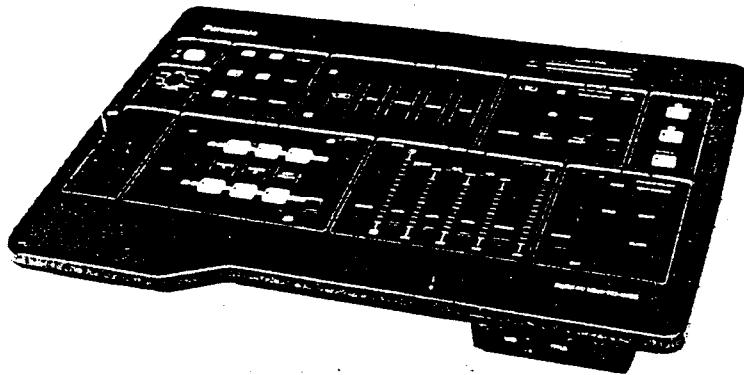


Service Manual

Digital AV Mixer
WJ-AVE5



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Panasonic

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

SPECIFICATIONS

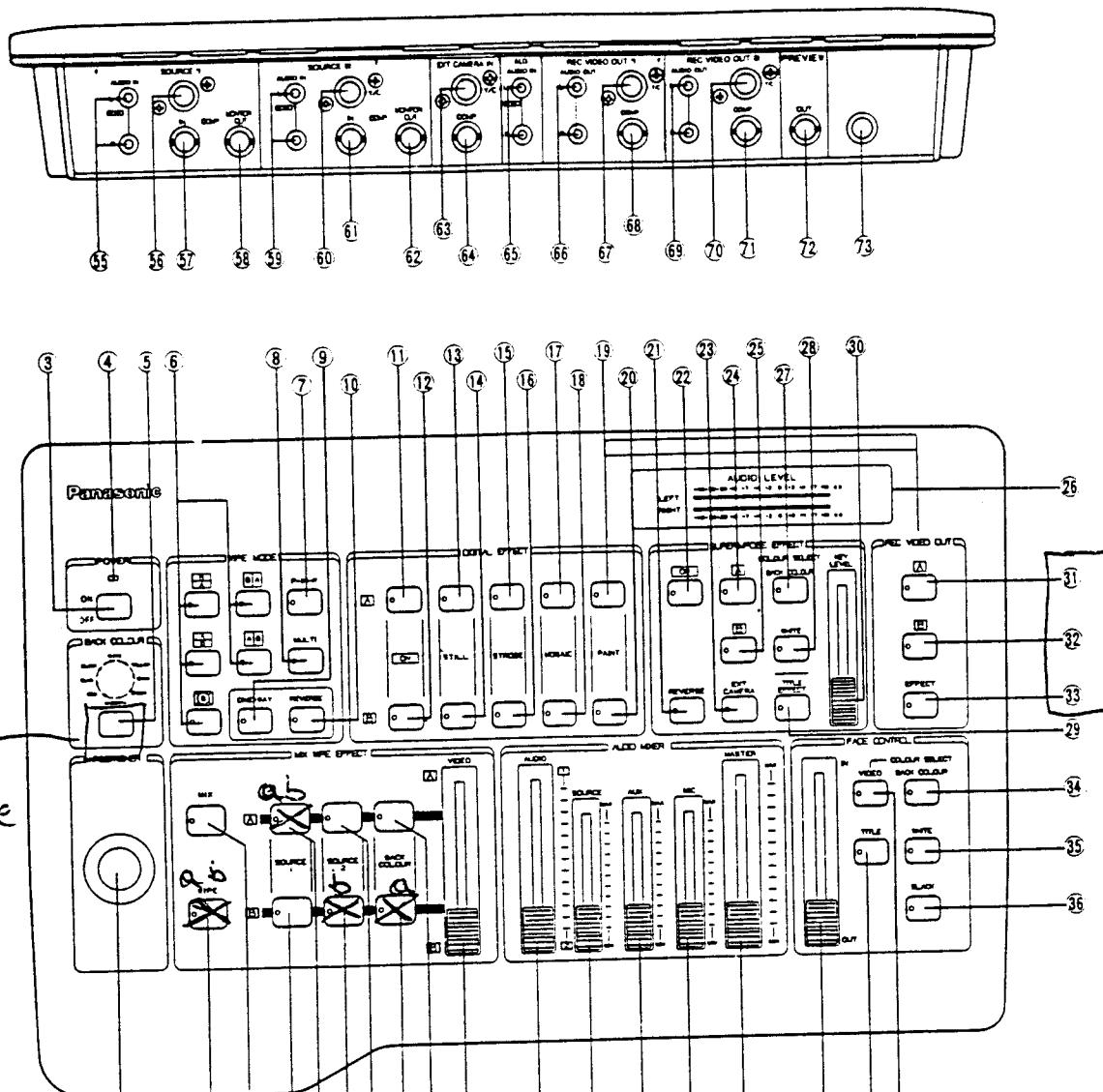
Source Input:	× 2 (SOURCE 1 and SOURCE 2)
Video Input:	1.0 Vp-p/75 ohms PAL composite signal, BNC connectors
Y/C Input:	Y signal; 1 Vp-p, C signal; 0.3 Vp-p, 75 ohms, Mini DIN 4 pin connector
Audio Input:	-6 dBV/15 kohms, pin jack (Left and Right)
External Camera Input:	1.0 Vp-p/75 ohms CCIR or PAL composite signal, BNC connector × 1
Recording Output:	× 2 (REC OUT 1 and REC OUT 2)
Video Output:	1.0 Vp-p/75 ohms, PAL composite signal, BNC connectors
Y/C Output:	Y signal; 1 Vp-p, C signal; 0.3 Vp-p 75 ohms, Mini DIN 4 pin connector
Audio Output:	-6 dBV/1 kohms, pin jack (left and Right)
Preview Video output:	1.0 Vp-p/75 ohms, PAL composite signal, BNC connector × 1
Monitor Output:	× 2 (MONITOR OUT 1 and MONITOR OUT 2) 1.0 Vp-p/75 ohms, PAL composite signal, BNC connector.
External Sound Input:	
MIC Input (mono):	-60 dB/600 ohms, unbalanced, tip-ring-sleeve type phono jack × 1
AUX Input:	-6 dBV/15 kohms, pin jacks (Left and Right)
Character (TITLE) Input:	10-pin connector × 1 for optional Character Generator WV-KB12 or WJ-TTL5
Effects:	
Video:	Still, Strobe, Mosaic, Paint, Mix, Wipe, Superimpose, Fade-in/out
Audio:	Mix, Fade
Back Colours:	White, Yellow, Cyan, Green, Magenta, Red, Blue, Black
Wipe Patterns:	98 patterns
Others:	P-IN-P, MULTI, ONE-WAY, REVERSE
Gain:	Unity (Video)
Signal-to-noise Ratio (Typical):	Video: 45 dB (Composite), 45 dB (Y/C) Audio: 60 dB
Power Source:	240 AC, 50 Hz for WJ-AVE5/A and WJ-AVE5/B; 220V AC 50 Hz for WJ-AVE5/G
Power Consumption:	13W
Ambient Temperature:	0° - 40°C
Ambient Humidity:	Less than 90%
Dimensions:	420(W) × 70(H) × 280(D) mm
Weight:	2.8 kg

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

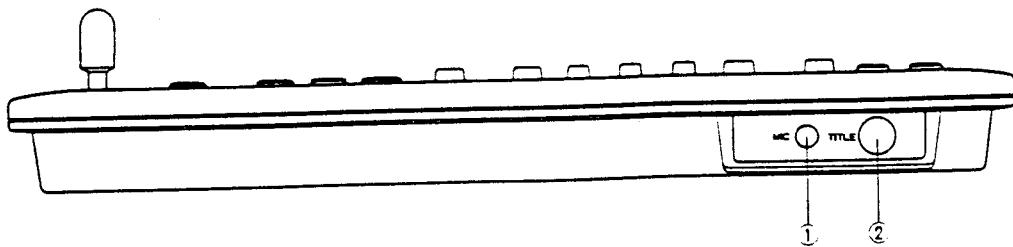
OPTIONAL ACCESSORIES

- Character Generator WV-KB12, WJ-TTL5

MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS



a = Source 1
b = Source 2



1 Microphone Input Jack (MIC)

This jack is used to connect a microphone with a tip-ring-sleeve or tip-sleeve type phone plug.

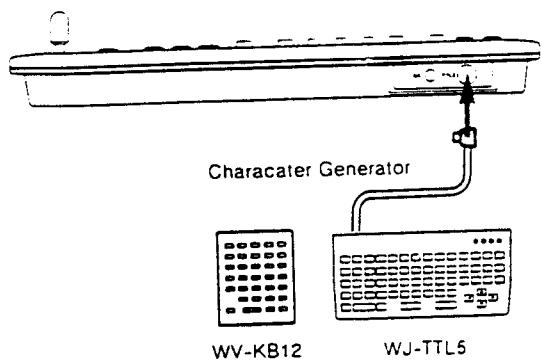
2. Title Input Connector (TITLE)

This connector is used to connect the optional Character Generator WV-KB12 or 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) : ID (WV-KB1)

Notes:

- When WV-KB12 is used with this unit, the following functions of the WV-KB12 are Disabled:
 - Stopwatch display
 - Title colour setting
 - Title page display
 - During scrolling of titles in the smallest character size using WJ-TTL5, the place 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 WV-KB12 or WJ-TTL5 to the Title Input Connector (2) as shown below.



3. Power ON/OFF Switch (POWER ON/OFF)

Power ON/OFF SWITCH
Press this switch to turn on the power. The Power Indicator (4) lights up when this switch is pressed.

4. Power Indicator (POWER)

5. Back Colour Selection Switch (BACK COLOUR)

This control is used to select the background colour for Mix, Wipe, Superimpose and Video Fader operations. One of the following eight background colours can be chosen: White, Yellow, Cyan, Green, Magenta, Red, Blue and Black. The colour changes by pressing this switch.

6. Wipe Pattern Selection Switches (WIPE MODE)

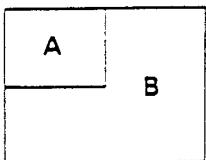
In combination of five switches, the following wipe patterns can be made as shown in the table. The LED lights when pressed. Please note that the positioning of the pattern by operating a Joystick Positioner (54) is effective for three patterns marked "P" in the table.

7. Picture-In-Picture Switch (P-IN-P)

A 1/4 sized · Picture-In-Picture mode will be obtained by pressing this switch once. The LED lights up. When this switch is pressed again, a 1/16 sized · Picture -In-Picture mode will be obtained. The positioning of the Picture-In-Picture mode can be operated by the Joystick Positioner (54). When this switch is pressed third time, this mode ends to return to a normal picture mode. Then LED lights off.

Notes:

- (1) When you change the Mix/Wipe Control (45) from A to B or B to A in P-IN-P mode, the pictures alter their position from B to A or A to B correspondingly.
- (2) When a 1/4 sized or 1/16 sized · picture is positioned to the left edge, the P-IN-P mode may not be completed in the fringe area for some television monitor.



- (3) The Strobe and the Still will not function when the picture-in-picture mode is used.

8. Multi Wipe Pattern Switch (MULTI)

When this switch is pressed once, the wiped pattern multiplied by four times. And when this switch is pressed again, the wiped pattern multiplied by sixteen times. The LED lights up when this mode is selected. The LED lights off when this switch is pressed three times to return to normal wipe mode.

9. One-Way Wipe Switch (ONE-WAY)

When this switch is pressed, the LED lights up, the wiping direction stays same in regardless of changing the Mix/Wipe Control (45).

10. Reverse Wipe Switch (REVERSE)

When this switch is pressed, the LED lights up, the position of the wiped pictures will be laid reversely.

11. A-bus Digital Effect ON/OFF Switch (ON)-A

This switch is the A-bus ON/OFF switch for the digital effects, such as STROBE, STILL, MOSAIC and PAINT.

12. B-bus Digital Effect ON/OFF Switch (ON)-B

This switch is the B-bus ON/OFF switch for the digital effects, such as STROBE, STILL, MOSAIC and PAINT.

13. A-bus Still ON/OFF Switch (STILL)-A

This switch is used to freeze the A-bus picture. Pressing this switch once, the A-bus image will freeze and the LED indicator in the switch lights. To return to a "live" picture, press the switch once more. The LED indicator goes off.

14. B-bus Still ON/OFF Switch (STILL)-B

This switch is used to freeze the B-bus picture. Pressing this switch once, the B-bus image will freeze and the LED indicator in the switch lights. To return to a "live" picture, press the switch once more. The LED indicator goes off.

15. A-bus Strobe ON/OFF Switch (STROBE)-A

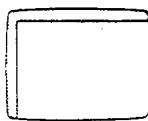
This switch is used to obtain a strobe effect of the A-bus picture. Pressing this switch once, strobe effect is applied to the A-bus image and the LED indicator in the switch lights. The time interval of the strobe effect can be changed by pressing this switch repeatedly. Adjustment is possible from approx. 0.2 to 1 second in five steps. To return to a normal picture, press the switch once more. The LED indicator goes off.

16. B-bus Strobe ON/OFF Switch (STROBE)-B

This switch is used to obtain a strobe effect of the B-bus picture. Pressing this switch once, strobe effect is applied to the B-bus image and the LED indicator in the switch lights. The time interval of the strobe effect can be changed by pressing this switch repeatedly. Adjustment is possible from approx. 0.2 to 1 second in five steps. To return to a normal picture, press the switch once more. The LED indicator goes out.

17. A-bus Mosaic ON/OFF Switch (MOSAIC)-A

This switch is used to obtain a mosaic effect of the A-bus picture. Pressing this switch once, a mosaic effect is applied to the A-bus image and the LED indicator in the switch lights. The mosaic size can be changed in four steps by pressing this switch repeatedly.



When the mosaic effect is selected, the mosaic effect is not performed in the left and top edges. It does not indicate equipment failure. To return to a normal picture, press the switch once more. the LED indicator goes off.

18. B-bus Mosaic ON/OFF Switch (MOSAIC)-B

This switch is used to obtain a mosaic effect of the B-bus picture. Pressing this switch once, a mosaic effect is applied to the B-bus image and the LED indicator in the switch lights. The mosaic size can be changed in four steps by pressing this switch repeatedly.



When the mosaic effect is selected, the mosaic effect is not performed in the left and top edges. It does not indicate equipment failure. To return to a normal picture, press the switch once more. the LED indicator goes off.

19. A-bus Paint ON/OFF Switch (PAINT)-A

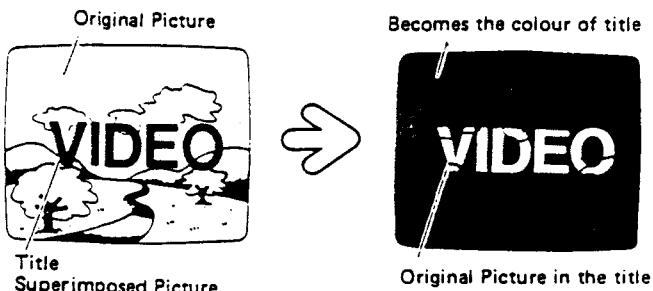
This switch is used to obtain an oil-paint touch effect for the A-bus picture. Pressing this switch once, an oil paint touch effect is applied to the A-bus image and the LED indicator in the switch lights. The graduation of paint effect can be changed in 4 steps (2 bits to 5 bits). To return to a normal picture, press the switch once more. The LED indicator goes off.

20. B-bus Paint ON/OFF Switch (PAINT)-B

This switch is used to obtain an oil-paint touch effect for the B-bus picture. Pressing this switch once, an oil paint touch effect is applied to the B-bus image and the LED indicator in the switch lights. The graduation of paint effect can be changed in 4 steps (1 bit to 4 bits). To return to a normal picture, press the switch once more. The LED indicator goes off.

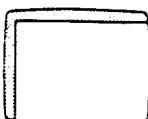
21. Reverse Switch (REVERSE)

This switch is used to select the polarity of the superimposed key signal.



22. Superimpose ON/OFF Switch (ON)

This is the master ON/OFF switch for the superimpose function.



When the superimpose effect is selected, the superimpose effect is not performed in the left and top edges. It does not indicate equipment failure.

23. External Camera Selection Switch (EXT CAMERA)

This switch is used to select a external camera as a key signal for the Superimpose Effect.

24. A-bus Selection Switch (A)

This switch is used to select a A-bus picture as a key signal for the Superimpose Effect.

25. B-bus Selection Switch (B)

This switch is used to select a B-bus picture as a key signal for the Superimpose Effect.

26. Audio Level Indicator (AUDIO LEVEL)

These LED indicators show the output level for the left and right channels respectively.

27. Back Colour Switch (BACK COLOUR)

This switch is used to select the colour of the superimposed titles chosen by the Back Colour Selection Switch (5).

28. White Colour Switch (WHITE)

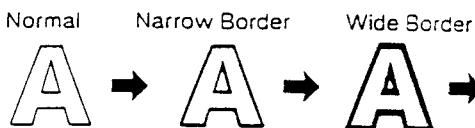
This switch is used to select the colour of the superimposed titles as a white colour.

29. Title Effect Switch (TITLE EFFECT)

By depressing this switch, the superimposed titles can be changed as follows:

Normal → Narrow Border → Wide Border →

→ Narrow Shadow → Wide Shadow → Drop Shadow →



30. Key Level Control (KEY LEVEL)

This control is used to adjust the luminance level of the key signal.

31. A-bus Recording Video Output Selection Switch (REC VIDEO OUT/A)

This switch is used to select the A-bus picture as for the Recording Video Output signal. The LED lights up when this switch is selected.

32. B-bus Recording Video Output Selection Switch (REC VIDEO OUT/B)

This switch is used to select the B-bus picture as for the Recording Video Output signal. The LED lights up when this switch is selected.

33. Effect Recording Video Output Selection Switch (REC VIDEO OUT/EFFECT)

This switch is used to select the effected signal (Superimpose, Mix/Wipe or Fade) as for the Recording Video Output signal. The LED lights up when this switch is selected.

34. Colour Selection Switch (BACK COLOUR)

This switch is used to select the colour for the fade-out mode. The colour is set by the Back Colour Selection Switch (5). The LED lights up when this switch is selected.

35. Colour Selection Switch (WHITE)

This switch is used to select a white colour when the picture fades out in white. The LED lights up when this switch is selected.

36. Colour Selection Switch (BLACK)

This Switch is used to select a black colour when the picture fades out in black. The LED lights up when this switch is selected.

37. Video Fade Switch (VIDEO)

When this switch is selected, the picture will be faded in or out. The LED lights up when this switch is selected.

38. Title Fade Switch (TITLE)

When this switch is selected, the title will be faded in or out. The LED lights up when this switch is selected.

39. Fade Lever (IN/OUT)

Moving this lever from OUT to IN, fade-in of the picture takes place. Fade-out is accomplished by moving the lever from IN to OUT.

40. Audio Master Level Control (MASTER, MAX/MIN)

This is the overall attenuator for the Audio Mixer.

41. Microphone Level Control (MIC, MAX/MIN)

This is the attenuator for the microphone signal fed to the Microphone Input Jack (1).

42. Auxiliary Audio Level Control (AUX, MAX/MIN)

This is the input attenuator for the auxiliary audio signal fed to the Auxiliary Audio Input Connectors (65) on the rear panel.

43. Source Level Control (SOURCE, MAX/MIN)

This is the overall attenuator for the mixed AUDIO 1 and AUDIO 2 sound.

44. Audio Control (AUDIO, 1/2)

This control is used to balance the mixed audio signal fed to SOURCE 1 (AUDIO 1) input connector and the signal fed to SOURCE 2 (AUDIO 2) input connector on the rear panel.

45. Mix/Wipe Control (VIDEO A, B)

In the wipe mode, moving this lever from A to B will increase the portion of the B input, and vice versa. In the mix mode, video images are switched between A and B.

46. A-bus Back Colour Selection Switch

(BACK COLOUR)

This switch is used to allocate the back colour signal to the A-bus input. The back colour signal can be set by the Back Colour Selection Switch (5). The LED lights up when this switch (46) is selected.

47. B-bus Back Colour Selection Switch

(BACK COLOUR)

This switch is used to allocate the back colour signal to the B-bus input. The back colour signal can be set by the Back Colour Selection Switch (5). The LED lights up when this switch (47) is selected.

Note:

When the B-bus Back Colour Selection Switch (47) is selected from the B-bus Source 2 Selection Switch (49), the LED on the B-bus Source 2 Selection Switch (49) blinks.

This blinking tells you that the Source 2 picture will be selected when the B-bus Selection Switch (25) is pressed. The same procedure will take place when A-bus or Source 1 is used.

48. A-bus Source 2 Selection Switch (SOURCE 2)-A

This switch is used to allocate the source 2 video signal to the A-bus input. The LED lights up when this switch is selected.

49. B-bus Source 2 Selection Switch (SOURCE 2)-B

This switch is used to allocate the source 2 video signal to the B-bus input. The LED lights up when this switch is selected.

50. A-bus Source 1 Selection Switch (SOURCE 1)-A

This switch is used to allocate the source 1 video signal to the A-bus input. The LED lights up when this switch is selected.

51. B-bus Source 1 Selection Switch (SOURCE 1)-B

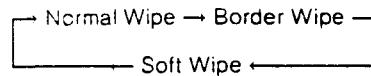
This switch is used to allocate the source 1 video signal to the B-bus input. The LED lights up when this switch is selected.

52. Mix Mode Selection Switch (MIX)

When this switch is pressed, the LED lights up, the mix mode is selected in the MIX/WIPE EFFECT.

53. Wipe Mode Selection Switch (WIPE)

When this switch is pressed, the LED lights up, the wipe mode is selected in the MIX/WIPE EFFECT. By pressing this switch, the wipe mode will be changed as follows:



Note:

When the Border Wipe is selected, the colour can be added on the border by the Back Colour Selection Switch (5).

54. Joystick Positioner (POSITIONER)

The position of the wiped pattern such as circle, square and diamond, which is selected by the Wipe Pattern Selection Switch (6) or the Picture-In-Picture Switch (7), can be freely set using this joystick.

55. Source 1 Audio Connectors

(SOURCE 1, AUDIO L/R)

-6 dBV/15 kohms audio signals for the SOURCE 1 should be supplied to these input (IN) connectors. When the monophonic audio signal is fed to the L-channel, this signal will be distributed to the R-channel internally.

56. Source 1 Y/C Video Input Connector

(SOURCE 1, Y/C IN)

The luminance (Y) and chroma (C) signals from VTR or colour TV should be supplied to this connector.

Note:

The Y/C input has a priority over the composite input in circuitry.

When both the Y/C video signal and the composite video signal are supplied to the SOURCE 1 connectors at the same time, only Y/C video signal goes into the circuit.

57. Source 1 Video Input Connector (SOURCE 1, COMP.IN)

A 1.0 Vp-p/75 ohms composite video signal should be supplied to the input (IN) connector.

Notes:

- (1) If the input signal does not meet the PAL colour standard or the CCIR B/W standard, this could cause synchronization error.
- (2) In case the S/N ratio of the input signal is very low, this may reflect to in a low-quality picture.
- (3) If the input video signal is very jittery, such as a picture played back on a VTR, synchronization or colour error may appear.

58. Source 1 Video Output Connector

(SOURCE 1, COMP. MONITOR OUT)

A 1.0Vp-p/75 ohms composite video signal will be supplied at this connector for the monitoring purpose of the Source 1 Video Input signal.

59. Source 2 Audio Connectors

(SOURCE 2, AUDIO L/R)

-6 dBV/15 kohms audio signals for the SOURCE 2 should be supplied to these input (IN) connectors. When the monophonic audio signal is fed to the L-channel, this signal will be distributed to the R-channel internally.

60. Source 2 Y/C Video Input Connector

(SOURCE 2, Y/C IN)

The luminance (Y) and chroma (C) signals from VTR or colour TV should be supplied to this connector.

Note:

The Y/C input has a priority over the composite input in circuitry.

When both the Y/C video signal and the composite video signal are supplied to the Source 2 connectors at the same time, only Y/C video signal goes into the circuit.

61. Source 2 Video Input Connector

(SOURCE 2, COMP. IN)

The IN connector accepts a 1.0 Vp-p/75 ohm composite video signal.

Notes:

- (1) If the input signal does not meet the PAL colour standard or the CCIR B/W standard, this could cause synchronization error.
- (2) In case the S/N ratio of the input signal is very low, this may reflect to in a low-quality picture.
- (3) If the input video signal is very jittery, such as a picture played back on a VTR, synchronization or colour error may appear.

62. Source 2 Video Output Connector

(SOURCE 2, COMP. MONITOR OUT)

A 1.0 Vp-p/75 ohms composite video signal will be supplied at this connector for the monitoring purpose of the Source 2 Video Input signal.

63. Y/C External Camera Input Connector

(EXT CAMERA IN Y/C)

The luminance (Y) and chroma (C) signal from VTR or colour TV should be supplied to this connector.

Note:

1. The Y/C input has a priority over the composite input in circuitry.
When both the Y/C video signal and the composite video signal are supplied to the External Camera Input connectors at the same time, only Y/C video signal goes into the circuit.
2. This input accepts only video camera signal and will not accept VTR playback signal.

64. Composite Video External Camera Input Connector (EXT CAMERA IN COMP.)

For the key signal in the superimpose mode, this connector accepts a 1.0 Vp-p/75 ohms composite video signal. The external sync is not necessary for the camera.

Note:

This input accepts only video camera signal and will not accept VTR playback signal.

65. Auxiliary Audio Input Connectors (AUX AUDIO IN)

Accept -6 dBV/15 kohms audio signal from an external audio source. When the monophonic audio signal is fed to the L-channel, this signal will be distributed to the R-channel internally.

66. Recording Audio Output Connectors

(AUDIO OUT 1, L/R)

-6 dBV/1 kohms audio signals for recording are supplied at these connectors.

67. Y/C Recording Video Output Connector

(REC VIDEO OUT 1, Y/C)

The luminance (Y) and chroma (C) signals are obtained from this connector when composite or Y/C signal is supplied to source 1 or 2.

68. Recording Video Output Connectors

(REC VIDEO OUT 1, COMP.)

A 1.0 Vp-p/75 ohm composite video signal, as selected by the Recording Video Output Selection Switches (31), (32), (33), is provided at these connectors.

69. Recording Audio Output Connectors

(AUDIO OUT 2, L/R)

-6 dBV/1 kohms audio signals for recording are supplied at these connectors.

70. Y/C Recording Video Output Connector

(REC VIDEO OUT 2, Y/C)

The luminance (Y) and chroma (C) signals are obtained from this connector when composite or Y/C signal is supplied to source 1 or 2.

71. Recording Video Output Connectors

(REC VIDEO OUT 2, COMP.)

A 1.0 Vp-p/75 ohm composite video signal, as selected by the Recording Video Output Selection Switches (31), (32), (33), is provided at these connectors.

72. Preview Output Connector (PREVIEW OUT)

A 1.0 Vp-p/75 ohm composite video signal of the EFFECT (all effect) image is provided at this connector.

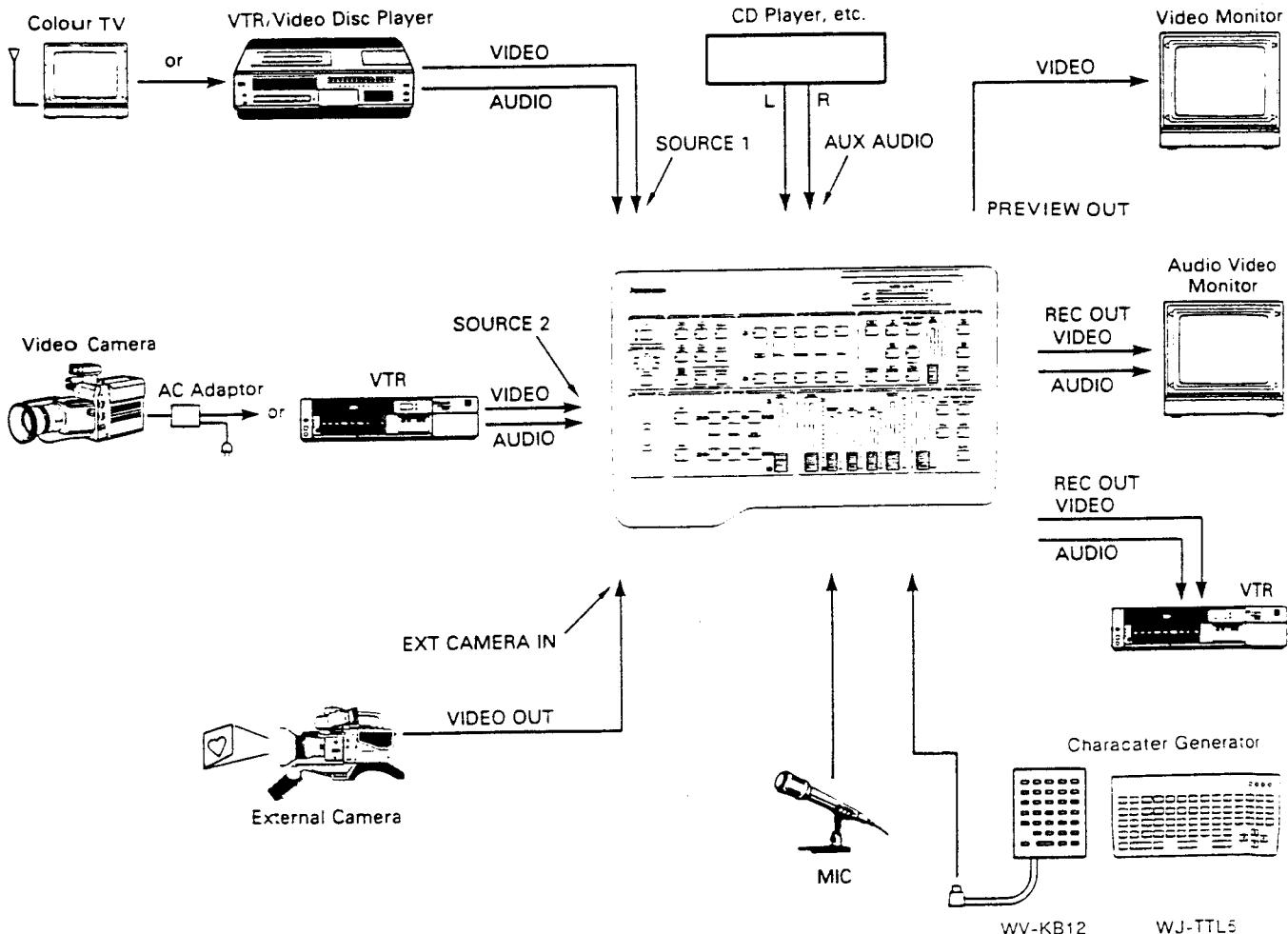
73. Power Cord

SYSTEM CONNECTION

Caution:

Keep the POWER CN/OFF switch turned OFF while making the connections.

1. Connect the coaxial cable with BNC connectors between the video output of the VTR, Video Disc Player, TV Tuner Output or Video Camera and the SOURCE 1 COMP. IN connector on the rear panel of the Digital AV Mixer or connect Y/C cable (4 pin) between VTR and the SOURCE 1 Y/C Video Input Connector on the rear panel of the Digital AV Mixer.
2. Connect the audio cable with pin plugs between the audio output of the VTR, Video Disk Player, TV Tuner Output or Video Camera and the SOURCE 1 AUDIO IN connectors on the rear panel of the Digital AV Mixer.
3. Connect the coaxial cable or Y/C cable (4 pin) and audio cable for the SOURCE 2 inputs of the Digital AV Mixer in the same manner as steps 1 and 2 above.
4. Connect the coaxial cable with BNC connectors between the video output of the external camera (B/W or colour camera for superimposing) and the EXT CAMERA IN connector of the Digital AV Mixer.
5. If the Character Generator WV-KB12 or WJ-TTL5 (sold separately) is used, connect the 10-pin cable connector of the Character Generator to the TITLE connector of the Digital AV Mixer.
6. If an auxiliary audio source is required, connect the audio cable with pin plugs between the audio output of the audio source (CD player, Tape Recorder or Record Player) and the AUX IN connectors of the Digital AV Mixer.
7. If necessary, connect the microphone cable with a tip-ring-sleeve type or tip-sleeve type phone plug to the MIC input connector of the Digital AV Mixer.
8. For previewing the image, connect the coaxial cable with BNC connectors between the PREVIEW OUT connector of the Digital AV Mixer and the VIDEO IN connector of a video monitor.
9. For recording, connect the coaxial cables with BNC connectors (Y/C cable) between the REC VIDEO OUT connectors of the Digital AV Mixer and the VIDEO IN connectors of the VTR and Video Monitor.
10. For recording, connect the audio cable with pin plugs between the REC AUDIO OUT connectors of the Digital AV Mixer and the AUDIO IN connectors of the VTR and Video Monitor.



System Connections

CIRCUIT DESCRIPTION

1. POWER BOARD

This board receives AC power through power cord and supply it to the Regulator board in order to make +5V DC, +12V DC and -12V DC.

The regulated DC powers from the Regulator board are supplied to this board again and removed the noise on the DC power line by filter consisting of capacitor and inductor.

The DC powers thus obtained are fed to the other circuit board.

2. REGULATOR BOARD

This board receives AC power from the Power board and regulates +5V DC, +12V DC and -12V DC powers.

When the power switch on the Power board is turned ON, AC power is rectified by D1, DC appears at cathodes side of D1 and motive current for switching transistor Q2 is fed through R2 and r3 and turning Q2 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 B2 and B1) of T1 due to induction.

3. REAR PANEL BOARD

3-1 Input Signal Section

This board receives all input signals supplied to this mixer and sends them to the Main board for video signals, the Switch board for audio signals.

3-1-1 Composite Video Signal

The composite video signal supplied from the composite video input connector CN1 on the rear panel is fed to the filters through buffer Q1. The low pass filter CF1 passes through luminance (Y) signal only and sends it to the Main board. The band pass filter CF2 passes through chrominance (C) signal (4.43MHz : PAL, 3.58MHz : NTSC component) only and sends it to the Main board.

3-1-2 Y/C Signal

The Y and C signals supplied from the Y/C video input connector on the Rear Panel are fed to the Main board through buffer Q4 and Q5 respectively.

3-1-3 Video Signal for External Video Camera

When the external camera is connected to the Composite Video External Camera Input Connector CN8, the composite video signal is supplied to the 4.43MHz Trap (PAL), 3.58MHz Trap (NTSC) and luminance (Y) signal only is sent through

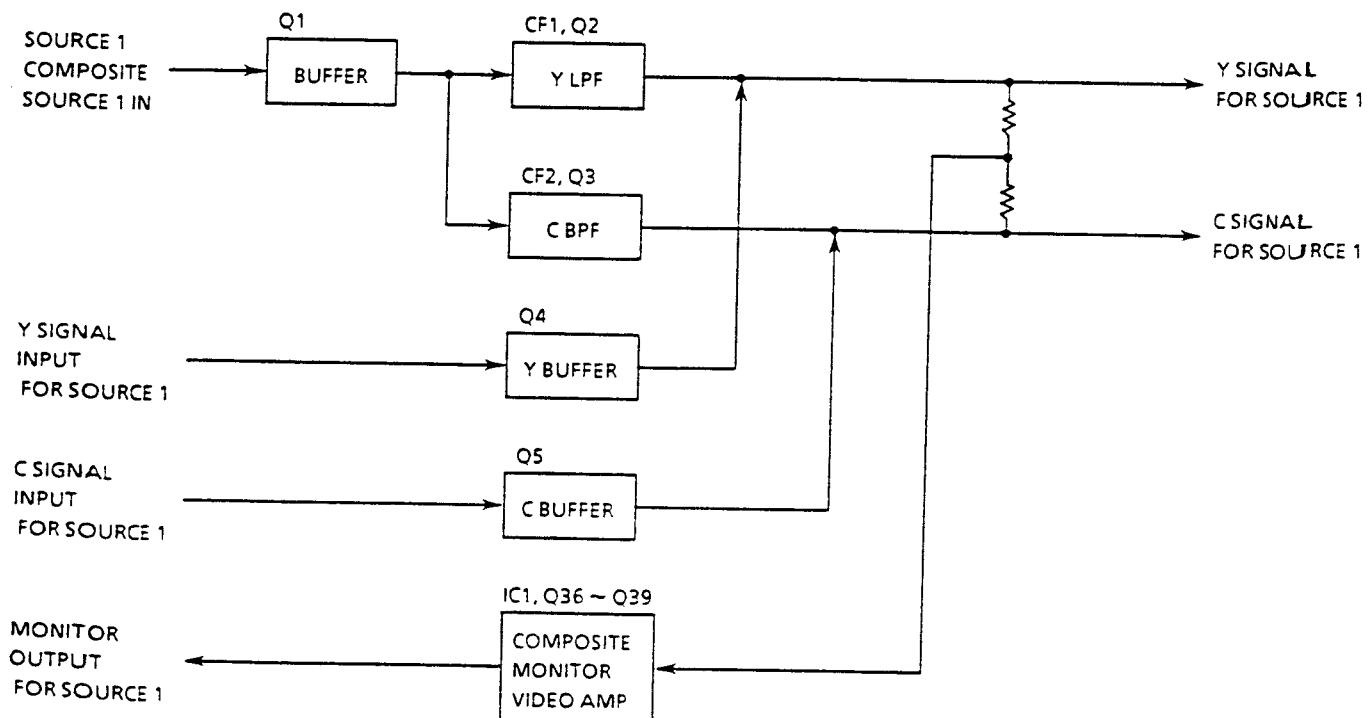


Fig. 3-1 Input Signal Section

buffer Q32 to the Main board for the key signal in the superimpose mode.

When the external camera is connected to the Y/C External Camera Input Connector SK5, the luminance (Y) signal only is sent to the Main board through buffer Q33 and pin 11 of CN11 for the key signal in the superimpose mode.

3-2 Output Signal Section

This board receives the effected Y and C signals from the Main board and converts it into the composite video signal.

3-2-1 Y/C Recording Video Output Signal

The luminance (Y) signal obtained at pin 7 of CN11 is sent through the amplifier consists of Q17 to Q19 and Q34 to the Y/C Recording Video Output Connector as Y signal.

The chrominance (C) signal obtained at pin 9 of CN11 is supplied through the amplifier consists of Q20 to Q23 to the Y/C Recording Video Output Connector as C signal.

3-2-2 Composite Recording Video Output Signal

The Y signal obtained at pin 7 of CN11, the C signal obtained at pin 9 of CN11 are sent to the buffer Q30 and Q29 respectively and they are mixed at the base of Q35 in order to make a composite video signal. The composite video signal thus obtained at the emitter of Q35 is fed through the amplifiers IC3 and Q24 to Q27 to the Recording Video Output Connector on the Rear panel.

3-2-3 Source (Monitor) 1 and 2 Video Output Signal

The Y and C signals made by composite video signal or supplied from the Y/C Video Input Connector are mixed at the cross point of R10 and R11 in order to make a composite video signal and it is sent to the Video Output Connector CN2 through the amplifier consists of IC1 and Q36 to Q39.

4. SWITCH BOARD

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

4-1 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, all LEDs lights by pressing the switches on this board.

4-2 Audio Signal Section

This circuit receives audio signals and sends them out to the Rear board by mixing them and by adjusting their levels.

a. VR1 (AUDIO CONTROL)

This control is used to balance the mixed audio signal fed to SOURCE 1 input connector and the signal fed to SOURCE 2 input connector.

b. VR2 (SOURCE LEVEL CONTROL)

This control is the overall attenuator for the mixed AUDIO 1 and AUDIO 2 sound.

c. VR3 (AUX AUDIO LEVEL CONTROL)

This control is the input attenuator for the auxiliary audio signal fed to the Auxiliary Audio Input Connectors.

d. VR4 (AUDIO MASTER LEVEL CONTROL)

This control is the overall attenuator for the Audio Mixer.

e. VR11 (MIC LEVEL CONTROL)

This control is the attenuator for the microphone signal fed to the Microphone Input Jack.

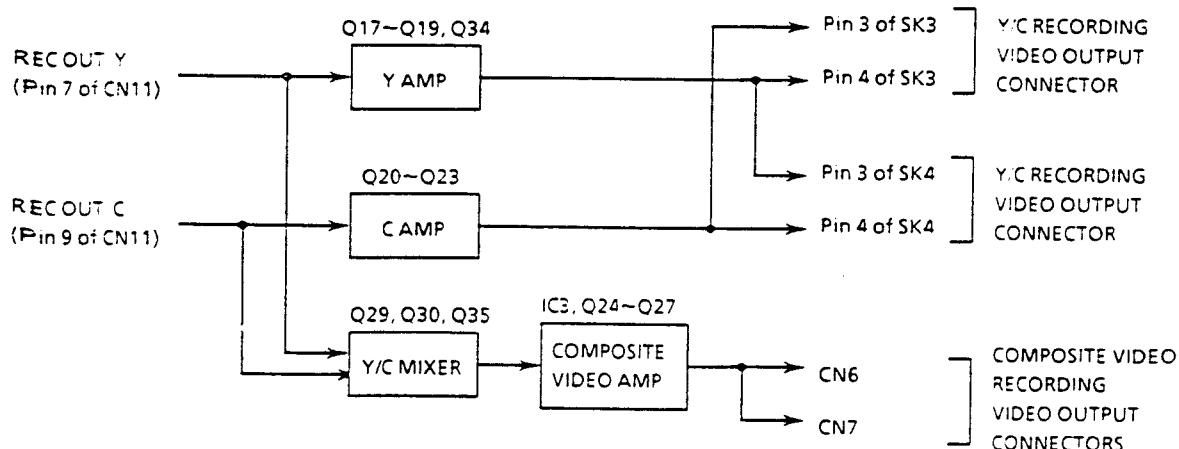


Fig. 3-2 Output Signal Section

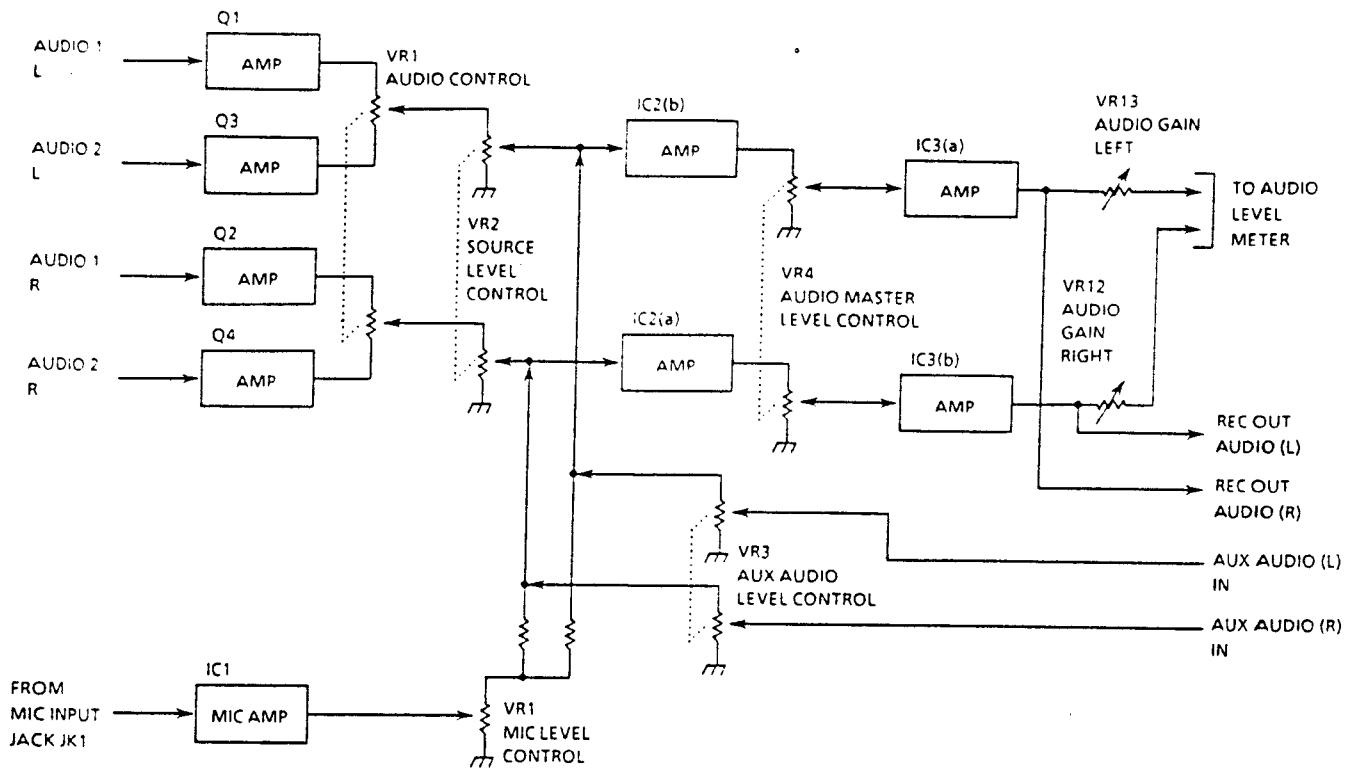


Fig. 4-1 Audio Signal Section

5. MAIN BOARD

5-1 Analog Signal Section

5-1-1 A/D Converter Circuit

This circuit generates Y, R-Y & B-Y signals from the VIDEO 1 and 2 and separates composite sync signals from them as shown in the figure 5-2.

5-1-2 D/A Converter Circuit

This circuit receives 8 bits digital signals and converts them into analog signals as shown in the figure 5-1.

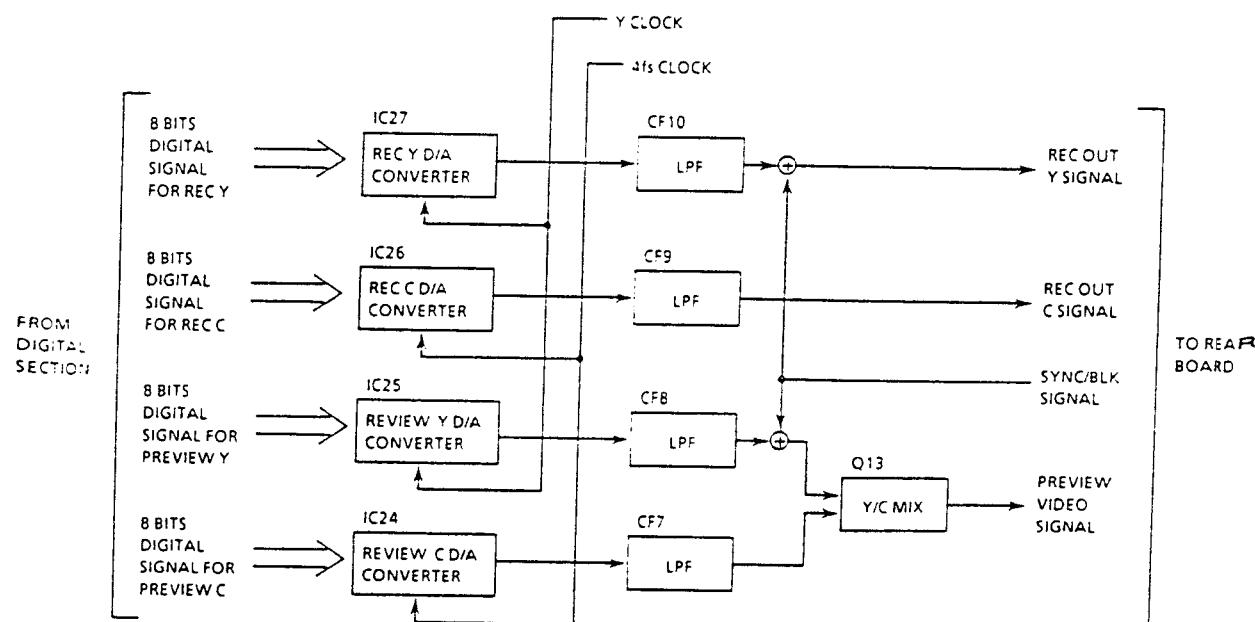


Fig. 5-1 D/A Converter Circuit

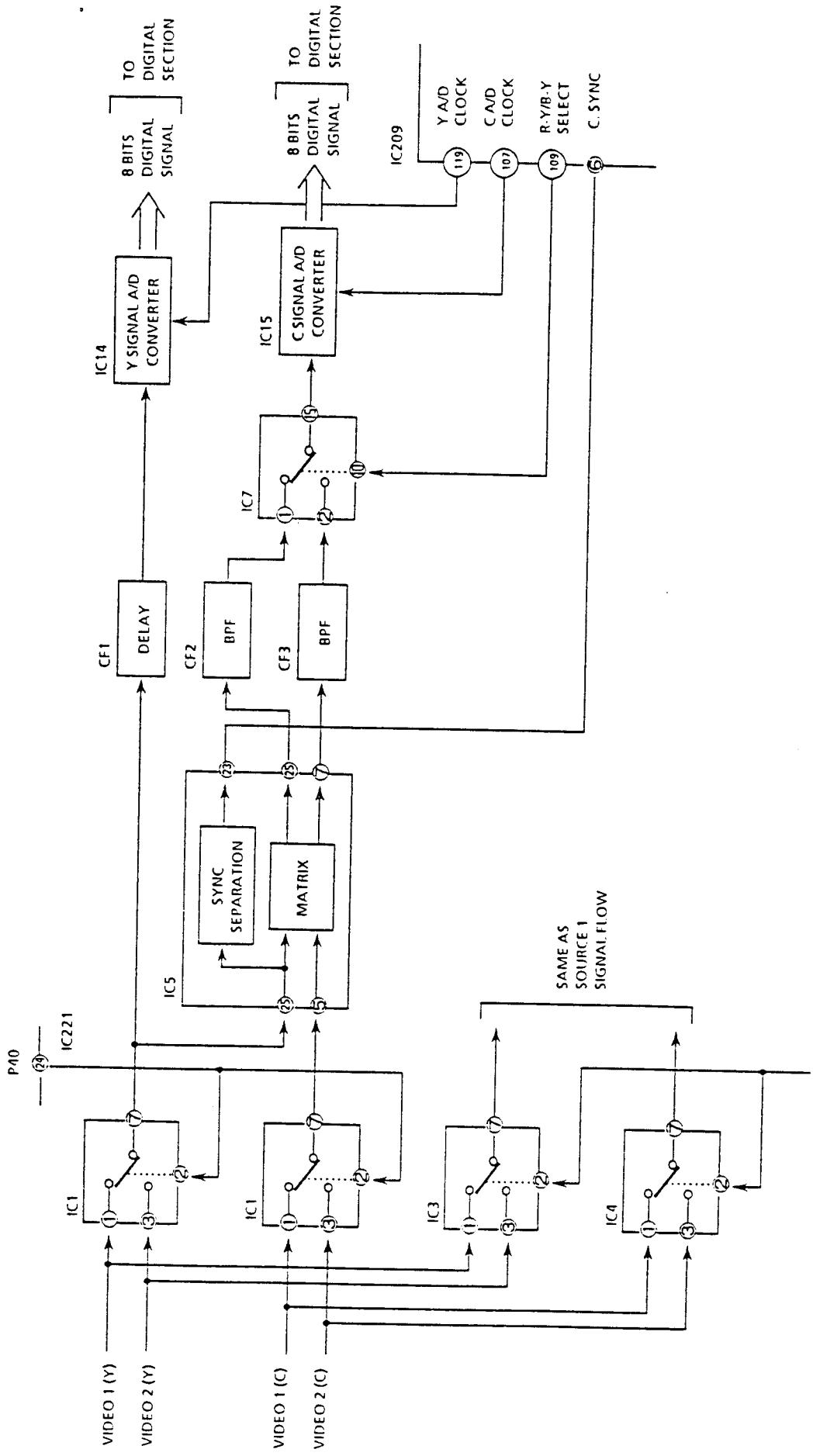


Fig. 5-2 A/D Converter Circuit

5-2 Digital Signal Section

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

5-2-1 Memory Control IC

Memory Control IC (MN53040LVX3) has the following function and generator 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

Pin identification is as follows.

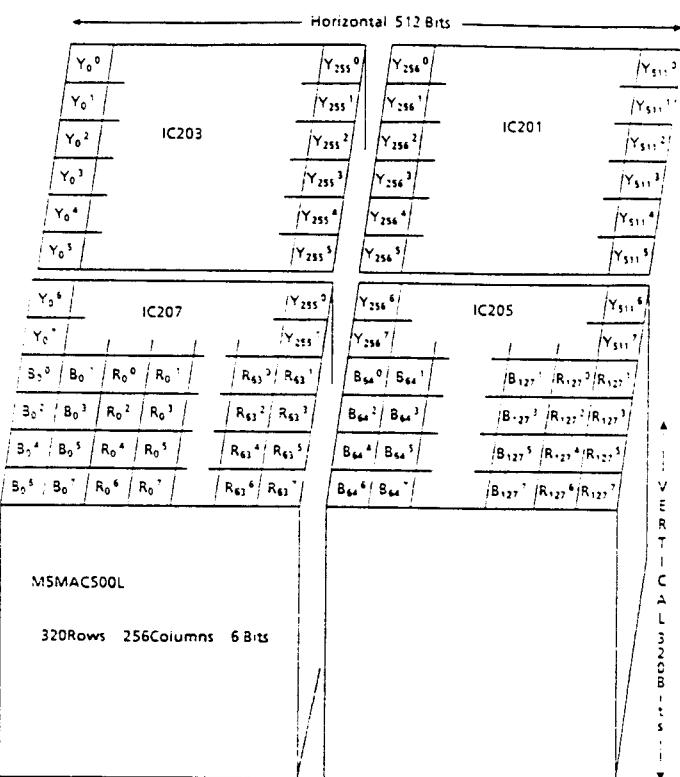
Pin No.	Pin Name	In/Out	Description	31	FIELD	In	Field/Frame Mode Select (H : Field, L : Frame)
1	VCO	—	Not Used	32	RST	In	Reset for Initialize
2	VSS	—	Ground	33	ANOTH	Out	Picture in Picture Pulse
3	WPC	Out	Write PLL Phase Comparator	34	YCD7	Out	Y. Chroma Data 7
4	WCLMP	Out	Write Clamp Pulse	35	YCD6	Out	Y. Chroma Data 6
5	WHBLK	Out	Write Horizontal Blanking Pulse	36	YCD5	Out	Y. Chroma Data 5
6	EXSYNC	In	External Sync from Sync Separator	37	YCD4	Out	Y. Chroma Data 4
7	ST	In	Strobe Pulse for Data Latch Gate	38	YCD3	Out	Y. Chroma Data 3
8	REG0	In	Register 0	39	YCD2	Out	Y. Chroma Data 2
9	REG1	In	Register 1	40	YCD1	Out	Y. Chroma Data 1
10	REG2	In	Register 2	41	YCD0	Out	Y. Chroma Data 0
11	REG3	In	Register 3	42	MC3	In	Memory Chroma Data 3
12	D0	In	Data 0	43	MC2	In	Memory Chroma Data 2
13	D1	In	Data 1	44	MC1	In	Memory Chroma Data 1
14	BS	In	B ch/A ch Select (H : B ch, L : Ach)	45	MC0	In	Memory Chroma Data 0
15	VDD	In	+ 5V DC Power	46	VSS	—	Ground
16	HIGH	In	Resolution High/Low Control (H : 14.3MHz, L : 9.6MHz)	47	PAL	In	NTSC or PAL (H : PAL, L : NTSC)
17	VSS	—	Ground	48	VDD	In	+ 5V DC Power
18	D2	In	Data 2	49	MY7	In	Memory Y Data 7
19	D3	In	Data 3	50	MY6	In	Memory Y Data 6
20	D4	In	Data 4	51	MY5	In	Memory Y Data 5
21	D5	In	Data 5	52	MY4	In	Memory Y Data 4
22	D6	In	Data 6	53	MY3	In	Memory Y Data 3
23	D7	In	Data 7	54	MY2	In	Memory Y Data 2
24	V	In	Read Vertical Drive Pulse	55	MY1	In	Memory Y Data 1
25	H	In	Read Horizontal Drive Pulse	56	MY0	In	Memory Y Data 0
26	HS	In	Read H. Reset Pulse	57	VSS	—	Ground
27	YCLK	In	Y Clock for A/D Converter	58	VDD	In	+ 5V DC Power
28	YCLK	—	Not Used	59	SIC3	—	Not Used
29	RCLK	—	Not Used	60	SIC2	Out	Serial Input Clock 2
30	VSS	—	Ground	61	SIC1	Out	Serial Input Clock 1
				62	OEFN3	Out	Output Enable 3 (Positive)
				63	OEFN2	Out	Not used
				64	OEFN1	Out	Output Enable 1 (Negative)
				65	SOC3	Out	Serial Output Clock 3
				66	SOC2	Out	Serial Output Clock 2
				67	SOC1	Out	Serial Output Clock 1
				68	VSS	—	Ground
				69	VDD	In	+ 5V DC Power
				70	SIC3	—	Not Used
				71	SIC2	Out	Row Address Set Pulse
				72	SIC1	Out	Column Address Set Pulse
				73	RAS	Out	Address 0
				74	CAS	Out	Address 1
				75	A0	Out	Address 2
				76	A1	Out	Ground
				77	VSS	—	Ground
				78	TEST	In	Ground
				79	VDD	In	+ 5V DC Power
				80	A2	Out	Address 2

81	A3P	Out	Address 3 (Positive)
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
87	CTM3	Out	Chroma Data 3
88	CTM2	Out	Chroma Data 2
89	CTM1	Out	Chroma Data 1
90	CTM0	Out	Chroma Data 0
91	YTM7	Out	Y Data 7
92	YTM6	Out	Y Data 6
93	YTM5	Out	Y Data 5
94	YTM4	Out	Y Data 4
95	YTM3	Out	Y Data 3
96	YTM2	Out	Y Data 2
97	YTM1	Out	Y Data 1
98	YTM0	Out	Y Data 0
99	CAD7	In	A/D Chroma Data 7
100	CAD6	In	A/D Chroma Data 6
101	CAD5	In	A/D Chroma Data 5
102	CAD4	In	A/D Chroma Data 4
103	CAD3	In	A/D Chroma Data 3
104	-- CAD2	In	A/D Chroma Data 2
105	CAD1	In	A/D Chroma Data 1
106	CAD0	In	A/D Chroma Data 0
107	CADCK	Out	Clock for Chroma A/D Converter
108	VDD	In	+ 5V DC Power
109	CSL	Out	Clock for R-Y, B-Y Switching
110	VSS	—	Ground
111	YAD7	In	A/D Y Data 7
112	YAD6	In	A/D Y Data 6
113	YAD5	In	A/D Y Data 5
114	YAD4	In	A/D Y Data 4
115	YAD3	In	A/D Y Data 3
116	YAD2	In	A/D Y Data 2
117	YAD1	In	A/D Y Data 1
118	YAD0	In	A/D Y Data 0
119	YADCK	Out	Clock for Y A/D Converter
120	WHR	—	Not Used
121	2S	—	Not Used
122	SOR	—	Not Used
123	VDD	In	+ 5V DC Power
124	VCO	In	Voltage Controlled Oscillator for Write Clock

5-2-2 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.



Assignment of DRAM for 1 Field

Odd Field	IC203 (Y1 ~ Y6)	IC201 (Y1 ~ Y6)
	IC207 (Y7, Y8, C ~ C4)	IC205 (Y7, Y8, C ~ C4)
Even Field	IC212 (Y1 ~ Y6)	IC210 (Y1 ~ Y6)
	IC216 (Y7, Y8, C ~ C4)	IC214 (Y7, Y8, C ~ C4)

Left picture Right picture

Left picture Right picture

Fig. 5-3 Assignment of Memory IC

Pin identification is as follows.

Pin No.	Pin Name	In/Out	Description				
1	VSS	—	Ground	6	A4	In	Y. Chroma Data 4
2	SID1	In	Data 1	7	A5	In	Y. Chroma Data 5
3	SID2	In	Data 2	8	A6	In	Y. Chroma Data 6
4	SID3	In	Data 3	9	A7	In	Y. Chroma Data 7
5	SOD1	Out	Memory Data 1	10	BSEL	In	Bch Select
6	SOD2	Out	Memory Data 2	11	BOD	In	Border
7	SOD3	Out	Memory Data 3	12	CHR	In	Character
8	SOD4	Out	Memory Data 4	13	BLCHR	In	Character Blanking (Edge)
9	SOD5	Out	Memory Data 5	14	ABSUP	Out	Superimpose
10	SOD6	Out	Memory Data 6	15	VDD	In	+ 5V DC power
11	SID4	In	Data 4	16	YCLK	In	Y Clock for D/A Converter
12	SID5	In	Data 5	17	VSS	—	Ground
13	SID6	In	Data 6	18	RCLK	In	R Clock for D/A Converter
14	IR7/A7	In	Address 7	19	VSS	—	Ground
15	IR6/A6	In	Address 6	20	MD0	In	Memory Data 0
16	IR5/A5	In	Address 5	21	MD1	In	Memory Data 1
17	IR4/A4	In	Address 4	22	MD2	In	Memory Data 2
18	IR3/A3	In	Address 3	23	MD3	In	Memory Data 3
19	IR2/A2	In	Address 2	24	MD4	In	Memory Data 4
20	IR1/A1	In	Address 1	25	MD5	In	Memory Data 5
21	A8/A0	In	Address 0	26	MD6	In	Memory Data 6
22	IRS/CAS	In	Column Address Set Pulse	27	MD7	In	Memory Data 7
23	RAS/IRE	In	Row Address Set Pulse	28	BCD0	In	Color Bar Data 0
24	SIC	In	Serial Input Clock	29	BCD1	In	Color Bar Data 1
25	SOC	In	Serial Output Clock	30	BCD2	In	Color Bar Data 2
26	SIE	—	Ground	31	VDD	In	+ 5V DC Power
27	SOE	In	Output Enable-1 (Positive)	32	VSS	—	Ground
28	VCC	In	+ 5V DC Power	33	REG0	In	Register 0
				34	REG1	In	Register 1
				35	REG2	In	Register 2
				36	REG3	In	Register 3
				37	D0	In	Data 0
				38	D1	In	Data 1
				39	D2	In	Data 2
				40	D3	In	Data 3
				41	D4	In	Data 4
				42	D5	In	Data 5
				43	D6	In	Data 6
				44	D7	In	Data 7
				45	ST1	In	Strobe
				46	VSS	—	Ground
1	VSS	—	Ground	47	NCBLK	Out	Blanking Pulse (Negative)
2	A0	In	Y. Chroma Data 0	48	VDD	In	+ 5V DC Power
3	A1	In	Y. Chroma Data 1	49	VP	In	Vertical Pulse
4	A2	In	Y. Chroma Data 2	50	F4SC	In	Subcarrier
5	A3	In	Y. Chroma Data 3	51	LBSC	In	
				52	LSW	In	
				53	BFP	In	Burst Flag Pulse
				54	CBLK	In	Composite Blankin
				55	VDD	In	+ 5V DC Power

5-2-3 Wipe/Mix/Fade/Superimpose Control IC

This IC (MN53100LBG) has a following functions inside it.

- (a) Digital Mixing Function
- (b) Digital Fade Function
- (c) Digital Encoder Function
- (d) Superimpose Function
- (e) Back Color Generator

Pin identification is as follows.

Pin No.	Pin Name	In/Out	Description				
1	VSS	—	Ground	47	NCBLK	Out	Blanking Pulse (Negative)
2	A0	In	Y. Chroma Data 0	48	VDD	In	+ 5V DC Power
3	A1	In	Y. Chroma Data 1	49	VP	In	Vertical Pulse
4	A2	In	Y. Chroma Data 2	50	F4SC	In	Subcarrier
5	A3	In	Y. Chroma Data 3	51	LBSC	In	
				52	LSW	In	
				53	BFP	In	Burst Flag Pulse
				54	CBLK	In	Composite Blankin
				55	VDD	In	+ 5V DC Power

56	VSS	—	Ground	105	TD0	—	Not Used
57	TEST0	—	Not Used	106	TD1	—	Not Used
58	TEST1	—	Not Used	107	TD2	—	Not used
59	TEST2	—	Not Used	108	VDD	In	+ 5V DC Power
60	PRVC0	Out	Preview C0	109	TD3	—	Not Used
61	PRVC1	Out	Preview C1	110	VSS	—	Ground
62	VDD	In	+ 5V DC Power	111	TD4	—	Not Used
63	VSS	—	Ground	112	TD5	—	Not Used
64	PRVC2	Out	Preview C2	113	TD6	—	Not Used
65	PRVC3	Out	Preview C3	114	TD7	—	Not Used
66	PRVC4	Out	Preview C4	115	B0	In	Bch Y/C 0
67	PRVC5	Out	Preview C5	116	B1	In	Bch Y/C 1
68	PRVC6	Out	Preview C6	117	B2	In	Bch Y/C 2
69	PRVC7	Out	Preview C7	118	B3	In	Bch Y/C 3
70	VSS	—	Ground	119	B4	In	Bch Y/C 4
71	VDD	In	+ 5V DC Power	120	B5	In	Bch Y/C 5
72	PRVY0	Out	Preview Y0	121	B6	In	Bch Y/C 6
73	PRVY1	Out	Preview Y1	122	B7	In	Bch Y/C 7
74	PRVY2	Out	Preview Y2	123	ASEL	In	Ach Select
75	PRVY3	Out	Preview Y3	124	VDD	In	+ 5V DC Power
76	PRVY4	Out	Preview Y4				
77	VSS	—	Ground				
78	PAL	In	PAL/NTSC Select				
79	VDD	In	+ 5V DC Power				
80	PRVY5	Out	Preview Y5				
81	PRVY6	Out	Preview Y6				
82	PRVY7	Out	Preview Y7				
83	VSS	—	Ground				
84	VDD	In	+ 5V DC Power				
85	RECC0	Out	Recording C0				
86	RECC1	Out	Recording C1				
87	RECC2	Out	Recording C2				
88	RECC3	Out	Recording C3				
89	RECC4	Out	Recording C4				
90	RECC5	Out	Recording C5				
91	RECC6	Out	Recording C6	1	VSS	—	Ground
92	RECC7	Out	Recording C7	2	EXWP	In	External Wipe Pattern
93	VDD	In	+ 5V DC Power	3	CHB	In	Character B
94	VSS	—	Ground	4	CHC	In	Character C
95	RECY0	Out	Recording Y0	5	CH0	Out	Character 0H Delay
96	RECY1	Out	Recording Y1	6	CH1	In	Character 1H Delay
97	RECY2	Out	Recording Y2	7	CH2	In	Character 2H Delay
98	RECY3	Out	Recording Y3	8	CH3	In	Character 3H Delay
99	RECY4	Out	Recording Y4	9	CH4	In	Character 4H Delay
100	RECY5	Out	Recording Y5	10	WP0	Out	Wipe Pattern
101	RECY6	Out	Recording Y6	11	VSS	—	Ground
102	RECY7	Out	Recording Y7	12	VDD	In	+ 5V DC Power
103	VSS	—	Ground	13	CLK	Out	Clock for Memory Read
104	VDD	In	+ 5V DC Power	14	VSS	—	Ground
				15	CLK	In	Clock for Character

5-2-4 Wipe Pattern/Wipe Pattern Edge/Character Edge Generator IC

This IC (MN53100LBH2) has a following function and generator inside it.

- (a) Digital Wipe Pattern Generator
- (b) Border/Shadow Generator for Character
- (c) Border/Soft Wipe Generator for Wipe Pattern
- (d) Phase Lock Loop (PLL) for Memory Read-out Clock
- (e) Output for Color Bar Data

Pin identification is as follows.

Pin No.	Pin Name	In/Out	Description
1	VSS	—	Ground
2	EXWP	In	External Wipe Pattern
3	CHB	In	Character B
4	CHC	In	Character C
5	CH0	Out	Character 0H Delay
6	CH1	In	Character 1H Delay
7	CH2	In	Character 2H Delay
8	CH3	In	Character 3H Delay
9	CH4	In	Character 4H Delay
10	WP0	Out	Wipe Pattern
11	VSS	—	Ground
12	VDD	In	+ 5V DC Power
13	CLK	Out	Clock for Memory Read
14	VSS	—	Ground
15	CLK	In	Clock for Character

16	VDD	In	+ 5V DC Power	66	MD1	Out	Mix Data 1
17	WP1	In	Wipe Pattern 1H Delay	67	MD0	Out	Mix Data 0
18	WP2	In	Wipe Pattern 2H Delay	68	CHA	In	Character A
19	WP3	In	Wipe Pattern 3H Delay	69	BLCHR	Out	Character Blanking Output
20	WP4	In	Wipe Pattern 4H Delay	70	CHR	Out	Character
21	TEST0	—	Not Used	71	BOD	Out	Border for Wipe Pattern
22	TEST1	—	Not Used	72	TP8	Out	Mosaic Wipe
23	PC	Out	Phase Comparator for Read Clock PLL	73	TP7	In	Test Data 7
24	OSC	In	Oscillator	74	TP6	In	Not Used
25	VDD	In	+ 5V DC Power	75	VDD	In	+ 5V DC Power
26	VSS	—	Ground	76	VSS	—	Ground
27	OSC	Out	Oscillator	77	TP5	—	Not Used
28	TEST2	—	Not Used	78	TP4	—	Not Used
29	TEST3	—	Not Used	79	TP3	—	Not Used
30	TEST4	—	Not Used	80	TP2	—	Not Used
31	TEST5	—	Not Used	81	TP1	—	Not Used
32	ST	In	Strobe for Data Latch Gate	82	TP0	—	Not Used
33	REG0	In	Register 0	83	TED8	—	Not used
34	REG1	In	Register 1	84	TED7	—	Not Used
35	REG2	In	Register 2	85	TED6	—	Not Used
36	REG3	In	Register 3	86	TED5	—	Not used
37	VSS	—	Ground	87	VDD	In	+ 5V DC Power
38	TEST6	—	Not Used	88	PAL	In	NTSC or PAL (H : PAL, L : NTSC)
39	VDD	In	+ 5V DC Power	89	VSS	—	Ground
40	D0	In	Data 0	90	TED4	—	Not Used
41	D1	In	Data 1	91	TED3	—	Not Used
42	D2	In	Data 2	92	TED2	—	Not Used
43	D3	In	Data 3	93	TED1	—	Not used
44	D4	In	Data 4	94	TED0	—	Not used
45	D5	In	Data 5	95	VSS	In	Wipe Pattern A
46	D6	In	Data 6	96	HREF	In	Wipe Pattern B
47	D7	In	Data 7	97	HRST	Out	Read H. Reset Pulse
48	V	In	Vertical Drive Pulse	98	RCLK	—	Horizontal Reference for PLL
49	H	In	Horizontal Drive Pulse	99	HIGH	In	Resolution High/Low Control
50	VDD	In	+ 5V DC Power	100	VDD	In	+ 5V DC Power
51	VSS	—	Ground				
52	VCHRG	—	Not Used				
53	HCHRG	—	Not Used				
54	BC2	Out	Back Color Data 0				
55	BC1	Out	Back Color Data 1				
56	BC0	Out	Back Color Data 2				
57	MD7	Out	Mix Data 7				
58	MD6	Out	Mix Data 6				
59	MD5	Out	Mix Data 5				
60	MD4	Out	Mix Data 4				
61	MD3	Out	Mix Data 3				
62	VSS	—	Ground				
63	RST	In	Reset				
64	VDD	In	+ 5V DC Power				
65	MD2	Out	Mix Data 2				

5-2-5 Sync Generator IC

This IC (MN676021PPS) generates all pulses which are used for synchronization of video 1 and 2 signal.

Pin identification is as follows.

Pin No.	Pin Name	In/Out	Description				
1	VDD1	In	+ 5V DC Power	8	H04	---	Not Used
2	VSS1	—	Ground	9	H05	—	Not Used
3	EXfscl	In	External Subcarrier	10	HREF	—	Not Used
4	4fscOSCI	In	Ground	11	NC	—	Not Used
5	4fscOSCO	---	Not Used	12	NC	—	Not Used
6	SC1	Out	Subcarrier 1	13	NC	—	Not Used
7	SC2	—	Not Used	14	EXSYNC	In	External Sync
8	BSC	—	Not Used	15	PAL	In	NTSC or PAL
9	VPCO	—	Not Used				(H : PAL, L : NTSC)
10	EXT/INT	In	External or Internal	16	RST	In	Reset input
11	CP1	In	Line Switch Cont	17	VDD	In	+ 5V DC Power
12	HR	In	Horizontal Reset	18	NC	—	Not Used
13	VR	In	Vertical Reset	19	V	In	VP input
14	EX910fHI	In	External Frequency	20	H	In	Wide Horizontal Drive
15	SW4	—	Not Used	21	IN	—	Not Used
16	SW3	—	Not Used	22	NOUT	—	Not Used
17	SW2	—	Not Used	23	HS	In	Horizontal Start Pulse
18	SW1	—	Not Used	24	HPCO	Out	H. Phase Comparator
19	BF	Out	Burst Flag Pulse	25	NC	—	Not used
20	WBLK	—	Not Used	26	VR	Out	Vertical Reset
21	CP2	—	Not Used	27	LSWCNT	Out	Latch Switch Control
22	CP1V	—	Not Used	28	EXT	Out	External or Internal (EXT : H)
23	BLK	Out	Composite Blanking	29	NC	—	Not Used
24	WHD	Out	Wide Horizontal Drive	30	NC	—	Not Used
25	VP	Out	Vertical Pulse	31	MONIT3	—	Not Used
26	SYNC	Out	Sync	32	MONIT2	—	Not Used
27	VSS2	—	Ground	33	MONIT1	—	Not Used
28	VDD2	In	+ 5V DC Power	34	NC	—	Not Used
				35	NC	—	Not Used
				36	TEST3	—	Not Used
				37	TEST2	—	Not Used
				38	TEST1	—	Not Used
				39	VSS	—	Ground
				40	NC	—	Not Used
				41	SC	—	Not used
				42	NC	—	Not Used
				43	HSCPC	Out	H. SC Phase Control
				44	SCOSC	In	SC Oscillator

5-2-6 External Sync Generator IC

This IC (MN53007LVW1) generates all pulses which are synchronized with the external camera.

Pin identification is as follows.

Pin No.	Pin Name	In/Out	Description
1	SCOSC	Out	
2	NC	—	Not used
3	FSC4	Out	Subcarrier
4	NC	—	Not Used
5	NC	—	Not Used
6	FREQ	—	Not Used
7	PCR	—	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 sixteen screws holding the edge of top cover and open the top cover.

3. Connection

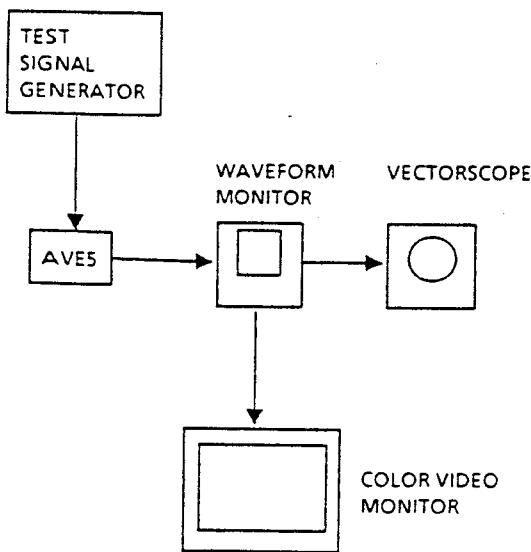


Fig. 3-1

- Connect the coaxial cable between the REC VIDEO OUT 1 connector on the rear panel of WJ-AVES 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 on pages 24 and 25 for adjustment.

(1) +5V adjustment

Test point:	TP37 (+5V)	Main board
Adjust:	VR1 (+5V ADJ)	Power board

- Connect the digital voltmeter to TP37 on the Main board.
- Adjust VR1 on the Power board for $5.0V \pm 0.02V$.

(2) FSC adjustment

Test point:	TP211 (FSC)	Main board
Adjust:	VR201 (FSC)	Main board

- Connect the frequency counter to TP211 on the Main board.
- Adjust VR201 on the Main board for $4.433619MHz \pm 5Hz$ (PAL), $3.579545MHz \pm 5Hz$ (NTSC).

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

Test point:	TP204 (R VCO)	Main board
Adjust:	L215 (VCO R)	Main board

- Connect the digital voltmeter to TP204 on the Main board.
- Adjust L215 on the Main board for $2.8V \pm 0.1V$.

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

Test points:	TP208 (W VCO A)	Main board
	TP206 (W VCO B)	Main board
Adjusts:	L202 (W VCO A)	Main board
	L206 (W VCO B)	Main board

- Connect the coaxial cable between the VIDEO OUT connector of the test signal generator and the SOURCE 1 IN (VIDEO) 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 TP208 on the Main board.
- Adjust L202 on the Main board for $2.8V \pm 0.1V$.
- Disconnect the coaxial cable which is connected to the SOURCE 1 IN (VIDEO) connector on the rear panel of the mixer, and connect it to the SOURCE 2 IN (VIDEO) connector on the rear panel of the mixer.

- Connect the digital voltmeter to TP206 on the Main board.
- Adjust L206 on the Main board for $2.8V \pm 0.1V$.

(5) F VCXO adjustment

Test points:	TP401 (VCO A)	Main board
	TP402 (VCO B)	Main board
Adjusts:	CT1 (VCO A)	Main board
	CT2 (VCO B)	Main board

- Disconnect the coaxial cable from the SOURCE 1 IN (VIDEO) or SOURCE 2 IN (VIDEO) connector on the rear panel.
- Connect the frequency counter to TP401 on the Main board.
- Adjust CT1 on the Main board for $4.433619MHz \pm 10Hz$ (PAL), $3.579545 MHz \pm 10Hz$ (NTSC).
- Connect the frequency counter to TP402 on the Main board.
- Adjust CT2 on the Main board for $4.433619MHz \pm 10Hz$ (PAL), $3.579545 MHz \pm 10Hz$ (NTSC).

(6) Burst gate pulse (BGP) width adjustment

Test points:	TP1 (BFG-A)	Main board
	TP2 (SYNC-A)	Main board
	TP12 (SYNC-B)	Main board
	TP14 (BFG-B)	Main board
Adjusts:	VR1 (BURST GATE A)	Main board
	VR9 (BURST GATE B)	Main board

- Connect the coaxial cable between the VIDEO OUT connector of the test signal generator and the SOURCE 1 IN (VIDEO) 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 TP1 and TP2 on the Main board.
- Connect the external trigger input of oscilloscope to TP2 on the Main board and set the oscilloscope to H rate and expand the horizontal blanking period.
- Adjust VR1 on the Main board so that the duty of waveform at TP1 becomes $9\mu sec \pm 0.1\mu sec$ (PAL), $7.8\mu sec \pm 0.1\mu sec$ (NTSC).
- Connect the coaxial cable to the SOURCE2 IN (VIDEO) connector and supply the composite color bar signal from the test signal generator.
- Connect the oscilloscope to TP14 and TP12 on the Main board.
- Connect the external trigger input of oscilloscope to TP12 on the Main board and set the oscilloscope to H rate and expand the horizontal blanking period.

- Adjust VR9 on the Main board so that the duty of waveform at TP14 becomes $9\mu sec \pm 0.1\mu sec$ (PAL), $7.8\mu sec \pm 0.1\mu sec$ (NTSC).

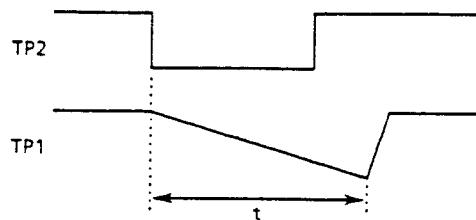


Fig 4-1

(7) Carrier balance adjustment

Test point:	REC VIDEO OUT connector	Rear panel
Adjusts:	VR6 (CARRIER BAL A-1)	Main board
	VR7 (CARRIER BAL A-2)	Main board
	VR14 (CARRIER BAL B-1)	Main board
	VR15 (CARRIER BAL B-2)	Main board

- Supply the composite color bar signal to the SOURCE 1 IN (VIDEO) connector.
- Set the GAIN control of vectorscope to maximum.
- Adjust VR6 and VR7 on the Main board so that the vector positions on the center of vectorscope and the carrier leak of the video signal on the waveform monitor becomes minimum.
- Supply the composite color bar signal to the SOURCE 2 IN (VIDEO) connector.
- Adjust VR14 and VR15 on the Main board so that the vector positions on the center of vectorscope and the carrier leak of the video signal on the waveform monitor becomes minimum.

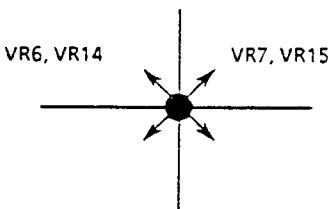


Fig 4-2

(8) Pedestal adjustment

Test point:	REC VIDEO OUT connector	Rear panel
Adjusts:	VR8 (PEDESTAL A)	Main board
	VR16 (PEDESTAL B)	Main board

- Supply the composite color bar signal to the SOURCE 1 IN (VIDEO) connector.

For PAL

- While observing the waveform monitor, adjust VR8 on the Main board so that the black bar is just touching to the blanking level. (Black level becomes $0\text{mV} \pm 14\text{mV}$)

For NTSC

- While observing the waveform monitor, adjust VR8 on the Main board so that the black level becomes $35\text{mV} \pm 14\text{mV}$.
- Supply the composite color bar signal to the SOURCE 2 IN (VIDEO) connector.

For PAL

- While observing the waveform monitor, adjust VR16 on the Main board so that the black bar is just touching to the blanking level. (Black level becomes $0\text{mV} \pm 14\text{mV}$)

For NTSC

- While observing the waveform monitor, adjust VR16 on the Main board so that the black level becomes $35\text{mV} \pm 14\text{mV}$.

CAUTION : Even if VR8 or VR16 is turned too much, the
for PAL black bar will be touched to the blanking
level. It therefore should be adjusted for just
touching to the blanking level.

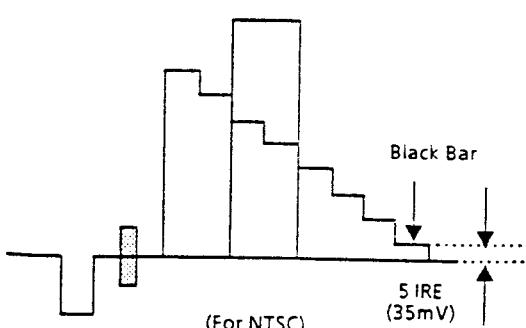
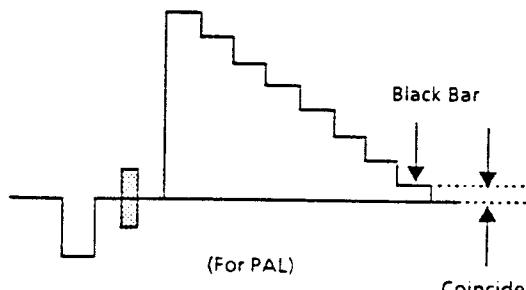


Fig 4-3

(9) Y gain adjustment

Test point:	REC VIDEO OUT connector	Rear panel
Adjusts:	VR4 (Y GAIN A)	Main board
	VR12 (Y GAIN B)	Main board

- Supply the composite color bar signal to the SOURCE 1 IN (VIDEO) connector.

While observing the waveform monitor, adjust VR8 on the Main board so that Y signal (white bar) level becomes $0.7\text{Vp-p} \pm 0.02\text{Vp.p}$ (PAL), $100\text{IRE} \pm 3\text{IRE}$ (NTSC).

- Supply the composite color bar signal to the SOURCE 2 IN (VIDEO) connector.

While observing the waveform monitor, adjust VR12 on the Main board so that Y signal (white bar) level becomes $0.7\text{Vp-p} \pm 0.02\text{Vp.p}$ (PAL), $100\text{IRE} \pm 3\text{IRE}$ (NTSC).

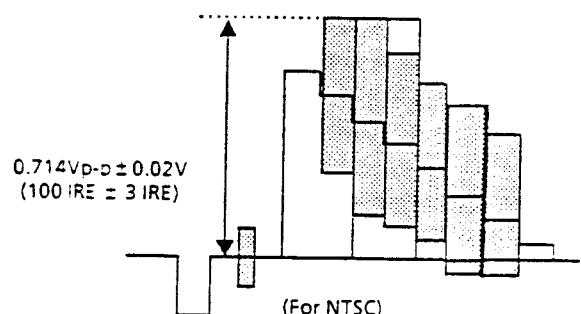
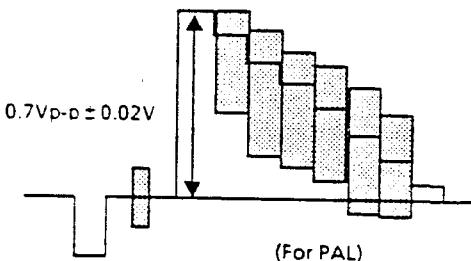


Fig 4-4

- Connect the coaxial cable to the SOURCE 2 IN (VIDEO) connector and SOURCE 1 IN (VIDEO) connector on the rear panel.
- Press the switch on the Wipe Pattern selection switches for the horizontal wipe so that the pictures of A and B channel are displayed on the monitor screen.

- Adjust VR16 and VR12 on the Main board so that the difference between black and white levels of A and B channels become within 0.14mV (PAL), 2 IRE (NTSC).

CAUTION : When VR16 and VR12 are turned too much, the black and white bar will be suppressed.

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

Test point:	REC VIDEO OUT connector	Rear panel
Adjusts:	VR3 (TINT A)	Main board
	VR2 (CHROMA GAIN A)	Main board
	VR5 (B-Y GAIN A)	Main board
	VR11 (TINT B)	Main board
	VR10 (CHROMA GAIN B)	Main board
	VR13 (B-Y GAIN B)	Main board

- Supply the composite color bar signal to the SOURCE 1 IN (VIDEO) connector.
- While observing the vectorscope, adjust VR3, VR2 and VR5 on the Main board so that the all vectors fall into their respective boxes.

Effect of controls

VR2 -- Chroma Gain (R-Y Gain)
 VR3 -- Tint
 VR5 -- B-Y Gain

- Supply the composite color bar signal to the SOURCE2 IN (VIDEO) connector.
- While observing the vectorscope, adjust VR11, VR10 and VR13 on the Main board so that the all vectors fall into their respective boxes.

Effect of controls

VR10 -- Chroma Gain (R-Y Gain)
 VR11 -- Tint
 VR13 -- B-Y Gain

- Press the **A** switch on the Wipe Pattern selection switches for the horizontal wipe so that the pictures of A and B channel are displayed on the monitor screen.
- Adjust VR2 and VR5 for A channel, VR10 and VR13 for B channel so that the difference between chroma gain of A and B channel becomes within 3%.
- Adjust VR3 for A channel, VR11 for B channel so that the difference between chroma phase of A and B channel becomes within 4°.

(11) Horizontal phase adjustment

Test point:	REC VIDEO OUT connector	Rear panel
Adjust:	VR502 (H.PHASE)	Main board

- Supply the color bar signal to the SOURCE 1 and 2 IN (VIDEO) connector.
- Press the **A** switch on the Wipe Pattern selection switches for the horizontal wipe so that the pictures of A and B channel are displayed on the monitor screen.
- While observing the waveform monitor, adjust VR502 on the Main board so that Y level of A channel becomes equal to that of B channel.

(12) REC OUT Y gain adjustment

Test point:	REC VIDEO OUT connector	Rear Panel
Adjust:	VR20 (REC Y GAIN)	Main board

- Supply the composite color bar signal to the SOURCE 1 IN (VIDEO) connector.
- Set the GAIN control of vectorscope to maximum.
- Adjust VR6 and VR7 on the Main board so that the vector positions on the center of vectorscope and the carrier leak of the video signal on the waveform monitor becomes minimum.
- While observing the waveform monitor, adjust VR20 on the Main board so that Yellow (white) level becomes $580\text{mV} \pm 20\text{mV}$ (PAL), $83\text{IRE} \pm 3\text{IRE}$ (NTSC).

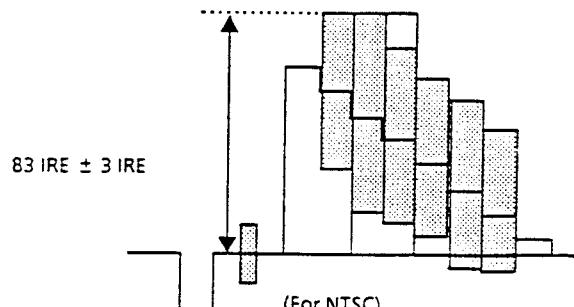
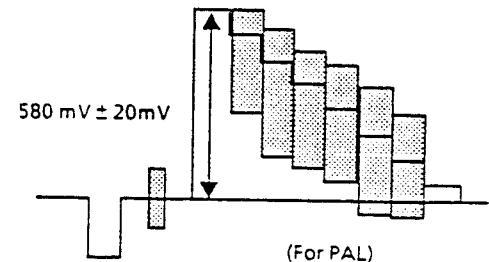


Fig. 4-5

(13) REC OUT C gain adjustment

Test point: REC VIDEO OUT connector Rear Panel
 Adjust: VR19 (REC C GAIN) Main board

- Keep the connection and condition for step (12).
- While observing the waveform monitor, adjust VR19 on the Main board so that the burst level becomes 0.3V (PAL), 0.286V (NTSC).

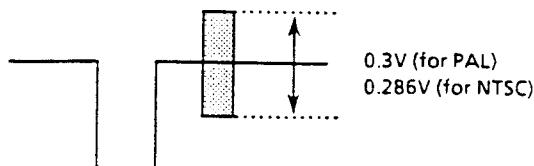


Fig. 4-6

(15) Preview C gain adjustment

Test point: PREVIEW OUT connector Rear Panel
 Adjusts: VR17 (PREVIEW C GAIN) Main board

- Keep the connection and condition for step (12).
- While observing the waveform monitor, adjust VR17 on the Main board so that the burst level becomes 0.3V (PAL), 0.286V (NTSC).

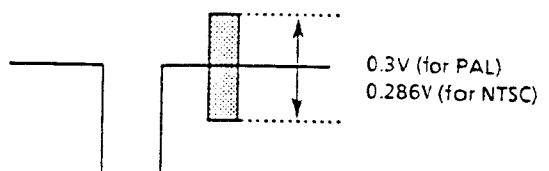


Fig. 4-8

(14) Preview Y gain adjustment

Test point: PREVIEW OUT connector Rear Panel
 Adjust: VR18 (PREVIEW Y GAIN) Main board

- Keep the connection and condition for step (12).
- While observing the waveform monitor, adjust VR18 on the Main board so that Yellow (white) level becomes $580\text{mV} \pm 20\text{mV}$ (PAL), $83\text{IRE} \pm 3\text{IRE}$ (NTSC).

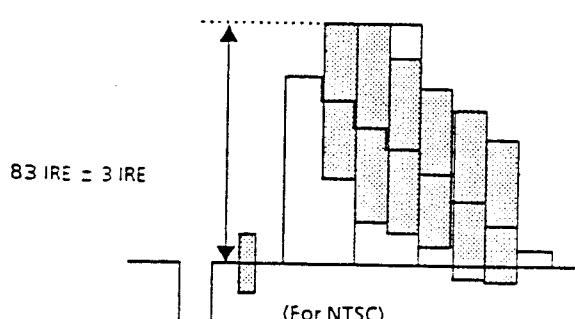
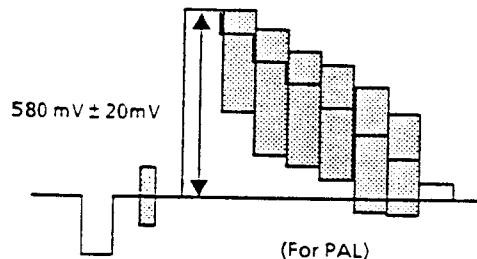


Fig. 4-7

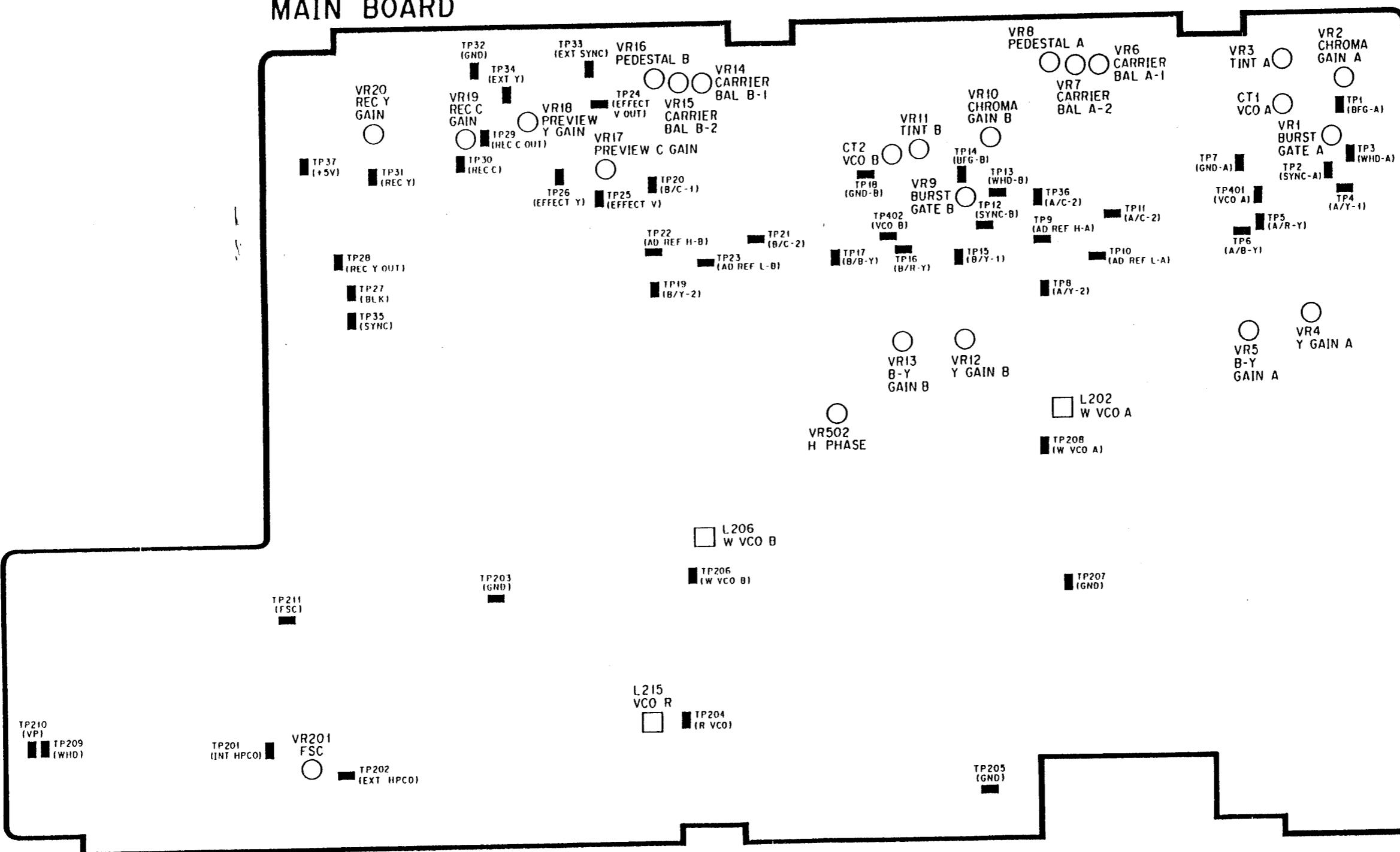
(16) Audio gain adjustment

Test points: REC AUDIO OUT connectors Rear Panel
 Adjusts: VR13 (AUDIO RIGHT GAIN) Switch board
 VR12 (AUDIO LEFT GAIN) Switch board

- Connect the audio cables with pin connector (RCA connectors) between the output terminal or connector of the low frequency test signal generator and the SOURCE 1 AUDIO L and INPUT connector of WJ-AVES.
- Disconnect the audio cables from the SOURCE 2 AUDIO L and R INPUT connectors of WJ-AVES.
- Supply the 1 Kz, -10dB (316mV rms) sinewave signal to the SOURCE 1 AUDIO L and INPUT connector of WJ-AVES from the test signal generator.
- Set the AUDIO Control (AUDIO 1 / AUDIO 2) to the AUDIO 1 end.
- Set the SOURCE level control (MAX / MIN) and the Audio Master Level Control (MAX / MIN).
- Set the Microphone Level Control (MAX / MN) and the Auxiliary Audio Level Control (MAX / MIN) to the MIN end.
- Set the AUDIO level control (MAX / MIN) so that the REC AUDIO OUT L level becomes -6dB (PAL), -8dB (NTSC).
- Confirm that the all LEDs for left channel are lit on by turning VR12 fully counterclockwise, turn VR13 clockwise slowly and stop it at where the red LED for +1 point is off and LEDs from 0 point and lower are lit on.
- Confirm that the all LEDs for right channel are lit on by turning VR13 fully counterclockwise, turn VR12 clockwise slowly and stop it at where the red LED for +2 point is off and LEDs from 0 point and lower are lit on.

LOCATION OF TEST POINTS AND ADJUSTING CONTROLS

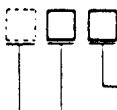
MAIN BOARD



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.



Rank of DC Current Gain (h_{FE})
Transistor Number

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	2SJ84
T	2SC2406	1T	2SC3077
U	2SC2404	1X	2SC2845
V	2SC2295	2B	2SK374
W	2SD602	2C	2SK116

Example

- WQ → 2SD602 – Q
YQ → 2SD601 – Q
1BS → 2SB814 – S

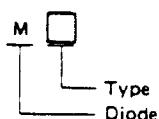
Appearance and Symbols



	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	MA2BW-B
MC	MA153	ML	MA2BT-A
MD	MA2B-A	MN	MA151WA
ME	MA2B-B	MO	MA152WA
MF	MA2BW-A	MT	MA151WK
MH	MA151K	MU	MA152WK

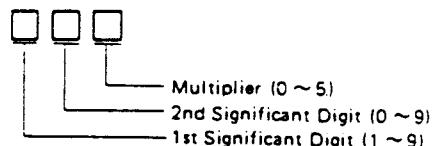
Appearance and Symbols



	1	2	3
MA28/2BW/2BT	-	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:

$$330 \rightarrow 33 \times 10^0 = 33 \text{ ohms}$$

$$561 \rightarrow 56 \times 10^1 = 560 \text{ ohms}$$

$$123 \rightarrow 12 \times 10^3 = 12 \text{ kohms}$$

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. 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.

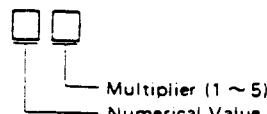
EXAMPLE:

$$0.5 \rightarrow 0.5 \text{ pF} \quad 2.5 \rightarrow 2.5 \text{ pF}$$

$$75 \rightarrow 0.75 \text{ pF} \quad 33 \rightarrow 33 \text{ pF}$$

$$1 \rightarrow 1 \text{ pF} \quad 82 \rightarrow 82 \text{ pF}$$

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	O	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:

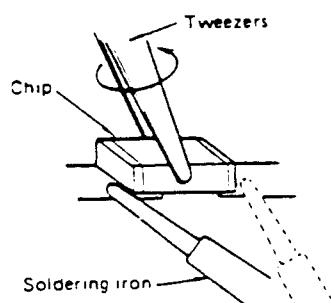
$$\begin{aligned} A1 &\longrightarrow 10 \times 10^1 = 100 \text{ pF} \\ N2 &\longrightarrow 33 \times 10^2 = 3300 \text{ pF} \\ S3 &\longrightarrow 47 \times 10^3 = 47000 \text{ pF} \end{aligned}$$

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.

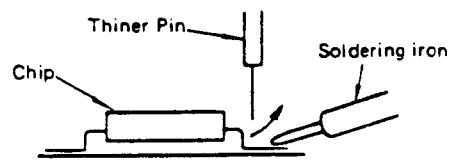


5-2 Removal (IC)

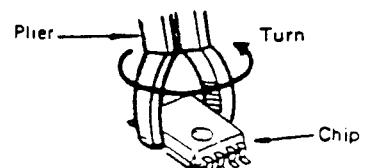
1. Add the solder wick and solder iron to each lead of the IC and remove solder.



2. Add the solder iron to each lead of the IC and lift each lead of the IC using thiner pin.

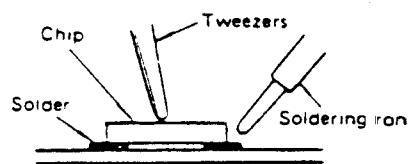


3. Remove IC turning it with plier.

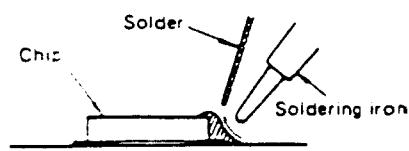


5-3 Mounting

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

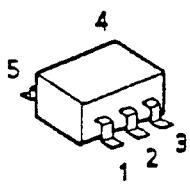


3. Solder both ends of chip (three leads for chip transistor)

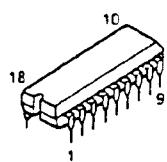


APPEARANCE OF IC, TRANSISTOR AND DIODE

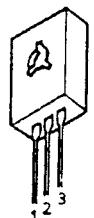
YWSC7508F
YWSC75U04F



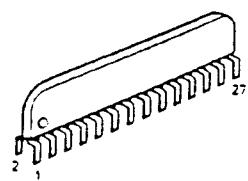
AN90B20



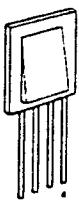
AN79N12



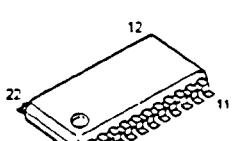
YWM5M4C500L



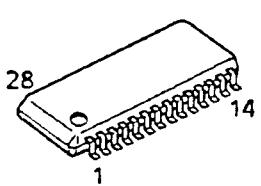
AN608P



MN6550BS



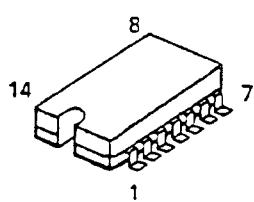
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MN676021PPS



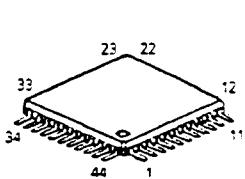
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AN78L09
AN1431T
AN78M12



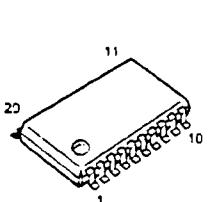
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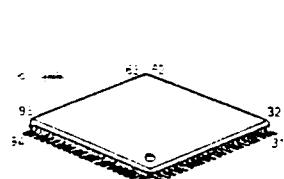
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MN53100LBG

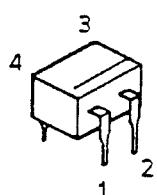
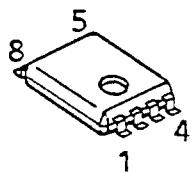
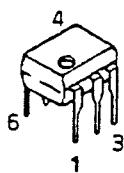


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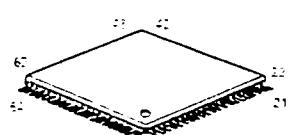
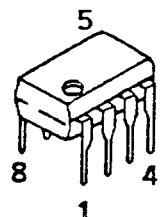
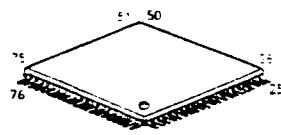
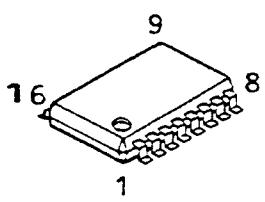


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MN53030LVR1

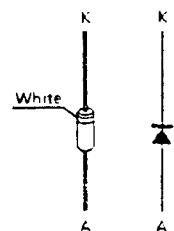
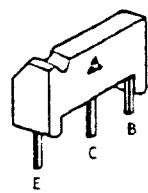
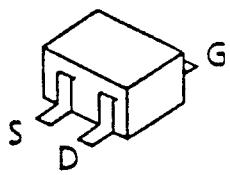
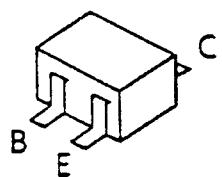


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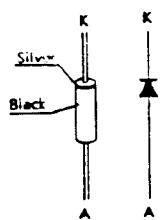
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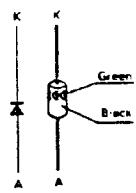
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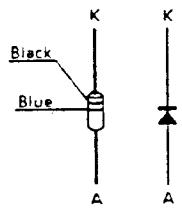
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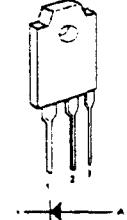
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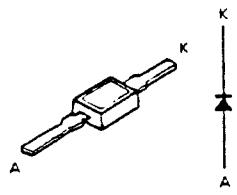
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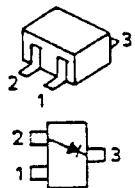
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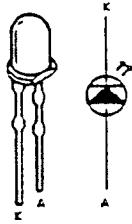
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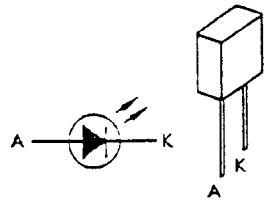
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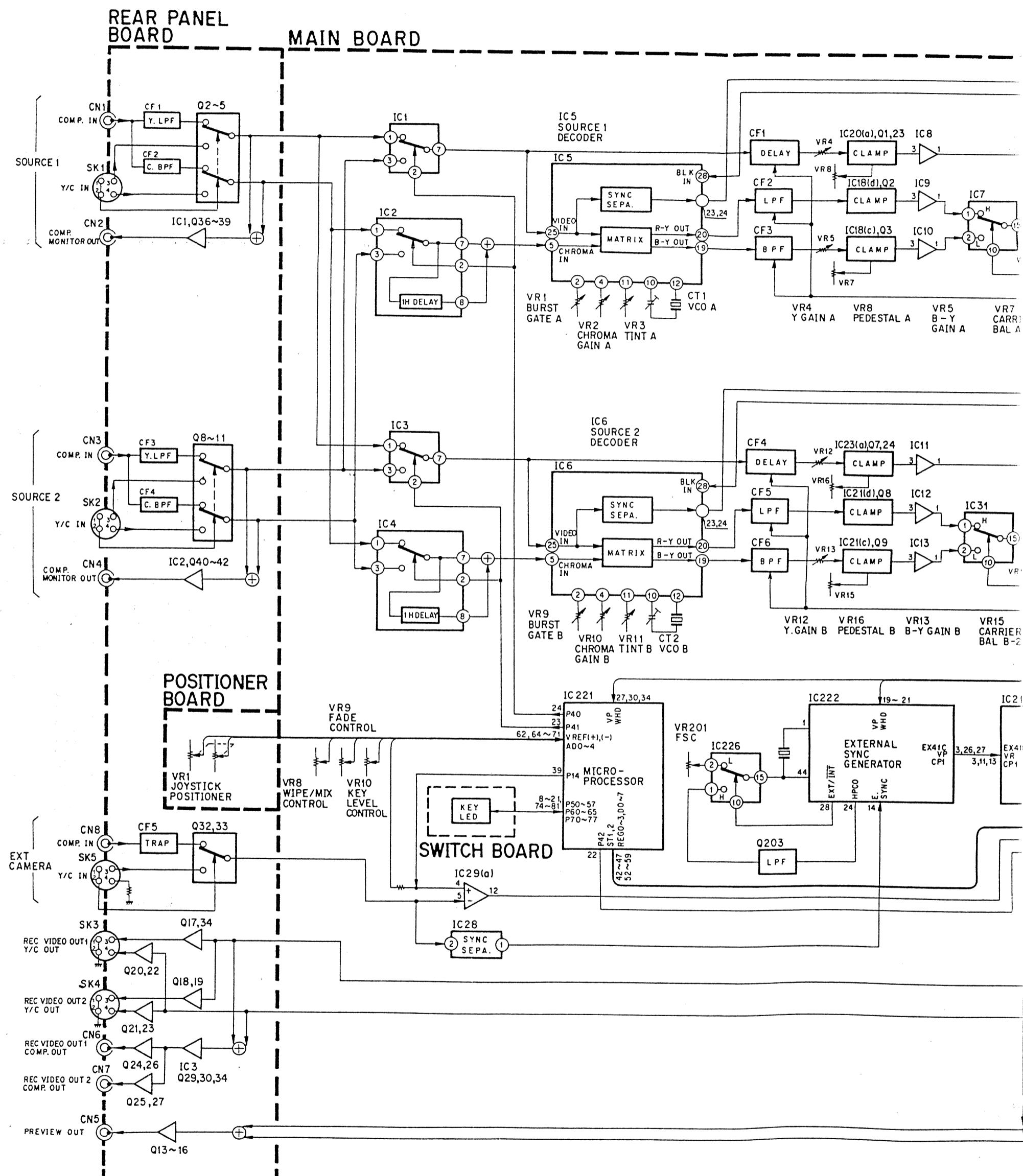


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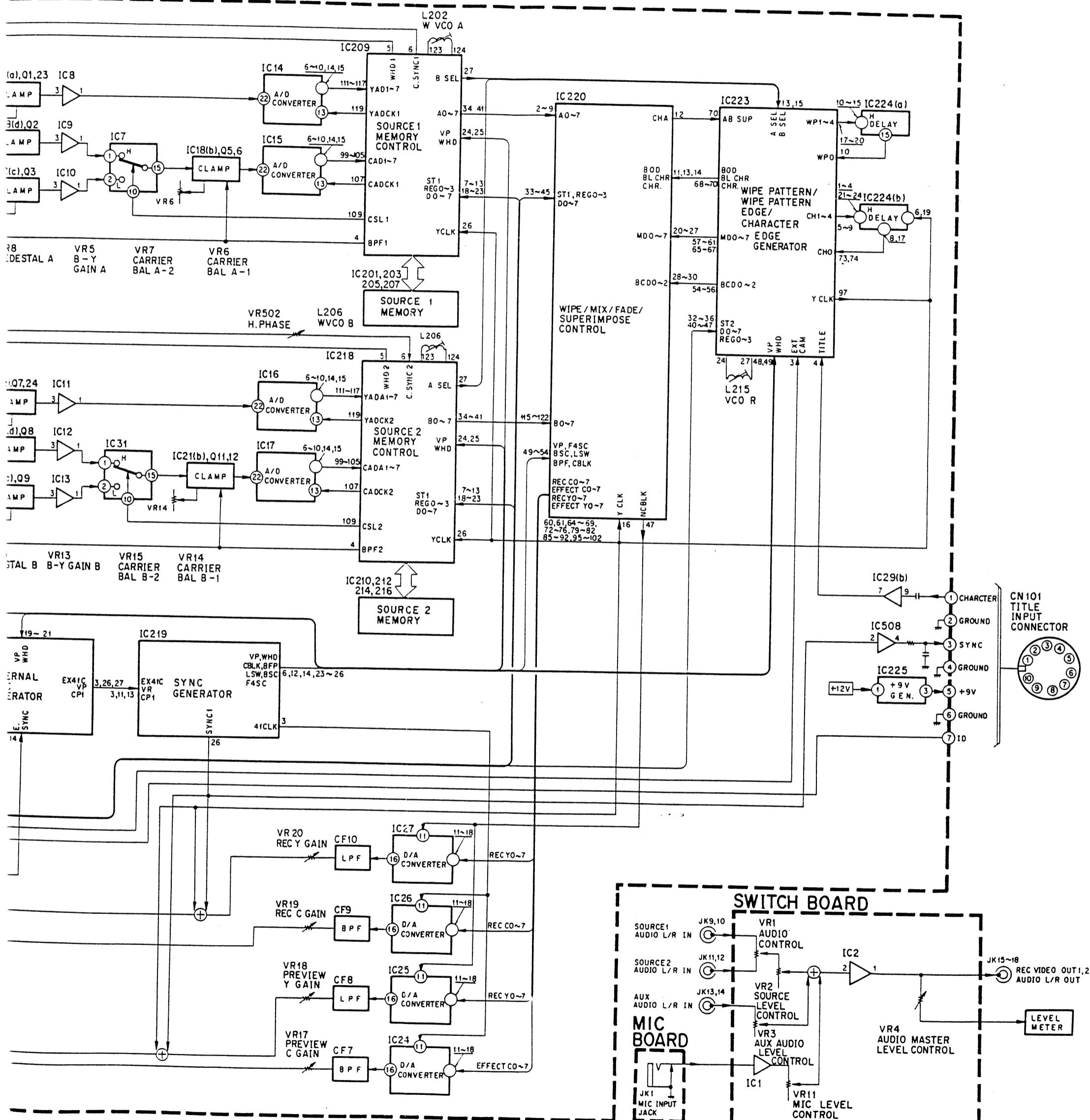


LN210RP





BLOCK DIAGRAM OF WJ-AVE5



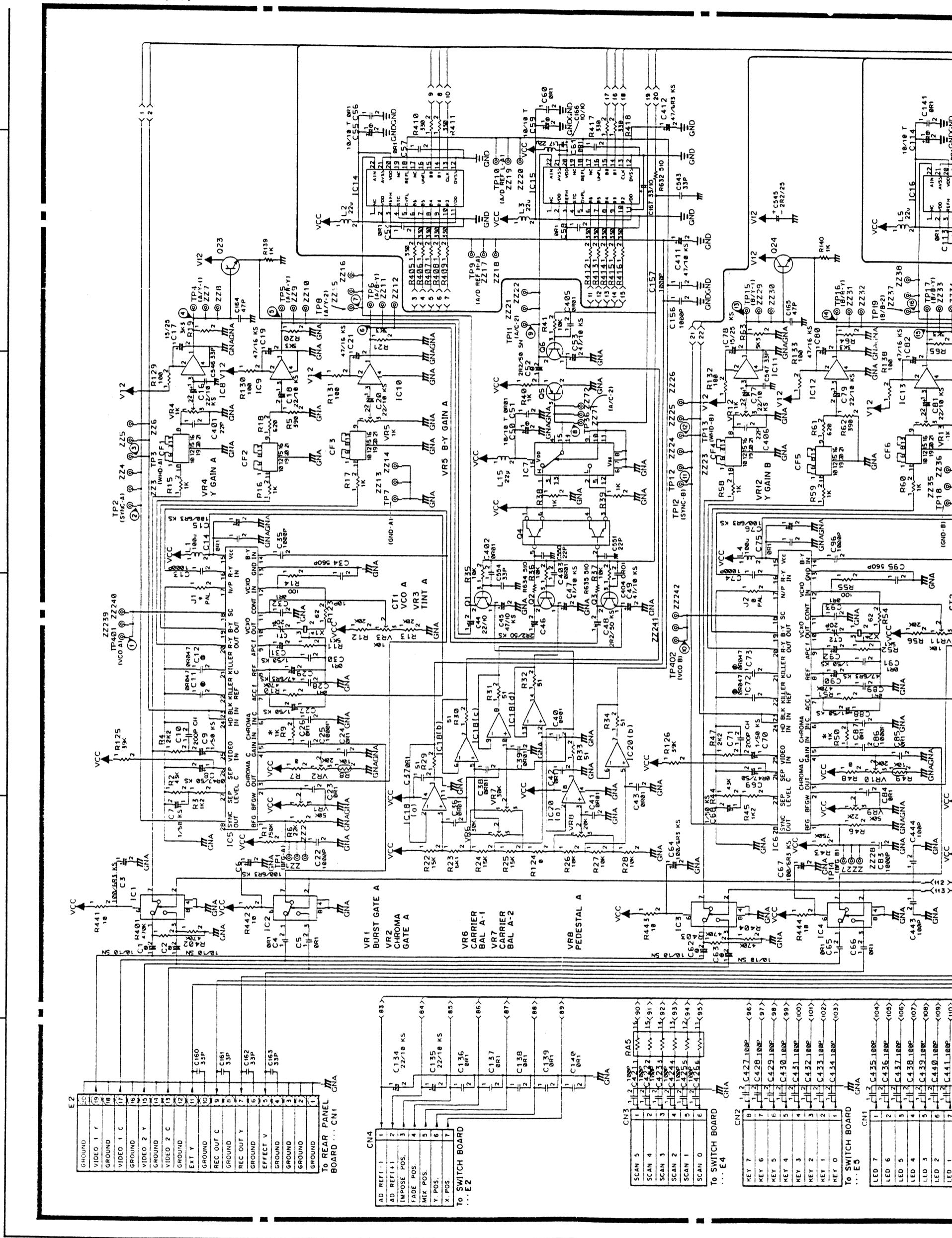
SCHEMATIC DIAGRAM OF MAIN BOA

Main Board

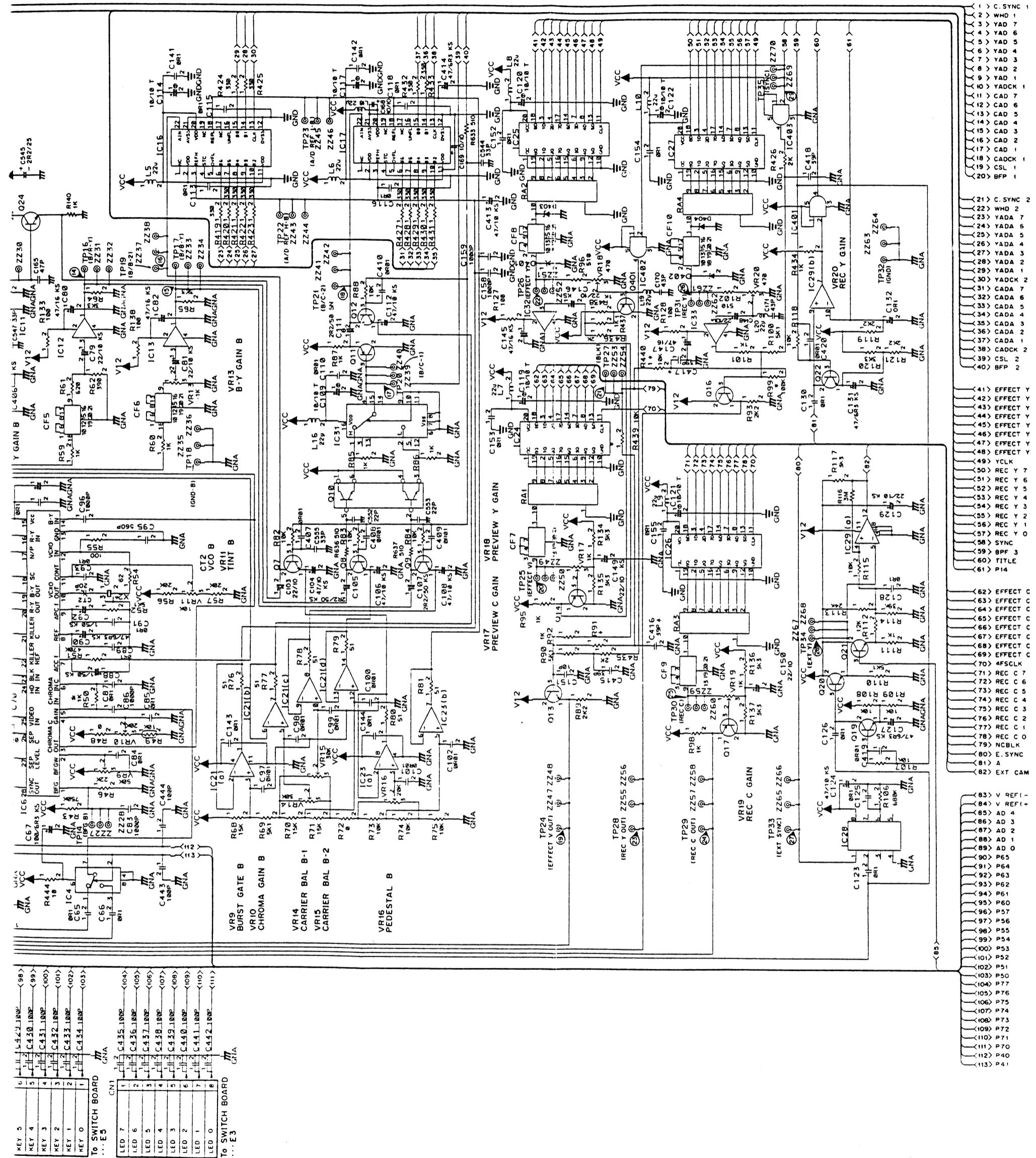
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IC4	B4
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IC6	C4
IC7	D3
IC8	D1
IC9	D2
IC10	D2
IC11	D4
IC12	D4
IC13	D5
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IC15	E3
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IC17	E6
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IC502	A7
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IC506	E3
IC507	D3
IC508	B6
IC509	E8
IC510	D8
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Q2	C3
Q3	C3
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Q5	D3
Q6	E3
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Q11	D6
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Q13	C6
Q14	C6
Q16	D7
Q17	C7
Q19	C8
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Q22	D8
Q23	E2
Q24	E4
Q201	D3
Q202	H5
Q203	G5
Q204	D7
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O401	E3
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Q503	D3
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D202	F6
D203	F3
D205	H3
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MAIN BOARD (A)



1 OF MAIN BOARD (ANALOG SIGNAL SECTION)



	IC1	IC2	IC3	IC4	IC5	IC6	IC7	IC8	IC9	IC10	IC11	IC12	IC13	IC14	IC15	IC16	IC17	IC18	IC20
Pin 1	2.1	2.8	2.1	2.9	2.6	2.7	1.8	6.5	6.3	6.5	6.4	6.3	6.5	0	0	0	0	3.8	1.5
2	4.2	0	0	4.2	2.0	2.1	1.8	11.2	11.2	11.2	11.2	11.2	11.2	4.8	4.9	4.9	4.9	3.5	1.5
3	2.1	2.9	2.1	2.8	2.0	2.1	0.3	2.5	2.5	2.5	2.5	2.5	2.5	3.4	3.5	3.4	3.4	3.5	0
4	0	0	0	0	2.4	2.4	0.3	0	0	0	0	0	0	0	0	0	0	4.9	0
5	2.1	0	2.1	0	2.8	2.8	0.3							0	0	0	0	-2.4	1.5
6	4.8	4.8	4.8	4.8	2.8	2.8	0							0.9	0.9	0.9	1.5	2.4	0
7	1.6	2.1	1.6	2.1	4.0	4.0	0							1.7	0.3	1.7	0.7	2.4	1.1
8	0	0	0	0	2.8	2.9	0							1.5	0	1.6	0.3	2.4	4.9
9					2.8	2.8	0							1.6	-0.6	1.6	-0.3	2.4	
10					2.7	2.7	2.4							0.9	-0.4	0.6	-0.2	2.4	
11					2.3	2.3	0							4.9	4.9	4.9	4.9	0	
12					3.2	3.1	0.3							0	0	0	0	2.4	
13					0	0	0.3							2.7	2.4	2.7	2.4	2.4	
14					2.8	2.8	0.3							-0.2	0	0.5	0	2.4	
15					4.8	4.8	1.6							-0.8	0.3	-1.5	0.2		
16					2.8	2.7	4.9							0.3	0	0.3	0		
17					0	0								0	0	0	0		
18					3.9	3.9								1.4	1.4	1.4	1.4		
19					2.0	1.9								0	0	0	0		
20					1.9	1.9								4.9	4.9	4.9	4.9		
21					2.2	2.2								0	0	0	0		
22					2.6	2.6								2.0	2.4	2.0	2.4		
23					4.3	4.3													
24					4.3	4.3													
25					2.7	2.7													
26					2.7	2.8													
27					2.5	2.5													
28					3.9	3.9													

	IC209																		IC222		
Pin 1	3.9	41	0	B1	0	121	0											2.5	41	49	
2	0	42	17	82	0	122	0											2	0	42	0
3	2.6	43	1.3	83	0	123	5.0											3	17	43	24
4	0.2	44	1.2	84	0	124	0											4	0	44	24
5	4.3	45	0.6	85	0													5	0		
6	4.6	46	0	86	0													6	-9.5		
7	0	47	5.0	87	-6.5													7	0		
8	4.8	48	5.0	88	0													8	1.9		
9	4.8	49	0.8	89	-3.8													9	4.9		
10	4.7	50	1.6	90	-4.5													10	2.9		
11	4.8	51	1.5	91	0.9													11	0		
12	4.7	52	0	92	0													12	0		
13	4.7	53	1.6	93	0													13	0		
14	0	54	1.4	94	1.2													14	0		
15	5.0	55	2.0	95	-0.3													15	5.0		
16	0	56	0	96	-2.3													16	5.0		
17	0	57	0	97	-4.0													17	5.0		
18	4.7	58	5.0	98	0													18	0		
19	4.7	59	5.0	99	3.0													19	0		
20	4.7	60	5.0	100	1.9													20	0.8		
21	4.7	61	0	101	0													21	0.8		
22	4.8	62	-3.2	102	2.0													22	0.8		
23	4.7	63	-7.1	103	1.8													23	5.0		
24	0	64	0	104	1.6													24	0.1		
25	0.8	65	-6.8	105	2.0													25	0		
26	0	66	-5.2	106	0													26	5.0		
27	2.5	67	0	107	-14.2													27	0		
28	-1.4	68	0	108	5.0													28	0		
29	-14.8	69	5.0	109	-6.9													29	0		
30	0	70	-14.5	110	0													30	0		
31	5.0	71	0	111	1.0													31	5.0		
32	5.0	72	0	112	1.8													32	0		
33	0	73	4.6	113	1.7													33	4.9		
34	-2.0	74	4.6	114	2.0													34	0		
35	-1.3	75	0	115	1.9													35	0		
36	-1.6	76	0	116	1.7													36	0		
37	0	77	0	117	2.1													37	0		
38	-2.8	78	0	118	0													38	0		
39	-2.8	79	5.0	119	-2.0													39	0		
40	-3.6	80	0	120	4.9													40	0		

	IC21	IC23	IC28	IC29	IC31	IC32	IC33	IC201	IC203	IC205	IC207	IC210	IC212	IC214	IC216	IC219	IC224	IC226
Pin 1	3.8	1.5	0	0	1.8	6.5	6.5	0	0	0	0	0	0	0	0	5.0	0	0.4
2	3.4	1.5	1.5	0	1.8	11.3	11.3	0	0	1.9	1.9	0	0	1.8	1.8	0	0	2.3
3	3.3	1.5	0	0	0.2	2.5	2.5	1.9	1.9	1.0	1.0	2.1	2.1	1.0	1.0	1.5	0	0.3
4	0	0	0	0	1.7	0.2	0	0	1.9	1.9	1.0	1.0	1.6	1.6	1.0	0	0	0.4
5	0	1.4	4.9	1.9	0.2	0	0	0	1.5	1.5	0	0	1.5	1.5	5.0	0	0.4	
6	0	1.4	1.2	0	0	0	0	-0.2	-0.2	0.7	0.7	-0.4	-0.4	0.7	0.7	2.3	5.0	0
7	2.4	1.1	0	0.3	0	0	0	-0.2	-0.2	-1.8	-1.8	-0.2	-0.2	-2.0	-2.0	2.3	0	0
8	2.4	4.9	0	0	0	0	0	0.6	0.6	-0.9	-0.9	0.6	0.6	-1.0	-1.0	0.1	2.6	0
9	2.4	0	0	0	0	0	0	1.4	1.4	-1.7	-1.7	1.4	1.4	-0.9	-0.9	0	3.9	0
10	2.4	3.4	2.4	0	0	0	0	1.4	1.4	-2.0	-2.0	1.3	1.3	-2.4	-2.4	0	3.9	0
11	0	11.9	0	0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.7	1.7	2.5	3.9	0	4	0
12	2.4	0	0.3	0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.7	1.7	2.5	3.9	0	4	

	IC21B					
Pin 1	4.3	41 0	81 0	121 0		
2	0	42 1.7	82 0	122 0		
3	2.5	43 1.2	83 0	123 5.0		
4	0.2	44 1.2	84 0	124 2.7		
5	4.3	45 0.6	85 0			
6	4.6	46 0	86 0			
7	0	47 5.0	87 -7.0			
8	4.8	48 5.0	88 0			
9	4.8	49 0.8	89 0			
10	4.7	50 1.5	90 -4.6			
11	4.7	51 1.5	91 0.9			
12	4.7	52 1.6	92 0			
13	4.7	53 1.3	93 1.5			
14	5.0	54 1.3	94 0			
15	5.0	55 1.7	95 -0.1			
16	0	56 0	96 -1.9			
17	0	57 0	97 -4.1			
18	4.7	58 4.9	98 0			
19	4.7	59 5.0	99 3.2			
20	4.7	60 5.0	100 1.7			
21	4.7	61 5.0	101 1.5			
22	4.7	62 -5.9	102 1.6			
23	4.7	63 -7.5	103 1.5			
24	0	64 -5.3	104 1.5			
25	0.8	65 -8.3	105 2.0			
26	4.9	66 -6.9	106 0			
27	2.5	67 -6.8	107 -12.6			
28	-2.1	68 0	108 5.0			
29	-15.0	69 5.0	109 -5.0			
30	0	70 -13.3	110 0			
31	5.0	71 -9.9	111 0.9			
32	5.0	72 0	112 1.8			
33	0	73 4.6	113 1.8			
34	-3.8	74 4.6	114 1.9			
35	-2.7	75 0	115 1.6			
36	-3.1	76 0	116 1.6			
37	-4.2	77 0	117 1.8			
38	-4.4	78 0	118 0			
39	-4.7	79 5.0	119 -2.6			
40	-6.1	80 0	120 4.9			

	IC220					
Pin 1	C	41 4.7	81 1.8	121 1.8		
2	0	42 4.8	82 0.9	122 2.2		
3	1.9	43 4.7	83 0	123 0		
4	1.6	44 4.7	84 5.0	124 5.0		
5	1.8	45 0	85 0			
6	1.9	46 0	86 1.6			
7	1.7	47 3.7	87 1.3			
8	0	48 5.0	88 1.2			
9	2.2	49 0	89 1.2			
10	0	50 2.4	90 1.2			
11	0	51 0	91 1.3			
12	0	52 2.5	92 3.0			
13	0	53 0.2	93 5.0			
14	0	54 1.2	94 0			
15	0	55 0	95 0			
16	2.6	56 0	96 1.6			
17	0	57 0	97 0			
18	0	58 0	98 1.6			
19	0	59 0	99 0			
20	5.0	60 0	100 1.8			
21	0	61 1.7	101 1.8			
22	5.0	62 5.0	102 1.0			
23	5.0	63 0	103 0			
24	0	64 1.3	104 5.0			
25	5.0	65 1.2	105 0			
26	0	66 1.1	106 0			
27	5.0	67 1.2	107 0.2			
28	0	68 0	108 5.0			
29	2.2	69 3.0	109 0.2			
30	0	70 0	110 0			
31	5.0	71 5.0	111 0.2			
32	0	72 0	112 0.2			
33	4.7	73 1.6	113 0.2			
34	4.8	74 1.6	114 0.2			
35	4.8	75 1.6	115 0			
36	4.8	76 1.9	116 1.8			
37	4.8	77 0	117 1.6			
38	4.7	78 0	118 1.6			
39	4.7	79 0	119 0			
40	4.7	80 1.8	120 0			

	IC221					
Pin 1	0.5	41 0	81 0.8			
2	0.5	42 0	82 0			
3	0.8	43 0	83 0			
4	0.8	44 4.8	84 0			
5	0.8	45 4.8				
6	0.8	46 4.8				
7	0	47 4.8				
8	0	48 0				
9	0	49 0				
10	0	50 5.0				
11	0	51 0				
12	0	52 0				
13	0	53 4.8				
14	0	54 4.8				
15	0	55 4.8				
16	4.9	56 4.8				
17	0	57 4.8				
18	0	58 4.8				
19	0	59 0				
20	0	60 0				
21	5.0	61 1.2				
22	5.0	62 1.2				
23	0	63 1.7				
24	4.9	64 1.7				
25	0	65 1.2				
26	0	66 1.7				
27	0	67 1.2				
28	0	68 2.5				
29	0	69 2.3				
30	0.8	70 2.6				
31	2.3	71 3.8				
32	2.1	72 5.0				
33	0	73 5.8				
34	0.8	74 0				
35	4.2	75 0.8				
36	0	76 0				
37	0	77 0				
38	0	78 0.8				
39	1.1	79 0				
40	0	80 1.6				

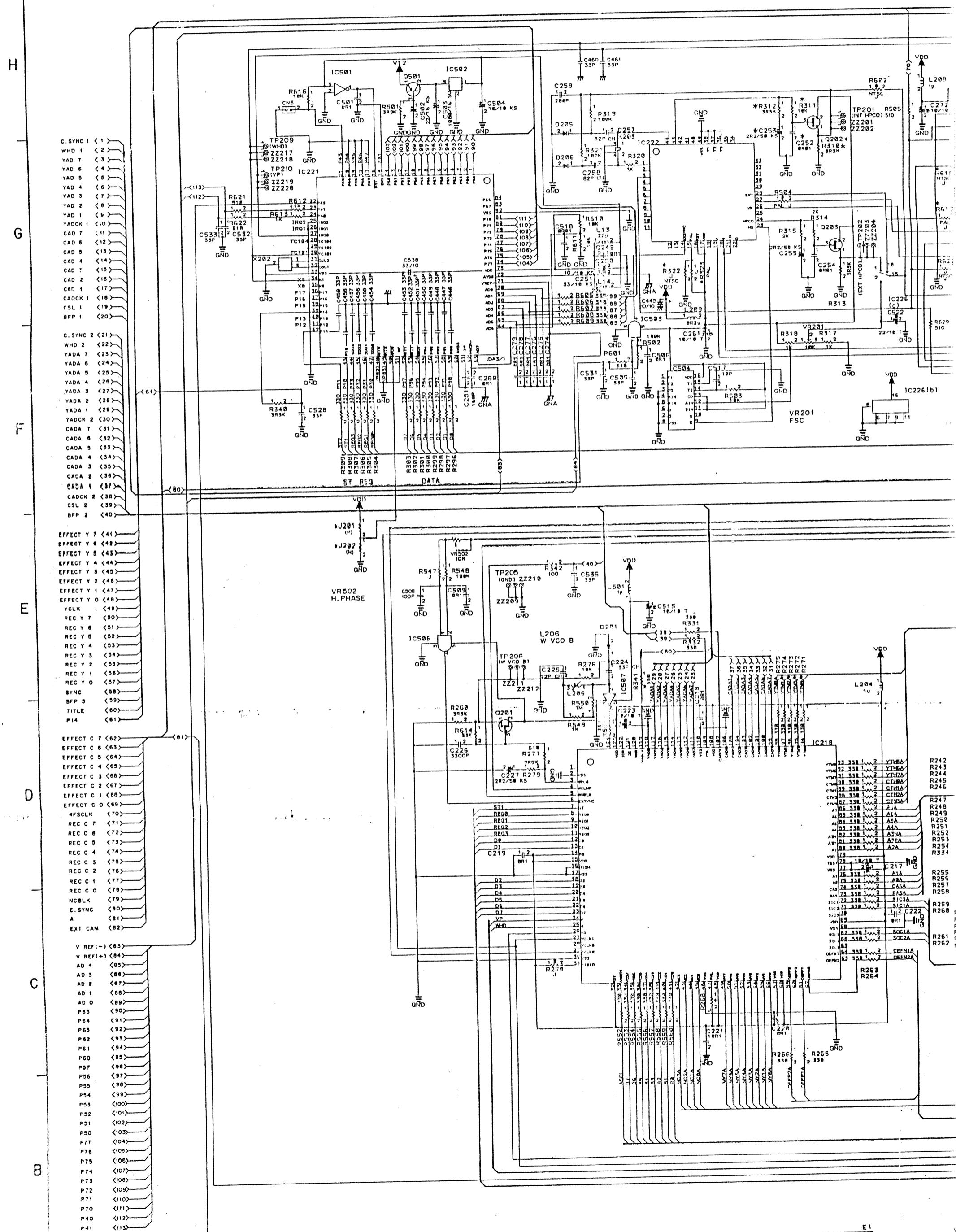
	IC223					
Pin 1	0	41 4.7	81 0			
2	0	42 4.7	82 0			
3	0.2	43 4.7	83 0			
4	0	44 4.7	84 0			
5	0	45 4.7	85 0			
6	0	46 4.7	86 0			
7	0	47 4.7	87 5.0			
8	0	48 0	88 5.0			
9	0	49 0.8	89 0			
10	5.0	50 5.0	90 0			
11	0	51 0	91 0			
12	5.0	52 0.6	92 0			
13	1.5	53 1.0	93 0			
14	0	54 2.2	94 0			
15	1.5	55 2.2	95 0			
16	5.0	56 2.1	96 0			
17	3.9	57 5.0	97 4.9			
18	3.9	58 5.0	98 1.0			
19	3.9	59 5.0	99 0			
20	3.9	60 5.0	100 5.0			
21	0	61 5.0				
22	0	62 0				
23	2.7	63 5.0				
24	2.5	64 5.0				
25	5.0	65 5.0				
26	0	66 5.0				
27	4.6	67 5.0				
28	0	68 0				
29	0	69 0				
30	0	70 0				
31	0	71 0				
32	4.8	72 0				
33	4.8	73 0				
34	4.8	74 0				
35	4.8	75 0.8				
36	4.8	76 0				
37	0	77 0				
38	0	78 0.8				
39	5.0	79 0				
40	4.7	80 0				

	C401	C402	C403	C501	C502	C503	C504	C505	C506	C507	C508	C509	C510
Pin 1	4.9	4.9	4.9	5.0	0	0	0	0	3.9	C	4.9	3.9	0
2	0.3	4.6	4.6	0	0	0	0.3	2.4	3.9	C	4.5	3.9	2.5
3	0	0	0	4.9	11.9	0	0	0	0	0	0	0	0
4	0	4.6	4.6				0	0	2.6	4.6	2.5	4.6	2.5
5	4.9	4.9	4.9				5.0	0	5.0	5.0	5.0	5.0	5.0
6													
7									5.0				
8									0				
9									5.0				
10									0				
11									0				
12									0.8				
13									5.0				
14									0				
15									1.0				
16									5.0				

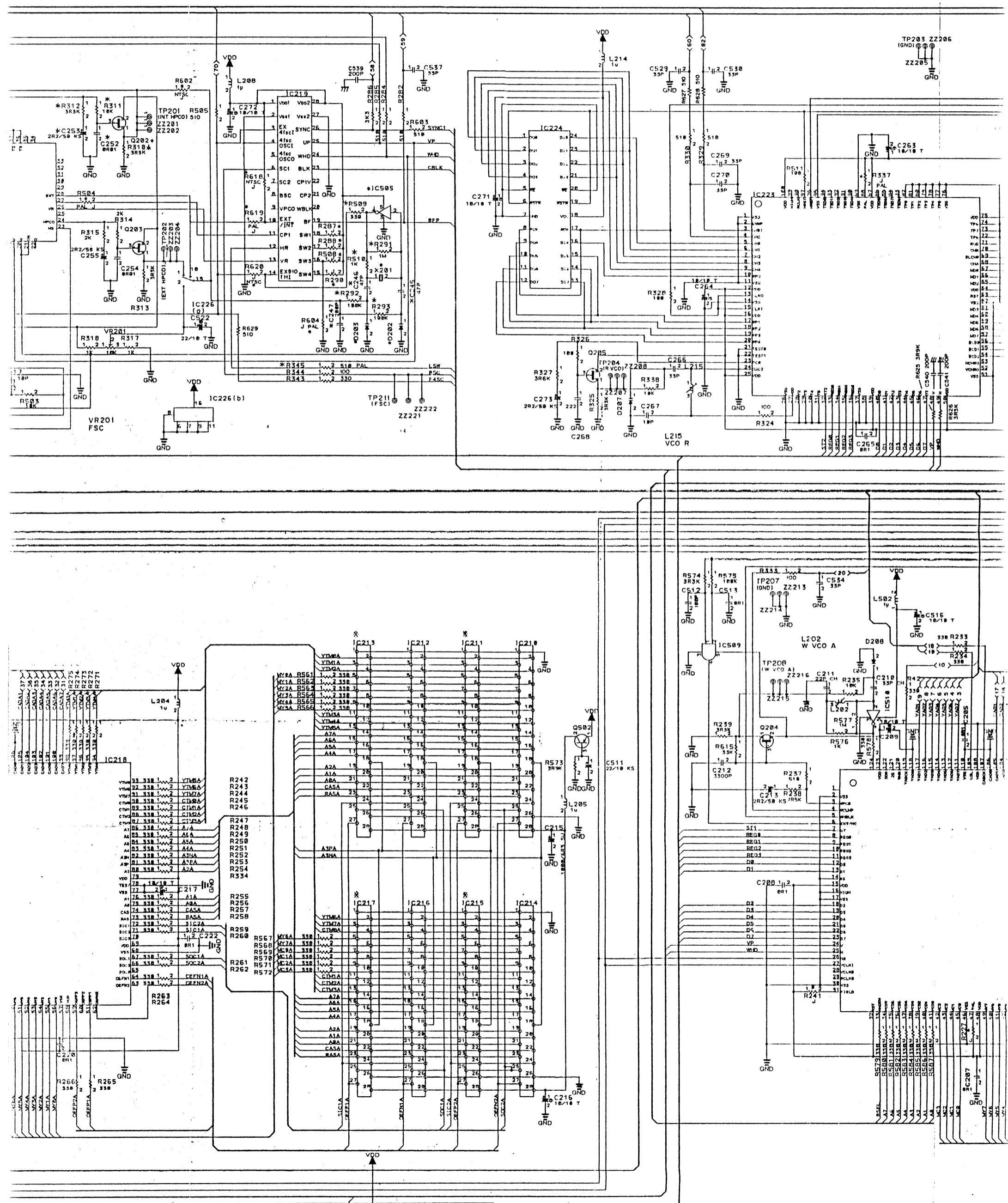
	B	C	E
Q1	-0.4	2.0	1.5
2	0.1	2.4	2.5
3	0.1	2.4	2.4
5	1.8	0	0
6	0.1	2.	

SCHEMATIC DIAGRAM

MAIN BOARD (B)

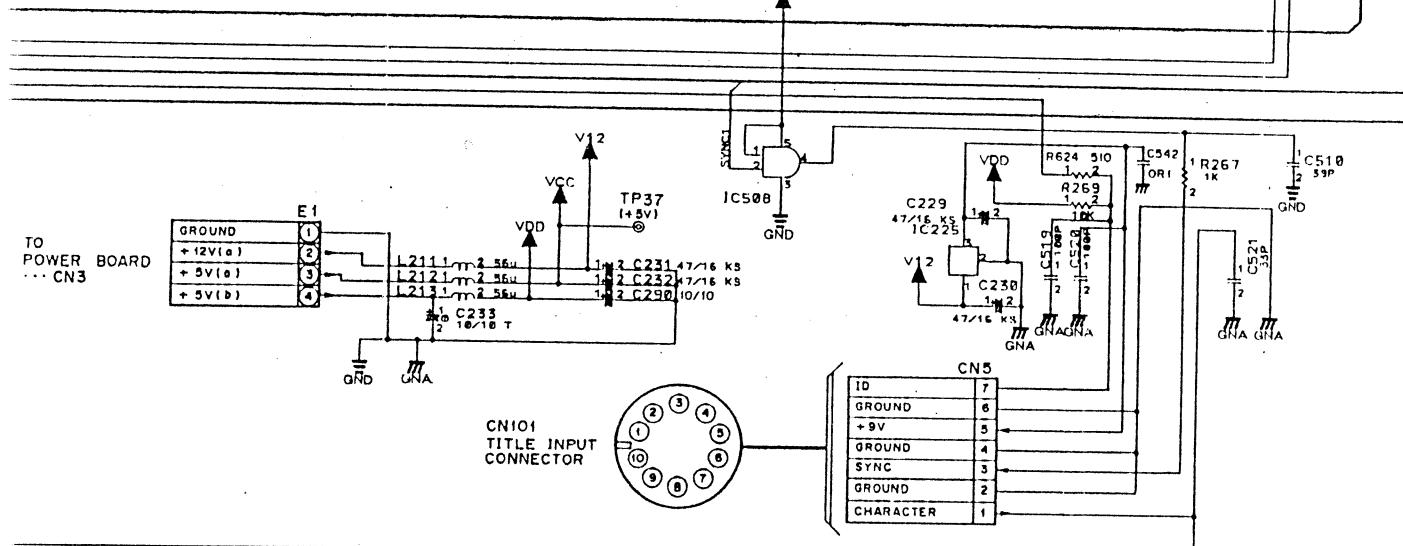
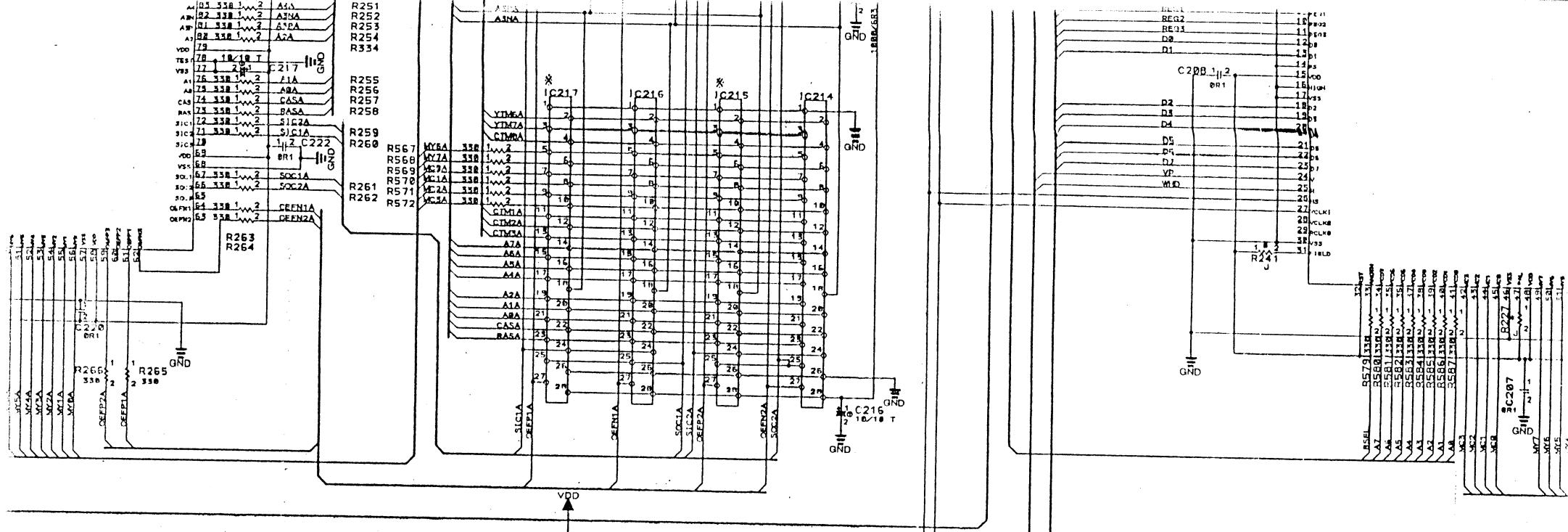


IEMTIC DIAGRAM OF MAIN BOARD (DIGITAL SIGNAL SECTION)



*marked parts are shown in follows: *marked parts are shown in foll

Ref. No.	PAL	NTSC	Ref. No.	PAL	NTSC
----------	-----	------	----------	-----	------



* marked parts are shown in follows: * marked parts are shown in fol

Ref. No.	PAL	NTSC
J1	USED	NOT USE
J2	USED	NOT USE
R91	NOT USED	USED
R99	NOT USED	USED
R439	NOT USED	USED
R440	NOT USED	USED
C416	NOT USED	USED
C417	NOT USED	USED
R9	IK	10K
R50	IK	10K

Ref. No.	PAL	NTSC
I C 505	USED	NOT USED
Q 202	USED	NOT USED
D 202	USED	NOT USED
D 203	USED	NOT USED
X 201	USED	NOT USED
J 201	USED	NOT USED
J 202	NOT USED	USED
R 227	USED	NOT USED
R 268	USED	NOT USED
R 287	NOT USED	USED
R 288	NOT USED	USED
R 290	NOT USED	USED
R 291	USED	NOT USED

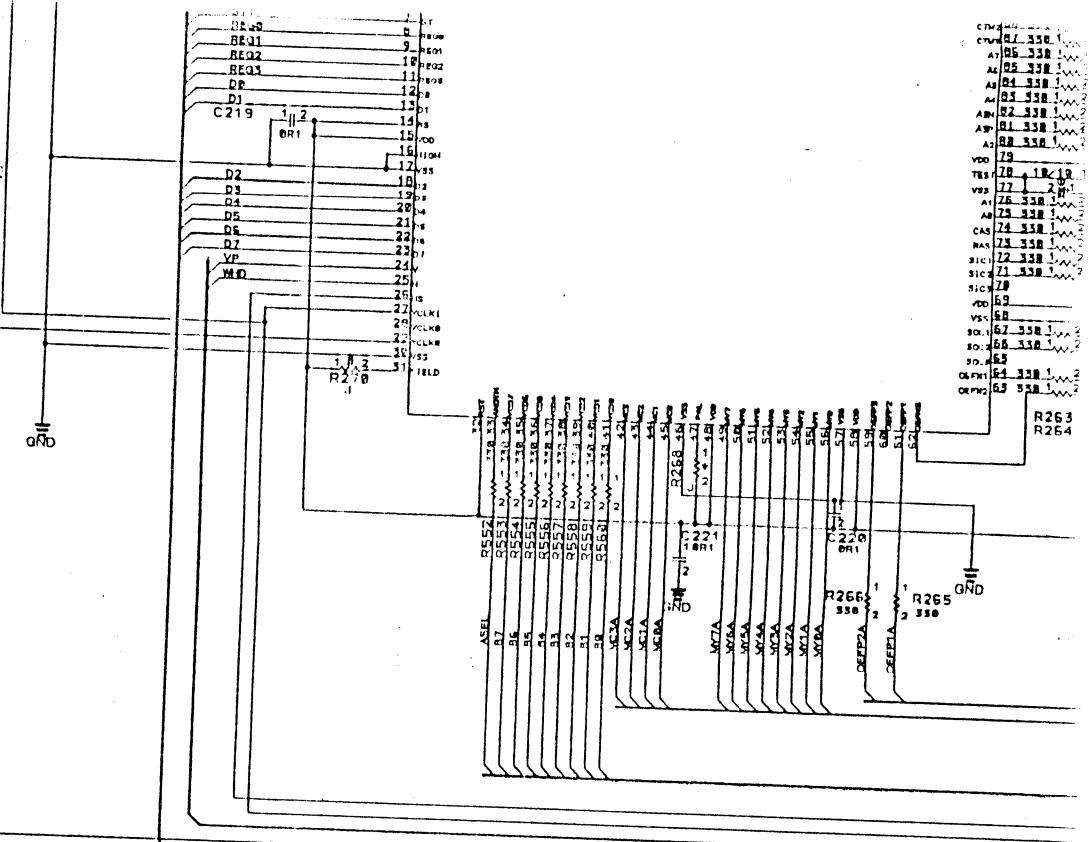
REC C 7 <71>
 REC C 6 <72>
 REC C 5 <73>
 REC C 4 <74>
 REC C 3 <75>
 REC C 2 <76>
 REC C 1 <77>
 REC C 0 <78>
 NCBLK <79>
 E_SYNC <80>
 A <81>
 EXT CAM <82>

V_REF(-) <83>
 V_REF(+1) <84>
 AD 4 <85>
 AD 3 <86>
 AD 2 <87>
 AD 1 <88>
 AD 0 <89>
 P65 <90>
 P64 <91>
 P63 <92>
 P62 <93>
 P61 <94>
 P60 <95>
 P57 <96>
 P56 <97>
 P55 <98>
 P54 <99>
 P53 <100>
 P52 <101>
 P51 <102>
 P50 <103>
 P77 <104>
 P76 <105>
 P75 <106>
 P74 <107>
 P73 <108>
 P72 <109>
 P71 <110>
 P70 <111>
 P40 <112>
 P41 <113>

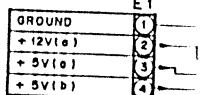
C

B

A



TO
POWER BOARD
--- CN3

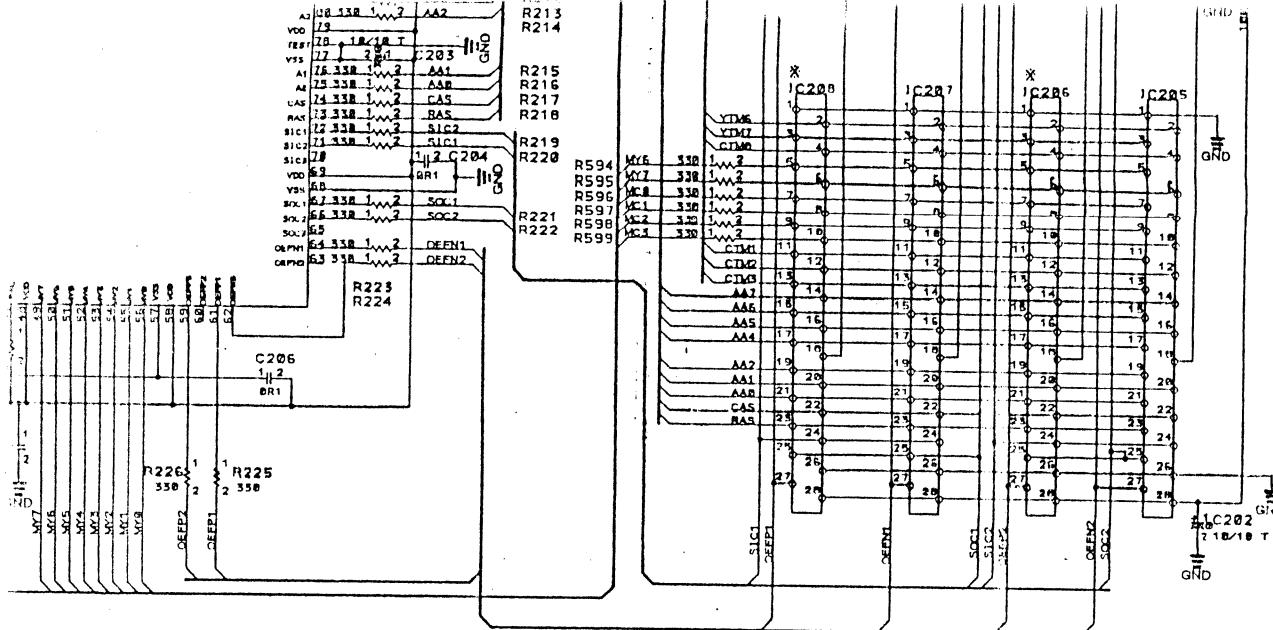


1

2

3

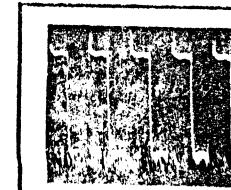
4



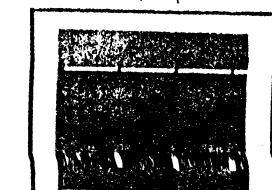
* marked parts are not used.

in follows:

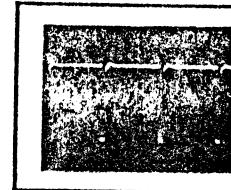
SC	Ref. No.	PAL	NTSC	Ref. No.	PAL	NTSC
I USED	R292	USED	NOT USED	R510	USED	NOT USED
I USED	R293	USED	NOT USED	R602	NOT USED	USED
I USED	R310	USED	NOT USED	R604	USED	NOT USED
I USED	R311	USED	NOT USED	R618	NOT USED	USED
I USED	R312	USED	NOT USED	R619	USED	NOT USED
I USED	R322	NOT USED	USED	R620	NOT USED	USED
ED	R323	USED	NOT USED	C245	USED	NOT USED
I USED	R336	USED	NOT USED	C246	USED	NOT USED
I USED	R337	USED	NOT USED	C247	USED	NOT USED
ED	R345	USED	NOT USED	C252	USED	NOT USED
ED	R504	USED	NOT USED	C253	USED	NOT USED
I USED	R508	NOT USED	USED			
I USED	R509	USED	NOT USED			



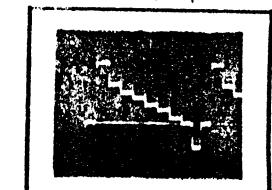
11. 1V/DIV, 20 μ s/DIV



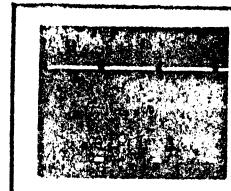
27. 0.2V/DIV, 10μs/DIV



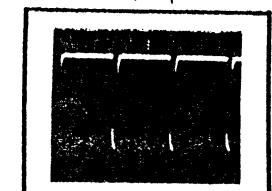
12. 1V/DIV, 20μs/DIV



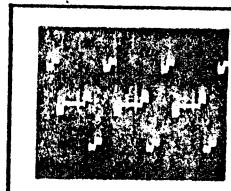
28. 1V/DIV, 20μs/DIV



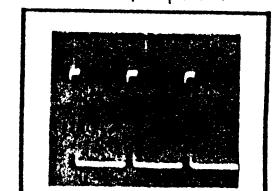
13. 0.5V/DIV, 20 μ s/DIV



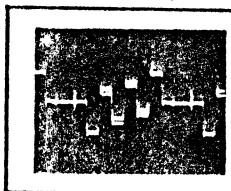
29. 1V/DIV, 200μS/DIV



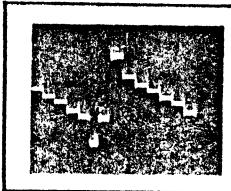
14. 0.5V/DIV, 10μs/DIV



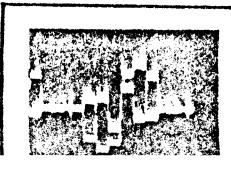
30. 1V/DIV 5ms/DIV

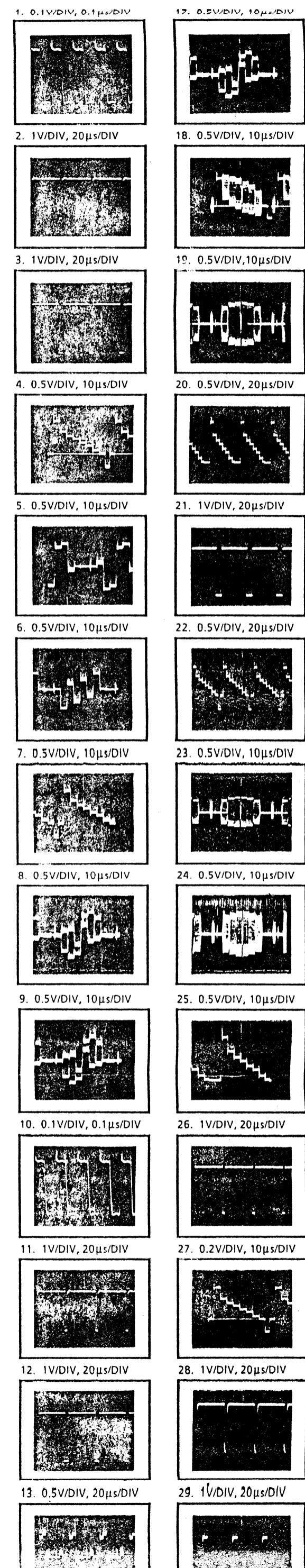
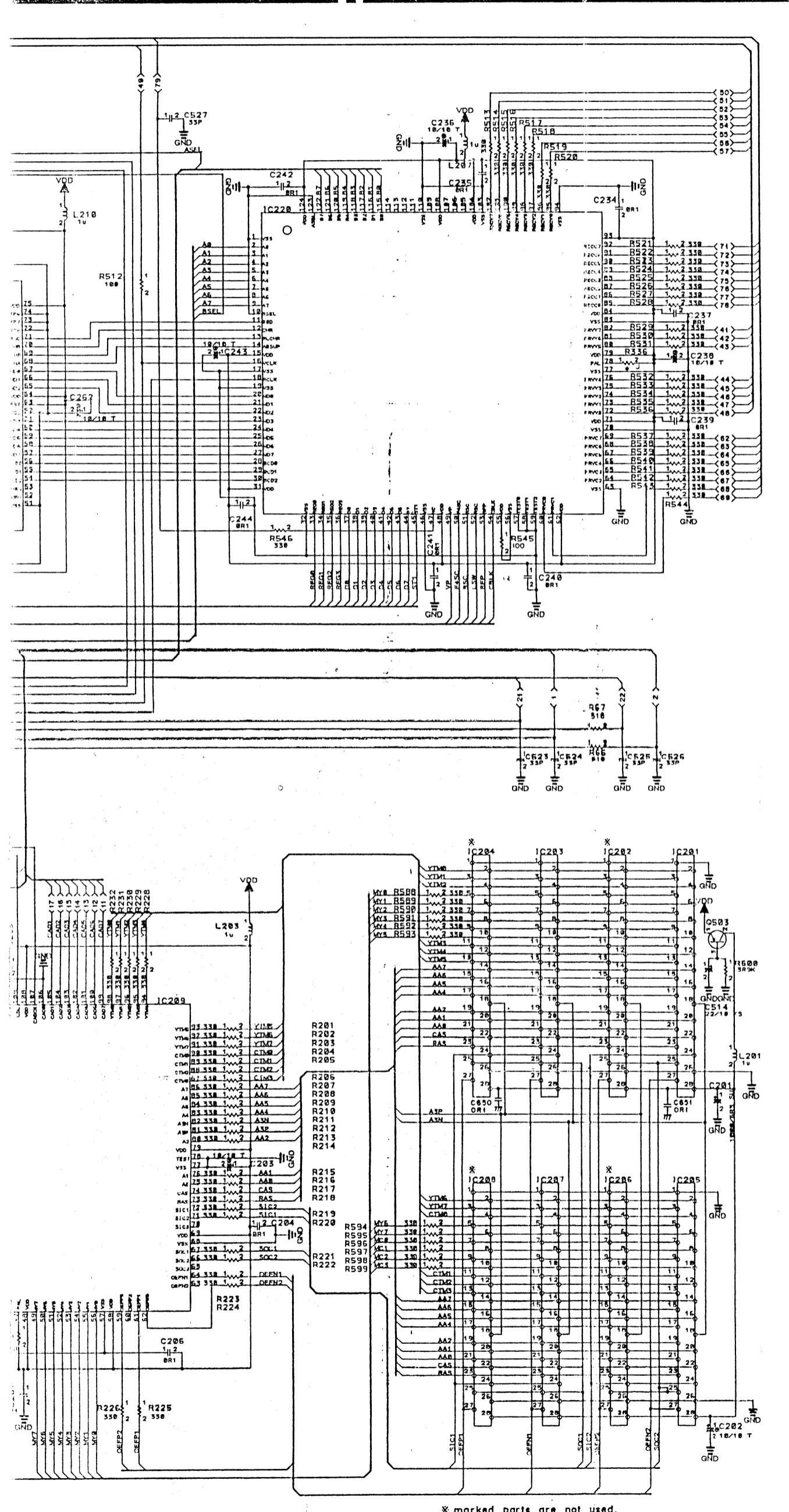


15. 0.5V/DIV, 10μs/DIV



16 0.5V/DIV, 10 μ s/DIV





in follows:

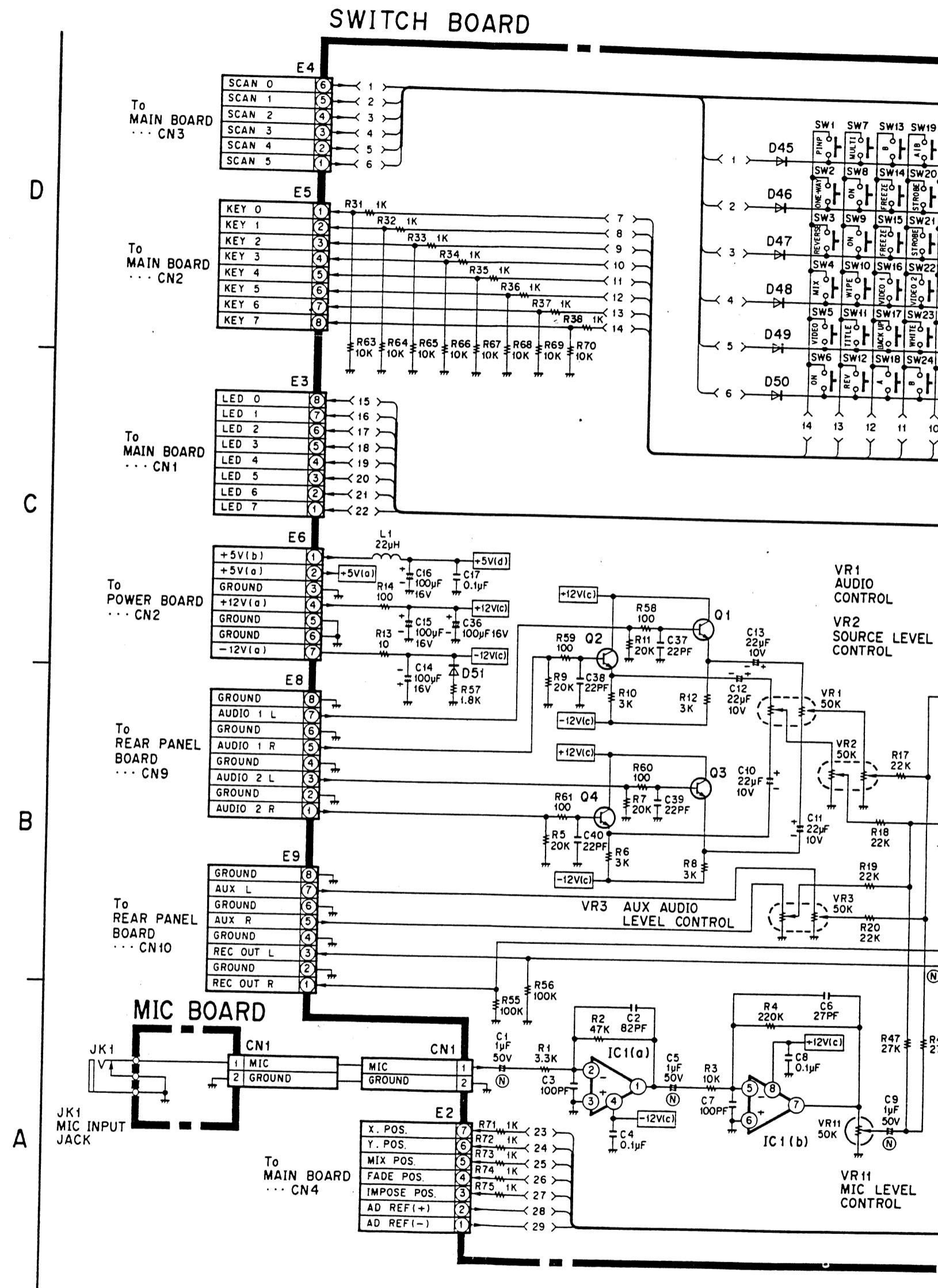
ISCS	Ref. No.	PAL	NTSC	Ref. No.	PAL	NTSC
------	----------	-----	------	----------	-----	------

SCHEMATIC DIAGRAM OF

Switch Board

<Index>

IC1	A2
IC2	B4
IC3	B4
IC5	C5
Q1	C3
Q2	C2
Q3	B3
Q4	B2
Q5	A3
Q6	A4
Q7	D4
Q8	D4
Q9	D4
Q10	D4
Q11	D4
Q12	C4
D1	D5
D2	D5
D3	D5
D4	D5
D5	D5
D6	D5
D7	D5
D8	D5
D9	D5
D10	D5
D11	D5
D12	D5
D13	D5
D14	D5
D15	D5
D16	D5
D17	D5
D18	D5
D19	D5
D20	D5
D21	D5
D22	D5
D23	D5
D24	D5
D25	D5
D26	D5
D27	D5
D28	D5
D29	D5
D30	D5
D31	D5
D32	D5
D33	D5
D34	D5
D35	D5
D36	D5
D37	D5
D38	D5
D39	D5
D40	D5
D41	D5
D42	D5
D43	D5
D44	A4
D45	D3
D46	D3
D47	D3
D48	D3
D49	D3
D50	D3
D51	C3
	B2



<VOLTAGE>

	IC1	IC2	IC3	IC5
Pin 1	0	0	0	0
2	0	0	0	0.8
3	0	0	0	1.6
4	-11.7	-11.7	-11.7	0
5	0	0	0	0.8
6	0	0	0	0
7	0	0	0	1.6
8	9.1	9.1	9.1	0.8
9				0
10				0
11				1.5
12				1.5
13				2.6
14				2.3
15				2.6
16				1.9
17				2.2
18				2.6

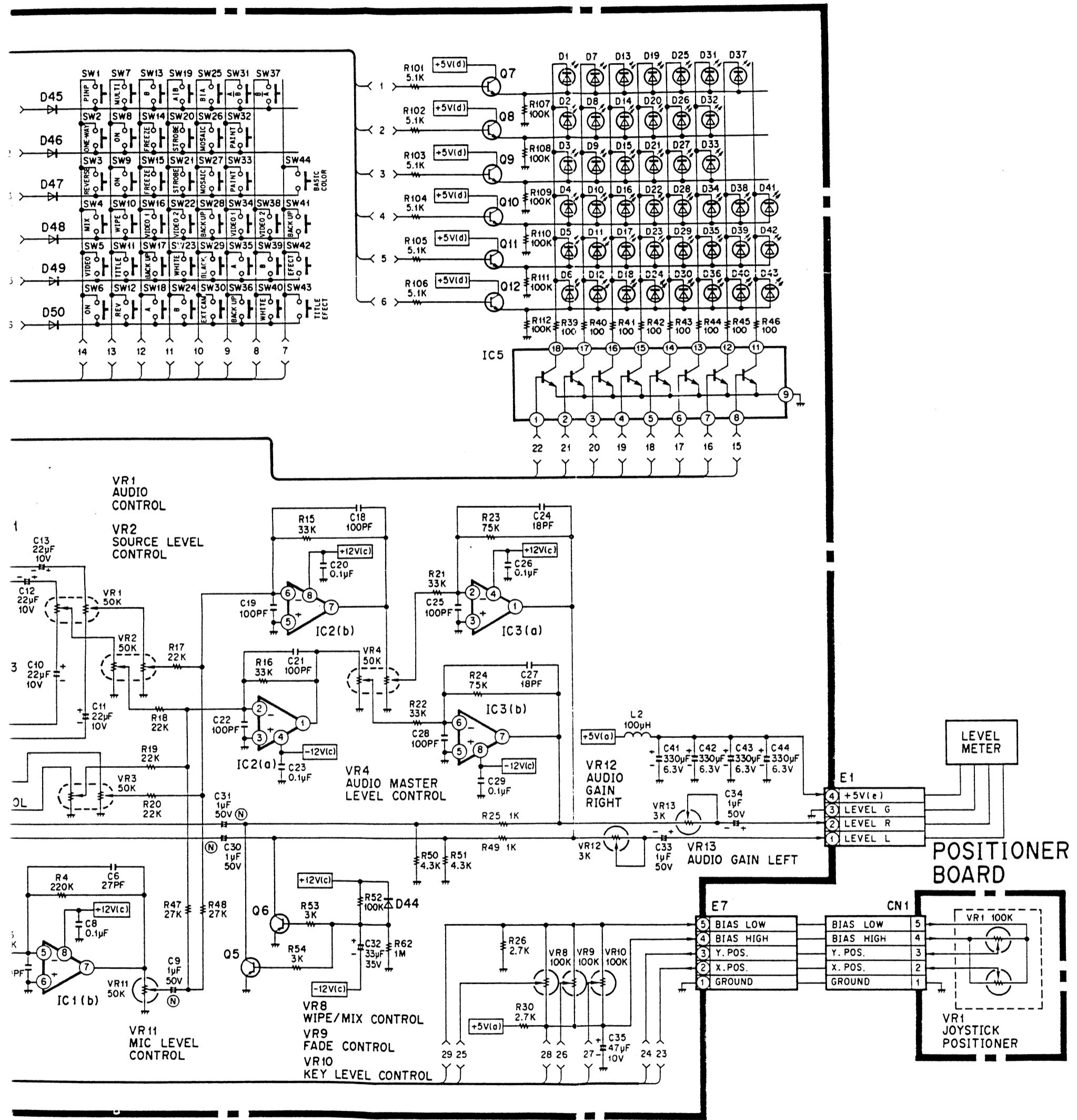
	B	C	E
Q1	-0.8	9.1	-0.2
2	-0.1	9.1	-0.8
3	-0.1	9.1	-0.7
4	-0.8	9.1	-0.1
5	0	0	8.3
6	0	0	8.3
7	0.7	5.0	0.8
8	0.7	5.0	0.8
9	0.7	5.0	0.8
10	0.5	5.0	0.7
11	0.5	5.0	0.7
12	0.6	5.0	0.7

1

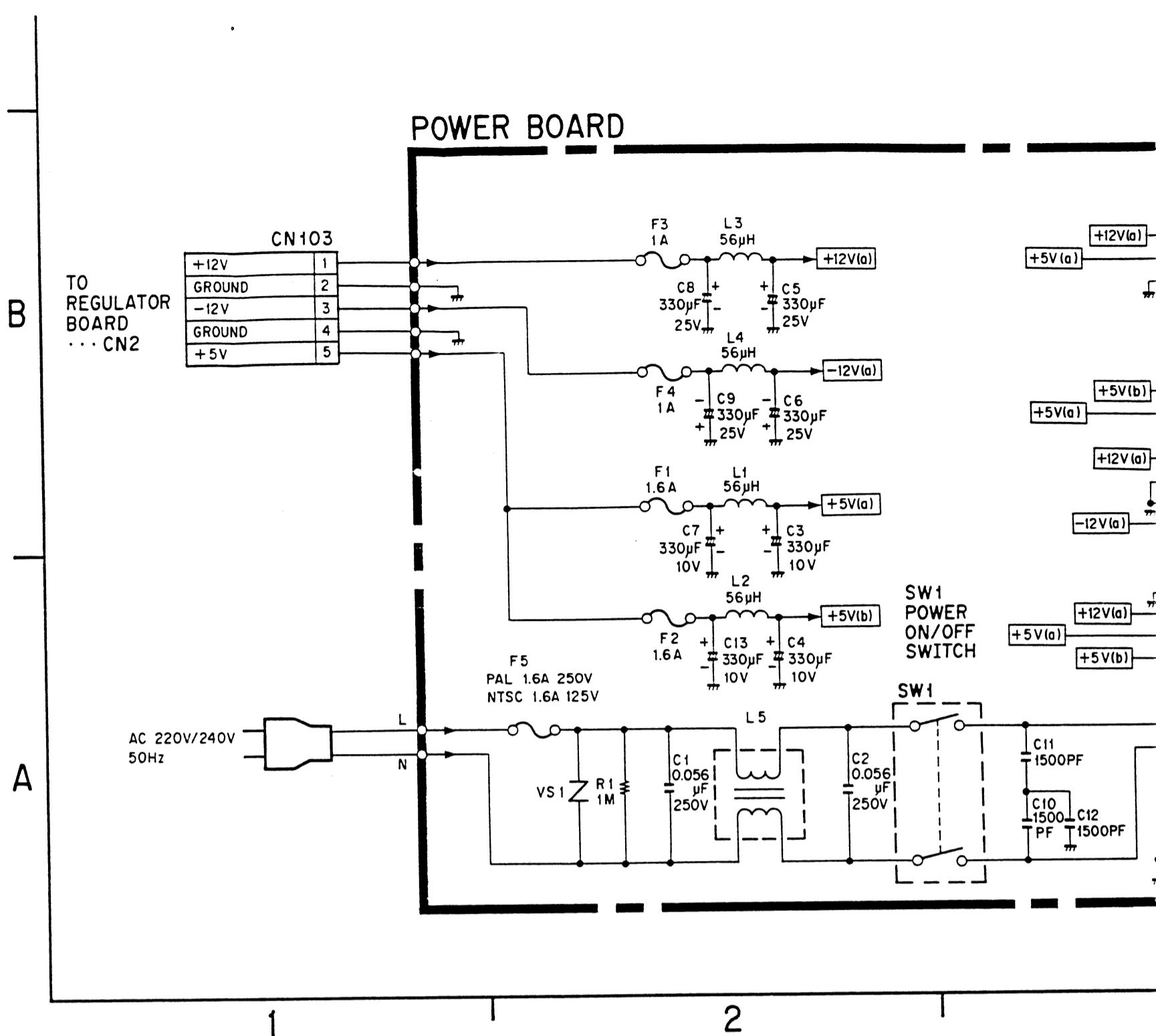
2

3

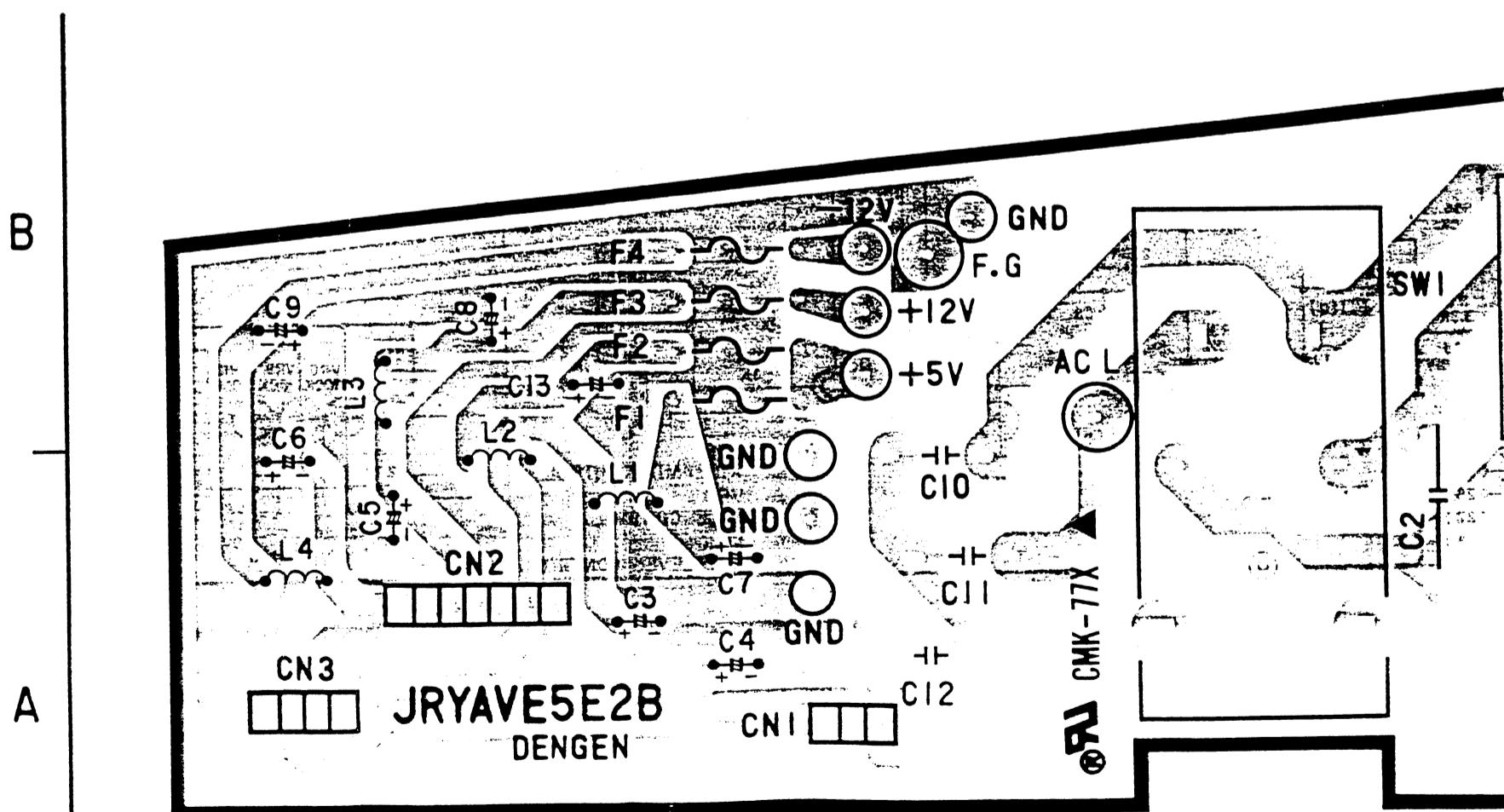
DIAGRAM OF SWITCH BOARD



SCHEMATIC DIAGRAM OF POWER BOARD

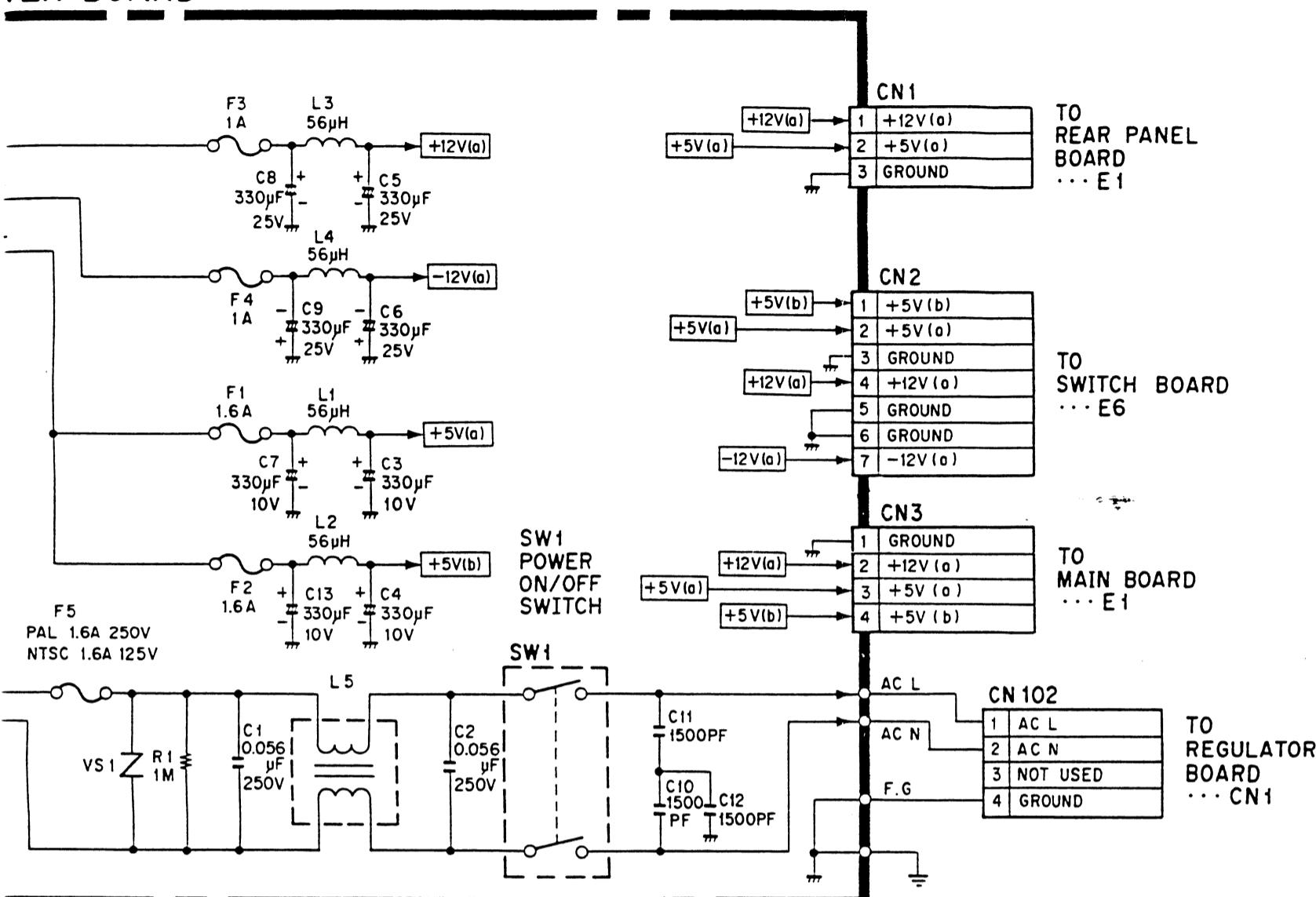


CONDUCTOR VIEW OF POWER BOARD



CHEMATIC DIAGRAM OF POWER BOARD

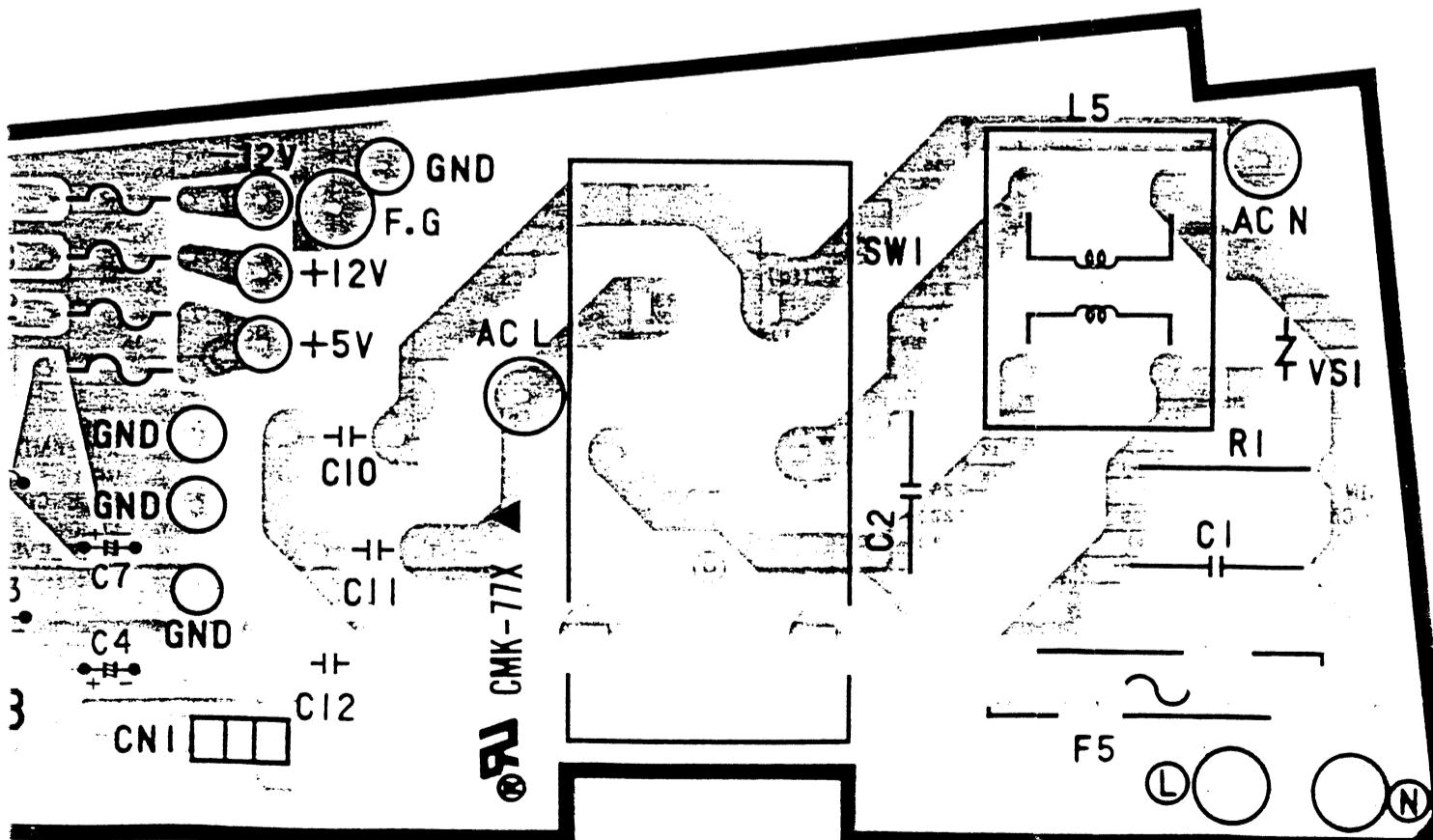
POWER BOARD



2

3

CONDUCTOR VIEW OF POWER BOARD

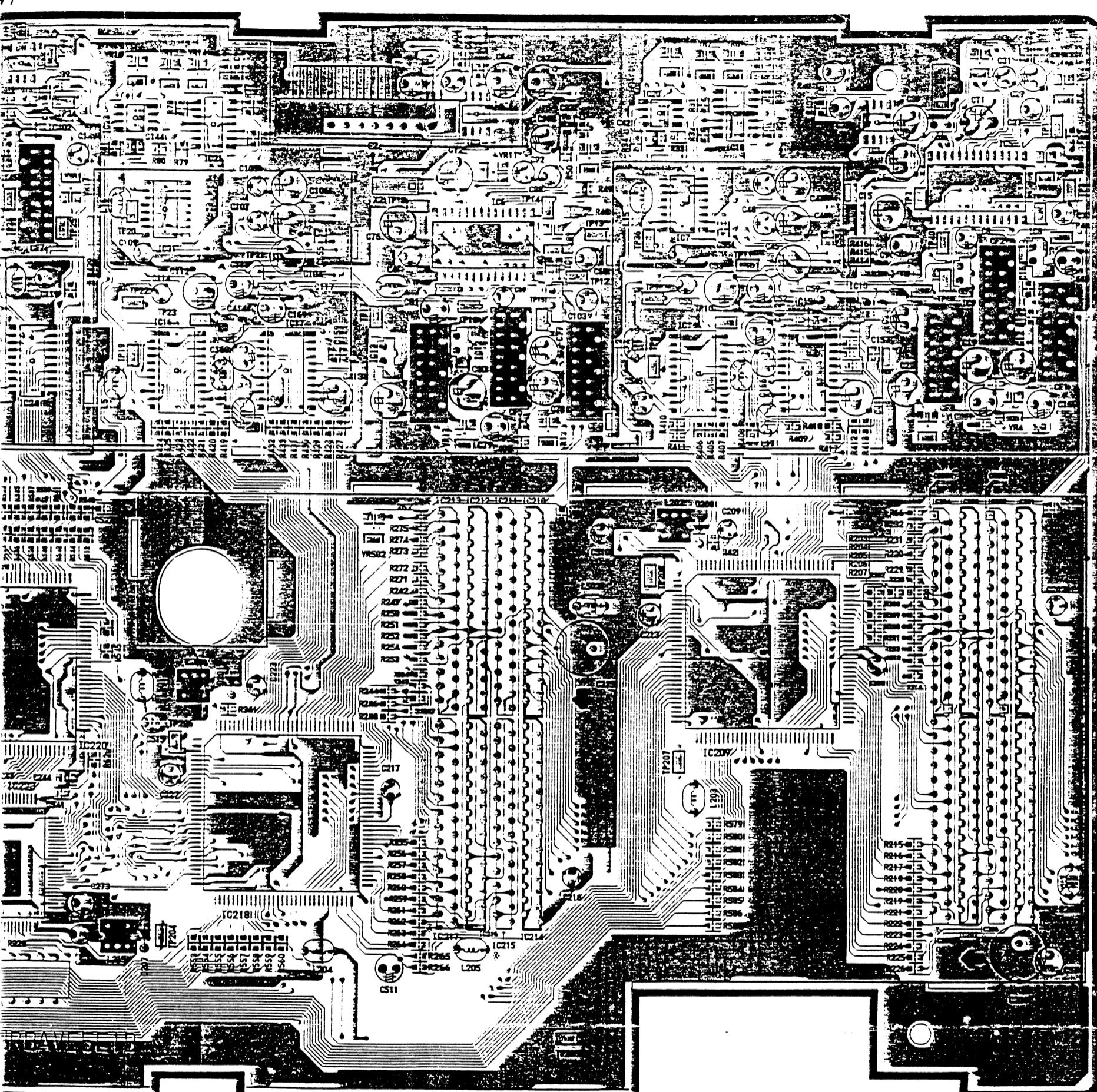


FRONT SIDE VIEW)

2

3

4



* marked parts are not soldered.

4

5

6

7

CONDUCTOR VIEW OF MA

Main Board

<Index>

Component Side

IC1 D7
IC3 D5
IC5 D7
IC6 D5
IC7 D6
IC8 D7
IC9 D7
IC10 D6
IC11 D5
IC12 C5
IC13 C5
IC14 C6
IC15 C6
IC16 C4
IC17 C4
IC18 D6
IC20 D6
IC21 D4
IC23 D4
IC24 C3
IC25 C3
IC26 C3
IC27 C3
IC28 D3
IC29 D3
IC31 D4
IC32 D3
IC33 D2
IC201 87
IC203 87
IC205 87
IC207 87
IC209 86
IC210 85
IC212 85
IC214 85
IC216 85
IC218 84
IC219 82
IC220 83
IC221 B1
IC222 A2
IC223 B3
IC224 A3
IC225 C3
IC226 B3
IC401 D3
IC402 D4
IC501 B1
IC502 B1
IC503 A3
IC504 A3
Q13 D3
Q17 D3
Q202 A2
Q401 D3
D201 B4
D202 B2
D203 B3
D205 A2
D206 A2
D207 A4
D208 C6
D401 D3
D402 D3
D403 D3
D404 D2

MAIN BOARD (COMPONENT SIDE VIEW)

* marked parts are shown in foll

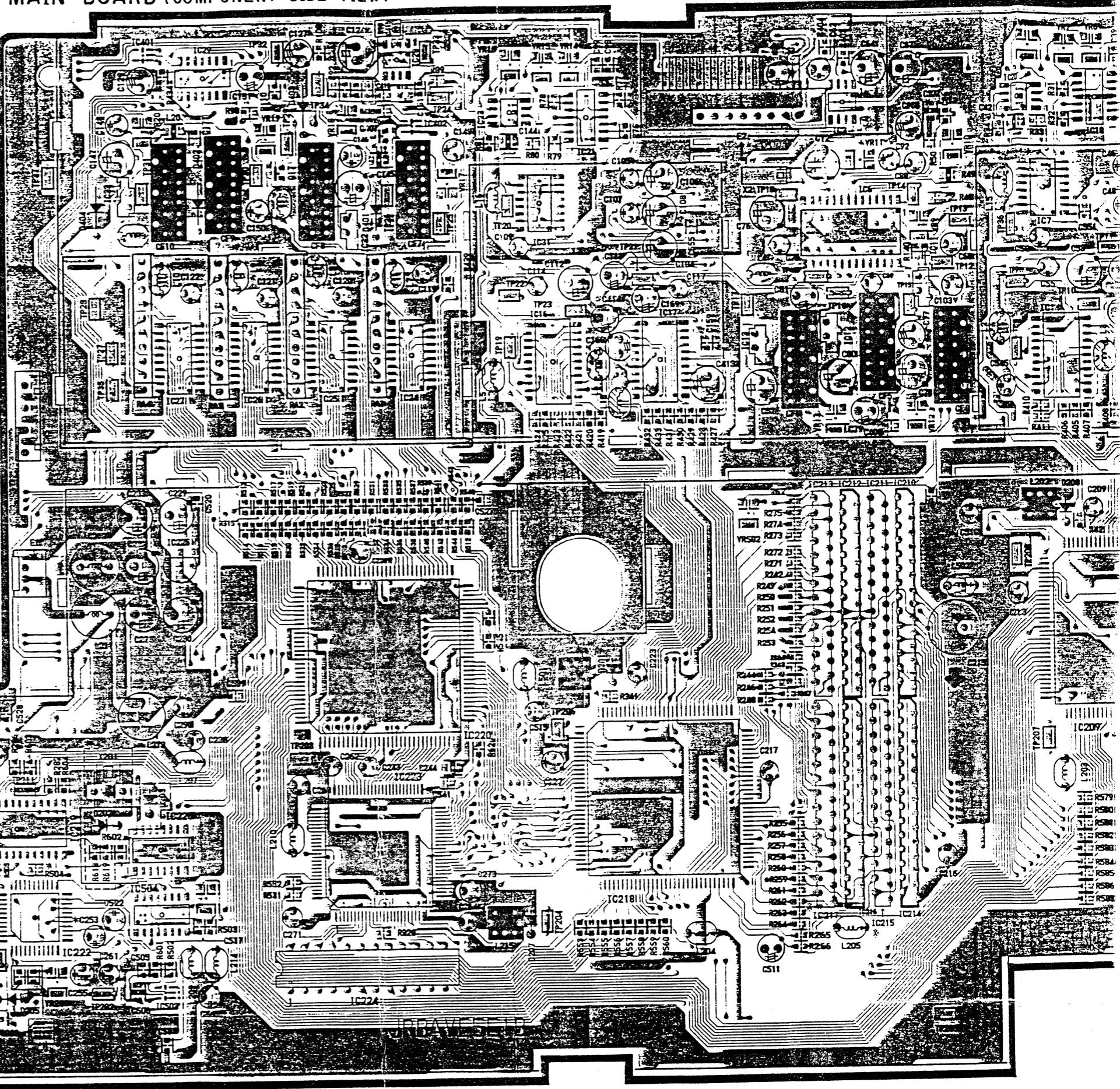
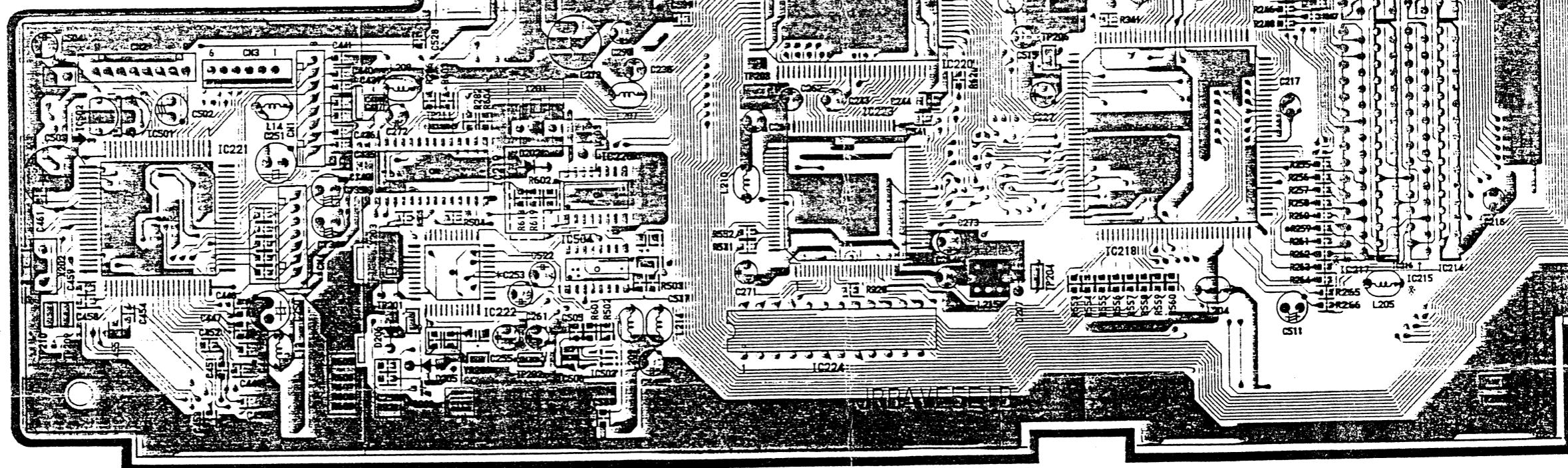
Ref. No.	PAL	NTSC
Q202	USED	NOT USED
D202	USED	NOT USED
D203	USED	NOT USED
R91	NOT USED	USED
R439	NOT USED	USED
R504	USED	NOT USED
R602	NOT USED	USED
R604	USED	NOT USED
R618	NOT USED	USED
R619	USED	NOT USED
C253	USED	NOT USED
C416	NOT USED	USED
X201	USED	NOT USED

D

C

B

A

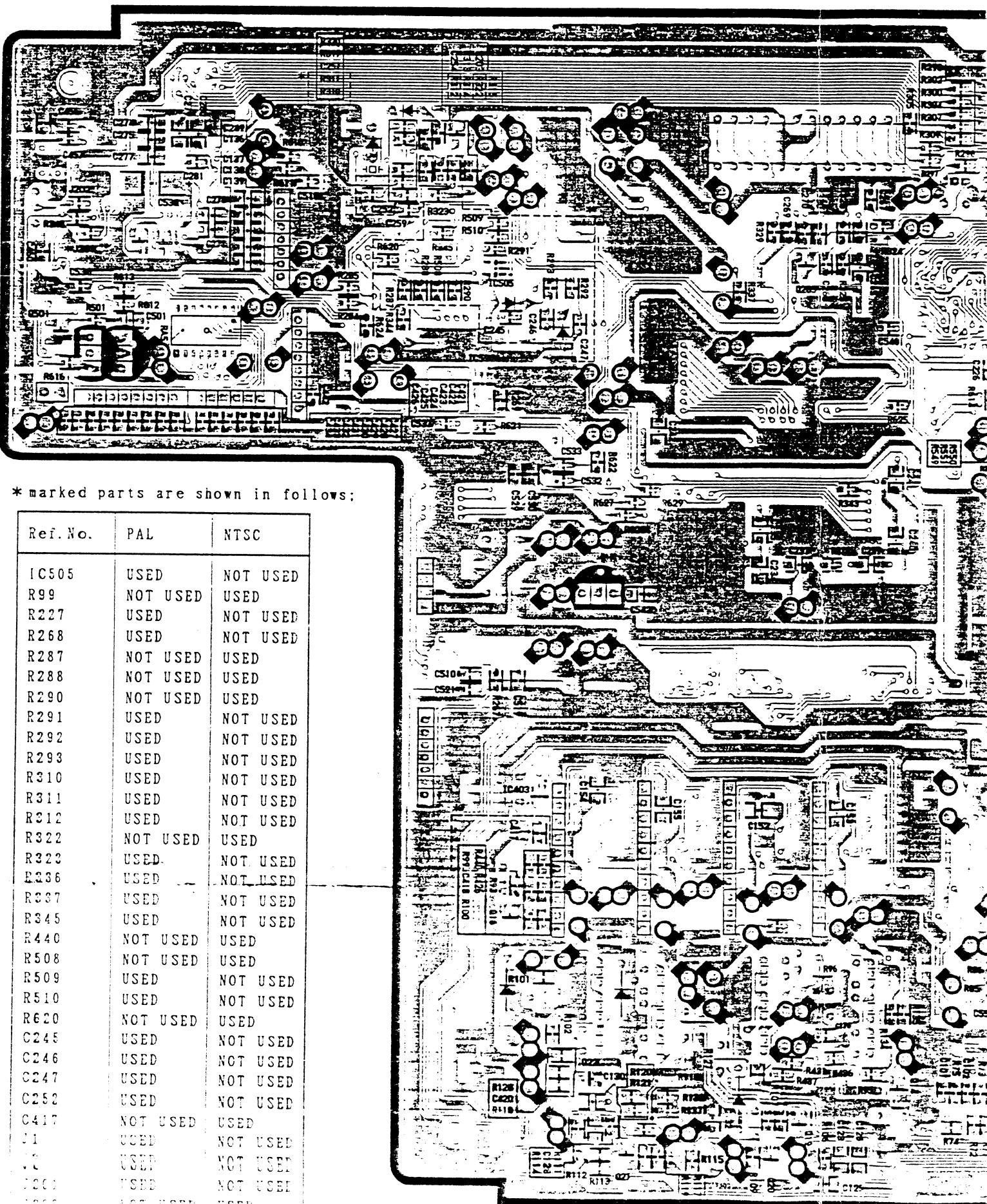


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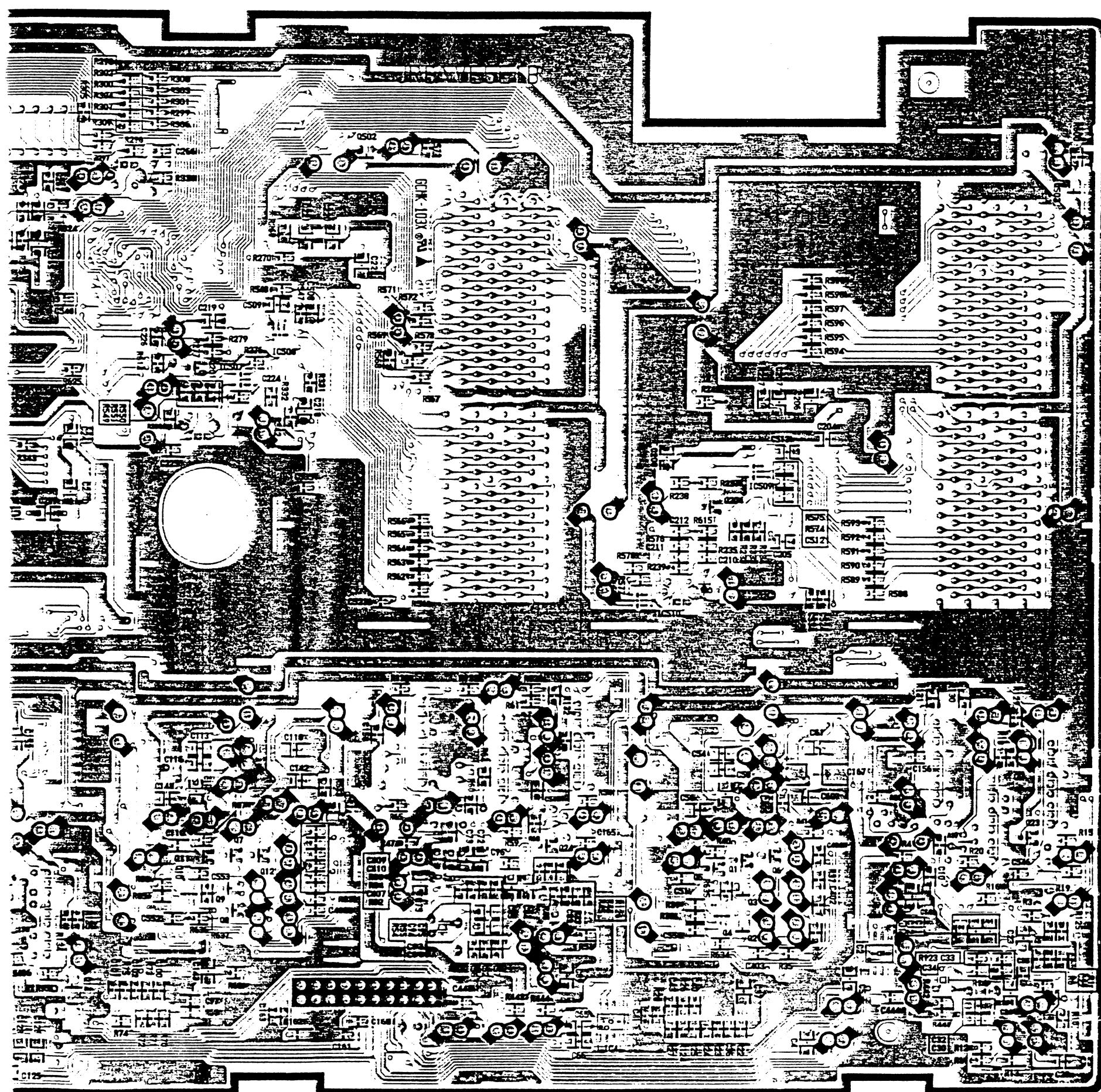
Pattern Side

I2	A7
IC4	A6
IC403	B2
IC505	D2
IC506	C4
IC507	C4
IC508	C3
IC509	C6
IC510	B6
Q1	B6
Q2	A6
Q3	A6
Q4	A6
Q5	B6
Q6	B6
Q7	B4
Q8	A4
Q9	A4
Q10	A4
Q11	B4
Q12	B4
Q14	A4
Q16	B2
Q19	A3
Q20	A3
Q21	A3
Q22	A3
Q23	B7
Q24	B5
Q201	C4
Q203	D2
Q204	C6
Q205	D3
Q501	D1
Q502	D5
Q503	D7

MAIN BOARD (PATTERN SIDE VIEW)



VIEW OF MAIN BOARD

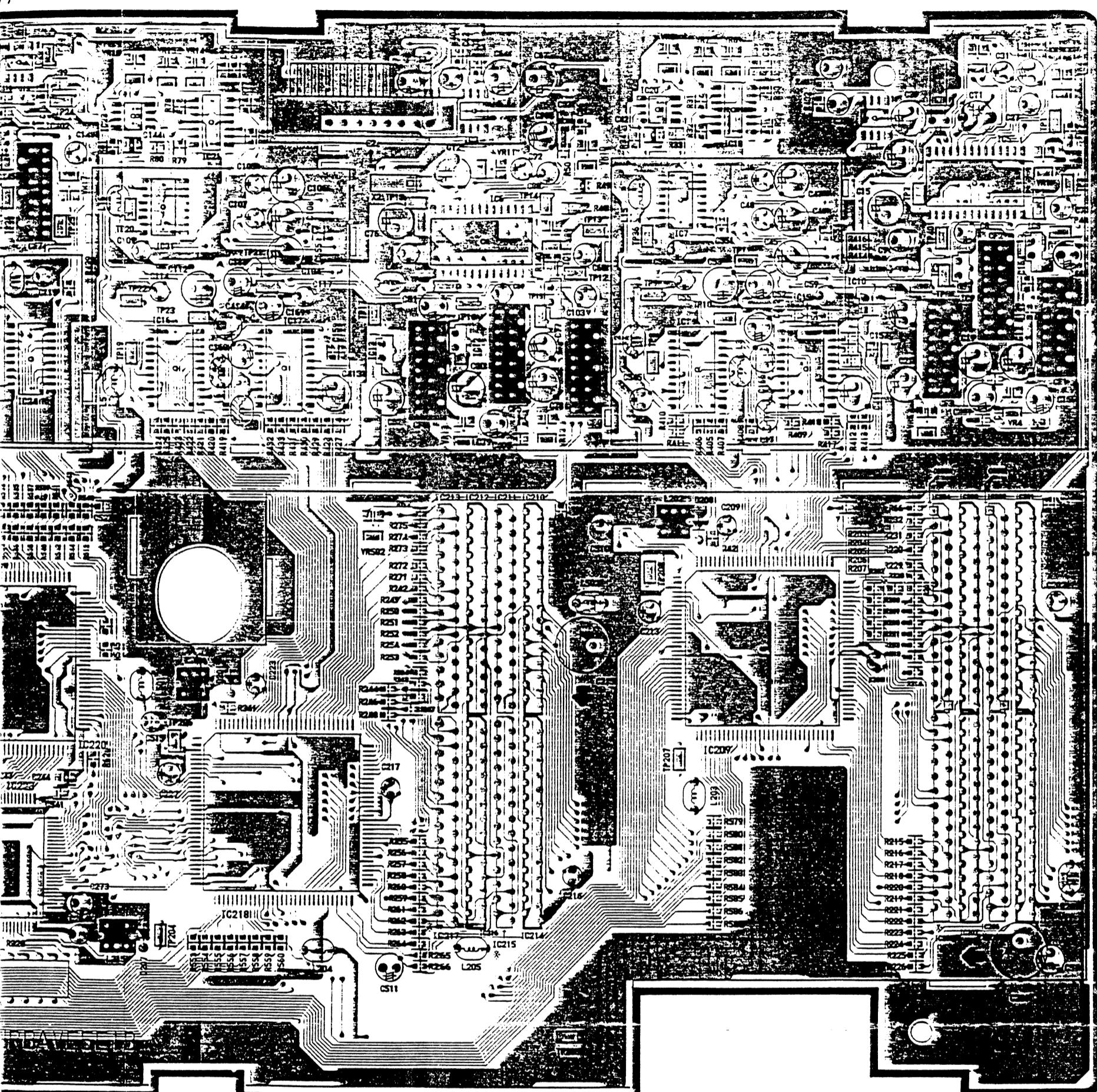


4

5

6

7



* marked parts are not soldered.

4

5

6

7

CONDUCTOR VIEW OF MA

Main Board

<index>

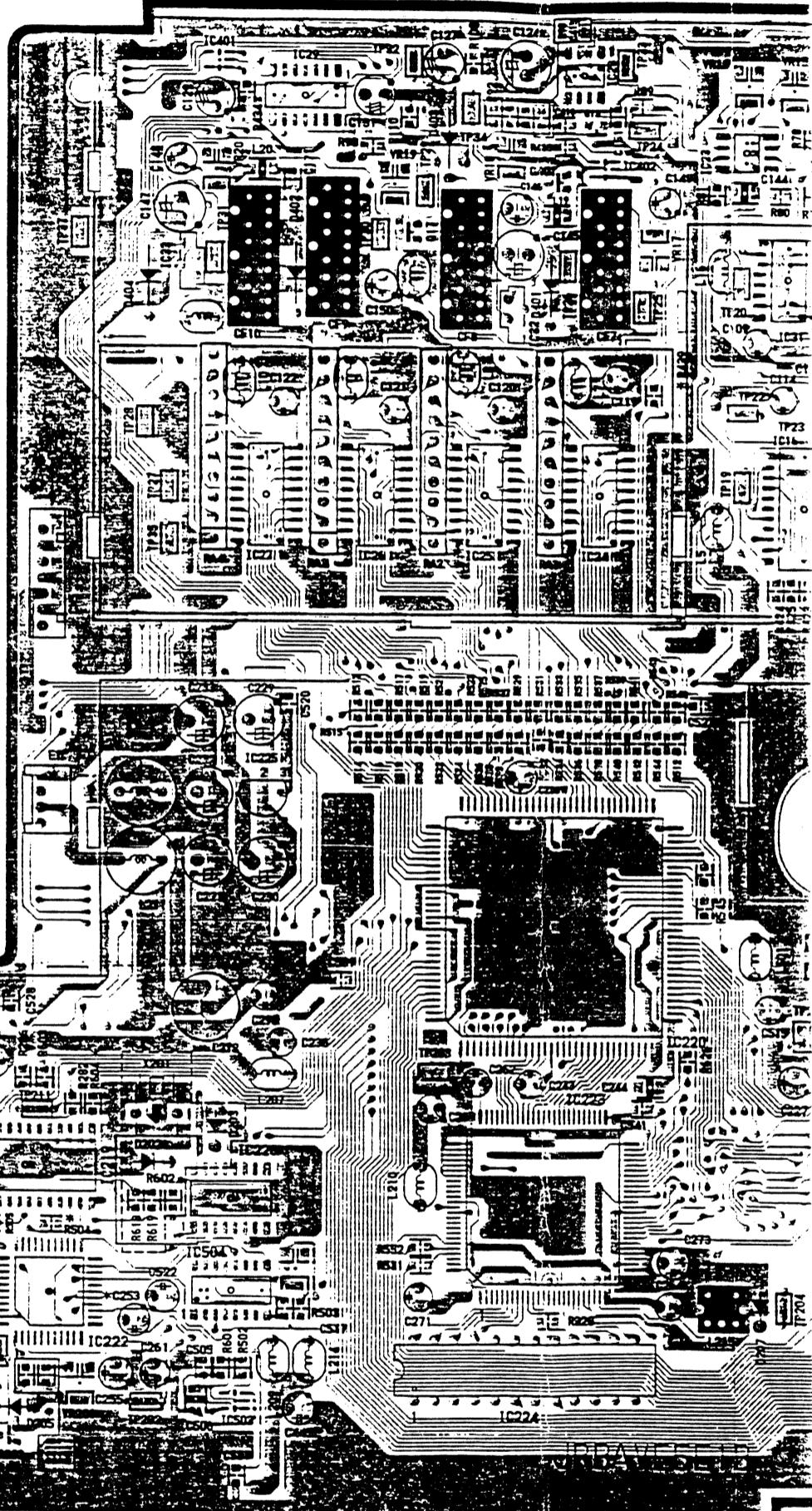
Component Side

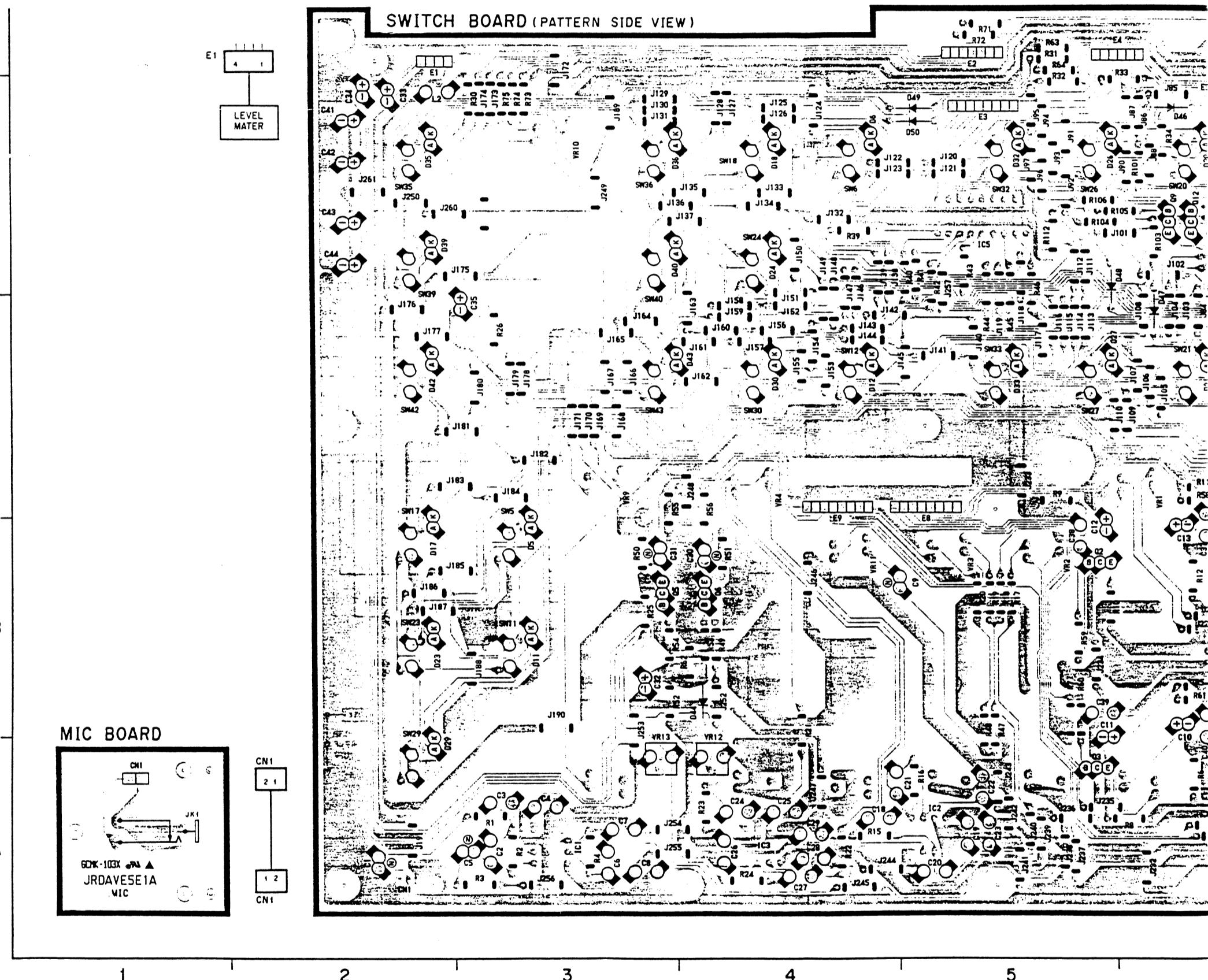
IC1	D7
IC3	D5
IC5	D7
IC6	D5
IC7	D6
IC8	D7
IC9	D7
IC10	D6
IC11	D5
IC12	C5
IC13	C5
IC14	C6
IC15	C6
IC16	C4
IC17	C4
IC18	D6
IC20	D6
IC21	D4
IC23	D4
IC24	C3
IC25	C
IC26	C3
IC27	C3
IC28	D3
IC29	D3
IC31	D4
IC32	D3
IC33	D2
IC201	E7
IC203	B7
IC205	B7
IC207	B7
IC209	B6
IC210	B5
IC212	B5
IC214	B5
IC216	B5
IC218	B4
IC219	B2
IC220	B3
IC221	B1
IC222	A2
IC223	B3
IC224	A3
IC225	C3
IC226	B3
IC401	D3
IC402	D4
IC501	B1
IC502	B1
IC503	A3
IC504	A3
Q13	D3
Q17	D3
Q202	A2
Q401	D3
D201	B4
D202	B2
D203	B3
D205	A2
D206	A2
D207	A4
D208	C6
D401	D3
D402	D3
D403	D3
D404	D2

* marked parts are shown in foll

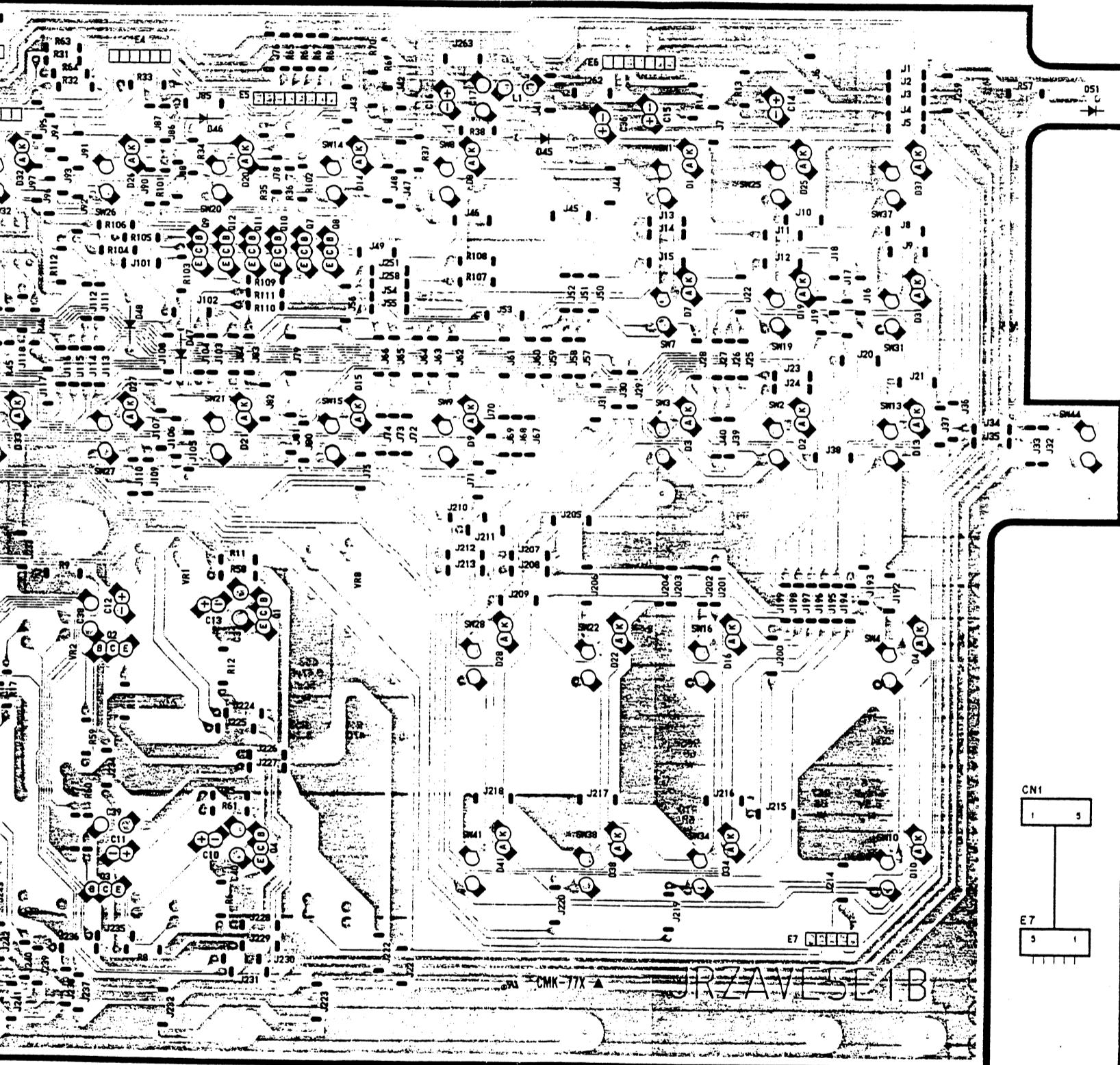
Ref. No.	PAL	NTSC
Q202	USED	NOT USED
D202	USED	NOT USED
D203	USED	NOT USED
R91	NOT USED	USED
R439	NOT USED	USED
R504	USED	NOT USED
R602	NOT USED	USED
R604	USED	NOT USED
R618	NOT USED	USED
R619	USED	NOT USED
C253	USED	NOT USED
C416	NOT USED	USED
X201	USED	NOT USED

MAIN BOARD (COMPONENT SIDE VIEW)





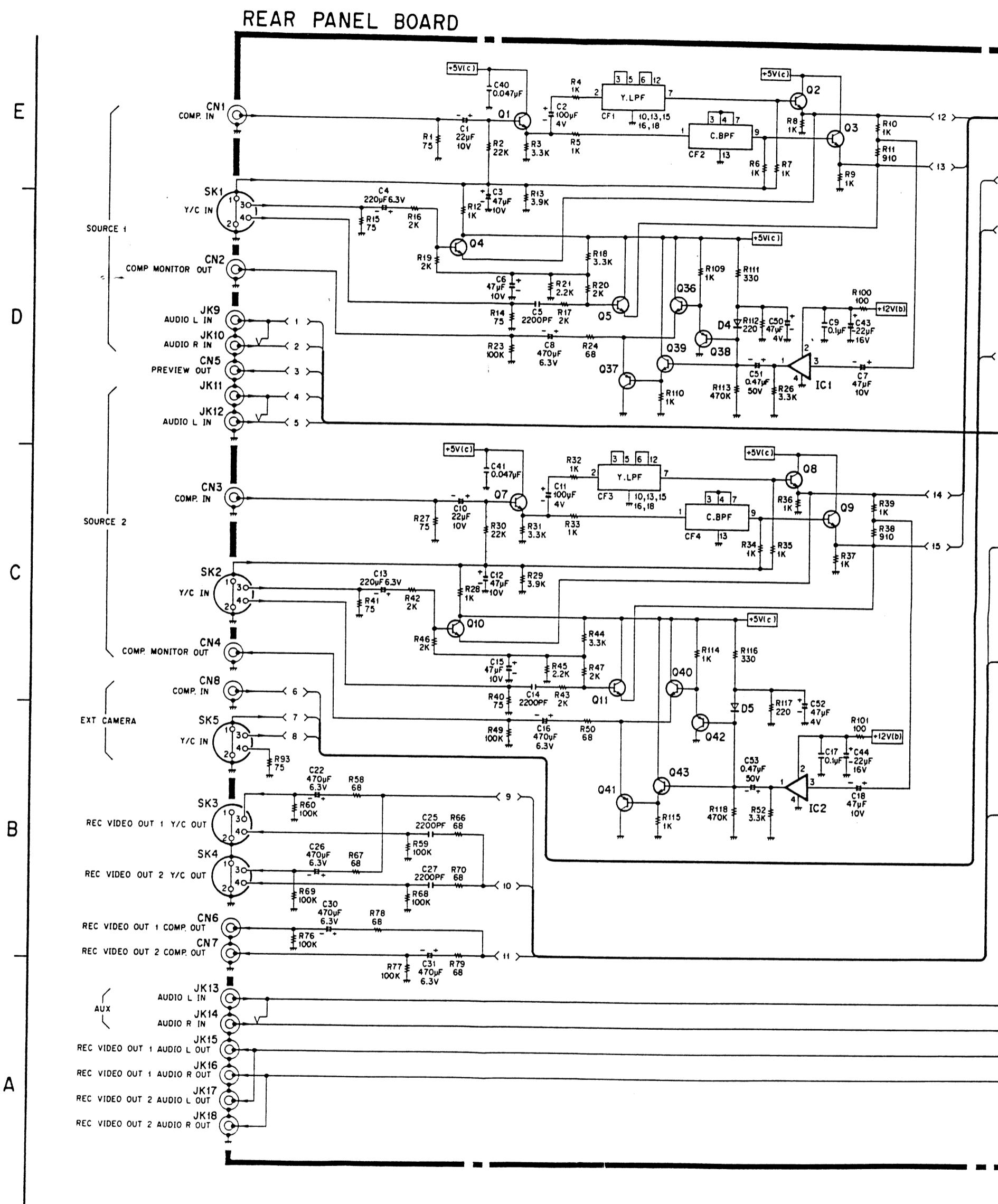
VIEW OF SWITCH BOARD



SCHEMATIC DIAGRAM OF REA

<Index>

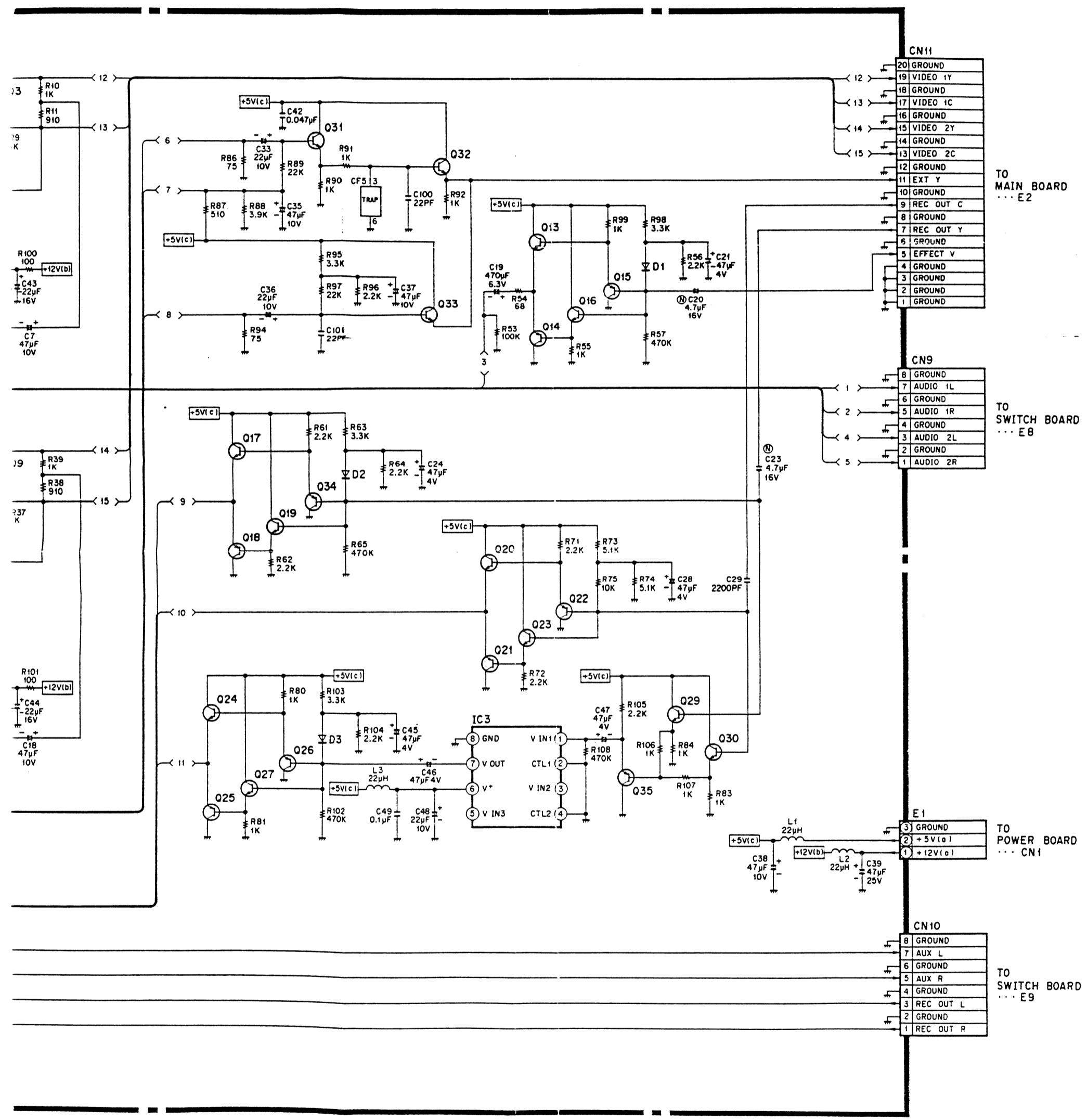
IC1	D4
IC2	B4
IC3	B6
Q1	E2
Q2	E4
Q3	E4
Q4	D2
Q5	D3
Q7	C2
Q8	C4
Q9	C4
Q10	C2
Q11	C3
Q13	D6
Q14	D6
Q15	D6
Q16	D6
Q17	C5
Q18	C5
Q19	C5
Q20	C6
Q21	C6
Q22	C6
Q23	C6
Q24	B5
Q25	B5
Q26	B5
Q27	B5
Q29	B6
Q30	B7
Q31	E5
Q32	E5
Q33	D5
Q34	B6
Q35	B6
Q36	D3
Q37	D3
Q38	D3
Q39	D3
Q40	C3
Q41	B3
Q42	B3
Q43	B3
D1	D6
D2	C5
D3	B5
D4	D3
D5	C3



	IC1	IC2	IC3
Pin 1	6.5	6.3	2.5
2	11.2	11.2	0
3	2.6	2.6	2.2
4	0	0	0
5			2.2
6			4.9
7			2.3
8			0

	B	C	E
Q1	3.8	4.9	3.2
2	3.9	4.9	3.2
3	3.9	4.9	3.2
4	1.9	4.9	3.2
5	1.9	4.9	3.2
7	3.8	4.9	3.2
8	3.9	4.9	3.2
9	3.9	4.9	3.2
10	1.9	4.9	3.2
11	1.9	4.9	3.2
13	3.1	4.9	2.5
14	1.9	0	2.5
15	2.5	0	3.1
16	2.5	4.9	1.9
17	3.1	4.9	2.5
18	1.8	0	2.5
19	2.4	4.9	1.9
20	3.0	4.9	2.4
21	1.8	0	2.4
22	2.4	0	3.0
23	2.4	4.9	1.8
24	3.1	4.9	2.5
25	1.9	0	2.5
26	2.5	0	3.1
27	2.5	4.9	1.9
29	2.5	4.9	1.8
30	2.4	4.9	1.8
31	4.0	4.9	3.3
32	3.3	4.9	2.7
33	2.0	4.9	2.7
34	2.5	0	3.1
35	1.8	0	2.4
36	3.0	4.9	2.4
37	1.8	0	2.5
38	2.4	0	3.0
39	2.4	4.9	1.8
40	3.0	4.9	2.4
41	1.8	0	2.4
42	2.4	0	3.0
43	2.4	4.9	1.8

RAM OF REAR PANEL BOARD

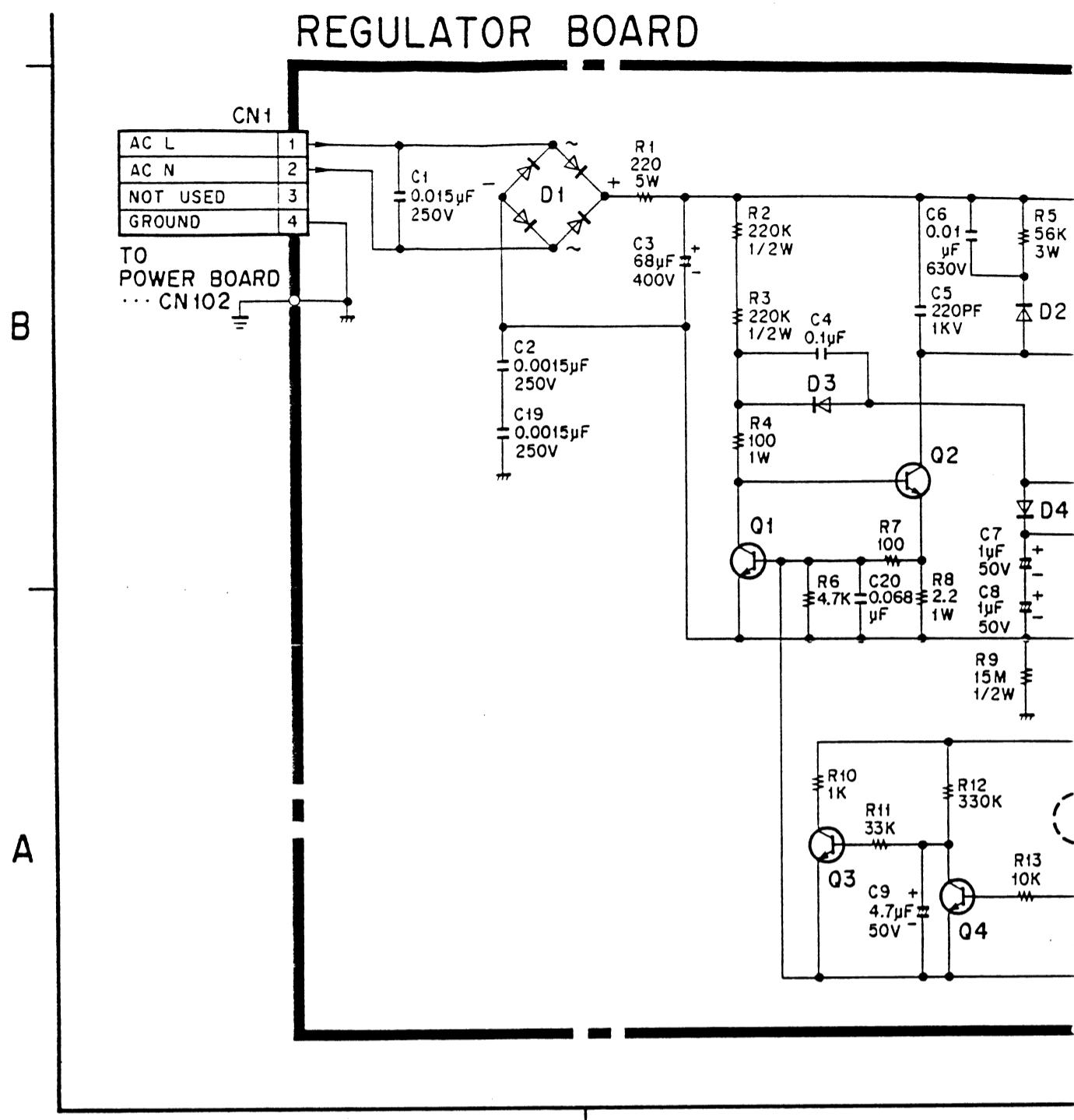


SCHEMATIC DIAGRAM O

REGULATOR BOARD

<Index>

IC1	B3
IC2	B3
IC3	A3
Q1	B2
Q2	B2
Q3	A2
Q4	A2
D1	B1
D2	B2
D3	B2
D4	B2
D5	A3
D6	B3
D7	B3
D8	B3

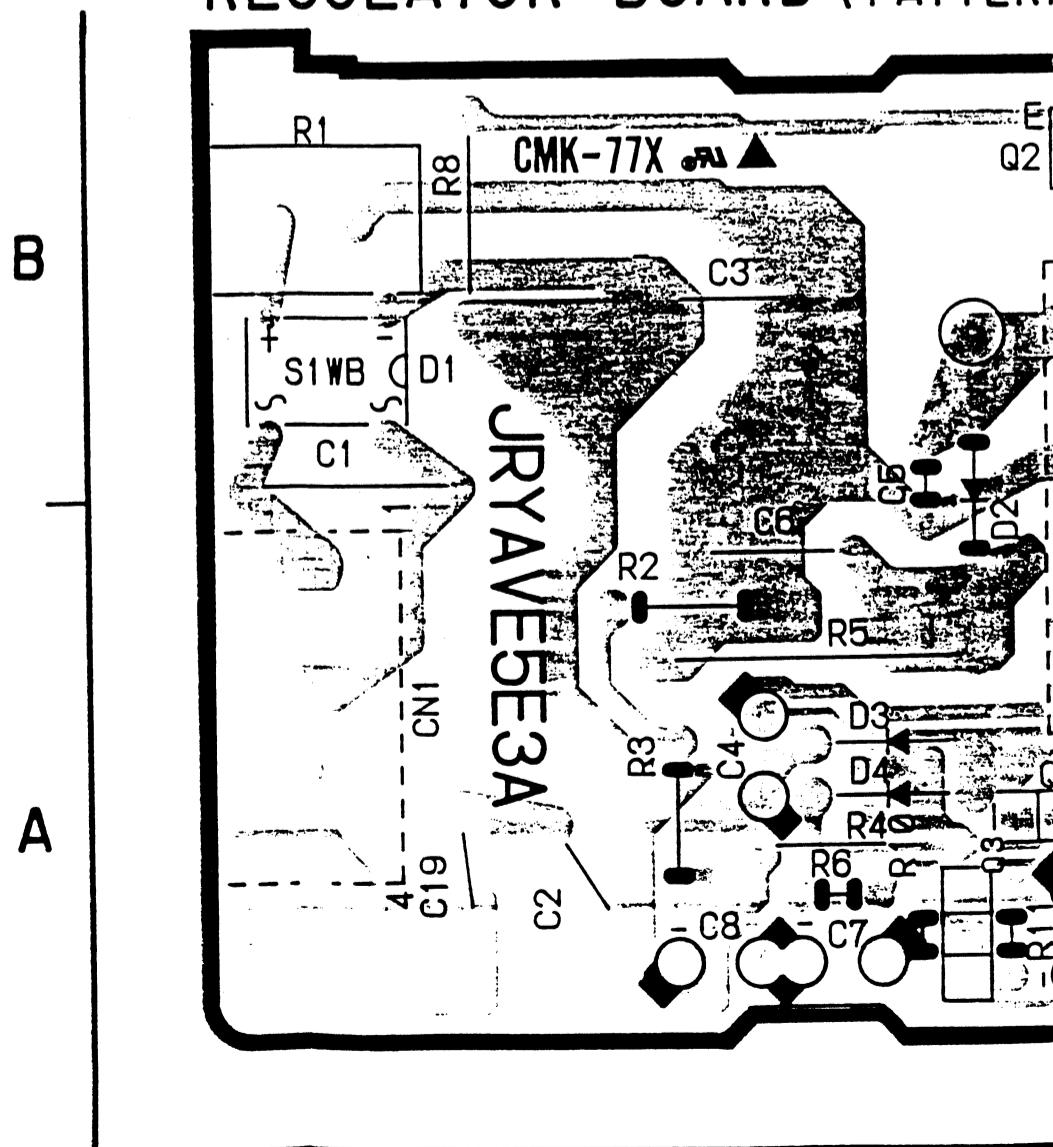


CONDUCTOR VIEW OF

REGULATOR BOARD (PATTERN)

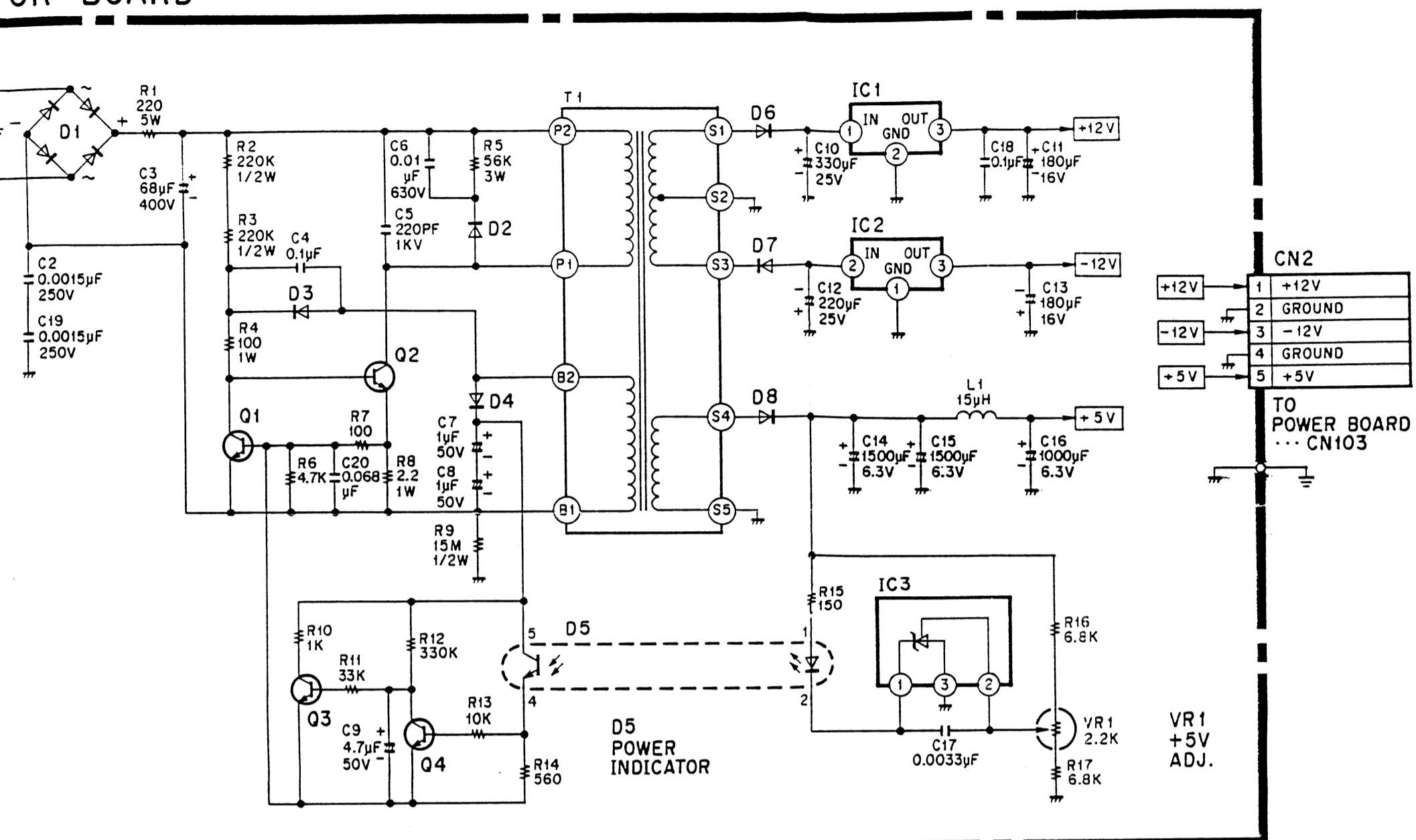
<Index>

IC1	B3
IC2	A3
IC3	A3
Q1	A2
Q2	B2
Q3	A2
Q4	A2
D1	B1
D2	B2
D3	A2
D4	A2
D5	A3
D6	B3
D7	A3
D8	B3



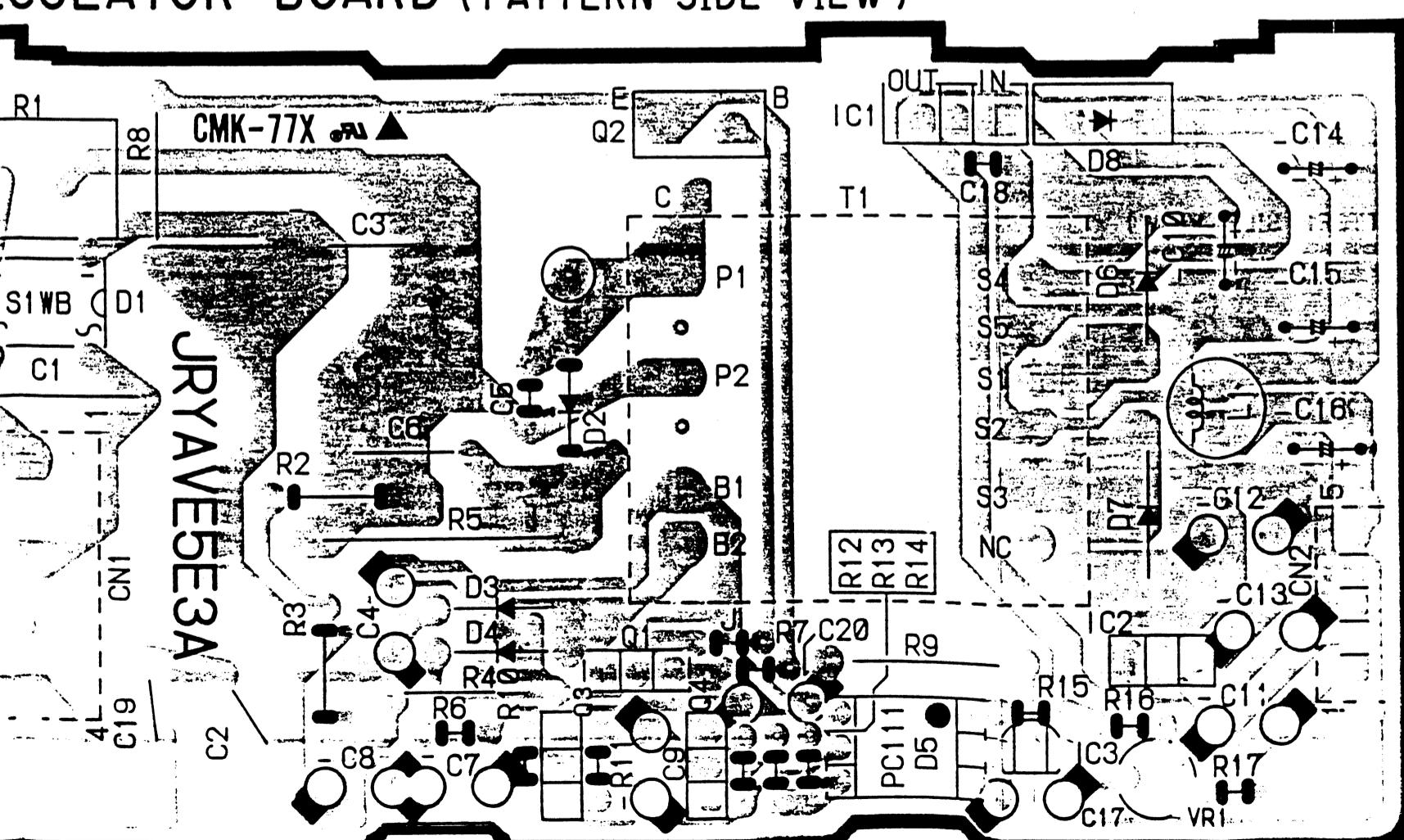
SCHEMATIC DIAGRAM OF REGULATOR BOARD

REGULATOR BOARD

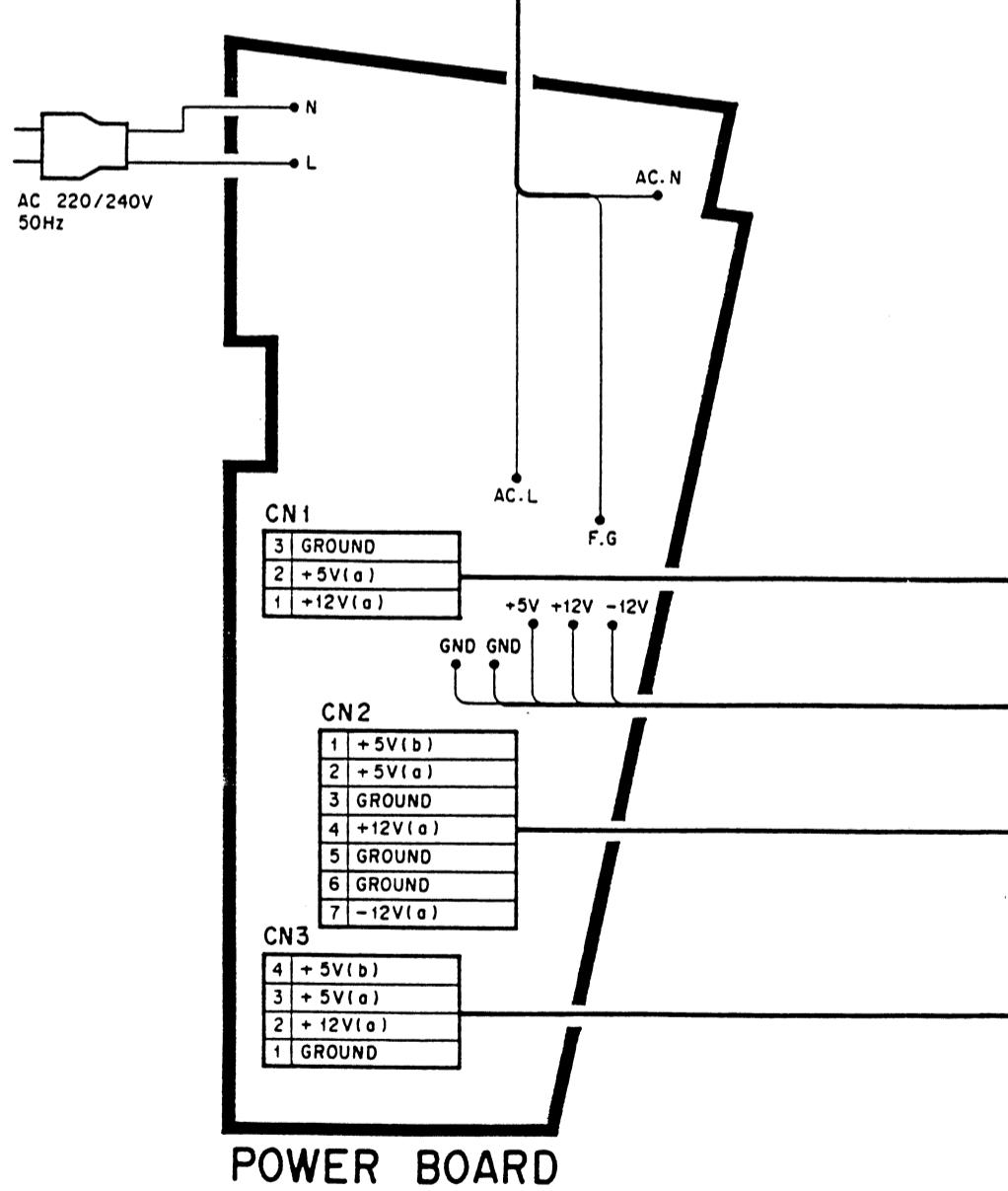
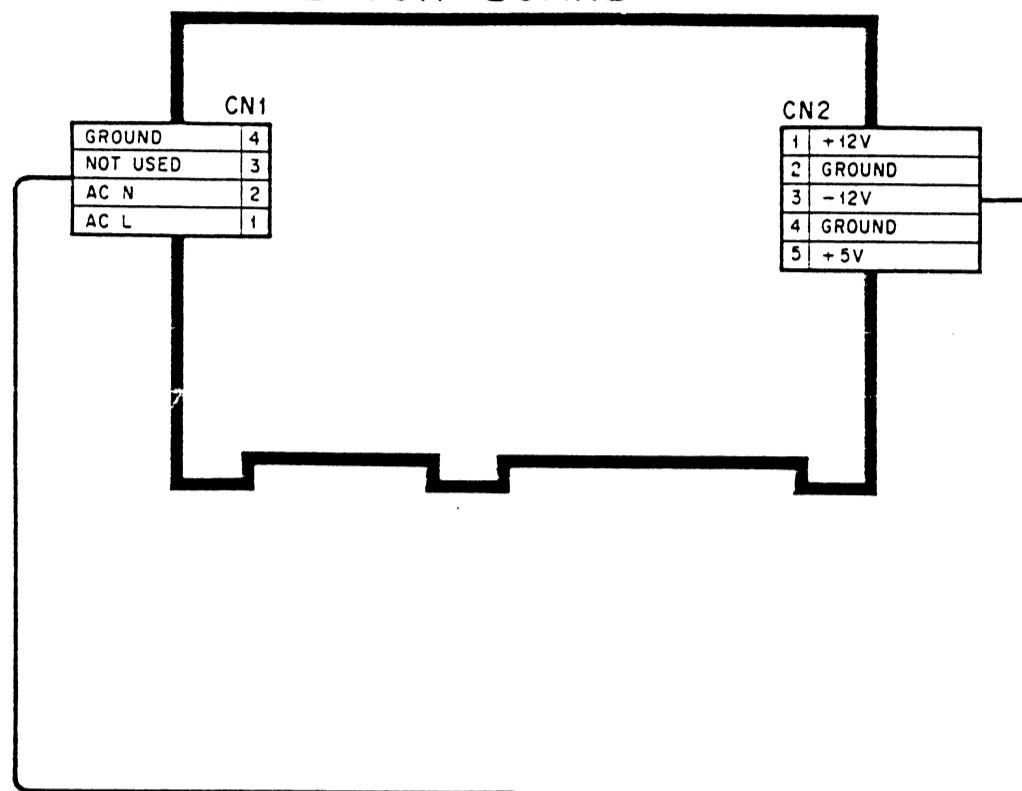


CONDUCTOR VIEW OF REGULATOR BOARD

REGULATOR BOARD (PATTERN SIDE VIEW)



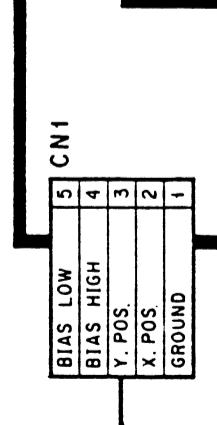
REGULATOR BOARD



SWITCH BOARD

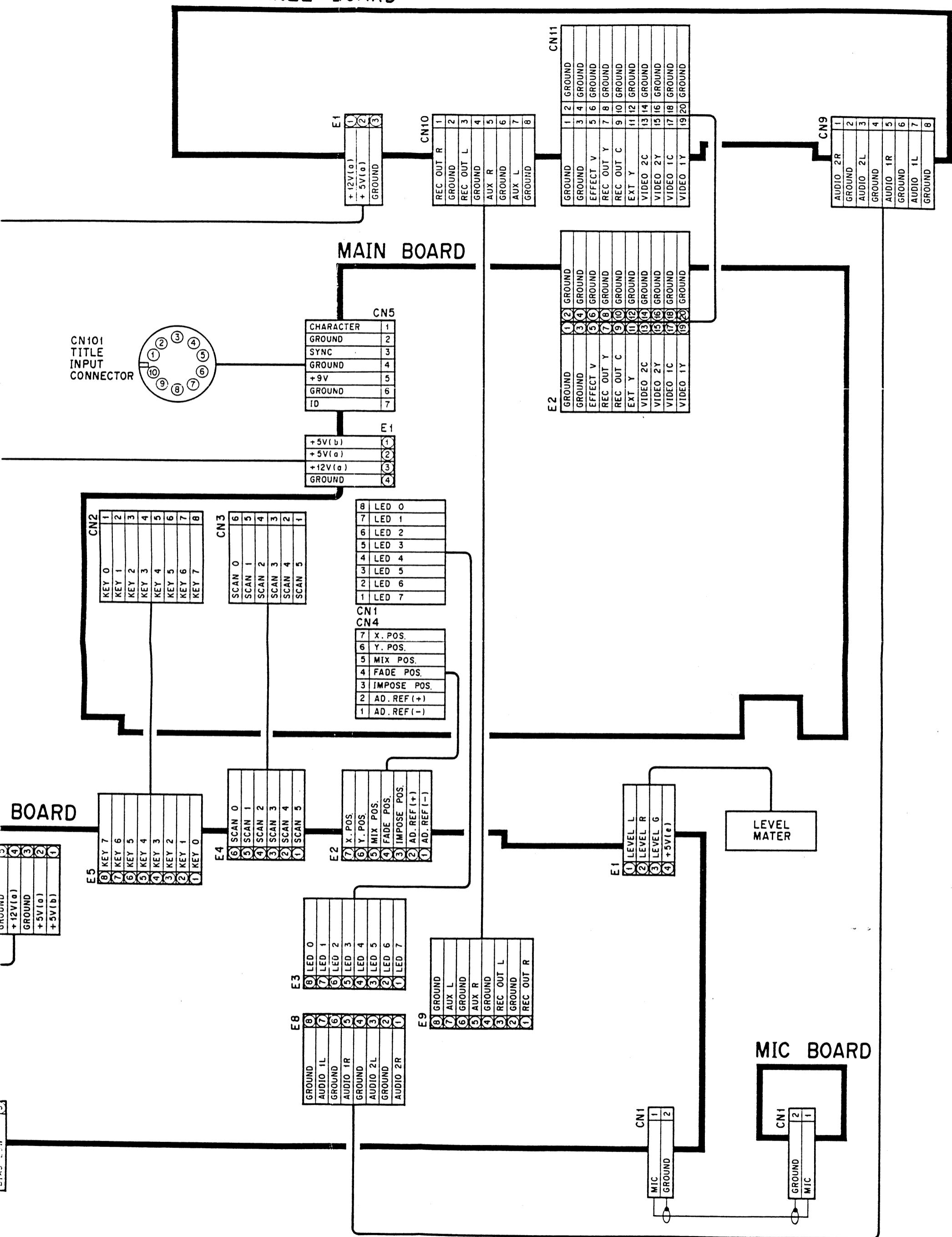
-12V(a)	7
GROUND	6
GROUND	5
+12V(a)	4
GROUND	3
+5V(a)	2
+5V(b)	1

POSITIONER BOARD



GROUND	7
X. POS.	6
Y. POS.	5
BIAS HIGH	4
BIAS LOW	3

REAR PANEL BOARD

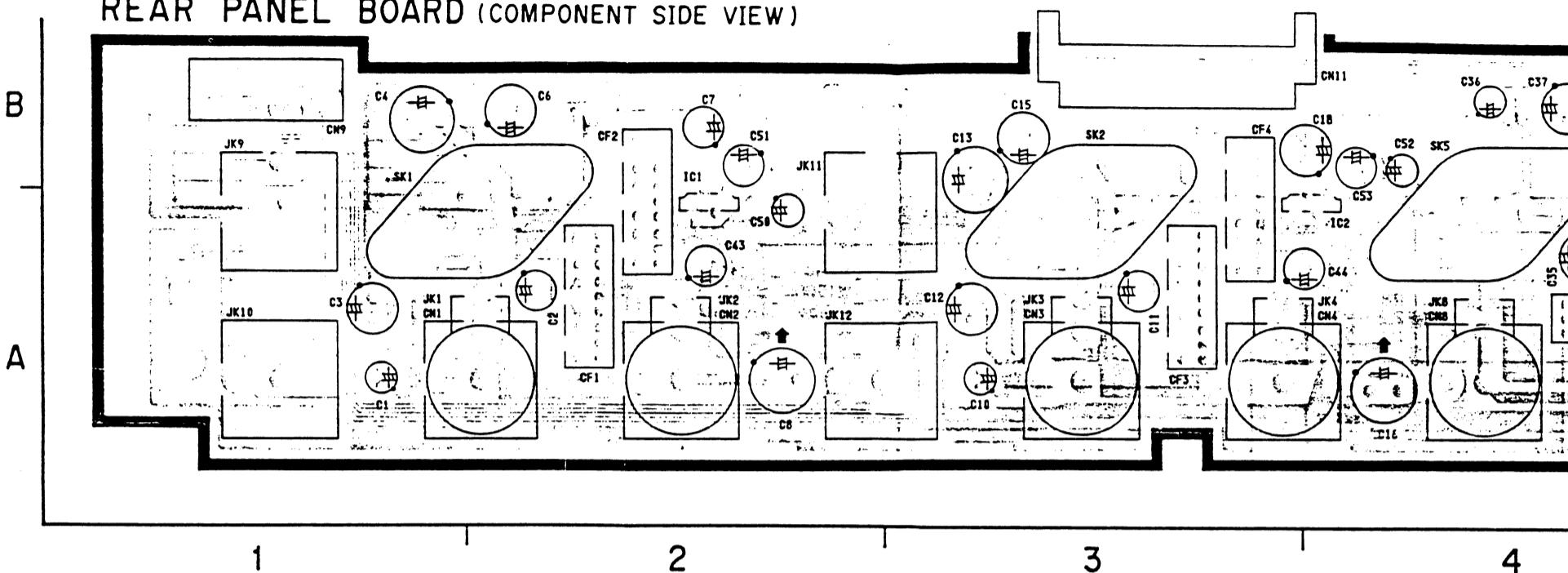


<Index>

Component Side

IC1 A2
IC2 A4

REAR PANEL BOARD (COMPONENT SIDE VIEW)

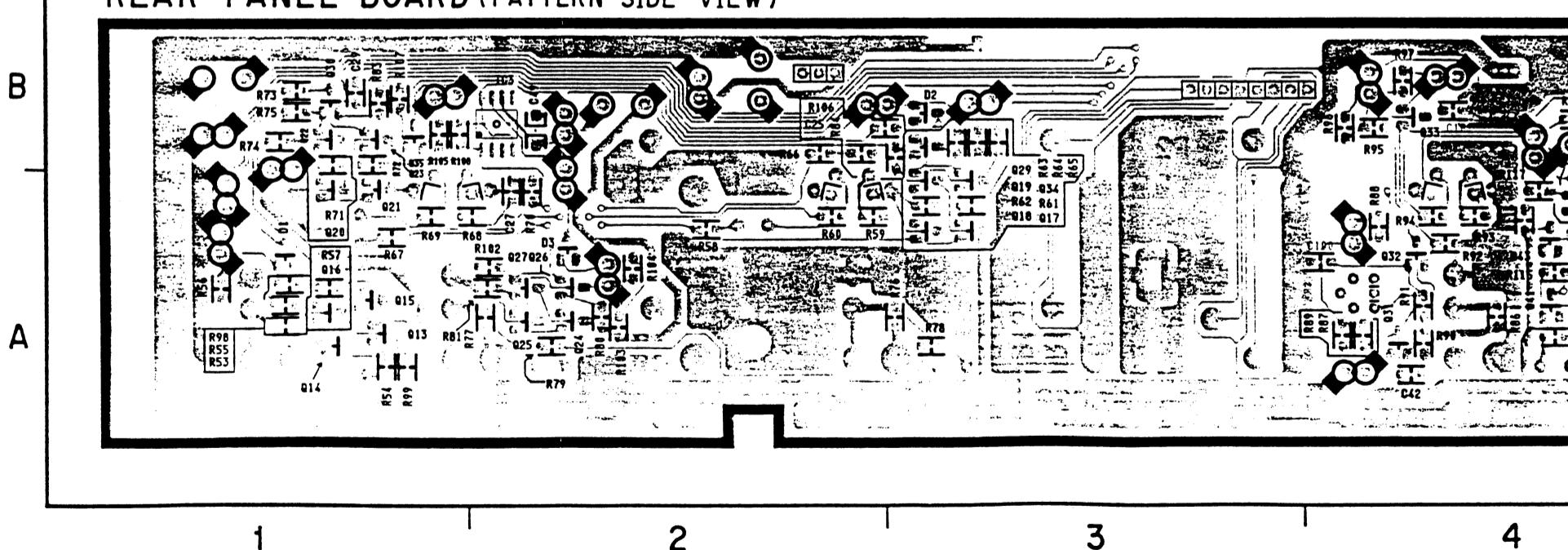


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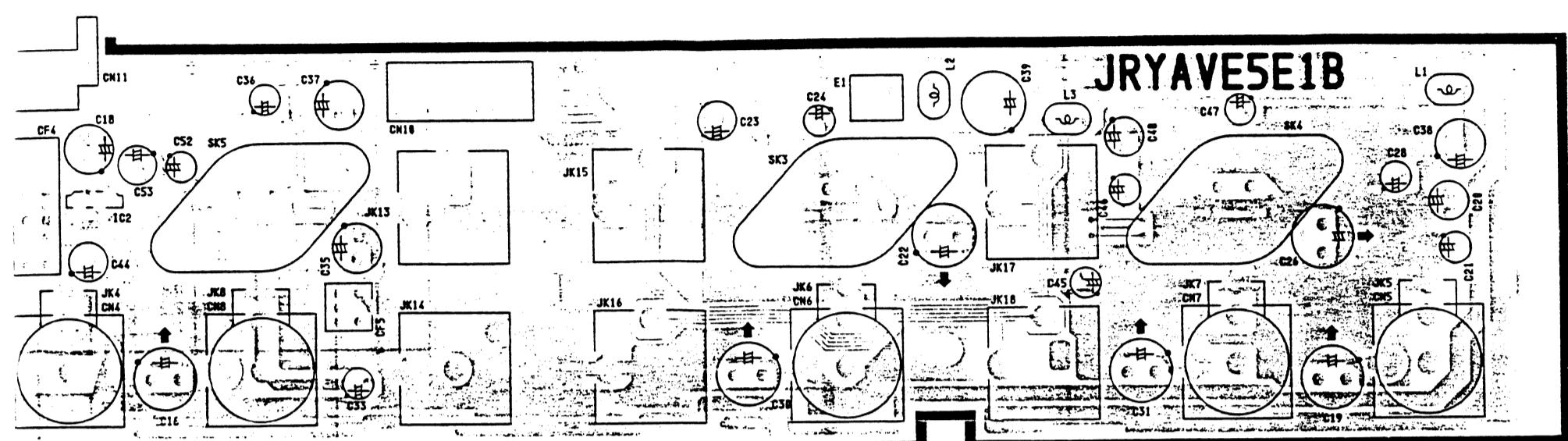
PatternSide

IC3	B2
Q1	A6
Q2	A6
Q3	B6
Q4	A6
Q5	B6
Q7	A5
Q8	A5
Q9	B5
Q10	B5
Q11	B5
Q13	A1
Q14	A1
Q15	A1
Q16	A1
Q17	A3
Q18	A3
Q19	A3
Q20	A1
Q21	A1
Q22	B1
Q23	B1
Q24	A2
Q25	A2
Q26	A2
Q27	A2
Q29	B3
Q30	B1
Q31	A4
Q32	A4
Q33	B4
Q34	A3
Q35	B1
Q36	A6
Q37	A6
Q38	A6
Q39	A6
Q40	A4
Q41	A4
Q42	A4
Q43	A4
D1	A1
D2	B3
D3	A2
D4	A6
D5	A4

REAR PANEL BOARD (PATTERN SIDE VIEW)



VIEW OF REAR PANEL BOARD

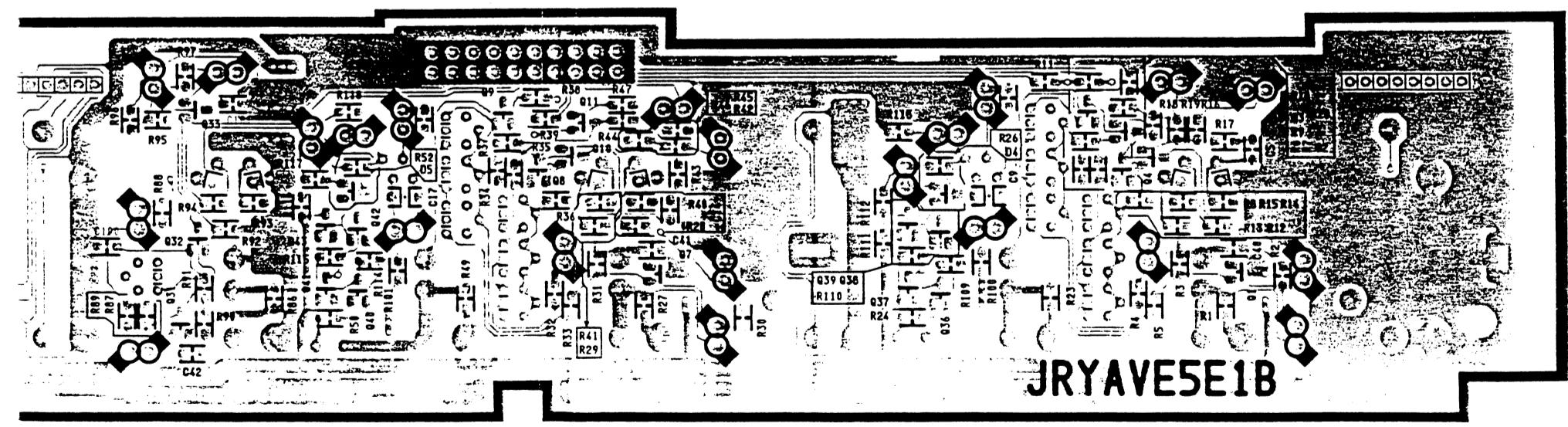


4

5

6

7



4

5

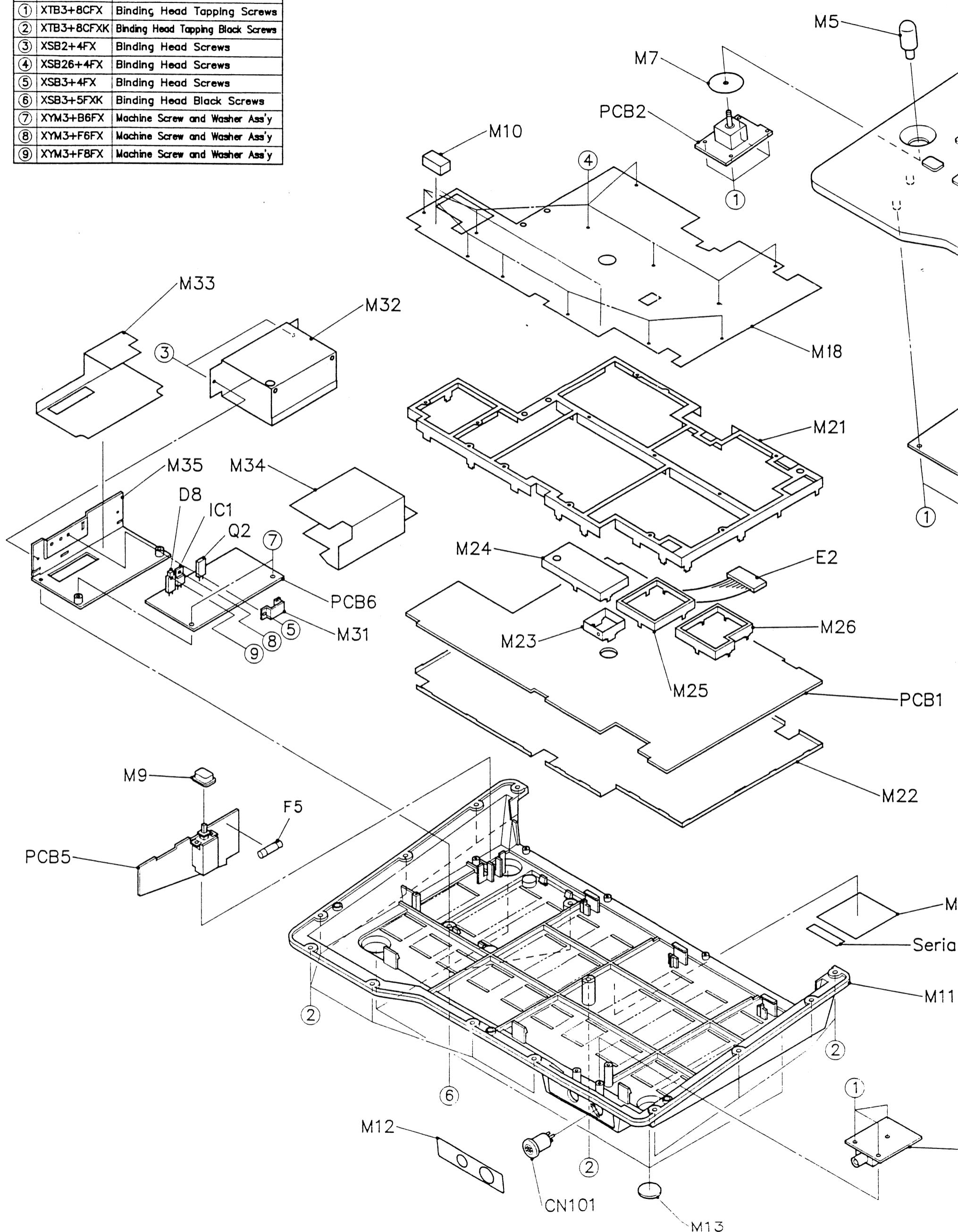
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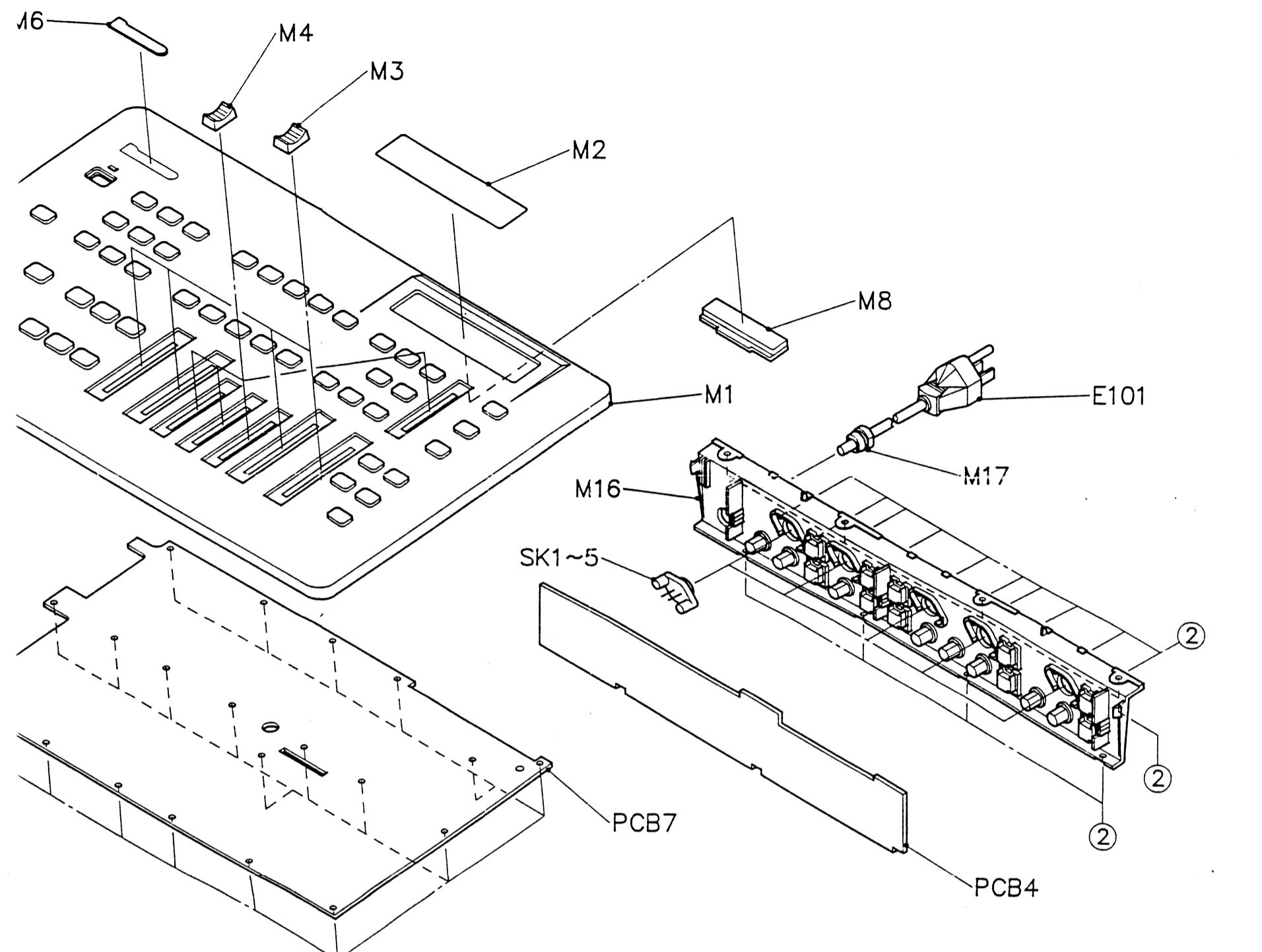
EXPLODED

Numbers show screws

No.	Screws	Description
①	XTB3+8CFX	Binding Head Tapping Screws
②	XTB3+8CFXK	Binding Head Tapping Black Screws
③	XSB2+4FX	Binding Head Screws
④	XSB26+4FX	Binding Head Screws
⑤	XSB3+4FX	Binding Head Screws
⑥	XSB3+5FXK	Binding Head Black Screws
⑦	XYM3+B6FX	Machine Screw and Washer Ass'y
⑧	XYM3+F6FX	Machine Screw and Washer Ass'y
⑨	XYM3+F8FX	Machine Screw and Washer Ass'y

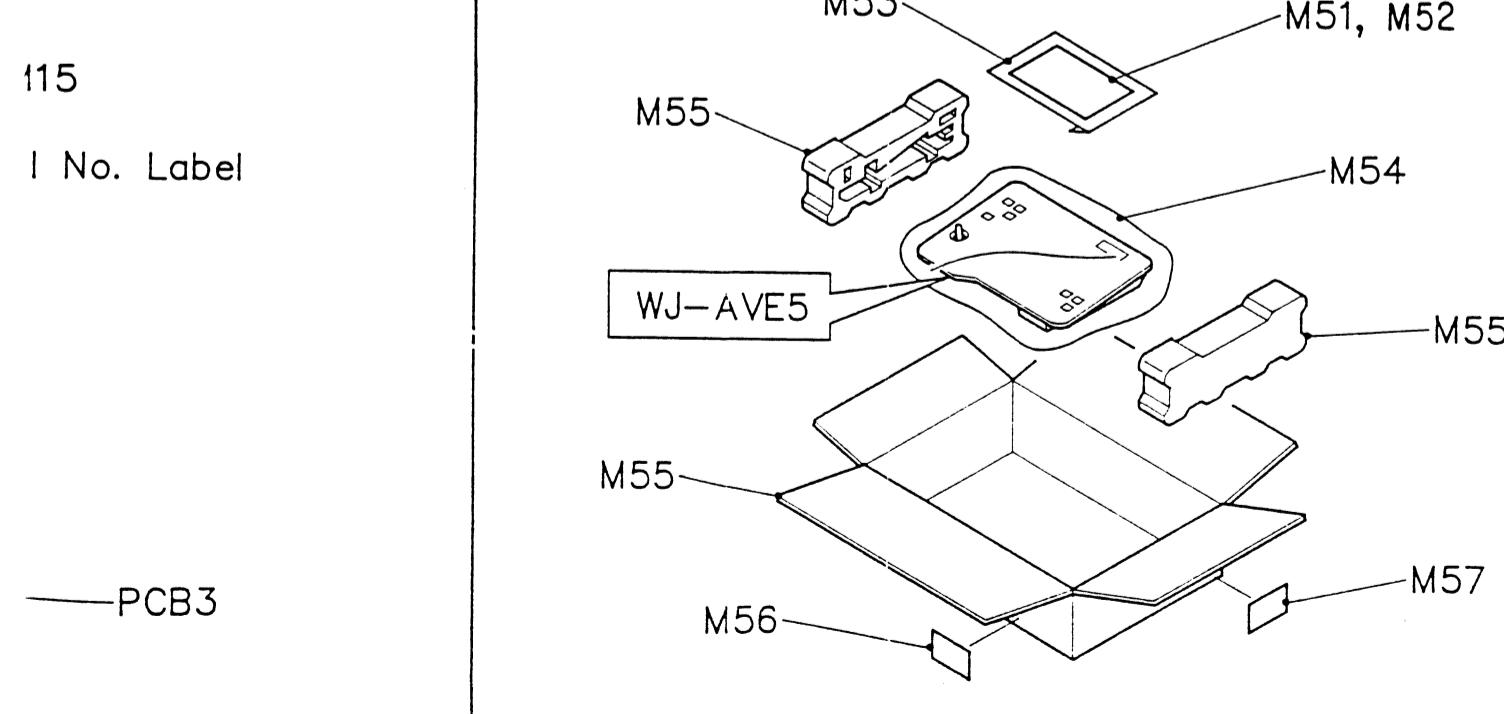


VIEW



PACKAGING

115
I No. Label



REPLACEMENT PARTS LIST

Important Notice

1. Components identified by "Δ" 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					
IC1	AN78M12	IC	PCB1 (NLA)	YWJKBAVE5E1A	Printed Circuit Board Assy
Q2	2SC3866	Transistor	IC1	YWNJM2246M	IC
D8	ERC20M02	Diode	IC2	YWNJM2233BM	IC
F5 Δ	XBA2C16ET0A	Current Fuse 1.6A 250V	IC3	YWNJM2246M	IC
CN101	YWD0111N618	10-pin Title Input Connector	IC4	YWNJM2233BM	IC
SK1-5	YWM1824	Terminal Connector	IC5,6	YWM51271FP	IC
E101 Δ	YWKP56LT2F22	AC Power Cord for WJ-AVES/A	IC7	MC74HC4053F	IC
	YWGTS2F	AC Power Cord for WJ-AVE5/B	IC8-13	AN608P	IC
	YWKP4192F22	AC Power Cord for WJ-AVE5/C,G	IC14-17	MN6550BS	IC
E102	YFCD20ACCAP	Insulator	IC18	YWNJM3403AM	IC
M1	YVV0MA0084AN	Upper Cover Assy	IC20	NJM2904M	IC
M2	YVV5WA1115A4	Display Panel	IC21	YWNJM3403AM	IC
M3	YVV5RA0300A3	Sled Knob A	IC23	NJM2904M	IC
M4	YVV5RA0301A3	Sled Knob B	IC24-27	YWMC74HC374F	IC
M5	YVV4RA0087A4	Positioner Lever	IC28	YWLM1881M	IC
M6	YVV7PA0086A3	Panasonic Badge	IC29	NJM319M	IC
M7	YVV2VA0038A4	Lever Barrier	IC31	MC74HC4053F	IC
M8	YWLI1244	Level Meter Unit	IC32,33	AN608P	IC
M9	YVV6JA0105A4	Power Button	IC201,203	YWM5M4C500L	IC
M10	YVV2FA0493A4	Cushion for Printed Board	IC205,207	YWM5M4C500L	IC
M11	YVV9AA0654AN	Bottom Cover Assy	IC209	MN53040LVX3	IC
M12	YVV5WA1116A4	Connector Panel	IC210,212	YWM5M4C500L	IC
M13	YVV5LA0036B4	Rubber Foot	IC214,216	YWM5M4C500L	IC
M15 Δ	YVV7QA2266A4	Main Label for WJ-AVE5/A	IC218	MN53040LVX3	IC
	YVV7QA2297A4	Main Label for WJ-AVE5/B	IC219	MN676021PPS	IC
	YVV7QA2343A4	Main Label for WJ-AVE5/C	IC220	MN53100LBG	IC
	YVV7QA2298A4	Main Label for WJ-AVE5/G	IC221	MN188166CCP2	IC
M16	YVV9AA0655AN	Rear Panel Assy	IC222	MN53007LVW1	IC
M17	YWSR4K4	Cord Clamp	IC223	MN53100LBH2	IC
M18	YVV2HA0883A1	Shield Plate	IC224	YWUPD42101C3	IC
			IC225	AN78L09	IC
			IC226	MC74HC4053F	IC
			IC401-403	YWSC7S08F	IC
			IC501	M51951ASL	IC
			IC502	AN78L05	IC
			IC503	YWSC7S08F	IC
			IC504	MN4528BS	IC
			IC505	YWSC7SU04F	IC
			IC506	YWSC7S08F	IC
			IC507	YWSC7SU04F	IC
			IC508,509	YWSC7S08F	IC
			IC510	YWSC7SU04F	IC
			Q1-3	2SD1328S	Transistor
			Q4	XN4501	Transistor
			Q5	2SB709-QRS	Transistor
			Q6-9	2SD1328S	Transistor

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
Q10	XN4501	Transistor	R54	YF2116620JT	Carbon 62 ohms 1/16W
Q11	2SB709-QRS	Transistor	R55	YF2116101JT	Carbon 100 ohms 1/16W
Q12	2SD1328S	Transistor	R56,57	YF2116203JT	Carbon 20K ohms 1/16W
Q13	2SD601-RS	Transistor	R58-60	YF2116102GT	Carbon 1K ohms 1/16W
Q14	2SB709-QRS	Transistor	R61	YF2116621JT	Carbon 620 ohms 1/16W
Q16	2SD601-RS	Transistor	R62	YF2116391JT	Carbon 390 ohms 1/16W
Q17	2SB709-QRS	Transistor	R63-65	YF2116332JT	Carbon 3.3K ohms 1/16W
Q19	2SD1328S	Transistor	R66,67	YF2116511JT	Carbon 510 ohms 1/16W
Q20	2SD601-RS	Transistor	R68	YF2116153JT	Carbon 15K ohms 1/16W
Q21,22	2SD1328S	Transistor	R69	YF2116512JT	Carbon 5.1K ohms 1/16W
Q23,24	2SD601-RS	Transistor	R70,71	YF2116153JT	Carbon 15K ohms 1/16W
Q201	2SK198-Q	Transistor	R73-75	YF2116103JT	Carbon 10K ohms 1/16W
Q202,203	2SK198-Q	FET	R76-81	YF2116510JT	Carbon 51 ohms 1/16W
Q204	2SK198-Q	Transistor	R82-84	YF2116103JT	Carbon 10K ohms 1/16W
Q205	2SK198-Q	FET	R85-87	YF2116102GT	Carbon 1K ohms 1/16W
Q401,501	2SB709-QRS	Transistor	R88	YF2116103JT	Carbon 10K ohms 1/16W
Q502,503	2SB709-QRS	Transistor	R89	YF2116222GT	Carbon 2.2K ohms 1/16W
D201-203	1SV153	Diode	R90	YF2116512JT	Carbon 5.1K ohms 1/16W
D205-208	1SV153	Diode	R92	YF2116102GT	Carbon 1K ohms 1/16W
D401-404	1SS99	Diode	R93	YF2116222GT	Carbon 2.2K ohms 1/16W
R1	YF2116754JT	Carbon 750K ohms 1/16W	R95	YF2116102GT	Carbon 1K ohms 1/16W
R2	YF2116433GT	Carbon 43K ohms 1/16W	R96	YF2116511JT	Carbon 510 ohms 1/16W
R3	YF2116122JT	Carbon 1.2K ohms 1/16W	R98	YF2116102GT	Carbon 1K ohms 1/16W
R4	YF2116222GT	Carbon 2.2K ohms 1/16W	R100	YF2116512JT	Carbon 5.1K ohms 1/16W
R5	YF2116391JT	Carbon 390 ohms 1/16W	R101	YF2116102GT	Carbon 1K ohms 1/16W
R6	YF2116223JT	Carbon 22K ohms 1/16W	R102	YF2116511JT	Carbon 510 ohms 1/16W
R8	L311J103J332	Thermistor	R106	YF2116684JT	Carbon 680K ohms 1/16W
R9	YF2116102GT	Carbon 1K ohms 1/16W	R107-109	YF2116103JT	Carbon 10K ohms 1/16W
R10	YF2116474JT	Carbon 470K ohms 1/16W	R110	YF2116512JT	Carbon 5.1K ohms 1/16W
R11	YF2116512JT	Carbon 5.1K ohms 1/16W	R111	YF2116102GT	Carbon 1K ohms 1/16W
R12,13	YF2116203JT	Carbon 20K ohms 1/16W	R112	YF2116123JT	Carbon 12K ohms 1/16W
R14	YF2116101JT	Carbon 100 ohms 1/16W	R113	YF2116243JT	Carbon 24K ohms 1/16WF
R15-17	YF2116102GT	Carbon 1K ohms 1/16W	R114	YF2116393GT	Carbon 39K ohms 1/16W
R18	YF2116621JT	Carbon 620 ohms 1/16W	R115	YF2116103JT	Carbon 10K ohms 1/16W
R19-21	YF2116332JT	Carbon 3.3K ohms 1/16W	R116	YW2116305JT	Carbon 3M ohms
R22	YF2116153JT	Carbon 15K ohms 1/16W	R117	YF2116332JT	Carbon 3.3K ohms 1/16W
R23	YF2116512JT	Carbon 5.1K ohms 1/16W	R118	YF2116103JT	Carbon 10K ohms 1/16W
R24,25	YF2116153JT	Carbon 15K ohms 1/16W	R119	YF2116222GT	Carbon 2.2K ohms 1/16W
R26-28	YF2116103JT	Carbon 10K ohms 1/16W	R120	YF2116332JT	Carbon 3.3K ohms 1/16W
R29-34	YF2116510JT	Carbon 51 ohms 1/16W	R121	YF2116222GT	Carbon 2.2K ohms 1/16W
R35-37	YF2116103JT	Carbon 10K ohms 1/16W	R123	YF2116620JT	Carbon 62 ohms 1/16W
R38-40	YF2116102GT	Carbon 1K ohms 1/16W	R125,126	YF2116393GT	Carbon 39K ohms 1/16W
R41	YF2116103JT	Carbon 10K ohms 1/16W	R127-133	YF2116101JT	Carbon 100 ohms 1/16W
R42	YF2116331JT	Carbon 330 ohms 1/16W	R134-137	YF2116332JT	Carbon 3.3K ohms 1/16W
R43	YF2116754JT	Carbon 750K ohms 1/16W	R138	YF2116101JT	Carbon 100 ohms 1/16W
R44	YF2116433GT	Carbon 43K ohms 1/16W	R139,140	YF2116102GT	Carbon 1K ohms 1/16W
R45	YF2116122JT	Carbon 1.2K ohms 1/16W	R201-226	YF2116331JT	Carbon 330 ohms 1/16W
R46	YF2116223JT	Carbon 22K ohms 1/16W	R228-234	YF2116331JT	Carbon 330 ohms 1/16W
R47	YF2116222GT	Carbon 2.2K ohms 1/16W	R235	YF2116103JT	Carbon 10K ohms 1/16W
R49	L311J103J332	Thermistor	R237	YF2116511JT	Carbon 510 ohms 1/16W
R50	YF2116102GT	Carbon 1K ohms 1/16W	R238	YF2116752JT	Carbon 7.5K ohms 1/16W
R51	YF2116474JT	Carbon 470K ohms 1/16W	R239	YF2116332JT	Carbon 3.3K ohms 1/16W
R52	YF2116512JT	Carbon 5.1K ohms 1/16W	R242-266	YF2116331JT	Carbon 330 ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION		REF.NO.	PART NO.	DESCRIPTION	
R267	YF2116102GT	Carbon	1K ohms 1/16W	R548	YF2116104JT	Carbon	100K ohms 1/16W
R269	YF2116103JT	Carbon	10K ohms 1/16W	R549	YF2116102GT	Carbon	1K ohms 1/16W
R271-275	YF2116331JT	Carbon	330 ohms 1/16W	R550	YW2116105JT	Carbon	1M ohms 1/16W
R276	YF2116103JT	Carbon	10K ohms 1/16W	R551-572	YF2116331JT	Carbon	330 ohms 1/16W
R277	YF2116511JT	Carbon	510 ohms 1/16W	R573	YF2116392JT	Carbon	3.9K ohms 1/16W
R279	YF2116752JT	Carbon	7.5K ohms 1/16W	R574	YF2116332JT	Carbon	3.3K ohms 1/16W
R280	YF2116332JT	Carbon	3.3K ohms 1/16W	R575	YF2116104JT	Carbon	100K ohms 1/16W
R282,284	YF2116511JT	Carbon	510 ohms 1/16W	R576	YF2116102GT	Carbon	1K ohms 1/16W
R285	YF2116511JT	Carbon	510 ohms 1/16W	R577	YW2116105JT	Carbon	1M ohms 1/16W
R286	YF2116332JT	Carbon	3.3K ohms 1/16W	R578-599	YF2116331JT	Carbon	330 ohms 1/16W
R291	YW2116105JT	Carbon	1M ohms 1/16W	R600	YF2116392JT	Carbon	3.9K ohms 1/16W
R292,293	YF2116104JT	Carbon	100K ohms 1/16W	R601,603	YF2116511JT	Carbon	510 ohms 1/16W
R296-309	YF2116331JT	Carbon	330 ohms 1/16W	R605-609	YF2116331JT	Carbon	330 ohms 1/16W
R310	YF2116322JT	Carbon	3.3K ohms 1/16W	R610,611	YF2116103JT	Carbon	10K ohms 1/16W
R311	YF2116103JT	Carbon	10K ohms 1/16W	R612,613	YF2116102GT	Carbon	1K ohms 1/16W
R312,313	YF2116332JT	Carbon	3.3K ohms 1/16W	R614,615	YF2116333GT	Carbon	33K ohms 1/16W
R314,315	YF2116202JT	Carbon	2K ohms 1/16W	R616	YF2116103JT	Carbon	10K ohms 1/16W
R317,318	YF2116102GT	Carbon	1K ohms 1/16W	R621,622	YF2116511JT	Carbon	510 ohms 1/16W
R319	YF2116104JT	Carbon	100K ohms 1/16W	R624	YF2116511JT	Carbon	510 ohms 1/16W
R320	YF2116102GT	Carbon	1K ohms 1/16W	R625	YF2116392JT	Carbon	3.9K ohms 1/16W
R321	YF2116104JT	Carbon	100K ohms 1/16W	R626	YF2116332JT	Carbon	3.3K ohms 1/16W
R324	YF2116101JT	Carbon	100 ohms 1/16W	R627-629	YF2116511JT	Carbon	510 ohms 1/16W
R325	YF2116332JT	Carbon	3.3K ohms 1/16W	R632-637	YF2116511JT	Carbon	510 ohms 1/16W
R326	YF2116101JT	Carbon	100 ohms 1/16W	VR1	EVM1DSW30B54	Variable Resistor	50K ohms
R327	YF2116362JT	Carbon	3.6K ohms 1/16W	VR2	EVM1DSW30B24	Variable Resistor	20K ohms
R328	YF2116101JT	Carbon	100 ohms 1/16W	VR3	EVM1DSW30B14	Variable Resistor	10K ohms
R329,330	YF2116511JT	Carbon	510 ohms 1/16W	VR4,5	EVM1DSW30B13	Variable Resistor	1K ohms
R331,332	YF2116331JT	Carbon	330 ohms 1/16W	VR6,7	EVM1DSW30B34	Variable Resistor	30K ohms
R333	YF2116101JT	Carbon	100 ohms 1/16W	VR8	EVM1DSW30B24	Variable Resistor	20K ohms
R334	YF2116331JT	Carbon	330 ohms 1/16W	VR9	EVM1DSW30B54	Variable Resistor	50K ohms
R338	YF2116103JT	Carbon	10K ohms 1/16W	VR10	EVM1DSW30B24	Variable Resistor	20K ohms
R340	YF2116332JT	Carbon	3.3K ohms 1/16W	VR11	EVM1DSW30B14	Variable Resistor	10K ohms
R341	YF2116331JT	Carbon	330 ohms 1/16W	VR12,13	EVM1DSW30B13	Variable Resistor	1K ohms
R342	YF2116101JT	Carbon	100 ohms 1/16W	VR14,15	EVM1DSW30B34	Variable Resistor	30K ohms
R343	YF2116331JT	Carbon	330 ohms 1/16W	VR16	EVM1DSW30B24	Variable Resistor	20K ohms
R344	YF2116101JT	Carbon	100 ohms 1/16W	VR17	EVM1DSW30B13	Variable Resistor	1K ohms
R345	YF2116511JT	Carbon	510 ohms 1/16W	VR18	EVM1DSW30BQ2	Variable Resistor	470 ohms
R401-404	YF2116474JT	Carbon	470K ohms 1/16W	VR19	EVM1DSW30B13	Variable Resistor	1K ohms
R405-425	YF2116331JT	Carbon	330 ohms 1/16W	VR20	EVM1DSW30BQ2	Variable Resistor	470 ohms
R426	YF2116202JT	Carbon	2K ohms 1/16W	VR201,502	EVM1DSW30B14	Variable Resistor	10K ohms
R427-433	YF2116331JT	Carbon	330 ohms 1/16W	RA1-4	YWRKM10L102F	Block Resistor	
R434	YF2116102GT	Carbon	1K ohms 1/16W	RAS	EXBML16V101JA	Block Resistor	
R435,436	YF2116202JT	Carbon	2K ohms 1/16W	C1,2	ECEA1AKN100	Electrolytic	10 μF 10V
R437,438	YF2116102GT	Carbon	1K ohms 1/16W	C3	ECEAOJKS101	Electrolytic	100 μF 6.3V
R441-444	YF2116100JT	Carbon	10 ohms 1/16W	C4,5	YWT316B104MT	Ceramic	0.1 μF
R501	YF2116392JT	Carbon	3.9K ohms 1/16W	C6	ECEAOJKS101	Electrolytic	100 μF 6.3V
R502	YF2116104JT	Carbon	100K ohms 1/16W	C7	ECEA1HKS010	Electrolytic	1 μF 50V (KS)
R503	YF2116103JT	Carbon	10K ohms 1/16W	C8	ECEA1HKS47	Electrolytic	0.47 μF 50V
R505	YF2116511JT	Carbon	510 ohms 1/16W	C9	ECEA1HKS010	Electrolytic	1 μF 50V (KS)
R509	YF2116331JT	Carbon	330 ohms 1/16W	C10	YFA00201CHJT	Ceramic	200 pF
R510	YF2116102GT	Carbon	1K ohms 1/16W	C11,12	YWT316B473MT	Ceramic	0.047 μF
R511,512	YF2116101JT	Carbon	100 ohms 1/16W	C13	YFA00102XKT	Ceramic	1000 pF
R513-544	YF2116331JT	Carbon	330 ohms 1/16W	C14	YWT316B104MT	Ceramic	0.1 μF
R545	YF2116101JT	Carbon	100 ohms 1/16W	C15	ECEAOJKS101	Electrolytic	100 μF 6.3V
R546	YF2116331JT	Carbon	330 ohms 1/16W	C16	ECEA1AKA220	Electrolytic	22 μF 10V

REF.NO.	PART NO.	DESCRIPTION		REF.NO.	PART NO.	DESCRIPTION	
C17	ECSF1EE156	Tantalum	15 μ F 25V	C83	YF400102XKT	Ceramic	1000 pF
C18	ECEA1AKA220	Electrolytic	22 μ F 10V	C84,85	YWT316B104MT	Ceramic	0.1 μ F
C19	ECEA1CKA470	Electrolytic	47 μ F 16V	C86	YF400102XKT	Ceramic	1000 pF
C20	ECEA1AKA220	Electrolytic	22 μ F 10V	C87	YWT316B104MT	Ceramic	0.1 μ F
C21	ECEA1CKA470	Electrolytic	47 μ F 16V	C88	ECEA1HKS010	Electrolytic	1 μ F 50V (KS)
C22	YF400102XKT	Ceramic	1000 pF	C89	YWT316B104MT	Ceramic	0.1 μ F
C23,24	YWT316B104MT	Ceramic	0.1 μ F	C90	ECEA0JKA470	Electrolytic	47 μ F 6.3V
C25	YF400102XKT	Ceramic	1000 pF	C91	YWT316B104MT	Ceramic	0.1 μ F
C26	YWT316B104MT	Ceramic	0.1 μ F	C92	ECEA1HKS010	Electrolytic	1 μ F 50V (KS)
C27	ECEA1HKS010	Electrolytic	1 μ F 50V (KS)	C93	YWT316B104MT	Ceramic	0.1 μ F
C28	YWT316B104MT	Ceramic	0.1 μ F	C95	YF400561CHJT	Ceramic	560 pF
C29	ECEA0JKA470	Electrolytic	47 μ F 6.3VV	C96	YF400102XKT	Ceramic	1000 pF
C30	YWT316B104MT	Ceramic	0.1 μ F	C97-102	YF400103XMT	Ceramic	0.01 μ F
C31	ECEA1HKS010	Electrolytic	1 μ F 50V (KS)	C103	ECEA1AKA220	Electrolytic	22 μ F 10V
C32	YWT316B104MT	Ceramic	0.1 μ F	C104	ECEA1AKA470	Electrolytic	47 μ F 10V
C34	YF400561CHJT	Ceramic	560 pF	C105	ECEA1HKA2R2	Electrolytic	2.2 μ F 50V
C35	YF400102XKT	Ceramic	1000 pF	C106	ECEA1AKA470	Electrolytic	47 μ F 10V
C36	YF400103XMT	Ceramic	0.01 μ F	C107	ECEA1HKA2R2	Electrolytic	2.2 μ F 50V
C37	YWT316B104MT	Ceramic	0.1 μ F	C108	ECEA1AKA470	Electrolytic	47 μ F 10V
C38-41	YF400103XMT	Ceramic	0.01 μ F	C109	ECSF1AE106	Tantalum	10 μ F 10V
C42	YWT316B104MT	Ceramic	0.1 μ F	C110	YF400103XMT	Ceramic	0.01 μ F
C43	YF400103XMT	Ceramic	0.01 μ F	C111	ECEA1HSN2R2	Electrolytic	2.2 μ F 50V
C44	ECEA1AKA220	Electrolytic	22 μ F 10V	C112	ECEA1AKA470	Electrolytic	47 μ F 10V
C45	ECEA1AKA470	Electrolytic	47 μ F 10V	C113	YWT316B104MT	Ceramic	0.1 μ F
C46	ECEA1HKA2R2	Electrolytic	2.2 μ F 50V	C114	ECSF1AE106	Tantalum	10 μ F 10V
C47	ECEA1AKA470	Electrolytic	47 μ F 10V	C115,116	YWT316B104MT	Ceramic	0.1 μ F
C48	ECEA1HKA2R2	Electrolytic	2.2 μ F 50V	C117	ECSF1AE106	Tantalum	10 μ F 10V
C49	ECEA1AKA470	Electrolytic	47 μ F 10V	C118	YWT316B104MT	Ceramic	0.1 μ F
C50	ECSF1AE106	Tantalum	10 μ F 10V	C119-122	ECSF1AE106	Tantalum	10 μ F 10V
C51	YF400103XMT	Ceramic	0.01 μ F	C123	YWT316B104MT	Ceramic	0.1 μ F
C52	ECEA1HSN2R2	Electrolytic	2.2 μ F 50V	C124	ECEA1AKA470	Electrolytic	47 μ F 10V
C53	ECEA1AKA470	Electrolytic	47 μ F 10V	C125,126	YWT316B104MT	Ceramic	0.1 μ F
C54	YWT316B104MT	Ceramic	0.1 μ F	C127	ECEA0JKA470	Electrolytic	47 μ F 6.3V
C55	ECSF1AE106	Tantalum	10 μ F 10V	C128	YWT316B104MT	Ceramic	0.1 μ F
C56-58	YWT316B104MT	Ceramic	0.1 μ F	C129	ECEA1AKA220	Electrolytic	22 μ F 10V
C59	ECSF1AE106	Tantalum	10 μ F 10V	C130	YWT316B104MT	Ceramic	0.1 μ F
C60,61	YWT316B104MT	Ceramic	0.1 μ F	C131	ECEA0JKA470	Electrolytic	47 μ F 6.3V
C62,63	ECEA1AKN100	Electrolytic	10 μ F 10V	C132	YWT316B104MT	Ceramic	0.1 μ F
C64	ECEA0JKS101	Electrolytic	100 μ F 6.3V	C134,135	ECEA1AKA220	Electrolytic	22 μ F 10V
C65,66	YWT316B104MT	Ceramic	0.1 μ F	C136-144	YWT316B104MT	Ceramic	0.1 μ F
C67	ECEA0JKS101	Electrolytic	100 μ F 50V	C145	ECEA1CKA470	Electrolytic	47 μ F 16V
C68	ECEA1HKS010	Electrolytic	1 μ F 50V (KS)	C146	ECEA1AKA220	Electrolytic	22 μ F 10V
C69	ECEA1HKS47	Electrolytic	0.47 μ F 50V	C147	ECEA1CKA470	Electrolytic	47 μ F 16V
C70	ECEA1HKS010	Electrolytic	1 μ F 50V (KS)	C148-150	ECEA1AKA220	Electrolytic	22 μ F 10V
C71	YF400201CHJT	Ceramic	200 pF	C151	YF400100CHDT	Ceramic	10 pF
C72,73	YWT316B473MT	Ceramic	0.047 μ F	C152-155	YWT316B104MT	Ceramic	0.1 μ F
C74	YF400102XKT	Ceramic	1000 pF	C156-159	YF400102XKT	Ceramic	1000 pF
C75	YWT316B104MT	Ceramic	0.1 μ F	C160-163	YF400330CHJT	Ceramic	33 pF
C76	ECEA0JKS101	Electrolytic	100 μ F 6.3V	C164,165	YF400470CHJT	Ceramic	47 pF
C77	ECEA1AKA220	Electrolytic	22 μ F 10V	C166	ECSF1AE106	Tantalum	10 μ F 10V
C78	ECSF1EE156	Tantalum	10 μ F 25V	C167	ECST1AD336ZR	Electrolytic	33 μ F 10V
C79	ECEA1AKA220	Electrolytic	22 μ F 10V	C168,169	ECSF1AE106	Tantalum	10 μ F 10V
C80	ECEA1CKA470	Electrolytic	47 μ F 16V	C170,171	YF400430CHJT	Ceramic	43 pF (CH)
C81	ECEA1AKA220	Electrolytic	22 μ F 10V	C201	ECEA0JU102	Electrolytic	1000 μ F 6.3V
C82	ECEA1CKA470	Electrolytic	47 μ F 16V	C202,203	ECSF1AE106	Tantalum	10 μ F 10V

REF.NO.	PART NO.	DESCRIPTION		REF.NO.	PART NO.	DESCRIPTION	
C204-208	YWT316B104MT	Ceramic	0.1 μ F	C419,420	YF400103XMT	Ceramic	0.01 μ F
C209	ECSF1AE106	Tantalum	10 μ F 10V	C421-444	YF400101SLKT	Ceramic	100 pF
C210	YF400330CHJT	Ceramic	33 pF	C445	ECSF1AE106	Tantalum	10 μ F 10V
C211	YF400220CHJT	Ceramic	22 pF	C446-461	YF400330CHJT	Ceramic	33 pF
C212	YF400332XKT	Ceramic	3300 pF	C501	YWT316B104MT	Ceramic	0.1 μ F
C213	ECEA1HKS2R2	Electrolytic	2.2 μ F 50V	C502	ECEA1CKA220	Electrolytic	22 μ F 16V
C215	ECEA0JU102	Electrolytic	1000 μ F 6.3V	C503	ECEA1CU102	Electrolytic	1000 μ F 16V
C216,217	ECSF1AE106	Tantalum	10 μ F 10V	C504	ECSF1AE106	Tantalum	10 μ F 10V
C218-222	YWT316B104MT	Ceramic	0.1 μ F	C505	YF400330CHJT	Ceramic	33 pF
C223	ECSF1AE106	Tantalum	10 μ F 10V	C506	YWT316B104MT	Ceramic	0.1 μ F
C224	YF400330CHJT	Ceramic	33 pF	C508	YF400101CHJT	Ceramic	100 pF
C225	YF400220CHJT	Ceramic	22 pF	C509	YWT316B104MT	Ceramic	0.1 μ F
C226	YF400332XKT	Ceramic	3300 pF	C510	YF400390CHJT	Ceramic	39 pF
C227	ECEA1HKS2R2	Electrolytic	2.2 μ F 50V	C511	ECEA1AKA220	Electrolytic	22 μ F 10V
C229-232	ECEA1CKA470	Electrolytic	47 μ F 16V	C512	YF400101CHJT	Ceramic	100 pF
C233	ECSF1AE106	Tantalum	10 μ F 10V	C513	YWT316B104MT	Ceramic	0.1 μ F
C234,235	YWT316B104MT	Ceramic	0.1 μ F	C514	ECEA1AKA220	Electrolytic	22 μ F 10V
C236	ECSF1AE106	Tantalum	10 μ F 10V	C515,516	ECSF1AE106	Tantalum	10 μ F 10V
C237	YWT316B104MT	Ceramic	0.1 μ F	C517	YF400100CHDT	Ceramic	10 pF
C238	ECSF1AE106	Tantalum	10 μ F 10V	C518	YF400103XMT	Ceramic	0.01 μ F
C239-242	YWT316B104MT	Ceramic	0.1 μ F	C519,520	YF400101SLKT	Ceramic	100 pF
C243	ECSF1AE106	Tantalum	10 μ F 10V	C521	YF400330CHJT	Ceramic	33 pF
C244	YWT316B104MT	Ceramic	0.1 μ F	C522	ECEA1AKA220	Electrolytic	22 μ F 10V
C245,246	YF400470CHJT	Ceramic	47 pF	C523-535	YF400330CHJT	Ceramic	33 pF
C247	YF400201CHJT	Ceramic	200 pF	C537	YF400330CHJT	Ceramic	33 pF
C249	YWT316B104MT	Ceramic	0.1 μ F	C538	ECST1AD336ZR	Tantalum	33 μ F 10V
C250	ECSF1AE106	Tantalum	10 μ F 10V	C539-541	YF400201CHJT	Ceramic	200 pF
C251	ECSF1AE336	Tantalum	33 μ F 10V	C542	YWT316B104MT	Ceramic	0.1 μ F
C252	YF400103XMT	Ceramic	0.01 μ F	C543,544	YF400330CHJT	Ceramic	33 pF
C253	ECEA1HKS2R2	Electrolytic	2.2 μ F 50V	C545	ECSF1EE225	Tantalum	2.2 μ F 10V
C254	YF400103XMT	Ceramic	0.01 μ F	C546,547	YF400330CHJT	Ceramic	33 pF
C255	ECEA1HKS2R2	Electrolytic	2.2 μ F 50V	C550-553	YF400220CHJT	Ceramic	22 pF
C257,258	YF400820CHJT	Ceramic	82 pF	C554,555	YF400330CHJT	Ceramic	33 pF
C259	YF400201CHJT	Ceramic	200 pF	C650,651	ECQV1H104JZ	Plastic	0.1 μ F 50V
C261-264	ECSF1AE106	Tantalum	10 μ F 10V	CT1,2	YFTZ03R200FR	Trimmer Capacitor	20 pF
C265	YWT316B104MT	Ceramic	0.1 μ F	L1	ELESE101KA	Coil	100 μ H
C266	YF400330CHJT	Ceramic	33 pF	L2,3	ELESE220KA	Coil	22 μ H
C267	YF400100CHDT	Ceramic	10 pF	L4	ELESE101KA	Coil	100 μ H
C268	YF400222XKT	Ceramic	2200 pF	L5-10	ELESE220KA	Coil	22 μ H
C269,270	YF400330CHJT	Ceramic	33 pF	L13,14	ELESE220KA	Coil	22 μ H
C271,272	ECSF1AE106	Tantalum	10 μ F 10V	L15,16	LF7R55FT220K	Coil	22 μ H
C273	ECEA1HKS2R2	Electrolytic	2.2 μ F 50V	L17,18	ELESE220KA	Coil	22 μ H
C274-280	YWT316B104MT	Ceramic	0.1 μ F	L19,20	YWF3216E220K	Coil	22 μ H
C281	YF400151SLKT	Ceramic	150 pF	L201	YWELESN1R0MA	Coil	1 μ H
C290	ECSF1AE106	Tantalum	10 μ F 10V	L202	YWSSLE0381	Coil	380 μ H
C401	YF400220CHJT	Ceramic	22 pF	L203-205	YWELESN1R0MA	Coil	1 μ H
C402-405	YF400103XMT	Ceramic	0.01 μ F	L206	YWSSLE0381	Coil	380 μ H
C406	YF400220CHJT	Ceramic	22 pF	L207,208	YWELESN1R0MA	Coil	1 μ H
C407-410	YF400103XMT	Ceramic	0.01 μ F	L209	ELESE8R2KA	Coil	8.2 μ H
C411	ECEA1AKA470	Electrolytic	47 μ F 10V	L210	YWELESN1R0MA	Coil	1 μ H
C412	ECEA0JKA470	Electrolytic	47 μ F 6.3V	L211-213	ELC08D082	Coil	8.2 μ H
C413	ECEA1AKA470	Electrolytic	47 μ F 10V	L214	YWELESN1R0MA	Coil	1 μ H
C414	ECEA0JKA470	Electrolytic	47 μ F 6.3V	L215	YWSSLE0381	Coil	380 μ H
C415	YF400390CHJT	Ceramic	39 pF	L501,502	YWELESN1R0MA	Coil	1 μ H
C418	YF400390CHJT	Ceramic	39 pF	X1,2	YFMS30917M10	Crystal Oscillator	

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
REAR PANEL BOARD					
X201	YWN8R4R40625	Crystal Oscillator	PCB4 (NLA)	YWJKYAVE5E1A	Printed Circuit Board Assy
X202	EF0GC8004A4	Oscillator	IC1,2	AN608P	IC
X203	YFMS30917M10	Crystal Oscillator	IC3	YWNJM2246M	IC
CF1	YWYS30387	Filter	Q1-5	2SD601-RS	Transistor
CF2,3	YWYS30384	Filter	Q7-11	2SD601-RS	Transistor
CF4	YWYS30387	Filter	Q13	2SD601-RS	Transistor
CF5,6	YWYS30384	Filter	Q14,15	2SB709-QRS	Transistor
CF7	YWYS30484	Filter	Q16,17	2SD601-RS	Transistor
CF8	YWYS30386	Filter	Q18	2SB709-QRS	Transistor
CF9	YWYS30484	Filter	Q19,20	2SD601-RS	Transistor
CF10	YWYS30386	Filter	Q21,22	2SB709-QRS	Transistor
CN1	YW530140810	8-pin Connector	Q23,24	2SD601-RS	Transistor
CN2	YW530140810R	8-pin Connector	Q25,26	2SB709-QRS	Transistor
CN4	YW530140710Y	7-pin Connector	Q27,29	2SD601-RS	Transistor
CN5	YW530140710	7-pin Connector	Q30-33	2SD601-RS	Transistor
CN6	YWRE022TD19	2-pin Connector	Q34,35	2SB709-QRS	Transistor
J1,2	YF21160R00T	Jumper Resistor	Q36	2SD601-RS	Transistor
J7,48	YF21160R00T	Jumper Resistor	Q37,38	2SB709-QRS	Transistor
J72,124	YF21160R00T	Jumper Resistor	Q39,40	2SD601-RS	Transistor
J201,227	YF21160R00T	Jumper Resistor	Q41,42	2SB709-QRS	Transistor
J241,268	YF21160R00T	Jumper Resistor	Q43	2SD601-RS	Transistor
J270,323	YF21160R00T	Jumper Resistor	D1-5	MA151K	Diode
J336,337	YF21160R00T	Jumper Resistor	R1	YF2116750JT	Carbon
J504,547	YF21160R00T	Jumper Resistor	R2	YF2116223JT	Carbon
J604,619	YF21160R00T	Jumper Resistor	R3	YF211632J2T	Carbon
CN3	YW530140610	6-pin Connector	R4-10	YF2116102GT	Carbon
E1-37	YWRCT2125TPV	Terminal	R11	YF2116911JT	Carbon
E201-211	YWRCT2125TPV	Terminal	R12	YF2116102GT	Carbon
E401,402	YWRCT2125TPV	Terminal	R13	YF2116392JT	Carbon
M21	YVV2HA0885A1	Shield Parts	R14,15	YF2116750JT	Carbon
M22	YVV2HA0886A1	Shield Parts	R16,17	YF2116202JT	Carbon
M23	YVV2HA0887A4	Shield Parts	R18	YF211632J2T	Carbon
M24	YVV2HA0889A4	Shield Parts	R19,20	YF2116202JT	Carbon
M25	YVV2HA0890A4	Shield Parts	R21	YF2116222GT	Carbon
M26	YVV2HA0891A4	Shield Parts	R23	YF2116104JT	Carbon
POSITIONER BOARD					
PCB2	YWJRAAVE5E1A	Printed Board	R24	YF2116680JT	Carbon
VR1	YWVL201104L	Variable Resistor	R26	YF211632J2T	Carbon
CN1	YW530150510	5-pin Connector	R27	YF2116750JT	Carbon
MIC BOARD					
PCB3	YWJRAAVE5E1B	Printed Board	R28	YF2116102GT	Carbon
CN1	YW530150210	2-pin Connector	R29	YF2116392JT	Carbon
JK1	YWLLJ23083090	Jack	R30	YF2116223JT	Carbon
			R31	YF211632J2T	Carbon
			R32-37	YF2116102GT	Carbon
			R38	YF2116911JT	Carbon
			R39	YF2116102GT	Carbon
			R40,41	YF2116750JT	Carbon
			R42,43	YF2116202JT	Carbon
			R44	YF211632J2T	Carbon
			R45	YF2116222GT	Carbon
			R46,47	YF2116202JT	Carbon

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
POWER BOARD					
PCB5 (NLA) VS1 R1 C1,2 C3,4 C5,6 C7 C8,9 C10-12 C13 L1,2 L3,4 L5 SW1 F1,2  F3,4  CN1 CN2 CN3 E1 TP1	YWJKYAVE5E2A ERZC07DK471U ERC12ZGK105 ECQU2A563MT ECA1AFQ331 ECA1EFQ331 ECA1AFQ331 ECA1EFQ331 ECKDRS152ME ECA1AFQ331 YFELC10E007 ELC08D082 ELF18D290H YWSDDFA325 SSFR1.6A002 YWSSFR1AF002 YW530140310 YW530140710R YW530140410 S-N5057 YW7M028	Printed Circuit Board Assy Znr Solid Resistor 1M ohms Plastic 0.056 μ F Electrolytic 330 μ F 10V Electrolytic 330 μ F 25V Electrolytic 330 μ F 10V Electrolytic 330 μ F 25V Ceramic 1500 pF Electrolytic 330 μ F 10V Coil Coil Coil Push Switch Current Fuse 1.6A Current Fuse 1A 3-pin Connector 7-pin Connector 4-pin Connector Fuse Holder Test-pin	R12 R13 R14 R15 R16,17 VR1 C1 C2 C3 C4 C5 C6 C7,8 C9 C10 C11 C12 C13 C14,15 C16 C17 C18 C19 C20 L1 T1 CN1 CN2 E1 M31 M32 M33 M34 M35 M36	ERDS2TJ334 ERDS2TJ103 ERDS2TJ561 ERDS2TJ151 ER052CKF6801 YFH0621A2R2K ECQU2A153MN CK45E2EA332 EC052GA680CA ECQV1H104JZ ECKD3A221KBN ECQE6103JZ ECEA1HFS010 ECEA1HU4R7 ECA1EFQ331 ECEA1CFE181 ECEA1FE221 ECEA1CFE181 ECA0JFQ152 ECA0JFQ102 ECOB1H332JZ RPE132F104Z CK45E2EA332 ECQV1H683JZ YWTSL07150K ETS27K722A YW5289-4A EMCS0552M YWMA01 YWV2CA0318A4 YWV2HA0892A3 YWV2PA0403A4 YWV2PA0415A3 YWV7DA0267A3 YWV1BA0020A4	Carbon 330K ohms 1/4W Carbon 10K ohms 1/4W Carbon 560 ohms 1/4W Carbon 150 ohms 1/4W Metal 6.8 ohms Variable Resistor 2.2K ohms Plastic 0.015 μ F 250V Ceramic 3300 pF 250V Electrolytic 68 μ F 400V Plastic 0.1 μ F 50V (TF) Ceramic 220 pF Plastic 0.01 μ F 630V Electrolytic 1 μ F Electrolytic 4.7 μ F 50V Electrolytic 330 μ F 25V Electrolytic 180 μ F Electrolytic 220 μ F Electrolytic 180 μ F Electrolytic 1500 μ F Electrolytic 1000 μ F Plastic 0.0033 μ F Ceramic 0.1 μ F Ceramic 0.0033 μ F Plastic 0.068 μ F Coil 15 μ F Power Transformer 4-pin Connector 5-pin Connector Terminal Hold Plate Shield Parts Insulator Insulator Heat Sink Support
REGULATOR BOARD					
PCB6 (NLA) IC2 IC3 Q1 Q3,4 Q2 D1 D2 D3,4 D5 D6,7 R1 R2,3 R4 R5 R6 R7 R8 R9 R10 R11	YWJKYAVE5E3A AN79N12 AN1431T 2SD973-QRS 2SD636-QRS 2SC3866 S1WBA60 ES1F EM01Z YWPC111 ERB44-02 ERF57.220 ERDS1TJ224 ERG1S.101 ERG3S.563P ERDS2TJ472 ERDS2TJ101 ERX1S12R2 ERC12ZGM156 ERDS2TJ102 ERDS2TJ333	Printed Circuit Board Assy IC IC Transistor Transistor trans. Diode Diode Diode Diode Diode Wire Wound 220 ohms 5W Carbon 220 Kohms 1/2W Metal 100 ohms 1W Metal 56K ohms 3W Carbon 4.7K ohms 1/4W Carbon 100 ohms 1/4W Metal 2.2 ohms Solid Resistor 15M ohms 1/2W Carbon 1K ohms 1/4W Carbon 33K ohms 1/4W			

REF.NO.	PART NO.	DESCRIPTION		REF.NO.	PART NO.	DESCRIPTION	
R49	YF2116104JT	Carbon	100K ohms 1/16W	C6,7	ECEA1AKA470	Electrolytic	47 μF 10V
R50	YF2116680JT	Carbon	68 ohms 1/16W	C8	ECEAOJU471	Electrolytic	470 μF 6.3V
R52	YF2116332JT	Carbon	3.3K ohms 1/16W	C9	YWT316B104MT	Ceramic	0.1 μF
R53	YF2116104JT	Carbon	100K ohms 1/16W	C10	ECEA1AKA220	Electrolytic	22 μF 10V
R54	YF2116680JT	Carbon	68 ohms 1/16W	C11	ECEA0GKA101	Electrolytic	100 μF 4V
R55	YF2116102GT	Carbon	1K ohms 1/16W	C12	ECEA1AKA470	Electrolytic	47 μF 10V
R56	YF2116222GT	Carbon	2.2K ohms 1/16W	C13	ECEAOJKA221	Electrolytic	220 μF 6.3V
R57	YF2116474JT	Carbon	470K ohms 1/16W	C14	YF400222XKT	Ceramic	2200 pF
R58	YF2116680JT	Carbon	68 ohms 1/16W	C15	ECEA1AKA470	Electrolytic	47 μF 10V
R59,60	YF2116104JT	Carbon	100K ohms 1/16W	C16	ECEAOJU471	Electrolytic	470 μF 6.3V
R61,62	YF2116222GT	Carbon	2.2K ohms 1/16W	C17	YWT316B104MT	Ceramic	0.1 μF
R63	YF2116332JT	Carbon	3.3K ohms 1/16W	C18	ECEA1AKA470	Electrolytic	47 μF 10V
R64	YF2116222GT	Carbon	2.2K ohms 1/16W	C19	ECEAOJU471	Electrolytic	470 μF 6.3V
R65	YF2116474JT	Carbon	470K ohms 1/16W	C20	ECEA1CKN4R7	Electrolytic	4.7 μF 16V
R66,67	YF2116680JT	Carbon	68 ohms 1/16W	C21	ECEA0GKA470	Electrolytic	47 μF 4V
R68,69	YF2116104JT	Carbon	100K ohms 1/16W	C22	ECEAOJU471	Electrolytic	470 μF 6.3V
R70	YF2116680JT	Carbon	68 ohms 1/16W	C23	ECEA1CKN4R7	Electrolytic	4.7 μF 16V
R71,72	YF2116222GT	Carbon	2.2K ohms 1/16W	C24	ECEA0GKA470	Electrolytic	47 μF 4V
R73,74	YF2116512JT	Carbon	5.1K ohms 1/16W	C25	YF400222XKT	Ceramic	2200 pF
R75	YF2116103JT	Carbon	10K ohms 1/16W	C26	ECEAOJU471	Electrolytic	470 μF 6.3V
R76,77	YF2116104JT	Carbon	100K ohms 1/16W	C27	YF400222XKT	Ceramic	2200 pF
R78,79	YF2116680JT	Carbon	68 ohms 1/16W	C28	ECEA0GKA470	Electrolytic	47 μF 4V
R80,81	YF2116102GT	Carbon	1K ohms 1/16W	C29	YF400222XKT	Ceramic	2200 pF 6.3V
R83,84	YF2116102GT	Carbon	1K ohms 1/16W	C30,31	ECEAOJU471	Electrolytic	470 μF 10V
R86	YF2116750JT	Carbon	75 ohms 1/16W	C33	ECEA1AKA220	Electrolytic	22 μF 10V
R87	YF2116511JT	Carbon	510 ohms 1/16W	C35	ECEA1AKA470	Electrolytic	47 μF 10V
R88	YF2116392JT	Carbon	3.9K ohms 1/16W	C36	ECEA1AKA220	Electrolytic	22 μF 10V
R89	YF2116223JT	Carbon	22K ohms 1/16W	C37,38	ECEA1AKA470	Electrolytic	47 μF 10V
R90-92	YF2116102GT	Carbon	1K ohms 1/16W	C39	ECEA1EKA470	Electrolytic	47 μF 25V
R93,94	YF2116750JT	Carbon	75 ohms 1/16W	C40-42	YF400473FZT	Ceramic	0.047 μF
R95	YF2116332JT	Carbon	3.3K ohms 1/16W	C43,44	ECEA1CKS220	Electrolytic	22 μF 16V
R96	YF2116222GT	Carbon	2.2K ohms 1/16W	C45-47	ECEA0GKA470	Electrolytic	47 μF 4V
R97	YF2116223JT	Carbon	22K ohms 1/16W	C48	ECEA1AKA220	Electrolytic	22 μF 10V
R98	YF2116332JT	Carbon	3.3K ohms 1/16W	C49	YWT316B104MT	Ceramic	0.1 μF
R99	YF2116102GT	Carbon	1K ohms 1/16W	C50	ECEA0GKA470	Electrolytic	47 μF 4V
R100,101	YF2116101JT	Carbon	100 ohms 1/16W	C51	ECEA1HKAR47	Electrolytic	0.47 μF 50V
R102	YF2116474JT	Carbon	470K ohms 1/16W	C52	ECEA0GKA470	Electrolytic	47 μF 4V
R103	YF2116332JT	Carbon	3.3K ohms 1/16W	C53	ECEA1HKAR47	Electrolytic	0.47 μF 4V
R104,105	YF2116222GT	Carbon	2.2K ohms 1/16W	C100,101	YF400220CHJT	Ceramic	22 pF
R106,107	YF2116102GT	Carbon	1K ohms 1/16W	L1-3	ELESE220KA	Coil	22 μH
R108	YF2116474JT	Carbon	470K ohms 1/16W	CF1	YWYS30389	Filter	
R109,110	YF2116102GT	Carbon	1K ohms 1/16W	CF2	YWYS30383	Filter	
R111	YF2116331JT	Carbon	330 ohms 1/16W	CF3	YWYS30389	Filter	
R112	YF2116221JT	Carbon	220 ohms 1/16W	CF4	YWYS30383	Filter	
R113	YF2116474JT	Carbon	470K ohms 1/16W	CF5	YWY5G0382	Filter	
R114,115	YF2116102GT	Carbon	1K ohms 1/16W	CN9	YW530150810B	8-pin Connector	
R116	YF2116331JT	Carbon	330 ohms 1/16W	CN10	YW530150810Y	8-pin Connector	
R117	YF2116221JT	Carbon	220 ohms 1/16W	CN11	FCN795P020L0	20-pin Connector	
R118	YF2116474JT	Carbon	470K ohms 1/16W				
C1	ECEA1AKA220	Electrolytic	22 μF 10V				
C2	ECEA0GKA101	Electrolytic	100 μF 4V				
C3	ECEA1AKA470	Electrolytic	47 μF 10V				
C4	ECEAOJKA221	Electrolytic	220 μF 6.3V				
C5	YF400222XKT	Ceramic	2200 pF				

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
SWITCH BOARD					
PCB7 (NLA) IC1-3 IC5 Q1-4 Q5,6	YWJKZAVE5E1A YWNJM2068DD AN90B20 2SD1991A 2SB1320A	Printed Circuit Board Assy IC IC Transistor Transistor	VR12,13 C1 C2 C3 C4	EVNDXAA03B33 ECEA1HKN010 ECCF1H820J ECKF1H101KB ECQV1H104JZ	Variable Resistor 3K ohms Electrolytic 1 μF 50V Ceramic 82 pF 50V Ceramic 100 pF 50V Plastic 0.1 μF 50V (TF)
Q7-12 D1-43 D44-50 D51 R1	2SD1992A YWLT3S44P MA165 LN210RP EROS2CKF3301	Transistor LED Diode LED Metal	C5 C6 C7 C8 C9	ECEA1HKN010 ECCF1H270JC ECKF1H101KB ECQV1H104JZ ECEA1HKN010	Electrolytic 1 μF 50V Ceramic 27 pF Ceramic 100 pF 50V Plastic 0.1 μF 50V (TF) Electrolytic 1 μF 50V
R2 R3 R4 R5 R6	EROS2CKF4702 EROS2CKF1002 EROS2CKF2203 ERDS2TJ203 ERDS2TJ302	Metal Metal Metal Carbon Carbon	C10-13 C14-16 C17 C18,19 C20	ECEA1AKA220 ECEA1CKS101 ECQV1H104JZ ECKF1H101KB ECQV1H104JZ	Electrolytic 22 μF 10V Electrolytic 100 μF 16V Plastic 0.1 μF 50V (TF) Ceramic 100 pF 50V Plastic 0.1 μF 50V (TF)
R7 R8 R9 R10 R11	ERDS2TJ203 ERDS2TJ302 ERDS2TJ203 ERDS2TJ302 ERDS2TJ203	Carbon Carbon Carbon Carbon Carbon	C21,22 C23 C24 C25 C26	ECKF1H101KB ECQV1H104JZ ECCF1H180JC ECKF1H101KB ECQV1H104JZ	Ceramic 100 pF 50V Plastic 0.1 μF 50V (TF) Ceramic 18 pF Ceramic 100 pF 50V Plastic 0.1 μF 50V (TF)
R12 R13 R14 R15,16 R17-20	ERDS2TJ302 ERDS2TJ100 ERDS2TJ101 EROS2CKF3302 EROS2CKF2202	Carbon Carbon Carbon Metal Metal	C27 C28 C29 C30,31 C32	ECCF1H180JC ECKF1H101KB ECQV1H104JZ ECEA1HKN010 ECEA1VKA330I	Ceramic 18 pF Ceramic 100 pF 50V Plastic 0.1 μF 50V (TF) Electrolytic 1 μF 50V Electrolytic 33 μF 35V
R21,22 R23,24 R25 R26,30 R31-38	EROS2CKF3302 EROS2CKF7502 EROS2CKF1001 ERDS2TJ272 ERDS2TJ102	Metal Metal Metal Carbon Carbon	C33,34 C35 C36 C37-40 C41-44	ECEA1HKS010 ECEA1AKS470 ECEA1CKS101 ECCF1H220JC ECEA0JKS331	Electrolytic 1 μF 50V (KS) Electrolytic 47 μF 10V Electrolytic 100 μF 16V Ceramic 22 pF 50V Electrolytic 330 μF 6.3V
R39-46 R47,48 R49 R50,51 R52	ERDS2TJ101 EROS2CKF2702 EROS2CKF1001 EROS2CKF4301 ERDS2TJ104	Carbon Metal Metal Metal Carbon	L1 L2 SW1-44 CN1	ELESE220KA ELESE101KA EVQQTU05R YW530150210	Coil 22 μH Coil 100 μH Push Switch 2-pin Connector
R53,54 R55,56 R57 R58-61 R62	ERDS2TJ302 ERDS2TJ104 ERDS2TJ182 ERDS2TJ101 ERDS2TJ105	Carbon Carbon Carbon Carbon Carbon	ACCESSORY PARTS/PACKAGING PARTS		
R63-70 R71-75 R101-106 R107-112 VR1	ERDS2TJ103 ERDS2TJ102 ERDS2TJ512 ERDS2TJ104 EWAQA0X05B54	Carbon Carbon Carbon Carbon Variable Resistor 50K ohms	M51 M52 M53 M54 M55 M56 M57	YWV8QA2154AN YWV8EA0136A3 XZB26X40C05 XZB55X71C1 YWV9CA1475AN YWV9CB1475BN YWV9CD1475AN YWV9CC1475BN YWV7SA1187A3 YWV7SA1210A3 YWV7SA1188A3 YWS-SNPRB06	Operating Instructions Dustor Cover Polyethylene Bag for Printed Polyethylene Bag for AV Mixer Packaging Assy for WJ-AVE 5/A Packaging Assy for WJ-AVE 5/B Packaging Assy for WJ-AVE 5/C Packaging Assy for WJ-AVE 5/G Packaging Label for WJ-AVE 5/B Packaging Label for WJ-AVE 5/C Packaging Label for WJ-AVE 5/G Packaging Label
VR2,3 VR4 VR8,9 VR10 VR11	EWAPA1X05C54 EWAQA1X05C54 EWAQFEX05B15 EWAPFEX05B15 EWAPFEX05C54	Variable Resistor 50K ohms Variable Resistor 50K ohms Variable Resistor 100K ohms Variable Resistor 100K ohms Variable Resistor 50K ohms			