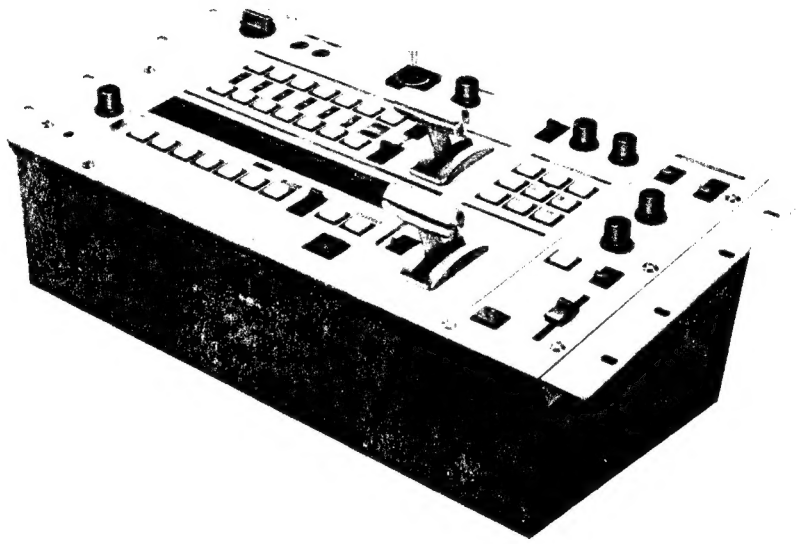
SEG-2000A
SEG-2000AP
SEG-2000APM

SPECIAL-EFFECTS GENERATOR

Revised-2



SONY®

SERVICE MANUAL

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

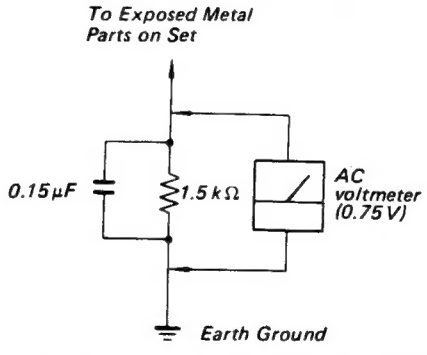


Fig. A. Using an AC voltmeter to check AC leakage.

SPECIFICATIONS

Signal system EIA standards, NTSC color system

Switching system Vertical blanking switcher

Effects

MIX Dissolve by special effects control lever and PGM/PST MIX lever

WIPE
6 wipe patterns (selectable)
Wipe edge: The softness is continuously variable.
Border line: Hue, chroma, luminance, width and amplitude are continuously variable.

EXT KEY
Input signal: 0.7 Vp-p (VB) or 10 Vp-p (VBS), 75 ohms, unbalanced,
EXT KEY connector (BNC)
Slicer circuit is included.

EXT WIPE
EXT WIPE IN connector (6-pin DIN) accepts 84 wipe patterns from WEX-2000 wipe pattern extender

DOWNSTREAM KEYER
Gen-lock with PGM bus line signal
B AND W CAMERA connector (6 pin)
Output signal: HD, VD, 4 Vp-p, 75 ohms, unbalanced
Input signal: 0.7 Vp-p (video), 75 ohms, unbalanced
Shadow: Wide and narrow (selectable)

BACKGROUND COLOR
Chroma: 0 — 700 mVp-p (variable according to the hue level)
Hue: 0° — 360°
Luminance (Y): 0 — 500 mV continuously variable

Input signal
VIDEO IN 1 — 6 connectors
(BNC type) × 6
0.7 Vp-p (VB) or 1.0 Vp-p (VBS), 75 ohms, unbalanced, with 75 ohm termination switch
(The PHASE INDICATION switch does not function with the VB input signal.)
VIDEO IN AUX connector
(BNC type) × 1
1 Vp-p (VBS), 75 ohms, unbalanced, with 75 ohm termination switch
GEN LOCK IN connector
(BNC type) × 1
1 Vp-p (VBS) or 0.3V/0.3V (black burst), 75 ohms

Output signal
PGM OUT 1 — 3 connectors
(BNC type) × 3
PST OUT 1, 2 connectors
(BNC type) × 2
1 Vp-p (VBS), 75 ohms, unbalanced
VIDEO OUT connectors
(BNC type) × 7
1 Vp-p (VBS), 75 ohms, unbalanced (loop-through output of the corresponding VIDEO IN connector)
BLACK BURST OUT 1 — 4 connectors
(BNC type) × 4
Sync, burst 0.3 Vp-p, 75 ohms, unbalanced
V DRIVE OUT connector
(BNC type) × 1
4 Vp-p, 75 ohms, unbalanced

Tally/intercom
TALLY/INTERCOM 1 — 4 connectors
(DIN, 4 pin) × 4
Maximum pick-up value in a relay
24V 200 mA DC

DG, DP 1.5%, less than 1.5° (APL 10 — 90%)

Crosstalk (3.58 MHz) Over −40 dB

Power requirements
120 Vac ± 10%, 50/60 Hz
10 — 24 Vdc
BP-60 Battery pack (1 or 2)

Power consumption
AC operation: 37W
DC operation: 30W

Operating temperature 0°C to 40°C (32°F to 104°F)

Dimensions Approx. 482 × 168 × 266 mm (w/h/d) (19 × 6⅝ × 10½ inches)

Weight Approx. 9.5 kg (20 lb 15 oz)

Supplied accessory AC power cord 1

Design and specifications subject to change without notice.

RECOMMENDED EQUIPMENT AND ACCESSORIES

Color video camera DXC-1800, DXC-1850, DXC-6000, DXC-M3
Camera control unit CCU-1800, CCU-6000, CCU-M3
Black and white camera AVC-3250
Carrying case LC-2006
Battery pack BP-60
Color video monitor PVM series
Cables CCDD cable, CCF cable, UGC cable
Wipe pattern extender WEX-2000
Universal chroma keyer CRK-2000

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9. EFFECT SYSTEM ALIGNMENT

10. BLOCK DIAGRAM

11. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

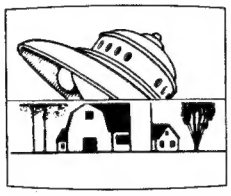
12. SPARE PARTS AND JIG

SECTION 1
GENERAL DESCRIPTION

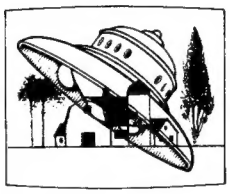
1-1. FEATURES

Wide variety of inputs and outputs
The SEG-2000A is equipped with various connectors:
Six video source inputs and an auxiliary video input, an external wipe signal input, an external key input, a B & W camera input for downstream keyer and a gen-lock input. Three program outputs and two preset outputs, seven video outputs, four black burst outputs and a V drive output. Four tally intercom connectors are also provided.

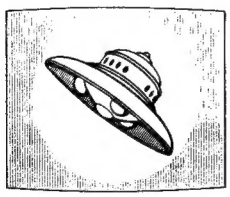
Wipe
Six wipe patterns are available. The edge of the wipe pattern can be soften, sharpened or given a colored border as desired.



Cut in and mixing
Instantaneous program transition—cut in—or gradual transition of one program to another—mix—is possible.



External key
The A and B bus pictures may be keyed with a video signal or key signal from a camera, etc. connected to the EXT KEY IN connector.



Downstream keyer
Letters or figures from a monochrome camera can be key-inserted in the program and preset pictures. For easier viewing, shadows can be produced on the downstream keying signal.

Background color
A built-in background color generator permits color background for keying, for the border of the wipe pattern, etc. Hue, chroma and luminance of the background color are continuously adjustable, so that a precise color can be obtained.

Easy phase adjustment
The H and SC phase difference between the SEG and the connected equipment can be easily adjusted by observing the indicator pattern displayed on the preset monitor screen.

3-way power operation
The unit can be powered by ac house current, BP-60 rechargeable battery packs or an external dc source.

Rack mounting
The unit is designed to be mounted in a 19-inch EIA standard rack.

Portability
The unit can be used outdoors when it is installed in an optional LC-2006 carrying case and powered by BP-60 rechargeable battery packs.

Micro computer control
Operations are controlled by the built-in micro computer.

1-2. PRECAUTIONS

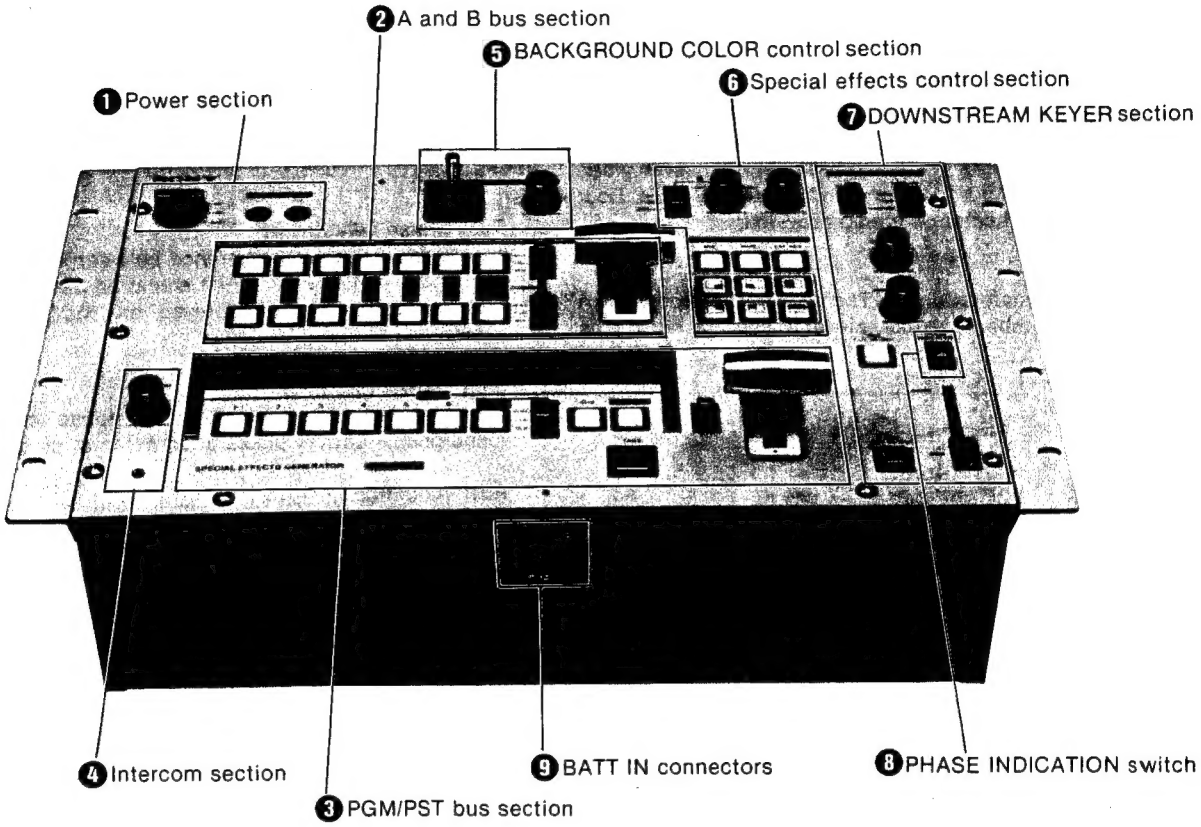
On safety
- For ac operation, operate the unit only on 120 V ac, 50/60 Hz. For dc operation, use the BP-60 battery pack or a dc power source of 10 - 24 V.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time.
- To disconnect a cord, pull it out by the plug. Never pull the cord itself.

On installation
- Allow adequate air circulation to prevent internal heat buildup. Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation slots.
- Do not install the unit near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust or mechanical vibration or shock.
- Keep the unit away from equipment with strong magnets, such as speakers.

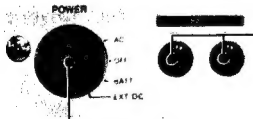
On cleaning
Clean the cabinet, panel and controls with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent such as alcohol or benzine which may damage the finish.

1-3. LOCATION AND FUNCTION OF PARTS AND CONTROLS

1-3-1. Control Panel



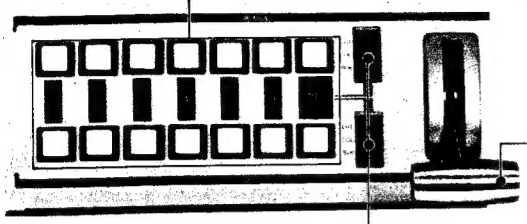
❶ Power section



BATT (battery) meters and low voltage alarm lamps
The BATT 1 and 2 meters show the condition of the BP-60 rechargeable battery packs connected to the BATT IN 1 and 2 connectors during battery operation. When the voltage supplied from a rechargeable battery pack falls below the rated value, the corresponding lamp will blink and after a few minutes the power will be interrupted. When a lamp or lamps start blinking, replace the battery or batteries.

POWER switch
Select the power source with this switch. When the unit is not being used, set the switch to OFF.
AC: For use with an ac power source.
OFF: To turn the unit off.
BATT: For use with rechargeable battery packs.
EXT. DC: For use with an external dc power source connected to the EXT DC IN connector.

❷ A and B bus section

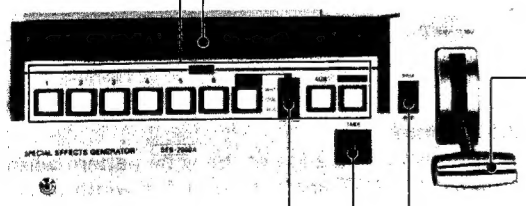


A and B bus buttons
Select the desired video inputs or the built-in color generator for special effects. The pressed buttons will light up and the button of the input selected as the program output will blink.

Special effects control lever
Gradually replaces the A bus picture with the B bus picture, or vice versa, when the MIX or WIPE EFFECTS SELECT button is engaged. When the lever is moved to the uppermost position, the A bus picture will be obtained and when the lever is moved to the lowermost position, the B bus picture will be obtained.

BACKGROUND mode select switches
Select the background color of the corresponding bus.
WHT: White
COL: Color selected by the BACKGROUND COLOR joystick.
BLK: Black

❸ PGM/PST (program/preset) bus section



PST bus buttons
Selects the desired PST bus outputs from the PST OUT connectors when the PGM/PST switch is set to PST. The PGM bus outputs from the PGM OUT connectors are selected simultaneously when the PGM/PST switch is set to PGM.
The pressed button will light up.

PGM bus indicator
The input selected as the program output from the PGM OUT connectors is indicated here.

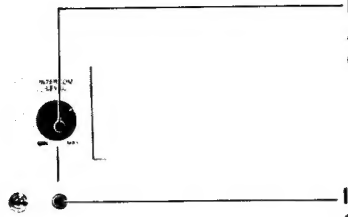
PGM/PST MIX lever
Gradually replaces the PGM bus picture with the PST bus picture, or vice versa.
● This lever will function only when the PGM/PST switch is set to PST.

PGM/PST switch
PGM: Set to this position when the PST and PGM bus outputs are to be selected simultaneously by a PST bus button.
PST: Set to this position when only the PST bus output is to be selected by a PST bus button.
● When you want to adjust the phase, be sure to set this switch to PGM and the PHASE INDICATION switch to ON.

TAKE button
Instantaneously switches the PST bus picture to the PGM bus picture.
● This button will function only when the PGM/PST switch is set to PST.

BACKGROUND mode select switch
Selects the background color.
WHT: White
COL: Color selected by the BACKGROUND COLOR joystick.
BLK: Black

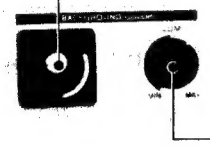
❹ Intercom section



INTERCOM LEVEL control
Adjusts the received sound level from the other video unit at the headset connected to the INTERCOM connector.

INTERCOM connector
Connect the Sony DR-100 intercom headset (optional) here to allow communication between the SEG-2000A and the video equipment connected to the rear TALLY/INTERCOM connectors.

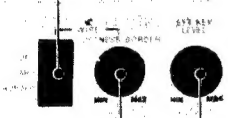
❺ BACKGROUND COLOR control section



BACKGROUND COLOR joystick
Adjusts the hue of the background color by rotating and the chroma level by tilting.

LUM (luminance) control
Adjusts the brightness of the background color. Clockwise rotation brightens the color.

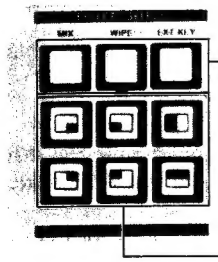
❻ Special effects control section



WIPE edge selector
SOFT: To soften the edge of the wipe pattern.
HARD: To sharpen the edge of the wipe pattern.
BORDER: To border the edge of the wipe pattern. The border color is the complementary color (color supplied when the joystick is rotated 180°) of the color selected by the BACKGROUND COLOR joystick.

EXT KEY LEVEL control
Adjusts the key level of the input signal connected to the EXT KEY IN connector.

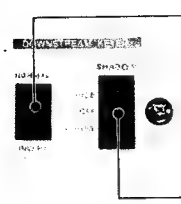
WIPE SOFTNESS/BORDER control
This control adjusts the softness of the edge of the wipe pattern when the WIPE edge selector is set to SOFT and it adjusts the width of the border of the wipe pattern when the WIPE selector is set to BORDER.



EFFECTS SELECT buttons
MIX: To mix the A and B bus pictures.
WIPE: To wipe the A bus picture with the B bus picture, or vice versa, using the wipe pattern selected by the wipe pattern buttons.
EXT KEY: To key the A and B bus pictures using the input signal from the EXT KEY IN connector.

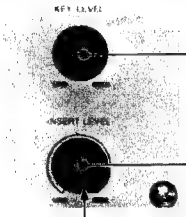
Wipe pattern buttons
Select the wipe pattern.

❼ DOWNSTREAM KEYER section



NORMAL/INVERT switch
NORMAL: When keying black letters against a white background.
INVERT: When keying white letters against a black background.

SHADOW switch
WIDE: To produce a wide shadow to the downstream keying signal.
OFF: No shadow.
NARROW: To produce a narrow shadow to the downstream keying signal. When the letters to be keyed are rather small, use this position.

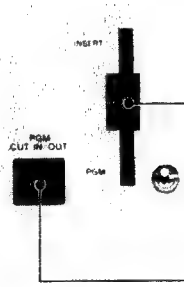


KEY LEVEL control
Adjusts the downstream keying level.

INSERT LEVEL control
Adjusts the brightness level of the insert signal. Turn the control to the right to obtain white letters and to the left to obtain black letters.

At this position, the level is 700 mV. If the control is turned counterclockwise into the black zone, the level may be too high.

PST CUT IN/OUT button
Press to cut in or cut out the keying signal from the B & W camera connected to the B/W CAMERA connector on the PST bus picture.
The button lights when the letters are inserted.



INSERT lever
Move the lever upwards (to INSERT) to gradually insert the letters to the PGM bus picture and move the lever downwards (to PGM) to remove the letters. At the PGM position no letter will appear.
When the letters are inserted, the PGM CUT IN/OUT button will light up.

PGM CUT IN/OUT button
Press to cut in or cut out the letters to the PGM bus picture.
The button lights when the letters are inserted.

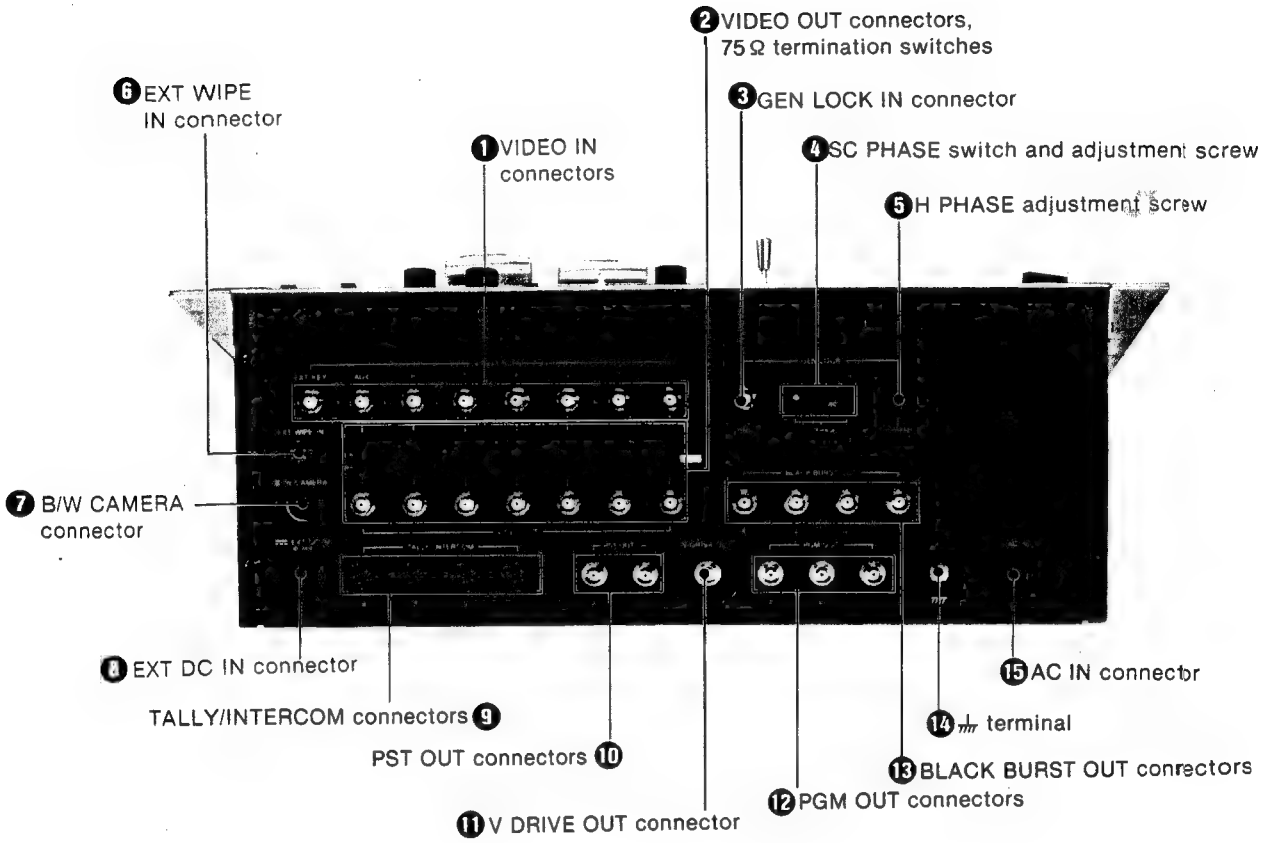
❽ PHASE INDICATION switch

For phase adjustment between the SEG and the connected equipment, set this switch to ON and set the PGM/PST switch to PGM. The phase indicator pattern will appear on the preset monitor screen. Use this pattern as a guide for phase adjustment. See page 14.

❾ BATT (battery pack) IN connectors

To operate the SEG with battery packs, connect Sony BP-60 battery packs (optional) to these connectors.

1-3-2. Connector Panel



❶ VIDEO IN connectors (BNC type)
Connect video signals from video cameras, VTRs which are connected to time base correctors, etc.
1 to 6 connectors: The input signals to these connectors should be synchronized with the SEG-2000A.
AUX connector: An input signal which is not synchronized with the SEG-2000A can be connected here. Connect the VTR directly.
EXT KEY connector (75-ohm termination): Connect a keying signal which is synchronized with the SEG-2000A here for external key operation.

❷ VIDEO OUT connectors (BNC type) and 75 Ω termination switch
The video signals connected to the above VIDEO IN connectors are fed out from these connectors (loop-through output). Connect to the video input connectors on a monitor to monitor the video signal connected to the VIDEO IN connector directly.
● Be sure to set the 75 Ω termination switch to OFF when these connectors are used. When they are not being used, set this switch to ON.

❸ GEN LOCK IN (generator lock input) connector (BNC type)
Connect a reference VBS or black burst signal to this connector to synchronize the SEG-2000A with an external sync signal. All equipment connected to the SEG will then be synchronized with this reference signal.

❹ SC PHASE switch and adjustment screw
This switch roughly adjusts the subcarrier phase of the PGM output signal to the subcarrier phase of the gen-lock reference signal.
After rough adjustment with the SC PHASE switch, adjust the SC phase precisely with the adjustment screw.

❺ H PHASE adjustment screw
Turn to adjust the H phase of the PGM output signal to that of the gen-lock reference signal.

❻ EXT WIPE IN (external wipe signal input) connector (DIN 6-pin)
Connect the optional Sony WEX-2000 wipe pattern extender. Selection from 84 wipe patterns and wipe operation can be performed on the WEX-2000.

❼ B/W CAMERA (black and white camera) connector (6-pin)
For downstream keyer operation, connect a B & W camera with a 6-pin connector using a CCF camera cable.

❽ EXT DC IN (external dc input) connector (DIN 4-pin)
For external dc power operation, connect a dc power source (10 - 24 V dc) here.

❾ TALLY/INTERCOM connectors (DIN 4-pin)
Connect to the tally/intercom connector of a camera or a camera control unit using a CCDD cable. When a headset is connected to the INTERCOM connector on the front panel, the communication between the SEG and the camera operators is possible. The tally lamp of the camera selected by the SEG will light up.
● The TALLY/INTERCOM 1 to 4 connectors correspond to the VIDEO IN 1 to 4 connectors.
● The tally circuit incorporates a relay with a maximum pick-up value of 24 V, 200 mA DC.

❿ PST OUT (preset output) connectors (BNC type)
These connectors output the preset picture signals selected by the PST bus button.
Connect to the video inputs on monitors.

⓫ V DRIVE OUT (vertical drive output) connector (BNC type)
A 4 V p-p vertical drive signal is output here.

⓬ PGM OUT (program output) connectors (BNC type)
Connect to the video inputs of monitors, VTRs, etc.

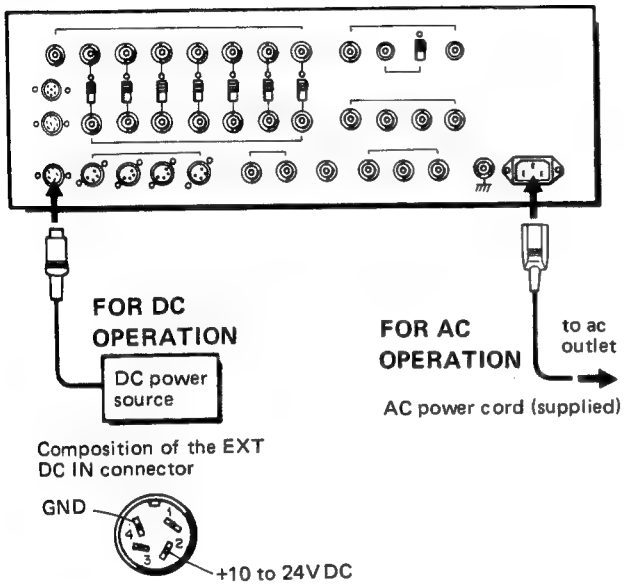
⓭ BLACK BURST OUT connectors (BNC type)
Black burst (sync 0.3 V p-p, burst 0.3 V p-p) signals are output here. Connect these outputs to the GEN LOCK IN connectors of the video equipment being used so that the equipment will be synchronized with the SEG-2000A. The same black burst signal is output at each connector in parallel. The 1 to 4 connectors are independent of the VIDEO IN 1 to 4 connectors.

⓮ ⏚ (ground) terminal
Connect to a good ground when required.

⓯ AC IN connector
Connect the supplied ac power cord here.

1-4. POWER SOURCES

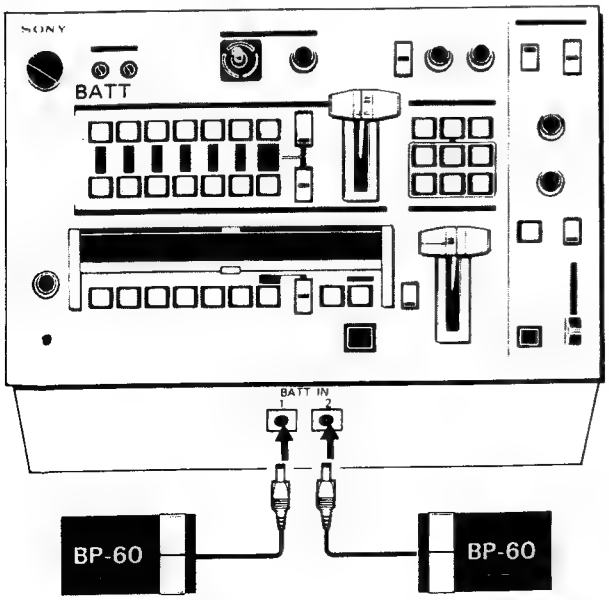
The SEG-2000A operates with the power from any of these three sources.
—AC power
—BP-60 battery pack
—DC power source of 10 V - 24 V



Note
When the SEG-2000A operates with the dc power, some connection may cause noises on the picture when the camera control units, monitors, etc. are connected. For details, please consult the Sony dealer from whom this unit was purchased.

BATTERY PACK

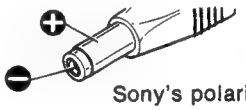
Connect the BP-60 battery packs to the BATT IN connectors.



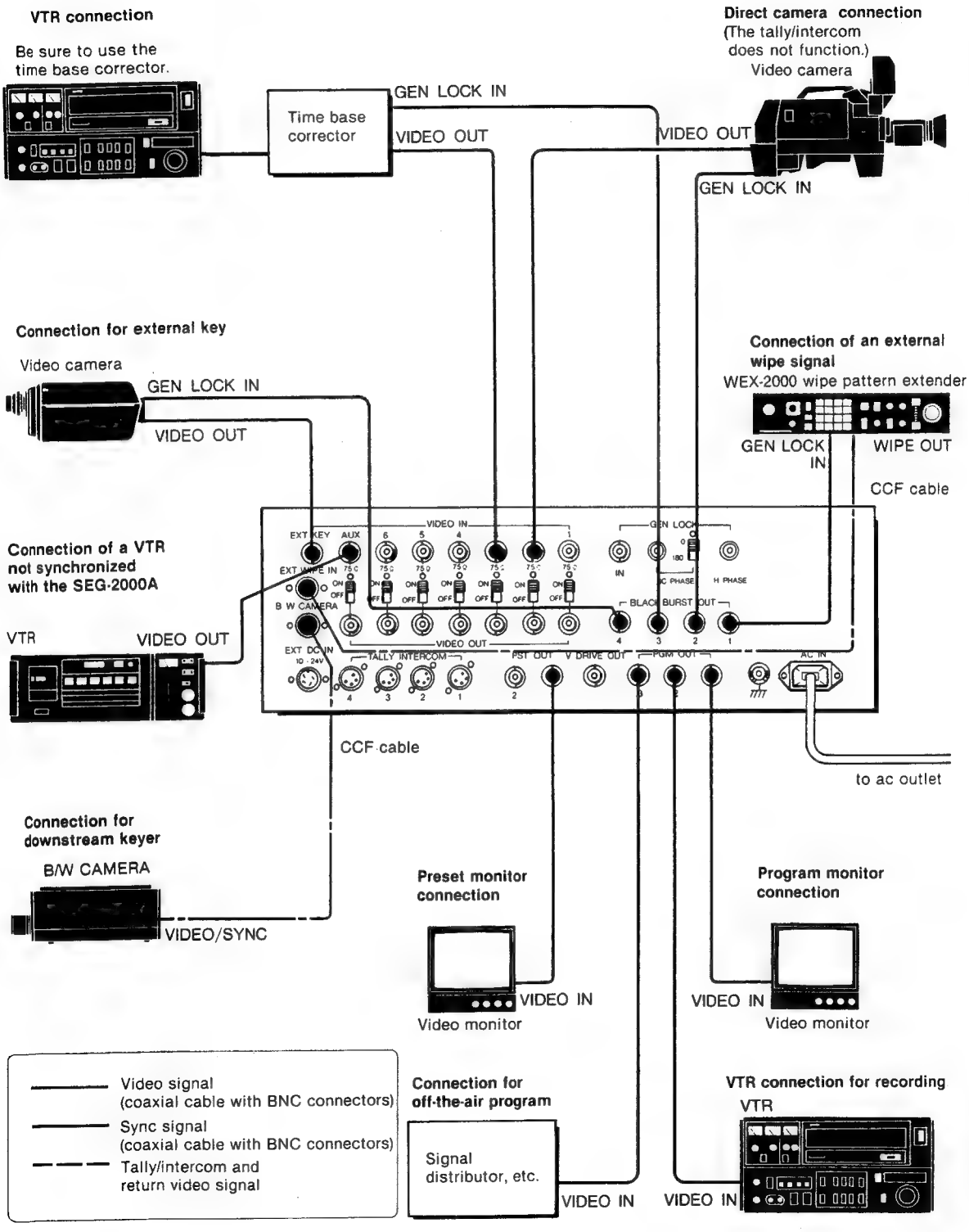
●The LC-2006 carrying case (optional) is convenient for carrying the SEG-2000A with two battery packs for portable operation.

Battery life
Two fully charged batteries allow about two and one half hours of continuous operation at normal temperature. Operation with a battery pack is, of course, possible.
The two batteries operate in series. When the voltage of one of them falls below the rated value, the BATT lamp flickers, the battery meter registers the red scale and after a few minutes the power from that battery is automatically shut off.
To replace the exhausted battery with a charged one, be sure to set the POWER switch to OFF. If the battery is replaced while the other battery is supplying the power, the noise may appear.

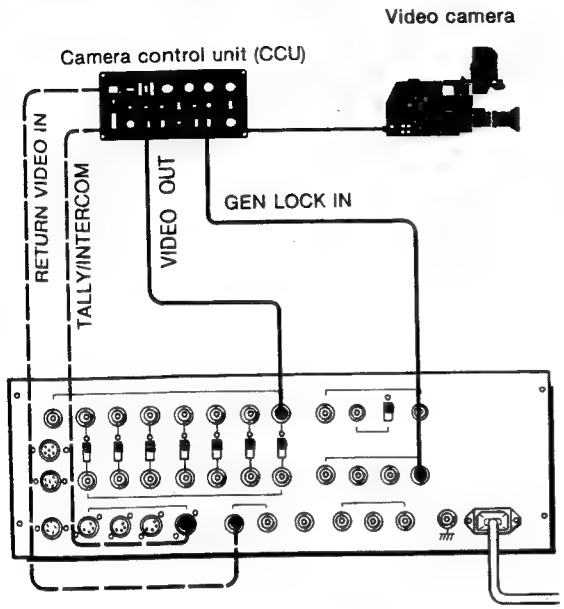
Notes on batteries
●The operating life of the battery will be shortened when it is very cold or when it is exhausted. When the operating period of a recharged battery is less than 30 minutes at normal temperature, the battery should be replaced with a new one.
●Charge the battery immediately after use using the BC-20 or BC-1000 battery charger. Do not permit the battery to remain discharged.
●When the battery pack is not used for a long time, be sure to recharge it every six months.
●Do not use any battery pack other than that manufactured by Sony. Polarity of the battery plug of other packs may differ.



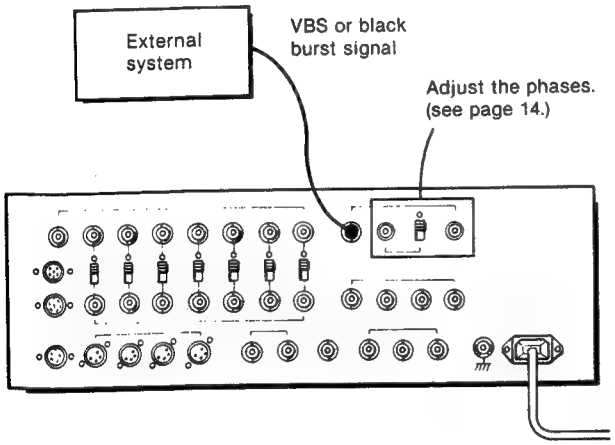
1-5. CONNECTIONS



TO CONNECT A CAMERA USING A CCU

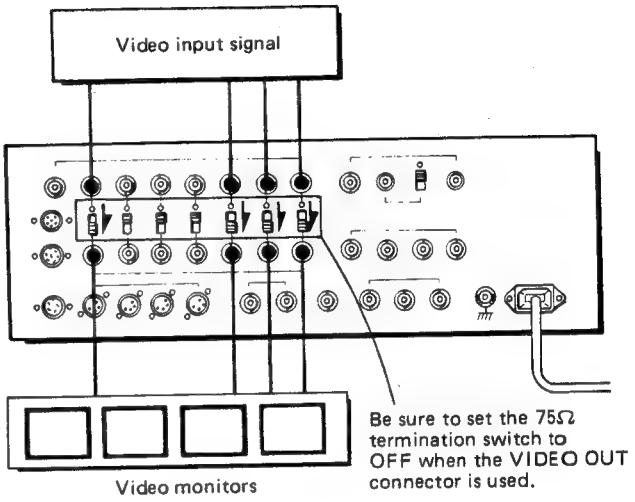


TO SYNCHRONIZE THE SEG-2000A WITH AN EXTERNAL SYSTEM



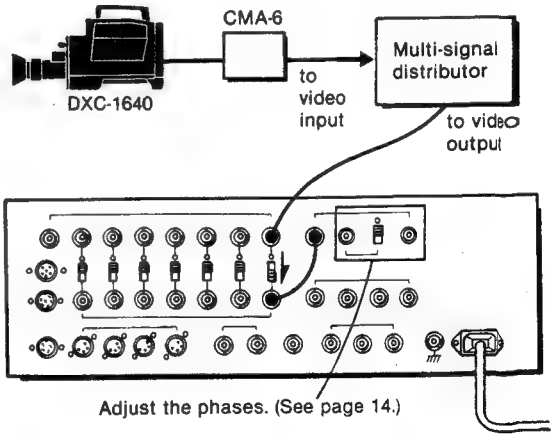
CONNECTION FOR DIRECT MONITORING

To monitor the video signal to the VIDEO IN connector, connect video monitors to the VIDEO OUT connectors corresponding to the input signal.



TO USE A CAMERA WHICH CANNOT BE SYNCHRONIZED WITH THE VBS OR BLACK BURST SIGNAL

Connect the camera through the multi-signal distributor as illustrated below so that the SEG-2000A will synchronize with the camera.

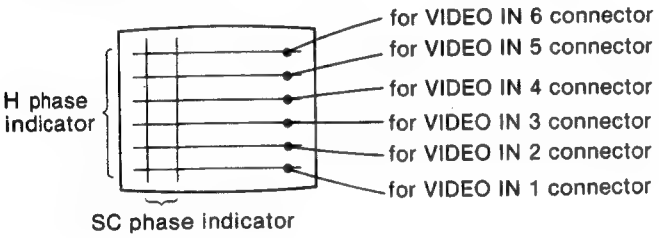


●The connection to other VIDEO IN connectors are the same as on the previous page.

1-6. ADJUSTMENTS

1-6-1. Adjust the phases, video level, hue, chroma level, etc., between the connected equipment.

1. Adjust the phases of all equipment as follows.
   1) Turn the power of all equipment on.
   2) Turn the SEG-2000A on.
   3) Set the PGM/PST switch to PGM.
   4) Set the PHASE INDICATION switch to ON. The phase indicator pattern will appear on the preset monitor screen.



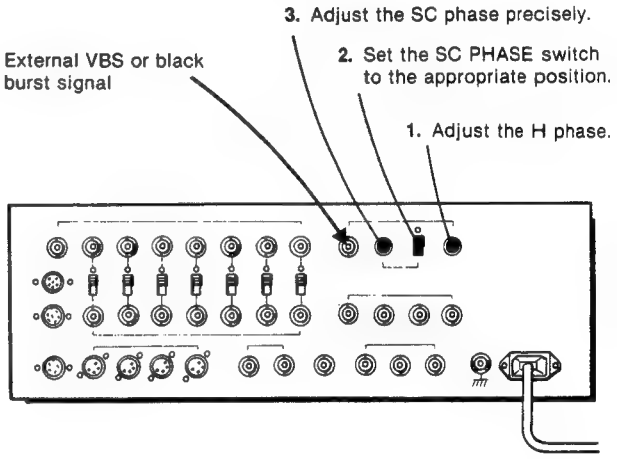
   5) Press the PST bus line button "1".
   6) Turn the H phase control on the equipment connected to the VIDEO IN 1 connector so that the H phase indicator for the VIDEO IN 1 connector appears on the preset monitor screen.
   7) Turn the SC phase control on the same equipment so that the two lines of the SC phase indicator are as close as possible.
   - The adjustment of the phases of the equipment connected to the VIDEO IN 1 connector is finished. For the equipment connected to the VIDEO IN 2 through 6 connectors, repeat steps 5), 6) and 7).
   - Be sure to adjust the H phase first, then the SC phase.
2. Adjust the color of the video monitors.
   Use the color bars generated by the video camera or the camera control unit to adjust the hue so that the same color will be obtained on all video monitors.
3. Adjust the level—video output level, pedestal level, chroma level, hue, etc.—of all equipment so that the same level is obtained.

- When the input signal is the VB, the phase indicator does not function.

TO SYNCHRONIZE WITH AN EXTERNAL SYSTEM

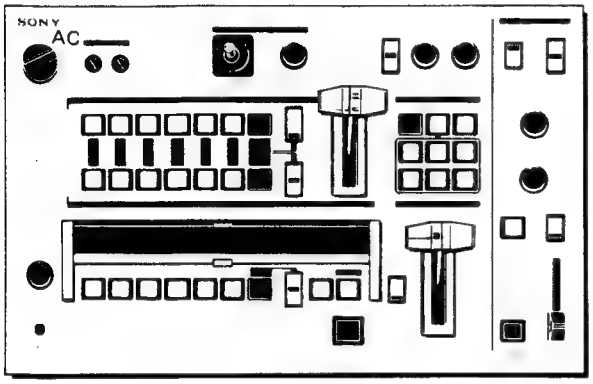
To synchronize the SEG-2000A with an external VBS or black burst signal, align the H phase and the SC phase of the external signal with the H phase and SC phase of the PGM OUT signal.

- To use the phase indicator pattern for adjusting the phases, connect an external sync signal to one of the VIDEO IN 1 - 6 connectors and connect the loop-through output signal to the GEN LOCK IN connector.



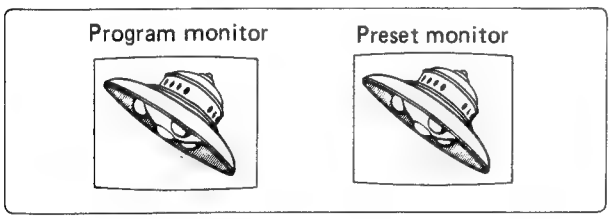
1-6-2. OPERATION

Set the POWER switch to the appropriate position depending on the power source to be used. The unit will be turned on and the buttons indicated below will light up.



To output a program picture

1. Set the PGM/PST switch to PGM.
2. Select the program picture with the PST bus button. (The picture of the preset monitor is simultaneously selected.) The corresponding PGM bus indicator will light.

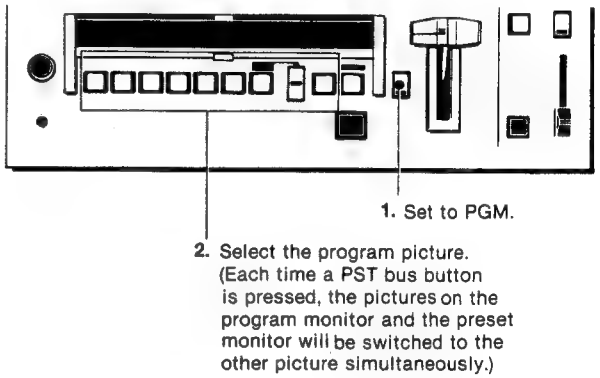


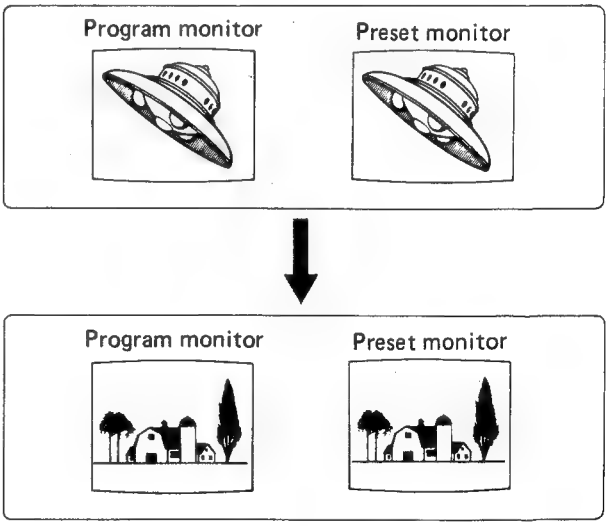
CUT IN

An instantaneous transition between two video sources can be made in the following two ways.

Using the PST bus buttons

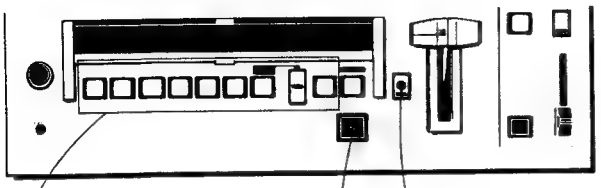
The program output can be switched directly to another output.



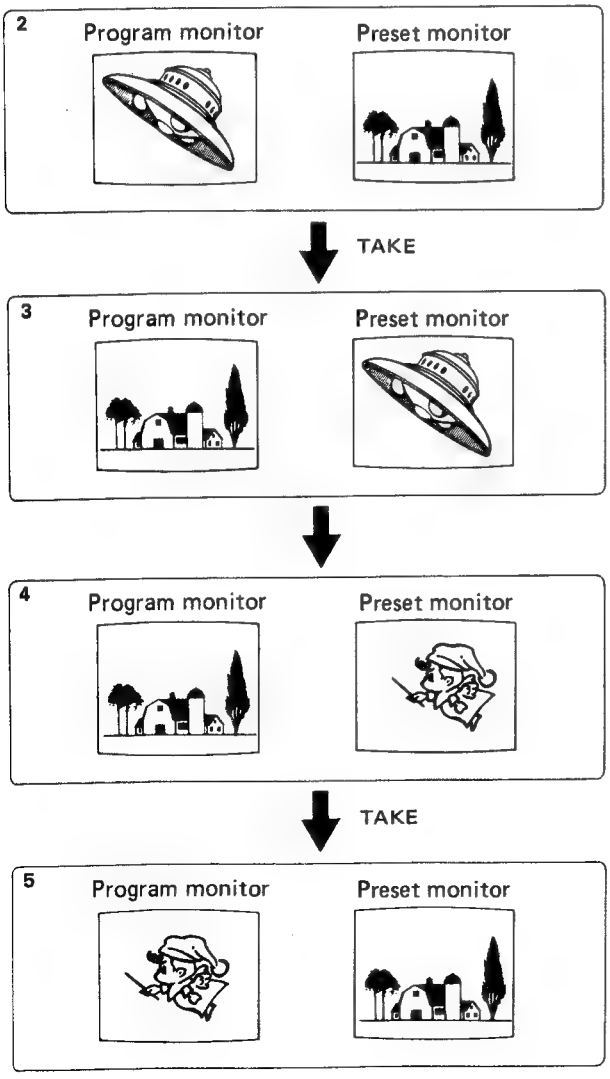


Using the TAKE button

You can check the picture to be output next on the preset monitor.



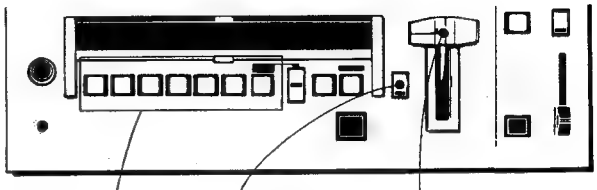
2. Select a preset picture.
1. Set to PST.
4. Select the next preset picture.
3. Press TAKE.(The program picture and the preset picture will be exchanged instantaneously.)
5. Press TAKE to cut in the next picture.



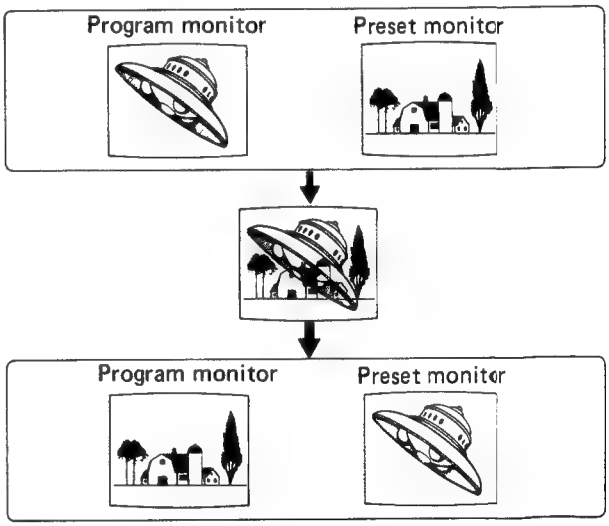
TO INTERCHANGE TWO PICTURES BY MIXING

The mixing can be done in the following two ways.

Using the PGM/PST MIX lever



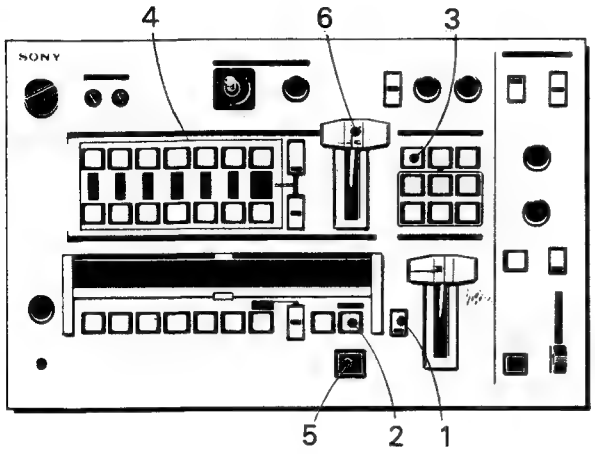
1. Set to PST.
2. Select a preset picture.
4. Select the next preset picture.
3. Move to the opposite(The program and preset pictures will be gradually interchanged.)
5. Move to the opposite position.



- The speed of the interchange depends on how fast you move the lever.
- The uppermost and the lowermost positions of the PGM/PST MIX lever is not assigned to either the program or preset picture. The pictures will be interchanged each time the lever is moved from one position to the other.
- The signal connected to the AUX connector cannot be mixed with the VIDEO IN 1 - 6 inputs and the background color. When the PGM/PST MIX lever is moved to the end, the picture is exchanged instantaneously.

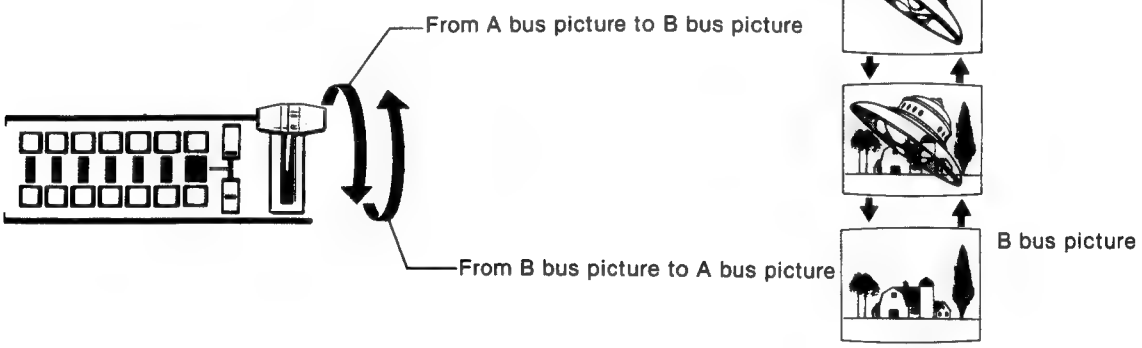
Using the MIX button

The picture selected by an A bus button can be gradually replaced by the picture selected by a B bus button, and vice versa.



1. Set the PGM/PST switch to PST.
2. Press the EFFECTS button.
3. Press the MIX button.
4. Select an A bus picture with an A bus button and a B bus picture with a B bus button.
5. Press the TAKE button.
6. Move the special effects control lever to the opposite position.
   When the lever is moved from the A bus side to the B bus side, the A bus picture on the program monitor screen will dissolve to the B bus picture, and vice versa.

● The button which corresponds to the picture being output from the PGM OUT connectors blinks.
● The speed of the interchange depends on how fast you move the lever.



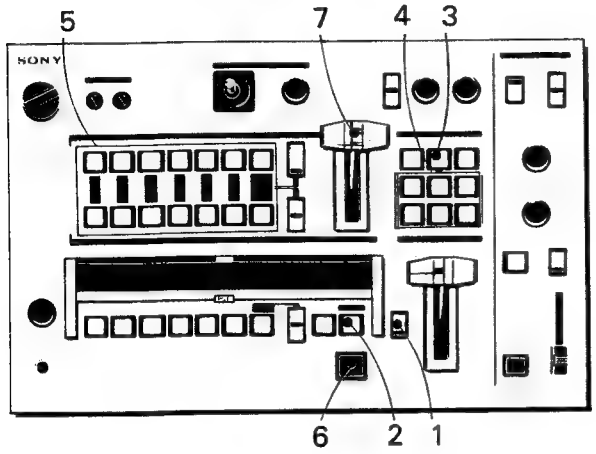
TO SWITCH CONSECUTIVELY THREE OR MORE PICTURES

Use the special effects control lever and the PGM/PST MIX lever.

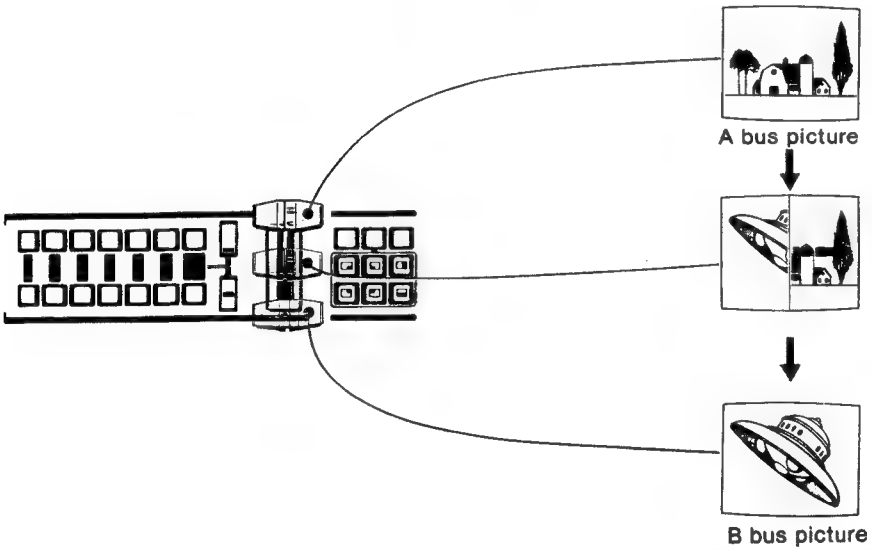
1. Switch the A bus picture to the B bus picture or the B bus picture to the A bus picture as in "Using the MIX button".
2. Select the picture to be output next with the PST bus button.
3. Move the PGM/PST MIX lever to the opposite position.

WIPE

Two inputs selected by an A bus button and a B bus button may be wiped as described below. Six different wipe patterns are available.

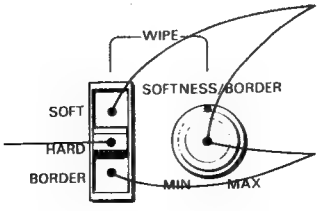


1. Set the PGM/PST switch to PST.
2. Press the EFFECTS button.
3. Press the WIPE button.
4. Select the desired wipe pattern.
5. Select an A bus picture with an A bus button and a B bus picture with a B bus button.
6. Press the TAKE button.
7. Move the special effects control lever to the opposite position. The program picture will be wiped by the selected wipe pattern. The button which corresponds to the picture being output from the PGM OUT connectors blinks.



The edge of the wipe pattern

The dividing line of the wipe pattern can be sharpened, softened or bordered with the WIPE edge selector and the SOFTNESS/BORDER control.



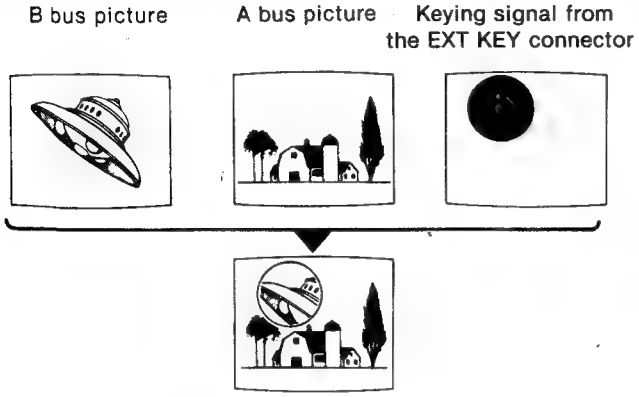
To soften the wipe pattern edge
Set the WIPE edge selector to SOFT and adjust the softness with the SOFTNESS/BORDER control.

To sharpen the wipe pattern edge
Set the WIPE edge selector to HARD.

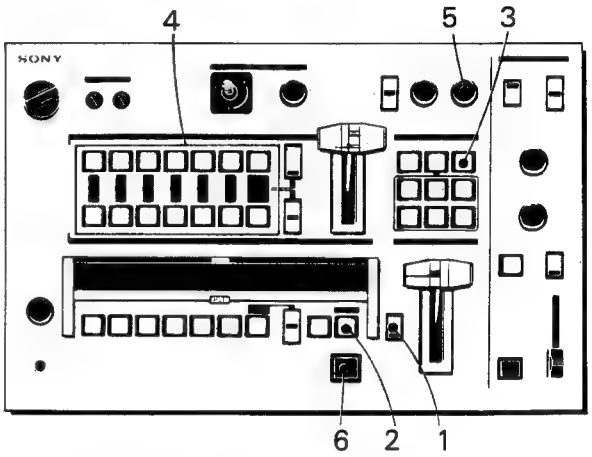
To border the wipe pattern edge
Set the WIPE edge selector to BORDER and adjust the width of the border with the SOFTNESS/BORDER control.
- Adjust the color of the border with the BACKGROUND COLOR joystick. The border color is the complementary color of the color selected by the joystick.

EXTERNAL KEY

The B bus picture is key-inserted in the A bus picture with the keying signal from the EXT KEY connector.

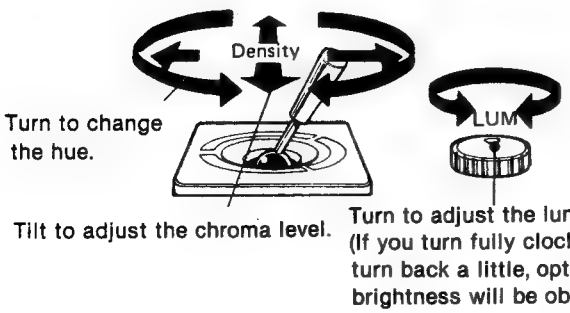


1. Set the PGM/PST switch to PST.
2. Press the EFFECTS button.
3. Press the EXT KEY button.
4. Select an A bus picture with an A bus button and a B bus picture with a B bus button. The buttons on the A bus line and B bus line blink.
5. Turn the EXT KEY LEVEL control so that the keying signal will appear clearly.
6. Press the TAKE button.

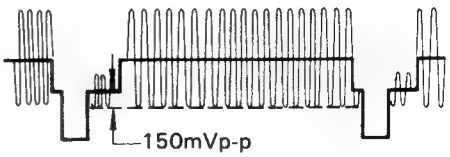


BACKGROUND COLOR

You can select the color of the background with the BACKGROUND mode select switch when the BACKGROUND button is pressed.
For a white background, set the switch to WHT.
For a black background, set the switch to BLK.
For a colored background, set the switch to COL and adjust the color with the BACKGROUND COLOR joystick and the LUM control.
Using the background color function, the picture can be faded in from a white, black or colored scene, or be faded out into a white, black or colored scene during mixing. It is also possible to color the keying signal of the external key.

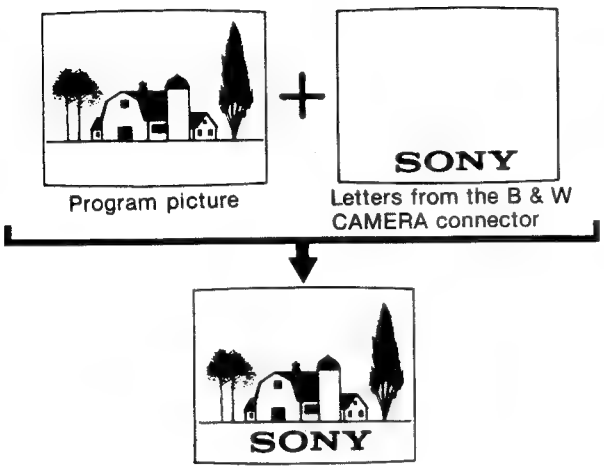


CAUTION
When using highly saturated color matting, check (on a waveform monitor) that the chroma level does not fall below the value shown in the illustration. If the LUM control is turned counterclockwise with the chroma level high, picture fluctuation may occur on the equipment connected to the SEG-2000A.



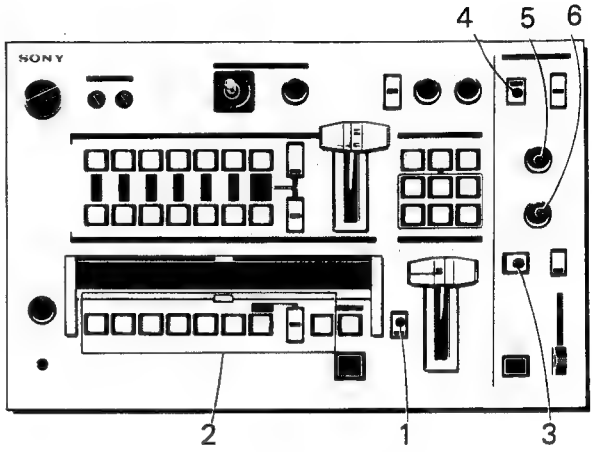
DOWNSTREAM KEYER

Monochrome letters or pattern from the B & W CAMERA connector can be inserted into the program or preset picture.



Preparations

Adjust the letters to be inserted by monitoring the preset picture.



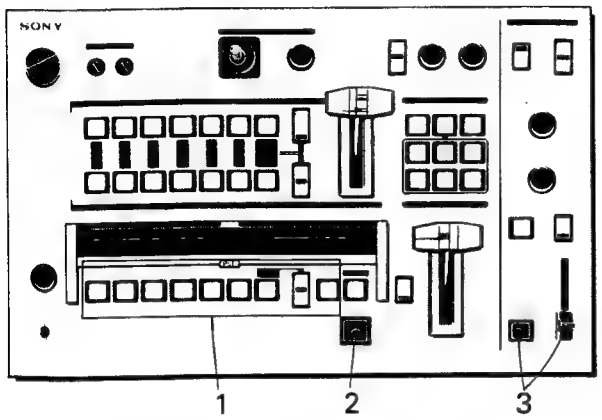
1. Set the PGM/PST switch to PST.
2. Select the picture on which the letters are inserted by pressing the appropriate PST bus button.
3. Press the PST CUT IN/OUT button, and the button will light.
4. Set the NORMAL/INVERT switch appropriately: To insert the black letters against a white background, set to NORMAL; to insert the white letters against a black background, set to INVERT.
5. Turn the KEY LEVEL control so that the letters to be inserted appear clearly.
6. Turn the INSERT LEVEL control to adjust the brightness of the letters to be inserted. Clockwise rotation gives a brighter picture.

Note

If the AUX input is selected on either of the PST bus line or the PGM bus line, the letters cannot be inserted in the preset picture. Because the keying signal is synchronized with the program picture, the preset picture, which is not synchronized with the program picture, will be unstable if the keying signal is inserted.
When both PST and PGM bus lines select the AUX input, the letters can be inserted into the preset picture.

To insert the letters on the program picture

Once you adjust the keying signal by monitoring the preset picture, insert the keying signal into the program picture as follows.

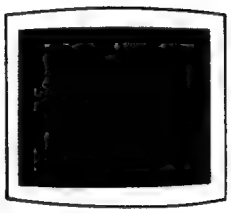


1. Select a picture on which the keying signal is inserted by pressing the appropriate PST bus button.
2. Press the TAKE button. The picture selected in Step 1 will be output as a program picture.
3. **To insert the keying signal with cut-in mode,** press the PGM CUT IN/OUT button. The button will light.
   To insert the signal with the fade-in mode (gradually), move the INSERT lever from the PGM side to the INSERT side. The PGM CUT IN/OUT button will light.

To remove the inserted signal quickly (the cut-out mode), press the PGM CUT IN/OUT button. The light of the button goes out.
To remove the inserted signal gradually (the fade-out mode), move the INSERT lever from the INSERT side to the PGM side. The light of the PGM CUT IN/OUT button goes out.

Where letters can be inserted

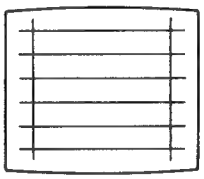
Shoot a white paper with the black and white camera for the downstream keyer and set the NORMAL/INVERT switch to INVERT.
Turn the KEY LEVEL control until the white paper appears on the monitor screen. You can insert the letters within this area.



● The pattern of the phase indicator is a guide to the area where you can enter letters.

For a guide to positioning letters

1. Set the PGM/PST switch to PST.
2. Press the PST CUT IN/OUT button. The button will light.
3. Set the PHASE INDICATION switch to ON. The following pattern will appear on the preset monitor. Position the letters while referring to the vertical and horizontal lines.



Shadow effects

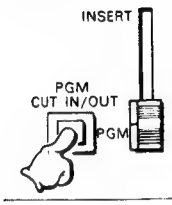
The addition of shadows may make the display of letters more effective, especially when inserting white letters or figures into a light picture.
Set the SHADOW switch to the appropriate position. To obtain a wide shadow, set the switch to WIDE; to obtain a narrow shadow, set it to NARROW. We recommend using the NARROW position for adding shadows to small or thin letters.

SONY
shodow effect.

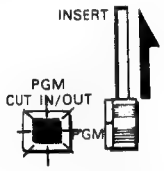
Combining the cut-in/out and fade-in/out operations

The PGM CUT IN/OUT button and the INSERT lever can be used together so that the following operations are possible.

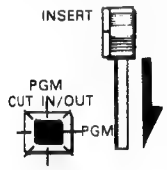
Cut-in/fade-out

1. 

The letters will be cut in.
- The PGM CUT IN/OUT button light.

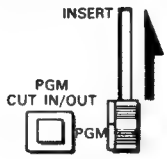
2. 

The picture does not change.

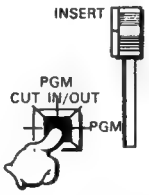
3. 

The inserted letters will be faded out.
- When the lever is moved to the PGM position, the PGM CUT IN/OUT button will go out.

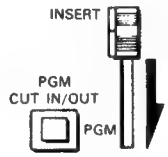
Fade-in/cut-out

1. 

The letters will be faded in.
- The PGM CUT IN/OUT button will light.

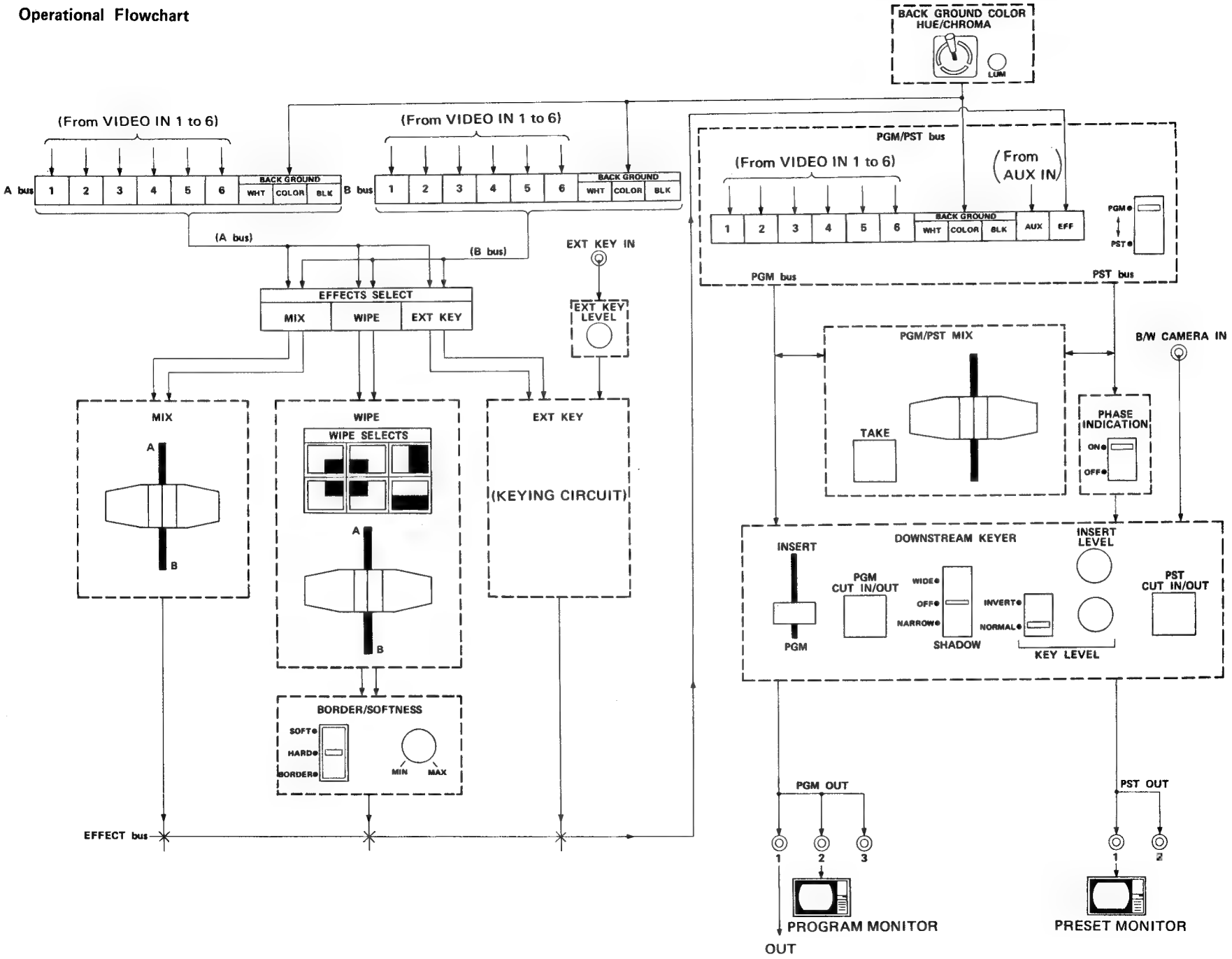
2. 

The inserted letters will be cut out.
- The light of the button will go out.

3. 

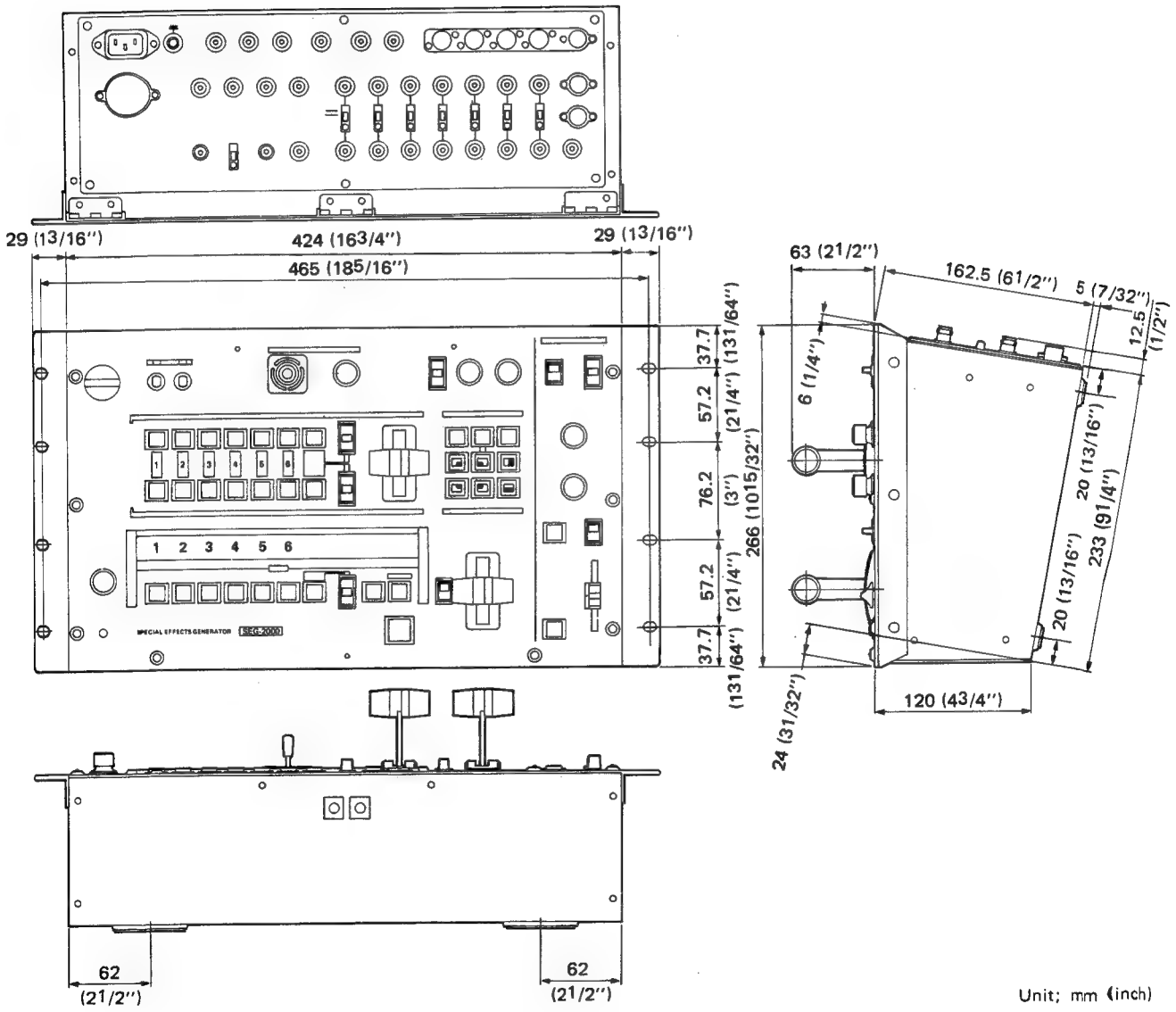
Return the lever to the PGM position.
The picture does not change.

Operational Flowchart



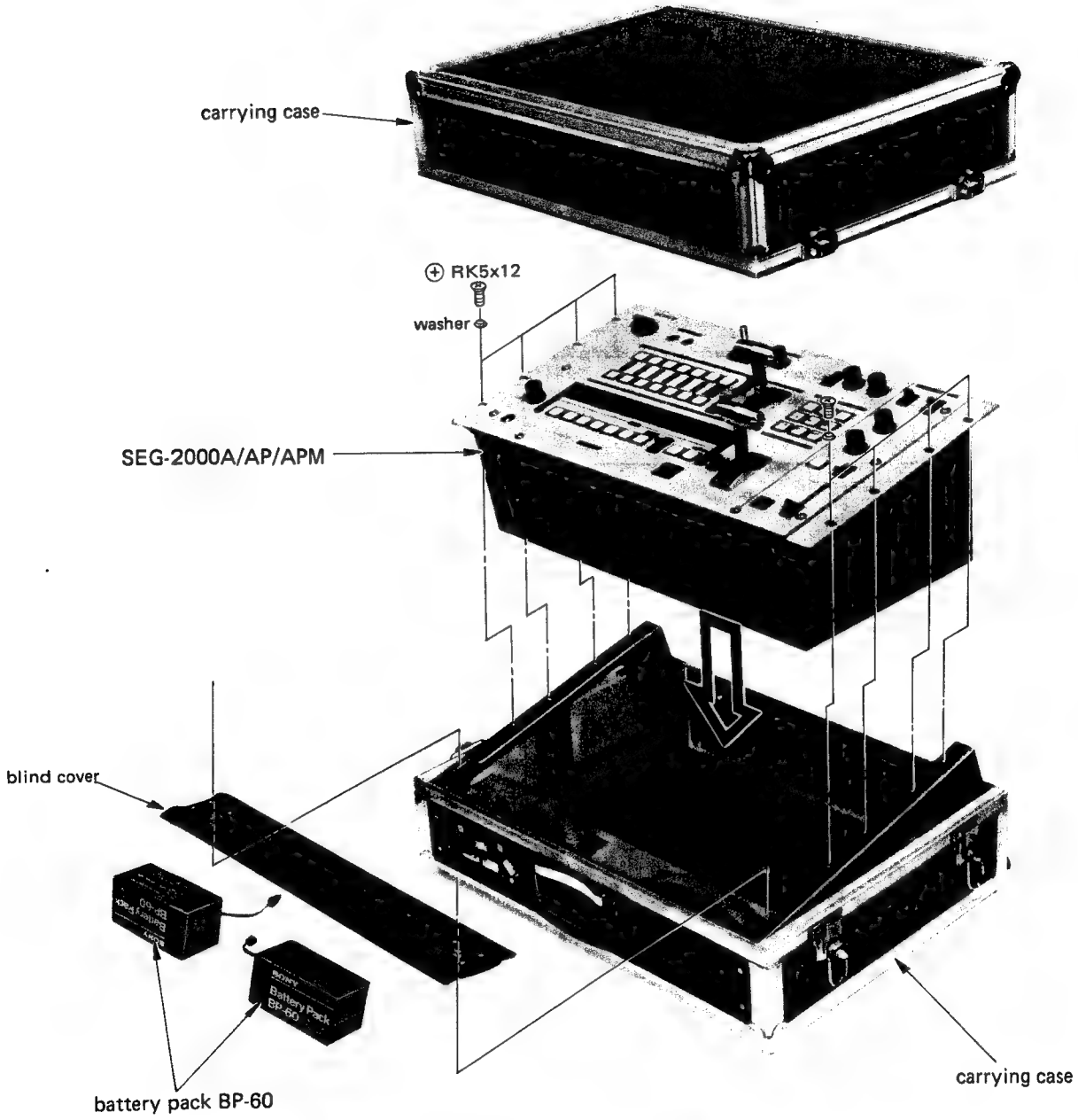
1-7. INSTALLMENT TO CARRYING CASE

1-7-1. Dimensions



Unit; mm (inch)

1-7-2. Installment to Carrying Case of the LC-2006 (Optional)

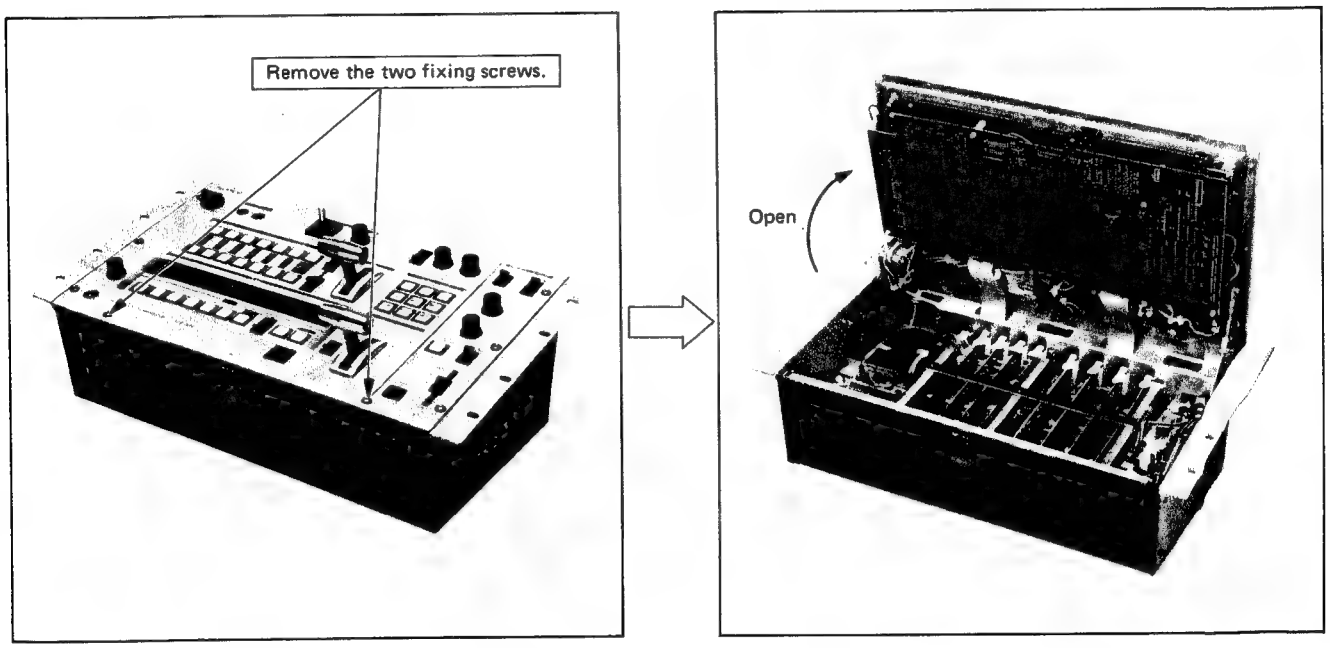


SECTION 2
CAUTION AND OTHER INFORMATION

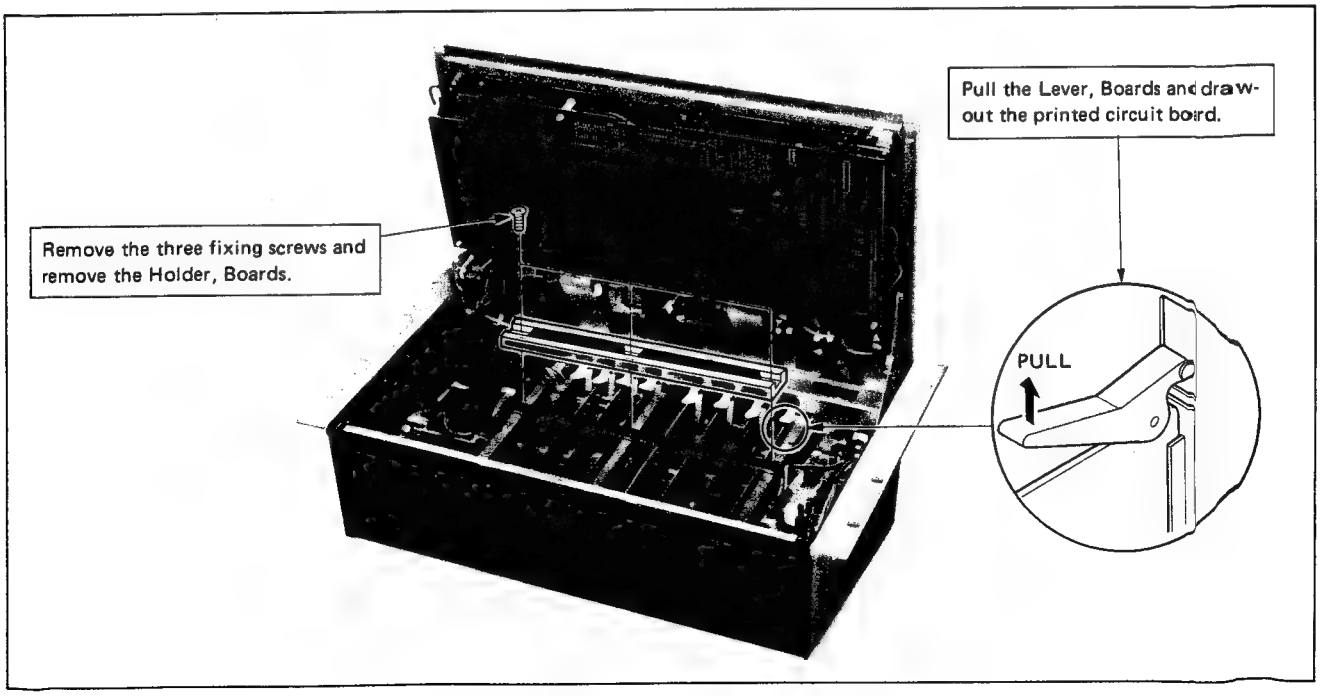
2-1. NOTES ON SERVICING

- Most of the maintenance of the SEG-2000A/AP/APM can be done without removing it from the console.
- When an inside repair or adjustment of the machine is required, the printed circuit boards can be checked by opening the control panel block as follows.

2-1-1. Removal of Control Panel Block

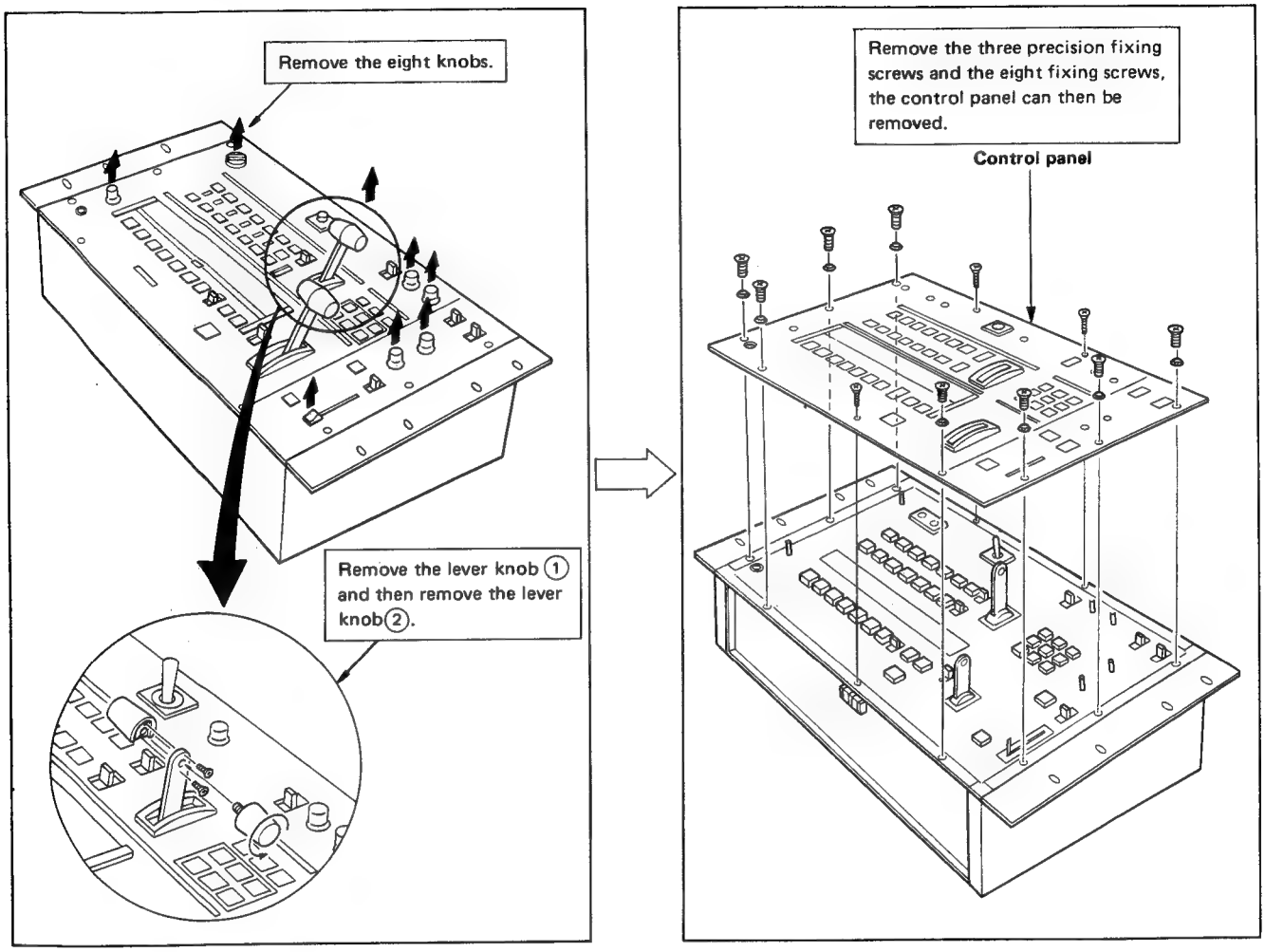


2-1-2. Removal of Printed Circuit Boards for Special Effect

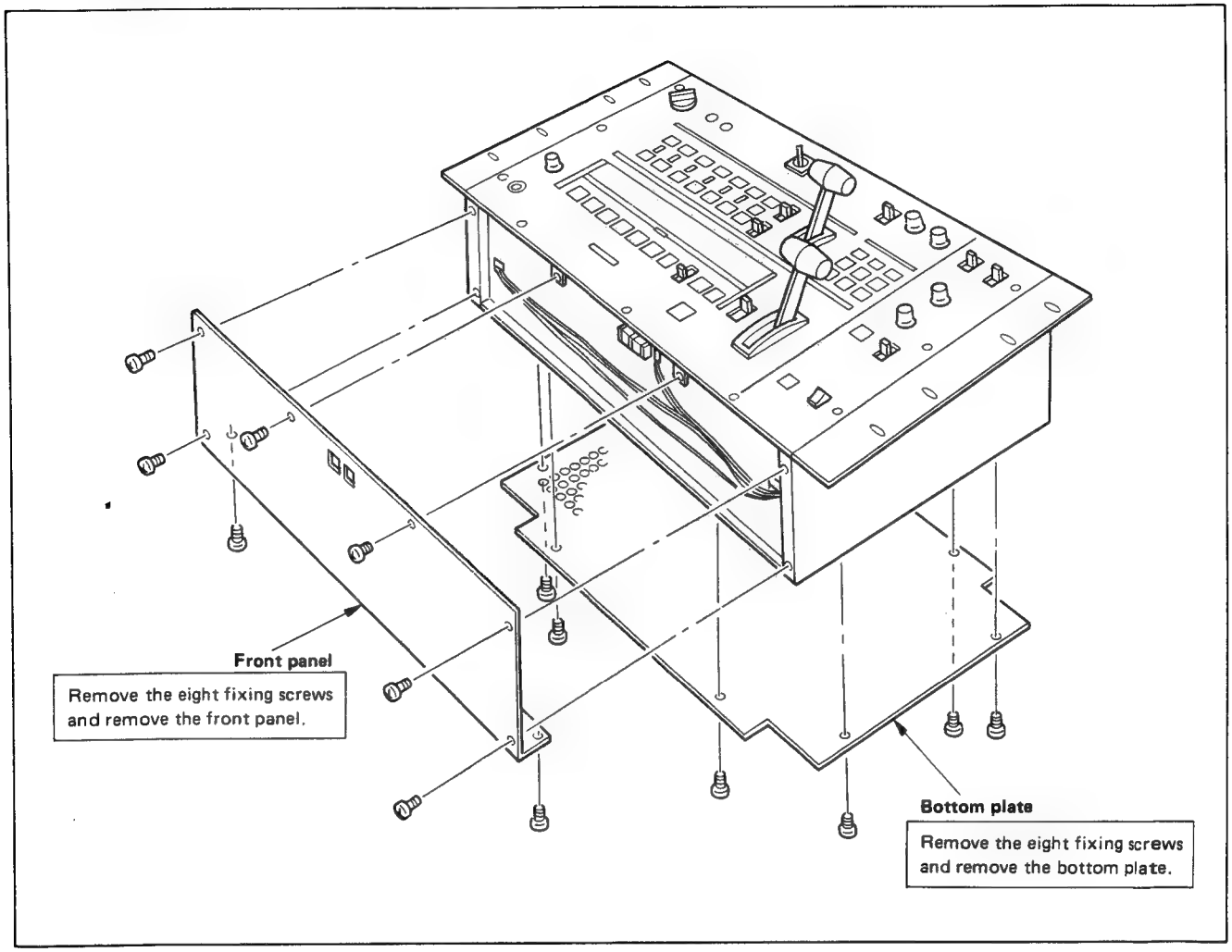


2-2. DISASSEMBLY OF CABINET

2-2-1. Removal of Control Panel

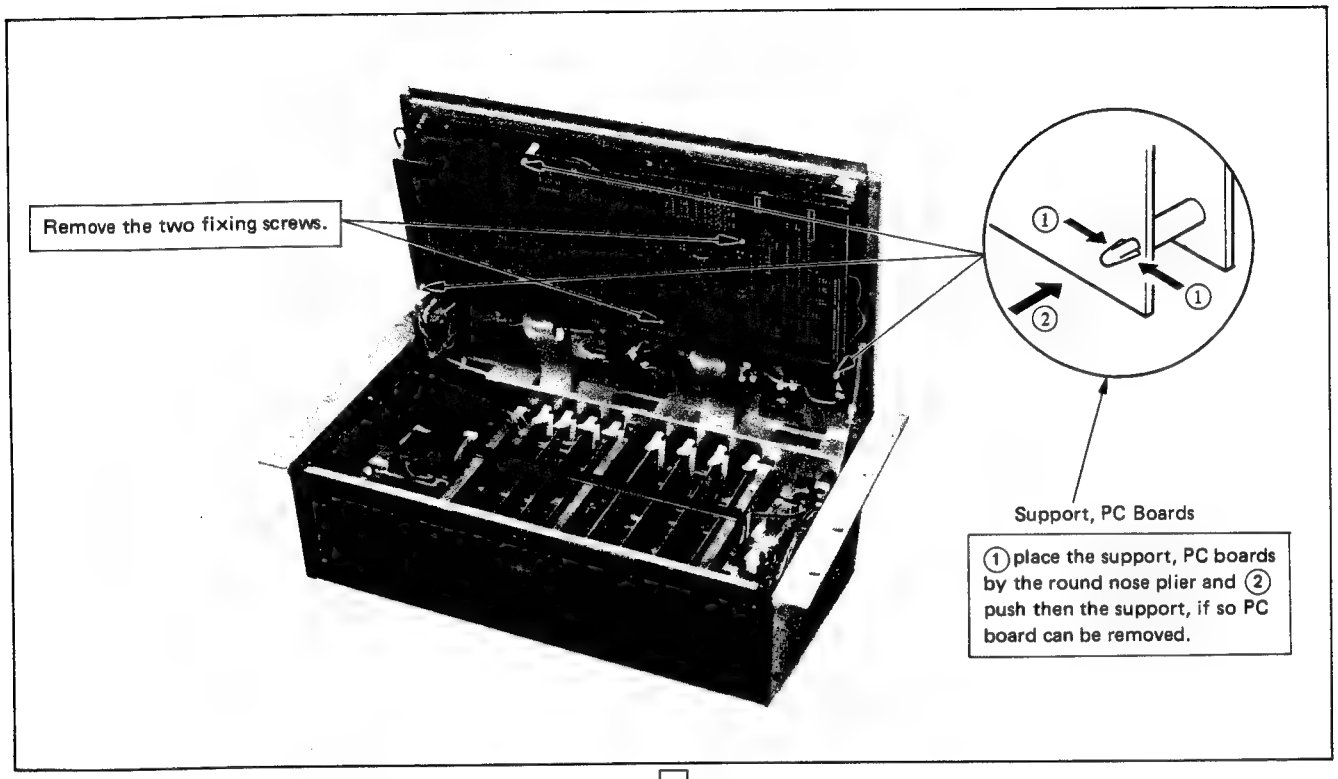


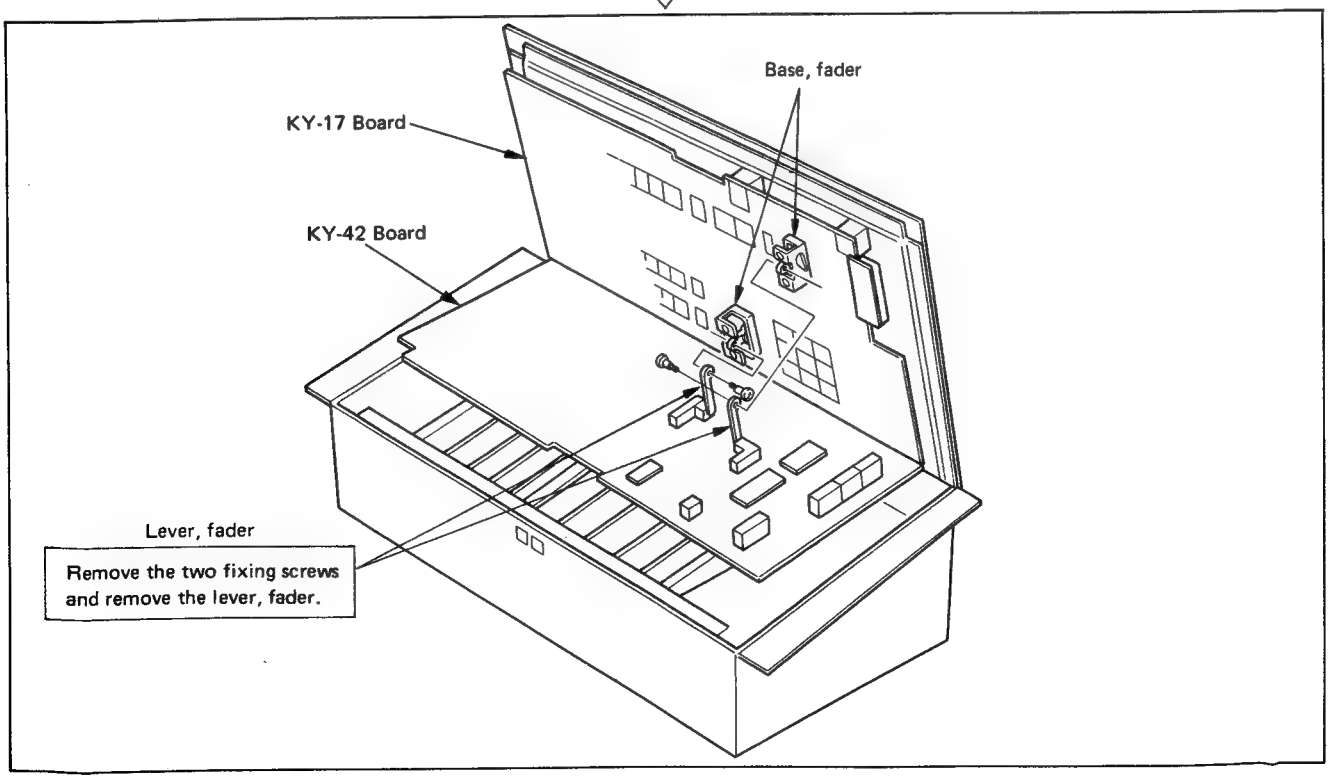
2-2-2. Removal of Front Panel and Bottom Plate



2-3. REMOVAL OF CONTROL SYSTEM BOARDS

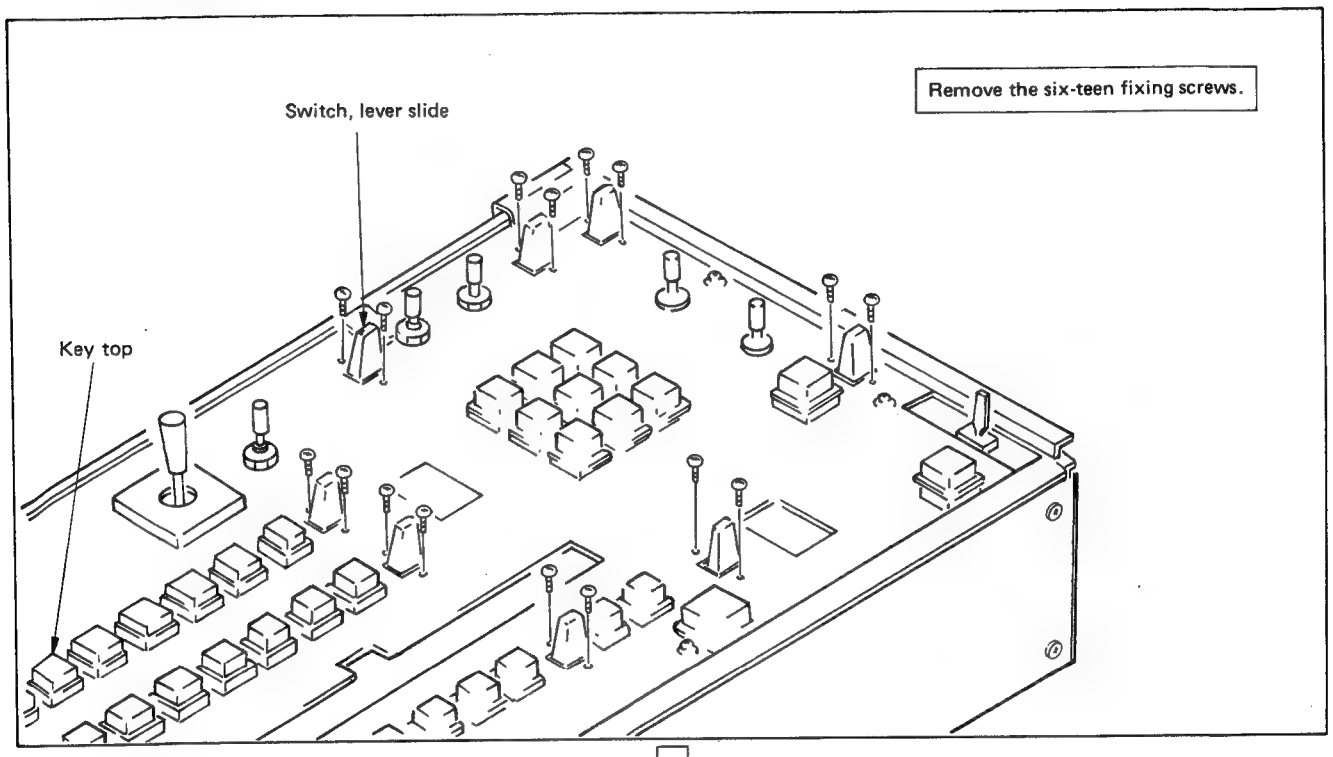
2-3-1. Removal of KY-42 Board

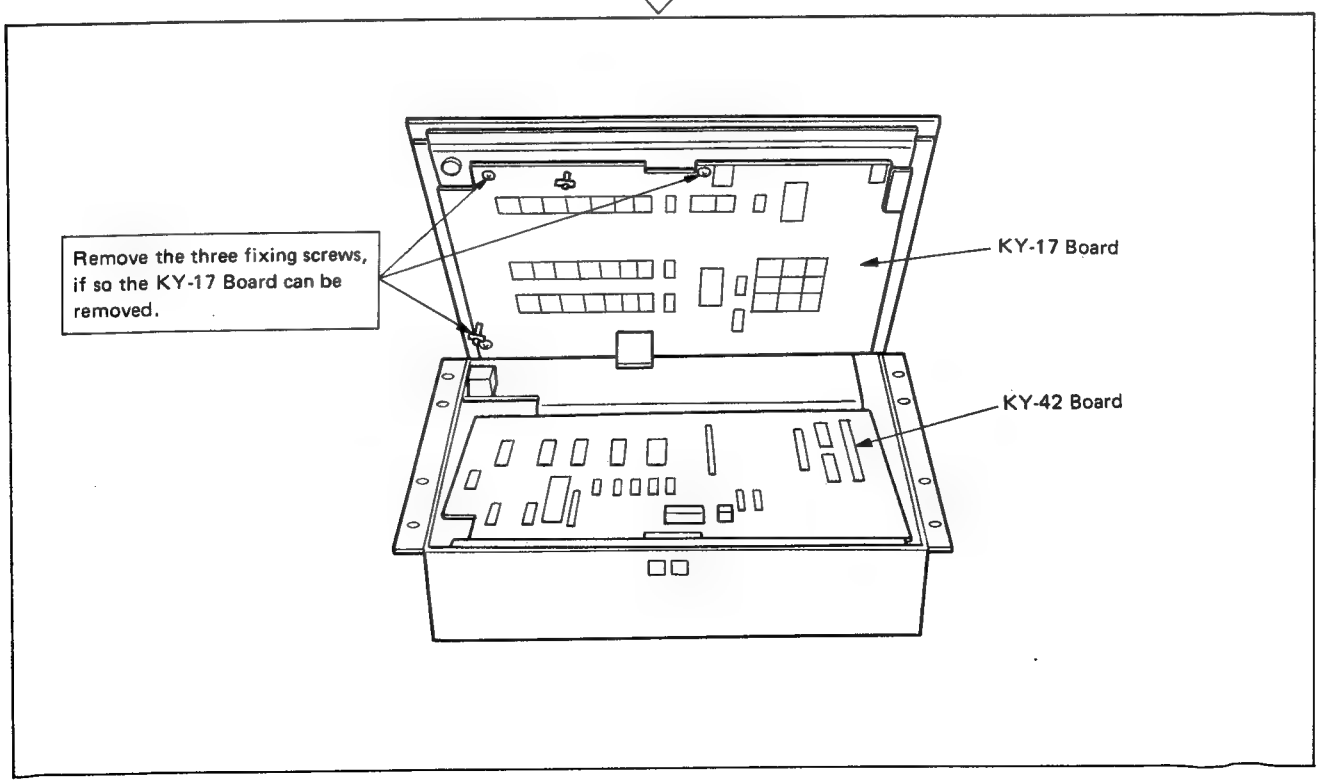




2-3-2. Removal of KY-17 Board

Note: Perform the sec. 2-2-1, Removal of Control Panel and the sec. 2-3-1, Removal of KY-42 board before removing this.

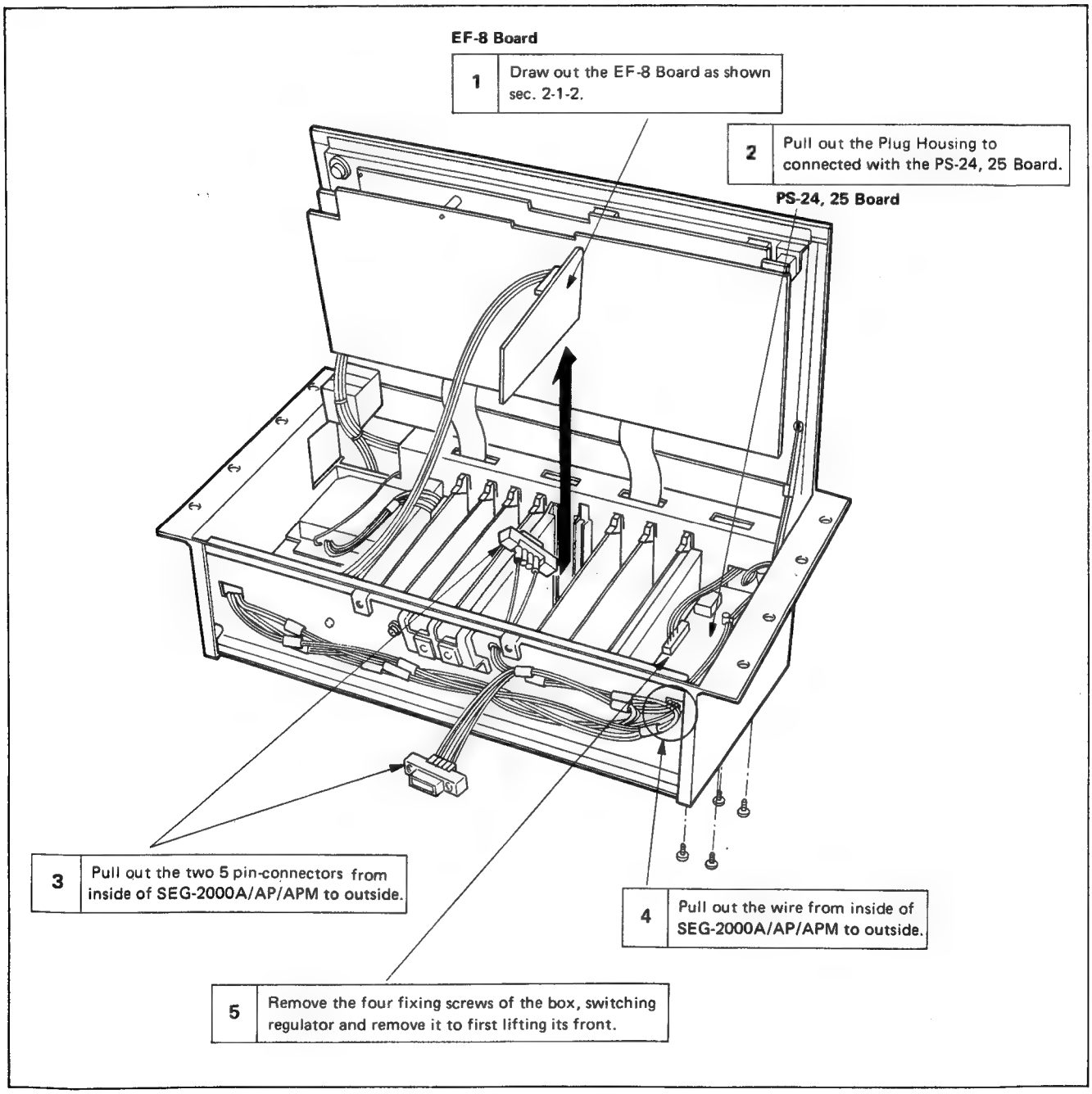




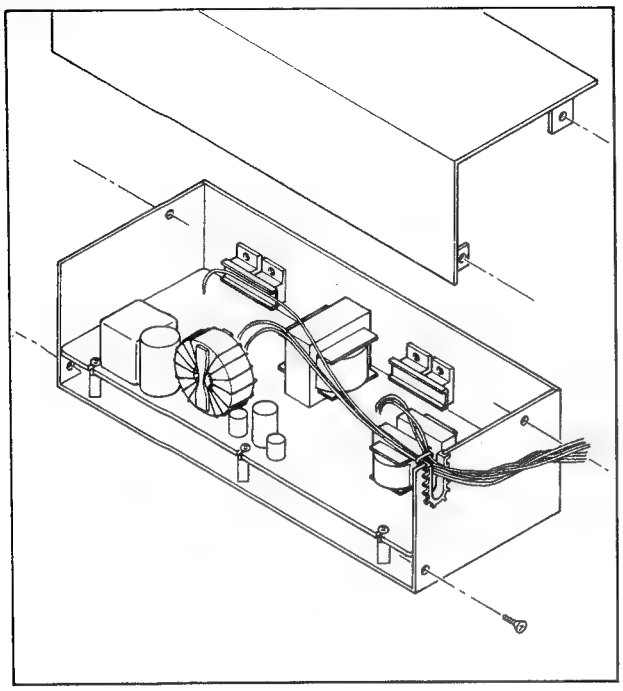
2-3-3. Removal of Switching Regulator

Note: Perform the sec. 2-2-2, Removal of Front Panel and Bottom Plate before removing this.

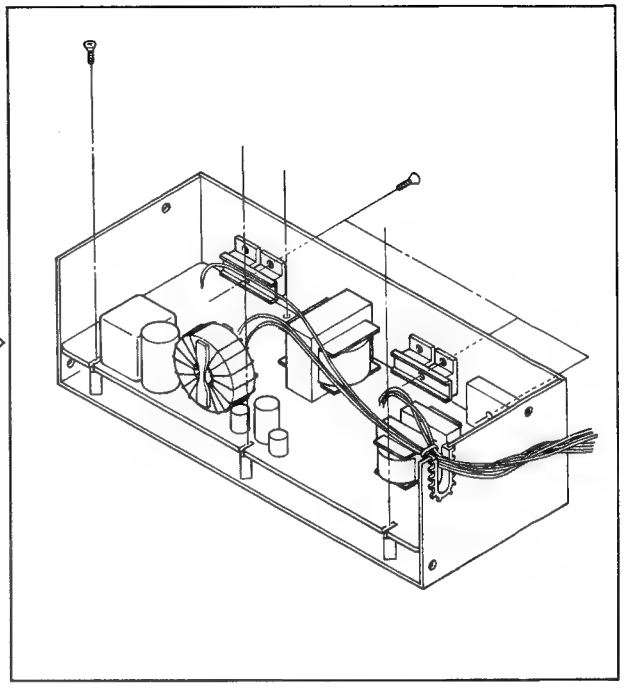
Step 1. Removal of the Box, Switching regulator



Step 2. Removal of the switching regulator

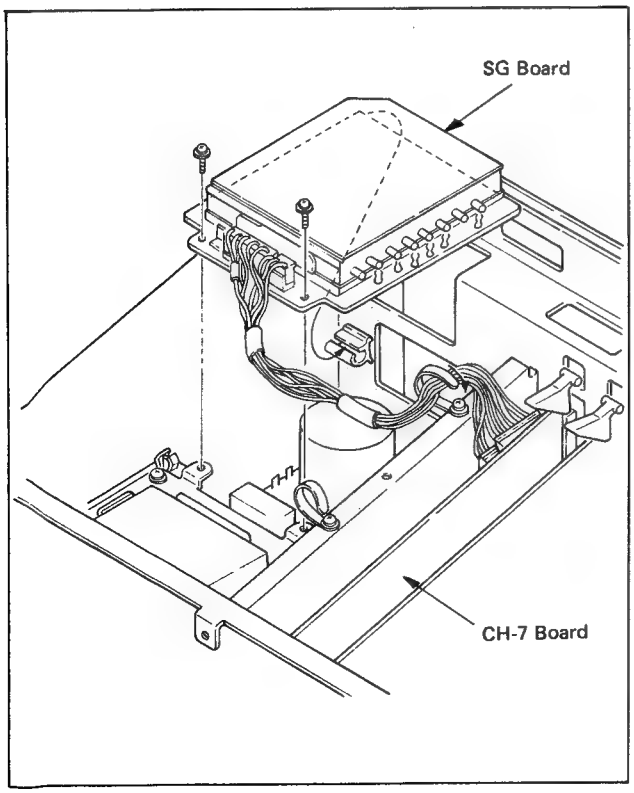


Remove the four fixing screws and remove the cover of the Box.



Remove the four fixing screws of the PC Board and the three fixing screws of the heat sink.

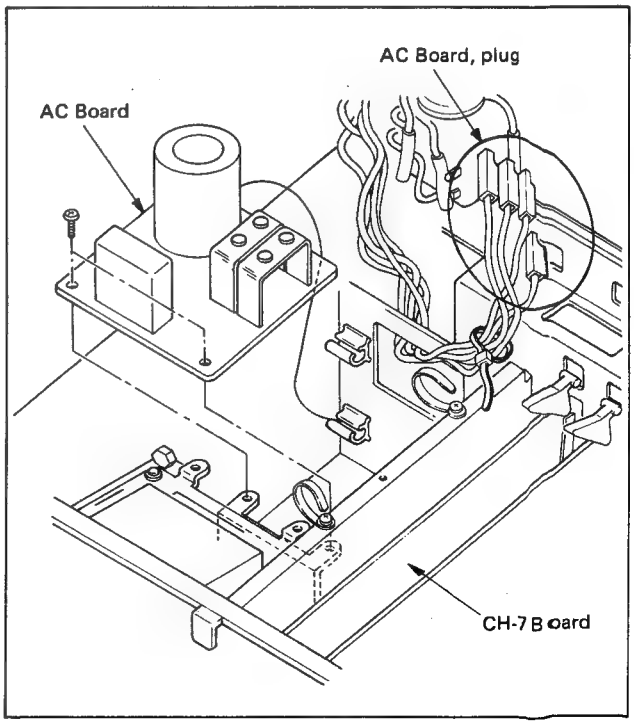
2-3-4. Removal of SG Board



Remove the two fixing screws and then the SG Board can be removed.

2-3-5. Removal of AC Board

Note: Perform the sec. 2-3-4, Removal of SG Board before removing this.

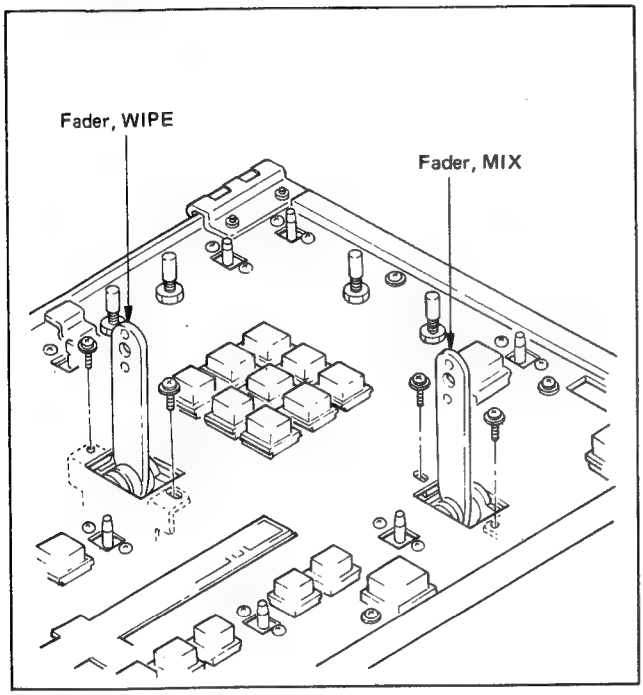


Remove the two fixing screws and then the AC Board can be removed.

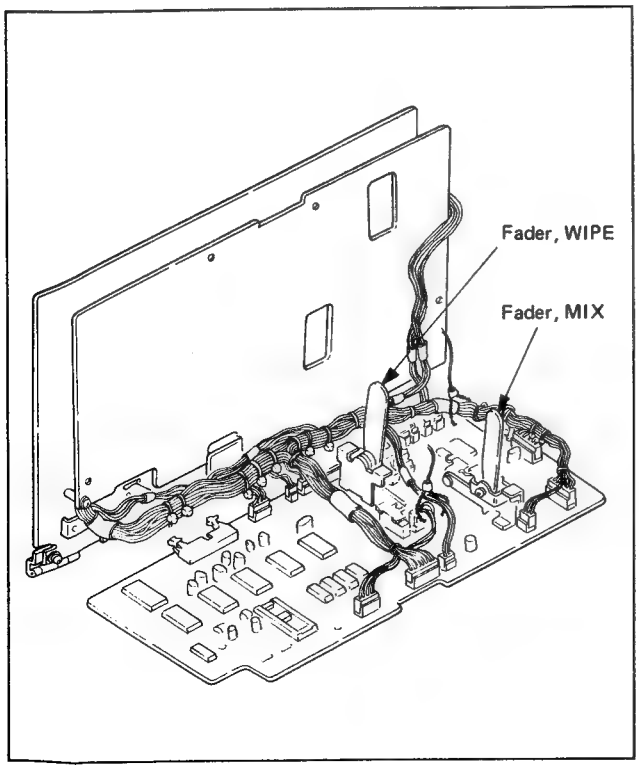
2-4. "FADER" TORQUE ADJUSTMENT

Step 1. Remove the control panel as shown the sec. 2-2-1.

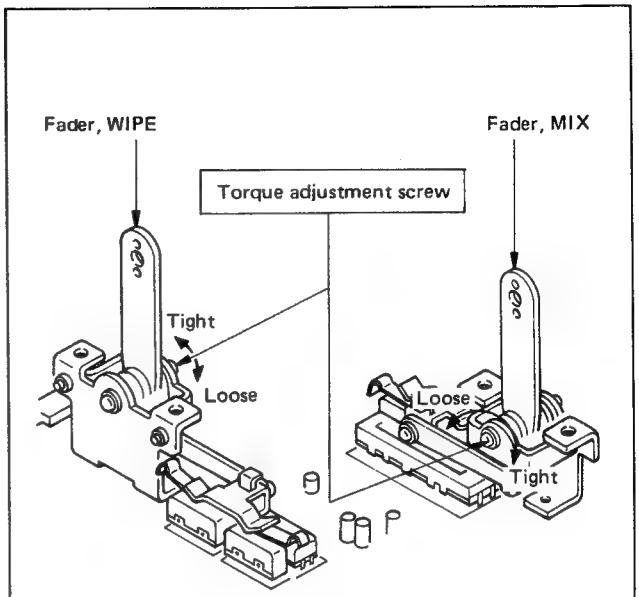
Step 2. Remove the two fixing screws of the WIPE fader and the MIX fader.



Step 3. Remove the KY-42 Board as shown the sec. 2-3-1.

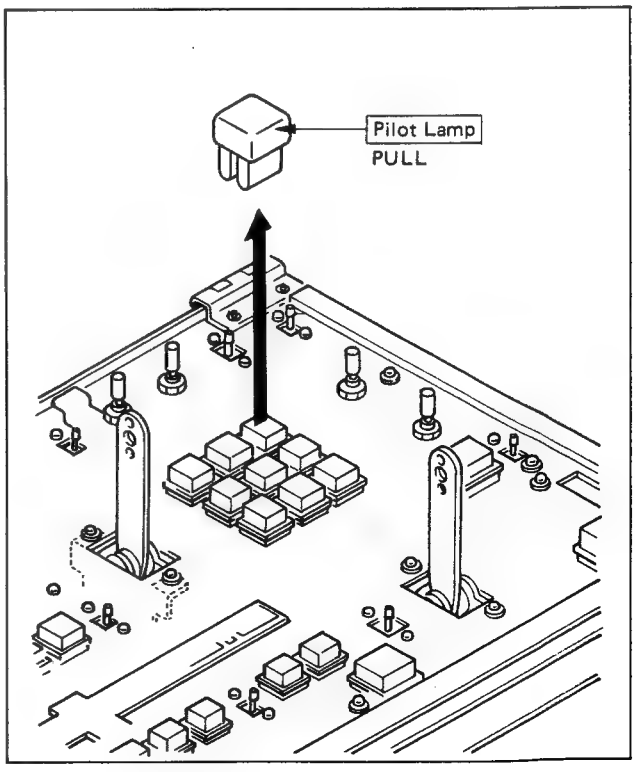


Step 4. Torque Adjustment



[When the movement of fader is light]
Turn the adjustment screw to clockwise.
[When the movement of fader is heavy]
Turn the adjustment screw to counterclockwise.

2-5. REPLACEMENT OF PILOT LAMP



SECTION 3
POWER SUPPLY ALIGNMENT

3-1. DC VOLTAGE ADJUSTMENT

Note: Perform this adjustment after SYNC signal is supplied to the machine.

3-1-1. REG 14V Adjustment

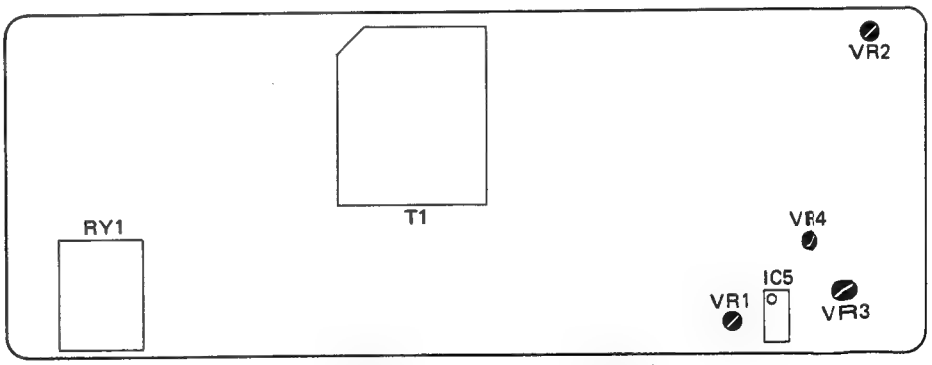
machine condition for adjustment	measuring point	adjustment
	Q6-corrector/ KY-42 board, 14.0 V ± 0.05 Vdc	⊘ VR4/PS-36

3-1-2. REG 9V Adjustment

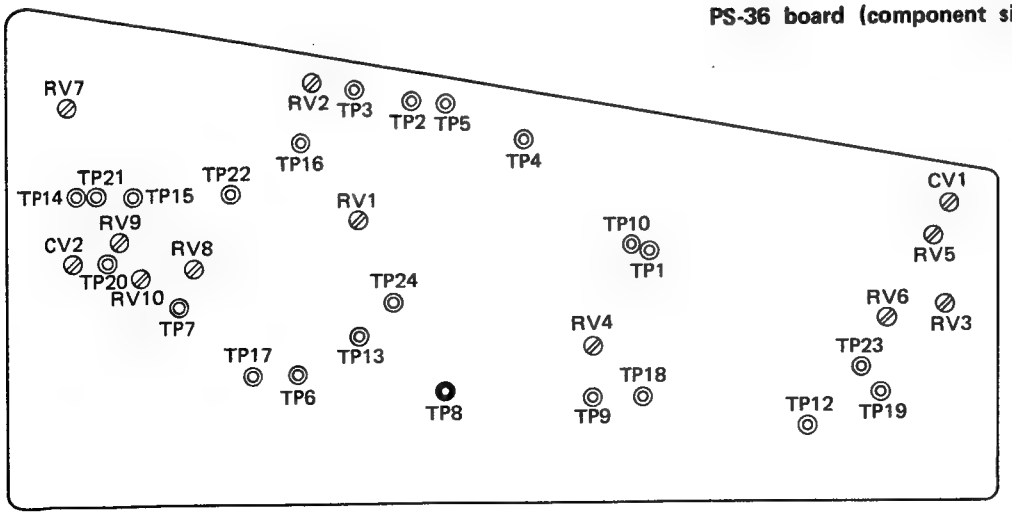
machine condition for adjustment	measuring point	adjustment
	IC5-8pin/ PS-36, 10.5 V ~ 11.0 Vdc	⊘ VR1(B)/PS-36 ⊘ VR3/PS-36

3-1-3. REG –5V Adjustment

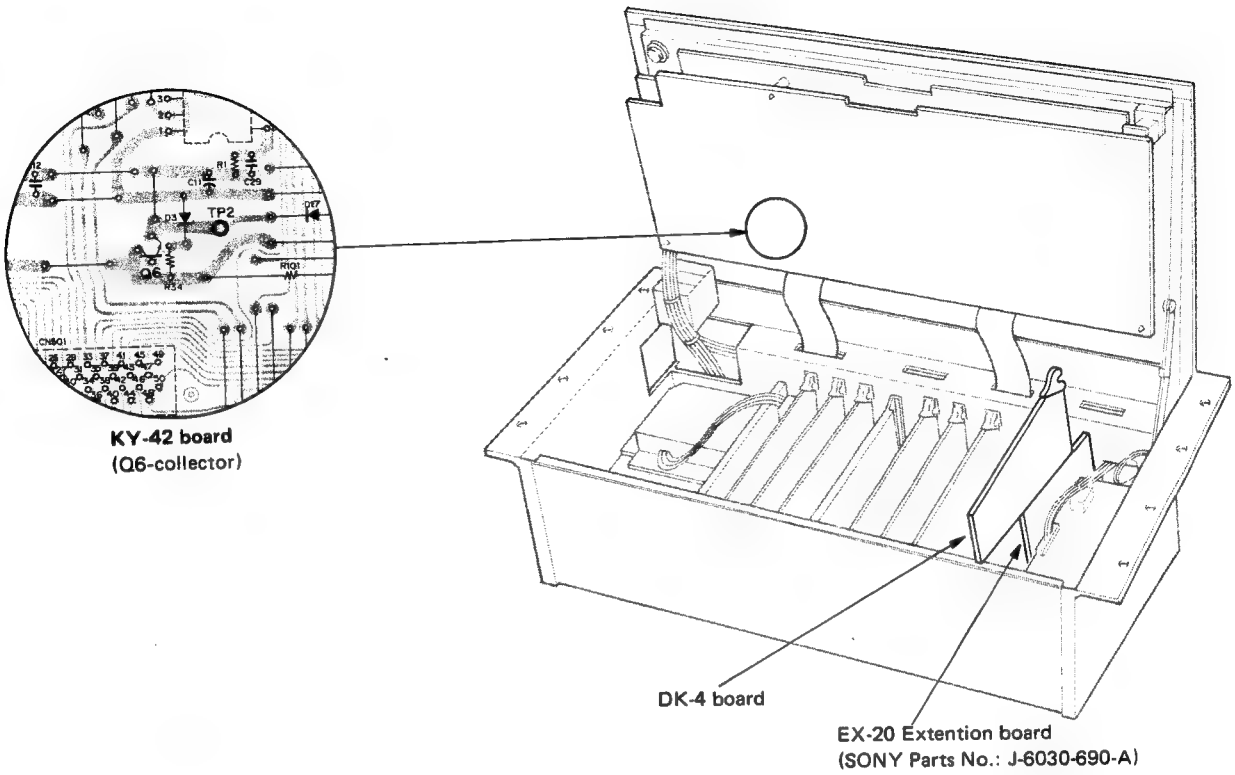
machine condition for adjustment	measuring point	adjustment
	TP8/DK-4 board, –5.0 V ± 0.05 Vdc	⊘ VR2(A)/PS-36



PS-36 board (component side)

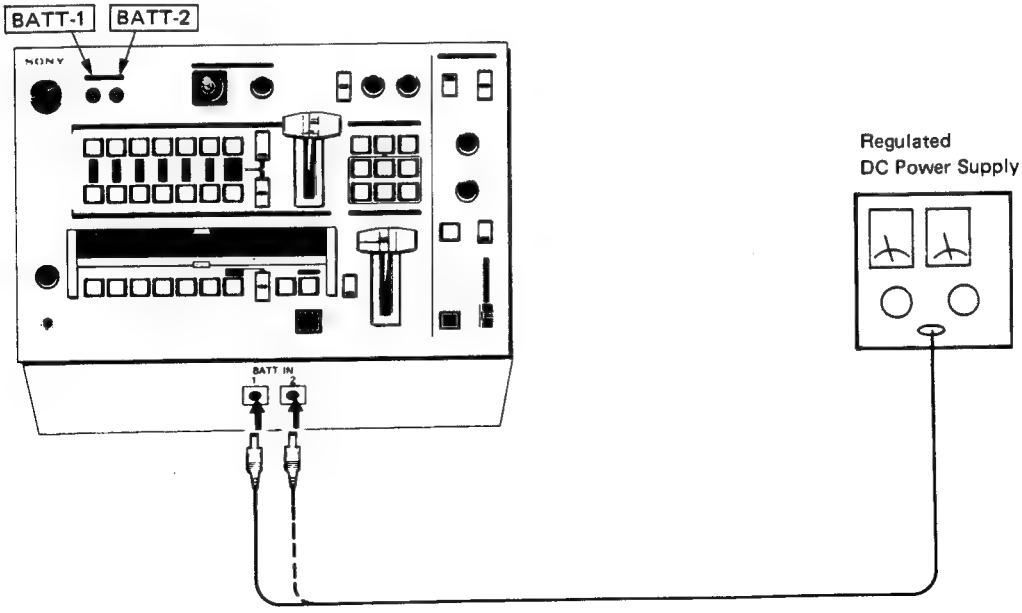


DK-4 board (component side)



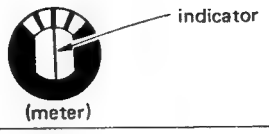
3-2. BATTERY SHUT-OFF ADJUSTMENT

[Equipment & Connection]

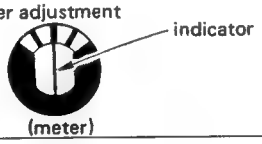


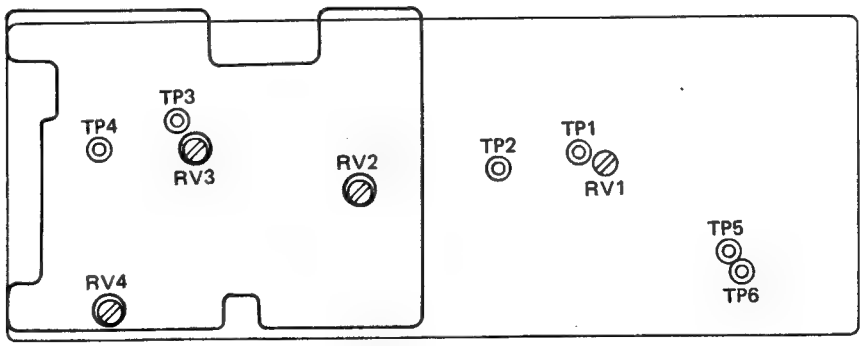
Note: Two plugs should not be connected to BATT IN 1 and 2 at the same time.

3-2-1. BATT-1 Shut-off Adjustment

machine condition for adjustment	measuring point	adjustment
• POWER switch; BATT • BATT IN-1; 12.0 V ± 0.05 Vdc	1. Level meter adjustment  	⊘ RV2/PS-25
• POWER switch; BATT • BATT IN-1; 10.8 V ~ 10.85 Vdc	2. OFF voltage adjustment Be sure that the LED of BATT-1 put out light between 10.8 Vdc and 10.85 Vdc.	⊘ RV1/PS-25 Once turn the ⊘ RV1 to fully clockwise, and gradually turn it to fully counterclockwise.

3-2-2. BATT-2 Shut-off Adjustment

machine condition for adjustment	measuring point	adjustment
• POWER switch; BATT • BATT IN-2; 12.0 V ± 0.05 Vdc	1. Level meter adjustment  	⊘ RV4/PS-25
• POWER switch; BATT • BATT IN-2; 10.8 V ~ 10.85 Vdc	2. OFF voltage adjustment Be sure that the LED of BATT-1 put out light between 10.8 Vdc and 10.85 Vdc.	⊘ RV3/PS-25 Once turn ⊘ RV1 to fully clockwise, and gradually turn it to fully counterclockwise.

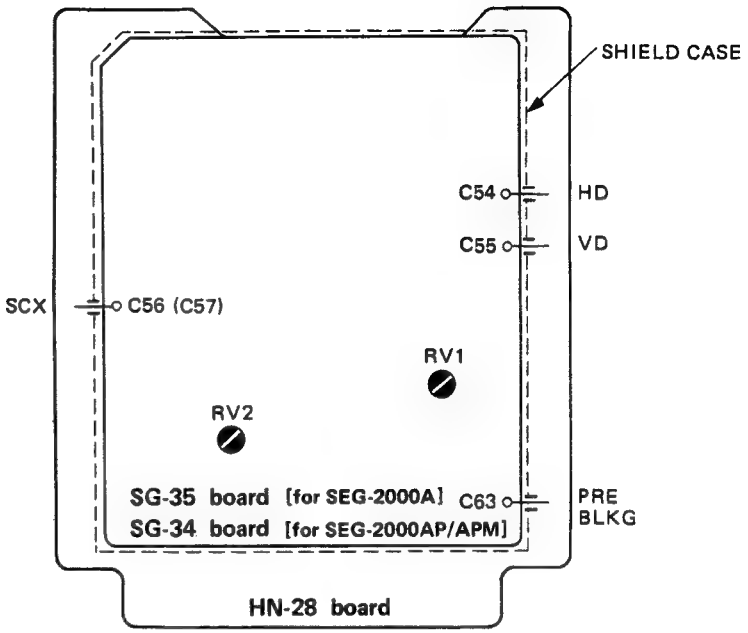


PS-24, PS-25 board (component side)

SECTION 4
SYNC GENERATOR ALIGNMENT

[Equipment Required]

- Frequency countor
- Dual oscilloscope

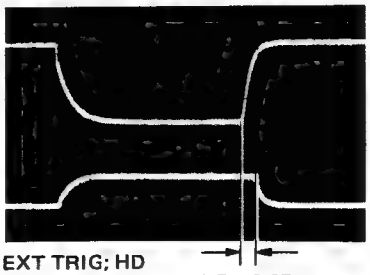


( ); SEG-2000A/AP/APM

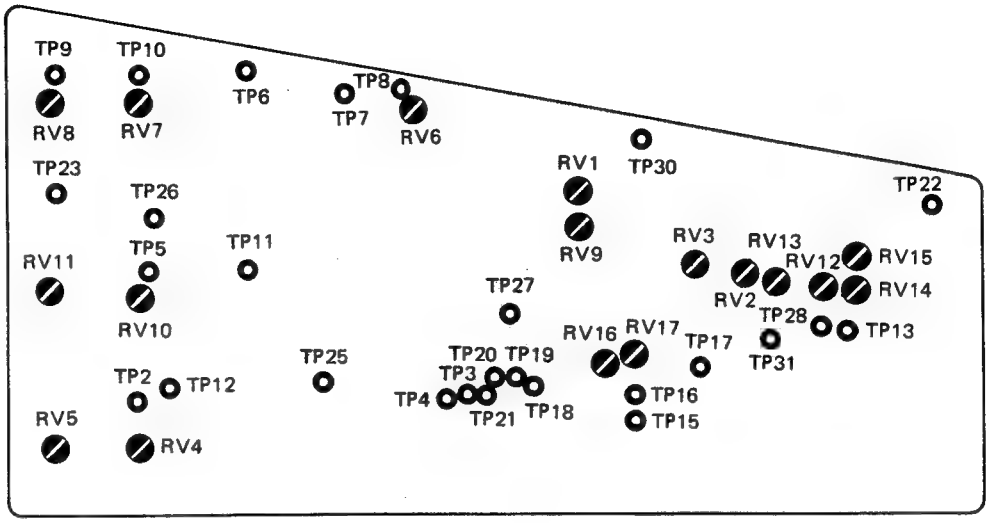
4-1. SUB-CARRIER FREQUENCY ADJUSTMENT

machine condition for adjustment	measuring point	adjustment
	[for SEG-2000A] C56 (GND; shield case)/SG-35 3,579,545 Hz ± 10 Hz	◐ RV1/SG-35
	[for SEG-2000AP/APM] C57 (GND; shield case)/SG-34 4,433,618 Hz ± 10 Hz (PAL) 3,575,611 Hz ± 10 Hz (PAL-M)	◐ RV1/SG-34

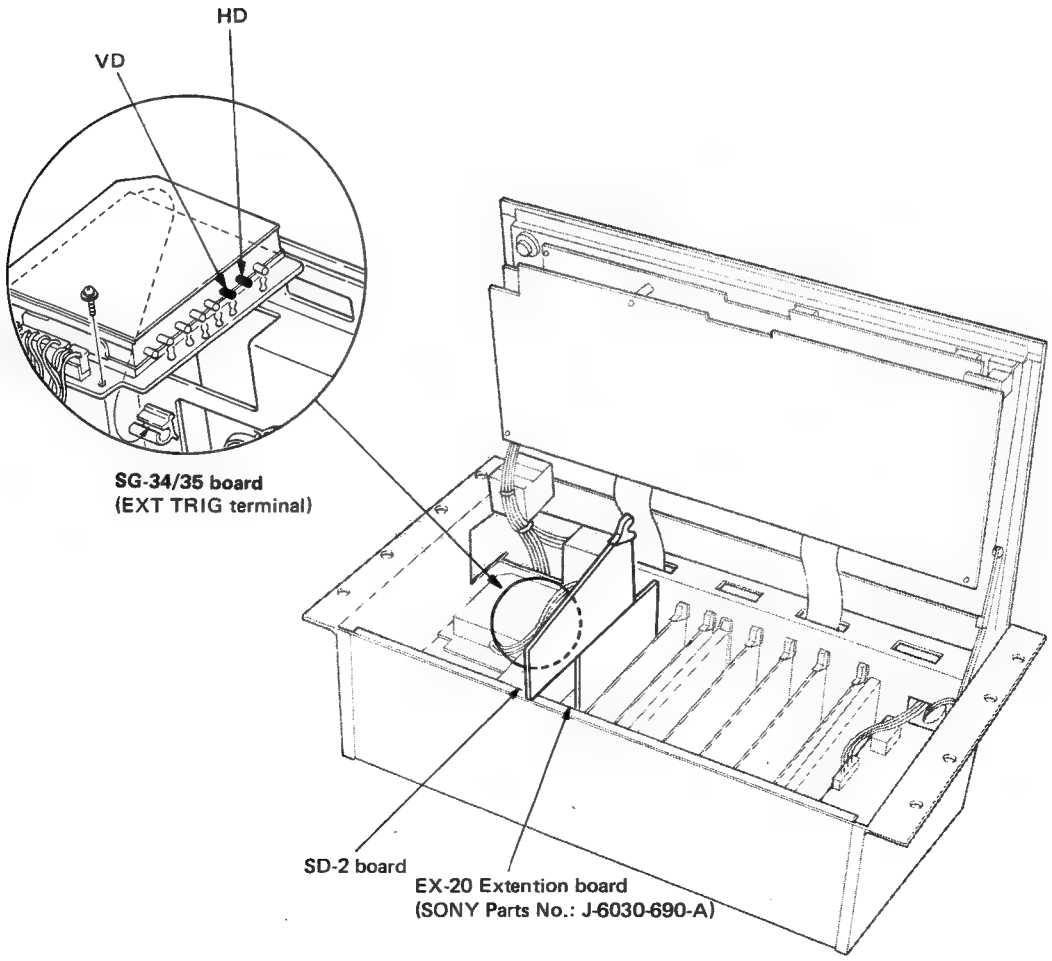
4-2. PRE BLKG WIDTH ADJUSTMENT

machine condition for adjustment	measuring point	adjustment
	CH1; C54 (HD) CH2; C65 (PRE BLKG EXT TRIG; HD  0.5 ± 0.05 μsec	◐ RV2/SG-35 or SG-34

SECTION 5
EFFECT CONTROL PULSE ALIGNMENT



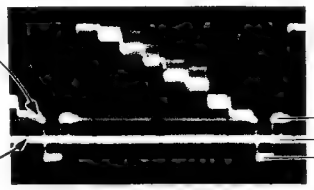
SD-2 board



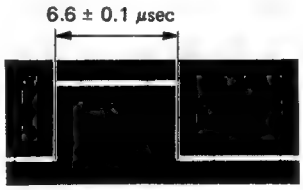
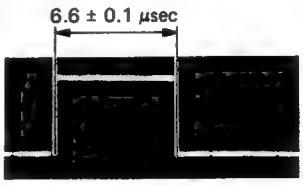
[Equipment Required]

- Dual trace oscilloscope
- SONY MD-1600/P/PM multisignal distributor or equivalent

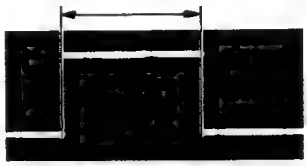
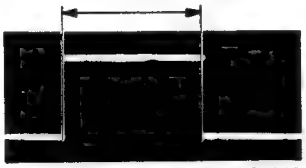
5-1. AUX SYNC LEVEL ADJUSTMENT

machine condition for adjustment	measuring point	adjustment
• AUX IN; 75% color bar signal	CH1; TP7/SD-2 CH2; TP8/SD-2  EXT TRIG; HD **Note:** Set the oscilloscope at "DC mode" and put together the "GND" of CH-1 and CH-2.	⊘RV6/SD-2

5-2. H SYNC PULSE WIDTH ADJUSTMENT

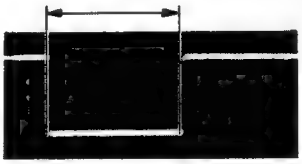
machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM mode • AUX IN; 75% Color bar signal	1. INT H Sync Pulse Width Adjustment PGM BUS selector; Except "AUX"  TP25/SD-2 EXT TRIG; HD	⊘RV2/SD-2
	2. EXT H Sync Pulse Width Adjustment PGM BUS selector; "AUX"  TP25/SD-2 EXT TRIG; HD	⊘RV7/SD-2

5-3. V SYNC PULSE WIDTH ADJUSTMENT

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM mode • AUX IN; 75% color bar signal	1. INT V Sync Pulse Width Adjustment PGM BUS selector; Except "AUX" 0.5 ± 0.04 msec TP26/SD-2  EXT TRIG; VD	⊘ RV4/SD-2
	2. EXT V Sync Pulse Width Adjustment PGM BUS selector; "AUX" 0.5 ± 0.04 msec TP26/SD-2  EXT TRIG; VD	

5-4. BLKG PULSE WIDTH ADJUSTMENT

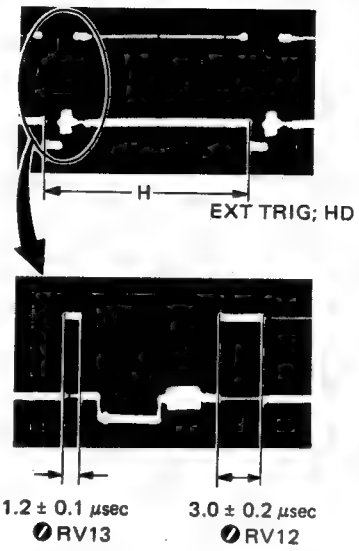
5-4-1. H PRE BLKG Pulse Width Adjustment

machine condition for adjustment	measuring point	adjustment
	7.0 ± 0.1 μsec [for SEG-2000A/APM] 8.8 ± 0.1 μsec [for SEG-2000AP] TP4/SD-2  EXT TRIG; HD	⊘ RV3/SD-2

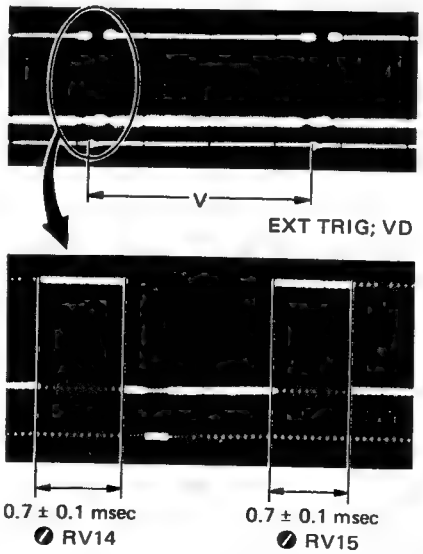
5-4-2. V PRE BLKG Pulse Width Adjustment

machine condition for adjustment	measuring point	adjustment
	0.94 ± 0.01 msec [for SEG-2000A] 1.24 ± 0.01 msec [for SEG-2000AP] 0.90 ± 0.01 msec [for SEG-2000APM] TP3/SD-2  EXT TRIG; VD	⊘ RV5/SD-2

5-4-3. DSK H BLKG Pulse Width Adjustment

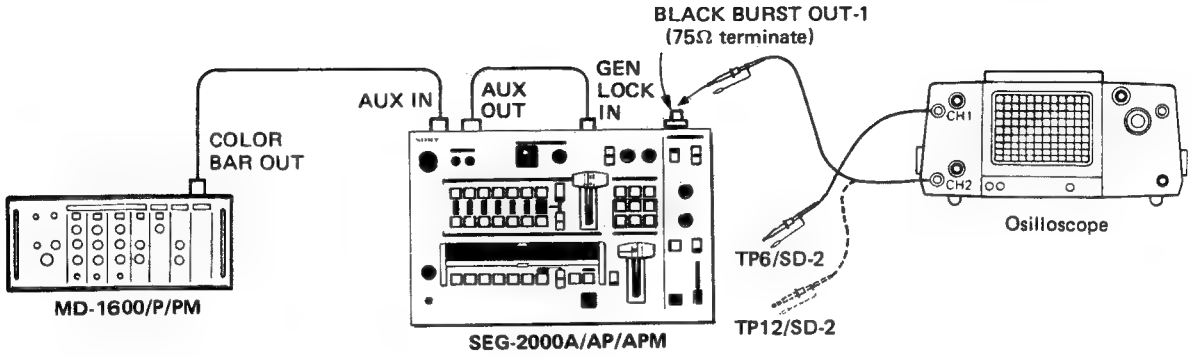
machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM mode • PGM BUS selector; BACK GROUND "WHT" • PGM CUT IN/OUT switch; ON • NORMAL/INVERT switch; NORMAL • DSK KEY LEVEL control; ↷ MAX • INSERT LEVEL control; ↶ MIN • SHADOW switch; OFF	PGM OUT/rear panel  	RV12/SD-2 RV13/SD-2

5-4-4. DSK V BLKG Pulse Width Adjustment

machine conditions for adjustment	measuring point	adjustment
• Same as the preseding clause	PGM OUT/rear panel  	RV14/SD-2 RV15/SD-2

5-5. DSK CLAMP PULSE WIDTH ADJUSTMENT

[Equipment Required & Connection]



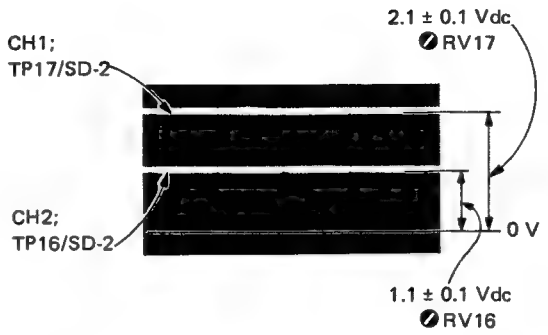
5-5-1. Clamp Pulse Phase and Pulse Width Adjustment

machine condition for adjustment	measuring point	adjustment
AUX IN; 75% color bar signal	1.1 ± 0.1 μsec [for SEG-2000A/AP] 1.4 ± 0.1 μsec [for SEG-2000APM] ◐ RV10 CH1; TP6/SD-2 CH2; TP12/SD-2 EXT TRIG; HD 1.8 ± 0.1 μsec ◐ RV11	◐ RV10/SD-2 ◐ RV11/SD-2

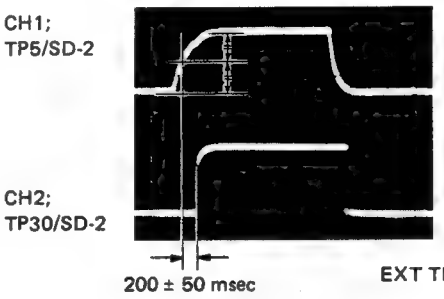
5-5-2. AUX Clamp Pulse Width Adjustment

machine condition for adjustment	measuring point	adjustment
AUX IN; 75% color bar signal	TP11/SD-2 EXT TRIG; HD 1.8 ± 0.1 μsec	◐ RV9/SD-2

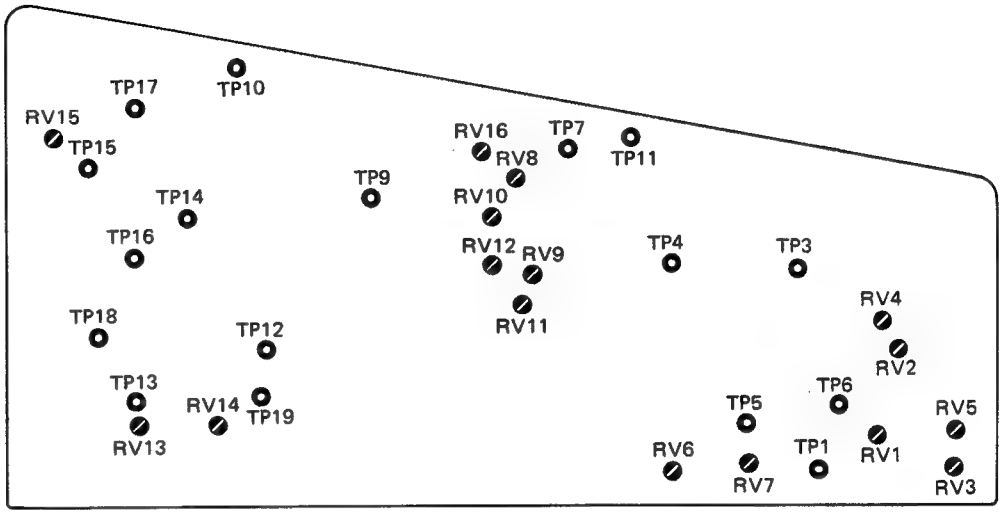
5-6. BORDER LINE WIDTH ADJUSTMENT

machine condition for adjustment	measuring point	adjustment
		RV16/SD-2 RV17/SD-2

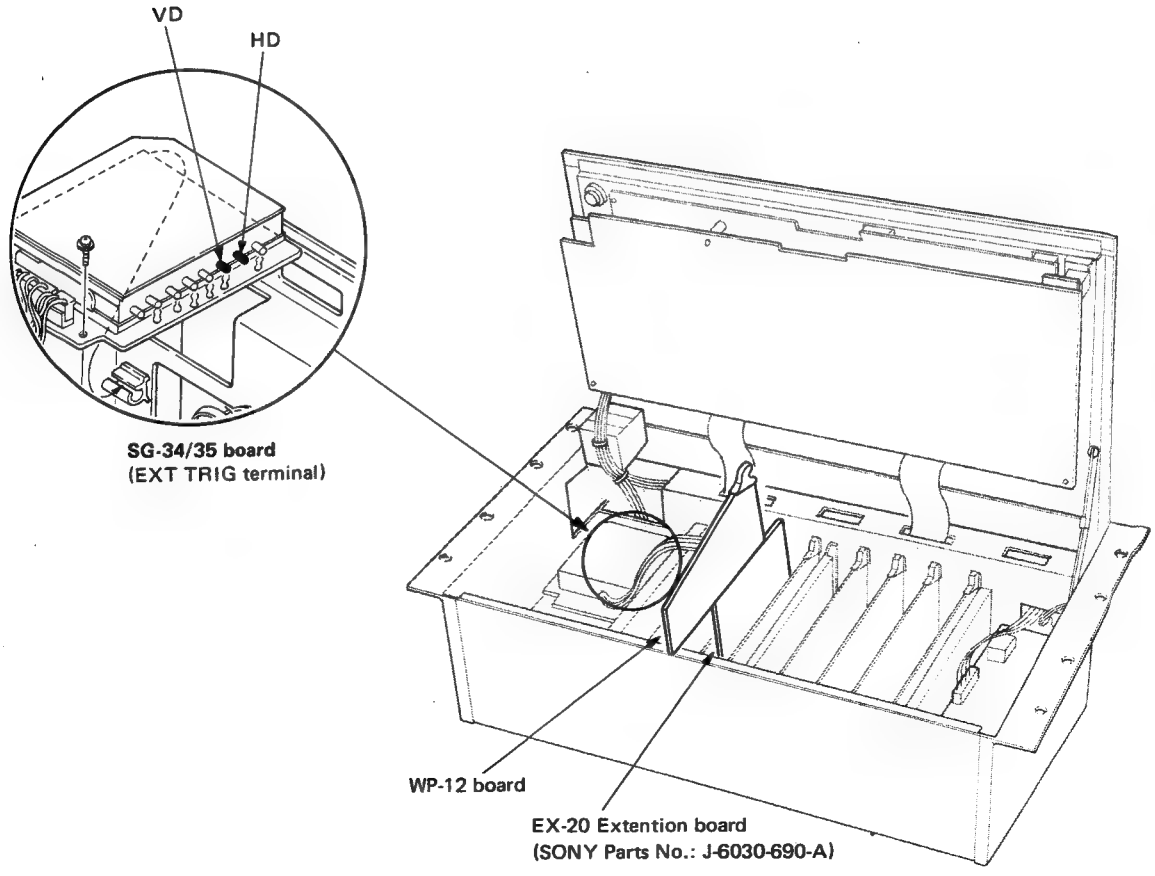
5-7. SYNC DELAY ADJUSTMENT

machine condition for adjustment	measuring point	adjustment
		RV1/SD-2

SECTION 6
WIPE SYSTEM ALIGNMENT



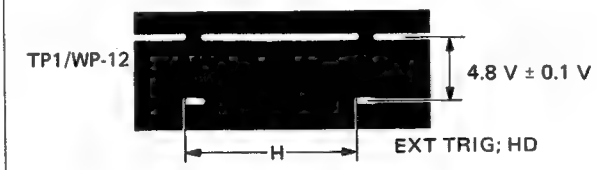
WP-12 board (component side)



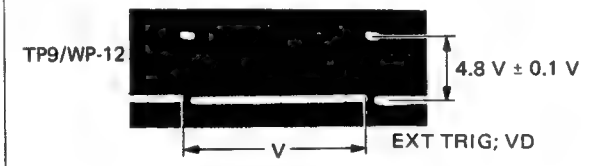
[Equipment Required]

- Dual trace oscilloscope
- Monitor TV

6-1. H BLKG LEVEL ADJUSTMENT

machine condition for adjustment	measuring point	adjustment
• EFFECTS SELECT switch; WIPE "▬"		⊘ RV1/WP-12

6-2. V BLKG LEVEL ADJUSTMENT

machine condition for adjustment	measuring point	adjustment
• EFFECTS SELECT switch; WIPE "▀"		⊘ RV8/WP-12

WIPE

6-3. WIPE PULSE ADJUSTMENT

Note: The H1 Pulse Adjustment, the V1 Pulse Adjustment, the V2 Pulse Adjustment and the H2 Pulse Adjustment mutually affect each other.
Consequently, when performing these adjustment, alternately repeat the four adjustments two or three times to obtain the desired spec.

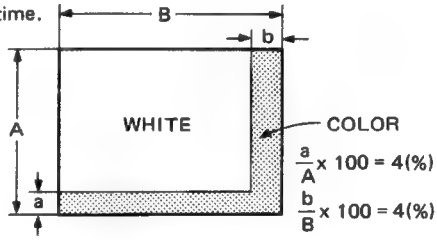
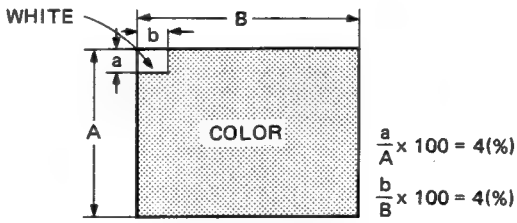
6-3-1. H1 Pulse Adjustment

machine condition for adjustment	measuring point	adjustment
• EFFECTS SELECT switch; WIPE	⊘ RV2 3.2 V ± 0.1 V[for SEG-2000A/APM] 3.6 V ± 0.1 V[for SEG-2000AP] 	⊘ RV2/WP-12 ⊘ RV3/WP-12 Alternately repeat the two adjustments two or three times to obtain the desired spec.

6-3-2. V1 Pulse Adjustment 1

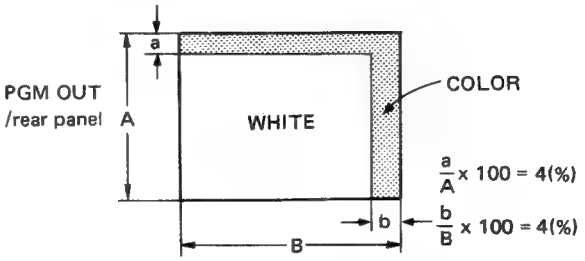
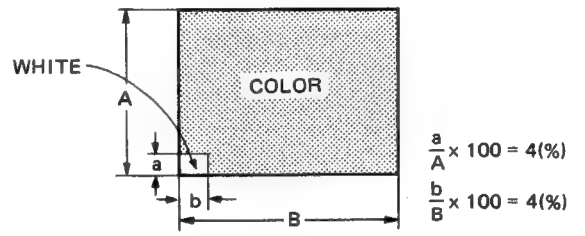
machine condition for adjustment	measuring point	adjustment
• EFFECTS SELECT switch; WIPE	Turn the RV11, RV12 fully clockwise ↻.  TP9/WP-12 EXT TRIG; VD 2.0 V ± 0.05 V ◐ RV16	◐ RV16/WP-12

6-3-3. V1 Pulse Adjustment 2

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM mode • PGM BUS selector; EFF mode • A BUS selector; BACK GROUND "COLOR" • B BUS selector; BACK GROUND "WHT" • EFFECTS SELECT switch; WIPE "▬" • SOFT/HARD/BORDER switch; HARD • PGM/PST MIX Lever; front side or rear side	**step. 1** When laying down the EFFECT Lever to the front side, adjust so that "a" and "b" fade away at the same time.  PGM OUT /rear panel B b A a WHITE COLOR $\frac{a}{A} \times 100 = 4(\%)$ $\frac{b}{B} \times 100 = 4(\%)$	◐ RV10/WP-12
	step 2. When laying down the EFFECT Lever to the rear side, adjust so that "a" and "b" fade away at the same time.  WHITE B b a A COLOR $\frac{a}{A} \times 100 = 4(\%)$ $\frac{b}{B} \times 100 = 4(\%)$	◐ RV9/WP-12

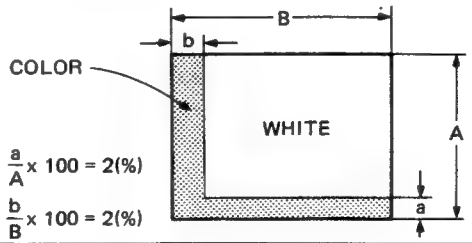
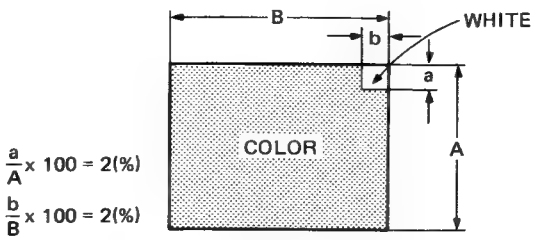
Note: The step 1 and step 2 mutually affect each other. Consequently, alternatly repeat the two adjustments two or three times to obtain the desired spec.

6-3-4. V2 Pulse Adjustment

machine conditions for adjustment	measuring point	adjustment
Difference of preceding clause. • EFFECTS SELECT switch; WIPE "▬"	**step 1.** When laying down the EFFECT Lever to the front side, adjust so that "a" and "b" fade away at the same time.  	◐ RV12/WP-12
	step 2. When laying down the EFFECT Lever to the rear side, adjust so that "a" and "b" fade away at the same time.  	◐ RV11/WP-12

Note: The step 1 and step 2 mutually affect each other. Consequently, alternatly repeat the two adjustments two or three times to obtain the desired spec.

6-3-5. H2 Pulse Adjustment

machine conditions for adjustments	measuring point	adjustments
Difference of preceding clause • EFFECTS SELECT switch; WIPE "▬"	**step 1.** When laying down the EFFECT Lever to the front side, adjust so that "a" and "b" fade away at the same time.  	◐ RV5/WP-12
	step 2. When laying down the EFFECT Lever to the rear side, adjust so that "a" and "b" fade away at the same time.  	◐ RV4/WP-12

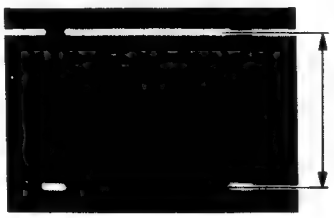
Note: The step 1 and step 2 mutually affect each other. Consequently, alternatly repeat the two adjustments two or three times to obtain the desired spec.

6-4. EFFECTS FADER VOLTAGE ADJUSTMENT

6-4-1. EFFECTS WIPE Fader Limit Voltage Adjustment

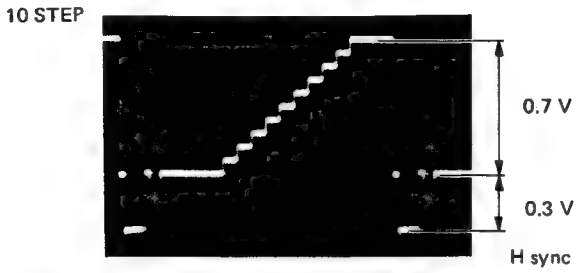
machine conditions for adjustments	measuring point	adjustments
• A BUS selector; BACK GROUND "COLOR" • B BUS selector; BACK GROUND "WHT" • EFFECTS SELECT switch; WIPE "▣" • SOFT/HARD/BORDER switch; SOFT • SOFTNESS/BORDER control; ↻ MAX	1. Upper Limit Voltage Adjustment. Set the EFFECTS Lever to the rear side until the point just before the micro switch action sound is heard. TP4/WP-12  5.6 V ± 0.1 Vdc	◐ RV6/WP-12
	2. Lower Limit Voltage Adjustment. Set the EFFECTS Lever to the front side until the point just before the micro switch action sound is heard. TP4/WP-12  3.2 V ± 0.1 Vdc	◐ RV7/WP-12

6-4-2. EFFECTS MIX Fader Limit Voltage Adjustment

machine condition for adjustment	measuring point	adjustment
	1. Upper Limit Voltage Adjustment Set the EFFECTS Lever fully to front side.  1.3 ± 0.1 V EXT TRIG; HD	◐ RV14/WP-12
	2. Lower Limit Voltage Adjustment Set the EFFECTS Lever fully to rear side.  0.55 ± 0.02 V EXT TRIG; HD	◐ RV13/WP-12

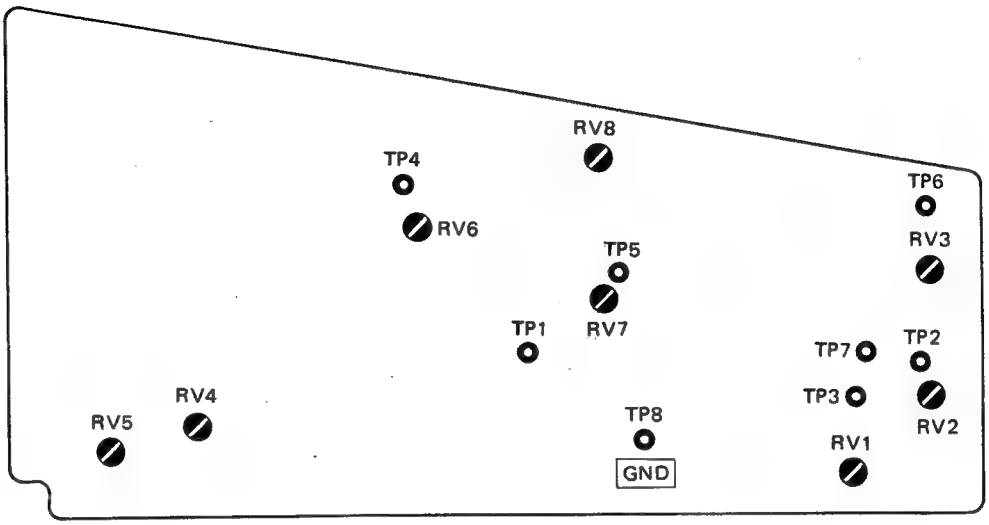
6-5. EXT KEY CLAMP LEVEL ADJUSTMENT

If the NON-MODULATED LINEARITY signal is available, proceed to this adjustments.
If the NON-MODULATED LINEARITY signal as shown below, is available.

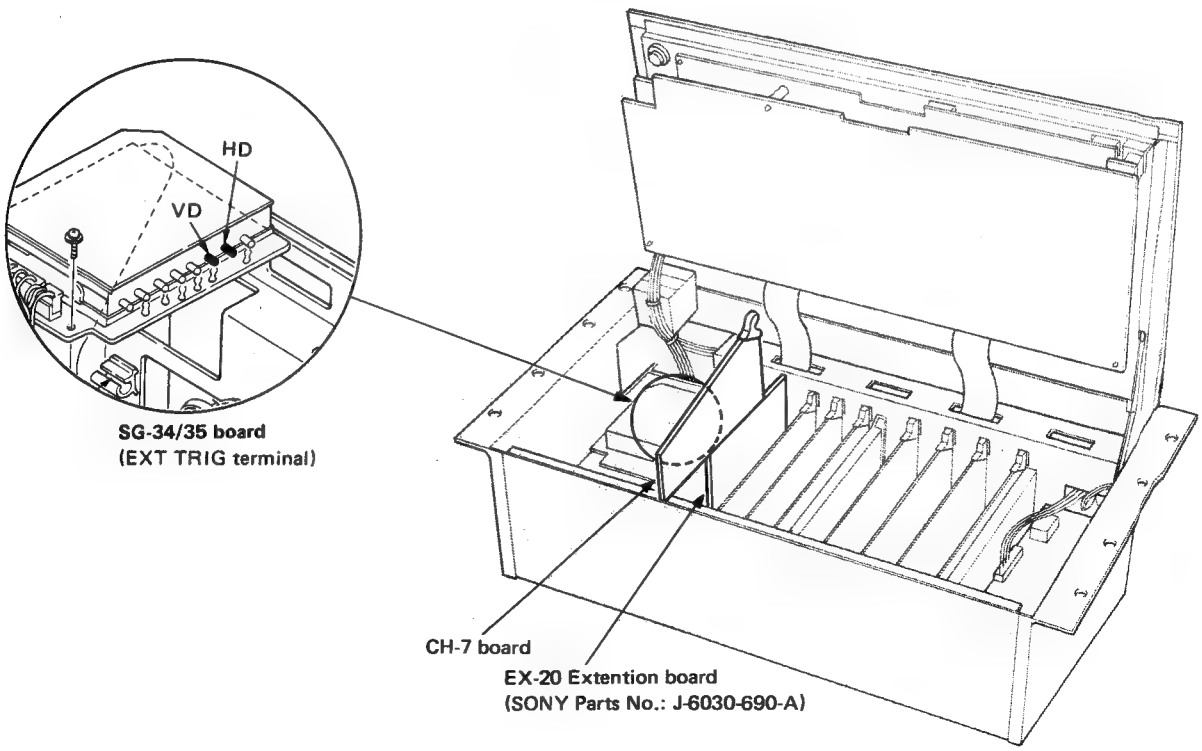


machine conditions for adjustment	measuring point	adjustment
• EFFECTS SELECT switch; EXT KEY • EXT KEY LEVEL control; ↺ MIN • EXT KEY IN; NON-MODULATED LINEARITY Signal.	• Set the oscilloscope at DC range and put together the "GND" of CH1 and CH2. CH1; TP15/WP-12 CH2; TP17/WP-12 0.9 ± 0.04 Vdc	◐ RV15/WP-12

SECTION 7
PHASE INDICATION SYSTEM ALIGNMENT



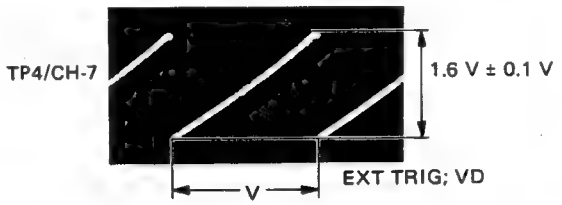
CH-7 board



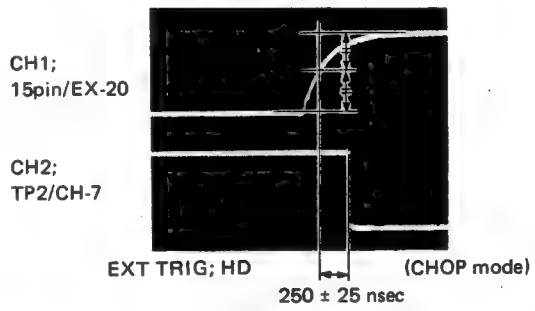
[Equipment Required]

- Dual trace oscilloscope

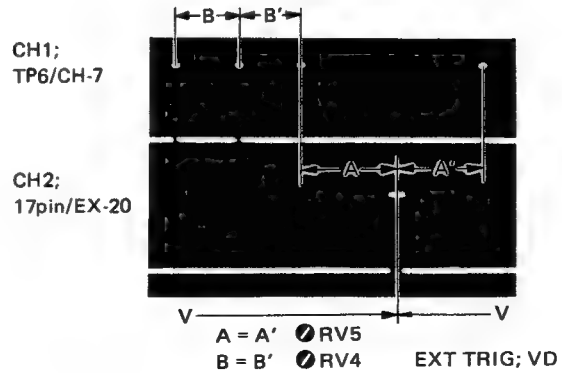
7-1. V RAMP GAIN ADJUSTMENT

machine condition for adjustment	measuring point	adjustment
		◐RV6/CH-7

7-2. SYNC DELAY ADJUSTMENT

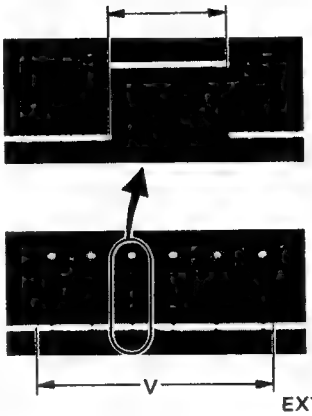
machine condition for adjustment	measuring point	adjustment
		◐RV2/CH-7

7-3. H PHASE INDICATION ADJUSTMENT

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PST BUS selector; # 1 ⬇ • PGM/PST switch; PST		◐RV4/CH-7 ◐RV5/CH-7

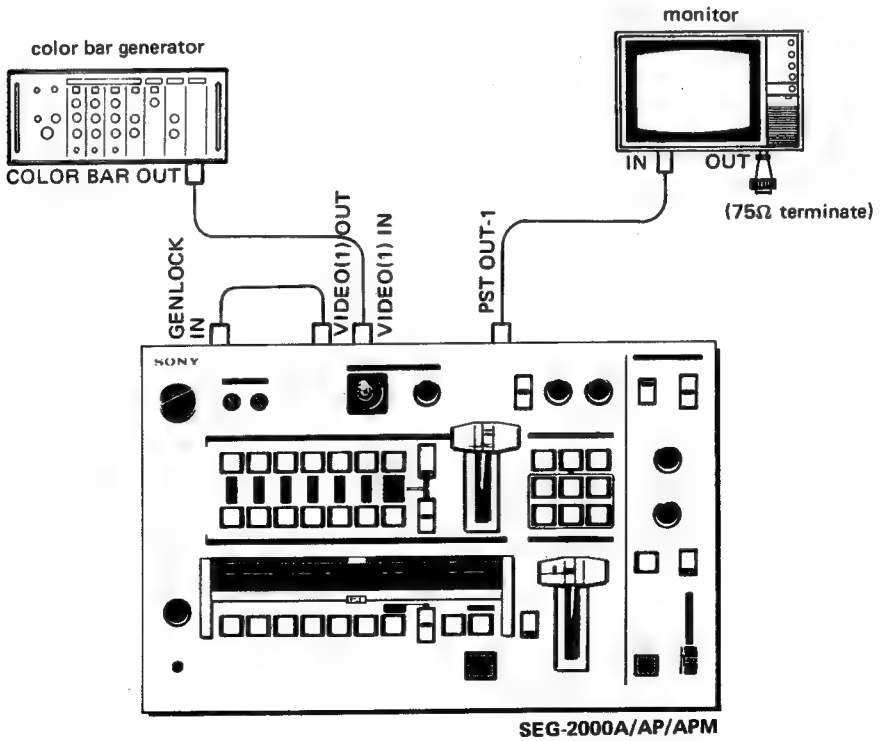
PHASE INDICATION

7-4. H PHASE INDICATION PULSE WIDTH ADJUSTMENT

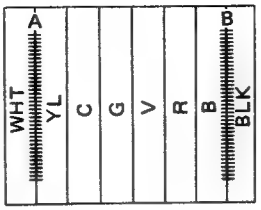
machine condition for adjustment	measuring point	adjustment
	TP3/CH-7 200 ± 100 μsec  	◐ RV3/CH-7

7-5. SC PHASE INDICATION ADJUSTMENT (1)

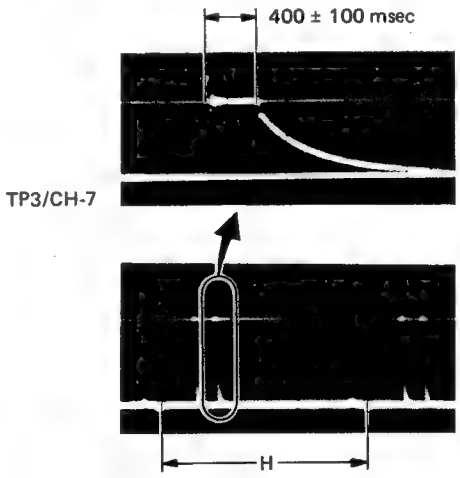
[Equipment Required]



SEG-2000A/AP/APM

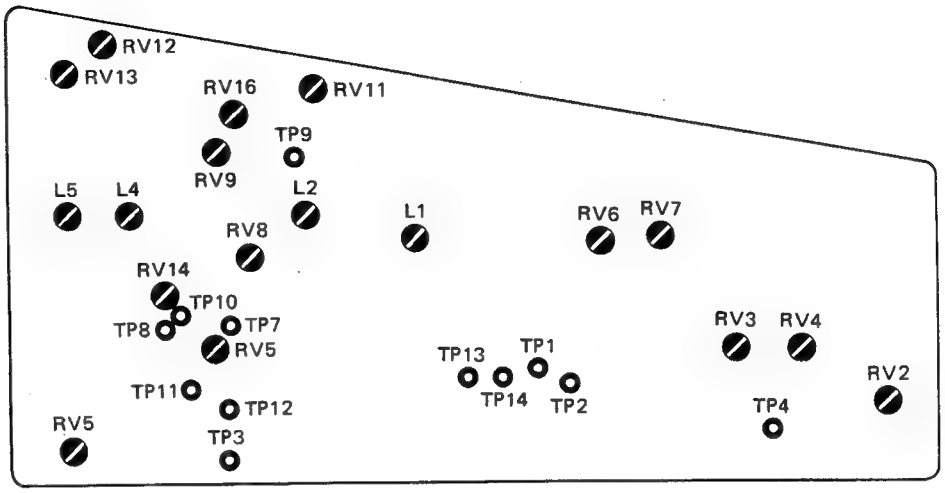
machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PST • PST BUS selector; # 1 • PHASE INDICATION switch; ON VIDEO-1 IN connector; 75% color bar signal	PST OUT-1/rear panel monitor  **step 1.** Adjust the ⊘RV7 so that "B" line is positioned between BLUE and BLACK. **step 2.** Adjust the ⊘RV8 so that "A" line is positioned between WHITE and YELLOW.	⊘RV7/CH-7 ⊘RV8/CH-7

7-6. SC PHASE INDICATION PULSE WIDTH ADJUSTMENT

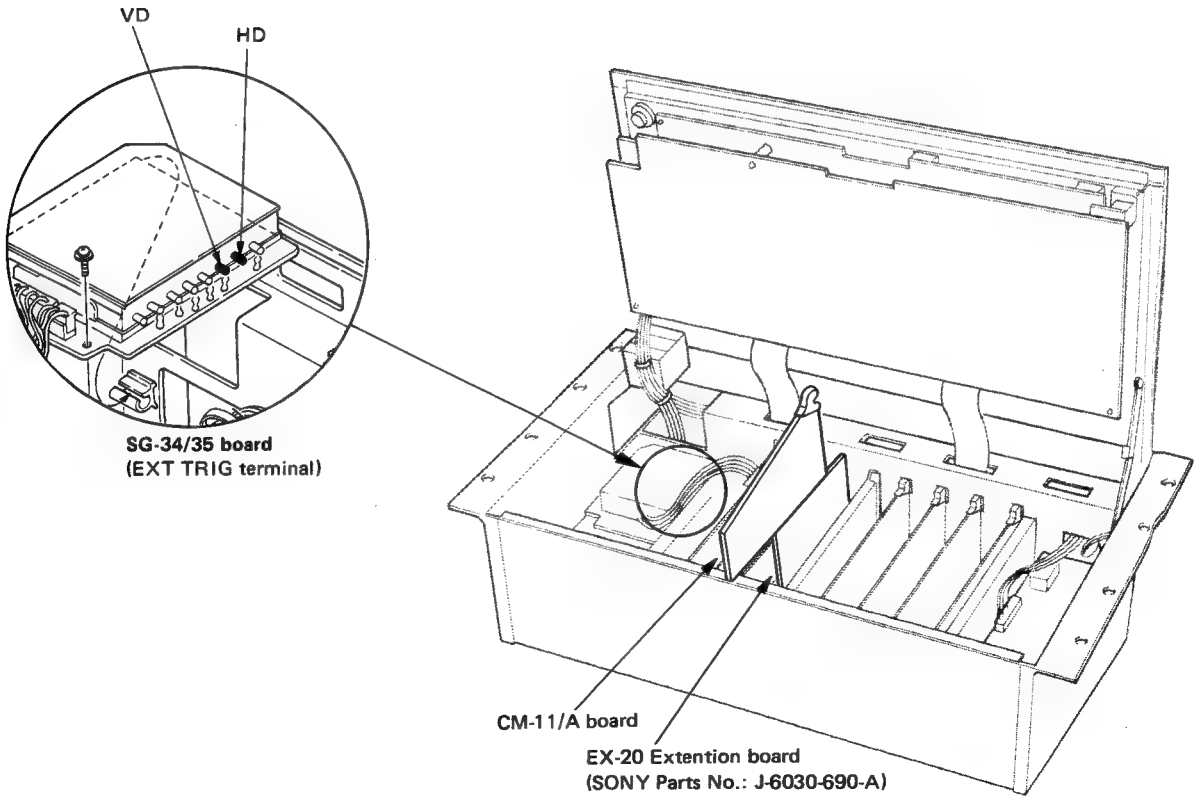
machine condition for adjustment	measuring point	adjustment
	 EXT TRIG; HD	⊘RV1/CH-7

PHASE INDICATION

SECTION 8
BACK GROUND COLOR SYSTEM ALIGNMENT

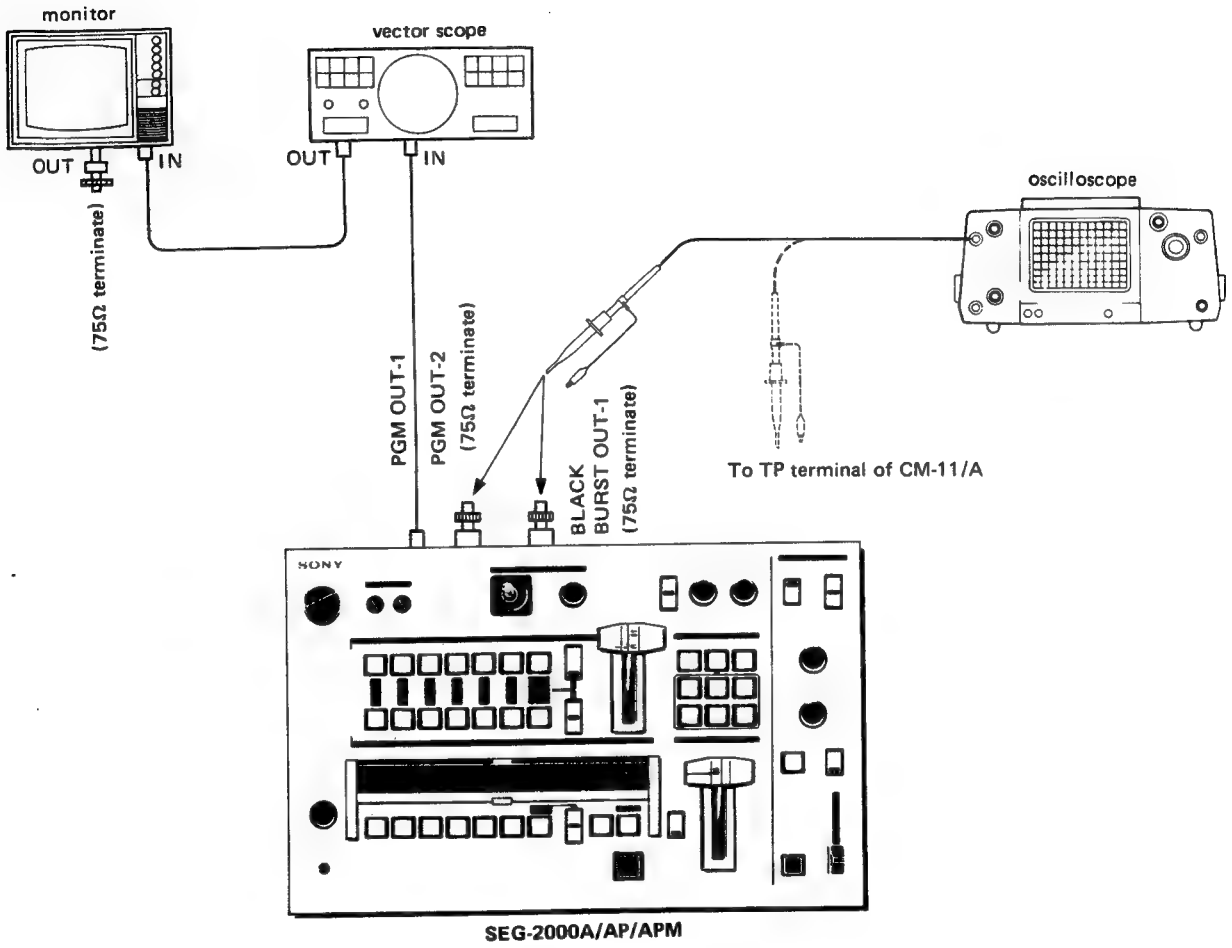


CM-11/A board



[Equipment Required]

- Digital voltmeter
- Vectorscope
- Dual trace oscillosope
- Monitor TV



BACK GROUND COLOR

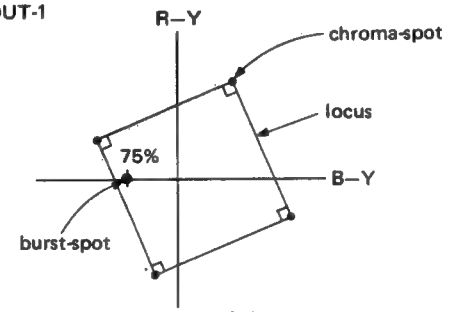
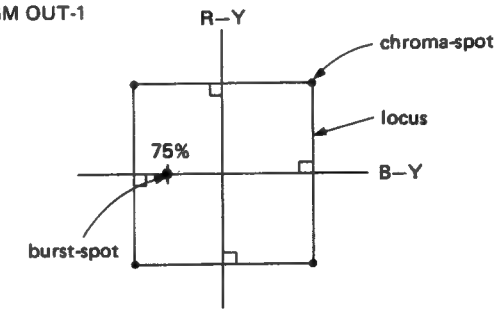
8-1. +5V VOLTAGE ADJUSTMENT

machine condition for adjustment	measuring point	adjustment
	TP3 (GND; TP2)/CM-11A 5.0 V ± 0.1 Vdc or CM-11	⊘RV15/CM-11A or CM-11

8-2. BACK GROUND COLOR PHASE ADJUSTMENT

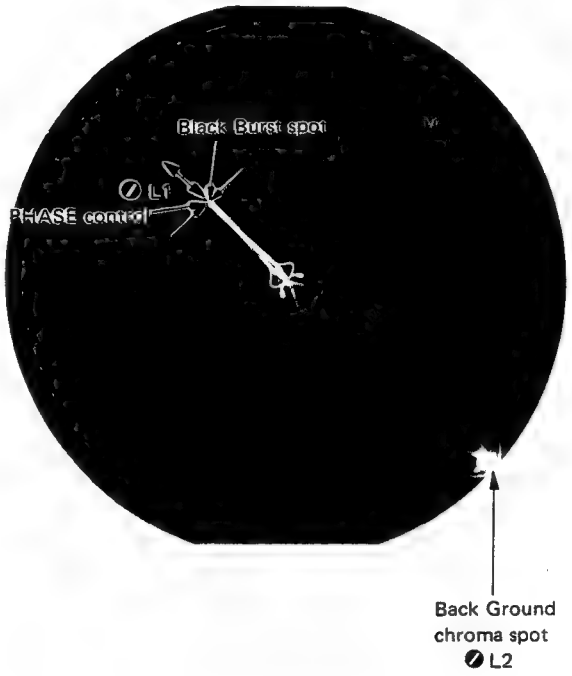
Note: The sec. 8-2, BACK GROUND COLOR PHASE ADJUSTMENT, the sec. 8-4, BLACK BURST ADJUSTMENT, the sec. 8-6, CARRIER BALANCE ADJUSTMENT and the sec. 8-8, BACK GROUND VIDEO LEVEL ADJUSTMENT mutually affect each other. Consequently, when performing these adjustment, alternately repeat the four adjustments two or three times to obtain the desired spec.

[For SEG-2000A use]

machine condition for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM BUS selector; BACK GROUND "COLOR"	1. Sub-carrier 90° Adjustment PGM OUT-1  Adjust ⊘L1 so that the locus of chroma-spot on screen become most square.	⊘ L1/CM-11A Turn the Joystick fully to tilting
	2. Back Ground Color Phase Adjustment PGM OUT-1  Adjust ⊘ L2 so that the action of chroma spot on screen become most orthogonal locus against B–Y and R–Y.	⊘ L2/CM-11A Turn the Joystick fully to tilting

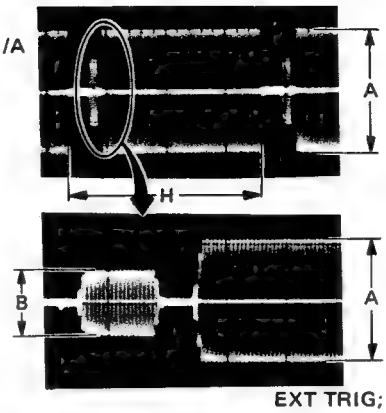
Note: The ⊘L1 and the ⊘L2 mutually affect each other. Consequently, alternatly repeat the two adjustments two or three times to obtain the desired spec.

[For SEG-2000AP/APM use]

machine conditions for adjustment	measuring point & adjustment
• PGM/PST switch; PGM • PST BUS selector; BACK GROUND "COLOR" • PGM/PST MIX Lever; front side • BACK GROUND COLOR joystick ; chroma level "MAX"	**step 1.** Depress the NTSC pushbutton of vectorscope and set the two burst spots on 75% vector Graticule by the PHASE control. **step 2.** Adjust the ⊘ L1/CM-11 so that the burst spot become a dot. **step 3.** Adjust the ⊘ L2/CM-11 so that the some of four corner chroma spot become a dot. PGM OUT-1 /rear panel 

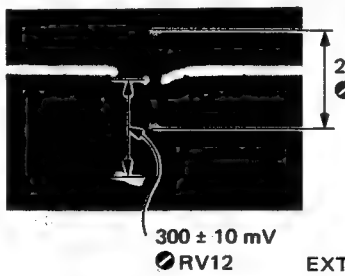
Note: The step 1 and step 2 mutually affect each other. Consequently, alternately repeat the two adjustment two or three times to obtain the desired spec.

8-3. BURST SYNC LEVEL ADJUSTMENT

machine condition for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PST BUS selector; BACK GROUND "COLOR" • LUM control; fully clockwise	TP9/CM-11/A  EXT TRIG; HD **step 1.** Set the joystick so that the level of "A" become most maximum. **step 2.** Burst Level Adjustment A : B = 7 : 3	⊘RV2/CM-11A or CM-11

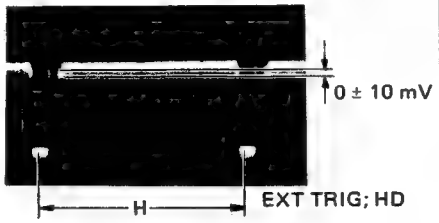
8-4. BLACK BURST ADJUSTMENT (1)

Note: The sec. 8-2, Back Ground Color Phase Adjustment, the sec. 8-4, Black Burst Adjustment (1), the sec. 8-6, Carrier Balance Adjustment and the sec. 8-8, Back Ground Video Level Adjustment mutually affect each other.
Consequetly, when performing these adjustments, alternately repeat the four adjustments two or three times to obtain the desired spec.

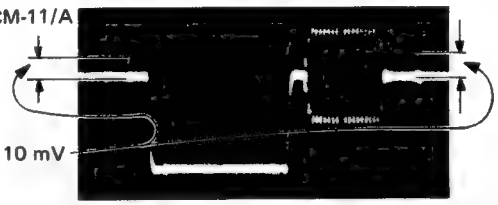
machine condition for adjustment	measuring point	adjustment
	⊘ RV3/CM-11A or CM-11 ⟶ fully to counterclockwise BLACK BURST OUT-1 /rear panel  EXT TRIG; HD	⊘RV12/CM-11A or CM-11 ⊘RV13/CM-11A or CM-11 Adjust the two adjustments mutually affect each other. Consequently, alternately repeat the them two or three times to obtain the desired spec.

8-5. BLACK BURST ADJUSTMENT (2)

8-5-1. Black Level Adjustment

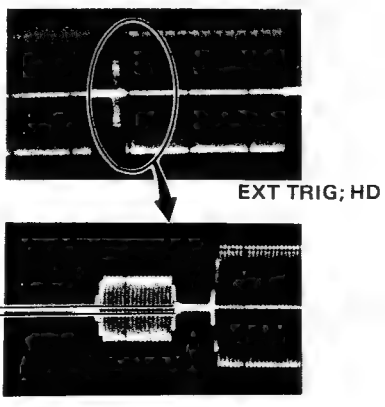
machine condition for adjustment	measuring point	adjustment
	BLACK BURST OUT-1 /rear panel 	⊘ RV11/CM-11A or CM-11

8-5-2. DC Balance Adjustment

machine condition for adjustment	measuring point	adjustment
	TP12/CM-11/A 	⊘ RV6/CM-11A or CM-11

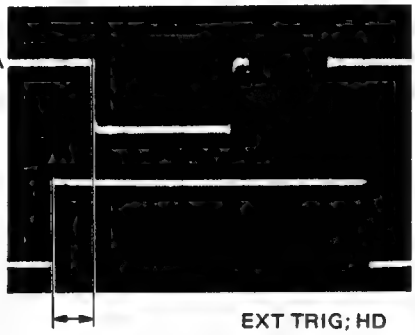
8-6. CARRIER BALANCE ADJUSTMENT

Note: The sec. 8-2, Back Ground Color Phase Adjustment, the sec. 8-4, Black Burst Adjustment (1), the sec. 8-6, Carrier Balance Adjustment and the sec. 8-8, Back Ground Video Level Adjustment mutually affect each other.
Consequently, when performing these adjustments, alternately repeat the four adjustments two or three times to obtain the desired spec.

machine condition for adjustment	measuring point	adjustment
	TP9/CM-11/A  Adjust ⊘ RV6 and ⊘ RV7 alternately and repeatly two or three times to obtain desired spec.	⊘ RV6/CM-11A or CM-11 ⊘ RV7/CM-11A or CM-11

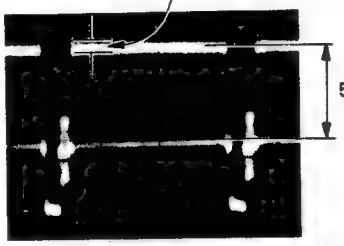
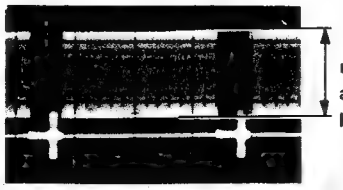
BACK GROUND COLOR

8-7. BLKG PHASE ADJUSTMENT

machine condition for adjustment	measuring point	adjustment
	CH2; TP12/CM-11/A CH1; TP7/CM-11/A  EXT TRIG; HD 1.5 ± 0.1 μsec [SEG-2000A/APM] 1.55 ± 0.1 μsec [SEG-2000AP]	⊘ RV4/CM-11A or CM-11

8-8. BACK GROUND VIDEO LEVEL ADJUSTMENT

Note: The sec. 8-2, Back Ground Color Phase Adjustment, the sec. 8-4, Black Burst Adjustment, the sec. 8-6, Carrier Balance Adjustment and the sec. 8-8, Back Ground Video Level Adjustment mutually affect each other.
Consequently, when performing these adjustments, alternately repeat the four adjustments two or three times to obtain the desired spec.

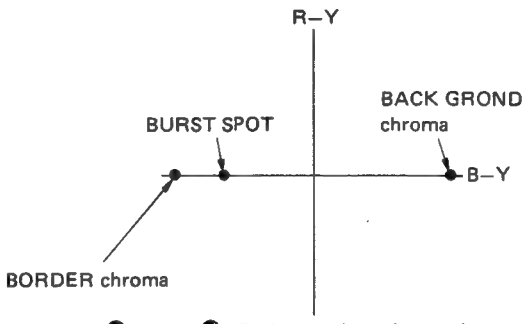
machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PST BUS selector; BACK GROUND "COLOR" • LUM control; fully clockwise • PGM/PST MIX lever; front side	1. Y Level Adjutsment PGM OUT-2/rear panel minimize by Joystick  500 ± 20 mV ⊘ RV5 EXT TRIG; HD	⊘ RV5/CM-11A or CM-11
	2. Chroma Level Adjustment PGM OUT-2/rear panel  maximum amplitude by Joystick ⇩ 700 ± 40 mV ⊘ RV8 EXT TRIG; HD	⊘ RV8/CM-11A or CM-11

8-9. BORDER VIDEO AMP ADJUSTMENT

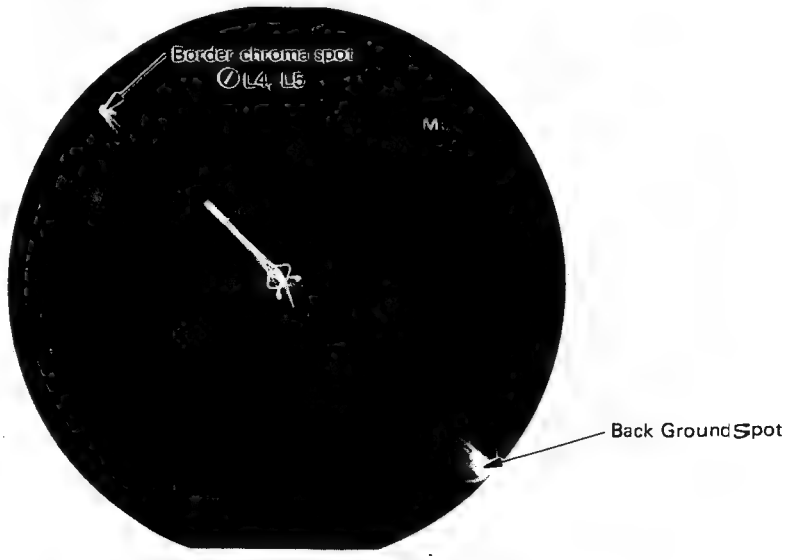
Note: The sec. 8-9-1, Phase Adjustment and the sec. 8-9-2, Chroma Level Adjustment mutually affect each other.
Consequently, alternately repeat the two adjustments two or three times to obtain the desired spec.

8-9-1. Border Phase Adjustment

[For SEG-2000A use]

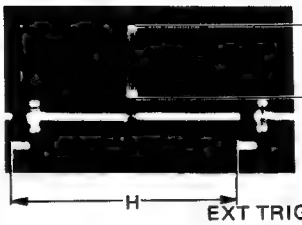
machine conditions for adjustment	measuring point	adjustment
• A BUS selector; BACK GROUND "COLOR" • B BUS selector; BACK GROUND "COLOR" • PGM BUS selector; EFF • EFFECTS SELECT; WIPE□■ • PGM/PST MIX Lever; center • SOFT/HARD/BORDER switch; BORDER • SOFTNESS/BORDER control; fully to clockwise	• Set the Joystick control for correct BACK GROUND Chroma spot.  Adjust the ⊘ L4 and ⊘ L5 alternately and repeatly two or three times for correct BORDER chroma.	⊘ L4/CM-11A ⊘ L5/CM-11A

[For SEG-2000AP/APM use]

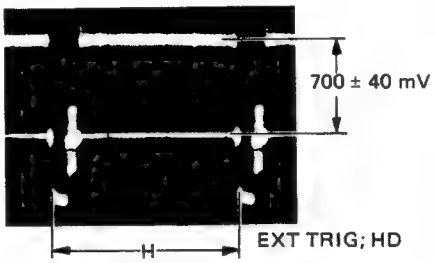
machine conditions for adjustment	measuring point & adjustment
• A BUS selector; BACK GROUND "COLOR" • B BUS selector; BACK GROUND "COLOR" • PGM BUS selector; EFF • EFFECTS SELECT; WIPE□■ • PGM/PST MIX Lever; center • SOFT/HARD/BORDER switch; fully to clockwise Vectorscope mode ⟶ NTSC	Adjust the ⊘ L4 and ⊘ L5 alternately and repeatly two or three times so that the some of four corner border chroma spot become a dot. 

BACK GROUND COLOR

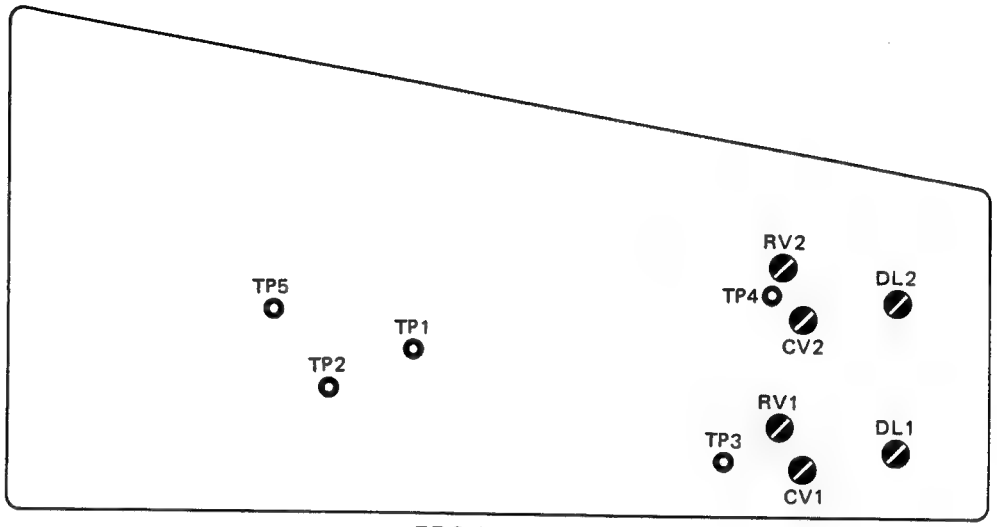
8-9-2. Border Chroma Level Adjustment

machine conditions for adjustment	measuring point	adjustment
• A BUS selector; # 1 • B BUS selector; # 1 • PST BUS selector; EFF • EFFECTS SELECT; WIPE ◨ • MIX Lever; center • SOFT/HARD/BORDER switch; BORDER • SOFTNESS/BORDER control; fully to clockwise	PGM OUT-2 /rear panel  	RV14/CM-11A or CM-11

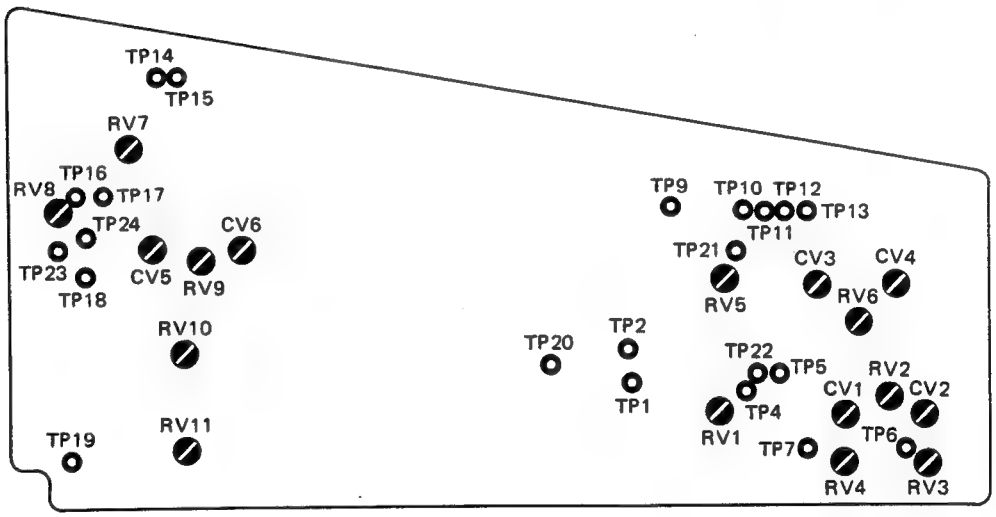
8-10. WHITE LEVEL ADJUSTMENT

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM BUS selector; BACK GROUND "WHT" • PGM/PST MIX Lever; front side	PGM OUT-2 /rear panel  	RV9/CM-11A or CM-11

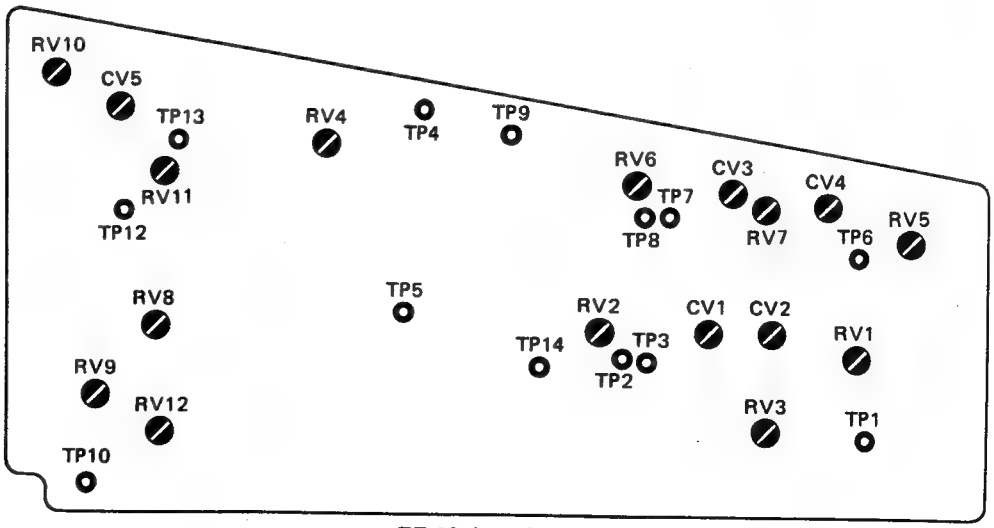
SECTION 9
EFFECT SYSTEM ALIGNMENT



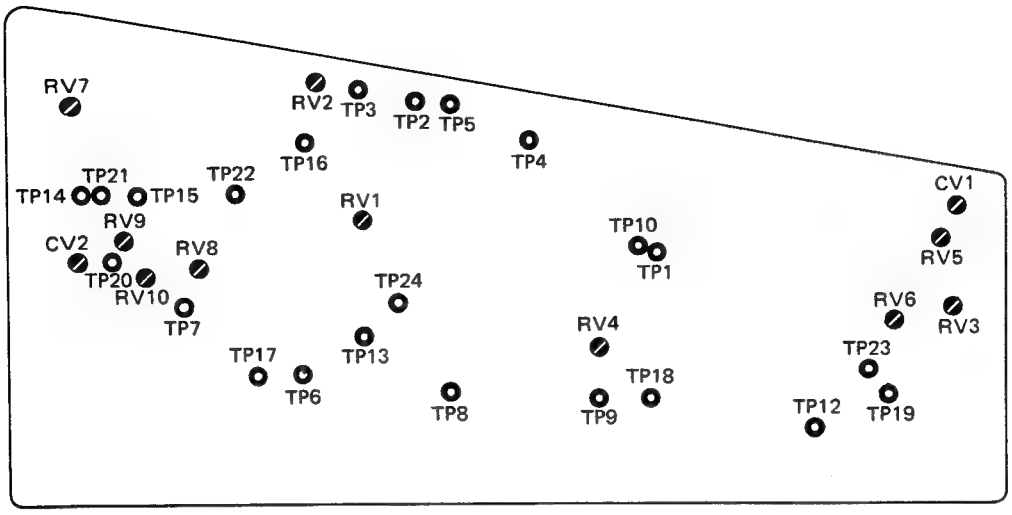
EF-8 board



EF-9 board



EF-10 board



DK-4 board (component side)

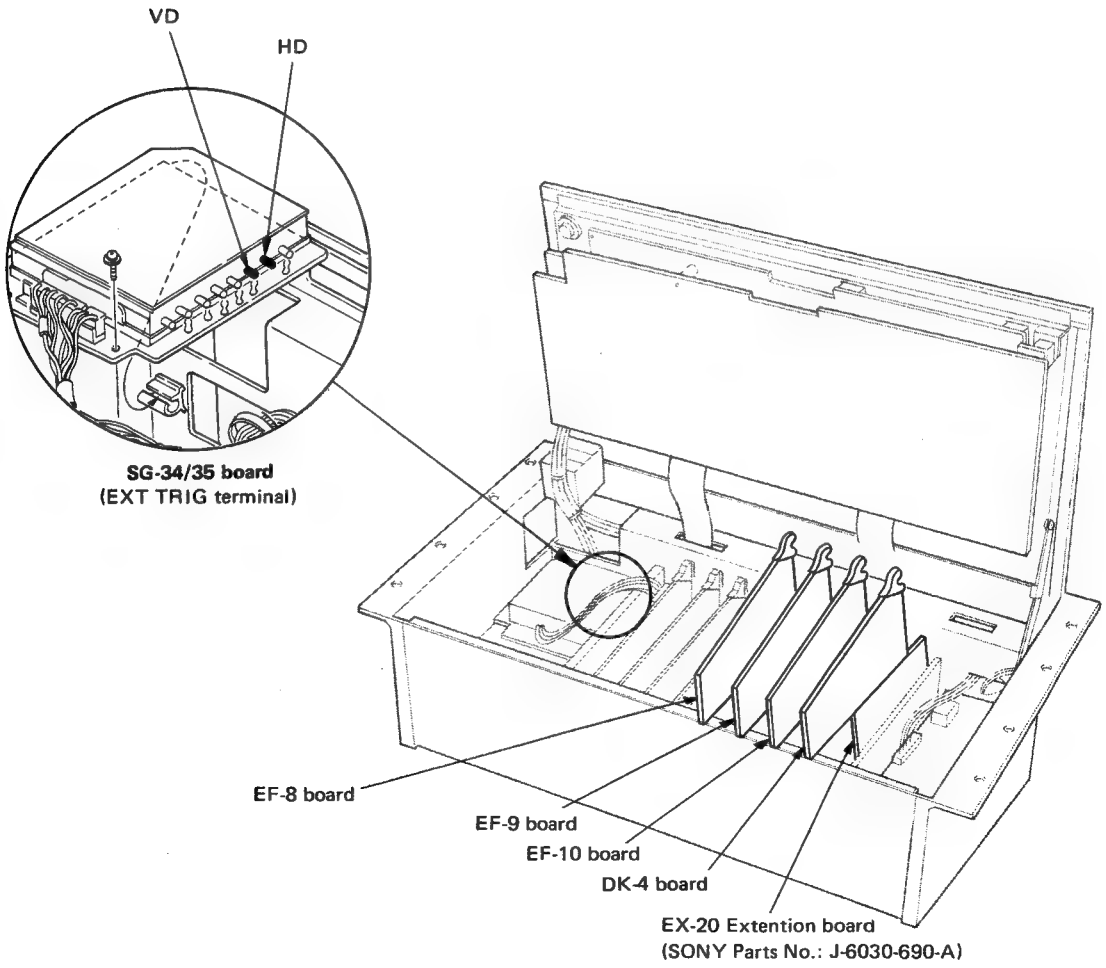


Fig. 9-1. Location of measuring points and controls

EFFECT

[Equipment Required]

- Dual Trace Oscilloscope (more than 30 MHz)
- Vector Scope
- Sweep Generator
- Color Bar Generator (SONY MD-1600/P/PM multisignal distributor or equivalent)

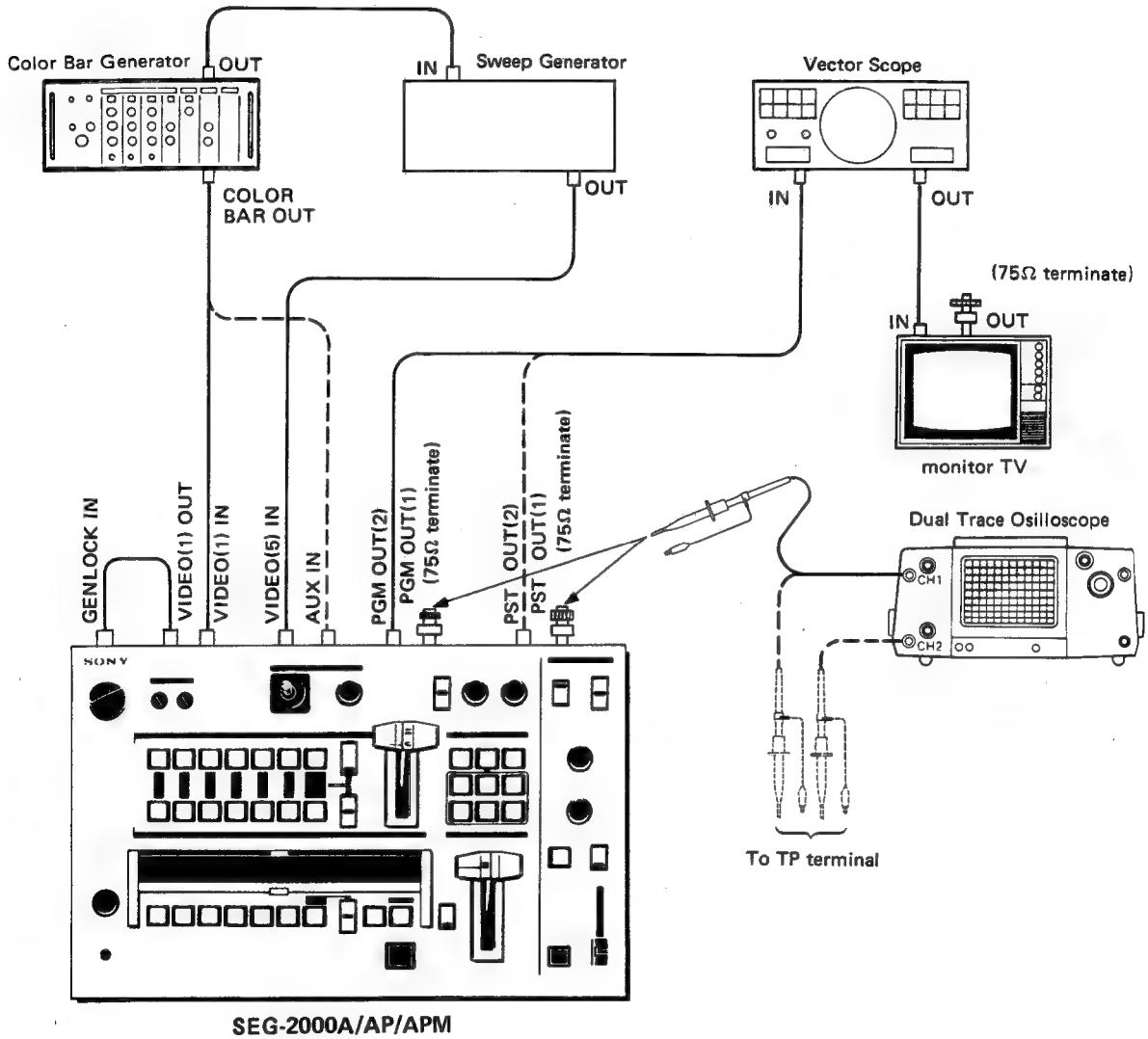
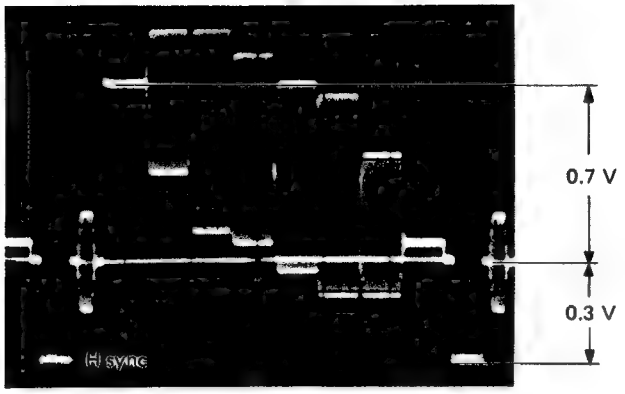


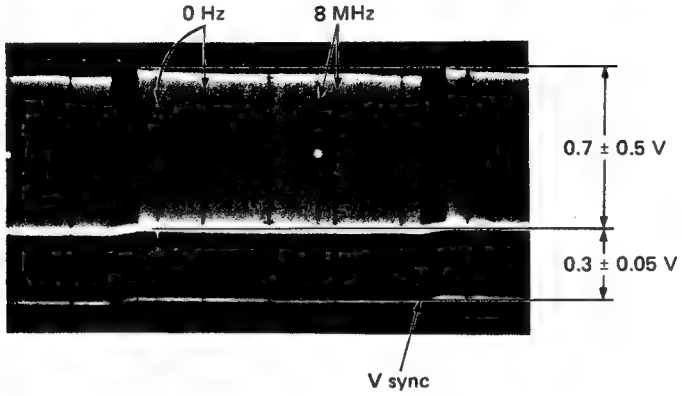
Fig. 9-2. Connection diagram

[Video Signals Required]

- 75% color bar signal



- Gated Sweep Signal; (To be used only in frequency response adj.)



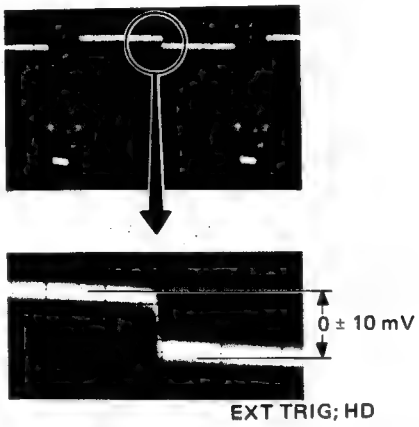
9-1. PGM/PST MIX AMP BLKG BIAS ADJUSTMENT

EFFECT

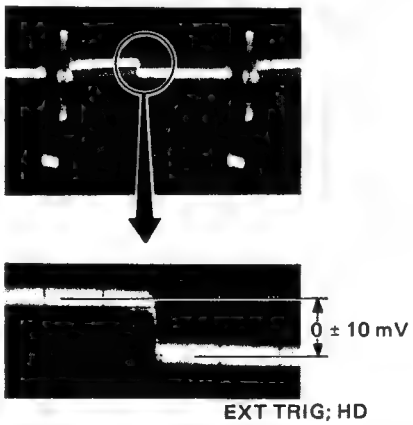
machine conditions for adjustment	measuring point	adjustment
• A BUS selector; BACK GROUND "WHT" • B BUS selector; BACK GROUND "WHT" • PGM/PST switch; PGM • PST BUS selector; EFF • EFFECTS SELECT; WIPE ◻■ • SOFT/HARD/BORDER switch; HARD • EFFECTS Lever; center	• Connect CH1 and CH2 of oscilloscope at TP2/EF-9, and set the DC range. Set the PGM/PST MIX lever fully to rear side. 420 ~ 470 mVdc ⊘RV3 CH1: TP12/EF-9 CH2: TP21/EF-9 500 ~ 550 mVdc ⊘RV4 Set the PGM/PST MIX lever fully to front side.	⊘RV3/EF-9 ⊘RV4/EF-9

9-2. A & B BUS VIDEO AMP ADJUSTMENT

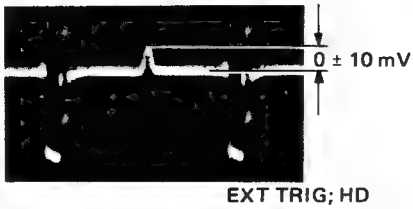
9-2-1. Video Level Adjustment

machine conditions for adjustment	measuring point	adjustment
Same as preceding clause;	PGM OUT-1 /rear panel 	⊘RV9/EF-9

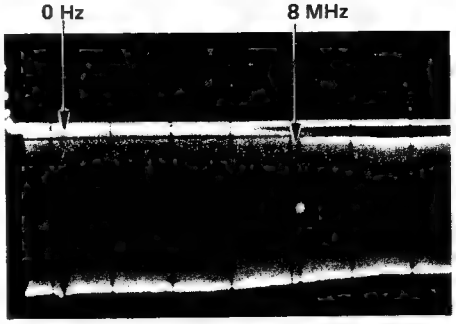
9-2-2. Clamp Level Adjustment

machine conditions for adjustment	measuring point	adjustment
• A BUS selector; # 2 (non-signal) • B BUS selector; # 2 (non-signal) • EFFECTS lever; rear side • PGM/PST MIX lever; front side		⊘RV7/EF-9

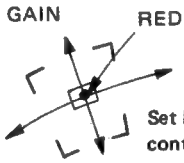
9-2-3. Balance Adjustment

machine conditions for adjustment	measuring point	adjustment
• Same as preceding clause; • SOFT/HARD/BORDER switch; SOFT • SOFTNESS/BORDER control; fully clockwise		⊘RV8/EF-9

9-2-4. Frequency Response Adjustment

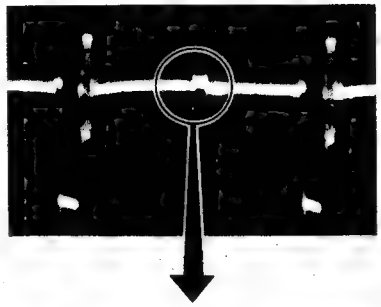
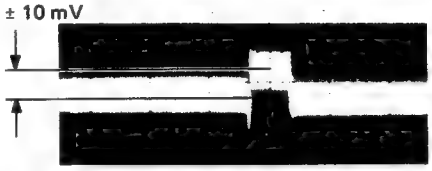
machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PST BUS selector; EFF • A BUS selector; # 5 (Sweep Signal) • B BUS selector; # 2 (non-signal) • EFFECTS Lever; rear side • PGM/PST MIX lever; front side	TP19/EF-9 0 Hz 8 MHz  0 Hz: Refer; 8 MHz: ±20 mV EXT TRIG; VD	⊘CV6/EF-9

9-2-5. Chroma Signal Adjustment

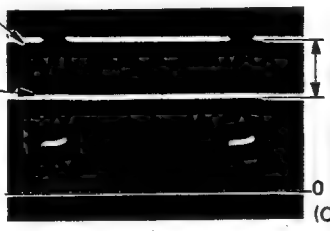
machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PST BUS selector; EFF • A BUS selector; # 1 • B BUS selector; # 1 • EFFECTS SELECT; MIX OPERATING MODE SELECTION /vectorscope **[SEG-2000A]** Depress the VECTOR pushbutton **[SEG-2000AP/APM]** Depress the NTSC pushbutton	1. VECTORSCOPE setting; Set the EFFECTS Lever fully to the rear side.  PGM OUT-2 /rear panel Set PHASE and GAIN control (vectorscope) for correct RED phase and gain.	
	2. Chroma Signal Adjustment; Adjust ⊘CV5 so that the fluctation of RED spot become most minimize when the EFFECTS Lever is changed to rear side from front side two or three times.	⊘CV5/EF-9

EFFECT

9-3. BORDER BLACK LEVEL ADJUSTMENT

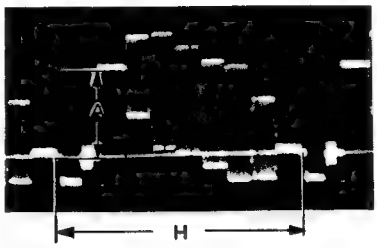
machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PST BUS selector; EFF • A BUS selector; # 2 • B BUS selector; # 2 • EFFECTS SELECT; WIPE ◻■ • SOFT/HARD/BORDER selector; BORDER • SOFTNESS/BORDER control; fully clockwise • LUM control; fully counterclockwise • EFFECTS lever; center	PGM OUT-1/rear panel  10 ± 10 mV  EXT TRIG; HD	⊘ RV10/EF-9

9-4. EFFECT KEY PULSE CLAMP LEVEL ADJUSTMENT

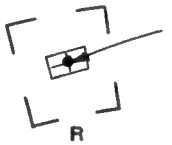
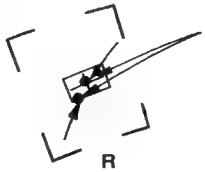
machine conditions for adjustment	measuring point	adjustment
• EFFECTS SELECT; WIPE ◻■ • EFFECTS lever; front side	CH1 TP17/EF-19 CH2 TP16/EF-9  850 ± 40 mVdc 0 Vdc (CH1 = CH2) EXT TRIG; HD	⊘ RV11/EF-9

9-5. C & D BUS VIDEO AMP ADJUSTMENT

9-5-1. C BUS Video Level Adjustment

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • A BUS selector; # 1 • B BUS selector; # 1 • EFFECTS Lever; rear side • PGM/PST MIX Lever; front side	1. Measuring of input signal level; Set PST BUS to EFF.  PGM OUT-1 /rear panel Measure the level of "A". EXT TRIG; HD	
	2. Video Level Adjustment; Set PST BUS to # 1. A ± 10 mV	⊘RV1/EF-8

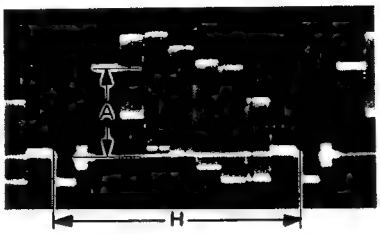
9-5-2. C BUS Chroma Signal Adjustment

machine conditions for adjustment	measuring point & adjustment
• A BUS selector; # 1 • B BUS selector; # 1 • EFFECTS lever; rear side • PGM/PST MIX lever; front side • PGM/PST switch; PST OPERATING MODE SELECTION /vectorscope **[SEG-2000A]** Depress the VECTOR pushbutton **[SEG-2000AP/APM]** Depress the NTSC pushbutton	1. VECTORSCOPE setting; Set PST BUS to "EFF".  RED spot Set PHASE and GAIN control (vectorscope) for correct RED phase and gain. PST OUT-2 /rear panel
	2. Chroma Signal Adjustment Change the PST bus to "# 1" and "EFF" alternately repeat two or three times. ⊘CV1/EF-8 ⊘DL1/EF-8 **[SEG-2000A]** Adjust the ⊘CV1 and ⊘DL1 alternately and repeatly so that the fluctation of RED spot become most minimize. **[SEG-2000APM]**  RED spot Adjust the ⊘CV1 and ⊘DL1 alternately and repeatly so that the RED spot become a dot.

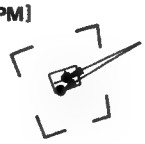
Note: (1) ⊘DL1; Delay Line with tap.
(2) Reference spec; GAIN less than 2.5%
PHASE less than 2.5°

EFFECT

9-5-3. D BUS Video Level Adjustment

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • A BUS selector; # 1 • B BUS selector; # 1 • EFFECTS lever; rear side • PGM/PST MIX lever; front side	1. Measuring of input signal level; Set PST BUS to EFF.  PGM OUT-1 /rear panel Measure the level of "A" EXT TRIG; HD	
	2. Video Level Adjustment Set PST BUS to # 1. A ± 10 mV	⊘RV2/EF-8

9-5-4. D BUS Chroma Signal Adjustment

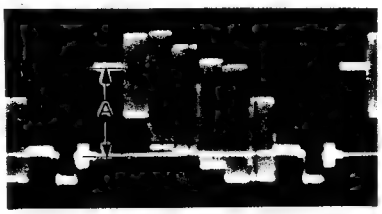
machine conditions for adjustment	measuring point & adjustment
• Same as preceading clause; OPERATING MODE SELECTION /vectorscope **[SEG-2000A]** Depress the VECTOR pushbutton **[SEG-2000AP/APM]** Depress the NTSC pushbutton	1. VECTORSCOPE setting; Set PST BUS to EFF.  RED spot. Set PHASE and GAIN control (vectorscope) for correct RED phase and gain. PGM OUT-2 /rear panel
	2. Chroma Signal Adjustment Change the PST bus to # 1 and EFF alternately repeat two or three times. ⊘CV2/EF-8 ⊘DL2/EF-8 **[SEG-2000A]** Adjust the ⊘CV2 and ⊘DL2 alternately and repeatly so that the fluctation of RED spot become most minimize. **[SEG-2000AP/APM]**  RED spot Adjust the ⊘CV2 and ⊘DL2 alternately and repeatly that the RED spot become a dot.

Note: (1) ⊘DL2; Delay Line with tap.
(2) Reference spec; PHASE less than 2.5°
GAIN less than 2.5%

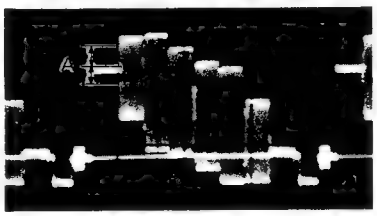
EFFECT

9-6. PGM/PST MIX AMP ADJUSTMENT

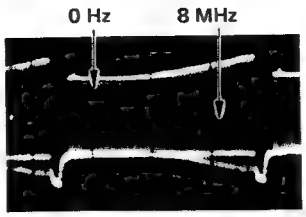
9-6-1. PGM BUS Video Level Adjustment

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM BUS selector; # 1 • PST BUS selector; # 1	1. Measuring of input signal level. Set the PGM/PST MIX Lever fully to front side. PGM OUT-1 /rear panel  Measure the level of "A" EXT TRIG; HD	
	2. Video Level Adjustment Set the PGM/PST MIX Lever fully to rear side. A ± 10 mV	⊘RV6/EF-9

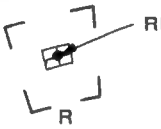
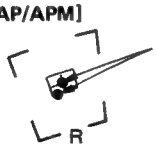
9-6-2. PGM BUS Balance Adjustment

machine conditions for adjustment	measuring point	adjustment
• Same as preceding clause;;	PGM OUT-1/rear panel  EXT TRIG; HD Adjust for no level fluctation of "A" when the PGM/PST MIX Lever is changed to front side from rear side two or three times. A = 0 ± 10 mV	⊘RV5/EF-9

9-6-3. PGM BUS Frequency Response Adjustment

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PST • PST BUS selector; # 5 (sweep signal) • PST BUS selector; # 2 (non-signal) • PGM/PST MIX lever; front side	TP13/EF-9  EXT TRIG; VD 0 Hz: Refer 8 MHz: ±20 mV	⊘ CV4/EF-9

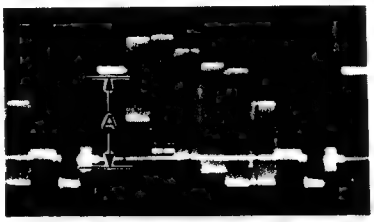
9-6-4. PGM BUS Chroma Signal Adjustment

machine conditions for adjustment	measuring point & adjustment
• PGM/PST switch; PST • PST BUS selector; # 1	1. VECTORSCOPE setting. Set the PGM/PST MIX Lever fully to front side.  RED spot Set PHASE and GAIN control (vectorscope) for correct RED phase and gain. PGM OUT-2 /rear panel
	2. Chroma Signal Adjustment, Change the PGM/PST MIX Lever fully to front side and rear side alternately and repeatly two or three times. **[SEG-2000A]** Adjust the ⊘ CV3/EF-9 so that the fluctation of RED spot become most minimize. **[SEG-2000AP/APM]**  RED spot Adjust the ⊘ CV3/EF-9 so that the RED spot become a dot.

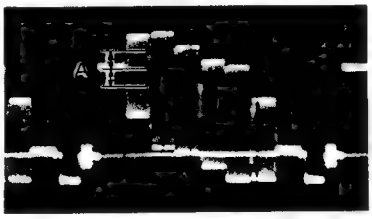
Note: Reference spec; GAIN less than 2.5%
PHASE less than 2.5°

EFFECT

9-6-5. PST BUS Video Level Adjustment

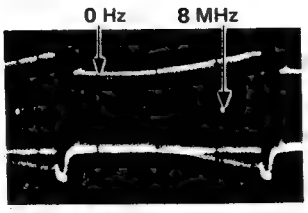
machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM BUS selector; # 1 • PST BUS selector; # 1	1. Measuring of input signal level. Set the PGM/PST MIX Lever fully to front side.  PST OUT-1 /rear panel EXT TRIG; HD Measure the level of "A"	
	2. Video Level Adjustment. Set the PGM/PST MIX Lever fully to rear side. A ± 10 mV	⊘RV2/EF-9

9-6-6. PST BUS Balance Adjustment

machine conditions for adjustment	measuring point	adjustment
• Same as preceding clause;	 PST OUT-1 /rear panel EXT TRIG; HD Adjust for no level fluctation of "A" when the PGM/PST MIX Lever is changed to front side from rear side two or three times. A = 0 ± 20 mV	⊘RV1/EF-9

EFFECT

9-6-7. PST BUS Frequency Response Adjustment

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM BUS selector; # 5 (sweep signal) • PGM/PST MIX Lever; front side	TP3/EF-9  EXT TRIG; VD 0 Hz: Refer 8 MHz: ±20 mV	⊘ CV2/EF-9

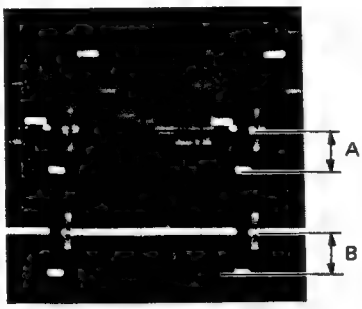
9-6-8. PST BUS Chroma Signal Adjustment

machine conditions for adjustment	measuring point & adjustment
• PGM/PST switch; PGM • PGM BUS selector; # 1 • PST BUS selector; # 1	1. VECTORSCOPE setting; Set the PGM/PST MIX Lever fully to front side. PST OUT-2 /rear panel  RED spot Set PHASE and GAIN control (vectorscope) for correct RED phase and gain.
	2. Chroma Signal Adjustment Change the PGM/PST MIX Lever fully to front side and rear side alternately and repeatly two or three times. **[SEG-2000A]** Adjust the ⊘ CV1/EF-9 so that the fluctation of RED spot become most minimize. **[SEG-2000AP/APM]**  RED spot Adjust the ⊘ CV1/EF-9 so that the RED spot become a dot.

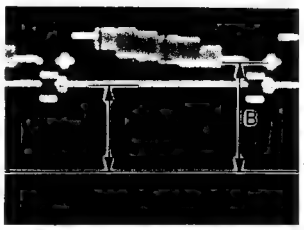
9-7. BURST REPLACEMENT AMP ADJUSTMENT

Note: Perform the sec. 8-4 Black Burst Adjustment (1) and the sec. 8-5 Black Burst Adjustment (2) befor starting this adjustment.

9-7-1. Black Burst Sync Level Adjustment

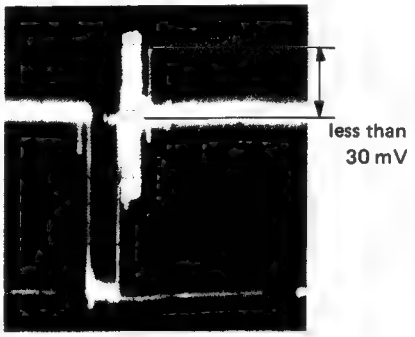
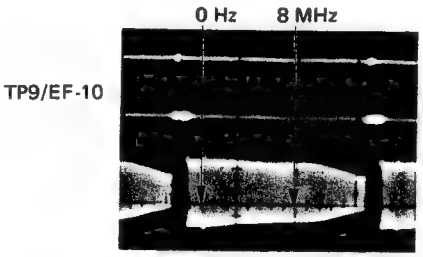
machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM BUS selector; # 1 • PGM/PST MIX Lever; front side	CH1; TP6/EF-10 ├CHOP mode CH2; TP4/EF-10  EXT TRIG; HD B = A ± 10 mV	⊘RV4/EF-10

9-7-2. PGM BUS Clamp Level Adjustment

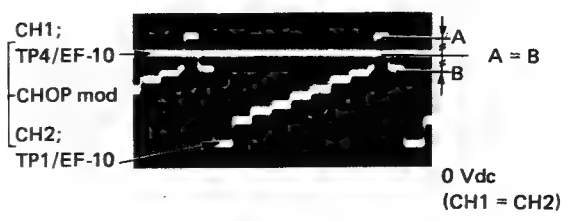
machine conditions for adjustment	measuring point	adjustment
• Same as preceding clause;	CH2; TP6/EF-10 ├CHOP mode CH1; TP4/EF-10  0 Vdc (CH1=CH2) EXT TRIG; HD A = B ± 10 mVdc	⊘RV5/EF-10

EFFECT

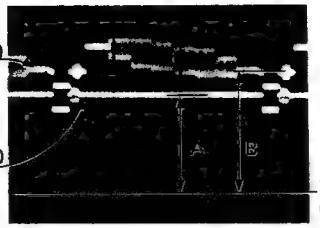
9-7-3. PGM BUS Burst Replacement Adjustment

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM/PST MIX Lever; front side • PGM BUS selector; # 2 (non-signal)	1. Gain Adjustment  EXT TRIG; HD	⊘ RV7/EF-10
	2. Balance Adjustment  	⊘ RV6/EF-10
• PGM/PST switch; PGM • PGM BUS selector; # 5 (sweep signal) • PGM/PST MIX Lever; rear side	3. Frequency Response Adjustment  0 Hz | 8 MHz Refer | ±20 mV EXT TRIG; VD	⊘ CV4/EF-10

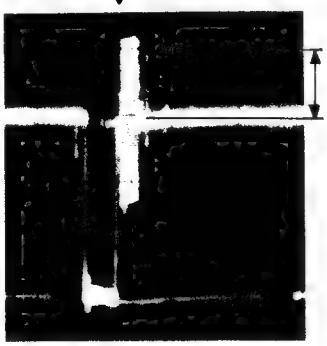
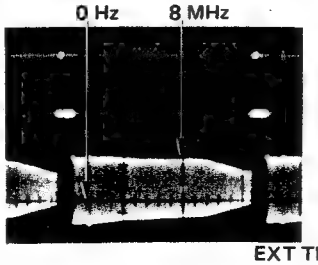
9-7-4. PST BUS Clamp Level Adjustment

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM BUS selector; # 1 • PGM/PST MIX Lever; front side	 EXT TRIG; HD	⊘ RV1/EF-10

9-7-5. Sync (2) Level Adjustment

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM BUS selector; # 1 • PGM/PST MIX Lever; front side	CH2; TP12/EF-10 CH1; TP11/EF-10  0 Vdc (CH1 = CH2) EXT TRIG; HD A = B ± 20 mVdc	⊘RV11/EF-10

9-7-6. PST BUS Burst Replacement Adjustment

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM BUS selector; # 2 (non-signal) • PGM/PST MIX Lever; front side	1. Gain Adjustment PST OUT-1 /rear panel  10 ± 10 mV EXT TRIG; HD	⊘RV3/EF-10
	2. Balance Adjustment  less than 30 mV	⊘RV2/EF-10
	3. Frequency Response Adjustment 0 Hz 8 MHz TP5/EF-10  EXT TRIG; VD	⊘CV2/EF-10

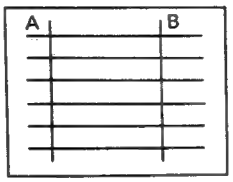
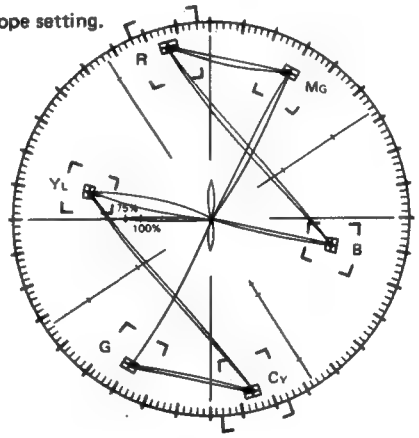
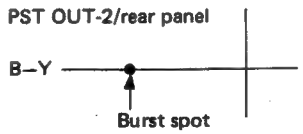
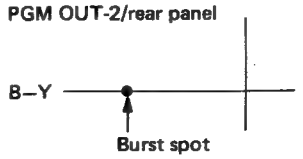
0 Hz	8 MHz
Refer	±20 mV

EFFECT

9-7-7. Burst Phase Adjustment

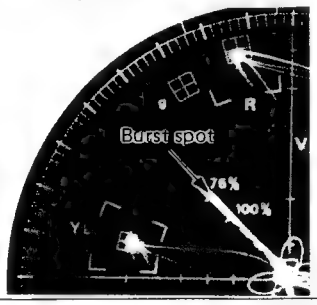
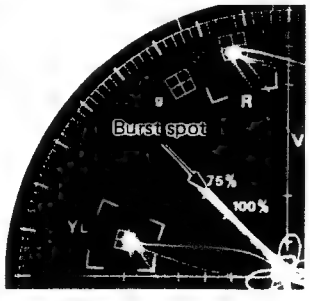
Note: Perform the sec. 7-5 SC Phase Indication Adjustment (1) before starting this adjustment.

[For SEG-2000A use]

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM BUS selector; # 1 • PST BUS selector; # 1 • PGM/PST MIX Lever; front side • SC PHASE 0°/180° switch/rear panel; 0° • PHASE INDICATION switch; ON	1. SC PHASE INDICATION Adjustment ● RV8/EF-10 ⟶ fully to counterclockwise monitor PST OUT-2 /rear panel  **step 1.** Adjust the ● RV9 to voluntary position so that the longitudinal line of "B" is appeared on monitor screen. **step 2.** Adjust the ● SC PHASE so that the longitudinal line of "B" is most nearly to the longitudinal line of "A".	● RV9/EF-10 ● SC PHASE/rear panel
	2. Vectorscope setting.  Set the "PHASE" (vectorscope) so that the each chroma spot come within specified each zone.	
	3. PST BUS Burst Phase Adjustment PST OUT-2/rear panel  Adjust so that the Burst spot comes on B–Y 180° Axis.	● CV1/EF-10
	4. PGM BUS Burst Phase Adjustment PGM OUT-2/rear panel  **step 1.** Perform the (2) Vectorscope setting. **step 2.** Adjust so that the Burst spot comes on B–Y 180° Axis.	● CV3/EF-10

EFFECT

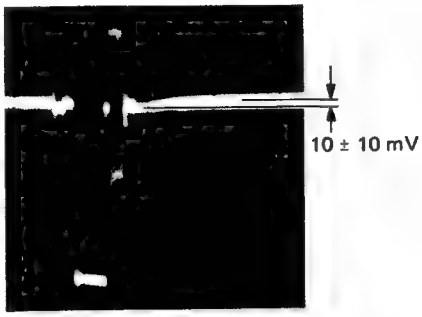
[For SEG-2000AP/APM]

machine conditions for adjustment	measuring point & adjustment
• PGM/PST switch; PGM • PGM BUS selector; # 1 • PST BUS selector; # 1 • PGM/PST MIX Lever; front side • SC PHASE 0°/180° switch; 0° • PHASE INDICATION switch; ON OPERATING MODE SELECTION /vectorscope; NTSC mode	1. SC PHASE INDICATION Adjustment; Same as adjustment for SEG-2000A use.
	2. Vectorscope setting; Set the "PHASE (Vectorscope)" so that the chroma spots of ±V come within specified each zone "⊞". 
	3. PST BUS Burst Phase Adjustment PST OUT-2 /rear panel  Adjust the ◐ CV1/EF-10 so that the Burst spot become a dot.
	4. PGM BUS Burst Phase Adjustment PGM OUT-2 /rear panel  Adjust the ◐ CV3/EF-10 so that the Burst spot become a dot.

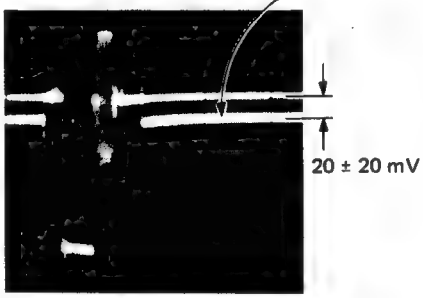
EFFECT

9-8. DSK AMP ADJUSTMENT

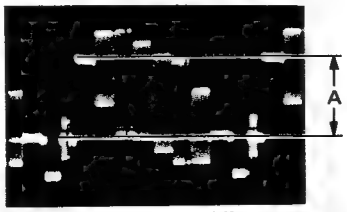
9-8-1. PGM BUS Clamp Level Adjustment

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM BUS selector; # 2 (non-signal) • DSK KEY LEVEL control; fully to clockwise • INSERT LEVEL control; fully to counterclockwise • NORMAL/INVERT switch; NORMAL • PGM CUT IN/OUT switch; ON	PGM OUT-1 /rear panel  10 ± 10 mV EXT TRIG; HD	⊘ RV7/DK-4

9-8-2. PGM BUS Balance Adjustment

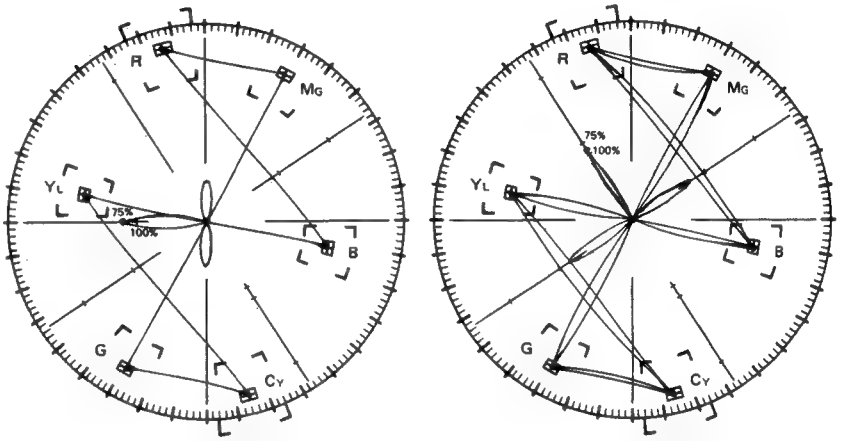
machine conditions for adjustment	measuring point	adjustment
Same as preceding clause; ↓ • PGM CUT IN/OUT switch; OFF	Operate the "PGM ⟷ INSERT" control to rear side from front side alternately two or three times. Black Level PGM OUT-1 /rear panel  20 ± 20 mV EXT TRIG; HD	⊘ RV8/DK-4

9-8-3. PGM BUS Video Level Adjustment

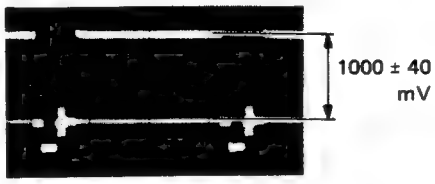
machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM BUS selector; # 1 • PGM/PST MIX Lever; front side	1. Measuring of Input signal level VIDEO OUT-1 /rear panel  A Measure the level of "A" EXT TRIG; HD	
	2. Video Level Adjustment PGM OUT-1/rear panel A ± 10 mV	⊘ RV9/DK-4

9-8-4. PGM BUS Frequency Response Adjustment

Note: Be sure that the Input video signal is the correct 75% color bar signal.

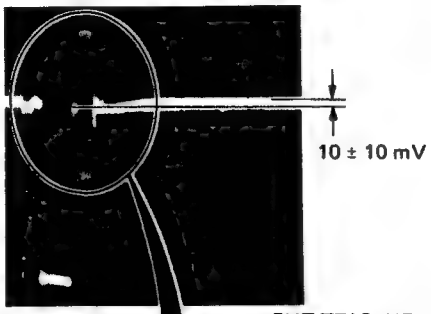
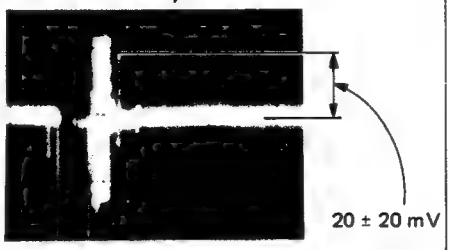
machine conditions for adjustment	measuring point & adjustment
• PGM/PST switch; PGM • PGM BUS selector; # 1 • PGM/PST MIX Lever; front side	PGM OUT-2/rear panel.  [SEG-2000A] [SEG-2000AP/APM] Adjust the ◐ CV2/DK-4 so that the each chroma spots come within specified each zone. " ⊞ ".

9-8-5. INSERT Level Adjustment

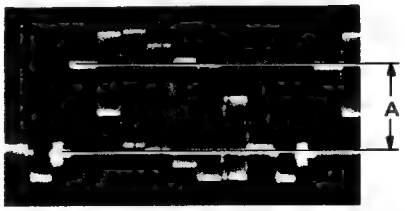
machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM BUS selector; # 2 (non-signal) • DSK KEY LEVEL control; fully to clockwise • NORMAL/INVERT switch; NORMAL • PGM CUT IN/OUT switch; ON	PGM OUT-1 /rear panel  EXT TRIG; HD	◐ RV1/DK-4

EFFECT

9-8-6. PST BUS Clamp Level Adjustment

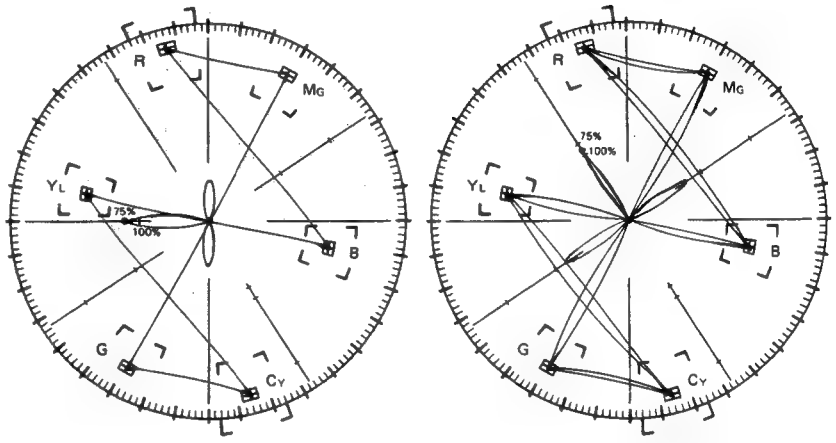
machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PST • PST BUS selector; # 2 (non-signal) • PST CUT IN/OUT switch; ON • NORMAL/INVERT switch; NORMAL • DSK KEY LEVEL control; fully to clockwise • INSERT LEVEL control; fully to counterclockwise	1. Clamp Level Adjustment PST OUT-1 /rear panel  	⊘ RV3/DK-4
	2. Balance Adjustment  	⊘ RV4/DK-4

9-8-7. PST BUS Video Level Adjustment

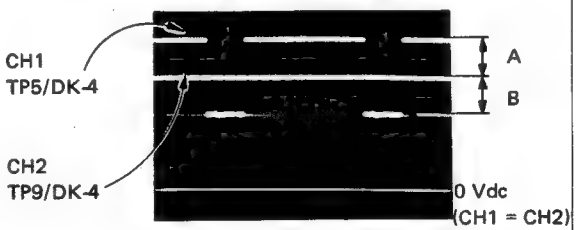
machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PST • PST BUS selector; # 1 • PGM/PST MIX Lever; front side	1. Measuring of Input signal level. VIDEO OUT-1 /rear panel  Measure the level of "A" EXT TRIG; HD	
	2. Video Level Adjustment PST OUT-1/rear panel A ± 10 mV	⊘ RV5/DK-4

9-8-8. PST BUS Frequency Response Adjustment

Note: Be sure that the Input video signal is the correct 75% color bar signal.

machine conditions for adjustment	measuring point & adjustment
• PGM/PST switch; PST • PST BUS selector; # 1 • PGM/PST MIX Lever; front side	PST OUT-2/rear panel  [SEG-2000A] [SEG-2000AP/APM] Adjust the ◐CV1/DK-4 so that the each chroma spots come within specified each zone "⊞".

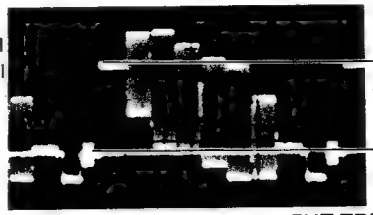
9-8-9. DSK Key Pulse Clamp Level Adjust

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PST BUS selector; Except AUX • DSK KEY LEVEL control; fully to clockwise • NORMAL/INVERT switch; NORMAL • SHADOW switch; OFF • PST CUT IN/OUT switch; ON	 A = B	◐RV2/DK-4

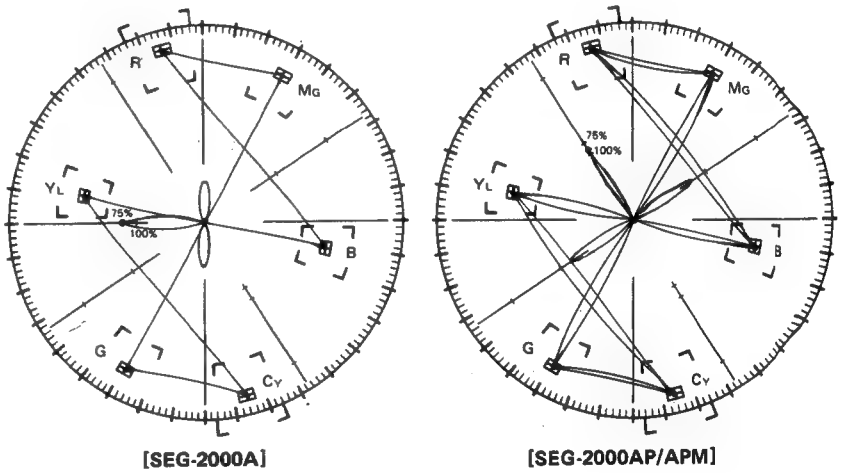
EFFECT

9-9. AUX AMP ADJUSTMENT

9-9-1. AUX Video Level Adjustment

machine conditions for adjustment	measuring point	adjustment
• PGM/PST switch; PGM • PGM BUS selector; AUX AUX IN; 75% color bar signal	PGM OUT-1 /rear panel  775 ± 10 mV EXT TRIG; HD	◐ RV10/EF-10

9-9-2. AUX Frequency Response Adjustment

machine conditions for adjustment	measuring point & adjustment
Same as preceding clause.	PGM OUT-2/rear panel  [SEG-2000A] [SEG-2000AP/APM] Adjust the ◐ CV5/EF-10 so that the each chroma spots come within specified each zone. "⊞".

EFFECT

9-10. DG·DP ADJUSTMENT

[Equipment Required]

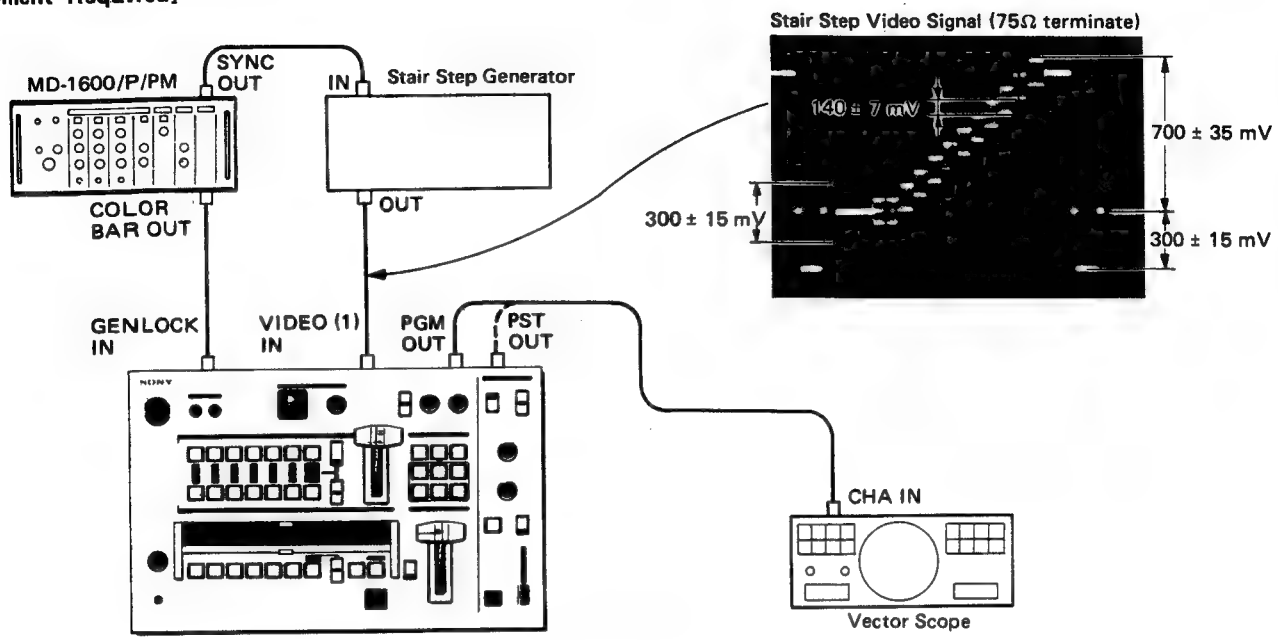


Fig. 9-3. Connection & ten-step modulated staircase linearity signal

[DG·DP MEASUREMENT]

Note: Make use of Tektronix type 520A.

1. DG (DIFF. GAIN) Measurement

Change the signal source to the ten-step modulated-staircase linearity signal; see Fig. 9-3. Depress VECTOR pushbutton, change the CHANNEL A GAIN switch to MAX GAIN, and adjust CHANNEL A GAIN control to place the staircase vector tip on the outer ring of the vector graticule (disregard the burst vector). Check that Aϕ, FULL FIELD and CH A pushbuttons are still engaged. Depress the Y pushbutton. A luminance staircase waveform is displayed.

Depress the DIFF GAIN pushbutton and use the VERT POSITION control to place the left side of the trace on the 0 graticule line (scale on right). Each vertical marker indicates one linearity step, making it possible to measure differential gain between any two points on the staircase.

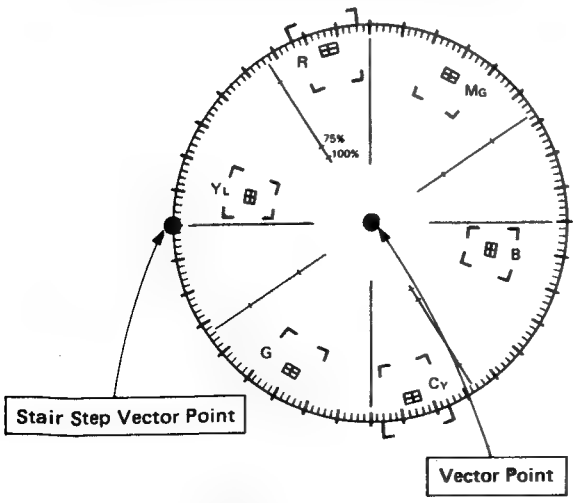


Fig. 9-4. Ten-step luminance staircase waveform

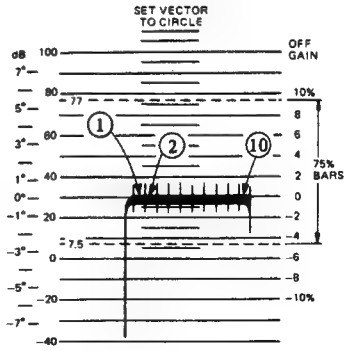


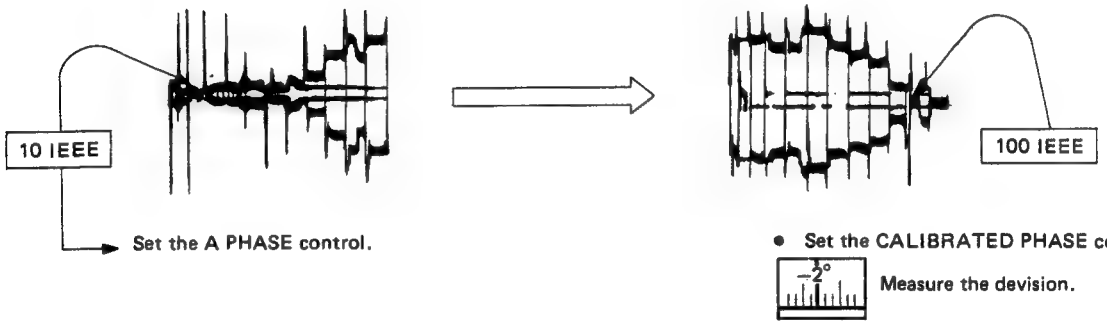
Fig. 9-5. No differential gain over a ten-step staircase

2. DP (DIFF. PHASE) Measurement

Depress the VECTOR pushbutton, set the CHANNEL A gain switch to MAX GAIN and adjust the GAIN control to place the staircase vector on the graticule outer ring (disregard the burst vector). Set the CALIBRATED PHASE dial to 0. Set the DIFF PHASE slide switch to DOUBLE. Depress the DIFF PHASE pushbutton and adjust the CHANNEL A PHASE control for a null at the first staircase step.

Differential phase may be measured peak to peak, from the first step (black level) to the last step (white level) or step to step. If a ramp waveform is used, the measurement should be made from the initial null to the peak amplitude.

Since a null is now present at the black level, simply adjust the CALIBRATED PHASE control until a null occurs at the point where the differential phase is to be measured. The CALIBRATED PHASE dial now reads the differential phase between the black level and the selected level. If differential phase between two other points is to be made, null one of the levels and read the dial, then null the other level and subtract the smaller reading from the larger to provide the differential phase between the two levels.



9-10-1. PGM BUS DG·DP Adjustment

machine conditions for adjustment	measuring point	adjustment
• A BUS selector; # 1 • B BUS selector; # 1 • EFFECTS SELECT; MIX • EFFECTS Lever; rear side • PGM/PST MIX Lever; rear side	PGM OUT-1/rear panel Spec. APL / DG / DP 10% / less than 1.5% / less than 1.5° 90% / less than 1.5% / less than 1.5° The specified value should be satisfied whenever the PGM BUS is in the # 1 and # EFF position.	⊘ RV10/DK-4

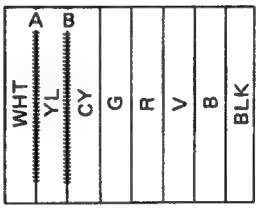
9-10-2. PST BUS DG·DP Adjustment

machine conditions for adjustment	measuring point	adjustment
• Same as preceding clause;	PST OUT-1/rear panel Spec. APL / DG / DP 10% / less than 1.5% / less than 1.5° 90% / less than 1.5% / less than 1.5° The specified value should be satisfied whenever the PST BUS is in the # 1 and # EFF position.	⊘ RV6/DK-4

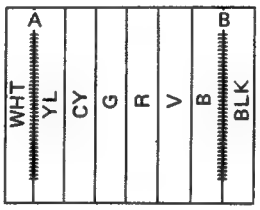
9-11. SC PHASE INDICATION ADJUSTMENT (2)

Note: Perform the sec. 7-5 SC PHASE INDICATION Adjustment (1) before starting this adjustment.

9-11-1. Bias Adjustment

machine conditions for adjustment	measuring point	adjustment
• PST BUS selector; # 1 • PGM BUS selector; # 1 • PGM/PST switch; PGM • PGM/PST MIX Lever; front side • PHASE INDICATION switch; ON • SC PHASE 0°/180° switch/rear panel; 0°	PST OUT-2/rear panel monitor  **step 1.** Set the ⊘ SC PHASE/rear panel so that the longitudinal line of "B" nears to the most left side. **step 2.** Adjust the ⊘ RV9 so that the longitudinal line of "B" is positioned between Yellow and Cyanogen.	⊘ RV9/EF-10

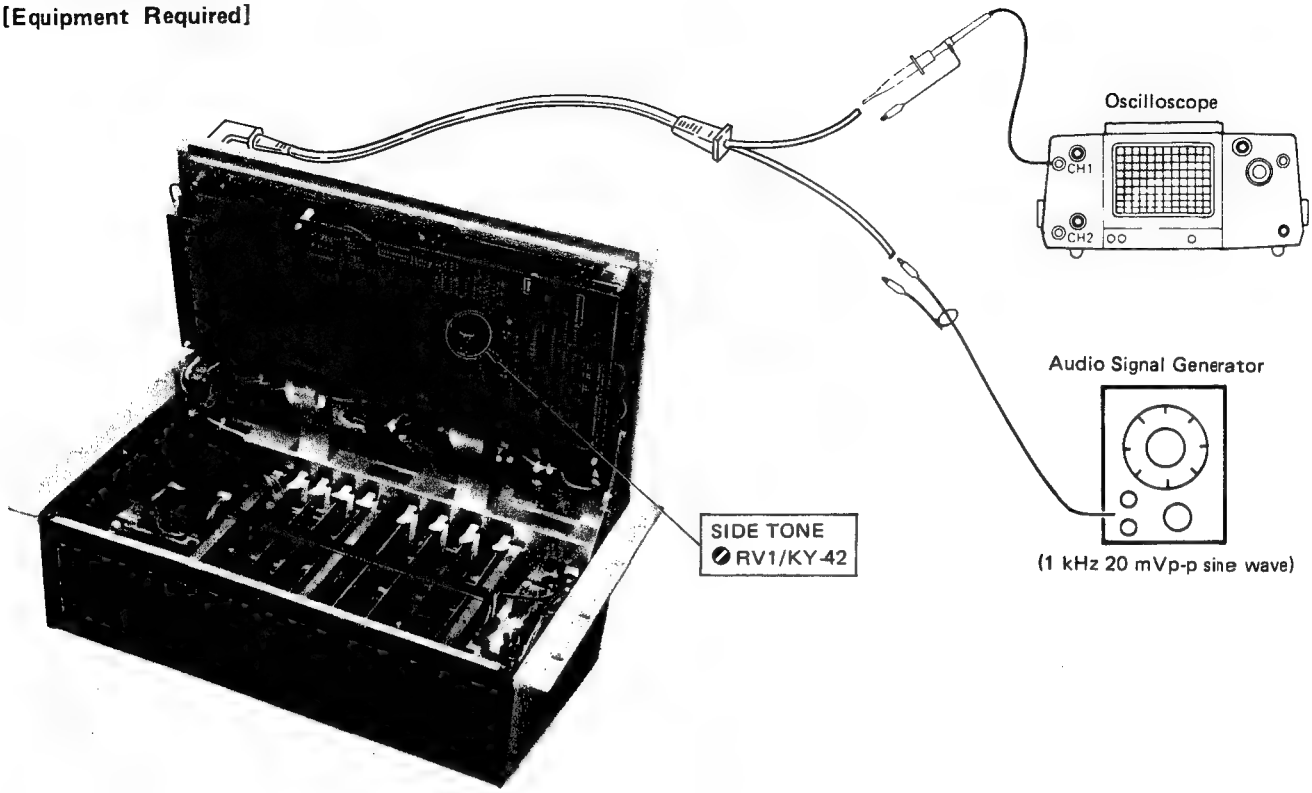
9-11-2. Limit Level Adjustment

machine conditions for adjustment	measuring point	adjustment
Same as preceding clause; ⬇ • SC PHASE 0°/180° switch/ rear panal; 180°	PST OUT-2/rear panel monitor  **step 1.** Set the ⊘ SC PHASE/rear panel so that the longitudinal line of "B" nears to the most right side. **step 2.** Adjust the ⊘ RV12 so that the longitudinal line of "B" is positioned between BLUE and BLACK.	⊘ RV12/EF-10

EFFECT

9-12. INTERCOM LEVEL ADJUSTMENT

[Equipment Required]

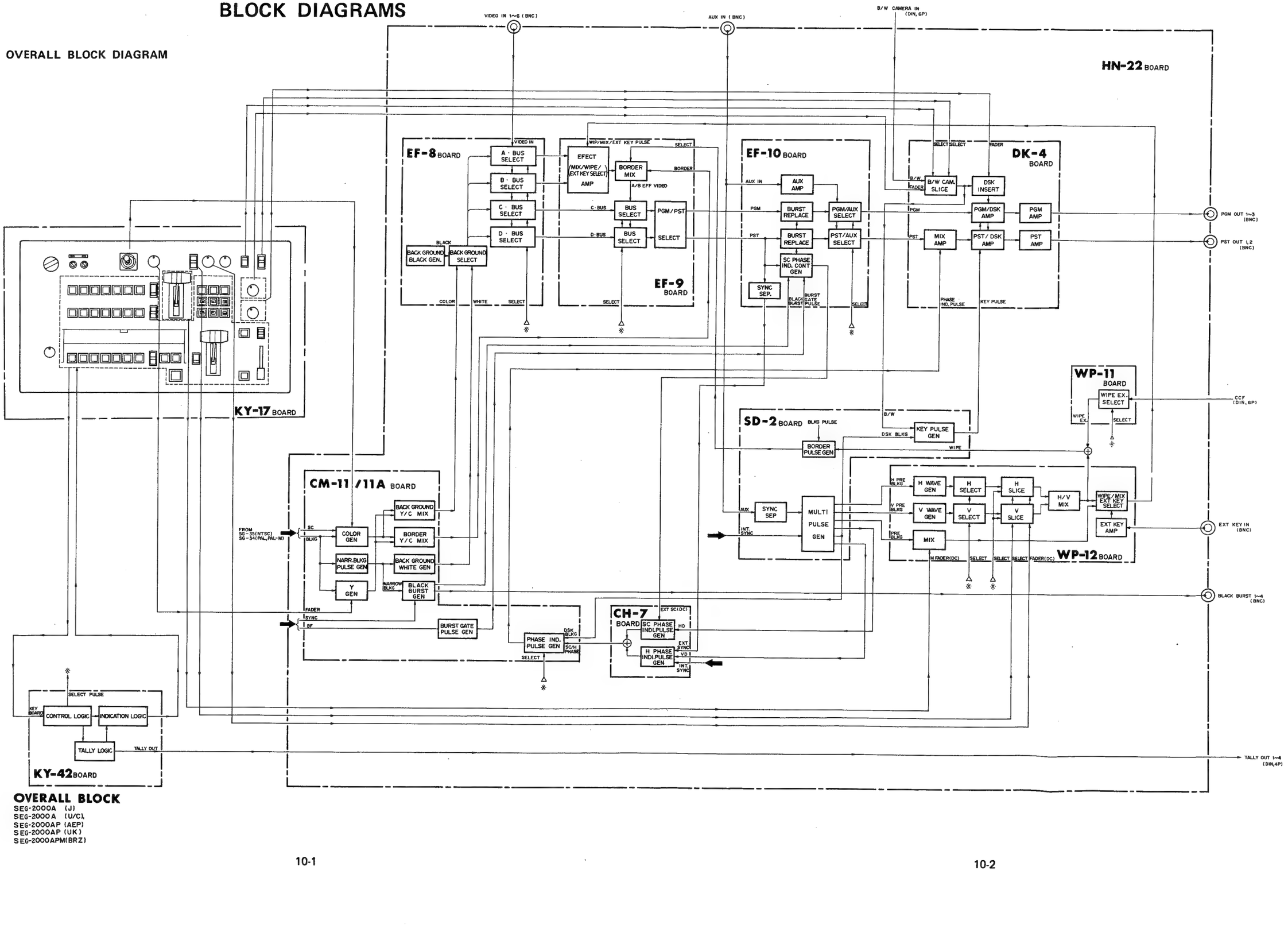


machine conditions for adjustment	measuring point	adjustment
INTERCOM LEVEL control; fully to clockwise	INTERCOM OUT/Phone Jack 5.2V ± 0.1Vp-p	RV1/KY-42

EFFECT

SECTION 10
BLOCK DIAGRAMS

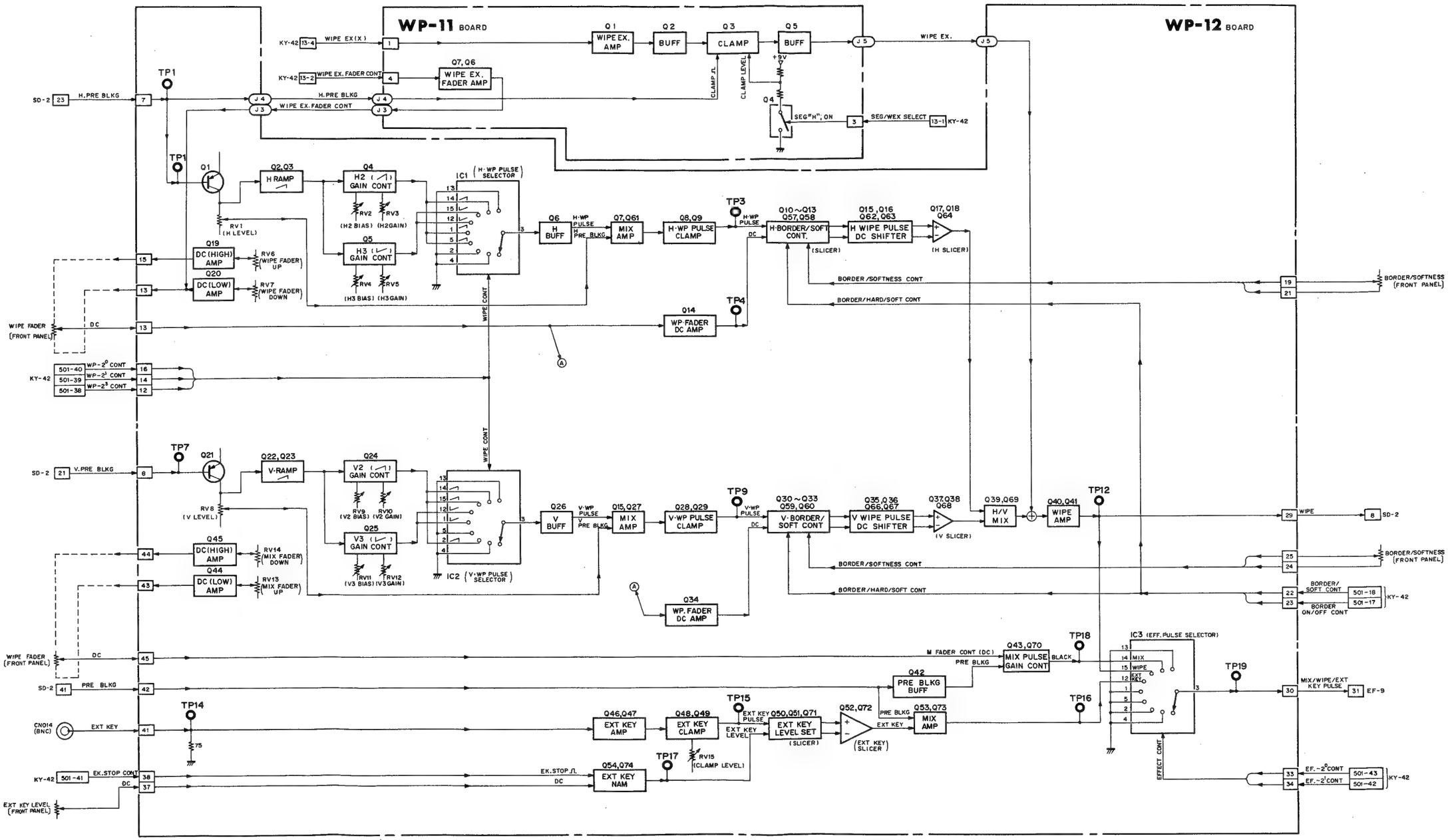
OVERALL BLOCK DIAGRAM



OVERALL BLOCK

SEG-2000A (J)
SEG-2000A (U/C),
SEG-2000AP (AEP)
SEG-2000AP (UK)
SEG-2000APM(BRZ)

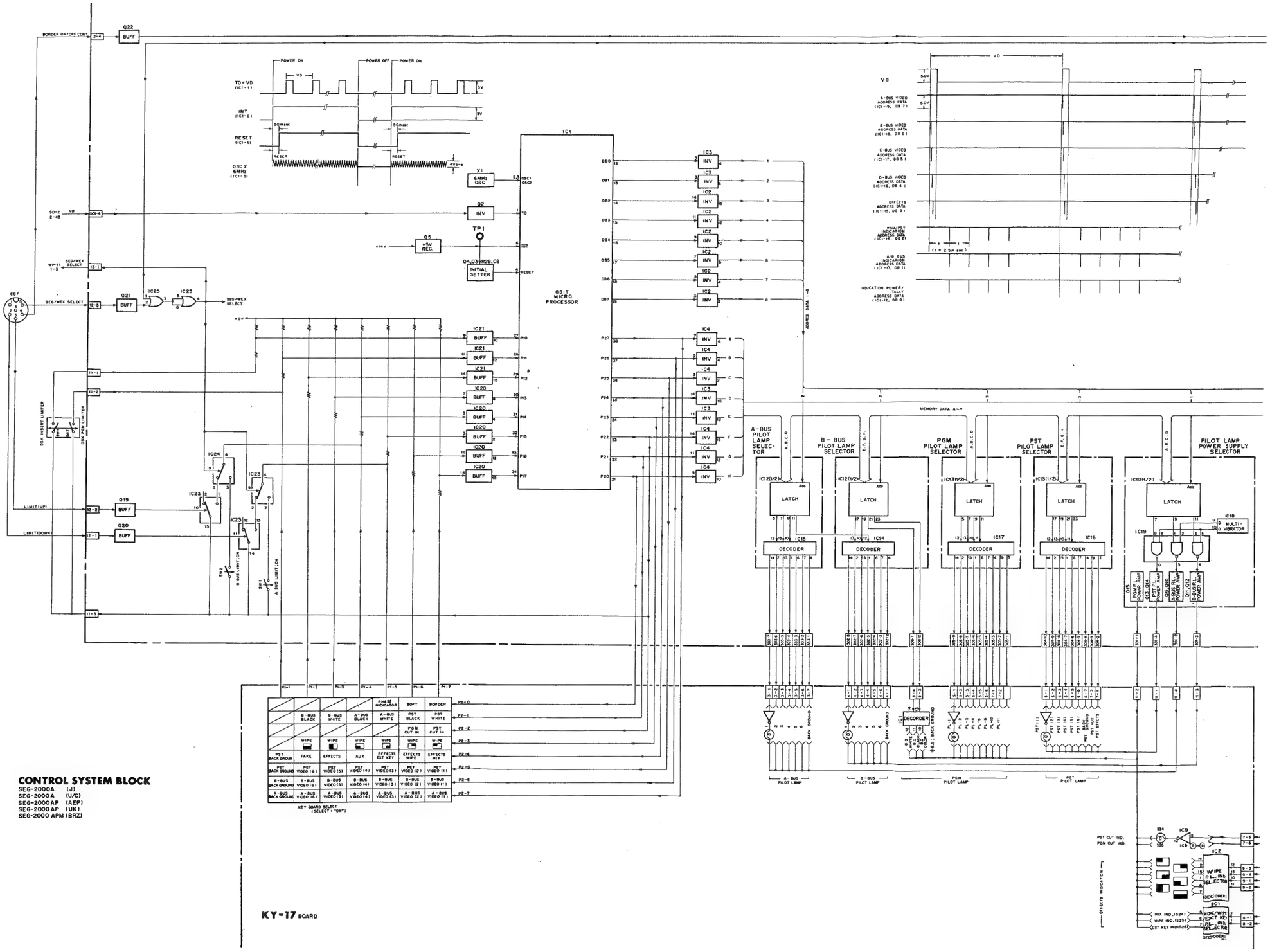
WIPE SYSTEM BLOCK DIAGRAM



WIPE SYSTEM BLOCK

SEG-2000A (J)
SEG-2000A (U/C)
SEG-2000AP (AEP)
SEG-2000AP (UK)
SEG-2000APM(BRZ)

CONTROL SYSTEM BLOCK DIAGRAM

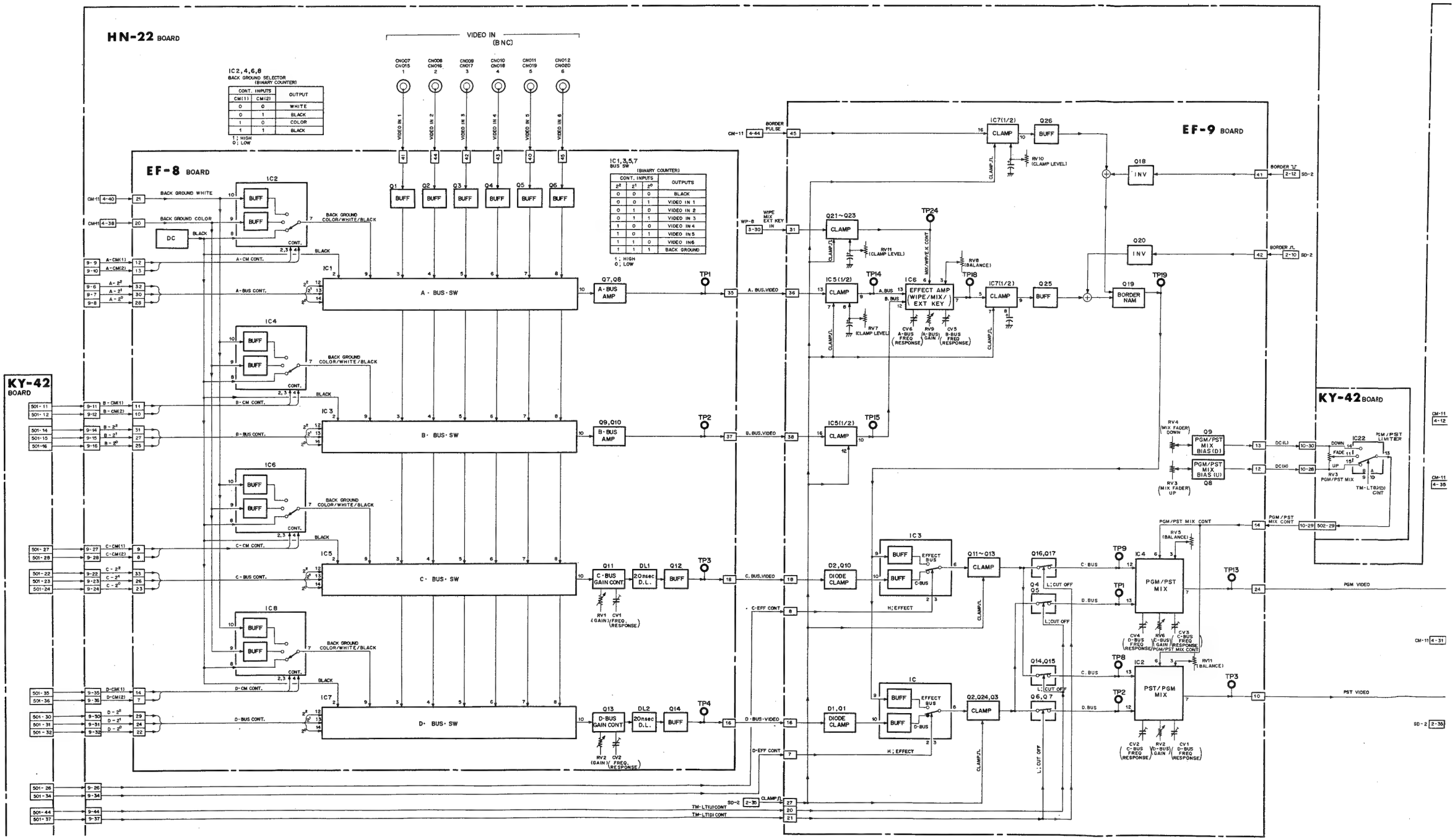


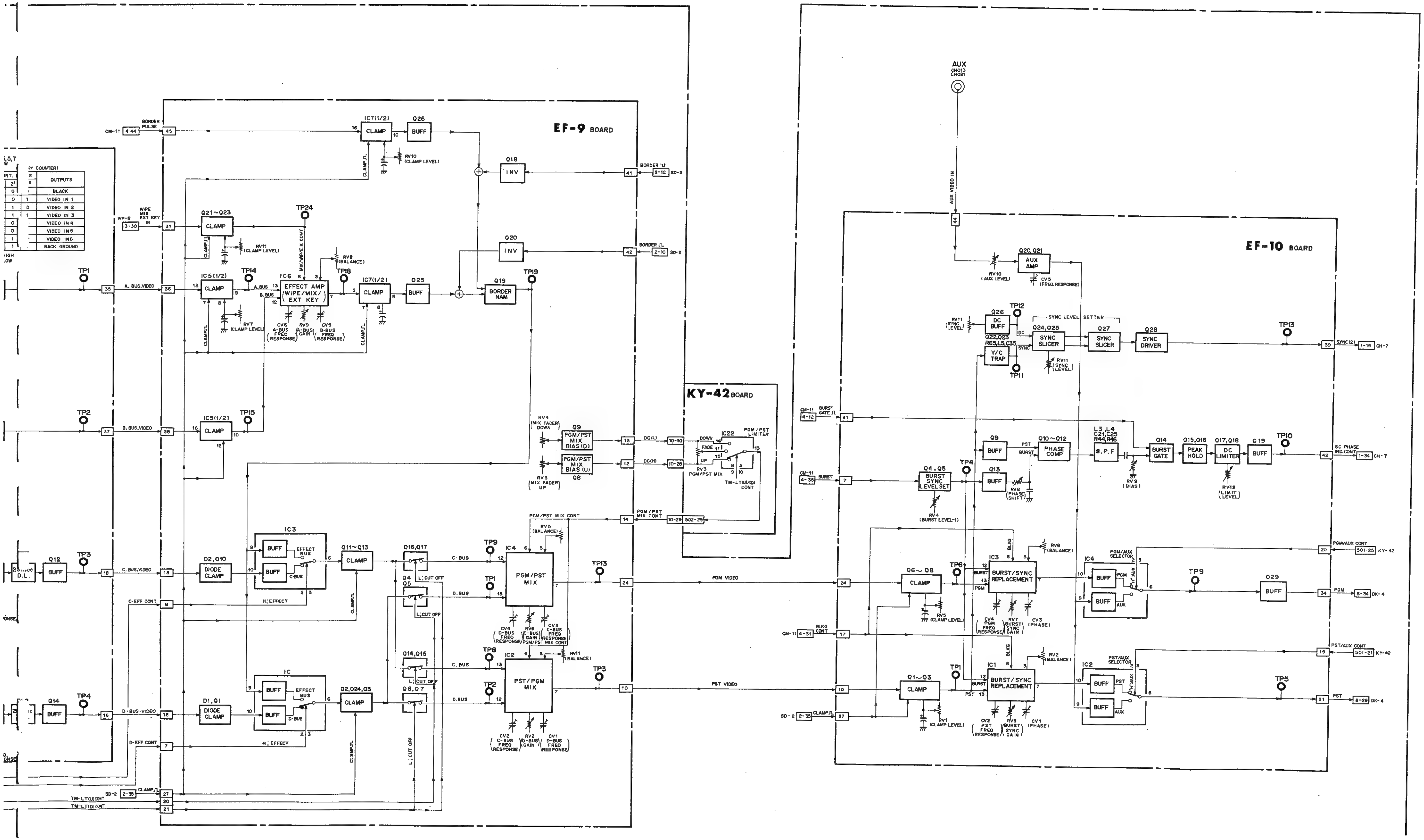
CONTROL SYSTEM BLOCK
SEG-2000A (J)
SEG-2000A (U/C)
SEG-2000AP (AEP)
SEG-2000AP (UK)
SEG-2000APM (BRZ)

KY-17 BOARD

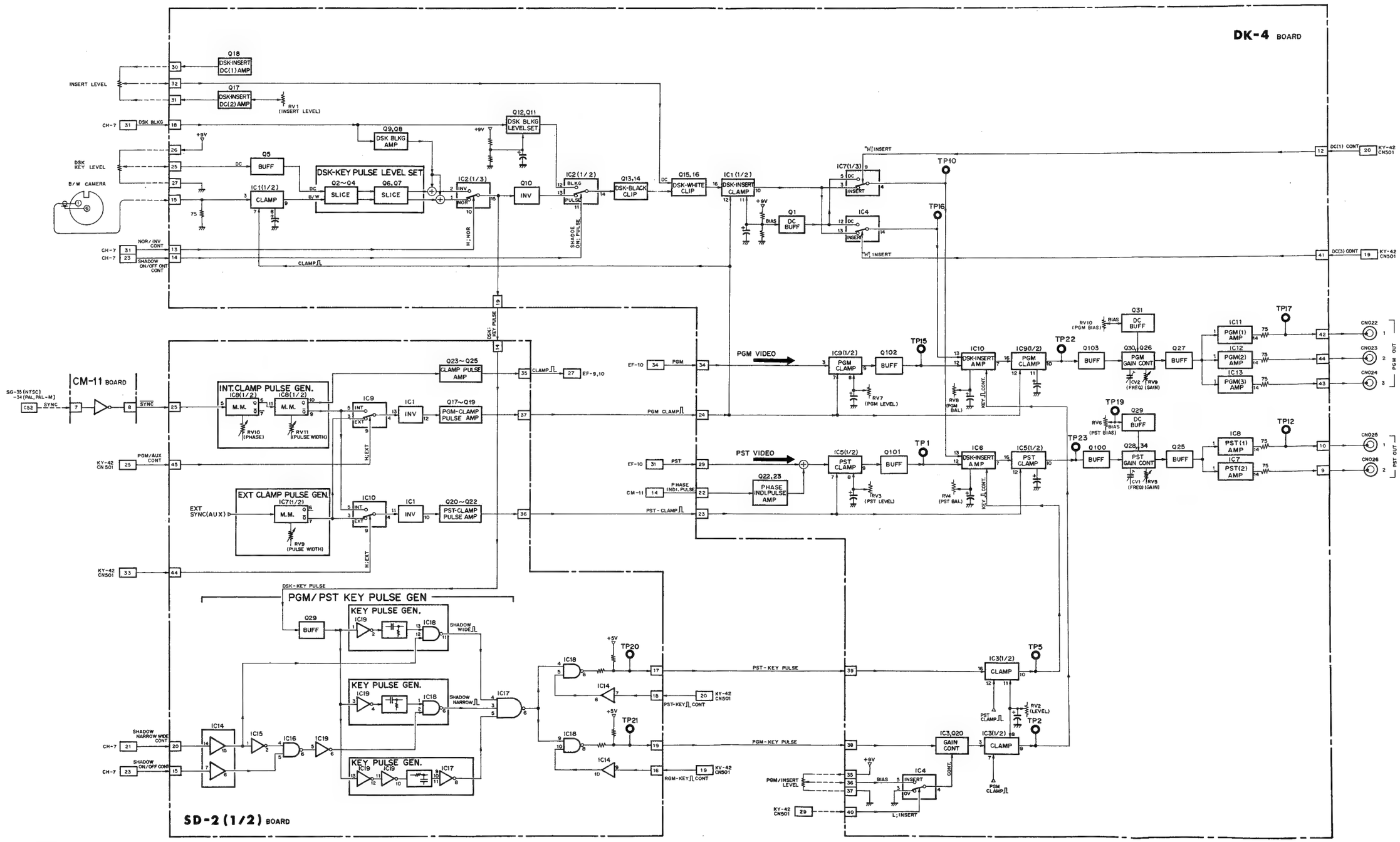
KY-42 BOARD

SPECIAL EFFECT VIDEO SIGNAL SYSTEM BLOCK DIAGRAM




EF-9 BOARD
KY-42 BOARD
EF-10 BOARD
AUX
CLAMP
BUFF
INV
BORDER NAM
EFFECT AMP (WIPE/MIX/ EXT KEY)
PGM/PST MIX BIAS(D)
PGM/PST MIX BIAS (U)
PGM/PST MIX
PST/PGM MIX
DIODE CLAMP
AUX AMP
DC BUFF
SYNC SLICER
SYNC DRIVER
Y/C TRAP
PHASE COMP
B.P.F
BURST GATE
PEAK HOLD
DC LIMITER
BURST SYNC LEVEL SET
BURST/SYNC REPLACEMENT
PGM VIDEO
PST VIDEO

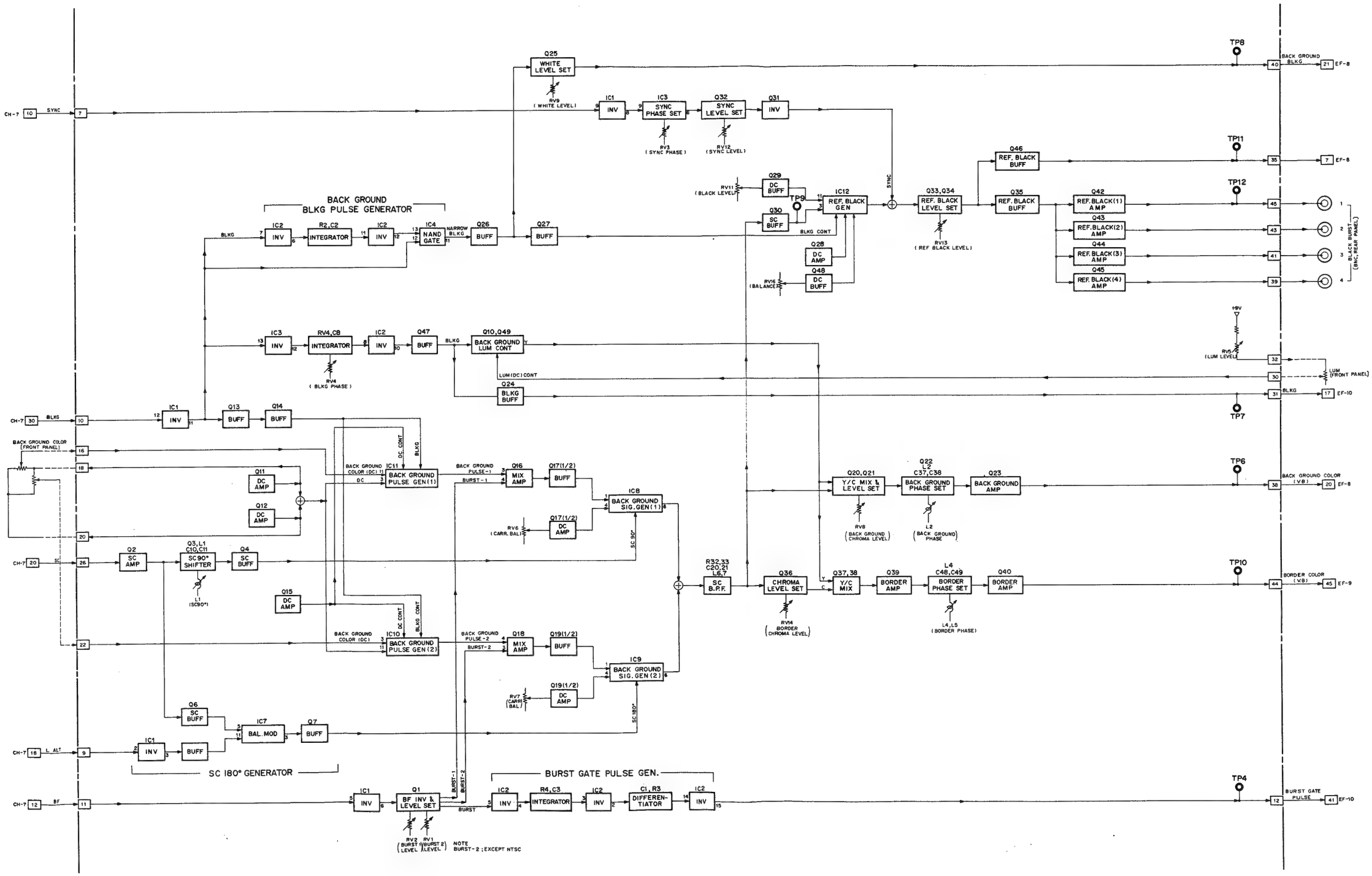
DOWNSTREAM KEYER SYSTEM BLOCK DIAGRAM



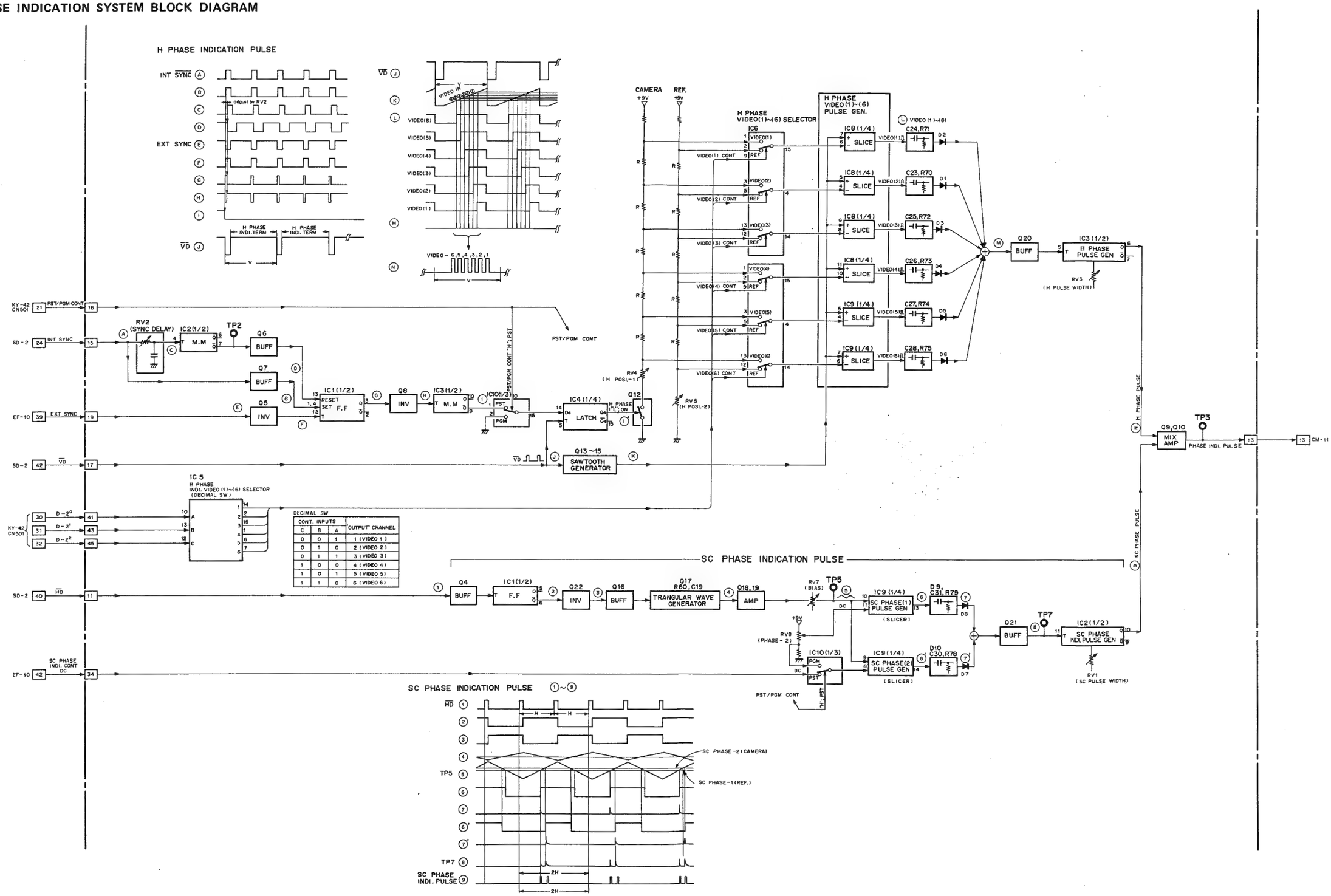
DOWNSTREAM KEYER SYSTEM BLOCK

SEG-2000A (J)
SEG-2000A (U/C)
SEG-2000 AP (AEP)
SEG-2000 AP (UK)
SEG-2000 APM(BRZ)

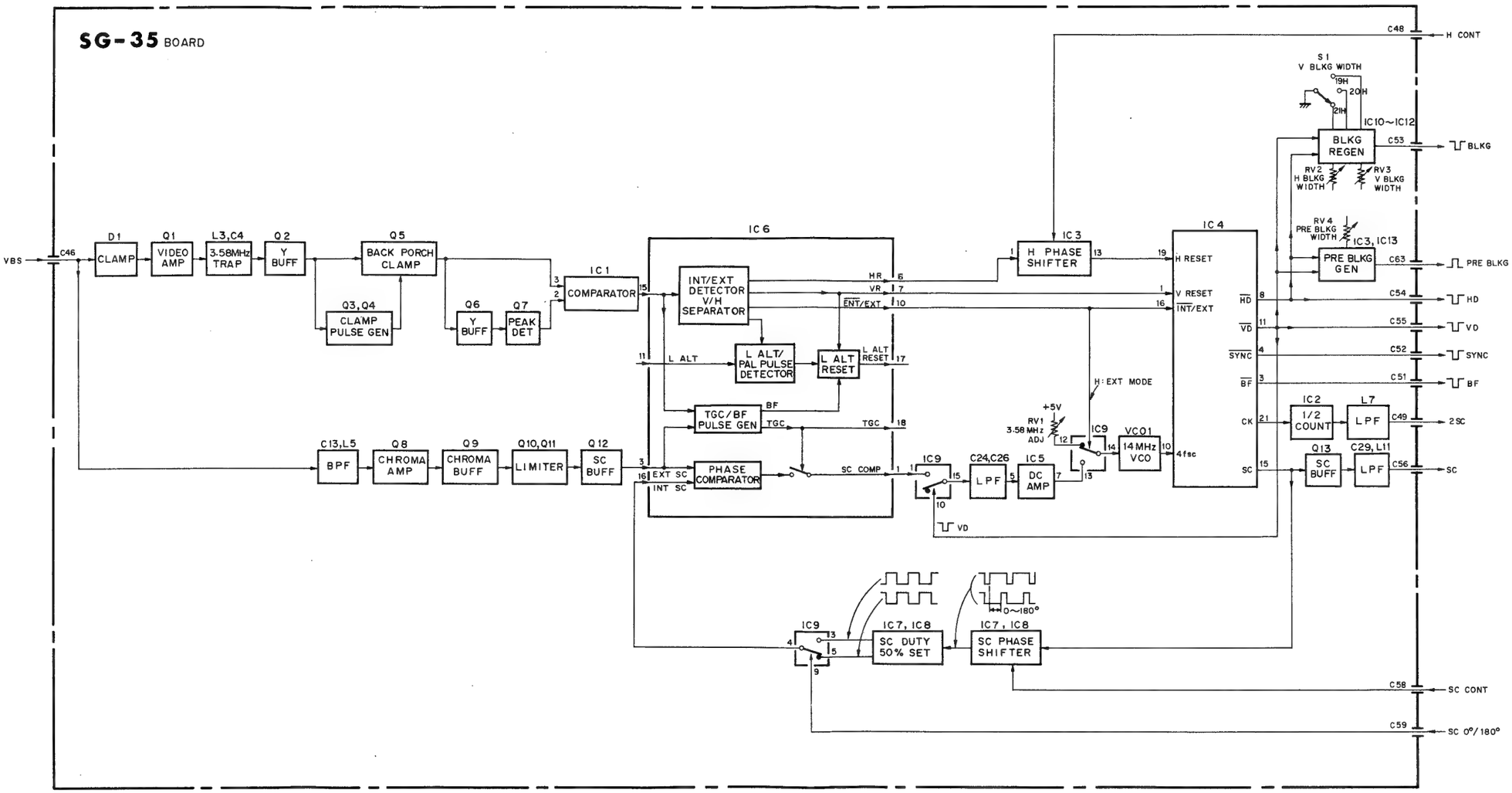
BACK GROUND COLOR SYSTEM BLOCK DIAGRAM



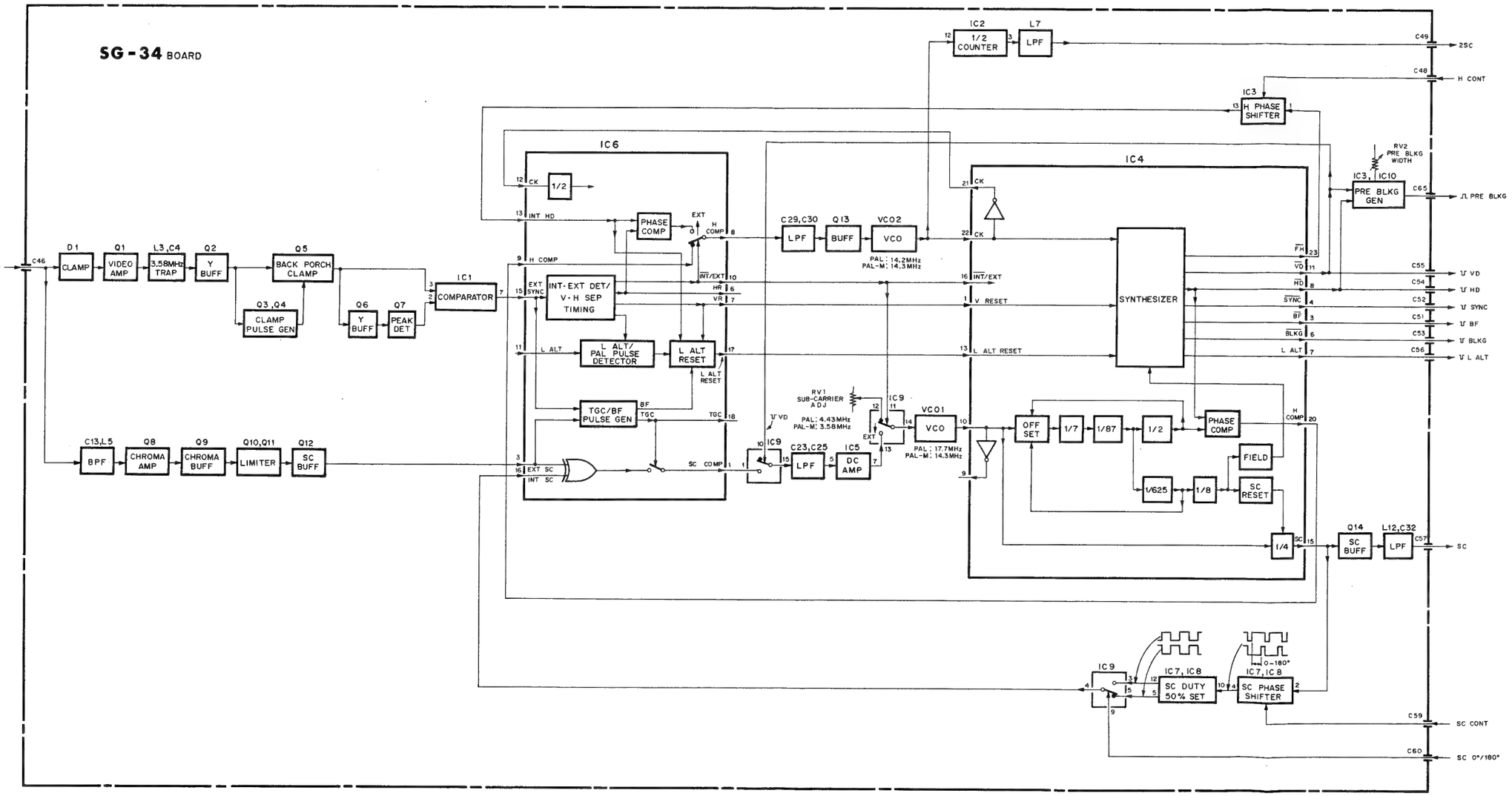
PHASE INDICATION SYSTEM BLOCK DIAGRAM



SG-35 BOARD SYNC GENERATOR SYSTEM BLOCK DIAGRAM
[For SEG-2000A use]

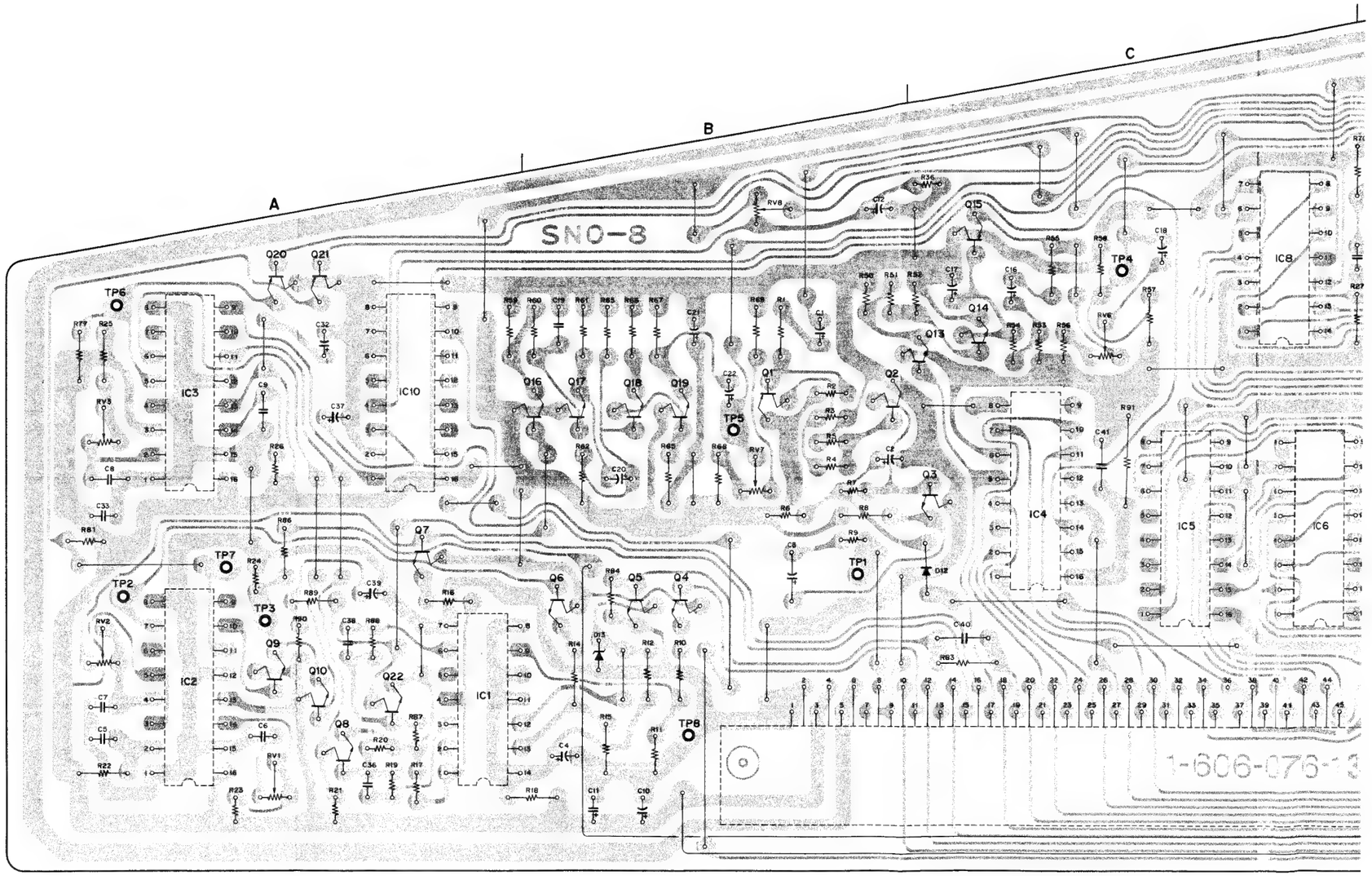


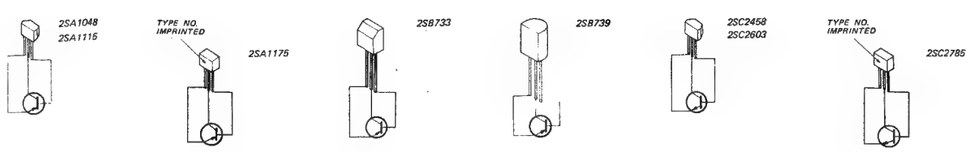
SG-34 BOARD SYNC GENERATOR SYSTEM BLOCK DIAGRAM
[For SEG-2000AP/APM use]

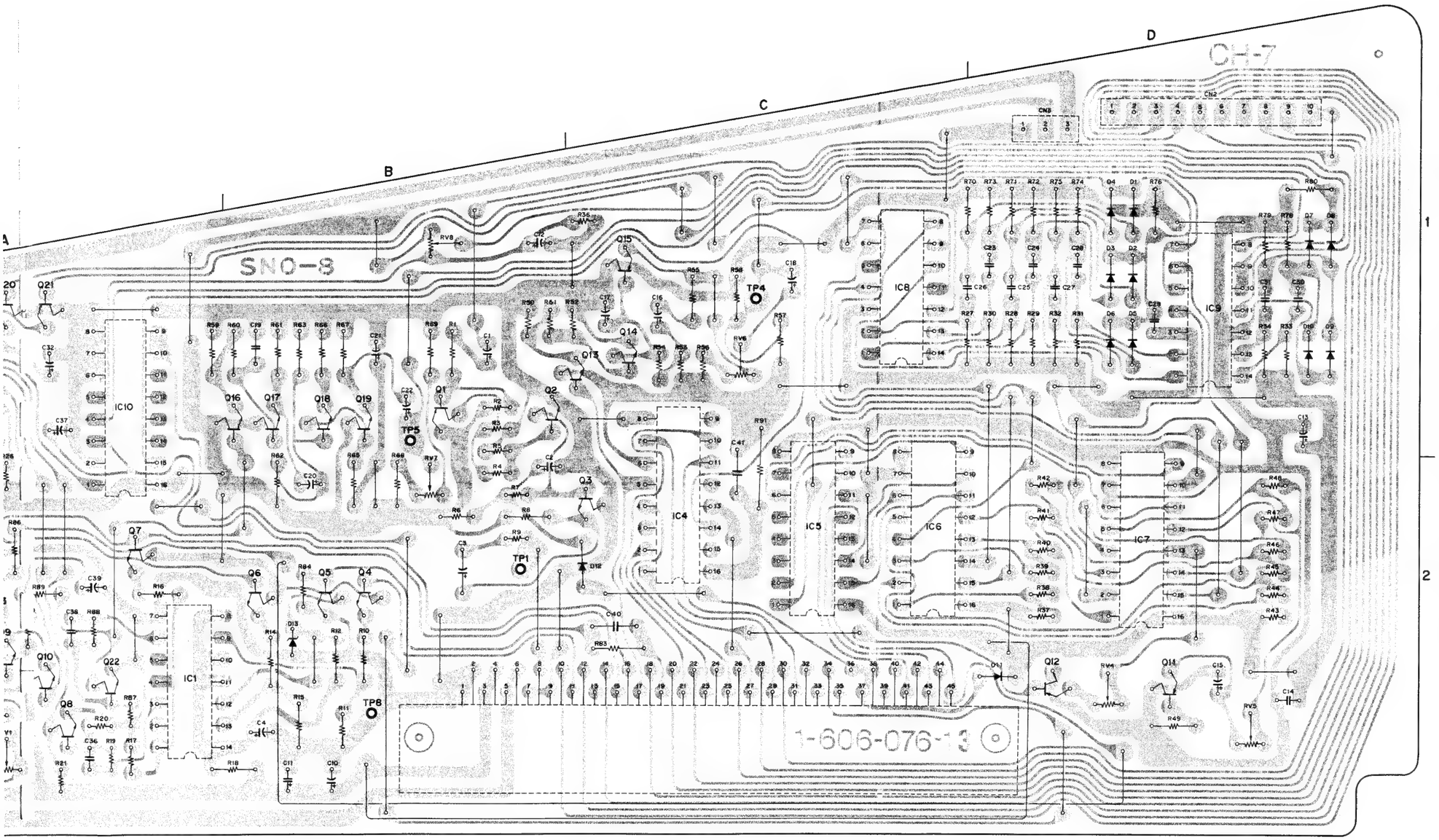


SECTION 11
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

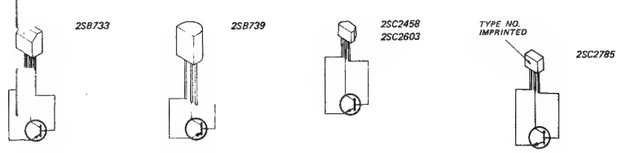
CH-7 BOARD
– SOLDERING SIDE –





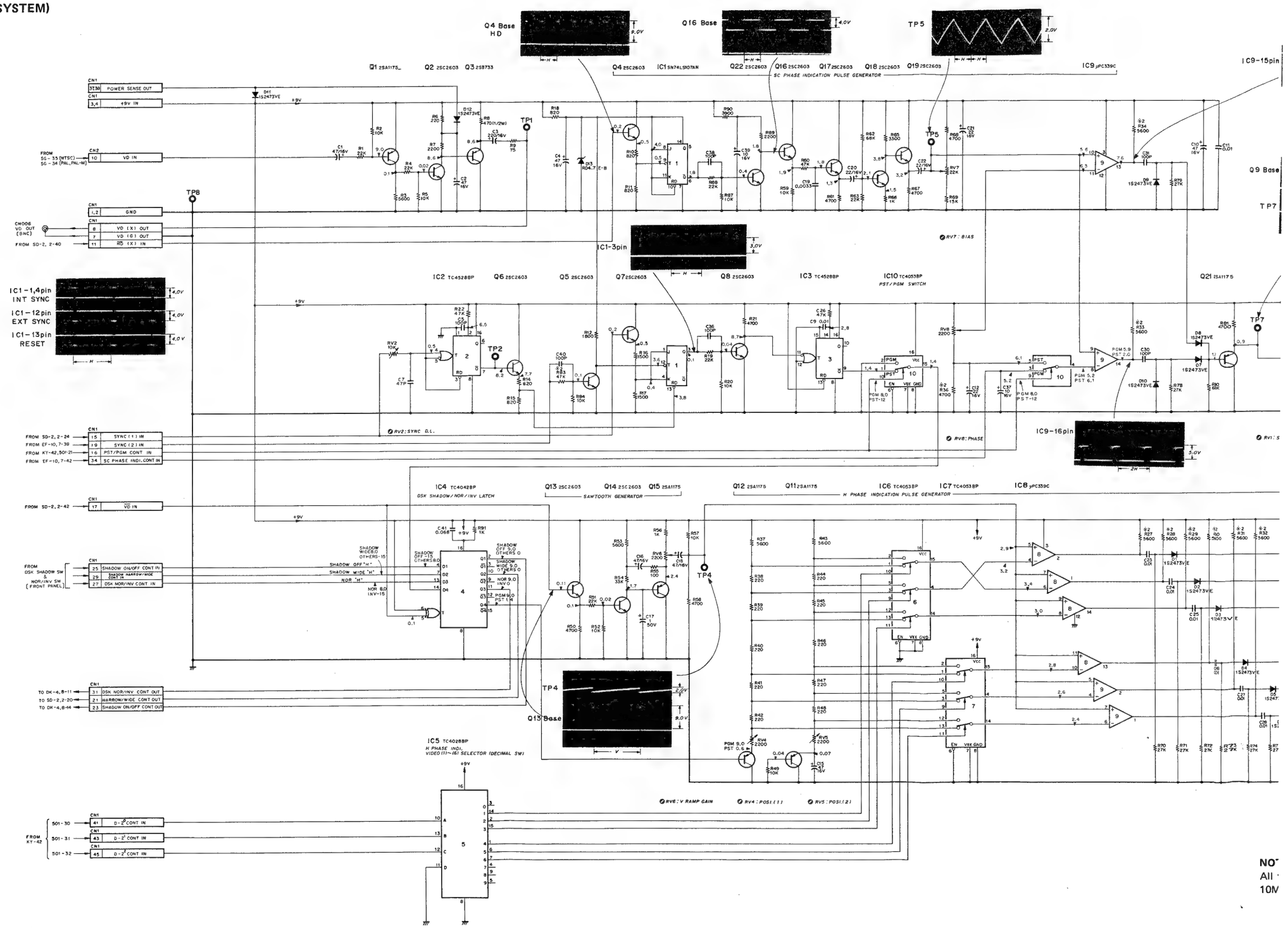


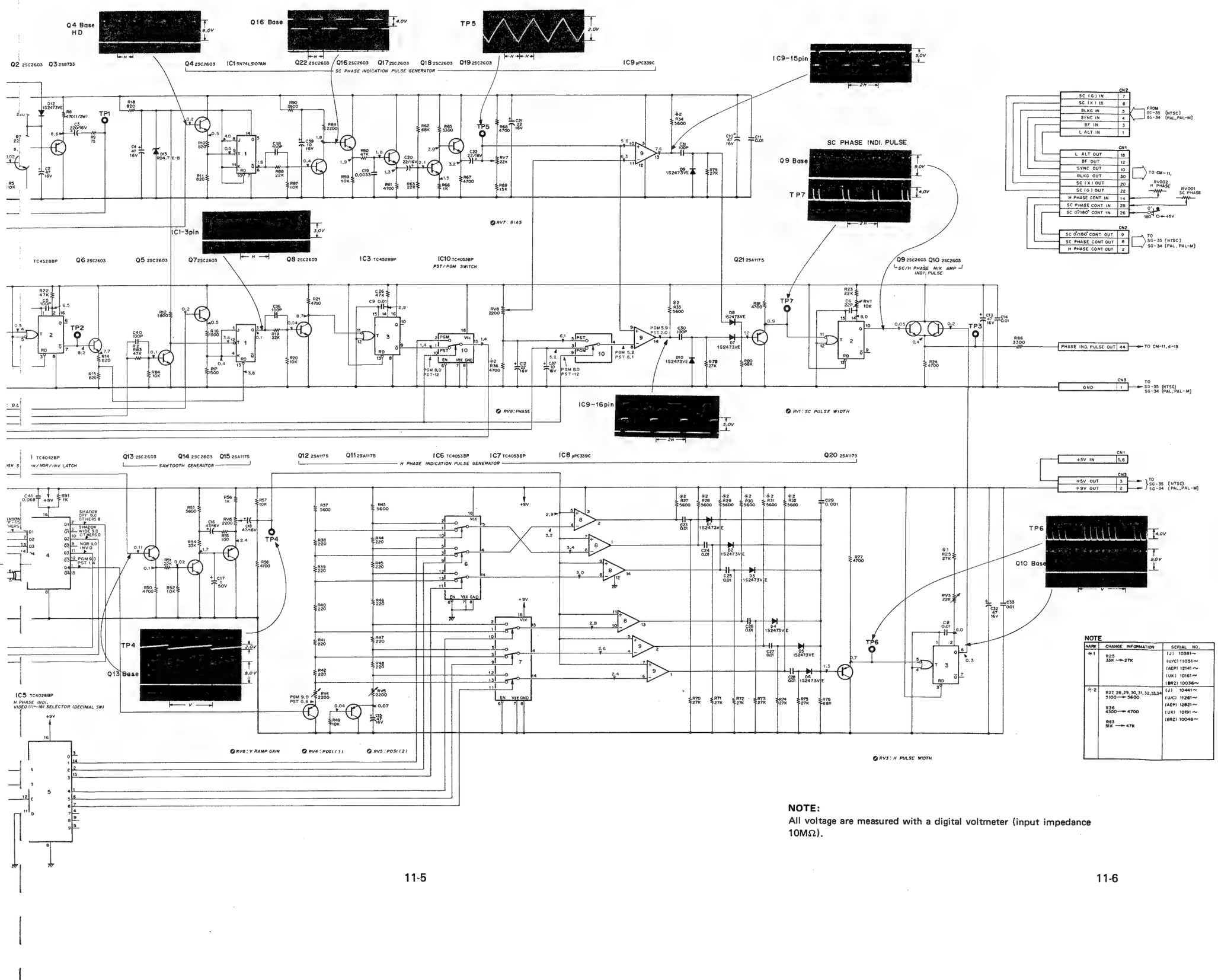
D1	D - 1
D2	D - 1
D3	D - 1
D4	D - 1
D5	D - 1
D6	D - 1
D7	D - 1
D8	D - 1
D9	D - 1
D10	D - 1
D11	D - 2
D12	C - 2
D13	B - 2
IC1	A - 2
IC2	A - 2
IC3	A - 1
IC4	C - 2
IC5	C - 2
IC6	C - 2
IC7	D - 2
IC8	C - 1
IC9	D - 1
IC10	A - 1
Q1	B - 1
Q2	B - 1
Q3	C - 2
Q4	B - 2
Q5	B - 2
Q6	B - 2
Q7	A - 2
Q8	A - 2
Q9	A - 2
Q10	A - 2
Q11	D - 2
Q12	D - 2
Q13	C - 1
Q14	C - 1
Q15	C - 1
Q16	B - 1
Q17	B - 1
Q18	B - 1
Q19	B - 1
Q20	A - 1
Q21	A - 1
Q22	A - 2
RV1	A - 2
RV2	A - 2
RV3	A - 1
RV4	D - 2
RV5	D - 2
RV6	C - 1
RV7	B - 2
RV8	B - 1
TP1	B - 2
TP2	A - 2
TP3	A - 2
TP4	C - 1
TP5	B - 1
TP6	A - 1
TP7	A - 2
TP8	B - 2



CH-7 BOARD
1-606-076-12, 13
SEG-2000/2000A
SEG-2000P/2000AP
SEG-2000PM/2000APM

CH-7 BOARD (PHASE INDICATION SYSTEM)





NOTE

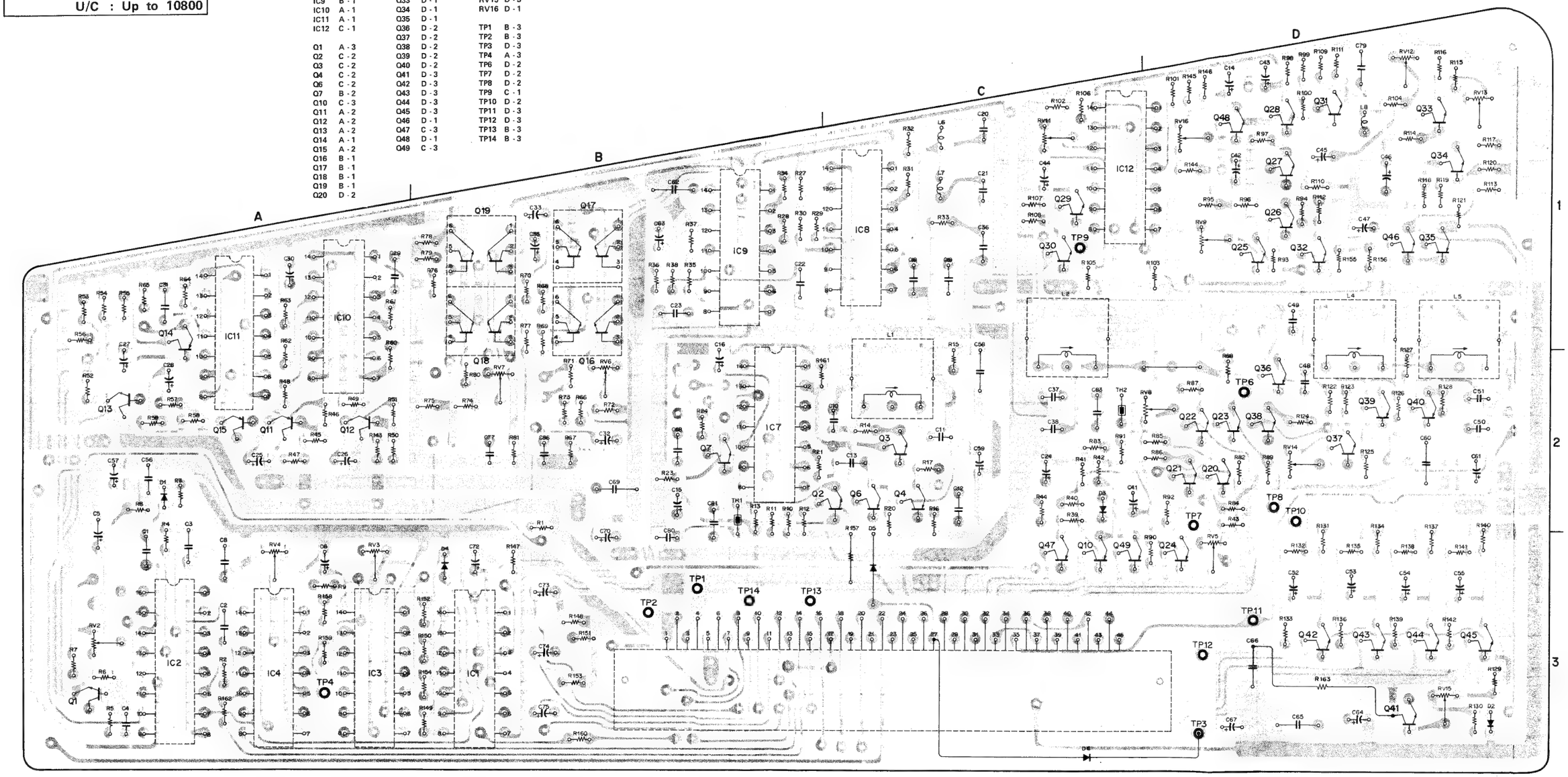
MARK	CHANGE INFORMATION	SERIAL NO.
※1	R25 33K → 27K	(J) 10381~ (U/C) 11051~ (AEP) 12141~ (UK) 10161~ (BRZ) 10036~
※2	R27, 28, 29, 30, 31, 32, 33, 34 5100 → 5600 R36 4300 → 4700 R83 33K → 47K	(J) 10441~ (U/C) 11261~ (AEP) 12821~ (UK) 10191~ (BRZ) 10048~

NOTE:
All voltage are measured with a digital voltmeter (input impedance 10MΩ).

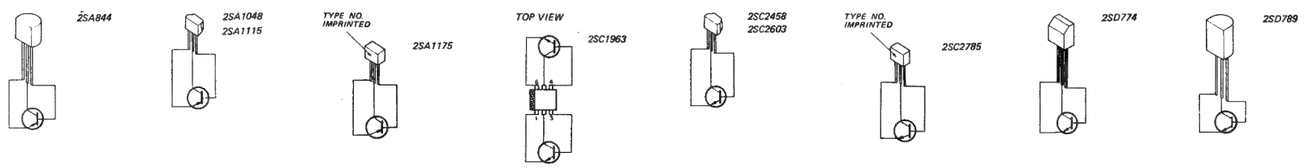
CM-11A BOARD
[For SEG-2000A use]

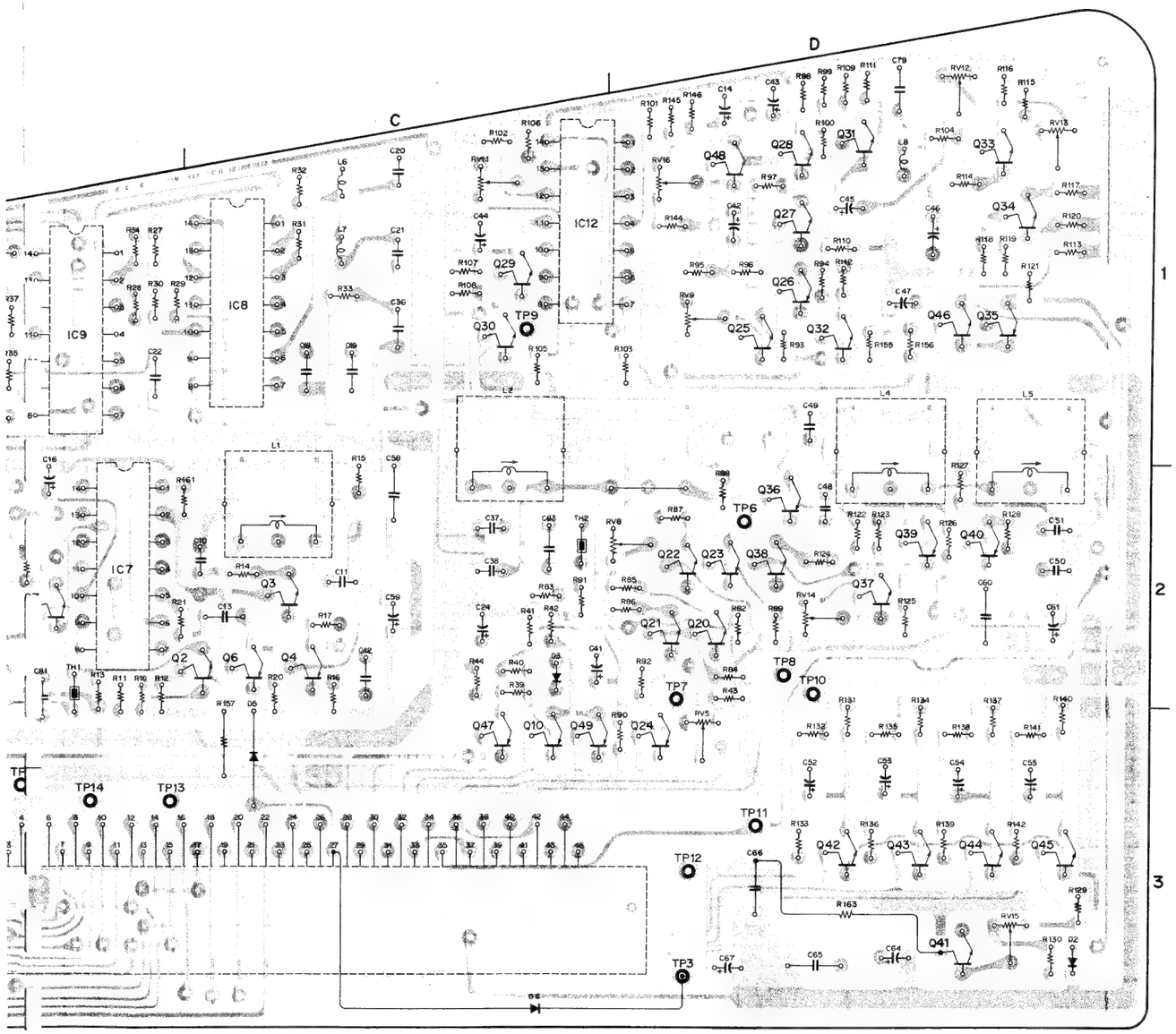
Serial No. J	: Up to 10280
U/C	: Up to 10800

D1	A - 2	Q21	D - 2	RV2	A - 3
D2	D - 3	Q22	D - 2	RV3	A - 3
D3	C - 2	Q23	D - 2	RV4	A - 3
D4	B - 3	Q24	D - 3	RV5	D - 3
D5	C - 3	Q25	D - 1	RV6	B - 2
		Q26	D - 1	RV7	B - 2
IC1	B - 3	Q27	D - 1	RV8	D - 2
IC2	A - 3	Q28	D - 1	RV9	D - 1
IC3	A - 3	Q29	C - 1	RV11	C - 1
IC4	A - 3	Q30	C - 1	RV12	D - 1
IC7	B - 2	Q31	D - 1	RV13	D - 1
IC8	C - 1	Q32	D - 1	RV14	D - 2
IC9	B - 1	Q33	D - 1	RV15	D - 3
IC10	A - 1	Q34	D - 1	RV16	D - 1
IC11	A - 1	Q35	D - 1		
IC12	C - 1	Q36	D - 2	TP1	B - 3
		Q37	D - 2	TP2	B - 3
Q1	A - 3	Q38	D - 2	TP3	D - 3
Q2	C - 2	Q39	D - 2	TP4	A - 3
Q3	C - 2	Q40	D - 2	TP6	D - 2
Q4	C - 2	Q41	D - 3	TP7	D - 2
Q6	C - 2	Q42	D - 3	TP8	D - 2
Q7	B - 2	Q43	D - 3	TP9	C - 1
Q10	C - 3	Q44	D - 3	TP10	D - 2
Q11	A - 2	Q45	D - 3	TP11	D - 3
Q12	A - 2	Q46	D - 1	TP12	D - 3
Q13	A - 2	Q47	C - 3	TP13	B - 3
Q14	A - 1	Q48	D - 1	TP14	B - 3
Q15	A - 2	Q49	C - 3		
Q16	B - 1				
Q17	B - 1				
Q18	B - 1				
Q19	B - 1				
Q20	D - 2				

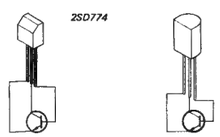


CM-11A BOARD
1-606-071-22
SEG-2000/2010A



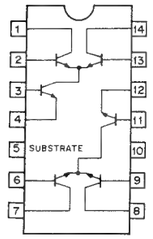


CM-11A BOARD
1-606-071-22
SEG-2000/2000A

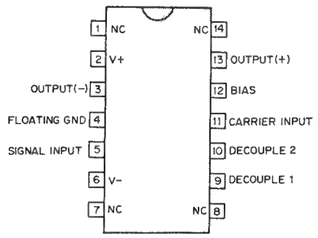


11-8(a)

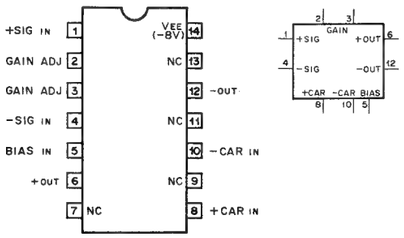
CA3054 (RCA)
DIFFERENTIAL AMPLIFIER
—TOP VIEW—



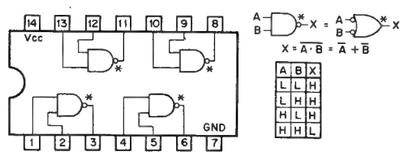
CX120 (SONY)
DOUBLE-BALANCED MOD/DEMOD
-TOP VIEW-



MC1496P (MOTOROLA)
BALANCED MODULATOR/DEMODULATOR
—TOP VIEW—

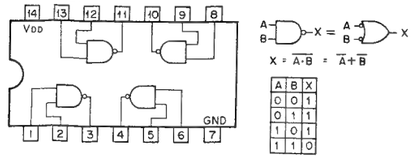


SN74LS26N (TI)
TTL 2-INPUT NAND GATE WITH OPEN-COLLECTOR
—TOP VIEW—



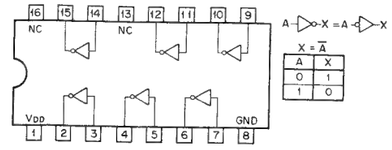
A	B	X
L	L	H
L	H	H
H	L	H
H	H	L

TC4011BP (TOSHIBA)
C-MOS 2-INPUT NAND GATE
—TOP VIEW—



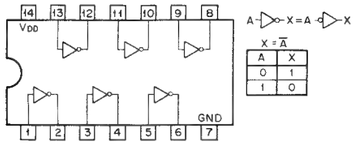
A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

TC4049BP (TOSHIBA)
C-MOS INVERTING TYPE BUFFER/CONVERTER
—TOP VIEW—



A	X
0	1
1	0

TC4069UBP (TOSHIBA)
C-MOS INVERTER
—TOP VIEW—



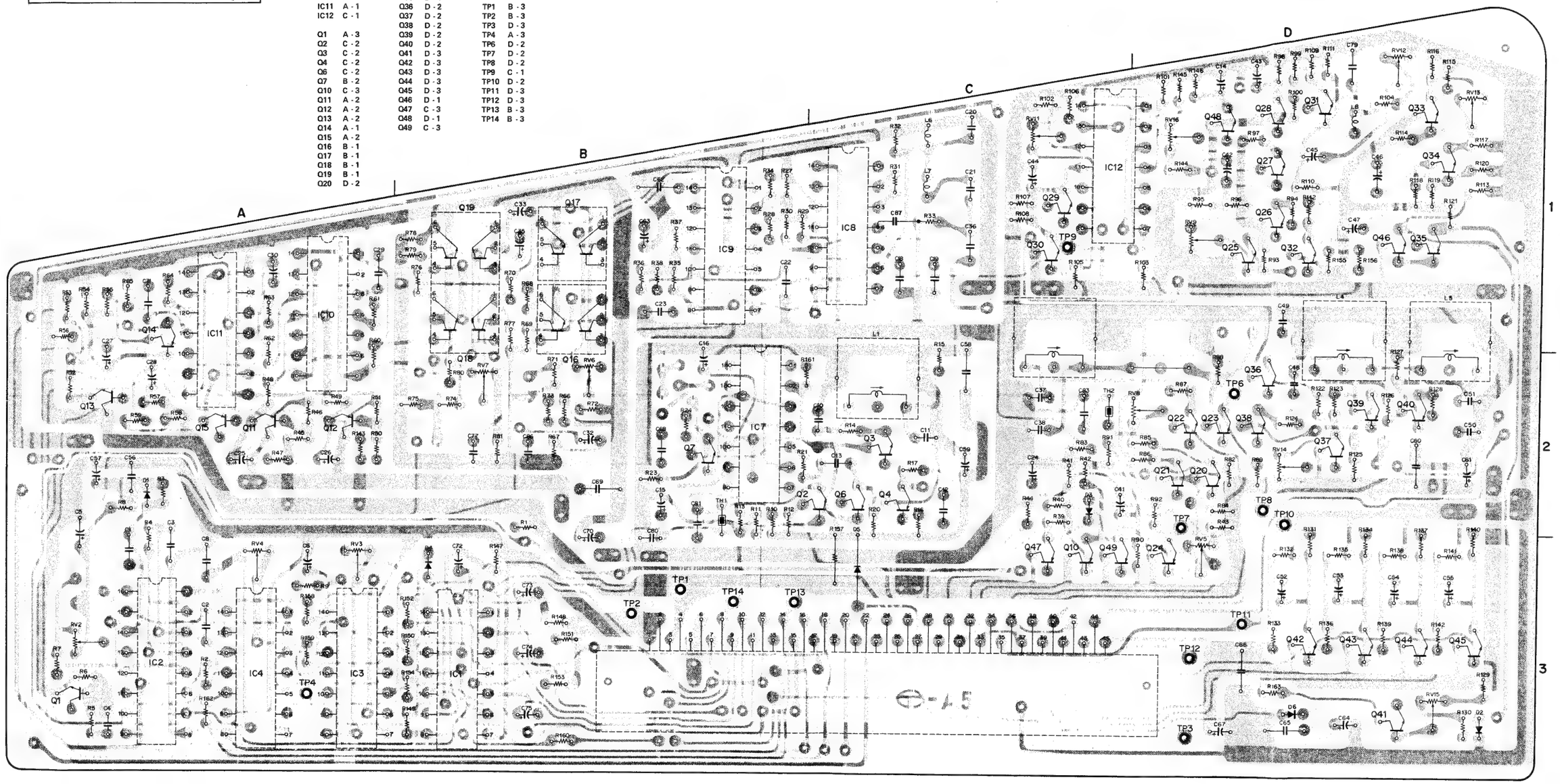
A	X
0	1
1	0

11-9(a)

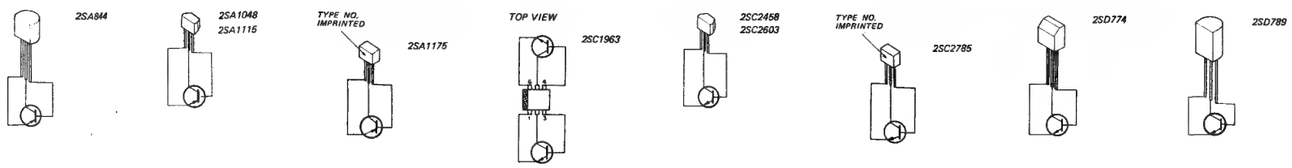
CM-11A BOARD
[for SEG-2000A use]

Serial No. J	:	10281 and higher
U/C	:	10801 and higher

D1	A - 2	Q21	D - 2	RV2	A - 3
D2	D - 3	Q22	D - 2	RV3	A - 3
D3	C - 2	Q23	D - 2	RV4	A - 3
D4	B - 3	Q24	D - 3	RV5	D - 3
D5	C - 3	Q25	D - 1	RV6	B - 2
D6	D - 3	Q26	D - 1	RV7	B - 2
		Q27	D - 1	RV8	D - 2
IC1	B - 3	Q28	D - 1	RV9	D - 1
IC2	A - 3	Q29	C - 1	RV11	C - 1
IC3	A - 3	Q30	C - 1	RV12	D - 1
IC4	A - 3	Q31	D - 1	RV13	D - 1
IC7	B - 2	Q32	D - 1	RV14	D - 2
IC8	C - 1	Q33	D - 1	RV15	D - 3
IC9	B - 1	Q34	D - 1	RV16	D - 1
IC10	A - 1	Q35	D - 2		
IC11	A - 1	Q36	D - 2	TP1	B - 3
IC12	C - 1	Q37	D - 2	TP2	B - 3
		Q38	D - 2	TP3	D - 3
Q1	A - 3	Q39	D - 3	TP4	A - 3
Q2	C - 2	Q40	D - 3	TP6	D - 2
Q3	C - 2	Q41	D - 3	TP7	D - 2
Q4	C - 2	Q42	D - 3	TP8	D - 2
Q6	C - 2	Q43	D - 3	TP9	C - 1
Q7	B - 2	Q44	D - 3	TP10	D - 2
Q10	C - 3	Q45	D - 3	TP11	D - 3
Q11	A - 2	Q46	D - 1	TP12	D - 3
Q12	A - 2	Q47	C - 3	TP13	B - 3
Q13	A - 2	Q48	D - 1	TP14	B - 3
Q14	A - 1	Q49	C - 3		
Q15	A - 2				
Q16	B - 1				
Q17	B - 1				
Q18	B - 1				
Q19	B - 1				
Q20	D - 2				



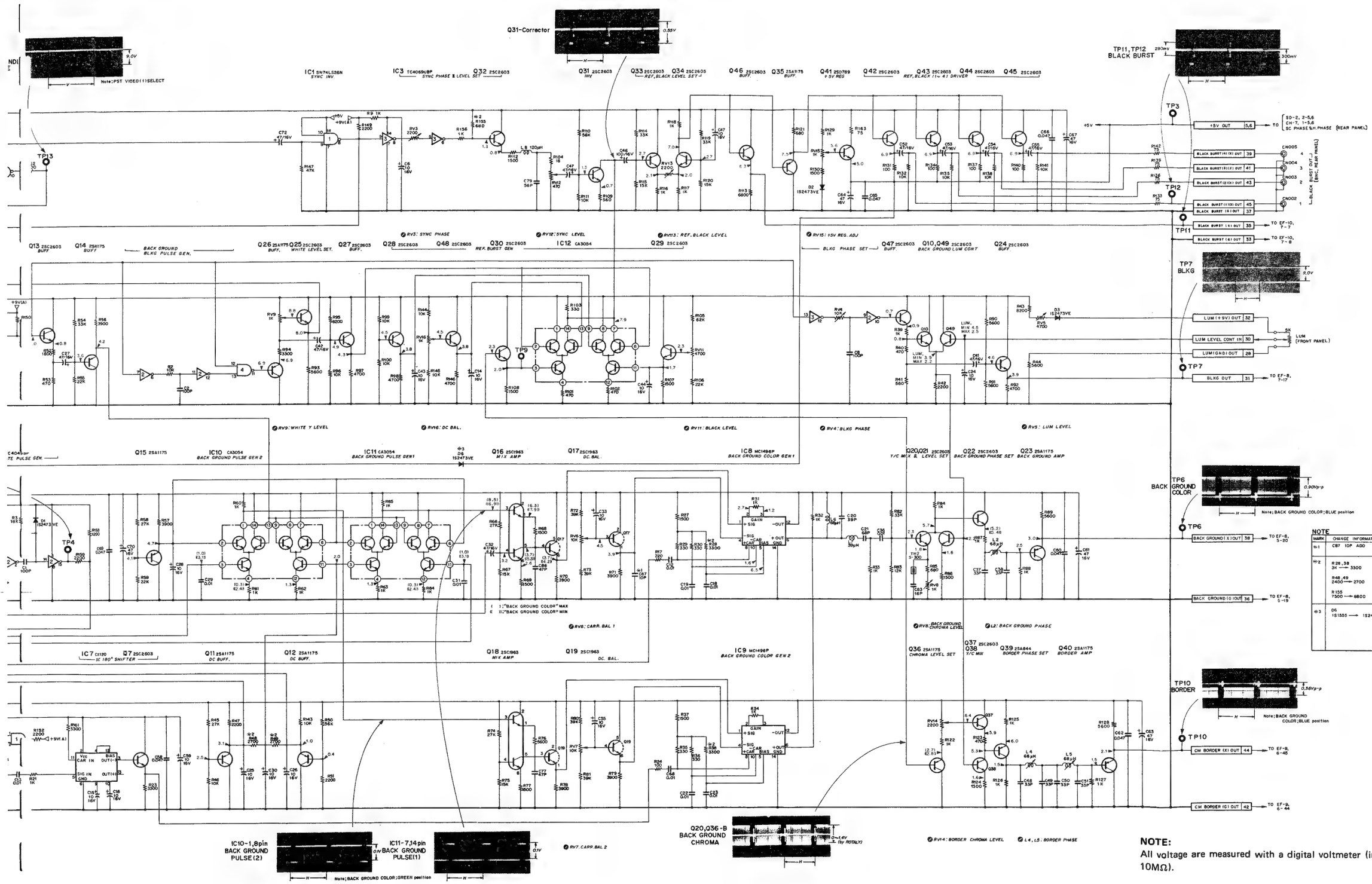
CM-11A BOARD
1-606-071-23
SEG-2000/SEG-2000A



11-8(b)

11-9(b)

CM-11A BOARD (BACK GROUND COLOR SYSTEM)
[For SEG-2000A use]



NOTE

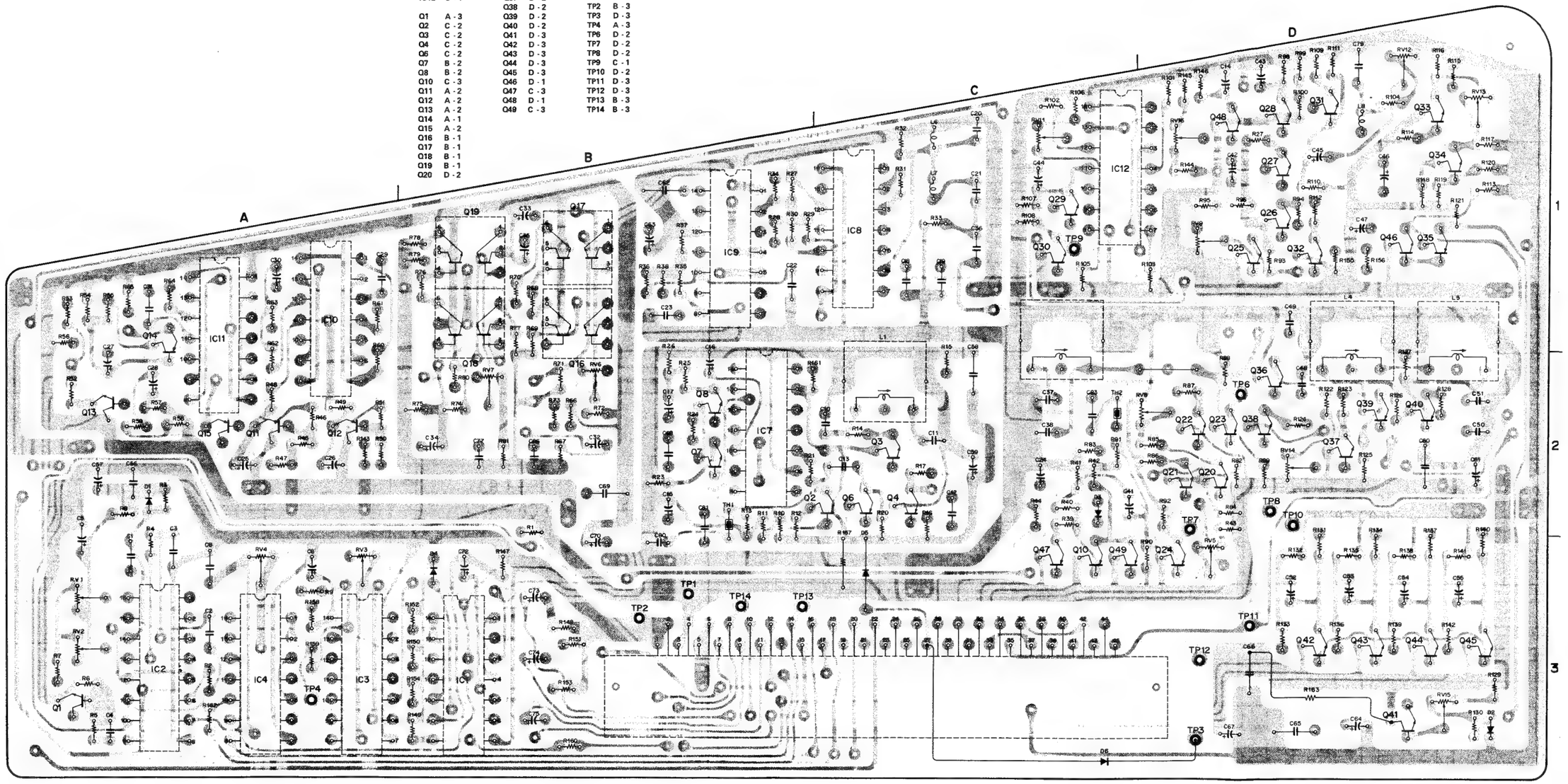
MARK	CHANGE INFORMATION	SERIAL NO.
※1	CB7 10P ADD	(J) 10331~ (U/C) 10901~
※2	R28,38 3K ⟶ 3300 R48,49 2400 ⟶ 2700 R155 7500 ⟶ 6800	(J) 10441~ (U/C) 11261~
※3	D6 1S1555 ⟶ 1S2473VE	(J) 10281~ (U/C) 10801~

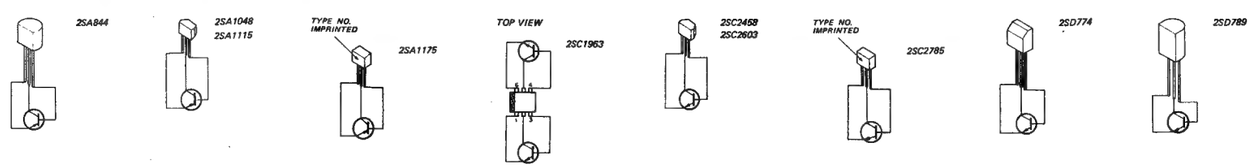
NOTE:
All voltage are measured with a digital voltmeter (input impedance 10MΩ).

CM-11 BOARD
[For SEG-2000AP/APM use]

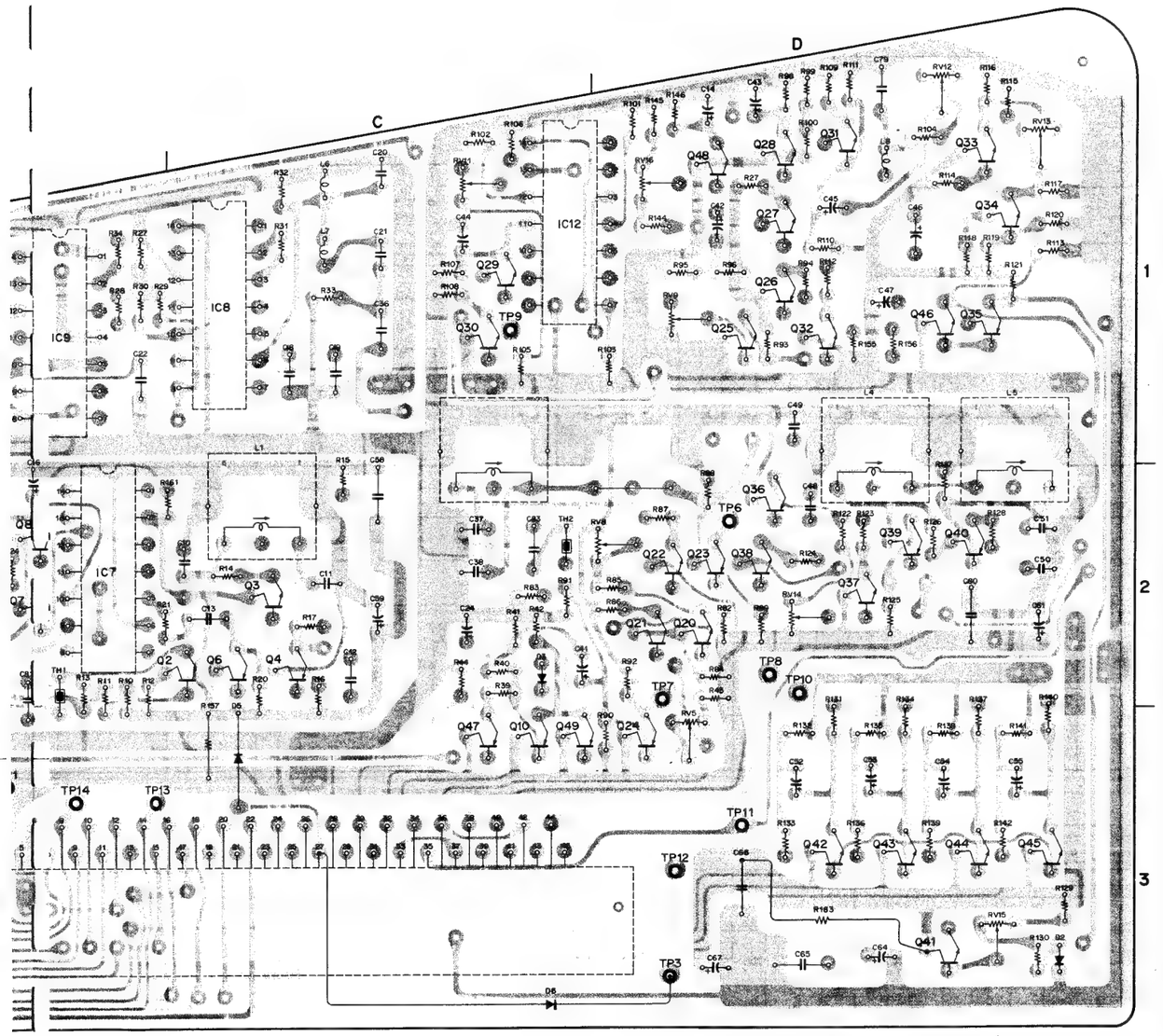
Serial No.		
AEP	:	Up to 11330
UK	:	Up to 10120
BRZ	:	Up to 10015

D1	A - 2	Q21	D - 2	RV1	A - 3
D2	D - 3	Q22	D - 2	RV2	A - 3
D3	C - 2	Q23	D - 2	RV3	A - 3
D4	B - 3	Q24	D - 3	RV4	A - 3
D5	C - 3	Q25	D - 1	RV5	D - 3
D6	C - 3	Q26	D - 1	RV6	B - 2
		Q27	D - 1	RV7	B - 2
IC1	B - 3	Q28	D - 1	RV8	D - 2
IC2	A - 3	Q29	C - 1	RV9	D - 1
IC3	A - 3	Q30	C - 1	RV11	C - 1
IC4	A - 3	Q31	D - 1	RV12	D - 1
IC7	B - 2	Q32	D - 1	RV13	D - 1
IC8	C - 1	Q33	D - 1	RV14	D - 2
IC9	B - 1	Q34	D - 1	RV15	D - 3
IC10	A - 1	Q35	D - 2	RV16	D - 1
IC11	A - 1	Q36	D - 2		
IC12	C - 1	Q37	D - 2	TP1	B - 3
		Q38	D - 2	TP2	B - 3
Q1	A - 3	Q39	D - 2	TP3	D - 3
Q2	C - 2	Q40	D - 2	TP4	A - 3
Q3	C - 2	Q41	D - 3	TP6	D - 2
Q4	C - 2	Q42	D - 3	TP7	D - 2
Q6	C - 2	Q43	D - 3	TP8	D - 2
Q7	B - 2	Q44	D - 3	TP9	C - 1
Q8	B - 2	Q45	D - 3	TP10	D - 2
Q10	C - 3	Q46	D - 1	TP11	D - 3
Q11	A - 2	Q47	C - 3	TP12	D - 3
Q12	A - 2	Q48	D - 1	TP13	B - 3
Q13	A - 2	Q49	C - 3	TP14	B - 3
Q14	A - 1				
Q15	A - 2				
Q16	B - 1				
Q17	B - 1				
Q18	B - 1				
Q19	B - 1				
Q20	D - 2				

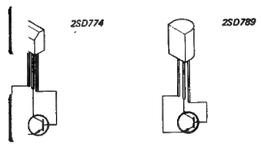




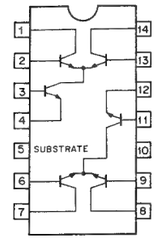
CM-11 BOARD
1-606-071-12
SEG-2000P/2000AP
SEG-2000PM/2000APM



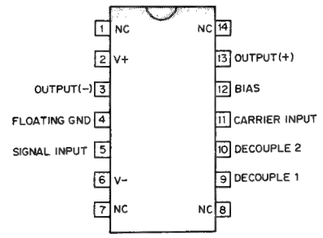
CM-11 BOARD
1-606-071-12
SEG-2000P/2000AP
SEG-2000PM/2000APM



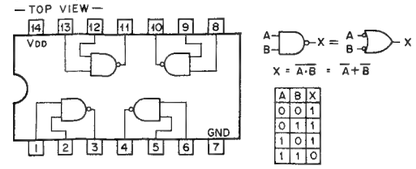
CA3054 (RCA)
DIFFERENTIAL AMPLIFIER
– TOP VIEW –



CX120 (SONY)
DOUBLE-BALANCED MOD/DEMOD
– TOP VIEW –

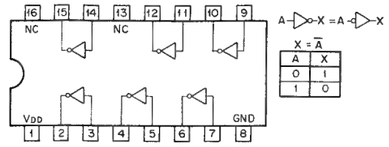


TC4011BP (TOSHIBA)
C-MOS 2-INPUT NAND GATE
– TOP VIEW –



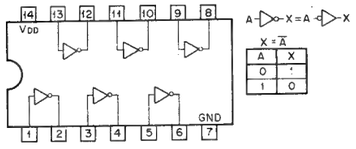
A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

TC4049BP (TOSHIBA)
C-MOS INVERTING TYPE BUFFER/CONVERTER
– TOP VIEW –



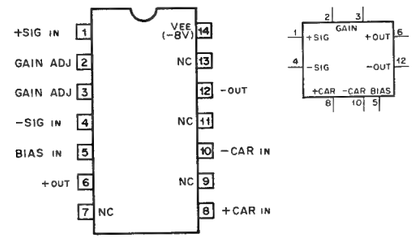
A	X
0	1
1	0

TC4069UBP (TOSHIBA)
C-MOS INVERTER
– TOP VIEW –

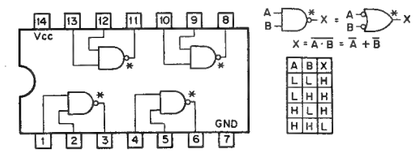


A	X
0	1
1	0

MC1496P (MOTOROLA)
BALANCED MODULATOR/DEMODULATOR
– TOP VIEW –



SN74LS26N (TI)
TTL 2-INPUT NAND GATE WITH OPEN-COLLECTOR
– TOP VIEW –

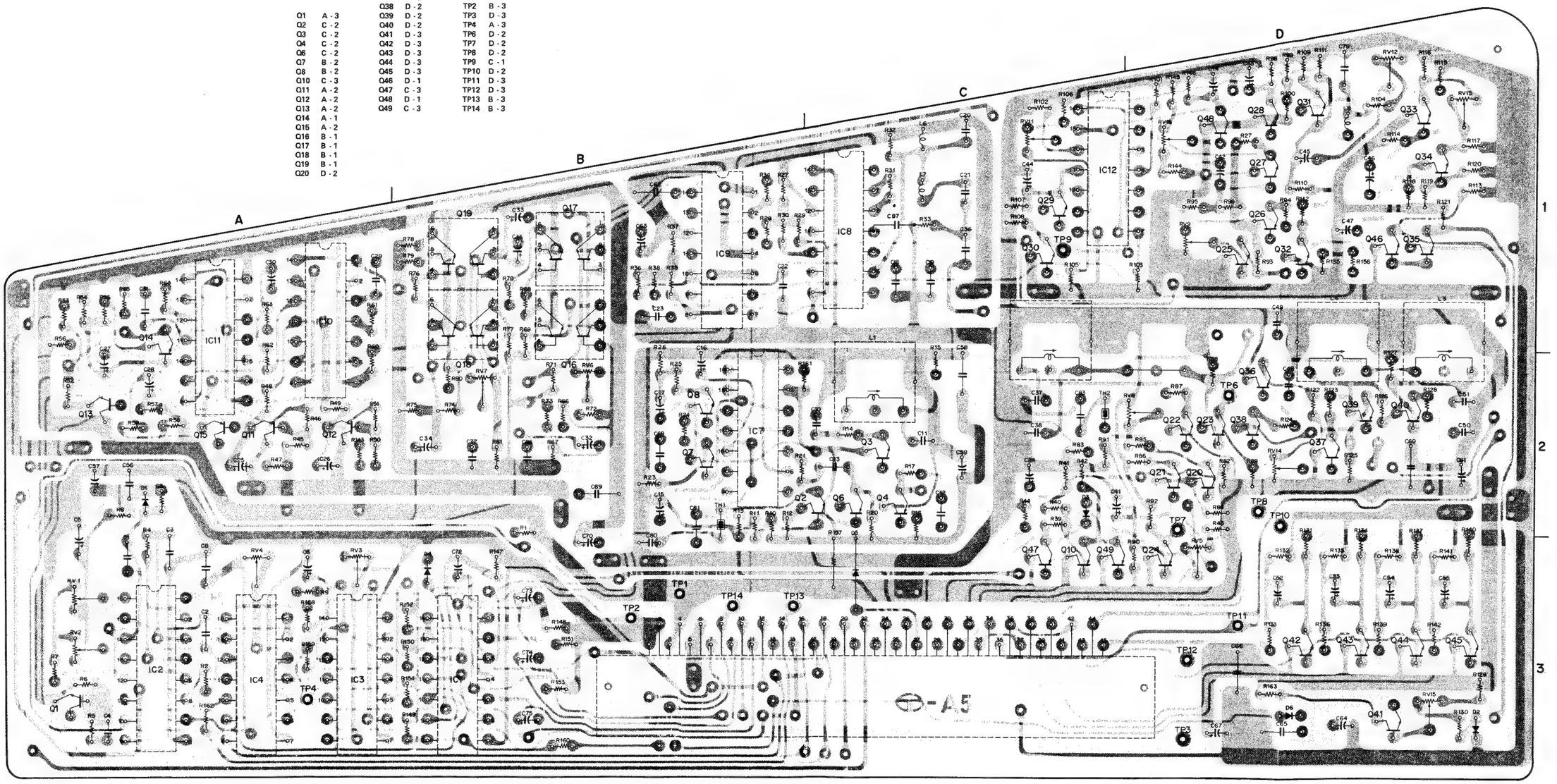


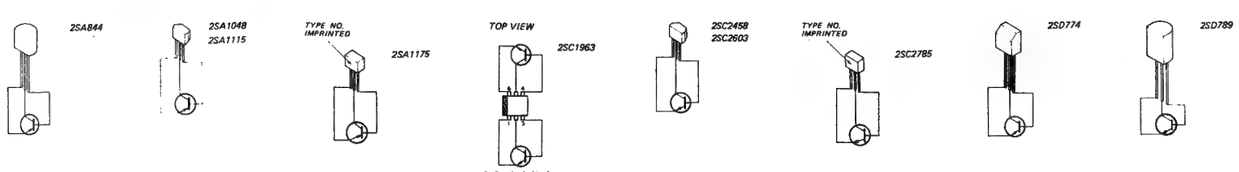
A	B	X
L	L	H
L	H	H
H	L	H
H	H	L

CM-11 BOARD
[for SEG-2000AP/APM use]

Serial No.	AEP	: 11331 and higher
	UK	: 10121 and higher
	BRZ	: 10016 and higher

D1	A-2	Q21	D-2	RV1	A-3
D2	D-3	Q22	D-2	RV2	A-3
D3	C-2	Q23	D-2	RV3	A-3
D4	B-3	Q24	D-3	RV4	A-3
D5	C-3	Q25	D-1	RV5	D-3
D6	C-3	Q26	D-1	RV6	B-2
		Q27	D-1	RV7	B-2
IC1	B-3	Q28	D-1	RV8	D-2
IC2	A-3	Q29	C-1	RV9	D-1
IC3	A-3	Q30	C-1	RV11	C-1
IC4	A-3	Q31	D-1	RV12	D-1
IC7	B-2	Q32	D-1	RV13	D-1
IC8	C-1	Q33	D-1	RV14	D-2
IC9	B-1	Q34	D-1	RV15	D-3
IC10	A-1	Q35	D-1	RV16	D-1
IC11	A-1	Q36	D-2		
IC12	C-1	Q37	D-2	TP1	B-3
		Q38	D-2	TP2	B-3
Q1	A-3	Q39	D-2	TP3	D-3
Q2	C-2	Q40	D-2	TP4	A-3
Q3	C-2	Q41	D-3	TP6	D-2
Q4	C-2	Q42	D-3	TP7	D-2
Q6	C-2	Q43	D-3	TP8	D-2
Q7	B-2	Q44	D-3	TP9	C-1
Q8	B-2	Q45	D-3	TP10	D-2
Q10	C-3	Q46	D-1	TP11	D-3
Q11	A-2	Q47	C-3	TP12	D-3
Q12	A-2	Q48	D-1	TP13	B-3
Q13	A-2	Q49	C-3	TP14	B-3
Q14	A-1				
Q15	A-2				
Q16	B-1				
Q17	B-1				
Q18	B-1				
Q19	B-1				
Q20	D-2				



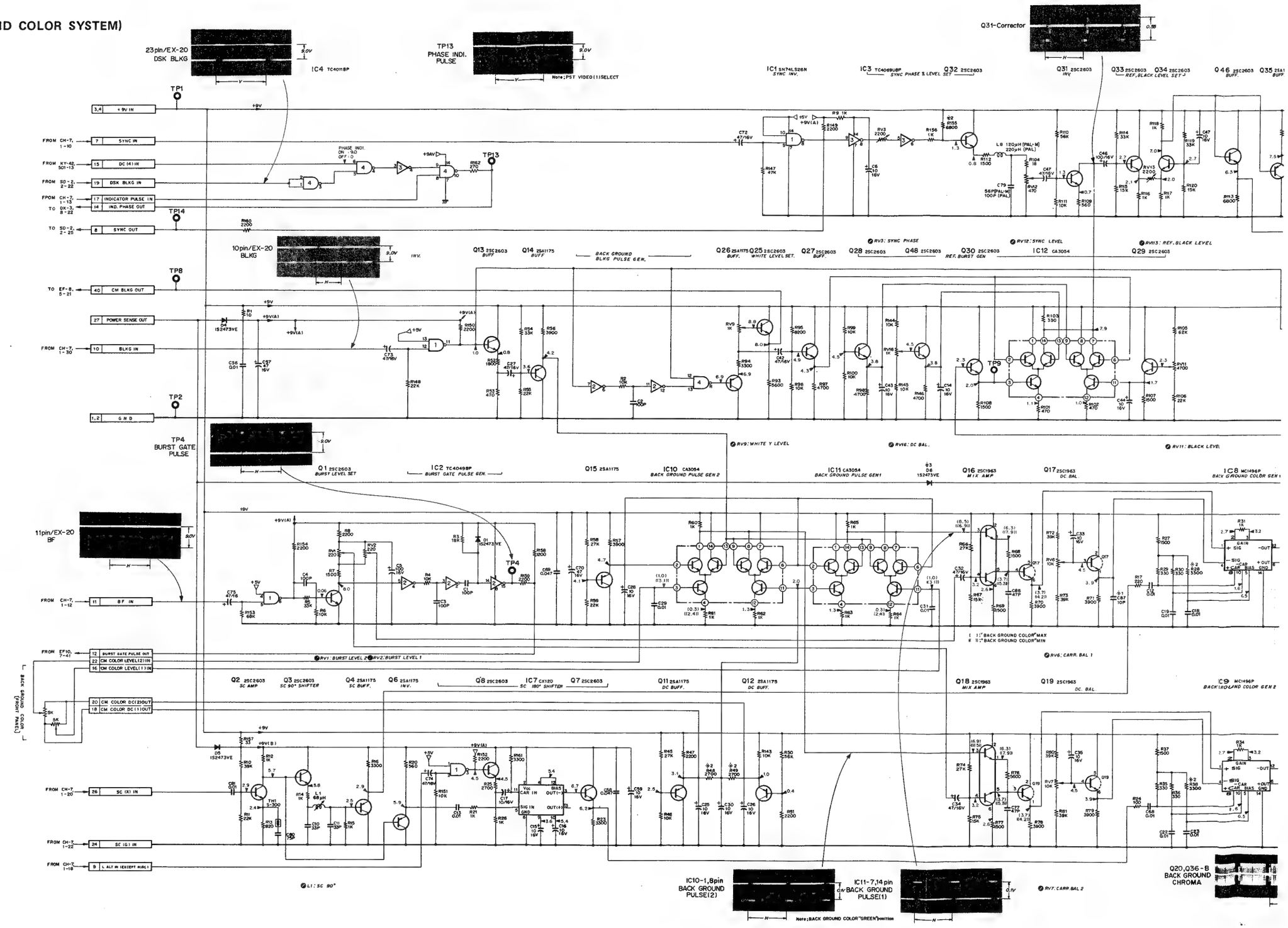


11-14(b)

CM-11 BOARD
1-606-071-13
SEG-2000P/2000AP
SEG-2000PM/2000APM

11-15(b)

CM-11 BOARD (BACK GROUND COLOR SYSTEM)
[For SEG-2000AP/APM use]

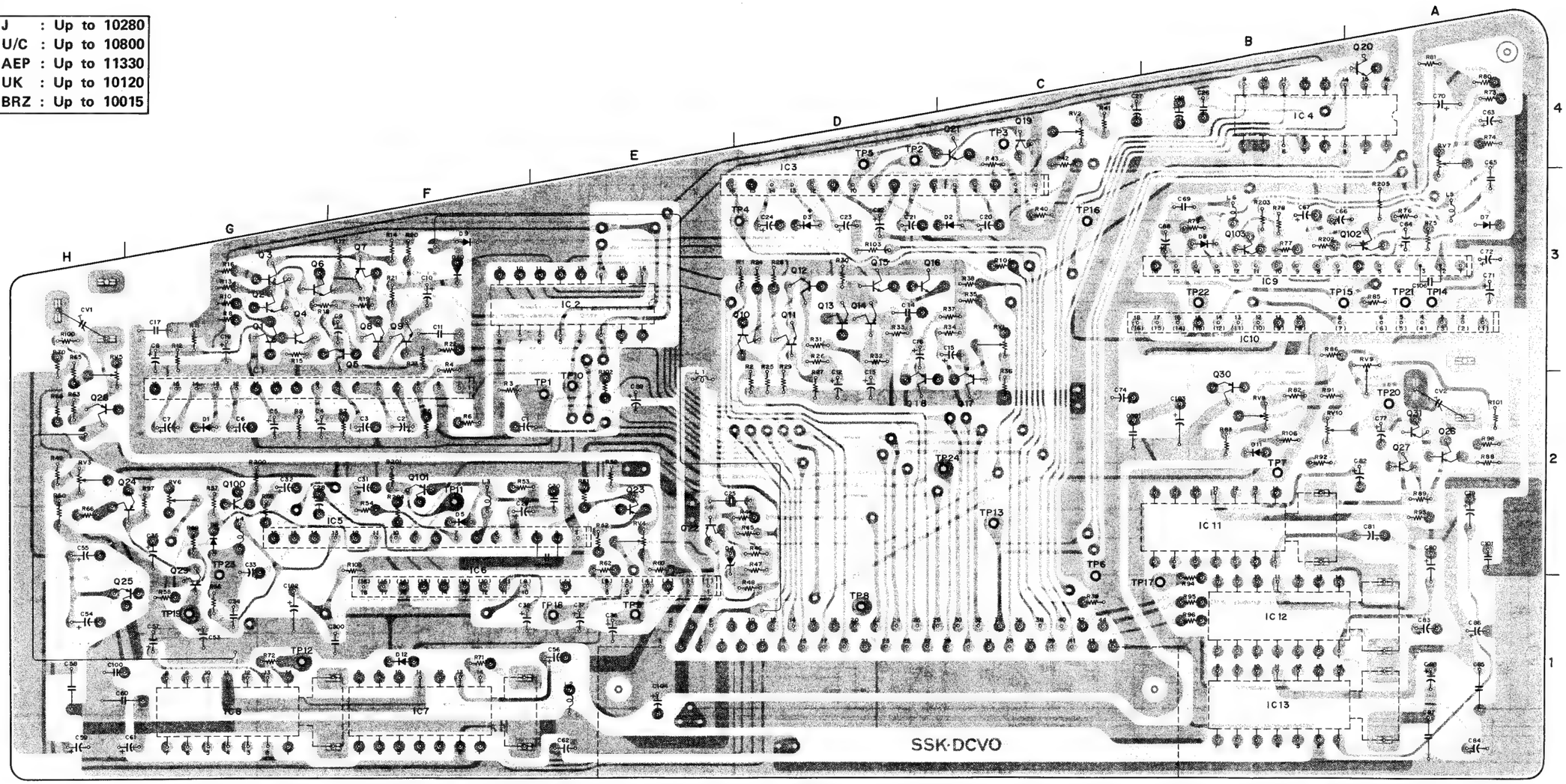


NOTE

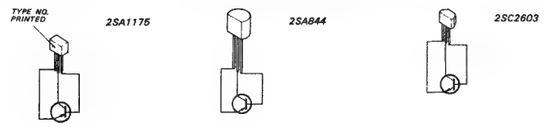
MARK	CHANGE INFORMATION	SERIAL NO.
※1	C87 10P ADD	(AEP) 11991~ (UK) 10151~ (BRZ) 10036~
※2	R28,38 3K→3300 R48,49 2400→2700 R155 7500→6800	(AEP) 12821 ~ (UK) 10191 ~ (BRZ) 10046~
◈3	D6 151355 → 152473VE	(AEP) 11331~ (UK) 10121 ~ (BRZ) 10016 ~

DK-4 BOARD

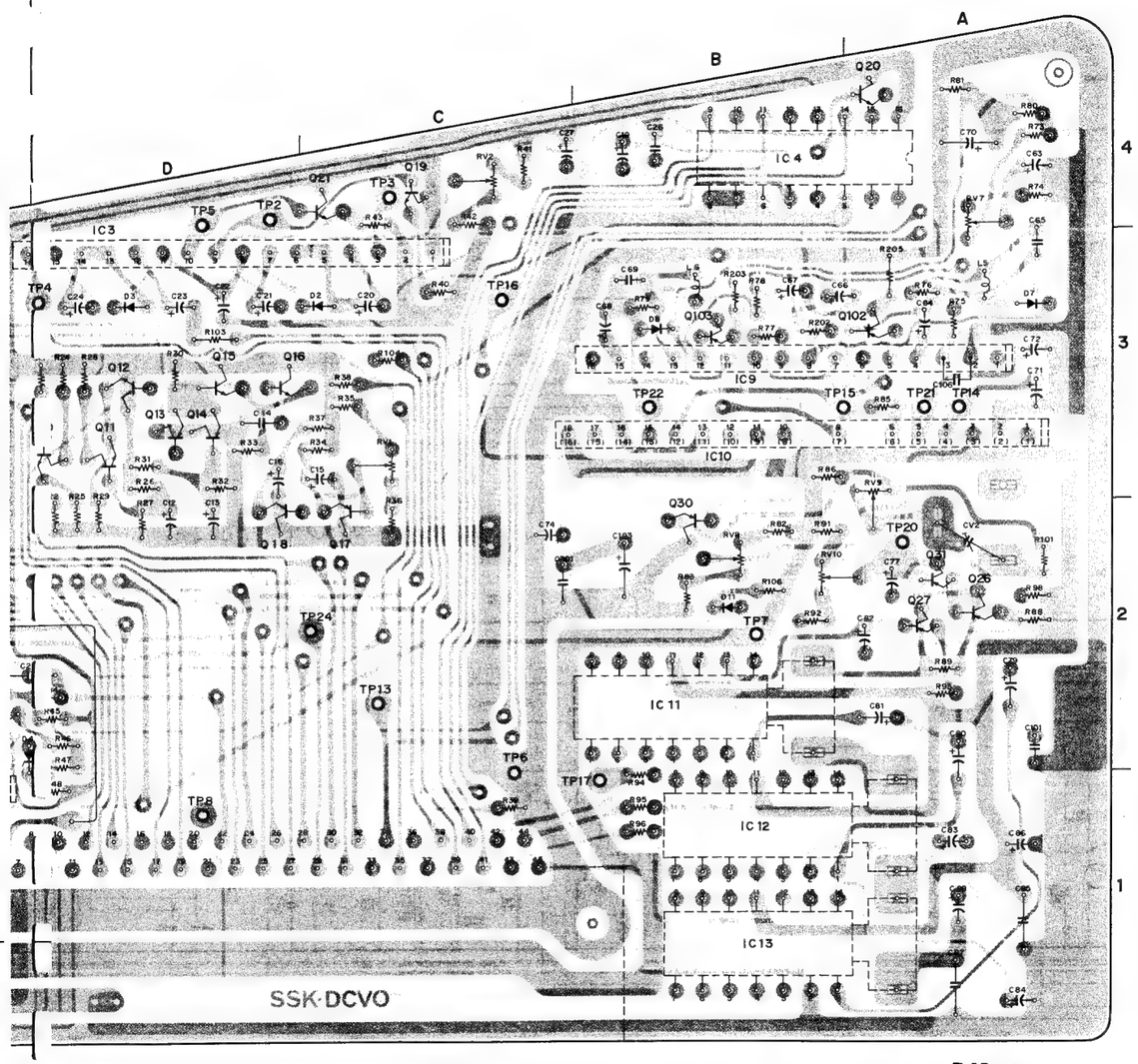
Serial No.		
J	: Up to	10280
U/C	: Up to	10800
AEP	: Up to	11330
UK	: Up to	10120
BRZ	: Up to	10015



CV1	H-3	TP1	
CV2	A-2	TP2	
		TP3	
D1	G-2	TP4	
D2	C-3	TP5	
D3	D-3	TP6	
D4	D-2	TP7	
D5	F-2	TP8	
D6	G-2	TP9	
D7	A-3	TP10	
D8	B-3	TP11	
D9	F-3	TP12	
D10	F-3	TP13	
D11	B-2	TP14	
D12	F-1	TP15	
		TP16	
IC1	F-2	TP17	
IC2	E-3	TP18	
IC3	D-3	TP19	
IC4	B-4	TP20	
IC5	F-2	TP21	
IC6	F-1	TP22	
IC7	F-1	TP23	
IC8	G-1	TP24	
IC9	B-3		
IC10	B-3		
IC11	B-2		
IC12	B-1		
IC13	B-1		
Q1	G-3		
Q2	G-3		
Q3	G-3		
Q4	G-3		
Q5	F-3		
Q6	G-3		
Q7	F-3		
Q8	F-3		
Q9	F-3		
Q10	D-3		
Q11	D-3		
Q12	D-3		
Q13	D-3		
Q14	D-3		
Q15	D-3		
Q16	D-3		
Q17	C-2		
Q18	D-2		
Q19	C-4		
Q21	C-4		
Q22	E-2		
Q23	E-2		
Q24	G-2		
Q25	G-1		
Q26	A-2		
Q27	A-2		
Q28	H-2		
Q29	G-1		
Q30	B-2		
Q31	A-2		
Q100	G-2		
Q101	F-2		
Q102	A-3		
RV1	C-3		
RV2	C-2		
RV3	H-2		
RV4	E-2		
RV5	H-2		
RV6	G-2		
RV7	A-3		
RV8	B-2		
RV9	A-2		
RV11	B-2		



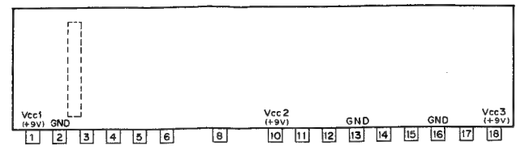
DK-4 BOARD-11
– SOLDERING SIDE –
SEG-2000A
SEG-2000AP
SEG-2000APM

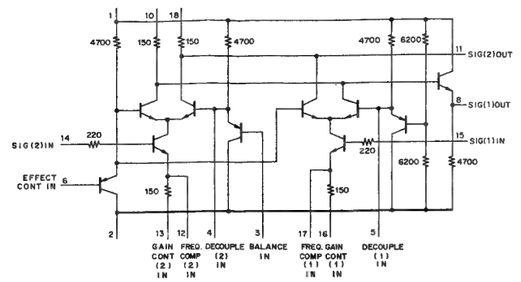


CV1	H-3	TP1	E-2
CV2	A-2	TP2	D-3
		TP3	C-4
D1	G-2	TP4	D-3
D2	C-3	TP5	D-3
D3	D-3	TP6	C-1
D4	D-2	TP7	B-2
D5	F-2	TP8	D-1
D6	G-2	TP9	E-1
D7	A-3	TP10	E-2
D8	B-3	TP11	F-2
D9	F-3	TP12	G-1
D10	F-3	TP13	C-2
D11	B-2	TP14	A-3
D12	F-1	TP15	A-3
		TP16	C-3
IC1	F-2	TP17	B-1
IC2	E-3	TP18	E-1
IC3	D-3	TP19	G-1
IC4	B-4	TP20	A-2
IC5	F-2	TP21	A-3
IC6	F-1	TP22	B-3
IC7	F-1	TP23	G-1
IC8	G-1	TP24	C-2
IC9	B-3		
IC10	B-3		
IC11	B-2		
IC12	B-1		
IC13	B-1		
Q1	G-3		
Q2	G-3		
Q3	G-3		
Q4	G-3		
Q5	F-3		
Q6	G-3		
Q7	F-3		
Q8	F-3		
Q9	F-3		
Q10	D-3		
Q11	D-3		
Q12	D-3		
Q13	D-3		
Q14	D-3		
Q15	D-3		
Q16	D-3		
Q17	C-2		
Q18	D-2		
Q19	C-4		
Q21	C-4		
Q22	E-2		
Q23	E-2		
Q24	G-2		
Q25	G-1		
Q26	A-2		
Q27	A-2		
Q28	H-2		
Q29	G-1		
Q30	B-2		
Q31	A-2		
Q100	G-2		
Q101	F-2		
Q102	A-3		
RV1	C-3		
RV2	C-2		
RV3	H-2		
RV4	E-2		
RV5	H-2		
RV6	G-2		
RV7	A-3		
RV8	B-2		
RV9	A-2		
RV10	B-2		

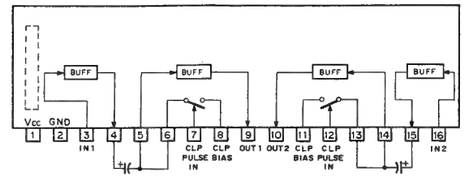
DK-4 BOARD-11
-SOLDERING SIDE-
SEG-2000A
SEG-2000AP
SEG-2000APM

BX3991 (SONY)
FADER EFFECT AMPLIFIER
— REAR VIEW —

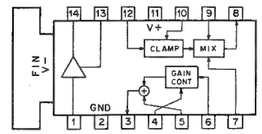




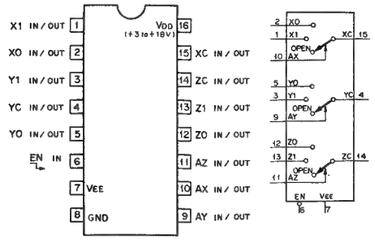
BX3992 (SONY)
DUAL CLAMPER
— REAR VIEW —



CX 814 (SONY)
—TOP VIEW—



CD4053BE (RCA)
HD14053BP (HITACHI)
MB84053B (FUJITSU)
MC14053BCP (MOTOROLA)
MSM4053 (OKI)
TC4053BF (TOSHIBA) FLAT PACKAGE
TC4053BP (TOSHIBA)
uPD4053BC (NEC)
C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —

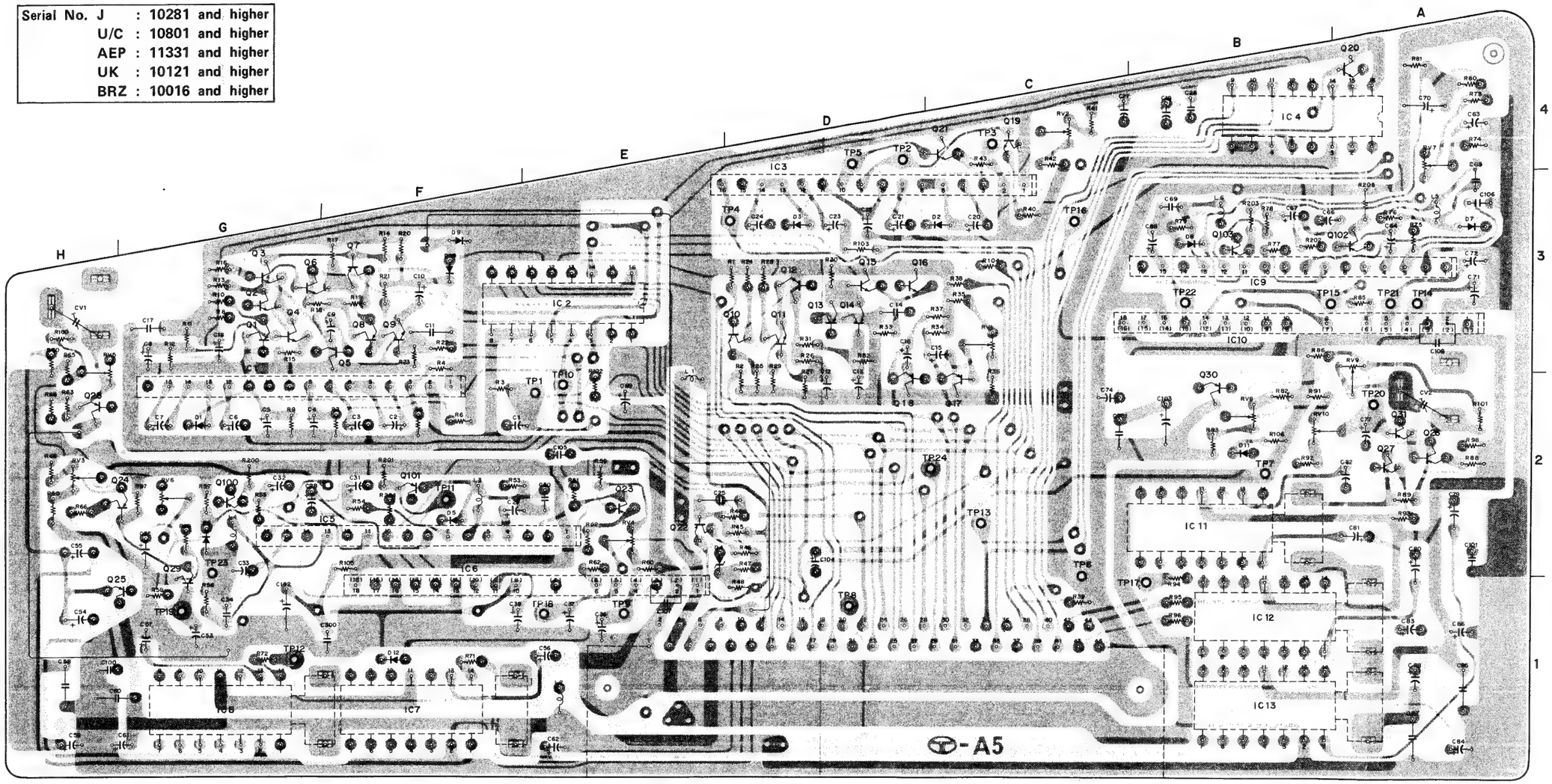


CONT. INPUTS		ON
EN	A (X,Y,Z)	CHANNEL
0	0	0
0	1	1
1	X	OPEN

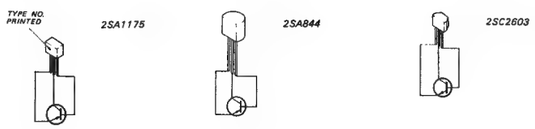
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE.

DK-4 BOARD
– SOLDERING SIDE –

Serial No.		
J	:	10281 and higher
U/C	:	10801 and higher
AEP	:	11331 and higher
UK	:	10121 and higher
BRZ	:	10016 and higher

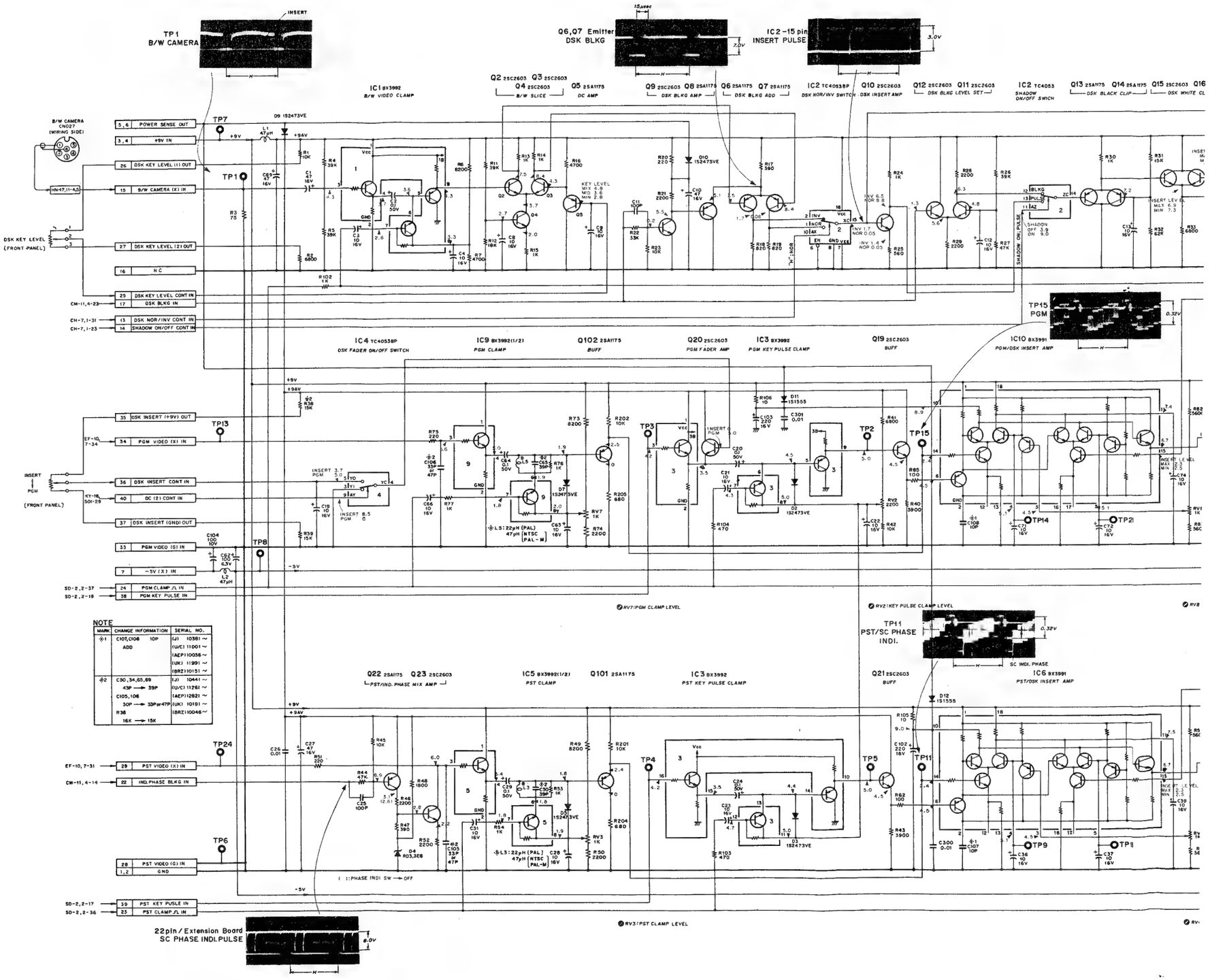


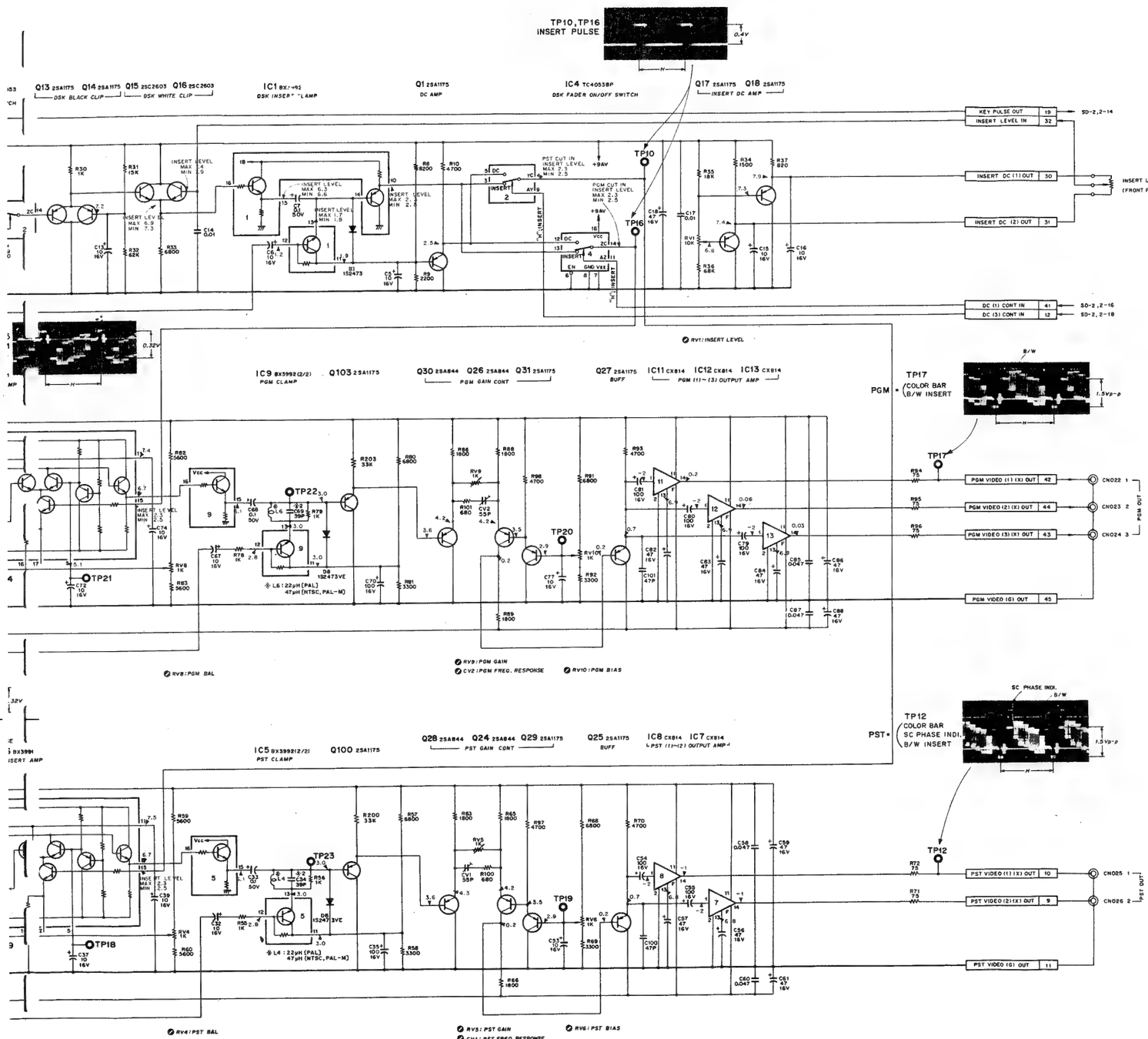
CV1	H-3	TP1	E-2
CV2	A-2	TP2	D-3
		TP3	C-4
D1	G-2	TP4	D-3
D2	C-3	TP5	D-3
D3	D-3	TP6	C-1
D4	D-2	TP7	B-2
D5	F-2	TP8	D-1
D6	G-2	TP9	E-1
D7	A-3	TP10	E-2
D8	B-3	TP11	F-2
D9	F-3	TP12	G-1
D10	F-3	TP13	C-2
D11	B-2	TP14	A-3
D12	F-1	TP15	A-3
		TP16	C-3
IC1	F-2	TP17	B-1
IC2	E-3	TP18	E-1
IC3	D-3	TP19	G-1
IC4	B-4	TP20	A-2
IC5	F-2	TP21	A-3
IC6	F-1	TP22	B-3
IC7	F-1	TP23	G-1
IC8	G-1	TP24	C-2
IC9	B-3		
IC10	B-3		
IC11	B-2		
IC12	B-1		
IC13	B-1		
Q1	G-3		
Q2	G-3		
Q3	G-3		
Q4	G-3		
Q5	F-3		
Q6	G-3		
Q7	F-3		
Q8	F-3		
Q9	F-3		
Q10	D-3		
Q11	D-3		
Q12	D-3		
Q13	D-3		
Q14	D-3		
Q15	D-3		
Q16	D-3		
Q17	C-2		
Q18	D-2		
Q19	C-4		
Q21	C-4		
Q22	E-2		
Q23	E-2		
Q24	G-2		
Q25	G-1		
Q26	A-2		
Q27	A-2		
Q28	H-2		
Q29	G-1		
Q30	B-2		
Q31	A-2		
Q100	G-2		
Q101	F-2		
Q102	A-3		
RV1	C-3		
RV2	C-2		
RV3	H-2		
RV4	E-2		
RV5	H-2		
RV6	G-2		
RV7	A-3		
RV8	B-2		
RV9	A-2		
RV10	B-2		



DK-4 BOARD – 12
– SOLDERING SIDE –
SEG-2000A
SEG-2000AP
SEG-2000APM

DK-4 BOARD (DOWNSTREAM KEYER SYSTEM)





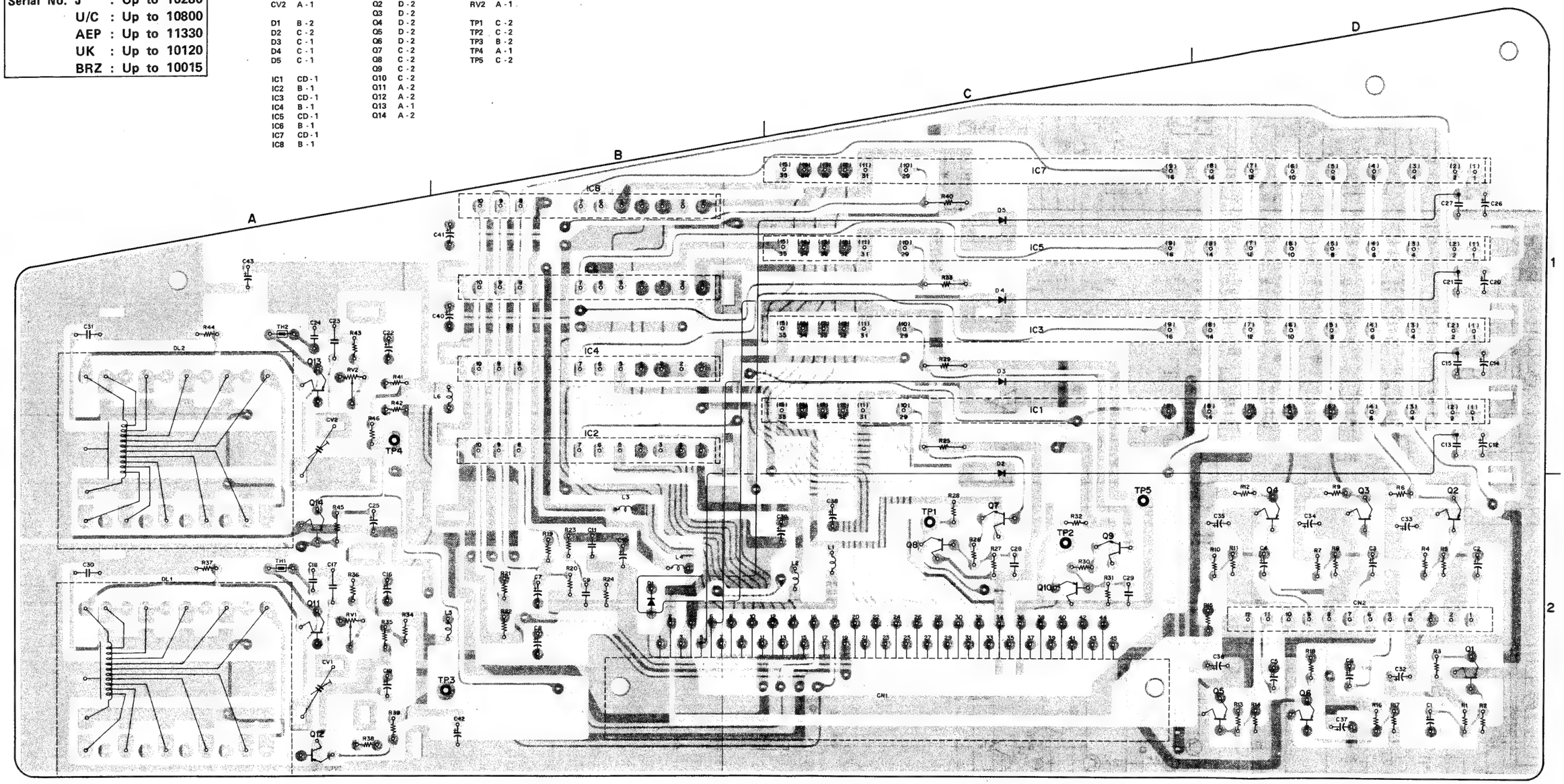
NOTE:

1. All voltage are measured with a digital voltmeter (input impedance 10MΩ).
2. Waveform photographs are taken under the following conditions:
   - Color bar signal (1 Vp-p) input to "VIDEO IN"
   - NORMAL/INVERT ; NORMAL
   - PHASE INDICATION ; ON
   - INSERT ; CUT IN
   - SHADOW ; OFF

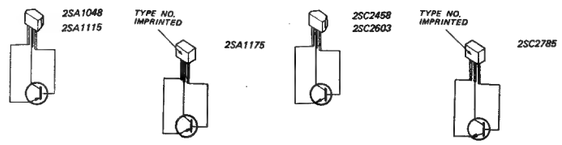
EF-8 BOARD
– SOLDERING SIDE –

Serial No. J	:	Up to 10280
U/C	:	Up to 10800
AEP	:	Up to 11330
UK	:	Up to 10120
BRZ	:	Up to 10015

CV1	A-2	Q1	D-2	RV1	A-2		
CV2	A-1	Q2	D-2	RV2	A-1		
		Q3	D-2				
D1	B-2	Q4	D-2	TP1	C-2		
D2	C-2	Q5	D-2	TP2	C-2		
D3	C-1	Q6	D-2	TP3	B-2		
D4	C-1	Q7	C-2	TP4	A-1		
D5	C-1	Q8	C-2	TP5	C-2		
		Q9	C-2				
IC1	CD-1	Q10	C-2				
IC2	B-1	Q11	A-2				
IC3	CD-1	Q12	A-2				
IC4	B-1	Q13	A-1				
IC5	CD-1	Q14	A-2				
IC6	B-1						
IC7	CD-1						
IC8	B-1						



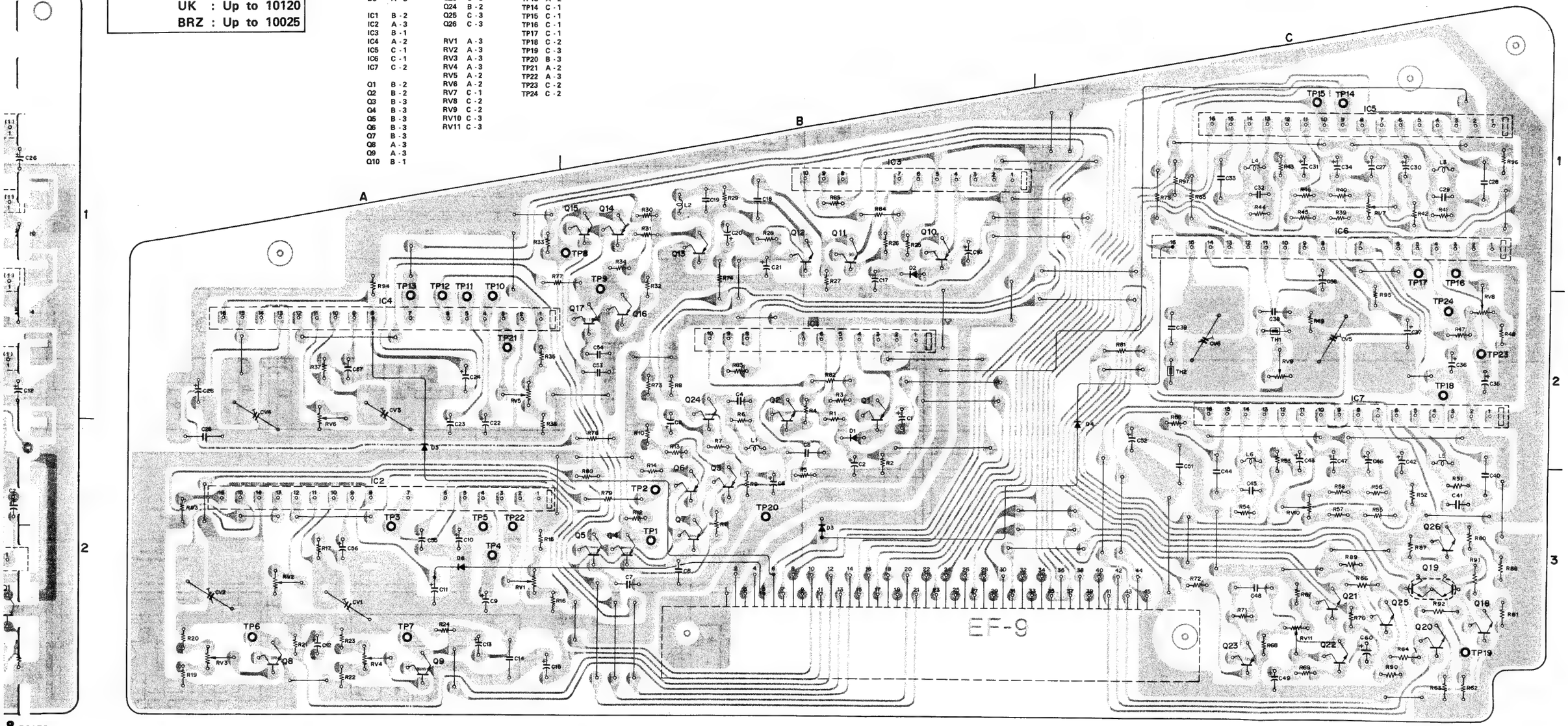
EF-8 BOARD
1-606-074-13
SEG-2000
SEG-2000P
SEG-2000PM
SEG-2000A
SEG-2000AP
SEG-2000APM

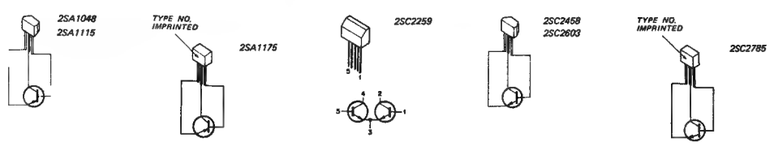


EF-9 BOARD
– SOLDERING SIDE –

Serial No.	J	: Up to 10280
	U/C	: Up to 10800
	AEP	: Up to 11470
	UK	: Up to 10120
	BRZ	: Up to 10025

CV1	A - 3	Q11	B - 1	TP1	B - 3
CV2	A - 3	Q12	B - 1	TP2	B - 3
CV3	A - 2	Q13	B - 1	TP3	A - 3
CV4	A - 2	Q14	B - 1	TP4	A - 3
CV5	C - 2	Q15	B - 1	TP5	A - 3
CV6	C - 2	Q16	B - 2	TP6	A - 3
		Q17	B - 2	TP7	A - 3
D1	B - 2	Q18	C - 3	TP8	B - 1
D2	B - 1	Q19	C - 3	TP9	B - 2
D3	B - 3	Q20	C - 3	TP10	A - 2
D4	C - 2	Q21	C - 3	TP11	A - 2
D5	A - 2	Q22	C - 3	TP12	A - 2
D6	A - 3	Q23	C - 3	TP13	A - 2
		Q24	B - 2	TP14	C - 1
IC1	B - 2	Q25	C - 3	TP15	C - 1
IC2	A - 3	Q26	C - 3	TP16	C - 1
IC3	B - 1			TP17	C - 1
IC4	A - 2	RV1	A - 3	TP18	C - 2
IC5	C - 1	RV2	A - 3	TP19	C - 3
IC6	C - 1	RV3	A - 3	TP20	B - 3
IC7	C - 2	RV4	A - 3	TP21	A - 2
		RV5	A - 2	TP22	A - 3
Q1	B - 2	RV6	A - 2	TP23	C - 2
Q2	B - 2	RV7	C - 1	TP24	C - 2
Q3	B - 3	RV8	C - 2		
Q4	B - 3	RV9	C - 2		
Q5	B - 3	RV10	C - 3		
Q6	B - 3	RV11	C - 3		
Q7	B - 3				
Q8	A - 3				
Q9	A - 3				
Q10	B - 1				





11-28(a)

EF-9 BOARD
1-606-075-12
SEG-2000/2000A
SEG-2000P/2000AP
SEG-2000PM/2000APM

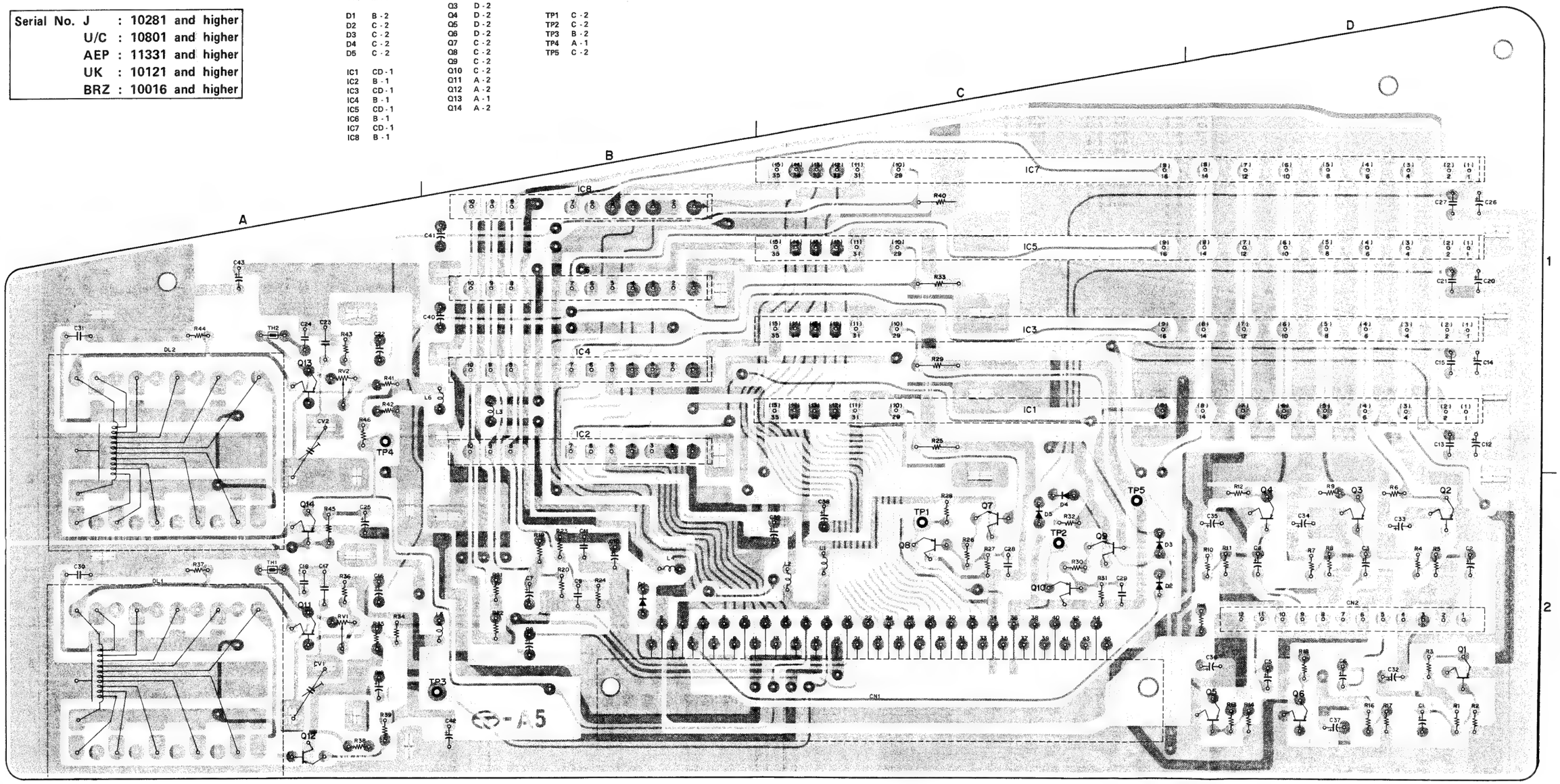
11-29(a)

EF-8 BOARD

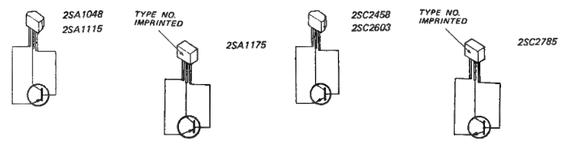
– SOLDERING SIDE –

Serial No. J	:	10281 and higher
U/C	:	10801 and higher
AEP	:	11331 and higher
UK	:	10121 and higher
BRZ	:	10016 and higher

CV1	A-2	Q1	D-2	RV1	A-2
CV2	A-1	Q2	D-2	RV2	A-1
		Q3	D-2		
D1	B-2	Q4	D-2	TP1	C-2
D2	C-2	Q5	D-2	TP2	C-2
D3	C-2	Q6	D-2	TP3	B-2
D4	C-2	Q7	C-2	TP4	A-1
D5	C-2	Q8	C-2	TP5	C-2
		Q9	C-2		
IC1	CD-1	Q10	C-2		
IC2	B-1	Q11	A-2		
IC3	CD-1	Q12	A-2		
IC4	B-1	Q13	A-1		
IC5	CD-1	Q14	A-2		
IC6	B-1				
IC7	CD-1				
IC8	B-1				



EF-8 BOARD
1-606-074-14
SEG-2000
SEG-2000P
SEG-2000PM
SEG-2000A
SEG-2000AP
SEG-2000APM

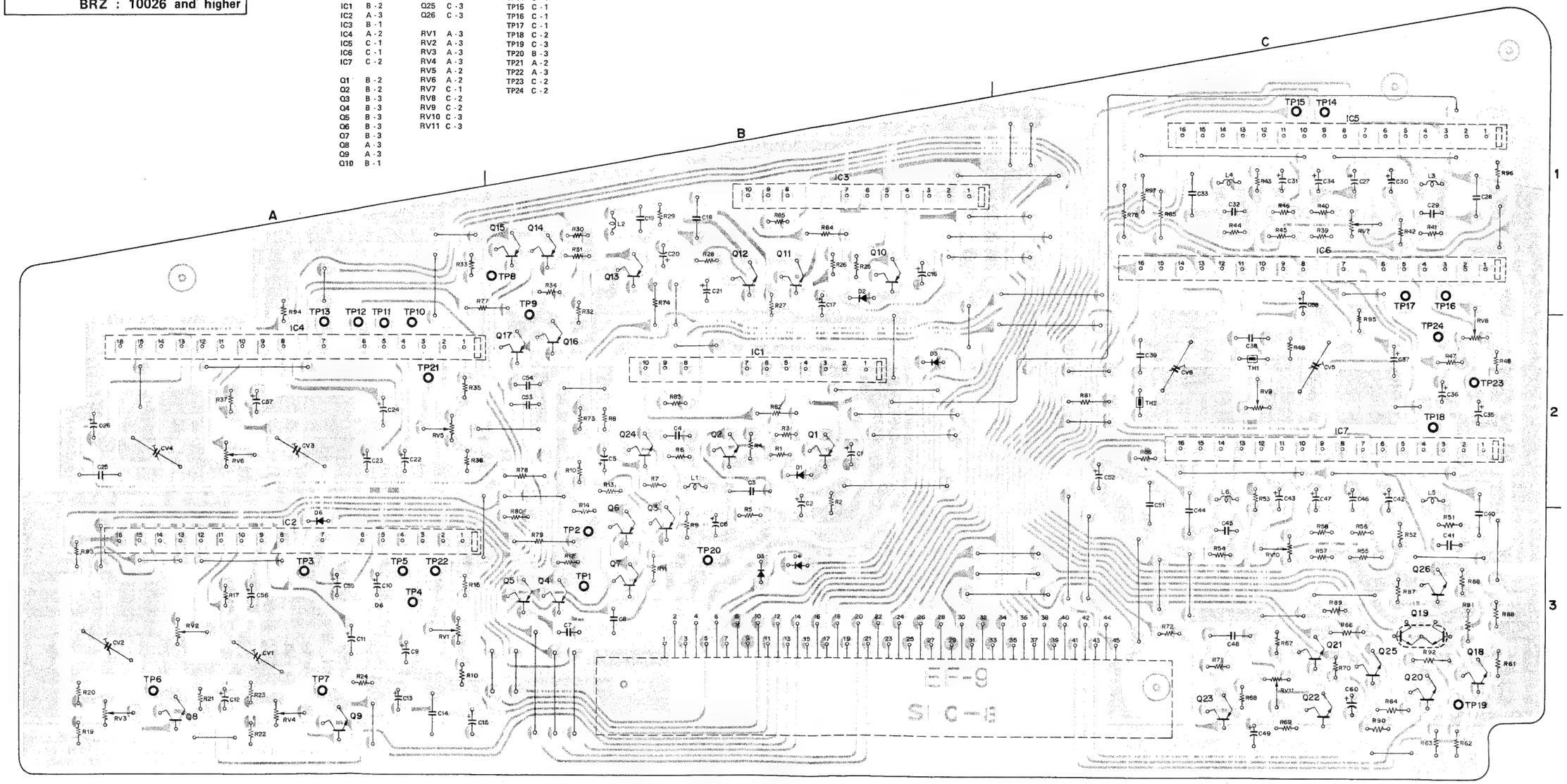


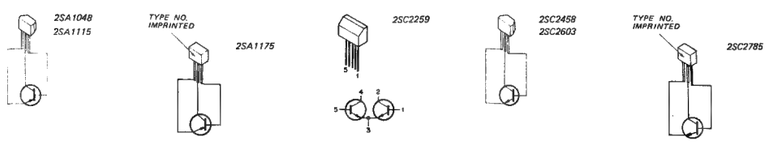
EF-9 BOARD

– SOLDERING SIDE –

Serial No.		
	J	: 10281 and higher
	U/C	: 10801 and higher
	AEP	: 11471 and higher
	UK	: 10121 and higher
	BRZ	: 10026 and higher

CV1	A - 3	Q11	B - 1	TP1	B - 3		
CV2	A - 3	Q12	B - 1	TP2	B - 3		
CV3	A - 2	Q13	B - 1	TP3	A - 3		
CV4	A - 2	Q14	B - 1	TP4	A - 3		
CV5	C - 2	Q15	B - 1	TP5	A - 3		
CV6	C - 2	Q16	B - 2	TP6	A - 3		
		Q17	B - 2	TP7	A - 3		
D1	B - 2	Q18	C - 3	TP8	B - 1		
D2	B - 1	Q19	C - 3	TP9	B - 2		
D3	B - 3	Q20	C - 3	TP10	A - 2		
D4	B - 2	Q21	C - 3	TP11	A - 2		
D5	B - 2	Q22	C - 3	TP12	A - 2		
D6	A - 3	Q23	C - 3	TP13	A - 2		
		Q24	B - 2	TP14	C - 1		
IC1	B - 2	Q25	C - 3	TP15	C - 1		
IC2	A - 3	Q26	C - 3	TP16	C - 1		
IC3	B - 1			TP17	C - 1		
IC4	A - 2	RV1	A - 3	TP18	C - 2		
IC5	C - 1	RV2	A - 3	TP19	C - 3		
IC6	C - 1	RV3	A - 3	TP20	B - 3		
IC7	C - 2	RV4	A - 3	TP21	A - 2		
		RV5	A - 2	TP22	A - 3		
Q1	B - 2	RV6	A - 2	TP23	C - 2		
Q2	B - 2	RV7	C - 1	TP24	C - 2		
Q3	B - 3	RV8	C - 2				
Q4	B - 3	RV9	C - 2				
Q5	B - 3	RV10	C - 3				
Q6	B - 3	RV11	C - 3				
Q7	B - 3						
Q8	A - 3						
Q9	A - 3						
Q10	B - 1						



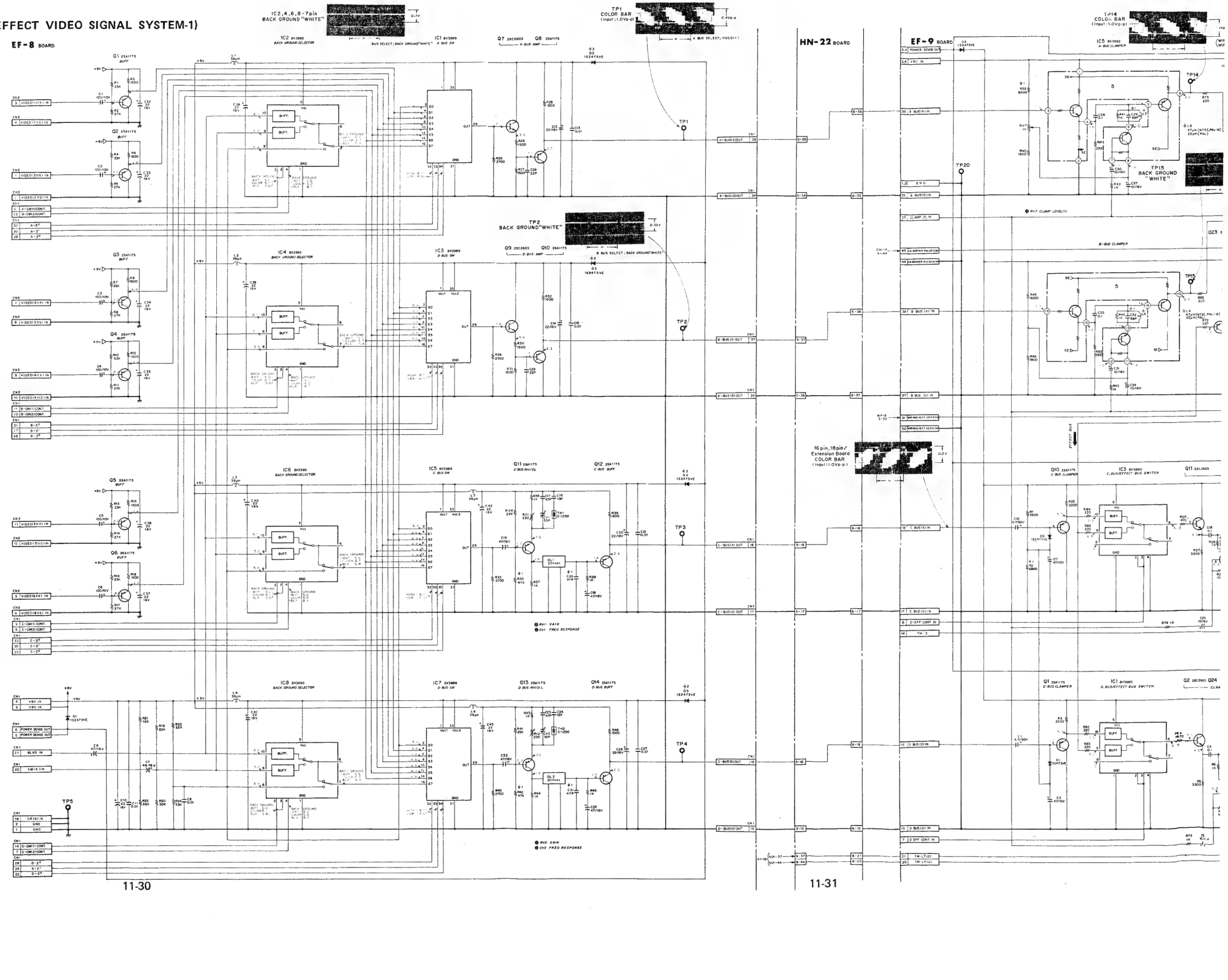


11-28(b)

EF-9 BOARD
1-606-075-13
SEG-2000/2000A
SEG-2000P/2000AP
SEG-2000PM/2000APM

11-29(b)

EF-8, EF-9 BOARD (SPECIAL EFFECT VIDEO SIGNAL SYSTEM-1)



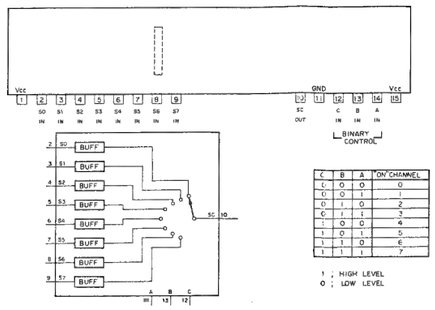
(For EF-8 Board)
NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
Φ1	C30,31 SW ——→ 47P R30,42 SW ——→ 47K	(J) 10441 ~ (UC) 11281 ~ (AEP) 12821 ~ (UK) 10181 ~ (BRZ) 10046 ~
Φ2	D2,D3,D4,D5 1S133 ——→ 1S2473VE	(J) 10281 ~ (UC) 10801 ~ (AEP) 11331 ~ (UK) 10121 ~ (BRZ) 10016 ~

11-32

BX3989 (SONY)
8-CHANNEL MULTIPLEXER WITH BUFFER

—REAR VIEW—

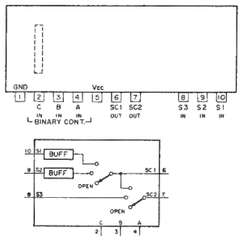


C	B	A	ON CHANNEL
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	0	0	4
1	0	1	5
1	1	0	6
1	1	1	7

1 ; HIGH LEVEL
0 ; LOW LEVEL

BX3990 (SONY)
3-CHANNEL MULTIPLEXER

—REAR VIEW—



CONT. INPUTS			OUTPUTS	
C	B	A	SC1	SC2
0	0	0	S1	S1
0	0	1	S1	S3
0	1	0	OPEN	OPEN
0	1	1	OPEN	S3
1	0	0	OPEN	OPEN
1	0	1	OPEN	S3
1	1	0	S2	S2
1	1	1	S2	S3

1 ; HIGH LEVEL
0 ; LOW LEVEL

(For EF-9 Board)
NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
● 1	C4,19,39,32,41,45 43P ⟶ 39P	(J) 10441 ~ (UC) 11281 ~
	R2 6200 ⟶ 6800	(AEP) 12821 ~ (UK) 10191 ~
	R8 8100 ⟶ 8200	(BRZ) 10046 ~
	R20,23 4500 ⟶ 4700	
	R39 7500 ⟶ 8200	
	R91,92 13K ⟶ 12K	

NOTE:

1. All voltage are measured with a digital voltmeter (input impedance 10MΩ).
2. Waveform photographs are taken with color bar signal (1 Vp-p) input to "VIDEO IN".

11-33

EF-10 BOARD
– SOLDERING SIDE –

Serial No.	J	: Up to 10280
	U/C	: Up to 10800
	AEP	: Up to 11470
	UK	: Up to 10120
	BRZ	: Up to 10025

CV1 B-2
CV2 A-2
CV3 B-1
CV4 A-1
CV5 D-1

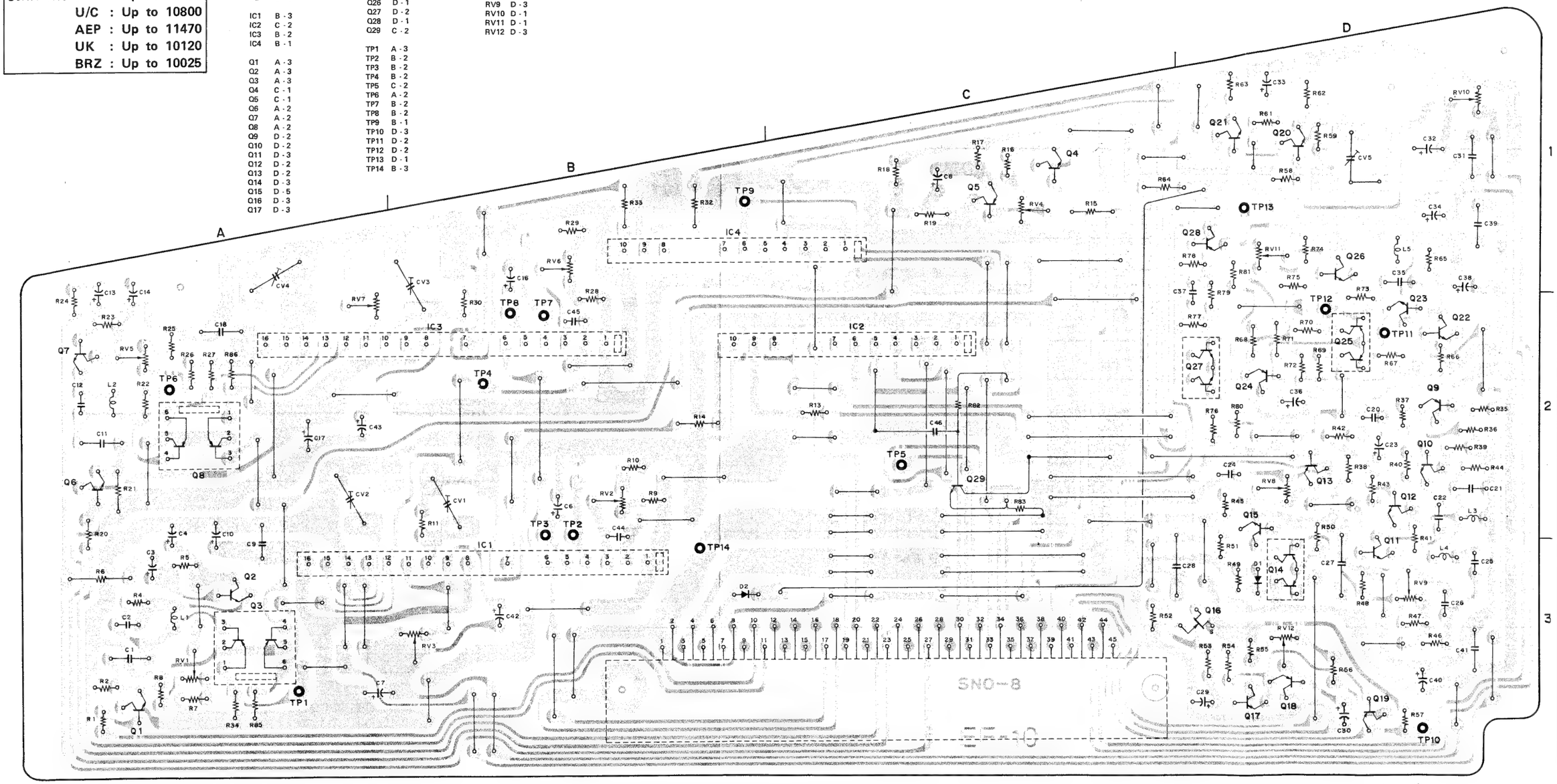
D1 D-3
D2 B-3

IC1 B-3
IC2 C-2
IC3 B-2
IC4 B-1

Q1 A-3
Q2 A-3
Q3 A-3
Q4 C-1
Q5 C-1
Q6 A-2
Q7 A-2
Q8 A-2
Q9 D-2
Q10 D-2
Q11 D-3
Q12 D-2
Q13 D-3
Q14 D-5
Q15 D-3
Q16 D-3
Q17 D-3
Q18 D-3
Q19 D-3
Q20 D-1
Q21 D-1
Q22 D-2
Q23 D-2
Q24 D-2
Q25 D-2
Q26 D-1
Q27 D-2
Q28 D-1
Q29 C-2

TP1 A-3
TP2 B-2
TP3 B-2
TP4 B-2
TP5 C-2
TP6 A-2
TP7 B-2
TP8 B-2
TP9 B-1
TP10 D-3
TP11 D-2
TP12 D-2
TP13 D-1
TP14 B-3

RV1 A-3
RV2 B-2
RV3 B-3
RV4 C-1
RV5 A-2
RV6 B-1
RV7 B-1
RV8 D-2
RV9 D-3
RV10 D-1
RV11 D-1
RV12 D-3



EF-10 BOARD
1-606-080-12
SEG-2000/2000A
SEG-2000P/2000AP
SEG-2000PM/2000APM

TOP VIEW 2SA884

2SA979

2SA1048
2SA1115

TYPE NO. IMPRINTED
2SA1175

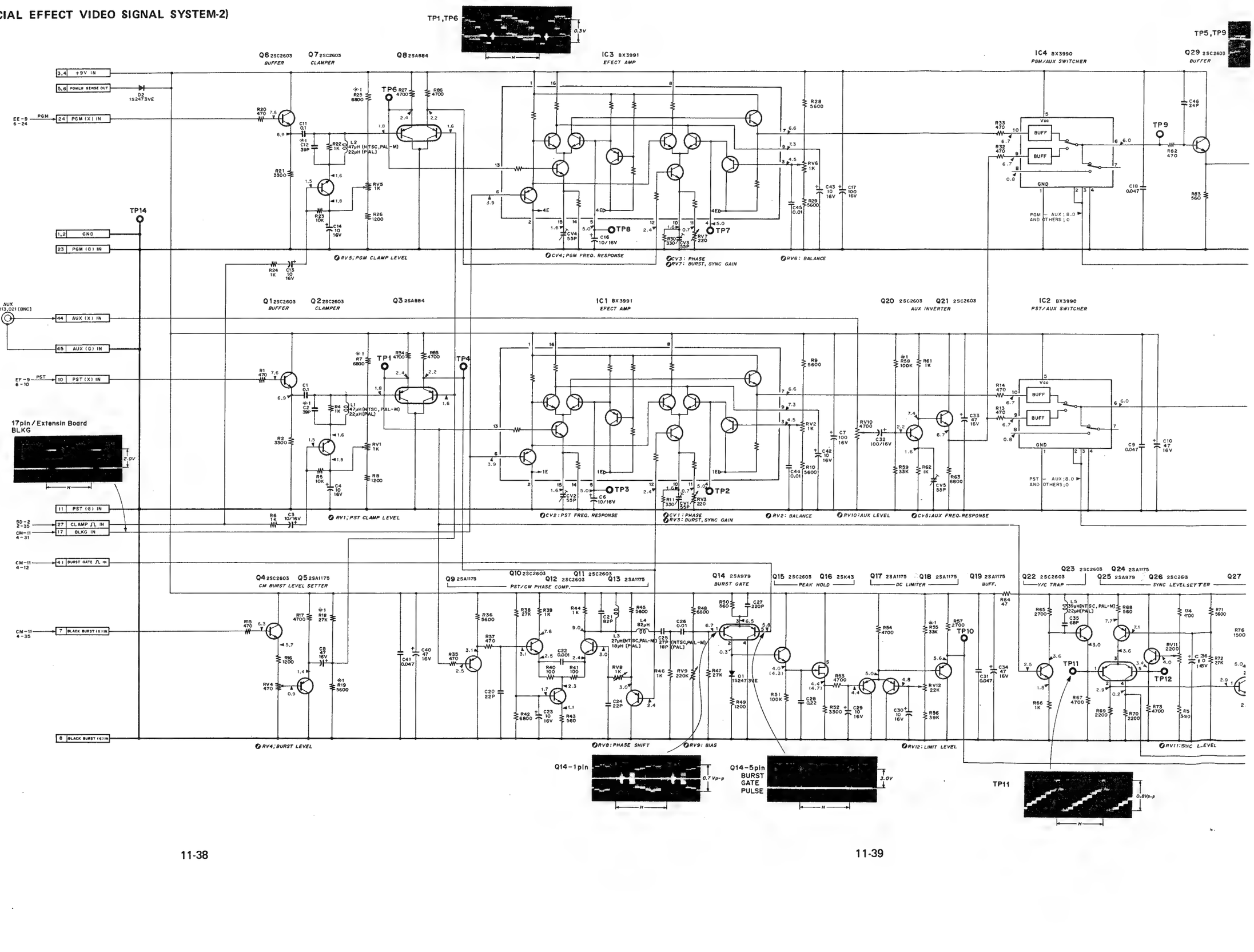
2SC2259

2SC2458
2SC2603

TYPE NO. IMPRINTED
2SC2785

2SK43

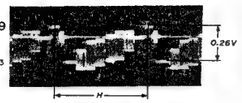
EF-10 BOARD (SPECIAL EFFECT VIDEO SIGNAL SYSTEM-2)



IC3 BX3991
EFECT AMP

IC4 BX3990
PGM/AUX SWITCHER

Q29 2SC2603
BUFFER



R28 5600
R33 470
R32 470
R82 470
R83 560
C46 24P
C18 0.047
C43 10 16V
C17 100 16V
C45 0.01
R29 5600
RV6 1K
TP9
TP8
TP7
C16 10/16V
CV4 55P
R30 330
CV3 55P
RV7 220
PGM(X) OUT 34
PGM (G) OUT 33
PGM/AUX CONT 20
SD-2 2-45
DK-4 8-34

CV4; PGM FREQ. RESPONSE
CV3: PHASE
RV7: BURST, SYNC GAIN
RV6: BALANCE

IC1 BX3991
EFECT AMP

Q20 2SC2603 Q21 2SC2603
AUX INVERTER

IC2 BX3990
PST/AUX SWITCHER

R9 5600
R10 5600
RV2 1K
C7 100 16V
C42 10 16V
C44 0.01
RV10 4700
C32 100/16V
C33 47 16V
※1 R58 100K
R61 1K
R59 33K
R62 1K
R63 6800
CV5 55P
R14 470
R13 470
C9 0.047
C10 47 16V
TP5
TP3
TP2
C6 10/16V
CV2 55P
R11 330
CV1 55P
RV3 220
PST(X) OUT 31
PST(G) OUT 30
PST/AUX CONT IN 19
SD-2 2-44
DK-4 8-29

CV2: PST FREQ. RESPONSE
CV1: PHASE
RV3: BURST, SYNC GAIN
RV2: BALANCE
RV10: AUX LEVEL
CV5: AUX FREQ. RESPONSE

Q10 2SC2603 Q11 2SC2603 Q12 2SC2603 Q13 2SA1175
PST/CM PHASE COMP.

Q14 2SA979
BURST GATE

Q15 2SC2603 Q16 2SK43
PEAK HOLD

Q17 2SA1175 Q18 2SA1175
DC LIMITER

Q19 2SA1175
BUFF.

Q22 2SC2603
Y/C TRAP

Q23 2SC2603 Q24 2SA1175 Q25 2SA979 Q26 2SC2603
SYNC LEVEL SETTER

Q27 2SC2259

Q28 2SA1175
SYNC AMP

R38 27K
R39 1K
R44 1K
R45 5600
C21 82P
L4 82μH
C26 0.01
R46 6800
R50 560
C27 220P
L3 27μH(NTSC,PAL-M) 18μH (PAL)
C25 27P 18P (PAL) (NTSC,PAL-M)
R40 100
R41 100
C22 0.001
RV8 1K
R46 1K
RV9 220K
R47 27K
C24 22P
R42 6800
C23 10 16V
R43 560
D1 1S247/3YE
R49 1200
R51 100K
R54 4700
R53 4700
C28 022
R52 3300
C29 10 16V
※1 R55 33K
R57 2700
TP10
C30 10 16V
R56 39K
R64 47
C31 0.047
C34 47 16V
R65 2700
C35 68P
L5 39μH(NTSC,PAL-M) 22μH(PAL)
R66 1K
TP11
R67 4700
R68 560
RV11 2200
TP12
R69 2200
R70 2200
R74 4700
R71 5600
C36 10 16V
R72 27K
R73 4700
R75 3900
R76 1500
R77 1500
C37 220P
R79 22K
R78 10K
C39 0.047
C38 47 16V
TP13
R80 1K
R81 2200
SYNC (2) OUT 39
SC PHASE INDI. OUT 42
CH-7 1-19
CH-7 1-34

RV8: PHASE SHIFT
RV9: BIAS
RV12: LIMIT LEVEL
RV11: SYNC LEVEL

NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
※1	C2,12 43P → 39P	(J) 10441~
		(U/C) 11261~
	R7,25 7500 → 6800	(AEP) 12821~
		(UK) 10191~
	R18 30K → 27K	(BRZ) 10046~
	R19 6200 → 5600	
	R55 30K → 33K	
	R58 91K → 100K	

Q14-1pin
0.7 Vp-p
H

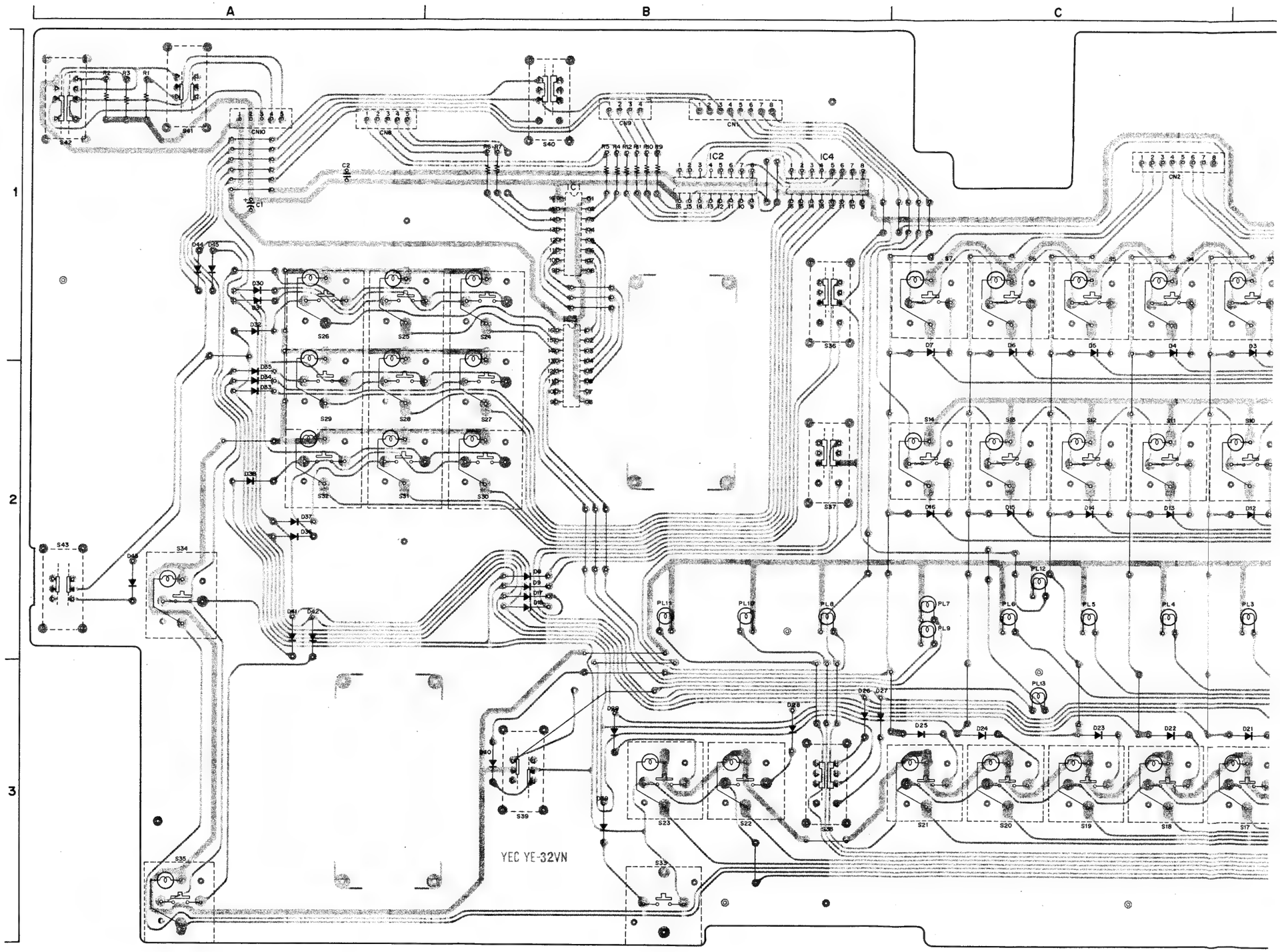
Q14-5pin BURST GATE PULSE
3.0V
H

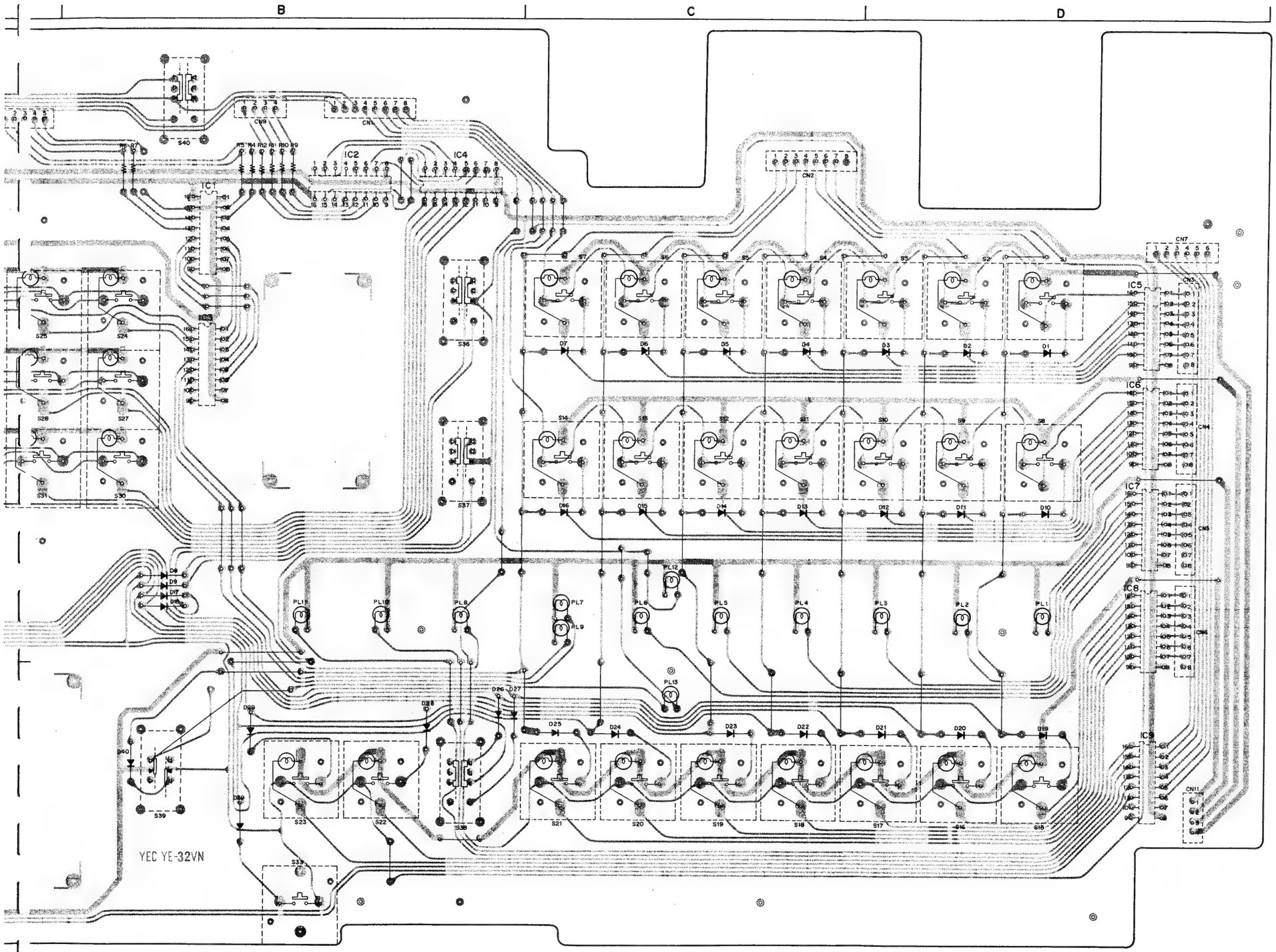
TP11
0.8Vp-p
H

TP13 SYNC(2)
9.0V
H

TP10 SC PHASE INDI. CONT
5.6Vdc

KY-17 BOARD
– SOLDERING SIDE –



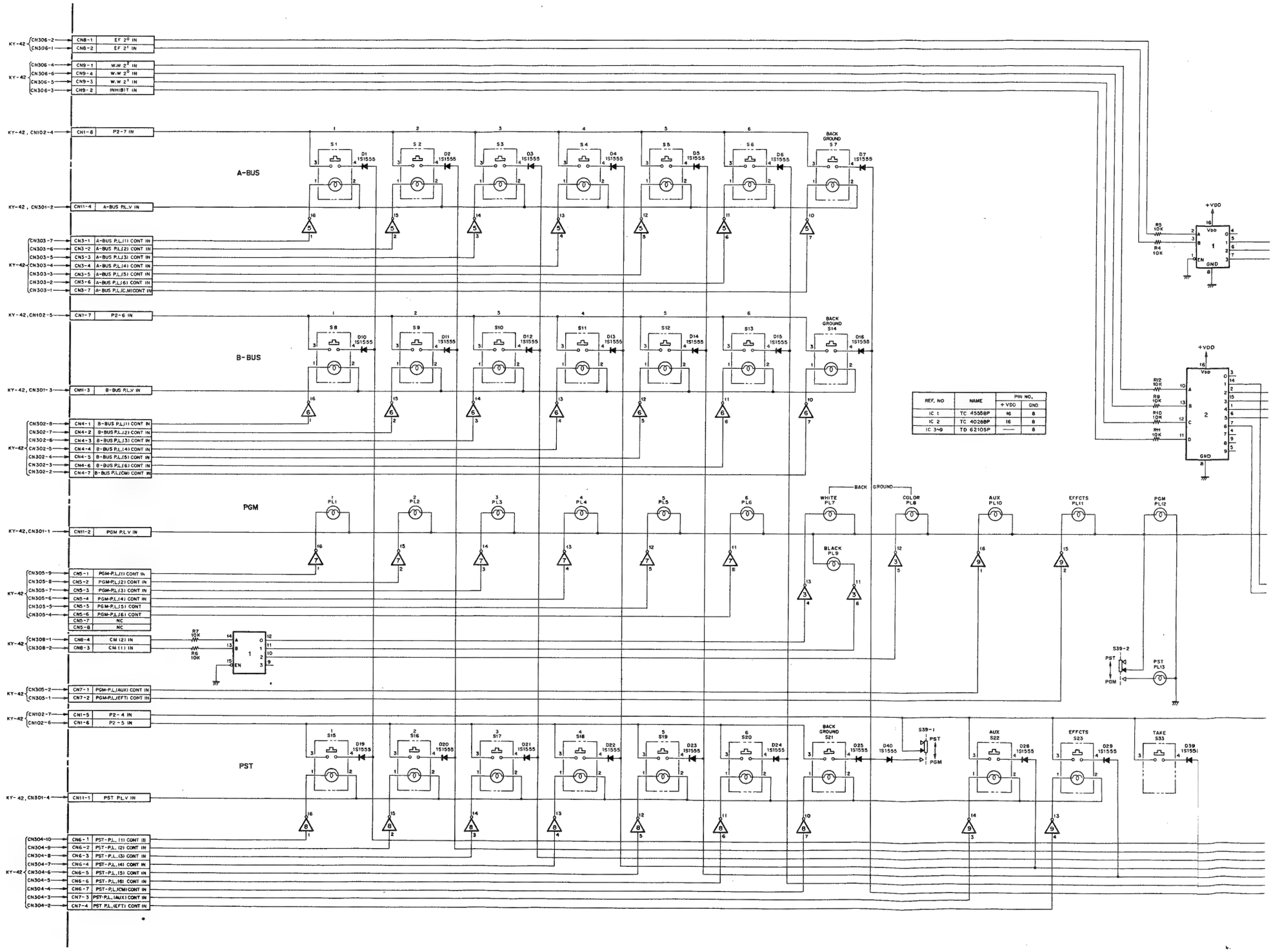


D1	D - 1
D2	D - 1
D3	D - 1
D4	C - 1
D5	C - 1
D6	C - 1
D7	C - 1
D8	B - 2
D9	B - 2
D10	D - 2
D11	D - 2
D12	D - 2
D13	C - 2
D14	C - 2
D15	C - 2
D16	C - 2
D17	B - 2
D18	B - 2
D19	D - 3
D20	D - 3
D21	D - 3
D22	C - 3
D23	C - 3
D24	C - 3
D25	C - 3
D26	B - 3
D27	B - 3
D28	B - 3
D29	B - 3
D30	A - 1
D31	A - 1
D32	A - 1
D33	A - 2
D34	A - 2
D35	A - 2
D36	A - 2
D37	A - 2
D38	A - 2
D39	B - 3
D40	B - 3
D41	A - 2
D42	A - 2
D43	A - 2
D44	A - 1
D45	A - 1

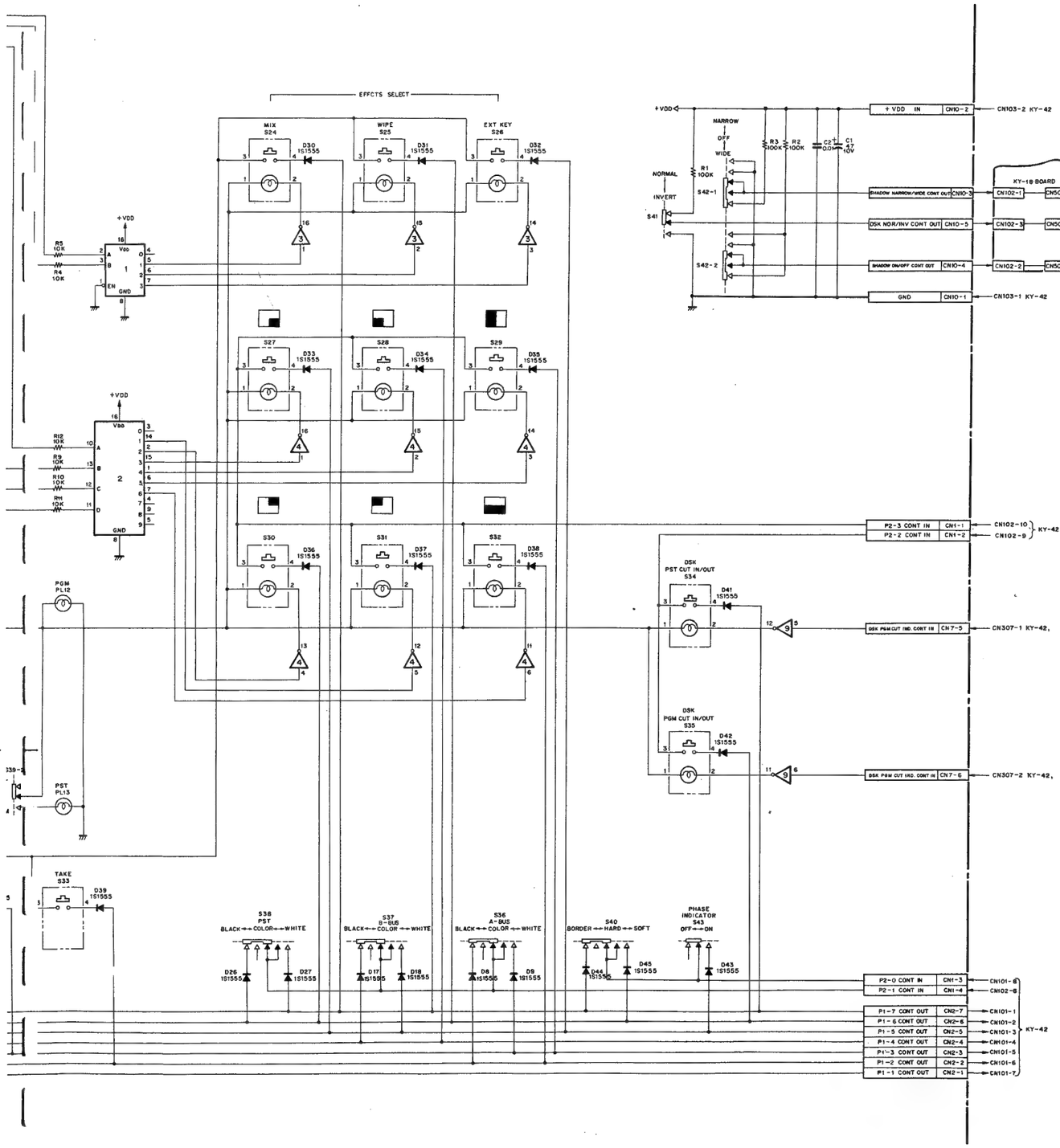
IC1	B - 1
IC2	B - 1
IC3	B - 1
IC4	B - 1
IC5	D - 1
IC6	D - 2
IC7	D - 2
IC8	D - 2
IC9	D - 3

KY-17 BOARD
1-606-069-14
SEG-2000/2000A
SEG-2000P/2000AP
SEG-2000PM/2000APM

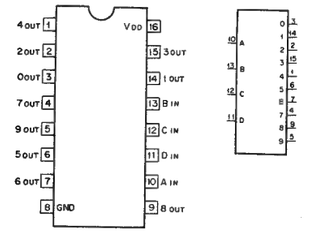
KY-17 BOARD (CONTROL SYSTEM-1)



REF. NO	NAME	PIN NO.	
		+ VDD	GND
IC 1	TC 4555BP	16	8
IC 2	TC 4028BP	16	8
IC 3-9	TD 62105P	—	8



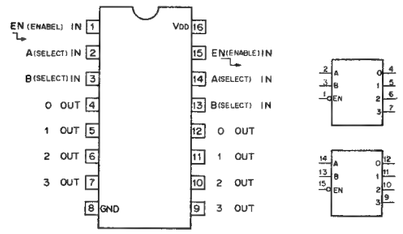
TC4028BP (TOSHIBA)
C-MOS BCD TO DECIMAL DECODER
—TOP VIEW—



STATE	INPUTS				OUTPUTS									
	D	C	B	A	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
1	0	0	0	1	0	1	0	0	0	0	0	0	0	0
2	0	0	1	0	0	0	1	0	0	0	0	0	0	0
3	0	0	1	1	0	0	0	1	0	0	0	0	0	0
4	0	1	0	0	0	0	0	0	1	0	0	0	0	0
5	0	1	0	1	0	0	0	0	0	1	0	0	0	0
6	0	1	1	0	0	0	0	0	0	0	1	0	0	0
7	0	1	1	1	0	0	0	0	0	0	0	1	0	0
8	1	X	X	0	0	0	0	0	0	0	0	0	1	0
9	1	X	X	1	0	0	0	0	0	0	0	0	0	1

0; LOW
1; HIGH
X; LOW OR HIGH

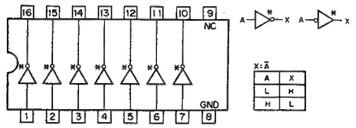
TC4555BP (TOSHIBA)
C-MOS BINARY TO 1-OF-4 DECODER / DEMULTIPLEXER
—TOP VIEW—



INPUTS			OUTPUTS			
EN	B	A	3	2	1	0
0	0	0	0	0	0	1
0	0	1	0	0	1	0
0	1	0	0	1	0	0
0	1	1	1	0	0	0
1	X	X	0	0	0	0

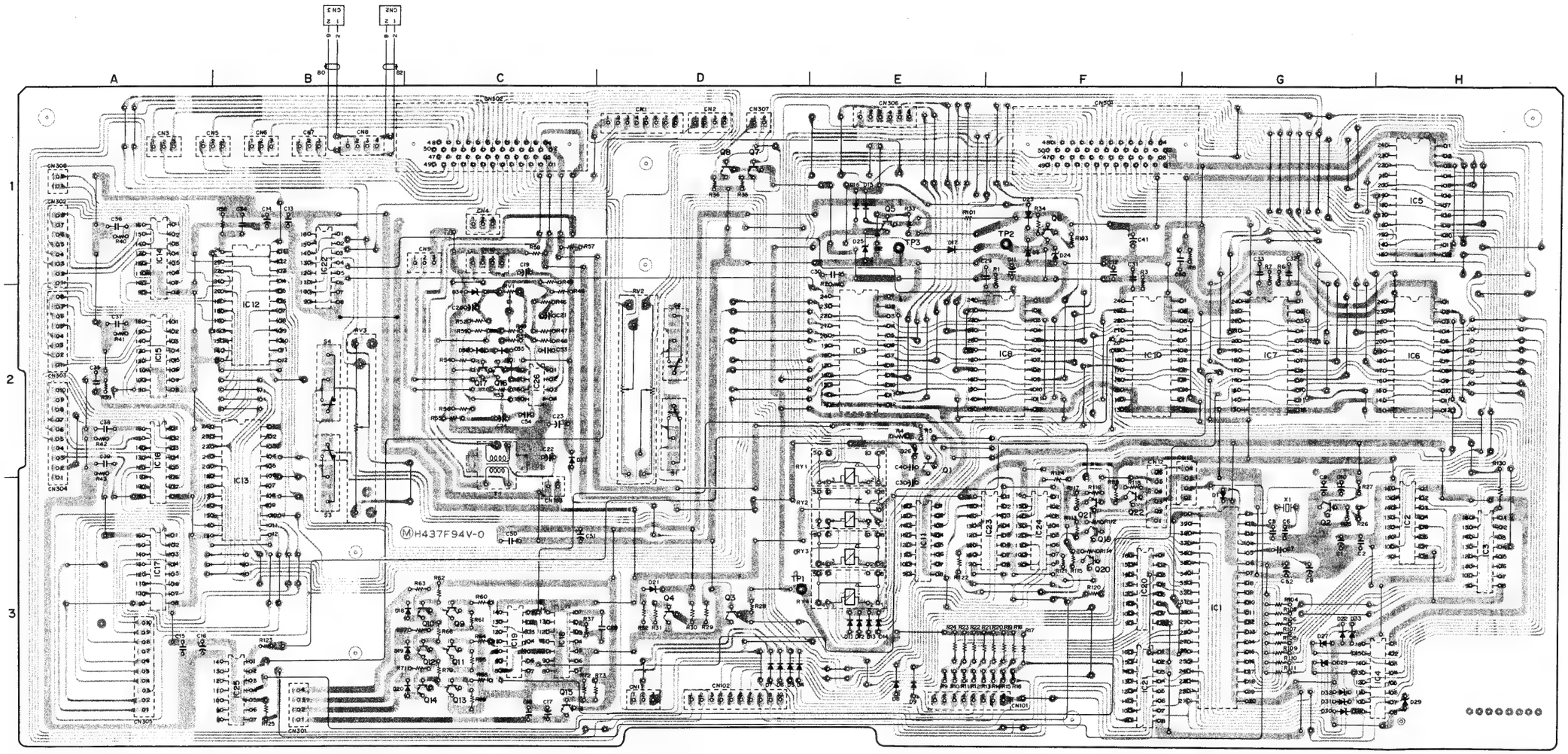
X = DON'T CARE
0 = LOW LEVEL
1 = HIGH LEVEL

TD 62105 P (TOSHIBA)
TTL INVERTING DRIVER WITH OPEN COLLECTOR
—TOP VIEW—



* OPEN COLLECTOR

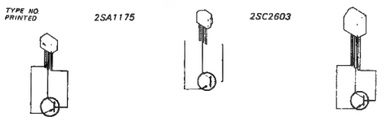
KY-42 BOARD

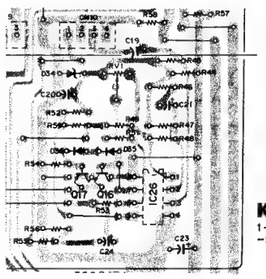


CN1	D - 1	IC11	E - 3
CN2	D - 1	IC12	B - 2
CN3	A - 1	IC13	B - 2
CN4	C - 1	IC14	A - 1
CN5	A - 1	IC15	A - 2
CN6	B - 1	IC16	A - 2
CN7	B - 1	IC17	A - 3
CN8	B - 1	IC18	C - 3
CN9	C - 1	IC19	C - 3
CN10	C - 1	IC20	F - 3
CN101	E - 3	IC21	F - 3
CN102	D - 3	IC22	B - 1
CN103	C - 3	IC23	F - 3
CN112	F - 3	IC24	F - 3
CN113	G - 3	IC25	B - 3
CN301	B - 3	IC26	C - 2
CN302	A - 1		
CN303	A - 2	Q1	E - 2
CN304	A - 2	Q2	G - 3
CN305	A - 3	Q3	D - 3
CN306	E - 1	Q4	D - 3
CN307	D - 1	Q5	E - 1
CN308	A - 1	Q6	F - 1
CN501	F - 1	Q7	D - 1
CN502	C - 1	Q8	D - 1
		Q9	C - 3
D1	G - 3	Q10	C - 3
D2	E - 1	Q11	C - 3
D3	F - 1	Q12	C - 3
D4	D - 3	Q13	C - 3
D5	D - 3	Q14	C - 3
D6	D - 3	Q15	C - 3
D7	D - 3	Q16	C - 2
D8	E - 3	Q17	C - 2
D9	E - 3	Q19	F - 3
D10	D - 3	Q20	F - 3
D11	E - 3	Q21	F - 3
D12	E - 3	Q22	F - 3
D13	E - 3		
D14	E - 3	RV1	C - 2
D15	E - 1	RV2	D - 2
D16	E - 1	RV3	B - 2
D17	E - 1		
D18	C - 3	RY1	E - 2
D19	C - 3	RY2	E - 3
D20	C - 3	RY3	E - 3
D21	D - 3	RY4	E - 3
D22	G - 3		
D23	F - 1	S1	D - 2
D24	F - 1	S2	D - 2
D25	E - 1	S3	B - 2
D26	E - 2	S4	B - 2
D27	G - 3		
D28	G - 3	TP1	D - 3
D29	H - 3	TP2	F - 1
D30	G - 3	TP3	E - 1
D31	G - 3		
D32	G - 3	X1	G - 3
D33	G - 3		
D34	C - 2		
D35	C - 2		
D36	C - 2		
D37	C - 2		
IC1	G - 3		
IC2	H - 3		
IC3	H - 4		
IC4	H - 3		
IC5	H - 1		
IC6	H - 2		
IC7	G - 2		
IC8	F - 2		
IC9	E - 2		
IC10	F - 2		

KY-42 BOARD
1-610-344-12,13
-SOLDERING SIDE-
SEG-2000A
SEG-2000AP
SEG-2000APM

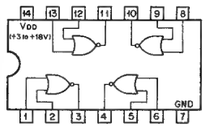
TYPE NO PRINTED





KY-42 BOARD
1-610-344-11
-SOLDERING SIDE-

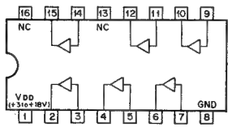
TC4001BP (TOSHIBA)
C-MOS 2-INPUT NOR GATE
— TOP VIEW —



A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

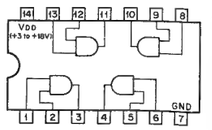
0 ; LOW LEVEL
1 ; HIGH LEVEL

TC4050BP (TOSHIBA)
C-MOS NON-INVERTING TYPE BUFFER/CONVERTER
— TOP VIEW —



A	Y
0	0
1	1

TC4081BP (TOSHIBA)
C-MOS 2-INPUT AND GATE
— TOP VIEW —



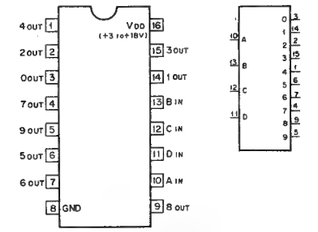
A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL

D-1 IC11 E-3
D-1 IC12 B-2
A-1 IC13 B-2
C-1 IC14 A-1
A-1 IC15 A-2
B-1 IC16 A-2
B-1 IC17 A-3
B-1 IC18 C-3
C-1 IC19 C-3
C-1 IC20 F-3
E-3 IC21 F-3
D-3 IC22 B-1
C-3 IC23 F-3
F-3 IC24 F-3
G-3 IC25 B-3
B-3 IC26 C-2
A-1

A-2 Q1 E-2
A-2 Q2 G-3
A-3 Q3 D-3
E-1 Q4 D-3
D-1 Q5 E-1
A-1 Q6 F-1
F-1 Q7 D-1
C-1 Q8 D-1
Q9 C-3
G-3 Q10 C-3
E-1 Q11 C-3
F-1 Q12 C-3
D-3 Q13 C-3
D-3 Q14 C-3
D-3 Q15 C-2
D-3 Q16 C-2
E-3 Q17 C-2
E-3 Q19 F-3
D-3 Q20 F-3
E-3 Q21 F-3
E-3 Q22 F-3
E-3
E-3 RV1 C-2
E-1 RV2 D-2
E-1 RV3 B-2
E-1
RY1 E-2
RV2 E-3
RV3 E-3
RY4 E-3
3-3
F-1 S1 D-2
F-1 S2 D-2
E-1 S3 B-2
E-2 S4 B-2
3-3
3-3 TP1 D-3
4-3 TP2 F-1
3-3 TP3 E-1
3-3
3-3 X1 G-3
3-3
3-2
3-2
3-2
3-2
3-2
3-3
4-3
4-4
4-3
4-1
4-2
3-2
3-2
3-2

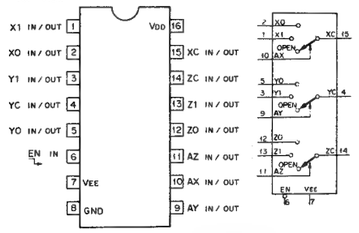
TC4028BP (TOSHIBA)
C-MOS BCD TO DECIMAL DECODER
— TOP VIEW —



STATE	INPUTS D	C	B	A	OUTPUTS 0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
1	0	0	0	1	0	1	0	0	0	0	0	0	0	0
2	0	0	1	0	0	0	1	0	0	0	0	0	0	0
3	0	0	1	1	0	0	0	1	0	0	0	0	0	0
4	0	1	0	0	0	0	0	0	1	0	0	0	0	0
5	0	1	0	1	0	0	0	0	0	1	0	0	0	0
6	0	1	1	0	0	0	0	0	0	0	1	0	0	0
7	0	1	1	1	0	0	0	0	0	0	0	1	0	0
8	1	X	X	0	0	0	0	0	0	0	0	0	1	0
9	1	X	X	1	0	0	0	0	0	0	0	0	0	1

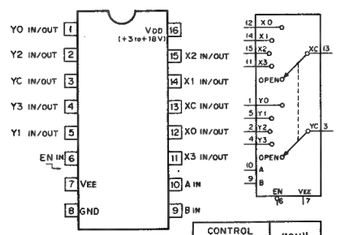
0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

TC4053BP (TOSHIBA)
C-MOS 2-CHANNEL MULTIPLEXER / DEMULTIPLEXER
—TOP VIEW—



CONT. INPUTS EN	A (X,Y,Z)	ON CHANNEL
L	L	O
L	H	1
H	X	OPEN

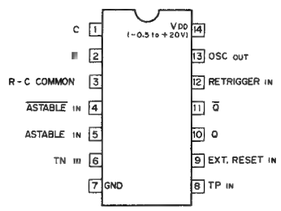
TC4052BP (TOSHIBA)
C-MOS 4-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —



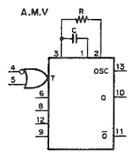
CONTROL INPUTS B	A	"ON" CHANNEL
0	0	0
0	1	1
1	0	2
1	1	3
X	X	OPEN

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE.

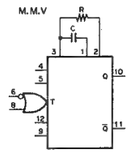
TC40478P (TOSHIBA)
C-MOS MONOSTABLE/ASTABLE MULTIVIBRATOR
— TOP VIEW —



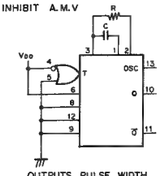
A.M.V



M.M.V

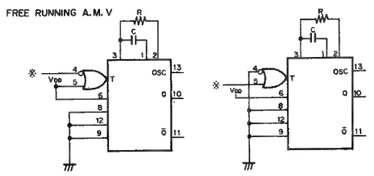


INHIBIT A.M.V



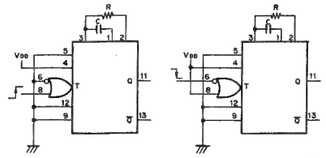
OUTPUTS PULSE WIDTH
Q, Q̄ ; T = 4.40RC
OSC; T = 2.20RC

FREE RUNNING A.M.V

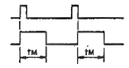


※ THE INPUT PULSE IS NOT CONCERNED WITH "H" AND "L"

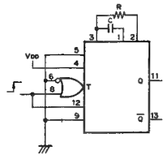
NON-RETRIGGERABLE M.M.V



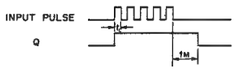
INPUT PULSE



RETRIGGERABLE M.M.V



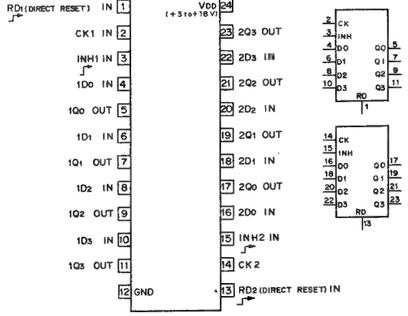
INPUT PULSE



LAST CLOCK PULSE EDGE; FALL (tC<tM)

OUTPUT PULSE WIDTH tM = 2.48RC

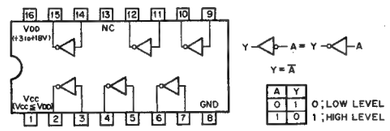
TC4508BP (TOSHIBA)
C-MOS 4-BIT LATCH
— TOP VIEW —



1 STAGE RD	CK	INH	D3	D2	D1	D0	Q3	Q2	Q1	Q0
0	↑	0	0	0	0	0	0	0	0	0
0	↑	0	0	0	0	1	0	0	0	1
0	↑	0	0	0	1	0	0	0	1	0
0	↑	0	0	1	0	0	0	1	0	0
0	↑	0	1	0	0	0	1	0	0	0
0	0	0	X	X	X	X	LATCHED			
1	X	0	X	X	X	X	0	0	0	0
X	X	1	X	X	X	X	OPEN			

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

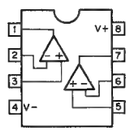
TC5020BP (TOSHIBA)
C-MOS LOW-TO-HIGH VOLTAGE TRANSLATION INVERTER
— TOP VIEW —



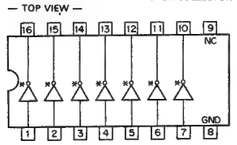
A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

TL062CP (TI)
TL062ACP (TI)
TL062CNS (TI)
OPERATIONAL AMPLIFIER
(JFET INPUT)
—TOP VIEW—



TD62105P (TOSHIBA)
TTL INVERTING DRIVER WITH OPEN COLLECTOR
— TOP VIEW —

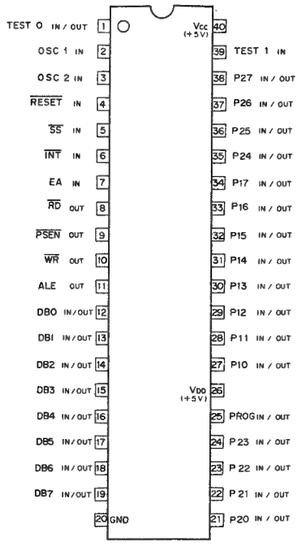


Y = Ā A	Y
0	1
1	0

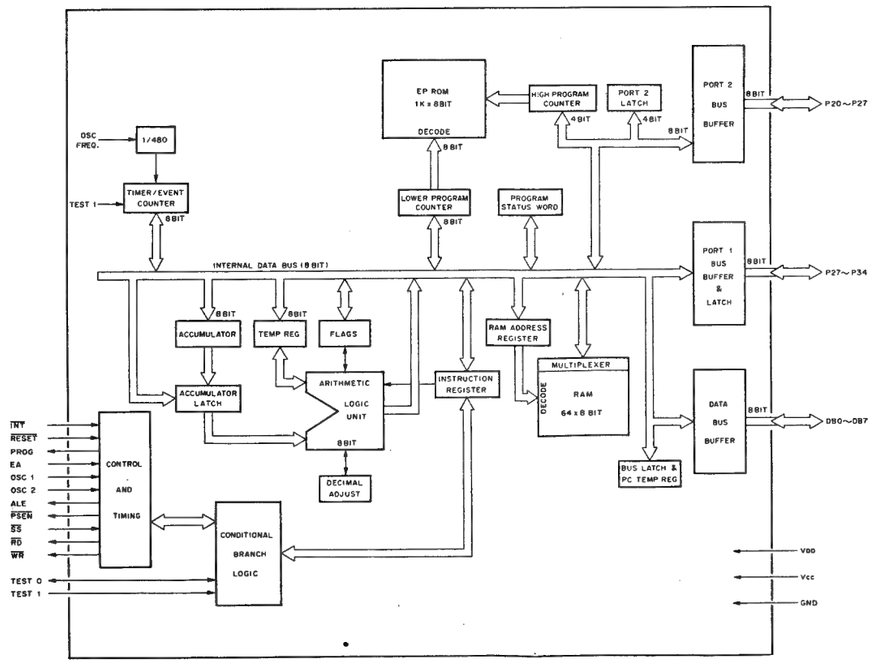
0; LOW LEVEL
1; HIGH LEVEL

※ OPEN COLLECTOR

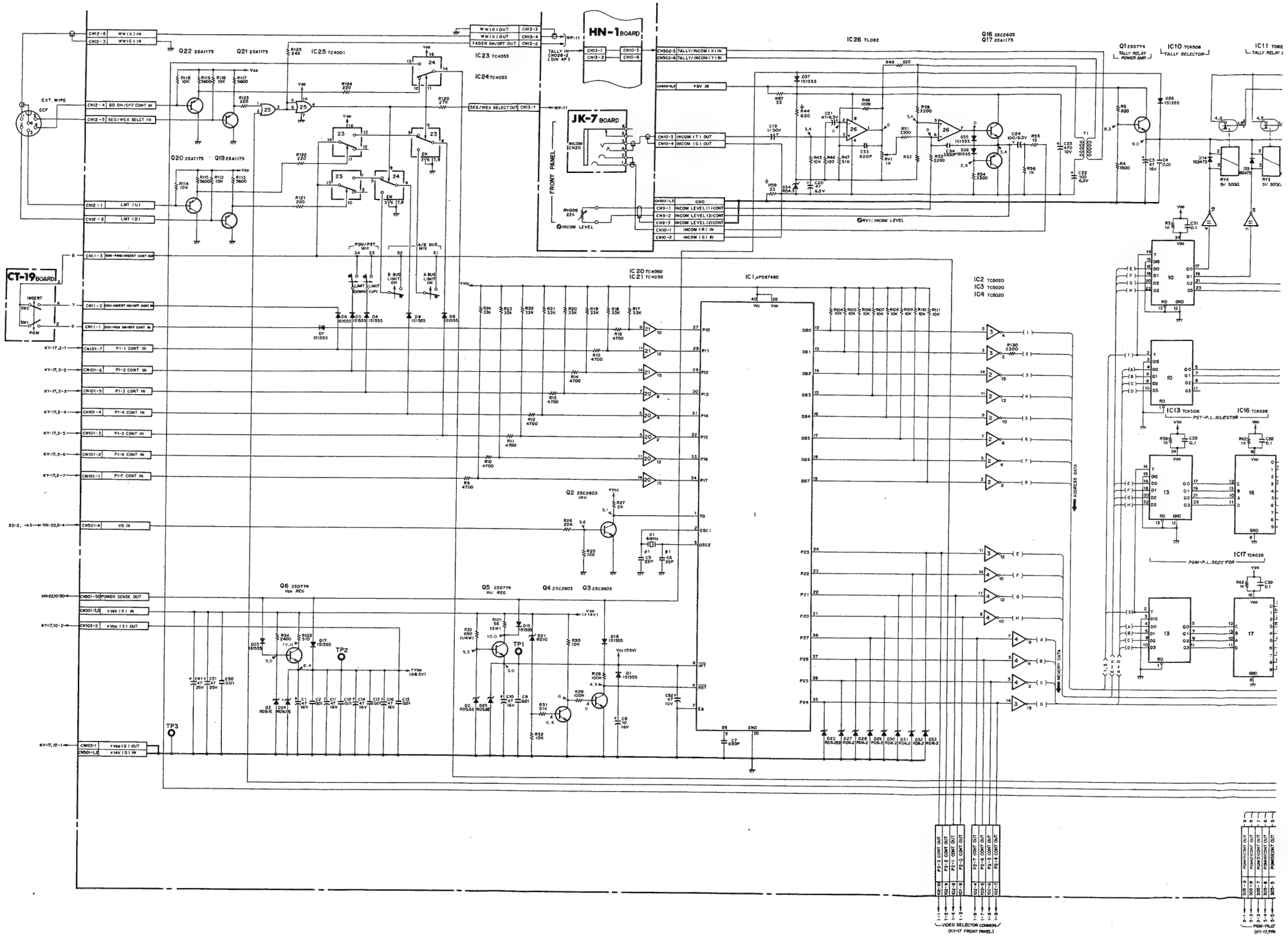
μPD8748D (NEC)
N-MOS 8-BIT MICROPROCESSOR
— TOP VIEW —

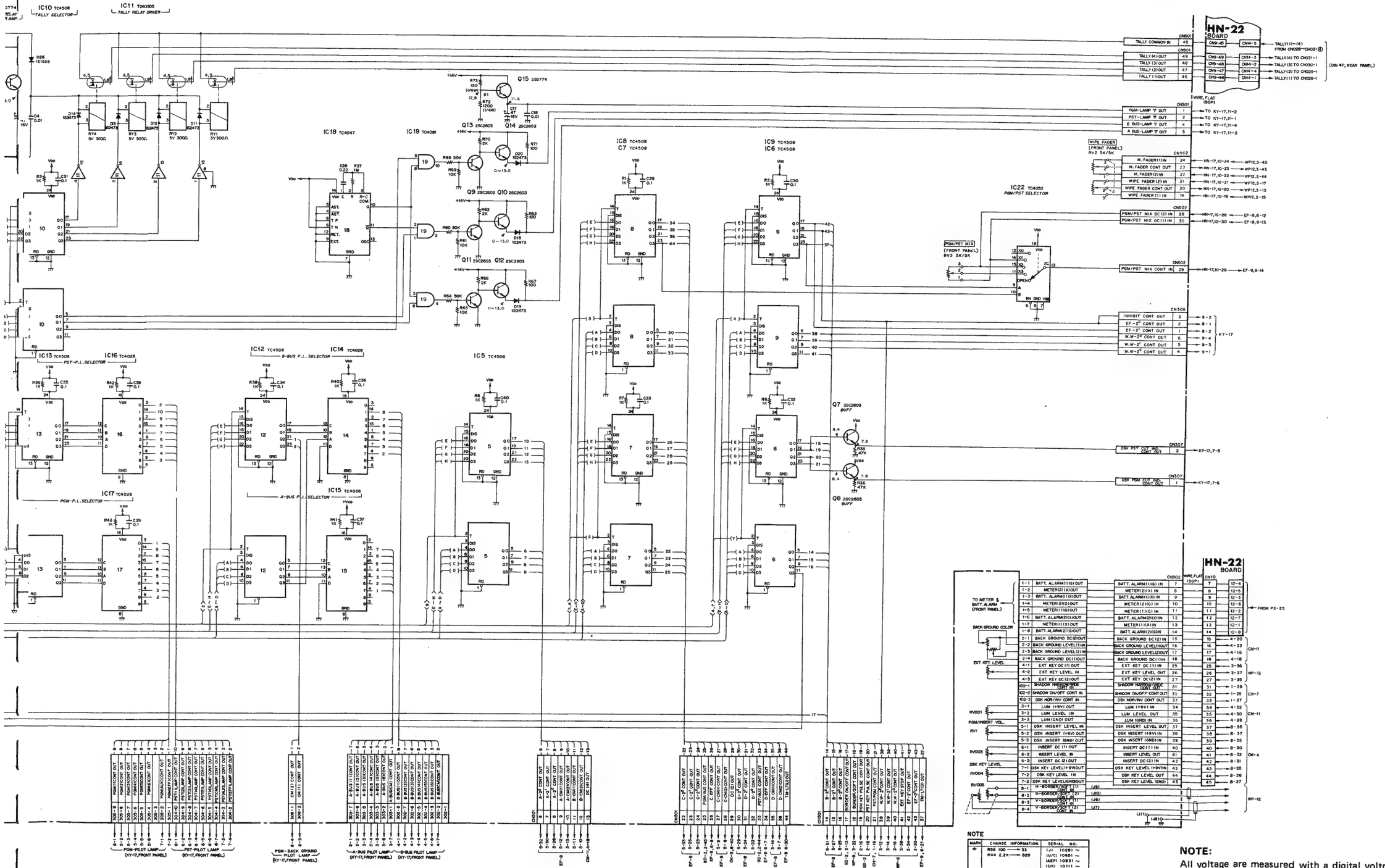


ALE; ADDRESS LATCH ENABLE
PSEN; PROGRAM STORE ENABLE
SS; SINGLE STEP
EA; EXTERNAL ACCESS
PROG; PROGRAM PULSE
RD; READ
WR; WRITE



KY-42 BOARD (CONTROL SYSTEM-2)





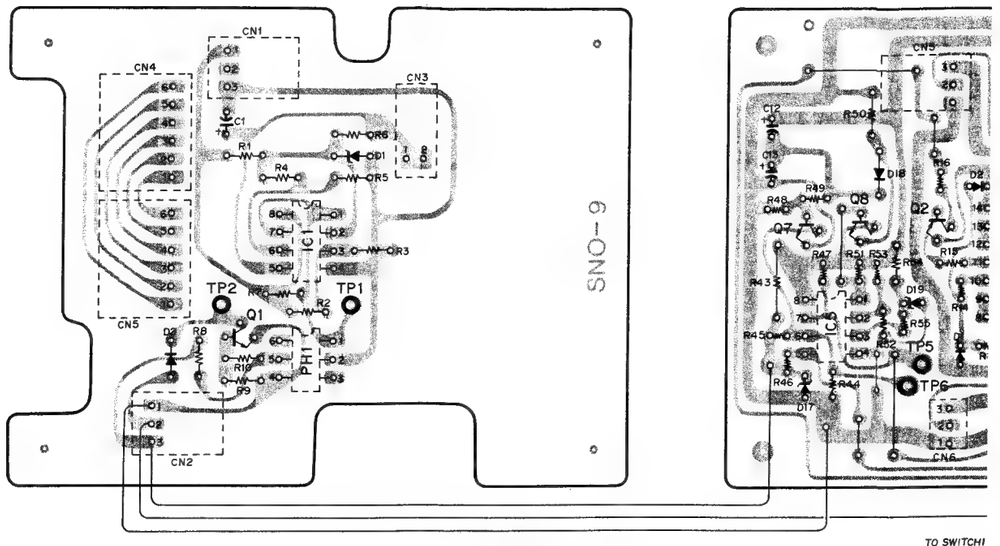
NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
※	R56 100Ω → 33Ω R44 2.2K → 820Ω	(J) 10281 ~ (U/C) 10651 ~ (AEP) 10831 ~ (UK) 10111 ~ (BRZ) 10018 ~
※1	C5,6 20P → 22P R72 1300Ω → 1200Ω	(J) 10441 ~ (U/C) 11261 ~ (AEP) 12821 ~ (UK) 10191 ~ (BRZ) 10046 ~

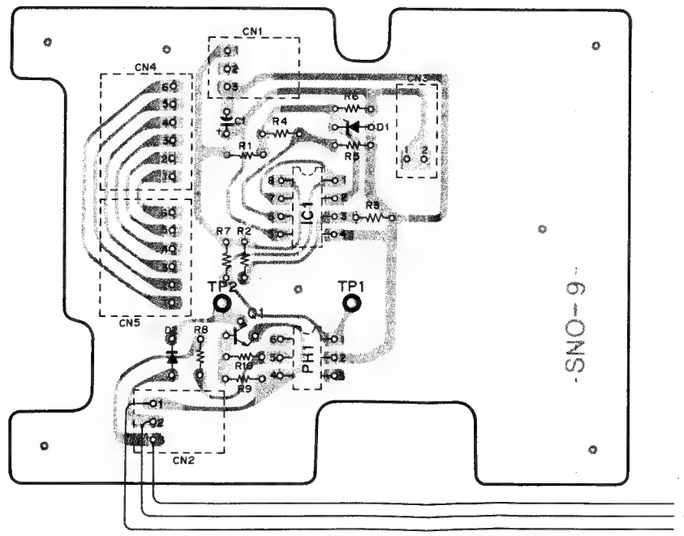
NOTE:
All voltage are measured with a digital voltmeter (input impedance 10MΩ).

PS-24, PS-25, AC-31, AC-31A

PS-24, PS-25 BOARD
AC-31, AC-31A BOARD

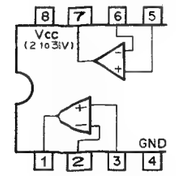


PS-24 BOARD -11
-SOLDERING SIDE-
SEG-2000A
SEG-2000AP
SEG-2000APM

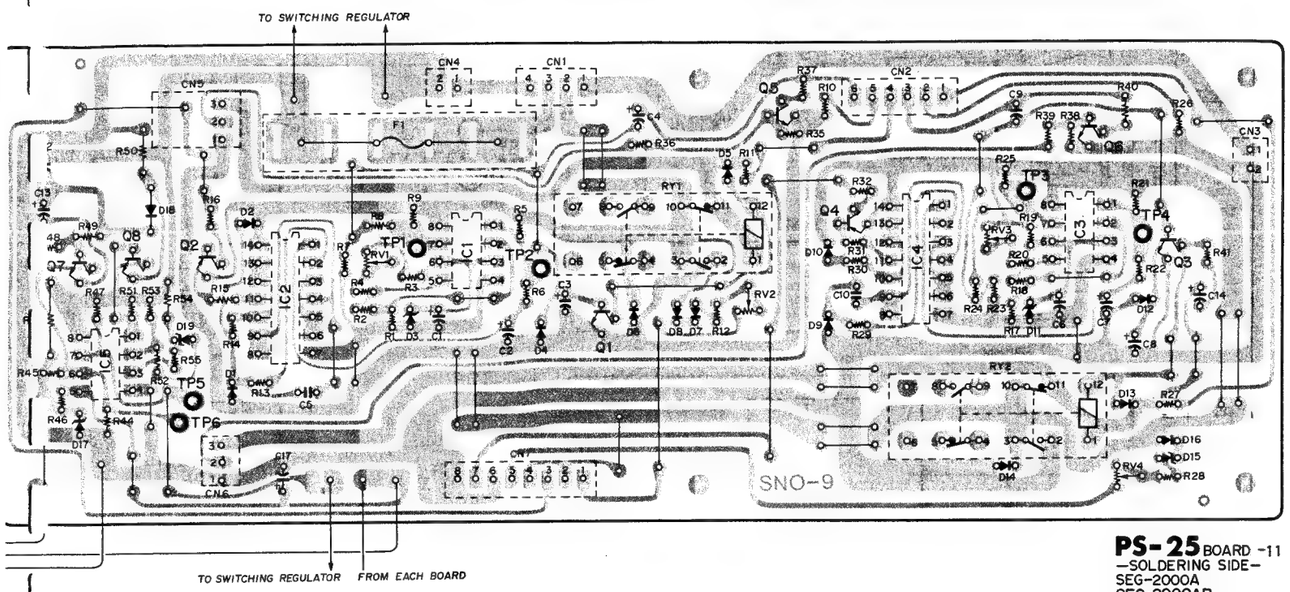


PS-24 BOARD -12
-SOLDERING SIDE-
SEG-2000A
SEG-2000AP
SEG-2000APM

NJM2903 D (JRC)
VOLTAGE COMPARATOR
— TOP VIEW —



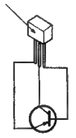
PS-24, PS-25, AC-31, AC-31A



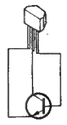
PS-25 BOARD -11
—SOLDERING SIDE—
SEG-2000A
SEG-2000AP
SEG-2000APM

TYPE NO. PRINTED

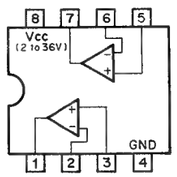
2SA1175



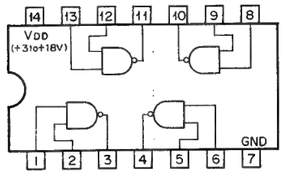
2SC2603

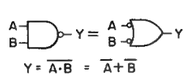


NJM2903D (JRC)
VOLTAGE COMPARATOR
— TOP VIEW —



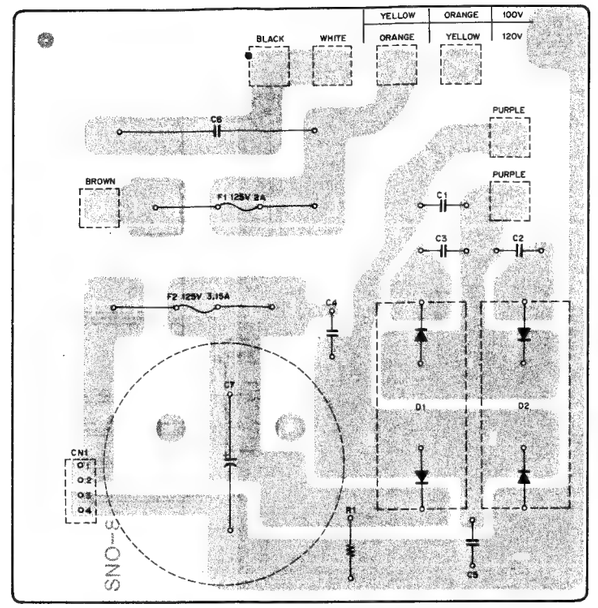
TC4011BP (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —



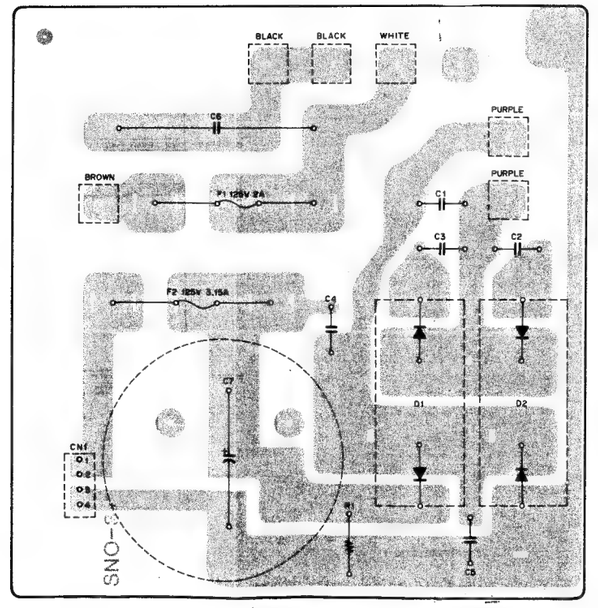


A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0:LOW LEVEL
1:HIGH LEVEL

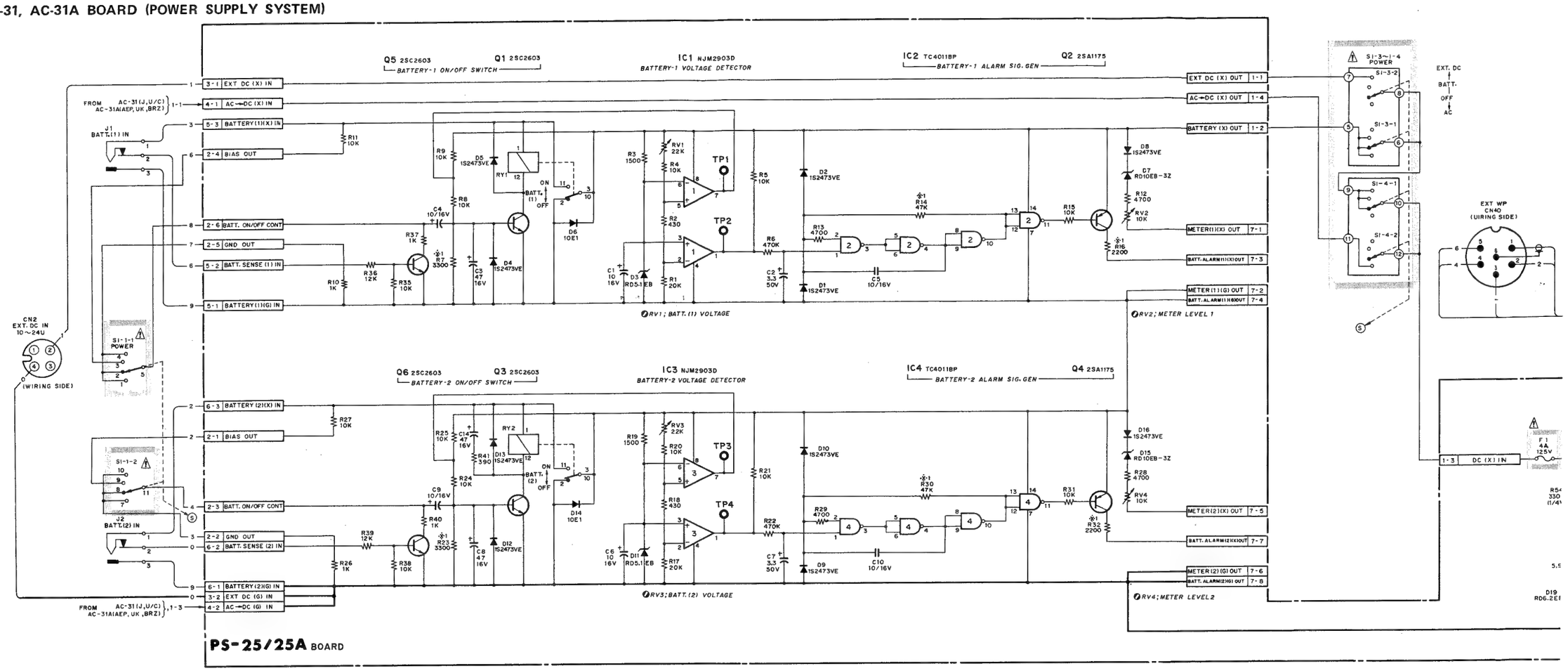


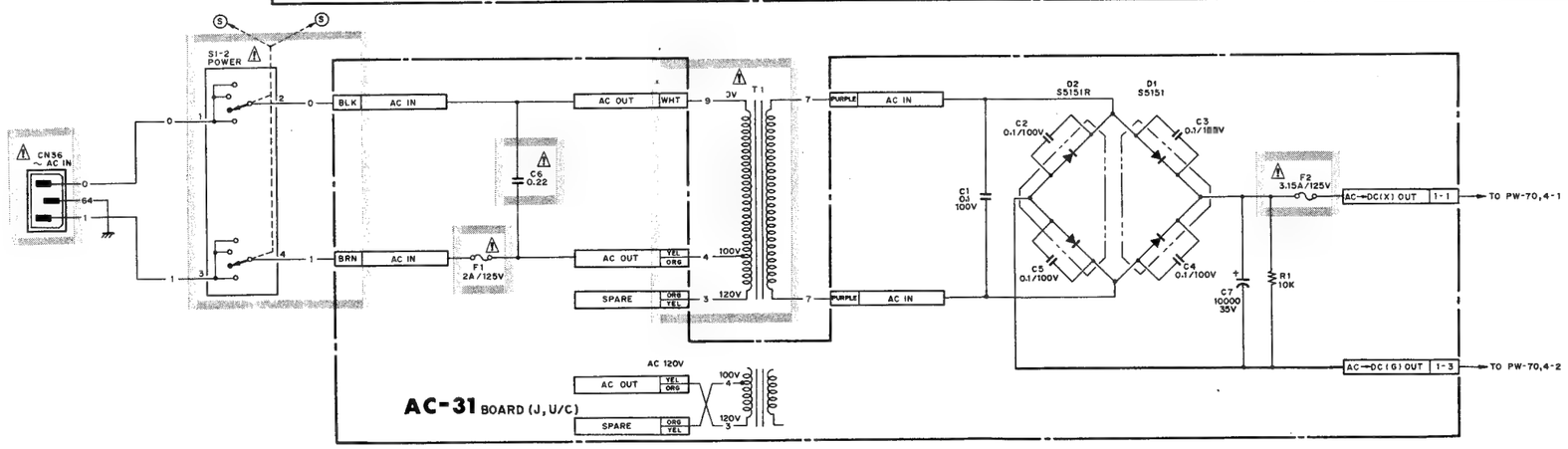
AC-31 BOARD
1-606-078-11,12,13
SEG-2000/2000A

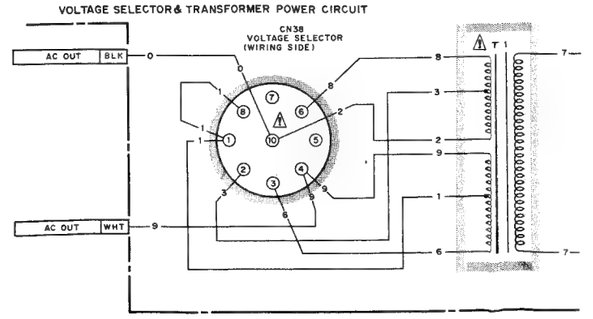


AC-31A BOARD
1-606-078-21,22,23
SEG-2000P/2000AP
SEG-2000PM/2000APM

PS-24, PS-25, AC-31, AC-31A BOARD (POWER SUPPLY SYSTEM)



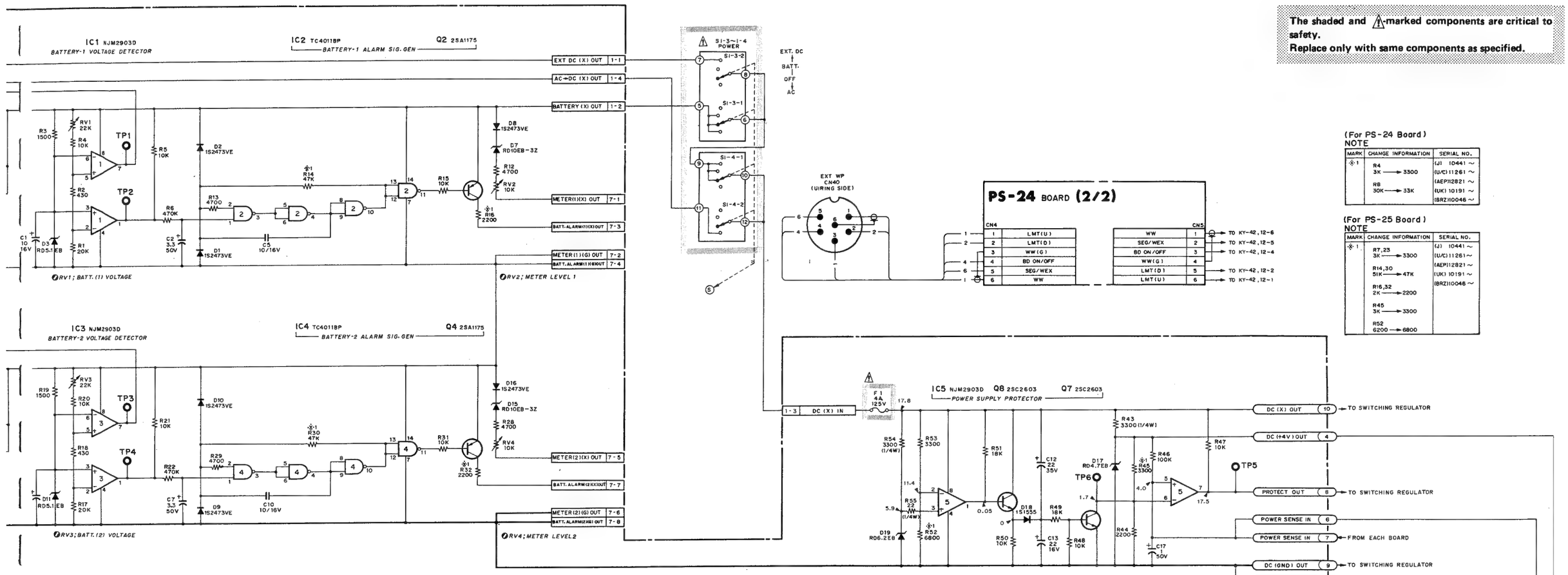




PS-24, PS-25, AC-31, AC-31A

NOTE:

The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.

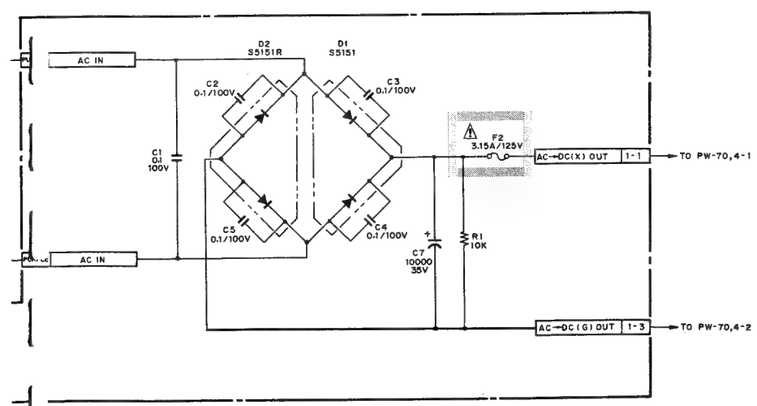


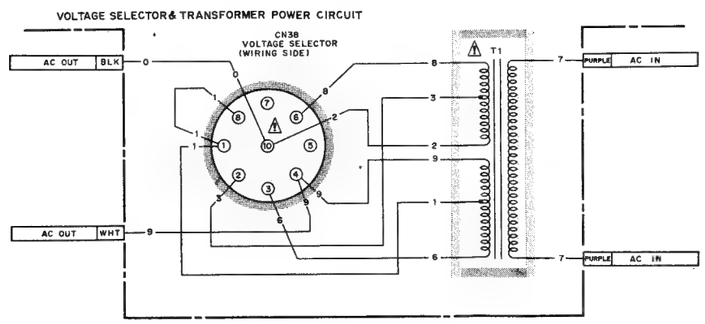
(For PS-24 Board)
NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
※1	R4 3K → 3300	(J) 10441 ~
		(U/C) 11261 ~
		(AEP)12821 ~
	R8 30K → 33K	(UK) 10191 ~
		(BRZ)10046 ~

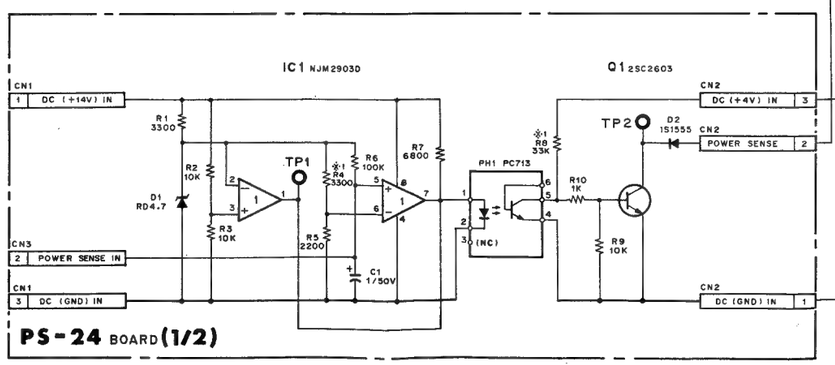
(For PS-25 Board)
NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
※1	R7,23 3K → 3300	(J) 10441 ~
		(U/C) 11261 ~
	R14,30 51K → 47K	(AEP)12821 ~
		(UK) 10191 ~
	R16,32 2K → 2200	(BRZ)10046 ~
	R45 3K → 3300	
	R52 6200 → 6800	





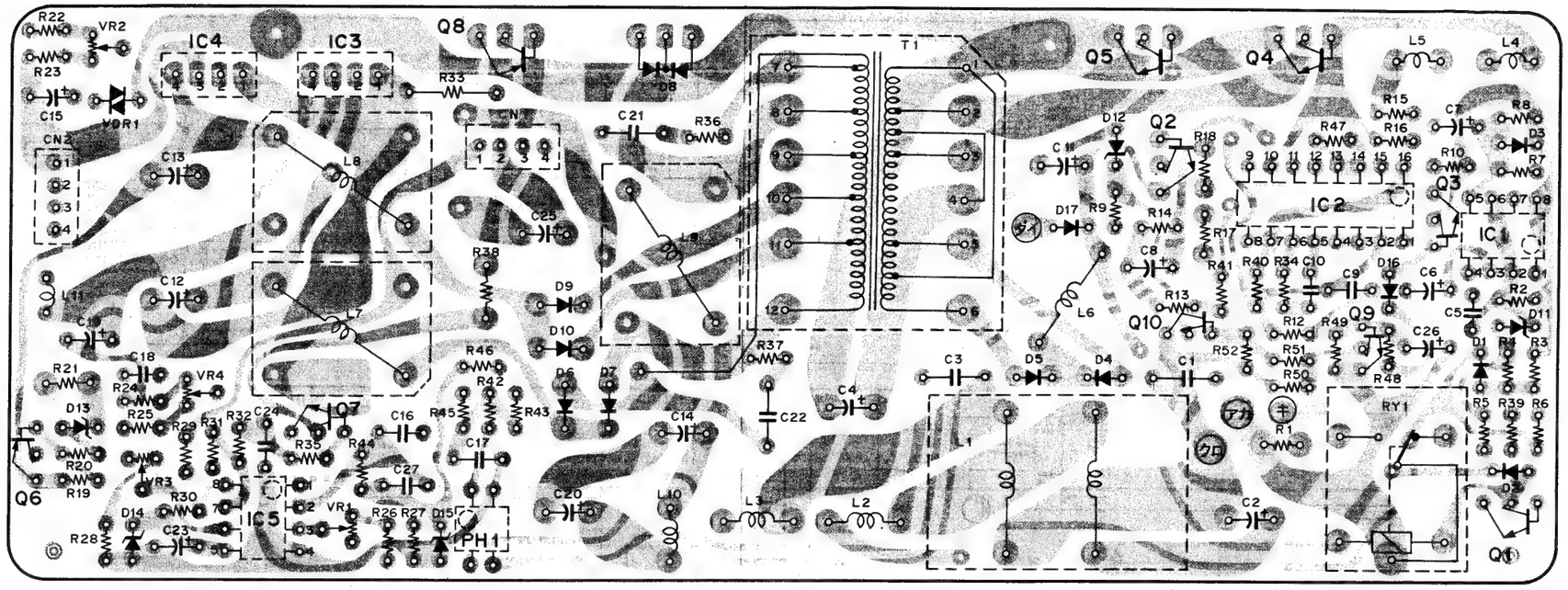
AC-31A BOARD (AEP, UK, BRZ)
SAME AS AC-31 BOARD



NOTE:
All voltage are measured with a digital voltmeter (input impedance 10MΩ).

PS-36 BOARD

Serial No. J	: Up to 10170
U/C	: Up to 10500
AEP	: Up to 10380
UK	: Up to 10040

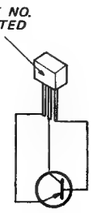


PS-36 BOARD -11

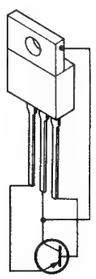
-SOLDERING SIDE-

SEG-2000A
SEG-2000AP
SEG-2000APM

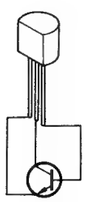
TYPE NO. PRINTED



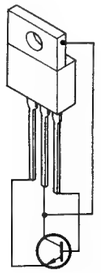
2SA1175



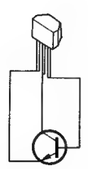
2SB856



2SC1364



2SC2315
2SC2334



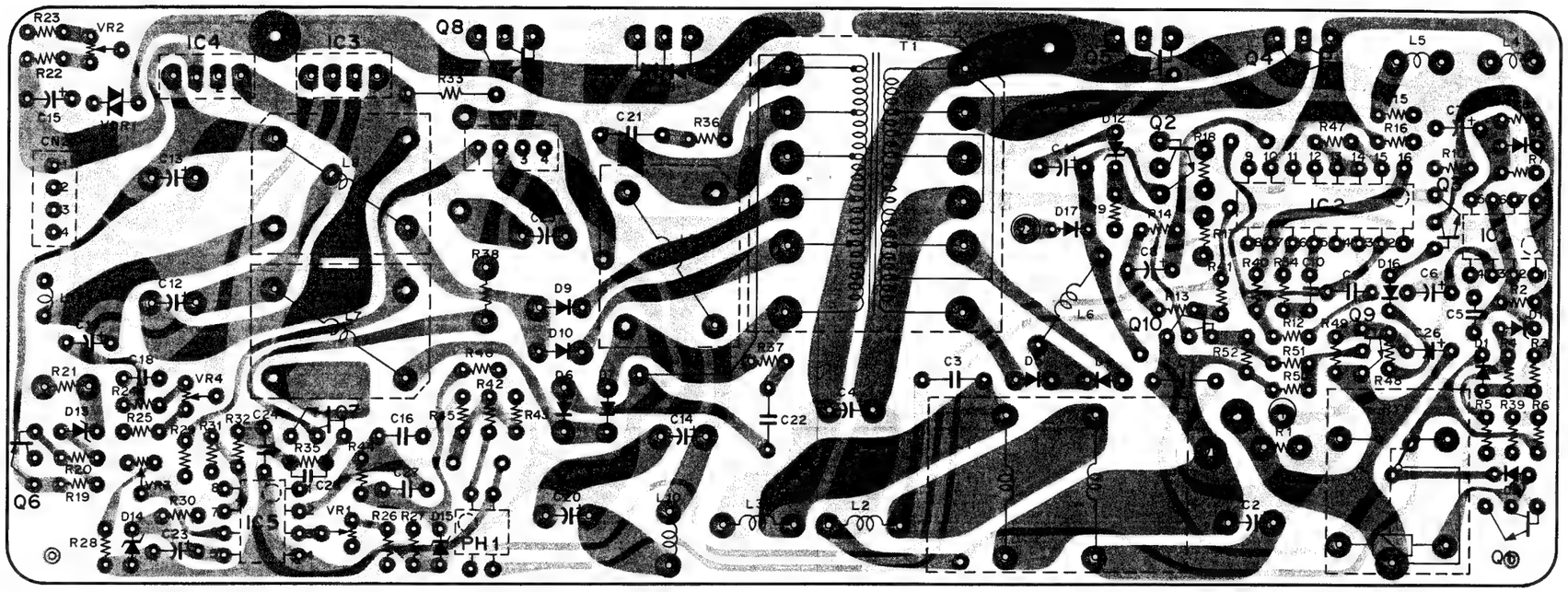
2SC2603

11-64(a)

11-65(a)

PS-36 BOARD

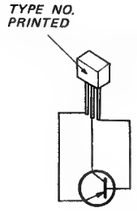
Serial No.	J	: 10171 and higher
	U/C	: 10501 and higher
	AEP	: 10381 and higher
	UK	: 10041 and higher
	BRZ	: 10001 and higher



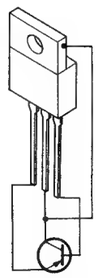
PS-36 BOARD -12
-SOLDERING SIDE-

SEG-2000A
SEG-2000AP
SEG-2000APM

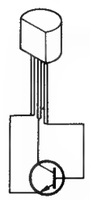
TYPE NO. PRINTED



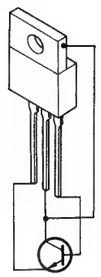
2SA1175



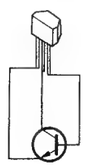
2SB856



2SC1364

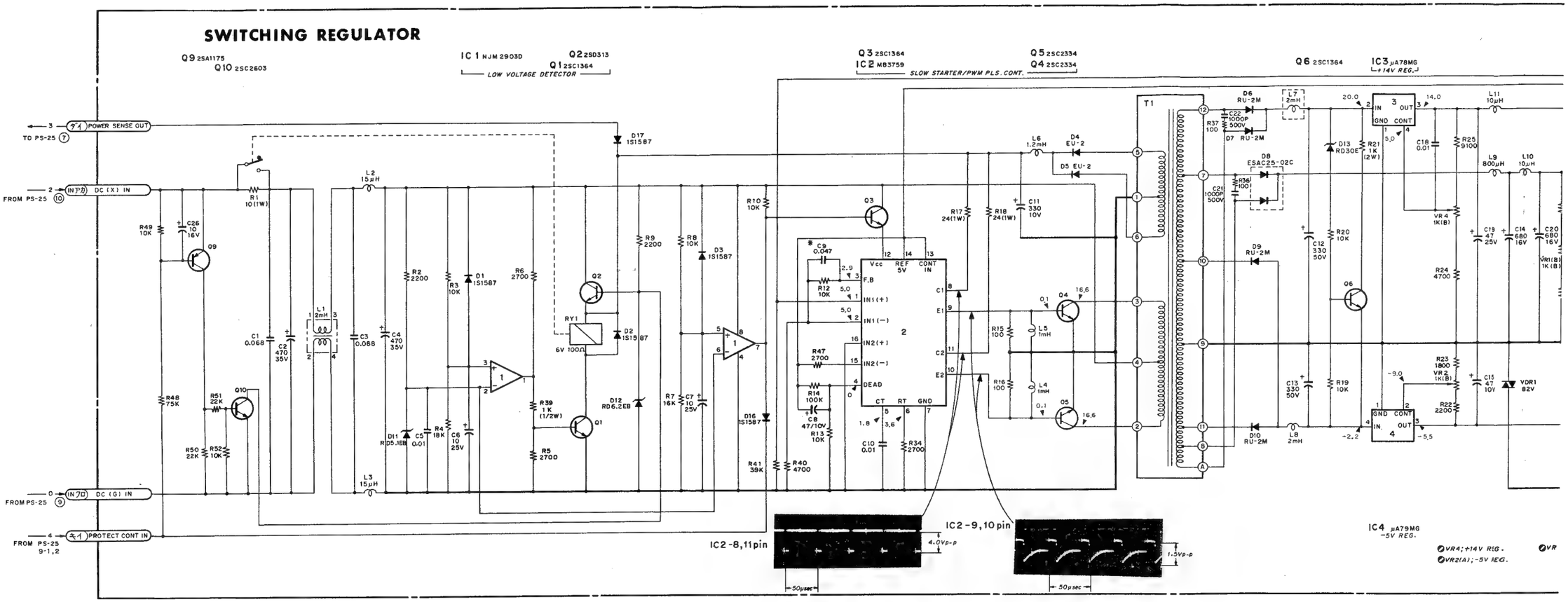


2SC2315
2SC2334

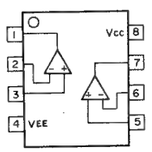


2SC2603

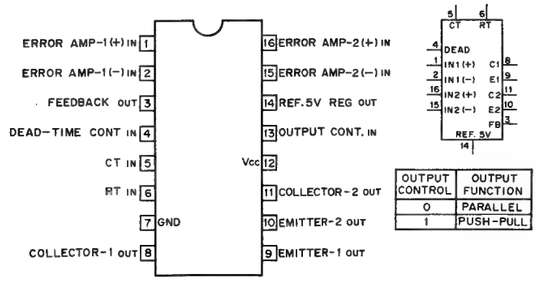
PS-36 BOARD (SWITCHING REGURATOR)



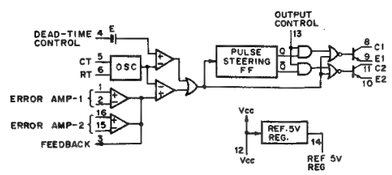
NJM2903D (JRC)
OPERATIONAL AMPLIFIER
-TOP VIEW-



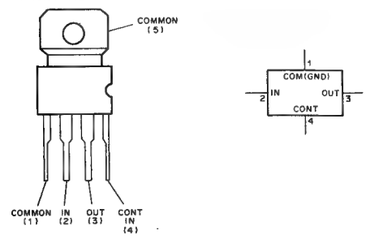
MB3759 (FUJITSU)
PWM POWER CONTROL
—TOP VIEW—



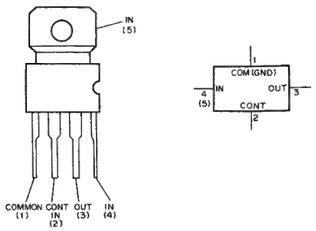
OUTPUT CONTROL	OUTPUT FUNCTION
0	PARALLEL
1	PUSH-PULL



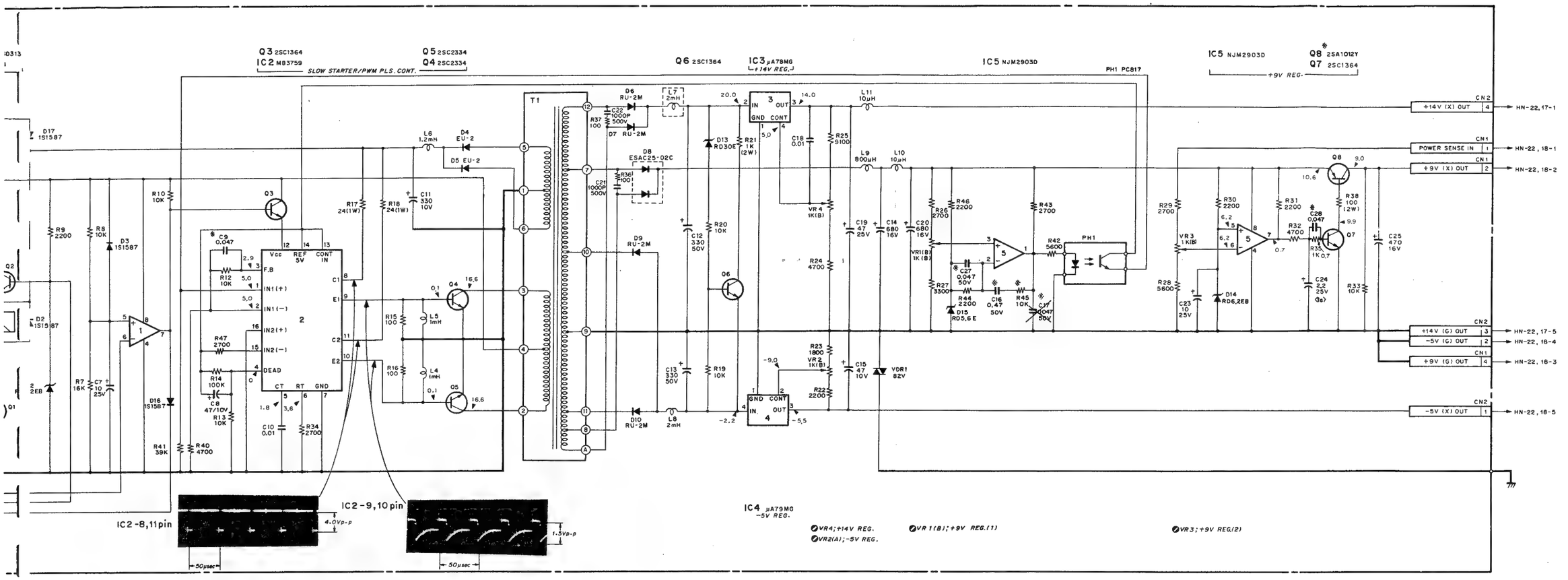
μA78MG (FSC)
FOUR TERMINAL POSITIVE ADJUSTABLE VOLTAGE REGULATOR
—FRONT VIEW—

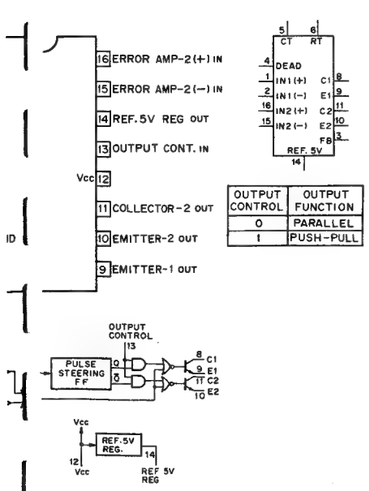


μA79MGU1C (FSC)
FOUR TERMINAL NEGATIVE ADJUSTABLE VOLTAGE REGULATOR
—FRONT VIEW—



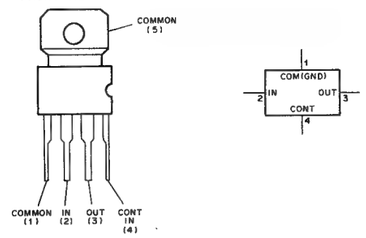
PS-36



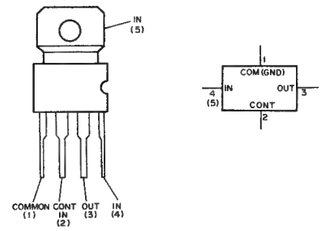


OUTPUT CONTROL	OUTPUT FUNCTION
0	PARALLEL
1	PUSH-PULL

μA78MG (FSC)
FOUR TERMINAL POSITIVE ADJUSTABLE VOLTAGE REGULATOR
—FRONT VIEW—



μA79MGU1C (FSC)
FOUR TERMINAL NEGATIVE ADJUSTABLE VOLTAGE REGULATOR
—FRONT VIEW—



NOTE

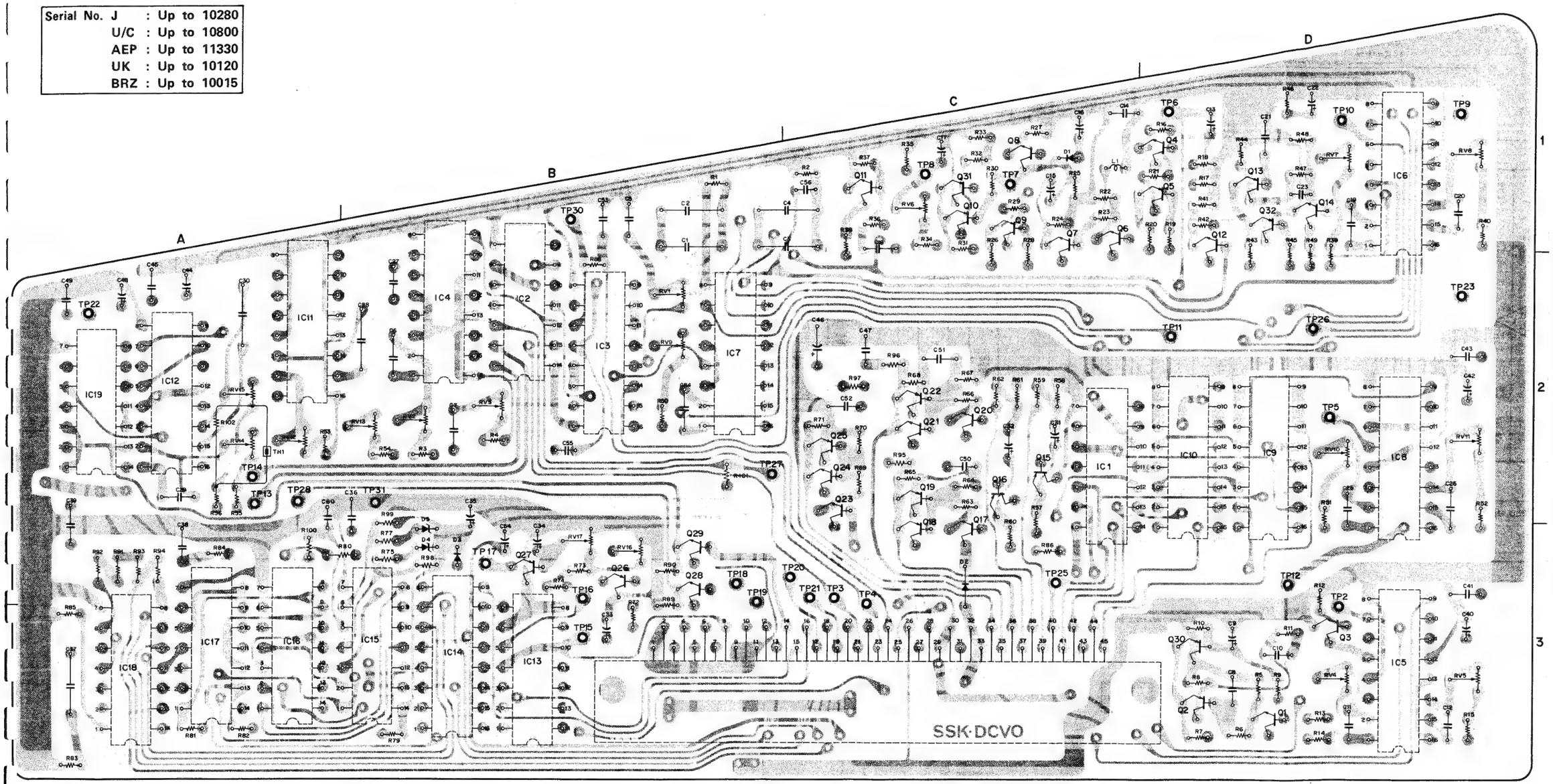
MARK	CHANGE INFORMATION	SERIAL NO.
※	R45 1K ⟶ 10K	J; 10171~
	C16 3.3μF ⟶ 0.47μF	U/C; 10501~
	C28 0.047μF ADD	AEP; 10381~
	C9 1μF ⟶ 0.047μF	UK; 10041~
	Q8 2SB850-03-B ⟶ 2SA1012Y	BRZ; 10001~
	C17 ⟶ DELETE	
	C27 0.47 ⟶ 0.047	

NOTE:
All voltage are measured with a digital voltmeter (input impedance 10MΩ).

SD-2 BOARD

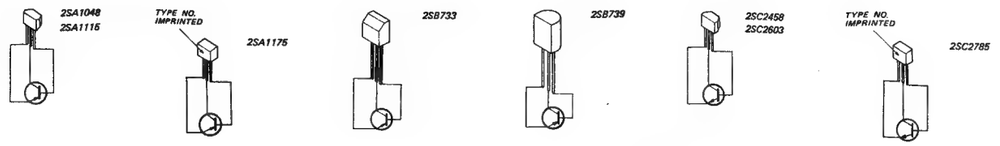
– SOLDERING SIDE –

Serial No.	J	: Up to 10280
	U/C	: Up to 10800
	AEP	: Up to 11330
	UK	: Up to 10120
	BRZ	: Up to 10015



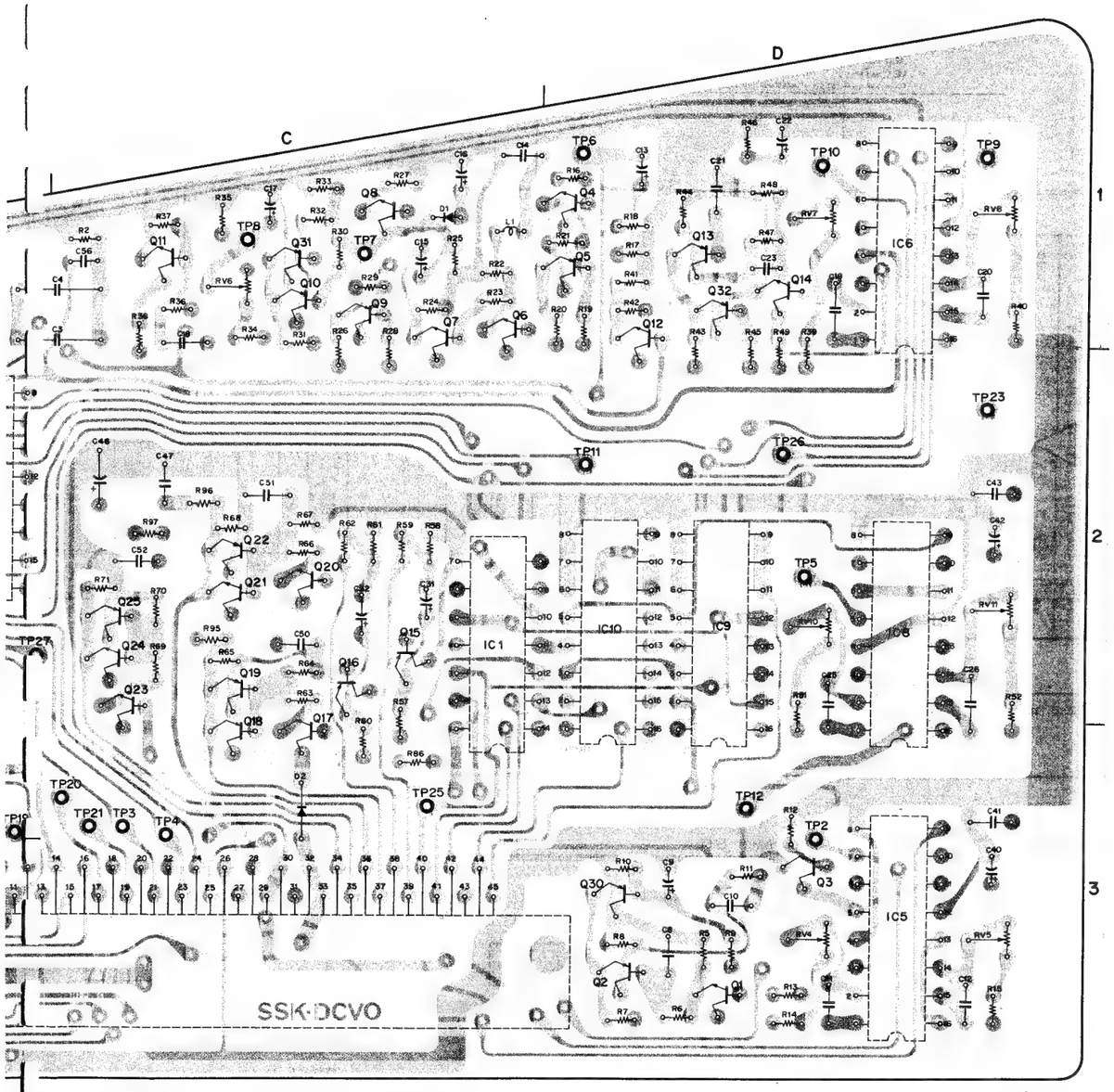
D1	C - 1	R
D2	C - 3	R
D3	B - 3	R
D4	B - 3	R
D5	B - 3	R
		R
IC1	C - 2	R
IC2	B - 2	R
IC3	B - 2	R
IC4	B - 2	R
IC5	D - 3	R
IC6	D - 1	R
IC7	B - 2	R
IC8	D - 2	R
IC9	D - 2	R
IC10	D - 2	R
IC11	A - 2	R
IC12	A - 2	
IC13	B - 3	T
IC14	B - 3	T
IC15	B - 3	T
IC16	A - 3	T
IC17	A - 3	T
IC18	A - 3	T
IC19	A - 2	T
		T
Q1	D - 3	T
Q2	D - 3	T
Q3	D - 3	T
Q4	D - 1	T
Q5	D - 1	T
Q6	C - 1	T
Q7	C - 1	T
Q8	C - 1	T
Q9	C - 1	T
Q10	C - 1	T
Q11	C - 1	T
Q12	D - 1	T
Q13	D - 1	T
Q14	D - 1	T
Q15	C - 2	T
Q16	C - 2	T
Q17	C - 3	T
Q18	C - 3	T
Q19	C - 2	T
Q20	C - 2	T
Q21	C - 2	
Q22	C - 2	
Q23	C - 2	
Q24	C - 2	
Q25	C - 2	
Q26	B - 3	
Q27	B - 3	
Q28	B - 3	
Q29	B - 3	
Q30	D - 3	
Q31	C - 1	
Q32	D - 1	

SD-2 BOARD
t-606-070-12
SEG-2000/2000A
SEG-2000P/2000AP
SEG-2000PM/2000APM



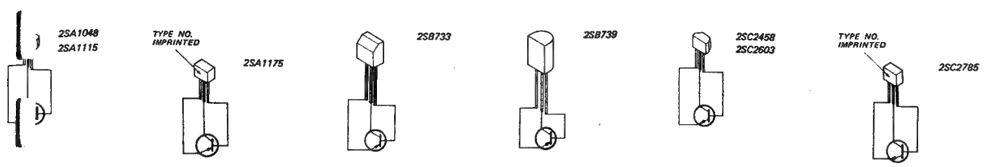
11-69(a)

11-70(a)



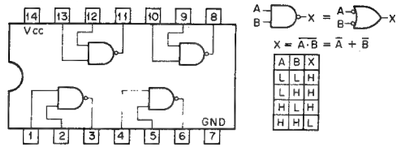
D1	C-1	RV1	B-2
D2	C-3	RV2	B-2
D3	B-3	RV3	B-2
D4	B-3	RV4	D-3
D5	B-3	RV5	D-3
		RV6	C-1
IC1	C-2	RV7	D-1
IC2	B-2	RV8	D-1
IC3	B-2	RV9	B-2
IC4	B-2	RV10	D-2
IC5	D-3	RV11	D-2
IC6	D-1	RV12	A-2
IC7	B-2	RV13	B-2
IC8	D-2	RV14	A-2
IC9	D-2	RV15	A-2
IC10	D-2	RV16	B-3
IC11	A-2	RV17	B-3
IC12	A-2		
IC13	B-3	TP2	D-3
IC14	B-3	TP3	C-3
IC15	B-3	TP4	C-3
IC16	A-3	TP5	D-2
IC17	A-3	TP6	D-1
IC18	A-3	TP7	C-1
IC19	A-2	TP8	C-1
		TP9	D-1
Q1	D-3	TP10	D-1
Q2	D-3	TP11	D-2
Q3	D-3	TP12	D-3
Q4	D-1	TP13	A-2
Q5	D-1	TP14	A-2
Q6	C-1	TP15	B-3
Q7	C-1	TP16	B-3
Q8	C-1	TP17	B-3
Q9	C-1	TP18	B-3
Q10	C-1	TP19	B-3
Q11	C-1	TP20	C-3
Q12	D-1	TP21	C-3
Q13	D-1	TP22	A-2
Q14	D-1	TP23	D-2
Q15	C-2	TP25	C-3
Q16	C-2	TP26	D-2
Q17	C-3	TP27	B-2
Q18	C-3	TP28	A-2
Q19	C-2	TP30	B-1
Q20	C-2	TP31	B-2
Q21	C-2		
Q22	C-2		
Q23	C-2		
Q24	C-2		
Q25	C-2		
Q26	B-3		
Q27	B-3		
Q28	B-3		
Q29	B-3		
Q30	D-3		
Q31	C-1		
Q32	D-1		

SD-2 BOARD
1-606-070-12
SEG-2000/2000A
SEG-2000P/2000AP
SEG-2000PM/2000APM



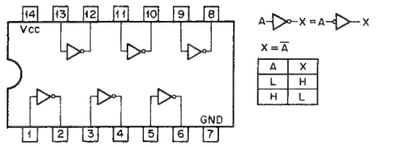
11-70(a)

SN74LS00N (TI)
TTL NAND GATE
— TOP VIEW —



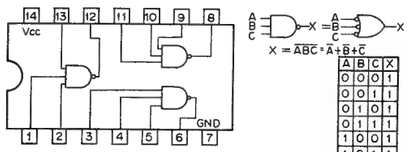
A	B	X
L	L	H
L	H	H
H	L	H
H	H	L

SN74LS04N (TI)
TTL INVERTER
— TOP VIEW —



A	X
L	H
H	L

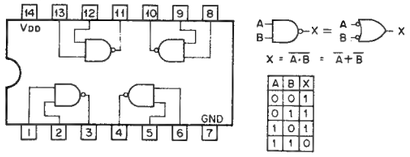
SN74LS10N (TI)
TTL 3-INPUT POSITIVE NAND GATE
— TOP VIEW —



A	B	C	X
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	0

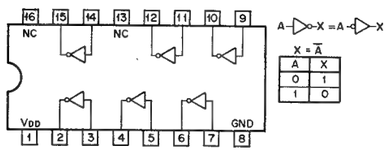
0: LOW LEVEL
1: HIGH LEVEL

TC4011BP (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —



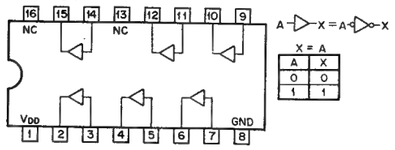
A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

TC4049BP (TOSHIBA)
C-MOS INVERTING TYPE BUFFER / CONVERTER
— TOP VIEW —



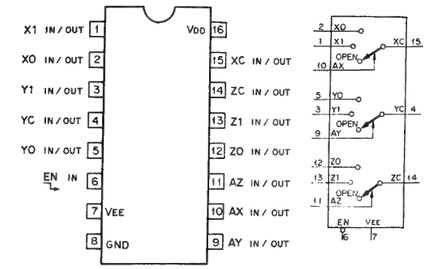
A	X
0	1
1	0

TC4050BP (TOSHIBA)
C-MOS NON-INVERTING TYPE BUFFER / CONVERTER
— TOP VIEW —



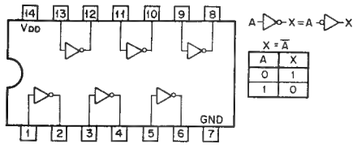
A	X
0	0
1	1

TC4053BP (TOSHIBA)
C-MOS 2-CHANNEL MULTIPLEXER / DEMULTIPLEXER
— TOP VIEW —



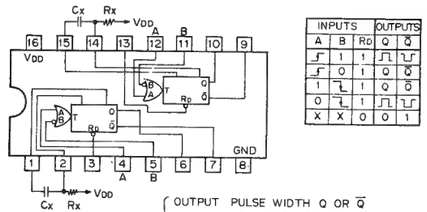
CONT. INPUTS		ON
EN	A (X,Y,Z)	CHANNEL
0	0	0
0	1	1
1	X	OPEN

TC4069UBP (TOSHIBA)
C-MOS INVERTER
— TOP VIEW —



A	X
0	1
1	0

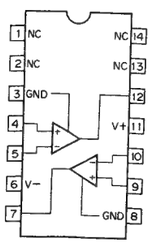
TC4528BP (TOSHIBA)
C-MOS RETRIGGERABLE / RESETTABLE MMV
— TOP VIEW —



INPUTS			OUTPUTS	
A	B	Rd	Q	Q̄
↓	1	1	⎍	⎍
↓	0	1	0	1
1	↑	1	0	1
0	↑	1	⎍	⎍
X	X	0	0	1

OUTPUT PULSE WIDTH Q OR Q̄
• (FOR Cx ≧ 0.01μF USE FORMULA)
PW = 0.2 · Rx · Cx · ℓn (VDD − GND)
• (FOR Cx < 0.01μF USE DATA BOOK)

μPC 319C (NEC)
DUAL VOLTAGE COMPARATOR
— TOP VIEW —

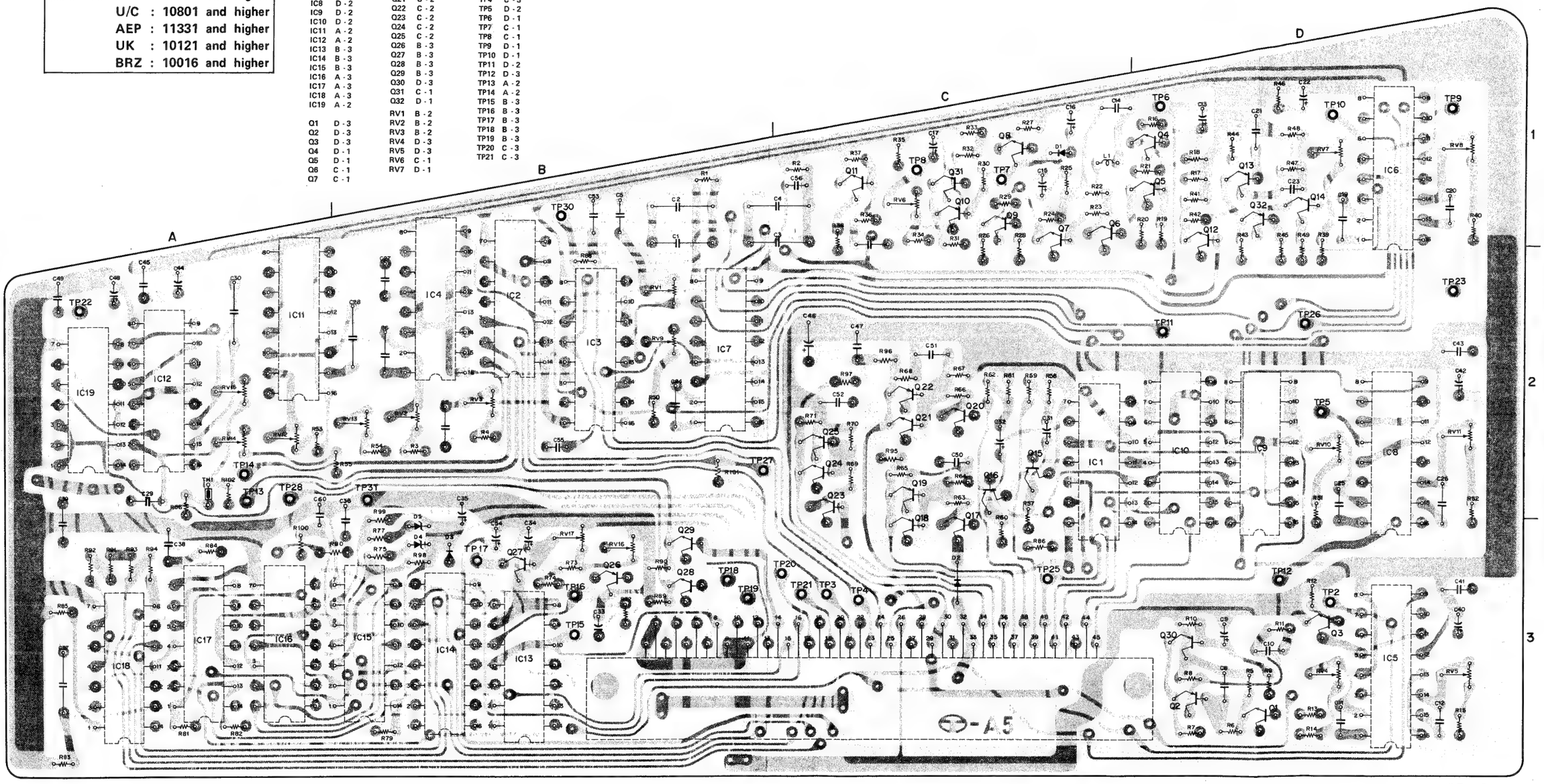


11-71

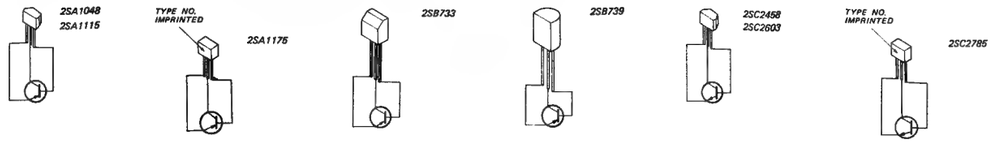
SD-2 BOARD
– SOLDERING SIDE –

Serial No. J	:	10281 and higher
U/C	:	10801 and higher
AEP	:	11331 and higher
UK	:	10121 and higher
BRZ	:	10016 and higher

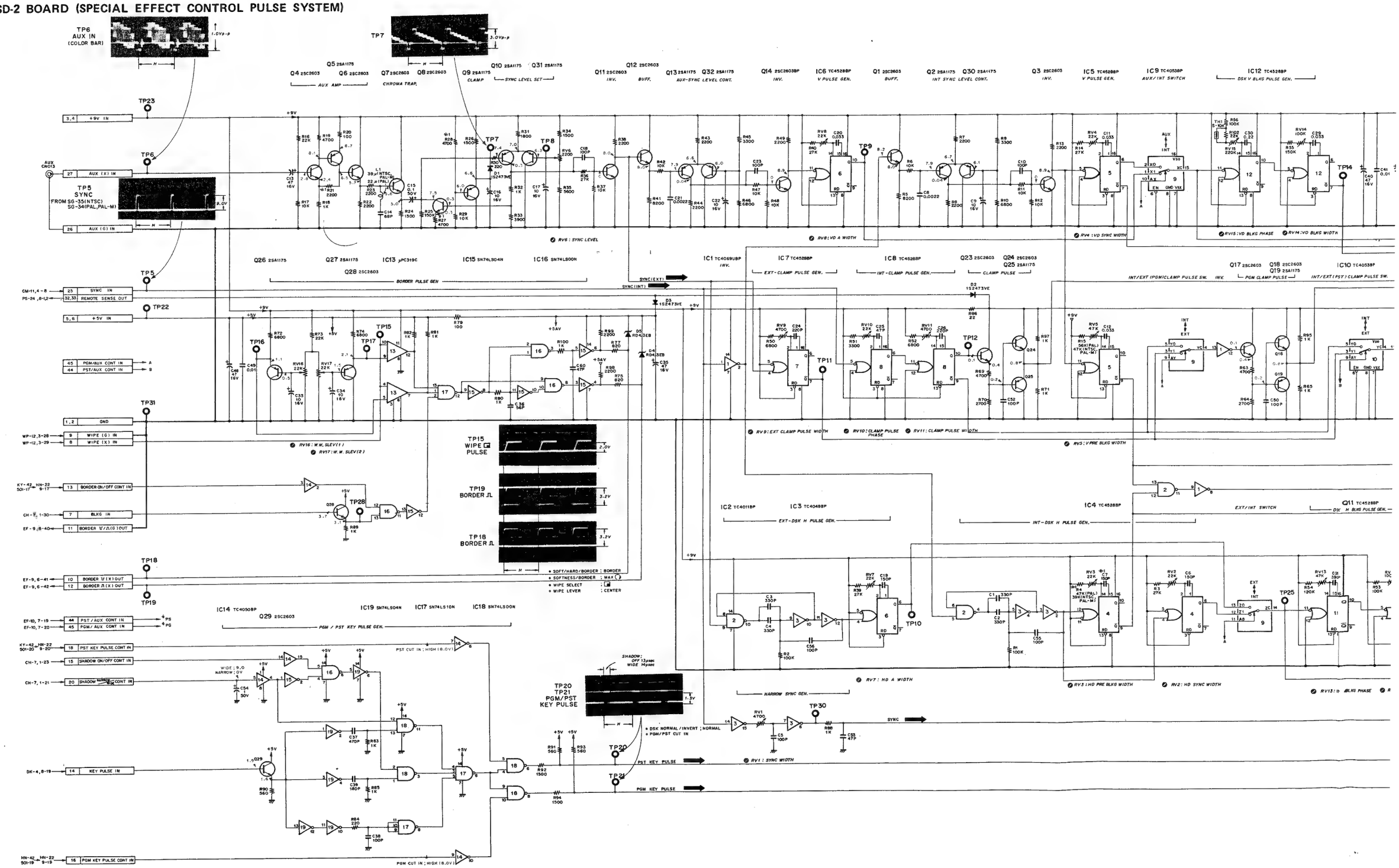
D1	C - 1
D2	C - 3
D3	B - 3
D4	B - 3
D5	B - 3
IC1	C - 2
IC2	B - 2
IC3	B - 2
IC4	B - 2
IC5	D - 3
IC6	D - 1
IC7	B - 2
IC8	D - 2
IC9	D - 2
IC10	D - 2
IC11	A - 2
IC12	A - 2
IC13	B - 3
IC14	B - 3
IC15	B - 3
IC16	A - 3
IC17	A - 3
IC18	A - 3
IC19	A - 2
Q1	D - 3
Q2	D - 3
Q3	D - 3
Q4	D - 1
Q5	D - 1
Q6	C - 1
Q7	C - 1
Q8	C - 1
Q9	C - 1
Q10	C - 1
Q11	C - 1
Q12	D - 1
Q13	D - 1
Q14	D - 1
Q15	C - 2
Q16	C - 2
Q17	C - 3
Q18	C - 3
Q19	C - 2
Q20	C - 2
Q21	C - 2
Q22	C - 2
Q23	C - 2
Q24	C - 2
Q25	C - 2
Q26	B - 3
Q27	B - 3
Q28	B - 3
Q29	B - 3
Q30	D - 3
Q31	C - 1
Q32	D - 1
RV1	B - 2
RV2	B - 2
RV3	B - 2
RV4	D - 3
RV5	D - 3
RV6	C - 1
RV7	D - 1
RV8	D - 1
RV9	B - 2
RV10	D - 2
RV11	D - 2
RV12	A - 2
RV13	B - 2
RV14	A - 2
RV15	A - 2
RV16	B - 3
RV17	B - 3
TP2	D - 3
TP3	C - 3
TP4	C - 3
TP5	D - 2
TP6	D - 1
TP7	C - 1
TP8	C - 1
TP9	D - 1
TP10	D - 1
TP11	D - 2
TP12	D - 3
TP13	A - 2
TP14	A - 2
TP15	B - 3
TP16	B - 3
TP17	B - 3
TP18	B - 3
TP19	B - 3
TP20	C - 3
TP21	C - 3
TP22	A - 2
TP23	D - 2
TP25	C - 3
TP26	D - 2
TP27	B - 2
TP28	A - 2
TP30	B - 1
TP31	B - 2

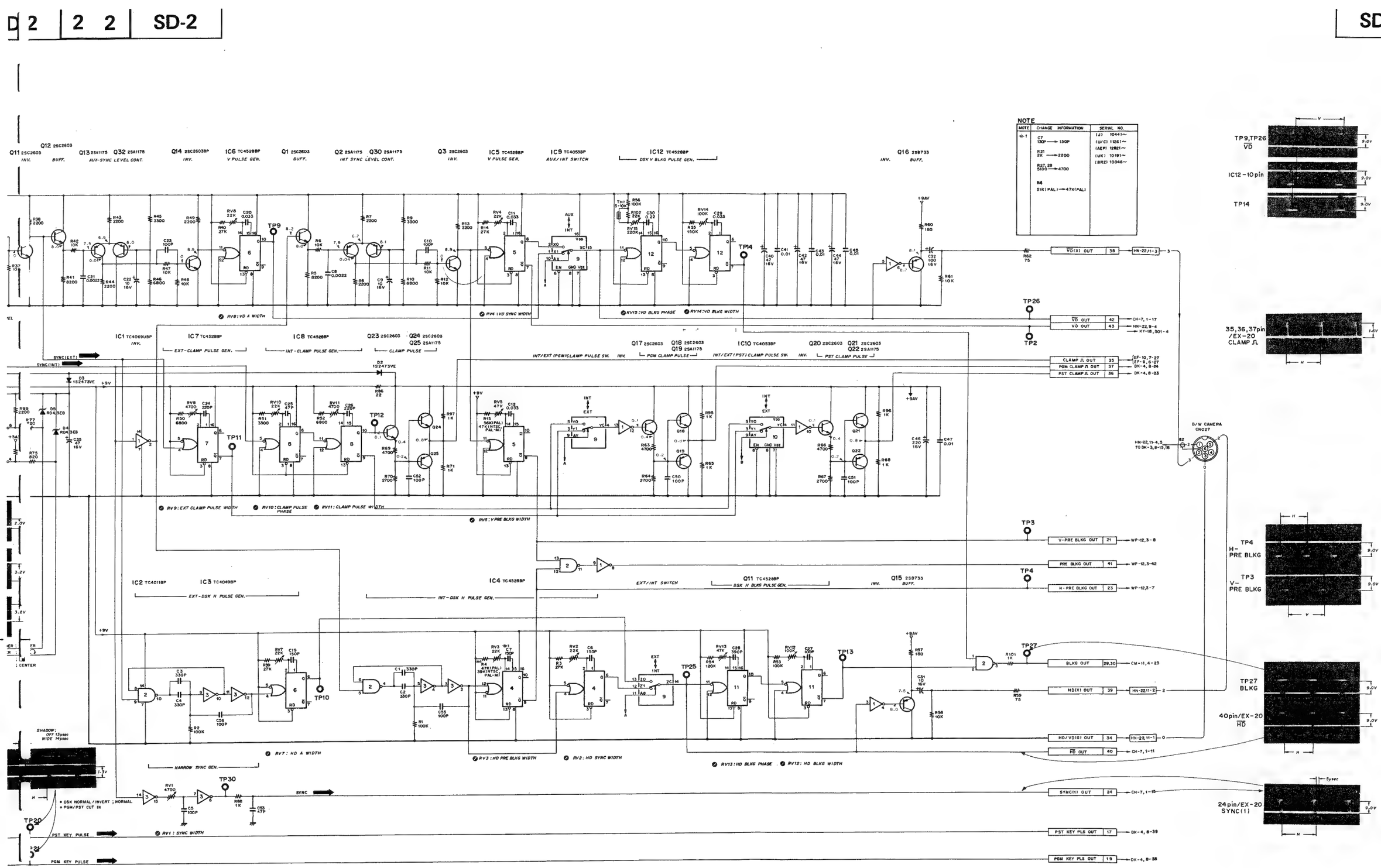


SD-2 BOARD
1-606-070-13
SEG-2000/SEG-2000A
SEG-2000P/SEG-2000AP
SEG-2000PM/SEG-2000APM

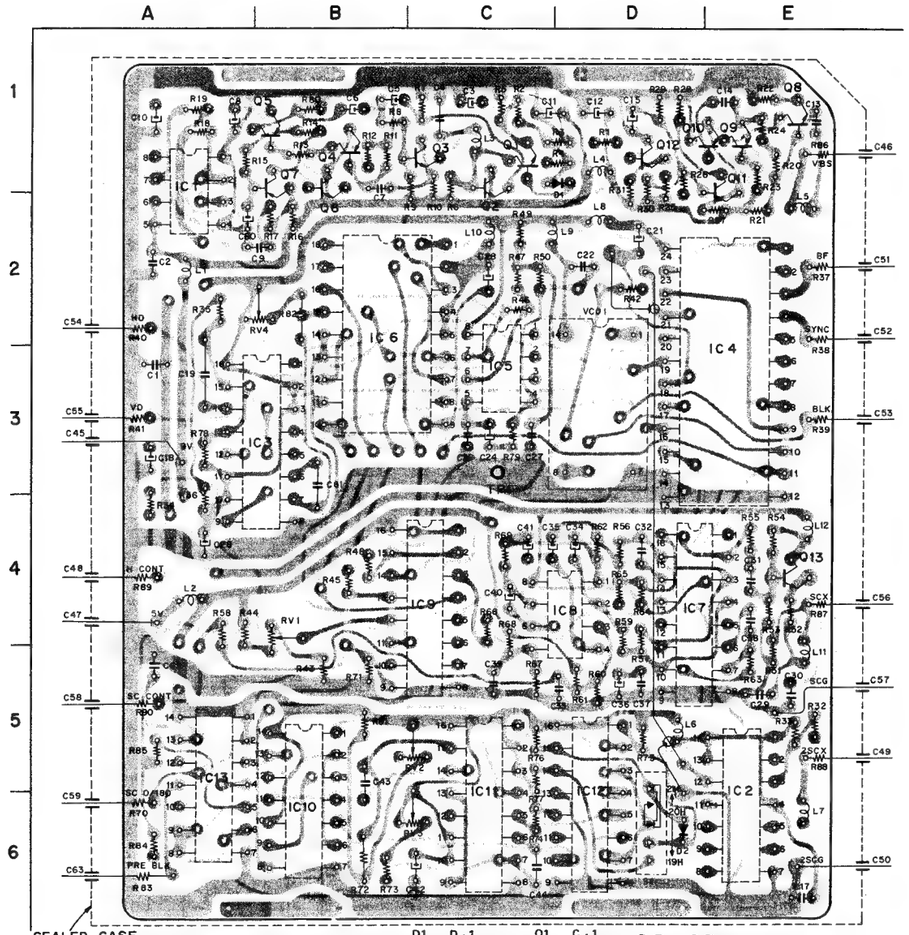


SD-2 BOARD (SPECIAL EFFECT CONTROL PULSE SYSTEM)




Q11 2SC2603 INV.
Q12 2SC2603 BUFF.
Q13 2SA1175 AUX-SYNC LEVEL CONT.
Q32 2SA1175
Q14 2SC2603BP INV.
IC6 TC4528BP V PULSE GEN.
Q1 2SC2603 BUFF.
Q2 2SA1175
Q30 2SA1175 INT SYNC LEVEL CONT.
Q3 2SC2603 INV.
IC5 TC4528BP V PULSE GEN.
IC9 TC4053BP AUX/INT SWITCH
IC12 TC4528BP DSK V BLKG PULSE GEN.
Q16 2SB733 INV.
BUFF.
NOTE
MOTE | CHANGE INFORMATION | SERIAL NO.
*1 C7 130P → 150P | (J) 10441~
R21 2K → 2200 | (U/C) 11261~
R27, 28 5100 → 4700 | (AEP) 12821~
R4 51K(PAL) → 47K(PAL) | (UK) 10191~
(BRZ) 10046~
RV8:VD A WIDTH
RV4:VD SYNC WIDTH
RV15:VD BLKG PHASE
RV14:VD BLKG WIDTH
VD(X1) OUT 38 → HN-22,11-3
VD OUT 42 → CH-7, 1-17
VD OUT 43 → HN-22, 9-4, KY-18, 501-4
CLAMP FL OUT 35 → EF-10, 7-27, EF-9, 6-27
PGM CLAMP FL OUT 37 → DK-4, 8-24
PST CLAMP FL OUT 36 → DK-4, 8-23
IC1 TC4069UBP INV.
IC7 TC4528BP EXT-CLAMP PULSE GEN.
IC8 TC4528BP INT-CLAMP PULSE GEN.
Q23 2SC2603 Q24 2SC2603 Q25 2SA1175 CLAMP PULSE
Q17 2SC2603 Q18 2SC2603 Q19 2SA1175 PGM CLAMP PULSE
IC10 TC4053BP INT/EXT (PGM)CLAMP PULSE SW.
Q20 2SC2603 Q21 2SC2603 Q22 2SA1175 PST CLAMP PULSE
INT/EXT (PST) CLAMP PULSE SW. INV.
SYNC(EXT)
SYNC(INT)
RV9:EXT CLAMP PULSE WIDTH
RV10:CLAMP PULSE PHASE
RV11:CLAMP PULSE WIDTH
RV5:V PRE BLKG WIDTH
V-PRE BLKG OUT 21 → WP-12,3-8
PRE BLKG OUT 41 → WP-12,3-42
H-PRE BLKG OUT 23 → WP-12,3-7
IC2 TC4011BP
IC3 TC4049BP
EXT-DSK H PULSE GEN.
IC4 TC4528BP
INT-DSK H PULSE GEN.
EXT/INT SWITCH
Q11 TC4528BP DSK H BLKG PULSE GEN.
Q15 2SB733 INV. BUFF.
RV7:HD A WIDTH
RV3:HD PRE BLKG WIDTH
RV2:HD SYNC WIDTH
RV13:HD BLKG PHASE
RV12:HD BLKG WIDTH
NARROW SYNC GEN.
BLKG OUT 29,30 → CM-11, 4-23
HD(X1) OUT 39 → HN-22,11-2
HD/VD(G) OUT 34 → HN-22,11-1
RD OUT 40 → CH-7, 1-11
SYNC(1) OUT 24 → CH-7, 1-15
PST KEY PLS OUT 17 → DK-4, 8-39
PGM KEY PLS OUT 19 → DK-4, 8-38
RV1:SYNC WIDTH
* DSK NORMAL/INVERT ; NORMAL
* PGM/PST CUT IN
PST KEY PULSE
PGM KEY PULSE
B/W CAMERA CN027
HN-22,11-4,5 TO DK-3,8-15,16
TP9,TP26 VD
IC12-10pin
TP14
35,36,37pin /EX-20 CLAMP FL
TP4 H-PRE BLKG
TP3 V-PRE BLKG
TP27 BLKG
40pin/EX-20 HD
24pin/EX-20 SYNC(1)

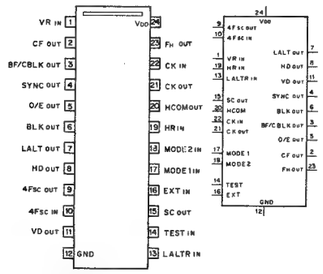
SG-35 BOARD
– SOLDERING SIDE –
[For SEG-2000A use]



D1	D-1	Q1	C-1	RV1	B-4
D2	D-6	Q2	C-1	RV2	C-5
		Q3	C-1	RV3	C-6
IC1	A-1	Q4	B-1	RV4	B-2
IC2	E-6	Q5	B-1		
IC3	B-3	Q6	B-1	TP1	C-3
IC4	E-3	Q7	B-1		
IC5	C-3	Q8	E-1		
IC6	B-2	Q9	E-1		
IC7	E-4	Q10	D-1		
IC8	D-4	Q11	E-1		
IC9	C-4	Q12	D-1		
IC10	B-6	Q13	E-4		
IC11	C-6				
IC12	D-6				
IC13	A-6				

SG-35 BOARD
–SOLDERING SIDE–
1-603-028-14
SEG-2000
DXC-1800
SEG-2000A
CRK-2000

CX773A (SONY)
C-MOS SYNC GENERATOR (NTSC, PAL-M, PAL, SECAM)
—TOP VIEW—



O/E : ODD/EVEN FIELD
CF : COLOUR FRAME PULSE
HCOM : H COMPARATOR

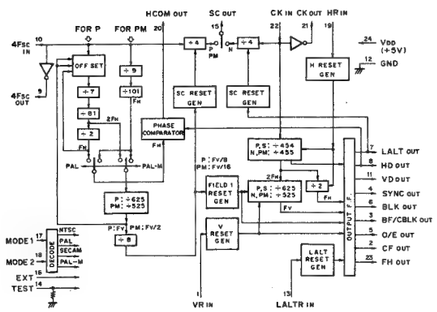
SYSTEM	4Fsc	CLOCK
NTSC	910 FH	910 FH
PAL	1135 FH+2 Fv	908 FH
PALM	909 FH	910 FH
SECAM	———	906 FH

INTUPS MODE 1	INTUPS MODE 2	SYSTEM
0	0	NTSC
0	1	SECAM
1	0	PALM
1	1	PAL

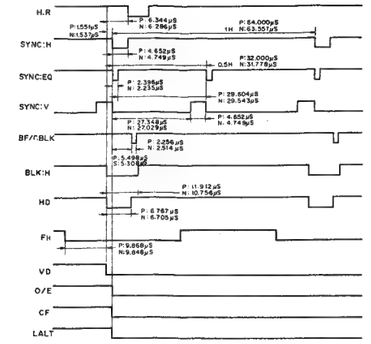
"1" : VDD
"0" : GND

INTUPS EXT	INTUPS TEST	FUNCTION
0	0	INTERNAL
0	1	INVALID
1	0	EXT
1	1	TEST

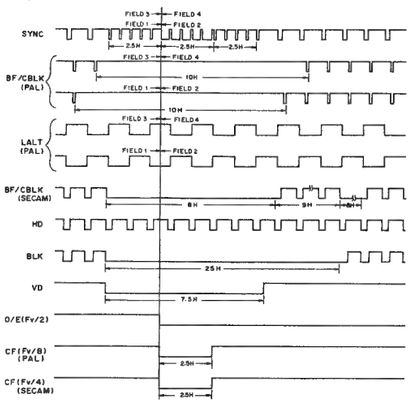
TEST "0" OPEN
(INTERNALLY (PULLED DOWN)



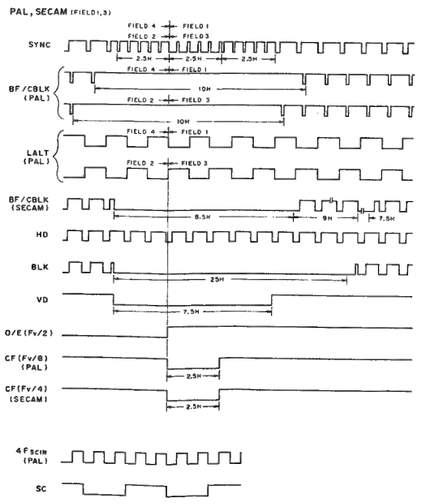
P: PAL, SECAM
N: NTSC, PALM



PAL, SECAM (FIELD 4, 2)



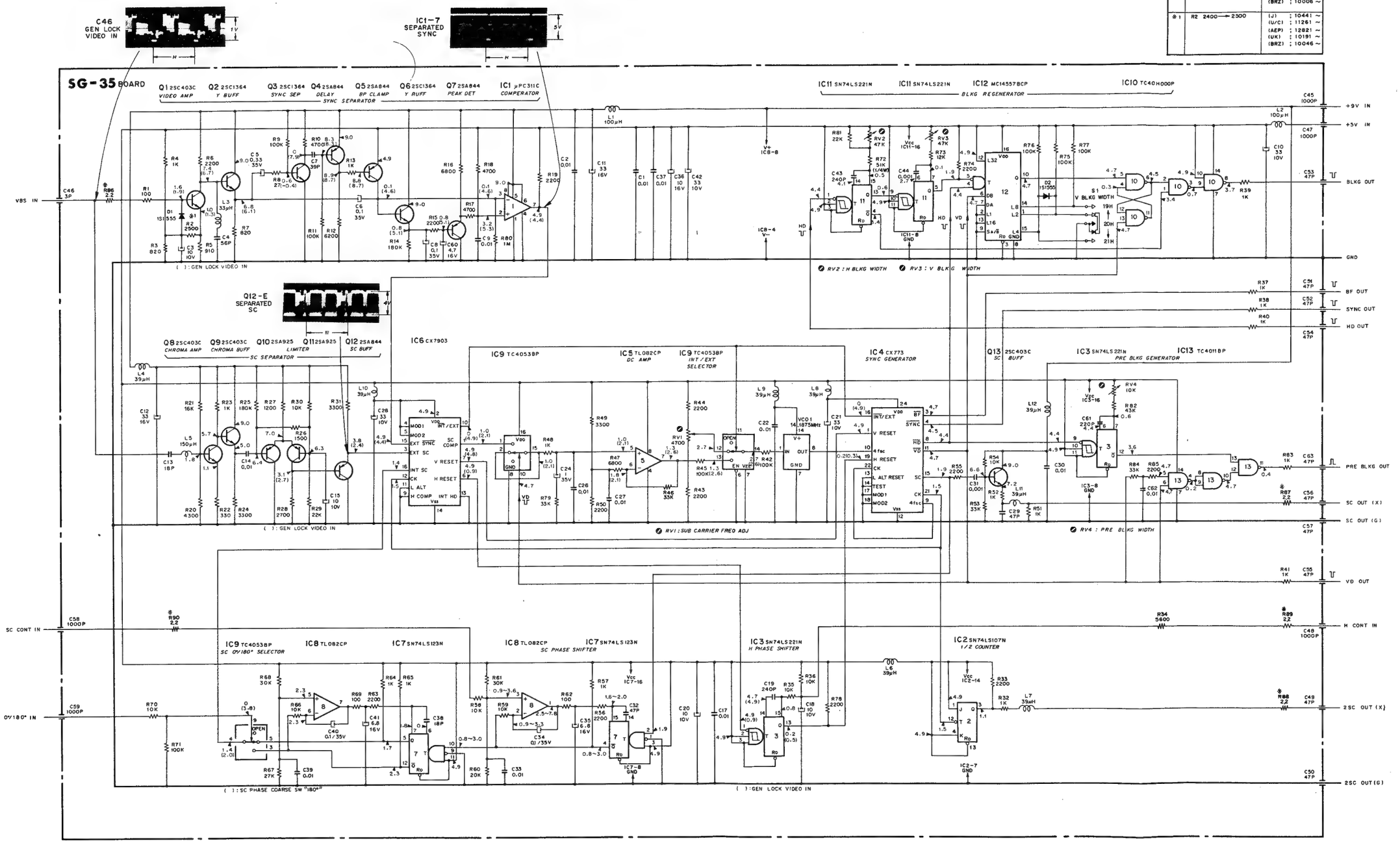
PAL, SECAM (FIELD 1, 3)



SG-35 BOARD (SYNC GENERATOR SYSTEM)
[For SEG-2000A use]

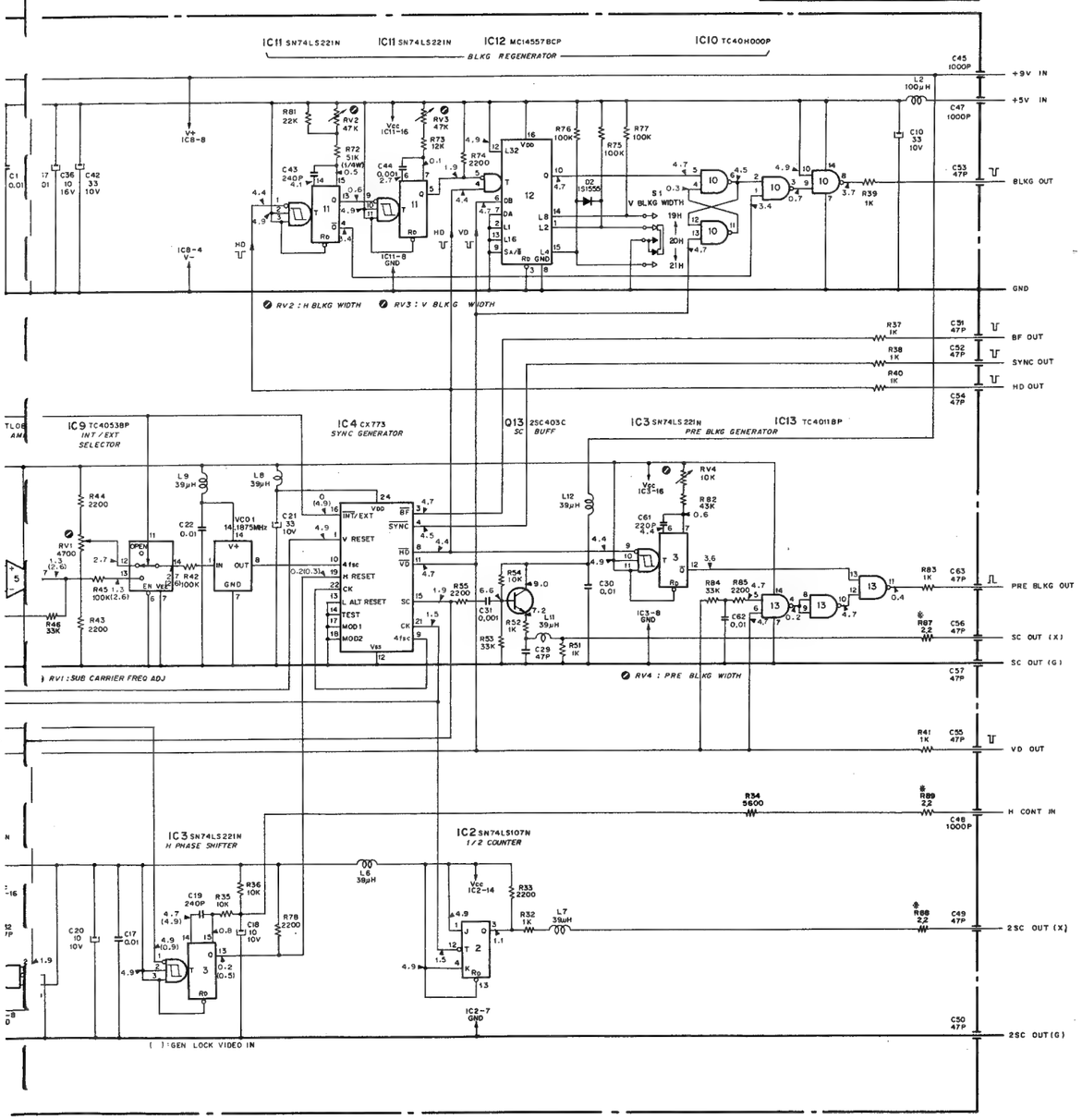
NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
※	R54,7,9,10,11 ↓ R86,87,88,89,90(2.2Ω)	(U/C) : 10601 ~ (J) : 10251 ~ (AEP) : 10631 ~ (UK) : 10591 ~ (BRZ) : 10006 ~
※1	R2 2400 ⟶ 2500	(J) : 10441 ~ (U/C) : 11261 ~ (AEP) : 12821 ~ (UK) : 10191 ~ (BRZ) : 10046 ~

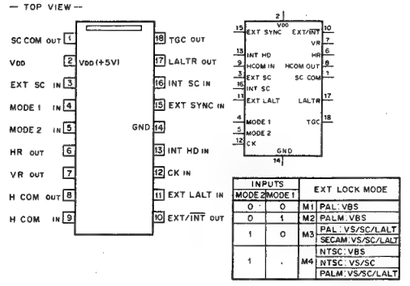


NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
※	RS 4,7,9,10,11 → R86,87,88,89,90(2.2Ω)	(U/C) : 10601 ~ (J) : 10251 ~ (AEP) : 10631 ~ (UK) : 10091 ~ (BRZ) : 10006 ~
※1	R2 2400Ω → 2500Ω	(J) : 10441 ~ (U/C) : 11261 ~ (AEP) : 12821 ~ (UK) : 10191 ~ (BRZ) : 10046 ~

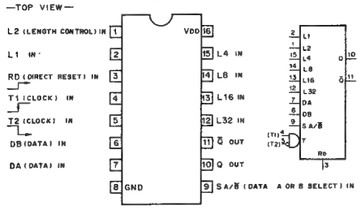


CX7903 (SONY)
CMOS GENLOCK DRIVER FOR CX773
— TOP VIEW —



INPUTS MODE 2	INPUTS MODE 1	EXT LOCK MODE
0	0	M1 : PAL : VBS
0	1	M2 : PALM : VBS
1	0	M3 : PAL : VS/SC/LALT SECAM : VS/SC/LALT
1	1	M4 : NTSC : VBS NTSC : VS/SC PALM : VS/SC/LALT

MC14557BCP (MOTOROLA)
C-MOS 1-TO-64-BIT VARIABLE LENGTH SHIFT REGISTER
— TOP VIEW —



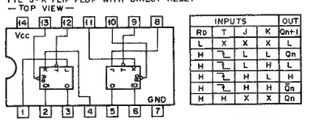
LENGTH SELECT TRUTH TABLE

L32	L16	L8	L4	L2	L1	REGISTER LENGTH
0	0	0	0	0	0	1-BIT
0	0	0	0	0	1	2-BIT
0	0	0	0	1	0	3-BIT
0	0	0	0	1	1	4-BIT
0	0	0	1	0	0	5-BIT
:	:	:	:	:	:	:
1	1	1	1	0	0	61-BIT
1	1	1	1	0	1	62-BIT
1	1	1	1	1	0	63-BIT
1	1	1	1	1	1	64-BIT

INPUTS RD	SA/B	T1	T2	OUTPUT Q
0	0	↓	0	DB
0	1	↓	0	DA
0	0	1	↓	DB
0	1	1	↓	DA
1	X	X	X	0

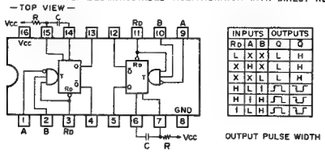
0 ; LOW
1 ; HIGH
X ; DON'T CARE

SN74LS107N (TI)
TTL J-K FLIP FLOP WITH DIRECT RESET
— TOP VIEW —



INPUTS RD	T	J	K	OUT Qn+1
L	X	X	X	L
H	↓	L	L	Qn
H	↓	L	H	L
H	↓	H	L	H
H	↓	H	H	Q̄n
H	H	X	X	Qn

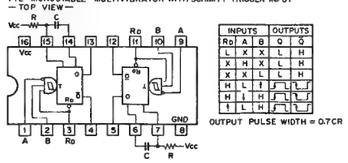
SN74LS123N (TI)
TTL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR WITH DIRECT RESET
— TOP VIEW —



INPUTS RD	A	B	OUTPUTS Q	Q̄
L	X	X	L	H
X	L	X	L	H
X	X	L	L	H
H	↓	↓	⊓	⊔
H	↓	H	⊓	⊔
H	H	↓	⊓	⊔

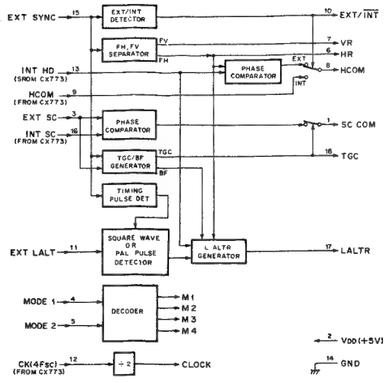
OUTPUT PULSE WIDTH

SN74LS221N (TI)
TTL MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT
— TOP VIEW —

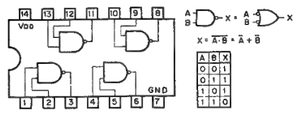


INPUTS RD	A	B	OUTPUTS Q	Q̄
L	X	X	L	H
X	H	X	L	H
X	X	L	L	H
H	↓	↓	⊓	⊔
H	↓	H	⊓	⊔
↑	L	H	⊓	⊔

OUTPUT PULSE WIDTH = 0.7CR

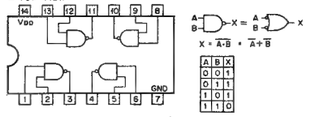


TC40H000P (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —



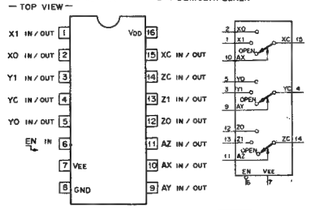
A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

TC4011BP (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —



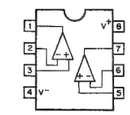
A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

TC4053BP (TOSHIBA)
C-MOS 2-CHANNEL MULTIPLEXER / DEMULTIPLEXER
— TOP VIEW —

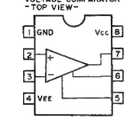


CONT. INPUTS EN	A (X,Y,Z)	ON CHANNEL
0	0	0
0	1	1
1	X	OPEN

TL082CP (TI)
OPERATIONAL AMPLIFIER
(JFET-INPUT)
— TOP VIEW —



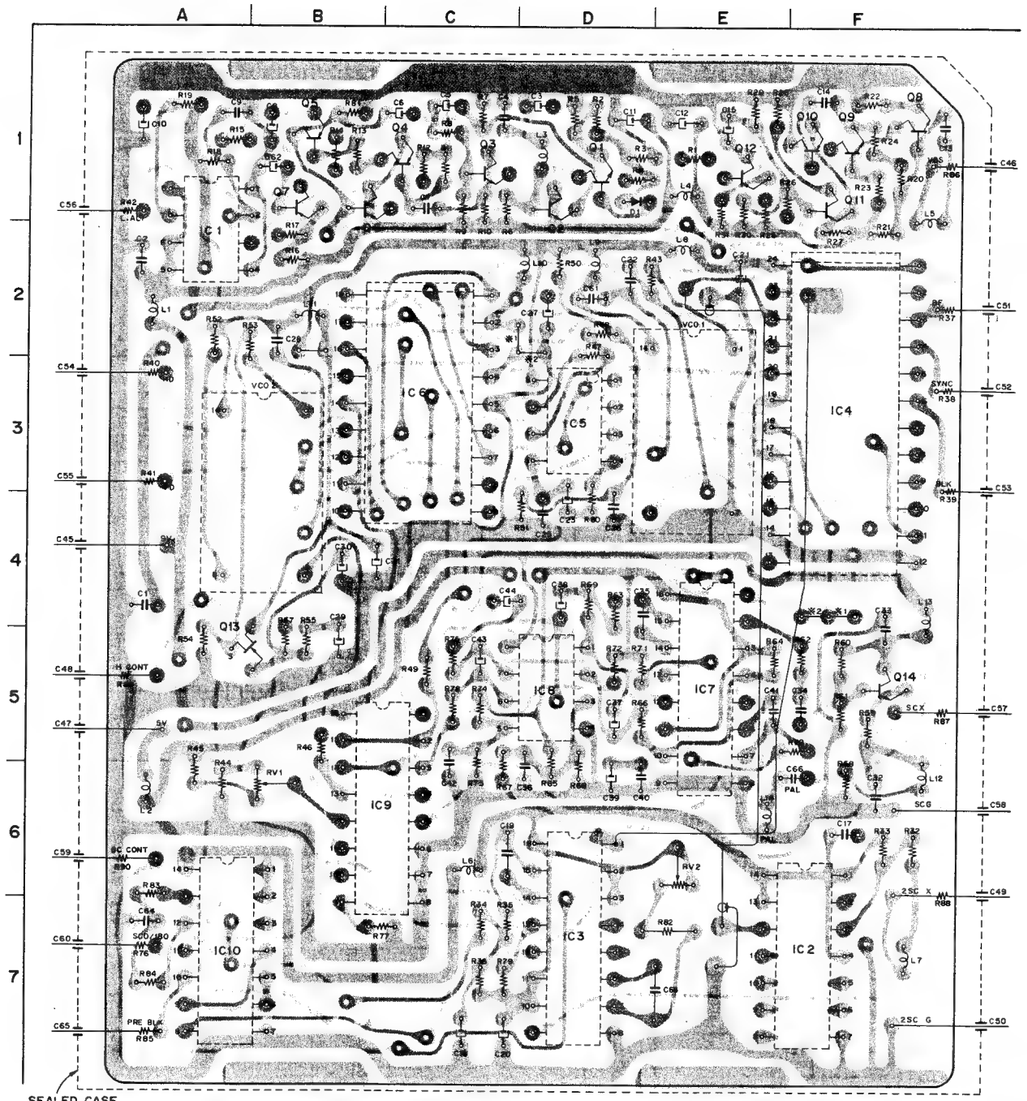
μPC311C (NEC)
VOLTAGE COMPARATOR
— TOP VIEW —



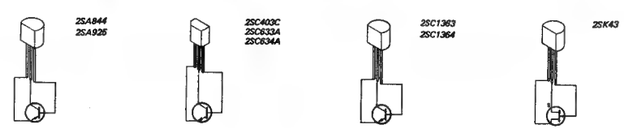
NOTE:

1. All voltage are measured with a digital voltmeter (input impedance 10MΩ).
2. Waveform photographs are taken under the following conditions:
   - Color bar signal (1 Vp-p) input to "VIDEO IN"

SG34 BOARD
[For SEG-2000AP/APM use]



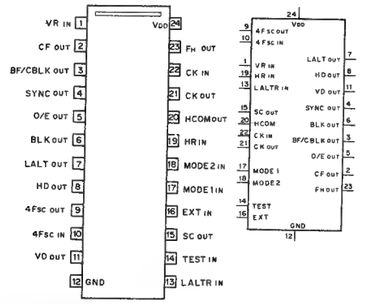
D1	D-1
IC1	A-2
IC2	F-7
IC3	D-7
IC4	F-3
IC5	D-3
IC6	C-3
IC7	E-5
IC8	D-5
IC9	C-6
IC10	A-7
Q1	D-1
Q2	D-1
Q3	C-1
Q4	C-1
Q5	B-1
Q6	B-1
Q7	B-1
Q8	F-1
Q9	F-1
Q10	F-1
Q11	F-1
Q12	E-1
Q13	B-5
Q14	F-5
RV1	B-6
RV2	E-6



SG-34 BOARD
– SOLDERING SIDE –
1-603-029-14
SEG-2000P/PM
DXC-1800P/PM
SEG-2000AP/APM
CRK-2000P/PM

	※1	※2
PAL	OPEN	SHORT
PAL-M	SHORT	OPEN

CX773A (SONY)
C-MOS SYNC GENERATOR (NTSC, PAL-M, PAL, SECAM)
—TOP VIEW—



O/E : ODD/EVEN FIELD
CF : COLOUR FRAME PULSE
HCOM : H COMPARATOR

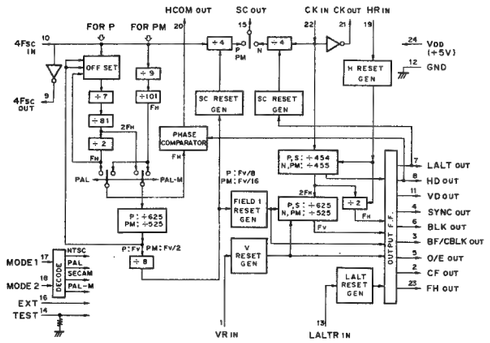
SYSTEM	4Fsc	CLOCK
NTSC	910 FH	910FH
PAL	1135 FH+2Fv	908FH
PALM	909FH	910FH
SECAM		908FH

INTUPS MODE1	INTUPS MODE2	SYSTEM
0	0	NTSC
0	1	SECAM
1	0	PALM
1	1	PAL

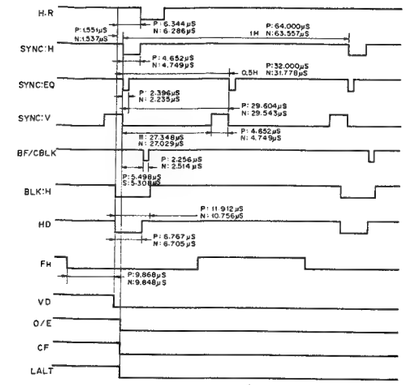
"1" : VDD
"0" : GND

INTUPS EXT	INTUPS TEST	FUNCTION
0	0	INTERNAL
0	1	INVALID
1	0	EXT
1	1	TEST

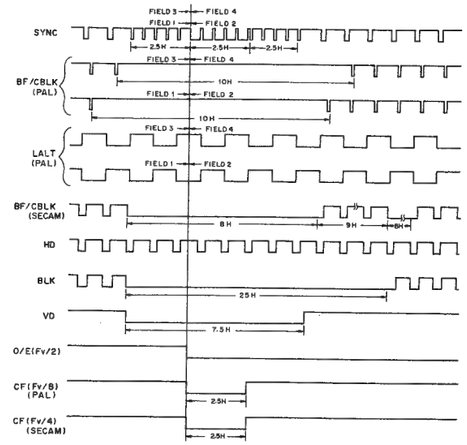
TEST "0" : OPEN INTERNALLY (PULLED DOWN)



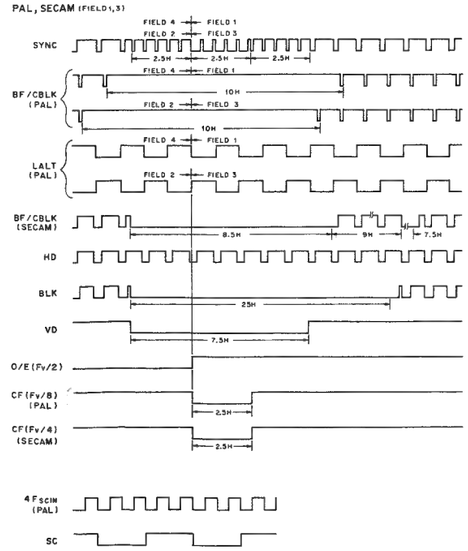
P: PAL, SECAM
N: NTSC, PALM



PAL, SECAM (FIELD 4,2)



PAL, SECAM (FIELD 1,3)

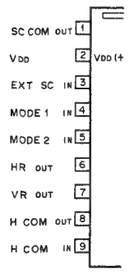


SG-34 BOARD (SYNC GENERATOR SYSTEM)
[For SEG-2000AP/APM use]

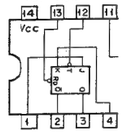
NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
*	RS 1,2,3,4,7,9 ↓ R86,87,88,89,90(2.2Ω)	(U/C) : 10301~ (J) : 10221~ (AEP) : 10471~ (UK) : 10051~ (BRZ) : 10011~
*1	R2 2400 → 2200 R5 910 → 820 R12 6200 → 6800 R20 4300 → 3900 R21 16K → 15K	(J) : 10441 ~ (U/C) : 11261 ~ (AEP) : 12821 ~ (UK) : 10191 ~ (BRZ) : 10046 ~

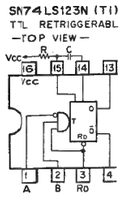
CX7903 (SONY)
CMOS GENLOCK DRIV
— TOP VIEW —



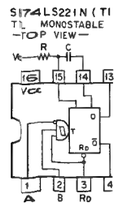
SN74LS107N (TI)
TTL J-K FLIP FLOP
—TOP VIEW—



SN74LS123N (TI)
TTL RETRIGGERABL
—TOP VIEW—

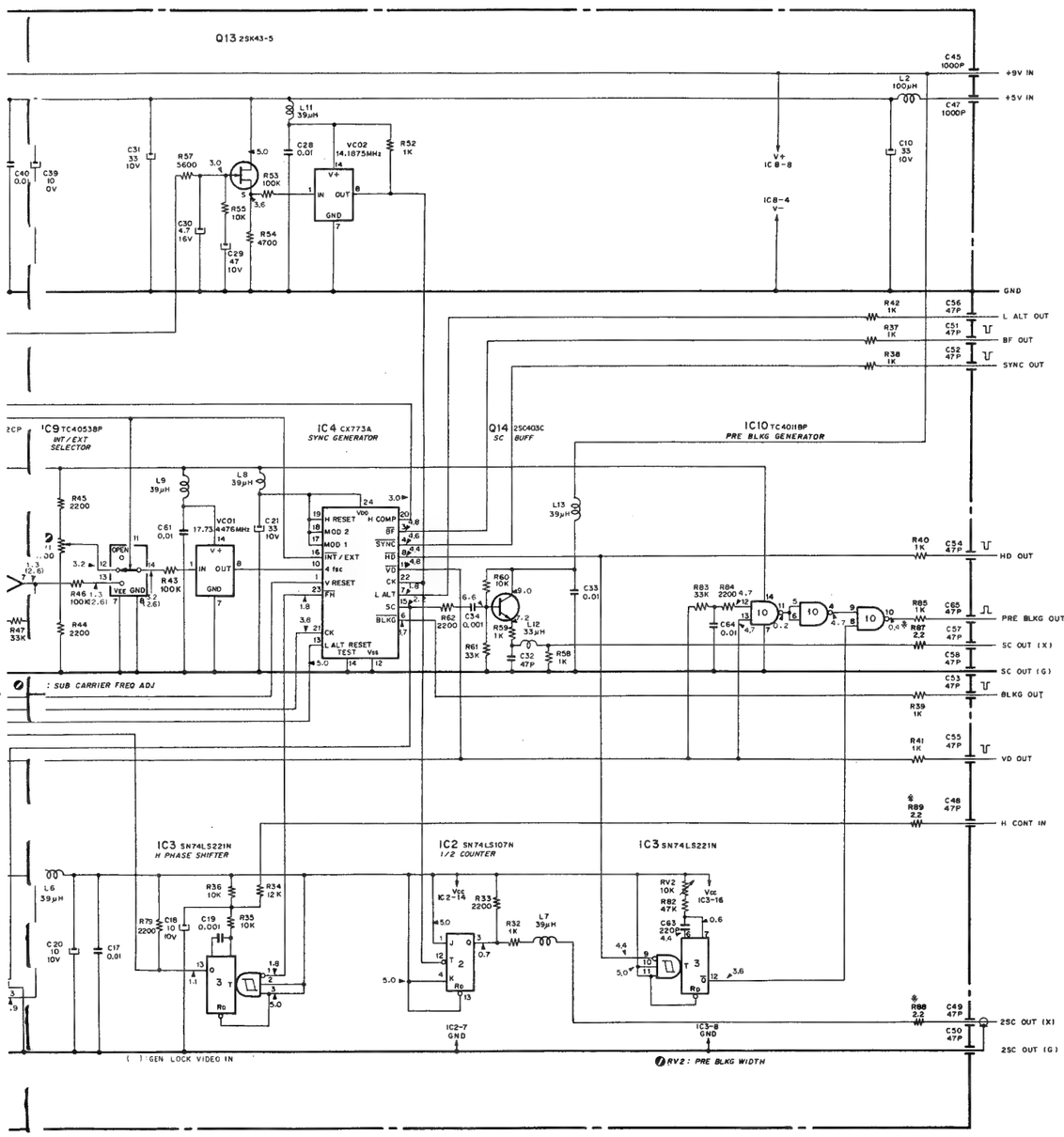


SN74LS221N (TI)
TTL MONOSTABLE
—TOP VIEW—

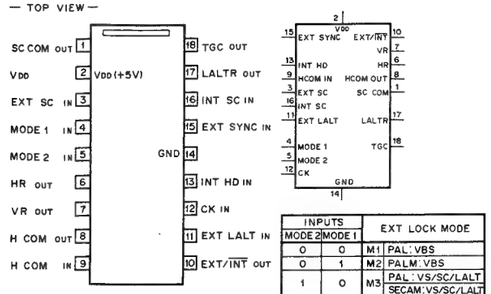


NOTE

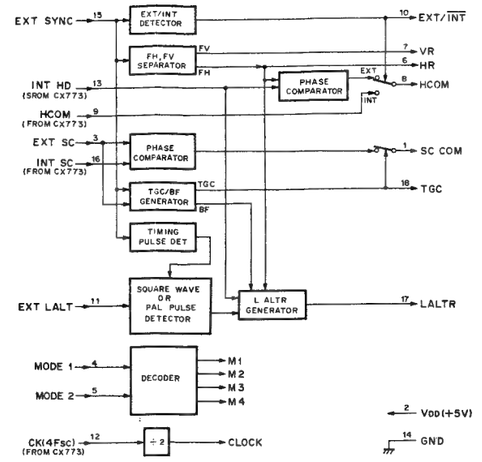
MARK	CHANGE INFORMATION	SERIAL NO.
※	RS 1, 2, 3, 4, 7, 9 → R86, 87, 88, 89, 90 (2.2Ω)	(U/C) : 10301~ (J) : 10221~ (AEP) : 10471~ (UK) : 10051~ (BRZ) : 10011~
※1	R2 2400 → 2200 R5 910 → 820 R12 6200 → 6800 R20 4300 → 3900 R21 16K → 15K	(J) : 10441 ~ (U/C) : 11261 ~ (AEP) : 12821 ~ (UK) : 10191 ~ (BRZ) : 10046 ~



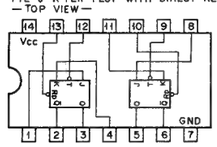
CX7903 (SONY)
CMOS GENLOCK DRIVER FOR CX773
— TOP VIEW —



INPUTS MODE 2	INPUTS MODE 1	EXT LOCK MODE	
0	0	M1	PAL: VBS
0	1	M2	PALM: VBS
1	0	M3	PAL: VS/SC/LALT SECAM: VS/SC/LALT
1	1	M4	NTSC: VBS NTSC: VS/SC PALM: VS/SC/LALT

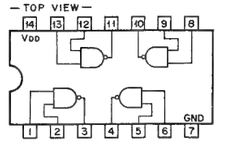


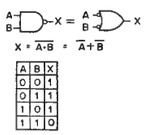
SN74LS107N (TI)
TTL J-K FLIP FLOP WITH DIRECT RESET
— TOP VIEW —



INPUTS RD	T	J	K	OUT Qn+1
L	X	X	X	L
H	↓	L	L	Qn
H	↓	L	H	L
H	↓	H	L	H
H	↓	H	H	$\overline{Qn}$
H	H	X	X	Qn

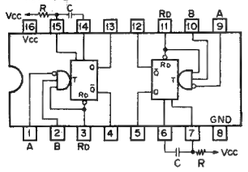
TC4011BP (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —





A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

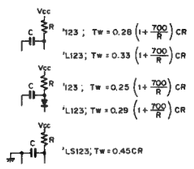
SN74LS123N (TI)
TTL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR WITH DIRECT RESET
— TOP VIEW —



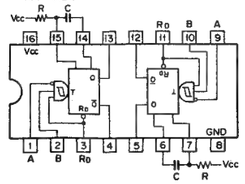
INPUTS Rd	A	B	OUTPUTS Q	$\overline{Q}$
0	X	X	0	1
X	1	X	0	1
X	X	1	0	1
1	0	↑	⊓	⊔
↑	↑	↑	⊓	⊔
↑	0	↑	⊓	⊔

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

OUTPUT PULSE WIDTH



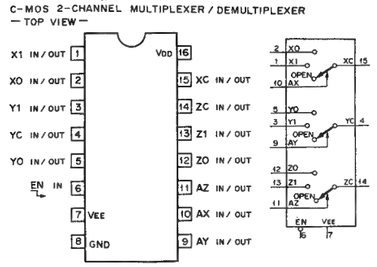
SN74LS221N (TI)
TTL MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT
— TOP VIEW —



INPUTS Rd	A	B	OUTPUTS Q	$\overline{Q}$
L	X	X	L	H
X	H	X	L	H
X	X	L	L	H
H	L	↓	⊓	⊔
H	↓	H	⊓	⊔
↑	L	H	⊓	⊔

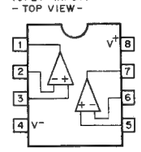
OUTPUT PULSE WIDTH = 0.7CR

TC4053BP (TOSHIBA)
C-MOS 2-CHANNEL MULTIPLEXER / DEMULTIPLEXER
— TOP VIEW —

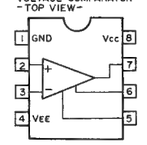


CONT. INPUTS EN	A (X, Y, Z)	ON CHANNEL
0	0	0
0	1	1
1	X	OPEN

TL082CP (TI)
OPERATIONAL AMPLIFIER
(JFET-INPUT)
— TOP VIEW —



μPC311C (NEC)
VOLTAGE COMPARATOR
— TOP VIEW —

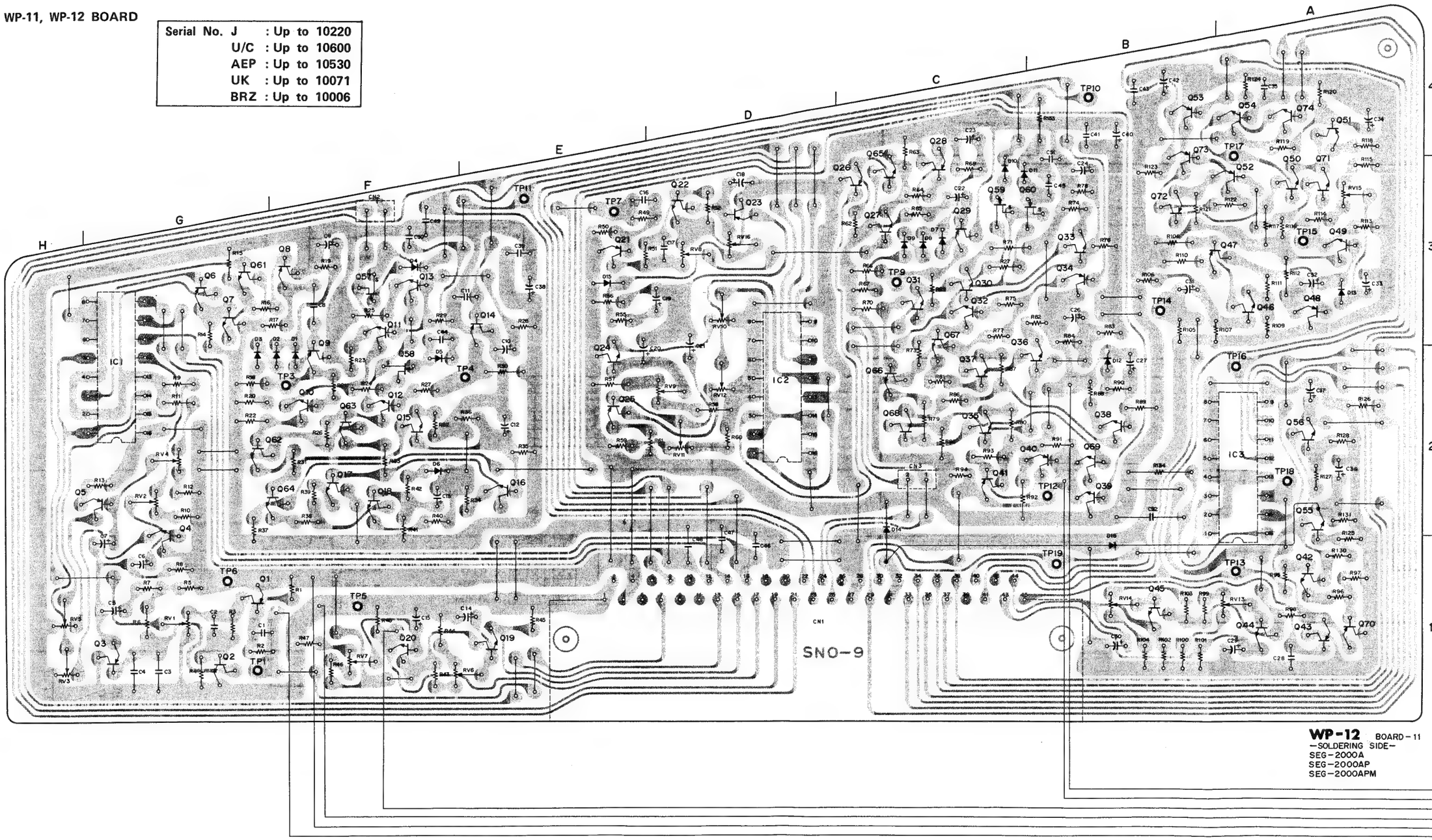


NOTE:

1. All voltage are measured with a digital voltmeter (input impedance 10MΩ).
2. Waveform photographs are taken under the following conditions:
   - Color bar signal (1 Vp-p) input to "VIDEO IN"

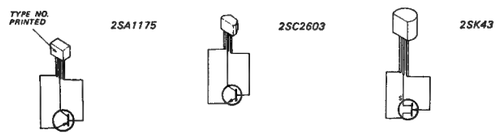
WP-11, WP-12 BOARD

Serial No.		
	J	: Up to 10220
	U/C	: Up to 10600
	AEP	: Up to 10530
	UK	: Up to 10071
	BRZ	: Up to 10006



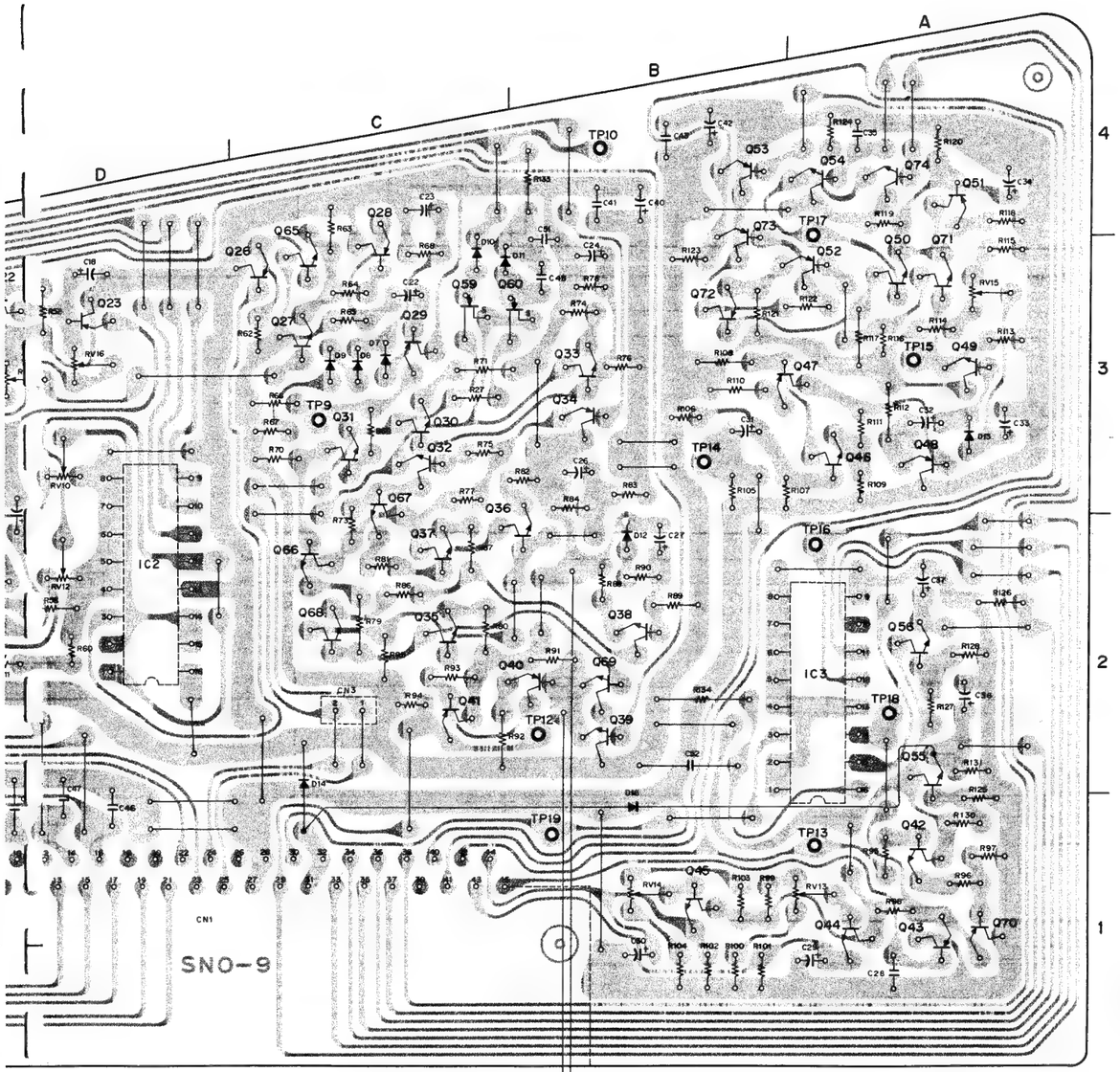
CN1	D - 1	Q60	B - 3		
CN2	F - 3	Q61	G - 3		
CN3	C - 2	Q62	G - 2		
		Q63	F - 2		
D1	F - 3	Q64	G - 2		
D2	F - 3	Q65	C - 3		
D3	G - 3	Q66	C - 2		
D4	F - 3	Q67	C - 3		
D5	F - 2	Q68	C - 2		
D6	F - 2	Q69	B - 2		
D7	C - 3	Q70	A - 1		
D8	C - 3	Q71	A - 3		
D9	C - 3	Q72	B - 3		
D10	C - 3	Q73	B - 4		
D11	C - 3	Q74	A - 4		
D12	B - 2				
D13	A - 3	RV1			
D14	C - 2	RV2	G - 2		
D15	E - 3	RV3	H - 1		
		RV4			
IC1	G - 2	RV5	H - 1		
IC2	D - 2	RV6	F - 1		
IC3	A - 2	RV7	F - 1		
		RV8	D - 3		
Q1	G - 1	RV9	D - 2		
Q2	G - 1	RV10	D - 3		
Q3	G - 1	RV11	D - 2		
Q4	G - 2	RV12	D - 2		
Q5	G - 2	RV13			
Q6	G - 3	RV14			
Q7	G - 3	RV15	A - 3		
Q8	F - 3	RV16	D - 3		
Q9	F - 3				
Q10	F - 2	TP1	G - 1		
Q11	F - 3	TP3	F - 2		
Q12	F - 2	TP4	E - 2		
Q13	F - 3	TP5	F - 1		
Q14	E - 3	TP6	G - 1		
Q15	F - 2	TP7	E - 3		
Q16	E - 2	TP8	A - 2		
Q17	F - 2	TP9	C - 3		
Q18	F - 2	TP10	B - 4		
Q19	E - 1	TP11	E - 3		
Q20	F - 1	TP12	B - 2		
Q21	E - 3	TP13	A - 1		
Q22	D - 3	TP14	B - 3		
Q23	D - 3	TP15	A - 3		
Q24	E - 2	TP16	A - 2		
Q25	E - 2	TP17	A - 4		
Q26	C - 3	TP18	A - 2		
Q27	C - 3	TP19	B - 1		
Q28	C - 3				
Q29	C - 3				
Q30	C - 3				
Q31	C - 3				
Q32	C - 3				
Q33	B - 3				
Q34	B - 3				
Q35	C - 2				
Q36	B - 2				
Q37	C - 2				
Q38	B - 2				
Q39	B - 2				
Q40	B - 2				
Q41	C - 2				
Q42	A - 1				
Q43	A - 1				
Q44	A - 1				
Q45	B - 1				
Q46	A - 3				
Q47	A - 3				
Q48	A - 3				
Q49	A - 3				
Q50	A - 3				
Q51	A - 4				
Q52	A - 3				
Q53	B - 4				
Q54	A - 4				
Q55	A - 2				
Q56	A - 2				
Q57	F - 3				
Q58	F - 2				
Q59	C - 3				

WP-12 BOARD - 11
-SOLDERING SIDE-
SEG-2000A
SEG-2000AP
SEG-2000APM



11-87(a)

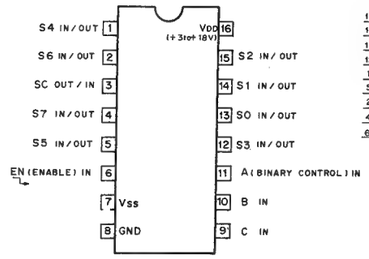
11-88(a)

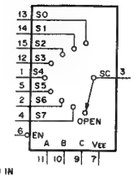


WP-12 BOARD-11
-SOLDERING SIDE-
SEG-2000A
SEG-2000AP
SEG-2000APM

CN1	D-1	Q60	B-3
CN2	F-3	Q61	G-3
CN3	C-2	Q62	G-2
		Q63	F-2
D1	F-3	Q64	G-2
D2	F-3	Q65	C-3
D3	G-3	Q66	C-2
D4	F-3	Q67	C-3
D5	F-2	Q68	C-2
D6	F-2	Q69	B-2
D7	C-3	Q70	A-1
D8	C-3	Q71	A-3
D9	C-3	Q72	B-3
D10	C-3	Q73	B-4
D11	C-3	Q74	A-4
D12	B-2		
D13	A-3	RV1	
D14	C-2	RV2	G-2
D15	E-3	RV3	H-1
		RV4	
IC1	G-2	RV5	H-1
IC2	D-2	RV6	F-1
IC3	A-2	RV7	F-1
		RV8	D-3
Q1	G-1	RV9	D-2
Q2	G-1	RV10	D-3
Q3	G-1	RV11	D-2
Q4	G-2	RV12	D-2
Q5	G-2	RV13	
Q6	G-3	RV14	
Q7	G-3	RV15	A-3
Q8	F-3	RV16	D-3
Q9	F-3		
Q10	F-2	TP1	G-1
Q11	F-3	TP3	F-2
Q12	F-2	TP4	E-2
Q13	F-3	TP5	F-1
Q14	E-3	TP6	G-1
Q15	F-2	TP7	E-3
Q16	E-2	TP8	A-2
Q17	F-2	TP9	C-3
Q18	F-2	TP10	B-4
Q19	E-1	TP11	E-3
Q20	F-1	TP12	B-2
Q21	E-3	TP13	A-1
Q22	D-3	TP14	B-3
Q23	D-3	TP15	A-3
Q24	E-2	TP16	A-2
Q25	E-2	TP17	A-4
Q26	C-3	TP18	A-2
Q27	C-3	TP19	B-1
Q28	C-3		
Q29	C-3		
Q30	C-3		
Q31	C-3		
Q32	C-3		
Q33	B-3		
Q34	B-3		
Q35	C-2		
Q36	B-2		
Q37	C-2		
Q38	B-2		
Q39	B-2		
Q40	B-2		
Q41	C-2		
Q42	A-1		
Q43	A-1		
Q44	A-1		
Q45	B-1		
Q46	A-3		
Q47	A-3		
Q48	A-3		
Q49	A-3		
Q50	A-3		
Q51	A-4		
Q52	A-3		
Q53	B-4		
Q54	A-4		
Q55	A-2		
Q56	A-2		
Q57	F-3		
Q58	F-2		
Q59	C-3		

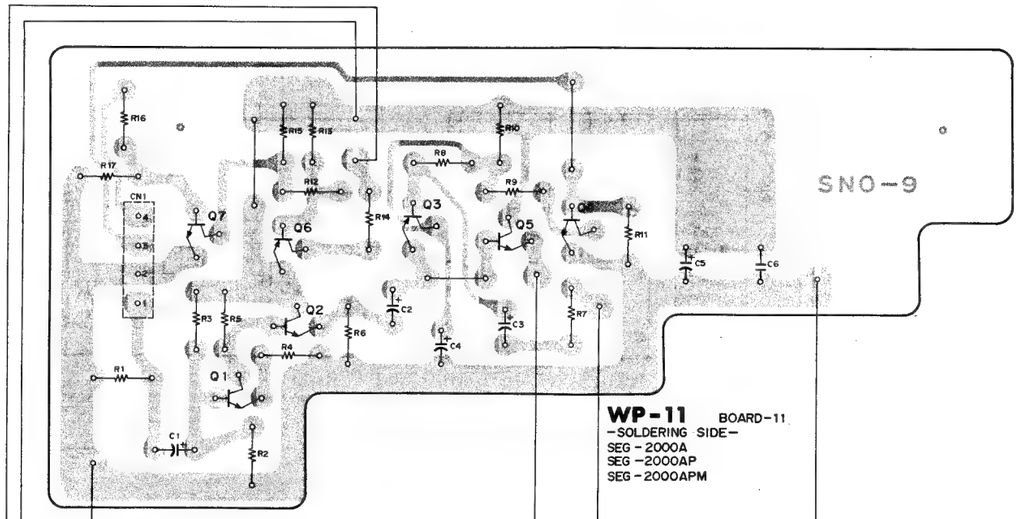
TC4051BP (TOSHIBA)
C-MOS 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —





EN	C	B	A	"ON" CHANNEL
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	X	X	X	OPEN

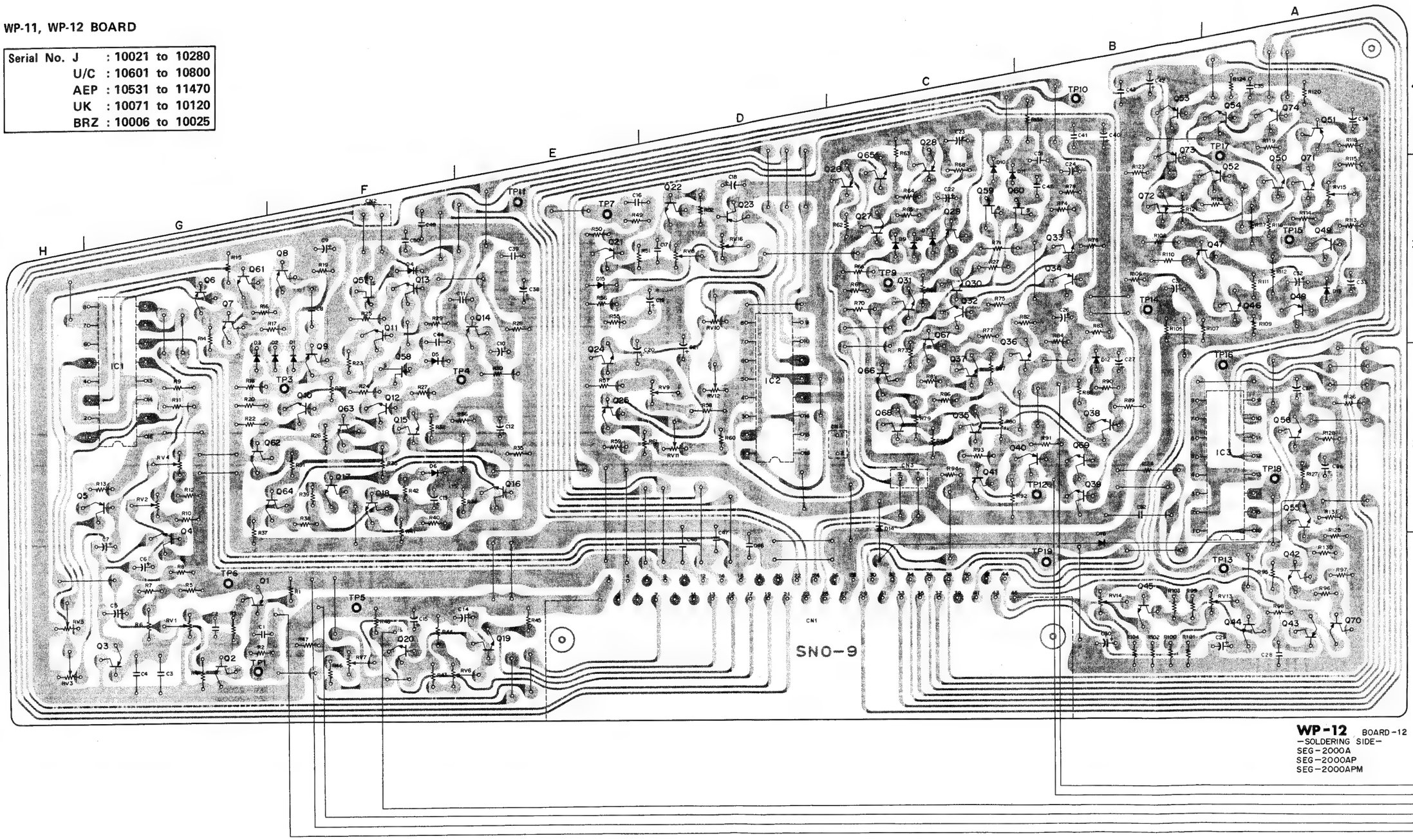
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE



WP-11 BOARD-11
-SOLDERING SIDE-
SEG-2000A
SEG-2000AP
SEG-2000APM

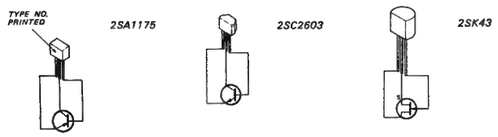
WP-11, WP-12 BOARD

Serial No.	J	: 10021	to	10280
	U/C	: 10601	to	10800
	AEP	: 10531	to	11470
	UK	: 10071	to	10120
	BRZ	: 10006	to	10025



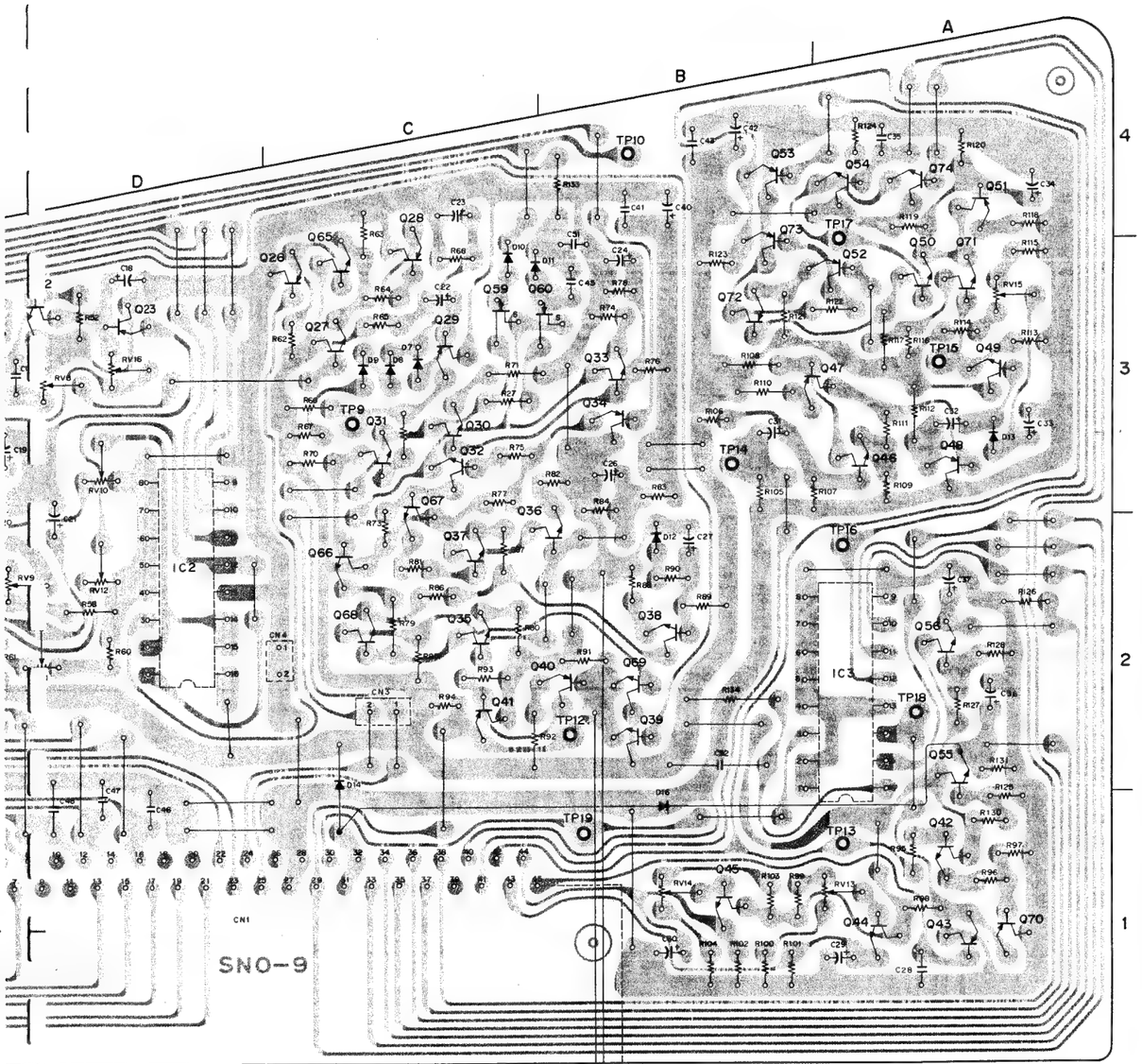
WP-12 BOARD-12
—SOLDERING SIDE—
SEG-2000A
SEG-2000AP
SEG-2000APM

CN1	D-1	Q60
CN2	F-3	Q61
CN3	C-2	Q62
		Q63
D1	F-3	Q64
D2	F-3	Q65
D3	G-3	Q66
D4	F-3	Q67
D5	F-2	Q68
D6	F-2	Q69
D7	C-3	Q70
D8	C-3	Q71
D9	C-3	Q72
D10	C-3	Q73
D11	C-3	Q74
D12	B-2	
D13	A-3	RV1
D14	C-2	RV2
D15	E-3	RV3
		RV4
IC1	G-2	RV5
IC2	D-2	RV6
IC3	A-2	RV7
		RV8
Q1	G-1	RV9
Q2	G-1	RV10
Q3	G-1	RV11
Q4	G-2	RV12
Q5	G-2	RV13
Q6	G-3	RV14
Q7	G-3	RV15
Q8	F-3	RV16
Q9	F-3	
Q10	F-2	TP1
Q11	F-3	TP3
Q12	F-2	TP4
Q13	F-3	TP5
Q14	E-3	TP6
Q15	F-2	TP7
Q16	E-2	TP8
Q17	F-2	TP9
Q18	F-2	TP10
Q19	E-1	TP11
Q20	F-1	TP12
Q21	E-3	TP13
Q22	D-3	TP14
Q23	D-3	TP15
Q24	E-2	TP16
Q25	E-2	TP17
Q26	C-3	TP18
Q27	C-3	TP19
Q28	C-3	
Q29	C-3	
Q30	C-3	
Q31	C-3	
Q32	C-3	
Q33	B-3	
Q34	B-3	
Q35	C-2	
Q36	B-2	
Q37	C-2	
Q38	B-2	
Q39	B-2	
Q40	B-2	
Q41	C-2	
Q42	A-1	
Q43	A-1	
Q44	A-1	
Q45	B-1	
Q46	A-3	
Q47	A-3	
Q48	A-3	
Q49	A-3	
Q50	A-3	
Q51	A-4	
Q52	A-3	
Q53	B-4	
Q54	A-4	
Q55	A-2	
Q56	A-2	
Q57	F-3	
Q58	F-2	
Q59	C-3	



11-87(b)

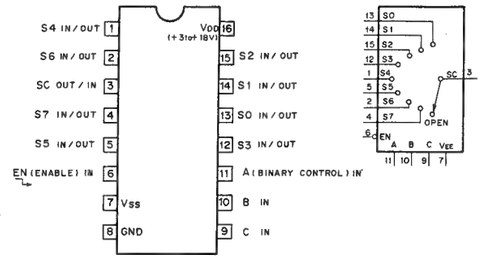
11-88(b)



CN1	D - 1	Q60	B - 3	D1	F - 3
CN2	F - 3	Q61	G - 3	D2	F - 3
CN3	E - 2	Q62	G - 2	D3	G - 3
		Q63	F - 2	D4	F - 3
		Q64	G - 2	D5	F - 2
		Q65	C - 3	D6	F - 2
		Q66	C - 2	D7	C - 3
		Q67	C - 3	D8	C - 3
		Q68	C - 2	D9	C - 3
		Q69	B - 2	D10	C - 3
		Q70	A - 1	D11	C - 3
		Q71	A - 3	D12	B - 2
		Q72	B - 3	D13	A - 3
		Q73	B - 4	D14	C - 2
		Q74	A - 4	D15	E - 3
IC1	G - 2	RV1			
IC2	D - 2	RV2	G - 2		
IC3	A - 2	RV3	H - 1		
		RV4			
Q1	G - 1	RV5	H - 1		
Q2	G - 1	RV6	F - 1		
Q3	G - 1	RV7	F - 1		
Q4	G - 2	RV8	D - 3		
Q5	G - 2	RV9	D - 2		
Q6	G - 3	RV10	D - 3		
Q7	G - 3	RV11	D - 2		
Q8	F - 3	RV12	D - 2		
Q9	F - 3	RV13			
Q10	F - 2	RV14		TP1	G - 1
Q11	F - 3	RV15	A - 3	TP3	F - 2
Q12	F - 2	RV16	D - 3	TP4	E - 2
Q13	F - 3			TP5	F - 1
Q14	E - 3			TP6	G - 1
Q15	F - 2			TP7	E - 3
Q16	E - 2			TP8	A - 2
Q17	F - 2			TP9	C - 3
Q18	F - 2			TP10	B - 4
Q19	E - 1			TP11	E - 3
Q20	F - 1			TP12	B - 2
Q21	E - 3			TP13	A - 1
Q22	D - 3			TP14	B - 3
Q23	D - 3			TP15	A - 3
Q24	E - 2			TP16	A - 2
Q25	E - 2			TP17	A - 4
Q26	C - 3			TP18	A - 2
Q27	C - 3			TP19	B - 1
Q28	C - 3				
Q29	C - 3				
Q30	C - 3				
Q31	C - 3				
Q32	C - 3				
Q33	B - 3				
Q34	B - 3				
Q35	C - 2				
Q36	B - 2				
Q37	C - 2				
Q38	B - 2				
Q39	B - 2				
Q40	B - 2				
Q41	C - 2				
Q42	A - 1				
Q43	A - 1				
Q44	A - 1				
Q45	B - 1				
Q46	A - 3				
Q47	A - 3				
Q48	A - 3				
Q49	A - 3				
Q50	A - 3				
Q51	A - 4				
Q52	A - 3				
Q53	B - 4				
Q54	A - 4				
Q55	A - 2				
Q56	A - 2				
Q57	F - 3				
Q58	F - 2				
Q59	C - 3				

WP-12 BOARD-12
—SOLDERING SIDE—
SEG-2000A
SEG-2000AP
SEG-2000APM

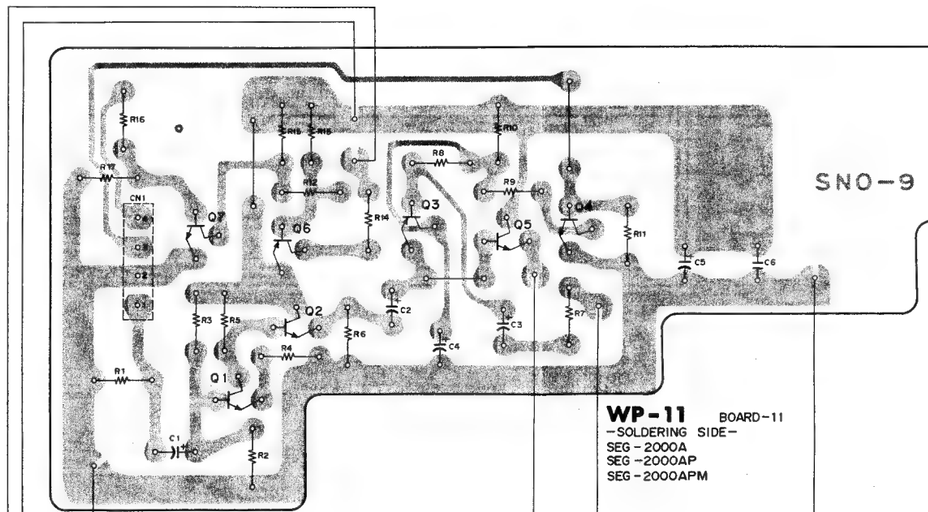
TC4051BP (TOSHIBA)
C-MOS 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —



EN	C	B	A	"ON" CHANNEL
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	X	X	X	OPEN

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

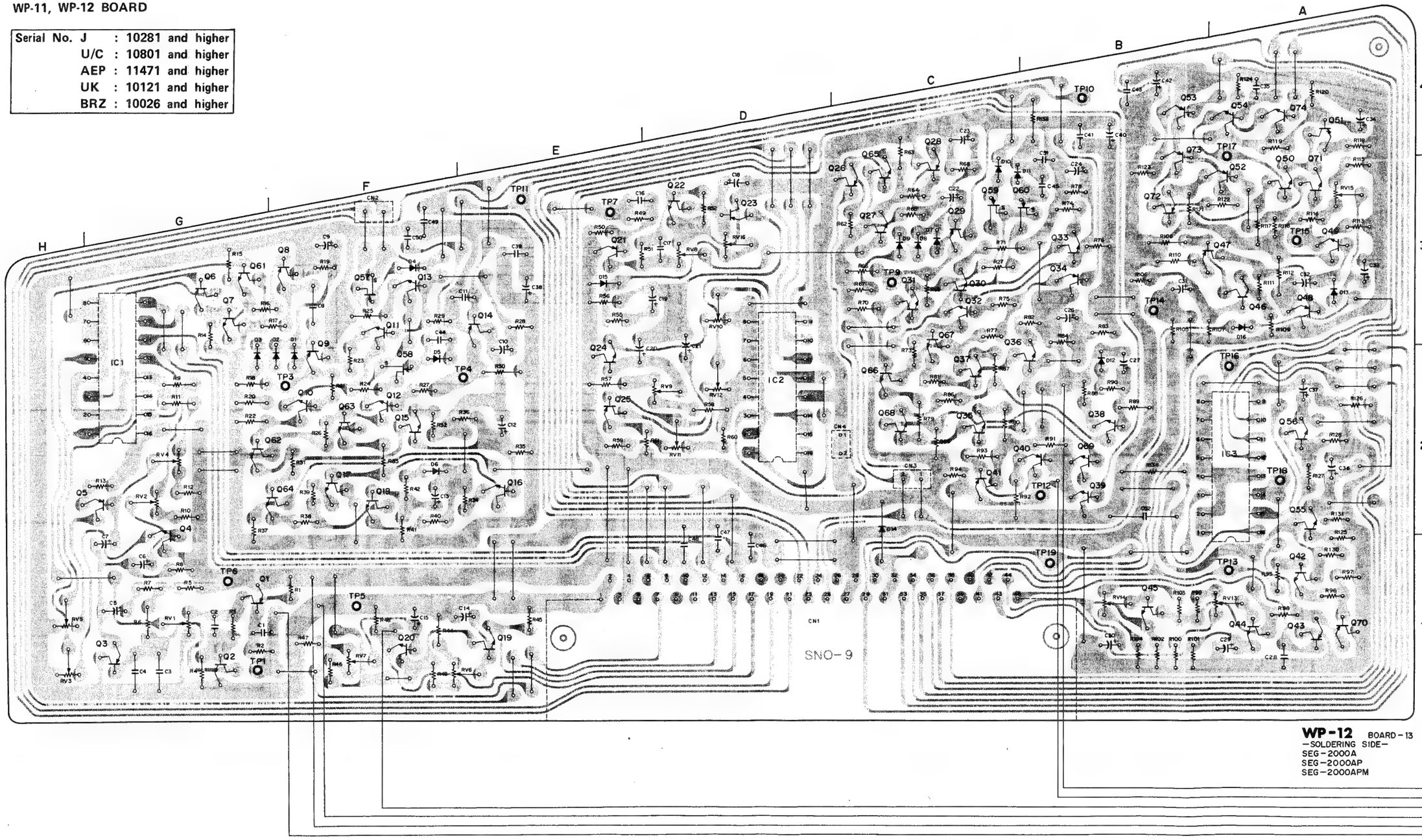
Serial No.	J	: Up to 10280
	U/C	: Up to 10800
	AEP	: Up to 11470
	UK	: Up to 10120
	BRZ	: Up to 10025



WP-11 BOARD-11
—SOLDERING SIDE—
SEG-2000A
SEG-2000AP
SEG-2000APM

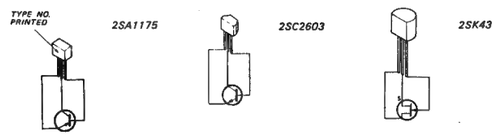
WP-11, WP-12 BOARD

Serial No. J	:	10281 and higher
U/C	:	10801 and higher
AEP	:	11471 and higher
UK	:	10121 and higher
BRZ	:	10026 and higher



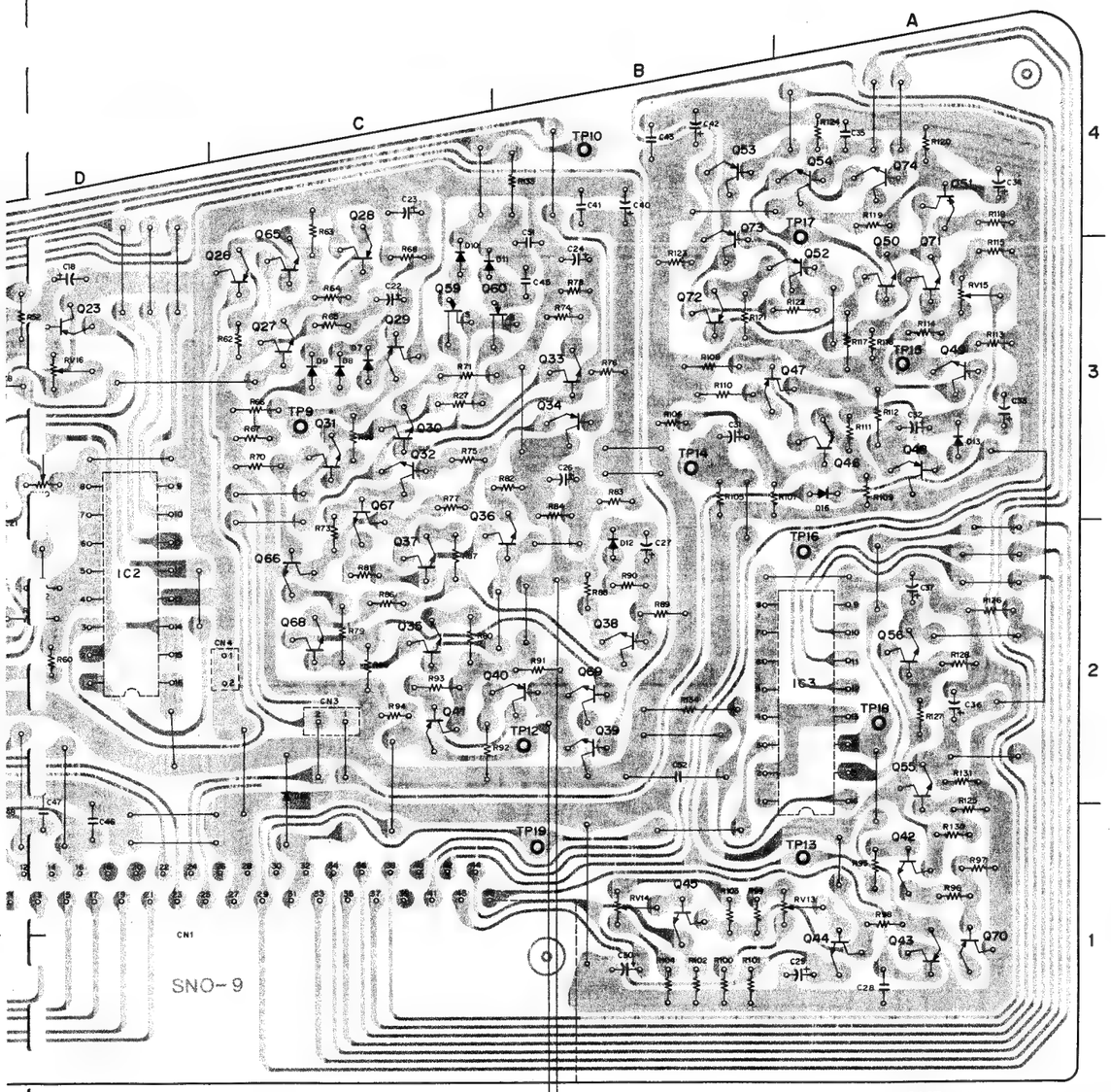
WP-12 BOARD-13
—SOLDERING SIDE—
SEG-2000A
SEG-2000AP
SEG-2000APM

CN1	D-1	Q60	B-3	TP1	G-1	D1	F-3
CN2	F-3	Q61	G-3	TP3	F-2	D2	F-3
CN3	C-2	Q62	G-2	TP4	E-2	D3	G-3
		Q63	F-2	TP5	F-1	D4	F-3
		Q64	G-2	TP6	G-1	D5	F-2
		Q65	C-3	TP7	E-3	D6	F-2
		Q66	C-2	TP8	A-2	D7	C-3
		Q67	C-3	TP9	C-3	D8	C-3
		Q68	C-2	TP10	B-4	D9	C-3
		Q69	B-2	TP11	E-3	D10	C-3
		Q70	A-1	TP12	B-2	D11	C-3
		Q71	A-3	TP13	A-1	D12	B-2
		Q72	B-3	TP14	B-3	D13	A-3
		Q73	B-4	TP15	A-3	D14	C-2
		Q74	A-4	TP16	A-2	D15	E-3
				TP17	A-4	D16	A-3
		RV1		TP18	A-2		
IC1	G-2	RV2	G-2	TP19	B-1		
IC2	D-2	RV3	H-1				
IC3	A-2	RV4					
		RV5	H-1				
Q1	G-1	RV6	F-1				
Q2	G-1	RV7	F-1				
Q3	G-1	RV8	D-3				
Q4	G-2	RV9	D-2				
Q5	G-2	RV10	D-3				
Q6	G-3	RV11	D-2				
Q7	G-3	RV12	D-2				
Q8	F-3	RV13					
Q9	F-3	RV14					
Q10	F-2	RV15	A-3				
Q11	F-3	RV16	D-3				
Q12	F-2						
Q13	F-3						
Q14	E-3						
Q15	F-2						
Q16	E-2						
Q17	F-2						
Q18	F-2						
Q19	E-1						
Q20	F-1						
Q21	E-3						
Q22	D-3						
Q23	D-3						
Q24	E-2						
Q25	E-2						
Q26	C-3						
Q27	C-3						
Q28	C-3						
Q29	C-3						
Q30	C-3						
Q31	C-3						
Q32	C-3						
Q33	B-3						
Q34	B-3						
Q35	C-2						
Q36	B-2						
Q37	C-2						
Q38	B-2						
Q39	B-2						
Q40	B-2						
Q41	C-2						
Q42	A-1						
Q43	A-1						
Q44	A-1						
Q45	B-1						
Q46	A-3						
Q47	A-3						
Q48	A-3						
Q49	A-3						
Q50	A-3						
Q51	A-4						
Q52	A-3						
Q53	B-4						
Q54	A-4						
Q55	A-2						
Q56	A-2						
Q57	F-3						
Q58	F-2						
Q59	C-3						



11-87(c)

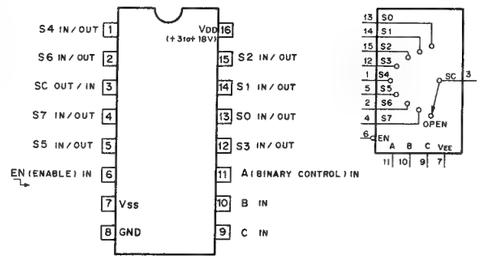
11-88(c)



WP-12 BOARD-13
-SOLDERING SIDE-
SEG-2000A
SEG-2000AP
SEG-2000APM

CN1	D-1	Q60	B-3
CN2	F-3	Q61	G-3
CN3	C-2	Q62	G-2
		Q63	F-2
D1	F-3	Q64	G-2
D2	F-3	Q65	C-3
D3	G-3	Q66	C-2
D4	F-3	Q67	C-3
D5	F-2	Q68	C-2
D6	F-2	Q69	B-2
D7	C-3	Q70	A-1
D8	C-3	Q71	A-3
D9	C-3	Q72	B-3
D10	C-3	Q73	B-4
D11	C-3	Q74	A-4
D12	B-2		
D13	A-3	RV1	
D14	C-2	RV2	G-2
D15	E-3	RV3	H-1
D16	A-3	RV4	
		RV5	H-1
IC1	G-2	RV6	F-1
IC2	D-2	RV7	F-1
IC3	A-2	RV8	D-3
		RV9	D-2
Q1	G-1	RV10	D-3
Q2	G-1	RV11	D-2
Q3	G-1	RV12	D-2
Q4	G-2	RV13	
Q5	G-2	RV14	
Q6	G-3	RV15	A-3
Q7	G-3	RV16	D-3
Q8	F-3		
Q9	F-3	TP1	G-1
Q10	F-2	TP3	F-2
Q11	F-3	TP4	E-2
Q12	F-2	TP5	F-1
Q13	F-3	TP6	G-1
Q14	E-3	TP7	E-3
Q15	F-2	TP8	A-2
Q16	E-2	TP9	C-3
Q17	F-2	TP10	B-4
Q18	F-2	TP11	E-3
Q19	E-1	TP12	B-2
Q20	F-1	TP13	A-1
Q21	E-3	TP14	B-3
Q22	D-3	TP15	A-3
Q23	D-3	TP16	A-2
Q25	E-2	TP17	A-4
Q26	C-3	TP18	A-2
Q27	C-3	TP19	B-1
Q28	C-3		
Q29	C-3		
Q30	C-3		
Q31	C-3		
Q32	C-3		
Q33	B-3		
Q34	B-3		
Q35	C-2		
Q36	B-2		
Q37	C-2		
Q38	B-2		
Q39	B-2		
Q40	B-2		
Q41	C-2		
Q42	A-1		
Q43	A-1		
Q44	A-1		
Q45	B-1		
Q46	A-3		
Q47	A-3		
Q48	A-3		
Q49	A-3		
Q50	A-3		
Q51	A-4		
Q52	A-3		
Q53	B-4		
Q54	A-4		
Q55	A-2		
Q56	A-2		
Q57	F-3		
Q58	F-2		
Q59	C-3		

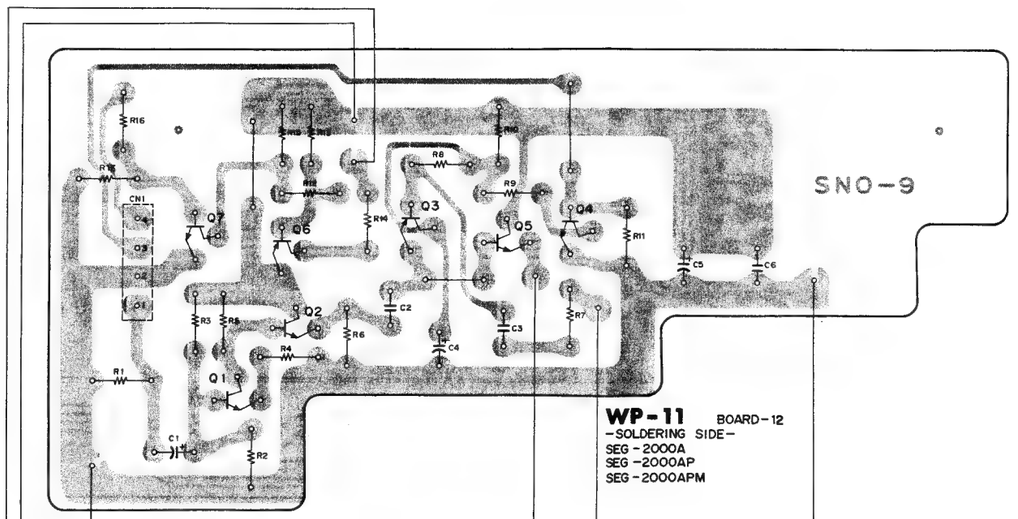
TC4051BP (TOSHIBA)
C-MOS 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —



EN	C	B	A	"ON" CHANNEL
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	X	X	X	OPEN

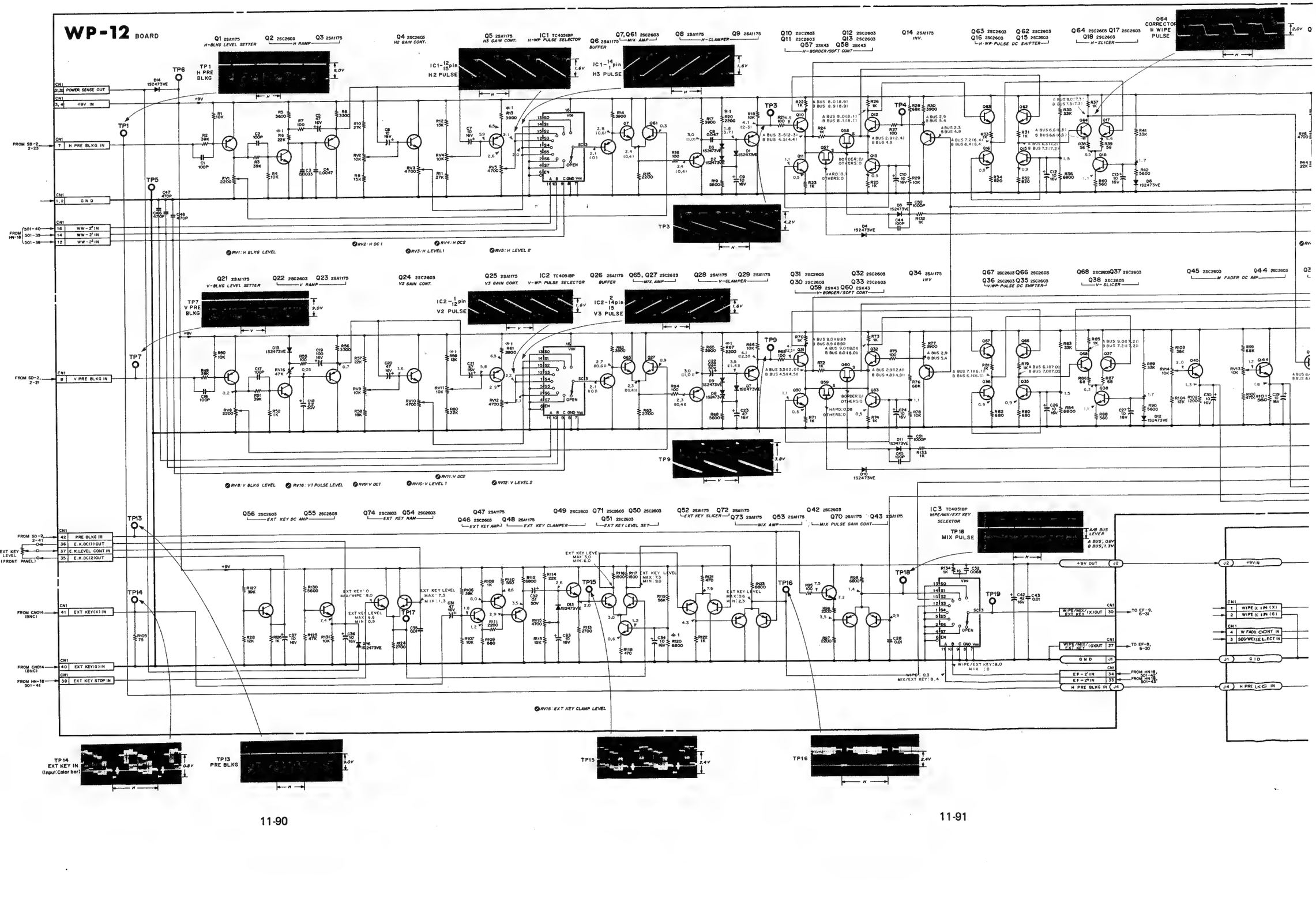
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

Serial No.	J	: 10281 and higher
	U/C	: 10801 and higher
	AEP	: 11471 and higher
	UK	: 10121 and higher
	BRZ	: 10026 and higher



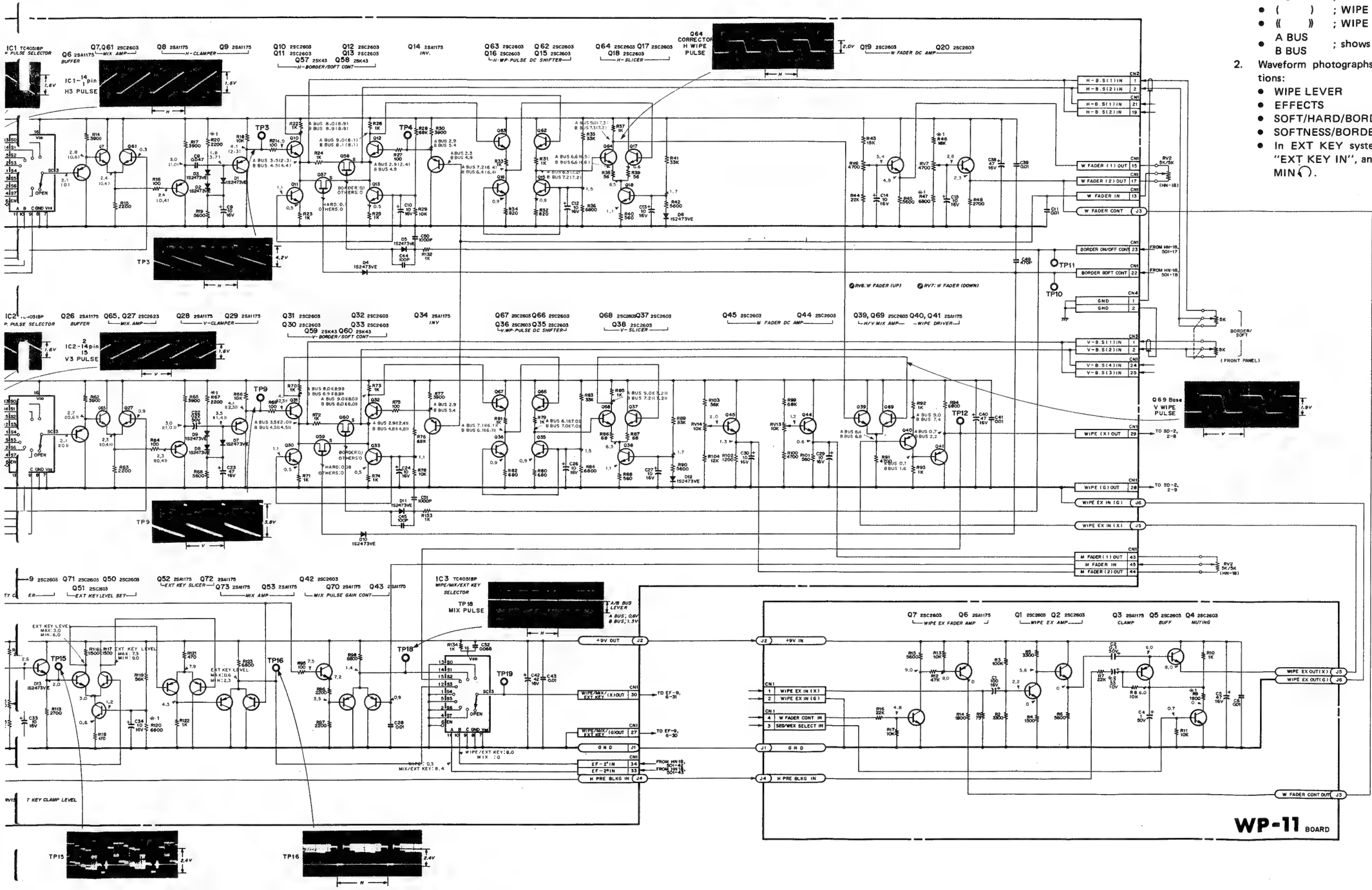
WP-11 BOARD-12
-SOLDERING SIDE-
SEG-2000A
SEG-2000AP
SEG-2000APM

WP-11, WP-12 BOARD (WIPE SYSTEM)



NOTE:

1. All voltage are mesaured with a digital voltmeter (input impedance 10MΩ) and taken under the following conditions;
   - NO MARK ; WIPE "OTHERS" SELECT
   - ( ) ; WIPE
   - (( )) ; WIPE
   - A BUS / B BUS ; shows the position of the wipe lever.
2. Waveform photographs are taken under the following conditions:
   - WIPE LEVER ; CENTER
   - EFFECTS ; WIPE
   - SOFT/HARD/BORDER ; BORDER
   - SOFTNESS/BORDER ; MAX
   - In EXT KEY system, input color bar signal (1 Vp-p) to "EXT KEY IN", and turn "EXT KEY LEVEL" control to MIN.



(For WP-12 Board)

NOTE

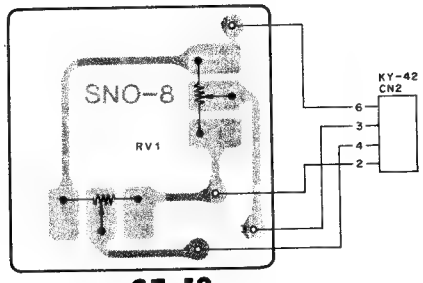
MARK	CHANGE INFORMATION	SERIAL NO.
※1	R13,R61 4300 → 3900	(J) 10411~
		(U/C) 11121~
		(AEP) 12421~
	R47,R120 8200 → 6800	(UK) 10161~
		(BRZ) 10046~
	R46 22K → 18K	
※2	R6 24K → 22K	(J) 10441~
		(U/C) 11261~
		(AEP) 12821~
	R20,67 2K → 2200	(UK) 10191~
		(BRZ) 10046~
	R38 13K → 12K	

(For WP-11 Board)

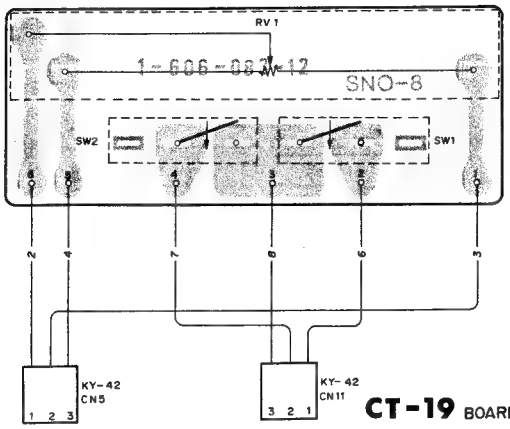
NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
※1	R9 2K → 1800	(J) 10441~
		(U/C) 11261~
		(AEP) 12821~
		(UK) 10191~
		(BRZ) 10046~

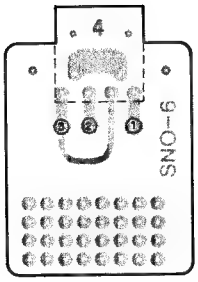
CT-18 BOARD
CT-19 BOARD
JK-7 BOARD
LP-12 BOARD



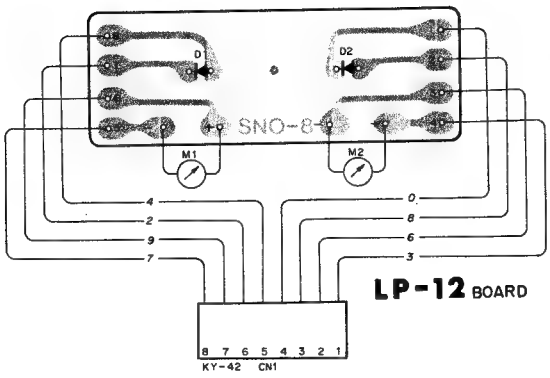
CT-18 BOARD



CT-19 BOARD



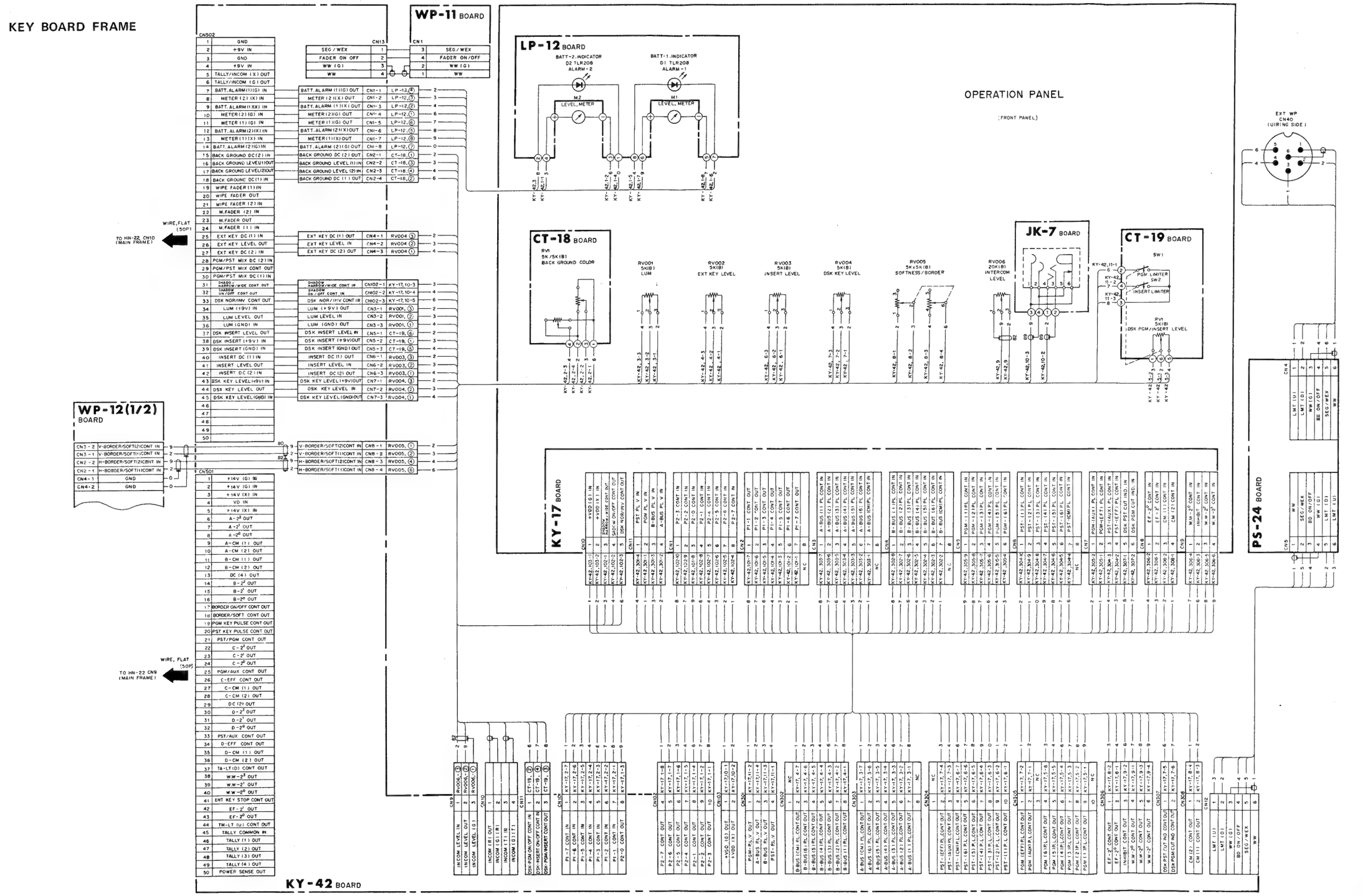
JK-7 BOARD-11
– SOLDERING SIDE –
SEG-2000A
SEG-2000AP
SEG-2000APM



LP-12 BOARD

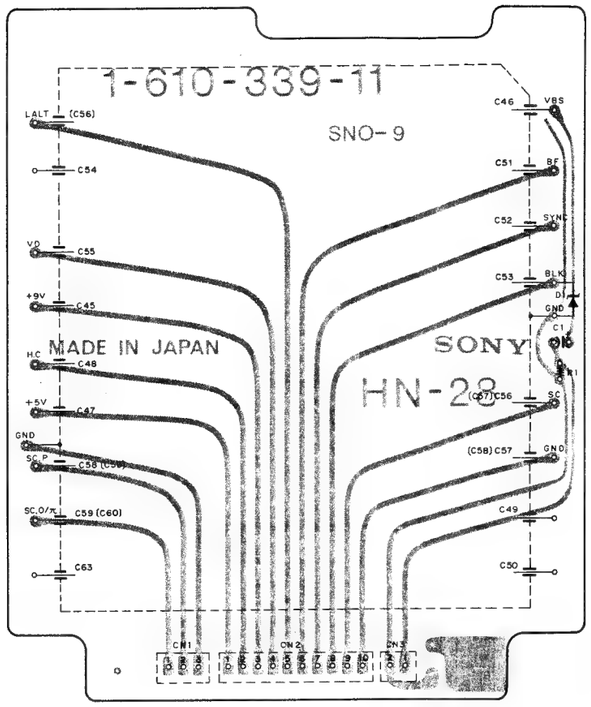
KEY BOARD FRAME CT-18, CT-19, JK-7, LP-12

KEY BOARD FRAME



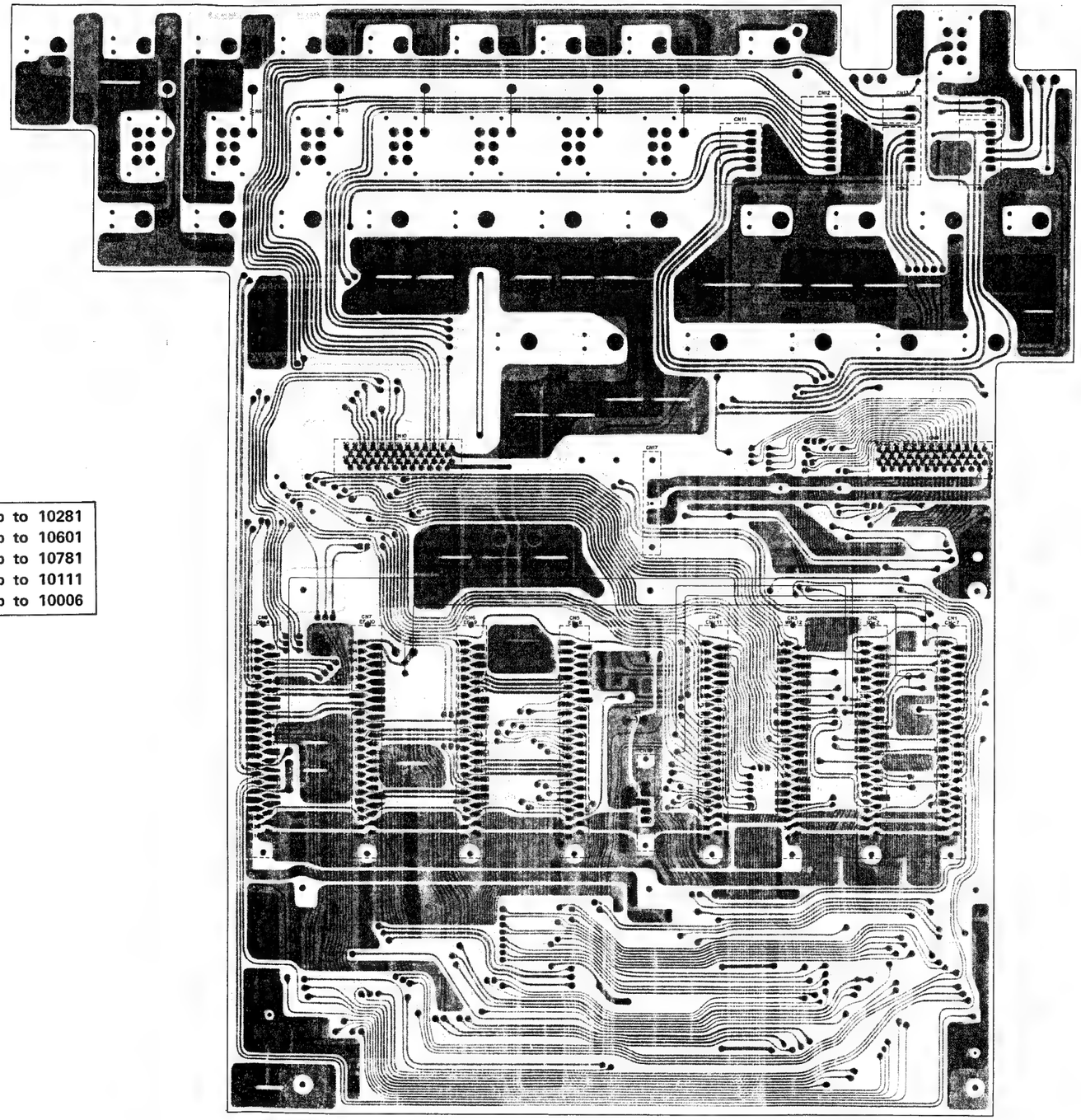
MAIN FRAME HN-22, HN-28

HN-22 BOARD
HN-28 BOARD



HN-28 BOARD-11
– SOLDERING SIDE –
SEG-2000A

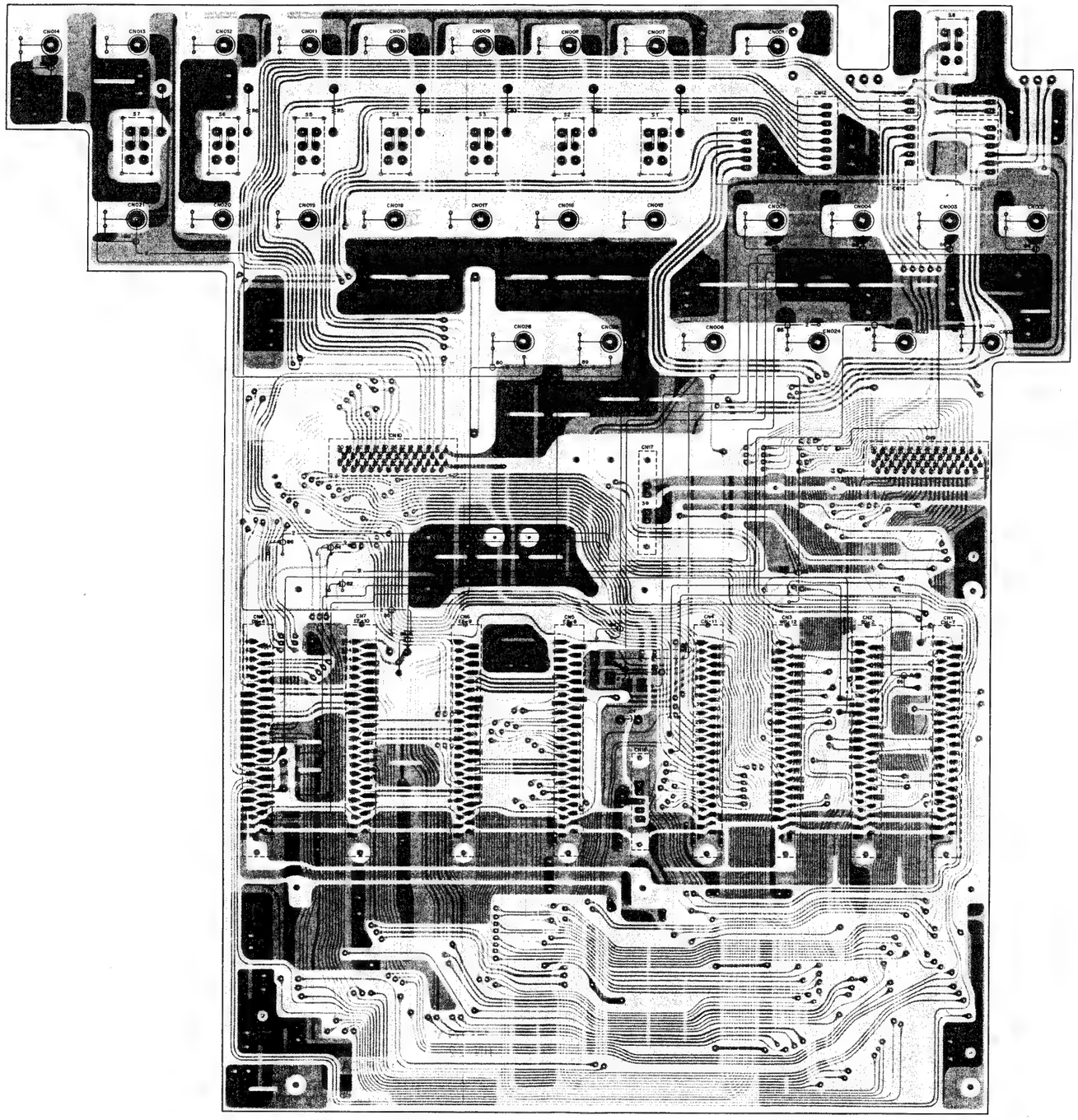
Serial No.		
J	: Up to	10281
U/C	: Up to	10601
AEP	: Up to	10781
UK	: Up to	10111
BRZ	: Up to	10006



HN-22 BOARD-11,12
– SOLDERING SIDE –
SEG-2000A
SEG-2000AP
SEG-2000APM

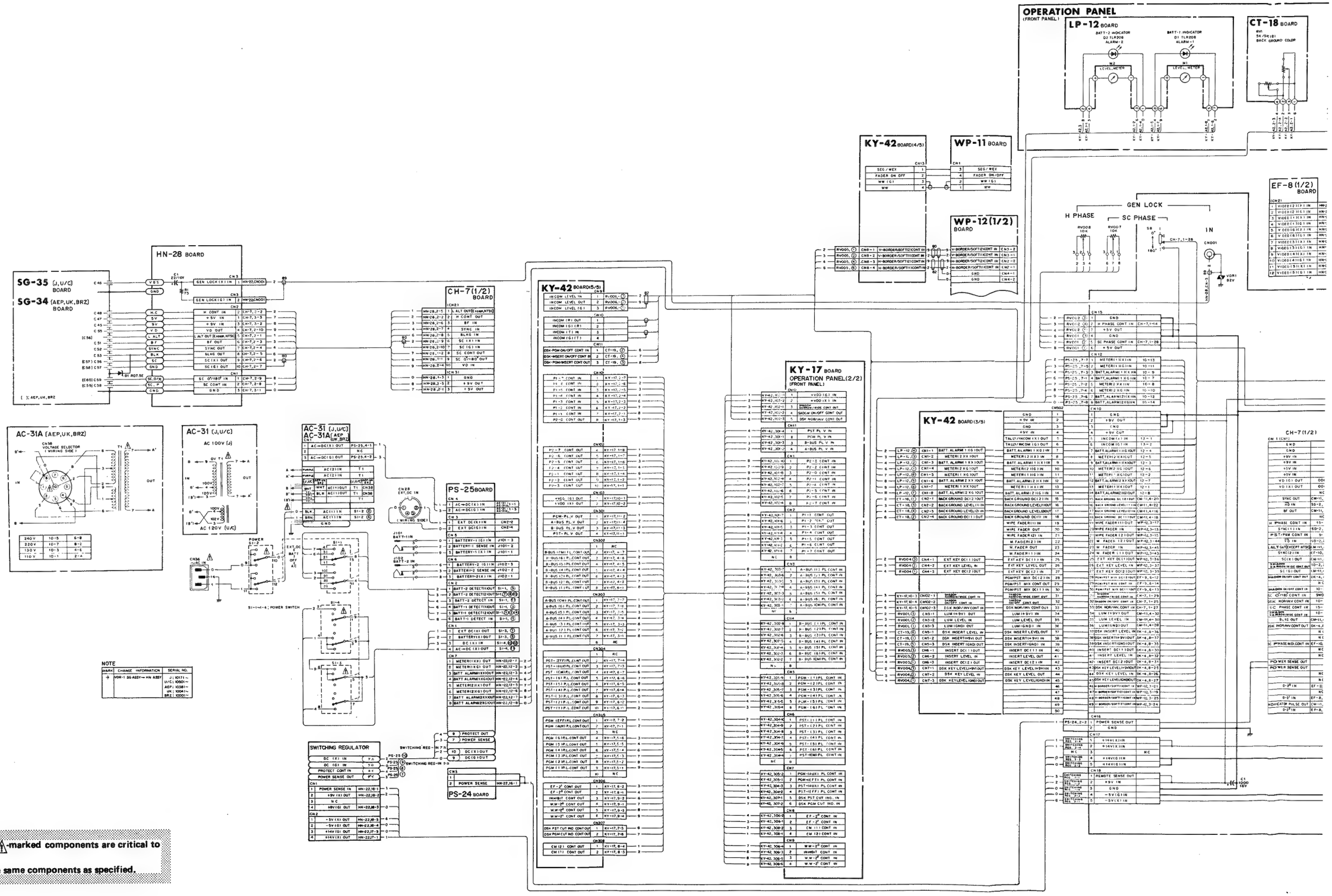
HN-22 BOARD

Serial No.	J	: 10281 and higher
	U/C	: 10601 and higher
	AEP	: 10781 and higher
	UK	: 10111 and higher
	BRZ	: 10006 and higher



HN-22 BOARD-13
– SOLDERING SIDE –
SEG-2000A
SEG-2000AP
SEG-2000APM

MAIN FRAME


OPERATION PANEL
(FRONT PANEL)
LP-12 BOARD
CT-18 BOARD
KY-42 BOARD(4/5)
WP-11 BOARD
WP-12(1/2) BOARD
EF-8(1/2) BOARD
GEN LOCK
H PHASE
SC PHASE
IN
HN-28 BOARD
SG-35 (J,U/C) BOARD
SG-34 (AEP,UK,BRZ) BOARD
CH-7(1/2) BOARD
KY-42 BOARD(5/5)
KY-17 BOARD
OPERATION PANEL(2/2)
(FRONT PANEL)
KY-42 BOARD(3/5)
AC-31A (AEP,UK,BRZ)
AC-31 (J,U/C)
AC-31 (J,U/C)
AC-31A(AEP UK,BRZ)
PS-25 BOARD
PS-24 BOARD
SWITCHING REGULATOR
POWER SW
NOTE
NOTE:
The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.

CT-18 BOARD

JK-7 BOARD

CT-19 BOARD

EF-8(1/2) BOARD

HN-22 BOARD
SERIAL NO. 10261 AND HIGHER (USA/CND)
SERIAL NO. 10171 AND HIGHER (AEP)
SERIAL NO. 10021 AND HIGHER (UK)
SERIAL NO. 10001 AND HIGHER (BRZ)
SERIAL NO. 10061 AND HIGHER (J)

BLACK BURST OUT

PGM OUT

PST OUT

VD OUT

VIDEO IN (BNC)

AUX

EXT KEY

B/W CAMERA

TALLY/INTERCOM

PS-24 BOARD

KY-42 BOARD (2/3)

KY-42 BOARD (1/3)

CH-7(1/2)

SD-2

WP-12(1/2)

CM-11A(J,U/C)
CM-11(AEP,UK,BRZ)

EF-8(1/2)

EF-9

EF-10

DK-4

SECTION 12
SPARE PARTS AND JIG

12-1. PARTS INFORMATION

1. **Safety Related Component Warning**

   Components identified by shading on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose part numbers appear as shown in this manual or in service bulletins and service manual supplements published by Sony.

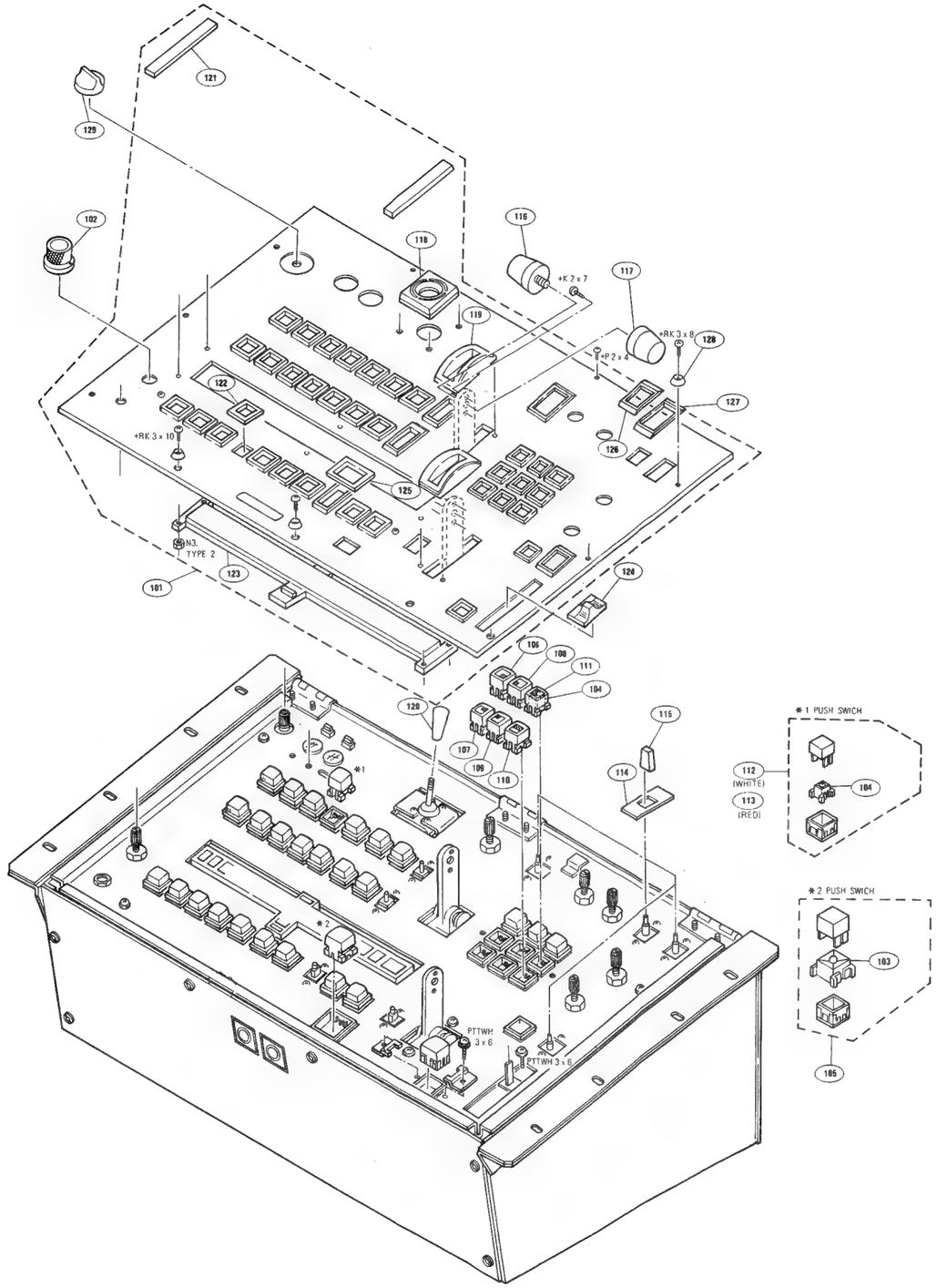
2. Replace Parts that are supplied from Sony Parts Center can sometimes have different shape and external appearance than what are actually used in equipment. This is due to **"accomodating the improved parts and/or engineering changes"** or **"standardization of genuine parts"**.

   - This manual's exploded views and electrical spare parts list are indicating the parts numbers of "the standardized genuine parts at present".
   - Regarding engineering parts changes in our engineering department, refer Sony service bulletins and service manual supplements.

3. **Printed Components in Bold-Face type** on the exploded views and electrical spare parts list are normally stocked for replacement purposes. The remaining parts are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

4. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

12-2. EXPLODED VIEW
Control Panel Block

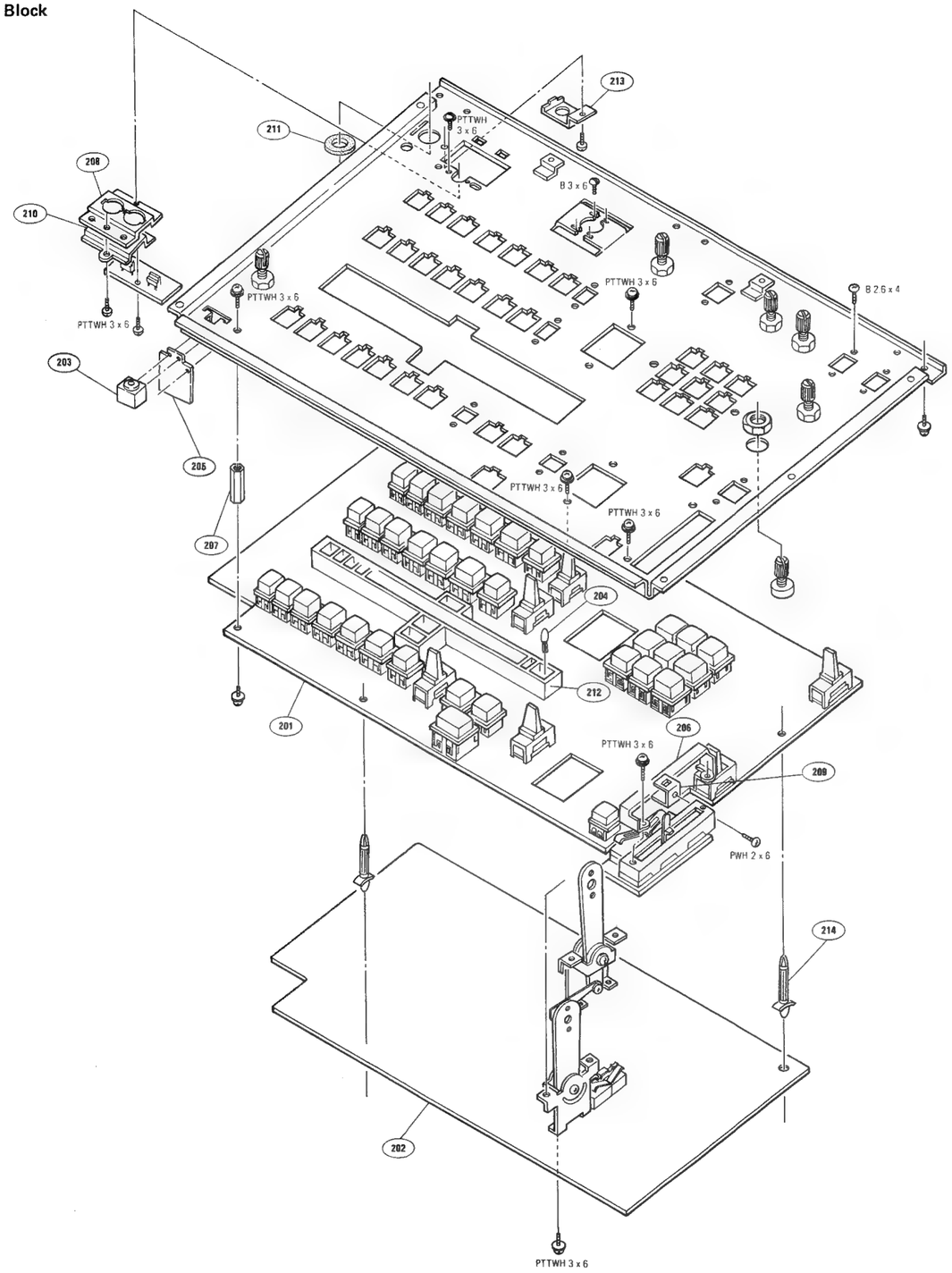


No.	Parts No.	Description
101	A-7605-048-A	PANEL ASSY, CONTROL
102	**X-3651-342-0**	**KNOB ASSY, CONTROL**
103	**1-518-450-21**	**PILOT LAMP**
104	**1-518-480-00**	**PILOT LAMP**
105	**1-553-551-51**	**SWITCH, PUSH**
	3-706-481-12	**KEYTOP**
106	**1-553-939-11**	**SWITCH, PUSH**
	3-706-584-11	**KEYTOP**
107	**1-553-939-21**	**SWITCH, PUSH**
	3-706-584-01	**KEYTOP**
108	**1-553-939-31**	**SWITCH, PUSH**
	3-706-584-11	**KEYTOP**
109	**1-553-939-41**	**SWITCH, PUSH**
	3-706-584-01	**KEYTOP**
110	**1-553-939-91**	**SWITCH, PUSH**
	3-706-584-31	**KEYTOP**
111	**1-554-074-00**	**SWITCH, PUSH**
	3-706-584-21	**KEYTOP**
112	**1-553-939-71**	**SWITCH, PUSH**
	3-706-480-01	**KEYTOP (WHITH)**
113	**1-553-939-81**	**SWITCH, PUSH**
	3-706-480-12	**KEYTOP (RED)**
114	2-249-363-00	PLATE, LEVER SWITCH
115	**2-252-620-00**	**KNOB, LEVER SWITCH**
116	**2-254-705-00**	**KNOB, (6) LEVER**
117	**2-254-708-00**	**KNOB, (5) LEVER**
118	2-254-713-00	COVER, JOYSTICK
119	2-254-758-00	COVER, WIPE LEVER
120	**2-296-508-00**	**KNOB, JOYSTICK**
121	2-296-528-00	FRAME, ORNAMENTAL
122	2-296-534-00	ESCUTCHEON
123	2-296-535-00	PLATE, INDICATION
124	**3-536-814-00**	**KNOB, SLIDE CONTROL**
125	3-668-011-00	ESCUTCHEON (17), BUTTON
126	3-668-016-00	FRAME (SMALL), ORNAMENTAL
127	3-668-018-00	FRAME (MIDOLE), ORNAMENTAL
128	**3-703-224-00**	**WASHER (3 DIA), ORNAMENTAL**
129	**4-858-419-11**	**KNOB SELECTOR**

NOTE:

1. **The shaded and ⚠-marked components are critical to safety.**
   Replace only with same component as specified.
2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
3. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

Control System Printed Circuit Boards Block

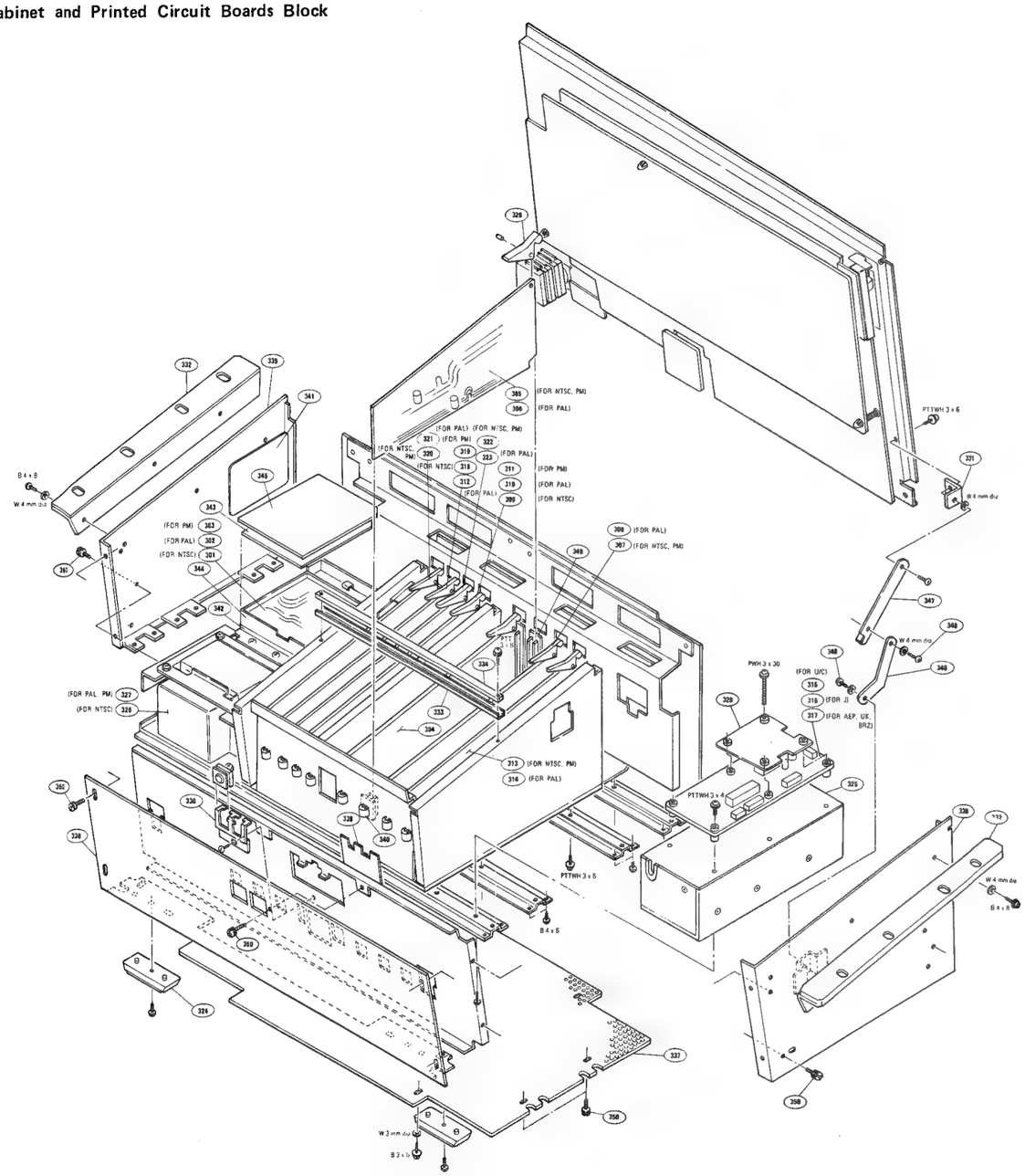


No.	Parts No.	Description
201	A-7511-750-A	MOUNTED CIRCUIT BOARD "KY-17"
202	A-7511-987-A	MOUNTED CIRCUIT BOARD "KY-42"
203	**1-507-883-00**	**JACK, SMALL TYPE, 4P**
204	**1-518-361-00**	**LAMP**
205	1-610-337-00	PRINTED CIRCUIT BOARD "JK-7"
206	2-296-522-00	BRACEKT, CONTROL, SLIDE
207	2-296-523-00	STUDE (1), PCB
208	2-296-525-00	RETAINER, METER
209	2-296-526-00	PLATE, FUNCTION SWITCH
210	2-296-527-00	HOLDER, LED
211	2-296-533-00	CUSHION, KNOB
212	2-296-537-00	HOLDER, LAMP
213	3-664-227-00	ESCUTCHEON, CONTROL
214	3-703-353-07	SUPPORT, BOARD

NOTE:

1. **The shaded and ⚠-marked components are critical to safety.**
   Replace only with same component as specified.
2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
3. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

Cabinet and Printed Circuit Boards Block



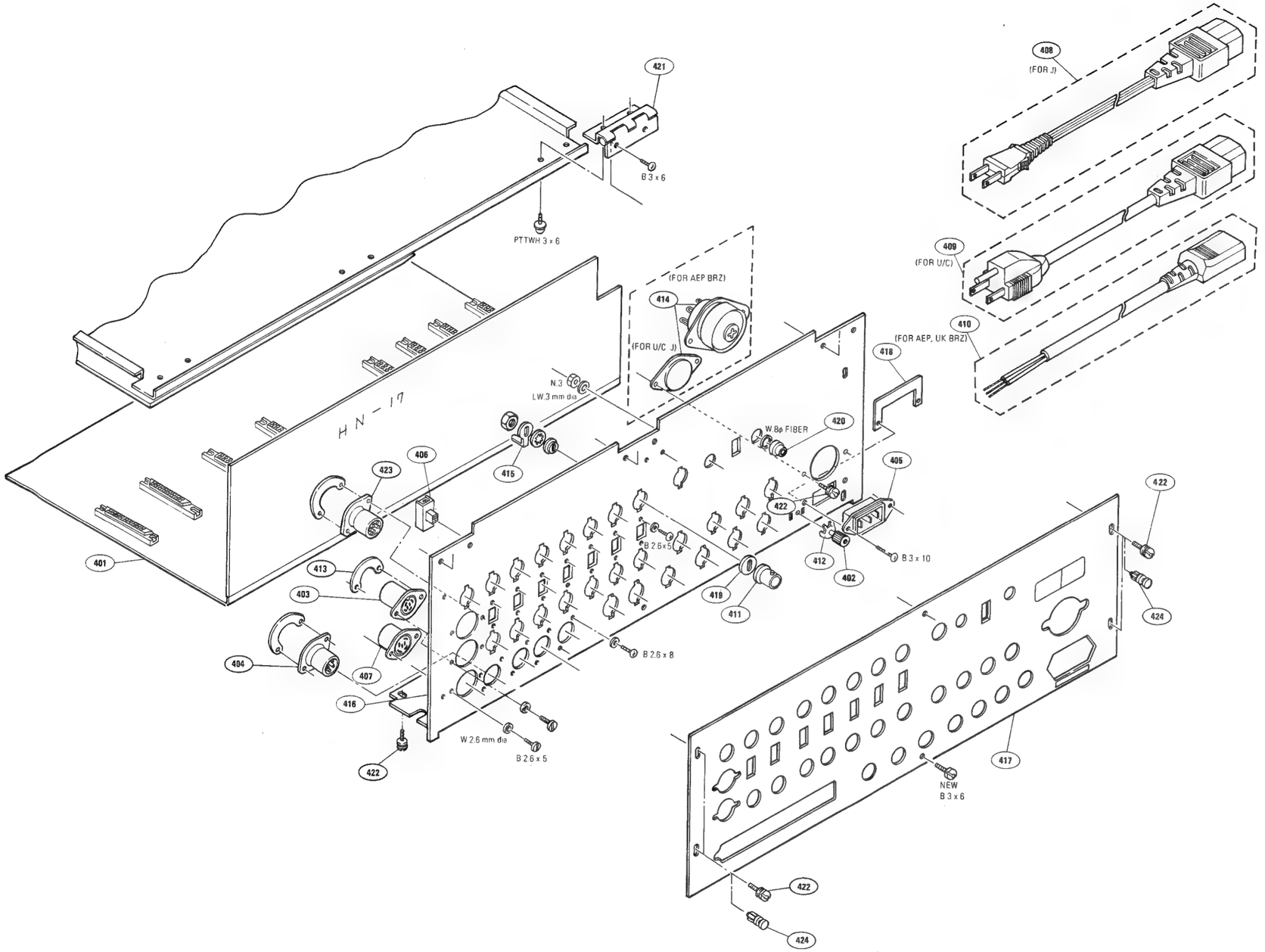
No.	Parts No.	Description
337	2-296-546-00	PLATE, BOTTOM
338	2-296-552-00	PANEL, FRONT
339	2-296-554-00	INSULATOR
340	3-642-310-00	HOLDER, CIRCUIT BOARD
341	3-664-236-00	INSULATOR REG
342	3-664-242-00	LID, LOWER, SG SHIELD
343	3-664-243-00	LID, UPPER, SG SHIELD
344	3-664-244-00	CASE, SHIELDE, SG
345	3-664-245-00	INSULATOR
346	3-670-521-00	ARM (A)
347	3-670-522-00	ARM (B)
348	**4-835-134-00**	**SCREW, TD 3.8x2.5**
349	4-836-132-00	SUPPORT, CIRCUIT BOARD
350	2-282-129-01	SCREW, BW3x6

NOTE:

1. **The shaded and ⚠-marked components are critical to safety.**
   Replace only with same component as specified.
2. Parts printed in **Bold-Face** type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
3. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

No.	Parts No.	Description
301	A-7511-518-A	MOUNTED CIRCUIT BOARD "SG-35" (FOR NTSC)
302	A-7511-520-A	MOUNTED CIRCUIT BOARD "SG-34" (FOR PAL)
303	A-7511-652-A	MOUNTED CIRCUIT BOARD "SG-34" (FOR PM)
304	A-7511-729-A	MOUNTED CIRCUIT BOARD "EF-8"
305	A-7511-730-A	MOUNTED CIRCUIT BOARD "EF-9" (FOR NTSC, PM)
306	A-7511-731-A	MOUNTED CIRCUIT BOARD "EF-9" (FOR PAL)
307	A-7511-732-A	MOUNTED CIRCUIT BOARD "EF-10" (FOR NTSC, PM)
308	A-7511-733-A	MOUNTED CIRCUIT BOARD "EF-10" (FOR PAL)
309	A-7511-734-A	MOUNTED CIRCUIT BOARD "CM-11" (FOR NTSC)
310	A-7511-735-A	MOUNTED CIRCUIT BOARD "CM-11" (FOR PAL)
311	A-7511-736-A	MOUNTED CIRCUIT BOARD "CM-11" (FOR PM)
312	A-7511-741-A	MOUNTED CIRCUIT BOARD "SD-2" (FOR PAL)
313	A-7511-979-A	MOUNTED CIRCUIT BOARD "DK-4" (FOR NTSC, PM)
314	A-7511-980-A	MOUNTED CIRCUIT BOARD "DK-4" (FOR PAL)
⚠315	A-7511-981-A	MOUNTED CIRCUIT BOARD "PS-25" (FOR U/C)
⚠316	A-7511-982-A	MOUNTED CIRCUIT BOARD "PS-25" (FOR J)
⚠317	A-7511-983-A	MOUNTED CIRCUIT BOARD "PS-25" (FOR AEP, UK, BRZ)
318	A-7615-092-A	SD ASSY (FOR NTSC)
319	A-7615 093-A	SD ASSY (FOR PM)
320	A-7615-094-A	CH ASSY (FOR NTSC, PM)
321	A-7615-095-A	CH ASSY (FOR PAL)
322	A-7615-131-A	WP ASSY (FOR NTSC, PM)
323	A-7615-132-A	WP ASSY (FOR PAL)
324	X-3565-417-0	LEG ASSY
325	1-413-086-22	SWITCHING REGULATOR
⚠326	**1-447-154-00**	**TRANSFORMER, POWER (FOR NTSC)**
⚠327	**1-447-155-00**	**TRANSFORMER, POWER (FOR PAL, PM)**
328	1-610-341-00	PRINTED CIRCUIT BOARD "PS-24"
329	2-251-622-00	LEVER, PC BOARD
330	2-296-507-00	HOLDER, JACK, BATTERY
331	2-296-521-00	HOLDER, STAY
332	2-296-536-00	BRACKET,RACK
333	2-296-539-00	HOLDER, PC BOARD
334	2-296-540-00	CUSHION, PC BOARD
335	2-296-544-00	PLATE (R), SIDE
336	2-296-545-00	PLATE (L), SIDE

Connector Panel Block



No.	Parts No.	Description
401	A-7511-831-A	MOUNTED CIRCUIT BOARD "HN-22"
402	**X-2068-004-0**	**TERMINAL ASSY**
403	**1-509-422-XX**	**RECEPTACLE, FEMALE "B/W CAMERA"**
404	**1-509-501-00**	**RECEPTACLE "TALLY/INTERCOM"**
⚠405	**1-509-547-00**	**AC INLET, "AC IN" (CN36)**
406	**1-516-576-00**	**SLIDE, SWITCH**
407	**1-526-531-00**	**RECEPTACLE, MALE "EXT, DC IN"**
⚠408	**1-534-754-15**	**POWER CODE (FOR J)**
⚠409	**1-551-812-00**	**POWER CODE (FOR U/C)**
⚠410	**1-556-760-11**	**POWER CODE (FOR AEP, UK, BRZ)**
411	**1-561-336-00**	**RECEPTACLE, MALE BNC**
412	**2-068-008-00**	**WAHSER**
413	**2-070-339-00**	**NUT, PLATE**
414	2-228-109-00	LID, MASKING (EXCEPT PAL, PM)
	⚠1-526-572-00	**VOLTAGE SELECTOR (FOR PAL, PM)**
415	2-286-707-00	LUG, BNC
416	2-296-541-11	PANEL, REAR (S/N NO. Up to NOTE 4)
	2-296-541-12	PANEL, REAR (S/N NO. NOTE 5 and higher)
417	2-296-549-11	PANEL, ORNAMENTAL (S/N NO. Up to NOTE 4)
	2-296-549-12	PANEL, ORNAMENTAL (S/N NO. NOTE 5 and higher)
418	3-625-620-00	BRACKET, AC CONNECTOR
419	**3-654-545-00**	**SPACER, BNC**
420	3-664-227-00	ESCUTCHEON, CONTROL
421	**4-335-902-11**	**HINGE, BRACKET**
422	**2-282-129-01**	**SCREW, BW3x6 (S/N NO. Up to NOTE 4)**
423	**1-508-055-00**	**RECEPTACLE, 6P MALE "EXT WIPE IN"**
424	**4-812-134-00**	**RIVET NYLON, 3.5 (S/N NO. NOTE 5 and higher)**

NOTE:

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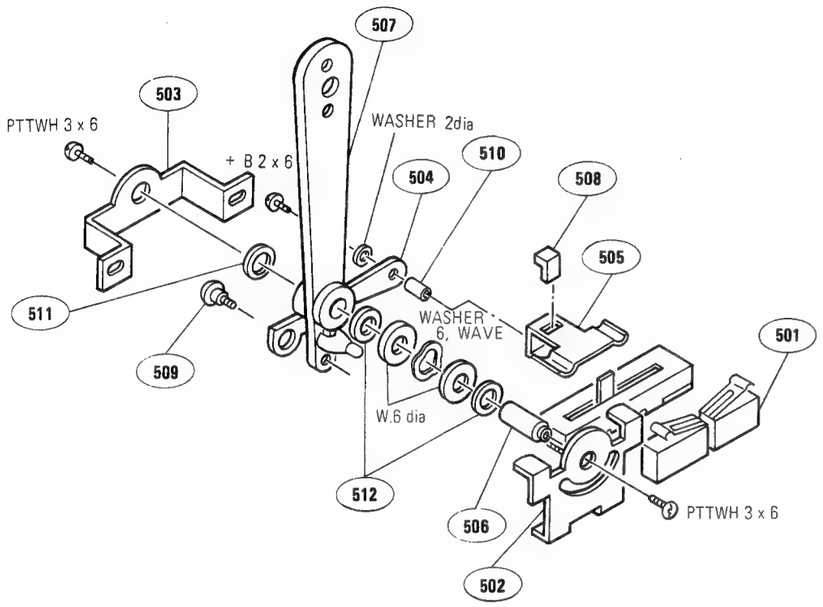
3. Item with no part number and/or no description are not stocked because they are seldom required for routine service.
4. U/C ..... S/N 10500
   P (AEP) .... S/N 10380
   P (UK) ..... S/N 10040
   PM (BRZ)... S/N 10005
5. U/C ..... S/N 10501
   P (AEP) .... S/N 10381
   P (UK) ..... S/N 10041
   PM (BRZ)... S/N 10006

Wipe Lever Block



No.	Parts No.	Description
501	**1-552-665-00**	**SWITCH, MICRO**
502	2-296-509-00	BASE, FADER
503	2-296-510-00	SUPPORT, SHAFT
504	2-296-511-00	ROD
505	2-296-512-00	PLATE, SHAFT
506	2-296-513-00	SHAFT, FADER
507	2-296-514-00	LEVER, WIPE
508	2-296-529-00	PLATW, PAD
509	3-613-164-00	SHAFT, STEP
510	3-657-841-61	SPACER, 2ϕ
511	3-701-444-11	WASHER, 6ϕ
512	3-701-444-21	WASHER, 6ϕ

NOTE:

1. **The shaded and ⚠-marked components are critical to safety.**
   Replace only with same component as specified.
2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
3. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

12-3. ELECTRICAL PARTS LIST

Parts that are not listed in the "reference numbers order list" are shown in following table.
Reference numbers are omitted.

CAPACITOR

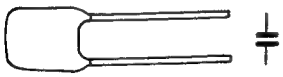
SILVERED MICA CAPACITOR

1 pF through 620 pF
±5%, 50WV

Parts No. 1-107-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1 pF	098	15 pF	065	51 pF	078	180 pF	091
2	099	16	066	56	079	200	092
3	100	18	067	62	080	220	093
4	101	20	068	68	081	240	094
5	102	22	069	75	082	270	095
6	103	24	070	82	083	300	096
7	104	27	071	91	084	330	097
8	105	30	072	100	085	360	231
9	106	33	073	110	086	390	232
10	061	36	074	120	087	430	233
11	062	39	075	130	088	470	234
12	063	43	076	150	089	510	235
13	064	47	077	160	090	560	236
						620	237

MYLAR CAPACITOR



0.00047μF through 0.22μF
±5% 50WV

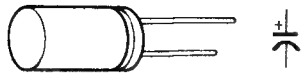
Parts No. 1-130-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
0.00047μF	467	0.0039μF	478	0.033μF	489
0.00056	468	0.0047	479	0.039	490
0.00068	469	0.0056	480	0.047	491
0.00082	470	0.0068	481	0.056	492
0.001	471	0.0082	482	0.068	493
0.0012	472	0.01	483	0.082	494
0.0015	473	0.012	484	0.1	495
0.0018	474	0.015	485	0.12	496
0.0022	475	0.018	486	0.15	497
0.0027	476	0.022	487	0.18	498
0.0033	477	0.027	488	0.22	499

C, ELECTROLYTIC

ELECTROLYTIC CAPACITOR

0.47μF through 470μF
6.3WV through 100WV



Parts No. 1-123-□□□-00

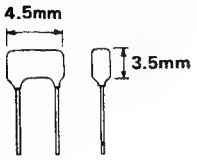
Value		Parts No. −□□□−
0.47μF	50V	379
	63	
	100	
1	50	380
	63	
	100	
2.2	50	381
	63	
	100	
3.3	50	382
	63	
	100	
4.7	25	369
	35	
	50	
	63	
	100	383
10	16	356
	25	
	35	
	50	
	63	370
	100	384
22	16	330
	25	
	35	357
	50	

Value		Parts No. −□□□−
22μF	63V	371
	100	385
33	6.3	318
	10	
	16	
	25	343
	35	
	50	372
	63	
	100	386
47	6.3	306
	10	
	16	332
	25	
	35	359
	50	
	63	373
	100	387
100	6.3	307
	10	
	16	333
	25	
	35	345
	50	360
	63	374

Value		Parts No. −□□□−
100μF	100V	388
220	6.3	308
	10	
	16	321
	25	334
	35	346
	50	361
	63	375
	100	389
330	6.3	309
	10	
	16	322
	25	335
	35	347
	50	362
	63	376
	100	390
470	6.3	298
	10	310
	16	323
	25	336
	35	348
	50	363
	63	377
	100	391

RESISTOR

METAL FILM RESISTOR



± 1%, 1/8W
10Ω through 33 kΩ

Parts No. 1-214-□□□-00

Value	Parts No. -□□□-
10Ω	509
11	510
12	511
13	512
15	513
16	514
18	515
20	516
22	517
24	518
27	519
30	520
33	521
36	522
39	523
43	524
47	525
51	526
56	527
62	528
68	529
75	530
82	531
91	532

Value	Parts No. -□□□-
100Ω	533
110	534
120	535
130	536
150	537
160	538
180	539
200	540
220	541
240	542
270	543
300	544
330	545
360	546
390	547
430	548
470	549
510	550
560	551
620	552
680	553
750	554
820	555
910	556

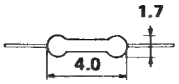
Value	Parts No. -□□□-
1.0kΩ	557
1.1	558
1.2	559
1.3	560
1.5	561
1.6	562
1.8	563
2.0	564
2.2	565
2.4	566
2.7	567
3.0	568
3.3	569
3.6	570
3.9	571
4.3	572
4.7	573
5.1	574
5.6	575
6.2	576
6.8	577
7.5	578
8.2	579
9.1	580

Value	Parts No. -□□□-
10kΩ	581
11	582
12	583
13	584
15	585
16	586
18	587
20	588
22	589
24	590
27	591
30	592
33	593

R, CARBON

CARBON RESISTOR (1/8W)

±5%, 1/8W, non-special type
2.2Ω through 1MΩ



Parts No. 1-246-□□□-00

Value	Parts No. −□□□−
1Ω	−
1.1	−
1.2	−
1.3	−
1.5	−
1.6	−
1.8	−
2	−
2.2	751
2.4	812
2.7	752
3	813
3.3	753
3.6	814
3.9	754
4.3	815
4.7	755
5.1	816
5.6	756
6.2	817
6.8	757
7.5	818
8.2	758
9.1	819
10Ω	759
11	820
12	760
13	821
15	761
16	822
18	762
20	823
22	763
24	824
27	764
30	825

Value	Parts No. −□□□−
33Ω	765
36	826
39	766
43	827
47	767
51	828
56	768
62	829
68	769
75	830
82	770
91	831
100Ω	771
110	832
120	772
130	833
150	773
160	834
180	774
200	835
220	775
240	836
270	776
300	837
330	777
360	838
390	778
430	839
470	779
510	840
560	780
620	841
680	781
750	842
820	782
910	843

Value	Parts No. −□□□−
1kΩ	783
1.1	844
1.2	784
1.3	845
1.5	785
1.6	846
1.8	786
2	847
2.2	787
2.4	848
2.7	788
3.0	849
3.3	789
3.6	850
3.9	790
4.3	851
4.7	791
5.1	852
5.6	792
6.2	853
6.8	793
7.5	854
8.2	794
9.1	855
10kΩ	795
11	856
12	796
13	857
15	797
16	858
18	798
20	859
22	799
24	860
27	800
30	861

Value	Parts No. −□□□−
33kΩ	801
36	862
39	802
43	863
47	803
51	864
56	804
62	865
68	805
75	866
82	806
91	867
100kΩ	807
110	868
120	808
130	869
150	809
160	870
180	810
200	871
220	811

Parts No. 1-247-□□□-00

Value	Parts No. −□□□−
240kΩ	054
270	046
300	055
330	047
360	056
390	048
430	057
470	049
510	058
560	050
620	059
680	051
750	060
820	052
910	061
1MΩ	053

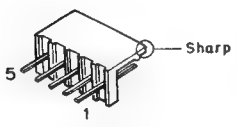
ABBREVIATION

REF. No.	DESCRIPTION	REF. No.	DESCRIPTION	REF. No.	DESCRIPTION
C	CAPACITOR	IC	IC	RV	VARIABLE RESISTOR
CN	CONNECTOR	L	INDUCTOR	RY	RELAY
CV	VARIABLE CAPACITOR	M	METER	S	SWITCH
D	DIODE	PL	LAMP	T	TRANSFORMER
DL	DELAY LINE	Q	TRANSISTOR	TH	THERMISTOR
F	FUSE	R	RESISTOR	X	OSCILATOR

All capacitors are in micro faraols unless otherwise specified.
All inductors are in micro henries unless otherwise specified.
All resistors are in ohms.

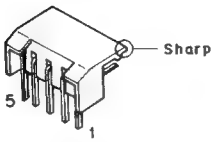
CONNECTOR

top-type receptacle



2P	1-560-356-00
3P	1-560-357-00
4P	1-560-358-00
5P	1-560-359-00
6P	1-560-360-00
8P	1-560-361-00
10P	1-560-362-00
12P	1-560-363-00

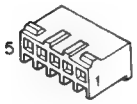
side-type receptacle



2P	1-560-364-00
3P	1-560-365-00
4P	1-560-366-00
5P	1-560-367-00
6P	1-560-368-00
8P	1-560-369-00
10P	1-560-370-00
12P	1-560-371-00

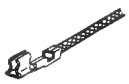
plug

housing



2P	1-561-514-00
3P	1-561-515-00
4P	1-561-516-00
5P	1-561-517-00
6P	1-561-518-00
8P	1-561-519-00
10P	1-561-520-00
12P	1-561-521-00

contact



1-560-372-00

AC-31/31A, CH-7

Ref. No.	Parts No.	Description
AC-31 BOARD (NTSC)		
AC-31A BOARD (PAL, PAL-M)		
	1-606-078-12	PRINTED CIRCUIT BOARD "AC-31" (NTSC)
	1-606-078-22	PRINTED CIRCUIT BOARD "AC-31A" (PAL, PAL-M)
	1-517-072-00	**HOLDER, FUSE (NTSC)**
	1-533-131-00	**HOLDER, FUSE (PAL, PAL-M)**
	⚠1-535-173-00	**TERMINAL, INSERT**
C1	**1-108-389-00**	**MYLAR 0.1 10% 100V**
C2	**1-108-389-00**	**MYLAR 0.1 10% 100V**
C3	**1-108-389-00**	**MYLAR 0.1 10% 100V**
C4	**1-108-389-00**	**MYLAR 0.1 10% 100V**
C5	**1-108-389-00**	**MYLAR 0.1 10% 100V**
⚠C6	**1-130-238-00**	**MYLAR 0.22 20% 125V (NTSC)**
⚠C6	**1-130-160-00**	**MYLAR 0.22 20% 250V (PAL, PAL-M)**
C7	**1-125-275-00**	**ELECT (BLOCK) 10000 99% 35V**
CN1	1-508-902-00	RECEPTACLE, 4P MALE
	1-509-985-00	PLUG HOUSING 4P
	1-509-982-00	PLUG CONTACT
D1	**8-719-851-51**	**S5151**
D2	**8-719-801-51**	**S5151R**
⚠F1	**1-532-268-XX**	**2A (U/C)**
⚠F1	**1-532-203-00**	**2A TIME-LAG (PAL, PAL-M)**
⚠F2	**1-532-403-XX**	**3.15A (U/C)**
⚠F2	**1-532-237-00**	**3.15A TIME-LAG (PAL, PAL-M)**

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Ref. No.	Parts No.	Description
CH-7 BOARD		
	A-7615-094-A	ADJUSTED CIRCUIT BOARD "CH-7"
	1-560-427-00	RECEPTACLE 45P MALE
C6	**1-107-210-00**	**MICA 22PF 5% 500V**
C11	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C12	**1-123-622-00**	**ELECT 22 20% 16V**
C14	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C17	**1-123-611-00**	**ELECT 1 20% 50V**
C20	**1-123-622-00**	**ELECT 22 20% 16V**
C21	**1-123-622-00**	**ELECT 22 20% 16V**
C22	**1-123-622-00**	**ELECT 22 20% 16V**
C23	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C24	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C25	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C26	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C27	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C28	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C30	**1-102-106-00**	**CERAMIC 100PF 10% 50V**
C31	**1-102-106-00**	**CERAMIC 100PF 10% 50V**
C33	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C36	**1-102-106-00**	**CERAMIC 100PF 10% 50V**
C37	**1-123-617-00**	**ELECT 10 20% 16V**
C38	**1-102-106-00**	**CERAMIC 100PF 10% 50V**
C39	**1-123-617-00**	**ELECT 10 20% 16V**
C40	**1-102-106-00**	**CERAMIC 100PF 10% 50V**
D1	**8-719-815-55**	**1S1555**
D2	**8-719-815-55**	**1S1555**
D3	**8-719-815-55**	**1S1555**
D4	**8-719-815-55**	**1S1555**
D5	**8-719-815-55**	**1S1555**
D6	**8-719-815-55**	**1S1555**
D7	**8-719-815-55**	**1S1555**
D8	**8-719-815-55**	**1S1555**
D9	**8-719-815-55**	**1S1555**
D10	**8-719-815-55**	**1S1555**
D11	**8-719-815-55**	**1S1555**
D12	**8-719-815-55**	**1S1555**
D13	**8-719-100-27**	**RD4.7EB2**
IC1	**8-759-901-07**	**SN74LS107AN: TI**
IC2	**8-759-245-28**	**TC4528BP: TOSHIBA**
IC3	**8-759-245-28**	**TC4528BP: TOSHIBA**
IC4	**8-759-240-42**	**TC4042BP: TOSHIBA**
IC5	**8-759-240-28**	**TC4028BP: TOSHIBA**

Ref. No.	Parts No.	Description
IC6	8-759-240-53	TC4053BP: TOSHIBA
IC7	8-759-240-53	TC4053BP: TOSHIBA
IC8	8-759-133-90	μPC339C: NEC
IC9	8-759-133-90	μPC339C: NEC
IC10	8-759-240-53	TC4053BP: TOSHIBA
Q1	8-729-117-54	2SA1175
Q2	8-729-606-32	2SC2603
Q3	8-729-113-32	2SB733
Q4	8-729-606-32	2SC2603
Q5	8-729-606-32	2SC2603
Q6	8-729-606-32	2SC2603
Q7	8-729-606-32	2SC2603
Q8	8-729-606-32	2SC2603
Q9	8-729-606-32	2SC2603
Q10	8-729-606-32	2SC2603
Q11	8-729-117-54	2SA1175
Q12	8-729-117-54	2SA1175
Q13	8-729-606-32	2SC2603
Q14	8-729-606-32	2SC2603
Q15	8-729-117-54	2SA1175
Q16	8-729-606-32	2SC2603
Q17	8-729-606-32	2SC2603
Q18	8-729-606-32	2SC2603
Q19	8-729-606-32	2SC2603
Q20	8-729-117-54	2SA1175
Q21	8-729-117-54	2SA1175
Q22	8-729-606-32	2SC2603
R8	1-247-232-00	CARBON 470 5% 1/2W
RV1	1-226-703-00	METAL 10K
RV2	1-226-703-00	METAL 10K
RV3	1-226-773-00	METAL 22K
RV4	1-226-702-00	METAL 2.2K
RV5	1-226-702-00	METAL 2.2K
RV6	1-226-702-00	METAL 2.2K
RV7	1-226-773-00	METAL 22K
RV8	1-226-702-00	METAL 2.2K

NOTE:

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Ref. No.	Parts No.	Description
CM-11 BOARD		
	A-7511-734-A	MOUNTED CIRCUIT BOARD "CM-11" (NTSC)
	A-7511-735-A	MOUNTED CIRCUIT BOARD "CM-11" (PAL)
	A-7511-736-A	MOUNTED CIRCUIT BOARD "CM-11" (PAL-M)
C4	1-102-106-00	CERAMIC 100PF 10% 50V
C6	1-123-617-00	ELECT 10 20% 16V
C10	1-107-159-00	MICA 33PF 5% 500V
C11	1-107-159-00	MICA 33PF 5% 500V
C12	1-130-516-00	MYLAR 0.01 10% 50V
C13	1-130-516-00	MYLAR 0.01 10% 50V
C14	1-123-617-00	ELECT 10 20% 16V
C15	1-123-617-00	ELECT 10 20% 16V
C16	1-123-617-00	ELECT 10 20% 16V
C17	1-123-617-00	ELECT 10 20% 16V (PAL, PAL-M)
C18	1-130-516-00	MYLAR 0.01 10% 50V
C19	1-130-516-00	MYLAR 0.01 10% 50V
C22	1-130-516-00	MYLAR 0.01 10% 50V
C23	1-130-516-00	MYLAR 0.01 10% 50V
C24	1-123-617-00	ELECT 10 20% 16V
C25	1-123-617-00	ELECT 10 20% 16V
C26	1-123-617-00	ELECT 10 20% 16V
C28	1-123-617-00	ELECT 10 20% 16V
C29	1-161-013-00	CERAMIC 0.01 10% 25V
C30	1-123-617-00	ELECT 10 20% 16V
C31	1-161-013-00	CERAMIC 0.01 10% 25V
C33	1-123-617-00	ELECT 10 20% 16V
C35	1-123-617-00	ELECT 10 20% 16V
C36	1-130-516-00	MYLAR 0.01 10% 50V
C37	1-107-159-00	MICA 33PF 5% 500V
C38	1-107-159-00	MICA 33PF 5% 500V
C43	1-123-617-00	ELECT 10 20% 16V
C44	1-123-617-00	ELECT 10 20% 16V
C47	1-123-617-00	ELECT 10 20% 16V
C48	1-107-159-00	MICA 33PF 5% 500V (NTSC)
C48	1-107-210-00	MICA 22PF 5% 500V (PAL, PAL-M)
C49	1-107-159-00	MICA 33PF 5% 500V (NTSC)
C49	1-107-210-00	MICA 22PF 5% 500V (PAL, PAL-M)
C50	1-107-159-00	MICA 33PF 5% 500V (NTSC)
C50	1-107-210-00	MICA 22PF 5% 500V (PAL, PAL-M)
C51	1-107-159-00	MICA 33PF 5% 500V (NTSC)
C51	1-107-210-00	MICA 22PF 5% 500V (PAL, PAL-M)
C56	1-161-013-00	CERAMIC 0.01 10% 25V
C58	1-130-628-00	MYLAR 0.047 10% 50V
C59	1-123-617-00	ELECT 10 20% 16V

Ref. No.	Parts No.	Description
C60	1-130-628-00	MYLAR 0.047 10% 50V
C62	1-130-628-00	MYLAR 0.047 10% 50V
C65	1-130-628-00	MYLAR 0.047 10% 50V
C66	1-130-628-00	MYLAR 0.047 10% 50V
C68	1-130-516-00	MYLAR 0.01 10% 50V
C69	1-130-628-00	MYLAR 0.047 10% 50V
C81	1-130-516-00	MYLAR 0.01 10% 50V
C83	1-107-207-00	MICA 16PF 5% 500V
C87	1-107-202-00	MICA 10PF 5% 500V
CN1	1-560-427-00	RECEPTACLE, 45P MALE
D1	8-719-815-55	1S1555
D2	8-719-815-55	1S1555
D3	8-719-815-55	1S1555
D4	8-719-815-55	1S1555
D5	8-719-815-55	1S1555
D6	8-719-904-73	1S2473VE
IC1	8-759-900-26	SN74LS26N: TI
IC2	8-759-240-49	TC4049BP: TOSHIBA
IC3	8-759-240-69	TC4069UBP: TOSHIBA
IC4	8-759-240-11	TC4011BP: TOSHIBA
IC7	8-751-200-00	CX120: SONY
IC8	8-759-014-96	MC1496P: MOTOROLA
IC9	8-759-014-96	MC1496P: MOTOROLA
IC10	8-759-930-54	CA3054: RCA
IC11	8-759-930-54	CA3054: RCA
IC12	8-759-930-54	CA3054: RCA
L1	1-407-574-00	VARIABLE 68
L2	1-407-574-00	VARIABLE 68
L4	1-407-574-00	VARIABLE 68 (NTSC)
L4	1-407-573-00	VARIABLE 47 (PAL, PAL-M)
L5	1-407-574-00	VARIABLE 68 (NTSC)
L5	1-407-573-00	VARIABLE 47 (PAL, PAL-M)
L6	1-407-167-XX	MICRO 68 (NTSC)
L6	1-407-164-XX	MICRO 39 (PAL, PAL-M)
L7	1-407-164-XX	MICRO 39
L8	1-407-170-XX	MICRO 120 (NTSC)
L8	1-407-173-XX	MICRO 220 (PAL, PAL-M)

Ref. No.	Parts No.	Description
Q1	8-729-606-32	2SC2603
Q2	8-729-606-32	2SC2603
Q3	8-729-606-32	2SC2603
Q4	8-729-117-54	2SA1175
Q6	8-729-117-54	2SA1175
Q7	8-729-606-32	2SC2603
Q8	8-729-606-32	2SC2603 (PAL, PAL-M)
Q10	8-729-606-32	2SC2603
Q11	8-729-117-54	2SA1175
Q12	8-729-117-54	2SA1175
Q13	8-729-606-32	2SC2603
Q14	8-729-117-54	2SA1175
Q15	8-729-117-54	2SA1175
Q16	8-765-222-20	2SC1963
Q17	8-765-222-20	2SC1963
Q18	8-765-222-20	2SC1963
Q19	8-765-222-20	2SC1963
Q20	8-729-606-32	2SC2603
Q21	8-729-606-32	2SC2603
Q22	8-729-606-32	2SC2603
Q23	8-729-117-54	2SA1175
Q24	8-729-606-32	2SC2603
Q25	8-729-606-32	2SC2603
Q26	8-729-117-54	2SA1175
Q27	8-729-606-32	2SC2603
Q28	8-729-606-32	2SC2603
Q29	8-729-606-32	2SC2603
Q30	8-729-606-32	2SC2603
Q31	8-729-606-32	2SC2603
Q32	8-729-606-32	2SC2603
Q33	8-729-606-32	2SC2603
Q34	8-729-606-32	2SC2603
Q35	8-729-117-54	2SA1175
Q36	8-729-117-54	2SA1175
Q37	8-729-606-32	2SC2603
Q38	8-729-606-32	2SC2603
Q39	8-729-384-48	2SA844
Q40	8-729-117-54	2SA1175
Q41	8-729-177-43	2SD774
Q42	8-729-606-32	2SC2603
Q43	8-729-606-32	2SC2603
Q44	8-729-606-32	2SC2603
Q45	8-729-606-32	2SC2603
Q46	8-729-606-32	2SC2603
Q47	8-729-606-32	2SC2603
Q48	8-729-606-32	2SC2603
Q49	8-729-606-32	2SC2603

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Ref. No.	Parts No.	Description
R105	**1-215-825-00**	**METAL 62K 1% 0.1W**
R163	**1-246-446-00**	**CARBON 75 5% 1/4W**
RV1	**1-226-701-00**	**METAL 220 (PAL, PAL-M)**
RV2	**1-226-701-00**	**METAL 220**
RV3	**1-226-702-00**	**METAL 2.2K**
RV4	**1-226-703-00**	**METAL 10K**
RV5	**1-226-772-00**	**METAL 4.7K**
RV6	**1-226-703-00**	**METAL 10K**
RV7	**1-226-703-00**	**METAL 10K**
RV8	**1-226-771-00**	**METAL 1K**
RV9	**1-226-771-00**	**METAL 1K**
RV11	**1-226-772-00**	**METAL 4.7K**
RV12	**1-226-770-00**	**METAL 470**
RV13	**1-226-702-00**	**METAL 2.2K**
RV14	**1-226-702-00**	**METAL 2.2K**
RV15	**1-226-771-00**	**METAL 1K**
RV16	**1-226-771-00**	**METAL 1K**
TH1	**1-800-071-XX**	**DIRECT-HEATING DISK 300Ω**
TH2	**1-800-071-XX**	**DIRECT-HEATING DISK 300Ω**

CT-18 BOARD

	1-606-082-00	PRINTED CIRCUIT BOARD "CT-18"
RV1	**1-226-342-00**	**5K "BACKGROUND COLOR"**

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Ref. No.	Parts No.	Description
CT-19 BOARD		
	1-606-083-00	PRINTED CIRCUIT BOARD "CT-19"
RV1	**1-228-441-00**	**SLIDE 5K "DSK PGM/INSERT LEVEL"**
S1	**1-552-665-00**	**MICRO "PGM LIMITER"**
S2	**1-552-665-00**	**MICRO "INSERT LIMITER"**

DK-4 BOARD

	A-7511-979-A	MOUNTED CIRCUIT BOARD "DK-4" (NTSC, PAL-M)
	A-7511-980-A	MOUNTED CIRCUIT BOARD "DK-4" (PAL)
	1-560-427-00	RECEPTACLE, 45P MALE
C2	**1-123-607-00**	**ELECT 0.1 20% 50V**
C3	**1-123-617-00**	**ELECT 10 20% 16V**
C4	**1-123-617-00**	**ELECT 10 20% 16V**
C5	**1-123-617-00**	**ELECT 10 20% 16V**
C6	**1-123-617-00**	**ELECT 10 20% 16V**
C7	**1-123-607-00**	**ELECT 0.1 20% 16V**
C8	**1-123-617-00**	**ELECT 10 20% 16V**
C9	**1-123-617-00**	**ELECT 10 20% 16V**
C11	**1-102-106-00**	**CERAMIC 100PF 10% 50V**
C12	**1-123-617-00**	**ELECT 10 20% 16V**
C13	**1-123-617-00**	**ELECT 10 20% 16V**
C14	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C15	**1-123-617-00**	**ELECT 10 20% 16V**
C16	**1-123-617-00**	**ELECT 10 20% 16V**
C17	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C19	**1-123-617-00**	**ELECT 10 20% 16V**
C20	**1-123-607-00**	**ELECT 0.1 20% 50V**
C21	**1-123-617-00**	**ELECT 10 20% 16V**
C22	**1-123-617-00**	**ELECT 10 20% 16V**
C23	**1-123-617-00**	**ELECT 10 20% 16V**

Ref. No.	Parts No.	Description
C24	1-123-607-00	ELECT 0.1 20% 50V
C25	1-102-106-00	CERAMIC 100PF 10% 50V
C26	1-161-013-00	CERAMIC 0.01 10% 25V
C28	1-123-617-00	ELECT 10 20% 16V
C29	1-123-607-00	ELECT 0.1 20% 50%
C31	1-123-617-00	ELECT 10 20% 16V
C32	1-123-617-00	ELECT 10 20% 16V
C33	1-123-607-00	ELECT 0.1 20% 50V
C35	1-124-143-00	ELECT 100 20% 16V
C36	1-123-617-00	ELECT 10 20% 16V
C37	1-123-617-00	ELECT 10 20% 16V
C39	1-123-617-00	ELECT 10 20% 16V
C53	1-123-617-00	ELECT 10 20% 16V
C54	1-124-143-00	ELECT 100 20% 16V
C55	1-124-143-00	ELECT 100 20% 16V
C63	1-123-617-00	ELECT 10 20% 16V
C64	1-123-607-00	ELECT 0.1 20% 50V
C66	1-123-617-00	ELECT 10 20% 16V
C67	1-123-617-00	ELECT 10 20% 16V
C68	1-123-607-00	ELECT 0.1 20% 50V
C70	1-124-143-00	ELECT 100 20% 16V
C71	1-123-617-00	ELECT 10 20% 16V
C72	1-123-617-00	ELECT 10 20% 16V
C74	1-123-617-00	ELECT 10 20% 16V
C77	1-123-617-00	ELECT 10 20% 16V
C79	1-124-143-00	ELECT 100 20% 16V
C80	1-124-143-00	ELECT 100 20% 16V
C81	1-124-143-00	ELECT 100 20% 16V
C100	1-101-880-00	CERAMIC 47PF 5% 50V
C101	1-101-880-00	CERAMIC 47PF 5% 50V
C102	1-124-144-00	ELECT 220 20% 16V
C103	1-124-144-00	ELECT 220 20% 16V
C105	1-107-159-00	MICA 33PF 5% 500V
C106	1-107-159-00	MICA 33PF 5% 500V
C107	1-107-202-00	MICA 10PF 5% 500V
C108	1-107-202-00	MICA 10PF 5% 500V
C300	1-161-013-00	CERAMIC 0.01 10% 25V
C301	1-161-013-00	CERAMIC 0.01 10% 25V
CV1	1-141-084-XX	CERAMIC 55P
CV2	1-141-084-XX	CERAMIC 55P
D1	8-719-815-55	1S1555
D2	8-719-815-55	1S1555
D3	8-719-815-55	1S1555
D4	8-719-133-07	RD3.3EB
D5	8-719-815-55	1S1555

Ref. No.	Parts No.	Description
D6	8-719-815-55	1S1555
D7	8-719-815-55	1S1555
D8	8-719-815-55	1S1555
D9	8-719-815-55	1S1555
D10	8-719-815-55	1S1555
D11	8-719-815-55	1S1555
D12	8-719-815-55	1S1555
IC1	8-749-939-92	BX3992: SONY
IC2	8-759-240-53	TC4053BP: TOSHIBA
IC3	8-749-939-92	BX3992: SONY
IC4	8-759-240-53	TC4053BP: TOSHIBA
IC5	8-749-939-92	BX3992: SONY
IC6	8-749-939-91	BX3991: SONY
IC7	8-758-140-00	CX814: SONY
IC8	8-758-140-00	CX814: SONY
IC9	8-749-939-92	BX3992: SONY
IC10	8-749-939-91	BX3991: SONY
IC11	8-758-140-00	CX814: SONY
IC12	8-758-140-00	CX814: SONY
IC13	8-758-140-00	CX814: SONY
L1	1-407-165-XX	MICRO 47
L2	1-407-165-XX	MICRO 47
L3	1-407-165-XX	MICRO 47 (NTSC, PAL-M)
L3	1-407-161-XX	MICRO 22 (PAL)
L4	1-407-165-XX	MICRO 47 (NTSC, PAL-M)
L4	1-407-161-XX	MICRO 22 (PAL)
L5	1-407-165-XX	MICRO 47 (NTSC, PAL-M)
L5	1-407-161-XX	MICRO 22 (PAL)
L6	1-407-165-XX	MICRO 47 (NTSC, PAL-M)
L6	1-407-161-XX	MICRO 22 (PAL)
Q1	8-729-117-54	2SA1175
Q2	8-729-606-32	2SC2603
Q3	8-729-606-32	2SC2603
Q4	8-729-606-32	2SC2603
Q5	8-729-117-54	2SA1175
Q6	8-729-117-54	2SA1175
Q7	8-729-117-54	2SA1175
Q8	8-729-117-54	2SA1175
Q9	8-729-606-32	2SC2603
Q10	8-729-606-32	2SC2603

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Ref. No.	Parts No.	Description
Q11	8-729-606-32	2SC2603
Q12	8-729-606-32	2SC2603
Q13	8-729-117-54	2SA1175
Q14	8-729-117-54	2SA1175
Q15	8-729-606-32	2SC2603
Q16	8-729-606-32	2SC2603
Q17	8-729-117-54	2SA1175
Q18	8-729-117-54	2SA1175
Q19	8-729-606-32	2SC2603
Q20	8-729-606-32	2SC2603
Q21	8-729-606-32	2SC2603
Q22	8-729-117-54	2SA1175
Q23	8-729-606-32	2SC2603
Q24	8-729-384-48	2SA844
Q25	8-729-117-54	2SA1175
Q26	8-729-384-48	2SA844
Q27	8-729-117-54	2SA1175
Q28	8-729-384-48	2SA844
Q29	8-729-117-54	2SA1175
Q30	8-729-384-48	2SA844
Q31	8-729-117-54	2SA1175
Q100	8-729-117-54	2SA1175
Q101	8-729-117-54	2SA1175
Q102	8-729-117-54	2SA1175
Q103	8-729-117-54	2SA1175
R32	1-215-825-00	METAL 62K 1% 0.1W
RV1	1-226-703-00	METAL 10K
RV2	1-226-702-00	METAL 2.2K
RV3	1-226-771-00	METAL 1K
RV4	1-226-771-00	METAL 1K
RV5	1-226-771-00	METAL 1K
RV6	1-226-771-00	METAL 1K
RV7	1-226-771-00	METAL 1K
RV8	1-226-771-00	METAL 1K
RV9	1-226-771-00	METAL 1K
RV10	1-226-771-00	METAL 1K

Ref. No.	Parts No.	Description
EF-8 BOARD		
	A-7511-729-A	MOUNTED CIRCUIT BOARD "EF-8"
C9	1-161-013-00	CERAMIC 0.01 10% 25V
C10	1-123-622-00	ELECT 22 20% 16V
C11	1-161-013-00	CERAMIC 0.01 10% 25V
C12	1-123-622-00	ELECT 22 20% 16V
C13	1-161-013-00	CERAMIC 0.01 10% 25V
C14	1-123-622-00	ELECT 22 20% 16V
C15	1-161-013-00	CERAMIC 0.01 10% 25V
C18	1-107-206-00	MICA 15PF 5% 500V
C20	1-123-622-00	ELECT 22 20% 16V
C21	1-161-013-00	CERAMIC 0.01 10% 25V
C24	1-107-206-00	MICA 15PF 5% 500V
C26	1-123-622-00	ELECT 22 20% 16V
C27	1-161-013-00	CERAMIC 0.01 10% 25V
C28	1-107-210-00	MICA 22PF 5% 500V
C29	1-107-210-00	MICA 22PF 5% 500V
C32	1-131-373-00	TANTALUM 22 10% 16V
C33	1-131-373-00	TANTALUM 22 10% 16V
C34	1-131-373-00	TANTALUM 22 10% 16V
C35	1-131-373-00	TANTALUM 22 10% 16V
C36	1-131-373-00	TANTALUM 22 10% 16V
C37	1-131-373-00	TANTALUM 22 10% 16V
C38	1-131-373-00	TANTALUM 22 10% 16V
C39	1-131-373-00	TANTALUM 22 10% 16V
C40	1-131-373-00	TANTALUM 22 10% 16V
C41	1-131-373-00	TANTALUM 22 10% 16V
C42	1-131-373-00	TANTALUM 22 10% 16V
C43	1-131-373-00	TANTALUM 22 10% 16V
CN1	1-560-427-00	RECEPTACLE, 45P MALE
CV1	1-141-084-XX	CERAMIC
CV2	1-141-084-XX	CERAMIC
D1	8-719-815-55	1S1555
D2	8-719-904-73	1S2473VE
D3	8-719-904-73	1S2473VE
D4	8-719-904-73	1S2473VE
D5	8-719-904-73	1S2473VE

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EF-8, EF-9

Ref. No.	Parts No.	Description
DL1	**1-415-261-00**	**20nS**
DL2	**1-415-261-00**	**20nS**
IC1	**8-749-939-89**	**BX3989: SONY**
IC2	**8-749-939-90**	**BX3990: SONY**
IC3	**8-749-939-89**	**BX3989: SONY**
IC4	**8-749-939-90**	**BX3990: SONY**
IC5	**8-749-939-89**	**BX3989: SONY**
IC6	**8-749-939-90**	**BX3990: SONY**
IC7	**8-749-939-89**	**BX3989: SONY**
IC8	**8-749-939-90**	**BX3990: SONY**
L1	**1-407-164-XX**	**MICRO 39**
L2	**1-407-164-XX**	**MICRO 39**
L3	**1-407-164-XX**	**MICRO 39**
L4	**1-407-164-XX**	**MICRO 39**
L5	**1-407-164-XX**	**MICRO 39**
L6	**1-407-164-XX**	**MICRO 39**
Q1	**8-729-117-54**	**2SA1175**
Q2	**8-729-117-54**	**2SA1175**
Q3	**8-729-117-54**	**2SA1175**
Q4	**8-729-117-54**	**2SA1175**
Q5	**8-729-117-54**	**2SA1175**
Q6	**8-729-117-54**	**2SA1175**
Q7	**8-729-606-32**	**2SC2603**
Q8	**8-729-117-54**	**2SA1175**
Q9	**8-729-606-32**	**2SC2603**
Q10	**8-729-117-54**	**2SA1175**
Q11	**8-729-117-54**	**2SA1175**
Q12	**8-729-117-54**	**2SA1175**
Q13	**8-729-117-54**	**2SA1175**
Q14	**8-729-117-54**	**2SA1175**
RV1	**1-226-701-00**	**METAL 220**
RV2	**1-226-701-00**	**METAL 220**
TH1	**1-800-199-00**	**1250Ω**
TH2	**1-800-199-00**	**1250Ω**

Ref. No.	Parts No.	Description
EF-9 BOARD		
	A-7511-730-A	MOUNTED CIRCUIT BOARD "EF-9" (NTSC, PAL-M)
	A-7511-731-A	MOUNTED CIRCUIT BOARD "EF-9" (PAL)
C1	**1-123-619-00**	**ELECT 4.7 20% 50V**
C5	**1-123-617-00**	**ELECT 10 20% 16V**
C6	**1-123-617-00**	**ELECT 10 20% 16V**
C7	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C8	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C9	**1-123-617-00**	**ELECT 10 20% 16V**
C10	**1-123-617-00**	**ELECT 10 20% 16V**
C12	**1-123-617-00**	**ELECT 10 20% 16V**
C13	**1-123-617-00**	**ELECT 10 20% 16V**
C16	**1-123-619-00**	**ELECT 4.7 20% 50V**
C20	**1-123-617-00**	**ELECT 10 20% 16V**
C21	**1-123-617-00**	**ELECT 10 20% 16V**
C22	**1-123-617-00**	**ELECT 10 20% 16V**
C23	**1-123-617-00**	**ELECT 10 20% 16V**
C27	**1-123-617-00**	**ELECT 10 20% 16V**
C30	**1-123-617-00**	**ELECT 10 20% 16V**
C31	**1-123-617-00**	**ELECT 10 20% 16V**
C34	**1-123-617-00**	**ELECT 10 20% 16V**
C35	**1-123-617-00**	**ELECT 10 20% 16V**
C36	**1-123-617-00**	**ELECT 10 20% 16V**
C42	**1-123-617-00**	**ELECT 10 20% 16V**
C43	**1-123-617-00**	**ELECT 10 20% 16V**
C46	**1-123-617-00**	**ELECT 10 20% 16V**
C47	**1-123-617-00**	**ELECT 10 20% 16V**
C49	**1-123-617-00**	**ELECT 10 20% 16V**
C50	**1-123-617-00**	**ELECT 10 20% 16V**
C53	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C54	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C55	**1-123-611-00**	**ELECT 1 20% 50V**
C56	**1-123-617-00**	**ELECT 10 20% 16V**
C57	**1-123-617-00**	**ELECT 10 20% 16V**
C58	**1-123-617-00**	**ELECT 10 20% 16V**
CN1	1-560-427-00	RECEPTACLE, 45P MALE

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Ref. No.	Parts No.	Description
CV1	1-141-084-XX	CERAMIC 55PF
CV2	1-141-084-XX	CERAMIC 55PF
CV3	1-141-084-XX	CERAMIC 55PF
CV4	1-141-084-XX	CERAMIC 55PF
CV5	1-141-084-XX	CERAMIC 55PF
CV6	1-141-084-XX	CERAMIC 55PF
D1	8-719-815-55	1S1555
D2	8-719-815-55	1S1555
D3	8-719-815-55	1S1555
D4	8-719-904-73	1S2473VE
D5	8-719-904-73	1S2473VE
D6	8-719-904-73	1S2473VE
IC1	8-749-939-90	BX3990: SONY
IC2	8-749-939-91	BX3991: SONY
IC3	8-749-939-90	BX3990: SONY
IC4	8-749-939-91	BX3991: SONY
IC5	8-749-939-92	BX3992: SONY
IC6	8-749-939-91	BX3991: SONY
IC7	8-749-939-92	BX3992: SONY
L1	1-407-165-XX	MICRO 47 (NTSC, PAL-M)
L1	1-407-161-XX	MICRO 22 (PAL)
L2	1-407-165-XX	MICRO 47 (NTSC, PAL-M)
L2	1-407-161-XX	MICRO 22 (PAL)
L3	1-407-165-XX	MICRO 47 (NTSC, PAL-M)
L3	1-407-161-XX	MICRO 22 (PAL)
L4	1-407-165-XX	MICRO 47 (NTSC, PAL-M)
L4	1-407-161-XX	MICRO 22 (PAL)
L5	1-407-165-XX	MICRO 47 (NTSC, PAL-M)
L5	1-407-161-XX	MICRO 22 (PAL)
L6	1-407-165-XX	MICRO 47 (NTSC, PAL-M)
L6	1-407-161-XX	MICRO 22 (PAL)
Q1	8-729-117-54	2SA1175
Q2	8-729-606-32	2SC2603
Q3	8-729-117-54	2SA1175
Q4	8-729-117-54	2SA1175
Q5	8-729-117-54	2SA1175
Q6	8-729-117-54	2SA1175
Q7	8-729-117-54	2SA1175
Q8	8-729-606-32	2SC2603
Q9	8-729-606-32	2SC2603
Q10	8-729-117-54	2SA1175
Q11	8-729-606-32	2SC2603
Q12	8-729-606-32	2SC2603
Q13	8-729-117-54	2SA1175
Q14	8-729-117-54	2SA1175
Q15	8-729-117-54	2SA1175
Q16	8-729-117-54	2SA1175
Q17	8-729-117-54	2SA1175
Q18	8-729-606-32	2SC2603
Q19	8-729-625-91	2SC2259
Q20	8-729-606-32	2SC2603
Q21	8-729-606-32	2SC2603
Q22	8-729-606-32	2SC2603
Q23	8-729-117-54	2SA1175
Q24	8-729-606-32	2SC2603
Q25	8-729-606-32	2SC2603
Q26	8-729-606-32	2SC2603
RV1	1-226-771-00	METAL 1K
RV2	1-226-701-00	METAL 220
RV3	1-226-702-00	METAL 2.2K
RV4	1-226-702-00	METAL 2.2K
RV5	1-226-771-00	METAL 1K
RV6	1-226-701-00	METAL 220
RV7	1-226-771-00	METAL 1K
RV8	1-226-771-00	METAL 1K
RV9	1-226-701-00	METAL 220
RV10	1-226-771-00	METAL 1K
RV11	1-226-702-00	METAL 2.2K
TH1	1-800-071-XX	DIRECT-HEATING DISK 300Ω
TH2	1-800-071-XX	DIRECT-HEATING DISK 300Ω

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EF-10

Ref. No.	Parts No.	Description
EF-10 BOARD		
	A-7511-732-A	MOUNTED CIRCUIT BOARD "EF-10" (NTSC, PAL-M)
	A-7511-733-A	MOUNTED CIRCUIT BOARD "EF-10" (PAL)
	1-560-427-00	RECEPTACLE, 45P MALE
C3	**1-123-617-00**	**ELECT 10 20% 16V**
C4	**1-123-617-00**	**ELECT 10 20% 16V**
C6	**1-123-617-00**	**ELECT 10 20% 16V**
C13	**1-123-617-00**	**ELECT 10 20% 16V**
C14	**1-123-617-00**	**ELECT 10 20% 16V**
C16	**1-123-617-00**	**ELECT 10 20% 16V**
C20	**1-107-210-00**	**MICA 22PF 5% 500V**
C23	**1-123-617-00**	**ELECT 10 20% 16V**
C24	**1-107-210-00**	**MICA 22PF 5% 500V**
C25	**1-107-157-00**	**MICA 27PF 5% 500V (NTSC, PAL-M)**
C25	**1-107-208-00**	**MICA 18PF 5% 500V (PAL)**
C26	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C29	**1-123-617-00**	**ELECT 10 20% 16V**
C30	**1-123-617-00**	**ELECT 10 20% 16V**
C36	**1-123-617-00**	**ELECT 10 20% 16V**
C37	**1-102-110-00**	**CERAMIC 220PF 10% 50V**
C41	**1-161-021-00**	**CERAMIC 0.047 10% 25V**
C42	**1-123-617-00**	**ELECT 10 20% 16V**
C43	**1-123-617-00**	**ELECT 10 20% 16V**
C44	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C45	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C46	**1-107-211-00**	**MICA 24PF 5% 500V**
CV1	**1-141-084-XX**	**CERAMIC 55PF**
CV2	**1-141-084-XX**	**CERAMIC 55PF**
CV3	**1-141-084-XX**	**CERAMIC 55PF**
CV4	**1-141-084-XX**	**CERAMIC 55PF**
CV5	**1-141-084-XX**	**CERAMIC 55PF**
D1	**8-719-815-55**	**1S1555**
D2	**8-719-815-55**	**1S1555**
IC1	**8-749-939-91**	**BX3991: SONY**
IC2	**8-749-939-90**	**BX3990: SONY**
IC3	**8-749-939-91**	**BX3991: SONY**
IC4	**8-749-939-90**	**BX3990: SONY**

Ref. No.	Parts No.	Description
L1	**1-407-165-XX**	**MICRO 47 (NTSC, PAL-M)**
L1	**1-407-161-XX**	**MICRO 22 (PAL)**
L2	**1-407-165-XX**	**MICRO 47 (NTSC, PAL-M)**
L2	**1-407-161-XX**	**MICRO 22 (PAL)**
L3	**1-407-162-XX**	**MICRO 27 (NTSC, PAL-M)**
L3	**1-407-160-XX**	**MICRO 18 (PAL)**
L4	**1-407-168-XX**	**MICRO 82**
L5	**1-407-164-XX**	**MICRO 39 (NTSC, PAL-M)**
L5	**1-407-161-XX**	**MICRO 22 (PAL)**
Q1	**8-729-606-32**	**2SC2603**
Q2	**8-729-606-32**	**2SC2603**
Q3	**8-765-020-00**	**2SA884**
Q4	**8-729-606-32**	**2SC2603**
Q5	**8-729-117-54**	**2SA1175**
Q6	**8-729-606-32**	**2SC2603**
Q7	**8-729-606-32**	**2SC2603**
Q8	**8-765-020-00**	**2SA884**
Q9	**8-729-117-54**	**2SA1175**
Q10	**8-729-606-32**	**2SC2603**
Q11	**8-729-606-32**	**2SC2603**
Q12	**8-729-606-32**	**2SC2603**
Q13	**8-729-117-54**	**2SA1175**
Q14	**8-729-697-92**	**2SA979**
Q15	**8-729-606-32**	**2SC2603**
Q16	**8-723-304-00**	**2SK43-4**
Q17	**8-729-117-54**	**2SA1175**
Q18	**8-729-117-54**	**2SA1175**
Q19	**8-729-117-54**	**2SA1175**
Q20	**8-729-606-32**	**2SC2603**
Q21	**8-729-606-32**	**2SC2603**
Q22	**8-729-606-32**	**2SC2603**
Q23	**8-729-606-32**	**2SC2603**
Q24	**8-729-117-54**	**2SA1175**
Q25	**8-729-697-92**	**2SA979**
Q26	**8-729-606-32**	**2SC2603**
Q27	**8-729-625-91**	**2SC2259**
Q28	**8-729-117-54**	**2SA1175**
Q29	**8-729-606-32**	**2SC2603**
RV1	**1-226-771-00**	**METAL 1K**
RV2	**1-226-771-00**	**METAL 1K**
RV3	**1-226-701-00**	**METAL 220**
RV4	**1-226-770-00**	**METAL 470**
RV5	**1-226-771-00**	**METAL 1K**

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Ref. No.	Parts No.	Description
RV6	**1-226-771-00**	**METAL 1K**
RV7	**1-226-701-00**	**METAL 220**
RV8	**1-226-771-00**	**METAL 1K**
RV9	**1-226-776-00**	**METAL 220K**
RV10	**1-226-772-00**	**METAL 4.7K**
RV11	**1-226-702-00**	**METAL 2.2K**
RV12	**1-226-773-00**	**METAL 22K**

Ref. No.	Parts No.	Description
S1	**1-516-576-00**	**SLIDE**
S2	**1-516-576-00**	**SLIDE**
S3	**1-516-576-00**	**SLIDE**
S4	**1-516-576-00**	**SLIDE**
S5	**1-516-576-00**	**SLIDE**
S6	**1-516-576-00**	**SLIDE**
S7	**1-516-576-00**	**SLIDE**
S8	**1-516-576-00**	**SLIDE**

HN-22 BOARD

	A-7511-831-A	MOUNTED CIRCUIT BOARD "HN-22"
	1-560-674-00	RECEPTACLE, 50P
	1-561-776-00	50P SOCKET
C1	**1-123-324-00**	**ELECT 1000 20% 16V**
CN1	1-560-428-00	RECEPTACLE, 45P FEMALE
CN2	1-560-428-00	RECEPTACLE, 45P FEMALE
CN3	1-560-428-00	RECEPTACLE, 45P FEMALE
CN4	1-560-428-00	RECEPTACLE, 45P FEMALE
CN5	1-560-428-00	RECEPTACLE, 45P FEMALE
CN6	1-560-428-00	RECEPTACLE, 45P FEMALE
CN7	1-560-428-00	RECEPTACLE, 45P FEMALE
CN8	1-560-428-00	RECEPTACLE, 45P FEMALE
CN9	1-556-026-00	RECEPTACLE, WIRE FLAT TYPE
CN10	1-556-026-00	RECEPTACLE, WIRE FLAT TYPE
CN17	**1-560-809-00**	**RECEPTACLE, 5P MALE**
CN18	**1-560-809-00**	**RECEPTACLE, 5P MALE**
R1 ~ R7	**1-247-104-00**	**CARBON 75 5% 1/4W**

JK-7 BOARD

	1-610-337-00	PRINTED CIRCUIT BOARD "JK-7"
J1	**1-507-883-00**	**SMALL TYPE 4P**
VDR1	**1-806-504-00**	**ERZ-C05DK820**

HN-28 BOARD

	1-610-339-00	PRINTED CIRCUIT BOARD "HN-28"
C1	**1-123-622-00**	**ELECT 22 20% 16V**
D1	**8-719-100-44**	**RD7.5EB2 (PAL, PAL-M)**
VDR1	**1-806-504-00**	**ERZ-C05DK820**

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Ref. No.	Parts No.	Description
KY-17 BOARD		
	A-7511-750-A	MOUNTED CIRCUIT BOARD "KY-17"
C2	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
D1~D45	**8-719-815-55**	**1S1555**
IC1	**8-759-245-55**	**TC4555BP: TOSHIBA**
IC2	**8-759-240-28**	**TC4028BP: TOSHIBA**
IC3	**8-759-262-15**	**TD62105P: TOSHIBA**
IC4	**8-759-262-15**	**TD62105P: TOSHIBA**
IC5	**8-759-262-15**	**TD62105P: TOSHIBA**
IC6	**8-759-262-15**	**TD62105P: TOSHIBA**
IC7	**8-759-262-15**	**TD62105P: TOSHIBA**
IC8	**8-759-262-15**	**TD62105P: TOSHIBA**
IC9	**8-759-262-15**	**TD62105P: TOSHIBA**
PL1~PL13	**1-518-361-00**	**12V, 40mA "PGM INDICATORS"**

Ref. No.	Parts No.	Description
S1~S23	**1-553-939-71**	**PUSH for "BUS"**
	1-518-480-00	**LAMP, 12V, 30mA**
S24	**1-553-939-71**	**PUSH "EFFECTS SELECT-MIX"**
	1-518-480-00	**LAMP, 12V, 30mA**
S25	**1-553-939-71**	**PUSH "EFFECTS SELECT-WIPE"**
	1-518-480-00	**LAMP, 12V, 30mA**
S26	**1-553-939-71**	**PUSH "EFFECTS SELECT-EXT KEY"**
	1-518-480-00	**LAMP, 12V, 30mA**
S27	**1-553-939-21**	**PUSH "WIPE ▭ "**
	1-518-480-00	**LAMP, 12V, 30mA**
S28	**1-553-939-31**	**PUSH "WIPE ▭ "**
	1-518-480-00	**LAMP, 12V, 30mA**
S29	**1-554-074-11**	**PUSH "WIPE ▭ "**
	1-518-480-00	**LAMP, 12V, 30mA**
S30	**1-553-939-11**	**PUSH "WIPE ▭ "**
	1-518-480-00	**LAMP, 12V, 30mA**
S31	**1-553-939-41**	**PUSH "WIPE ▭ "**
	1-518-480-00	**LAMP, 12V, 30mA**
S32	**1-553-939-61**	**PUSH "WIPE ▭ "**
	1-518-480-00	**LAMP, 12V, 30mA**
S33	**1-553-551-51**	**PUSH "TAKE"**
	1-518-480-00	**LAMP, 12V, 30mA**
S34	**1-553-939-71**	**PUSH "DSK PST CUT IN/OUT"**
	1-518-480-00	**LAMP, 12V, 30mA**
S35	**1-553-939-81**	**PUSH "DSK PGM CUT IN/OUT"**
	1-518-480-00	**LAMP, 12V, 30mA**
S36	**1-516-995-00**	**SLIDE "A BUS BLACK/COLOR/WHITE"**
S37	**1-516-995-00**	**SLIDE "B BUS BLACK/COLOR/WHITE"**
S38	**1-516-995-00**	**SLIDE "PST BLACK/COLOR/WHITE"**
S39	**1-516-961-21**	**SLIDE "PGM/PST"**
S40	**1-516-995-00**	**SLIDE "BORDER/HARD/SOFT"**
S41	**1-516-961-21**	**SLIDE "NORMAL/INVERT"**
S42	**1-516-995-00**	**SLIDE "NARROW/OFF/WIDE"**
S43	**1-516-961-21**	**SLIDE "PHASE INDICATOR"**

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Ref. No.	Parts No.	Description
KY-42 BOARD		
	A-7511-987-A	MOUNTED CIRCUIT BOARD "KY-42"
C2	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C4	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C5	**1-107-210-00**	**MICA 22PF 5% 500V**
C6	**1-107-210-00**	**MICA 22PF 5% 500V**
C7	**1-102-116-00**	**CERAMIC 680PF 10% 50V**
C8	**1-123-617-00**	**ELECT 10 20% 16V**
C9	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C12	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C19	**1-123-611-00**	**ELECT 1 20% 50V**
C20	**1-123-647-00**	**ELECT 47 20% 6.3V**
C21	**1-123-647-00**	**ELECT 47 20% 6.3V**
C22	**1-123-661-00**	**ELECT 100 20% 6.3V**
C23	**1-124-142-00**	**ELECT 470 20% 10V**
C24	**1-123-661-00**	**ELECT 100 20% 6.3V**
C52	**1-131-381-00**	**TANTALUM 47 10% 10V**
C53	**1-102-117-00**	**CERAMIC 820PF 10% 50V**
C54	**1-161-007-00**	**CERAMIC 0.0033 10% 25V**
CN501	1-560-675-00	RECEPTACLE, 50P MALE
CN502	1-560-675-00	RECEPTACLE, 50P MALE
D1	**8-719-815-55**	**1S1555**
D2	**8-719-156-07**	**RD5.6EB**
D3	**8-719-191-07**	**RD9.1EB**
D4	**8-719-815-55**	**1S1555**
D5	**8-719-815-55**	**1S1555**
D6	**8-719-815-55**	**1S1555**
D7	**8-719-815-55**	**1S1555**
D8	**8-719-815-55**	**1S1555**
D9	**8-719-815-55**	**1S1555**
D11	**8-719-815-55**	**1S1555**
D12	**8-719-815-55**	**1S1555**
D13	**8-719-815-55**	**1S1555**
D14	**8-719-815-55**	**1S1555**
D15	**8-719-815-55**	**1S1555**
D16	**8-719-815-55**	**1S1555**
D17	**8-719-815-55**	**1S1555**
D18	**8-719-815-55**	**1S1555**
D19	**8-719-815-55**	**1S1555**
D20	**8-719-815-55**	**1S1555**
D21	**8-719-100-57**	**RD10EB2**

Ref. No.	Parts No.	Description
D22	**8-719-100-38**	**RD6.2EB2**
D23	**8-719-815-55**	**1S1555**
D24	**8-719-191-07**	**RD9.1EB**
D25	**8-719-156-07**	**RD5.6EB**
D26	**8-719-815-55**	**1S1555**
D27	**8-719-100-38**	**RD6.2EB2**
D28	**8-719-100-38**	**RD6.2EB2**
D29	**8-719-100-38**	**RD6.2EB2**
D30	**8-719-100-38**	**RD6.2EB2**
D31	**8-719-100-38**	**RD6.2EB2**
D32	**8-719-100-38**	**RD6.2EB2**
D33	**8-719-100-38**	**RD6.2EB2**
D34	**8-719-143-07**	**RD4.3EB**
D35	**8-719-815-55**	**1S1555**
D36	**8-719-815-55**	**1S1555**
D37	**8-719-815-55**	**1S1555**
IC1	**8-759-758-71**	**μPD8748D-200012: NEC**
IC2	**8-759-250-20**	**TC5020: TOSHIBA**
IC3	**8-759-250-20**	**TC5020: TOSHIBA**
IC4	**8-759-250-20**	**TC5020: TOSHIBA**
IC5	**8-759-045-08**	**MC14508BCP: MOTOROLA**
IC6	**8-759-045-08**	**MC14508BCP: MOTOROLA**
IC7	**8-759-045-08**	**MC14508BCP: MOTOROLA**
IC8	**8-759-045-08**	**MC14508BCP: MOTOROLA**
IC9	**8-759-045-08**	**MC14508BCP: MOTOROLA**
IC10	**8-759-045-08**	**MC14508BCP: MOTOROLA**
IC11	**8-759-262-15**	**TD62105P: TOSHIBA**
IC12	**8-759-045-08**	**MC14508BCP: MOTOROLA**
IC13	**8-759-045-08**	**MC14508BCP: MOTOROLA**
IC14	**8-759-240-28**	**TC4028BP: TOSHIBA**
IC15	**8-759-240-28**	**TC4028BP: TOSHIBA**
IC16	**8-759-240-28**	**TC4028BP: TOSHIBA**
IC17	**8-759-240-28**	**TC4028BP: TOSHIBA**
IC18	**8-759-240-47**	**TC4047BP: TOSHIBA**
IC19	**8-759-240-81**	**TC4081BP: TOSHIBA**
IC20	**8-759-240-50**	**TC4050BP: TOSHIBA**
IC21	**8-759-240-50**	**TC4050BP: TOSHIBA**
IC22	**8-759-240-52**	**TC4052BP: TOSHIBA**
IC23	**8-759-240-53**	**TC4053BP: TOSHIBA**
IC24	**8-759-240-53**	**TC4053BP: TOSHIBA**
IC25	**8-759-240-01**	**TC4001BP: TOSHIBA**
IC26	**8-759-990-62**	**TL062CP: TI**

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Ref. No.	Parts No.	Description
Q1	8-729-177-43	2SD774
Q2	8-729-606-32	2SC2603
Q3	8-729-606-32	2SC2603
Q4	8-729-606-32	2SC2603
Q5	8-729-177-43	2SD774
Q6	8-729-177-43	2SD774
Q7	8-729-606-32	2SC2603
Q8	8-729-606-32	2SC2603
Q9	8-729-606-32	2SC2603
Q10	8-729-606-32	2SC2603
Q11	8-729-606-32	2SC2603
Q12	8-729-606-32	2SC2603
Q13	8-729-606-32	2SC2603
Q14	8-729-606-32	2SC2603
Q15	8-729-177-43	2SD774
Q16	8-729-606-32	2SC2603
Q17	8-729-117-54	2SA1175
Q19	8-729-117-54	2SA1175
Q20	8-729-117-54	2SA1175
Q21	8-729-117-54	2SA1175
Q22	8-729-117-54	2SA1175
R33	1-247-127-00	CARBON 680 5% 1/4W
R72	1-246-475-00	CARBON 1.2K 5% 1/4W
R73	1-247-111-00	CARBON 150 5% 1/4W
R101	1-207-633-00	WIRE 56 10% 3W
RV1	1-224-249-XX	METAL 1K
RV2	1-228-443-00	SLIDE 5K/5K
RV3	1-228-443-00	SLIDE 5K/5K
RY1	1-515-434-00	MICRO LEAD 5V 300Ω
RY2	1-515-434-00	MICRO LEAD 5V 300Ω
RY3	1-515-434-00	MICRO LEAD 5V 300Ω
RY4	1-515-434-00	MICRO LEAD 5V 300Ω
S1	1-552-665-00	MICRO
S2	1-552-665-00	MICRO
S3	1-552-665-00	MICRO
S4	1-552-665-00	MICRO
T1	1-427-487-00	OUTPUT
X1	1-527-812-00	6MHz

Ref. No.	Parts No.	Description
LP-12 BOARD		
	1-606-081-00	PRINTED CIRCUIT BOARD "LP-12"
D1	8-719-802-08	TLR208
D2	8-719-802-08	TLR208
M1	1-520-427-00	LEVEL
M2	1-520-427-00	LEVEL
PS-24 BOARD		
	1-610-341-00	PRINTED CIRCUIT BOARD "PS-24"
C1	1-123-611-00	ELECT 1 20% 50V
D1	8-719-100-27	RD4.7EB2
D2	8-719-815-55	1S1555
IC1	8-759-729-03	NJM2903D: JRC
PH1	8-719-907-13	PC713
Q1	8-729-606-32	2SC2603

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Ref. No.	Parts No.	Description
PS-25 BOARD		
	A-7511-981-A	MOUNTED CIRCUIT BOARD "PS-25" (NTSC)
	A-7511-983-A	MOUNTED CIRCUIT BOARD "PS-25" (PAL, PAL-M)
	1-517-072-00	**HOLDER, FUSE (NTSC)**
	1-533-131-00	**HOLDER, FUSE (PAL, PAL-M)**
C1	**1-123-617-00**	**ELECT 10 20% 16V**
C2	**1-123-613-00**	**ELECT 3.3 20% 50V**
C3	**1-123-821-00**	**ELECT 47 20% 16V**
C4	**1-123-617-00**	**ELECT 10 20% 16V**
C5	**1-124-284-00**	**ELECT (NONPOLAR) 10 20% 16V**
C6	**1-123-617-00**	**ELECT 10 20% 16V**
C7	**1-123-613-00**	**ELECT 3.3 20% 50V**
C8	**1-123-821-00**	**ELECT 47 20% 16V**
C9	**1-123-617-00**	**ELECT 10 20% 16V**
C10	**1-124-284-00**	**ELECT (NONPOLAR) 10 20% 16V**
C13	**1-123-622-00**	**ELECT 22 20% 16V**
C14	**1-123-821-00**	**ELECT 47 20% 16V**
C17	**1-123-611-00**	**ELECT 1 20% 50V**
CN1	1-508-902-00	RECEPTACLE, 4P MALE
	1-509-985-00	PLUG HOUSING 4P
	1-509-982-00	PLUG CONTACT
CN3	**1-508-900-00**	**RECEPTACLE, 2P MALE**
	1-509-983-00	PLUG HOUSING 2P
	1-509-982-00	PLUG CONTACT
CN4	**1-508-900-00**	**RECEPTACLE, 2P MALE**
	1-509-983-00	PLUG HOUSING 2P
	1-509-982-00	PLUG CONTACT
CN5	1-508-934-00	RECEPTACLE, 3P MALE
	1-509-984-00	PLUG HOUSING 3P
	1-509-982-00	PLUG CONTACT
CN6	1-508-934-00	RECEPTACLE, 3P MALE
	1-509-984-00	PLUG HOUSING 3P
	1-509-982-00	PLUG CONTACT
D1	**8-719-815-55**	**1S1555**
D2	**8-719-815-55**	**1S1555**
D3	**8-719-151-07**	**RD5.1EB**
D4	**8-719-815-55**	**1S1555**
D5	**8-719-815-55**	**1S1555**
D6	**8-719-200-02**	**10E2**
D7	**8-719-100-58**	**RD10EB3**
D8	**8-719-815-55**	**1S1555**
D9	**8-719-815-55**	**1S1555**
D10	**8-719-815-55**	**1S1555**
D11	**8-719-151-07**	**RD5.1EB**
D12	**8-719-815-55**	**1S1555**
D13	**8-719-815-55**	**1S1555**
D14	**8-719-200-02**	**10E2**
D15	**8-719-100-58**	**RD10EB3**
D16	**8-719-815-55**	**1S1555**
D17	**8-719-100-27**	**RD4.7EB2**
D18	**8-719-815-55**	**1S1555**
D19	**8-719-100-38**	**RD6.2EB2**
⚠**F1**	**1-532-349-XX**	**4A 125V (U/C)**
⚠**F1**	**1-532-350-00**	**TIME-LAG 4A (PAL, PAL-M)**
IC1	**8-759-729-03**	**NJM2903D: JRC**
IC2	**8-759-240-11**	**TC4011BP: TOSHIBA**
IC3	**8-759-729-03**	**NJM2903D: JRC**
IC4	**8-759-240-11**	**TC4011BP: TOSHIBA**
IC5	**8-759-729-03**	**NJM2903D: JRC**
Q1	**8-729-606-32**	**2SC2603**
Q2	**8-729-117-54**	**2SA1175**
Q3	**8-729-606-32**	**2SC2603**
Q4	**8-729-117-54**	**2SA1175**
Q5	**8-729-606-32**	**2SC2603**
Q6	**8-729-606-32**	**2SC2603**
Q7	**8-729-606-32**	**2SC2603**
Q8	**8-729-606-32**	**2SC2603**
R43	**1-247-143-00**	**CARBON 3.3K 5% 1/4W**
R54	**1-247-143-00**	**CARBON 3.3K 5% 1/4W**
R55	**1-202-850-00**	**SOLID 2.2 1/4W**
RV1	**1-226-773-00**	**METAL 22K**
RV2	**1-226-703-00**	**METAL 10K**
RV3	**1-226-773-00**	**METAL 22K**
RV4	**1-226-703-00**	**METAL 10K**
RY1	**1-515-355-00**	**12V, 720Ω**
RY2	**1-515-355-00**	**12V, 720Ω**

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PS-36

Ref. No.	Parts No.	Description
PS-36 BOARD		
	1-413-086-22	SWITCHING RGULATOR
C14	**1-123-955-00**	**ELECT 680 20% 16V**
C16	**1-123-049-00**	**ELECT (NONPOLAR) 0.47 20% 50V**
C20	**1-123-955-00**	**ELECT 680 20% 16V**
C21	**1-102-038-00**	**CERAMIC 0.001 99% 500V**
C22	**1-102-038-00**	**CERAMIC 0.001 99% 500V**
C24	**1-131-355-00**	**TANTALUM 2.2 10% 25V**
C26	**1-123-617-00**	**ELECT 10 20% 16V**
D1	**8-719-815-80**	**1S1587**
D2	**8-719-815-80**	**1S1587**
D3	**8-719-815-80**	**1S1587**
D4	**1-806-326-11**	**EU-2**
D5	**1-806-326-11**	**EU-2**
D6	**8-719-302-00**	**RU-2M**
D7	**8-719-302-00**	**RU-2M**
D8	**8-719-912-52**	**ESAC25-02C**
D9	**8-719-302-00**	**RU-2M**
D10	**8-719-302-00**	**RU-2M**
D11	**8-719-151-07**	**RD5.1EB**
D12	**8-719-100-38**	**RD6.2EB2**
D13	**8-719-100-07**	**RD30EB**
D14	**8-719-100-38**	**RD6.2EB2**
D15	**8-719-156-07**	**RD5.6EB**
D16	**8-719-815-80**	**1S1587**
D17	**8-719-815-80**	**1S1587**
IC1	**8-759-729-03**	**NJM2903D: JRC**
IC2	**8-759-937-59**	**MB3759: FUJITSU**
IC3	**1-806-327-11**	**μA78MG: FSC**
IC4	**8-759-907-91**	**μA79MG: FSC**
IC5	**8-759-729-03**	**NJM2903D: JRC**
L1	**1-421-495-00**	**CHOKE 2mH**
L2	**1-421-491-00**	**CHOKE 15**
L3	**1-421-491-00**	**CHOKE 15**
L4	**1-407-492-00**	**MICRO 1mH**
L5	**1-407-492-00**	**MICRO 1mH**

Ref. No.	Parts No.	Description
L6	**1-421-492-00**	**CHOKE 1.2mH**
L7	**1-421-493-00**	**CHOKE 2mH**
L8	**1-421-493-00**	**CHOKE 2mH**
L9	**1-421-494-00**	**CHOKE 800**
L10	**1-421-462-00**	**CHOKE 10**
L11	**1-421-461-00**	**CHOKE 10**
PH1	**8-719-902-56**	**DIODE PC817**
Q1	**8-729-663-47**	**2SC1364**
Q2	**8-729-331-53**	**2SC2315**
Q3	**8-729-663-47**	**2SC1364**
Q4	**8-729-133-40**	**2SC2334**
Q5	**8-729-133-40**	**2SC2334**
Q6	**8-729-663-47**	**2SC1364**
Q7	**8-729-663-47**	**2SC1364**
Q8	**1-806-219-11**	**2SA1012-Y**
Q9	**8-729-117-54**	**2SA1175**
Q10	**8-729-606-32**	**2SC2603**
R1	**1-212-372-00**	**METAL OXIDE 10 1W**
R2	**1-246-481-00**	**CARBON 2.2K 1/4W**
R3	**1-246-497-00**	**CARBON 10K 1/4W**
R4	**1-246-503-00**	**CARBON 18K 1/4W**
R5	**1-246-483-00**	**CARBON 2.7K 1/4W**
R6	**1-246-483-00**	**CARBON 2.7K 1/4W**
R7	**1-246-502-00**	**CARBON 16K 1/4W**
R8	**1-246-497-00**	**CARBON 10K 1/4W**
R9	**1-246-481-00**	**CARBON 2.2K 1/4W**
R10	**1-246-497-00**	**CARBON 10K 1/4W**
R12	**1-246-497-00**	**CARBON 10K 1/4W**
R13	**1-246-497-00**	**CARBON 10K 1/4W**
R14	**1-246-521-00**	**CARBON 100K 1/4W**
R15	**1-246-449-00**	**CARBON 100 1/4W**
R16	**1-246-449-00**	**CARBON 100 1/4W**
R17	**1-215-245-00**	**METAL OXIDE 24 1W**
R18	**1-215-245-00**	**METAL OXIDE 24 1W**
R19	**1-246-497-00**	**CARBON 10K 1/4W**
R20	**1-246-497-00**	**CARBON 10K 1/4W**
R21	**1-206-664-00**	**METAL OXIDE 1K 2W**
R22	**1-246-481-00**	**CARBON 2.2K 1/4W**
R23	**1-246-479-00**	**CARBON 1.8K 1/4W**
R24	**1-246-489-00**	**CARBON 4.7K 1/4W**
R25	**1-246-496-00**	**CARBON 9.1K 1/4W**

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Ref. No.	Parts No.	Description
R26	1-246-483-00	CARBON 2.7K 1/4W
R27	1-246-485-00	CARBON 3.3K 1/4W
R28	1-246-491-00	CARBON 5.6K 1/4W
R29	1-246-483-00	CARBON 2.7K 1/4W
R30	1-246-481-00	CARBON 2.2K 1/4W
R31	1-246-481-00	CARBON 2.2K 1/4W
R32	1-246-513-00	CARBON 4.7K 1/4W
R33	1-246-497-00	CARBON 10K 1/4W
R34	1-246-483-00	CARBON 2.7K 1/4W
R35	1-246-473-00	CARBON 1K 1/4W
R36	1-246-449-00	CARBON 100 1/4W
R37	1-246-449-00	CARBON 100 1/4W
R38	1-206-640-00	METAL OXIDE 100 2W
R39	1-244-873-00	CARBON 1K 5% 1/2W
R40	1-246-485-00	CARBON 3.3K 5% 1/4W
R41	1-246-489-00	CARBON 4.7K 1/4W
R42	1-246-491-00	CARBON 5.6K 5% 1/4W
R43	1-246-483-00	CARBON 2.7K 5% 1/4W
R44	1-246-481-00	CARBON 2.2K 5% 1/4W
R45	1-246-497-00	CARBON 10K 1/4W
R46	1-246-481-00	CARBON 2.2K 5% 1/4W
R47	1-246-483-00	CARBON 2.7K 5% 1/4W
R48	1-246-518-00	CARBON 75K 5% 1/4W
R49	1-246-497-00	CARBON 10K 5% 1/4W
R50	1-246-505-00	CARBON 22K 5% 1/4W
R51	1-246-505-00	CARBON 22K 5% 1/4W
R52	1-246-497-00	CARBON 10K 5% 1/4W
RY1	1-515-441-00	6V, 100Ω
T1	1-447-194-00	CONVERTER
VDR1	1-806-504-00	ERZ-C05DK820 82V
VR1	1-226-771-00	METAL 1K
VR2	1-226-771-00	METAL 1K
VR3	1-226-771-00	METAL 1K
VR4	1-226-771-00	METAL 1K

Ref. No.	Parts No.	Description
SD-2 BOARD		
	A-7615-092-A	ADJUSTED CIRCUIT BOARD "SD-2" (NTSC, PAL-M)
	A-7615-093-A	ADJUSTED CIRCUIT BOARD "SD-2" (PAL)
	1-560-427-00	RECEPTACLE, 45P MALE
C9	1-123-617-00	ELECT 10 20% 16V
C10	1-102-106-00	CERAMIC 100PF 10% 50V
C15	1-123-607-00	ELECT 0.1 20% 50V
C16	1-123-617-00	ELECT 10 20% 16V
C17	1-123-617-00	ELECT 10 20% 16V
C18	1-102-106-00	CERAMIC 100PF 10% 50V
C22	1-123-617-00	ELECT 10 20% 16V
C23	1-102-106-00	CERAMIC 100PF 10% 50V
C31	1-123-617-00	ELECT 10 20% 16V
C33	1-123-617-00	ELECT 10 20% 16V
C34	1-123-617-00	ELECT 10 20% 16V
C41	1-161-013-00	CERAMIC 0.01 10% 25V
C43	1-161-013-00	CERAMIC 0.01 10% 25V
C45	1-161-013-00	CERAMIC 0.01 10% 25V
C47	1-161-013-00	CERAMIC 0.01 10% 25V
C49	1-161-013-00	CERAMIC 0.01 10% 25V
C50	1-102-106-00	CERAMIC 100PF 10% 50V
C51	1-102-106-00	CERAMIC 100PF 10% 50V
C52	1-102-106-00	CERAMIC 100PF 10% 50V
C54	1-123-611-00	ELECT 1 20% 50V
C55	1-102-106-00	CERAMIC 100PF 10% 50V
C56	1-102-106-00	CERAMIC 100PF 10% 50V
D1	8-719-815-55	1S1555
D2	8-719-815-55	1S1555
D3	8-719-815-55	1S1555
D4	8-719-100-23	RD4.3EB2
D5	8-719-100-23	RD4.3EB2
IC1	8-759-240-69	TC4069UBP: TOSHIBA
IC2	8-759-240-11	TC4011BP: TOSHIBA
IC3	8-759-240-49	TC4049BP: TOSHIBA
IC4	8-759-245-28	TC4528BP: TOSHIBA
IC5	8-759-245-28	TC4528BP: TOSHIBA

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Ref. No.	Parts No.	Description
IC6	8-759-245-28	TC4528BP: TOSHIBA
IC7	8-759-245-28	TC4528BP: TOSHIBA
IC8	8-759-245-28	TC4528BP: TOSHIBA
IC9	8-759-240-53	TC4053BP: TOSHIBA
IC10	8-759-240-53	TC4053BP: TOSHIBA
IC11	8-759-245-28	TC4528BP: TOSHIBA
IC12	8-759-245-28	TC4528BP: TOSHIBA
IC13	8-759-103-19	μPC319C: NEC
IC14	8-759-240-50	TC4050BP: TOSHIBA
IC15	8-759-900-04	SN74LS04N: TI
IC16	8-759-900-00	SN74LS00N: TI
IC17	8-759-900-10	SN74LS10N: TI
IC18	8-759-900-00	SN74LS00N: TI
IC19	8-759-900-04	SN74LS04N: TI
L1	1-407-164-XX	MICRO 39 (NTSC, PAL-M)
L1	1-407-161-XX	MICRO 22 (PAL)
Q1	8-729-606-32	2SC2603
Q2	8-729-117-54	2SA1175
Q3	8-729-606-32	2SC2603
Q4	8-729-606-32	2SC2603
Q5	8-729-117-54	2SA1175
Q6	8-729-606-32	2SC2603
Q7	8-729-606-32	2SC2603
Q8	8-729-606-32	2SC2603
Q9	8-729-117-54	2SA1175
Q10	8-729-117-54	2SA1175
Q11	8-729-606-32	2SC2603
Q12	8-729-606-32	2SC2603
Q13	8-729-117-54	2SA1175
Q14	8-729-606-32	2SC2603
Q15	8-729-113-32	2SB733
Q16	8-729-113-32	2SB733
Q17	8-729-606-32	2SC2603
Q18	8-729-606-32	2SC2603
Q19	8-729-117-54	2SA1175
Q20	8-729-606-32	2SC2603
Q21	8-729-606-32	2SC2603
Q22	8-729-117-54	2SA1175
Q23	8-729-606-32	2SC2603
Q24	8-729-606-32	2SC2603
Q25	8-729-117-54	2SA1175

Ref. No.	Parts No.	Description
Q26	8-729-117-54	2SA1175
Q27	8-729-117-54	2SA1175
Q28	8-729-606-32	2SC2603
Q29	8-729-606-32	2SC2603
Q30	8-729-117-54	2SA1175
Q31	8-729-117-54	2SA1175
Q32	8-729-117-54	2SA1175
RV1	1-226-772-00	METAL 4.7K
RV2	1-226-773-00	METAL 22K
RV3	1-226-773-00	METAL 22K
RV4	1-226-711-00	SOLID 22K
RV5	1-226-774-00	METAL 47K
RV6	1-226-702-00	METAL 2.2K
RV7	1-226-773-00	METAL 22K
RV8	1-226-711-00	SOLID 22K
RV9	1-226-772-00	METAL 4.7K
RV10	1-226-773-00	METAL 22K
RV11	1-226-772-00	METAL 4.7K
RV12	1-226-775-00	METAL 100K
RV13	1-226-774-00	METAL 47K
RV14	1-226-775-00	METAL 100K
RV15	1-226-776-00	METAL 220K
RV16	1-226-711-00	SOLID 22K
RV17	1-226-711-00	SOLID 22K
TH1	1-800-202-XX	S-10K

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Ref. No.	Parts No.	Description
SG-35 BOARD (NTSC)		
	A-7511-518-A	MOUNTED CIRCUIT BOARD "SG-35"
C1	1-161-013-00	CERAMIC 0.01 10% 25V
C2	1-161-013-00	CERAMIC 0.01 10% 25V
C3	1-131-377-00	TANTALUM 10 10% 10V
C5	1-131-344-00	TANTALUM 0.33 10% 35V
C6	1-131-341-00	TANTALUM 0.1 10% 35V
C8	1-131-341-00	TANTALUM 0.1 10% 35V
C9	1-161-013-00	CERAMIC 0.01 10% 25V
C10	1-131-380-00	TANTALUM 33 10% 10V
C11	1-131-374-00	TANTALUM 33 10% 16V
C12	1-131-374-00	TANTALUM 33 10% 16V
C13	1-107-208-00	MICA 18PF 5% 500V
C14	1-161-013-00	CERAMIC 0.01 10% 25V
C15	1-131-377-00	TANTALUM 10 10% 10V
C17	1-161-013-00	CERAMIC 0.01 10% 25V
C18	1-131-377-00	TANTALUM 10 10% 10V
C20	1-131-377-00	TANTALUM 10 10% 10V
C21	1-131-380-00	TANTALUM 33 10% 10V
C22	1-161-013-00	CERAMIC 0.01 10% 25V
C24	1-131-347-00	TANTALUM 1 10% 35V
C26	1-161-013-00	CERAMIC 0.01 10% 25V
C27	1-161-013-00	CERAMIC 0.01 10% 25V
C28	1-131-380-00	TANTALUM 33 10% 10V
C30	1-161-013-00	CERAMIC 0.01 10% 25V
C31	1-161-039-00	CERAMIC 0.001 10% 25V
C33	1-161-013-00	CERAMIC 0.01 10% 25V
C34	1-131-341-00	TANTALUM 0.1 10% 35V
C35	1-131-370-00	TANTALUM 6.8 10% 16V
C36	1-131-377-00	TANTALUM 10 10% 10V
C37	1-161-013-00	CERAMIC 0.01 10% 25V
C38	1-107-208-00	MICA 18PF 5% 500V
C39	1-161-013-00	CERAMIC 0.01 10% 25V
C40	1-131-341-00	TANTALUM 0.1 10% 35V
C41	1-131-370-00	TANTALUM 6.8 10% 16V
C42	1-131-380-00	TANTALUM 33 10% 10V
C43	1-109-154-00	MICA 240PF 5% 300V
C44	1-108-227-00	MYLAR 0.001 10% 50V
C45	1-102-363-00	CERAMIC 0.001 50V
C46	1-102-242-00	CERAMIC 3PF ±0.5PF 50V
C47	1-102-363-00	CERAMIC 0.001 50V
C48	1-102-246-00	CERAMIC 47PF 10% 150V
C49	1-102-246-00	CERAMIC 47PF 10% 150V
C50	1-102-246-00	CERAMIC 47PF 10% 150V
C51	1-102-246-00	CERAMIC 47PF 10% 150V
C52	1-102-246-00	CERAMIC 47PF 10% 150V
C53	1-102-246-00	CERAMIC 47PF 10% 150V
C54	1-102-246-00	CERAMIC 47PF 10% 150V
C55	1-102-246-00	CERAMIC 47PF 10% 150V
C56	1-102-246-00	CERAMIC 47PF 10% 150V
C57	1-102-246-00	CERAMIC 47PF 10% 150V
C58	1-102-246-00	CERAMIC 47PF 10% 150V
C59	1-102-363-00	CERAMIC 0.001 50V
C60	1-131-369-00	TANTALUM 4.7 10% 16V
C61	1-107-177-00	MICA 220PF 5% 500V
C62	1-161-013-00	CERAMIC 0.01 10% 25V
C63	1-102-246-00	CERAMIC 47PF 10% 150V
D1	8-719-911-19	1SS119
D2	8-719-911-19	1SS119
IC1	8-759-131-11	μPC311C: NEC
IC2	8-759-901-07	SN74LS107AN: TI
IC3	8-759-902-21	SN74LS221N: TI
IC4	8-757-731-00	CX773A: SONY
IC5	8-759-990-82	TL082CP: TI
IC6	8-757-903-00	CX7903: SONY
IC7	8-759-901-23	SN74LS123N: TI
IC8	8-759-990-82	TL082CP: TI
IC9	8-759-240-53	TC4053BP: TOSHIBA
IC10	8-759-220-00	TC40H000P: TOSHIBA
IC11	8-759-902-21	SN74LS221N: TI
IC12	8-759-045-57	MC14557BCP: MOTOROLA
IC13	8-759-240-11	TC4011BP: TOSHIBA
L1	1-407-169-XX	MICRO 100
L2	1-407-169-XX	MICRO 100
L3	1-407-163-XX	MICRO 33
L4	1-407-164-XX	MICRO 39
L5	1-408-021-00	MICRO 150
L6	1-407-164-XX	MICRO 39
L7	1-407-164-XX	MICRO 39
L8	1-407-164-XX	MICRO 39
L9	1-407-164-XX	MICRO 39
L10	1-407-164-XX	MICRO 39

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Ref. No.	Parts No.	Description
L11	1-407-164-XX	MICRO 39
L12	1-407-164-XX	MICRO 39
Q1	8-729-603-50	2SC403SP
Q2	8-729-178-54	2SC2785
Q3	8-729-178-54	2SC2785
Q4	8-729-117-54	2SA1175
Q5	8-729-117-54	2SA1175
Q6	8-729-178-54	2SC2785
Q7	8-729-117-54	2SA1175
Q8	8-729-603-50	2SC403SP
Q9	8-729-603-50	2SC403SP
Q10	8-765-212-20	2SA925
Q11	8-765-212-20	2SA925
Q12	8-729-117-54	2SA1175
Q13	8-729-603-50	2SC403SP
R72	1-214-173-00	METAL 51K 1% 1/4W
R82	1-214-170-00	METAL 39K 1% 1/4W
RV1	1-226-772-00	METAL 4.7K
RV2	1-226-774-00	METAL 47K
RV3	1-226-774-00	METAL 47K
RV4	1-226-703-00	METAL 10K
S1	1-553-429-00	SLIDE
VCO1	1-527-478-00	14.31818MHz

Ref. No.	Parts No.	Description
SG-34 BOARD		
	A-7511-520-A	MOUNTED CIRCUIT BOARD "SG-34" (PAL)
	A-7511-652-A	MOUNTED CIRCUIT BOARD "SG-34" (PAL-M)
C1	1-161-013-00	CERAMIC 0.01 10% 25V
C2	1-161-013-00	CERAMIC 0.01 10% 25V
C3	1-131-377-00	TANTALUM 10 10% 10V
C5	1-131-344-00	TANTALUM 0.33 10% 35V
C6	1-131-341-00	TANTALUM 0.1 10% 35V
C8	1-131-341-00	TANTALUM 0.1 10% 35V
C9	1-161-013-00	CERAMIC 0.01 10% 25V
C10	1-131-380-00	TANTALUM 33 10% 10V
C11	1-131-374-00	TANTALUM 33 10% 16V
C12	1-131-374-00	TANTALUM 33 10% 16V
C14	1-161-013-00	CERAMIC 0.01 10% 25V
C15	1-131-377-00	TANTALUM 10 10% 10V
C17	1-161-013-00	CERAMIC 0.01 10% 25V
C18	1-131-377-00	TANTALUM 10 10% 10V
C19	1-108-227-00	MYLAR 0.001 10% 50V
C20	1-131-377-00	TANTALUM 10 10% 10V
C21	1-131-380-00	TANTALUM 33 10% 10V
C23	1-131-347-00	TANTALUM 1 10% 35V
C25	1-161-013-00	CERAMIC 0.01 10% 25V
C26	1-161-013-00	CERAMIC 0.01 10% 25V
C27	1-131-380-00	TANTALUM 33 10% 10V
C28	1-161-013-00	CERAMIC 0.01 10% 25V
C29	1-131-380-00	TANTALUM 47 10% 10V
C30	1-131-369-00	TANTALUM 4.7 10% 16V
C31	1-131-380-00	TANTALUM 47 10% 10V
C33	1-161-013-00	CERAMIC 0.01 10% 25V
C34	1-161-039-00	CERAMIC 0.001 10% 25V
C36	1-161-013-00	CERAMIC 0.01 10% 25V
C37	1-131-341-00	TANTALUM 0.1 10% 35V
C38	1-131-370-00	TANTALUM 6.8 10% 16V
C39	1-131-377-00	TANTALUM 10 10% 10V
C40	1-161-013-00	CERAMIC 0.01 10% 25V
C41	1-107-208-00	MICA 18PF 5% 500V
C42	1-161-013-00	CERAMIC 0.01 10% 25V
C43	1-131-341-00	TANTALUM 0.1 10% 35V
C44	1-131-370-00	TANTALUM 6.8 10% 16V
C45	1-102-363-00	CERAMIC 0.001 50V
C46	1-102-242-00	CERAMIC 3PF ±0.5PF 50V
C47	1-102-363-00	CERAMIC 0.001 50V
C48	1-102-246-00	CERAMIC 47PF 10% 150V

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Ref. No.	Parts No.	Description
C49	1-102-246-00	CERAMIC 47PF 10% 150V
C50	1-102-246-00	CERAMIC 47PF 10% 150V
C51	1-102-246-00	CERAMIC 47PF 10% 150V
C52	1-102-246-00	CERAMIC 47PF 10% 150V
C53	1-102-246-00	CERAMIC 47PF 10% 150V
C54	1-102-246-00	CERAMIC 47PF 10% 150V
C55	1-102-246-00	CERAMIC 47PF 10% 150V
C56	1-102-246-00	CERAMIC 47PF 10% 150V
C57	1-102-246-00	CERAMIC 47PF 10% 150V
C58	1-102-246-00	CERAMIC 47PF 10% 150V
C59	1-102-246-00	CERAMIC 47PF 10% 150V
C60	1-102-363-00	CERAMIC 0.001 50V
C61	1-161-013-00	CERAMIC 0.01 10% 25V
C62	1-131-369-00	TANTALUM 4.7 10% 16V
C64	1-161-013-00	CERAMIC 0.01 10% 25V
C65	1-102-246-00	CERAMIC 47PF 10% 150V
C66	1-107-157-00	MICA 27PF 5% 500V (PAL)
D1	8-719-911-19	1SS119
IC1	8-759-131-11	μPC311C: NEC
IC2	8-759-901-07	SN74LS107AN: TI
IC3	8-759-902-21	SN74LS221N: TI
IC4	8-757-731-00	CX773A: SONY
IC5	8-759-990-82	TL082CP: TI
IC6	8-757-903-00	CX7903: SONY
IC7	8-759-901-23	SN74LS123N: TI
IC8	8-759-990-82	TL082CP: TI
IC9	8-759-240-53	TC4053BP: TOSHIBA
IC10	8-759-240-11	TC4011BP: TOSHIBA
L1	1-407-169-XX	MICRO 100
L2	1-407-169-XX	MICRO 100
L3	1-407-163-XX	MICRO 33
L4	1-407-164-XX	MICRO 39
L5	1-408-355-00	MICRO 100
L6	1-407-164-XX	MICRO 39
L7	1-407-164-XX	MICRO 39
L8	1-407-164-XX	MICRO 39
L9	1-407-164-XX	MICRO 39
L10	1-407-164-XX	MICRO 39
L11	1-407-164-XX	MICRO 39
L12	1-407-163-XX	MICRO 33
L13	1-407-164-XX	MICRO 39
L14	1-408-356-00	MICRO 120 (PAL)

Ref. No.	Parts No.	Description
Q1	8-729-603-50	2SC403SP
Q2	8-729-178-54	2SC2785
Q3	8-729-178-54	2SC2785
Q4	8-729-117-54	2SA1175
Q5	8-729-117-54	2SA1175
Q6	8-729-178-54	2SC2785
Q7	8-729-117-54	2SA1175
Q8	8-729-603-50	2SC403SP
Q9	8-729-603-50	2SC403SP
Q10	8-765-212-20	2SA925
Q11	8-765-212-20	2SA925
Q12	8-729-117-54	2SA1175
Q13	8-723-304-00	2SK43-4
Q14	8-729-603-50	2SC403SP
R51	1-246-481-00	CARBON 2.2K 5% 1/4W
RV1	1-226-772-00	METAL 4.7K
RV2	1-226-703-00	METAL 10K
VCO1	1-527-585-00	17.734475MHz (PAL)
VCO1	1-527-798-00	14.3024MHz (PAL-M)
VCO2	1-527-729-00	14.1875MHz (PAL)
VCO2	1-527-478-00	14.31818MHz (PAL-M)

NOTE:

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   Replace only with same components as specified.

2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

WP ASSY, WP-11, WP-12

Ref. No.	Parts No.	Description
WP ASSY BOARD		
	A-7615-131-A	ADJUSTED CIRCUIT BOARD (NTSC, PAL-M)
	A-7615-132-A	ADJUSTED CIRCUIT BOARD (PAL)
WP-11 BOARD		
C1	1-124-143-00	ELECT 100 20% 16V
C3	1-124-289-00	ELECT (NONPOLAR) 33 20% 10V
C4	1-123-611-00	ELECT 1 20% 50V
C5	1-123-821-00	ELECT 47 20% 16V
Q1	8-729-606-32	2SC2603
Q2	8-729-606-32	2SC2603
Q3	8-729-117-54	2SA1175
Q4	8-729-606-32	2SC2603
Q5	8-729-606-32	2SC2603
Q6	8-729-117-54	2SA1175
Q7	8-729-606-32	2SC2603

Ref. No.	Parts No.	Description
WP-12 BOARD		
C1	1-102-106-00	CERAMIC 100PF 10% 50V
C2	1-102-106-00	CERAMIC 100PF 10% 50V
C6	1-123-617-00	ELECT 10 20% 16V
C7	1-123-617-00	ELECT 10 20% 16V
C9	1-123-617-00	ELECT 10 20% 16V
C10	1-123-617-00	ELECT 10 20% 16V
C11	1-161-013-00	CERAMIC 0.01 10% 25V
C12	1-123-617-00	ELECT 10 20% 16V
C13	1-123-617-00	ELECT 10 20% 16V
C14	1-123-617-00	ELECT 10 20% 16V
C15	1-123-617-00	ELECT 10 20% 16V
C16	1-102-106-00	CERAMIC 100PF 10% 50V
C17	1-102-106-00	CERAMIC 100PF 10% 50V
C18	1-131-361-00	TANTALUM 2.2 20% 20V
C22	1-123-608-00	ELECT 0.22 20% 50V
C24	1-123-617-00	ELECT 10 20% 16V
C26	1-123-617-00	ELECT 10 20% 16V
C27	1-123-617-00	ELECT 10 20% 16V
C28	1-161-013-00	CERAMIC 0.01 10% 25V
C29	1-123-617-00	ELECT 10 20% 16V
C30	1-123-617-00	ELECT 10 20% 16V
C32	1-123-607-00	ELECT 0.1 20% 50V
C33	1-123-617-00	ELECT 10 20% 16V
C34	1-123-617-00	ELECT 10 20% 16V
C35	1-161-013-00	CERAMIC 0.01 10% 25V
C36	1-123-617-00	ELECT 10 20% 16V
C37	1-123-617-00	ELECT 10 20% 16V
C39	1-161-013-00	CERAMIC 0.01 10% 25V
C41	1-161-013-00	CERAMIC 0.01 10% 25V
C43	1-161-013-00	CERAMIC 0.01 10% 25V
C44	1-102-106-00	CERAMIC 100PF 10% 50V
C45	1-102-106-00	CERAMIC 100PF 10% 50V
C46	1-102-114-00	CERAMIC 470PF 10% 50V
C47	1-102-114-00	CERAMIC 470PF 10% 50V
C48	1-102-114-00	CERAMIC 470PF 10% 50V
C49	1-102-114-00	CERAMIC 470PF 10% 50V
C50	1-161-039-00	CERAMIC 0.001 10% 25V
C51	1-161-039-00	CERAMIC 0.001 10% 25V
CN1	1-560-427-00	RECEPTACLE, 45P MALE

NOTE:

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2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

Ref. No.	Parts No.	Description
D1	8-719-815-55	1S1555
D2	8-719-815-55	1S1555
D3	8-719-815-55	1S1555
D4	8-719-815-55	1S1555
D5	8-719-815-55	1S1555
D6	8-719-815-55	1S1555
D7	8-719-815-55	1S1555
D8	8-719-815-55	1S1555
D9	8-719-815-55	1S1555
D10	8-719-815-55	1S1555
D11	8-719-815-55	1S1555
D12	8-719-815-55	1S1555
D13	8-719-815-55	1S1555
D14	8-719-815-55	1S1555
D15	8-719-815-55	1S1555
D16	8-719-904-73	1S2473VE
IC1	8-759-240-51	TC4051BP: TOSHIBA
IC2	8-759-240-51	TC4051BP: TOSHIBA
IC3	8-759-240-51	TC4051BP: TOSHIBA
Q1	8-729-117-54	2SA1175
Q2	8-729-606-32	2SC2603
Q3	8-729-117-54	2SA1175
Q4	8-729-606-32	2SC2603
Q5	8-729-117-54	2SA1175
Q6	8-729-117-54	2SA1175
Q7	8-729-606-32	2SC2603
Q8	8-729-117-54	2SA1175
Q9	8-729-117-54	2SA1175
Q10	8-729-606-32	2SC2603
Q11	8-729-606-32	2SC2603
Q12	8-729-606-32	2SC2603
Q13	8-729-606-32	2SC2603
Q14	8-729-117-54	2SA1175
Q15	8-729-606-32	2SC2603
Q16	8-729-606-32	2SC2603
Q17	8-729-606-32	2SC2603
Q18	8-729-606-32	2SC2603
Q19	8-729-606-32	2SC2603
Q20	8-729-606-32	2SC2603
Q21	8-729-117-54	2SA1175
Q22	8-729-606-32	2SC2603
Q23	8-729-117-54	2SA1175
Q24	8-729-606-32	2SC2603
Q25	8-729-117-54	2SA1175

Ref. No.	Parts No.	Description
Q26	8-729-117-54	2SA1175
Q27	8-729-606-32	2SC2603
Q28	8-729-117-54	2SA1175
Q29	8-729-117-54	2SA1175
Q30	8-729-606-32	2SC2603
Q31	8-729-606-32	2SC2603
Q32	8-729-606-32	2SC2603
Q33	8-729-606-32	2SC2603
Q34	8-729-117-54	2SA1175
Q35	8-729-606-32	2SC2603
Q36	8-729-606-32	2SC2603
Q37	8-729-606-32	2SC2603
Q38	8-729-606-32	2SC2603
Q39	8-729-606-32	2SC2603
Q40	8-729-117-54	2SA1175
Q41	8-729-117-54	2SA1175
Q42	8-729-606-32	2SC2603
Q43	8-729-117-54	2SA1175
Q44	8-729-606-32	2SC2603
Q45	8-729-606-32	2SC2603
Q46	8-729-606-32	2SC2603
Q47	8-729-117-54	2SA1175
Q48	8-729-117-54	2SA1175
Q49	8-729-606-32	2SC2603
Q50	8-729-606-32	2SC2603
Q51	8-729-606-32	2SC2603
Q52	8-729-117-54	2SA1175
Q53	8-729-117-54	2SA1175
Q54	8-729-606-32	2SC2603
Q55	8-729-606-32	2SC2603
Q56	8-729-606-32	2SC2603
Q57	8-723-304-00	2SK43-4
Q58	8-723-304-00	2SK43-4
Q59	8-723-304-00	2SK43-4
Q60	8-723-304-00	2SK43-4
Q61	8-729-606-32	2SC2603
Q62	8-729-606-32	2SC2603
Q63	8-729-606-32	2SC2603
Q64	8-729-606-32	2SC2603
Q65	8-729-606-32	2SC2603
Q66	8-729-606-32	2SC2603
Q67	8-729-606-32	2SC2603
Q68	8-729-606-32	2SC2603
Q69	8-729-606-32	2SC2603
Q70	8-729-117-54	2SA1175

NOTE:

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WP-12, FRAME

Ref. No.	Parts No.	Description
Q71	8-729-606-32	2SC2603
Q72	8-729-117-54	2SA1175
Q73	8-729-117-54	2SA1175
Q74	8-729-606-32	2SC2603
RV1	1-226-702-00	METAL 2.2K
RV2	1-226-703-00	METAL 10K
RV3	1-226-772-00	METAL 4.7K
RV4	1-226-703-00	METAL 10K
RV5	1-226-772-00	METAL 4.7K
RV6	1-226-772-00	METAL 4.7K
RV7	1-226-772-00	METAL 4.7K
RV8	1-226-702-00	METAL 2.2K
RV9	1-226-703-00	METAL 10K
RV10	1-226-772-00	METAL 4.7K
RV11	1-226-703-00	METAL 10K
RV12	1-226-772-00	METAL 4.7K
RV13	1-226-703-00	METAL 10K
RV14	1-226-703-00	METAL 10K
RV15	1-226-772-00	METAL 4.7K
RV16	1-226-774-00	METAL 47K

NOTE:

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Ref. No.	Parts No.	Description
FRAME		
CN001 ~ CN026	1-561-336-00	RECEPTACLE, BNC
CN027	1-509-422-00	RECEPTACLE, 6P FEMALE "B/W CAMERA"
CN028	1-526-531-00	RECEPTACLE, 4P FEMALE "EXT DC IN 10 ~ 24V"
CN029 ~ CN032	1-509-501-00	RECEPTACLE, 4P MALE "TALLY/INTERCOM"
⚠CN36	1-509-547-00	~AC IN
⚠CN38	1-526-572-00	VOLTAGE SELECTOR (PAL, PAL-M)
CN40	1-508-055-00	RECEPTACLE, 6P MALE "EXT WIPE IN"
J101	1-507-465-00	POWER OUTSIDE "BATT-1 IN"
J102	1-507-465-00	POWER OUTSIDE "BATT-2 IN"
RV001 ~ RV004	1-228-491-00	CARBON 5K
RV005	1-228-442-00	CARBON 5K/5K "SOFTNESS/BORDER"
RV006	1-228-492-00	CARBON 20K "INTERCOM LEVEL"
RV007	1-226-917-00	CARBON 10K "SC PHASE"
RV008	1-226-917-00	CARBON 10K "H PHASE"
⚠S1	1-554-359-11	ROTARY POWER (NTSC)
⚠S1	1-554-359-21	ROTARY POWER (PAL, PAL-M)
⚠T1	1-447-154-00	"POWER" WITH CONNECTOR AND FASTEN RECEPTACLE (NTSC)
⚠T1	1-447-155-00	"POWER" WITH CONNECTOR AND FASTEN RECEPTACLE (PAL, PAL-M)
	1-509-921-00	CONNECTOR
	⚠1-535-047-00	FASTEN RECEPTACLE

Ref. No. Parts No. Description

12-4. PACKING MATERIAL AND ACCESSORIES (SUPPLIED)

⚠	**1-551-812-00**	**CORD, POWER (U/C)**
⚠	**1-556-760-11**	**CORD, POWER (PAL, PAL-M)**
	2-296-555-00	CARTON, INDIVIDUAL
	2-296-556-00	CUSHION, LOWER, LEFT
	2-296-557-00	CUSHION, LOWER, RIGHT
	2-296-558-00	CUSHION, UPPER
	3-701-641-00	BAG, POLY (FOR SEG-2000A/AP/APM)
	3-701-629-00	BAG, POLY (FOR CORD)
	3-701-630-00	BAG, POLY (FOR MANUAL)
⚠	**3-773-457-22**	**MANUAL, INSTRUCTION (U/C)**
⚠	**3-773-457-11**	**MANUAL, INSTRUCTION (PAL, PAL-M)**

12-5. JIG

J-6030-690-A EXTENSION BOARD, EX-20

NOTE:

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CARBON RESISTOR (1/6W)

±5%, 1/6W, non-special type
2.2Ω through 1MΩ

Parts No. 1-247-□□□-00

Value	Parts No. −□□□−
1Ω	–
1.1	–
1.2	–
1.3	–
1.5	–
1.6	–
1.8	–
2	–
2.2	767
2.4	768
2.7	769
3	770
3.3	771
3.6	772
3.9	773
4.3	774
4.7	775
5.1	776
5.6	777
6.2	778
6.8	779
7.5	780
8.2	781
9.1	782
10Ω	783
11	784
12	785
13	786
15	787
16	788
18	789
20	790
22	791
24	792
27	793
30	794
33	795

Value	Parts No. −□□□−
36Ω	796
39	797
43	798
47	799
51	800
56	801
62	802
68	803
75	804
82	805
91	806
100Ω	807
110	808
120	809
130	810
150	811
160	812
180	813
200	814
220	815
240	816
270	817
300	818
330	819
360	820
390	821
430	822
470	823
510	824
560	825
620	826
680	827
750	828
820	829
910	830
1kΩ	831
1.1	832

Value	Parts No. −□□□−
1.2kΩ	833
1.3	834
1.5	835
1.6	836
1.8	837
2	838
2.2	839
2.4	840
2.7	841
3	842
3.3	843
3.6	844
3.9	845
4.3	846
4.7	847
5.1	848
5.6	849
6.2	850
6.8	851
7.5	852
8.2	853
9.1	854
10kΩ	855
11	856
12	857
13	858
15	859
16	860
18	861
20	862
22	863
24	864
27	865
30	866
33	867
36	868
39	869

Value	Parts No. −□□□−
43kΩ	870
47	871
51	872
56	873
62	874
68	875
75	876
82	877
91	878
100kΩ	879
110	880
120	881
130	882
150	883
160	884
180	885
200	886
220	887
240	888
270	889
300	890
330	891
360	892
390	893
430	894
470	895
510	896
560	897
620	898
680	899
750	900
820	901
910	902
1MΩ	903