

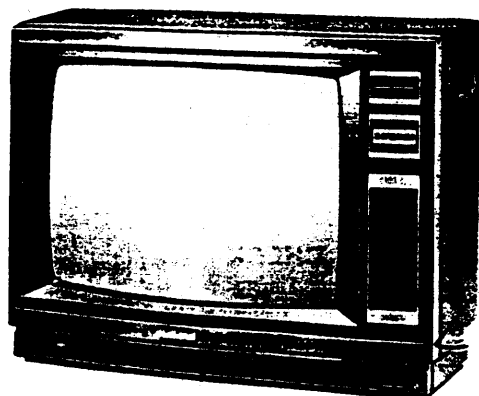
Service Manual

Colour Television

TC-2070M

TC-2071MR

M15L chassis



TC-2071MR

Specifications

TC-2070M

Power Source :	Alternating Current (AC) 220 - 240 V 50 Hz
Power Consumption :	80 W (Max.)
Aerial Impedance :	75 Ω unbalanced, Coaxial Type
Receiving System :	PAL - B, G
Receiving Channels :	VHF 2 ~ 12 UHF 21 ~ 69
Intermediate Frequency :	Video 38.9 MHz Sound 33.4 MHz Colour 34.47 MHz
High Voltage :	24.5 kV at zero beam current
Picture Tube :	5130B22 51 cm (20 inches) measured diagonally, 90° deflection
Audio Output :	2.5 W (Max.)
Speaker :	12 x 8 cm, 8 Ω , Oval Type (Woofer) 3 cm, 400 Ω , Round Type (Tweeter)
Dimensions :	Height : 463 mm Width : 597 mm Depth : 473 mm
Mass :	19.5 kg (NET)

TC-2071MR

Power Source :	Alternating Current (AC) 220 - 240 V 50 Hz
Power Consumption :	80 W (Max.) 7 W (Stand-by condition)
Aerial Impedance :	75 Ω unbalanced, Coaxial Type
Receiving System :	PAL - B, G
Receiving Channels :	VHF 2 ~ 12 UHF 21 ~ 69
Intermediate Frequency :	Video 38.9 MHz Sound 33.4 MHz Colour 34.47 MHz
High Voltage :	24.5 kV at zero beam current
Picture Tube :	5130B22 51 cm (20 inches) measured diagonally, 90° deflection
Audio Output :	2.5 W (Max.)
Speaker :	12 x 8 cm, 8 Ω , Oval Type (Woofer) 3 cm, 400 Ω , Round Type (Tweeter)
Remote Controller :	25 functions Infrared Controller
Dimensions :	Height : 463 mm Width : 597 mm Depth : 473 mm
Mass :	19.5 kg (NET)

Specifications are subject to change without notice.

Mass (weight) and dimensions shown are approximate.

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C.P.O. Box 288, Osaka 530-91, Japan

ADJUSTMENTS

ITEM / PREPARATION	ADJUSTMENT PROCEDURE								
<p>B VOLTAGE</p> <p>1. Operate the TV set.</p> <p>2. Set controls : Screen (on FBT) minimum Contrast minimum Colour minimum</p>	<p>1. Confirm that the indicated test points for the specified voltage.</p> <table border="0"> <tr> <td>TPE1 : 113 ± 2.0 V</td> <td>TPE8 : 177 ± 15 V</td> </tr> <tr> <td>TPE2 : 12 ± 1.0 V</td> <td>Cathode of D1118 : 4.4 ± 0.5 V (TC-2070M)</td> </tr> <tr> <td>TPE3 : 17 ± 2.0 V</td> <td>TPE51 : 4.7 ± 0.5 V (TC-2071MR)</td> </tr> <tr> <td>TPE4 : 25 ± 1.5 V</td> <td>TPE52 : 5.0 ± 0.5 V</td> </tr> </table>	TPE1 : 113 ± 2.0 V	TPE8 : 177 ± 15 V	TPE2 : 12 ± 1.0 V	Cathode of D1118 : 4.4 ± 0.5 V (TC-2070M)	TPE3 : 17 ± 2.0 V	TPE51 : 4.7 ± 0.5 V (TC-2071MR)	TPE4 : 25 ± 1.5 V	TPE52 : 5.0 ± 0.5 V
TPE1 : 113 ± 2.0 V	TPE8 : 177 ± 15 V								
TPE2 : 12 ± 1.0 V	Cathode of D1118 : 4.4 ± 0.5 V (TC-2070M)								
TPE3 : 17 ± 2.0 V	TPE51 : 4.7 ± 0.5 V (TC-2071MR)								
TPE4 : 25 ± 1.5 V	TPE52 : 5.0 ± 0.5 V								
<p>RF AGC</p> <p>1. Receive a colour bar pattern.</p> <p>2. Set the input level to 63 ± 2 dB. (75Ω opened)</p> <p>3. Connect an oscilloscope to TPE12 with DC mode.</p>	<p>1. Turn RF AGC control (R108) fully clockwise.</p> <p>2. Slowly turn RF AGC control counterclockwise to set it at the point just before voltage at TPE12 drops.</p> <p>3. Increase the input level by 2 dB and confirm that the voltage changes.</p>								
<p>HIGH VOLTAGE</p> <p>1. Operate the TV set.</p> <p>2. Set controls : Screen (on FBT) minimum Contrast minimum Colour minimum</p>	<p>1. Connect a DC voltage meter to TPE1 and confirm the voltage is 113 ± 2.0 V.</p> <p>2. Connect a high voltage meter (Resistor type) to an anode of the picture tube.</p> <p>3. Confirm that the high voltage is within a range of $24.5 (+ 1.5, - 1.3)$ kV.</p>								

ITEM / PREPARATION	ADJUSTMENT PROCEDURE	WAVEFORM
<p>SUB CONTRAST</p> <p>1. Receive a colour bar pattern.</p> <p>2. Connect an oscilloscope to TPE32.</p> <p>3. Connect a short jumper between TPE7 and TPE52.</p> <p>4. Set Colour control to Normal (Centre) and Contrast control to Max.</p>	<p>1. Adjust Sub Bright, Screen and Bright controls : 0.5 ± 0.2 V</p> <p>2. Adjust Sub Contrast control (R302) : 3.6 ± 0.1 V (Waveform should not be saturated.)</p>	<p>3.6\pm0.1 V (by R302) 0.5 ± 0.2 V 2.8 V 0V (by SUB BRIGHT, SCREEN & BRIGHT CONTROLS)</p> <p>Fig. 3</p>
<p>COLOUR PHASE</p> <p>1. Receive a colour bar pattern.</p> <p>2. Connect an oscilloscope to TPE32.</p> <p>3. Connect a short jumper between Pin 8 and Pin 9 of IC601.</p> <p>4. Connect a short jumper between Pin 3 of IC601 and TPE52.</p>	<p>1. Set Colour control to Normal (Centre) and Contrast control to Max.</p> <p>2. Adjust APC trimmer (C617) to obtain synchronous waveform.</p>	<p>Fig. 4</p>
<p>DELAY LINE</p> <p>1. Receive a colour bar pattern.</p> <p>2. Connect an oscilloscope to TPE32.</p> <p>3. Set Colour control to Normal (Centre) and Contrast control to Max.</p>	<p>1. Adjust the position (A) shown in Fig. 5 to zero level by R611.</p> <p>2. Minimize the differences (B) shown in Fig. 5 by L601.</p>	<p>(A) (B)</p> <p>Fig. 5</p>

ITEM / PREPARATION	ADJUSTMENT PROCEDURE	WAVEFORM
<p>COLOUR OUTPUT</p> <p>1. Receive a colour bar pattern.</p> <p>2. Connect an oscilloscope to TPE32.</p> <p>3. Set Colour control to Normal (Centre) and Contrast control to Max.</p> <p>4. Connect a short jumper between TPE7 and TPE52.</p>	<p>1. Adjust Sub Bright, Screen and Bright controls : 0.5 ± 0.2 V</p> <p>2. Adjust Sub Colour control (R620) : 2.4 ± 0.2 V</p> <p>3. Connect the oscilloscope to TPE34.</p> <p>4. Confirm that the amplitude of waveform : 3.5 ± 0.4 V</p>	<p>TPE32 2.4 ± 0.2 V 0.5 ± 0.2 V 2.8 V 0V (by SUB BRIGHT, SCREEN & BRIGHT CONTROLS)</p> <p>Fig. 6</p>

SCHEMATIC DIAGRAM FOR MODELS TC - 2070M / 2071MR (M15L CHASSIS)

IMPORTANT SAFETY NOTICE

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

NOTES :

1. RESISTOR

All resistors are carbon 1/4W resistor, unless marked as follows:
Unit of resistance is OHM [Ω] (K = 1,000 , M = 1,000,000).

- | | |
|------------------|-----------------|
| ○ : Nonflammable | ⊠ : Metal Oxide |
| △ : Solid | ⊙ : Metal Film |
| ⊞ : Wire Wound | ⊗ : Fuse |

2. CAPACITOR

All capacitors are ceramic 50V capacitor, unless marked as follows:
Unit of capacitance is μ F, unless otherwise noted.

- | | |
|------------------------------|----------------------|
| ⊗ : Temperature Compensation | + # - : Electrolytic |
| Ⓜ : Polyester | NP # : Bipolar |
| Ⓜ : Metallized Polyester | Ⓜ : Dipped Tantalum |
| ⊞ : Polypropylene | Ⓜ : Z - Type |

3. COIL

Unit of inductance is μ H, unless otherwise noted.

4. Marked " \odot " on the schematic diagram shows lead-less parts.

5. TEST POINT

○ : Test Point position

6. VOLTAGE MEASUREMENT

Voltage is measured by a DC voltmeter.

Conditions of the measurement are the following:

- | | |
|-------------------------|------------------------|
| Power Source | AC 220V nominal 50Hz |
| Receiving Signal | Colour Bar signal (RF) |
| All customer's controls | Maximum position |

7. Number in red circle indicates waveform number. (See waveform pattern table.)

8. When arrow mark (\nearrow) is found, connection is easily found from the direction of arrow.

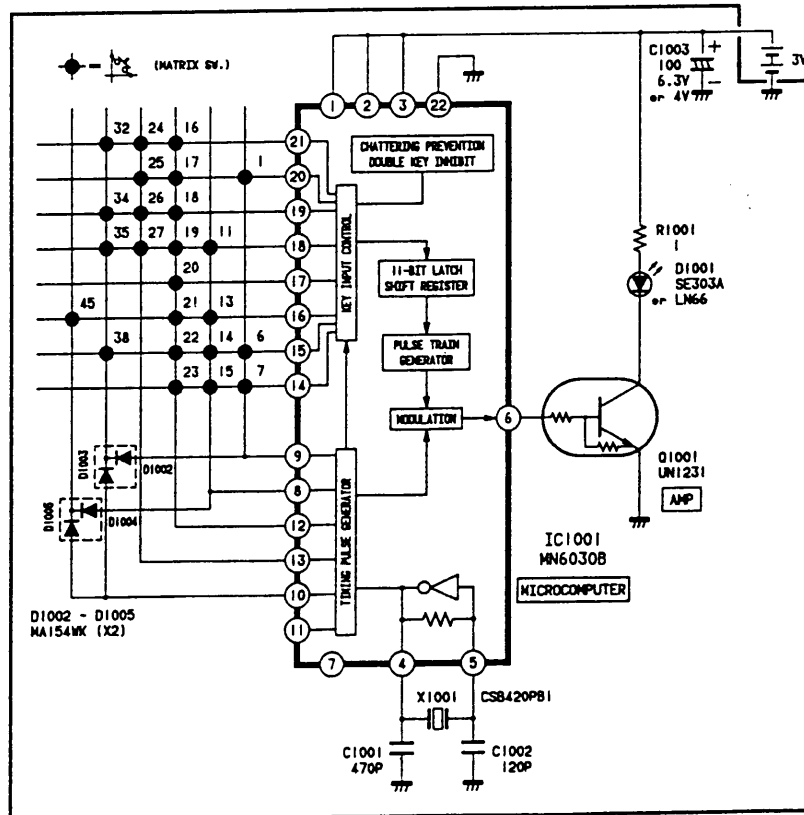
9. \Rightarrow : Indicates the major signal flow.

10. This schematic diagram is the latest at the time of printing and subject to change without notice.

Remote Control Transmitter EUR64531 for TC - 2071MR

Key Function Table

KEY NO.	DATA CODE	FUNCTION TV (CODE, 00)	KEY NO.	DATA CODE	FUNCTION TV (CODE, 00)
1	01	VOL +	21	15	6
6	06	BRIGHT +	22	16	7
7	07	NORMAL	23	17	8
11	0B	MUTE	24	18	9
12	0C	COLOUR +	25	19	10
13	0D	VOL -	26	1A	11
14	0E	COLOUR -	27	1B	12
15	0F	BRIGHT -	32	20	POWER
16	10	1	34	22	PROG. UP
17	11	2	35	23	PROG. DN
18	12	3	38	26	RECALL
19	13	4	45	2D	OFF TIMER
20	14	5	—	—	—

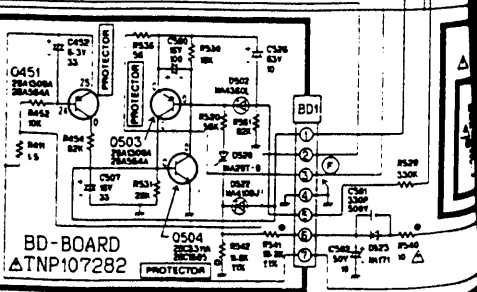
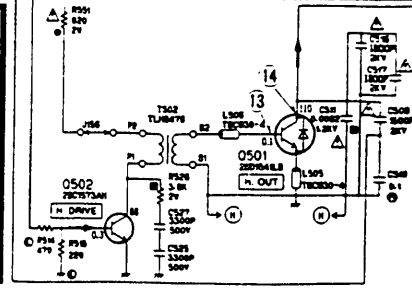
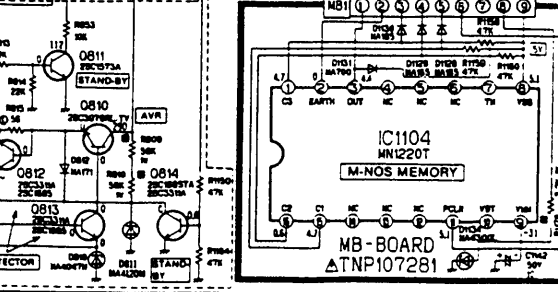
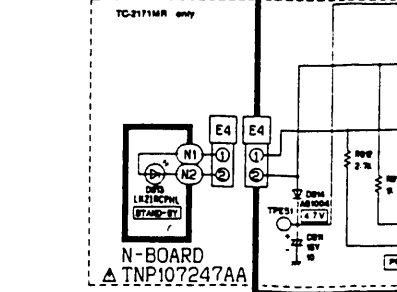
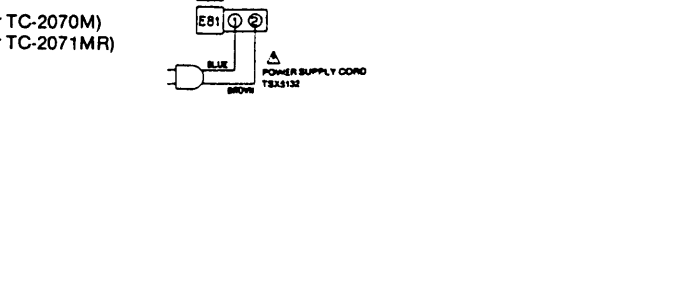
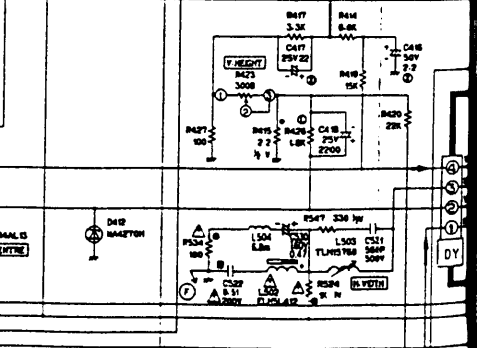
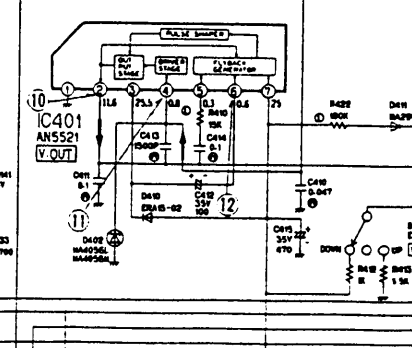
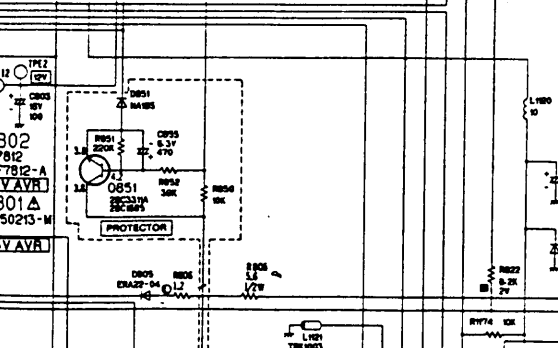
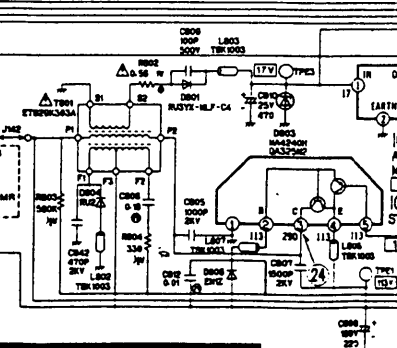
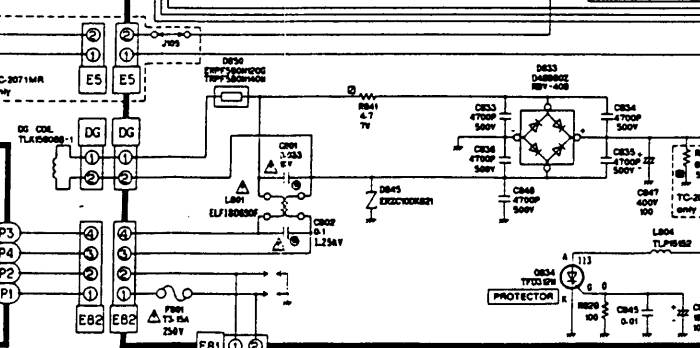
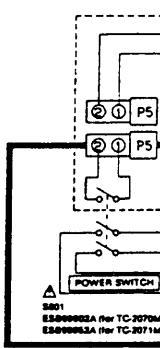
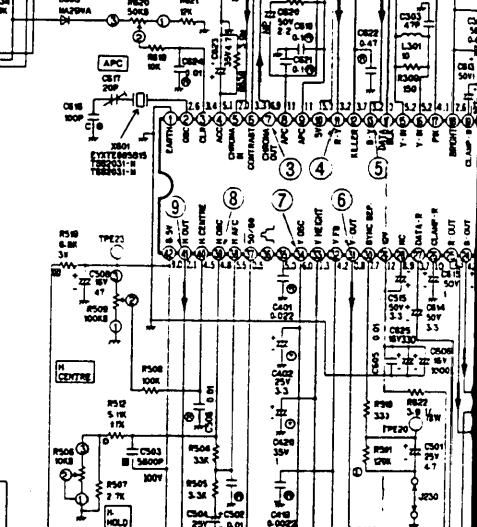
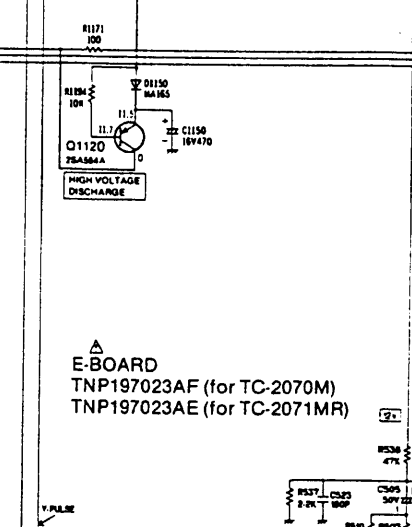
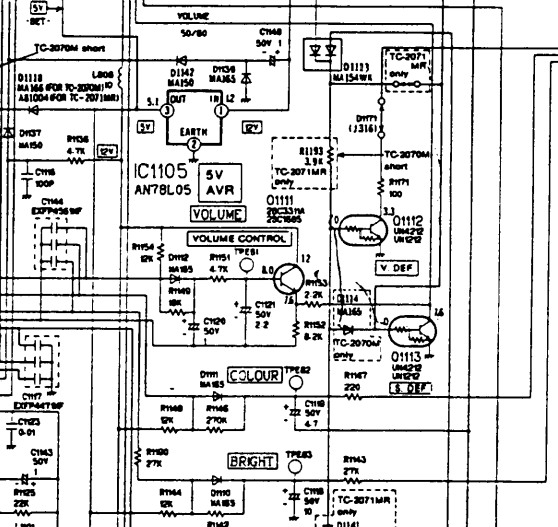
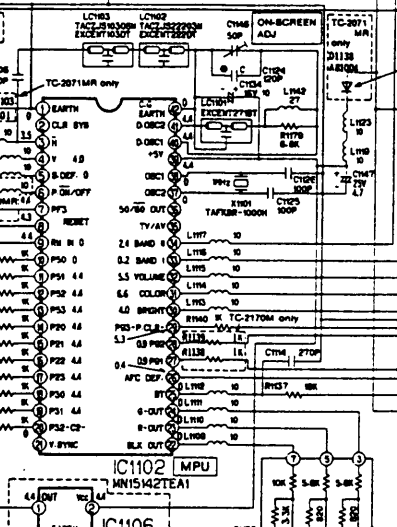
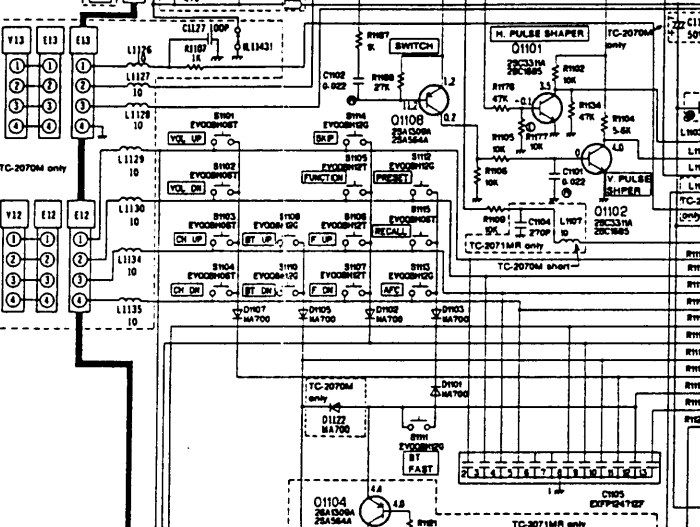
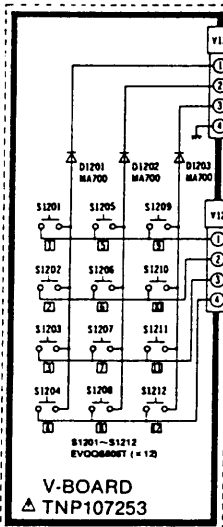
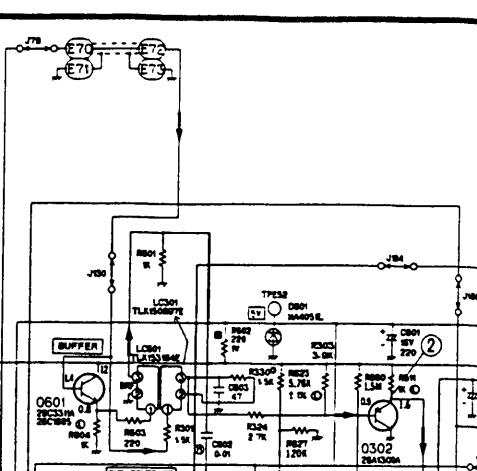
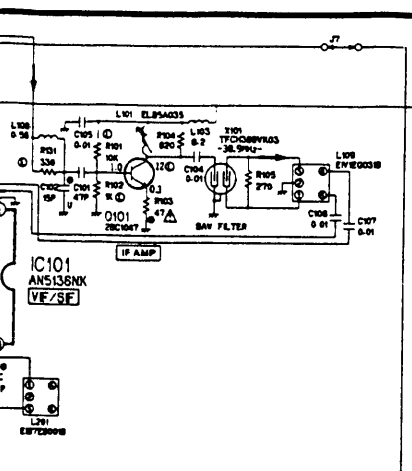
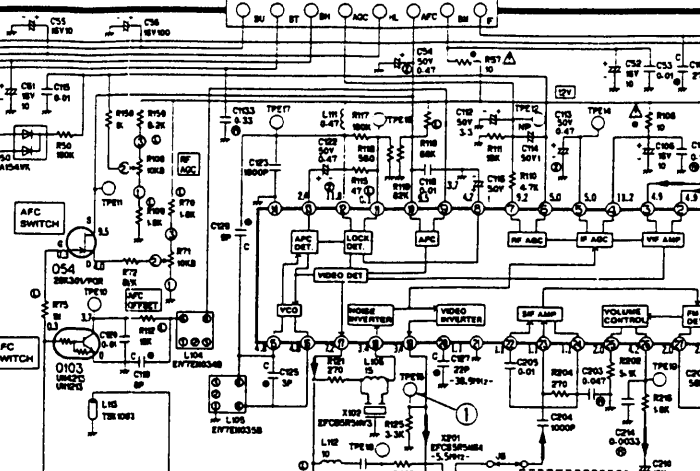
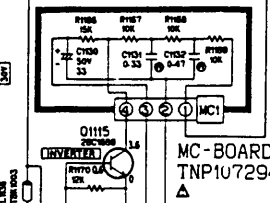
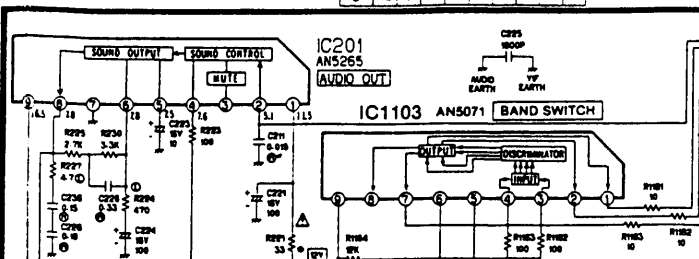
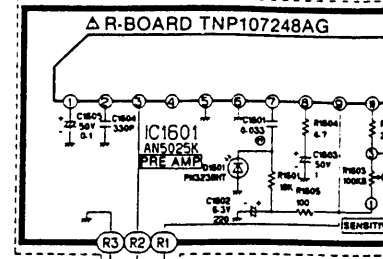
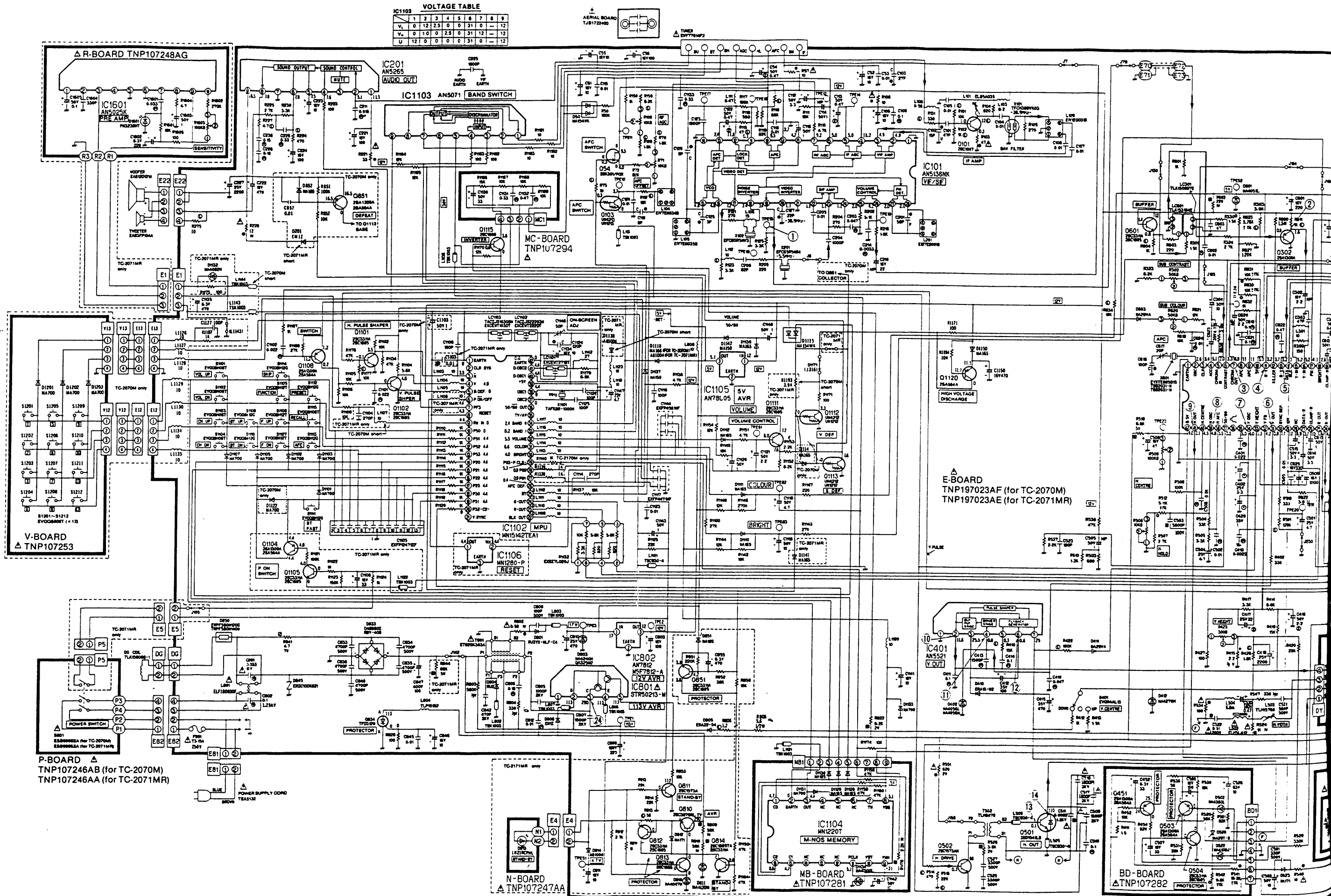


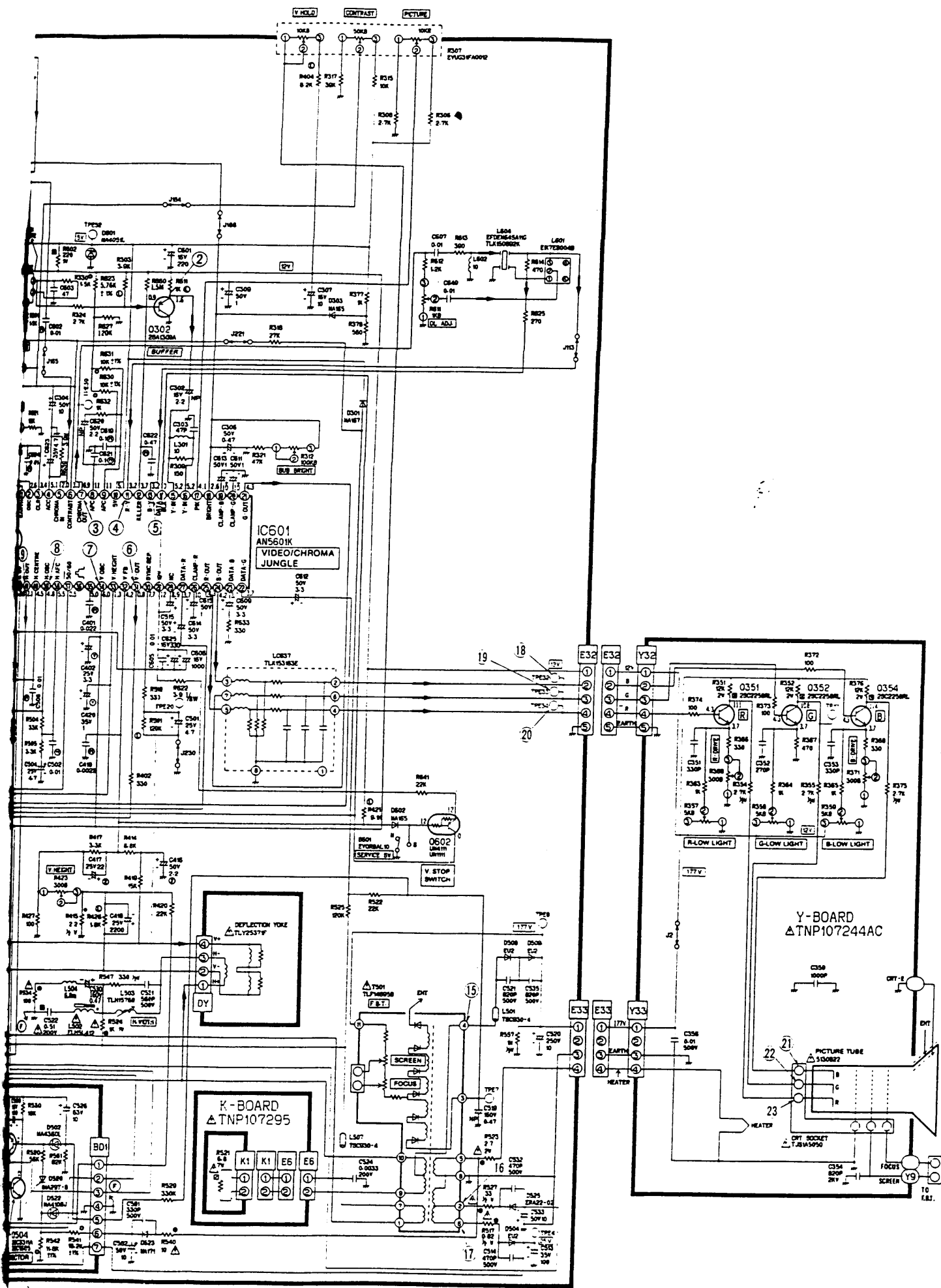
WAVEFORM PATTERN TABLE

<p>①</p> <p>2.3V_{p-p} (20µs)</p>	<p>②</p> <p>0.6V_{p-p} (20µs)</p>	<p>③</p> <p>2.2V_{p-p} (20µs)</p>	<p>④</p> <p>0.42V_{p-p} (20µs)</p>
<p>⑤</p> <p>0.65V_{p-p} (20µs)</p>	<p>⑥</p> <p>1.8V_{p-p} (5ms)</p>	<p>⑦</p> <p>3.0V_{p-p} (5ms)</p>	<p>⑧</p> <p>4.8V_{p-p} (20µs)</p>
<p>⑨</p> <p>5.6V_{p-p} (20µs)</p>	<p>⑩</p> <p>52V_{p-p} (5ms)</p>	<p>⑪</p> <p>1.8V_{p-p} (5ms)</p>	<p>⑫</p> <p>28V_{p-p} (5ms)</p>
<p>⑬</p> <p>22V_{p-p} (20µs)</p>	<p>⑭</p> <p>900V_{p-p} (20µs)</p>	<p>⑮</p> <p>92V_{p-p} (20µs)</p>	<p>⑯</p> <p>48V_{p-p} (20µs)</p>
<p>⑰</p> <p>205V_{p-p} (20µs)</p>	<p>⑱</p> <p>4.3V_{p-p} (20µs)</p>	<p>⑲</p> <p>3.6V_{p-p} (20µs)</p>	<p>⑳</p> <p>5.3V_{p-p} (20µs)</p>
<p>㉑</p> <p>120V_{p-p} (20µs)</p>	<p>㉒</p> <p>100V_{p-p} (20µs)</p>	<p>㉓</p> <p>130V_{p-p} (20µs)</p>	<p>㉔</p> <p>450V_{p-p} (20µs)</p>

VOLTAGE TABLE

IC1103	1	2	3	4	5	6	7	8	9
V ₁	0	12	2.5	0	0	31	0	-	12
V ₂	0	1.0	0	2.5	0	31	12	-	12
V ₃	12	0	0	0	0	31	0	-	12





BLOCK DIAGRAM FOR INTEGRATED CIRCUIT

IC601 AN5601K

