XV-T33F

SERVICE MANUAL

AEP Model
UK Model
Australian Model
E Model

Family Studio

SPECIFICATIONS

Connectors

Video input	Phono jack (1) Input signal: 1 Vp-p, 75 ohms unbalanced, sync negative
S video input	4-pin mini DIN connector (1) Luminance signal: 1 Vp-p, 75 ohms unbalanced, sync negative Chrominance signal: 0.286 Vp-p, 75 ohms unbalanced
Video output	Phono jack (1) Output signal: 1 Vp-p, 75 ohms unbalanced, sync negative
S video output	4-pin mini DIN connector (1) Luminance signal: 1 Vp-p, 75 ohms unbalanced, sync negative Chrominance signal: 0.286 Vp-p, 75 ohms unbalanced

General

Power requirements	240 V AC (for UK and Australia)/220 – 230 V AC (for other countries), 50/60 Hz
Power consumption	10 W
Operating temperature	0°C to 40°C (32°F to 104°F)
Operating humidity	20 % to 80 %
Dimensions	Approx. 360 × 73 × 257 mm (w/h/d) (14 1/4 × 2 7/8 × 10 1/8 inches)
Weight	Approx. 1.7 kg (3 lb 12 oz)
Supplied accessories	Video connecting cable (2) Drawing pen (1) Quick Reference Card (1 set) Operating Instructions (1)

Design and specifications are subject to change without notice.

Video Sketch Titler

SONY®

MICROFILM

TABLE OF CONTENTS

SAFETY CHECK-OUT

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

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

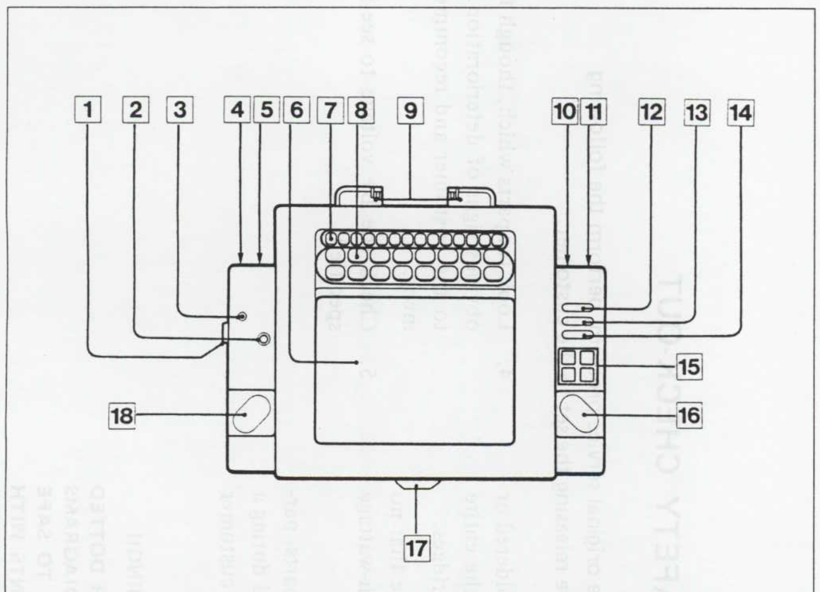
COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

This section is extracted from instruction manual.

SECTION 1 GENERAL

Identifying the Parts

Familiarize yourself with the parts of the titler before you start the operations.



1 **Power switch**
Switch on to turn on the power.

2 **CLEAR button**
Press to clear the screen.

3 **POWER indicator**
Lights up when the power goes on.

4 **S VIDEO input jack**
Use this jack to connect to the S video output jack of the player.

5 **VIDEO input jack**
Use this jack to connect to the video output jack of the player.

6 **Pad**
Use this pad to draw titles on using the supplied pen.

7 **Color select keys**
Select the colour of the title. (rainbow) chooses the rainbow colour (see "Rainbow Colours" on page 36). (T) chooses transparent.

8 **Drawing keys**
Select various ways to create a title. See "Function of the Drawing Keys" on page 9 for details.

9 **Pen holder**
Lay the supplied pen on this holder.

10 **S VIDEO output jack**
Use this jack to connect to the S video input jack of the recorder.

Identifying the Parts

11 **VIDEO output jack**
Use this jack to connect to the video input jack of the recorder.

12 **SUPERIMPOSE button and indicator**
You can superimpose titles on the video picture when the indicator lights up. Each time you press this button, the indicator lights up and goes out alternately.

Indicator	What you see on the screen
On	The title on the video picture
Off	The title only

13 **1 PAGE 2 button and indicators**
The video sketch titler has two screens to create and scroll titles with. These screens are called PAGE 1 and PAGE 2. Select the screen you want to work on. Each time you press this button, the indicators of PAGE 1 and PAGE 2 light up alternately.

Indicator	You are working on
PAGE 1 is on	The title on page 1
PAGE 2 is on	The title on page 2

14 **DRAW STANDBY button and indicators**
Select the mode for creating and scrolling the titles.
Each time you press this button, the DRAW and STANDBY indicators light up alternately.

Indicator	You are
DRAW is on	Creating the title
STANDBY is on	Ready to scroll the title

15 **WIPE PATTERN buttons and indicators**
Select how to scroll the title.
When you press the button, the indicator lights up.
The following table shows the function of each button.

Button	How the title scrolls
	Appears and disappears instantly
	Scrolls from the bottom upwards
	Scrolls from the top downwards
	Appears from the center and scrolls outwards or disappears as it goes from the title edge to the center

16 **DRAW/WIPE OUT button**
Press when creating a title. Also, press to make the title disappear.

17 **Quick reference card**
Use the card to conveniently refer to the use of the titler.

18 **DRAW/WIPE IN button**
Press when creating a title. Also, press to scroll in the title.

Function of the Drawing Keys

The following table shows the function of the drawing keys.

Drawing key	Function	Reference page
	Draw a square.	25
	Draw a circle.	25
	Draw a caption.	25
	Draw a wooden board.	25
	Draw a wooden line.	25
ABC	Select a letter.	15, 23
MENU	Select a sample title and illustration.	24
	Erase a title and illustration.	29
	Draw a thin curved line.	24
	Draw a thick curved line.	24
	Draw an outlined curved line.	24
	Draw a checkered curved line.	24
	Draw an outlined straight line.	25
	Paint a title and illustration.	27
	Copy a title and illustration.	28
	Undo a previous action.	29

Connecting Video Equipment

Connect the titler to video equipment before you start using the titler. This section explains two ways to connect video equipment, basic connection and connection using the S video jacks.

Video Equipment Used with the Titler

When using the titler, you need the following video equipment for connection:
- a TV or a monitor for creating titles and viewing the video picture
- a VCR or a video camera recorder for playing the original videotapes (player)
- a VCR for recording the titles and original tapes combined (recorder)

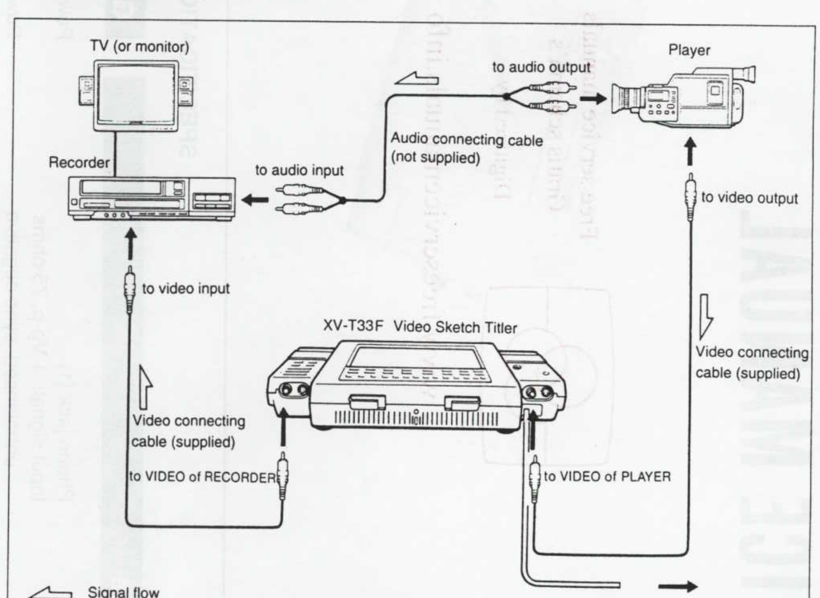
Note on Connection

Be sure to turn off the power of the titler and video equipment before connection.

About the player and the recorder
- Connect the red plug to the audio right jack (red) and the white plug to the audio left jack (white).
- Connect the yellow plug to the video jack (yellow).
- When the player or the recorder is a monaural type, use a monaural A/V connecting cable such as VMC-910MS/920MS (phono plug X 2 - phono plug X 3) (not supplied).
- When both the player and the recorder have the S video jacks, we recommend you to use the S video jacks with optional cables such as YC-15V/30V/15EV/30EV.

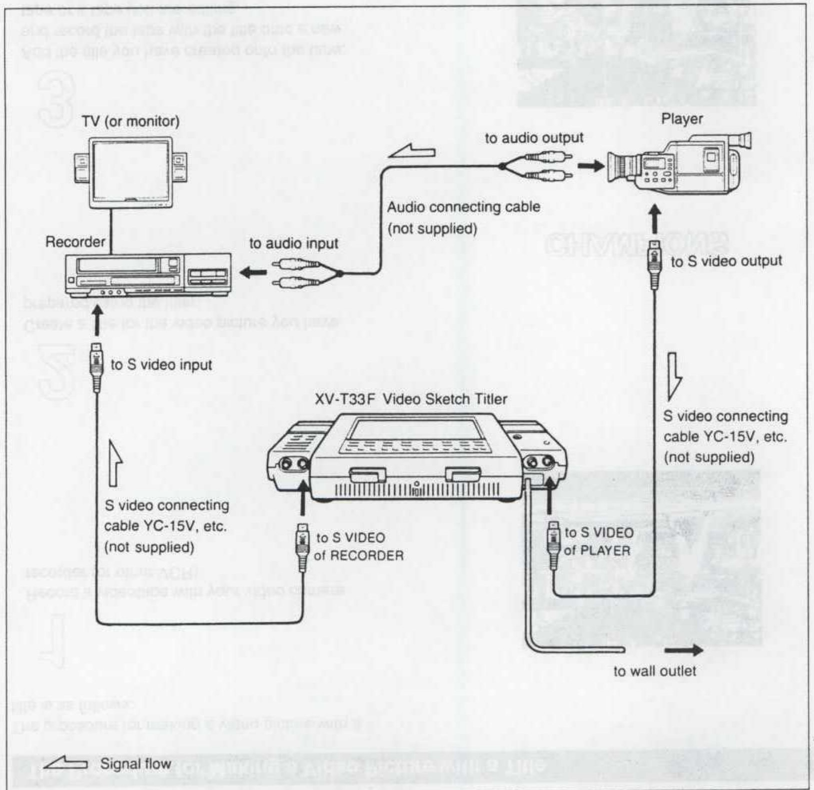
Basic Connection

The following illustration shows the connection of the titler with the video equipment.



Connection Using the S Video Jacks

The following illustration shows the connection of the titler with video equipment that has the S video jacks.



When using the S video jacks

When you use either the video input jack or the S video input jack to input the signal from the player, the signal is output from both the video output jack and the S video output jack. But to get a clearer picture from the player, we recommend you to use the S video jacks of the player and the recorder when using the S video jacks of the titler, or use the video jacks of the player and the recorder when using the video jacks of the titler.

Before You Begin

Before using the titler, check the connections and prepare the player and the recorder as follows:

Connection

Check that the player and the recorder are connected to the titler. If not, refer to page 10.

Player

- Insert the originally recorded tape.
- When the player has an input/output selector for the audio/video jacks, set it to ON (or output).
- Set the power switch to VTR (PLAYER) (or ON).

Recorder

- Insert a tape for recording. Check that the safety tab is not in the preventive position.
- Set the input selector to LINE IN.
- Make the necessary settings for recording such as recording mode, recording level, etc. See the operating instructions of the recorder for details.

Trying Out the Titler

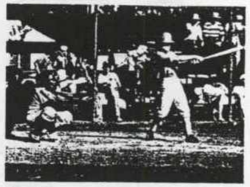
To demonstrate the titler's most basic operations, this section shows how to create a simple title and add the title to a video picture. It is helpful for beginners who want to start using the titler right away. For details about the basic operations demonstrated in this section, see "Basic Operations" on page 20. More advanced operations are detailed in "Advanced Operations" on page 31.

The Procedure for Making a Video Picture with a Title

The procedure for making a video picture with a title is as follows:

1

Record a videotape with your video camera recorder (or other VCR).



2

Create a title for the video picture you have prepared using the titler.

3

Add the title you have created onto the tape, and record the tape with the title onto a new tape or a tape you are editing.

Trying Out the Titler

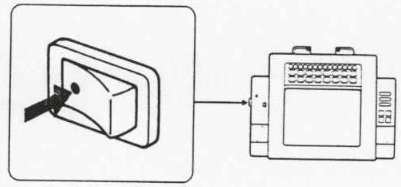
Getting Started

The titler provides a demonstration picture of sample titles when you turn on the power. This demonstration shows you what you can do with the titler.

1 Turn on the power of the video equipment.

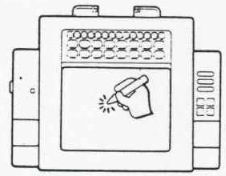
2 Turn on the power of the titler.

The demonstration appears on the screen.



3 When you finish looking at the demonstration or want to exit from it, touch the pad with the drawing pen.

The demonstration stops. Now, you can start creating your own titles.



To stop using the titler
Turn off the power of the titler.

Note
Once you turn off the power, the title you have created is lost.

Creating a Title

Create a title using the letters of the alphabet.
For example, create the word "CHAMPIONS" in the center of the screen as shown below.

CHAMPIONS

Before you begin
We use the following words in this manual:

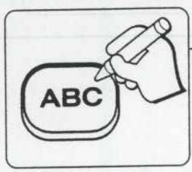
choose: Move the icon on the monitor by moving the pen on the pad, then press either DRAW/WIPE IN or DRAW/WIPE OUT while the icon is touching the item you want to choose.

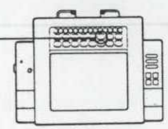
move: Move the icon on the monitor by moving the pen on the pad.

DRAW: The DRAW/WIPE IN button and the DRAW/WIPE OUT button are called "DRAW."

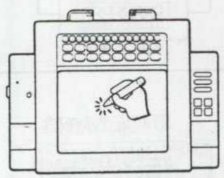
1 Press (ABC) with the pen.

The alphabet menu appears on the screen.





2 Press the pad with the pen to display the icon on the screen.

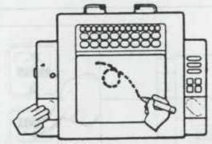


(continued)

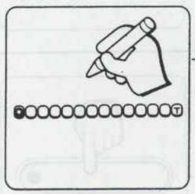
Trying Out the Titler

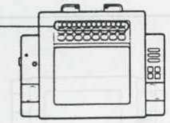
3 To change the type or size of the font, choose (FONT) or (SIZE).

There are three types of font. Each font has two sizes, large and small. Each time you choose (FONT) or (SIZE), the type or size of a letter changes. You see it change by watching "A" on the right side of the menu.



4 Press one of the colour select keys with the pen to select the colour of the font.



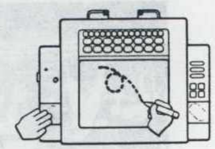


5 Choose "CHAMPIONS" from the menu.

The letters you have selected appear on the bottom of the screen.

To correct a letter
Choose ⬅.
The very last letter on the bottom of the screen disappears. Select a correct letter.

To make a space between the letters
Choose ➡.

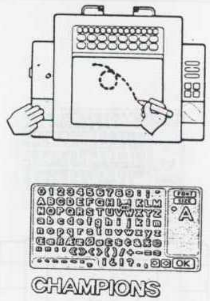


CHAMP

(continued)

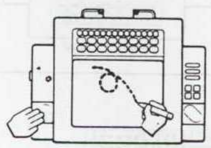
6 Choose (OK) when you finish selecting the letters.

A select box indicating the bounds of the selected letters appears on the screen.



7 Move the select box to the position where you want to add the letters on the video picture, then press DRAW while the box is holding the position.

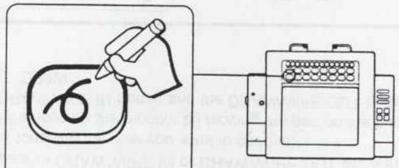
The letters you have selected appear on the screen inside the select box.



To change the position of the title
Move the select box to the desired position, then press DRAW.

8 Press (6) with the pen.

The select box disappears from the screen.
Now you are ready to add the title onto the video picture.

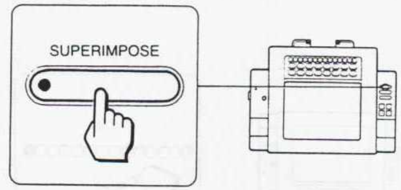


Trying Out the Titler

Adding the Title onto the Video Picture

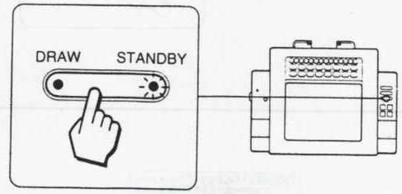
Add the title you have created onto the video picture.
For example, add the title by scrolling (moving it) in from the bottom of the screen to the center, then make the title disappear (wipe out) by scrolling upwards off the screen.

1 Press SUPERIMPOSE to turn on the indicator.



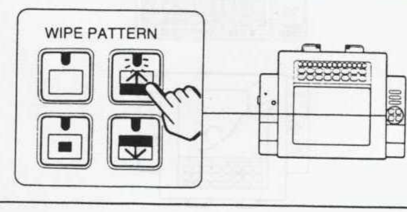
2 Press DRAW STANDBY.

The STANDBY (right) indicator lights up.



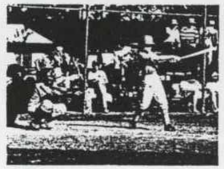
3 Press one of the WIPE PATTERN buttons.

In this lesson, select [icon] to scroll from the bottom upwards.



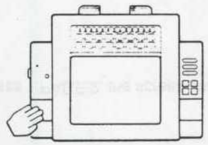
(continued)

4 Locate the start of the scene you want to make the title appear, and set the player to playback pause mode and the recorder to recording pause mode.



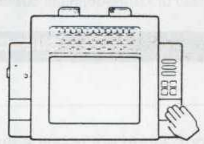
5 Start playback and recording, then press DRAW/WIPE IN.

The title scrolls in from the bottom to the center.



6 Press DRAW/WIPE OUT when the playback picture comes to the scene you want the title to disappear from.

The title scrolls upwards and out of the screen.

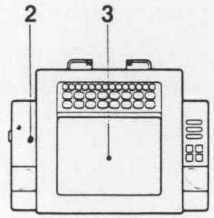


7 Stop the recorder and the player when you finish editing the tape.

You have finished using the titler to create and add a title. Now you can create any title you like and add it onto your videotape. If you want to know more about the use of the titler, go to the next section.

Working with the Titler

You can learn the basic use of the titler in the section "Trying Out the Titler."
In this section, you find how to start and end the titler and how to use the screens.



Starting the Titler

1. Turn on the power of the video equipment.
2. Turn on the power of the titler.
3. Press the pad with the pen to stop the demonstration.

Notes

- *When pressing buttons or keys on the titler, you can hear a small signal from the titler. To make the titler silent, turn on the power while pressing either DRAW/WIPE IN or DRAW/WIPE OUT.*
- *When the power of the titler is off, nothing appears on the screen even though the power of the player is on. To see the picture from the player, turn on the titler and press the pad with the pen.*

Ending the Titler

Turn off the power of the titler.

Note

The titles you have created are lost once you turn off the power.

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Adjusting the Screen Position

Press either DRAW/WIPE IN or DRAW/WIPE OUT and one of the following WIPE PATTERN buttons simultaneously.

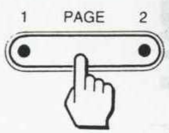
To adjust the screen position	Press
to left	
to right	
to up	
to down	

> ***Note***
> *You cannot create a title in the upper and lower margins of the screen.*

Using Two Screens

You can use two screens simultaneously to create titles.

To change the screen
Press 1 PAGE 2.



Each time you press 1 PAGE 2, the screen changes alternately.

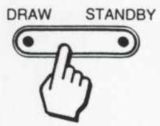
Creating a Title

You can learn the basics of title creation in the section "Trying Out the Titler."
In this section, you find how to choose fonts, sample titles and illustrations, how to draw titles, how to paint titles in a color of your choice, how to set the background colors, and how to copy titles and illustrations.

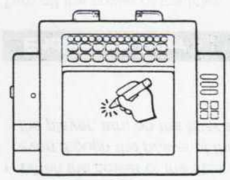
When Creating a Title

When creating a title, make sure the DRAW (left) indicator of DRAW STANDBY is lit.

To light up DRAW
Press DRAW STANDBY.

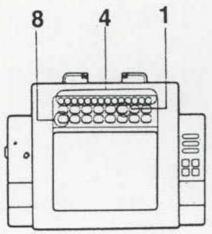


OR
Press the pad with the pen when watching the demonstration.



Choosing Fonts

You can choose from three types and two sizes of font as well as insert the Spanish accent (see page 37 for details). When choosing fonts, you can also choose colors.



1 Press (ABC) with the pen.

2 Move the icon to (FONT), then press DRAW while the icon is touching (FONT), to change the type of font.

To change the type of font again
Repeat Step 2.

3 Move the icon to (SIZE), then press DRAW while the icon is touching (SIZE), to change the size of the font.

To change the size of font again
Repeat Step 3.

4 Press one of the colour select keys with the pen to select the colour of the font.

5 Move the icon to one of the letter of the menu one by one, then press DRAW while the icon is touching the letter to select the letters.

To insert an accent mark
Select a letter, then select the accent mark for the letter. The accent mark automatically comes with the letter. Accent marks conform to French, German, Spanish, Italian, Portuguese, Swedish, Norwegian, Danish, and Finnish.

To correct a letter
Move the icon to , then press DRAW while the icon is touching . The very last letter on the bottom of the screen disappears. Select a correct letter as in Step 5.

To make a space between the letters
Move the icon to , then press DRAW while the icon is touching .

6 Move the icon to (OK), then press DRAW while the icon is touching (OK) when you finish selecting the letters.

7 Move the select box to the position where you want to add the letters onto the video picture, then press DRAW while the box is holding the position.

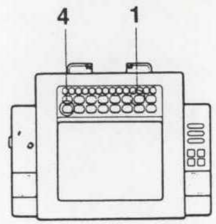
To change the position of the title
Repeat step 7.

8 Press with the pen.

Note on an accent mark
An accent mark on the last letter of the line may not be inserted after you have chosen the letters for the whole line on the screen.

Choosing Sample Titles and Illustrations

The titler contains sample titles and illustrations. You can choose from 41 different kinds of sample titles and illustrations (see page 37 for details).



1 Press (MENU) with the pen.

2 Move the icon to the title or illustration, then press DRAW while the icon is touching the title or illustration.

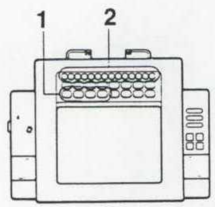
3 Move the select box to the position where you want to add the title or illustrations onto the video picture, then press DRAW while the box is holding the position.

To change the position of the title or illustration
Repeat step 3.

4 Press with the pen.

Drawing a Title

You can choose curved lines, straight lines, or figures to draw a title freehand. When choosing lines or figures, you can also choose colors. To draw a letter, use curved lines.



To draw a curved line

1 Press one of the following drawing keys with the pen.

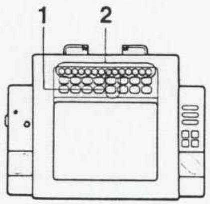
To draw	Press
a thin curve	
a thick curve	
an outlined curve	
a checkered curve	

2 Press one of the colour select keys with the pen to select the colour of the curve.

3 Draw a title by moving the icon while pressing DRAW.

Notes on an outlined curve
- *An outlined curve is automatically cut when it is too long.*
- *The colours of the outline are as follows:*

Colour of curve	*Colour of outline*
Black, transparent	*White*
Others	*Black*



To draw a straight line

1 Press one of the following drawing keys with the pen.

To draw	Press
an outlined line	
an wooden line	

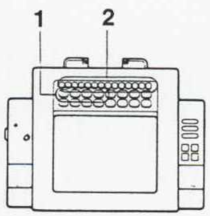
2 Press one of the colour select keys with the pen to select the colour of the line.

3 Draw a title by moving the icon while pressing DRAW.

Note on an outlined line

The colours of the outline are as follows:

Colour of outlined line	*Colour of outline*
Black, transparent	*White*
Others	*Black*



To draw a figure

1 Press one of the following drawing keys with the pen.

To use	Press
a square	
a circle	
a caption	
a wooden board	

2 Press one of the colour select keys with the pen to select the colour of the figure.

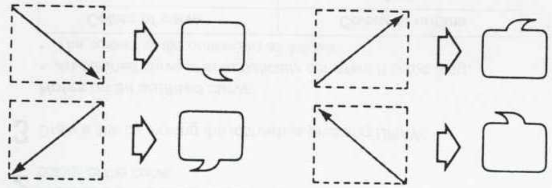
3 Draw a line diagonally by moving the icon while pressing DRAW.

To draw	Draw
a square, wooden board	a diagonal line
a circle	the diagonal line of a square where a circle is to be inscribed
a caption	the diagonal line of a square where a caption is to be inscribed

Creating a Title

Note on drawing a caption

The direction of the caption changes as you change the direction of the diagonal.



Note on an outline of a figure

The colours of the outline are as follows:

Colour of figure	*Colour of outline*
Black, transparent	*White*
Others	*Black*

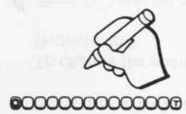
Choosing Colours

When choosing fonts or drawing titles freehand, you can choose the colour you want using the colour select key.

T chooses transparent. chooses the rainbow colour (see also page 31 and 36 for details).

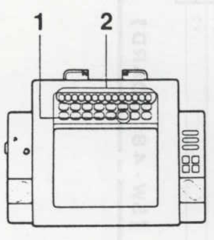
To choose colour

After pressing the drawing key with the pen, press one of the colour select keys with the pen.



Creating a Title

Painting a Title



You can paint a title in any colour you want using the colour select keys.

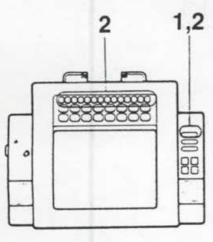
1 Press (icon) with the pen.

2 Press one of the colour select keys with the pen.

3 Move the icon to the outlined portion where you want to paint, then press DRAW while the icon is touching the portion with its tip.

To change the colour
Repeat steps 1 to 3.

Setting the Background of the Title



You can choose a background colour for the title. You can also set the video picture as the background for the title.

To choose the background colour

1 Press SUPERIMPOSE to turn off the indicator.

2 Simultaneously press SUPERIMPOSE and one of the colour select keys with the pen to select the background colour.

To set the video picture as the background
Choose (T) when choosing the background colour.

To remove the video picture from the background
Press SUPERIMPOSE to turn off the indicator.

To change the background colour to the video picture

1 Press SUPERIMPOSE to turn off the indicator.

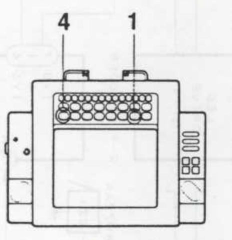
2 Simultaneously press SUPERIMPOSE and (T) with the pen.

To get the appropriate background
To be sure to get the background you have set, set SUPERIMPOSE and DRAW STANDBY as follows:

To get	Set
video picture background	SUPERIMPOSE to on and the color to transparent.
light grey background	SUPERIMPOSE to off and the color to transparent.
the colour set for the background (not transparent)	SUPERIMPOSE to off. Or, set SUPERIMPOSE to on and DRAW STANDBY to STANDBY.

Notes
- *SUPERIMPOSE comes on and the background colour is set to transparent when you turn on the titler.*
- *When the title appears on the screen or disappears from the screen, the background is set to the colour of the present screen.*
- *When you select a different colour for both screens, you can change the background colour immediately after making the title appear on or disappear from the screen.*

Copying Titles and Illustrations



You can copy titles and illustrations on the same screen or to the other screen.

1 Press (icon) with the pen.

2 Draw a line diagonally while pressing DRAW to enclose the title that you want to copy in a select box.

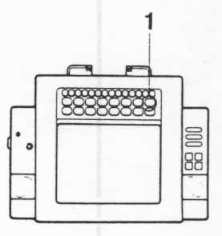
3 Move the select box to the position where you want to copy the title, then press DRAW while the box is holding the position.

To copy the title to the other screen
1 Press 1 PAGE 2.
2 Repeat step 3.

To repeat coping the same title
Repeat step 3.

4 Press (icon) with the pen.

Erasing Titles and Illustrations



You can erase titles and illustrations like using an eraser or erase the whole screen at once.

1 Press (icon) with the pen.

2 Move the icon over what you want to erase while pressing DRAW.

To erase a small portion
1 Press (icon) (a thin line) or (icon) (a thick line), then (T) (transparent color) with the pen.

2 Move the icon over what you want to erase while pressing DRAW.

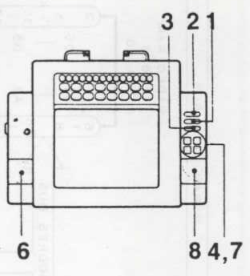
To erase the whole screen
Press CLEAR.

Undoing the Previous Action

When you make a mistake while creating a title, you can undo the mistake. This is only good for the previous action.

To undo the previous action
Press (icon) with the pen.

Adding the Title onto the Video Picture



You can add the title onto the video picture after you have created it. When adding the title onto the video picture, you can choose from four different ways to make the title appear and disappear.

1 Press 1 PAGE 2 to select the screen that has a title you want to add onto the video picture.

2 Press SUPERIMPOSE to turn on the indicator.

3 Press DRAW STANDBY to turn on STANDBY (right).

4 Press one of the following WIPE PATTERN buttons to select how the title appears or scrolls in.

To make the title	Press
appear instantly	(icon)
scroll in from the bottom and scroll upwards	(icon)
scroll in from the top and scroll downwards	(icon)
appear from the center to outwards	(icon)

5 Locate the start of the scene where you want to add the title, and set the player to playback pause mode and the recorder to recording pause mode.

6 Start playback and recording when the tape comes to the scene where you want to make the title appear, then press DRAW/WIPE IN.

7 Press one of the WIPE PATTERN buttons to select how the title disappears from the screen.

To make the title	Press
disappear instantly	(icon)
scroll out upwards	(icon)
scroll out downwards	(icon)
disappear from the title edge to the center	(icon)

8 Press DRAW/WIPE OUT when the playback picture comes to the scene where you want to make the title disappear.

9 Stop the player and the recorder when you finish editing the tape.

To repeat scrolling the title when (icon) or (icon) is selected
Keep DRAW/WIPE IN pressed in step 6.

Using the Rainbow Colour

The rainbow colour has twenty colours. See "Rainbow Colours" on page 36 for details. You can only select a single rainbow colour for all the titles on the same screen or on the other screen.

To use the rainbow colour
Press (icon) with the pen when choosing the colour.

Each time you press (icon), the colour changes.

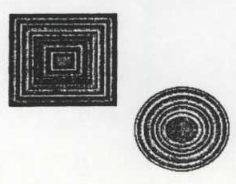
To choose the previous color
Simultaneously press (icon) and either DRAW/WIPE IN or DRAW/WIPE OUT.

Creating a Title Using the Rainbow Colour

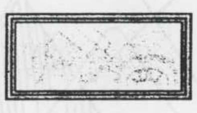
Here are some of the effective ways to create titles using the rainbow colour.

Choosing fonts
Refer to "Choosing Fonts" on page 23. You can choose from three types of the rainbow colour. Select the type by moving the icon to one of three A's on the right side of the menu, then press DRAW while the icon is touching the A.

Drawing a figure
Refer to "To draw a figure" on page 25 and draw concentric squares or circles inwards. The rainbow colour circulates inside the figure.



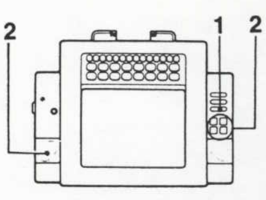
Drawing a frame
Refer to "To draw a figure" on page 25 and draw two concentric squares. Use a rainbow colour for the outer square and the transparent colour for the inner square. The rainbow colour circulates inside the frame.



Drawing a streaming line
Refer to "To draw a curved line" on page 24 or "To draw a straight line" on page 25 and draw a line freehand. The rainbow colour flows in the direction of the line.

Drawing dots
Refer to "To draw a curved line" on page 24 and draw dots. The dots speckle the rainbow colour.

Choosing a Wipe Pattern



To help you choose a wipe pattern, you can perform each wipe pattern on titles automatically. The titles are wiped in and out in all the available ways for both screens.

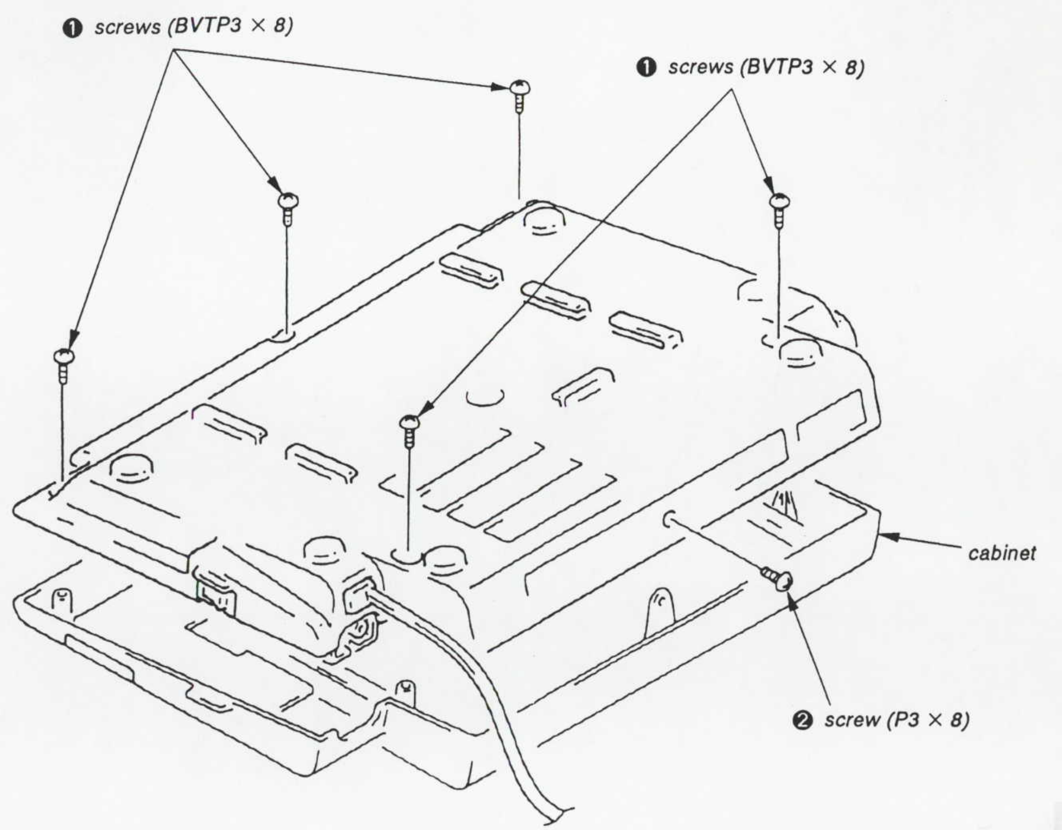
1 Press DRAW STANDBY to turn on STANDBY (right).

2 Press all the WIPE PATTERN buttons and DRAW/WIPE IN simultaneously.

To stop the title scroll
Press the pad with the pen.

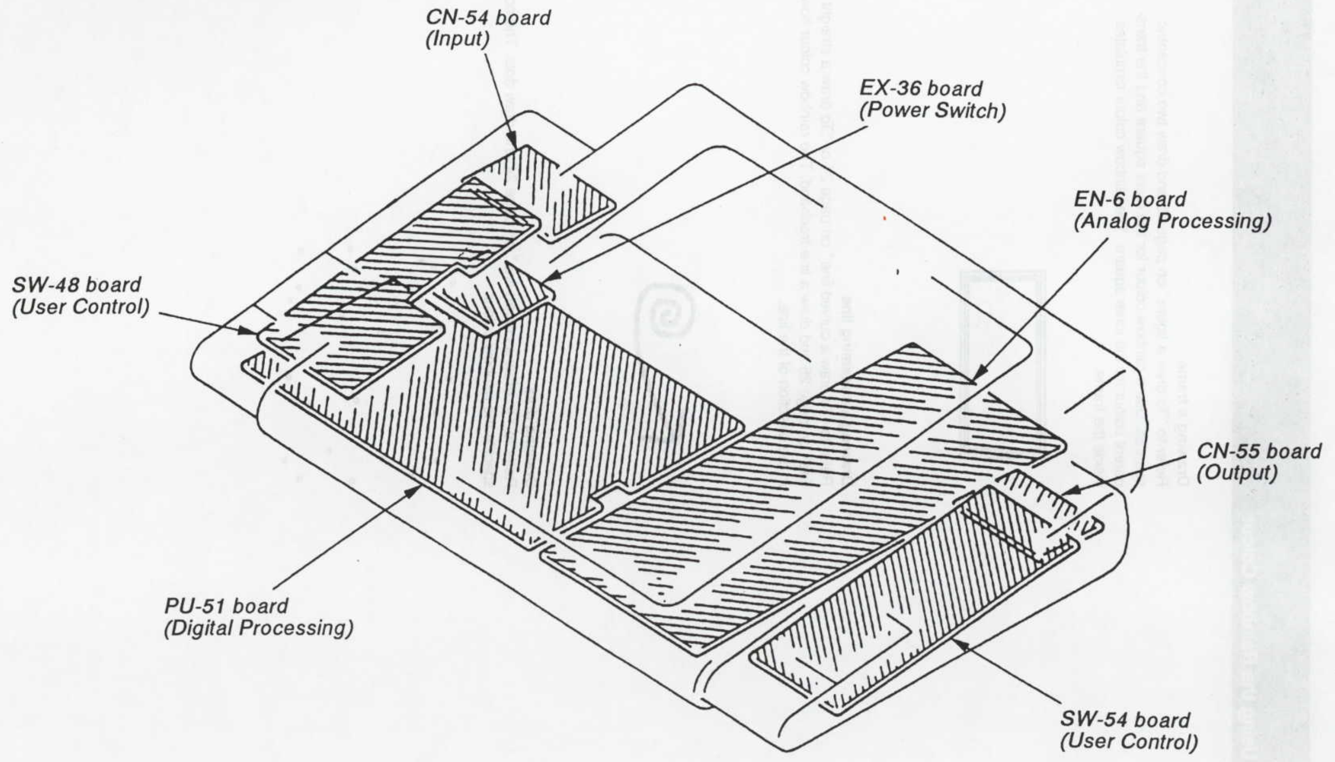
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

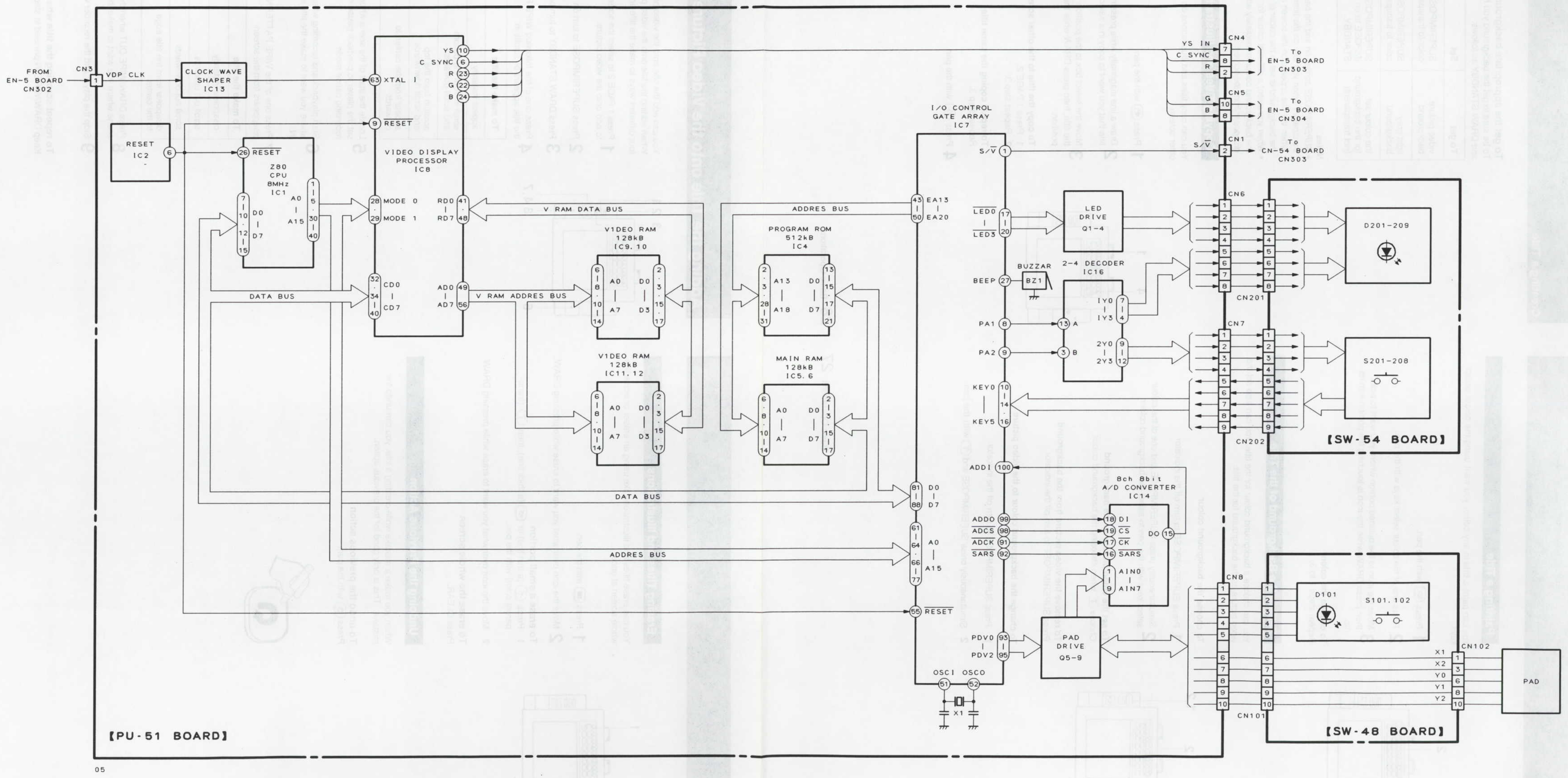


SECTION 3
DIAGRAMS

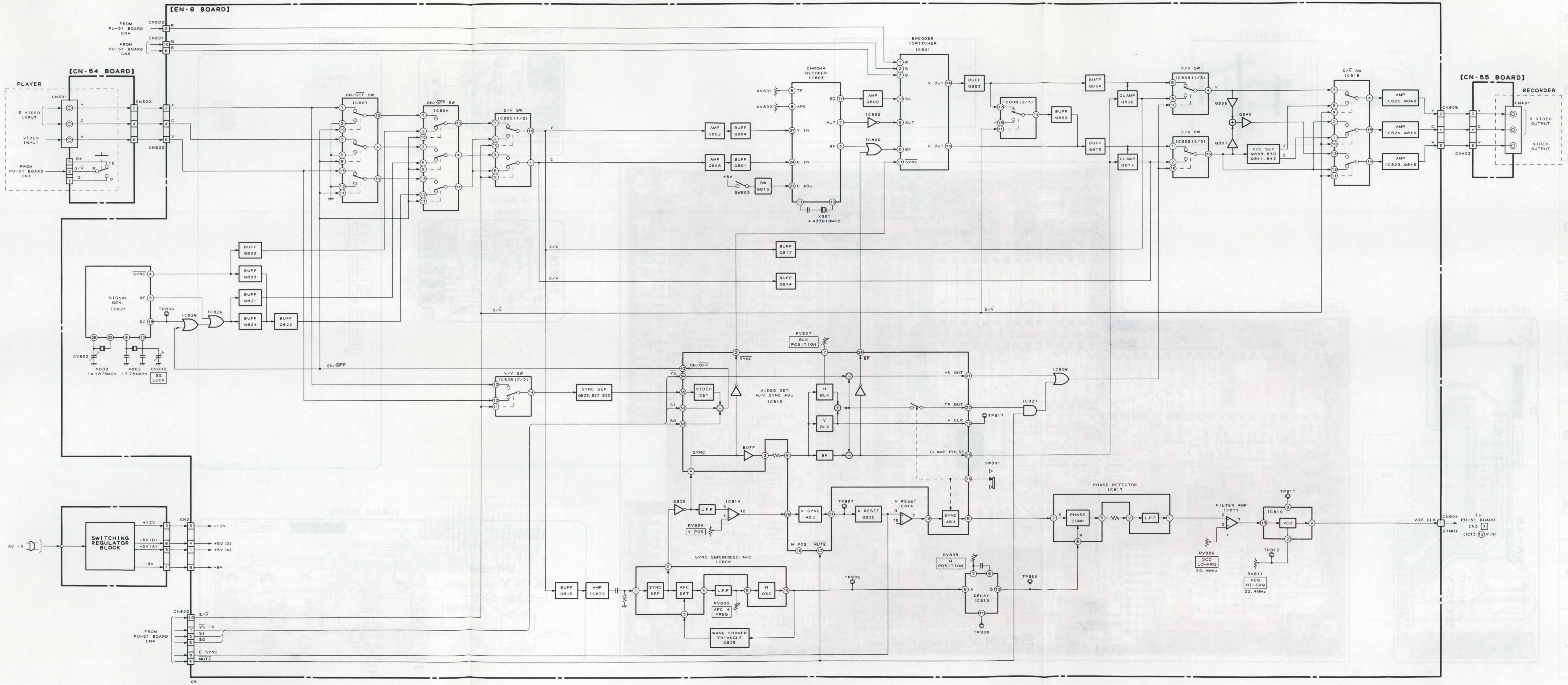
3-1. CIRCUIT BOARDS LOCATION



3-2. DIGITAL PROCESSING SECTION BLOCK DIAGRAM

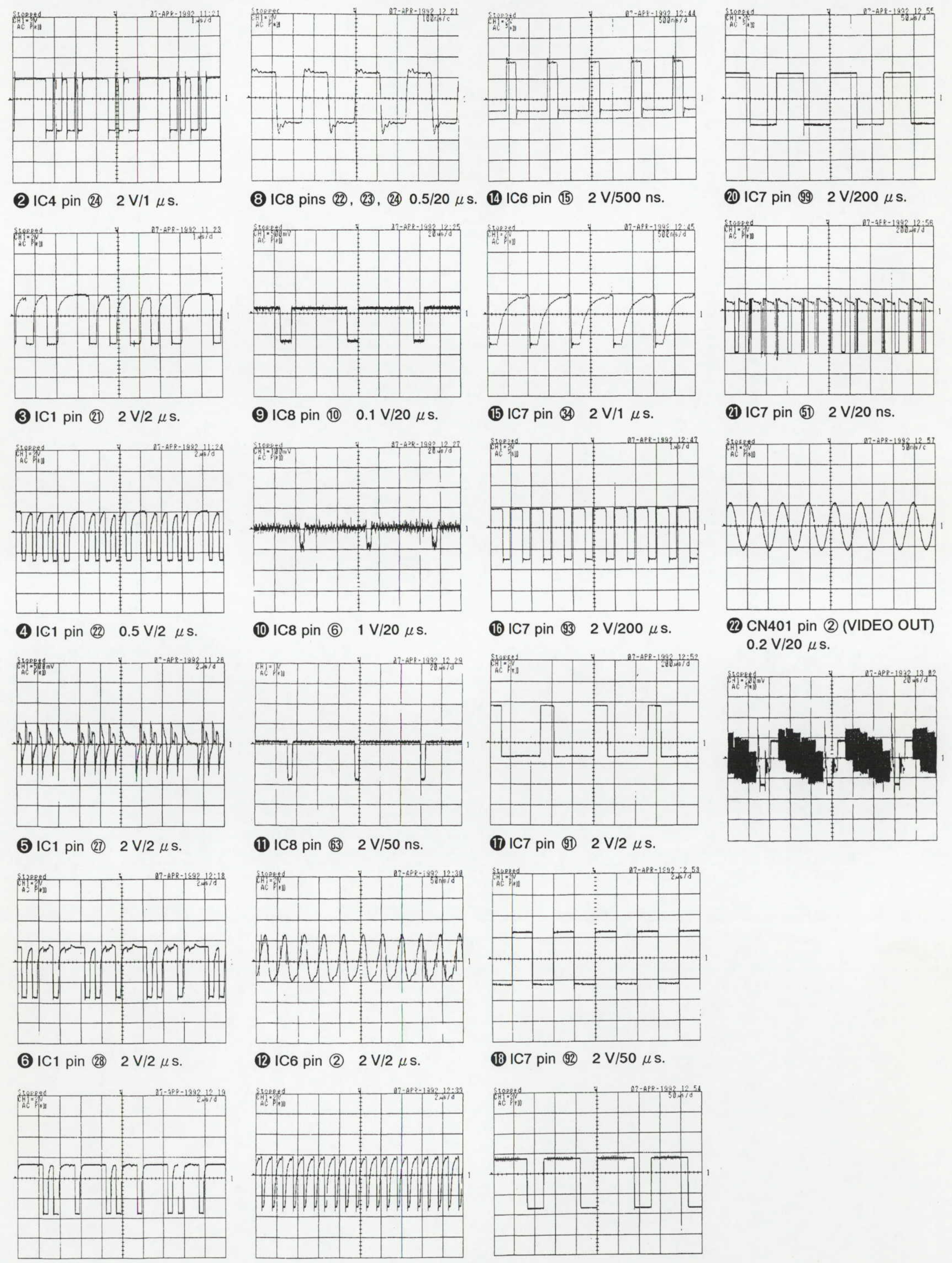


3-3. ANALOG PROCESSING SECTION BLOCK DIAGRAM



SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

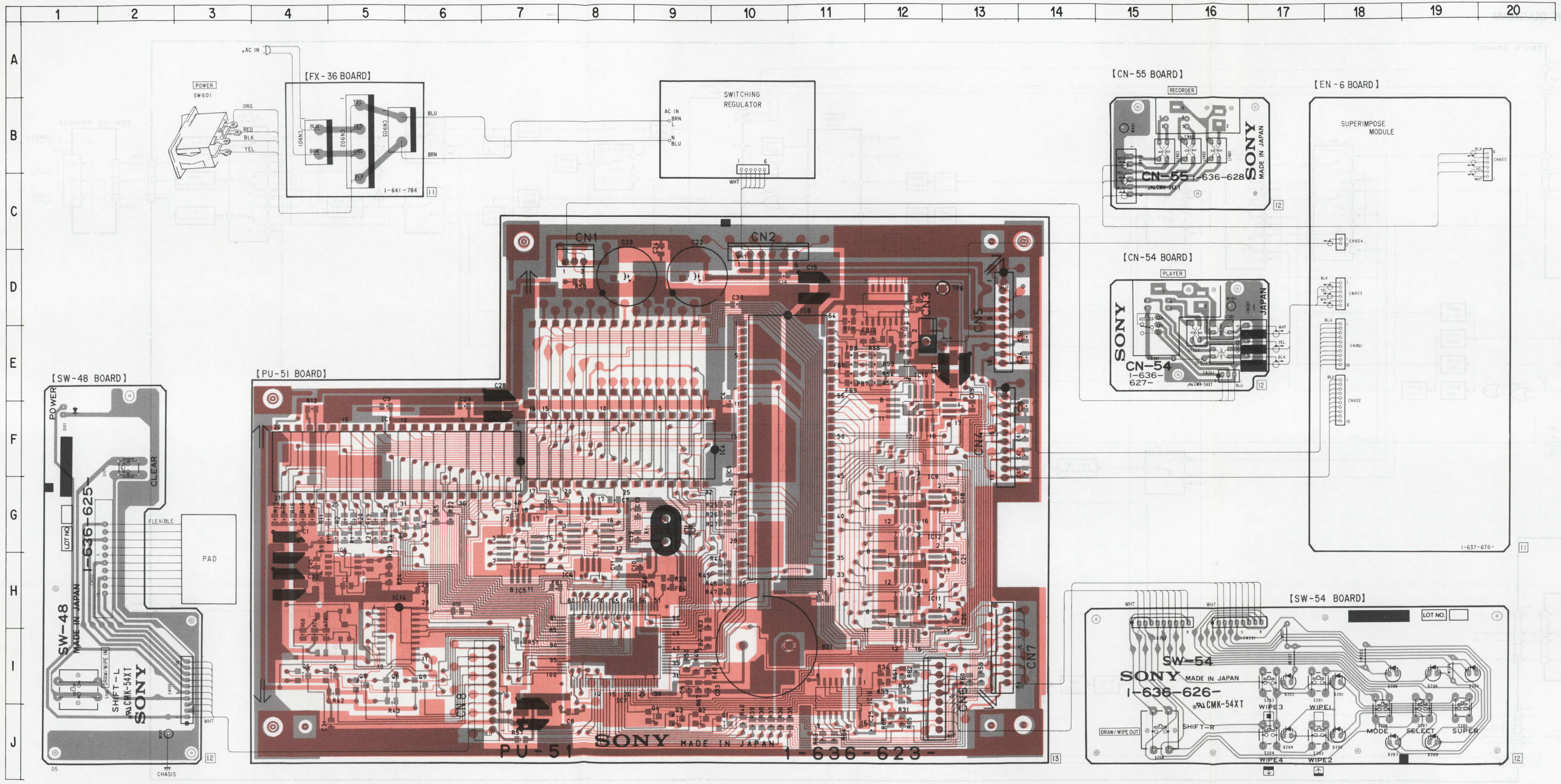
• Waveforms (PU-51 Board)



1. IC4 pin 22 2 V/100 µs.
2. IC4 pin 24 2 V/1 µs.
3. IC1 pin 21 2 V/2 µs.
4. IC1 pin 22 0.5 V/2 µs.
5. IC1 pin 27 2 V/2 µs.
6. IC1 pin 28 2 V/2 µs.
7. IC1 pin 6 2 V/100 ns.
8. IC8 pins 22, 23, 24 0.5/20 µs.
9. IC8 pin 19 0.1 V/20 µs.
10. IC8 pin 6 1 V/20 µs.
11. IC8 pin 53 2 V/50 ns.
12. IC6 pin 2 2 V/2 µs.
13. IC6 pin 19 2 V/500 ns.
14. IC6 pin 15 2 V/500 ns.
15. IC7 pin 34 2 V/1 µs.
16. IC7 pin 33 2 V/200 µs.
17. IC7 pin 91 2 V/2 µs.
18. IC7 pin 92 2 V/50 µs.
19. IC7 pin 98 2 V/50 µs.
20. IC7 pin 99 2 V/200 µs.
21. IC7 pin 51 2 V/20 ns.
22. CN401 pin 2 (VIDEO OUT) 0.2 V/20 µs.

4-1. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

PU-51 (DIGITAL PROCESSING), SW-48 (USER CONTROL), SW-54 (USER CONTROL), CN-54 (INPUT), CN-55 (OUTPUT) AND EX-36 (POWER SWITCH) PRINTED WIRING BOARDS



PU-51 (DIGITAL PROCESSING), SW-48 (USER CONTROL), SW-54 (USER CONTROL), CN-54 (INPUT), CN-55 (OUTPUT) AND EX-36 (POWER SWITCH) SCHEMATIC DIAGRAM

Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- Voltage measurement condition. When turning power on, the set starts demonstrating. At this time touching somewhere on the pad with the assorted pen, the set goes to the condition waiting for the input. The voltage value is measured in its condition.
- Voltages are taken with a VOM (10 MΩ/V). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope under the condition waiting for the input and the color bar signal is fed with the pattern generator from PLAYER terminal. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to wavefroms.

Note on Printed Wiring Board:

- ░░░ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

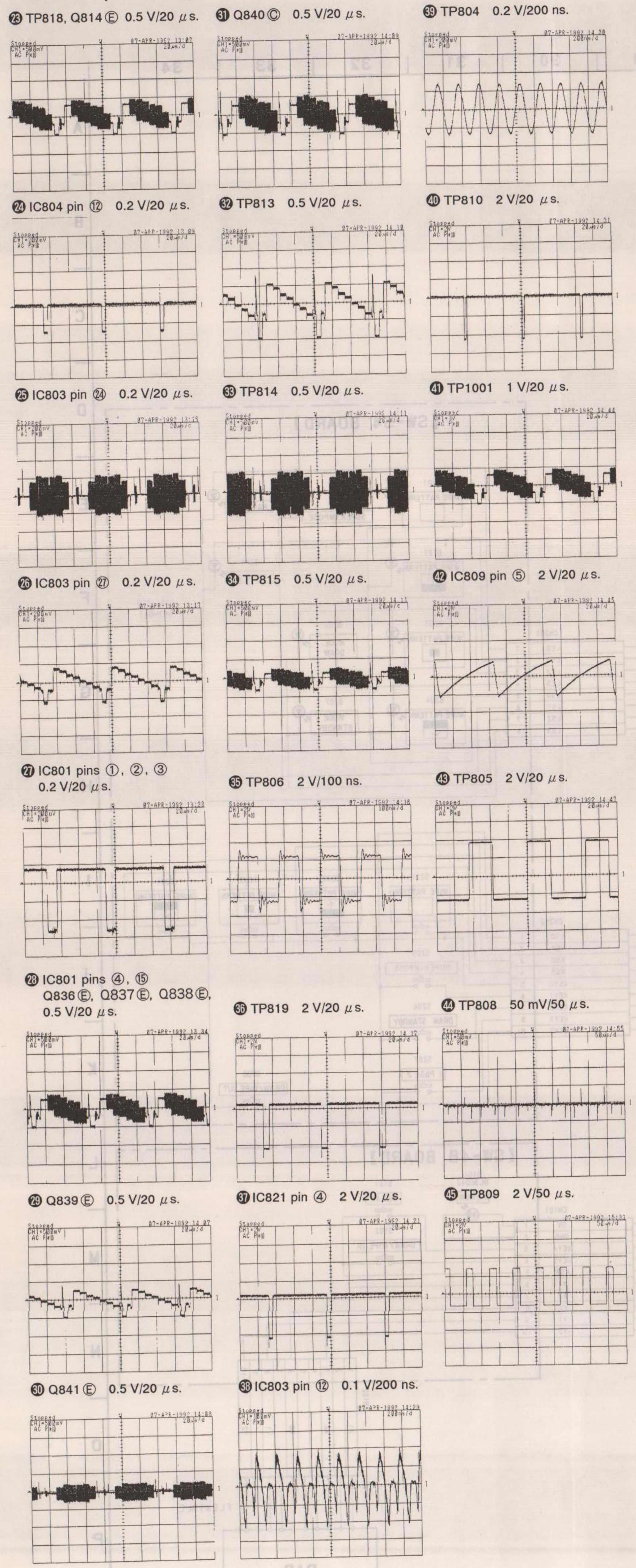
- ░░░ : Pattern of the rear side.

• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D101	F-1	IC9	G-12
D201	I-18	IC10	F-12
D202	J-18	IC11	H-12
D203	I-17	IC12	H-12
D204	J-17	IC13	D-12
D205	I-19	IC14	H-5
D206	I-18	IC15	H-4
D207	J-18	IC16	I-11
D208	I-19		
D209	J-19	Q1	J-10
		Q2	J-9
IC1	F-5	Q3	J-9
IC2	H-5	Q4	J-9
IC4	F-9	Q5	I-4
IC5	H-7	Q6	I-5
IC6	H-6	Q7	I-5
IC7	I-8	Q8	I-5
IC8	E-11	Q9	I-4

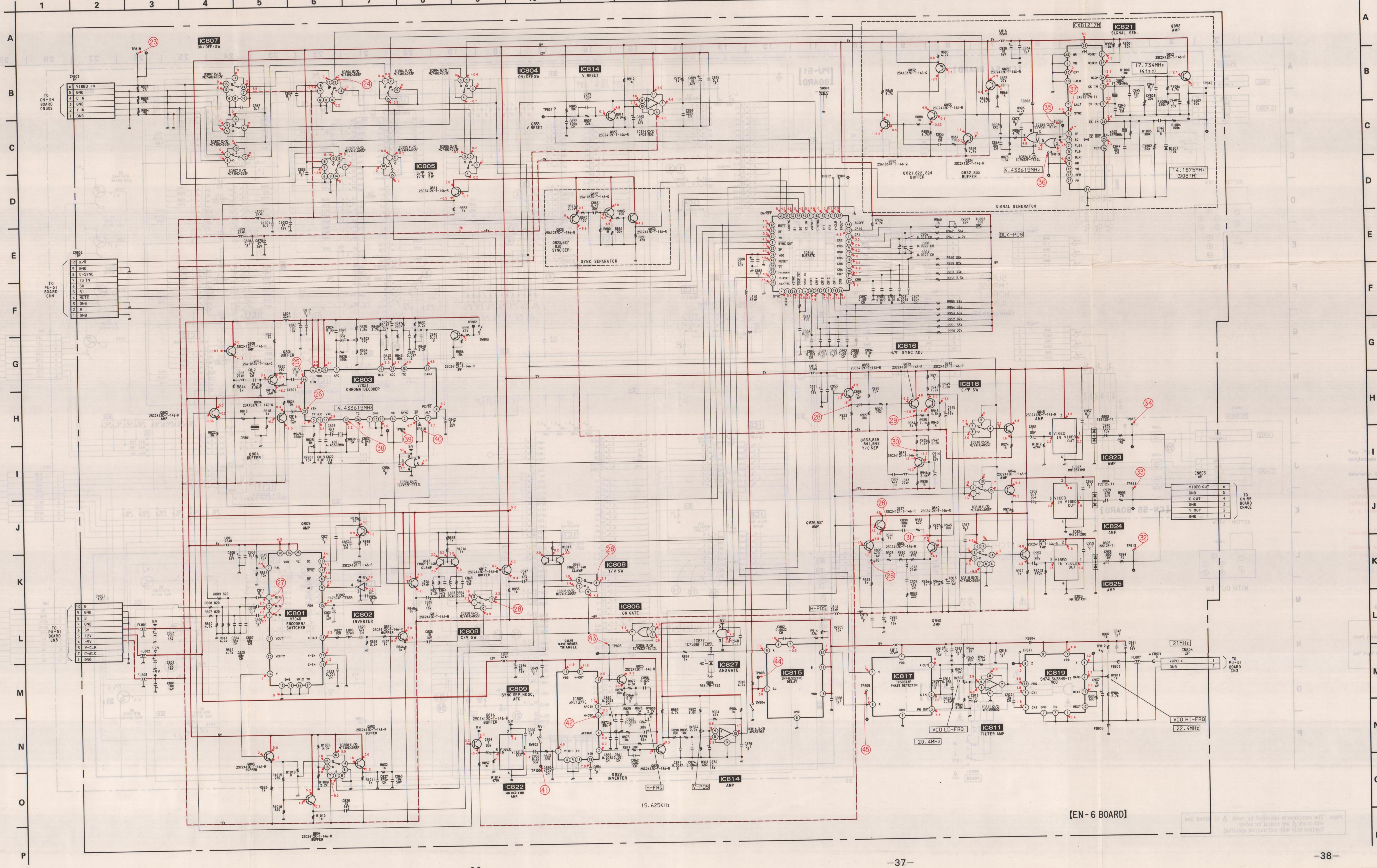
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

• Waveforms (EN-6 Board)



EN-6 (ANALOG PROCESSING) SCHEMATIC DIAGRAM

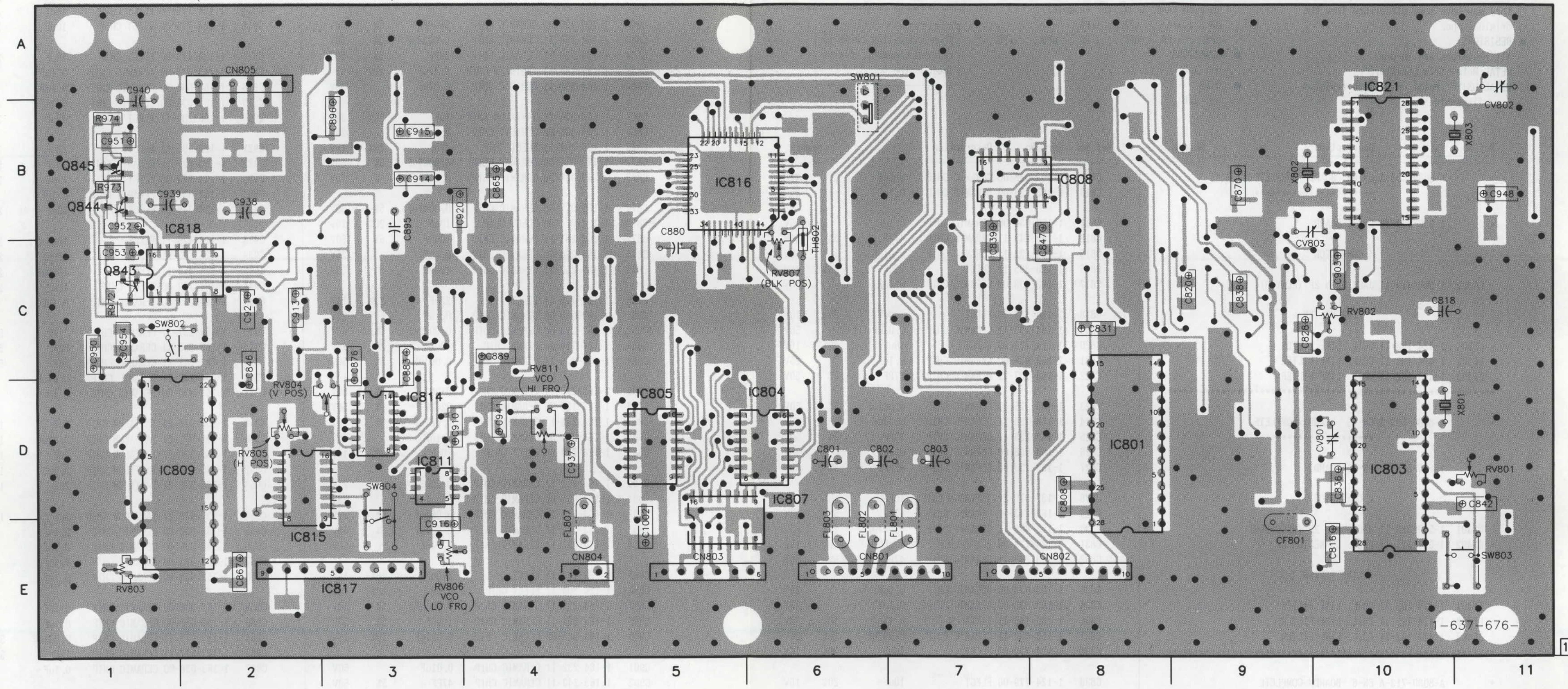
• See page 29 for Notes.



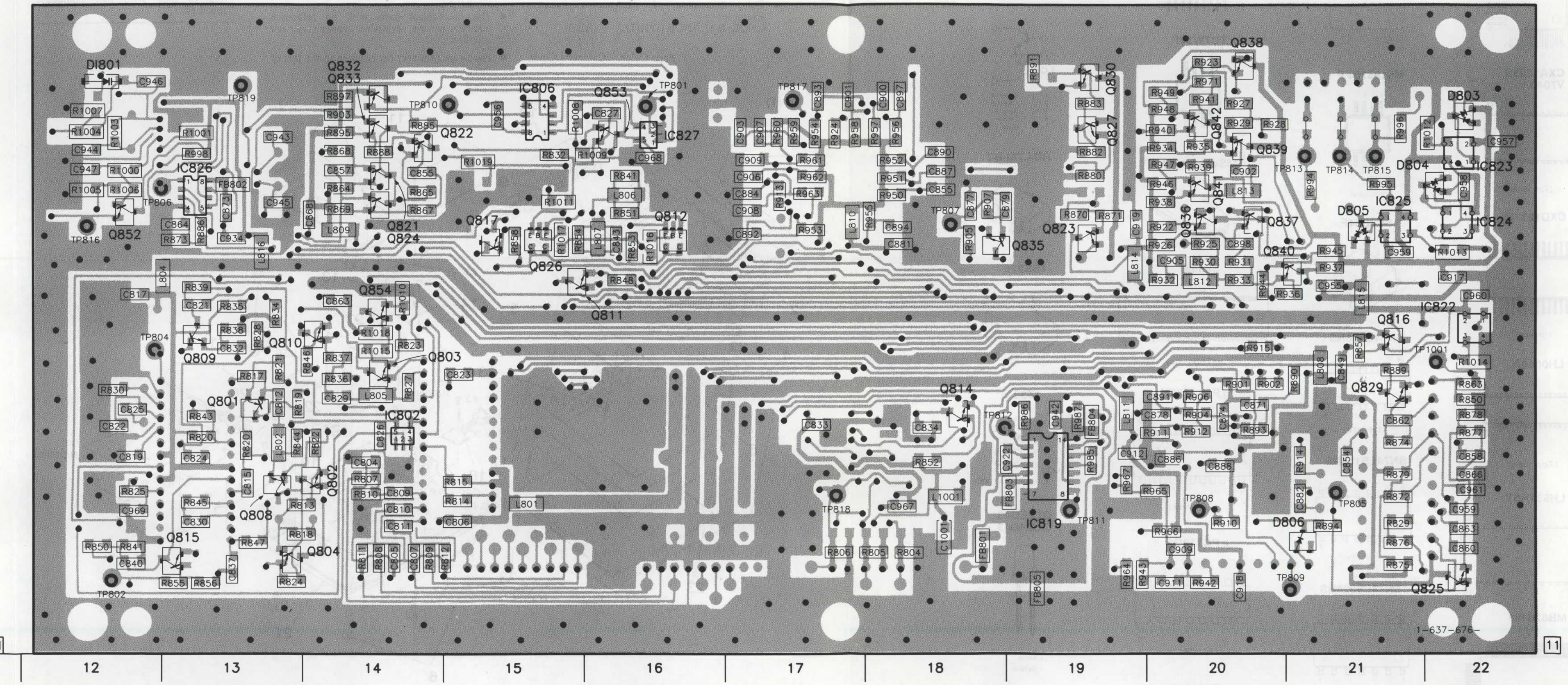
• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D803	B-22	Q808	D-13
D804	B-22	Q809	C-13
D805	B-21	Q810	C-14
D806	E-21	Q811	C-15
		Q812	C-16
DI801	A-12	Q814	D-18
		Q815	E-13
IC801	D-8	Q816	C-21
IC802	D-14	Q817	C-15
IC803	D-10	Q821	B-14
IC804	D-6	Q822	B-14
IC805	D-5	Q823	B-19
IC806	B-15	Q824	B-14
IC807	E-5	Q825	E-22
IC808	B-7	Q826	C-15
IC809	D-1	Q827	B-19
IC811	D-3	Q829	D-21
IC814	D-3	Q830	A-19
IC815	D-2	Q832	A-14
IC816	B-5	Q833	B-14
IC817	E-3	Q835	C-18
IC818	C-2	Q836	B-20
IC819	D-19	Q837	B-20
IC821	B-10	Q838	A-20
IC822	C-22	Q839	B-20
IC823	B-22	Q840	C-21
IC824	B-22	Q841	B-20
IC825	B-21	Q842	B-20
IC826	B-13	Q843	C-1
IC827	B-16	Q844	B-1
		Q845	B-1
Q801	D-13	Q852	B-12
Q802	D-14	Q853	B-16
Q803	C-14	Q854	C-14
Q804	E-13		

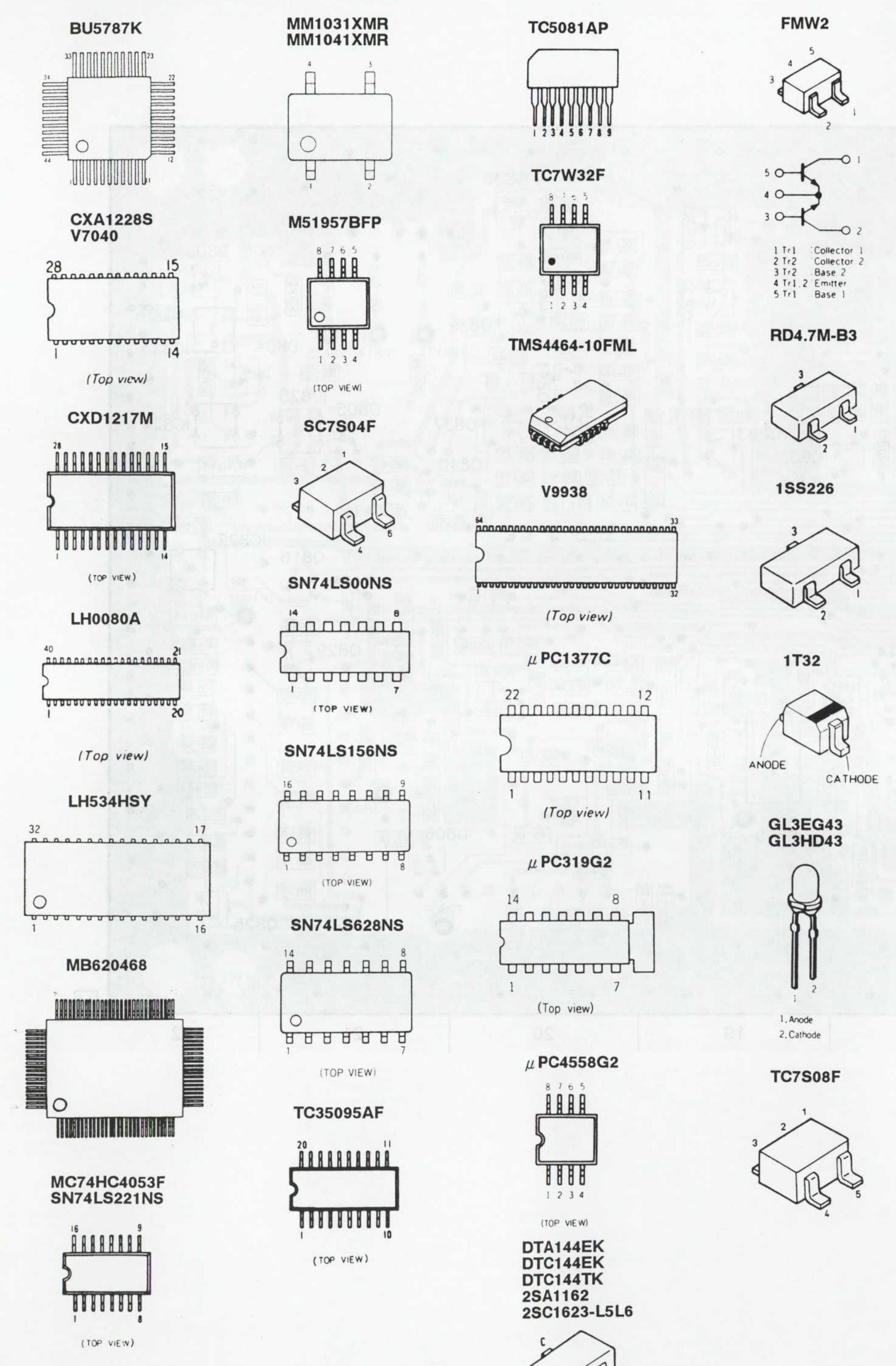
EN–6 BOARD (COMPONENT SIDE)



EN–6 BOARD (CONDUCTOR SIDE)



4-2. SEMICONDUCTORS



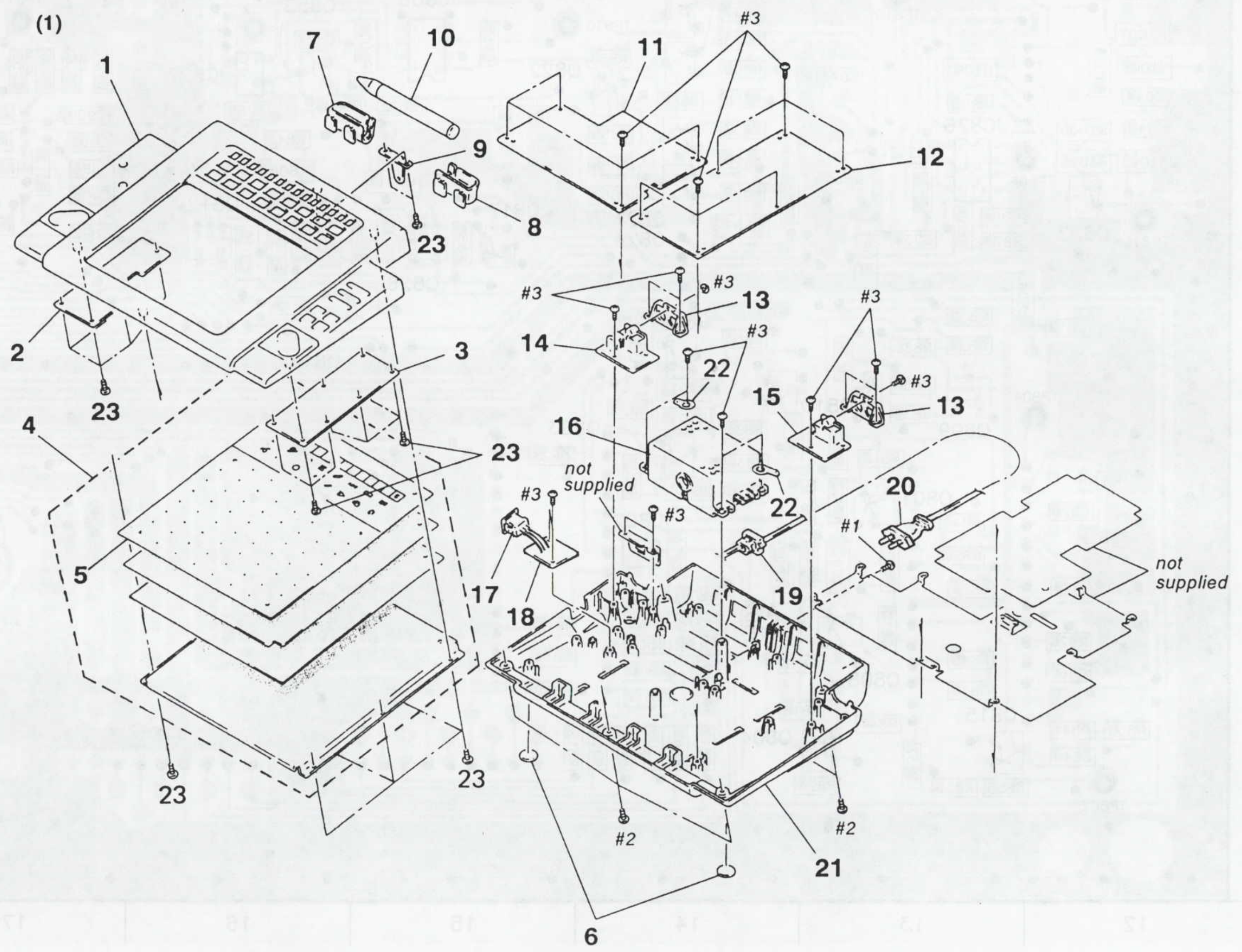
SECTION 5
EXPLODED VIEW

NOTE:

- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ Parts Color ↑ Cabinet's Color
- Items marked "∗" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

(1)



Ref. No.	Part No.	Description	Remark
1	X-4620-198-2	CASE (UPPER) ASSY	
* 2	A-8080-684-A	SW-48 BOARD, COMPLETE	
* 3	A-8080-683-A	SW-54 BOARD, COMPLETE	
4	A-8042-166-A	TABLET ASSY (AEP, Australian, E)	
4	A-8042-288-A	TABLET ASSY (UK)	
5	4-622-000-01	SHEET	
6	4-620-790-01	FOOT	
7	4-620-597-11	HOLDER (L), PEN	
8	4-620-596-11	HOLDER (R), PEN	
* 9	4-620-586-01	STOPPER	
10	X-4620-176-1	PEN ASSY	
* 11	A-8080-711-A	PU-51 BOARD, COMPLETE	
* 12	A-8080-713-A	EN-6 BOARD, COMPLETE	
13	4-620-591-11	BRACKET, JACK	
* 14	A-8080-688-A	CN-54 BOARD, COMPLETE	
* 15	A-8080-689-A	CN-55 BOARD, COMPLETE	
⚠ 16	1-413-693-12	SWITCHING REGULATOR (UK)	
⚠ 16	1-413-693-21	SWITCHING REGULATOR (AEP, Australian, E)	
⚠ 17	1-570-455-21	SWITCH, AC POWER SEESAW	
* 18	1-641-784-11	EX-36 BOARD	
19	3-703-244-11	BUSHING (2104), CORD	
⚠ 20	1-574-358-41	CORD, POWER (Australian)	
⚠ 20	1-575-651-11	CORD, POWER (AEP, E)	
⚠ 20	1-575-652-11	CORD, POWER (UK)	
* 21	4-620-602-11	CASE (LOWER)	
22	4-621-926-01	CLAMP	
23	4-928-635-01	SCREW, +BV (2.6X8) TAPPING	

SECTION 6
ELECTRICAL PARTS LIST

CN-54 CN-55 EN-6

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA ..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
*	A-8080-688-A	CN-54 BOARD, COMPLETE			
		********************			
*	1-636-627-12	CN-54 BOARD			
		< CONNECTOR >			
CN301	1-580-319-11	JACK, PIN 2P (PLAYER)			
		< LINE FILTER >			
LF301	1-424-102-11	COIL, LINE FILTER			
LF302	1-424-102-11	COIL, LINE FILTER			
LF303	1-424-102-11	COIL, LINE FILTER			
**					
*	A-8080-689-A	CN-55 BOARD, COMPLETE			
		********************			
*	1-636-628-12	CN-55 BOARD			
		< CONNECTOR >			
CN401	1-580-320-11	JACK, PIN 2P (RECORDER)			
* CN402	1-564-521-11	PLUG, CONNECTOR 6P			
		< LINE FILTER >			
LF401	1-424-102-11	COIL, LINE FILTER			
LF402	1-424-102-11	COIL, LINE FILTER			
LF403	1-424-102-11	COIL, LINE FILTER			
**					
*	A-8080-713-A	EN-6 BOARD, COMPLETE			
		********************			
		< CAPACITOR >			
C801	1-126-101-11	ELECT	100uF	20%	16V
C802	1-126-101-11	ELECT	100uF	20%	16V
C803	1-126-101-11	ELECT	100uF	20%	16V
C804	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C805	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C806	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C807	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C808	1-126-395-11	ELECT	22uF	20%	16V
C809	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C810	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C811	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C812	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C815	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C816	1-126-395-11	ELECT	22uF	20%	16V
C817	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C818	1-124-584-00	ELECT	100uF	20%	10V
C819	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C820	1-124-779-00	ELECT	10uF	20%	16V
C821	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C822	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C823	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C824	1-164-336-11	CERAMIC CHIP	0.33uF		25V
C825	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C826	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C827	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C828	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C829	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C830	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C831	1-124-779-00	ELECT CHIP	10uF	20%	16v
C832	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C833	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C834	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C836	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C837	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C838	1-124-779-00	ELECT	10uF	20%	16V
C839	1-124-779-00	ELECT	10uF	20%	16V
C840	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C841	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C842	1-135-085-21	TANTALUM CHIP	4.7uF	10%	25V
C843	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C846	1-126-395-11	ELECT	22uF	20%	16V
C847	1-124-779-00	ELECT	10uF	20%	16V
C849	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C850	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C854	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C855	1-163-227-11	CERAMIC CHIP	10PF	5%	50V
C857	1-163-237-11	CERAMIC CHIP	27PF	5%	50V

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Ref. No.	Part No.	Description			Remark
C858	1-163-986-00	CERAMIC CHIP	0.027uF	10%	25V
C859	1-164-705-91	CERAMIC CHIP	0.0036uF	5%	50V
C860	1-163-213-00	CERAMIC CHIP	0.0022uF	5%	50V
C862	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C863	1-164-756-11	CERAMIC CHIP	0.0033uF	5%	50V
C864	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C865	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C866	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C867	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C868	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C870	1-126-204-11	ELECT CHIP	47uF	20%	16V
C871	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C873	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C874	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C876	1-124-779-00	ELECT CHIP	10uF	20%	16v
C877	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C878	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C879	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C880	1-126-395-11	ELECT	22uF	20%	16V
C881	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C882	1-163-213-00	CERAMIC CHIP	0.0022uF	5%	50V
C883	1-124-779-00	ELECT CHIP	10uF	20%	16v
C884	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C885	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C886	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C887	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C888	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C889	1-124-779-00	ELECT CHIP	10uF	20%	16v
C890	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C891	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C892	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C893	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C894	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C895	1-126-103-11	ELECT	470uF	20%	16V
C896	1-126-204-11	ELECT CHIP	47uF	20%	16V
C897	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C898	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C900	1-163-986-00	CERAMIC CHIP	0.027uF	10%	25V
C901	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C902	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C903	1-164-705-91	CERAMIC CHIP	0.0036uF	5%	50V
C904	1-163-213-00	CERAMIC CHIP	0.0022uF	5%	50V
C905	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C906	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C907	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C908	1-163-213-00	CERAMIC CHIP	0.0022uF	5%	50V
C909	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C910	1-126-395-11	ELECT	22uF	20%	16V
C911	1-164-343-11	CERAMIC CHIP	0.056uF	10%	25V
C912	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C913	1-126-395-11	ELECT	22uF	20%	16V
C914	1-124-779-00	ELECT CHIP	10uF	20%	16v
C915	1-124-779-00	ELECT CHIP	10uF	20%	16v
C916	1-124-779-00	ELECT CHIP	10uF	20%	16v
C917	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C918	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C919	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C920	1-126-204-11	ELECT CHIP	47uF	20%	16V
C921	1-126-395-11	ELECT	22uF	20%	16V
C922	1-163-227-11	CERAMIC CHIP	10PF	5%	50V
C930	1-124-779-00	ELECT CHIP	10uF	20%	16v
C934	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C937	1-124-779-00	ELECT CHIP	10uF	20%	16v
C938	1-124-473-11	ELECT	1000uF	20%	10V
C939	1-126-103-11	ELECT	470uF	20%	16V
C940	1-124-473-11	ELECT	1000uF	20%	10V
C941	1-124-779-00	ELECT CHIP	10uF	20%	16v
C942	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C943	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C944	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C945	1-163-227-11	CERAMIC CHIP	10PF	5%	50V
C946	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C947	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C948	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C950	1-135-072-21	TANTALUM CHIP	0.22uF	10%	35V
C951	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C952	1-135-070-00	TANTALUM CHIP	0.1uF	10%	35V
C953	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C954	1-135-076-21	TANTALUM CHIP	1uF	10%	35V
C955	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C956	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C957	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C958	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C959	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C960	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C961	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C963	1-163-227-11	CERAMIC CHIP	10PF	5%	50V
C967	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C968	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C969	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1001	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C1002	1-126-204-11	ELECT CHIP	47uF	20%	16V
		< FILTER >			
CF801	1-409-425-11	TRAP, CERAMIC			

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
* CN801	1-564-712-11	PIN, CONNECTOR (SMALL TYPE) 10P	
* CN802	1-564-712-11	PIN, CONNECTOR (SMALL TYPE) 10P	
* CN803	1-564-509-11	PLUG, CONNECTOR 6P	
* CN804	1-564-505-11	PLUG, CONNECTOR 2P	
* CN805	1-564-509-11	PLUG, CONNECTOR 6P	
		< VARIABLE CAPACITOR >	
CV801	1-141-370-11	CAP, CHIP TRIMMER	
CV802	1-141-331-11	CAP, CHIP TRIMMER	
CV803	1-141-311-11	CAP, TRIMMER 20PF	
		< DIODE >	
D803	8-719-800-76	DIODE 1SS226	
D804	8-719-800-76	DIODE 1SS226	
D805	8-719-800-76	DIODE 1SS226	
D806	8-719-105-74	DIODE RD4.7M-B3	
		< DIODE >	
DI801	8-719-949-46	DIODE 1T32	
		< FERRITE BEAD >	
FB801	1-216-295-00	METAL CHIP 0 5% 1/10W	
FB802	1-412-390-21	INDUCTOR CHIP 0uH	
FB803	1-412-390-21	INDUCTOR CHIP 0uH	
FB804	1-412-390-21	INDUCTOR CHIP 0uH	
FB805	1-412-390-21	INDUCTOR CHIP 0uH	
		< ENCAPSULATED COMPONENT >	
FL801	1-236-058-11	ENCAPSULATED COMPONENT	
FL802	1-236-058-11	ENCAPSULATED COMPONENT	
FL803	1-236-058-11	ENCAPSULATED COMPONENT	
FL807	1-236-058-11	ENCAPSULATED COMPONENT	
		< IC >	
IC801	8-752-033-58	IC V7040	
IC802	8-759-031-84	IC SC7S04F	
IC803	8-752-033-32	IC CXA1228S	
IC804	8-759-011-65	IC MC74HC4053F	
IC805	8-759-011-65	IC MC74HC4053F	
IC806	8-759-242-68	IC TC7W32F	
IC807	8-759-011-65	IC MC74HC4053F	
IC808	8-759-011-65	IC MC74HC4053F	
IC809	8-759-100-60	IC uPC1377C	
IC811	8-759-100-96	IC uPC4558G2	
IC814	8-759-105-49	IC uPC319G2	
IC815	8-759-907-81	IC SN74LS221NS	
IC816	8-759-520-61	IC BU5787K	
IC817	8-759-250-81	IC TC5081AP	

Ref. No.	Part No.	Description	Remark
IC818	8-759-011-65	IC MC74HC4053F	
IC819	8-759-931-47	IC SN74LS628NS	
IC821	8-752-332-67	IC CXD1217M	
IC822	8-759-504-44	IC MM1031XMR	
IC823	8-759-504-44	IC MM1031XMR	
IC824	8-759-505-86	IC MM1041XMR	
IC825	8-759-504-44	IC MM1031XMR	
IC826	8-759-242-68	IC TC7W32F	
IC827	8-759-234-20	IC TC7S80F	
		< JUMPER RESISTOR >	
JP801	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP802	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP803	1-216-295-00	METAL CHIP 0 5% 1/10W	
		< COIL >	
L801	1-408-781-00	INDUCTOR CHIP 22uH	
L802	1-408-782-11	INDUCTOR CHIP 27uH	
L804	1-408-781-00	INDUCTOR CHIP 22uH	
L805	1-408-782-11	INDUCTOR CHIP 27uH	
L806	1-408-782-11	INDUCTOR CHIP 27uH	
L807	1-408-782-11	INDUCTOR CHIP 27uH	
L808	1-408-785-21	INDUCTOR CHIP 47uH	
L809	1-408-782-11	INDUCTOR CHIP 27uH	
L810	1-408-785-21	INDUCTOR CHIP 47uH	
L811	1-408-785-21	INDUCTOR CHIP 47uH	
L812	1-408-782-11	INDUCTOR CHIP 27uH	
L813	1-408-782-11	INDUCTOR CHIP 27uH	
L814	1-408-781-00	INDUCTOR CHIP 22uH	
L815	1-408-781-00	INDUCTOR CHIP 22uH	
L816	1-408-781-00	INDUCTOR CHIP 22uH	
L1001	1-408-782-11	INDUCTOR CHIP 27uH	
		< TRANSISTOR >	
Q801	8-729-216-22	TRANSISTOR 2SA1162	
Q802	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q803	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q804	8-729-216-22	TRANSISTOR 2SA1162	
Q808	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q809	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q810	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q811	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q812	8-729-903-82	TRANSISTOR FMW2	
Q814	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q815	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q816	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q817	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q821	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q822	8-729-216-22	TRANSISTOR 2SA1162	

Ref. No.	Part No.	Description		Remark
Q823	8-729-216-22	TRANSISTOR	2SA1162	
Q824	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q825	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q826	8-729-903-82	TRANSISTOR	FMW2	
Q827	8-729-216-22	TRANSISTOR	2SA1162	
Q829	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q830	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q832	8-729-216-22	TRANSISTOR	2SA1162	
Q833	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q835	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q836	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q837	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q838	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q839	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q840	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q841	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q842	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q843	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q844	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q845	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q852	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q853	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q854	8-729-120-28	TRANSISTOR	2SC1623-L5L6	

< RESISTOR >

Ref. No.	Part No.	Description				Remark
R804	1-216-022-00	METAL CHIP	75	5%	1/10W	
R805	1-216-022-00	METAL CHIP	75	5%	1/10W	
R806	1-216-022-00	METAL CHIP	75	5%	1/10W	
R807	1-216-047-00	METAL CHIP	820	5%	1/10W	
R808	1-216-047-00	METAL CHIP	820	5%	1/10W	
R809	1-216-047-00	METAL CHIP	820	5%	1/10W	
R810	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R811	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R812	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R813	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R814	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R815	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R817	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R818	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R819	1-216-043-00	METAL CHIP	560	5%	1/10W	
R820	1-216-043-00	METAL CHIP	560	5%	1/10W	
R821	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R822	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R823	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R824	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R825	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R827	1-216-025-00	METAL CHIP	100	5%	1/10W	
R828	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R829	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R830	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R832	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R834	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R835	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R836	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R837	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R838	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R839	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R840	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R843	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R844	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R845	1-216-103-00	METAL CHIP	180K	5%	1/10W	
R846	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R847	1-216-111-00	METAL CHIP	390K	5%	1/10W	
R848	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R849	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R850	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R851	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R852	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R853	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R854	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R855	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R856	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R857	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R858	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R863	1-216-045-00	METAL CHIP	680	5%	1/10W	
R864	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R865	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R867	1-216-025-00	METAL CHIP	100	5%	1/10W	
R868	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R869	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R870	1-216-025-00	METAL CHIP	100	5%	1/10W	
R871	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R872	1-216-748-11	METAL CHIP	39K	1%	1/10W	
R873	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R874	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R875	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R876	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R877	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R878	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R879	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R880	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R882	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R883	1-216-025-00	METAL CHIP	100	5%	1/10W	
R885	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R886	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R888	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R889	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R890	1-216-073-00	METAL CHIP	10K	5%	1/10W	

Ref. No.	Part No.	Description			Remark
R891	1-216-041-00	METAL CHIP	470	5%	1/10W
R893	1-216-073-00	METAL CHIP	10K	5%	1/10W
R894	1-216-049-00	METAL CHIP	1K	5%	1/10W
R895	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R897	1-216-037-00	METAL CHIP	330	5%	1/10W
R901	1-216-045-00	METAL CHIP	680	5%	1/10W
R902	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R903	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R904	1-216-089-00	METAL CHIP	47K	5%	1/10W
R905	1-216-073-00	METAL CHIP	10K	5%	1/10W
R906	1-216-049-00	METAL CHIP	1K	5%	1/10W
R907	1-216-081-00	METAL CHIP	22K	5%	1/10W
R910	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R911	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R912	1-216-049-00	METAL CHIP	1K	5%	1/10W
R913	1-216-025-00	METAL CHIP	100	5%	1/10W
R914	1-216-081-00	METAL CHIP	22K	5%	1/10W
R915	1-216-049-00	METAL CHIP	1K	5%	1/10W
R922	1-216-049-00	METAL CHIP	1K	5%	1/10W
R923	1-216-049-00	METAL CHIP	1K	5%	1/10W
R924	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R925	1-216-295-00	METAL CHIP	0	5%	1/10W
R926	1-216-049-00	METAL CHIP	1K	5%	1/10W
R927	1-216-073-00	METAL CHIP	10K	5%	1/10W
R928	1-216-073-00	METAL CHIP	10K	5%	1/10W
R929	1-216-046-00	METAL CHIP	750	5%	1/10W
R930	1-216-041-00	METAL CHIP	470	5%	1/10W
R931	1-216-044-00	METAL CHIP	620	5%	1/10W
R932	1-216-033-00	METAL CHIP	220	5%	1/10W
R933	1-216-041-00	METAL CHIP	470	5%	1/10W
R934	1-216-049-00	METAL CHIP	1K	5%	1/10W
R935	1-216-050-00	METAL GLAZE	1.1K	5%	1/10W
R936	1-216-049-00	METAL CHIP	1K	5%	1/10W
R937	1-216-049-00	METAL CHIP	1K	5%	1/10W
R938	1-216-049-00	METAL CHIP	1K	5%	1/10W
R939	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R940	1-216-049-00	METAL CHIP	1K	5%	1/10W
R941	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R942	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R943	1-216-073-00	METAL CHIP	10K	5%	1/10W
R944	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R945	1-216-073-00	METAL CHIP	10K	5%	1/10W
R946	1-216-058-00	METAL GLAZE	2.4K	5%	1/10W
R947	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R948	1-216-064-00	METAL CHIP	4.3K	5%	1/10W
R949	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R950	1-216-083-00	METAL CHIP	27K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R951	1-216-085-00	METAL CHIP	33K	5%	1/10W
R952	1-216-095-00	METAL CHIP	82K	5%	1/10W
R953	1-216-093-00	METAL CHIP	68K	5%	1/10W
R954	1-216-091-00	METAL CHIP	56K	5%	1/10W
R955	1-216-095-00	METAL CHIP	82K	5%	1/10W
R956	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R957	1-216-085-00	METAL CHIP	33K	5%	1/10W
R958	1-216-095-00	METAL CHIP	82K	5%	1/10W
R959	1-216-095-00	METAL CHIP	82K	5%	1/10W
R960	1-216-085-00	METAL CHIP	33K	5%	1/10W
R961	1-216-068-00	METAL CHIP	6.2K	5%	1/10W
R962	1-216-091-00	METAL CHIP	56K	5%	1/10W
R963	1-216-049-00	METAL CHIP	1K	5%	1/10W
R964	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R965	1-216-073-00	METAL CHIP	10K	5%	1/10W
R966	1-216-049-00	METAL CHIP	1K	5%	1/10W
R967	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R971	1-216-295-00	METAL CHIP	0	5%	1/10W
R972	1-216-049-00	METAL CHIP	1K	5%	1/10W
R973	1-216-049-00	METAL CHIP	1K	5%	1/10W
R974	1-216-049-00	METAL CHIP	1K	5%	1/10W
R985	1-216-045-00	METAL CHIP	680	5%	1/10W
R986	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R987	1-216-049-00	METAL CHIP	1K	5%	1/10W
R994	1-216-022-00	METAL CHIP	75	5%	1/10W
R995	1-216-022-00	METAL CHIP	75	5%	1/10W
R996	1-216-022-00	METAL CHIP	75	5%	1/10W
R998	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1000	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1001	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1003	1-216-097-00	METAL CHIP	100K	5%	1/10W
R1004	1-216-097-00	METAL CHIP	100K	5%	1/10W
R1005	1-216-105-00	METAL CHIP	220K	5%	1/10W
R1006	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1007	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1008	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R1009	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R1010	1-216-049-00	METAL CHIP	1K	5%	1/10W
R1011	1-216-049-00	METAL CHIP	1K	5%	1/10W
R1012	1-216-113-00	METAL CHIP	470K	5%	1/10W
R1013	1-216-113-00	METAL CHIP	470K	5%	1/10W
R1014	1-216-113-00	METAL CHIP	470K	5%	1/10W
R1015	1-216-033-00	METAL CHIP	220	5%	1/10W
R1016	1-216-049-00	METAL CHIP	1K	5%	1/10W
R1017	1-216-049-00	METAL CHIP	1K	5%	1/10W
R1018	1-216-047-00	METAL CHIP	820	5%	1/10W
R1019	1-216-295-00	METAL CHIP	0	5%	1/10W

EN-6 **EX-36** **PU-51**

Ref. No.	Part No.	Description	Remark
		< VARIABLE RESISTOR >	
RV801	1-241-594-11	RES, ADJ, METAL GRAZE 10K	
RV802	1-241-590-11	RES, ADJ, METAL GRAZE 470	
RV803	1-241-592-11	RES, ADJ, METAL GRAZE 2.2K	
RV804	1-241-592-11	RES, ADJ, METAL GRAZE 2.2K	
RV805	1-241-594-11	RES, ADJ, METAL GRAZE 10K	
RV806	1-241-591-11	RES, ADJ, METAL GRAZE 1K	
RV807	1-241-595-11	RES, ADJ, METAL GRAZE 22K	
RV811	1-241-591-11	RES, ADJ, METAL GRAZE 1K	
		< SWITCH >	
SW801	1-570-863-11	SWITCH, SLIDE	
SW802	1-570-909-11	SWITCH, TACTIL (REFLOW TYPE)	
SW803	1-570-909-11	SWITCH, TACTIL (REFLOW TYPE)	
SW804	1-570-909-11	SWITCH, TACTIL (REFLOW TYPE)	
		< THERMISTOR >	
TH802	1-809-558-11	THERMISTOR (600)	
		< VIBRATOR >	
X801	1-567-504-81	OSCILLATOR, CRYSTAL 4.433619MHz	
X802	1-567-733-11	VIBRATOR, CRYSTAL	
X803	1-579-507-11	VIBRATOR, CRYSTAL	

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Ref. No.	Part No.	Description	Remark
*	1-641-784-11	EX-36 BOARD	
		************	
		< CONNECTOR >	
⚠* CN901	1-564-321-00	PIN, CONNECTOR 2P	
⚠ CN902	1-568-106-11	PIN, CONNECTOR 4P	
⚠* CN903	1-564-321-00	PIN, CONNECTOR 2P	

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Ref. No.	Part No.	Description	Remark
*	A-8080-711-A	PU-51 BOARD, COMPLETE	
		*********************	
*	1-636-623-13	PU-51 BOARD	
		< BUZZER >	
BZ1	1-529-070-11	BUZZER	
		< CAPACITOR >	
C1	1-126-392-11	ELECT CHIP 100uF 20%	6.3V
C2	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C3	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C4	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C5	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C6	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C7	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C8	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C9	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C10	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C11	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C12	1-163-099-00	CERAMIC CHIP 18PF 5%	50V
C13	1-163-097-00	CERAMIC CHIP 15PF 5%	50V
C14	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C15	1-126-392-11	ELECT CHIP 100uF 20%	6.3V
C16	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C17	1-126-392-11	ELECT CHIP 100uF 20%	6.3V
C18	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C19	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C20	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C21	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C22	1-126-929-11	ELECT 4700uF 20%	10V
C23	1-126-929-11	ELECT 4700uF 20%	10V
C24	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C25	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C26	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C27	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C28	1-126-392-11	ELECT CHIP 100uF 20%	6.3V
C29	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C30	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C31	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C32	1-126-392-11	ELECT CHIP 100uF 20%	6.3V
C34	1-163-107-00	CERAMIC CHIP 39PF 5%	50V
C35	1-163-107-00	CERAMIC CHIP 39PF 5%	50V
C36	1-163-107-00	CERAMIC CHIP 39PF 5%	50V
C41	1-163-109-00	CERAMIC CHIP 47PF 5%	50V
C42	1-163-107-00	CERAMIC CHIP 39PF 5%	50V
C43	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C45	1-163-109-00	CERAMIC CHIP 47PF 5%	50V
		< CONNECTOR >	
* CN1	1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P	
* CN2	1-564-509-11	PLUG, CONNECTOR 6P	
* CN6	1-564-710-11	PIN, CONNECTOR (SMALL TYPE) 8P	
* CN7	1-564-711-11	PIN, CONNECTOR (SMALL TYPE) 9P	
* CN8	1-564-712-11	PIN, CONNECTOR (SMALL TYPE) 10P	
		< FERRITE BEAD >	
FB1	1-412-390-21	INDUCTOR CHIP 0uH	
FB2	1-412-390-21	INDUCTOR CHIP 0uH	
FB3	1-412-390-21	INDUCTOR CHIP 0uH	
FB4	1-412-390-21	INDUCTOR CHIP 0uH	
FB5	1-412-390-21	INDUCTOR CHIP 0uH	
FB6	1-412-390-21	INDUCTOR CHIP 0uH	
FB7	1-412-390-21	INDUCTOR CHIP 0uH	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
FB8	1-412-390-21	INDUCTOR CHIP 0uH	
FB9	1-412-390-21	INDUCTOR CHIP 0uH	
FB10	1-412-390-21	INDUCTOR CHIP 0uH	
FB11	1-412-390-21	INDUCTOR CHIP 0uH	
FB12	1-412-390-21	INDUCTOR CHIP 0uH	
		< IC >	
IC1	8-759-916-80	IC LH0080A	
IC2	8-759-635-83	IC M51957BFP	
IC4	8-759-060-90	IC LH534HSY	
IC5	8-759-517-51	IC TMS4464-10FML	
IC6	8-759-517-51	IC TMS4464-10FML	
IC7	8-759-506-54	IC MB620468	
IC8	8-759-922-51	IC V9938	
IC9	8-759-517-51	IC TMS4464-10FML	
IC10	8-759-517-51	IC TMS4464-10FML	
IC11	8-759-517-51	IC TMS4464-10FML	
IC12	8-759-517-51	IC TMS4464-10FML	
IC13	8-759-929-73	IC SN74LS00NS	
IC14	8-759-245-58	IC TC35095AF	
IC16	8-759-930-48	IC SN74LS156NS	
		< COIL >	
L2	1-412-031-11	INDUCTOR CHIP 47uH	
		< TRANSISTOR >	
Q1	8-729-901-06	TRANSISTOR DTA144EK	
Q2	8-729-901-06	TRANSISTOR DTA144EK	
Q3	8-729-901-06	TRANSISTOR DTA144EK	
Q4	8-729-901-06	TRANSISTOR DTA144EK	
Q5	8-729-901-01	TRANSISTOR DTC144EK	
Q6	8-729-901-06	TRANSISTOR DTA144EK	
Q7	8-729-901-06	TRANSISTOR DTA144EK	
Q8	8-729-903-30	TRANSISTOR DTC144TK	
Q9	8-729-901-06	TRANSISTOR DTA144EK	
		< RESISTOR >	
R1	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R2	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R3	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R4	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R5	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R6	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R7	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R8	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R9	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R10	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R11	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R12	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	

Ref. No.	Part No.	Description	Remark
R13	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R14	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R15	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R16	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R17	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R18	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R19	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R20	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R21	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R22	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R23	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R24	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R25	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R26	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R27	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R28	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R29	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R31	1-216-025-00	METAL CHIP 100 5% 1/10W	
R32	1-216-025-00	METAL CHIP 100 5% 1/10W	
R33	1-216-025-00	METAL CHIP 100 5% 1/10W	
R34	1-216-025-00	METAL CHIP 100 5% 1/10W	
R35	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R36	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R37	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R38	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R39	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R40	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R42	1-216-115-00	METAL CHIP 560K 5% 1/10W	
R43	1-216-115-00	METAL CHIP 560K 5% 1/10W	
R44	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R45	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R46	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R47	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R48	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R49	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R50	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R51	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R52	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R53	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R54	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R55	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R56	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R57	1-216-033-00	METAL CHIP 220 5% 1/10W	
R58	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R59	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R60	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R61	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R62	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	

PU-51 SW-48 SW-54

Ref. No.	Part No.	Description	Remark
R63	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R64	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R65	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R66	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R67	1-216-295-00	METAL CHIP 0 5% 1/10W	
R68	1-216-013-00	METAL CHIP 33 5% 1/10W	
R70	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R72	1-216-013-00	METAL CHIP 33 5% 1/10W	
		< VIBRATOR >	
X1	1-567-881-11	VIBRATOR, CRYSTAL	

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Ref. No.	Part No.	Description	Remark
*	A-8080-684-A	SW-48 BOARD, COMPLETE	
		*********************	
*	1-636-625-12	SW-48 BOARD	
		< CONNECTOR >	
CN102	1-580-318-11	SOCKET, CONNECTOR 10P	
		< DIODE >	
D101	8-719-950-41	DIODE GL3EG43	
		< SWITCH >	
S101	1-554-303-21	SWITCH, TACTILE (CLEAR)	
S102	1-552-539-00	SWITCH, TACTILE (DRAW/WIPE IN)	

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Ref. No.	Part No.	Description	Remark
*	A-8080-683-A	SW-54 BOARD, COMPLETE	
		*********************	
*	1-636-626-12	SW-54 BOARD	
		< DIODE >	
D201	8-719-987-73	DIODE GL3HD43	
D202	8-719-987-73	DIODE GL3HD43	
D203	8-719-987-73	DIODE GL3HD43	
D204	8-719-987-73	DIODE GL3HD43	
D205	8-719-987-73	DIODE GL3HD43	
D206	8-719-987-73	DIODE GL3HD43	
D207	8-719-987-73	DIODE GL3HD43	
D208	8-719-987-73	DIODE GL3HD43	
D209	8-719-987-73	DIODE GL3HD43	
		< SWITCH >	
S201	1-554-303-21	SWITCH, TACTILE (WIPE 1)	
S202	1-554-303-21	SWITCH, TACTILE (WIPE 2)	
S203	1-554-303-21	SWITCH, TACTILE (WIPE 3)	
S204	1-554-303-21	SWITCH, TACTILE (WIPE 4)	
S205	1-554-303-21	SWITCH, TACTILE (SUPERIMPOSE)	
S206	1-554-303-21	SWITCH, TACTILE (DRAW STANDBY)	
S207	1-554-303-21	SWITCH, TACTILE (1 PAGE 2)	
S208	1-552-539-00	SWITCH, TACTILE (DRAW/WIPE OUT)	

****

MISCELLANEOUS
****

Ref. No.	Part No.	Description	Remark
⚠16	1-413-693-12	SWITCHING REGULATOR (UK)	
⚠16	1-413-693-21	SWITCHING REGULATOR (AEP, Australian, E)	
⚠17	1-570-455-21	SWITCH, AC POWER SEESAW	
⚠20	1-574-358-41	CORD, POWER (Australian)	
⚠20	1-575-651-11	CORD, POWER (AEP, E)	
⚠20	1-575-652-11	CORD, POWER (UK)	

****

ACCESSORIES & PACKING MATERIALS
****

Ref. No.	Part No.	Description	Remark
	1-690-088-11	CORD, CONNECTION (Pin-Pin)	
	3-752-636-42	MANUAL, INSTRUCTION (ENGLISH) (AEP, UK, Australian, E)	
	3-752-636-52	MANUAL, INSTRUCTION (AEP) (FRENCH, ITALIAN, SPANISH, GERMAN)	
	3-752-636-62	MANUAL, INSTRUCTION (AEP) (NEDERLAND, SVENSKA, SUOMI, DANSK, PORTUGUDE)	
	4-622-143-11	MANUAL, INSTANT INFORMATION (AEP, UK, Australian, E) (ENGLISH)	
	X-4620-176-1	PEN ASSY	

****

****
HARDWARE LIST
****

Ref. No.	Part No.	Description	Remark
#1	7-682-548-09	SCREW +P 3X8	
#2	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#3	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	

****

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SECTION 7
ELECTRICAL ADJUSTMENTS

In the electrical adjustments the following measuring equipments are required.

[Equipments Required]

1) Monitor TV
2) Oscilloscope: 2 phenomena, Band width more than 15 MHz, with delay mode. (Use 10:1 probe unless otherwise specified.)
3) Frequency counter
4) Pattern generator (With S terminal or Y/C terminals)
5) Vectorscope
6) Digital voltmeter

[Setting]

Adjust in the following setting unless otherwise specified.

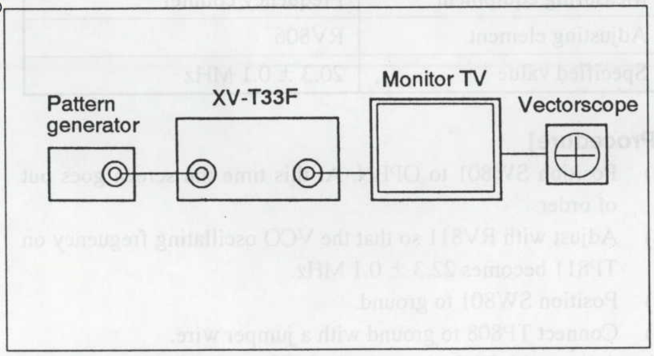


Fig. 7-1.

[Setup for Adjustment]

In adjustments, the video signal fed with the PAL color-bar pattarn generator is used as the signal for adjustment. Therefore, It is necessary that this video signal satisfies the specified value.

1. Using the composite video signal.
   Connect an oscilloscope to the video input terminal, and check the horizontal sync. signal width becomes approx. 0.3 V, the width of video portion 0.7 V, the width of the burst signal approx. 0.3 V and flat.
   See Fig. 7-2.

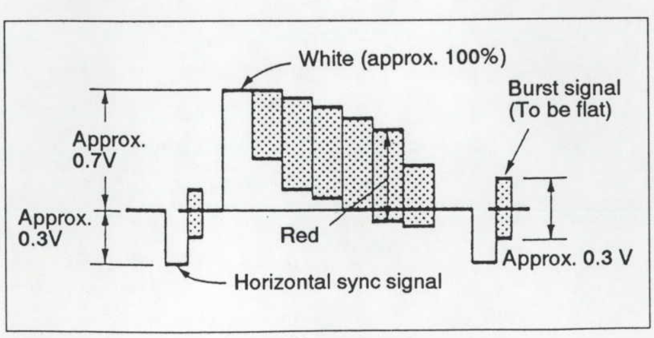


Fig. 7-2.

2. Using S video signal.
   Connect an oscilloscope to Y signal terminal (pin ⑦) of S video input terminal and check the horizontal sync. signal width of Y signal becomes approx. 0.3 V, width of video portion approx. 0.7 V. And olso connecto an oscilloscope to chroma signal terminal (pin ⑤) of S video input terminal and check the burst signal width of chroma signal becomes approx. 0.3 V.
   See Fig. 7-3.

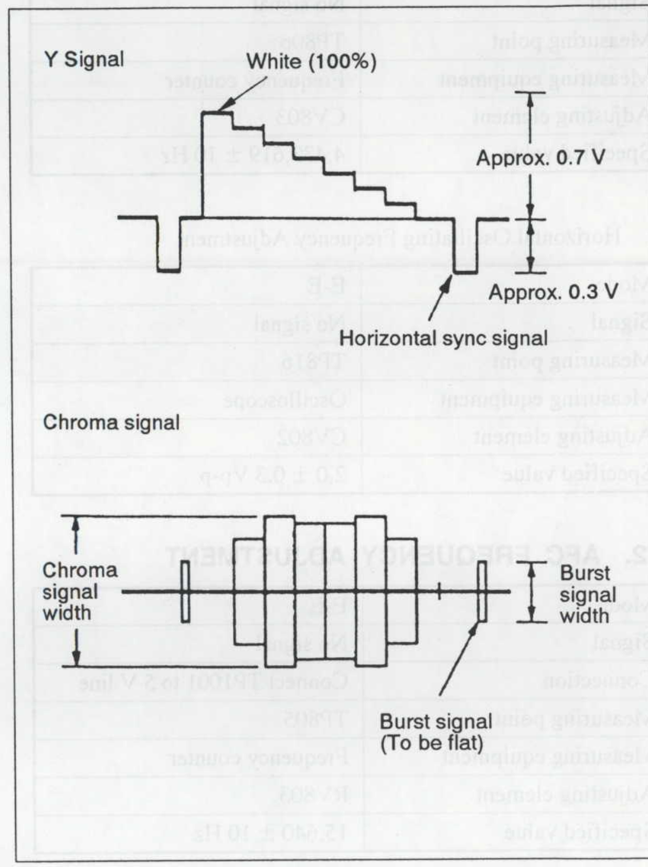


Fig. 7-3.

Note: When turing power on, the set starts demonstrating. At this time touching somewhere on the pad with the assorted pen, the set goes to the condition waiting for the input. The following electrical adjustments are performed in its condition.

7-1. SG CLOCK ADJUSTMENT

1) Sub-Carrier Frequency Adjustment

Mode	E-E
Signal	No signal
Measuring point	TP806
Measuring equipment	Frequency counter
Adjusting element	CV803
Specified value	4,433,619 ± 10 Hz

2) Horizontal Oscillating Frequency Adjustment

Mode	E-E
Signal	No signal
Measuring point	TP816
Measuring equipment	Oscilloscope
Adjusting element	CV802
Specified value	2.0 ± 0.3 Vp-p

7-2. AFC FREQUENCY ADJUSTMENT

Mode	E-E
Signal	No signal
Connection	Connect TP1001 to 5 V line
Measuring point	TP805
Measuring equipment	Frequency counter
Adjusting element	RV803
Specified value	15,640 ± 10 Hz

7-3. VDP (VIDEO DISPLAY PROCESSOR) ADJUSTMENT

Mode	E-E
Signal	No signal
VCO HI-FREQ. adjustment	
Connection	SW801: Open
Measuring point	TP811
Measuring equipment	Frequency counter
Adjusting element	RV811
Specified value	22.3 ± 0.1 MHz
VCO LO-FREQ. adjustment	
Connection	Connect TP808 to ground
Measuring point	TP811
Measuring equipment	Frequency counter
Adjusting element	RV806
Specified value	20.3 ± 0.1 MHz

[Procedure]

1) Position SW801 to OPEN. At this time the screen goes out of order.
2) Adjust with RV811 so that the VCO oscillating freguency on TP811 becomes 22.3 ± 0.1 MHz.
3) Position SW801 to ground.
4) Connect TP808 to ground with a jumper wire.
5) Adjust with RV806 so taht the VCO oscillating frequency on TP811 becomes 20.3 ± 0.1 MHz.
6) Remove a jumper wire between TP808 and ground.
7) Repeat items 1) to 6) so that both the specified value should be satisfied.
8) Confirm the SW801 turns to ground and a jumper wire has already removed.

7-4. AFC H POSITION ADJUSTMENT

Mode	E-E
Signal	Color-bar
Measuring point	CH1: TP818 (VIDEO) CH2: TP809 (H. POS)
Measuring equipment	Oscilloscope
Adjusting element	RV805
Specified value	d=0.5 ± 0.3 μsec

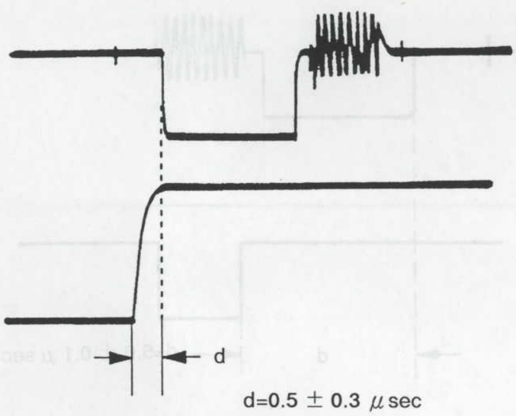


Fig. 7-4.

7-5. BLK POSITION ADJUSTMENT

Mode	E-E
Signal	Color-ber
Measuring point	CH1: TP818 (VIDEO) CH2: TP801 (BLK)
Measuring equipment	Oscilloscope
Adjusting element	RV807
Specified ealue	d=1.0 ± 0.3 μsec

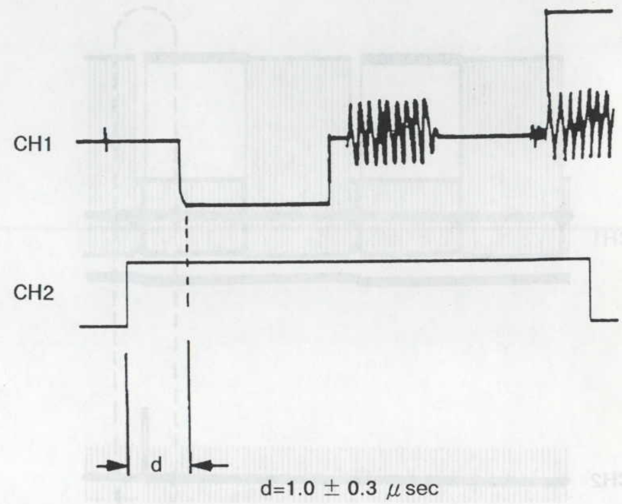


Fig. 7-5.

7-6. V RESET ADJUSTMENT

Mode	E-E
Signal	Color-bar
Measuring point	CH1: TP818 CH2: TP807
Measuring equipment	Oscilloscope
Adjusting element	RV804
Specified value	d=8 ± 1 μsec

Note: Trigger sets on CH2.

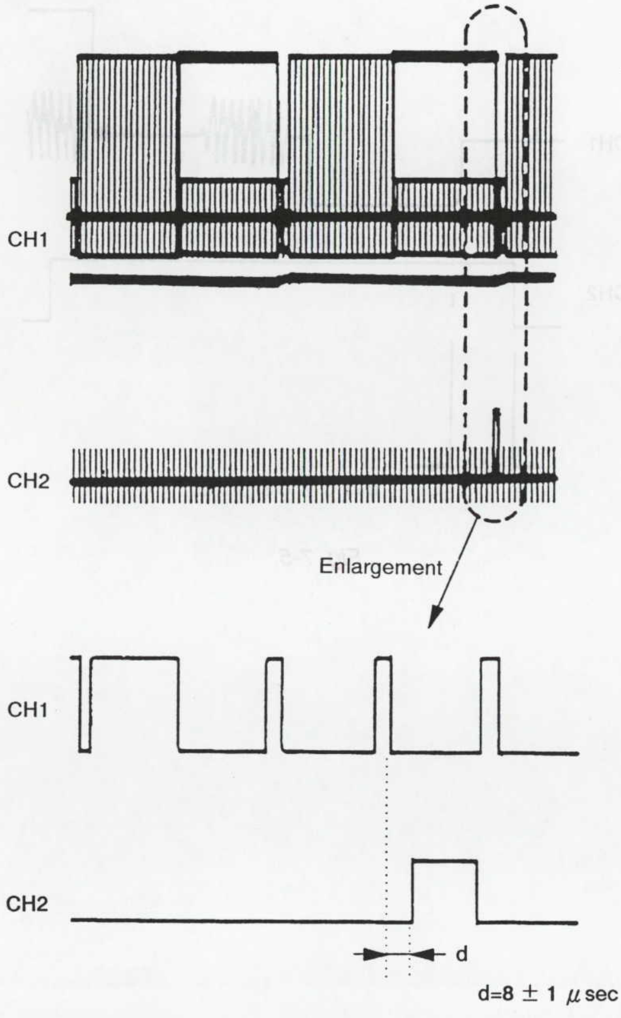


Fig. 7-6.

7-7. HUE ADJUSTMENT

1) Burst Flag Position Adjustment

Mode	E-E
Signal	Color-bar
Measuring point	CH1: TP818 (VIDEO) CH2: TP810 (BF)
Measuring equipment	Oscilloscope
Adjusting element	RV801
Specified value	d=5.6 ± 0.1 μsec

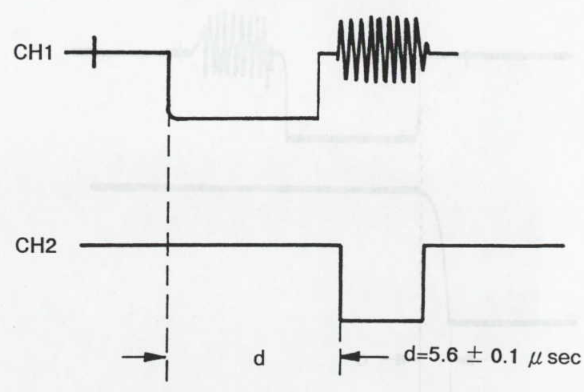


Fig. 7-7.

2) Chroma Decoder Freerun Frequency Adjustment

Mode	E-E
Signal	Color-bar
Connection	Connect TP 802 to 5 V line.
Measuring point	TP804
Measuring equipment	Frequency counter
Adjusting element	RV802
Specified value	4,433,650 ± 20 Hz

7-8. APC (AUTOMATIC PHASE CONTROL) ADJUSTMENT

Mode	E-E
Signal	Color-bar
Measuring point	TP818
Measuring equipment	Vectorscope
Adjusting element	CV801
Specified value	Match the color-bar phases of the input signal and the internal signal at the cyan (Cy) as the center.

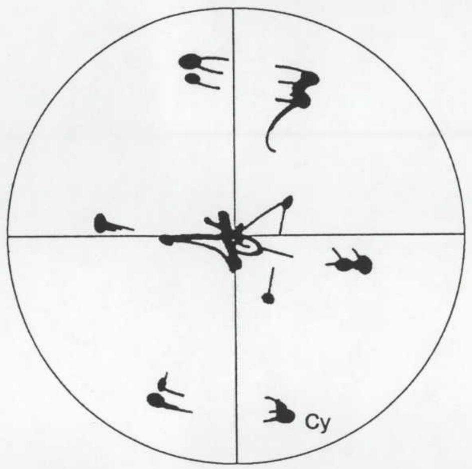
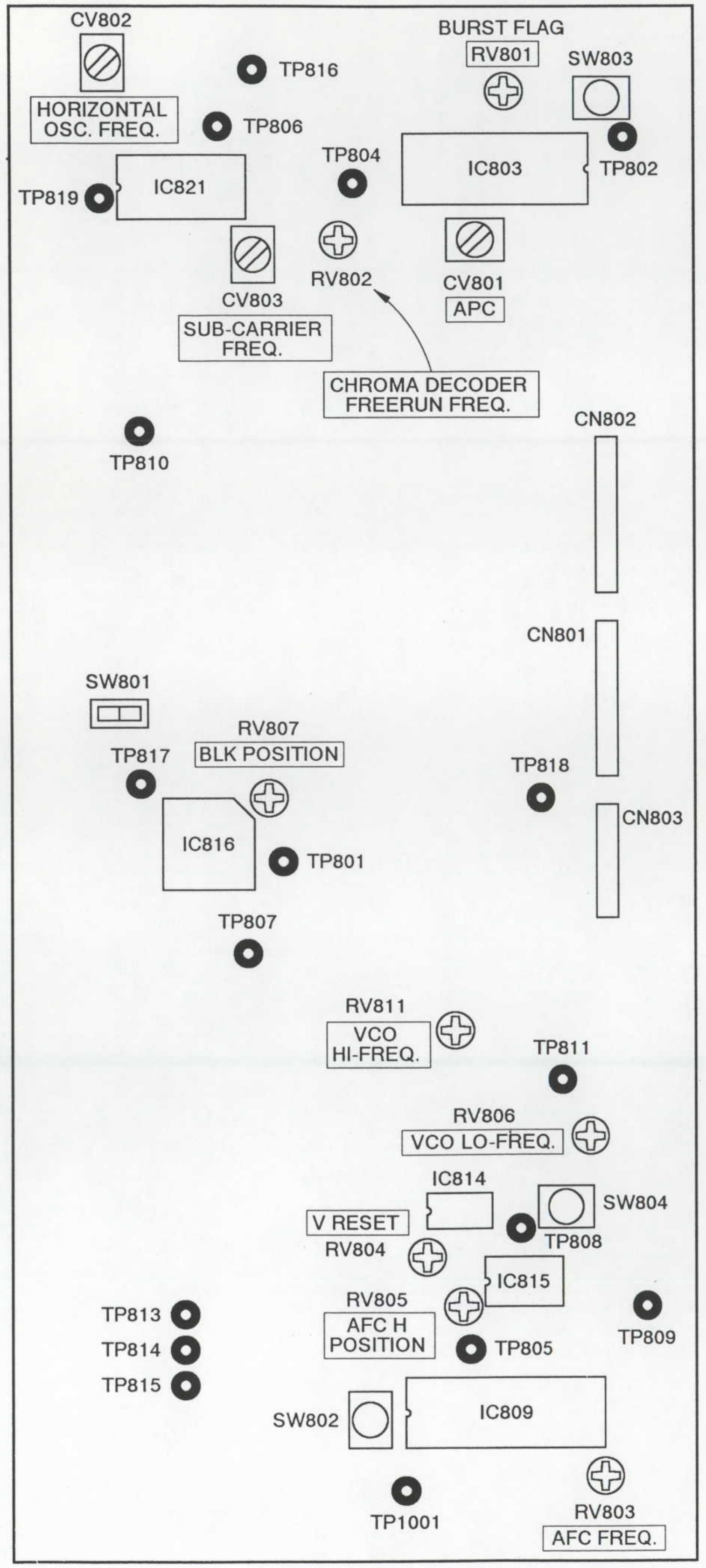


Fig. 7-8.

7-9. ADJUSTING PARTS LOCATION

EN-6 BOARD *– Component Side –*



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