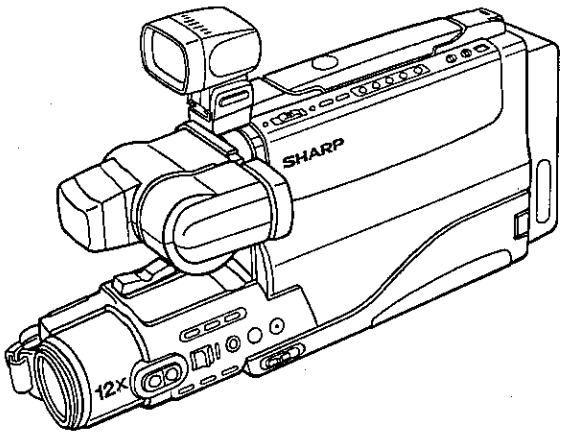
SHARP SERVICE MANUAL

S22W1VL-SX80/



VHS CAMCORDER

HQ HIGH QUALITY

MODELS VL-SX80/H /X VL-SX88

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

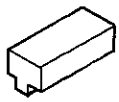
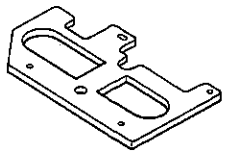
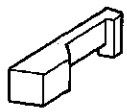
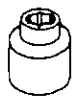
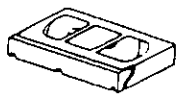
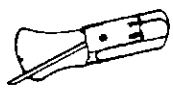
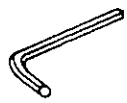
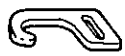
CONTENTS

SHARP CORPORATION

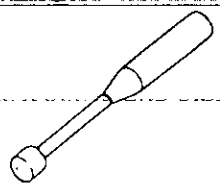
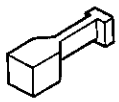
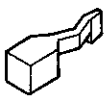
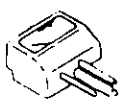
1. TOOLS NECESSARY FOR ADJUSTING THE UNITS

1-1. ADJUSTMENT OF VCR MECHANISM UNIT

Note: N indicates the new jigs.

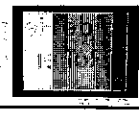
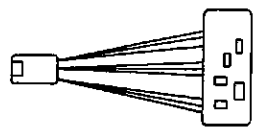
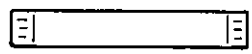
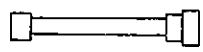
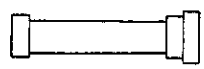
No.	Jig Item	Part No.	Code	Configuration	Note
1	Reel Disk Height Adjusting jig	JiGRH-L50U	—		N
2	Master Plane Jig	JiGMP-L50U	—		N
3	A/C Head Tilt, Retaining Guide Height Adjusting jig	JiGACH-L50U	—		N
4	Torque Gauge 90g	JiGTG0090	CM		
	Torque Gauge 1.2 kg	JiGTG1200	CN		
5	Gauge Head	JiGTH0006	AW		
6	Cassette Torque Meter	JiGVHT-063	CZ		
7	Tension Gauge (300g)	JiGSG0300	BF		
	Tension Gauge (2.0kg)	JiGTG2000	BS		
8	Hex Wrench (1.5mm)	JiGHW0015	AE		
9	Alignment Tape (PAL SP)	VROCPSV	CK		
	Alignment Tape	VRODBZFS	CA		
10	Tension Gauge Adaptor	JiGADP-L50U	—		N
11	Torque Driver (2kg·cm)	JiGTD0200	—		
	Torque Driver (12kg·cm)	JiGTD1200	CB		N

Note: N indicates the new jigs.

No.	Jig Item	Part No.	Code	Configuration	Note
12	Box Driver	JiGDRiVER110-4	AV		
		JiGDRiVER4.5SP	—		N
13	Reverse Guide Height, Supply Sub Guide Roller Height Adjusting Jig	JiGSUH-L50U	—		N
14	Take-up Sub Guide Roller Height Adjusting Jig	JiGTUH-L50U	—		N
15	Tape Tension Gauge	———	—		

1-2. ADJUSTMENT OF CAMERA UNIT

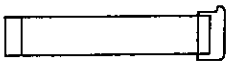
Note: N indicates the new jigs.

No.	Jig Item	Parts Code	Price Code	Configuration	Note
1	Gray Scale Chart (390 x 520mm)	JiGCHART-1	CP		
2	White Pattern Chart (390 x 520mm)	JiGCHART-2	CG		
3	Colour Bar Chart (240 x 520mm)	JiGCHART-4	**		
4	Solder (For chip parts service)	JiGHANDA-S256	BP		
5	Illuminometer (0~3000Lux)	JiGMETER-1	CT		
6	Colour Thermometer (1600~400000°K)	JiGMETER-2	**		
7	Colour Temperature Conversion Filter	JiGHOYA-LB165	BH		
8	Adjustment PWB Unit (Connected to TEST CON (S9))	CPWBF2303TA01	—		N
9	Adjustment PWB Unit (Connected to TEST1 (S18))	CPWBN2309TA01	—		N
10	Extension Wire (Connected to LENS UNIT⇔S4)	QCNW-1144TAZZ	—	 FFC 21Pin	N
11	Extension Wire (Connected to ZOOM SW WIRE⇔P10)	QCNW-1145TAZZ	—		N
12	Extension Wire (Connected to CAMERA OPERATION⇔P5)	QCNW-1146TAZZ	—		N

Note: Colour temperature convertion filter (jig item No. 7) may be obtained from HOYA Optics in your local market.

1-3. ADJUSTMENT OF VCR UNIT

Note: N indicates the new jigs.

No.	Jig Item	Part Code	Price Code	Configuration	Note
1	Extension Wire (Connected to MECHA UNIT⇔S7)	QCNW-1143TAZZ	—	 FFC 20Pin	N
2	Adjustment PWB Unit (Connected to TEST1 (S18))	CPWBN2309TA01	—		N
3	Adjustment PWB Unit (Connected to TEST2 (S14) or TEST3 (S20))	CPWBN2334TA01	—		N

2. FEATURES

1. Slim, compact design
2. CCD image sensor with F1.8, f = 6.5-78mm power zoom 12x variable speed zoom
3. CAT'S EYE – Minimum Illumination 2 lux
4. Digital Auto White Balance
5. Artificial Intelligence System for easy operation
6. 1/10000, 1/2000, 1/500, 1/120, and Standard 1/50-second switchable High-Speed Electronic Shutter for blur-free still images
7. Fine video editing with Flying Erase Head and Audio Dubbing
8. HQ (High Quality) picture
9. Self Timer for camera recording
10. Uses standard VHS video cassettes.
11. Warning Indicators – Battery, Low Light, Tape-End, etc
12. 3-way power source, AC, rechargeable battery or car battery (with optional VR-U30CH)
13. Liquid Crystal Colour Viewfinder
14. Video Light

3. SPECIFICATIONS

Signal System:	PAL colour and monochrome signals
Recording System:	VHS Standard
Tape Width:	12.7mm (1/2inch)
Maximum Recording/Playback Time:	240min. (With E-240 tape)
Tape Speed:	23.39mm/sec.
Pickup Device:	CCD Image Sensor (approx. 320,000 pixels including optical black)
Lens:	F1.8, f = 6.5-78mm power zoom, full range auto focus with macro function
Lens filter diameter:	43mm
Viewfinder:	0.7 inch colour liquid crystal display with diopter
Microphone:	Omni-directional electret condenser
Colour Temperature Compensation:	Auto white balance with white balance lock.
Minimum Illumination:	2 lux (with Gain up)
Video Output Level:	1.0 Vp-p composite, 75 ohm
Audio Output Level:	308mV, less than 600 ohms
Mic. Input Level:	– 62.8 dBs, 18k ohm (use a high impedance microphone with 3.5mm plug)
Power Requirement:	DC 6V
Power Consumption:	10W (MAX 16W when using the video light)
Dimensions (approx.):	$3^5/_{32}$"(W) × $7^5/_{32}$"(H) × $13^7/_8$"(D) [80(W) × 182(H) × 352.5(D)mm]
Weight (approx.):	3.7 lbs (1.7kg)

specifications are subject to change without notice.

AC Adaptor / Battery charger

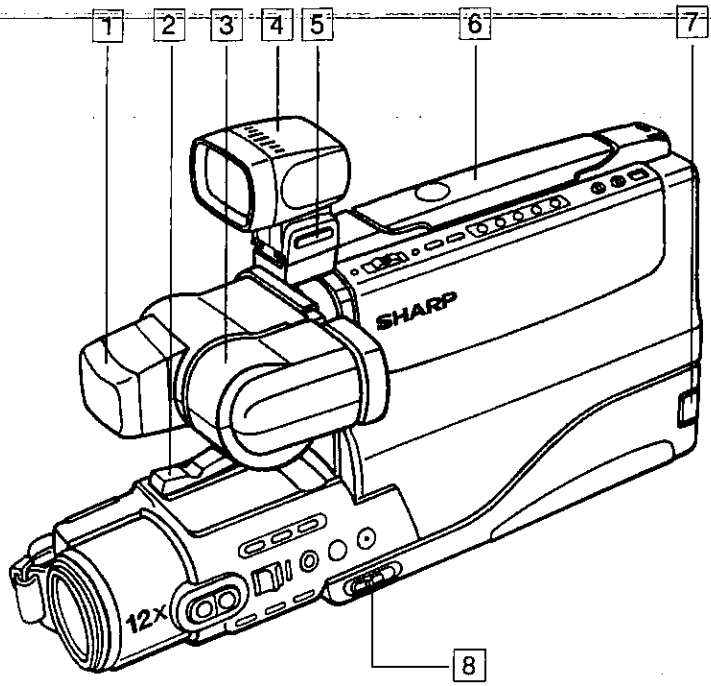
Power Requirement:	AC 110~240V, 50/60Hz
DC Output:	DC 6.8V ⎓ , 2.4A
Power Consumption:	27W
Dimensions (approx.):	$2^{27}/_{32}$"(W) × $1^{13}/_{16}$"(H) × $7^1/_4$"(D) [72(W) × 46(H) × 184(D)mm]
Weight (approx.):	0.99 lbs (450 g)

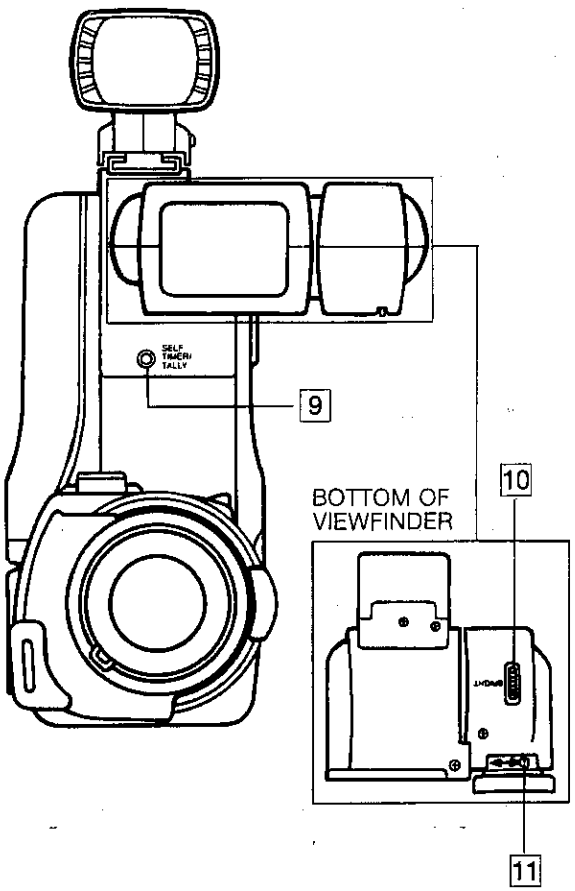
Battery pack BT-30N

DC Output:	DC6V
Dimensions:	$2^1/_4$"(W) × $5^3/_4$"(H) × $1^5/_{16}$"(D) [57(W) × 146(H) × 33(D)mm]
Weight:	1.3 lbs (590 g)

4. PART NAMES AND FUNCTIONS

FRONT VIEW





1 Microphone

2 POWER ZOOM WIDE/TELEPHOTO CONTROL button
Maximum telephoto when T (TELE) is pressed. Maximum wide angle when W (WIDE) is pressed. You can vary the speed of the zoom from approximately 6 seconds to 20 seconds by varying the degree of finger pressure on the zoom buttons.

3 Electronic Colour Viewfinder/Monitor
Displays the photographic subject. Also functions as a convenient colour monitor for playback of recorded material.

4 Video Light
Use when insufficient light conditions prevail.

5 Video Light Lock/Release button
Use when attaching and removing the videolight.

6 Retractable handle

7 BATTERY EJECT button
Used to detach the battery pack.

8 LIGHT mode switch
The light switch is switched on when light is needed while recording. When you would like light to automatically turn on when it becomes dark, set the switch to the SYNC position. When you would like to use the camcorder with the light on continuously set the switch to the ON positon.

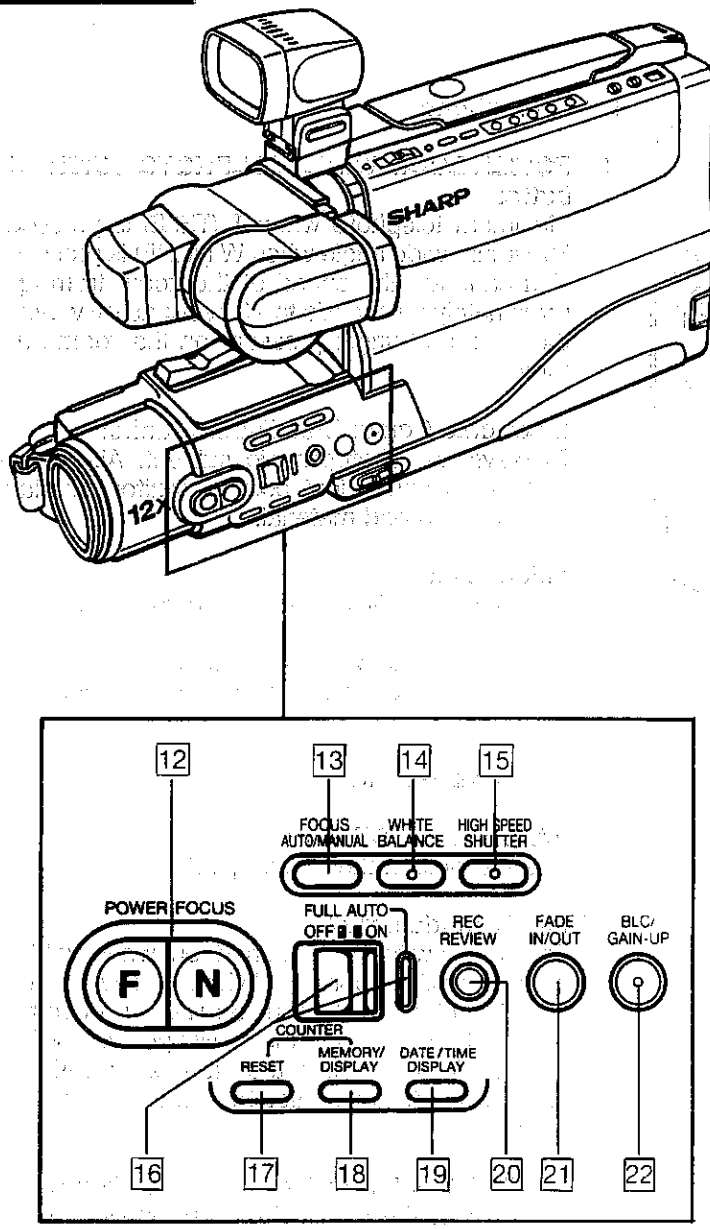
9 SELF TIMER button/Talent Tally indicator
If you press the SELF TIMER button while in the Record Pause mode, this indicator flashes for 10 seconds and then recording starts.

The Talent Tally indicator will light up when the camcorder begins recording, enabling the subject to determine whether the unit is recording or not.

10 Brightness Adjustment CONTROL
Use this control when you wish to adjust the brightness of the viewfinder.

Note In general, (after having adjusted viewfinder brightness, and having used the camcorder) set this control to the "center click" position. Your finger tips will feel a distinct "click" when it is returned to the proper position.

11 Diopter Adjustment lever
The setting at which an image in the viewfinder seems clear varies slightly depending on the individual. Using the diopter adjustment lever, adjust the image in the viewfinder until it becomes sharp.



12 POWER FOCUS button

13 AUTO/MANUAL FOCUS button
Press this button to select the "auto" mode. The camcorder will automatically focus on the subject, even if it is moving.
If, however, Auto Focus does not function because of the prevailing shooting conditions, push this button to select "manual" mode and focus manually using the POWER FOCUS button.

14 WHITE BALANCE button
Use this button to lock the white balance.

15 HIGH SPEED SHUTTER button
Use this button for a clear image replay of high speed motion in still mode (or slow mode with a regular VHS VCR).

16 FULL AUTO ON/OFF switch
Slide the switch on to engage the Full Auto mode. This mode makes problem-free recording easy for anyone.

17 COUNTER RESET button
Press to reset the tape counter display to "0000".

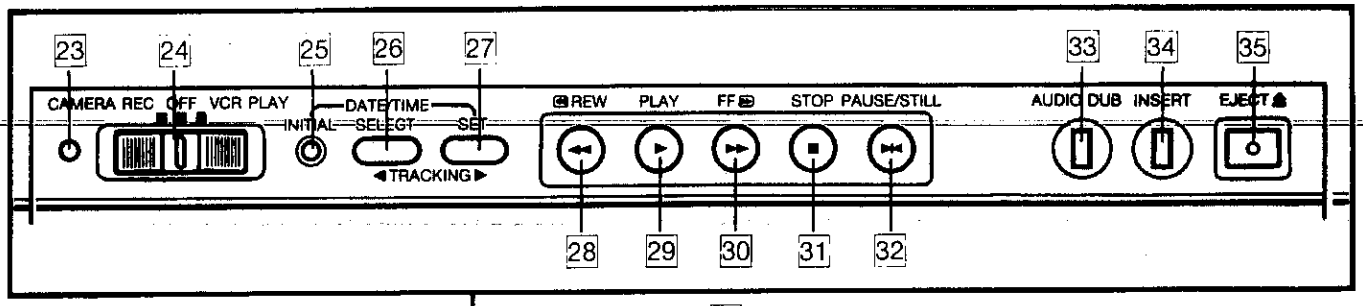
18 COUNTER MEMORY/DISPLAY ON/OFF button
When "M" is displayed on the viewfinder screen, the tape will stop when the Tape Counter reaches "0000" during fast forward or rewind. This button also displays the battery charge status and clears these displays from the viewfinder screen.

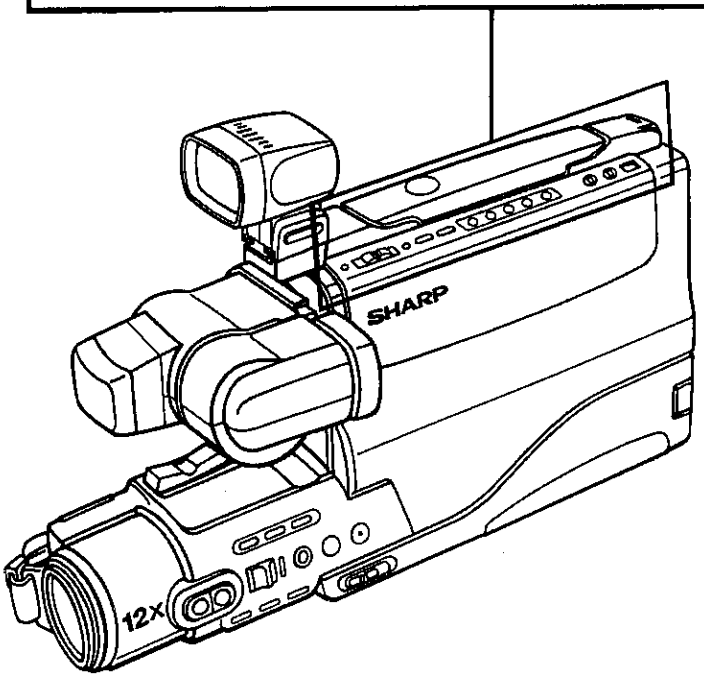
19 DATE/TIME DISPLAY ON/OFF button
Used to select date/time displays and clear these displays from the viewfinder screen.

20 REC REVIEW button
Press the REC REVIEW button in the recording pause mode to automatically play back and check the last two seconds of the recording in the viewfinder.

21 FADE IN/OUT button

22 BLC (Back Light Compensation)/GAIN-UP button
If the subject is darker than the background, the recorded subject may appear too dark and undefined. If this is the case, push this button for "BLC". When "LIGHT" is displayed in the viewfinder, press the button. The gain-up mode is engaged and the screen becomes brighter.





23 POWER indicator
The power indicator lights up (red) when power is turned on.

24 OPERATE switch (CAMERA REC/VCR PLAY select switch)
CAMERA REC: For camera recording
VCR PLAY: For playing back or editing tapes
OFF: Power off

25 DATE/TIME INITIAL button

26 TRACKING ◄ control button
DATE/TIME SELECT button

27 TRACKING ► control button
DATE/TIME SET button

28 REW/Reverse Search button
Used to rewind the tape, and for reverse video search during playback.

29 PLAY button
Press for playback.

30 FF/Forward Search button
Used to fast-forward the tape, and for forward video search during playback.

31 STOP button

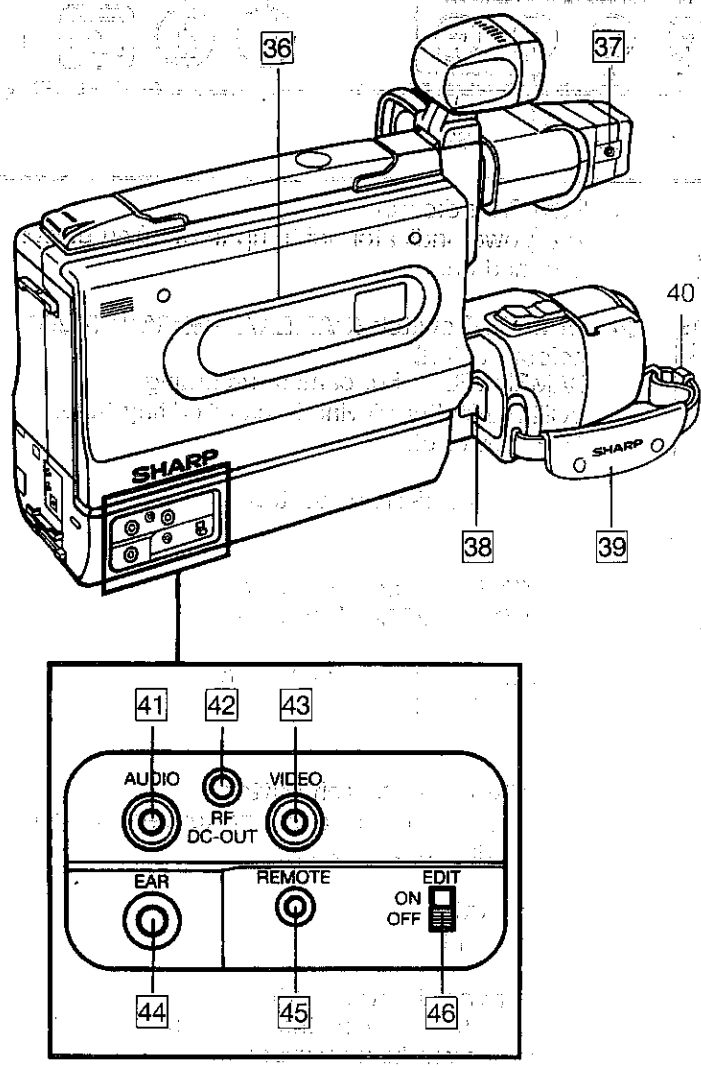
32 PAUSE/STILL button
Used to pause while recording from a television or other video source with an RCA TYPE AUDIO/VIDEO cable, or for viewing a still picture during playback.

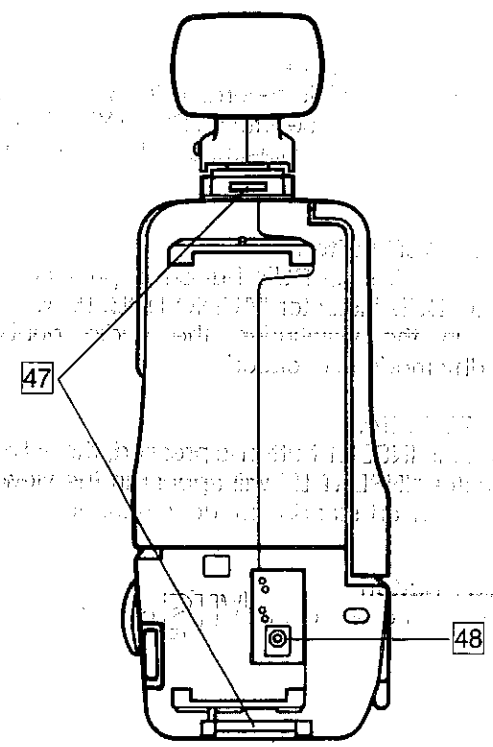
33 AUDIO DUB button
When the AUDIO DUB button is pressed, the AUDIO DUB indicator "AUDIO DUB. ▮▮" will appear in the viewfinder; the audio dubbing standby mode is engaged.

34 INSERT button
When the INSERT button is pressed, the INSERT indicator "INSERT ▮▮" will appear in the viewfinder; the insert standby mode is engaged.

35 EJECT button
Used to load or eject a VHS PAL cassette.

REAR VIEW





36 Cassette door

37 EXT. MIC (External Microphone) jack
Plug a microphone into this jack when you wish to record the sound of a subject which is further away from the camera.

38 REC START/STOP button
Press to start recording. Recording will pause if pressed during the recording mode.

Note This button functions only when the CAMERA REC/VCR PLAY Select switch is set to the CAMERA REC position.

39 Hand strap

40 Lens cap holder

41 AUDIO OUT terminal

42 RF DC-OUT terminal

43 VIDEO OUT terminal

44 EAR (Earphone) jack
Used for plugging in an earphone to monitor the sound during recording and playback.

45 REMOTE (Pause Remote Control) jack
Used for plugging in the Pause Remote Control VR-20ME (optional accessory) to operate the camcorder from a distance.

46 EDIT ON/OFF switch

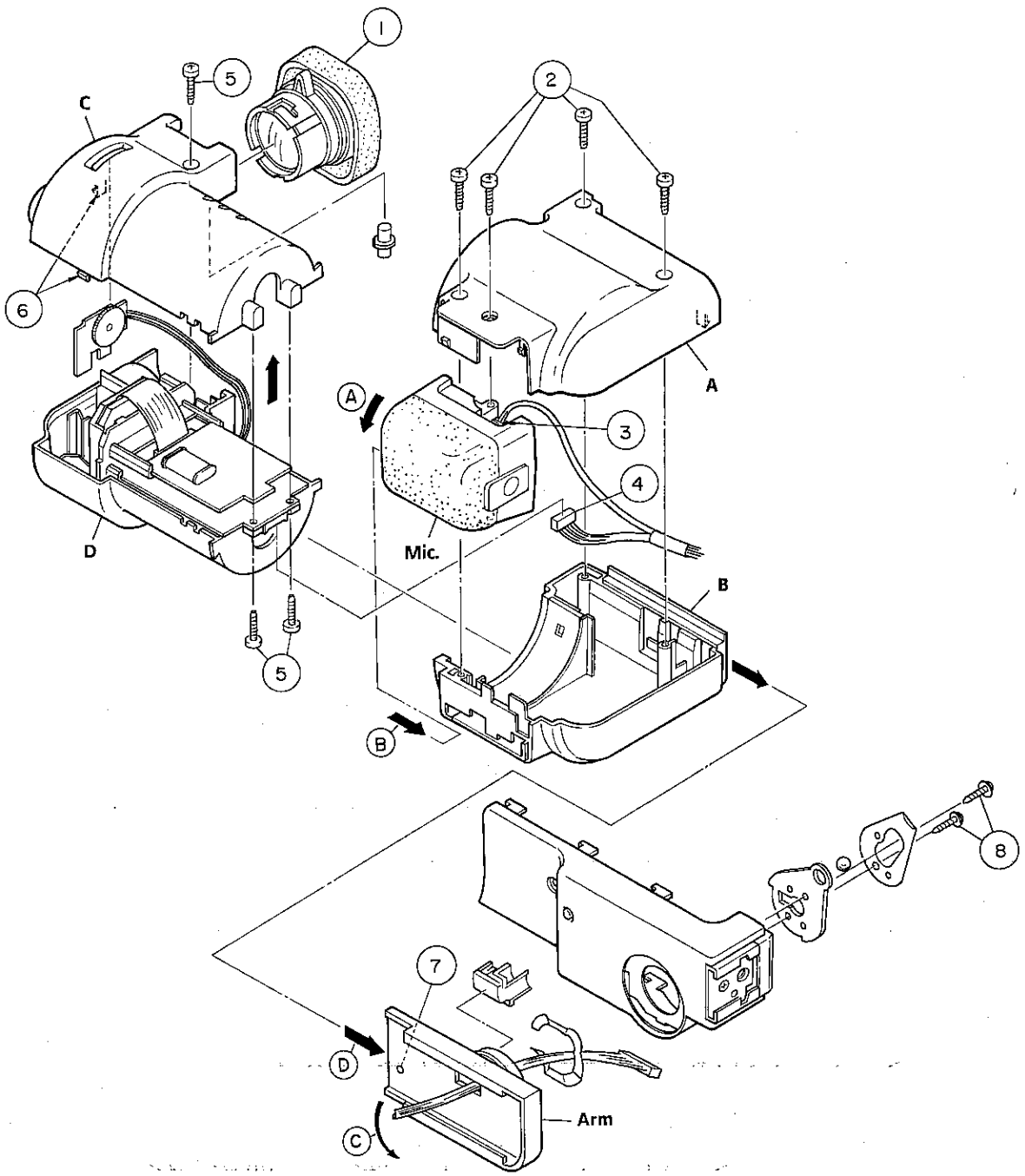
47 Shoulder Strap fittings

48 DC-IN jack

5. DISASSEMBLY AND REASSEMBLY

5-1. REMOVING THE VIEWFINDER

1. Remove the eyepiece unit ① from the viewfinder.
2. Unscrew the four screws ②, tilt the microphone in the direction of arrow Ⓐ and pull open the cabinet **A** upward from the cabinet **B**.
3. Disconnect the connector ③ from the microphone unit, and slide the microphone unit in the direction of the arrow Ⓑ to remove it from the cabinet **B**.
4. Disconnect the connector ④ from the assembly of the cabinets **C** and **D**.
5. Unscrew the three screws ⑤ and unhook the two claws ⑥ to remove the cabinet **C** from the cabinet **D**.
6. Turn the cabinet **B** and the arm in the direction of the arrow Ⓒ (where the arm comes at 90° to the cover).
7. Slide the cabinet **B** in the direction of the arrow Ⓓ until it comes in contact with the stopper spring.
8. Put a pointed thing (screwdriver tip or the like) through the hole ⑦ at the rear of the arm and push the stopper spring. Now remove the cabinet **B** in the direction of the arrow Ⓓ.
9. Unscrew the two screws ⑧ to remove the arm.



5-2. REMOVING THE CABINET

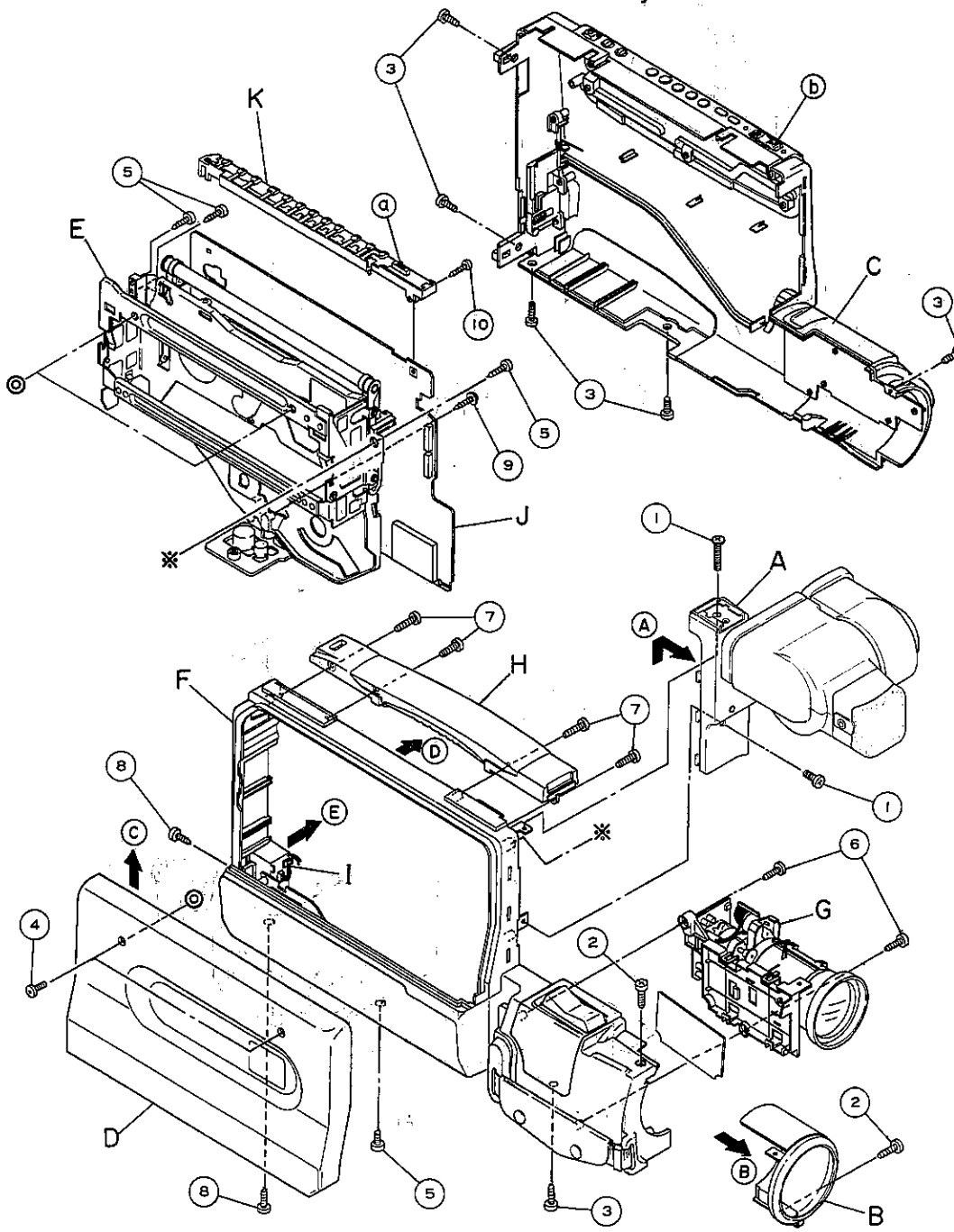
1. Unscrew the two screws ① and slide off position the viewfinder cover **A** in the direction of the arrow Ⓐ.
2. Unscrew the two screws ② and slide off position the lens cover **B** in the direction of the arrow Ⓑ.
3. Unscrew the six screws ③ to remove the cabinet assembly **C**.
4. Unscrew the two screws ④ and slide off position the cassette cover assembly **D** in the direction of the arrow Ⓒ.
5. Unscrew the four screws ⑤ to remove the mechanism chassis **E** from the cabinet assembly **F**.
6. Unscrew the two screws ⑥ to remove the lens unit **G** from the cabinet assembly **F**.
7. Unscrew the four screws ⑦ and slide off position the handle assembly **H** in the direction of the arrow Ⓓ.
8. Unscrew the two screws ⑧ and slide off position the belt holder and battery/DC terminal **I** in the direction of the arrow Ⓔ.
9. Unscrew the screw ⑨ to remove the main PWB **J**.
10. Unscrew the screw ⑩ to remove the VCR operation switch unit **K**.

Notes:

Precautions for reassembling the cabinet assembly **C**.

ⓐ Preset the slide switch (power switch) of the VCR operation switch unit **K** at CENTER.

ⓑ Preset the power switch knob of the cabinet assembly **C** at CENTER.



6. ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS

Here we will describe a relatively simple service work in the field, not referring to the more complicated repairs which would require the use of special equipment and tools (drum assembly or replacement, for example, which should be performed by qualified service personnel.)

* AC Adaptor must be used for the power supply when checking and adjustment of mechanism are performed.

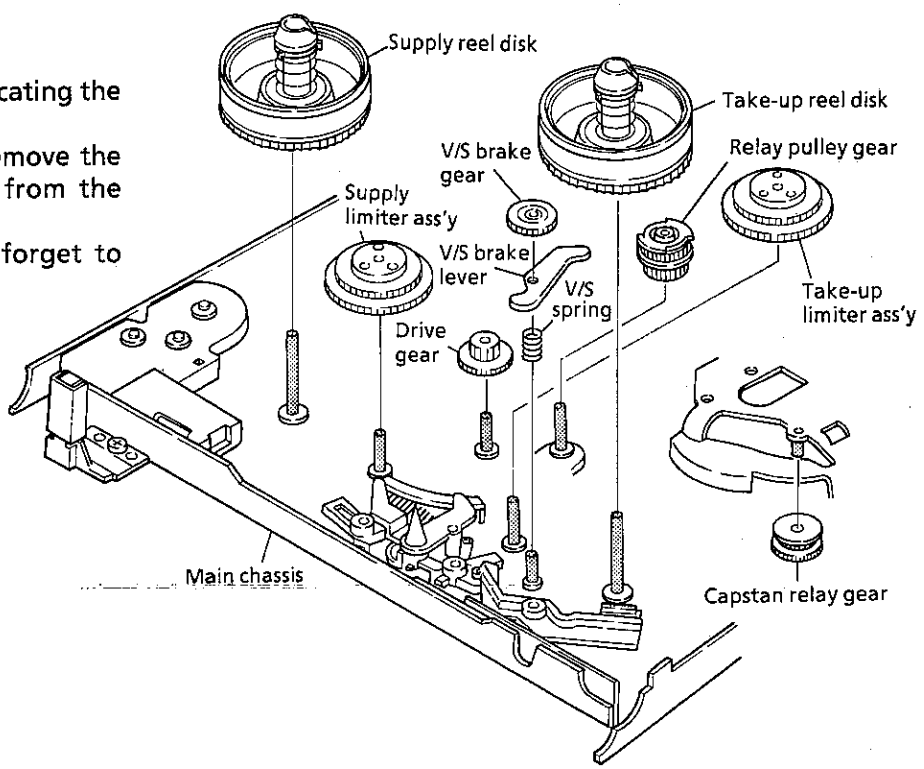
Mechanism Parts

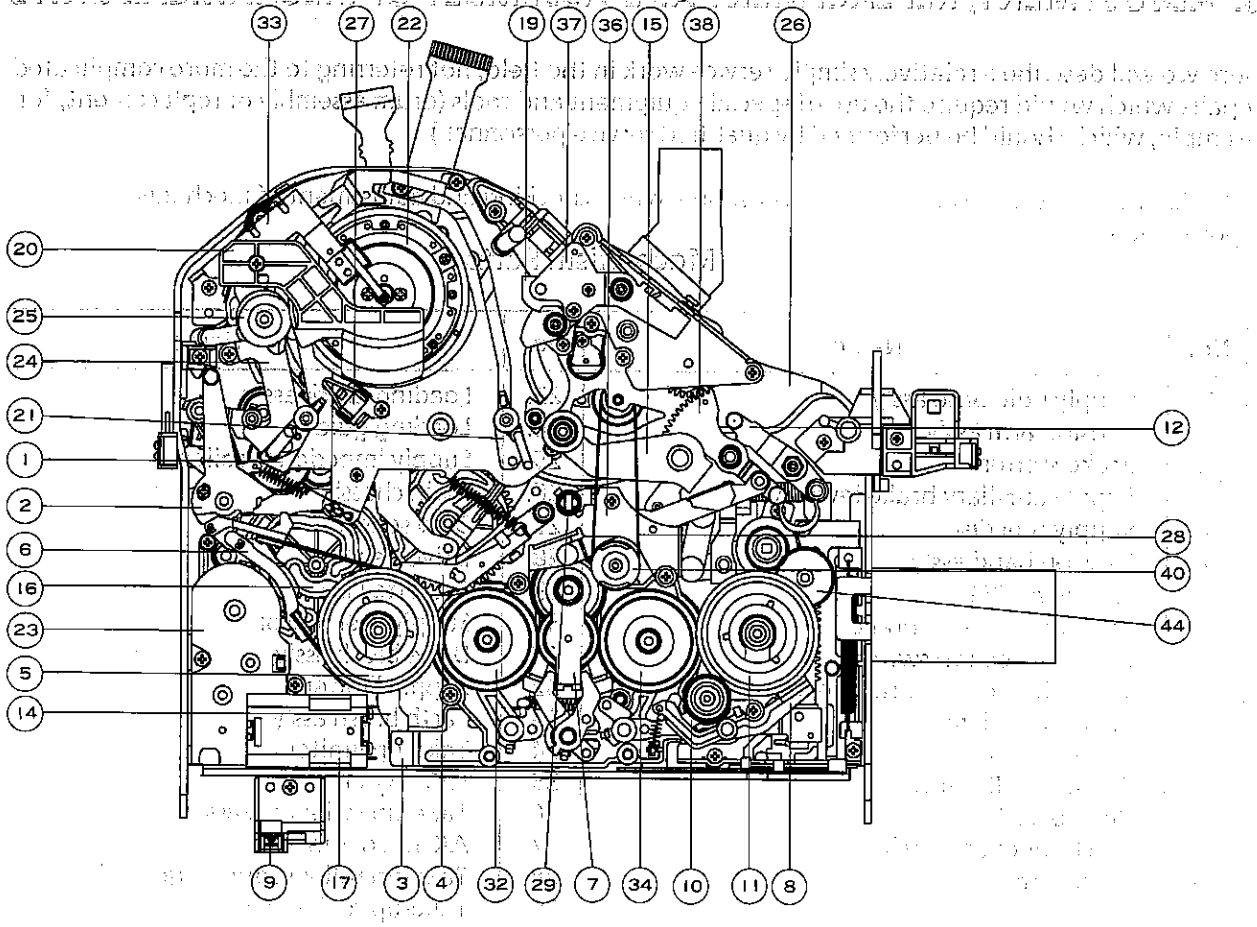
No.	Name	No.	Name
1.	Supply pole base ass'y	23.	Loading block ass'y
2.	Tension arm ass'y	24.	Loading guide
3.	Brake shifter	25.	Supply impedance roller
4.	Supply auxiliary brake lever-A	26.	Main chassis
5.	Supply reel disk	27.	Dew sensor
6.	Tension band ass'y	28.	Drive belt
7.	Idler lever P/B	29.	Cassette LED
8.	Take-up auxiliary brake	30.	Supply reel sensor
9.	Erase protection switch	31	Drive block ass'y
10.	V/S (video search) brake lever	32.	Supply limiter
11.	Take-up reel disk	33.	Earth brush ass'y
12.	Reverse guide	34.	Take-up limiter
13.	Capstan D.D. motor	35.	FPC holder
14.	Reel lever-B	36.	Take-up roller arm ass'y
15.	Pinch roller arm ass'y	37.	A/C head arm
16.	Master cam	38.	Take-up roller segment gear
17.	Loading motor	39.	Take-up reel sensor
18.	Cam switch	40.	Rellay pulley
19.	A/C head	41.	Drum motor
20.	Tape guide-C	42.	End sensor
21.	Take-up pole base	43.	Start sensor
22.	Drum ass'y	44.	Relay gear

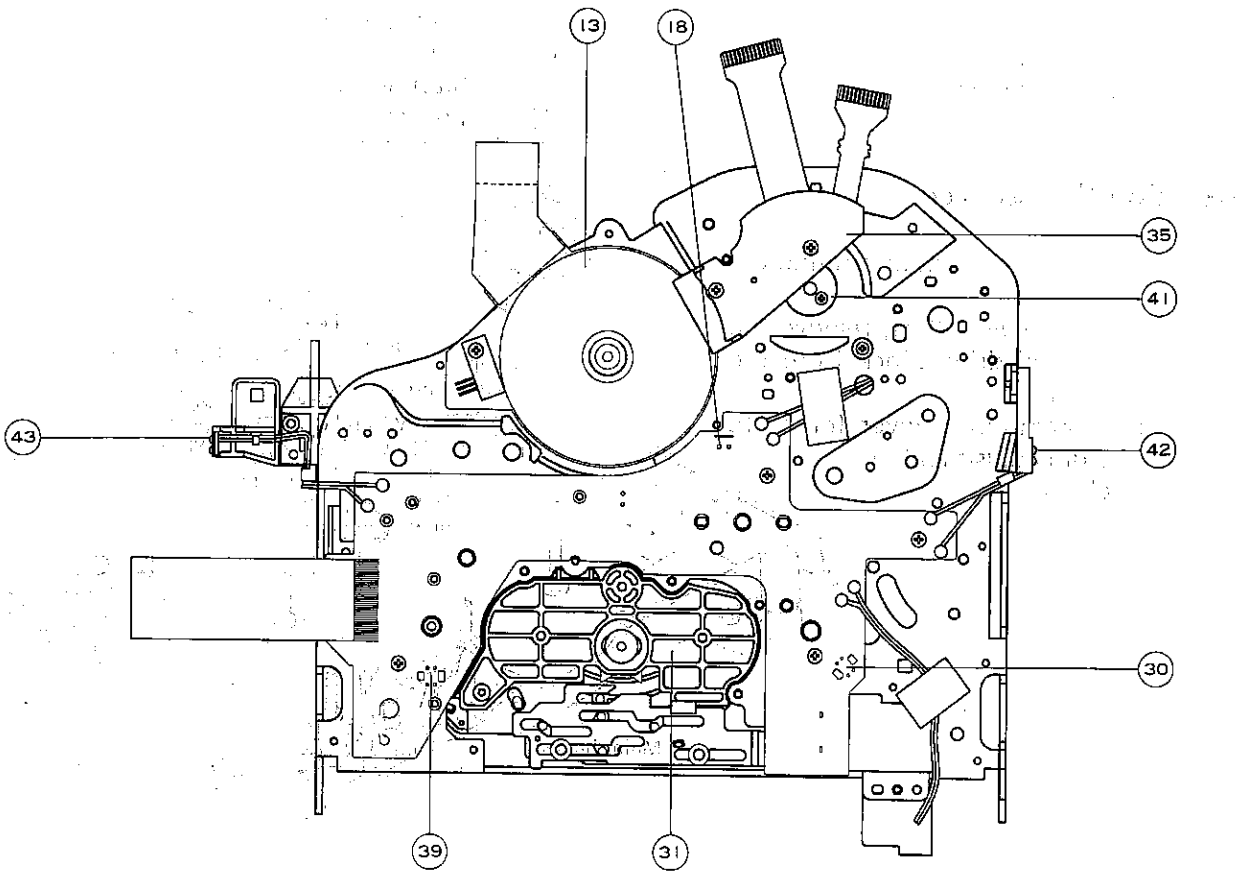
LUBRICATION (See page 15.)

Take the following steps in lubricating the shafts.

1. Referring to pages 18-21, remove the reel disks and drive block from the main chassis.
2. After reassembling, never forget to make height adjustment of each reel disk.




33
27
22
19
37
36
15
38
26
20
25
24
21
1
2
6
16
23
5
14
12
28
40
44
9
17
3
4
32
29
7
34
10
11
8


13
18
35
41
43
42
30
39
31

MECHANICAL PARTS REQUIRING PERIODIC INSPECTION

Use the following table as a guide to maintain the mechanical parts in good operating condition.

NO	Maintained every / Parts	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	3000 hrs.	Possible symptom encountered	Remarks
1	Guide roller ass'y	□	□	□	□	□	Lateral noise head occasionally blocked	Abnormal rotation or significant vibration requires replacement.
2	Supply impedance roller ass'y	□	□	□	□	□		
3	Sub guide roller	□	□	□	□	□		
4	Supply tilt base	□	□	□	□	□		Clean tape contact area with the specified cleaning liquid.
5	Take-up tilt base	□	□	□	□	□		
6	Tilt post (supply pole base)	□	□	□	□	□		
7	Tilt post (take-up pole base)	□	□	□	□	□		
8	Tension pole	□	□	□	□	□		
9	Rataining guide	□	□	□	□	□		
10	A/C head	□	□	□	□	○	Sound too small or distorted	
11	Video head						Poor S/N, no colour	
12	Capstan D.D. motor	□	□	□	○□	□	No tape running, uneven sound	
13	Pinch roller	□	□	□	□	○	No tape running, tape slack	Clean with the specified cleaning liquid.
14	Supply/Take-up reel disk		□△		□△	□△		Clean the shaft and apply oil to it. (See page 13.)
15	Capstan relay gear		□△		□△	□△		
16	Tension band ass'y					○		
17	Loading motor				○		Not injectable, not set in mode	
18	Drive block ass'y						See the chart below.	
Drive Block Ass'y								
1	Supply/Take-up torque limiter ass'y		□△		○□△	□△	No tape running, tape slack	Clean the shaft and apply oil to it. (See page 13.)
2	Drive gear		□△		□△	□△		
3	Relay pulley gear ass'y		□△		□△	□△		
4	Video search brake gear		□△		□△	□△		
5	Video search brake lever		□△		□△	□△		

Note: ○: Part replacement
□: Cleaning (For cleaning, use a lint-free cloth dampened with pure issoproplyl alcohol)
△: Oil refilling (The indicated point should be lubricated with high quality spindle oil every 1000 hrs.)

This model has no adjusting volumes for torques, tension, etc. If the reading is outside the specified range, clean or replace the part.

6-1. DISASSEMBLING AND REASSEMBLING THE CASSETTE HOUSING

Disassembly

1. Keep the cassette housing in the locked state.
2. Take the main spring L ① out of the point pin ②. Be careful not to bend the spring. (Fig. 6-1(a))
3. Release the lock plate hook ③ to put the cassette housing in the eject mode.
4. Remove the anti-erase switch fixing screw ④.
5. Remove the synchronized shaft bushing R and L fixing screws ⑤.
6. Pull the synchronized shaft bushings R and L in the direction of arrow out of the chassis. (Fig. 6-1(b))
7. Slide the O link L rear pin ⑥ in the direction of arrow off the chassis rail groove. (Fig. 6-1(c))
8. Pull up the O link R rear pin ⑦ off the chassis. (Fig. 6-1(d))

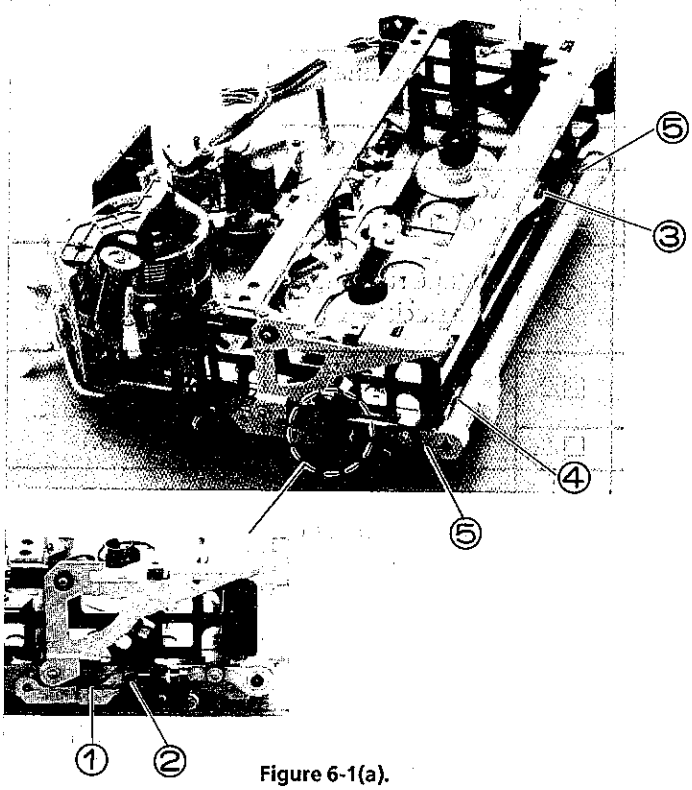


Figure 6-1(a).

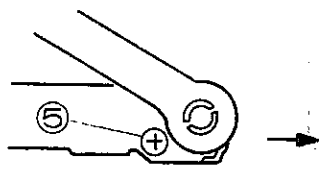


Figure 6-1(b).

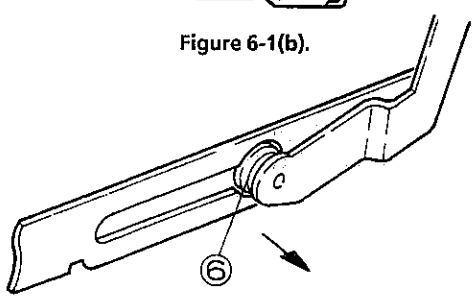


Figure 6-1(c).

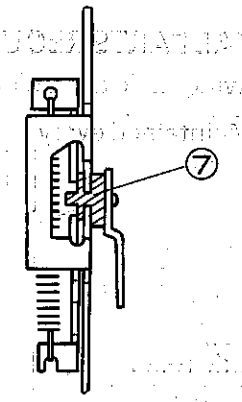


Figure 6-1(d).

Reassembly

1. Install the O link R and L rear pins in position (in the eject mode).
2. Install the synchronized shaft bushings R and L into the chassis.
3. Tighten up the fixing screws ⑤.
4. Fix the anti-erase switch with the fixing screw ④.
5. Keep the cassette housing in the locked state.
6. Hook the main spring L ① to the point pin ②. Be careful not to bend the spring.

Note:

Be careful not to damage the tape travel guides and other parts nearby.

6-2. REPLACEMENT AND HEIGHT ADJUSTMENT OF REEL DISK

1. Turn off the power (remove the adaptor and battery).
2. Remove the cassette housing ass'y.

Disassembly

[Supply reel disk]

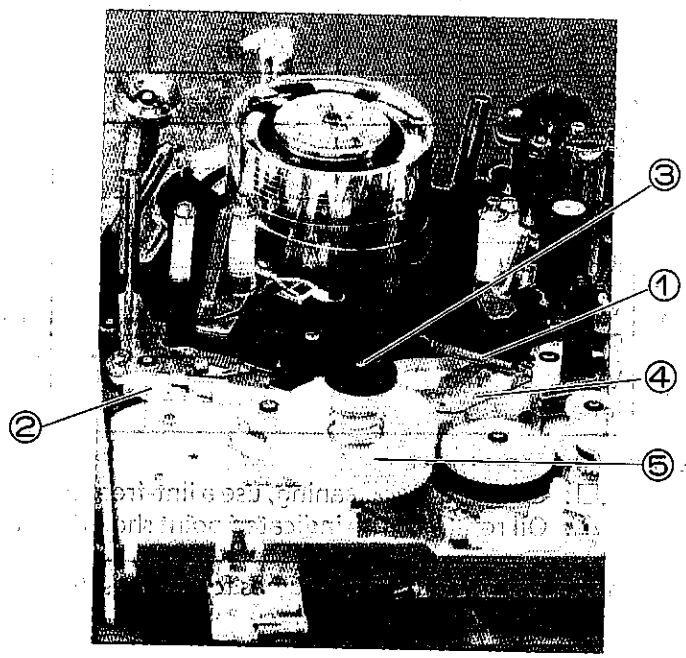


Figure 6-2(a).

1. Remove the supply auxiliary brake spring ①.
2. Remove the tension band ②.
3. Remove the cut washer ③ fixing the reel disk.
4. While disengaging the supply auxiliary brake ④, pull out the supply reel disk ⑤ upward.

Notes:

- Utmost care should be taken to avoid deformation of the tension band.
- While bending the claw portion outward, pull out the tension band upward.

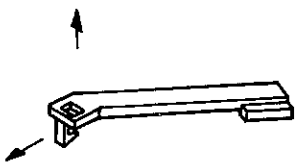


Figure 6-2(b).

[Take-up reel disk]

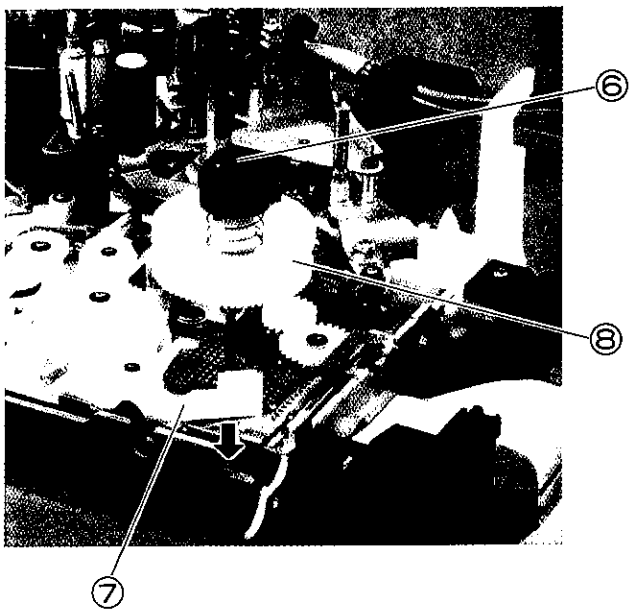


Figure 6-2(c).

1. Remove the cut washer ⑥ fixing the take-up reel disk.
2. While disengaging the take-up auxiliary brake lever ⑦ in the direction indicated by the arrow, pull out the take-up reel disk ⑧ upward.

Reassembly

[Supply reel disk]

1. Clean the supply reel shaft and apply oil (Shell Terrace #32) to it.
2. After ensuring the supply auxiliary brake ④ is disengaged, mount the supply reel disk ⑤ in position.
3. Coil the tension band ② around the specified portion of the supply reel disk and insert it into the hole in the tension arm.
4. Hang the supply auxiliary brake spring ① on the hook.
5. Attach the cut washer ③ .

Notes:

- Take care to avoid deformation of the tension band.
- Take care not to hit the reel disk against the limiter gear when mounting it.
- Take care not to damage the gear portion with tools.
- Check and adjust the tension pole position referring to Fig. 6-16 (a).

[Take-up reel disk]

1. Clean the take-up reel shaft and apply oil (Shell Terrace #32) to it.
2. While disengaging the take-up auxiliary brake lever ⑦, mount the take-up reel disk ⑧ in position.
3. Fit the cut washer ⑥ on the shaft and fix it.

Notes:

- Take care not to damage the gear portion of the reel disk.
- After reassembly, check the REW back tension torque referring to Fig. 6-12.
- Take care not to bend the V/S brake lever.

[Height adjustment]

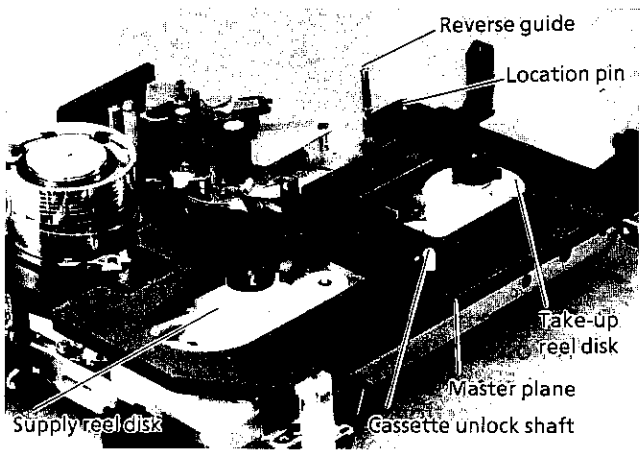


Figure 6-2(d).

Utmost care should be taken so as not to hit the master plane against the drum, etc. when setting it in the mechanism.

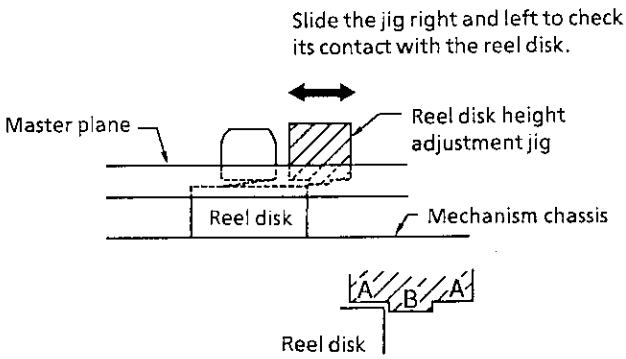


Figure 6-2(e).

Check if the reel disk top is lower than section A and higher than section B. If not, remove the reel disk according to the procedures described above and add, replace or remove the height adjustment washers (2.1W4-0.13, -0.25, -0.5) so that the reel disk top is between sections A and B.

Note:

It is useful for adjustment to remember the kinds of washers used when removing the reel disk. Adjustment can be made quickly if it is done before fitting the reel disk fixing cut washer.

6-3. DISASSEMBLY OF DRIVE BLOCK

1. Turn off the power (remove the adaptor and battery).
2. Remove the cassette housing ass'y.
3. Remove the supply and take-up reel disks.

Disassembly

1. Remove the cassette LED soldering portion on the mechanism relay PWB on the back of the mechanism.

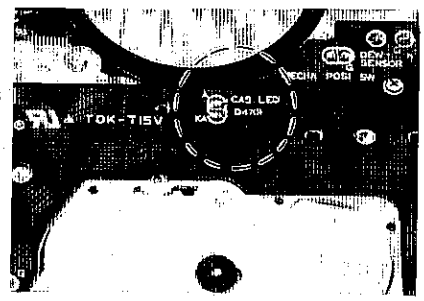


Figure 6-3(a).

2. Remove the drive belt ①.
   1) Position the relay pulley gear ass'y as shown in Fig. 6-3 (b).
   2) Hold section Ⓐ of the drive belt with fingers and, while moving it in Ⓑ direction, pull it out upward.

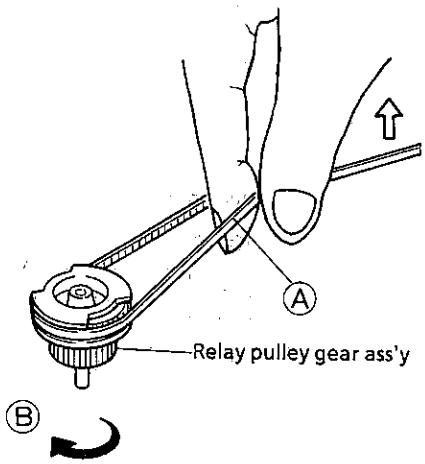


Figure 6-3(b).

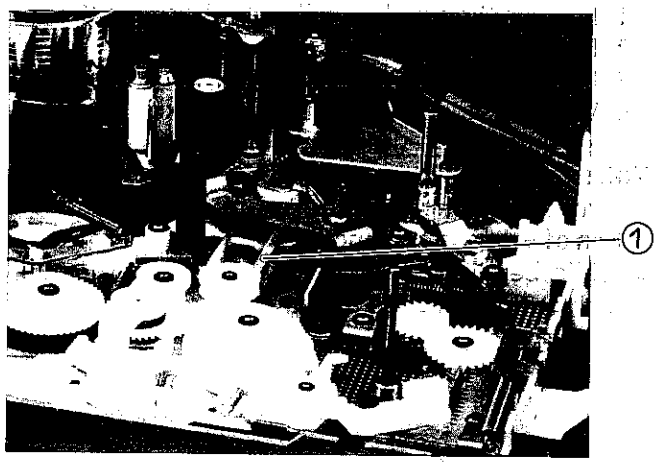


Figure 6-3(c).

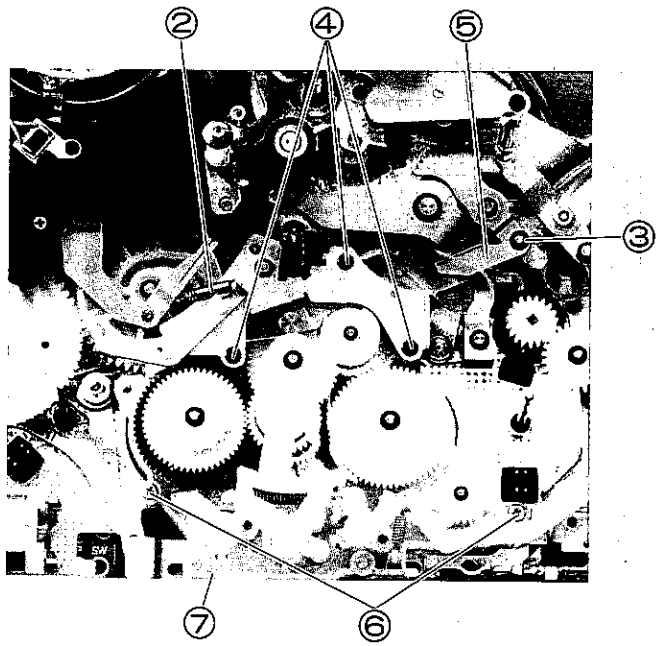


Figure 6-3(d).

3. Remove the supply auxiliary brake spring ②.
4. Remove the cut washer ③ fixing the segment gear ass'y and take-up roller arm plate.
5. Remove the three screws ④ fixing the take-up roller arm plate.
6. Pull out the take-up roller arm plate ⑤ upward.
7. Remove the two screws ⑥ fixing the drive block ass'y.
8. Pull out the drive block ass'y ⑦ upward.

Notes:

- Take care not to drop and lose the cassette LED.
- Take care to avoid applying undue force to the drive belt so that the core wires in the belt are not damaged.
- Take care to avoid deformation of the rod projecting from the take-up roller arm plate.

[REPLACEMENT OF LIMITER]

Disassembly

1. Move the brake shifter ① to the right by hand to disengage the main brake (S/T).
2. Remove the cut washers ②.
3. Move the idler (PB ass'y) ③ to either side.
4. Pull out the limiters ④ upward.

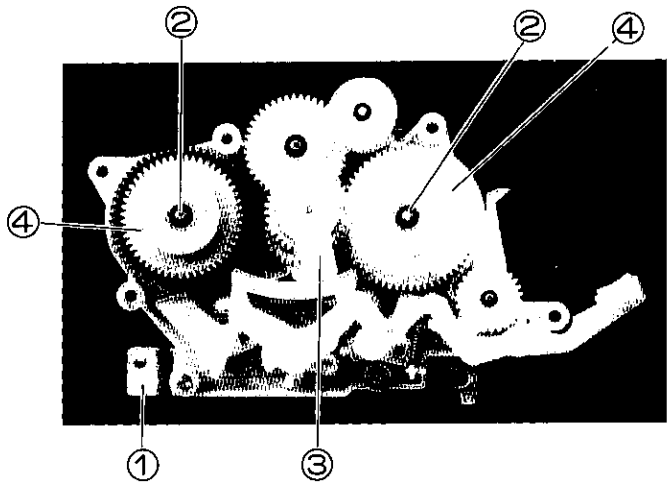


Figure 6-3(e).

Reassembly

1. Clean the limiter shaft and apply oil (Shell Terrace #32) to it.
2. Ensure that the main brake is disengaged.
3. Ensure that the idler (PB ass'y) ③ is shifted aside.
4. Mount the limiters ④ in position.
5. Fit the cut washers ② to fix it.

Notes:

- Take care not to damage the gears.
- To replace the limiters alone, it is enough to remove only the reel disk, not the entire drive block ass'y .

Reassembly

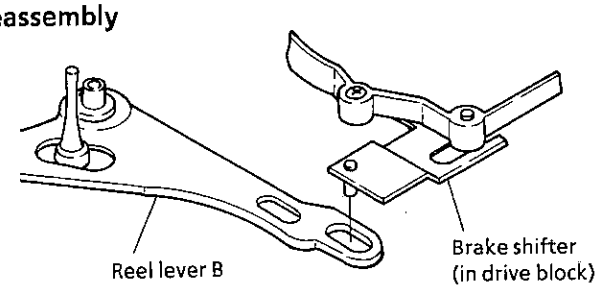


Figure 6-3(f).

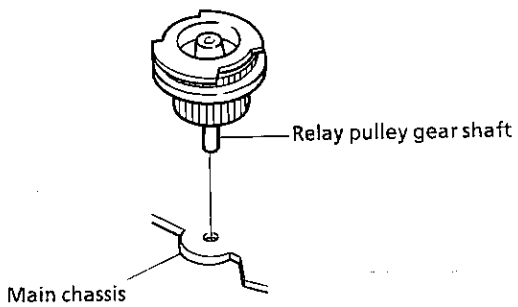


Figure 6-3(g).

1. To set the drive block, while inserting the pin of the brake shifter into the hole in the reel lever B, insert the relay pulley gear shaft into the hole of the main chassis.
2. Fix the drive block by tightening the two screws.
3. Set the take-up roller arm plate. At this time, properly fit the shaft projecting from the take-up roller arm plate into the sub-cam. Also ensure that the pin of the supply auxiliary brake lever is not on the sub-cam but in contact with the circumference of the sub-cam and that the LED holder is inserted in the hole in the main chassis.
4. Fit the rod portion of the take-up roller arm plate into the pin of the segment gear ass'y.
5. Fix the take-up roller arm plate by tightening the three screws.
6. Fix the portion inserted in step 4 by fitting the cut washer.
7. Hang the supply auxiliary brake spring on the hook (after installing the supply reel disk and tension band).

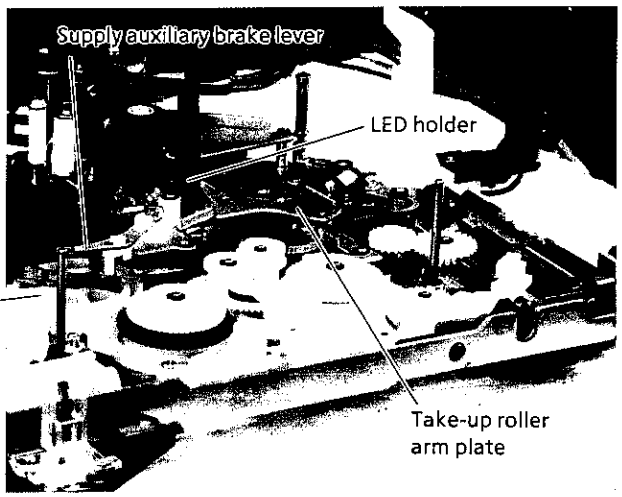


Figure 6-3(h).

8. Insert the LED into the LED holder and solder them.

Note:

For proper polarity, insert the LED so that the LED top is leveled with the holder.

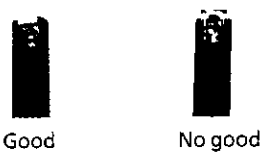


Figure 6-3(i).

Notes:

- Take care not to bend the rod portion of the take-up roller arm plate.
- Take care to avoid applying undue force and deforming the segment gear ass'y when fitting the cut washer.

6-4. DISASSEMBLY AND REASSEMBLY OF LOADING BLOCK

Disassembly

1. Remove the L/M soldering portion ① on the mechanism relay PWB.
2. Remove the four screws ②.
3. While lifting the front portion of the loading holder ass'y and slightly tilting it, put out the whole ass'y upward.

Note:
Take care to avoid applying undue force and damaging the gear.

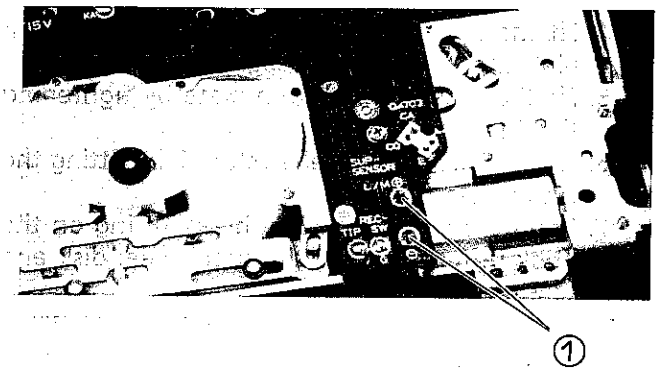


Figure 6-4(a).

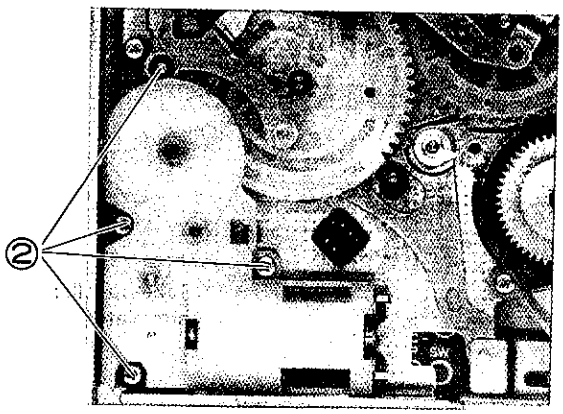


Figure 6-4(b).

Reassembly

1. Shift the gear B ③ of the loading block ass'y as shown in Fig. 6-4(c).
2. Fit the gear A ④ while engaging it with the master cam.
3. Ensure that the loading motor terminal is inserted in the hole in the mechanism relay PWB.
4. Tighten the four screws.
5. Solder the terminal to the relay PWB.

Notes:

- Take care not to damage the gears.
- Take care no to bend the motor terminal.

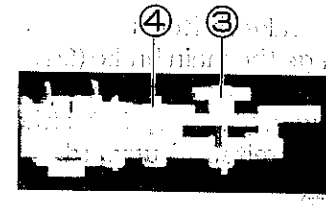


Figure 6-4(c).

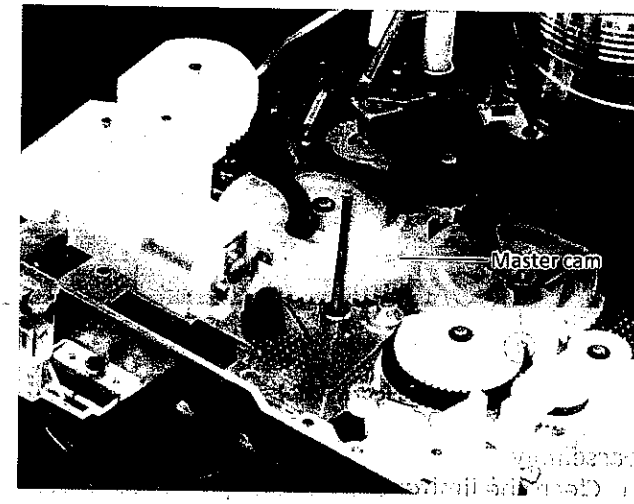


Figure 6-4(d).

6-5. REPLACEMENT OF LOADING MOTOR

Remove the loading block ass'y according to the procedures described above.

Disassembly

1. Using a nipper, cut off the two terminals ① on the motor body side protruding out of the holder.
2. Pull out the motor while unlocking both clicks ② of the holder.
3. Pull the worm ③ out of the motor output shaft.

Notes:

- Take care not to damage the gear portion when pulling out the worm. (If damaged, it will cause abnormal noise.)
- Take care not to break the clicks (snap portion) of the holder when unlocking them.

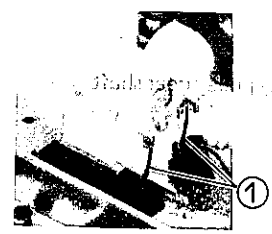


Figure 6-5(a).

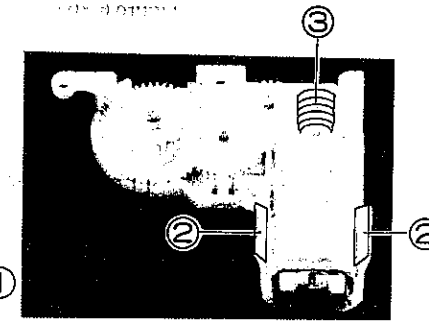


Figure 6-5(b).

Reassembly:

1. Press-fit the worm on the loading motor output shaft in the correct direction. (Refer to Fig. 6-5 (c) for dimension.)
2. Remove the three gears (worm wheel, gear A, gear B) from the holder.
3. Fit the motor terminal side in the snap portion of the holder, and then set the motor in the holder while pushing the output shaft side case.
4. Fit the worm wheel and gear B, and then fit the gear A while opening the falling-off preventive click of the holder.
5. Fit the attached terminals A/B in the holder and motor terminals and make soldering.

Notes:

- Take care not to damage the gears when removing and installing them. In particular, avoid forcedly fitting the gears causing damage at installation.
- Finish soldering within a short time.

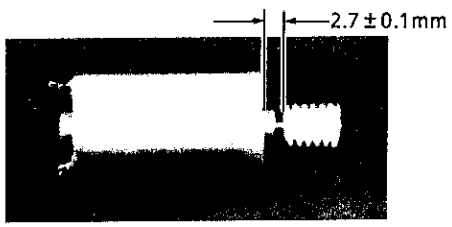


Figure 6-5(c).

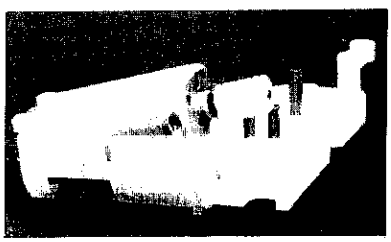


Figure 6-5(d).

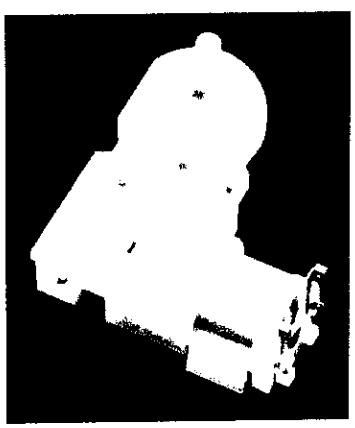


Figure 6-5(e).

6-6. REPLACEMENT OF CAPSTAN DD MOTOR

Disassembly

1. Remove the two screws ① fixing the FPC holding bracket and take off the FPC holding bracket.
2. Shift the take-up roller arm so that the three capstan fixing screws can be seen.
   Note:
   If the loading block is not removed, change the mode using DC power or dry batteries (1.5~3.0V).
   If removed, shift the take-up roller arm by turning the master cam by hand.
3. Remove the three screws ② and pull out the capstan DD motor downward.

Note:

Take care not to damage the shaft and gear portion when pulling out the capstan DD motor.

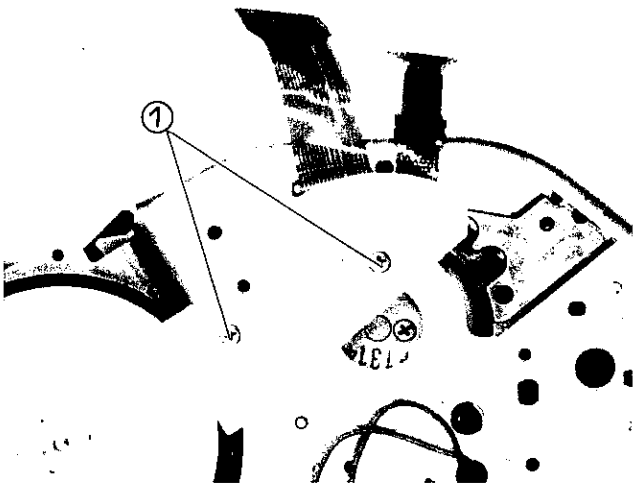


Figure 6-6(a).

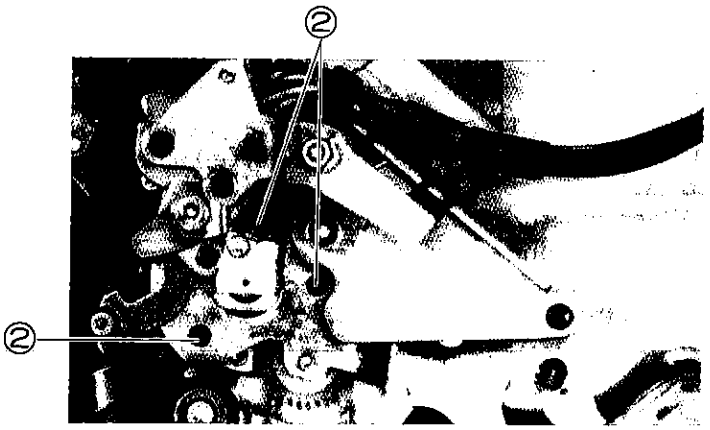


Figure 6-6(b).

Reassembly

1. Set the capstan DD motor while engaging its gear ③ with the capstan relay gear ④ of the main chassis.
2. Install the FPC holding bracket by tightening the two screws.
3. Fix the capstan DD motor by tightening the three screws while pushing it upward holding the rotor by hand.

Notes:

- Take care not to damage the shaft and gear of the capstan DD motor.
- Clean the capstan shaft.
- Take care to allow no metal dust, etc. to enter the motor.

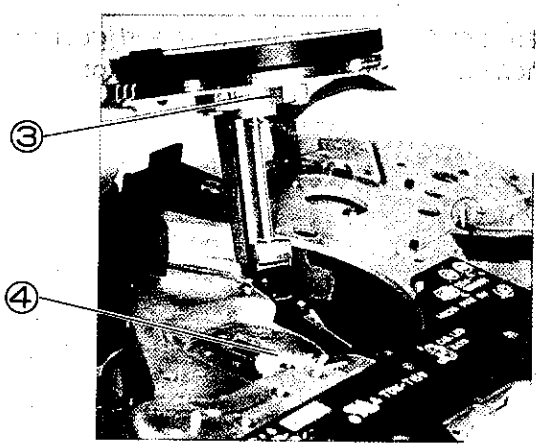


Figure 6-6(c).

6-7. CHECK OF FAST FORWARD TORQUE

Checking can be made without removing the cassette housing.

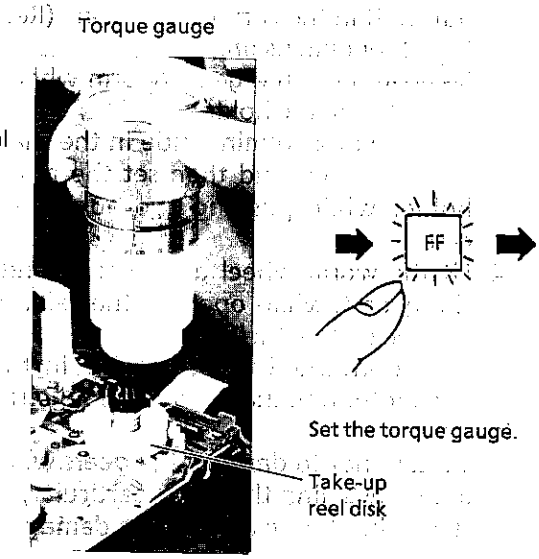
Checking

Check that the take-up torque in the fast forward mode is equal to the rated value (500g·cm) or over.

Notes:

- When measuring the torque, secure the torque gauge by hand so as not to let it loose.
- Do not put the reel disk in a locked position and finish the measurement within a short time.

(1) Setting



(2) Checking — Slowly turn the torque gauge clockwise by hand (about one turn every 2 to 3 seconds).

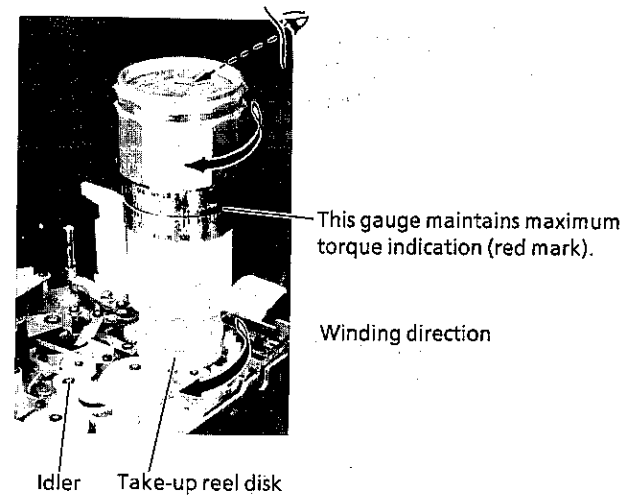


Figure 6-7.

6-8. CHECK OF REWIND TORQUE

Checking can be made without removing the cassette housing.

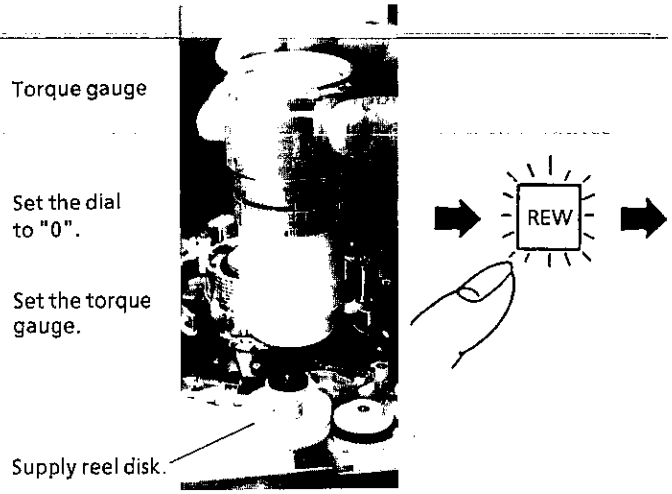
Checking

Check that the take-up torque in the rewind mode is equal to the rated value (500g·cm) or over.

Notes:

- When measuring the torque, secure the torque gauge by hand so as not to let it loose.
- Do not put the reel disk in a locked position and finish the measurement within a short time.

(1) Setting



(2) Checking

Slowly turn the torque gauge counterclockwise by hand (about one turn every 2 to 3 seconds).

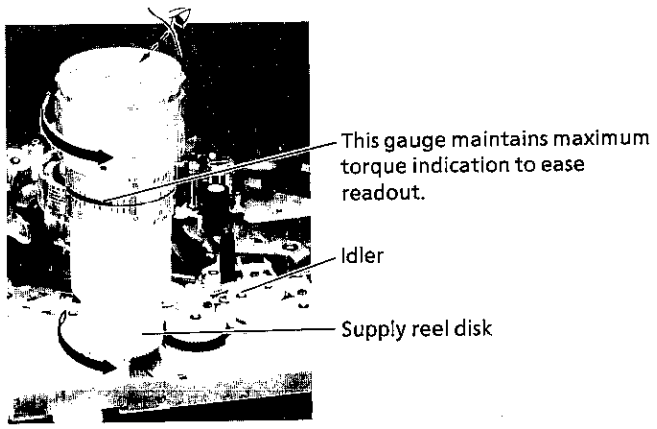


Figure 6-8.

6-9. CHECK AND ADJUSTMENT OF PLAY-BACK TORQUE

Checking can be made without removing the cassette housing.

Checking

Set the torque gauge onto the take-up reel disk. While turning the torque gauge slowly clockwise (about one turn every 2 to 3 seconds), check that the measured torque is within the specified range (108 ± 30g·cm).

Note:
When measuring the torque, take care to securely set the torque gauge onto the reel disk. If the torque gauge is loosely set, accurate measurement cannot be made.

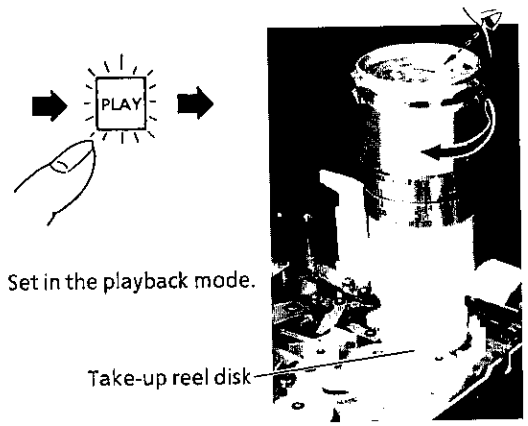


Figure 6-9.

Adjustment

If the take-up torque in the playback mode does not fall within the specified range, replace the take-up limiter ass'y.

Note:
The take-up torque indication will fluctuate due to the variation in the turning torque of the take-up limiter ass'y. Read out the torque at the center of the fluctuation.

6-10. CHECK AND ADJUSTMENT OF VIDEO SEARCH REWIND (VS-REW) TORQUE

Checking can be made without removing the cassette housing.

Checking

Set the torque gauge onto the supply reel disk. While turning the torque gauge slowly counterclockwise (about one turn every 2 to 3 seconds), check that the measured torque is within the specified range (216 ± 30g·cm).

Note:
When measuring the torque, take care to securely set the torque gauge onto the reel disk. If the torque gauge is loosely set, accurate measurement cannot be made.

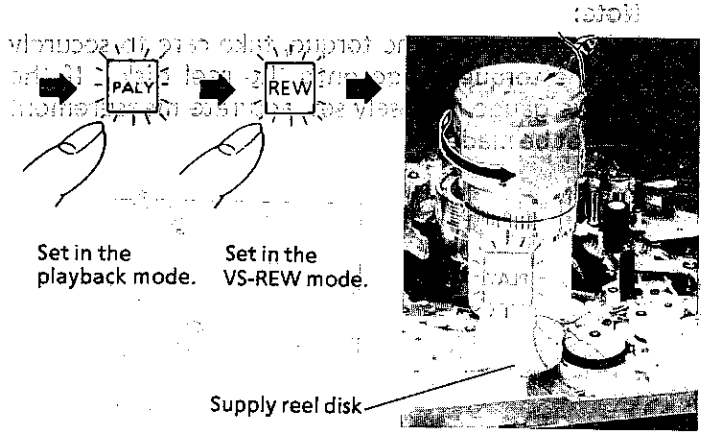


Figure 6-10.

Adjustment
If the take-up torque in the VS-REW mode does not fall within the specified range, replace the supply limiter ass'y.
Note:
The take-up torque indication will fluctuate due to the variation in the turning torque of the supply limiter ass'y. Read out the torque at the center of the fluctuation.

6-11. CHECK OF FAST FORWARD BACK TENSION

Checking can be made without removing the cassette housing.

Checking
Set the torque gauge onto the supply reel disk. While turning the torque gauge slowly clockwise (about one turn every 2 to 3 seconds), check that the measured torque is within the specified range (18 ± 5g·cm).
Note:
When measuring the torque, take care to securely set the torque gauge onto the reel disk. If the torque gauge is loosely set, accurate measurement cannot be made.

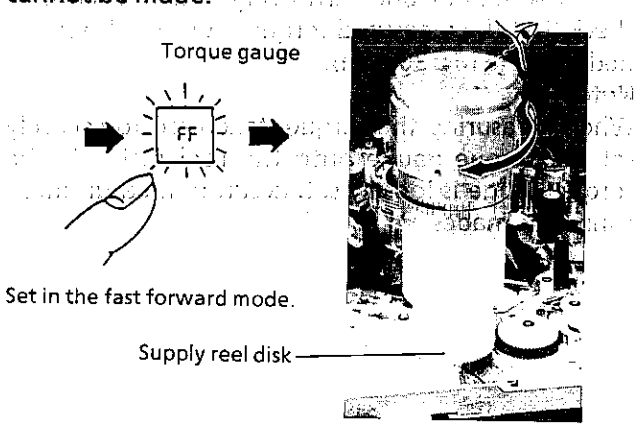


Figure 6-11.

6-12. CHECK OF REWIND BACK TENSION

Checking can be made without removing the cassette housing.

Checking
Set the torque gauge onto the take-up reel disk. While turning the torque gauge slowly counterclockwise (about one turn every 2 to 3 seconds), check that the measured torque is within the specified range (22 ± 5g·cm).
Note:
When measuring the torque, take care to securely set the torque gauge onto the reel disk. If the torque gauge is loosely set, accurate measurement cannot be made.

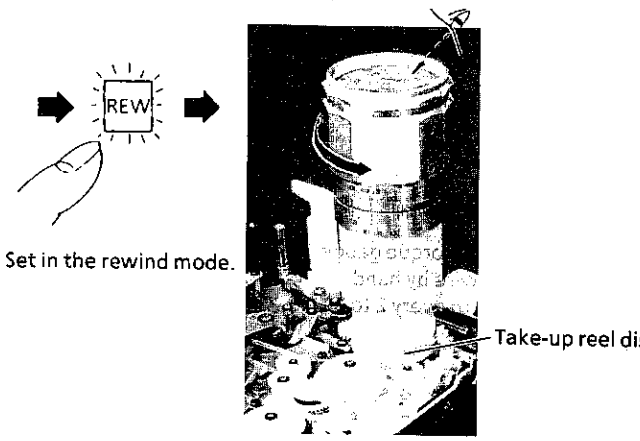


Figure 6-12.

6-13. CHECK OF VIDEO SEARCH REWIND (VS-REW) BACK TENSION

Checking can be made without removing the cassette housing.

Checking
Set the torque gauge onto the take-up reel disk. While turning the torque gauge slowly counterclockwise (about one turn every 2 to 3 seconds), check that the measured torque is within the specified range (36 ± 10g·cm).
Note:
When measuring the torque, take care to securely set the torque gauge onto the reel disk. If the torque gauge is loosely set, accurate measurement cannot be made.

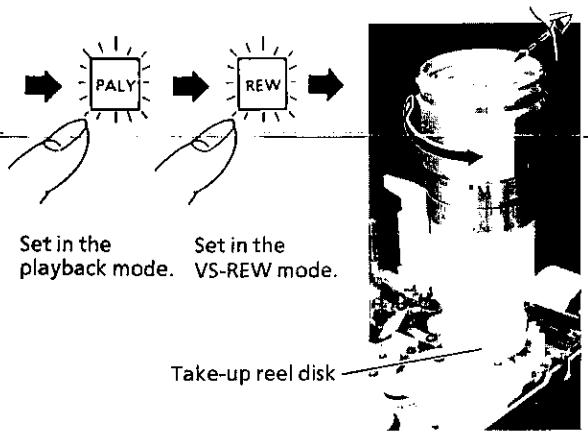


Figure 6-13.

6-14. CHECK OF PINCH ROLLER PRESSURE

Remove the cassette housing.

1. Move aside the pinch roller off the capstan shaft.
2. Hook the tension gauge adaptor onto the pinch roller shaft and set the tension gauge.
3. Slowly return the pinch roller to its position, and read the tension gauge indication when the pinch roller just comes in contact with the capstan shaft.
4. Check that the indication falls within the specified range (900 to 1100g).

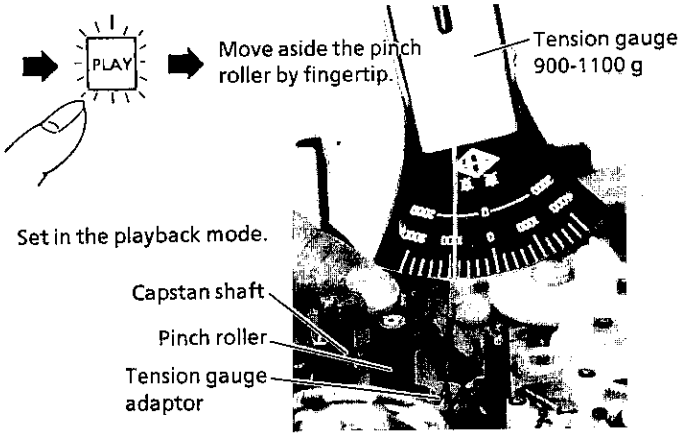
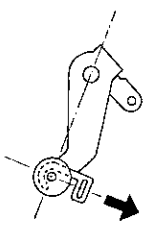


Figure 6-14(a).



Pull the pinch roller in the direction perpendicular to the line connecting the pinch roller shaft and the pinch roller arm rotating shaft.

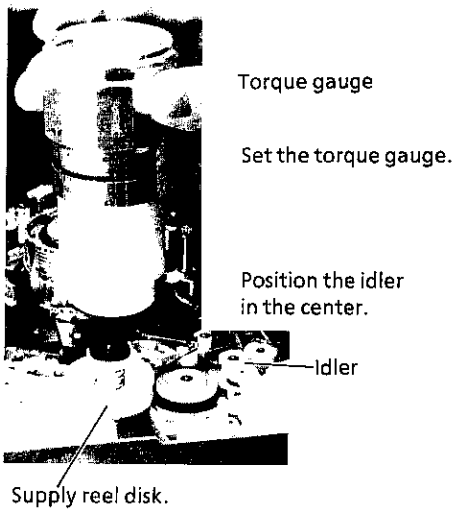
Figure 6-14(b).

6-15. CHECK OF BRAKE TORQUE

[CHECK OF SUPPLY SIDE BRAKE]

Checking

1. Checking can be made without removing the cassette housing.
2. Turn off the power in the ejection mode (remove the AC adaptor and battery).
3. Set the torque gauge onto the supply reel disk. While turning the torque gauge slowly in the bite and relief direction so that the indicator of the torque gauge rotates at the same speed as the reel disk, check that the indication falls within the specified range (bite direction : 200 ± 40g·cm, relief direction : 84 ± 30g·cm).



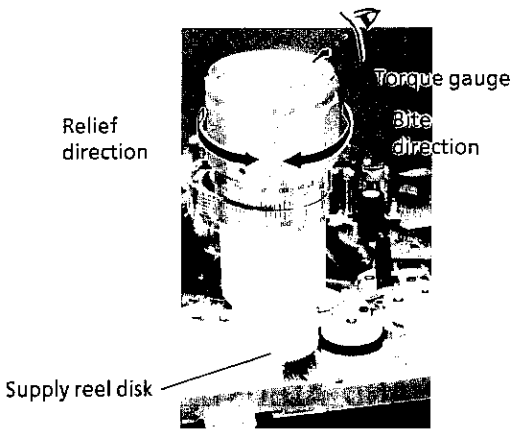
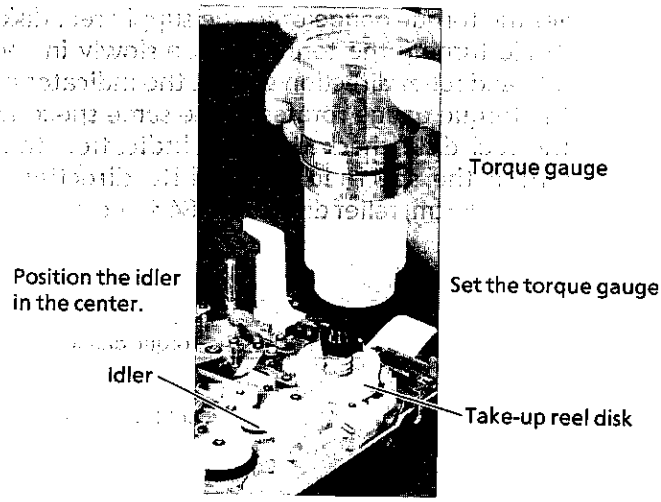


Figure 6-15(a).

[CHECK OF TAKE-UP SIDE BRAKE]

Checking

1. Checking can be made without removing the cassette housing.
2. Turn off the power in the ejection mode (remove the AC adaptor and battery).
3. Set the torque gauge onto the take-up reel disk. While turning the torque gauge slowly in the bite and relief direction so that the indicator of the torque gauge rotates at the same speed as the reel disk, check that the indication falls within the specified range (bite direction : 150 ± 30g·cm, relief direction : 108 ± 30g·cm).



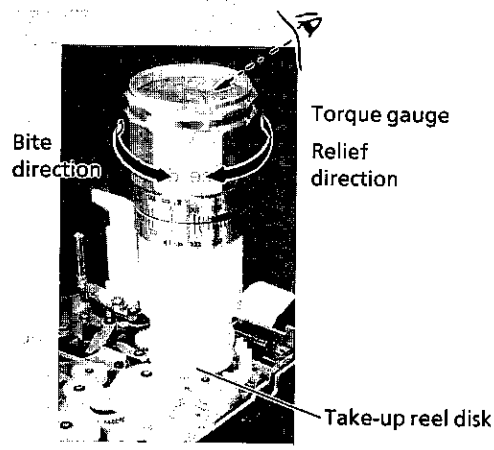


Figure 6-15(b).

6-16. CHECK AND ADJUSTMENT OF TENSION POLE POSITION AND PB/REC BACK TENSION

[TENSION POLE POSITION]

1. Set the mechanism position for the playback mode.
2. Remove the cassette housing.

Adjustment

1. Loosen the screw ① fixing the tension adjustment plate.
2. Turn the tension arm so that the gap between the subguide roller flange and the tension pole is about 1.2 mm, and then tighten the screw.

Notes:

- Take care not to damage the roller guide post of the travel system.
- When tightening the screw, support the tension arm body by finger to keep it from being bent.

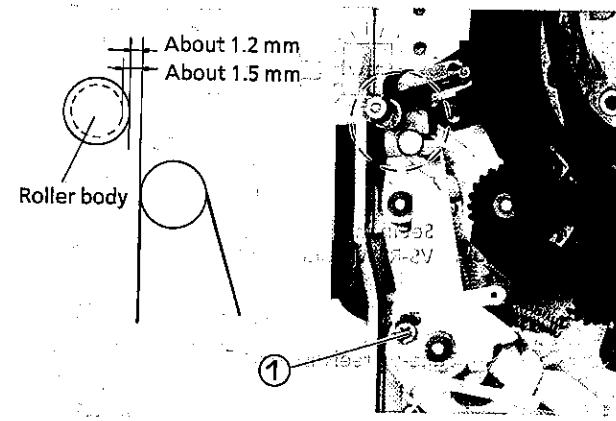


Figure 6-16(a).

Checking

1. Set the mechanism position in unloading condition. Set E-240 (only slightly wound) and place a weight (500 g) on it.
2. Set in the REC mode and run the tape.
3. Visually check the line in contact with the right side of the sub guide roller and the left side of the tension pole is approximately parallel with the chassis bent portion.

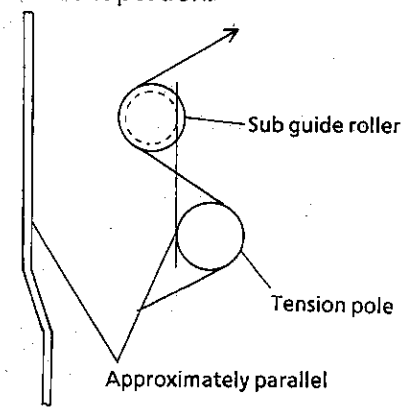


Figure 6-16(b).

4. If the above mentioned line is not approximately parallel with the chassis bent portion, increase or decrease the set value (1.2 or 1.5) at the position adjustment stated above, and then make checking again.

Reference:

The gap can be easily adjusted in the following way using a ϕ 1.5 pin.

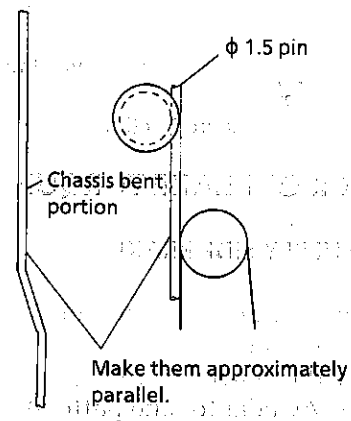


Figure 6-16(c).

[CHECK AND ADJUSTMENT OF PB/REC BACK TENSION]

1. Remove the cassette housing.
2. Remove the earth brush ass'y.

Check and Adjustment

1. Set E-240 (only slightly wound) and place a weight (500 g) on it.
2. Set in the REC mode and run the tape.
3. Move aside the supply impedance roller arm and load the tape tension gauge.
4. If the tape tension gauge indication is not within the specified range of 15 to 20 g, shift the hook portion of the tension spring to section A or section B so that the indication falls within the specified range.

Notes:

- Take care to avoid hitting the tape tension gauge against the running parts such as the drum (in particular the top end of upper drum) and supply impedance roller and damaging them.
- The tape used should be free from flaws, dirt, etc.

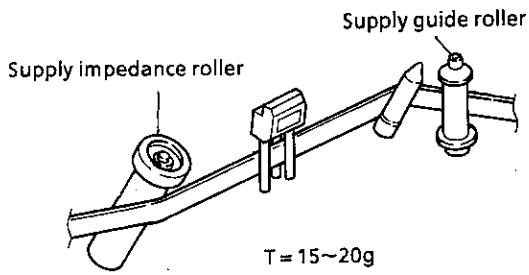


Figure 6-16(d).

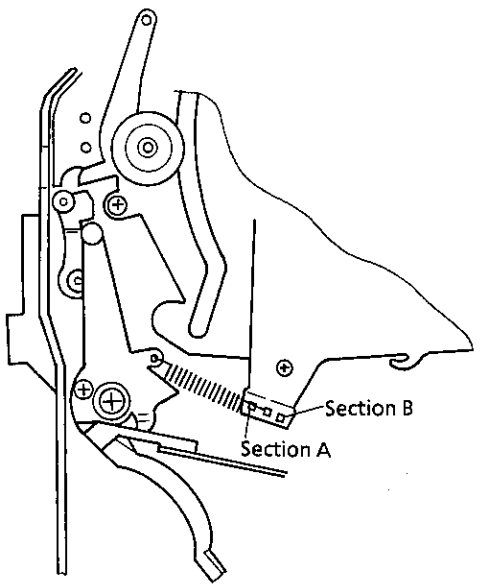


Figure 6-16(e).

6-17. DISASSEMBLY OF A/C HEAD PLATE

1. Make ejection and unplug the power cord.
2. Down the cassette housing (or remove it).

Disassembly

1. Remove the three screws ①.
2. Pull out the A/C head plate ② upward.

Note:
Take care not to bend the take-up roller arm.

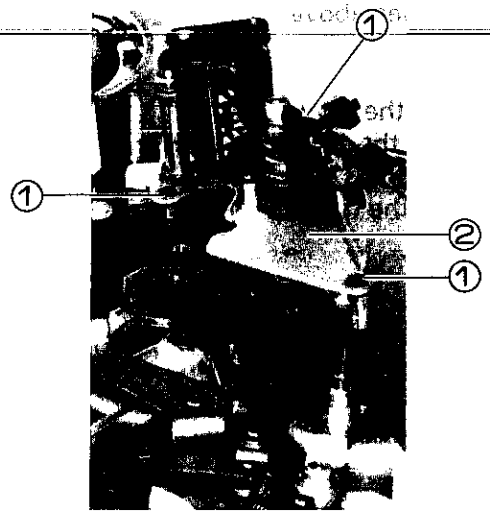


Figure 6-17(a).

Reassembly

1. Align the hole in the bottom of the segment gear ass'y with the convex portion of the take-up roller arm drive gear.
2. Insert the take-up roller arm drive gear shaft into the hole in the chassis.
3. Tighten the three screws.

Notes:

- After installing the A/C head plate, check and adjust the X-position, A/C head height, sub guide roller height, etc. according to the procedures of 6-23 and 6-24.
- Take care not to bend the take-up roller arm.
- Check that proper phase is provided.

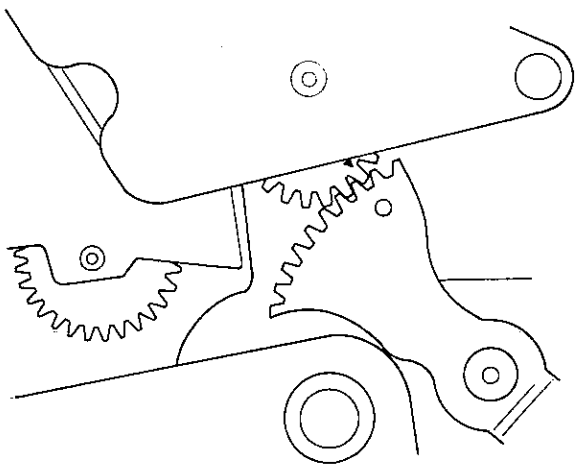


Figure 6-17(b).

6-18. DISASSEMBLY AND REASSEMBLY OF TAKE-UP ROLLER ARM

Remove the A/C head plate according to the procedures described above.

Disassembly

1. Remove the cut washer.
2. Remove the take-up roller arm return spring from the boss of the A/C head plate.
3. Pull out the take-up roller arm.

Reassembly

1. Insert the rotation shaft of the take-up roller arm into the boss of the A/C head plate.
2. At this time, the slot of the take-up roller arm should be fitted on the pin of the take-up roller arm double action lever.
3. Fit the cut washer.

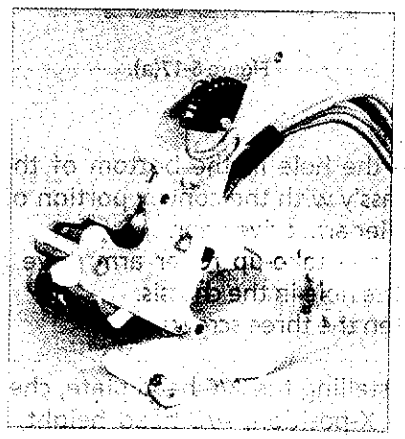


Figure 6-18.

6-19. REPLACEMENT OF A/C HEAD

With no cassette loaded in the unit, unplug the power cord.

Disassembly

1. Cut the nylon band ① fixing the A/C head lead wire on the A/C head plate ass'y and start sensor holder.
2. Remove the height adjustment nut ② and pull out the A/C head upward together with the A/C head arm.

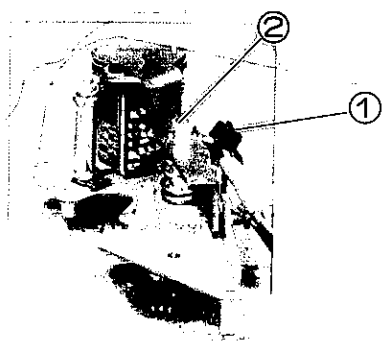


Figure 6-19(a).

3. Remove the three screws ③ fixing the A/C head on the A/C head arm.
4. Unsolder to remove the PWB from the A/C head.

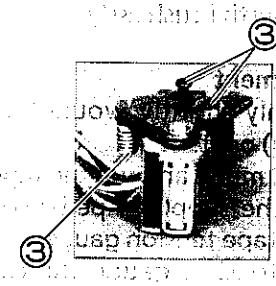


Figure 6-19(b).

Reassembly

1. Solder the removed PWB ④ to a new A/C head ⑤.
2. Fix the A/C head on the A/C head arm by tightening the three screws. (The gap between the A/C head and the A/C head arm should be about 0.8 mm and they should be approximately parallel.)
3. Fit the A/C head spring in the A/C head arm boss and fix it on the shaft of the A/C head plate ass'y with the nylon nut.
4. Hang the A/C head spring on the arm.

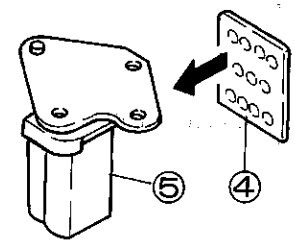


Figure 6-19(c).

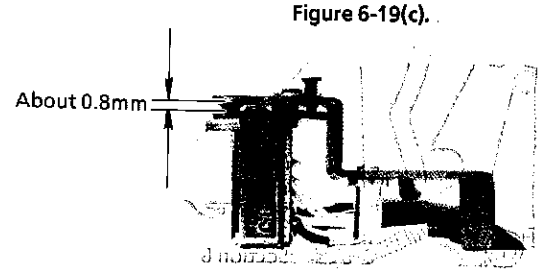


Figure 6-19(d).

6-20. DISASSEMBLING AND REASSEMBLING THE LOADING GUIDE

1. Remove the cassette housing.
2. Remove the drum assembly.
3. Turn the AC or DC (about 3 V) power on to set the mechanism to the PLAY (or REC) mode.
4. Remove the tension spring and the supply auxiliary brake spring.

Disassembly

1. Unsolder the dew sensor lead ①from the mechanism relay PWB.
2. Remove the take-up tilt base ②.
3. Unscrew the seven screws ③ and remove the cut washer ④ from the loading guide.
4. Pull up the loading guide off position together with the dew sensor lead.

Notes:

- Be careful not to damage the tape train parts (guide, post, roller) by the tools.
- Be careful not to touch the dew sensor surface.

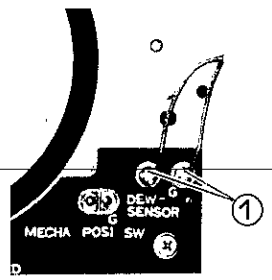


Figure 6-20(a).

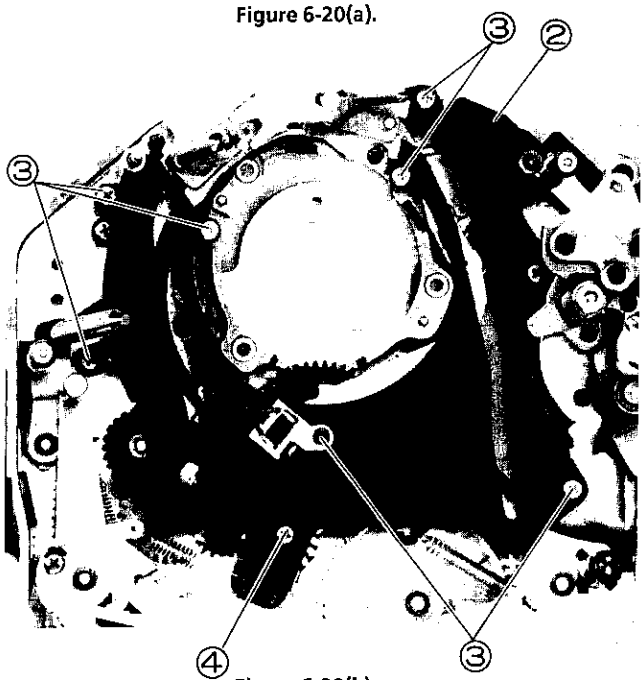


Figure 6-20(b).

Reassembly

1. Pass the dew sensor lead through the specified hole of the chassis, and set the loading guide in position.
2. Make sure that the loading guide is positioned correctly at the take-up loading gear shaft ⑤ and partially-toothed notched gear shaft ⑥ of the chassis. Now tighten up the seven screws to their specified torque and install the cut washer in position.
3. Mount the take-up tilt base.
4. Solder the dew sensor lead to the mechanism relay PWB.

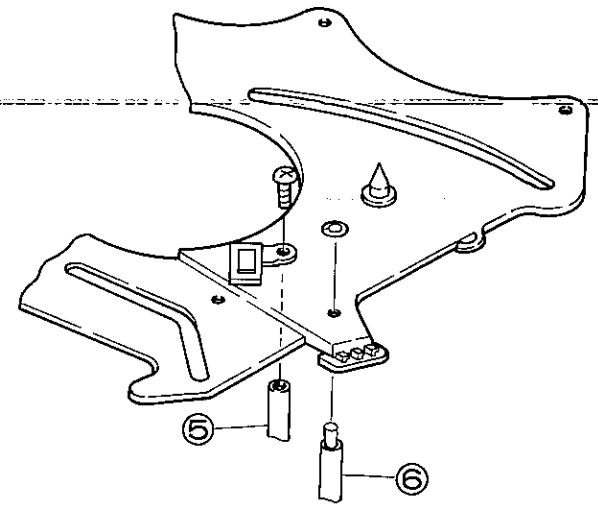


Figure 6-20(c).

6-21. DISASSEMBLING AND REASSEMBLING THE MASTER CAM

1. Remove the cassette housing.
2. Set the mechanism to the STOP mode.
3. Remove the loading block assembly.
4. Remove the tension arm and band.
5. Remove the drum assembly.
6. Remove the loading guide.

Disassembling

1. Unhook the spring ①of the supply roller arm drive lever.
2. Remove the cut washer ② from the tension release lever and pull out the lever upward.
3. Remove the cut washer ③ from the supply roller arm drive lever and pull out the lever upward.
4. Remove the cut washer ④ from the master cam and pull out the cam upward.

Note:

In drawing out the supply roller arm drive lever, be careful not to hit the lever against the chassis. The lever may be deformed.

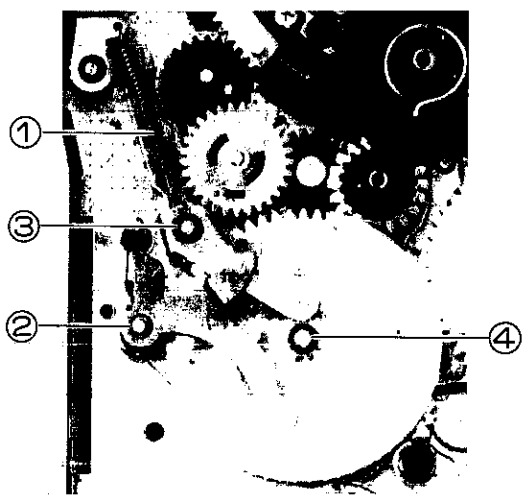


Figure 6-21(a).

Reassembly

1. Position the pinch link assembly and the reel lever B as shown in Fig. 6-21(b).
2. Install the master cam from above onto its shaft as shown in Fig. 6-21(c).
3. Move the reel lever B in the direction of arrow into the cam groove.
4. In the same way, put the pinch link assembly into the cam groove.
   Note:
   Turn the master cam and make sure the levers move correctly.
5. Place the supply roller arm drive lever, and put the cam follower pin into the master cam (in the wider groove).
6. Place the tension release lever, and put the cam follower pin into the master cam (in the narrower groove).
7. Hook the supply roller arm return spring to the supply roller arm drive lever.

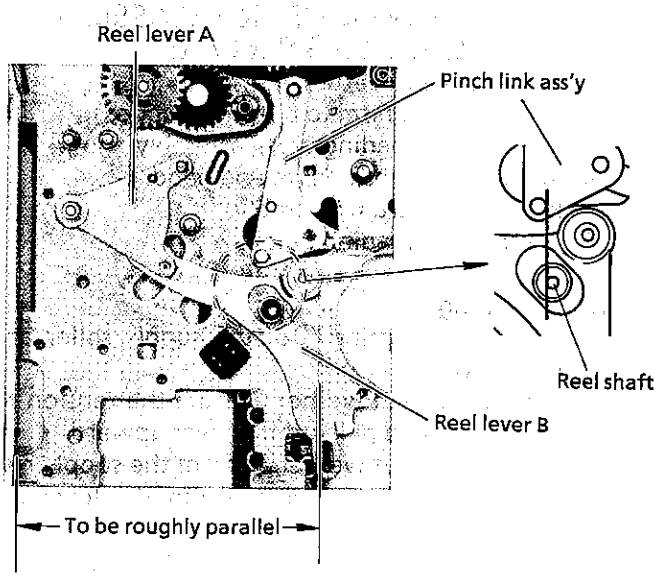


Figure 6-21(b).

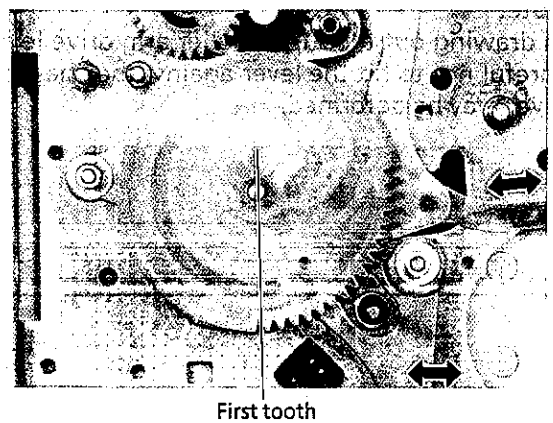


Figure 6-21(c).

[SETTING THE SUB-CAM]

1. Set the mechanism position switch to the D-cut portion of the sub-cam. Push the switch deep into position.
2. Rotate the mechanism position switch PWB so that the mechanism position terminal face the chassis' relief hole and the match mark of the master cam.
3. Arrange these parts onto the shaft as shown in Fig. 6-21(e).
4. Install the cut washer to fix the parts.

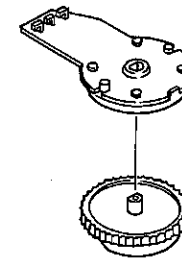


Figure 6-21(d).

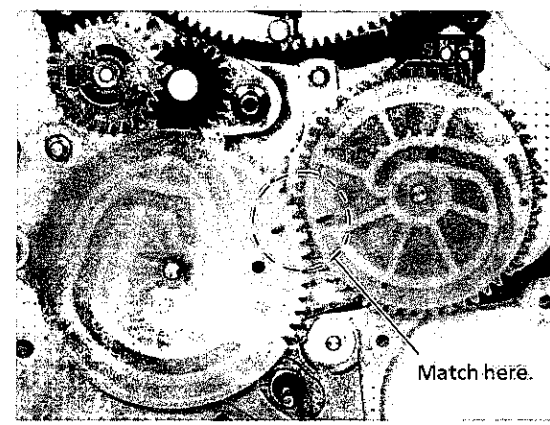


Figure 6-21(e).

6-22. POSITIONING THE SUPPLY/TAKE-UP LOADING SYSTEM

1. Return the crescent gear until its marking faces the mark on the supply relay gear B. (See section A.)
2. Place the after loading relay gear A and B assemblies from above so that their markings are as shown at sections B and C.
3. Place the partially-toothed gear assembly so that its marking face the marking on the supply relay gear A. Make sure that the first sheet of the master cam is engaged in the white partially-toothed gear. (See section D.)
4. Arrange the take-up loading gear assembly and the partially-toothed gear assembly so that their markings be as shown at section E.

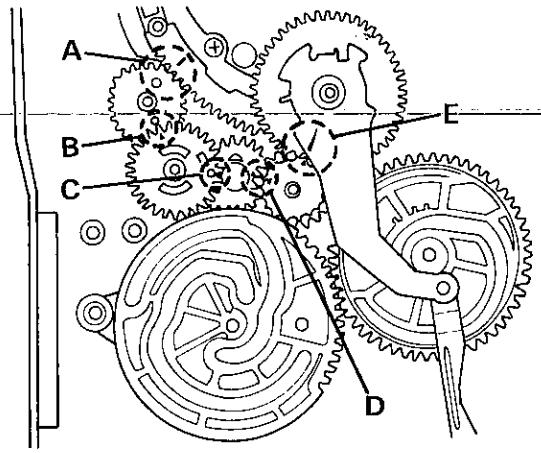


Figure 6-22.

6-23. REPLACEMENT OF A/C HEAD (ADJUSTMENT)

[A/C head tilt angle]

1. Set the mechanism chassis in the loading condition.
2. Set the master plane on the chassis as shown in Fig. 6-23(a).

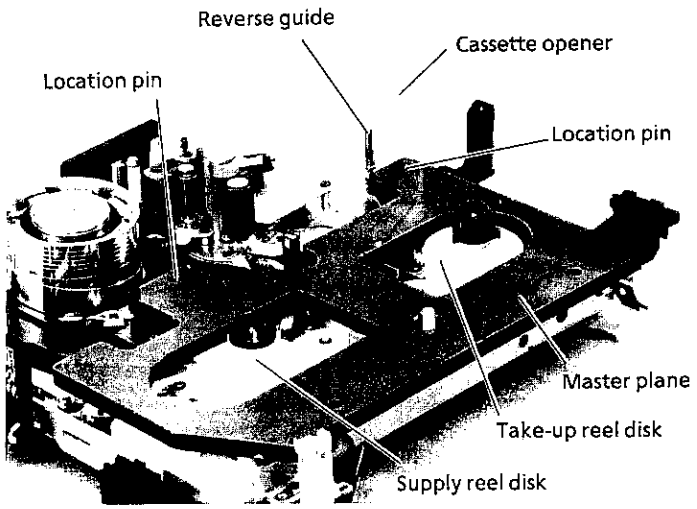


Figure 6-23(a).

3. Set the A/C head tilt adjusting jig as shown in Fig. 6-23(b).

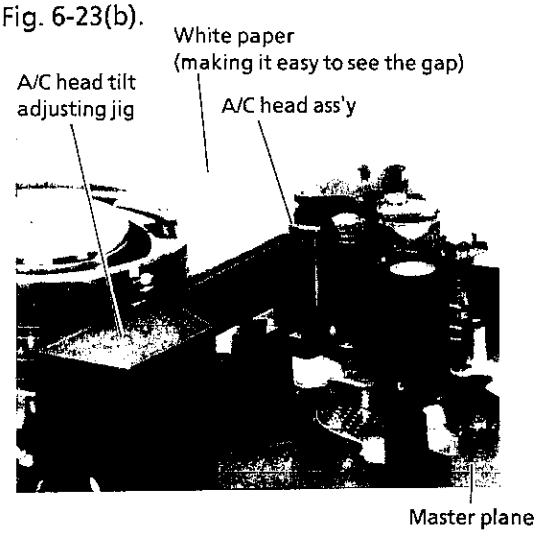


Figure 6-23(b).

4. Slowly turn the adjusting screw with a screwdriver to eliminate the gap between the A/C head and the jig.

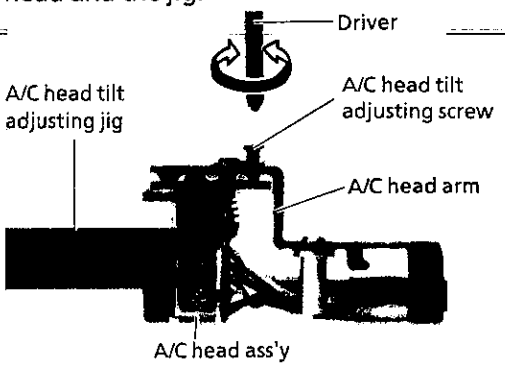


Figure 6-23(c).

5. Remove the master plane, set the tape in position, and select the playback mode. Then press a screwdriver's tip lightly against the portions A (upper edge of the tape) and B (lower edge) shown in Fig. 6-23(d) to check the tape's widthwise tension between the T roller and the A/C head. If this check shows that the portion B's tension is looser (more slackened) than that of the portion A, give the A/C head tilt adjusting screw a clockwise turn within 90° to 270° to make the portions A and B almost evenly tensioned.

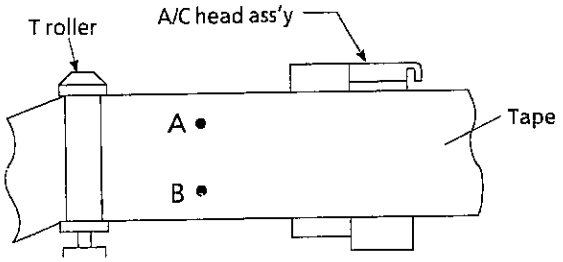


Figure 6-23(d).

[Coarse adjustment of A/C head height]

1. Set the tape in the mechanism chassis and select the playback mode.
2. Roughly adjust A/C head height by turning the A/C head height adjusting nut with the box driver so that the tape is located as shown in Fig. 6-23(f).

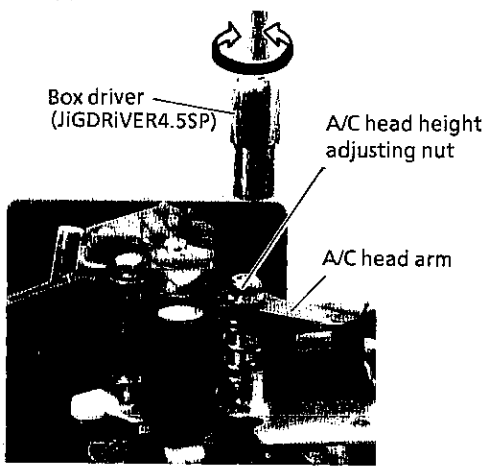
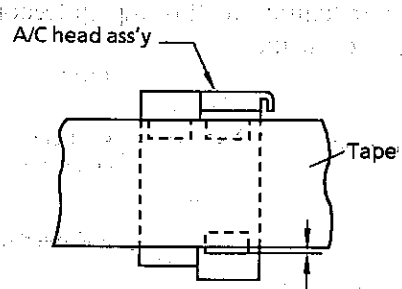


Figure 6-23(e).



Roughly adjust A/C head height so that the control head edge is located 0.3 to 0.5 mm below the lower edge of the tape by visual inspection.

Figure 6-23(f).

[Height adjustment of retaining guide, reverse guide, S roller and T roller]

Before making adjustment of tape travel, check the height of the retaining guide, reverse guide, Sroller and T roller by using the specified jig.
Set the mechanism chassis in the loading condition and set the master plane on the mechanism chassis. (See Fig. 6-23(a).)

<Retaining guide height adjustment>
Set the retaining guide height adjusting jig and check retaining guide height as shown in Fig. 6-23(g).

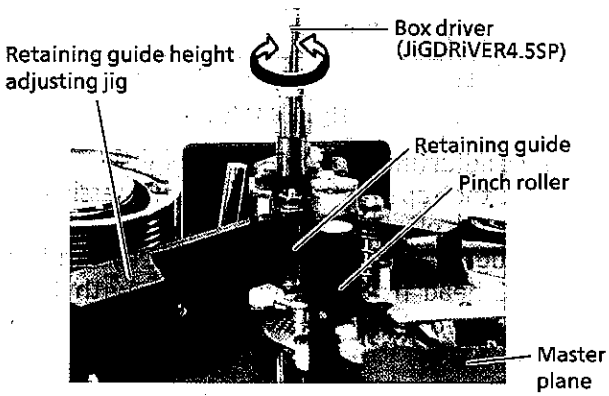


Figure 6-23(g).

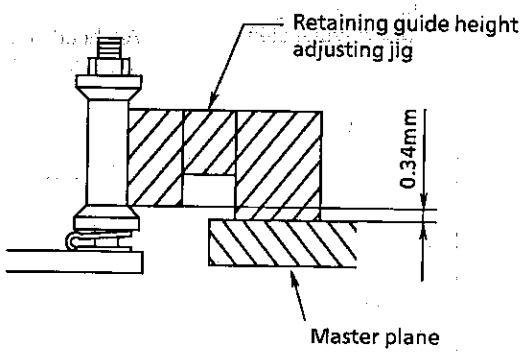


Figure 6-23(h).

<Reverse guide height adjustment>
Set the reverse guide height adjusting jig and check reverse guide height as shown in Fig. 6-23(i).

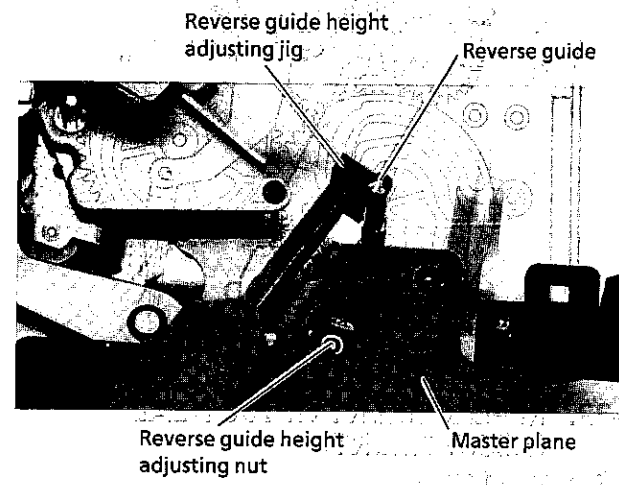


Figure 6-23(i).

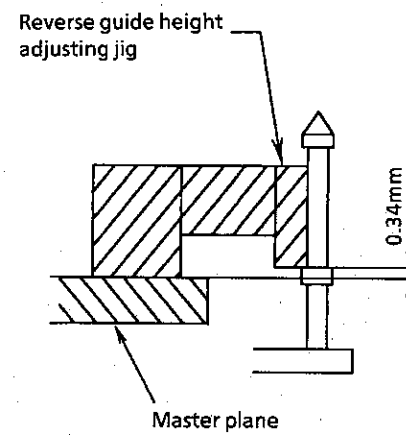


Figure 6-23(j).

<S roller height adjustment>
Set the S roller height adjusting jig and check S roller height as shown in Fig. 6-23(k)

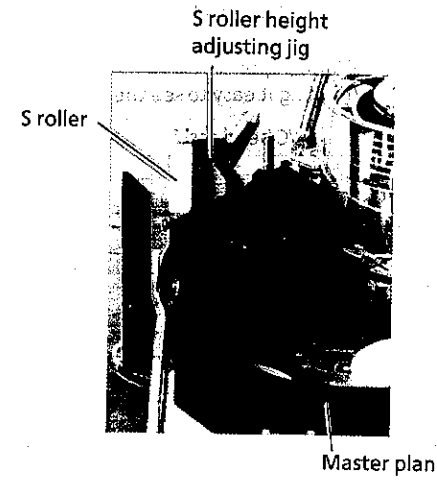


Figure 6-23(k).

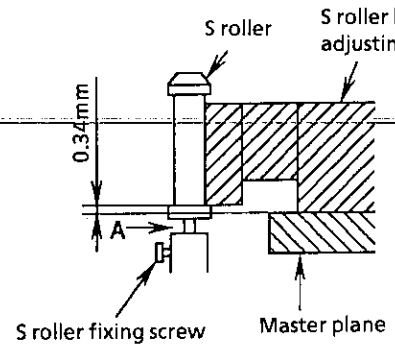


Figure 6-23(l).

If S roller height is not proper, loosen the fixing screw, insert a slender screwdriver into the gap between the lower flange and the boss (section A in Fig. 6-23(l)), shift the S roller with the screwdriver so that S roller height is aligned with the jig, and then tighten the fixing screw. (Do not make the fixing screw too loose. Otherwise, S roller height will change excessively.)
Let the tape run and check to see if its upper edge comes in contact with the S roller's upper flange and gets folded. If it does, raise the S roller until the tape's upper edge does not get folded or creased. In case the tape's lower edge comes in contact with the S roller's lower flange, readjust the S roller downward.

<T roller height adjustment>
Set the T roller height adjusting jig and check T roller height as shown in Fig. 6-23(m).

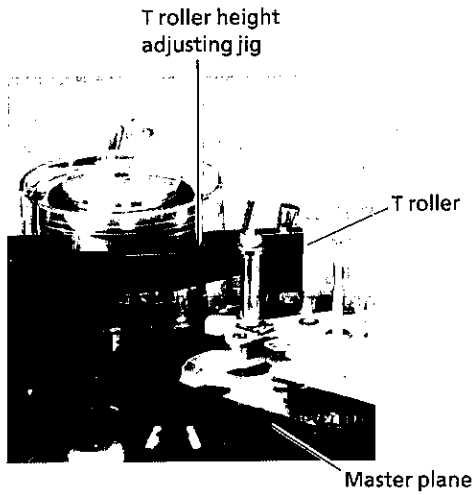


Figure 6-23(m).

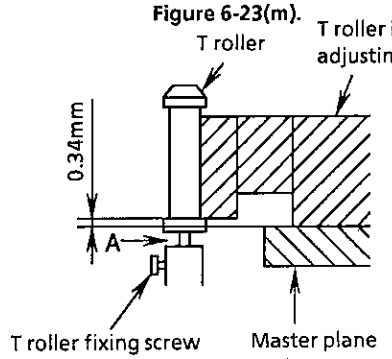


Figure 6-23(n).

If T roller height is not proper, align it with the jig in the same way as the S roller.
Just as in the case of the S roller, let the tape run and readjust the T roller up and down so that the tape's both edges may not get folded.

6-24. TAPE TRAVEL ADJUSTMENT

1. Remove the cassette housing.
2. Check and adjust the tension pole position (see "6-16. CHECK AND ADJUSTMENT OF TENSION POLE POSITION").
3. Check and adjust the video search rewind (VS-REW) back tension (see "6-13. CHECK OF VIDEO SEARCH REWIND (VS-REW) BACK TENSION).
4. Set the A/C head tilt adjusting jig (see "6-23. REPLACEMENT OF A/C HEAD").
5. Coarse adjustment of tape travel.
   1) Connect an oscilloscope to the PB CHROMA envelope test point (TP). An external trigger should be taken from the head switching pulse test point to the EXT jack of the oscilloscope.
   2) Loosen the fixing screw at the bottom of the guide roller and adjust the guide roller with the adjusting screwdriver to allow its free rotation. (Do not make the fixing screw too loose. Otherwise, irregular rotation of the guide roller may result.)

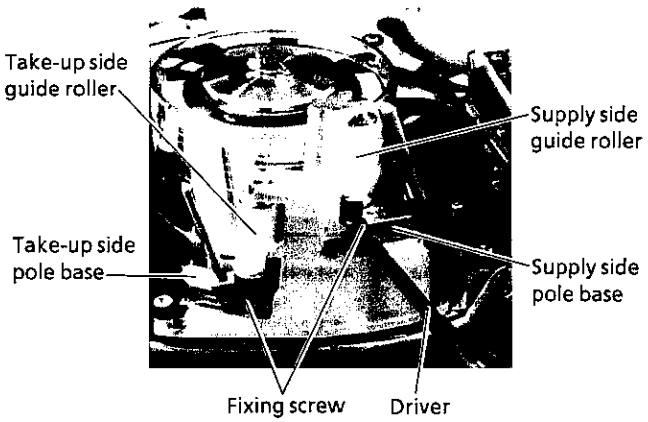


Figure 6-24(a).

   3) Load the tape travel adjusting cassette tape on the reel disk and play back it. (Place a weight of 400 to 500 g on the top of the cassette tape to keep it in position.)

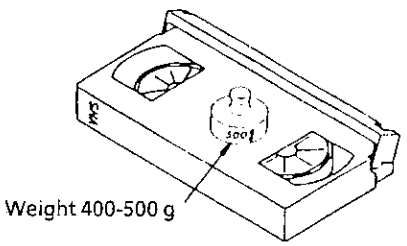


Figure 6-24(b).

4) Press the (+) and (−) tracking buttons to vary the envelope from the maximum to minimum amplitude, and vice versa. Check that the envelopes vary in the form of almost flat lines.
5) If not, adjust the height of both the supply and take-up side guide rollers with the guide roller adjusting hexagon wrench so that the envelopes vary in the form of almost flat lines.

Notes:

- To ease coarse adjustment of tape travel, it is recommended that the envelopes be preadjusted to a maximum amplitude by turning the X-position adjusting screw with the tracking control set to the center position.
- Especially, the envelope of the take-up side signal should be adjusted as flat as possible.

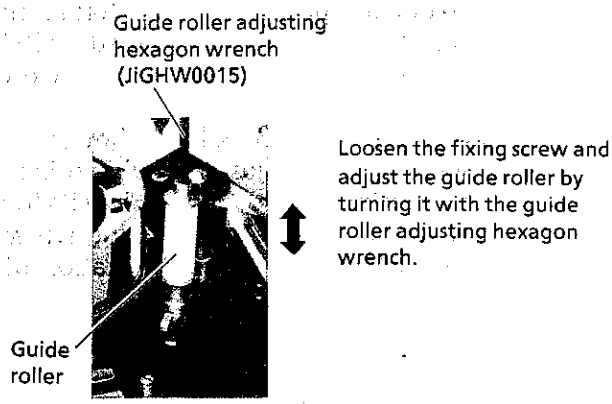


Figure 6-24(c).

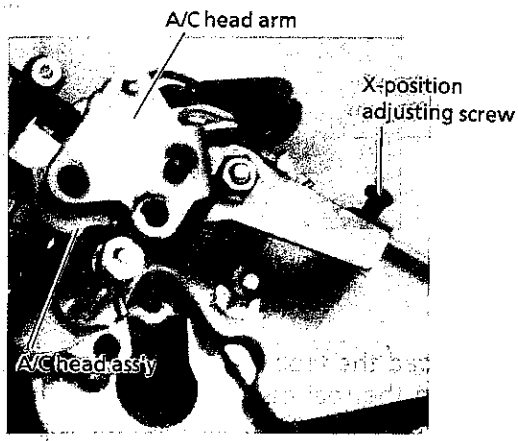


Figure 6-24(d).

6) Adjust the height of the retaining guide by using the retaining guide height adjusting box driver so that the lower flange comes in contact with the tape edge.

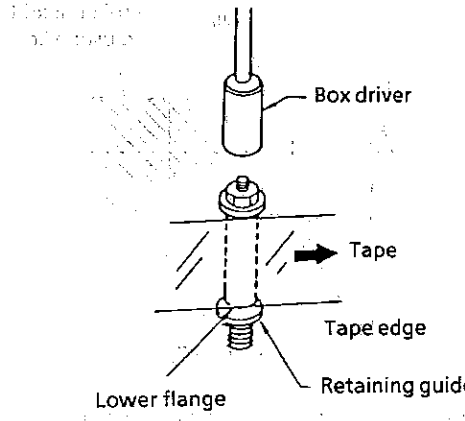


Figure 6-24(e).

6. Adjustment of A/C head and azimuth
1) Connect an oscilloscope to the audio output connector.
2) While playing back the 6 kHz audio portion (monoscope pattern for video signal) of the alignment tape, adjust the audio output waveform to the maximum level by turning the azimuth adjusting screw.

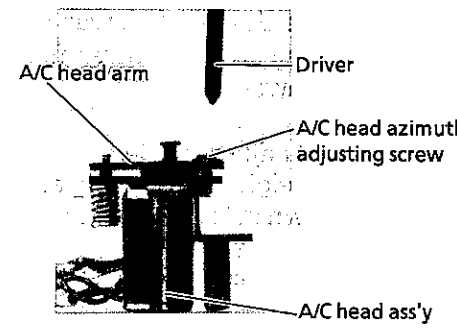


Figure 6-24(f).

3) While playing back the 1 kHz audio portion (color bar for video signal) of the alignment tape, adjust the audio output waveform to the maximum level by slowly turning the A/C head height adjusting nut with the A/C head height adjusting box driver.

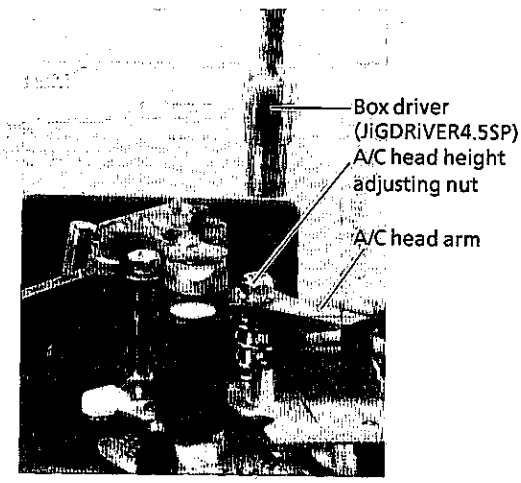


Figure 6-24(g).

4) Repeat the adjustment described in step 2.
5) After adjustment, apply locktite (adhesive) to the adjusting screws and nuts to fix them.

7. Tape travel compatibility adjustment
1) Connect an oscilloscope to the PB CHROMA envelope test point (TP). An external trigger should be taken from the head switching pulse test point to the EXT jack of the oscilloscope.
2) Play back the tape travel adjusting cassette tape.
3) Adjust the height of both the supply and take-up side guide rollers with the guide roller adjusting hexagon wrench so that the envelopes vary in the form of almost flat lines when pressing the (+) and (−) tracking buttons to vary the envelope from the maximum to minimum amplitude, and vice versa.
4) If the tape is located above or below the helical lead of the head, the PB CHROMA envelope will take the shape as shown in Fig. 6-24(h).
5) Adjust the envelope as flat as possible by the same procedure as step 5- 5).
6) While pressing the (+) and (−) tracking buttons, check that the envelopes vary in the form of almost flat lines.
7) Tighten the guide roller fixing screws to fix the guide rollers in the unloading condition.
8) Play back the tape travel adjusting cassette tape and check that the envelopes do not fluctuate.

8. Adjustment of A/C head X-position
1) Press the (+) and (−) tracking buttons simultaneously to set the tape transport in the preset condition.
2) Adjust the X-position of the A/C head by turning the X-position adjusting screw with the adjusting screwdriver so that the envelope of the low-channel head switching pulse becomes the maximum level.
3) Adjust the playback switching point.
4) Play back the self-recorded video tape to check the flatness of the envelopes and the audio output quality.

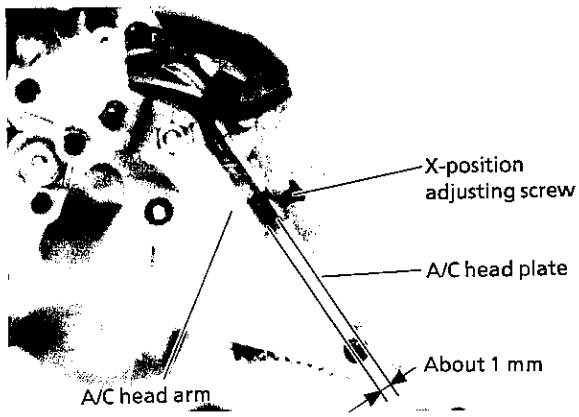


Figure 6-24(i).

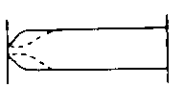
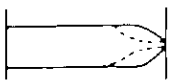
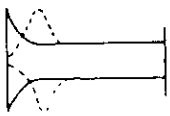
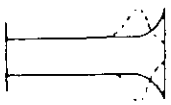
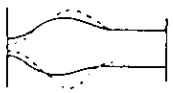
Tape is located above helical lead.		Tape is located below helical lead.	
Supply side	Take-up side	Supply side	Take-up side
			
			
Adjustment			
Make the envelope flat by turning the supply side guide roller clockwise (downward).	Make the envelope flat by turning the take-up side guide roller clockwise (downward).	Turn the supply side guide roller counterclockwise so that the flange of the guide roller lifts the tape upward. Then, turn the supply side guide roller clockwise to make the envelope flat.	Turn the take-up side guide roller counterclockwise so that the flange of the guide roller lifts the tape upward. Then, turn the take-up side guide roller clockwise to make the envelope flat.

Figure 6-24(h).

6-25. CLEANING OF TRAVEL SYSTEM

Clean the tape travel system if dirty.

1. Wiping with dry cotton swab
   With a dry cotton swab, wipe ②, ⑥, ⑧ and ⑪ in Fig. 6-25(a).
2. Cleaning with cotton swab moistened with alcohol
   With a cotton swab moistened with alcohol, clean ①, ③, ④, ⑤, ⑦, ⑨, ⑩, ⑫, ⑬, ⑭ and ⑮.

Note:
In cleaning the drum ⑦, be careful not to touch the video head (5 locations) with a cotton swab. (Fig. 6-25(b))

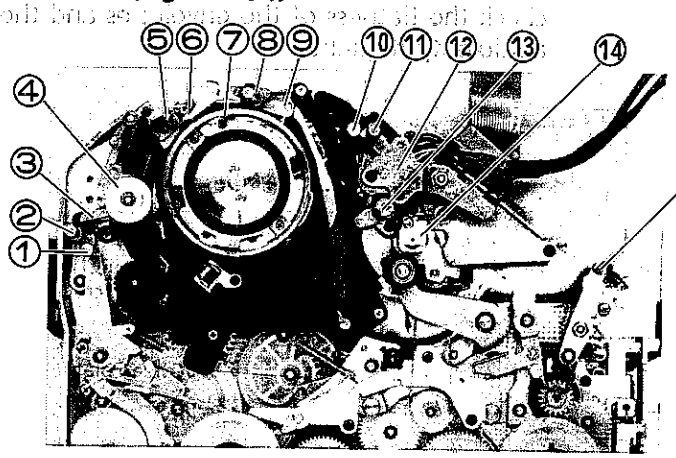


Figure 6-25(a).

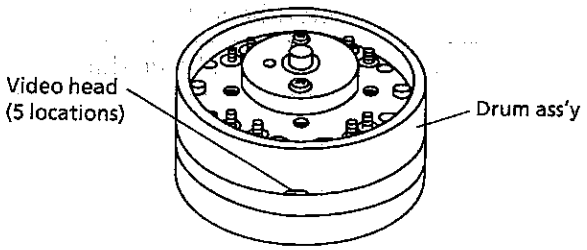


Figure 6-25(b).

6-26. REPLACEMENT OF DRUM MOTOR

1. Remove the earth brush ass'y fixing screw ① and remove the earth brush ass'y together with the tape guide C attached to it.

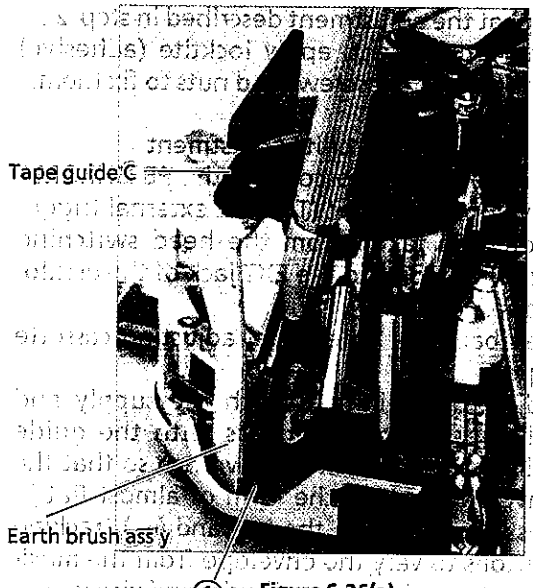


Figure 6-26(a).

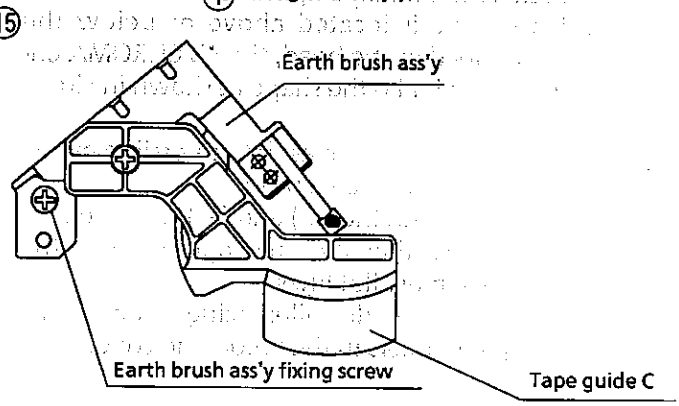


Figure 6-26(b).

2. Then, after removing the cut washer fixing the supply impedance roller arm, remove the supply impedance roller arm, supply impedance roller arm spring and washer. At this time, great care should be taken not to cause no scratch or dirt to the surface of the supply impedance roller and drum.

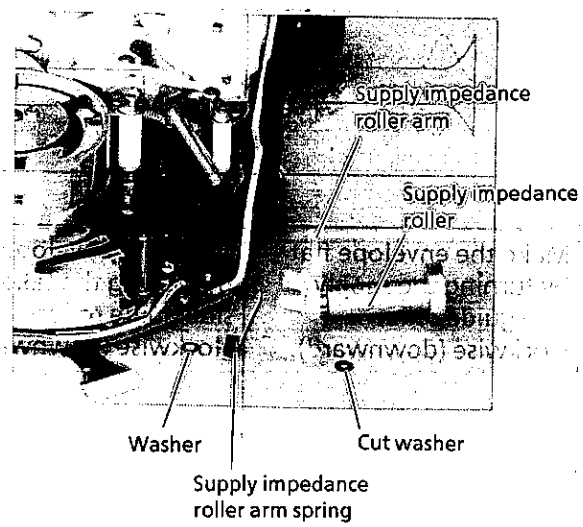


Figure 6-26(c).

3. From the back of the main chassis, remove the two FPC retaining bracket fixing screws ② and remove the FPC retaining bracket.

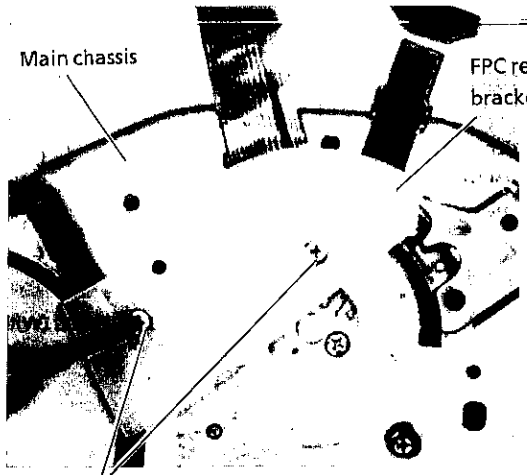


Figure 6-26(d).

4. From the back of the main chassis, remove the three drum fixing screws ③ and remove the upper and lower drum ass'y.

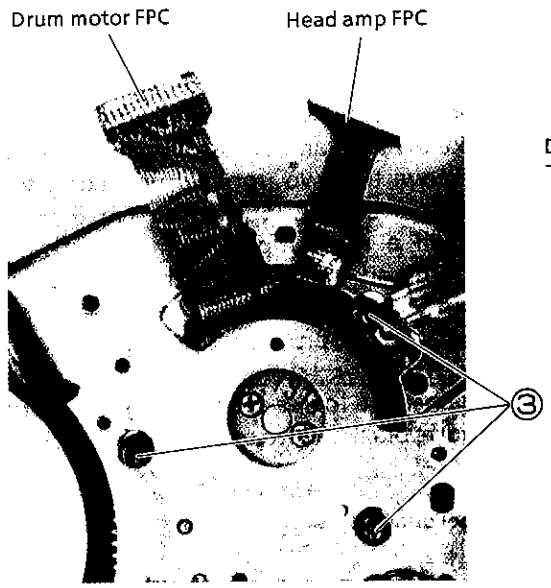


Figure 6-26(e).

5. Remove the two rotor fixing screws ④ and remove the drum motor rotor.

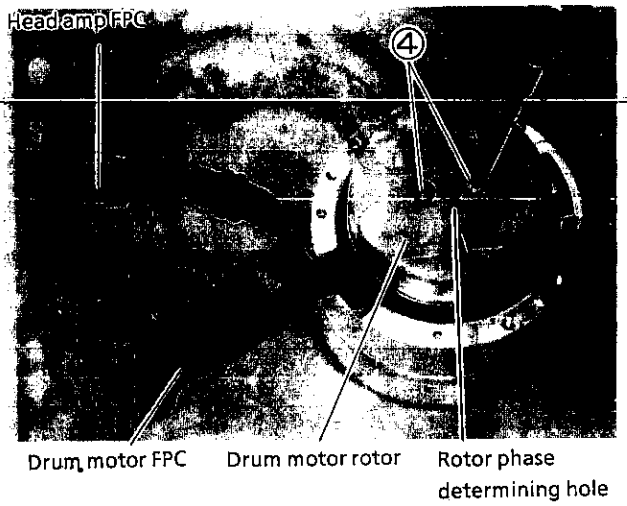


Figure 6-26(f).

6. Remove the three stator fixing screws and remove the drum motor stator.

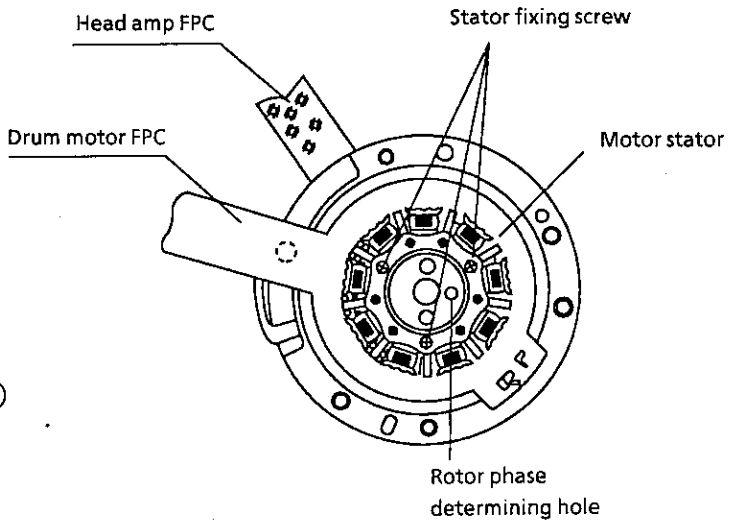


Figure 6-26(g).

7. Install a new drum motor stator in the reverse order to step 6. The three screws should be torqued to 1.0 ± 0.1 kg·cm. After tightening the screws, apply locktite to the head of the screws.
8. Install a new drum motor rotor in the reverse order to step 5. The two screws should be torqued to 2.0 ± 0.1 kg·cm.
9. Fix the completed drum unit on the drum base. Installation should be made in the reverse order to the above stated removal. At this time, be sure to pass the head amp FPC and drum motor FPC through the FPC passing hole in the main chassis. The three screws should be torqued to 1.0 ± 0.1 kg·cm.

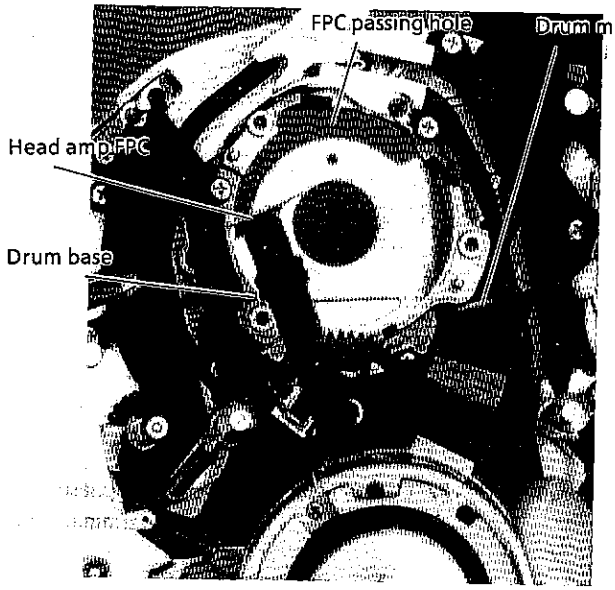


Figure 6-26(h).

10. Install the FPC retaining bracket in the reverse order to the removal. Then, while turning the drum by hand, check that the FPC does not come in contact with the motor rotor. The two screws should be torqued to 1.5 ± 0.1 kg·cm.
11. Install the supply impedance roller arm in the reverse order to the removal.
12. Install the earth brush ass'y in the reverse order to the removal. The screw should be torqued to 2.0 ± 0.1 kg·cm.
13. Make tape travel adjustment, X-position adjustment and switching point adjustment.

6-27. REPLACEMENT OF UPPER DRUM

Preparation before replacement

Before replacing the upper drum, assemble the upper drum radial runout measuring device by installing the microchecker stand and microchecker on the master plane.

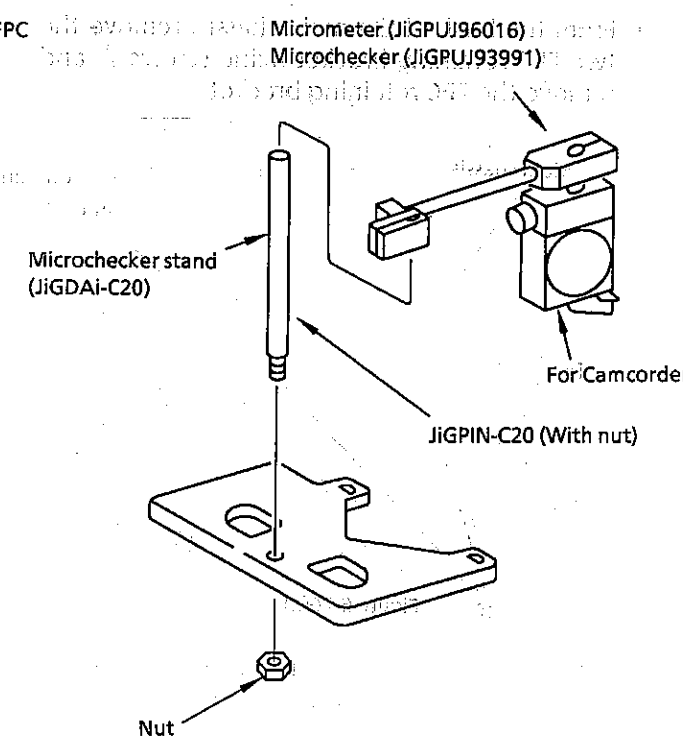


Figure 6-27(a).

1. Remove the two damper fixing screws ① and take off the damper ass'y (Fig. 6-27(b)).
2. Remove the two upper drum fixing screws ② and take off the upper drum (Fig. 6-26(b)).
3. Install a new upper drum referring to the matchmark and tighten the two upper drum fixing screws ③. At this time, great care should be taken not to hit the upper drum rotary transformer (cylindric black ferrite core) against the lower drum rotary transformer (cylindric black ferrite core) (Fig. 6-27(c)).

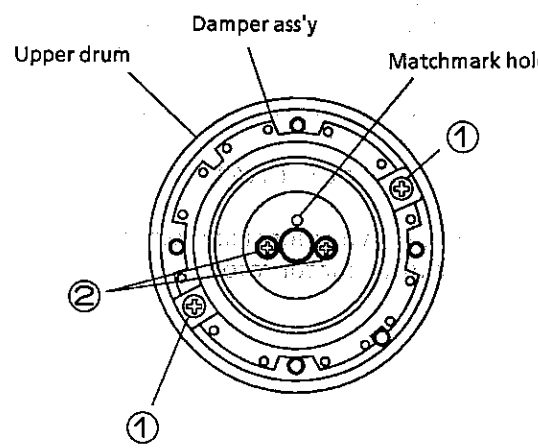


Figure 6-27(b).

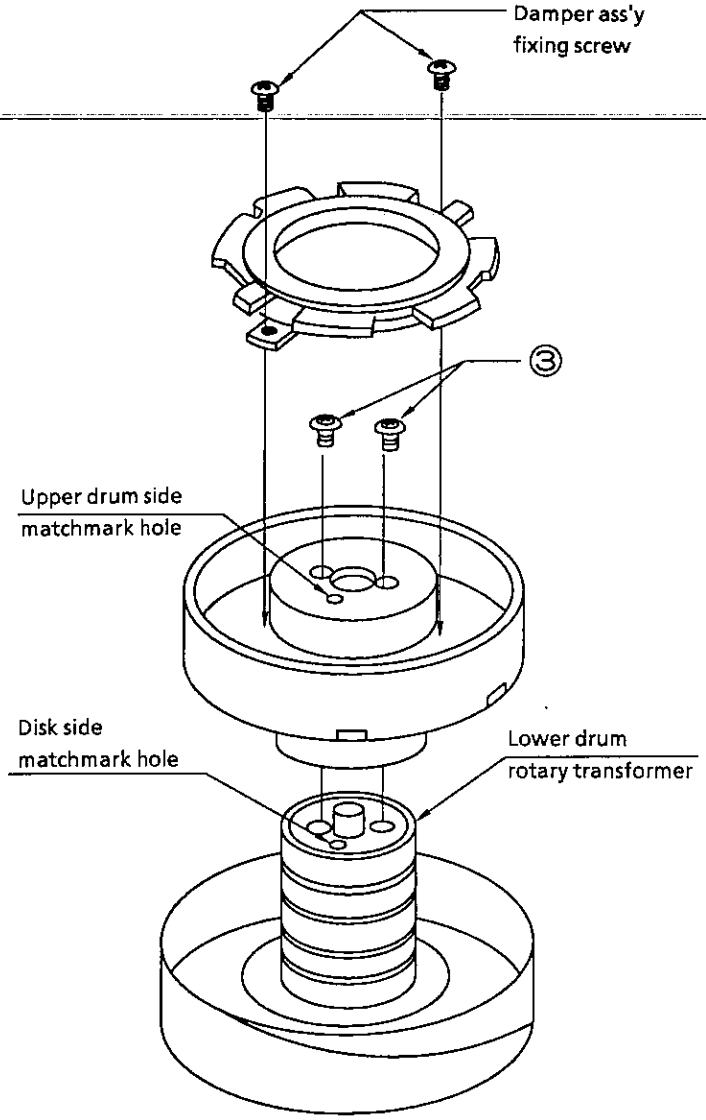


Figure 6-27(c).

4. Check of radial runout
   1) Install the radial runout measuring device prepared above on the mechanism chassis, taking care that the probe is not in contact with the drum. The probe should be located within 2 to 5 mm of the upper drum top.

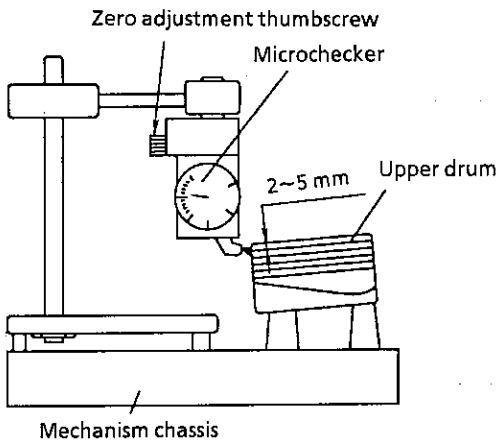


Figure 6-27(d).

   2) Turn the zero adjustment thumbscrew of the microchecker so that the indicator points at "0".
   3) While slowly turning the upper drum taking care not to apply undue force to it, check that the radial runout of the upper drum is within 4 µm. If not, half tighten the two upper drum fixing screws and make the following adjustment (Fig. 6-27(d)). Insert a clock screwdriver into the gap between upper drum and shaft opposite to the (+) peak direction of upper drum radial runout as shown in Fig. 6-27(e), and shift the upper drum opposite to the (+) peak direction so that the radial runout of the upper drum is within 4 µm (Fig. 6-27(e)).
   Then, fully tighten the upper drum fixing screws and check that the radial runout is within 4 µm. The upper drum fixing screws should be torqued to 2.0 ± 0.2 kg·cm.

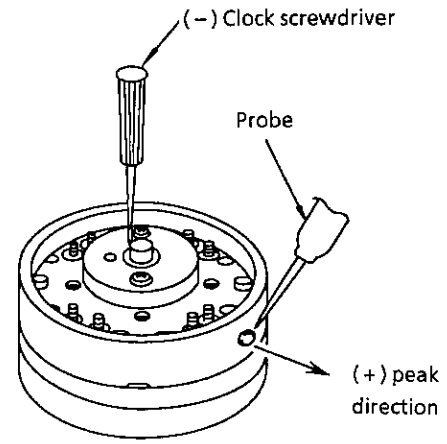


Figure 6-27(e).

5. Install the damper ass'y in the reverse order to the removal.
6. After replacing the upper drum, make switching point adjustment and X-position adjustment.

6-28. REPLACEMENT OF UPPER AND LOWER DRUM UNIT

Utmost care should be taken when removing or replacing the upper and lower drum unit. In particular, be sure to avoid touching the video head.

1. Remove the earth brush ass'y, supply impedance roller arm, FPC retaining bracket and the upper and lower drum and drum motor ass'y according to steps 1, 2, 3 and 4 of 6-26. REPLACEMENT OF DRUM MOTOR.
2. Place the upper and lower drum and drum motor ass'y with the upper drum at the bottom and remove the drum motor according to steps 5 and 6 of 6-26. REPLACEMENT OF DRUM MOTOR. Then, remove the pole base guide fixing screw and remove the pole base guide (Fig. 6-28).

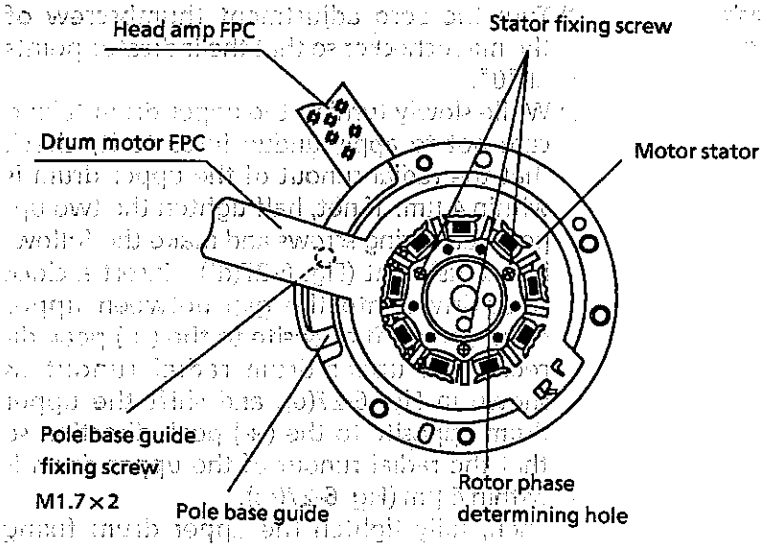


Figure 6-28.

3. Install the pole base guide removed in step 2 on the replacing upper and lower drum ass'y. The pole base guide fixing screw should be torqued to 0.7 ± 0.05 kg·cm.
   Then, install the drum motor removed in step 2 according to steps 6 and 7 of 6-26. REPLACEMENT OF DRUM MOTOR.
4. Install the upper and lower drum ass'y to which the pole base guide and drum motor are attached in step 3 above according to the step 9 of 6-26. REPLACEMENT OF DRUM MOTOR. Then, install the FPC retaining bracket, supply impedance roller and earth brush ass'y according to step 10, 11 and 12 of 6-26. REPLACEMENT OF DRUM MOTOR.
   Note:
   Take care that the upper and lower drum ass'y and surrounding parts are not damaged.
5. After replacing the upper and lower drum, be sure to make tape travel adjustment, X-position adjustment and switching point adjustment.

7. ADJUSTMENT OF ELECTRICAL CIRCUIT

7-1. ADJUSTMENT OF CAMERA SECTION

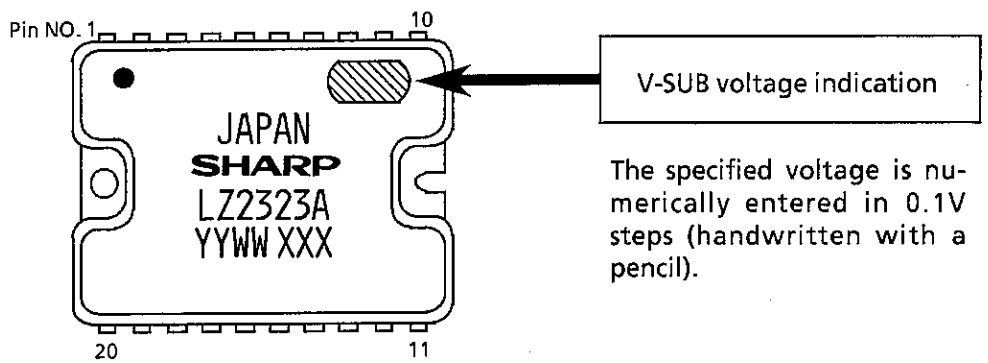
Service for Camera Section

- Servicing Method
  The following extension cords are required in performing PWB repair and re-adjustment of camera section.

Parts code	Connection point	Connector name
CPWBN2309TA01	Main PWB	S18 (TEST1)
CPWBF2303TA01	Main PWB	S9 (TEST CON)

CCD Sensor Replacement

- Before replacement
  1) The CCD image sensor has weaker characteristic than C-MOS LSI against the damage caused by static electricity. Therefore, Electro-static Damage Prevention Technique must thoroughly be carried out at replacement.
     - The soldering iron must be grounded.
     - Human body must also be grounded by wearing the wrist strap (via 1 MΩ resistor).
     - The CCD sensor must be put into the conductive sponge for its foot lead to be shorted until it is fixed on the board.
  2) Take good care not to stick any stain, dust or scar on the surface glass or optical filter of CCD sensor. If any stain such as fingerprints sticks, wipe it off with silicon paper or clean chamois.
  3) When replacing the CCD sensor, use the soldering iron with protection against static electricity and make soldering within a very short time.
  4) Before installing the CCD sensor, read the indicated value of V-SUB voltage shown on the back of CCD sensor and put it down on a note, etc. As for V-SUB voltage adjustment, see item 1 of adjustment procedure.



The specified voltage is numerically entered in 0.1V steps (handwritten with a pencil).

NOTE: Indication of voltage (V-SUB) set value
Voltage set value is indicated in the back of CCD sensor.

[DISASSEMBLY OF THE LENS UNIT]

Removing the lens holder

Unscrew the fixing screw ① and slide the lens hook ⓐ in the direction Ⓐ to remove the lens holder.

Removing the CCD sensor

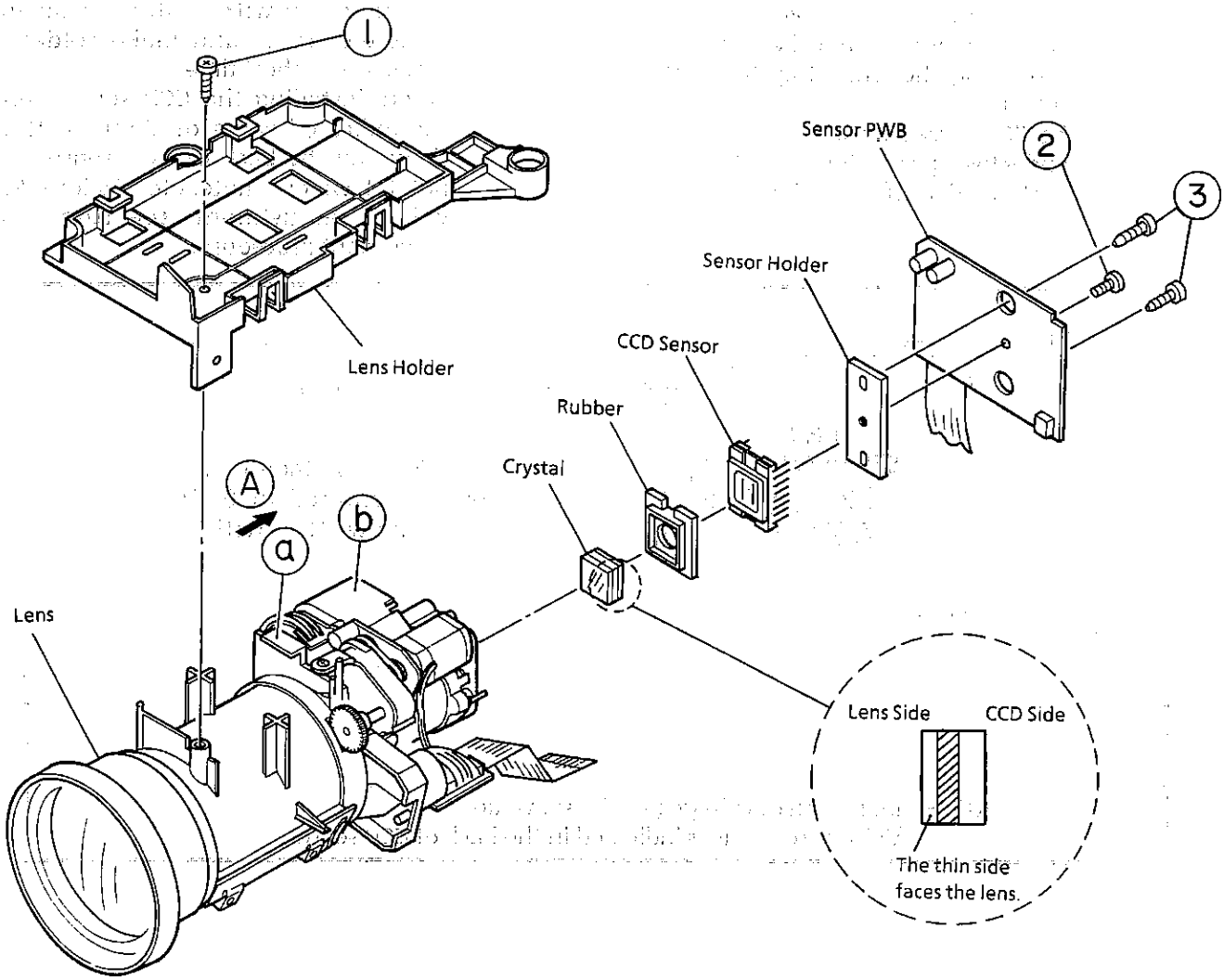
1. Unsolder the CCD sensor off the sensor PWB.
2. Unscrew the screw ② to remove the sensor PWB.
3. Unscrew the two screws ③ to remove the sensor holder, and then the CCD sensor.

Reassembling the CCD sensor

1. Get the lens unit upright (the CCD sensor with its face down), and put the crystal first and then the dust-proof rubber in the CCD holder. Place the crystal in such a way that its thin side faces the lens.
2. Insert the CCD sensor into the CCD holder (along the CCD holder's guide pin).
   Note:
   Insert the CCD sensor in the correct direction.
3. Mount the sensor holder to the lens with the two screws ③.
   Note:
   Place the sensor holder in such a way that its flat surface faces the CCD sensor surface.
4. Insert the CCD sensor pin carefully into the sensor PWB, and fix the sensor PWB with the screw ②.
5. Solder the CCD sensor pin with the sensor PWB.
   Note:
   Take care not to apply excessive heat.

Notes:

- When handling the lens unit, take care not to touch the part ⓑ and not to remove the screw fixing the part ⓑ.
- The CCD sensor is not resistant to static electricity; avoid working places exposed to static electricity.
- When mounting the CCD sensor, take care not to let dust or any other foreign matter go into the lens.

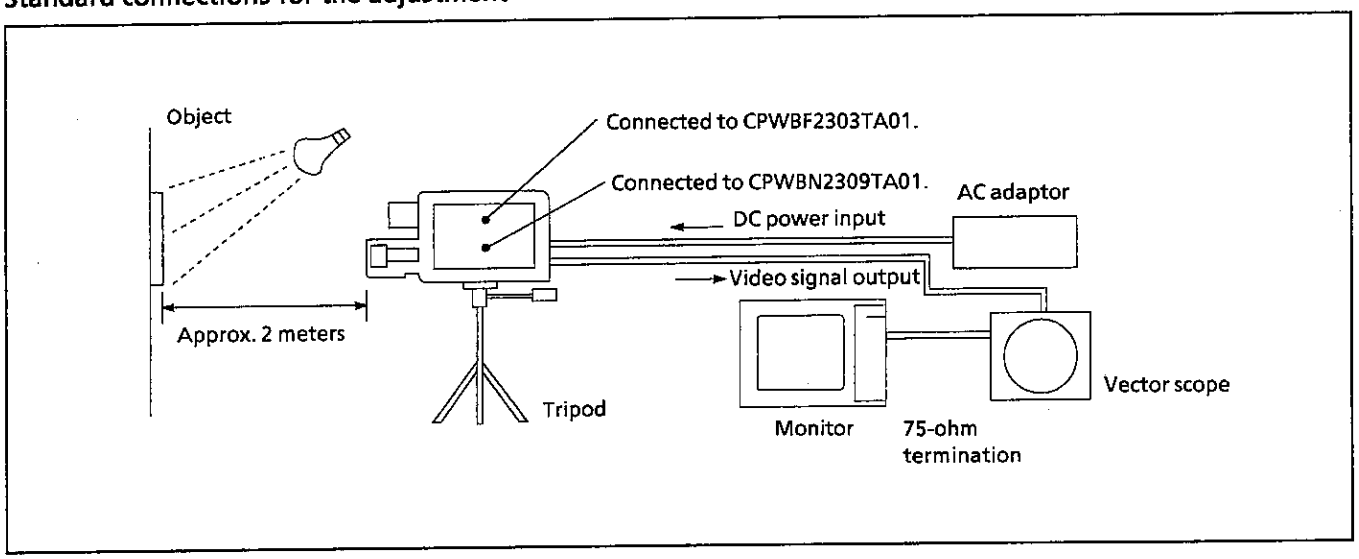


[ADJUSTING THE CAMERA UNIT]

Image objects, instruments, and jigs needed for the adjustment

- Gray scale chart
- Colour bar chart
- Oscilloscope
- Digital voltometer
- Illuminometer
- Colour video monitor
- Halogen light, 2 pcs.
- Camera adjusting jigs:
  CPWBN2309TA01
  CPWBF2303TA01
- Vector scope
- Colour thermometer
- AC adaptor
- RCA pin output cable
- Colour temperature conversion filter:
  Cold conversion HOYA "LB-165"

Standard connections for the adjustment



1. For adjusting the camera unit, wire the set (with its cabinet half open) to the temporarily fixed viewfinder (the shoe portion temporarily screwed down) and fix it on the tripod.
2. Connections to the instruments and the jigs are as shown in the figure above.

Preparations and items to check before the adjustment

1. Illumination
   Adjust the illuminance so that the entire pattern surface be uniformly exposed to the illuminance of some 3000 lux (It is therefore desirable to use two or more light sources).
   Colour temperature: 3200°K
2. Use a new test pattern neither stained nor faded.
3. In case any electric circuit is found having a trouble, be sure to locate it using an applicable instrument and repair or replace it before starting the adjustment. Never touch any adjusting controls or adjustment data without clearing away the trouble.
4. The camera unit uses microcomputers for adjusting the main camera signal system and the lens system. For microcomputer mode setting, the jig CPWBN2309TA01 is connected to the S18 connector (TEST 1) of the main PWB, and the CPWBF2303TA01 to the S9 connector (TEST CON.). Each mode is selected by an applicable switch setting.

Mode selection

a) For selecting the camera signal system adjusting mode, take the following steps:

1. Turn off the power.
2. Turn on the KEY switch of the jig CPWBF2303TA01 (Turn off other switches of the jig than the KEY switch).
3. Turn on the power.
4. Turn off the KEY switch of the jig CPWBF2303TA01.
5. Turn on the ADJ switch of the jig CPWBN2309TA01.
6. The camera signal system adjusting mode is attained.

(The monitor screen displays figures for the addresses and data to be adjusted, and the white balance is fixed to 3200°K so the signal system becomes adjustable.)

b) For selecting the lens system adjusting mode, take the following steps:

1. Turn off the power.
2. Turn on the ADJ switch of the jig CPWBF2303TA01 (Turn off other switches than the ADJ switch of the jig.)
3. Turn on the power.
4. The lens system adjusting mode is attained.

(The lens adjusting mode does not allow any lens operation.)

Note:
Select an applicable adjusting mode for each adjusting item.

c) For resuming the normal mode, take the following steps:

1. Turn off all the switches of the jigs.
2. Either depress the RESET key of the jig CPWBF2303TA01 or turn on the power after turning it off.
3. The normal mode is attained.

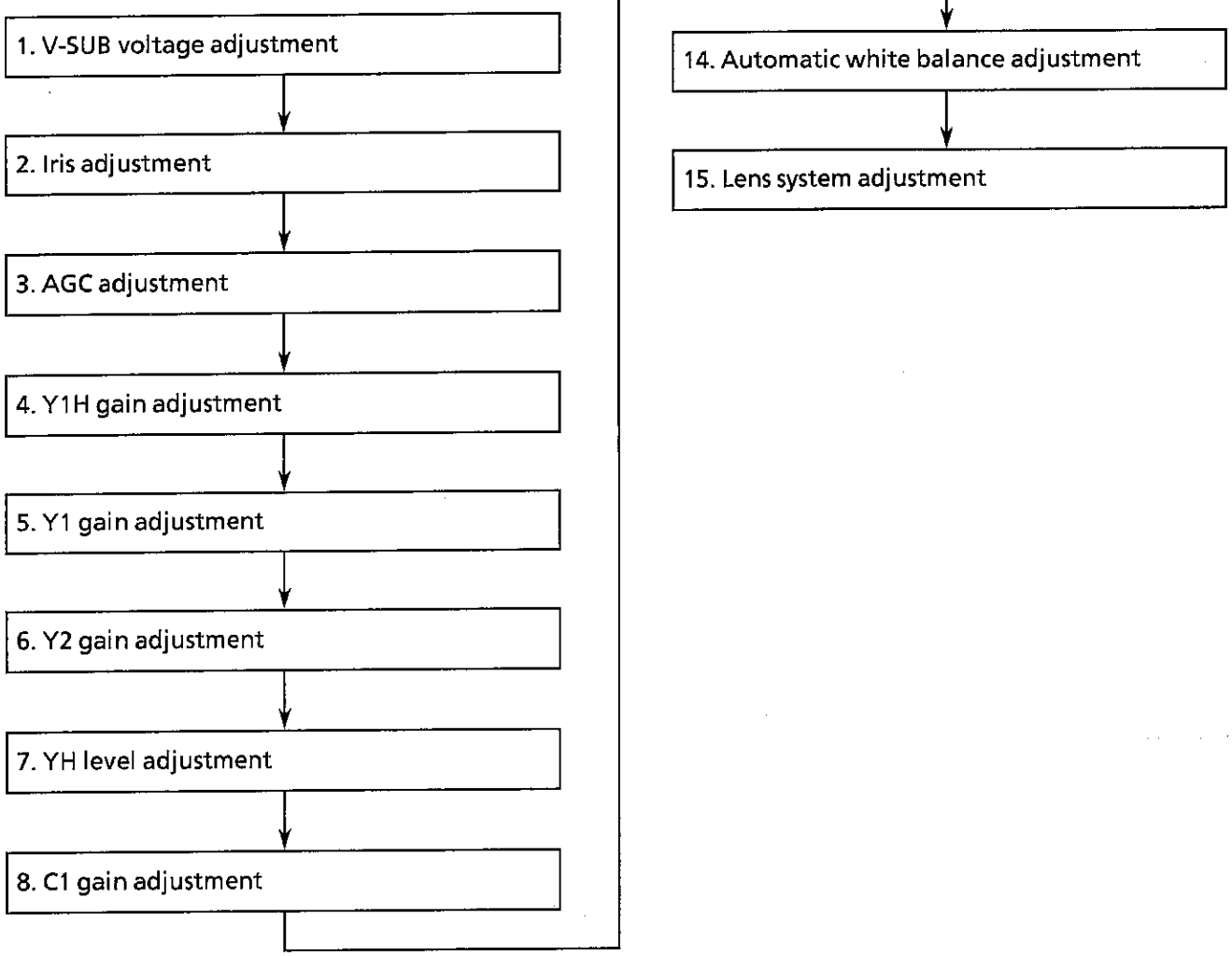
The table just below shows the camera signal system adjustment items (addresses).

CH01	Iris level	CH0A	B-Y level
CH02	AGC level	CH0B	R-Y level
CH03	C1 gain	CH0C	YH level
CH04	Y1 gain	CH13	Burst gain
CH05	Y2 gain	CH14	B gain
CH06	Y1H gain	CH15	R gain
CH07	C level	CH17	Highlight chroma suppress gain
CH08	B-Y matrix	CH18	B control
CH09	R-Y matrix	CH19	R control
		(CH11)	(T mode)

Notes:

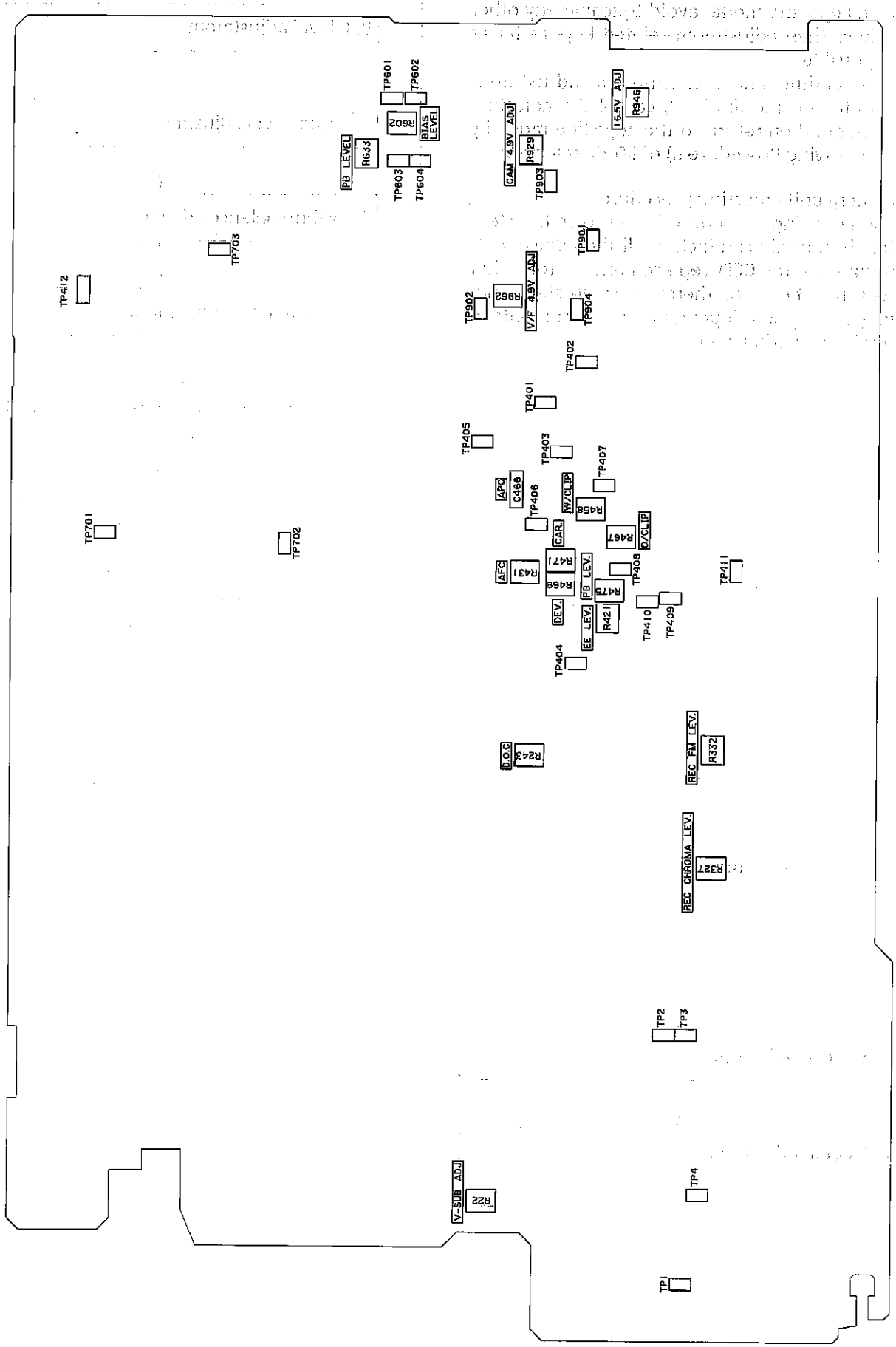
- Do not rewrite any other data than the data of the above shown addresses.
- In adjusting mode, avoid touching any other keys than adjustment-related keys as far as possible.
  If reading and rewriting the adjustment data become disabled, cancel the adjusting mode, then return to the adjusting mode by following Procedure a) of Mode selection.

5. Camera unit adjusting procedure
   The adjusting procedure here shows the steps for thoroughly conducting all the adjustments required after CCD replacement or for other reason. There are therefore some steps that may be skipped depending on the contents of servicing or adjustment.



Location of Test Points and Controls

- **Main Circuit**

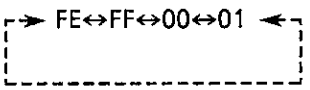


Camera signal system adjusting procedure

No	Adjusting Step	Display in Monitor Screen and Viewfinder (The symbol ≥ ≤ is blinking.)
1	By operating the FF·REW key, rewrite the blinking numeric data for selecting the item (address) you desire to adjust.	ADJ ≥00≤
2	By pressing the PLAY key, call data from the specified address.	ADJ 00 FF
3	By using the FF·REW key, rewrite the data and then make adjustment. (When the data is rewritten, the data displayed starts blinking.)	ADJ 00 ≥FF≤
4	By pressing the PLAY key, write the selected data to the address specified. That completes the adjustment (The data displayed stops blinking).	ADJ 00 FF
5	If the STOP key is pressed when in Step 2 or 4, control goes back to Step 1 where an item (address) to adjust is selectable.	ADJ ≥00≤

Notes:

- When the FF·REW key is kept pressed for longer than 0.3 seconds, it starts repeating displayed data replacement.
- When it is kept pressed for further 2 seconds while setting the data, it quickens data replacement.
- Addresses and data are displayed in hexadecimal notation, and the selection order is as follows:

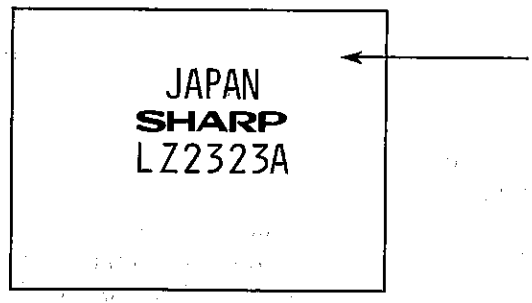


- The address and the data are displayed on the monitor screen and in the viewfinder (If the viewfinder is not connected, they are not displayed).

In the descriptions that follow, the jig CPWBN2309TA01 is abbreviated as Jig ① and the jig CPWBF2303TA01 as Jig ②.

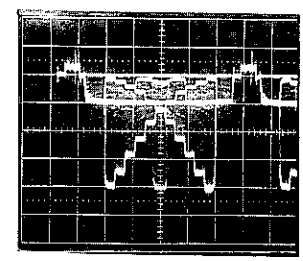
Item	Adjusting Procedure
1. V-SUB voltage adjustment **Note:** This adjustment is separately prepared for the CCD sensor. Conduct this adjustment therefore only when the CCD sensor is replaced. If the R22 (for V-SUB adjustment) is accidentally turned, remove the sensor PWB from the CCD sensor, make sure of the V-SUB voltage specified on the back of the CCD sensor, reinstall the sensor PWB to the CCD sensor, then adjust it as follows: • Measuring terminal: TP1 (V-SUB) • Adjustment point: R22 (for V-SUB ADJ) • Measuring instrument: Digital voltometer	Measure the voltage at the TP1 by using a digital voltometer, and adjust it by the R22 to: **(Voltage specified on the back of CCD sensor)** ± 0.05 V

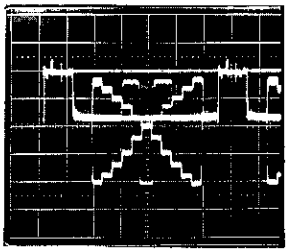
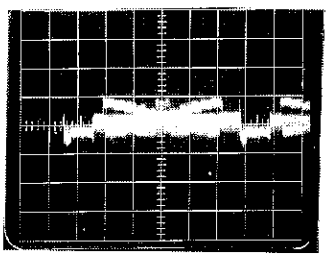
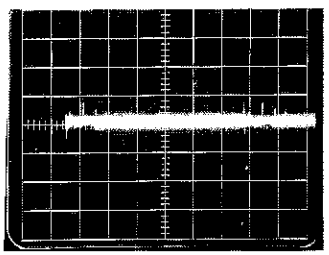
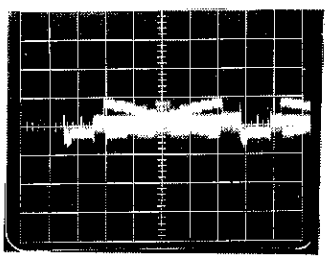
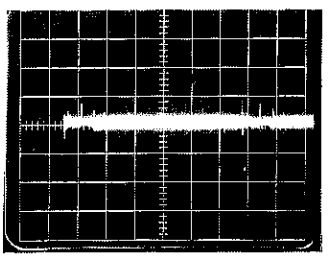
How to read the V-SUB voltage:

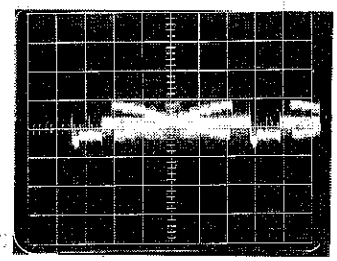
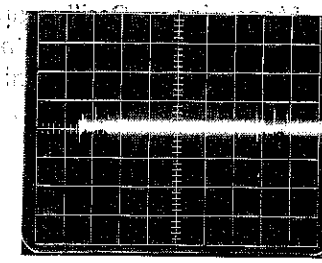
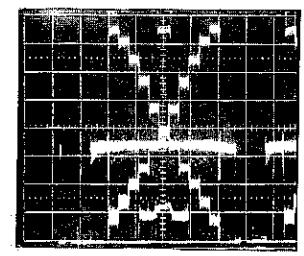
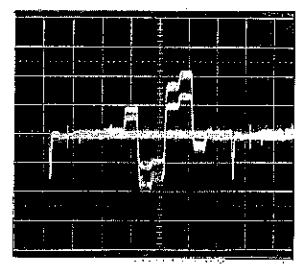
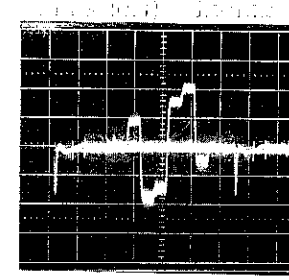


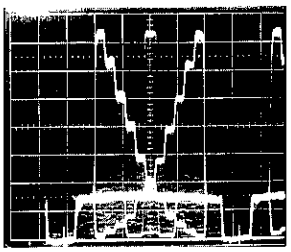
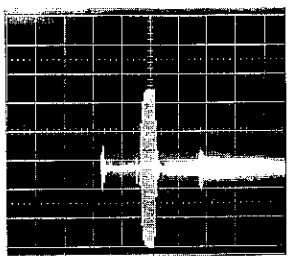
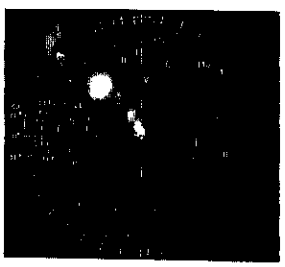
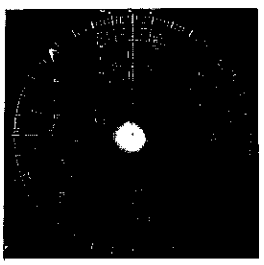
V-SUB voltage:

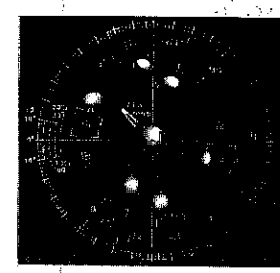
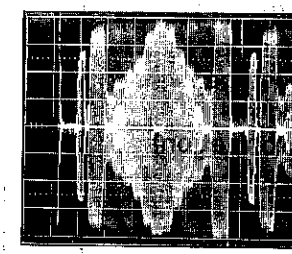
The V-SUB voltage is written on a 0.1-by-0.1 V basis (hand-written by pencil).

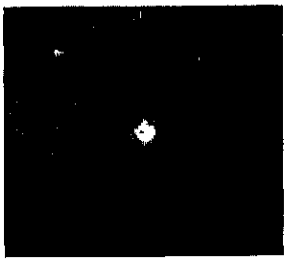
2. Iris adjustment • Measuring terminal: YC/CSY of Jig ② • Adjustment address: CH01 (Iris level) • Measuring instrument: Oscilloscope (Horizontal synchronization) • Object: Gray scale	1) Set CH11 (T mode) data to FF. 2) Shooting the gray scale at the standard angle of view, observe by the oscilloscope the waveform obtained at the terminal YC/CSY of Jig ②, and rewrite the data of CH01 so that the amplitude be adjusted to – 200 ± 10 mVp-p.  50 mV/div 10 µsec/div

Item	Adjusting Procedure
3. AGC adjustment ● Measuring terminal: Y of Jig ② ● Adjustment address: CH02 (AGC level) ● Measuring instrument: Oscilloscope (Horizontal synchronization) ● Object: Gray scale	Shooting the gray scale at the standard angle of view, observe by the oscilloscope the waveform obtained at the terminal Y of Jig ②, and rewrite the data of CH02 so that the amplitude be adjusted to −400 ± 10 mVp-p.  100 mV/div 10 µsec/div
4. Y1H gain adjustment ● Measuring terminal: TP of Jig ② ● Adjustment address: CH06 (Y1H gain) ● Measuring instrument: Oscilloscope (Horizontal synchronization) ● Object: Gray scale	Shooting the gray scale at the standard angle of view, observe by the oscilloscope the waveform at the terminal TP of Jig ②, and rewrite the data of CH06 so that the leak signal be adjusted to the minimum.  50 mV/div 10 µsec/div Imperfectly adjusted  50 mV/div 10 µsec/div Optimally adjusted
5. Y1 gain adjustment ● Measuring terminal: V-APT of Jig ② ● Adjustment address: CH04 (Y1 gain) ● Measuring instrument: Oscilloscope (Horizontal synchronization) ● Object: Gray scale	1) Set the CH05 (Y2 gain) data to 00. 2) Shooting the gray scale at the standard angle of view, observe by the oscilloscope the waveform obtained at the terminal V-APT of Jig ②, and adjust by rewriting the data of CH04 so that the leak signal be minimum.  50 mV/div 10 µsec/div Imperfectly adjusted  50 mV/div 10 µsec/div Optimally adjusted

Item	Adjusting Procedure
6. Y2 gain adjustment • Measuring terminal: V-APT of Jig ② • Adjustment address: CH05 (Y2 gain) • Measuring instrument: Oscilloscope (Horizontal synchronization) • Object: Gray scale	1) Shooting the gray scale at the standard angle of view, observe by the oscilloscope the waveform obtained at the terminal V-APT of Jig ② and make an adjustment by rewriting the CH05 data so that the leak signal be minimum. 2) Set the CH11 (T mode) data to 00.  50 mV/div 10 µsec/div Imperfectly adjusted  50 mV/div 10 µsec/div Optimally adjusted
7. YH level adjustment • Measuring terminal: CAM-Y of Jig ② • Adjustment address: CH0C (YH level) • Measuring instrument: Oscilloscope (Horizontal synchronization) • Object: Gray scale	Shooting the gray scale at the standard angle of view, observe by the oscilloscope the waveform obtained at the terminal CAM-Y of Jig ② and adjust the Y signal amplitude (without the sync signal) to 750 ± 10mVp-p by rewriting the data of CH0C.  100 mV/div 10 µsec/div
8. C1 gain adjustment • Measuring terminal: R-Y of Jig ② • Adjustment address: CH03 (C1 gain) • Measuring instrument: Oscilloscope (Horizontal synchronization) • Object: Colour bar chart	Shooting the colour bar chart, observe by the oscilloscope the waveform obtained at the terminal R-Y of Jig ② and make an adjustment by rewriting the data of CH03 so that the difference between 2H offset of the red component of the R-Y signal be minimum.  100 mV/div 10 µsec/div Imperfectly adjusted  100 mV/div 10 µsec/div Optimally adjusted

Item	Adjusting Procedure
9. C level adjustment ● Measuring terminal: TP of Jig ② ● Adjustment address: CH07 (C level) ● Measuring instrument: Oscilloscope (Horizontal synchronization) ● Object: Gray scale	1) Set the CH06 (Y1H gain) data to 00 (Be sure to remember the original data). 2) Shooting the gray scale with the standard angle of view, observe by the oscilloscope the waveform obtained at the terminal TP of Jig ② and adjust the amplitude to 365 ± 10mVp-p by rewriting the CH07 data. 3) Set the CH06 data back to the original value.  50 mV/div 10 µsec/div
10. Burst gain adjustment ● Measuring terminal: CAM-C of Jig ② ● Adjustment address: CH13 (Burst gain) ● Measuring instrument: Oscilloscope (Horizontal synchronization)	Observe the waveform obtained at the terminal CAM-C of Jig ② and adjust the amplitude to 270 ± 10 mVp-p by rewriting the data of CH13.  50 mV/div 5 µsec/div
11. White balance adjustment ● Measuring terminal: EE output ● Adjustment addresses: CH15 (R gain) CH14 (B gain) ● Measuring instrument: Vector scope Oscilloscope (horizontal synchronization) ● Object: Gray scale	Shooting the gray scale at the standard angle of view, adjust the white balance at the tangsten-halogen light source of 3200°K by rewriting the data of CH15 and CH14 so that the bright spot come to the center of the vector scope.  Imperfectly adjusted  Optimally adjusted

Item	Adjusting Procedure
12. Colour gain adjustment ● Measuring terminal: EE output ● Adjustment addresses: CH0B (R-Y gain) CH0A (B-Y gain) CH09 (R-Y matrix) CH08 (B-Y matrix) ● Measuring instrument: Vector scope ● Object: Colour bar chart	1) Shooting the colour bar chart, and set the angle of view to 75 percent. 2) Rewrite the data of CH0B, CH0A, CH09, and CH08 so that the bright spots of red and blue come to the positions on the vector scope as shown in the photo. The gain of the vector scope at that time is required to be so set that the burst come to the 75 percent amplitude point on the B-Y axis.  Angle of view: 75% Red level: 1.6 ± 0.10 times as high (Compared with the burst) Red phase: 103° ± 2° Blue level: 1.4 ± 0.10 times as high (Compared with the burst) Blue phase: 344° ± 5°
13. Highlight chroma suppress gain adjustment ● Measuring terminal: CAM-C of Jig ② ● Adjustment address: CH17 (CSG) ● Measuring instrument: Oscilloscope (Horizontal synchronization) ● Object: Gray scale	1) Shooting the gray scale at the standard angle of view, install the colour temperature conversion filter LB165 on the front of the lens, and put the camera in backlight compensation mode by the BLC switch of the camera operation PWB. 2) Then, observing by the oscilloscope the waveform obtained at the terminal CAM-C of Jig ②, make an adjustment so that the colour leak level of the gray scale 11th gradation scale be 10 ± 10 mVp-p. 3) Cancel the backlight compensation mode.  50 mV/div 10 µsec/div

Item	Adjusting Procedure
14. Auto white balance adjustment • Measuring terminal: EE output • Adjustment addresses: CH19 (R-CONT) CH18 (B-CONT) Measuring instrument: Vector scope • Object: Gray scale	1) Shooting the gray scale at the standard angle of view, mount the colour temperature conversion filter LB165 on the front of the lens. 2) Then make an adjustment so that the bright spot of the vector scope be at the center.  Imperfectly adjusted  Optimally adjusted

Note:
After completing the adjustment, be sure to cancel the adjustment mode.

Lens system adjusting procedure

1. For the lens system adjustment, shoot a contrasty object 50m or more away at the wide-angle end, and set the shutter to the high speed that causes the iris to fully open. (The light source for the object should be other than 50-Hz fluorescent light).
2. The items to adjust are automatically selected from one to the next when an adjustment is completed. A selection may also be made by using the ADJ MODE switch of Jig ②.

Item	Adjusting Procedure	Voltage at TP after Adj.
1. Shutter adjustment ● Measuring terminal: TP of Jig ② ● Measuring instrument: Digital voltometer	1) Press the ADJ SET switch of Jig ② when the voltage reaches 4.37 V at the terminal TP of Jig ② . 2) When the voltage at the TP of Jig ② comes to 3.75 V, the adjustment is complete.	3.75V
2. Iris opening adjustment ● Measuring terminal: TP of Jig ② ● Measuring instrument: Digital voltometer	1) Press the ADJ SET switch of Jig ② . 2) When the voltage at the terminal TP of Jig ② comes to 3.12 V, the adjustment is complete.	3.12V
3. Iris closing adjustment ● Measuring terminal: TP of Jig ② ● Measuring instrument: Digital voltometer	1) Press the ADJ SET switch of Jig ② . 2) When the voltage at the terminal TP of Jig ② comes to 2.5 V, the adjustment is complete.	2.5V
4. Wide-angle end position adjustment ● Measuring terminal: TP of Jig ② ● Measuring instrument: Digital voltometer	1) Press the ADJ SET switch of Jig ② . 2) When the voltage at the terminal TP of Jig ② comes to 1.87 V, the adjustment is complete.	1.87V
5. Telescopic end and mid position adjustment ● Measuring terminal: TP of Jig ② ● Measuring instrument: Digital voltometer	1) Press the ADJ SET switch of Jig ② . 2) When the voltage at the terminal TP of Jig ② comes to 1.25 V, the adjustment is complete.	1.25V

Notes:

Be sure to cancel the adjustment mode after the adjustments are completed.

Errors in the lens system adjustment

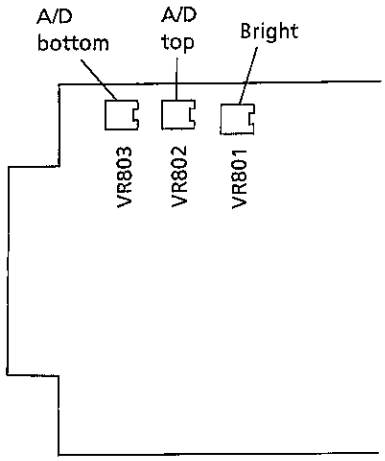
1. For any adjustment item, ending with the voltage at the TP0.62 V means an error in adjustment. In that case, the adjustment item does not change to the next item but stays on.
2. If the voltage at the TP does not change from 1.25 V when the power is turned on, the trouble has resulted from stepping motor operation, the photo interrupter circuit, or other. In that case, make a readjustment after repairing or replacing the applicable part.
3. If the voltage at the TP does not change from 5 V when the power is turned on in normal operation, the lens system data needs proper adjustment. Readjust in that case.

7-2. ADJUSTMENT OF THE COLOUR L.C.D. VIEWFINDER

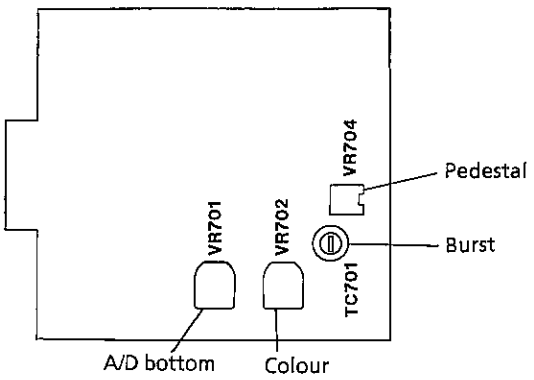
Instruments and tools required for adjustments

- Input signal (full colour bar 1Vp-p) generator
- Camcorder
- AC adaptor
- Extension cable
  -1 (QCNW-1172TAZZ)
  -2 (QCNW-1173TAZZ)

Location of Test Points and Controls

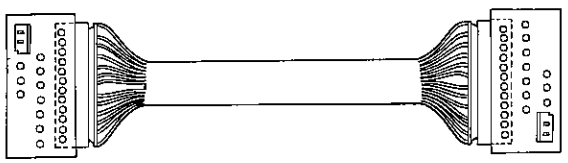


PWB1



PWB2

Extension cable



Extension cable 1 (PWB1 ⇔ PWB3)

Extension cable 2 (PWB1 ⇔ PWB2)

Test signal input

Before feeding the TEST signal to A/V OUT jack, make TP412 and TP401 (GND) on the main PWB (see page 87 and 88) short-circuited. By this, the video and audio output pins (A/V OUT) serve as the video and audio input pins (A/V IN).

Adjustment

1. Check of PWB3
   Connect the extension cable 1 between PWB1 and PWB3. Make sure the camera section is connected with the PWB1. Turn on the camera switch to see if the lamp comes on about one second later.

2. Connection for image adjustment
   Connect the extension cable 2 between PWB1 and PW2. Connect the BLUE output of the extension cable 2 PWB to the oscilloscope's probe. Connect the GND pin of the extension cable 2 PWB to the oscilloscope's GND terminal.

3. Pedestal level adjustment

Test signal	: Colour bar (TP412 GND short)
Test point	: Cable 2 Blue
Adjustment point	: VR704
Specification	: 1.0 ± 0.05V (Pedestal level)
Instrument	: Oscilloscope

Feed a 1Vp-p ten-tone stair-step test signal. Observe the Bout signal of the chroma IC on the oscilloscope screen and adjust VR704 as above.

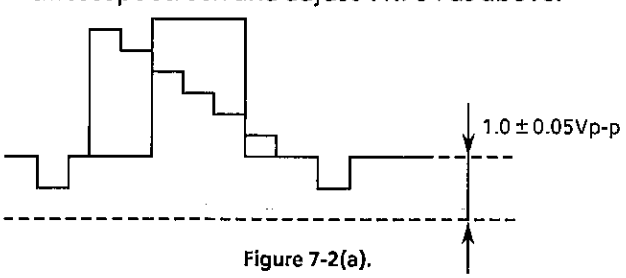


Figure 7-2(a).

4. Colour adjustment

Test signal	: Colour bar (TP412 GND short)
Test point	: Cable 2 Blue
Adjustment point	: VR702
Specification	: White and blue portions to be at the same level (0 ± 0.1V)
Instrument	: Oscilloscope

Feed the colour bar test signal (1Vp-p). Observe the Bout signal on the oscilloscope screen and adjust VR702 so that the white and blue portions be at the same level. (See Fig.7-2(b).)

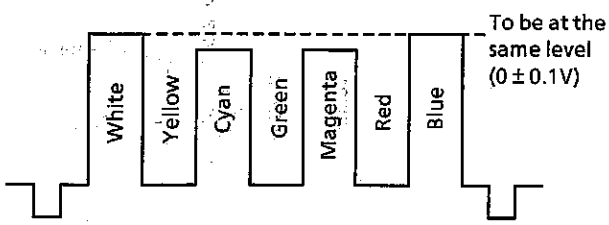


Figure 7-2(b).

5. Burst cleaning adjustment

Test signal	: Colour bar (TP412 GND short)
Test point	: Cable 2 Blue
Adjustment point	: TC701
Instrument	: Oscilloscope

Feed the colour bar test signal (1Vp-p). Observe the Bout signal of the chroma IC on the oscilloscope screen and adjust the trimmer (TC701) so that the Magenta output level be as flat as possible for every scanning line.

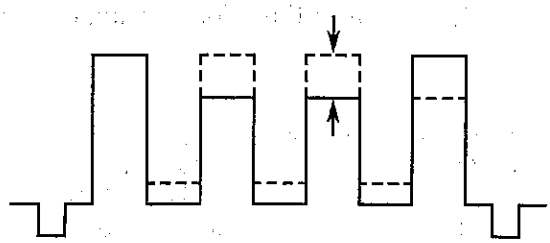


Figure 7-2(c).

6. A/D reference adjustment (top)

Test signal	: Ten-tone black-and white signal (TP412 GND short)
Test point	: Screen (visual check)
Adjustment point	: R802

Turn the control until the tone 10-9 border (white side) disappears. Adjust the control so that the tone 9-8 border should turn slightly dim.

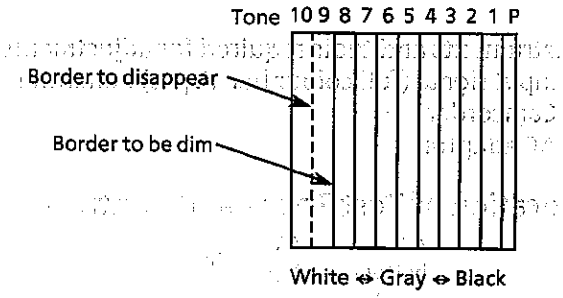


Figure 7-2(d).

7. A/D reference adjustment (bottom)

Test signal	: Ten-tone black-and white signal (TP412 GND short)
Test point	: Screen (visual check)
Adjustment point	: R803

Turn the control until the tone 2-1 border (black side) disappears. Turn back the control so that the tone 2-1 as well as 1-P borders should reappear.

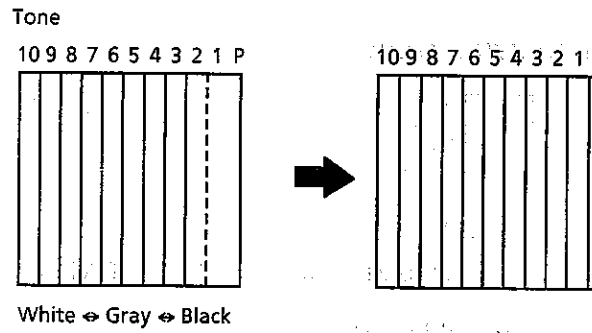
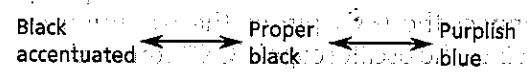


Figure 7-2(e).

8. Brightness adjustment

Test signal	: Black burst or camera flag signal (TP412 GND short)
Test point	: Screen (visual check)
Adjustment point	: R801

Turn the user brightness control R806 to the center click position. Watch the center of the screen from front. Turn R801 until the screen turns from purplish blue to gray. Be careful not to turn the control too much. Otherwise black is accentuated.



Note:

Adjustment holes in the viewfinder casing.

(1): R701, sub-A/D reference (bottom) adjustment
(2): R702, colour level adjustment
(3): Dummy

7-3. ADJUSTMENT OF VCR

Instruments

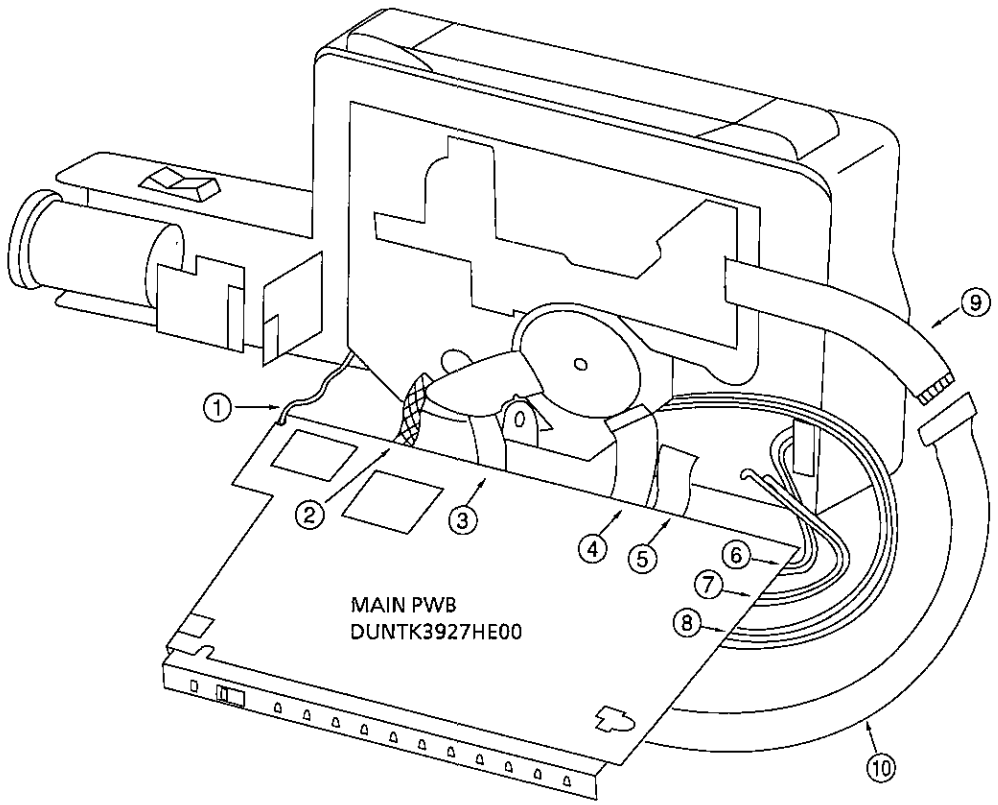
- Colour monitor TV
- DC regulated power supply
- VTVM
- Oscilloscope
- Audio generator (CR Oscillator)
- Colour bar generator
- Alignment tape
- Frequency counter
- Recording video tape (VHS)

Prior to the adjustment :

Most of the electrical adjustments are required after mechanical parts (video head included) have been replaced. Check that all the mechanical functions are normal before attempting adjustment of the electrical circuits.

Electrical adjustments require proper troubleshooting. After repair or parts replacement the following alignments may be required.

Basic Connection for VCR Adjustment



No.	Parts code	Description		
1	QCNW-1139TAZZ	Mecha.	⇔	Main PWB
2	——	FPC video head	⇔	Main PWB
3	——	FPC drum motor	⇔	Main PWB
4	——	FPC capstan motor	⇔	Main PWB
5	——	Terminal unit	⇔	Main PWB
6	QCNW-1125TAZZ	Battery terminal	⇔	Main PWB
7	QCNW-1127TAZZ	Li battery	⇔	Main PWB
8	QCNW-6740GEZZ	A/C head	⇔	Main PWB
9	QCNW-6781GEZZ	Mechanism relay PWB	⇔	Main PWB
10	QCNW-1143TAZZ	(Jig wire) QCNW-6781GEZZ	⇔	Main PWB

Test signal input

Before feeding the TEST signal to A/V OUT jack, make TP412 and TP401 (GND) on the main PWB (see page 87 and 88) short-circuited. By this, the video and audio output pins (A/V OUT) serve as the video and audio input pins (A/V IN).

Note:
See page 46 for the location of test points and controls.

[POWER CIRCUIT]

Preparations

Mode	: Stop
Input signal	: None
Test signal (audio/video)	: Camera signal
Specification	: 6.8 ± 0.2V
Instrument	: VTVM

1. Plug the AC adaptor in the unit and turn on the power. (CAMERA mode)
2. Make sure the input voltage is as specified.
3. Set the full auto lock switch.

CAM 4.9V adjustment

Mode	: Stop
Test point	: TP903
Adjustment point	: R929
Specification	: 4.9 ± 0.05V
Instrument	: VTVM

1. Connect the VTVM to TP903 .
2. Adjust R929 so that the voltage level of TP903 becomes 4.9 ± 0.05V.

+ 16.5V adjustment

Mode	: Stop
Test point	: TP901
Adjustment point	: R946
Specification	: 16.5 ± 0.05V
Instrument	: VTVM

1. Connect the VTVM to TP901.
2. Adjust R946 so that the voltage level at TP901 becomes 16.5 ± 0.05V.

VF 5.05V adjustment

Mode	: Stop
Test point	: TP904
Adjustment point	: R962
Specification	: 5.05 ± 0.05V
Instrument	: VTVM

1. Connect the VTVM to TP904.
2. Adjust R962 so that the voltage level at TP904 becomes 5.05 ± 0.05V.

[SYSTEM CONTROL/SERVO CIRCUIT]

Automatic battery sensor adjustment

Mode	: CAM
Test point	: P12-1
Specification	: 5.35V
Instrument	: Voltmeter

1. Set the power switch to the CAMERA position.
2. Load a rec-tip-provided tape.
3. Make TP702 (TEST 1) and GND short-circuited with a 13.8k ohm resistance. Adjust the supply voltage to the specified level.
4. Push the REC switch and the automatic adjustment will start. The REC LED starts flashing twice every second.
5. When this LED stops flashing but keeps on, the adjustment is over.

Automatic head switching point adjustment

Mode	: PB
Test point	: TP702
Specification	: 6.5H (automatically adjusted)

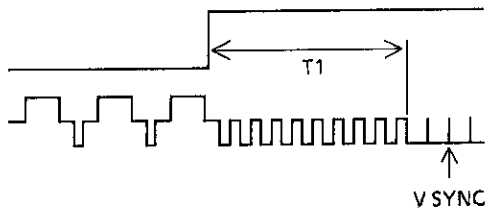
1. Set the power switch to the VCR position.
2. Load an alignment tape.
3. Push the PLAY switch to play back the tape.
4. Make TP702 (TEST 1) and GND short-circuited with the cycle switch.
5. Give a trigger input and the automatic adjustment will start. The REC LED starts flashing twice every second.
6. When this LED stops flashing but keeps on, the adjustment is over.
7. At this time if the tape is ejected, readjust the switching point in the following manner.

Manual head switching point adjustment

Input signal	: Alignment tape
Test point	: TP403, TEST1 terminal (S18) < VCR adjustment jig (CPWBN2309TA01) is used > (See page 6)
Instrument	: Oscilloscope

1. Connect the CPWBN2309TA01 to the S18 with its ADJ switch off.
2. Set the CAMERA / VCR switch to CAMERA.
3. Turn on the ADJ switch of the CPWBN2309TA01.
4. Look into the viewfinder and press the REW key to turn the character shown under the mode status indication "ADJ" into the figure "71." (When the figure "71" has been exceeded, press the "FF" key to go back to it.)
5. Press the PB key.
6. Press the FF or REW key to turn the character at the right of the figure "71" into "FF."
7. Press the PB key.
8. Turn off the ADJ switch of the CPWBN2309TA01.
9. Play back the alignment tape with the CAMERA / VCR switch set at VCR.

9. Play back the alignment tape with the CAMERA / VCR switch set at VCR.
10. Measure the head switching point (output of the CPWBN2309TA01's pin ③) and video output (TP403) to find the time for T1 in the figure below (msec).



11. Find the corresponding preset value in the table below.
12. Repeat the steps 2 thru 5.
13. Press the FF or REW key to turn the character at the right of the figure "71" ("FF") into the preset value found in the step 11.
14. Press the PB key.
15. Remove the CPWBN2309TA01 with its ADJ switch off.

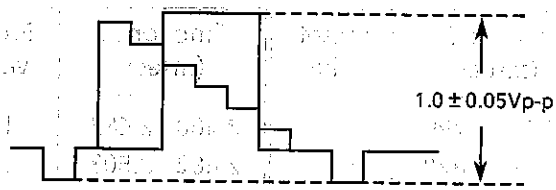
Time for T1 (msec)	Preset value	Time for T1 (msec)	Preset value	Time for T1 (msec)	Preset value	Time for T1 (msec)	Preset value
0.414 - 0.435	FF	1.096 - 1.117	BF	1.778 - 1.799	7F	2.460 - 2.482	3F
0.435 - 0.446	FD	1.117 - 1.139	BD	1.799 - 1.820	7D	2.482 - 2.503	3D
0.446 - 0.478	FB	1.139 - 1.160	BB	1.820 - 1.842	7B	2.503 - 2.524	3B
0.478 - 0.499	F9	1.160 - 1.181	B9	1.842 - 1.863	79	2.524 - 2.546	39
0.499 - 0.521	F7	1.181 - 1.203	B7	1.863 - 1.885	77	2.546 - 2.567	37
0.521 - 0.542	F5	1.203 - 1.224	B5	1.885 - 1.906	75	2.567 - 2.588	35
0.542 - 0.563	F3	1.224 - 1.245	B3	1.906 - 1.927	73	2.588 - 2.610	33
0.563 - 0.584	F1	1.245 - 1.267	B1	1.927 - 1.948	71	2.610 - 2.631	31
0.584 - 0.608	EF	1.267 - 1.288	AF	1.948 - 1.970	6F	2.631 - 2.652	2F
0.608 - 0.627	ED	1.288 - 1.309	AD	1.970 - 1.991	6D	2.652 - 2.674	2D
0.627 - 0.648	EB	1.309 - 1.331	AB	1.991 - 2.013	6B	2.674 - 2.695	2B
0.648 - 0.670	E9	1.331 - 1.352	A9	2.013 - 2.034	69	2.695 - 2.716	29
0.670 - 0.691	E7	1.352 - 1.373	A7	2.034 - 2.055	67	2.716 - 2.737	27
0.691 - 0.712	E5	1.373 - 1.395	A5	2.055 - 2.077	65	2.737 -2.759	25
0.712 - 0.734	E3	1.395 - 1.416	A3	2.077 - 2.098	63	2.759 - 2.780	23
0.734 - 0.755	E1	1.416 - 1.437	A1	2.098 - 2.119	61	2.780 - 2.801	21
0.755 - 0.776	DF	1.437 - 1.458	9F	2.119 - 2.141	5F	2.801 - 2.823	1F
0.776 - 0.798	DD	1.458 - 1.480	9D	2.141 - 2.162	5D	2.823 - 2.844	1D
0.798 - 0.819	DB	1.480 - 1.501	9B	2.162 - 2.183	5B	2.844 - 2.865	1B
0.819 - 0.840	D9	1.501 - 1.522	99	2.183 - 2.205	59	2.865 - 2.887	19
0.840 - 0.862	D7	1.522 - 1.543	97	2.205 - 2.226	57	2.887 - 2.908	17
0.862 - 0.883	D5	1.543 - 1.565	95	2.226 - 2.247	55	2.908 - 2.929	15
0.883 - 0.904	D3	1.565 - 1.586	93	2.247 - 2.268	53	2.929 - 2.951	13
0.904 - 0.925	D1	1.586 - 1.608	91	2.268 - 2.290	51	2.951 - 2.972	11
0.925 - 0.947	CF	1.608 - 1.629	8F	2.290 - 2.311	4F	2.972 - 2.993	F
0.947 - 0.968	CD	1.629 - 1.650	8D	2.311 - 2.332	4D	2.993 - 3.015	D
0.968 - 0.990	CB	1.650 - 1.672	8B	2.332 - 2.354	4B	3.015 - 3.036	B
0.990 - 1.011	C9	1.672 - 1.693	89	2.354 - 2.375	49	3.036 - 3.057	9
1.011 - 1.032	C7	1.693 - 1.714	87	2.375 - 2.396	47	3.057 - 3.079	7
1.032 - 1.054	C5	1.714 - 1.735	85	2.396 - 2.418	45	3.079 - 3.100	5
1.054 - 1.075	C3	1.735 - 1.757	83	2.418 - 2.439	43	3.100 - 3.121	3
1.075 - 1.096	C1	1.757 - 1.778	81	2.439 - 2.460	41	3.121 - 3.142	1

[Y/C CIRCUIT]

EE level adjustment

Mode	: VCR/AV IN (TP412 GND short)
Test point	: TP403, TP401 (GND), TP404 (trigger)
Adjustment point	: R421
Test signal (audio/video)	: —/Colour bar
Specification	: 1.0 ± 0.05Vp-p
Instrument	: Oscilloscope

1. Connect the oscilloscope to TP403.
2. Feed the colour bar input signal. Adjust R421 so that the video output level be 1.0 ± 0.05Vp-p.

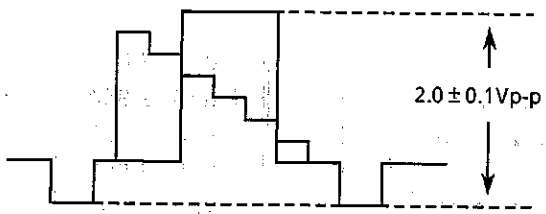


Playback Y level adjustment

Mode	: VCR/AV OUT (PB)
Input signal	: Alignment tape (staircase wave)
Test point	: TP402, TP401 (GND), TP404 (trigger)
Adjustment point	: R475
Specification	: 2.0 ± 0.1Vp-p
Instrument	: Oscilloscope

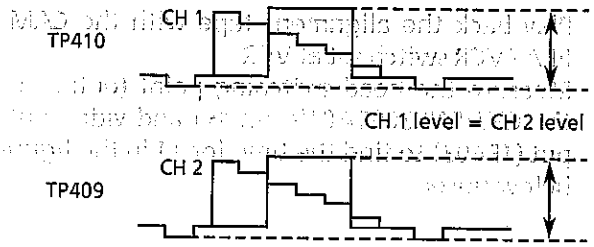
Note:
Not terminated

1. Connect the oscilloscope to TP402.
2. Play back the alignment tape.
3. Adjust R475 so that the video output level be 2.0 ± 0.1Vp-p.



DOC level adjustment

Mode	: VCR (PB)
Input signal	: Alignment tape
Test point	: TP410, TP409, TP404 (trigger)
Adjustment point	: R243
Specification	: CH 2 level = CH 1 level
Instrument	: Oscilloscope



1. Connect the oscilloscope to TP410, TP409.
2. Play back the alignment tape.
3. Adjust R243 to have the same level at TP410 and TP409.

FM carrier adjustment

Mode	: VCR/AV IN (TP412 GND short)
Test point	: TP408
Adjustment point	: R471
Test signal (audio/video)	: —/No signal
Specification	: 3.8MHz ± 50kHz
Instrument	: Frequency counter

Note:
Make this adjustment only when IC404 has been replaced or when the carrier deviation is apparently out of specification.

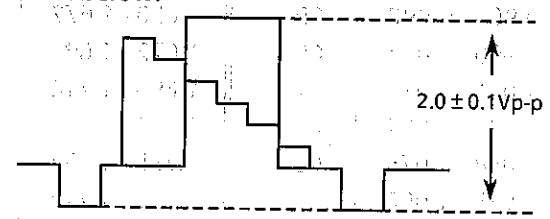
1. Keep the video input terminal open.
2. Connect the frequency counter to TP408.
3. Adjust R471 so that the frequency counter reading be 3.8MHz ± 50kHz.

Carrier deviation adjustment

Mode	: Self-REC/PB
Input signal	: Self-recorded tape
Test point	: TP402, TP404 (trigger)
Adjustment point	: R469
Test signal (audio/video)	: —/Colour bar
Specification	: 2.0 ± 0.1Vp-p
Instrument	: Oscilloscope

Note:
Make this adjustment only when IC404 has been replaced or when the carrier deviation is apparently out of specification.

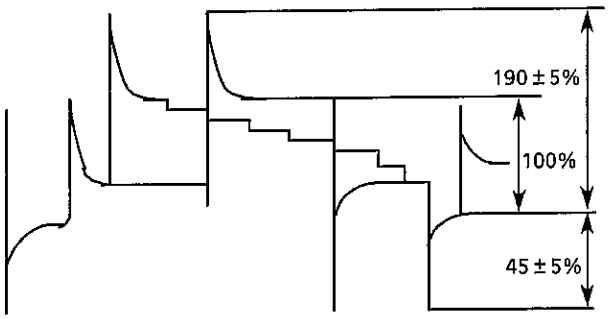
1. First make sure the EE level and playback Y level are as specified.
2. Feed the colour bar input signal to make self-recording and playback.
3. Observe the playback video signal level at TP402. If the level is below 2.0Vp-p, turn R469 clockwise. If it is above 2.0Vp-p, turn R469 counterclockwise. Make self-recording again.
4. Repeat the above step 3 until the playback video signal level comes within 2.0 ± 0.1Vp-p, as shown below.



White/dark clip adjustment

Mode	: VCR/AV IN (TP412 GND short)
Test point	: TP407, TP404 (trigger)
Adjustment point	: R458 (white) R467 (dark)
Test signal (audio/video)	: —/Colour bar
Specification	: White = 190 ± 5% Dark = 45 ± 5%
Instrument	: Oscilloscope

1. Connect the oscilloscope to TP407.
2. Feed the colour bar input signal.
3. Adjust R458 to obtain the white portion of 190 ± 5% and R467 for the dark portion of 45 ± 5% in the sync tip.



Automatic phase control adjustment

Mode	: VCR (PB)
Input signal	: Recorded tape (colour bar)
Test point	: TP406
Adjustment point	: C466
Specification	: 4433619 ± 15Hz
Instrument	: Frequency counter

1. Keep the PWB energized for longer than one minute and connect the frequency counter to TP406.
2. Play back the recorded tape.
3. Adjust C466 so that the frequency counter reading be 4433619 ± 15Hz.

40 fH AFC free-run frequency adjustment

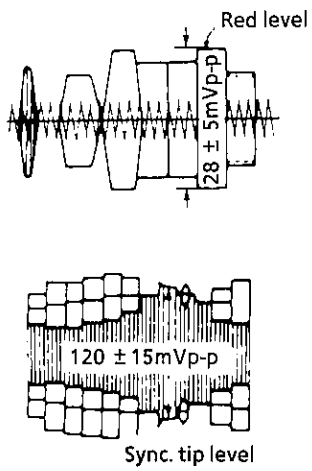
Mode	: VCR/AV IN (TP412 GND short)
Test point	: TP405, TEST 2 terminal (S14) < VCR adjustment jig (CPWBN2334TA01) is used > (See page 6)
Adjustment point	: R431
Specification	: 627 ± 5kHz
Instrument	: Frequency counter

1. Keep the PWB energized for longer than one minute and connect the frequency counter to TP405.
2. Connect the VCR adjustment jig to the Test 2 terminal (S14) with all the VCR adjustment jig switches set at the "TEST MODE 2."
3. Adjust R431 to make the frequency 627 ± 5kHz.

Recording current adjustment

Mode	: VCR/AV IN (REC) (TP412 GND short)
Test point	: TEST 3 terminal (S20) < VCR adjustment jig (CPWBN2334TA01) is used > (See page 6) HOT (SIG), COLD (GND), TP404 (trigger), TP401 (GND)
Adjustment point	: R327(C), R332(Y)
Test signal (audio/video)	: —/Colour bar
Specification	: C = 28 ± 5 mVp-p (red portion) Y = 120 ± 15mVp-p (sync tip portion)
Instrument	: Oscilloscope

1. Connect the VCR adjustment jig to the Test 3 terminal with all the VCR adjustment jig switches set at the "TEST MODE 3." Connect the probe's measuring terminal and the ground wire to the HOT and COLD sides, respectively (For CH1).
2. Connect the probe to TP404 and the ground lead to TP401 (for CH 2).
3. Feed the colour bar signal, set the unit to the REC mode and turn down R332 (Y) to zero.
4. Adjust R327 so that the red portion of the chroma signal be 28 ± 5mVp-p.
5. Adjust R332 so that the FM level of the sync tip portion be 120 ± 15mVp-p.



[AUDIO CIRCUIT]

Playback level adjustment

Mode	: PB
Input signal	: Alignment tape
Test point	: Audio output
Adjustment point	: R633
Specification	: – 8dBs ± 1dB (308mVrms)
Instrument	: VTVM

1. Connect the VTVM to the audio in/out jack.
2. Play back the alignment tape.
3. Adjust R633 so that the output level be – 8dBs (308mVrms).

AE erase voltage oscillation frequency check

Mode	: REC
Input signal	: Self-recorded tape
Test point	: TP601, TP602 (GND)
Specification	: Above 10Vp-p, 70 ± 5kHz
Instrument	: Oscilloscope

1. Connect the oscilloscope to TP601 and TP602 (GND).
2. Bring in the record mode. Make sure the oscillation voltage is above 10Vp-p and the oscillation frequency is 70 ± 5kHz.

Bias current adjustment

Mode	: REC
Input signal	: Self-recorded tape
Test point	: TP603, TP604
Adjustment point	: R602
Test signal (audio/video)	: No signal/Colour bar
Specification	: 2.9 ± 0.1mVrms
Instrument	: VTVM

1. Connect the VTVM to TP603 (hot) and TP604 (cold).
2. Bring in the record mode. Adjust R602 to obtain the output level of 2.9mVrms.

Recording/playback level check

Mode	: REC/PB
Input signal	: Self-recorded tape
Test point	: Audio output
Test signal (audio/video)	: 1kHz, – 8dBs (308mVrms)/Colour bar
Specification	: PB level = – 8dBs ± 3dB (308mVrms)
Instrument	: VTVM

1. Feed the input of 1kHz, – 8dBs (308mVrms) to the audio in/out jack. Make recording space of this signal.
2. Hook up the VTVM to the audio in/out jack. Play back the above recorded portion to make sure the output level is – 8dBs (308mVrms) ± 3dB.

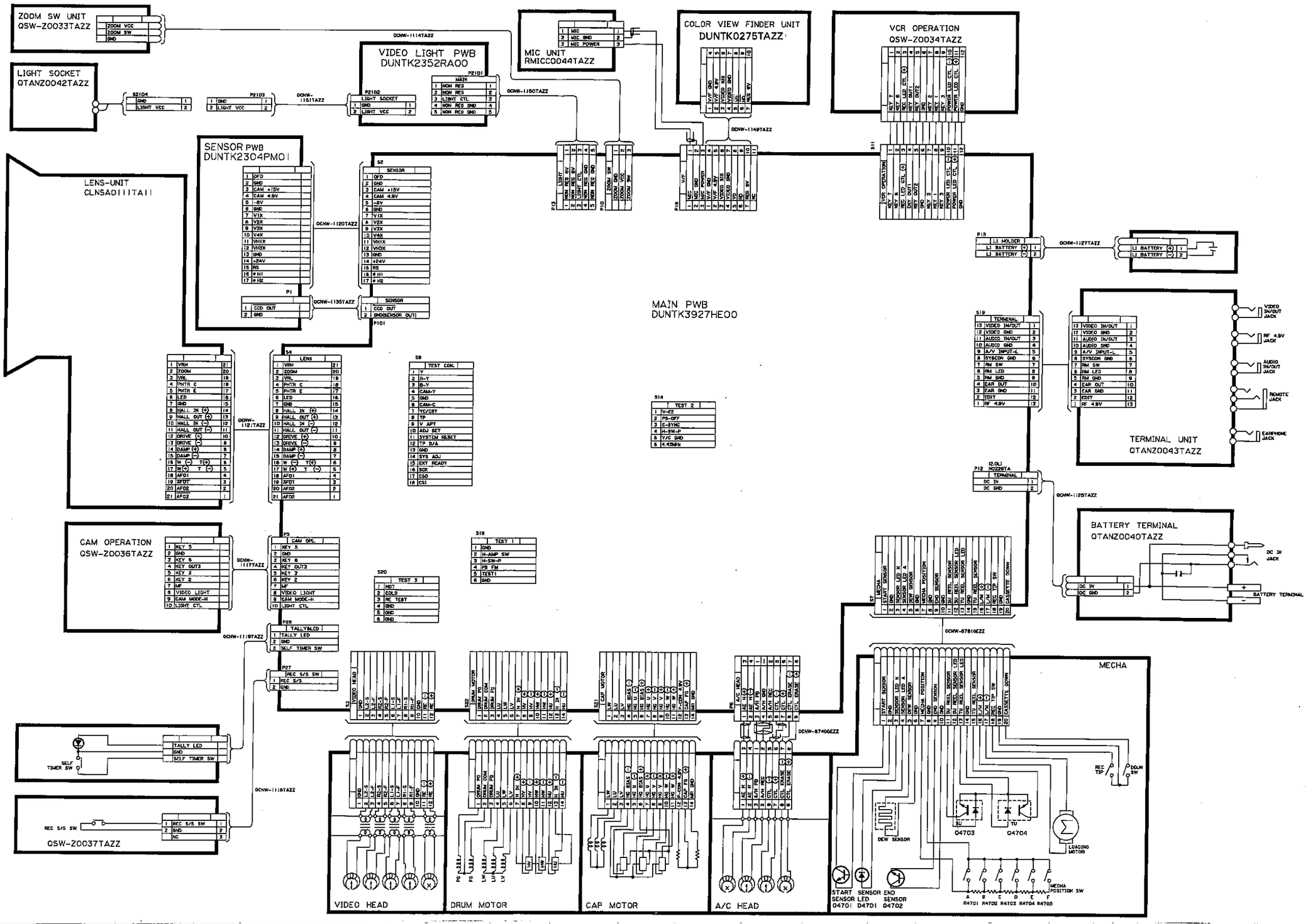
Dubbing-in/playback level check

Mode	: A.DUB/PB
Input signal	: Dubbing/Playback tape
Test point	: Audio output
Test signal (audio)	: 1 kHz – 8dBs (308mVrms)
Specification	: PB level = – 8dBs ± 3dB (308mVrms)
Instrument	: VTVM

Make recording in the dubbing mode. All the others are the same as in the preceding item.

8. SCHEMATIC DIAGRAM

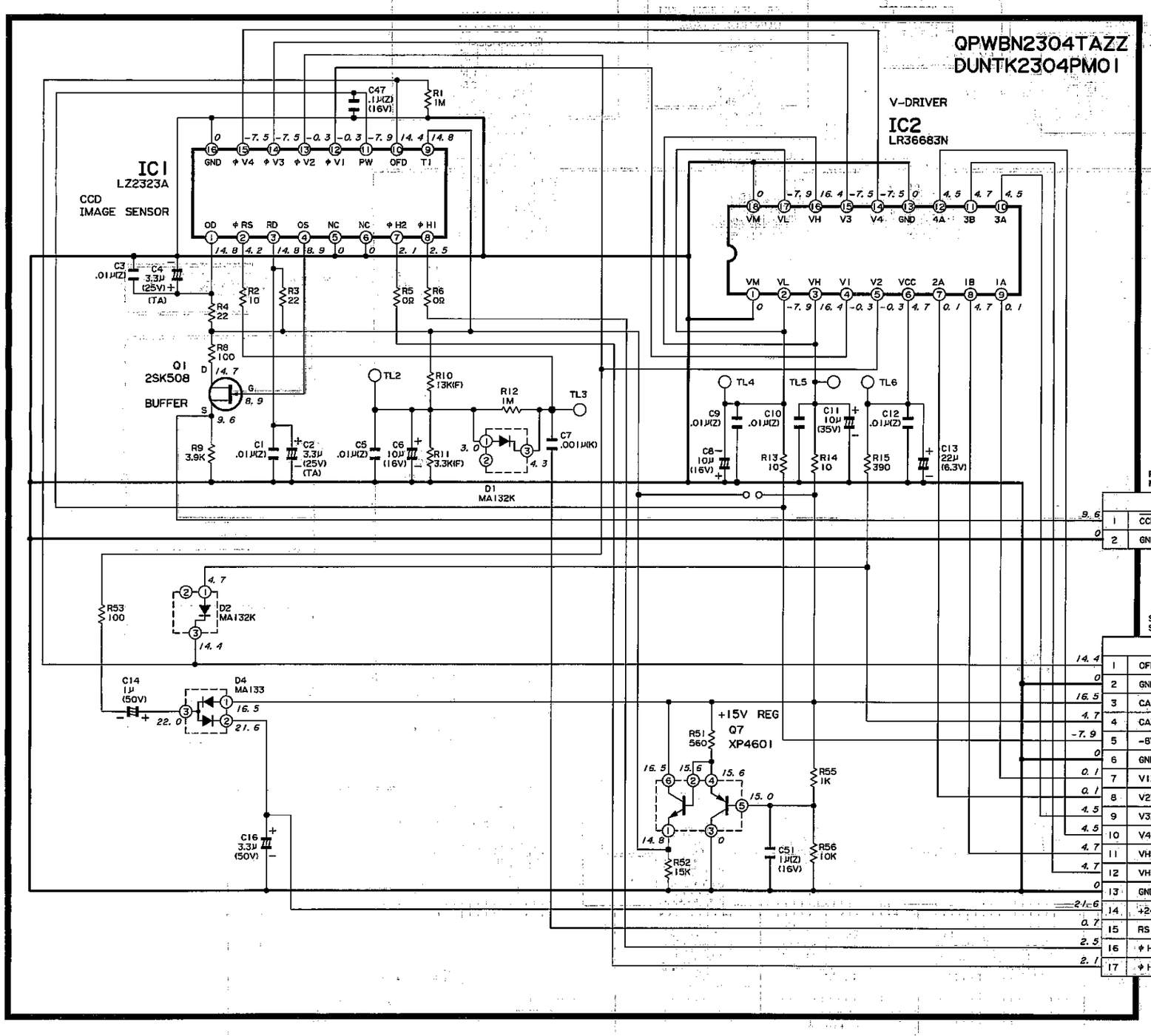
OVERALL SCHEMATIC DIAGRAM



SENSOR CIRCUIT SCHEMATIC DIAGRAM

Luminance/Colour Signal

QPWBN2304TAZZ
DUNTK2304PM01



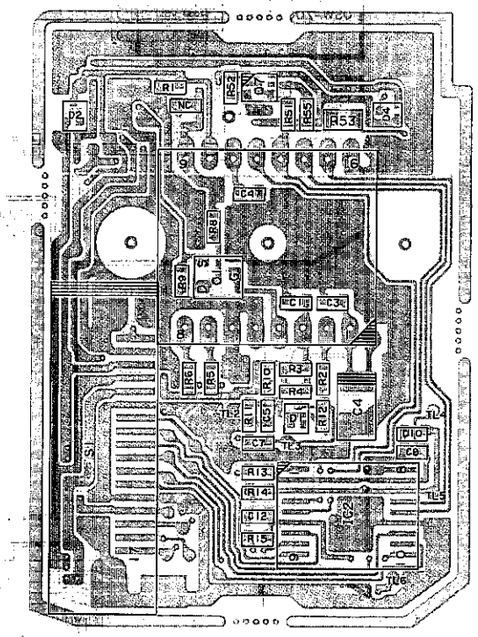
P1
N0264TA

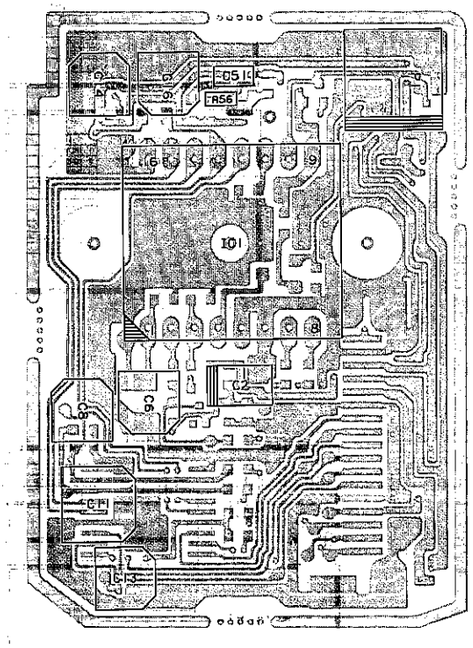
	SIGNAL	
1	CCD OUT	→
2	GND (SENSOR OUT)	—

S1
SOCN1736TA

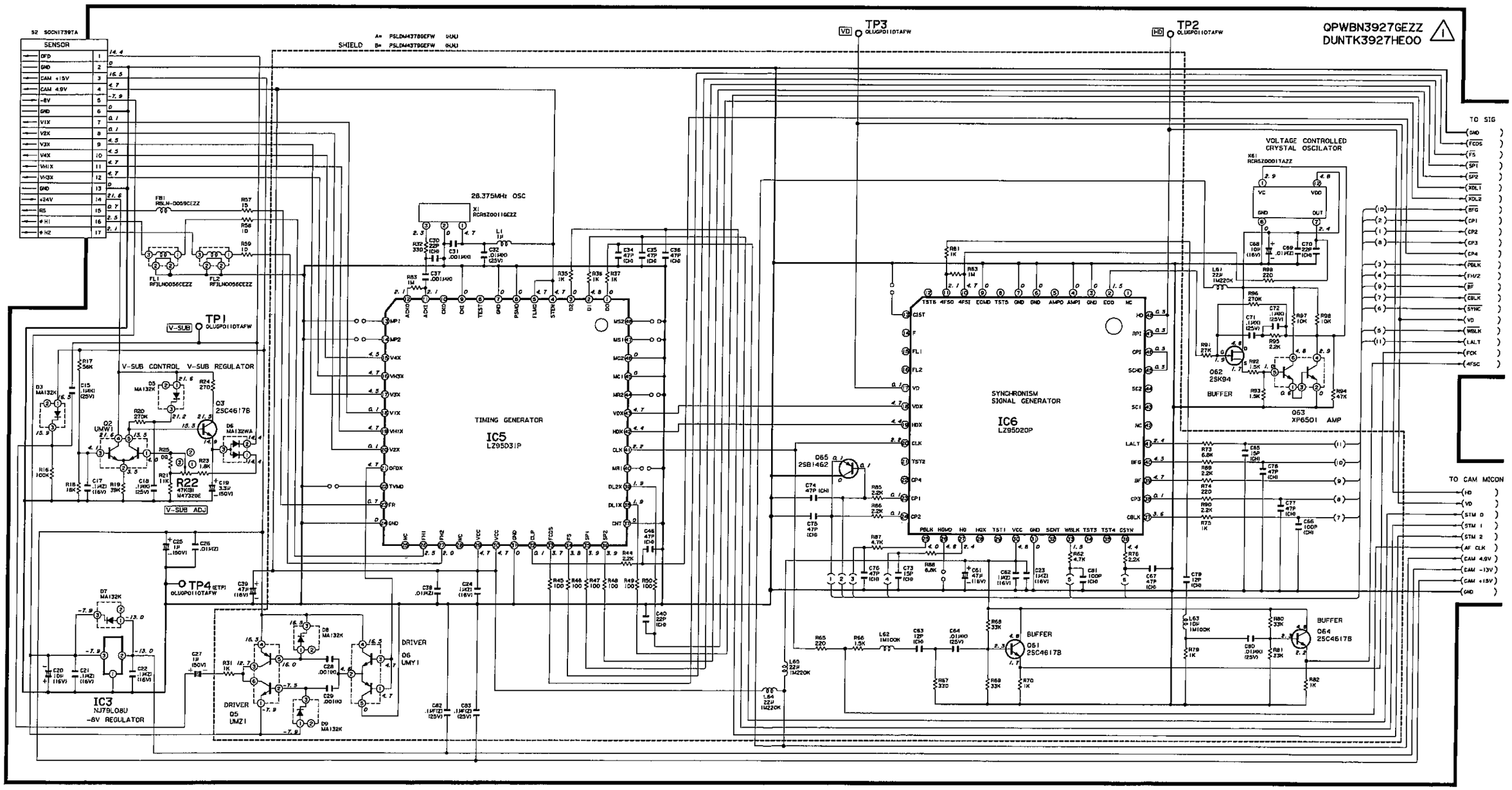
	SSG	
1	OFD	←
2	GND	—
3	CAM +15V	←
4	CAM 4.9V	←
5	-8V	←
6	GND	—
7	V1X	←
8	V2X	←
9	V3X	←
10	V4X	←
11	VH1X	←
12	VH3X	←
13	GND	—
14	+24V	→
15	RS	←
16	φH1	←
17	φH2	←

SENSOR P. W. B.





SSG CIRCUIT SCHEMATIC DIAGRAM

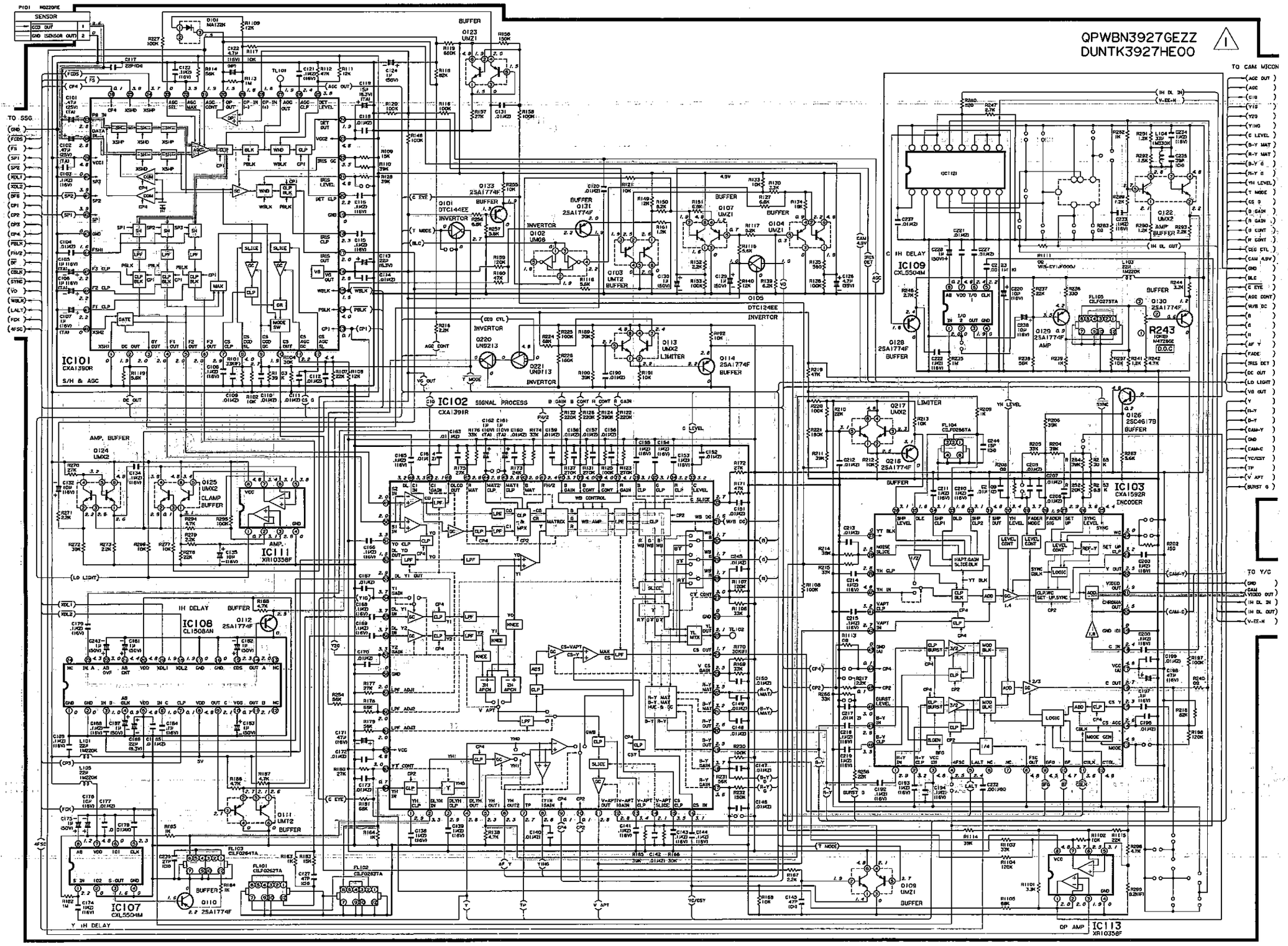


VL-SX80/H/X
VL-SX88

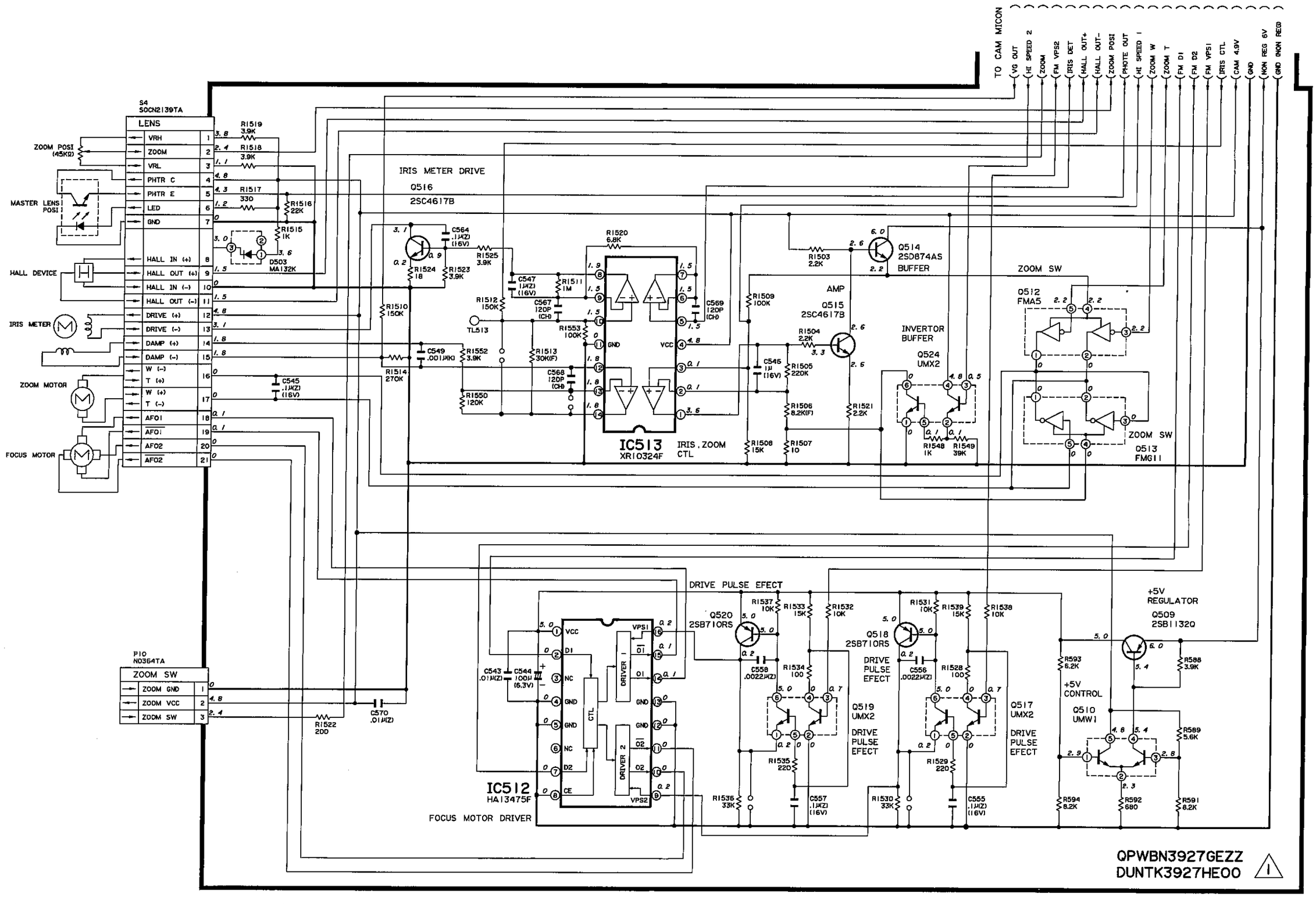
SIGNAL PROCESS CIRCUIT SCHEMATIC DIAGRAM

Luminance/Colour Signal Luminance Signal Colour Signal

QPWBN3927GEZZ
DUNTK3927HE00

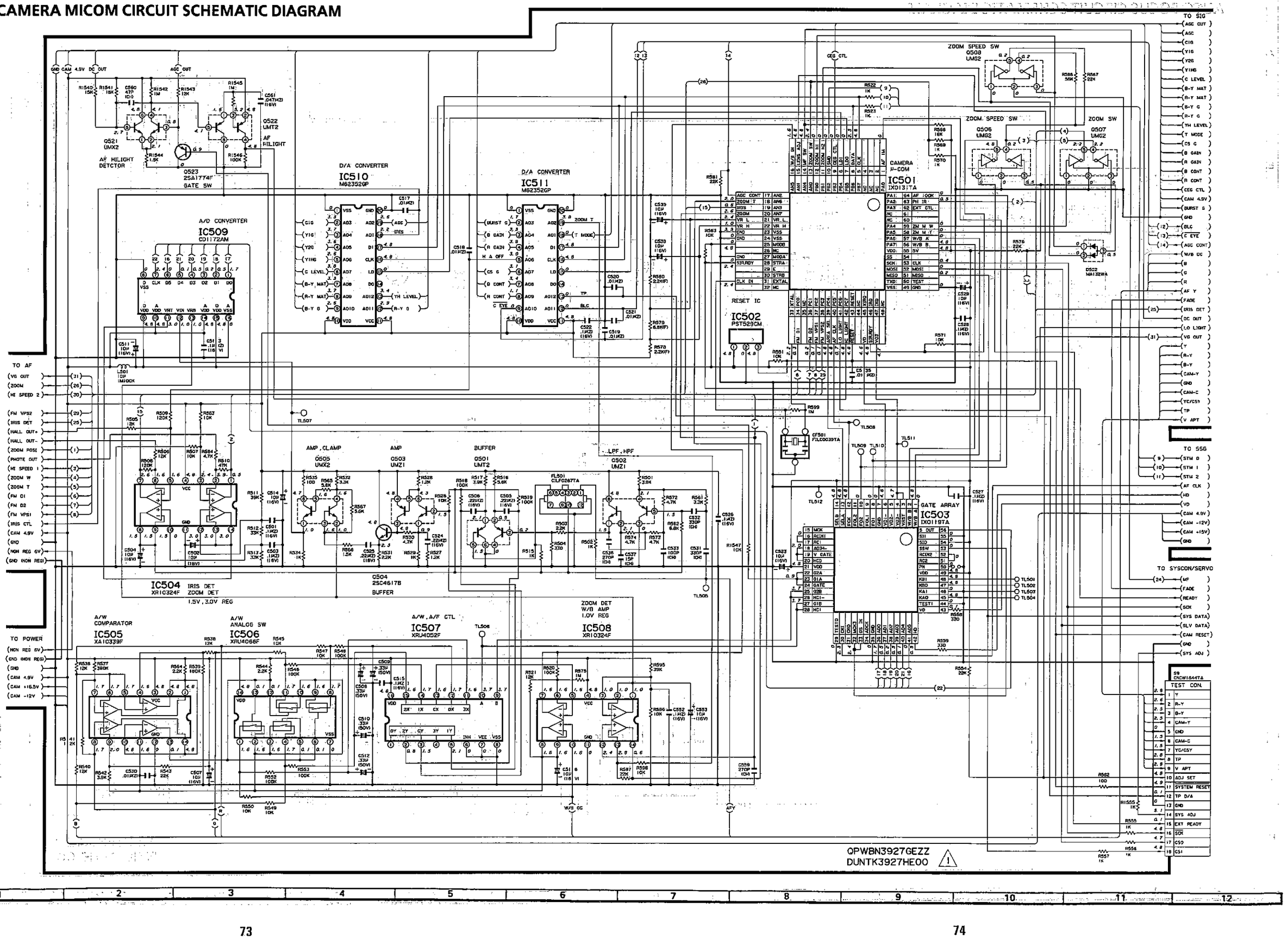


AUTO FOCUS CIRCUIT SCHEMATIC DIAGRAM



QPWBN3927GEZZ
DUNTK3927HE00

CAMERA MICOM CIRCUIT SCHEMATIC DIAGRAM

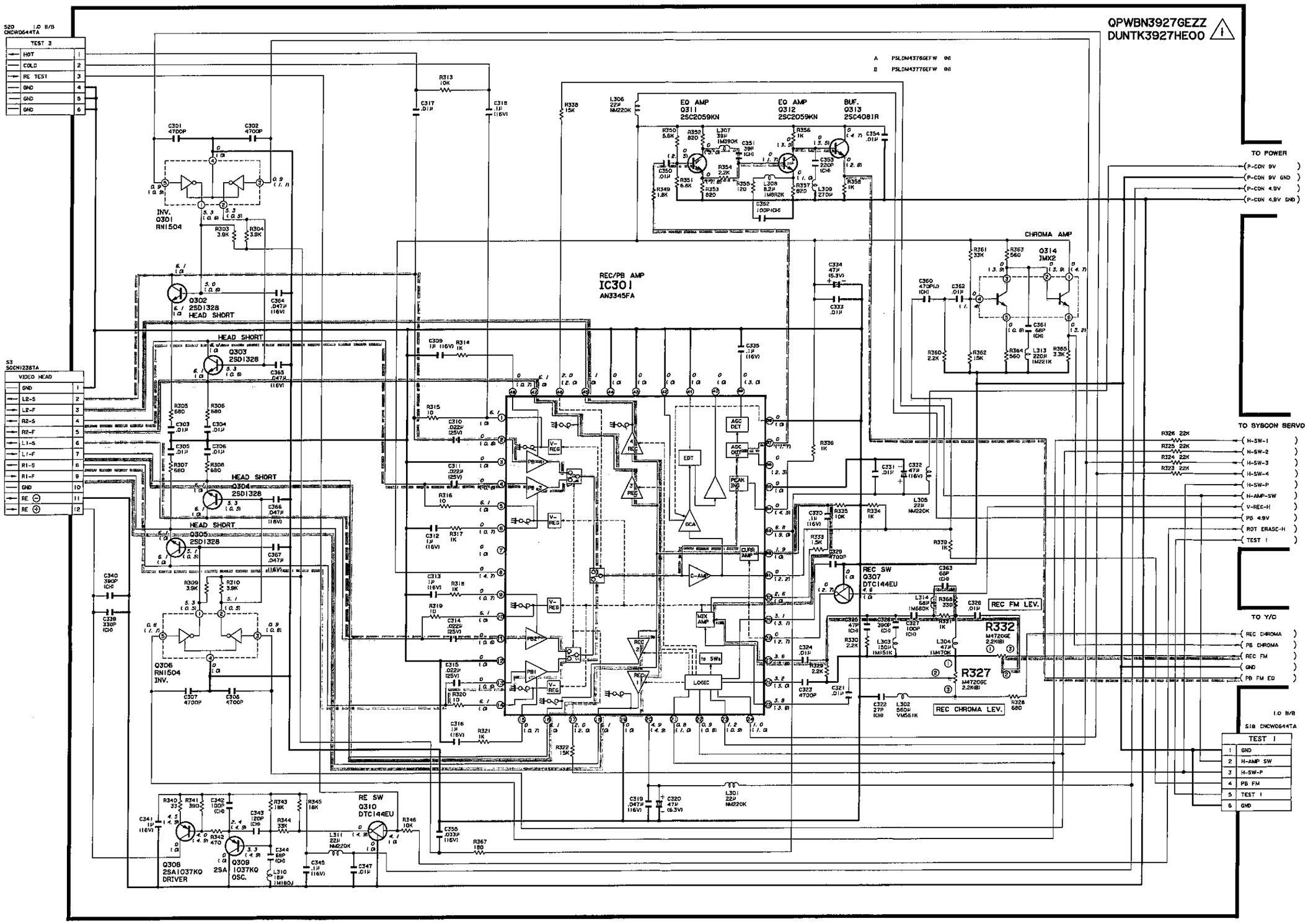


VL-SX80/H/X
VL-SX88

HEAD AMP CIRCUIT SCHEMATIC DIAGRAM

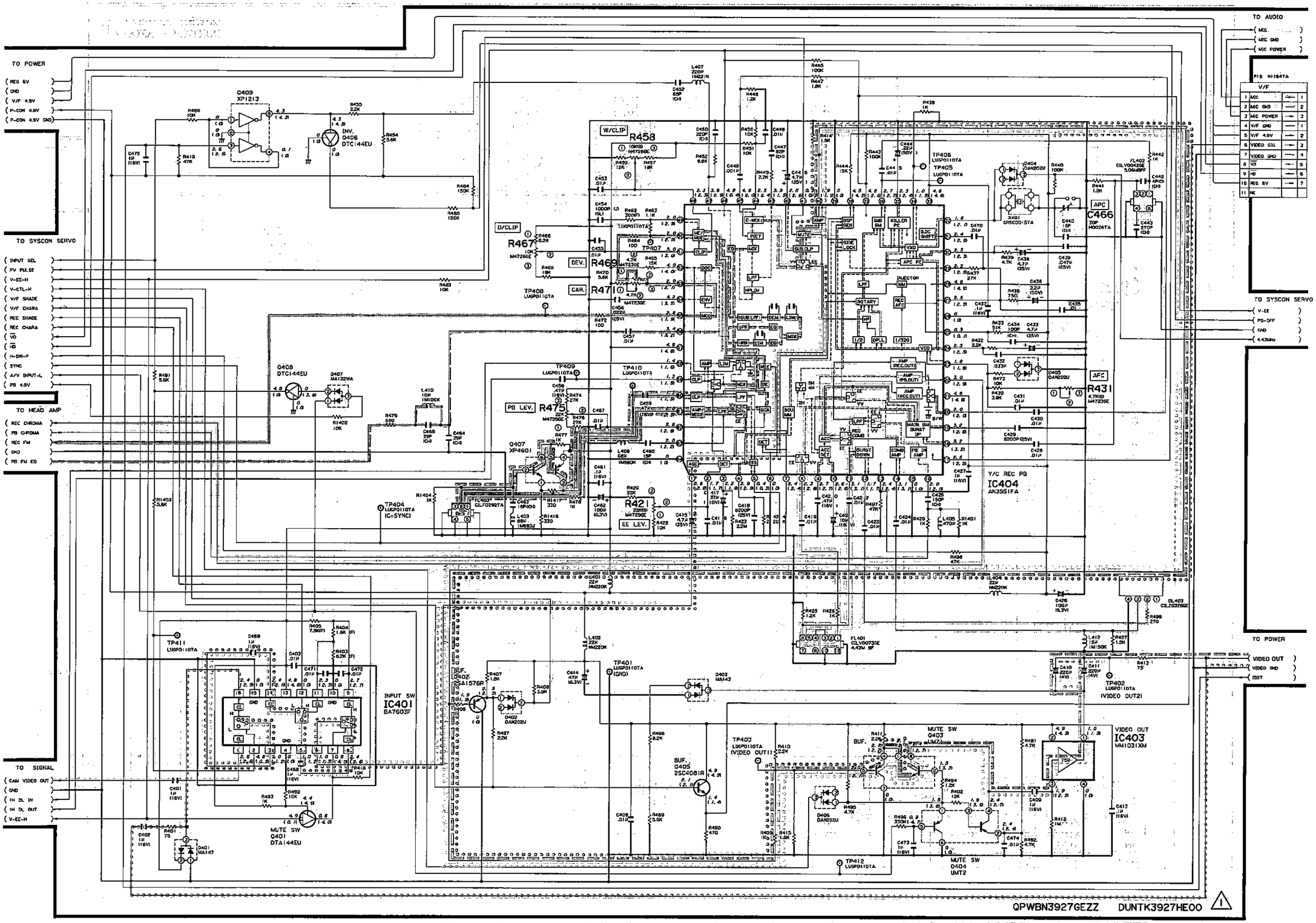
REC Y Signal
REC C Signal
PB Y Signal
PB C Signal

QPWBN3927GEZZ
DUNTK3927HE00



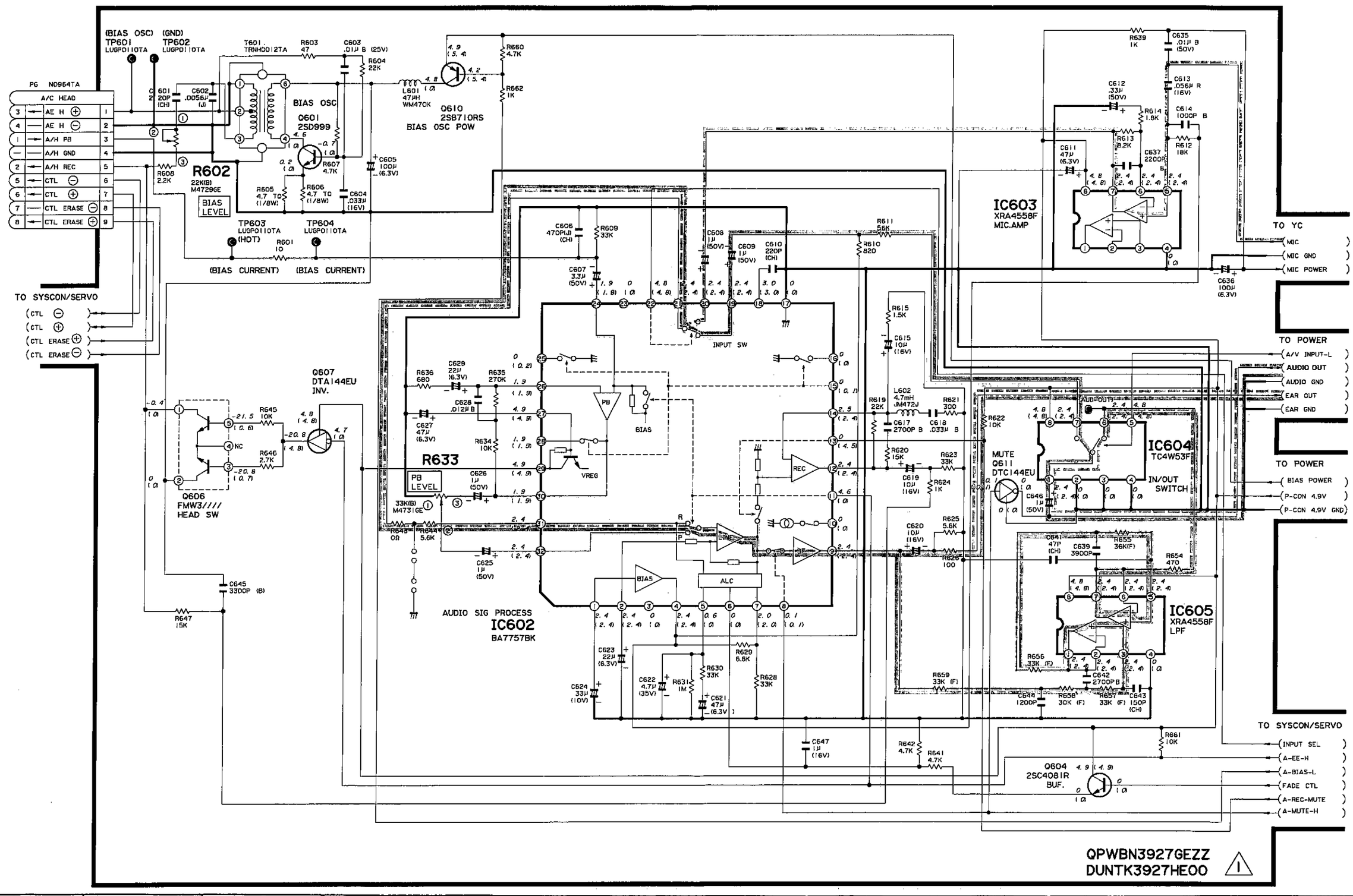
Y/C CIRCUIT SCHEMATIC DIAGRAM

Video in Signal
CAM Video Signal
REC Y Signal
REC C Signal
PB Y Signal
PB C Signal



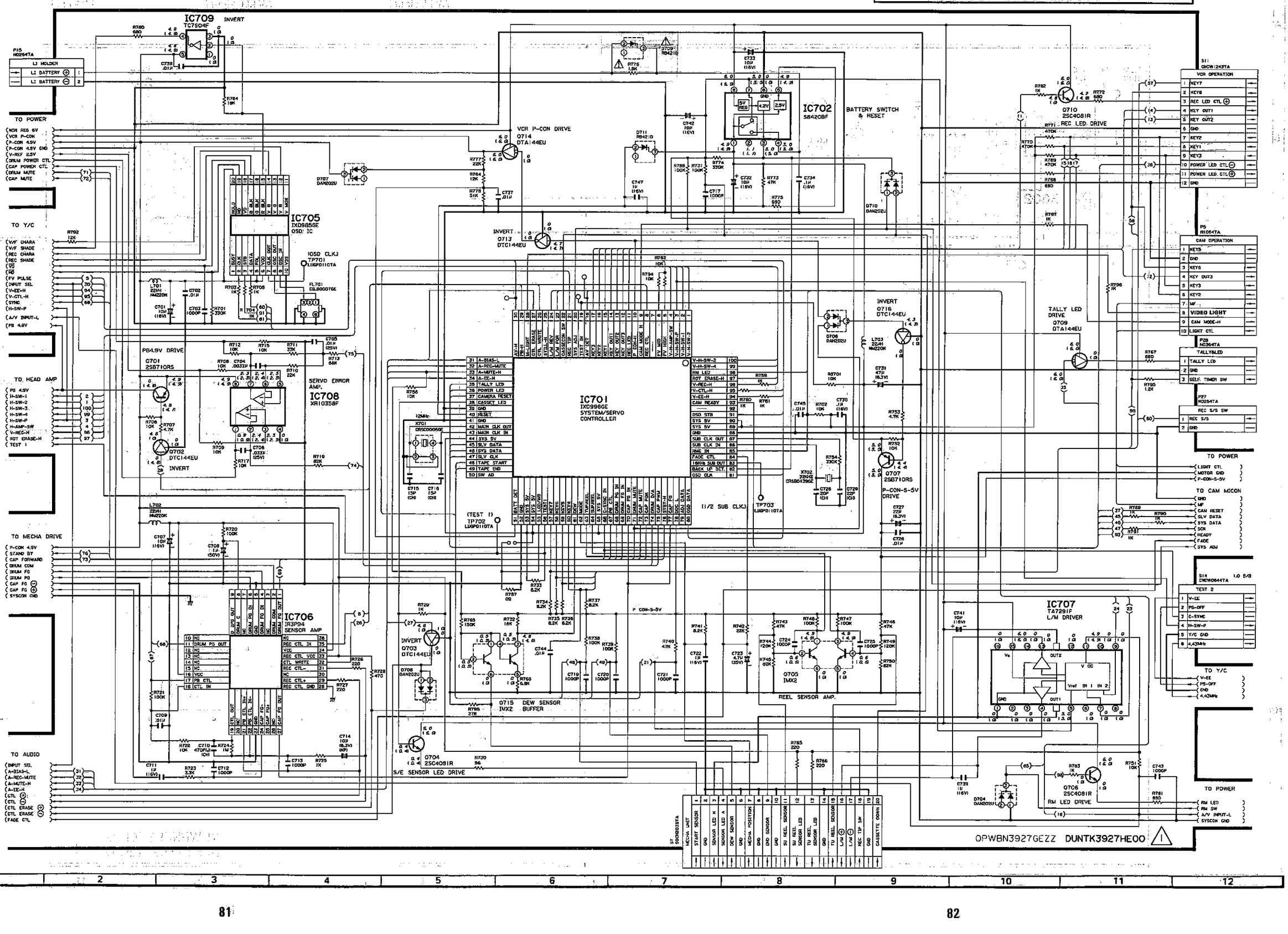
AUDIO CIRCUIT SCHEMATIC DIAGRAM

MIC. EE Signal
AV EE Signal
MIC. REC Signal
AV REC Signal
PB Signal

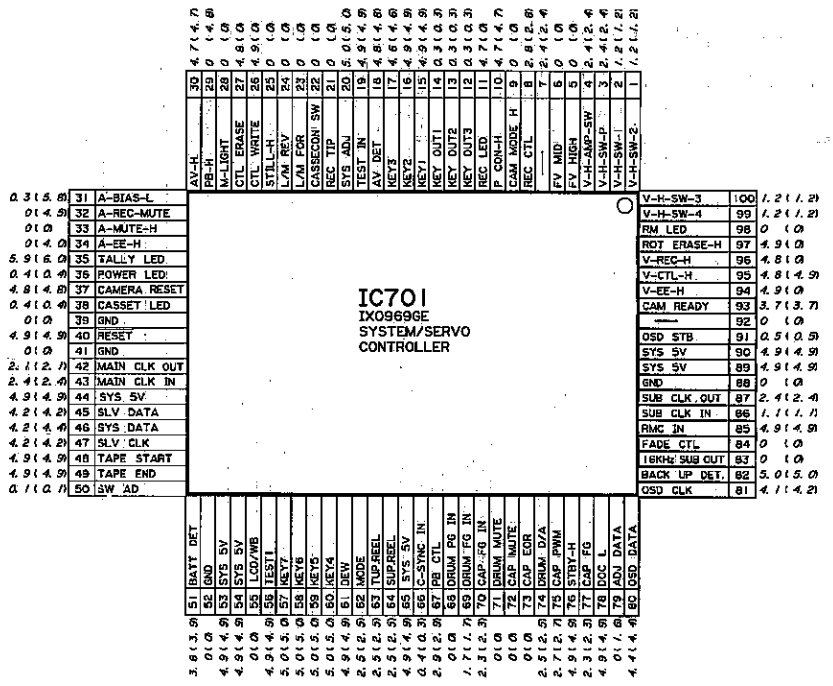


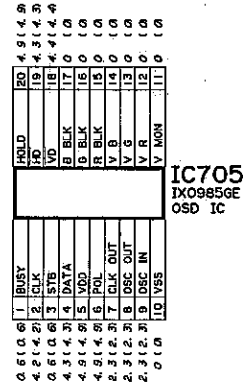
SYSTEM CONTROL/SERVO CIRCUIT SCHEMATIC DIAGRAM

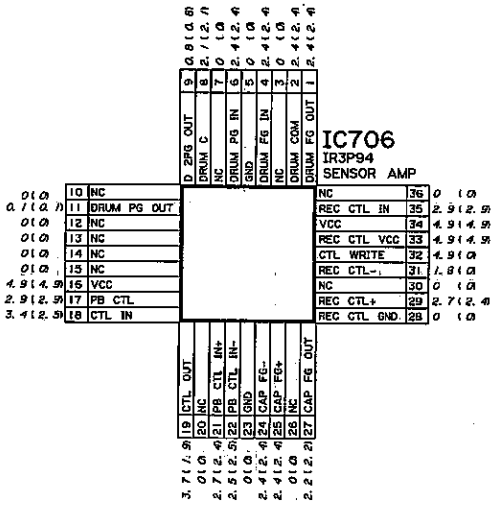
⚠ AND SHADED COMPONENTS = SAFETY RELATED PARTS



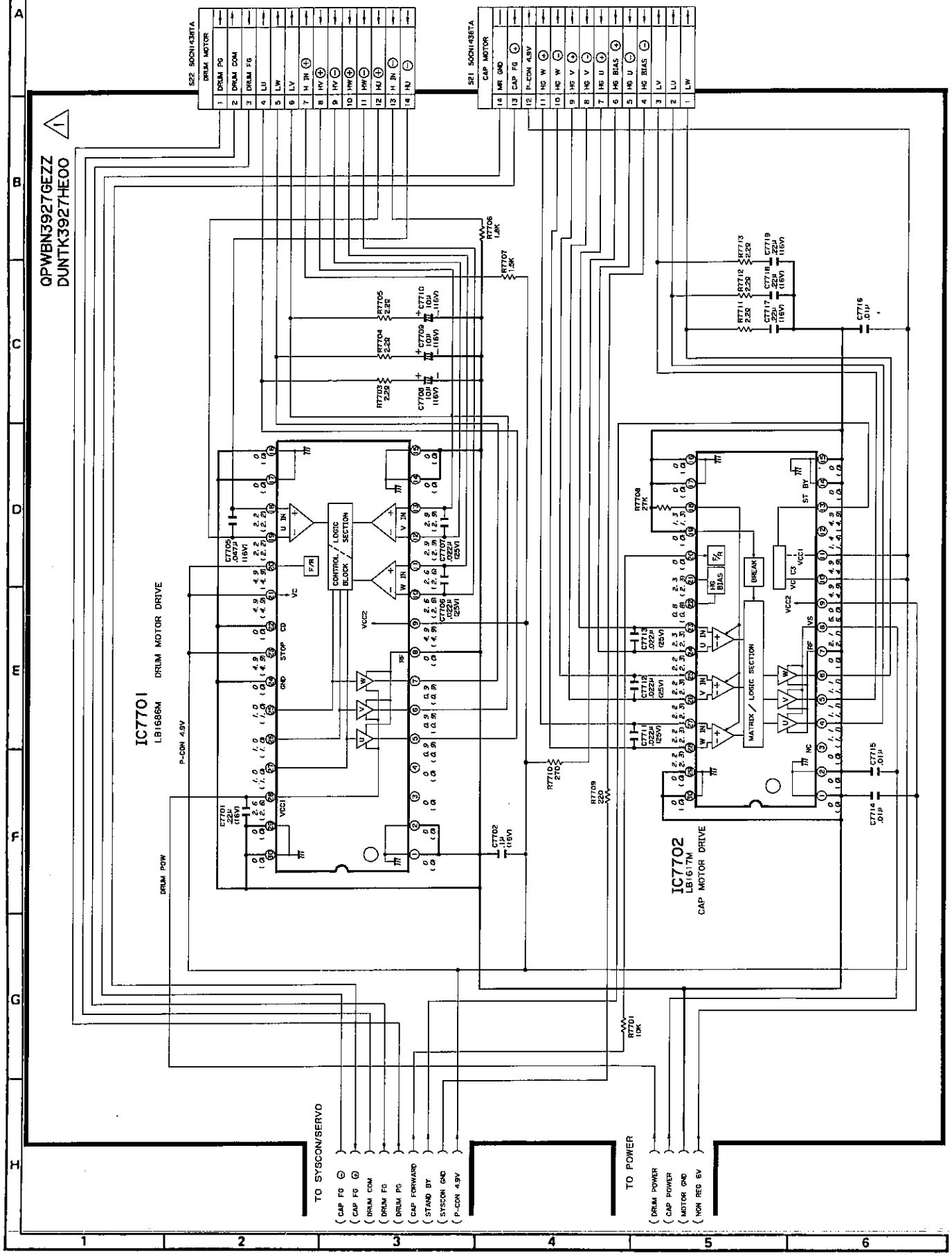
VOLTAGE CHART OF ICs







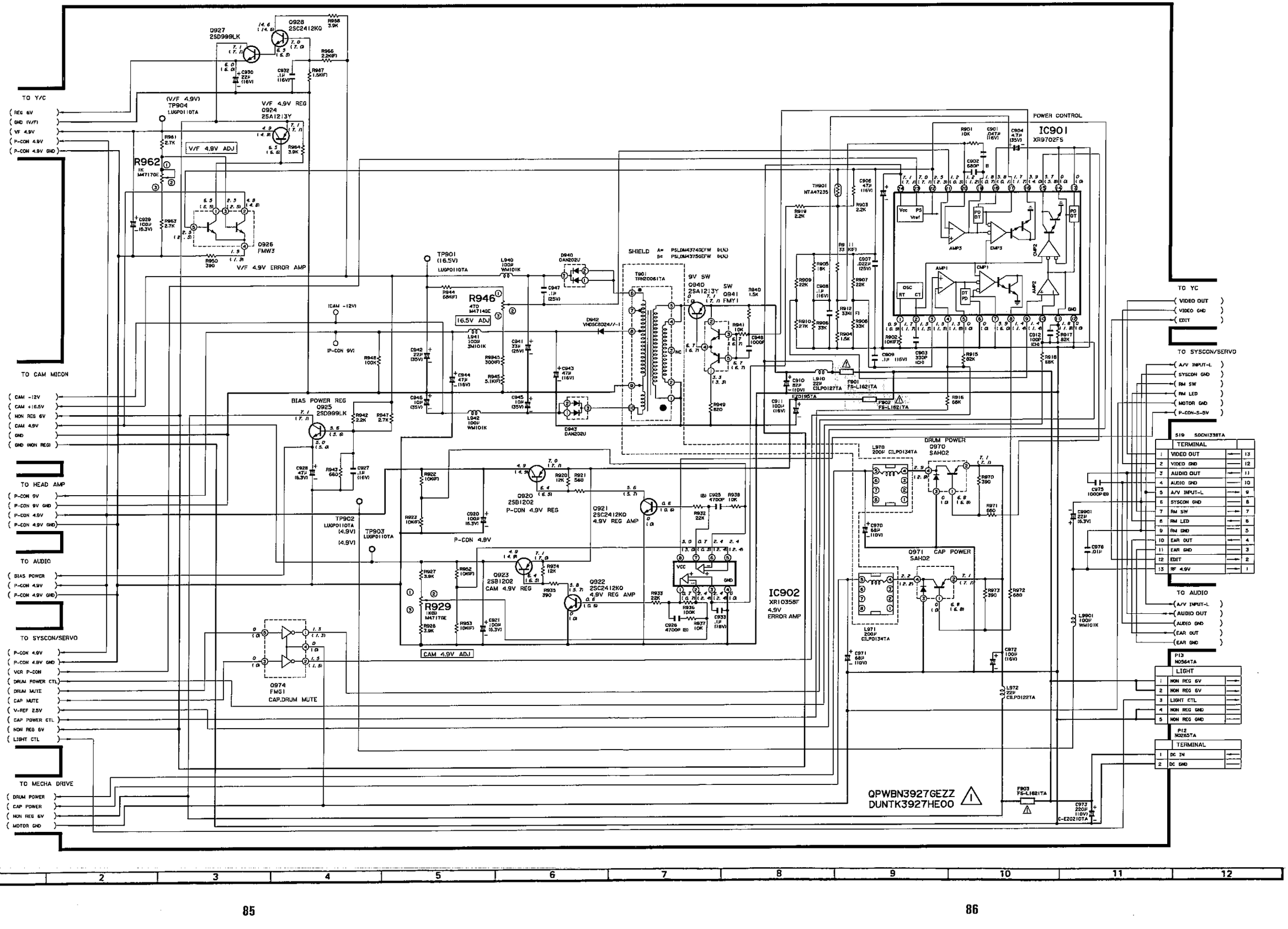
MECHA DRIVE CIRCUIT SCHEMATIC DIAGRAM



VL-SX80/H/X
VL-SX88

POWER CIRCUIT SCHEMATIC DIAGRAM

⚠ AND SHADED COMPONENTS = SAFETY RELATED PARTS



TERMINAL	
1 VIDEO OUT	13
2 VIDEO GND	12
3 AUDIO OUT	11
4 AUDIO GND	10
5 A/V INPUT-L	9
6 SYSCON GND	8
7 RM SW	7
8 RM LED	6
9 RM GND	5
10 EAR OUT	4
11 EAR GND	3
12 EDIT	2
13 RF 4.9V	1

P13 N0364TA

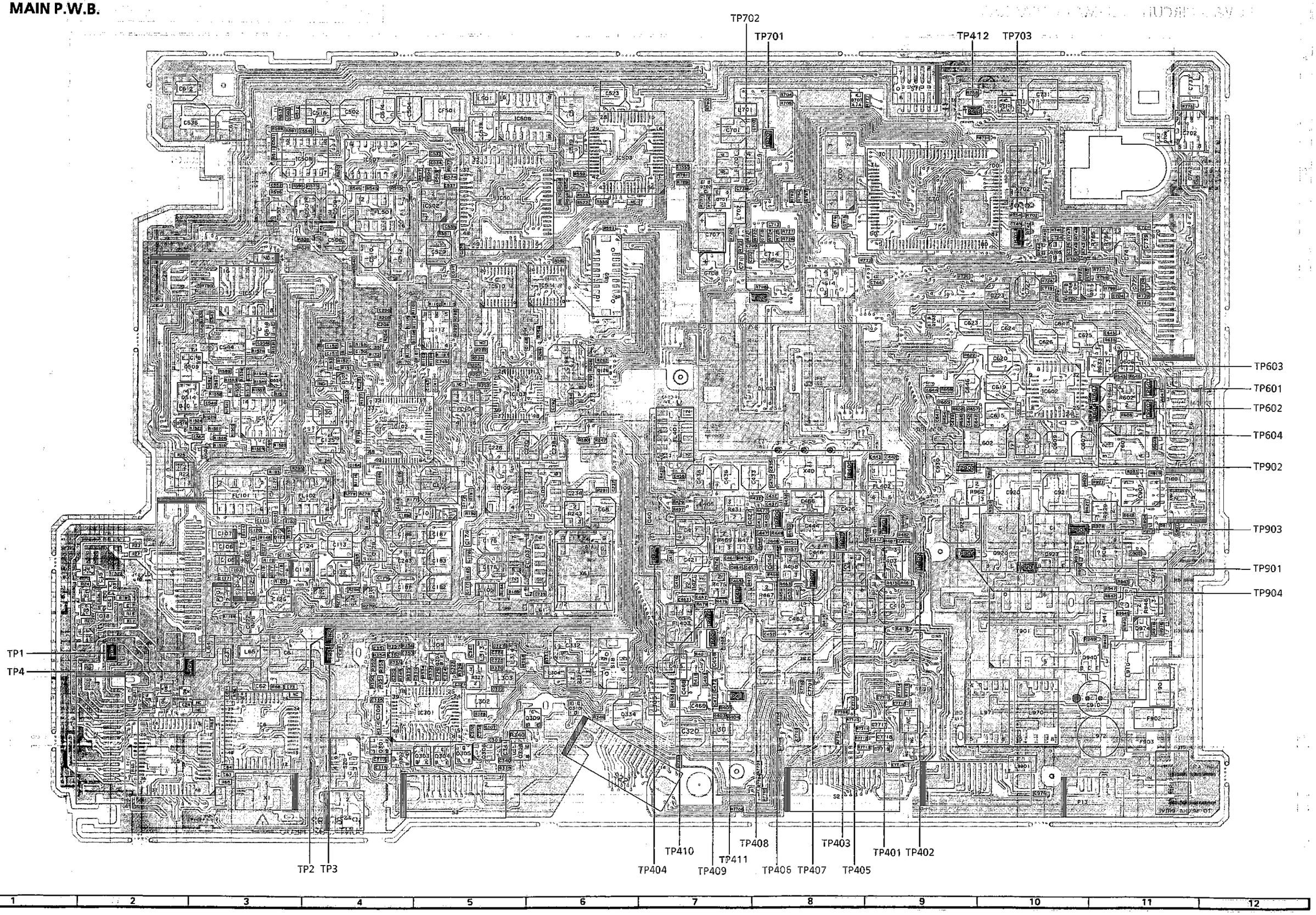
LIGHT	
1 NON REG 6V	
2 NON REG 6V	
3 LIGHT CTL	
4 NON REG GND	
5 NON REG GND	

P12 N0265TA

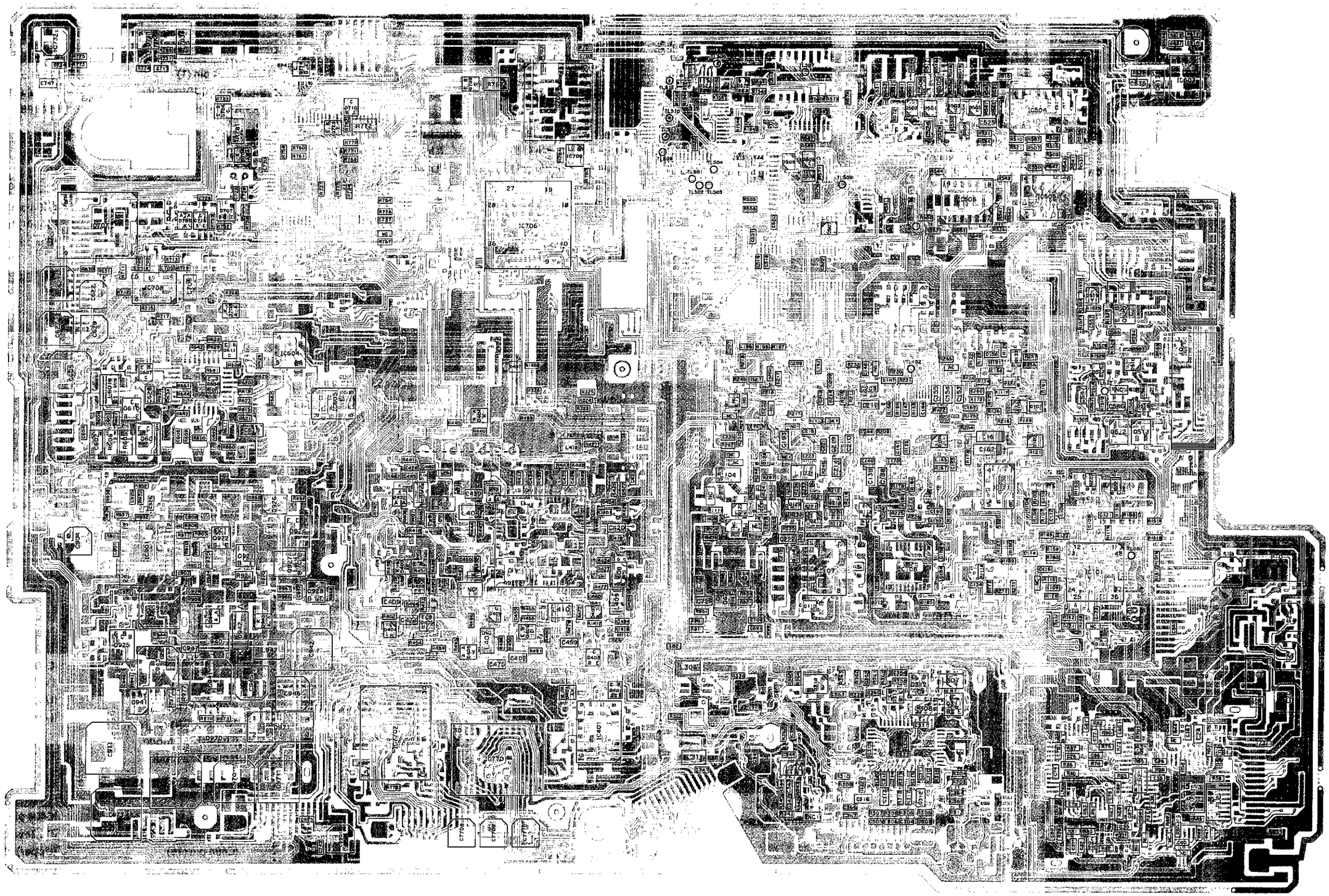
TERMINAL	
1 DC IN	
2 DC GND	

VL-SX80/H/X
VL-SX88

MAIN P.W.B.



VL-SX80/H/X
VL-SX88

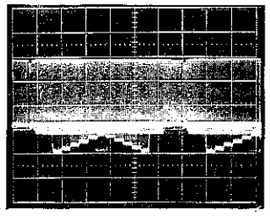


VL-SX80/H/X
VL-SX88

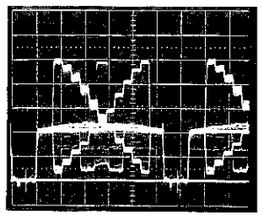
CAM-Y BLOCK

● SIGNAL PROCESS CIRCUIT

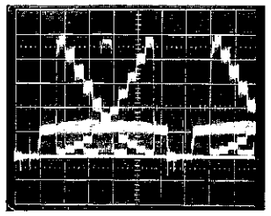
Object: Gray scale



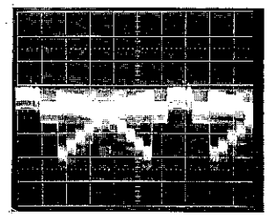
P101 pin (1) (CCD OUT)
50mV, 10µsec/div



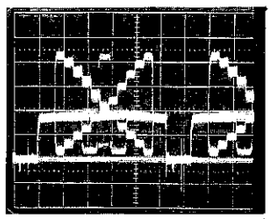
FL104 pin (2)
200mV, 10µsec/div



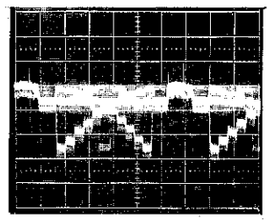
FL101 pin (12) (F3)
50mV, 10µsec/div



Q111 pin (1) (V-APT 1H)
50mV, 10µsec/div



FL103 pin (12) (1HDL)
50mV, 10µsec/div

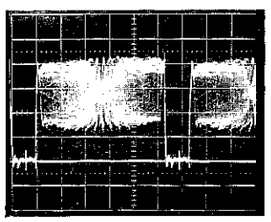


Q111 pin (3) (V-APT 2H)
50mV, 10µsec/div

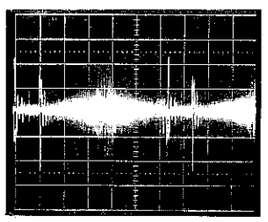
AUTO FOCUS BLOCK

● CAMERA MICOM CIRCUIT

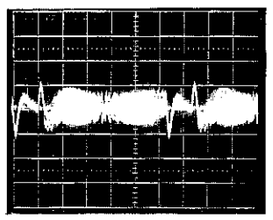
Object: Siemens star



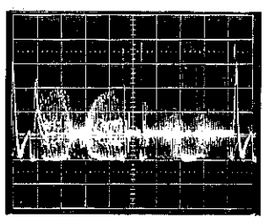
FL501 pin (1) (AF-Y)
200mV, 10µsec/div



IC507 pin (5) (AF-Y 1MHz)
50mV, 10µsec/div



IC507 pin (2) (AF-Y 100kHz)
50mV, 10µsec/div

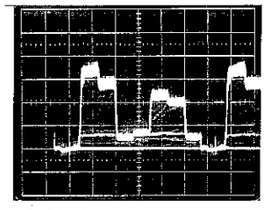


IC509 pin (12) (Edge sig.)

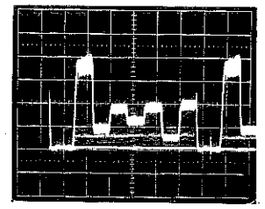
AUTO W/B BLOCK

● SIGNAL PROCESS CIRCUIT

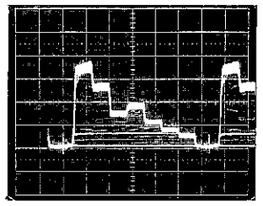
Object: Colour bar chart



IC102 pin (28) (W/B-R)
100mV, 10µsec/div



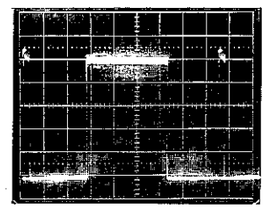
IC102 pin (30) (W/B-B)
100mV, 10µsec/div



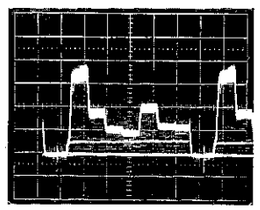
IC102 pin (29) (W/B-G)
100mV, 10µsec/div

● CAMERA MICOM CIRCUIT

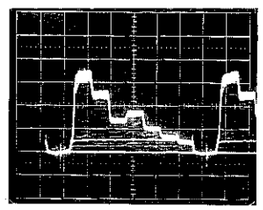
Object: Colour bar chart



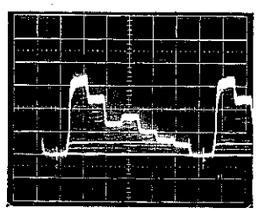
IC501 pin (16) (W/B IN)
200mV, 2msec/div



IC505 pin (6)
100mV, 10µsec/div



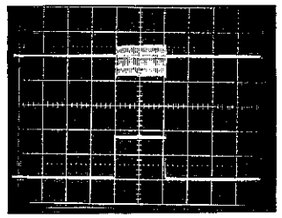
IC505 pin (7)
100mV, 10µsec/div



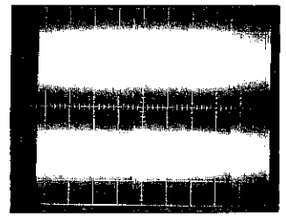
IC505 pin (4)
100mV, 10µsec/div

● HEAD AMP CIRCUIT

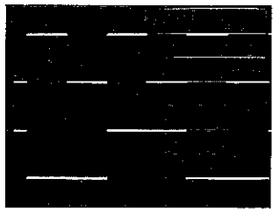
Input signal : Colour bar



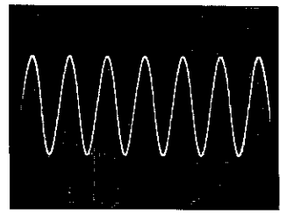
(Upper) IC301 pin (18)
(Lower) IC301 pin (21)
2V, 10msec/div
REC mode



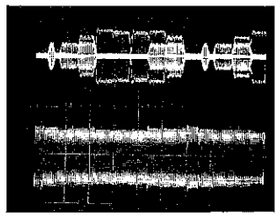
(Upper) IC301 pin (37)
(Lower) IC301 pin (31)
100mV, 5msec/div
PB mode



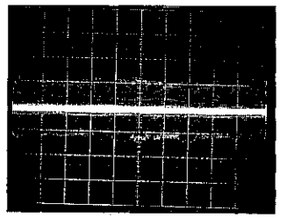
(Upper) IC301 pin (17)
(Lower) IC301 pin (46)
2V, 10msec/div
REC (PB) mode



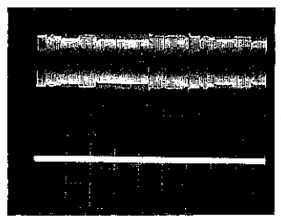
Connector S3
pin (11) - pin (12)
2V, 0.1µsec/div



(Upper) IC301 pin (25)
(Lower) IC301 pin (27)
50mV, 10µsec/div
REC mode

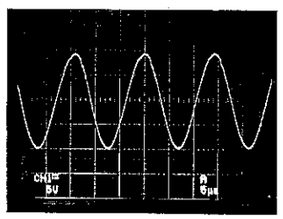


Connector S20 (REC TP)
pin (1) - pin (2)
50mV, 10 µsec/div
REC mode



(Upper) IC301 pin (30)
(Lower) IC301 pin (32)
100mV, 10µsec/div
REC mode

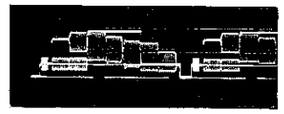
● AUDIO CIRCUIT



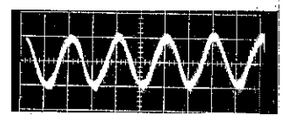
TP601-TP602 (GND)
5V, 5µsec/div

● Y/C CIRCUIT

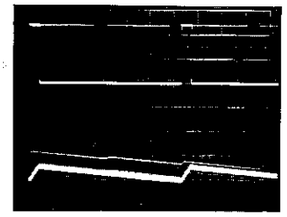
Input signal : Colour bar



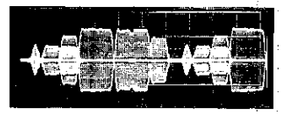
IC404 pin (1)
500mV, 10µsec/div
REC mode



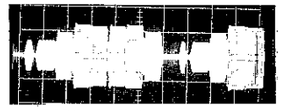
IC404 pin (18)
50mV, 0.1µsec/div
REC (PB) mode



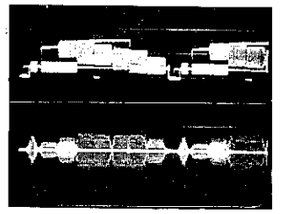
(Upper) IC404 pin (5)
2V, 10µsec/div
(Lower) IC404 pin (4)
200mV/div
REC (PB) mode



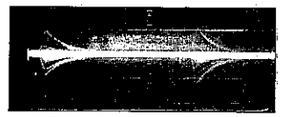
IC404 pin (20)
500mV, 10µsec/div
PB mode



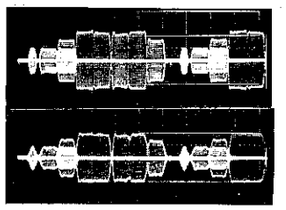
IC404 pin (22)
200mV, 10µsec/div
REC mode



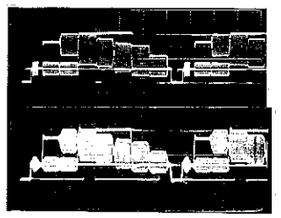
IC404 pin (8)
500mV, 10µsec/div
(Upper) REC mode
(Lower) PB mode



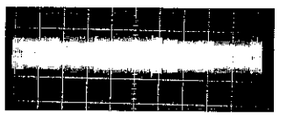
IC404 pin (27)
50mV, 10µsec/div
PB mode



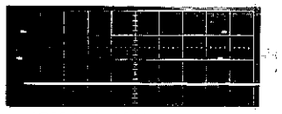
IC404 pin (14)
100mV, 10µsec/div
(Upper) REC mode
(Lower) PB mode



IC404 pin (40)
1V, 10µsec/div
(Upper) REC mode
(Lower) PB mode



IC404 pin (16)
50mV, 10µsec/div
PB mode



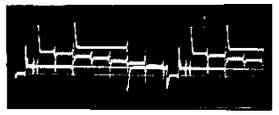
IC404 pin (41)
2V, 2msec/div
(Upper) PB STILL mode
(Lower) PB SEARCH mode

VL-SX80/H/X
VL-SX88

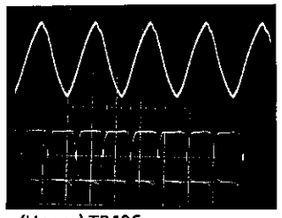
* The mark ◄ represents the ground level.

● Y/C CIRCUIT

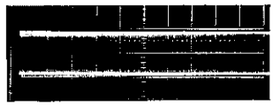
Input signal : Colour bar



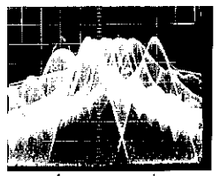
TP407
200mV, 10µsec/div
REC mode



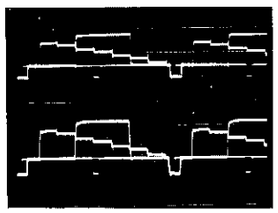
(Upper) TP406
200mV, 0.1µsec/div
(Lower) TP405
500mV/div
REC (PB) mode



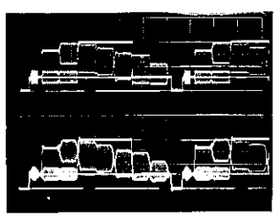
TP408
500mV, 10µsec/div
REC mode



TP408 (Spectrum)
0.2 MHz/div
REC mode

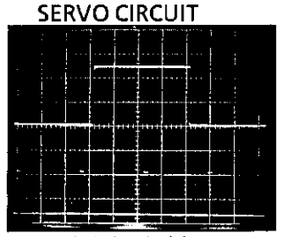


TP410
200mV, 10µsec/div
(Upper) REC mode
(Lower) PB mode

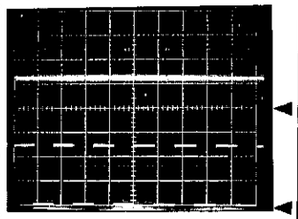


TP403
500mV, 10µsec/div
(Upper) REC mode
(Lower) PB mode

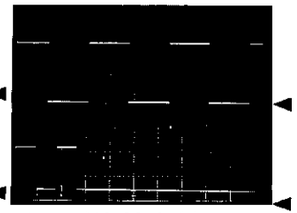
● SYSTEM CONTROL/ SERVO CIRCUIT



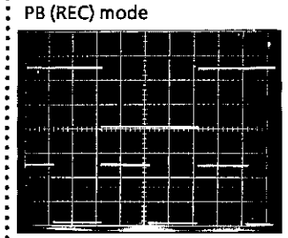
(Upper) IC701 pin (4)
(V-H-AMP-SW)
(Lower) IC706 pin (9)
(D 2PG OUT)
2V, 10msec/div
REC (PB) mode



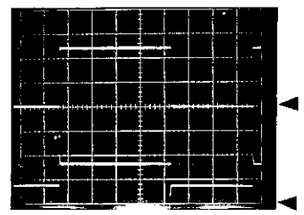
(Upper) IC701 pin (74)
(DRUM D/A)
(Lower) IC706 pin (1)
(DRUM FG)
2V, 1msec/div
PB (REC) mode



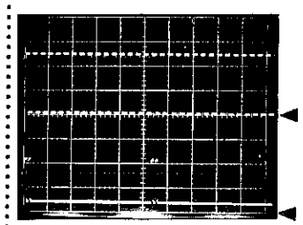
(Upper) IC706 pin (1)
(DRUM FG OUT)
(Lower) IC706 pin (9)
(D 2PG OUT)
2V, 0.5msec/div
REC (PB) mode



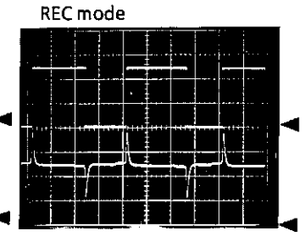
(Upper) IC701 pin (4)
(V-H-AMP-SW)
(Lower) IC701 pin (3)
(V-H-SW-P)
2V, 10msec/div
REC (PB) mode



(Upper) IC706 pin (35)
(REC CTL IN)
(Lower) P6 (A/C HEAD) pin (7)
(CTL ⊕)
(in AUDIO CIRCUIT)
2V, 5msec/div
REC mode

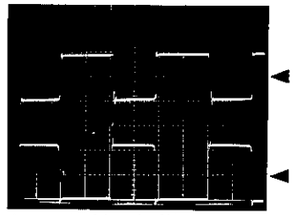


(Upper) IC706 pin (1)
(DRUM FG OUT)
(Lower) IC706 pin (9)
(D 2PG OUT)
2V, 5msec/div
REC (PB) mode

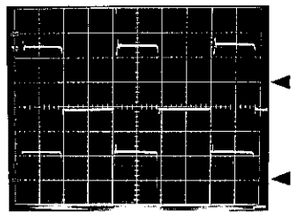


(Upper) IC701 pin (67)
(PB CTL)
2V, 10msec/div
(Lower) IC706 pin (19)
(CTL OUT) 1V/div
PB mode

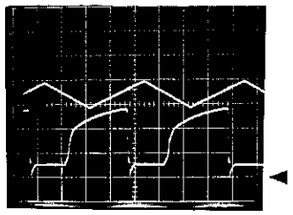
● POWER CIRCUIT



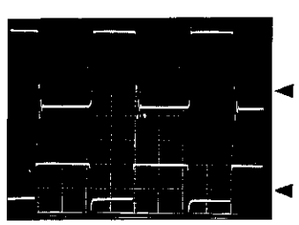
(Upper) T901 pin (8)
(P-CON 9V)
10V, 1µsec/div
(Lower) Q940 Collector
5V/div



(Upper) T901 pin (10) (– 13V)
(CAM – 12V)
10V, 1µsec/div
(Lower) Q940 Collector
5V/div



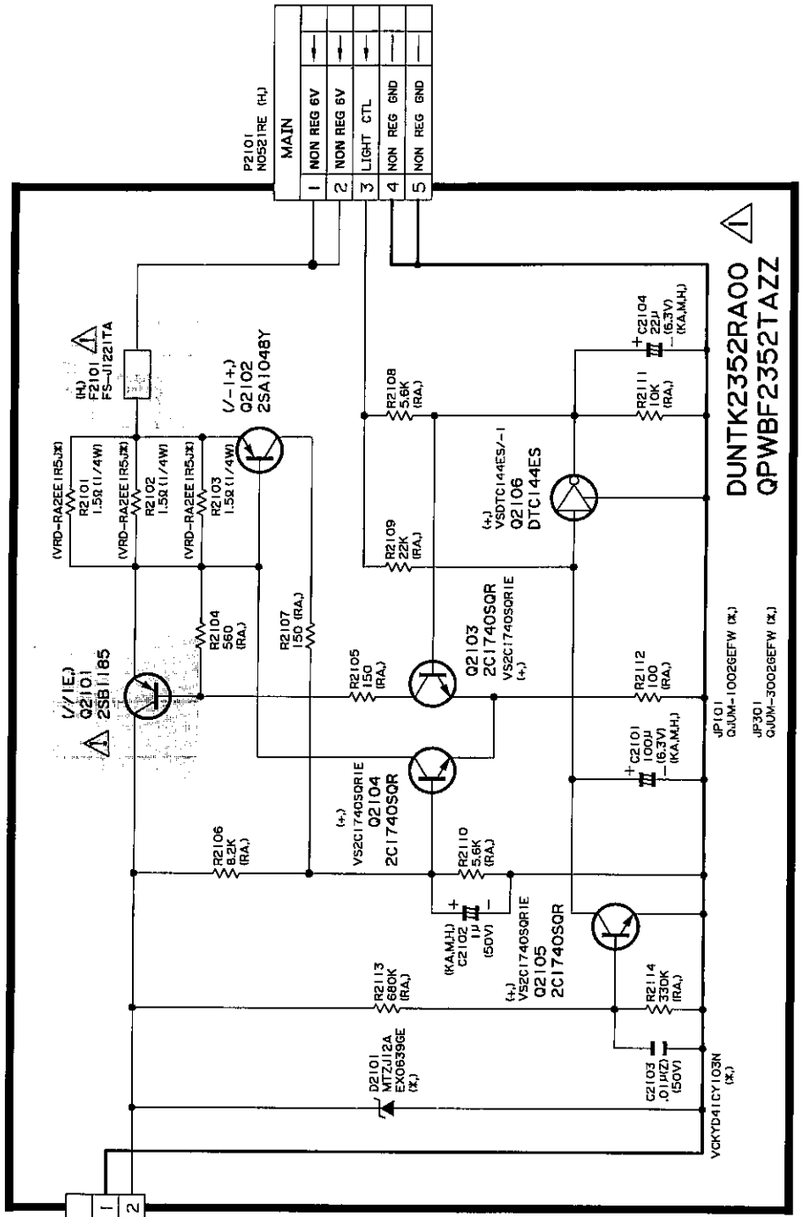
(Upper) IC901 pin (2)
(Triangular wave)
5V, 1µsec/div
(Lower) IC901 pin (16)
(15V system P.W.M.
output) 2V/div

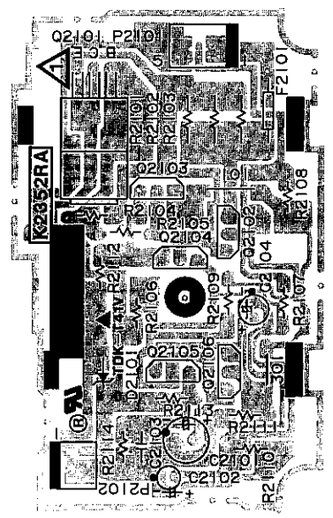


(Upper) T901 pin (6)
(CAM 16.5V)
(Lower) Q940 Collector
10V, 1µsec/div

VIDEO LIGHT CIRCUIT SCHEMATIC DIAGRAM

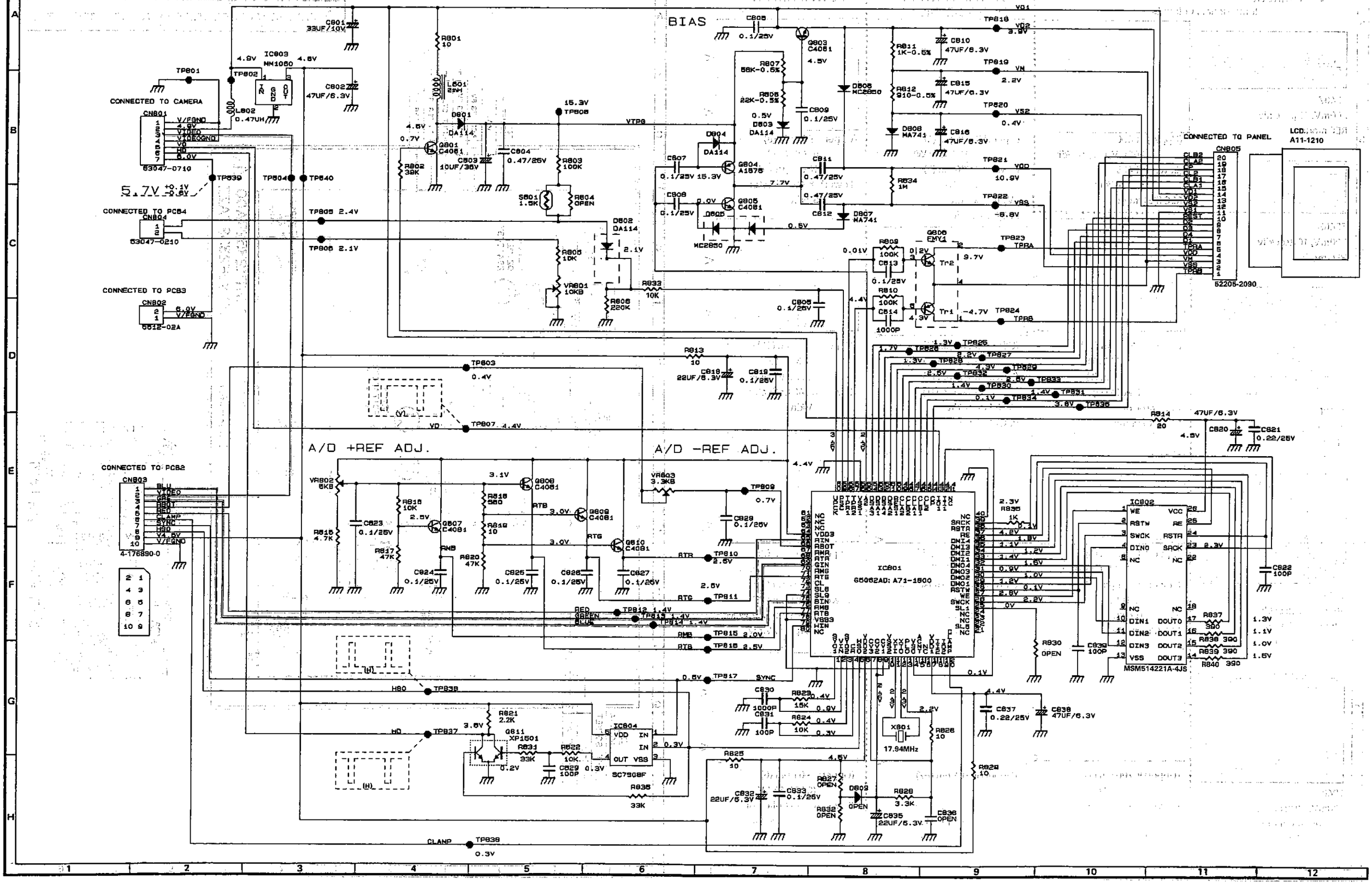
⚠ AND SHADED COMPONENTS = SAFETY RELATED PARTS



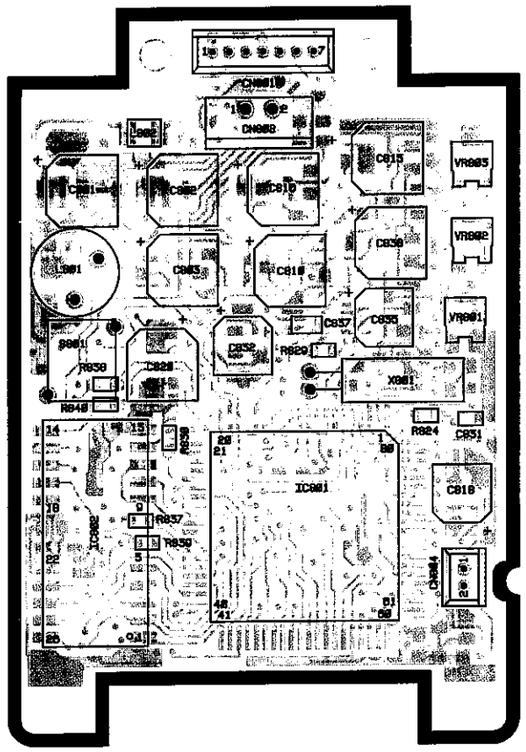


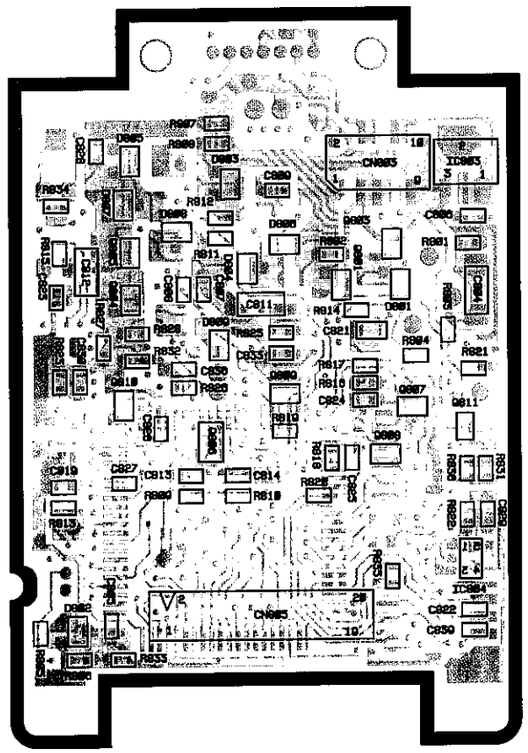
VIEWFINDER CIRCUIT 1 SCHEMATIC DIAGRAM

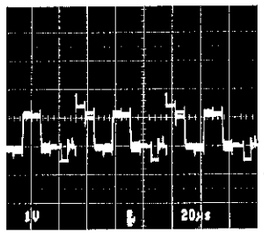
Composite Video Signal
Green Signal
Red Signal
Blue Signal



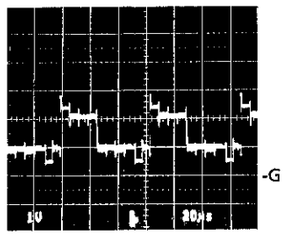
VIEWFINDER CIRCUIT 1 P.W.B.



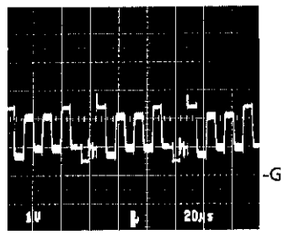




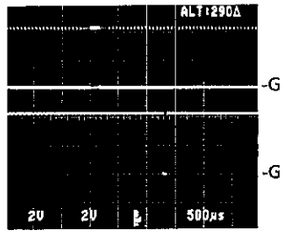
TP812
1V, 20µS/div



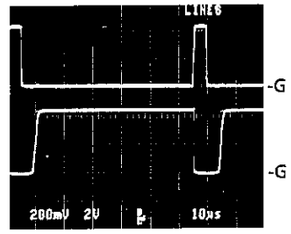
TP813
1V, 20µS/div



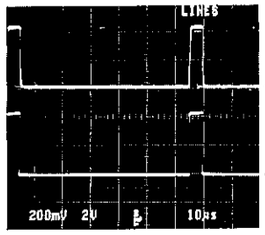
TP814
1V, 20µS/div



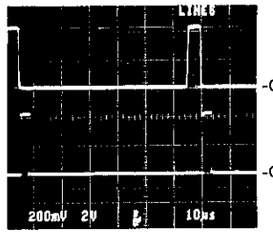
(Upper) TP817
(Lower) TP807
2V, 500µS/div



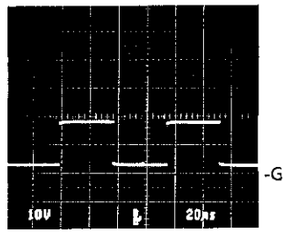
(Upper) TP817
2V, 10µS/div
(Lower) TP837
200mV, 10µS/div



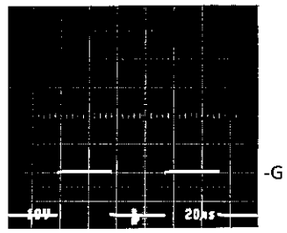
(Upper) TP817
2V, 10µS/div
(Lower) TP836
200mV, 10µS/div



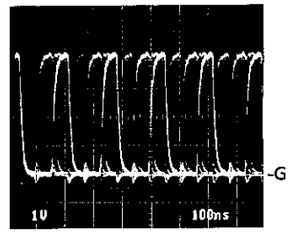
(Upper) TP817
2V, 10µS/div
(Lower) TP838
200mV, 10µS/div



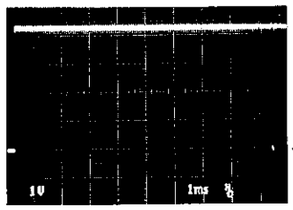
TP821
10V, 20µS/div



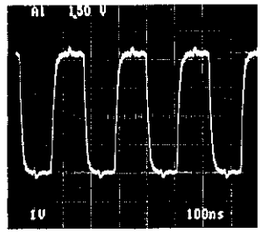
TP822
10V, 20µS/div



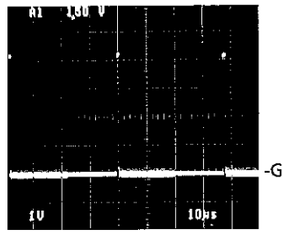
TP825-TP828
1V, 100nS/div



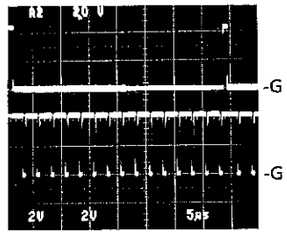
TP829
1V, 1mS/div



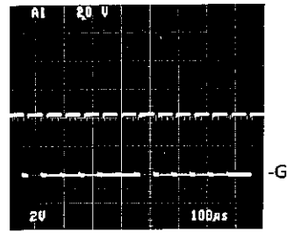
TP830-TP833
1V, 100nS/div



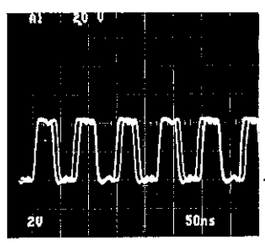
TP834
1V, 10µS/div



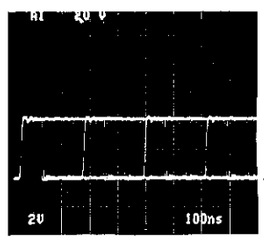
(Upper) TP834
(Lower) TP835
2V, 5µS/div



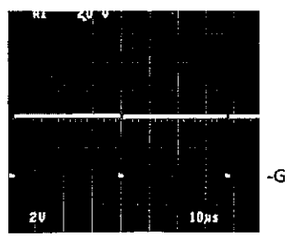
IC802 pin (1)
2V, 100µS/div



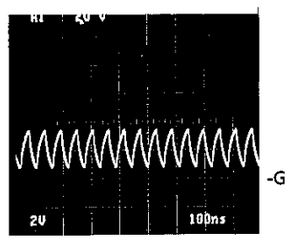
IC802 pin (3)
2V, 50nS/div



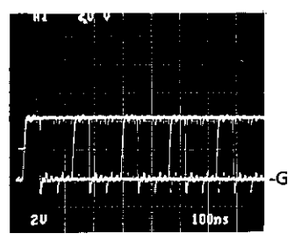
IC802 pin (4)
2V, 100nS/div



IC802 pin (25)
2V, 10µS/div



IC802 pin (23)
2V, 100nS/div

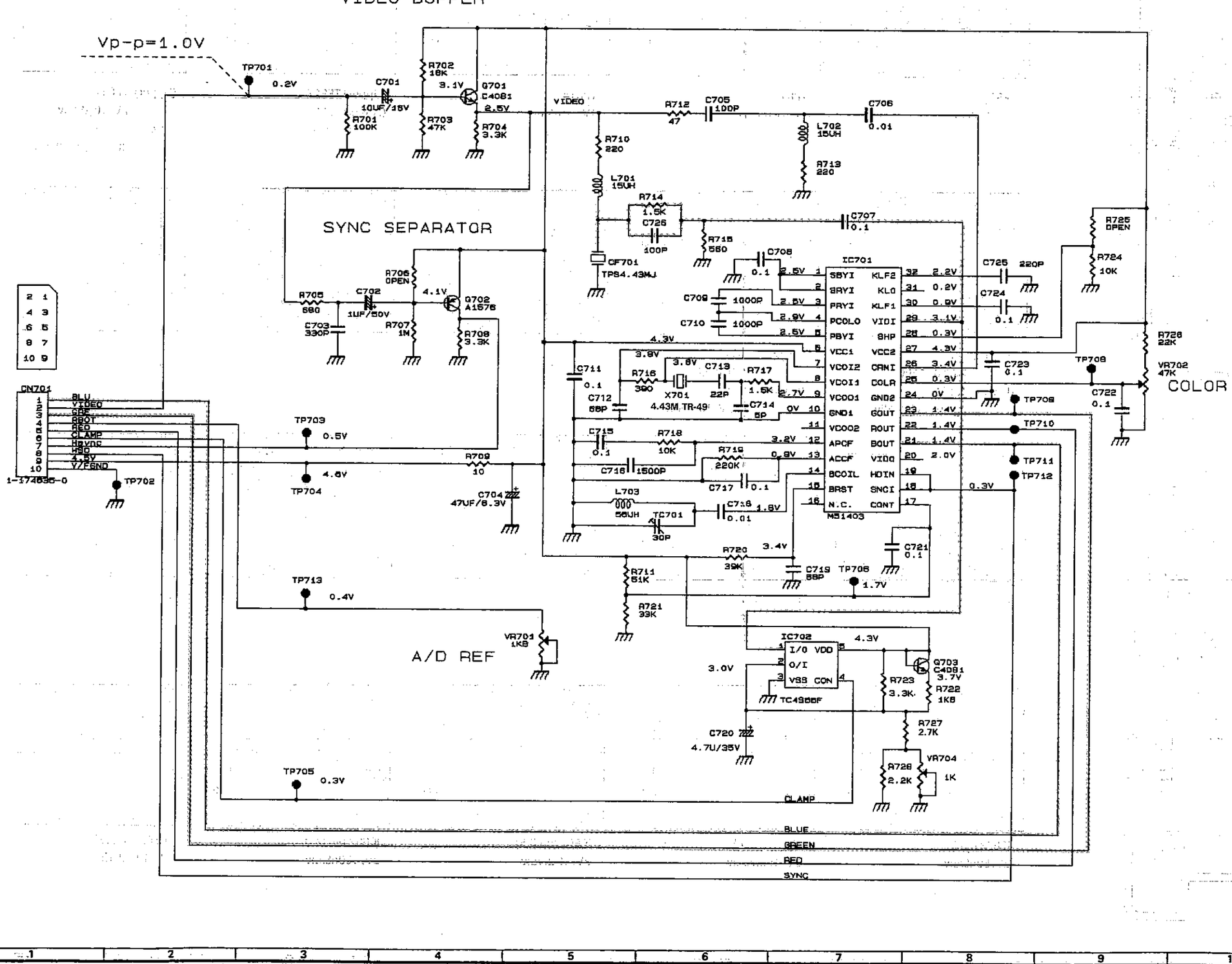


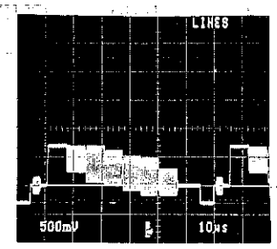
IC802 pin (17)
2V, 100nS/div

VL-SX80/H/X
VL-SX88

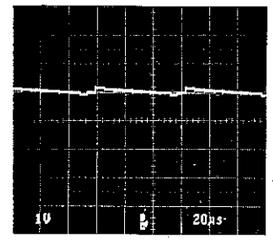
VIEWFINDER CIRCUIT 2 SCHEMATIC DIAGRAM

Composite Video Signal
Green Signal
Red Signal
Blue Signal
Colour Signal
Luminance Signal

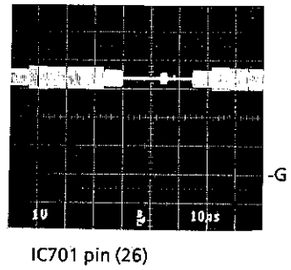




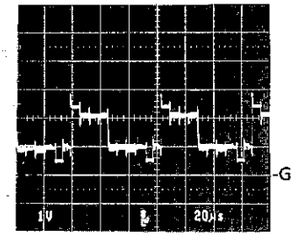
TP701
500mV, 10µS/div



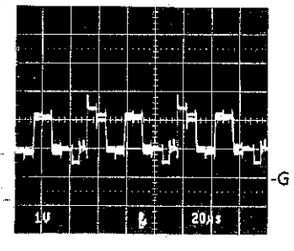
IC701 pin (29)
1V, 20µS/div



IC701 pin (26)
1V, 10µS/div

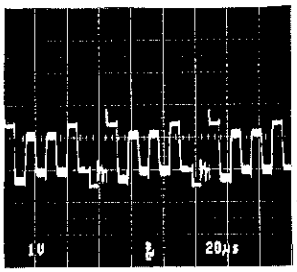


TP709
1V, 20µS/div

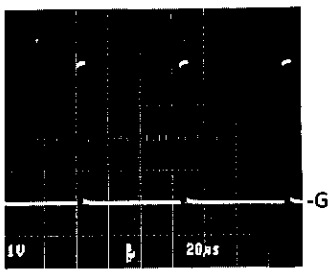


TP710
1V, 20µS/div

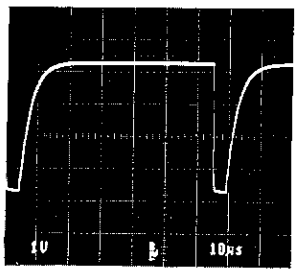
VIEWFINDER CIRCUIT 2 P.W.B.



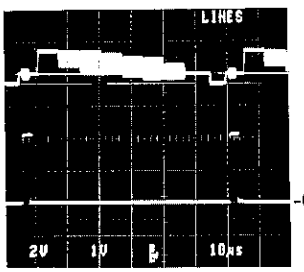
TP711
1V, 20μS/div



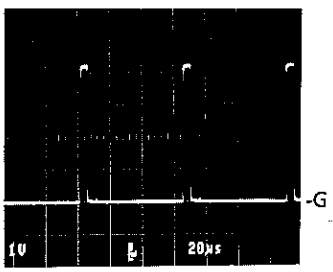
TP712
1V, 20μS/div



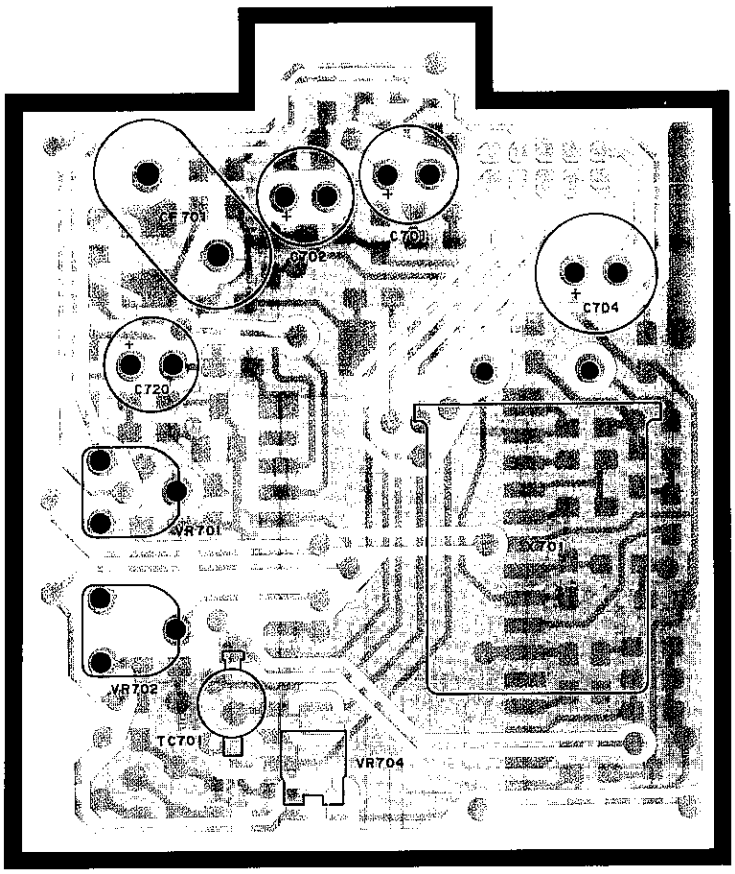
IC701 pin (15)
1V, 10μS/div

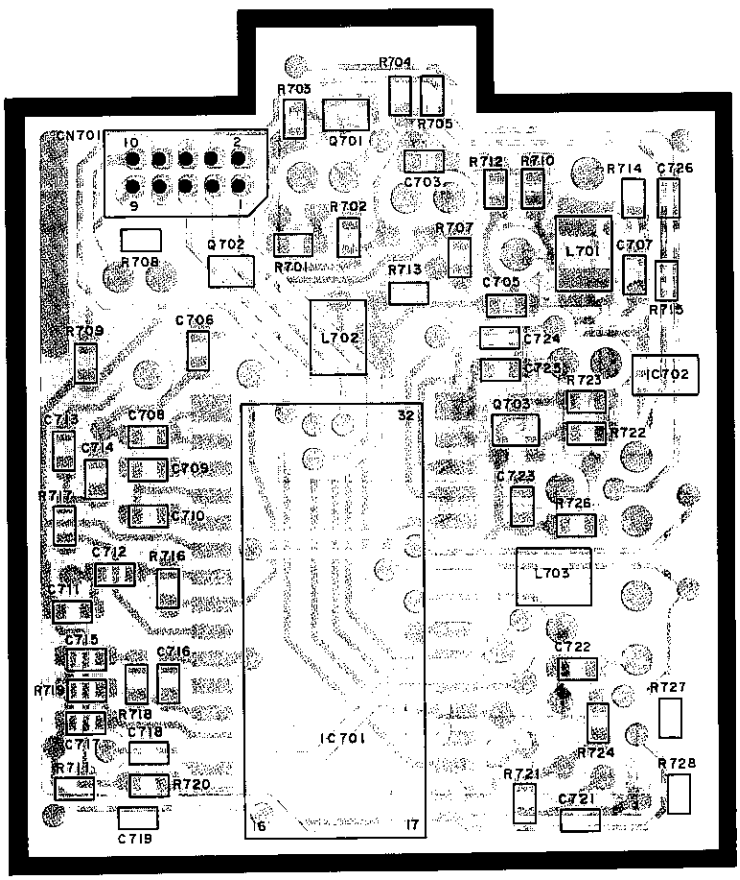


(Upper) TP701
1V, 10μS/div
(Lower) TP705
2V, 10μS/div



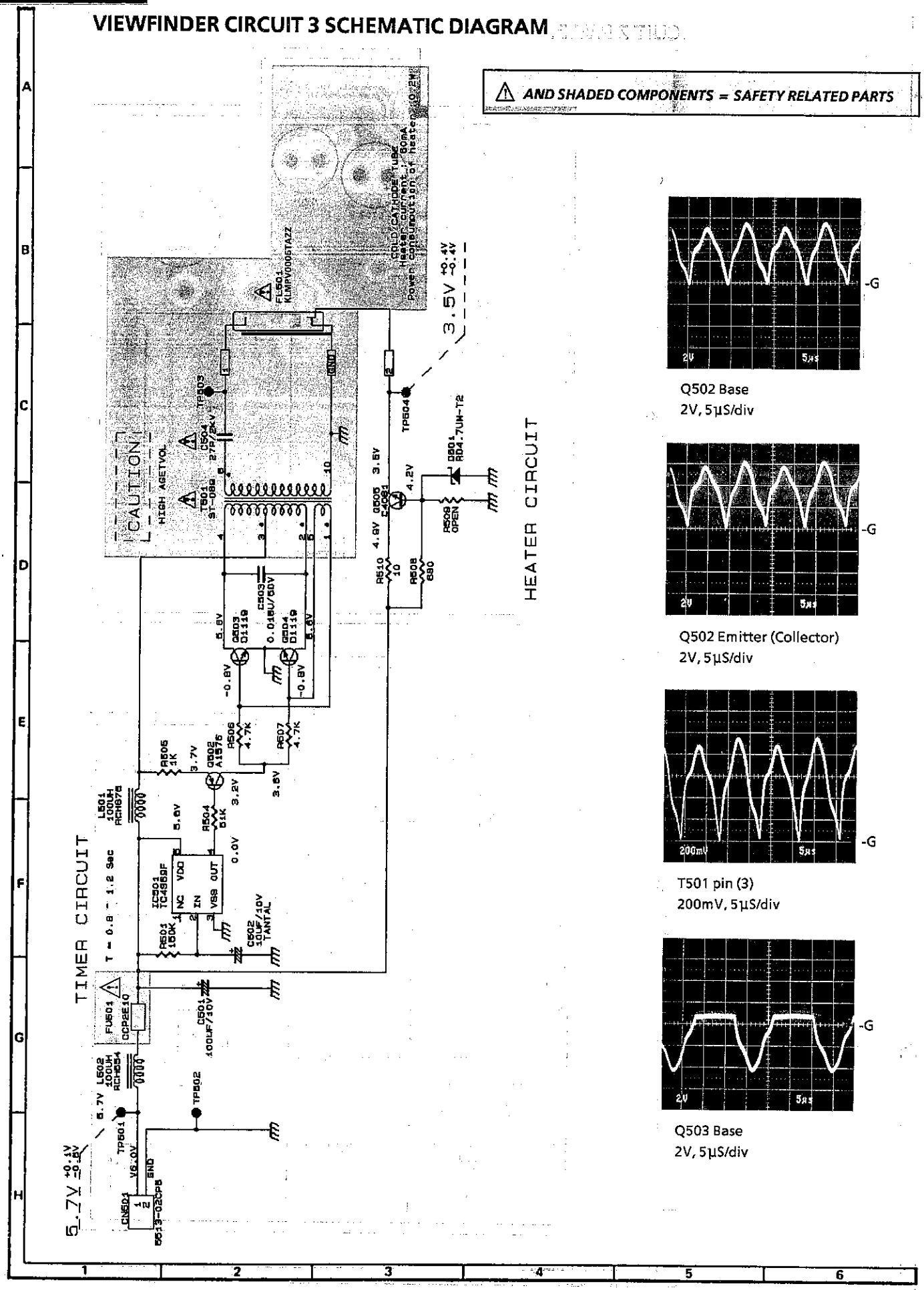
TP703
1V, 20μS/div





VIEWFINDER CIRCUIT 3 SCHEMATIC DIAGRAM

⚠ AND SHADED COMPONENTS = SAFETY RELATED PARTS



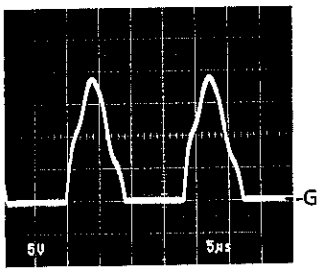
Q502 Base
2V, 5μS/div

Q502 Emitter (Collector)
2V, 5μS/div

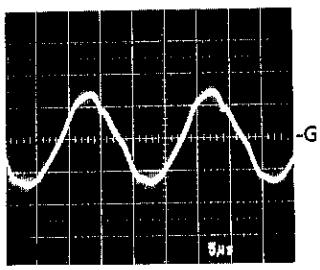
T501 pin (3)
200mV, 5μS/div

Q503 Base
2V, 5μS/div

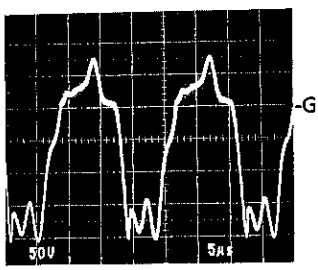
VIEWFINDER CIRCUIT 3 P.W.B



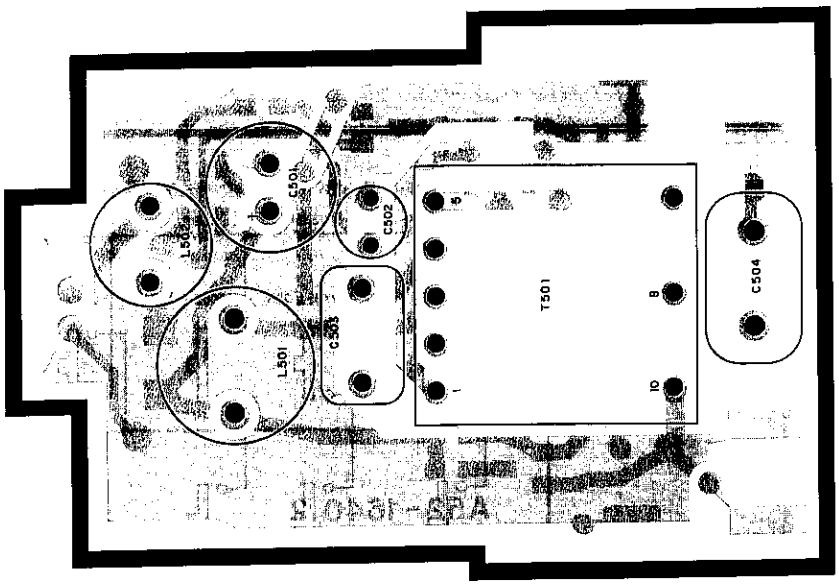
Q503 Collector
5V, 5µS/div

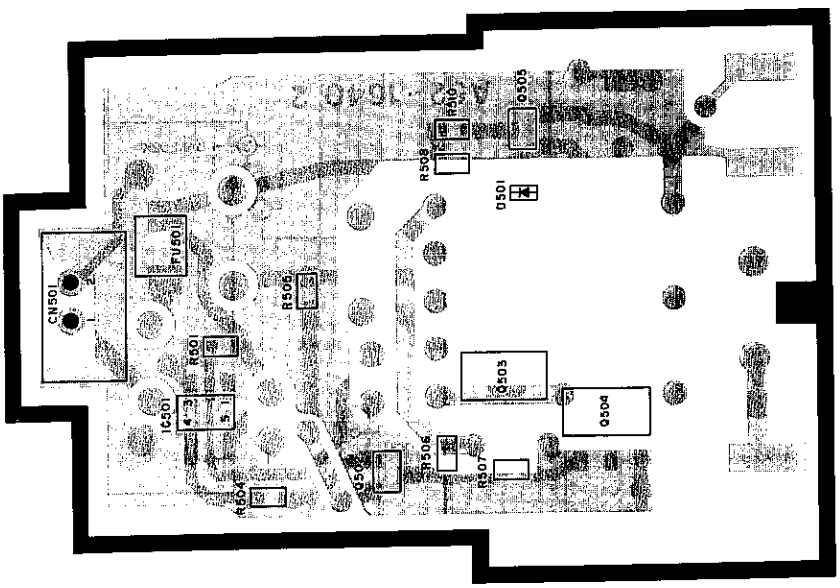


T501 pin (8)
500V, 5µS/div 1.37kVp-p

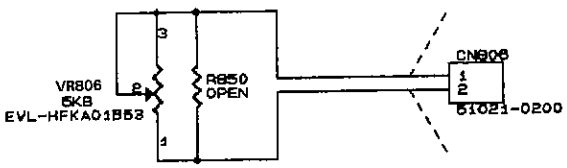


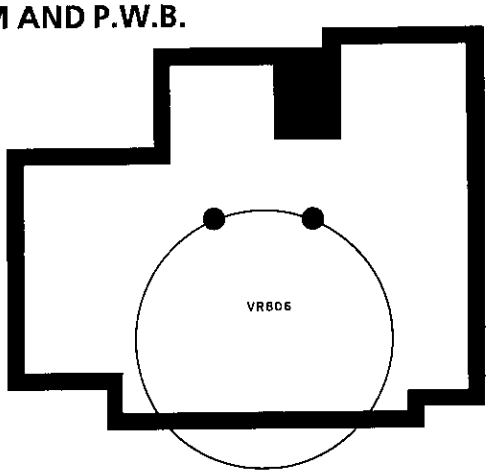
TP503
50V, 5µS/div



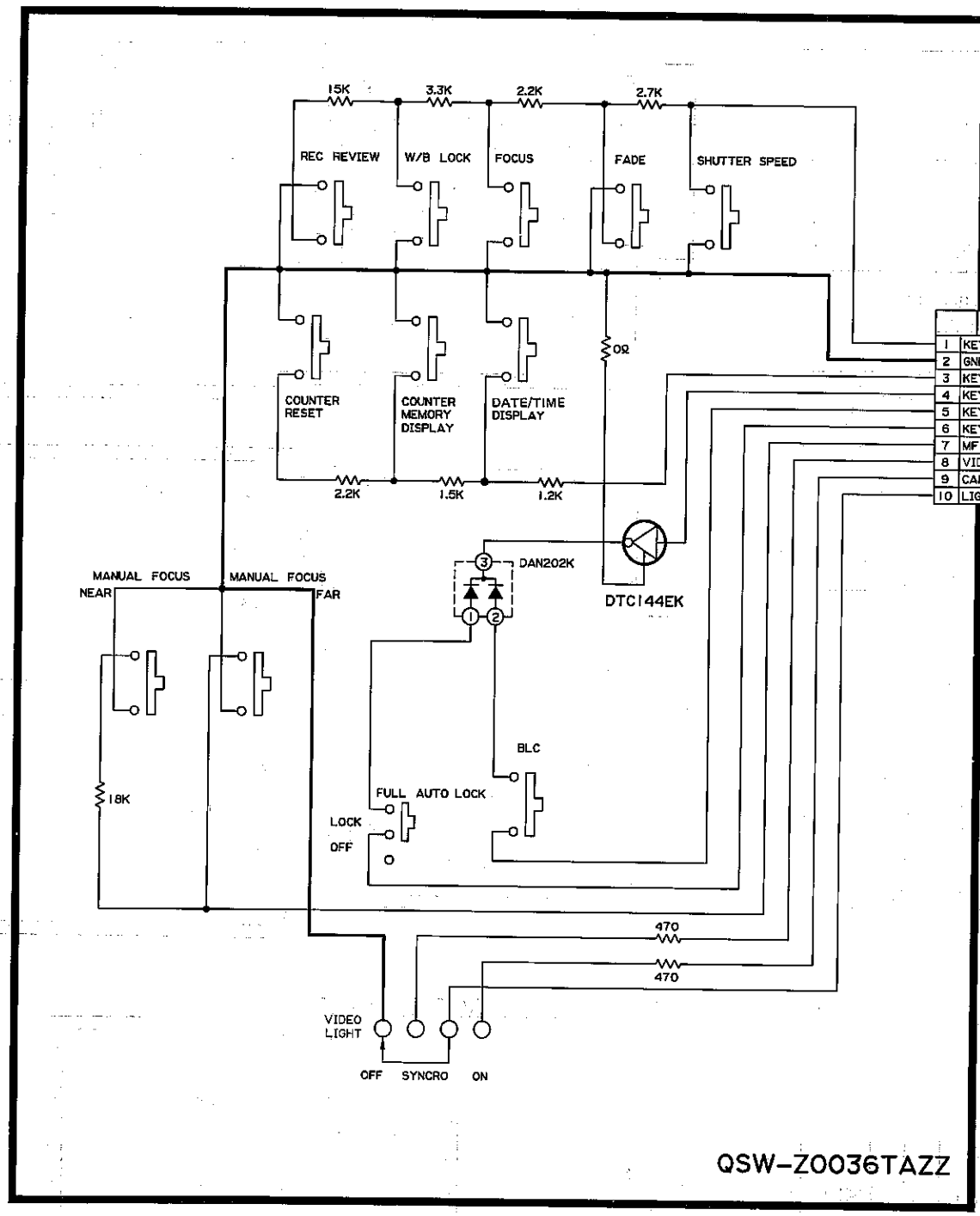


VIEWFINDER CIRCUIT 4 SCHEMATIC DIAGRAM AND P.W.B.

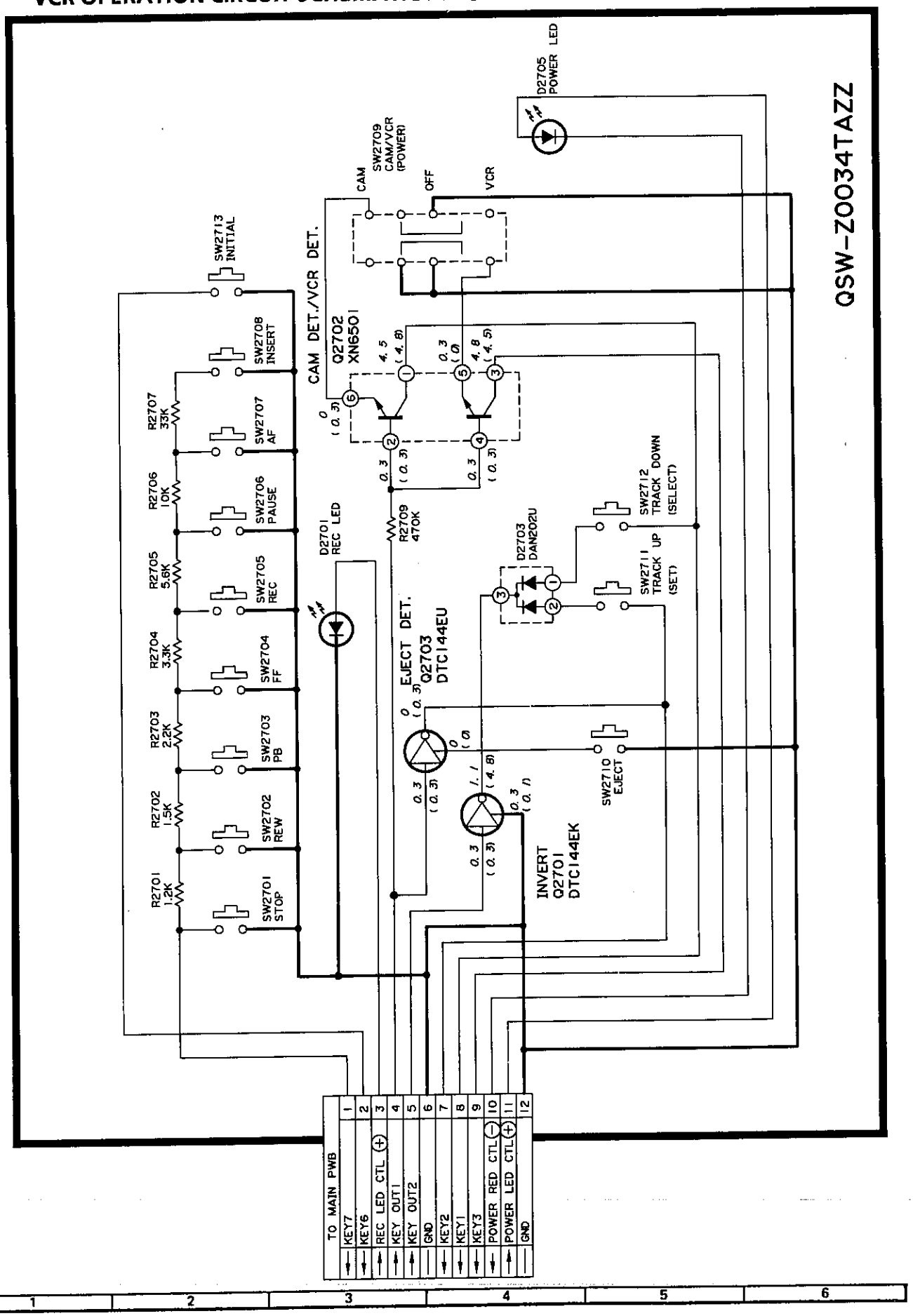




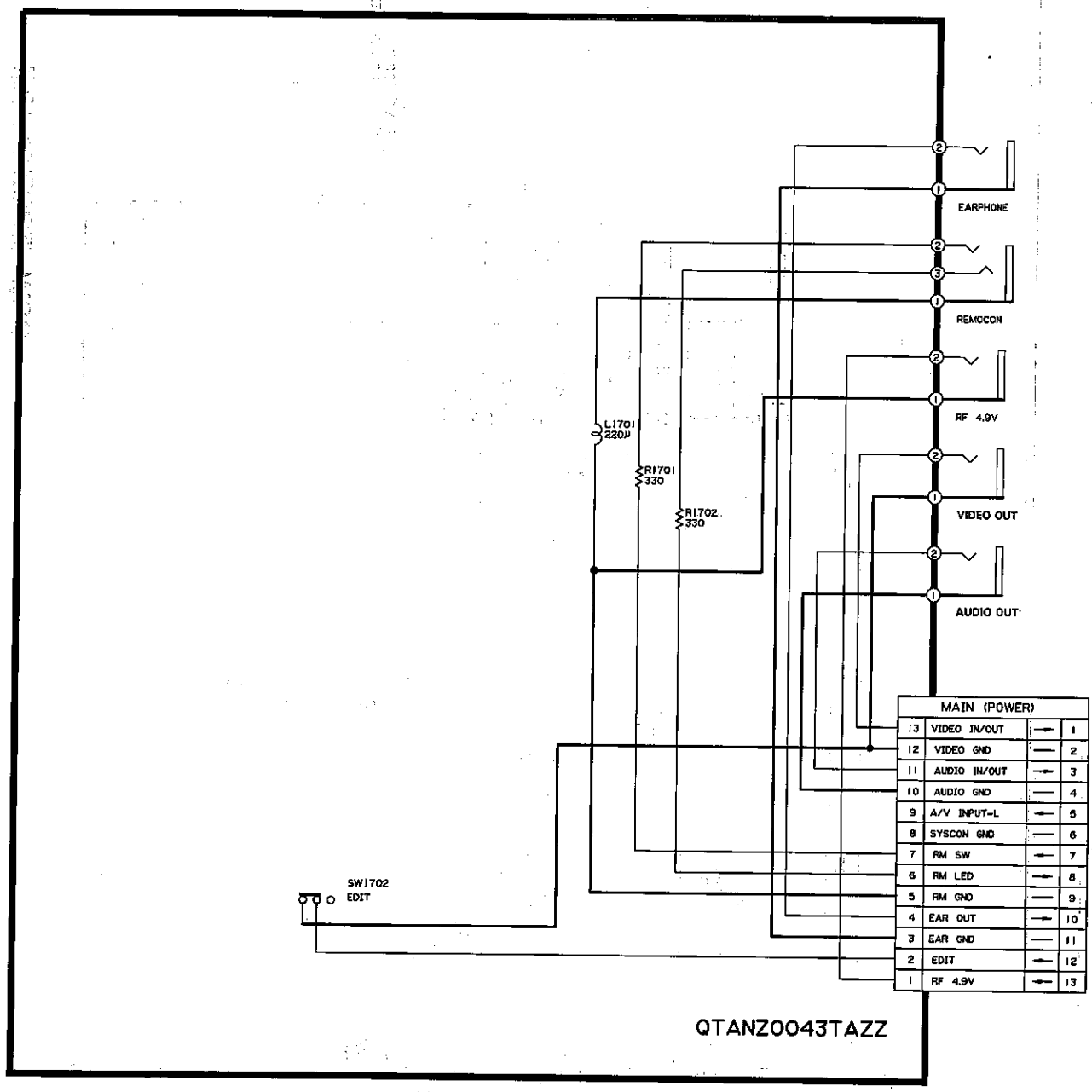
CAMERA OPERATION CIRCUIT SCHEMATIC DIAGRAM



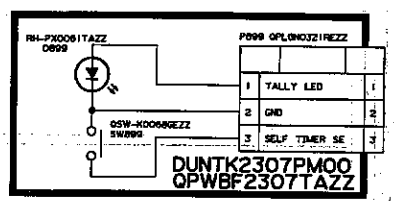
VCR OPERATION CIRCUIT SCHEMATIC DIAGRAM

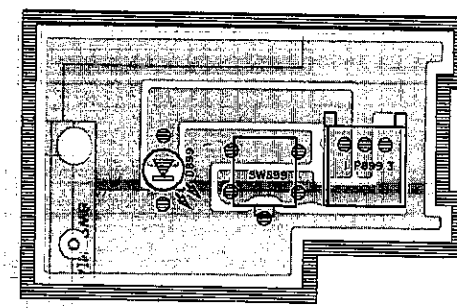


TERMINAL CIRCUIT SCHEMATIC DIAGRAM



TALLY/SELF TIMER CIRCUIT SCHEMATIC DIAGRAM AND P.W.B.





★ MARK: SPARE PARTS DELIVERY SECTION

PARTS LIST

PARTS REPLACEMENT

Many electrical and mechanical parts in camcorder have special safety-related characteristics.
These characteristics are often not evident from visual inspection nor can be protection afforded by them necessarily obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have special safety characteristics are identified in this manual, electrical components having such features are identified by ⚠ and shaded areas in the Replacement Parts Lists and Schematic Diagrams.
The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION
5. PRICE CODE

PWB ASSEMBLY IS NOT REPLACEMENT ITEM

⚠ MARK: SAFETY RELATED PARTS

Ref. No.	Part No.	★	Description	Code
PRINTED WIRING BOARD ASSEMBLY (NOT REPLACEMENT ITEM)				
	DUNTK0275TAZZ		Colour Viewfinder Circuit Board Ass'y	—
	DUNTK2304PM01		Sensor Circuit Board Ass'y	—
	DUNTK2307PM00		Tally/Self Timer Circuit Board Ass'y	—
	DUNTK2352RA00		Video Light Circuit Board Ass'y	—
	DUNTK3927HE00		Main Circuit Board Ass'y	—

Ref. No.	Part No.	★	Description	Code
DUNTK2304PM01 Sensor Circuit Board Ass'y				
INTEGRATED CIRCUITS				
IC2	VHiLR36683N-1		LR366831	AN
TRANSISTORS				
Q1	VS2SK508///-1		2SK508	AE
Q7	VSXP4601///-1		XP4601	AB
DIODES AND LED'S				
D1, 2	VHDMA132K//-1		Diode	AA
D4	VHDMA133///-1		Diode	AB
CAPACITORS				
C1, 3, 5, 9, 10, 12	VCKYCY1HF103Z		0.01µF 50V Ceramic	AA
C2, 4	VCSATE1EJ335M		3.3µF 25V Tantalum	AE
C6, 8	VCEAPF1CW106M		10µF 16V Electrolytic	AB
C7	VCKYCY1HB102K		1000pF 50V Ceramic	AA
C11	VCEAPF1VW106M		10µF 35V Electrolytic	AB
C13	VCEAPF0JW226M		22µF 6.3V Electrolytic	AB
C14	VCEAPF1HW105M		1.0µF 50V Electrolytic	AB
C16	VCEAPF1HW335M		3.3µF 50V Electrolytic	AB
C47	VCKYCY1CF104Z		0.1µF 16V Ceramic	AA
C51	VCKYTV1CF105Z		1.0µF 16V Ceramic	AB
RESISTORS				
R1, 12	VRS-CY1JF105J		1.0M 0.063W 5% Metal Oxide	AA
R2, 13, 14	VRS-CY1JF100J		10 0.063W 5% Metal Oxide	AA
R3, 4	VRS-CY1JF220J		22 0.063W 5% Metal Oxide	AA
R5, 6	VRS-CY1JF000J		00 0.063W 5% Metal Oxide	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
R8	VRS-CY1JF101J		100 0.063W 5% Metal Oxide	AA
R9	VRS-CY1JF392J		3.9k 0.063W 5% Metal Oxide	AA
R10	VRS-CY1JF133F		13k 0.063W 1% Metal Oxide	AA
R11	VRS-CY1JF332F		3.3k 0.063W 1% Metal Oxide	AA
R15	VRS-CY1JF391J		390 0.063W 5% Metal Oxide	AA
R51	VRS-CY1JF561J		560 0.063W 5% Metal Oxide	AA
R52	VRS-CY1JF153J		15k 0.063W 5% Metal Oxide	AA
R53	VRS-TV1JD101J		100 0.063W 5% Metal Oxide	AA
R55	VRS-CY1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R56	VRS-CY1JF103J		10k 0.063W 5% Metal Oxide	AA

MISCELLANEOUS PARTS

P1	QPLGN0264TAZZ		Plug	AC
S1	QSOCN1736TAZZ		Socket	AE

DUNTK2307PM00 Tally/Self Timer Circuit Board Ass'y

DIODES AND LED'S

D899	RH-PX0061TAZZ		Photodiode	AD

MISCELLANEOUS PARTS

P899	QPLGN0321REZZ		Plug	AA
S899	QSW-K0068GEZZ		Switch	AC

DUNTK2352RA00 Video Light Cicuit Board Ass'y

TRANSISTORS

⚠Q2101	VS2SB1185//1E		2SB1185	AE
Q2102	VS2SA1048Y/-1		2SA1048	AB
Q2103, 2104, 2105	VS2C1740SQR1E		2SC1740SQR	AC
Q2106	VSDTC144ES/-1		DTC144ES	AB

DIODES AND LED'S

D2101	RH-EX0639GEZZ		Zener Diode	AA

Ref. No.	Part No.	★	Description	Code
	CAPACITORS			
C2101	VCEAKG0JW107M		100μF 6.3V Electrolytic	AB
C2102	VCEAKM1HW105M		1.0μF 50V Electrolytic	AB
C2103	VCKYD41CY103N		0.01μF 16V Ceramic	AA
C2104	VCEAKM0JW226M		22μF 6.3V Electrolytic	AB
	RESISTORS			
R2101, 2102, 2103	VRD-RA2EE1R5J		1.5 1/4W 5% Carbon	AA
R2104	VRD-RA2BE561J		560 1/8W 5% Carbon	AA
R2105, 2107	VRD-RA2BE151J		150 1/8W 5% Carbon	AA
R2106	VRD-RA2BE822J		8.2k 1/8W 5% Carbon	AA
R2108, 2110	VRD-RA2BE562J		5.6k 1/8W 5% Carbon	AA
R2109	VRD-RA2BE223J		22k 1/8W 5% Carbon	AA
R2111	VRD-RA2BE103J		10k 1/8W 5% Carbon	AA
R2112	VRD-RA2BE101J		100 1/8W 5% Carbon	AA
R2113	VRD-RA2BE684J		680k 1/8W 5% Carbon	AA
R2114	VRD-RA2BE334J		330k 1/8W 5% Carbon	AA
	MISCELLANEOUS PARTS			
⚠F2101	QFS-J1221TAZZ		Fuse	AE
P2101	QPLGN0521REZZ		Plug	AB
P2102	QPLGN0229TAZZ		Plug	AB

DUNTK3927HE00 Main Circuit Board Ass'y

INTEGRATED CIRCUITS

IC3	VHiNJ79L08U-1		NJM79L08UA	AD
IC5	VHiLZ95D31P-1		LZ95D31P	AP
IC6	VHiLZ95D20P-1		LZ95D20P	AP
IC101	VHiCXA1390R-1		CXA1390R	AR
IC102	VHiCXA1391R-1		CXA1391R	AU
IC103	VHiCXA1592R-1		CXA1592R	AS
IC107, 109	VHiCXL5504M-1		CXL5504ohm	AP
IC108	VHiCL1508AN-1		CXL1508AN	AS
IC111, 113, 708, 902	VHiXR10358F-1		XRA10358F	AC
IC301	VHiAN3345FA-1		AN3345FAS	AQ
IC401	VHiBA7603F/-1		BA7603F	AF
IC403	VHiMM1031XM-1		MM1031XMR	AF
IC404	VHiAN3551FA-1		AN3551FAP	AV
IC501	RH-iX0131TAZZ		I.C.	AZ
IC502	VHiPST529CM-1		PST529C	AE
IC503	RH-iX0119TAZZ		MSM74H038GSV1K	AT
IC504, 508, 513	VHiXR10324F-1		XRA10324F	AD
IC505	VHiXA10339F-1		XRA10339F	AD
IC506	VHiXRU4066F-1		XRU4066BF	AC
IC507	VHiXRU4052F-1		XRU4052BF	AE
IC509	VHiCD1172AM-1		I.C.	AN
IC510, 511	VHiM62352GP-1		ohm62352GP	AQ
IC512	VHiHA13475F-1		HA13475FP	AL

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
IC602	VHiBA7757BK-1		BA7757BK	AL
IC603, 605	VHiXRA4558F-1		XRA4558F	AC
IC604	VHiTC4W53F/-1		TC4W53F	AE
IC701	RH-iX0996GEZZ		I.C.	AZ
IC702	VHiS8420BF/-1		S-8420BF-T1	AL
IC705	RH-iX0985GEZZ		UPD6451AGT818	AR
IC706	VHiiR3P94//-1		IR3P94	AM
IC707	VHiTA7291F/-1		TA7291F	AK
IC709	VHiTC7S04F/-1		TC7S04F	AC
IC901	VHiXR9702FS-1		XRA9702FS	AH
IC7701	VHiLB1686M/-1		LB1686M	AL
IC7702	VHiLB1617M/-1		LB1617M	AN
TRANSISTORS				
Q2, 510	VSUMW1/////-1		SUMW1	AB
Q3, 61, 64, 126, 504, 515, 516	VS2SC4617B/-1		2SC4617B	AA
Q5 104, 107, 109, 123, 403, 502, 503	VSUMZ1/////-1		SUMZ1	AB
Q6	VSUMY1/////-1		UMY1	AC
Q62	VS2SK94-X3/-1		2SK94	AC
Q63	VSXP6501///-1		XP6501	AB
Q65	VS2SB1462//-1		2SB1462	AA
Q101	VSDTC144EE/-1		DTC144EE	AA
Q102	VSUMG6/////-1		UMG6	AC
Q103, 111, 404, 501, 522	VSUMT2/////-1		UMT2	AB
Q105	VSDTC124EE/-1		DTC124EE	AA
Q110, 112, 114, 128, 129, 130, 131, 133, 218, 523	VS2SA1774F/-1		2SA1774F	AA
Q113, 122, 124, 125, 217, 505, 517, 519, 521, 524	VSUMX2/////-1		UMX2	AB
Q220	VSUN9213///-1		UN9213	AA
Q221	VSUN9113///-1		UN9113	AA
Q301, 306	VSRN1504///-1		RN1504	AB
Q302, 303, 304, 305	VS2SD1328-S-1		2SD1328	AD
Q307, 310, 406, 408, 611, 702, 703, 713, 716	VSDTC144EU/-1		DTC144EU	AB
Q308, 309	VS2SA1037KQ-1		2SA1037KQ	AA
Q311, 312	VS2SC2059KN1E		2SC2059KN	AC
Q313, 405, 604, 704, 706, 710	VS2SC4081R/-1		2SC4081R	AA
Q314, 705, 715	VSiMX2/////-1		IMX2	AB
Q401, 607, 709, 714	VSDTA144EU/-1		DTA144EU	AC
Q402	VS2SA1576R/-1		2SA1576R	AA
Q407	VSXP4601///-1		XP4601	AB
Q409	VSXP1213///-1		XP1213	AB
Q506, 507, 508	VSUMG2/////-1		UMG2	AC
Q509	VS2SB1132Q/-1		2SB1132Q	AC
Q512	VSFMA5/////-1		FMA5	AC
Q513	VSFMG11////-1		FMG11	AC
Q514	VS2SD874AS/-1		2SD874AS	AC
Q518, 520, 610, 701, 707	VS2SB710RS/-1		2SB710RS	AB
Q601, 925, 927	VS2SD999LK/-1		2SD999LK	AC
Q606, 926	VSFMW3/////-1		FMW3	AB
Q920, 923	VS2SB1202S/-1		2SB1202S	AD
Q921, 922, 928	VS2SC2412KQ-1		2SC2412KQ	AA
Q924, 940	VS2SA1213Y/-1		2SA1213Y	AD
Q941	VSFMY1/////-1		FMY1	AB
Q970, 971	VSSAH02////-1		SAH02	AE
Q974	VSFMG1/////-1		FMG1	AB

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
DIODES AND LED'S				
D3, 5, 7, 8, 9, 101, 503	VHDMA132K//-1		Diode	AA
D6, 407, 502	VHDMA132WA/-1		Diode	AA
D401, 403	VHDMA143///-1		Diode	AB
D402, 404, 405, 406, 704, 706, 707, 708, 710, 940, 943	VHDDAN202U/-1		Diode	AA
⚠D709, 711	VHDRB421D//-1		Diode	AA
D942	VHDSC8024//-1		Diode	AC
PACKAGED CIRCUITS				
TH901	VHHNTA47235-1		Thermistor	AC
X1	RCRSZ0011GEZZ		Crystal	AQ
X61	RCRSZ0001TAZZ		Crystal	AU
X401	RCRSC0015TAZZ		Crystal	AK
X701	RCRSC0006GEZZ		Crystal	AH
X702	RCRSB0139GEZZ		Crystal	AD
COIL AND TRANSFORMERS				
CF501	RFiLC0039TAZZ		Filter	AF
DL403	RCiLZ0328GEZZ		Coil	AM
FL1, 2	RFiLN0056CEZZ		Filter	AF
FL101	RCiLF0262TAZZ		Coil	AH
FL102	RCiLF0263TAZZ		Coil	AH
FL103	RCiLF0264TAZZ		Coil	AH
FL104	RCiLF0266TAZZ		Coil	AE
FL105	RCiLF0275TAZZ		Coil	AH
FL401	RCiLV0073GEZZ		Coil	AH
FL402	RCiLV0042GEZZ		Coil	AF
FL403	RCiLF0292TAZZ		Coil	AE
FL501	RCiLF0267TAZZ		Coil	AH
FL701	RCiLB0007GEZZ		Oscillation Coil	AE
L1	VPABM1R0JR82N		Peaking 1µH 5%	AC
L61, 64, 65, 101, 103, 105	VP-1M220K2R9N		Peaking 22µH 10%	AC
L62, 63, 410, 501	VP-1M100K1R6N		Peaking 10µH 10%	AC
L104	VP-1M330K4R2N		Peaking 33µH 10%	AC
L301, 305, 306, 311, 401, 402, 404, 701, 702, 703	VP-NM220K1R0N		Peaking 22µH 10%	AB
L302	VP-VM561K180N		Peaking 560µH 10%	AC
L303	VP-1M151K110N		Peaking 150µH 10%	AC
L304	VP-1M470K5R4N		Peaking 47µH 10%	AC
L307	VP-1M390K4R9N		Peaking 39µH 10%	AC
L308	VP-1M8R2M1R5N		Peaking 8.2µH 20%	AC
L309	VPAEM271K190N		Peaking 270µH 10%	AC
L310	VP-1M180J2R5N		Peaking 18µH 5%	AC
L313, 407	VP-1M221K170N		Peaking 220µH 10%	AC
L314, 408	VP-1M680K6R9N		Peaking 68µH 10%	AC
L405	VPAEM471K250N		Peaking 470µH 10%	AC
L409	VP-1M680J6R9N		Peaking 68µH 5%	AC
L412	VP-1M150K2R2N		Peaking 15µH 10%	AC
L601	VP-WM470K1R3N		Peaking 47µH 10%	AB
L602	VP-JM472J620N		Peaking 4700µH 5%	AD
L910	RCiLP0127TAZZ		Coil	AD
L940, 942, 9901	VP-WM101K3R5N		Peaking 100µH 10%	AB
L941	VP-3M101K4R0U		Peaking 100µH 10%	AB
L970, 971	RCiLP0134TAZZ		Coil	AG
L972	RCiLP0122TAZZ		Coil	AE
T601	RTRNH0012TAZZ		OSC. Transformer	AG
T901	RTRNZ0061TAZZ		Transformer	AK
CONTROLS				
R22	RVR-M4732GEZZ		Variable Resistor	AC
R243, 458, 467	RVR-M4726GEZZ		Variable Resistor	AC
R327, 332	RVR-M4720GEZZ		Variable Resistor	AC
R421, 475, 602	RVR-M4729GEZZ		Variable Resistor	AC
R431, 469, 471	RVR-M4723GEZZ		Variable Resistor	AC
R633	RVR-M4731GEZZ		Variable Resistor	AC
R929, 962	RVR-M4717GEZZ		Variable Resistor	AC
R946	RVR-M4714GEZZ		Variable Resistor	AC

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
CAPACITORS				
C15, 18, 71, 72	VCKYTV1EB104K		0.1µF 25V Ceramic	AB
C17, 21, 22, 103, 108, 115, 116, 121, 123, 134, 141, 143, 144, 165, 166, 168, 169, 179, 184, 188, 189, 192, 194, 197, 200, 215, 218, 233, 318, 330, 335, 345, 413, 437, 461, 501, 503, 513, 515, 522, 526, 527, 528, 545, 552, 555, 557, 564, 730, 734, 908, 909, 927, 932, 933, 7702	VCKYCY1CF104Z		0.1µF 16V Ceramic	AA
C19, 607	VCEAPF1HW335M		3.3µF 50V Electrolytic	AB
C20, 68, 132, 135, 176,	VCEAPF1CW106M		10µF 16V Electrolytic	AB
C220, 238, 421, 502, 504, 507, 511, 514, 516, 523, 529, 538, 539, 553, 615, 619, 620, 701, 732, 733, 741, 742, 7708, 7709, 7710	VCEAPF1CW106M		10µF 16V Electrolytic	AB
C23, 24, 62, 138, 139, 153, 154, 155, 174, 193, 203, 210, 211, 214, 219, 222, 234, 309, 312, 313, 316, 341, 401, 402, 409, 427, 468, 469, 473, 475, 546, 547, 647, 711, 722, 739, 747	VCKYTV1CF105Z		1.0µF 16V Ceramic	AB
C25, 27, 124, 129, 130, 175,	VCEAPF1HW105M		1.0µF 50V Electrolytic	AB

★MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
C181,	VCEAPF1HW105M		1.0µF 50V Electrolytic	AB
182,				
183,				
187,				
228,				
243,				
608,				
609,				
625,				
626,				
646				
C26,	VCKYCY1HF103Z		0.01µF 50V Ceramic	AA
38,				
69,				
104,				
109,				
110,				
111,				
112,				
114,				
118,				
120,				
131,				
140,				
142,				
146,				
147,				
148,				
149,				
150,				
151,				
152,				
156,				
157,				
158,				
159,				
160,				
163,				
164,				
167,				
170,				
172,				
173,				
177,				
185,				
190,				
196,				
199,				
206,				
207,				
208,				
209,				
212,				
213,				
217,				
221,				
227,				
237,				
245,				
303,				
304,				
305,				
306,				
317,				
321,				
324,				
328,				
331,				

Ref. No.	Part No.	★	Description	Code
C333,	VCKYCY1HF103Z		0.01µF 50V Ceramic	AA
347,				
350,				
354,				
362,				
403,				
408,				
416,				
419,				
422,				
423,				
424,				
428,				
430,				
431,				
435,				
445,				
448,				
453,				
455,				
457,				
467,				
470,				
471,				
472,				
474,				
517,				
518,				
519,				
520,				
521,				
530,				
535,				
543,				
570,				
702,				
709,				
726,				
737,				
738,				
744,				
745,				
976,				
7714,				
7715,				
7716				
C28,	VCKYCY1HB102K		1000pF 50V Ceramic	AA
29,				
31,				
37,				
178,				
223,				
232,				
449,				
549,				
614,				
703,				
712,				
713,				
717,				
719,				
720,				
721,				
724,				
725,				
743,				
948,				
975				
C30,	VCCCCY1HH220J		22pF 50V Ceramic	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
C40, 70, 117, 729	VCCCCY1HH220J		22pF 50V Ceramic	AA
C32, 64, 80, 603, 705	VCKYCY1EB103K		0.01μF 25V Ceramic	AA
C34, 35, 36, 46, 67, 74, 75, 76, 77, 78, 127, 145, 325, 560, 641	VCCCCY1HH470J		47pF 50V Ceramic	AA
C39, 61, 943	VCEAPL1CN476M		47μF 16V Electrolytic	AC
C63, 79	VCCCCY1HH120J		12pF 50V Ceramic	AA
C65, 73, 244, 460, 537, 715, 716	VCCCCY1HH150J		15pF 50V Ceramic	AA
C66, 81, 327, 342, 352, 434, 533, 912	VCCCCY1HH101J		100pF 50V Ceramic	AA
C82	VCKYCY1EF104Z		0.1μF 25V Ceramic	AA
C101, 102	VCSAPD1EJ474M		0.47μF 25V Tantalum	AD
C105, 106, 107	VCSAPD1CJ105M		1.0μF 16V Tantalum	AC
C113, 186, 623, 629, 727, 9901	VCEAPF0JW226M		22μF 6.3V Electrolytic	AB
C119	VCSATE0JJ156M		15μF 6.3V Tantalum	AE
C122	VCE9PC1CW475M		4.7μF 16V Electrolytic, (N.P)	AC
C126, 415, 433, 438, 446, 622, 723, 904	VCEAPF1VW475M		4.7μF 35V Electrolytic	AB
C161, 162	VCSAPD1AJ105M		1.0μF 10V Tantalum, (N.P)	AD
C171, 198, 332, 906, 944	VCEAPF1CW476M		47μF 16V Electrolytic	AC
C235, 351, 464, 465	VCCCCY1HH390J		39pF 50V Ceramic	AA
C239, 322	VCCCCY1HH270J		27pF 50V Ceramic	AA
C301, 302, 307, 308, 323, 329, 925, 926	VCKYCY1HB472K		4700pF 50V Ceramic	AA
C310, 311, 314, 315	VCKYCY1EB223K		0.022μF 25V Ceramic	AA
C319, 364, 365, 366, 367, 561, 901, 7705	VCKYCY1CF473Z		0.047μF 16V Ceramic	AA
C320, 334, 414, 611, 621, 627, 731, 928	VCEAPF0JW476M		47μF 6.3V Electrolytic	AB
C326, 340	VCCCCY1HH391J		390pF 50V Ceramic	AA
C339, 531, 532, 903	VCCCCY1HH331J		330pF 50V Ceramic	AA
C343, 567, 568, 569	VCCCCY1HH121J		120pF 50V Ceramic	AA
C344, 361, 363, 452	VCCCCY1HH680J		68pF 50V Ceramic	AA
C353, 450, 601, 610	VCCCCY1HH221J		220pF 50V Ceramic	AA
C355, 432, 604	VCKYCY1CF333Z		0.033μF 16V Ceramic	AA
C360, 606, 710	VCCCCY1HH471J		470pF 50V Ceramic	AA
C410, 411	VCEAPF0GW227M		220μF 4.0V Electrolytic	AB
C417, 624	VCEAPF1AW336M		33μF 10V Electrolytic	AC
C418,	VCKYCY1EB822K		8200pF 25V Ceramic	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
C429	VCKYCY1EB822K		8200pF 25V Ceramic	AA
C420, 458, 459	VCKYTV1CF474Z		0.47µF 16V Ceramic	AB
C425, 643	VCCCCY1HH151J		150pF 50V Ceramic	AA
C426, 462, 544, 636, 920, 921, 929	VCEAPF0JW107M		100µF 6.3V Electrolytic	AC
C436	VCEAPF1HW225M		2.2µF 50V Electrolytic	AB
C439	VCKYTV1EB473K		0.047µF 25V Ceramic	AB
C440, 463	VCCCCY1HH180J		18pF 50V Ceramic	AA
C442	VCCCCY1HH4R0C		4.0pF 50V Ceramic	AA
C443, 536, 559	VCCCCY1HH271J		270pF 50V Ceramic	AA
C444	VCEAPF1HW224M		0.22µF 50V Electrolytic	AB
C447	VCCCCY1HH820J		82pF 50V Ceramic	AA
C454	VCCSTV1HL102J		1000pF 50V Ceramic	AA
C456, 907, 7706, 7707, 7711, 7712, 7713	VCKYCY1EF223Z		0.022µF 25V Ceramic	AA
C505, 506, 524, 525, 7701, 7717, 7718, 7719	VCKYTV1CF224Z		0.22µF 16V Ceramic	AB
C508, 509, 510, 512, 612	VCEAPF1HW334M		0.33µF 50V Electrolytic	AB
C556, 558	VCKYCY1HF222Z		2200pF 50V Ceramic	AA
C602	VCFYEC1HM562J		5600pF 50V	AC
C605	VCEAPL0JN107M		100µF 6.3V Electrolytic	AC
C613	VCKYDQ1CR563K		0.056µF 16V Ceramic	AB
C617, 642	VCKYCY1HB272K		2700pF 50V Ceramic	AA
C618	VCKYDQ1HB333K		0.033µF 50V Ceramic	AB
C628	VCKYDV1HB123K		0.012µF 50V Ceramic	AB
C635	VCKYDV1HB103K		0.01µF 50V Ceramic	AB
C637	VCKYCY1HB222K		2200pF 50V Ceramic	AA
C639	VCKYCY1HB392K		3900pF 50V Ceramic	AA
C644	VCKYCY1HB122K		1200pF 50V Ceramic	AA
C645, 704	VCKYCY1HB332K		3300pF 50V Ceramic	AA
C706	VCKYTQ1EB333K		0.033µF 25V Ceramic	AA
C707	VCEAPE1CW106M		10µF 16V Electrolytic	AB
C708	VCEAPE1HW105M		1.0µF 50V Electrolytic	AB
C714	VCE9PC0JW106M		10µF 6.3V Electrolytic, (N.P)	AC
C728	VCCCCY1HH200J		20pF 50V Ceramic	AA
C902	VCKYCY1HB681K		680pF 50V Ceramic	AA
C910	RC-EZ0195TAZZ		Capacitor	AC
C911,	VCEAPK1CN107M		100µF 16V Electrolytic	AD
C972	VCEAPK1CN107M		100µF 16V Electrolytic	AD
C930	VCEAPF1CW226M		22µF 16V Electrolytic	AB
C941	VCEAPL1EN336M		33µF 25V Electrolytic	AC
C942	VCEAPF1VW226M		22µF 35V Electrolytic	AB
C945, 946	VCEAPF1VW106M		10µF 35V Electrolytic	AB
C947	VCKYTV1EF104Z		0.1µF 25V Ceramic	AB
C970, 971	VCEAPL1AN686M		68µF 10V Electrolytic	AC
C973	RC-EZ0210TAZZ		Capacitor	AC

VARIABLE CAPACITORS

C466	RTO-H0026TAZZ		Trimmer Capacitor	AD

RESISTORS

R16, 116, 120, 125, 136, 148, 153, 158, 197, 220, 225, 227, 230, 295, 440, 443, 445, 518, 519, 520, 546, 548, 552, 553, 720, 721, 731, 738, 739, 746, 747, 788, 936, 948, 1108, 1509, 1546, 1553	VRS-CY1JF104J		100k 0.063W 5% Metal Oxide	AA
R17, 114, 179, 231, 238, 254, 586,	VRS-CY1JF563J		56k 0.063W 5% Metal Oxide	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
R611	VRS-CY1JF563J		56k 0.063W 5% Metal Oxide	AA
R18, 134, 343, 345, 457, 468, 568, 612, 732, 784, 905, 1541	VRS-CY1JF183J		18k 0.063W 5% Metal Oxide	AA
R19, 103, 110, 128, 165, 190, 204, 206, 211, 264, 272, 511, 595, 1114, 1549	VRS-CY1JF393J		39k 0.063W 5% Metal Oxide	AA
R20, 96, 123, 131, 137, 635, 1514	VRS-CY1JF274J		270k 0.063W 5% Metal Oxide	AA
R21	VRS-CY1JF113J		11k 0.063W 5% Metal Oxide	AA
R23, 349, 407, 415, 447, 614, 1544, 7706	VRS-CY1JF182J		1.8k 0.063W 5% Metal Oxide	AA
R24, 499, 7710	VRS-CY1JF271J		270 0.063W 5% Metal Oxide	AA
R25, 208, 240, 283, 643, 757, 1111, 1113	VRS-CY1JF000J		0 0.063W 5% Metal Oxide	AA
R31, 35, 36, 37, 61, 70, 75, 79, 82, 163, 164, 184, 185, 209, 239,	VRS-CY1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R262, 314, 317, 318, 321, 331, 334, 336, 339, 356, 358, 406, 409, 426, 429, 438, 442, 477, 478, 493, 502, 515, 522, 523, 529, 534, 555, 556, 557, 569, 570, 624, 639, 662, 703, 704, 705, 725, 729, 759, 760, 761, 782, 783, 789, 790, 791, 796, 797, 1401, 1404, 1515, 1548, 1555	VRS-CY1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R32, 67, 236, 368, 504, 558, 559, 1416, 1417, 1517	VRS-CY1JF331J		330 0.063W 5% Metal Oxide	AA
R44, 76, 85, 86,	VRS-CY1JF222J		2.2k 0.063W 5% Metal Oxide	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
R89, 90, 95, 152, 167, 216, 217, 271, 273, 279, 293, 329, 330, 354, 360, 410, 411, 432, 449, 455, 487, 503, 531, 544, 564, 608, 903, 919, 942, 1503, 1504, 1521	VRS-CY1JF222J		2.2k 0.063W 5% Metal Oxide	AA
R45, 46, 47, 48, 49, 50, 464, 472, 535, 582, 626, 1528, 1534	VRS-CY1JF101J		100 0.063W 5% Metal Oxide	AA
R57	VRS-CY1JF150J		15 0.063W 5% Metal Oxide	AA
R58, 59, 315, 316, 319, 320, 601, 1507	VRS-CY1JF100J		10 0.063W 5% Metal Oxide	AA
R62, 87, 138, 186, 187, 188, 242, 294, 298, 439, 481, 482, 495,	VRS-CY1JF472J		4.7k 0.063W 5% Metal Oxide	AA
R530, 572, 573, 574, 584, 607, 641, 642, 660, 707, 753	VRS-CY1JF472J		4.7k 0.063W 5% Metal Oxide	AA
R63, 83, 113, 182, 235, 412, 575, 599, 631, 724, 1511, 1542, 1545	VRS-CY1JF105J		1.0M 0.063W 5% Metal Oxide	AA
R65, 74, 99, 726, 727, 1529, 1535, 7709	VRS-CY1JF221J		220 0.063W 5% Metal Oxide	AA
R66, 92, 93, 292, 333, 414, 427, 566, 615, ⚠776, 904, 940, 7707	VRS-CY1JF152J		1.5k 0.063W 5% Metal Oxide	AA
R68, 69, 80, 81, 169, 174, 176, 205, 215, 266, 344, 361, 512, 513, 609, 623, 628, 630, 711, 906, 908, 1103, 1106,	VRS-CY1JF333J		33k 0.063W 5% Metal Oxide	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
R1530, 1536	VRS-CY1JF333J		33k 0.063W 5% Metal Oxide	AA
R73, 88, 127, 151, 253, 256, 351, 452, 562, 629, 766, 1520	VRS-CY1JF682J		6.8k 0.063W 5% Metal Oxide	AA
R91, 157, 172, 175, 177, 180, 270, 437, 474, 476, 799, 910, 7708	VRS-CY1JF273J		27k 0.063W 5% Metal Oxide	AA
R94, 112, 160, 171, 219, 419, 497, 498, 510, 740, 743, 748, 773	VRS-CY1JF473J		47k 0.063W 5% Metal Oxide	AA
R97, 98, 102, 117, 121, 133, 168, 191, 192, 212, 213, 255, 277, 296, 297, 313, 335, 346, 418, 422, 450, 451, 473, 483, 486, 492, 507, 526,	VRS-CY1JF103J		10k 0.063W 5% Metal Oxide	AA
R545, 547, 549, 550, 551, 563, 571, 583, 596, 598, 622, 634, 645, 661, 702, 706, 708, 709, 712, 715, 717, 722, 751, 752, 758, 762, 794, 901, 937, 938, 941, 1102, 1402, 1531, 1532, 1537, 1538, 1547, 7701, 8701	VRS-CY1JF103J		10k 0.063W 5% Metal Oxide	AA
R101, 656, 657, 659, 911, 912	VRS-CY1JF333F		33k 0.063W 1% Metal Oxide	AA
R104, 166, 189, 214, 265	VRS-CY1JF303J		30k 0.063W 5% Metal Oxide	AA
R107, 210, 237, 258, 278, 323, 324, 325, 326, 420, 543, 554, 576, 581, 587, 597, 604,	VRS-CY1JF223J		22k 0.063W 5% Metal Oxide	AA

★MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
R619, 710, 742, 777, 907, 909, 932, 933, 1115, 1516	VRS - CY1JF223J		22k 0.063W 5% Metal Oxide	AA
R108, 111, 140, 149, 402, 459, 505, 506, 521, 536, 538, 540, 541, 764, 792, 920, 934, 1109, 1543	VRS - CY1JF123J		12k 0.063W 5% Metal Oxide	AA
R109, 183, 322, 338, 362, 444, 465, 620, 647, 1508, 1533, 1539, 1540	VRS - CY1JF153J		15k 0.063W 5% Metal Oxide	AA
R118, 218, 719, 745, 750, 915, 917	VRS - CY1JF823J		82k 0.063W 5% Metal Oxide	AA
R119	VRS - CY1JF684J		680k 0.063W 5% Metal Oxide	AA
R122, 126, 132, 424, 1505	VRS - CY1JF224J		220k 0.063W 5% Metal Oxide	AA
R124, 537	VRS - CY1JF394J		390k 0.063W 5% Metal Oxide	AA
R130, 244, 365, 532, 561, 723, 1101	VRS - CY1JF332J		3.3k 0.063W 5% Metal Oxide	AA
R135, 363, 364	VRS - CY1JF561J		560 0.063W 5% Metal Oxide	AA
R139, 593, 1117	VRS - CY1JF622J		6.2k 0.063W 5% Metal Oxide	AA
R150, 466, 488, 591, 594, 613, 733, 734, 735, 736, 737, 741	VRS - CY1JF822J		8.2k 0.063W 5% Metal Oxide	AA
R156, 232, 480, 484, 765, 1510, 1512	VRS - CY1JF154J		150k 0.063W 5% Metal Oxide	AA
R159, 198, 508, 509, 744, 749, 1104, 1107, 1550	VRS - CY1JF124J		120k 0.063W 5% Metal Oxide	AA
R161, 241, 289, 290, 291, 425, 441, 448, 494, 527, 528, 795	VRS - CY1JF122J		1.2k 0.063W 5% Metal Oxide	AA
R170, 658, 1513	VRS - CY1JF303F		30k 0.063W 1% Metal Oxide	AA
R173	VRS - CY1JF243J		24k 0.063W 5% Metal Oxide	AA
R178, 181, 224, 713, 916, 918, 1105	VRS - CY1JF683J		68k 0.063W 5% Metal Oxide	AA
R202	VRS - CY1JF151J		150 0.063W 5% Metal Oxide	AA
R221, 226, 539	VRS - CY1JF184J		180k 0.063W 5% Metal Oxide	AA
R246, 247, 646, 947, 961, 963	VRS - CY1JF272J		2.7k 0.063W 5% Metal Oxide	AA
R252	VRS - CY1JF203J		20k 0.063W 5% Metal Oxide	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
R257, 263, 350, 454, 470, 489, 491, 516, 565, 567, 589, 625, 644, 1116, 1118, 1119, 1403	VRS-CY1JF562J		5.6k 0.063W 5% Metal Oxide	AA
R280, 352, 353, 357, 610, 949	VRS-CY1JF821J		820 0.063W 5% Metal Oxide	AA
R299, 403, 1506	VRS-CY1JF822F		8.2k 0.063W 1% Metal Oxide	AA
R303, 304, 309, 310, 408, 430, 501, 517, 542, 588, 927, 928, 964, 968, 1518, 1519, 1523, 1525, 1552	VRS-CY1JF392J		3.9k 0.063W 5% Metal Oxide	AA
R305, 306, 307, 308, 328, 479, 592, 636, 768, 775, 780, 943	VRS-CY1JF681J		680 0.063W 5% Metal Oxide	AA
R340	VRS-TV1JD330J		33 0.063W 5% Metal Oxide	AA
R341, 950, 970, 973	VRS-CY1JF391J		390 0.063W 5% Metal Oxide	AA
R342, 490, 654, 728	VRS-CY1JF471J		470 0.063W 5% Metal Oxide	AA
R355	VRS-CY1JF121J		120 0.063W 5% Metal Oxide	AA
R367	VRS-CY1JF181J		180 0.063W 5% Metal Oxide	AA
R401, 413	VRS-CY1JF750J		75 0.063W 5% Metal Oxide	AA
R404	VRS-CY1JF162F		1.6k 0.063W 1% Metal Oxide	AA
R405	VRS-CY1JF752F		7.5k 0.063W 1% Metal Oxide	AA
R423	VRS-CY1JF225J		2.2M 0.063W 5% Metal Oxide	AA
R433, 778	VRS-CY1JF513J		51k 0.063W 5% Metal Oxide	AA
R436	VRS-CY1JF751J		750 0.063W 5% Metal Oxide	AA
R462, 9945	VRS-CY1JF301F		300 0.063W 1% Metal Oxide	AA
R463	VRS-CY1JF112J		1.1k 0.063W 5% Metal Oxide	AA
R496, 701, 754, 774	VRS-CY1JF334J		330k 0.063W 5% Metal Oxide	AA
R578, 580, 966	VRS-CY1JF222F		2.2k 0.063W 1% Metal Oxide	AA
R579	VRS-CY1JF682F		6.8k 0.063W 1% Metal Oxide	AA
R603	VRS-CY1JF470J		47 0.063W 5% Metal Oxide	AA
R605, 606	VRS-TQ2BD4R7J		4.7 1/8W 5% Metal Oxide	AA
R621	VRS-CY1JF301J		300 0.063W 5% Metal Oxide	AA
R655	VRS-CY1JF363F		36k 0.063W 1% Metal Oxide	AA
R730	VRS-CY1JF560J		56 0.063W 5% Metal Oxide	AA
R767, 772, 781	VRS-TQ2BD681J		680 1/8W 5% Metal Oxide	AA
R769, 770, 771	VRS-CY1JF474J		470k 0.063W 5% Metal Oxide	AA
R785, 786	VRS-TQ2BD221J		220 1/8W 5% Metal Oxide	AA
R902, 922, 923, 952, 953	VRS-CY1JF103F		10k 0.063W 1% Metal Oxide	AA
R921	VRS-TV1JD561J		560 0.063W 5% Metal Oxide	AA
R935	VRS-TV1JD391J		390 0.063W 5% Metal Oxide	AA
R944	VRS-CY1JF683F		68k 0.063W 1% Metal Oxide	AA
R945	VRS-CY1JF512F		5.1k 0.063W 1% Metal Oxide	AA
R967	VRS-CY1JF152F		1.5k 0.063W 1% Metal Oxide	AA
R971, 972	VRS-TV1JD681J		680 0.063W 5% Metal Oxide	AA
R1522	VRS-CY1JF201J		200 0.063W 5% Metal Oxide	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
R1524	VRS-CY1JF180J		18 0.063W 5% Metal Oxide	AA
R7703, 7704, 7705, 7711, 7712, 7713	VRS-CY1JF2R2J		2.2 0.063W 5% Metal Oxide	AA

MISCELLANEOUS PARTS

FB1	RBLN-0059CEZZ		Balun	AB
⚠F901, ⚠902, ⚠903	QFS-L1621TAZZ		Fuse	AE
P5	QPLGN1064TAZZ		Plug	AF
P6	QPLGN0964TAZZ		Plug	AF
P10, 28	QPLGN0364TAZZ		Plug	AC
P12	QPLGN0265TAZZ		Plug	AD
P13	QPLGN0564TAZZ		Plug	AC
P15, 27	QPLGN0264TAZZ		Plug	AC
P16	QPLGN1164TAZZ		Plug	AF
P101	QPLGN0220REZZ		Plug	AA
S2	QSOCN1739TAZZ		Socket	AE
S3	QSOCN1238TAZZ		Socket	AD
S4	QSOCN2139TAZZ		Socket	AE
S7	QSOCN2038TAZZ		Socket	AE
S9	QCNCW1844TAZZ		Connector	AE
S11	QCNCW1243TAZZ		Connector	AD
S14, 18, 20	QCNCW0644TAZZ		Connector	AC
S19	QSOCN1338TAZZ		Socket	AD
S21	QSOCN1436TAZZ		Socket	AE
S22	QSOCN1438TAZZ		Socket	AE

CABINET PARTS

TP1, 2, 3, 4, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410,	QLUGP0110TAFW		Lug	AA
TP411, 412, 601, 602, 603, 604, 701, 702, 703, 901, 902, 903, 904	QLUGP0110TAFW		Lug	AA

DUNTK0275TAZZ Colour Viewfinder Circuit Board Ass'y

INTEGRATED CIRCUITS

IC501	VHiTC4S69F/-1		TC4S69F	AC
IC701	9CLA71-0710		M51403FP	AT
IC702	9CLA71-1620		TC4S66F	AD
IC801	9CLA71-1600		G5062AD	AW
IC802	9CLA71-1530		MSM514221A-4JS	BC
IC803	9CLA71-1340		MM1060HMR	AF
IC804	9CLA71-1630		SC7S08F	AD

TRANSISTORS

Q502, 702, 804	9CLW01-1576		2SA1576	AB
Q503, 504	9CLW04-1119		2SD1119	AC
Q505, 701, 703, 801, 803, 805, 807, 808, 809, 810	9CLW03-4081		2SC4081	AB
Q806	9CLA72-0100		FMY1	AC
Q811	9CLA72-0110		XP1501	AC

DIODES

D501	9CLA73-0460		RD4.7UM-T2	AC
D801, 802, 803, 804	9CLA73-0420		DA114	AB
D805, 806	9CLA73-0430		MC2850	AB
D807, 808	9CLA73-0440		MA741	AC

PACKAGED CIRCUITS

X701	9CLA75-0810		4.43MHz	AG
X801	9CLA75-1090		17.94MHz	AK

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
COIL AND TRANSFORMERS				
CF701	9CLA75-0150			AD
L501	9CLA79-0220		100μH 0.95A	AD
L502	9CLA79-0500		100μH 420mA	AE
L701, 702	9CLA90-0330		15μH	AC
	or			
	9CLA90-0331		15μH	AC
L703	9CLA90-0360		56μH	AC
	or			
	9CLA90-0361		56μH	
L801	9CLA78-0100A		2mH	AE
L802	9CLA94-0440		0.47μH	
⚠T501	9CLA78-0340			AN
CONTROLS				
VR701	9CLA83-0710		1k(B)	AC
VR702	9CLA83-0650		47k	AC
VR704	9CLA83-0780		1k	AC
VR801	9CLA83-0720		10k(B)	AC
VR802	9CLA83-0730		5k(B)	AC
VR803	9CLA83-0760		3.3k(B)	AC
VR806	9CLA83-0750		5k(B)	AG
CAPACITORS				
⚠C504	9CLA88-0270		27pF 2kV Ceramic	AB
C703	VCCSCY1HL331K		330pF 50V Ceramic	
C705, 726, 822, 829, 831, 839	VCCCCY1HH101K		100pF 50V Ceramic	
C706, 718	VCCCCY1HB103K		0.01μF 50V Ceramic	
C707, 708, 711, 715, 717, 721, 722, 723, 724, 805, 806, 807, 808, 809, 813, 819, 823, 824, 825, 826, 827, 828, 833	VCKYCY1EF104Z		0.1μF 25V Ceramic	AA
C709, 710, 814, 830	VCKYCY1HB102K		1000pF 50V Ceramic	AA
C712, 719	VCCCCY1HH680K		68pF 50V Ceramic	AA
C713	VCCCCY1HH220J		22pF 50V Ceramic	AA
C714	VCCCCY1HH5R0D		5pF 50V Ceramic	
C716	VCKYCY1HB152K		1500pF 50V Ceramic	AA
C725	9CLW51-2212		220pF 50V Ceramic	
C801	9CLA86-0670		33μF 10V Electrolytic	AC
C802, 810, 815, 816, 820, 838	9CLA86-0680		47μF 6.3V Electrolytic	AC
C803	9CLA86-0660		10μF 35V Electrolytic	AC
C804, 811, 812	9CLW43-4749		0.47μF 25V	
C818, 832, 835	9CLA86-0690		22μF 6.3V Electrolytic	AC
C821, 837	9CLW42-2249		0.22μF 25V	
VARIABLE CAPACITOR				
TC701	9CLA89-0030		Trimming Capacitor	AD
RESISTORS				
R501	VRS-CY1JF154J		150k ohm 0.063W 5% Metal Oxide	AA
R504, 711	VRS-CY1JF513J		51k ohm 0.063W 5% Metal Oxide	AA
R505, 722, 835	VRS-CY1JF102J		1k ohm 0.063W 5% Metal Oxide	AA
R506, 507, 815	VRS-CY1JF472J		4.7k ohm 0.063W 5% Metal Oxide	AA
R508, 705	VRS-CY1JF681J		680 ohm 0.063W 5% Metal Oxide	AA
R510, 709, 801, 813, 819, 825, 826, 829, 830	VRS-CY1JF100J		10 ohm 0.063W 5% Metal Oxide	AA
R701, 803, 809, 810	VRS-CY1JF104J		100k ohm 0.063W 5% Metal Oxide	AA
R702	VRS-CY1JF183J		18k ohm 0.063W 5% Metal Oxide	AA
R703, 817, 820	VRS-CY1JF473J		47k ohm 0.063W 5% Metal Oxide	AA
R704, 708, 723, 828	VRS-CY1JF332J		3.3k ohm 0.063W 5% Metal Oxide	AA
R707, 834	VRS-CY1JF105J		1M ohm 0.063W 5% Metal Oxide	AA
R710, 713	VRS-CY1JF221J		220 ohm 0.063W 5% Metal Oxide	AA
R712	VRS-CY1JF470J		47 ohm 0.063W 5% Metal Oxide	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
R714, 717	VRS-CY1JF152J		1.5k ohm 0.063W 5% Metal Oxide	AA
R715, 818	VRS-CY1JF561J		560 ohm 0.063W 5% Metal Oxide	AA
R716, 837, 838, 839, 840	VRS-CY1JF391J		390 ohm 0.063W 5% Metal Oxide	AA
R718, 724, 805, 816, 822, 824, 833	VRS-CY1JF103J		10k ohm 0.063W 5% Metal Oxide	AA
R719, 806	VRS-CY1JF224J		220k ohm 0.063W 5% Metal Oxide	AA
R720, 802	VRS-CY1JF393J		39k ohm 0.063W 5% Metal Oxide	AA
R721, 831, 836	VRS-CY1JF333J		33k ohm 0.063W 5% Metal Oxide	AA
R726	VRS-CY1JF223J		22k ohm 0.063W 5% Metal Oxide	AA
R727	VRS-CY1JF272J		2.7k ohm 0.063W 5% Metal Oxide	AA
R728, 821	VRS-CY1JF222J		2.2k ohm 0.063W 5% Metal Oxide	AA
R807	9CLA81-0030		56k ohm 0.063W 0.5% Metal Film	AA
R808	9CLA81-0020		22k ohm 0.063W 0.5% Metal Film	AA
R811	9CLA81-0010		1k ohm 0.063W 0.5% Metal Film	AA
R812	9CLA81-0040		910 ohm 0.063W 0.5% Metal Film	AA
R814	VRS-CY1JF200J		20 ohm 0.063W 5% Metal Oxide	AA
R823	VRS-CY1JF153J		15k ohm 0.063W 5% Metal Oxide	AA

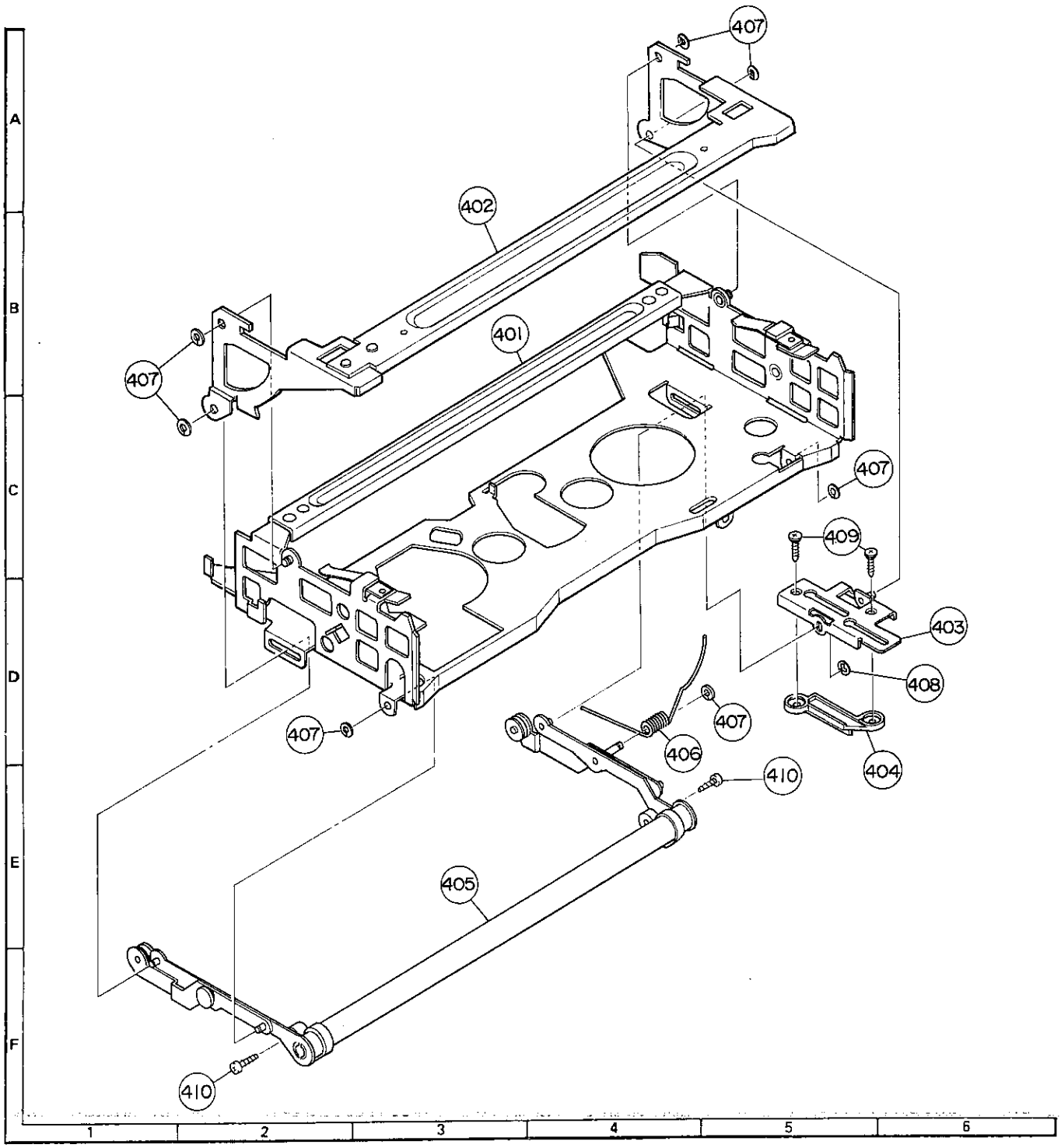
MISCELLANEOUS PARTS

	9CLA11-1210		LCD Panel	BT
S801	9CLA84-0090		1.5k ohm	
CN501	9CLA54-0930		Connector 2 pin	AC
CN701	9CLA54-0920		Connector 10 pin	AG
CN801	9CLA54-0870		Connector 7 pin	AC
CN802	9CLA54-0880		Connector 2 pin	AB
CN803	9CLA54-0890		Connector 10 pin	AD
CN804	9CLA54-0900		Connector 2 pin	AB
CN805	9CLA54-0910		Connector 20 pin	AL
CN806	9CLA54-0940		Connector 2 pin	AD
⚠FL501	KLMPV0005TAZZ		Lamp	AX
⚠FU501	9CLA84-0100		CCP2E10	AF

CASSETTE HOUSING CONTROL PARTS LIST

★MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
	CHLDX3063GE01		Ass'y Cassette Housing Control	BE
401	LHLDX3065GEZZ		Ass'y Housing	AV
402	MLEVF0356GEZZ		Ass'y Lid Angle	AL
403	MSLiF0063GEZZ		Ass'y Slider	AD
404	PGiDM0097GEZZ		Sub Spring Guide	AB
405	CLNKM0006GE00		Ass'y X-Link	AQ
406	MSPRD0132GEFJ		Sub Spring	AA
407	LX-WZ1046GE00		Washer (L-CW 2.1W-5-0.5)	AB
408	XRESJ20-04000		E-Ring (E-2.0)	AA
409	LX-BZ3111GEFD		Countersunk Screw, Flat Head (M2-4)	AA
410	XJPSD20P05000		B Tight Screw (M2×5)	AA



MECHANISM CHASSIS PARTS LIST

★MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
201	CHLDZ1800GE00		Ass'y Drive Block	BC
201-1	LHLDZ1800GEZZ		Drive Base W	AL
201-3	LX-WZ1003GE00		Cut Washer (2.1-5-0.5)	AA
201-4	LX-WZ1029GE00		Cut Washer (1.2-3-0.25)	AA
201-5	LX-WZ1030GE00		Cut Washer (1.6-4-0.25)	AA
201-6	LX-WZ1032GE00		Washer (2.1W4-0.25)	AA
201-7	PSPAZ0309GEZZ		Washer (1.6-6-0.5)	AA
201-8	LX-WZ1061GE00		Cut Washer (1.6-8-0.5)	AA
201-9	MLEVP0211GEZZ		Supply Brake Lever	AD
201-10	MLEVP0212GEZZ		Take-Up Brake Lever	AD
201-11	MLEVP0213GEZZ		Idler Stopper P/B-R	AA
201-12	MLEVP0214GEZZ		Idler Stopper P/B-L	AB
201-13	MLEVP0215GEZZ		Take-Up Auxiliary Brake	AC
201-14	MLEVP0216GE00		V/S Brake Lever	AA
201-15	MLEVP0217GE00		Idler Stopper F/R	AA
201-16	MSLiF0062GEZZ		Brake Shifter	AD
201-17	MSPRC0176GEFJ		V/S Brake Spring	AA
201-18	MSPRT0337GEFJ		Take-Up Auxiliary Brake Spring	AA
201-19	MSPRT0338GEFJ		Main Brake Spring	AA
201-20	NGERH1176GEZZ		Relay Pully	AD
201-21	NGERH1177GEZZ		Drive Gear	AA
201-22	NGERH1180GEZZ		Supply Limiter	AG
201-23	NGERH1181GEZZ		Take-Up Limiter	AG
201-24	NGERH1182GEZZ		V/S Brake Gear	AA
201-25	NiDR-0012GEZZ		Idler Lever P/B	AF
201-26	NiDR-0013GEZZ		Idler Lever F/R	AF
202	CPWBF3820GE00		Ass'y Start Sensor PWB	AG
202-1	QPWBF3820GEZZ		Start Sensor PWB	AB
202-2	RH-PX0153GEZZ		Start Sensor	AD
203	CPWBF3821GE00		Ass'y End Sensor PWB	AG
203-1	QPWBF3821GEZZ		End Sensor PWB	AB
203-2	RH-PX0153GEZZ		End Sensor	AD
204	CPWBF3823GE00		Ass'y Mechanism Relay PWB	AZ
204-1	LHLDZ1802GEZZ		Reel Sensor Holder	AC
204-3	QPWBF3823GEZZ		Mechanism Relay PWB	AM
204-4	RH-PX0122GEZZ		Reel Sensor	AG
206	GDAi-1031TA00		Tripod Mount	AG
207	LANGG9083GEFW		Supply Pole Base Slider	AB
208	LANGG9084GEFW		Take-Up Pole Base Slider	AB
209	LANGH0024GEZZ		Cassette Open Angle	AC
210	LANGK0147GEZZ		Ass'y A/C Head Plate	AN
211	LANGQ4023GEFD		Loading Motor Leading Plate-A	AA
212	LANGQ4024GEFD		Loading Motor Leading Plate-B	AA
213	LBNDK1006GEZZ		Ass'y Tension Band	AE
214	LCHSM0119GEZZ		Main Chassis	AZ
215	LHLDP1125GEZZ		LED Holder	AB
216	LHLDW1033CE00		Band, Nylon	AA
217	LHLDZ1144TA00		Mechanism Holder-A	AD
218	LHLDZ1145TA00		Mechanism Holder-B	AD
219	LHLDZ1795GEZZ		Start Sensor Holder	AB
220	LHLDZ1796GEZZ		End Sensor Holder	AB
221	LHLDZ1797GEZZ		Ass'y Loading Unit Holder	AG
222	LHLDZ1798GEZZ		Crescent Gear Holder	AC
223	LHLDZ1799GEZZ		Tension Band Adjusting Plate	AB
224	LHLDZ1801GEZZ		F.P.C. Holder	AB
225	LPOLM0039GEZZ		Ass'y Supply Pole Base	AL
226	LPOLM0040GEZZ		Ass'y Take-Up Pole Base	AL
227	LPOLP0001GEZZ		Ass'y Supply Tilt Pole Base	AH
228	LPOLP0002GEZZ		Ass'y Take-Up Tilt Pole Base	AH
229	XSPSD20P05000		Screw, (M2 × 5)	AA
230	LX-BZ3118GEFD		Spacer Screw	AB
231	LX-BZ3119GEFD		Screw, Tilt Adjusting	AB
232	LX-BZ3120GEZZ		Screw, X-Position Adjusting	AC
233	LX-BZ3121GEFD		Screw, Truss Head (M2 × 5)	AC
234	LX-BZ3134GEFD		Screw (M2 × 2.5)	AC
235	LX-NZ3032GEZZ		Nut (M2), Nylon	AB
236	LX-WZ1029GE00		Cut Washer (1.2-3-0.25)	AA
237	LX-WZ1030GE00		Cut Washer (1.6-4-0.25)	AA
238	LX-WZ1039GE00		Cut Washer (2.1-4-0.5)	AA
239	LX-WZ1050GE00		Cut Washer (1.6-3.5-0.25), LM	AB
240	LX-WZ1062GE00		Cut Washer (3.6-6-0.25)	AB
241	MARMM0084GEZZ		Ass'y Take-Up Loading Link	AE
242	MARMM0085GEZZ		Ass'y Tension Arm	AH
243	MARMM0086GEZZ		Ass'y Pinch Link	AK
244	MARMM0087GEZZ		Ass'y Take-Up Roller Arm Plate	AK
245	MARMM0088GEZZ		Ass'y Take-Up Roller Segment Gear	AG
246	MARMM0089GEZZ		Ass'y Take-Up Roller Arm	AH
247	MARMM0090GEZZ		Ass'y Supply Roller Arm	AH
248	MARMM0091GEZZ		Ass'y A/C Head Arm	AE
249	MARMM0092GEZZ		Ass'y Pinch Roller Arm	AH
250	MARMP0049GEZZ		Ass'y Supply Impedance Roller Arm	AG
251	MJNTM0004GEFJ		Supply Loading Arm	AC
252	MLEVC0039GEZZ		Ass'y Reverse Guide	AH
253	MLEVF0351GEZZ		Ass'y Tension Release Lever	AD
254	MLEVF0352GEZZ		Ass'y Reel Lever-A	AF
255	MLEVF0353GEZZ		Ass'y Reel Lever-B	AE
256	MLEVF0354GEZZ		Ass'y Supply Roller Arm Drive Lever	AF
257	MLEVF0355GEFW		Reciprocating Lever	AB

★ MARK: SPARE PARTS DELIVERY SECTION

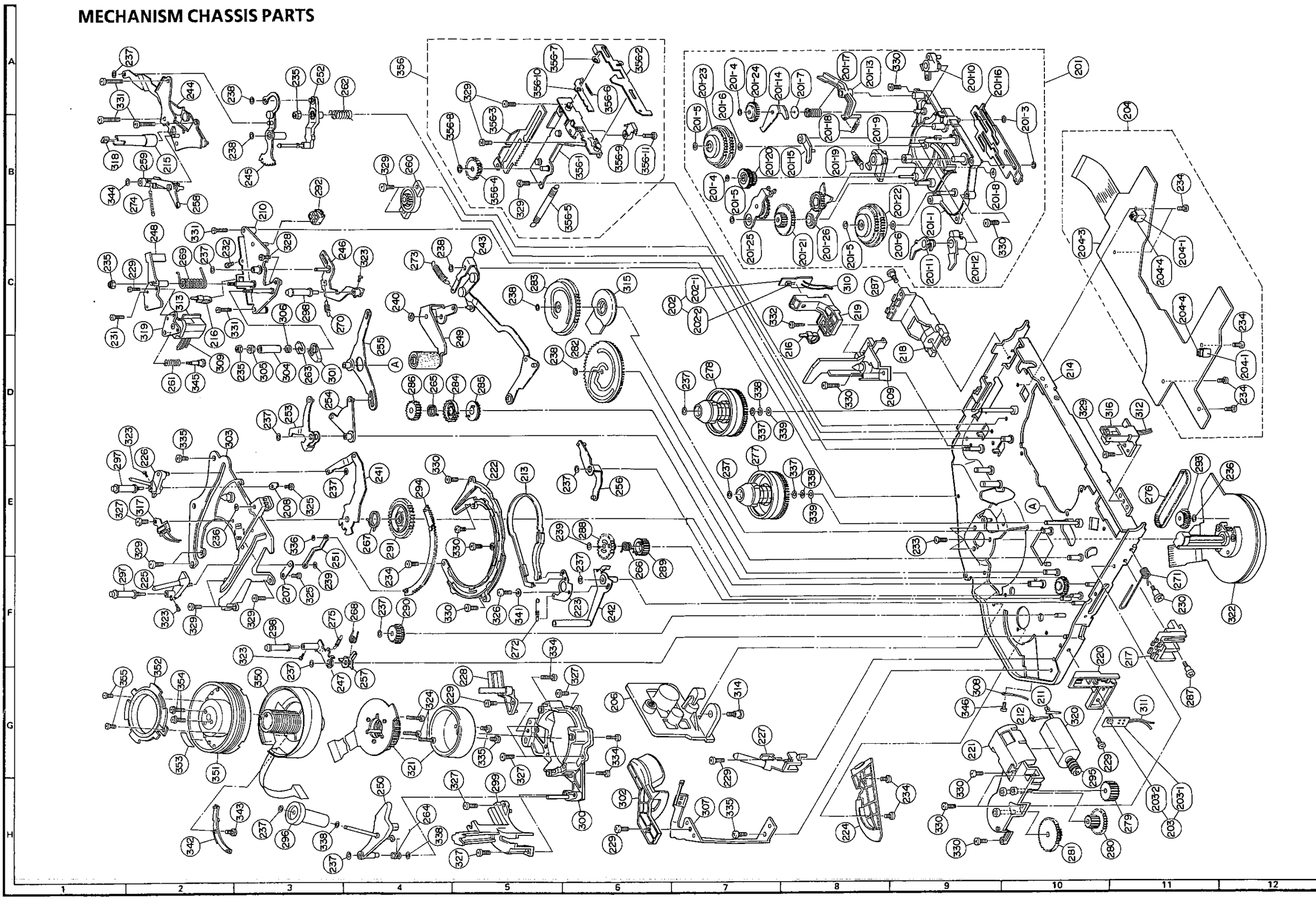
Ref. No.	Part No.	★	Description	Code
258	MLEVF0359GEZZ		Supply Auxiliary Brake Lever-A	AB
259	MLEVP0210GEZZ		Supply Auxiliary Brake Lever-B	AB
260	MLiFV0012GEZZ		Damper	AG
261	MSPRC0131GEFJ		A/C Head Spring	AA
262	MSPRD0133GEFJ		Reverse Guide Spring	AA
263	MSPRC0178GEFJ		Retaining Guide Spring	AB
264	MSPRD0124GEFJ		Supply Impedance Roller Arm Spring	AA
265	MSPRD0125GEFJ		Unloading Reciprocating Spring	AA
266	MSPRD0126GEFJ		After Loading Pressure Spring	AA
267	MSPRD0127GEFJ		Take-Up Pressure Spring	AA
268	MSPRD0128GEFJ		Supply Roller Arm Reciprocating Spring	AA
269	MSPRD0129GEFJ		A/C Head Arm Spring	AA
270	MSPRT0347GEFJ		Take-Up Roller Arm Return Spring	AA
271	MSPRD0131GEFJ		Main Spring-L	AA
272	MSPRT0339GEFJ		Tension Spring	AA
273	MSPRT0340GEFJ		Pinch Spring	AA
274	MSPRT0341GEFJ		Supply Auxiliary Brake Spring	AA
275	MSPRT0343GEFJ		Supply Roller Arm Return Spring	AA
276	NBLTT0005GE00		Drive Belt	AE
277	NDAiV1055GEZZ		Ass'y Supply Reel Disk	AF
278	NDAiV1056GEZZ		Ass'y Take-Up Reel Disk	AG
279	NGERH1162GEZZ		Worm Wheel	AB
280	NGERH1163GEZZ		Gear-A	AB
281	NGERH1164GEZZ		Gear-B	AB
282	NGERH1165GEZZ		Master Cam	AB
283	NGERH1166GEZZ		Sub Cam	AB
284	NGERH1167GEZZ		Teeth-Lacking Gear	AB
285	NGERH1168GEZZ		Supply Relay Gear-C	AB
286	NGERH1169GEZZ		Take-Up Relay Gear	AB
287	LX-BZ0173TAFD		Stepped Screw	AB
288	NGERH1172GEZZ		After Loading Pressure Gear-A	AB
289	NGERH1173GEZZ		After Loading Pressure Gear-B	AB
290	NGERH1174GEZZ		Supply Relay Gear-B	AB
291	NGERH1175GEZZ		Take-Up Loading Gear	AB
292	NGERH1184GEZZ		Take-Up Roller Arm Drive Gear	AB
293	NGERH1185GEZZ		Capstan Relay Gear	AD
294	NGERH3035GEZZ		Ass'y Crescent Gear	AF
295	NGERW1045GEZZ		Worm Gear	AC
296	NROLM0023GEZZ		Ass'y Supply Impedance Roller	AH
297	NROLP0087GEZZ		Ass'y Guide Roller	AG
298	NROLP0088GEZZ		Ass'y Sub Guide Roller	AG
299	PGiDC0045GEFW		V Stopper	AH
300	PGiDC0046GEZZ		Ass'y Drum Base	AS
301	PGiDM0094GE00		Tape Guide-B	AB
302	PGiDM0095GE00		Tape Guide-C	AC
303	PGiDM0096GE00		Loading Guide	AD
304	PGiDP0025GEFW		Retaining Tape Guide	AC
305	PGiDS0030GEFW		Upper Tape Guide Flange	AB
306	PGiDS0031GEFW		Lower Tape Guide Flange	AB
307	QBRSK0026GEZZ		Ass'y Earth Brush	AF
308	QCNW-1139TAZZ		Connecting Cord, Main PWB-Mechanism Relay PWB	AB
309	QCNW-6740GEZZ		Connecting Cord, A/C Head PWB-Main PWB	AL
310	QCNW-6741GEZZ		Connecting Cord, Start Sensor PWB-Mechanism Relay PWB	AB
311	QCNW-6742GEZZ		Connecting Cord, End Sensor PWB-Mechanism Relay PWB	AB
312	QCNW-6743GEZZ		Connecting Cord, Erase Protection SW-Mechanism Relay PWB	AB
313	QPWBF3822GEZZ		A/C Head PWB	AB
314	LX-BZ0174TAFD		Stepped Screw	AC
315	QSW-R0030GEZZ		Cam Switch	AL
316	QSW-Z0060GEZZ		Erase Protection Switch	AE
317	RDTCH0030GEZZ		Dew Sensor	AG
318	RH-PX0180GEZZ		Cassette LED	AD
319	RHEDU0079GEZZ		A/C A/E C/E Head	AW
320	RMOTM1058GEZZ		Loading Motor	AM
321	RMOTP1108GEZZ		Drum Motor	AX
322	RMOTV1001GEZZ		Capstan Motor	BB
323	XAPSF14P02000		Screw (M1.4×2)	AA
324	XAPSF17P11000		Screw (M1.7×11)	AA
325	XAPSF20P02000		Screw (M2×2)	AA
326	XAPSF20P03000		Screw (M2×3)	AA
327	XAPSF20P05000		Screw (M2×5)	AA
328	XAPSF20P06000		Screw (M2×6)	AA
329	LX-HZ3062GEFE		S Tight Screw (M2×4)	AA
330	LX-HZ3063GEFE		S Tight Screw (M2×6)	AA
331	LX-HZ3064GEFE		S Tight Screw (M2×10)	AA
332	XJPSD20P05000		B Tight Screw (M2×5)	AA
334	XSPSD17P08000		Screw (M1.7×8)	AA
335	XSPSD20P03000		Screw (M2×3)	AA
336	LX-WZ1068GE00		Cut Washer (1.2-3.2-0.25), LM	AA
337	XWHJZ21-01040		Washer (W2.1-4-0.13)	AA
338	XWHJZ21-02040		Washer (W2.1-4-0.25)	AA
339	XWHJZ21-05040		Washer (W2.1-4-0.5)	AA
341	XWHSD21-03043		Washer (2.1W-4.3-0.3)	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
342	PGIDM0110GE00		Pole Base Guide	AD
343	XSPSD17P02000		Screw (M1.7×2)	AA
344	LX-WZ1032GE00		Cut Washer (2.1W4-0.25)	AA
345	LX-BZ3077GEFD		Screw, A/C Head	AA
346	XBPSN26P03000		Screw (M2.6×3NI)	AA
350	DDRML0013HE06		Lower Drum (VL-SX80/H/X)	BL
350	DDRML0013HE07		Lower Drum (VL-SX88)	BH
351	DDRMU0011HE09		Upper Drum (VL-SX80/H/X)	BM
351	DDRMU0011HE10		Upper Drum (VL-SX88)	BP
352	NFLYV0065GEZZ		Dynamic Damper	AF
353	PSHEM0001GEZZ		Balance Weight	AA
354	LX-BZ3113GEFN		Screw (M2×6-NI)	AA
355	XSPSD14P04000		Screw (M1.4×4)	AA
356	CANGT9153GE00		Ass'y Lock Unit	AU
356-1	LANGT9153GEZZ		Base of Lock Unit	AH
356-2	MSLIF0064GEZZ		Lock Plate	AC
356-3	NGERR3002GEFD		Rack	AB
356-4	NGERH1183GEZZ		Relay Gear	AB
356-5	MSPRT0344GEFJ		Main Spring-R	AA
356-6	MSPRT0345GEFJ		Lock Spring	AA
356-7	XWHJZ31-02054		Washer (3.1W-5.4-0.25)	AA
356-8	LX-WZ1030GEZZ		Cut Washer (1.6-4-0.25)	AA
356-9	QSW-M0031GEZZ		Cassette Down Switch	AC
356-10	MLEVF0358GEFW		Ratch Lever	AE
356-11	XSPSD20P05000		Screw (M2×5)	AA

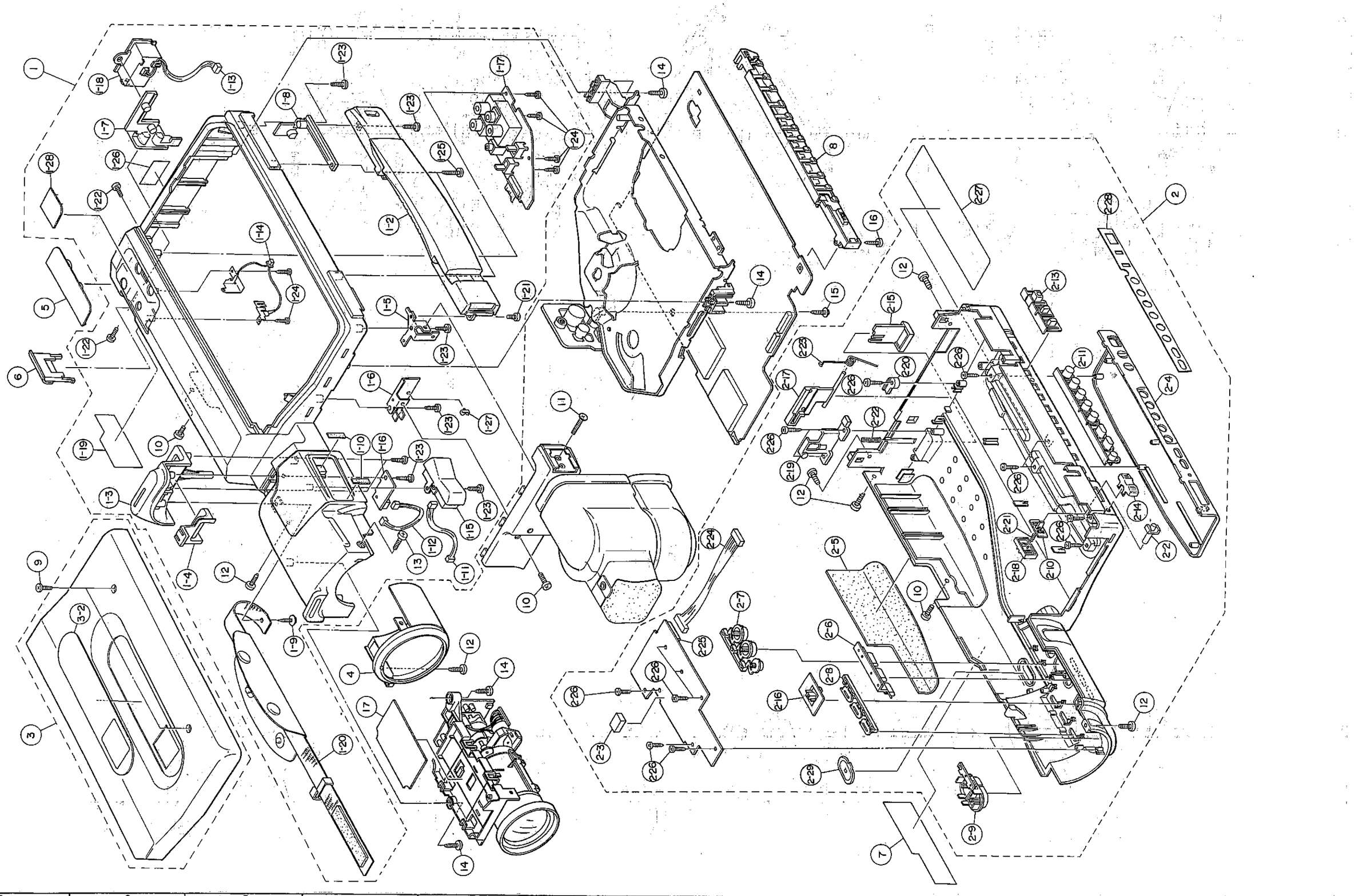
VL-SX80/H/X
VL-SX88

MECHANISM CHASSIS PARTS



VL-SX80/H/X
VL-SX88

CABINET PARTS



CABINET PARTS LIST

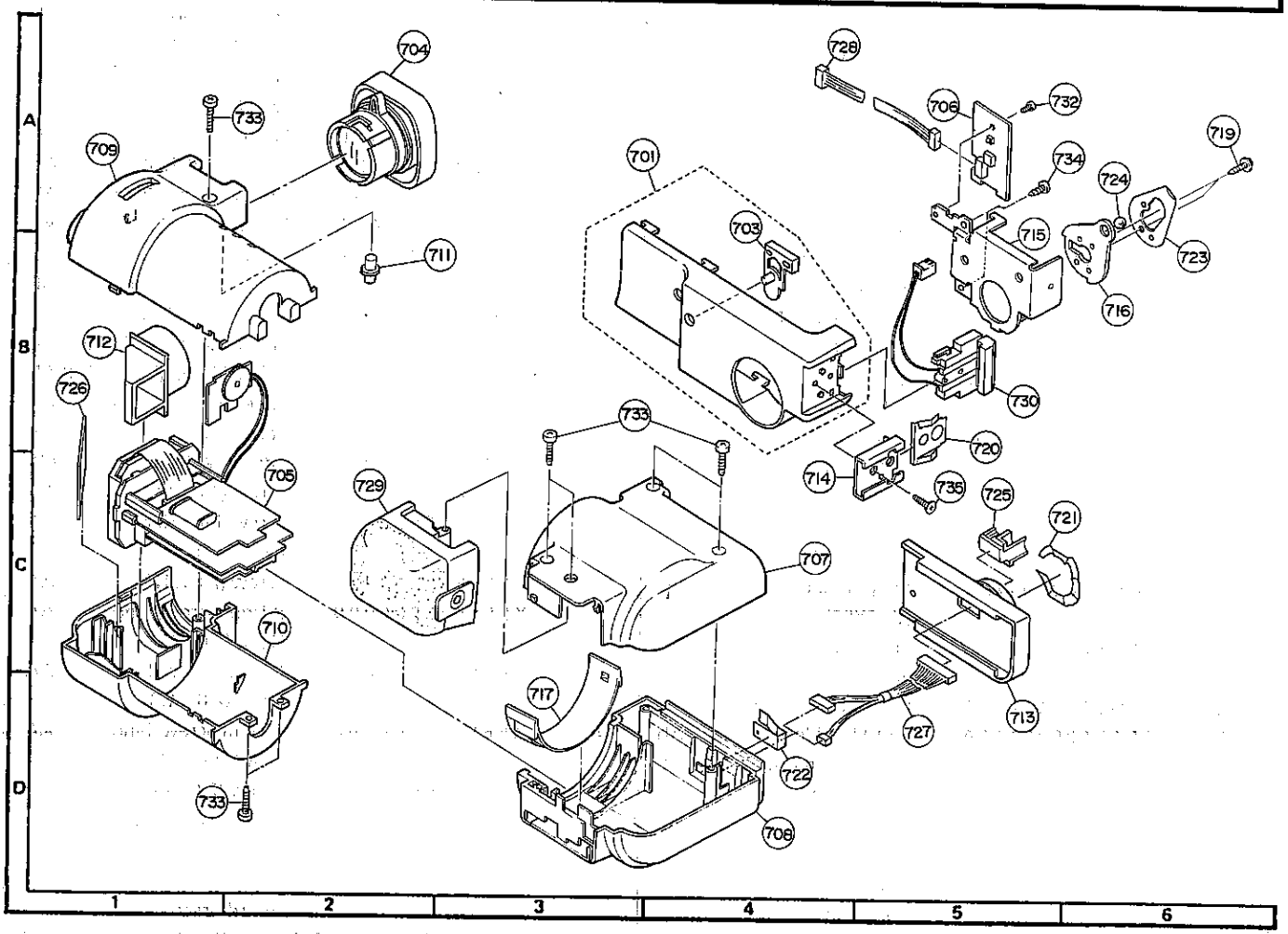
★MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
1	CCABA6059TA01		Ass'y Cabinet (L)	BL
1-2	CHNDP0022TA01		Ass'y Handle	AU
1-3	GCOVA1224TAKA		Cover, Grip	AL
1-4	JBTN-0175TASA		Button, REC S/S	AC
1-5	LANGT0429TAFW		Angle, Viewfinder	AC
1-6	LANGT0430TAFW		Angle, Viewfinder Cover (2)	AC
1-7	LHLDE1001TA00		Holder, Belt	AC
1-8	LHLDZ1148TA00		Holder, Cabinet	AC
1-9	LX-HZ0005TAFD		Screw (2.6×8)	AA
1-10	PSPAH0006TAZZ		Spacer, Zoom Switch	AA
1-11	QCNW-1114TAZZ		Connecting Cord, Zoom Switch-Main PWB	AD
1-12	QCNW-1118TAZZ		Connecting Cord, REC S/S-Main PWB	AD
1-13	QCNW-1125TAZZ		Connecting Cord, Battery Terminal-Main PWB	AD
1-14	QCNW-1127TAZZ		Connecting Cord, LI Holder-Main PWB	AF
1-15	QSW-Z0033TAZZ		Switch, Power Zoom	AL
1-16	QSW-Z0037TAZZ		Switch, REC S/S	AG
1-17	QTANZ0043TAZZ		Terminal, A/V	AU
1-18	QTANZ0040TAZZ		Terminal, Battery/DC	AL
1-19	TLABH0140TAZZ		Label, Caution	AB
1-20	UBNDT0050TASA		Strap, Grip	AN
1-21	XBBSF26P06000		Screw, Bind Head (M2.6×6)	AA
1-22	XEBSF26P06000		P Tight Screw, Bind Head (2.6×6)	AA
1-23	XEBSF26P08000		P Tight Screw, Bind Head (2.6×8)	AA
1-24	XEPSD20P06000		P Tight Screw, Pan Head (2×6)	AA
1-25	XEBSF26P12000		P Tight Screw, Bind Head (2.6×12)	AA
1-26	TLABH0140TAZZ		Label, Battery	AB
1-27	LHLDW1065GEZZ		Holder, Wire	AD
1-28	GCOVH1113TA00		Cover, A/V Switch	AC
2	CCABB6073TA01		Ass'y Cabinet (R) (VL-SX80/H)	BK
2	CCABB6070TA01		Ass'y Cabinet (R) (VL-SX80X)	BK
2	CCABB6070TA02		Ass'y Cabinet (R) (VL-SX88)	BH
2-2	GCOVA1228TAZZ		Cover, LED (A)	AC
2-3	PMLT-0078TAZZ		Spacer	AA
2-4	GCOVA1243TAKA		Cover, VCR Control	AQ
2-5	GPADS0009TASA		Pad, Shoulder	AH
2-6	JBTN-0169TASA		Button, Camera Control (A)	AC
2-7	JBTN-0170TASA		Button, Camera Control (B)	AC
2-8	JBTN-0171TASA		Button, Camera Control (C)	AE
2-9	JBTN-0172TASA		Button, Power Focus	AC
2-10	JBTN-0173TASA		Button, Push	AC
2-11	JBTN-0176TASA		Button, VCR Control (A)	AD
2-13	JBTN-0178TASA		Button, VCR Control (C)	AC
2-14	JKNBP0070TASA		Knob, Power Switch	AC
2-15	JKNBP0071TASA		Knob, Battery Eject	AC
2-16	JKNBP0072TASA		Knob Auto Lock Switch	AC
2-17	LHLDB1010TA00		Holder, Battery Latch	AD
2-18	LHLDZ1147TA00		Holder, Power Knob	AC
2-19	LHLDZ1149TA00		Holder, Latch (A)	AD
2-20	LHLDZ1150TA00		Holder, Latch (B)	AC
2-21	MSPRC0050TAFJ		Spring, Push Button	AA
2-22	MSPRC0051TAFJ		Spring, Battery Latch	AA
2-23	MSPRD0013TAFJ		Spring, Latch	AA
2-24	QCNW-1117TAZZ		Connecting Cord, Camera Operation Unit PWB-Main PWB	AG
2-25	QSW-Z0036TAZZ		Switch, Camera Operation	AW
2-26	XEPSD20P06000		P Tight Screw, Pan Head (2×6)	AA
2-27	TLABZ0272TAZZ		Feature Label (VL-SX80/H/X)	AF
2-27	TLABZ0273TAZZ		Feature Label (VL-SX88)	AG
2-28	PSPAH0014TA00		Spacer	AA
2-29	JBTN-0187TASA		Knob, Light Switch	AC
3	CFTAC1087TA03		Ass'y Cassette Cover	AT
3-2	HINDP0154TASA		Indicator	AF
4	GCOVA1227TASA		Cover, Lens	AH
5	GCOVH1110TA00		Cover, AV Terminal	AE
6	LHLDB1009TASA		Holder, LI Battery	AD
7	TLABM1389TAZZ		Label, Model (VL-SX80)	AB
7	TLABM1416TAZZ		Label, Model (VL-SX80H)	AB
7	TLABM1415TAZZ		Label, Model (VL-SX80X)	AB
7	TLABM1404TAZZ		Label, Model (VL-SX88)	AB
8	QSW-Z0034TAZZ		Switch, VCR Operation	AW
9	XHPSF26P08WS0		Screw (2.6×8)	AA
10	XBBSF26P06000		Screw, Bind Head (M2.6×6)	AA
11	XBSSF26P12000		Screw (2.6×12)	AA
12	XEBSF26P06000		P Tight Screw, Bind Head (2.6×6)	AA
13	XEBSF26P12000		P Tight Screw, Bind Head (2.6×12)	AA
14	XEBSF26P08000		P Tight Screw, Bind Head (2.6×8)	AA
15	LX-HZ0005TAFD		Screw (2.6×8)	AA
16	XEBSB20P06000		P Tight Screw, Bind Head (2×6)	AA
17	DUNTK2352RA00		Video Light Circuit Board Ass'y	—

VIEWFINDER PARTS LIST

★MARK: SPARE PARTS DELIVERY SECTION

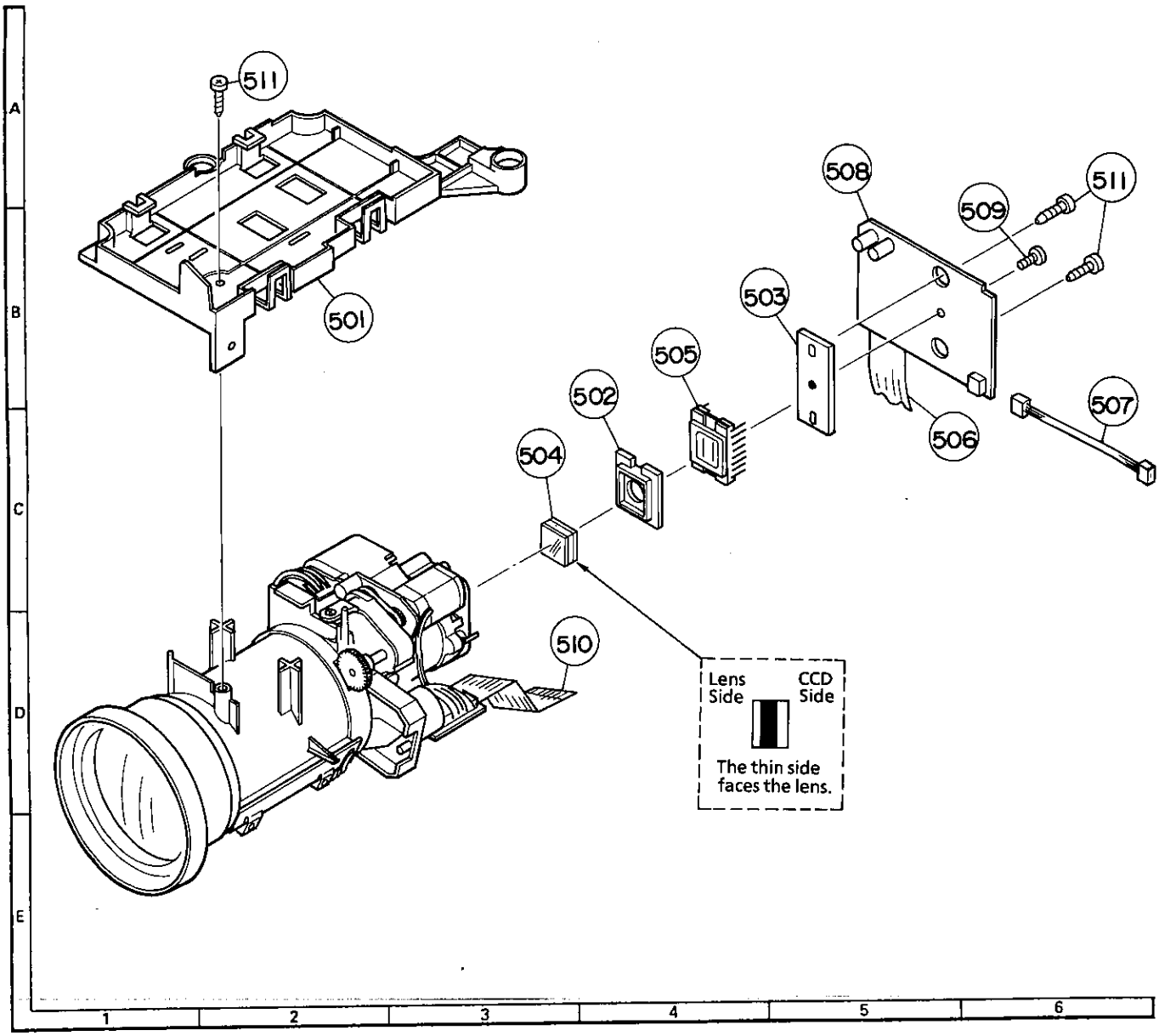
Ref. No.	Part No.	★	Description	Code
	DMON-6026QA02		Ass'y Viewfinder	CD
701	CCOVA1226TAK1		Ass'y Viewfinder Cover	AP
703	JBTN-0174TASA		Button, Self Timer	AD
704	CLNSV0001TA01		Viewfinder Lens Unit	AN
705	DUNTK0275TAZZ		Colour Viewfinder Circuit Board Ass'y	—
706	DUNTK2307PM00		Tally/Self Timer Circuit Board Ass'y	—
707	GCABA6069TAKA		Cabinet (A)	AF
708	GCABB6071TAKA		Cabinet (B)	AH
709	GCABC6023TAKA		Cabinet (C)	AF
710	GCABD6023TAKA		Cabinet (D)	AG
711	GCOVD1002TAZZ		Cover, Hole	AD
712	GCOVH1114TA00		Cover, LCD	AC
713	GDAI-1032TA00		Arm, Viewfinder Slide	AG
714	GDAI-3044TA00		Shoe	AD
715	LANGK0271TAFW		Angle, Rotating Carriage	AD
716	LANGT0423TAFW		Angle, Positioning Plate	AC
717	LHLDZ1169TA00		Holder, Viewfinder	AC
719	LX-HZ0015TAFD		Special Tight Screw (2.6×10)	AA
720	MSPRP0086TA00		Spring, Shoe	AD
721	MSPRP0087TAFW		Spring, Rotating Carriage	AB
722	MSPRP0088TAFW		Spring, Stopper	AB
723	MSPRP0089TAFW		Spring, Ball Bearing	AB
724	NBALS0006TAZZ		Ball, Bearing	AA
725	PCOVP1032TA00		Cover, Wire	AB
726	PMIR-0008TAZZ		Mirror	AE
727	QCNW-1149TAZZ		Connecting Cord, Viewfinder PWB-Main PWB	AK
728	QCNW-1119TAZZ		Connecting Cord, Tally/Self Timer PWB-Main PWB	AD
729	RMICC0044TAZZ		Microphone	AV
730	QTANZ0042TAZZ		Socket, Video Light	AK
732	XBPSD20P06000		Screw, Pan Head (2×6)	AA
733	XEPSB20P08000		P Tight Screw, Pan Head (2×8)	AA
734	XEBSF26P06000		P Tight Screw, Bind Head (2.6×6)	AA
735	XESSF20P08000		P Tight Screw, Flat Head (2×8)	AA



CAMERA UNIT PARTS LIST

★MARK: SPARE PARTS DELIVERY SECTION

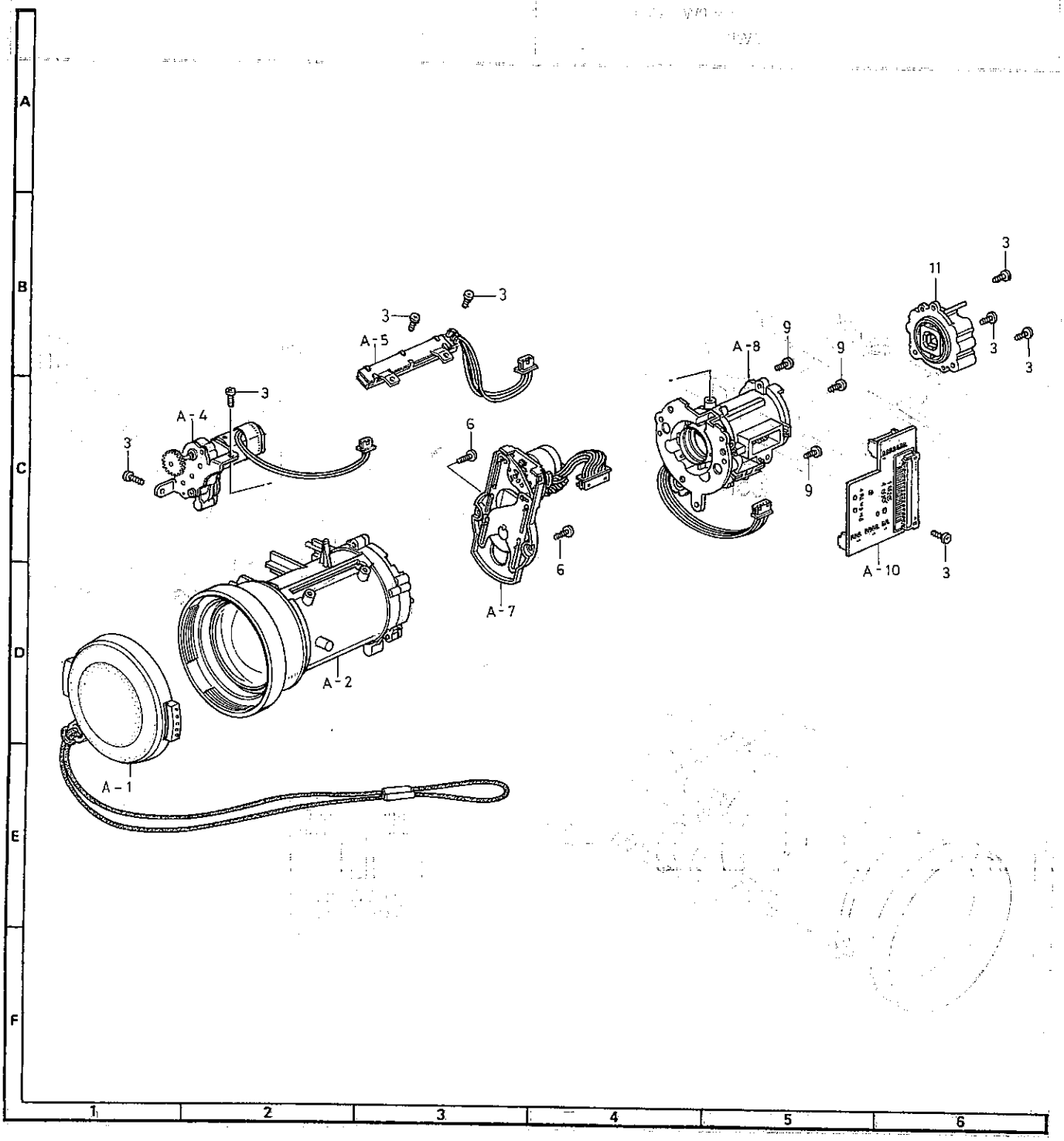
Ref. No.	Part No.	★	Description	Code
501	LHLDZ1146TAZZ		Lens Holder	AE
502	PCOVM8013TA00		Dust Protection Rubber	AF
503	LANGK0272TAFW		Sensor Holder	AB
504	PFiLW0056TAZZ		Crystal, Optical L.P.F.	AX
505	VHiLZ2323A/-1		CCD Sensor	BN
506	QCNW-1120TAZZ		Connecting Cord, Sensor PWB-Main PWB	AD
507	QCNW-1135TAZZ		Connecting Cord, Sensor PWB-Main PWB	AE
508	DUNTK2304PM01		Sensor Circuit Board Ass'y	—
509	XEPSD20P03000		Screw, Pan Head (M2×3)	AA
510	QCNW-1121TAZZ		Connecting Cord, Lens-Main PWB	AE
511	XEBSB20P06000		Screw, Bind Head (2.6×12)	AA



LENS UNIT PARTS LIST

★MARK: SPARE PARTS DELIVERY SECTION

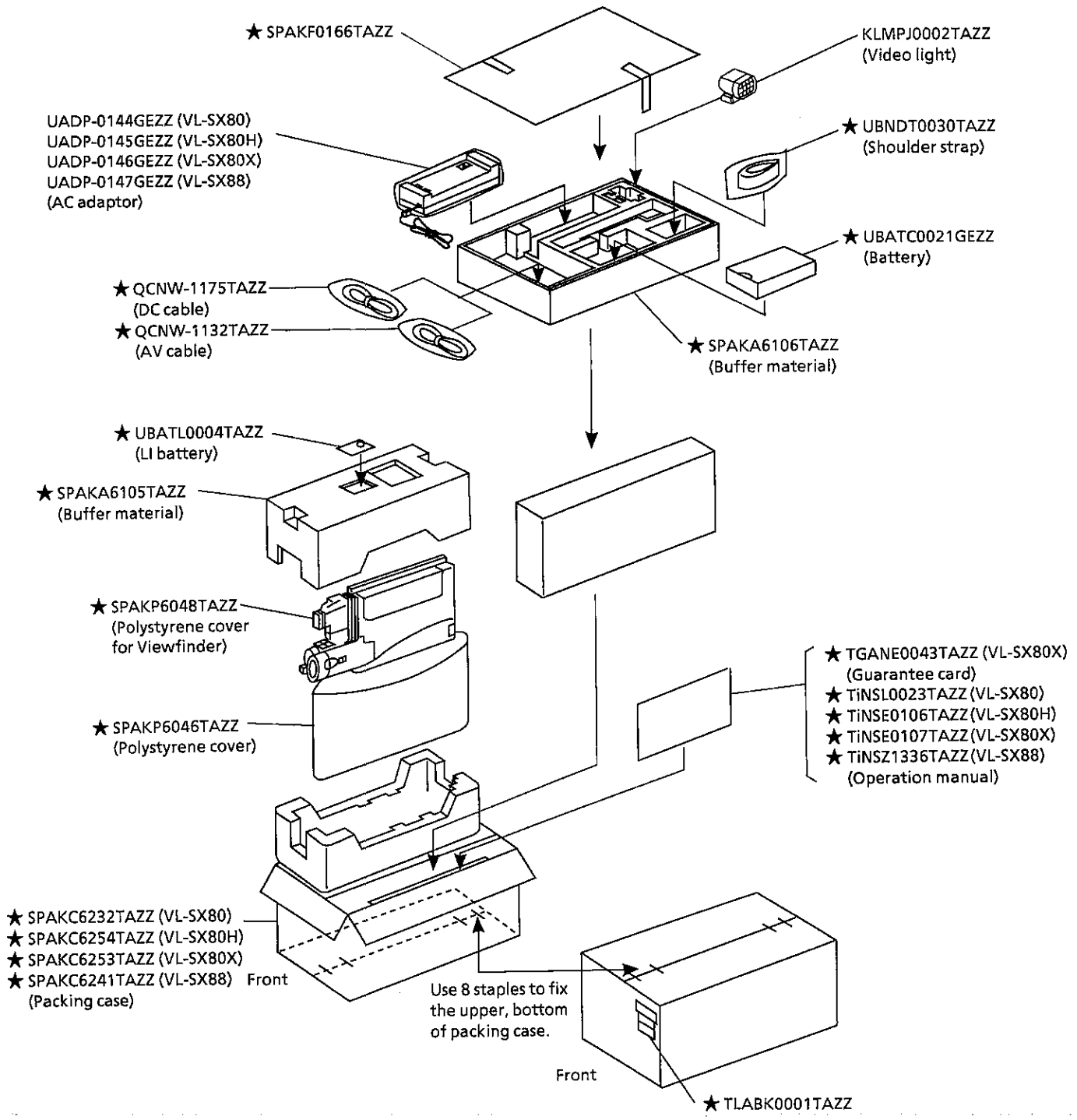
Ref. No.	Part No.	★	Description	Code
	CLNSA011 1TA11		Ass'y Lens Unit	CE
A-1	99JZSE514822		Lens Cap Ass'y	AM
A-2	99JZSE514830		Zoom Lens Ass'y	BU
3	99JSEBTP174030		Screw	AA
A-4	99JZSE514819		Power Zoom Motor Ass'y	AY
A-5	99JZSE514821		Zoom Potentiation Ass'y	AR
6	99JSEBTP144035		Screw	AA
A-7	99JZSE514818		Iris Ass'y	BA
A-8	99JZSE514831		MiLens Ass'y	BH
9	99JSEBTP174530		Screw	AA
A-10	99JZSE514857		Board to FFC PWB Ass'y	AT
11	99JZSE514812		CCD Sensor Holder	AE



PACKING OF THE SET

- **Setting positions of the SW**

VHS CAMCORDER	POWER SW. Position	OFF
	Full Auto Lock	OFF
	EDIT	OFF
	A/V IN/OUT	OUT
	LIGHT	OFF



★ Not Replacement Items

AC ADAPTOR for CAMCORDER

UADP-0144GEZZ (VL-SX80)
UADP-0145GEZZ (VL-SX80H)
UADP-0146GEZZ (VL-SX80X)
UNIT No. **UADP-0147GEZZ (VL-SX88)**

Features

- Compact and light-weight design for easier portability.
- Automatic voltage change AC 110V to AC 240V allows the adaptor usage even in your trips abroad.
- Charging function with battery pack.
- Rapid charging function to enable the charging in a shorter period of time.

Specifications

Power Requirement:	AC 110~240V, 50/60Hz
DC Output:	DC 6.8V, 2.4A
Power Consumption:	27W
Dimensions (approx.):	$2^{27}/_{32}$"(W) x $1^{13}/_{16}$"(H) x $7^{3}/_{16}$"(D) 72(W) x 46(H) x 182.5(D)mm
Weight (approx.):	0.99 lbs (450g)

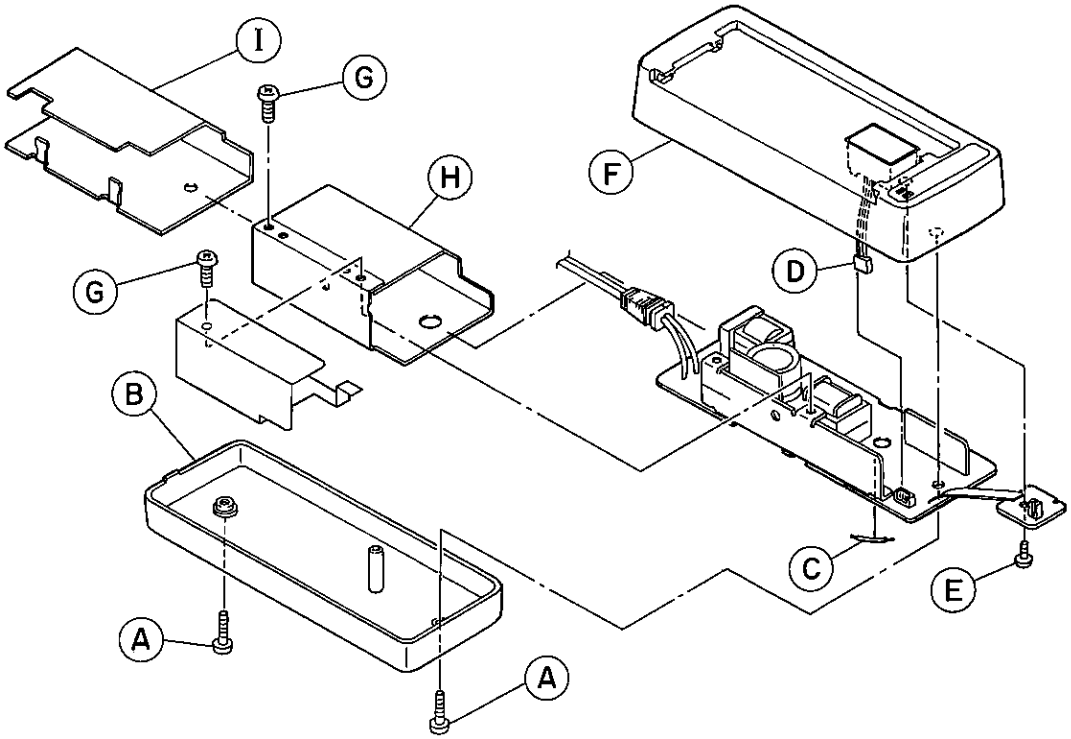
* Specifications are subject to change without notice.

PROCEDURES ON SERVICING

Servicing procedures

- Disassembly

1. Remove the two screws Ⓐ from the bottom of the case.
   Detach the lower half Ⓑ of the case.
2. Unsolder the jumper lead wire Ⓒ off the PWB.
3. Disconnect the connector Ⓓ off the main PWB.
4. Remove the screw Ⓔ from the top of the case.
   Detach the upper half Ⓕ of the case.
5. Remove another two screws Ⓖ.
6. Finally take out the shield plate Ⓗ and the insulating sheet Ⓘ.



OPERATION MANUAL

1. Outline

This AC adaptor consists of a separately excited switching regulator which employs control IC and a multifunctional circuit in the secondary side as shown by the block diagram in Fig.1.
The primary function of this adaptor is to perform constant-voltage and constant-current controls by comparing them with the reference voltage kept at the secondary side. It is also equipped with a full charge detector and a timer protector. Also working as a battery charger for a lead battery, this unit is so designed that the battery can easily be attached and removed.

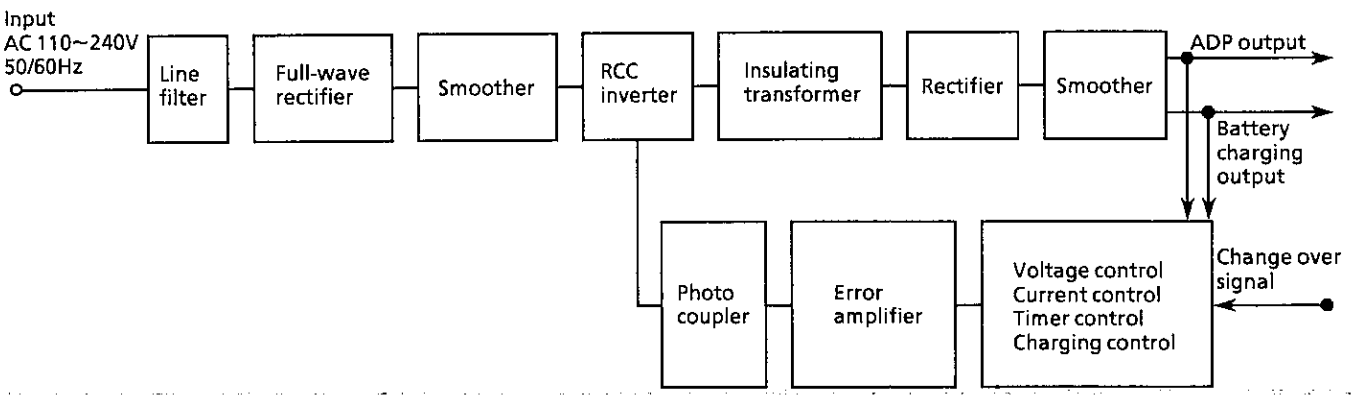


Figure 1. AC adaptor block diagram

2. Operation

(1) Adaptor mode

When the specialized battery is not attached to the adaptor, the constant DC voltage (+6.8V, 2.4A) can be obtained to operate CAMCORDER.
Its output property can withstand excessive current such as starting current and rush current.
Also, the overcurrent protector with fold back current, which controls the power when the short circuit from the outside occurs, is used to prevent the adaptor from being destroyed or broken down. It also prevents the temperature inside the adaptor from rising too excessively.

(2) Charge mode

This adaptor, when the specialized battery is attached, can be used as a quick charger. This charging operation is divided into operationing modes of three stages. The adaptor goes through these modes sequentially.
V-I property of each mode is shown in Fig. 2.

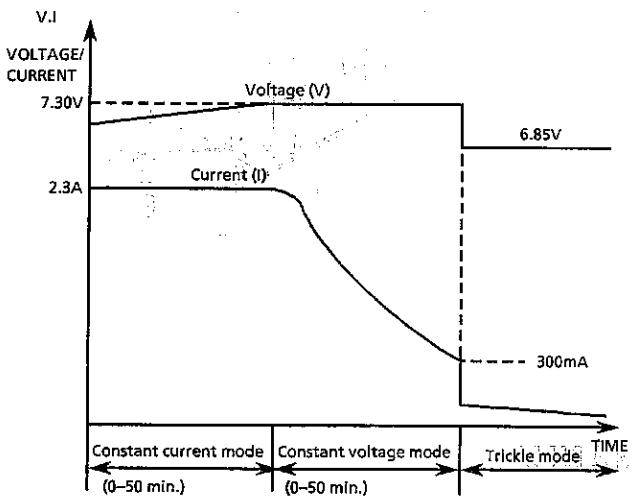


Figure 2. V-I property (Voltage/Current variation) in charge mode

3. Circuits

The circuits used for the adaptor are explained according to the circuit diagram in page 140 or 141.

(1) Input section

The input section consists of noise filter and rectification smoothing circuit of condensor input. The noise filter, which consists of L1, C1 and C2, reduces common noise. R1 is a resistance for discharging electricity retained at input AC plug when the power is turned off. R2 is a resistance which is required to be installed by the safety specification, but it also prevents static electricity from being generated. The amount of rush current which is caused when the power is turned on is greatly limited by R3, DC resistance of L1 and the operating resistance of D1.

(2) Switching section

The switching circuit, corresponding to the signals sent from the IC for controlling the primary side, makes FET Q1 work as a drive as a switch by using the DC voltage rectified through C3. It, together with the transformer T1, makes up a high-frequency inverter. R7 and C4 are surge absorber circuits which absorb the rectified surge voltage generated from the switching of Q1.

(3) Primary side control section

This section drives the switching section by converting the pulse duration of the signal received from the secondary side control circuit through the photo coupler.
The IC for MOSFET drive is used as a control IC. This IC, operating as an overvoltage protector, contains a circuit which stops oscillating when it detects the overvoltage at D5.

(4) Output circuit section

The secondary side output, which can be controlled by a popular on-off system, reduces output ripples and common mode noise through the choking coils of L2 and L3. D10 is used to prevent discharging trouble to the control circuit section caused when the input is turned off with the battery attached.

(5) Secondary side control section

The function of the secondary control section is to control the switching section by detecting the output voltage and current and conducting the detected signals to the primary side control circuit through the photo coupler. The secondary side control section employs a hybrid IC to realize high packaging density and adjustment-free design, and fine adjustment of output voltage and current is performed by the trimming.
The internal operation of IC2 is explained below referring to Fig. 3.
First, the constant voltage is adjusted and set by comparing the divided voltage potentials (R2 and R3) of standard voltage (output of IC3 inside IC2) with those (R27, R4 and R5) of output voltage at the OP AMP IC1-1 (ADP. mode). The output voltage in the CHG mode can be set by changing the ratio of the divided voltage potentials by turning on the SW. Q2, and that in the trickle mode can be set in the same way by turning on the SW. Q1.

ADP mode	6.80V
CHG mode	7.30V
Trickle mode	6.85V

OP AMP IC1-2, like IC1-1, sets the constant current value by using the divided resistance potentials. The SW. Q7 is used to shut off the constant current of 2.3A when the adaptor is in the ADP mode. The constant current of approximately 3.2A is sent in the ADP mode.

The comparator IC2-1 establishes the time for preventing troubles such as chattering caused by the attachment of the battery and for activating the overdischarged battery through the initial timer. About six minutes are provided for this time.
The timer is made up of a simple CR. (the condensor connected to ⑩ pin)

The comparator IC2-2 is an IC which determines the current value for detecting trickles. This value can be set by the ratio of divided voltage potentials of the standard voltage and the ratio of divided applied voltage potentials of the resistance for detecting electric current (resistance between pins ③ and ④ and pins ⑥ and ⑦).
The setting value is approximately 300mA.

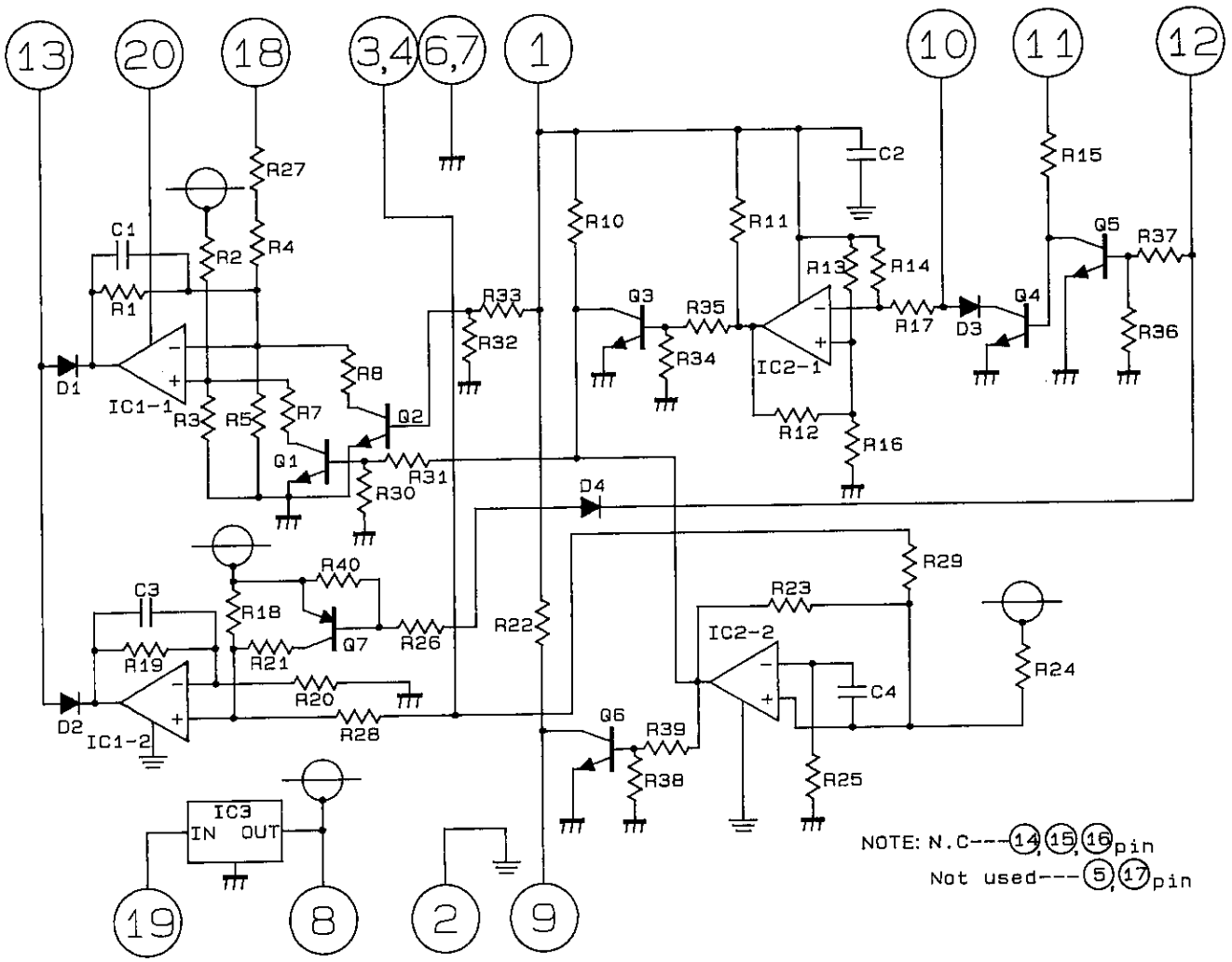


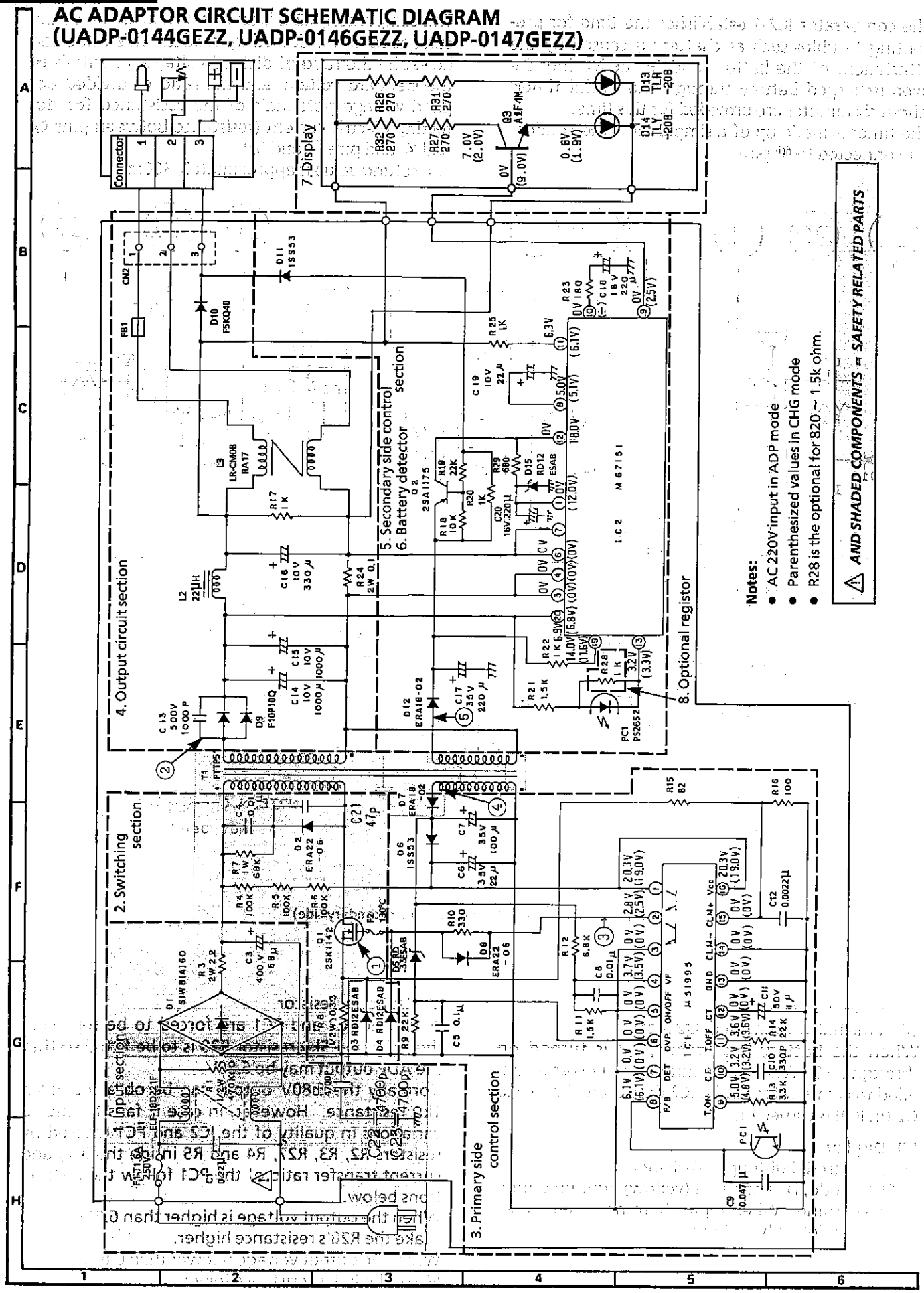
Figure 3. Circuit in IC2 (IC for controlling secondary side)

(6) Battery detector
With the battery removed, Q2 is off.
When the battery is attached, Q2 is turned on through D11. When Q2 is turned on, power is supplied to comparator IC2 (in IC2 described above and Q2 (in IC2) is turned on.

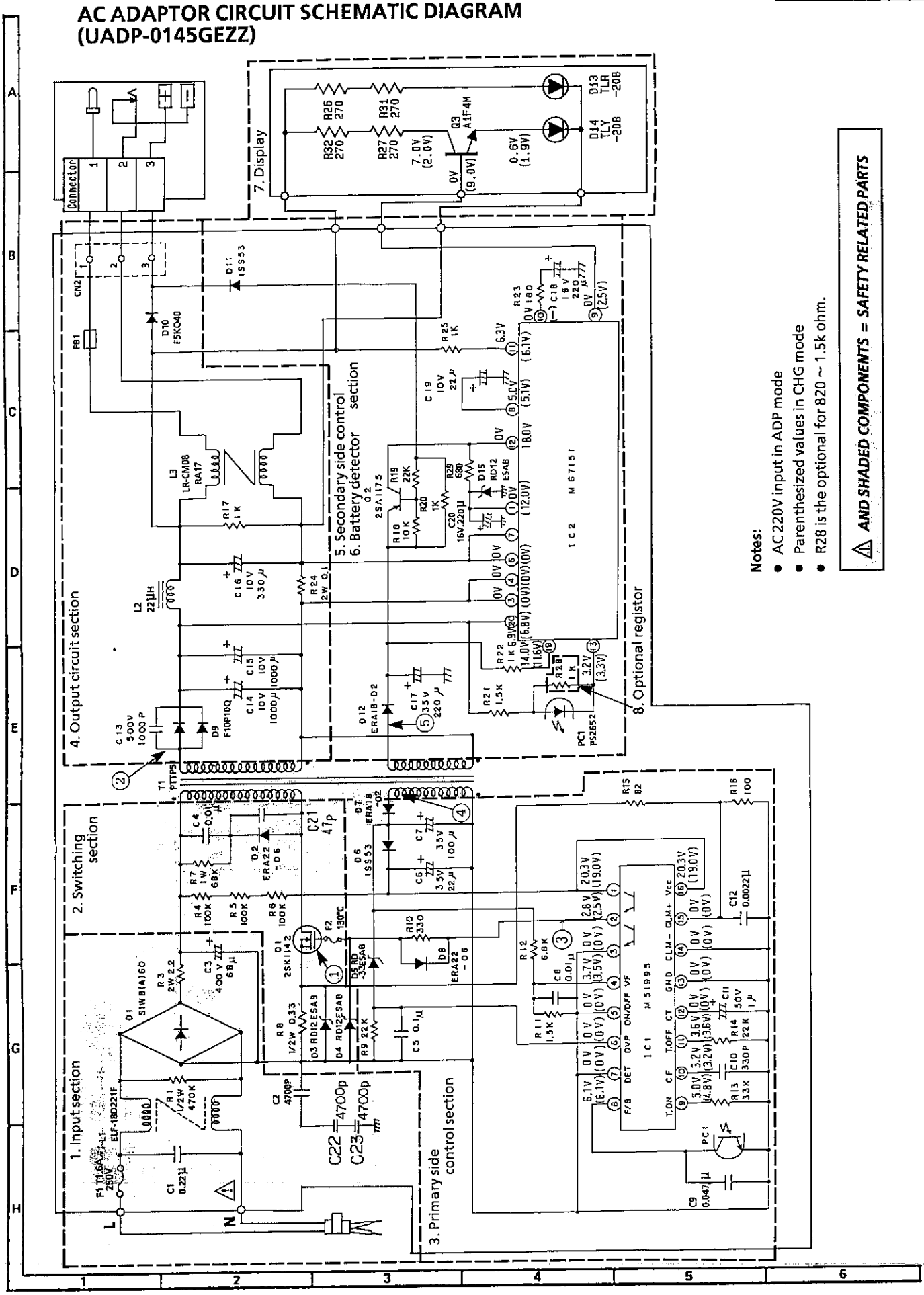
(7) Display
Only D13 (red) lights up in ADP mode.
In CHG mode, D13 and D14 (yellow) light up during rapid charging. When rapid charging is completed (trickle mode), only D14 goes out.

(8) Optional resistor
When the IC2 and PC1 are forced to be replaced, the 820Ω to 1.5kΩ resistor R28 is to be fitted so that the ADP output may be 6.80V.
Normally the 6.80V output can be obtained from 1kΩ resistance. However, in case it fails to due to variations in quality of the IC2 and PC1 (caused by resistors R2, R3, R27, R4 and R5 inside the IC2, and current transfer ratio of the PC1 follow the instructions below.
When the output voltage is higher than 6.80V:
Make the R28's resistance higher.
When the output voltage is lower than 6.80V:
Make the R28's resistance lower.

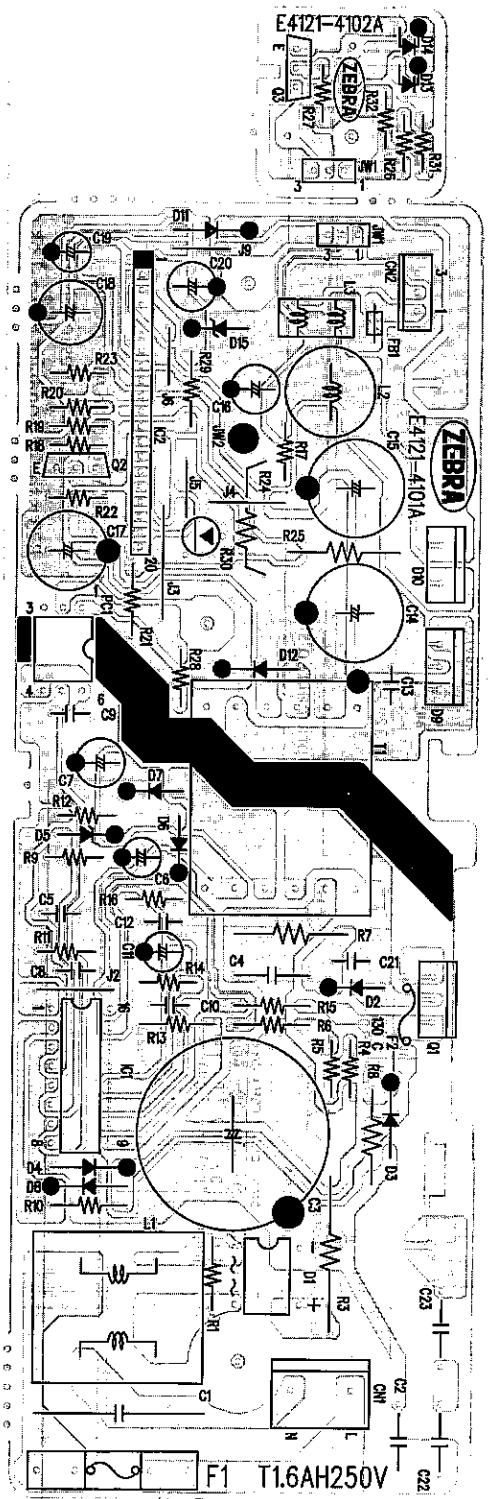
AC ADAPTOR CIRCUIT SCHEMATIC DIAGRAM
(UADP-0144GEZZ, UADP-0146GEZZ, UADP-0147GEZZ)



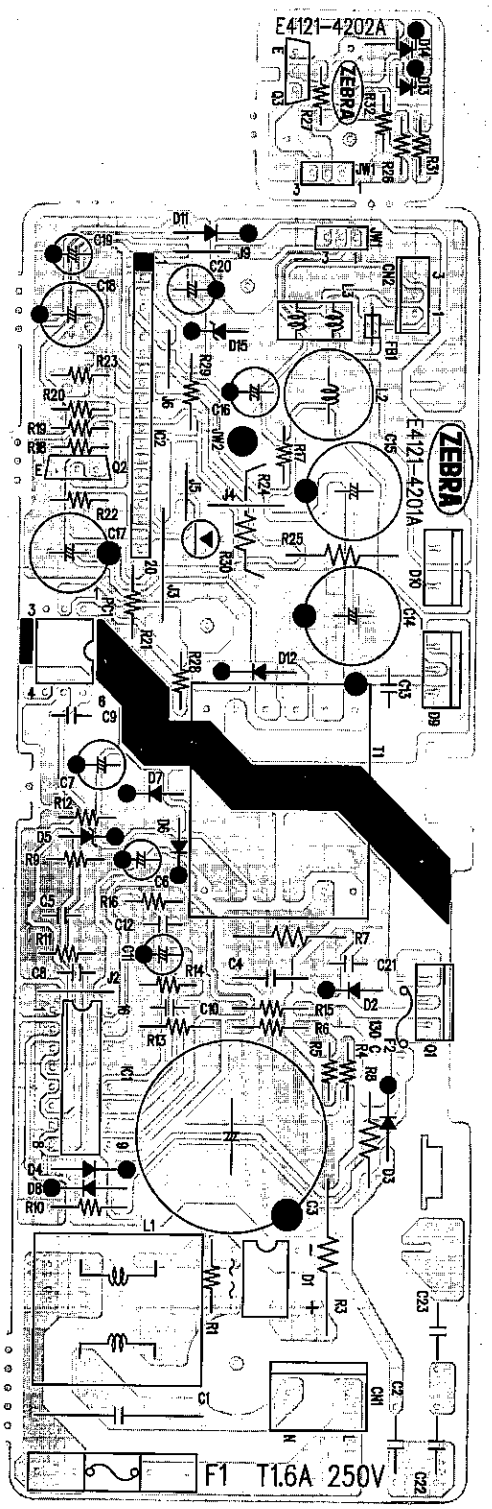
AC ADAPTOR CIRCUIT SCHEMATIC DIAGRAM (UADP-0145GEZZ)



AC ADAPTOR P.W.B (UADP-0144GEZZ)



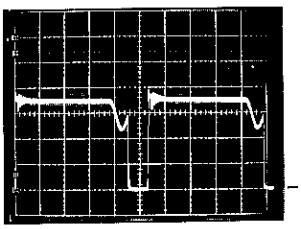
AC ADAPTOR P.W.B. (UADP-0145GEZZ, UADP-0146GEZZ, UADP-0147GEZZ)



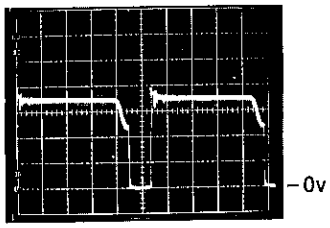
- **ADP mode**
  Power requirement :
  AC 220V
  On-load current : 2.4A

- **CHG mode**
  Power requirement :
  AC 220V
  Charged current : 2.3A

①

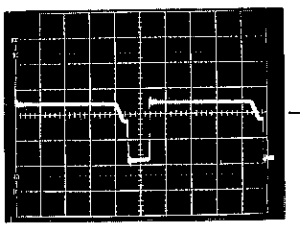


Q1 V (D-S)
100V, 2µsec/div

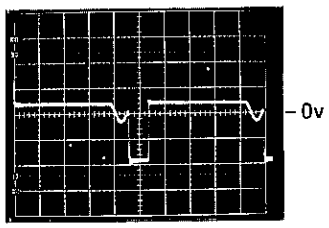


Q1 V (D-S)
100V, 2µsec/div

②

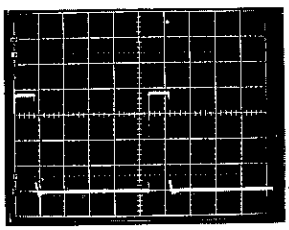


D9 V (A-G)
20V, 2µsec/div

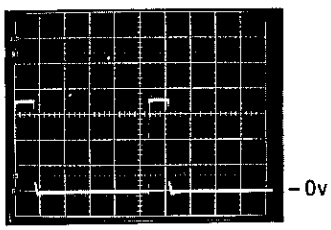


D9 V (A-G)
20V, 2µsec/div

③

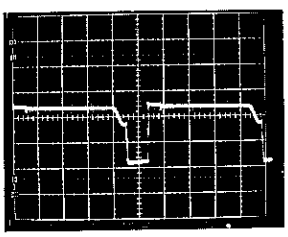


IC1 V (2-G)
5V, 2µsec/div

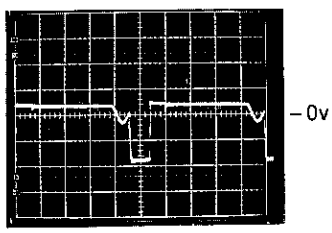


IC1 V (2-G)
5V, 2µsec/div

④

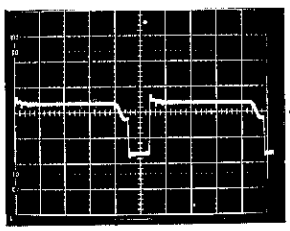


D7 V (A-G)
50V, 2µsec/div

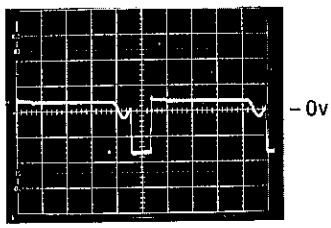


D7 V (A-G)
50V, 2µsec/div

⑤



D12 V (A-G)
50V, 2µsec/div



D12 V (A-G)
50V, 2µsec/div

REPLACEMENT PARTS LIST

PARTS REPLACEMENT

Many electrical and mechanical parts in camcorder have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by ⚠ and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION
5. PRICE CODE

⚠ MARK: SAFETY RELATED PARTS

PWB ASSEMBLY IS NOT REPLACEMENT ITEM

Ref. No.	Part No.	Description	Code

INTEGRATED CIRCUITS

IC1	95KUCC0044AZ	M51995	AP
IC2	95KUCH0093ZZ	M67151	AX

TRANSISTORS

⚠Q1	95KUAG0048AZ	2SK1142	AM
Q2	95KUAA0072AZ	2SA1175	AB
Q3	95KUAZ0004AZ	BA1F4M	AC

DIODES

⚠D1	95KUBB0148DZ	S1WB (A) 60	AF
⚠D2, 8	95KUBC0169CZ	ERA22-06	AC
D3, 4, 15	95KUBDAC120A	RD12ESAB	AB
D5	95KUBDAK330D	RD33ESAB	AB
D6, 11	95KUBA0004AZ	1SS53	AB
⚠D7, 12	95KUBC0221AZ	ERA18-02	AC
D9	95KUBB0168FZ	F10P10Q	AK
D10	95KUBC0167BZ	F5KQ40	AK
D13	95KUDC0092BZ	TLR-208	AC
D14	95KUDC0116AZ	TLY-208	AD

COILS AND TRANSFORMER

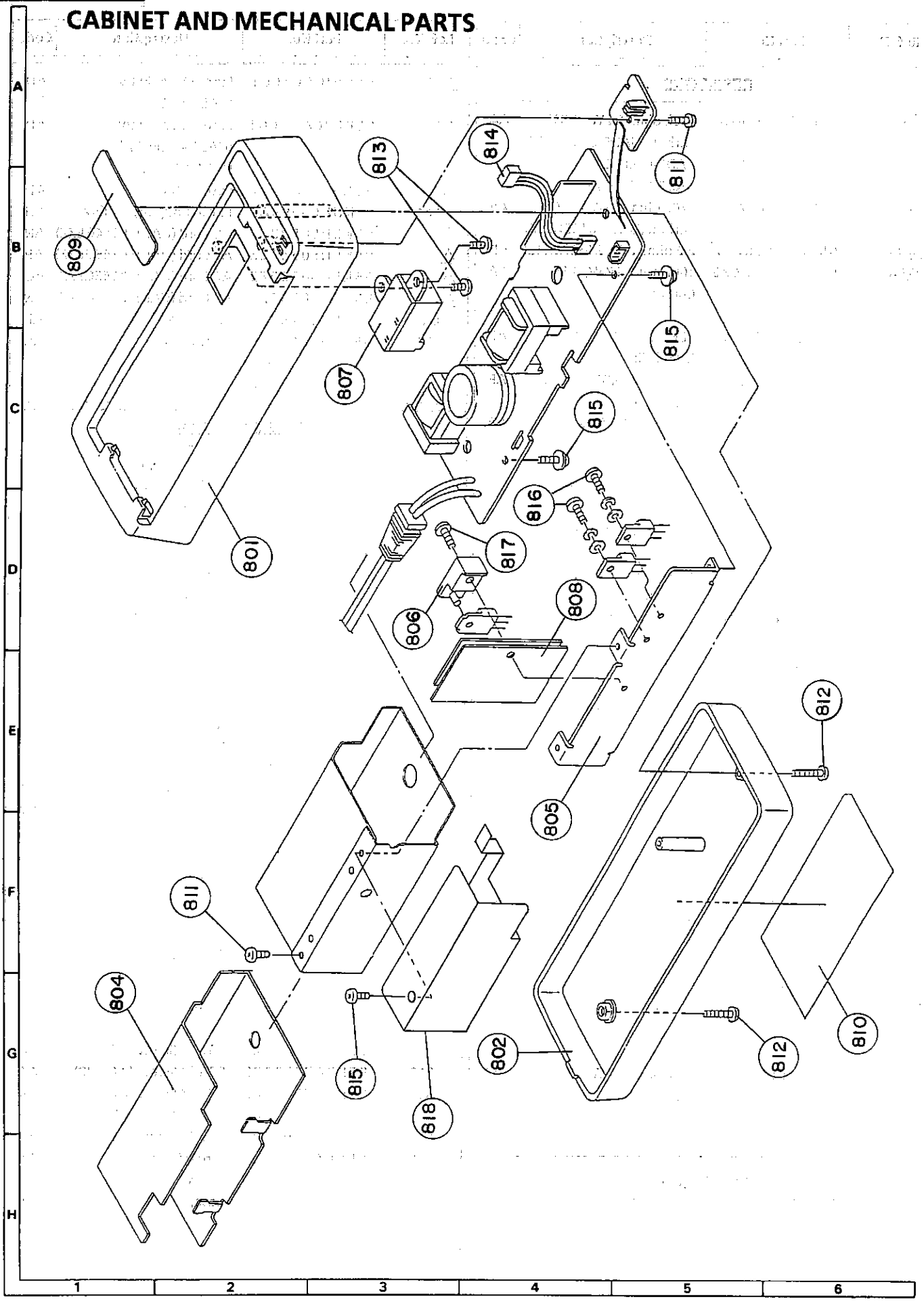
⚠L1	95KUKZ0465ZZ	Line Filter	AM
L2	95KUKZ0407ZZ	Line Filter	AE
L3	95KUKZ0408ZZ	Choke	AK
⚠T1	95K829035028	PTTP51, Power (UADP-0144GEZZ)	AX
⚠T1	95K129035044	PTTP51, Power (UADP-0145GEZZ, UADP-0146GEZZ, UADP-0147GEZZ)	

CAPACITORS

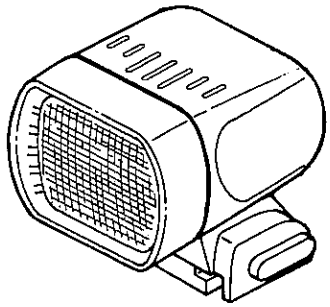
⚠C1	95KUGFZ224FD	0.22µF, 250V, ±20%, Film	AF
⚠C2, ⚠22, ⚠23	95KUGCQ472AB	4700pF, 125V, ±20%, Ceramic	AD
⚠C3	95KUGBQ680CD	68µF, 400V, ±20%, Electrolytic	AN
⚠C4	95KUGFT103FB	0.01µF, 630V, ±10%, Film	AC
C5	95KUGFF104AR	0.1µF, 50V, ±10%, Film	AC
C6	95KUGAE220DC	22µF, 35V, ±20%, Electrolytic	AE
C7	95KUGAE101NT	100µF, 35V, ±20%, Electrolytic	AC
C8	95KUGFF103AR	0.01µF, 50V, ±10%, Film	AB
C9	95KUGFF473AR	0.047µF, 50V, ±10%, Film	AB
C10	95KUGCF331BN	330PF, 50V, ±10%, Ceramic	AA
C11	95KUGAF1R0DC	1µF, 50V, ±20%, Electrolytic	AB
C12	95KUGFF222AR	2200pF, 50V, ±10%, Film	AB
C13	95KUGCS102AB	1000pF, 500 V, +100%~−0%, Ceramic	AB
C14, 15	95KUGAB102NJ	1000µF, 10V, ±20%, Electrolytic	AE
C16	95KUGAB331NT	330µF, 10V, ±20%, Electrolytic	AC
C17	95KUGAE221JF	220µF, 35V, ±20%, Electrolytic	AD
C18, 20	95KUGAC221JE	220µF, 16V, ±20%, Electrolytic	AC
C19	95KUGAB220DC	22µF, 10V, ±20%, Electrolytic	AB
⚠C21	95KUGCU470BF	47pF, 1kV, ±10%, Ceramic	AB

Ref. No.	Part No.	Description	Code
RESISTORS			
⚠R1	95KUEEC474AK	470k ohm, 1/2W, ±5%, Carbon (UADP-0144GEZZ, UADP-0146GEZZ, UADP-0147GEZZ)	AA
⚠R1	95KUECC474AE	470k ohm, 1/2W, ±10%, Carbon (UADP-0145GEZZ)	AB
⚠R3	95KUEAE2R2AA	2.2 ohm, 2W, ±5%, Metal	AD
⚠R4, ⚠5, ⚠6	95KUEEB104BB	100k ohm, 1/4W, ±5%, Carbon	AA
⚠R7	95KUEFD683AU	68k ohm, 1W, ±5%, Metal Film	AB
⚠R8	95KUEFCR33AP	0.33 ohm, 1/2W, ±10%, Metal Film	AB
R9, 14, 19	95KUEEB223BB	22k ohm, 1/4W, ±5%, Carbon	AA
R10	95KUEEB331BB	330 ohm, 1/4W, ±5%, Carbon	AA
R11, 21	95KUEEB152BB	1.5k ohm, 1/4W, ±5%, Carbon	AA
R12	95KUEEB682BB	6.8k ohm, 1/4W, ±5%, Carbon	AA
R13	95KUEEB333BB	33k ohm, 1/4W, ±5%, Carbon	AA
R15	95KUEEB820BB	82 ohm, 1/4W, ±5%, Carbon	AA
R16	95KUEEB101BB	100 ohm, 1/4W, ±5%, Carbon	AA
R17, 20, 22, 25, 28	95KUEEB102BB	1k ohm, 1/4W, ±5%, Carbon	AA
R18	95KUEEB103BB	10k ohm, 1/4W, ±5%, Carbon	AA
R23	95KUEEB181BB	180 ohm, 1/4W, ±5%, Carbon	AA
R24	95KUEFER10BJ	0.1 ohm, 2W, ±10%, Metal Film	AA
R26, 27, 31, 32	95KUEEB271BB	270 ohm, 1/4W, ±5%, Carbon	AA
R29	95KUEEB681BB	680 ohm, 1/4W, ±5%, Carbon	AA
MISCELLANEOUS			
⚠F1	95KPJCTG1601	Fuse, T1.6A, 250V (UADP-0144GEZZ)	AG
⚠F1	95KPJCAC1601	Fuse, T1.6A, 250V (UADP-0145GEZZ)	AD
⚠F1	95KDJCAY1601	Fuse, T1.6A, 250V (UADP-0146GEZZ, UADP-0147GEZZ)	AD
⚠F2	95KPJT0089ZZ	Fuse, 130°C	AD
PC1	95KUDC0093AZ	Photo Coupler, PS2652	AH
⚠	95KEHS0528ZZ	AC Cord (UADP-0144GEZZ)	AN
⚠	95KEHS0547ZZ	AC Cord (UADP-0145GEZZ)	AP
⚠	95KEHS0530ZZ	AC Cord (UADP-0146GEZZ)	AQ
⚠	95KEHS0531ZZ	AC Cord (UADP-0147GEZZ)	AN
CN2	95KPKZ0742ZZ	Connector, 3pin	AB
FB1	95KBFZ89192Z	Ferrite Bead	AH
CABINET PARTS			
801	95KMRZ5177ZZ	Cabinet, Upper (UADP-0144GEZZ, UADP-0146GEZZ, UADP-0147GEZZ)	AL
801	95KMRZ5205ZZ	Cabinet, Upper (UADP-0145GEZZ)	
802	95KMRZ5176ZZ	Cabinet, Lower (UADP-0144GEZZ, UADP-0146GEZZ, UADP-0147GEZZ)	AL
802	95KMRZ5206ZZ	Cabinet, Lower (UADP-0145GEZZ)	
803	95KLRZ5734ZZ	Case, Shield	AF
804	95KGZZ5043ZZ	Sheet, Insulator	AH
805	95KLRZ5738ZR	Sink, Heat	AH
806	95KMRZ5193ZZ	Bracket, Auxiliary	AC
807	95KPZZ0695ZZ	Terminal, Battery	AN
808	95KMRS5017ZZ	Sheet, Radiation	AE
809	95KSAB0973ZZ	Label	AE
810	95KSBB1454ZZ	Label, Model (UADP-0144GEZZ)	AD
810	95KSBB1453ZZ	Label, Model (UADP-0145GEZZ)	AD
810	95KSBB1479ZZ	Label, Model (UADP-0146GEZZ)	AD
810	95KSBB1451ZZ	Label, Model (UADP-0147GEZZ)	AD
811	95KRAZZ042ZB	B Tight Screw (2.6×6)	AA
812	95KRAZF002ZE	P Tight Screw (2.6×20)	AA
813	95KRAZF010ZB	P Tight Screw (2.6×4)	AA
814	95KECB7520ZZ	Connecting Cord	AF
815	95KRAZZ043ZB	B Tight Screw (2.6×6)	AA
816	95KRAZ3211ZB	Screw (3×8)	AA
817	95KRAA3080AB	Screw (3×8)	AA
818	95KLRZ5816ZZ	Case, Shield	AE

CABINET AND MECHANICAL PARTS



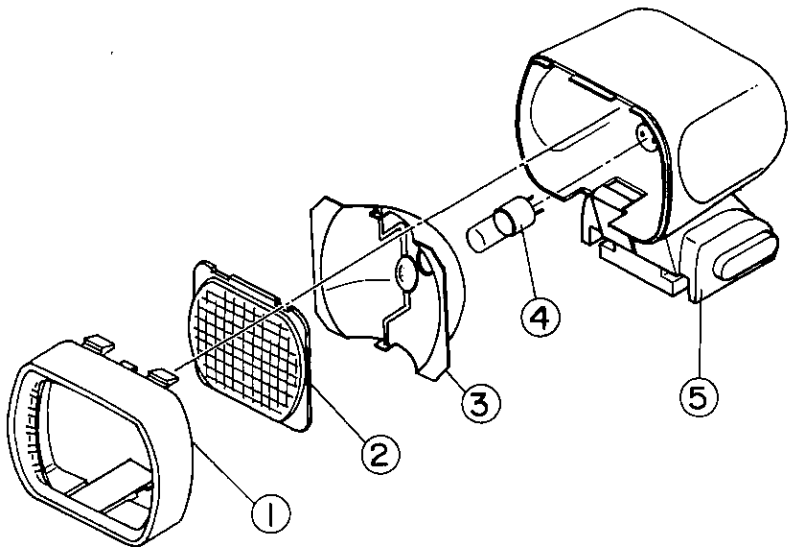
VIDEO LIGHT for CAMCORDER



DISASSEMBLING THE VIDEO LIGHT

1) Remove the light off the camcorder's body. (Refer to Replacing the Video Light lamp.)
2) Holding the bottom of the front panel ① with fingers, have it unhooked and removed by pulling it toward yourself.
3) Using a slotted screwdriver or the like, unhook the reflector ③ and take it out.
4) Take out the lens ② by having it unhooked off the front panel.
5) Pulling the light lamp ④ in the direction of the front panel, remove it off the light's body ⑤.

Note: * Since the interior of the light's body ⑤ is very complicated to reassemble, do not disassemble it.

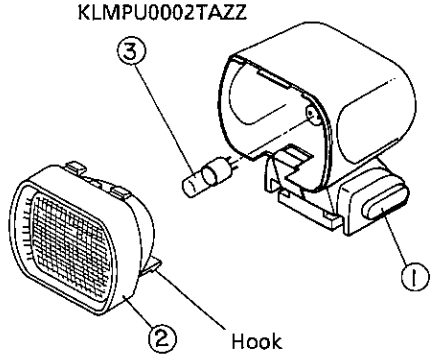


REPLACING THE VIDEO LIGHT LAMP

1) Turn off the camcorder and disconnect the power supply.
2) Pushing the lock button ①, slide the video light forward off the body.
3) Pushing the hook on the bottom of the light's front panel ② with a finger, unhook the light.
4) Remove the front panel ② by pulling it toward yourself.
5) Remove the lamp ③ by pulling it in the direction of the front panel.
   Be careful! The lamp may be hot.
6) Push a new lamp down firmly into the socket.
7) Hook the top of the front panel ② first, and then insert the bottom hook in until it clicks.

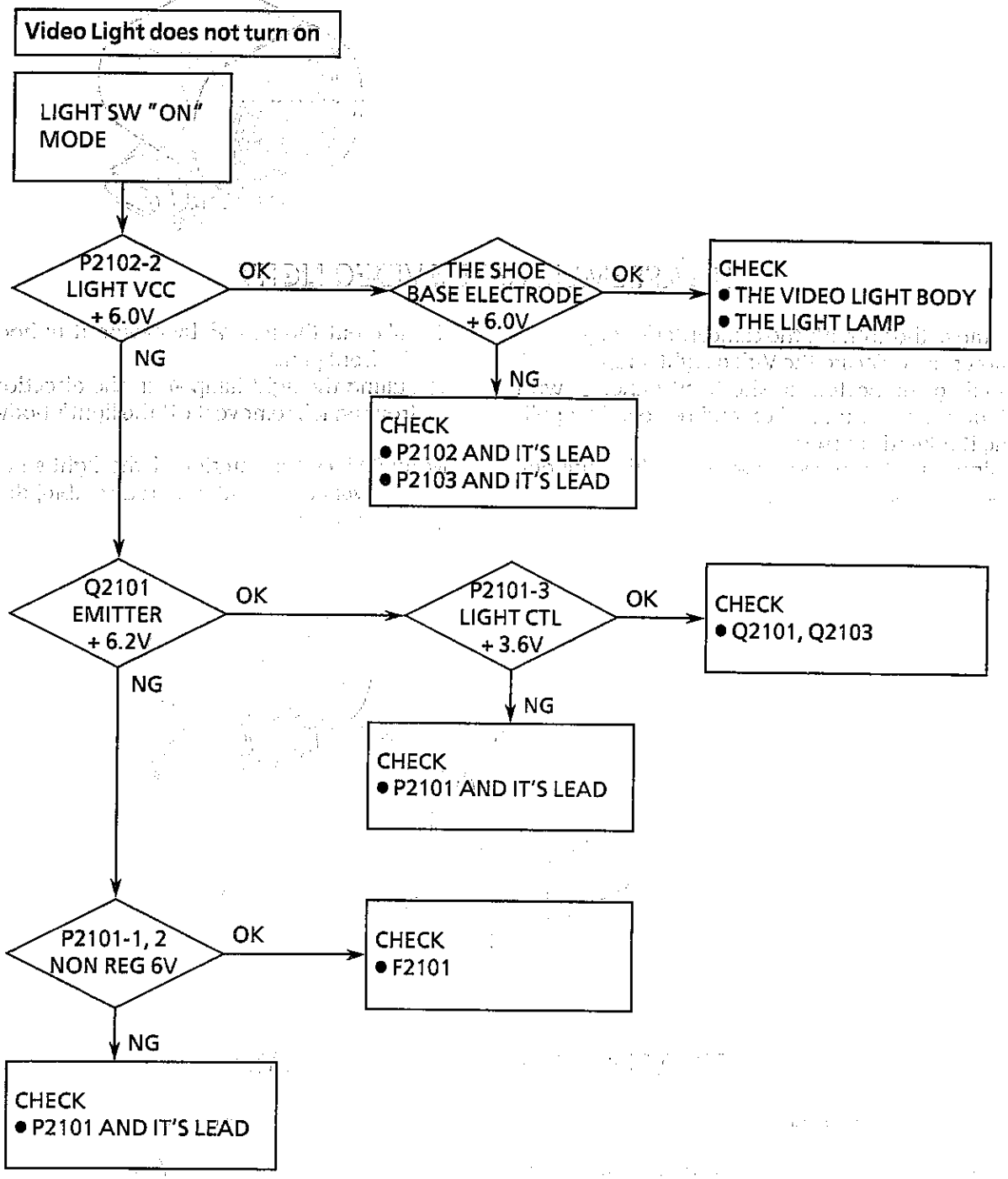
Notes: * Be sure to replace only with SHARP part No. KLMPU0002TAZZ for the reasons of safety and performance.

KLMPU0002TAZZ



* Hold the new lamp with a cloth or tissue paper to prevent soiling of the glass which will shorten the new lamp's life.

TROUBLESHOOTING



REPLACEMENT PARTS LIST

PARTS REPLACEMENT

Many electrical and mechanical parts in camcorder have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by ⚠ and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

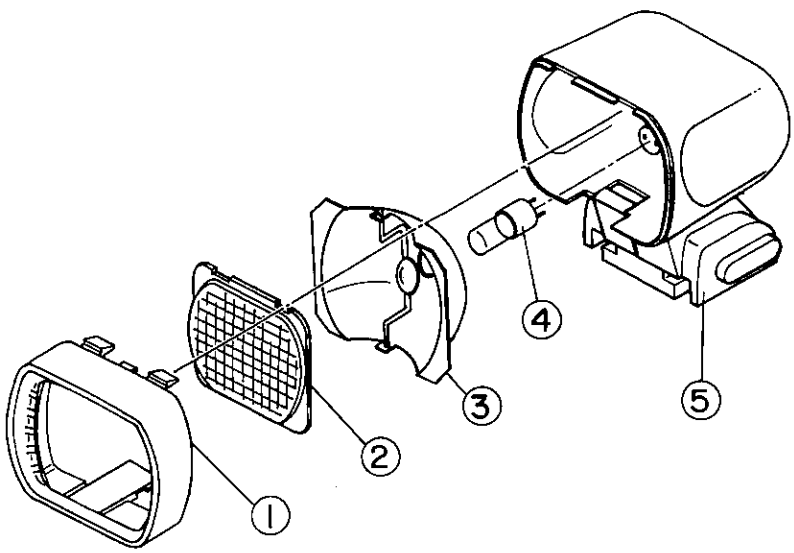
"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION
5. PRICE CODE

Ref. No.	Part No.	Description	Code
	KLMPJ0002TAZZ	Video Light Ass'y	AZ
1	91BEQ01200701A	Front Panel	AE
2	91BEQ01200702A	Lens	AN
3	91BEQ01100160A	Reflector	AM
4	KLMPU0002TAZZ	Mini Halide Lamp	AR
5	91BBQ49000085A	Light Main Body	AW

Note: Lamp ④ is provided as a service part. (KLMPU0002TAZZ)



Diassembled View of Video Light

SHARP

T8422-S
Printed in Japan