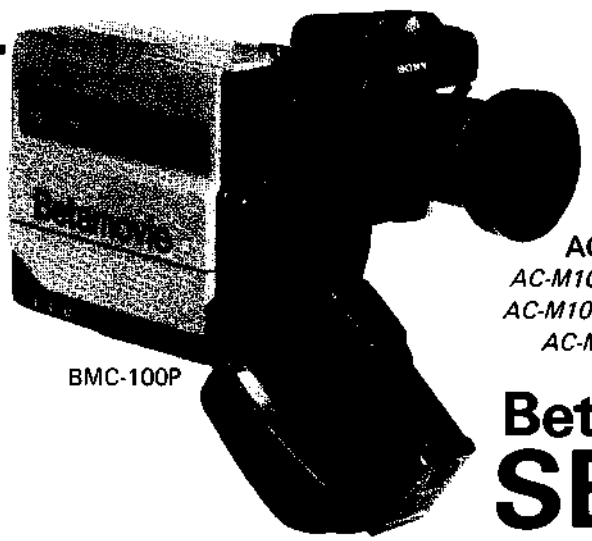
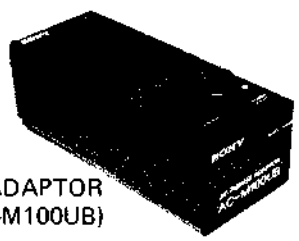
BMC-100P/100PK
AC POWER ADAPTOR

SERVICE MANUAL





AC POWER ADAPTOR
(AC-M100UB)

BMC-100P

AEP Model
UK Model
E Model
(See page 2)

AC POWER ADAPTOR
AC-M100E (AEP Model) Optional
AC-M100UB (UK Model) Supplied
AC-M110E (E Model) Supplied

Betamovie SB CHASSIS

November, 1983

Refer to separate adjustment manual, Part number 9-972-284-81.

SPECIFICATIONS

System

Video recording system	Rotary double-azimuth single-head, Helical scanning
Usable cassettes	Cassettes having the mark
Tape speed	18.73 mm/sec.
Maximum recording time	3 hours 35 min. (with L-830 video cassette)
Audio frequency response	50–8,000 Hz (using an external microphone)
Pickup tube	1/2-inch SMF Trinicon tube
Lens	Combined 6x power zoom lens f9 mm (F1.2)–54 mm (F1.4) with macro Filter diameter: 52 mm
Colour temperature selector	Built-in 2-step filter (3200°K/5500°K)
Minimum illumination	28 lux
Illumination range	28 lux to 100,000 lux (2.6 to 9294 footcandles), automatic sensitivity and iris

Inputs and outputs

DC IN 9.6 V jack	9.6 V dc
EARPHONE jack	Minijack, –26 dBs, 8-ohm impedance
REMOTE jack	Minijack
MIC jack	Minijack, –65 dBs, Low impedance

General

Power requirements	9.6 V dc
Power consumption	9.0 W
Operating temperature	0°C to 40°C (32°F to 104°F)
Dimensions	Approx. 125 × 220 × 357 mm (w/h/d) (5 × 8 3/4 × 14 1/8 inches) when packed
Weight	2.5 kg (5 lb 8 oz) Betamovie only
Viewfinder	TTL optical system, Eyesight correction adjustable (+2 – –4 DP)
Microphone	Built-in electret condenser mic
Accessories supplied	Eye cup cover...1 Shoulder strap...1 Earphone...1 Decal...1 Battery pack NP-11...1 (UK, E Model) AC Power adaptor AC-M100UB...1 (UK Model) AC-M110E...1 (E Model)

MICROFILM

Consumer VIDEO

Beta BETAMOVIE SONY®

BMC-100P . . . . . .AEP MODEL
AC POWER ADAPTOR and BATTERY PACK (optional)
BMC-100PK . . . . . .UK, E MODEL
AC POWER ADAPTOR and BATTERY PACK (supplied)

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 SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS 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. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

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AC-M100E/M100UB/M110E

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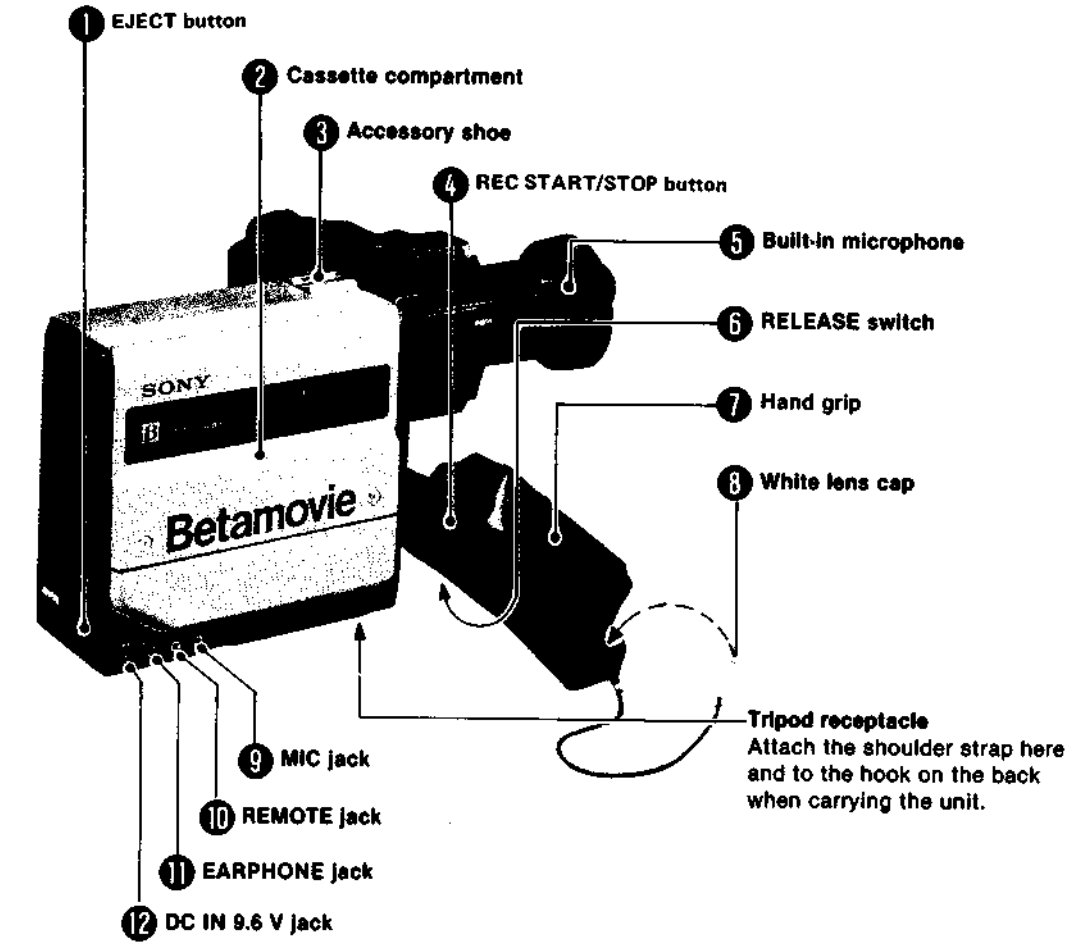
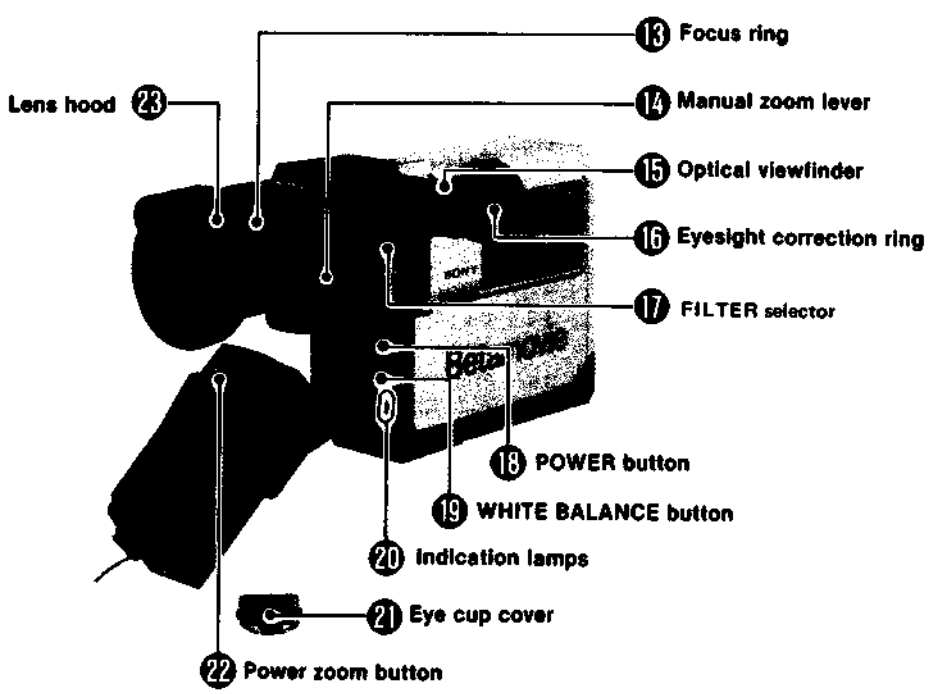
SECTION 1
OUTLINE

1-1. LOCATION AND FUNCTION OF PARTS AND CONTROLS





❶ **EJECT button**
Slide down to open the cassette compartment. (p. 9)
The button does not operate when the power is not supplied or the battery power is exhausted.

❷ **Cassette compartment**
Insert the cassette here. (p. 6)
If a cassette is not loaded, no function except the EJECT button will work.

❸ **Accessory shoe**
For attachment of an external microphone (with a SAD-100 external microphone shoe).

❹ **REC START/STOP button**
Press to start recording, press again to stop. (p. 8)

❺ **Built-in microphone**
Sound is recorded simultaneously with video taping.

❻ **RELEASE switch**
Slide to unlock the hand grip. Hand grip angle can be set in one of three positions. (p. 7)

❼ **Hand grip**
Comfortable grip that also holds the battery pack. (p. 6)

❽ **White lens cap**
Snap onto the hand grip belt when shooting. Place on the lens hood when the unit is not in use, or to adjust the white balance.

❾ **MIC jack**
For connection of an external microphone. The built-in microphone is automatically disconnected.

❿ **REMOTE jack**
For connection of an optional Betamovie Commander to control the unit from a distance.

⓫ **EARPHONE jack**
For connection of the supplied earphone to monitor the sound being recorded. (p. 8)

⓬ **DC IN 9.6 V jack**
For connection of an ac power adaptor or car battery cord. The internal battery power is automatically disconnected.

⓭ **Focus ring**
Turn the ring to focus while looking through the viewfinder. (p. 12, 15)

⓮ **Manual zoom lever**
Use the zoom lever to turn the zoom ring manually between W(wide-angle) and T(telephoto) positions.
For close-ups, turn the knob of the lever in the direction of arrow, then turn the lever counterclockwise until the ring is in the MACRO position.

⓯ **Optical viewfinder**
Place your right eye here so that the lens' full field of view can be seen.
It is possible to focus the lens with the power off. The letter lamps inside the viewfinder indicate all the information necessary for operation.
W: Lights steady when the white balance needs adjustment. (p. 10, 11)
Blinks during adjustment.
T: same as the TAPE/BATT indication lamp. (item ⓴)
C: same as the CAUTION indication lamp. (item ⓴).
L: Lights when the light level is too low. (p. 10)

⓰ **Eyesight correction ring**
Adjust to your eyesight to assure good focus. (p. 12)

Be sure to adjust when shooting for the first time.

⓱ **FILTER selector**
Set to the proper position in accordance with prevailing light conditions. (p. 10)
☼: Sunlight (outdoors or indoors)
☃: Incandescent lamps, fluorescent lamps or photo-flood lamps (indoors)

⓲ **POWER button**
Press to adjust the white balance or to set the standby mode for immediate recording starts. (p. 9) The STANDBY lamp will light.
Press again and the lamp goes off.

⓳ **WHITE BALANCE button**
Press to adjust the white balance with the white lens cap on, after setting the FILTER selector. (p. 10, 11)

⓴ **Indication lamps**
TAPE/BATT : Lights steady when the tape is running.
Blinks when the battery is exhausted. Replace the battery pack.
DEW : Lights when moisture has condensed inside the unit. Eject the cassette and let the Betamovie sit until the moisture evaporates. The unit can be used again if the light does not come on when the cassette is reinserted.
CAUTION : Blinks when the video head becomes clogged or dirty. Clean the video head with a Sony L-25CL video head cleaning cassette.
Lights steady when the unit is out of order. Contact the nearest Sony dealer or local Sony service facility.

㉑ **Eye cup cover**
Attach to the viewfinder eye cup when remotely controlling the unit.
Attach to the shoulder strap when not in use.

㉒ **Power zoom button**
Press for smooth power zooming between the W(wide-angle) and T(telephoto) positions.

㉓ **Lens hood**
Usually attached to the Betamovie. Remove when shooting close-ups or using an optional filter. (p. 13)

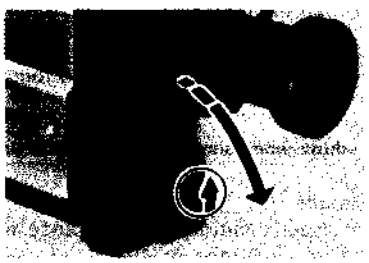
1-2. RECORDING

Operation is easy and practice shooting will help you to become familiar with the procedures.

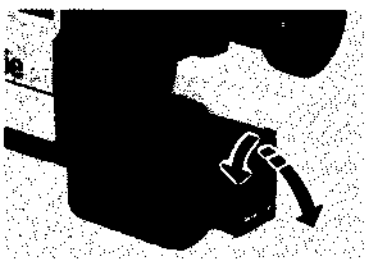
Preparations

1 Install a charged battery pack, NP-11.

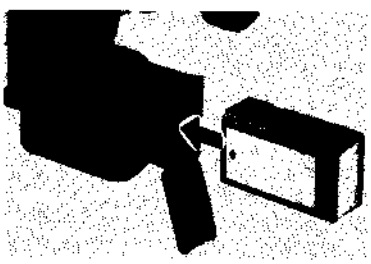
❶ Slide the RELEASE switch up to bring down the hand grip.



❷ Turn the BATTERY knob to OPEN, and open the lid.



❸ Insert a battery, close the lid and turn the knob to CLOSE.



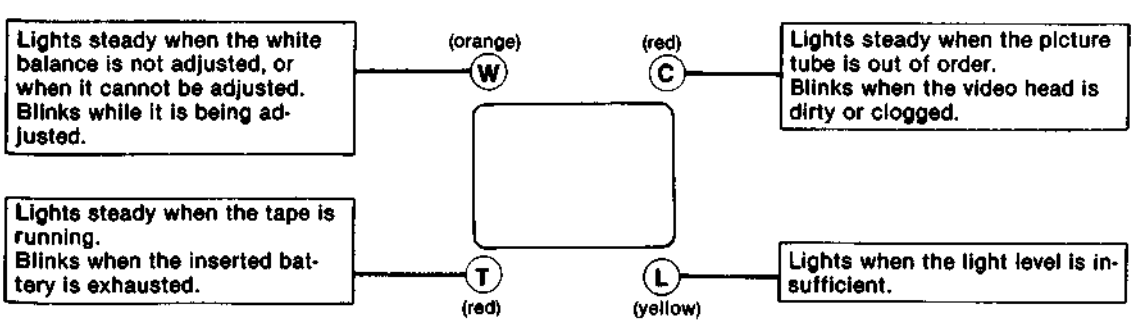
2 Install a cassette (with the safety tab).

❶ Slide the EJECT button down to pop up the compartment lid.

❷ Insert a cassette with the round window to the right and push down to settle.

❸ Press the left side of the compartment lid to close.

The letter lamps inside the viewfinder
The lamps blink or light steady to indicate all the information necessary for operation.



All the lamps light up at first when the POWER or REC START/STOP button is pressed.

Operation

Betamovie is only for recording.
For tape duplication, two other VCRs are required.

1 Set to the standby mode.

Press the POWER button.
The STANDBY lamp lights up.

2 Adjust the white balance.

With the white lens cap on

❷ Press the WHITE BALANCE button.

❶ Set the FILTER selector according to the prevailing light condition.

The "W" goes off when adjusted.

In the viewfinder

Sunlight (outdoors or indoors)

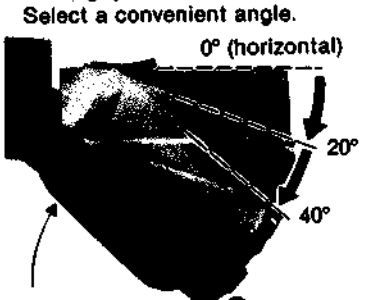
Artificial lights (indoors)

When you press the WHITE BALANCE button immediately after pressing the POWER button, the white balance may sometimes not adjust. In that case, press the WHITE BALANCE button again.

Get ready for shooting

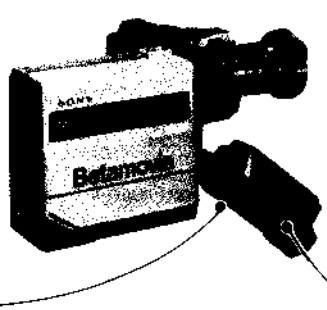
1 Lock the hand grip into a position.

Hand grip
Select a convenient angle.



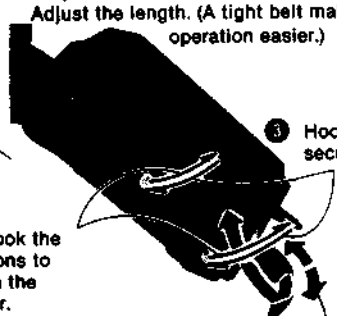
❶ Slide the RELEASE switch to unlock and bend.

❷ Release to lock at the desired angle.



2 Place your right hand under the grip belt and grasp the grip.

Grip belt
Adjust the length. (A tight belt makes operation easier.)



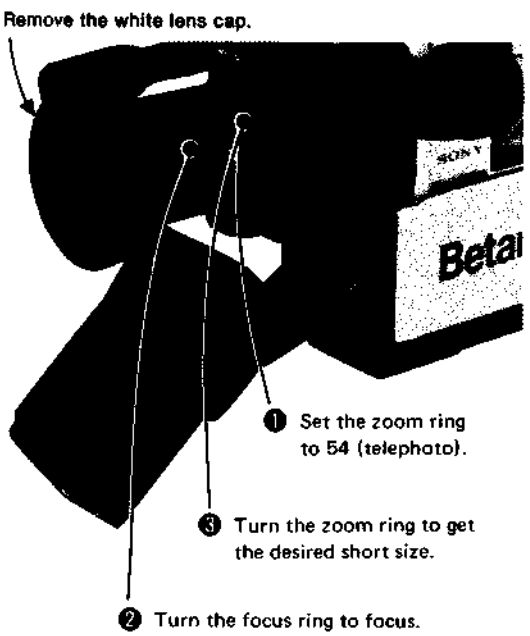
❸ Hook the buttons to secure the cover.

❶ Unhook the buttons to open the cover.

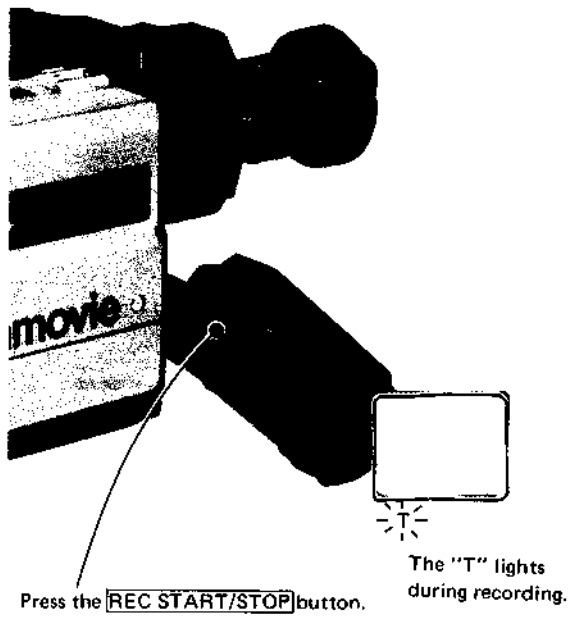
❷ Adjust the strap length to fit your hand.

3 Focus

Adjust the eyesight correction ring to your eye, when using for the first time or after another person. (See page 12, 15.)



4 Start recording

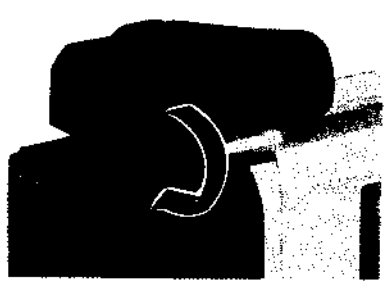


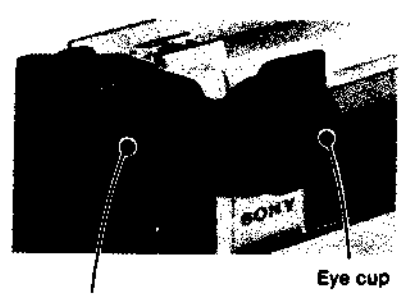
To stop recording momentarily
Press the REC START/STOP button again.
The STANDBY lamp is lit.
The unit is automatically turned off (the STANDBY lamp goes off) when it is in the standby mode over 3 minutes.

Monitoring the sound being recorded.
Plug the supplied eaphone into the EARPHONE jack and listen during recording.

3 Put the Betamovie on your shoulder, and put your right eye on the viewfinder eye cup.

Viewfinder
Fold down into operating position.





Resting the Betamovie on your shoulder helps to keep it steady for shooting.

To start recording again

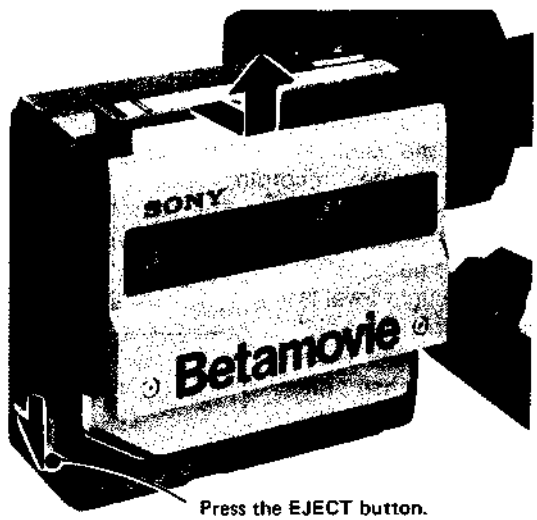
Press the REC START/STOP button again.

While the STANDBY lamp is lit.....
Recording starts immediately.
After the STANDBY lamp goes off.....
Recording starts after about 3 seconds.*
*It takes about 3 seconds for the picture tube warm-up before recording.

When you wish to start recording immediately, press the POWER button to set the Betamovie in the standby mode (the STANDBY lamp is lit.)
The battery power is also consumed in the standby mode as much as in the recording mode.

Smooth recordings can be made even if the recording is stopped and started again, unless the cassette is taken out.

5 Remove the recorded cassette.



Press the EJECT button.

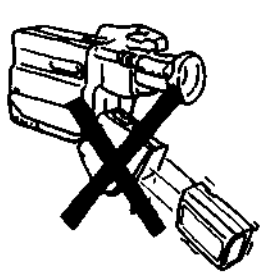
If the battery power is exhausted and the compartment lid cannot be opened, replace with a charged battery or connect with an ac power adaptor.

Run the tape for about 25 seconds **at the beginning of a cassette** before starting recording.
Otherwise you may miss the starting point during playback when the tape is played back on video cassette recorders.

For "once-only" events such as weddings etc., it is strongly recommended to have a trial run to check that everything is working perfectly.

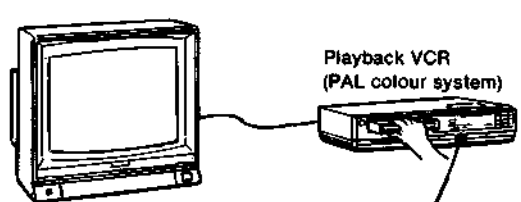
After recording

Take out the battery pack.
Hold the unit with the hand grip lid pointing up to open the battery compartment. Never point the lid downward as the battery pops out.



Charge the battery for the next use.

Playback of the tape
A video cassette recorder and a TV are required.



If streaks or snow appear on the TV screen, adjust the TRACKING control of the VCR for the best possible picture.

For details, refer to the Instruction manual of the VCR.

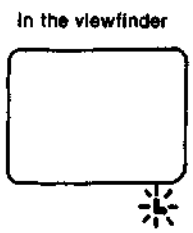
1-3. THREE POINTS TO CONSIDER WHEN SHOOTING

POINT 1

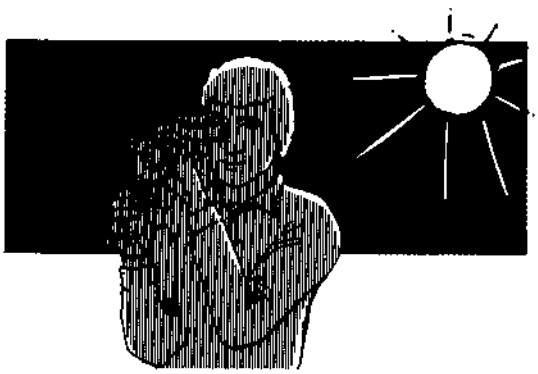
LIGHTING AND LIGHT DIRECTION

Is the subject sufficiently lighted? Actually, because the Betamovie uses Sony's SMF Trinicon® tube, recording can be done without special lighting. But for the best results, there are times when additional lighting is necessary.

When the light level is too low, the letter "L" will light in the viewfinder; increase the light level as necessary. The warning indicator will go out when the light level is satisfactory.



Generally, recording should be done with the sun at your back (front-lighting). This will illuminate the subject naturally and provide the best results from the very beginning of your recording.



It is also possible to record with the sun behind your subject (back-lighting), but this technique is more likely to produce less than satisfactory results until you become proficient. Front-lighting usually provides better results unless you're trying to create special effects

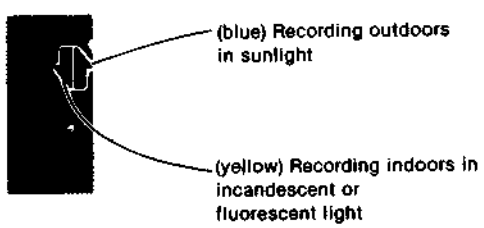
For further details, refer to the section "Brightness levels" in the HINTS FOR BETTER RECORDING section on page 13.

POINT 2

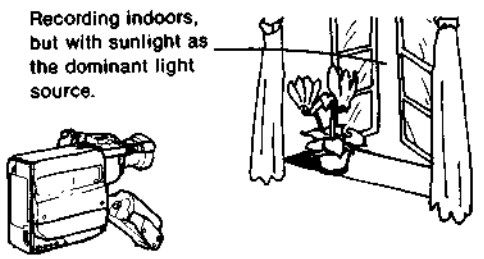
WHITE BALANCE

Because Betamovie uses an optical viewfinder, the image you see in it is usually the same colour as that of the subject. This is not always the case with the image being recorded, however, because of the fact that the colour of the subject can be affected by the colour temperature of the ambient light. The human eye has the ability to adapt to this situation, but a video camera does not. So to compensate for light temperature variations, the white balance control is used.
(See "Colour temperature" in the HINTS FOR BETTER RECORDING on page 13.)

White balance adjustment
First, set the FILTER to the appropriate ambient light position, depending on the most dominant light source.

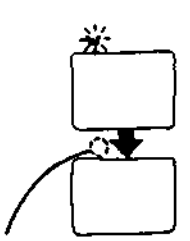


If the camera is indoors but the subject being recorded is in a window or outdoors, set the switch to the ☼ position.



With the [FILTER] set and **the white lens cap in place on the lens hood, aim the lens at a light source (indoors) or a subject from a distance of at least two meters (outdoors).** Then merely press the [WHITE BALANCE] button and the white balance will be perfectly adjusted automatically.

When adjusting white balance outdoors, more accurate adjustment can be made by setting the white balance in accordance with the light conditions the subject will be taped under. For example, if the subject will be taped in sunlight, **put the white lens cap on the lens hood** and point the camera toward the sun. If the subject will be taped in shadows, white balance should also be adjusted in shadows. When white balance adjustment is completed the "W" lamp in the viewfinder will go off.



Cautions on white balance adjustment

Losing white balance adjustment
The white balance adjustment is preserved for about 30 minutes after the power is turned off. If the power is off for more than 30 minutes, or if the [FILTER] selector position is changed, the white blance adjustment will be lost and the "W" lamp will light when the power is turned on. Set the white balance adjustment again as outlined above.

"W" lamp stays on after the WHITE BALANCE button is pushed.
- Adjustment cannot be made because of insufficient light (the "L" lamp will also light.)
- Adjustment cannot be made because of the presence of certain types of light, such as neon signs or tunnel lights.

Even if the "W" lamp does not go off, the white balance is nearly perfectly adjusted by the position of the [FILTER] selector, so recording is still possible.

Changing light sources
Because lighting remains basically the same for a given source, the white balance adjustment does not need to be changed very often. However, if a major light source change is made, such as from outdoor to indoor shooting, the white balance will have to be readjusted.

POINT 3

FOCUS

The first time you use the Betamovie, or if somebody else has been using the Betamovie, be sure to set the focus of the eyesight correction ring to your eyesight before recording.

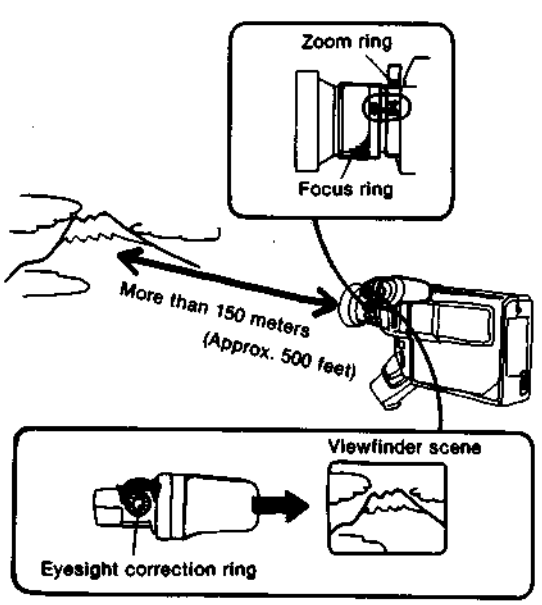
Eyesight adjustment

To properly use the optical viewfinder, it is first necessary to set the eyesight adjustment.

The distance of optimum vision varies from person to person, and the eyesight correction ring is incorporated to compensate for this. If this adjustment is not correct for the user, it is likely that the recorded images will not be in focus.

Using a subject

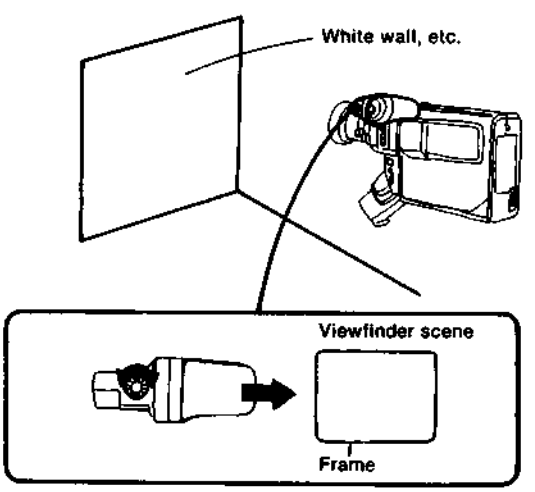
1. Set the zoom ring to **54** (telephoto) and the focus ring to ∞ (infinity).
2. Center a distant subject (at least 150 meters away) in the viewfinder.
3. Turn the eyesight correction ring until the clearest image of the subject is obtained.

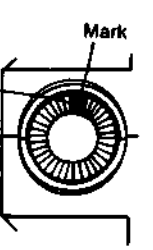


Using the viewfinder frame

When a subject cannot be taken from a distance, such as in a room, etc.

1. Aim the Betamovie at a brightly-lit solid colour object.
2. Turn the eyesight correction ring until the viewfinder frame is in focus.





You will find it useful to remember the setting of the eyesight correction ring so that you can easily reset it should the position be changed.

It does not matter how many times the ring is rotated to the left or right: the only thing that matters is the position of the mark on the ring.

1-4. UNDERSTANDING LIGHT – FOR BETTER RESULTS

Brightness levels

The single greatest influence on picture quality is the brightness level. Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording.

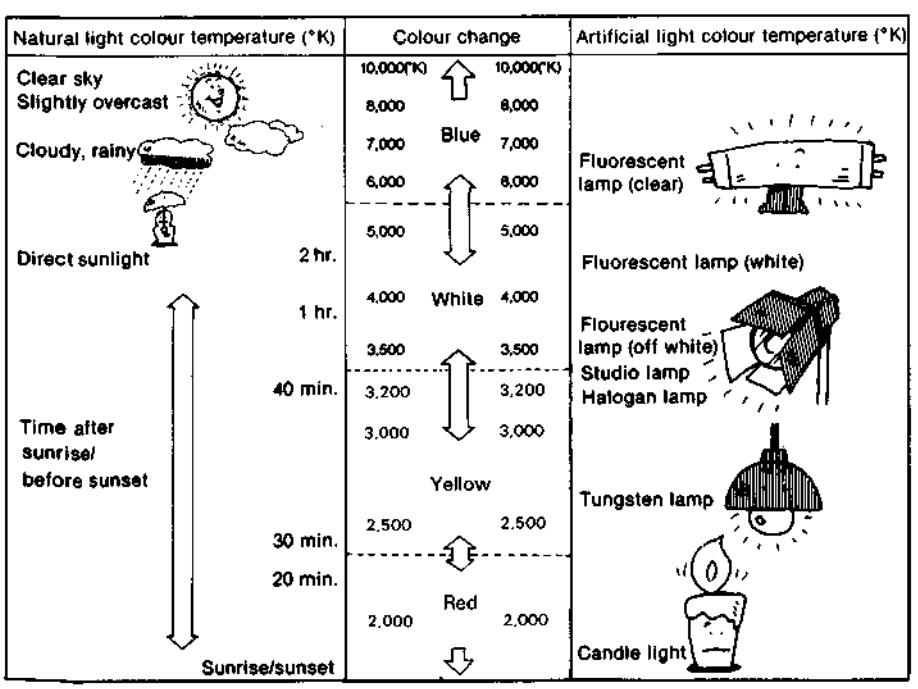
When to use an ND filter

Exceptionally bright scenes such as sunny days at the beach in summer or on snow fields in winter will look "washed out" when recorded. To make these scenes recorded naturally, an ND filter is required. (Refer to the chart)
Three types are available—ND2, ND4, ND8—which reduce the exposure level to 1/2, 1/4, and 1/8, respectively.
Select filters to match the lens diameter of 52 mm.

ND filter required	Unit: lux	
		Snow-covered mountains Snow fields Sandy beach, clear day in summer
Normal recording	100,000	Clear day, mid-day(100,000)
		Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000)
	10,000	
		Overcast day, one hour after sunrise (2,000) Office lit by fluorescent lamps, near window (1,000)
	1,000	Clear day, one hour before sunset (1,000) Department store counter (500~700)
	500	Station wicket (550)
Video light recommended		Office lit by fluorescent lamps (400~500) Room lit by two 30 W Fluorescent lamps (300) Subway station platform (300)
	100	Arcade at night (150~200)
Video light required		Theater lobby (15~35) Candle light (10~15)
	10	

Colour temperature – how it effects white balance adjustment

If the temperature of an object continues to increase, it will eventually begin giving off light. At this time, there is a fixed relationship between the object's temperature and its "light colour." The temperature of the object radiating the light is expressed in absolute temperature (°K). This is also known as the colour temperature, which in turn stands for "light colour." As colour temperature increases, the light colour changes from red to yellow to white to blue.



1-5. CHARACTERISTICS OF OPTICAL VIEWFINDERS

- **Color pictures are available**...

Subjects which tend to merge with the background,
such as a flower or bird in the woods or a rabbit in a field of snow,
which would be hard to see with a black-and-white viewfinder, can be clearly distinguished.

- **Compact and light-weight**...
- **Always ready**...

Color pictures are always viewable in the viewfinder, even without the Betamovie turned on.
Recording can start after about 3 seconds even if the unit is not in the standby mode.

- **Power saving**...

While an electronic viewfinder needs power to operate, an optical viewfinder consumes no power at all.

These are the reasons why an optical viewfinder is used for the Betamovie.
Keep in mind, however, that the picture being recorded is not exactly the picture shown in the optical viewfinder...
Note that you must set the eyesight adjustment of the viewfinder before you can focus accurately.

1-6. EYESIGHT ADJUSTMENT

First, set
the focus ring at ∞
the zoom ring at **54.**

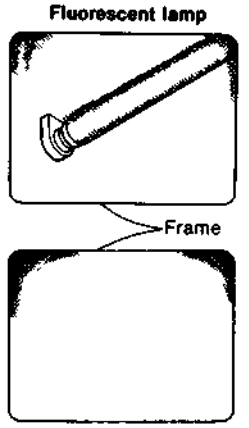
Select one of the following methods.

Indoors

Method 1 Remove the white lens cap and aim the unit at a fluorescent lamp. (It is not necessary that the focus ring be adjusted at this point.)

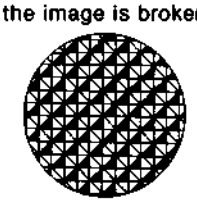
Method 2 Aim at an incandescent lamp **with the white lens cap on.**

Method 3 Remove the white lens cap and aim at a brightly-lit white object.



White lens cap attached or brightly-lit white object

Now adjust the eyesight correction ring so that the viewfinder frame is the clearest. Focusing the viewfinder requires some skill. You will know the viewfinder is focused when the image is broken up into very fine lines.

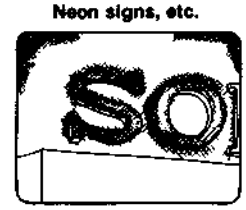

Enlargement of "fine lines" in the viewfinder

Outdoors

Method 1 (Daytime.) Center a subject at least 150 meters (500 feet) away in the viewfinder. Adjust the eyesight correction ring until the clearest image of the subject is obtained.

Method 2 (Night time.) Center a light at least 150 meters (500 feet) away in the viewfinder. Adjust the ring until the light is clear.

Neon signs, etc.

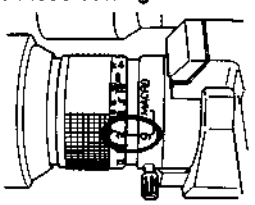

When the subject is the clearest, the "fine lines" are seen.

When the eyesight adjustment has been completed, the viewfinder frame is the clearest, the image in the viewfinder will be clear and broken up into very fine lines.

1-7. FOCUSING

How to be (almost always) in focus -rough focus

Make sure the eyesight adjustment is properly set.
Set the focus ring at **2m** and the zoom ring at **9** and leave them at these settings.



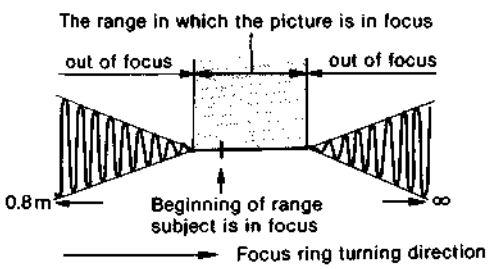
At these settings, the depth of field (the range in which the picture will be in focus) is:
Indoors from 1.2m to 9.5m (4 to 31 feet)
Outdoors on a clear day from 40cm (16 inches) to ∞ (infinity)

Use the viewfinder simply to frame the picture.

How to focus precisely

Make sure the eyesight adjustment is properly set.

1 Set the zoom ring at **54** and the focus ring at **0.8m.**
2 Turn the focus ring toward ∞ until the point at which the subject **begins to come into focus.**

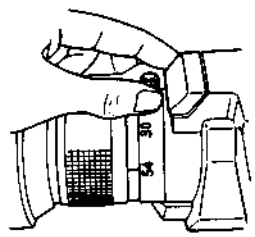


Now you are ready to start recording.

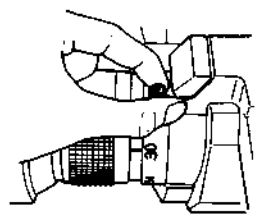
The closer the zoom ring is to **9**, the deeper the depth of field becomes. Shoot pictures as wide as possible (**30** and under) if there is no need to be telephoto. Be sure to focus for each shot with the zoom ring at **54.**

An easy way to manipulate the zoom ring for focusing while looking through the viewfinder.

1 Turn the zoom lever to **54** with your thumb.



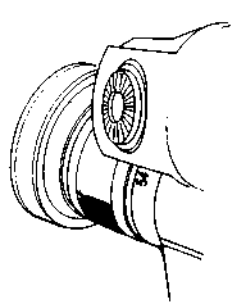
2 Place the thumb of the left hand as shown, and with your forefinger turn the lever until it touches your thumb. The value of the zoom ring will be around **30** at this point.



Practice eyesight adjustment and focusing over and over on the same tape until you are satisfied with the results.
It is better to practice on a subject with letters or lines on it, rather than a landscape. You might find it useful to record your voice as you practice — "Now the subject is just coming into focus" — so that you can see the relation between focus in the viewfinder and focus of the recorded subject.

To monitor the value of the zoom ring while looking through the viewfinder

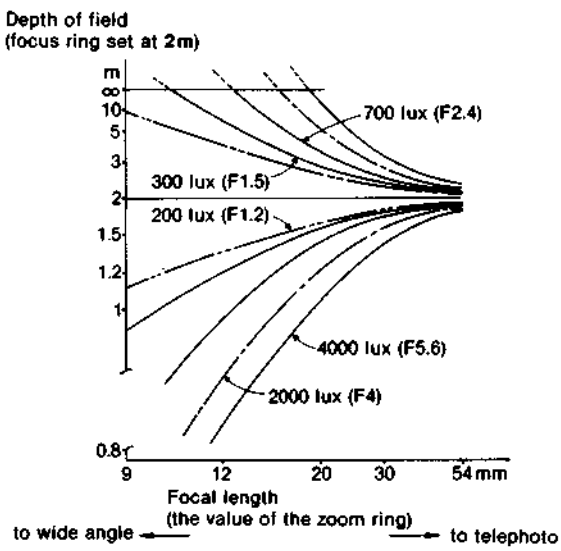
Open your left eye to see the zoom ring while keeping your right eye in the viewfinder.
When you see **54**, the ring is set approximately at **30.**
With practice, you can estimate the value of the zoom ring by the number seen with your left eye.

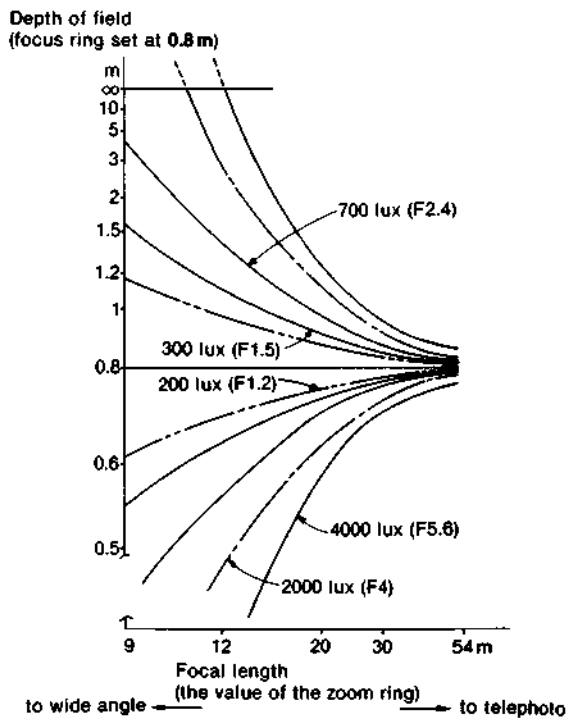


1-8. DEPTH OF FIELD

—Refer to the charts below.

In any lens a subject which extends some distance either side of the focal point can be shot in focus, as long as it falls within the "depth of field."
The depth of field varys depending on the lens' focal length (wide angle or telephoto), the amount of light and the distance from the subject.
The figures on the focus ring indicate the distance between the front of the lens (not including the lens hood) and the subject when the subject is in focus.





For a sharp picture, please observe the following points.

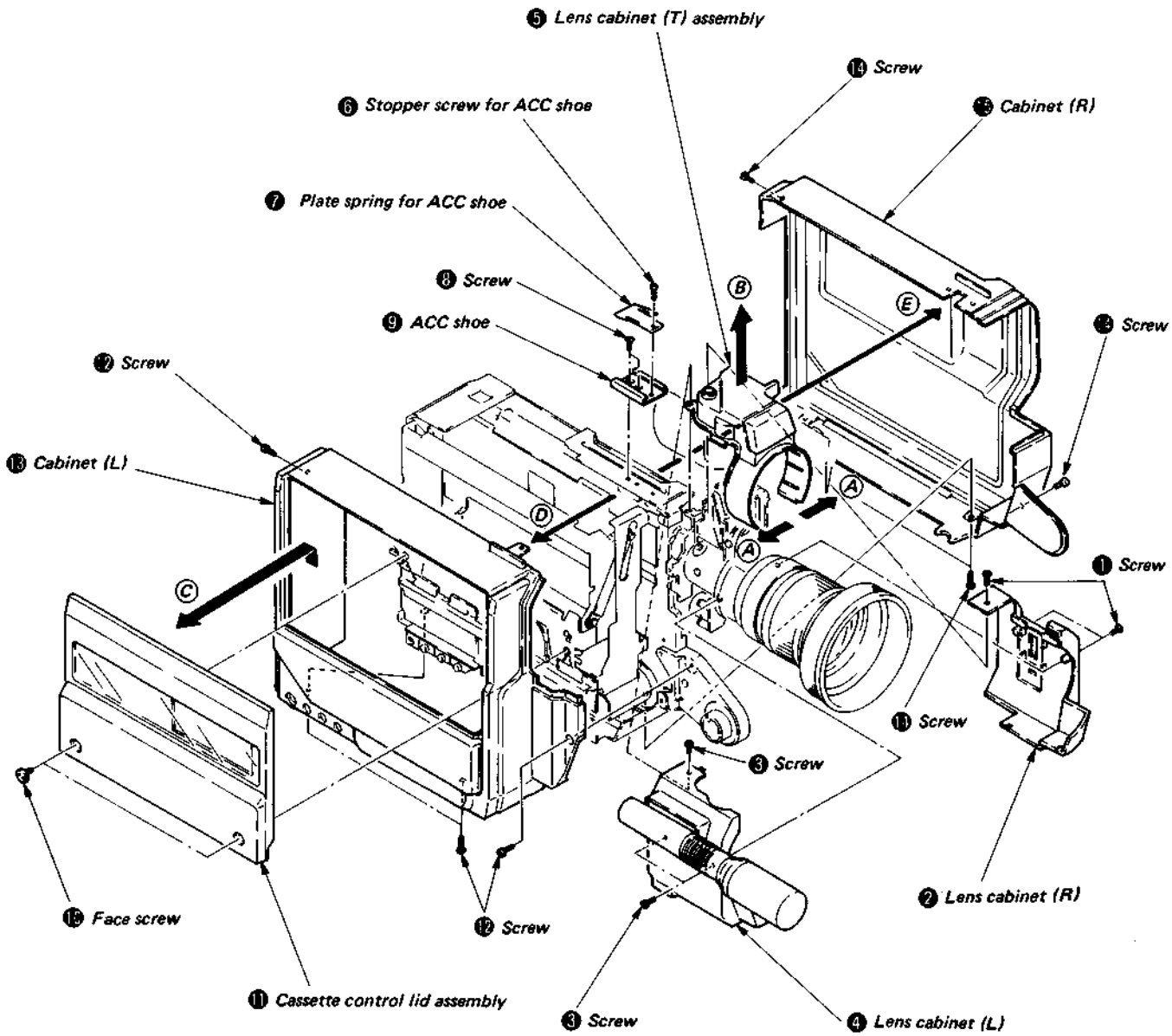
1 Get close to the subject.
2 Use a wide angle shot.
3 Make sure the light is sufficient.

These three points apply to any type of video camera.

SECTION 2
DISASSEMBLY

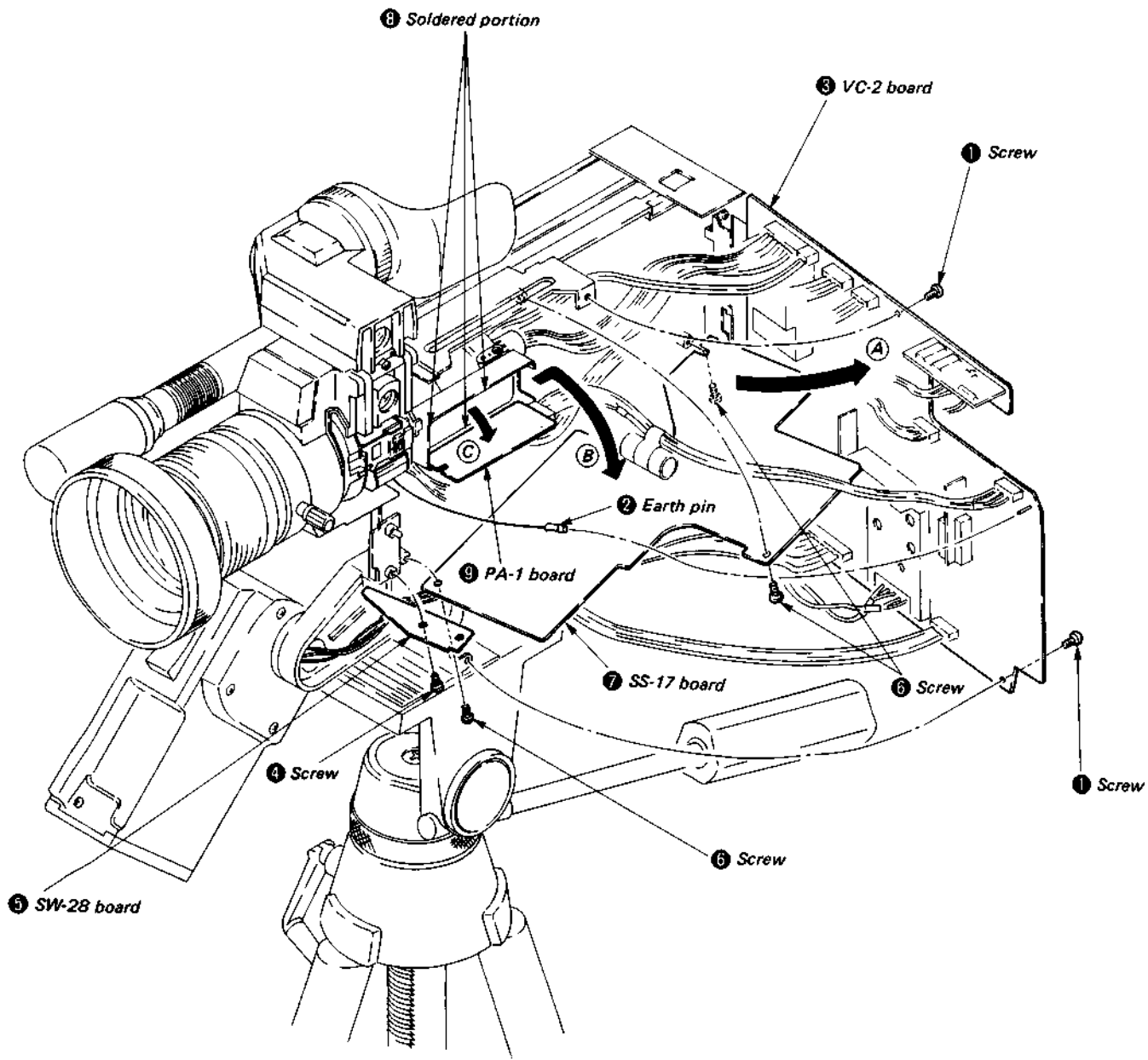
2-1. CABINET REMOVING PROCEDURE

❶ Remove three screws (+P2 x 8).
❷ Remove lens cabinet (R).
❸ Remove three screws (+P2 x 8).
❹ Remove lens cabinet (L).
❺ Remove lens cabinet (T) assembly in the direction of arrow Ⓑ after opening it in the direction of arrow Ⓐ.
❻ Remove Stopper screw for ACC shoe.
❼ Remove plate spring for ACC shoe.
❽ Remove two screws (K2.6 x 6).
❾ Remove ACC shoe.
❿ Remove two face screws.
⓫ Remove cassette control assembly in the direction of arrow Ⓒ.
⓬ Remove four screws (+B2.6 x 6).
⓭ Remove cabinet (L) in the direction of arrow Ⓓ.
⓮ Remove four screws (+B2.6 x 6).
⓯ Remove cabinet (R) in the direction of arrow Ⓔ.



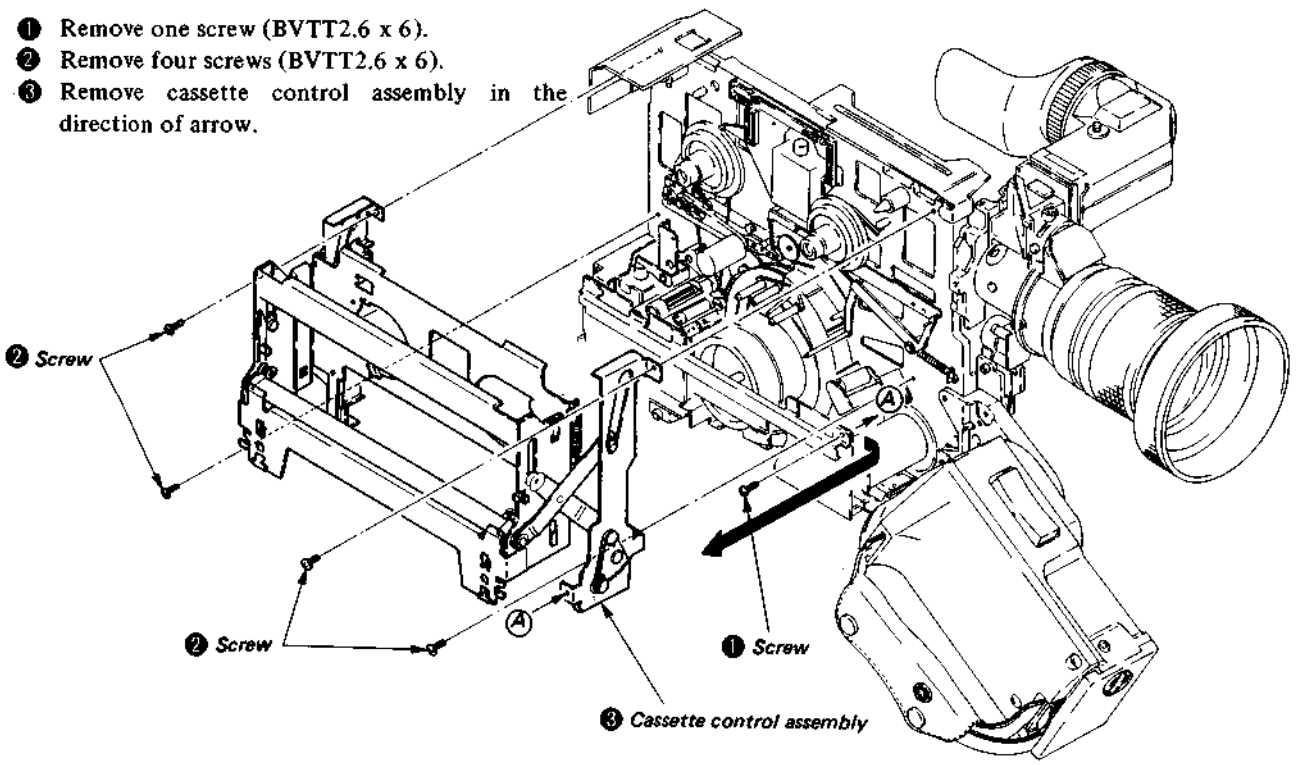
2-2. PROCEDURE FOR OPENING SS-17 AND VC-2 BOARDS

❶ Remove two screws (BVTT2.6 x 6).
❷ Pull out earth pin.
❸ Open VC-2 board in the direction of arrow Ⓐ.
❹ Remove one screw (+PTP2.6 x 10).
❺ Remove SW-28 board.
❻ Remove three screws (BVTT2.6 x 6).
❼ Open SS-17 board in the direction of arrow Ⓑ.
❽ Remove soldered portions of PA sield case and PA-1 board.
❾ Open PA-1 board in the direction of arrow Ⓒ.



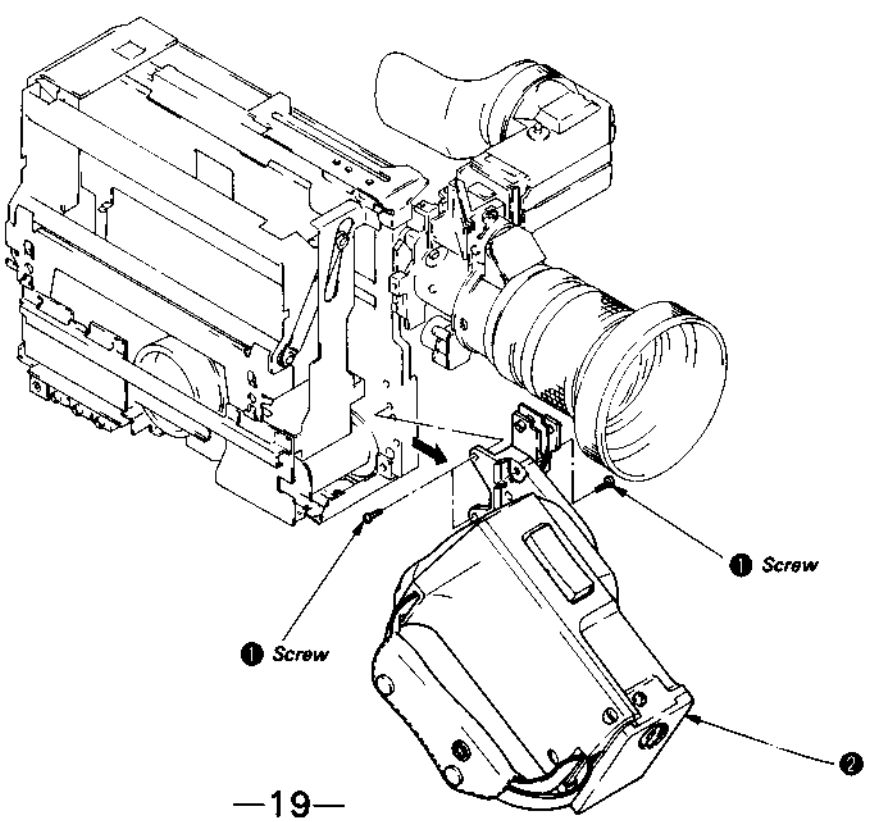
2-3. PROCEDURE FOR REMOVING CASSETTE CONTROL ASSEMBLY

❶ Remove one screw (BVTT2.6 x 6).
❷ Remove four screws (BVTT2.6 x 6).
❸ Remove cassette control assembly in the direction of arrow.



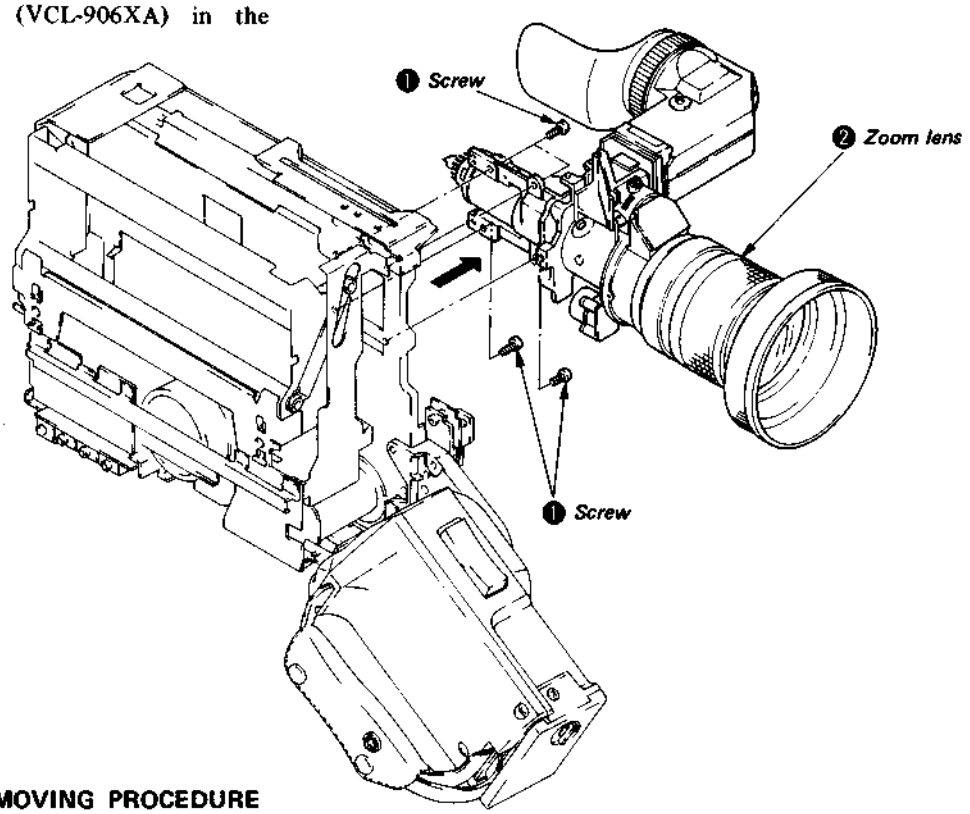
2-4. GRIP REMOVING PROCEDURE

❶ Remove three screws (BVTT2.6 x 8).
❷ Remove grip in the direction of arrow.



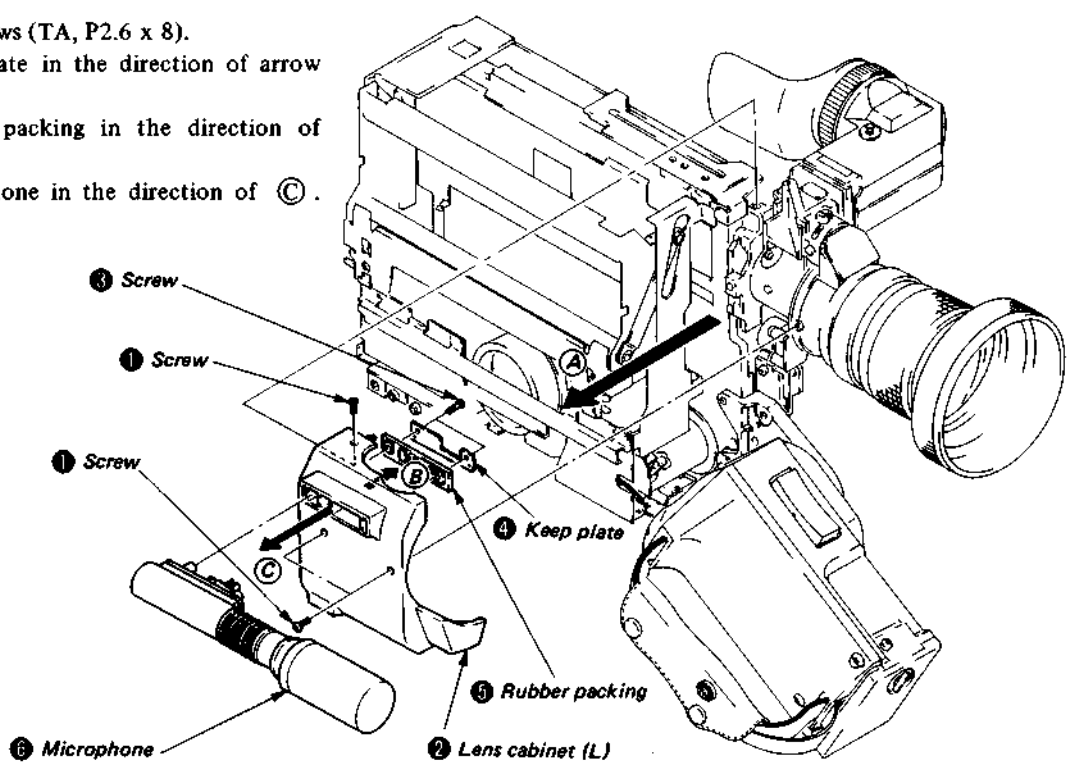
2-5. ZOOM LENS (VCL-906XA) REMOVING PROCEDURE

❶ Remove four screws (BVTT2.6 x 8).
❷ Remove zoom lens (VCL-906XA) in the direction of arrow.



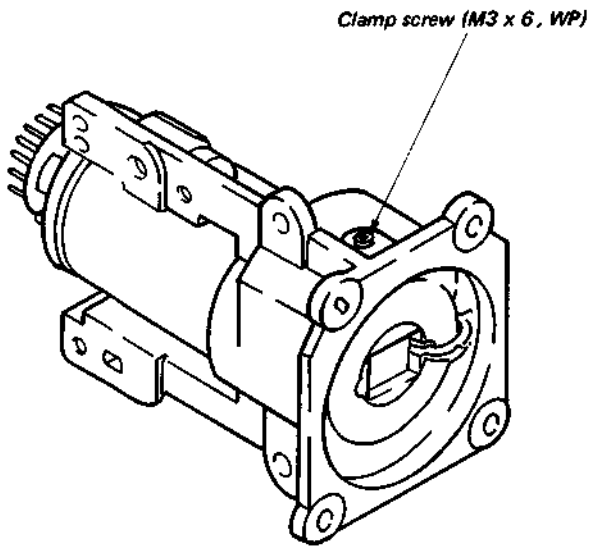
2-6. MICROPHONE REMOVING PROCEDURE

❶ Remove three screws (+P2 x 8).
❷ Remove lens cabinet (L) in the direction of arrow Ⓐ.
❸ Remove two screws (TA, P2.6 x 8).
❹ Remove keep plate in the direction of arrow Ⓑ.
❺ Remove rubber packing in the direction of arrow Ⓑ.
❻ Remove microphone in the direction of Ⓒ.

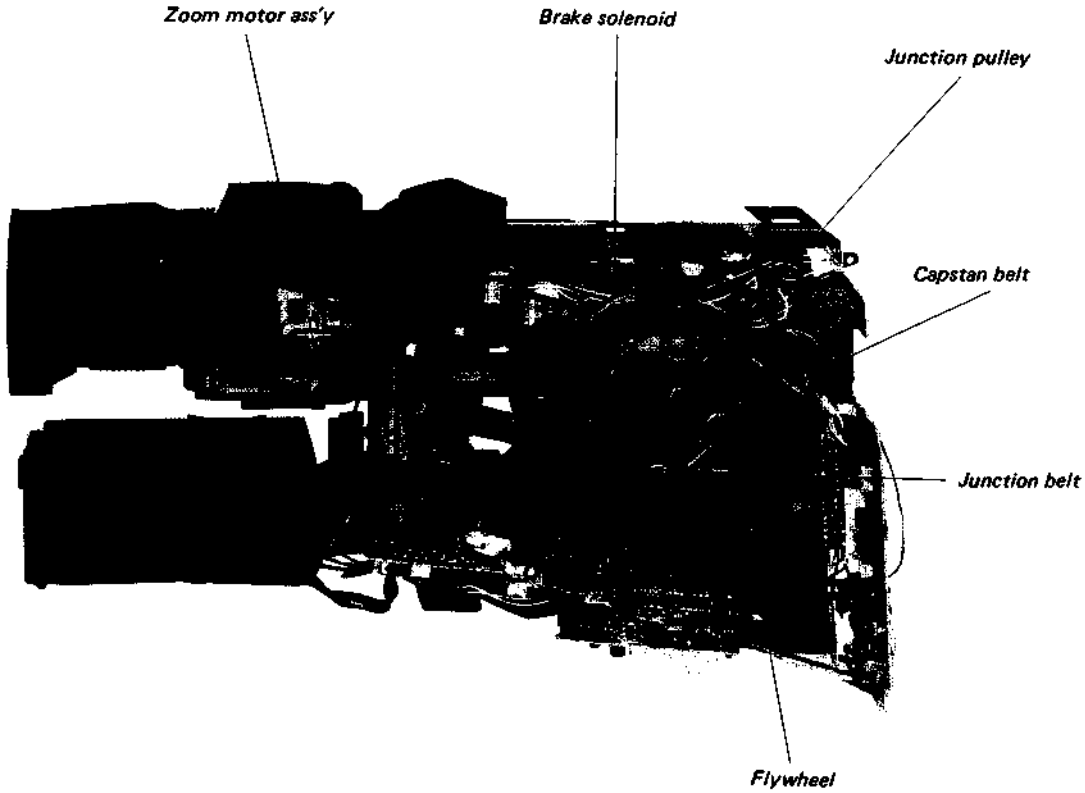


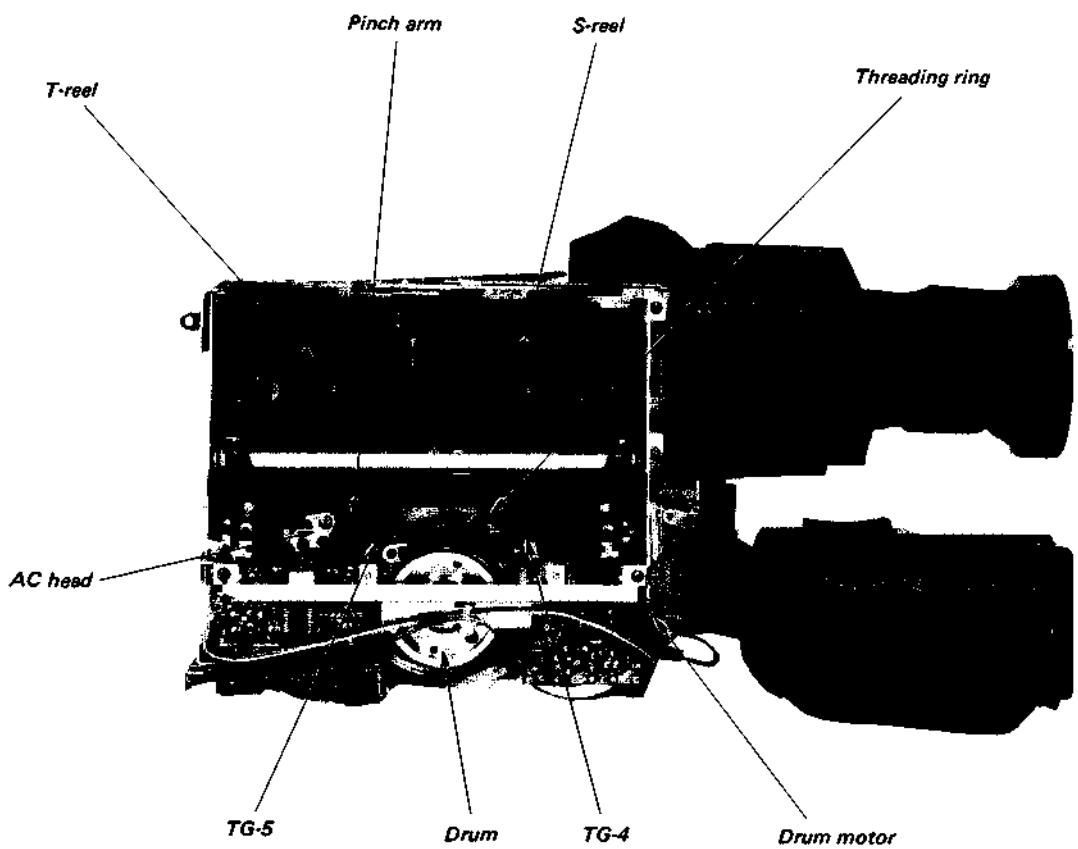
2-7. CAUTION WHEN REPLACING CAMERA TUBE

When tightening the clamp screw of camera tube (for replacement), tighten the clamp screw with a torque of 5.0kg·cm ± 1kg·cm.



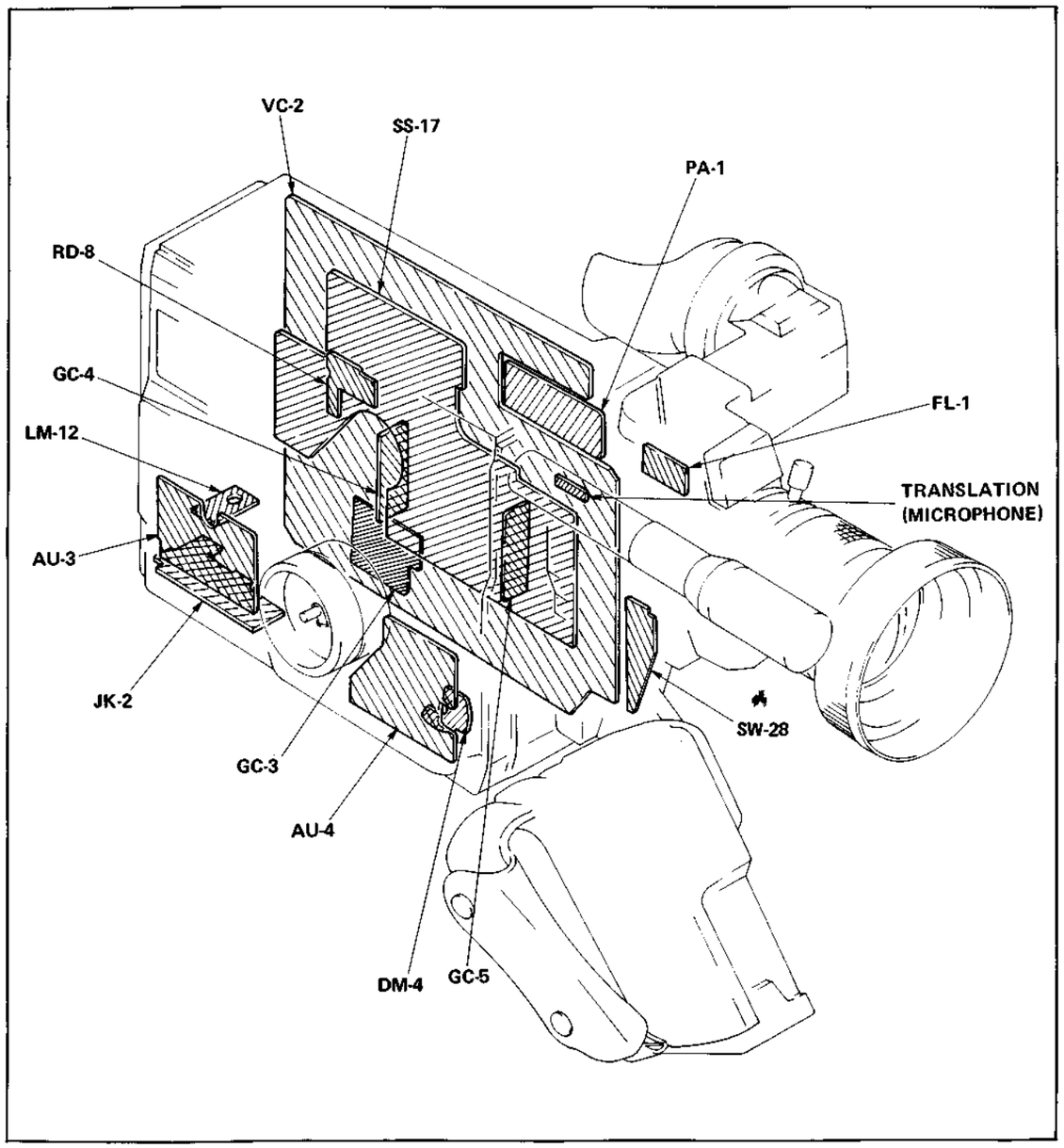
2-8. INSIDE VIEWS



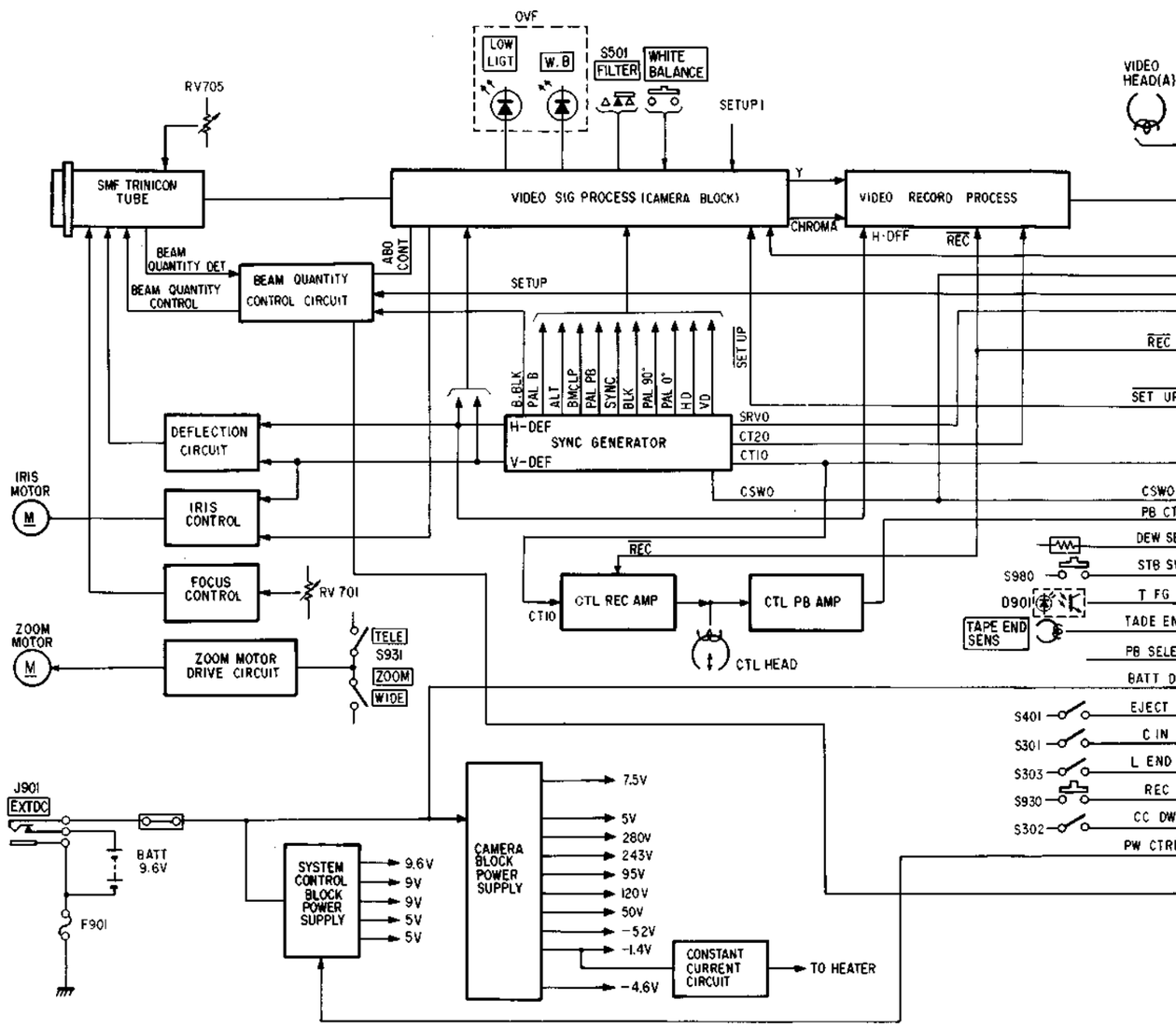


SECTION 3
BLOCK DIAGRAMS

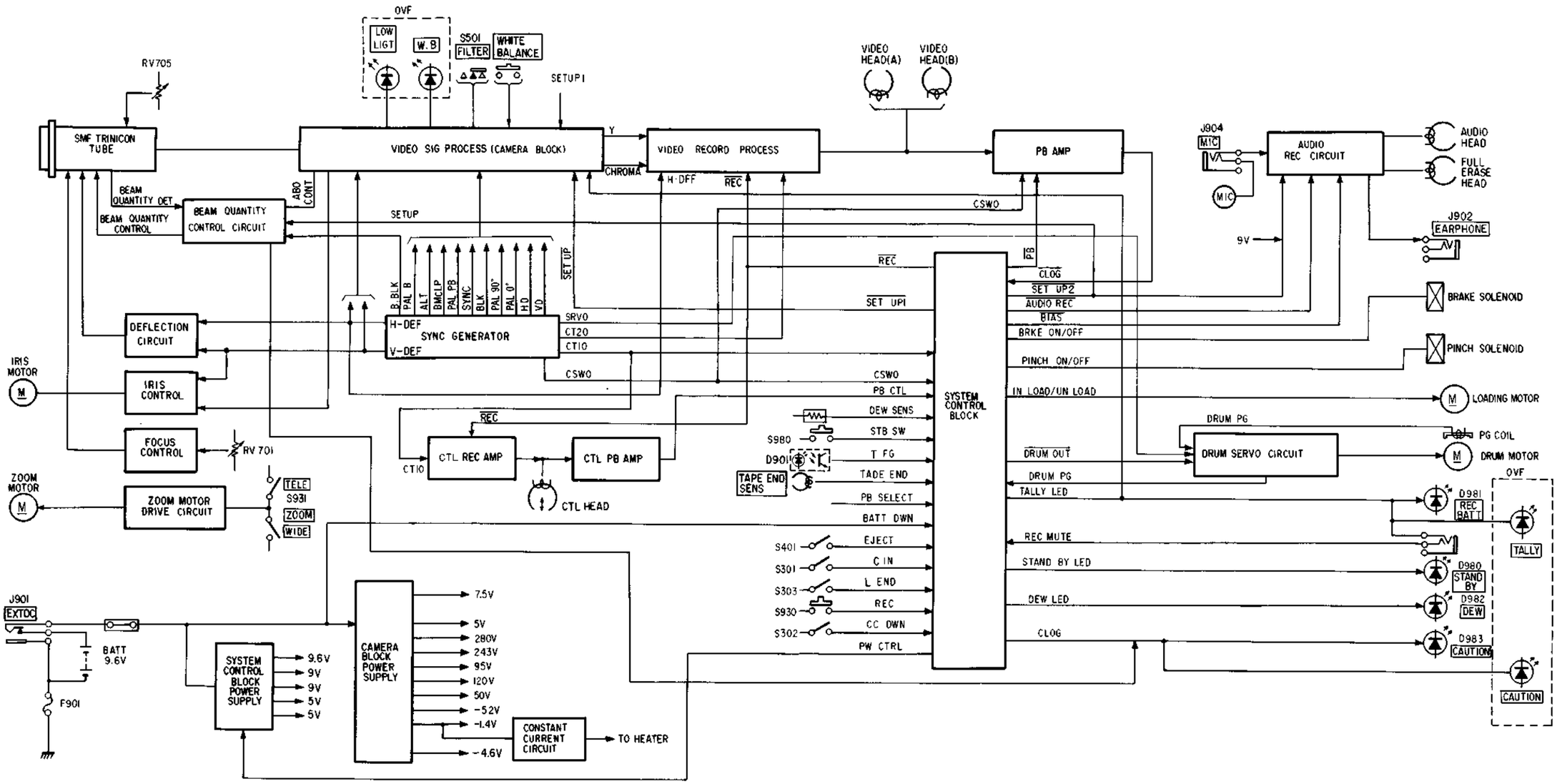
3-1. CIRCUIT BOARDS LOCATION



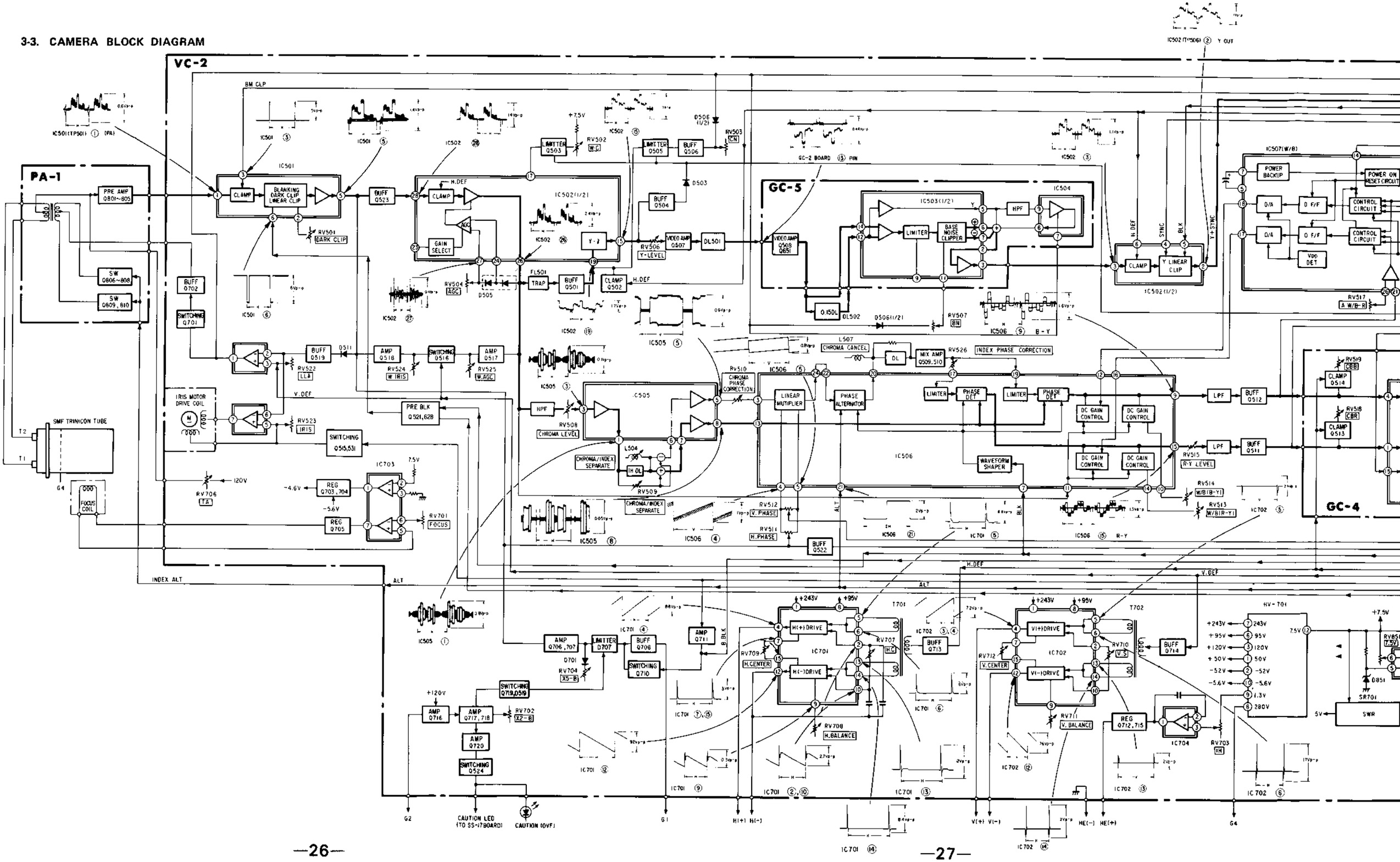
3-2. OVERALL BLOCK DIAGRAM

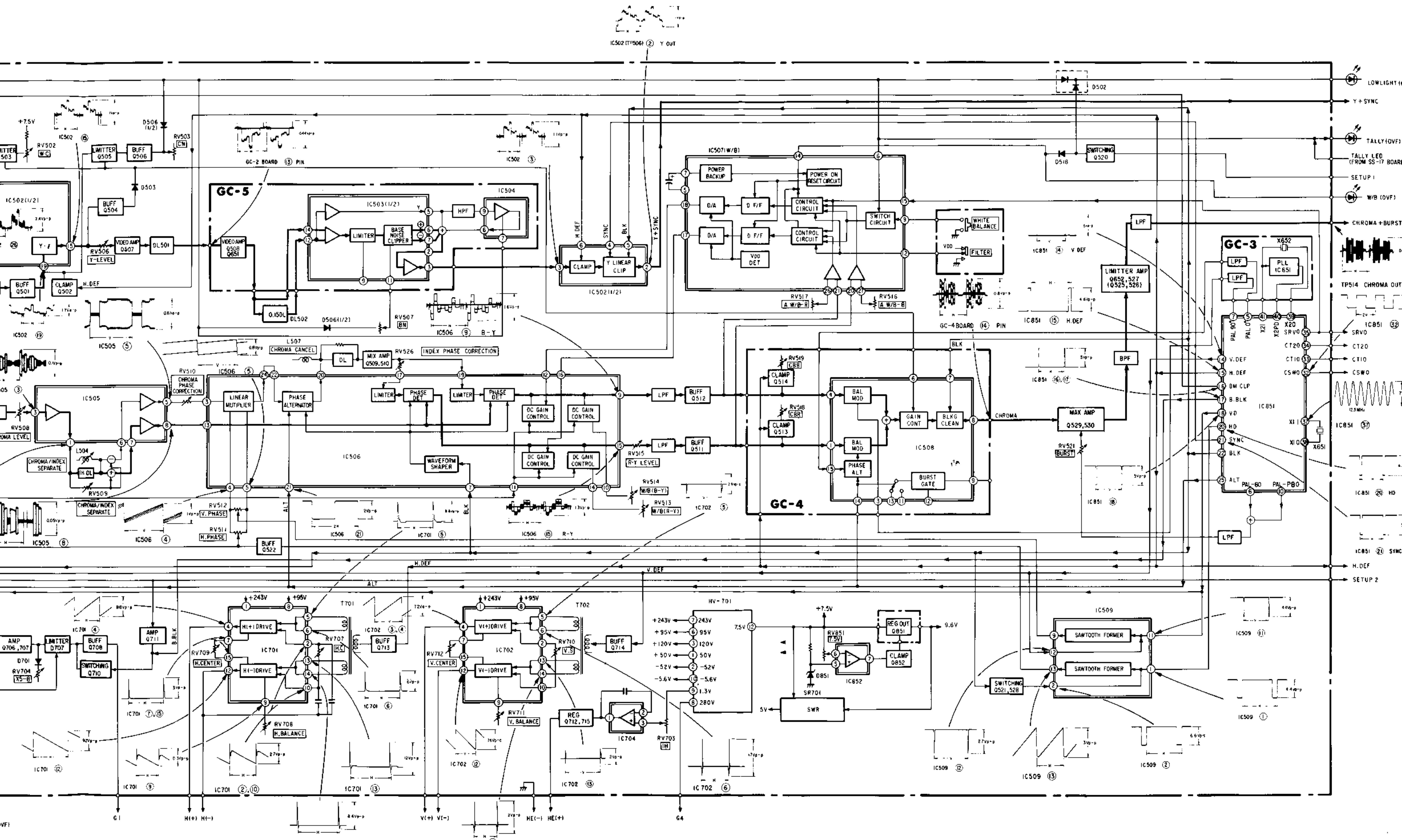


3-2. OVERALL BLOCK DIAGRAM



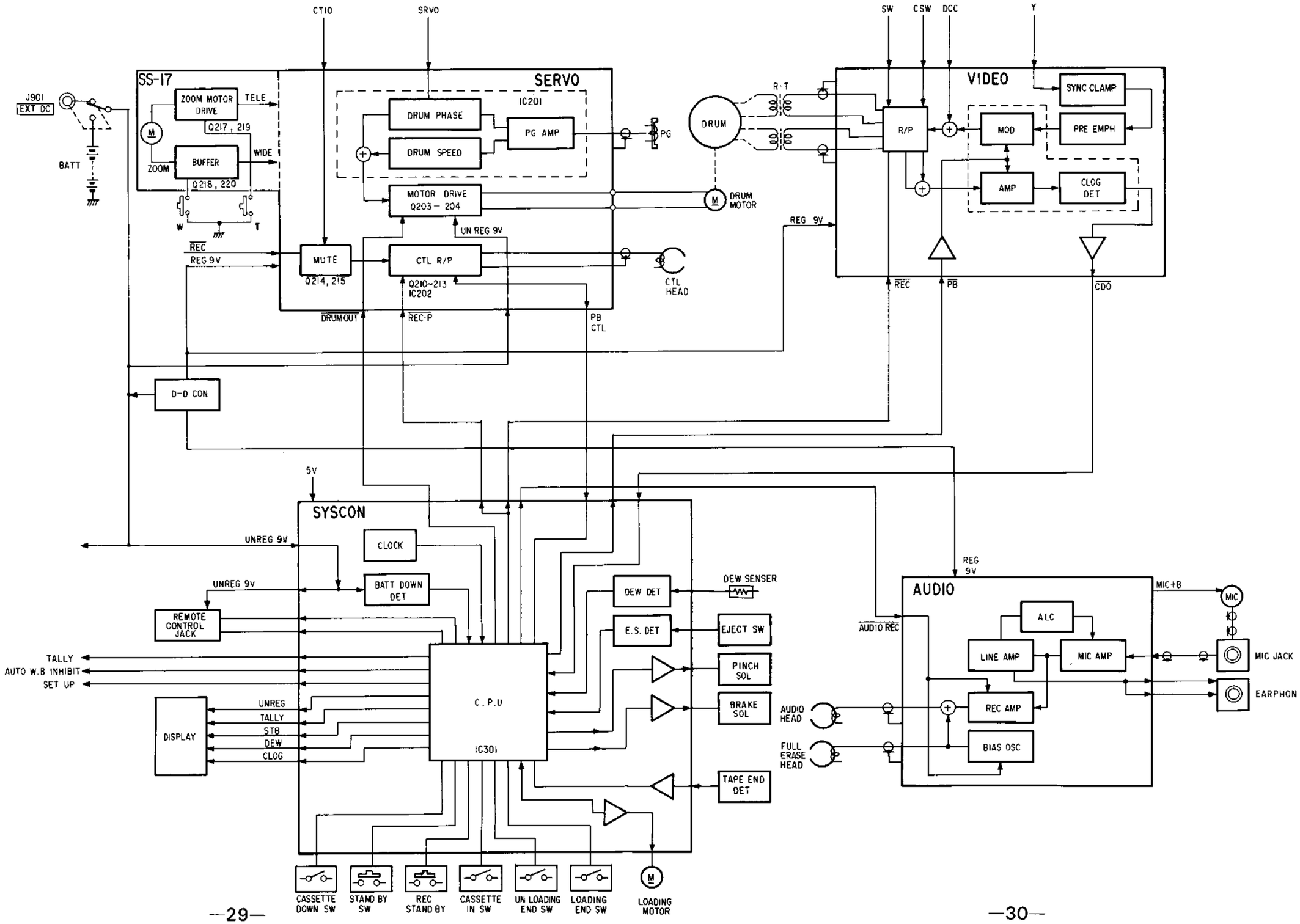
3-3. CAMERA BLOCK DIAGRAM



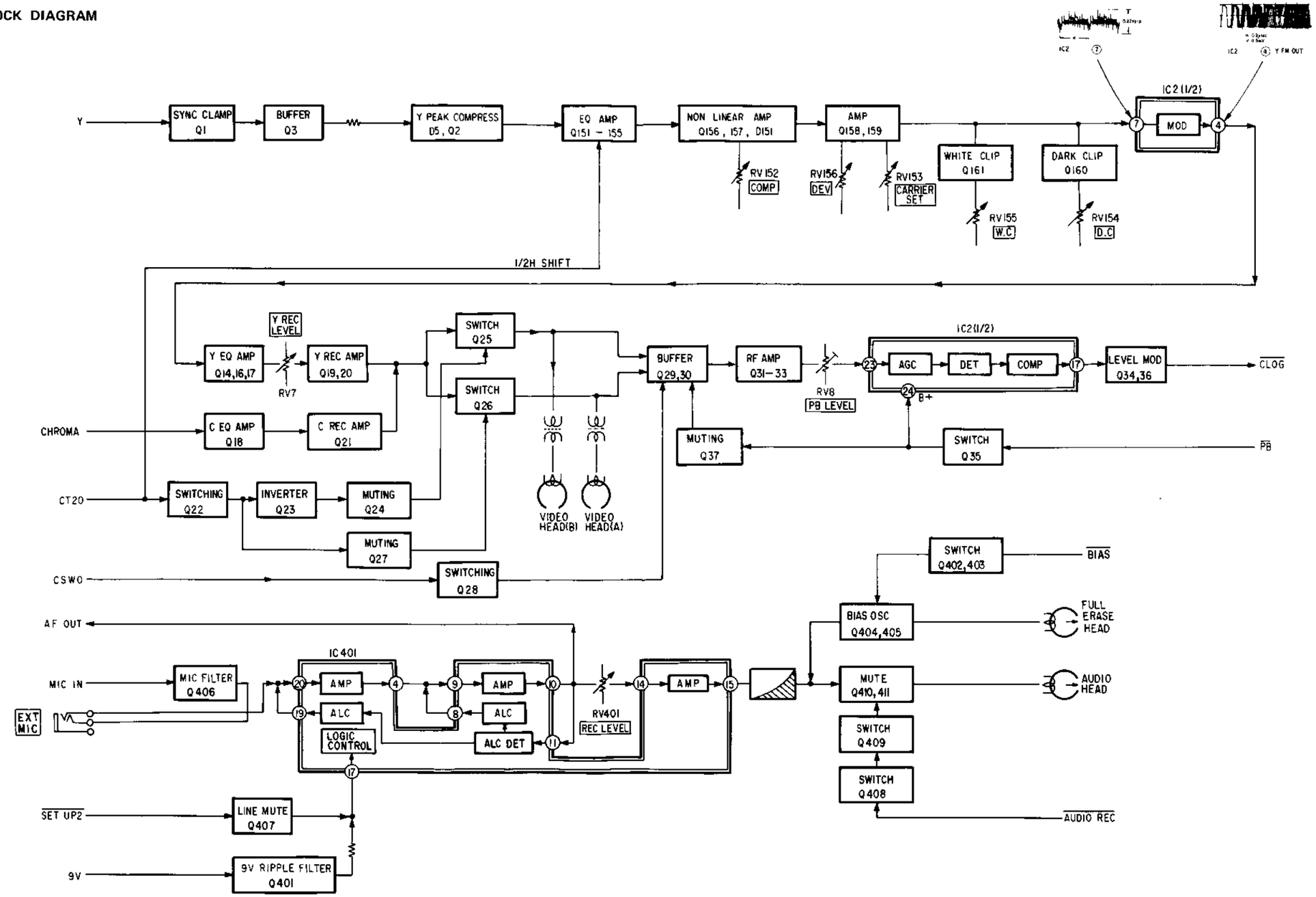


IC502 (TP506) ② Y OUT
LOWLIGHT
Y+SYNC
TALLY (OVF)
TALLY LED (FROM SS-17 BOARD)
SETUP 1
W/B (OVF)
CHROMA+BURST
TP514 CHROMA OUT
SRVO
CT20
CT10
CSWO
H.DEF
SETUP 2
GC-5
GC-4
GC-3
GC-2 BOARD ⑬ PIN
GC-4 BOARD ⑭ PIN
IC502(1/2)
IC503(1/2)
IC504
IC505
IC506
IC507(W/B)
IC508
IC509
IC701
IC702
IC704
IC851
IC852
HV-701
T701
T702
LIMITTER Q505
BUFF Q506
BUFF Q504
BUFF Q501
CLAMP Q502
VIDEO AMP Q507
VIDEO AMP Q508 Q651
DL501
DL502
0.15DL
HPF
LIMITER
BASE NOISE CLIPPER
CLAMP
Y LINEAR CLIP
POWER BACKUP
POWER ON RESET CIRCUIT
CONTROL CIRCUIT
D/A
D F/F
VDD DET
SWITCH CIRCUIT
WHITE BALANCE
FILTER
SWITCHING Q520
LPF
LIMITTER AMP Q652,527 (Q525,526)
BPF
PLL IC651
X652
X651
MAX AMP Q529,530
CHROMA
CHROMA PHASE CORRECTION
CHROMA CANCEL
DL
MIX AMP Q509,510
INDEX PHASE CORRECTION
LINEAR MUTIPLIER
PHASE ALTERNATOR
PHASE DET
WAVEFORM SHAPER
DC GAIN CONTROL
BUFF Q512
BUFF Q511
CLAMP Q514
CLAMP Q513
BAL MOD
PHASE ALT
GAIN CONT
BLKG CLEAN
BURST GATE
CHROMA/INDEX SEPARATE
H.DL
BUFF Q522
AMP Q706,707
LIMITTER D707
BUFF Q708
SWITCHING Q710
AMP Q711
H(+)DRIVE
H(-)DRIVE
BUFF Q713
V(+)DRIVE
V(-)DRIVE
BUFF Q714
REG Q712,715
REG OUT Q851
CLAMP Q852
SWR
SR701
SAWTOOTH FORMER
SWITCHING Q521,528
RV502 W.C
RV503 CN
RV506 Y-LEVEL
RV507 BN
RV508 CHROMA LEVEL
RV509
RV510
RV511 H.PHASE
RV512 V.PHASE
RV513 W/B(R-Y)
RV514 W/B(B-Y)
RV515 R-Y LEVEL
RV516 A W/B-B
RV517 A W/B-R
RV518 CBR
RV519 CBB
RV521 BURST
RV526
RV704 X5-6
RV706 H.BALANCE
RV707 H.C
RV709 H.CENTER
RV710 V.S
RV711 V.BALANCE
RV712 V.CENTER
RV703 IH
RV851 7.5V
D502
D503
D506
D518
D701
D851
+243V
+95V
-52V
-5.6V
+7.5V
9.6V
5V
H.DEF
V.DEF
ALT
B.BLK
BLK
SYNC
Y+SYNC
G1
H(+) H(-)
V(+) V(-)
HE(-) HE(+)
G4

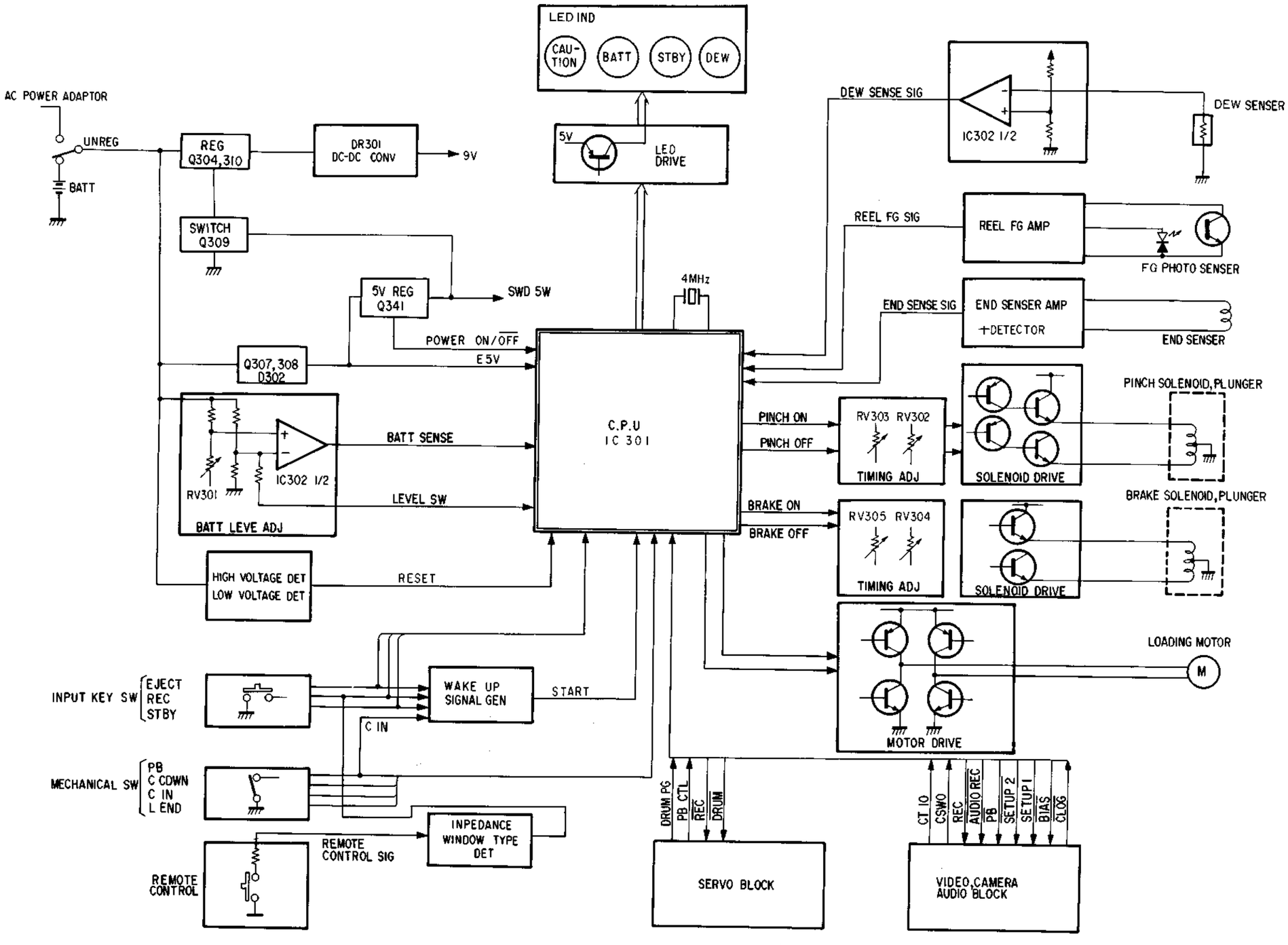
3-4. VIDEO BLOCK DIAGRAM (INCLUDING SERVO BLOCK DIAGRAM)



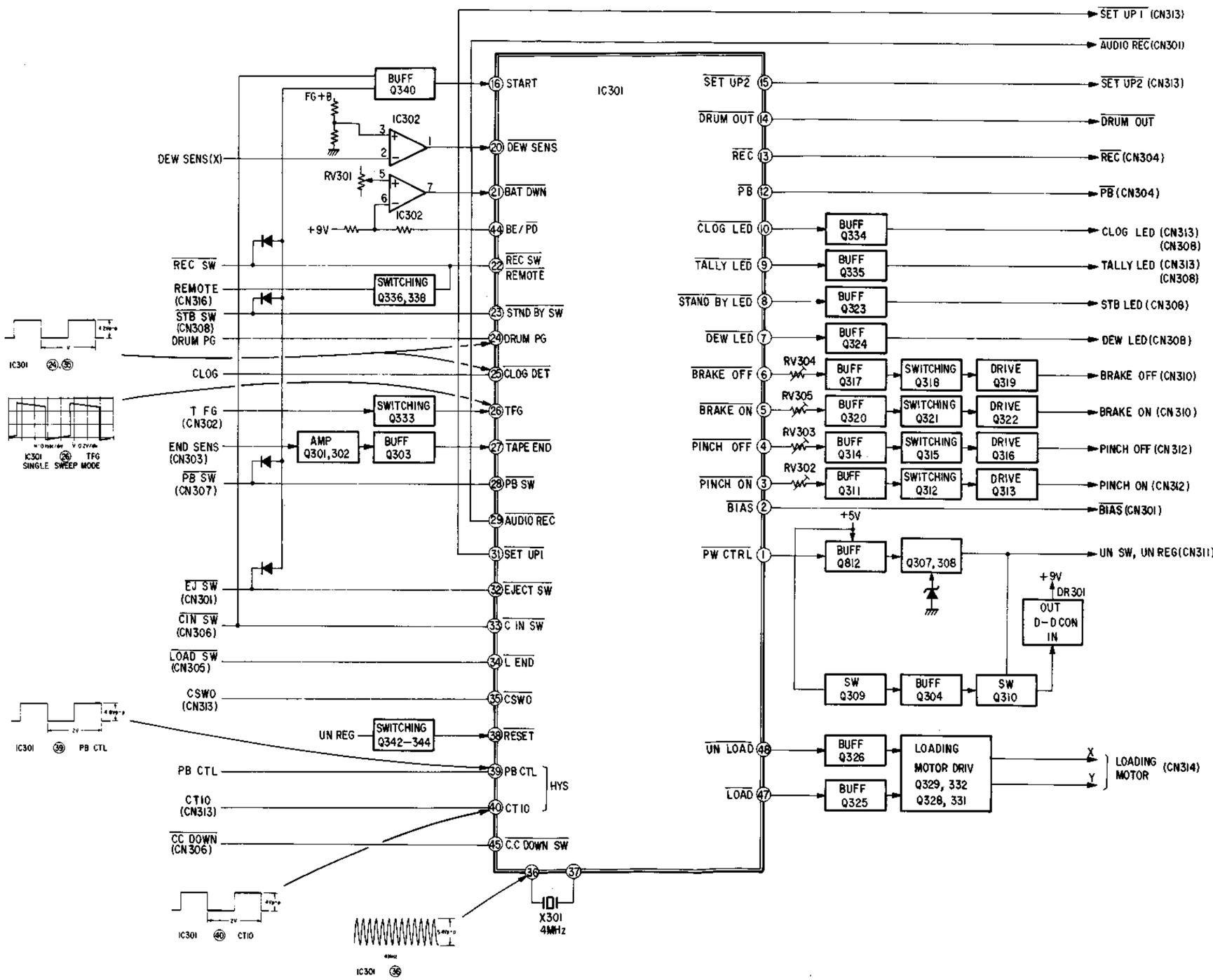
3-5. VIDEO, AUDIO BLOCK DIAGRAM



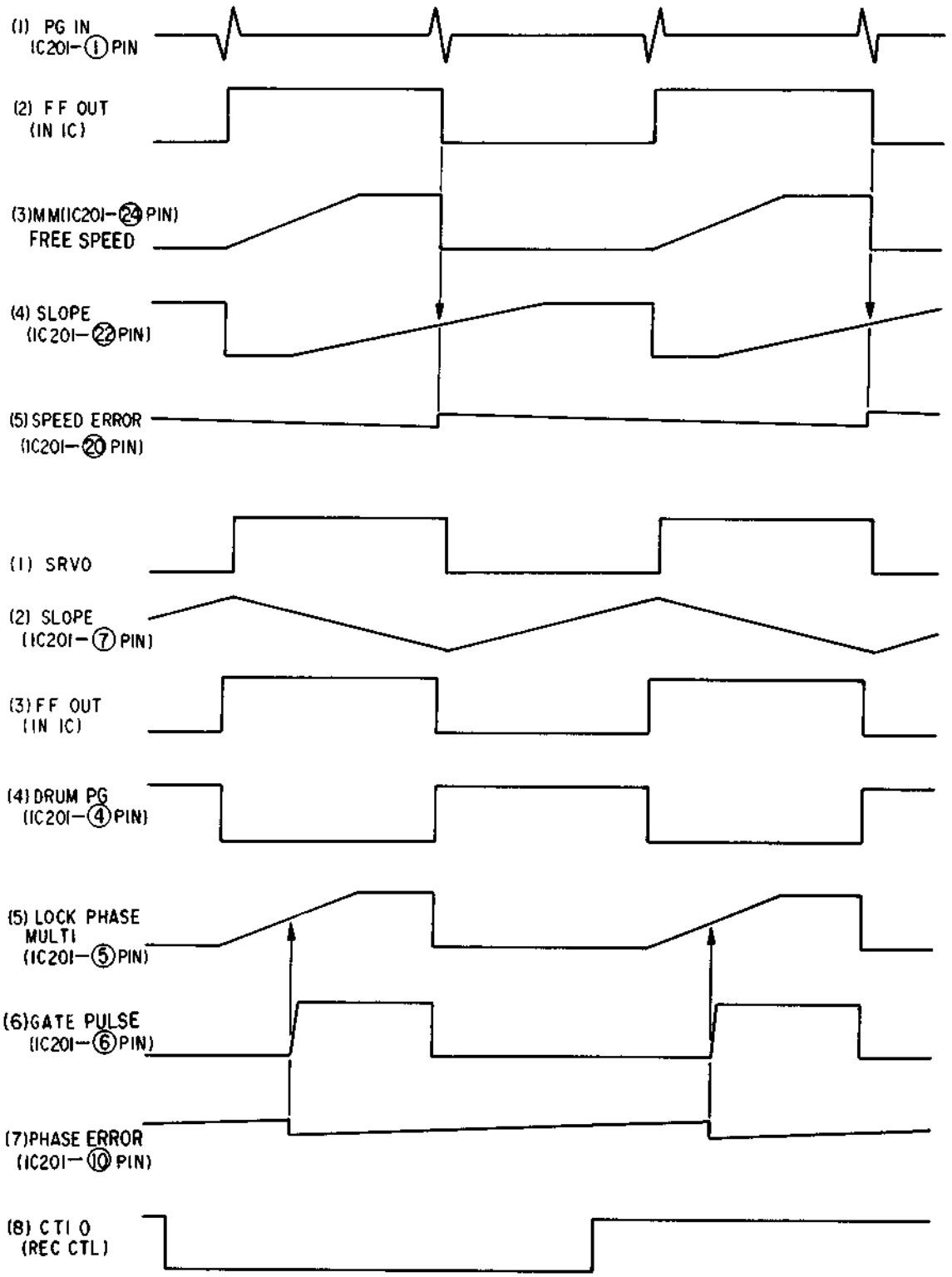
3-6. SYSTEM CONTROL BLOCK DIAGRAM (1)



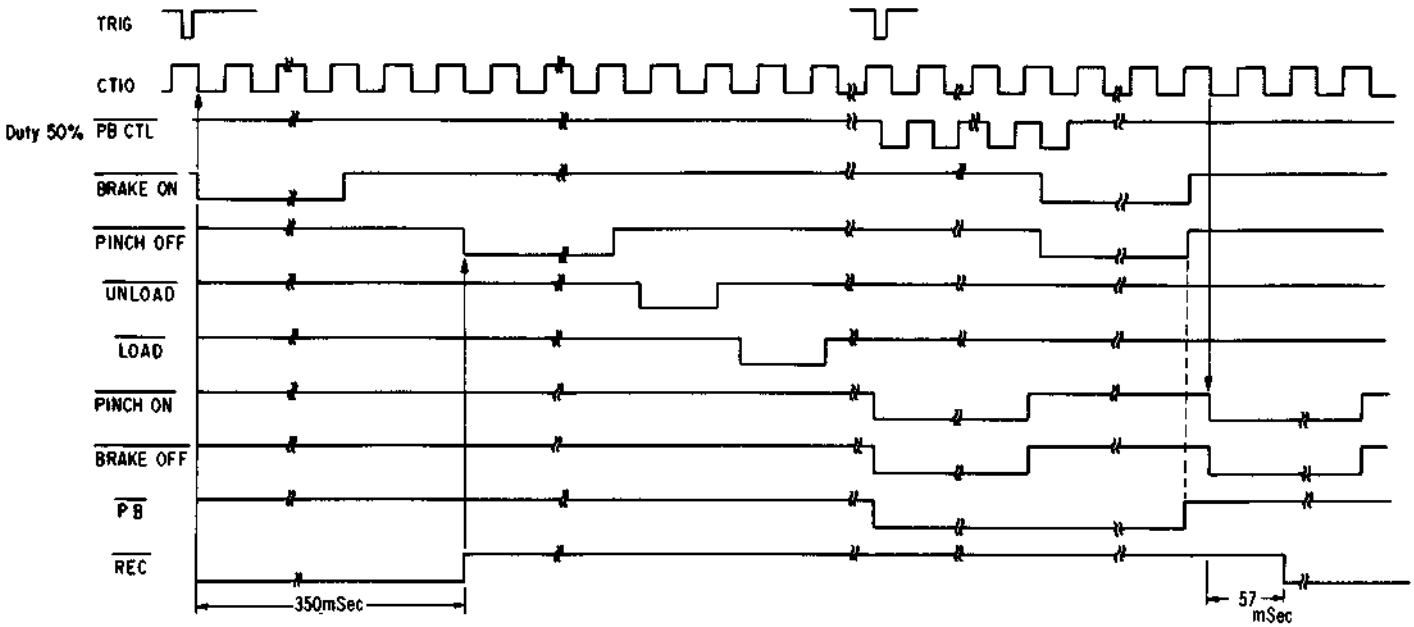
3-7. SYSTEM CONTROL BLOCK DIAGRAM (2)



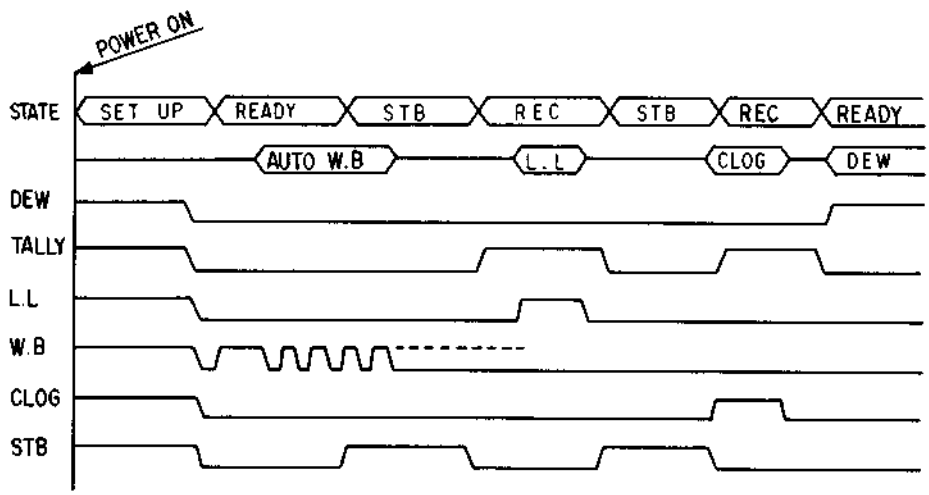
3-8. SERVO TIMING CHART



3-9. LINKED SHOOTING TIMING CHART



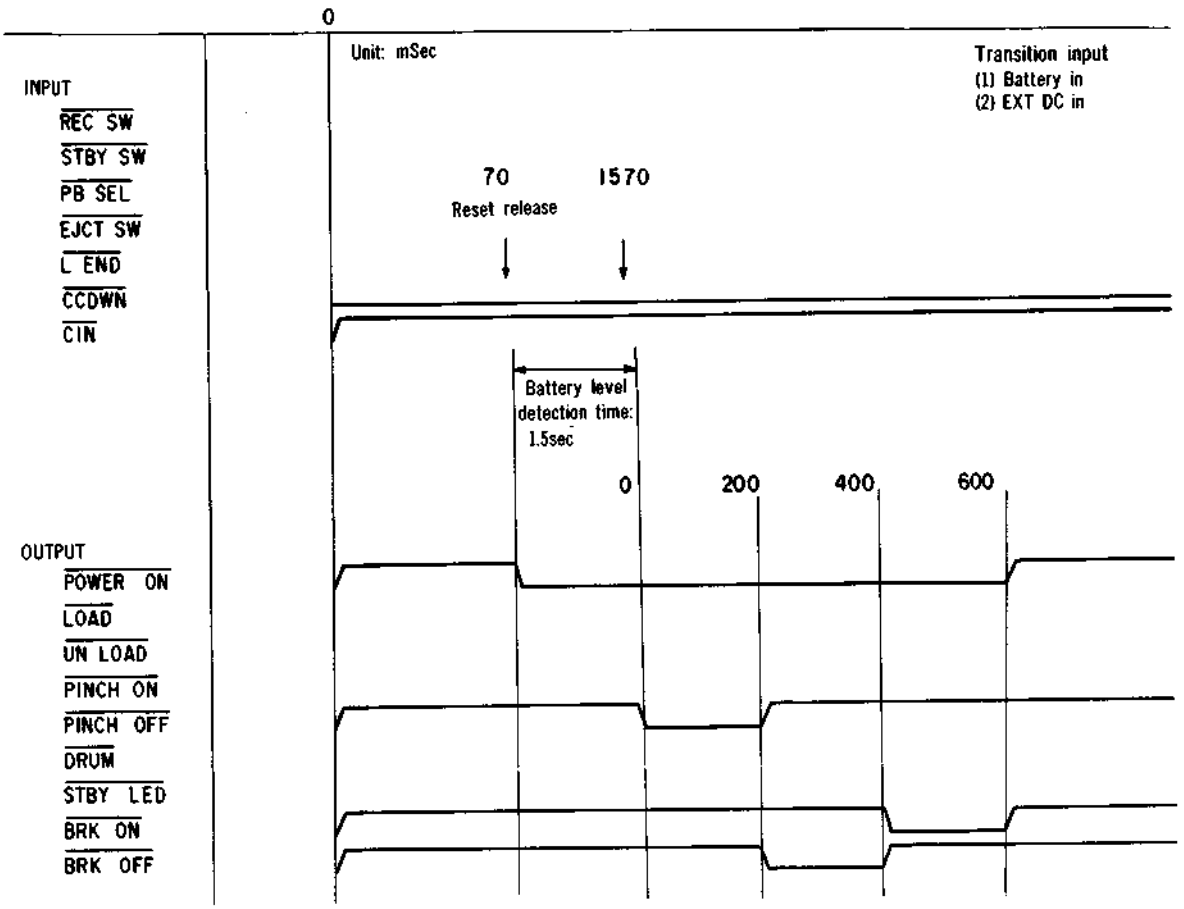
3-10. WARNING TIMING CHART



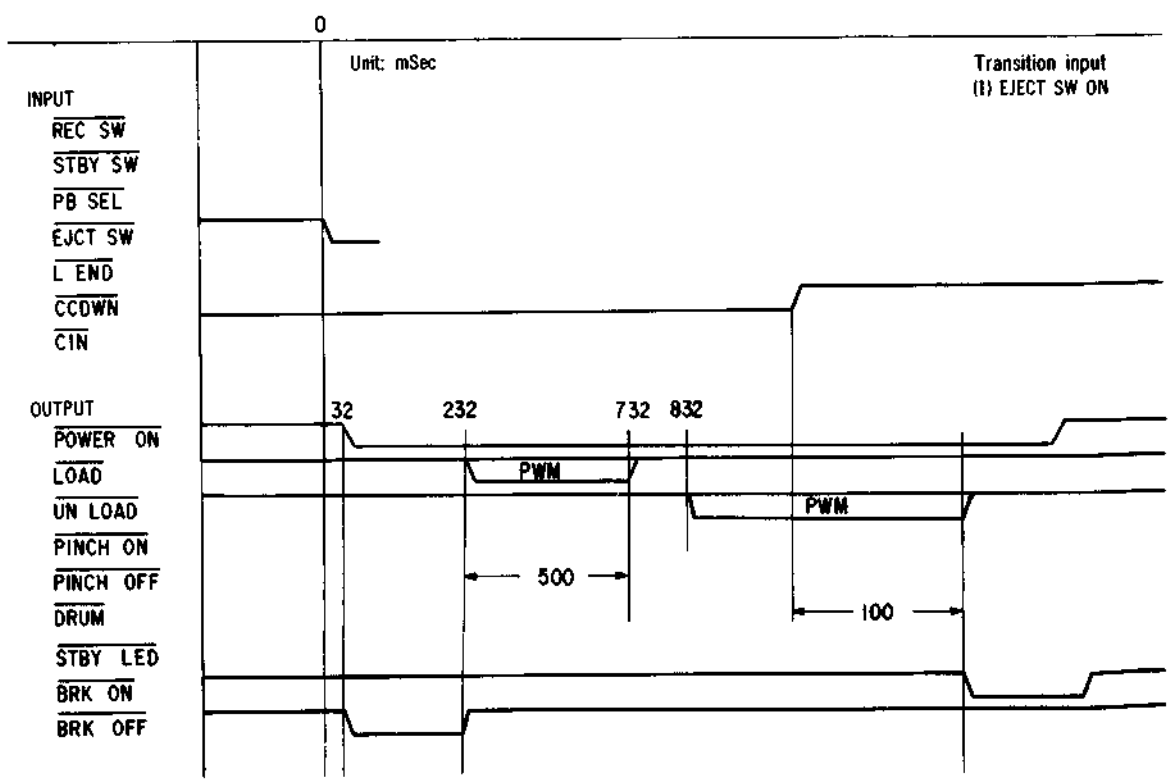
○ TURN-ON ◑ BLINK

INDICATION / WARNING item	DEW	TALLY	L.L	W.B	CAUTION	
DEW	○					
BATTERY POWER REMAINED		◑ 1Hz				
BATTERY DOWN		◑ 5Hz				
LOW LIGHT			○			
W.B NG/UNPROCESSED				○		
AUTO W.B OPERATION				◑ 15Hz		
CLOG					◑ 1Hz	
BEAM					○	

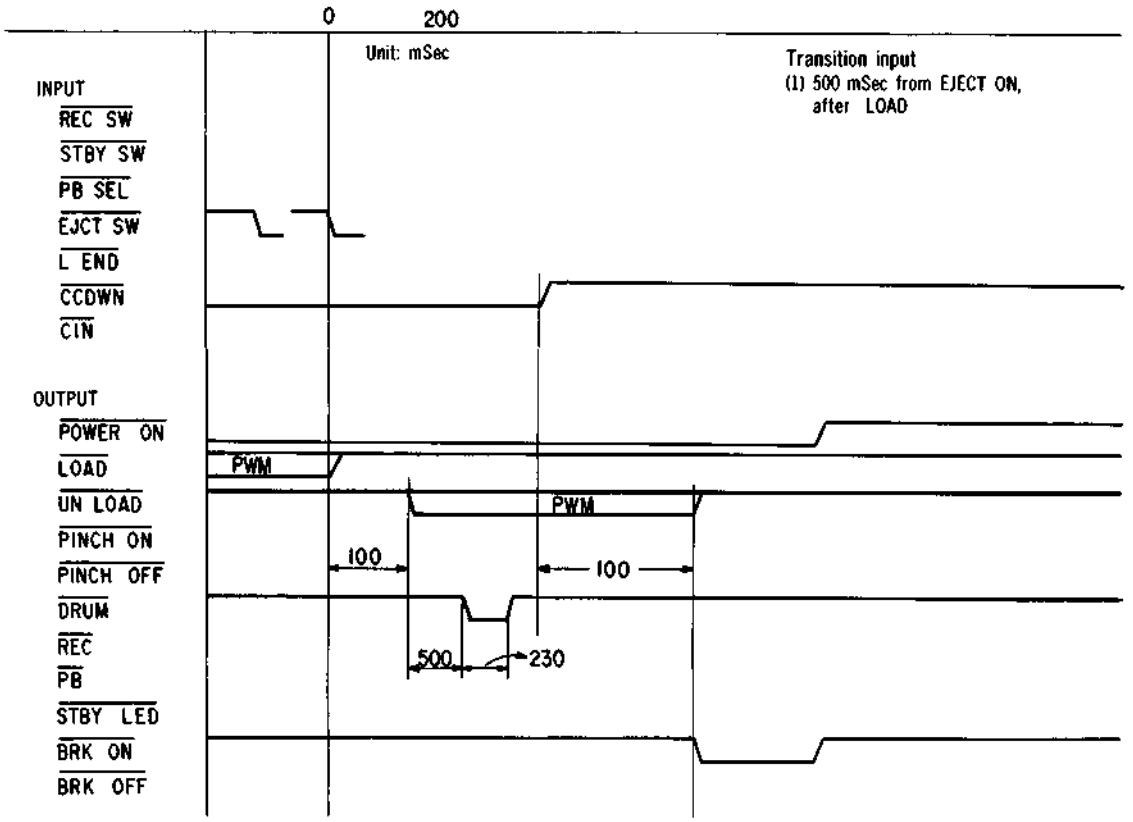
3-11-1. ALL OFF→HOLDER DOWN TIMING CHART



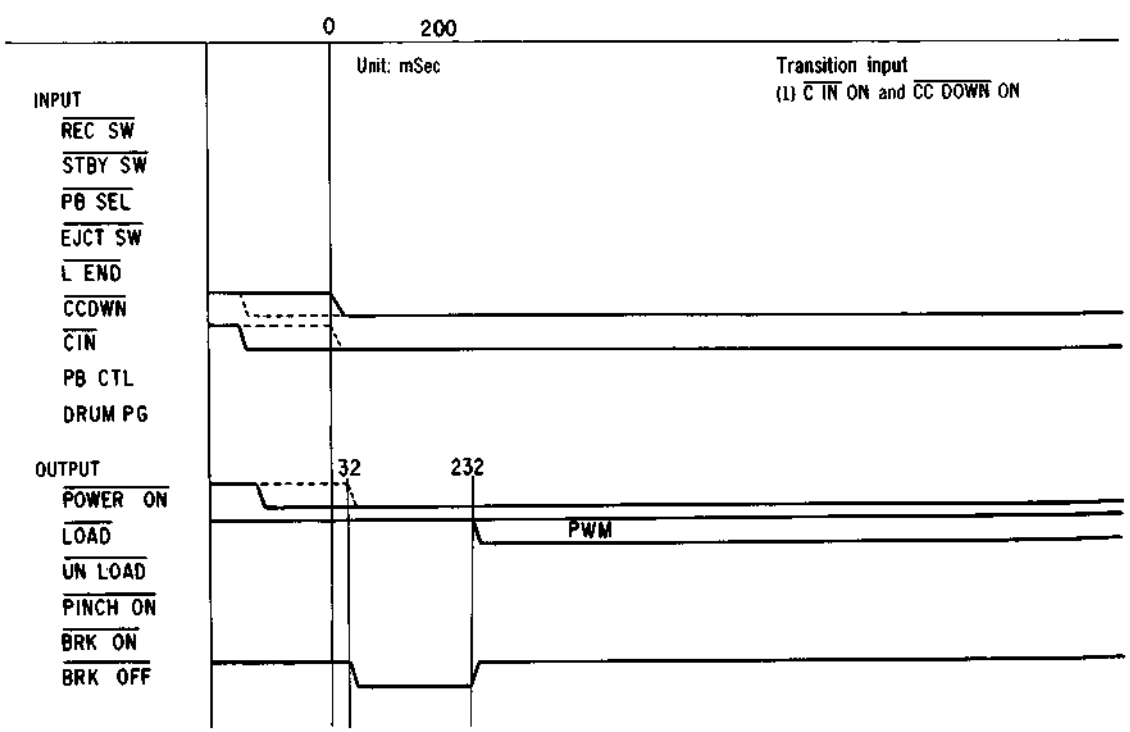
3-11-2. HOLDER DOWN→HOLDER UP TIMING CHART



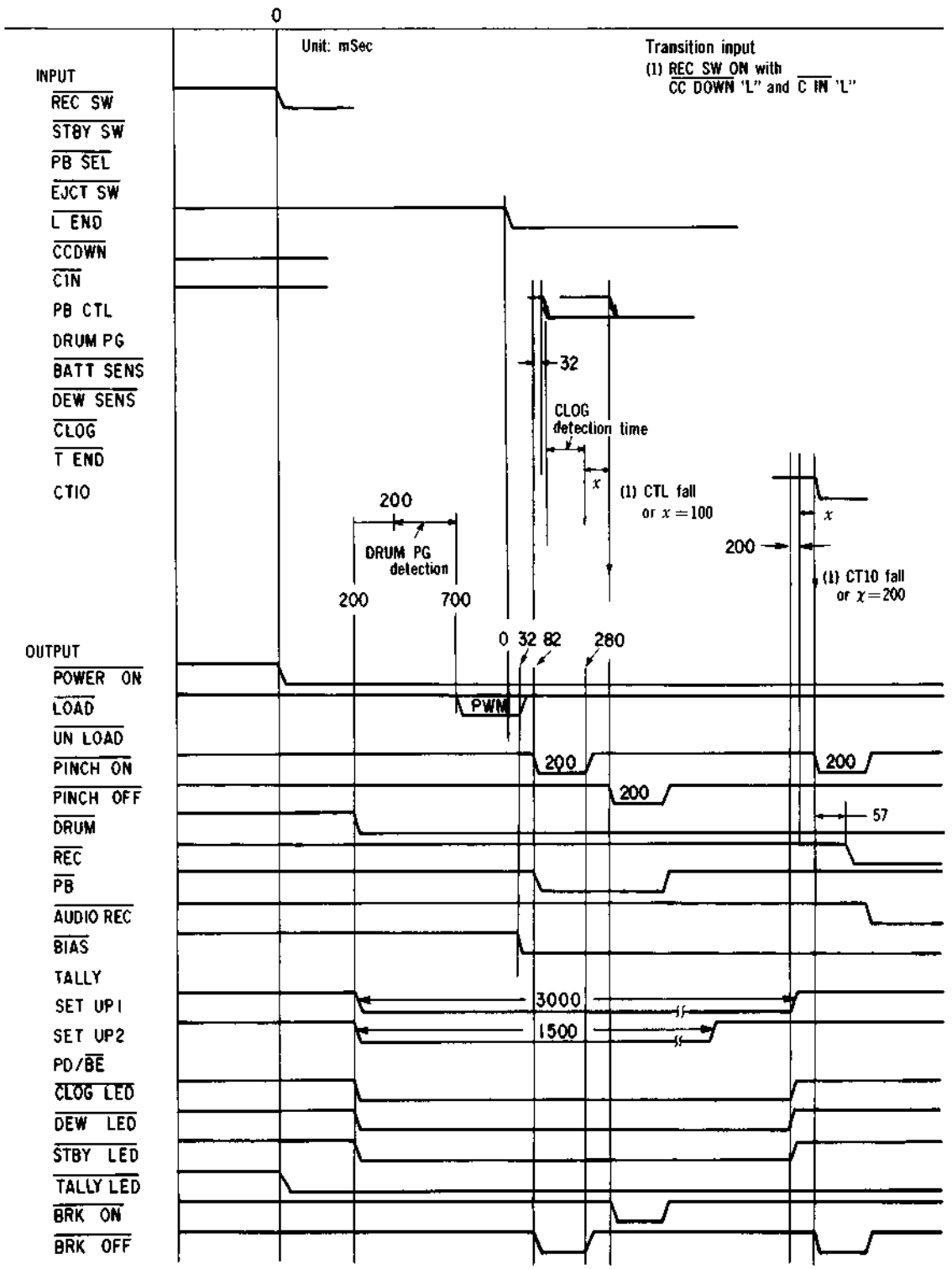
3-11-3. LOAD→UNLOAD→HOLDER UP TIMING CHART



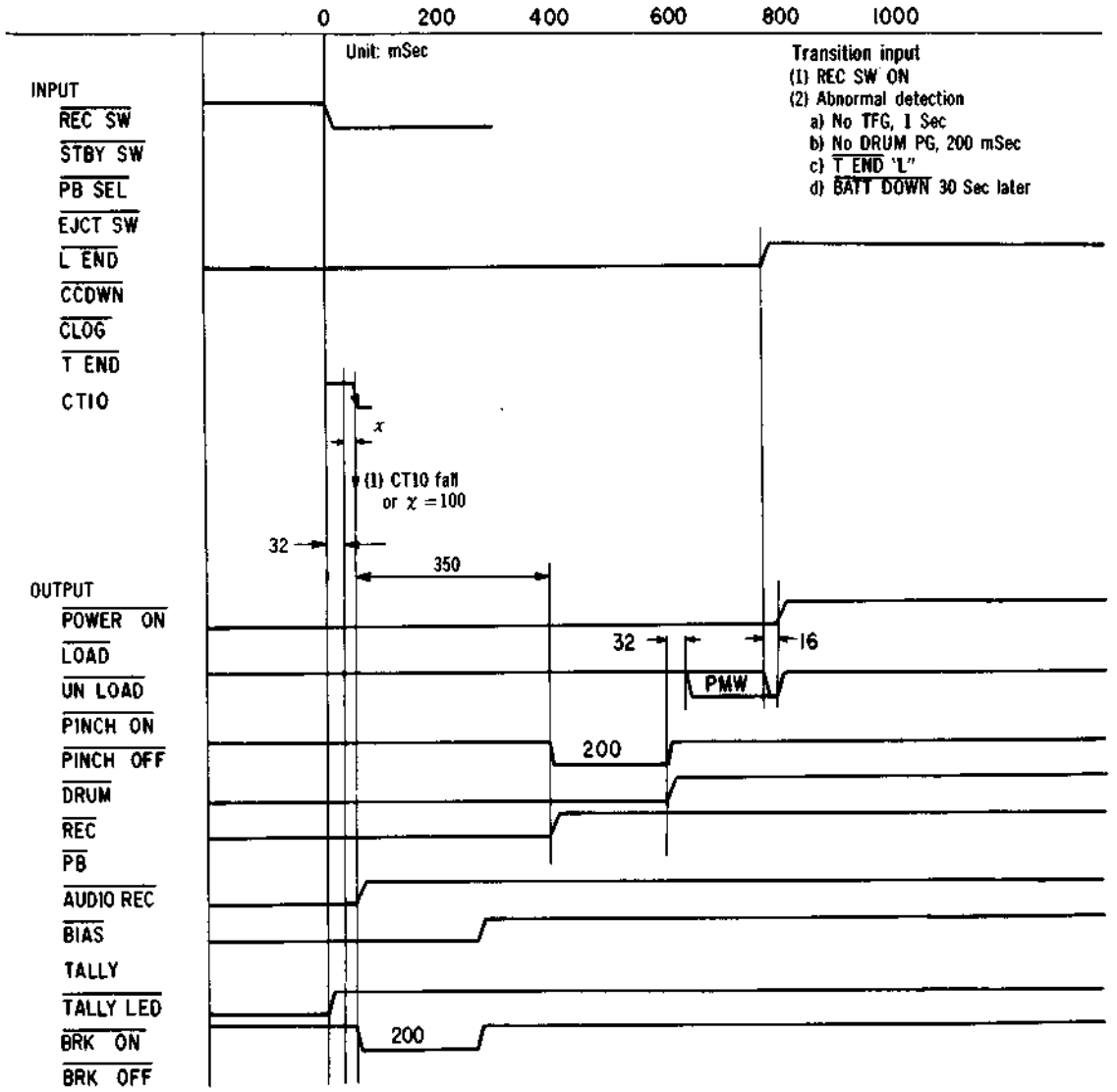
3-11-4. HOLDER DOWN→LOAD TIMING CHART



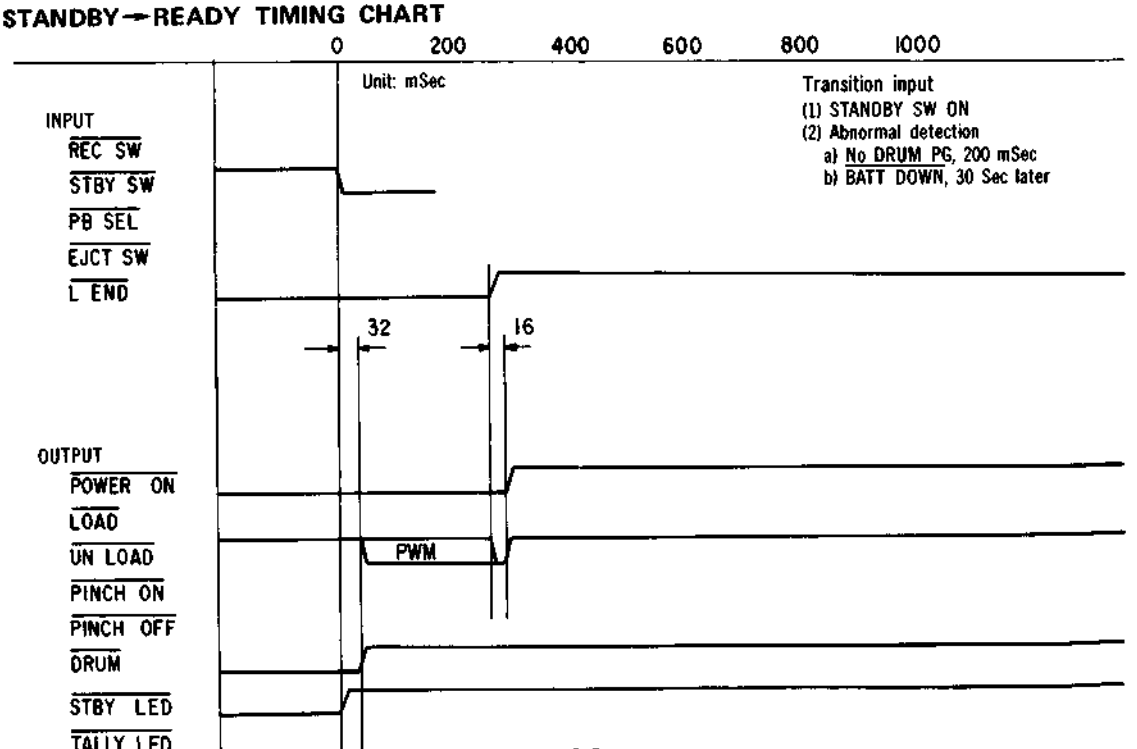
3-11-5. READY→REC TIMING CHART



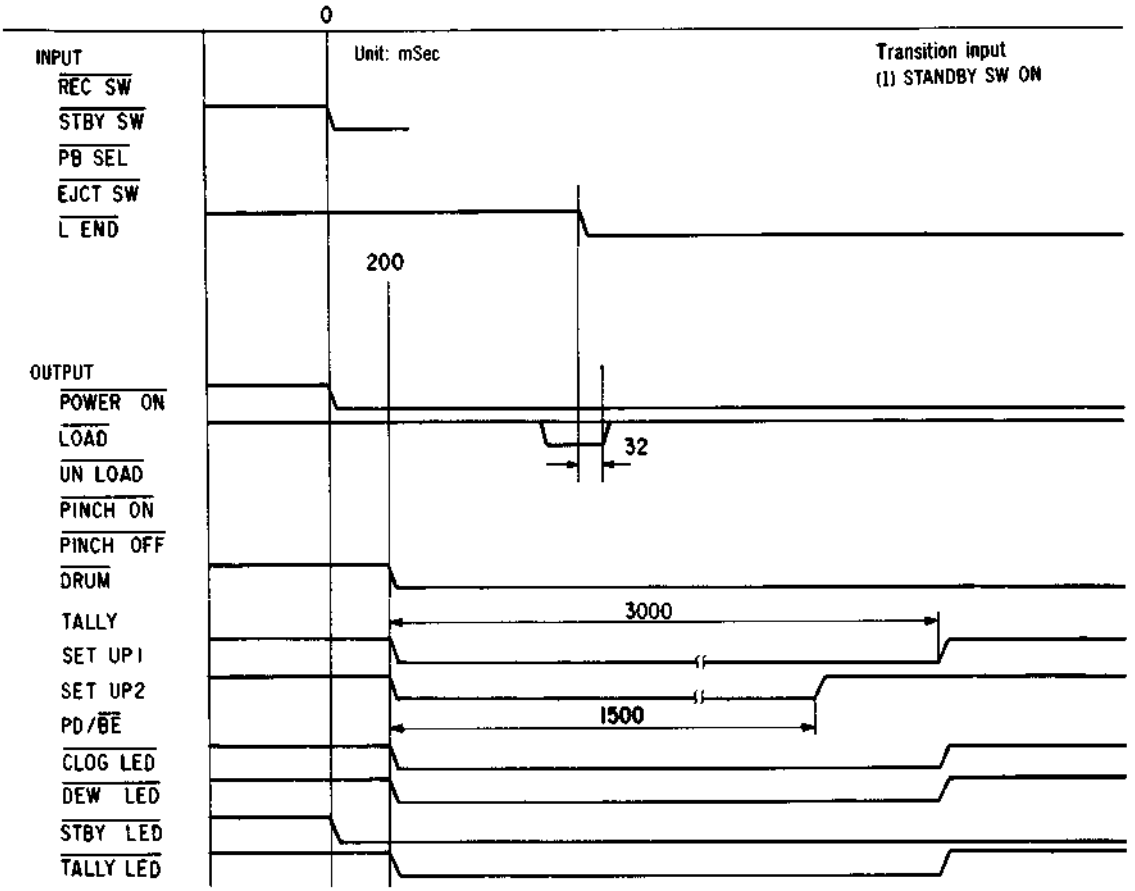
3-11-6. REC→READY TIMING CHART



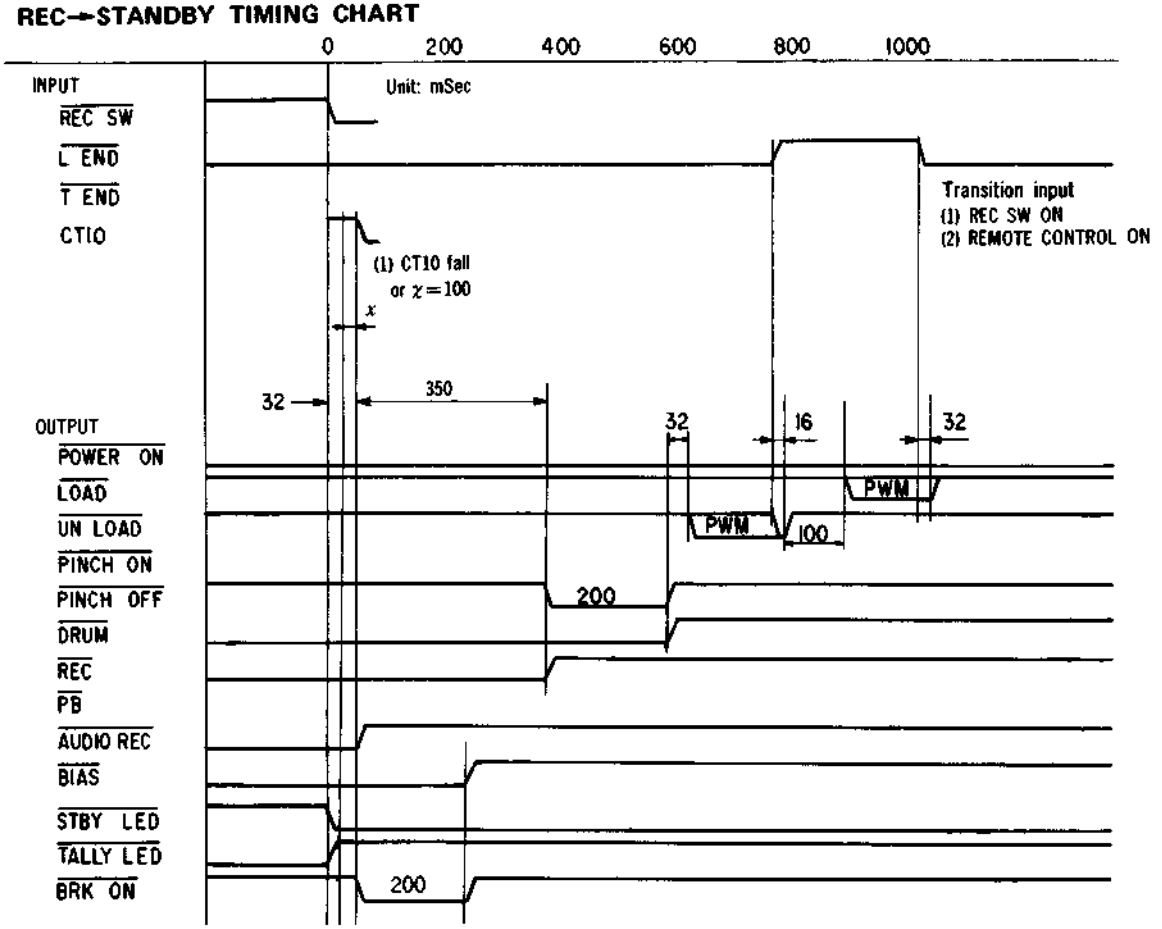
3-11-7. STANDBY→READY TIMING CHART



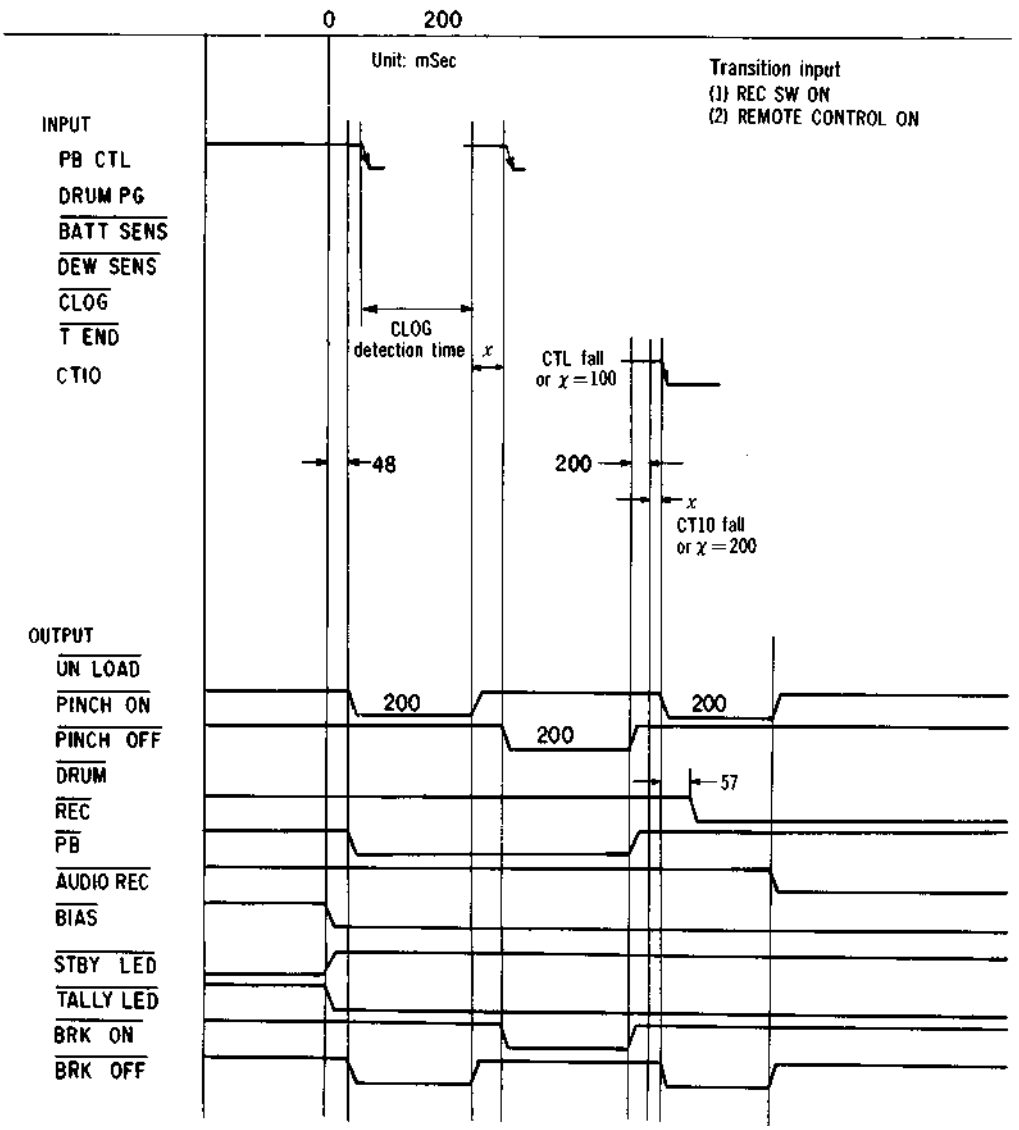
3-11-8. READY→STANDBY TIMING CHART



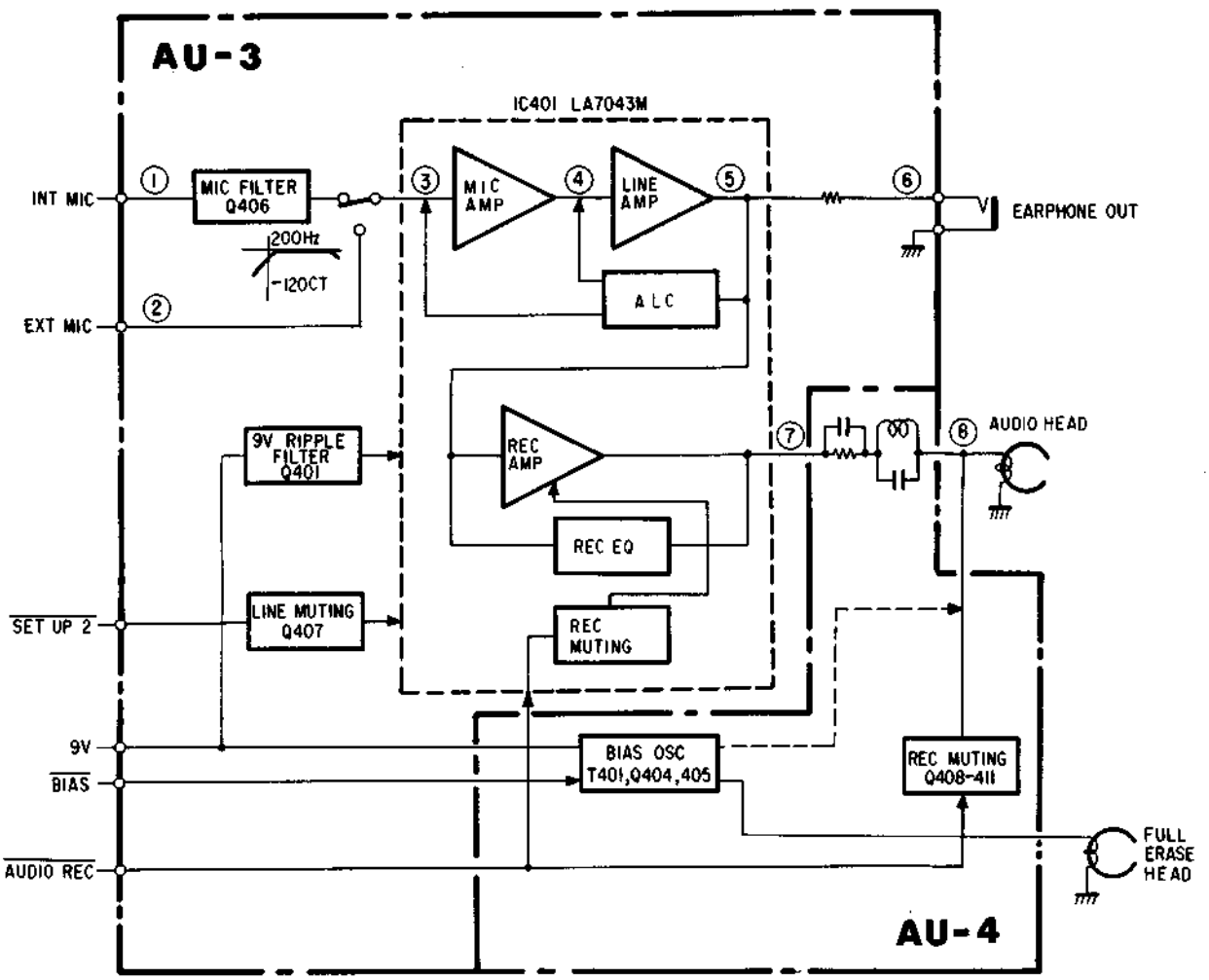
3-11-9. REC→STANDBY TIMING CHART



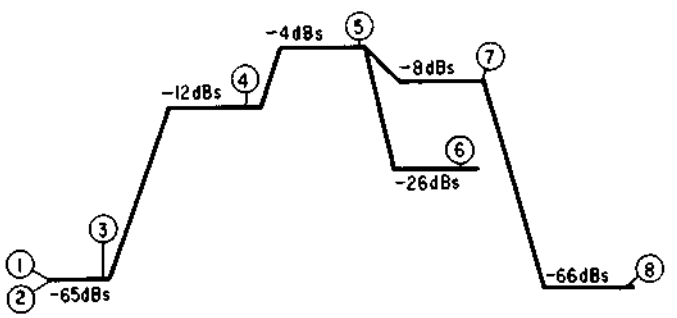
3-11-10. STANDBY→REC TIMING CHART



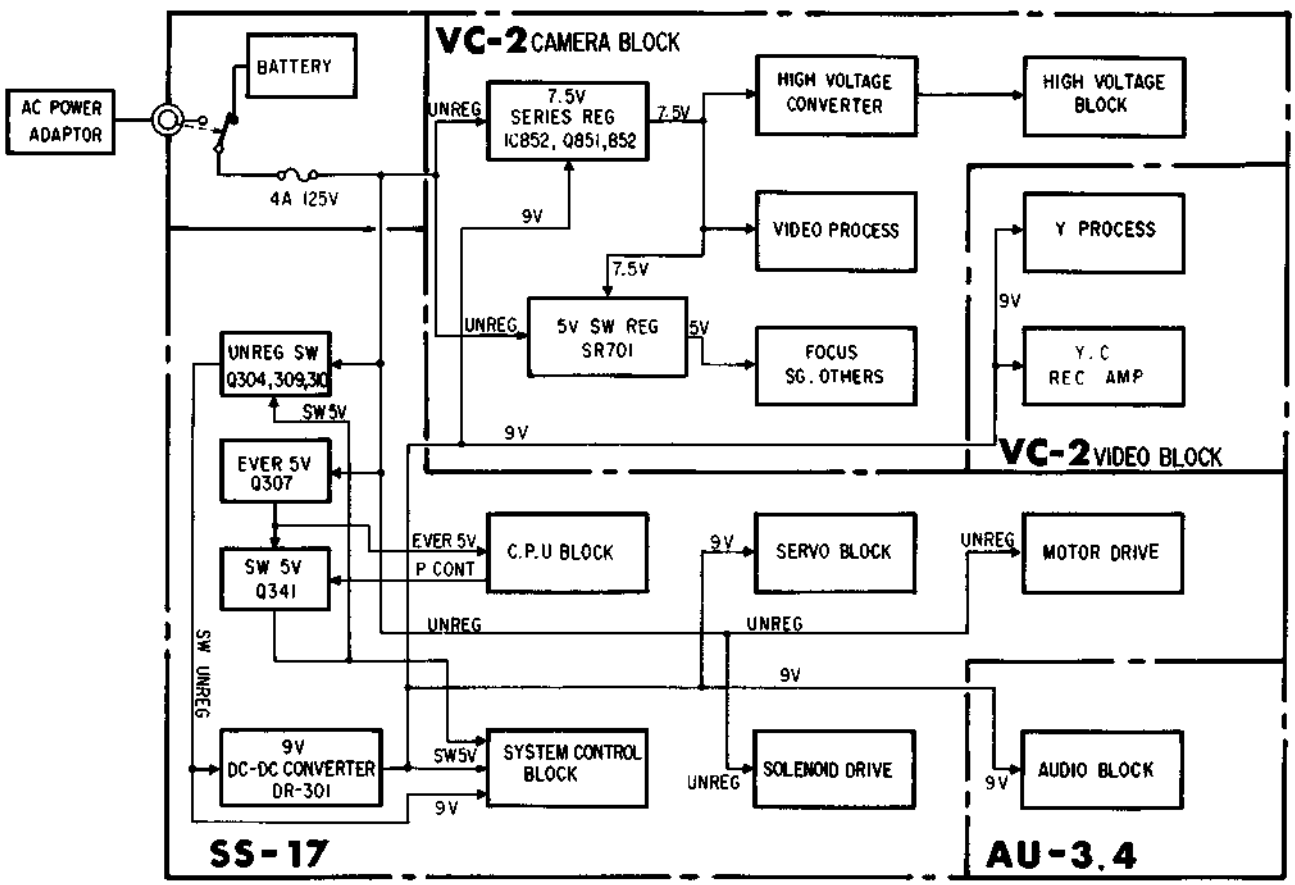
3-12. AUDIO BLOCK DIAGRAM



3-13. AUDIO LEVEL DIAGRAM



3-14. POWER SYSTEM BLOCK DIAGRAM

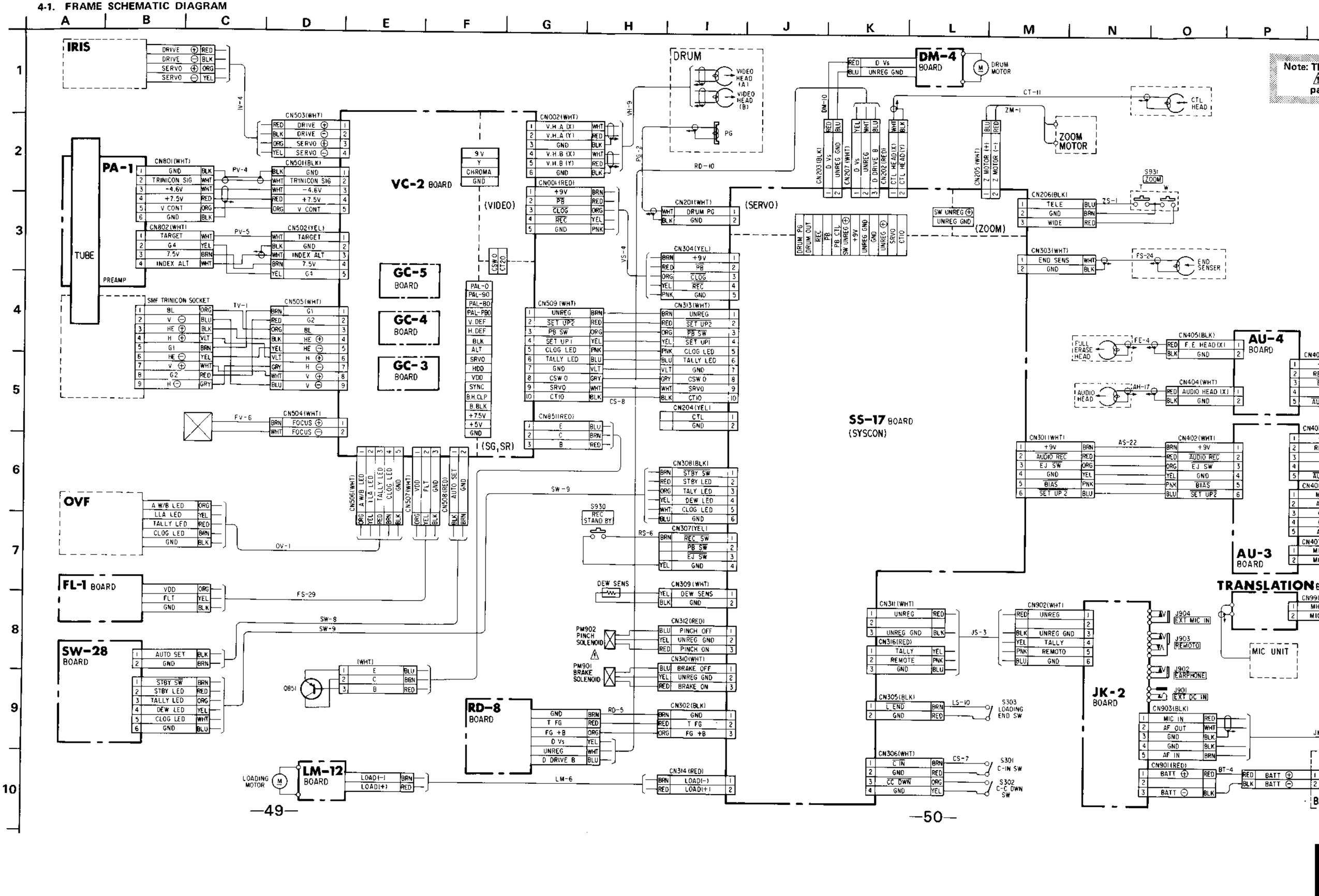


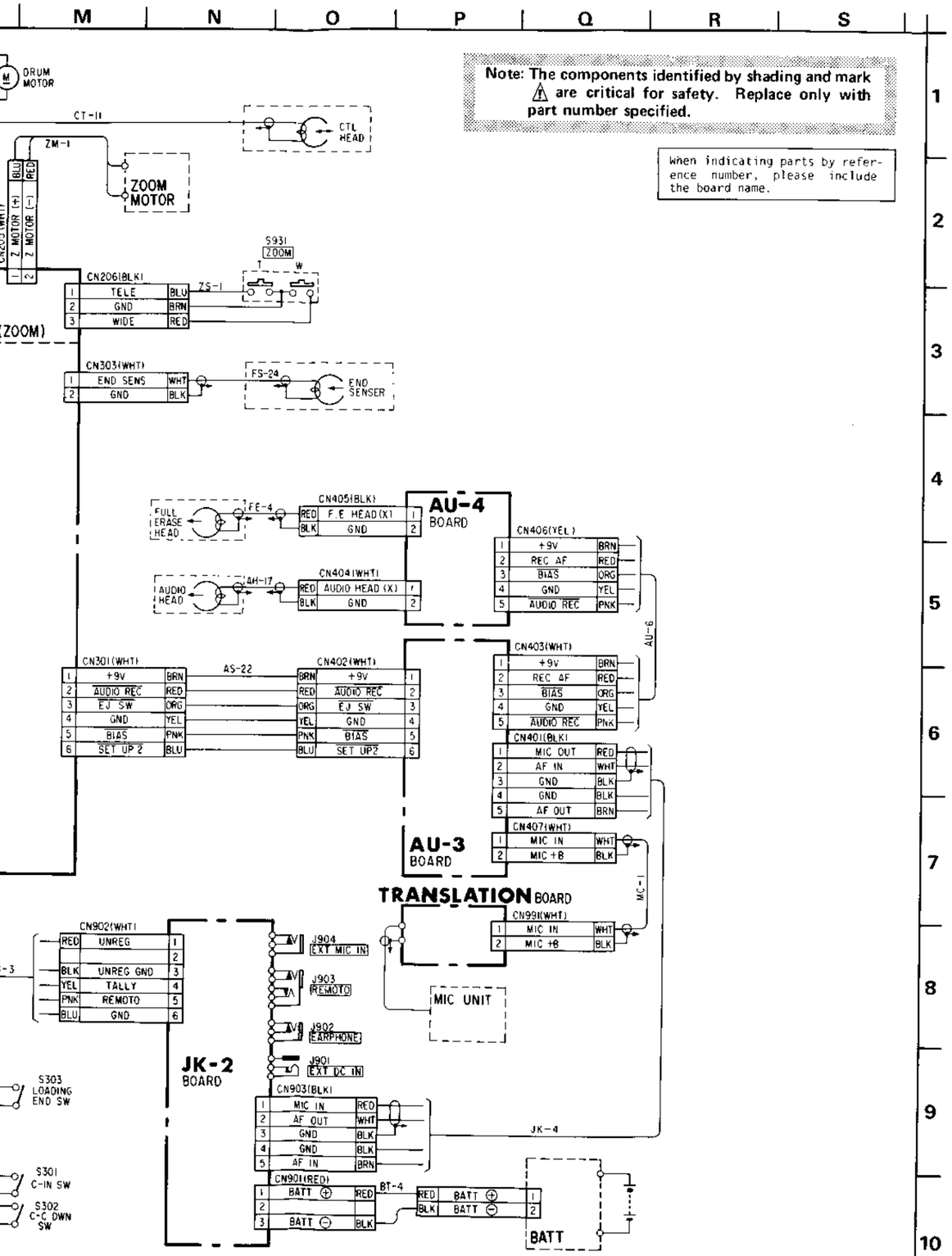
3-15. FUNCTION OF IC301 TERMINALS

Terminal No.	Terminal name	I/O	Functions
1	$\overline{\text{PWCTRL}}$	OUT	Turns on/off power supply circuit.
2	$\overline{\text{BIAS}}$	OUT	Turns on/off audio recording bias circuit.
3	$\overline{\text{PINCH ON}}$	OUT	Presses pinch roller against capstan. Pulse width of 200mS.
4	$\overline{\text{PINCH OFF}}$	OUT	Separates pinch roller from capstan. Pulse width of 200mS.
5	$\overline{\text{BRAKE ON}}$	OUT	Applies brake to reel base. Pulse width of 200mS.
6	$\overline{\text{BRAKE OFF}}$	OUT	Releases brake from reel base. Pulse width of 200mS.
7	$\overline{\text{DEW LED}}$	OUT	Turns on DEW LED.
8	$\overline{\text{STAND-BY LED}}$	OUT	Turns on STANDBY LED.
9	$\overline{\text{TALLY LED}}$	OUT	Turns on TALLY LED.
10	$\overline{\text{CLOG LED}}$	OUT	Turns on CAUTION LED.
11			Not used.
12	$\overline{\text{PB}}$	OUT	Operates PB amplifier for CLOG detection and for linked shooting.
13	$\overline{\text{REC}}$	OUT	Operates CTR recording amplifier of picture recording circuit.
14	$\overline{\text{DRUM OUT}}$	OUT	Turns on/off drum motor drive circuit.
15	$\overline{\text{SET UP 2}}$	OUT	Performs beam blacking of camera tube for 1.5 second during shifting from READY to REC, STANDBY and PB.
16	START	IN	Trigger input for starting IC301. Inputs occur when each switch of REC and STANDBY EJECT C-IN is turned on and when $\overline{\text{PB SW}}$ becomes "L".
17			Not used.
18	+5V (VDD)		+5V power supply terminal.
19			Not used
20	$\overline{\text{DEW SENS}}$	IN	Drum dew condensation input. Set is not operated during "L".
21	$\overline{\text{BAT DWN}}$	IN	When power supply voltage decreases, "L" occurs and the operation of set is stopped.
22	$\overline{\text{RECSW/REMOTE}}$	IN	Input of REC switch and remote control switch. When this input occurs, REC mode starts. Also, STANDBY and REC modes are switched every time there is an input.
23	$\overline{\text{STAND-BY SW}}$	IN	Input of STANDBY switch. By this input, STANDBY and READY (stop) modes are switched.
24	DRUM PG	IN	PG signal input by which whether the drum is normally rotated or not is checked.
25	$\overline{\text{CLOG DET}}$	IN	Whether the normal picture recording is being made or not is applied to this terminal. Whether the picture recording is normal or not is checked during linked shooting.
26	TFG	IN	FG of reel base rotation at T side is entered. If FG input is abnormal, set is stopped.
27	$\overline{\text{TAPE END}}$	IN	If the oscillation of TAPE END detection-oscillation circuit stops, then "L" is applied to this terminal and the set is stopped.
28	$\overline{\text{PB SW}}$	IN	If this terminal is set to "L", then the set will have PB mode.
29	$\overline{\text{AUDIO REC}}$	OUT	Operates audio sound recording circuit.
30			Not used.
31	$\overline{\text{SET UP 1}}$	OUT	Pulses of 3 seconds are delivered when shifting from READY to REC, STANDBY and PB, during which the set performs no operation. This output also turns on LEDs of WHITE BALANCE and LOW LIGHT. 3 seconds is mainly used for the rise of heater of picture tube.
32	$\overline{\text{EJECT SW}}$	IN	Cassette is ejected by this input.
33	$\overline{\text{C-IN SW}}$	IN	Input terminal of switch which detects the entry of a cassette. This switch also detects the claw for preventing picture recording of cassette and thus has the function to prevent picture recording.
34	$\overline{\text{L END}}$	IN	Input terminal for detecting the completion of loading.
35	$\overline{\text{CSWO}}$	IN	Input for distinguishing the output of A-head from the output of B-head during CLOG detection.
36	X'tal IN	IN	Terminal for connecting clock oscillation element.
37	X'tal OUT	OUT	Terminal for connecting clock oscillation element.
38	$\overline{\text{RESET}}$	IN	Trigger input of IC031 reset circuit.
39	PBCTL	IN	Input for taking pinch-off timing during linked shooting.
40	CTIO	IN	Input for taking REC start timing during linked shooting.
41			Not used.
42	GND		Earth terminal
43			Not used.
44	$\overline{\text{BE/PD}}$	OUT	Delivers "L" when the battery voltage is lower than 9.15 ± 0.1V.
45	$\overline{\text{CC DOWN SW}}$	IN	Detects a failure of cassette control.
46			Not used.
47	$\overline{\text{LOAD}}$	OUT	Output for performing the loading (pulse drive).
48	$\overline{\text{UN LOAD}}$	OUT	Output for performing unloading (pulse drive).

3-16. FUNCTION OF IC851 TERMINALS

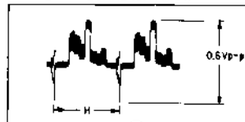
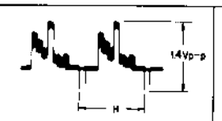
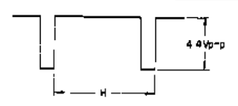
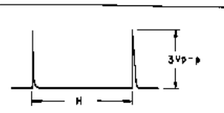
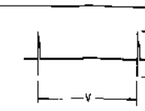
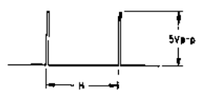
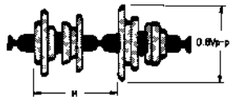
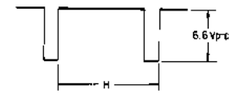
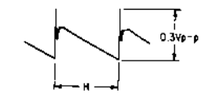
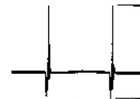
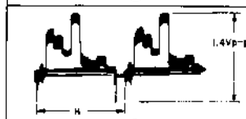
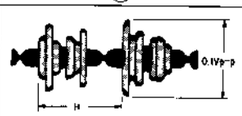
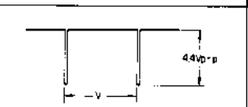
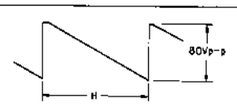
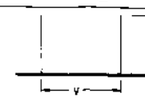
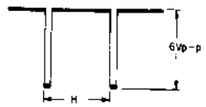
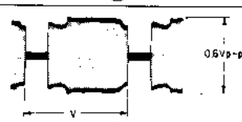
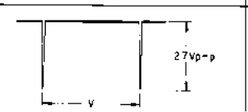
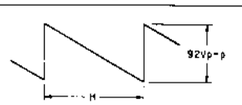
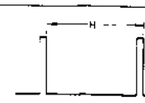
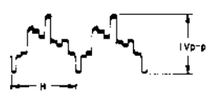
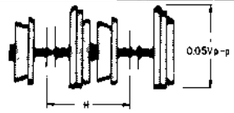
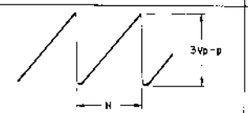
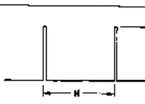
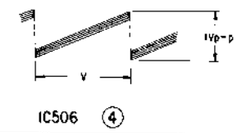
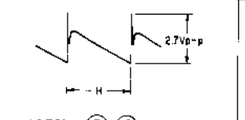
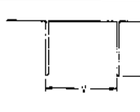
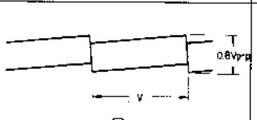
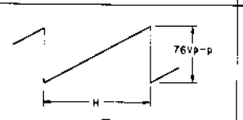
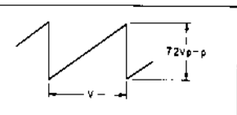
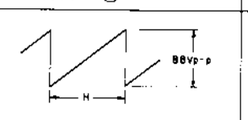
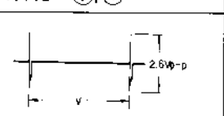
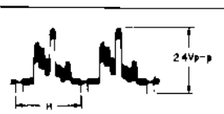
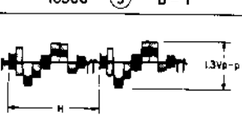
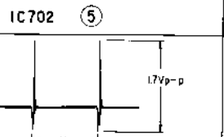
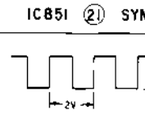
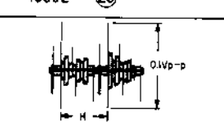
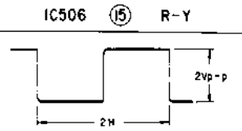
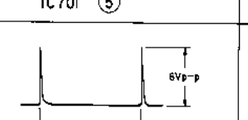
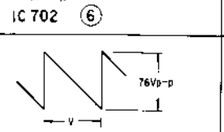
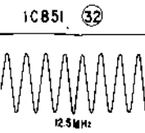
Terminal No.	Terminal name	I/O	Functions
1	TST1	IN	Input for measurement, normally fixed to 'H'.
2	TST2	IN	Input for measurement, normally fixed to 'H'.
3			Not used.
4	TST3	IN	Input for measurement, normally fixed to 'H'.
5	PPM0	OUT	PAL carrier color signal, fsc = (44 ± 1/8) · f_H
6	Vss		0V
7	PM90	OUT	PAL carrier color signal, -90° signal for PPM0.
8	XRST	IN	External reset input, normally fixed to 'H'.
9	PBO	OUT	Burst signal of PAL.
10	PPBO	OUT	Pilot burst signal of PAL.
11	FID	OUT	Frame ID signal of SECAM.
12	VID	OUT	Field ID signal of SECAM.
13	PPBF	OUT	Pilot burst flag signal of PAL.
14	DEVD	OUT	Deflection VD signal.
15	DEHD	OUT	Deflection HD signal.
16	BMCL	OUT	Black mask clamp signal.
17	BBLK	OUT	Beam blanking signal.
18	VDO	OUT	Vertical drive signal.
19	V_{DD}		+5V
20	HDO	OUT	Horizontal drive signal.
21	SYNC	OUT	Composite sync signal.
22	BLKO	OUT	Composite blanking signal of PAL.
23	BFO	OUT	Color burst flag signal of PAL.
24			Not used.
25	PALT	OUT	Line alternation signal of PAL.
26	XPAL	OUT	Inverted signal of PALT.
27	SALT	OUT	Line alternation signal of SECAM.
28	SCBL	OUT	Color blanking signal of SECAM.
29	SHBL	OUT	Horizontal blanking signal of SECAM.
30	CSWO	OUT	Video head switching signal for CLOG detection.
31	Vss		0V
32	CT10	OUT	CTL recording signal.
33	CT20	OUT	Video head switching signal for recording.
34	SRVO	OUT	Servo signal.
35	FLM2	OUT	Frame alternation signal.
36	KVID	IN	Controls whether the field ID portion of SCBL is to be sent out or not.
37	X1I	IN	702 · f_H in
38	X1O	OUT	702 · f_H out
39	X2O	OUT	706 · f_H out
40	X2PD	OUT	Phase detector output signal.
41	X2I	IN	706 · f_H in
42			Not used.
43	V_{DD}		+5V
44			Not used.
45			Not used.
46			Not used.
47			Not used.
48			Not used.


IRIS
DRIVE ⊕ RED
DRIVE ⊖ BLK
SERVO ⊕ ORG
SERVO ⊖ YEL
W-4
CN503(WHT)
RED DRIVE ⊕ 1
BLK DRIVE ⊖ 2
ORG SERVO ⊕ 3
YEL SERVO ⊖ 4
PA-1
TUBE
PREAMP
CN801(WHT)
1 GND BLK
2 TRINICON SIG WHT
3 -4.6V WHT
4 +7.5V RED
5 V CONT ORG
6 GND BLK
PV-4
CN501(BLK)
BLK GND 1
WHT TRINICON SIG 2
WHT -4.6V 3
RED +7.5V 4
ORG V CONT 5
CN802(WHT)
1 TARGET WHT
2 G4 YEL
3 7.5V BRN
4 INDEX ALT WHT
PV-5
CN502(YEL)
WHT TARGET 1
BLK GND 2
WHT INDEX ALT 3
BRN 7.5V 4
YEL G4 5
SMF TRINICON SOCKET
1 BL ORG
2 V ⊖ BLU
3 HE ⊕ BLK
4 H ⊕ VLT
5 G1 BRN
6 HE ⊖ YEL
7 V ⊕ WHT
8 G2 RED
9 H ⊖ GRY
TV-1
CN505(WHT)
BRN G1 1
RED G2 2
ORG BL 3
BLK HE ⊕ 4
YEL HE ⊖ 5
VLT H ⊕ 6
GRY H ⊖ 7
WHT V ⊕ 8
BLU V ⊖ 9
FV-6
CN504(WHT)
BRN FOCUS ⊕ 1
WHT FOCUS ⊖ 2
VC-2 BOARD
9V
Y
CHROMA
GND
(VIDEO)
GC-5 BOARD
GC-4 BOARD
GC-3 BOARD
CSW O
CTIO
PAL-0
PAL-90
PAL-80
PAL-PBO
V.DEF
H.DEF
BLK
ALT
SRVO
HDD
VDD
SYNC
B.H.CLP
B.BLK
+7.5V
+5V
GND
(SG,SR)
CN506(WHT)
ORG A.W/B LED
YEL LLA LED
RED TALLY LED
BRN CLOG LED
BLK GND
CN507(WHT)
ORG VDD
YEL FLT
BLK GND
CN508(RED)
BLK AUTO SET
BRN GND
OVF
A.W/B LED ORG
LLA LED YEL
TALLY LED RED
CLOG LED BRN
GND BLK
OV-1
FL-1 BOARD
VDD ORG
FLT YEL
GND BLK
FS-29
SW-8
SW-9
SW-28 BOARD
1 AUTO SET BLK
2 GND BRN
1 STBY SW BRN
2 STBY LED RED
3 TALLY LED ORG
4 DEW LED YEL
5 CLOG LED WHT
6 GND BLU
Q851
(WHT)
1 E BLU
2 C BRN
3 B RED
LOADING MOTOR
LM-12 BOARD
LOAD(-) BRN
LOAD(+) RED
LM-6
RD-8 BOARD
GND BRN
T FG RED
FG +B ORG
D Vs YEL
UNREG WHT
D DRIVE B BLU
RD-5
CN314(RED)
BRN LOAD(-) 1
RED LOAD(+) 2
CN002(WHT)
1 V.H.A (X) WHT
2 V.H.A (Y) RED
3 GND BLK
4 V.H.B (X) WHT
5 V.H.B (Y) RED
6 GND BLK
VH-9
PG-2
CN001(RED)
1 +9V BRN
2 PB RED
3 CLOG ORG
4 REC YEL
5 GND PNK
VS-4
CN509(WHT)
1 UNREG BRN
2 SET UP2 RED
3 PB SW ORG
4 SET UP1 YEL
5 CLOG LED PNK
6 TALLY LED BLU
7 GND VLT
8 CSW O GRY
9 SRVO WHT
10 CTIO BLK
CS-8
CN851(RED)
1 E BLU
2 C BRN
3 B RED
CN308(BLK)
BRN STBY SW 1
RED STBY LED 2
ORG TALY LED 3
YEL DEW LED 4
WHT CLOG LED 5
BLU GND 6
SW-9
S930
REC STAND BY
RS-6
CN307(YEL)
BRN REC SW 1
PB SW 2
EJ SW 3
YEL GND 4
DEW SENS
CN309(WHT)
YEL DEW SENS 1
BLK GND 2
PM902
PINCH SOLENOID
CN312(RED)
BLU PINCH OFF 1
YEL UNREG GND 2
RED PINCH ON 3
PM901
BRAKE SOLENOID
CN310(WHT)
BLU BRAKE OFF 1
YEL UNREG GND 2
RED BRAKE ON 3
CN302(BLK)
BRN GND 1
RED T FG 2
ORG FG +B 3
DRUM
VIDEO HEAD (A)
VIDEO HEAD (B)
PG
RD-10
CN201(WHT)
WHT DRUM PG 1
BLK GND 2
(SERVO)
CN304(YEL)
BRN +9V 1
RED PB 2
ORG CLOG 3
YEL REC 4
PNK GND 5
CN313(WHT)
BRN UNREG 1
RED SET UP2 2
ORG PB SW 3
YEL SET UP1 4
PNK CLOG LED 5
BLU TALLY LED 6
VLT GND 7
GRY CSW O 8
WHT SRVO 9
BLK CTIO 10
CN204(YEL)
CTL 1
GND 2
CN308(BLK)
BRN STBY SW 1
RED STBY LED 2
ORG TALY LED 3
YEL DEW LED 4
WHT CLOG LED 5
BLU GND 6
CN307(YEL)
BRN REC SW 1
PB SW 2
EJ SW 3
YEL GND 4
CN309(WHT)
YEL DEW SENS 1
BLK GND 2
CN312(RED)
BLU PINCH OFF 1
YEL UNREG GND 2
RED PINCH ON 3
CN310(WHT)
BLU BRAKE OFF 1
YEL UNREG GND 2
RED BRAKE ON 3
CN302(BLK)
BRN GND 1
RED T FG 2
ORG FG +B 3
DM-4 BOARD
RED D Vs
BLU UNREG GND
DRUM MOTOR
CT-11
CTL HEAD
DM-10
CN203(BLK)
RED D Vs
BLU UNREG GND
CN207(WHT)
YEL D Vs
WHT UNREG
BLU D DRIVE B
CN202(RED)
WHT CTL HEAD(X)
BLK CTL HEAD(Y)
ZM-1
CN205(WHT)
BLU Z MOTOR (+)
RED Z MOTOR (-)
ZOOM MOTOR
S931
ZOOM
T W
ZS-1
CN206(BLK)
1 TELE BLU
2 GND BRN
3 WIDE RED
CN303(WHT)
1 END SENS WHT
2 GND BLK
FS-24
END SENSER
DRUM PG
DRUM OUT
REC
PB
PB CTL
SW UNREG ⊕
+9V
UNREG GND
GND
UNREG ⊕
SRVO
CTIO
SW UNREG ⊕
UNREG GND
(ZOOM)
SS-17 BOARD
(SYSCON)
FULL ERASE HEAD
FE-4
CN405(BLK)
RED F.E HEAD(X) 1
BLK GND 2
AU-4 BOARD
AUDIO HEAD
AH-17
CN404(WHT)
RED AUDIO HEAD (X) 1
BLK GND 2
CN301(WHT)
1 +9V BRN
2 AUDIO REC RED
3 EJ SW ORG
4 GND YEL
5 BIAS PNK
6 SET UP2 BLU
AS-22
CN402(WHT)
BRN +9V 1
RED AUDIO REC 2
ORG EJ SW 3
YEL GND 4
PNK BIAS 5
BLU SET UP2 6
AU-3 BOARD
TRANSLATION
CN311(WHT)
1 UNREG RED
2
3 UNREG GND BLK
JS-3
CN902(WHT)
RED UNREG 1
2
BLK UNREG GND 3
YEL TALLY 4
PNK REMOTO 5
BLU GND 6
CN316(RED)
1 TALLY YEL
2 REMOTE PNK
3 GND BLU
CN305(BLK)
1 L END BRN
2 GND RED
LS-10
S303 LOADING END SW
CN306(WHT)
1 C IN BRN
2 GND RED
3 CC DWN ORG
4 GND YEL
CS-7
S301 C-IN SW
S302 C-C DWN SW
JK-2 BOARD
J904 EXT MIC IN
J903 REMOTO
J902 EARPHONE
J901 EXT DC IN
CN903(BLK)
1 MIC IN RED
2 AF OUT WHT
3 GND BLK
4 GND BLK
5 AF IN BRN
CN901(RED)
1 BATT ⊕ RED
2
3 BATT ⊖ BLK
BT-4
RED BATT ⊕
BLK BATT ⊖
MIC UNIT
Note: T



WAVEFORMS

VC-2 BOARD (CAMERA) H: $1.2f_H$ (18.9kHz)

 IC501 (TP501) ① (PA)	 IC502 ㉘	 IC509 ①	 IC701 ⑦,⑮	 IC702 ⑬
 IC501 ③	 IC505 ①	 IC509 ②	 IC701 ⑨	 IC702 ⑭
 IC501 ⑤	 IC505 ③	 IC509 ⑪	 IC701 ⑪	 IC851 ⑭ V
 IC501 ⑥	 IC505 ⑤	 IC509 ⑫	 IC701 ⑫	 IC851 ⑮ H.
 IC502 (TP506) ② Y OUT	 IC505 ⑧	 IC509 ⑬	 IC701 ⑬	 IC851 ⑯,⑰
 IC502 ③	 IC506 ④	 IC701 ②,⑩	 IC701 ⑭	 IC851 ⑱
 IC502 ⑮	 IC506 ⑤	 IC701 ③	 IC702 ③,④	 IC851 ⑳ HD
 IC502 ⑲	 IC506 ⑨ B-Y	 IC701 ④	 IC702 ⑤	 IC851 ㉑ SYN
 IC502 ㉖	 IC506 ⑮ R-Y	 IC701 ⑤	 IC702 ⑥	 IC851 ㉜
 IC502 ㉗	 IC506 ㉑	 IC701 ⑥	 IC702 ⑫	 IC851 ㊲

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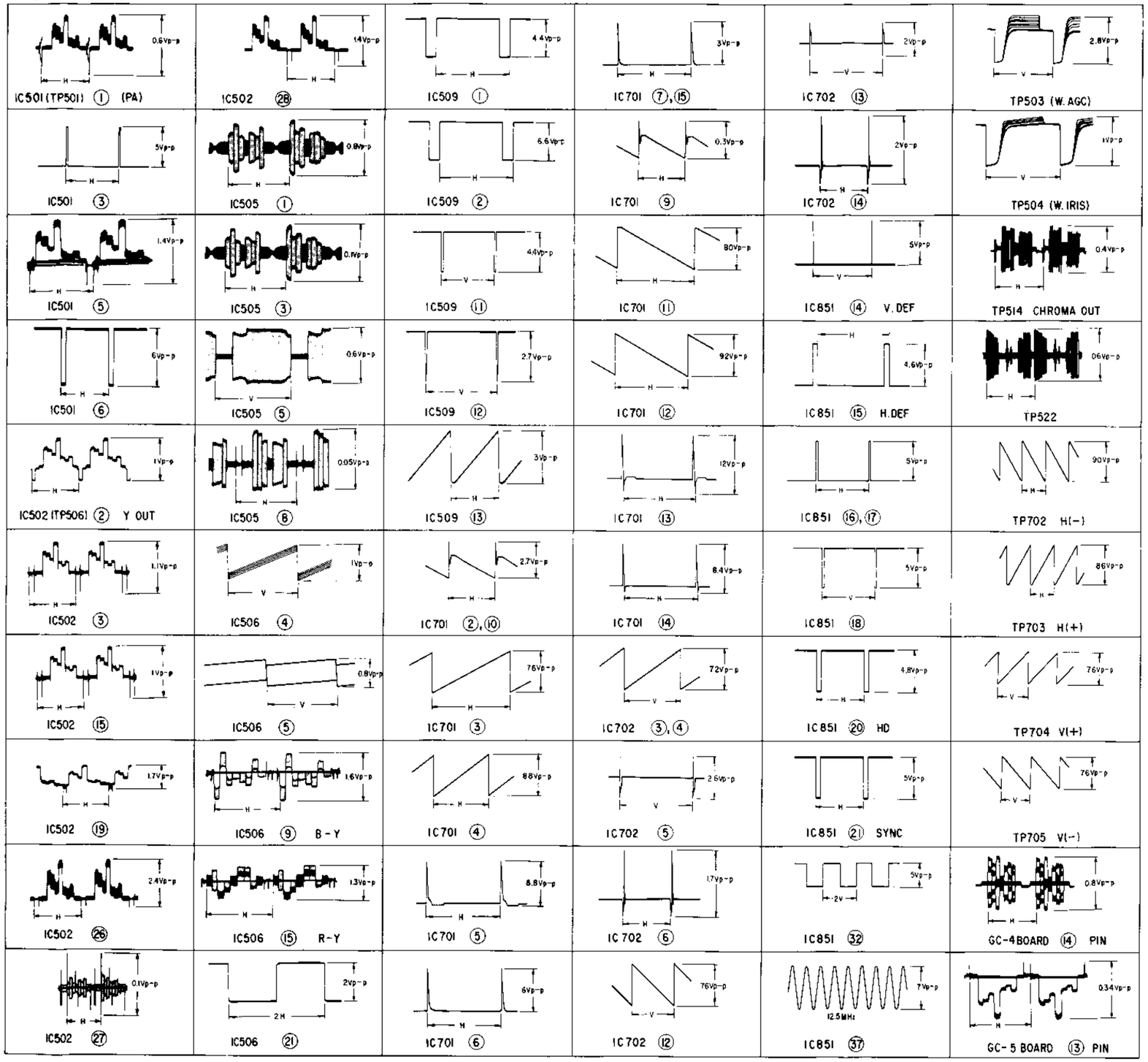
WAVEFORMS

VC-2 BOARD (CAMERA) H: 1.2f_H (18.9kHz)



4-2. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

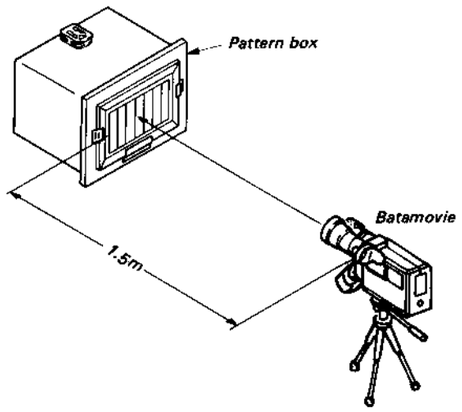
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

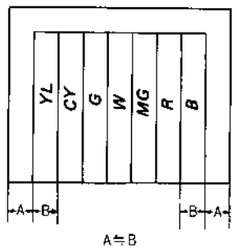
Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted.
  kΩ : 1000Ω, MΩ : 1000kΩ
- All capacitors are in μF unless otherwise noted. pF : μμF
  50WV or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ⊗ : Through hole.
- ▭ : nonflammable resistor.
- ——— : B+ bus.
- ▭ : adjustment for repair.
- Voltage and waveform measuring conditions:
  (1) Sample object: Pattern box color bars.
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm more).

1. Connection



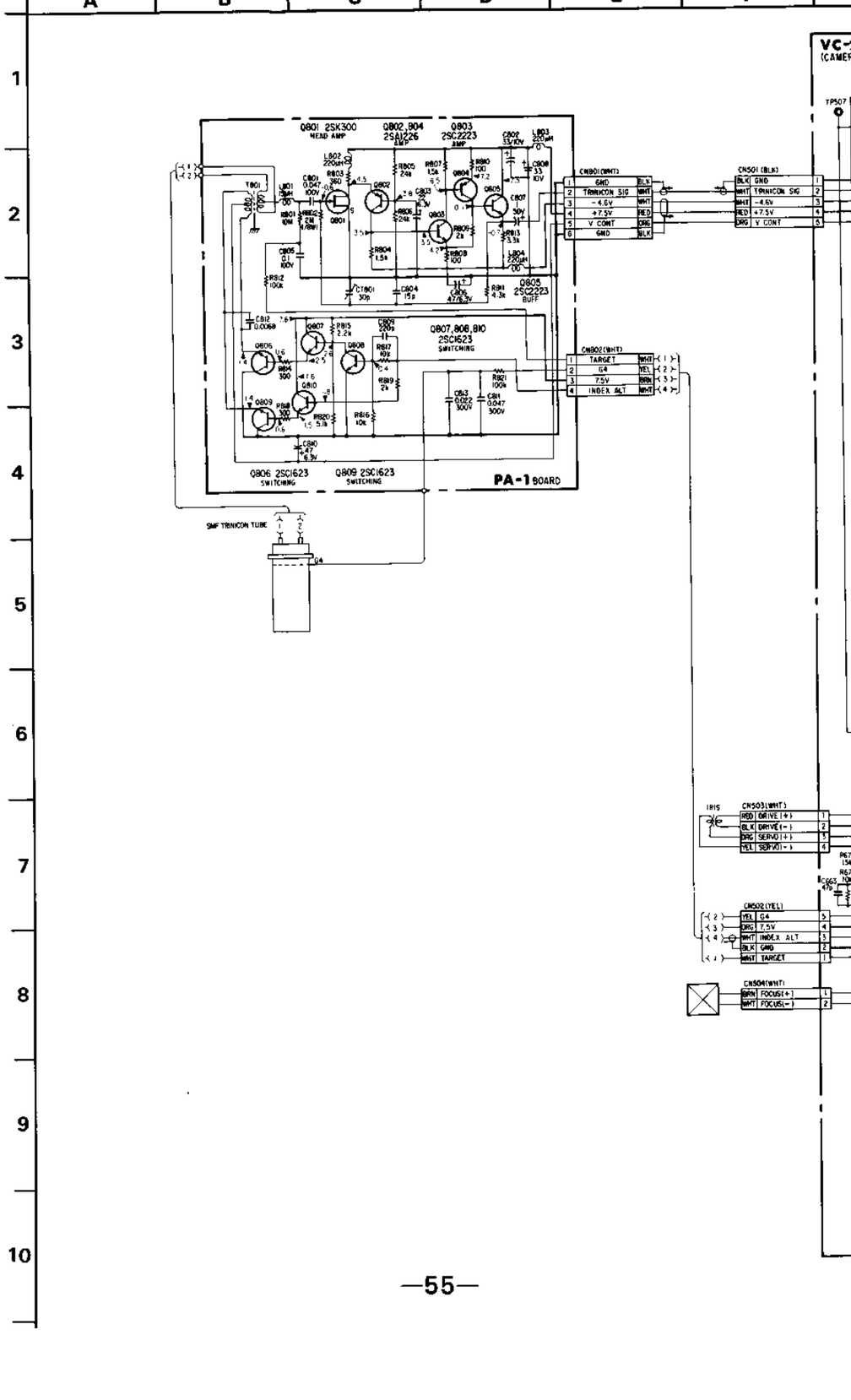
2. Shoot the subject so that the picture frame on the monitor is as shown in the figure below.

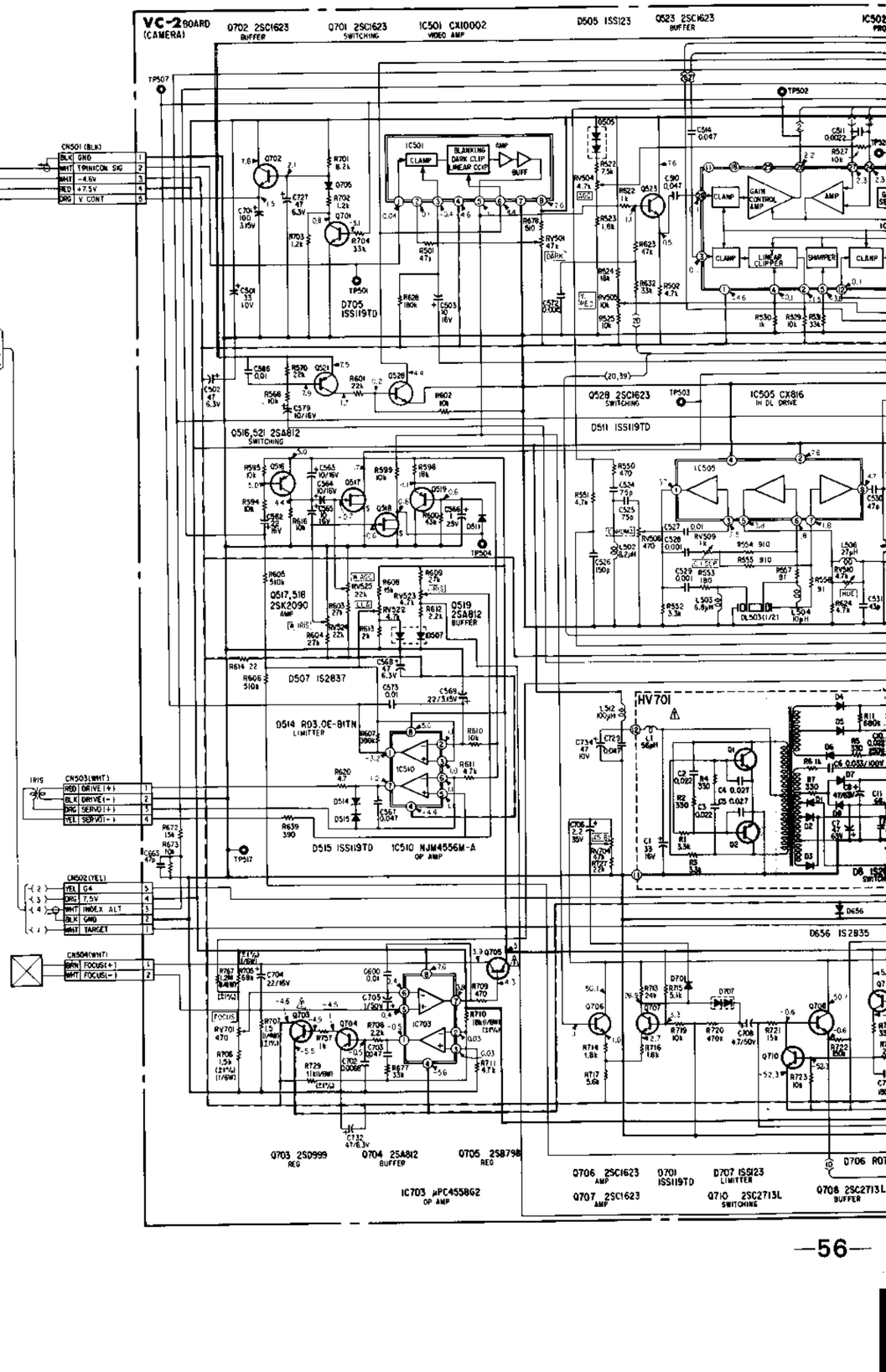


A≒B

PA-1 (PRE AMP), VC-2 (Y & CHROMA SIGNAL PROCESS), GC-3 (OSCILLATOR), GC-4 (MODULATER), GC-5 (DELAY), FL-1 (FILTER SWITCH) SCHEMATIC DIAGRAM

– Ref. No. PA-1 BOARD : 2,000 series, VC-2 BOARD, GC-3 BOARD, GC-4 BOARD, GC-5 BOARD : 1,000 series, FL-1 BOARD : 4,500 series –

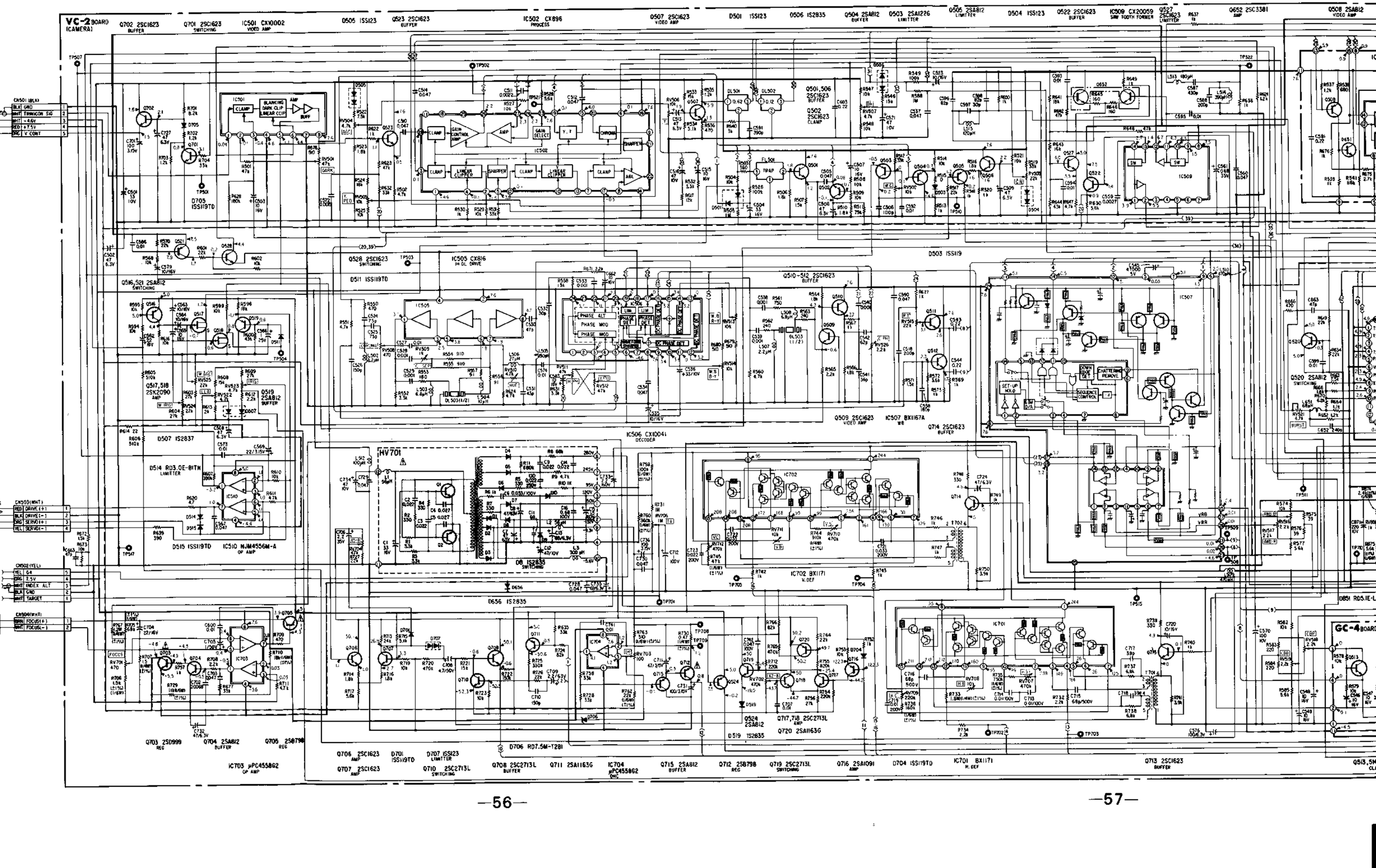


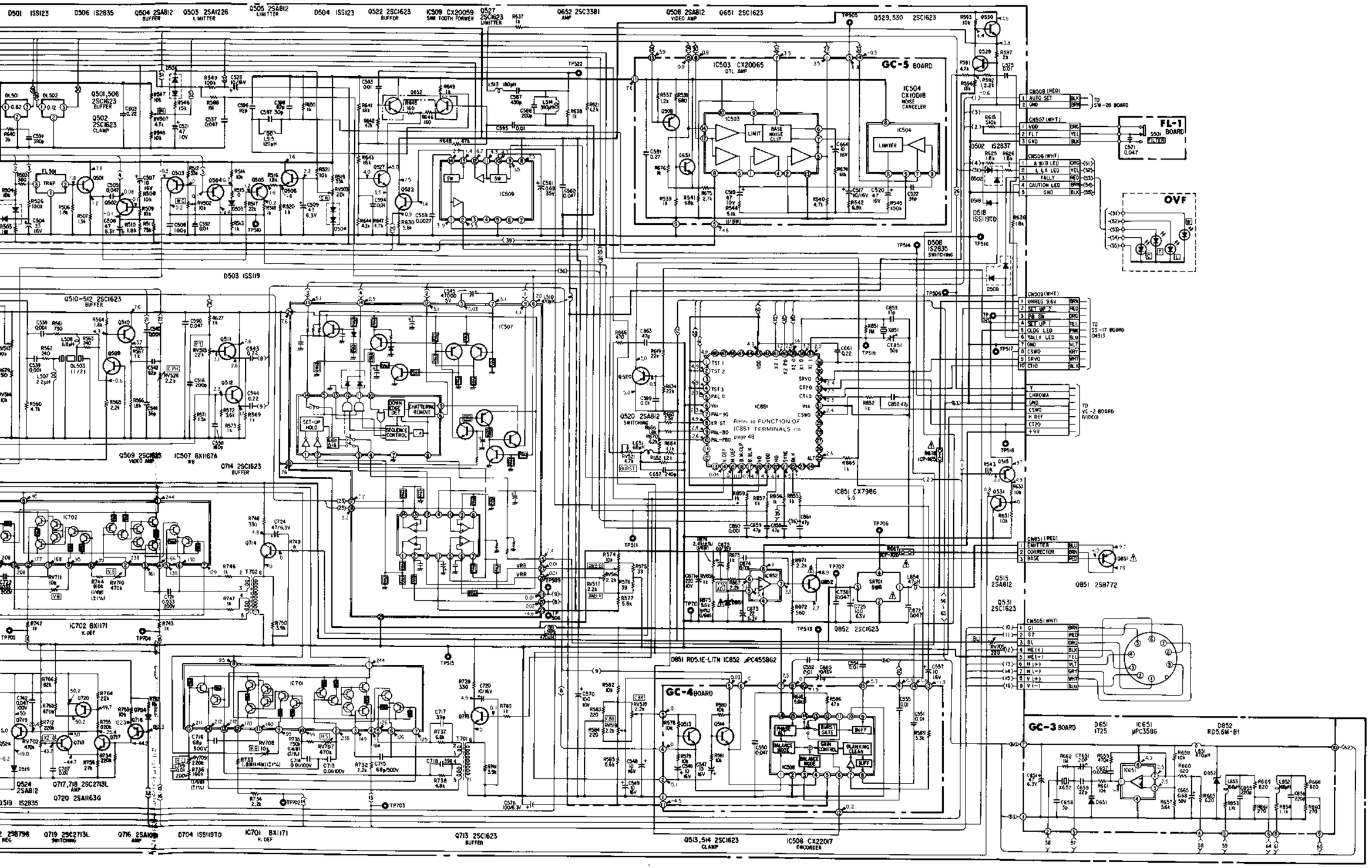


), GC-4 (MODULATER), GC-5 (DELAY), FL-1 (FILTER SWITCH) SCHEMATIC DIAGRAM

,000 series, FL-1 BOARD : 4,500 series –

F G H I J K L M N O P Q R S T U V




O
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A1
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8
9
10
GC-5 BOARD
IC503 CX20065 DTL AMP
IC504 CX10018 NOISE CANCELER
IC509 CX20059 SAW TOOTH FORMER
Q652 2SC3381 AMP
Q529, 530 2SC1623
TO SW-26 BOARD
FL-1 BOARD
OVF
IC507 BX1167A WB
Q714 2SC1623 BUFFER
Q510-512 2SC1623 BUFFER
D503 ISS119
IC851 CX7986 S.G
Refer to FUNCTION OF IC851 TERMINALS on page 48
Q520 2SA812 SWITCHING
TO SS-17 BOARD CN313
TO VC-2 BOARD (VIDEO)
Q851 2SB772
Q515 2SA812
Q531 2SC1623
Q852 2SC1623
IC702 BX1171 V.DEF
IC701 BX1171 H.DEF
Q713 2SC1623 BUFFER
GC-4 BOARD
Q513, 514 2SC1623 CLAMP
IC508 CX22017 ENCODER
D851 RD5.1E-LITN IC852 μPC4558G2
GC-3 BOARD
D651 1T25
IC651 μPC358G
D852 RD5.6M-B1
Q719 2SC2713L SWITCHING
Q716 2SA1048 AMP
Q717, 718 2SC2713L
Q720 2SA1163G
D704 ISS119TD

PA-1 (PRE AMP), VC-2 (Y & CHROMA SIGNALS PROCESS), GC-3 (OSCILLATOR), GC-4 (MODULATER), GC-5 (DELAY), FL-1 (FILTER SWITCH) PRINTED WIRING BOARDS

– Ref. No. PA-1 BOARD : 2,000 series, VC-2 BOARD, GC-3 BOARD, GC-4 BOARD, GC-5 BOARD : 1,000 series, FL-1 BOARD : 4,500 series –

A B C D E F G H I J K L M N O P

1 2 3 4 5 6 7 8 9 10

GC-3 BOARD (CONDUCTOR SIDE)

I-610-738-

GC-3 BOARD (COMPONENT SIDE)

I-610-738-

PA-1 BOARD (CONDUCTOR SIDE)

I-610-

GC-5 BOARD (CONDUCTOR SIDE)

I-611-418

GC-4 BOARD (CONDUCTOR SIDE)

I-611-417-

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 pattern face are indicated.

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

SMF TRINICON TUBE

FL-1 BOARD

1-610-553-

PA-1 BOARD (COMPONENT SIDE)

I-610-

GC-5 BOARD (COMPONENT SIDE)

I-611-418-

GC-4 BOARD (COMPONENT SIDE)

I-611-417-

DRUM

TO SS-17 BOARD CN201

VC-2 BOARD (COMPONENT SIDE)

I-610-732-

TO SW-28 BOARD

TO SS-17 BOARD CN304

L M N O P Q R S T U V W X Y Z A1 B1

VC-2 BOARD (COMPONENT SIDE)

VC-2 BOARD (CONDUCTOR SIDE)

Q , IC	D	ADJ	TP
IC507		RV516,RV524 RV702,RV705	702
IC510	701	RV517,RV525	515 703
718,708,710		RV704	
516 716 717 711	704 515		508 504
716,524 518,517 720 719	507,514 511		
531		RV706 RV522 RV523	701
519,707,706 520	519 707	RV513	503
IC506 515		RV510 RV514	
IC704	656	RV701	501 507
IC501 523	518 502 508,706	RV526	509
528		RV501 RV511	
702 511 701 IC505		RV515 RV504 RV512	505 708
510 529 IC509 522	505 501	RV509 RV507 RV505 RV508	502
IC502 530 704 715	705	RV703	522 511
501 IC703 509			521 709
703,712 502 652 512		RV518	
507 527	506	RV506 RV519	
503 705 714		RV521	705
504,505 506 33 521	504 503	RV503 RV502 RV711 RV710,RV712	704 516,517 506
27,31,32 156,154,152,3 IC702		RV8	510 513 514 11
158 22 37 IC701 160 18	153	RV156 RV154	9 518 16,519 8
151 2,1 21,24 159,161 28 23	5 152 151	RV155 RV708	6 13 152 7 151
157 IC851 155,20 35 713		RV707,RV709 RV153	14 15
153,19,29 30 IC2		RV152 RV151 RV851 CT851	5
14,25,26 36,34 IC852 16 852 17	7 6 851	RV7	706 707 520 710 10
Q , IC	D	ADJ	TP

S T U V W X Y Z A1 B1 C1 D1 E1 F1 G1 H1

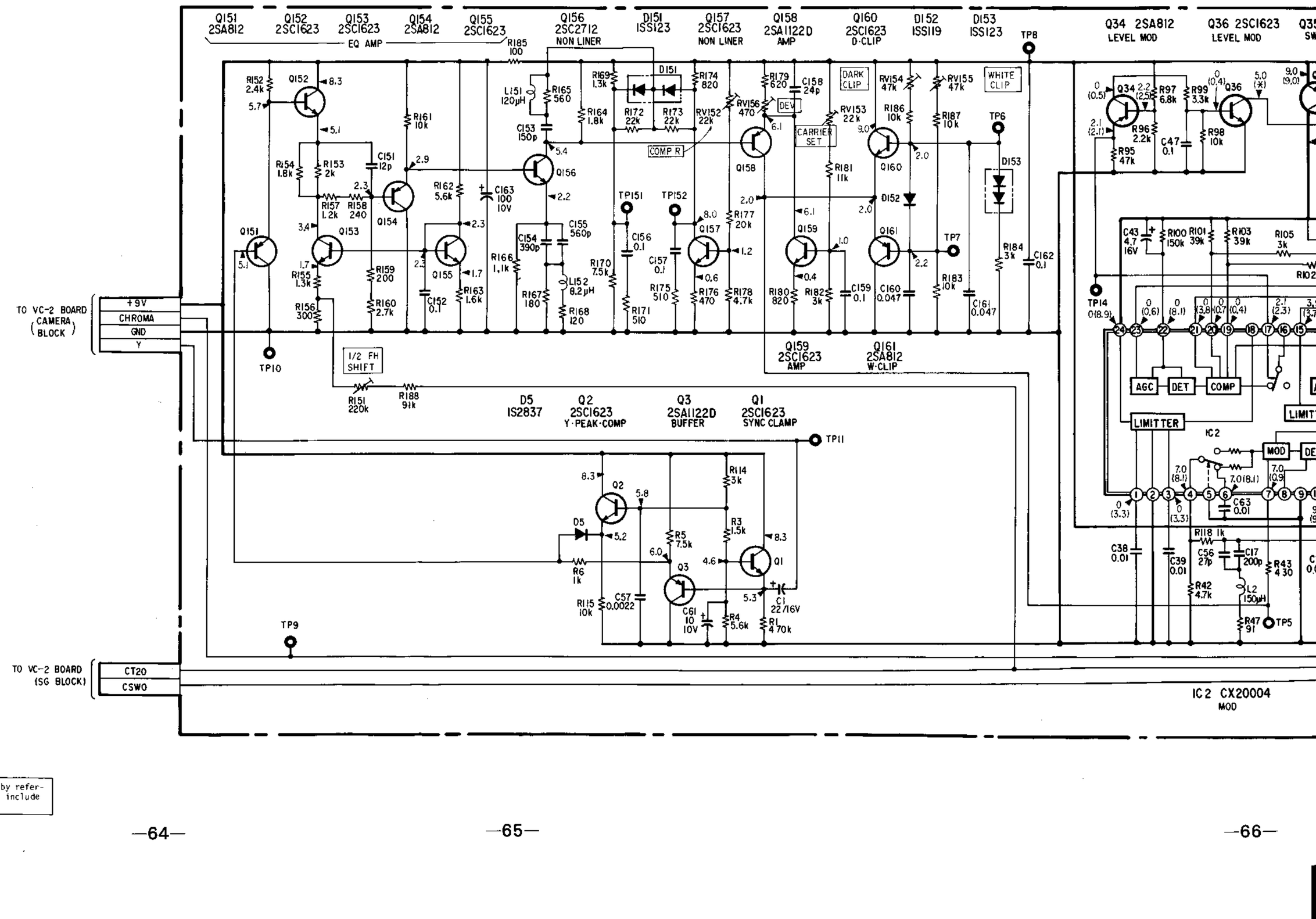
1 2 3 4 5 6 7 8 9 10

Q , IC	D	ADJ	TP
IC507		RV516,RV524 RV702,RV705	702
			515
IC510	701	RV517,RV525	703
718,706,710		RV704	
516 716 717 711	704 515		508
716,524 518,517 720 719	507,514 511		504
531		RV706 RV522 RV523	701
519,707,706	519		
520	707	RV513	503
IC506 515		RV510	
IC501 IC704	656	RV514	501
523	518 502 508 706	RV701 RV526	507 509
528		RV501 RV511	
702 511 701 IC505		RV515 RV504 RV512	505 708
510 529 IC509	505 501	RV509 RV507 RV508	502
IC502 530 522	704 705	RV703	
501 IC703 509	715		522 511 521 709
703,712		RV518	
502 652 512 507	506	RV506 RV519	
527 503	714 705	RV521 RV503 RV502 RV711	705 704
504,505 506 33 521	504 503	RV710,RV712 RV8	516,517 506 510 513 514 11
27,31,32 156,154,152,3 IC 702			9
158 160 18 22 37 IC 701	153	RV156 RV154	518 16,519 8 6
151 2,1 21,24 159,161 28 23	5 152 151	RV155 RV708	13 152 7 151
157 IC851 35 155,20 713		RV707,RV709 RV153	15 14
153,19,29 30 IC 2		RV152 RV151 RV851 CT851	5
14,25,26 36,34 IC852	7 6 851		706 707
16 852 17		RV7	520 710 10
Q , IC	D	ADJ	TP

VC-2 BOARD
(CONDUCTOR SIDE)
1-640-737-

VC-2 (Y & CHROMA SIGNALS PROCESS) SCHEMATIC DIAGRAM

– Ref. No. VC-2 BOARD : 1,000 series –



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

K L M N O P Q R S T U V W X Y Z A1

Q158 A1122D AMP

Q160 2SC1623 D-CLIP

D152 1SS119

D153 1SS123

TP8

Q34 2SA812 LEVEL MOD

Q36 2SC1623 LEVEL MOD

Q35 2SA812 SWITCHING

D7 HZ6B1LTD

DARK CLIP

WHITE CLIP

CARRIER SET

DEV

C158 24p

RV154 47k

RV155 47k

RV153 22k

R186 10k

R187 10k

R181 11k

TP6

D153

D152

Q159

Q161

TP7

R184 3k

C162 0.1

R182 3k

C159 0.1

C160 0.047

R183 10k

C161 0.047

Q159 2SC1623 AMP

Q161 2SA812 W-CLIP

TP11

R97 6.8k

R99 3.3k

R96 2.2k

R95 47k

C47 0.1

R98 10k

R107 100k

R108 3.9k

D7

Q37 2SC1623 MUTING

Q33 2SC1009A RF-AMP

Q32 2SC1009A RF-AMP

Q31 2SC1009A RF-AMP

Q29,30 2SC1009A BUFFER

Q28 2SC1623 SWITCHING

R112 100

R113 100

C33 33 10V

C43 4.7 16V

R100 150k

R101 39k

R103 39k

R105 3k

C44 0.047

R102 1.8k

TP14

R104 47k

C45 0.01

C42 0.01

Q33

C37 0.01

R93 33k

R91 33k

L8

C36 0.01

Q32

Q31

RV8 1k PB LEVEL

TP13

R94 33k

R92 47k

C55 0.01

R88 510

R89 150

R87 22k

R86 68k

R106 10k

Q37

R109 3.3k

R84 33k

C35 0.01

L7

C50 18p

R81 10k

Q30

D6

Q29

R78 4.7k

Q28

R79 33k

C41 0.047

C48 47 10V

D6 1S283

C31 0.01

R85 18k

C34 0.01

R82 3

R83 1k

R90

R80 33k

C32 0.01

R77 33k

C51 0.001

AGC DET COMP AMP

LIMITTER

LIMITTER

IC2

MOD DEMOD

C63 0.01

L3 33µH

C38 0.01

C39 0.01

R118 1k

C56 27p

C17 200p

R43 430

R42 4.7k

L2 150µH

R47 91

TP5

C18 0.047

C21 33 10V

C20 0.047

R76 10k

R46 62k

Q14

R53 1.2k

L4 12µH

C26 15p

R49 27k

R48 1k

R44 1k

Q16

R54 3.3k

C23 0.01

R52 24k

R45 750

R51 33k

C24 0.01

Q17

R50 2.2k

RV7 2.2k

Y REC LEVEL

C25 0.01

R57 47k

R55 12k

R56 1k

C54 3p

Q19

R58 150

Q20

TP15

R59 47

R62 1k

Q18

R61 2.2k

R63 8.2

C28 0.01

R112 1k

R29 36k

Q21

C58 0.047

R13 51

R60 200

C59 180p

Q22

R66 47k

R65 47k

R64 47k

Q23

R69 5.1k

R68 3.9k

R116 270

R110 10k

C52 0.22

R67 47k

Q25

R72 560

Q24

R70 100k

IC2 CX20004 MOD

Q14 2SC2223 Y-EQ

Q16 2SA1226 Y-EQ

Q17 2SA1226 Y-EQ

Q18 2SA1122D AMP

Q19 2SC1623 Y-REC

Q20 2SA812 Y-REC

Q21 2SC1623 AMP

Q22 2SC1623 SWITCHING

Q23 2SC1623 INVERTER

Q25 2SC1623 SWITCHING

Q24 2SC1623 MUTING

S T U V W X Y Z A1 B1 C1 D1 E1 F1 G1 H1

1 2 3 4 5 6 7 8 9 10

VC-2 BOARD
(VIDEO)

CN001(RED)

1	+9V	BRN
2	PB	RED
3	CLOG	ORG
4	REC	YEL
5	GND	PNK

TO SS-17 BOARD CN304

CN002(WHT)

1	V.H.A (X)	WHT
2	V.H.A (Y)	RED
3	GND	BLK
4	V.H.B (X)	WHT
5	V.H.B (Y)	RED
6	GND	BLK

VIDEO HEAD
A-CH
B-CH

TP16

no mark : REC mode.
( ) : PB mode.
* : Can not be measuerd.

Q37 2SC1623
MUTING

Q33 2SC1009A
RF·AMP

Q32 2SC1009A
RF·AMP

Q31 2SC1009A
RF·AMP

Q29,30 2SC1009A
BUFFER

Q28 2SC1623
SWITCHING

D6 1S2835

TP13

PB LEVEL

TP15

Y REC LEVEL

Q16 2SA1226
Y-EQ

Q17 2SA1226
Y-EQ

Q18 2SA1122D
AMP

Q19 2SC1623
Y-REC

Q20 2SA812
Y-REC

Q21 2SC1623
AMP

Q22 2SC1623
SWITCHING

Q23 2SC1623
INVERTER

Q25 2SC1623
SWITCHING

Q24 2SC1623
MUTING

Q26 2SC1623
SWITCHING

Q27 2SC1623
MUTING

VC-2 BOARD (VIDEO)

IC2 ④ Y FM OUT

IC2 ⑦

TP2 (CN002 ⑤)

TP4 (CN002 ②)

TP5

VC-2 (Y & CHROMA SIGNALS PROCESS) PRINTED WIRING BOARD

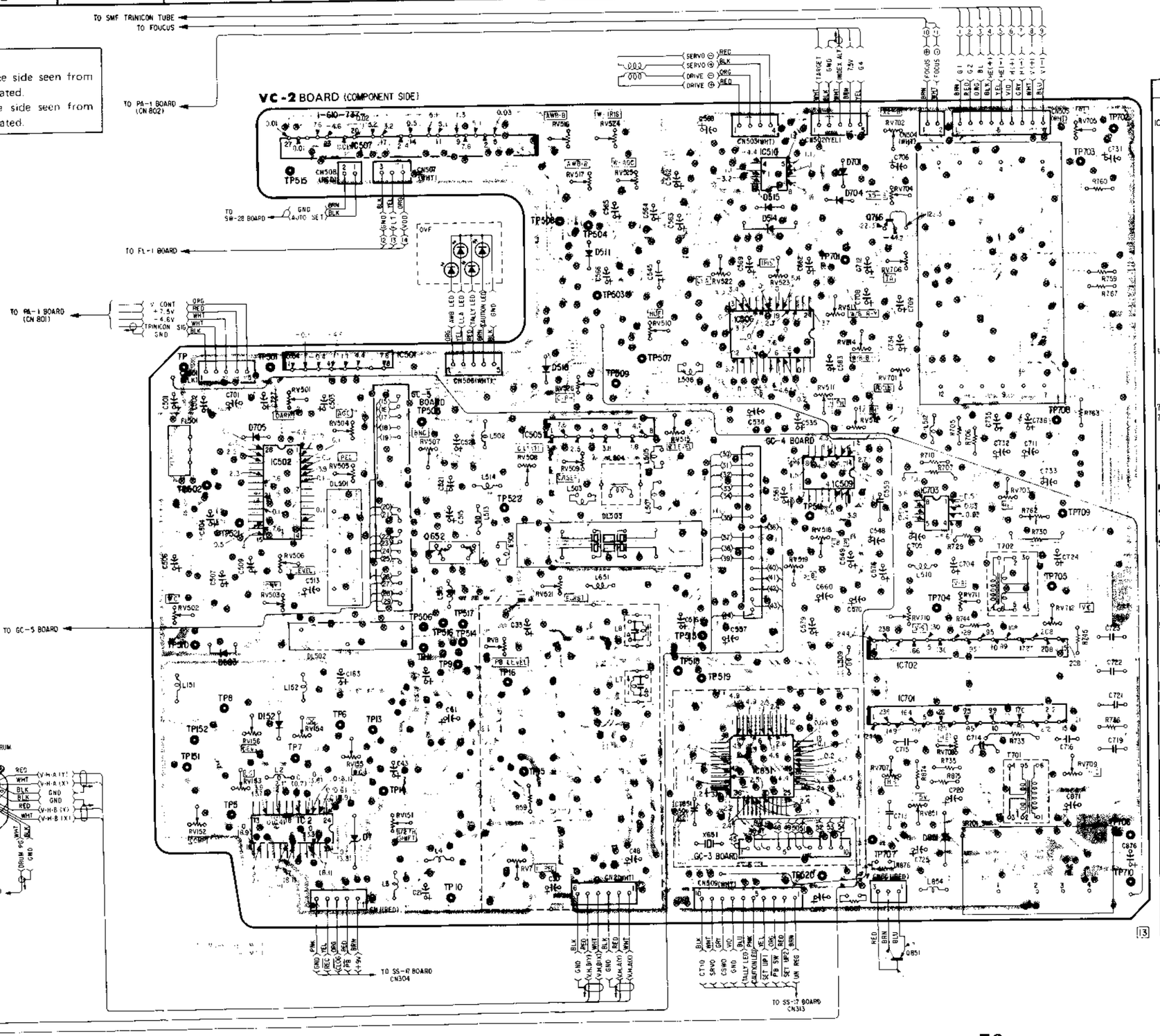
-- Ref. No. VC-2 BOARD : 1,000 series –

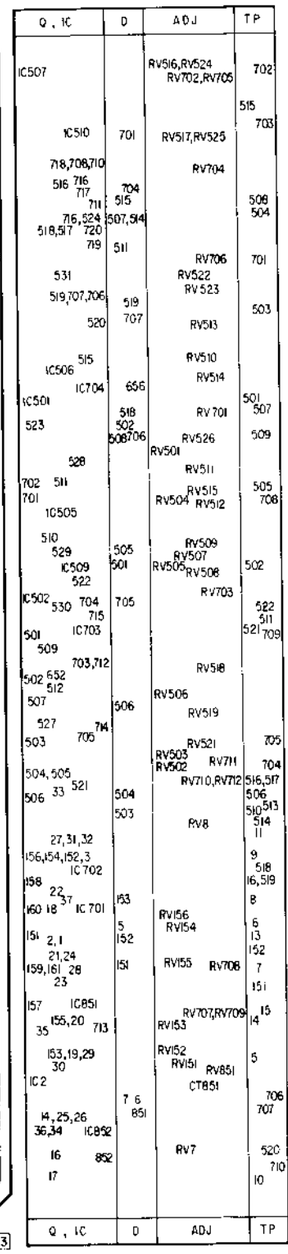
Caution:

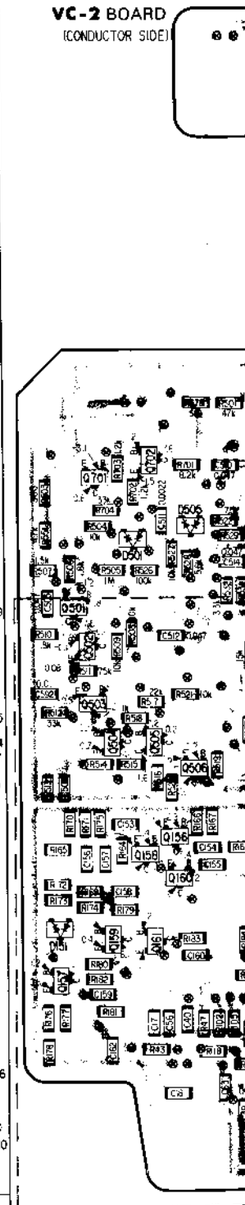
Pattern face side: (Conductor Side) Parts on the pattern face side seen from the pattern face are indicated.

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

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







Note: Refer to enlarged V

L M N O P Q R S T U V W X Y Z A1 B1

Q , IC	D	ADJ	TP
IC507		RV516,RV524 RV702,RV705	702
			515
IC510	701	RV517,RV525	703
718,708,710		RV704	
516 716 717	704		
711	515		508
716,524 518,517 720	507,514		504
719	511		
		RV706	701
531		RV522	
519,707,706		RV523	
	519		
520	707	RV513	503
IC506 515		RV510	
IC704	656	RV514	
IC501		RV701	501 507
523	518 502		
528	506	RV526 RV501	509
		RV511	
702 511 701		RV515	505
IC505		RV504 RV512	708
510		RV509	
529	505	RV507	
IC509	501	RV505 RV508	502
522		RV703	
IC502 530 704 715	705		522 511
501 IC703			521 709
509			
703,712		RV518	
502 652 512			
507	506	RV506	
		RV519	
527 714 503 705			
		RV521	705
504,505		RV503 RV502 RV711	704
506 33 521	504	RV710,RV712	516,517
	503		506 510 513
		RV8	514 11
27,31,32			9
156,154,152,3 IC 702			518
158 22 37 IC 701	153		16,519 8
160 18		RV156 RV154	6
151 2,1	5 152		13 152
21,24 159,161 28 23	151	RV155 RV708	7 151
157 IC851			
35 155,20 713		RV707,RV709 RV153	14 15
153,19,29 30		RV152 RV151 RV851	5
IC2		CT851	
	7 6 851		706 707
14,25,26 36,34 IC852			
16 852		RV7	520 710
17			10
Q , IC	D	ADJ	TP

VC-2 BOARD
(CONDUCTOR SIDE)

1-610-737-

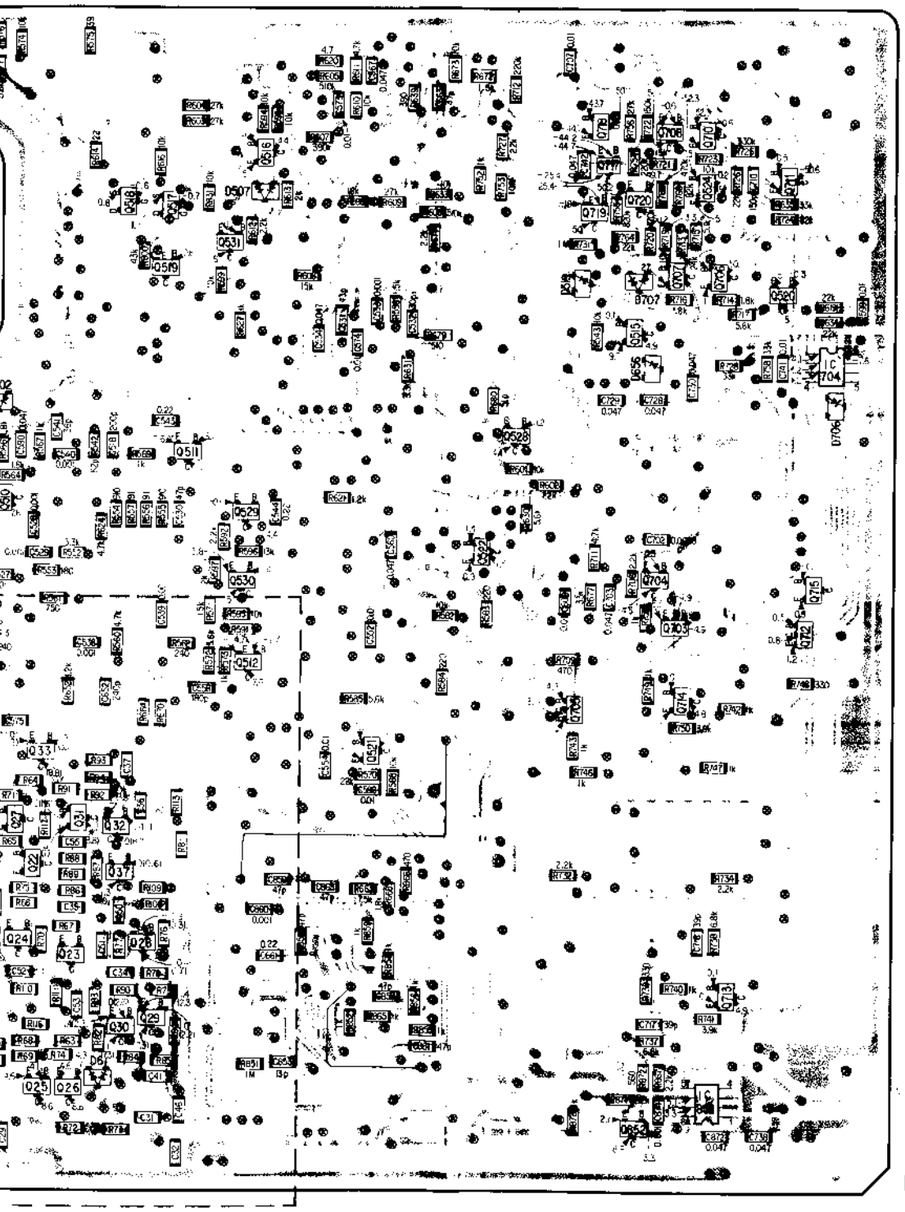
13

13

Note: Refer to enlarged VC-2 Board on page 89, 90.

S T U V W X Y Z A1 B1 C1 D1

1 2 3 4 5 6 7 8 9 10



SERVO, SYSTEM CONTROL

SS-17 (SERVO/SYSTEM CONTROL), DM-4 (DRUM MOTOR), RD-8 (DRUM MOTOR DRIVE/T. FG DET), SW-28 (FUNCTION, SWITCH & IND), JK-2 (JACK), LM-12 (LOADING MOTOR) SCHEMATIC DIAGRAM

– Ref. No. SS-17 BOARD : 3,000 series, DM-4, RD-8, SW-28, JK-2, LM-12 BOARD : 3,900 series –

A B C D E F G H I J K L M N O P

1 2 3 4 5 6 7 8 9 0

SS-17 BOARD (SERVO)

IC201 ① PG

IC201 ②PG(A), ③PG(B)

IC201 ⑤

IC201 ⑦

IC201 ㉒

IC201 ㉔

IC202 ③ REC CTL

IC202 ⑤

IC202 ⑦

SS-17 BOARD (SYSCON)

IC301 ㉞,㉟

IC301 ㊱ TFG SINGLE SWEEP MODE

IC301 ㊲

IC301 ㊴ PB CTL

IC301 ㊵ CTIO

SS-17 (1/2) BOARD

Q217,218 2SD999 ZOOM MOTOR DRIVE

Q219,220 2SA812 BUFFER

IC201 CXI86 DRUM SERVO

Q205 2SA812 BUFFER

Q204 2SC1623

Q203 2SC1623 SWITCHING

D202 E10DS2

ZOOM MOTOR

S93) ZOOM T W

CN205(WHT) BLU Z MOTOR (+) 1, RED Z MOTOR (–) 2

CN206(BLK) BLU TELE 1, BRN GND 2, RED WIDE 3

DRUM PG

CN201 (WHT) WHT DRUM PG 1, BLK GND 2

IC201 (1/2) SPEED REFERENCE DELAY, GATE (2) DELAY, COMPARATOR WAVEFORM GEN, KICK DELAY, F.F, PG(B) DELAY, PG (A) DELAY, GATE (2), PG DET

IC201 (2/2) LOCK PHASE DELAY, GATE (1) PULSE, GATE (1), TRACKING CONT DELAY, TRACKING CENTER DELAY, 1/2 COUNTER, NOISE STOP DELAY

Q201 2SC1623 SWITCHING

Q202 2SA812 BUFFER

TP201 TP202 TP203 TP204 TP205

DM-4 BOARD

L920 35μH

C921 0.022 C920 0.022

M902 DRUM MOTOR

CN203 (BLK) 1 D Vs, 2 UN REG GND

TAPE END SENSER

RD-8 BOARD

D901 GP2S028

Q901 2SB962 MOTOR DRIVE

TO AU-3 CN40

CN207 (WHT) 1 D Vs, 2 UN REG, 3 D DRIVE Ø

DRUM PG, DRUM OUT, REC, PB CTL, UN REG, 9V, UN REG GND, GND, SRVO, CTIO

CN204 (YEL) 1 CTL, 2 GND

CTL HEAD

CN202(RED) WHT CTL HEAD(X) 1, BLK CTL HEAD(Y) 2

Q210 2SA812 BUFFER

Q211–215 2SC1623 SWITCHING

IC202 μPC3586G CTL PB AMP

S302 C-C DOWN SW, S301 C-IN SW

SW-28 BOARD

S981 WHITE BALANCE

AUTO SET BLK, GND BRN

TO VC-28 BOARD CN508 (CAMERA)

S980 STAND BY

STBY SW BRN, STBY LED RED, TALLY LED ORG, DEW LED YEL, CLOG LED WHT, GND BLU

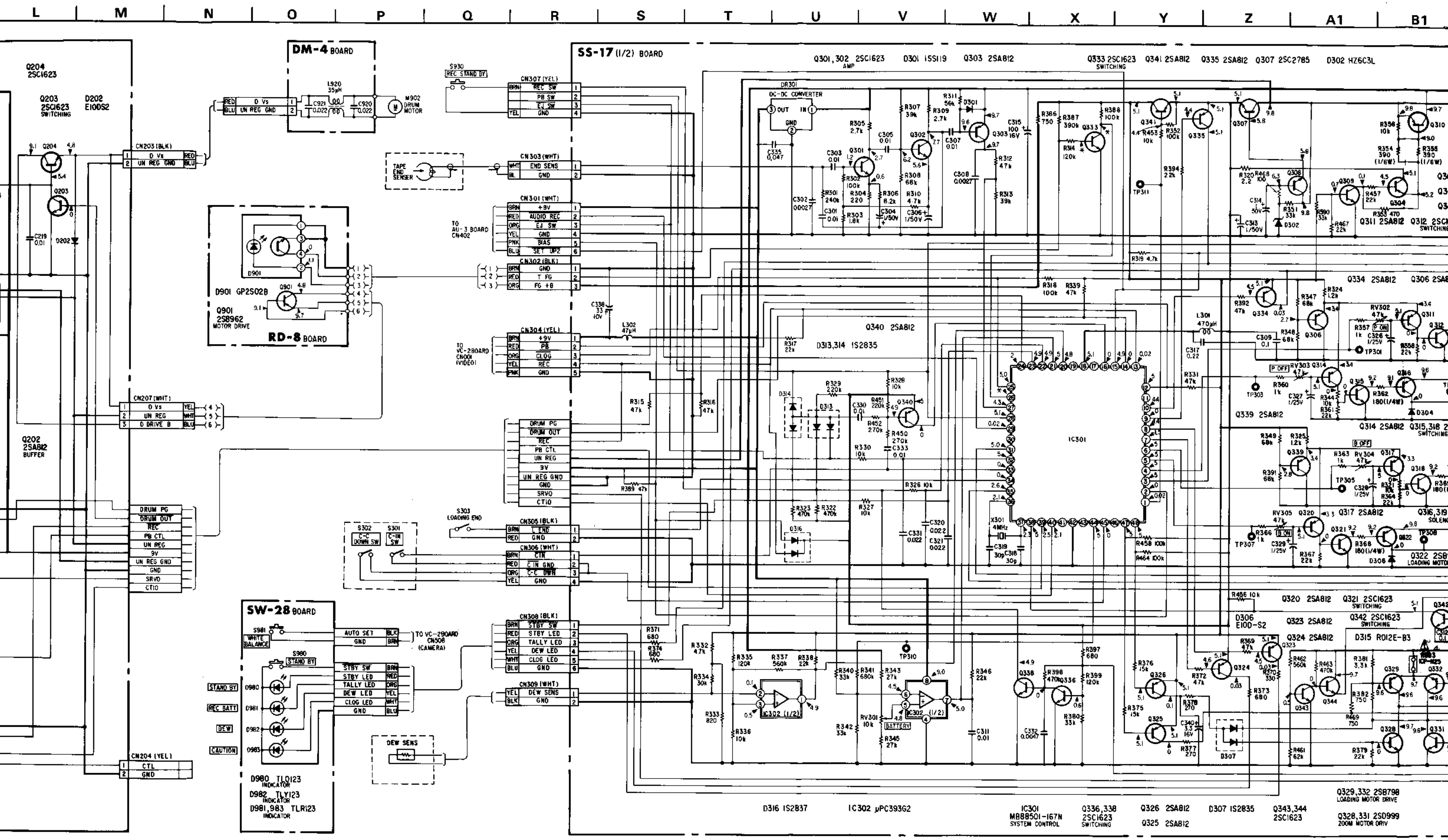
STAND BY, REC BATT, DEW, CAUTION

D980 TLO123 INDICATOR

D982 TLY123 INDICATOR

D981,983 TLR123 INDICATOR

DEW SENS


L M N O P Q R S T U V W X Y Z A1 B1
DM-4 BOARD
SS-17 (1/2) BOARD
RD-8 BOARD
SW-28 BOARD
D901 GP2S02B
Q901 2SB962 MOTOR DRIVE
Q204 2SC1623
Q203 2SC1623 SWITCHING
D202 E10DS2
Q202 2SA812 BUFFER
M902 DRUM MOTOR
TAPE END SENSER
TO AU-3 BOARD CN402
TO VC-280ARD CN001 (VIDEO)
TO VC-290ARD CN508 (CAMERA)
DEW SENS
D980 TLO123 INDICATOR
D982 TLY123 INDICATOR
D981,983 TLR123 INDICATOR
Q301,302 2SC1623 AMP
D301 1SS119
Q303 2SA812
Q333 2SC1623 SWITCHING
Q341 2SA812
Q335 2SA812
Q307 2SC2785
D302 HZ6C3L
DC-DC CONVERTER
Q340 2SA812
D313,314 1S2835
IC301
Q334 2SA812
Q339 2SA812
Q314 2SA812
Q317 2SA812
Q320 2SA812
Q321 2SC1623 SWITCHING
Q323 2SA812
Q342 2SC1623 SWITCHING
Q324 2SA812
D315 RO12E-B3
D306 E100-S2
D316 1S2837
IC302 μPC393G2
IC301 MB88501-167N SYSTEM CONTROL
Q336,338 2SC1623 SWITCHING
Q326 2SA812
Q325 2SA812
D307 1S2835
Q343,344 2SC1623
Q329,332 2SB798 LOADING MOTOR DRIVE
Q328,331 2SD999 ZOOM MOTOR DRIV

S T U V W X Y Z A1 B1 C1 D1 E1 F1 G1 H1 I1

2) BOARD

Q301,302 2SC1623 AMP D301 1SS119 Q303 2SA812 Q333 2SC1623 SWITCHING Q341 2SA812 Q335 2SA812 Q307 2SC2785 D302 HZ6C3L Q310 2SB1040 SWITCHING D308 E10D-S2

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

DR301 DC-DC CONVERTER

CN313 (WHT)
1 UN REG GRN
2 SET UP 2 RED
3 PB SW ORG
4 SET UP 1 YEL
5 CLOG LED PNK
6 TALLY LED BLU
7 GND VLT
8 CSWO GRY
9 SRVO WHT
10 CTIO BLK
TO VC-280ARD CN509 (VIDEO)

CN315
1 SW UN REG
2
3 UN REG GND

CN311 (WHT)
1 UNREG RED
2
3 UN REG GND BLK

CN312 (RED)
3 PINCH ON RED
2 UN REG GND YEL
1 PINCH OFF BLU

CN310 (WHT)
1 BRAKE OFF BLU
2 UN REG GND YEL
3 BRAKE ON RED

CN316 (RED)
1 TALLY YEL
2 REMOTE PNK
3 GND BLU

CN314 (RED)
2 LOAD (+) RED
1 LOAD (−) BRN

PM902 PINCH SOLENOID ⚠
PM901 BRAKE SOLENOID ⚠

IC301 terminals: DRUM PG, STAND BY SW, REC SW/REMOTE, BAT DWN, DEW SENS, +5V, START, SET UP 2, DRUM OUT, REC, PB, CLOG DET, TFG, TAPE END, PB SW, AUDIO REC, SET UP 1, EJECT SW, C-IN SW, LEND, CSWO, XTAL IN, CLOG LED, TALLY LED, STAND BY LED, DEW LED, BREAK OFF, BREAK ON, PINCH OFF, PINCH ON, BIAS, PWCTRL, XTAL OUT, RESET, PB CTL, CTIO, GND, BE/PD, CC DOWN SW, LOAD, UN LOAD

Refer to FUNCTION OF IC301 TERMINALS on page 47.

JK-2 BOARD

CN903 (BLK)
RED MIC IN 1
WHT AF OUT 2
BLK GND 3
BLK GND 4
GRN AF IN 5
TO AU-3 BOARD CN401
J904 (MIC) J902 (EARPHONE) J903 (REMOTE)

CN902 (WHT)
RED UN REG 1
2
BLK UN REG GND 3
YEL TALLY 4
PNK REMOTE 5
BLU GND 6
F901 T4A 250V ⚠ J901 DC IN 9.6V

CN901 (RED)
1 BATT ⊕ RED
2
3 BATT ⊖ BLK
BATTERY

LM-12 BOARD
L940 35μH C940 0.022 C941 0.022
M901 LOADING MOTOR

Q340 2SA812 D313,314 1S2835 Q334 2SA812 Q306 2SA812 Q313 2SB962 LOADING MOTOR DRIVE Q308 2SC1623 BUFFER Q309 2SC1623 SWITCHING Q304 2SA812 Q311 2SA812 Q312 2SC1623 SWITCHING Q339 2SA812 Q314 2SA812 Q315,318 2SC1623 SWITCHING Q317 2SA812 Q316,319 2SB798 SOLENOID DRIVE Q322 2SB962 LOADING MOTOR DRIVE Q320 2SA812 Q321 2SC1623 SWITCHING Q323 2SA812 Q342 2SC1623 SWITCHING Q324 2SA812 D315 RD12E-B3

D303 E10D-S2 D304 E10D-S2 D305 E10D-S2 D306 E10D-S2 D307 1S2835 D309 E10D-S2 D310 E10D-S2 D311 E10D-S2 D312 E10D-S2 D316 1S2837

IC302 μPC393G2

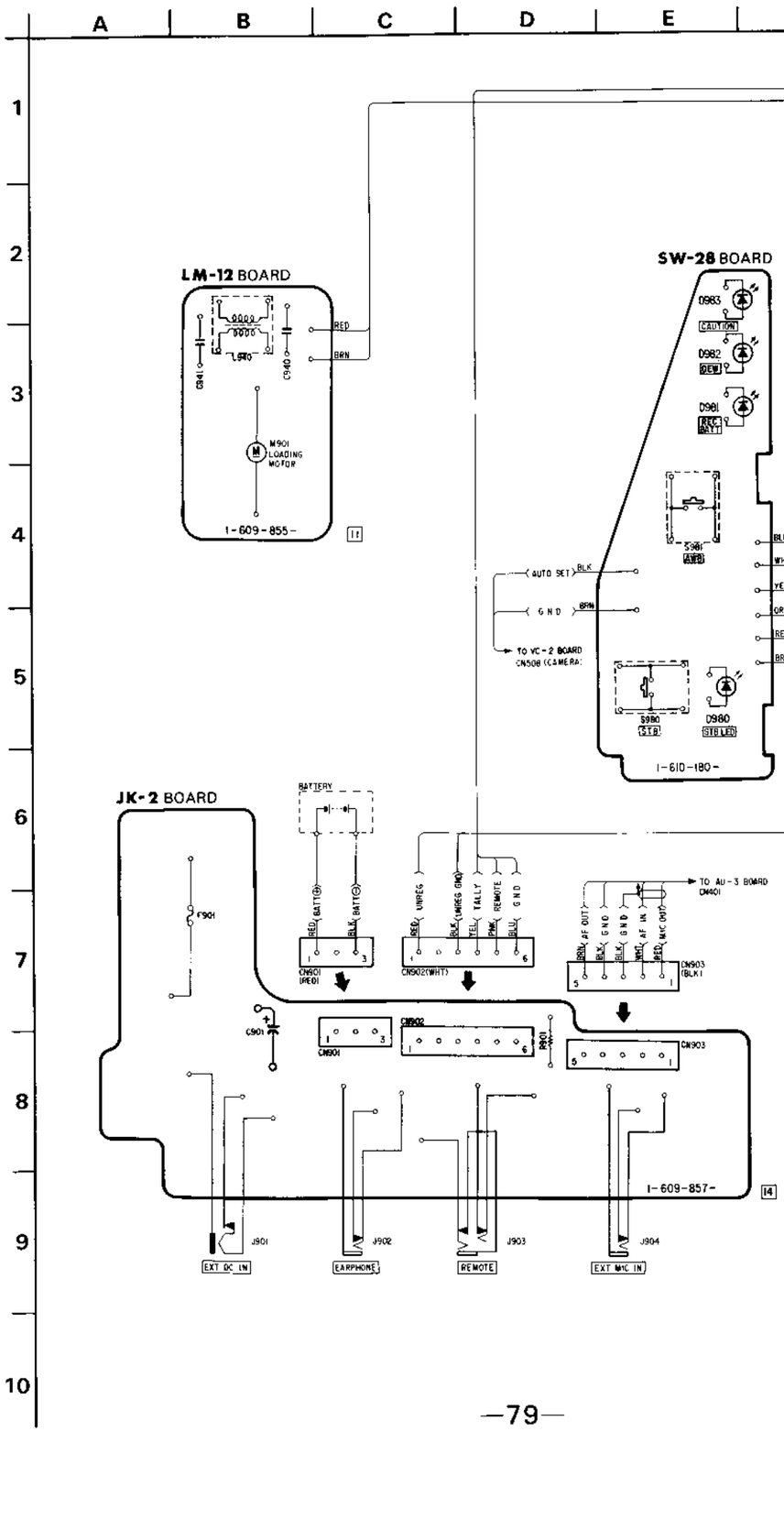
IC301 M88850I-167N SYSTEM CONTROL

Q336,338 2SC1623 SWITCHING Q326 2SA812 Q325 2SA812 Q343,344 2SC1623

Q329,332 2SB798 LOADING MOTOR DRIVE Q328,331 2SD999 ZOOM MOTOR DRIV

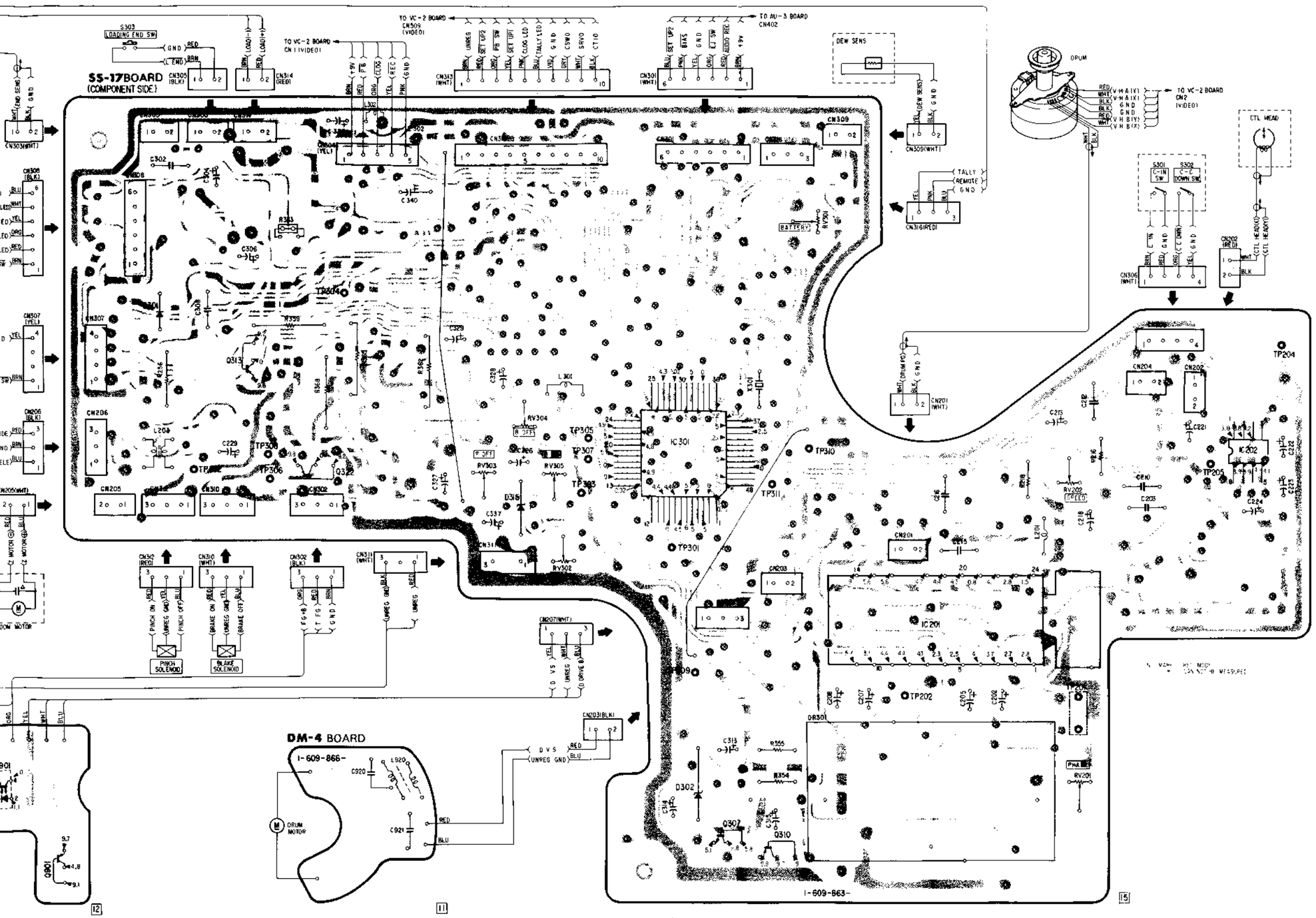
SS-17 (SERVO/SYSTEM CONTROL), DM-4 (DRUM MOTOR), RD-8 (DRUM MOTOR DRIVE/T. FG DET), SW-28 (FUNCTION, SWITCH & IND), JK-2 (JACK), LM-12 (LOADING MOTOR) PRINTED WIRING BOARDS

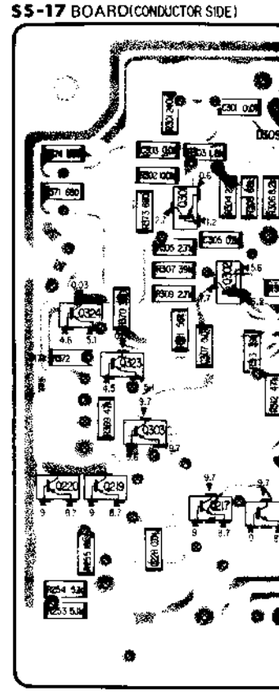
– Ref. No. SS-17 BOARD : 3,000 series, DM-4, RD-8, SW-28, JK-2, LM-12 BOARD : 3,900 series –



SERVO, SYSTEM CONTROL SERV

H I J K L M N O P Q R S T U V W X





Q , IC	D	ADJ	TP
	310		
	309,312		
341			
338,336			
328,331,335	311,307		
301		RV301	
334			
	314,313		
329			
332,325			
326			
302 IC302			
324			304
323 318 340			
317	301		
316			
313			
321,320			204
303 339			
312	303,304		
220,219			
306			
217,218 315		RV304	
311			305
322	306		308,310
314 IC301 IC202			302,307
319		RV303,RV202	306 205
203	202	RV305	311
333			303
205	305,315		
204			
342 210			
211	316	RV302	301
215,212,213,214			
202,IC201			
			309
309			
304			202,201
201			
	302		
		RV201	
308			
307 343	308		
310			
344			
Q , IC	D	ADJ	TP

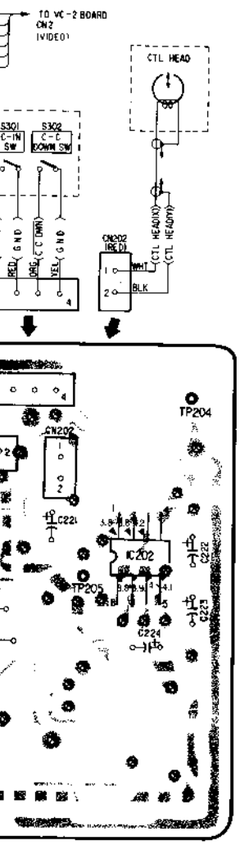
SERVO, SYSTEM CONTROL

S | T | U | V | W | X | Y | Z | A1 | B1 | C1 | D1 | E1 | F1 | G1 | H1 | I

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 pattern face are indicated.

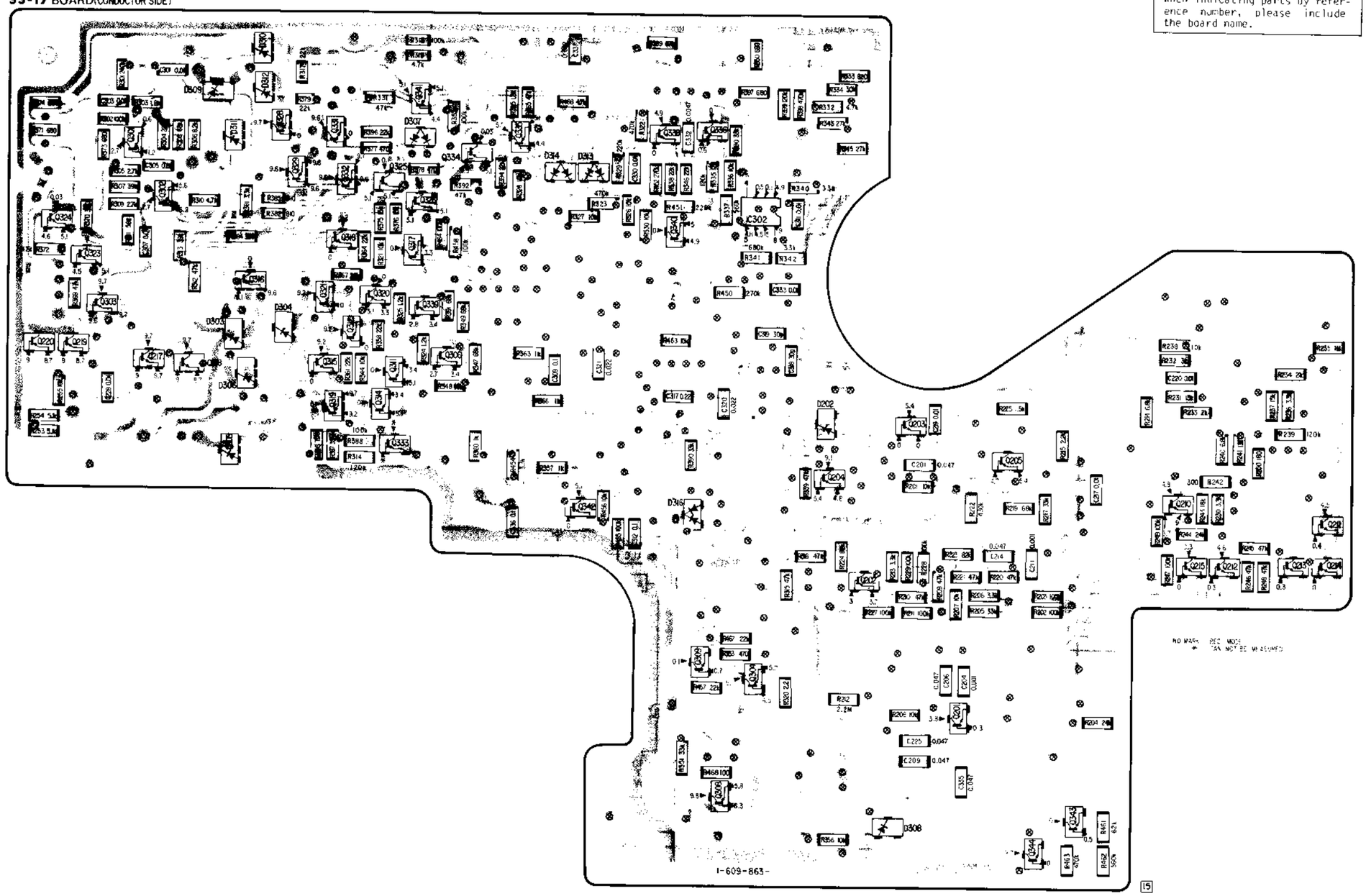
When indicating parts by reference number, please include the board name.

SS-17 BOARD(CONDUCTOR SIDE)



Q , IC	D	ADJ	TP
	310		
	309,312		
341			
338,336			
328,331,335	311,307		
301		RV301	
334			
	314,313		
329 332,325			
326			
302 IC302			
324			
323 318 317 340			304
	301		
316			
313			
321,320			204
303 339			
312	303,304		
220,219			
306			
217,218 315		RV304	
311			
322	306		305
314 IC301 IC202			308,310
319			302,307
203	202	RV303,RV202 RV305	306 205
333			311
205			303
204	305,315		
342 210			
211	316	RV302	301
215,212,213,214			
202,IC201			
309			309
304			202,201
201			
	302		
		RV201	
308			
307 343			
310	308		
344			

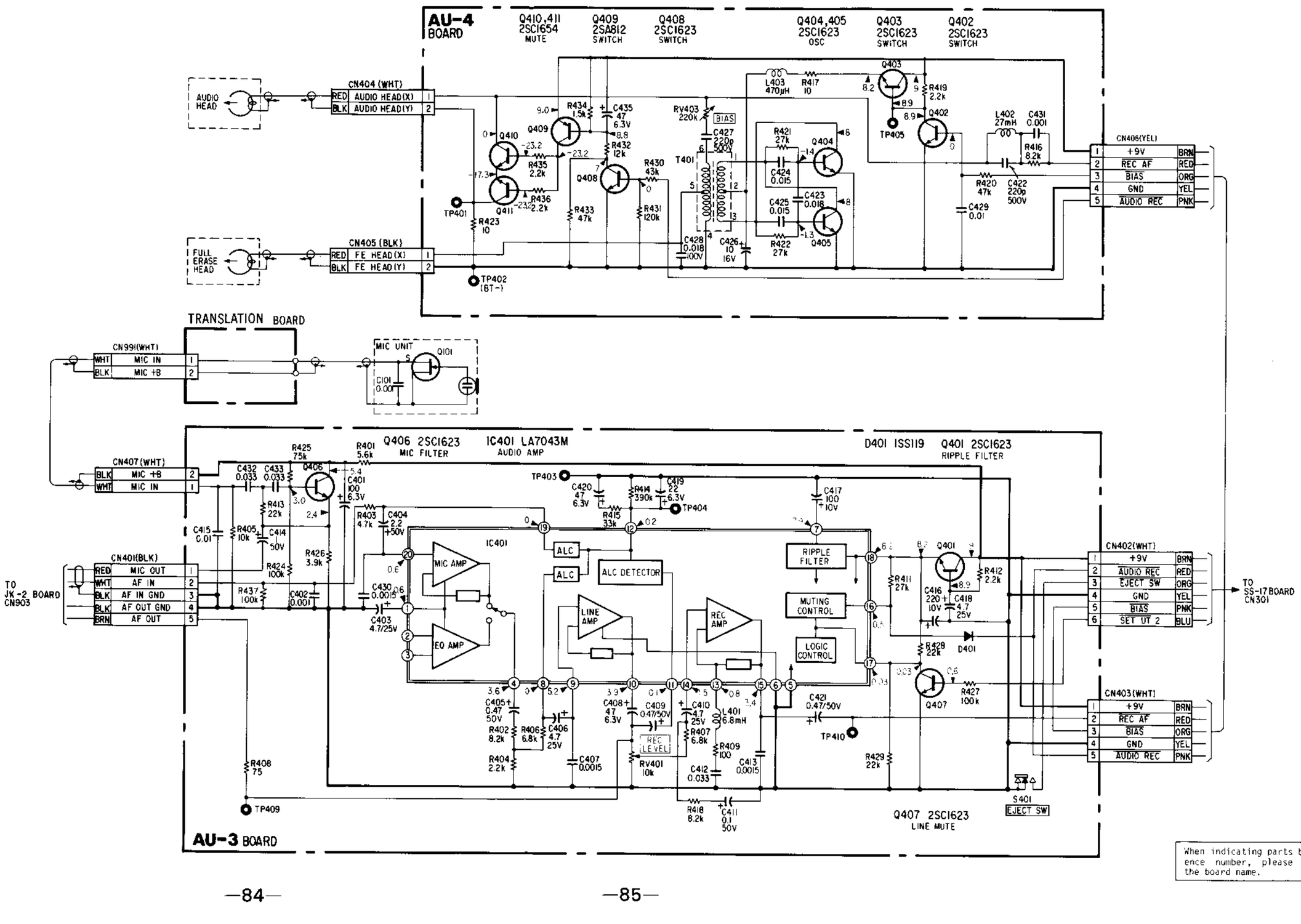
Q , IC | D | ADJ | TP



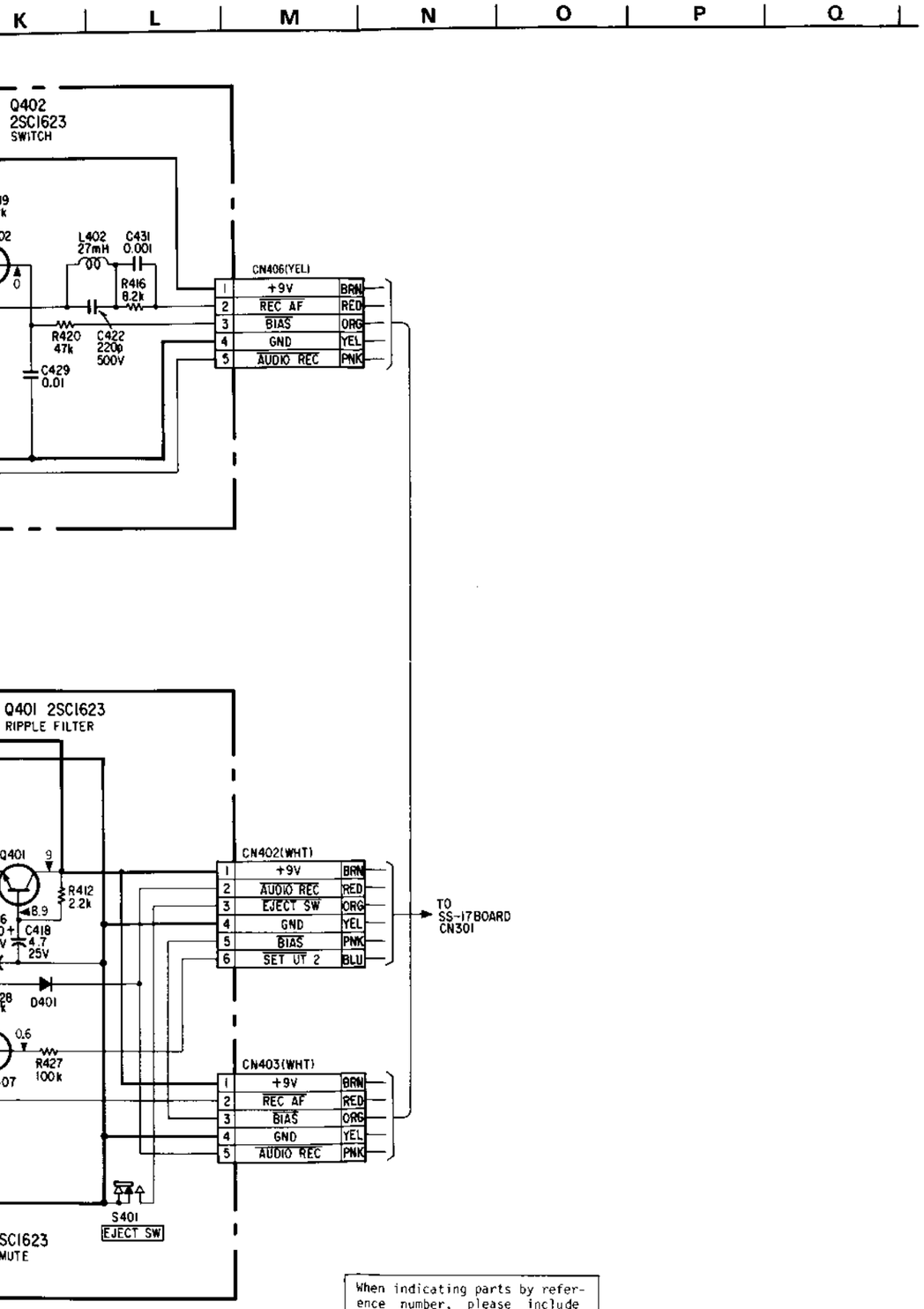
1 2 3 4 5 6 7 8 9 10

AU-3 (AUDIO SIGNAL RECORD/MONITOR PROCESS), AU-4 (AUDIO SIGNAL RECORD PROCESS), TRANSLATION (MIC IN) SCHEMATIC DIAGRAM

– Ref. No. AU-3, AU-4 BOARD : 4,400 series, TRANSLATION BOARD : 5,000 series –

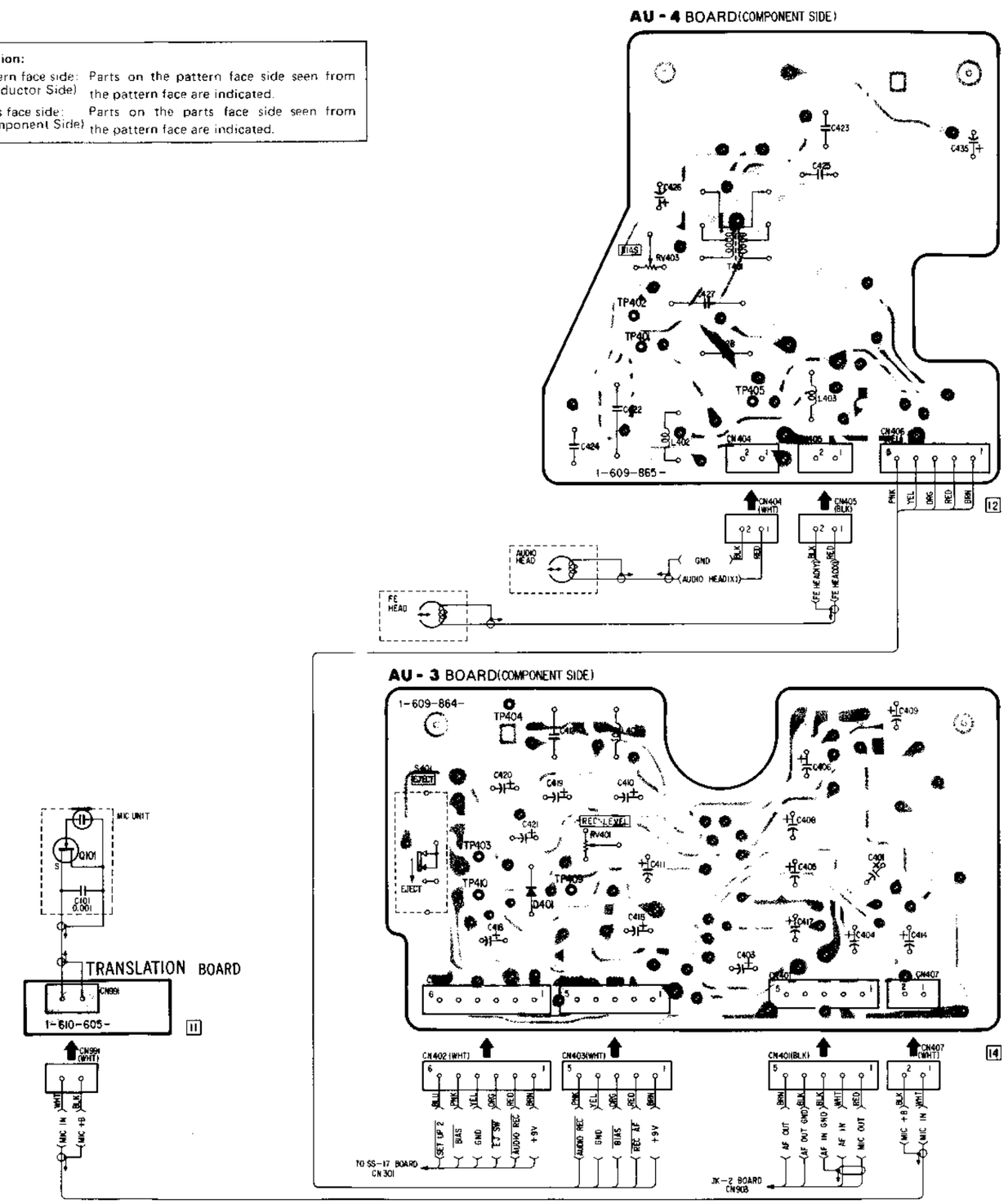


When indicating parts by reference number, please include the board name.



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

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 pattern face are indicated.



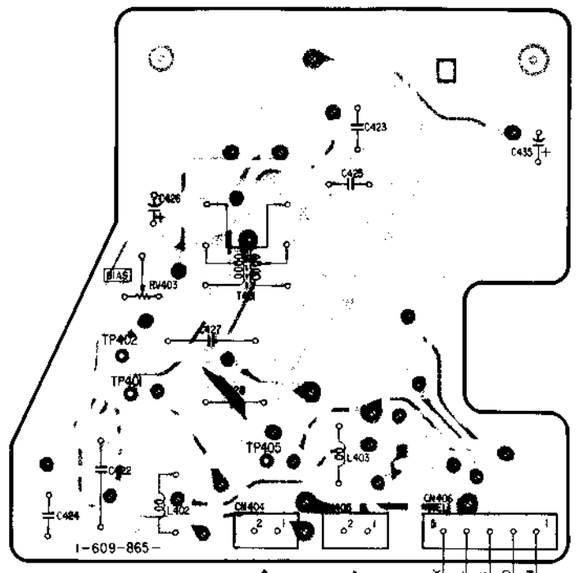
-3 (AUDIO SIGNAL RECORD/MONITOR PROCESS), AU-4 (AUDIO SIGNAL RECORD PROCESS), TRANSLATION (MIC IN) PRINTED WIRING BOARDS

Ref. No. AU-3, AU-4 BOARD : 4,400 series, TRANSLATION BOARD : 5,000 series –

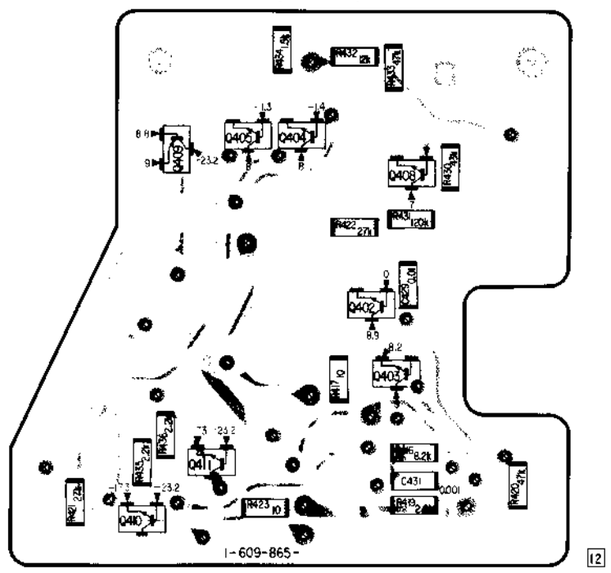
A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P

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 pattern face are indicated.

AU - 4 BOARD(COMPONENT SIDE)

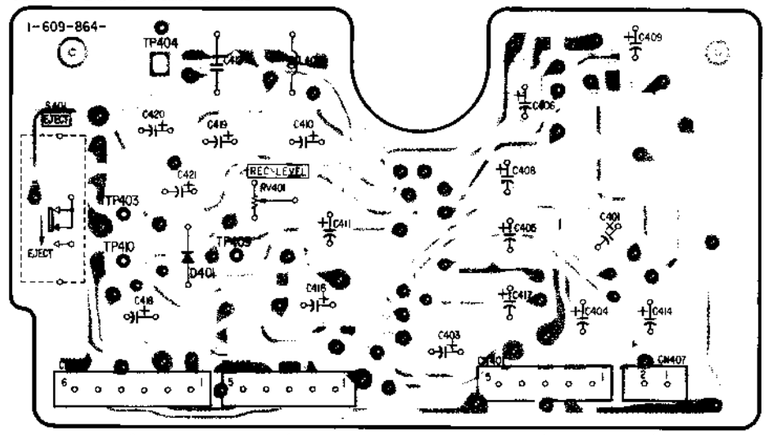


AU - 4 BOARD(CONDUCTOR SIDE)

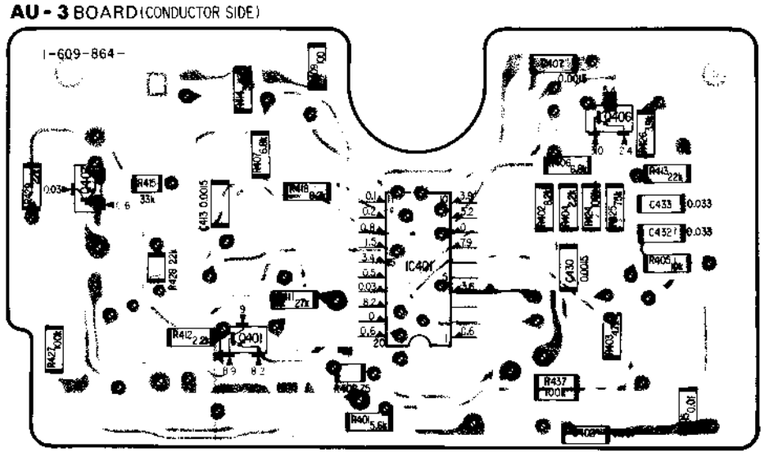


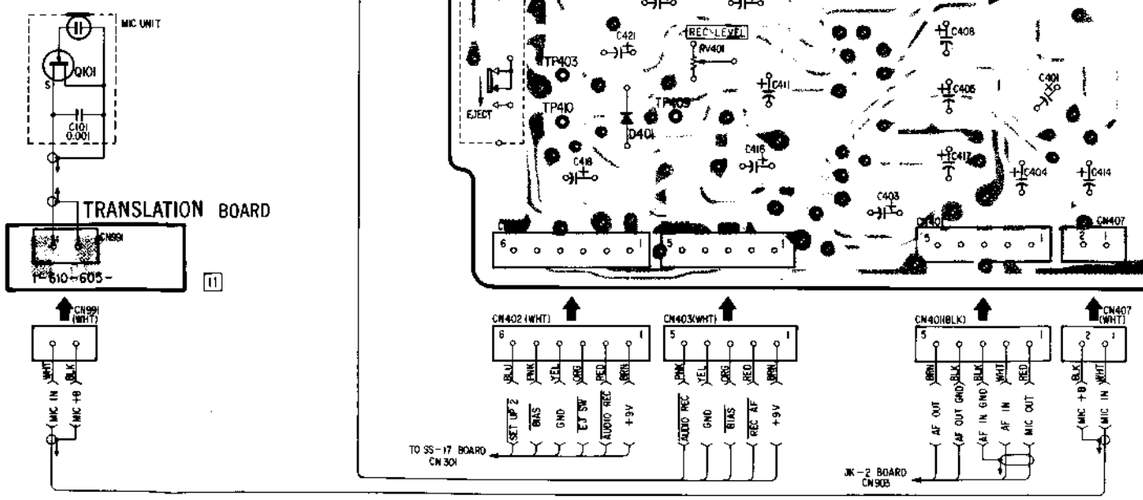
Q,IC	D	ADJ	TP
405,404			
409			
408			
		RV403	
402			
			402
403			401
411			405
410			
			404
406			
407			
		RV401	
			403
IC401	401		410 409
401			

AU - 3 BOARD(COMPONENT SIDE)



AU - 3 BOARD(CONDUCTOR SIDE)



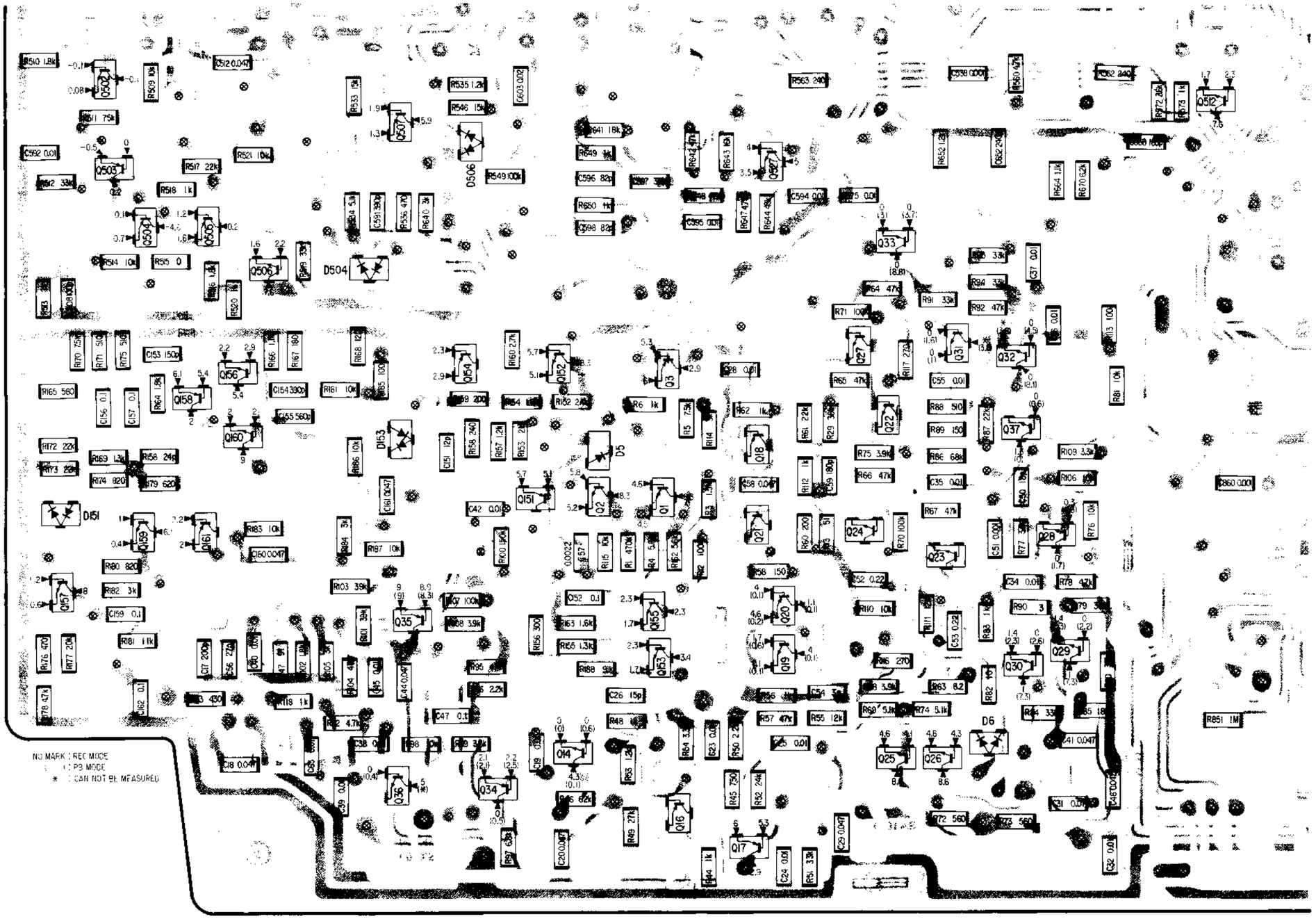


When indicating parts by reference number, please include the board name.

4-3. ENLARGED VC-2 BOARD (PATTERN FACE SIDE)

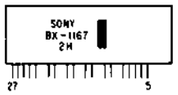
Caution:
Pattern face side: (Conductor Side) Parts on the pattern face side seen from the pattern face are indicated.

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



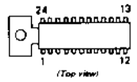
4-4. SEMICONDUCTORS

BX-1167A



BX-1171

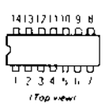
CX186



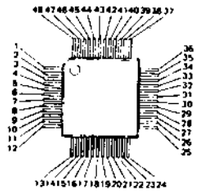
CX816

CX10018

CX896

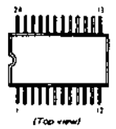


CX7986
MB88501-167N

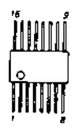


CX10041

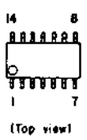
CX20004



CX22017

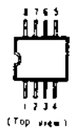


CX20059
CX20065

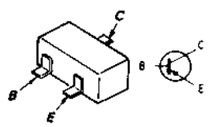


μPC4558G2

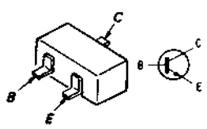
μPC358G
μPC358G2
μPC393G2



2SA812
2SA1122
2SA1226-E4



2SC1623
2SC2223-F14
2SC2712



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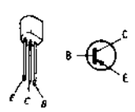
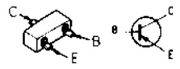
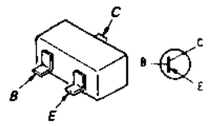


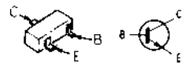
2SA1162
2SA1179



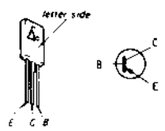
2SA1163



2SC1009A
2SC1163
2SC2713
2SC1654



2SB772



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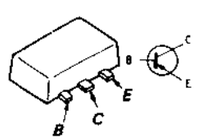
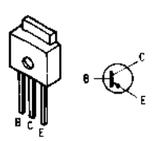


2SB1040



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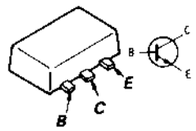

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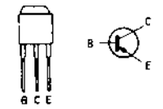

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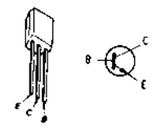
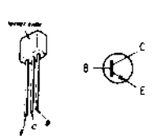
2SC2603



2SC2785



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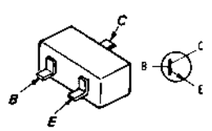
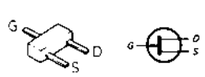
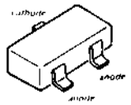


2SK300
2SK209Y

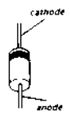


1S2835
1S2837
1SS123
MA151WA
RD5.6M-B1
RD7.5M-T2B1

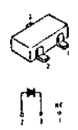


1SS119
1SS148

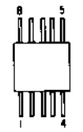
1SS133
HZ6C2L
HZ6C3L
RD12E-B2
RD12E-B3



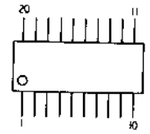
E10DS2



NJM4556M-A

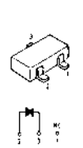


LA7043M

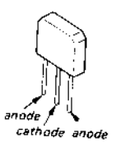


GP-2S02B

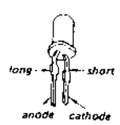
RD6.8M-B3



1T25



TLO123
TLR123
TLY123



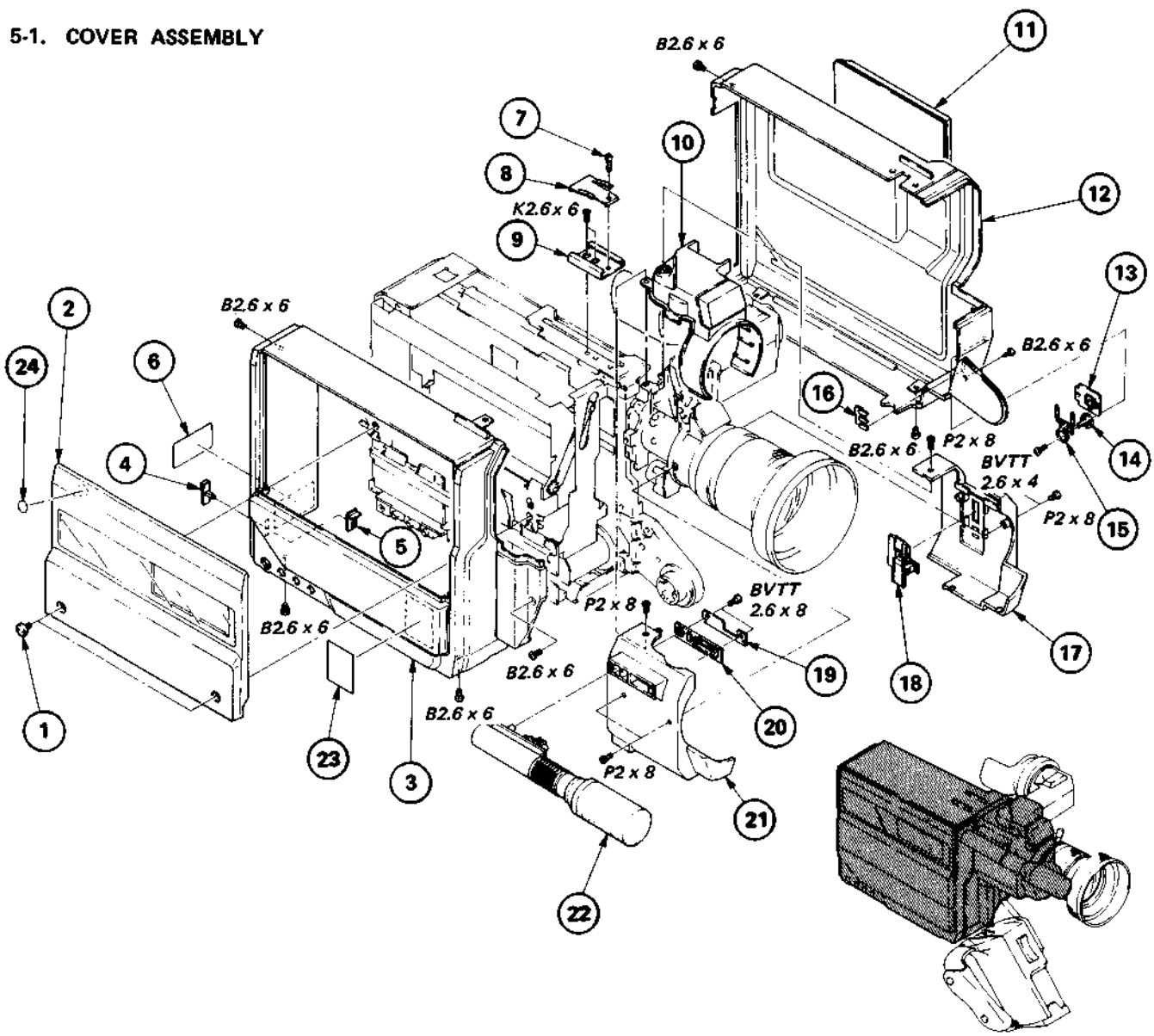
SECTION 5
EXPLODED VIEWS

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

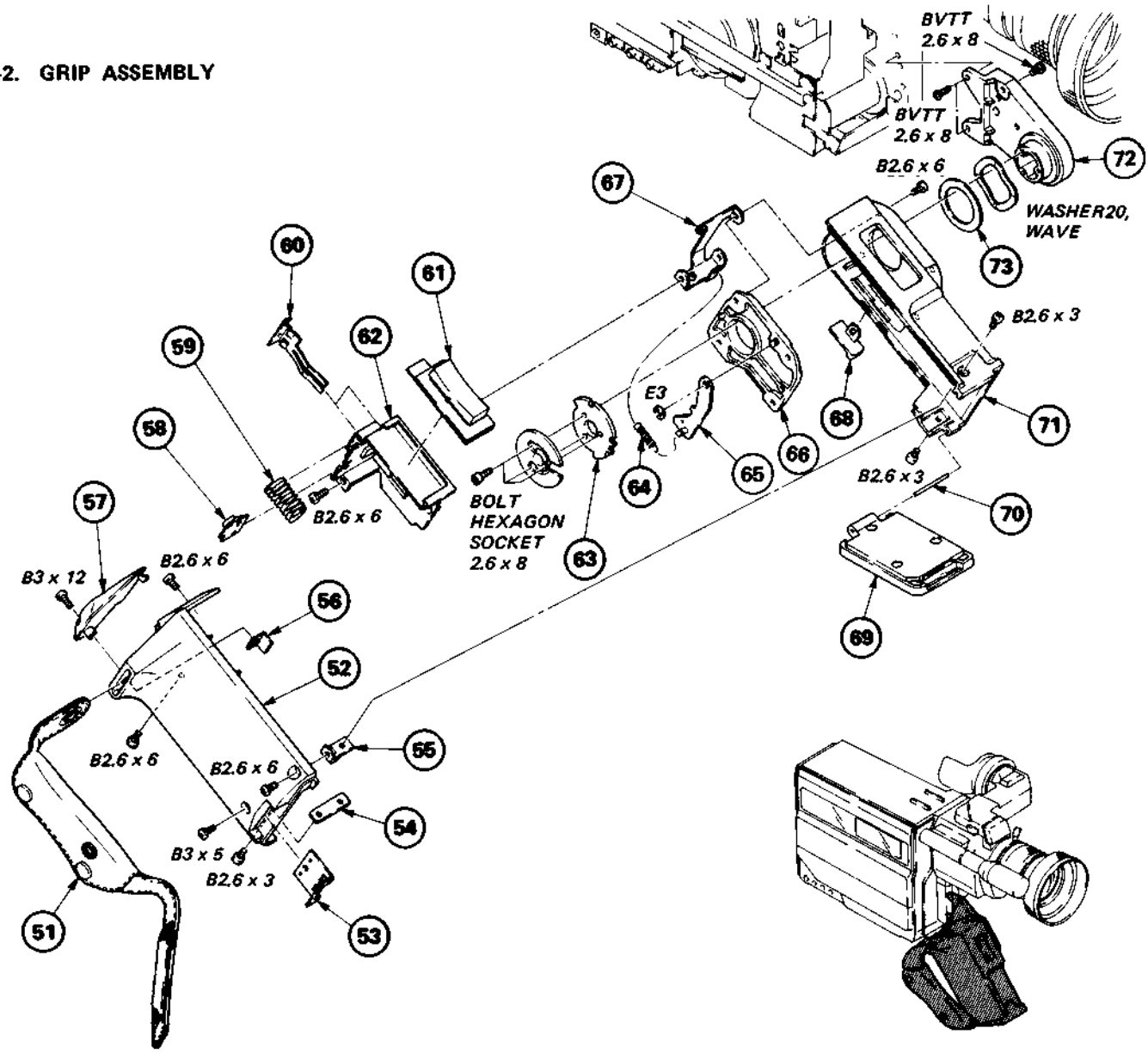
The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

5-1. COVER ASSEMBLY



No.	Part No.	Description	Remark
1	3-669-403-00	SCREW, ORNAMENTAL	
2	X-3681-463-0	LID ASSY, CASSETTE COMPARTMENT	
3	3-681-634-00	CABINET (LEFT)	
4	3-681-550-00	BUTTON, EJECT	
5	3-681-551-00	RETAINER, BUTTON, EJECT	
6	♦:3-681-677-00	LABEL, MODEL NUMBER AEP ONLY	
		LABEL, MODEL NUMBER E,UK ONLY	
7	3-681-544-00	SCREW, STOPPER, ACC SHOE	
8	3-681-543-00	SPRING, LEAF	
9	3-681-542-00	SHOE, ACC	
10	X-3681-442-0	CABINET (T) ASSY, LENS	
11	3-681-653-00	PAD, CABINET	
12	3-681-633-00	CABINET (RIGHT)	
13	X-3681-437-0	BUTTON ASSY, STAND BY	
14	3-681-552-00	BUTTON, W.B	
15	3-681-554-00	SPRING	
16	3-681-553-00	INDICATOR, LED	
17	3-681-635-00	CABINET (RIGHT), LENS	
18	X-3681-801-0	KNOB ASSY, F.SWITCH	
19	♦:3-681-662-00	PLATE, PUSH	
20	3-681-661-00	PACKING (B), RUBBER	
21	3-681-636-00	CABINET (LEFT), LENS	
22	8-814-165-01	MICROPHONE, BUILT-IN (C-2003)	
23	3-703-707-01	STICKER, SONY SYMBOL (21)	
24	3-566-226-21	LABEL, PUSH	

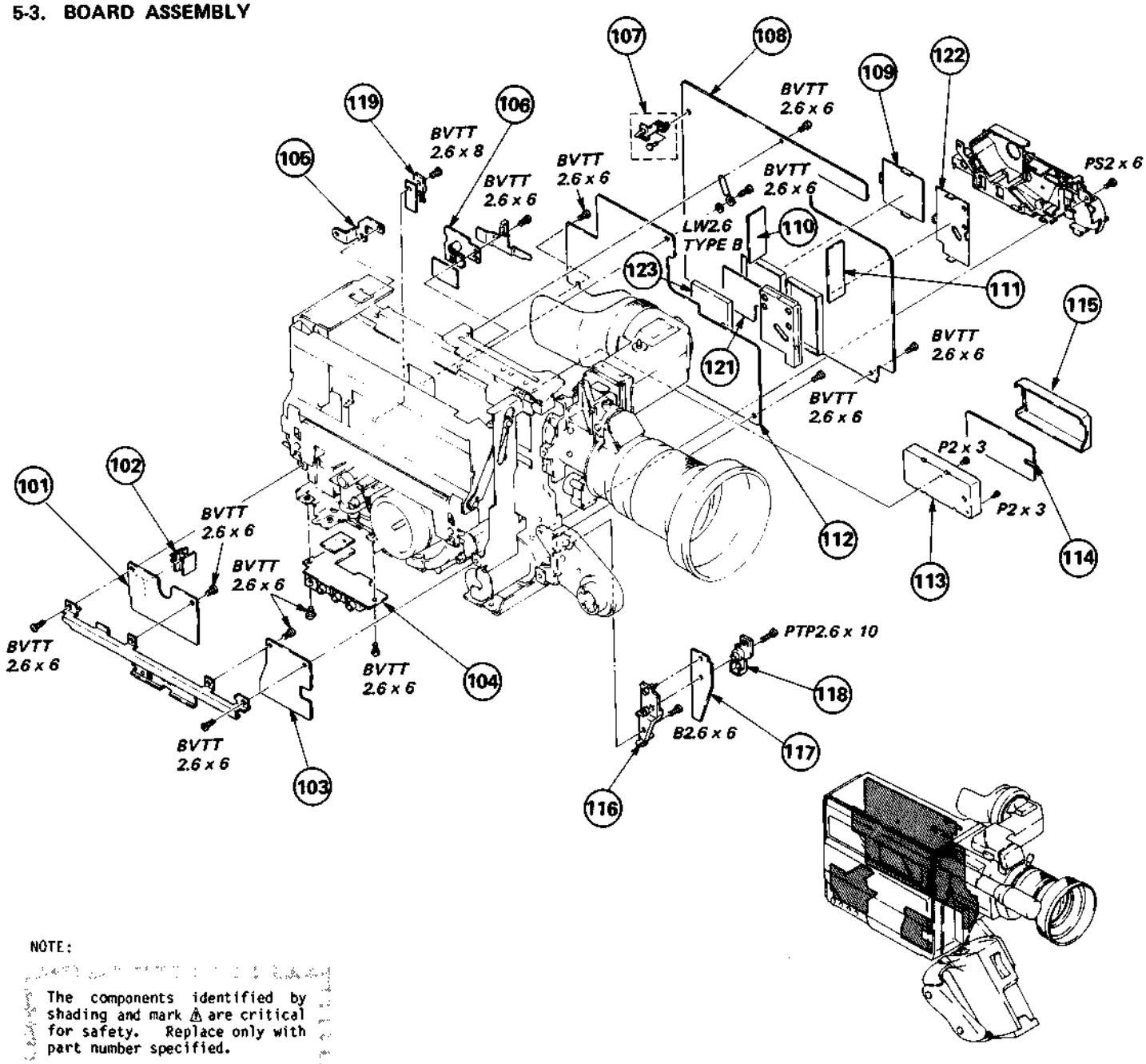
5-2. GRIP ASSEMBLY



No.	Part No.	Description	Remark
51	3-681-657-00	BAND, GRIP	
52	3-681-603-00	CABINET (LEFT), GRIP	
53	3-681-566-00	BRACKET (B), BAND	
54	♣:3-681-559-00	STOPPER (C), GLIP	
55	♣:3-681-562-00	STOPPER (B), GRIP	
56	3-681-565-00	BRACKET (A), BAND	
57	3-681-595-00	COVER, GRIP	
58	1-554-561-00	SWITCH, TACT (REC)	S930
59	3-681-569-00	SPRING, COMPRESSION	
60	3-681-568-00	TERMINAL, BATTERY	
61	1-554-560-00	SWITCH, SEESAW (ZOOM)	S931
62	3-681-593-00	CHASSIS, GRIP	

No.	Part No.	Description	Remark
63	♣:3-681-607-00	PLATE, FIXED, GLIP	
64	3-489-093-00	SPRING, TENSION	
65	♣:X-3681-424-0	PLATE ASSY, LOCK, GLIP	
66	♣:X-3681-418-0	TABLE ASSY (2), ROTARY	
67	♣:3-681-561-00	STOPPER, GRIP	
68	3-681-560-00	BUTTON, LOCK RELEASE	
69	A-6703-335-A	LID ASSY, BATTERY CASE	
70	♣:3-681-557-00	SHAFT, FULCRUM, BATTERY CASE LID	
71	3-681-602-00	CABINET (RIGHT), GRIP	
72	♣:3-681-594-00	RETAINER, GRIP	
73	♣:3-651-378-00	SHEET, FRICTION ADJUSTMENT	

5-3. BOARD ASSEMBLY

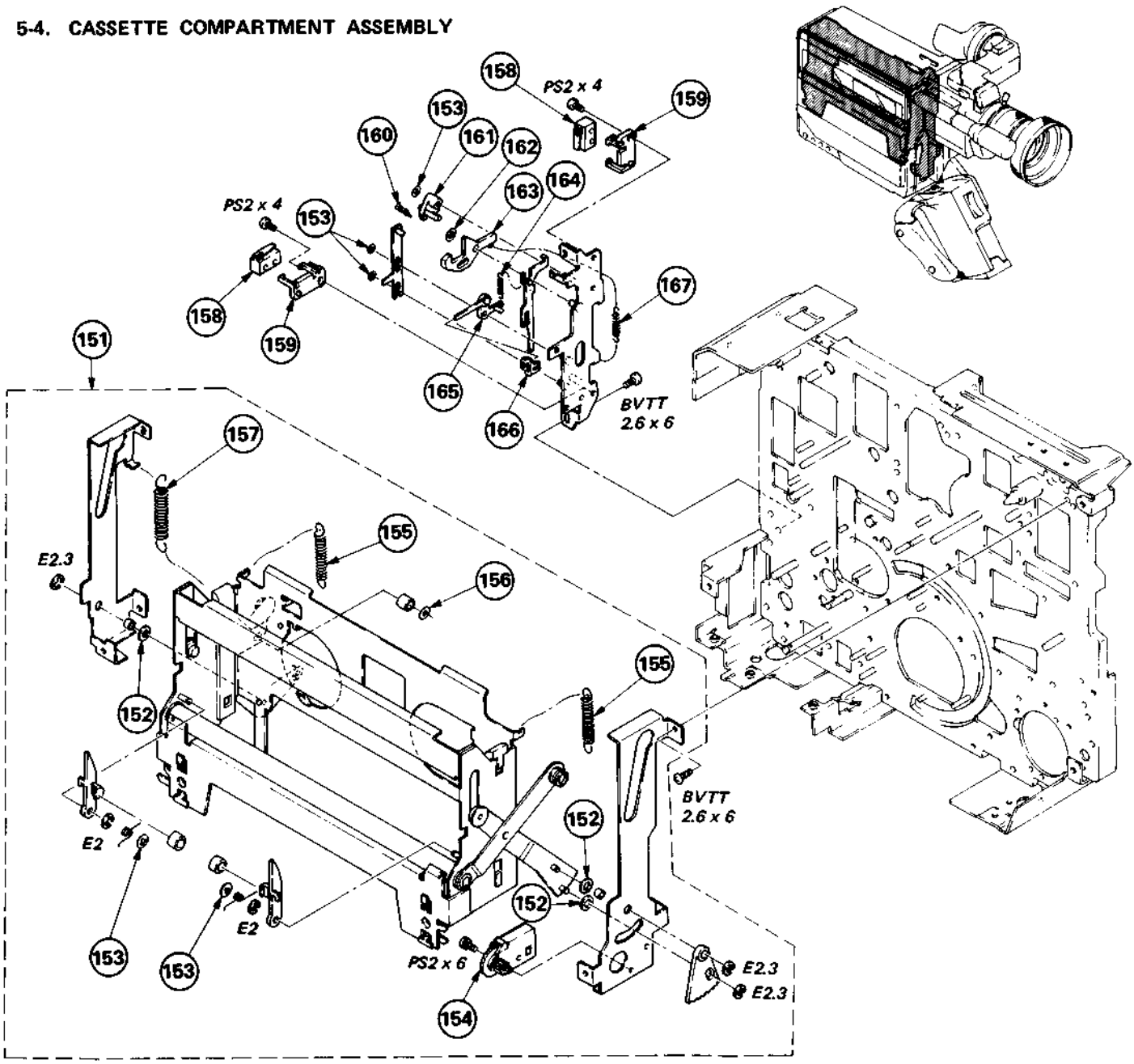


NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

No.	Part No.	Description	Remark
101	♣:1-609-864-00	AU-3 BOARD	
102	3-681-549-00	JOINTER, EJECT BUTTON	
103	♣:1-609-865-00	AU-4 BOARD	
104	♣:1-609-857-00	JK-2 BOARD	
105	3-681-548-00	BRACKET, HOOK	
106	♣:1-609-860-00	RD-8 BOARD	
107	♣:3-681-663-00	HOLDER, PC BOARD	
108	♣:A-7513-003-A	VC-2 BOARD, COMPLETE	
109	♣:X-3681-802-0	LID ASSY, REAR, SG SHIELD CASE	
110	♣:A-7513-004-A	GC-4 BOARD, COMPLETE	
111	♣:A-7513-006-A	GC-5 BOARD, COMPLETE	
112	♣:A-6717-339-A	SS-17 BOARD, COMPLETE	
113	♣:X-3681-804-0	CASE (MAIN) ASSY, PA SHIELD	
114	♣:A-7511-947-A	PA-1 BOARD, COMPLETE	
115	♣:3-681-806-00	LID, SHIELD CASE, PA	
116	3-681-600-00	HOLDER, CONTROL PC BOARD	
117	♣:1-610-180-00	SW-28 BOARD	
118	3-681-652-00	GUIDE, KNOB	
119	⚠.8-729-177-22	TRANSISTOR 2SB772 (Q851)	
121	♣:A-7513-005-A	GC-3 BOARD, COMPLETE	
122	♣:X-3681-805-0	LID ASSY, REAR, SHIELD CASE, RA	
123	X-3681-806-0	LID ASSY, SHIELD CASE, SG	

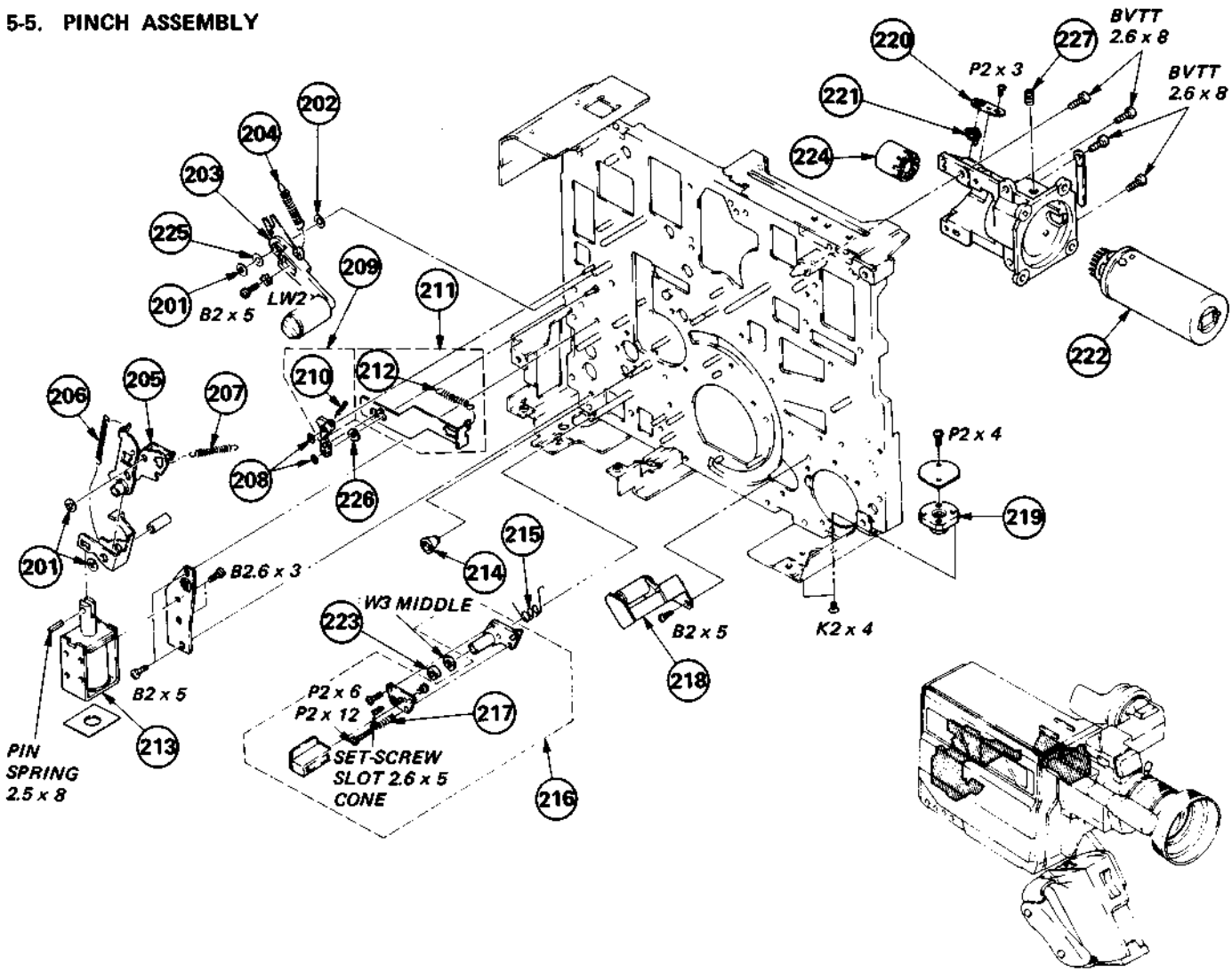
5-4. CASSETTE COMPARTMENT ASSEMBLY



No.	Part No.	Description	Remark
151	♣:A-6751-176-A	CASSETTE COMPARTMENT ASSY	152-157
152	3-678-822-00	SPACER	
153	3-669-465-00	WASHER (1.5), STOPPER	
154	3-681-528-00	DAMPER	
155	3-143-067-00	SPRING, TENSION	
156	3-669-595-00	WASHER (2), STOPPER	
157	3-681-527-00	SPRING, TENSION	
158	1-554-582-00	SWITCH, MICRO S301 (CASSETTE IN) S302 (CASSETTE DOWN)	

No.	Part No.	Description	Remark
159	♣:3-681-587-00	TABLE, SWITCH	
160	3-561-627-00	SPRING, TENSION	
161	♣:3-681-539-00	LOCK, ARM	
162	3-669-596-00	WASHER (2.3), STOPPER	
163	♣:3-681-538-00	ARM, LOCK	
164	3-567-028-00	SPRING, TENSION	
165	♣:X-3681-417-0	DETECTION ASSY, LOCK	
166	♣:3-681-588-00	STAY, DETECTION	
167	3-555-026-00	SPRING, TENSION	

5-5. PINCH ASSEMBLY

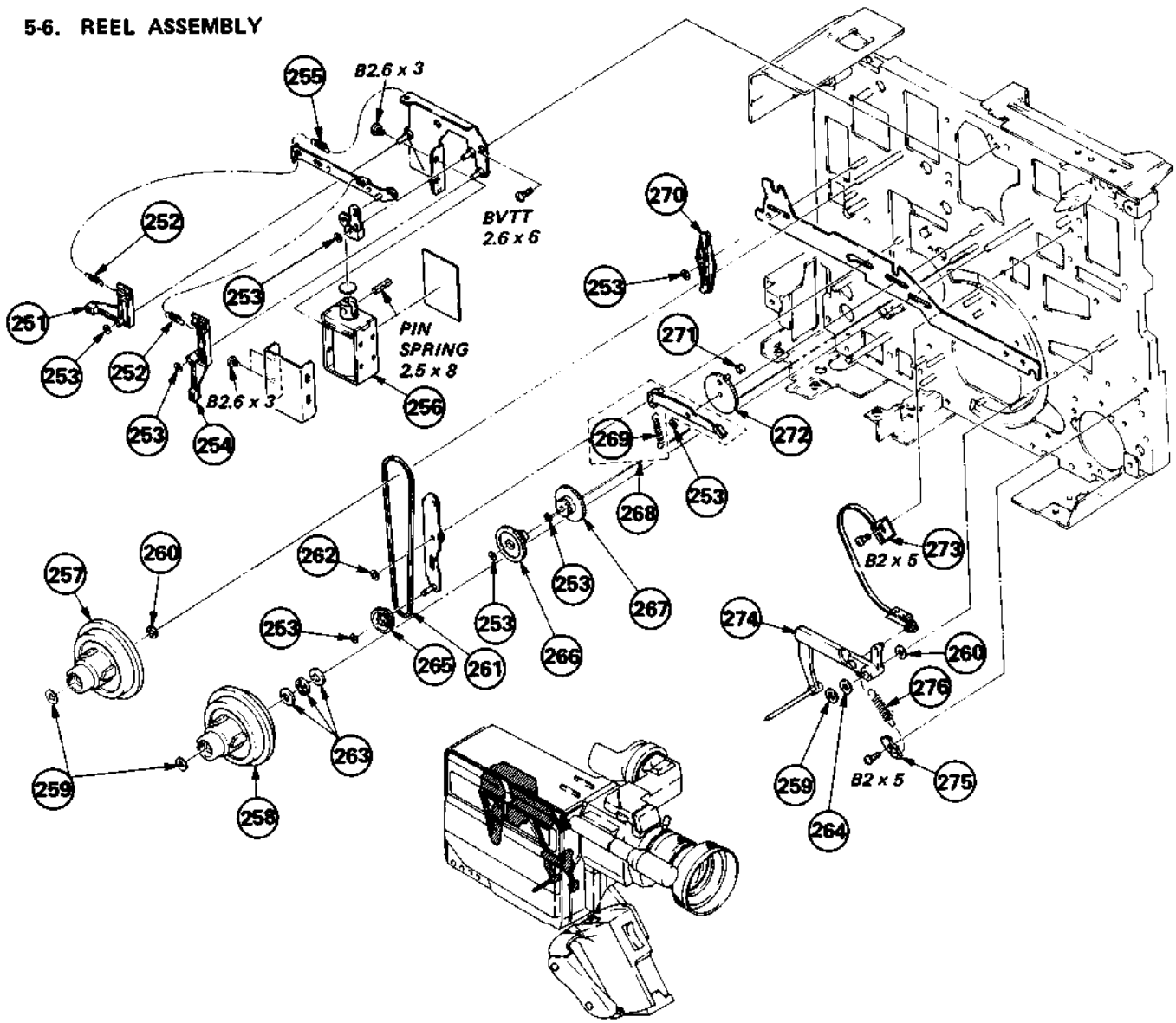


No.	Part No.	Description	Remark
201	3-669-596-00	WASHER (2.3), STOPPER	
202	3-701-439-21	WASHER	
203	♦:A-6747-230-A	ARM BLOCK ASSY, PINCH	204
204	3-536-786-00	SPRING, TENSION	
205	♦:X-3681-406-0	LEVER ASSY, PINCH PRESS	
206	3-681-452-00	SPRING, TENSION	
207	3-578-397-00	SPRING, TENSION	
208	3-669-465-00	WASHER (1.5), STOPPER	
209	A-6747-235-A	LEVER (E) BLOCK ASSY, EJECT	210
210	3-547-667-00	SPRING, TENSION	
211	A-6747-234-A	LEVER (G) BLOCK ASSY, RELEASE	212
212	3-535-346-00	SPRING, TENSION	
213	⚠:1-454-357-21	SOLENOID, PLUNGER (PINCH) PM902	
214	3-681-622-00	NUT, ADJUSTMENT, CTL HEAD	
215	3-681-621-00	SPRING	
216	A-6736-038-A	HEAD BLOCK ASSY, AC	217
217	3-669-615-00	SPRING, COMPRESSION	
218	8-825-561-10	HEAD, ERAZE (EF254-21)	
219	3-681-547-00	BRACKET, TRIPOD	
220	♦:3-681-809-00	RETAINER, PIN, ADJUSTMENT	
221	3-681-808-00	PIN, ADJUSTMENT	
222	8-701-032-29	CT-3222	
223	3-669-318-00	NUT, ADJUSTMENT, GUIDE	
224	1-562-325-00	SOCKET ASSY, IMAGE PICKUP TUBE	
225	3-701-439-21	WASHER	
226	3-570-615-11	POLY-WASHER (DIA.1.2)	
227	3-701-508-00	SET SCREW, DOUBLE POINT 3X6	

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

5-6. REEL ASSEMBLY

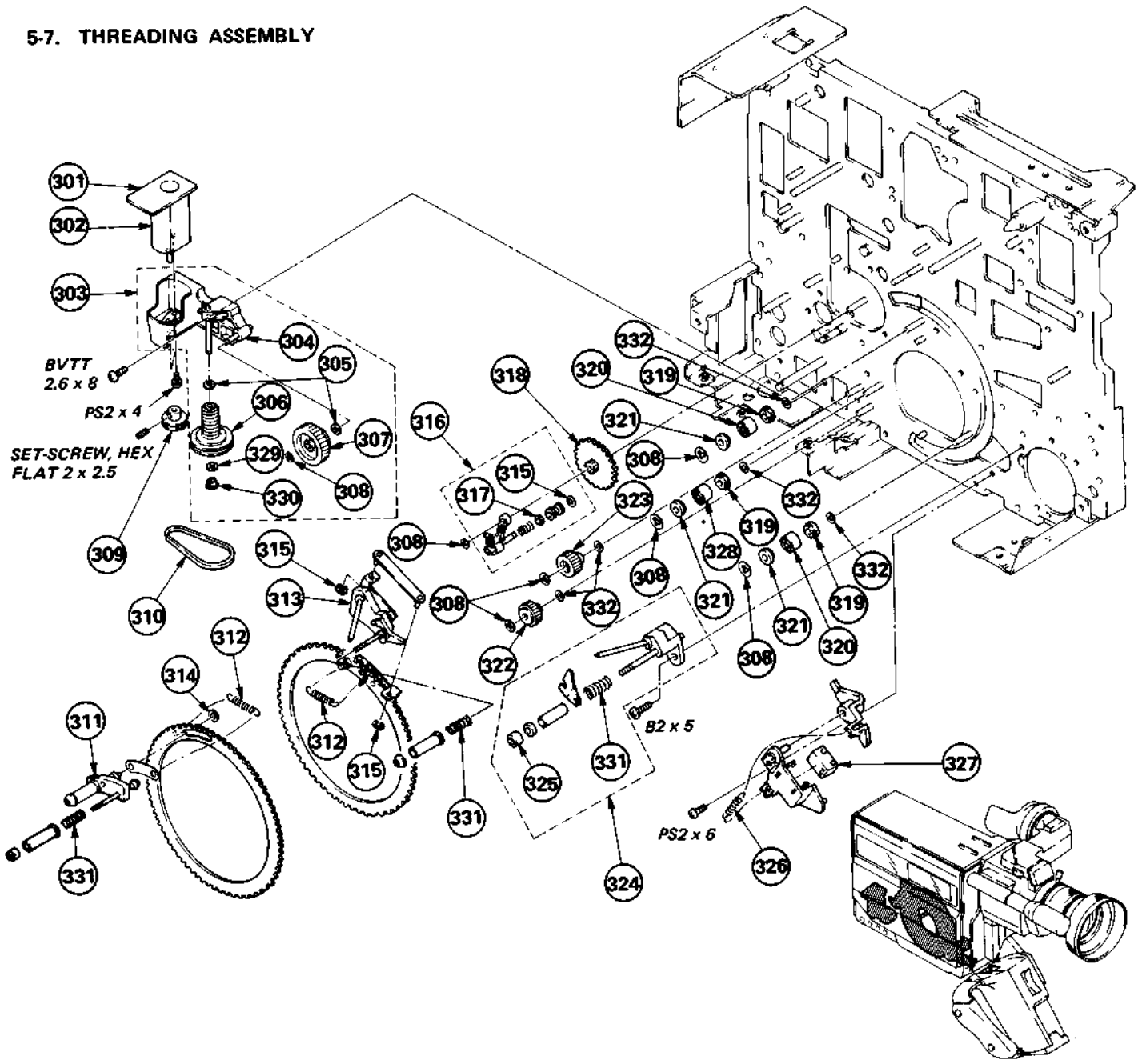


No.	Part No.	Description	Remark
251	A-6741-054-A	BRAKE ASSY, TAKE-UP	
252	3-307-938-00	SPRING, TENSION	
253	3-669-465-00	WASHER (1.5), STOPPER	
254	A-6741-053-A	BRAKE ASSY, SUPPLY	
255	3-527-025-00	SPRING, TENSION	
256	⚠1-454-357-11	SOLENOID, PLUNGER (BRAKE) PM901	
257	X-3681-404-0	TABLE ASSY (TAKE-UP), REEL	
258	X-3681-405-0	TABLE ASSY (SUPPLY), REEL	
259	3-669-596-00	WASHER (2.3), STOPPER	
260	3-701-439-21	WASHER	
261	3-681-447-00	BELT, FWD	
262	3-570-615-00	POLY-WASHER (DIA.1.2)	
263	3-681-449-00	BEARING, THRUST	
264	3-701-439-21	WASHER	
265	3-681-478-00	GEAR, FWD	
266	3-681-435-00	GEAR (B), DRIVING	
267	3-681-434-00	GEAR (A), DRIVING	
268	A-6741-055-A	BRAKE ASSY, SOFT	269
269	3-672-461-00	SPRING, TENSION	
270	3-681-438-00	LEVER, PINCH CONVERSION	
271	♣:3-681-443-00	ROLLER, DRIVING	
272	3-681-436-00	GEAR (C), DRIVING	
273	X-3681-410-0	BAND ASSY, TENSION REGULATOR	
274	♣:X-3681-402-0	ARM ASSY, TENSION REGULATOR	
275	3-681-439-00	RETAINER, SPRING	
276	3-536-767-XX	SPRING, TENSION	

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

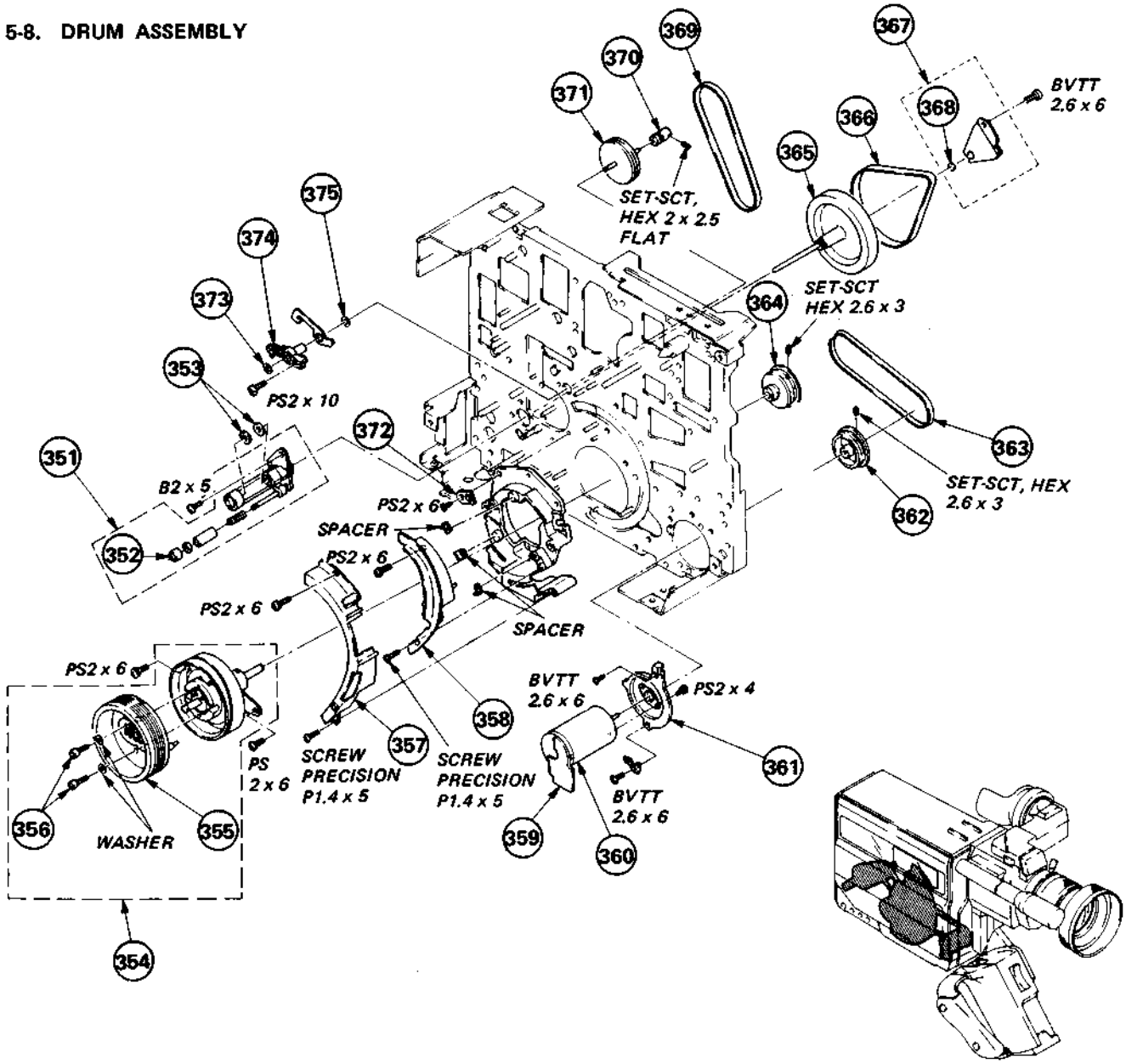
5-7. THREADING ASSEMBLY



No.	Part No.	Description	Remark
301	♣:1-609-855-00	LM-12 BOARD	
302	8-835-098-01	MOTOR, DC (DNR-6600A) M901(LOADING)	
303	♣:A-6737-126-A	CASE BLOCK ASSY, MOTOR	304,305,306,307 308,329,330
304	♣:X-3681-430-0	CASE ASSY, MOTOR	
305	3-701-437-21	WASHER	
306	♣:X-3681-429-0	GEAR ASSY, WORM	
307	♣:3-681-422-00	WHEEL, WORM	
308	3-669-465-00	WASHER (1.5), STOPPER	
309	3-681-423-00	PULLEY, MOTOR, LOADING	
310	3-681-424-00	BELT, LOADING	
311	♣:A-6750-151-A	BASE BLOCK ASSY, TG5	331
312	3-564-935-00	SPRING, TENSION	
313	♣:A-6746-033-A	BASE BLOCK ASSY, TG4	331
314	3-681-678-00	WASHER, STOPPER	
315	3-570-615-00	POLY-WASHER (DIA.1.2)	
316	A-6747-233-A	ARM ASSY, EG	315,317

No.	Part No.	Description	Remark
317	3-701-436-01	WASHER, 1.6	
318	3-681-437-00	GEAR (A), EJECT	
319	3-681-433-00	ROLLER (C), RING GUIDE	
320	3-681-429-00	ROLLER (B), RING GUIDE	
321	3-681-428-00	ROLLER (A), RING GUIDE	
322	3-681-430-00	GEAR (S), LOADING	
323	3-681-431-00	GEAR (T), LOADING	
324	♣:A-6746-032-A	BASE BLOCK ASSY, TG1	325,331
325	3-669-446-00	NUT, GUIDE, NO. 6	
326	3-307-938-00	SPRING, TENSION	
327	1-554-581-00	SWITCH, MICRO (LOADING END) S303	
328	3-681-674-00	ROLLER (D), GUIDE, RING	
329	3-701-437-01	WASHER	
330	3-703-075-00	CAP 2, SHAFT	
331	3-669-666-00	SPRING, COMPRESSION	
332	3-701-437-11	WASHER	

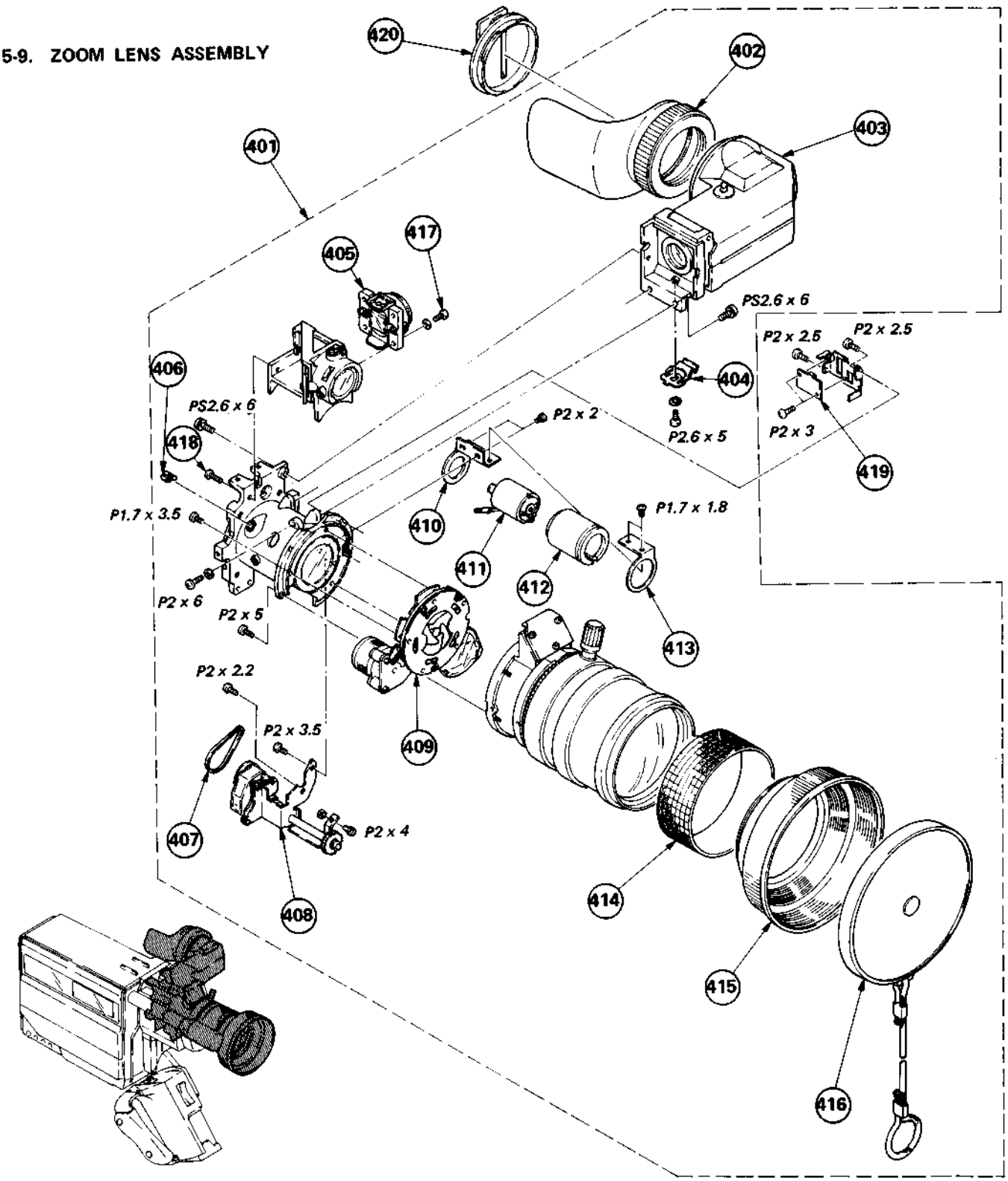
5-8. DRUM ASSEMBLY



No.	Part No.	Description	Remark
351	A-6735-050-A	BEARING BLOCK ASSY, CAPSTAN	352
352	3-669-446-00	NUT, GUIDE, NO. 6	
353	3-681-448-00	RING (C), FELT	
354	A-6050-216-A	DSH-44A-R	355,356,364
355	A-6762-154-A	DRUM ASSY, ROTARY UPPER (DSR-44-R)	
356	3-681-308-00	BOLT (C2X6), MOLE, HEXAGON	
357	3-681-628-00	GUIDE (S-2), THREADING	
358	3-681-627-00	GUIDE (S-1), THREADING	
359	♣:1-609-866-00	DM-4 BOARD	
360	8-835-099-01	MOTOR, DC (MNR-5003A) M902(DRUM)	
361	♣:3-681-577-00	BRACKET, DRUM MOTOR	
362	3-681-425-00	PULLEY, MOTOR, DRUM	
363	3-681-446-00	BELT, DRUM	
364	3-681-314-03	PULLEY	
365	♣:X-3681-425-0	FLYWHEEL ASSY	
366	3-681-444-00	BELT, CAPSTAN	
367	♣:A-6740-081-A	RETAINER ASSY, THRUST	368

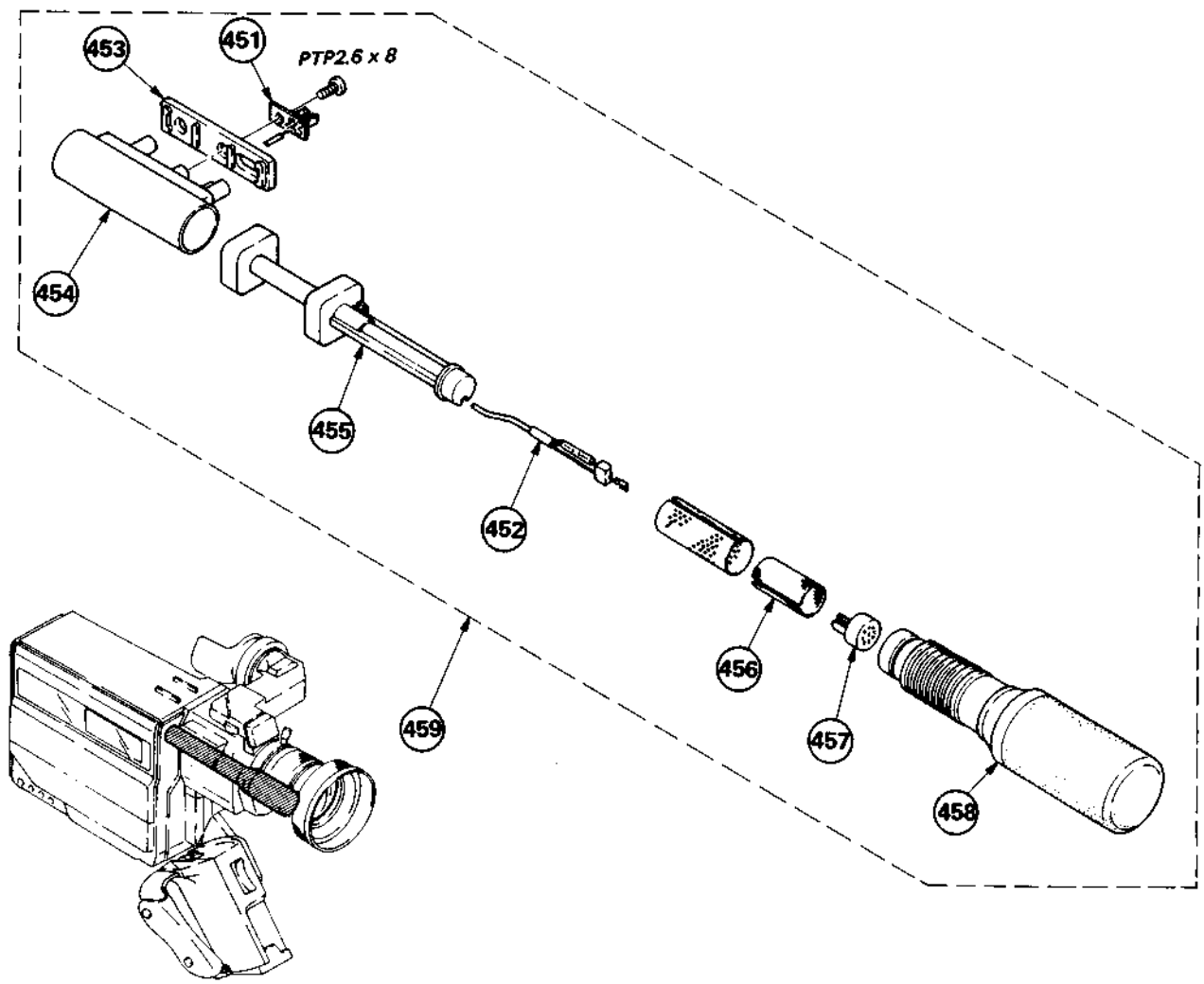
No.	Part No.	Description	Remark
368	3-682-543-00	RETAINER, FLYWHEEL	
369	3-681-445-00	BELT, RELAY	
370	3-682-740-01	PULLEY (P), MIDWAY	
	3-682-740-11	PULLEY (P), MIDWAY	
	3-682-740-21	PULLEY (P), MIDWAY	
	3-682-740-31	PULLEY (P), MIDWAY	
	3-682-740-41	PULLEY (P), MIDWAY	
	3-682-740-51	PULLEY (P), MIDWAY	
	3-682-740-61	PULLEY (P), MIDWAY	
	3-682-740-71	PULLEY (P), MIDWAY	
	3-682-740-81	PULLEY (P), MIDWAY	
371	X-3681-411-0	PULLEY ASSY, RELAY	
372	1-806-682-00	SENSOR, DEW CONDENSATION	
373	3-669-465-00	WASHER (1.5), STOPPER	
374	♣:X-3681-443-0	BEARING ASSY (P), RELAY PULLEY	
375	3-701-437-01	WASHER	

5-9. ZOOM LENS ASSEMBLY



No.	Part No.	Description	Remark
401	A-7613-052-A	LENS (VCL-906XA) ASSY, ZOOM	402-418
402	3-706-869-00	CUP, EYE	
403	3-706-868-00	EYEPIECE ASSY	
404	♣:3-706-870-00	CLAW, ROCK	
405	3-706-871-00	SCREEN ASSY, LED	
406	3-706-859-00	ADJUSTMENT PIECE, BF	
407	3-706-860-00	BELT, Z	
408	3-706-864-00	GEAR ASSY, ZOOM	
409	3-706-858-00	FILTER ASSY, IRIS	
410	♣:3-706-862-00	BRACKET A, Z MOTOR	
411	3-706-865-00	MOTOR ASSY, ZOOM	
412	3-706-861-00	RUBBER, VIBRATION PROOF	
413	♣:3-706-863-00	BRACKET B, Z MOTOR	
414	3-706-857-00	KNURL, FOCUS RUBBER	
415	3-706-855-00	HOOD	
416	3-706-856-00	CAP, HOOD	
417	3-681-824-11	SCREW +P2X6	
418	3-681-824-01	SCREW +P2X5	
419	♣:1-610-553-00	FL-1 BOARD	
420	3-681-823-00	COVER, EYECUP	

5-10. MICROPHONE ASSEMBLY



No.	Part No.	Description	Remark
451	♦:1-610-605-00	TRANSLATION BOARD	
452	X-2532-703-0	FET ASSY	
453	2-532-723-00	PACKING (A), RUBBER	
454	2-532-726-00	CASE, MICROPHONE	
455	♦:X-2532-705-0	JOINT ASSY	
456	♦:2-532-717-00	MESH, SHIELD	
457	8-814-173-01	MICROPHONE, BUILT-IN (CU11-01)	
458	X-2532-704-0	SCREEN ASSY, WINDOW	
459	8-814-165-01	MICROPHONE, BUILT-IN (C-2003)	451-458

HARDWARE LIST

SCREW

7-621-772-20	SCREW +B 2X5
7-621-775-00	SCREW +B 2.6X3
7-621-773-95	SCREW +B 2.6X6
7-682-550-09	SCREW +B 3X12
7-682-546-09	SCREW +B 3X5
7-685-862-01	SCREW +BVTT 2.6X6 (S)
7-685-863-01	SCREW +BVTT 2.6X8 (S)
7-621-591-00	SCREW +K 2X4
7-621-559-20	SCREW +K 2.6X4
7-621-592-00	SCREW +K 2.6X6
7-685-233-19	SCREW +KTP 2.6X6 TYPE2NON-SLIT
7-621-255-15	SCREW +P 2X3
7-621-255-25	SCREW +P 2X4
7-685-135-11	SCREW +P 2.6X10 TYPE2 NON-SLIT
7-621-259-15	SCREW +P 2.6X3
7-685-131-11	SCREW +P 2.6X4 TYPE2 NON-SLIT
7-685-134-11	SCREW +P 2.6X8 TYPE2 NON-SLIT
7-628-253-45	SCREW +PS 2X10
7-628-253-05	SCREW +PS 2X4
7-628-253-25	SCREW +PS 2X6
7-628-254-25	SCREW +PS 2.6X8
7-627-553-28	SCREW, PRECISION +P 2X2.5
7-627-851-27	SCREW, PRECISION +P 1.4X5
7-621-905-55	SCREW, TOTSU P 2X6
7-621-905-85	SCREW, TOTSU P 2X12
7-627-853-88	PRECISION SCREW +P 2X8 TYPE 3

SET-SCREW

7-621-712-45	SET-SCREW, SLOT 2.6X5CONE POINT
7-621-734-09	SET-SCT, HEX. 2.6X3
7-621-731-08	SET-SCT, HEX. 2X2.5, FLAT POINT

SPRING PIN

7-626-317-21	PIN, SPRING 2.5X8
7-626-308-31	SPRING PIN 1.4X8

STOP RING

7-624-102-04	STOP RING 1.5, TYPE -E
7-624-104-04	STOP RING 2.0, TYPE -E
7-624-105-04	STOP RING 2.3, TYPE -E
7-624-106-04	STOP RING 3.0, TYPE -E

WASHER

7-623-711-07	WASHER 20, WAVE
7-688-003-11	W 3, MIDDLE
7-623-420-07	LW 2, TYPE B
7-623-421-07	LW 2.6, TYPE B

BOLT

7-683-413-05	BOLT, HEXAGON SOCKET 2.6X8

PA-1 **VC-2**

SECTION 6
ELECTRICAL PARTS LIST

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

NOTE:

- The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.
- ⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.
- Items marked " ♣ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

CAPACITORS
- MF : μF, PF : μμF

RESISTORS
- All resistors are in ohms
- F : nonflammable

COILS
- MMH : mH, UH : μH

Ref.No.	Part No.	Description			Remark
	♣:A-7511-947-A	PA-1 BOARD, COMPLETE **********			
	♣:1-610-551-11	PA-1 BOARD			
		CAPACITOR			
C801	1-163-831-00	CERAMIC CHIP 0.047MF	10%	100V	
C802	1-131-380-00	TANTALUM 33MF	10%	10V	
C803	1-124-222-00	ELECT 22MF	20%	6.3V	
C804	1-163-231-00	CERAMIC CHIP 15PF	5%	50V	
C805	1-163-832-00	CERAMIC CHIP 0.1MF	10%	100V	
C806	1-124-224-00	ELECT 47MF	20%	6.3V	
C807	1-124-255-00	ELECT 1MF	20%	50V	
C808	1-131-380-00	TANTALUM 33MF	10%	10V	
C809	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C810	1-124-224-00	ELECT 47MF	20%	6.3V	
C811	1-162-183-00	CERAMIC 0.047MF		300V	
C812	1-163-019-00	CERAMIC CHIP 0.0068MF	10%	50V	
		CONNECTOR			
CN501	♣:1-557-032-00	CONNECTOR ASSY (2.0MM) 5P			
CN502	♣:1-556-910-00	CONNECTOR ASSY (2.0MM) 5P			
CN801	♣:1-564-016-00	PIN, CONNECTOR 6P			
CN802	♣:1-564-014-00	PIN, CONNECTOR 4P			
		TRIMMER			
CT801	1-141-245-00	TRIMMER, CERAMIC			
		COIL			
L801	1-408-939-00	COIL, PERSEVERE (151UH)			
L802	1-408-948-00	MICRO INDUCTOR 220UH			
L803	1-408-948-00	MICRO INDUCTOR 220UH			
L804	1-408-948-00	MICRO INDUCTOR 220UH			
		TRANSISTOR			
Q801	8-729-130-03	TRANSISTOR 2SK300			
Q802	8-729-122-63	TRANSISTOR 2SA1226-E4			
Q803	8-729-102-08	TRANSISTOR 2SC2223-F14			
Q804	8-729-122-63	TRANSISTOR 2SA1226-E4			
Q805	8-729-102-08	TRANSISTOR 2SC2223-F14			
Q806	8-729-100-66	TRANSISTOR 2SC1623			
Q807	8-729-102-66	TRANSISTOR 2SC1623			
Q808	8-729-102-66	TRANSISTOR 2SC1623			
Q809	8-729-100-66	TRANSISTOR 2SC1623			
Q810	8-729-100-66	TRANSISTOR 2SC1623			
		RESISTOR			
R801	1-208-259-00	RES, MICRO (HIGH MEGA OHM) 10M			
R802	1-216-277-00	METAL CHIP 2M	5%	1/8W	
R803	1-216-038-00	METAL CHIP 360	5%	1/10W	
R804	1-216-053-00	METAL CHIP 1.5K	5%	1/10W	
R805	1-216-082-00	METAL CHIP 24K	5%	1/10W	
R806	1-216-082-00	METAL CHIP 24K	5%	1/10W	
R807	1-216-053-00	METAL CHIP 1.5K	5%	1/10W	
R808	1-216-025-00	METAL CHIP 100	5%	1/10W	
R809	1-216-056-00	METAL CHIP 2K	5%	1/10W	
R810	1-216-025-00	METAL CHIP 100	5%	1/10W	
R811	1-216-064-00	METAL CHIP 4.3K	5%	1/10W	
R812	1-216-097-00	METAL CHIP 100K	5%	1/10W	
R813	1-216-061-00	METAL CHIP 3.3K	5%	1/10W	
R814	1-216-036-00	METAL CHIP 300	5%	1/10W	
R815	1-216-057-00	METAL CHIP 2.2K	5%	1/10W	
R816	1-216-073-00	METAL CHIP 10K	5%	1/10W	
R817	1-216-073-00	METAL CHIP 10K	5%	1/10W	
R818	1-216-036-00	METAL CHIP 300	5%	1/10W	
R819	1-216-056-00	METAL CHIP 2K	5%	1/10W	
R820	1-216-066-00	METAL CHIP 5.1K	5%	1/10W	
R821	1-216-097-00	METAL CHIP 100K	5%	1/10W	
		TRANSFORMER			
T801	1-437-126-21	TRANSFORMER, DRIVE			
	♣:A-7513-003-A	VC-2 BOARD, COMPLETE **********			
	♣:3-662-075-00	COVER, CONTROL			
	♣:3-681-826-00	CASE (MAIN), SHIELD, RA			
	♣:3-681-827-00	LID, SHIELD CASE, RA			
	♣:3-681-830-00	CASE (MAIN), SHIELD, SG			
	♣:3-681-831-00	LID, SHIELD CASE, SG			
	♣:3-681-832-00	SHEET (A), INSULATING, SG			
	3-681-834-00	CUSHION, RUBBER			
	9-911-839-XX	CUSHION (2X2), RUBBER			
		PIN			
BP501	♣:1-564-317-00	PIN, BOARD TO BOARD 5P			
BP502	♣:1-564-318-00	PIN, BOARD TO BOARD 10P			
BP503	♣:1-564-317-00	PIN, BOARD TO BOARD 5P			
BP504	♣:1-564-318-00	PIN, BOARD TO BOARD 10P			
		CONNECTOR			
C001	1-123-622-00	ELECT 22MF	20%	16V	
C017	1-163-124-00	CERAMIC CHIP 200PF	5%	50V	
C018	1-163-080-00	CERAMIC CHIP 0.047MF	10%	25V	
C019	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V	
C020	1-163-080-00	CERAMIC CHIP 0.047MF	10%	25V	
C021	1-123-645-00	ELECT 33MF	20%	10V	
C023	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V	
C024	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V	
C025	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V	
C026	1-163-231-00	CERAMIC CHIP 15PF	5%	50V	
C028	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V	
C029	1-163-080-00	CERAMIC CHIP 0.047MF	10%	25V	
C030	1-123-645-00	ELECT 33MF	20%	10V	
C031	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V	
C032	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V	

Ref.No.	Part No.	Description			Remark
C033	1-123-645-00	ELECT	33MF	20%	10V
C034	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C035	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C036	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C037	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C038	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C039	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C040	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C041	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C042	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C043	1-124-231-00	ELECT	4.7MF	20%	16V
C044	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C045	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C046	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C047	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C048	1-123-822-00	ELECT	47MF	20%	10V
C050	1-163-233-00	CERAMIC CHIP	18PF	5%	50V
C051	1-163-009-00	CERAMIC CHIP	0.001MF	10%	50V
C052	1-163-081-00	CERAMIC CHIP	0.22MF		25V
C053	1-163-081-00	CERAMIC CHIP	0.22MF		25V
C054	1-163-220-91	CERAMIC CHIP	3PF	0.25PF	50V
C055	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C056	1-163-103-00	CERAMIC CHIP	27PF	5%	50V
C057	1-163-013-00	CERAMIC CHIP	0.0022MF	10%	50V
C058	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C059	1-163-123-00	CERAMIC CHIP	180PF	5%	50V
C061	1-131-377-00	TANTALUM	10MF	20%	10V
C063	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C151	1-163-229-00	CERAMIC CHIP	12PF	5%	50V
C152	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C153	1-163-255-00	CERAMIC CHIP	150PF	5%	50V
C154	1-163-265-91	CERAMIC CHIP	390PF	5%	50V
C155	1-163-269-00	CERAMIC CHIP	560PF	5%	50V
C156	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C157	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C158	1-163-236-91	CERAMIC CHIP	24PF	5%	50V
C159	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C160	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C161	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C162	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C163	1-124-169-00	ELECT	100MF	20%	10V
C501	1-131-380-00	TANTALUM	33MF	10%	10V
C502	1-131-387-00	TANTALUM	47MF	10%	6.3V
C503	1-124-233-00	ELECT	10MF	20%	16V
C504	1-123-645-00	ELECT	33MF	20%	10V
C505	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C506	1-123-647-00	ELECT	47MF	20%	6.3V
C507	1-124-233-00	ELECT	10MF	20%	16V
C508	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C509	1-123-647-00	ELECT	47MF	20%	6.3V
C510	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C511	1-163-013-00	CERAMIC CHIP	0.0022MF	10%	50V
C512	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V

Ref.No.	Part No.	Description			Remark
C513	1-123-647-00	ELECT	47MF	20%	6.3V
C514	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C515	1-124-233-00	ELECT	10MF	20%	16V
C516	1-123-822-00	ELECT	47MF	20%	10V
C518	1-163-124-00	CERAMIC CHIP	200PF	5%	50V
C521	1-123-822-00	ELECT	47MF	20%	10V
C523	1-124-233-00	ELECT	10MF	20%	16V
C524	1-163-114-00	CERAMIC CHIP	75PF	5%	50V
C525	1-163-114-00	CERAMIC CHIP	75PF	5%	50V
C526	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C527	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C528	1-163-009-00	CERAMIC CHIP	0.001MF	10%	50V
C529	1-163-009-00	CERAMIC CHIP	0.001MF	10%	50V
C530	1-163-243-00	CERAMIC CHIP	47PF	5%	50V
C531	1-163-242-00	CERAMIC CHIP	43PF	5%	50V
C532	1-163-104-00	CERAMIC CHIP	30PF	5%	50V
C533	1-163-009-00	CERAMIC CHIP	0.001MF	10%	50V
C534	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C535	1-131-371-00	TANTALUM	10MF	10%	16V
C536	1-123-645-00	ELECT	33MF	20%	10V
C537	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C538	1-163-009-00	CERAMIC CHIP	0.001MF	10%	50V
C539	1-163-009-00	CERAMIC CHIP	0.001MF	10%	50V
C540	1-163-009-00	CERAMIC CHIP	0.001MF	10%	50V
C541	1-163-240-00	CERAMIC CHIP	36PF	5%	50V
C542	1-163-246-00	CERAMIC CHIP	62PF	5%	50V
C543	1-163-081-00	CERAMIC CHIP	0.22MF		25V
C544	1-163-081-00	CERAMIC CHIP	0.22MF		25V
C545	1-125-299-00	**********	47000MF		5V
C548	1-131-371-00	TANTALUM	10MF	10%	16V
C549	1-131-371-00	TANTALUM	10MF	10%	16V
C552	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C554	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C557	1-124-233-00	ELECT	10MF	20%	16V
C558	1-163-123-00	CERAMIC CHIP	180PF	5%	50V
C559	1-130-476-00	MYLAR	0.0027MF	5%	50V
C560	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C561	1-131-346-00	TANTALUM	0.68MF	10%	35V
C562	1-123-622-00	ELECT	22MF	20%	16V
C563	1-131-371-00	TANTALUM	10MF	10%	16V
C564	1-124-233-00	ELECT	10MF	20%	16V
C565	1-124-233-00	ELECT	10MF	20%	16V
C566	1-131-408-00	TANTALUM	1MF	10%	25V
C567	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C568	1-123-647-00	ELECT	47MF	20%	6.3V
C569	1-131-391-00	TANTALUM	22MF	20%	3.15V
C570	1-124-169-00	ELECT	100MF	20%	10V
C572	1-163-011-00	CERAMIC CHIP	0.0015MF	10%	50V
C573	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C574	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C575	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C576	1-123-661-00	ELECT	100MF	20%	6.3V
C579	1-124-233-00	ELECT	10MF	20%	16V

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

VC-2

Ref.No.	Part No.	Description			Remark
C583	1-124-233-00	ELECT	10MF	20%	16V
C586	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C587	1-163-132-00	CERAMIC CHIP	430PF	5%	50V
C588	1-163-124-00	CERAMIC CHIP	200PF	5%	50V
C590	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C591	1-163-004-00	CERAMIC CHIP	390PF	10%	50V
C592	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C593	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C594	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C595	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C596	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C597	1-163-104-00	CERAMIC CHIP	30PF	5%	50V
C598	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C599	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C600	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C603	1-163-081-00	CERAMIC CHIP	0.22MF		25V
C652	1-163-126-00	CERAMIC CHIP	240PF	5%	50V
C660	1-123-617-00	ELECT	10MF	20%	16V
C661	1-163-081-00	CERAMIC CHIP	0.22MF		25V
C662	1-124-233-00	ELECT	10MF	20%	16V
C663	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C701	1-131-395-00	TANTALUM	100MF	10%	3.15V
C702	1-163-019-00	CERAMIC CHIP	0.0068MF	10%	50V
C703	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C704	1-123-622-00	ELECT	22MF	20%	16V
C705	1-124-255-00	ELECT	1MF	20%	50V
C706	1-124-243-11	ELECT	2.2MF	20%	35V
C707	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C708	1-123-619-00	ELECT	4.7MF	20%	50V
C709	1-123-367-00	ELECT	2.2MF	20%	63V
C710	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C711	1-131-393-00	TANTALUM	47MF	10%	3.15V
C712	1-123-380-00	ELECT	1MF	20%	100V
C713	1-106-196-00	MYLAR	0.01MF	5%	100V
C714	1-106-196-00	MYLAR	0.01MF	5%	100V
C715	1-107-036-00	MICA	68PF	5%	500V
C716	1-107-036-00	MICA	68PF	5%	500V
C717	1-163-107-00	CERAMIC CHIP	39PF	5%	50V
C718	1-163-107-00	CERAMIC CHIP	39PF	5%	50V
C719	1-106-367-00	MYLAR	0.01MF	5%	200V
C720	1-124-233-00	ELECT	10MF	20%	16V
C721	1-108-427-00	MYLAR	0.033MF	10%	200V
C722	1-108-427-00	MYLAR	0.033MF	10%	200V
C723	1-108-425-00	MYLAR	0.022MF	5%	200V
C724	1-123-647-00	ELECT	47MF	20%	6.3V
C725	1-123-661-00	ELECT	100MF	20%	6.3V
C727	1-123-647-00	ELECT	47MF	20%	6.3V
C728	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C729	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C730	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C731	1-131-395-00	TANTALUM	100MF	10%	3.15V
C732	1-131-387-00	TANTALUM	47MF	10%	6.3V
C733	1-123-026-00	ELECT	2.2MF		160V
C734	1-131-381-00	TANTALUM	47MF	20%	10V
C735	1-131-388-00	TANTALUM	68MF	20%	6.3V
C736	1-131-395-00	TANTALUM	100MF	10%	3.15V
C738	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C741	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C742	1-163-831-00	CERAMIC CHIP	0.047MF	10%	100V
C852	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C853	1-163-230-00	CERAMIC CHIP	13P	5%	50V
C858	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C859	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C860	1-163-009-00	CERAMIC CHIP	0.001MF	10%	50V
C861	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C863	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C871	1-124-140-00	ELECT	220MF	20%	10V
C872	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V
C873	1-131-385-00	TANTALUM	22MF	20%	6.3V
C874	1-163-009-00	CERAMIC CHIP	0.001MF	10%	50V
C875	1-131-341-00	TANTALUM	0.1MF	20%	35V

CONNECTOR

CN001	&1-564-004-00	PIN, CONNECTOR	5P
CN002	&1-564-005-00	PIN, CONNECTOR	6P
CN501	&1-564-004-00	PIN, CONNECTOR	5P
CN502	&1-564-004-00	PIN, CONNECTOR	5P
CN503	&1-564-003-00	PIN, CONNECTOR	4P
CN504	&1-564-001-11	PIN, CONNECTOR	2P
CN505	&1-564-008-00	PIN, CONNECTOR	9P
CN506	&1-564-004-00	PIN, CONNECTOR	5P
CN507	&1-564-002-00	PIN, CONNECTOR	3P
CN508	&1-564-001-11	PIN, CONNECTOR	2P
CN509	&1-564-009-00	PIN, CONNECTOR	10P
CN510	&1-564-187-00	PIN, CONNECTOR	
CN851	&1-564-002-00	PIN, CONNECTOR	3P

TRIMMER

CT851	1-141-260-00	CAP, TRIMMER 50PF

DIODE

D005	8-719-100-05	DIODE 1S2837
D006	8-719-100-03	DIODE 1S2835
D007	8-719-910-64	DIODE HZ6B1L
D151	8-719-101-23	DIODE 1SS123
D152	8-719-921-20	DIODE 1SS119TD
D153	8-719-101-23	DIODE 1SS123
D501	8-719-101-23	DIODE 1SS123
D502	8-719-100-05	DIODE 1S2837
D503	8-719-921-20	DIODE 1SS119TD
D504	8-719-101-23	DIODE 1SS123
D505	8-719-101-23	DIODE 1SS123
D506	8-719-100-03	DIODE 1S2835
D507	8-719-100-05	DIODE 1S2837
D508	8-719-100-03	DIODE 1S2835

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

Ref.No.	Part No.	Description	Remark
D511	8-719-921-20	DIODE 1SS119TD	
D514	=>8-719-100-15	DIODE RD3.0EB-B2	
D515	8-719-921-20	DIODE 1SS119TD	
D518	8-719-921-20	DIODE 1SS119TD	
D519	8-719-100-03	DIODE 1S2835	
D656	8-719-100-03	DIODE 1S2835	
D701	8-719-921-20	DIODE 1SS119TD	
D704	8-719-921-20	DIODE 1SS119TD	
D705	8-719-921-20	DIODE 1SS119TD	
D706	=>8-719-106-18	DIODE RD6.8M-B3	
D707	8-719-101-23	DIODE 1SS123	
D851	⚠8-719-154-51	DIODE RD5.1E-L1	
		DELAY LINE	
DL501	1-415-329-00	DELAY LINE	
DL502	1-415-331-00	DELAY LINE	
DL503	1-415-349-00	DELAY LINE, 1H	
		FILTER	
FL501	1-235-234-00	ENCAPSULATED COMPONENT	
		CONVERTER	
HV701	⚠1-464-275-00	CONVERTER BLOCK, DC-DC	
		IC	
IC002	8-759-600-49	IC CX20004	
IC501	8-759-920-02	IC CX10002	
IC502	8-758-960-00	IC CX896	
IC505	8-758-160-00	IC CX816	
IC506	8-759-600-40	IC CX10041	
IC507	8-741-116-71	IC BX1167A	
IC509	8-759-906-39	IC CX20059	
IC510	8-759-700-45	IC NJM4556M-A	
IC701	8-741-117-10	IC BX1171	
IC702	8-741-117-10	IC BX1171	
IC703	8-759-100-96	IC UPC4558G2	
IC704	8-759-100-96	IC UPC4558G2	
IC851	8-759-908-54	IC CX7986	
IC852	8-759-100-96	IC UPC4558G2	
		COIL	
L002	1-408-423-00	MICRO INDUCTOR 150UH	
L003	1-408-609-00	MICRO INDUCTOR 33UH	
L004	1-408-410-00	MICRO INDUCTOR 12UH	
L007	1-406-067-00	COIL, RF	
L008	1-406-067-00	COIL, RF	
L151	1-408-422-00	MICRO INDUCTOR 120UH	
L152	1-408-408-00	MICRO INDUCTOR 8.2UH	
L502	1-408-602-00	MICRO INDUCTOR 8.2UH	
L503	1-408-936-00	MICRO INDUCTOR 6.8UH	
L504	1-407-927-00	COIL, VARIABLE 10UH	
L505	1-408-021-00	MICRO INDUCTOR 150UH	
L506	1-408-022-00	MICRO INDUCTOR 27UH	
L507	1-408-595-00	MICRO INDUCTOR 2.2UH	
L508	1-408-936-00	MICRO INDUCTOR 6.8UH	
L509	1-408-462-11	MICRO INDUCTOR 470UH	
L510	1-408-462-11	MICRO INDUCTOR 470UH	
L512	1-421-421-00	COIL, CHOKE 100UH	
L513	1-408-618-00	MICRO INDUCTOR 180UH	
L514	1-408-622-00	MICRO INDUCTOR 390UH	
L515	1-408-990-00	MICRO INDUCTOR 120UH	
L651	1-408-613-00	MICRO INDUCTOR 68UH	
L854	1-408-956-00	COIL, CHOKE	
		TRANSISTOR	
Q001	8-729-100-66	TRANSISTOR 2SC1623	
Q002	8-729-100-66	TRANSISTOR 2SC1623	
Q003	8-729-312-22	TRANSISTOR 2SA1122	
Q014	8-729-102-08	TRANSISTOR 2SC2223-F14	
Q016	8-729-122-63	TRANSISTOR 2SA1226-E4	
Q017	8-729-122-63	TRANSISTOR 2SA1226-E4	
Q018	8-729-312-22	TRANSISTOR 2SA1122	
Q019	8-729-100-66	TRANSISTOR 2SC1623	
Q020	8-729-100-76	TRANSISTOR 2SA812	
Q021	8-729-100-66	TRANSISTOR 2SC1623	
Q022	8-729-100-66	TRANSISTOR 2SC1623	
Q023	8-729-100-66	TRANSISTOR 2SC1623	
Q024	8-729-100-66	TRANSISTOR 2SC1623	
Q025	8-729-100-66	TRANSISTOR 2SC1623	
Q026	8-729-100-66	TRANSISTOR 2SC1623	
Q027	8-729-100-66	TRANSISTOR 2SC1623	
Q028	8-729-100-66	TRANSISTOR 2SC1623	
Q029	8-729-101-25	TRANSISTOR 2SC1009A	
Q030	8-729-101-25	TRANSISTOR 2SC1009A	
Q031	8-729-101-25	TRANSISTOR 2SC1009A	
Q032	8-729-101-25	TRANSISTOR 2SC1009A	
Q033	8-729-101-25	TRANSISTOR 2SC1009A	
Q034	8-729-100-76	TRANSISTOR 2SA812	
Q035	8-729-100-76	TRANSISTOR 2SA812	
Q036	8-729-100-66	TRANSISTOR 2SC1623	
Q037	8-729-100-66	TRANSISTOR 2SC1623	
Q151	8-729-100-76	TRANSISTOR 2SA812	
Q152	8-729-100-66	TRANSISTOR 2SC1623	
Q153	8-729-100-66	TRANSISTOR 2SC1623	
Q154	8-729-100-76	TRANSISTOR 2SA812	
Q155	8-729-100-66	TRANSISTOR 2SC1623	
Q156	8-729-271-23	TRANSISTOR 2SC2712	
Q157	8-729-100-66	TRANSISTOR 2SC1623	
Q158	8-729-312-22	TRANSISTOR 2SA1122	
Q159	8-729-100-66	TRANSISTOR 2SC1623	
Q160	8-729-100-66	TRANSISTOR 2SC1623	
Q161	8-729-100-76	TRANSISTOR 2SA812	
Q501	8-729-100-66	TRANSISTOR 2SC1623	
Q502	8-729-100-66	TRANSISTOR 2SC1623	
Q503	8-729-122-63	TRANSISTOR 2SA1226-E4	

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

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Ref.No.	Part No.	Description	Remark
Q504	8-729-100-76	TRANSISTOR 2SA812	
Q505	8-729-100-76	TRANSISTOR 2SA812	
Q506	8-729-100-66	TRANSISTOR 2SC1623	
Q507	8-729-100-66	TRANSISTOR 2SC1623	
Q509	8-729-100-66	TRANSISTOR 2SC1623	
Q510	8-729-100-66	TRANSISTOR 2SC1623	
Q511	8-729-100-66	TRANSISTOR 2SC1623	
Q512	8-729-100-66	TRANSISTOR 2SC1623	
Q515	8-729-102-76	TRANSISTOR 2SA812-T2M6	
Q516	8-729-100-76	TRANSISTOR 2SA812	
Q517	⇒8-729-220-92	TRANSISTOR 2SK209Y	
Q518	⇒8-729-220-92	TRANSISTOR 2SK209Y	
Q519	8-729-100-76	TRANSISTOR 2SA812	
Q520	8-729-100-76	TRANSISTOR 2SA812	
Q521	8-729-100-76	TRANSISTOR 2SA812	
Q522	8-729-100-66	TRANSISTOR 2SC1623	
Q523	8-729-100-66	TRANSISTOR 2SC1623	
Q524	8-729-100-76	TRANSISTOR 2SA812	
Q527	8-729-100-66	TRANSISTOR 2SC1623	
Q528	8-729-100-66	TRANSISTOR 2SC1623	
Q529	8-729-102-26	TRANSISTOR 2SC1623-T2L6	
Q530	8-729-100-66	TRANSISTOR 2SC1623	
Q531	8-729-102-26	TRANSISTOR 2SC1623-T2L6	
Q652	8-729-202-57	TRANSISTOR 2SC3381	
Q701	8-729-100-66	TRANSISTOR 2SC1623	
Q702	8-729-100-66	TRANSISTOR 2SC1623	
Q703	⚠8-729-104-08	TRANSISTOR 2SD999	
Q704	8-729-100-76	TRANSISTOR 2SA812	
Q705	⚠8-729-104-02	TRANSISTOR 2SB798	
Q706	8-729-100-66	TRANSISTOR 2SC1623	
Q707	8-729-100-66	TRANSISTOR 2SC1623	
Q708	8-729-271-32	TRANSISTOR 2SC2713	
Q710	8-729-271-32	TRANSISTOR 2SC2713	
Q711	8-729-216-32	TRANSISTOR 2SA1163	
Q712	⚠8-729-104-02	TRANSISTOR 2SB798	
Q713	8-729-100-66	TRANSISTOR 2SC1623	
Q714	8-729-100-66	TRANSISTOR 2SC1623	
Q715	8-729-100-76	TRANSISTOR 2SA812	
Q716	8-729-200-17	TRANSISTOR 2SA1091	
Q717	8-729-271-32	TRANSISTOR 2SC2713	
Q718	8-729-271-32	TRANSISTOR 2SC2713	
Q719	8-729-271-32	TRANSISTOR 2SC2713	
Q720	8-729-216-32	TRANSISTOR 2SA1163	
Q852	⚠8-729-102-26	TRANSISTOR 2SC1623	

RESISTOR

Ref.No.	Part No.	Description			Remark
R001	1-216-113-00	METAL CHIP	470K	5% 1/10W	
R003	1-216-053-00	METAL CHIP	1.5K	5% 1/10W	
R004	1-216-067-00	METAL CHIP	5.6K	5% 1/10W	
R005	1-216-070-00	METAL CHIP	7.5K	5% 1/10W	
R006	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R012	1-216-025-00	METAL CHIP	100	5% 1/10W	
R013	1-216-018-00	METAL CHIP	51	5% 1/10W	
R029	1-216-086-00	METAL CHIP	36K	5% 1/10W	
R042	1-216-065-00	METAL CHIP	4.7K	5% 1/10W	
R043	1-216-040-00	METAL CHIP	430	5% 1/10W	
R044	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R045	1-216-046-00	METAL CHIP	750	5% 1/10W	
R046	1-216-092-00	METAL CHIP	62K	5% 1/10W	
R047	1-216-024-00	METAL CHIP	91	5% 1/10W	
R048	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R049	1-216-083-00	METAL CHIP	27K	5% 1/10W	
R050	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R051	1-216-085-00	METAL CHIP	33K	5% 1/10W	
R052	1-216-082-00	METAL CHIP	24K	5% 1/10W	
R053	1-216-051-00	METAL CHIP	1.2K	5% 1/10W	
R054	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	
R055	1-216-075-00	METAL CHIP	12K	5% 1/10W	
R056	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R057	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R058	1-216-029-00	METAL CHIP	150	5% 1/10W	
R059	1-215-389-00	METAL	47	1% 1/6W	
R060	1-216-032-00	METAL CHIP	200	5% 1/10W	
R061	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R062	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R063	1-216-313-00	METAL CHIP	8.2	5% 1/10W	
R064	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R065	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R066	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R067	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R068	1-216-063-00	METAL CHIP	3.9K	5% 1/10W	
R069	1-216-066-00	METAL CHIP	5.1K	5% 1/10W	
R070	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R071	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R072	1-216-043-00	METAL CHIP	560	5% 1/10W	
R073	1-216-043-00	METAL CHIP	560	5% 1/10W	
R074	1-216-066-00	METAL CHIP	5.1K	5% 1/10W	
R075	1-216-063-00	METAL CHIP	3.9K	5% 1/10W	
R076	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R077	1-216-085-00	METAL CHIP	33K	5% 1/10W	
R078	1-216-065-00	METAL CHIP	4.7K	5% 1/10W	
R079	1-216-085-00	METAL CHIP	33K	5% 1/10W	
R080	1-216-085-00	METAL CHIP	33K	5% 1/10W	
R081	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R082	1-216-001-00	METAL CHIP	10	5% 1/10W	
R083	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R084	1-216-085-00	METAL CHIP	33K	5% 1/10W	
R085	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R086	1-216-093-00	METAL CHIP	68K	5% 1/10W	
R087	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R088	1-216-042-00	METAL CHIP	510	5% 1/10W	
R089	1-216-029-00	METAL CHIP	150	5% 1/10W	
R090	1-216-303-91	METAL CHIP	3	5% 1/10W	
R091	1-216-085-00	METAL CHIP	33K	5% 1/10W	
R092	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R093	1-216-085-00	METAL CHIP	33K	5% 1/10W	

NOTE:

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

Ref.No.	Part No.	Description				Remark
R094	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R095	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R096	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R097	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R098	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R099	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R100	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R101	1-216-087-00	METAL CHIP	39K	5%	1/10W	
R102	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R103	1-216-087-00	METAL CHIP	39K	5%	1/10W	
R104	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R105	1-216-060-00	METAL CHIP	3K	5%	1/10W	
R106	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R107	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R108	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R109	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R110	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R111	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R112	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R113	1-216-025-00	METAL CHIP	100	5%	1/10W	
R114	1-216-060-00	METAL CHIP	3K	5%	1/10W	
R115	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R116	1-216-035-00	METAL CHIP	270	5%	1/10W	
R117	1-216-035-00	METAL CHIP	270	5%	1/10W	
R118	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R152	1-216-058-00	METAL CHIP	2.4K	5%	1/10W	
R153	1-216-056-00	METAL CHIP	2K	5%	1/10W	
R154	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R155	1-216-052-00	METAL CHIP	1.3K	5%	1/10W	
R156	1-216-036-00	METAL CHIP	300	5%	1/10W	
R157	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R158	1-216-034-00	METAL CHIP	240	5%	1/10W	
R159	1-216-032-00	METAL CHIP	200	5%	1/10W	
R160	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R161	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R162	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R163	1-216-054-00	METAL CHIP	1.6K	5%	1/10W	
R164	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R165	1-216-043-00	METAL CHIP	560	5%	1/10W	
R166	1-216-050-00	METAL CHIP	1.1K	5%	1/10W	
R167	1-216-031-00	METAL CHIP	180	5%	1/10W	
R168	1-216-027-00	METAL CHIP	120	5%	1/10W	
R169	1-216-052-00	METAL CHIP	1.3K	5%	1/10W	
R170	1-216-070-00	METAL CHIP	7.5K	5%	1/10W	
R171	1-216-042-00	METAL CHIP	510	5%	1/10W	
R172	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R173	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R174	1-216-047-00	METAL CHIP	820	5%	1/10W	
R175	1-216-042-00	METAL CHIP	510	5%	1/10W	
R176	1-216-041-00	METAL CHIP	470	5%	1/10W	
R177	1-216-080-00	METAL CHIP	20K	5%	1/10W	
R178	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R179	1-216-044-00	METAL CHIP	620	5%	1/10W	

Ref.No.	Part No.	Description				Remark
R180	1-216-047-00	METAL CHIP	820	5%	1/10W	
R181	1-216-074-00	METAL CHIP	11K	5%	1/10W	
R182	1-216-060-00	METAL CHIP	3K	5%	1/10W	
R183	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R184	1-216-060-00	METAL CHIP	3K	5%	1/10W	
R185	1-216-025-00	METAL CHIP	100	5%	1/10W	
R186	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R187	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R188	1-216-096-00	METAL CHIP	91K	5%	1/10W	
R501	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R502	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R503	1-216-038-00	METAL CHIP	360	5%	1/10W	
R504	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R505	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R506	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R507	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R508	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R509	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R510	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R511	1-216-094-00	METAL CHIP	75K	5%	1/10W	
R512	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R513	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R514	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R515	1-216-295-00	METAL CHIP	0	5%	1/10W	
R516	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R517	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R518	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R519	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R520	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R521	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R522	1-216-070-00	METAL CHIP	7.5K	5%	1/10W	
R523	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R524	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R525	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R526	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R527	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R528	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R529	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R530	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R531	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R532	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R533	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R534	1-216-066-00	METAL CHIP	5.1K	5%	1/10W	
R535	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R536	1-216-041-00	METAL CHIP	470	5%	1/10W	
R543	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R546	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R547	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R548	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R549	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R550	1-216-041-00	METAL CHIP	470	5%	1/10W	
R551	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R552	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	

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

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Ref.No.	Part No.	Description				Remark
R553	1-216-031-00	METAL CHIP	180	5%	1/10W	
R554	1-216-048-00	METAL CHIP	910	5%	1/10W	
R555	1-216-048-00	METAL CHIP	910	5%	1/10W	
R556	1-216-024-00	METAL CHIP	91	5%	1/10W	
R557	1-216-024-00	METAL CHIP	91	5%	1/10W	
R558	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R560	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R561	1-216-046-00	METAL CHIP	750	5%	1/10W	
R562	1-216-034-00	METAL CHIP	240	5%	1/10W	
R563	1-216-034-00	METAL CHIP	240	5%	1/10W	
R564	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R565	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R566	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R567	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R568	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R569	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R570	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R571	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R572	1-216-062-00	METAL CHIP	3.6K	5%	1/10W	
R573	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R574	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R575	1-216-015-00	METAL CHIP	39	5%	1/10W	
R576	1-216-015-00	METAL CHIP	39	5%	1/10W	
R577	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R582	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R583	1-216-033-00	METAL CHIP	220	5%	1/10W	
R584	1-216-033-00	METAL CHIP	220	5%	1/10W	
R585	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R588	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R591	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R592	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R593	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R594	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R595	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R596	1-216-076-00	METAL CHIP	13K	5%	1/10W	
R597	1-216-056-00	METAL CHIP	2K	5%	1/10W	
R598	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R599	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R600	1-216-088-00	METAL CHIP	43K	5%	1/10W	
R601	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R602	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R603	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R604	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R605	1-216-114-00	METAL CHIP	510K	5%	1/10W	
R606	1-216-114-00	METAL CHIP	510K	5%	1/10W	
R607	1-216-111-00	METAL CHIP	390K	5%	1/10W	
R608	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R609	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R610	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R611	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R612	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R613	1-216-056-00	METAL CHIP	2K	5%	1/10W	
R614	1-216-009-00	METAL CHIP	22	5%	1/10W	
R615	1-216-114-00	METAL CHIP	510K	5%	1/10W	
R616	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R617	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R619	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R620	1-216-308-00	METAL CHIP	4.7	5%	1/10W	
R621	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R622	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R623	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R624	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R625	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R626	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R627	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R628	1-216-103-00	METAL CHIP	180K	5%	1/10W	
R630	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R631	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R632	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R633	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R634	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R635	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R636	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R637	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R638	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R639	1-216-039-00	METAL CHIP	390	5%	1/10W	
R640	1-216-060-00	METAL CHIP	3K	5%	1/10W	
R641	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R642	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R643	1-216-078-00	METAL CHIP	16K	5%	1/10W	
R644	1-216-088-00	METAL CHIP	43K	5%	1/10W	
R645	1-216-030-00	METAL CHIP	160	5%	1/10W	
R646	1-216-030-00	METAL CHIP	160	5%	1/10W	
R647	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R648	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R649	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R650	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R652	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R663	1-216-070-00	METAL CHIP	7.5K	5%	1/10W	
R664	1-216-050-00	METAL CHIP	1.1K	5%	1/10W	
R666	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R667	⚠1-532-685-00	LINK, IC (ICP-N20)				
R670	1-216-068-00	METAL CHIP	6.2K	5%	1/10W	
R671	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R672	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R673	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R677	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R678	1-216-042-00	METAL CHIP	510	5%	1/10W	
R679	1-216-042-00	METAL CHIP	510	5%	1/10W	
R680	1-216-042-00	METAL CHIP	510	5%	1/10W	
R701	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R702	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R703	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R704	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R705	1-215-465-00	METAL	68K	1%	1/6W	
R706	1-215-425-00	METAL	1.5K	1%	1/6W	
R707	1-215-658-00	METAL	1.5	1%	1/4W	
R708	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R709	1-216-041-00	METAL CHIP	470	5%	1/10W	
R710	1-215-451-00	METAL	18K	1%	1/6W	

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

Ref.No.	Part No.	Description				Remark
R711	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R712	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R713	1-216-082-00	METAL CHIP	24K	5%	1/10W	
R714	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R715	1-216-066-00	METAL CHIP	5.1K	5%	1/10W	
R716	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R717	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R719	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R720	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R721	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R722	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R723	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R724	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R725	1-216-109-00	METAL CHIP	330K	5%	1/10W	
R726	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R727	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R728	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R729	1-215-446-00	METAL	11K	1%	1/6W	
R730	1-214-996-00	METAL	0.47	1%	1/4W	
R731	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R732	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R733	1-214-970-00	METAL	1.8M	1%	1/4W	
R734	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R735	1-214-961-00	METAL	750K	1%	1/4W	
R736	1-215-474-00	METAL	160K	1%	1/6W	
R737	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R738	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R739	1-216-037-00	METAL CHIP	330	5%	1/10W	
R740	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R741	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R742	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R743	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R744	1-214-963-00	METAL	910K	1%	1/4W	
R745	1-215-461-00	METAL	47K	1%	1/6W	
R746	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R747	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R748	1-216-037-00	METAL CHIP	330	5%	1/10W	
R749	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R750	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R752	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R753	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R754	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R755	1-216-119-00	METAL CHIP	820K	5%	1/10W	
R756	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R757	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R758	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R759	1-215-469-00	METAL	100K	1%	1/6W	
R760	1-214-953-00	METAL	360K	1%	1/4W	
R762	1-215-453-00	METAL	22K	1%	1/6W	
R763	1-215-414-00	METAL	510	1%	1/6W	
R764	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R765	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R766	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R767	1-214-966-00	METAL	1.2M	1%	1/4W	
R831	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R851	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R852	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R855	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R856	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R857	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R859	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R865	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R866	1-216-041-00	METAL CHIP	470	5%	1/10W	
R867	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R871	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R872	1-216-043-00	METAL CHIP	560	5%	1/10W	
R873	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R874	1-215-430-00	METAL	2.4K	1%	1/6W	
R875	1-215-439-00	METAL	5.6K	1%	1/6W	
R876 ⚠	1-532-637-00	LINK, IC (ICP-N25)				

VARIABLE RESISTOR

RV007	1-226-702-00	RES, ADJ, METAL GLAZE	2.2K
RV008	1-226-771-00	RES, ADJ, METAL GLAZE	1K
RV151	1-226-776-00	RES, ADJ, METAL GLAZE	220K
RV152	1-226-773-00	RES, ADJ, METAL GLAZE	22K
RV153	1-226-773-00	RES, ADJ, METAL GLAZE	22K
RV154	1-226-774-00	RES, ADJ, METAL GLAZE	47K
RV155	1-226-774-00	RES, ADJ, METAL GLAZE	47K
RV156	1-226-770-00	RES, ADJ, METAL GLAZE	470
RV501	1-226-753-00	RES, ADJ, SOLID	47K
RV502	1-226-710-00	RES, ADJ, SOLID	10K
RV503	1-226-711-00	RES, ADJ, SOLID	22K
RV504	1-226-709-00	RES, ADJ, SOLID	4.7K
RV505	1-226-710-00	RES, ADJ, SOLID	10K
RV506	1-226-710-00	RES, ADJ, SOLID	10K
RV507	1-226-709-00	RES, ADJ, SOLID	4.7K
RV508	1-226-706-00	RES, ADJ, SOLID	470
RV509	1-226-707-00	RES, ADJ, SOLID	1K
RV510	1-226-709-00	RES, ADJ, SOLID	4.7K
RV511	1-226-753-00	RES, ADJ, SOLID	47K
RV512	1-226-753-00	RES, ADJ, SOLID	47K
RV513	1-226-710-00	RES, ADJ, SOLID	10K
RV514	1-226-710-00	RES, ADJ, SOLID	10K
RV515	1-226-711-00	RES, ADJ, SOLID	22K
RV516	1-226-702-00	RES, ADJ, METAL GLAZE	2.2K
RV517	1-226-702-00	RES, ADJ, METAL GLAZE	2.2K
RV518	1-226-702-00	RES, ADJ, METAL GLAZE	2.2K
RV519	1-226-702-00	RES, ADJ, METAL GLAZE	2.2K
RV521	1-226-709-00	RES, ADJ, SOLID	4.7K
RV522	1-226-709-00	RES, ADJ, SOLID	4.7K
RV523	1-226-709-00	RES, ADJ, SOLID	4.7K
RV524	1-226-711-00	RES, ADJ, SOLID	22K
RV525	1-226-711-00	RES, ADJ, SOLID	22K
RV526	1-226-708-00	RES, ADJ, SOLID	2.2K
RV701	1-226-770-00	RES, ADJ, METAL GLAZE	470

NOTE:

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

VC-2 GC-3 GC-4 GC-5

Ref.No.	Part No.	Description	Remark
RV702	1-226-715-00	RES, ADJ, SOLID 470K	
RV703	1-226-769-00	RES, ADJ, METAL GLAZE 100	
RV704	1-226-753-00	RES, ADJ, SOLID 47K	
RV705	1-226-701-00	RES, ADJ, METAL GLAZE 220	
RV706	1-226-777-00	RES, ADJ, METAL GLAZE 1M	
RV707	1-226-704-00	RES, ADJ, METAL GLAZE 470K	
RV708	1-226-703-00	RES, ADJ, METAL GLAZE 10K	
RV709	1-226-776-00	RES, ADJ, METAL GLAZE 220K	
RV710	1-226-704-00	RES, ADJ, METAL GLAZE 470K	
RV711	1-226-703-00	RES, ADJ, METAL GLAZE 10K	
RV712	1-226-704-00	RES, ADJ, METAL GLAZE 470K	
RV851	1-226-771-00	RES, ADJ, METAL GLAZE 1K	
		SR BLOCK	
SR701⚠	1-464-276-00	SR BLOCK	
		TRANSFORMER	
T701	1-433-260-00	TRANSFORMER, COUPLING (H)	
T702	1-433-261-00	TRANSFORMER, COUPLING (V)	
		CRYSTAL	
X651	1-567-158-00	VIBRATOR, CRYSTAL	

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♣:	A-7513-005-A	GC-3 BOARD, COMPLETE **********	
		CAPACITOR	
C657	1-163-019-00	CERAMIC CHIP 0.0068MF 10% 50V	
C658	1-163-222-00	CERAMIC CHIP 5PF 0.25PF 50V	
C659	1-163-235-00	CERAMIC CHIP 22PF 5% 50V	
C665	1-124-254-00	ELECT 0.68MF 20% 50V	
C851	1-131-387-00	TANTALUM 47MF 10% 6.3V	
C855	1-163-259-00	CERAMIC CHIP 220PF 5% 50V	
C856	1-163-259-00	CERAMIC CHIP 220PF 5% 50V	
		TRIMMER	
CT651	1-141-246-00	CAP, TRMIIER	
		DIODE	
D651	8-712-500-00	DIODE 1T25	
D852	8-719-105-90	DIODE RD5.6M-B1	
		IC	
IC651	8-759-193-58	IC UPC358G	
		COIL	
L851	1-408-429-00	MICRO INDUCTOR 470UH	
L852	1-408-613-00	MICRO INDUCTOR 68UH	
L853	1-408-613-00	MICRO INDUCTOR 68UH	
		RESISTOR	
R657	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R658	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R659	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R660	1-216-044-00	METAL CHIP 620 5% 1/10W	
R661	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R662	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R665	1-216-044-00	METAL CHIP 620 5% 1/10W	
R668	1-216-047-00	METAL CHIP 820 5% 1/10W	
R669	1-216-047-00	METAL CHIP 820 5% 1/10W	
R853	1-216-050-00	METAL CHIP 1.1K 5% 1/10W	
R854	1-216-050-00	METAL CHIP 1.1K 5% 1/10W	
R860	1-216-035-00	METAL CHIP 270 5% 1/10W	
R861	1-216-035-00	METAL CHIP 270 5% 1/10W	
		CRYSTAL	
X652	1-567-157-00	VIBRATOR, CRYSTAL	

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♣:	1-611-417-00	GC-4 BOARD **********	
		CAPACITOR	
C546	1-124-233-00	ELECT 10MF 20% 16V	
C547	1-124-233-00	ELECT 10MF 20% 16V	
C550	1-163-080-00	CERAMIC CHIP 0.047MF 10% 25V	
C551	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C555	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
		IC	
IC508	8-759-906-59	IC CX22017	
		TRANSISTOR	
Q513	8-729-100-66	TRANSISTOR 2SC1623	
Q514	8-729-100-66	TRANSISTOR 2SC1623	
		RESISTOR	
R578	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R579	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R580	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R581	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R586	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R589	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R618	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	

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♣:	1-611-418-00	GC-5 BOARD **********	
		CAPACITOR	
C517	1-124-233-00	ELECT 10MF 20% 16V	
C519	1-123-822-00	ELECT 47MF 20% 10V	
C520	1-124-231-00	ELECT 4.7MF 20% 16V	
C522	1-163-106-00	CERAMIC CHIP 36PF 5% 50V	
C581	1-163-081-00	CERAMIC CHIP 0.22MF 25V	
C664	1-124-233-00	ELECT 10MF 20% 16V	

NOTE:

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

Ref.No.	Part No.	Description				Remark
		IC				
IC503	8-759-906-47	IC CX20065				
IC504	8-759-905-85	IC CX10018				
		TRANSISTOR				
Q508	8-729-100-76	TRANSISTOR 2SA812				
Q651	8-729-100-66	TRANSISTOR 2SC1623				
		RESISTOR				
R537	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R538	1-216-045-00	METAL CHIP	680	5%	1/10W	
R539	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R540	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R541	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R542	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R544	1-215-659-00	METAL	5.1K	5%	1/8W	
R545	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R674	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R675	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R676	1-216-049-00	METAL CHIP	1K	5%	1/10W	
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	♣:1-610-553-00	FL-1 BOARD **********				
		CAPACITOR				
C571	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V	
		CONNECTOR				
CN507	♣:1-556-642-00	CONNECTOR ASSY (2.0MM) 3P				
		SWITCH				
S501	1-554-377-21	SWITCH, SLIDE				
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	♣:1-609-864-00	AU-3 BOARD **********				
		CAPACITOR				
C401	1-124-225-00	ELECT	100MF	20%	6.3V	
C402	1-163-009-00	CERAMIC CHIP	0.001MF	10%	50V	
C403	1-124-238-11	ELECT	4.7MF	20%	25V	
C404	1-124-257-00	ELECT	2.2MF	20%	50V	
C405	1-124-253-00	ELECT	0.47MF	20%	50V	
C406	1-124-238-11	ELECT	4.7MF	20%	25V	
C407	1-163-011-00	CERAMIC CHIP	0.0015MF	10%	50V	
C408	1-123-647-00	ELECT	47MF	20%	6.3V	
C409	1-124-253-00	ELECT	0.47MF	20%	50V	
C410	1-124-238-11	ELECT	4.7MF	20%	25V	
C411	1-124-249-00	ELECT	0.1MF	20%	50V	
C412	1-130-489-00	MYLAR	0.033MF	5%	50V	
C413	1-163-011-00	CERAMIC CHIP	0.0015MF	10%	50V	
C414	1-124-255-00	ELECT	1MF	20%	50V	
C415	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C416	1-124-140-00	ELECT	220MF	20%	10V	
C417	1-124-169-00	ELECT	100MF	20%	10V	
C418	1-124-238-11	ELECT	4.7MF	20%	25V	
C419	1-124-222-00	ELECT	22MF	20%	6.3V	
C420	1-123-647-00	ELECT	47MF	20%	6.3V	
C421	1-124-253-00	ELECT	0.47MF	20%	50V	
C430	1-163-011-00	CERAMIC CHIP	0.0015MF	10%	50V	
C432	1-163-078-00	CERAMIC CHIP	0.033MF	10%	25V	
C433	1-163-078-00	CERAMIC CHIP	0.033MF	10%	25V	
		CONNECTOR				
CN401	♣:1-564-004-00	PIN, CONNECTOR 5P				
CN402	♣:1-564-005-00	PIN, CONNECTOR 6P				
CN403	♣:1-564-004-00	PIN, CONNECTOR 5P				
CN407	♣:1-564-001-11	PIN, CONNECTOR 2P				
		DIODE				
D401	8-719-911-19	DIODE 1SS119				
		IC				
IC401	8-759-800-43	IC LA7043M				
		COIL				
L401	1-421-600-00	COIL, CHOKE (6.8MMH)				
		TRANSISTOR				
Q401	8-729-100-66	TRANSISTOR 2SC1623				
Q406	8-729-100-66	TRANSISTOR 2SC1623				
Q407	8-729-100-66	TRANSISTOR 2SC1623				
		RESISTOR				
R401	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R402	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R403	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R404	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R405	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R406	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R407	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R408	1-216-022-00	METAL CHIP	75	5%	1/10W	
R409	1-216-025-00	METAL CHIP	100	5%	1/10W	
R411	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R412	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R413	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R414	1-216-111-00	METAL CHIP	390K	5%	1/10W	
R415	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R418	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R424	1-216-097-00	METAL CHIP	100K	5%	1/10W	

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

AU-3 AU-4 SS-17

Ref.No.	Part No.	Description				Remark
R425	1-216-094-00	METAL CHIP	75K	5%	1/10W	
R426	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R427	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R428	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R429	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R437	1-216-097-00	METAL CHIP	100K	5%	1/10W	
		VARIABLE RESISTOR				
RV401	1-226-703-00	RES, ADJ, METAL GLAZE 10K				
		SWITCH				
S401	1-554-364-00	SWITCH, SLIDE				

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♣	1-609-865-00	AU-4 BOARD				
		**********				
		CAPACITOR				
C422	1-107-177-00	MICA	220PF	5%	500V	
C423	1-130-486-51	MYLAR	0.018MF	5%	50V	
C424	1-130-485-00	MYLAR	0.015MF	5%	50V	
C425	1-130-485-00	MYLAR	0.015MF	5%	50V	
C426	1-124-233-00	ELECT	10MF	20%	16V	
C427	1-107-177-00	MICA	220PF	5%	500V	
C428	1-130-303-00	FILM	0.018MF	5%	100V	
C429	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C431	1-163-009-00	CERAMIC CHIP	0.001MF	10%	50V	
C435	1-123-647-00	ELECT	47MF	20%	6.3V	
		CONNECTOR				
CN404	♣:1-564-001-11	PIN, CONNECTOR 2P				
CN405	♣:1-564-001-11	PIN, CONNECTOR 2P				
		COIL				
L402	1-421-601-00	COIL, CHOKE (27MMH)				
L403	1-408-429-00	MICRO INDUCTOR 470UH				
		TRANSISTOR				
Q402	8-729-100-66	TRANSISTOR 2SC1623				
Q403	8-729-100-66	TRANSISTOR 2SC1623				
Q404	8-729-100-66	TRANSISTOR 2SC1623				
Q405	8-729-100-66	TRANSISTOR 2SC1623				
Q408	8-729-100-66	TRANSISTOR 2SC1623				
Q409	8-729-100-76	TRANSISTOR 2SA812				
Q410	8-729-103-52	TRANSISTOR 2SC1654				
Q411	8-729-103-52	TRANSISTOR 2SC1654				
		RESISTOR				
R416	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R417	1-216-001-00	METAL CHIP	10	5%	1/10W	
R419	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R420	1-216-089-00	METAL CHIP	47K	5%	1/10W	

Ref.No.	Part No.	Description				Remark
R421	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R422	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R423	1-216-001-00	METAL CHIP	10	5%	1/10W	
R430	1-216-088-00	METAL CHIP	43K	5%	1/10W	
R431	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R432	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R433	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R434	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R435	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R436	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
		VARIABLE RESISTOR				
RV403	1-226-776-00	RES, ADJ, METAL GLAZE 220K				
		TRANSFORMER				
T401	1-433-271-00	TRANSFORMER, BIAS OSCILLATOR				

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♣	A-6717-339-A	SS-17 BOARD, COMPLETE				
		**********				
♣	3-662-075-00	COVER, CONTROL				
		CAPACITOR				
C201	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V	
C202	1-124-227-11	ELECT	10MF	20%	10V	
C203	1-130-491-00	MYLAR	0.047MF	5%	50V	
C204	1-163-009-00	CERAMIC CHIP	0.001MF	10%	50V	
C205	1-131-344-00	TANTALUM	0.33MF	20%	35V	
C206	1-163-078-00	CERAMIC CHIP	0.033MF	10%	25V	
C207	1-124-233-00	ELECT	10MF	20%	16V	
C208	1-124-233-00	ELECT	10MF	20%	16V	
C209	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V	
C210	1-130-494-51	MYLAR	0.082MF	5%	50V	
C211	1-163-009-00	CERAMIC CHIP	0.001MF	10%	50V	
C212	1-130-489-00	MYLAR	0.033MF	5%	50V	
C213	1-124-253-00	ELECT	0.47MF	20%	50V	
C214	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V	
C215	1-130-479-00	MYLAR	0.0047MF	5%	50V	
C216	1-161-772-11	CERAMIC	0.1MF	10%	25V	
C217	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C218	1-124-169-00	ELECT	100MF	20%	10V	
C219	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C220	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C221	1-124-231-00	ELECT	4.7MF		16V	
C222	1-124-243-11	ELECT	2.2MF	20%	35V	
C223	1-124-227-11	ELECT	10MF	20%	10V	
C224	1-124-243-11	ELECT	2.2MF	20%	35V	
C225	1-163-080-00	CERAMIC CHIP	0.047MF	10%	25V	
C228	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C229	1-124-234-00	ELECT	22MF	20%	16V	
C301	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C302	1-130-476-00	MYLAR	0.0027MF	5%	50V	

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

Ref.No.	Part No.	Description			Remark
C303	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C304	1-124-255-00	ELECT	1MF	20% 50V	
C305	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C306	1-124-255-00	ELECT	1MF	20% 50V	
C307	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C308	1-130-476-00	MYLAR	0.0027MF	5% 50V	
C309	1-163-038-00	CERAMIC CHIP	0.1MF	25V	
C311	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C312	1-163-038-00	CERAMIC CHIP	0.1MF	25V	
C313	1-124-255-00	ELECT	1MF	20% 50V	
C314	1-124-255-00	ELECT	1MF	20% 50V	
C315	1-124-168-00	ELECT	100MF	20% 16V	
C317	1-163-081-00	CERAMIC CHIP	0.22MF	25V	
C318	1-163-104-00	CERAMIC CHIP	30PF	5% 50V	
C319	1-163-104-00	CERAMIC CHIP	30PF	5% 50V	
C320	1-163-037-00	CERAMIC CHIP	0.022MF	10% 25V	
C321	1-163-037-00	CERAMIC CHIP	0.022MF	10% 25V	
C326	1-131-408-00	TANTALUM	1MF	20% 25V	
C327	1-131-408-00	TANTALUM	1MF	20% 25V	
C328	1-131-408-00	TANTALUM	1MF	20% 25V	
C329	1-131-408-00	TANTALUM	1MF	20% 25V	
C330	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C331	1-163-037-00	CERAMIC CHIP	0.022MF	10% 25V	
C332	1-163-017-00	CERAMIC CHIP	0.0047MF	10% 50V	
C333	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C335	1-163-075-00	CERAMIC CHIP	0.047MF	50V	
C336	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C337	1-124-233-00	ELECT	10MF	20% 16V	
C338	1-131-380-00	TANTALUM	33MF	10% 10V	
C340	1-131-368-00	TANTALUM	3.3MF	10% 16V	

CONNECTOR

CN201	★1-564-012-00	PIN, CONNECTOR	2P
CN202	★1-564-001-11	PIN, CONNECTOR	2P
CN203	★1-564-012-00	PIN, CONNECTOR	2P
CN204	★1-564-001-11	PIN, CONNECTOR	2P
CN205	★1-564-001-11	PIN, CONNECTOR	2P
CN206	★1-564-002-00	PIN, CONNECTOR	3P
CN207	★1-564-013-00	PIN, CONNECTOR	3P
CN301	★1-564-016-00	PIN, CONNECTOR	6P
CN302	★1-564-002-00	PIN, CONNECTOR	3P
CN303	★1-564-001-11	PIN, CONNECTOR	2P
CN305	★1-564-001-11	PIN, CONNECTOR	2P
CN306	★1-564-003-00	PIN, CONNECTOR	4P
CN307	★1-564-003-00	PIN, CONNECTOR	4P
CN308	★1-564-005-00	PIN, CONNECTOR	6P
CN309	★1-564-001-11	PIN, CONNECTOR	2P
CN310	★1-564-002-00	PIN, CONNECTOR	3P
CN311	★1-564-002-00	PIN, CONNECTOR	3P
CN312	★1-564-002-00	PIN, CONNECTOR	3P
CN313	★1-564-020-00	PIN, CONNECTOR	10P
CN314	★1-564-001-11	PIN, CONNECTOR	2P
CN316	★1-564-002-00	PIN, CONNECTOR	3P

Ref.No.	Part No.	Description	Remark
		DIODE	
D202	8-719-200-27	DIODE E10DS2	
D301	8-719-911-19	DIODE 1SS119	
D302	=>8-719-910-68	DIODE HZ602L	
D303	8-719-200-27	DIODE E10DS2	
D304	8-719-200-27	DIODE E10DS2	
D305	8-719-200-27	DIODE E10DS2	
D306	8-719-200-27	DIODE E10DS2	
D307	8-719-100-03	DIODE 1S2835	
D308	8-719-200-27	DIODE E10DS2	
D309	8-719-200-27	DIODE E10DS2	
D310	8-719-200-27	DIODE E10DS2	
D311	8-719-200-27	DIODE E10DS2	
D312	8-719-200-27	DIODE E10DS2	
D313	8-719-100-03	DIODE 1S2835	
D314	8-719-100-03	DIODE 1S2835	
D315	8-719-100-66	DIODE RD12E-B3	
D316	8-719-100-05	DIODE 1S2837	
		CONVERTER	
DR301	1-464-269-00	CONVERTER, DC-DC	
		IC	
IC201	8-759-601-86	IC CX186	
IC202	8-759-100-94	IC UPC358G2	
IC301	8-759-909-65	IC MB88501-167N	
IC302	8-759-100-93	IC UPC393G2	
		COIL	
L201	1-408-450-11	MICRO INDUCTOR	47UH
L203	1-407-847-00	MICRO INDUCTOR	35UH
L301	1-408-462-11	MICRO INDUCTOR	470UH
L302	1-408-450-11	MICRO INDUCTOR	47UH
		TRANSISTOR	
Q201	8-729-100-66	TRANSISTOR	2SC1623
Q202	8-729-100-76	TRANSISTOR	2SA812
Q203	8-729-100-66	TRANSISTOR	2SC1623
Q204	8-729-100-66	TRANSISTOR	2SC1623
Q205	8-729-100-76	TRANSISTOR	2SA812
Q210	8-729-100-76	TRANSISTOR	2SA812
Q211	8-729-100-66	TRANSISTOR	2SC1623
Q212	8-729-100-66	TRANSISTOR	2SC1623
Q213	8-729-100-66	TRANSISTOR	2SC1623
Q214	8-729-100-66	TRANSISTOR	2SC1623
Q215	8-729-100-66	TRANSISTOR	2SC1623
Q217	8-729-199-92	TRANSISTOR	2SD999
Q218	8-729-199-92	TRANSISTOR	2SD999
Q219	8-729-100-76	TRANSISTOR	2SA812
Q220	8-729-100-76	TRANSISTOR	2SA812
Q301	8-729-100-66	TRANSISTOR	2SC1623
Q302	8-729-100-66	TRANSISTOR	2SC1623

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

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Ref.No.	Part No.	Description	Remark
Q303	8-729-100-76	TRANSISTOR 2SA812	
Q304	8-729-100-76	TRANSISTOR 2SA812	
Q306	8-729-100-76	TRANSISTOR 2SA812	
Q307	=>8-729-245-83	TRANSISTOR 2SC2458	
Q308	8-729-100-66	TRANSISTOR 2SC1623	
Q309	8-729-100-66	TRANSISTOR 2SC1623	
Q310	8-729-104-36	TRANSISTOR 2SB1040	
Q311	8-729-100-76	TRANSISTOR 2SA812	
Q312	8-729-100-66	TRANSISTOR 2SC1623	
Q313	8-729-102-78	TRANSISTOR 2SB962	
Q314	8-729-100-76	TRANSISTOR 2SA812	
Q315	8-729-100-66	TRANSISTOR 2SC1623	
Q316	8-729-101-07	TRANSISTOR 2SB798	
Q317	8-729-100-76	TRANSISTOR 2SA812	
Q318	8-729-100-66	TRANSISTOR 2SC1623	
Q319	8-729-101-07	TRANSISTOR 2SB798	
Q320	8-729-100-76	TRANSISTOR 2SA812	
Q321	8-729-100-66	TRANSISTOR 2SC1623	
Q322	8-729-102-78	TRANSISTOR 2SB962	
Q323	8-729-100-76	TRANSISTOR 2SA812	
Q324	8-729-100-76	TRANSISTOR 2SA812	
Q325	8-729-100-76	TRANSISTOR 2SA812	
Q326	8-729-100-76	TRANSISTOR 2SA812	
Q328	8-729-199-92	TRANSISTOR 2SD999	
Q329	8-729-101-07	TRANSISTOR 2SB798	
Q331	8-729-199-92	TRANSISTOR 2SD999	
Q332	8-729-101-07	TRANSISTOR 2SB798	
Q333	8-729-100-66	TRANSISTOR 2SC1623	
Q334	8-729-100-76	TRANSISTOR 2SA812	
Q335	8-729-100-76	TRANSISTOR 2SA812	
Q336	8-729-100-66	TRANSISTOR 2SC1623	
Q338	8-729-100-66	TRANSISTOR 2SC1623	
Q339	8-729-100-76	TRANSISTOR 2SA812	
Q340	8-729-100-76	TRANSISTOR 2SA812	
Q341	8-729-100-76	TRANSISTOR 2SA812	
Q342	8-729-100-66	TRANSISTOR 2SC1623	
Q343	8-729-100-66	TRANSISTOR 2SC1623	
Q344	8-729-100-66	TRANSISTOR 2SC1623	

RESISTOR

Ref.No.	Part No.	Description			Remark
R201	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R202	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R203	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R204	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R205	1-216-085-00	METAL CHIP	33K	5% 1/10W	
R206	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R207	1-216-075-00	METAL CHIP	12K	5% 1/10W	
R208	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	
R209	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R210	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R211	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R212	1-216-129-00	METAL CHIP	2.2M	5% 1/10W	
R213	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	
R214	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R215	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R216	1-215-465-00	METAL	68K	1% 1/6W	
R217	1-216-085-00	METAL CHIP	33K	5% 1/10W	
R218	1-215-469-00	METAL	100K	1% 1/6W	
R219	1-216-093-00	METAL CHIP	68K	5% 1/10W	
R220	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R221	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R222	1-216-111-00	METAL CHIP	390K	5% 1/10W	
R223	1-216-095-00	METAL CHIP	82K	5% 1/10W	
R224	1-216-095-00	METAL CHIP	82K	5% 1/10W	
R225	1-216-053-00	METAL CHIP	1.5K	5% 1/10W	
R227	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R228	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R229	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R230	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	
R231	1-216-077-00	METAL CHIP	15K	5% 1/10W	
R232	1-216-060-00	METAL CHIP	3K	5% 1/10W	
R233	1-216-056-00	METAL CHIP	2K	5% 1/10W	
R234	1-216-056-00	METAL CHIP	2K	5% 1/10W	
R235	1-216-121-00	METAL CHIP	1M	5% 1/10W	
R236	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	
R237	1-216-077-00	METAL CHIP	15K	5% 1/10W	
R238	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R239	1-216-099-00	METAL CHIP	120K	5% 1/10W	
R240	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R241	1-216-076-00	METAL CHIP	13K	5% 1/10W	
R242	1-216-036-00	METAL CHIP	300	5% 1/10W	
R243	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R244	1-216-082-00	METAL CHIP	24K	5% 1/10W	
R245	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R246	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R247	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R248	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R249	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R250	1-216-031-00	METAL CHIP	180	5% 1/10W	
R253	1-216-066-00	METAL CHIP	5.1K	5% 1/10W	
R254	1-216-066-00	METAL CHIP	5.1K	5% 1/10W	
R255	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R256	1-246-446-00	CARBON	75	5% 1/4W	
R301	1-216-106-00	METAL CHIP	240K	5% 1/10W	
R302	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R303	1-216-055-00	METAL CHIP	1.8K	5% 1/10W	
R304	1-216-033-00	METAL CHIP	220	5% 1/10W	
R305	1-216-059-00	METAL CHIP	2.7K	5% 1/10W	
R306	1-216-071-00	METAL CHIP	8.2K	5% 1/10W	
R307	1-216-087-00	METAL CHIP	39K	5% 1/10W	
R308	1-216-093-00	METAL CHIP	68K	5% 1/10W	
R309	1-216-059-00	METAL CHIP	2.7K	5% 1/10W	
R310	1-216-065-00	METAL CHIP	4.7K	5% 1/10W	
R311	1-216-091-00	METAL CHIP	56K	5% 1/10W	
R312	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R313	1-216-087-00	METAL CHIP	39K	5% 1/10W	

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

Ref.No.	Part No.	Description				Remark
R314	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R315	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R316	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R317	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R318	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R319	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R320	1-216-298-00	METAL CHIP	2.2	5%	1/10W	
R321	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R322	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R323	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R324	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R325	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R326	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R327	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R328	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R329	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R330	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R331	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R332	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R333	1-216-047-00	METAL CHIP	820	5%	1/10W	
R334	1-216-084-00	METAL CHIP	30K	5%	1/10W	
R335	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R336	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R337	1-216-115-00	METAL CHIP	560K	5%	1/10W	
R338	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R339	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R340	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R341	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R342	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R343	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R344	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R345	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R346	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R347	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R348	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R349	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R350	1-216-045-00	METAL CHIP	680	5%	1/10W	
R351	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R352	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R353	1-216-041-00	METAL CHIP	470	5%	1/10W	
R354	1-247-821-00	CARBON	390	5%	1/6W	
R355	1-247-821-00	CARBON	390	5%	1/6W	
R356	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R357	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R358	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R359	1-246-455-00	CARBON	180	5%	1/4W	
R360	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R361	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R362	1-246-455-00	CARBON	180	5%	1/4W	
R363	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R364	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R365	1-246-455-00	CARBON	180	5%	1/4W	
R366	1-216-049-00	METAL CHIP	1K	5%	1/10W	

Ref.No.	Part No.	Description				Remark
R367	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R368	1-246-455-00	CARBON	180	5%	1/4W	
R369	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R370	1-216-037-00	METAL CHIP	330	5%	1/10W	
R371	1-216-045-00	METAL CHIP	680	5%	1/10W	
R372	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R373	1-216-045-00	METAL CHIP	680	5%	1/10W	
R374	1-216-045-00	METAL CHIP	680	5%	1/10W	
R375	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R376	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R377	1-216-035-00	METAL CHIP	270	5%	1/10W	
R378	1-216-035-00	METAL CHIP	270	5%	1/10W	
R379	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R380	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R381	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R382	1-216-046-00	METAL CHIP	750	5%	1/10W	
R383	⚠ 1-532-637-00	LINK, IC (ICP-M25)				
R384	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R385	1-216-046-00	METAL CHIP	750	5%	1/10W	
R386	1-216-046-00	METAL CHIP	750	5%	1/10W	
R387	1-216-111-00	METAL CHIP	390K	5%	1/10W	
R388	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R389	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R390	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R391	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R392	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R394	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R395	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R396	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R397	1-216-045-00	METAL CHIP	680	5%	1/10W	
R398	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R399	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R450	1-216-107-00	METAL CHIP	270K	5%	1/10W	
R451	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R452	1-216-107-00	METAL CHIP	270K	5%	1/10W	
R453	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R454	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R455	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R456	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R457	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R458	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R461	1-216-092-00	METAL CHIP	62K	5%	1/10W	
R462	1-216-115-00	METAL CHIP	560K	5%	1/10W	
R463	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R464	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R465	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R466	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R467	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R468	1-216-025-00	METAL CHIP	100	5%	1/10W	
R469	1-216-046-00	METAL CHIP	750	5%	1/10W	
R470	1-216-046-00	METAL CHIP	750	5%	1/10W	

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

SS-17 LM-12 DM-4 RD-8 SW-28 JK-2 TRANSLAION

Ref.No.	Part No.	Description	Remark
		VARIABLE RESISTOR	
RV201	1-228-760-00	RES, ADJ, METAL GLAZE 47K	
RV202	1-226-772-00	RES, ADJ, METAL GLAZE 4.7K	
RV301	1-226-703-00	RES, ADJ, METAL GLAZE 10K	
RV302	1-226-774-00	RES, ADJ, METAL GLAZE 47K	
RV303	1-226-774-00	RES, ADJ, METAL GLAZE 47K	
RV304	1-226-774-00	RES, ADJ, METAL GLAZE 47K	
RV305	1-226-774-00	RES, ADJ, METAL GLAZE 47K	
		CRYSTAL	
X301	1-567-192-00	OSCILLATOR, CERAMIC	
		**********	
	♣:1-609-855-00	LM-12 BOARD	
		**********	
		CAPACITOR	
C940	1-101-005-00	CERAMIC 0.022MF	50V
C941	1-101-005-00	CERAMIC 0.022MF	50V
		COIL	
L940	1-407-847-00	MICRO INDUCTOR 35UH	
		**********	
	♣:1-609-866-00	DM-4 BOARD	
		**********	
		CAPACITOR	
C920	1-101-005-00	CERAMIC 0.022MF	50V
C921	1-101-005-00	CERAMIC 0.022MF	50V
		COIL	
L920	1-407-847-00	MICRO INDUCTOR 35UH	
		**********	
	♣:1-609-860-00	RD-8 BOARD	
		**********	
		DIODE	
D901	8-719-921-03	DIODE GP-2S02B	
		TRANSISTOR	
Q901	8-729-102-78	TRANSISTOR 2SB962	
		**********	
	♣:1-610-180-00	SW-28 BOARD	
		**********	
	♣:3-670-095-00	HOLDER, LED	
	♣:3-681-570-00	HOLDER, LED	
	♣:3-682-518-00	CUSHION	
		DIODE	
D980	8-719-812-30	DIODE TL0123	
D981	8-719-812-31	DIODE TLR123	
D982	8-719-812-32	DIODE TLY123	
D983	8-719-812-31	DIODE TLR123	
		SWITCH	
S980	1-554-174-00	SWITCH, KEY BOARD	
S981	1-554-174-00	SWITCH, KEY BOARD	
		**********	
	♣:1-609-857-00	JK-2 BOARD	
		**********	
	♣:1-533-146-00	HOLDER, FUSE	
		CAPACITOR	
C901	1-124-233-00	ELECT 10MF 20%	16V
		CONNECTOR	
CN901	♣:1-564-002-00	PIN, CONNECTOR 3P	
CN902	♣:1-564-005-00	PIN, CONNECTOR 6P	
CN903	♣:1-564-004-00	PIN, CONNECTOR 5P	
		FUSE	
F901	⚠:1-532-350-00	FUSE, TIME-LAG T4A 250V	
		JACK	
J901	1-507-886-00	JACK, POWER	
J902	1-507-885-11	JACK, MINIATURE	
J903	1-507-884-00	JACK, STEREO MINIATURE	
J904	1-507-885-21	JACK, MINIATURE	
		RESISTOR	
R901	1-247-799-00	CARBON 47 5%	1/6W
		**********	
	♣:1-610-605-00	TRANSLATION BOARD	
		**********	
	2-523-713-00	TERMINAL	
		CAPACITOR	
C101	1-163-205-21	CERAMIC CHIP 0.001MF 10%	50V
		CONNECTOR	
CNP101	1-564-001-11	PIN, CONNECTOR 2P	
		TRANSISTOR	
Q101	8-729-700-06	TRANSISTOR NJM2056-4	

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

Ref.No.	Part No.	Description	Remark
		MISCELLANEOUS	
		**********	
	♣:1-556-970-00	CONNECTOR ASSY (2.0MM) 3P	
	1-562-325-00	SOCKET ASSY, IMAGE PICKUP TUBE	
	1-806-682-00	SENSOR, DEW CONDENSATION	
	8-814-165-01	MICROPHONE, BUILT-IN (C-2003)	
	8-814-173-00	MICROPHONE, BUILT-IN (CU11-01)	
	8-825-561-10	HEAD, ERAZE (EF254-21)	
	8-701-032-29	CT-3222	
M901	8-835-098-01	MOTOR, DC (DNR-6600A) (LOADING)	
M902	8-835-099-01	MOTOR, DC (MNR-5003A) (DRUM)	
PM901⚠	1-454-357-11	SOLENOID, PLUNGER (BRAKE)	
PM902⚠	1-454-357-21	SOLENOID, PLUNGER (PINCH)	
Q851 ⚠	8-729-177-22	TRANSISTOR 2SB772	
S301	1-554-582-00	SWITCH, MICRO (CASSETTE IN)	
S302	1-554-582-00	SWITCH, MICRO (CASSETTE DOWN)	
S303	1-554-581-00	SWITCH, MICRO (LOADING END)	
S930	1-554-561-00	SWITCH, TACT (REC)	
S931	1-554-560-00	SWITCH, SEESAW (ZOOM)	

****

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
A-6701-361-A	BELT ASSY, SHOULDER	
1-504-044-00	EARPHONE, MAGNETIC (ME-21)	
3-532-616-00	BAG, POLYETHYLENE	
3-681-680-00	COVER, MICROPHONE	
3-682-534-00	CUSHION (UPPER)	
3-682-535-00	CUSHION (LOWER)	
3-682-541-11	INDIVIDUAL CARTON	
3-682-561-00	PAD AEP	
3-773-534-11	MANUAL,INSTRUCTION(English) AEP, UK	
3-773-534-51	MANUAL,INSTRUCTION(French, Germany) AEP	
3-773-534-61	MANUAL,INSTRUCTION(Dutch, Swedish) AEP	
3-773-534-71	MANUAL,INSTRUCTION(Spanish, Italian) AEP	
3-773-534-81	MANUAL,INSTRUCTION(English, Arabic) E	
3-682-536-00	CUSHION(A), BLOCK (BMC-100PK)	
3-682-537-00	CUSHION(B), BLOCK (BMC-100PK)	
3-682-538-00	PAD (BMC-100PK)	
3-682-539-00	SPACER (BMC-100PK)	

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

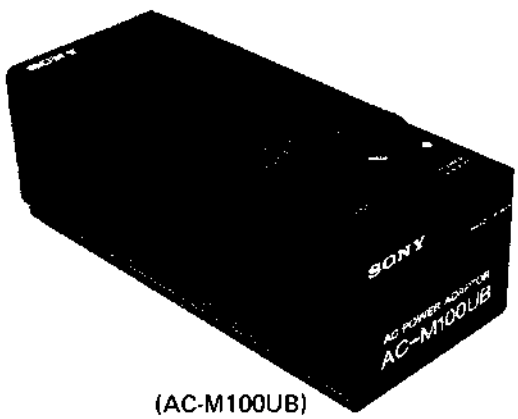
AC-M100E/M100UB/M110E

SERVICE MANUAL

AEP Model
(AC-M100E)

UK Model
(AC-M100UB)

E Model
(AC-M110E)



(AC-M100UB)

SPECIFICATIONS

Power requirements	110 – 240 V ac, 50/60 Hz
Power consumption	26 W
Output voltage	9.6 V dc
Output current	1.0 A
Charging voltage	14 V dc
Charging current	1.2 A
Rechargeable battery	NP-11
Operating temperatures	0°C to 40°C (32°F to 104°F)
Storage temperatures	–20°C to +65°C (–4°F to 149°F)
Dimensions	Approx. 88 × 78 × 212 mm (w/h/d) ($3\frac{1}{2} \times 3\frac{1}{8} \times 8\frac{3}{8}$ inches)
Weight	Approx. 1.1 kg (2 lb 7 oz) net
Cord length	Mains lead: Approx. 2.2 m (7.2 feet)
	DC OUT cord: Approx. 2 m (6.5 feet)
Supplied accessory	AC plug adaptor (1) . . . AC-M110E (E Model) only

AC POWER ADAPTOR

SONY

SECTION 1
OUTLINE

1-1. FEATURES

The AC-M100E/M100UB/M110E ac power adaptor is designed to enable the BMC-100 or BMC-100P Betamovie to operate from house current. It can also be used for charging the NP-11 battery pack.

1-2. PRECAUTIONS

On safety

● This ac power adaptor operates on 110–240 V ac without any voltage adaptation.

FOR AC-M100UB (UK MODEL)

IMPORTANT

The wires in the mains lead are coloured in accordance with the following code:

Blue: Neutral

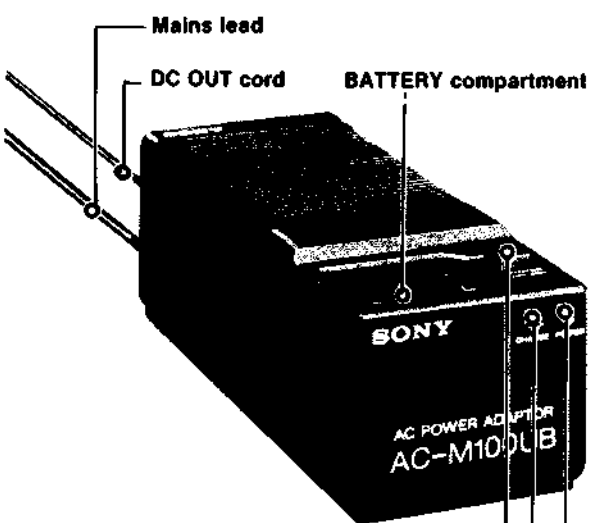
Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

1-3. LOCATION AND FUNCTION OF PARTS



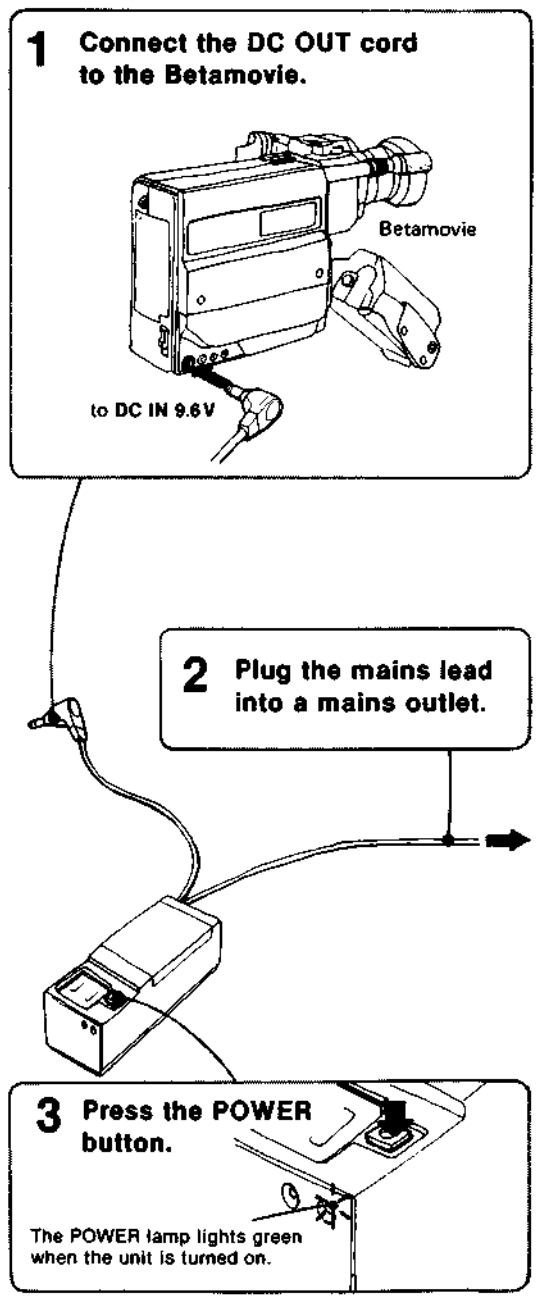
POWER button
Push down to turn the unit on.
If a battery pack is inserted, charging starts.

CHARGE lamp
Lights (orange) while the inserted battery pack is being charged.

POWER lamp
Lights (green) when the power is turned on.

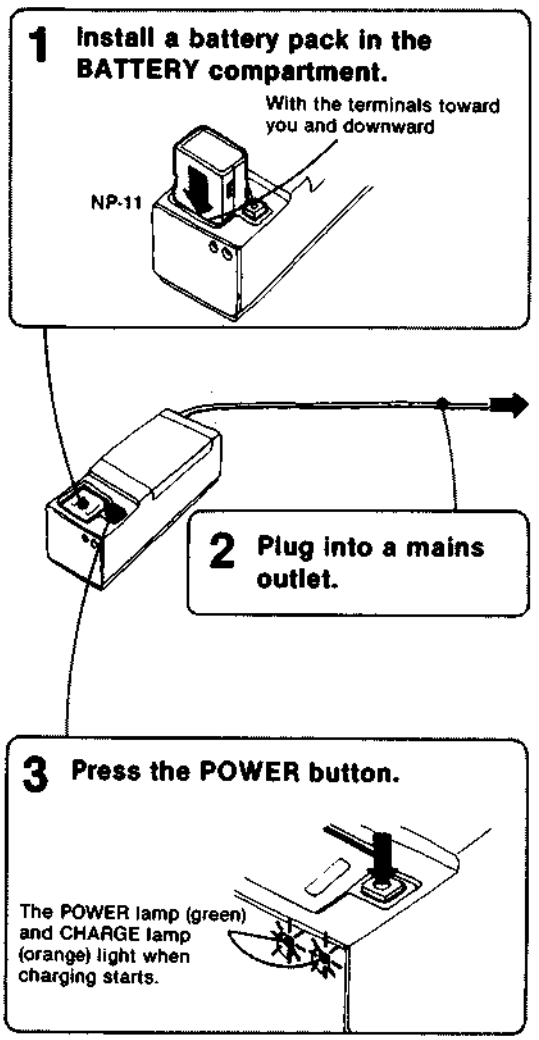
1-4. INSTRUCTION

AC POWER OPERATION OF THE BETAMOVIE



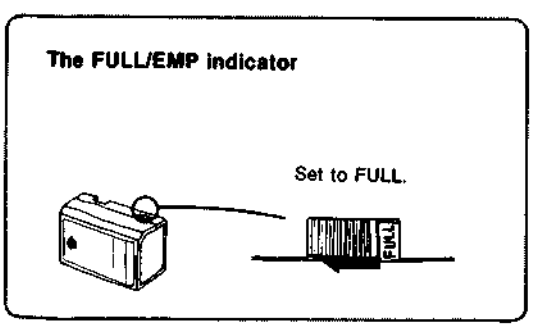
To turn the Betamovie on and off, press the POWER button of the Betamovie.

CHARGING THE BATTERY PACK



Charging time at normal temperature
NP-11: Approx. 1 hour

When the battery has been fully charged
The charging will stop automatically and the CHARGE lamp will go off.
Turn the adaptor off and remove the battery pack.



The charging temperature range
The battery pack can be charged from 5°C to 40°C (41°F to 104°F).

The Betamovie cannot be operated during charging.
If the POWER button is pressed when there is a battery pack in the BATTERY compartment, the adaptor is automatically set to the charging mode and power is not supplied to the Betamovie.

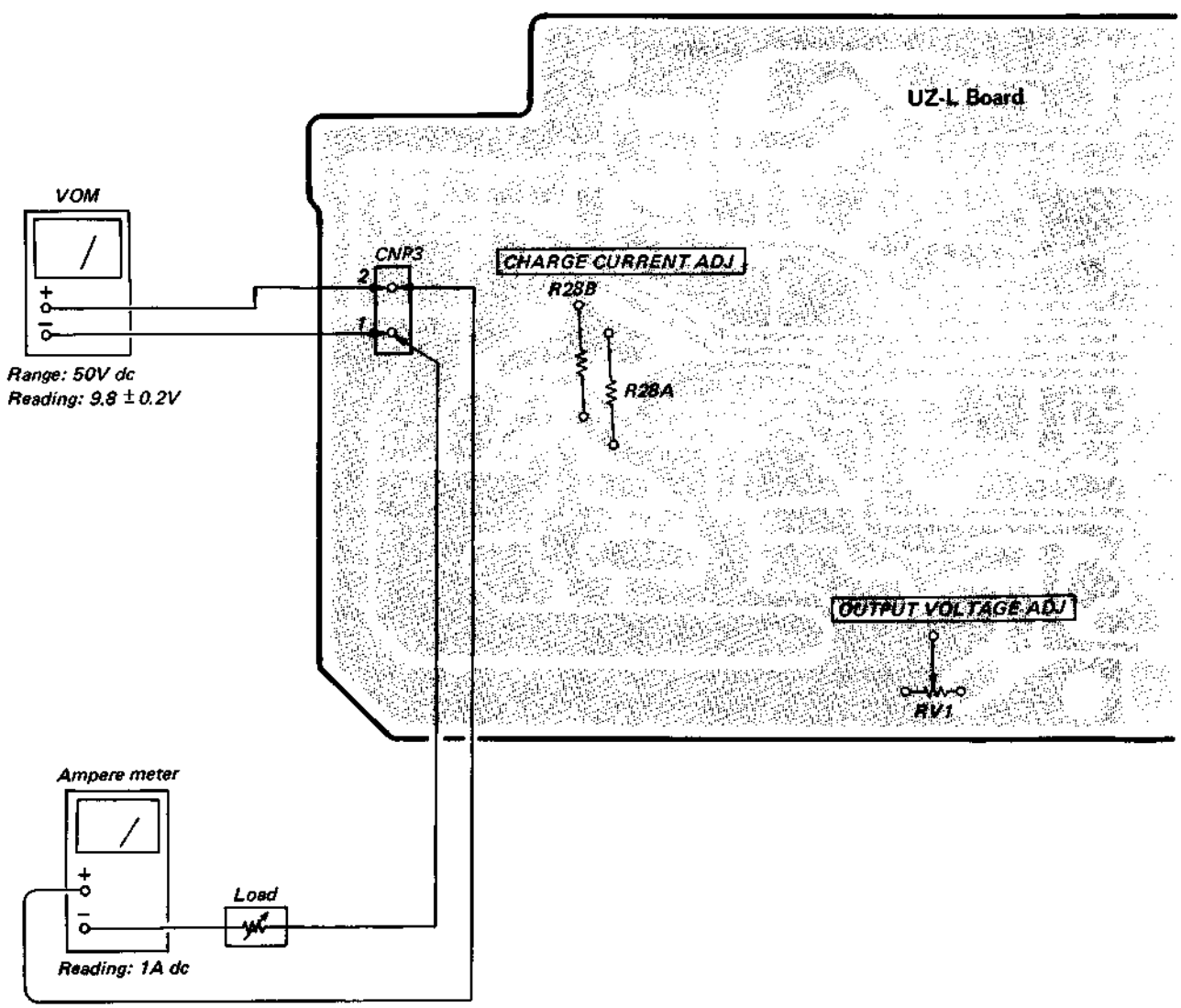
SECTION 2
ADJUSTMENTS

OUTPUT VOLTAGE ADJ

1) Connect a VOM and ampere meter as shown below.
2) Adjust RV1 for 9.8 ± 0.2V dc on the VOM.

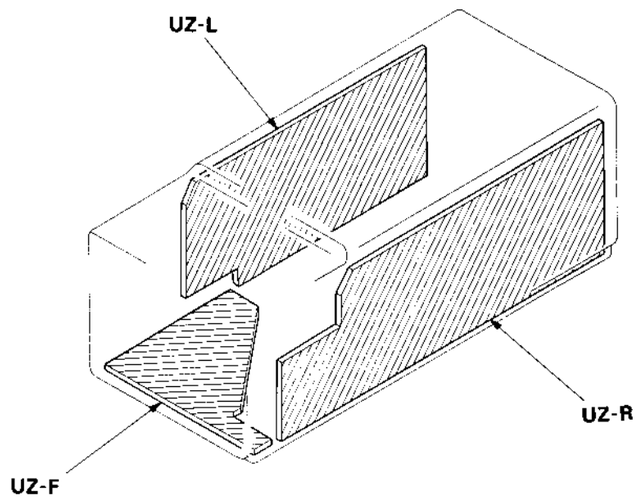
CHARGE CURRENT ADJ

1) Short-circuit between two battery terminals on UZ-F board.
2) Mount or disconnect a 12kΩ ¼W carbon resistor (R28B) as shown below, so that the charge current is 1.25 ± 0.2A.

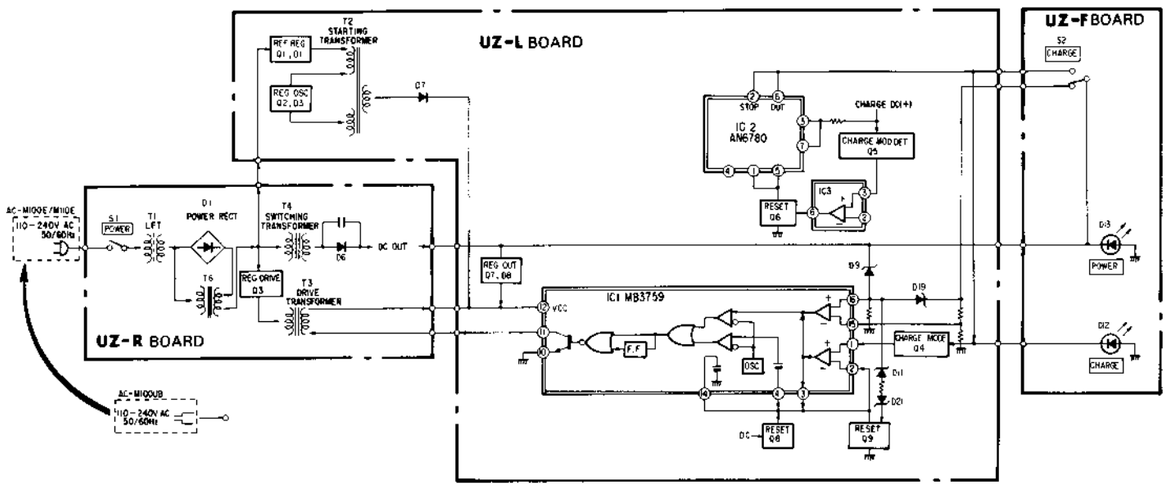


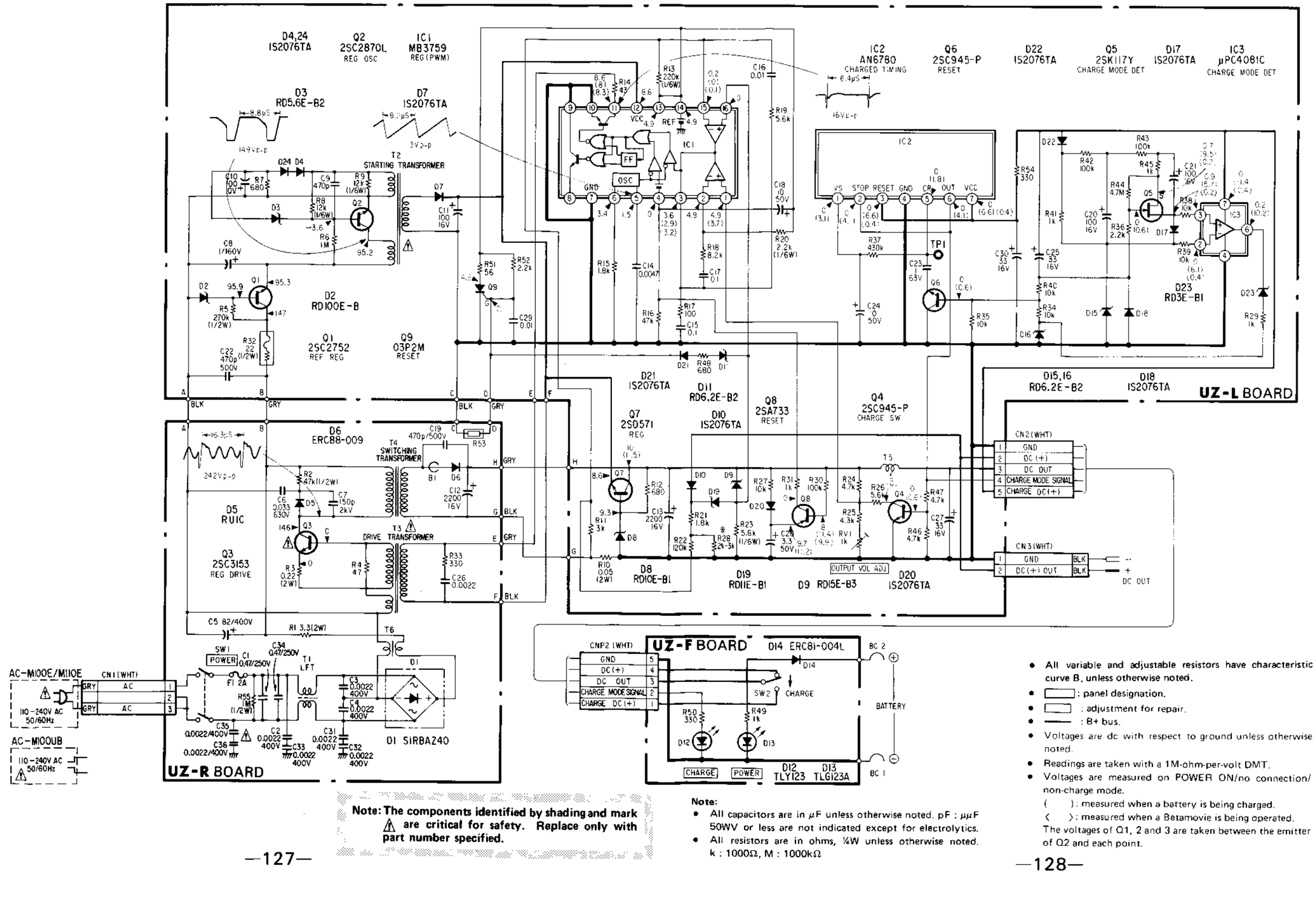
SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION



3-2. BLOCK DIAGRAM





Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

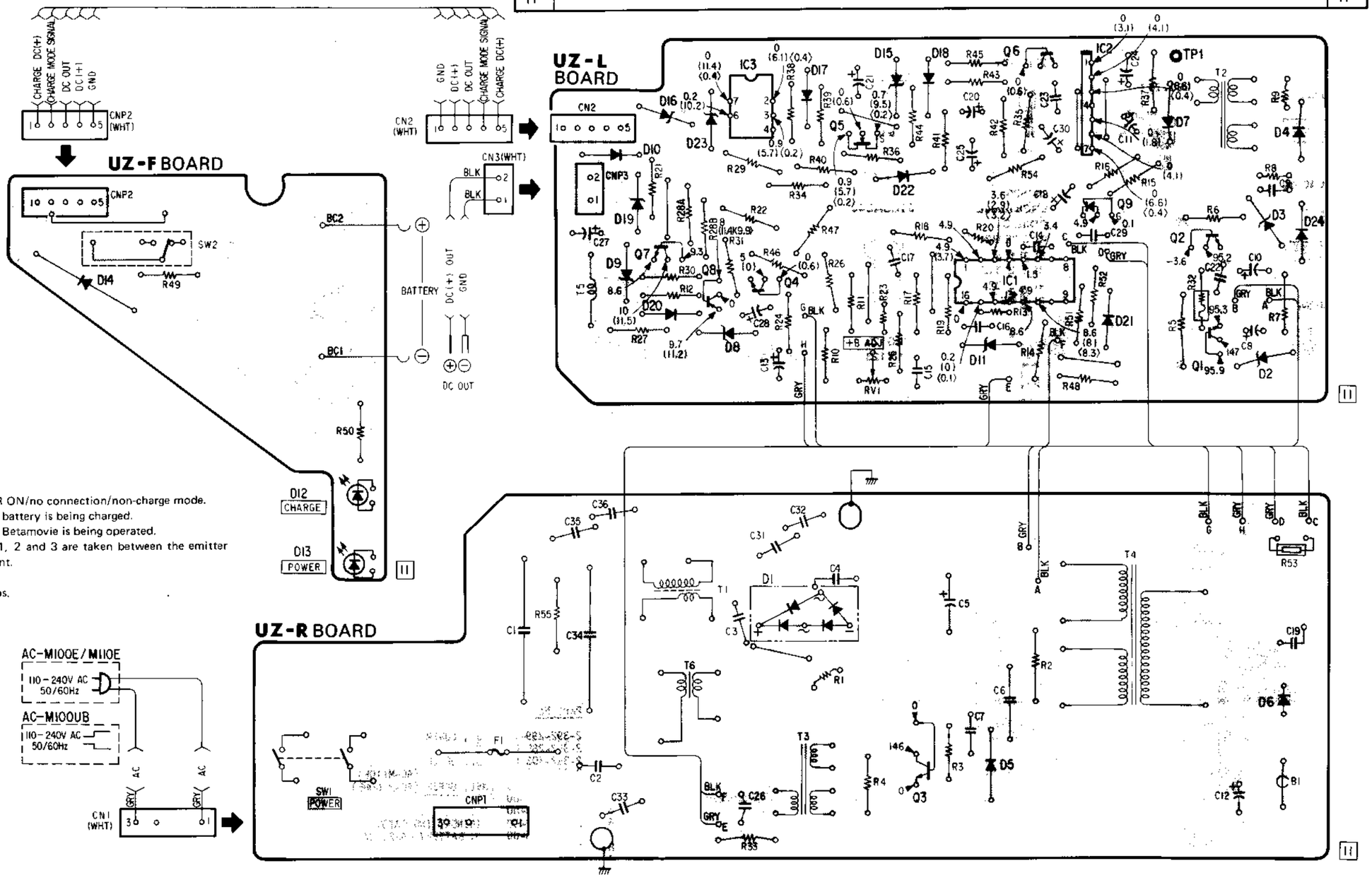
Note:

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics.
- All resistors are in ohms, ¼W unless otherwise noted. k : 1000Ω, M : 1000kΩ

- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- ——— : B+ bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a 1M-ohm-per-volt DMT.
- Voltages are measured on POWER ON/no connection/non-charge mode.
  ( ) : measured when a battery is being charged.
  〈 〉 : measured when a Betamovie is being operated.
  The voltages of Q1, 2 and 3 are taken between the emitter of Q2 and each point.

UZ-F **UZ-R** **UZ-L** **UZ-R**

Q IC	IC3: 7, 8, 4, 5 — IC1: 6 — IC2: 9, 1, 2	Q IC
D	10, 9, 19, 16, 20, 23, 8, 17, 15, 22, 18, 11, 21, 7, 2, 3, 4, 24	D
ADJ	RV1	ADJ
TP	1	TP

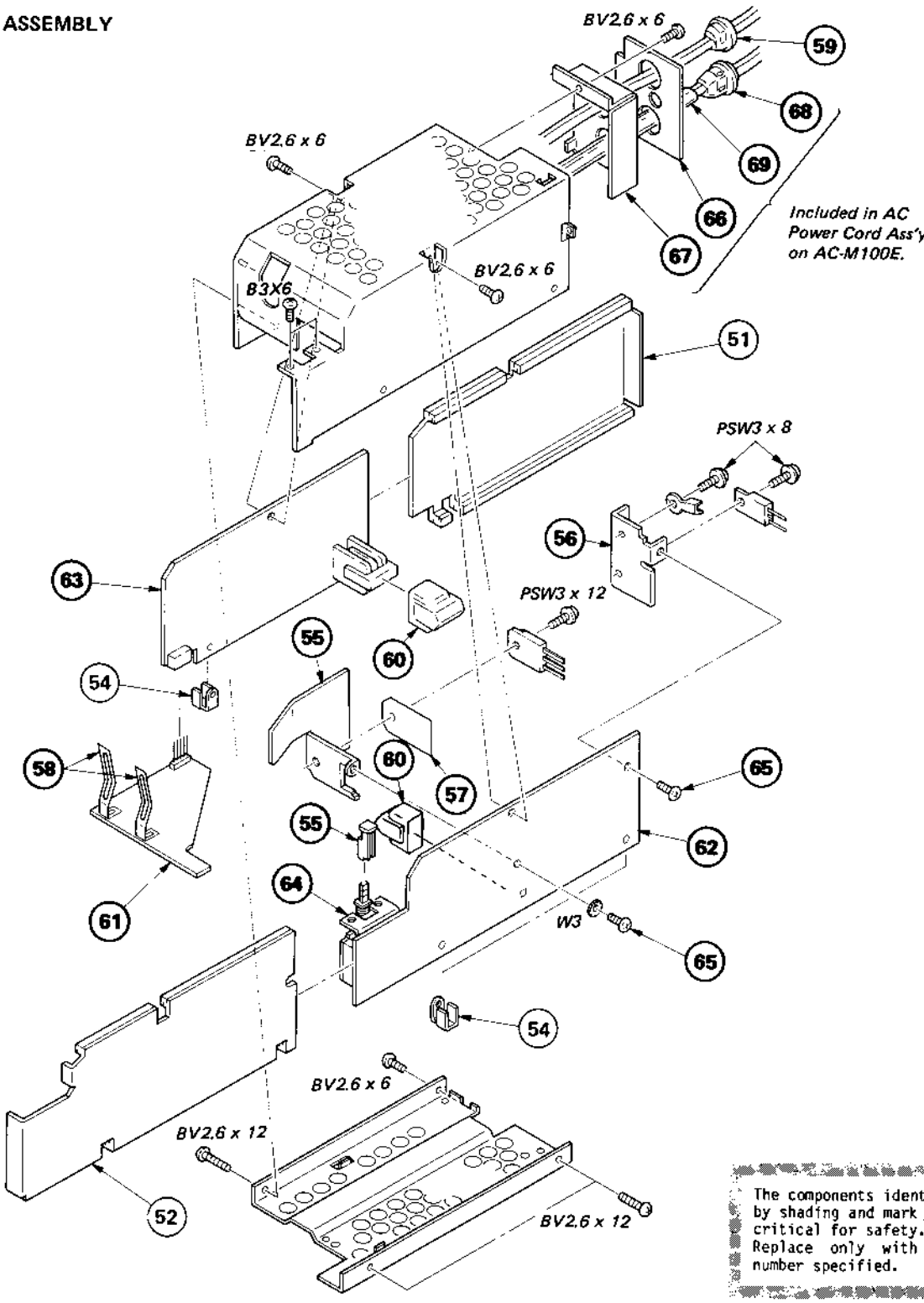


Note:

no mark : POWER ON/no connection/non-charge mode.
( ) : When a battery is being charged.
〈 〉 : When a Betamovie is being operated.
The voltages of Q1, 2 and 3 are taken between the emitter of Q2 and each point.

• : B+ bus.

4-2. CHASSIS ASSEMBLY



The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

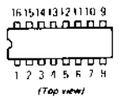
No.	Part No.	Description	Remark
51	♣:2-392-295-00	INSULATOR (LEFT)	
52	♣:2-392-296-00	INSULATOR (RIGHT)	
53	2-392-281-00	SHAFT	
54	2-392-702-00	BRACKET, GROUND	
55	♣:2-392-282-00	HEAT SINK (T)	
56	♣:2-392-283-00	HEAT SINK (D)	
57	2-392-701-00	SHEET, INSULATING	
58	2-392-284-00	TERMINAL, BATTERY	
59	2-231-019-00	BUSHING, DC CORD	
60	4-886-828-00	COVER, LFT	

No.	Part No.	Description	Remark
61	♣:1-610-645-00	UZ-F BOARD	
62	♣:1-611-263-00	UZ-R BOARD	
63	♣:1-611-264-00	UZ-L BOARD	
64	⚠ 1-553-834-21	SWITCH, POWER (SW1)	
65	2-291-546-00	SCREW (3X6), SMALL	
66	2-392-717-00	PLATE (E), ORNAMENTAL, REAR PANEL (AC-M100UB/M110E)	
67	♣:2-392-718-00	PANEL (E), REAR (AC-M100UB/M110E)	
68	⚠ 2-234-904-00	BUSHING, AC CORD (AC-M100UB/M110E)	
69	♣:9-983-573-01	TUBE, VINYL (AC-M100UB/M110E)	

3-5. SEMICONDUCTORS

AN6780

MB3759



μPC4081C

03P2M

2SA1027R
2SC945-P

2SC2752

2SC2870L

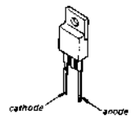
2SC3153

2SD774

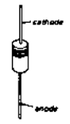
2SK117Y

1S1585
ERC81-004L
RD3E-B1
RD6.2E-B2
RD10E-B1
RD11E-B1Z
RD15E-B3
RD100E

ERC88-009

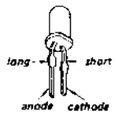


RU1C



S1RBAZ40

TLG123
TLY123

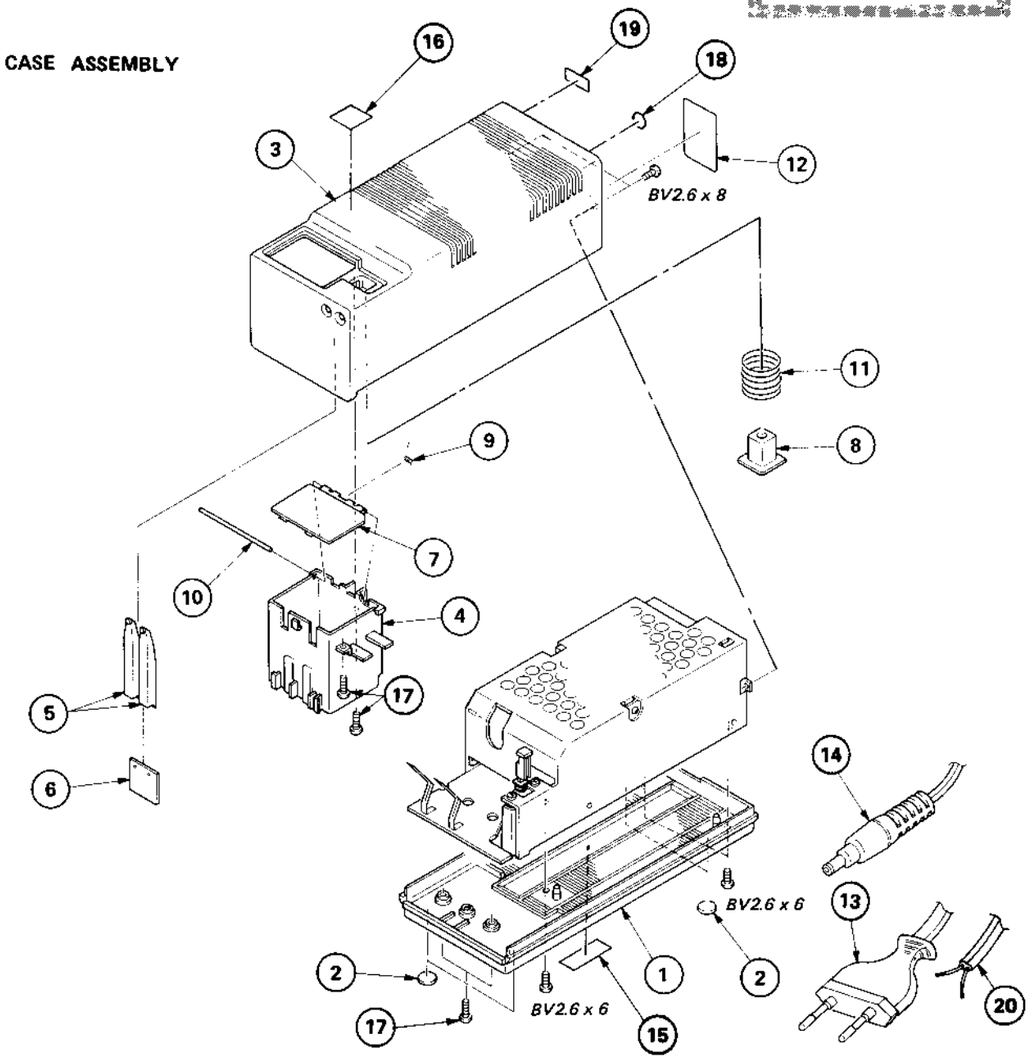


SECTION 4
EXPLODED VIEWS

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

4-1. CASE ASSEMBLY



No.	Part No.	Description	Remark
1	2-392-299-00	CASE, LOWER	
2	2-392-285-00	FOOT	
3	2-392-703-05	CASE, UPPER (AC-M100E)	
	2-392-703-04	CASE, UPPER (AC-M110E)	
	2-392-703-06	CASE, UPPER (AC-M100UB)	
4	2-392-704-00	CASE, BATTERY	
5	2-392-286-00	INDICATOR, UZ	
6	2-392-287-00	RETAINER, INDICATOR	
7	2-392-288-00	LID, BATTERY CASE, UZ	
8	2-392-289-00	BUTTON, UZ	
9	2-392-290-00	SPRING, TORSION	
10	2-392-291-00	SHAFT	
11	2-392-292-00	SPRING, COMPRESSION	
12	♦:2-392-715-00	LABEL, MODEL NUMBER (AC-M100E)	
	♦:2-392-716-00	LABEL, MODEL NUMBER (AC-M110E)	
	♦:2-392-719-00	LABEL, MODEL NUMBER (AC-M100UB)	
13	⚠ 9-983-645-01	CORD ASSY, POWER (AC-M100E/M110E)	66,67 68,69
14	1-557-111-00	CORD, DC OUTPUT	
15	3-703-043-21	LABEL, CAUTION, MAIN	
16	3-703-710-01	STICKER, SONY SYMBOL	
17	9-983-575-01	SCREW +BV2.6X10	
18	3-701-940-01	LABEL, BEAB (AC-M100UB)	
19	3-703-676-01	LABEL, APROVAL (AC-M100E)	
20	⚠ 9-983-588-01	MAINS LEAD (AC-M100UB)	

HARDWARE LIST

SCREW

7-682-547-04	SCREW +B 3X6	
7-682-948-01	SCREW +PSW 3X8	
7-682-950-01	SCREW +PSW 3X12	
7-685-862-01	SCREW +BVTT 2.6X6	(S)
7-685-862-09	SCREW +BVTT 2.6X6	(S)
7-685-863-09	SCREW +BVTT 2.6X8	(S)
7-685-865-01	SCREW +BVTT 2.6X12	(S)

WASHER

7-623-422-07	LW 3, TYPE B	

SECTION 5
ELECTRICAL PARTS LIST

UZ-L

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

NOTE:

- The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.
- =>: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

CAPACITORS
- MF : μF, PF : μμF

RESISTORS
- All resistors are in ohms
- F : nonflammable

COILS
- MMH : mH, UH : μH

Ref.No.	Part No.	Description		Remark
	♦:1-611-264-00	UZ-L BOARD **********		
		CAPACITOR		
C8	9-982-786-01	ELECT	1MF	160V
C9	1-102-114-00	CERAMIC	470PF	50V
C10	1-123-307-00	ELECT	100MF	10V
C11	1-123-320-00	ELECT	100MF	16V
C13	9-983-553-01	ELECT	2200MF	16V
C14	1-108-234-00	PE TEREPHTHALATE	0.0047MF	50V
C15	1-108-251-00	PE TEREPHTHALATE	0.1MF	50V
C16	1-108-239-00	PE TEREPHTHALATE	0.01MF	50V
C17	1-108-251-00	PE TEREPHTHALATE	0.1MF	50V
C18	1-123-356-00	ELECT	10MF	50V
C20	1-123-320-00	ELECT	100MF	16V
C21	1-123-320-00	ELECT	100MF	16V
C22	9-982-783-01	CERAMIC	470PF	500V
C23	9-983-554-01	FILM	1MF	63V
C24	1-123-356-00	ELECT	10MF	50V
C25	1-123-318-00	ELECT	33MF	16V
C27	1-123-318-00	ELECT	33MF	16V
C28	1-123-354-00	ELECT	3.3MF	50V
C29	1-102-129-00	CERAMIC	0.01MF	50V
C30	1-123-318-00	ELECT	33MF	16V
		CONNECTOR		
CN2	♦:9-983-570-01	HOUSING, CONNECTOR (5P)		
		PLUG		
CNP3	♦:9-983-571-01	PIN, CONNECTOR (2P)		
		DIODE		
D2	8-719-110-00	DIODE RD10E-B		
D3	8-719-156-25	DIODE RD5.6E-B2Z		
D4	=>8-719-815-55	DIODE 1S1585		
D7	=>8-719-815-55	DIODE 1S1585		
D8	8-719-100-56	DIODE RD10E-B1		
D9	8-719-100-72	DIODE RD15E-B3		
D10	=>8-719-815-55	DIODE 1S1585		
D11	8-719-100-38	DIODE RD6.2E-B2		
D15	8-719-100-38	DIODE RD6.2E-B2		
D16	8-719-100-38	DIODE RD6.2E-B2		
D17	=>8-719-815-55	DIODE 1S1585		
D18	=>8-719-815-55	DIODE 1S1585		
D19	8-719-100-60	DIODE RD11E-B1		
D20	=>8-719-815-55	DIODE 1S1585		
D21	=>8-719-815-55	DIODE 1S1585		
D22	=>8-719-815-55	DIODE 1S1585		
D23	8-719-100-14	DIODE RD3.0E-B1		
D24	=>8-719-815-55	DIODE 1S1585		

Ref.No.	Part No.	Description		Remark
		IC		
IC1	8-759-937-59	IC MB3759		
IC2	9-983-564-01	IC AN6780		
IC3	8-759-101-30	IC UPC4081C		
		TRANSISTOR		
Q1	8-729-175-22	TRANSISTOR 2SC2752		
Q2	9-983-561-01	TRANSISTOR 2SC2870L		
Q4	8-729-194-57	TRANSISTOR 2SC945-P		
Q5	8-729-201-16	TRANSISTOR 2SK117Y		
Q6	8-729-194-57	TRANSISTOR 2SC945-P		
Q7	=>8-729-177-43	TRANSISTOR 2SD774		
Q8	=>8-729-612-77	TRANSISTOR 2SA1027R		
Q9	9-983-563-01	THYRISTOR 03P2M		
		RESISTOR		
R5	1-244-931-00	CARBON	270K	1/2W
R6	1-246-545-00	CARBON	1M	1/4W
R7	1-246-469-00	CARBON	680	1/4W
R8	1-247-857-00	CARBON	12K	1/6W
R9	1-247-857-00	CARBON	12K	1/6W
R10	1-217-596-00	METAL PLATE	0.05	2W
R11	1-246-484-00	CARBON	3K	1/4W
R12	1-246-469-00	CARBON	680	1/4W
R13	1-247-887-00	CARBON	220K	1/6W
R14	1-246-440-00	CARBON	43	1/4W
R15	1-246-479-00	CARBON	1.8K	1/4W
R16	1-246-513-00	CARBON	47K	1/4W
R17	1-246-449-00	CARBON	100	1/4W
R18	1-246-495-00	CARBON	8.2K	1/4W
R19	1-246-491-00	CARBON	5.6K	1/4W
R20	1-247-839-00	CARBON	2.2K	1/6W
R21	1-246-479-00	CARBON	1.8K	1/4W
R22	1-246-523-00	CARBON	120K	1/4W
R23	1-247-849-00	CARBON	5.6K	1/6W
R24	1-246-489-00	CARBON	4.7K	1/4W
R25	1-246-488-00	CARBON	4.3K	1/4W
R26	1-246-491-00	CARBON	5.6K	1/4W
R27	1-246-497-00	CARBON	10K	1/4W
R28A	1-246-483-00	CARBON	2.7K	1/4W
R28B	1-246-499-00	CARBON	12K	1/4W
R29	1-246-473-00	CARBON	1K	1/4W
R30	1-246-521-00	CARBON	100K	1/4W
R31	1-246-473-00	CARBON	1K	1/4W
R32	1-212-865-00	FUSE	22	1/2W
R34	1-246-497-00	CARBON	10K	1/4W
R35	1-246-497-00	CARBON	10K	1/4W
R36	1-246-481-00	CARBON	2.2K	1/4W
R37	1-246-536-00	CARBON	430K	1/4W
R38	1-246-497-00	CARBON	10K	1/4W
R39	1-246-497-00	CARBON	10K	1/4W
R40	1-246-497-00	CARBON	10K	1/4W

UZ-L | UZ-R | UZ-F

Ref.No.	Part No.	Description			Remark
R41	1-246-473-00	CARBON	1K	1/4W	
R42	1-246-521-00	CARBON	100K	1/4W	
R43	1-246-521-00	CARBON	100K	1/4W	
R44	9-983-557-01	CARBON	4.7M	1/4W	
R45	1-246-473-00	CARBON	1K	1/4W	
R46	1-246-489-00	CARBON	4.7K	1/4W	
R47	1-246-489-00	CARBON	4.7K	1/4W	
R48	1-246-469-00	CARBON	680	1/4W	
R51	1-246-443-00	CARBON	56	1/4W	
R52	1-246-481-00	CARBON	2.2K	1/4W	
R53	9-983-558-01	THERMISTOR (POSITIVE)			
R54	1-246-461-00	CARBON 330		1/4W	
		VARIABLE RESISTOR			
RV1	1-224-660-21	ADJ, METAL FILM 1K-B			
		TRANSFORMER			
T2	⚠1-437-140-00	TRANSFORMER, STARTING			
T5	9-983-567-01	COIL, CHOKE			
**********					
	♣:1-611-263-00	UZ-R BOARD **********			
	1-533-087-00	HOLDER, FUSE			
		RING			
B1	9-983-568-01	RING, FERRITE BEAD			
		CAPACITOR			
C1	⚠1-130-712-00	FILM	0.47MF	250V	
C2	⚠1-161-742-00	CERAMIC	2200PF	400V	
C3	⚠1-161-742-00	CERAMIC	2200PF	400V	
C4	⚠1-161-742-00	CERAMIC	2200PF	400V	
C5	⚠9-983-550-01	ELECT	82MF	400V	
C6	9-983-551-01	FILM	0.033MF	630V	
C7	9-983-552-01	CERAMIC	150PF	2KV	
C12	9-983-553-01	ELECT	2200MF	16V	
C19	9-982-783-01	CERAMIC	470PF	500V	
C26	1-108-230-00	PE TEREPHTHALATE	0.0022MF	50V	
C31	⚠1-161-742-00	CERAMIC	2200PF	400V	
C32	⚠1-161-742-00	CERAMIC	2200PF	400V	
C33	⚠1-161-742-00	CERAMIC	2200PF	400V	
C34	⚠1-130-712-00	FILM	0.47MF	250V	
C35	⚠1-161-742-00	CERAMIC	2200PF	400V	
C36	⚠1-161-742-00	CERAMIC	2200PF	400V	
		PLUG			
CNP1	♣:1-560-676-00	PIN, CONNECTOR (3P)			

Ref.No.	Part No.	Description			Remark
		DIODE			
D1	⚠9-983-559-01	DIODE S1RBAZ40			
D5	8-719-300-80	DIODE RU1C			
D6	9-983-560-01	DIODE ERC88-009			
		FUSE			
F1	⚠1-532-203-00	FUSE, 2A 250V			
		TRANSISTOR			
Q3	⚠8-729-801-69	TRANSISTOR 2SC3153			
		RESISTOR			
R1	9-983-555-01	CEMENT	3.3	2W	
R2	1-244-913-00	CARBON	47K	1/2W	
R3	9-983-556-01	CEMENT	0.22	2W	
R4	1-246-441-00	CARBON	47	1/4W	
R33	1-246-461-00	CARBON	330	1/4W	
R55	⚠1-202-645-00	SOLID	1M	1/2W	
		SWITCH			
SW1	⚠1-553-834-21	SWITCH, POWER			
		TRANSFORMER			
T1	⚠1-408-941-00	COIL, CHOKE			
T3	⚠1-437-136-00	TRANSFORMER, DRIVE			
T4	⚠1-437-138-00	TRANSFORMER, SWITCHING			
T6	⚠1-408-941-00	COIL, CHOKE			
**********					
	♣:1-610-645-00	UZ-F BOARD **********			
	2-392-284-00	TERMINAL, BATTERY			
		PLUG			
CNP2	♣:9-983-569-01	PIN, CONNECTOR (5P)			
		DIODE			
D12	8-719-812-32	DIODE TLY123			
D13	8-719-812-33	DIODE TLG123A			
D14	8-719-981-00	DIODE ERC81-004			
		RESISTOR			
R49	1-246-473-00	CARBON	1K	1/4W	
R50	1-246-461-00	CARBON	330	1/4W	
		SWITCH			
SW2	9-983-566-01	SWITCH, MINIATURE			

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

Ref.No.	Part No.	Description	Remark
		MISCELLANEOUS	
	1-557-111-00	CORD, DC OUTPUT	
	⚠9-983-588-01	MAINS LEAD (AC-M100UB)	
	⚠9-983-645-01	CORD ASSY, POWER (AC-M100E/M110E)	
CN1	♦1-561-777-00	HOUSING, CONNECTOR 3P (AC-M100UB/M110E)	

ACCESSORIES AND PACKING MATERIALS

Part No.	Description	Remark
1-506-409-00	ADAPTOR, AC PLUG (AC-M110E)	
2-366-916-00	CUSHION	
2-366-919-00	BAG, PROTECTION	
2-392-728-11	INDIVIDUAL CARTON (AC-M110E)	
2-392-728-21	INDIVIDUAL CARTON (AC-M100E)	
2-392-728-31	INDIVIDUAL CARTON (AC-M100UB)	
3-773-555-11	MANUAL, INSTRUCTION (AC-M100E)	
3-773-555-41	MANUAL, INSTRUCTION (AC-M110E)	
3-773-555-51	MANUAL, INSTRUCTION (AC-M100UB)	

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

BMC-100P/100PK
AC POWER ADAPTOR

9-972-284-01

Sony Corporation

English
83K0485-1
Printed in Japan
© 1983

BMC-100P/100PK

SONY

ADJUSTMENT MANUAL

CORRECTION-1

File this CORRECTION-1 with the adjustment manual.

AEP Model
(BMC-100P)
UK Model
(BMC-100PK)
E Model
(BMC-100PK)

May, 1984

: Corrected portion

CORRECT

Page 5

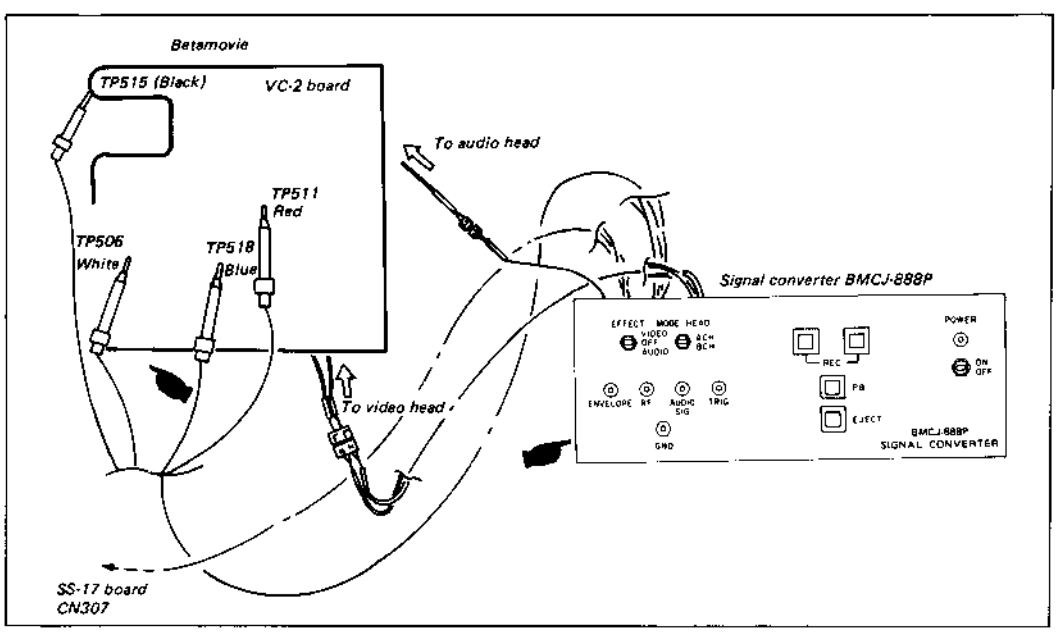


Fig. 1-4

INCORRECT

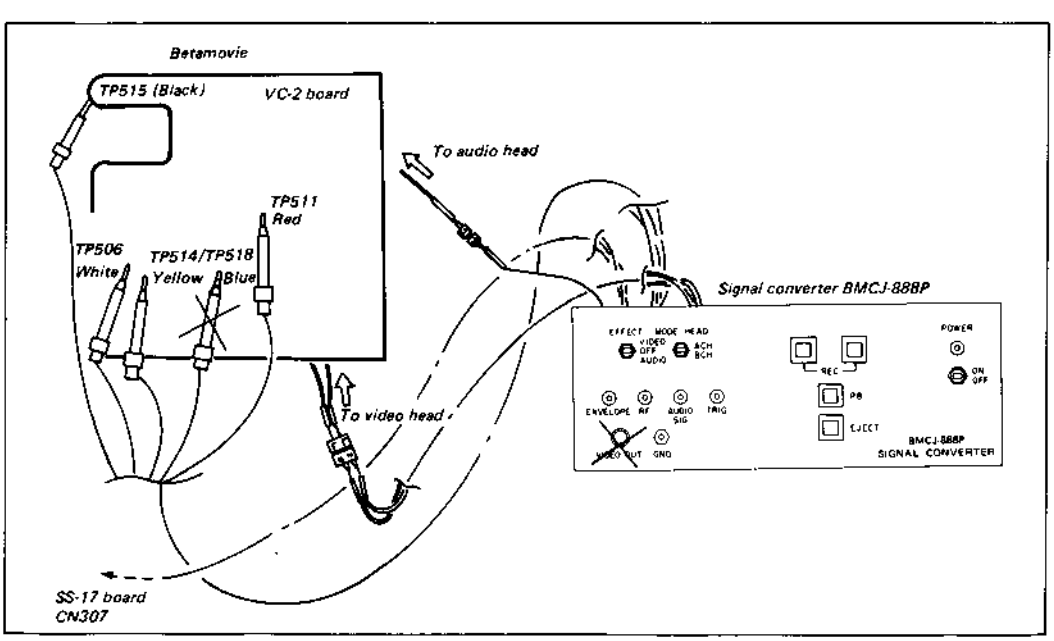


Fig. 1-4

MICROFILM

9-972-284-92

Consumer VIDEO

English
84E0488-1
Printed in Japan

© 1984

BMC-100P/100PK

SONY
SERVICE MANUAL

AEP Model
UK Model
E Model

June, 1985

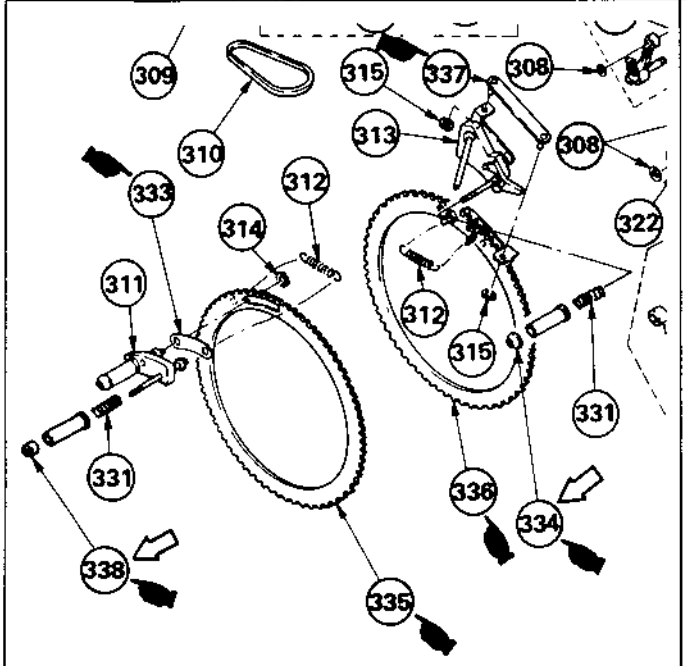
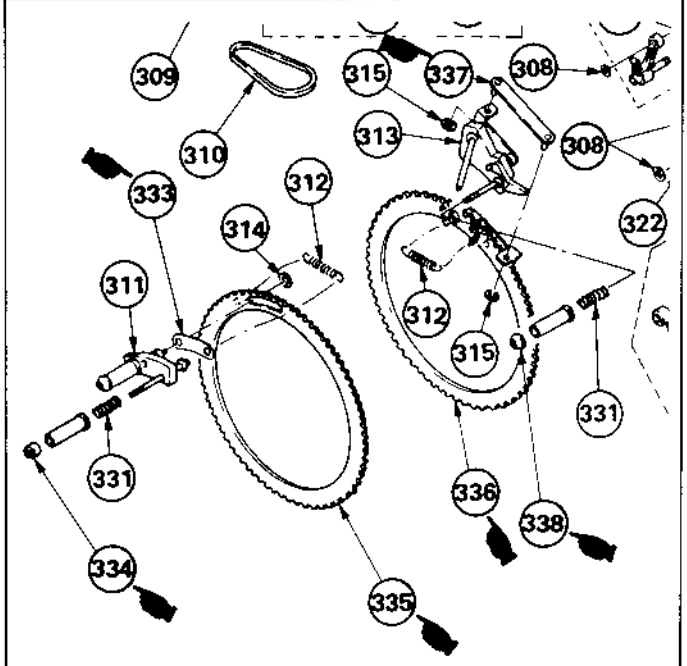
CORRECTION-4

- There is mistake in the Supplement-1 (9-972-284-82). Please correct.
- File this Correction with the Supplement-1.

Supplement-1 Page 7

5-7. THREADING ASSEMBLY

⇦ : **Corrected Portion**

CORRECT	INCORRECT
	

MICROFILM

9-972-284-95

Consumer VIDEO

Sony Corporation

English
85F0468-1
Printed in Japan
© 1985

BMC-100P/100PK
AC POWER ADAPTOR

SONY
SERVICE MANUAL

AEP Model
UK Model
E Model

April, 1984

SUPPLEMENT-1

File this supplement-1 with the service manual.

Subject: Change and Correction of BMC-100P/100PK Repair Part Names

(1) Change of names for GC-4 and GC-5 board names

Previous name		New name
GC-4 Board	⟶	GC-6 Board
GC-5 Board	⟶	GC-7 Board

(2) Cautions required due change in zoom lens ass'y

(3) Addition and change of repair parts

(4) There were some mistakes in the names of the semiconductor products. Please correct.

MICROFILM

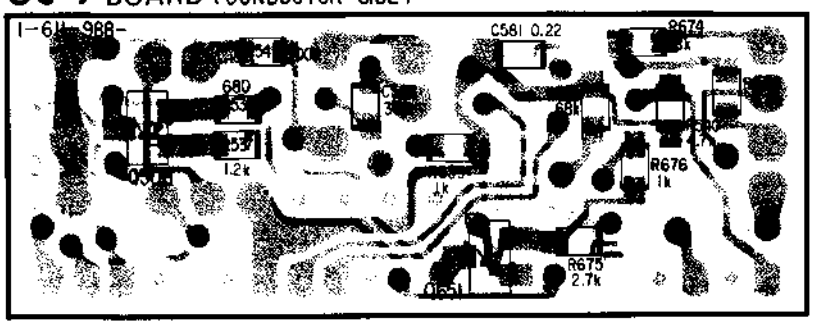
Consumer VIDEO

(1) Change of names for GC-4 and GC-5 board names

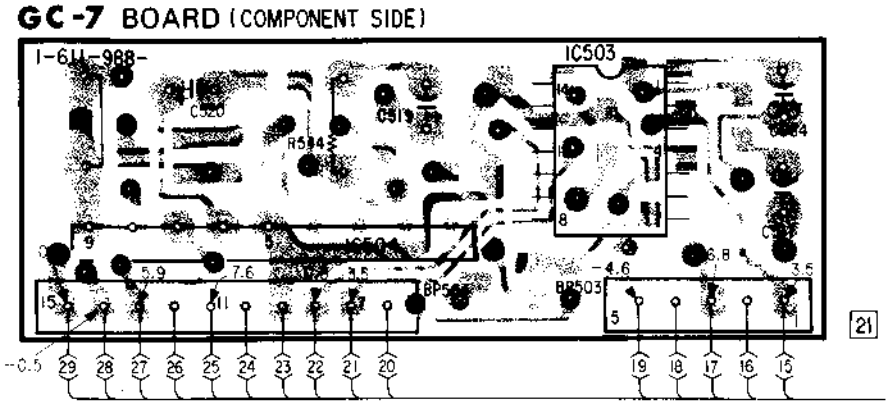
Page 59, 60

The patterns of the GC-4 and GC-5 boards have been slightly modified, and their part Nos. have also been changed.

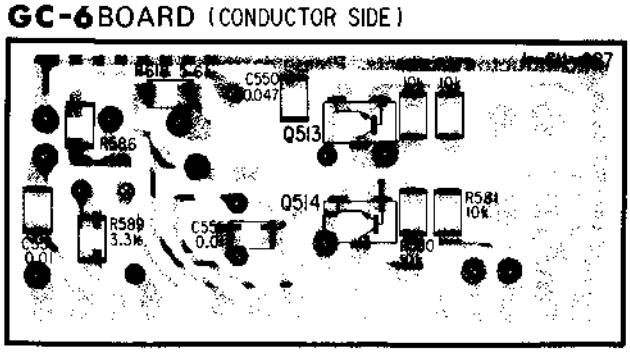
GC-7 BOARD (CONDUCTOR SIDE)



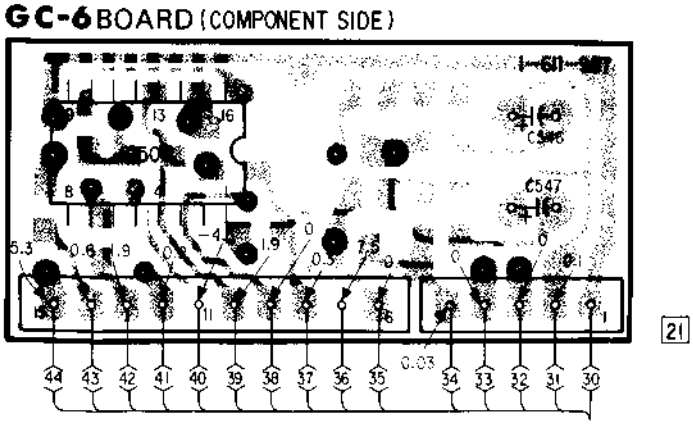
GC-7 BOARD (COMPONENT SIDE)



GC-6 BOARD (CONDUCTOR SIDE)



GC-6 BOARD (COMPONENT SIDE)



Board	Part No.
GC-6	1-611-987-21
GC-7	1-611-988-21

(2) Cautions required due change in zoom lens ass'y

In consequence of the change in zoom lens ass'y (401), now, lens cabinet (10) requires different treatments according to the ass'y versions.

With the zoom lens ass'ies with the shipping mark label codes ending in 1 or subsequent alphabetic letters in red stamp (Fig. 2), the following lens cabinet should be used.

X-3681-485-1 Lens Cabinet (TL) Ass'y

Note that the zoom lens ass'ies with the mark codes ending in A through H in black stamp are used with the previous lens cabinets.

X-3681-442-0 Lens Cabinet (T) Ass'y

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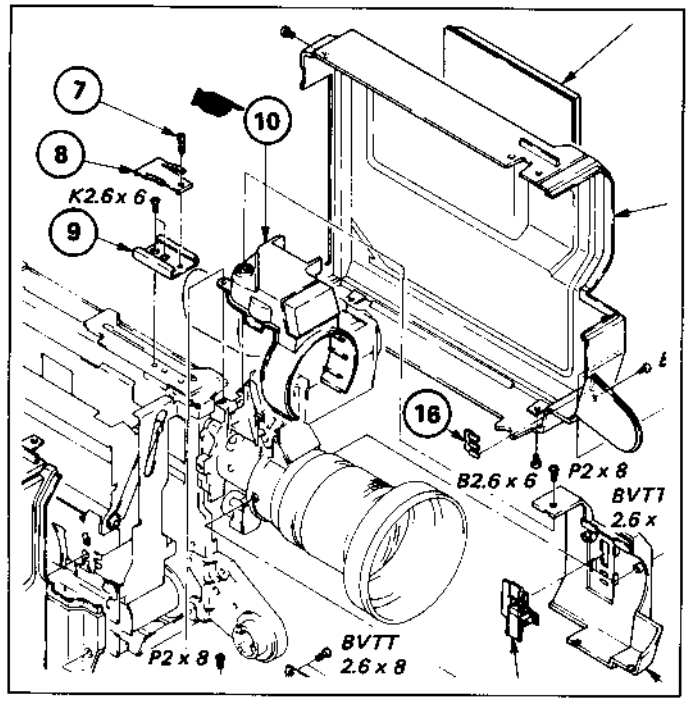


Fig. 1

Service manual page 101

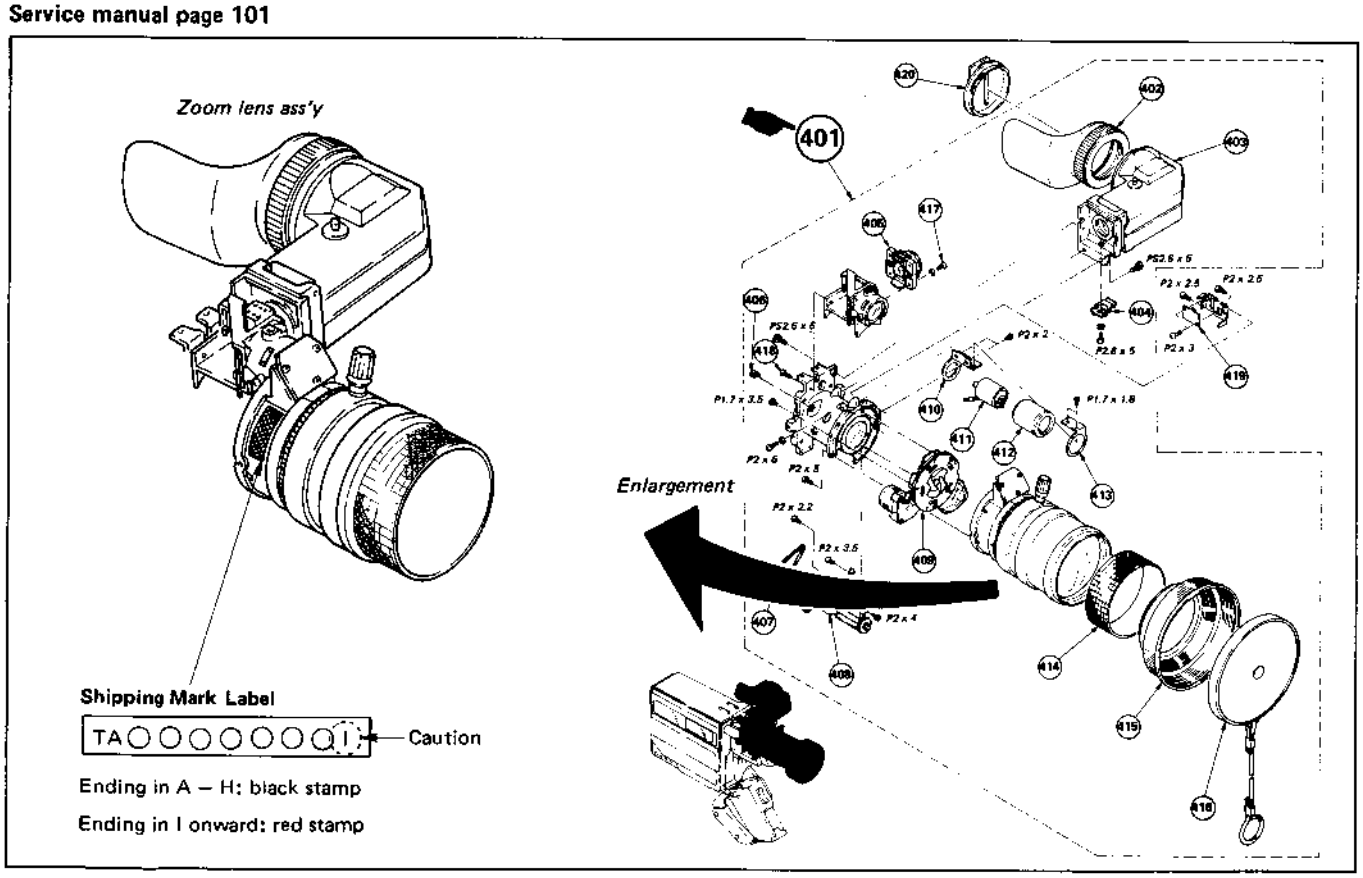


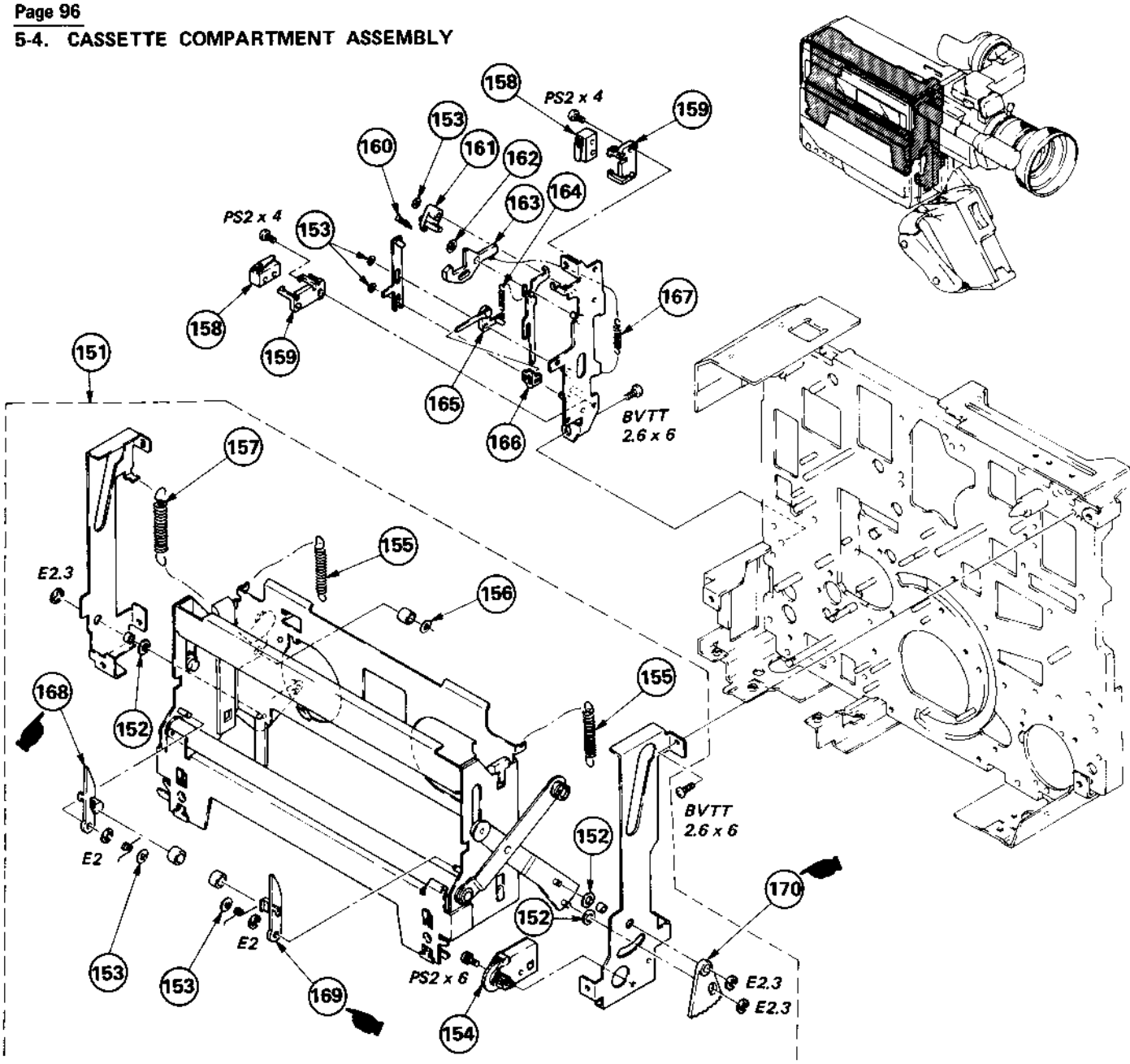
Fig. 2

No.	Part No.	Description	Remark
401	A-7613-052-B	Zoom lens VCL-906XA Ass'y	

(3) Addition and change of repair parts

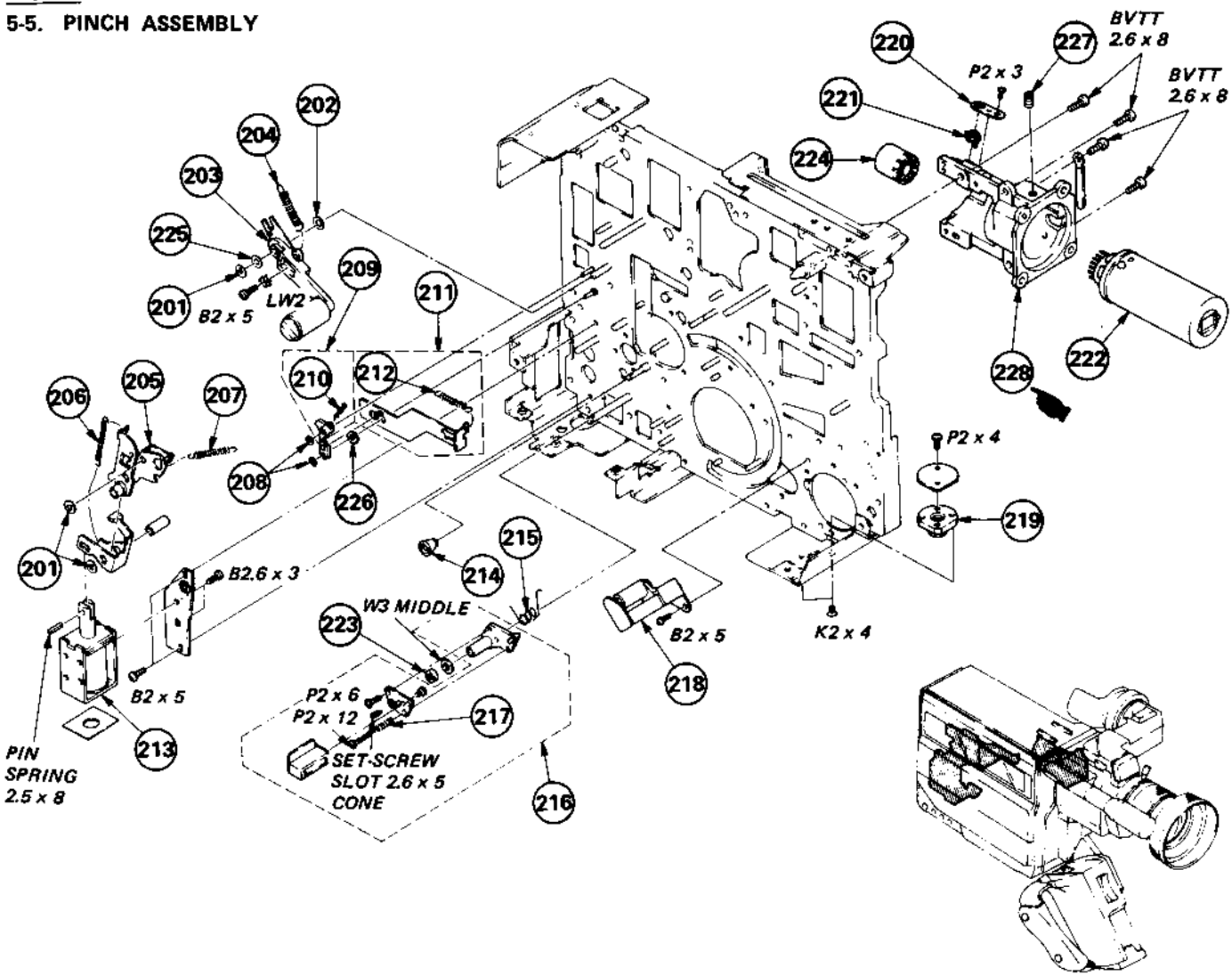
Page 96

5-4. CASSETTE COMPARTMENT ASSEMBLY



No.	Part No.	Description	Remark
151	♣:A-6751-176-A	CASSETTE COMPARTMENT ASSY	152-157, 168-170
152	3-678-822-00	SPACER	
153	3-669-465-00	WASHER (1.5), STOPPER	
154	3-681-528-00	DAMPER	
155	3-143-067-00	SPRING, TENSION	
156	3-669-595-00	WASHER (2), STOPPER	
157	3-681-527-00	SPRING, TENSION	
158	1-554-582-00	SWITCH, MICRO S301 (CASSETTE IN) S302 (CASSETTE DOWN)	
159	♣:3-681-587-00	TABLE, SWITCH	
160	3-561-627-00	SPRING, TENSION	
161	♣:3-681-539-00	LOCK, ARM	
162	3-669-596-00	WASHER (2.3), STOPPER	
163	♣:3-681-538-00	ARM, LOCK	
164	3-567-028-00	SPRING, TENSION	
165	♣:X-3681-417-0	DETECTION ASSY, LOCK	
166	♣:3-681-588-00	STAY, DETECTION	
167	3-555-026-00	SPRING, TENSION	
168	3-681-511-00	RETAINER (RIGHT) CASSETTE	
169	3-681-512-00	RETAINER (LEFT) CASSETTE	
170	3-681-525-00	GEAR	

5-5. PINCH ASSEMBLY

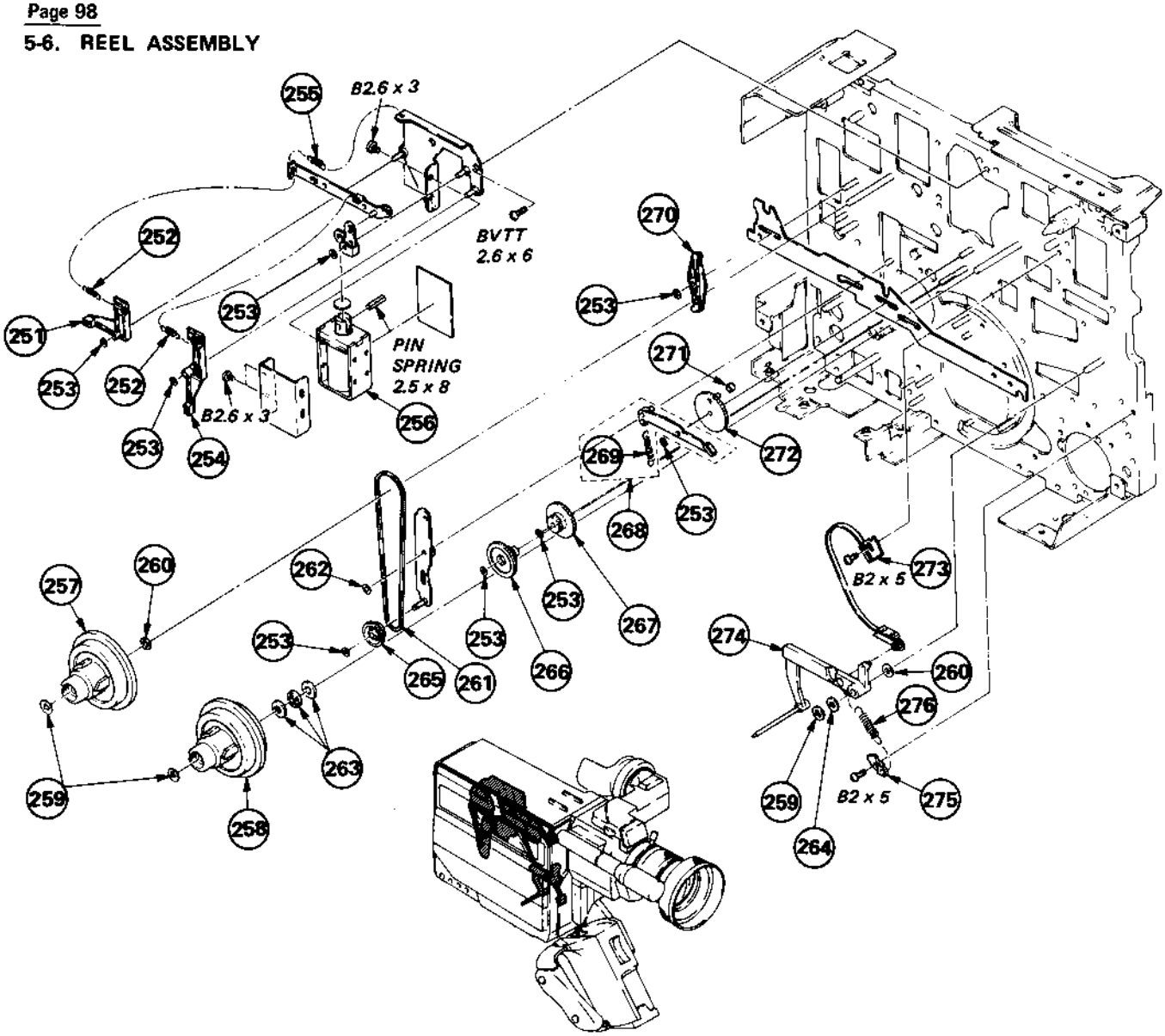


No.	Part No.	Description	Remark
201	3-669-596-00	WASHER (2.3), STOPPER	
202	3-701-439-21	WASHER	
203	A-6747-230-A	ARM BLOCK ASSY, PINCH	204
204	3-536-786-00	SPRING, TENSION	
205	♣:X-3681-406-0	LEVER ASSY, PINCH PRESS	
206	3-681-452-00	SPRING, TENSION	
207	3-578-397-00	SPRING, TENSION	
208	3-669-465-00	WASHER (1.5), STOPPER	
209	A-6747-235-A	LEVER (E) BLOCK ASSY, EJECT	210
210	3-547-667-00	SPRING, TENSION	
211	A-6747-234-A	LEVER (G) BLOCK ASSY, RELEASE	212
212	3-535-346-00	SPRING, TENSION	
213	⚠ 1-454-357-21	SOLENOID, PLUNGER (PINCH) PM902	
214	3-681-622-00	NUT, ADJUSTMENT, CTL HEAD	
215	3-681-621-00	SPRING	
216	A-6736-038-A	HEAD BLOCK ASSY, AC	217
217	3-669-615-00	SPRING, COMPRESSION	
218	8-825-561-10	HEAD, ERAZE (EF254-21)	
219	3-681-547-00	BRACKET, TRIPOD	
220	♣:3-681-809-00	RETAINER, PIN, ADJUSTMENT	
221	3-681-808-00	PIN, ADJUSTMENT	
222	8-701-032-29	CT-3222	
223	3-669-318-00	NUT, ADJUSTMENT, GUIDE	
224	1-562-325-00	SOCKET ASSY, IMAGE PICKUP TUBE	
225	3-701-439-21	WASHER	
226	3-570-615-11	POLY-WASHER (DIA.1.2)	
227	3-701-508-00	SET SCREW, DOUBLE POINT 3X6	
228	3-681-813-01	FRAME, LENS	

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

5-6. REEL ASSEMBLY



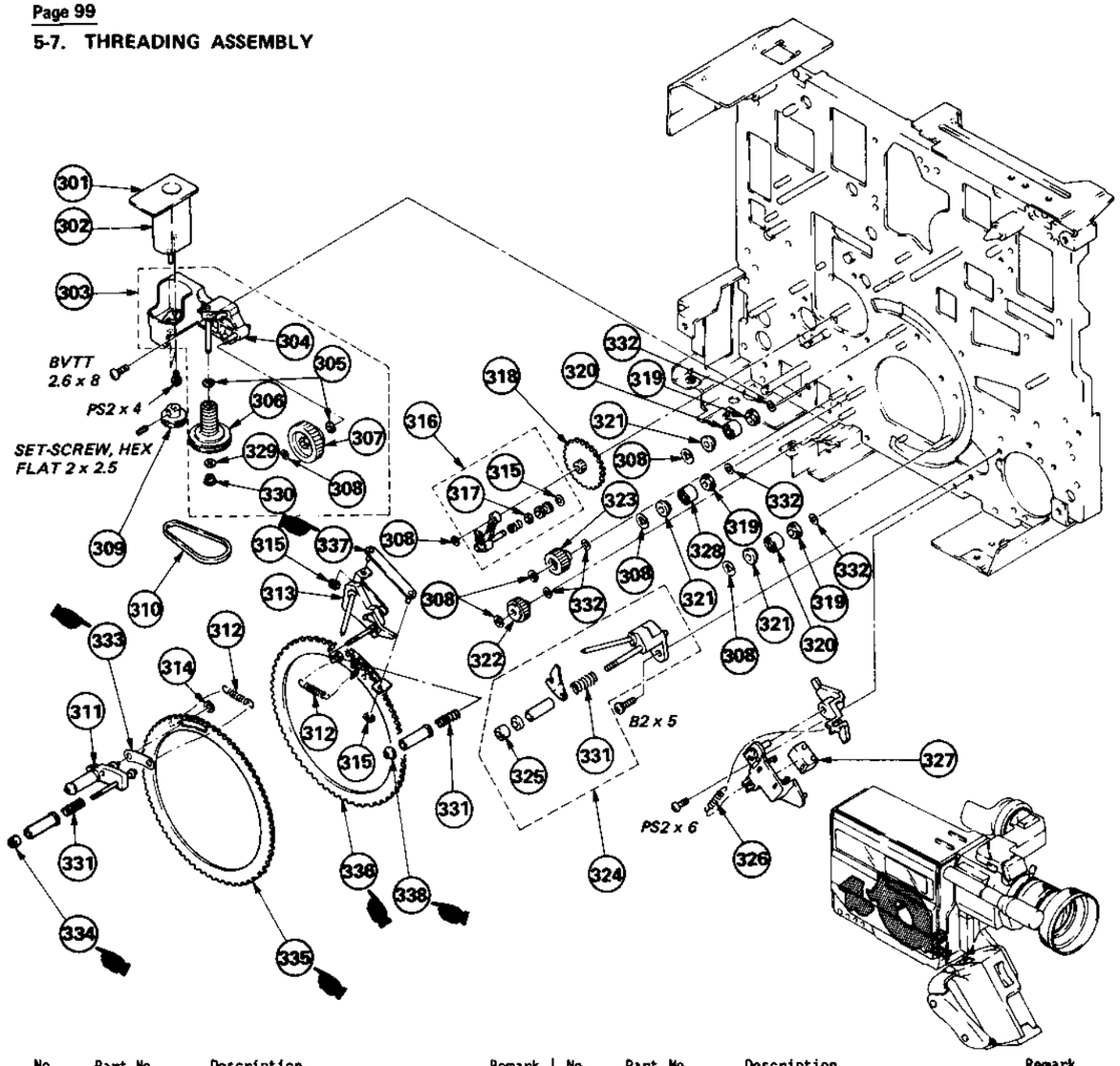
No.	Part No.	Description	Remark
251	A-6741-054-A	BRAKE ASSY, TAKE-UP	
252	3-307-938-00	SPRING, TENSION	
253	3-669-465-00	WASHER (1.5), STOPPER	
254	A-6741-053-A	BRAKE ASSY, SUPPLY	
255	3-527-025-00	SPRING, TENSION	
256	⚠ 1-454-357-11	SOLENOID, PLUNGER (BRAKE) PM901	
257	X-3681-404-0	TABLE ASSY (TAKE-UP), REEL	
258	X-3681-405-0	TABLE ASSY (SUPPLY), REEL	
259	3-669-596-00	WASHER (2.3), STOPPER	
260	3-701-439-21	WASHER	
261	3-681-447-00	BELT, FWD	
262	3-570-615-00	POLY-WASHER (DIA.1.2)	
263	3-681-449-00	BEARING, THRUST	
264	3-701-439-21	WASHER	

No.	Part No.	Description	Remark
265	3-681-478-00	GEAR, FWD	
266	3-681-435-00	GEAR (B), DRIVING	
267	3-681-434-00	GEAR (A), DRIVING	
268	A-6741-055-A	BRAKE ASSY, SOFT	269
269	3-672-461-00	SPRING, TENSION	
270	3-681-438-00	LEVER, PINCH CONVERSION	
271	3-681-443-00	ROLLER, DRIVING	
272	3-681-436-00	GEAR (C), DRIVING	
273	X-3681-410-0	BAND ASSY, TENSION REGULATOR	
274	♦:X-3681-402-0	ARM ASSY, TENSION REGULATOR	
275	3-681-439-00	RETAINER, SPRING	
276	3-536-767-XX	SPRING, TENSION	

NOTE:

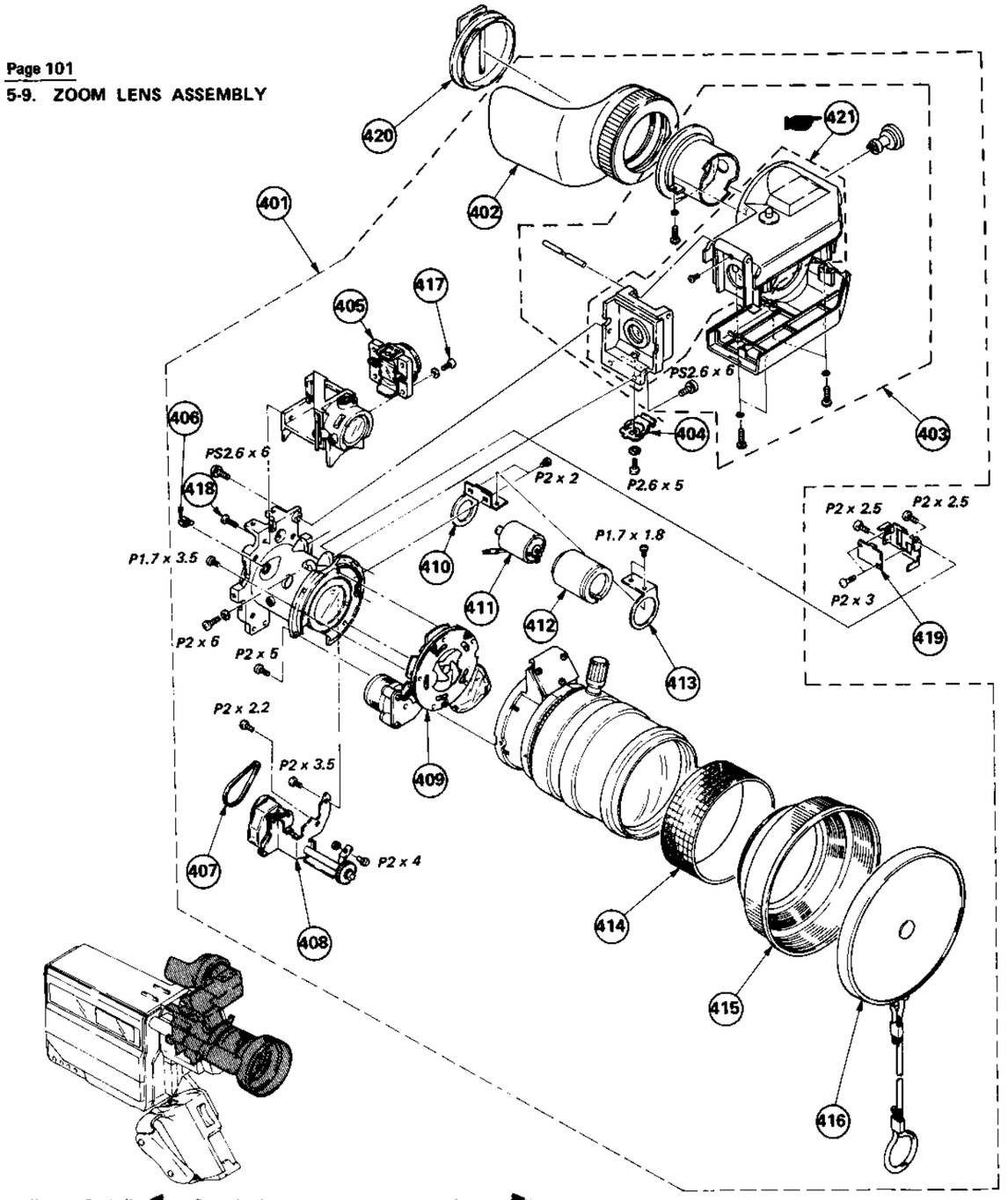
The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

5-7. THREADING ASSEMBLY



No.	Part No.	Description	Remark
301	♣:1-609-855-00	LM-12 BOARD	
302	8-835-098-01	MOTOR, DC (DNR-6600A) M901(LOADING)	
303	♣:A-6737-126-A	CASE BLOCK ASSY, MOTOR	304,305,306,307 308,329,330
304	X-3681-430-0	CASE ASSY, MOTOR	
305	3-701-437-21	WASHER	
306	X-3681-429-0	GEAR ASSY, WORM	
307	3-681-422-00	WHEEL, WORM	
308	3-669-465-00	WASHER (1.5), STOPPER	
309	3-681-423-00	PULLEY, MOTOR, LOADING	
310	3-681-424-00	BELT, LOADING	
311	A-6750-151-A	BASE BLOCK ASSY, TG5	331
312	3-564-935-00	SPRING, TENSION	
313	A-6746-033-A	BASE BLOCK ASSY, TG4	331
314	3-681-678-00	WASHER, STOPPER	
315	3-570-615-00	POLY-WASHER (DIA.1.2)	
316	A-6747-233-A	ARM ASSY, EG	315,317
317	3-701-436-01	WASHER, 1.6	
318	3-681-437-00	GEAR (A), EJECT	
319	3-681-433-00	ROLLER (C), RING GUIDE	
320	3-681-429-00	ROLLER (B), RING GUIDE	
321	3-681-428-00	ROLLER (A), RING GUIDE	
322	3-681-430-00	GEAR (S), LOADING	
323	3-681-431-00	GEAR (T), LOADING	
324	♣:A-6746-032-A	BASE BLOCK ASSY, TG1	325,331
325	3-669-446-00	NUT, GUIDE, NO. 6	
326	3-307-938-00	SPRING, TENSION	
327	1-554-581-00	SWITCH, MICRO (LOADING END) S303	
328	3-681-674-00	ROLLER (D), GUIDE, RING	
329	3-701-437-01	WASHER	
330	3-703-075-00	CAP 2, SHAFT	
331	3-669-666-00	SPRING, COMPRESSION	
332	3-701-437-11	WASHER	
333	3-681-419-01	POLY-SLIDER, TG5 BASE	
334	3-681-404-01	FLANGE (UPPER), TG4	
335	3-681-418-01	RING (T), LOADING	
336	X-3681-431-1	RING (S) ASSY, THREADING	
337	X-3681-432-1	JOINT (B) ASSY, TG4 BASE	
338	3-681-410-01	NUT, TG6	

5-9. ZOOM LENS ASSEMBLY



No.	Part No.	Description	Remark
401	A-7613-052-B	LENS (VCL-906XA) ASSY, ZOOM	402-418,421
402	3-706-869-00	CUP, EYE	
403	3-706-868-00	EYEPIECE ASSY	421
404	♣:3-706-870-00	CLAW, ROCK	
405	3-706-871-00	SCREEN ASSY, LED	
406	3-706-859-00	ADJUSTMENT PIECE, BF	
407	3-706-860-00	BELT, Z	
408	3-706-864-00	GEAR ASSY, ZOOM	
409	3-706-858-00	FILTER ASSY, IRIS	
410	♣:3-706-862-00	BRACKET A, Z MOTOR	
411	3-706-865-00	MOTOR ASSY, ZOOM	
412	3-706-861-00	RUBBER, VIBRATION PROOF	
413	♣:3-706-863-00	BRACKET B, Z MOTOR	
414	3-706-857-00	KNURL, FOCUS RUBBER	
415	3-706-855-00	HOOD	
416	3-706-856-00	CAP, HOOD	
417	3-681-824-11	SCREW +P2X6	
418	3-681-824-01	SCREW +P2X5	
419	♣:1-610-553-00	FL-1 BOARD	
420	3-681-823-00	COVER, EYECUP	
421	A-7613-054-A	UPPER FINDER CASE ASSY, KIT	

(4) There were some mistakes in the names of the semiconductor products. Please correct.

PA-1 BOARD

Page	CORRECT				INCORRECT			
	Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
104	Q807	8-729-100-66	TRANSISTOR 2SC1623		Q807	8-729-102-66	TRANSISTOR 2SC1623	
	Q808	8-729-100-66	TRANSISTOR 2SC1623		Q808	8-729-102-66	TRANSISTOR 2SC1623	

VC-2 BOARD

Page	CORRECT				INCORRECT			
	Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
106	D152	8-719-911-19	DIODE 1SS119		D152	8-719-921-20	DIODE 1SS119TD	
	D503	8-719-911-19	DIODE 1SS119		D503	8-719-921-20	DIODE 1SS119TD	
107	D511	8-719-911-19	DIODE 1SS119		D511	8-719-921-20	DIODE 1SS119TD	
	D515	8-719-911-19	DIODE 1SS119		D515	8-719-921-20	DIODE 1SS119TD	
	D518	8-719-911-19	DIODE 1SS119		D518	8-719-921-20	DIODE 1SS119TD	
	D701	8-719-911-19	DIODE 1SS119		D701	8-719-921-20	DIODE 1SS119TD	
	D704	8-719-911-19	DIODE 1SS119		D704	8-719-921-20	DIODE 1SS119TD	
	D705	8-719-911-19	DIODE 1SS119		D705	8-719-921-20	DIODE 1SS119TD	
108	Q515	8-729-100-76	TRANSISTOR 2SA812		Q515	8-729-102-76	TRANSISTOR 2SA812-T2M6	
	Q529	8-729-100-66	TRANSISTOR 2SC1623		Q529	8-729-102-26	TRANSISTOR 2SC1623-T2L6	
	Q531	8-729-100-66	TRANSISTOR 2SC1623		Q531	8-729-102-26	TRANSISTOR 2SC1623-T2L6	
	Q652	8-729-202-72	TRANSISTOR 2SC3381		Q652	8-729-202-57	TRANSISTOR 2SC3381	

9-972-284-82

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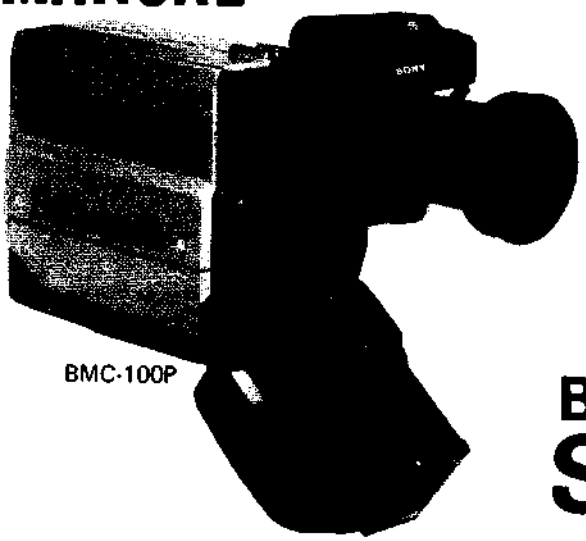
BMC-100P/100PK

ADJUSTMENT MANUAL

AEP Model
(BMC-100P)
UK Model
(BMC-100PK)
E Model
(BMC-100PK)



BMC-100P

Betamovie SB CHASSIS

December, 1983

File this Adjustment Manual with the Service Manual.

MICROFILM

Beta BETAMOVIE SONY®

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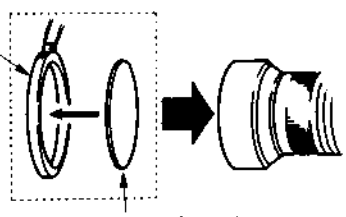
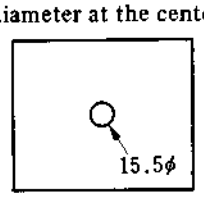
SECTION 1
PREPARATION BEFORE ADJUSTMENT (CAMERA SECTION)

1-1. LIST OF SERVICING JIGS

Oscilloscope; digital electronic voltmeter (4 digits); AC adapter; adjusting screwdriver; L-wrench; level; special purpose color monitor.

Ref No.	Name	Part code	Use
J 1	Jig for oscillating 5.4MHz Note: To be remodeled from a 4.5MHz oscillator jig.	J-6023-420-A ※ Crystal replacement	H size adjustment
	Part requred for remodeling: (5.4MHz crystal)	J-6080-809-A	
J 2	Red filter	J-6080-059-A	Focus adjustment, HV phase correction adjustment
J 3	ND filter 0.4	J-6080-806-A	x2 beam adjustment, LLA adjustment
	ND filter 0.1	J-6080-807-A	LLA adjustment
	ND filter 1.0	J-6080-808-A	LLA adjustment
J 4	Pattern box PTB-100 (For 90–130V ac) PTB-200 (For 190–240V ac)	 J-6020-490-A J-6020-680-A	
J 5	Color chart	J-6020-250-A	
J 6	Signal converter BMCJ-888P	J-6080-820-A	x2 beam adjustment, x5 beam adjustment, H size adjustment, flange back adjustment, V size adjustment, V centering adjustment
J 7	2.2Ω standard resistor	J-6080-812-A	Heater constant current adjustment
The following jigs must be produced: (1) Black cap White cap  To be cut from a sheet of black paper.			H balance adjustment, V balance adjustment, bias light adjustment, H size adjustment, dark adjustment, AGC weighting adjustment, iris weighting adjustment, burst level adjustment, carrier balance adjustment
(2) High brightness pattern Bond a sheet of black paper to a cardboard and make a hole 15.5mm in diameter at the center of the paper.  			x2 beam adjustment, x5 beam adjustment, knee adjustment

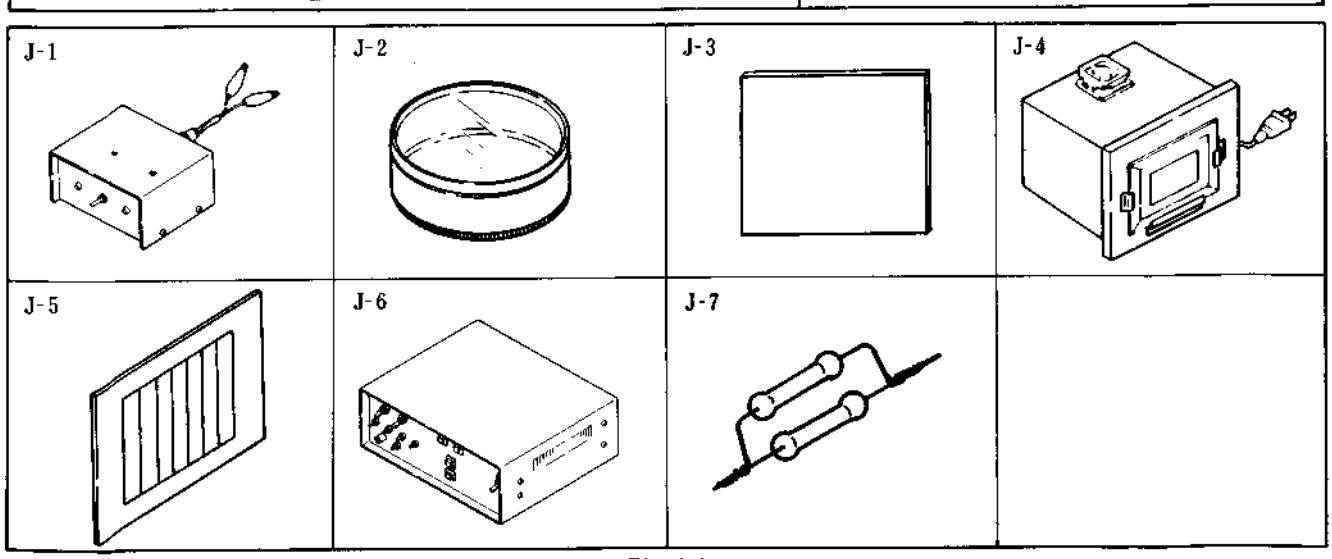


Fig. 1-1

1-2. PREPARATION

1) Set filter selector to ☼ (indoor).
2) Also perform the white balance if there are no special notes ("W" is to be turned off).

1-3. CONNECTION DIAGRAM

1) Set up pattern box and Betamovie as shown below.
2) Level the Betamovie and the pattern box, and place the in same height.

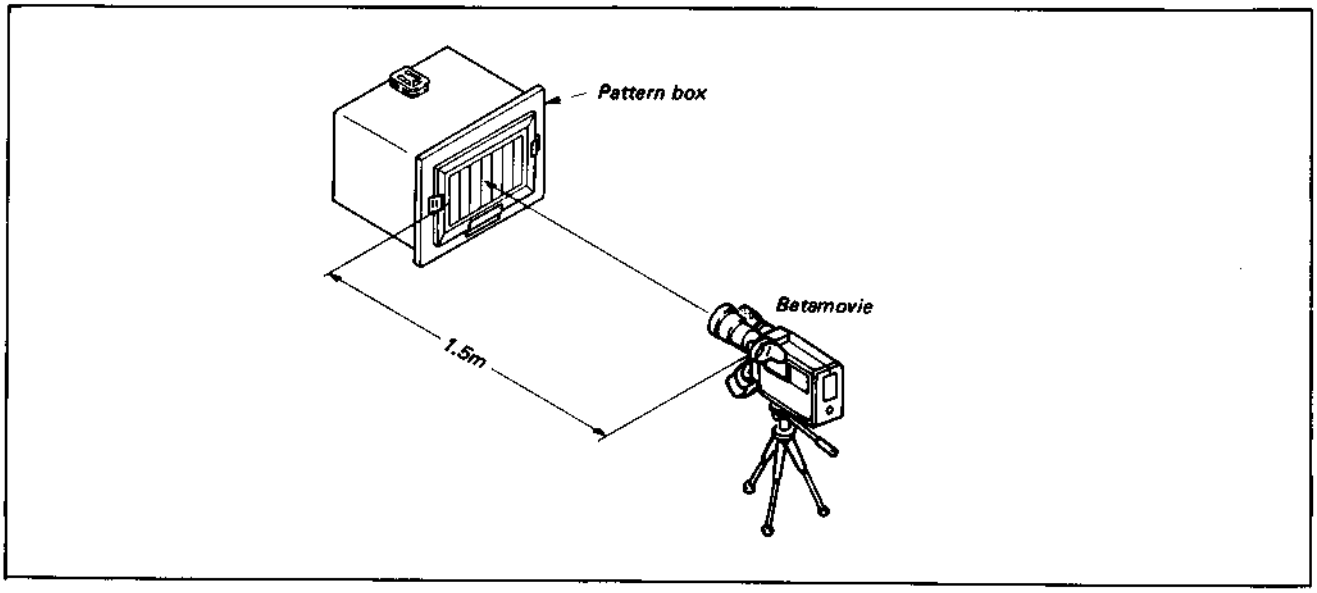


Fig. 1-2

3) Connect Betamovie, signal converter BMCJ-888P and special purpose monitor together as shown below.

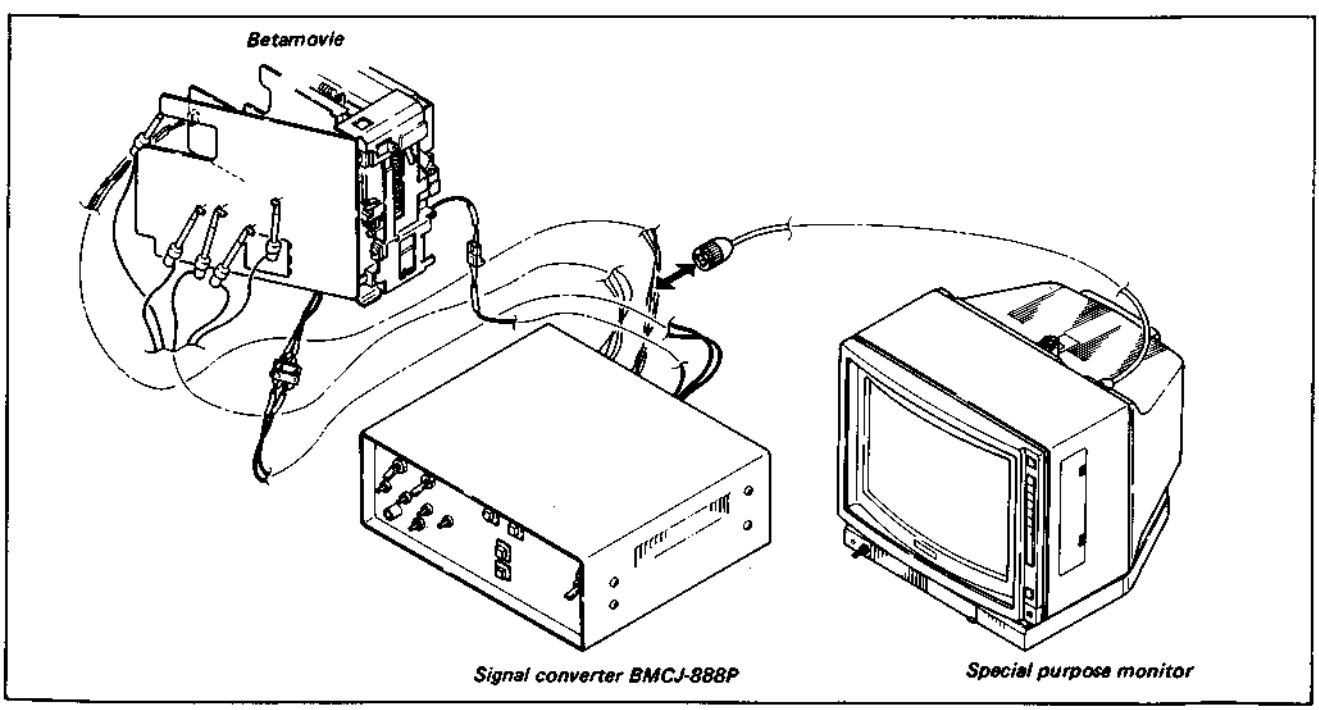


Fig. 1-3

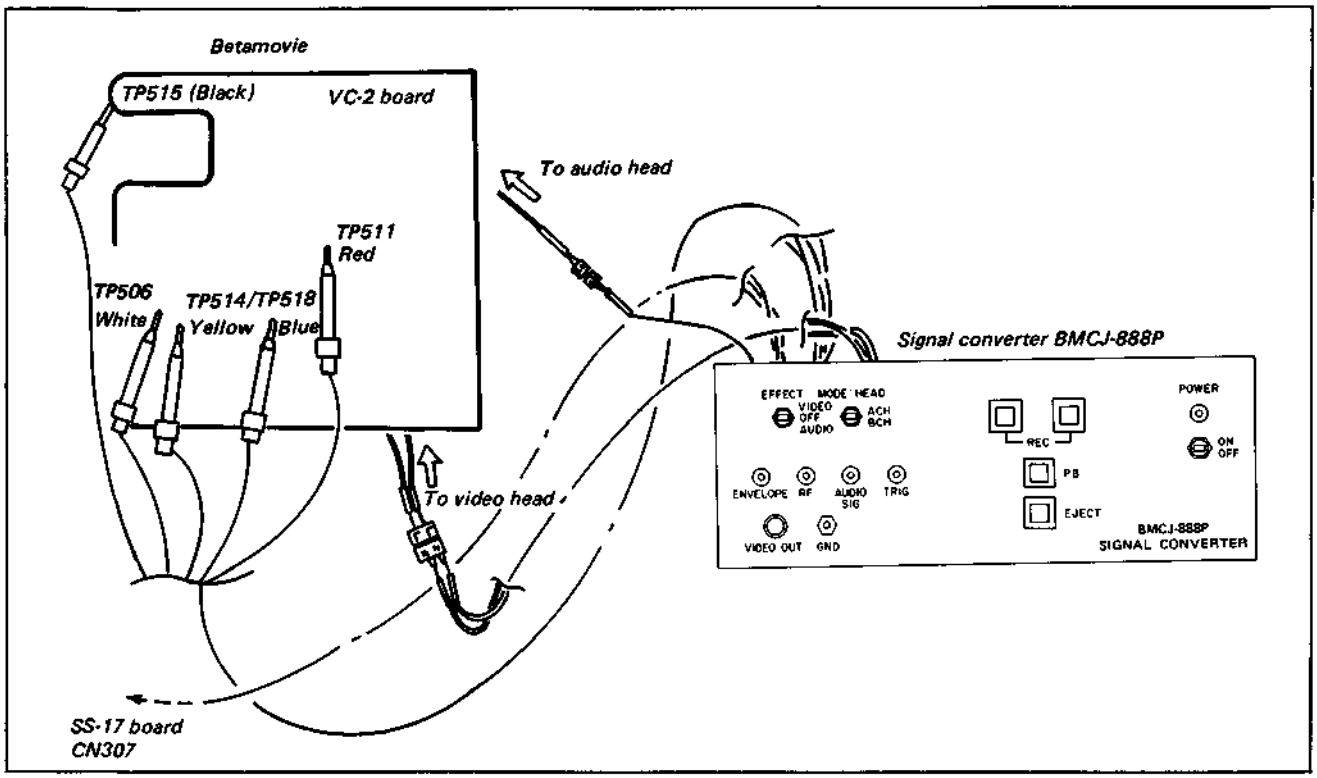


Fig. 1-4

1-4. EYESIGHT ADJUSTMENT

Adjusting Procedure:

1) Direct camera toward a bright, plain object such as white paper.
2) Turn the eyesight adjusting knob so as to make finder frame clearly recognizable.

1-5. PROCEDURE FOR DETERMINING MONITOR CENTER (RASTER CENTER) OF SPECIAL PURPOSE MONITOR FOR BETAMOVIE

This is required for "OVF and optical axis confirmation" and "V centering adjustment".

Note: Use a normal set for the determination.

Oscilloscope: TP506
Object: High brightness pattern
Zoom lever: 30 mm

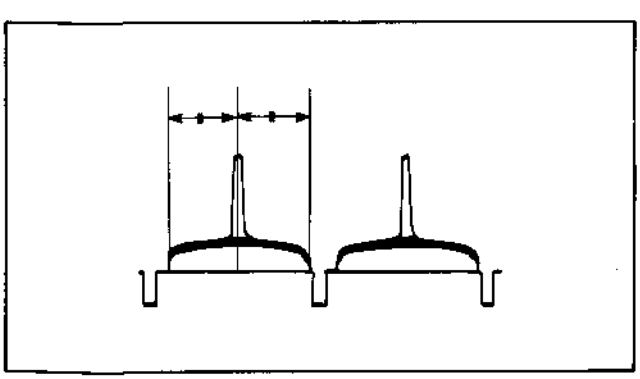


Fig. 1-5

1) Oscilloscope TIME/DIV: 20μsec (H)
   Adjust universal head to the left or right so as to position the spot portion to the center.
2) Oscilloscope TIME/DIV: 5msec (V)
   Adjust universal head upward or downward so as to position the spot portion to the center.

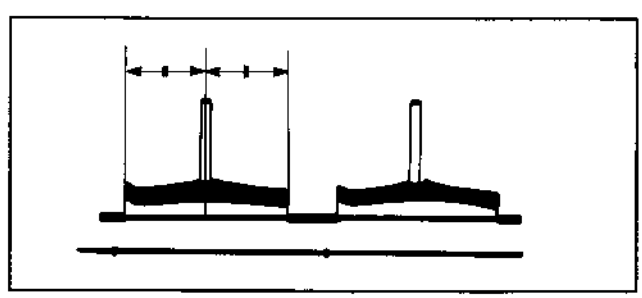


Fig. 1-6

3) Use the center of spot displayed on the monitor screen as monitor center. (Show a mark on the monitor center')

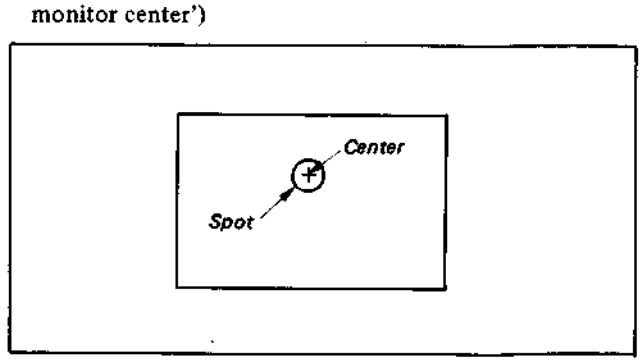


Fig. 1-7

1-6. PRECAUTIONS

(1)

Be sure to take the following precautions before starting adjustment:

1) SMF Trinicon tube may be easily burned if there is incident light before a rise of beam. Therefore, be sure to prohibit the entry of light in lens before beam adjustment. (Do not direct camera to a light source.)

2) Adjust color pattern by fully aligning to the bottom side. (If this is not performed, the weighting circuit begins to operate and normal iris and AGC operation will not occur.)

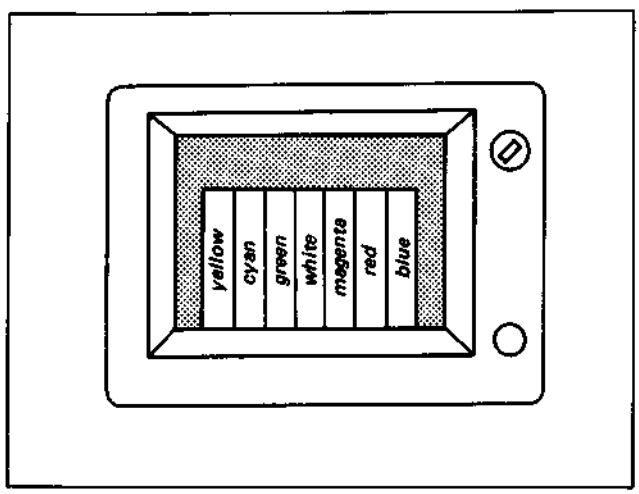


Fig. 1-8

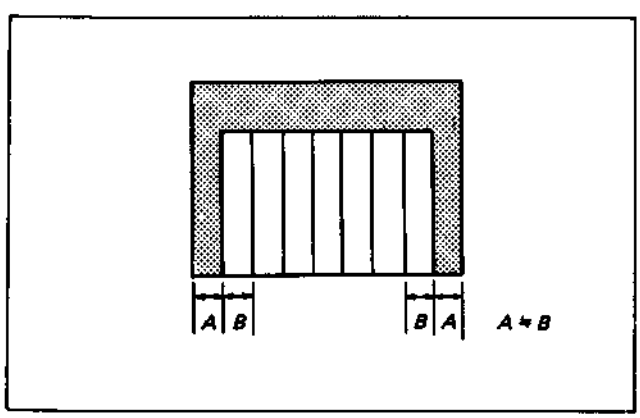


Fig. 1-9

(2) VC-2 board

High voltage is applied to the hatched portion. Your may have an electric shock if you touch this portion.

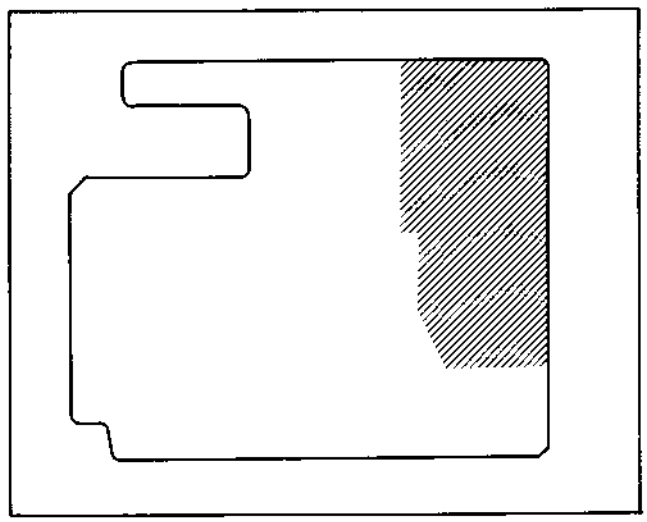
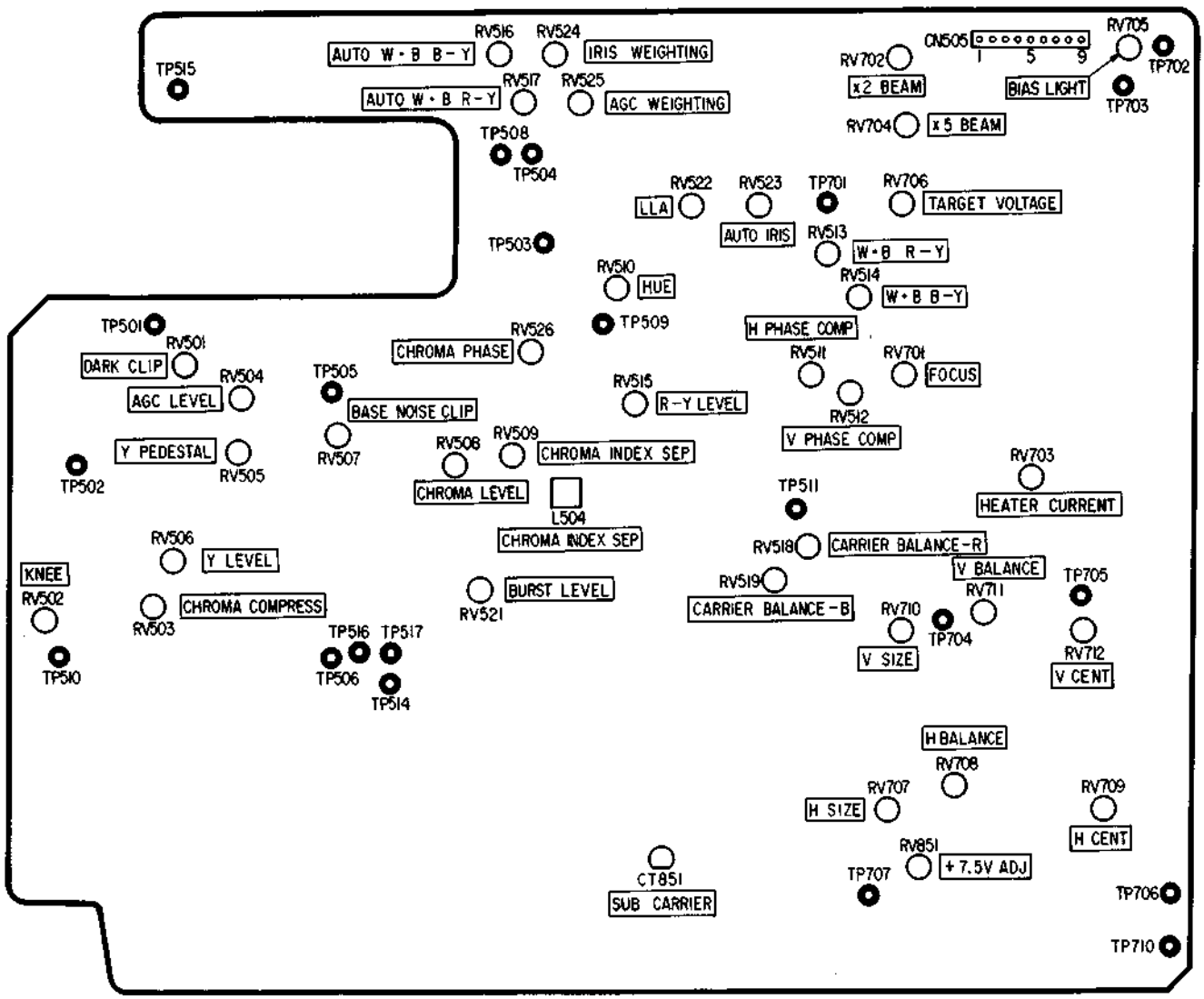


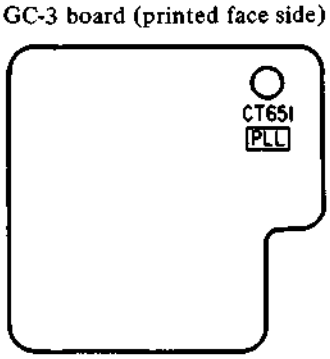
Fig. 1-10

1-7. RV AND TP LOCATION

VC-2 board (printed face side)



GC-3 board (printed face side)



SECTION 2
ADJUSTMENTS (CAMERA SECTION)

2-1. ADJUSTMENT OF 7.5V POWER SUPPLY AND HEATER

2-1-1. Adjustment of +7.5V Power Supply Voltage

Adjusting Procedure:

1) Cover lens with a black cap.
2) Connect ⊕ probe of digital voltmeter to TP706 (7.5V line) and ⊖ probe to TP710.
3) Turn RV851 so as to adjust the voltage at that time to 7.54V ± 0.075V.

Adjusted value: 7.54V ± 0.075V

2-1-2. Adjustment of Constant Current of Heater

Note: This adjustment should be performed only when the following parts were replaced or adjusted:
(Replacement of HV701, adjustment of RV851, replacement of R730, R762, R763, RV703)
* Only the confirmation is necessary when replacing trinicon tube.

Adjusting Procedure:

1) Remove the socket of trinicon tube.
2) Attach 2.2Ω standard resistor and digital voltmeter as shown below.
3) Turn RV703 so as to adjust the voltage to 682 ±6mV.

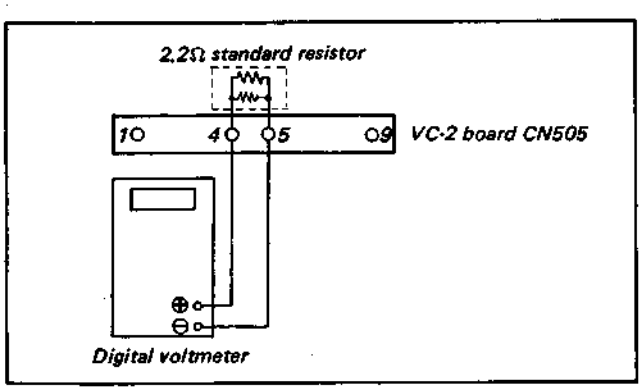


Fig. 2-1

2-2. ADJUSTMENT OF DEFLECTION SYSTEM

2-2-1. H Balance Adjustment

Oscilloscope: CH-1: TP702, CH-2: TP703 } ADD mode
Note: Oscilloscope range 2V/DIV

Adjusting Procedure:

1) Cover lens with a black cap.
2) Turn and adjust RV708 so as to make the waveform parabolic as shown below.

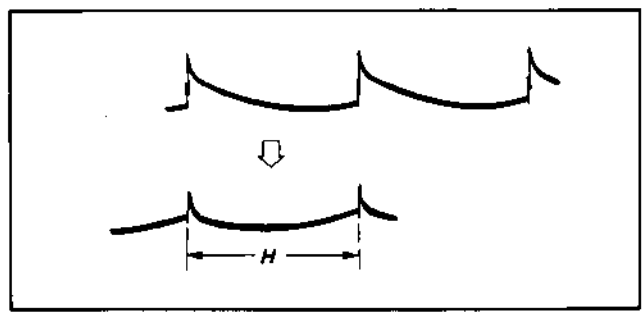


Fig. 2-2

2-2-2. Adjustment of V Balance

Oscilloscope: CH-1: TP704, CH-2: TP705 } ADD mode
Note: Oscilloscope range 2V/DIV

Adjusting Procedure:

Turn and adjust RV711 so as to make the waveform straight as shown below.

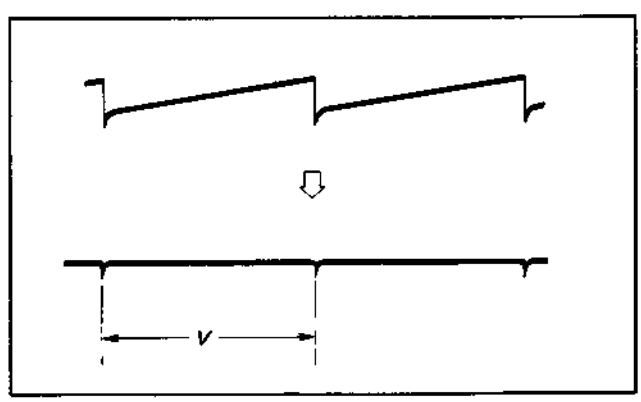


Fig. 2-3

2-2-3. Target Voltage Adjustment

Adjusting Procedure:

1) Connect ⊕ probe of digital voltmeter to TP701 and ⊖ probe to TP515 respectively.
2) Turn RV706 and adjust voltage to 49 ± 2V.

Note: Turn RV706 little by little clockwise starting from its utmost end on the printed face of the board.

2-2-4. Bias Light Adjustment

Oscilloscope: TP501

Adjusting Procedure:

1) Cover lens with a black cap.
2) Adjust the level to 20 ± 8mVp-p using RV705 as shown below.

Note: Temporarily adjust beam prior to the bias light adjustment.

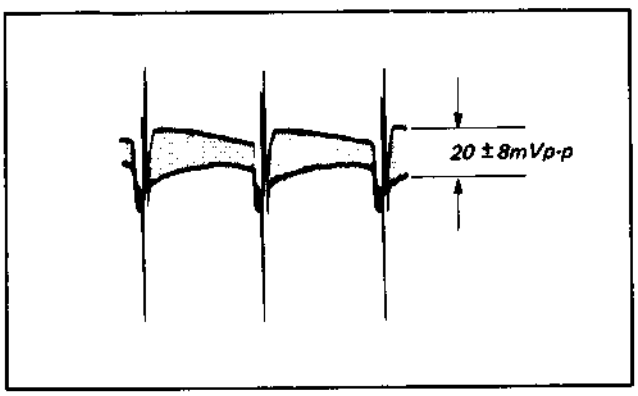
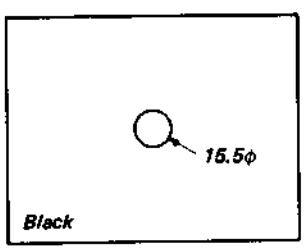


Fig. 2-4

2-2-5. x2 Beam Adjustment

Oscilloscope: TP501

Object to be shot: High brightness pattern (shown below).



Adjusting Procedure:

1) Turn RV702 fully counterclockwise and RV704 fully clockwise on the printed face.
2) Cover lens with ND-0.4 filter.
3) Set zoom lever to the utmost telephoto end.
4) Adjust output waveform to 480 ± 50mV using RV702.

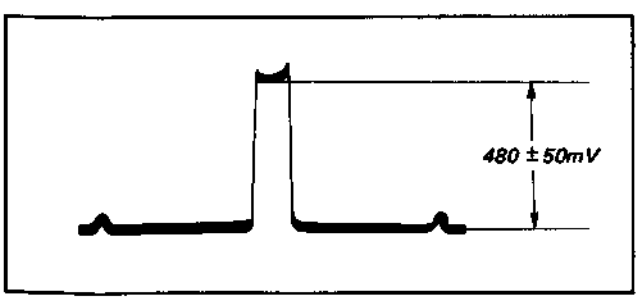
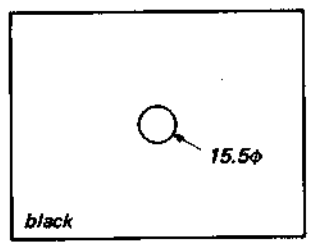


Fig. 2-5

2-2-6. x5 Beam Adjustment (ABO)

Oscilloscope: TP501

Object to be shot: High brightness pattern (shown below).



Adjusting Procedure:

1) Set zoom lever to the utmost telephoto end.
2) Turn RV704 counterclockwise on the printed face and adjust the peak-to-peak value of the waveform shown in Fig. 2-6 to 1.2 ± 0.1Vp-p.

Note: Make this adjustment more than 1 minute after turning power on.

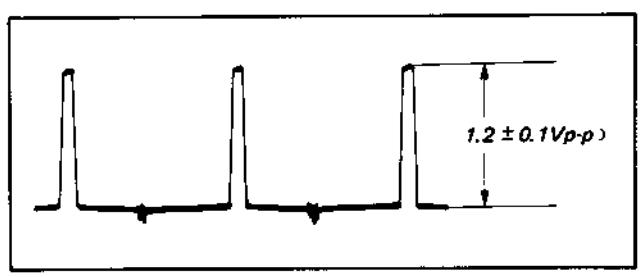


Fig. 2-6

2-2-7. Focus Adjustment

Oscilloscope: TP501

Object to be shot: Fully white pattern

Adjusting Procedure:

1) After shooting the white pattern fully on the picture frame, cover the lens with a red filter.
2) Turn RV701 so as to make the carrier component of the waveform shown below maximum.

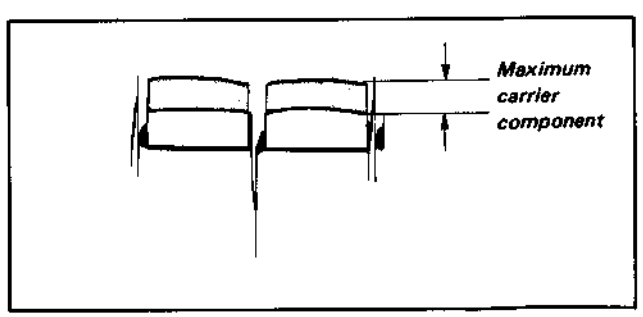


Fig. 2-7

2-2-8. H Size Adjustment

Connect 5.4MHz oscillator jig as shown below.

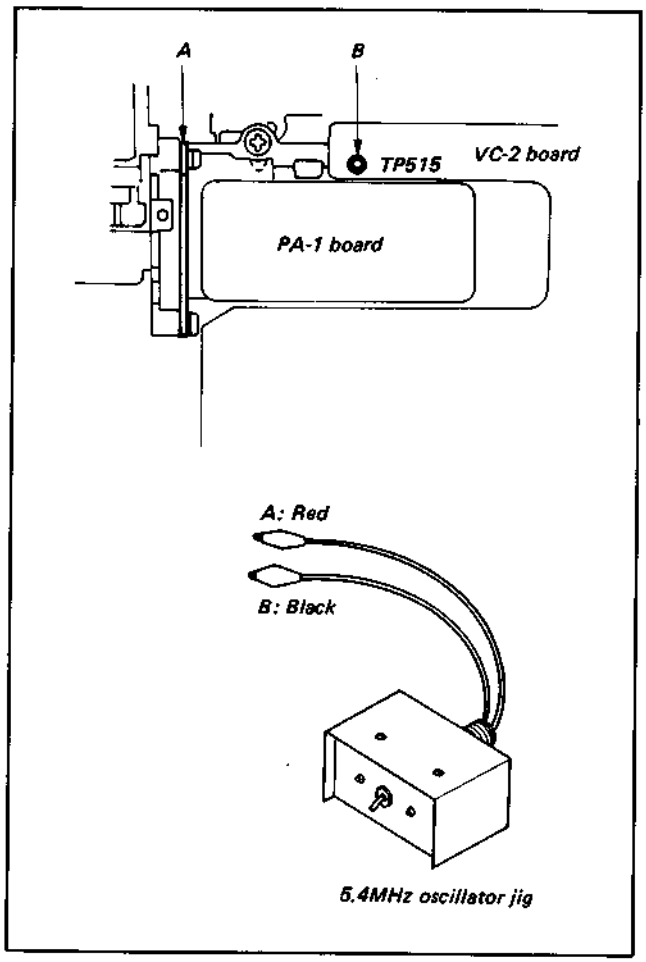


Fig. 2-8

Adjusting Procedure:

1) Cover the lens with a white cap.
2) While observing the color monitor, adjust RV707 so as to make the number of beats the smallest laterally as shown below, and confirm that the number of beats is less than 6.7.

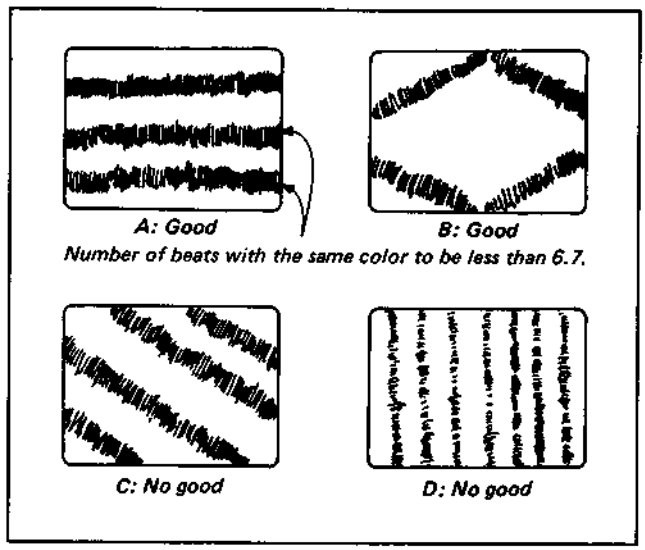


Fig. 2-9

2-2-9. H Centering Adjustment

Oscilloscope: CH-1: TP501
CH-2: TP511

Object to be shot: Fully white pattern

Adjusting Procedure:

Turn RV-709 fully counterclockwise first on the pattern face and then gradually turn it clockwise so as to make the width of black mask of waveform shown in Fig. 2-10 equal to 2.9 ± 0.4μsec from the rise of HD pulse shown below.

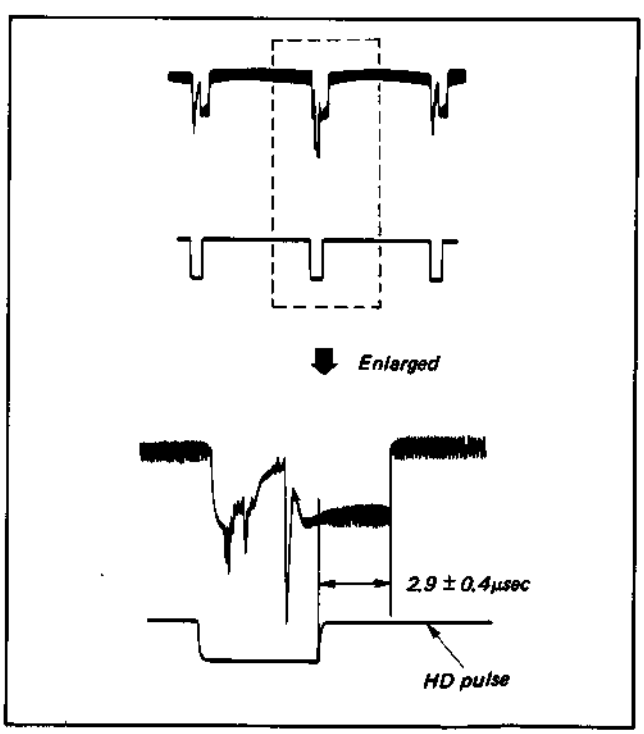


Fig. 2-10

2-2-10. Adjustment of Levelness

1) Place the camera and object in level, and focus the lens on the object.

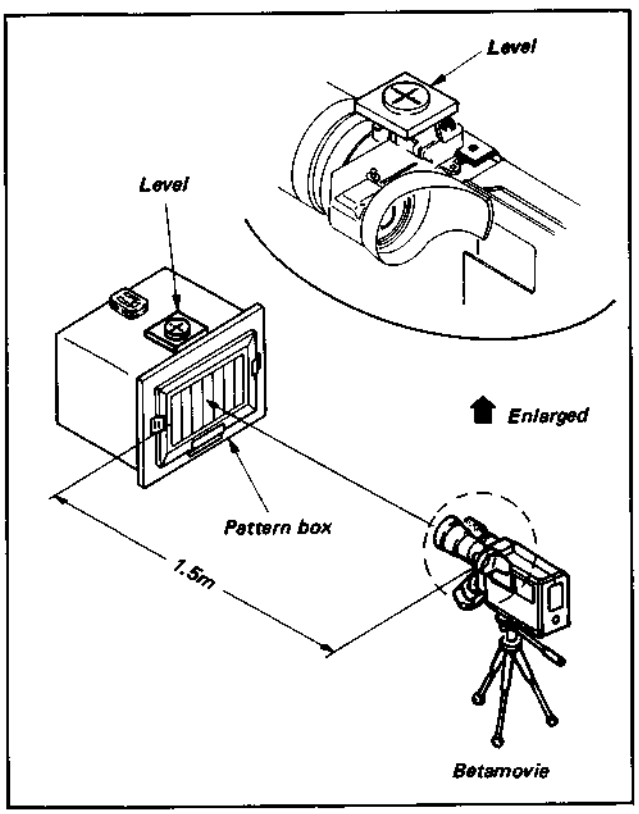


Fig. 2-11

2) Loosen the clamp screw of Trinicon tube with a hexagon key wrench, and turn level adjusting pin with a regular screwdriver so as to make the Trinicon tube level.

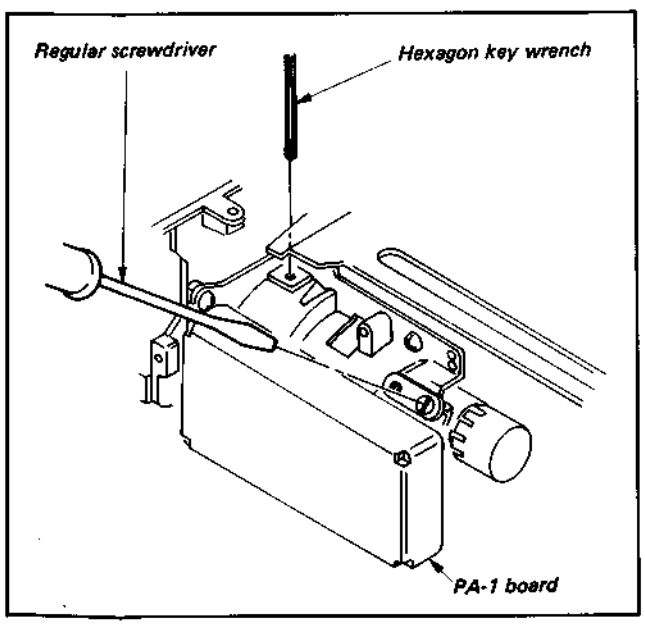


Fig. 2-12

2-2-11. Flange Back Adjustment (F. B.)

Adjusting Procedure:

1) Set the focus ring of lens to 1.5m.
2) Set zoom ring to a wide angle end of 9mm.
3) Loosen lens lock screw A.
4) Slightly rotate lens with a screwdriver having a narrow blade from C-portion.
5) Adjust the adjust screw of B-portion so as to make the clearest at the center of monitor.
6) Tighten the lens lock screw A.
7) When the focus ring is rotated to make the center the clearest, the position of the focus ring must be within the standard range.
8) If the step 7 fails, repeat steps 3 to 6.

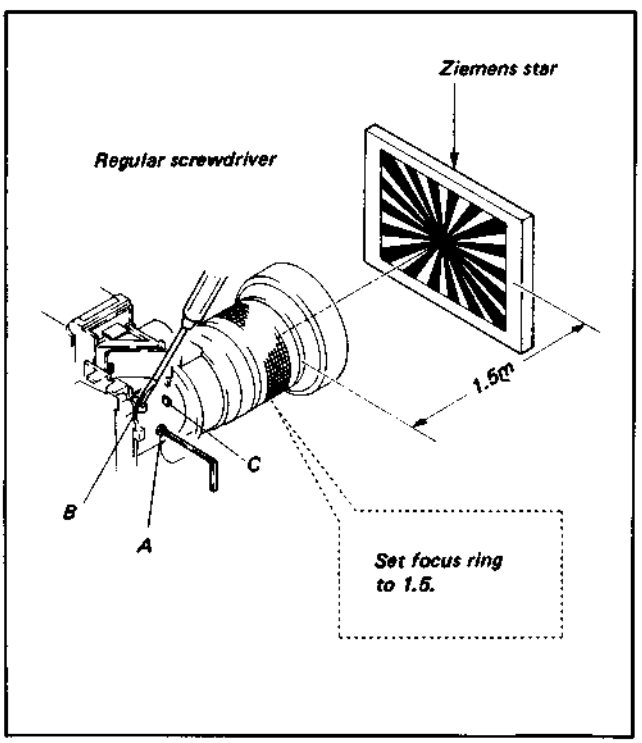


Fig. 2-13

Note: Start adjustment only after moving the zoom lever back and forth more than once between wide angle end and telephoto end.

Standard range of step 7: 1.2 | 1.5 | 2

2-2-12. Confirmation of Horizontal Optical Axis with OVF

Object to be shot: Color pattern

Adjusting Procedure:

1) Set the zoom lever to the telephoto end.
2) Adjust the universal head so as to align the pattern box center with monitor center.
3) Adjust the adjust screw so as to align the finder with pattern box center.

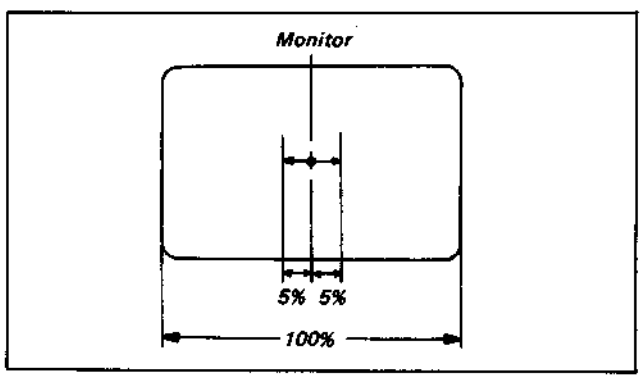


Fig. 2-14

Standard:

When the finder center is aligned with pattern box center, the deviation on the monitor must be within ±5%.

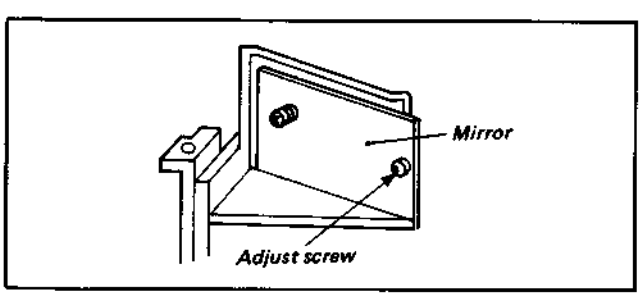


Fig. 2-15

2-2-13. V Size Adjustment

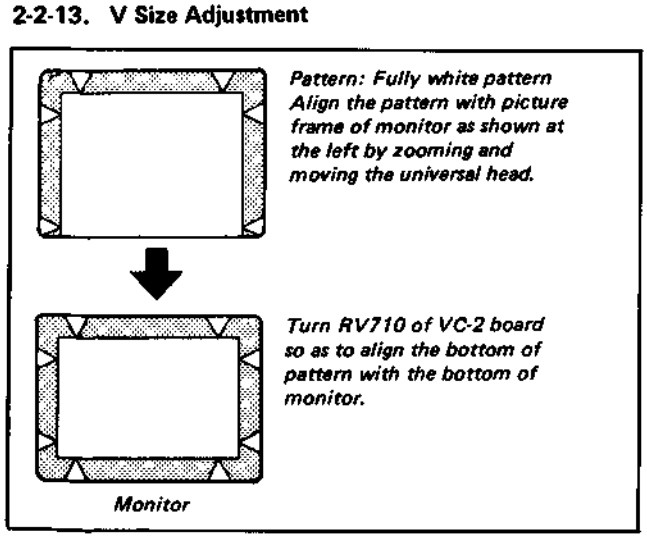


Fig. 2-16

2-2-14. Adjustment of V Centering

Show marks to the centers of white pattern and monitor screen. Set the zoom lever to telephoto and focus the lens.

Adjusting Procedure:

1) Align the center of pattern with the center of lens by moving the universal head, set the zoom to wide angle, and align the center of screen to the center of white pattern.
2) If the center of screen is deviated from the center of white pattern after setting the zoom to telephoto, then deviate the center of fully white pattern by one-fifth of center-to-center distance A in the direction of deviation by adjusting RV712.
3) After setting the zoom to wide angle, align the center of fully white pattern with the center of lens by moving the universal head, and align the center of the pattern with the center of screen.
4) Set the zoom to telephoto, and confirm that the deviation between the center of screen and the center of white pattern is less than 1/25 of screen length ℓ.

Note: If the deviation is not less than 1/25 of ℓ, then repeat the adjustment again.

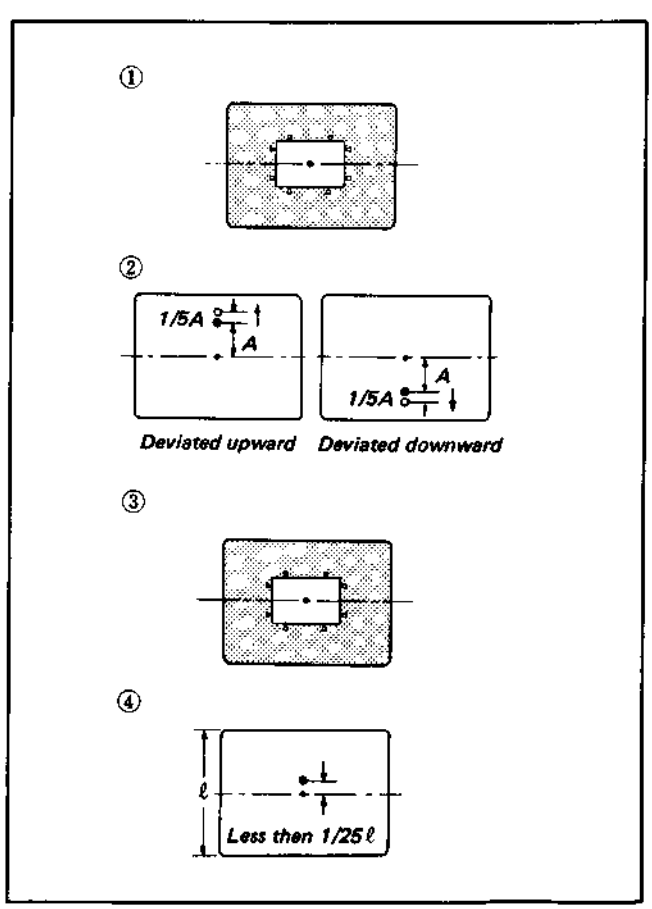


Fig. 2-17

2-3. ADJUSTMENT OF Y SYSTEM

2-3-1. Adjustment of Iris Weighting

Oscilloscope: TP504

Adjusting Procedure:

1) Cover the lens with a black cap.
2) Turn RV524 so as to align the point where the voltage is 100mV lower than the fully voltage value with the point of 4.6 ± 0.2mS as shown in Fig. 2-18.

Note: LLA in the finder must have been turned on.

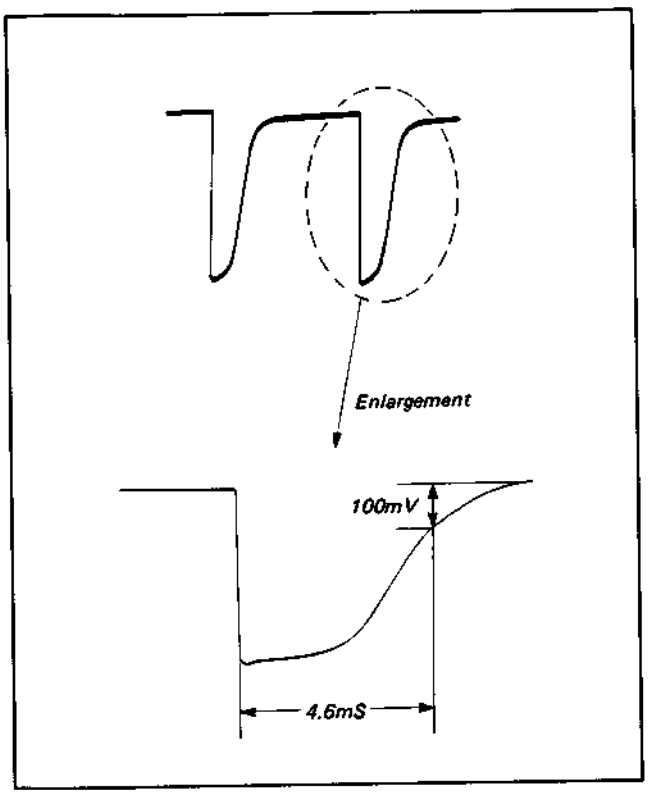


Fig. 2-18

2-3-2. Adjustment of Auto Iris

Oscilloscope: TP501

Object to be shot: Color pattern

Adjusting Procedure:

Turn RV523 so as to make the peak-to-peak value of waveform of Fig. 2-19 equal to 240 ± 30mVp-p.

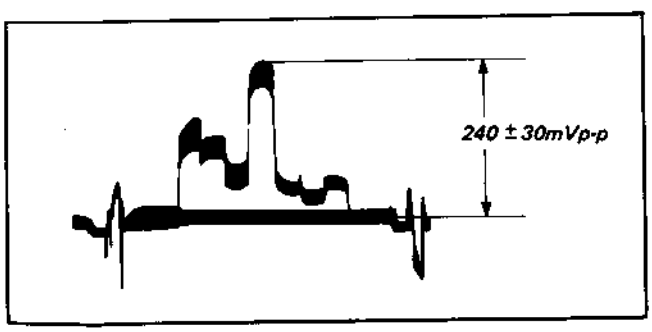


Fig. 2-19

2-3-3. Adjustment of Dark Clip

Oscilloscope: TP502, AC mode

Adjusting Procedure:

1) Cover the lens with a black cap.
2) Turn RV501 so as to make the clamped portion during blanking equal to 0V.

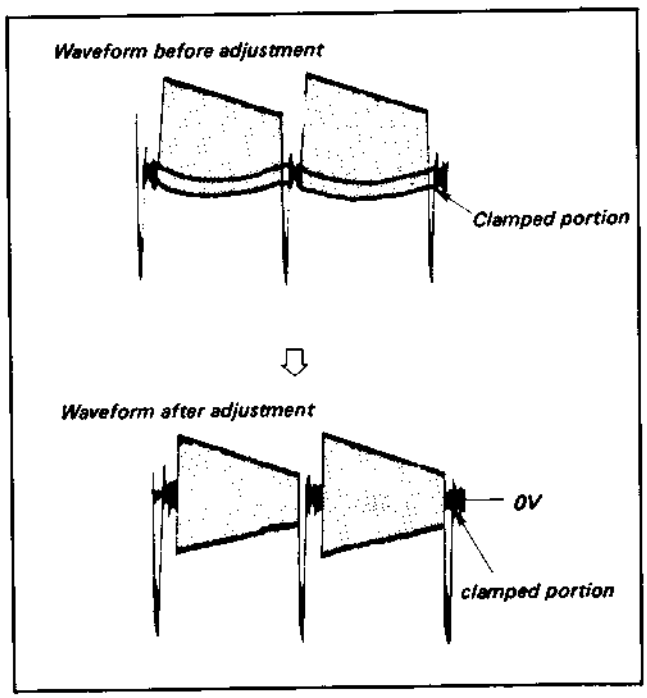


Fig. 2-20

2-3-4. Adjustment of AGC Weighting

Oscilloscope: TP503

Adjusting Procedure:

1) Cover the lens with a black cap.
2) Turn RV525 of VC-2 board so as to align the point where the voltage is 200mV lower than the full voltage value with the point of 4.6±0.2mS as shown below. (Fig. 2-21)

Note: LLA in the finder must have been turned on.

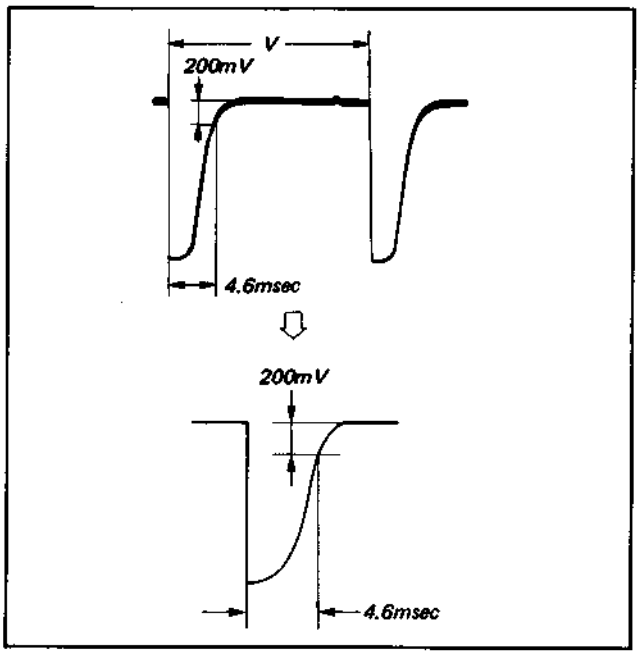


Fig. 2-21

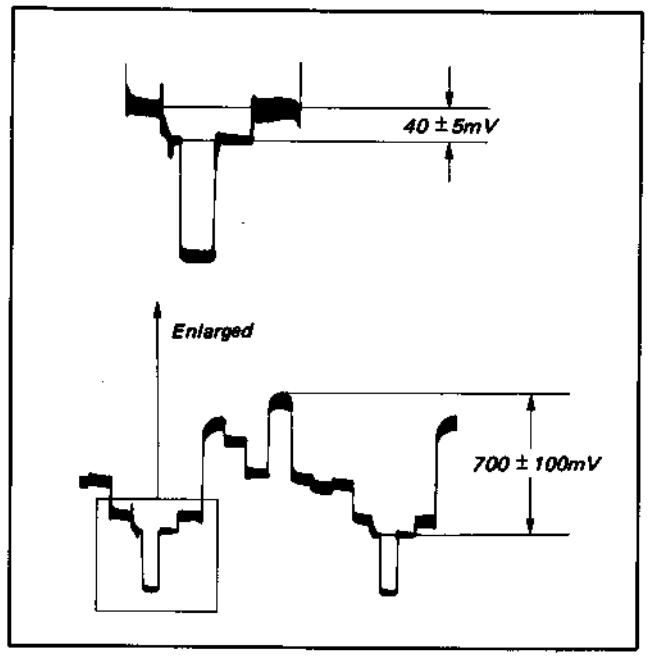


Fig. 2-23

2-3-5. Adjustment of AGC Level

Oscilloscope: TP502

Object to be shot: Color pattern

Adjusting Procedure:

Turn RV504 so as to make the peak-to-peak value of waveform shown below equal to 1.5 ± 0.2V.

Note: This value should be observed 3 to 4 seconds after the adjustment.

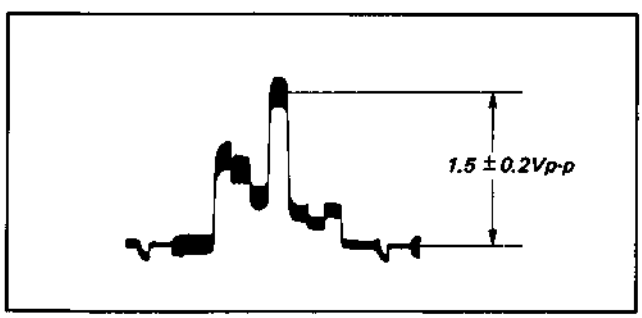


Fig. 2-22

2-3-6. Adjustment of Y Pedestal and Y Level

Oscilloscope: TP506

Object to be shot: Color pattern

Adjusting Procedure:

1) Turn RV505 so as to make the pedestal level equal to 40 ± 5mV as shown below.
2) Turn RV506 so as to make Y level equal to 700 ± 100mV as shown below.
3) Check the pedestal again and confirm that it is within the standard range.
4) If the pedestal is not within the standard range, readjust RV505 and RV506 and repeat the steps 1 and 2.

2-3-7. Adjustment of Base Noise Clip

Oscilloscope: TP505

Object to be shot: Color pattern

Adjusting Procedure:

Turn RV507 so as to make level equal to 10 ± 5mV as shown below.

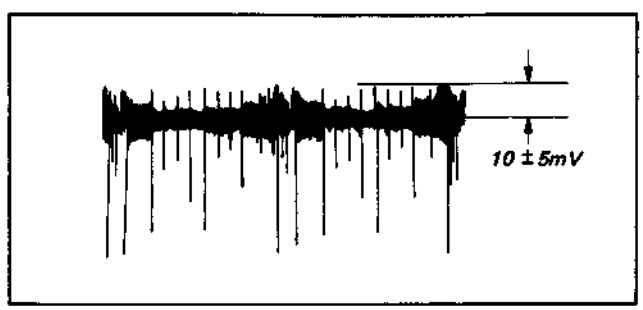


Fig. 2-24

2-3-8. Knee Adjustment

Oscilloscope: TP506

Object to be shot: High brightness pattern (shown below)

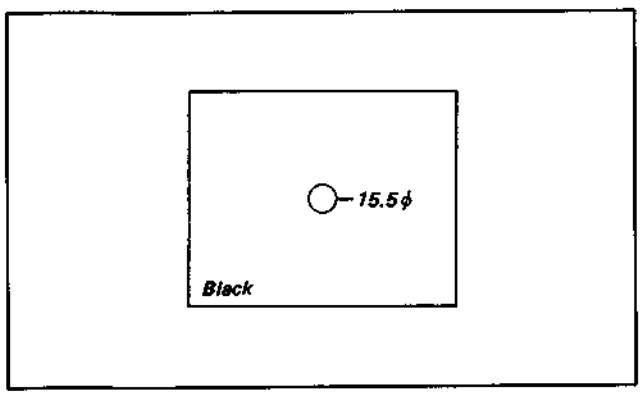


Fig. 2-25

Adjusting Procedure:

1) Set the zoom to telephoto end.
2) Turn RV502 so as to make the value of waveform of Fig. 2-26 equal to 900 ± 100mV.

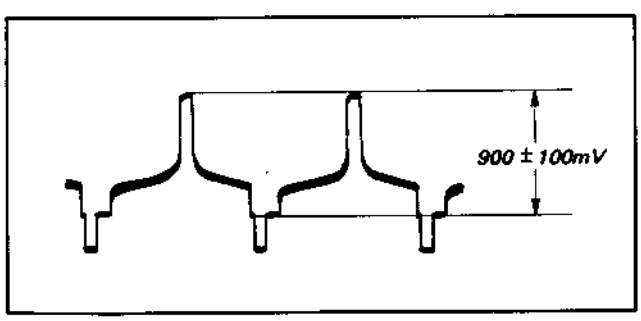


Fig. 2-26

2-3-9. LLA Adjustment

Object to be shot: Color pattern

Adjusting Procedure:

1) Cover the lens with ND filters 0.4 and 1.0 and adjust RV522 on VC-1 board so as to turn on LLA lamp.
2) Remove ND filters 0.4 and 1.0 from the front of lens.
3) Cover the lens with ND filters 0.1 and 1.0 and confirm that the LLA lamp will be turned off. If it does not, adjust RV522 so as to turn off LLA lamp.
4) Repeat steps 1 and 3 once again for confirming the adjustment.

2-4. ADJUSTMENT OF CHROMA SYSTEM

2-4-1. Adjustment of Burst Level

Oscilloscope: TP514

Adjusting Procedure:

1) Cover the lens with a black cap.
2) Turn RV521 so as to make the burst level equal to 280 ± 10mV as shown below.

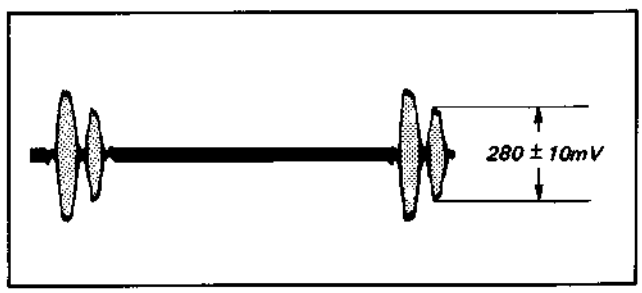


Fig. 2-27

2-4-2. Adjustment of HV Phase Correction

Oscilloscope: CH-1: TP509, CH-2: TP508 } X-Y mode

Object to be shot: White pattern

Adjusting Procedure:

1) Shoot the white pattern with 5% cut.

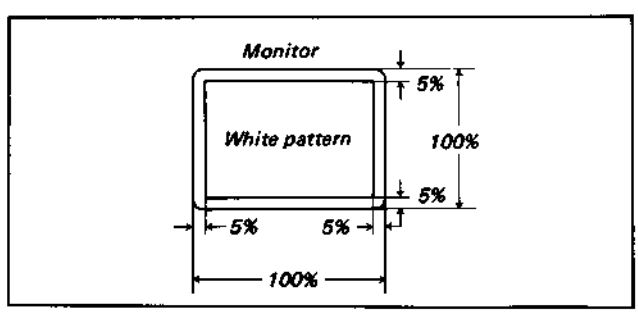


Fig. 2-28

2) Cover with a red filter.
3) Adjust with RV511 and RV512 so as to make the size of spot minimum. (Fig. 2-29)

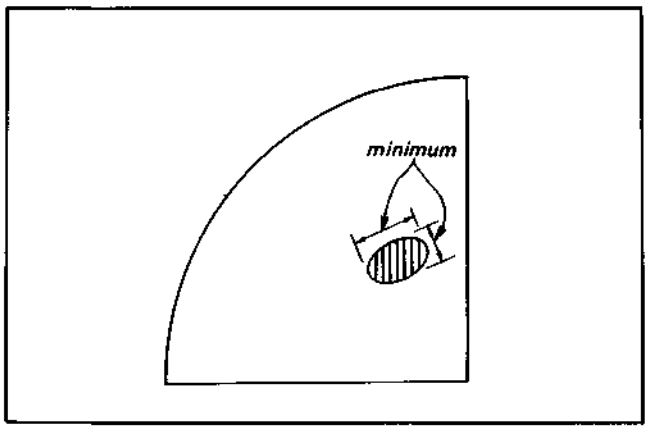


Fig. 2-29

2-4-3. Adjustment of Chroma Index Separation

Oscilloscope: CH-1: TP509 / CH-2: TP508 } X-Y mode

Object to be shot: Color pattern

Adjusting Procedure:

Adjust with RV509 and L504 alternately to overlap spots as many as possible.

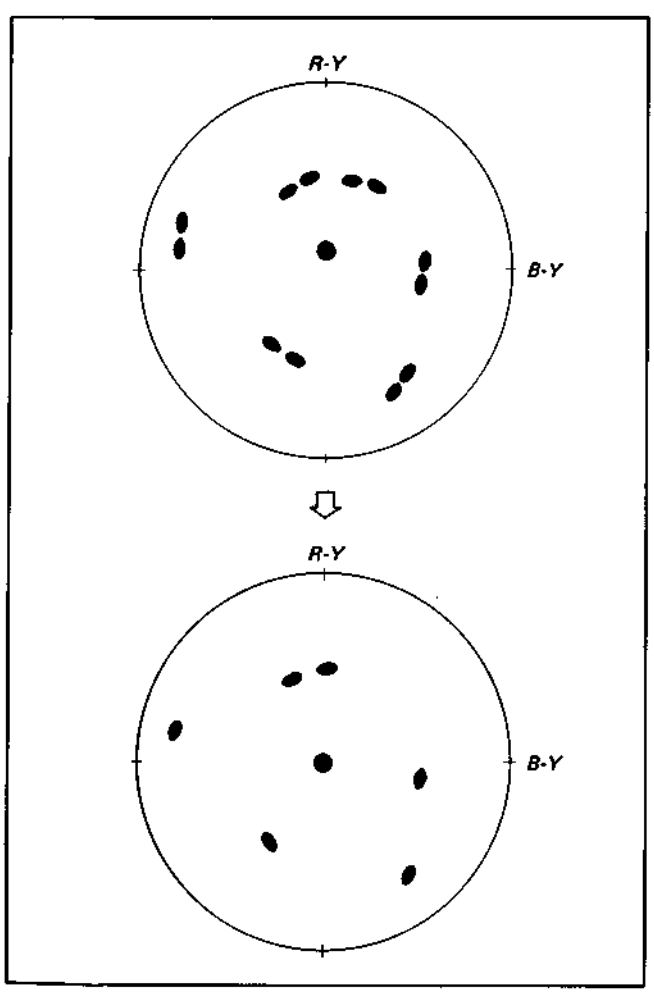


Fig. 2-30

2-4-4. Adjustment of Chroma Compression

Oscilloscope: TP510

Object to be shot: Color pattern

Adjusting Procedure:

1) Set filter selector to ☼ (indoor), and depress the white balance button to turn off W in the finder.
2) Cover the lens with a black cap.
3) Turn RV503 so as to make the output equal to 450 ± 30mV in DC level.
4) Confirm the color reproducibility.

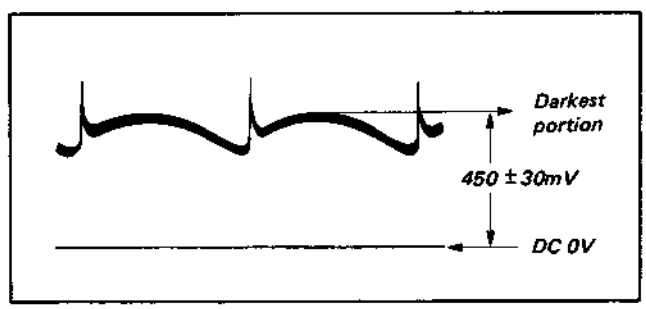


Fig. 2-31

2-4-5. Auto White Balance

Oscilloscope: CH-1: TP509 / CH-2: TP508 } X-Y mode

Object to be shot: White pattern

Adjusting Procedure:

1) Set filter switch to ☼ (indoor).
2) Adjust with RV516 and RV517 so as to let the spot become the origin when white balance button is depressed.

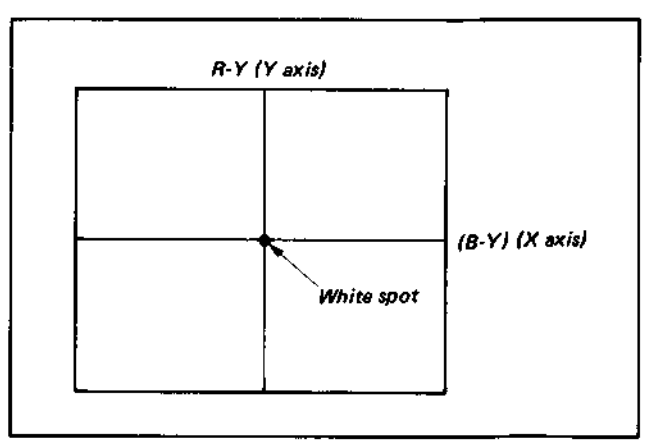


Fig. 2-32

3) Confirm that "W" in the view finder is turned off.
4) Confirm that the spot will deviate when the filter switch is switched to ✷ (outdoor).

2-4-6. Adjustment of Color Reproducibility

1. Adjustment of Chroma Level Phase

1) Oscilloscope: CH-1: TP509, CH-2: TP508 } X-Y mode
   Cover with a black cap.
2) Connect the red clip of 5.4MHz oscillator jig to TP501 and the black clip to TP515.
3) Make the shape as round as possible by adjusting with RV515 and RV526.

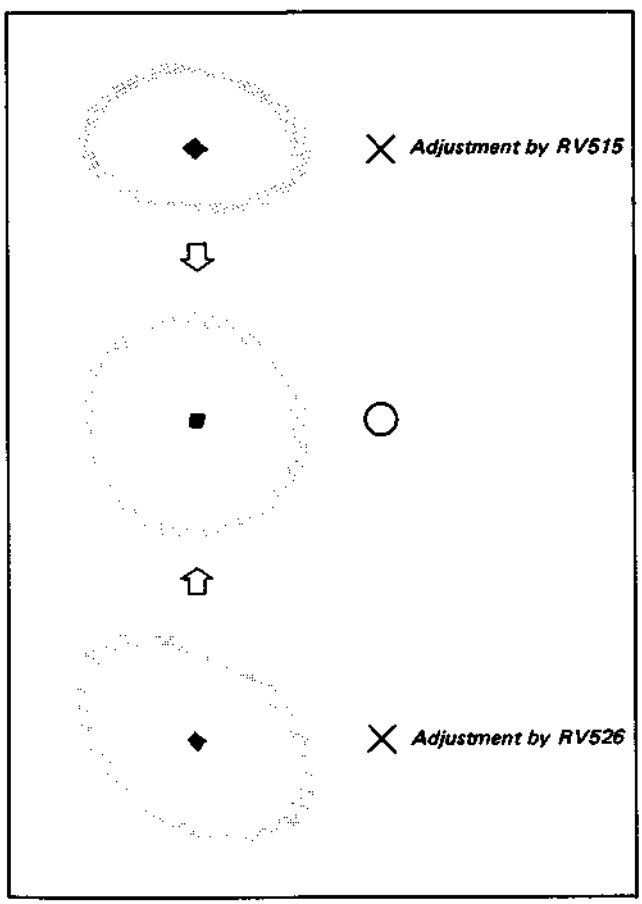


Fig. 2-33

4) Remove the black cap.
5) Oscilloscope: TP514
   Adjust RV508 to bring the larger of red levels A and B to 150 ± 10mV.

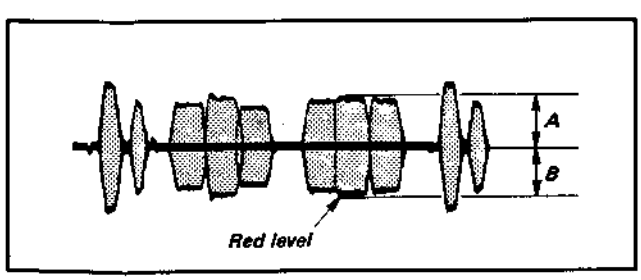


Fig. 2-34

2. Adjustment of Carrier Balance

Oscilloscope: TP514

Object to be shot: Color pattern

Adjusting Procedure:

Adjust with RV518 and RV519 so as to make the carrier component minimum.

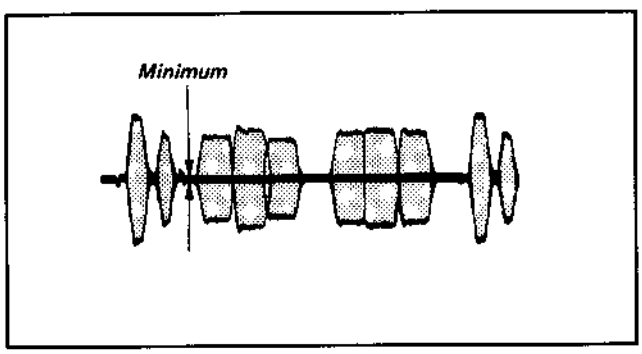


Fig. 2-35

3. HUE Adjustment

Oscilloscope: CH-1: TP509, CH-2: TP508 } X-Y mode

Adjusting Procedure:

Adjust with RV510 so as to have the red spots located within the standard phase frame.

4. Adjustment of White Balance

Oscilloscope : CH-1 : TP509, CH-2 : TP508 } X-Y mode

Object to be shot: Color pattern

Adjusting Procedure:

1) Adjust with RV513 and RV514 so as to let the white spot become the origin. (Fig. 2-36)

Note: Switch the filter switch from ☼ (indoor) to ☀ (outdoor) and to ☼ and adjust the white balance while "W" is lighted.

2) Confirm that all color spots located within the standard phase frame.
3) If the above step 2) is not satisfied, repeat above steps **3** through **4**.

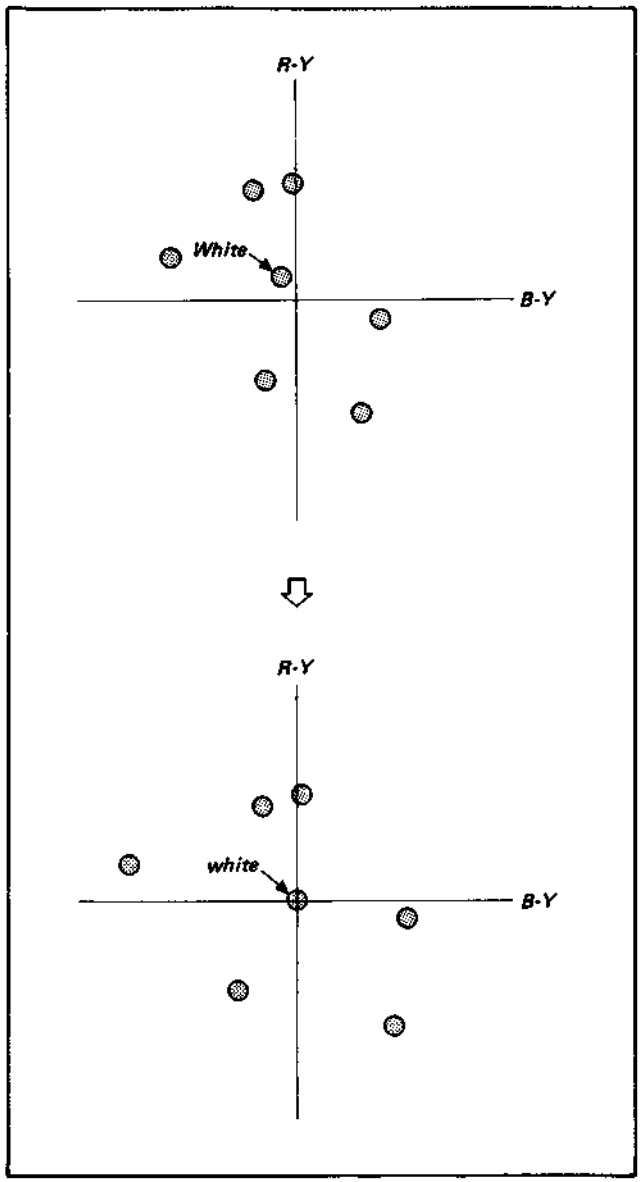


Fig. 2-36

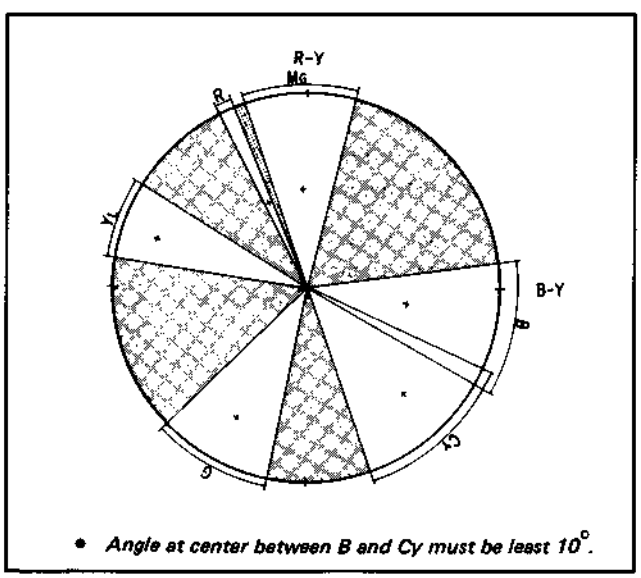


Fig. 2-37 Standard phase frame

2-4-7. PLL Adjustment (GC-3 Board)

Oscilloscope: CH-1, Point A (VC-2 Board)
External SYNC: TP511 (HD pulse)

Adjustment Procedure:

1) Short pins ① and ② of IC651 (GC-3 board) together.
2) Disconnect points A and B on VC-2 board by unsoldering. (Fig. 2-38)

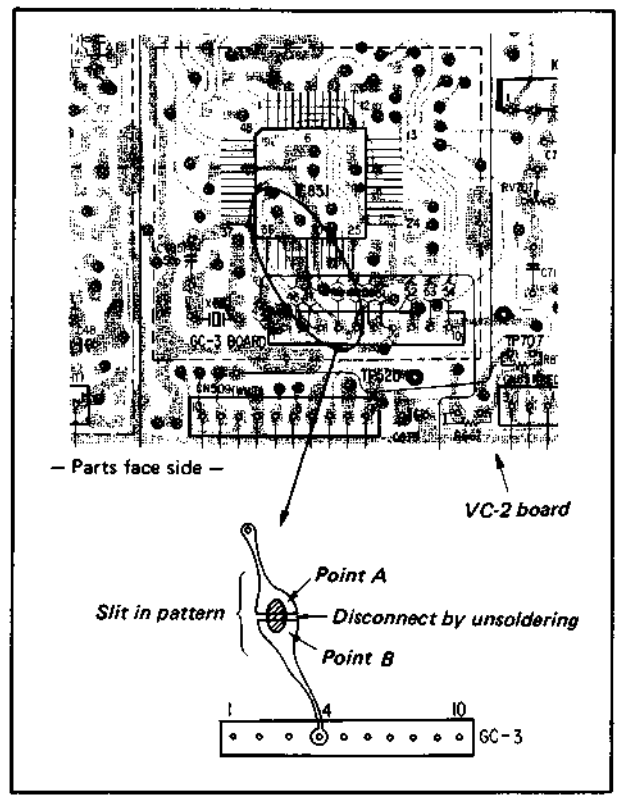


Fig. 2-38

3) Adjust CT651 to minimize fluctuation of beats. (Fig. 2-39)

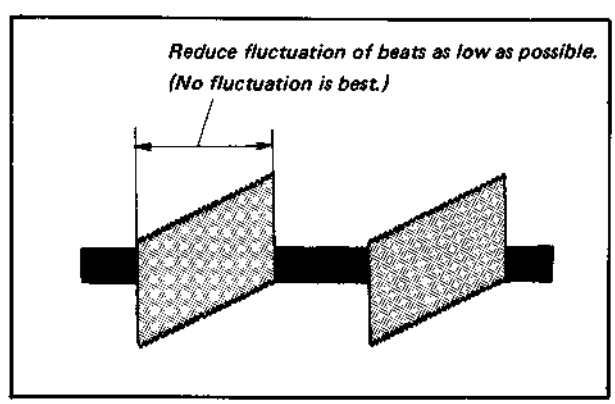


Fig. 2-39

4) Join points A and B by soldering, and disconnect pins ① and ② of IC651.
5) Check that the voltage at point A is 1.75V with a digital voltmeter.
6) If requirement 5) is not met, repeat 1) through 5).

SECTION 3
ALIGNMENT OF MECHANICAL COMPONENTS (VIDEO SECTION)

3-1. PREPARATION FOR CHECKING, ALIGNMENT, AND REPLACEMENT OF MECHANICAL COMPONENTS

3-1-1. Removal of Cabinet

1) Remove the three screws ❶ , and remove the lens cabinet, right ❷ .
2) Remove the three screws ❸ , and remove the lens cabinet, left ❹ .
3) While opening the lens cabinet (T) ass'y ❺ in the direction of the arrow ⓐ , remove it in the direction of the arrow ⓑ .
4) Remove the ACC shoe stopper screw ❻ , and remove the ACC shoe leaf spring ❼ .
5) Remove the two screws ❽ , and remove the ACC shoe ❾ .
6) Remove the two face screws ❿ , and remove the cassette compartment lid ass'y ⓫ .
7) Remove the four screws ⓬ , and remove the cabinet, left ⓭ .
8) Remove the four screws ⓮ , and remove the cabinet, right ⓯ .

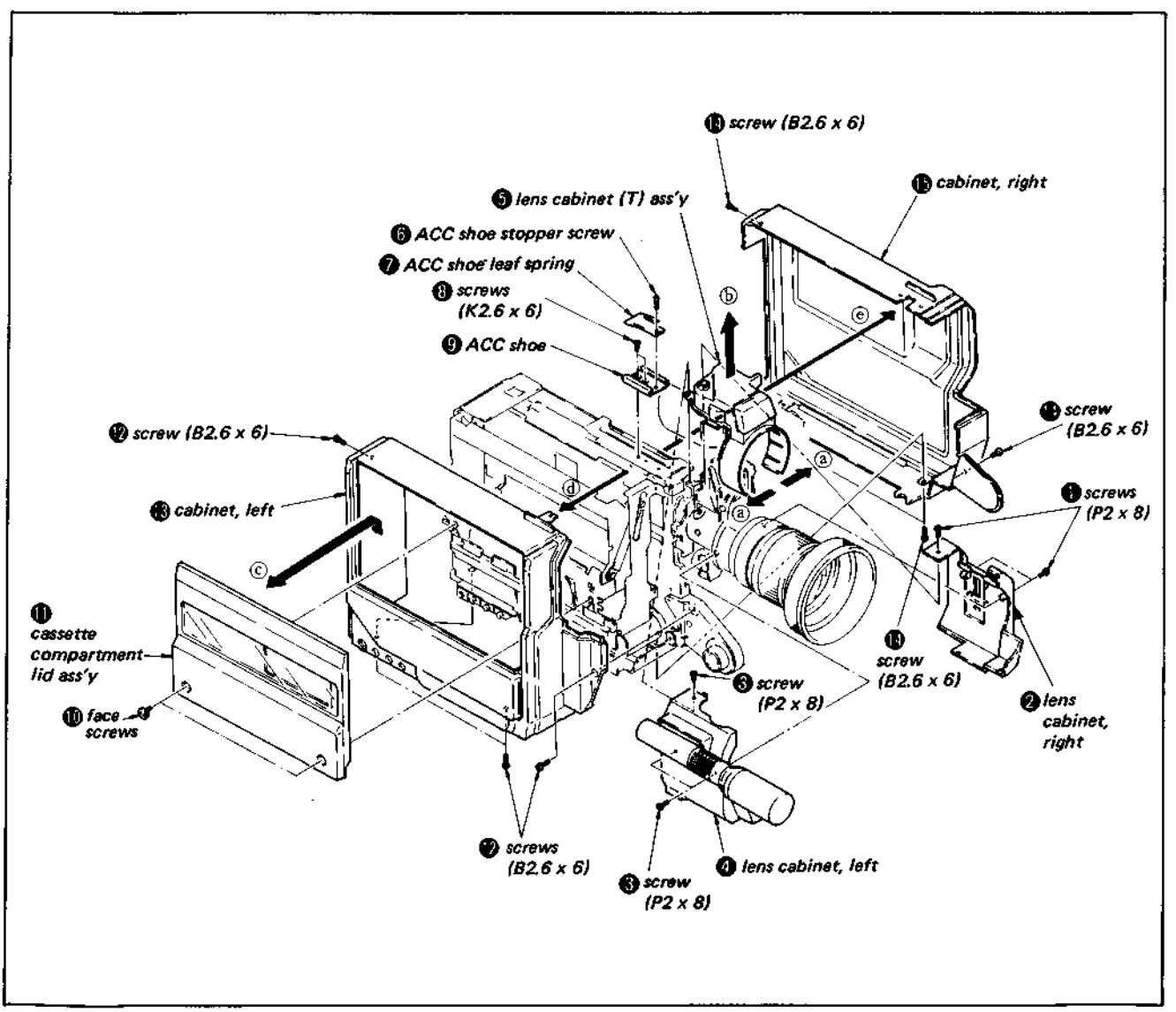


Fig. 3-1

3-1-2. Removal of Cassette Ass'y

1) Remove the screw ❶ .
2) Remove the four screws ❷ .
3) Turn down AU-3 and AU-4 boards in the direction of the arrow ⓐ .
4) Remove the cassette compartment ass'y ❸ .

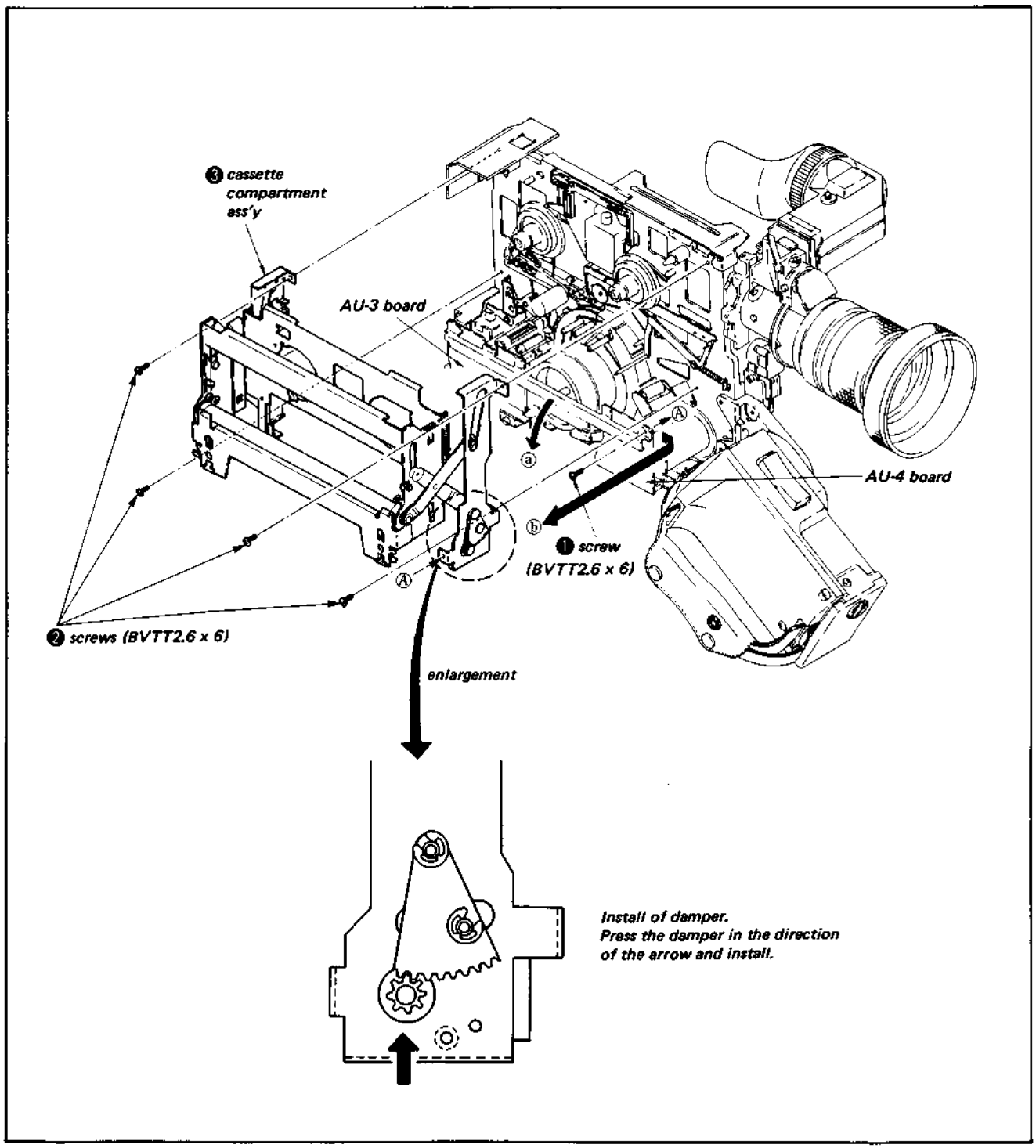


Fig. 3-2

3-1-3. Method of Opening VC-2, SS-17 and PA-1 Boards

1) Remove the two screws ❶.
2) Pull out the earth pin ❷.
3) Open the VC-2 board ❸.
4) Remove the screw ❹ and remove SW-28 board ❺.
5) Remove the three screws ❻, and open SS-17 board in the direction of the arrow ⓑ.
6) Remove the solder from the three soldered sections of PA-1 board ❽, and open in the direction of the arrow ⓒ.

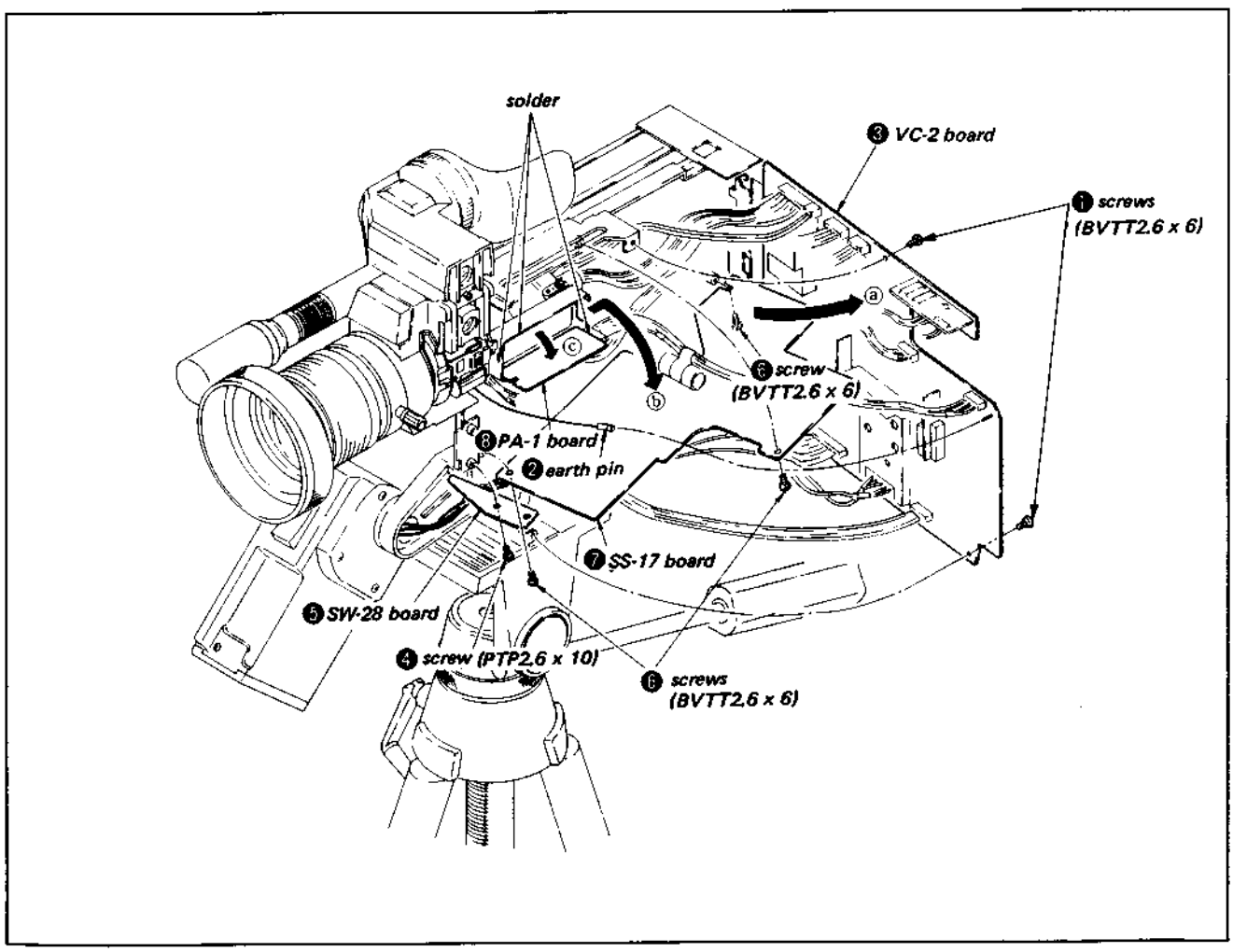


Fig. 3-3

3-2. PERIODIC CHECKS AND MAINTENANCE

The following routine inspections and maintenance procedures are recommended to assure proper functioning and performance of the set, and to extend the life of the machine and the tapes.

3-2-1. Maintenance After Servicing

After the set has been serviced, the following maintenance items must be carried out, regardless of the length of time that the set has been in use.

1. Upper Drum (Rotary Drum)

1) Clean the rotary drum using the cleaning piece (Ref. No. J6) soaked in cleaning fluid (Ref. No. J4). Press the cleaning piece lightly against the rotary drum while rotating the drum manually in the counterclockwise direction. (Never clean by rotating the drum under power, or in the clockwise direction. Clockwise rotation will cause the drum belt to come off or slip from the proper position, causing operating problems.)
2) Also, never clean the video head by moving the cleaning piece in the perpendicular direction. There is a strong possibility that such a procedure will damage the video head.

2. Cleaning the Tape Running System

1) Clean the tape guide, drum face, capstan shaft, and pinch roller using a cleaning piece soaked in cleaning fluid.

3. Cleaning the Drive System

1) Clean the drive section (belt, reel, other) using a cloth soaked in cleaning fluid.

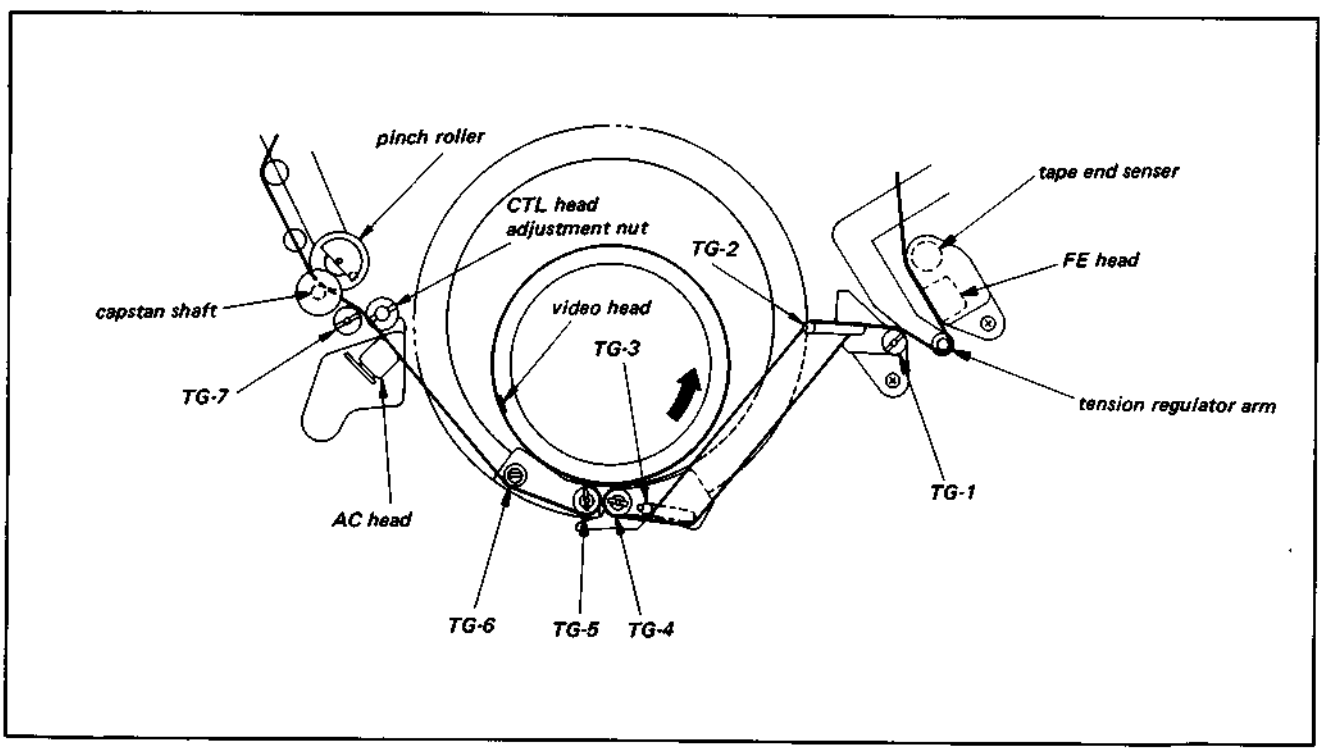


Fig. 3-4

3-2-2. Periodic Check Items

Carry out maintenance checks for the following items according to the length of time the unit has been in use.

○ : Cleaning, ◎ : Lubrication, ★ : Replacement, ☆ : Checking

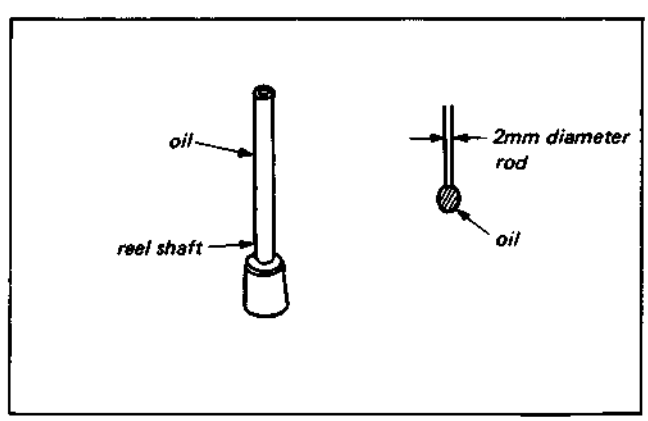
	Maintenance checks	Operating period (H) / Replacement Part No.	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Running System	Cleaning of running surface of tape	———	○	○	○	○	○	○	○	○	○	○	These procedures must be carried out at each servicing. Use light pressure on the AC head as too much force can move it out of position
	Cleaning and degaussing AC head ass'y	A-6736-038-A	○	○	○	○	○	○	○	○	○	○	
	Cleaning and degaussing rotary drum	A-6762-154-A	○	○	○	○	○	○	○	○	○	○	The operating environment and method of use greatly affect the longevity of the video head.
	FE head	8-825-561-10	○	○	○	○	○	○	○	★	○	○	
Drive System	FWD belt	3-681-447-00	○	○	○	○	○	○	○	★	○	○	• These belts must be checked at each servicing. • Parts should be replaced at the operating intervals indicated, or every two years. • The tape speed should always be checked when replacing the capstan belt and the relay belt.
	Loading belt	3-681-424-00											
	Drum belt	3-681-446-00	○	○	★	○	○	★	○	○	★	○	
	Capstan belt	3-681-444-00											
	Relay belt	3-681-445-00											
	Cleaning iron core and opening of brake solenoid	1-454-357-11	–	–	–	○	–	–	–	○	–	–	
	Cleaning iron core and opening of pinch solenoid	1-454-357-21											
	Take-up reel	X-3681-404-0	–	☆	–	★	–	☆	–	★	–	☆	
	Capstan bearing	A-6735-050-A	–	◎	–	◎	–	◎	–	◎	–	◎	
	Drum motor	8-835-099-01	–	○	–	★	–	○	–	★	–	○	
Performance Checks	Abnormal sound	———	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Measurement of back tension	———	–	☆	–	☆	–	☆	–	☆	–	☆	Standard is 35 to 40g (measured with SL-0011).
	Brake system	———	–	☆	–	☆	–	☆	–	☆	–	☆	Check edit function adjustment.
	Measurement of FWD torque	———	–	☆	–	☆	–	☆	–	☆	–	☆	Check using SL-0003C. Standard is 40 $^{+10}_{-14}$ g·cm
	Tape speed	3-682-740-00	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Check tape speed adjustment. Replace midway pulley (P) as required.

Note 1: OVERHAUL

When overhauling the unit, replace the parts refering to the outline above. The loading motor is not included in the above and should be overhauled about every 20,000 operations.

Note 2: SONY Oil

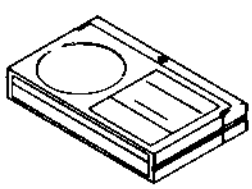
* SONY oil should always be used. (If oil of a different viscosity is used the correct functioning of the unit cannot be assured.)
  SONY oil: Part No. 7-661-018-01
* Always use clean SONY oil to for lubricate the bearings. (Dirty oil can cause the bearings to overheat and be subjected to excessive wear.)
* The amount of oil to be applied is shown in the following diagram. One drop should be used at the tip of a 2mm diameter rod.



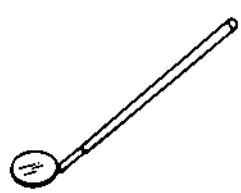
3-2-3. Summary of Servicing Tools

Ref. No.	Name	Cord No.	Fixture No.	Use, etc.
J1	Forward back tension measurement tape	J-6080-003-C	SL-0003C	FWD torque measurement
J2	Small adjustment mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape pass adjustment and tape running system check
J3	Alignment tape	8-969-995-13	KR5-3C	Tracking and tape path adjustment
		8-969-995-52	KR5-2H	
J4	Cleaning fluid	Y-2031-001-0		
J5	Thickness gauge	9-911-053-00		Opening adjustment
J6	Cleaning piece	2-034-697-00		Cleaning all sections
J7	Head demagnetizer			Video, audio head degaussing
J8	Lapping tape	8-888-004-00		Video head cleaning
J9	Sector type gauge (for 50g)	7-732-050-20		FWD back tension measurement
J10	Reel table tension gauge	J-6080-011-A	SL-0011	FWD back tension measurement
J11	Driver, tape path	J-6080-811-A		Tape guide adjustment

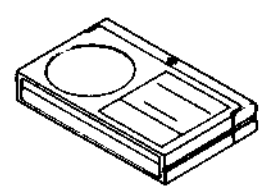
J1



J2

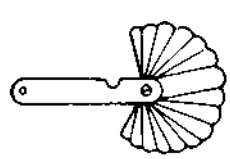


J3

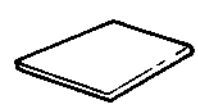


J4

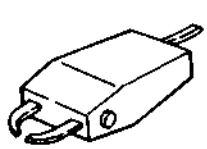
J5



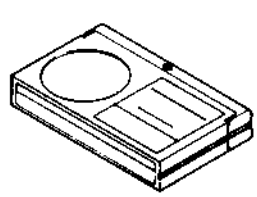
J6



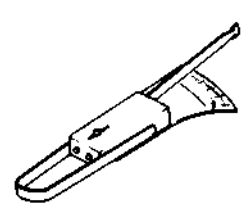
J7



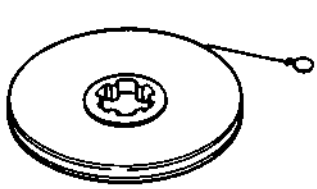
J8



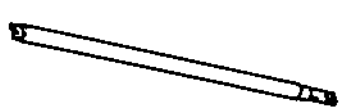
J9



J10



J11



3-3. REMOVAL AND ADJUSTMENT OF MECHANICAL PARTS

Handling Machinery with Cassette Compartment Ass'y Removed

[Threading Method]

1) Press the arm lock ❶ in the direction of arrow Ⓐ, and turn the microswitch ❷ ON.
2) Move the lock arm ❸ in the direction of the arrow Ⓑ.
3) Press the lock detection assebmly ❹.
4) Move the push plate ❺ in the direction of the arrow Ⓒ, turn the microswitch ❻ ON, and start the threading ❺ operation.

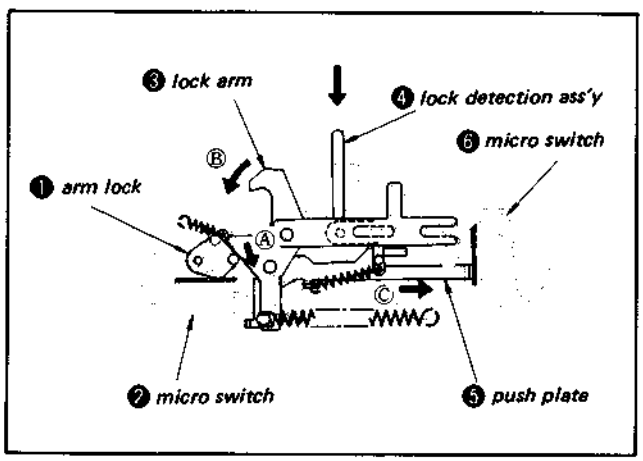


Fig. 3-5 (a)

[Recording Method]

1) Complete the threading operation.
2) While pressing the lock detection ass'y ❶, press the REC START/STOP button on the grip block.

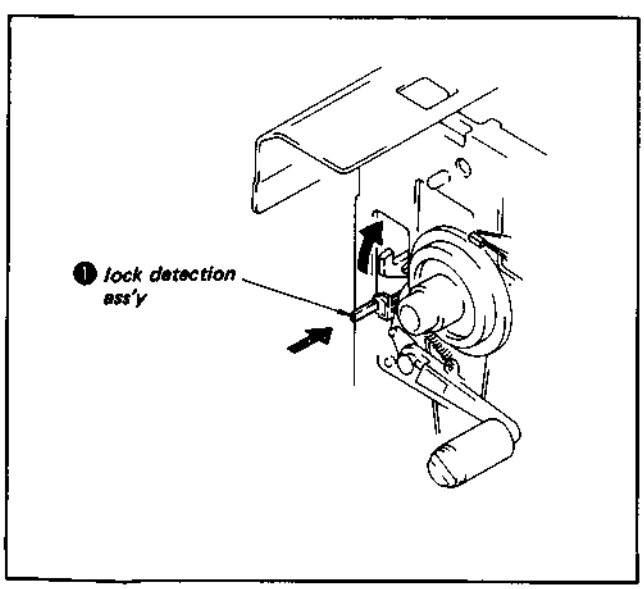


Fig. 3-5 (b)

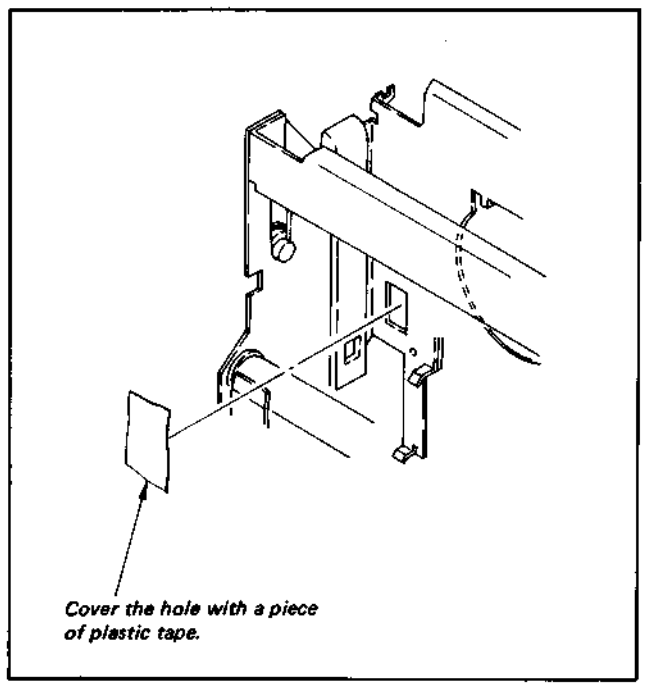


Fig. 3-6

3-3-1. Removal of Mechanical Parts

1. Removal of Cassette Compartment Lock Ass'y

1) Pull out the connector ❶.
2) Remove the two screws ❷.
3) Remove the cassette compartment lock ass'y.

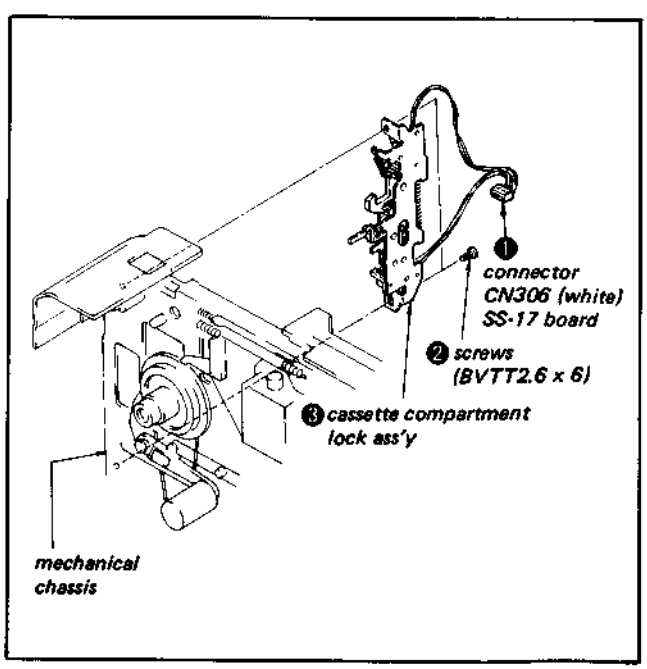


Fig. 3-7

2. Removal of Brake Solenoid Ass'y

- **When removing or replacing this unit, adjust the "brake solenoid location" and the "edit" function.**

1) Pull out the connector ❶.
2) Remove the two screws ❷.
3) Remove the brake solenoid ❸.
4) Remove the two screws ❹ and the BS cover ❺.
5) Pull out the spring pin ❻, and remove the brake solenoid ❼.

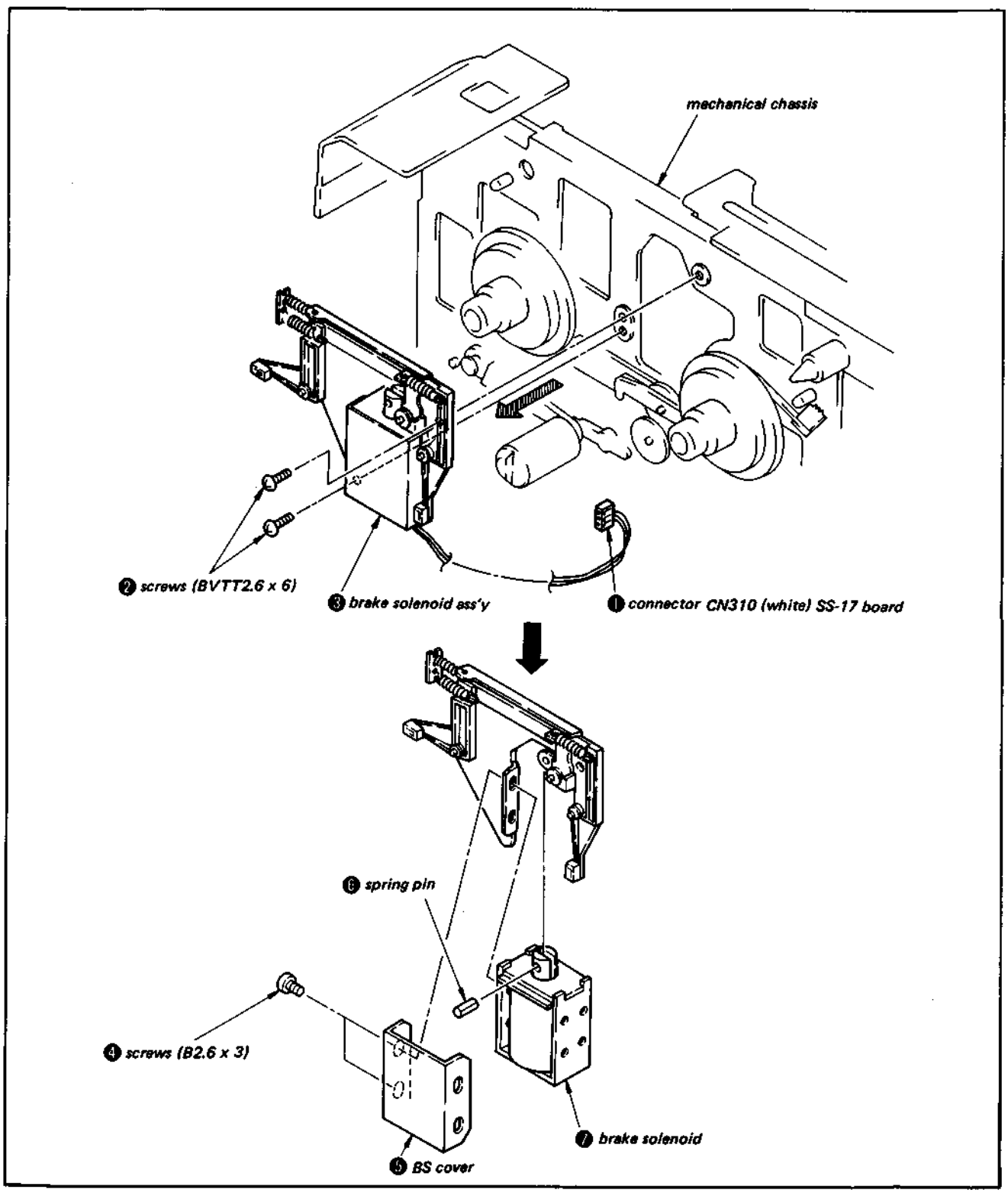


Fig. 3-8

3. Removal of the S Reel

1) Remove the stopper washer (2.3) ❶ .
2) Remove the S reel ❷ .

Note: Take care not to lose the thrust bearing.

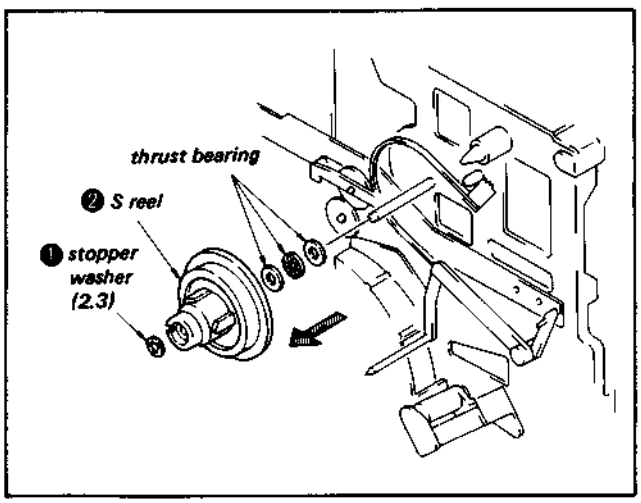


Fig. 3-9

4. Removal of the T Reel

1) Remove the stopper washer (2.3) ❶ .
2) Remove the FWD belt ❷ .
3) Remove the T reel ❸ .

Note: Take care not to lose the washers (1 or 2, depending on the set).

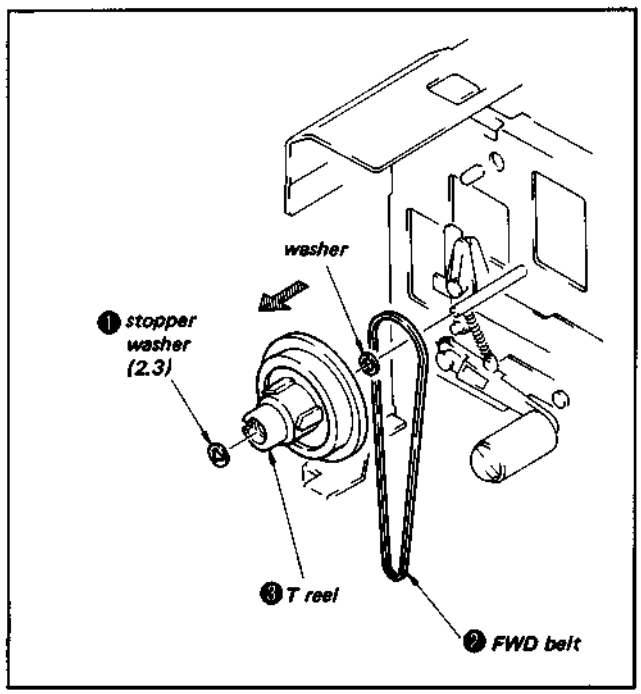


Fig. 3-10

5. Removal of Pinch Roller Ass'y

- **When removing or replacing this unit, perform the "pinch roller location adjustment".**

1) Remove the stopper washer (2.3) ❶ .
2) Remove the tension spring ❷ .
3) Remove the pinch roller ass'y ❸ .

Note: Take care not to lose the washer.

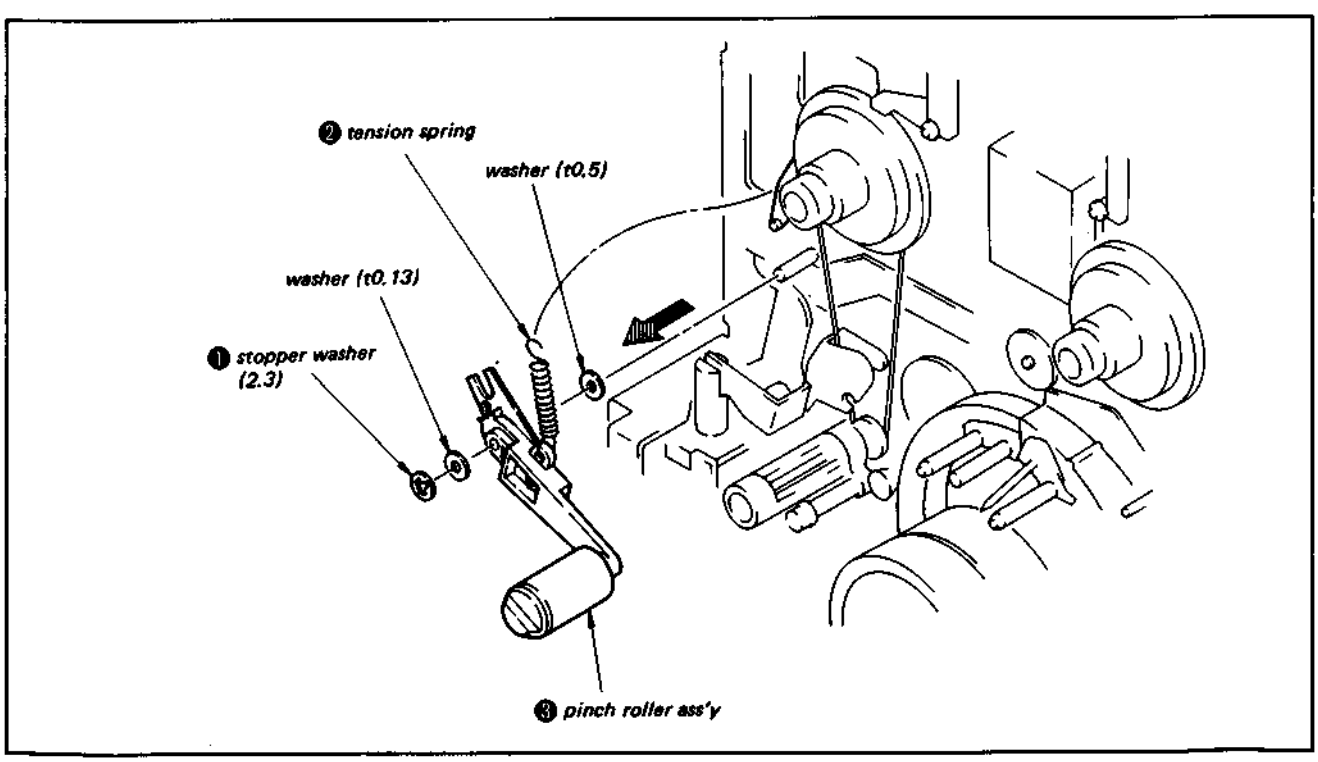


Fig. 3-11

6. Removal of Loading Motor Ass'y

1) Remove the screw ❶.
2) Remove the connector ❷ or the solder (Ⓐ section).
3) Remove the loading motor ass'y ❸.

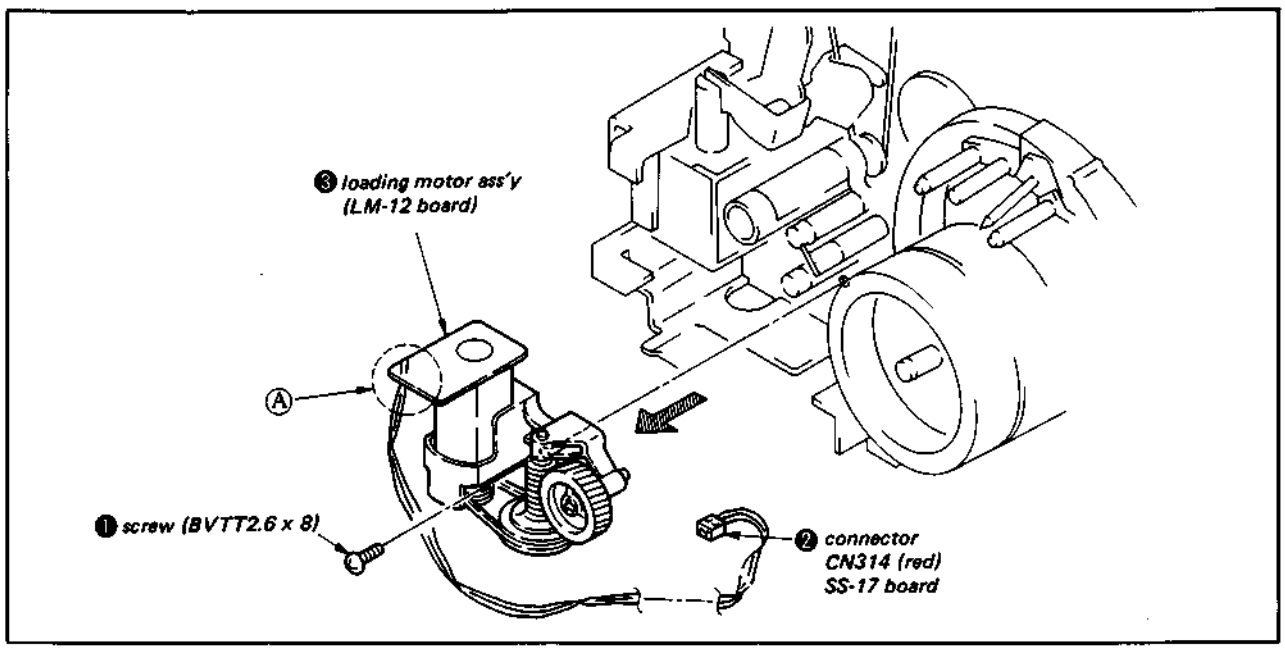


Fig. 3-12

7. Removal of Pinch Solenoid Ass'y

- **When removing or replacing this unit, adjust the "pinch solenoid location" and the "edit" function.**

1) Remove the tension spring ❶.
2) Pull out the connector ❷.
3) Remove the two stopper washers (2.3) ❸.
4) Remove the two screws ❹.
5) Press the FWD belt in the direction of the arrow Ⓐ, and remove the pinch solenoid ass'y ❺.

[Precautions to be taken on installation]

As shown in Fig. 3-13, twist in the direction of the arrow and secure.
If not twisted, the plunger will not operate smoothly.

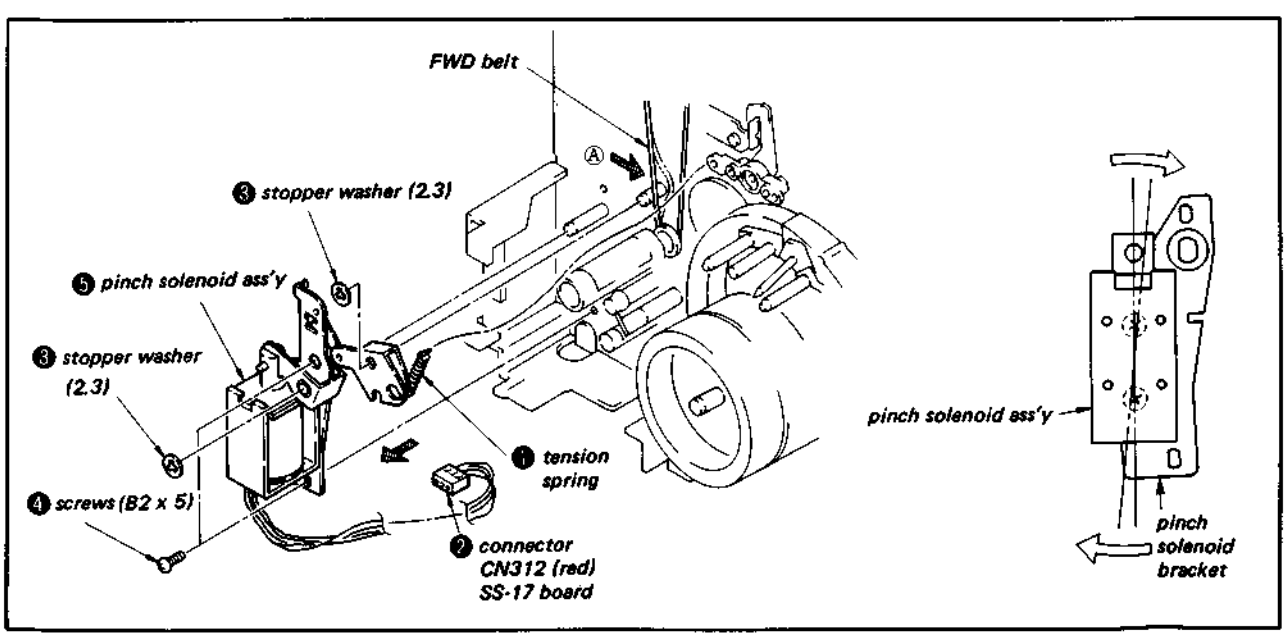


Fig. 3-13

8. Removal of Drum Motor Ass'y

1) Remove the drum belt ❶.
2) Remove the two screws ❷.
3) Remove the connector ❸ or the solder (Ⓐ section).
4) Remove the drum motor ass'y.

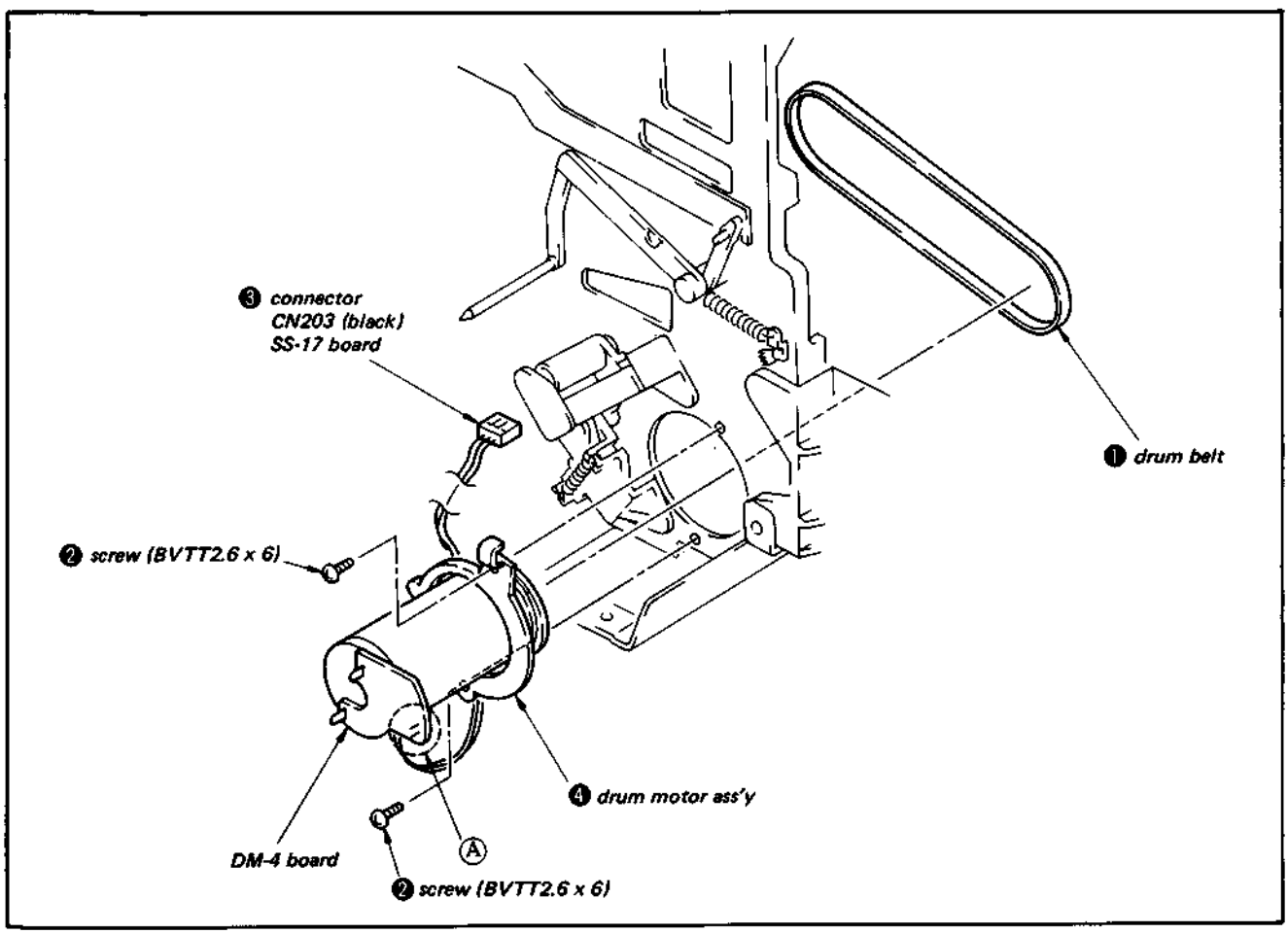


Fig. 3-14

9. Removal of FE Head Ass'y

1) Remove the two connectors ❶ or the solder (Ⓐ and Ⓑ sections).
2) Remove the screw ❷.
3) Remove the FE head ass'y ❸.

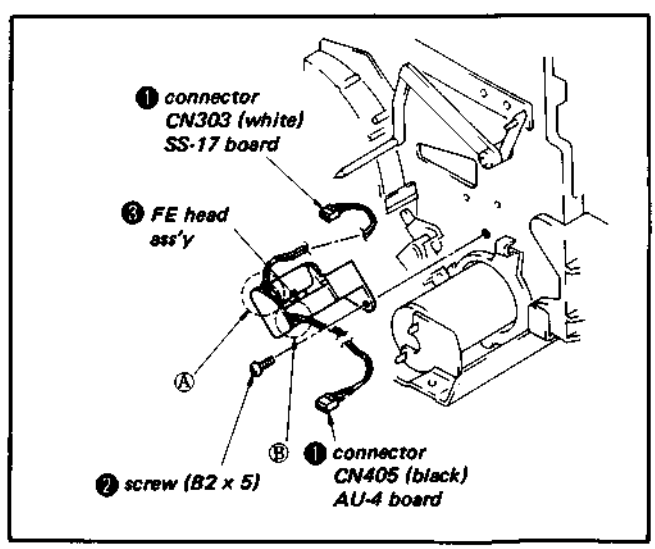


Fig. 3-15

10. Removal of AC Head Ass'y

- **When removing or replacing this unit, perform the "audio height adjustment" and the "audio azimuth adjustment".**

1) Remove the guide adjustment nut ❶.

Note: Take care not to lose the 3ϕ washer.

2) Remove the solder on the lead line.
3) Remove the AC head ❷.

Note: Take care not to lose the adjustment spring.

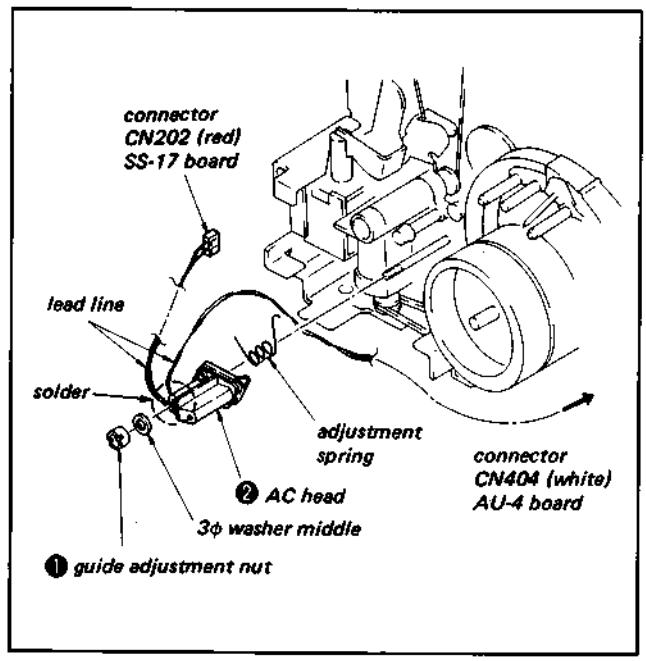


Fig. 3-16

11. Removal of Capstan Flywheel Ass'y

1) Remove the capstan belt ❶.
2) Remove the screw ❷.
3) Remove the thrust retainer plate ❸.
4) Remove the flywheel ❹.

Note: Take care not to lose the two oil seal rings (c).

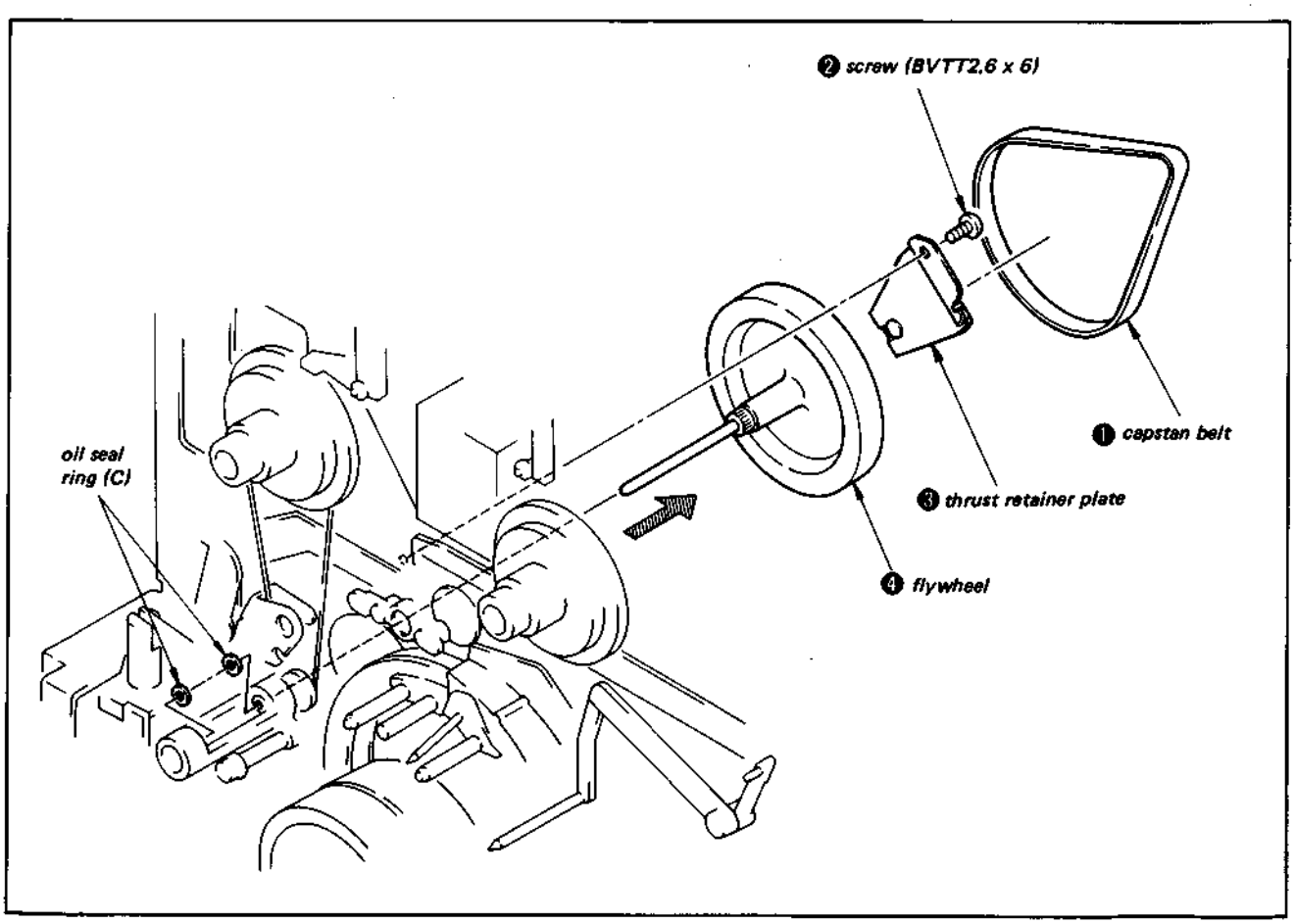


Fig. 3-17

12. Removal of Capstan Bearing Block Ass'y

- **When removing or replacing this unit, check the "tape path".**

1) Remove the three screws ❶.
2) Remove the capstan bearing block ass'y.

[Precautions to be taken on installation]

Press in the clockwise direction, then tighten the screws.

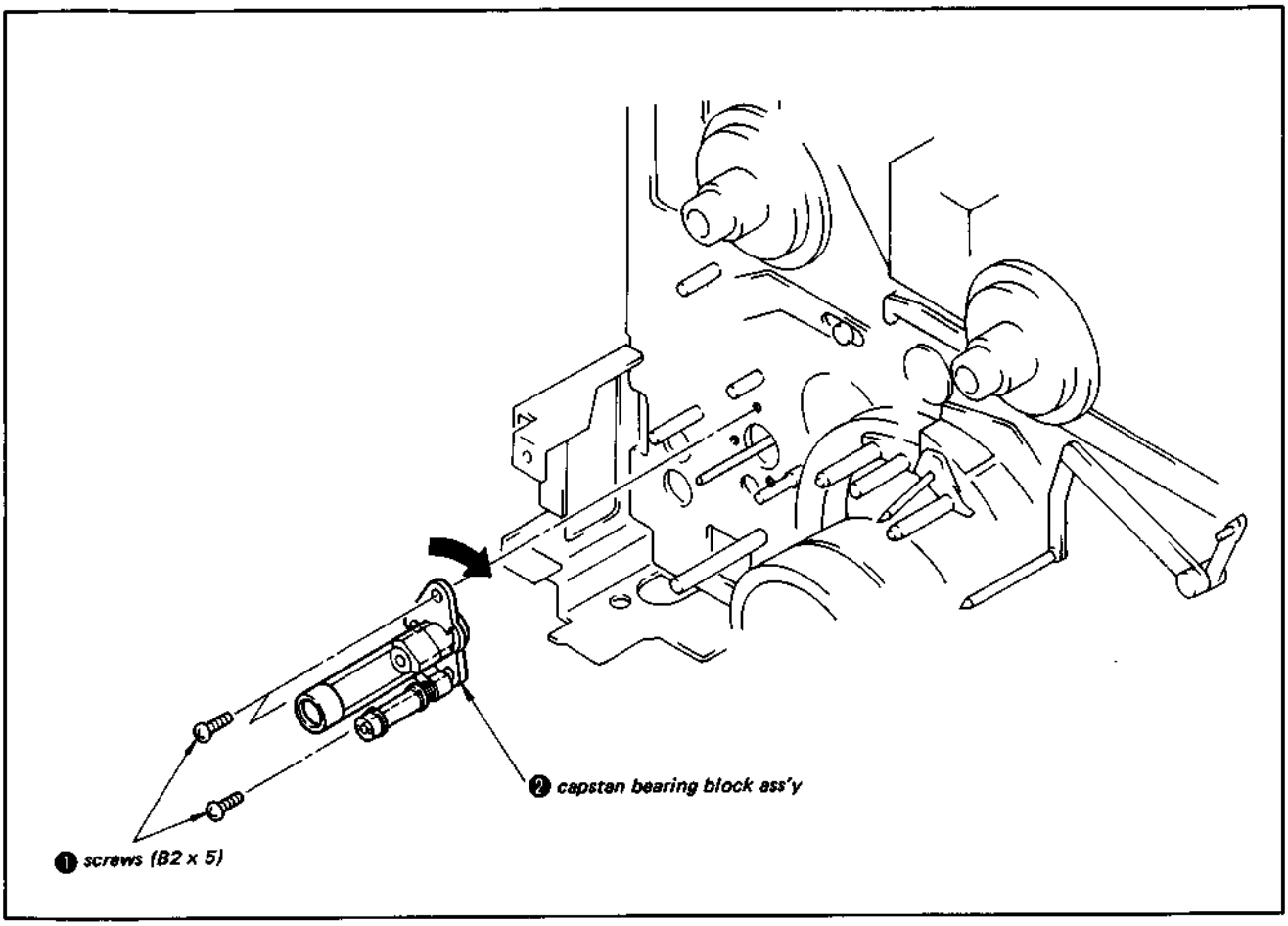


Fig. 3-18

13. Removal of TG-1 Base Block Ass'y

- **When removing or replacing this unit, check the "tape path".**

1) Remove the screw ❶.
2) Remove the TG-1 base block ass'y.

[Precaution to be taken on installation]

After installation, run an actual tape, equalize the vertical tape tension between No. 2 guide and No. 3 guide, and align the TG-1 base block ass'y ❷ position by turning in the direction of the arrow.

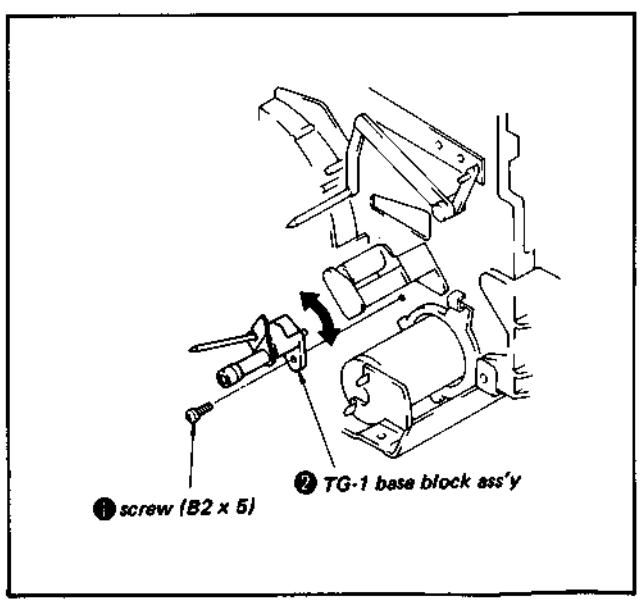


Fig. 3-19

14. Removal of Tension Regulator Band Ass'y

- **When removing or replacing this unit, perform the "tension regulator lever position adjustment" and the "FWD back tension adjustment".**

1) Remove the screw ❶.
2) Remove the tension spring ❷.
3) Remove the stopper washer (2.3) ❸.
4) Remove the tension regulator arm ❹.
5) Remove the tension regulator arm from the tension regulator band ❺.

Note: Take care not to lose the washer.

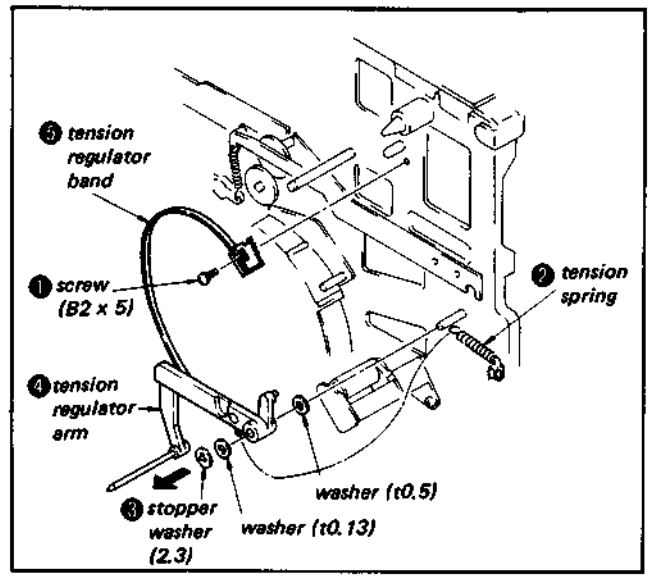


Fig. 3-20

15. Removal of Drum Ass'y

- **When removing or replacing this unit, check the "tape path".**

1) Remove the drum belt ❶.
2) Pull out the two connectors ❷.
3) Remove the two screws ❸.
4) Remove the drum ass'y ❹.

Note: Because there are cases where a drum spacer is also inserted, care should be taken not to lose it. Also, when installing and replacing the drum ass'y, this spacer should be properly installed.

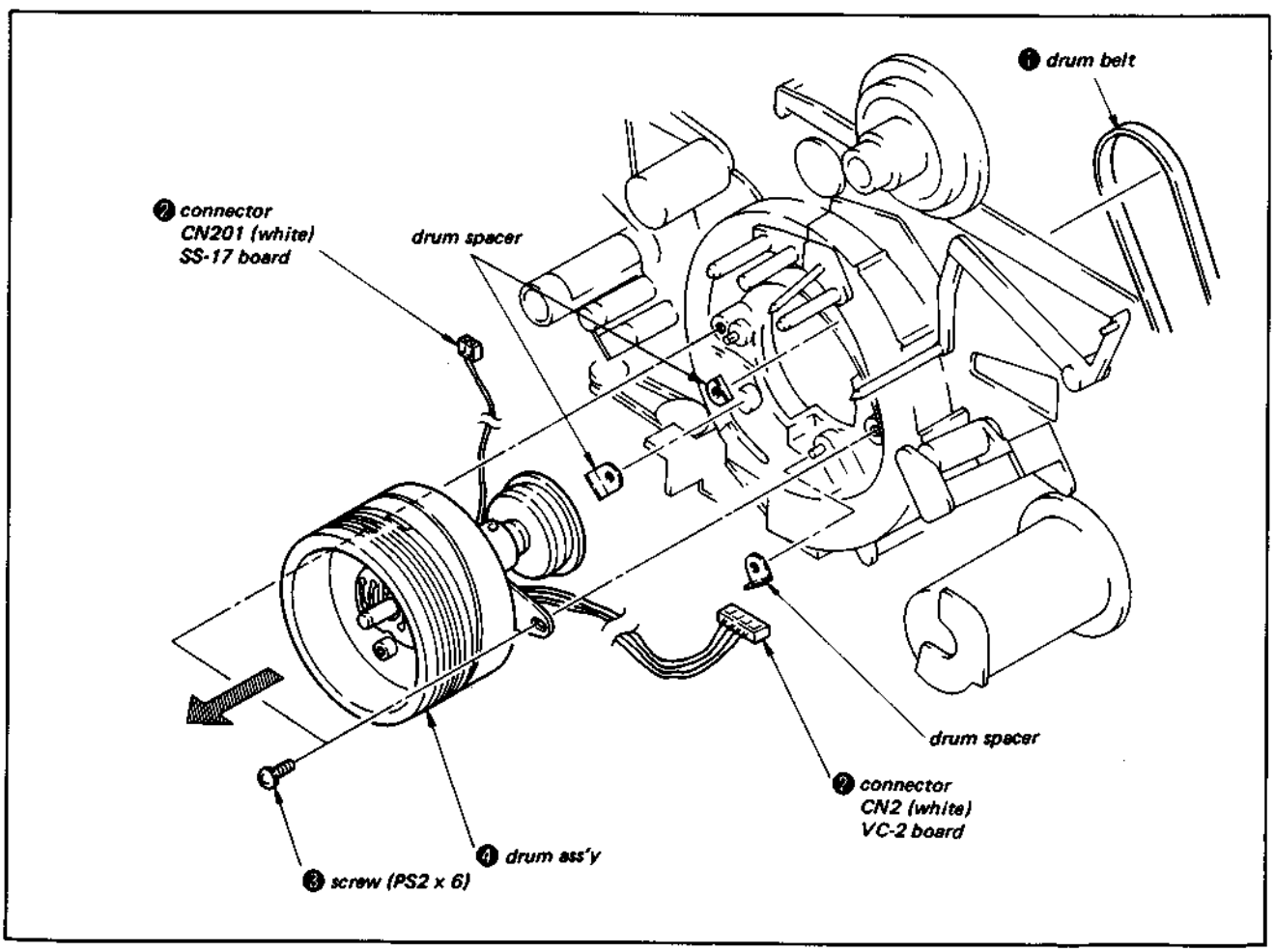


Fig. 3-21

16. Removal of Upper Drum (Rotary Drum)

- **When removing or replacing this unit, check the "tape path". and perform an "angle ratio alignment".**

1) Remove the hexagon hole bolt.

Note: Take care not to lose the two washers.

2) Remove the solder from the four enamel wires.

Note: Do not remove the solder from the vinyl wire.

3) Remove the upper drum ❷ .

Note: When removing the upper drum, leave the lower drum in place as far as possible, and take care not to disrupt the tape path.

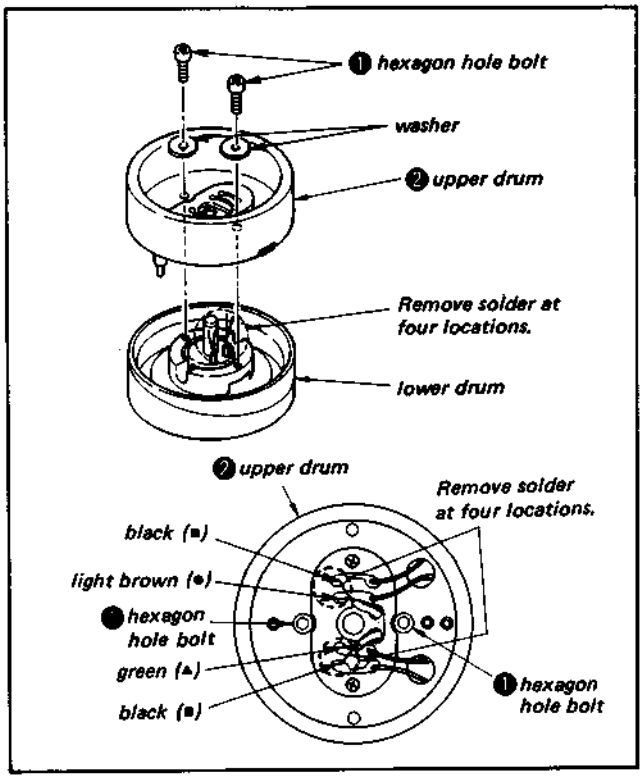


Fig. 3-22

17. Removal of Threading Guides (S-1), (S-2)

1) Remove the two screws ❶ .
2) Remove the threading guide (S-2) ❷ .
3) Remove the two screws ❸ .
4) Remove the threading guide (S-1) ❹ .

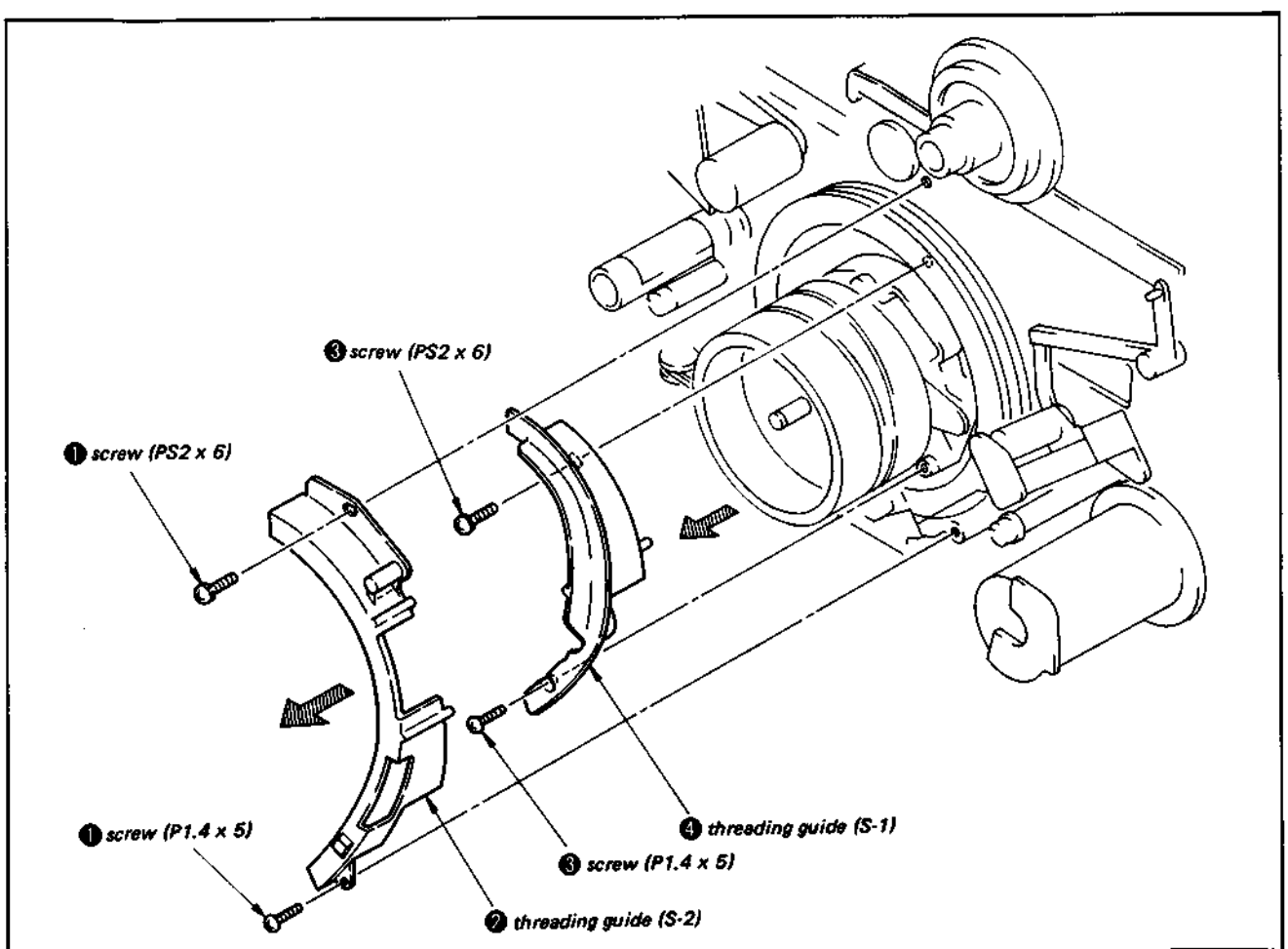


Fig. 3-23

18. Removal of Loading Rings (S), (T)

- **When removing or replacing this unit, perform the "loading ring (S), (T) location adjustment" and the "pinch roller position adjustment".**

1) Remove the four screws ❶.
2) Remove the DEW condensation sensor ❷.
3) Remove the drum base ❸.
4) Remove the two stopper washers ❹.
5) Remove the ring guide roller (A) ❺ (two places).
6) Remove the loading ring (T) ❻ in the direction of the arrow Ⓑ, while pressing it in the direction of the arrow Ⓐ.

* Remove the loading rings (S), and (T) without removing the ring guide rollers (three places).

7) Remove the ring guide roller (B) ❼.
8) Remove the ring guide roller (D) ❽.
9) Remove the loading ring (S) ❾ in the direction of the arrow Ⓑ, while pressing it in the direction of the arrow Ⓒ.
10) It is unnecessary to remove the ring guide roller (C) ❿ and the two washers, but care should be taken that they are not lost.

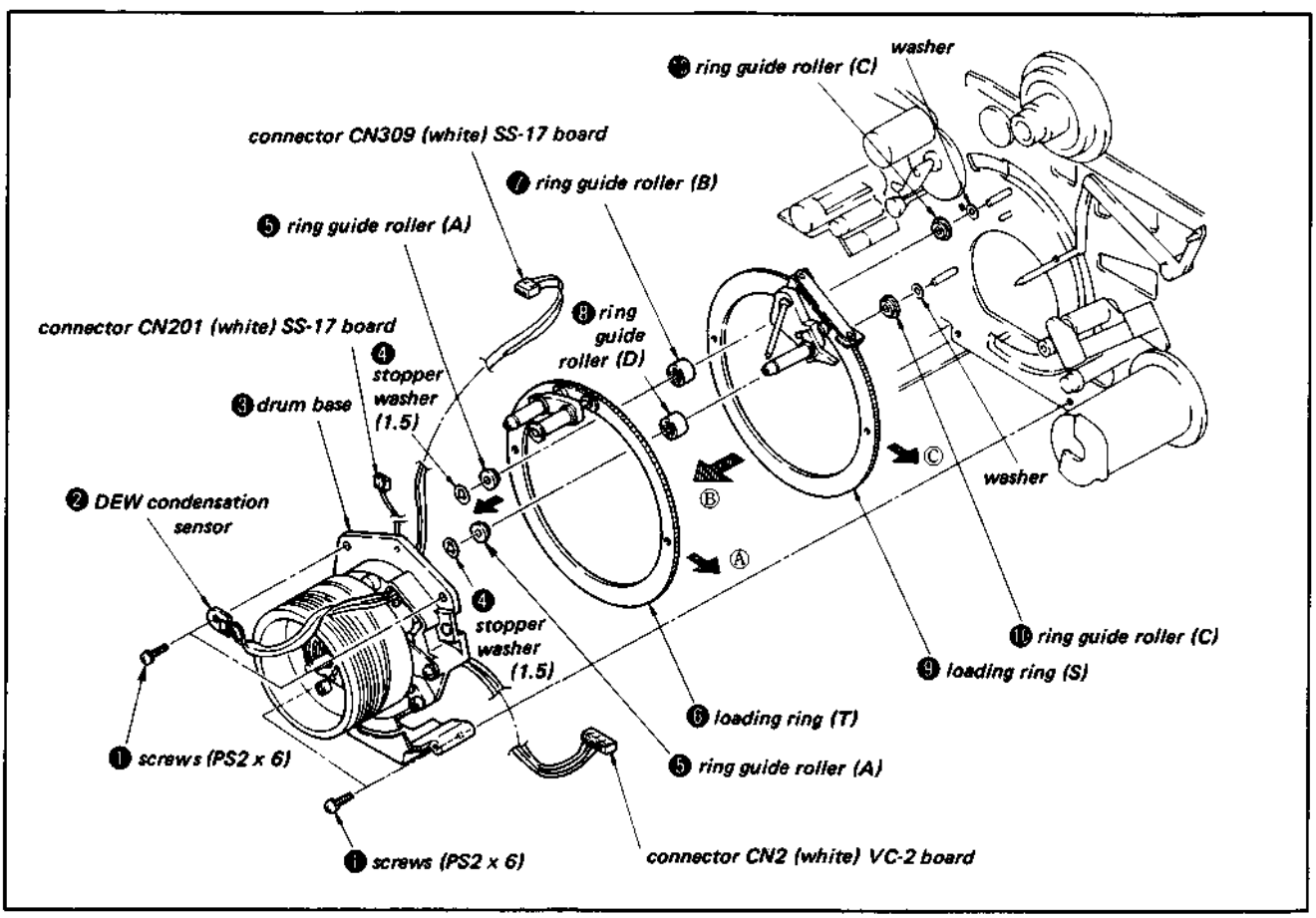


Fig. 3-24

19. Removal of TG-4 Base Block Ass'y

- **When removing or replacing this unit, check the "tape path".**

1) Remove the poly-washer (1.2) ❶.
2) Remove the TG-4 base plate (B) ❷.
3) Remove the poly-washer (1.2) ❸.
4) Remove the TG-4 base block ass'y ❹.

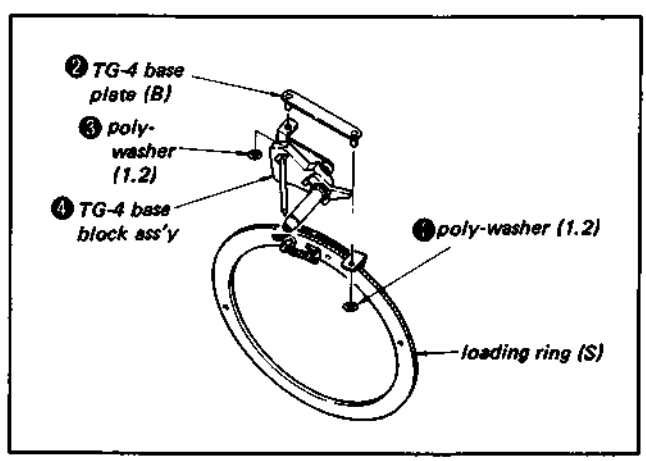


Fig. 3-25

20. Removal of TG-5 Base Block Ass'y

- **When removing or replacing this unit, check the "tape path".**

1) Remove the tension spring ❶ from Ⓐ section.
2) Remove the stopper washer ❷.
3) Remove the TG-5 base block ass'y ❸.

Note: Take care not to lose the TG-5 base poly-slider.

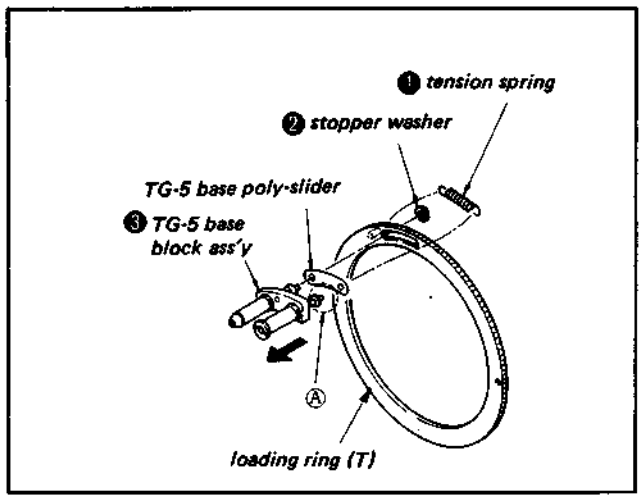


Fig. 3-26

21. Removal of Midway Pulley (P) and Relay Pulley Ass'y

[Removal of Midway Pulley (P)]

- **When the relay pulley has been replaced, perform the "tape speed alignment".**

1) Remove the relay belt ❶.
2) Loosen the set-sct hexagon screw ❷ and remove the midway pulley (P).

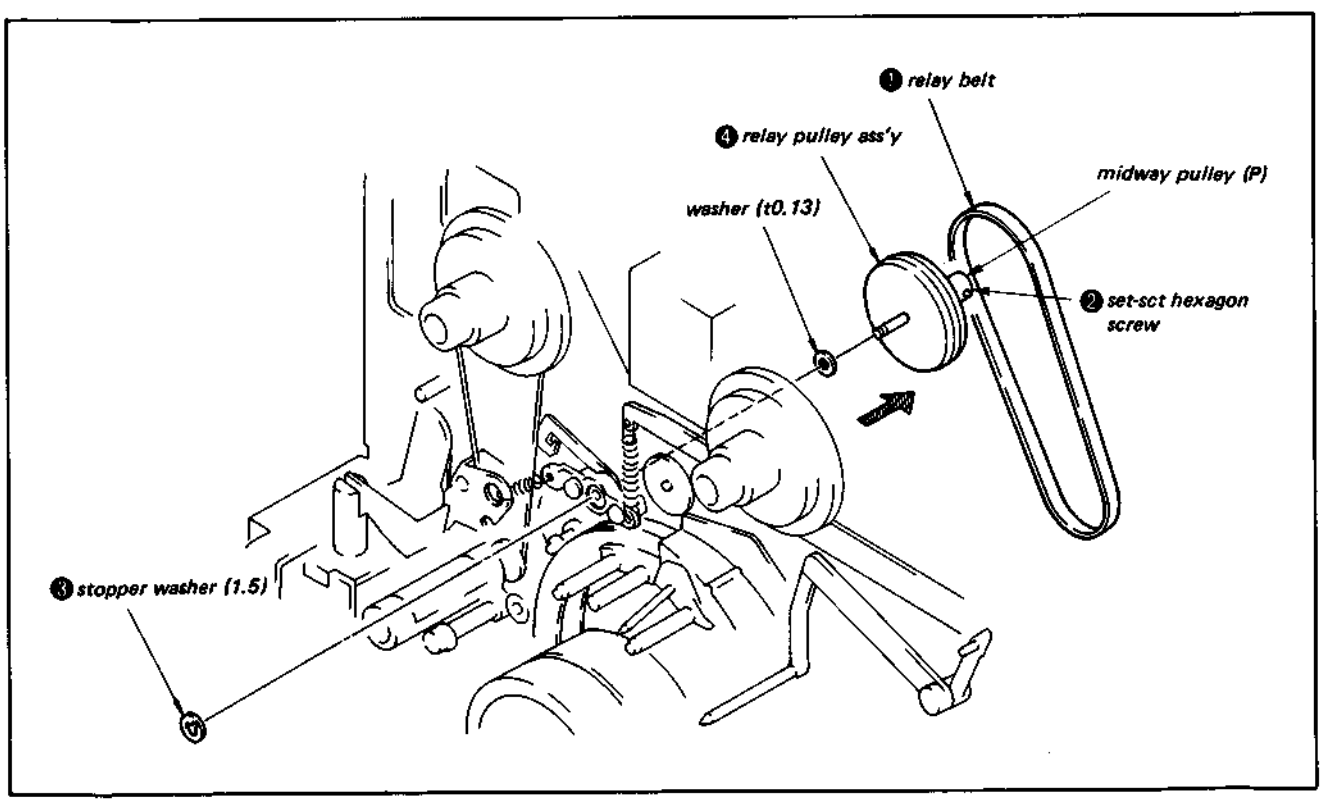


Fig. 3-27

[Removal of Relay Pulley Ass'y]

- **When the midway pulley (P) has been replaced, perform the "tape speed alignment".**

1) Remove the relay belt ❶.
2) Remove the stopper washer (1.5) ❸.
3) Remove the relay pulley ass'y ❹.

3-3-2. Mechanical Alignment

1. Adjustment of Loading Motor Pulley Opening

1) Adjust the opening between the loading motor pulley ❶ and the motor case ❷ to 3mm.

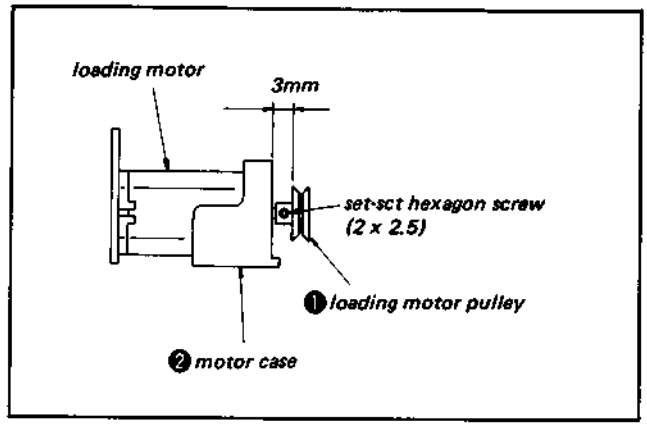


Fig. 3-28

2. Adjustment of Drum Motor Pulley Opening

1) Adjust the opening between the drum motor pulley ❶ and the drum motor bracket ❷ to 3mm.

3. Adjustment of the Position of the Loading Ring (S), (T)

- **When making this adjustment, check the "pinch roller position adjustment".**

1) Secure the loading gear (S) ❶ with the stopper washer (1.5) ❷.
2) Put the loading rings (S) ❸ and (T) ❹ in threading status.
3) Line up the loading rings (S) and (T) with the positioning holes in the mechanical chassis.
4) Engage the loading gear (T) ❺, and secure it with the stopper washer (1.5) ❻.

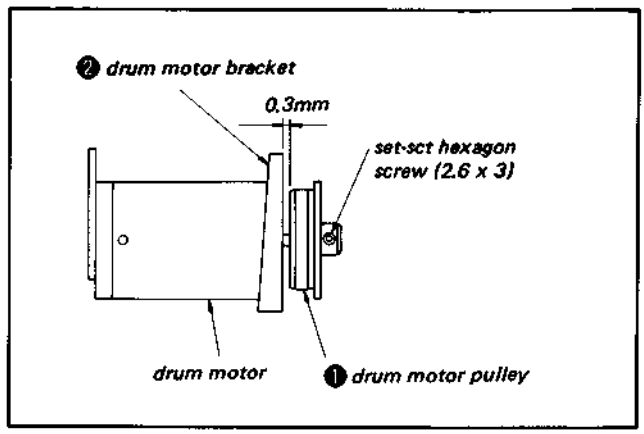


Fig. 3-29

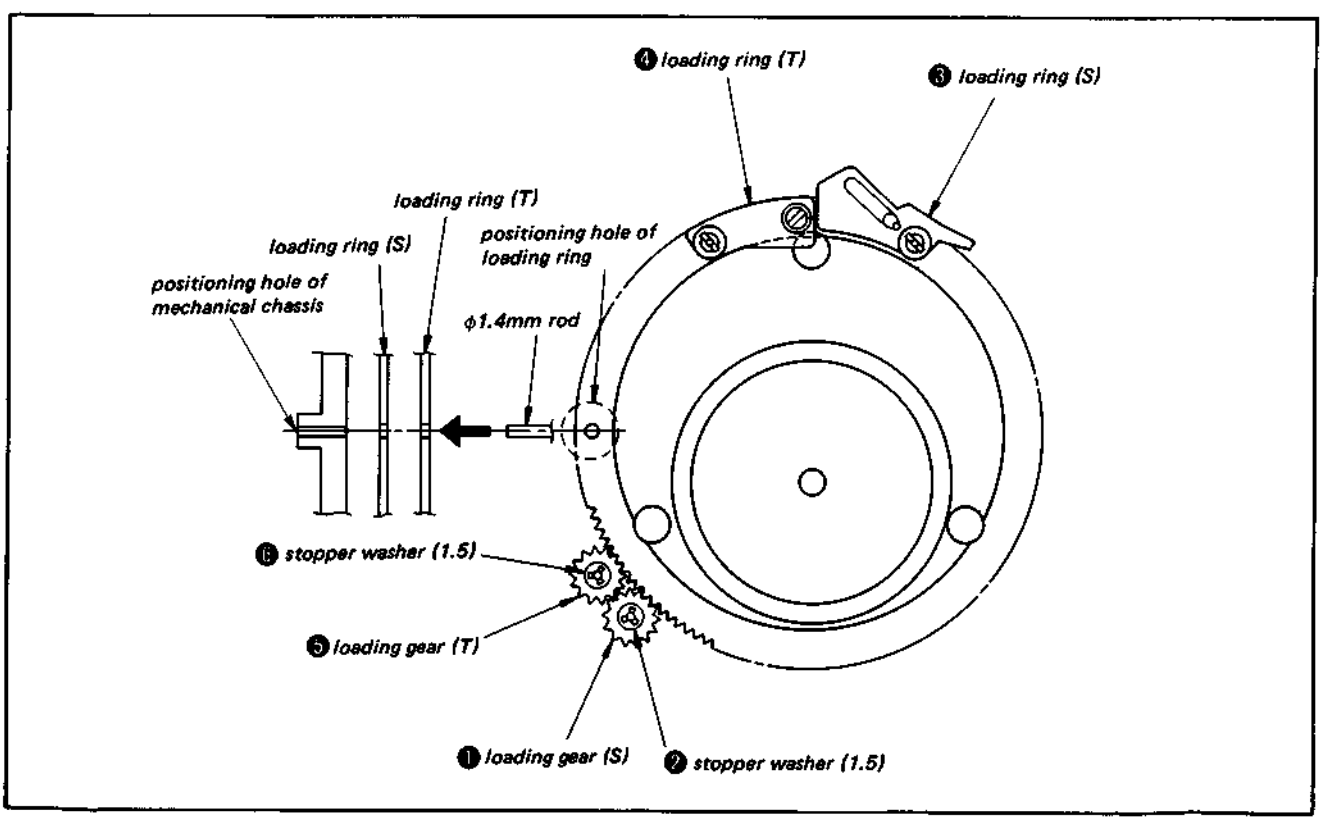


Fig. 3-30

4. Adjustment of the Position of the Driving Gears (A), (B)

1) Put in threading status and line up the loading ring positioning holes.
2) Press the PT function lever ❶ in the direction of the arrow and line up the mechanical chassis and PT function lever ❶ positioning holes, then secure the PT function lever by inserting the 1.4mm diam rod.
3) Engage the driving gears (A) ❷ and (B) ❸ as indicated in the drawing.

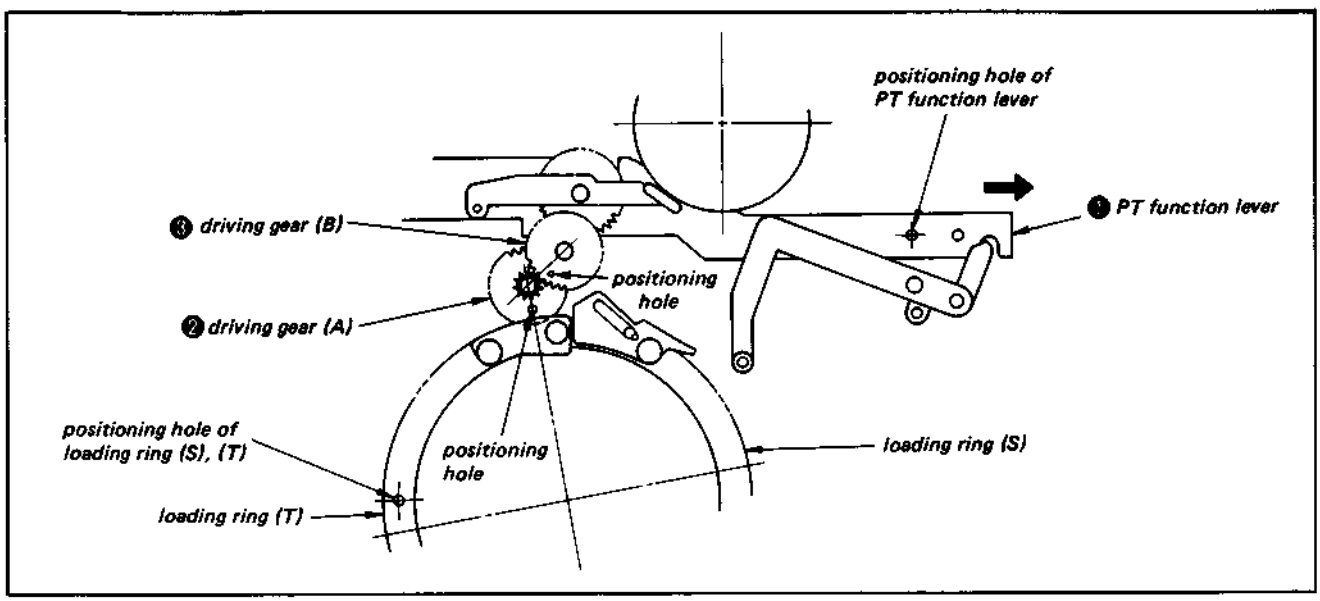


Fig. 3-31

5. Adjustment of the Position of the Pinch Solenoid

1) Loosen the two screws ❶.
2) Press the plunger ❸ of the pinch solenoid ❷ in the direction of arrow Ⓐ.
3) At that time, move the PS bracket ❻ in the direction of arrow Ⓑ, so that the opening between the pinch press lever ❹ and the pinch press lever (D) ❺ becomes 0.5mm.
4) Tighten the two screws ❶.
5) Turn on the power, press the REC START/STOP button, and turn the pinch solenoid ON/OFF, and confirm that the opening is 0.5mm.

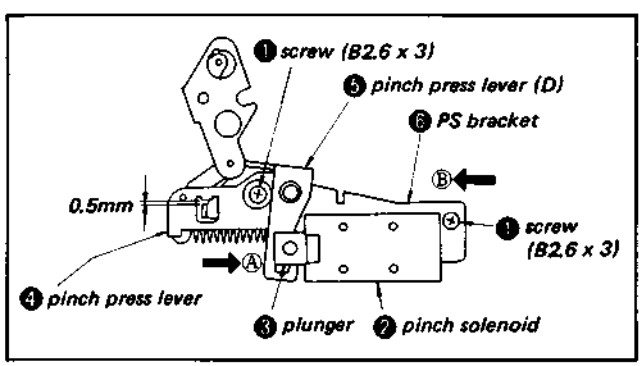


Fig. 3-32

6. Adjustment of the Position of the Brake Solenoid

1) Press the plunger of the brake solenoid in the direction of the arrow Ⓐ. First set the brake rubber to touch the S reel and T reel, then press the plunger further. Next adjust the brake solenoid position in the Ⓑ direction and set with the screws ❺.
2) With the plunger ❷ pulled in the direction of the arrow Ⓒ, adjust the opening between the brake rubber ❹ and the S reel and T reel to 0.5 to 1.0mm.

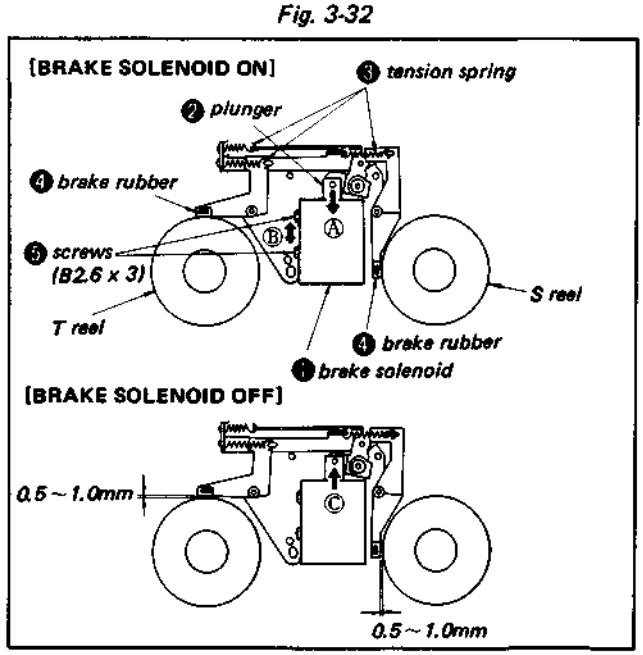


Fig. 3-33

7. Adjustment of the Position of the Pinch Roller

1) Turn on the power, and after completing the threading operation, press the REC START/STOP button two or three times to turn the pinch solenoid ON and OFF.

Note: If threading is done manually, the final threaded position will be inaccurate. Therefore, threading should always be carried out with the power applied, after which the pinch solenoid should be turned ON and OFF.

2) Loosen the screw ❶ , and adjust the opening between the pinch roller ❷ and the capstan shaft ❸ to 0.5mm.
3) Depress the REC START/STOP button, and turn the pinch solenoid ON and OFF, to confirm that the opening is 0.5mm.

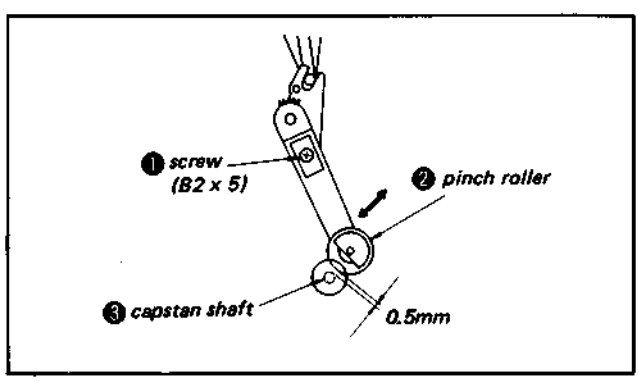


Fig. 3-34

8. Adjustment of the Position of the Tension Regulator Arm

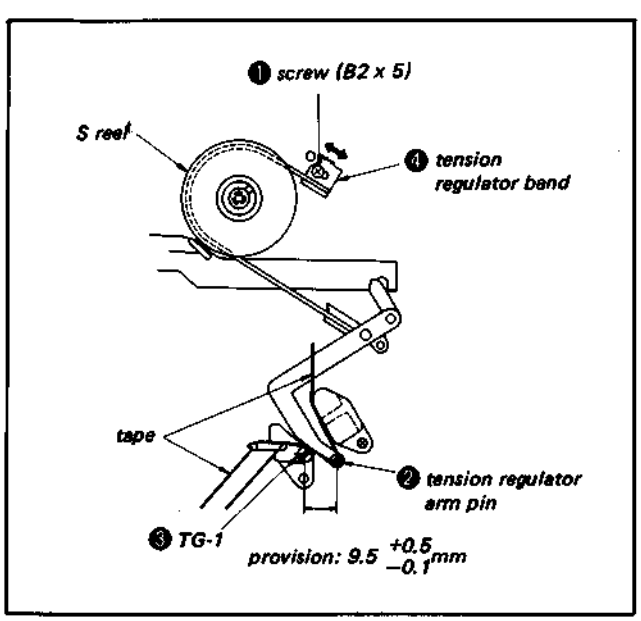


Fig. 3-35

1) Apply power, and record without a cassette.
2) Loosen the screw ❶ , adjust the center-to-center distance of the tension regulator arm pin ❷ and TG-1 ❸ to about 10.5mm, and temporarily stop the tension regulator band ❹ .
3) Insert a cassette and start to record. Confirm that the abovementioned distance is 9.5 $^{+0.5}_{-0.1}$mm.
4) If this provision is not satisfied, readjust the tension regulator band position ❹ .

9. Adjustment of the FWD Back Tension

1) Set the reel table tension gauge ❶ and run the tape through at 2cm/sec.

Note: Run the tape through so that it is in contact with the outer circumference of the upper drum (rotary drum).

2) Loosen the screw ❷ and adjust the position of the spring retainer ❹ with the sector type gauge (for 50g) ❸ showing 35 to 40g.
3) Tighten the screw ❷ .

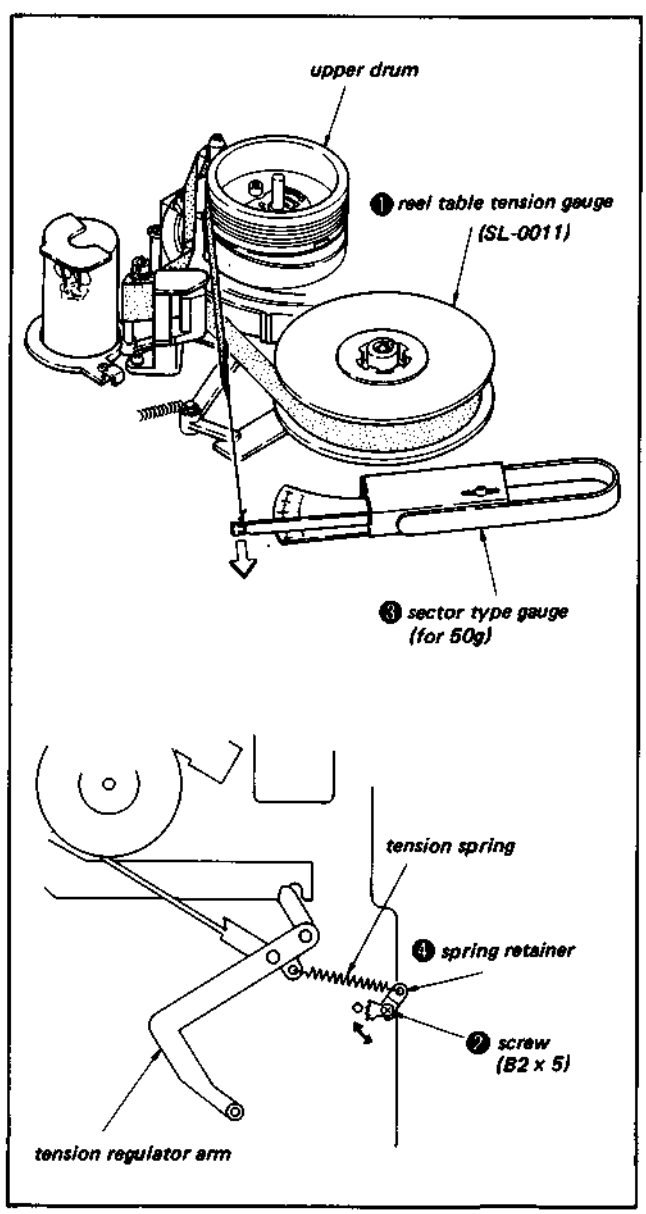


Fig. 3-36

10. Tape Speed Adjustment

This unit has only a drum servo and no capstan servo. Therefore the tape speed (2cm/sec) is determined by midway pulley (P).

Connection diagram

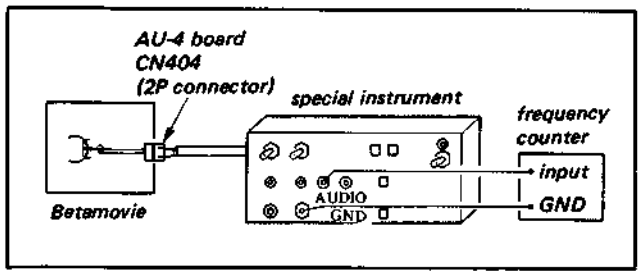


Fig. 3-37

[Adjustment method]

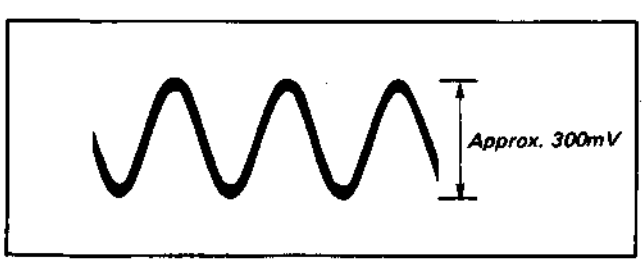
Mode: Playback
Signal: Alignment tape 3kHz signal
Frequency counter: Special instrument AUDIO SIG terminal

1) Playback alignment tape 3kHz (color bar).

Note: If the safety tab of the alignment tape has been removed, cover that section with tape.

2) Correct the frequency counter value.

- Correction method
  The Tape Speed Calibration Value is recorded on the alignment tape.
  * For example, if this value is 0.1%, when the frequency counter shows 2,997Hz, the Speed, i.e. 2cm/sec, is correct.
  * At −0.1%, 3,003Hz is displayed at the correct speed.



Special instrument AUDIO SIG terminal

Fig. 3-38

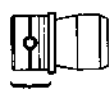
3) Replace the midway pulley (P) to obtain the corrected frequency $^{+6}_{-18}$Hz.

Midway pulley (P): 3-682-740-□□ (0 to 9) ← Figure showing diam.

End

Diameter (Note 1)	Number	0	1	2	3	4	5	6	7	8	9
	Code		I	II	III	IIII	I	II	III	IIII	IIIII
	Smaller ← → Larger										
Tape speed	Slower ← → Faster										
Remarks	The frequency changes about 7Hz for a one rank difference in diameter.										

Note 1: Diameter identification



Wide grooves and narrow grooves indicate diameter.

11. Adjustment of AC Head (Audio/CTL)

- Connect the special instrument (signal converter BMCJ-888P) and make the adjustment.

Adjustment terminology

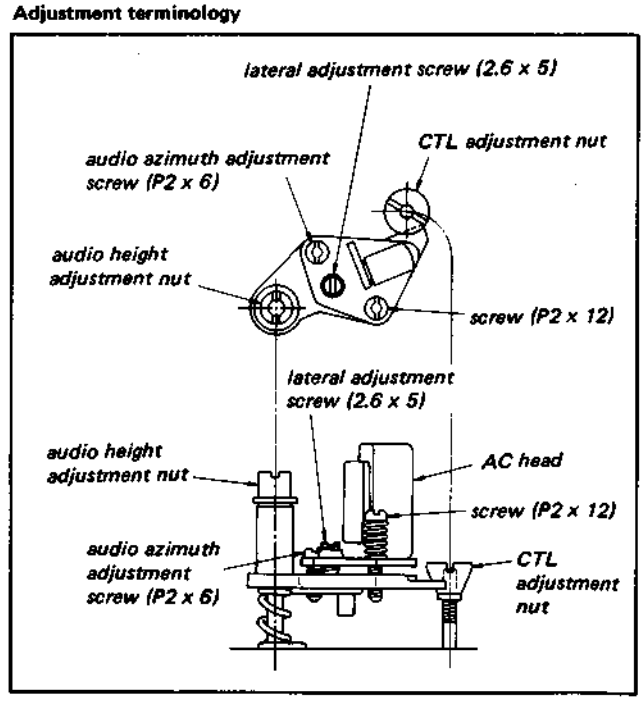
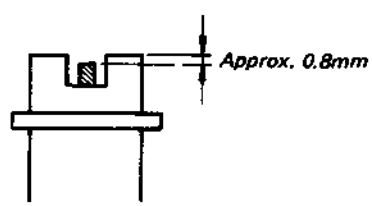


Fig. 3-39

[Height adjustment]

1) Turn the audio height adjustment nut and set as shown in the following diagram.



2) Play back the 333Hz section of the alignment tape and adjust the audio height adjustment nut to get the maximum output level.
3) Confirm that there is no curling in the No. 7 guide.

[Azimuth adjustment]

1) Play back the 5kHz section on the alignment tape and adjust the audio azimuth adjustment screw to give the maximum output level.
2) Run the tape for a short time to confirm that there is no extensive change in the output level.

[Lateral adjustment]

- **When this adjustment is made, carry out the "height adjustment" and "azimuth adjustment".**

1) Play back the 5kHz section on the alignment tape.
2) Confirm that there is no curling in the No. 7 guide.
3) Turn the lateral adjustment screw until the output level remains unchanged when pressure is applied to the tension regulator arm ❶ in the direction of the arrow.

Note: Adjust the lateral adjustment screw within a range of 45deg.

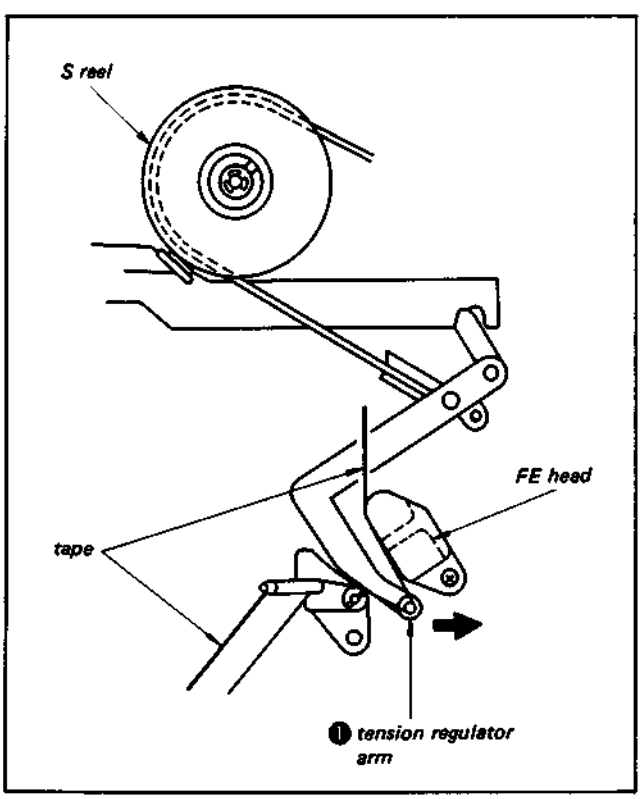


Fig. 3-40

12. Adjustment of the Position of the CTL (AC Head)

- Connect the special instrument (signal converter BMCJ-888P) and carry out the adjustment.

Adjustment terminology

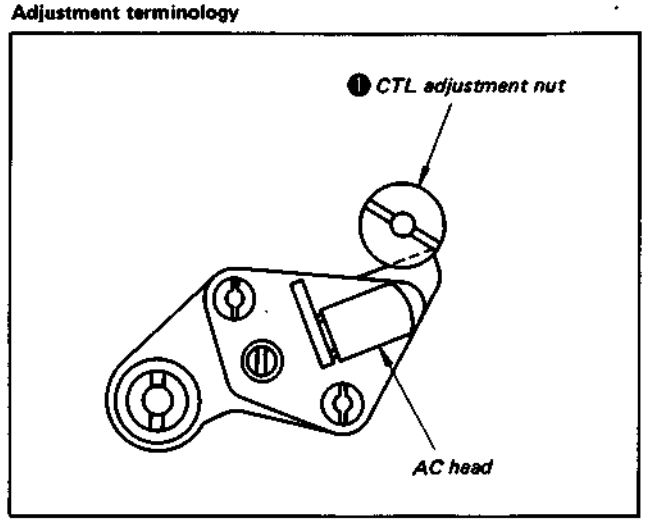


Fig. 3-41

Mode: Playback
Signal: Alignment tape tracking signal (KR5-3C is recommended)
* KR5-3C: This tape is made especially for tracking, and has a recorded time of 40min.
Oscilloscope: CH-1 RF terminal of special instrument
CH-2 TP204 (CTL signal) of SS-17 board

[Adjustment method]

1) Adjust the CTL adjustment nut until the CTL signal and phase are as shown in the following diagram at maximum RF output.

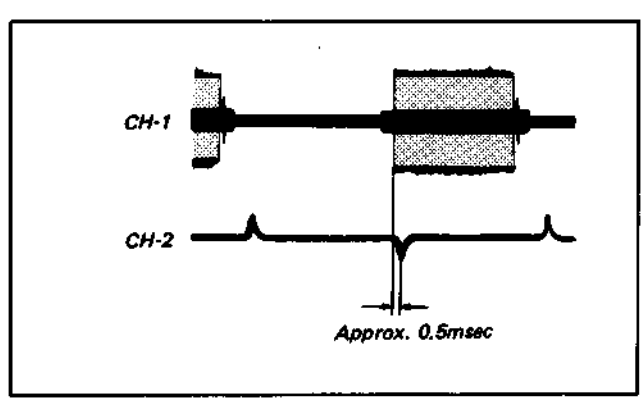


Fig. 3-42

2) Confirm that there is no noise, even when the TRACKING knob on the playback VTR is rotated ±30deg, when the tape being played back on the VTR is a 100% white signal recording made on the Betamovie.

3) If noise occurs, switch from the Betamovie recording → playback on the VTR → recording after turning the CTL adjusting nut on the Betamovie → playback on the VTR.

13. Checking FWD Torque

To measure, FWD torque, set the measuring cassette (SL-0003C) and confirm that the T-reel indicator reaches 40 $^{+10}_{-14}$g·cm.

* If the standard is not met, replace the T reel and check that the value falls within the standards.

3-4. TAPE PATH ADJUSTMENT

This adjustment significantly effects the picture quality in each mode and the interchangeability of the tape, so great care should be taken in carrying it out.

3-4-1. Tracking Adjustment

1. Preparation

1) Connect the special instrument (signal converter BMCJ-888P). (See page 4. Fig. 1-3)
2) Check the tape speed
   This unit does not have a playback servo, so tracking failures can occur periodically, and the RF output level changes. For this reason, the conventional method of adjusting with a TRACKING knob to set at 2/3 of the maximum output level cannot be applied. Therefore, adjustment is made during a change in the RF output level, and it is necessary to first check whether the adjustment is made during an increase or a decrease.

[Checking method]

While looking at the special monitor (converted to f_H=18.75kHz), or while looking at the oscilloscope connected to the RF terminal of the special instrument (BMCJ-888P), touch the capstan flywheel with the fingertips, and change the RF output level.

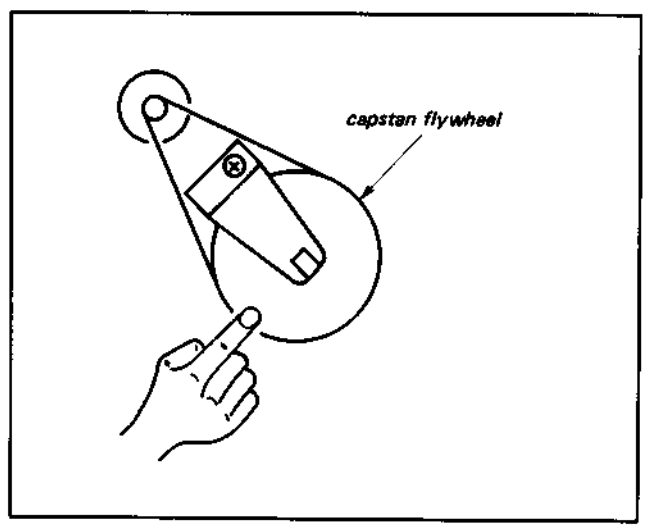


Fig. 3-43

Direction of change	Tape Speed	Adjustment made
Same direction	Slow	During increase
Reverse direction	Fast	During decrease

The same direction is defined as the condition when:

- During an increase, when touching the flywheel, the output level increases.
- Druing a decrease, when touching the flywheel, the output level decreases.

The reverse direction is defined as the condition when:

- During an increase, when touching the flywheel, the output level decreases.
- During a decrease, when touching the flywhee, the output level increases.
- Using the above method, check the tape speed to determine whether the RF output level should be increased or decreased.

3) Check the adjustment level
Check the maximum value of the RF output level, and adjust to 2/3, or check that level (noting it).

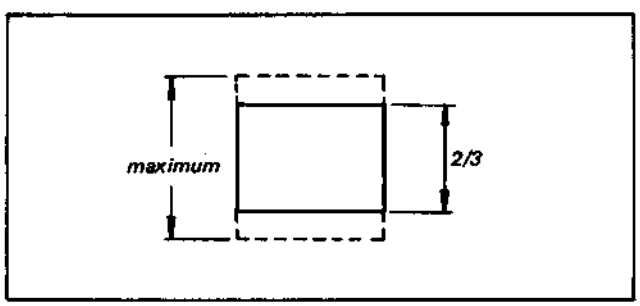


Fig. 3-44

2. Adjustment method

Diagram showing adjustment guide arrangement

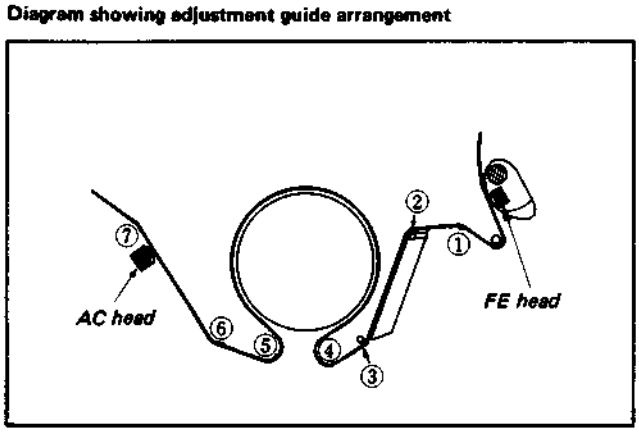


Fig. 3-45

The tape guides are numbered from No. 1 to No. 7. The role of each is as follows.

Guide No.	Role
No. 1 guide	Vertical regulation
No. 2 & No. 3 guides	Fixed guides (no regulation)
No. 4 & No. 5 guide	Upward regulation
No. 6 guide	Downward regulation
No. 7 guide	Upward regulation

[Rough adjustment]

First make an approximate alignment at the tape entrance and exit side.

1) Rotate No. 6 & No. 7 guides to create a space of 0.2mm between the guides and the tape.
2) Check that there is tape at the lighted section of the FE head (core section).
If not set No. 1 guide according to Fig. 3-46.

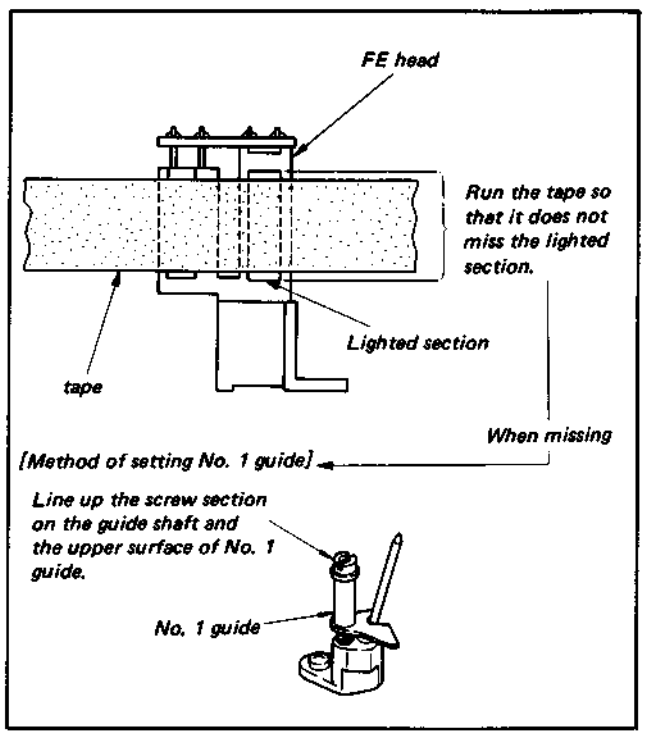


Fig. 3-46

[Fine adjustment]

Entrance side adjustment

1) Make the tape as flat as possible at No. 1 and No. 4 guides.
2) Check that there is tape at the lighted section of the FE head (core section).
3) Any curl at No. 1 guide and No. 4 guide must be less than 0.5mm.
4) Set No. 4 guide with the lock screw.

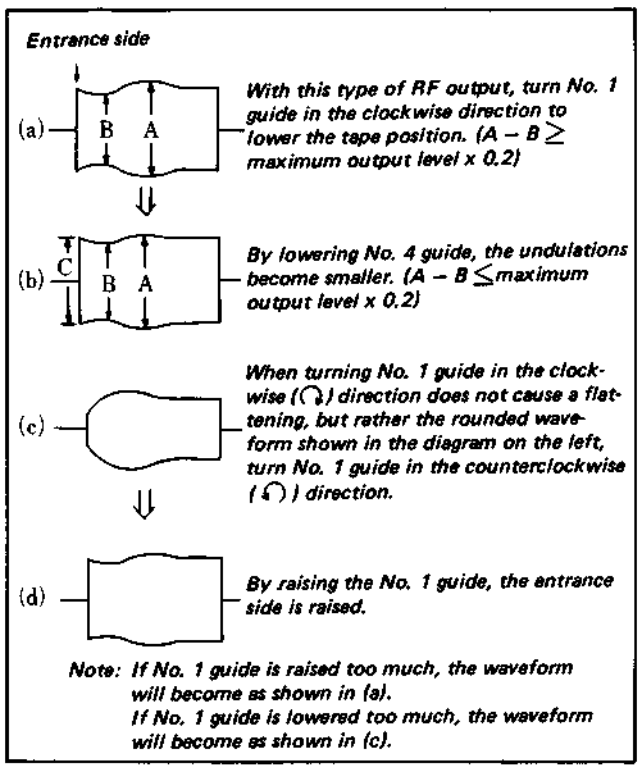


Fig. 3-47

[Exit side adjustment]

1) Adjust with No. 5 guide to obtain a flat or slightly sagging pattern, then set with the lock screw.
2) Check to see that the tape runs parallel to the upper flange of No. 5 guide.

Note: Any curl must be less than 0.5mm
If the tape does not run parallel to the upper flange, insert a drum spacer as shown in ⓒ of Fig. 3-50.

3) Make No. 6 guide parallel to the lower edge of the tape.

Note: There must be no curl.

4) Make No. 7 guide parallel to the upper edge of the tape.

Note: There must be no curl.

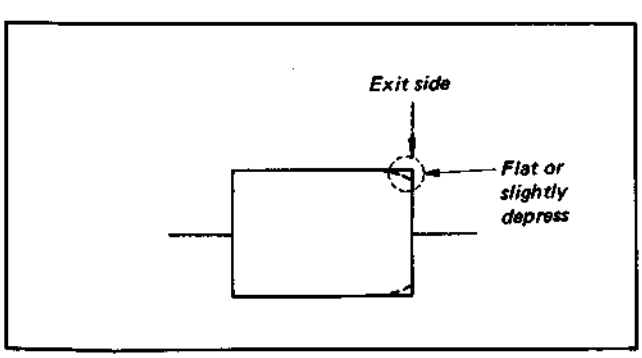


Fig. 3-48

[Standards]

Check the tape speed, and determine whether the check was made with the output level increasing or decreasing, then check at 2/3 of the maximum output level.

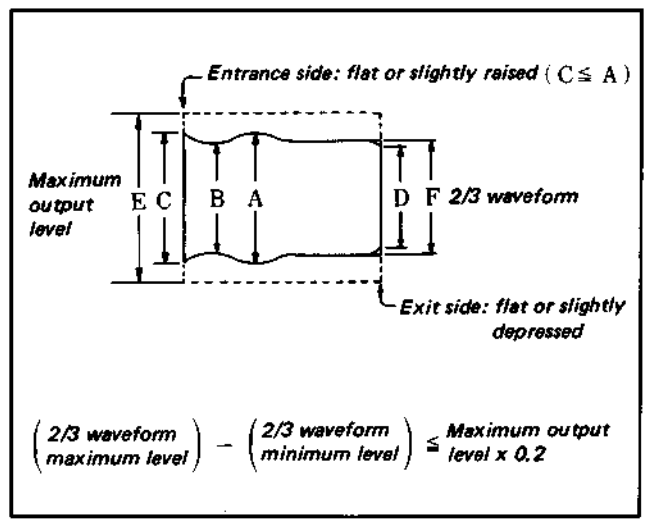


Fig. 3-49

[Outside of standards]

When standards cannot be met by adjusting only No. 1 and No. 4 guides, and No. 5 guide.
Add a drum spacer (thickness 80μ: 3-681-669-01; 40μ: 3-681-669-11) between the drum and the mechanical chassis. First use the 80μ spacer, and if this causes an inclination in the other direction, remove it and insert the 40μ spacer. A maximum of 120μ may be inserted at one position.

Diagram showing locations to insert drum spacers

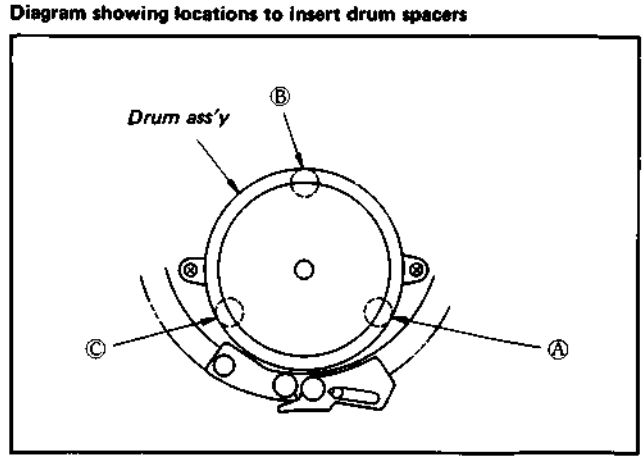


Fig. 3-50

Indications of insertion locations

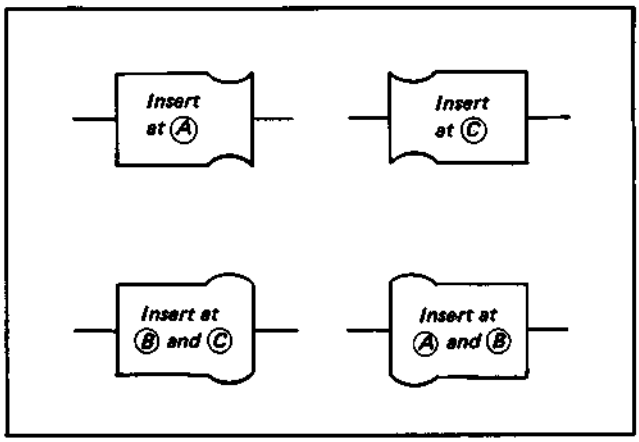


Fig. 3-51

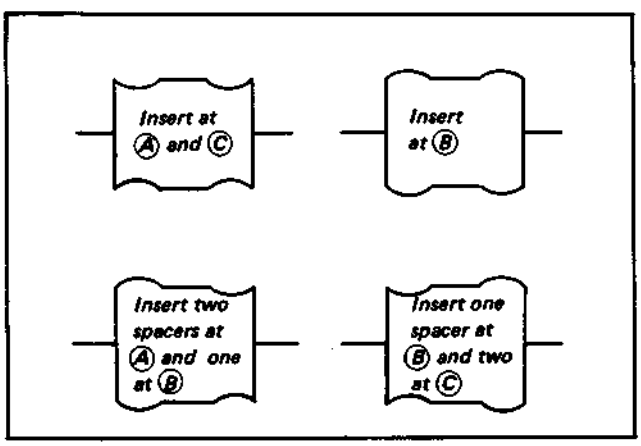


Fig. 3-52

SECTION 4
ELECTRICAL ALIGNMENT (VIDEO SECTION)

[Equipment required]

1) Oscilloscope: Dual-trace, bandwidth more than 10MHz with delay mode.
2) Frequency counter.
3) Digital voltmeter.
4) Alignment tape, type KR5-2H and KR5-3C.
5) Pattern box.
6) Audio generator.
7) Audio attenuator.
8) Audio distortion meter.
9) Audio level meter.
10) VTR (For Betamovie camera, because the VTR does not have playback or rewind functions.
11) Signal generator

[Preparatory setup for alignment]

The signal obtained from the camera is used in the alignment of the VTR, so the output signal must be within the specified range.
Verify the video signals by connecting the oscilloscope to TP11 (luminance signal) and TP9 (chroma signal) on the VC-2 board.

1. Connection diagram

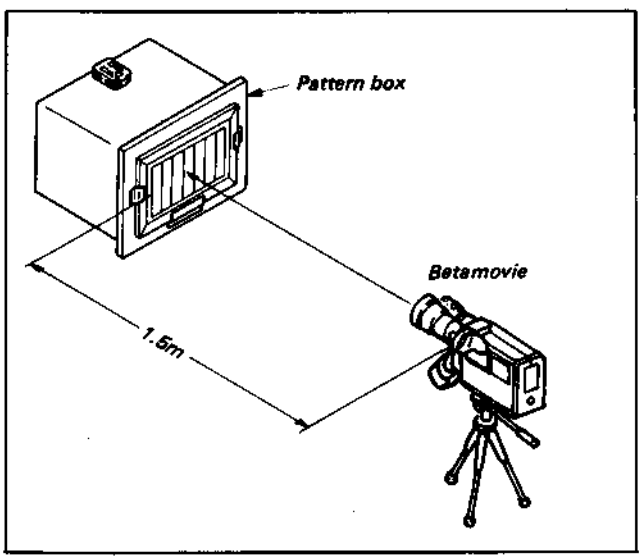


Fig. 4-1

2. Align the color bar signal on the monitor as shown in the following diagram.

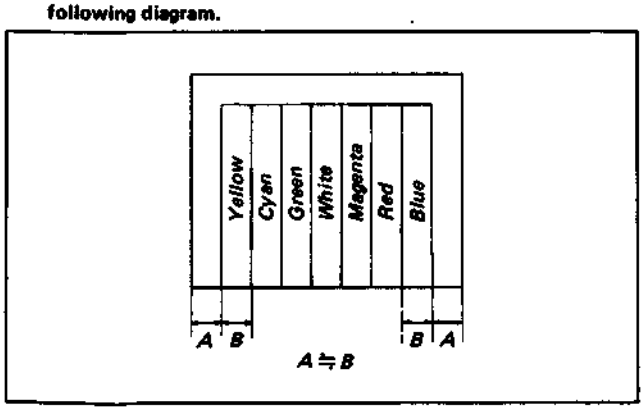


Fig. 4-2

3. Signals

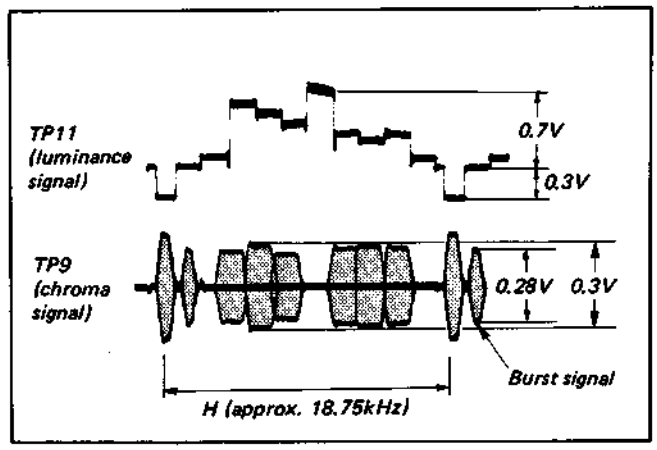


Fig. 4-3

[Method of eliminating signal from video circuit of VTR]

The luminance signal and the chroma signal supplied from the camera to the VTR via a solder bridge on the VC-2 board. To cut off signals while aligning the video circuit, remove this solder bridge.

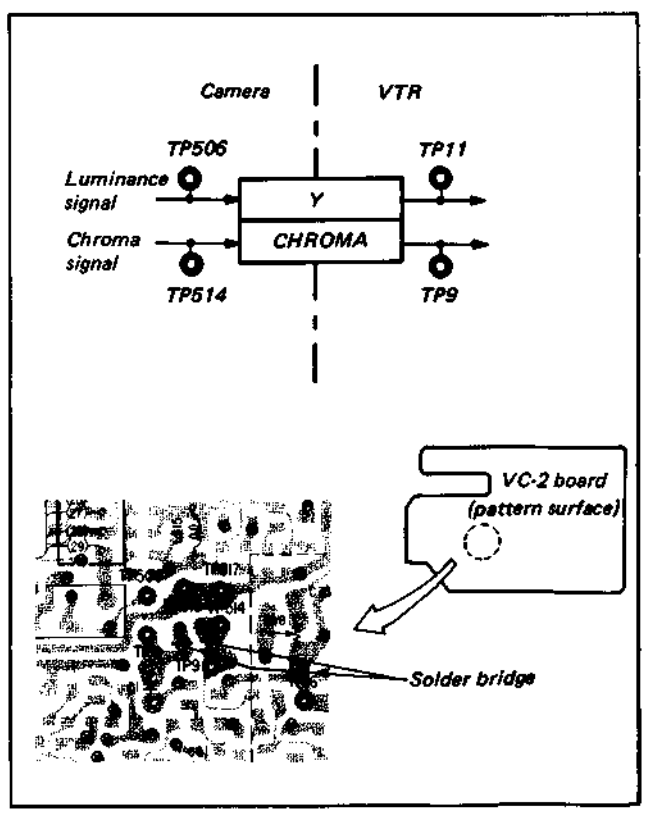


Fig. 4-4

[Alignment screwdriver]

For alignment of the semi-fixed VRs and inductances on the printed circuit boards, use the special tool supplied as illustrated in Fig. 4-5. An ordinary screwdriver is too large to adjust the VRs from the pattern side of the board. Use the metal blade of the tool to adjust VRs and trimmer capacitors.

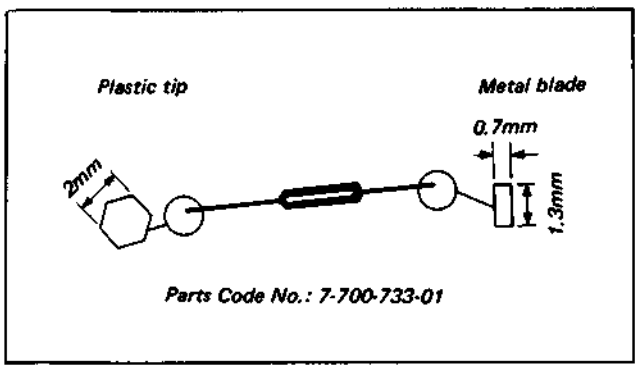
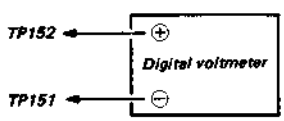


Fig. 4-5 Special alignment tool

4-1. VIDEO SYSTEM ALIGNMENT

4-1-1. Compress Adjustment

Mode: Record
Signal: None (solder bridge between TP506 and TP11 removed)
Digital voltmeter:



[Adjustment method]

1) Adjust to 0.3 ± 0.01V with RV152.

4-1-2. Y-FM Deviation Adjustment

Mode: Record
Signal: Pattern box (100% white)
Oscilloscope: TP11

[Adjustment method]

1) Turn the Betamovie zoom ring until the luminance signal on TP11 is 1.2Vp-p.

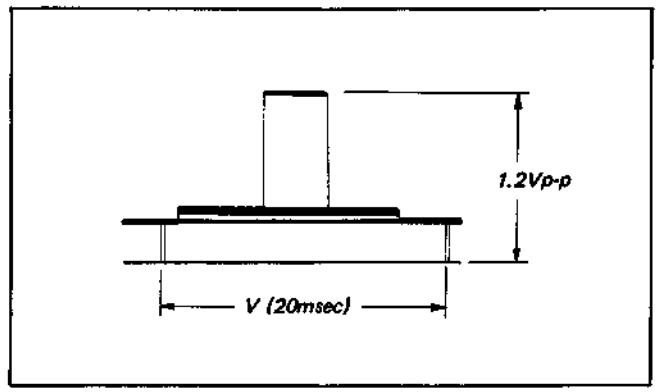


Fig. 4-6

2) Connect the oscilloscope to TP15.
3) Adjust RV156 until the signal is as shown in the following diagram.

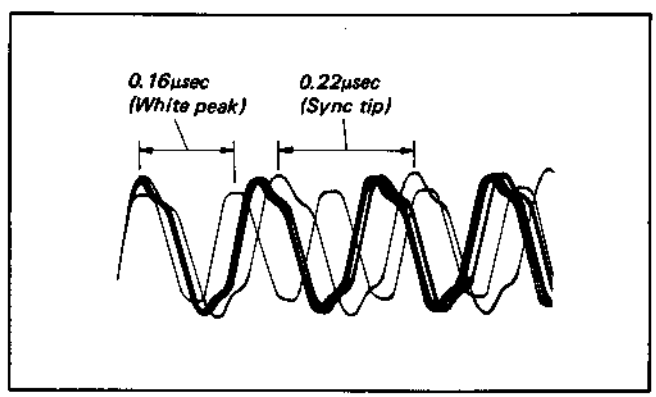


Fig. 4-7

4-1-3. Y-FM Carrier Set Adjustment

Mode: Record
Signal: None (solder bridge between TP506 and TP11 removed)
Frequency counter: TP15

[Adjustment method]

1) Adjust to 4.56 ± 0.04MHz with RV153.

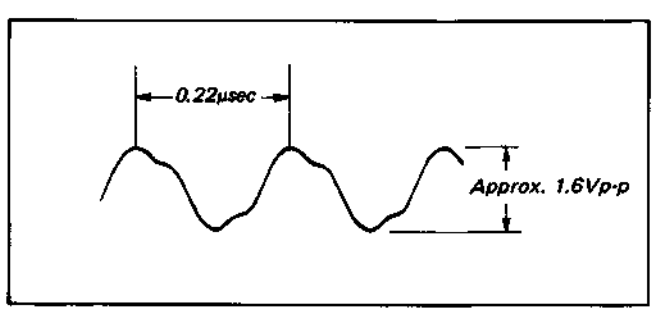
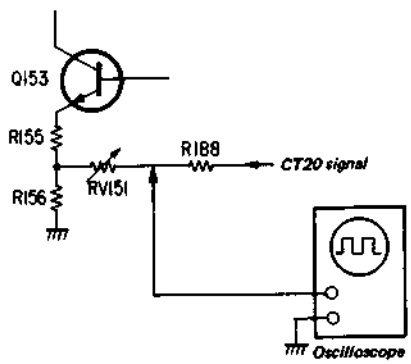


Fig. 4-8

4-1-4. 1/2fH Shift Adjustment

Mode: Record
Signal: None (solder bridge between TP506 and TP11 removed)
Oscilloscope:



[Adjustment method]

1) Adjust to 2.5Vp-p with RV151.

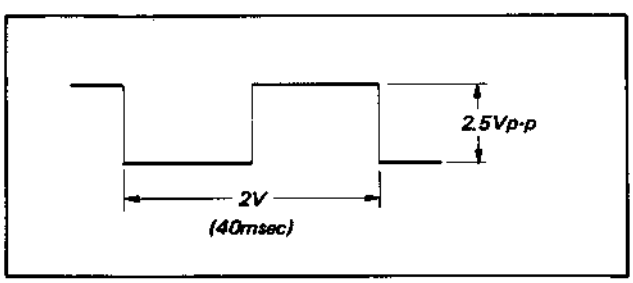


Fig. 4-9

4-1-5. Dark Clip Adjustment

Mode: Record
Signal: None (solder bridge between TP506 and TP11 removed)
Frequency counter: TP15

[Adjustment method]

1) Connect Q1 base to TP10 (GND).
2) Adjust to 2.96 ± 0.03MHz with RV154.

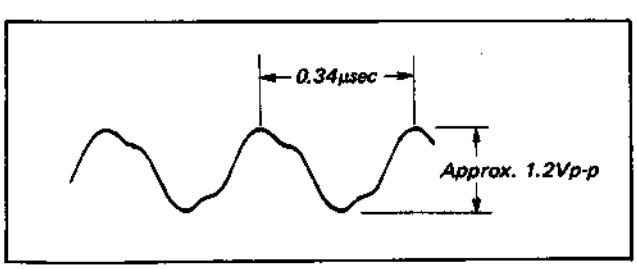


Fig. 4-10

4-1-6. White Clip Adjustment

Mode: Record
Signal: None (solder bridge between TP506 and TP11 removed)
Frequency counter: TP15

[Adjustment method]

1) Connect the base of Q1 to TP8 (+9V) with a 1.5kΩ resistor.
2) Adjust to 8.13 ± 0.03MHz with RV155.

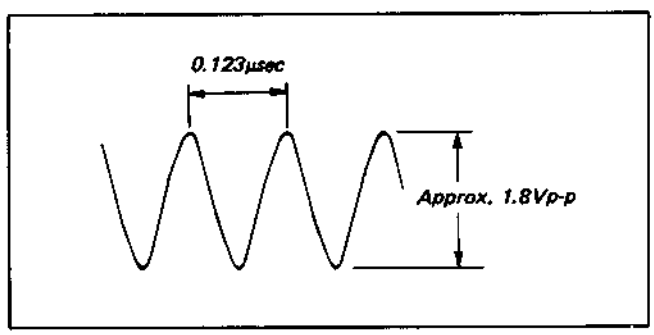


Fig. 4-11

4-1-7. Y-FM Record Current Adjustment

Mode: Record
Signal: None (solder bridge between TP506 and TP11 removed)
Oscilloscope: TP15

[Adjustment method]

1) Adjust to 1.24 ± 0.04Vp-p with RV7.

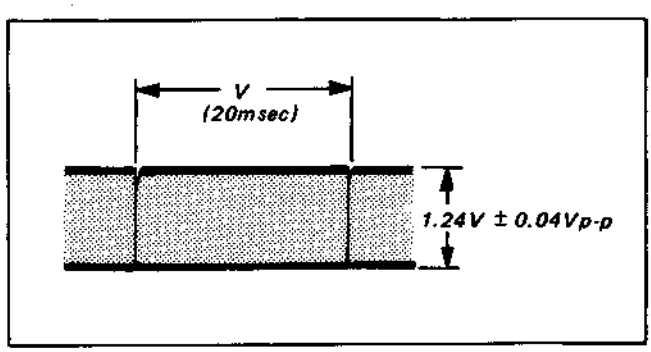


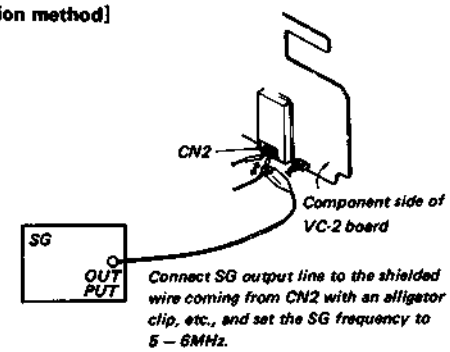
Fig. 4-12

4-1-8. Clog Detection Adjustment

1. Adjustment of playback frequency characteristics

Mode: Playback (short pins ② and ④ of CN307 on SS-17 board)
Signal: Connect signal generator (SG) as shown below.
Oscilloscope: TP13

[Connection method]



[Adjustment method]

1) Adjust SG output level until TP13 output level is 100 – 200mVp-p.

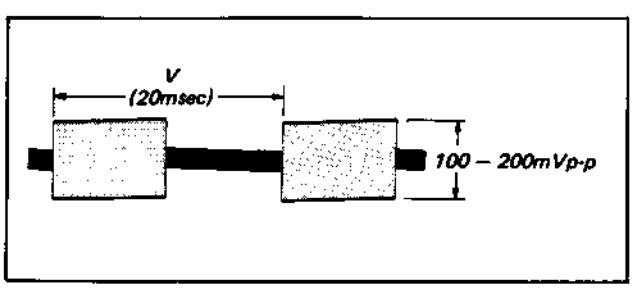


Fig. 4-13

2) With the SG frequency set to 5.06MHz, adjust L7 until the output level is a maximum.
3) Then, with the SG frequency set to 6.24MHz, adjust L8 until the output level is a maximum.

2. Adjustment of clog detection level

Mode: Record
Signal: Black level (lens covered with black paper)
Oscilloscope: TP15

[Adjustment method]

1) Adjust RV7 until the output level at TP15 is 290mVp-p, and record.

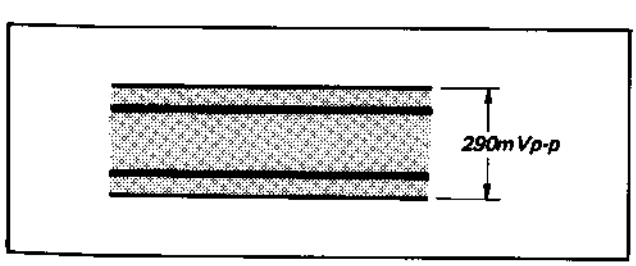


Fig. 4-14

2) Connect the oscilloscope to TP14.
3) Playback the recorded signal. (Short pins ② and ④ of CN307 on SS-17 board to get the playback mode.)
4) Turn RV8 fully clockwise (↻), as viewed from the pattern side, then, slowly turn it counter-clockwise (↺) until the state shown in Fig. 4-15 is attained.

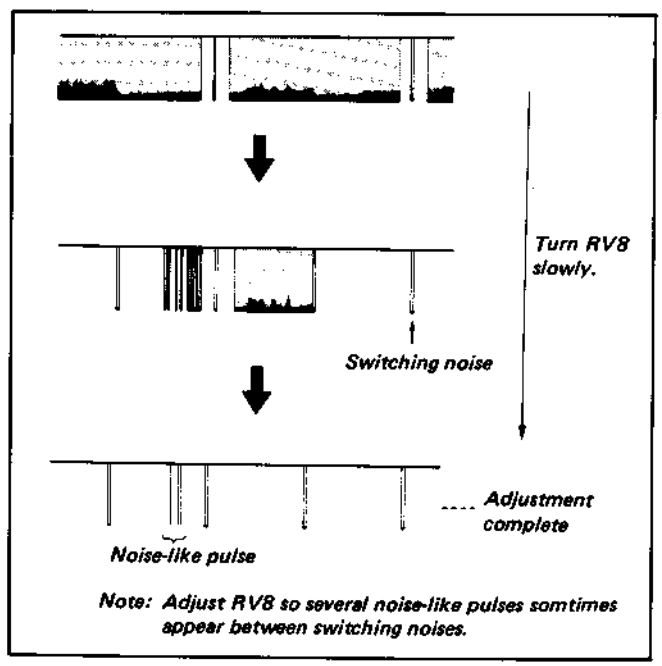


Fig. 4-15

5) With the recording current (TP15 output level) remaining at 290mVp-p, repeatedly press the REC START/STOP button 40 times, and make sure that the CAUTION lamp flickers each time.

Note: • Clog detection takes place when the STAND-BY mode is changed over to the RECORD mode.
• To turn off the flickering CAUTION lamp, either turn off the POWER switch or eject the cassette.

6) Then, adjust the recording current to 460mVp-p with RV7, repeatedly press the REC START/STOP button 40 times, and make sure that the CAUTION lamp does not flicker at all.
7) If 5) and 6) are not satisfied, finely adjust RV8.
8) After the adjustment is completed, return RV7 to the original position. (Refer to 4-1-7. Y-FM Record Current Adjustment.)

4-2. SYSTEM CONTROL SYSTEM ADJUSTMENT

4-2-1. Battery Power-off Voltage Adjustment (SS-17 board)

Mode: Record
Constant voltage power supply: External power input
Digital voltmeter: J901 (JK-2 board) ⊕ terminal

[Adjustment method]

1) Adjust the power supply voltage until the digital voltmeter reads 9.6V dc.
2) Turn RV301 fully clockwise (↻).
3) Put into recording mode.
4) Adjust the power supply voltage until the digital voltmeter reads 9.0V dc.
5) Turn RV301 slowly counterclockwise (↺), and stop where the camera is shut off automatically.

Note: When the Betamovie is automatically shut off because of low supply power voltage, only the EJECT function will operate. To continue the adjustment, cut the power momentarily and after the voltage returns to its original value, turn on again.

[Checking method]

1) Adjust the power supply voltage until the digital voltmeter reads 9.6V dc.
2) Put into recording mode.
3) Slowly lower the power supply voltage, and make sure that, as the digital voltmeter reading drops to 9.10 – 9.35V dc, the CAUTION lamp flickers at 1Hz.
4) Further lower the power supply voltage, and make sure that the automatic shut-off operates when the digital voltmeter reading drops below 9.0 ± 0.1V dc.

4-3. SERVO SYSTEM ADJUSTMENT

4-3-1. Drum Speed Adjustment

Mode: Record
Oscilloscope: TP203 (pin ⑩ of IC201)
(or digital voltmeter)

[Adjustment method]

Adjust to 3.3 ± 0.2V dc with RV202.

4-3-2. Drum Phase Adjustment

Mode: Record
Oscilloscope: CH1 TP201 (pin④of IC201)
CH2 TP202 (pin⑨of CN313)

[Adjustment method]

Adjust to 0 ± 30μsec with RV201. (See Fig. 4-16)

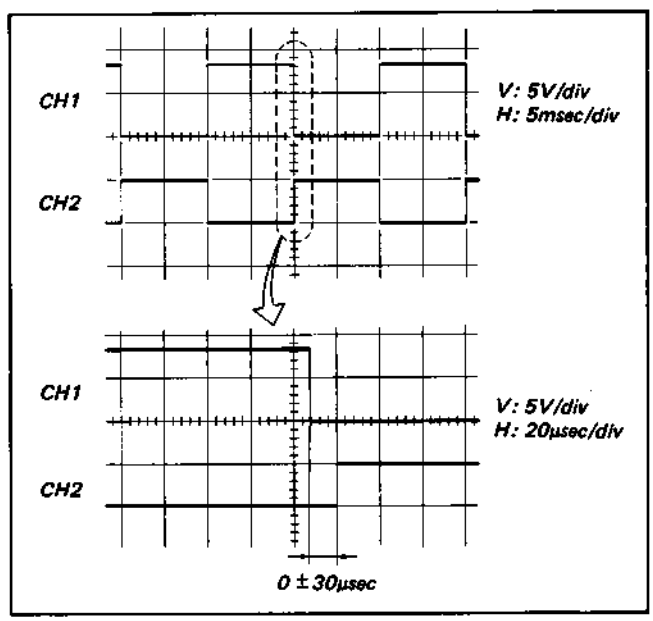


Fig. 4-16

4-3-3. Servo Lock Check

Mode: Standby
Oscilloscope: CH1 Pin⑥of IC201
CH2 Pin⑦of IC201

[Checking method]

Lock so that the waveforms of CH1 and CH2 are as shown in Fig. 4-17.

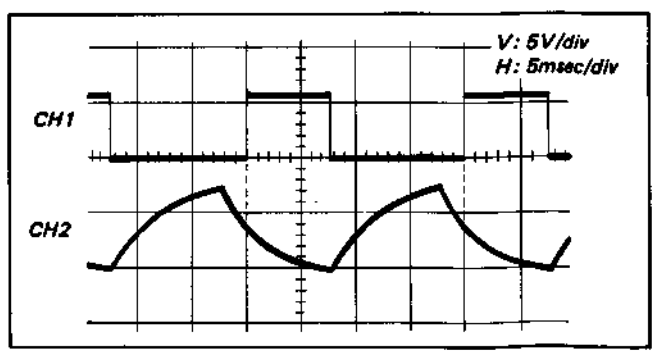


Fig. 4-17

4-3-4. Edit Adjustment

Carry out adjustments **1** through **5** given below. If adjustments **4** and **5** are not satisfied, a clear edit cannot be obtained.

1. Pinch-on delay adjustment

Mode: Standby ⟶ record
Oscilloscope: CH1 TP301
CH2 TP302
Trigger CH1
Trigger slope ⊖ (negative)
Sweep mode NORM ····· Adjust the trigger level until a waveform appears on the oscilloscope when changed over from standby to record mode.

[Adjustment method]

1) Adjust the delay time for switching from standby to record to 5 ± 0.5msec with RV302.

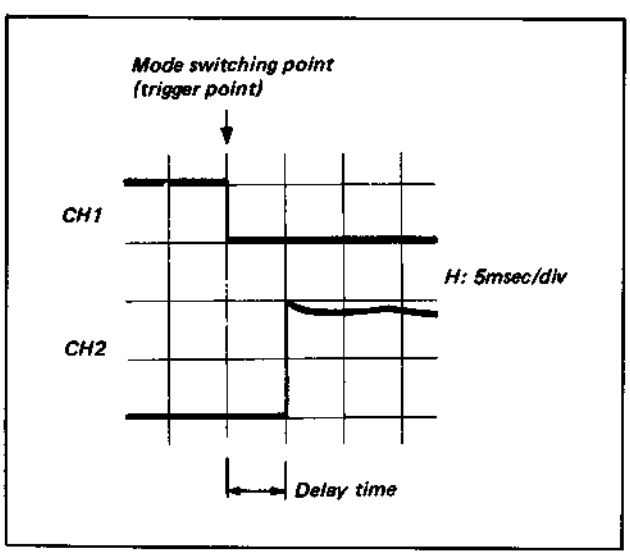


Fig. 4-18

2. Pinch-off delay adjustment

Mode: Standby⟷ record
Oscilloscope: CH1 TP303
CH2 TP304
Trigger CH1
Trigger slope ⊖ (negative)
Sweep mode NORM ····· Adjust the trigger level until a waveform appears on the oscilloscope when changing over between standby and record mode.

[Adjustment method]

1) Adjust the delay time for switching over from standby to record to 12 ± 0.5msec with RV303.

2) Make " **5. Playback CTL Phase Adjustment** ".

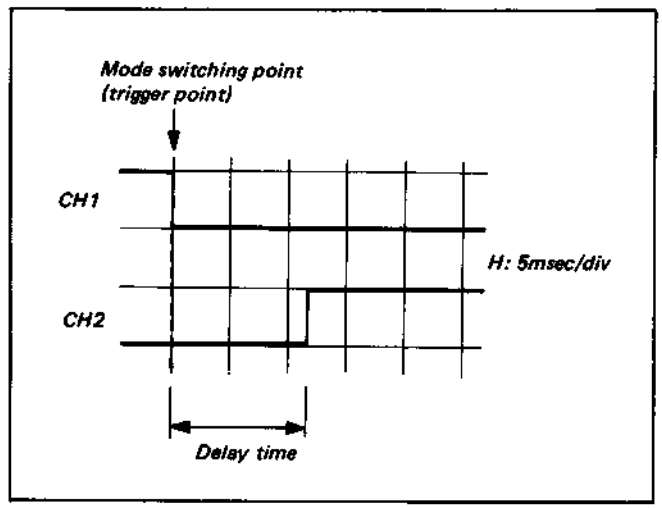


Fig. 4-19

3. Brake-on delay adjustment

Mode: Standby⟷ record
Oscilloscope: CH1 TP307
CH2 TP308
Trigger CH1
Trigger slope ⊖ (negative)
Sweep mode NORM ····· Adjust the trigger level until a waveform appears on the oscilloscope when switching over between standby and record.

[Adjustment method]

1) Adjust the delay time for switching over from standby to record to 12 ± 0.5msec with RV305.
2) Carry out " **5. Playback CTL Phase Adjustment** ".

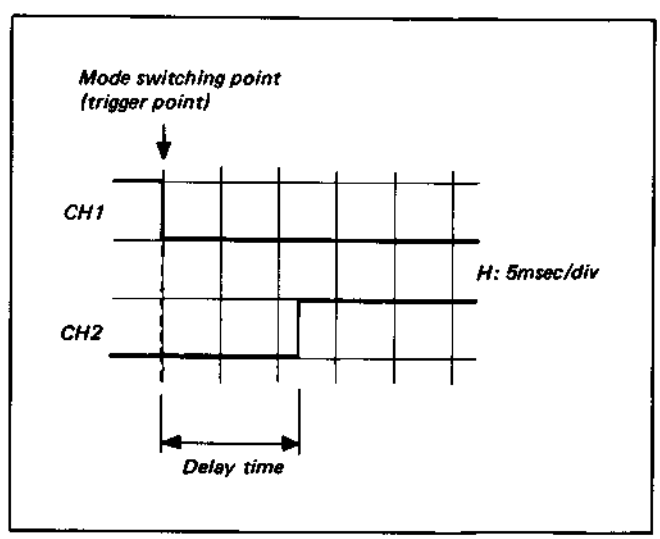


Fig. 4-20

4. Brake-off delay adjustment

Mode: Standby ⟶ record
Oscilloscope: CH1 TP305
CH2 TP306
Trigger CH1
Trigger slope ⊖ (negative)
Sweep mode NORM ····· Adjust the trigger level until a waveform appears on the oscilloscope when switching from standby to record.

[Adjustment method]

1) Adjust the delay time for switching from standby to record to 17 ± 0.5msec with RV304.

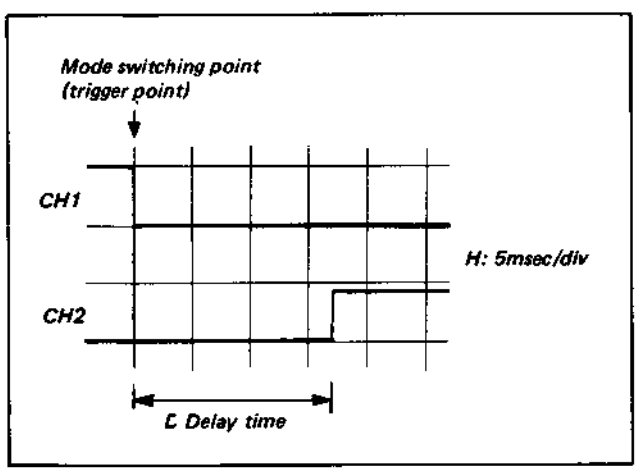


Fig. 4-21

5. Playback CTL phase adjustment

Make this adjustment accurately as inaccuracy causes noise on the edited tape.

Mode: Standby ⟶ playback
Oscilloscope: CH1 Pin ⑩ of CN509 on VC-2 board (CT10 signal)
CH2 TP204 on SS-17 board (CTL signal)
Signal: Recorded tape

[Adjustment method]

1) When the mode is switched over from STANDBY to PLAYBACK, a solenoid actuating noise is heard three times. Check that the CTL signal position at the 3rd actuation is as shown in Fig. 4-22. The CTL signal position shifts, so switch-over between STANDBY and PB several times and take the center of the range of CTL positions for checking.

Note: The CTL signal shifts right and left because there is no playback servo. For this reason, check at the 3rd actuation.

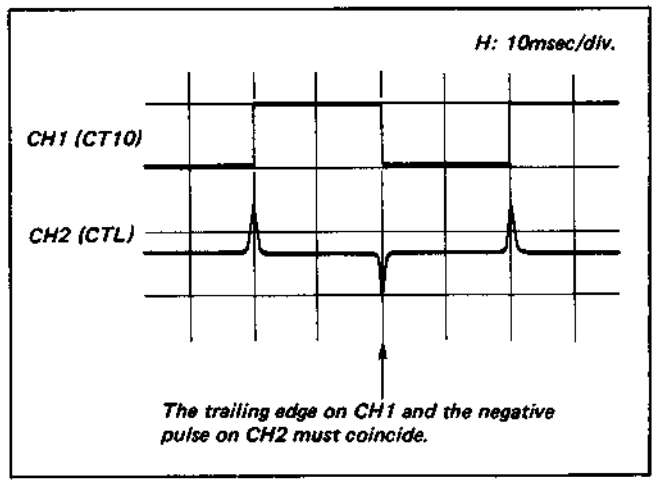


Fig. 4-22

2) If the pulses do not match as shown, carry out "**2. Pinch-off delay adjustment**" and "**3. Brake-on delay adjustment**" again. Ensure that the delay time for the two adjustments is equal.

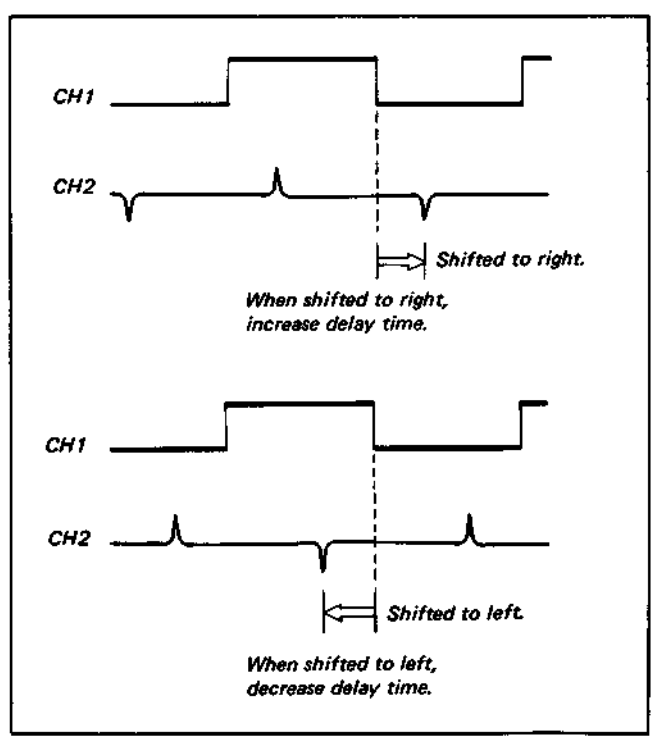


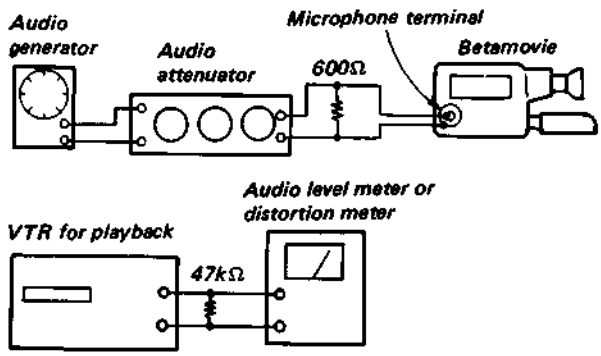
Fig. 4-23

3) When the delay times are not between 10 and 20msec, check "**3-3-2. 7. Pinch roller position adjustment**".

4-4. AUDIO SYSTEM ADJUSTMENT

To adjust the audio system, a tape recorded by the Betamovie is played back on a VTR with reliable playback characteristics.

[Connecting the equipment]



Note: The playback VTR must have had its audio head azimuth and the audio playback system (playback frequency characteristics and playback level) adjusted.

4-4-1. Audio Head Adjustment

See "MECHANICAL ADJUSTMENT".

4-4-2. Bias Oscillation Frequency Adjustment

Mode: Record
Frequency counter: Pin①of CN404
Oscilloscope: Pin①of CN404

[Adjustment method]

1) With the oscilloscope only connected to pin ① of CN404, read the bias signal level.
2) Turn RV403 fully clockwise (↷).
3) Connect the frequency counter to pin①of CN404.
4) Adjust the bias oscillation frequency to 67.7 – 70.0kHz or 60 – 64.5kHz with T401.
5) Disconnect the frequency counter.
6) Adjust the bias signal level to the level read in 1) with RV403.

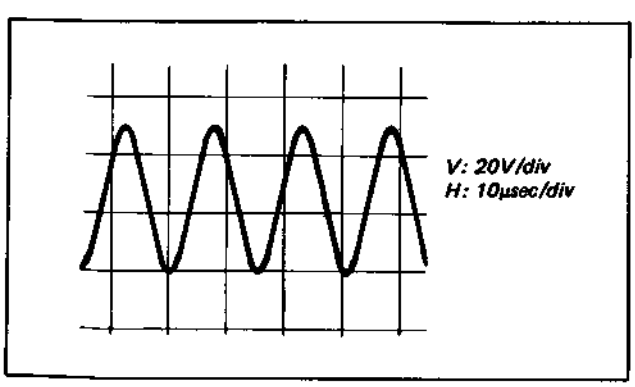


Fig. 4-24

4-4-3. Bias Leak Check (AU-3 board)

Mode: Record
Input signal: None
Oscilloscope: TP410

[Checking method]

1) Make sure that the bias leak is below 500mV.

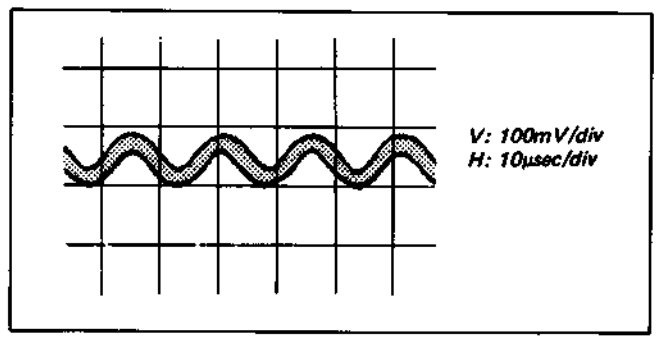


Fig. 4-25

4-4-4. Output Level Check

Mode: Record
Input signal: 333Hz, –50dB
Level meter: Earphone terminal (load impedance greater than 1kΩ)

[Checking method]

1) The output level at the earphone terminal must be –4 ± 1.5dB.

4-4-5. Record Bias Current Adjustment (AU-4 board)

Mode: Record and playback
Input signal: 333Hz, –80dB and 7kHz, –80dB
Level meter: Audio output terminal of playback VTR

[Adjustment method]

1) Record 333Hz, signals at –80dB.
2) Record 7kHz, signals at –80dB.
3) Playback the recorded tape on the playback VTR, and measure the ratio of the 7kHz output level to the 333Hz output level.

Standard: The 7kHz output level should be 0 ± 1dB relative to the 333Hz output level.

4) If the standard requirement is not met, turn RV403 as below, and repeat adjustments 1) through 3).

7kHz output level	RV403 adjustment
Low	Clockwise (↷)
High	Counterclockwise (↶)

4-4-6. Recording Level Adjustment (AU-3 board)

Mode: Record and playback
Input signal: 333Hz, −50dB
Level meter recording: TP410
Level meter playback: Playback VTR audio output terminal

[Adjustment method]

1) Put in the recording mode, and note the TP410 signal level. (approx. −8dB)
2) Playback the recorded tape on the playback VTR, and check the playback output level.

Standard: −10dB*1 or −5dB*2

3) If the standard is not met, adjust the TP410 signal level with RV401, to correct the error and repeat 1) and 2).

*1 When playback VTR audio output level is −10dB.
*2 When playback VTR audio output level is −5dB.

4-4-7. Distortion Check

Mode: Record and playback
Input signal: 333Hz, −50dB
Distortion meter: Audio out terminal of playback VTR

[Adjustment method]

1) Make a recording
2) Playback the recorded tape on the playback VTR, and check the distortion.

Standard: 4% maximum

4-4-8. S/N Ratio Check

Mode: Record and playback
Input signal: 333Hz, −50dB and no signal
Level meter: Audio out terminal of playback VTR

[Adjustment method]

1) Record 333Hz, −50dB signals.
2) Record with no signal.
3) Playback the recorded tape on the playback VTR, and measure the ratio between the signal level (333Hz) and the noise level (no signal).

Standard: Greater than 35dB.