BMC-500P
BC-300E/AS

SERVICE MANUAL

AEP Model
E Model
(BC-300E)
Australian Model
(BC-300AS)

BC-300E

BMC-500P

AF CCD
Auto Focus Charge Coupled Device
Betamovie

April, 1985

SB CHASSIS

Refer to the SUPPLEMENT for the information of BC-300E/AS Multi battery charger and Adjustment method.

SPECIFICATIONS

System

Video recording system	Rotary double-azimuth single-head, Helical scanning FM system
Usable cassettes	Cassettes having the mark
Tape speed	18.73 mm/sec.
Maximum recording time	3 hours 35 min. (with L-830 video cassette)
Image device	CCD image sensor
Lens	Combined 6x power zoom lens f12 mm (F1.4)–72 mm (F1.8) Filter diameter: 52 mm
Autofocus system	Infrared autofocus
Colour temperature selector	Auto: From tungsten lamp lighting to a cloudy day Preset values: ☀: 5,800K ☆: 3,200K
Minimum illumination	28 lux
Recommendable illumination	More than 300 lux
Illumination range	28 lux to 100,000 lux (2.6 to 9290 footcandles)

Inputs and outputs

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

Data Display System

Clock	Crystal lock
Date indication	From Jan. 1, 1980 to Dec. 31, 2009
Time indication	24-hour cycle
Power back-up	Back-up duration of 2 years with lithium battery CR2025

– Continued on next page –

MICROFILM

Beta BETAMOVIE
SONY

Consumer VIDEO

General

Power requirements
9.6 V dc

Power consumption
6.5 W

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

Dimensions: Approx. 146 × 177 × 374 mm (w/h/d) (5¾ × 7 × 14¾ inches) when packed

Weight: 2.49 kg (5 lb 8 oz) Betamovie only

Viewfinder: Optical system, Eyesight correction adjustable (+2 – −4 DP)

Microphone: Built-in electret condenser mic

Accessories supplied

NP-11 battery pack...1
BC-300E multi battery charger...1 (AEP, E model)
BC-300AS multi battery charger...1 (Australian model)
Shoulder strap...1
Handle...1
Decal...1
Lithim battery CR2025...1

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.

TABLE OF CONTENTS

❶ Built-in microphone
Sound is recorded simultaneously while video taping.

❷ Infrared beam detector
During auto focusing this detector receives the infrared beam reflected from the subject and measures the distance between the Betamovie and the subject.

❸ Tape running lamp
Lights up when the tape is running. Blinks when the rechargeable battery is low.

❹ Infrared beam transmitter
During auto focusing this transmitter sends the infrared beam toward the subject.

❺ Lens hood
It prevents unnecessary light from entering the lens.
Remove it when using an optional lens or a filter.

❻ BATTERY knob and battery compartment
Slide the knob to the right to open the compartment.

❼ Focus ring
To focus manually turn the ring while looking through the viewfinder.

❽ Manual zoom lever
This lever is attached to the zoom ring to manually adjust between the wide-angle and telephoto positions.

❾ Accessory shoe
Video lights or external microphones with an SAD-100 shock mount adaptor may be attached here.

❿ Optical viewfinder
The inside lamps indicate the necessary information for operation.
The viewfinder can be attached to the other side of the mounting for convenient viewing with your left eye. (See page 10.)

> **Note**
> Whenever you do not use the viewfinder, (e.g. When operating the unit by remote control) be sure to lock the viewfinder by pushing it toward the microphone.

⓫ Eyesight correction knob
This knob must be adjusted to your sight to assure accurate focusing. The knob should be adjusted before initial operation and readjusted each time a different person uses the Betamovie.

⓬ Data Display System (DDS)
Indications will appear when a lithium battery and a rechargeable battery (or other power source) are supplied.
DATA SET button: Press to memorize a digit during date/time setting.
ADJUST button: The digit advances at each press of the ADJUST button during date/time setting. Keep the button depressed to advance the digits continuously.
BATT COUNTER button: Keep this button pressed to have the total elapsed recorded time displayed. The counter returns to "0:00" once the power supply is cut off and furnished again.
COUNTER button: Press to display the tape counter reading. Neither date nor time will be recorded while the display window shows the tape counter reading. The counter returns to "0:00:00" when a cassette is taken out and inserted again.
TIME button: When the TIME button is depressed, the time will be displayed in the window and will also be recorded on the tape.
DATE button: When the DATE button is depressed, the date will be displayed in the window and will also be recorded on the tape.
Display window: The following indications will blink to show what is wrong.
- : The video head may have clogged up.
- : The rechargeable battery is exhausted. If the indication " DATE " or " TIME " blinks with "", the lithium battery is exhausted. Replace the lithium battery.
- : The tape is at its end.
- : Moisture has condensed inside the unit.

⓭ Lithium battery compartment
Insert the supplied lithium battery to activate the DDS.

SECTION 1
GENERAL

1-1. WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

Dangerously high voltages are present inside the unit. Do not open the cabinet. Refer servicing to qualified personnel only.

1-2. FEATURES

- Betamovie is a compact, lightweight combination VCR/camera.
- CCD (Charge-Coupled Device) image device contains 290,000 elements and reproduces a fine picture in natural colour without lag or burn-in.
- Auto focusing by infrared beam adjusts the focus for the subject appearing in the center marker of the viewfinder.
- Date or time can be inserted (superimposed) during recording.
- Data Display System (DDS) allows the display of tape counter, battery counter and caution indications, as well as date and time.
- Recordings as long as 3 hours 35 minutes on L-830 tape are possible.
- A motorized auto zoom lens assures smooth zooms.
- Viewfinder can be adjusted for viewing with your left eye.
- Energy-saving quick-start system.

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

1-3. PRECAUTIONS

Mechanism

- Betamovie is for recording use only.
- Cassettes cannot be loaded or removed if the battery pack is not inserted or if the AC power adaptor is not connected. Furthermore, if a cassette is not loaded, only the EJECT button will operate.

Tape Compatibility

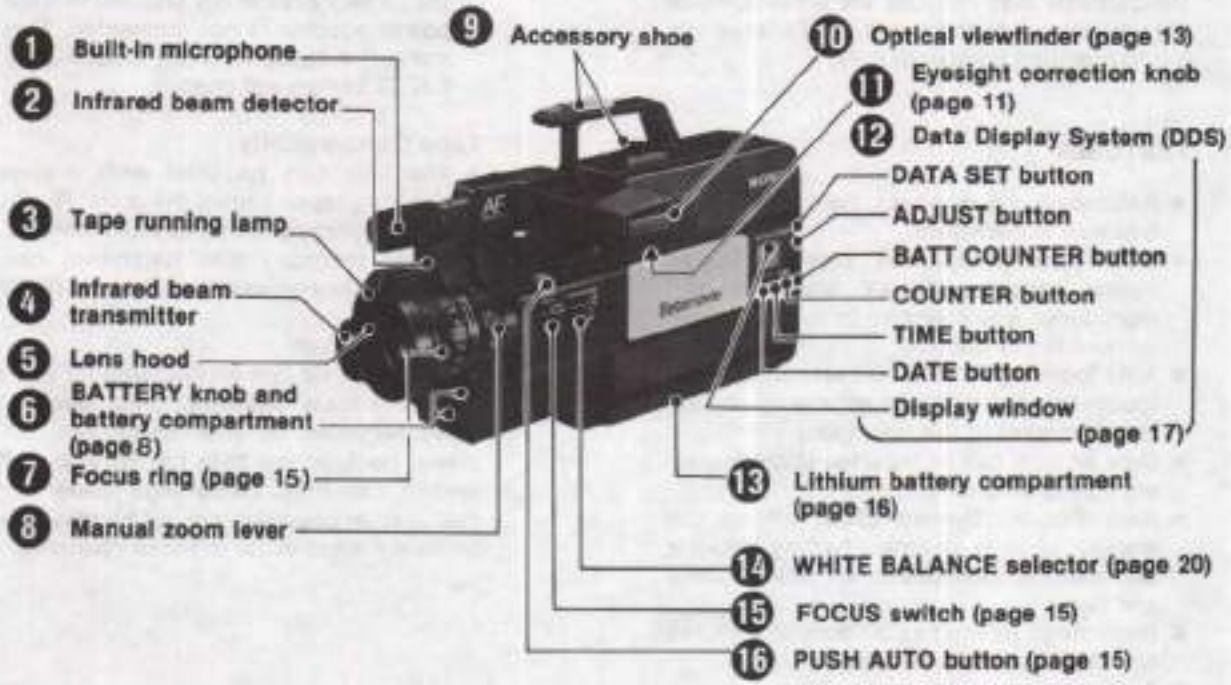
- The unit can be used with any video cassette tapes having the mark .
- Tape recording speed is 18.73 mm/sec.
- Tapes recorded with Betamovie can be played back on any Beta format VCR.

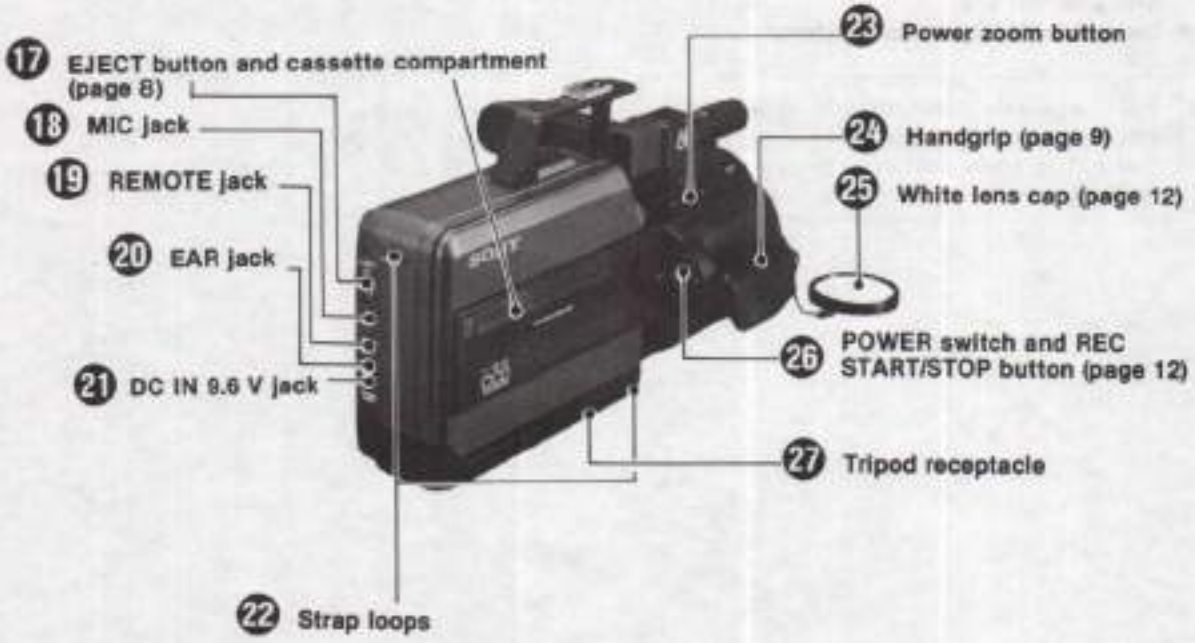
Colour System

Your Betamovie is manufactured for use with PAL broadcast systems. This means that tapes recorded on your Betamovie can be played back on the Beta format VCR in PAL-system countries. Recordings made in non-PAL-system countries cannot be played back on Beta format VCRs in those countries.

1-4. LOCATION AND FUNCTION OF PARTS AND CONTROLS

For details, refer to the pages in parentheses.





⑭ WHITE BALANCE selector
Press the selector down from the " ▽ " position to adjust the white balance automatically. To be able to start recording quickly or to shoot in the dusk, for example, when the colour temperature is constantly changing, set this selector to "☀" when the subject is outdoors and to " ⌂ " when the subject is indoors.

⑮ FOCUS switch
Set to AUTO to focus automatically for the subject appearing in the center marker in the viewfinder. Set to MAN (manual) for manual focusing.

⑯ PUSH AUTO button
Even if the FOCUS switch is set to the MAN position, you can focus automatically by keeping this button depressed.

⑰ EJECT button and cassette compartment
Slide the EJECT button downward to open the cassette compartment. This button will not operate if no power is supplied.

⑱ MIC (microphone) jack
Connect an external microphone to this jack. The built-in microphone will then be disconnected.

⑲ REMOTE jack
Connect an optional Remote Commander to control the tape transport from a distance.

⑳ EAR (earphone) jack
Connect an optional earphone to monitor the sound being recorded.

㉑ DC IN 9.6 V jack
Connect an ac power adaptor (optional) or a car battery cord (optional) here. When a power source is connected, the battery power is disconnected.

㉒ Strap loops
Attach the supplied shoulder strap here.

㉓ Power zoom button
Press for a smooth powered zoom between the wide-angle (W) and telephoto (T) positions.

㉔ Handgrip
Hold the grip for hand-held shots.

㉕ White lens cap
Put on the lens cap when the white balance is to be adjusted or when the unit is not in use.

㉖ POWER switch and REC START/STOP button
Slide POWER switch upward (ON) to turn on the unit and downward (OFF) to turn it off. Press the REC START/STOP button to start or stop recording.
When you are not recording, auto focusing will not activate even if the FOCUS switch is set to AUTO, but can be activated by depressing the PUSH AUTO button.

㉗ Tripod receptacle
Attach an optional tripod for a stable recording.

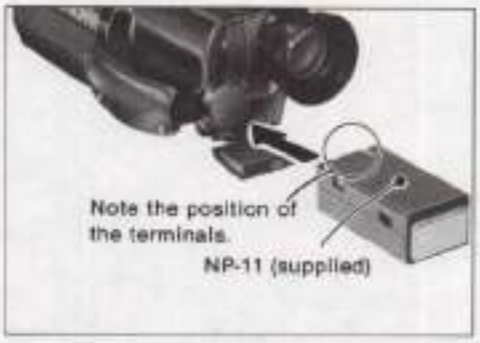
1 Install the lithium battery for date/time setting.

See page 16.

2 Install a charged battery pack, NP-11 (supplied).

1 Slide the BATTERY knob to the right to open the compartment.

2 Insert the charged battery pack into the compartment and close the lid.



3 Load the cassette.

1 Slide the EJECT button downward.

2 Install the cassette with the round window to the right.

3 Press and close the compartment lid.

Checking the cassette

Cassette safety tab
Make sure that a cassette to be recorded has a safety tab or piece of tape in place over the opening on the cassette bottom.

Recording from the beginning of the tape
Run Betamovie for about 25 seconds at the beginning of a cassette before recording to avoid missing the starting point during playback on a video cassette recorder.

Using partially-recorded tapes
Wind the tape on a VCR to the point from which further recording is to begin. When recording is resumed from the end of a previously-recorded portion, the section of tape wound on the drum will not be recorded (about 10 seconds).

Cassette	Recording time
L-830	215 min. (3 hr. 35 min.)
L-750	195 min. (3 hr. 15 min.)
L-500	130 min. (2 hr. 10 min.)
L-370	95 min. (1 hr. 35 min.)
L-250	65 min. (1 hr. 5 min.)
L-125	30 min.

4 Set the FOCUS switch to the AUTO position.

5 Rest Betamovie on your shoulder.

Ⓐ

Snap the viewfinder to the operating position and place your right eye seourely against the eye cup.

Do not lift up or push down on the viewfinder.

Ⓑ

Slip your right hand under the grip belt.
Grip belt adjustment
❶ Unsnap the cover.
❷ Adjust the strap length.
❸ Snap the cover closed.

Attaching the viewfinder to the other side of the mounting for viewing with your left eye

1 Pull and remove the cover.

2 Unlock the viewfinder arm, push up the pin from the bottom, and pull it out from the top.

3 Turn the viewfinder over and attach it to the other side and insert the pin.

4 Slide the cover back into place.

Note
When attaching the viewfinder to the other side, be careful not to touch the lens.

6 Adiust the eyesight correction knob.

When using the Betamovie for the first time or after someone else has used the camera, adjust the eyesight correction knob.
Turn the knob so that the marker in the viewfinder is sharp and clear.
For quick future reference and adjustment, make note of the setting of the eyesight correction knob.

Attaching the supplied handle

❶ Insert the hook into the hole.
❷ Tighten the screw.
❸ Push the holder down and fix the handle.

1 **Set the POWER switch to ON.**

2 **Put the supplied white lens cap over the lens and point the unit at the major light source if recording takes place indoors, or at a subject more than 2 meters (6.6 ft) away from the unit if recording takes place outdoors.**
Then press down the WHITE BALANCE selector from the "↓" position.
The selector comes back to "↓" position and white balance is automatically adjusted.

Blinks while the white balance is automatically being adjusted and disappears when the adjustment is completed. Be sure to point the lens at a major light source or the subject.

See page 20 for more information on white balance.

3 **Frame the subject inside the marker and begin recording by pressing the REC START/STOP button.**
Auto focusing is activated if the FOCUS switch is set to ON.

Base point for measuring the distance between your Betamovie and the subject.

4 **To stop recording, press the REC START/STOP button.**
To resume recording, press the button again.

- To produce a consecutive gap-free recording on a cassette, do not remove the cassette between recordings. See page 19 for a consecutive recording.
- To listen to the sound being recorded, connect an optional earphone to the EAR jack.

After recording

1 Set the POWER switch to OFF.

To stop recording, press the REC START/STOP button to stop the tape, then set the POWER switch to OFF. If you set the POWER switch to OFF when the tape is running, the setting noise might be recorded.

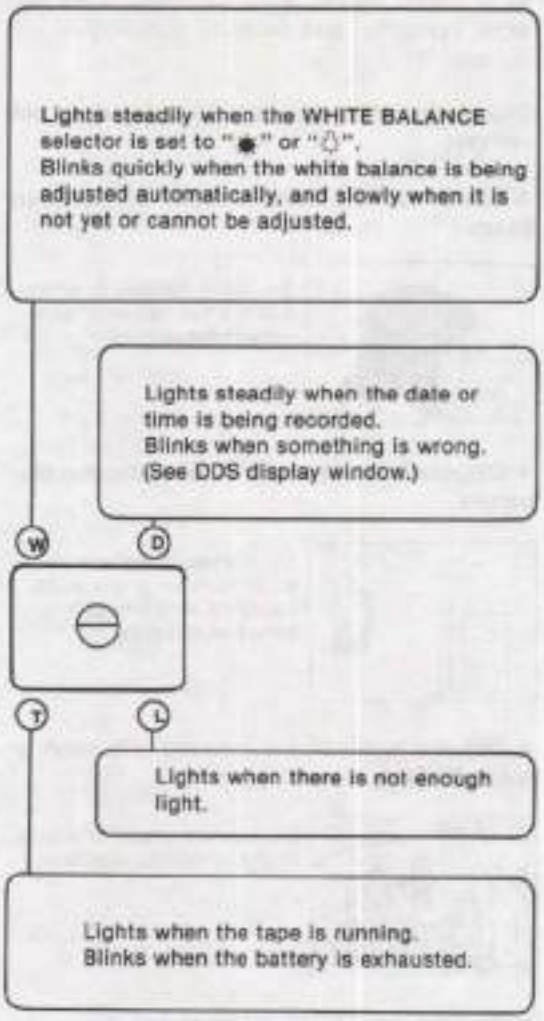
2 Slide the EJECT button to remove the recorded cassette.
If the battery power is exhausted and the cassette compartment lid cannot be opened, replace the battery with a charged one or connect the unit to an ac power adaptor.

Playback of recorded tapes

A Beta format VCR and a TV (PAL colour system) are required.
For details, refer to the instruction manual of the VCR.

The lamps inside the viewfinder

Four lamps at each corner of the viewfinder light up initially when the REC START/STOP button is pressed and recording is started.



1-7. AUTO FOCUSING

This Betamovie focuses by transmitting an infrared beam toward the subject and receiving the reflected beam with an infrared beam detector.

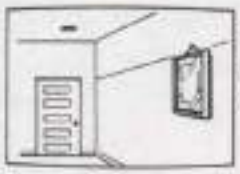
With the marker in the viewfinder centered on the subject, auto focusing can be activated for most subjects. However, for some subjects listed below, auto focusing does not work correctly and manual focusing is required.

Objects for which the auto focusing does not activate

• Black objects which absorb the infrared beam

Ex. black curtain, or when a black subject enters the viewfinder marker.

• Objects in which the infrared reflection disperses



Ex. a smooth surface aimed at from an angle. Auto focusing activates if it is aimed at squarely.

• Objects in which the infrared reflection is not sufficient

Ex. bushes, grass or plants in the telephoto position.

• Objects in which the infrared beam is reflected too much.

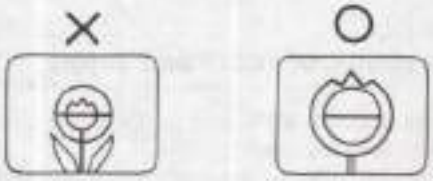
Ex. traffic signs, a white wall, mirror, or subject through plate glass.

• Objects which are not solid

Ex. fireworks, candle flame or smoke.

Notes

- Auto focusing works up to about 13 meters (43 feet). Adjust the focus manually for a subject more than 13 meters away.
- If special effect lenses or filters are used, focus should be set manually.
- If the lens or the infrared beam detector are dirty, auto focusing does not function correctly. Wipe clean with a soft cloth.
- When using the auto focus function, do not turn or stop the focus ring forcibly. Do not look into the infrared beam transmitter for a long time.
- Auto focusing may not be correctly activated if the subject goes inside the marker in the viewfinder when the zoom ring is in the telephoto position. In this case, take focus manually, or approach the subject so that the subject includes the marker in it.



1-8. MANUAL FOCUSING

1 Set the FOCUS switch to MAN.

2 Turn the manual zoom lever to the telephoto position (7Z) to make the subject as large as possible in the viewfinder.

3 Turn the focus ring to achieve sharp focus.

If the subject has a vertical line, adjust focus until the vertical line connects.

Turn the focus ring to "1.3 m".

Turn the focus ring to "∞".

4 Set the desired shot length using the manual zoom lever.

Information

- Focusing with the lens in wide angle can lead to shots being out of focus. This is because the focusing field is wider in wide angle than in telephoto, making it harder to achieve sharp focus.
- When shooting a scene with lots of movement outdoors, the subject can be kept in good focus regardless of movement by setting the zoom lever to 12 and the focus ring to 2 m.

For your reference

- Focus depth of field with the focus ring set at "2 m" and the manual zoom lever at "12":
  Indoors: 1.1 – 13 m
  Outdoors, clear: 50 cm – ∞
- Focus depth of field with the zoom lever set at 12:

Focus ring	Focus depth of field (indoors)
1.3 m (4 ft. 3 in.)	0.84–2.93 m (2 ft. 9 in.–9 ft. 7 in.)
1.5 m (4 ft. 11 in.)	0.94–4.19 m (3 ft. 1 in.–13 ft. 9 in.)
2 m (6 ft. 7 in.)	1.08–13..8 m (3 ft. 7 in.–45 ft. 3 in.)
3 m (9 ft. 10 in.)	1.31–∞ (4 ft. 4 in.–∞)
5 m (16 ft. 5 in.)	1.59–∞ (5 ft. 3 in.–∞)

Quick focus adjustment

For quick, automatic adjustment of focus while recording in the manual mode, simply press the PUSH AUTO button until the subject is correctly focused.

If you press the PUSH AUTO button before starting recording, you can get a well-focused picture from the beginning of the recording.

Date/time inserting function is designed for your convenience during recording. At the first time of shooting install the supplied lithium battery and then a rechargeable battery pack to adjust the date and time.

Lithium battery insertion

Before installing the lithium battery, be sure to take out the battery pack or disconnect any other power sources.

1 Open the battery compartment cover on the bottom of the unit.

2 Install the supplied CR2025 lithium battery with the face marked ⊕ facing out.

3 Close the cover.

Note

If you have supplied a power source before or just after inserting the lithium battery into the unit, it could happen that the "0:00:00" indication does not appear in the display window or that you cannot adjust the date and time. In those cases disconnect the power source and take out the lithium battery. Then wait about a minute and insert the lithium battery and supply the power source again.

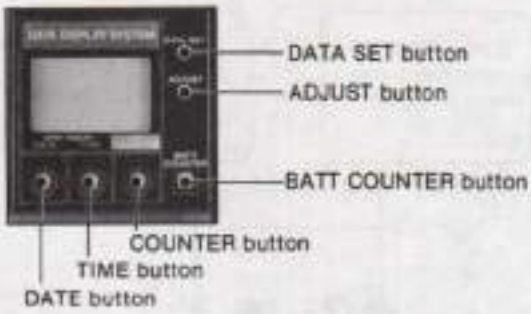
Lithium battery replacement

When both the indications DATE or TIME and ◁ start to blink, the inserted lithium battery is exhausted and needs to be replaced. Take out the exhausted battery by pushing it upward with a ball-point pen or similar object. In normal operation the life of a lithium battery is up to two years.

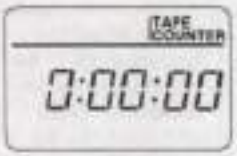
Notes on lithium battery

- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Do not break up the battery nor throw it into a fire, which might cause it to explode. Carefully dispose of the used batteries.

Date/time adjustment

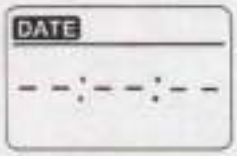


1 After installing the lithium battery, insert the battery pack or connect another power source.
Tape counter will appear in the DDS display window.

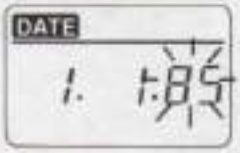


2 Adjust the date. (Ex. February 14, 1986)

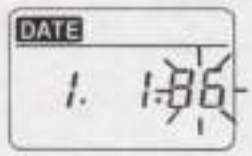
(1) Press DATE button.

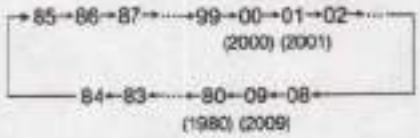


(2) Press DATA SET button for more than a second.



(3) Adjust the year with ADJUST button.
Year indication changes as follows:



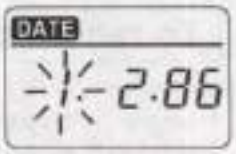


(4) Press DATA SET button.

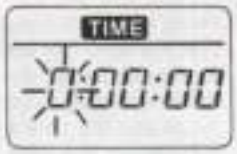
(5) Adjust the month with ADJUST button.
Month indication changes from 1 to 12 in order.

(6) Press DATA SET button.

(7) Adjust the day with ADJUST button.
The incorporated memory differentiates among the months with 28, 29, 30 or 31 days according to the year and month adjusted above.

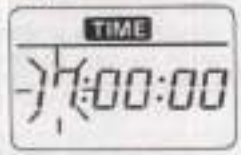


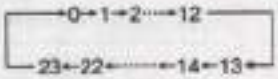
(8) Press DATA SET button.
The time indication appears.



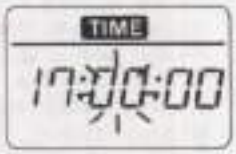
3 Adjust the time. (Ex. 5:30 PM)

(1) Adjust the hour with ADJUST button.
The hour indication changes as follows:

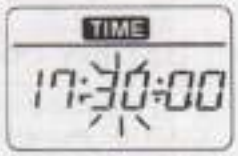




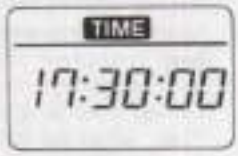
(2) Press DATA SET button.



(3) Adjust the minute with ADJUST button.
The minute indication changes from "00" to "59" in order.



(4) With the time signal, press DATA SET button.
The clock starts from 00 second.



Once adjusted, the clock continues to work, regardless of the Betamovie's power, as long as the lithium battery remains.

To re-adjust an incorrect date or time, press the DATA SET button till the incorrect digit blinks and correct it with the ADJUST button.

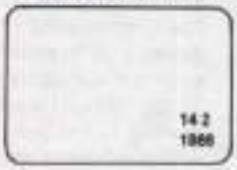
To record date or time

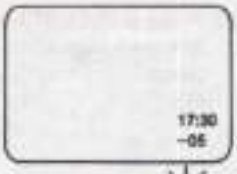
Press the DATE button so that the date will appear in the display window. Start recording in this mode and the date will be recorded at the same time.

Press the TIME button so that the time will appear in the display window. Start recording in this mode and the time will be recorded at the same time.

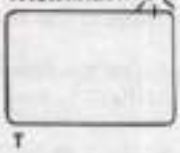
The "D" lamp lights steadily in the viewfinder when the date or time is being recorded.

<Recorded picture>





<Viewfinder> D

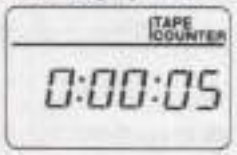


T

To stop date/time recording

If you do not wish to record the date or time, press the COUNTER button so that the tape counter appears in the display window. The tape counter returns to "0:00:00" once the cassette is taken out and inserted again.

<DDS display window>



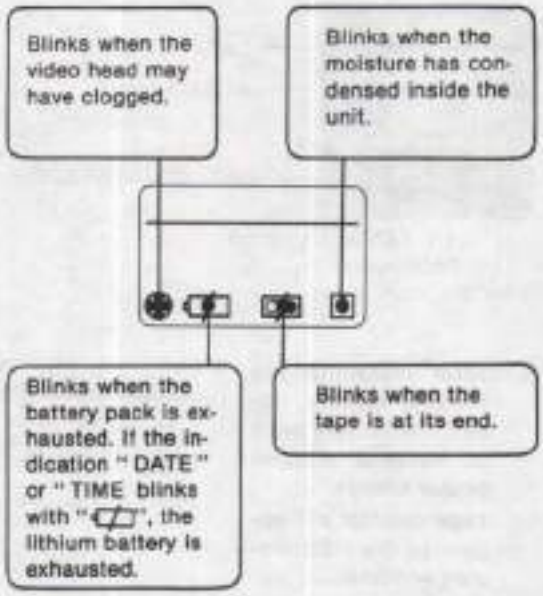
Battery counter

While you keep the BATT COUNTER depressed, the display window shows how long the power has been consumed, or the total recording time. This battery counter returns to "0:00" when the battery pack is taken out and re-inserted, or when other power sources are cut off and re-supplied.

Note

The total recording time depends upon the recharging condition of the battery. When using the battery pack as a power source, read the battery counter only for your reference.

Caution indications



1-10. MAKING CONSECUTIVE RECORDING

Smooth, "gap-free" recordings can be made on the tape, even if the power is shut off, as long as the tape is not removed from the camera before it is fully recorded. To ensure that the tape does not have to be removed before being fully recorded, observe the following:

- Select the recording time of the cassette according to the planned recording time, and devote one tape to a single theme.
- If the tape must be removed before being fully recorded, extend the last scene for a few seconds to allow a margin for overlapping the next scene when recording is resumed.

When the cassette is removed before being fully recorded

When reloaded, the tape will automatically be advanced by about 10 seconds, which can cause gaps to be inserted in the tape. It is possible to eliminate these gaps by using a video deck to rewind the cassette, but please keep in mind that it is unlikely that the gaps can be perfectly bridged. This is why it is recommended that the cassette should not be removed until fully recorded if at all possible.

Notes

- It is possible that a "rainbow effect" will be seen in portions where the previously recorded and newly recorded portions overlap, when the tape is rewound on a video deck.
- Be careful not to touch the tape while handling the cassette. This can affect the tape's characteristics to lower recording quality.

1-11. TWO TIPS FOR OPTIMIZING COLOUR BALANCE

POINT 1

Brightness

Is the subject sufficiently lighted? With the Betamovie, most recording can be done without special lighting, indoors or outdoors. But for best results and for proper function of the autofocus system, there are times when additional lighting is necessary (especially in low light conditions indoors). When the light level is low, the letter "L" will appear in the viewfinder; increase the light level as necessary.

Light direction

Generally, shooting 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 shooting.

It is also possible to shoot 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.

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.

How to adjust white balance
With this Betamovie, white balance can be automatically set, or manually set to two predetermined values.

Automatic white balance adjustment
You can have a more accurate white balance using the automatic adjustment.
With the white lens cap on, aim the Betamovie at a light source when recording indoors, or at a subject more than 2 meters (6.6 ft.) away when recording outdoors. Then slide the WHITE BALANCE selector down from the "⌐↓" position. The selector will return to the "⌐↓" position and the white balance is automatically adjusted. While the white balance is being adjusted, the "W" lamp quickly blinks in the viewfinder and will go off when the adjustment has been completed.

After white balance has been adjusted, this setting will be maintained for 1.5 hours after Betamovie's power has been turned off. As long as light conditions do not change, this setting will be proper for shooting. However, if light conditions change, white balance should be reset for best results.

Notes

- Adjustment cannot be made when the "L" lamp in the viewfinder lights up or when the "W" lamp blinks slowly because of insufficient light. Put the white lens cap on and raise the light level so that the "L" lamp will not light up.
- For night lights or fireworks, set the WHITE BALANCE selector to "✸", and for a candle flame, set it to "△".

Adjustment using preset white balance settings

In most lighting conditions white balance can be adjusted to a satisfactory level just by setting the WHITE BALANCE selector to "✸" or "△".

If there is no time to set white balance before shooting or when you want to shoot the scene when colour temperature is changing gradually such as in the twilight, setting the white balance switch to one of the two preset positions will provide satisfactory results.

While recording with the WHITE BALANCE selector set to "✸" or "△", the "W" lamp in the viewfinder will light steadily.

<When the subject is outdoors>

<When the subject is indoors>

If the camera is indoors but the subject being recorded is in a window or outdoors, set the WHITE BALANCE selector to the ✸ position.

Moisture Condensation

If the Betamovie is brought directly from a cold to a warm location, moisture may condense on the drum assembly inside the unit. In this condition, the tape may have a tendency to adhere to the head drum.

Moisture in the unit
To prevent possible damage under these circumstances, the Betamovie is furnished with a moisture sensor. If moisture is present, the sensor will activate to prevent operation and the "[drop]" indication will blink in the DDS display window. No function button except the EJECT button will work.

If the [drop] indication lights, moisture has condensed inside the unit.

Eject the cassette and let the Betamovie sit until the moisture evaporates.

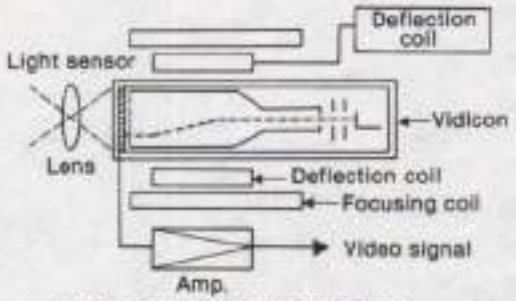
The [drop] indication will continue to blink until the moisture has evaporated. You can use the Betamovie again when the [drop] indication goes off.

Moisture on the lens
If the image you see in the viewfinder is blurred because of moisture, normal operation will not be possible though the [drop] indication des not light. Turn off the Betamovie and wait until the moisture evaporates.

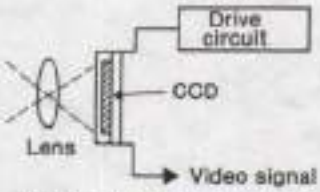
Operating in low temperature conditions
Vapor is apt to condense in low temperatures (around 0°C or 32°F), and may cause a condition of moisture condensation but not enough to cause the [drop] indication to light.
The picture on a tape recorded under these conditions may be distorted.
If the Betamovie is used in a cold location, such as a ski area, use of the optional Betamovie Jacket is recommended.

1-13. CCD BETAMOVIE FEATURES

CCD Betamovie differs from conventional pick-up tube cameras not just in the adoption of semiconductors. Because deflection and focusing coils are not necessary, and because the output signal from the CCD is much stronger, shooting is possible even in strong magnetic fields, and camera construction is lighter and less complicated.



<Pick-up tube camera structure>



<CCD Betamovie structure>

CCD Betamovie has the following features not found in conventional cameras.

1 **No image lag or burn-in**
No problem occurs even if the operator makes the mistake of shooting the sun with this camera. Also, compared with current pick-up tube cameras, lag is greatly lowered.

2 **Superior colour reproduction**
The imaging elements practically eliminates colour impurity, resulting in pure, natural rendition of colours.

3 **High-definition picture**
290,000 elements have reduced the pseudo signal, which is apt to appear with the solid state image devices, and have consequently realized a fine picture.

4 **Quick start-up**
Shooting can begin within a few seconds of turning on the power. No more missed shots waiting for the camera to warm up.

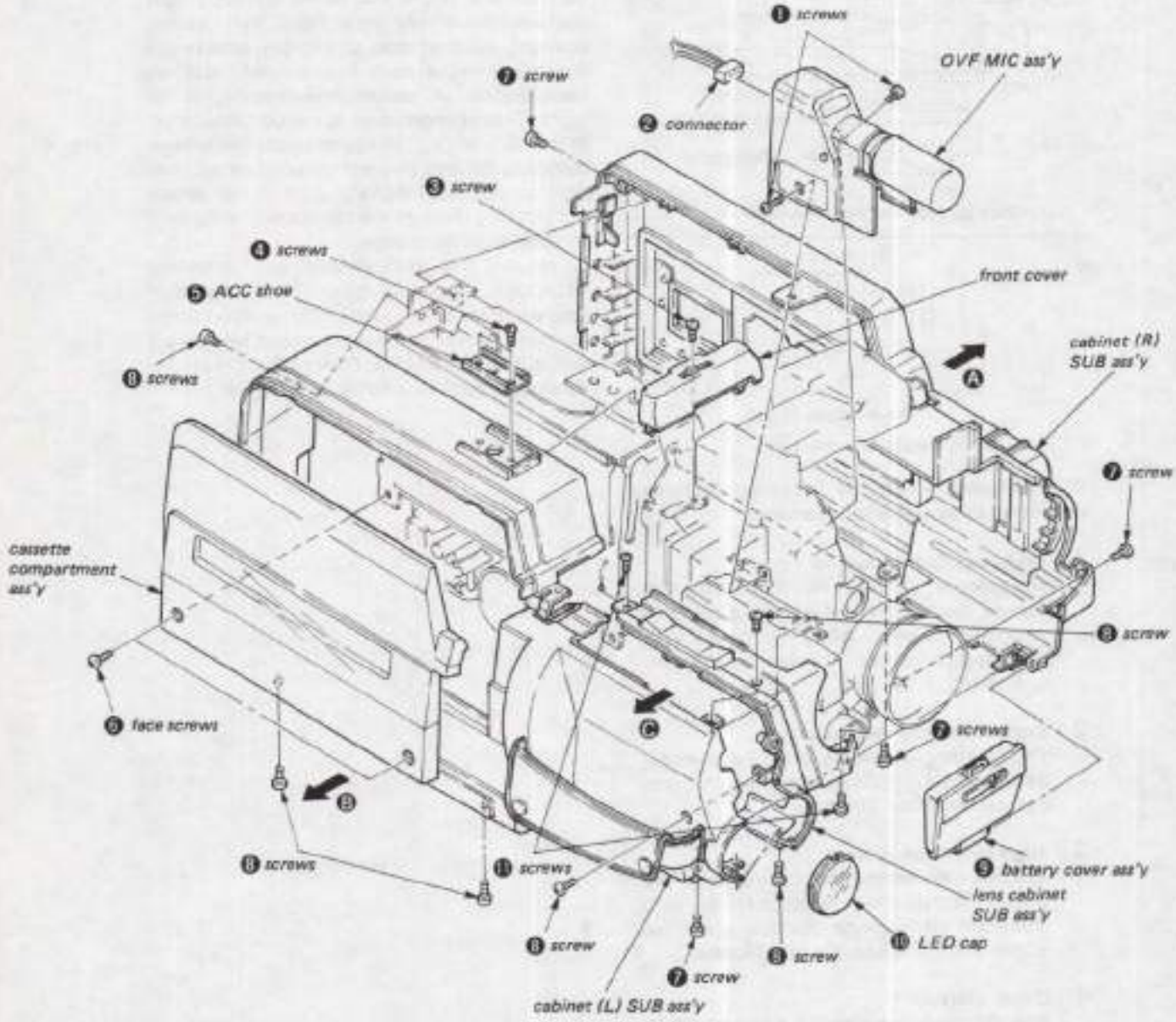
5 **Excellent portability**
The small size, lightweight, and easy operation of the Betamovie not only makes extended taping more convenient, but more pleasurable, as well. The Betamovie was designed to make video taping easy to everyone.

The "smear" phenomenon
Generally, imaging devices may produce a belt-like line above and below a strong light sources, especially reflections from strong sunlight, such as that at mid-day, and bright lights against a dark background, such as candlelights or automobile headlights at night. This phenomenon is called "smear".
In the case of CCD image devices, this phenomenon is caused by electrons converted from light to electrical signals deep in the sensor not passing through the sensor but being sent directly into the charge.
To prevent this phenomenon, such shooting situations should, of course, be avoided. If you want to shoot under these conditions, however, smear can be prevented by using a soft filter or rainbow filter, which will dissipate the light to a sufficient degree.

SECTION 2
DISASSEMBLY

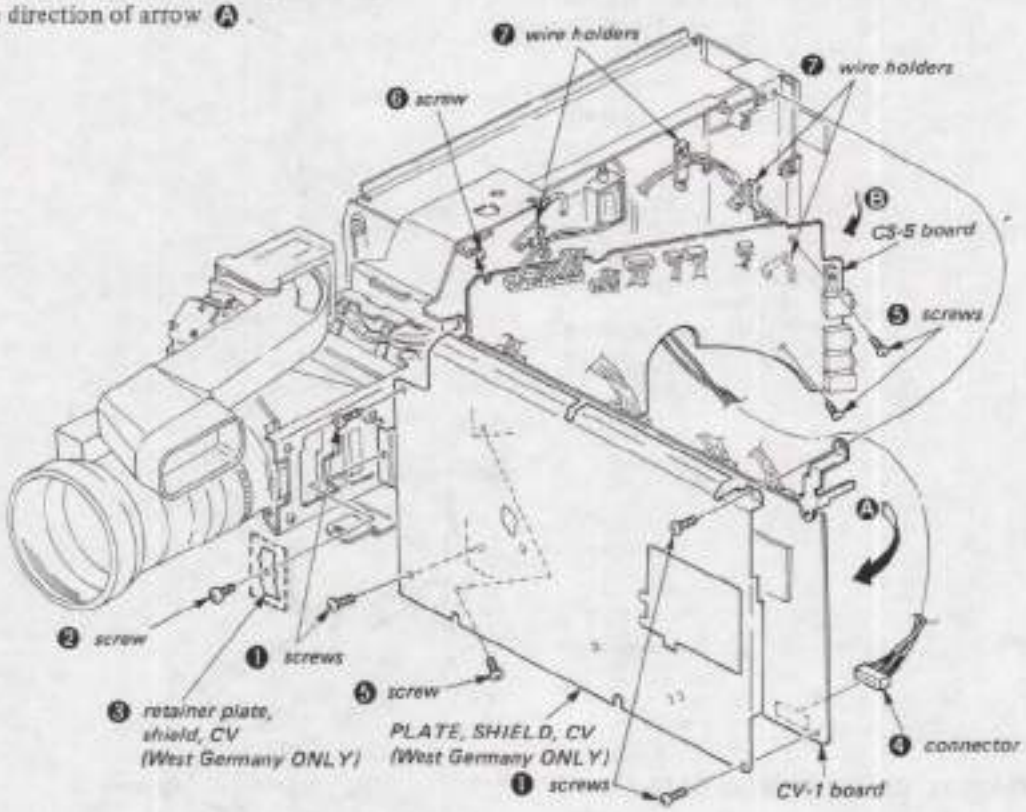
2-1. REMOVAL OF CABINET

1) Remove the two screws (B2.6 x 5) ❶ .
2) Remove the OVF MIC assembly and the 3P connector ❷ .
3) Remove the screw (B2.6 x 5)) ❸ and the front cover.
4) Remove the two screws (K2.6 x 8) ❹ and remove the ACC shoe ❺ .
5) Remove the two face screws ❻ and remove the cassette compartment assembly.
6) Remove the five screws (B2.6 x 5) ❼ and remove the cabinet subassembly (R) in the direction of arrow Ⓐ .
7) Remove the six screws (B2.6 x 5) ❽ and remove the cabinet subassembly (L) in the direction of arrow Ⓑ .
8) Remove the battery cover subassembly ❾ and the cap ❿ .
9) Remove the two screws (B2.6 x 5) ⓫ and remove the lens cap subassembly in the direction of arrow Ⓒ .



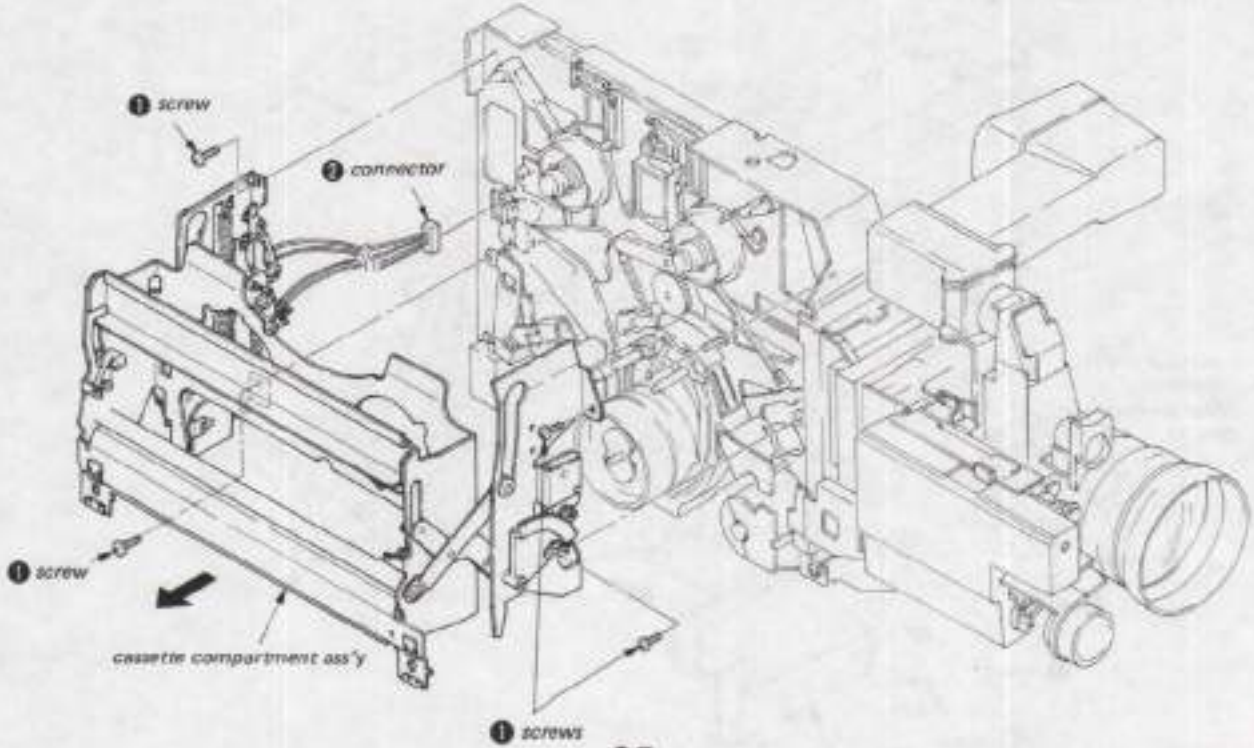
2-2. METHOD OF OPENING CV-1, CS-5 BOARDS

1) Remove the four screws (BVTT2.6 x5) ❶ .
2) Remove the screw (BVTT2.6 x 6) ❷ , and retainer plate, shield, CV ❸ (West Germany ONLY)
3) Remove the connector (CN301) ❹ and open CV-1 board in the direction of arrow Ⓐ .
4) Remove the three screws (BVTT2.6 x 6) ❺ and loosen the screw (BVTT2.6 x 6) ❻ .
5) Remove the four wire holders ❼ and open CS-5 board in the direction of arrow Ⓑ .



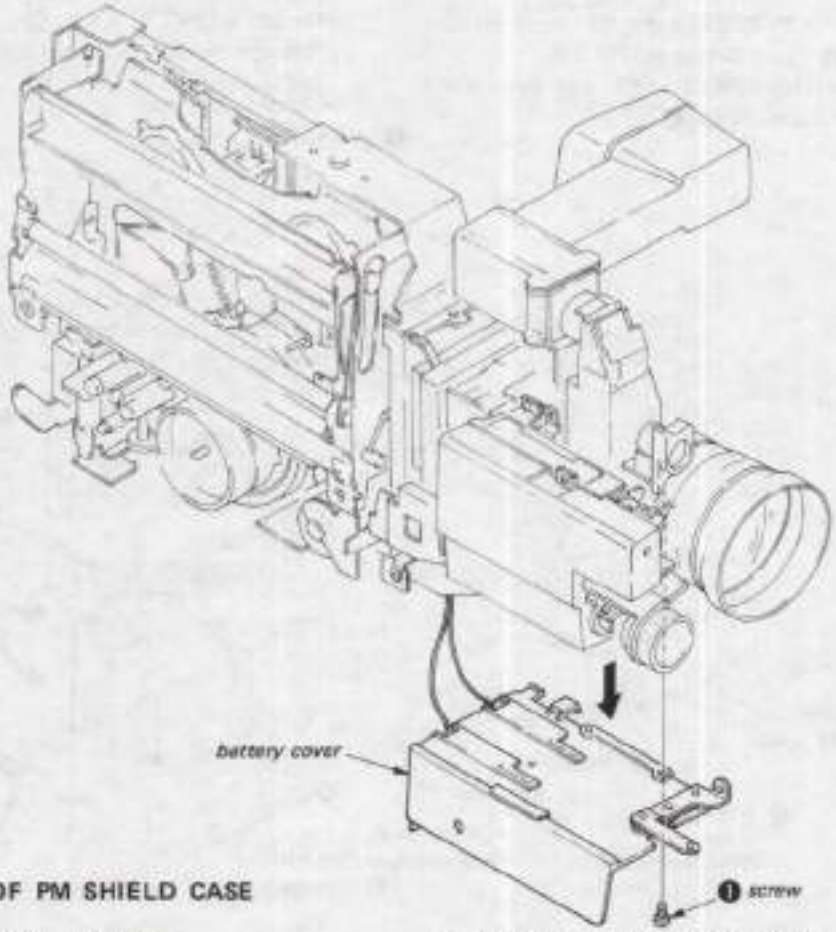
2-3. REMOVAL OF CASSETTE COMPARTMENT ASS'Y

1) Remove the four screws (BVTT2.6 x 6) ❶ .
2) Remove the cassette compartment assembly in the direction of the arrow.
3) Remove the connector (CN004) ❷ on the CS-5 board.



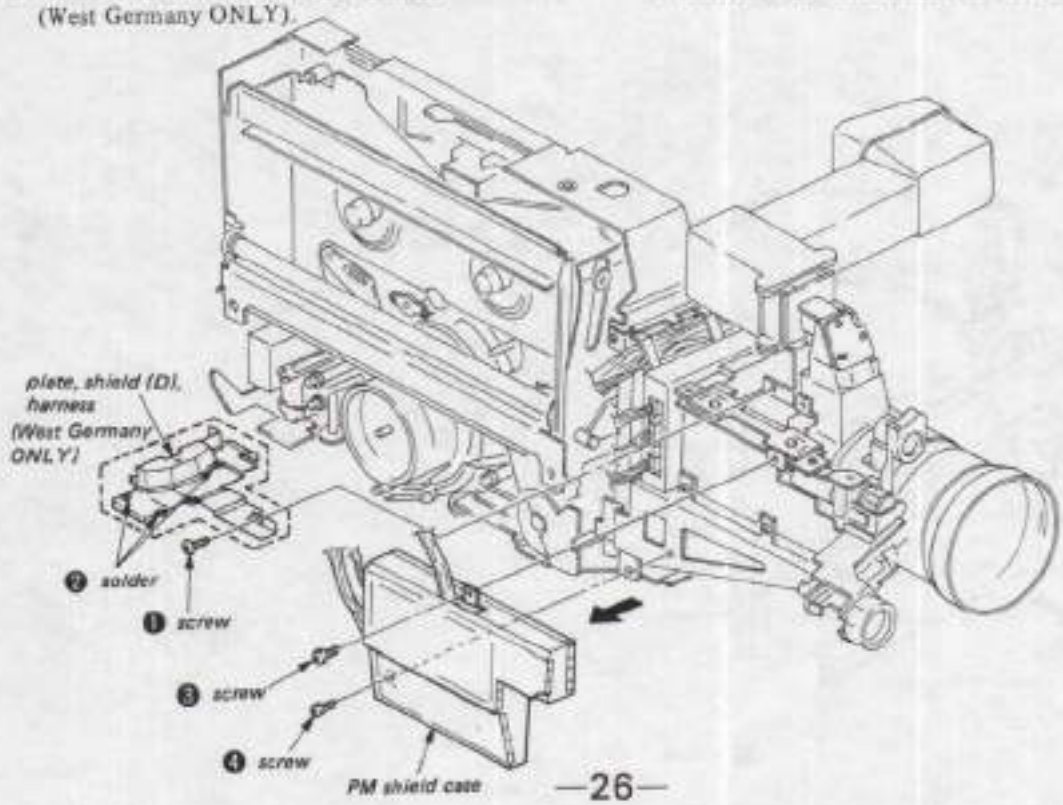
2-4. REMOVAL OF BATTERY COVER

1) Remove the screw (BVTT2.6 x 6) ❶ .
2) Remove the battery cover in the direction of arrow.



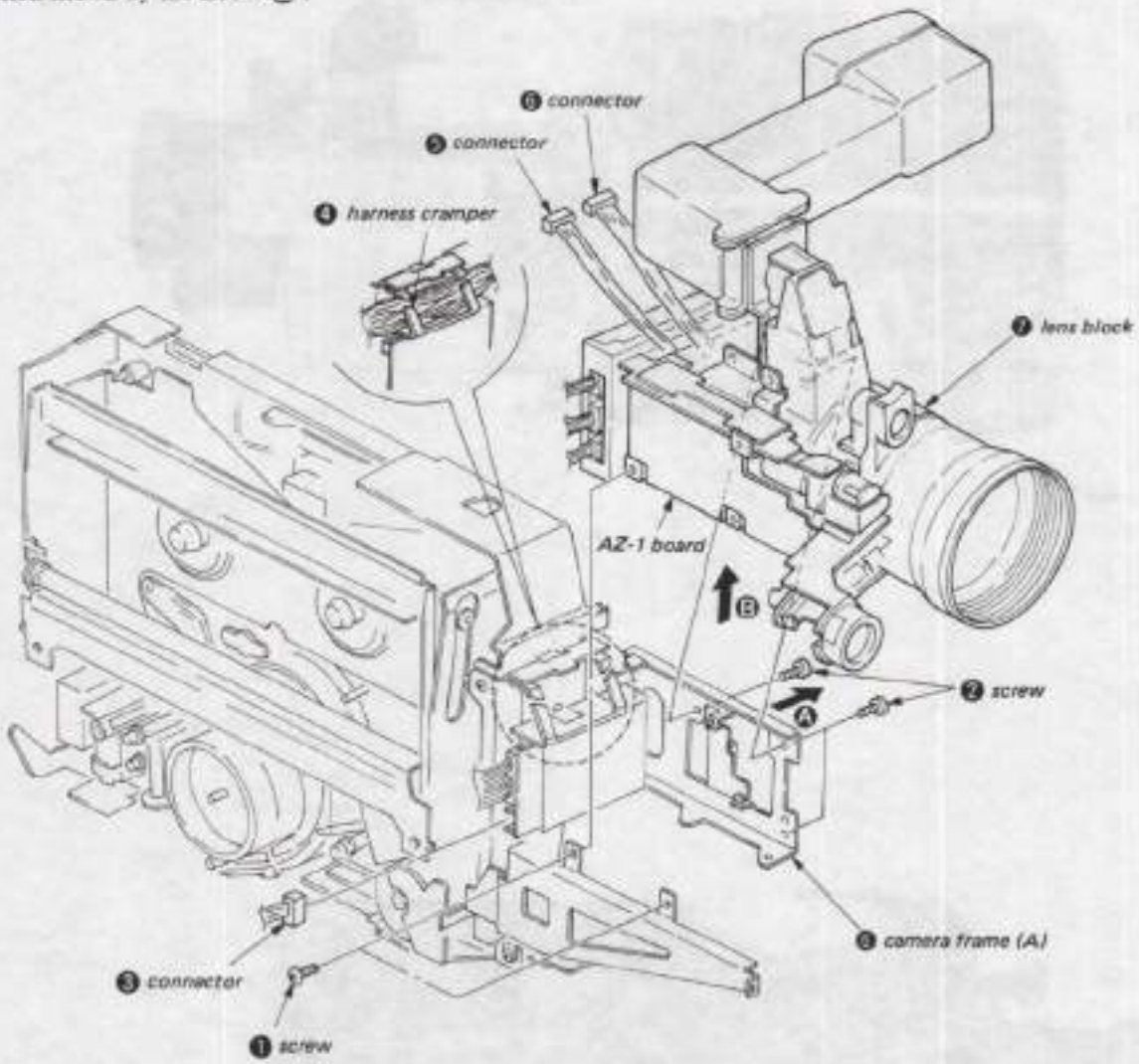
2-5. REMOVAL OF PM SHIELD CASE

1) Remove the screw (B2.6 x 5)❶.
2) Unsolder ❷ the four portions.
3) Remove the plate, shield (D), haness. (West Germany ONLY).
4) Remove the screw (B2.6 x 3) ❸ , and the screw (B2 x4) ❹ .
5) Remove the PM shield case in the direction of arrow.

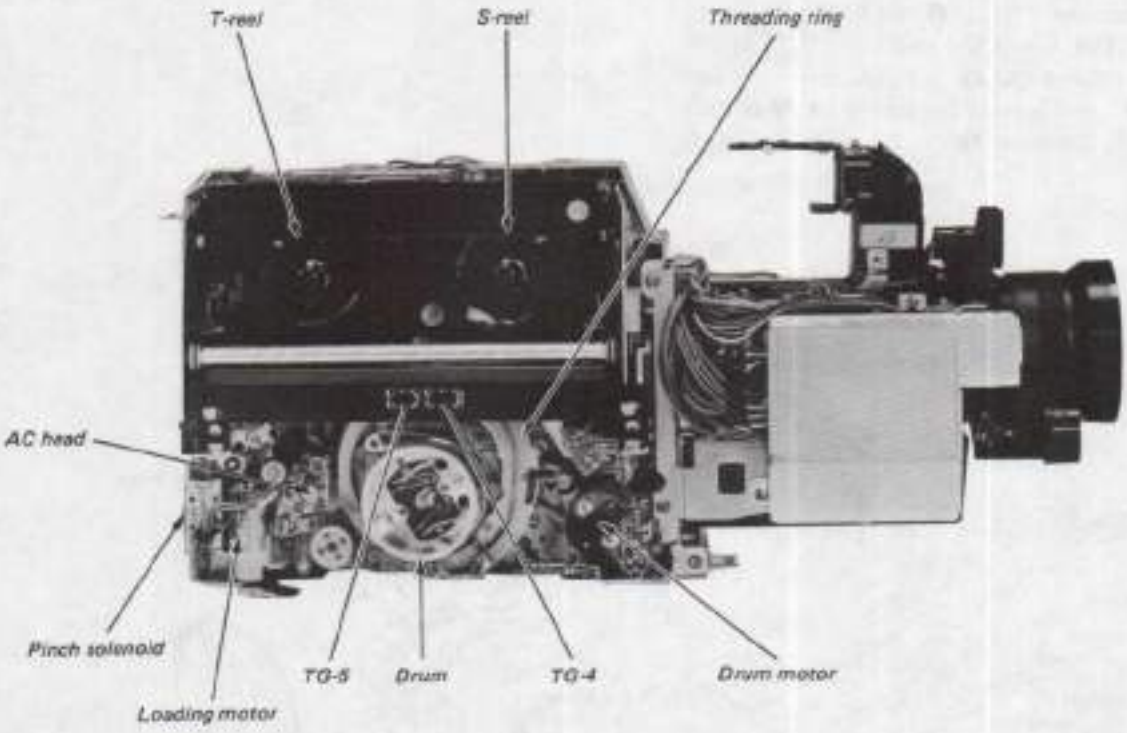


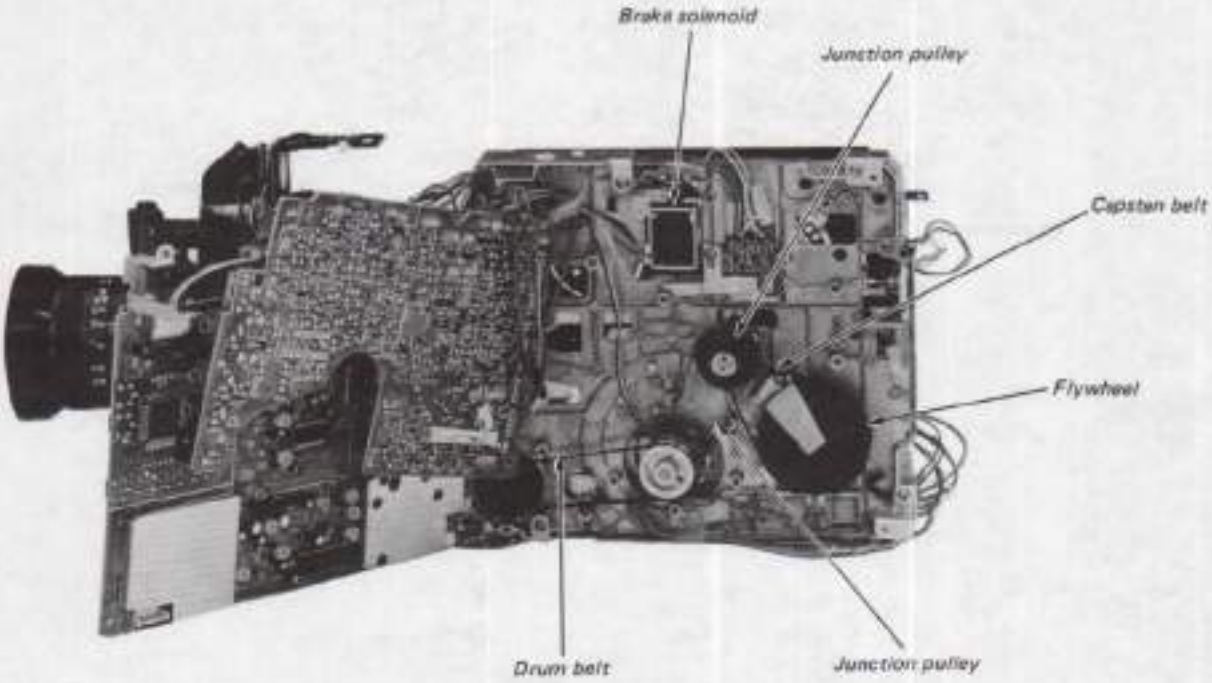
2-6. REMOVAL OF LENS BLOCK

1) Remove two screws (BVTT2.6 x 5) ❶ .
2) Remove three screws (BVTT2.6 x 8) ❷ .
3) Pull out the connector ❸ and remove the harness from the harness cramper.
4) Pull out the connector CN012 ❺ on CS-5 board and the connector CN804 6 on CV-1 board.
5) Open the camera frame (A) ❽ in the direction shown by the arrow Ⓐ , and remove the lens block ❼ in the direction shown by the arrow Ⓑ .



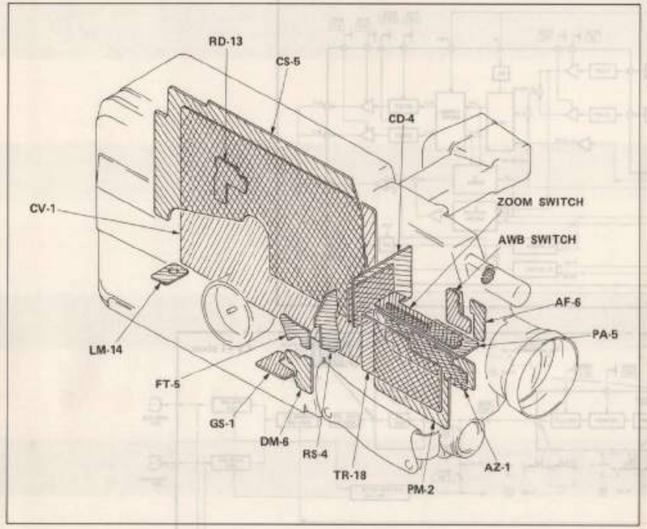
2-7. INTERNAL VIEWS



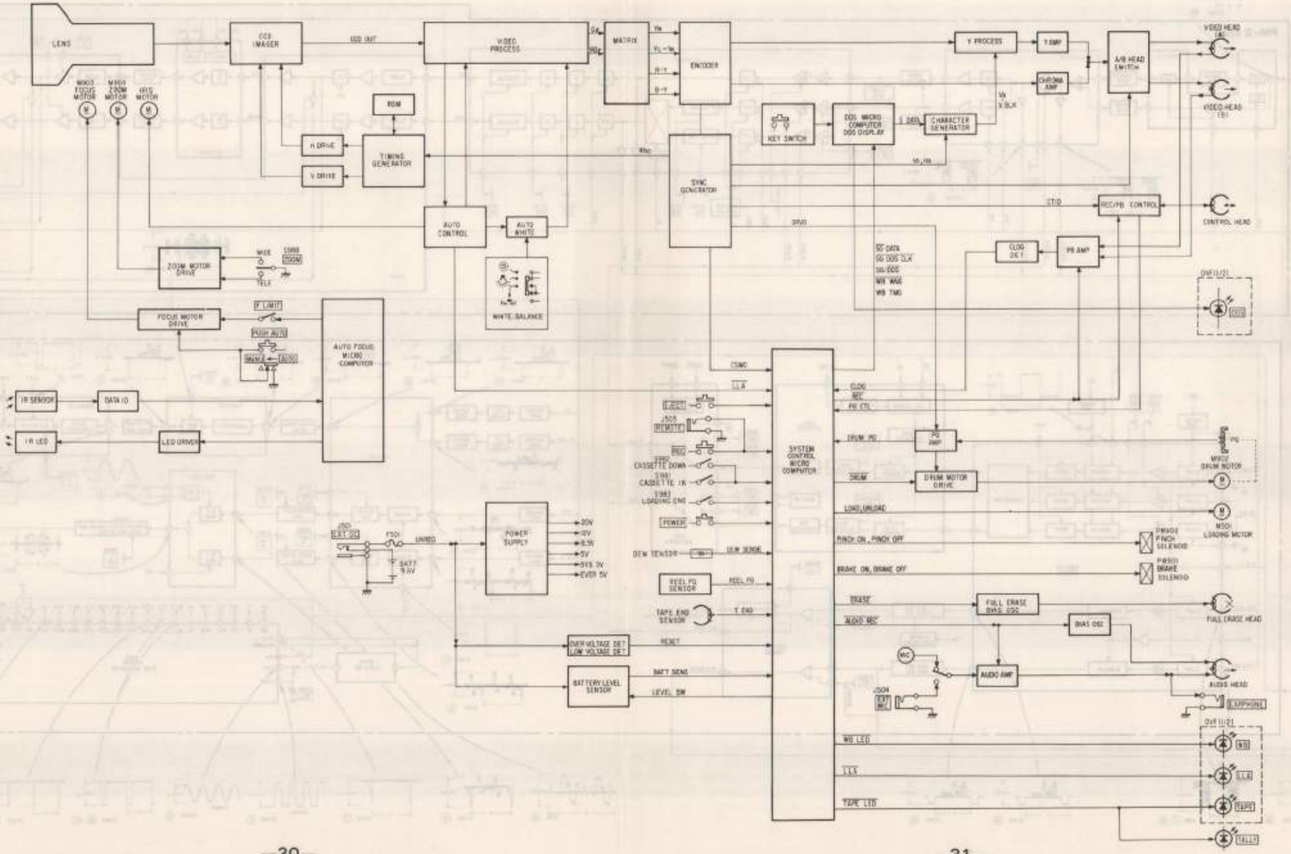


SECTION 3
DIAGRAMS

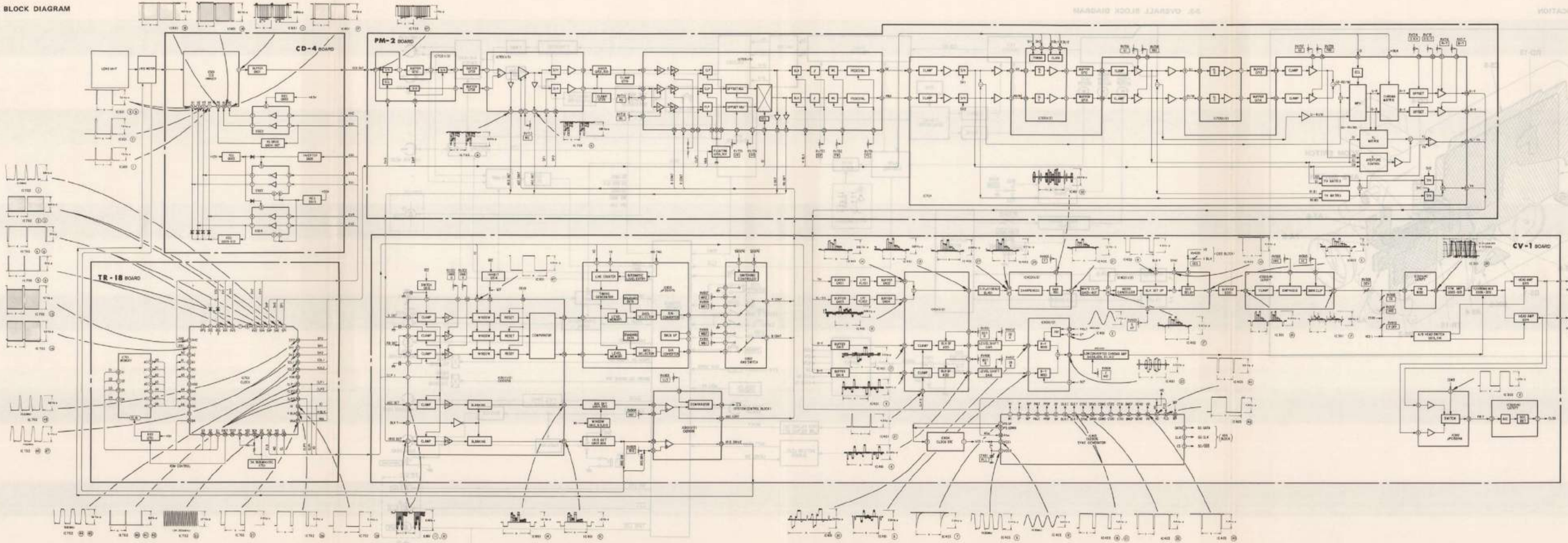
3-1. CIRCUIT BOARDS LOCATION



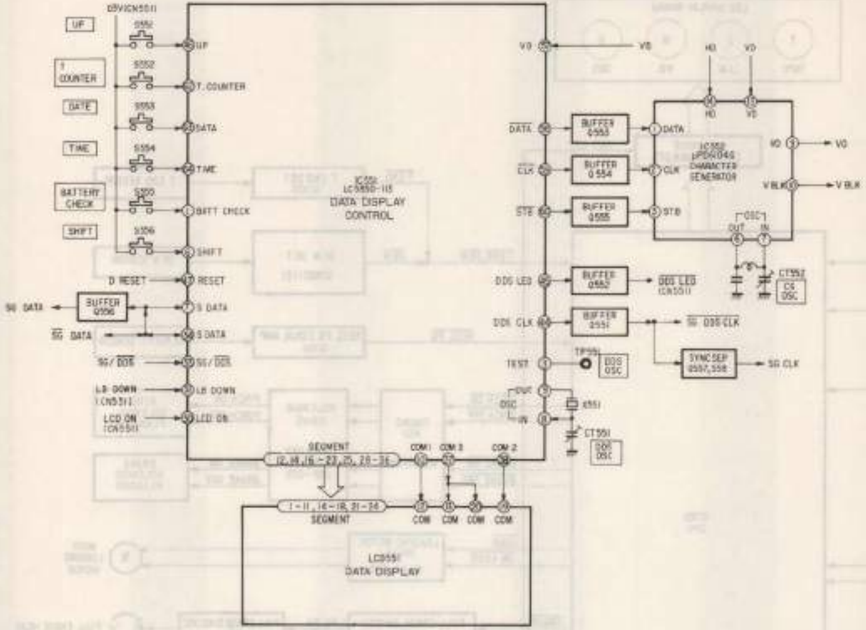
3-2. OVERALL BLOCK DIAGRAM



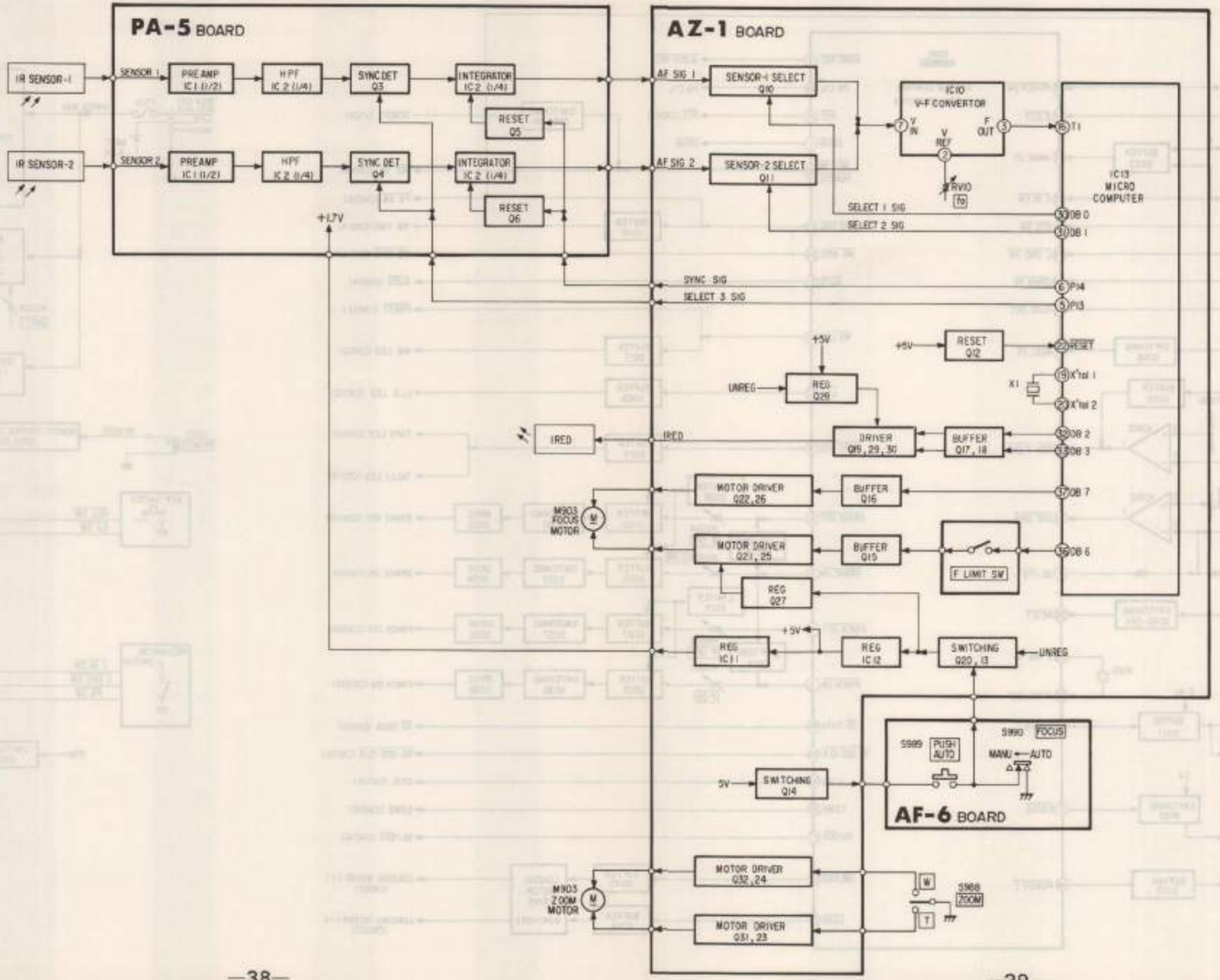
3-3. CAMERA, VIDEO BLOCK DIAGRAM



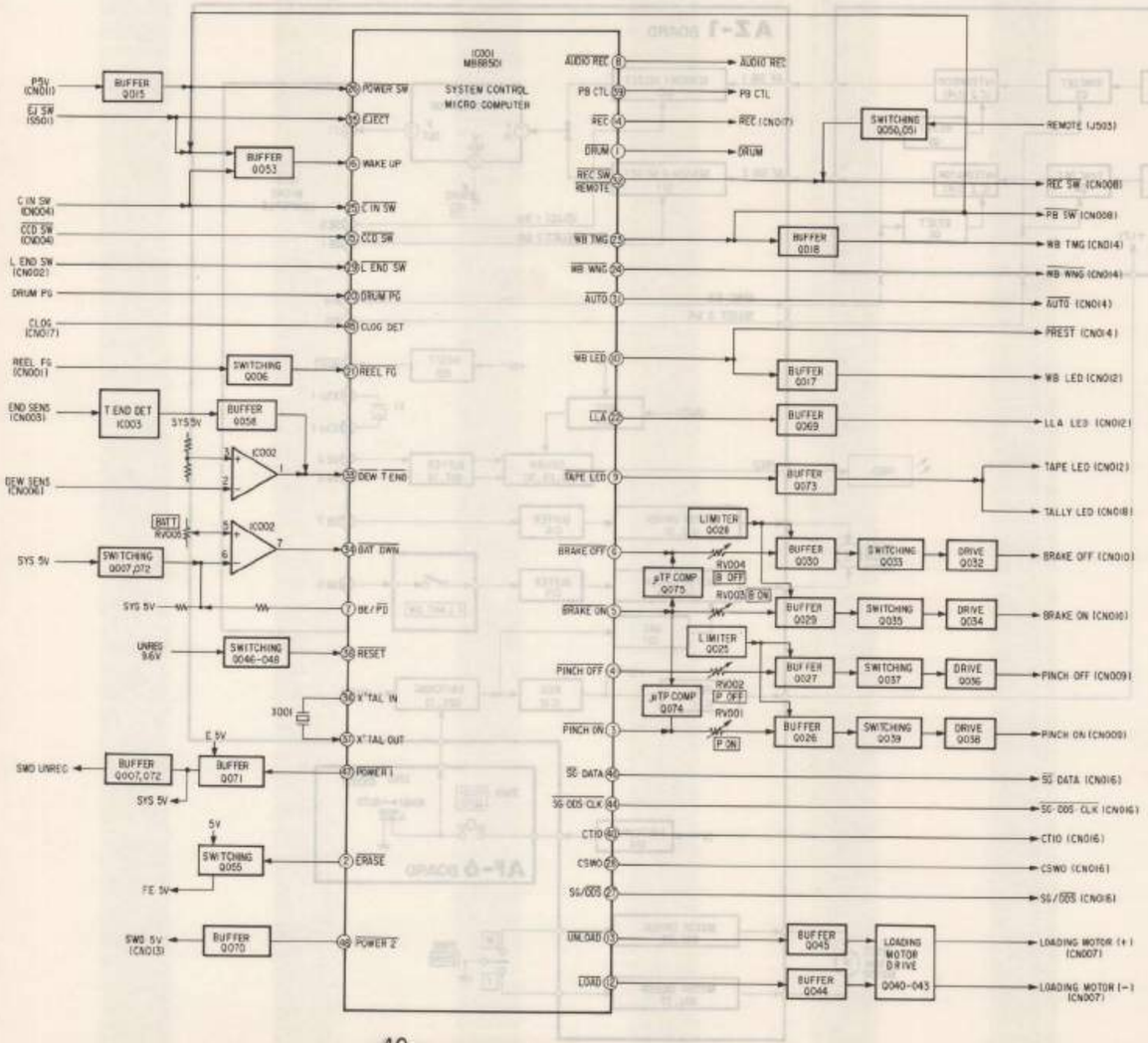
3-4. DDS BLOCK DIAGRAM



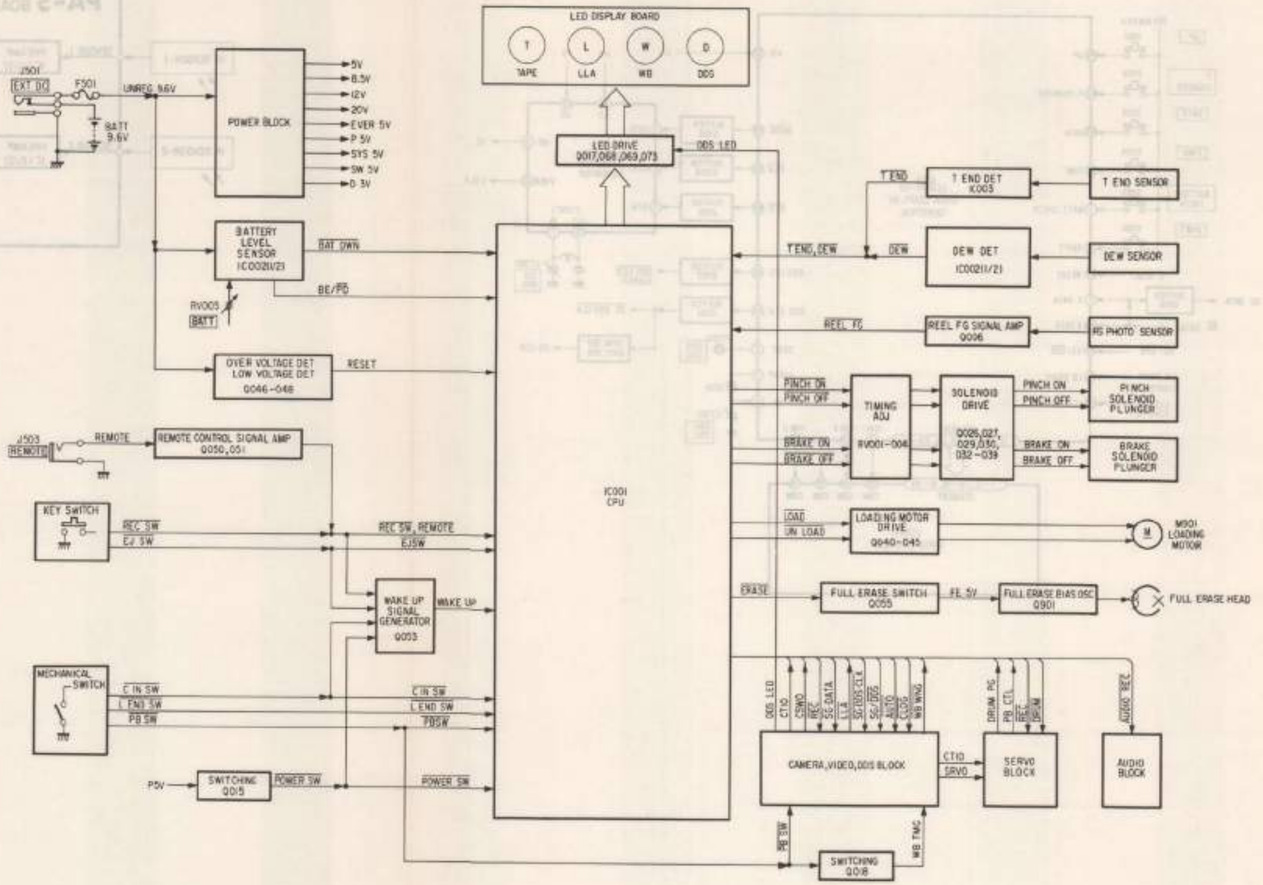
3-5. LENS BLOCK DIAGRAM



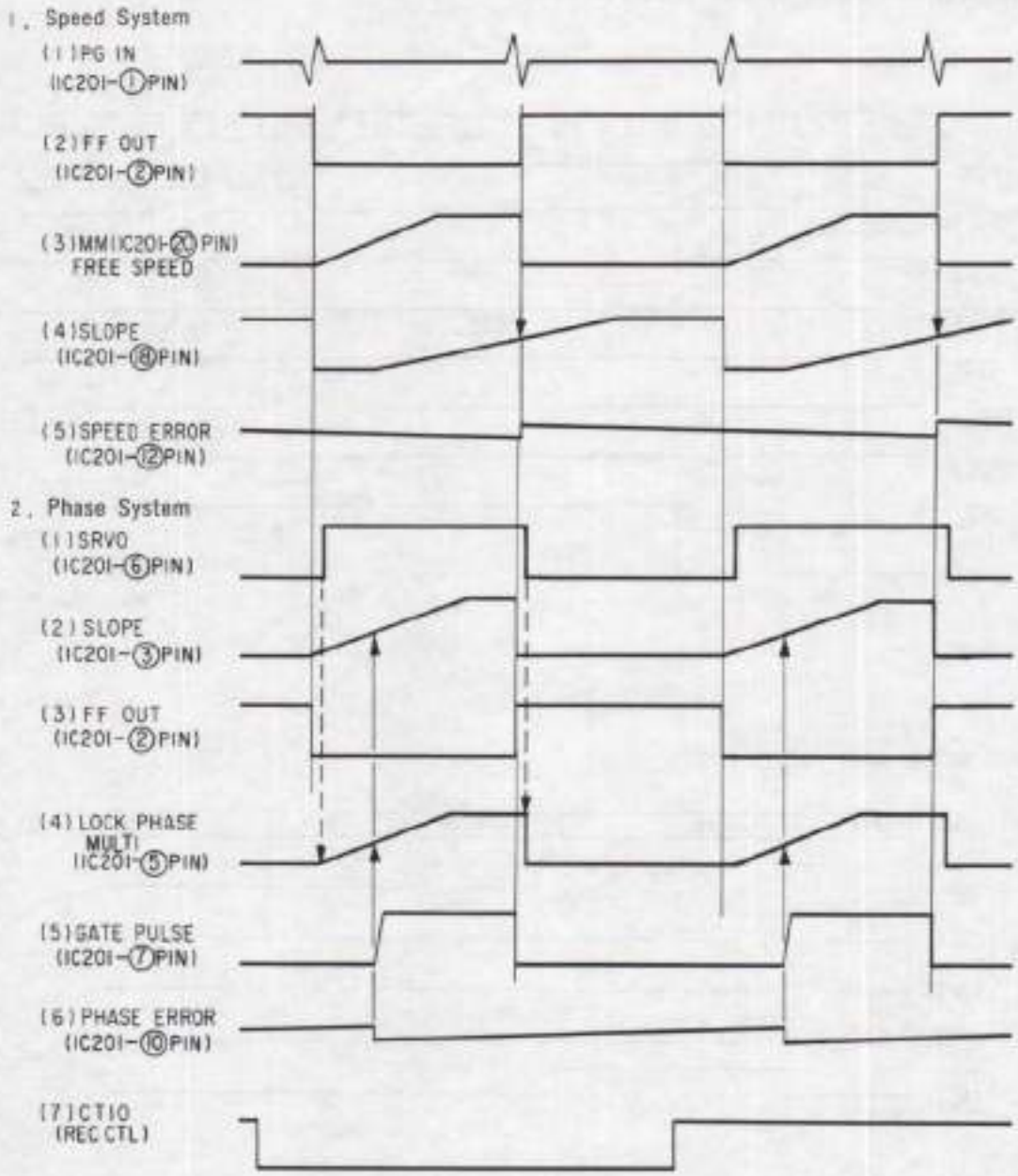
3-6. SYSTEM CONTROL BLOCK DIAGRAM (1)



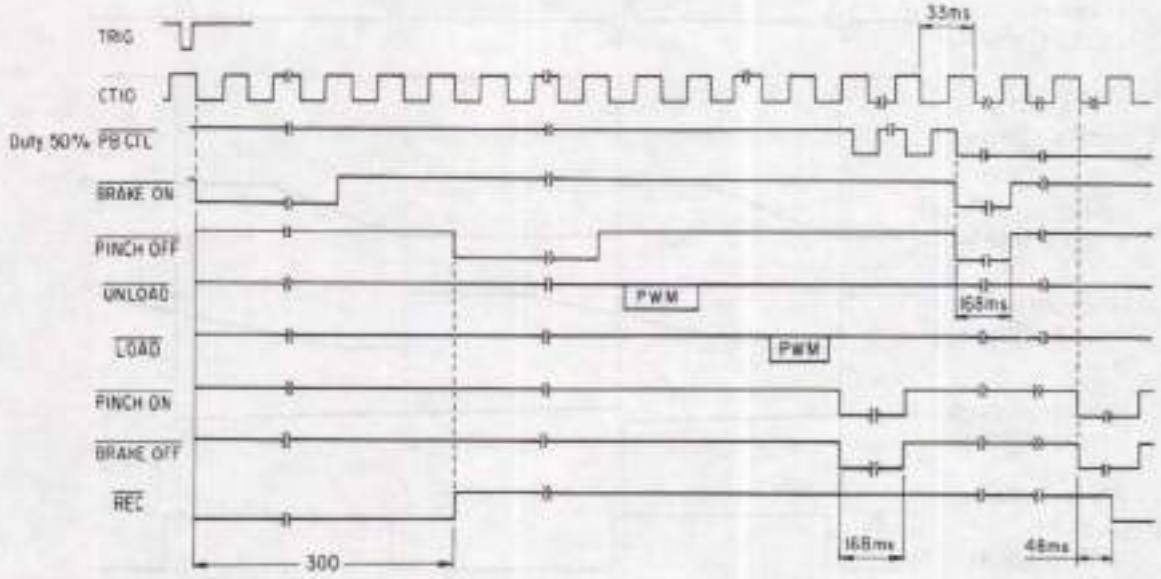
3-7. SYSTEM CONTROL BLOCK DIAGRAM (2)



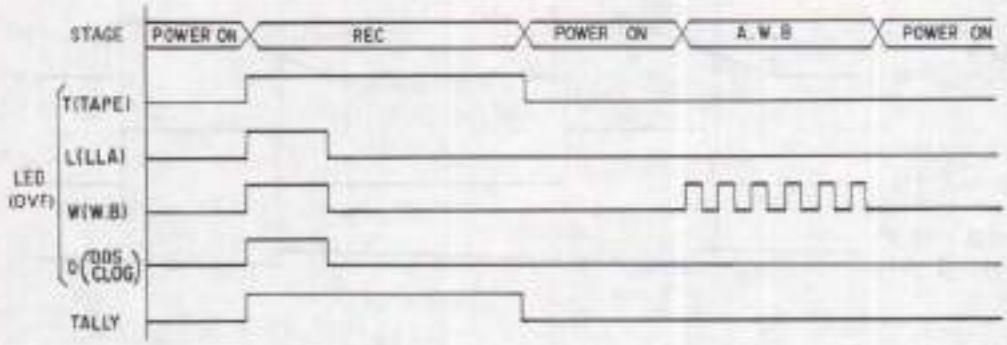
3-11. SERVO TIMING CHART



3-12. LED INDICATION TIMING CHART (DDS →OFF, WB →OK)



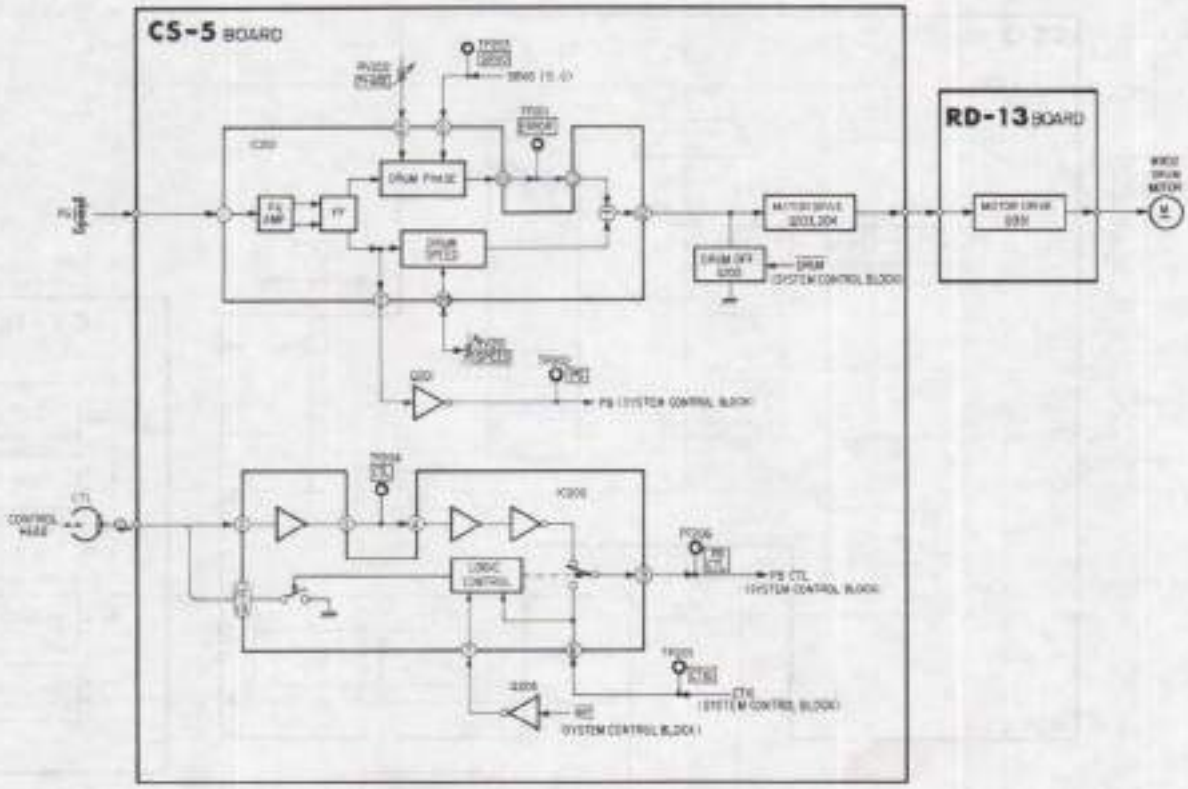
3-13. WARNING MODE AND INDICATION



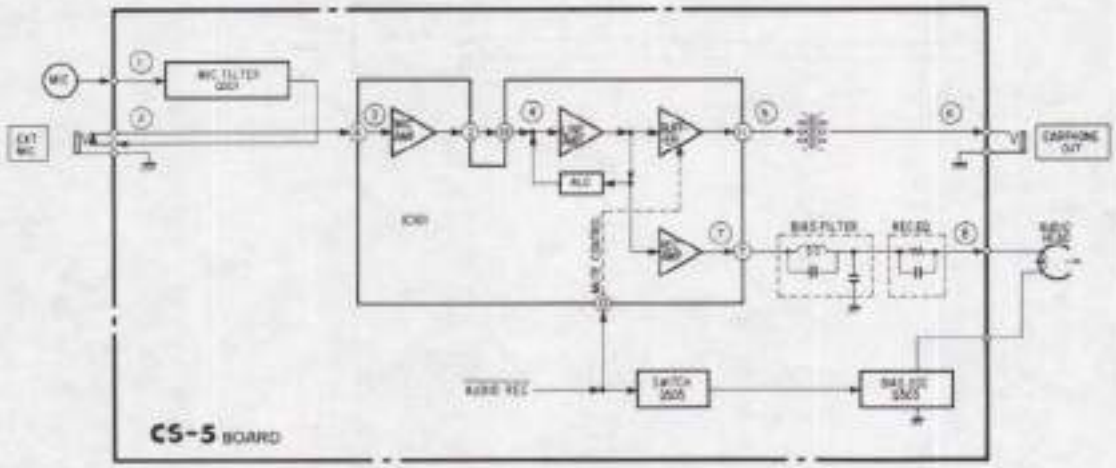
○ TURN-ON ◑ BLINK

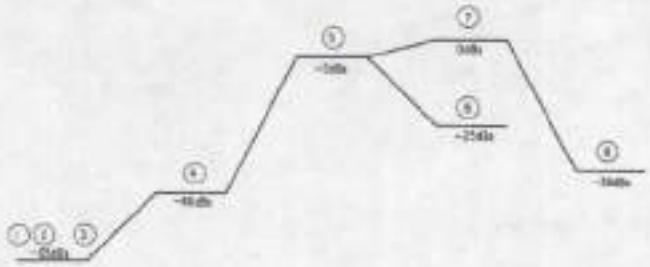
INDICATION / WARNING	LED (OVF) T TAPE	L LOW LIGHT	W W.B	D DDS	TALLY LED	DATA DISPLAY SYSTEM ⊗ CLOG	BATT	TAPE END	DEW
DEW									◑ 1Hz
TAPE END								◑ 1Hz	
BATTERY ALARM	◑ 1Hz				◑ 1Hz		◑ 1Hz		
BATTERY DOWN							◑ 4Hz		
LOW LIGHT		○							
WB PRESET			○						
AUTO WB OPERATION			◑ 8Hz						
AUTO WB NG			◑ 1Hz						
CLOG				◑ 1Hz		◑ 1Hz			
DDS ON				○					

3-8. SERVO BLOCK DIAGRAM



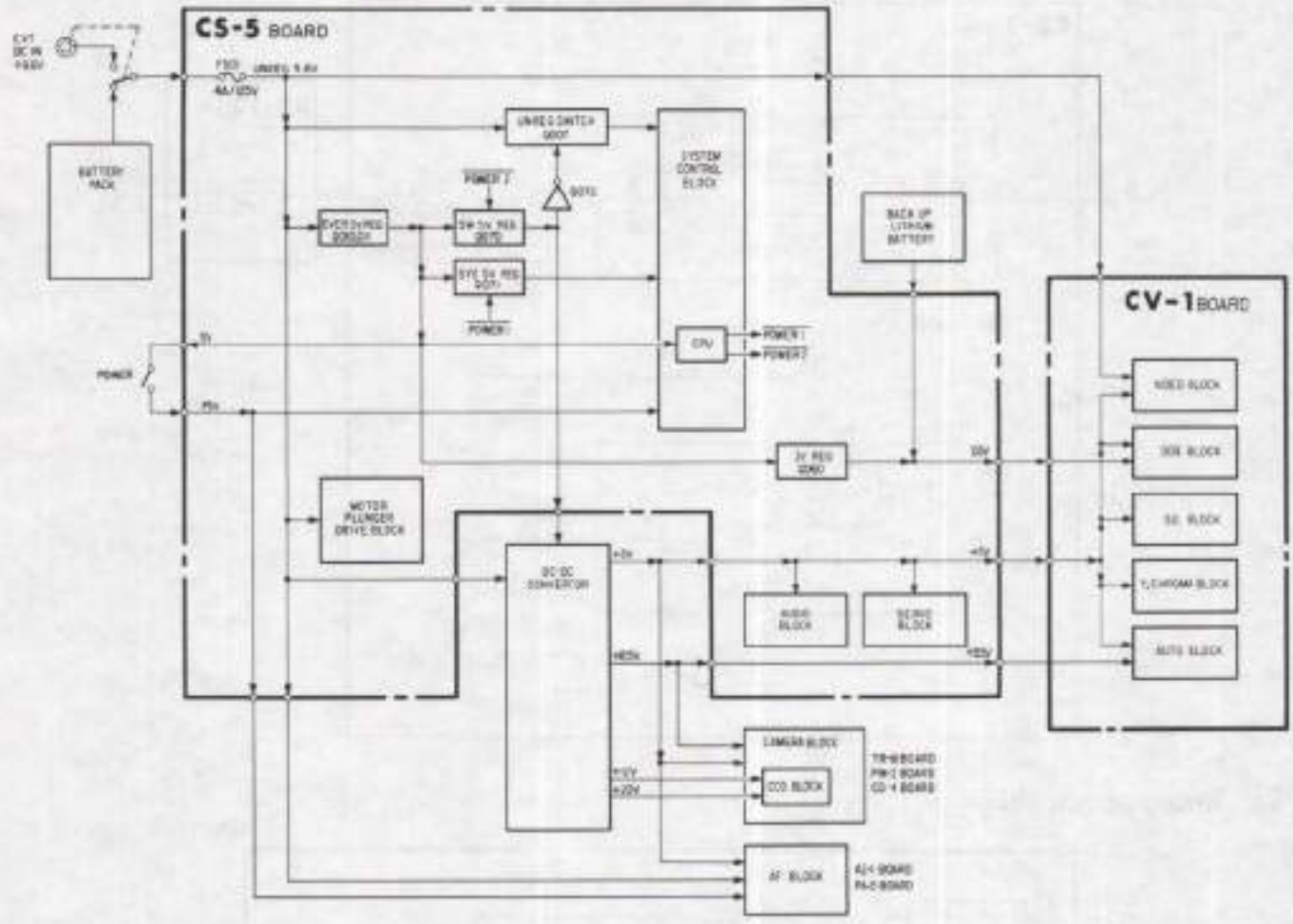
3-9. AUDIO BLOCK DIAGRAM



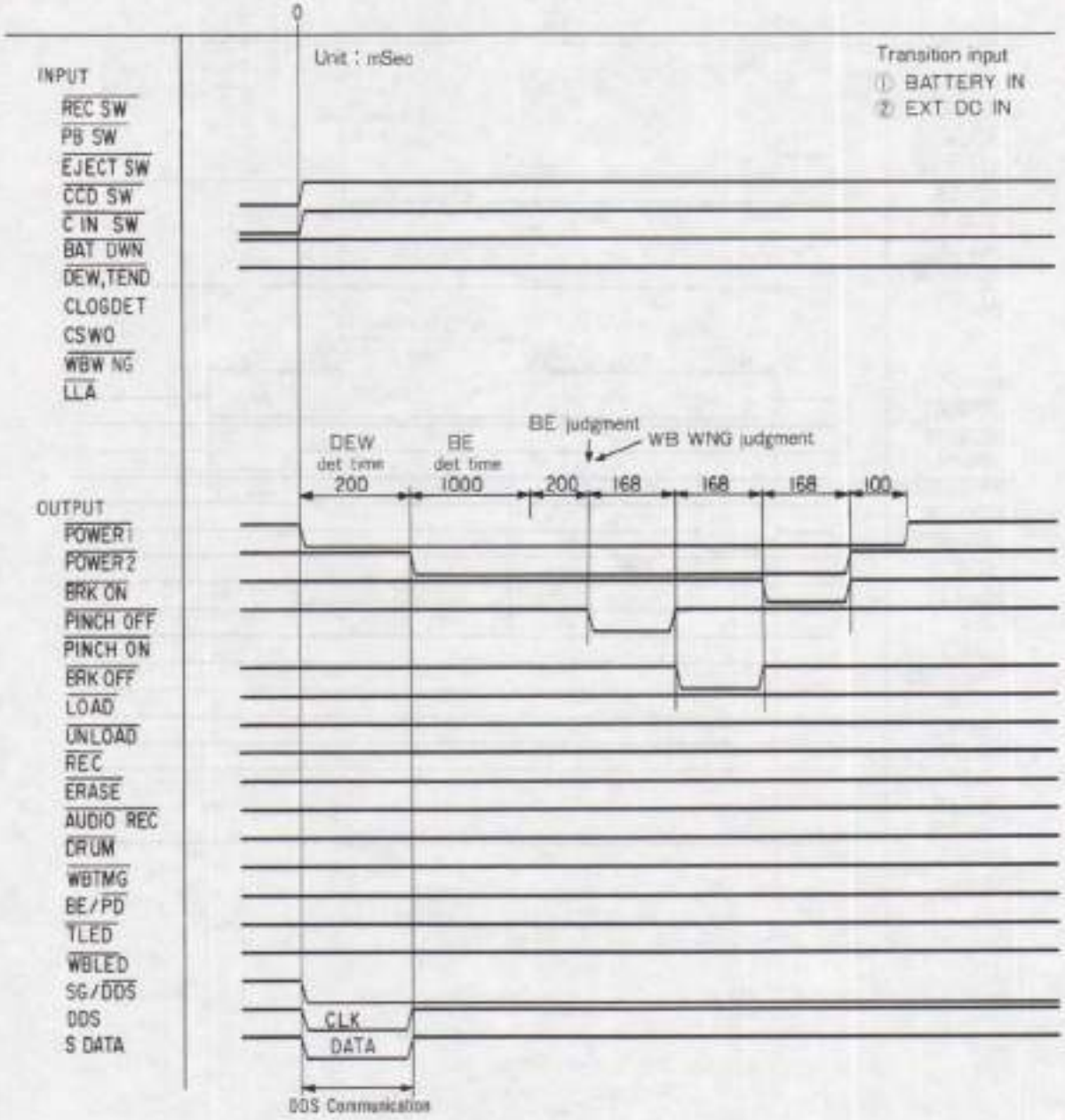


AUDIO LEVEL DIAGRAM

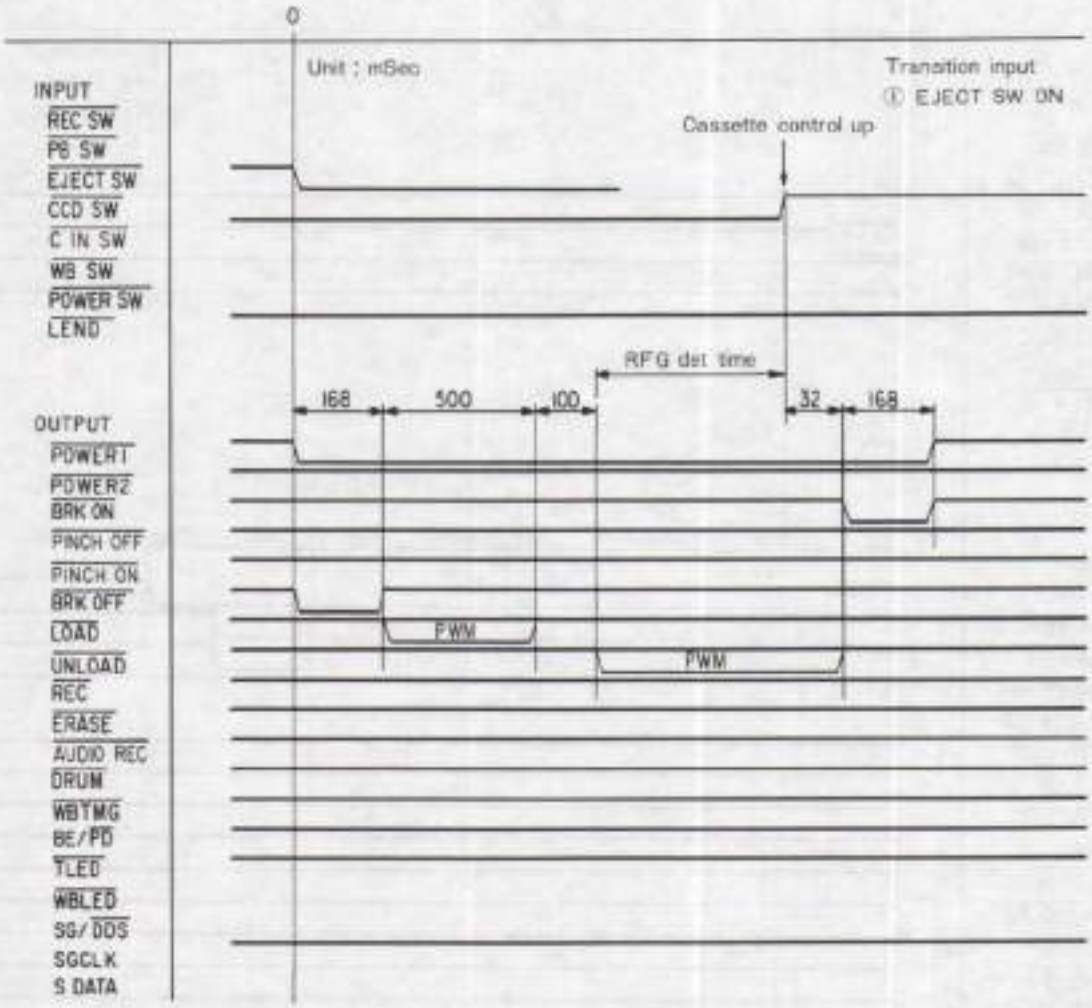
3-10. POWER BLOCK DIAGRAM



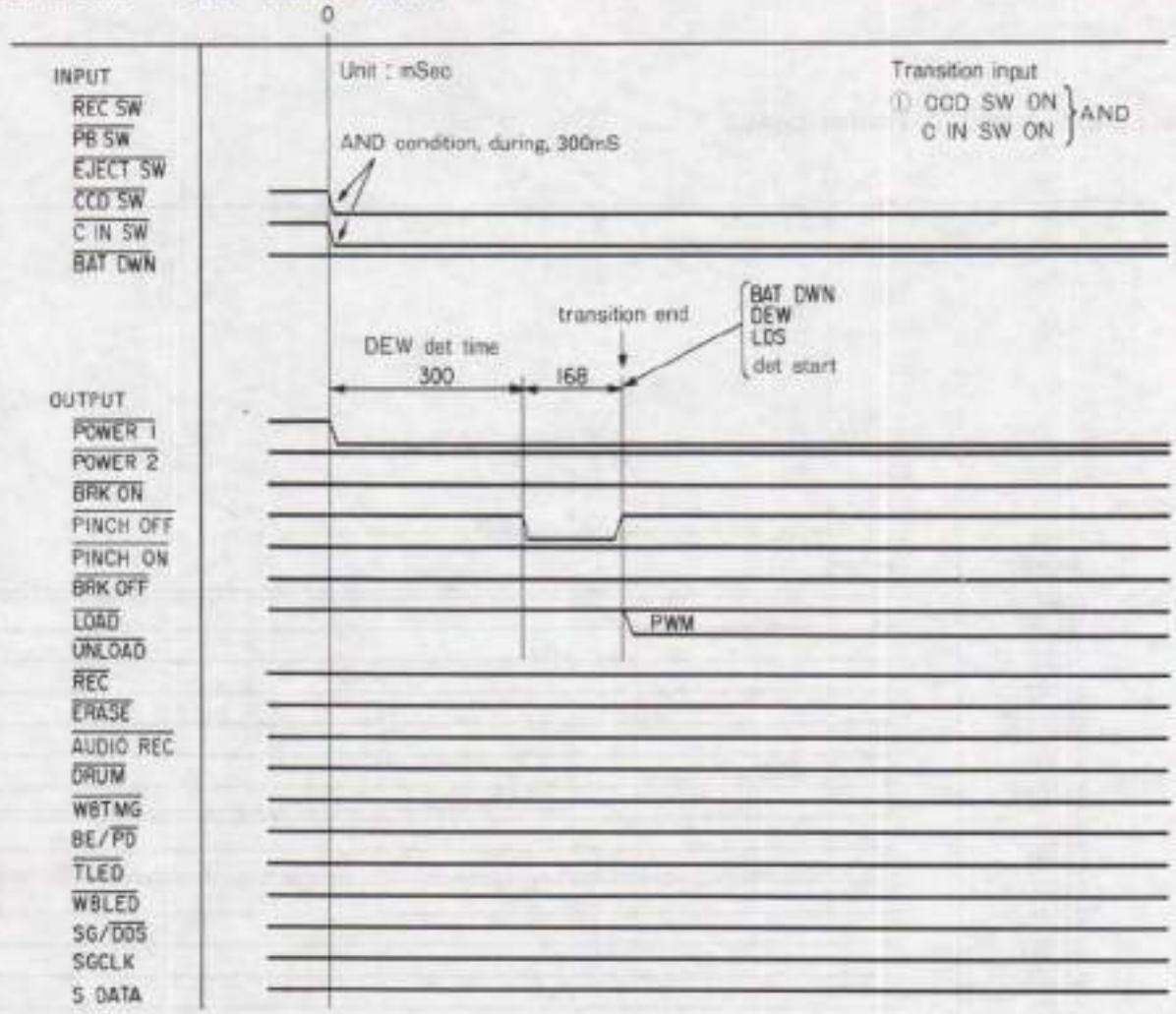
3-14. ALL OFF → HOLDER UP TIMING CHART



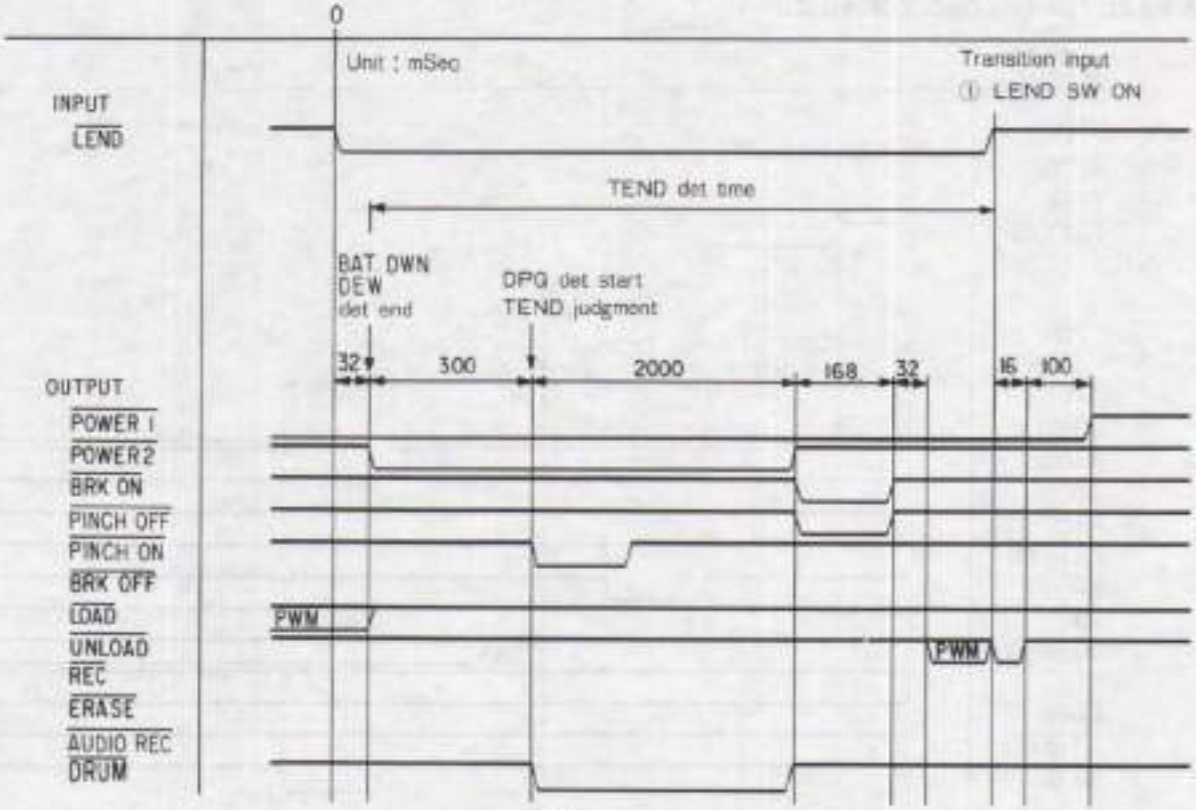
3-15. HOLDER DOWN → HOLDER UP TIMING CHART



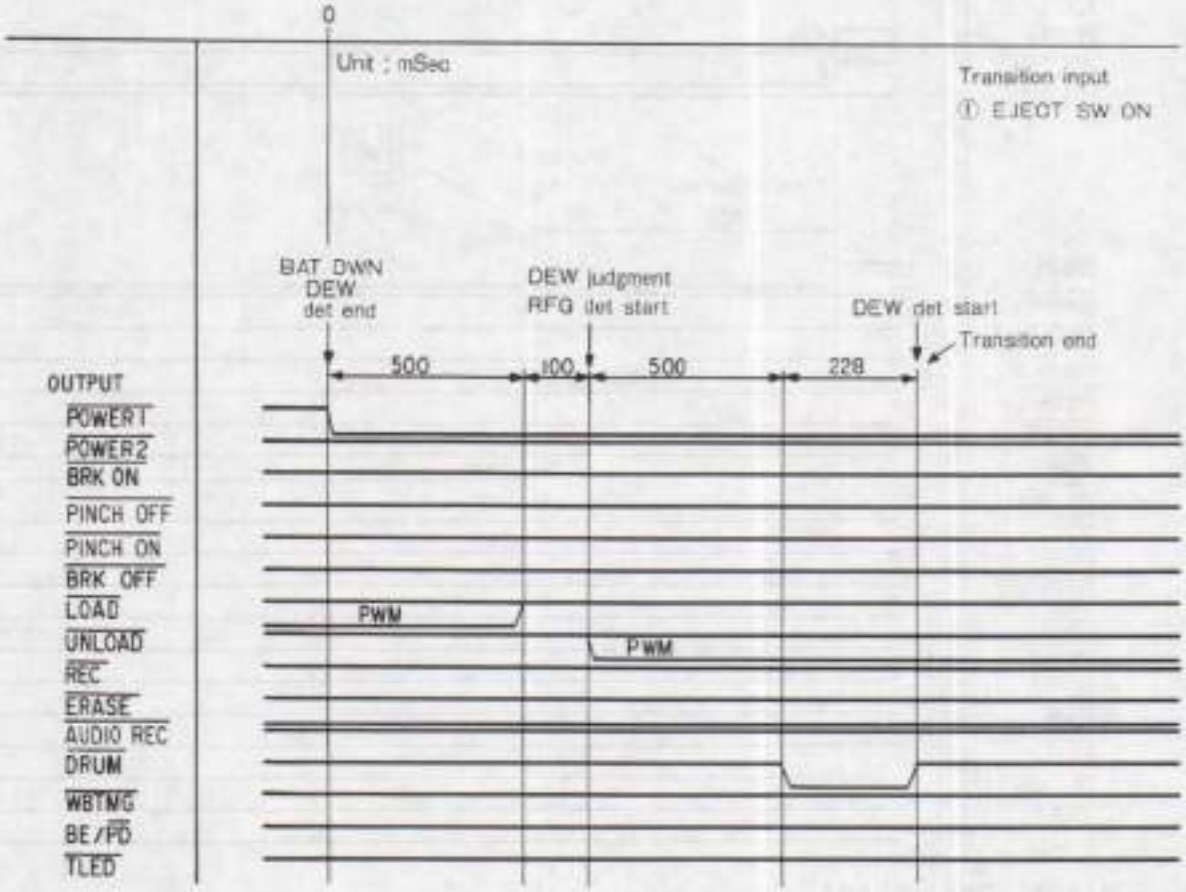
3-16. HOLDER DOWN → LOAD TIMING CHART



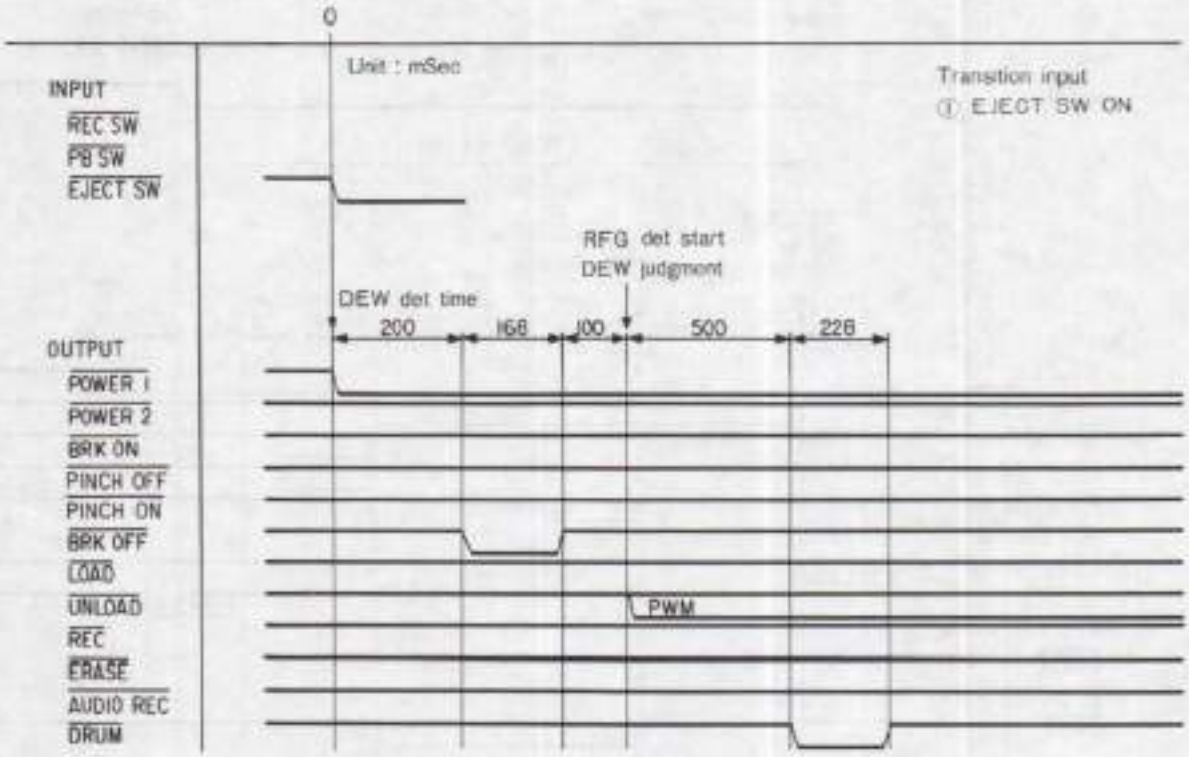
3-17. LOAD → READY TIMING CHART



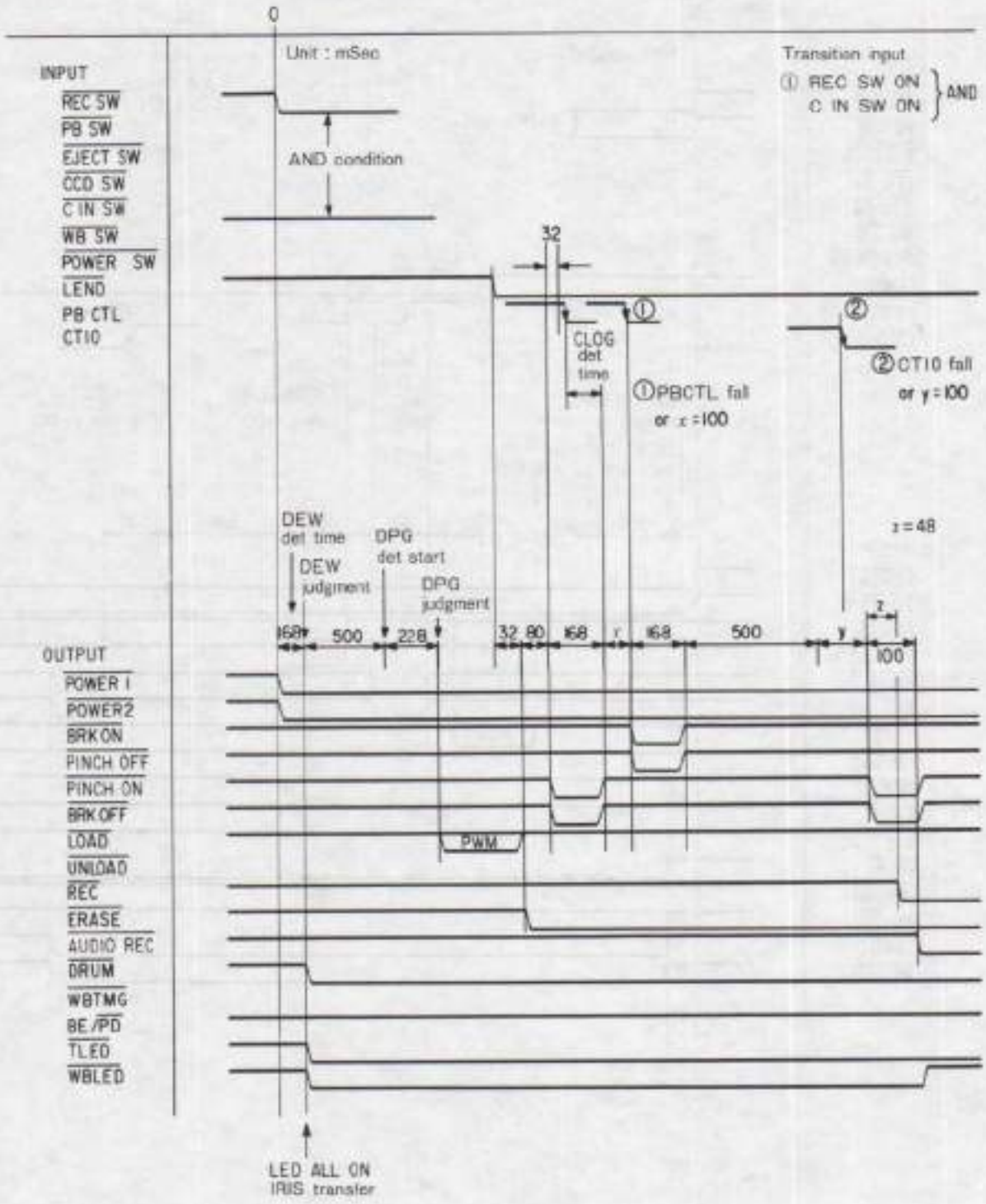
3-18. LOAD → UNLOAD TIMING CHART



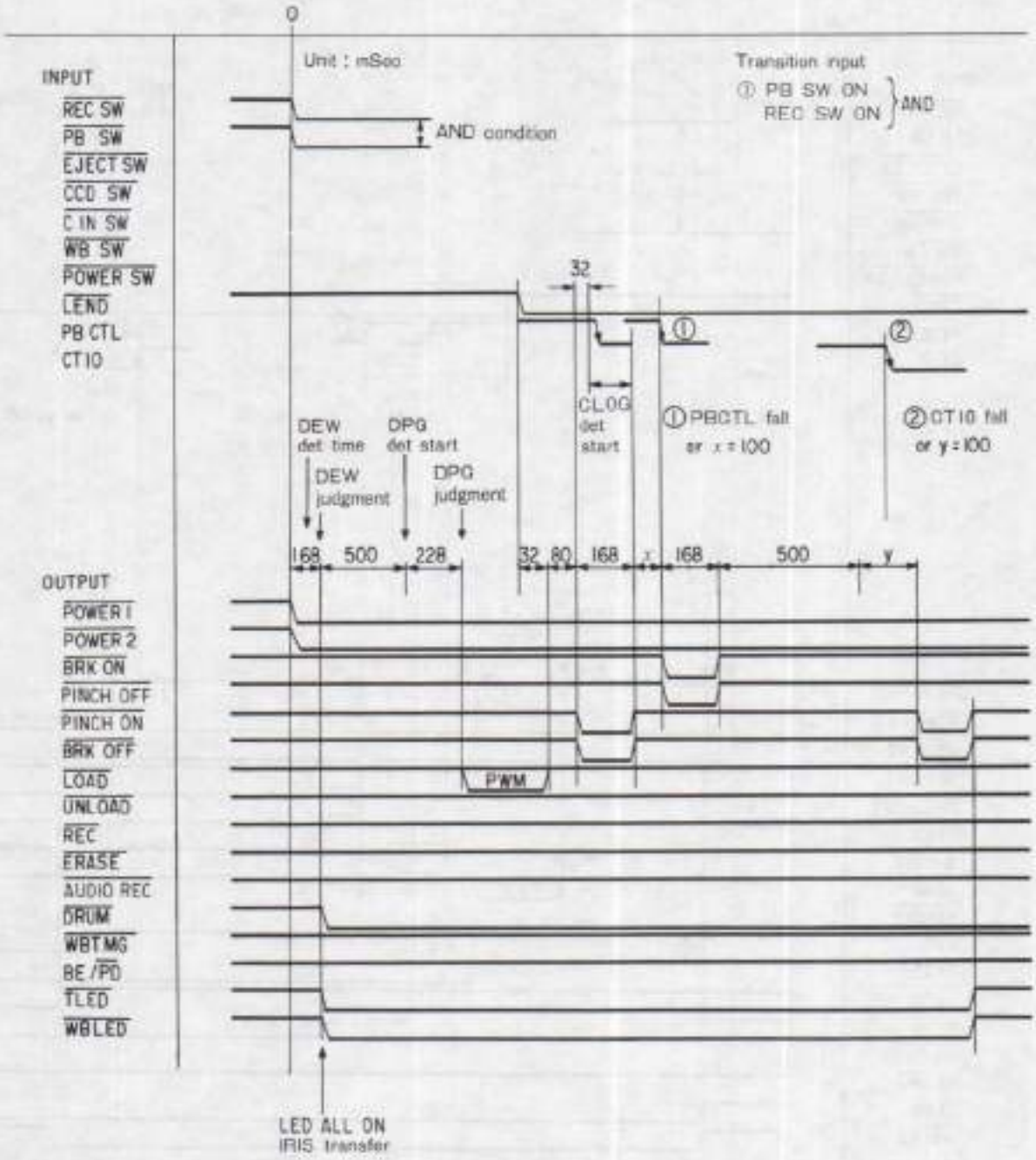
3-19. READY → UNLOAD TIMING CHART



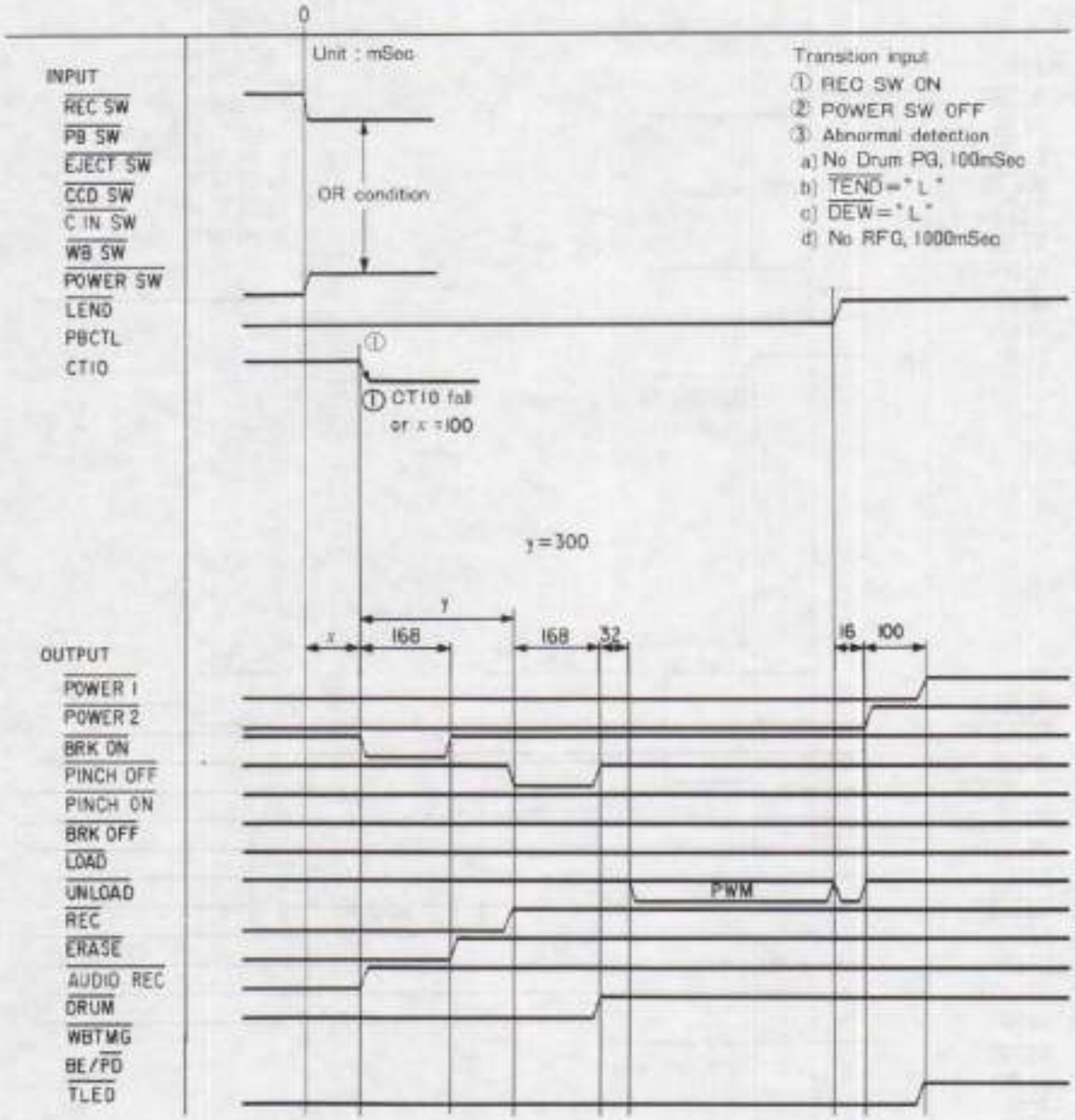
3-20. READY → REC TIMING CHART



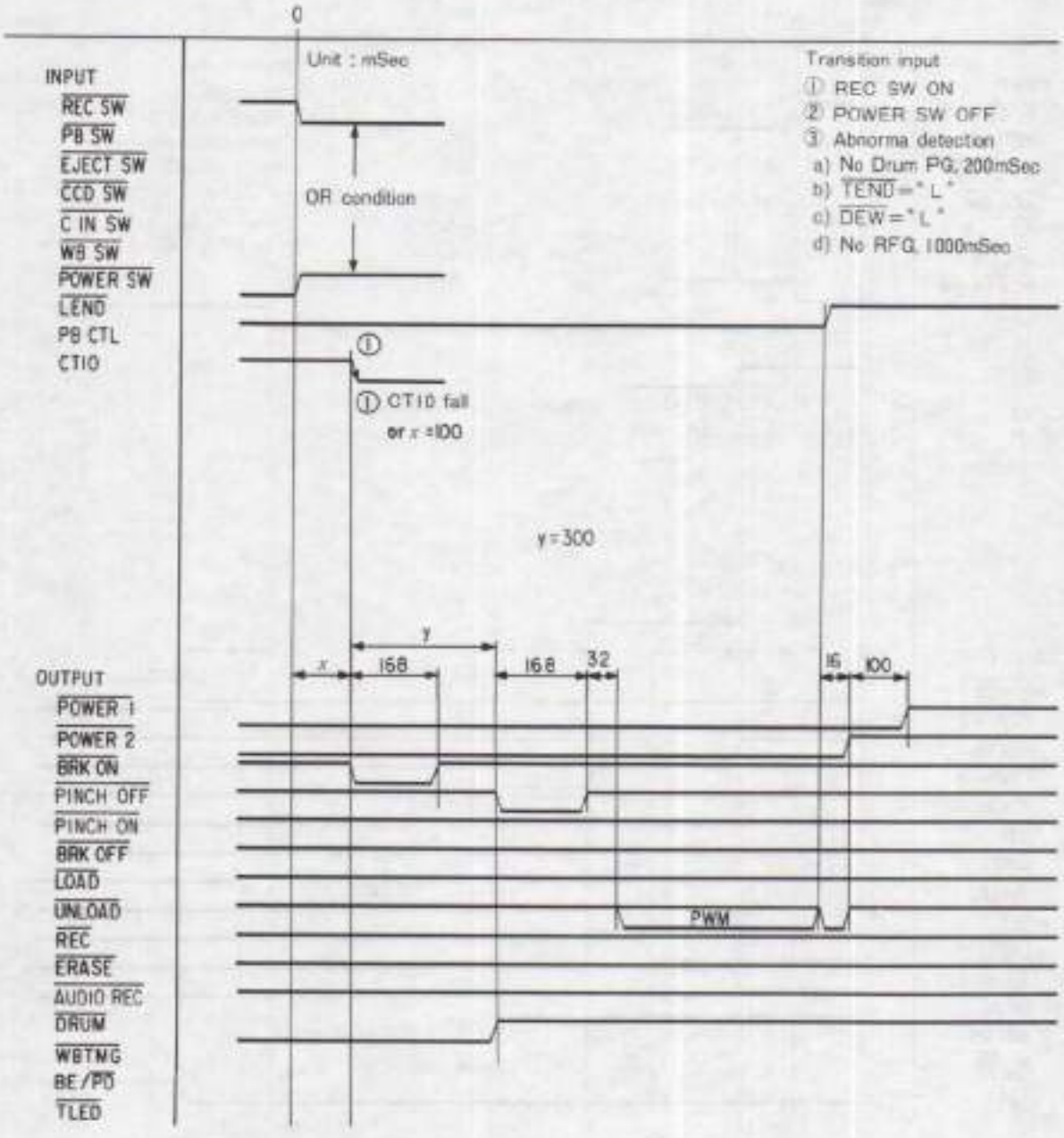
3-21. READY → PB TIMING CHART



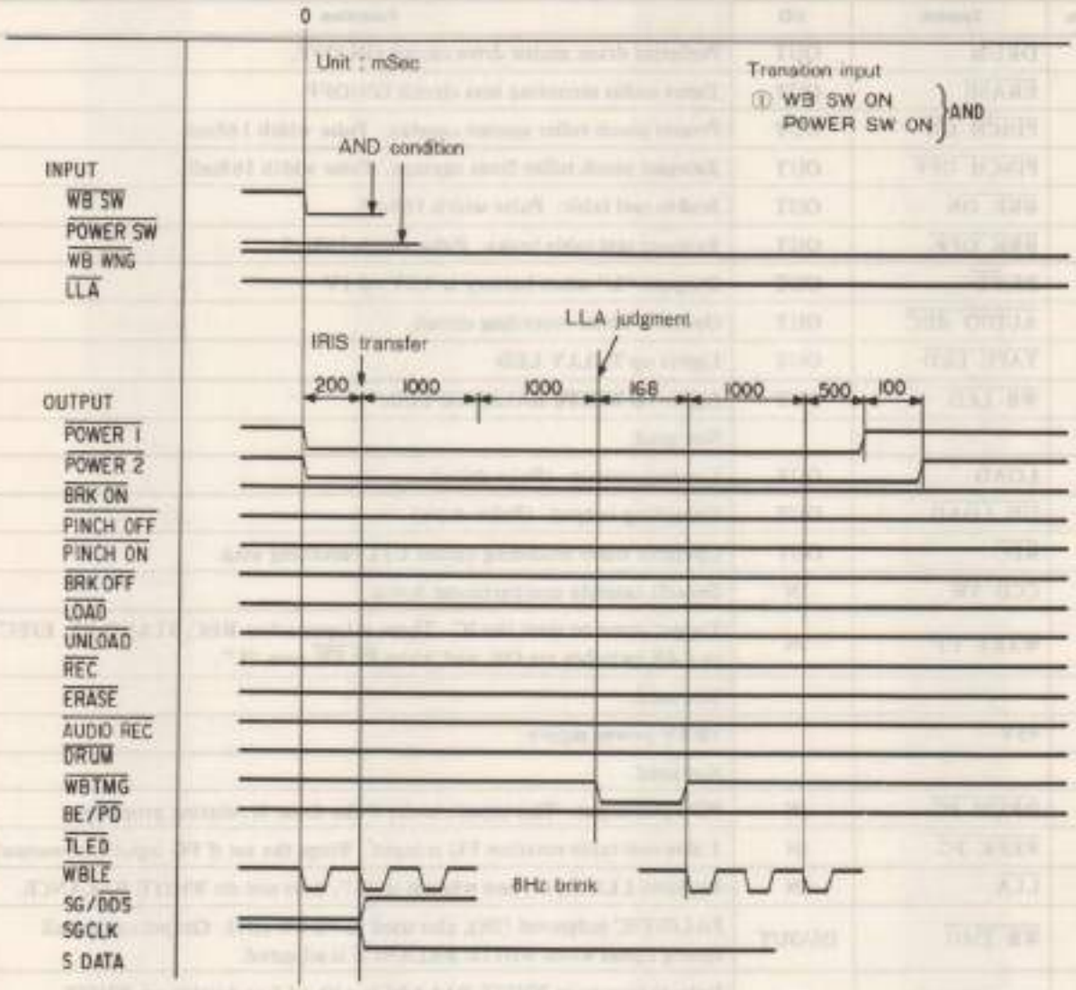
3-22. REC → READY TIMING CHART



3-23. PB → READY TIMING CHART



3-24. READY → AUTO WHITE BALANCE → READY TIMING CHART



3-25. IC403 Pin Functions (CV-1 Board)

Pin No.	Symbol	I/O	Function
1	W1	OUT	Measurement input. 700-fH/5 Fixed "L". IRIS WINDOW PULSE.
2			Not used.
3	DATA	IN	Sets IRIS WINDOW PULSE. DATA input pin.
4	CLK	IN	Sets IRIS WINDOW PULSE. DATA input pin.
5	CS	IN	Sets IRIS WINDOW PULSE. DATA input pin.
6	Vss	Power Supply	0V
7	$\overline{PDUP}$	OUT	NTSC carrier color signal, fsc = (44 – ¼)·fH. VCO phase detector output.
8	$\overline{PDDWN}$	OUT	NTSC carrier color signal, –90° signal relative to SC 0°. VCO phase detector output.
9	VCOO	OUT	VCO output.
10			Ground pin.
11	NT/$\overline{P}$	IN	NTSC, PAL switching pin.
12	VCOI	IN	VCO input.
13	SC 0°	OUT	NTSC carrier color signal fsc = (44 – ¼)·fH
14	SC 90°	OUT	NTSC carrier color signal, –90° signal relative to SC 0°.
15	PALT	OUT	Line alternation signal of PAL.
16	PPBF	OUT	Pilot burst flag signal of PAL.
17	BF	OUT	Beam Blanking, Color Burst Flag.
18	BLKC	OUT	Vertical Drive. Chroma Blanking Pulse.
19	V_{DD}	Power Supply	+5V
20	D466	IN	Horizontal Drive. Chroma delay time correction pin.
21	BLKY	OUT	Composite sync. Y Blanking pulse.
22	SYNC.	OUT	Composite blanking. Composite sync.
23			Not used.
24	SRVO	OUT	Signal for servo.
25			Not used.
26	CSWO	OUT	
27	CT20	OUT	
28	CT10	OUT	
29			Not used.
30	V_{DD}	Power Supply	+5V
31	Vss	Power Supply	0V
32	4fsc	OUT	
33		IN	Head correction input.
34		IN	Head correction input.
35		IN	Head correction input.
36	4fsc	IN	Head correction input. Sets Delay/Advance.
37	B.M. CL	OUT	Black mask clamp (for TUb)
38	V. DEF	OUT	Deflection VD.
39	H. DEF	OUT	Deflection HD.
40	V.D.	OUT	Head correction input, correction data 2^1. Vertical drive.

Pin No.	Symbol	I/O	Function
41	H.D	OUT	Horizontal drive.
42	FLD	IN	Even odd output.
43	V_{DD}	Power Supply	5V
44			Not used.
45	$\overline{WP}$		AWB WINDOW PULSE.
46			Measurement input, normally fixed "L".
47			Measurement input, normally fixed "L".
48	RESET		RESET pin.

3-26. IC001 PIN FUNCTIONS (CS-5 Board)

Pin No.	Symbol	I/O	Function
1	$\overline{DRUM}$	OUT	Performs drum motor drive circuit ON/OFF.
2	$\overline{ERASE}$	OUT	Turns audio recording bias circuit ON/OFF.
3	$\overline{PINCH\ ON}$	OUT	Presses pinch roller against capstan. Pulse width 168mS.
4	$\overline{PINCH\ OFF}$	OUT	Releases pinch roller from capstan. Pulse width 168mS.
5	$\overline{BRK\ ON}$	OUT	Brakes reel table. Pulse width 168mS.
6	$\overline{BRK\ OFF}$	OUT	Releases reel table brake. Pulse width 168mS.
7	BE/$\overline{PD}$	OUT	Outputs "L" when battery is 9.0V ±0.1V.
8	$\overline{AUDIO\ REC}$	OUT	Operates audio recording circuit.
9	$\overline{TAPE\ LED}$	OUT	Lights up TALLY LED.
10	$\overline{WB\ LED}$	OUT	Lights up WHITE BALANCE LED.
11			Not used.
12	$\overline{LOAD}$	OUT	Loading output. (Pulse drive)
13	$\overline{UN\ LOAD}$	OUT	Unloading output. (Pulse drive)
14	$\overline{REC}$	OUT	Operates video recording circuit CTL recording amp.
15	$\overline{CCD\ SW}$	IN	Detects cassette compartment down.
16	$\overline{WAKE\ UP}$	IN	Trigger input to start the IC. There is input when REC, STAND-BY, EJECT, or C-IN switches are ON, and when PB SW goes "L".
17			Not used.
18	+5V		+B 5V power supply.
19			Not used.
20	$\overline{DRUM\ FG}$	IN	FG signal input. This input checks if the drum is rotating properly.
21	$\overline{REEK\ FG}$	IN	T side reel table rotation FG is input. Stops the set if FG input is abnormal.
22	$\overline{LLA}$	IN	Receives LLA input, and when it is "L", does not do WHITE BALANCE.
23	$\overline{WB\ TMG}$	IN/OUT	PAL/NTSC judgment (IN), also used as PB SW (IN). Outputs a 168mS timing signal when WHITE BALANCE is adjusted.
24	$\overline{WB\ WNG}$	IN	Detects improper WHITE BALANCE with "L" and lights up WHITE BALANCE LED.
25	$\overline{CIN\ SW}$	IN	Input pin for switch which detects that a cassette is inserted. This switch detects the recording-proof claw also.
26	$\overline{POWER\ SW}$	IN	STAND-BY switch input. STAND-BY and READY (stop) are switched by this input.
27	SG/$\overline{DDS}$	OUT	SG and DDS chip select signal.
28	CSWO	IN	Input for distinguishing between A head output and B head output during CLOG detection.
29	$\overline{LEND\ SW}$	IN	Input pin which detects loading.
30			Not used.
31	$\overline{WB\ SW}$	IN	Input from the switch which does WHITE BALANCE.
32	$\overline{REC\ SW}$	IN	REC switch and remote control switch input. When there is input, REC mode starts, then each time there is another input switching is performed between STAND-BY and REC mode.

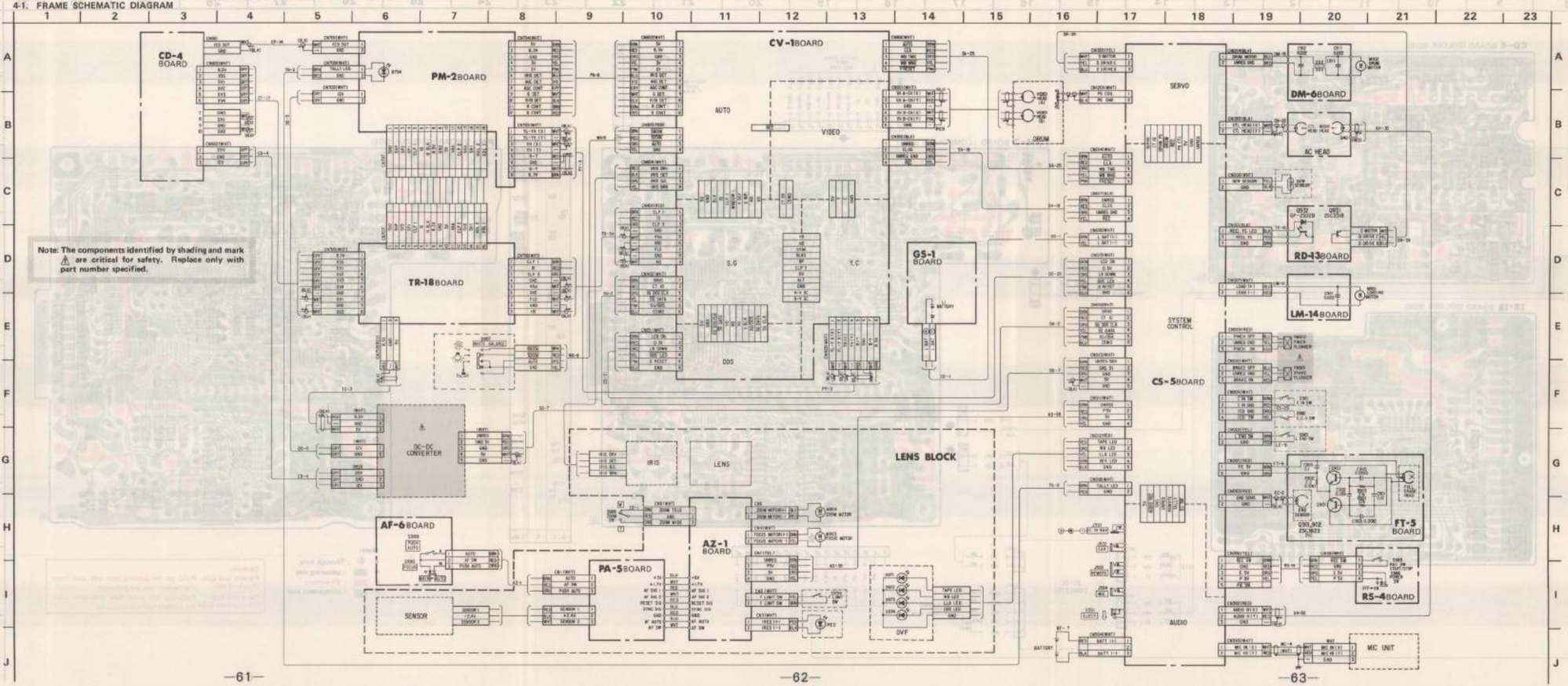
Pin No.	Symbol	I/O	Function
33	$\overline{\text{DEW, TAPE END}}$	IN	$\overline{\text{DEW}}$ is drum condensation input. Does not allow the set to operate when "L". $\overline{\text{TAPE END}}$ receives "L" input when the TAPE END detection oscillation circuit stops oscillating and the set stops. Shares detection circuit input.
34	$\overline{\text{BAT DWN}}$	IN	Goes "L" when power supply voltage drops and stops set operation.
35	$\overline{\text{EJECT SW}}$	IN	The cassette is ejected by this input.
36	X'tal OUT	OUT	Clock oscillator connection pin.
37	X'tal IN	IN	Clock oscillator connection pin.
38	$\overline{\text{RESET}}$	IN	Trigger input for IC reset circuit.
39	PB CTL	IN	Input for pinch-off timing for linked shooting.
40	$\overline{\text{CTL0}}$	IN	Input for start of REC timing for linked shooting.
41			Not used.
42	GND		Ground pin.
43			Not used.
44	SG CLK	OUT	Clock for transmitting 24 bit iris data to SG.
45	CLOG DET	IN	Whether or not proper recording is being done is input here. This check is done for linked shooting.
46	S. DATA	OUT	Data line for data (8 bit) to DDS and iris data (24 bit) to SG.
47	POWER 1	OUT	Mainly used to turn mechanical drive system power ON/OFF.
48	POWER 2	OUT	Mainly used for turning power for camera and some IC's ON/OFF.

3-27. IC702 PIN FUNCTIONS (TR-18 Board)

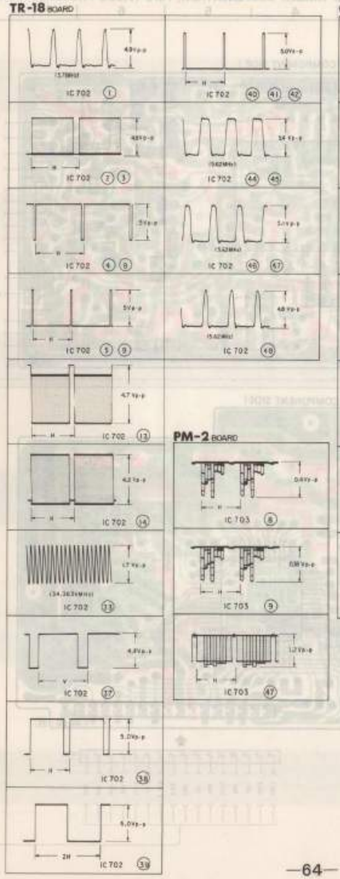
Pin No.	Symbol	I/O	Function
1	SP1	O	Color separation sampling hold pulse.
2	SHD	O	Imager output signal sampling hold pulse.
3	SHP	O	Imager output signal sampling hold pulse.
4	XV4	O	Imager drive pulse.
5	XV2	O	Imager drive pulse.
6	V_{SS}		Power supply
7	HTSG	I	Test input (GND)
8	XV3	O	Imager drive pulse.
9	XV1	O	
10	XSG2	O	
11	XSG1	O	
12	XPG	O	
13	XH2	O	
14	XH1	O	
15	A2	O	Address output for external ROM.
16	A1	O	
17	A0	O	
18	A3	O	
19	V_{DD}		Power supply.
20	A4	O	Address output for external ROM.
21	A5	O	
22	A6	O	
23	CM	I	Test input (GND)
24	D4	I	ROM data input.
25	D3	I	ROM data input.
26	D2	I	
27	D1	I	
28	XVCT	O	ROM power supply modulation pulse.
29	TEST	I	Test input (GND).
30	CP	I	Clock input.
31	V_{SS}		Power supply.
32	XCK	O	Waveform shaping output.
33	CK	I	Waveform shaping input.
34	FLD	I	Frame sync signal.
35	HD	I	Horizontal sync signal.
36	CL	O	Clock output for CX7930.
37	VAA	O	Vertical Pre BLK.
38	HBLK	O	Horizontal Pre BLK.
39	ID	O	Line sequence signal identification signal.
40	CLP3	O	Clamp pulse.
41	CLP2	O	
42	CLP1	O	
43	V_{DD}		Power supply.
44	XDL2	O	CCD DL drive pulse.
45	XDL1	O	
46	SH2	O	CCD DL sampling hold pulse.
47	SH1	O	
48	SP2	O	Color separation sampling hold pulse.

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

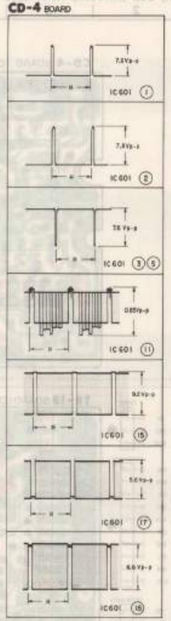
4-1. FRAME SCHEMATIC DIAGRAM



TR-18 BOARD



CD-4 BOARD



PM-2 BOARD

CCD BLOCK CCD BLOCK

CCD BLOCK CCD BLOCK

CD-4 BOARD (COMPONENT SIDE)

CD-4 BOARD (SOLDER SIDE)

TR-18 BOARD (COMPONENT SIDE)

TR-18 BOARD (SOLDER SIDE)

PM-2 BOARD (COMPONENT SIDE)

PM-2 BOARD (SOLDER SIDE)

Note:
: Through hole.
: soldering side
: B+ pattern
: component side

Caution:
Pattern face side: (Solder 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.

CD-4 (CCD IMAGER, CCD DRIVER), TR-18 (CCD IMAGER COMPENSATION), PM-2 (VIDEO PROCESS) SCHEMATIC DIAGRAM

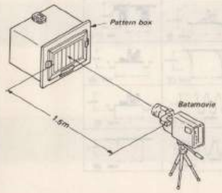
CCD BLOCK CCD BLOCK

CCD BLOCK

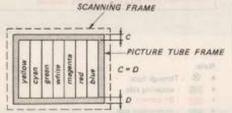
Note:

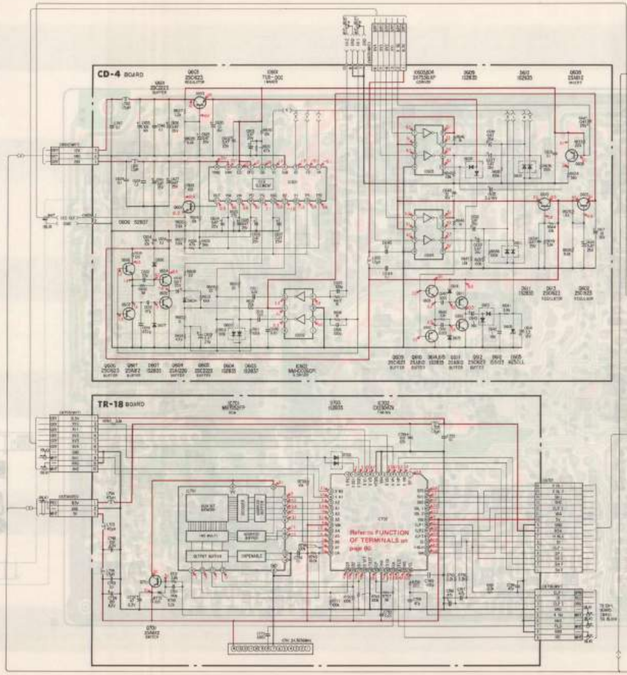
- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, ¼W unless otherwise noted.
  kΩ : 1000 Ω, MΩ : 1000 kΩ
- All capacitors are in μF unless 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.
- ▭ : 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 or more).
  (3) REC mode

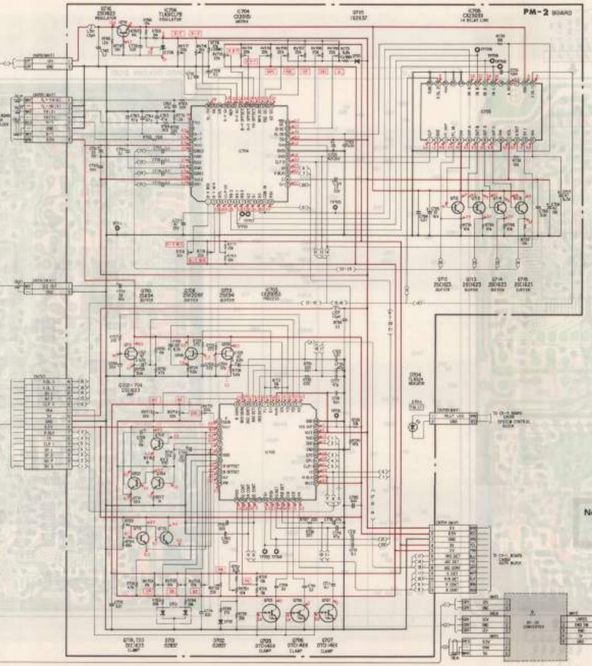
1. Connection



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

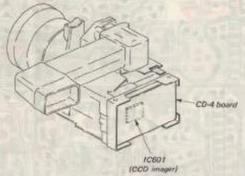






Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

- **NOTES ON REPLACING CCD IMAGER BLOCK**
- The CCD imager block (IC601, IC701) mounted on the CD-4 and TR-18 boards is composed of the CCD imager (IC601) and a correction ROM* (IC701) which is for optimizing imager response. The correction ROM and corresponding CCD imager are produced together, and therefore neither of them can be replaced individually.
  * The correction ROM is not included on some sets because it is not required in those cases.
- There are two types of CCD imagers supplied as service parts, so depending on the set being serviced, handle as described below.
  (1) When both the CCD imager and correction ROM are supplied together:
  Replace both the CCD imager and correction ROM. If there is not correction ROM mounted on the set being serviced, install the one which is supplied.
  (2) When only CCD imager is supplied:
  This CCD imager does not require correction, so if there is a correction ROM on the set, remove it, and replace the CCD imager only.
- The CCD imager block (IC601, IC701) is not mounted on the mounted CD-4 board and mounted TR-18 board which are supplied as service parts.
  When replacing the CD-4 and TR-18 boards, remove the CCD imager block from the old boards and mount on the new boards.

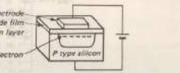


IC601 (CCD IMAGER) LAYOUT

IC701 (CORRECTION ROM) LAYOUT

- **NOTES ON HANDLING THE CCD IMAGER**

The CCD (Charge-Coupled Device) is a semiconductor which has MOS capacity unit elements lined up regularly. The CCD imager is a sensor, or "electronic eye" which has about 250,000 of these unit elements within a 1cm. square semiconductor board. Because of the structure of the CCD imager, the insulation resistance of the oxide film is extremely high, and the film is also very thin. This means that the CCD imager insulation may be damaged if potential difference is caused by static electricity in clothes or the human body. Please handle the CCD imager carefully, therefore, in the same way as for a MOS-IC.
(Be especially careful during dry weather or in a very dry location.)



UNIT ELEMENT (MOS CAPACITY)

- **NOTES ON REPLACING THE CCD IMAGER**

(1) Place in a MOS pack or wrap in aluminum foil to store so that all of the pins are the same potential. (Store like this until mounting in the set being serviced.)
(2) When replacing the CCD imager, be careful of dirt or dust sticking to it. The black cap is for protecting against dirt, and also to prevent strong light from touching the CCD imager. Remove the black cap after mounting the CCD imager in the set.
(3) Be sure to perform readjustment of the camera block after replacing the CCD imager.

CV-1 (Y & CHROMA PROCESS) PRINTED WIRING BOARD

CV-1 BOARD (COMPONENT SIDE)

CV-1 BOARD (SOLDER SIDE)

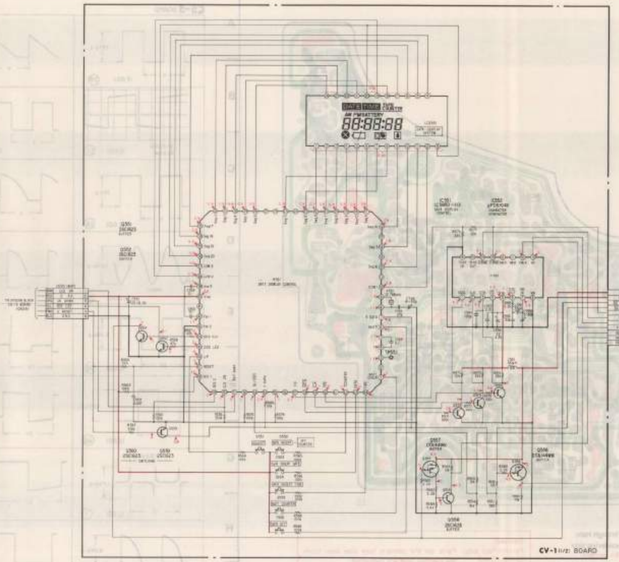
CV-1 wave

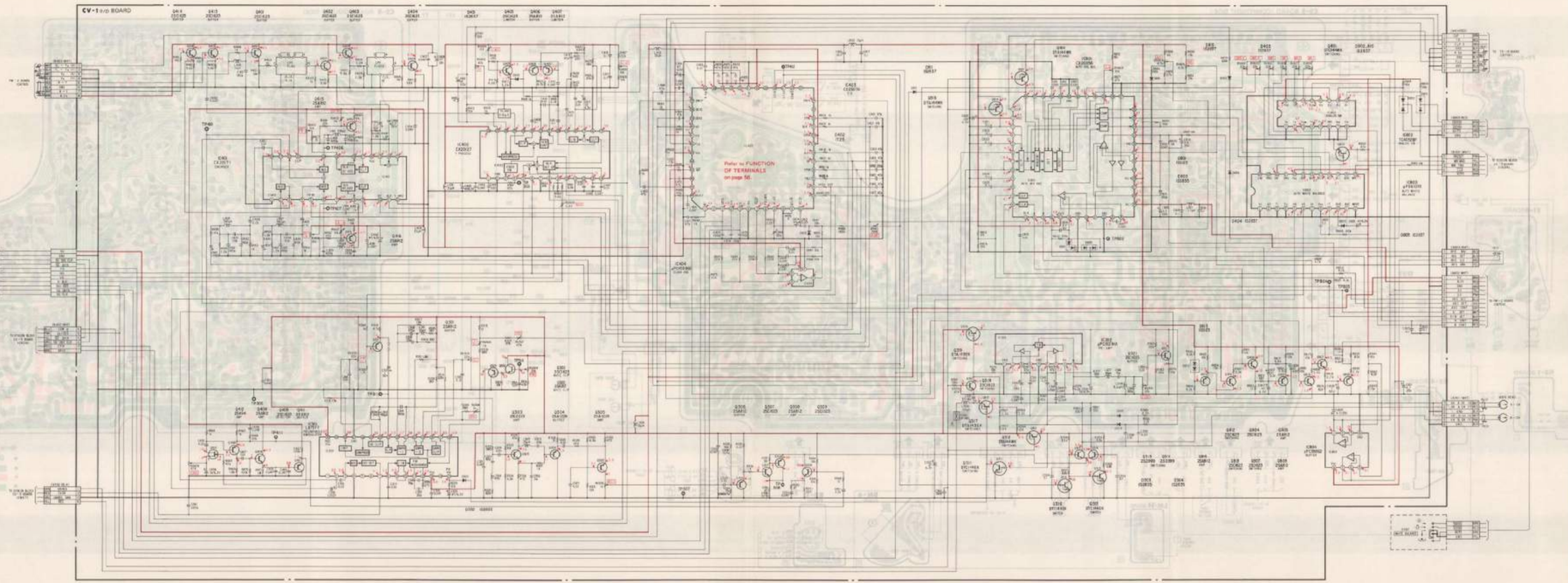
DATE TIME TAPE COUNTER
AM PM BATTERY
88:88:88

Caution:
Pattern face side: (Solder 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.

Note:
- ⊗ : Through hole.
- : soldering side
- : B+ pattern
- : component side

CV-1 (Y & CHROMA PROCESS) SCHEMATIC DIAGRAM





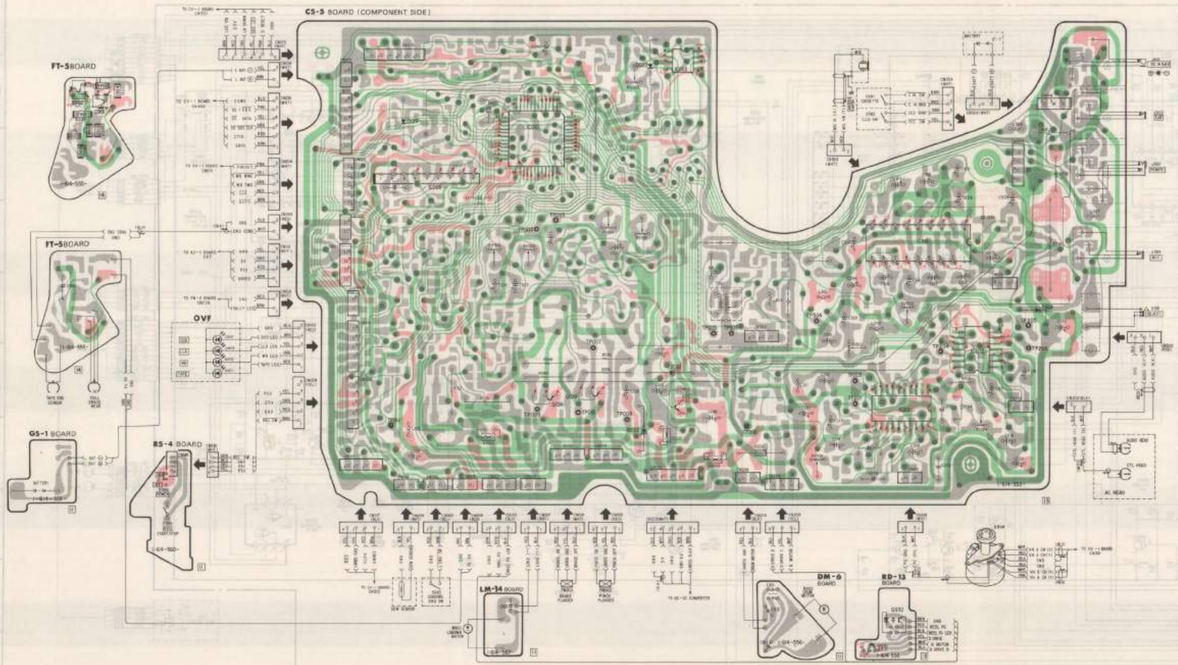
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

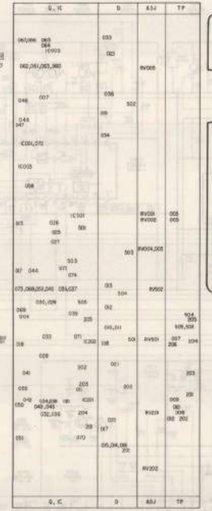
AUDIO, SERVO/SYSTEM CONTROL AUDIO, SERVO/SYSTEM CONTROL
AUDIO, SERVO/SYSTEM CONTROL AUDIO, SERVO/SYSTEM CONTPOL

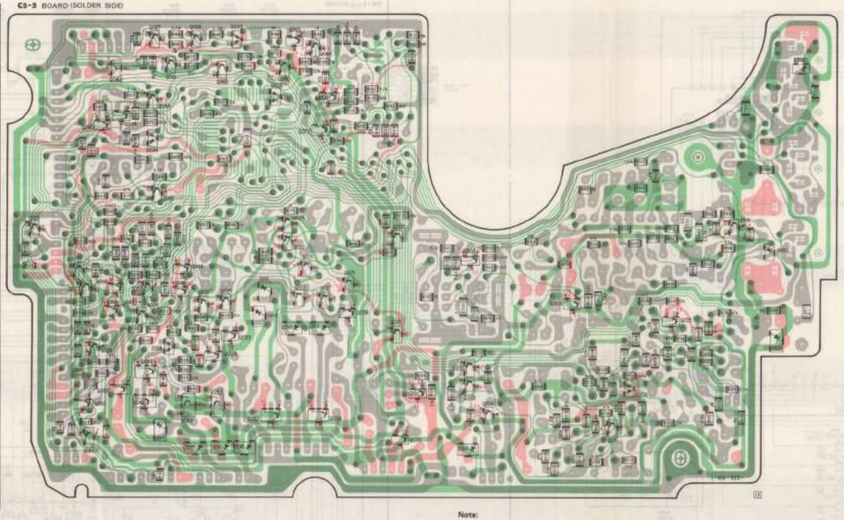
FT-5 (TAPE END SENSOR, FULL ERASE HEAD), RS-4 (SWITCH), CS-5 (AUDIO PROCESS, SERVO/SYSTEM CONTROL), LM-14 (LOADING MOTOR), DM-6 (DRUM MOTOR), RD-13 (DRUM MOTOR DRIVE), GS-1 (BATTERY) PRINTED WIRING BOARDS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

A B C D E F G H I J

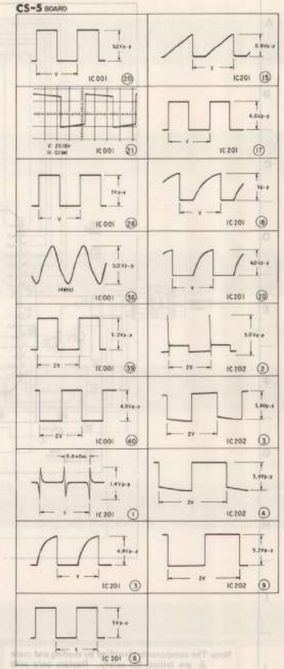






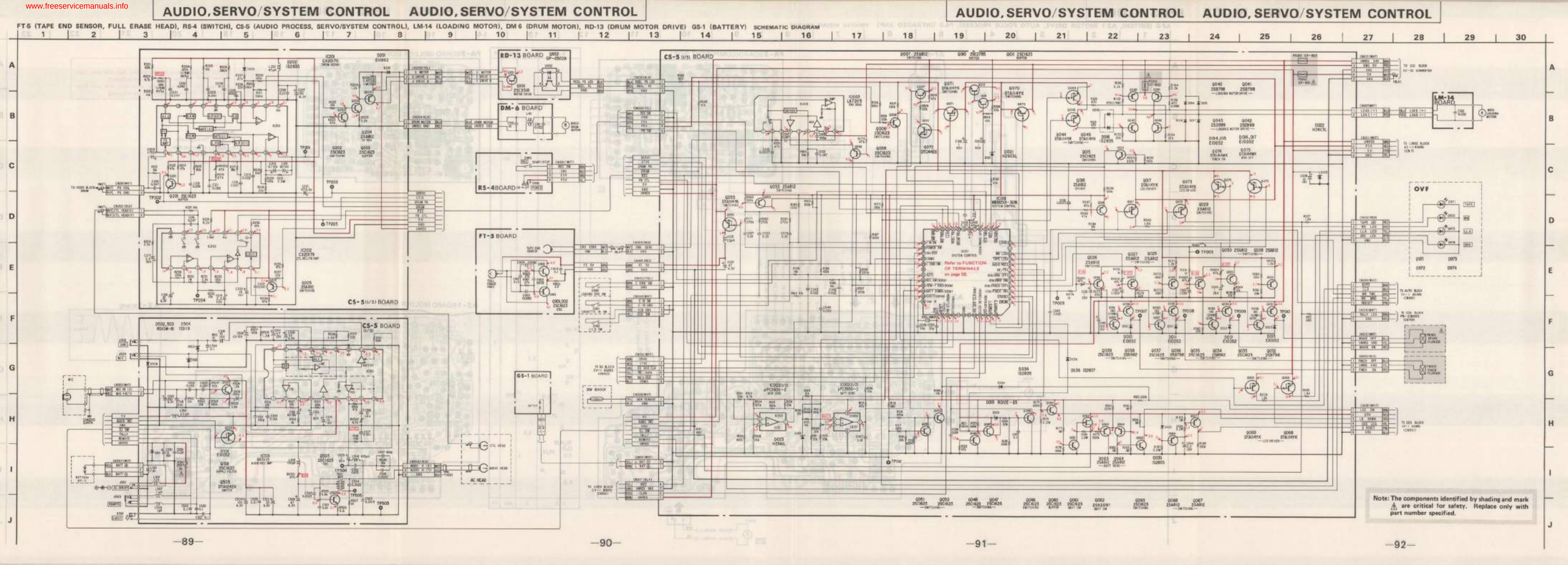
Notes:
- ⊗ : Through hole.
- : soldering side
- : B+ pattern
- : component side

Caution:
Pattern face side: (Bonder Side) Parts on the pattern face side seen from the pattern face are indicased.
Parts face side: (Compponent Side) Parts on the parts face side seen from the pattern face are indicased.



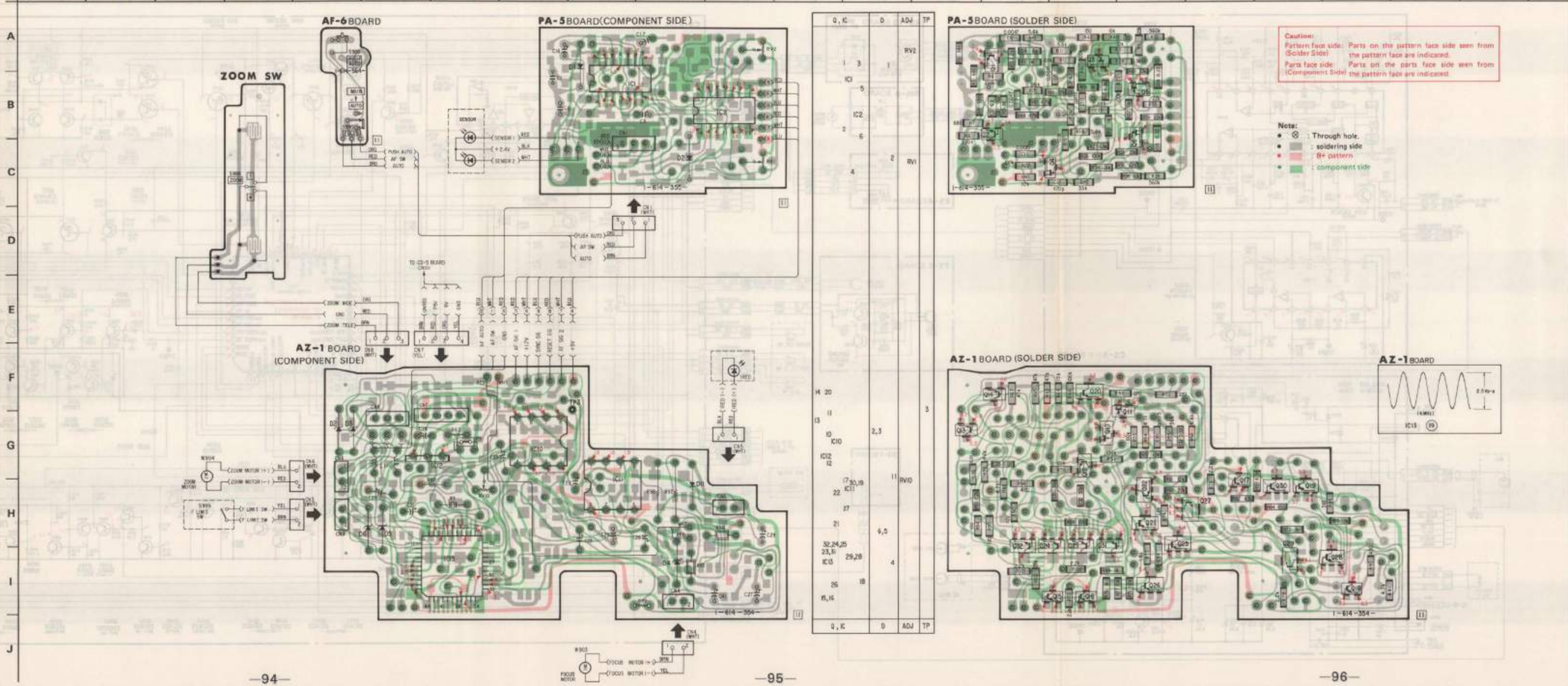
AUDIO, SERVO/SYSTEM CONTROL AUDIO, SERVO/SYSTEM CONTROL

FT-5 (TAPE END SENSOR, FULL ERASE HEAD), RS-4 (SWITCH), CS-5 (AUDIO PROCESS, SERVO/SYSTEM CONTROL), LM-14 (LOADING MOTOR), DM-6 (DRUM MOTOR), RD-13 (DRUM MOTOR DRIVE) GS-1 (BATTERY) SCHEMATIC DIAGRAM



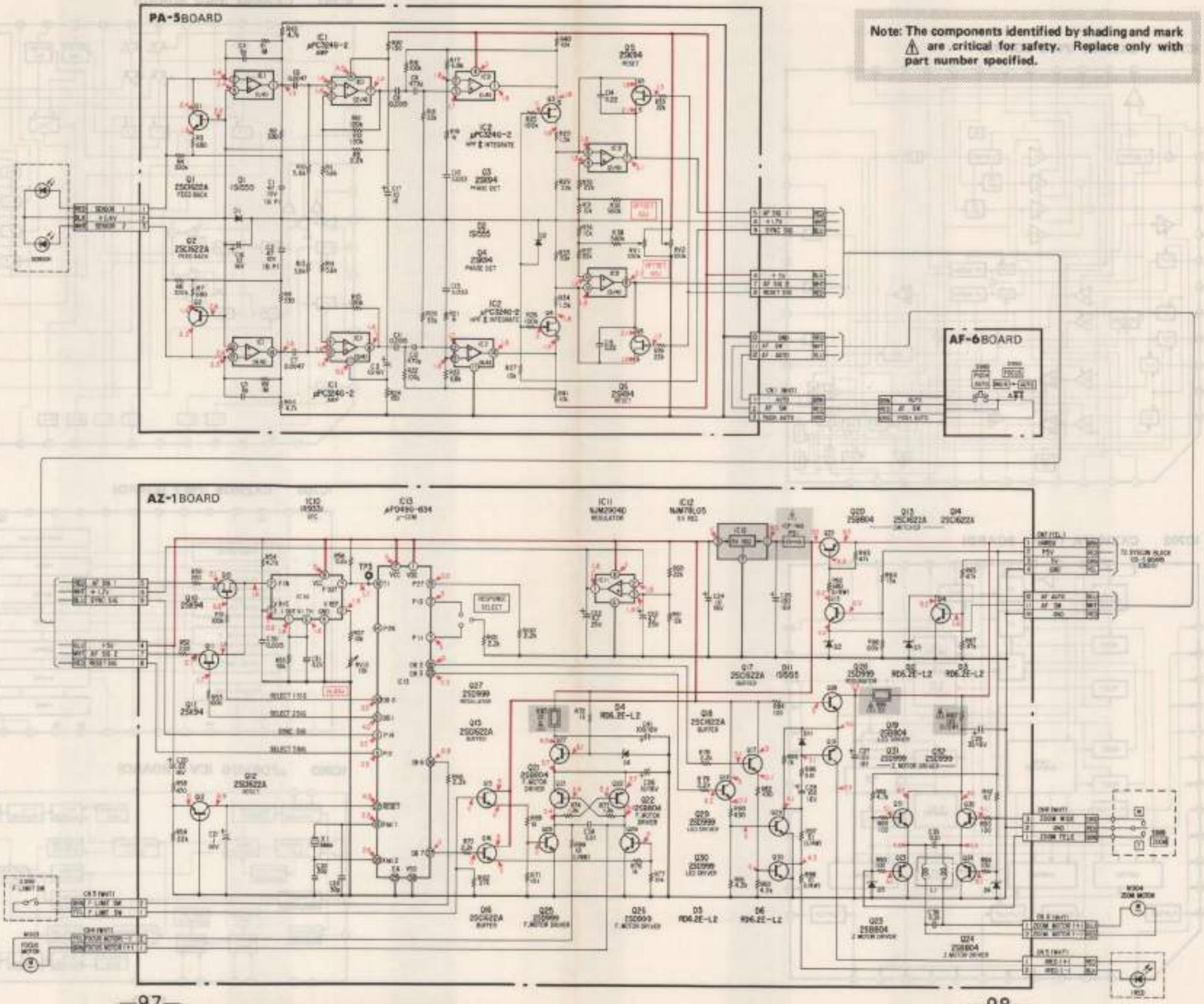
LENS BLOCK LENS BLOCK

AF-6 (SWITCH), AZ-1 (MOTOR DRIVE, AUTO FOCUS PROCESS), PA-5 (INFRARED AMP) PRINTED WIRING BOARDS

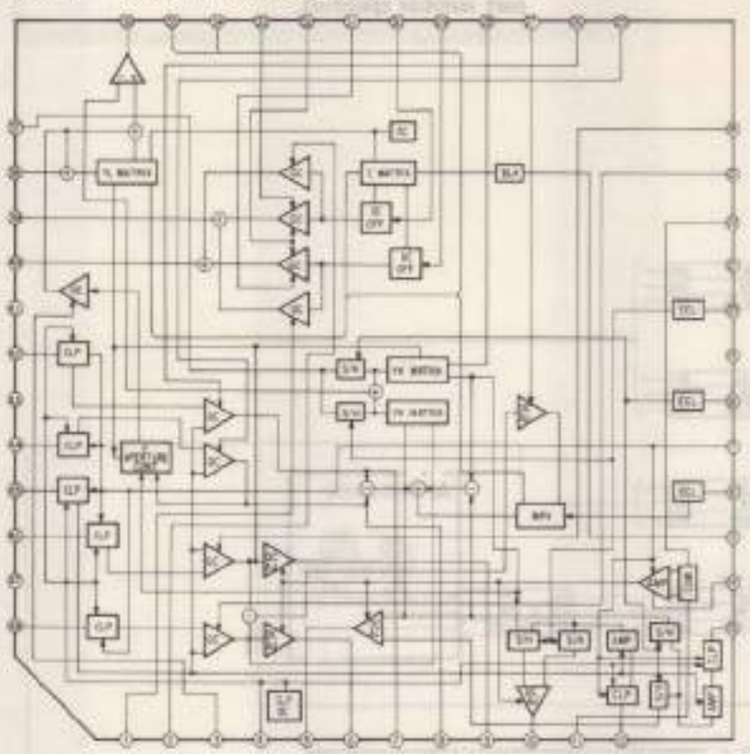


AF-6 (SWITCH), AZ-1 (MOTOR DRIVE, AUTO FOCUS PROCESS), PA-5 (INFRARED AMP) SCHEMATIC DIAGRAM

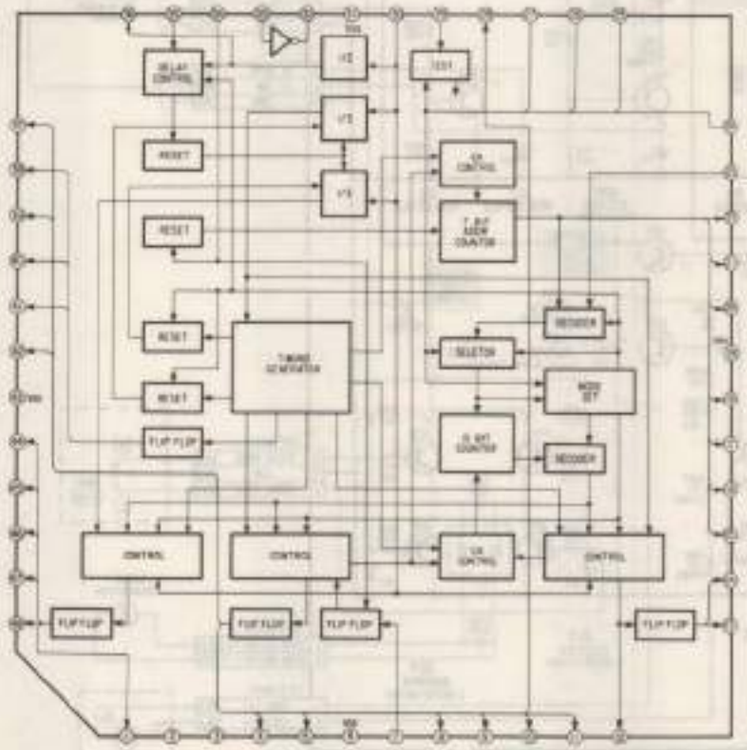
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.



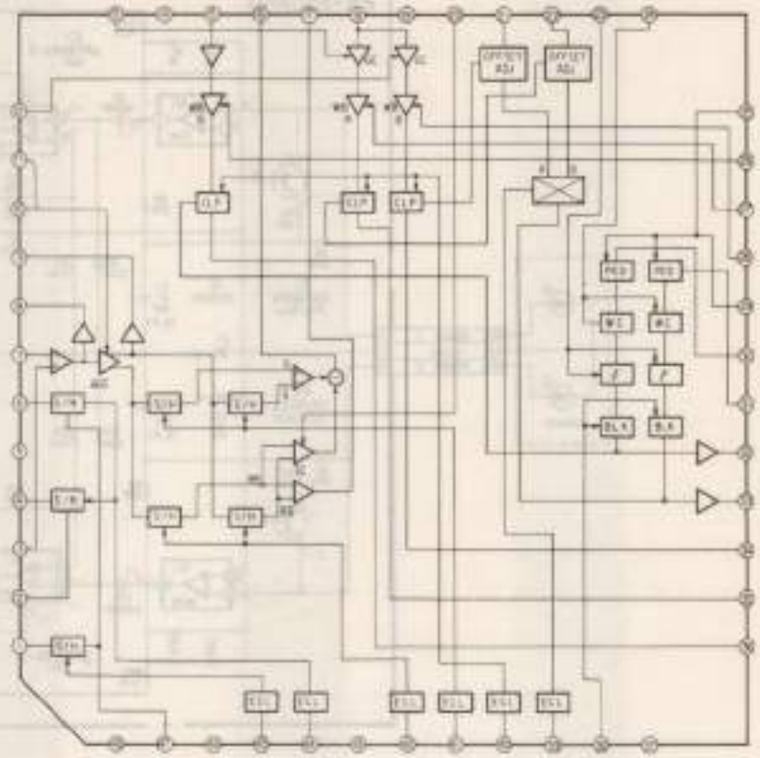
IC704 CX20151 (PM-2 BOARD)



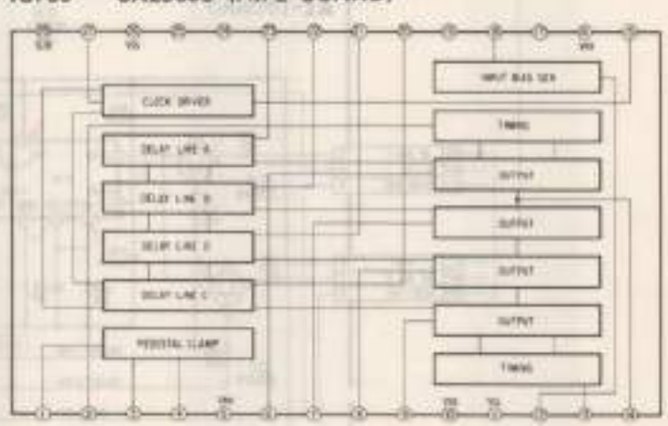
IC702 CX23047A (TR-18 BOARD)



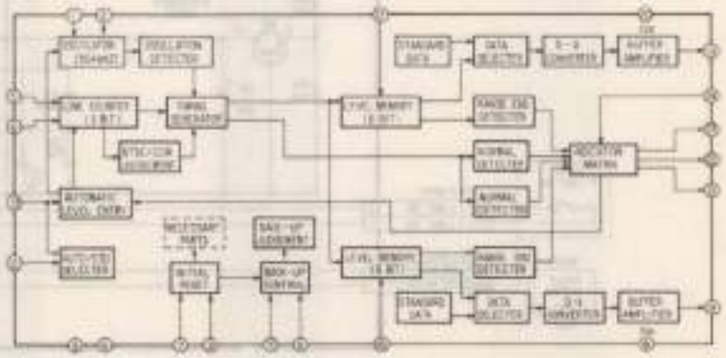
IC703 CX20053 (PM-2 BOARD)



IC705 CX23039 (PM-2 BOARD)



IC803 μPD6107G (CV-1 BOARD)



4-4. SEMICONDUCTORS

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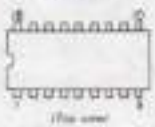

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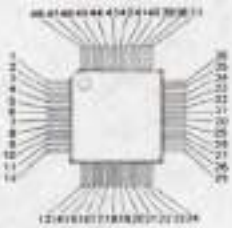
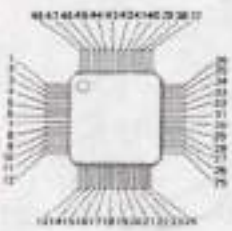
CX23047A
CX23076
CXQ88501-301Q
M888501-301N

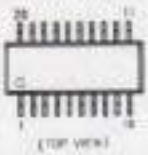


CX20127

CX20151

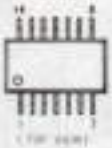


CX20170



CX20171

CX20179



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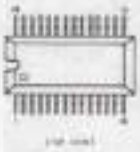

CX826
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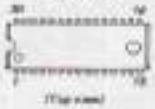

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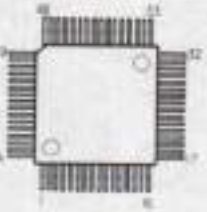

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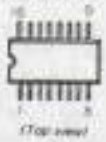
MB84052BPF
TC4052BF



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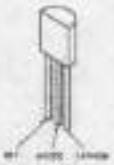
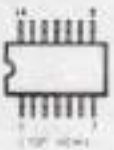
NJM78L05A

TL431CLP
TL431CLPB

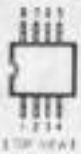


μPC324G2



μPC1521HA

μPC358G2
μPC393G2
μPC4558G2



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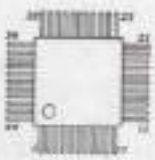
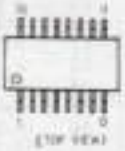
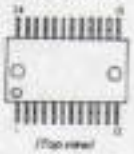


μPD6104G



μPD6107G



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2SA1179
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2SC1623
2SC2223-F14
2SC2412
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2SC3052
DTA114YK
DTA124EK
DTA143EK
DTA144EK
DTA144WK
DTC114EK
DTC144EK
DTC144WK

2SB798
2SB804
2SD999

2SB962

2SC2458
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2SC2785

2SC3518

2SK94
2SK209

1S2835
DAP202K
MA151WA

1S2837
DAN202K
MA151WK

1S1555
EQA02-11C
EQA02-11D
HZ5B-LL
HZ5C-LL
HZ6A-1L
HZ6C-2L
HZ6C-3L
HZ12E-B2
HZ12E-B3
RD4.3E-B2
RD5.1J-N3
RD6.2E-L2
RD6.2J-N2
RD12E-B2
RD12E-B3

1SS123
DA204K
MA153

1T25

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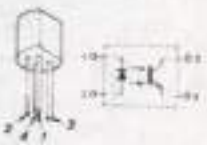
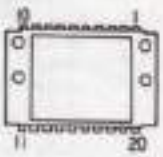
RD12M-B1
RD12M-B2
RD13M-B1

GP-2S02A
GP-2S02B
NJL5141E



TLR124

ICX-018K



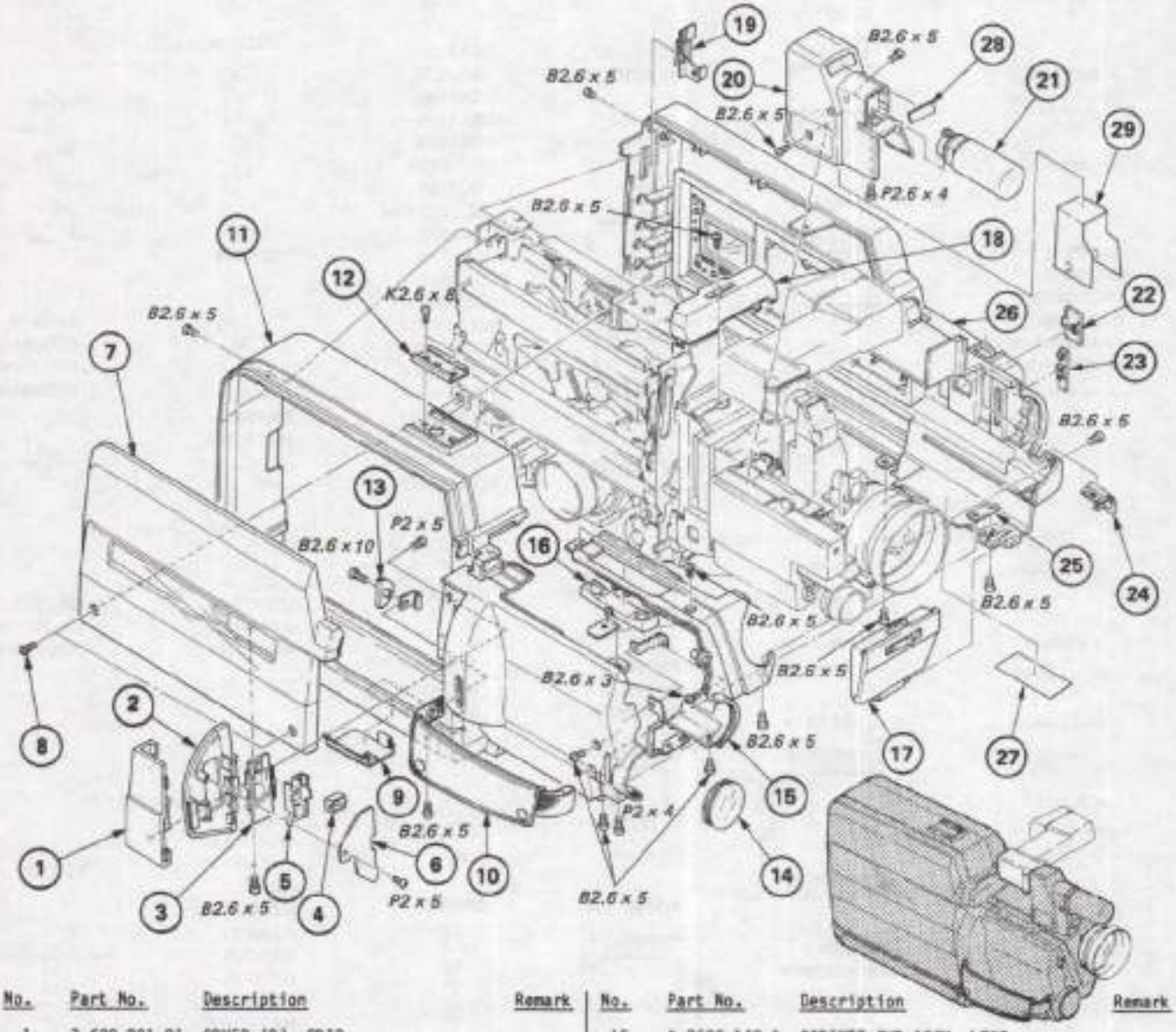
SECTION 5
EXPLODED VIEWS

NOTE:

- Itmes 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 mechanical parts with no reference number in the exploded views are not supplied.

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

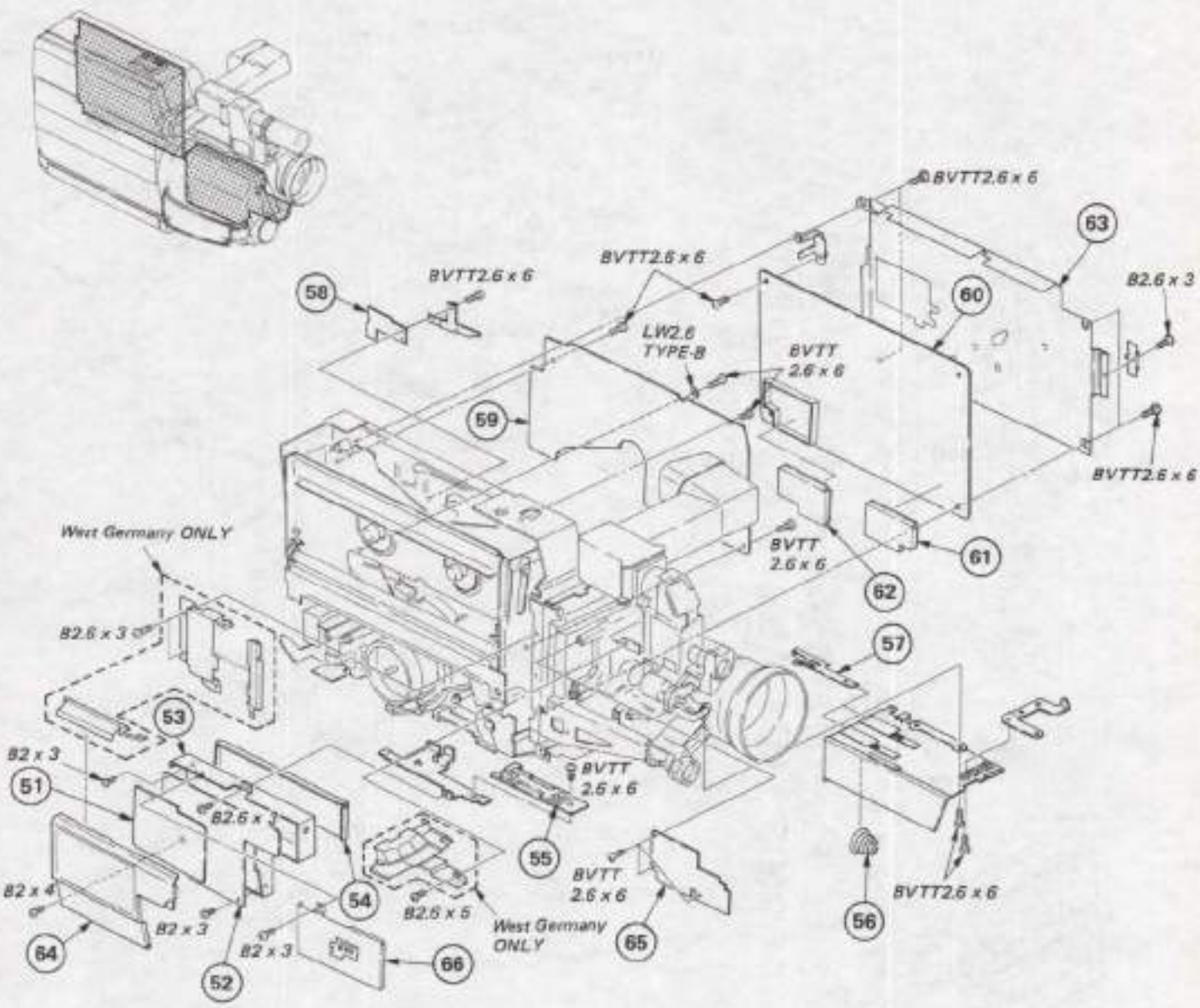
5-1. COVER ASSEMBLY



No.	Part No.	Description	Remark
1	3-690-291-01	COVER (B), GRIP	
2	3-690-296-01	COVER (A), GRIP	
3	3-690-293-01	KEY TOP, POWER	
4	3-690-281-01	BUTTON, REC	
5	*3-690-292-01	RETAINER, REC PC BOARD	
6	*1-614-560-11	RS-4 BOARD	
7	A-6703-519-A	LID BLOCK ASSY	
8	3-690-267-01	SCREW, ORNAMENTAL	
9	3-690-273-01	LID, BATTERY CASE	
10	3-690-297-01	BELT, GRIP	
11	X-3690-138-1	CABINET (LEFT) SUB ASSY	
12	3-690-252-01	SHOE, ACC	
13	3-690-280-01	RETAINER, FITTING, BELT	
14	3-690-285-11	CAP, RADIATA BLOCK (WEST GERMANY ONLY)	
	3-690-285-01	CAP, RADIATA BLOCK (AUSTRALIAN,E MODEL)	

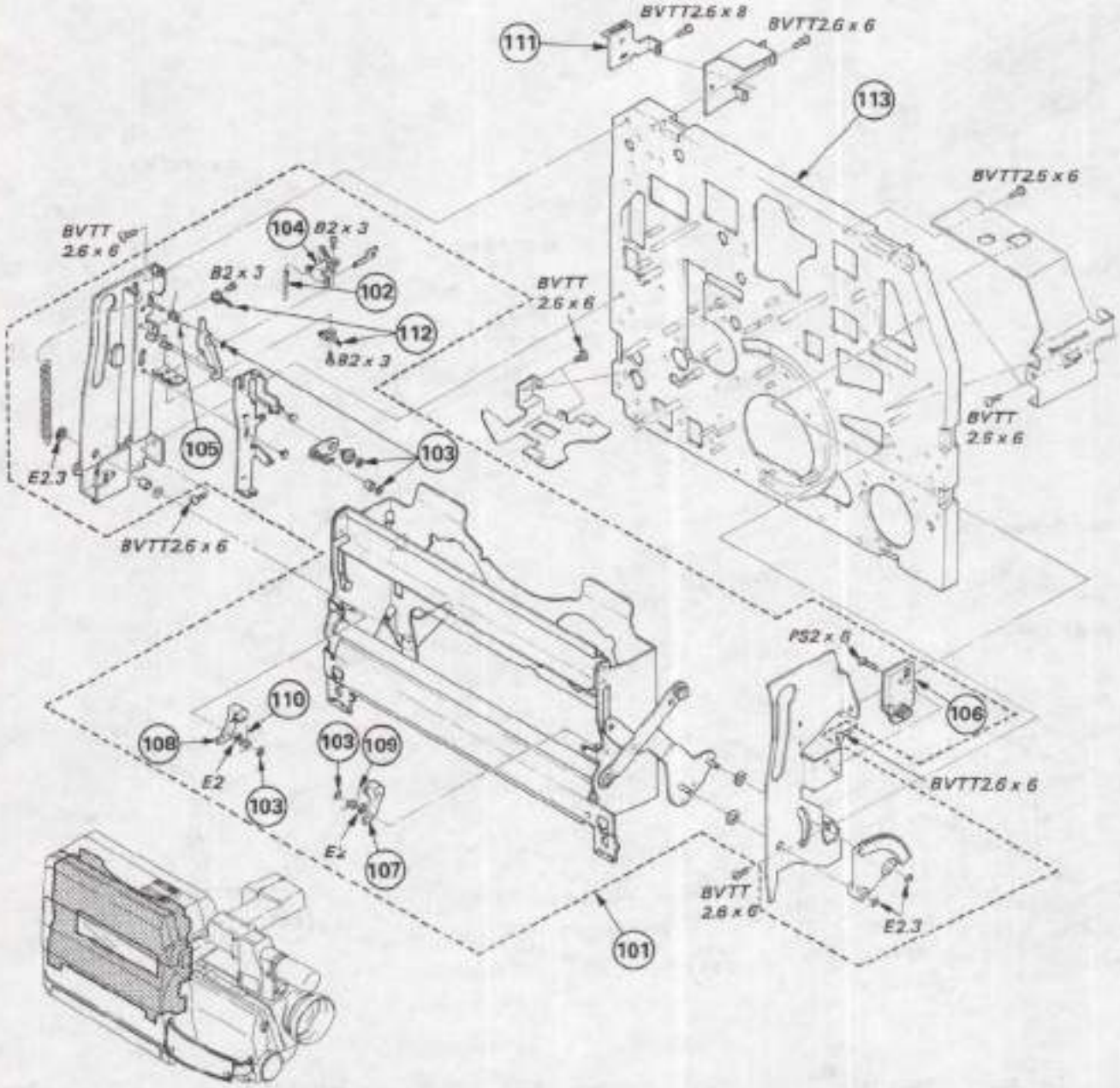
No.	Part No.	Description	Remark
15	X-3690-140-1	CABINET SUB ASSY, LENS	
16	3-690-294-01	KEY TOP, ZOOM	
17	A-6703-506-A	LID BLOCK ASSY, BATTERY	
18	3-690-272-01	COVER, FRONT	
19	3-690-269-01	KNOB, EJ	
20	3-690-301-01	COVER, OVF	
21	8-814-210-00	MICRPHONE (C-2006)	
22	3-690-289-01	KEY TOP, W/B	
23	3-690-288-01	KEY TOP, SELECTION, AF	
24	3-690-295-01	KEY TOP, MANUAL	
25	3-690-290-01	NUT, PLATE	
26	X-3690-139-1	CABINET (RIGHT) SUB ASSY	
27	*3-691-195-01	LABEL, MODEL NUMBER (WEST GERMANY ONLY)	
	*3-691-197-01	LABEL, MODEL NUMBER (AUSTRALIAN,E MODEL)	
28	3-881-221-00	EMBLEM, SONY	
29	*3-691-207-01	PLATE, SHIELD, OVF (WEST GERMANY ONLY)	

5-2. BOARD ASSEMBLY



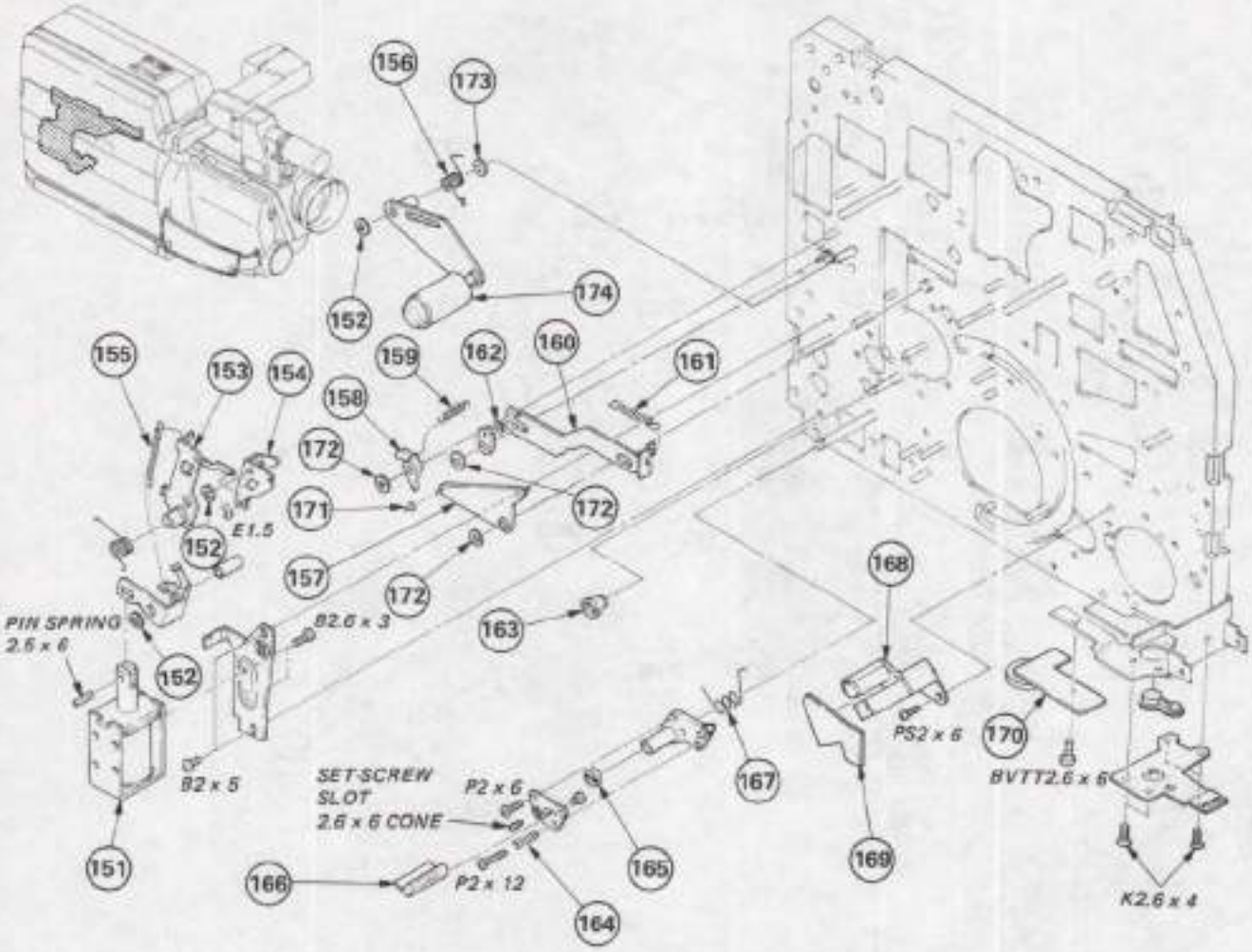
No.	Part No.	Description	Remark
51	*A-6725-439-A	TR-18 BOARD, COMPLETE	
52	*A-6725-438-A	PM-2 BOARD, COMPLETE	
53	*3-690-239-01	CASE (MAIN), SHIELD, PM	
54	*X-3690-134-1	LID(LOWER) ASSY, SHIELD CASE, PM	
55	1-570-152-11	SWITCH, PUSH (ZOOM) S988	
56	3-690-245-01	SPRING, COMPRESSION	
57	3-690-244-01	TERMINAL, BATTERY	
58	*1-614-558-11	RD-13 BOARD	
59	*A-6715-254-A	CS-5 BOARD, COMPLETE	
60	*A-6711-610-A	CV-1 BOARD, COMPLETE	
61	*X-3690-136-1	CASE (REAR LID) ASSY, SHIELD, SG	
62	*X-3690-137-1	CASE (REAR LID) ASSY, SHIELD, V	
63	*3-691-166-01	PLATE, SHIELD, CV (WEST GERMANY ONLY)	
64	*X-3690-135-1	LID(UPPER) ASSY, SHIELD CASE, PM	
65	*A-6729-163-A	AZ-1 BOARD, COMPLETE	
66	*X-3691-104-1	PLATE ASSY, GROUND	

5-3. CASSETTE COMPARTMENT ASSEMBLY



No.	Part No.	Description	Remark
101	A-6751-221-A	CASSETTE COMPARTMENT BLOCKASSY	102-110, 112
102	3-642-491-00	SPRING, TENSION	
103	3-669-465-00	WASHER (1.5), STOPPER	
104	*3-690-210-01	HOLDER, STICK, DETECTION	
105	3-690-213-01	SPRING	
106	*3-681-528-00	DAMPER	
107	*3-690-227-01	LEVER (LEFT), PRESS	
108	*3-690-228-01	LEVER (RIGHT), PRESS	
109	*3-690-229-01	SPRING (LEFT)	
110	*3-690-230-01	SPRING (RIGHT)	
111	3-690-258-01	SHEET METAL, STRAP	
112	1-570-112-11	SWITCH, LEAF (CASSETTE IN) S901, (CASSETTE DOWN) S902	
113	*3-3690-101-1	CHASSIS ASSY, MECHANICAL	

5-4. PINCH ASSEMBLY

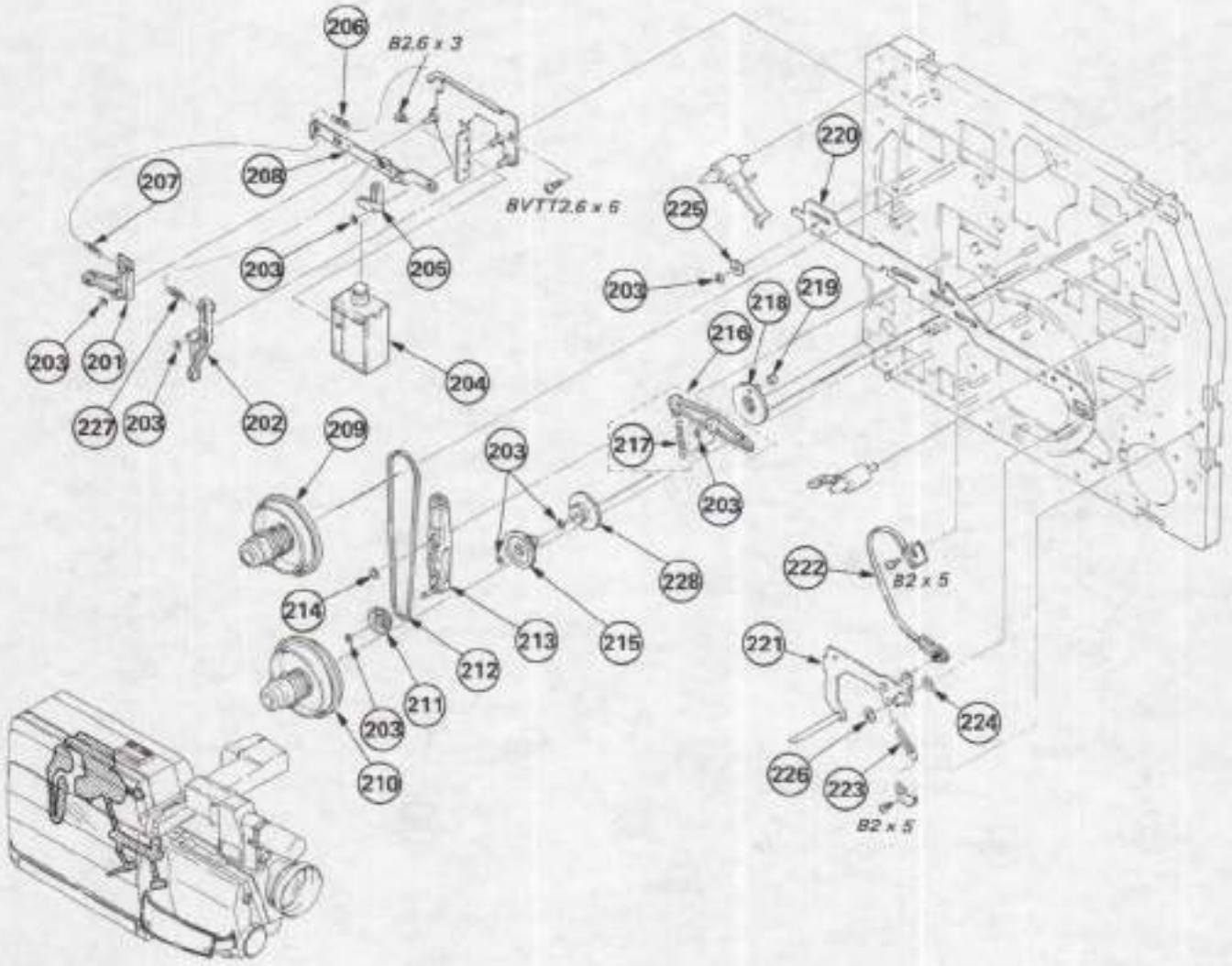


No.	Part No.	Description	Remark
151	⚠1-454-357-22	SOLENOID, PLUNGER (PINCH) PM902	
152	3-684-909-01	WASHER (S), STOPPER	
153	*X-3690-120-1	LEVER ASSY, PINCH PRESS	
154	*X-3690-122-1	LEVER (A) ASSY, PINCH PRESS	
156	3-683-539-00	SPRING, TENSION	
156	3-690-156-01	SPRING	
157	*X-3690-116-1	LEVER ASSY, PINCH LOAD	
158	3-690-232-01	LEVER (E), EJECT	
159	3-547-667-00	SPRING, TENSION	
160	X-3690-124-1	LEVER (G) ASSY, LOCK RELEASE	
161	3-480-175-00	SPRING, TENSION	
162	3-570-615-00	POLY-WASHER (DIA.1.2)	
163	3-681-622-00	NUT, ADJUSTMENT, CTL HEAD	
164	3-669-615-00	SPRING, COMPRESSION	
165	3-669-318-00	NUT, ADJUSTMENT, GUIDE	
166	8-825-560-20	HEAD, AC (RP-253-Z102A)	
167	3-681-621-00	SPRING	
168	8-825-561-30	HEAD, ERASE (EF 254-21B)	
169	*A-6725-431-A	FT-5 BOARD, COMPLETE	
170	*1-614-559-11	GS-1 BOARD	
171	3-690-163-01	ROLLER, LEVER, PINCH LOAD	
	3-690-163-11	ROLLER, LEVER, PINCH LOAD	
	3-690-163-21	ROLLER, LEVER, PINCH LOAD	
	3-690-163-31	ROLLER, LEVER, PINCH LOAD	
	3-690-163-41	ROLLER, LEVER, PINCH LOAD	
172	3-669-465-00	WASHER (1.5), STOPPER	
173	3-701-439-21	WASHER	
174	X-3690-114-1	PINCH ROLLER (L) ASSY	

* The pinch roller lever adjustment spacer 171 is an adjustment part, and there are different sizes. Refer to the adjustment method for details.

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

5-5. REEL ASSEMBLY

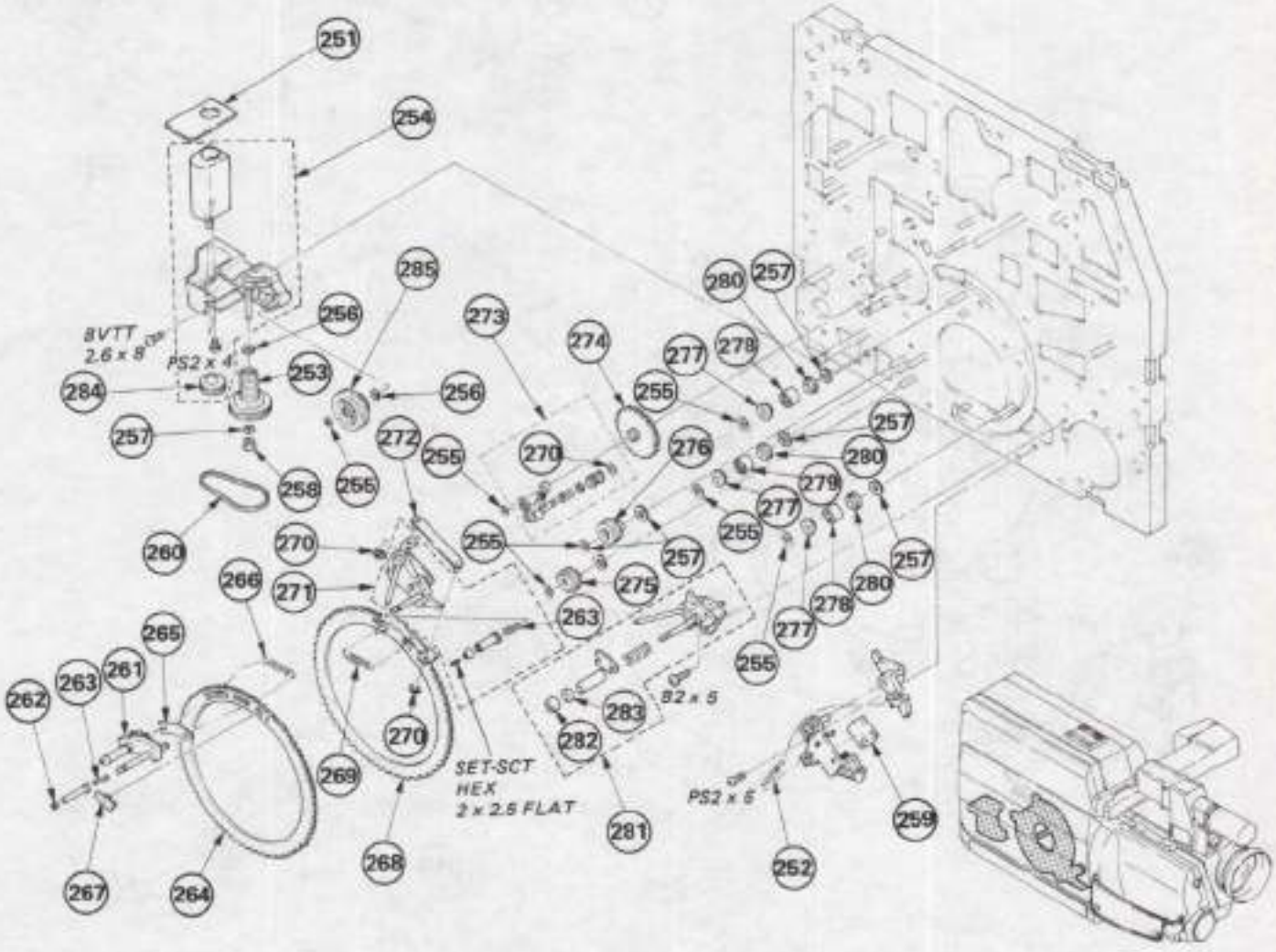


No.	Part No.	Description	Remark
201	A-6741-064-A	BRAKE BLOCK ASSY, TAKE-UP	
202	A-6741-063-A	BRAKE BLOCK ASSY, SUPPLY	
203	3-669-465-00	WASHER (1.5), STOPPER	
204	⚠1-454-391-11	SOLENOID, PLUNGER (BRAKE) PM901	
205	3-690-193-01	LEVER, FUNCTION, BRAKE	
206	3-305-903-00	SPRING, TENSION	
207	3-533-373-00	SPRING, TENSION	
208	3-690-307-01	SLIDER, BRAKE	
209	X-3690-117-1	TABLE (T) ASSY, REEL	
210	X-3690-118-1	TABLE (S) ASSY, REEL	
211	3-681-478-00	GEAR, FWD	
212	3-681-447-00	BELT, FWD	
213	X-3690-125-1	LEVER ASSY, FWD	
214	3-570-615-00	POLY-WASHER (DIA.1.2)	

No.	Part No.	Description	Remark
215	3-681-435-00	GEAR (B), DRIVING	
216	A-6741-065-A	BRAKE BLOCK ASSY, SOFT	217
217	3-492-141-XX	SPRING, TENSION	
218	3-690-162-01	GEAR (C), DRIVING	
219	3-681-443-00	ROLLER, DRIVING	
220	3-691-111-01	LEVER, PT FUNCTION	
221	X-3690-108-1	ARM (P) ASSY, TENSION REGULATOR	
222	X-3681-410-0	BAND ASSY, TENSION REGULATOR	
223	3-536-767-XX	SPRING, TENSION	
224	3-701-439-21	WASHER	
225	3-307-933-00	WASHER	
226	3-684-909-01	WASHER (S), STOPPER	
227	3-570-233-00	SPRING, TENSION	
228	3-681-434-00	GEAR (A), DRIVING	

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

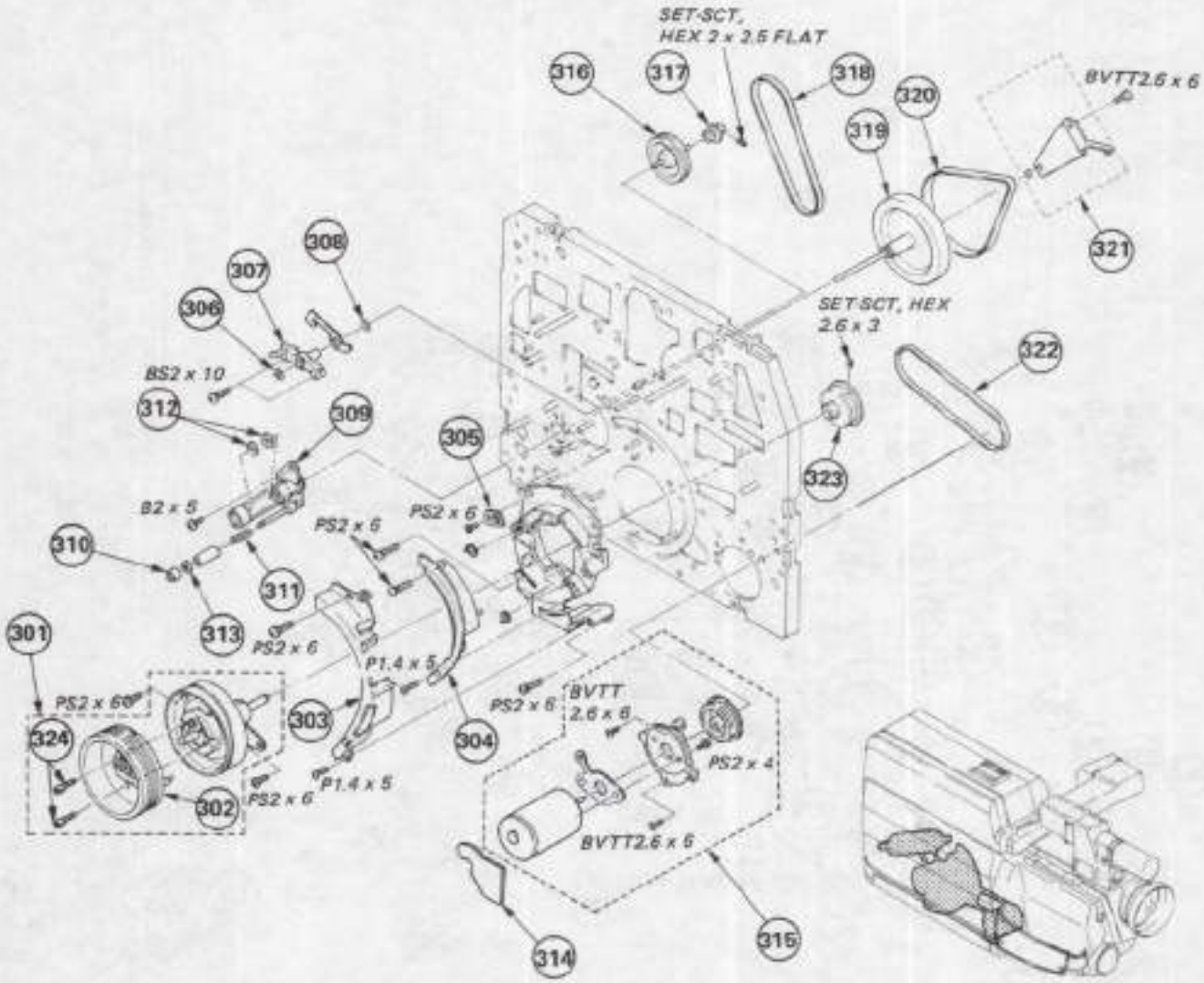
5-6. THREADING ASSEMBLY



No.	Part No.	Description	Remark
251	*1-614-557-11	LM-14 BOARD	
252	3-307-938-00	SPRING, TENSION	
253	X-3681-429-0	GEAR ASSY, WORM	
254	X-369-110-21	CASE ASSY, MOTOR	284
255	3-669-465-00	WASHER (1.5), STOPPER	
256	3-701-437-21	WASHER	
257	3-701-437-11	WASHER	
258	3-703-075-00	CAP 2, SHAFT	
259	1-554-581-00	SWITCH, MICRO (LOADING END) S983	
260	3-681-424-00	BELT, LOADING	
261	A-6750-176-A	BASE BLOCK ASSY, TG5	
262	3-681-410-01	NUT, TG6	
263	3-669-666-00	SPRING, COMPRESSION	
264	3-691-112-01	RING (T), LOADING	
265	3-691-114-01	SLIDER, POLYETHYLENE, TG5 BASE	
266	3-527-189-03	SPRING, TENSION	
267	*3-691-113-01	STOPPER, RING	
268	*X-3690-104-1	RING (S) ASSY, LOADING	

No.	Part No.	Description	Remark
269	3-564-935-00	SPRING, TENSION	
270	3-570-615-00	POLY-WASHER (DIA.1.2)	
271	A-6746-043-A	BASE BLOCK ASSY, TG4	263
272	*X-3690-105-1	JOINT (B) ASSY, TG4 BASE	
273	A-6747-244-A	ARM BLOCK ASSY, EG	270
274	3-681-437-00	GEAR (A), EJECT	
275	3-681-430-00	GEAR (S), LOADING	
276	3-681-431-00	GEAR (T), LOADING	
277	3-681-428-00	ROLLER (A), RING GUIDE	
278	3-681-429-00	ROLLER (B), RING GUIDE	
279	3-681-674-00	ROLLER (D), GUIDE, RING	
280	3-681-433-00	ROLLER (C), RING GUIDE	
281	A-6746-044-A	BASE BLOCK ASSY, TG1	282, 283
282	3-669-446-00	NUT, GUIDE, NO. 6	
283	3-679-910-00	FLANGE (S), GUIDE, NUMBER 6	
284	X-369-110-21	PULLEY, MOTOR, LOADING	
285	3-681-422-00	WHEEL, WORM	

5-7. DRUM ASSEMBLY

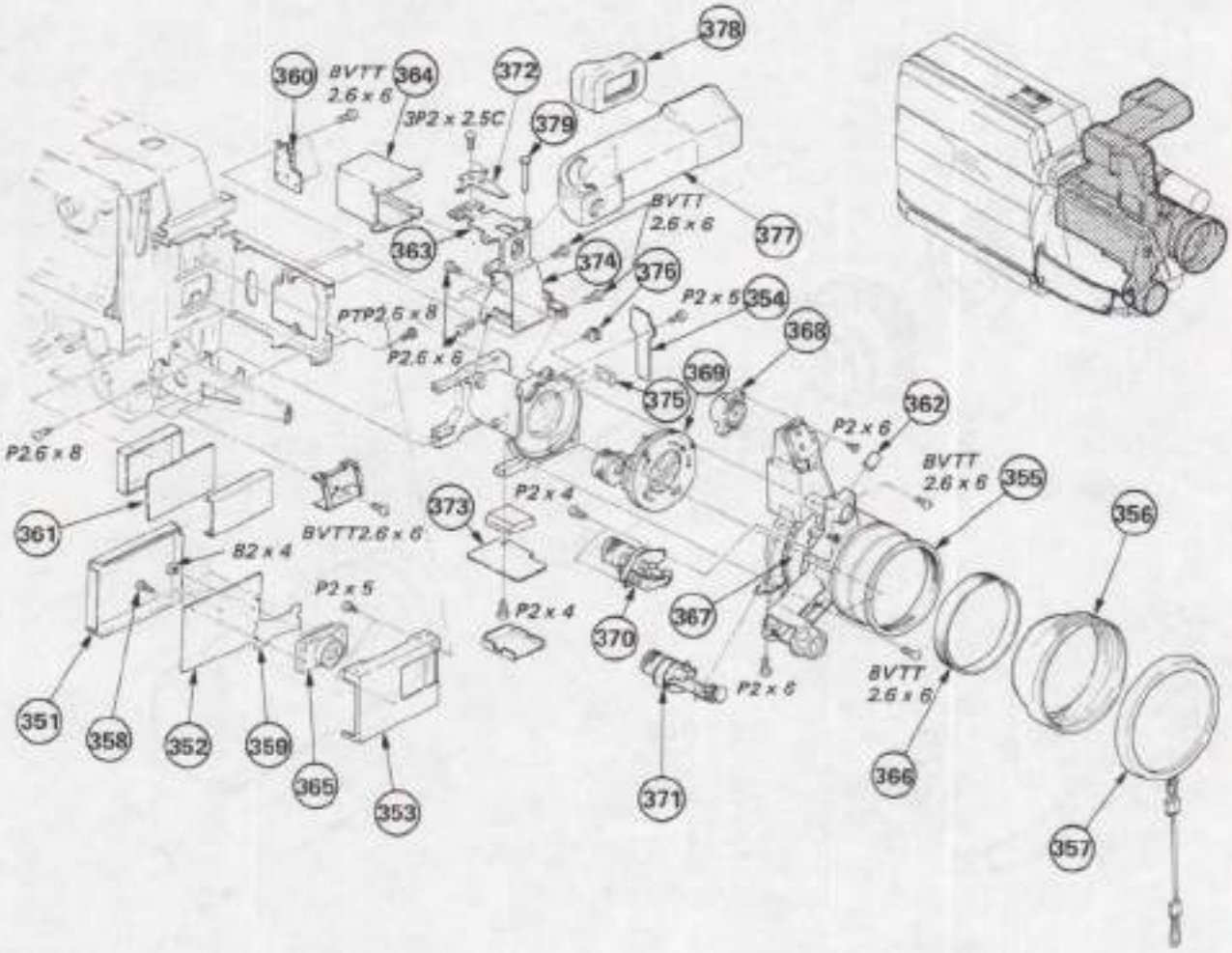


No.	Part No.	Description	Remark
301	A-6050-216-A	DRUM ASSY, ROTARY UPPER (DSH-44A-R)	302,323, 324
302	A-6762-154-A	DSR-44-R	
303	3-691-110-01	GUIDE (S-2), LOADING	
304	3-691-109-01	GUIDE (S-1), LOADING	
305	1-806-682-00	SENSOR, DEW CONDENSATION	
306	3-669-465-00	WASHER (1.5), STOPPER	
307	*X-3690-123-1	BEARING ASSY (P), PULLEY, RELAY	
308	3-701-437-01	WASHER	
309	X-3690-119-1	BEARING ASSY, CAPSTAN	
310	3-669-446-00	NUT, GUIDE, NO. 6	
311	3-669-666-00	SPRING, COMPRESSION	
312	3-681-448-00	RING (C), FELT	
313	3-684-972-01	FLANGE (UPPER), TG7	
314	*1-614-556-11	DM-6 BOARD	
315	X-3690-112-1	MOTOR ASSY, DRUM M902	
316	X-3681-411-0	PULLEY ASSY, RELAY	

No.	Part No.	Description	Remark
317	3-682-740-01	PULLEY (P), RELAY	
	3-682-740-11	PULLEY (P), RELAY	
	3-682-740-21	PULLEY (P), RELAY	
	3-682-740-31	PULLEY (P), RELAY	
	3-682-740-41	PULLEY (P), RELAY	
	3-682-740-51	PULLEY (P), RELAY	
	3-682-740-61	PULLEY (P), RELAY	
	3-682-740-71	PULLEY (P), RELAY	
	3-682-740-81	PULLEY (P), RELAY	
	3-682-740-91	PULLEY (P), RELAY	
318	3-681-445-00	BELT, RELAY	
319	*X-3681-429-0	FLYWHEEL ASSY	
320	3-681-444-00	BELT, CAPSTAN	
321	*A-6740-085-A	RETAINER ASSY, THRUST	
322	3-681-446-00	BELT, DRUM	
323	3-681-314-03	PULLEY	
324	3-681-308-00	BOLT (C2X6), MOLE, HEXAGON	

* The 317 relay pulley (B) is an adjustment part and there are different sizes. Refer to the adjustment method for details.

5-8. LENS BLOCK ASSEMBLY

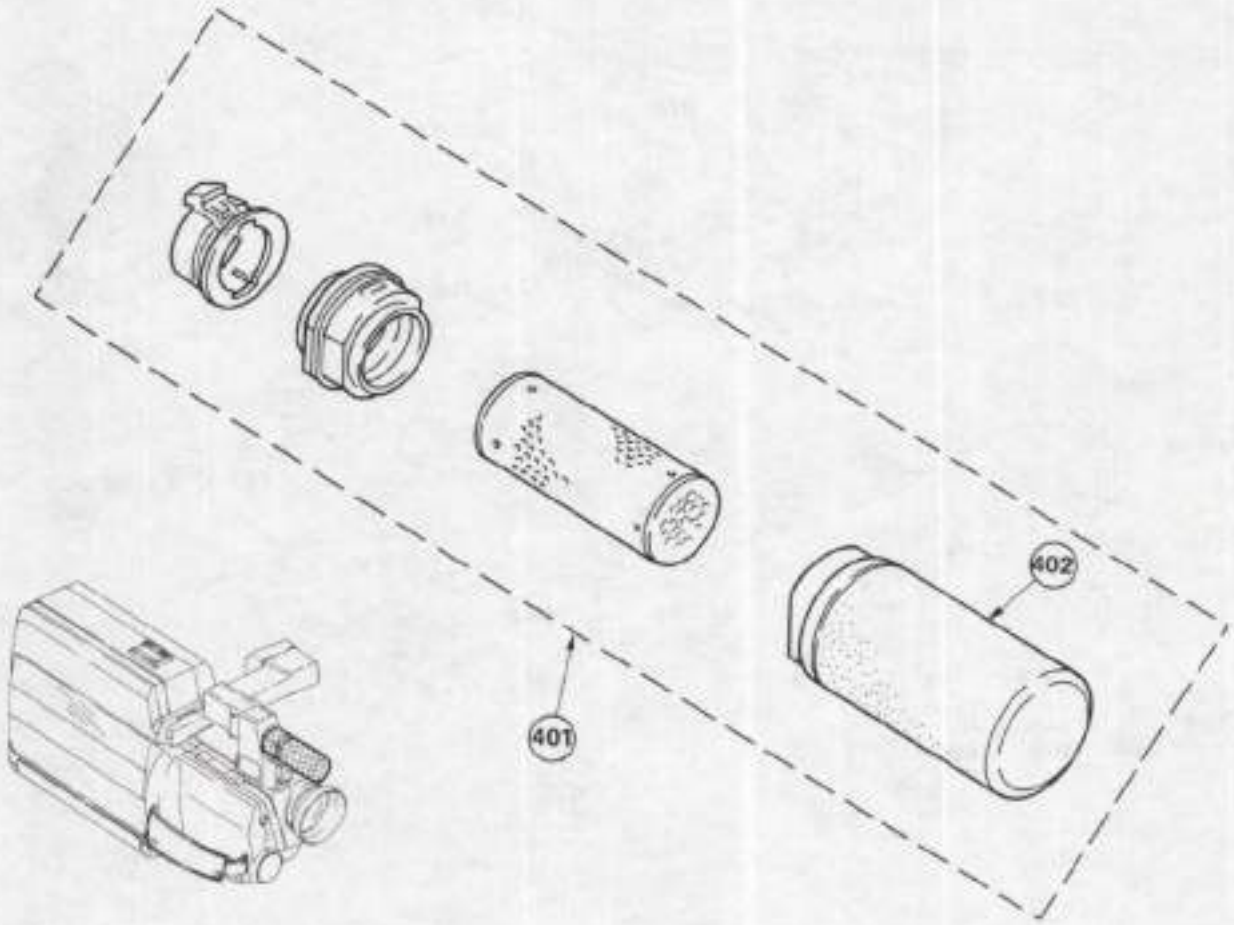


No.	Part No.	Description	Remark
351	*1-3690-133-1	LID ASSY, SHIELD CASE, CD	
352	*A-6725-453-A	CD-4 BOARD, COMPLETE	
353	*3-690-236-01	CASE (MAIN), SHIELD, CD	
354	*1-614-564-11	AF-6 BOARD	
355	1-547-156-11	LENS, ZOOM (VCL-1206YD)	
356	3-690-302-01	HOOD	
357	3-690-303-01	CAP, LENS	
358	3-686-811-01	SCREW (2X12), SMALL	
359	*3-690-235-01	SHEET, INSULATING, CCD	
360	1-570-151-11	SWITCH, SLIDE (W/B) S987	
361	⚠1-464-438-11	CONVERTER (5), DC-DC	
362	3-707-161-01	CAP, ZOOM LEVER	
363	*3-707-172-01	HINGE	
364	3-707-171-01	COVER, HINGE	
365	8-750-010-21	CCD IMAGER (IU021-K-AA)	

No.	Part No.	Description	Remark
366	3-707-160-01	RUBBER, FOCUS	
367	3-707-175-01	RING UNIT, ZOOM	
368	3-707-165-01	SCREEN UNIT, LED	
369	3-707-176-01	IRIS UNIT	
370	3-707-174-01	MOTOR UNIT, F	
371	3-707-173-01	MOTOR UNIT, Z	
372	3-707-163-01	CLAW, LOCK	
373	*A-6729-164-A	PA-5 BOARD, COMPLETE	
374	*3-707-178-01	HOLDER, HINGE	
375	*3-707-168-01	BRACKET, ADJUSTMENT, FB	
376	*3-707-164-01	BRACE, FB ADJUSTMENT	
377	3-707-169-01	FINDER	
378	3-707-170-01	EYE CUP	
379	*3-707-159-01	PIN, HINGE	

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

5-9. MICROPHONE ASSEMBLY



No.	Part No.	Description	Remark
401	8-814-210-00	MICROPHONE (C-2006)	
402	X-2536-702-1	SCREEN ASSY, WINDOW	

5-10. HARDWARE LIST

SCREW

7-621-559-20	SCREW +K 2.6X4
7-621-561-29	+K 2.6X8
7-621-772-00	SCREW +B 2X3
7-621-772-08	SCREW +B 2X3
7-621-772-18	SCREW +B 2X4
7-621-772-20	SCREW +B 2X5
7-621-775-00	SCREW +B 2.6X3
7-621-775-08	SCREW +B 2.6X3
7-621-775-20	SCREW +B 2.6X5
7-621-775-50	SCREW +B 2.6X10
7-621-905-85	SCREW, TOTSU P 2X6
7-621-905-85	SCREW, TOTSU P 2X12
7-628-253-05	SCREW +PS 2X4
7-628-253-25	SCREW +PS 2X5
7-628-253-35	SCREW +PS 2X8
7-628-253-45	SCREW +PS 2X10
7-682-544-04	SCREW +P 3X3
7-685-103-14	SCREW +P 2X5 TYPE2 NON-SLIT
7-685-133-14	SCREW +P 2.6X6 TYPE1
7-685-134-14	SCREW +P 2.6X8 TYPE2 NON-SLIT
7-685-233-19	SCREW +KTP 2.6X6 TYPE2NON-SLIT
7-685-790-04	SCREW +BVTT 2.6X4 (5)
7-685-862-01	SCREW +BVTT 2.6X6 (5)
7-685-793-04	SCREW +BVTT 2.6X8 (5)

SET-SCREW

7-621-712-55	SET-SCREW, SLOT 2.6X5CONE POINT
7-621-731-08	SET-SCT, HEX. 2X2.5, FLAT POINT

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

SPRING PIN

7-626-308-31	SPRING PIN 1.4X8
7-626-317-11	PIN, SPRING 2.5X6

PRECISION SCREW

7-627-651-27	SCREW, PRECISION +P 1.4X5
7-627-853-48	PRECISION SCREW +P 2X4 TYPE 3

WASHER

7-623-421-07	LW 2.6, TYPE B
7-623-954-01	WASHER 3.0, FIBER
7-688-002-03	W 2.6, SMALL

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

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

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

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

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

Ref.No	Part No.	Description		Remark
	*A-6711-610-A	CV-1 BOARD, COMPLETE		
		**********		
	*3-690-260-01	CASE (MAIN), SHIELD, V		
	*3-690-263-01	CASE (MAIN), SHIELD, SG		
		CAPACITOR		
C301	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C307	1-123-611-00	ELECT 1MF	20%	50V
C308	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C309	1-163-119-00	CERAMIC CHIP 120PF	5%	50V
C312	1-163-031-00	CERAMIC CHIP 0.01		50V
C314	1-163-130-00	CERAMIC CHIP 360PF	5%	50V
C316	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C317	1-163-031-00	CERAMIC CHIP 0.01MF		50V
C318	1-163-107-00	CERAMIC CHIP 39PF	5%	50V
C319	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C320	1-123-647-00	ELECT 47MF	20%	6.3V
C321	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C322	1-163-115-00	CERAMIC CHIP 82PF	5%	50V
C324	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C325	1-163-100-00	CERAMIC CHIP 20PF	5%	50V
C326	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C327	1-163-031-00	CERAMIC CHIP 0.01MF		50V
C328	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C329	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C330	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C332	1-124-224-00	ELECT 47MF	20%	6.3V
C333	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C334	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C335	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C336	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C337	1-124-235-11	ELECT 33MF	20%	16V
C338	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C339	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C340	1-124-255-00	ELECT 1MF	20%	50V
C341	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C342	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C343	1-124-255-00	ELECT 1MF	20%	50V
C344	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C345	1-124-229-00	ELECT 33MF	20%	6.3V
C348	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C349	1-163-257-00	CERAMIC CHIP 180PF	5%	50V
C350	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C351	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C354	1-163-031-00	CERAMIC CHIP 0.01MF		50V
C355	1-163-031-00	CERAMIC CHIP 0.01MF		50V
C356	1-163-088-00	CERAMIC CHIP 5PF	0.25PF	50V
C357	1-163-107-00	CERAMIC CHIP 39PF	5%	50V
C358	1-123-611-00	ELECT 1MF	20%	50V
C361	1-163-125-00	CERAMIC CHIP 220PF	5%	50V
C362	1-163-139-00	CERAMIC CHIP 560PF	5%	50V
C401	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C402	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C403	1-163-132-00	CERAMIC CHIP 430PF	5%	50V
C404	1-163-121-00	CERAMIC CHIP 150PF	5%	50V
C405	1-123-612-00	ELECT 2.2MF	20%	50V
C406	1-123-612-00	ELECT 2.2MF	20%	50V
C407	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C408	1-123-822-00	ELECT 47MF	20%	10V
C409	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C410	1-163-031-00	CERAMIC CHIP 0.01MF		50V
C411	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C412	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C413	1-163-115-00	CERAMIC CHIP 82PF	5%	50V
C414	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C415	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C416	1-163-031-00	CERAMIC CHIP 0.01MF		50V
C417	1-123-618-00	ELECT 22MF	20%	6.3V
C418	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C419	1-123-647-00	ELECT 47MF	20%	6.3V
C420	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C421	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C422	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C423	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C424	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C425	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C426	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C427	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C428	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C429	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C430	1-163-122-00	CERAMIC CHIP 160PF	5%	50V
C431	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C432	1-163-122-00	CERAMIC CHIP 160PF	5%	50V
C433	1-163-132-00	CERAMIC CHIP 430PF	5%	50V
C434	1-163-121-00	CERAMIC CHIP 150PF	5%	50V
C435	1-163-122-00	CERAMIC CHIP 160PF	5%	50V
C436	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C437	1-163-122-00	CERAMIC CHIP 160PF	5%	50V
C438	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C439	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C440	1-123-611-00	ELECT 1MF	20%	50V
C441	1-123-611-00	ELECT 1MF	20%	50V
C442	1-123-647-00	ELECT 47MF	20%	6.3V
C443	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C444	1-163-031-00	CERAMIC CHIP 0.01MF		50V
C445	1-163-031-00	CERAMIC CHIP 0.01MF		50V
C446	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C447	1-163-031-00	CERAMIC CHIP 0.01MF		50V
C448	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C449	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C450	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C452	1-163-141-00	CERAMIC CHIP 0.001MF	5%	50V
C453	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C454	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C455	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V

Ref.No	Part No.	Description			Remark
C456	1-124-221-11	ELECT	10MF	20%	6.3V
C457	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C458	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C459	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C460	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C461	1-123-617-00	ELECT	10MF	20%	6.3V
C462	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C463	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C464	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C465	1-123-647-00	ELECT	47MF	20%	6.3V
C466	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C468	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C469	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C470	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C471	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C472	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C473	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C474	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C475	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C551	1-123-618-00	ELECT	22MF	20%	6.3V
C552	1-163-103-00	CERAMIC CHIP	27PF	5%	50V
C553	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C554	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C555	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C556	1-123-618-00	ELECT	22MF	20%	6.3V
C557	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C558	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C559	1-163-075-00	CERAMIC CHIP	0.047MF		50V
C560	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C801	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C802	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C803	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C804	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C805	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C806	1-131-383-00	TANTALUM	10MF	20%	6.3V
C807	1-123-647-00	ELECT	47MF	20%	6.3V
C808	1-123-611-00	ELECT	1MF	20%	50V
C809	1-124-283-00	ELECT	4.7MF	20%	16V
C810	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C811	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C812	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C813	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C814	1-124-275-00	ELECT	2.2MF	20%	35V
C815	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C816	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C817	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C818	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C819	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C820	1-123-616-00	ELECT	4.7MF	20%	25V
C821	1-123-616-00	ELECT	4.7MF	20%	25V
C822	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C823	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C824	1-163-077-00	CERAMIC CHIP	0.1MF		50V

Ref.No	Part No.	Description			Remark
C825	1-131-387-00	TANTALUM	47MF	20%	6.3V
C826	1-123-613-00	ELECT	3.3MF	20%	50V
C831	1-163-031-00	CERAMIC CHIP	0.01MF		50V
C832	1-123-661-00	ELECT	100MF	20%	6.3V
C836	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C837	1-123-647-00	ELECT	47MF	20%	6.3V

CONNECTOR

CN301	*1-564-005-00	PIN, CONNECTOR 6P
CN302	*1-564-014-00	PIN, CONNECTOR 4P
CN401	*1-564-019-11	PIN, CONNECTOR 9P
CN402	*1-564-016-00	PIN, CONNECTOR 6P
CN403	*1-564-018-11	PIN, CONNECTOR 8P
CN551	*1-564-016-00	PIN, CONNECTOR 6P
CN801	*1-564-015-00	PIN, CONNECTOR 5P
CN802	*1-564-022-00	PIN, CONNECTOR 12P
CN803	*1-564-014-00	PIN, CONNECTOR 4P
CN804	*1-564-014-00	PIN, CONNECTOR 4P

TRIMAR

CT401	1-141-245-00	TRIMAR, CERAMIC
CT551	1-141-227-00	CAP, CERAMIC TRIMMER
CT552	1-141-245-00	TRIMAR, CERAMIC

DIODE

D302	8-719-100-03	DIODE 1S2835
D303	8-719-100-03	DIODE 1S2835
D304	8-719-100-03	DIODE 1S2835
D401	8-719-100-05	DIODE 1S2837
D402	8-712-500-00	DIODE 1T25
D403	8-719-100-05	DIODE 1S2837
D404	8-719-100-05	DIODE 1S2837
D801	8-719-101-23	DIODE 1SS123
D802	8-719-100-05	DIODE 1S2837
D803	8-719-101-23	DIODE 1SS123
D805	8-719-100-05	DIODE 1S2837
D810	8-719-100-05	DIODE 1S2837
D811	8-719-100-05	DIODE 1S2837
D813	8-719-101-23	DIODE 1SS123
D815	8-719-100-05	DIODE 1S2837

DELAY LINE

DL401	1-415-331-00	DELAY LINE

FILTER

FL401	1-235-485-11	FILTER, LOW PASS (YH)
FL402	1-235-456-11	FILTER, LOW PASS (YL-YH)

IC

IC301	8-759-801-62	IC LA7077
IC302	8-759-103-17	IC UPC1521HA
IC401	8-752-017-10	IC CX20171
IC402	8-752-012-70	IC CX20127

Ref.No	Part No.	Description	Remark
IC403	8-752-307-60	IC CXZ3076	
IC404	8-759-100-96	IC UPC4558G2	
IC551	8-759-801-59	IC LC5850-113	
IC552	8-759-103-14	IC UPD6104G	
IC801	8-759-908-12	IC CXZ0056	
IC802	8-759-201-00	IC TC4052BF	
IC803	8-759-103-03	IC UPD6107G	
IC804	8-759-100-94	IC UPC358G2	
		COIL	
L301	1-408-970-21	MICRO INDUCTOR 10UH	
L303	1-408-979-21	MICRO INDUCTOR 56UH	
L304	1-408-969-21	MICRO INDUCTOR 470UH	
L305	1-408-972-21	MICRO INDUCTOR 150H	
L306	1-408-982-11	MICRO INDUCTOR 100UH	
L307	1-408-981-21	MICRO INDUCTOR 82UH	
L308	1-408-967-21	MICRO INDUCTOR 5.6UH	
L309	1-408-976-21	MICRO INDUCTOR 33UH	
L401	1-408-987-21	MICRO INDUCTOR 330UH	
L403	1-408-976-21	MICRO INDUCTOR 33UH	
L404	1-408-450-11	MICRO INDUCTOR 47UH	
L405	1-408-987-21	MICRO INDUCTOR 330UH	
L406	1-408-987-21	MICRO INDUCTOR 330UH	
L407	1-408-987-21	MICRO INDUCTOR 330UH	
L408	1-408-976-21	MICRO INDUCTOR 33UH	
L409	1-408-976-21	MICRO INDUCTOR 33UH	
L410	1-408-970-21	MICRO INDUCTOR 10UH	
L551	1-408-982-11	MICRO INDUCTOR 100UH	
L552	1-408-976-21	MICRO INDUCTOR 33UH	
L801	1-408-960-21	MICRO INDUCTOR 1.5UH	
L802	1-408-960-21	MICRO INDUCTOR 1.5UH	
		LCD	
LCD551	1-807-115-11	LCD	
		IC LINK	
PS301	1-532-605-11	LINK, IC (ICP-N10)	
		TRANSISTOR	
Q301	8-729-100-76	TRANSISTOR 2SA812	
Q302	8-729-100-66	TRANSISTOR 2SC1623	
Q303	8-729-102-08	TRANSISTOR 2SC2223-F14	
Q304	8-729-122-63	TRANSISTOR 2SA1226	
Q305	8-729-122-63	TRANSISTOR 2SA1226	
Q306	8-729-100-76	TRANSISTOR 2SA812	
Q307	8-729-100-66	TRANSISTOR 2SC1623	
Q308	8-729-100-76	TRANSISTOR 2SA812	
Q309	8-729-100-66	TRANSISTOR 2SC1623	
Q311	8-729-901-01	TRANSISTOR DTC144EK	
Q312	8-729-900-99	TRANSISTOR DTA144WK	
Q313	8-729-901-01	TRANSISTOR DTC144EK	
Q314	8-729-199-92	TRANSISTOR 2SD999	
Q315	8-729-199-92	TRANSISTOR 2SD999	
Q316	8-729-901-01	TRANSISTOR DTC144EK	
Q317	8-729-901-47	TRANSISTOR DTA143EK	
Q318	8-729-100-66	TRANSISTOR 2SC1623	
Q319	8-729-901-47	TRANSISTOR DTA143EK	
Q321	8-729-100-66	TRANSISTOR 2SC1623	
Q322	8-729-100-76	TRANSISTOR 2SA812	
Q401	8-729-100-66	TRANSISTOR 2SC1623	
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	
Q406	8-729-100-76	TRANSISTOR 2SA812	
Q407	8-729-100-76	TRANSISTOR 2SA812	
Q408	8-729-100-76	TRANSISTOR 2SA812	
Q409	8-729-100-66	TRANSISTOR 2SC1623	
Q411	8-729-100-76	TRANSISTOR 2SA812	
Q412	8-729-109-44	TRANSISTOR 2SK94	
Q413	8-729-100-66	TRANSISTOR 2SC1623	
Q414	8-729-100-66	TRANSISTOR 2SC1623	
Q415	8-729-100-76	TRANSISTOR 2SA812	
Q416	8-729-100-76	TRANSISTOR 2SA812	
Q551	8-729-100-66	TRANSISTOR 2SC1623	
Q552	8-729-100-66	TRANSISTOR 2SC1623	
Q553	8-729-100-66	TRANSISTOR 2SC1623	
Q554	8-729-100-66	TRANSISTOR 2SC1623	
Q555	8-729-100-66	TRANSISTOR 2SC1623	
Q556	8-729-900-99	TRANSISTOR DTA144WK	
Q557	8-729-900-99	TRANSISTOR DTA144WK	
Q558	8-729-100-66	TRANSISTOR 2SC1623	
Q559	8-729-100-66	TRANSISTOR 2SC1623	
Q560	8-729-100-66	TRANSISTOR 2SC1623	
Q801	8-729-901-03	TRANSISTOR DTC144WK	
Q804	8-729-100-66	TRANSISTOR 2SC1623	
Q805	8-729-100-76	TRANSISTOR 2SA812	
Q807	8-729-100-66	TRANSISTOR 2SC1623	
Q808	8-729-100-76	TRANSISTOR 2SA812	
Q812	8-729-100-66	TRANSISTOR 2SC1623	
Q813	8-729-100-66	TRANSISTOR 2SC1623	
Q814	8-729-900-99	TRANSISTOR DTA144WK	
Q815	8-729-100-76	TRANSISTOR 2SA812	
Q816	8-729-900-99	TRANSISTOR DTA144WK	
		RESISTOR	
R304	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R305	1-216-029-00	METAL CHIP 150 5% 1/10W	
R306	1-216-036-00	METAL CHIP 300 5% 1/10W	
R307	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R308	1-216-048-00	METAL CHIP 910 5% 1/10W	
R310	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R312	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R313	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R314	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	

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

Ref.No	Part No.	Description				Remark
R315	1-216-001-00	METAL CHIP	10	5%	1/10W	
R316	1-216-047-00	METAL CHIP	820	5%	1/10W	
R317	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R318	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R319	1-216-034-00	METAL CHIP	240	5%	1/10W	
R320	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R321	1-216-043-00	METAL CHIP	560	5%	1/10W	
R322	1-216-047-00	METAL CHIP	820	5%	1/10W	
R323	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R324	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R325	1-216-041-00	METAL CHIP	470	5%	1/10W	
R326	1-216-041-00	METAL CHIP	470	5%	1/10W	
R327	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R328	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R329	1-216-041-00	METAL CHIP	470	5%	1/10W	
R330	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R331	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R332	1-216-041-00	METAL CHIP	470	5%	1/10W	
R333	1-215-463-00	METAL	66K	1%	1/6W	
R334	1-215-449-00	METAL	15K	1%	1/6W	
R335	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R336	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R337	1-216-029-00	METAL CHIP	150	5%	1/10W	
R338	1-215-389-00	METAL	47	1%	1/6W	
R340	1-216-017-00	METAL CHIP	47	5%	1/10W	
R341	1-216-033-00	METAL CHIP	220	5%	1/10W	
R344	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R345	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R353	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R354	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R357	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R358	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R360	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R361	1-216-037-00	METAL CHIP	330	5%	1/10W	
R362	1-216-037-00	METAL CHIP	330	5%	1/10W	
R363	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R364	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R365	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R366	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R367	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R368	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R369	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R370	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R373	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R374	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R375	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R376	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R377	1-216-043-00	METAL CHIP	560	5%	1/10W	
R378	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R382	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R383	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R384	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R385	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	

Ref.No	Part No.	Description				Remark
R386	1-216-035-00	METAL CHIP	270	5%	1/10W	
R387	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R388	1-216-295-00	METAL CHIP	0	5%	1/10W	
R389	1-216-043-00	METAL CHIP	560	5%	1/10W	
R401	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R402	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R403	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R404	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R405	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R406	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R407	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R408	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R409	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R410	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R411	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R412	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R413	1-216-295-00	METAL CHIP	0	5%	1/10W	
R414	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R415	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R416	1-216-035-00	METAL CHIP	270	5%	1/10W	
R417	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R418	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R419	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R420	1-216-045-00	METAL CHIP	680	5%	1/10W	
R421	1-216-037-00	METAL CHIP	330	5%	1/10W	
R422	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R423	1-216-037-00	METAL CHIP	330	5%	1/10W	
R424	1-216-045-00	METAL CHIP	680	5%	1/10W	
R425	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R426	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R427	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R428	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R429	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R430	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R431	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R432	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R433	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R434	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R435	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R436	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R437	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R438	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R439	1-216-033-00	METAL CHIP	220	5%	1/10W	
R440	1-216-033-00	METAL CHIP	220	5%	1/10W	
R441	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R442	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R443	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R444	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R445	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R446	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R447	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R448	1-216-123-11	METAL CHIP	1.2M	5%	1/10W	
R449	1-216-123-11	METAL CHIP	1.2M	5%	1/10W	

Ref.No	Part No.	Description				Remark
R450	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R451	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R452	1-216-061-00	METAL CHIP	22K	5%	1/10W	
R453	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R454	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R455	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R456	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R457	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R458	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R459	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R460	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R461	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R462	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R463	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R464	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R465	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R466	1-216-035-00	METAL CHIP	270	5%	1/10W	
R467	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R468	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R469	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R470	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R471	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R472	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R473	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R475	1-216-295-00	METAL CHIP	0	5%	1/10W	
R477	1-216-295-00	METAL CHIP	0	5%	1/10W	
R480	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R481	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R482	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R483	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R484	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R485	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R486	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R487	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R489	1-216-025-00	METAL CHIP	100	5%	1/10W	
R490	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R491	1-216-025-00	METAL CHIP	100	5%	1/10W	
R492	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R493	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R494	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R498	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R551	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R552	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R553	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R554	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R555	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R556	1-216-109-00	METAL CHIP	330K	5%	1/10W	
R557	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R558	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R559	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R561	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R562	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R564	1-216-097-00	METAL CHIP	100K	5%	1/10W	

Ref.No	Part No.	Description				Remark
R565	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R566	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R567	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R568	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R569	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R570	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R571	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R572	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R573	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R574	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R575	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R576	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R577	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R578	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R579	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R580	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R581	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R582	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R583	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R584	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R585	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R586	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R587	1-216-109-00	METAL CHIP	330K	5%	1/10W	
R801	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R802	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R803	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R804	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R805	1-216-087-00	METAL CHIP	39K	5%	1/10W	
R811	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R813	1-216-045-00	METAL CHIP	680	5%	1/10W	
R815	1-216-069-00	METAL CHIP	6.8K	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	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R819	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R820	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R821	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R822	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R827	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R828	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R829	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R830	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R831	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R832	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R833	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R837	1-216-021-00	METAL CHIP	68	5%	1/10W	
R838	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R841	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R842	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R843	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R844	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R845	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R846	1-216-097-00	METAL CHIP	100K	5%	1/10W	

Ref.No	Part No.	Description				Remark
R850	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R854	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R855	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R856	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R857	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R858	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R859	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R860	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R863	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R864	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R865	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R866	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R869	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R872	1-216-077-00	METAL CHIP	15K	5%	1/10W	

VARIABLE RESISTOR

RV303	1-226-711-00	RES, ADJ, SOLID	22K
RV304	1-226-711-00	RES, ADJ, SOLID	22K
RV305	1-226-711-00	RES, ADJ, SOLID	22K
RV306	1-226-707-00	RES, ADJ, SOLID	1K
RV307	1-226-753-00	RES, ADJ, SOLID	47K
RV308	1-226-707-00	RES, ADJ, SOLID	1K
RV309	1-226-707-00	RES, ADJ, SOLID	1K
RV310	1-228-891-00	RES, ADJ, METAL GLAZE	10K
RV401	1-226-710-00	RES, ADJ, SOLID	10K
RV402	1-226-703-00	RES, ADJ, METAL GLAZE	10K
RV403	1-226-753-00	RES, ADJ, SOLID	47K
RV404	1-226-703-00	RES, ADJ, METAL GLAZE	10K
RV405	1-226-710-00	RES, ADJ, SOLID	10K
RV406	1-226-710-00	RES, ADJ, SOLID	10K
RV407	1-226-703-00	RES, ADJ, METAL GLAZE	10K
RV408	1-226-708-00	RES, ADJ, SOLID	2.2K
RV409	1-228-894-00	RES, ADJ, METAL GLAZE	47K
RV410	1-226-714-00	RES, ADJ, SOLID	220K
RV801	1-226-711-00	RES, ADJ, SOLID	22K
RV802	1-226-711-00	RES, ADJ, SOLID	22K
RV803	1-226-710-00	RES, ADJ, SOLID	10K
RV804	1-226-709-00	RES, ADJ, SOLID	4.7K
RV805	1-226-709-00	RES, ADJ, SOLID	4.7K
RV807	1-226-711-00	RES, ADJ, SOLID	22K
RV808	1-226-711-00	RES, ADJ, SOLID	22K
RV809	1-226-711-00	RES, ADJ, SOLID	22K
RV810	1-226-711-00	RES, ADJ, SOLID	22K

SWITCH

S551	1-554-980-11	SWITCH, KEY BOARD
S552	1-554-980-11	SWITCH, KEY BOARD
S553	1-554-980-11	SWITCH, KEY BOARD
S554	1-554-980-11	SWITCH, KEY BOARD
S555	1-554-980-11	SWITCH, KEY BOARD
S556	1-554-980-11	SWITCH, KEY BOARD

Ref.No	Part No.	Description				Remark
		CRYSTAL				
X551	1-527-997-00	VIBRATOR, CRYSTAL				
		**********				
	*A-6715-254-A	CS-5 BOARD, COMPLETE				
		**********				
	*1-533-146-00	HOLDER, FUSE				
	*3-662-075-00	COVER, CONTROL				
		CAPACITOR				
C010	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V	
C011	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C012	1-123-611-00	ELECT	1MF	20%	50V	
C013	1-123-611-00	ELECT	1MF	20%	50V	
C018	1-163-081-00	CERAMIC CHIP	0.22MF		25V	
C019	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C020	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C021	1-131-408-00	TANTALUM	1MF	20%	25V	
C022	1-131-408-00	TANTALUM	1MF	20%	25V	
C023	1-131-408-00	TANTALUM	1MF	20%	25V	
C024	1-131-408-00	TANTALUM	1MF	20%	25V	
C025	1-163-105-00	CERAMIC CHIP	33PF	5%	50V	
C026	1-163-105-00	CERAMIC CHIP	33PF	5%	50V	
C027	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C028	1-123-617-00	ELECT	10MF	20%	16V	
C029	1-131-387-00	TANTALUM	47MF	10%	6.3V	
C031	1-130-023-00	FILM	0.0027MF	5%	100V	
C032	1-163-036-00	CERAMIC CHIP	0.047MF		50V	
C033	1-163-131-00	CERAMIC CHIP	390PF	5%	50V	
C034	1-163-036-00	CERAMIC CHIP	0.047MF		50V	
C036	1-163-015-00	CERAMIC CHIP	0.0033	10%	50V	
C037	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C038	1-163-025-00	CERAMIC CHIP	0.001MF		50V	
C040	1-131-361-00	TANTALUM	2.2MF	20%	16V	
C042	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V	
C043	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V	
C044	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V	
C045	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V	
C046	1-123-321-00	ELECT	220MF	20%	16V	
C201	1-136-161-00	MYLAR	0.047MF	10%	50V	
C202	1-136-164-00	MYLAR	0.082	5%	50V	
C203	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V	
C204	1-163-077-00	CERAMIC CHIP	0.1MF		50V	
C205	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V	
C206	1-163-031-00	CERAMIC CHIP	0.01MF		50V	
C207	1-124-225-00	ELECT	100MF	20%	6.3V	
C208	1-163-075-00	CERAMIC CHIP	0.047MF	10%	25V	
C209	1-123-611-00	ELECT	1MF	20%	50V	
C210	1-136-162-00	MYLAR	0.056	5%	50V	
C211	1-130-527-51	MYLAR	0.082MF	10%	50V	
C212	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V	

Ref.No	Part No.	Description		Remark
C213	1-163-033-00	CERAMIC CHIP 0.022MF	10%	25V
C214	1-123-617-00	ELECT 1Ω	20%	16V
C215	1-123-617-00	ELECT 1Ω	20%	16V
C216	1-163-075-00	CERAMIC CHIP 0.047MF	10%	25V
C217	1-123-612-00	ELECT 2.2MF	20%	50V
C218	1-123-618-00	ELECT 22MF	20%	6.3V
C219	1-123-612-00	ELECT 2.2MF	20%	50V
C220	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C221	1-123-647-00	ELECT 47MF	20%	6.3V
C222	1-123-617-00	ELECT 10MF	20%	16V
C501	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C502	1-163-074-00	CERAMIC CHIP 0.033MF	10%	25V
C503	1-163-074-00	CERAMIC CHIP 0.033MF	10%	25V
C504	1-124-225-00	ELECT 100MF	20%	6.3V
C505	1-123-661-00	ELECT 100MF	20%	6.3V
C506	1-123-611-00	ELECT 1MF	20%	50V
C507	1-163-139-00	CERAMIC CHIP 820PF	5%	50V
C508	1-123-617-00	ELECT 10MF	20%	16V
C509	1-123-646-00	ELECT 33MF	20%	6.3V
C510	1-123-616-00	ELECT 4.7MF	20%	25V
C511	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C512	1-123-617-00	ELECT 10MF	20%	16V
C513	1-123-611-00	ELECT 1MF	20%	50V
C514	1-123-617-00	ELECT 10MF	20%	16V
C515	1-123-646-00	ELECT 33MF	20%	6.3V
C516	1-123-617-00	ELECT 10MF	20%	16V
C517	1-163-141-00	CERAMIC CHIP 0.001MF	5%	50V
C520	1-163-014-00	CERAMIC CHIP 0.0027MF	10%	50V
C521	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C522	1-163-023-00	CERAMIC CHIP 0.015MF	10%	50V
C523	1-163-145-00	CERAMIC CHIP 0.0015MF	10%	50V
C524	1-106-180-00	MYLAR 0.0022MF	5%	100V
C525	1-124-255-00	ELECT 1MF	20%	50V
C526	1-163-213-00	CERAMIC CHIP 0.0022MF	5%	50V
C527	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C528	1-124-224-00	ELECT 47MF	20%	6.3V
C529	1-163-031-00	CERAMIC CHIP 0.01MF		50V
C530	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C531	1-124-233-00	ELECT 10MF	20%	16V
C532	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C533	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C534	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C535	1-102-074-00	CERAMIC 0.001MF		50V

CONNECTOR

CN001	*1-564-002-00	PIN, CONNECTOR 3P
CN002	*1-564-001-11	PIN, CONNECTOR 2P
CN003	*1-564-001-11	PIN, CONNECTOR 2P
CN004	*1-564-003-00	PIN, CONNECTOR 4P
CN005	*1-564-001-11	PIN, CONNECTOR 2P
CN006	*1-564-001-11	PIN, CONNECTOR 2P
CN007	*1-564-001-11	PIN, CONNECTOR 2P
CN008	*1-564-004-00	PIN, CONNECTOR 5P
CN009	*1-564-002-00	PIN, CONNECTOR 3P
CN010	*1-564-002-00	PIN, CONNECTOR 3P
CN011	*1-564-003-00	PIN, CONNECTOR 4P
CN012	*1-564-004-00	PIN, CONNECTOR 5P
CN013	*1-564-004-00	PIN, CONNECTOR 5P
CN014	*1-564-004-00	PIN, CONNECTOR 5P
CN015	*1-564-005-00	PIN, CONNECTOR 6P
CN016	*1-564-005-00	PIN, CONNECTOR 6P
CN017	*1-564-003-00	PIN, CONNECTOR 4P
CN018	*1-564-001-11	PIN, CONNECTOR 2P
CN019	*1-564-001-11	PIN, CONNECTOR 2P
CN201	*1-564-001-11	PIN, CONNECTOR 2P
CN202	*1-564-001-11	PIN, CONNECTOR 2P
CN203	*1-564-002-00	PIN, CONNECTOR 3P
CN204	*1-564-001-11	PIN, CONNECTOR 2P
CN502	*1-564-002-00	PIN, CONNECTOR 3P
CN503	*1-564-001-11	PIN, CONNECTOR 2P
CN504	*1-564-002-00	PIN, CONNECTOR 3P

DIODE

D010	8-719-200-27	DIODE E10DS2
D011	8-719-200-27	DIODE E10DS2
D012	8-719-200-27	DIODE E10DS2
D013	8-719-200-27	DIODE E10DS2
D014	8-719-200-27	DIODE E10DS2
D015	8-719-200-27	DIODE E10DS2
D016	8-719-200-27	DIODE E10DS2
D017	8-719-200-27	DIODE E10DS2
D018	8-719-100-03	DIODE 1S2835
D019	8-719-100-55	DIODE RD12E-B3
D021	8-719-910-69	DIODE HZ6C3L
D022	8-719-910-69	DIODE HZ6C3L
D023	8-719-910-61	DIODE HZ6A1L
D033	8-719-100-03	DIODE 1S2835
D034	8-719-100-03	DIODE 1S2835
D036	8-719-100-05	DIODE 1S2837
D201	8-719-200-27	DIODE E10DS2
D202	8-719-100-03	DIODE 1S2835
D501	8-719-200-27	DIODE E10DS2
D502	8-719-106-79	DIODE RD13M-B1
D503	8-719-106-79	DIODE RD13M-B1
D504	8-719-911-19	DIODE 1SS119

FUSE

F501	⚠1-532-350-11	FUSE, TIME LAG 4A 250V

IC

IC001	8-759-912-93	IC MB88501-301N
IC002	8-759-100-93	IC UPC393G2
IC003	8-759-800-72	IC LA7205
IC201	8-752-017-00	IC CXA0170
IC202	8-752-017-90	IC CXA0179

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

Ref.No	Part No.	Description	Remark
IC501	8-759-911-23	IC BA5115	
		JACK	
J501	1-507-886-00	JACK, POWER	
J502	1-507-885-11	JACK, MINIATURE	
J503	1-507-884-00	JACK, STEREO MINIATURE	
J504	1-507-885-21	JACK, MINIATURE	
		COIL	
L002	1-408-623-00	MICRO INDUCTOR 470UH	
L003	1-408-976-21	MICRO INDUCTOR 33UH	
L201	1-407-165-XX	MICRO INDUCTOR 47UH	
L501	1-408-962-11	MICRO INDUCTOR 2.2UH	
L502	1-410-252-11	MICRO INDUCTOR 1UH	
L503	1-410-252-11	MICRO INDUCTOR 1UH	
L504	1-407-177-XX	MICRO INDUCTOR 470UH	
L505	1-408-982-11	MICRO INDUCTOR 100UH	
L506	1-408-958-31	MICRO INDUCTOR 1UH	
L507	1-408-958-31	MICRO INDUCTOR 1UH	
		IC LINK	
PS001 ⚠	1-532-685-11	LINK, IC (ICP-N20)	
PS002 ⚠	1-532-637-11	LINK, IC (ICP-N25)	
PS003 ⚠	1-532-637-11	LINK, IC (ICP-N25)	
		TRANSISTOR	
Q006	8-729-100-66	TRANSISTOR 2SC1623	
Q007	8-729-100-76	TRANSISTOR 2SA812	
Q010 ⚠	8-729-245-83	TRANSISTOR 2SC2458	
Q011	8-729-100-66	TRANSISTOR 2SC1623	
Q015	8-729-100-66	TRANSISTOR 2SC1623	
Q017	8-729-901-46	TRANSISTOR DTA114YK	
Q018	8-729-100-76	TRANSISTOR 2SA812	
Q025	8-729-100-76	TRANSISTOR 2SA812	
Q026	8-729-100-76	TRANSISTOR 2SA812	
Q027	8-729-100-76	TRANSISTOR 2SA812	
Q028	8-729-100-76	TRANSISTOR 2SA812	
Q029	8-729-100-76	TRANSISTOR 2SA812	
Q030	8-729-100-76	TRANSISTOR 2SA812	
Q032	8-729-101-07	TRANSISTOR 2SB798	
Q033	8-729-100-66	TRANSISTOR 2SC1623	
Q034	8-729-102-78	TRANSISTOR 2SB962	
Q035	8-729-100-66	TRANSISTOR 2SC1623	
Q036	8-729-101-07	TRANSISTOR 2SB798	
Q037	8-729-100-66	TRANSISTOR 2SC1623	
Q038	8-729-102-78	TRANSISTOR 2SB962	
Q039	8-729-100-66	TRANSISTOR 2SC1623	
Q040	8-729-101-07	TRANSISTOR 2SB798	
Q041	8-729-101-07	TRANSISTOR 2SB798	
Q042 ⚠	8-729-199-92	TRANSISTOR 2SD999	
Q043 ⚠	8-729-199-92	TRANSISTOR 2SD999	
Q044	8-729-901-46	TRANSISTOR DTA114YK	
Q045	8-729-901-46	TRANSISTOR DTA114YK	
Q046	8-729-100-66	TRANSISTOR 2SC1623	
Q047	8-729-100-66	TRANSISTOR 2SC1623	
Q048	8-729-100-66	TRANSISTOR 2SC1623	
Q050	8-729-100-66	TRANSISTOR 2SC1623	
Q051	8-729-100-66	TRANSISTOR 2SC1623	
Q053	8-729-100-76	TRANSISTOR 2SA812	
Q055	8-729-901-46	TRANSISTOR DTA114YK	
Q058	8-729-100-66	TRANSISTOR 2SC1623	
Q060	8-729-100-66	TRANSISTOR 2SC1623	
Q061	8-729-100-66	TRANSISTOR 2SC1623	
Q062	8-729-109-44	TRANSISTOR 2SK94	
Q063	8-729-100-76	TRANSISTOR 2SA812	
Q064	8-729-100-76	TRANSISTOR 2SA812	
Q065	8-729-100-66	TRANSISTOR 2SC1623	
Q066	8-729-100-76	TRANSISTOR 2SA812	
Q067	8-729-100-76	TRANSISTOR 2SA812	
Q068	8-729-901-46	TRANSISTOR DTA114YK	
Q069	8-729-901-46	TRANSISTOR DTA114YK	
Q070	8-729-901-46	TRANSISTOR DTA114YK	
Q071	8-729-901-46	TRANSISTOR DTA114YK	
Q072	8-729-901-01	TRANSISTOR DTC144EK	
Q073	8-729-901-46	TRANSISTOR DTA114YK	
Q074	8-729-900-99	TRANSISTOR DTA144WK	
Q075	8-729-900-99	TRANSISTOR DTA144WK	
Q201	8-729-100-66	TRANSISTOR 2SC1623	
Q202	8-729-100-66	TRANSISTOR 2SC1623	
Q203	8-729-100-66	TRANSISTOR 2SC1623	
Q204	8-729-100-76	TRANSISTOR 2SA812	
Q205	8-729-100-76	TRANSISTOR 2SA812	
Q501	8-729-100-66	TRANSISTOR 2SC1623	
Q503	8-729-100-66	TRANSISTOR 2SC1623	
Q505	8-729-901-05	TRANSISTOR DTA124EK	
		RESISTOR	
R001	1-216-047-00	METAL CHIP 820 5% 1/10W	
R003	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R016	1-216-111-00	METAL CHIP 390K 5% 1/10W	
R017	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R018	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R019	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R024	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R032	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R033	1-216-105-00	METAL CHIP 220K 5% 1/10W	
R034	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R037	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R039	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R042	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R044	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R047	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R048	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R061	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R062	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R063	1-216-105-00	METAL CHIP 220K 5% 1/10W	

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

Ref.No	Part No.	Description				Remark
R071	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R072	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R073	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R074	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R075	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R076	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R078	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R079	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R080	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R081	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R082	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R083	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R084	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R085	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R088	1-247-113-00	CARBON	180	5%	1/4W	
R089	1-247-113-00	CARBON	180	5%	1/4W	
R090	1-247-113-00	CARBON	180	5%	1/4W	
R091	1-247-113-00	CARBON	180	5%	1/4W	
R096	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R099	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R101	1-216-084-00	METAL CHIP	30K	5%	1/10W	
R102	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R103	1-216-047-00	METAL CHIP	820	5%	1/10W	
R104	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R105	1-216-115-00	METAL CHIP	560K	5%	1/10W	
R106	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R108	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R109	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R110	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R111	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R112	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R113	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R115	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R116	1-216-045-00	METAL CHIP	680	5%	1/10W	
R117	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R118	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R121	1-216-115-00	METAL CHIP	560K	5%	1/10W	
R122	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R123	1-216-111-00	METAL CHIP	390K	5%	1/10W	
R124	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R125	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R128	1-216-041-00	METAL CHIP	470	5%	1/10W	
R129	1-216-041-00	METAL CHIP	470	5%	1/10W	
R130	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R132	1-247-123-00	CARBON	470	5%	1/4W	
R133	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R134	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R136	1-247-123-00	CARBON	470	5%	1/4W	
R139	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R141	1-216-045-00	METAL CHIP	680	5%	1/10W	
R143	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R144	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R146	1-216-093-00	METAL CHIP	68K	5%	1/10W	

Ref.No	Part No.	Description				Remark
R156	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R159	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R160	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R163	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R164	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R165	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R166	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R167	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R168	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R170	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R171	1-216-107-00	METAL CHIP	270K	5%	1/10W	
R172	1-216-045-00	METAL CHIP	680	5%	1/10W	
R173	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R174	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R175	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R176	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	
R177	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R178	1-216-103-00	METAL CHIP	180K	5%	1/10W	
R179	1-216-115-00	METAL CHIP	560K	5%	1/10W	
R180	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R181	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R182	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R183	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R184	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R185	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R186	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	
R187	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	
R188	1-216-109-00	METAL CHIP	330K	5%	1/10W	
R189	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	
R192	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R193	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R194	1-216-025-00	METAL CHIP	100	5%	1/10W	
R195	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R196	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R197	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R198	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R201	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R202	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R203	1-215-465-00	METAL	68K	1%	1/6W	
R204	1-215-471-00	METAL	120K	1%	1/6W	
R205	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R206	1-216-115-00	METAL CHIP	560K	5%	1/10W	
R207	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R208	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R209	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R210	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R211	1-216-111-00	METAL CHIP	390K	5%	1/10W	
R212	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R213	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R214	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R215	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R216	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R217	1-216-079-00	METAL CHIP	18K	5%	1/10W	

Ref.No	Part No.	Description				Remark
R218	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R219	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R220	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R221	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	
R222	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R223	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R224	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R225	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R226	1-217-636-00	WIREWOUND	0.47		1W	
R227	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R228	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R229	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R230	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R231	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R232	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R233	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R234	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R235	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R236	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R237	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R238	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R501	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R502	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R503	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R504	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R505	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R506	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R507	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R508	1-216-123-11	METAL CHIP	1.2M	5%	1/10W	
R509	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R510	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R511	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R512	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R513	1-216-024-00	METAL CHIP	91	5%	1/10W	
R514	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R515	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R516	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R517	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R518	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R525	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R526	1-216-309-00	METAL CHIP	5.6	5%	1/10W	
R527	1-216-001-00	METAL CHIP	10	5%	1/10W	
R529	1-216-076-00	METAL CHIP	13K	5%	1/10W	

VARIABLE RESISTOR

RV001	1-226-753-00	RES, ADJ, SOLID 47K	
RV002	1-226-753-00	RES, ADJ, SOLID 47K	
RV003	1-226-753-00	RES, ADJ, SOLID 47K	
RV004	1-226-753-00	RES, ADJ, SOLID 47K	
RV005	1-226-711-00	RES, ADJ, SOLID 22K	
RV201	1-226-772-00	RES, ADJ, METAL GLAZE 4.7K	
RV202	1-228-760-00	RES, ADJ, METAL GLAZE 47K	
RV501	1-226-770-00	RES, ADJ, METAL GLAZE 470	

Ref.No	Part No.	Description	Remark
RV502	1-226-709-00	RES, ADJ, SOLID 4.7K	

SWITCH

S501	1-554-364-00	SWITCH, SLIDE	

TRANSFORMER

T501	1-433-294-11	TRANSFORMER, BIAS OSCILLATION	

CRYSTAL

X001	1-567-192-11	OSCILLATOR, CERAMIC	

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*A-6725-453-A CD-4 BOARD, COMPLETE

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The CCD imager block (IC601, IC701) is not mounted on the mounted CD-4 board and mounted TR-18 board which are supplied as service parts.
When replacing the CD-4 and TR-18 boards, remove the CCD imager block from the old boards and mount on the new boards.

CAPACITOR

C601	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C602	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C603	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C604	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C605	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C606	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C607	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C609	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C610	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C611	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C612	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C613	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C614	1-135-092-21	TANTAL, CHIP	3.3MF	20%	16V
C615	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C616	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C617	1-124-233-00	ELECT	10MF	20%	16V
C624	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C625	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C626	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C627	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C628	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C629	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C630	1-124-233-00	ELECT	10MF	20%	16V
C632	1-163-235-00	CERAMIC CHIP	22PF	5%	50V
C633	1-163-243-00	CERAMIC CHIP	47PF	5%	50V
C634	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C635	1-135-092-21	TANTAL, CHIP	3.3MF	20%	16V
C636	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C637	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C638	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C639	1-135-083-00	TANTAL, CHIP	0.47MF	20%	25V
C640	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C641	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C642	1-135-091-00	TANTAL, CHIP	1MF	20%	16V
C643	1-135-091-00	TANTAL, CHIP	1MF	20%	16V

Ref.No	Part No.	Description		Remark
C644	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C645	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C646	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C647	1-135-083-00	TANTAL. CHIP 0.47MF	20%	25V
C648	1-124-233-00	ELECT 10MF	20%	16V
C651	1-135-083-00	TANTAL. CHIP 0.47MF	20%	25V
C654	1-124-169-00	ELECT 100MF	20%	10V
C655	1-124-168-00	ELECT 100MF	20%	16V
C656	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C746	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C747	1-163-077-00	CERAMIC CHIP 0.1MF		50V

DIODE

D603	8-719-100-05	DIODE 1S2837
D604	8-719-100-03	DIODE 1S2835
D605	8-719-951-13	DIODE HZ5CLL
D606	8-719-100-05	DIODE 1S2837
D607	8-719-100-03	DIODE 1S2835
D609	8-719-100-03	DIODE 1S2835
D610	8-719-100-03	DIODE 1S2835
D611	8-719-100-03	DIODE 1S2835
D612	8-719-101-23	DIODE 1SS123
D614	8-719-100-03	DIODE 1S2835
D615	8-719-100-03	DIODE 1S2835

IC

IC601	8-750-010-22	IC CCD IMAGER (ICX018-K1AA)
IC602	8-759-000-26	IC MM1D026CP1
IC603	8-759-953-61	IC SN75361AP
IC604	8-759-953-61	IC SN75361AP

COIL

L601	1-408-960-21	MICRO INDUCTOR 1.5UH
L602	1-408-960-21	MICRO INDUCTOR 1.5UH
L702	1-408-960-21	MICRO INDUCTOR 1.5UH

TRANSISTOR

Q601	8-729-102-08	TRANSISTOR 2SC2223-F14
Q602	8-729-100-66	TRANSISTOR 2SC1623
Q603	8-729-100-66	TRANSISTOR 2SC1623
Q604	8-729-122-63	TRANSISTOR 2SA1226
Q605	8-729-102-08	TRANSISTOR 2SC2223-F14
Q606	8-729-100-66	TRANSISTOR 2SC1623
Q607	8-729-100-76	TRANSISTOR 2SA812
Q608	8-729-100-76	TRANSISTOR 2SA812
Q609	8-729-100-66	TRANSISTOR 2SC1623
Q610	8-729-100-76	TRANSISTOR 2SA812
Q611	8-729-100-76	TRANSISTOR 2SA812
Q612	8-729-100-66	TRANSISTOR 2SC1623
Q613	8-729-100-66	TRANSISTOR 2SC1623

Ref.No	Part No.	Description			Remark
		RESISTOR			
R601	1-216-025-00	METAL CHIP 100	5%	1/10W	
R602	1-216-067-00	METAL CHIP 5.6K	5%	1/10W	
R603	1-216-059-00	METAL CHIP 2.7K	5%	1/10W	
R604	1-216-075-00	METAL CHIP 12K	5%	1/10W	
R605	1-216-091-00	METAL CHIP 56K	5%	1/10W	
R606	1-216-089-00	METAL CHIP 47K	5%	1/10W	
R607	1-216-067-00	METAL CHIP 5.6K	5%	1/10W	
R608	1-216-009-00	METAL CHIP 22	5%	1/10W	
R609	1-216-009-00	METAL CHIP 22	5%	1/10W	
R610	1-216-009-00	METAL CHIP 22	5%	1/10W	
R611	1-216-097-00	METAL CHIP 100K	5%	1/10W	
R612	1-216-097-00	METAL CHIP 100K	5%	1/10W	
R613	1-216-097-00	METAL CHIP 100K	5%	1/10W	
R614	1-216-081-00	METAL CHIP 22K	5%	1/10W	
R615	1-216-295-00	METAL CHIP 0	5%	1/10W	
R616	1-216-065-00	METAL CHIP 4.7K	5%	1/10W	
R617	1-216-049-00	METAL CHIP 1K	5%	1/10W	
R618	1-216-049-00	METAL CHIP 1K	5%	1/10W	
R619	1-216-025-00	METAL CHIP 100	5%	1/10W	
R625	1-216-055-00	METAL CHIP 1.8K	5%	1/10W	
R626	1-216-071-00	METAL CHIP 8.2K	5%	1/10W	
R627	1-216-061-00	METAL CHIP 1.2K	5%	1/10W	
R628	1-216-071-00	METAL CHIP 8.2K	5%	1/10W	
R630	1-216-075-00	METAL CHIP 12K	5%	1/10W	
R631	1-216-089-00	METAL CHIP 47K	5%	1/10W	
R632	1-216-121-00	METAL CHIP 1M	5%	1/10W	
R633	1-216-081-00	METAL CHIP 22K	5%	1/10W	
R634	1-216-043-00	METAL CHIP 560	5%	1/10W	
R635	1-216-097-00	METAL CHIP 100K	5%	1/10W	
R636	1-216-097-00	METAL CHIP 100K	5%	1/10W	
R637	1-216-097-00	METAL CHIP 100K	5%	1/10W	
R638	1-216-097-00	METAL CHIP 100K	5%	1/10W	
R640	1-216-081-00	METAL CHIP 22K	5%	1/10W	
R641	1-216-063-00	METAL CHIP 3.9K	5%	1/10W	
R642	1-216-049-00	METAL CHIP 1K	5%	1/10W	
R643	1-216-055-00	METAL CHIP 1.8K	5%	1/10W	
R644	1-216-055-00	METAL CHIP 1.8K	5%	1/10W	
R645	1-216-063-00	METAL CHIP 3.9K	5%	1/10W	
R646	1-216-049-00	METAL CHIP 1K	5%	1/10W	
R647	1-216-055-00	METAL CHIP 1.8K	5%	1/10W	

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*A-6725-438-A PM-2 BOARD, COMPLETE
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3-686-857-01 HOLDER, VF-LED

CAPACITOR

C702	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C703	1-123-661-00	ELECT 100MF	20%	6.3V
C704	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C705	1-123-647-00	ELECT 47MF	20%	6.3V

Ref.No	Part No.	Description			Remark
C706	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C707	1-123-820-00	ELECT	47MF	20%	6.3V
C708	1-123-647-00	ELECT	33MF	20%	16V
C709	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C710	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C711	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C712	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C713	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C715	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C716	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C717	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C718	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C719	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C720	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C721	1-123-616-00	ELECT	4.7MF	20%	25V
C722	1-123-616-00	ELECT	4.7MF	20%	25V
C723	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C724	1-124-256-00	ELECT	1.5MF	20%	50V
C725	1-123-617-00	ELECT	10MF	20%	16V
C726	1-124-245-00	ELECT	4.7MF	20%	16V
C727	1-124-224-00	ELECT	47MF	20%	6.3V
C728	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C731	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C732	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C745	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C758	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C759	1-123-645-00	ELECT	33MF	20%	10V
C760	1-123-645-00	ELECT	33MF	20%	10V
C761	1-131-380-00	TANTALUM	33MF	20%	10V
C762	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C763	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C764	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C765	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C774	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C775	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C776	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C777	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C778	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C779	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C780	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C781	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C783	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C790	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C791	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C793	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C794	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C795	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V

CONNECTOR

CN701	*1-564-001-11	PIN, CONNECTOR	2P
CN703	*1-564-018-11	PIN, CONNECTOR	8P
CN704	*1-564-011-11	PIN, CONNECTOR	12P
CN709	*1-564-001-11	PIN, CONNECTOR	2P

Ref.No	Part No.	Description	Remark
DIODE			
D701	8-719-100-05	DIODE 1S2837	
D702	8-719-100-05	DIODE 1S2837	
D704	8-719-812-41	DIODE TLR124	
D705	8-719-100-05	DIODE 1S2837	
IC			
IC703	8-759-908-09	IC CX20053	
IC704	8-752-015-10	IC CX20151	
IC705	8-752-303-90	IC CX23039	
IC706	8-759-908-15	IC TL431CLPB	
COIL			
L701	1-408-960-21	MICRO INDUCTOR 1.5UH	
L707	1-408-960-21	MICRO INDUCTOR 1.5UH	
TRANSISTOR			
Q702	8-729-100-66	TRANSISTOR 2SC1623	
Q703	8-729-100-66	TRANSISTOR 2SC1623	
Q704	8-729-100-66	TRANSISTOR 2SC1623	
Q705	8-729-900-53	TRANSISTOR DTC114EK	
Q706	8-729-900-53	TRANSISTOR DTC114EK	
Q707	8-729-900-53	TRANSISTOR DTC114EK	
Q708	8-729-109-44	TRANSISTOR 2SK94	
Q709	8-729-109-44	TRANSISTOR 2SK94	
Q710	8-729-109-44	TRANSISTOR 2SK94	
Q712	8-729-100-66	TRANSISTOR 2SC1623	
Q713	8-729-100-66	TRANSISTOR 2SC1623	
Q714	8-729-100-66	TRANSISTOR 2SC1623	
Q715	8-729-100-66	TRANSISTOR 2SC1623	
Q716	8-729-100-66	TRANSISTOR 2SC1623	
Q719	8-729-100-66	TRANSISTOR 2SC1623	
Q720	8-729-100-66	TRANSISTOR 2SC1623	
RESISTOR			
R713	1-216-035-00	METAL CHIP 270 5%	1/10W
R714	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R715	1-216-049-00	METAL CHIP 1K 5%	1/10W
R716	1-216-081-00	METAL CHIP 22K 5%	1/10W
R717	1-216-049-00	METAL CHIP 1K 5%	1/10W
R718	1-216-073-00	METAL CHIP 10K 5%	1/10W
R719	1-216-077-00	METAL CHIP 15K 5%	1/10W
R720	1-216-085-00	METAL CHIP 33K 5%	1/10W
R723	1-216-035-00	METAL CHIP 270 5%	1/10W
R724	1-216-067-00	METAL CHIP 5.6K 5%	1/10W
R725	1-216-035-00	METAL CHIP 270 5%	1/10W
R726	1-216-067-00	METAL CHIP 5.6K 5%	1/10W
R727	1-216-035-00	METAL CHIP 270 5%	1/10W
R728	1-216-067-00	METAL CHIP 5.6K 5%	1/10W
R729	1-216-073-00	METAL CHIP 10K 5%	1/10W
R730	1-216-089-00	METAL CHIP 47K 5%	1/10W
R733	1-216-073-00	METAL CHIP 10K 5%	1/10W

Ref.No	Part No.	Description				Remark
R734	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R735	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R736	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R737	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R738	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R743	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R752	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R761	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R762	1-216-033-00	METAL CHIP	220	5%	1/10W	
R763	1-216-033-00	METAL CHIP	220	5%	1/10W	
R764	1-216-033-00	METAL CHIP	220	5%	1/10W	
R765	1-216-033-00	METAL CHIP	220	5%	1/10W	
R766	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R767	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R768	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R769	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R770	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R771	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R773	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R774	1-216-025-00	METAL CHIP	100	5%	1/10W	
R775	1-216-218-00	METAL CHIP	6.8K	5%	1/8W	
R776	1-216-222-00	METAL CHIP	10K	5%	1/8W	
R781	1-216-033-00	METAL CHIP	220	5%	1/10W	
R782	1-216-033-00	METAL CHIP	220	5%	1/10W	
R783	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R784	1-216-087-00	METAL CHIP	39K	5%	1/10W	
R785	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R786	1-216-033-00	METAL CHIP	220	5%	1/10W	
R787	1-216-033-00	METAL CHIP	220	5%	1/10W	
R791	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R792	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R793	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R794	1-216-093-00	METAL CHIP	68K	5%	1/10W	

VARIABLE RESISTOR

RV701	1-230-679-11	RES, ADJ, CARBON 10K	
RV702	1-230-067-00	RES, ADJ, CARBON 22K	
RV703	1-230-067-00	RES, ADJ, CARBON 22K	
RV704	1-230-679-11	RES, ADJ, CARBON 10K	
RV705	1-230-679-11	RES, ADJ, CARBON 10K	
RV706	1-230-067-00	RES, ADJ, CARBON 22K	
RV707	1-230-067-00	RES, ADJ, CARBON 22K	
RV708	1-230-067-00	RES, ADJ, CARBON 22K	
RV709	1-230-067-00	RES, ADJ, CARBON 22K	
RV710	1-230-067-00	RES, ADJ, CARBON 22K	
RV711	1-230-067-00	RES, ADJ, CARBON 22K	
RV712	1-230-067-00	RES, ADJ, CARBON 22K	
RV713	1-230-067-00	RES, ADJ, CARBON 22K	
RV714	1-230-067-00	RES, ADJ, CARBON 22K	
RV715	1-230-067-00	RES, ADJ, CARBON 22K	
RV716	1-230-067-00	RES, ADJ, CARBON 22K	
RV717	1-230-067-00	RES, ADJ, CARBON 22K	
RV718	1-230-067-00	RES, ADJ, CARBON 22K	

Ref.No	Part No.	Description	Remark
RV719	1-230-067-00	RES, ADJ, CARBON 22K	

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*A-6725-439-A TR-18 BOARD, COMPLETE

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The CCD imager block (IC601, IC701) is not mounted on the mounted CD-4 board and mounted TR-18 board which are supplied as service parts.
When replacing the CD-4 and TR-18 boards, remove the CCD imager block from the old boards and mount on the new boards.

CAPACITOR

C701	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C748	1-123-661-00	ELECT	100MF	20%	6.3V
C749	1-124-169-00	ELECT	100MF	20%	10V
C752	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C753	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C754	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C755	1-123-647-00	ELECT	47MF	20%	6.3V
C756	1-123-661-00	ELECT	100MF	20%	6.3V
C766	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C767	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C769	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C770	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C792	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C796	1-163-109-00	CERAMIC CHIP	47PF	5%	50V

CONNECTOR

CN705	*1-564-020-00	PIN, CONNECTOR 10P
CN706	*1-564-019-11	PIN, CONNECTOR 9P
CN708	*1-564-013-00	PIN, CONNECTOR 3P

DIODE

D703	8-719-100-03	DIODE 1S2835

IC

IC701	8-750-010-22	IC CCD IMAGER (IU018-K1AA)
IC702	8-759-913-03	IC CX23047A

COIL

L703	1-408-956-00	COIL, CHOKE
L704	1-408-956-00	COIL, CHOKE
L705	1-408-960-21	MICRO INDUCTOR 1.5UH
L706	1-408-960-21	MICRO INDUCTOR 1.5UH

TRANSISTOR

Q701	8-729-100-76	TRANSISTOR 2SA812

RESISTOR

R702	1-216-097-00	METAL CHIP	100K	5%	1/10W
R705	1-216-033-00	METAL CHIP	220	5%	1/10W
R709	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R710	1-216-097-00	METAL CHIP	100K	5%	1/10W
R711	1-216-097-00	METAL CHIP	100K	5%	1/10W
R712	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R739	1-216-073-00	METAL CHIP	10K	5%	1/10W
R740	1-216-061-00	METAL CHIP	3.3K	5%	1/10W

Ref.No	Part No.	Description				Remark
R745	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R751	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R757	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R758	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R760	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R772	1-216-025-00	METAL CHIP	100	5%	1/10W	
R799	1-216-097-00	METAL CHIP	100K	5%	1/10W	
		CRYSTAL				
X701	1-567-414-11	OSCILLATOR, CRYSTAL				
		**********				
	*A-6725-431-A	FT-5 BOARD, COMPLETE				
		**********				
		CAPACITOR				
C901	1-136-166-00	MYLAR	0.12MF		5%	50V
C902	1-163-079-00	CERAMIC CHIP	0.039MF		10%	25V
C903	1-163-020-00	CERAMIC CHIP	0.0082MF		10%	50V
C904	1-163-077-00	CERAMIC CHIP	0.1MF			50V
C905	1-163-020-00	CERAMIC CHIP	0.0082MF		10%	50V
		TRANSISTOR				
Q901	8-729-100-66	TRANSISTOR 2SC1623				
Q902	8-729-100-66	TRANSISTOR 2SC1623				
		RESISTOR				
R901	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R902	1-216-298-00	METAL CHIP	2.2	5%	1/10W	
R903	1-216-083-00	METAL CHIP	27K	5%	1/10W	
		**********				
	*A-6729-163-A	AZ-1 BOARD, COMPLETE				
		**********				
		CAPACITOR				
C1020	1-123-622-00	ELECT	22MF		20%	16V
C1021	1-123-611-00	ELECT	1MF		20%	50V
C1022	1-123-616-00	ELECT	4.7MF		20%	25V
C1023	1-123-616-00	ELECT	4.7MF		20%	25V
C1024	1-123-617-00	ELECT	10MF		20%	16V
C1025	1-124-168-00	ELECT	100MF		20%	16V
C1026	1-123-617-00	ELECT	10MF		20%	16V
C1027	1-124-168-00	ELECT	100MF		20%	16V
C1028	1-124-168-00	ELECT	100MF		20%	16V
C1029	1-123-820-00	ELECT	33MF		20%	10V
C1030	1-163-011-00	CERAMIC CHIP	0.0015MF		10%	50V
C1031	1-163-021-00	CERAMIC CHIP	0.01MF		10%	50V
C1032	1-163-104-00	CERAMIC CHIP	30PF		5%	50V
C1033	1-163-104-00	CERAMIC CHIP	30PF		5%	50V
C1034	1-163-021-00	CERAMIC CHIP	0.01MF		10%	50V
C1035	1-163-021-00	CERAMIC CHIP	0.01MF		10%	50V
C1036	1-163-021-00	CERAMIC CHIP	0.01MF		10%	50V
C1041	1-124-168-00	ELECT	100MF		20%	16V
		CONNECTOR				
CN1003	*1-564-001-11	PIN, CONNECTOR 2P				
CN1004	*1-564-001-11	PIN, CONNECTOR 2P				
CN1005	*1-564-001-11	PIN, CONNECTOR 2P				
CN1006	*1-564-001-11	PIN, CONNECTOR 2P				
CN1007	*1-564-014-00	PIN, CONNECTOR 4P				
CN1008	*1-564-013-00	PIN, CONNECTOR 3P				
		DIODE				
D1002	8-719-101-61	DIODE RD6.2E-L2				
D1003	8-719-101-61	DIODE RD6.2E-L2				
D1004	8-719-101-61	DIODE RD6.2E-L2				
D1005	8-719-101-61	DIODE RD6.2E-L2				
D1006	8-719-101-61	DIODE RD6.2E-L2				
D1011	8-719-816-55	DIODE 1S1555				
		IC				
IC1010	9-986-323-01	IC 1R9331				
IC1011	8-759-700-42	IC NJM2904D				
IC1012	⚠ 8-759-708-05	IC NJM78L05A				
IC1013	9-986-324-01	IC UPD49G-834				
		COIL				
L1001	1-404-566-11	COIL, FILTER				
		IC LINK				
PS1001	⚠ 1-532-605-00	LINK, IC (ICP-N10)				
		TRANSISTOR				
Q1010	8-729-109-44	TRANSISTOR 2SK94				
Q1011	8-729-109-44	TRANSISTOR 2SK94				
Q1012	8-729-100-66	TRANSISTOR 2SC1623				
Q1013	8-729-100-66	TRANSISTOR 2SC1623				
Q1014	8-729-100-66	TRANSISTOR 2SC1623				
Q1015	8-729-100-66	TRANSISTOR 2SC1623				
Q1016	8-729-100-66	TRANSISTOR 2SC1623				
Q1017	8-729-100-66	TRANSISTOR 2SC1623				
Q1018	8-729-100-66	TRANSISTOR 2SC1623				
Q1019	8-729-104-24	TRANSISTOR 2SB804				
Q1020	8-729-104-24	TRANSISTOR 2SB804				
Q1021	8-729-104-24	TRANSISTOR 2SB804				
Q1022	8-729-104-24	TRANSISTOR 2SB804				
Q1023	8-729-104-24	TRANSISTOR 2SB804				
Q1024	8-729-104-24	TRANSISTOR 2SB804				
Q1025	8-729-199-92	TRANSISTOR 2SD999				
Q1026	8-729-199-92	TRANSISTOR 2SD999				
Q1027	8-729-199-92	TRANSISTOR 2SD999				
Q1028	8-729-199-92	TRANSISTOR 2SD999				
Q1029	8-729-199-92	TRANSISTOR 2SD999				

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

Ref.No	Part No.	Description				Remark
Q1030	8-729-199-92	TRANSISTOR 2SD999				
Q1031	8-729-199-92	TRANSISTOR 2SD999				
Q1032	8-729-199-92	TRANSISTOR 2SD999				
		RESISTOR				
R1050	1-216-033-00	METAL CHIP	220	5%	1/10W	
R1051	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R1052	1-216-033-00	METAL CHIP	220	5%	1/10W	
R1053	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R1054	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R1055	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R1056	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R1057	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R1058	1-216-041-00	METAL CHIP	470	5%	1/10W	
R1059	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R1060	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R1061	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R1062	1-247-127-00	CARBON	680	5%	1/4W	
R1063	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R1064	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R1065	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R1066	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R1067	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R1068	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R1069	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R1070	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R1071	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R1072	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R1073	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R1074	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R1076	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R1077	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R1078	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R1079	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R1080	1-216-040-00	METAL CHIP	430	5%	1/10W	
R1081	1-216-064-00	METAL CHIP	4.3K	5%	1/10W	
R1082	1-216-040-00	METAL CHIP	430	5%	1/10W	
R1083	1-216-064-00	METAL CHIP	4.3K	5%	1/10W	
R1084	1-216-025-00	METAL CHIP	100	5%	1/10W	
R1085	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R1086	1-216-042-00	METAL CHIP	510	5%	1/10W	
R1087 ⚠	1-244-851-00	CARBON	120	5%	1/2W	
R1088	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R1089	1-216-025-00	METAL CHIP	100	5%	1/10W	
R1090	1-216-025-00	METAL CHIP	100	5%	1/10W	
R1092	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R1093	1-216-025-00	METAL CHIP	100	5%	1/10W	
R1094	1-216-025-00	METAL CHIP	100	5%	1/10W	
R1097	1-247-100-00	CARBON	51	5%	1/4W	
R1098	1-247-083-00	CARBON	10	5%	1/4W	
R1099	1-247-083-00	CARBON	10	5%	1/4W	
R1100	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R1101	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R1102	1-216-083-00	METAL CHIP	27K	5%	1/10W	

Ref.No	Part No.	Description	Remark
		THERMISTOR	
R1095 ⚠	1-806-888-11	THERMISTOR (POSITIVE)	
R1096 ⚠	1-806-888-11	THERMISTOR (POSITIVE)	
		VARIABLE RESISTOR	
RV1010	1-228-891-00	RES, ADJ, METAL GLAZE 10K	
		CRYSTAL	
X1001	1-527-992-11	OSCILLATOR, CERAMIC	
		**********	
	*A-6729-164-A	PA-5 BOARD, COMPLETE	
		**********	
	*3-707-166-01	CASE (1), SHIELD, PA-5	
	*3-707-167-01	CASE (2), SHIELD, PA-5	
		CAPACITOR	
C1003	1-123-617-00	ELECT 10MF 20% 16V	
C1004	1-163-089-00	CERAMIC CHIP 6PF 0.25PF 50V	
C1005	1-163-089-00	CERAMIC CHIP 6PF 0.25PF 50V	
C1006	1-163-017-00	CERAMIC CHIP 0.0047MF 10% 50V	
C1007	1-163-017-00	CERAMIC CHIP 0.0047MF 10% 50V	
C1008	1-163-011-00	CERAMIC CHIP 0.0015MF 10% 50V	
C1009	1-163-005-00	CERAMIC CHIP 470PF 10% 50V	
C1010	1-163-034-00	CERAMIC CHIP 0.033MF 50V	
C1011	1-163-011-00	CERAMIC CHIP 0.0015MF 10% 50V	
C1012	1-163-005-00	CERAMIC CHIP 470PF 10% 50V	
C1013	1-163-034-00	CERAMIC CHIP 0.033MF 50V	
C1014	1-163-081-00	CERAMIC CHIP 0.22MF 25V	
C1015	1-163-081-00	CERAMIC CHIP 0.22MF 25V	
C1016	1-123-617-00	ELECT 10MF 20% 16V	
C1017	1-123-617-00	ELECT 10MF 20% 16V	
		CONNECTOR	
CN1001	*1-564-013-00	PIN, CONNECTOR 3P	
		DIODE	
D1001	8-719-815-55	DIODE 1S1555	
D1002	8-719-815-55	DIODE 1S1555	
		IC	
IC1001	8-759-100-95	IC UPC324G2	
IC1002	8-759-100-95	IC UPC324G2	
		TRANSISTOR	
Q1001	8-729-100-66	TRANSISTOR 2SC1623	
Q1002	8-729-100-66	TRANSISTOR 2SC1623	
Q1003	8-729-109-44	TRANSISTOR 2SK94	
Q1004	8-729-109-44	TRANSISTOR 2SK94	
Q1005	8-729-109-44	TRANSISTOR 2SK94	
Q1006	8-729-109-44	TRANSISTOR 2SK94	

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

Ref.No	Part No.	Description				Remark
		RESISTOR				
R1001	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R1002	1-216-037-00	METAL CHIP	330	5%	1/10W	
R1003	1-216-045-00	METAL CHIP	680	5%	1/10W	
R1004	1-216-109-00	METAL CHIP	330K	5%	1/10W	
R1005	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R1006	1-216-109-00	METAL CHIP	330K	5%	1/10W	
R1007	1-216-045-00	METAL CHIP	680	5%	1/10W	
R1008	1-216-037-00	METAL CHIP	330	5%	1/10W	
R1009	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R1010	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R1011	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R1012	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R1013	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R1014	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R1015	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R1016	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R1017	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R1018	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R1019	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R1020	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R1021	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R1022	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R1023	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R1024	1-216-029-00	METAL CHIP	150	5%	1/10W	
R1025	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R1026	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R1027	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R1028	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R1029	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R1030	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R1031	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R1032	1-216-115-00	METAL CHIP	560K	5%	1/10W	
R1033	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R1034	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R1035	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R1036	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R1037	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R1038	1-216-115-00	METAL CHIP	560K	5%	1/10W	
R1039	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R1040	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R1041	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R1042	1-216-029-00	METAL CHIP	150	5%	1/10W	
R1043	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R1044	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
		VARIABLE RESISTOR				
RV1001	1-228-895-00	RES, ADJ, METAL GLAZE 100K				
RV1002	1-228-895-00	RES, ADJ, METAL GLAZE 100K				

Ref.No	Part No.	Description			Remark
	*1-614-560-11	RS-4 BOARD			
		**********			
		CONNECTOR			
CN981	*1-564-014-00	PIN, CONNECTOR 4P			
		SWITCH			
S985	1-553-542-21	SWITCH, KEY			
S986	1-570-134-11	SWITCH, SLIDE			
	*1-614-564-11	AF-6 BOARD			
		**********			
		SWITCH			
S989	1-554-541-12	SWITCH, TACK			
S990	1-554-977-41	SWITCH, SLIDE			
	*1-614-557-11	LM-14 BOARD			
		**********			
		CAPACITOR			
C921	1-101-005-00	CERAMIC	0.022MF		50V
	*1-614-556-11	DM-6 BOARD			
		**********			
		CAPACITOR			
C911	1-101-005-00	CERAMIC	0.022MF		50V
C912	1-161-773-00	CERAMIC	0.1MF	20%	25V
		COIL			
L911	1-407-847-00	MICRO INDUCTOR 35UH			
	*1-614-558-11	RD-13 BOARD			
		**********			
	*3-690-161-01	HOLDER, PW			
		TRANSISTOR			
Q931	8-729-105-19	TRANSISTOR 2SC3518			
		DIODE			
Q932	8-719-921-03	DIODE GP-2S028			

Ref.No	Part No.	Description	Remark
	*1-614-559-11	GS-1 BOARD	
		**********	
	1-550-104-11	HOLDER, BATTERY	

****

MISCELLANEOUS

	⚠1-464-438-11	CONVERTER (S), DC-DC	
	*1-535-559-11	LEAD JUMPER (16 CORE)	
	1-547-156-11	LENS, ZOOM (VCL-1206YD)	
	1-806-682-00	SENSOR, DEW CONDENSATION	
	8-814-210-00	C-2006, MICROPHONE	
	8-825-560-20	HEAD, AC (RP-253-2102A)	
	8-825-561-30	HEAD, ERASE (EF 254-210)	
IC601	8-750-010-23	CCD IMAGER (IO021-K-AA)	
M901	X-369-110-21	MOTOR, DC (DNR-6603A)(LOADING)	
M902	X-3690-112-1	MOTOR ASSY, DRUM	
PM901	⚠1-454-391-11	SOLENOID, PLUNGER (BRAKE)	
PM902	⚠1-454-357-21	SOLENOID, PLUNGER (PINCH)	
S981	1-570-112-11	SWITCH, LEAF (C IN)	
S982	1-570-112-11	SWITCH, LEAF (C DOWN)	
S983	1-554-581-00	SWITCH, MICRO (LOADING END)	
S987	1-570-151-11	SWITCH, SLIDE (W/B)	
S988	1-570-152-11	SWITCH, PUSH (ZOOM)	

****

ACCESSORIES AND PACKING MATERIALS

Part No.	Description	Remark
3-532-616-00	BAG, POLYETHYLENE	
3-691-157-01	BELT, STRAP	
*3-691-161-01	CUSHION (UPPER)	
*3-691-162-01	CUSHION (LOWER)	
*3-691-163-11	INDIVIDUAL CARTON	
3-691-167-01	HANDLE	
3-760-210-11	MANUAL, INSTRUCTION (AEP, AUSTRALIAN, E MODEL)(ENGLISH)	
3-760-210-41	MANUAL, INSTRUCTION (AEP MODEL) (FRENCH, GERMANY, DETCH)	
3-760-210-51	MANUAL, INSTRUCTION (AEP MODEL) (SPANISH, SWEDISH, ITARIAN)	
3-760-210-71	MANUAL, INSTRUCTION (E MODEL) (ARABIC)	

****

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

9-972-375-01

Sony Corporation

English
85D0464-1
Printed in Japan

BMC-500P

SONY

SERVICE MANUAL

AEP Model
E Model
Australian Model

April, 1985

SUPPLEMENT-1

File this supplement with the service manual.

SUBJECT: ADJUSTMENT

MICROFILM

Consumer
VIDEO

TABLE OF CONTENTS

1. PREPARATION BEFORE ADJUSTMENT(CAMERA)

1-1. LIST OF SERVICING JIGS

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

Ref. No.	Name	Part code	Use
J1	Pattern box PTB-100 (For 90–130Vac) PTB-200 (For 190–240Vac)	 J-6020-490-A J-6020-680-A	
J2	Signal converter BMCJ-888P	J-6080-820-A	
J3	Colour chart	J-6020-250-A	
J4	ND filter 0.3	J-6080-818-A	LLA adjustment
	ND filter 1.0	J-6080-808-A	LLA adjustment, MAX gain adjustment
	ND filter 0.9	J-6080-833-A	MAX gain adjustment
J5	Filter (W14)	J-6080-830-A	R gain, B gain adjustment
	Filter (C22)	J-6080-829-A	
	Filter (For fine weather)	J-6080-058-A	MR2, MB2 (5800°K) adjustment

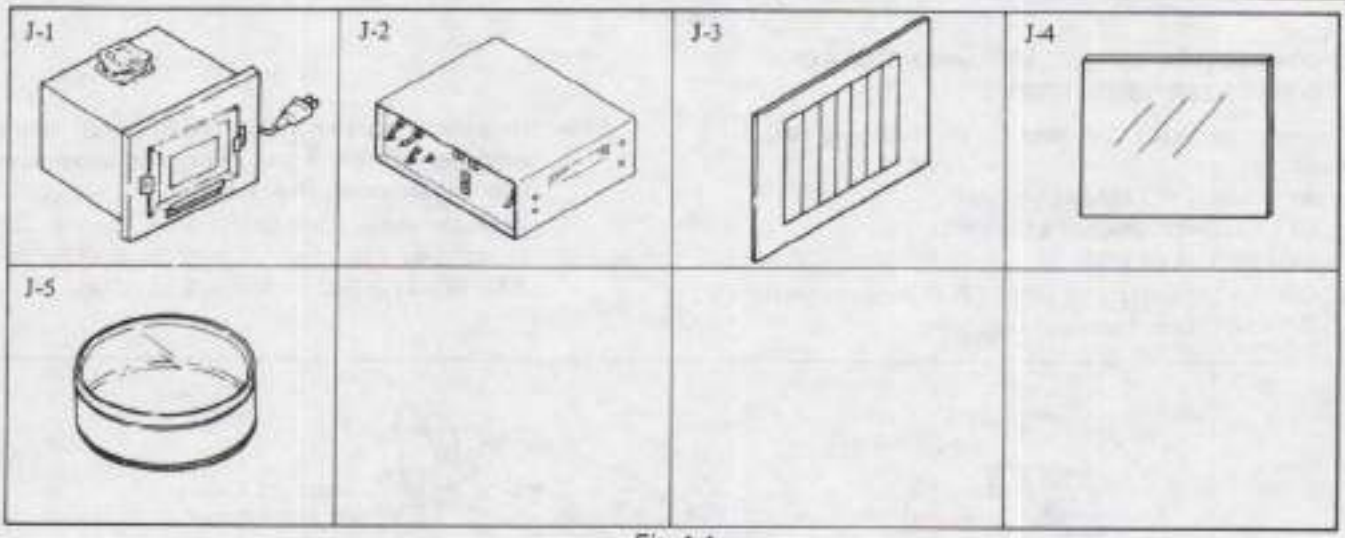


Fig. 1-1.

The following jigs must be produced:

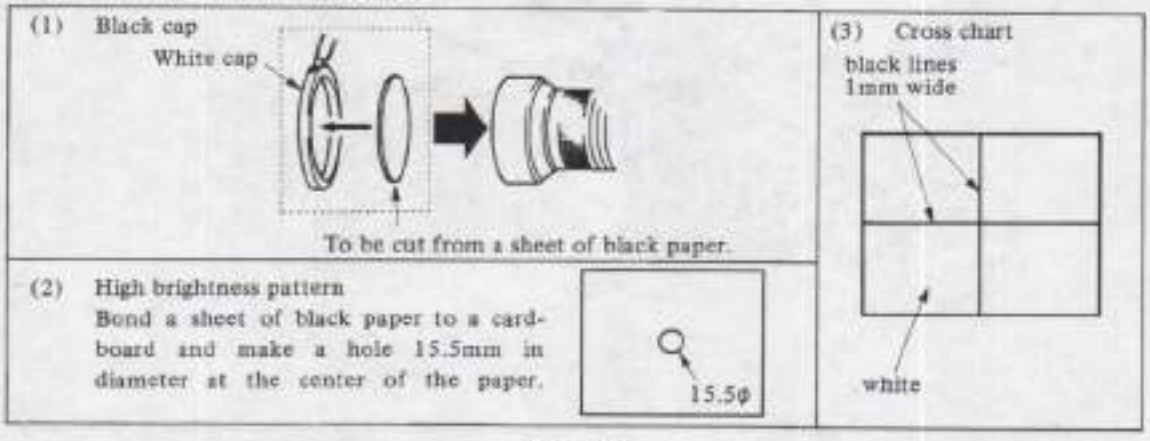


Fig. 1-2.

1-2. PREPARATION

1) 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 in the same height.

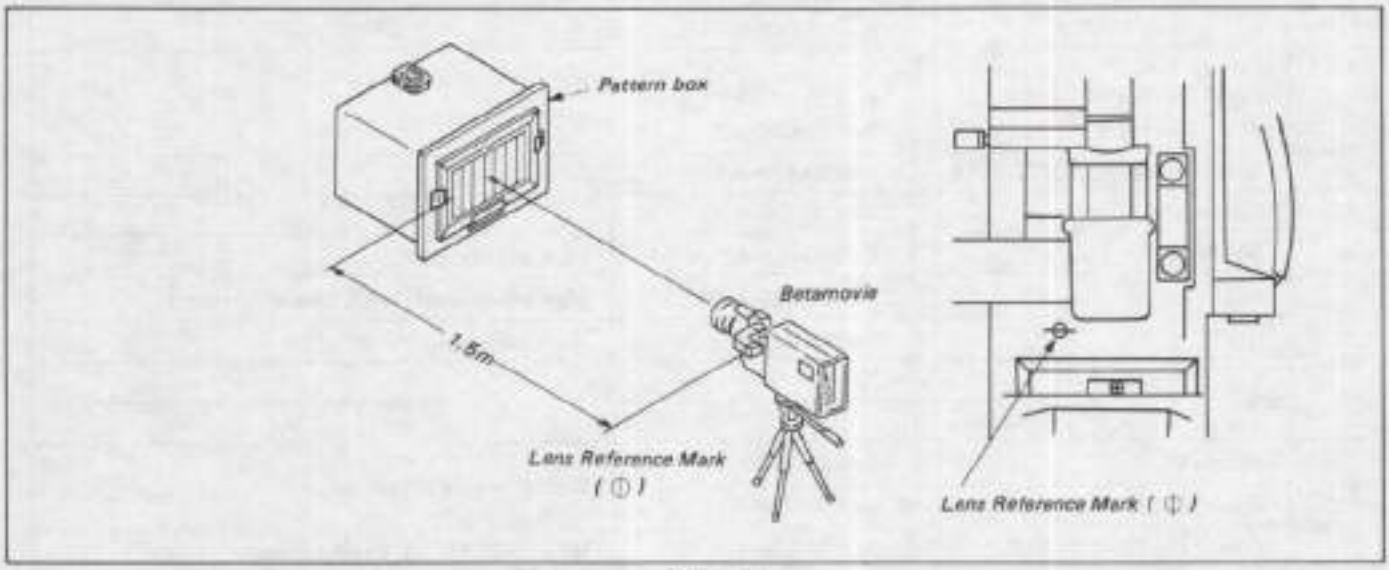


Fig. 1-3.

1-4. CONNECTION OF BMC-500P AND SIGNAL CONVERTER (BMCJ-888P)

1) Connect the signal converter for the following adjustments.
   - AC (audio/CTL) head adjustment
   - CTL (AC head) position adjustment
   - Tape path adjustment

1. Connect the Betamovie (BMC-500P), signal converter (BMCJ-888P) and monitor as follows.

Note: Be sure to ground TP012 (CS-5 board) before adjusting. IF this is not done, the adjustment tape will be erased. (Fig. 1-4)

Also, the signal converter function key can not be used at this time, so play back using the REC START/STOP button on BMC-500P.

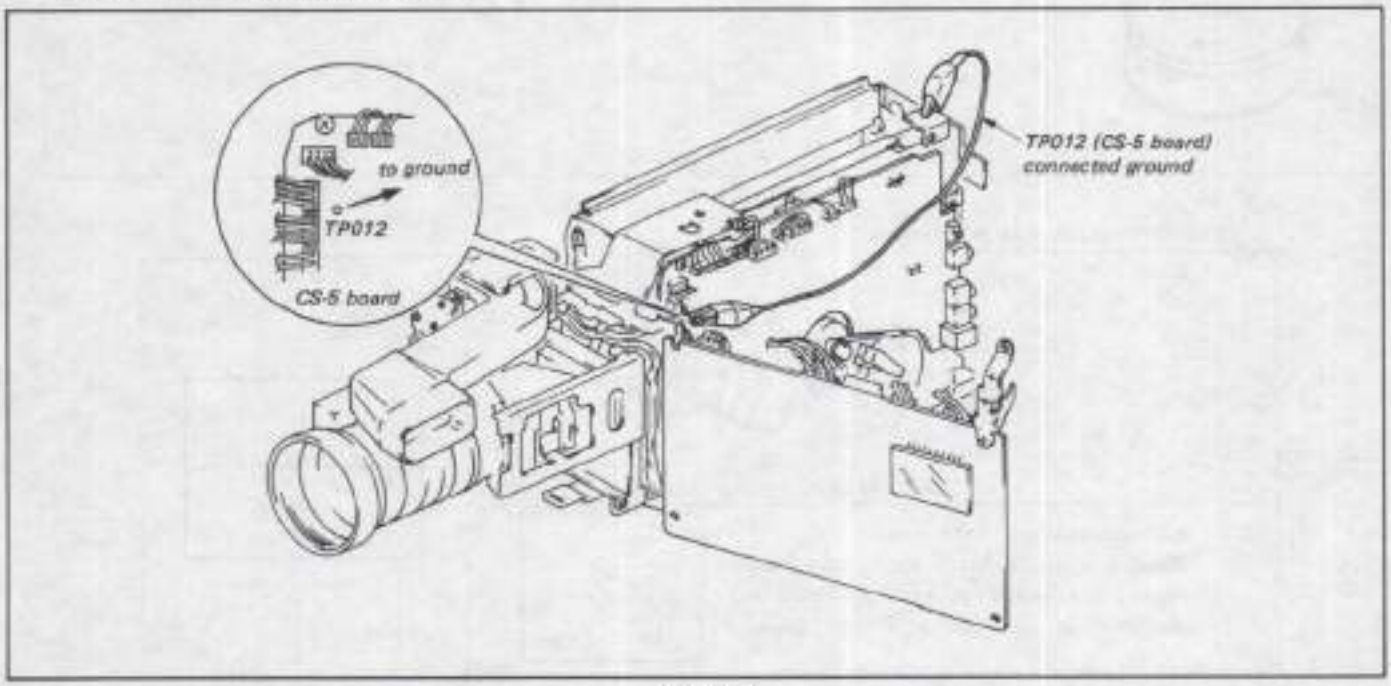


Fig. 1-4.

2. Connect Betamovie, signal converter BMCJ-888P and special purpose monitor together as shown in Fig. 1-5, Fig. 1-6. (Also needed when adjusting the video part tape path.)

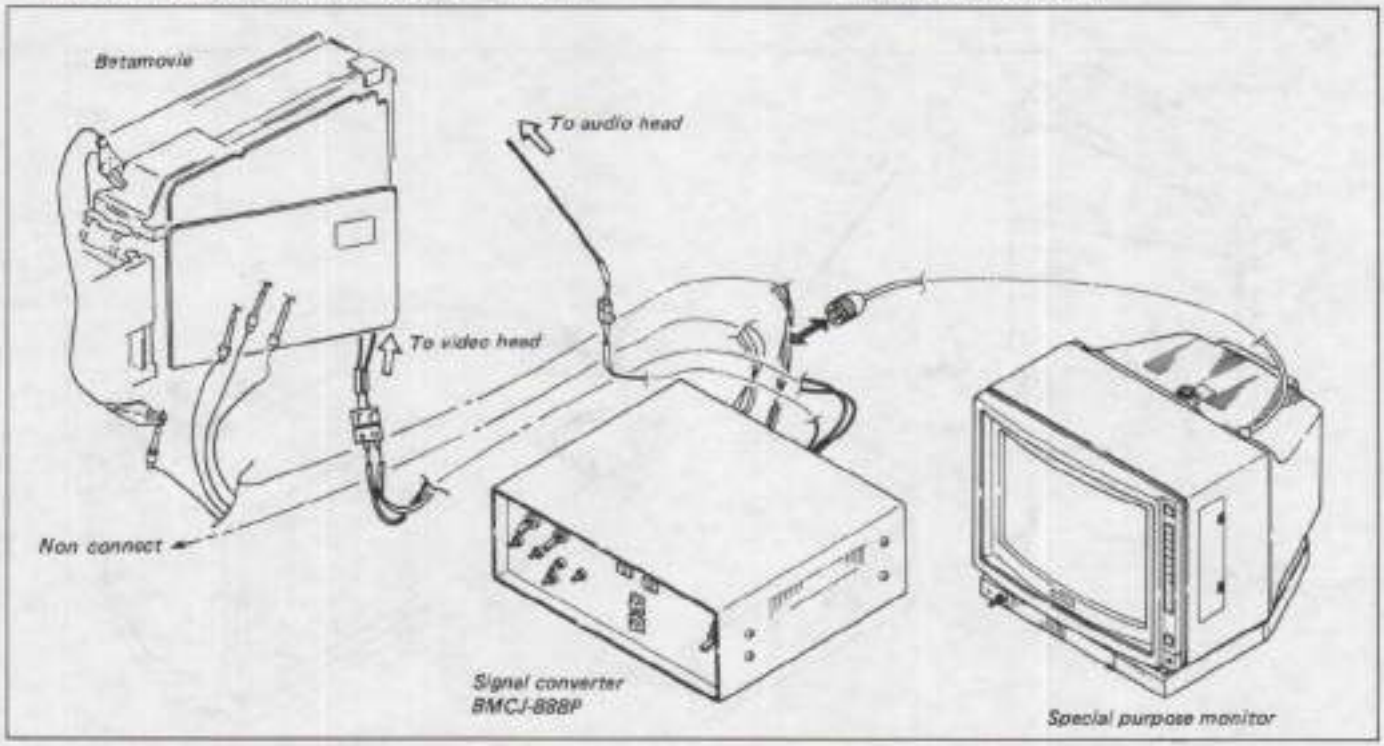


Fig. 1-5.

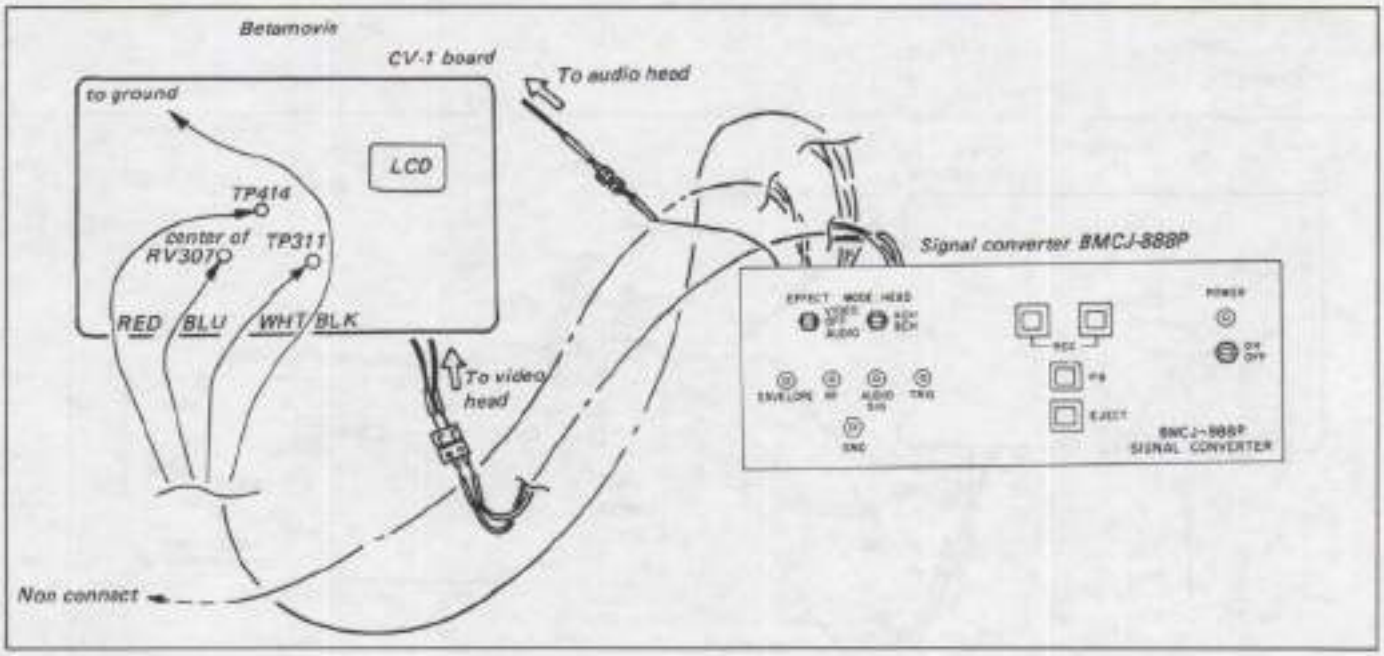


Fig. 1-6.

2) Except for item 1).

1. Connect Betamovie, signal converter BMCJ-888P and special purpose monitor together as shown in Fig. 1-7, Fig. 1-8.

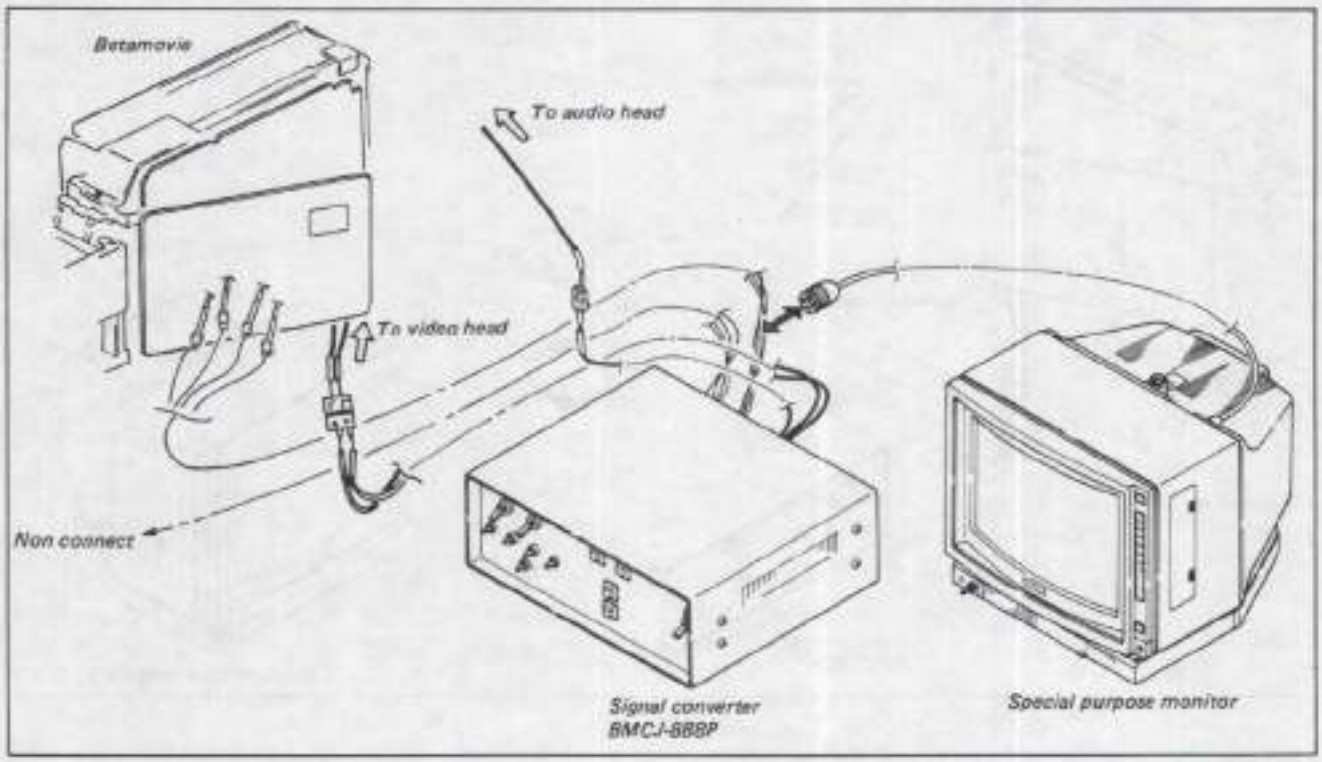


Fig. 1-7.

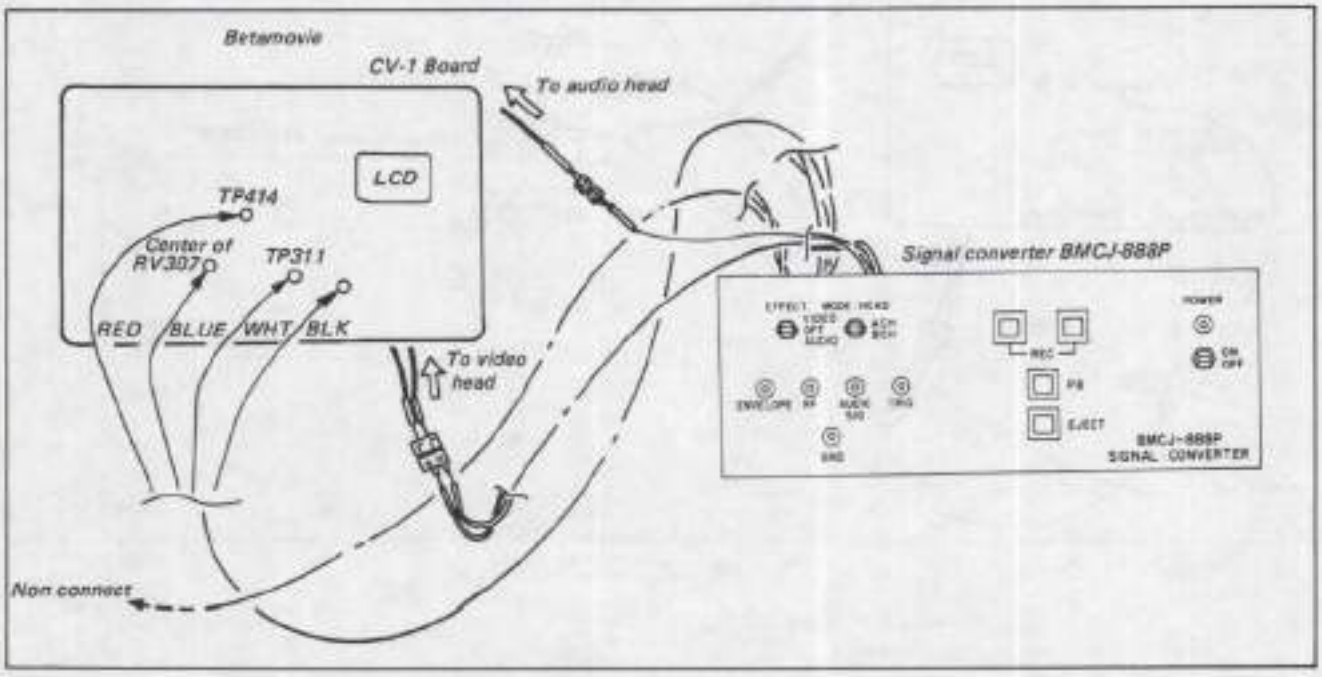


Fig. 1-8.

1-5. EYESIGHT ADJUSTMENT

Adjusting Procedure:

1) Direct camera toward a bright, plain object such as white paper.

2) Adjust the visibility adjustment knob so that the split image can be clearly seen.

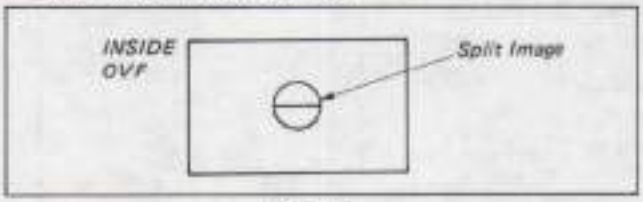


Fig. 1-9.

1-6. PROCEDURE FOR DETERMINING MONITOR CENTER (RASTER CENTER) OF SPECIAL PURPOSE MONITOR FOR BETAMOVIE

Necessary for "OVF Centering and Horizontal Check" and "OVF Optical Axis Check".

Note: Use a normal set for the determination.

Oscilloscope: TP311 (CV-1 Board)

Object: High luminosity pattern

Zoom lever: 50mm

Adjusting Procedure:

1) With the oscilloscope at H cycle (76.3μsec), adjust the pan head left and right so that the luminence portion is at the center.

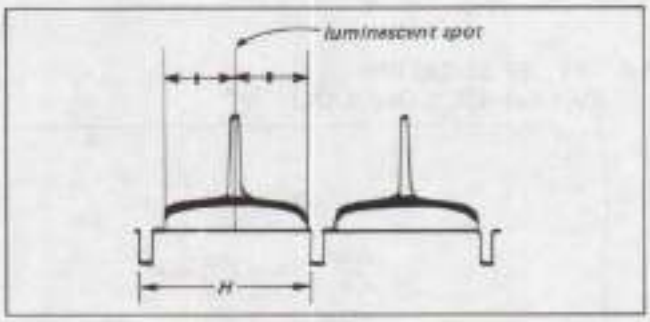


Fig. 1-10.

2) With the oscilloscope at V cycle (16.7msec), adjust the pan head up and down so that the luminence portion is at the center.

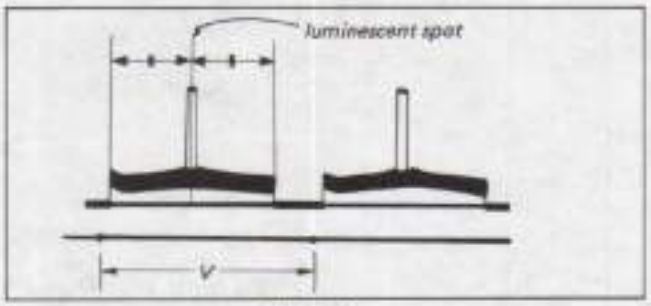


Fig. 1-11.

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

Fig. 1-12.

1-7. PRECAUTIONS

1) Adjust the picture frame as shown in Fig. 1-13 when using a colour bar chart for adjustment. (Standard picture frame)

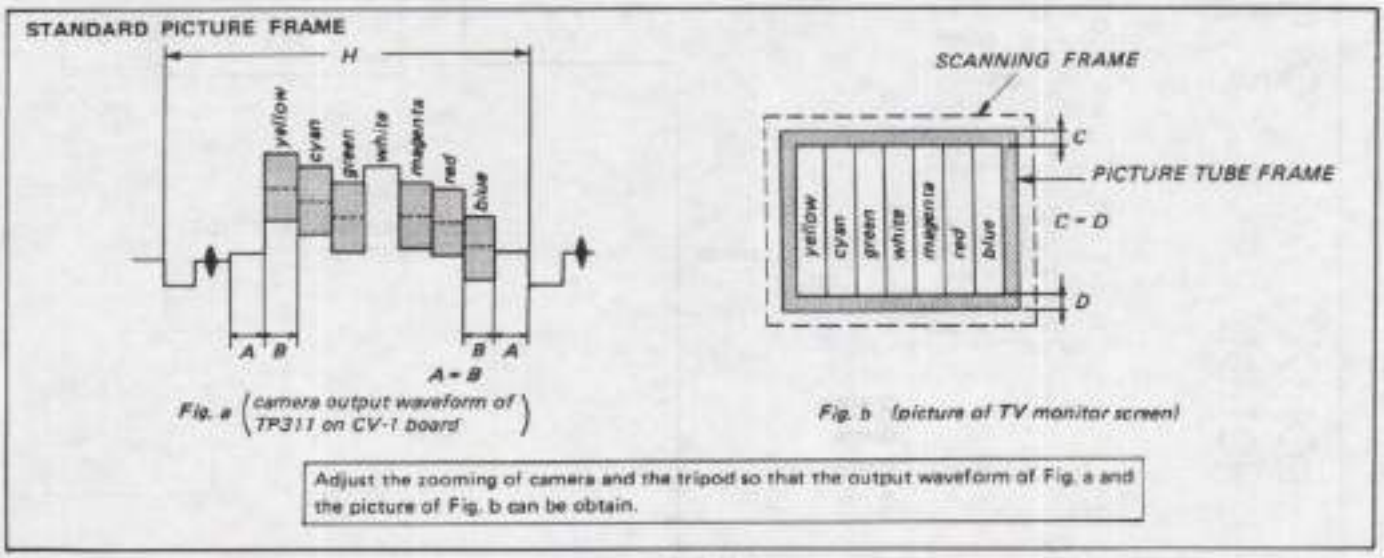


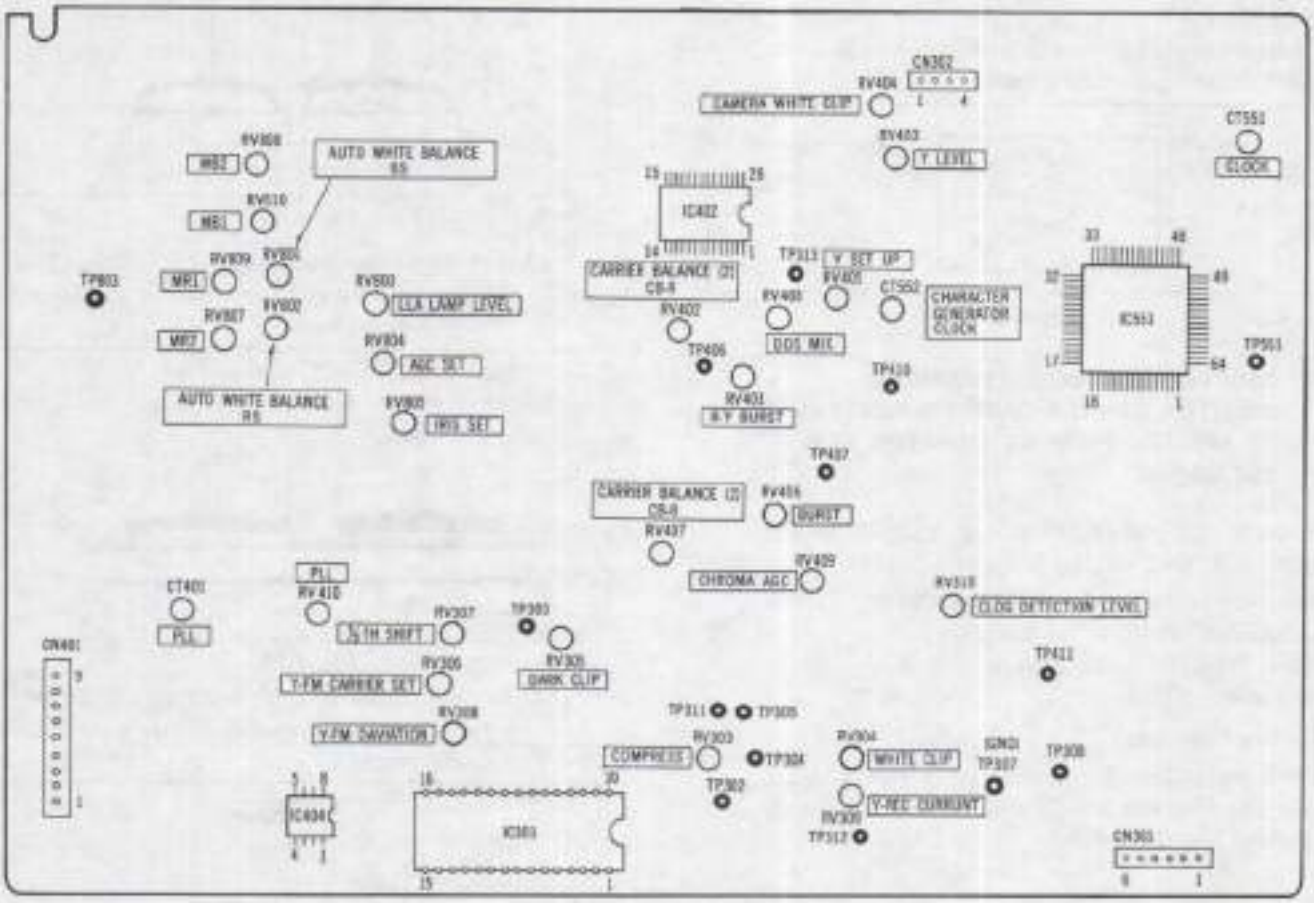
Fig. a (camera output waveform of TP311 on CV-1 board)

Fig. b (picture of TV monitor screen)

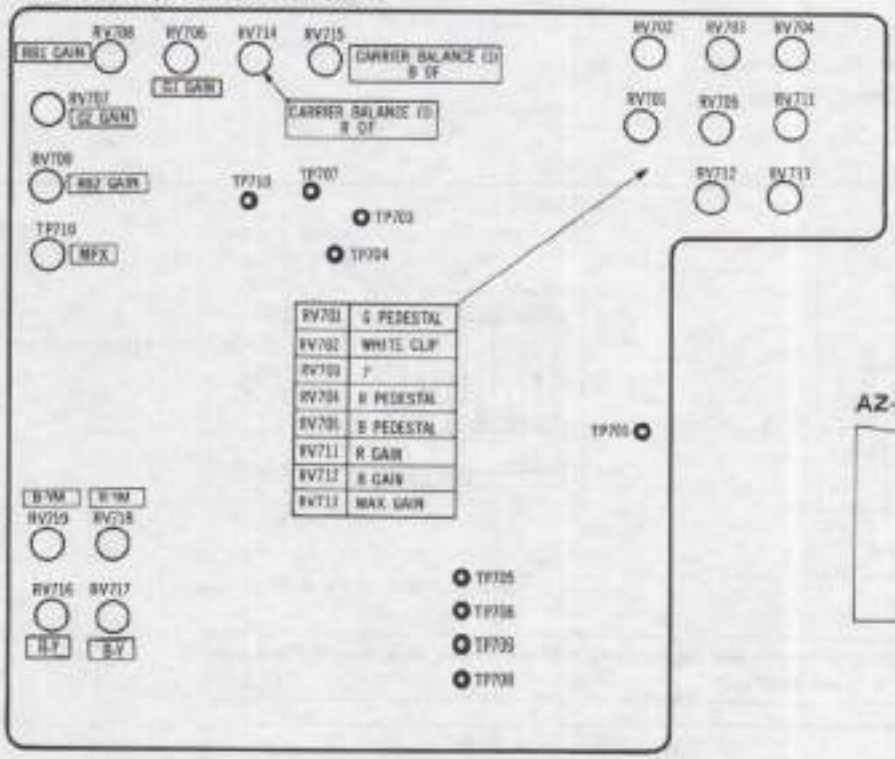
Fig. 1-13.

1-8. RV, TP LOCATION

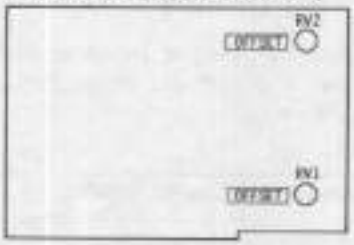
CV-1 Board (SOLDER SIDE)



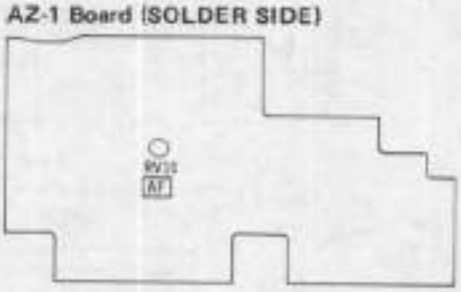
PM-2 Board (COMPONENT SIDE)



PA-5 Board (SOLDER SIDE)



AZ-1 Board (SOLDER SIDE)



2. ADJUSTMENTS(CAMERA)

2-1. Lens Block Adjustment

2-1-1. Flange Back Adjustment (F. B.)

Subject: Siemens star
Signal converter and special monitor: Refer to "1-3. Connection Diagram" for connection.

[Adjustment Procedure]

1) Turn the auto focus switch OFF and confirm that the iris is open.
2) Shoot the Siemens star in a position 2 meters from the lens reference mark, and match up the center of the monitor and the center of the Siemens star.
3) Confirm that the lens zoom lever moves fully to the wide angle side (12mm) and the telephoto side (72mm), then set it at wide angle (12mm).
4) Set lens focus ring mark to the center of "2".
5) Loosen the hexagonal socket screw with an Allen Wrench.
6) Turn the flange back adjustment screw while observing the monitor, and adjust so that the center of the Siemens star is clearest.
7) Hold the flange back adjustment screw so that it doesn't turn, and tighten the hexagonal screw (tightening torque 2.5kg/cm).
8) Turn the focus ring with the zoom lens still on wide angle (12mm) setting, and confirm that the center is clearest within the range shown in Fig. 2-2.
9) If not within the specifications, repeat steps 3)–8).

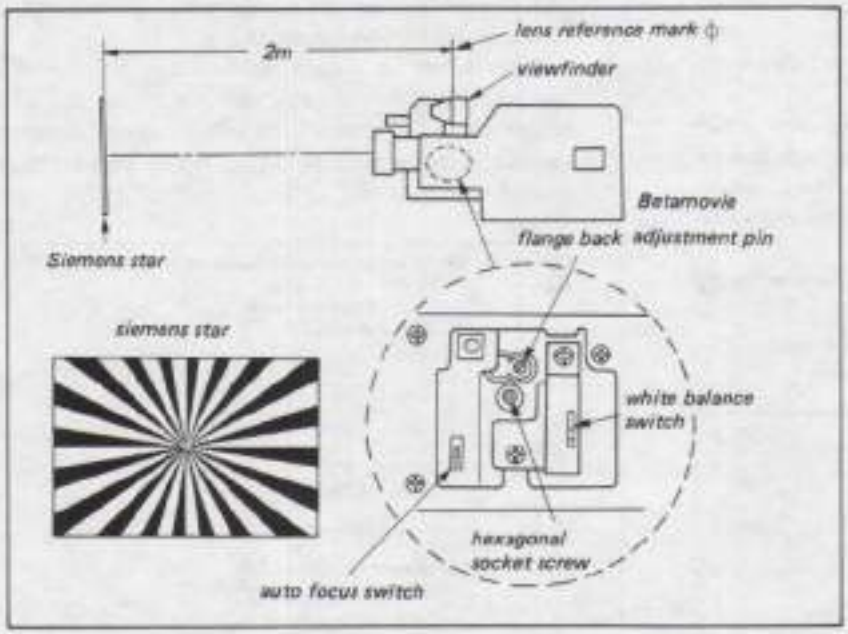


Fig. 2-1.

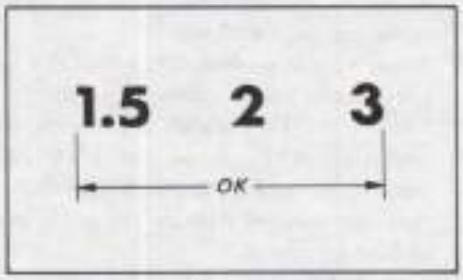


Fig. 2-2.

2-1-2. OVF Flange Back Check and Adjustment

Subject: Cross chart (Refer to Fig. 1-2.)
Signal converter: Refer to "1-3. Connection Diagram" for connection.
Special monitor: Refer to "1-3. Connection Diagram" for connection.

[Check and Adjustment Procedure]

1) Turn the auto focus switch OFF and confirm that the iris is open.
2) Shoot the cross chart in a position 2 meters from the lens reference mark and match it up to the center of the monitor.
3) Move the zoom lever from telephoto (72mm) to wide angle (12mm) to telephoto (72mm) and confirm that the lever moves fully, then set it at telephoto (72mm).
4) Adjust the OVF visibility adjustment knob so that the split image in the viewfinder can be clearly seen.
5) Turn the focus ring while observing the monitor until the cross chart is clearest, and note the position of the focus ring and focus indicator at that time.
6) Look at the viewfinder and confirm that the vertical lines on the cross chart meet at the split image. Be sure to position the eye firmly on the eyecup so that neither the top nor bottom of the split image is darkened.
7) Note the position of the focus ring and focus indicator when the focus ring has been turned so that the cross chart vertical lines match at the split image. The difference between this position and that in step 5) when matched up with the monitor should be within ±1.5mm. (Refer to Fig. 2-3.)

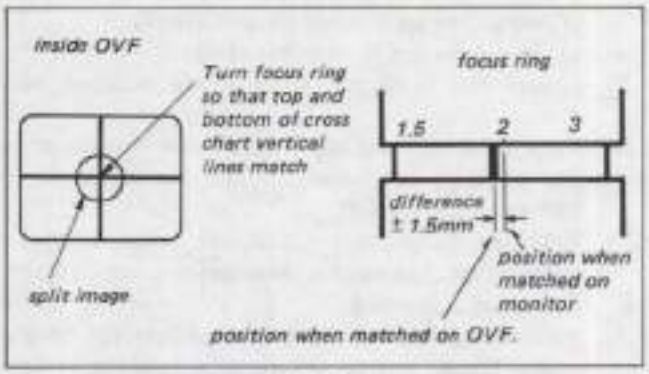


Fig. 2-3

8) If OVF focus is not within the specifications, repeat 4) and 5), then perform the following adjustment while observing the viewfinder.
9) Insert a blade screwdriver in the OVF focus adjustment portion and hold it down.
10) Loosen the OVF focus adjustment screw, and while observing OVF, move the OVF focus adjustment portion up and down with the blade screwdriver so that the vertical lines in the cross chart in the OVF split image match.
11) Then tighten the OVF focus adjustment screw, being careful not to move the adjustment portion.
12) Perform steps 3) – 7), then if still not within the specifications, perform steps 9) – 11) again.

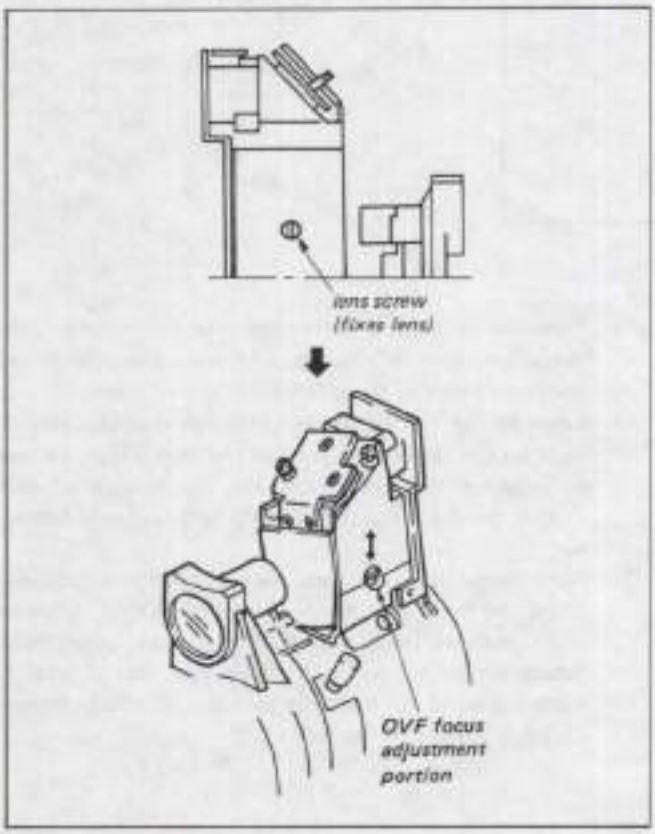


Fig. 2-4

2-1-3. OVF Centering and Horizontal Check

Subject: White pattern (Place a mark in the center.)
Signal converter: Refer to "1-3. Connection Diagram" for connection.
Special monitor: Place a mark in the center of the monitor (raster center). Refer to "1-5. Procedure for Determining Monitor Center (Raster Center) of Special Purpose Monitor for Betamovie".

[Check Procedure]

1) Adjust the OVF visibility adjustment knob so that the split image in the OVF is clearly visible.
2) Shoot the white pattern, and adjust the zoom ring so that the picture frame is visible in the viewfinder.
3) Adjust the pan head so that the frame is not slanted and so that the centerr of the white pattern and the center of the viewfinder match.
4) At this time the difference between the center of the white pattern and the monitor center should be within ±10% for both vertical and horizontal directions on the monitor picture. Also, white pattern frame slant should be within ±3%.

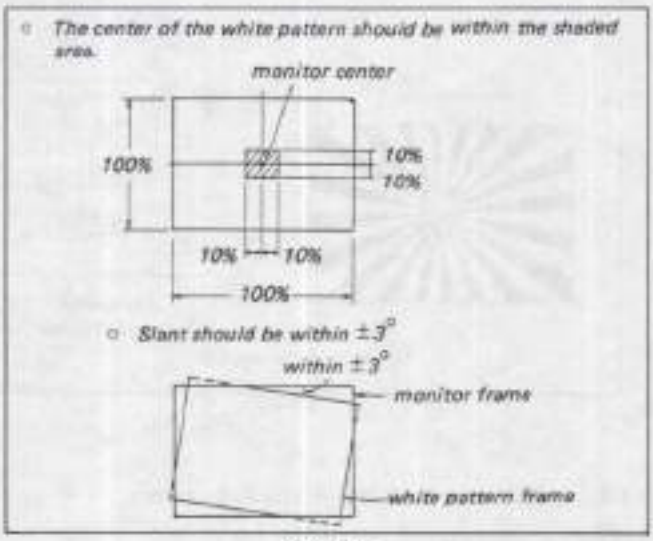


Fig. 2-5

2-1-4. OVF Optical Axis Check

Subject: White pattern (Place a mark in the center)
Signal converter: Refer to "1-3. Connection Diagram" for connection.
Special monitor: Place a mark in the center of the monitor (raster center). Refer to "1-5. Procedure for Determining Monitor Center (Raster Center) of Special Purpose Monitor for Betamovie".

[Check Procedure]

1) Set the zoom ring at the telephoto end (72mm) and focus on the white pattern.
2) Move the zoom ring to the wide angle side (12mm) and adjust the pan head so that the centers of the white pattern and monitor match.
3) Set the zoom ring to the telephoto side (72mm) and check that the movement of the white pattern center on the monitor screen is within ±30% in the horizontal direction and ±20% in the vertical direction.

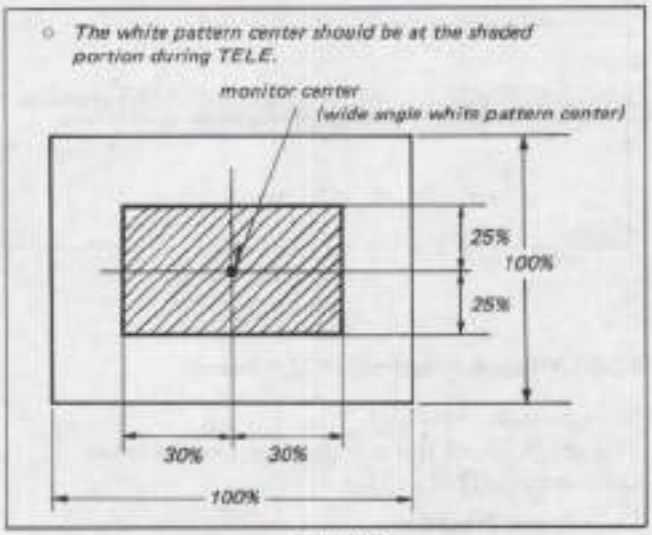


Fig. 2-6

2-2. Y System Adjustment

2-2-1. IRIS Set Adjustment (CV-1 Board, PM-2 Board)

Subject: Colour pattern
Oscilloscope: PM-2 board TP701 (CCD)
GND: PM shield case

[Adjustment Procedure]

1) Turn RV805 (IRIS) on CV-1 board fully clockwise (↷).
2) Adjust to 180 ±5mV with RV805 (IRIS).

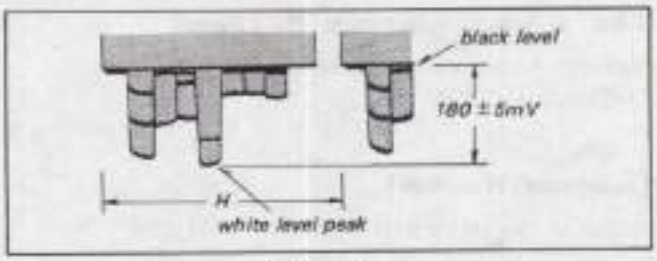


Fig. 2-7

2-2-2. AGC Set Adjustment (CV-1 Board)

Subject: Colour pattern
Oscilloscope: TP803 (GD)
GND: TP802

[Adjustment Procedure]

1) Set PM-2 board RV711 (R GAIN), RV712 (B GAIN) and RV713 (MAX GAIN) to mechanical center.

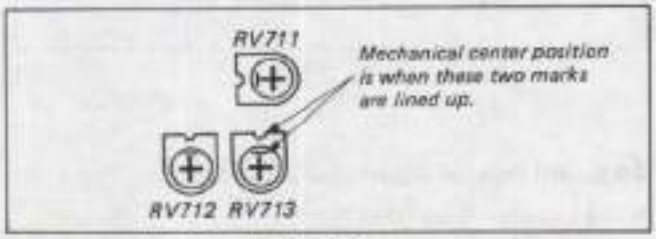


Fig. 2-8

2) Adjust to 200 ±5mVp-p with CV-1 board RV804.

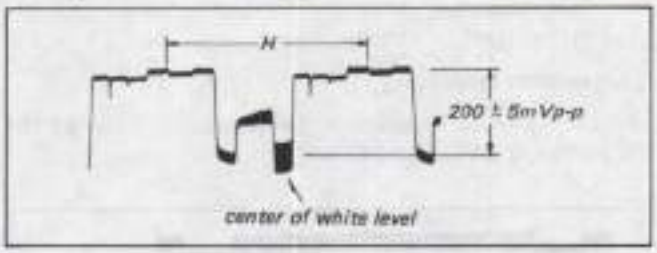


Fig. 2-9

2-2-3. γ Adjustment and White Clip (1) Adjustment (PM-2 Board)

Subject: Colour pattern
Oscilloscope: TP703 (Gγ)
GND: PM shield case

[Adjustment Procedure]

1) Preset RV702 (PW) by turning fully clockwise (↷).
2) Adjust to 380 ±5mVp-p with RV703 (Gγ).
3) Adjust to 360 ±5mVp-p with RV702 (PW).

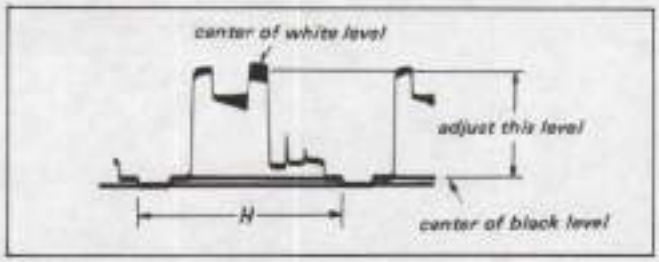


Fig. 2-10

2-2-4. G Pedestal Adjustment (PM-2 Board)

Subject: All black (Place a black cap over the lens.)
Oscilloscope: TP703 (Gγ)

[Adjustment Procedure]

Adjust to 25 ±5mVp-p with RV701.

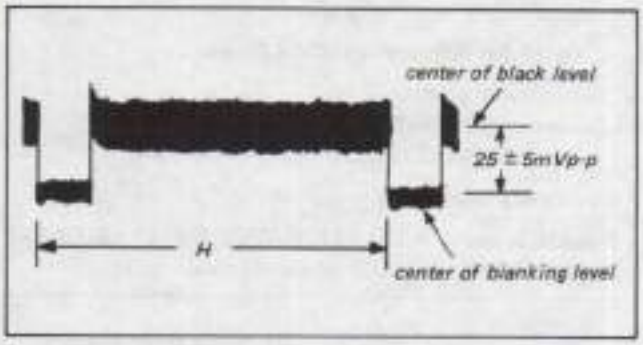


Fig. 2-11

2-2-5. RB Pedestal Adjustment (PM-2 Board)

White balance: Auto (M3)
Subject: All black (Place a black cap over the lens.)
Oscilloscope: CH1: TP703 (Gγ)
CH2: TP704 (RBγ)
Vertical mode: ADD
CH2 polarity: INVERT

[Adjustment Procedure]

Adjust waveform amplitude to minimum with RV704 (R PED) and RV705 (B PED).

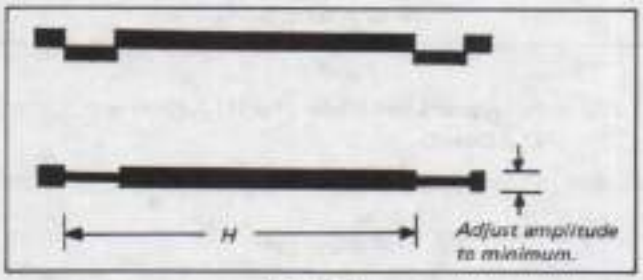


Fig. 2-12

2-2-6. Matrix Gain Adjustment (PM-2 Board)

White balance: Auto (M3)
Subject: White pattern
Oscilloscope vertical mode: ADD
CH2 polarity: INVERT

[Adjustment Procedure]

Connect the oscilloscope as shown in the table below and adjust so that the waveform amplitudes are minimum with each adjustment element.

Adjustment for repair	Oscilloscope		Adjustment element
	CH1	CH2	
G1 gain	TP705	TP706	RV706
G2 gain	TP705	TP707	RV707
RB1 gain	TP708	TP709	RV708
RB2 gain	TP708	TP710	RV709

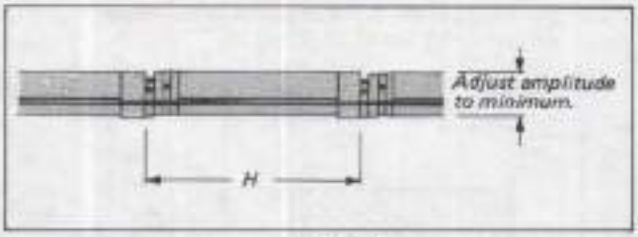


Fig. 2-13

2-2-7. Y Set-up Adjustment (CV-1 Board)

White balance: Auto (M3)
Subject: All black (Place a black cap over the lens.)
Oscilloscope: TP311 (Y)

[Adjustment Procedure]

Adjust to 25 ±5mV with RV405.

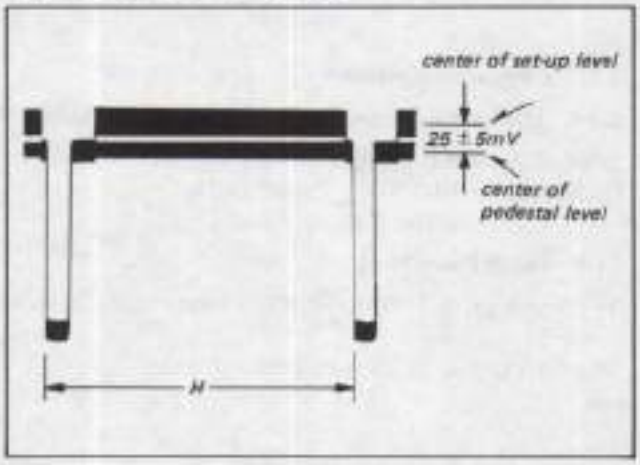


Fig. 2-14

2-2-8. Y Level Adjustment (CV-1 Board)

White balance: Auto (M3)
Subject: Colour pattern
Oscilloscope: TP311 (Y)

[Adjustment Procedure]

1) Turn CV-1 board RV404 (CWC) fully clockwise (◯) so that its output is maximum.
2) Adjust to 510 ±10mV with RV403 (Y).

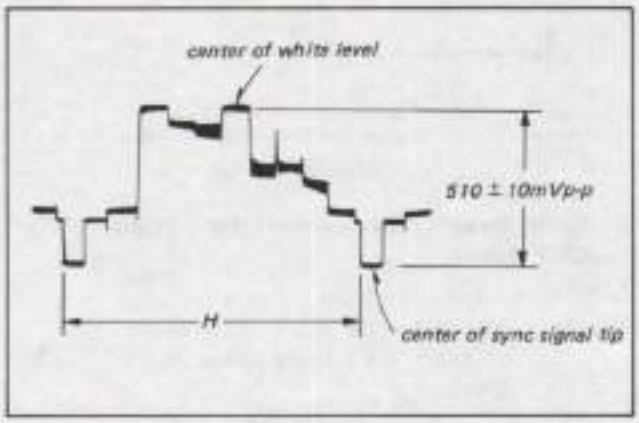


Fig. 2-15

2-2-9. White Clip (2) Adjustment (CV-1 Board)

White balance: Auto (M3)
Subject: High luminance pattern
Oscilloscope: TP311 (Y)

[Adjustment Procedure]

Adjust to 550 ±10mVp-p with CV-1 board RV404.

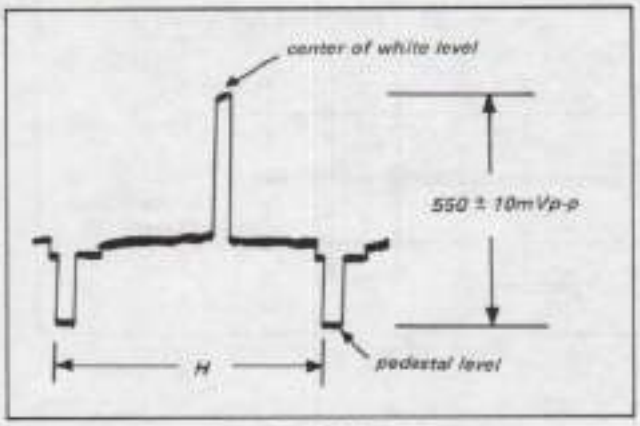


Fig. 2-16

2-2-10. MAX Gain Adjustment (PM-2 Board, CV-1 Board)

White balance: Auto (M3)
Subject: Colour pattern
Oscilloscope: CV-1 board TP311 (Y)
ND filter: 1.8 (Overlap 0.9 and 0.9 ND filters)

[Adjustment Procedure]

1) Place the ND filter 1.8 over the lens.
2) Adjust to 175 ±5mV with PM-2 board RV713.

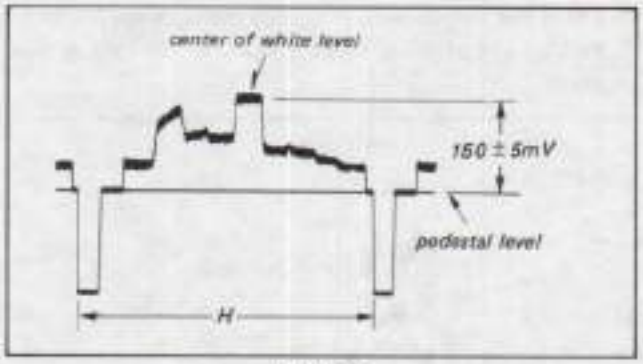


Fig. 2-17

2-2-11. LLA Lamp Level Adjustment (CV-1 Board)

Subject: Colour pattern
ND filter: 1.0, 0.3

[Adjustment Procedure]

1) Place the 1.0 and 0.3 ND filters in front of the lens and adjust RV803 so that the LLA lamp goes on.
   Note: It takes 5–8 seconds for the lamp to go on.
2) Place ND filter 1.0 over the front of the lens, wait 5 – 8 seconds and confirm that the "L" lamp does not light up.
3) If the lamp lit up in step 2), repeat steps 1) and 2).

2-3. Chroma System Adjustment

2-3-1. MPX Adjustment (PM-2 Board, CV-1 Board)

White balance: Auto (M3)
Subject: All black (Place a black cap over the lens.)
Oscilloscope: CH1 (X): CV-1 board TP407 (B-Y)
CH2 (Y): CV-1 board TP406 (R-Y)
Mode: X-Y

[Adjustment Procedure]

1) Adjust PM-2 board RV710 so that there is one black luminescent spot.

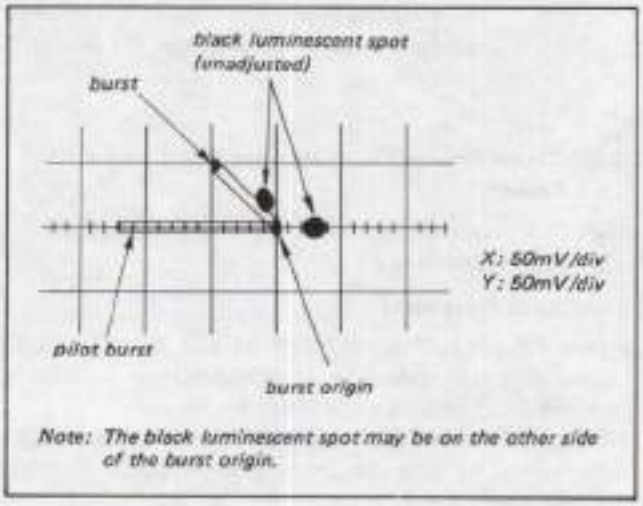


Fig. 2-18

2) Shoot the colour pattern and adjust with RV709 (RB2) so that the splitting of each luminescent spot is minimum.

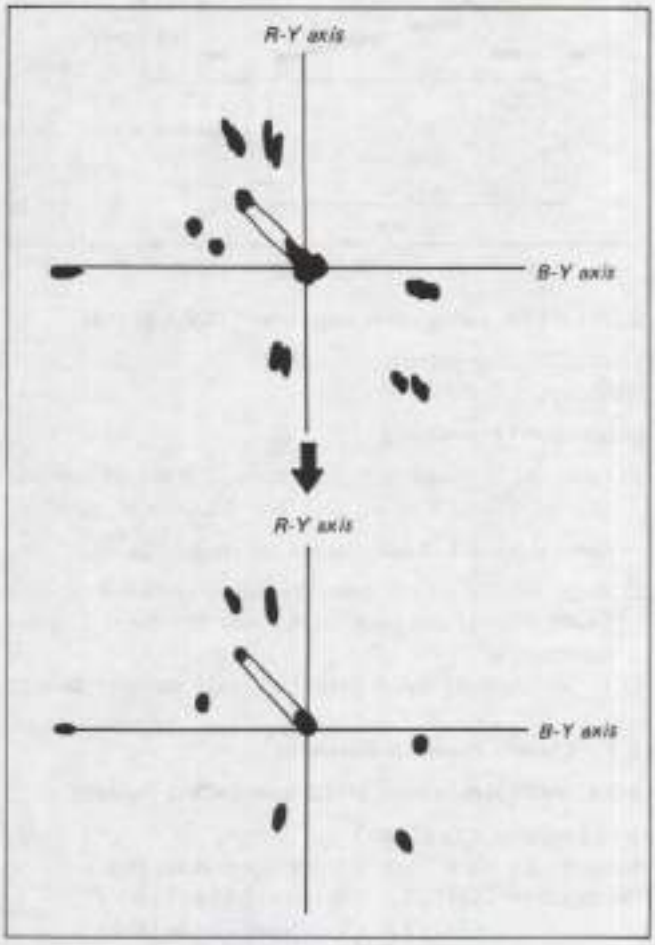


Fig. 2-19

3) Return the subject to all black and confirm that the black luminescent spot is within the specifications.
Specifications: The difference between the burst starting point and black luminescent spot is 5mV on both the R-Y and B-Y axis.

2-3-2. Carrier Balance (1) Adjustment (PM-2 Board, CV-1 Board)

Subject: All black (Place a black cap over the lens.)
Oscilloscope: TP410 (C)

[Adjustment Procedure]

1) Turn CV-1 board RV402 (CB-R) and RV407 (CB-B) alternately to make the blanking portion amplitude (carrier leak) minimum (less than 5mVp-p).
2) Turn PM-2 board RV714 (R OF) and RV715 (B OF) alternately so that the image portion carrier is minimum.

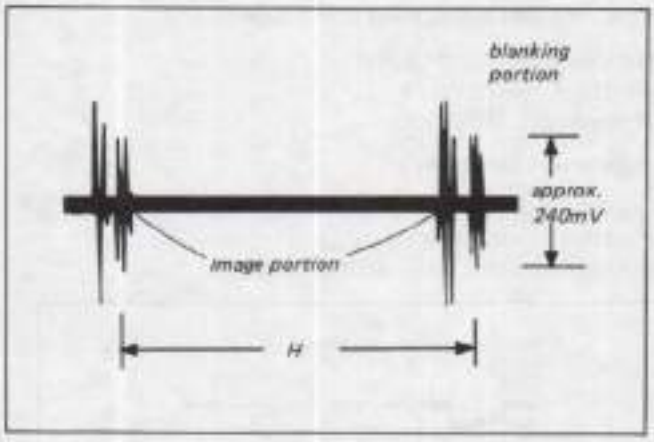


Fig. 2-20

2-3-3. Carrier Balance (2) Adjustment (PM-2 Board, CV-1 Board)

Subject: All black (Place a black cap over the lens.)
Oscilloscope: CH1 (X): CV-1 board TP407 (B-Y)
CH2 (Y): CV-1 board TP406 (R-Y)
Mode: X-Y

[Adjustment Procedure]

Adjust PM-2 board RV714 (F OF) and RV715 (B OF) so that the burst origin and black luminescent spot match.

Specification: The difference between the burst origin and black luminescent spot centers must be less than 10mV on both the X and Y axes.

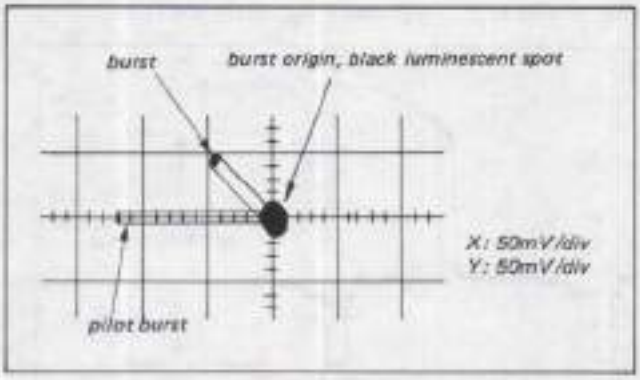


Fig. 2-21

2-3-4. Burst Adjustment (CV-1 Board)

Subject: All black (Place a black cap over the lens.)
Oscilloscope: TP410

[Adjustment Procedure]

Adjust RV401 (BST-R) and RV406 (BST-B) with the + points as a guide so that the burst luminous spots locate within the PAL burst phase frame.

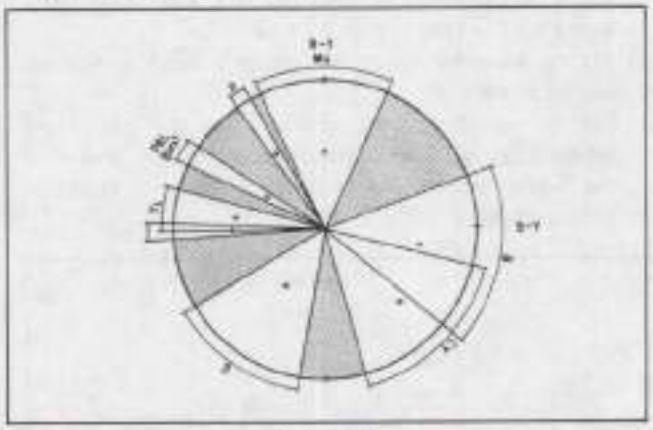


Fig. 2-22

2-3-5. Auto White Balance (1) Adjustment (CV-1 Board, PM-2 Board)

White balance: Auto (M3)
Subject: White pattern
Oscilloscope (CV-1 board): CH1 TP803 (G-DET)
CH2 TP804 (RB DET)
GND TP802

a) vertical mode: ADD
CH2 polarity: INVERT

[Adjustment Procedure]

1) Set oscilloscope as for a), and make the waveform a straight line with CV-1 board RV801 (BS) and RV802 (RS).

Note: For 1) use stand-by mode, and press the white balance switch each time when adjusting.

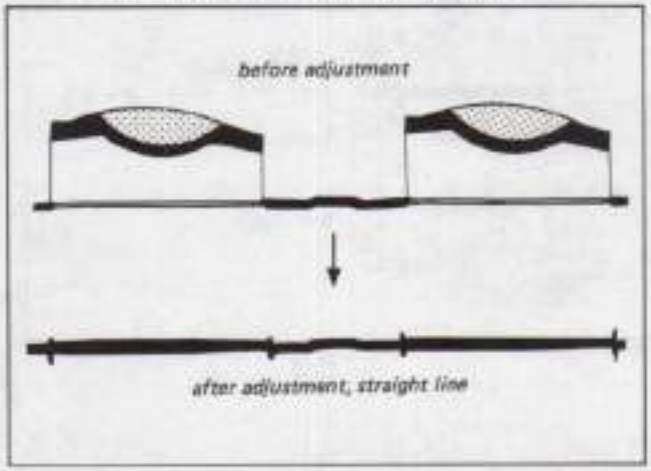


Fig. 2-23

2-3-6. Auto White Balance (2) Adjustment (CV-1 Board)

White balance: Auto (M3)
Subject: White pattern
Oscilloscope: CH1 (X): CV-1 board TP407 (B-Y)
CH2 (Y): CV-1 board TP406 (R-Y)
Mode: X-Y

[Adjustment Procedure]

Set to stand-by mode, and adjust RV801 (BS) and RV802 (RS) so that the white luminescent spot and burst point match, while pressing the white balance switch.

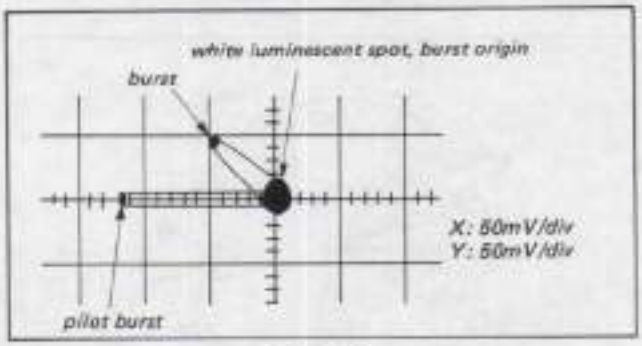


Fig. 2-24

[Check Procedure]

Confirm that the waveform of RED level on TP410 measured with an oscilloscope is 400 ±40mVp-p.

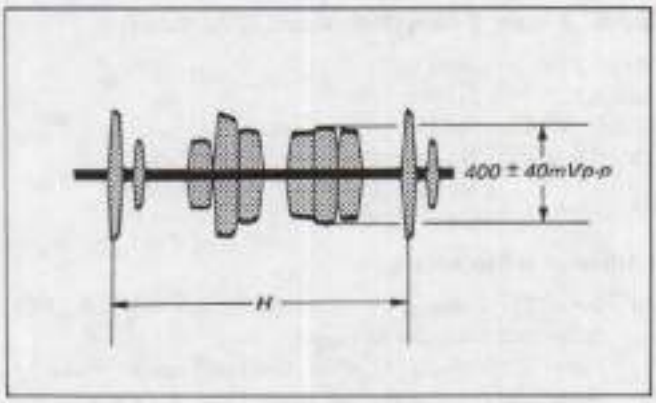


Fig. 2-25

2-3-7. Colour Reproducibility Adjustment (PM-2 Board, CV-1 Board)

White balance: 3200°K (M1 ☼)
Subject: Colour pattern
Oscilloscope: CH1 (X): CV-1 board TP407 (B-Y)
CH2 (Y): CV-1 board TP406 (R-Y)
Mode: X-Y (50mV/div)

[Adjustment Procedure]

Adjust with PM-2 board RV716 (R-Y), RV717 (B-Y), RV718 (R-YM), and RV719 (B-YM) with the + points as a guide so that the luminescent spots of all of the colours are within the phase frame specifications.

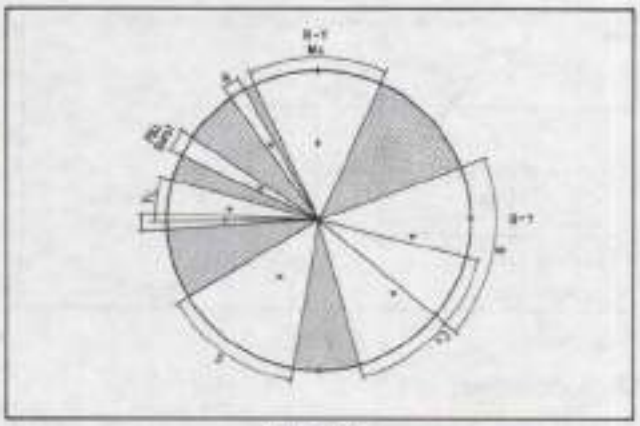


Fig. 2-26

2-3-8. R Gain, B Gain (PM-2 Board, CV-1 Board)

White balance: Auto (M3)
Subject: White pattern
Filter: W14 and C22
Oscilloscope: CH1 (X): CV-1 board TP407 (B-Y)
CH2 (Y): CV-1 board TP406 (R-Y)
Mode: X-Y

[Adjustment Procedure]

1) Turn PM-2 board RV711 (RG) and RV712 (BG) fully counterclockwise (↺).
2) Place a filter (W14) over the lens, set to stand-by mode and then press the white balance switch down.
3) Put into recording mode and confirm that the white luminescent spot is to the left of the R-Y axis. (Fig. 2-27 Ⓐ)
4) Move the white luminescent spot to a position 15 ±5mV to the right of the R-Y axis with PM-2 board RV712 (BG). (Fig. 2-27 Ⓑ)
5) Set to stand-by mode and press the white balance switch.
6) Set to recording mode and confirm that the white luminescent spot is on the R-Y axis. (Fig. 2-27 Ⓒ)
7) Remove the W14 filter and place the C22 filter over the lens, set to stand-by mode and press the white balance switch.
8) Set to recording mode and confirm that the white luminescent spot is below (slightly right) the B-Y axis. (Fig. 2-28 Ⓓ)
9) Move the white luminescent spot to a position 30 ±5mV above (slightly left) the B-Y axis with PM-2 board RV711 (RG). (Fig. 2-28 Ⓔ)
10) Set to stand-by mode and press the white balance switch down.
11) Set to recording mode and confirm that the white luminescent spot and burst origin match, and that the white balance warning lamp does not light up. (Fig. 2-28 Ⓕ)

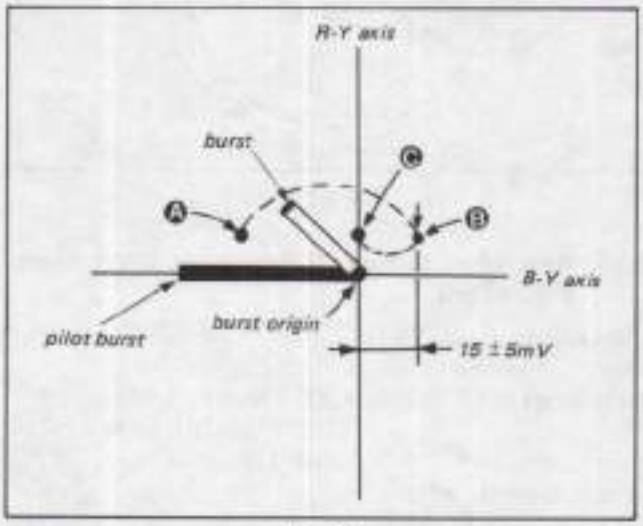


Fig. 2-27

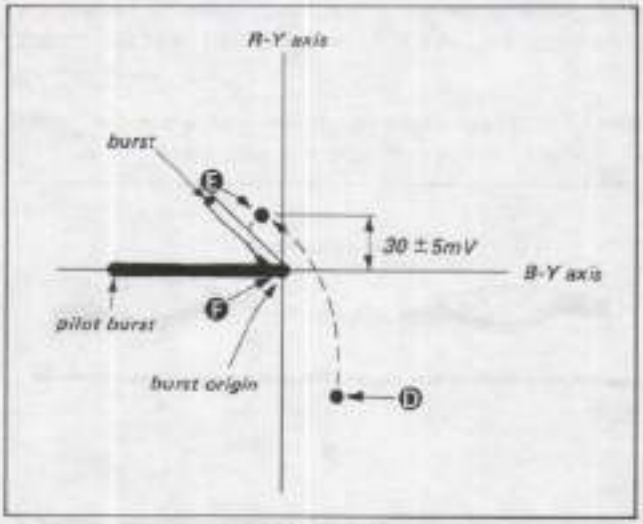


Fig. 2-28

2-3-9. MR1, MB1 (3200°K) Adjustment (CV-1 Board)

White balance: 3200°K (M1, ☼)
Subject: Colour pattern
Oscilloscope: CH1 (X): CV-1 board TP407 (B-Y)
CH2 (Y): CV-1 board TP406 (R-Y)
Mode: X-Y

[Adjustment Procedure]

Match up the white luminescent spot and burst origin with RV809 (MR1) and RV810 (MB1). (Refer to Fig. 2-24)

2-3-10. MR2, MB2 (5800°K) Adjustment (CV-1 Board)

White balance: 5800°K (M2, ☀)
Subject: Colour pattern
Filter: for sunlight use
Oscilloscope: CH1 (X): CV-1 board TP407 (B-Y)
CH2 (Y): CV-1 board TP406 (R-Y)
Mode: X-Y

[Adjustment Procedure]

1) Place the sunlight filter over the lens.
2) Adjust the white luminescent spot to a position 20mV directly under the burst origin with RV807 (MR2) and RV808 (MB2).

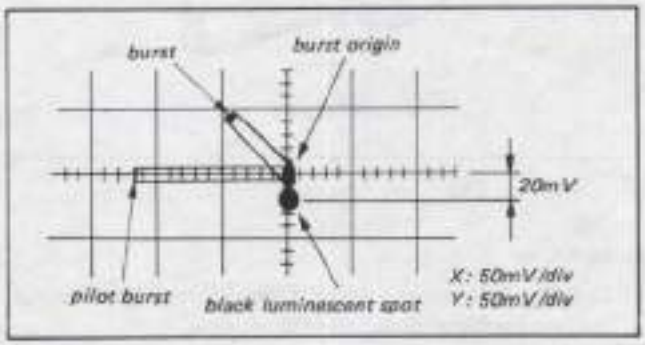


Fig. 2-29

2-3-11. Chroma AGC Adjustment (CV-1 Board)

Subject: Colour pattern
Oscilloscope: TP411

[Adjustment Procedure]

Adjust chroma signal maximum amplitude to 200 ±10mVp-p with RV409.

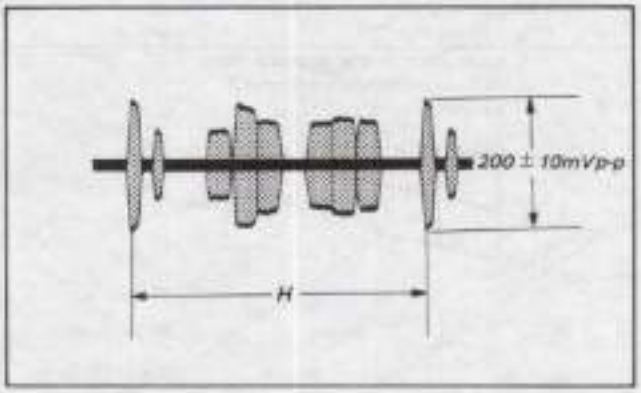


Fig. 2-30

2-4. Adjustment of Automatic Focus System

2-4-1. Measurement Distance Check

Connection Diagram

1) Set up the cross chart and the Betamovie as shown in the diagram below.
2) Align the heights and horizontal levels of the cross chart and Betamovie.

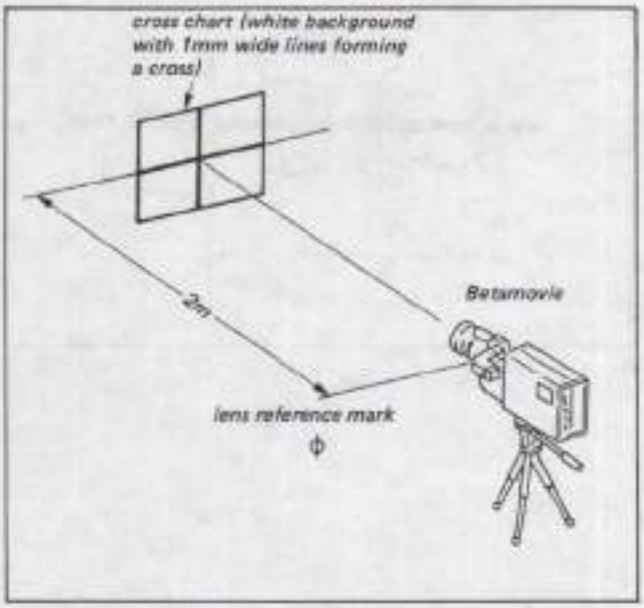


Fig. 2-32

[Checking Procedure]

1) Set the focus switch to AUTO.
2) Set the lens zoom ring on the telephoto side. Rotate the focus ring to ∞ by hand.
3) Check that the difference between the 2m mark on the focus ring and the mark is ±1.5mm when the focus ring is released. (Refer to Fig. 2-33)

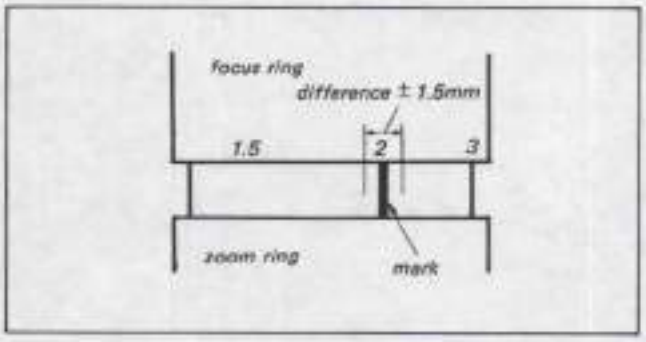


Fig. 2-33

4) Rotate the focus ring to 1.3m by hand.
5) Check that the difference between the 2m mark on the focus ring and the mark is ±1.5mm when the focus ring is released.

2-5. Zoom Lens (YCL-1206YD)

2-5-1. Notes on Replacement, Precautions and Checks

1. Viewfinder

[Replacement]

1) Slide the hinge cover back and remove.
2) Take out the hinge pin and remove the viewfinder.

[Mounting]

1) Insert the hinge pin after replacing the viewfinder.
2) Mount the hinge cover.

[Checks]

1) Visibility adjustment operation confirmation.
2) Check for dirty viewfinder.
   Be especially careful of dirt on the viewfinder protective glass, as shown in Fig. 2-34. Clean if necessary.

Fig. 2-34

2. Lock Claw

1) Loosen the screw holding the lock claw and adjust the folding force of the viewfinder. (Fig. 2-35)

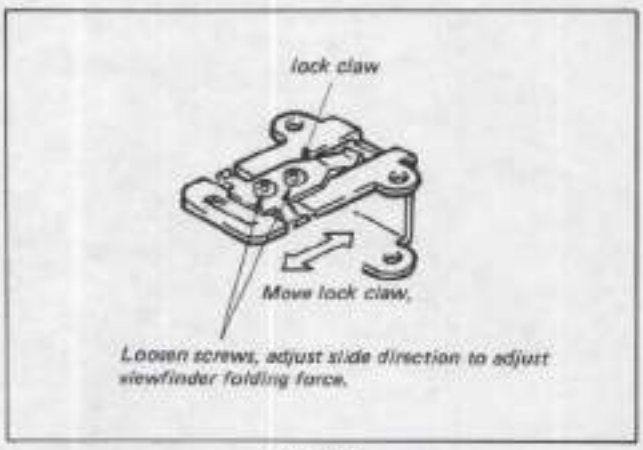


Fig. 2-35

2) Tightly the adjustment screw firmly and lock.

3. Zoom Motor Unit and Focus Motor Unit

1) When mounting the zoom motor unit and focus motor unit, adjust the engagement of the gears so that the play of the manual zoom and focus ring is 0.5mm – 1mm on the zoom ring and focus ring respectively, and fix with screws. (Fig. 2-36)

Note: If there is not enough play, manual torque will be heavy at high and low temperatures.

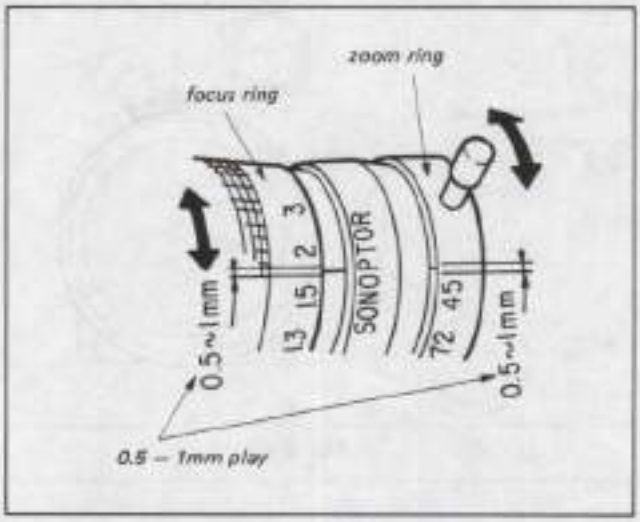


Fig. 2-36

4. Iris Unit

1) Check iris operation. (Fig. 2-37)
2) Adjust flange back.

Fig. 2-37

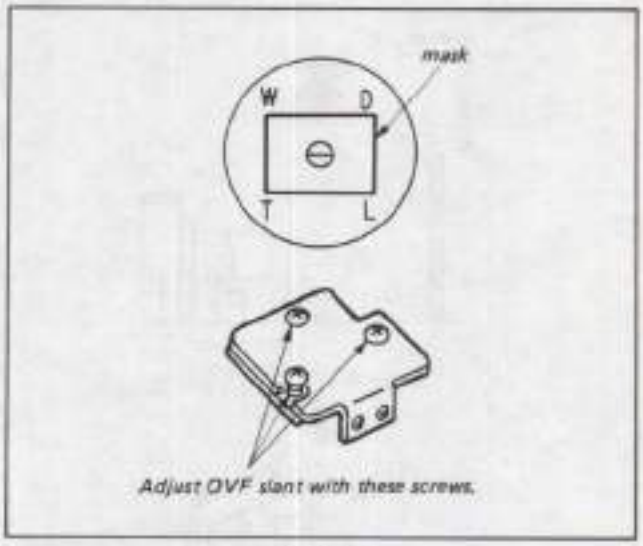


Fig. 2-38

5. LED Screen Unit

1) Replace LED screen unit and adjust OVF slant. (Mask slant inside OVF)
With the mounting screws loosened, move the unit in the rotation direction and tighten the screws. (Fig. 2-38)
2) Check to see if the OVF surface is slanted. If no, adjust with a mirror.
3) OVF Focus Check
While observing the monitor, and after checking the lens flange back, open the iris with the zoom telephoto (72mm), and get just focus on the monitor. Adjust if OVF focus at this time is off.

[Adjustment Procedure]

1. Perform visibility adjustment. (Fig. 2-39)
2. Hold down the OVF FB adjustment portion with a blade screwdriver in the groove. (Be careful that the lens does not drop down when the mounting screw is loosened.)
3. Loosen the mounting screw.
4. Move the OVF FB adjustment portion with the blade screwdriver and stop when focused.
5. Tighten the screw. (Be sure to tighten sufficiently, as it is self-tapped.)
6. Focus with OVF and then confirm that monitor is focused also. If not, repeat steps 1–6.

4) Confirm that the display LED inside the OVF lights up.

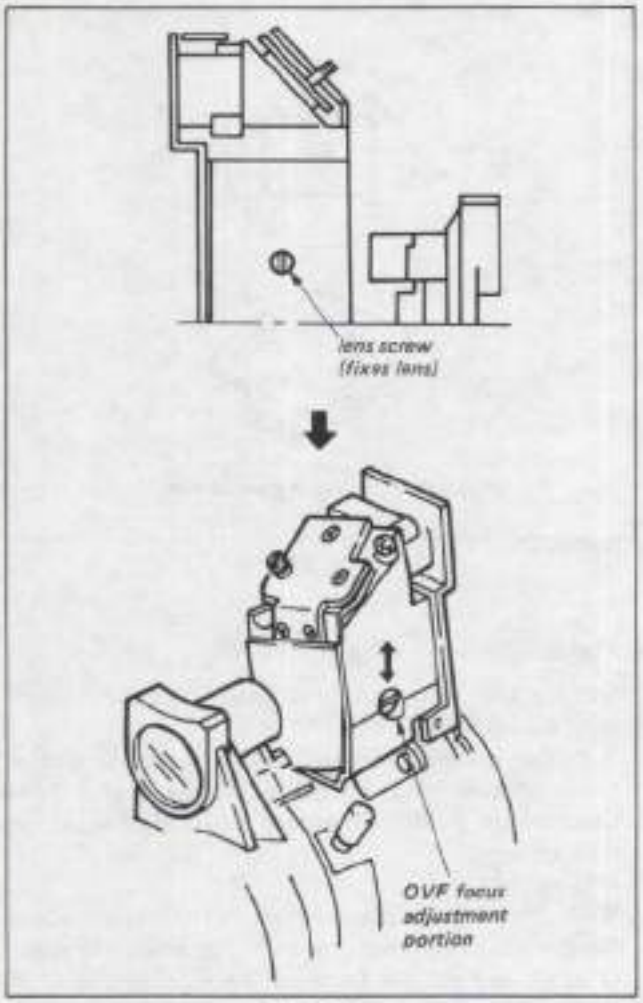


Fig. 2-39

6. Zoom Ring Unit

[Replacement]

1) Open the AZ-1 board.
2) Remove the zoom motor unit from the lens barrel.
3) Remove the screw holding the rear lens barrel and the rear lens barrel. (Fig. 2-40)
4) Remove the screw holding the middle lens barrel and the middle lens barrel. (Fig. 2-41)
5) Remove the zoom ring unit.
6) Replace the zoom ring unit.

[Mounting Procedure]

1) Mount the zoom ring unit. (Fig. 2-42)
2) Mount the middle lens barrel on the rear lens barrel.
3) Mount the zoom motor unit and lens barrel.
4) Check manual zoom operation.
5) Be careful not to get dirt or fingerprints on the lens.
6) Be careful not to scratch the ND filter on the iris unit.
7) Adjust flange back.
8) Check OVF focus, slant and center, and adjust if necessary.
9) Check zoom manual operation and back rush amount (play).
10) Check iris operation.

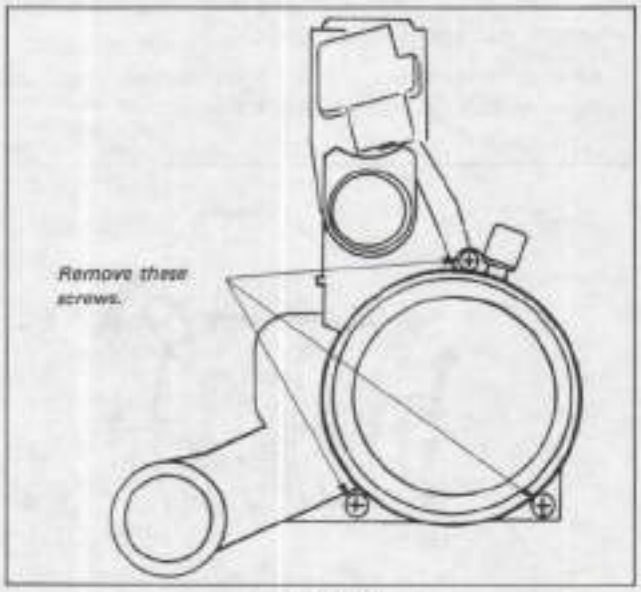


Fig. 2-40

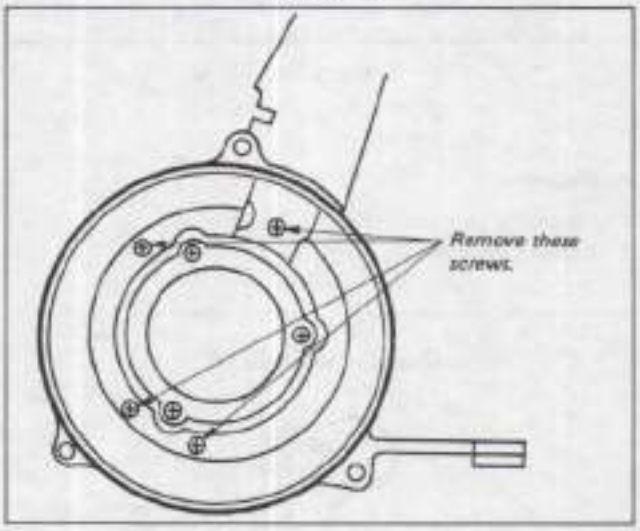


Fig. 2-41

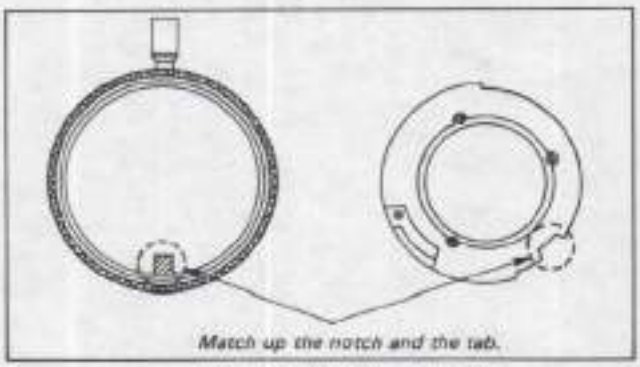


Fig. 2-42

2-5-2. AF Adjustment

1. VFC Adjustment

Required equipment: Frequency counter

[Adjustment Procedure]

1) Short the ZD-1 cathode and 1.7V line to make the waveform stationary.
2) Measure the frequency between TP3 and GND and adjust with RV10 if not within the specification.

   Specification: 29.5 – 30.3kHz (cycle 33 $^{+1}_{-0}$ μsec)

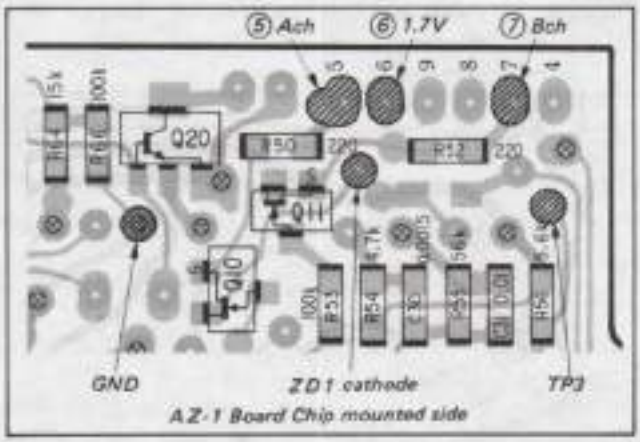


Fig. 2-43

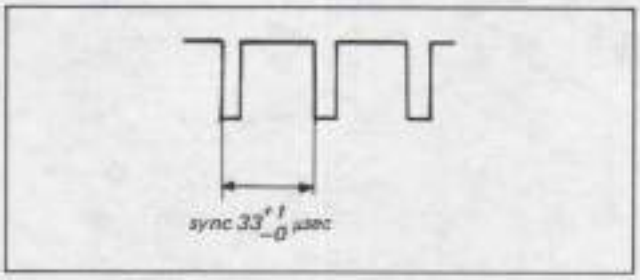


Fig. 2-44

2. Offset Adjustment

Required equipment:

Oscilloscope: CH1 Ach (⑤) . . . AZ-1 board
CH2 Bch (⑦) . . . AZ-1 board
(Fig. 2-47)

[Adjustment Procedure]

1) Cover so that infrared rays do not enter the light-receiving sensor. (A 25φ piece will work.) (Fig. 2-45)
2) Connect GND to the 1.7V line (⑥). (Fig. 2-47)
3) Adjust PA-5 board RV1 (Ach) and RV2 (Bch) so that the Ach and Bch integrated waveforms are 0 (0 potential difference).

   Specifications: within $^{+0.02V}_{-0.05V}$

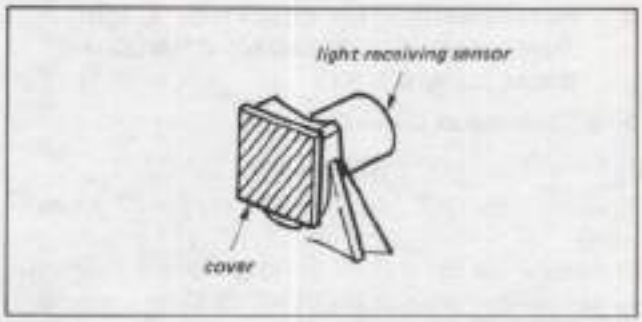


Fig. 2-45

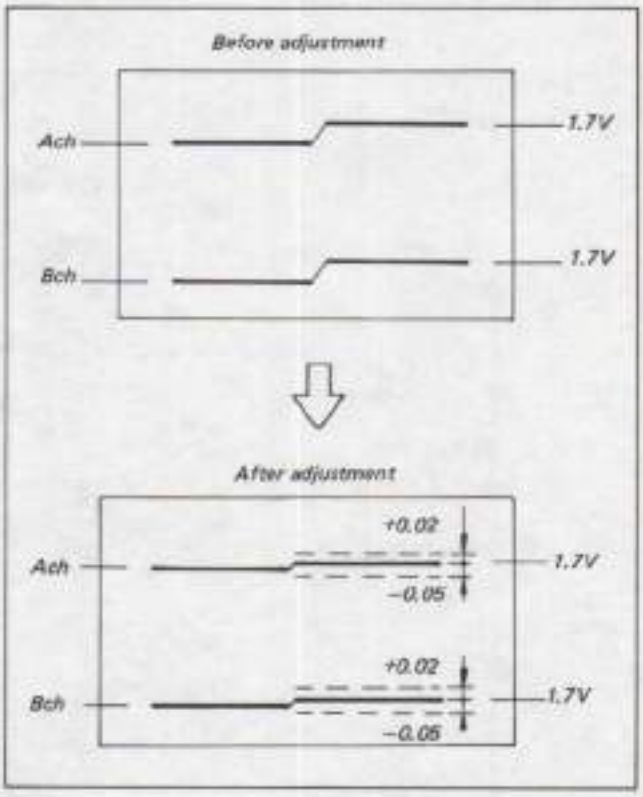


Fig. 2-46

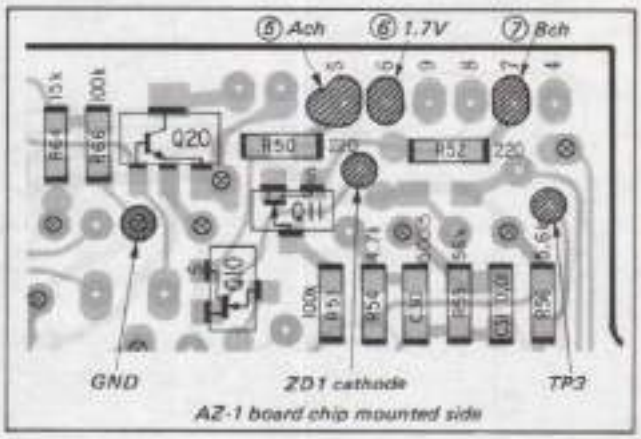


Fig. 2-47

3. ALIGNMENT OF MECHANICAL COMPONENTS(VIDEO)

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

3-1-1. Removal of Cabinet

1) Remove two screws (B2.6 x 5) ❶.
2) Remove the OVF MIC assembly and the 3P connector ❷.
3) Remove the screw (B2.6 x 5) ❸ and the front cover.
4) Remove the two screws (K2.6 x 8) ❹ and remove the ACC shoe ❺.
5) Remove the two face screws ❻ and remove the cassette compartment assembly.
6) Remove the five screws (B2.6 x 5) ❼ and remove the cabinet subassembly (R) in the direction of arrow Ⓐ.
7) Remove the six screws (B2.6 x 5) ❽ and remove the cabinet subassembly (L) in the direction of arrow Ⓑ.
8) Remove the battery cover subassembly ❾ and the cap ❿.
9) Remove the two screws (B2.6 x 5) ⓫ and remove the lens cap subassembly in the direction of arrow Ⓒ.

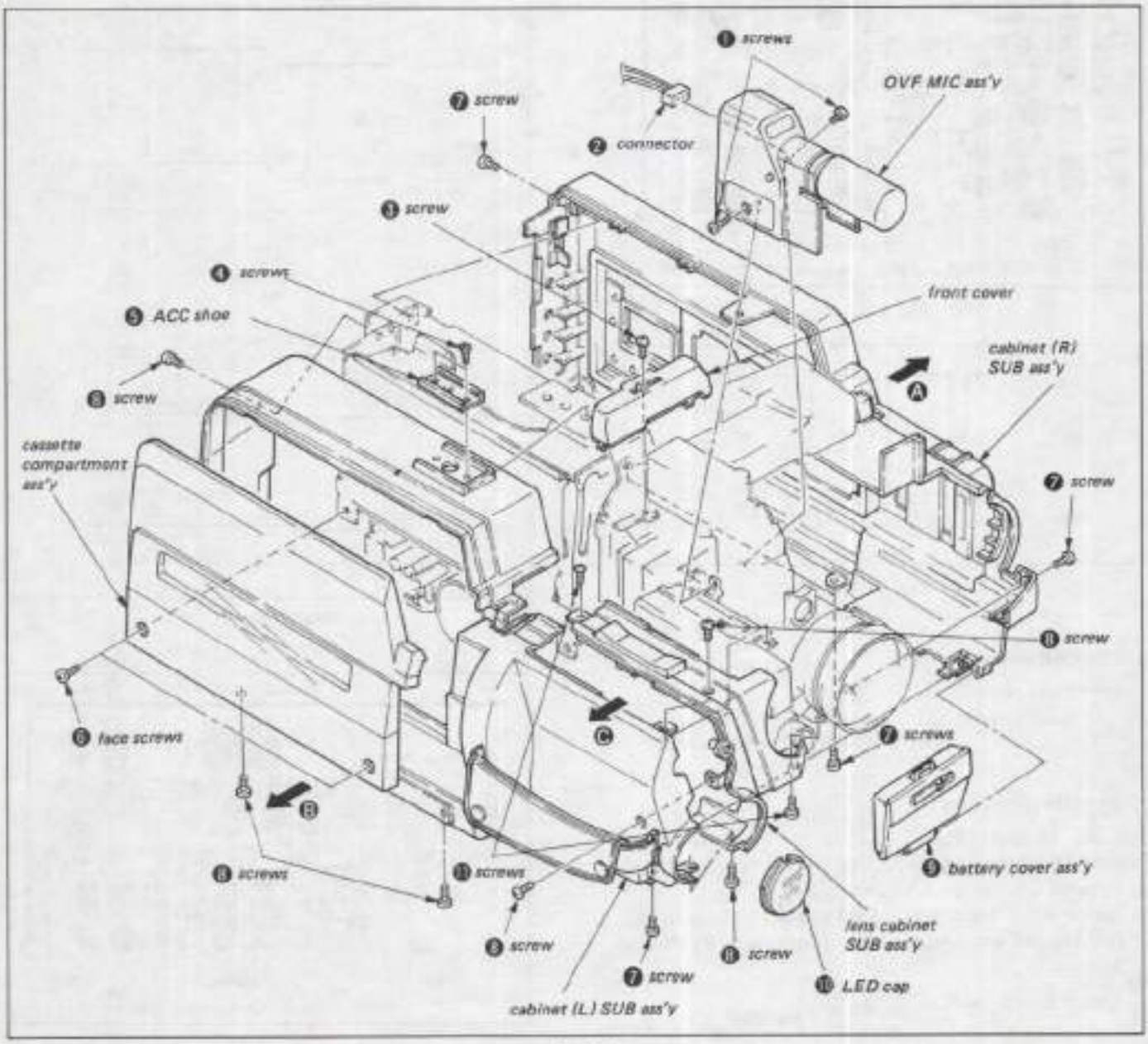


Fig. 3-1.

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

1) Remove the four screws (BVTT2.6 x 6) ❶.
2) Remove the cassette compartment assembly in the direction of the arrow.
3) Remove the connector (CN004) ❷ on the CS-5 board.

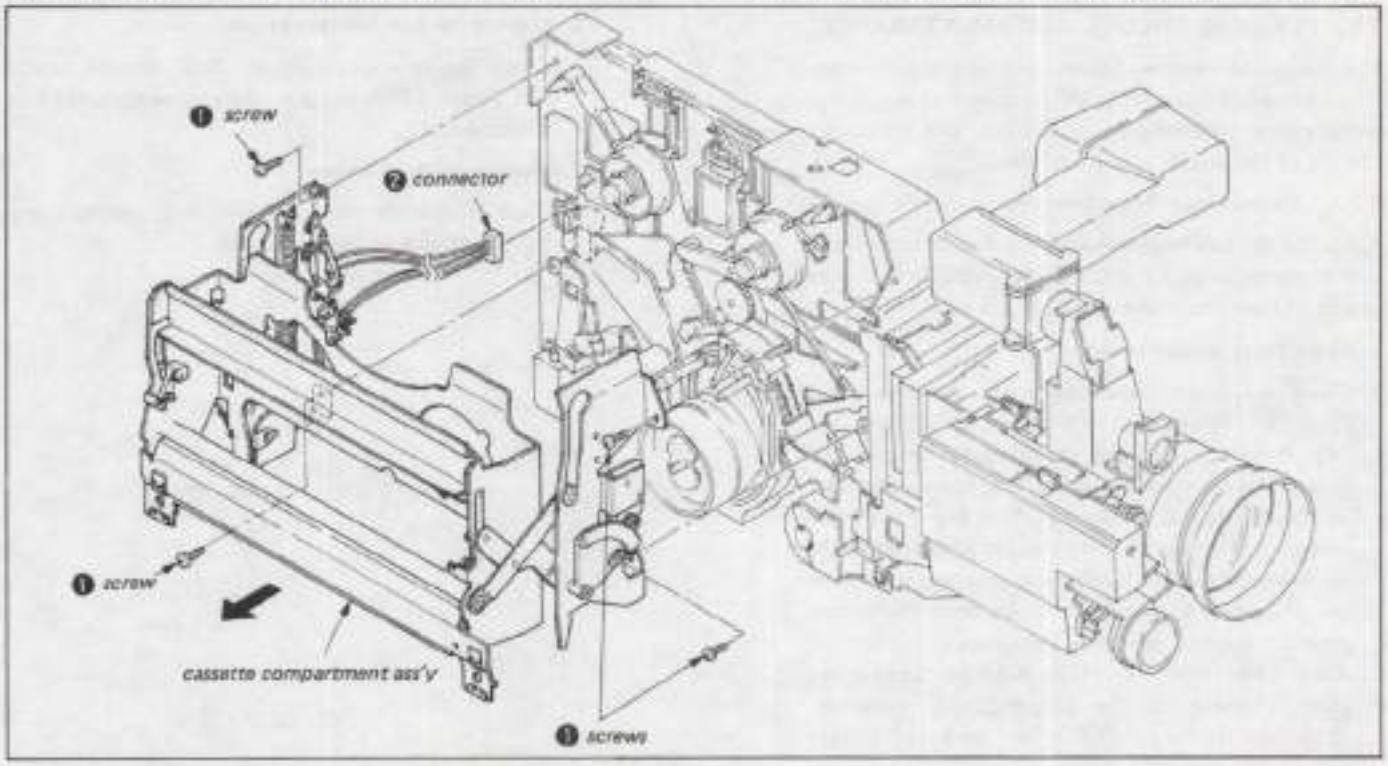


Fig. 3-2.

3-1-3. Method of Opening CV-1, CS-5 Boards

1) Remove the four screws (BVTT2.6 x6) ❶.
2) Remove the screw (BVTT2.6 x 6) ❷, and retainer plate, shield, CV ❸ (West Germany ONLY)
3) Remove the connector (CN301) ❹ and open CV-1 board in the direction of arrow Ⓐ.
4) Remove the three screws (BVTT2.6 x 6) ❺ and loosen the screw (BVTT2.6 x 6) ❻.
5) Remove the four wire holders ❼ and open CS-5 board in the direction of arrow Ⓑ.

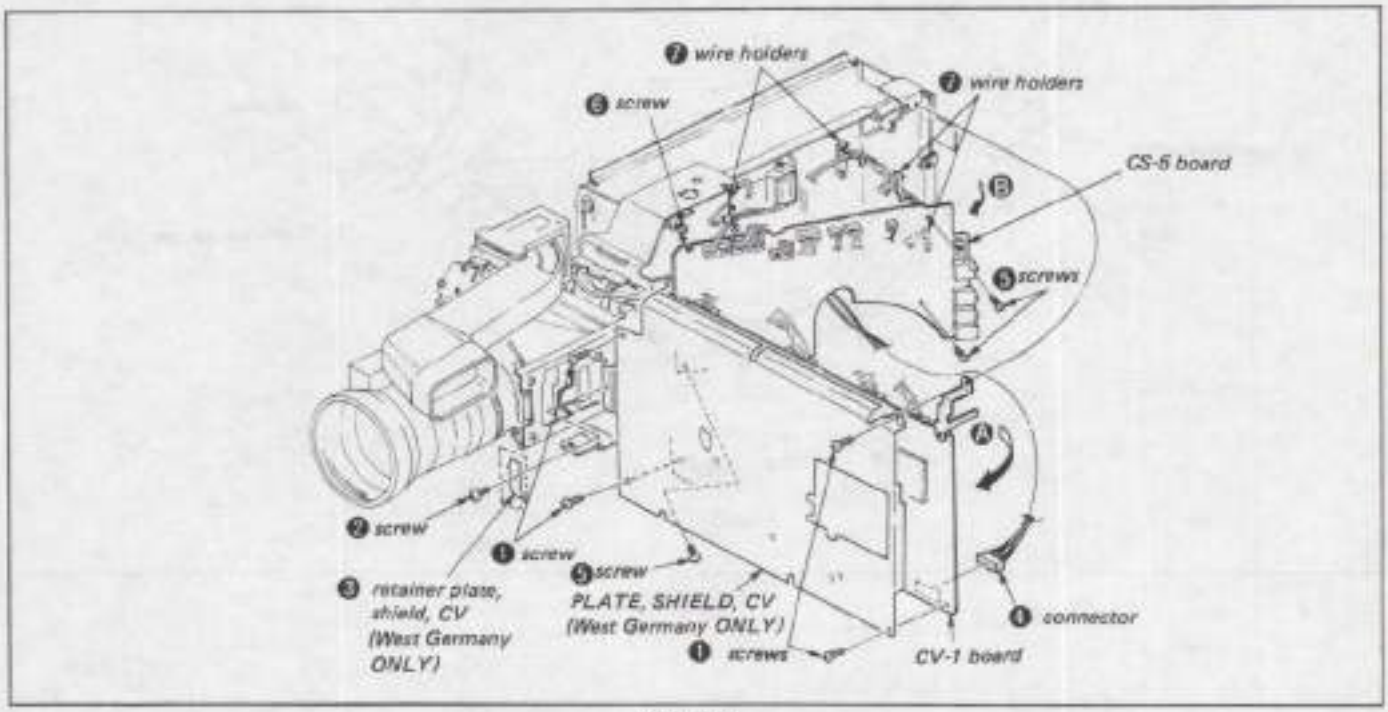


Fig. 3-3.

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.

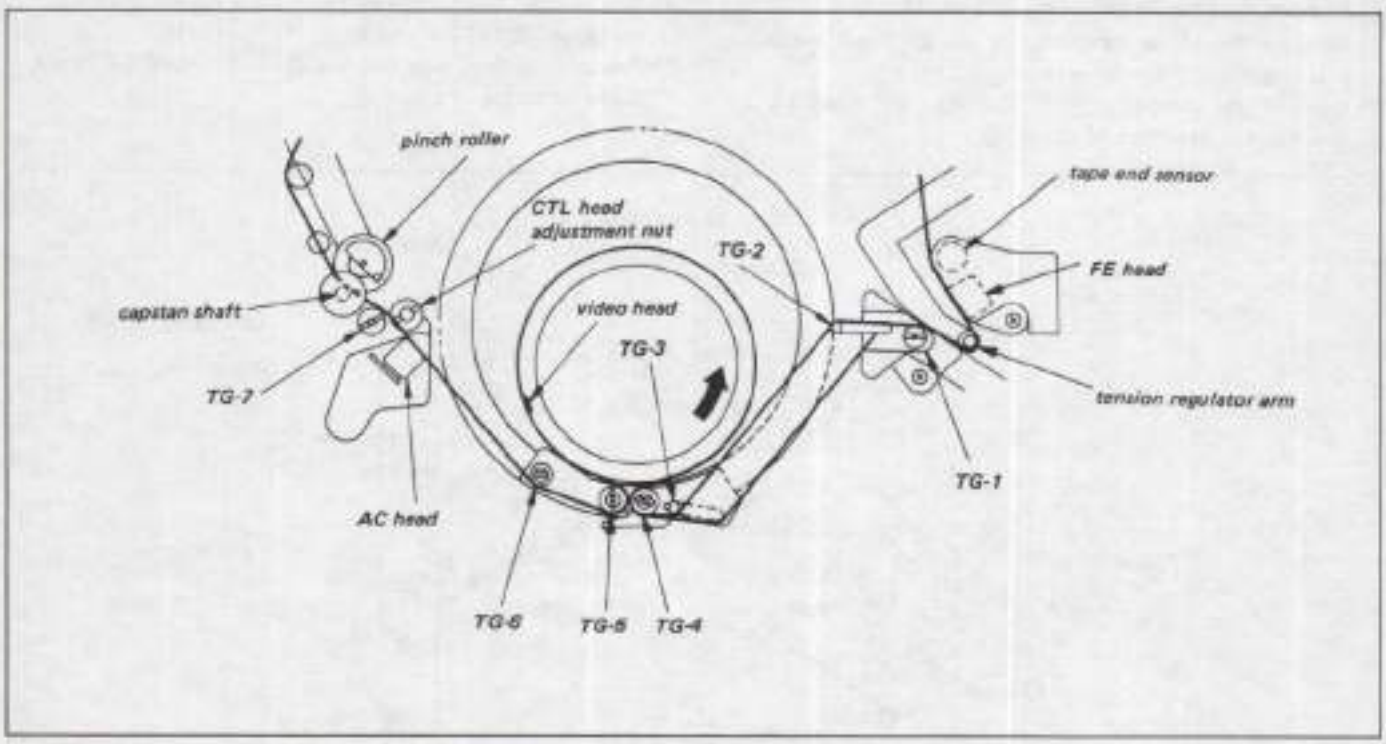


Fig. 3-4

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

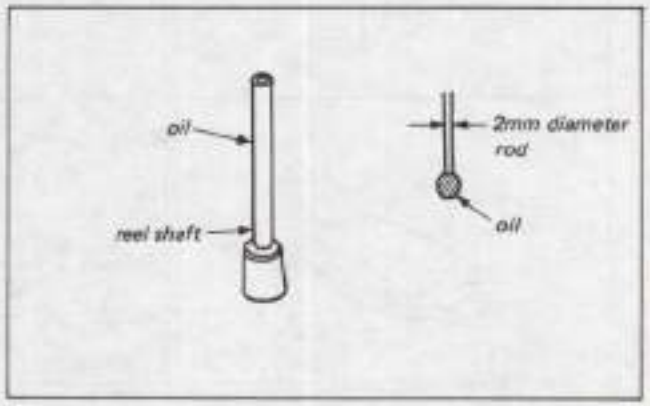
	Maintenance checks	Operating period (H) / Replacement Part No.	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Running System	Cleaning of running surface of tape	———	○	○	○	○	○	○	○	○	○	○	These procedures must be carried out at each servicing. Use light pressure on the AC head as too much force can move it out of position
	Cleaning and degaussing AC head ass'y	A-6736-048-A	○	○	○	○	○	○	○	○	○	○	
	Cleaning and degaussing rotary drum	A-6360-128-A	○	○	○	○	○	○	○	○	○	○	The operating environment and method of use greatly affect the longevity of the video head.
	FE head	8-825-581-30	○	○	○	○	○	○	○	●	○	○	
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	1-454-391-11	–	–	–	○	–	–	–	○	–	–	
	Cleaning iron core and opening of pinch solenoid	1-454-357-21											
	Take-up reel	X-3690-117-1	–	☆	–	●	–	☆	–	●	–	☆	
	Capstan bearing	4-6735-651-A	–	⊙	–	⊙	–	⊙	–	⊙	–	⊙	
	Drum motor	8-835-135-01	–	○	–	●	–	○	–	●	–	○	
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	1-681-664-□□	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Check tape speed adjustment. Replace relay pulley 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. 7-661-088-01
* 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	KR5-2E	
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	Sold in market		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
J12	Video head checker	7-732-080-01	SL-5151	Video head check

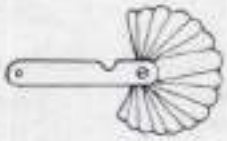
J1

J2

J3

J4

J5



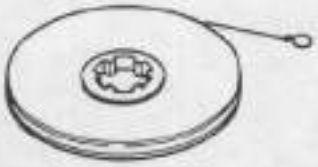
J6

J7

J8

J9

J10



J11

J12

3-3. REMOVAL AND ADJUSTMENT OF MECHANICAL PARTS

Handling Machinery with Cassette Compartment Ass'y Removed

[Threading Method]

1) Set the cassette compartment assembly so that the cassette compartment is down to turn on the leaf switch.
2) Press the lock detection assembly to turn it on. (See Fig. 3-6.)

Note: Remove the cassette compartment with the connector (CS-5 board CN004) on the leaf switch still connected.
(If the connector is to be removed, please short CN004 pins 1 and 2, and pins 3 and 4.

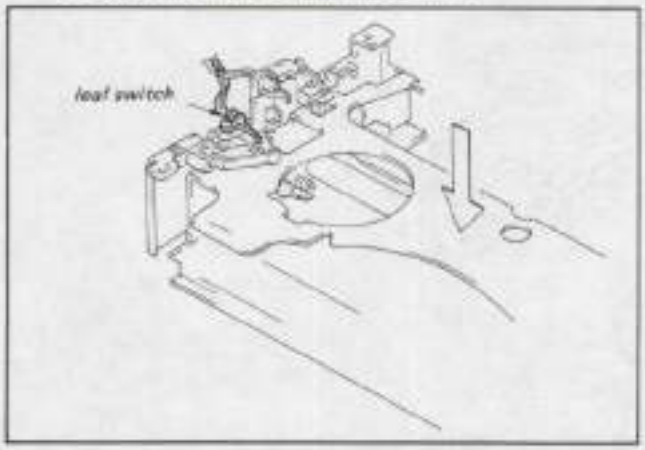


Fig. 3-5.

[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.

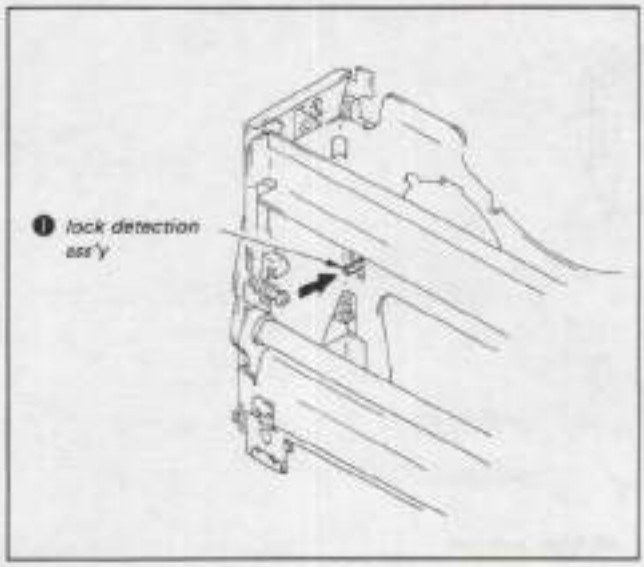


Fig. 3-6.

* If the hole is covered with a piece of tape, the cassette compartment will go down when a tape is inserted and threading will begin.

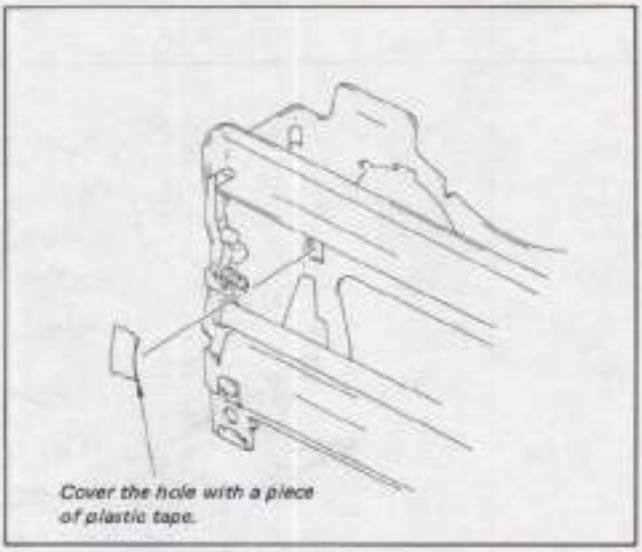


Fig. 3-7.

3-3-1. Removal of Mechanical Parts

1. 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 brake solenoid ❺.

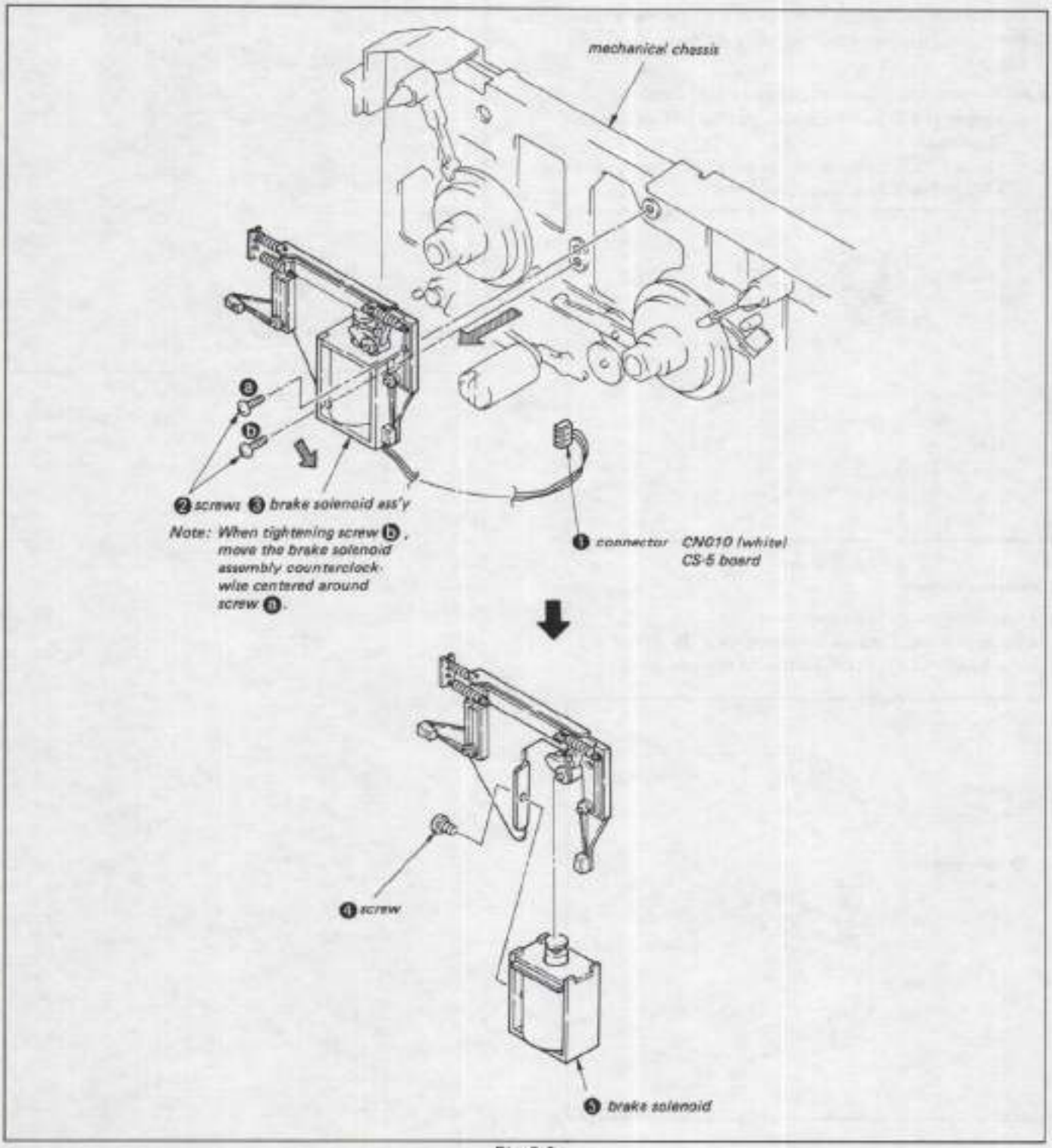


Fig. 3-8.

2. Removal of the S Reel

1) Press the claw ❶ on the chassis in the direction of the arrow.

2) Remove the S reel ❷.

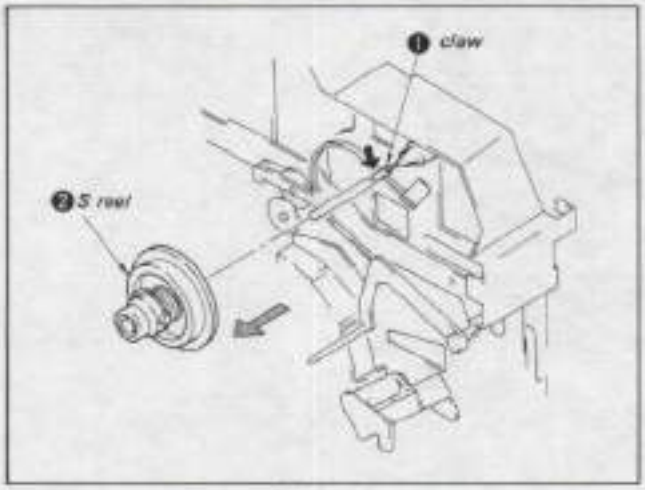


Fig. 3-9.

3. Removal of the T reel (See Fig. 3-10)

1) Press the claw ❶ on the chassis in the direction of the arrow.

2) Remove the FWD belt ❷ from the T reel while pulling the T reel ❸ out in the direction of arrow ⓐ.

3) Remove the T reel ❸.

Note: Be careful not to get grease from the shaft on the FWD belt ❷.

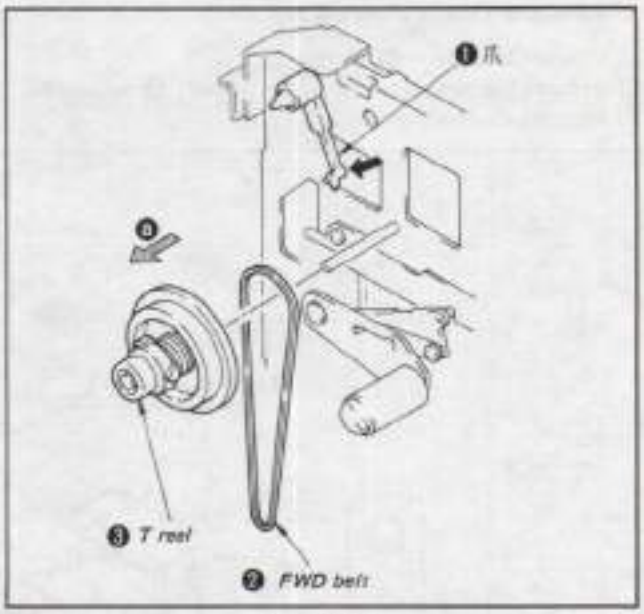


Fig. 3-10.

4. Removal of Pinch Roller Arm Ass'y (See Fig. 3-11)

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

1) Remove the stopper washer ❶.

2) Remove the end of the coiled spring ❷ from the hole in the chassis.

3) Remove the pinch roller arm assembly ❸.

Note: This is easier to remove if unthreading has been completed.

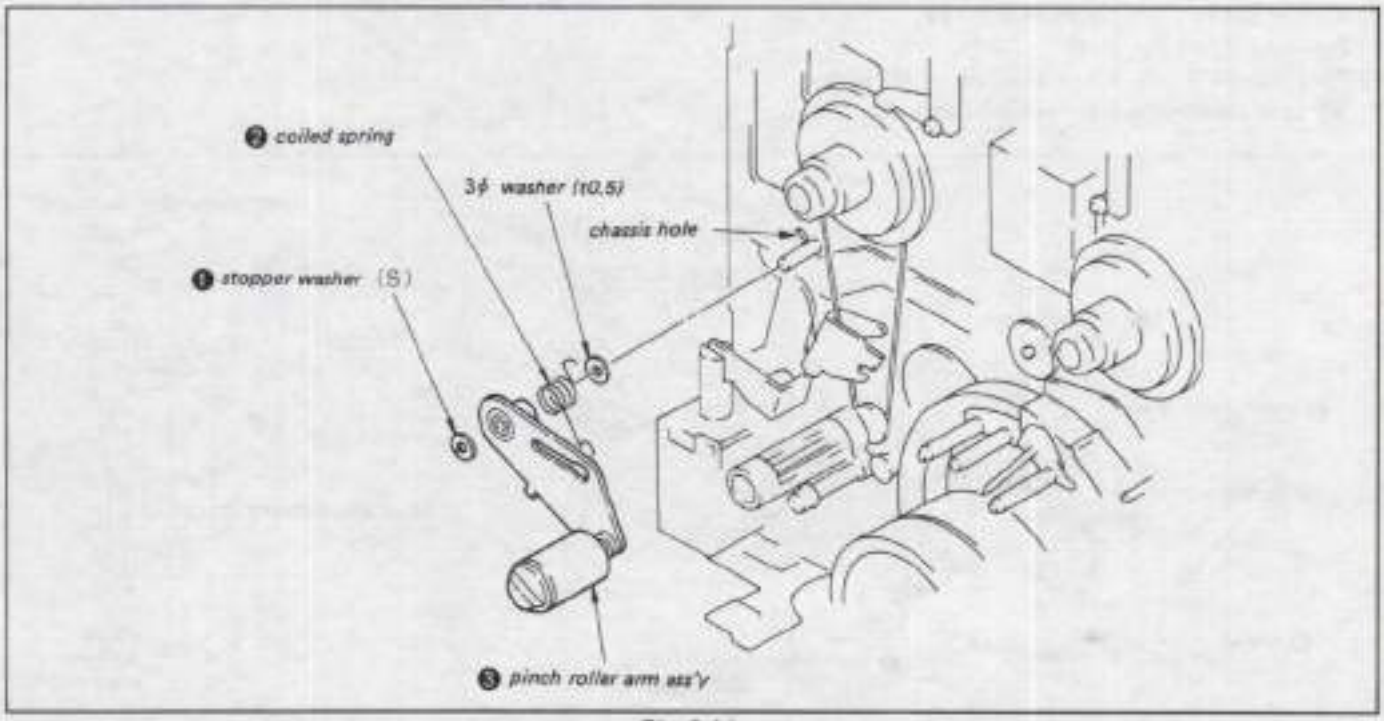


Fig. 3-11.

5. 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.

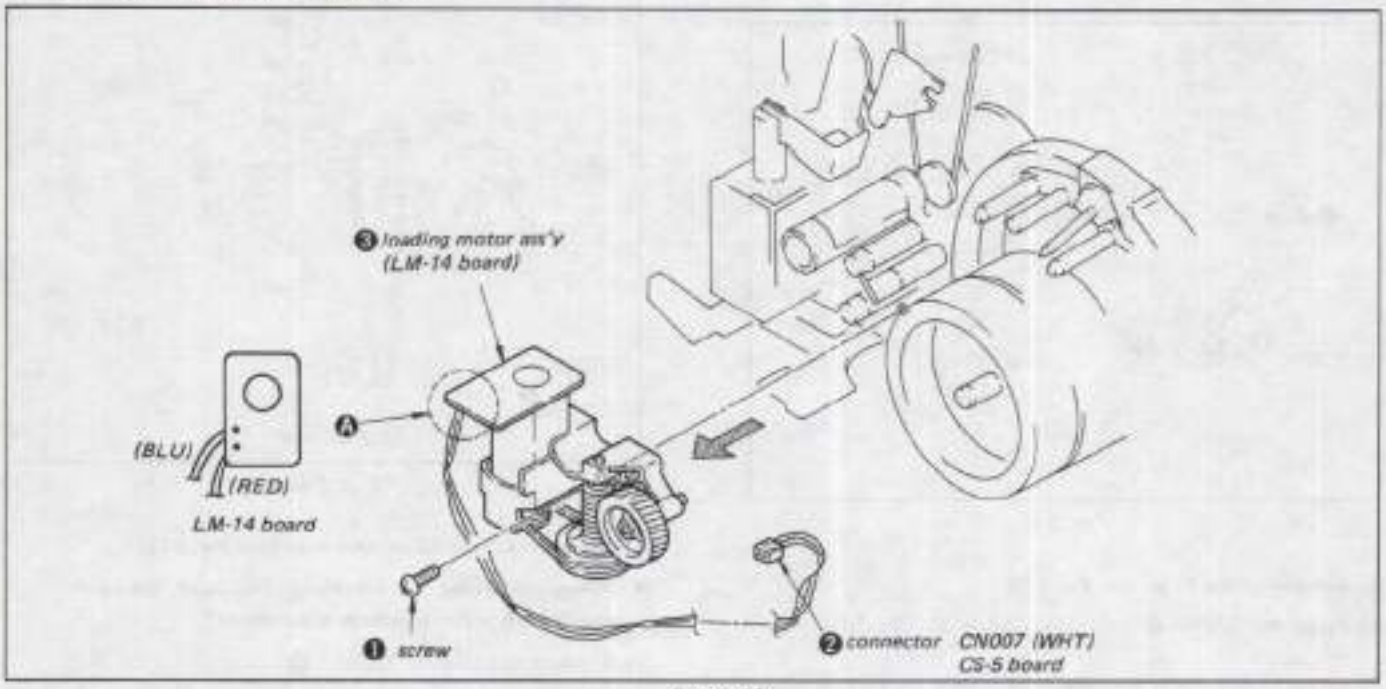


Fig. 3-12.

6. Removal of Pinch Solenoid Ass'y

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

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

[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.

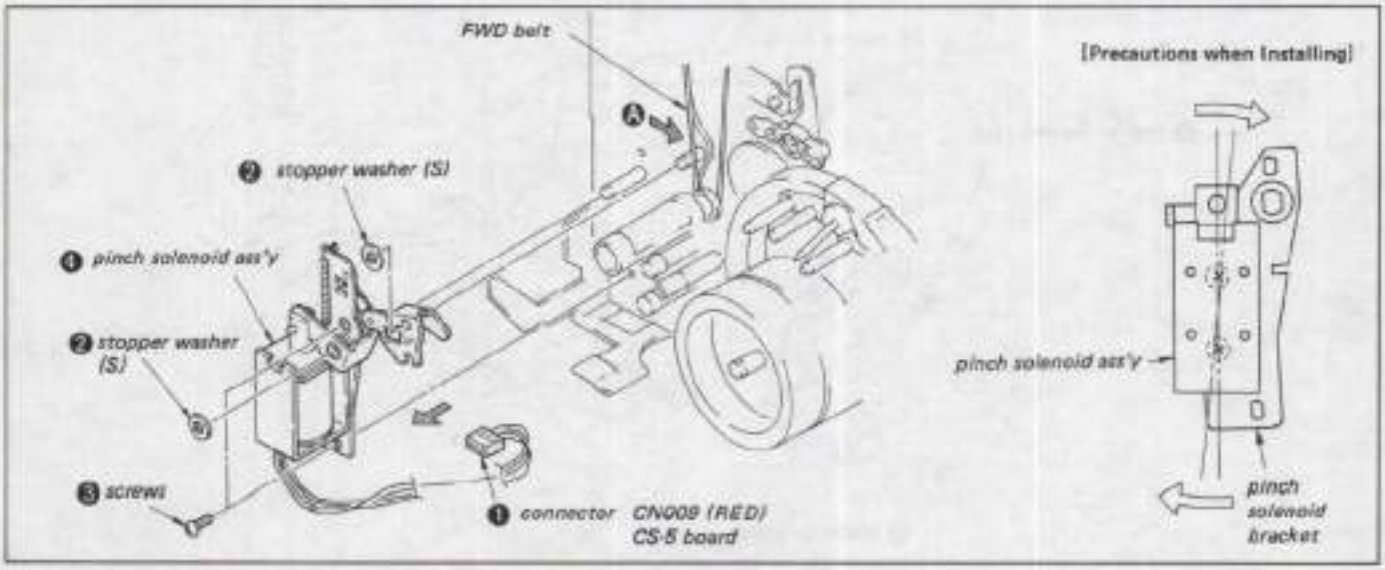


Fig. 3-13.

7. 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.

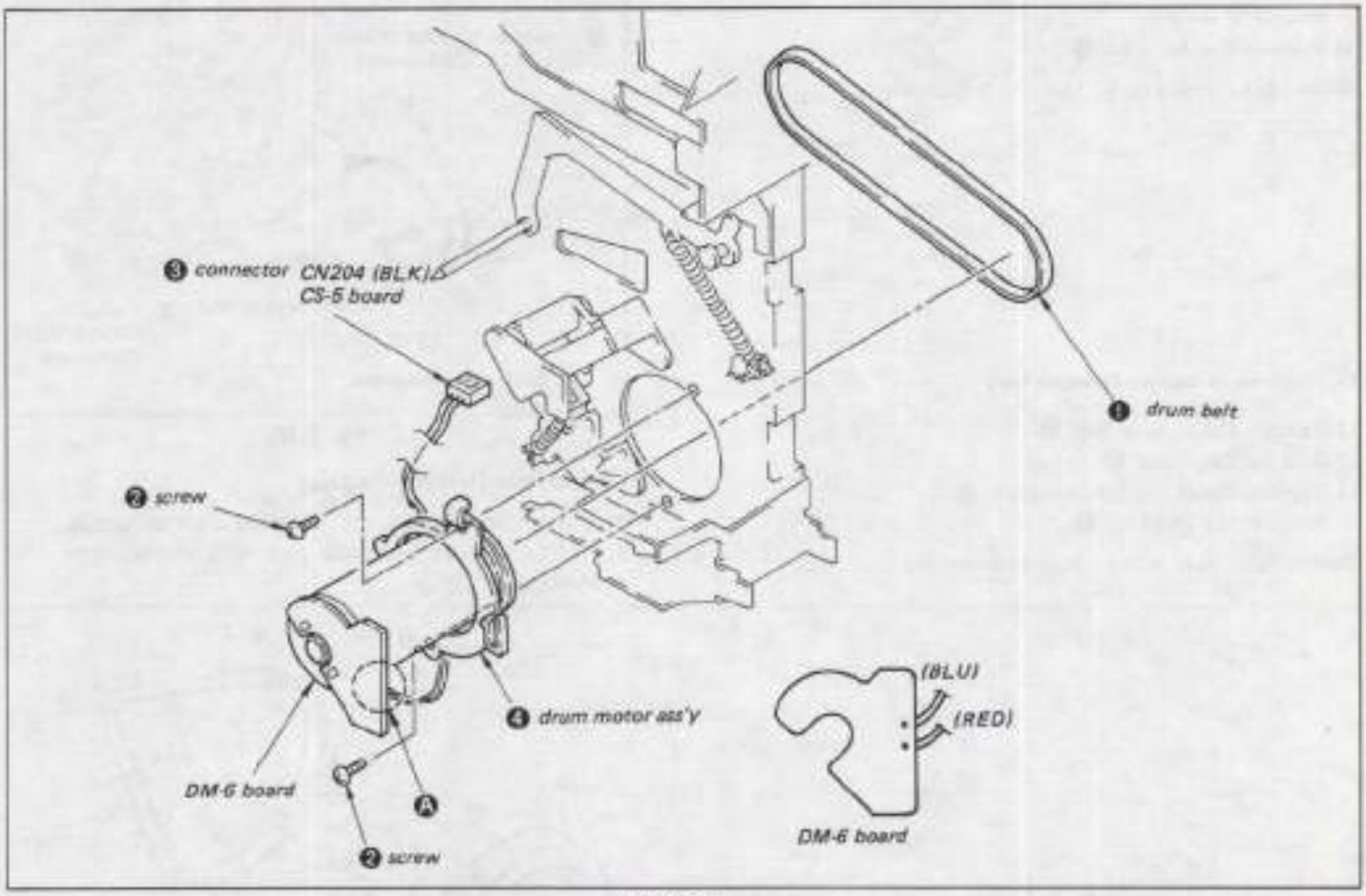


Fig. 3-14.

8. Removal of FE Head Ass'y

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

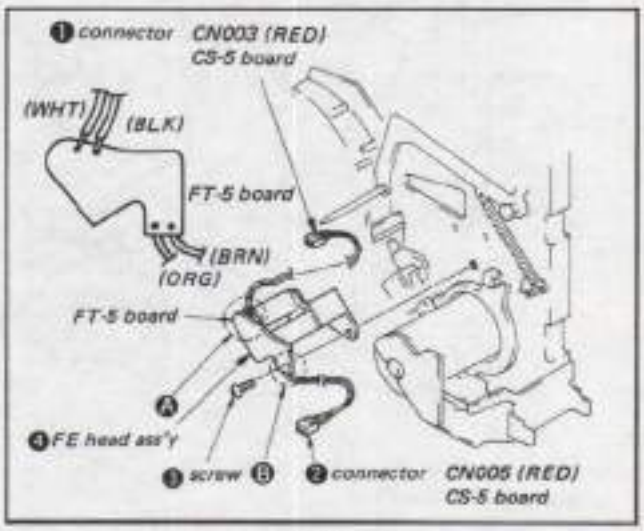


Fig. 3-15.

9. 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.
2) Remove the two connector ❷ and ❸ or the solder (Ⓐ section).
3) Remove the AC head ❹.

Note: Take care not to lose the adjustment spring.

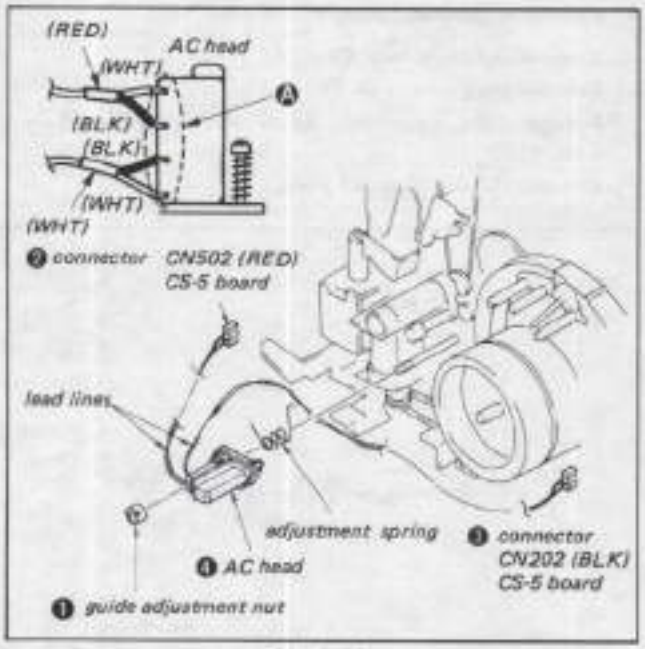


Fig. 3-16.

10. 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.

[Precautions During Mounting]

- The oil seal should not be lifted after mounting.
- Carefully clean the shaft part with alcohol after mounting.

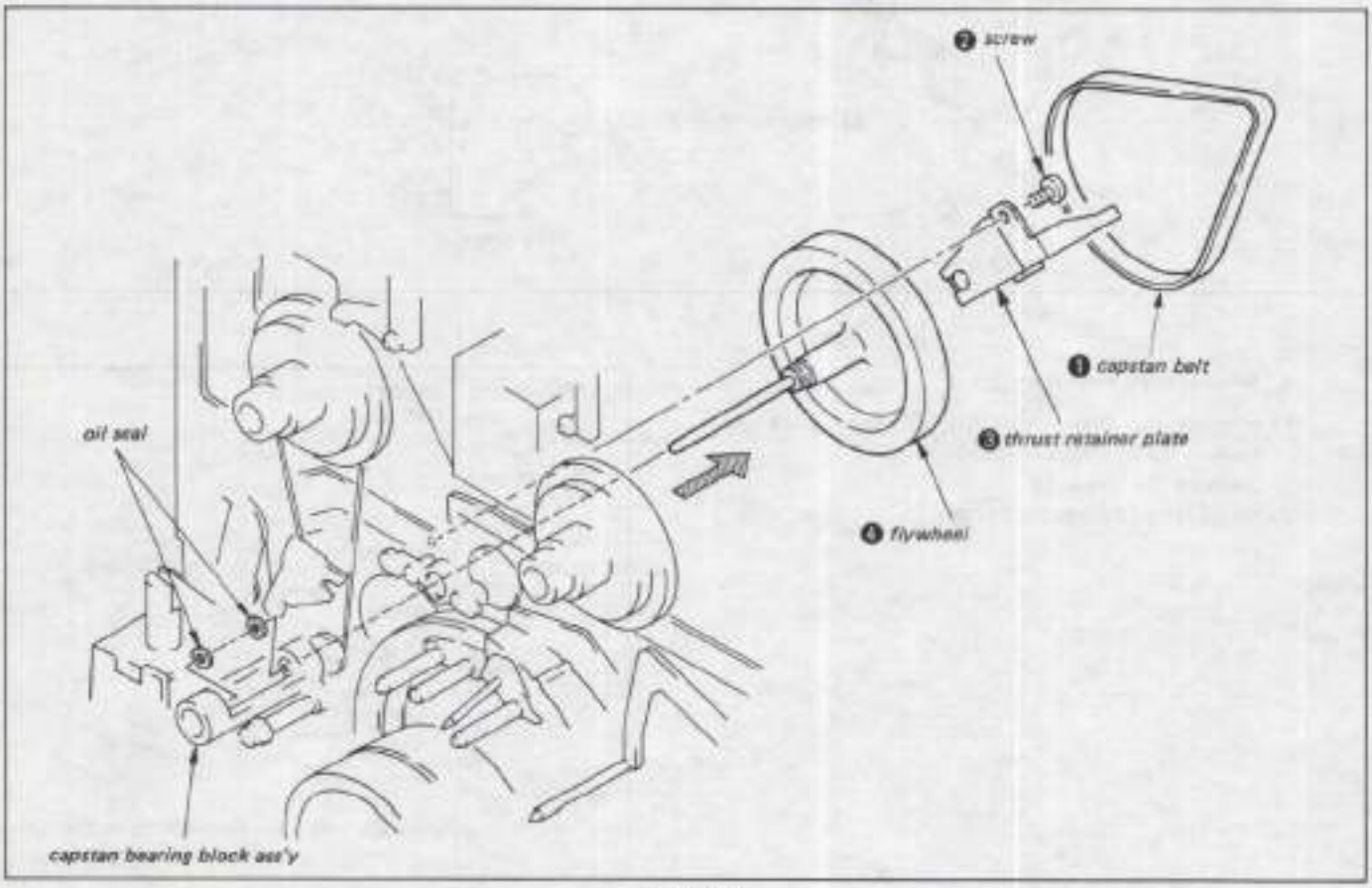


Fig. 3-17.

11. 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.

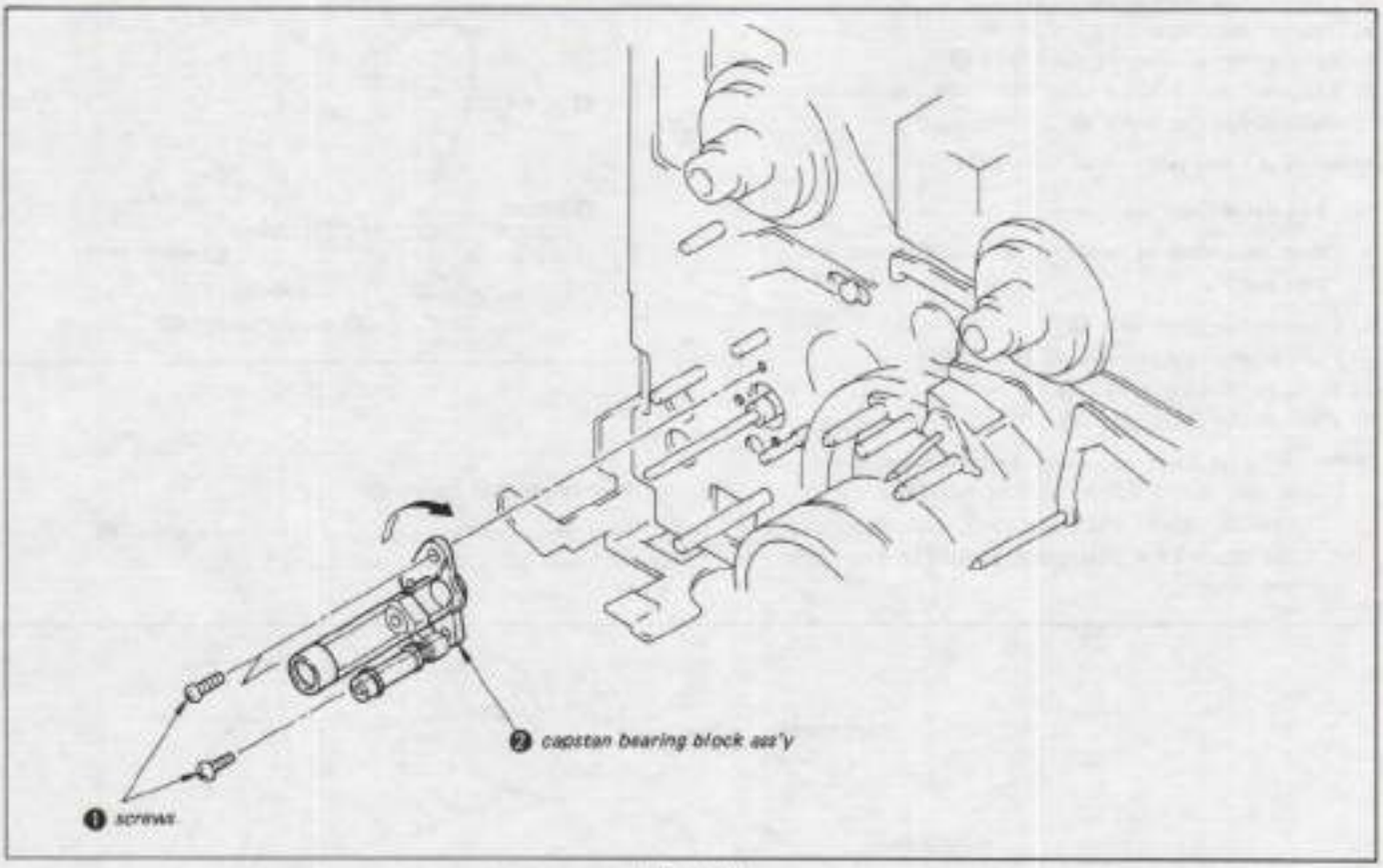


Fig. 3-18.

12. 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.

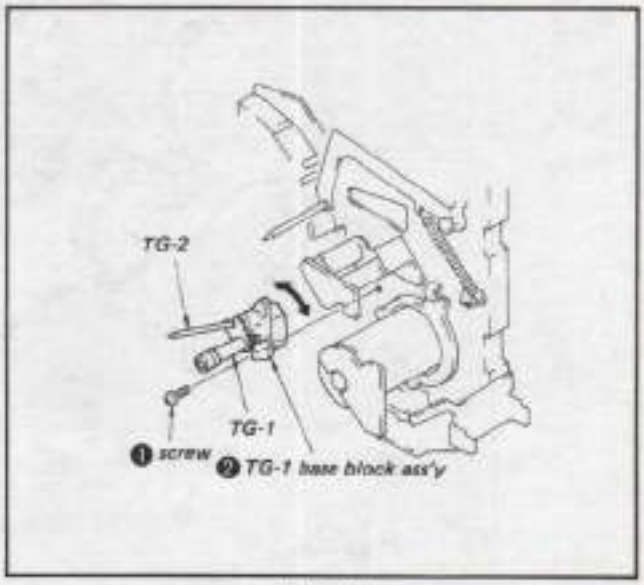


Fig. 3-19.

13. 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 (S) 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.

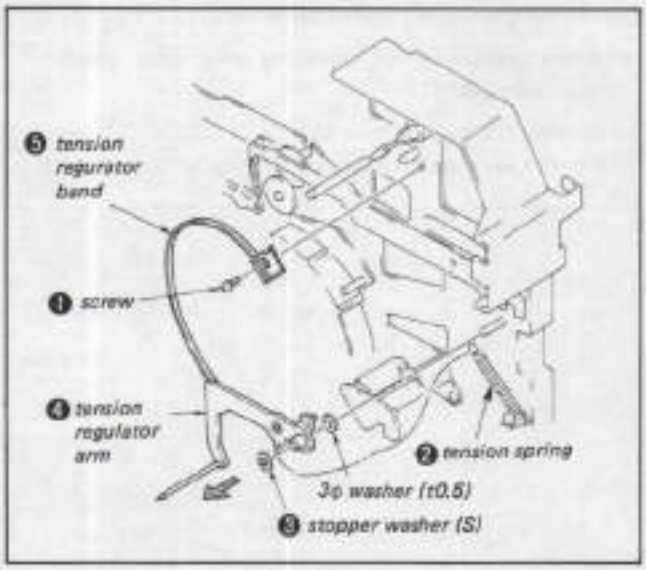


Fig. 3-20.

14. 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 and ❸.
3) Remove the two screws ❹.
4) Remove the drum ass'y ❺.

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.

[Precautions when Installing]

After temporarily tightening the two screws ❹, twist clockwise (↷) when tightening firmly.

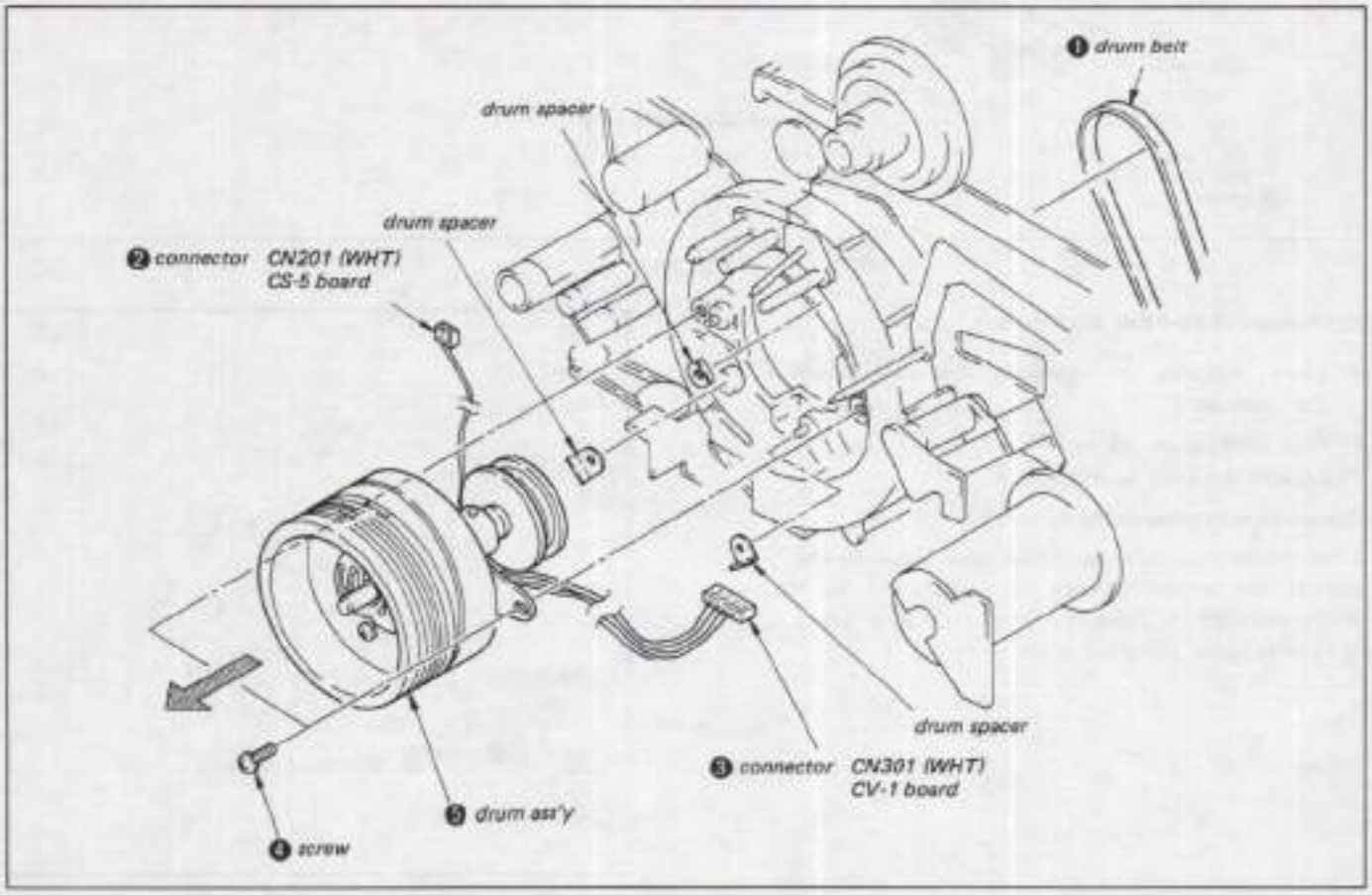


Fig. 3-21.

15. State of Wear of Video Heads Check

As the accuracy of the check depends on the state of the heads and precision of the checker, the results should be taken only as an indication of the state of wear.

[Adjustment of video head checker]

1) Mechanical zero
   Verify that the pointer of the video head checker is at the mechanical zero position. If it is not at this position, adjust the mechanical zero control.
2) Battery voltage check
   Set the MODE switch to "BATT" and set the POWER switch to "ON". The deflection of the pointer should be within the range marked "BATT". If not, replace the battery (use a 6F22 battery) as follows.
3) Calibration check
   Set the POWER switch to "ON" and the MODE switch to "CAL", then adjust the CAL control so that the pointer is on the CAL mark.

   Note 1: Be sure to carry out this adjustment whenever the RANGE switch is changed.

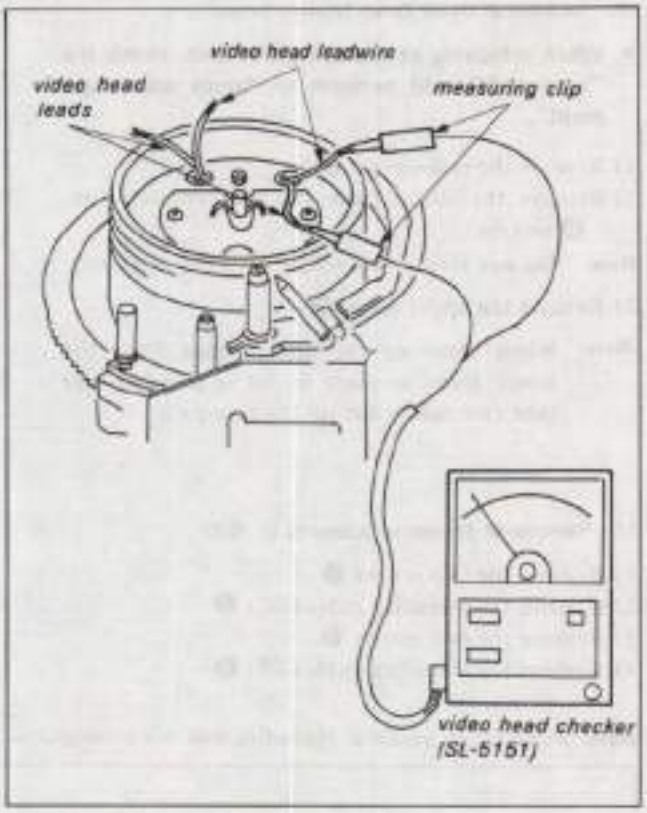
   Note 2: Be sure to check CAL before measuring the head and proceed the measurement after adjusting CAL. If CAL is not properly set.

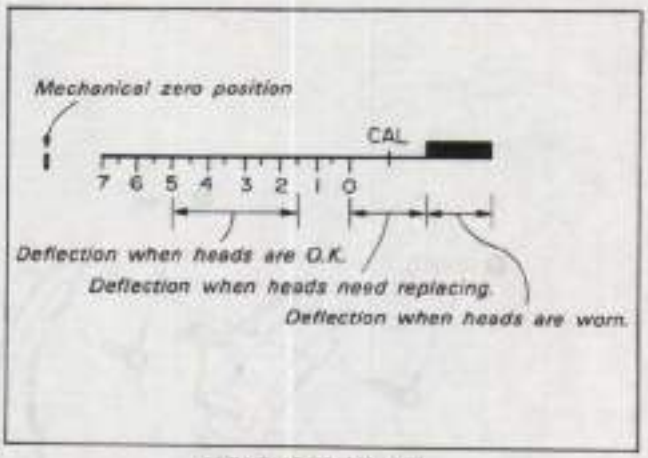
* Please refer to the Instruction Manual for the video head checker (SL-5151) for details on "Video Head Checker Alignment".

[Method of measurement]

1) Remove the two screws that hold the damper assembly in place, then remove the damper assembly.
2) Detach the lead wires on the 2 video heads.
3) Attach the measuring clips to the head leads.
   Be sure to separate the leads by at least 1.5 cm.
4) Set RANGE switch to "B" and MODE switch to "MEAS". The pointer will deflect to indicate the state of wear of the heads.

   Note: The deflection for the 2 video heads may be different, so be sure to measure both.





MEASURED VALUE

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 two screws ❶.
2) Remove the solder from the four enamel wires (Ⓐ section).

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.

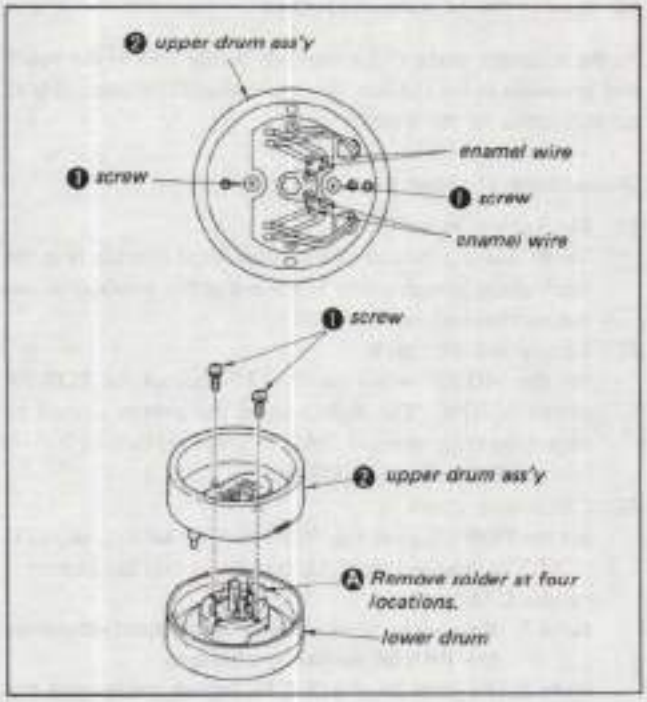


Fig. 3-22.

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.

Note: Removal is easier if threading has been completed.

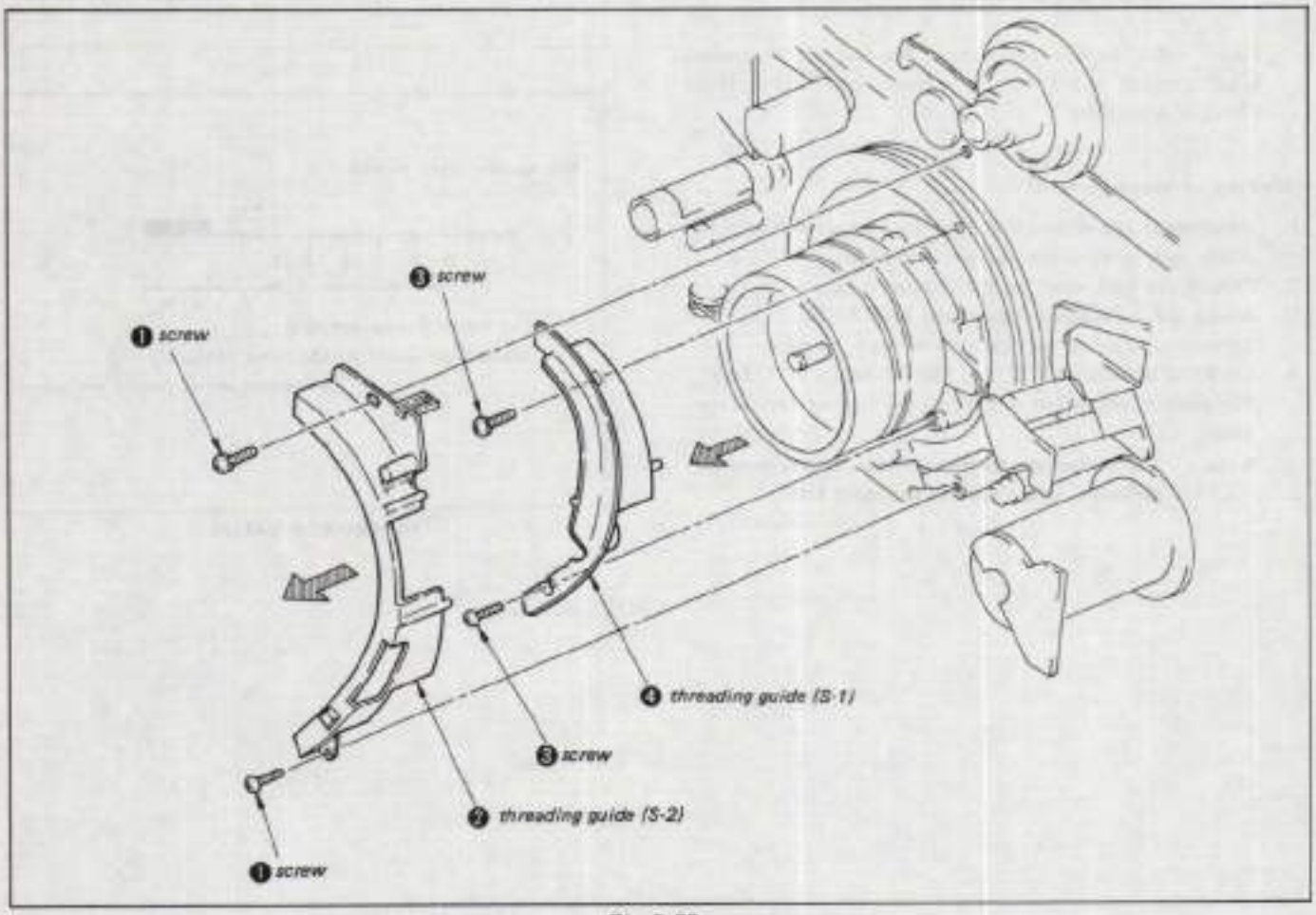


Fig. 3-23.

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

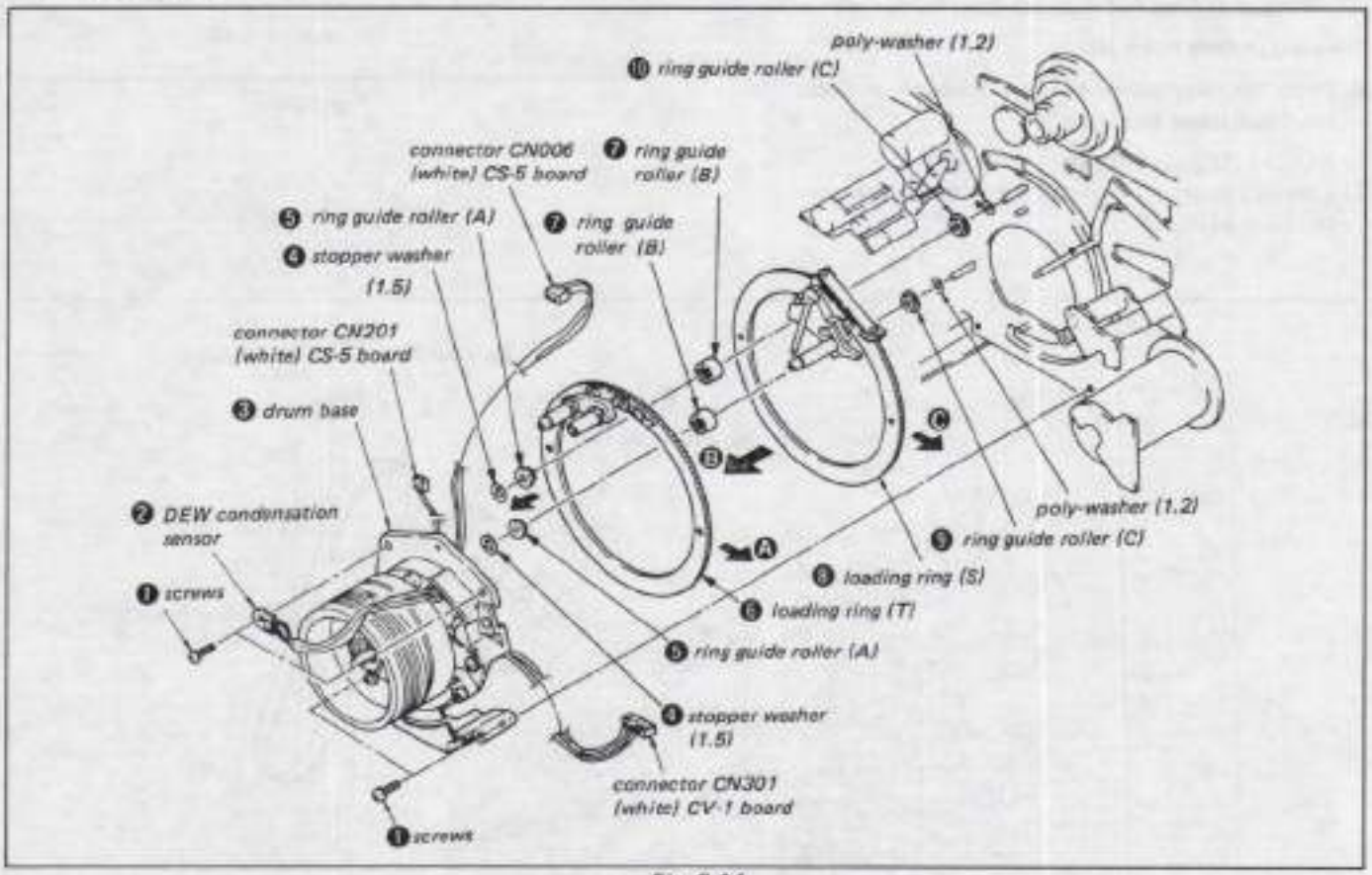


Fig. 3-24.

19. Removal of TG-3, 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.

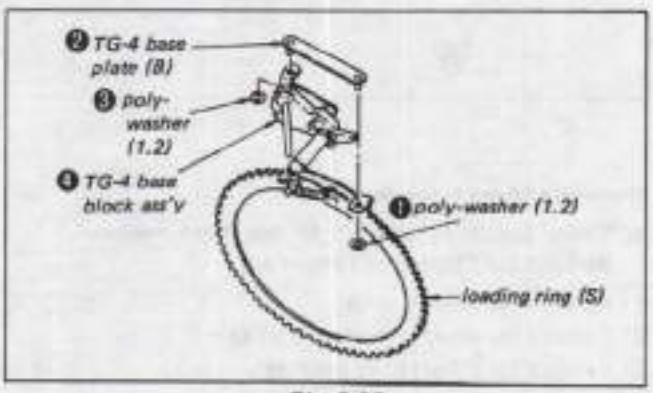


Fig. 3-25.

20. Removal of TG-5, TG-6 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 TG-5 base block ass'y ❷.

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

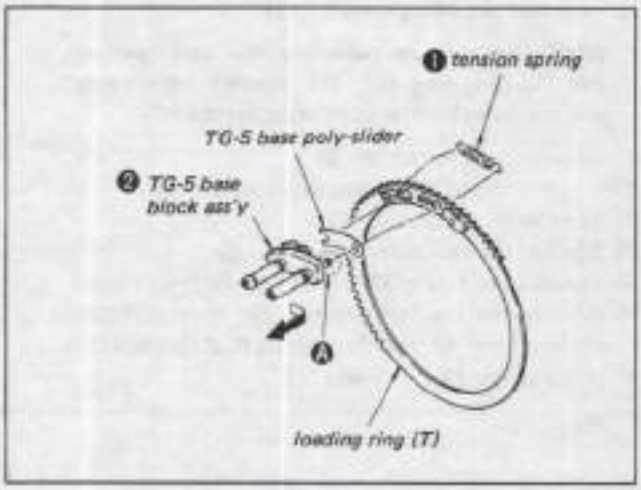


Fig. 3-26.

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

[Removal of Relay Pulley (B)]

- **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 relay pulley ❸.

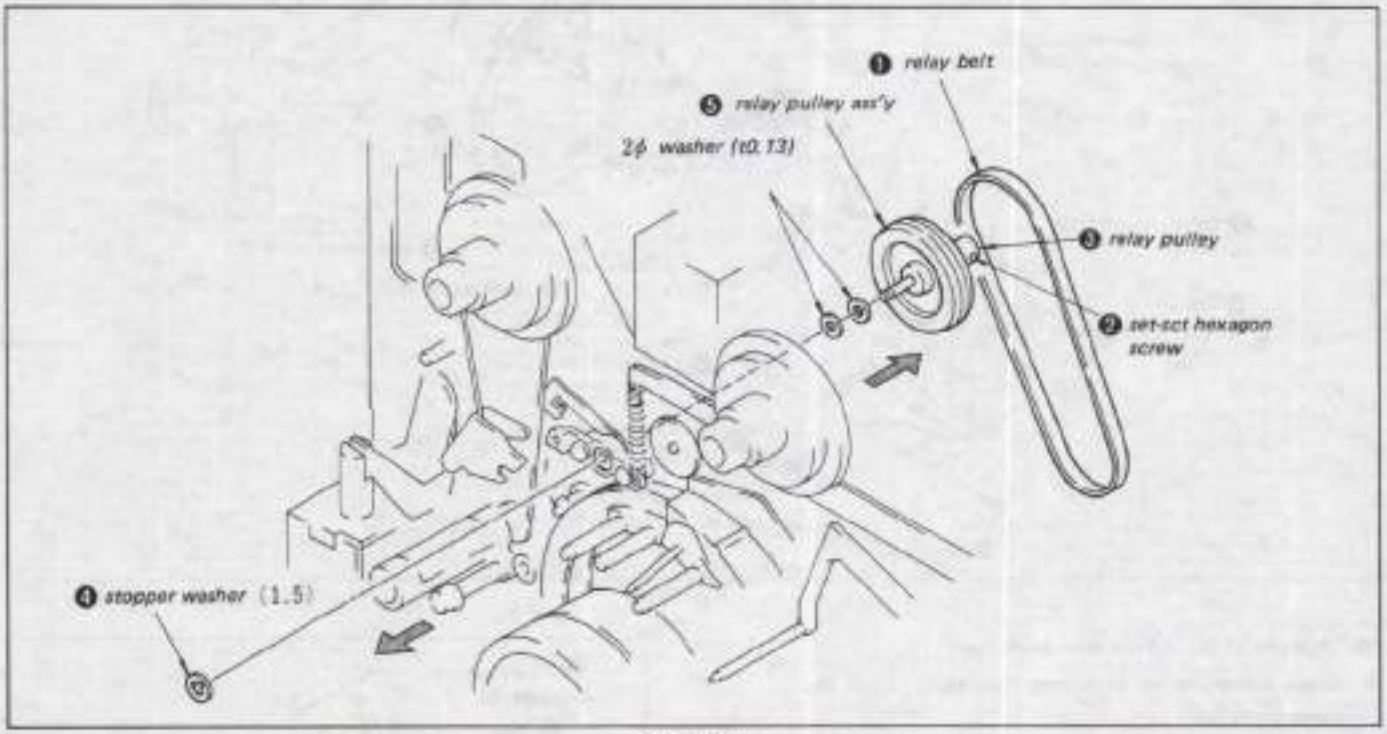


Fig. 3-27.

[Removal of Relay Pulley Ass'y]

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

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

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.

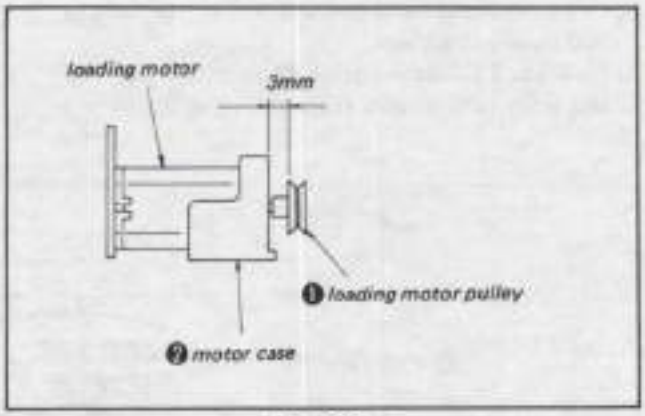


Fig. 3-28.

2. Adjustment of Drum Motor Pulley Opening

1) Adjust the opening between the drum motor pulley ❶ and the drum motor bracket ❷ to 0.3mm.

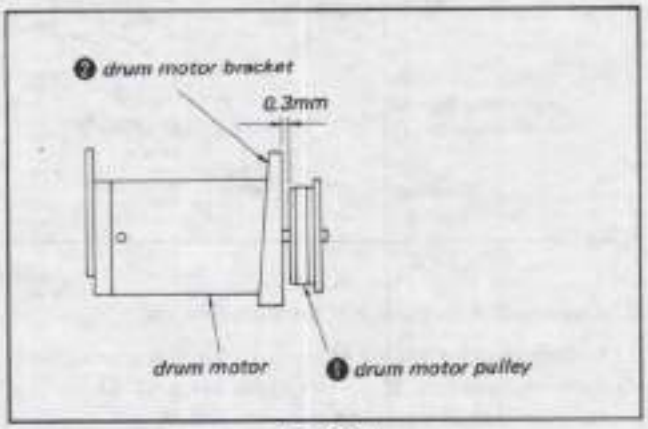


Fig. 3-29.

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 unthreading 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.

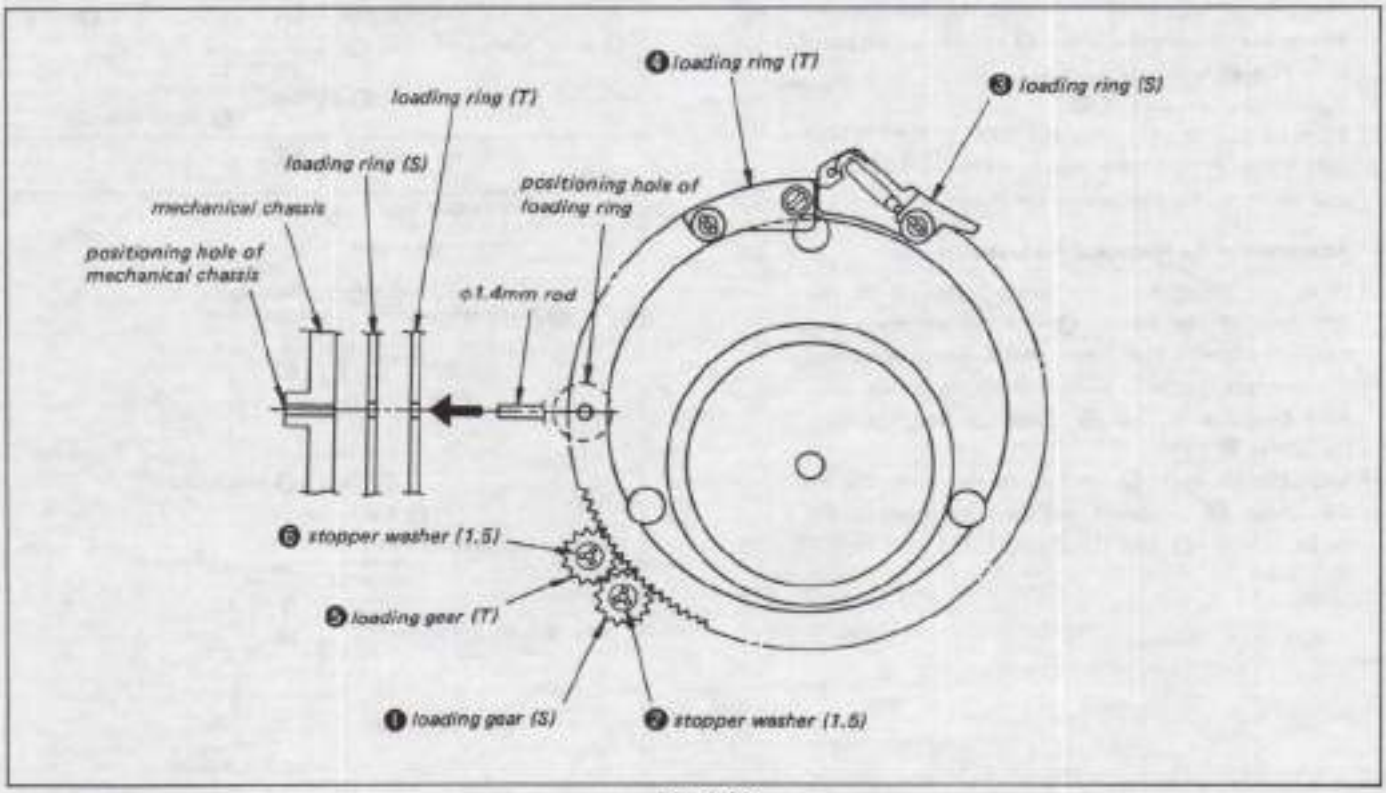


Fig. 3-30.

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

1) Put in unthreading 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) Position drive gear (A) ❷ as shown in the figure.
4) Position drive gear (B) ❸ as shown in the figure. (If not lined up exactly, they can be off slightly in the counterclockwise direction.)

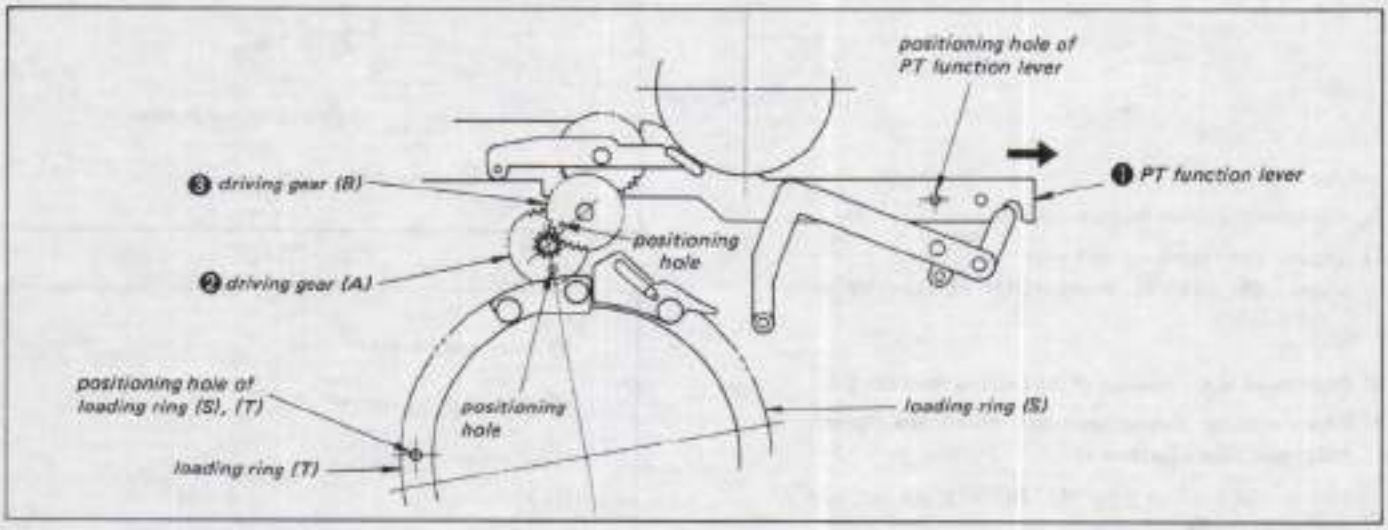


Fig. 3-31.

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.

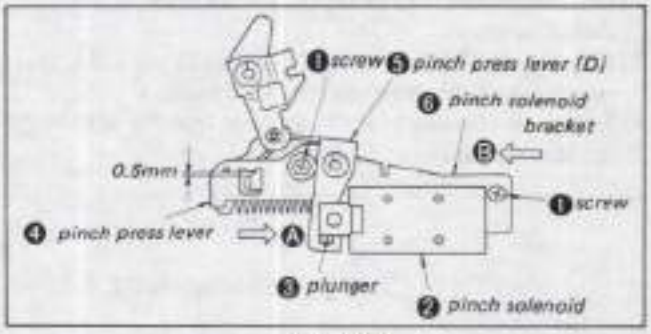


Fig. 3-32.

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 screw ❺.
2) With the plunger ❷ pulled in the direction of the arrow Ⓒ, confirm the opening between the brake rubber ❹ and the S reel and T reel to 0.3 to 0.8mm.

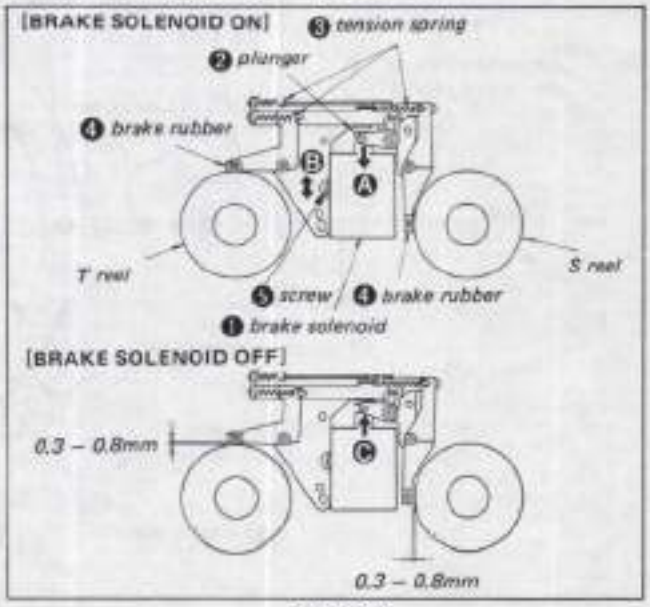


Fig. 3-33.

7. Adjustment of the Position of the Pinch Roller

1) Supply power, and after threading is completed, press the REC START/STOP button to turn the pinch solenoid ON/OFF several times, and confirm that the clearance between the pinch roller and the capstan shaft is 0.5mm.

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) When not within the specification, replace the pinch roller lever adjustment spacer ❶. Pinch roller lever adjustment spacer 3-690-163-01 ~ 41 (5 types)

3) Press the REC START/STOP button to turn the pinch solenoid ON/OFF and confirm that the clearance is 0.5mm.

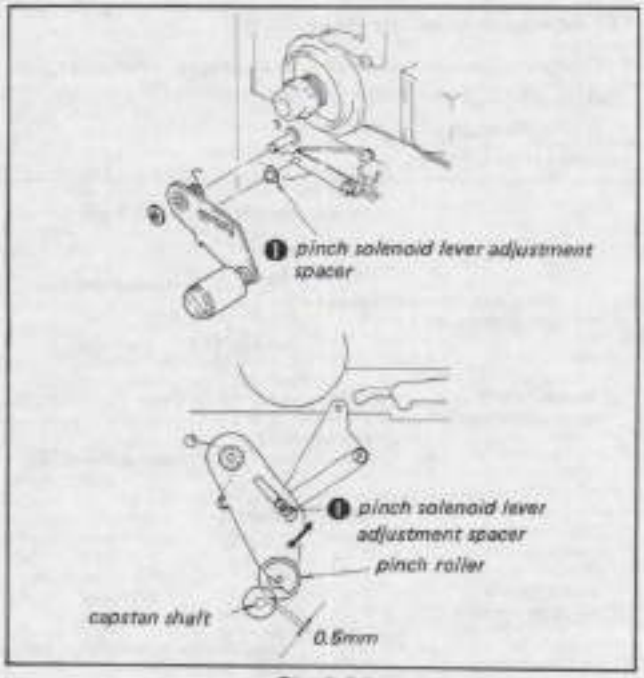


Fig. 3-34.

8. Adjustment of the Position of the Tension Regulator Arm

1) Apply power, and record without a cassette.

2) Loosen the screw ❷, adjust the center-to-center distance of the tension regulator arm pin ❸ 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 Reel Table Tension

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

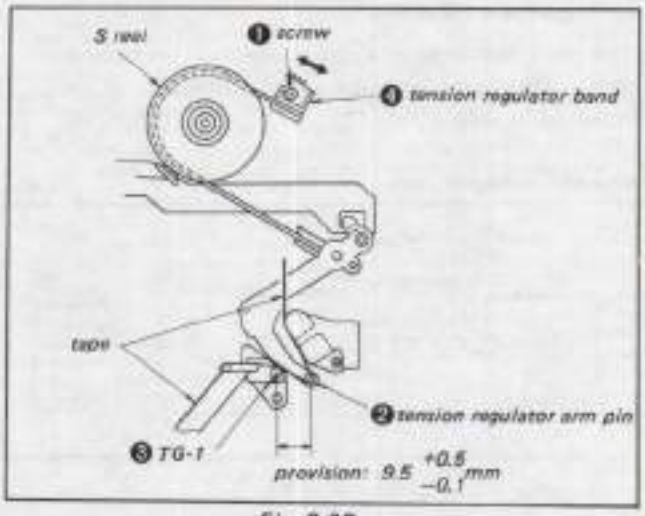


Fig. 3-35.

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.

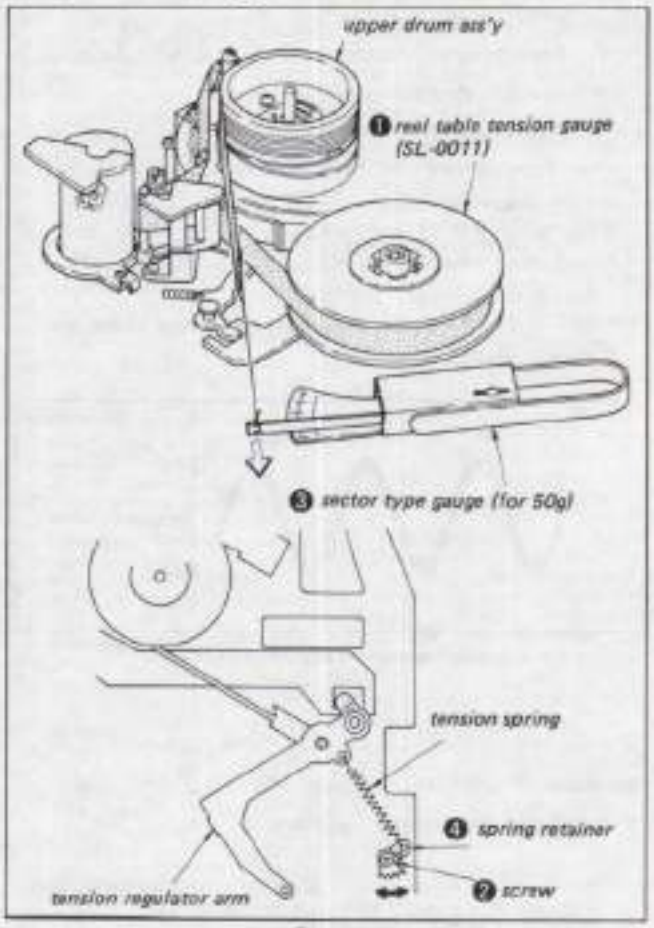


Fig. 3-36.

10. Tape Speed Adjustment

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

Connection diagram

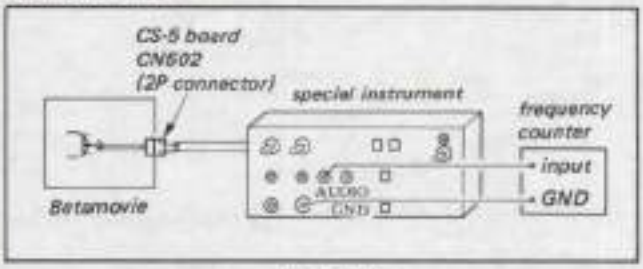


Fig. 3-37

[Adjustment method]

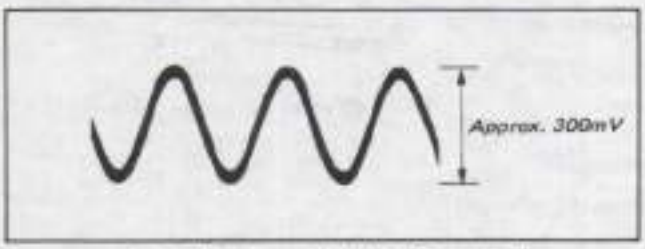
Mode: Playback
Signal: Alignment tape Beta II 3kHz signal
Frequency counter: Special instrument AUDIO SIG terminal

1) Playback alignment tape Beta II 3kHz (colour 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 Beta II Speed, i.e. 2cm/sec, is correct.
  - At −0.1%, 3.003Hz is displayed at the correct Beta II speed.



Special instrument AUDIO SIG terminal

Fig. 3-38

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

Relay pulley (B): 3-681-664-□□ (0 to 9)
Figure showing diam.
End

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

Note 1: Diameter identification

1. Marked unit

Stamped number indicates diameter (unrelated to grooves)

2 Unmarked unit

Wide grooves and narrow grooves indicate diameter. (This part shows "7".)

11. Adjustment of AC Head (Audio/CTL)

- Connect the special instrument (signal converter BMCJ-888U) and make the adjustment.
  Refer to page 131, item 1-4.

Adjustment terminology

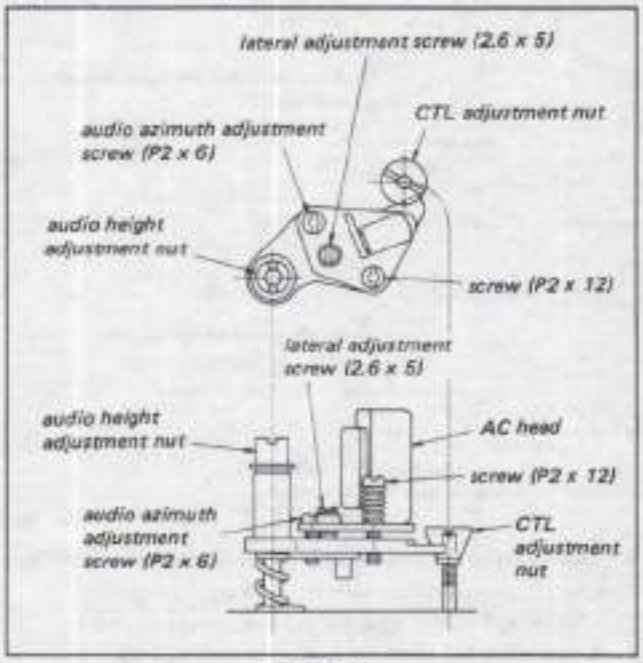
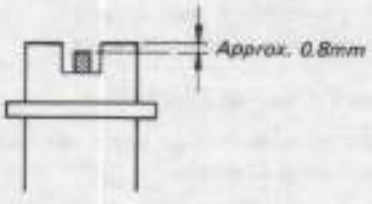


Fig. 3-39

[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.

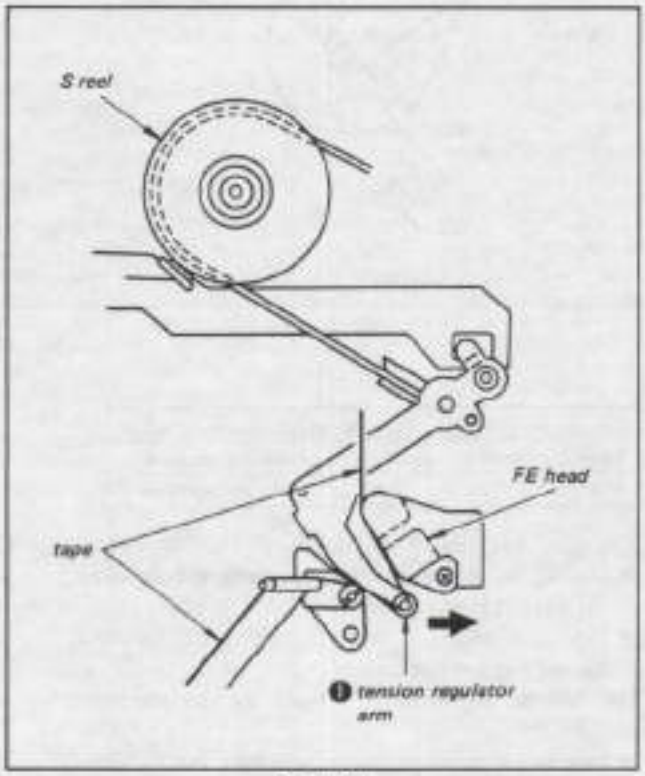


Fig. 3-40

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

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

Adjustment terminology

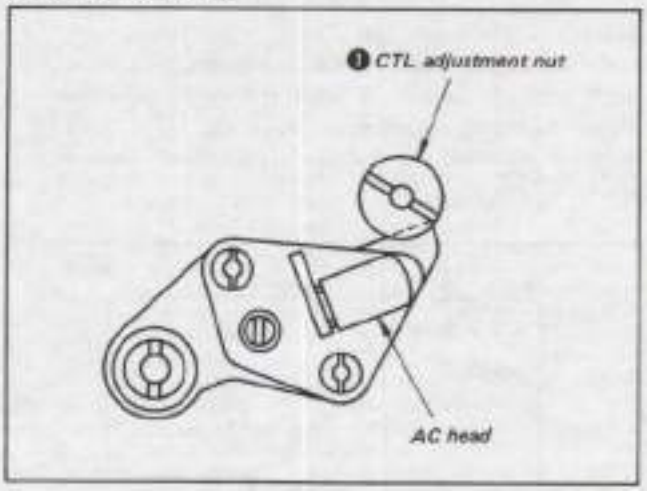


Fig. 3-41

Mode: Playback
Signal: Alignment tape tracking signal (KR5-3 is recommended)
* KR5-3: 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.

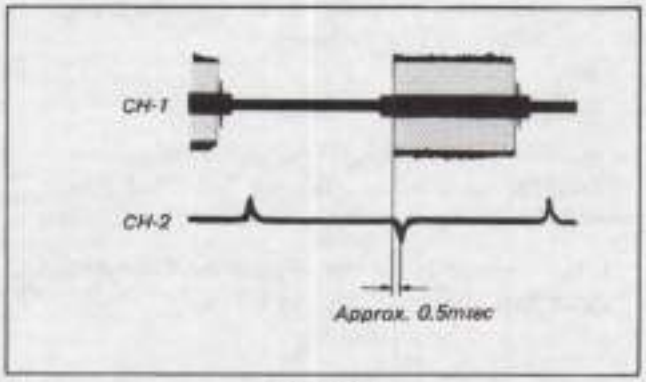


Fig. 3-42

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. Adjustment of Video Head Dihedral

Because a combined video head is used this unit, comprising video heads A and B conventional adjustment methods cannot be used and corrections are made electrically. Therefore, when the video head is being replaced, the following procedures should be carried out.

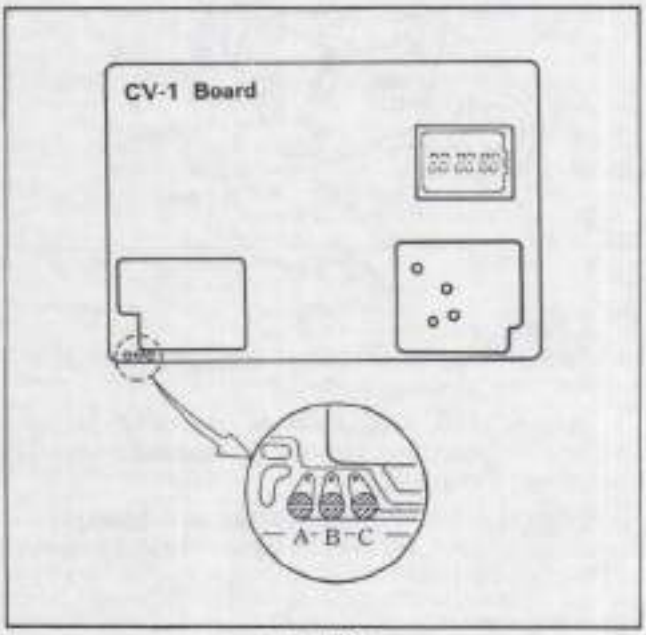


Fig. 3-43.

[Adjustment method]

Remove the solder bridges at A, B, C on the CV-1 board as indicated in the diagram.

14. 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-888U). (See page 131, item 1-4.)

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 = 18.9kHz), or while looking at the oscilloscope connected to the RF terminal of the special instrument (BMCJ-888U), touch the capstan flywheel with the fingertips, and change the RF output level.

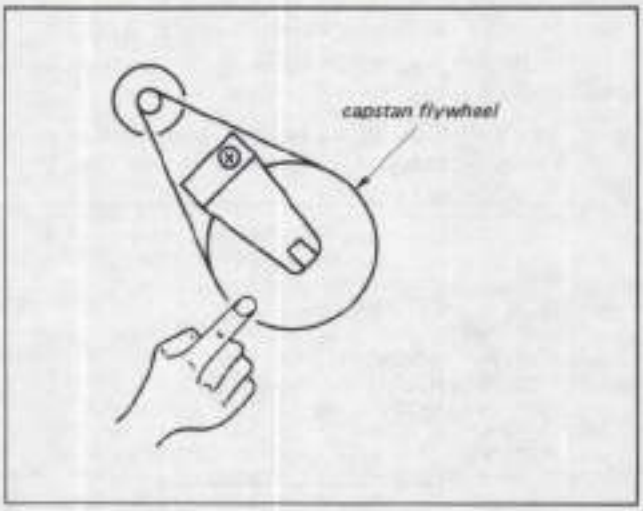


Fig. 3-44.

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).

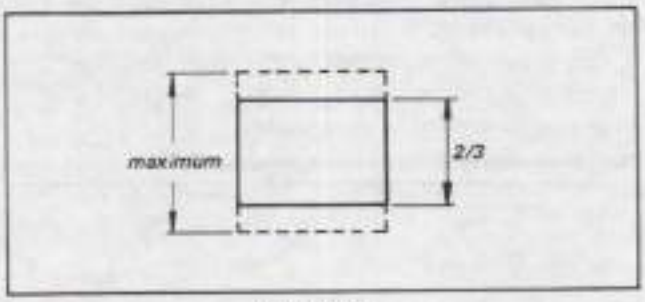


Fig. 3-45

2. Adjustment method

Diagram showing adjustment guide arrangement

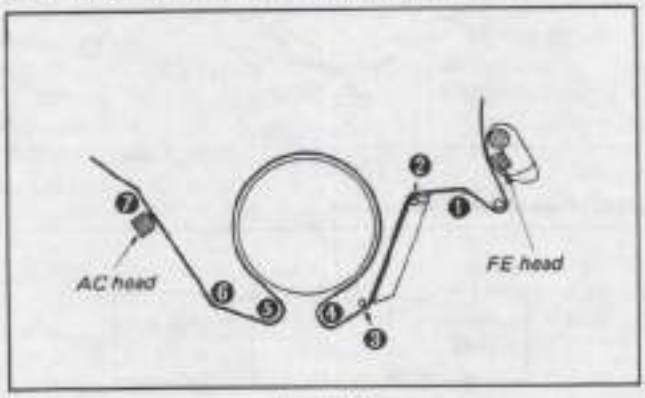


Fig. 3-46

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. 3-47.

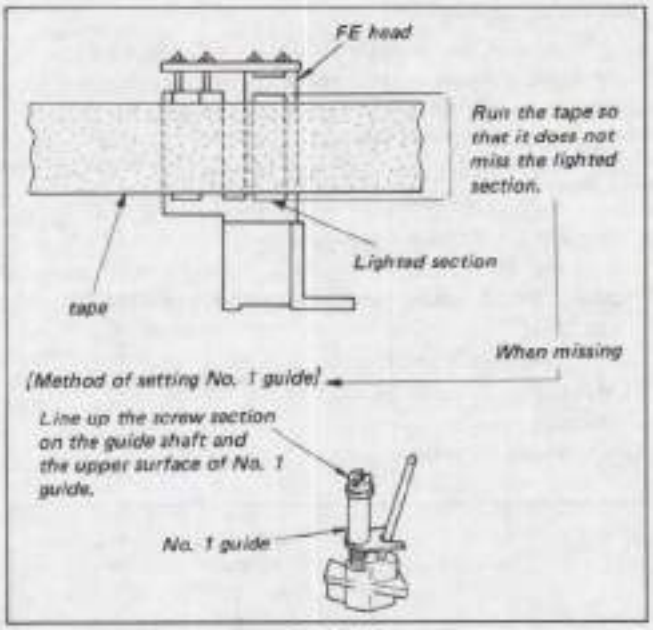


Fig. 3-47.

[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.

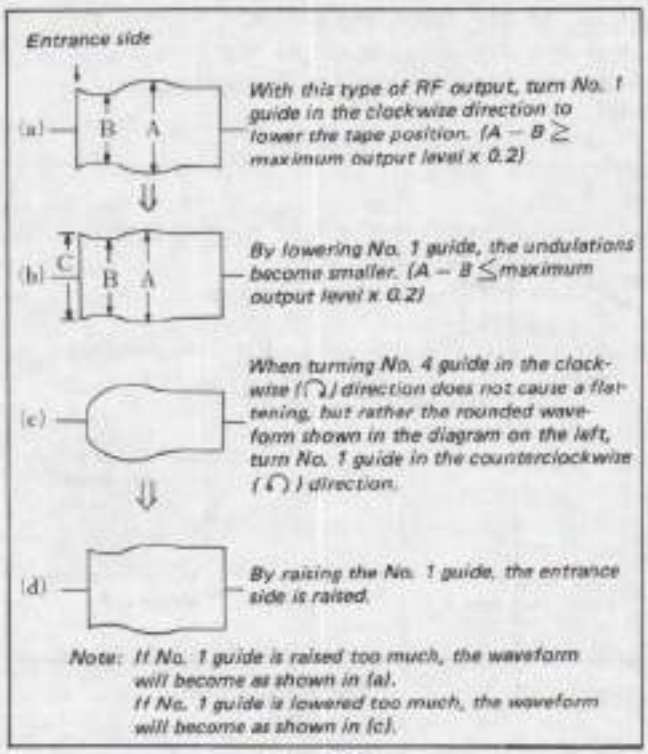


Fig. 3-48

[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. 3-51.

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.

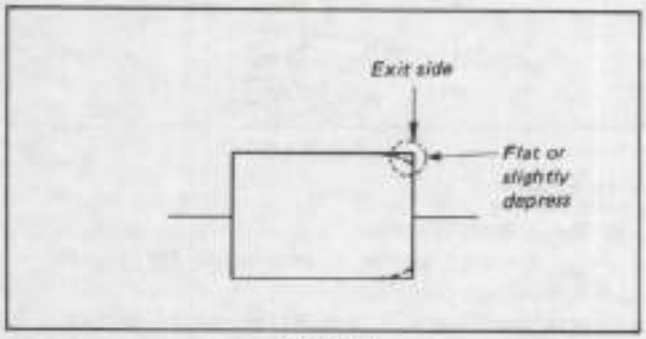


Fig. 3-49

[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.

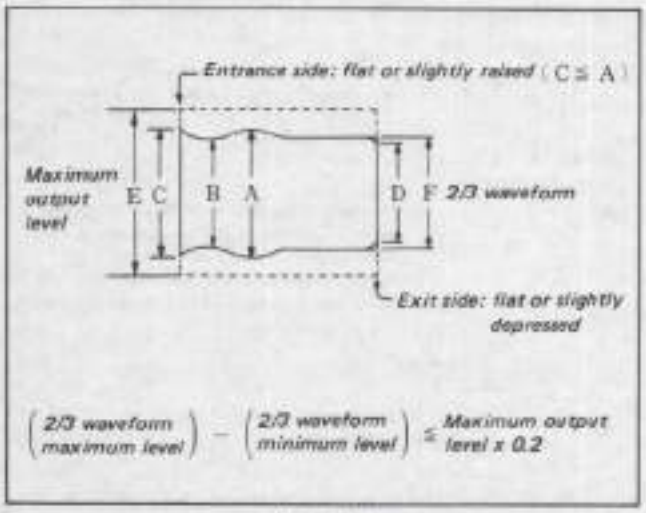


Fig. 3-50

[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

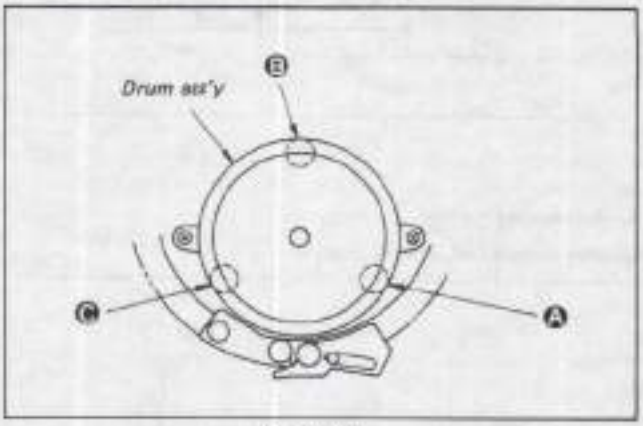


Fig. 3-51

Indications of insertion locations

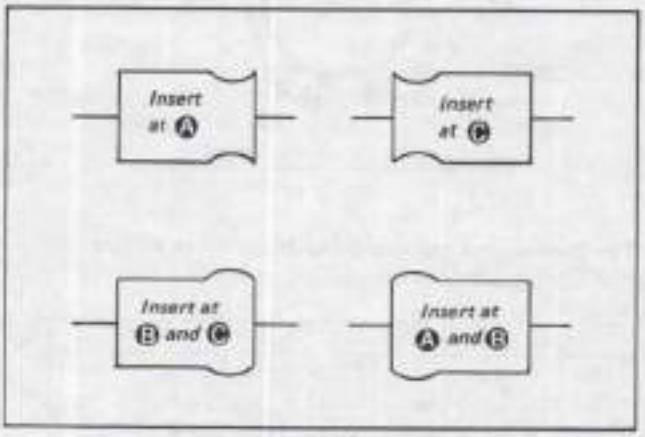


Fig. 3-52

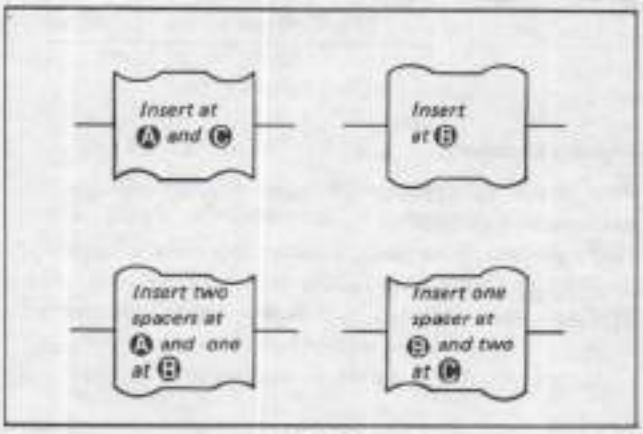


Fig. 3-53

4. ELECTRICAL ALIGNMENT(VIDEO)

[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 or KR5-3C.
5) Pattern box.
6) Audio generator.
7) Audio attenuator.
8) Audio distortion meter.
9) Audio level meter.
10) VTR (For Betamovie, because it does not have playback or rewind function, to check and rewind.)

[Preparatory set-up for alignment]

The signal obtained from the camera is used in the alignment of the VTR, so it is necessary that the output signal be within certain specifications.
Verify video signals by connecting the oscilloscope to TP311 (luminance signal) and TP410 (chroma signal) on the CV-1 board.

1. Connection diagram

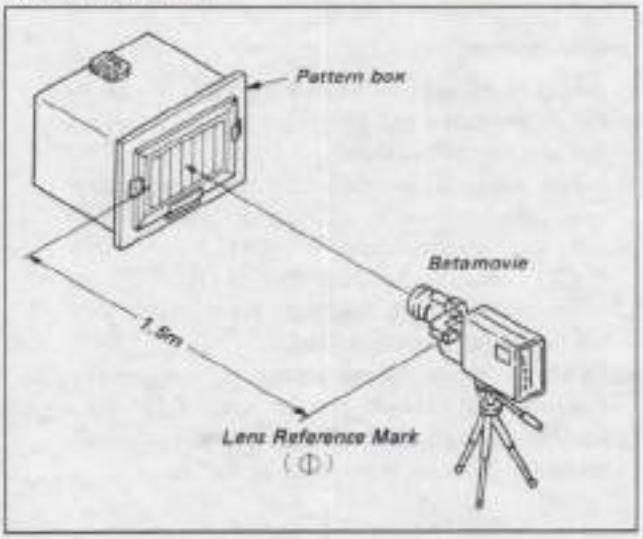


Fig. 4-1

2. Alignment colour bar signal on the monitor as shown in the following diagram.

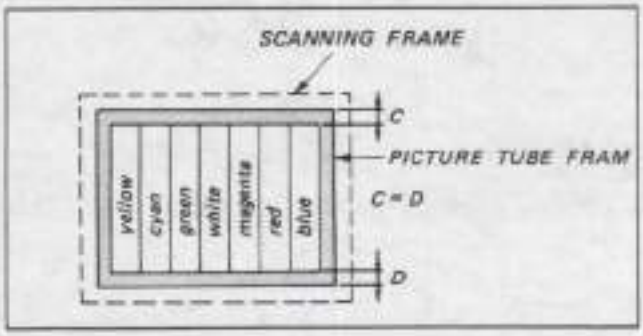


Fig. 4-2

3. Signals

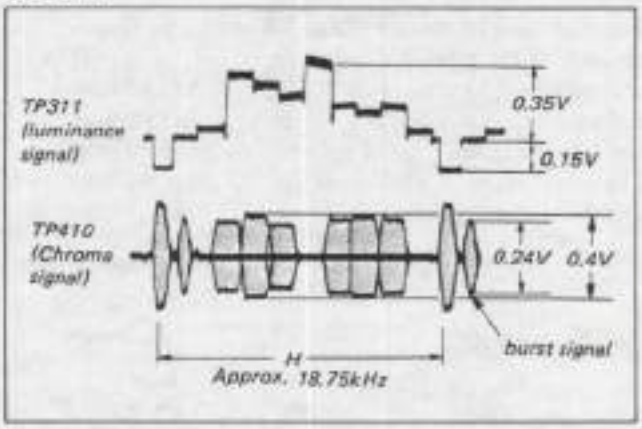


Fig. 4-3

[Method of eliminating signal from video circuit of VTR]

The pattern of the luminance signal and the chroma signal is supplied from the camera to the VTR via a solder bridge on the CV-1 board; therefore, when aligning the video circuit, if no signal is required remove solder bridge.
By removing the solder bridge it is possible to eliminate the signal from the VTR video circuit.

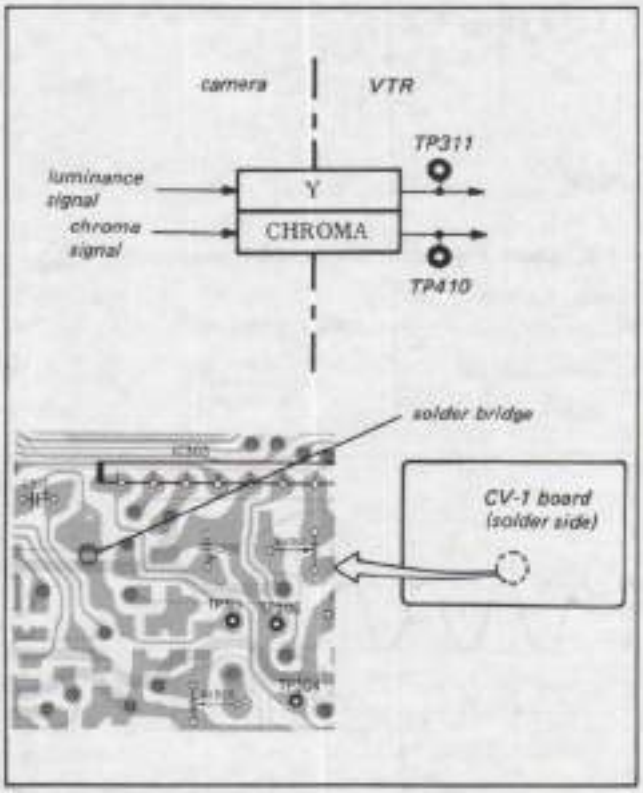


Fig. 4-4

[Alignment screw driver]

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

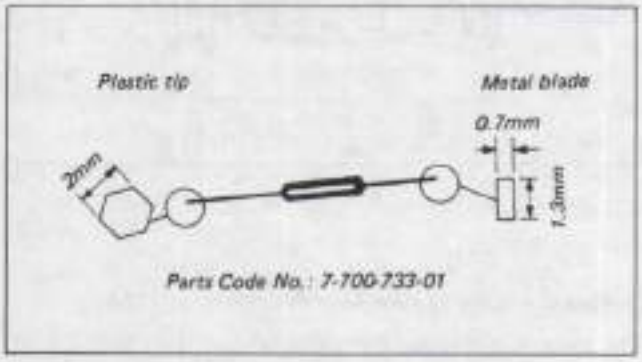


Fig. 4-5 Special alignment

4-1. ADJUSTMENT OF SYSTEM CONTROL SYSTEM

4-1-1. Power Source Check (CS-5 board)

Must be performed in the recording mode.

1) EVER 5V check
   Emitter of Q010 must be 5 $^{+0.5}_{-0.3}$V dc.
2) SWD UNREG power check
   Collector of Q007 must be 9.5 ±0.2V dc.
3) SWD 5V check
   Collector of Q070 must be 5 ±0.5V dc.

4-1-2. Clock Frequency Check (CS-5 board)

Mode: Record
Frequency counter: Pin 37 of IC001

[Checking method]

1) Must be 4.0 ±0.2MHz.

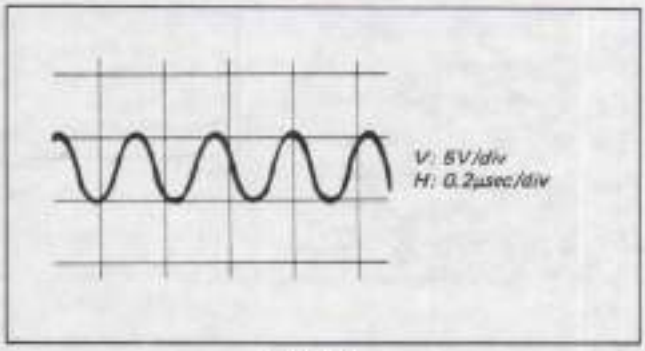


Fig. 4-6

4-1-3. Battery Power-Off Voltage Adjustment (CS-5 board)

Mode: Record
Constant voltage power: External power input
Digital voltmeter: F501 (Fuse) J501 side

[Adjustment method]

1) Adjust the power source voltage so that the digital voltmeter reading becomes 9.6V.
2) Fully rotate RV005 in the counterclockwise (↺) direction.
3) Put into recording mode.
4) Adjust the power source voltage so that the digital voltmeter reading becomes 8.9V.
5) Slowly rotate RV005 in the clockwise (↻) direction, stopping at the automatic shut-off position.

Note: When the Betamovie camera is automatically shut off because of low voltage, only the EJECT function is operable. To continue the adjustment, cut the power momentarily, and after the voltage returnes to its original value, restart the power.

[Checking method]

1) Adjust the power source voltage until the digital voltmeter reading is 9.6V.
2) Put into recording mode.
3) Slowly lower the power source voltage, and when the digital voltmeter reading goes below 9.05 ± 0.1Vdc, confirm that the TALLY lamp and " ▭ " mark flicker on and off at 1Hz.
   If the battery mark does not flicker at 9.05Vdc, set to 9.0Vdc and check again.
4) Lower the power voltage further, and confirm that the automatic shut-off operates and " ▭ " mark flickers on and off at 4Hz when the digital voltmeter reading goes below 8.95 ±0.05Vdc.

4-2. ADJUSTMENT OF THE SERVO SYSTEM

4-2-1. Drum Speed Adjustment (CS-5 board)

Mode: Record
Oscilloscope: TP201 (pin ⑩ of IC201)
or, digital voltmeter

[Adjustment method]

Adjust to 1.8V ±0.2Vdc with RV201.

4-2-2. Drum Phase Adjustment

Mode: Record
Oscilloscope: CH1 TP202
CH2 TP203

[Adjustment method]

Adjust to 0μsec ±30μsec with RV202.
(See Fig. 4-7)

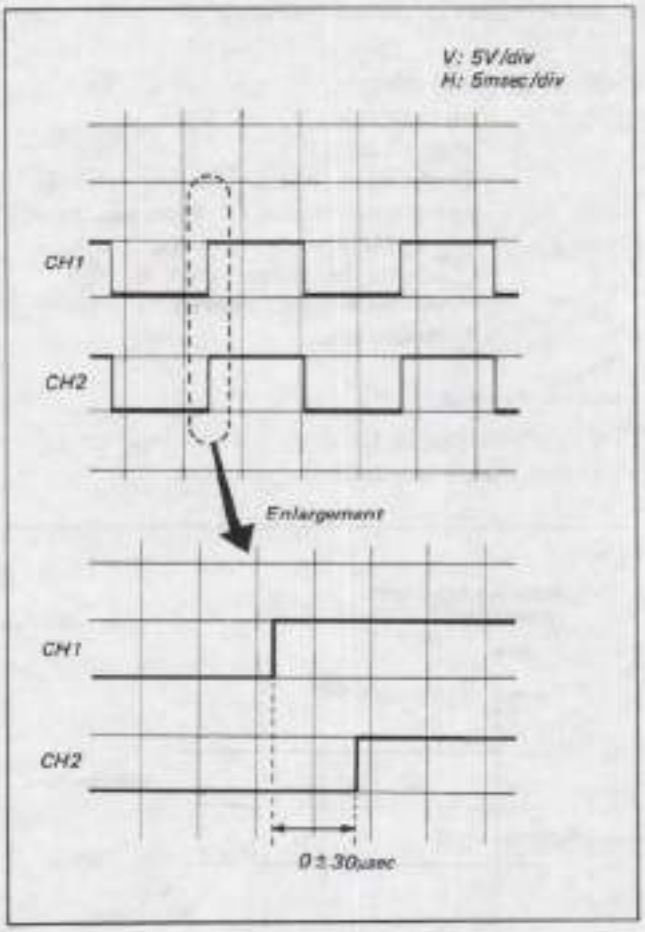


Fig. 4-7.

4-2-3. Edit Adjustment

Carry out Instructions 1 through 5 . Unless Instructions 4 and 5 , in particular, are carried out, a clear edit cannot be obtained.

1. Pinch-On Delay Adjustment (CS-5 board)

Mode: Standby – Record
Oscilloscope: CH1 TP003
CH2 TP007
Trigger CH1
Trigger slope – (minus)
Sweep mode NORM . . . When going standby → recording mode, adjust the trigger level so that the waveform appears in the oscilloscope.

[Adjustment method]

1) With RV001, adjust the delay quantity to 5msec ±1msec when going standby → record.

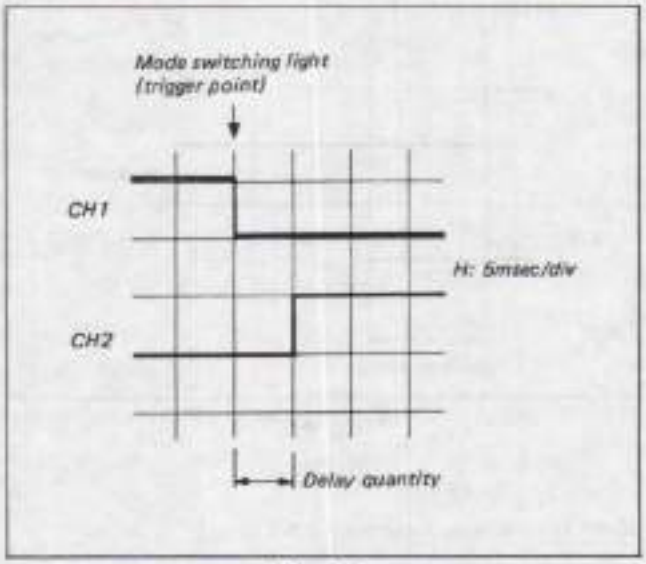


Fig. 4-8.

2. Pinch-Off Delay Adjustment (CS-5 board)

Mode: Standby – Record
Oscilloscope: CH1 TP005
CH2 TP008
Trigger CH1
Trigger sloep – (minus)
Sweep mode NORM . . . When switching standby ◄–► recording mode, adjust the trigger level so that the waveform appears in the oscilloscope.

[Adjustment method]

1) With RV002, adjust the delay quantity to 10msec. ± 0.5msec when switching standby ◄–► record.
2) Carry out "5. **Playback CTL Phase Adjustment**".

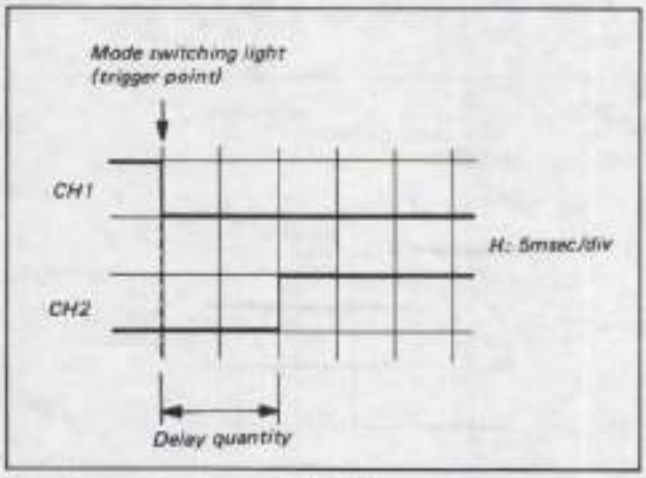


Fig. 4-9.

3. BRAKE-on Delay Adjustment (CS-5 board)

Mode: Standby ◄–► Record
Oscilloscope: CH1 TP005
CH2 TP009
Trigger CH1
Trigger scope – (minus)
Sweep mode NORM. . . . When switching standby ◄–► recording mode, adjust the trigger level so that the waveform appears on the oscilloscope.

[Adjustment method]

1) With RV003, adjust the delay to 10msec ±0.5 msec while switching between standby ◄–► recording mode.
2) Carry out "5. **Playback CTL Phase Adjustment**".

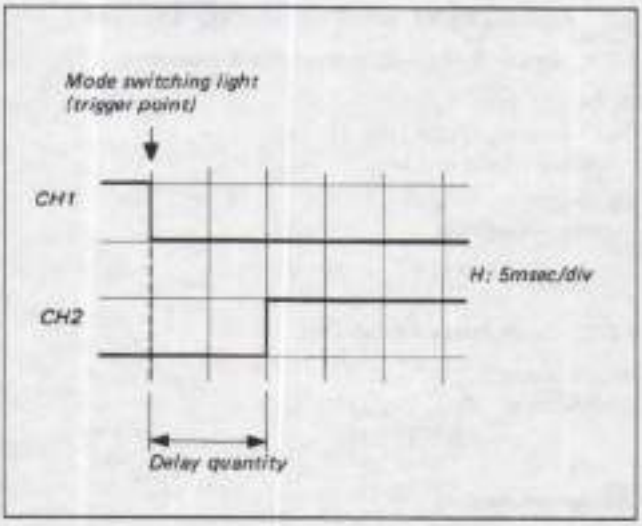


Fig. 4-10.

4. Brake-Off Delay Adjustment (CS-5 board)

Mode: Standby – Record
Oscilloscope: CH1 TP003
CH2 TP010
Trigger CH1
Trigger slope – (minus)
Sweep mode NORM . . . When switching standby ◄–► recording mode, adjust the trigger level so that the waveform appears in the oscilloscope.

[Adjustment method]

1) With RV004, adjust the delay quantity to 21msec ±1msec when going standby – recording.

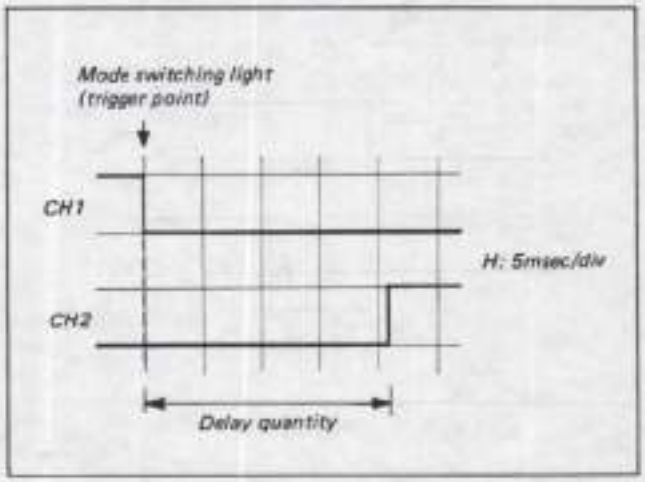


Fig. 4-11.

5. Playback CTL Phase Adjustment (CS-5 board)

If there is a discrepancy in this adjustment, noise will develop during editing so adjustment accurately.

Mode: Standby → playback
Oscilloscope: CH1 TP205 (CT10 signal)
CH2 TP204 (CTL signal)
Signal: Recorded tape

[Adjustment method]

1) When changing from standby to playback mode, the noise from the solenoid action occurs three times. Check to see that on the third occurrence the position of the CTL signal is as shown in Fig. 4-22. Because there is some scattering of the CTL signal, switch from standby to playback several times and check the center of the scattering.

Note: The CTL signal shifts from right to left because there is no playback servo, so for this reason the check should be carried out on the third occurrence of the sound.

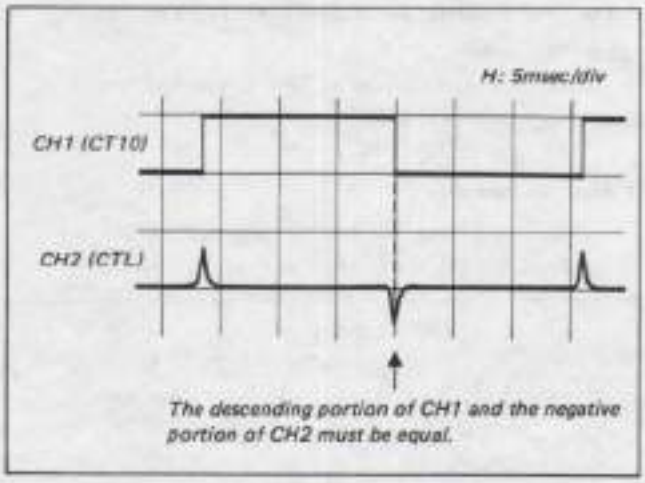


Fig. 4-12.

2) When there is a discrepancy, change the delay quantities for **2. Pinch-Off Delay Adjustment**, and **3. Break-On Delay Adjustment** and readjust. Make both adjusted delay quantities the same.

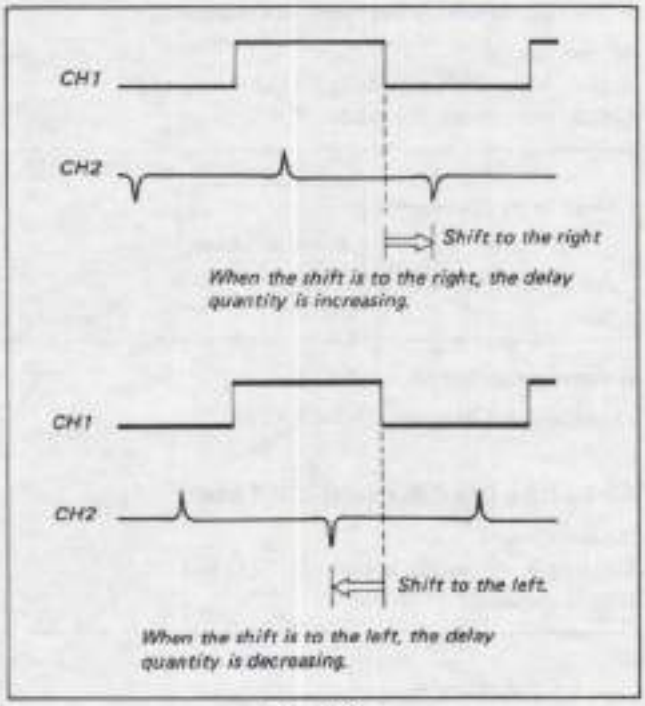


Fig. 4-13.

3) When the delay quantity cannot be adjusted to within 5msec to 15msec, confirm **"7. Pinch Roller Position Adjustment"**.

4-3. VIDE SYSTEM ALIGNMENT

4-3-1. PLL Adjustment (CV-1 board)

Mode: Record
Digital voltmeter: TP415 (IC404 ①)

[Adjustment method]

1) Observe TP415 waveform on oscilloscope.

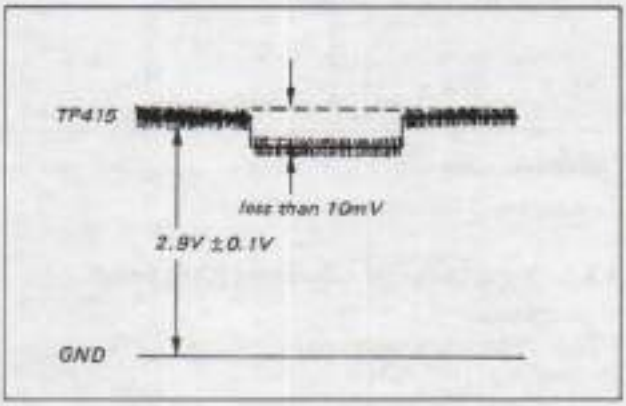
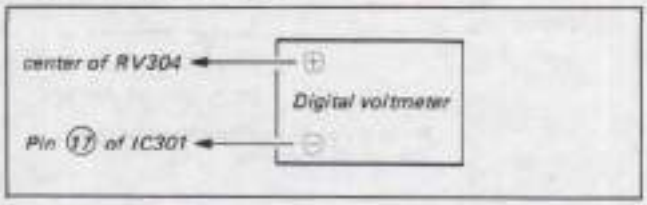


Fig. 4-14.

2) Adjust TP415 DC voltage to 2.9V ±0.1V with CT401.
3) Adjust TP415 voltage level difference to less than 10mV with RV410.

4-3-2. White Clip Adjustment (CV-1 board)

Mode: Record
Signal: None (solder bridge of TP311 removed)
Digital voltmeter: See below

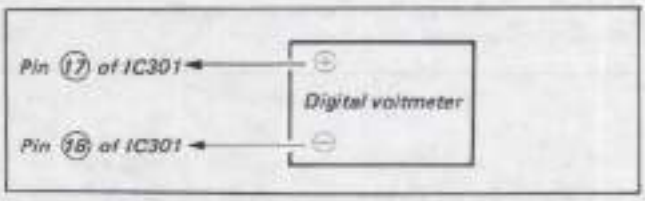


[Adjustment method]

1) Adjust to 520 ±10mV with RV304.

4-3-3. Dark Clip Adjustment (CV-1 board)

Mode: Record
Signal: None (solder bridge of TP311 removed)
Digital voltmeter: See below.

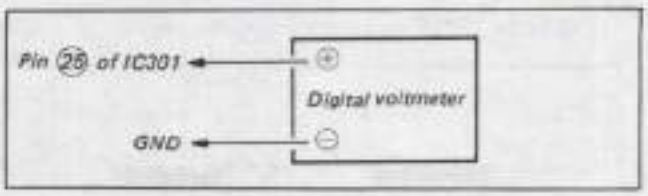


[Adjustment method]

1) Adjust to 250 ±10mV with RV305.

4-3-4. Compress Adjustment (CV-1 board)

Mode: Record
Signal: None (solder bridge of TP311 removed)
Digital voltmeter: See below



[Adjustment method]

1) Adjust to 3.85 ±0.05V with RV303.

4-3-5. Y-FM Deviation Adjustment (CV-1 board)

Mode: Record
Signal: Pattern box (all white)
Oscilloscope: TP308
GND: TP307

[Adjustment method]

1) Turn the Betamovie zoom ring until the luminance signal at TP311 is 0.5Vp-p.

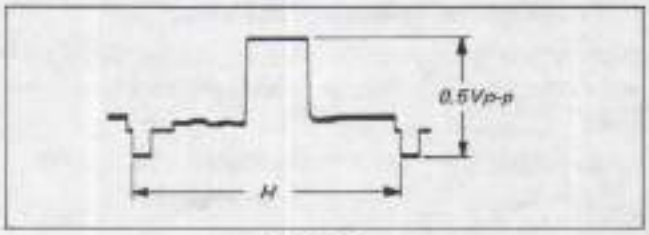


Fig. 4-15.

2) Connect the oscilloscope to TP308.
3) Adjust RV308 until the waveform is as shown below.

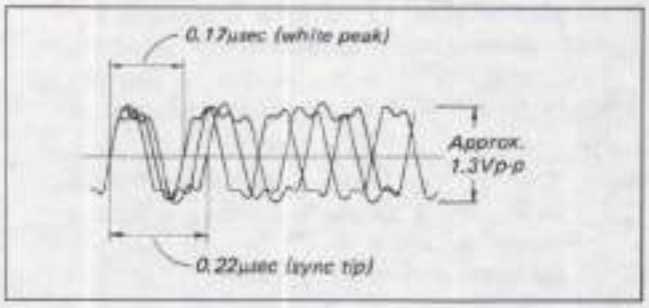


Fig. 4-16.

4-3-6. Y-FM Carrier Set Adjustment (CV-1 board)

Mode: Record
Signal: None (solder bridge of TP311 removed)
Frequency counter: TP308
GND: TP307

[Adjustment method]

1) Adjust to 4.56MHz ±0.04MHz using RV306.
2) Readjust the Y-FM deviation as described in 4-3-5.

Fig. 4-17.

4-3-7. 1/2f_H Shift Adjustment (CV-1 board)

Mode: Record
Signal: Any signal
Oscilloscope: RV307 pin on the R317 side

[Adjustment method]

1) Adjust to 4.3Vp-p with RV307.

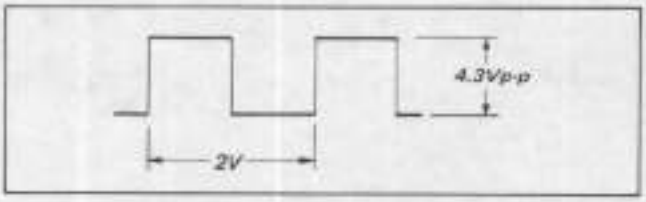


Fig. 4-18.

4-3-8. Y-FM Record Current Adjustment (CV-1 board)

Mode: Record
Signal: None (solder bridge of TP311 removed)
Oscilloscope: TP308
GND TP307

[Adjustment method]

1) Adjust to 1.30V ±0.05Vp-p with RV309.

Note: The oscilloscope should be one with range over 50MHz and frequency response should be calibrated.

Fig. 4-19.

4-3-9. Clog Detection Level Adjustment (CV-1 board)

- A tape is used on which only a CTL signal is recorded, so prepare a tape recorded with CN301 of CV-1 board removed.

Mode: Playback (short TP012 (FB SW) and GND on CS-5 board)
Signal: Non-signal recorded tape outlined aboce.
Oscilloscope: Pin ② of CN302

[Adjustment method]

1) Rotate RV310 fully in the clockwise (↻) direction when viewed from the pattern screen, then slowly rotate in the counterclockwise (↺) direction, and set in the postion where the pulsating noise sometimes shows.
2) Next, confirm that the CAUTION lamp does not flicker when play back a normally recorded tape. The CAUTION lamp should flicker when the earlier no-signal record tape is played back. Repeat clean editing of separately recorded segments ten times and check that the D lamp and " ⊗ " mark do not flicker.

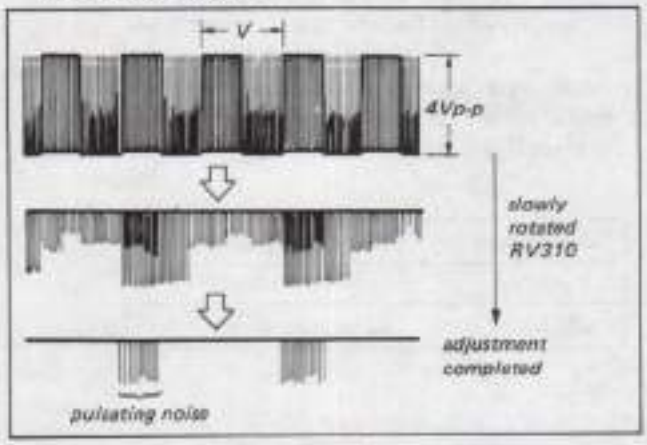


Fig. 4-20.

4-4. DDS BLOCK ALIGNMENT

4-4-1. Clock Adjustment (CV-1 board)

Mode: Standby
Oscilloscope: TP551 (Pin ③ of IC551)
Frequency counter: SIGNAL OUT of oscilloscope

[Adjustment method]

Adjust to 32.00000 ±0.00015Hz with CT551.

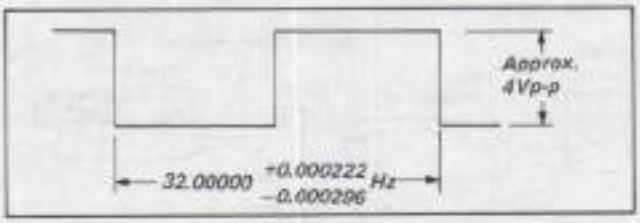


Fig. 4-21.

4-4-2. Character Generator Clock Adjustment (CV-1 board)

Mode: Record
Signal: All brack signal (Cover the lens with a black cap)
Oscilloscope: TP311 (Y OUT)

[Adjustment method]

1) Push the DATE button.
2) Adjust to 4μsec ±1μsec with CT552.

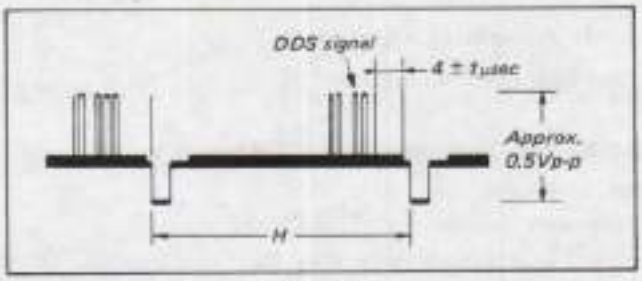


Fig. 4-22.

4-4-3. DDS Mix Adjustment (CV-1 board)

Mode: Record
Signal: All black signal (Cover the lens with a black cap)
Oscilloscope: TP311 (Y OUT)

[Adjustment method]

1) Push the DATE button.
2) Adjust RV408 so that DDS white level is 0.4V.

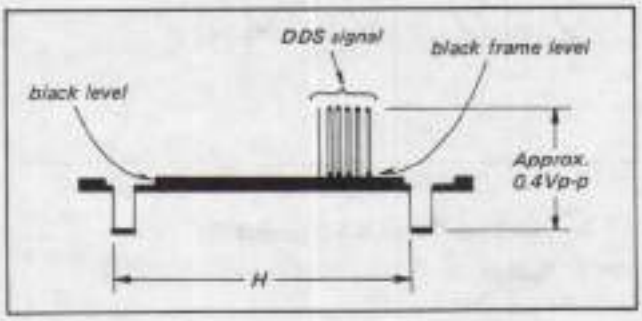
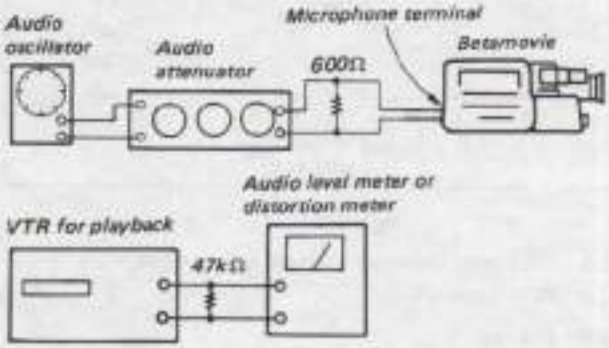


Fig. 4-23.

4-5. ADJUSTMENT OF AUDIO SYSTEM

The adjustment of the audio system is carried out while confirming the sound recorded tape with the Betamovie, playback on a VTR with reliable playback characteristics.

[Connecting the equipment]



Note: The VTR for playback completes the video head azimus adjustment and the audio playback system adjustment (playback frequency characteristics adjustment and playback level adjustment).

4-5-1. Audio Head Adjustment

See "Mechanical Adjustment".

4-5-2. Bias Oscillation Check (CS-5 board)

Mode: Record
Frequency counter: Pin ② of CN502

Note: Use probe of more than 1MΩ and less than 10PF.

[Checking method]

1) Frequency must be 66kHz ± 6kHz.

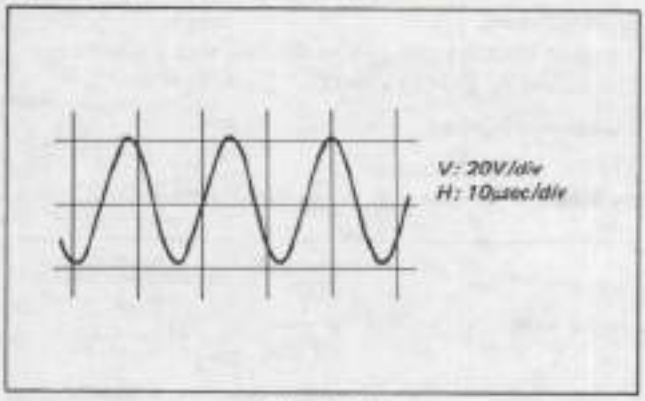


Fig. 4-24

4-5-3. Bias Leak Check (CS-5 board)

Mode: Record
Input signal: None
Oscilloscope: TP504
GND TP503

[Checking method]

1) Bias leak must be below 1Vp-p.

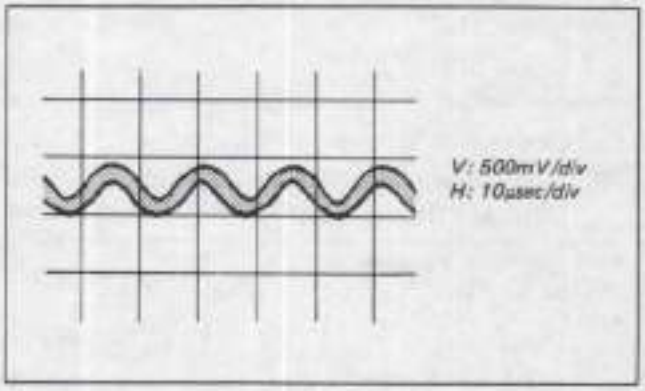


Fig. 4-25

4-5-4. Output Level Check (CS-5 board)

Mode: Record
Input signal: 333Hz, −30dBs
Level meter or oscilloscope: TP502
GND: TP503

[Checking method]

1) The output level must be −5 ±1.5dBs (1.25 ±0.25Vp-p).

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

Mode: Record and playback
Input signal: 333Hz, −80dBs and 7kHz, −80dBs
Level meter: Sound output terminal of playback VTR

[Adjustment method]

1) Record a 333Hz, −80dBs signal
2) Record a 7kHz, −80dBs signal
3) Playback the recorded tape on the playback VTR, and obtain the ratio of the 7kHz output level to the 333Hz output level.

Standard: The 7kHz output level must be 0 ± 1dB as opposed to the 333Hz output level.

4) In the case where the standard is not satisfied, rotate RV501 as follows, and repeat Instructions 1) through 3).

7kHz Output Level	RV501 Adjustment
Small	Counterclockwise (↺)
Large	Clockwise (↻)

4-5-6. Recording Level Adjustment (CS-5 board)

Mode: Record and playback
Input signal: 333Hz, −50dBs
Level meter recording: TP504
playback: Playback VTR AUDIO OUT terminal

[Adjustment method]

1) Put in recording mode and note the signal output level of TP504 (Approx. 0.85dBs, 2Vp-p)
2) Playback the recorded tape on the playback VTR, and check the playback output level.

Specification: −10 ±1dBs
(line audio output −10dBs VTR)
−5 ±1dBs
(line audio output −5dBs VTR)

3) When the standard is not met, adjust the TP502 signal level with RV502 in such a way as to correct the error, then repeat 1) and 2).

4-5-7. Distortion Check (CS-5 board)

Mode: Record and playback
Input signa: 333Hz, −50dBs
Distortion meter: AUTIO 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: less than 4%

4-5-8. S/N Ratio Check (CS-5 board)

Mode: Record and playback
Input signal: 333Hz, −50dBs and no signal
Level meter: AUDIO OUT terminal of playback VTR

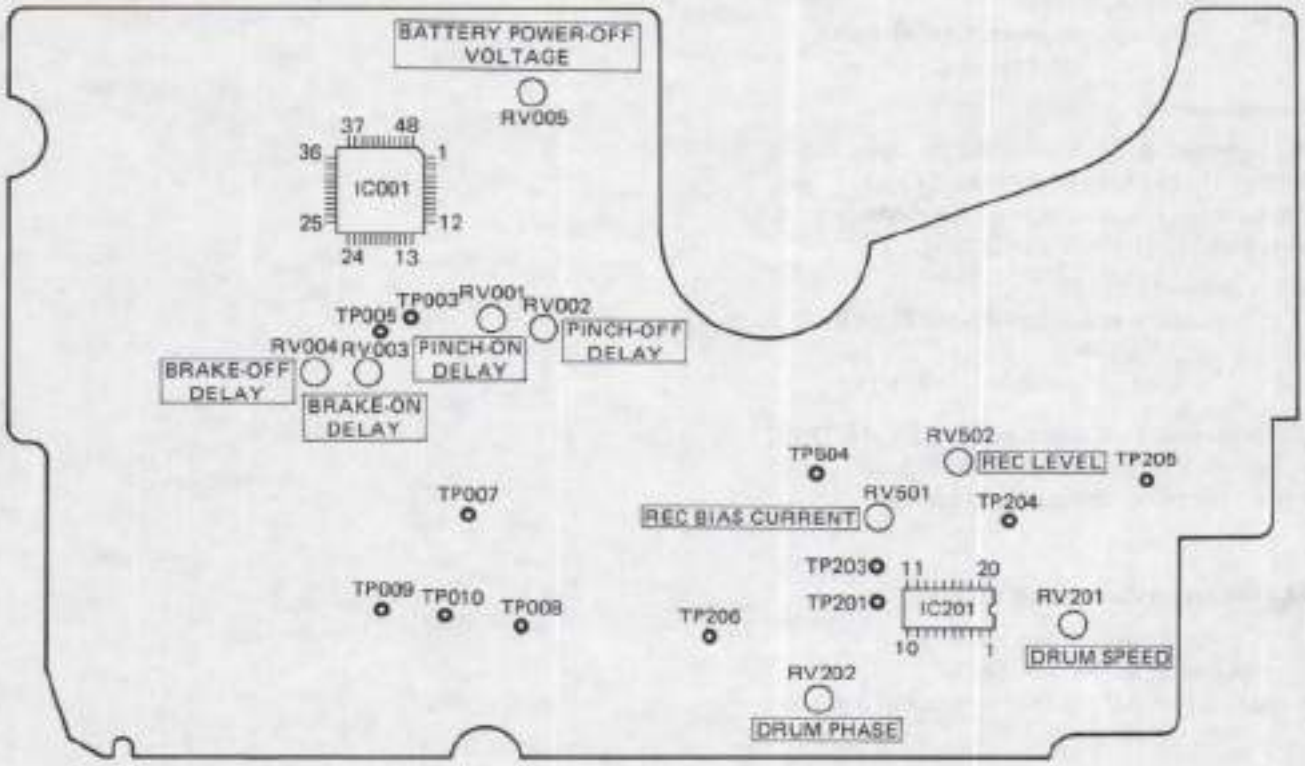
[Adjustment method]

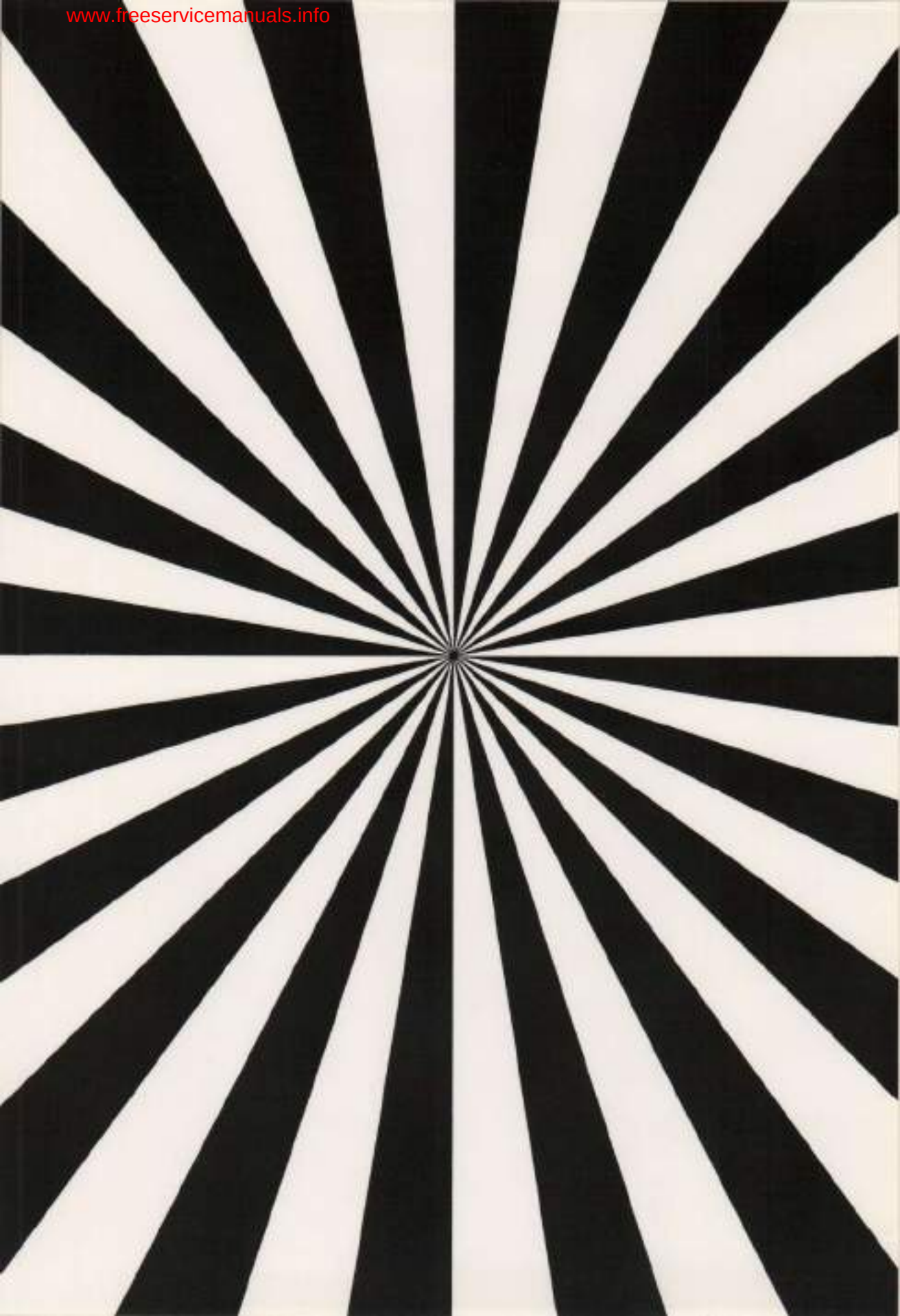
1) Record the 333Hz, −50dBs signal
2) Record with no signal.
3) Play back a recorded tape on a playback VTR and get the difference between the signal level (333Hz portion and noise level (no signal portion).

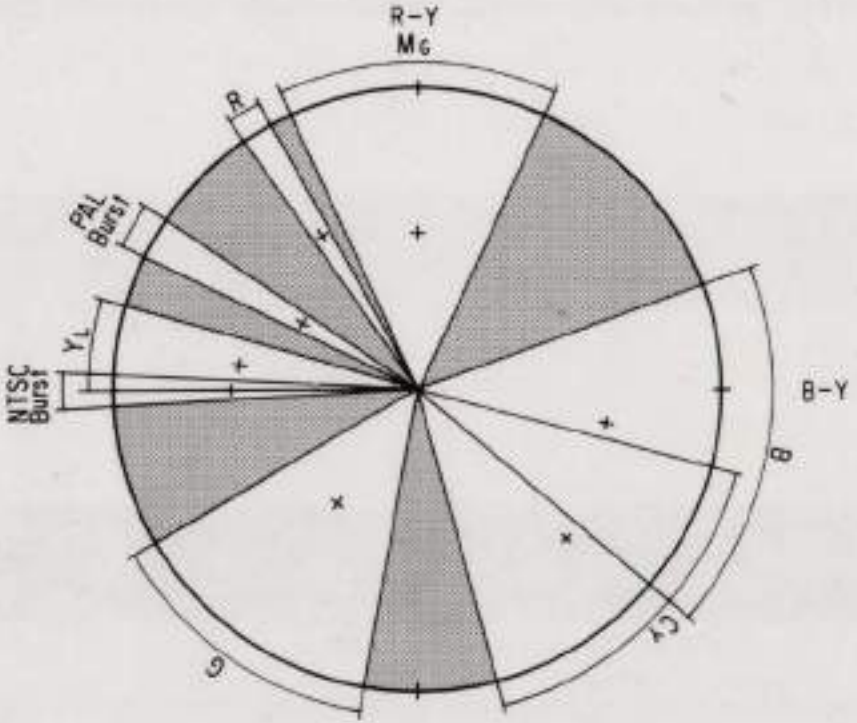
Standard: Greater than 35dB.

4-6. RV, TP LOCATION

CS-5 Board (SOLDER SIDE)







BMC-500 Series

9-972-375-81

Sony Corporation

English
85D0464-1
Printed in Japan

BMC-500P
BC-300E/AS

SONY

SERVICE MANUAL

AEP Model
E Model
(BC-300E)
Australian Model
(BC-300AS)

June, 1985

SUPPLEMENT-2

Subject: Addition of BC-300E/AS Service Data

This supplement includes the service data of BC-300E/AS multi battery charger supplied.
File this supplement with the service manual.

SPECIFICATIONS

Power requirements	110 - 240 V ac, 50/60 Hz
Power consumption	28 W
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 +60°C (-4°F to +140°F)
Dimensions	Approx. 88 × 40 × 201.5 mm (w/h/d) (3½ × 1⅝ × 8 inches)
Weight	Approx. 600 g (1 lb 5 oz) net
AC power cord length	Approx. 2.3 m (7.6 feet)

MICROFILM

Consumer VIDEO

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.

SECTION 1
GENERAL

The BC-300E/AS multi battery charger enables you to charge consecutively three NP-11 battery packs.

1-1. PRECAUTIONS

On safety

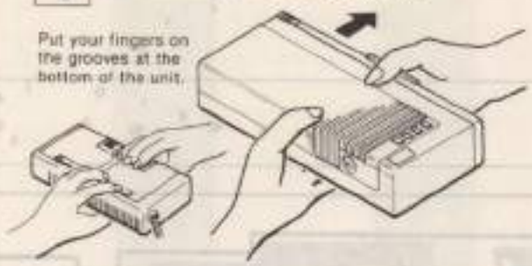
- This battery charger operates on 110 - 240 V ac without any voltage adaptation.
- Allow adequate air circulation to prevent internal heat build-up.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet when it is not to be used for an extended period of time.
- To disconnect the cord, pull it out by the plug. Never pull it by the cord.
- Charge NP-11 (nickel-cadmium) batteries only. Do not charge any other type of batteries, such as lead-acid.

The set is not disconnected from the ac power source (mains) as long as it is connected to the wall outlet, even if the set itself has been turned off.

1-2. LOCATION AND FUNCTION OF PARTS

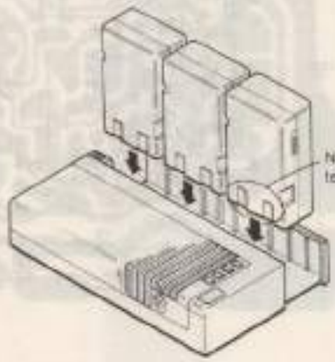
1-3. CHARGING OPERATION

1 **Pull out the battery compartment.**

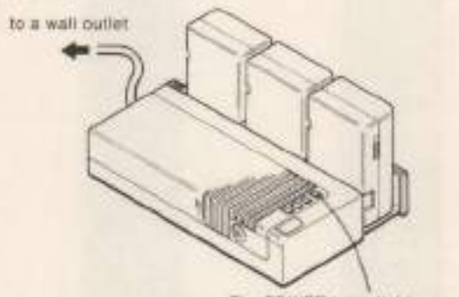


2 **Install the NP-11 battery packs.**

Three battery packs can be inserted for charging, but you can also charge just one or two packs. Insert the packs in any position you choose.

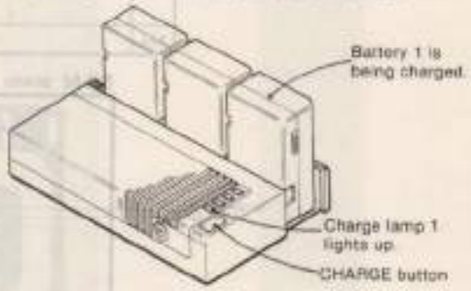


3 **Plug the ac power cord into the wall outlet.**



4 **Press the CHARGE button.**

Batteries are charged in consecutive order, starting from battery compartment 1 to 3 in order. Each lamp corresponds to a battery compartment. The lamp will light up when the battery is being charged. The lamp will go off when charging has finished.



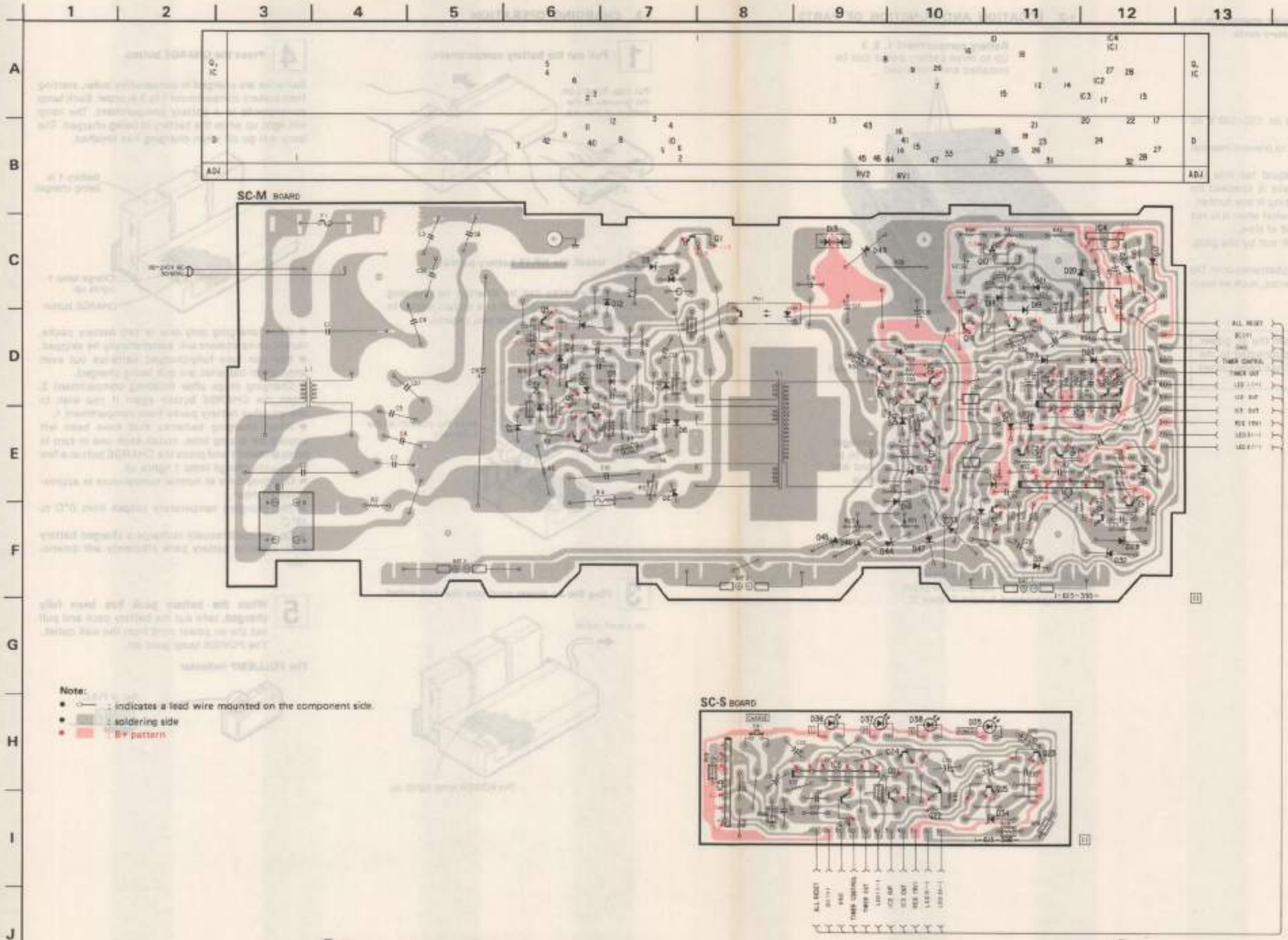
- When charging only one or two battery packs, vacant compartment will automatically be skipped.
- You can take fully-charged batteries out even when other batteries are still being charged.
- Charging stops after finishing compartment 3. Press the CHARGE button again if you wish to charge other battery packs from compartment 1.
- When charging batteries that have been left unused for a long time, install each one in turn in compartment 1 and press the CHARGE button a few times until charge lamp 1 lights up.
- Charging time at normal temperature is approximately 1 hour.
- The charging temperature ranges from 0°C to 40°C.
- Do not continuously recharge a charged battery pack because battery pack efficiency will deteriorate.

5 **When the battery pack has been fully charged,** take out the battery pack and pull out the ac power cord from the wall outlet. The POWER lamp goes off.

The FULL/EMP indicator

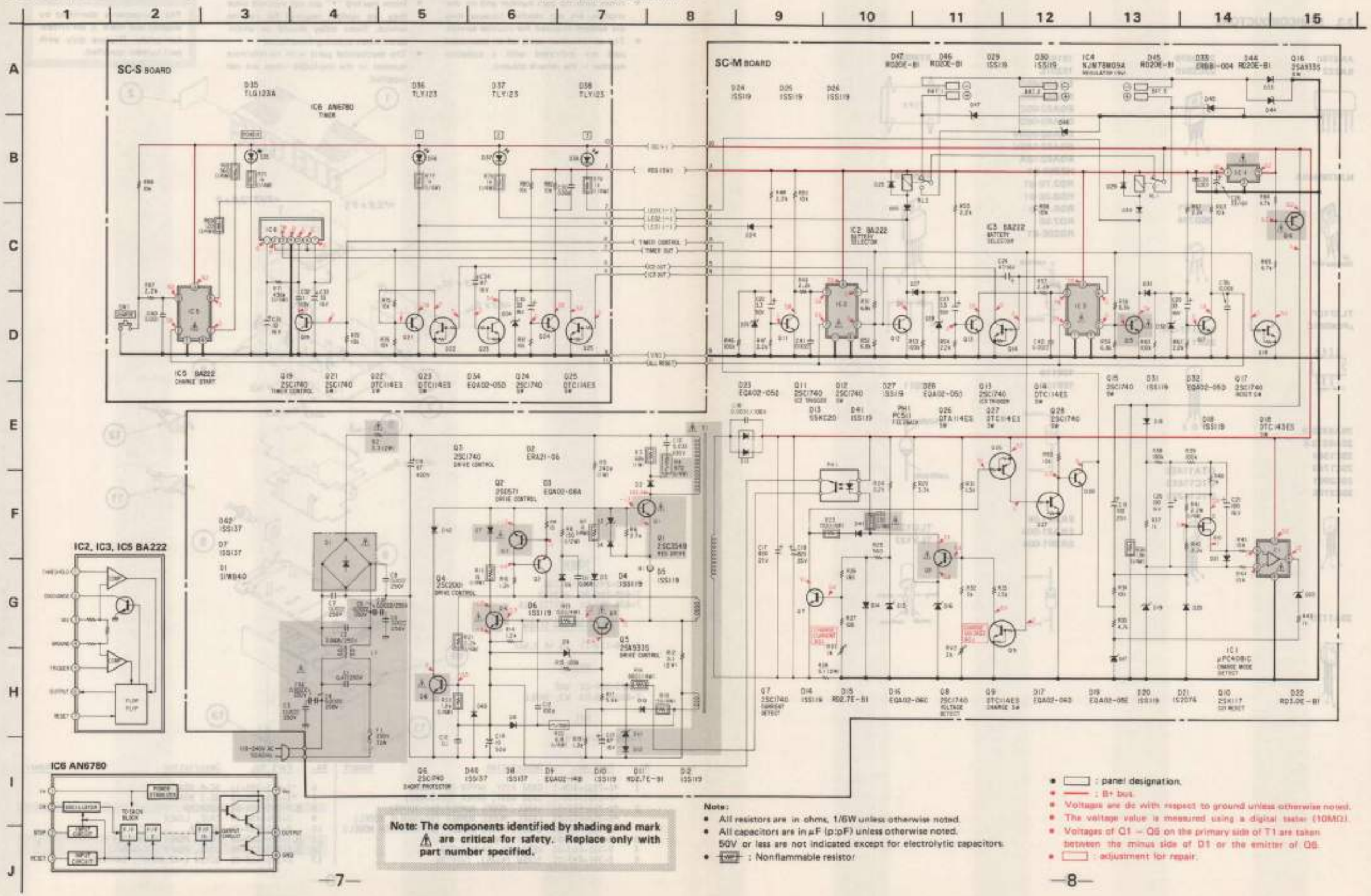
SECTION 2
DIAGRAMS

2-1. SC-S (CHARGE CONTROL), SC-M (POWER, CHARGE CURRENT, VOLTAGE DETECTION) PRINTED WIRING BOARDS



Note:
- ○— : indicates a lead wire mounted on the component side.
- : soldering side
- : B+ pattern

2-2. SC-S (CHARGE CONTROL), SC-M (POWER, CHARGE CURRENT, VOLTAGE DETECTION) SCHEMATIC DIAGRAM



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

Note:

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- ▭ : Nonflammable resistor

- ▭ : panel designation.
- ——— : B+ bus.
- Voltages are dc with respect to ground unless otherwise noted.
- The voltage value is measured using a digital tester (10MΩ).
- Voltages of Q1 – Q6 on the primary side of T1 are taken between the minus side of D1 or the emitter of Q6.
- ▭ : adjustment for repair.

2-3. SEMICONDUCTORS

AN6780
BA222

2SC2979
2SC3649

NJM78M09A

2SD571
2SD774

TL071CP
μPC4081C

2SK117-GR
2SK117-Y

2SA933S-R
2SA933S-S
2SC1364
2SC1740
2SC2001
2SC2785

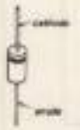
DTA114ES
DTC114ES
DTC143ES

2SA1175

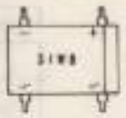
1S1585
1S2076
EQA02-05D
EQA02-05E
EQA02-06C
EQA02-06D
EQA02-08AV
EQA02-14BV
EQA02-18A
HZ20E-B1
RD2.7E-B1
RD3.0E-B1
RD5.1E-B
RD7.5E
RD20E-B1

1SS119
1SS137

ERA21-06
ERA81-004
ERB81-004



S1WB40



S5KC20

PC511

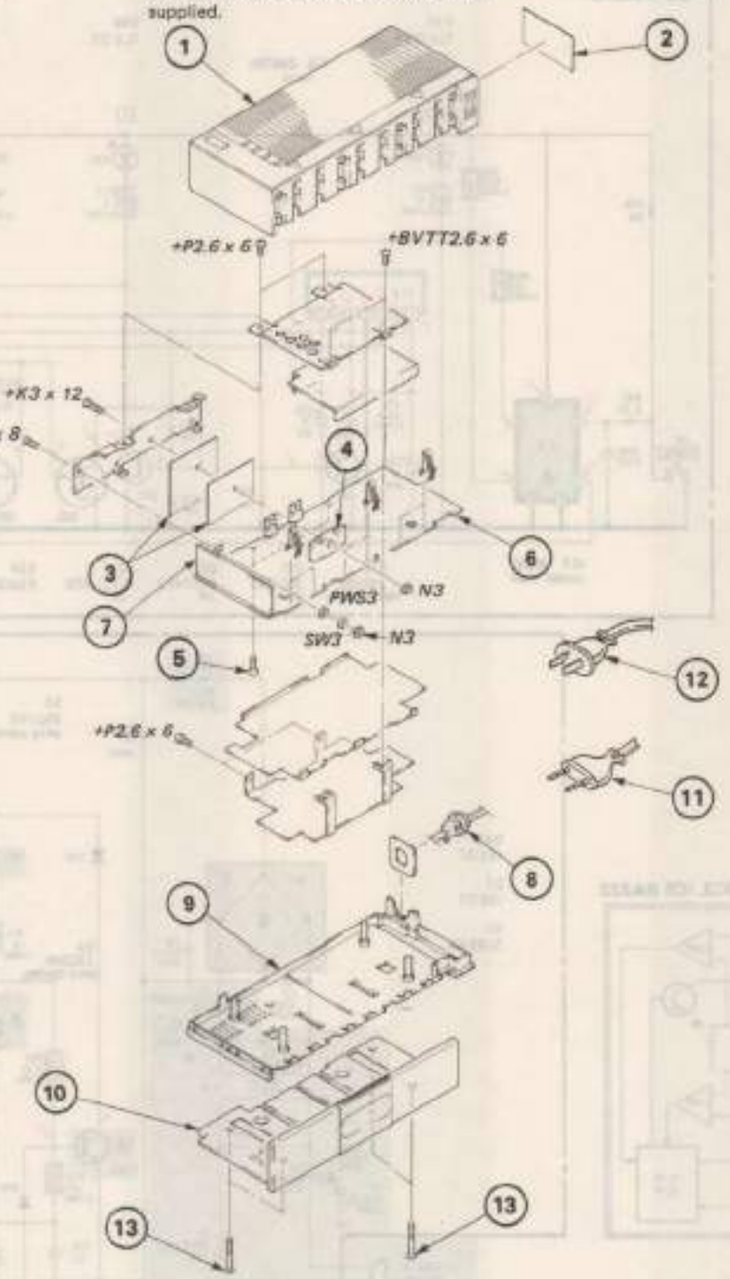
TLG123A
TLY123

SECTION 3
EXPLODED VIEW

NOTE:

- Itmes 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 mechanical parts with no reference number in the exploded views are not supplied.

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



SCREW

7-682-248-09 +K3X8
7-682-250-09 +K3X12
7-685-862-01 +BVTT2.6X6

SELF-TAPPING SCREW

7-685-133-11 TA +P 2.6X6

WASHER

7-623-208-22 SW3
7-686-003-03 W3, SMALL

NUT

7-684-023-04 N3

No.	Part No.	Description	Remark
1	*X-2391-405-1	CASE ASSY, UPPER (BC-300E)	
	*X-2391-406-1	CASE ASSY, UPPER (BC-300AS)	
2	*2-350-451-01	LABEL, MODEL NUMBER (BC-300AS)	
	*2-350-452-01	LABEL, MODEL NUMBER (BC-300E/E MODEL)	
	*2-350-453-01	LABEL, MODEL NUMBER (BC-300E/AEP MODEL)	
3	2-391-462-01	SHEET, RADIATION	
4	2-391-463-01	RETAINER, TRANSISTOR	
5	2-391-457-01	SCREW (+3X6), TAPPING	
6	*1-615-395-11	SC-M BOARD	
7	*1-615-396-11	SC-S BOARD	
8	⚠2-391-456-01	BUSHING	
9	2-391-432-01	CASE, LOWER	
10	2-391-433-01	DRAWER	
11	⚠1-534-817-XX	CORD, POWER (BC-300E)	
12	⚠1-551-732-00	CORD, POWER (BC-300AS)	
13	2-391-458-01	SCREW (+K2.6X30), TAPPING	

SECTION 4
ELECTRICAL PARTS LIST

NOTE:

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

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

- All resistors are in ohms.
- F : nonflammable

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

CAPACITORS

- MF : μF, PF : μμF

COILS

- MMH : mH, UH : μH

Ref.No	Part No.	Description				Remark
	*1-615-395-11	SC-M BOARD				
		**********				
	2-391-454-01	TERMINAL, BATTERY				
		FERRITE BEAD				
B001	1-543-264-11	BEAD, FERRITE				
		CAPACITOR				
C001	⚠1-136-411-11	FILM	0.47MF	20%	250V	
C002	⚠1-136-364-00	FILM	0.068MF	20%	250V	
C003	⚠1-161-742-00	CERAMIC	0.0022MF	20%	400V	
C004	⚠1-161-742-00	CERAMIC	0.0022MF	20%	400V	
C005	⚠1-161-742-00	CERAMIC	0.0022MF	20%	400V	
C006	⚠1-161-742-00	CERAMIC	0.0022MF	20%	400V	
C007	1-161-742-00	CERAMIC	0.0022MF	20%	400V	
C008	1-161-742-00	CERAMIC	0.0022MF	20%	400V	
C009	1-119-500-00	ELECT	47MF		400V	
C010	1-136-206-11	FILM	0.033MF	5%	630V	
C011	1-130-493-00	MYLAR	0.068MF	5%	50V	
C012	1-102-106-00	CERAMIC	100PF	10%	50V	
C013	1-123-332-00	ELECT	47MF	20%	16V	
C014	1-123-875-11	ELECT	10MF	20%	50V	
C015	1-130-495-00	MYLAR	0.1MF	5%	50V	
C016	1-106-184-00	MYLAR	0.0033MF	5%	100V	
C017	1-124-759-00	ELECT	820MF	20%	25V	
C018	1-124-759-00	ELECT	820MF	20%	25V	
C019	1-124-478-11	ELECT	100MF	20%	25V	
C020	1-124-445-00	ELECT	100MF	20%	16V	
C021	1-123-333-00	ELECT	100MF	20%	16V	
C022	1-123-613-00	ELECT	3.3MF	20%	50V	
C023	1-123-613-00	ELECT	3.3MF	20%	50V	
C024	1-123-821-00	ELECT	47MF	20%	16V	
C025	1-123-820-00	ELECT	33MF	20%	16V	
C026	1-123-820-00	ELECT	33MF	20%	16V	
C036	⚠1-161-742-00	CERAMIC	0.0022MF	20%	400V	
C037	⚠1-161-742-00	CERAMIC	0.0022MF	20%	400V	
C038	1-130-493-00	MYLAR	0.068MF	5%	50V	
C039	1-130-471-00	MYLAR	0.001MF	5%	50V	
C041	1-130-475-00	MYLAR	0.0022MF	5%	50V	
C042	1-130-475-00	MYLAR	0.0022MF	5%	50V	
		DIODE				
D001	⚠8-719-500-04	DIODE S1WB40				
D002	1-807-256-11	DIODE ERA21-06				
D003	⚠8-719-175-07	DIODE RD7.5E				
D004	8-719-911-19	DIODE 1SS119				
D005	8-719-911-19	DIODE 1SS119				
D006	8-719-911-19	DIODE 1SS119				
D007	⚠1-807-257-11	DIODE 1SS137				
D008	1-807-257-11	DIODE 1SS137				
D009	8-719-914-14	DIODE EQA02-14BV				
D010	8-719-911-19	DIODE 1SS119				

Ref.No	Part No.	Description	Remark
D011	⚠8-719-100-12	DIODE RD2.7E-B1	
D012	⚠8-719-911-19	DIODE 1SS119	
D013	8-719-550-02	DIODE S5KC20	
D014	8-719-911-19	DIODE 1SS119	
D015	8-719-100-12	DIODE RD2.7E-B1	
D016	8-719-913-76	DIODE EQA02-06CV	
D017	8-719-913-77	DIODE EQA02-06DV	
D018	8-719-911-19	DIODE 1SS119	
D019	8-719-151-07	DIODE RD5.1E-B	
D020	8-719-911-19	DIODE 1SS119	
D021	8-719-815-85	DIODE 1S1585	
D022	8-719-100-14	DIODE RD3.0E-B1	
D023	8-719-151-07	DIODE RD5.1E-B	
D024	8-719-911-19	DIODE 1SS119	
D025	8-719-911-19	DIODE 1SS119	
D026	8-719-911-19	DIODE 1SS119	
D027	8-719-911-19	DIODE 1SS119	
D028	8-719-151-07	DIODE RD5.1E-B	
D029	8-719-911-19	DIODE 1SS119	
D030	8-719-911-19	DIODE 1SS119	
D031	8-719-911-19	DIODE 1SS119	
D032	8-719-151-07	DIODE RD5.1E-B	
D033	8-719-981-01	DIODE ERA81-004	
D040	1-807-257-11	DIODE 1SS137	
D041	8-719-911-19	DIODE 1SS119	
D042	1-807-257-11	DIODE 1SS137	
D044	8-719-100-79	DIODE RD20E-B1	
D045	8-719-100-79	DIODE RD20E-B1	
D046	8-719-100-79	DIODE RD20E-B1	
D047	8-719-100-79	DIODE RD20E-B1	
		FUSE	
F001	⚠1-532-203-00	FUSE T2A 250V	
		IC	
IC001	⚠8-759-101-30	IC UPC4081C	
IC002	⚠1-807-251-11	IC BA222	
IC003	⚠1-807-251-11	IC BA222	
IC004	⚠8-759-700-14	IC MM78M09A	
		COIL	
L001	⚠1-410-238-11	COIL, CHOKE 42.5MMH	
		PHOTO COUPLER	
PH001	1-807-259-11	PHOTO COUPLER PC511	
		TRANSISTOR	
Q001	⚠1-807-253-11	TRANSISTOR 2SC3549	
Q002	8-729-177-43	TRANSISTOR 2SD774	
Q003	⚠8-729-663-47	TRANSISTOR 2SC1364	
Q004	⚠8-729-100-13	TRANSISTOR 2SC2001	
Q005	⚠8-729-901-52	TRANSISTOR 2SA933S-R	

Ref.No	Part No.	Description				Remark
Q006	⚠8-729-663-47	TRANSISTOR 2SC1364				
Q007	8-729-663-47	TRANSISTOR 2SC1364				
Q008	⚠8-729-663-47	TRANSISTOR 2SC1364				
Q009	8-729-900-80	TRANSISTOR DTC114ES				
Q010	8-729-201-16	TRANSISTOR 2SK117-Y				
Q011	8-729-663-47	TRANSISTOR 2SC1364				
Q012	8-729-663-47	TRANSISTOR 2SC1364				
Q013	8-729-663-47	TRANSISTOR 2SC1364				
Q014	8-729-900-80	TRANSISTOR DTC114ES				
Q015	⚠8-729-663-47	TRANSISTOR 2SC1364				
Q016	⚠8-729-901-52	TRANSISTOR 2SA933S-R				
Q017	8-729-663-47	TRANSISTOR 2SC1364				
Q018	1-807-255-11	TRANSISTOR DTC143ES				
Q026	8-729-900-61	TRANSISTOR DTA114ES				
Q027	8-729-900-80	TRANSISTOR DTC114ES				
Q028	8-729-663-47	TRANSISTOR 2SC1364				
		RESISTOR				
R002	⚠1-205-788-00	CEMENTED	3.3	10%	2W	
R003	1-214-599-00	METAL OXIDE	68K	5%	1W	F
R004	⚠1-217-407-00	FUSIBLE	470	5%	1/4W	F
R005	1-249-502-00	CARBON	240K	5%	1W	
R006	1-247-841-00	CARBON	2.7K	5%	1/6W	
R007	1-247-131-00	CARBON	1K	5%	1/4W	F
R008	1-247-220-00	CARBON	150	5%	1/2W	
R009	1-247-783-00	CARBON	10	5%	1/6W	
R010	1-247-833-00	CARBON	1.2K	5%	1/6W	
R011	1-247-087-00	CARBON	15	5%	1/4W	F
R012	1-205-788-00	CEMENTED	3.3	10%	2W	
R013	1-247-111-00	CARBON	150	5%	1/4W	F
R014	1-247-833-00	CARBON	1.2K	5%	1/6W	
R015	1-247-881-00	CARBON	120K	5%	1/6W	
R016	1-247-127-00	CARBON	680	5%	1/4W	F
R017	1-247-849-00	CARBON	5.6K	5%	1/6W	
R018	1-247-087-00	CARBON	15	5%	1/4W	F
R019	1-247-833-00	CARBON	1.2K	5%	1/6W	
R020	1-217-385-00	FUSIBLE	6.8	5%	1/4W	F
R021	1-247-139-11	CARBON	2.2K	5%	1/4W	F
R022	1-247-137-00	CARBON	1.8K	5%	1/4W	F
R023	1-247-111-00	CARBON	150	5%	1/4W	F
R024	1-249-421-11	CARBON	2.2K	5%	1/6W	
R025	1-247-825-00	CARBON	560	5%	1/6W	
R026	1-247-813-00	CARBON	180	5%	1/6W	
R027	1-807-252-11	THERMISTOR 21D27				
R028	1-205-787-00	CEMENTED	0.1	10%	2W	
R029	1-247-843-00	CARBON	3.3K	5%	1/6W	
R030	⚠1-247-119-00	CARBON	330	5%	1/4W	F
R031	1-247-836-00	CARBON	1.6K	5%	1/6W	
R032	1-247-842-00	CARBON	3K	5%	1/6W	
R033	1-247-835-00	CARBON	1.5K	5%	1/6W	
R034	1-247-855-00	CARBON	10K	5%	1/6W	
R035	1-247-847-00	CARBON	4.7K	5%	1/6W	
R036	1-247-135-00	CARBON	1.5K	5%	1/4W	F

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

Ref.No	Part No.	Description				Remark
R037	1-247-831-00	CARBON	1K	5%	1/6W	
R038	1-247-879-00	CARBON	100K	5%	1/6W	
R039	1-247-879-00	CARBON	100K	5%	1/6W	
R040	1-247-831-00	CARBON	1K	5%	1/6W	
R041	1-210-021-00	CARBON	2.2M	5%	1/4W	
R042	1-249-421-11	CARBON	2.2K	5%	1/6W	
R043	1-247-855-00	CARBON	10K	5%	1/6W	
R044	1-247-855-00	CARBON	10K	5%	1/6W	
R045	1-247-831-00	CARBON	1K	5%	1/6W	
R046	1-247-879-00	CARBON	100K	5%	1/6W	
R047	1-249-421-11	CARBON	2.2K	5%	1/6W	
R048	1-249-421-11	CARBON	2.2K	5%	1/6W	
R049	1-249-421-11	CARBON	2.2K	5%	1/6W	
R050	1-247-855-00	CARBON	10K	5%	1/6W	
R051	1-247-851-00	CARBON	6.8K	5%	1/6W	
R052	1-247-851-00	CARBON	6.8K	5%	1/6W	
R053	1-247-879-00	CARBON	100K	5%	1/6W	
R054	1-249-421-11	CARBON	2.2K	5%	1/6W	
R055	1-249-421-11	CARBON	2.2K	5%	1/6W	
R056	1-247-855-00	CARBON	10K	5%	1/6W	
R057	1-249-421-11	CARBON	2.2K	5%	1/6W	
R058	1-247-851-00	CARBON	6.8K	5%	1/6W	
R059	1-247-851-00	CARBON	6.8K	5%	1/6W	
R060	1-247-879-00	CARBON	100K	5%	1/6W	
R061	1-249-421-11	CARBON	2.2K	5%	1/6W	
R062	1-249-421-11	CARBON	2.2K	5%	1/6W	
R063	1-247-855-00	CARBON	10K	5%	1/6W	
R064	1-247-847-00	CARBON	4.7K	5%	1/6W	
R065	1-247-847-00	CARBON	4.7K	5%	1/6W	
R083	1-247-855-00	CARBON	10K	5%	1/6W	
		VARIABLE RESISTOR				
RV001	1-226-428-00	RES, ADJ, CARBON 1K				
RV002	1-226-429-00	RES, ADJ, CARBON 2K				
		RELAY				
RL001	1-515-581-11	RELAY, MICRO				
RL002	1-515-581-11	RELAY, MICRO				
		TRANSFORMER				
T001	⚠1-437-171-11	TRANSFORMER, SWITCHING (A)				
	*1-615-398-11	SC-S BOARD				
		**********				
		CAPACITOR				
C030	1-130-493-00	MYLAR	0.068MF	5%	50V	
C031	1-123-617-00	ELECT	10MF	20%	16V	
C032	1-130-834-00	FILM	1MF	5%	63V	
C033	1-123-820-00	ELECT	33MF	20%	16V	
C034	1-123-821-00	ELECT	47MF	20%	16V	

Ref.No	Part No.	Description				Remark
C035	1-123-820-00	ELECT	33MF	20%	16V	
C040	1-130-471-00	MYLAR	0.001MF	5%	50V	
		DIODE				
D034	8-719-151-07	DIODE RD5.1E-B				
D035	8-719-812-33	DIODE TLS123A				
D036	8-719-812-32	DIODE TLY123				
D037	8-719-812-32	DIODE TLY123				
D038	8-719-812-32	DIODE TLY123				
		IC				
IC005	⚠1-807-251-11	IC BA222				
IC006	8-759-400-85	IC AN6780				
		TRANSISTOR				
Q019	8-729-663-47	TRANSISTOR 2SC1364				
Q021	8-729-663-47	TRANSISTOR 2SC1364				
Q022	8-729-900-80	TRANSISTOR DTC114ES				
Q023	8-729-900-80	TRANSISTOR DTC114ES				
Q024	8-729-663-47	TRANSISTOR 2SC1364				
Q025	8-729-900-80	TRANSISTOR DTC114ES				
		RESISTOR				
R066	1-247-855-00	CARBON	10K	5%	1/6W	
R067	1-249-421-11	CARBON	2.2K	5%	1/6W	
R068	1-247-125-00	CARBON	560	5%	1/4W	F
R069	1-247-109-00	CARBON	120	5%	1/4W	F
R070	1-247-131-00	CARBON	1K	5%	1/4W	F
R071	1-246-536-00	CARBON	430K	5%	1/4W	
R072	1-247-855-00	CARBON	10K	5%	1/6W	
R075	1-247-855-00	CARBON	10K	5%	1/6W	
R076	1-247-855-00	CARBON	10K	5%	1/6W	
R077	1-247-131-00	CARBON	1K	5%	1/4W	F
R078	1-247-131-00	CARBON	1K	5%	1/4W	F
R079	1-247-131-00	CARBON	1K	5%	1/4W	F
R080	1-247-855-00	CARBON	10K	5%	1/6W	
R081	1-247-855-00	CARBON	10K	5%	1/6W	
R082	1-247-855-00	CARBON	10K	5%	1/6W	
		SWITCH				
SW001	1-554-088-00	SWITCH, KEY BOARD				

****

MISCELLANEOUS
****

⚠1-534-817-XX CORD, POWER (BC-300E)
⚠1-561-732-00 CORD, POWER (BC-300AS)

****

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
1-506-409-00	ADAPTOR, CONVERSION (E MODEL)	
*2-391-423-01	CUSHION	
*2-391-425-21	INDIVIDUAL CARTON (BC-300E)	
*2-391-425-31	INDIVIDUAL CARTON (BC-300AS)	
3-760-352-11	MANUAL, INSTRUCTION (BC-300E)	
3-760-352-41	MANUAL, INSTRUCTION (BC-300AS)	

****

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

9-972-375-82
Sony Corporation
English
85F0464-1
Printed in Japan

BMC-500P
BC-300E/AS

SONY

SERVICE MANUAL

AEP Model
E Model
(BC-300E)
Australian Model
(BC-300AS)

January, 1986

SUPPLEMENT-3

Subject

This supplement updates the service manual and includes the revised schematic diagrams, printed wiring boards and electrical parts list for the CCD BLOCK, CAMERA/VIDEO and AUDIO/SYSTEM CONTROL section as follows.

File this supplement with the service manual.

[Details of the Change]

1. **CCD BLOCK Section**
   - **CD-4, TR-18, PM-2 Boards**
     - The pattern has been changed.
     - The end of part No. has been also changed from -13 to -14.

2. **CAMERA/VIDEO Section**
   - **CV-1 Board**
     - The pattern has been changed.
     - The end of part No. has been also changed from -13 to -15. (See this supplement -3 for the circuit board that the end of part No. is -14.)

3. **AUDIO/SYSTEM CONTROL Section**
   - **CS-5 Board**
     - The pattern has been changed.
     - The end of part No. has been also changed from -13 to -15. (See this supplement -3 for the circuit board that the end of part No. is -14.)

Though the name of other circuit boards are mentioned, they are not changed.
The lens block is omitted because it is not changed.

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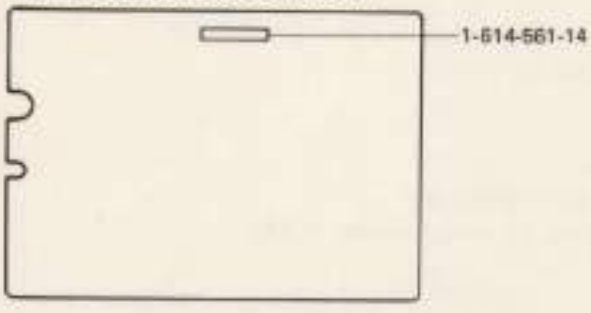
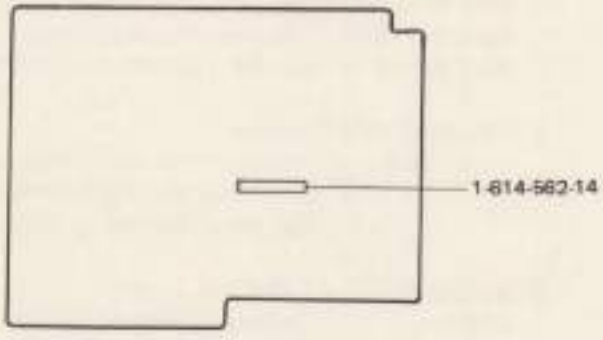
The part No. of the circuit board is indicated on the board as shown below.

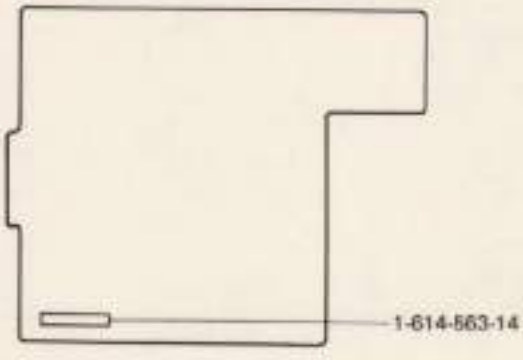
CD-4 BOARD (SOLDER SIDE)



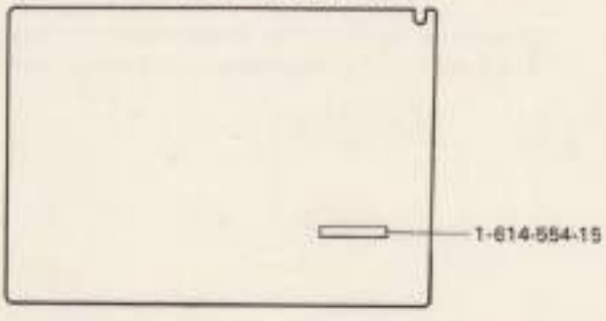
TR-18 BOARD (COMPONENT SIDE)



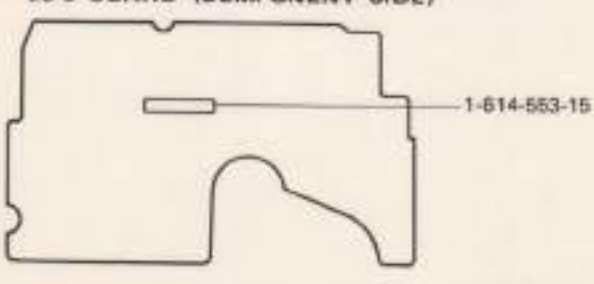
PM-2 BOARD (COMPONENT SIDE)



CV-1 BOARD (COMPONENT SIDE)

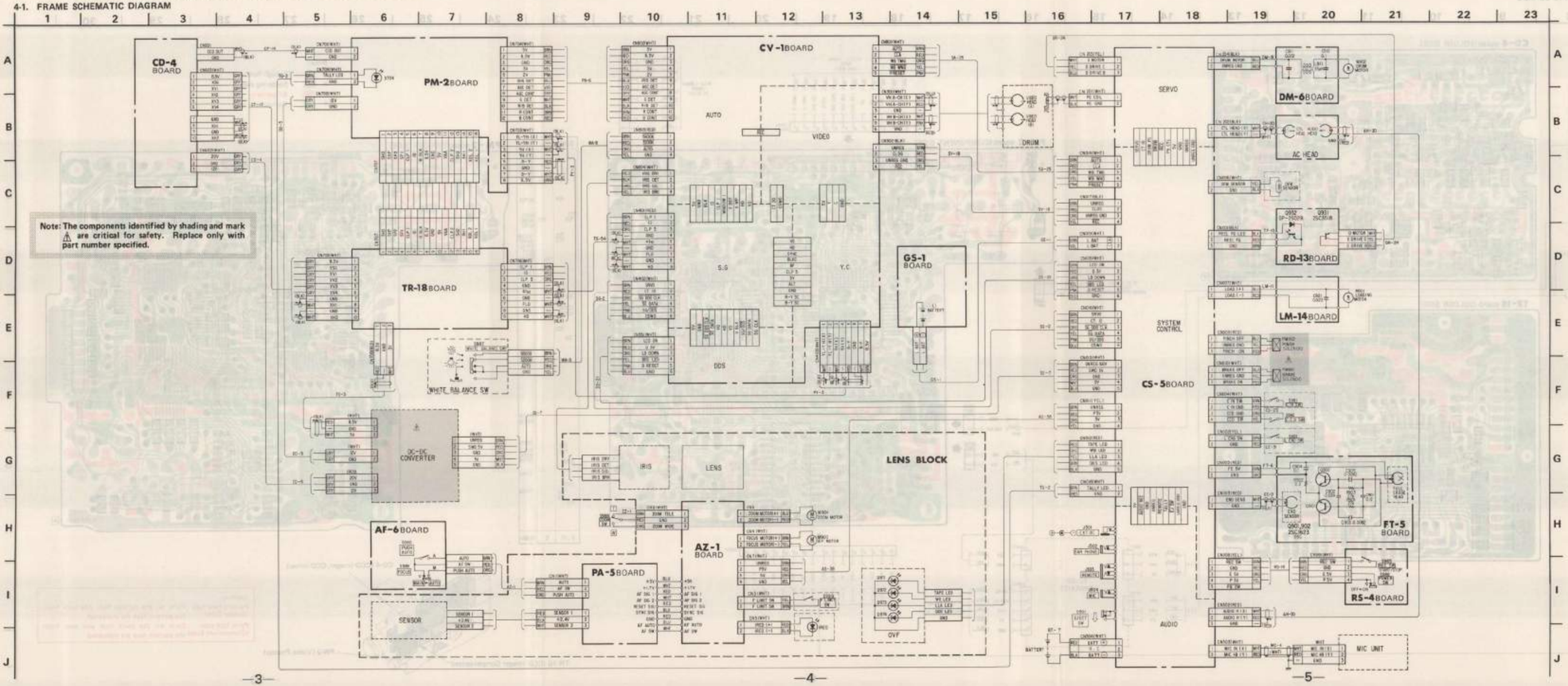


CS-5 BOARD (COMPONENT SIDE)

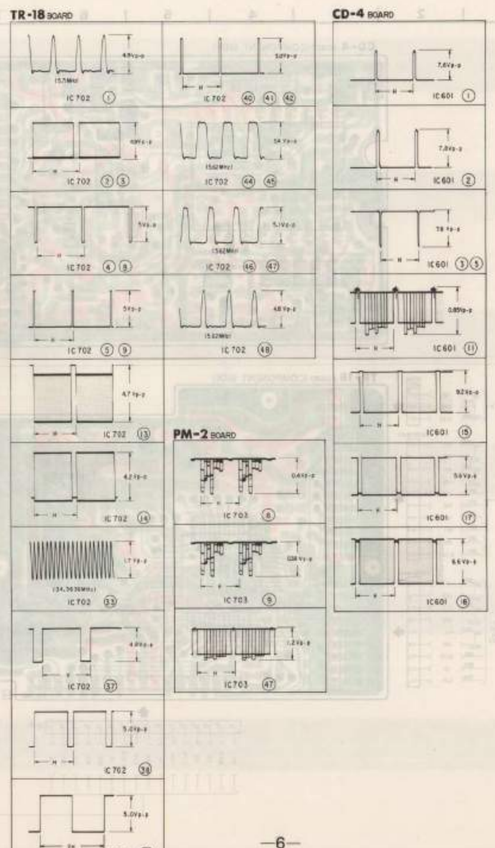


SECTION 4
SCHEMATIC DIAGRAM AND PRINTED WIRING BOARDS

4-1. FRAME SCHEMATIC DIAGRAM



FRAME FRAME



CCD BLOCK CCD BLOCK

4-2. CD-4 (CCD IMAGER, CCD DRIVER), TR-18 (CCD IMAGER COMPENSATION), PM-2 (VIDEO PROCESS) PRINTED WIRING BOARDS

CD-4 BOARD (COMPONENT SIDE)

CD-4 BOARD (SOLDER SIDE)

TR-18 BOARD (COMPONENT SIDE)

TR-18 BOARD (SOLDER SIDE)

PM-2 BOARD (COMPONENT SIDE)

PM-2 BOARD (SOLDER SIDE)

Note:
- ⊗ : Through hole.
- : Soldering side.
- : B+ pattern.
- : Component side.

DC-DC CONVERTER

CD-4 (CCD Imager, CCD driver)

PW-2 (Video Process)

TR-18 (CCD Imager Compensation)

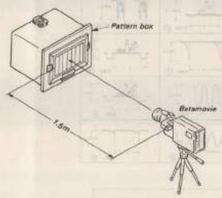
Caution:
Pattern face side: (Solder Side) Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side) Parts on the parts face side seen from the pattern face are indicated.

CD-4 (CCD IMAGER, CCD DRIVER), TR-18 (CCD IMAGER COMPENSATION), PM-2 (VIDEO PROCESS) SCHEMATIC DIAGRAM

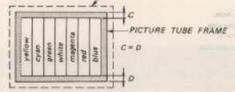
Note:

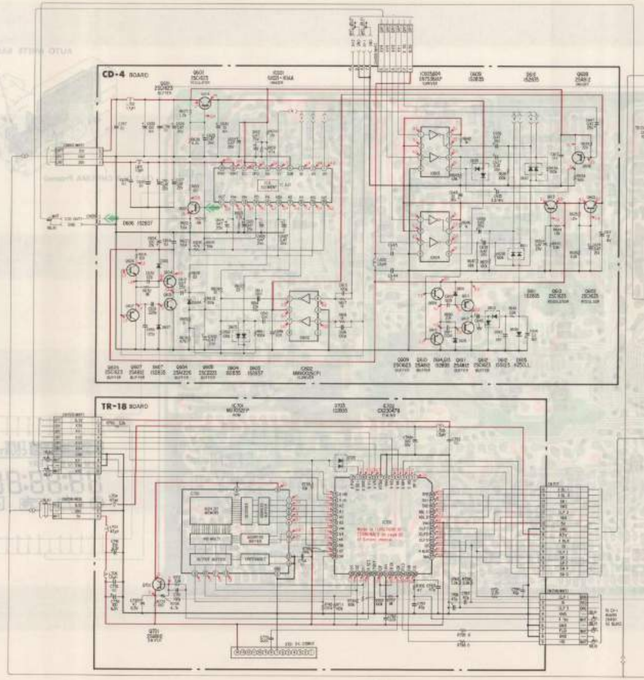
- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, ¼W unless otherwise noted.
  kΩ : 1000 Ω, MΩ : 1000 kΩ
- All capacitors are in μF unless 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.
- ▭ : 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 or more).
  (3) REC mode

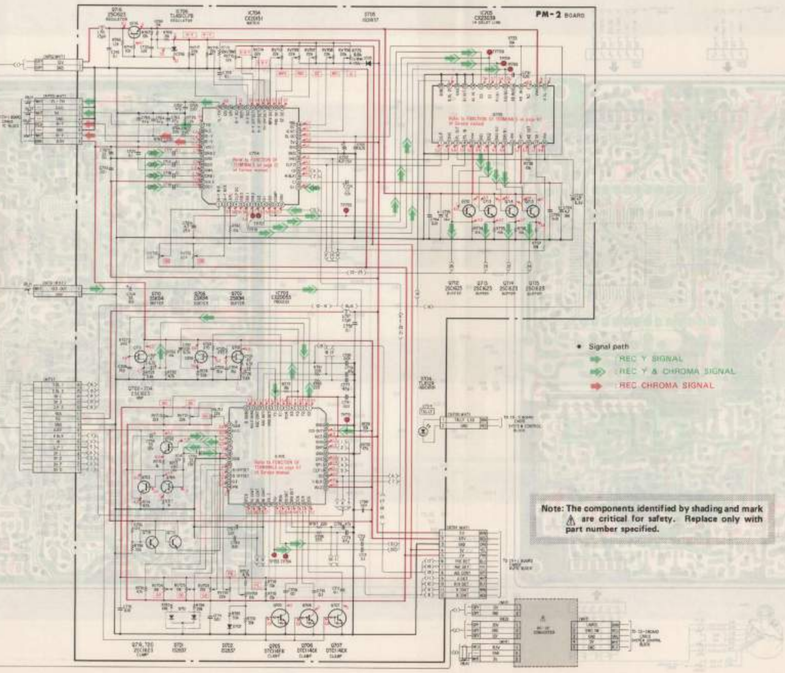
1. Connection



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

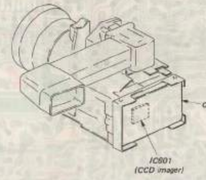






Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

- **NOTES ON REPLACING CCD IMAGER BLOCK**
- The CCD imager block (IC601, IC701) mounted on the CD-4 and TR-18 boards is composed of the CCD imager (IC601) and a correction ROM* (IC701) which is for optimizing imager response. The correction ROM and corresponding CCD imager are produced together, and therefore neither of them can be replaced individually.
  * The correction ROM is not included on some sets because it is not required in those cases.
- There are two types of CCD imagers supplied as service parts, so depending on the set being serviced, handle as described below.
  (1) When both the CCD imager and correction ROM are supplied together:
  Replace both the CCD imager and correction ROM.
  If there is not correction ROM mounted on the set being serviced, install the one which is supplied.
  (2) When only CCD imager is supplied:
  This CCD imager does not require correction, so if there is a correction ROM on the set, remove it, and replace the CCD imager only.
- The CCD imager block (IC601, IC701) is not mounted on the mounted CD-4 board and mounted TR-18 board which are supplied as service parts.
  When replacing the CD-4 and TR-18 boards, remove the CCD imager block from the old boards and mount on the new boards.

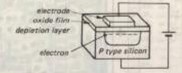


IC601 (CCD IMAGER) LAYOUT

IC701 (CORRECTION ROM) LAYOUT

- **NOTES ON HANDLING THE CCD IMAGER**

The CCD (Charge-Coupled Device) is a semiconductor which has MOS capacity unit elements lined up regularly. The CCD imager is a sensor, or "electronic eye" which has about 250,000 of these unit elements within a 1cm. square semiconductor board. Because of the structure of the CCD imager, the insulation resistance of the oxide film is extremely high, and the film is also very thin. This means that the CCD imager insulation may be damaged if potential difference is caused by static electricity in clothes or the human body. Please handle the CCD imager carefully, therefore, in the same way as for a MOS-IC.
(Be especially careful during dry weather or in a very dry location.)



UNIT ELEMENT (MOS CAPACITY)

- **NOTES ON REPLACING THE CCD IMAGER**

(1) Place in a MOS pack or wrap in aluminum foil to store so that all of the pins are the same potential. (Store like this until mounting in the set being serviced.)
(2) When replacing the CCD imager, be careful of dirt or dust sticking to it. The black cap is for protecting against dirt, and also to prevent strong light from touching the CCD imager. Remove the black cap after mounting the CCD imager in the set.
(3) Be sure to perform readjustment of the camera block after replacing the CCD imager.

CV-1 (Y & CHROMA PROCESS) PRINTED WIRING BOARD

CAMERA/VIDEO CAMERA/VIDEO

WHITE BALANCE SW

CV-1 BOARD (COMPONENT SIDE)

CV-1 BOARD (SOLDER SIDE)

AUTO WHITE BALANCE SW

CV-1 (Y & CHROMA Process)

DATE TIME TAPE COUNTER

AM PM BATTERY

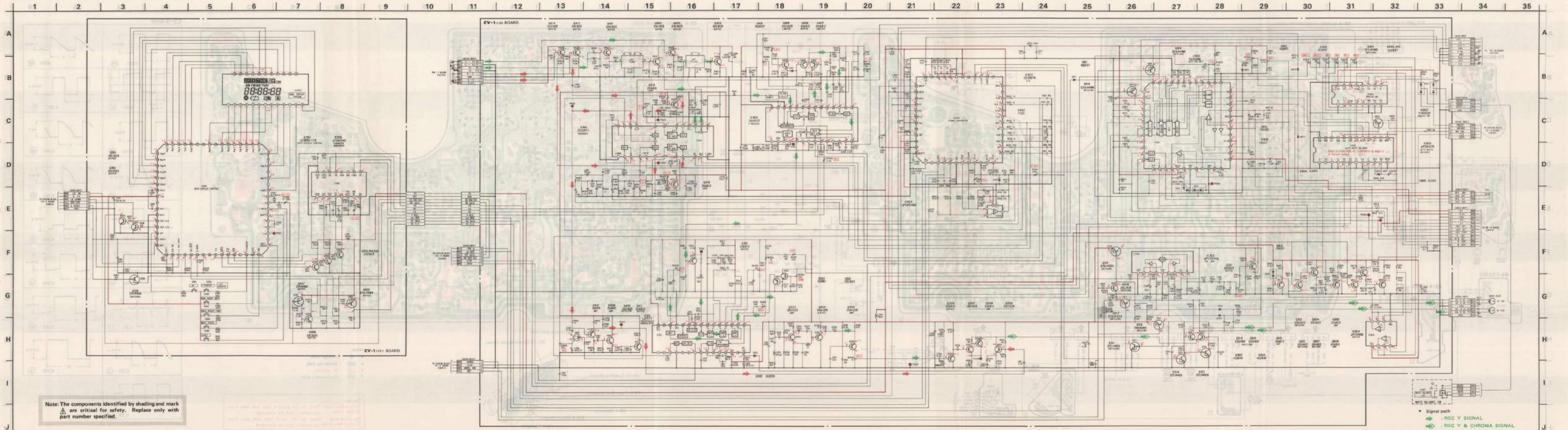
88:88:88

CV-1 con

Caution:
Pattern face side: (Solder 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.

Note:
- Through hole.
- Soldering side.
- B+ pattern.
- Component side.

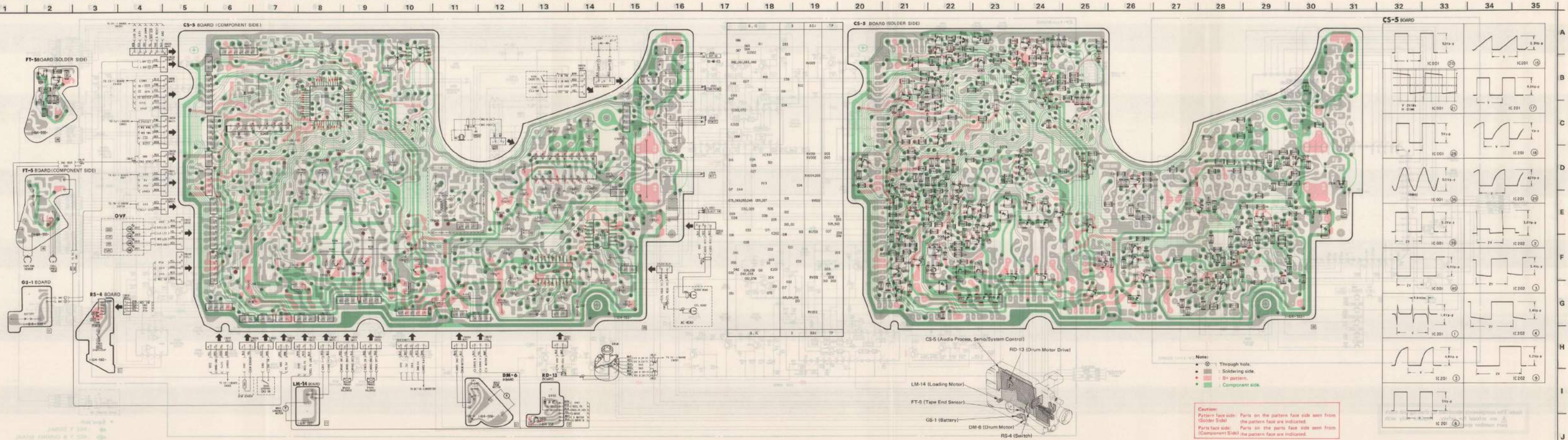
CV-1 (Y & CHROMA PROCESS) SCHEMATIC DIAGRAM



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

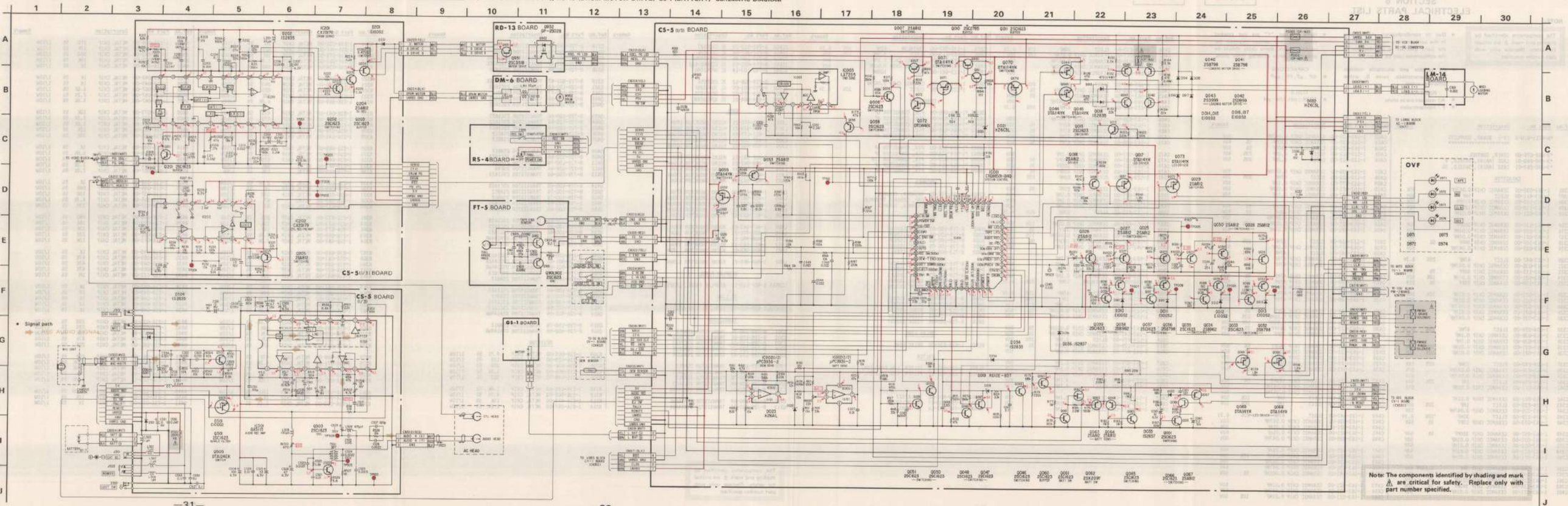
AUDIO, SERVO/SYSTEM CONTROL AUDIO, SERVO/SYSTEM CONTROL

FT-5 (TAPE END SENSOR, FULL ERASE HEAD), RS-4 (SWITCH), CS-5 (AUDIO PROCESS, SERVO/SYSTEM CONTROL), LM-14 (LOADING MOTOR), DM-6 (DRUM TOTOR), RD-13 (DRUM MOTOR DRIVE), GS-1 (BATTERY) PRINTED WIRING BOARDS



AUDIO, SERVO/SYSTEM CONTROL AUDIO, SERVO/SYSTEM CONTROL

FT-5 (TAPE END SENSOR, FULL ERASE HEAD), RS-4 (SWITCH), CS-5 (AUDIO PROCESS, SERVO/SYSTEM CONTROL), LM-14 (LOADING MOTOR), DM-6 (DRUM MOTOR), RD-13 (DRUM MOTOR DRIVE) GS-1 (BATTERY) SCHEMATIC DIAGRAM



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

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

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

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

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

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

Ref.No	Part No.	Description			Remark
	*A-6711-610-A	CV-1 BOARD, COMPLETE			
		**********			
	*3-662-075-00	COVER, CONTROL			
	*3-690-260-01	CASE (MAIN), SHIELD, V			
	*3-690-263-01	CASE (MAIN), SHIELD, SG			
		CAPACITOR			
C301	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C307	1-123-611-00	ELECT	1MF	20% 50V	
C308	1-162-113-00	CERAMIC CHIP	470PF	5% 50V	
C309	1-163-119-00	CERAMIC CHIP	120PF	5% 50V	
C312	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C314	1-163-130-00	CERAMIC CHIP	360PF	5% 50V	
C316	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C317	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C318	1-163-107-00	CERAMIC CHIP	39PF	5% 50V	
C319	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C320	1-123-647-00	ELECT	47MF	20% 6.3V	
C321	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C322	1-163-115-00	CERAMIC CHIP	82PF	5% 50V	
C324	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C325	1-163-100-00	CERAMIC CHIP	20PF	5% 50V	
C326	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C327	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C328	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C329	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C330	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C332	1-124-224-00	ELECT	47MF	20% 6.3V	
C333	1-163-038-00	CERAMIC CHIP	0.1MF	25V	
C334	1-163-038-00	CERAMIC CHIP	0.1MF	25V	
C335	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C336	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C337	1-124-242-00	ELECT	33MF	20% 16V	
C338	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C339	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C340	1-124-255-00	ELECT	1MF	20% 50V	
C341	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C342	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C343	1-124-255-00	ELECT	1MF	20% 50V	
C344	1-163-026-00	CERAMIC CHIP	0.047MF	50V	
C345	1-124-229-00	ELECT	33MF	20% 6.3V	
C348	1-163-083-00	CERAMIC CHIP	10PF	5% 50V	
C349	1-163-057-00	CERAMIC CHIP	180PF	5% 50V	
C350	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C351	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C354	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C355	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C356	1-163-008-00	CERAMIC CHIP	9PF	0.25PF 50V	
C357	1-163-107-00	CERAMIC CHIP	39PF	5% 50V	
C361	1-163-125-00	CERAMIC CHIP	220PF	5% 50V	
C362	1-163-135-00	CERAMIC CHIP	560PF	5% 50V	
C401	1-163-021-00	CERAMIC CHIP	0.01MF	50V	

Ref.No	Part No.	Description			Remark
C402	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C403	1-163-132-00	CERAMIC CHIP	430PF	5% 50V	
C404	1-163-121-00	CERAMIC CHIP	150PF	5% 50V	
C405	1-123-612-00	ELECT	2.2MF	20% 50V	
C406	1-123-612-00	ELECT	2.2MF	20% 50V	
C407	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C408	1-123-822-00	ELECT	47MF	20% 10V	
C409	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C410	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C411	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C412	1-163-117-00	CERAMIC CHIP	100PF	5% 50V	
C413	1-163-115-00	CERAMIC CHIP	82PF	5% 50V	
C414	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C415	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C416	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C417	1-123-618-00	ELECT	22MF	20% 6.3V	
C418	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C419	1-123-647-00	ELECT	47MF	20% 6.3V	
C420	1-163-109-00	CERAMIC CHIP	47PF	5% 50V	
C421	1-163-109-00	CERAMIC CHIP	47PF	5% 50V	
C422	1-163-109-00	CERAMIC CHIP	47PF	5% 50V	
C423	1-163-109-00	CERAMIC CHIP	47PF	5% 50V	
C424	1-163-109-00	CERAMIC CHIP	47PF	5% 50V	
C425	1-163-109-00	CERAMIC CHIP	47PF	5% 50V	
C426	1-163-109-00	CERAMIC CHIP	47PF	5% 50V	
C427	1-163-109-00	CERAMIC CHIP	47PF	5% 50V	
C428	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C429	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C430	1-163-122-00	CERAMIC CHIP	160PF	5% 50V	
C431	1-163-093-00	CERAMIC CHIP	10PF	5% 50V	
C432	1-163-122-00	CERAMIC CHIP	160PF	5% 50V	
C433	1-163-132-00	CERAMIC CHIP	430PF	5% 50V	
C434	1-163-121-00	CERAMIC CHIP	150PF	5% 50V	
C435	1-163-122-00	CERAMIC CHIP	160PF	5% 50V	
C436	1-163-093-00	CERAMIC CHIP	10PF	5% 50V	
C437	1-163-122-00	CERAMIC CHIP	160PF	5% 50V	
C438	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C439	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C440	1-123-611-00	ELECT	1MF	20% 50V	
C441	1-123-611-00	ELECT	1MF	20% 50V	
C442	1-123-647-00	ELECT	47MF	20% 6.3V	
C443	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C444	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C445	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C446	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C447	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C448	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C449	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C450	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C452	1-163-141-00	CERAMIC CHIP	0.001MF	5% 50V	
C453	1-163-021-00	CERAMIC CHIP	0.01MF	50V	
C454	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C455	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	

Ref.No	Part No.	Description			Remark
C456	1-124-233-00	ELECT	10MF	20% 6.3V	
C457	1-123-621-00	CERAMIC CHIP	0.01MF	10% 50V	
C458	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C459	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C460	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C461	1-123-617-00	ELECT	10MF	20% 16V	
C462	1-163-129-00	CERAMIC CHIP	220PF	5% 50V	
C463	1-163-109-00	CERAMIC CHIP	47PF	5% 50V	
C464	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C465	1-123-647-00	ELECT	47MF	20% 6.3V	
C466	1-163-035-00	CERAMIC CHIP	0.047MF	50V	
C468	1-163-109-00	CERAMIC CHIP	47PF	5% 50V	
C469	1-163-109-00	CERAMIC CHIP	47PF	5% 50V	
C470	1-163-109-00	CERAMIC CHIP	47PF	5% 50V	
C471	1-163-109-00	CERAMIC CHIP	47PF	5% 50V	
C472	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C473	1-163-117-00	CERAMIC CHIP	100PF	5% 50V	
C474	1-163-117-00	CERAMIC CHIP	100PF	5% 50V	
C475	1-163-117-00	CERAMIC CHIP	100PF	5% 50V	
C551	1-123-618-00	ELECT	22MF	20% 6.3V	
C552	1-163-103-00	CERAMIC CHIP	27PF	5% 50V	
C553	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C554	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C555	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C556	1-123-618-00	ELECT	22MF	20% 6.3V	
C557	1-163-021-00	CERAMIC CHIP	0.01MF	10% 50V	
C558	1-163-105-00	CERAMIC CHIP	33PF	5% 50V	
C559	1-163-075-00	CERAMIC CHIP	0.047PF	10% 25V	
C560	1-163-117-00	CERAMIC CHIP	100PF	5% 50V	
C801	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C802	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C803	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C804	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C805	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C806	1-131-383-00	TANTALUM	10MF	20% 6.3V	
C807	1-123-647-00	ELECT	47MF	20% 6.3V	
C808	1-123-611-00	ELECT	1MF	20% 50V	
C809	1-124-283-00	ELECT	4.7MF	20% 16V	
C810	1-163-141-00	CERAMIC CHIP	0.001MF	5% 50V	
C811	1-163-141-00	CERAMIC CHIP	0.001MF	5% 50V	
C812	1-163-141-00	CERAMIC CHIP	0.001MF	5% 50V	
C813	1-163-141-00	CERAMIC CHIP	0.001MF	5% 50V	
C814	1-124-075-00	ELECT	2.2MF	20% 35V	
C815	1-163-129-00	CERAMIC CHIP	330PF	5% 50V	
C816	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C817	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C818	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C819	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C820	1-123-616-00	ELECT	4.7MF	20% 25V	
C821	1-123-616-00	ELECT	4.7MF	20% 25V	
C822	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C823	1-163-077-00	CERAMIC CHIP	0.1MF	50V	
C824	1-163-077-00	CERAMIC CHIP	0.1MF	50V	

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

Ref.No	Part No.	Description	Remark
D825	1-131-387-00	TANTALUM 47MF 20% 6.3V	
D826	1-123-613-00	ELECT 3.3MF 20% 50V	
D827	1-163-077-00	CERAMIC CHIP 0.1MF 50V	
D831	1-163-021-00	CERAMIC CHIP 0.01MF 50V	
D832	1-123-661-00	ELECT 100MF 20% 6.3V	
D835	1-163-035-00	CERAMIC CHIP 0.047MF 50V	
D837	1-123-647-00	ELECT 47MF 20% 6.3V	
		CONNECTOR	
CN301	*1-564-005-00	PIN, CONNECTOR 6P	
CN302	*1-564-014-00	PIN, CONNECTOR 4P	
CN401	*1-564-019-11	PIN, CONNECTOR 9P	
CN402	*1-564-016-00	PIN, CONNECTOR 6P	
CN403	*1-564-018-11	PIN, CONNECTOR 8P	
CN551	*1-564-016-00	PIN, CONNECTOR 6P	
CN801	*1-564-015-00	PIN, CONNECTOR 5P	
CN802	*1-564-022-00	PIN, CONNECTOR 12P	
CN803	*1-564-017-00	PIN, CONNECTOR 4P	
CN804	*1-564-014-00	PIN, CONNECTOR 4P	
		TRIMMER	
CT401	1-141-245-00	TRIMMER, CERAMIC	
CT551	1-141-227-00	CAP, CERAMIC TRIMMER	
CT552	1-141-245-00	TRIMMER, CERAMIC	
		DIODE	
D302	8-719-100-03	DIODE 1SZ835	
D303	8-719-100-03	DIODE 1SZ835	
D304	8-719-100-03	DIODE 1SZ835	
D401	8-719-100-05	DIODE 1SZ837	
D402	8-712-500-00	DIODE 1T25	
D403	8-719-100-05	DIODE 1SZ837	
D404	8-719-100-05	DIODE 1SZ837	
D801	8-719-101-23	DIODE 1SS123	
D802	8-719-100-05	DIODE 1SZ837	
D803	8-719-101-23	DIODE 1SS123	
D805	8-719-100-05	DIODE 1SZ837	
D810	8-719-100-05	DIODE 1SZ837	
D811	8-719-100-05	DIODE 1SZ837	
D813	8-719-101-23	DIODE 1SS123	
D815	8-719-100-05	DIODE 1SZ837	
		DELAY LINE	
DL401	1-415-331-00	DELAY LINE	
		FILTER	
FL401	1-235-485-11	FILTER, LOW PASS (YH)	
FL402	1-235-456-11	FILTER, LOW PASS (YL-YH)	
		IC	
IC301	8-759-801-62	IC LA7077	
IC302	8-759-103-17	IC UPC1521HA	
IC401	8-752-017-10	IC CX20171	
IC402	8-752-012-70	IC CX20127	
IC403	8-752-907-60	IC CX23076	
IC404	8-759-100-96	IC UPC455BG2	
IC551	8-759-601-59	IC LC5850-113	
IC552	8-759-103-14	IC UPD6104G	
IC801	8-759-908-12	IC CX20056	
IC802	8-759-201-00	IC TC40528F	
IC803	8-759-103-03	IC UPD6107G	
IC804	9-984-864-01	IC NJM2904M	
		COIL	
L301	1-408-970-21	MICRO INDUCTOR 10UH	
L303	1-408-979-21	MICRO INDUCTOR 56UH	
L304	1-407-177-XX	MICRO INDUCTOR 470UH	
L305	1-407-189-XX	MICRO INDUCTOR 15UH	
L306	1-408-982-11	MICRO INDUCTOR 100UH	
L307	1-408-981-21	MICRO INDUCTOR 82UH	
L308	1-408-967-21	MICRO INDUCTOR 5.6UH	
L309	1-407-163-XX	MICRO INDUCTOR 33UH	
L401	1-408-987-21	MICRO INDUCTOR 330UH	
L403	1-407-163-XX	MICRO INDUCTOR 33UH	
L404	1-408-417-00	MICRO INDUCTOR 470UH	
L405	1-408-987-21	MICRO INDUCTOR 330UH	
L406	1-408-987-21	MICRO INDUCTOR 330UH	
L407	1-408-987-21	MICRO INDUCTOR 330UH	
L408	1-407-163-XX	MICRO INDUCTOR 33UH	
L409	1-407-163-XX	MICRO INDUCTOR 33UH	
L410	1-408-970-21	MICRO INDUCTOR 10UH	
L551	1-408-982-11	MICRO INDUCTOR 100UH	
L552	1-407-163-XX	MICRO INDUCTOR 33UH	
L801	1-408-960-21	MICRO INDUCTOR 1.5UH	
L802	1-408-960-21	MICRO INDUCTOR 1.5UH	
		DISPLAY PANEL	
LCD551	1-807-115-11	DISPLAY PANEL, LIQUID CRYSTAL (LCD)	
		IC LINK	
P5301⚠	1-532-605-00	LINK, IC (ICP-N10)	
		TRANSISTOR	
Q301	8-729-100-76	TRANSISTOR 2SA812	
Q302	8-729-100-66	TRANSISTOR 2SC1623	
Q303	8-729-102-08	TRANSISTOR 2SC2223	
Q304	8-729-122-63	TRANSISTOR 2SA1226	
Q305	8-729-122-63	TRANSISTOR 2SA1226	
Q306	8-729-100-76	TRANSISTOR 2SA812	
Q307	8-729-100-66	TRANSISTOR 2SC1623	
Q308	8-729-100-76	TRANSISTOR 2SA812	
Q309	8-729-100-66	TRANSISTOR 2SC1623	
Q311	8-729-901-01	TRANSISTOR DTC144EK	
Q312	8-729-900-89	TRANSISTOR DTA144WK	
Q313	8-729-901-01	TRANSISTOR DTC144EK	
Q314	8-729-199-92	TRANSISTOR 2SD999	
Q315	8-729-199-92	TRANSISTOR 2SD999	
Q316	8-729-901-01	TRANSISTOR DTC144EK	
Q317	8-729-901-47	TRANSISTOR DTA143EK	
Q318	8-729-100-66	TRANSISTOR 2SC1623	
Q319	8-729-901-47	TRANSISTOR DTA143EK	
Q321	8-729-100-66	TRANSISTOR 2SC1623	
Q322	8-729-100-77	TRANSISTOR 2SA812	
Q401	8-729-100-66	TRANSISTOR 2SC1623	
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	
Q406	8-729-100-76	TRANSISTOR 2SA812	
Q407	8-729-100-76	TRANSISTOR 2SA812	
Q408	8-729-100-76	TRANSISTOR 2SA812	
Q409	8-729-100-66	TRANSISTOR 2SC1623	
Q411	8-729-100-76	TRANSISTOR 2SA812	
Q412	8-729-109-44	TRANSISTOR 2SK94	
Q413	8-729-100-66	TRANSISTOR 2SC1623	
Q414	8-729-100-66	TRANSISTOR 2SC1623	
Q415	8-729-100-76	TRANSISTOR 2SA812	
Q416	8-729-100-76	TRANSISTOR 2SA812	
Q551	8-729-100-66	TRANSISTOR 2SC1623	
Q552	8-729-100-66	TRANSISTOR 2SC1623	
Q553	8-729-100-66	TRANSISTOR 2SC1623	
Q554	8-729-100-66	TRANSISTOR 2SC1623	
Q555	8-729-100-66	TRANSISTOR 2SC1623	
Q556	8-729-900-99	TRANSISTOR DTA144WK	
Q557	8-729-900-99	TRANSISTOR DTA144WK	
Q558	8-729-100-66	TRANSISTOR 2SC1623	
Q559	8-729-901-01	TRANSISTOR DTC144EK	
Q801	8-729-901-03	TRANSISTOR DTC114EK	
Q804	8-729-100-66	TRANSISTOR 2SC1623	
Q805	8-729-100-76	TRANSISTOR 2SA812	
Q807	8-729-100-66	TRANSISTOR 2SC1623	
Q808	8-729-100-76	TRANSISTOR 2SA812	
Q812	8-729-100-66	TRANSISTOR 2SC1623	
Q813	8-729-100-66	TRANSISTOR 2SC1623	
Q814	8-729-900-99	TRANSISTOR DTA144WK	
Q815	8-729-100-76	TRANSISTOR 2SA812	
Q816	8-729-900-99	TRANSISTOR DTA144WK	
		RESISTOR	
R304	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R305	1-216-029-00	METAL CHIP 150 5% 1/10W	
R306	1-216-036-00	METAL CHIP 300 5% 1/10W	
R307	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R308	1-216-048-00	METAL CHIP 910 5% 1/10W	
R310	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R312	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R313	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R314	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	

Ref.No	Part No.	Description			Remark
R315	1-216-001-00	METAL CHIP	10	5% 1/10W	
R316	1-216-047-00	METAL CHIP	820	5% 1/10W	
R317	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R318	1-216-053-00	METAL CHIP	1.5K	5% 1/10W	
R319	1-216-034-00	METAL CHIP	240	5% 1/10W	
R320	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R321	1-216-043-00	METAL CHIP	560	5% 1/10W	
R322	1-216-047-00	METAL CHIP	820	5% 1/10W	
R323	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R324	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R325	1-216-041-00	METAL CHIP	470	5% 1/10W	
R326	1-216-041-00	METAL CHIP	470	5% 1/10W	
R327	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R328	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R329	1-216-041-00	METAL CHIP	470	5% 1/10W	
R330	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R331	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R332	1-216-041-00	METAL CHIP	470	5% 1/10W	
R333	1-215-463-00	METAL	56K	1% 1/6W	
R334	1-215-449-00	METAL	15K	1% 1/6W	
R335	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R336	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R337	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R338	1-215-389-00	METAL	47	1% 1/6W	
R340	1-216-017-00	METAL CHIP	47	5% 1/10W	
R341	1-216-033-00	METAL CHIP	220	5% 1/10W	
R344	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R345	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R353	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R354	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	
R357	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R358	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	
R360	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R361	1-216-037-00	METAL CHIP	330	5% 1/10W	
R362	1-216-037-00	METAL CHIP	330	5% 1/10W	
R363	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R364	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R365	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R366	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R367	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R368	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R369	1-216-091-00	METAL CHIP	56K	5% 1/10W	
R370	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R373	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R374	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R375	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R376	1-216-071-00	METAL CHIP	8.2K	5% 1/10W	
R377	1-216-043-00	METAL CHIP	560	5% 1/10W	
R378	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R382	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R383	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R384	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R385	1-216-050-00	METAL CHIP	1.1K	5% 1/10W	
R386	1-216-035-00	METAL CHIP	270	5% 1/10W	
R387	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R389	1-216-043-00	METAL CHIP	560	5% 1/10W	
R401	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R402	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R403	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R404	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R405	1-216-067-00	METAL CHIP	5.6K	5% 1/10W	
R406	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R407	1-216-067-00	METAL CHIP	5.6K	5% 1/10W	
R408	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R409	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R410	1-216-067-00	METAL CHIP	5.6K	5% 1/10W	
R411	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R412	1-216-085-00	METAL CHIP	33K	5% 1/10W	
R414	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R415	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R416	1-216-035-00	METAL CHIP	270	5% 1/10W	
R417	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	
R418	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R419	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R420	1-216-045-00	METAL CHIP	680	5% 1/10W	
R421	1-216-037-00	METAL CHIP	330	5% 1/10W	
R422	1-216-055-00	METAL CHIP	4.7K	5% 1/10W	
R423	1-216-037-00	METAL CHIP	330	5% 1/10W	
R424	1-216-045-00	METAL CHIP	680	5% 1/10W	
R425	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R426	1-216-085-00	METAL CHIP	33K	5% 1/10W	
R427	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R428	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R429	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R430	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R431	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R432	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R433	1-216-121-00	METAL CHIP	1M	5% 1/10W	
R434	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R435	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R436	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R437	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R438	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R439	1-216-033-00	METAL CHIP	220	5% 1/10W	
R440	1-216-033-00	METAL CHIP	220	5% 1/10W	
R441	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R442	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R443	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R444	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R445	1-216-105-00	METAL CHIP	220K	5% 1/10W	
R446	1-216-105-00	METAL CHIP	220K	5% 1/10W	
R447	1-216-085-00	METAL CHIP	33K	5% 1/10W	
R448	1-216-123-11	METAL CHIP	1.2M	5% 1/10W	
R449	1-216-123-11	METAL CHIP	1.2M	5% 1/10W	
R450	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R451	1-216-049-00	METAL CHIP	1K	5% 1/10W	

Ref.No	Part No.	Description				Remark
R452	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R453	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R454	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R455	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R456	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R457	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R458	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R459	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R460	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R461	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R462	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R463	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R464	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R465	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R466	1-216-035-00	METAL CHIP	270	5%	1/10W	
R467	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R468	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R469	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R470	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R471	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R472	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R473	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R475	1-216-295-00	METAL CHIP	0	5%	1/10W	
R477	1-216-295-00	METAL CHIP	0	5%	1/10W	
R480	1-216-103-00	METAL CHIP	180K	5%	1/10W	
R481	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R482	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R483	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R484	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R485	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R486	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R487	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R488	1-216-295-00	METAL CHIP	0	5%	1/10W	
R489	1-216-025-00	METAL CHIP	100	5%	1/10W	
R490	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R491	1-216-025-00	METAL CHIP	100	5%	1/10W	
R492	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R493	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R494	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R495	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R496	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R498	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R551	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R552	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R553	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R554	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R555	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R556	1-216-109-00	METAL CHIP	330K	5%	1/10W	
R557	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R558	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R559	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R561	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R562	1-216-097-00	METAL CHIP	100K	5%	1/10W	

Ref.No	Part No.	Description				Remark
R564	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R565	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R566	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R567	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R568	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R569	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R570	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R571	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R572	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R573	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R574	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R575	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R576	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R577	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R578	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R579	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R580	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R581	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R582	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R583	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R584	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R585	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R586	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R587	1-216-081-00	METAL CHIP	22K	5%	1/10W	
RB01	1-216-073-00	METAL CHIP	10K	5%	1/10W	
RB02	1-216-073-00	METAL CHIP	10K	5%	1/10W	
RB03	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
RB04	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
RB06	1-216-087-00	METAL CHIP	39K	5%	1/10W	
RB11	1-216-073-00	METAL CHIP	10K	5%	1/10W	
RB13	1-216-045-00	METAL CHIP	680	5%	1/10W	
RB15	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
RB16	1-216-073-00	METAL CHIP	10K	5%	1/10W	
RB17	1-216-073-00	METAL CHIP	10K	5%	1/10W	
RB18	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
RB19	1-216-095-00	METAL CHIP	82K	5%	1/10W	
RB20	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
RB21	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
RB22	1-216-113-00	METAL CHIP	470K	5%	1/10W	
RB27	1-216-083-00	METAL CHIP	27K	5%	1/10W	
RB28	1-216-073-00	METAL CHIP	10K	5%	1/10W	
RB29	1-216-083-00	METAL CHIP	27K	5%	1/10W	
RB30	1-216-077-00	METAL CHIP	15K	5%	1/10W	
RB31	1-216-083-00	METAL CHIP	27K	5%	1/10W	
RB32	1-216-091-00	METAL CHIP	56K	5%	1/10W	
RB33	1-216-121-00	METAL CHIP	1M	5%	1/10W	
RB37	1-216-017-00	METAL CHIP	47	5%	1/10W	
RB38	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
RB41	1-216-079-00	METAL CHIP	18K	5%	1/10W	
RB42	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
RB43	1-216-079-00	METAL CHIP	18K	5%	1/10W	
RB44	1-216-091-00	METAL CHIP	56K	5%	1/10W	
RB45	1-216-091-00	METAL CHIP	56K	5%	1/10W	

Ref.No	Part No.	Description				Remark
R846	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R850	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R854	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R855	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R856	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R857	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R858	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R859	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R860	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R863	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R864	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R865	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R866	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R869	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R872	1-216-073-00	METAL CHIP	10K	5%	1/10W	
		VARIABLE RESISTOR				
RV303	1-226-711-00	RES, ADJ, SOLID 22K				
RV304	1-226-711-00	RES, ADJ, SOLID 22K				
RV305	1-226-711-00	RES, ADJ, SOLID 22K				
RV306	1-226-707-00	RES, ADJ, SOLID 1K				
RV307	1-226-753-00	RES, ADJ, SOLID 47K				
RV308	1-226-707-00	RES, ADJ, SOLID 1K				
RV309	1-226-707-00	RES, ADJ, SOLID 1K				
RV310	1-229-891-00	RES, ADJ, METAL GLAZE 10K				
RV401	1-226-710-00	RES, ADJ, SOLID 10K				
RV402	1-230-522-11	RES, ADJ, METAL GLAZE 4.7K				
RV403	1-226-753-00	RES, ADJ, SOLID 47K				
RV404	1-226-703-00	RES, ADJ, METAL GLAZE 10K				
RV405	1-226-710-00	RES, ADJ, SOLID 10K				
RV406	1-226-710-00	RES, ADJ, SOLID 10K				
RV407	1-230-522-11	RES, ADJ, METAL GLAZE 4.7K				
RV408	1-226-708-00	RES, ADJ, SOLID 2.2K				
RV409	1-229-894-00	RES, ADJ, METAL GLAZE 47K				
RV410	1-226-714-00	RES, ADJ, SOLID 220K				
RV801	1-226-711-00	RES, ADJ, SOLID 22K				
RV802	1-226-711-00	RES, ADJ, SOLID 22K				
RV803	1-226-710-00	RES, ADJ, SOLID 10K				
RV804	1-230-522-11	RES, ADJ, SOLID 4.7K				
RV805	1-230-522-11	RES, ADJ, SOLID 4.7K				
RV807	1-226-711-00	RES, ADJ, SOLID 22K				
RV808	1-226-711-00	RES, ADJ, SOLID 22K				
RV809	1-226-711-00	RES, ADJ, SOLID 22K				
RV810	1-226-711-00	RES, ADJ, SOLID 22K				
		SWITCH				
S551	1-554-980-11	SWITCH, KEY BOARD				
S552	1-554-541-12	SWITCH, TACT				
S553	1-554-541-12	SWITCH, TACT				
S554	1-554-541-12	SWITCH, TACT				
S555	1-554-541-12	SWITCH, TACT				
S556	1-554-980-11	SWITCH, KEY BOARD				

Ref.No	Part No.	Description			Remark
		CRYSTAL			
X551	1-527-997-00	VIBRATOR, CRYSTAL			
		**********			
	*A-6715-268-A	CS-5 BOARD, COMPLETE			
		**********			
	*1-533-146-00	HOLDER, FUSE			
	*3-662-075-00	COVER, CONTROL			
		CAPACITOR			
C001	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C010	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C011	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C012	1-123-611-00	ELECT	1MF	20%	50V
C013	1-123-611-00	ELECT	1MF	20%	50V
C018	1-163-081-00	CERAMIC CHIP	0.22MF		25V
C019	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C020	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C021	1-131-347-00	TANTALUM	1MF	20%	25V
C022	1-131-347-00	TANTALUM	1MF	20%	25V
C023	1-131-347-00	TANTALUM	1MF	20%	25V
C024	1-131-347-00	TANTALUM	1MF	20%	25V
C025	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C026	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C027	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C028	1-123-617-00	ELECT	10MF	20%	16V
C029	1-131-387-00	TANTALUM	47MF	10%	6.3V
C031	1-130-023-00	FILM	0.0027MF	5%	100V
C032	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C033	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C034	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C036	1-163-015-00	CERAMIC CHIP	0.0033MF	10%	50V
C037	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C038	1-163-025-00	CERAMIC CHIP	0.001MF		50V
C040	1-131-361-00	TANTALUM	2.2MF	20%	16V
C041	1-131-383-00	TANTALUM	10MF	10%	6.3V
C042	1-163-037-00	CERAMIC CHIP	0.022MF	10%	25V
C043	1-163-037-00	CERAMIC CHIP	0.022MF	10%	25V
C044	1-163-037-00	CERAMIC CHIP	0.022MF	10%	25V
C045	1-163-037-00	CERAMIC CHIP	0.022MF	10%	25V
C046	1-123-321-00	ELECT	220MF	20%	16V
C201	1-136-161-00	MYLAR	0.047MF	10%	50V
C202	1-136-164-00	MYLAR	0.082MF	5%	50V
C203	1-163-025-00	CERAMIC CHIP	0.001MF		50V
C204	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C205	1-163-037-00	CERAMIC CHIP	0.022MF	10%	25V
C206	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C207	1-124-225-00	ELECT	100MF	20%	6.3V
C208	1-163-075-00	CERAMIC CHIP	0.047MF	10%	25V
C209	1-123-611-00	ELECT	1MF	20%	50V
C210	1-136-162-00	MYLAR	0.056MF	5%	50V

Ref.No	Part No.	Description			Remark
C211	1-136-164-00	MYLAR	0.082MF	10%	50V
C212	1-163-025-00	CERAMIC	0.001MF		50V
C213	1-163-037-00	CERAMIC CHIP	0.022MF	10%	25V
C214	1-123-617-00	ELECT	10MF	20%	16V
C215	1-123-617-00	ELECT	10MF	20%	16V
C216	1-163-075-00	CERAMIC CHIP	0.047MF	10%	25V
C217	1-123-612-00	ELECT	2.2MF	20%	50V
C218	1-123-618-00	ELECT	22MF	20%	6.3V
C219	1-123-612-00	ELECT	2.2MF	20%	50V
C220	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C221	1-123-647-00	ELECT	47MF	20%	6.3V
C222	1-123-617-00	ELECT	10MF	20%	16V
C223	1-163-024-00	CERAMIC CHIP	0.018MF	10%	50V
C501	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C502	1-163-074-00	CERAMIC CHIP	0.033MF	10%	25V
C503	1-163-074-00	CERAMIC CHIP	0.033MF	10%	25V
C504	1-124-225-00	ELECT	100MF	20%	6.3V
C505	1-123-661-00	ELECT	100MF	20%	6.3V
C506	1-123-611-00	ELECT	1MF	20%	50V
C507	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C508	1-123-617-00	ELECT	10MF	20%	16V
C509	1-123-646-00	ELECT	33MF	20%	6.3V
C510	1-123-616-00	ELECT	4.7MF	20%	25V
C511	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C512	1-123-617-00	ELECT	10MF	20%	16V
C513	1-123-611-00	ELECT	1MF	20%	50V
C514	1-123-617-00	ELECT	10MF	20%	16V
C515	1-123-646-00	ELECT	33MF	20%	6.3V
C516	1-123-617-00	ELECT	10MF	20%	16V
C517	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C518	1-123-617-00	ELECT	10MF	20%	16V
C520	1-163-014-00	CERAMIC CHIP	0.0027MF	10%	50V
C521	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C522	1-163-023-00	CERAMIC CHIP	0.015MF	10%	50V
C523	1-163-145-00	CERAMIC CHIP	0.0015MF	10%	50V
C524	1-108-369-12	MYLAR	0.0022MF	5%	100V
C525	1-124-255-00	ELECT	1MF	20%	50V
C526	1-163-213-00	CERAMIC CHIP	0.0022MF	5%	50V
C527	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C528	1-124-224-00	ELECT	47MF	20%	6.3V
C529	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C530	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C531	1-124-233-00	ELECT	10MF	20%	16V
C532	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C533	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C534	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C535	1-163-013-00	CERAMIC CHIP	0.0022MF	10%	50V
C536	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V

CONNECTOR

CN001	*1-564-002-00	PIN, CONNECTOR 3P
CN002	*1-564-001-11	PIN, CONNECTOR 2P
CN003	*1-564-001-11	PIN, CONNECTOR 2P
CN004	*1-564-003-00	PIN, CONNECTOR 4P
CN005	*1-564-001-11	PIN, CONNECTOR 2P
CN006	*1-564-001-11	PIN, CONNECTOR 2P
CN007	*1-564-001-11	PIN, CONNECTOR 2P
CN008	*1-564-004-00	PIN, CONNECTOR 5P
CN009	*1-564-002-00	PIN, CONNECTOR 3P
CN010	*1-564-002-00	PIN, CONNECTOR 3P
CN011	*1-564-003-00	PIN, CONNECTOR 4P
CN012	*1-564-004-00	PIN, CONNECTOR 5P
CN013	*1-564-004-00	PIN, CONNECTOR 5P
CN014	*1-564-004-00	PIN, CONNECTOR 5P
CN015	*1-564-005-00	PIN, CONNECTOR 6P
CN016	*1-564-005-00	PIN, CONNECTOR 6P
CN017	*1-564-003-00	PIN, CONNECTOR 4P
CN018	*1-564-001-11	PIN, CONNECTOR 2P
CN019	*1-564-001-11	PIN, CONNECTOR 2P
CN201	*1-564-001-11	PIN, CONNECTOR 2P
CN202	*1-564-001-11	PIN, CONNECTOR 2P
CN203	*1-564-002-00	PIN, CONNECTOR 3P
CN204	*1-564-001-11	PIN, CONNECTOR 2P
CN502	*1-564-002-00	PIN, CONNECTOR 3P
CN503	*1-564-001-11	PIN, CONNECTOR 2P
CN504	*1-564-002-00	PIN, CONNECTOR 3P

DIODE

D010	8-719-200-27	DIODE E10DS2
D011	8-719-200-27	DIODE E10DS2
D012	8-719-200-27	DIODE E10DS2
D013	8-719-200-27	DIODE E10DS2
D014	8-719-200-27	DIODE E10DS2
D015	8-719-200-27	DIODE E10DS2
D016	8-719-200-27	DIODE E10DS2
D017	8-719-200-27	DIODE E10DS2
D018	8-719-100-03	DIODE 1S2835
D019	8-719-100-65	DIODE RD12E-B2
D021	8-719-910-69	DIODE HZ6C3L
D022	8-719-910-69	DIODE HZ6C3L
D023	8-719-910-61	DIODE HZ6A1L
D033	8-719-100-05	DIODE 1S2837
D034	8-719-100-03	DIODE 1S2835
D036	8-719-100-05	DIODE 1S2837
D201	8-719-200-27	DIODE E10DS2
D202	8-719-100-03	DIODE 1S2835
D501	8-719-200-27	DIODE E10DS2
D504	8-719-106-79	DIODE 1S2835

FUSE

F501 ⚠	1-532-350-11	FUSE, TIME LAG 250V 4A

IC

IC001	8-759-912-93	IC MB88501-301N
IC002	8-759-100-93	IC UPC3936Z
IC003	8-759-800-72	IC LA7205

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

CS-5

Ref.No	Part No.	Description	Remark
IC201	8-752-017-00	IC CX20170	
IC202	8-752-017-90	IC CX20179	
IC501	8-759-911-23	IC BA5115	
		JACK	
J501	1-507-886-00	JACK, POWER	
J502	1-507-885-11	JACK, MINIATURE	
J503	1-507-884-00	JACK, STEREO MINIATURE	
J504	1-507-885-21	JACK, MINIATURE	
		COIL	
L002	1-408-429-00	MICRO INDUCTOR 470UH	
L003	1-407-163-XX	MICRO INDUCTOR 33UH	
L201	1-407-165-XX	MICRO INDUCTOR 47uH	
L501	1-408-962-21	MICRO INDUCTOR 2.2UH	
L502	1-410-252-11	MICRO INDUCTOR 1UH	
L503	1-410-252-11	MICRO INDUCTOR 1UH	
L504	1-407-177-XX	MICRO INDUCTOR 470UH	
L505	1-408-982-11	MICRO INDUCTOR 100UH	
L506	1-408-958-21	MICRO INDUCTOR 1UH	
L507	1-408-958-21	MICRO INDUCTOR 1UH	
		IC LINK	
PS001⚠	1-532-685-00	LINK, IC (ICP-N20)	
PS002⚠	1-532-637-00	LINK, IC (ICP-N25)	
PS003⚠	1-532-637-00	LINK, IC (ICP-N25)	
		TRANSISTOR	
Q001	8-729-100-66	TRANSISTOR 2SC1623	
Q006	8-729-100-66	TRANSISTOR 2SC1623	
Q007	8-729-100-76	TRANSISTOR 2SA812	
Q010	8-729-245-83	TRANSISTOR 2SC2458	
Q011	8-729-100-66	TRANSISTOR 2SC1623	
Q015	8-729-100-66	TRANSISTOR 2SC1623	
Q017	8-729-901-46	TRANSISTOR DTA114YK	
Q018	8-729-100-76	TRANSISTOR 2SA812	
Q025	8-729-100-76	TRANSISTOR 2SA812	
Q026	8-729-100-76	TRANSISTOR 2SA812	
Q027	8-729-100-76	TRANSISTOR 2SA812	
Q028	8-729-100-76	TRANSISTOR 2SA812	
Q029	8-729-100-76	TRANSISTOR 2SA812	
Q030	8-729-100-76	TRANSISTOR 2SA812	
Q032	8-729-101-07	TRANSISTOR 2SB798	
Q033	8-729-100-66	TRANSISTOR 2SC1623	
Q034	8-729-102-78	TRANSISTOR 2SB962	
Q035	8-729-100-66	TRANSISTOR 2SC1623	
Q036	8-729-101-07	TRANSISTOR 2SB798	
Q037	8-729-100-66	TRANSISTOR 2SC1623	
Q038	8-729-102-78	TRANSISTOR 2SB962	
Q039	8-729-100-66	TRANSISTOR 2SC1623	
Q040	8-729-101-07	TRANSISTOR 2SB798	
Q041	8-729-101-07	TRANSISTOR 2SB798	
Q042	8-729-199-92	TRANSISTOR 2SD999	
Q043	8-729-199-92	TRANSISTOR 2SD999	
Q044	8-729-901-46	TRANSISTOR DTA114YK	
Q045	8-729-901-46	TRANSISTOR DTA114YK	
Q046	8-729-100-66	TRANSISTOR 2SC1623	
Q047	8-729-100-66	TRANSISTOR 2SC1623	
Q048	8-729-100-66	TRANSISTOR 2SC1623	
Q050	8-729-100-66	TRANSISTOR 2SC1623	
Q051	8-729-100-66	TRANSISTOR 2SC1623	
Q053	8-729-100-76	TRANSISTOR 2SA812	
Q055	8-729-901-46	TRANSISTOR DTA114YK	
Q058	8-729-100-66	TRANSISTOR 2SC1623	
Q060	8-729-100-66	TRANSISTOR 2SC1623	
Q061	8-729-100-66	TRANSISTOR 2SC1623	
Q062	8-729-109-44	TRANSISTOR 2SK94	
Q063	8-729-100-76	TRANSISTOR 2SA812	
Q064	8-729-100-76	TRANSISTOR 2SA812	
Q065	8-729-100-66	TRANSISTOR 2SC1623	
Q066	8-729-100-66	TRANSISTOR 2SC1623	
Q067	8-729-100-76	TRANSISTOR 2SA812	
Q068	8-729-901-46	TRANSISTOR DTA114YK	
Q069	8-729-901-46	TRANSISTOR DTA114YK	
Q070	8-729-901-46	TRANSISTOR DTA114YK	
Q071	8-729-901-46	TRANSISTOR DTA114YK	
Q072	8-729-901-01	TRANSISTOR DTC144EK	
Q073	8-729-901-46	TRANSISTOR DTA114YK	
Q201	8-729-100-66	TRANSISTOR 2SC1623	
Q202	8-729-100-66	TRANSISTOR 2SC1623	
Q203	8-729-100-66	TRANSISTOR 2SC1623	
Q204	8-729-100-76	TRANSISTOR 2SA812	
Q205	8-729-100-76	TRANSISTOR 2SA812	
Q501	8-729-100-66	TRANSISTOR 2SC1623	
Q503	8-729-100-66	TRANSISTOR 2SC1623	
Q505	8-729-901-05	TRANSISTOR DTA124EK	

RESISTOR

R001	1-216-047-00	METAL CHIP	820	5%	1/10W
R003	1-216-089-00	METAL CHIP	47K	5%	1/10W
R016	1-216-111-00	METAL CHIP	390K	5%	1/10W
R017	1-216-097-00	METAL CHIP	100K	5%	1/10W
R018	1-216-081-00	METAL CHIP	22K	5%	1/10W
R019	1-216-089-00	METAL CHIP	47K	5%	1/10W
R024	1-216-085-00	METAL CHIP	33K	5%	1/10W
R032	1-216-097-00	METAL CHIP	100K	5%	1/10W
R033	1-216-105-00	METAL CHIP	220K	5%	1/10W
R034	1-216-097-00	METAL CHIP	100K	5%	1/10W
R037	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R039	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R042	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R044	1-216-073-00	METAL CHIP	10K	5%	1/10W
R047	1-216-089-00	METAL CHIP	47K	5%	1/10W
R048	1-216-089-00	METAL CHIP	47K	5%	1/10W
R061	1-216-107-00	METAL CHIP	270K	5%	1/10W
R062	1-216-107-00	METAL CHIP	270K	5%	1/10W

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

Ref.No	Part No.	Description				Remark
R063	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R071	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R072	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R073	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R074	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R075	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R076	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R078	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R079	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R080	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R081	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R082	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R083	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R084	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R085	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R088	1-247-703-11	CARBON	180	5%	1/4W	
R089	1-247-703-11	CARBON	180	5%	1/4W	
R090	1-247-703-11	CARBON	180	5%	1/4W	
R091	1-247-703-11	CARBON	180	5%	1/4W	
R095	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R099	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R101	1-216-084-00	METAL CHIP	30K	5%	1/10W	
R102	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R103	1-216-047-00	METAL CHIP	820	5%	1/10W	
R104	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R105	1-216-115-00	METAL CHIP	560K	5%	1/10W	
R106	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R108	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R109	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R110	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R111	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R112	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R113	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R115	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R116	1-216-046-00	METAL CHIP	680	5%	1/10W	
R117	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R118	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R121	1-216-115-00	METAL CHIP	560K	5%	1/10W	
R122	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R123	1-216-111-00	METAL CHIP	390K	5%	1/10W	
R124	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R125	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R128	1-216-041-00	METAL CHIP	470	5%	1/10W	
R129	1-216-041-00	METAL CHIP	470	5%	1/10W	
R130	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R132	1-247-708-11	CARBON	470	5%	1/4W	
R133	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R134	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R136	1-247-708-11	CARBON	470	5%	1/4W	
R139	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R141	1-216-045-00	METAL CHIP	680	5%	1/10W	
R143	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R144	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	

Ref.No	Part No.	Description				Remark
R146	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R156	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R159	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R160	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R163	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R164	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R165	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R166	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R167	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R168	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R170	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R171	1-216-107-00	METAL CHIP	270K	5%	1/10W	
R172	1-216-045-00	METAL CHIP	680	5%	1/10W	
R173	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R174	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R175	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R176	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R177	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R178	1-216-103-00	METAL CHIP	180K	5%	1/10W	
R179	1-216-115-00	METAL CHIP	560K	5%	1/10W	
R180	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R181	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R182	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R183	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R184	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R185	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R186	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R187	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R188	1-216-107-00	METAL CHIP	270K	5%	1/10W	
R189	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	
R192	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R193	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R194	1-216-025-00	METAL CHIP	100	5%	1/10W	
R195	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R196	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R197	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R198	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R201	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R202	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R203	1-215-465-00	METAL	68E	1%	1/6W	
R204	1-215-471-00	METAL	120K	1%	1/6W	
R205	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R206	1-216-115-00	METAL CHIP	560K	5%	1/10W	
R207	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R208	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R209	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R210	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R211	1-216-111-00	METAL CHIP	390K	5%	1/10W	
R212	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R213	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R214	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R215	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R216	1-216-083-00	METAL CHIP	27K	5%	1/10W	

Ref.No	Part No.	Description				Remark
R217	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R218	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R219	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R220	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R221	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	
R222	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R223	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R224	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R225	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R226	1-217-636-00	WIREWOUND	0.47		1W	
R227	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R228	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R229	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R230	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R231	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R232	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R233	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R234	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R235	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R236	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R237	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R238	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R239	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R501	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R502	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R503	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R504	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R505	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R506	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R507	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R508	1-216-123-11	METAL CHIP	1.2M	5%	1/10W	
R509	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R510	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R511	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R512	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R513	1-216-024-00	METAL CHIP	91	5%	1/10W	
R514	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R515	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R516	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R517	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R518	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R525	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R526	1-216-309-00	METAL CHIP	5.6	5%	1/10W	
R527	1-216-001-00	METAL CHIP	10	5%	1/10W	
R529	1-216-076-00	METAL CHIP	13K	5%	1/10W	

VARIABLE RESISTOR

RV001	1-226-753-00	RES, ADJ, SOLID 47K	
RV002	1-226-753-00	RES, ADJ, SOLID 47K	
RV003	1-226-753-00	RES, ADJ, SOLID 47K	
RV004	1-226-753-00	RES, ADJ, SOLID 47K	
RV005	1-226-711-00	RES, ADJ, SOLID 22K	
RV201	1-230-522-11	RES, ADJ, METAL GLAZE 4.7K	
RV202	1-228-760-00	RES, ADJ, METAL GLAZE 47K	
RV501	1-230-519-11	RES, ADJ, METAL GLAZE 470	
RV502	1-230-522-11	RES, ADJ, SOLID 4.7K	

SWITCH

S501	1-554-364-00	SWITCH, SLIDE

TRANSFORMER

T501	1-433-294-11	TRANSFORMER, BIAS OSCILLATION

CRYSTAL

X001	1-567-192-11	OSCILLATOR, CERAMIC

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*A-6725-431-A FT-5 BOARD, COMPLETE
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CAPACITOR

C901	1-136-166-00	MYLAR	0.12MF	5%	50V
C902	1-163-079-00	CERAMIC CHIP	0.039MF	10%	25V
C903	1-163-020-00	CERAMIC CHIP	0.0082MF	10%	50V
C904	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C905	1-163-020-00	CERAMIC CHIP	0.0082MF	10%	50V

TRANSISTOR

Q901	8-729-100-66	TRANSISTOR 2SC1623
Q902	8-729-100-66	TRANSISTOR 2SC1623

RESISTOR

R901	1-216-083-00	METAL CHIP	27K	5%	1/10W
R902	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R903	1-216-083-00	METAL CHIP	27K	5%	1/10W

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*A-6725-438-A PM-2 BOARD, COMPLETE
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3-686-857-01 HOLDER, VF-LED

CAPACITOR

C702	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C703	1-123-661-00	ELECT	100MF	20%	6.3V
C704	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C705	1-123-647-00	ELECT	47MF	20%	6.3V
C706	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C707	1-123-647-00	ELECT	47MF	20%	6.3V
C708	1-123-820-00	ELECT	33MF	20%	16V
C709	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C710	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C711	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C712	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C713	1-163-077-00	CERAMIC CHIP	0.1MF		50V

Ref.No	Part No.	Description		Remark
C716	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C717	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C718	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C719	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C720	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C721	1-123-616-00	ELECT 4.7MF	20%	25V
C722	1-123-616-00	ELECT 4.7MF	20%	25V
C723	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C724	1-124-256-00	ELECT 1.5MF	20%	50V
C725	1-123-617-00	ELECT 10MF	20%	16V
C726	1-124-845-00	ELECT 4.7MF	20%	16V
C727	1-124-224-00	ELECT 47MF	20%	6.3V
C728	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C731	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C732	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C745	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C758	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C759	1-123-645-00	ELECT 33MF	20%	10V
C760	1-123-645-00	ELECT 33MF	20%	10V
C761	1-131-380-00	TANTALUM 33MF	20%	10V
C762	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C763	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C764	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C765	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C774	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C775	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C776	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C777	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C778	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C779	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C780	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C781	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C783	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C790	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C791	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C793	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C794	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C795	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V

CONNECTOR

CN701	*1-564-001-11	PIN, CONNECTOR 2P
CN703	*1-564-018-11	PIN, CONNECTOR 8P
CN704	*1-564-011-11	PIN, CONNECTOR 12P
CN709	*1-564-001-11	PIN, CONNECTOR 2P

DIODE

D701	8-719-100-05	DIODE 1S2837
D702	8-719-100-05	DIODE 1S2837
D704	8-719-812-41	DIODE TLR124
D705	8-719-100-05	DIODE 1S2837

IC

IC703	8-759-908-09	IC CX20053
IC704	8-752-015-10	IC CX20151
IC705	8-752-303-90	IC CX23039
IC706	8-759-908-15	IC TL431CLP

COIL

L701	1-408-960-21	MICRO INDUCTOR 1.5UH
L707	1-408-960-21	MICRO INDUCTOR 1.5UH

TRANSISTOR

Q702	8-729-100-66	TRANSISTOR 2SC1623
Q703	8-729-100-66	TRANSISTOR 2SC1623
Q704	8-729-100-66	TRANSISTOR 2SC1623
Q705	8-729-900-53	TRANSISTOR DTC114EK
Q706	8-729-900-53	TRANSISTOR DTC114EK
Q707	8-729-900-53	TRANSISTOR DTC114EK
Q708	8-729-109-44	TRANSISTOR 2SK94
Q709	8-729-109-44	TRANSISTOR 2SK94
Q710	8-729-109-44	TRANSISTOR 2SK94
Q712	8-729-100-66	TRANSISTOR 2SC1623
Q713	8-729-100-66	TRANSISTOR 2SC1623
Q714	8-729-100-66	TRANSISTOR 2SC1623
Q715	8-729-100-66	TRANSISTOR 2SC1623
Q716	8-729-100-66	TRANSISTOR 2SC1623
Q719	8-729-100-66	TRANSISTOR 2SC1623
Q720	8-729-100-66	TRANSISTOR 2SC1623

RESISTOR

R713	1-216-045-00	METAL CHIP	680	5%	1/10W
R714	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R715	1-216-049-00	METAL CHIP	1K	5%	1/10W
R716	1-216-081-00	METAL CHIP	22K	5%	1/10W
R717	1-216-049-00	METAL CHIP	1K	5%	1/10W
R718	1-216-073-00	METAL CHIP	10K	5%	1/10W
R719	1-216-077-00	METAL CHIP	15K	5%	1/10W
R720	1-216-087-00	METAL CHIP	39K	5%	1/10W
R723	1-216-035-00	METAL CHIP	270	5%	1/10W
R724	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R725	1-216-035-00	METAL CHIP	270	5%	1/10W
R726	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R727	1-216-039-00	METAL CHIP	390	5%	1/10W
R728	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R729	1-216-073-00	METAL CHIP	10K	5%	1/10W
R730	1-216-089-00	METAL CHIP	47K	5%	1/10W
R733	1-216-073-00	METAL CHIP	10K	5%	1/10W
R734	1-216-073-00	METAL CHIP	10K	5%	1/10W
R735	1-216-073-00	METAL CHIP	10K	5%	1/10W
R736	1-216-073-00	METAL CHIP	10K	5%	1/10W
R737	1-216-073-00	METAL CHIP	10K	5%	1/10W
R738	1-216-073-00	METAL CHIP	10K	5%	1/10W
R743	1-216-073-00	METAL CHIP	10K	5%	1/10W
R752	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R761	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref.No	Part No.	Description				Remark
R762	1-216-033-00	METAL CHIP	220	5%	1/10W	
R763	1-216-033-00	METAL CHIP	220	5%	1/10W	
R764	1-216-033-00	METAL CHIP	220	5%	1/10W	
R765	1-216-033-00	METAL CHIP	220	5%	1/10W	
R766	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R767	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R768	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R769	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R770	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R773	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R774	1-216-025-00	METAL CHIP	100	5%	1/10W	
R775	1-216-218-00	METAL CHIP	6.8K	5%	1/8W	
R776	1-216-224-00	METAL CHIP	12K	5%	1/8W	
R781	1-216-033-00	METAL CHIP	220	5%	1/10W	
R782	1-216-033-00	METAL CHIP	220	5%	1/10W	
R783	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R784	1-216-087-00	METAL CHIP	39K	5%	1/10W	
R785	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R786	1-216-033-00	METAL CHIP	220	5%	1/10W	
R787	1-216-033-00	METAL CHIP	220	5%	1/10W	
R791	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R792	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R793	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R794	1-216-087-00	METAL CHIP	39K	5%	1/10W	

VARIABLE RESISTOR

RV701	1-230-679-11	RES, ADJ, CARBON	10K
RV702	1-230-067-00	RES, ADJ, CARBON	22K
RV703	1-230-067-00	RES, ADJ, CARBON	22K
RV704	1-230-679-11	RES, ADJ, CARBON	10K
RV705	1-230-679-11	RES, ADJ, CARBON	10K
RV706	1-230-067-00	RES, ADJ, CARBON	22K
RV707	1-230-067-00	RES, ADJ, CARBON	22K
RV708	1-230-067-00	RES, ADJ, CARBON	22K
RV709	1-230-067-00	RES, ADJ, CARBON	22K
RV710	1-230-067-00	RES, ADJ, CARBON	22K
RV711	1-230-067-00	RES, ADJ, CARBON	22K
RV712	1-230-067-00	RES, ADJ, CARBON	22K
RV713	1-230-067-00	RES, ADJ, CARBON	22K
RV714	1-230-067-00	RES, ADJ, CARBON	22K
RV715	1-230-067-00	RES, ADJ, CARBON	22K
RV716	1-230-067-00	RES, ADJ, CARBON	22K
RV717	1-230-067-00	RES, ADJ, CARBON	22K
RV718	1-230-067-00	RES, ADJ, CARBON	22K
RV719	1-230-067-00	RES, ADJ, CARBON	22K

Ref.No	Part No.	Description	Remark
	*A-6725-453-A	CD-4 BOARD, COMPLETE	
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The CCD imager block (IC601, IC701) is not mounted on the mounted CD-4 board and mounted TR-18 board which are supplied as service parts.
When replacing the CD-4 and TR-18 boards, remove the CCD imager block from the old boards and mount on the new boards.

CAPACITOR

C601	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C602	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C603	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C604	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C605	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C606	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C607	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C609	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C610	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C611	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C612	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C613	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C614	1-135-092-21	TANTAL. CHIP	3.3MF	20%	16V
C615	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C616	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C617	1-124-233-00	ELECT	10MF	20%	16V
C624	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C625	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C626	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C627	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C628	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C629	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C630	1-124-233-00	ELECT	10MF	20%	16V
C632	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C633	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C634	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C635	1-135-092-21	TANTAL. CHIP	3.3MF	20%	16V
C636	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C637	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C638	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C639	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C640	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C641	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C642	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C643	1-135-091-00	TANTAL. CHIP	1MF	20%	16V

Ref.No	Part No.	Description		Remark
C644	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C645	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C646	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C647	1-135-083-00	TANTAL. CHIP 0.47MF	20%	25V
C648	1-124-233-00	ELECT 10MF	20%	16V
C651	1-135-083-00	TANTAL. CHIP 0.47MF	20%	25V
C654	1-124-169-00	ELECT 100MF	20%	10V
C655	1-124-168-00	ELECT 100MF	20%	16V
C656	1-163-119-00	CERAMIC CHIP 120PF	5%	50V
C746	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C747	1-163-077-00	CERAMIC CHIP 0.1MF		50V
		DIODE		
D603	8-719-100-05	DIODE 1S2837		
D604	8-719-100-03	DIODE 1S2835		
D605	8-719-951-13	DIODE HZ5CLL		
D606	8-719-100-05	DIODE 1S2837		
D607	8-719-100-03	DIODE 1S2835		
D609	8-719-100-03	DIODE 1S2835		
D610	8-719-100-03	DIODE 1S2835		
D611	8-719-100-03	DIODE 1S2835		
D612	8-719-101-23	DIODE 1SS123		
D614	8-719-100-03	DIODE 1S2835		
D615	8-719-100-03	DIODE 1S2835		
		IC		
IC601	8-750-010-23	IC CCD IMAGER(IU021-K1AA)		
IC602	8-759-000-26	IC MM1002GCP1		
IC603	8-759-953-61	IC SN75361AP		
IC604	8-759-953-61	IC SN75361AP		
		COIL		
L601	1-408-960-21	MICRO INDUCTOR 1.5UH		
L602	1-408-960-21	MICRO INDUCTOR 1.5UH		
L702	1-408-960-21	MICRO INDUCTOR 1.5UH		
		TRANSISTOR		
Q601	8-729-100-66	TRANSISTOR 2SC1623		
Q602	8-729-100-66	TRANSISTOR 2SC1623		
Q603	8-729-100-66	TRANSISTOR 2SC1623		
Q604	8-729-122-63	TRANSISTOR 2SA1226		
Q605	8-729-102-08	TRANSISTOR 2SC2223		
Q606	8-729-100-66	TRANSISTOR 2SC1623		
Q607	8-729-100-76	TRANSISTOR 2SA812		
Q608	8-729-100-76	TRANSISTOR 2SA812		
Q609	8-729-100-66	TRANSISTOR 2SC1623		
Q610	8-729-100-76	TRANSISTOR 2SA812		
Q611	8-729-100-76	TRANSISTOR 2SA812		
Q612	8-729-100-66	TRANSISTOR 2SC1623		
Q613	8-729-100-66	TRANSISTOR 2SC1623		

Ref.No	Part No.	Description			Remark
		RESISTOR			
R601	1-216-025-00	METAL CHIP	100	5%	1/10W
R602	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R603	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R604	1-216-075-00	METAL CHIP	12K	5%	1/10W
R605	1-216-091-00	METAL CHIP	56K	5%	1/10W
R606	1-216-089-00	METAL CHIP	47K	5%	1/10W
R607	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R608	1-216-009-00	METAL CHIP	22	5%	1/10W
R609	1-216-009-00	METAL CHIP	22	5%	1/10W
R610	1-216-009-00	METAL CHIP	22	5%	1/10W
R611	1-216-097-00	METAL CHIP	100K	5%	1/10W
R612	1-216-097-00	METAL CHIP	100K	5%	1/10W
R613	1-216-097-00	METAL CHIP	100K	5%	1/10W
R614	1-216-081-00	METAL CHIP	22K	5%	1/10W
R615	1-216-295-00	METAL CHIP	0	5%	1/10W
R616	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R617	1-216-049-00	METAL CHIP	1K	5%	1/10W
R618	1-216-049-00	METAL CHIP	1K	5%	1/10W
R619	1-216-025-00	METAL CHIP	100	5%	1/10W
R625	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R626	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R627	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R628	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R630	1-216-075-00	METAL CHIP	12K	5%	1/10W
R631	1-216-089-00	METAL CHIP	47K	5%	1/10W
R632	1-216-121-00	METAL CHIP	1M	5%	1/10W
R633	1-216-081-00	METAL CHIP	22K	5%	1/10W
R634	1-216-043-00	METAL CHIP	560	5%	1/10W
R635	1-216-097-00	METAL CHIP	100K	5%	1/10W
R636	1-216-097-00	METAL CHIP	100K	5%	1/10W
R637	1-216-097-00	METAL CHIP	100K	5%	1/10W
R638	1-216-097-00	METAL CHIP	100K	5%	1/10W
R640	1-216-081-00	METAL CHIP	22K	5%	1/10W
R641	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R642	1-216-049-00	METAL CHIP	1K	5%	1/10W
R643	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R644	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R645	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R646	1-216-049-00	METAL CHIP	1K	5%	1/10W
R647	1-216-055-00	METAL CHIP	1.8K	5%	1/10W

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*A-6725-476-A TR-18 BOARD, COMPLETE

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The CCD imager block (IC601, IC701) is not mounted on the mounted CD-4 board and mounted TR-18 board which are supplied as service parts.
When replacing the CD-4 and TR-18 boards, remove the CCD imager block from the old boards and mount on the new boards.

		CAPACITOR			
C701	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C748	1-123-661-00	ELECT	100MF	20%	6.3V

Ref.No	Part No.	Description			Remark
C749	1-124-169-00	ELECT	100MF	20%	10V
C752	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C753	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C754	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C755	1-123-647-00	ELECT	47MF	20%	6.3V
C756	1-123-661-00	ELECT	100MF	20%	6.3V
C766	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C767	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C769	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C770	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C789	1-163-173-00	CERAMIC CHIP	47PF	5%	50V
C792	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C796	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
		CONNECTOR			
CN705	*1-564-020-00	PIN, CONNECTOR 10P			
CN706	*1-564-019-11	PIN, CONNECTOR 9P			
CN708	*1-564-013-00	PIN, CONNECTOR 3P			
		DIODE			
D703	8-719-100-03	DIODE 1S2835			
		IC			
IC701	8-750-010-23	IC CCD IMAGER (1U021-K1AA)			
IC702	8-759-922-28	IC CX23047B			
		COIL			
L703	1-408-956-00	COIL, CHOKE			
L704	1-408-956-00	COIL, CHOKE			
L705	1-408-960-21	MICRO INDUCTOR 1.5UH			
L706	1-408-960-21	MICRO INDUCTOR 1.5UH			
		TRANSISTOR			
Q701	8-729-100-76	TRANSISTOR 2SA812			
		RESISTOR			
R702	1-216-097-00	METAL CHIP	100K	5%	1/10W
R705	1-216-017-00	METAL CHIP	47	5%	1/10W
R709	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R710	1-216-097-00	METAL CHIP	100K	5%	1/10W
R711	1-216-097-00	METAL CHIP	100K	5%	1/10W
R712	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R739	1-216-073-00	METAL CHIP	10K	5%	1/10W
R740	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R745	1-216-097-00	METAL CHIP	100K	5%	1/10W
R751	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R757	1-216-121-00	METAL CHIP	1M	5%	1/10W
R758	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R760	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R772	1-216-025-00	METAL CHIP	100	5%	1/10W
R795	1-216-295-00	METAL CHIP	0	5%	1/10W
R796	1-216-295-00	METAL CHIP	0	5%	1/10W

Ref.No	Part No.	Description			Remark
R799	1-216-097-00	METAL CHIP	100K	5% 1/10W	
		CRYSTAL			
X701	1-567-414-11	OSCILLATOR, CRYSTAL			
**********					
	*1-614-560-11	RS-4 BOARD			
		**********			
		CONNECTOR			
CN981	*1-564-014-00	PIN, CONNECTOR 4P			
		SWITCH			
S985	1-553-542-21	SWITCH, KEY			
S986	1-570-134-11	SWITCH, SLIDE			
**********					
	*1-614-564-11	AF-6 BOARD			
		**********			
		SWITCH			
S989	1-553-977-41	SWITCH, SLIDE			
S990	1-554-641-12	SWITCH, TACT			
**********					
	*1-614-557-11	LM-14 BOARD			
		**********			
		CAPACITOR			
C921	1-101-005-00	CERAMIC	0.022MF		50V
**********					
	*1-614-556-11	DM-6 BOARD			
		**********			
		CAPACITOR			
C911	1-101-005-00	CERAMIC	0.022MF		50V
C912	1-161-063-00	CERAMIC	0.1MF	20%	25V
		COIL			
L911	1-407-847-00	MICRO INDUCTOR 35UH			
**********					
	*1-614-558-11	RD-13 BOARD			
		**********			
	*3-690-161-01	HOLDER, PR			
		TRANSISTOR			
Q931	8-729-105-19	TRANSISTOR 2SC3518			

Ref.No	Part No.	Description	Remark
Q932	8-719-921-03	DIODE GP-2502B	

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	*1-614-559-11	GS-1 BOARD	
		**********	
	1-550-104-11	HOLDER, BATTERY	

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MISCELLANEOUS

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⚠	1-464-438-11	CONVERTER (S), DC-DC	
	*1-535-559-11	LEAD, JUMPER (16 CORE)	
	1-547-156-11	LENS, ZOOM (VCL-1206YD)	
	1-806-682-00	SENSOR, DEW CONDENSATION	
	8-814-210-00	C-2006, MICRPHONE	
	8-825-560-20	HEAD, AC (RP-253-2102A)	
	8-825-561-30	HEAD, ERASE (EF 254-218)	
	8-750-010-23	CCD IMAGER BLOCK (IU021-K1AA)	
M901	X-3691-102-1	MOTOR, DC (DNR-6603A)	
M902	X-3690-112-1	MOTOR ASSY, DRUM	
PM901	⚠ 1-454-391-11	SOLENOID, PLUNGER (BRAKE)	
PM902	⚠ 1-454-357-21	SOLENOID, PLUNGER (PINCH)	
S961	1-570-112-11	SWITCH, LEAF (C IN)	
S962	1-570-112-11	SWITCH, LEAF (C DOWN)	
S963	1-554-581-00	SWITCH, MICRO (LOADING END)	
S987	1-570-151-11	SWITCH, SLIDE (W/B)	
S988	1-570-152-11	SWITCH, PUSH (ZOOM)	

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ACCESSORIES AND PACKING MATERIALS

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Part No.	Description	Remark
*3-575-954-00	BAG, PROTECTION	
3-691-157-01	BELT, STRAP	
*3-691-161-01	CUSHION (UPPER)	
*3-691-162-01	CUSHION (LOWER)	
*3-691-163-11	INDIVIDUAL CARTON	
3-691-167-01	HANDLE	
3-760-210-11	MANUAL, INSTRUCTION	(AEP, AUSTRLIAN, E MODEL)(ENGLISH)
3-760-210-41	MANUAL, INSTRUCTION	(AEP MODEL)(FRENCH, GERMANY, DETCH)
3-760-210-51	MANUAL, INSTRUCTION	(AEP MODEL)(SPANISH, SWEDISH, ITARIAN)
3-760-210-71	MANUAL, INSTRUCTION	(E MODEL)(ARABIC)

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

9-972-375-83

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