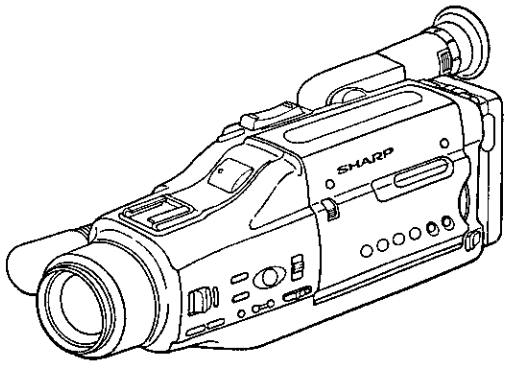
SHARP SERVICE MANUAL

S13Q4VL-N1S//



VIDEO CAMERA RECORDER 8 PAL

MODELS VL-N1S/H/X/N18E

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.

For the mechanical adjustments, refer to the service manual for the **MECHANISM SECTION DESCRIPTION.**

SHARP CORPORATION

6. ADJUSTMENT OF VCR SECTION

Before starting electric circuit adjustment

- Electric circuit adjustment becomes necessary, in most cases, when any of the wearable mechanical parts or the video head is replaced. Before starting electric circuit adjustment, be sure to check that the mechanical parts work perfect (i.e. the mechanical parts all been perfectly adjusted).
  In case a trouble or troubles are found in the electric circuits, be sure to down the cause(s) by using measuring instruments as described below. After locating the cause(s), then proceed to repair, replacement, or adjustment. Do not change the positions of the controls when adequate measuring instruments are not available.
- In order to implement a higher-density, smaller machine, most of the electric circuit parts used within the PWB units are of small-sized, surface-mounted type.
  For replacing part(s) as after-sale service, work with a soldering iron as speedily as possible. The heatresistance of the surface-mounted components is poor when compared with the larger-sized discrete parts used for television sets and stationary decks owing to their small sizes. Therefore, exercise due care so as to avoid long-time exposure of the poles of these parts to the heat of the soldering iron which may possibly cause them to have a trouble. Care should be exercised especially for chip-layer capacitor replacement.
  It is advisable to use a temperature-controlled ceramic soldering iron (Temperature at the tip: 250°C. Contacting time: Less than 5 seconds).

<Adjusting the video system>

Measuring instruments and others:

- Colour monitor TV set
- Digital voltmeter
- DC power supply
- Video recording tape
- Alignment tapes
  JiGWR5-5CSP (Y/C system adjustment) (Audio system adjustment)
  JiGWR2-3CS (Servo adjustment)
  JiGWR5-6C (H/A adjustment)
- Oscilloscope
- VTVM
- Signal generator
- Vectorscope
- Frequency counter
- Audio generator (CR oscillator)
- AC adapter (Supplied accessary)
- AV output cable
- DC cable (Supplied accessary)
- Video system extension cable (Table 6-B-1)

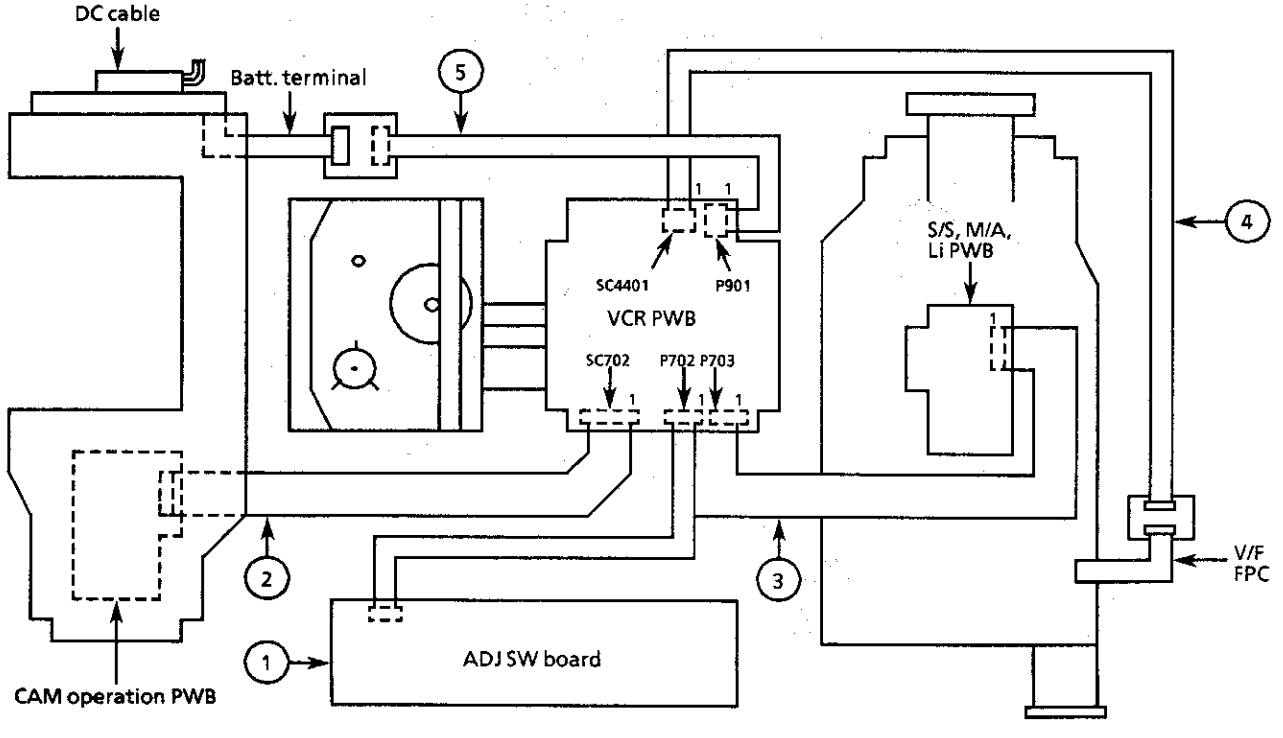


Figure 6-A-1. Connection for VCR adjustment

Basic connection diagram for VCR servicing

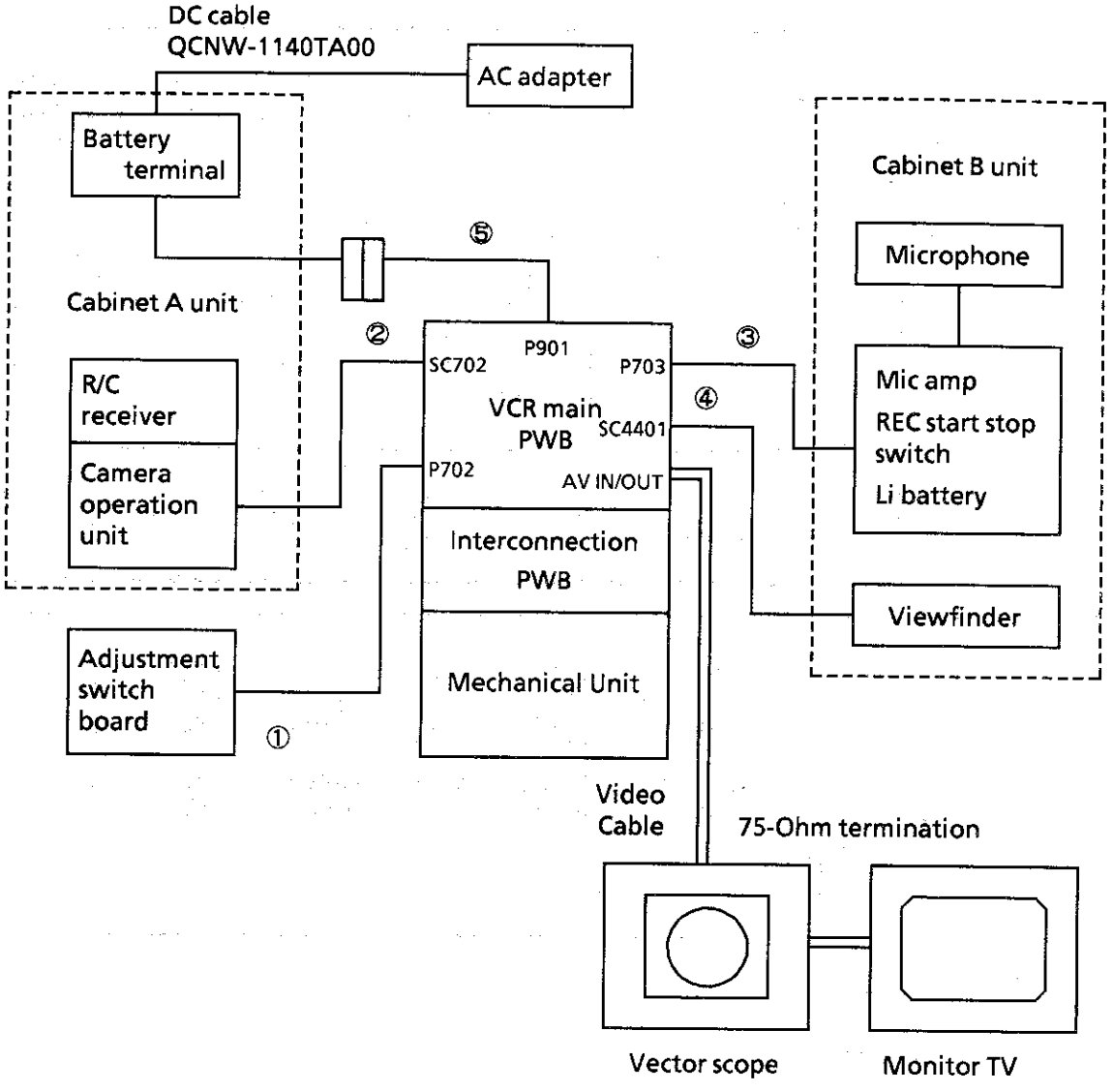


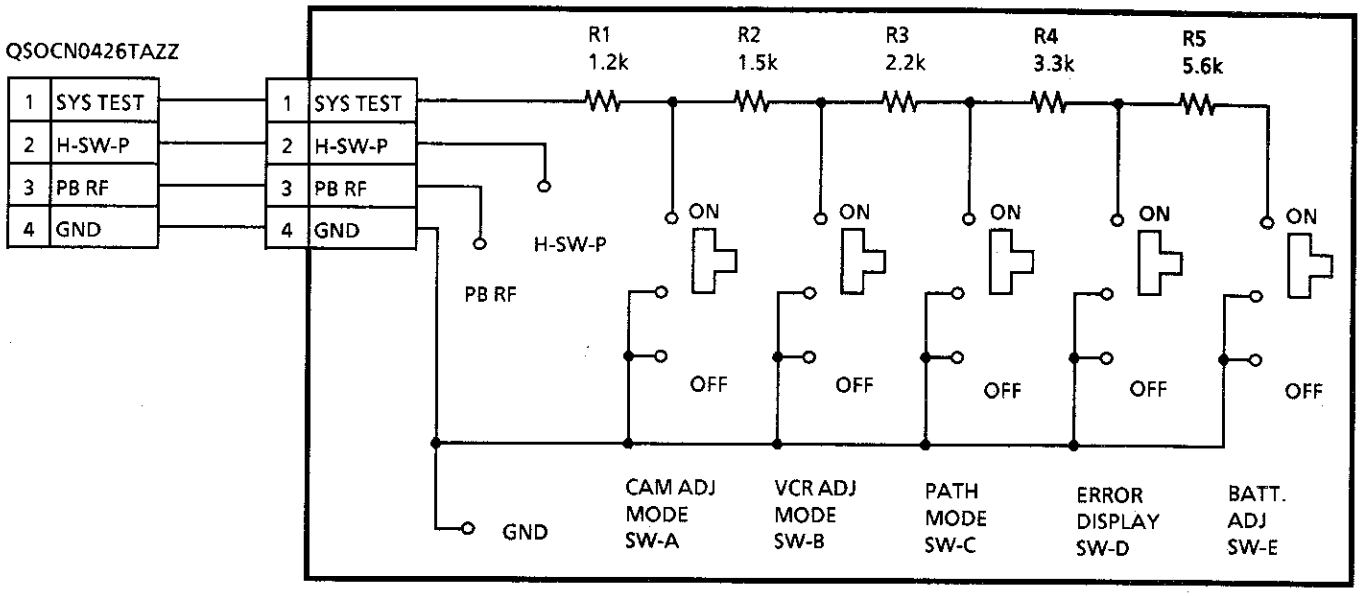
Figure 6-A-2.

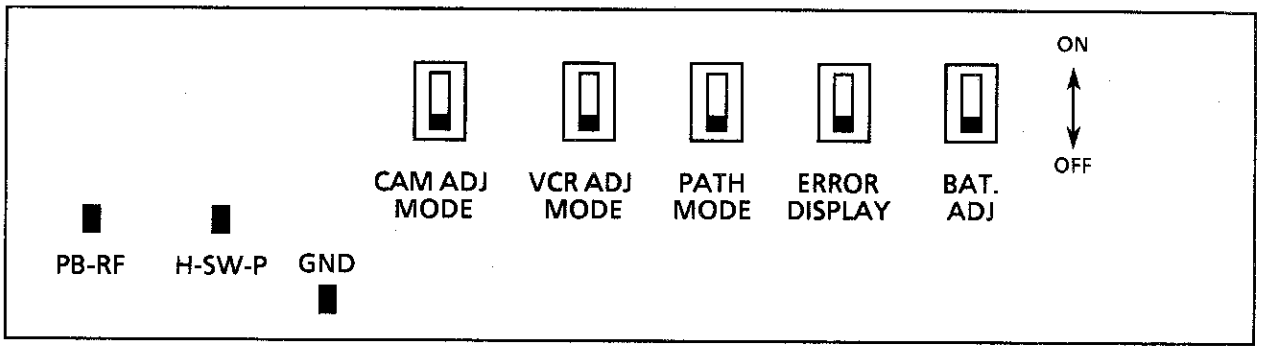
No.	Part code	Price code	Connecting point	Connector name
1	QCNW-1214TAZZ	BD	Adjustment switch board (4-pin)	~P702
2	QCNW-1218TAZZ	AH	Camera operation ~ Main PWB (12-pin)	~SC702
3	QCNW-1219TAZZ	AK	S/S, M/A, Li unit ~ Main PWB (7-pin)	~P703
4	QCNW-1221TAZZ	AW	V/F FPC ~ Main PWB (8-pin)	~SC4401
5	QCNW-1225TAZZ	AR	Battery terminal ~ Main PWB (2-pin)	~P901
6	JIGDRIVER-9	BE	Ceramic driver	0.4mm × 1.3mm
7	JIGSOLDER-921P	BS	Soldering iron	220V Type
8	JIGSOLDER-H0.4	BB	Soldering knife tip	0.4mm
9	JIGWR2-3CS	CL	System control	
10	JIGWR5-5CSP	BU	Y/C, Audio	
11	JIGWR5-6C	BX	H/A	

Table 6-B-1. VCR extension cables and adjustment jigs at a glance

- Switches on Adjustment PWB Unit

ADJUSTMENT SWITCH BOARD
(QCNW-1214TAZZ)



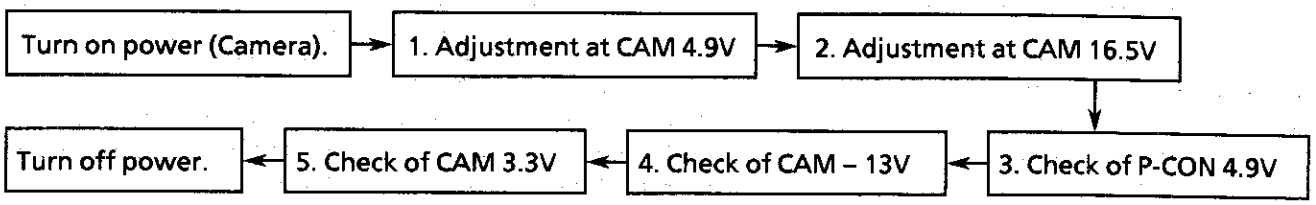


Note: ■ : Test point

▯ : Slide switch

CAM ADJ MODE	SW	: Used to set up the CAMERA adjustment mode.
VCR ADJ MODE	SW	: Used to set up input video signal mode in PAL.
PATH MODE	SW	: Used to tape travel compatibility adjustment.
ERROR DISPLAY	SW	: Used to display last error mode.
BAT. ADJ	SW	: Used for automatic low-battery sensor adjustment.
H-SW-P	TP	: Head switching pulse waveform. Used to RF frequency character adjustment, head switching point adjustment and tape travel compatibility adjustment.
PB RF	TP	: Playback RF envelope waveform. Used to RF frequency character adjustment, head switching point adjustment and tape travel compatibility adjustment.

6-1. POWER CIRCUIT

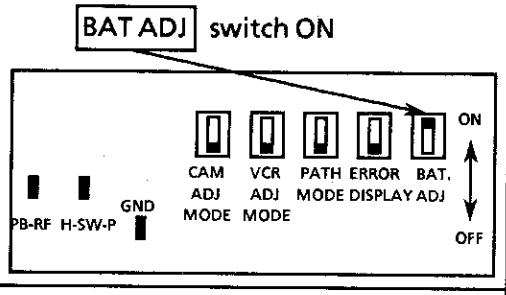
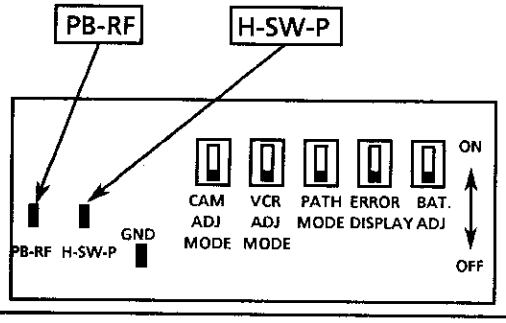
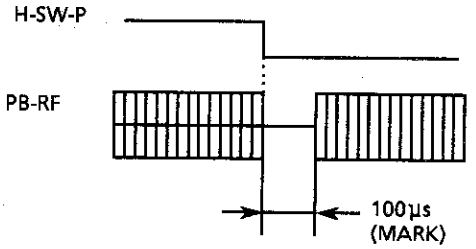


● Input 6V through battery terminal, and change power switch to camera side.

Item	Adjustment procedure
1. Adjustment at CAM 4.9V ● Test point : TP705-TP707 (GND) ● Adjustment point : R903 ● Specification : 4.90V ± 0.05V ● Instrument : VTVM	1) Turn control R903 to adjust VTVM indication at 4.90V ± 0.05V.
2. Adjustment at CAM 16.5V ● Test point : TP706-TP707 (GND) ● Adjustment point : R943 ● Specification : 16.5V ± 0.1V ● Instrument : VTVM	1) Turn control R943 to adjust VTVM indication at 16.5V ± 0.1V.
3. Check of P-CON 4.9V ● Test point : TP903-TP902 (GND) ● Specification : 4.92V ± 0.07V ● Instrument : VTVM	1) Make sure that the voltage between TP903 and TP902 (GND) is 4.92V ± 0.07V.
4. Check of CAM – 13V ● Test point : TP904-TP902 (GND) ● Specification : – 13.0V ± 1.0V ● Instrument : VTVM	1) Make sure that the voltage between TP904 and TP902 (GND) is – 13.0V ± 1.0V.
5. Check of CAM 3.3V ● Test point : TP906-TP902 (GND) ● Specification : 3.3V ± 0.1V ● Instrument : VTVM	1) Make sure that the voltage between TP906 and TP902 (GND) is 3.3V ± 0.1V.

● Turn off power.

6-2. SYSTEM CONTROL/SERVO CIRCUIT

Item	Adjustment procedure
1. Battery sensor adjustment ● Mode : CAMERA ● Test point : TP907 ● Adjustment point : R723 ● Specification : 5.5V ± 0.05V ● Instrument : Voltmeter DC power supply (Variable range: 5-10V, above 3A) 	1) Connect the adjustment jig to P702. 2) Connect the DC power to the power terminal and apply approx. 6V power voltage. At this time, be careful not to confuse the " + " mark with the " – " mark of the terminal. 3) Set the power switch to the "CAMERA" position. 4) Turn on the BAT ADJ switch. 5) Connect the voltmeter to the test point and gradually decrease the power voltage down to 5.5V ± 0.05V. 6) Adjust R723 until + 000 is displayed at the lower left in the V/F.
2. Head switching point adjustment ● Mode : VCR/PB ● Input signal : Alignment tape (JiGWR2-3CS) ● Test point : H-SW-P PB-RF ● Adjustment point : R722 ● Specification : 100µs ● Instrument : Oscilloscope 	1) Play back alignment tape (JiGWR2-3CS) and make triggering at the test point (H-SW-P) on the ADJ SW board. 2) Adjust R722 until the fall point of the H-SW-P is aligned with the point of the PB-RF at which signals disappear. 

6-3. Y/C CIRCUIT

● Input Signal Conditions Instrument set-up

For electrical adjustments of the Y/C circuit, a pattern generator is used to feed the video signal. It is important that the video signal output is as specified. Connect the oscilloscope to the video input and output terminals. Make sure the oscilloscope waveform of the video signal is as follows: video sync signal's amplitude at about 0.3 Vp-p; video portion's amplitude at about 0.7 Vp-p; burst signal amplitude at about 0.3 Vp-p and its top and bottom as flat as possible; and the level ratio of the burst signal to the red bar at 0.30 : 0.66. Figure A shows the video signal waveform for the standard colour bars.

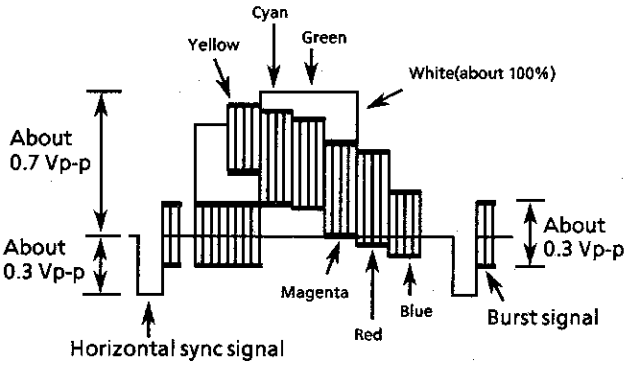


Figure A. Colour bar signal from pattern generator

※ When there is no Pattern Generator Available:

In this case, shoot a colour bar chart (JIGCHART-4) with a completely adjusted camcorder. Set the illumination so that the camcorder's video signal output (terminated with 75- ohm impedance) is as shown in Figure B. This colour bar signal can be used as an input signal for electrical adjustments.

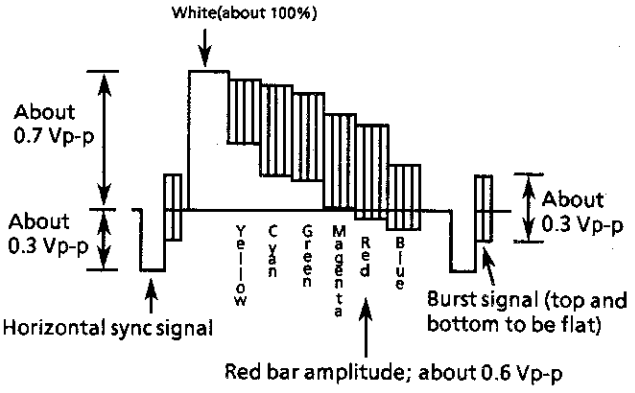
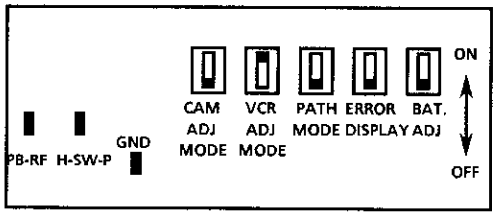
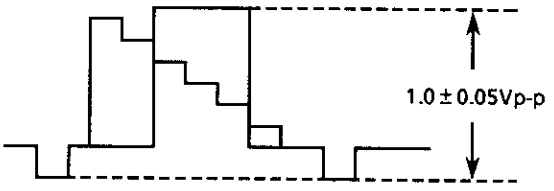
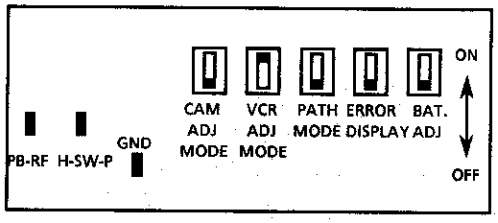
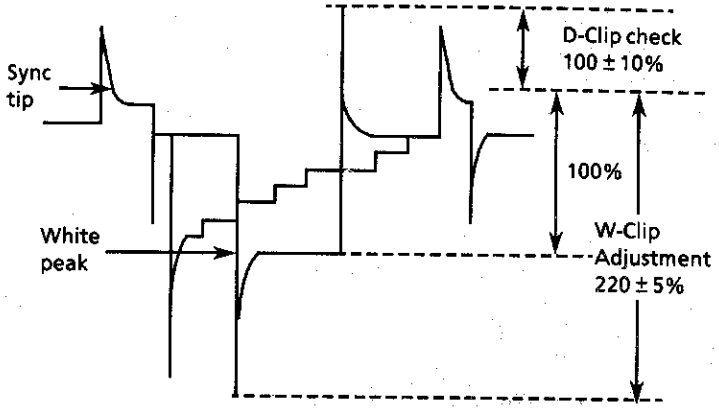
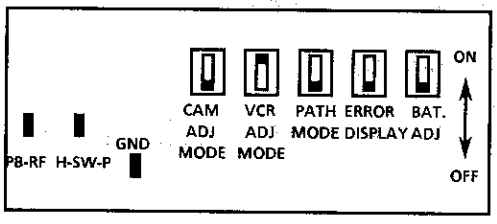
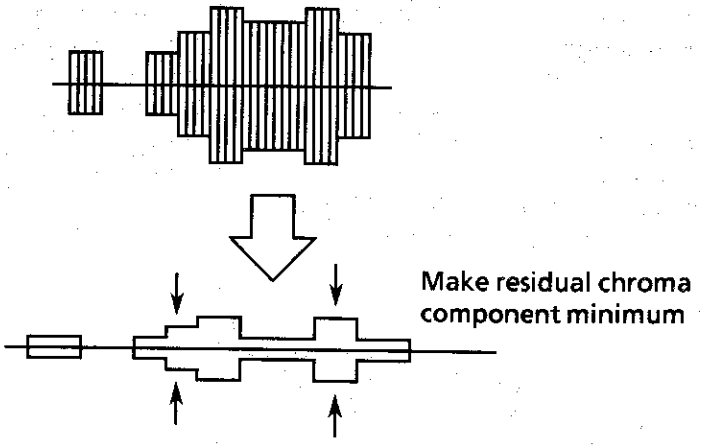
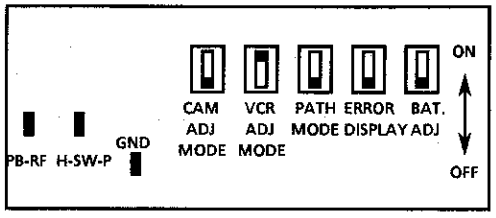
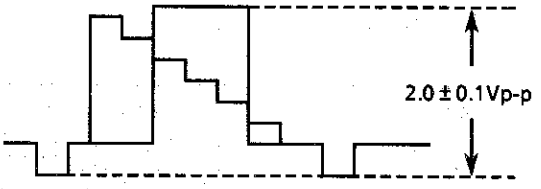
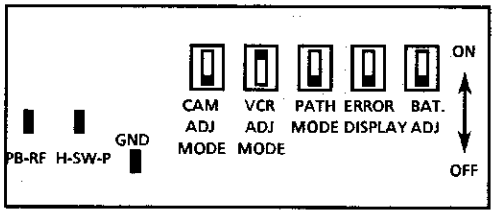
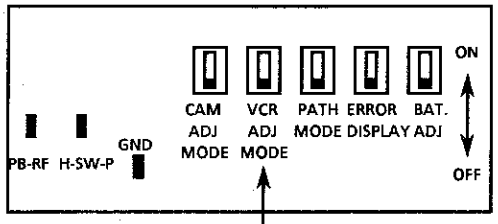
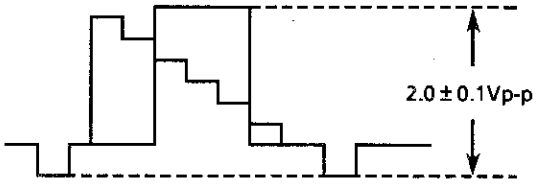
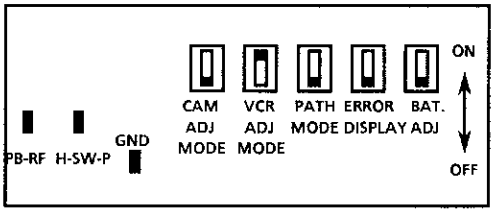
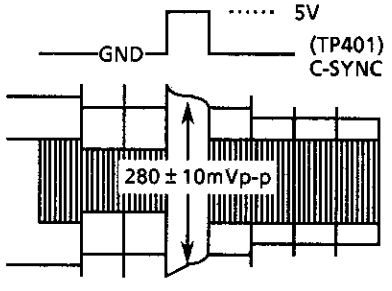


Figure B. Colour bar signal obtained by camcorder

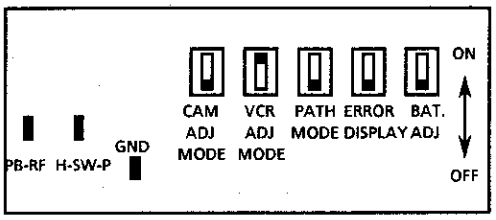
Item	Adjustment procedure
1. EE level adjustment ● Mode : VCR/AV IN ● Test signal : Colour bar ● Test point : TP4421 TP401 (Trigger) ● Adjustment point : R407 ● Specification : 1.0 ± 0.05Vp-p ● Instrument : Oscilloscope 	1) Before connecting the QCNW-1214TAZZ JiG to connector P702, make sure all the jig's switches are at OFF position. 2) VCR ADJ MODE SW ON. 3) Connect the oscilloscope to TP4421. 4) Feed the colour bar input signal. 5) Adjust TP4421 so that the video output level be 1.0 ± 0.05Vp-p . 6) VCR ADJ MODE SW OFF. 

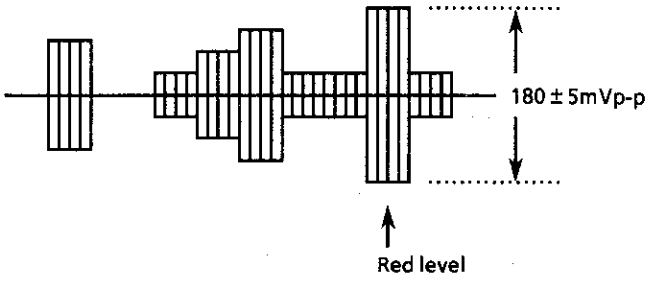
Item	Adjustment procedure
2. White clip adjustment ● Mode : VCR/AV IN ● Test signal : Colour bar ● Test point : TP420 TP401 (Trigger) ● Adjustment point : R418 ● Specification : 220 ± 5% ● Instrument : Oscilloscope 	1) Before connecting the QCNW-1214TAZZ JiG to connector P702, make sure all the jig's switches are at OFF position. 2) VCR ADJ MODE SW ON. 3) Connect the oscilloscope to TP420. 4) Feed the colour bar input signal. 5) Adjust TP420 to obtain the white portion of 220 ± 5% . (To be 100% between the sync tip and the white peak.) 6) Now check to see if the dark clip level is 100 ± 10% . 7) VCR ADJ MODE SW OFF. 
3. C-Comb filter adjustment ● Mode : VCR/AV IN ● Test signal : Colour bar ● Test point : TP461 TP401 (Trigger) ● Adjustment point : R4499 (PHASE) R4497 (GAIN) ● Specification : Minimum chroma level ● Instrument : Oscilloscope 	1) Before connecting the QCNW-1214TAZZ JiG to connector P702, make sure all the jig's switches are at OFF position. 2) VCR ADJ MODE SW ON. 3) Connect the oscilloscope to TP461. 4) Feed the colour bar input signal. 5) Measuring at TP461, adjust R4499, R4497 and R4499 again in that order so as to lower the residual chroma component to the minimum . (R4499 → R4497 → R4499) 6) VCR ADJ MODE SW OFF. 

Item	Adjustment procedure
4. $2f_L$ VCO adjustment ● Mode : VCR/AV IN ● Test signal : Colour bar ● Test point : TP463 ● Adjustment point : FL467 ● Specification : 2.5 ± 0.1V ● Instrument : VTVM 	1) Before connecting the QCNW-1214TAZZ JiG to connector P702, make sure all the jig's switches are at OFF position. 2) VCR ADJ MODE SW ON. 3) Connect the VTVM to TP463. 4) Feed the colour bar input signal. 5) Adjust core (FL467) so that $2f_L$ VCO voltage level be 2.5 ± 0.1V . 6) VCR ADJ MODE SW OFF.
5. PB Y level adjustment ● Mode : VCR/AV OUT (PB) ● Test signal : Alignment tape (Colour bar tape) ● Test point : TP4420 TP401 (Trigger) ● Adjustment point : R414 ● Specification : 2.0 ± 0.1 Vp-p ● Instrument : Oscilloscope	1) Connect the oscilloscope to TP4420. 2) Play back the alignment tape (JiGWR5-5CSP). 3) Adjust TP4420 so that the video output level be 2.0 ± 0.1Vp-p . 
6. Y FM carrier adjustment ● Mode : VCR/AV IN ● Test signal : No signal ● Test point : TP4320 ● Adjustment point : R431 ● Specification : 6.70 ± 0.05MHz ● Instrument : Frequency counter 	1) Before connecting the QCNW-1214TAZZ JiG to connector P702, make sure all the jig's switches are at OFF position. 2) VCR ADJ MODE SW ON. 3) Keep the video input terminal open. 4) Connect the frequency counter to TP4320. 5) Adjust R431 so that the frequency counter reading be 6.70 ± 0.05MHz . 6) VCR ADJ MODE SW OFF.

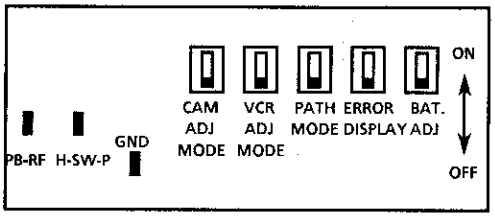
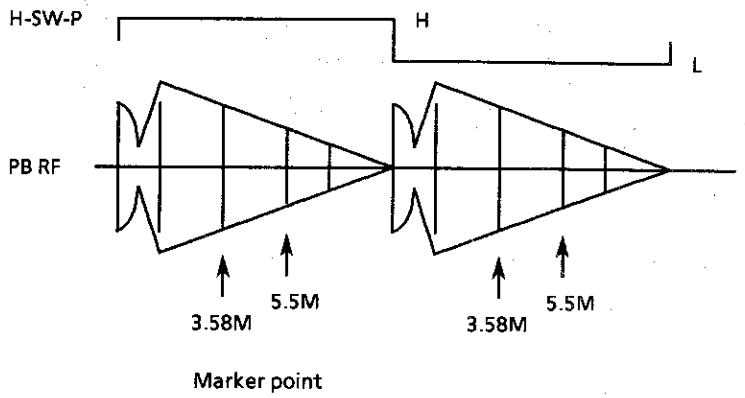
Item	Adjusting Procedure
7. Y FM signal deviation adjustment ● Mode : Self-REC/PB ● Test signal : Colour bar ● Tape : Self-recorded tape ● Test point : TP4420 TP401 (Trigger) ● Adjustment point : R430 ● Specification : 2.0 ± 0.1Vp-p ● Instrument : Oscilloscope  *1: SW ON *2: SW OFF	1) Before connecting the QCNW-1214TAZZ JiG to connector P702, make sure all the jig's switches are at OFF position. 2) First make sure the EE level and PB Y level are as specified. 3) Feed the colour bar input signal to make *1 self-recording and *2 playback. *1: at self-recording [VCR ADJ MODE] SW ON. *2: at playback [VCR ADJ MODE] SW OFF. 4) Connect the oscilloscope to TP4420. 5) Observe the *2 playback video signal level at TP4420. If the level is below 2.0Vp-p, turn R430 clockwise. If it is above 2.0Vp-p, turn R430 counterclockwise. Make *1 self-recording again. 6) Repeat the above step 4) until the *2 playback video signal level comes within [2.0 ± 0.1Vp-p], as shown below. 
8. REC Y level adjustment ● Mode : VCR/AV IN ● Test signal : Colour bar ● Test point : TP4321 TP401 (Trigger) ● Adjustment point : R4325 ● Specification : 280 ± 10mVp-p ● Instrument : Oscilloscope 	1) Before connecting the QCNW-1214TAZZ JiG to connector P702, make sure all the jig's switches are at OFF position. 2) [VCR ADJ MODE] SW ON. 3) Connect the oscilloscope to TP4321. 4) Feed the colour bar input signal. 5) Adjust TP4321 so that the FM Y level of sync tip portion be [280 ± 10mVp-p]. 6) [VCR ADJ MODE] SW OFF.  Sync. tip level

Item	Adjusting Procedure
9. REC C level adjustment ● Mode : VCR/AV IN ● Test signal : Colour bar ● Test point : TP4360 TP401 (Trigger) ● Adjustment point : R4364 ● Specification : 180 ± 5mVp-p ● Instrument : Oscilloscope	1) Before connecting the QCNW-1214TAZZ JiG to connector P702, make sure all the jig's switches are at OFF position. 2) VCR ADJ MODE SW ON. 3) Connect the oscilloscope to TP4360. 4) Feed the colour bar input signal. 5) Adjust TP4360 so that the red portion of the chroma level be 180 ± 5mVp-p . 6) VCR ADJ MODE SW OFF.

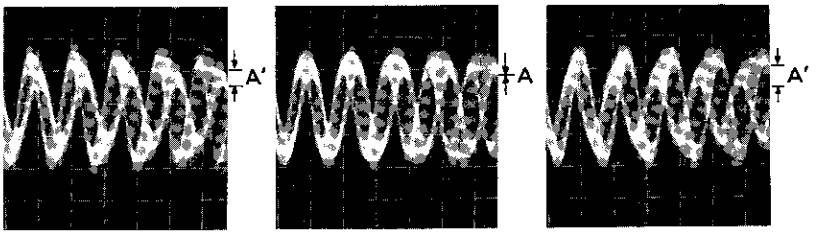




6-4. H/A CIRCUIT

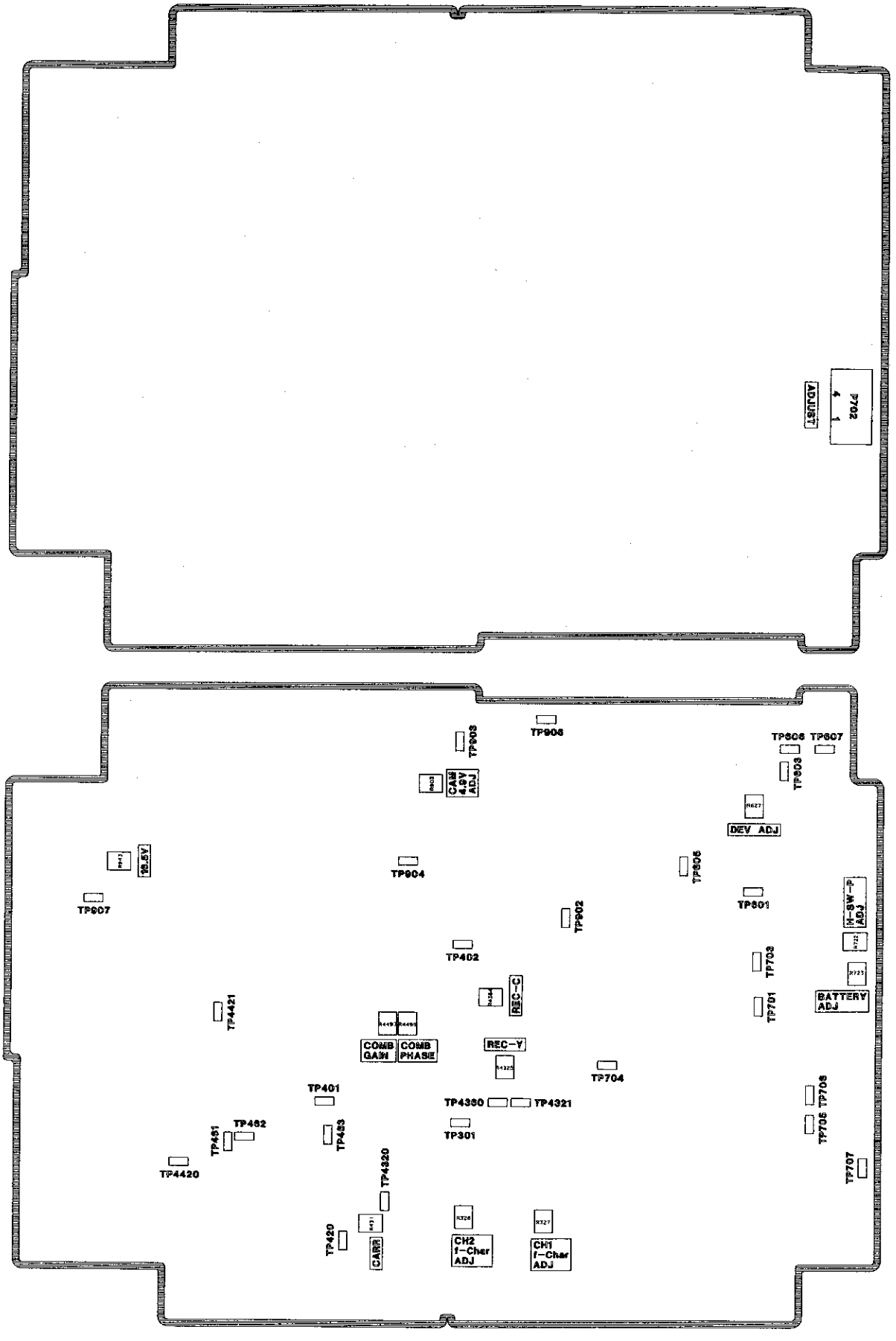
Item	Adjustment procedure
1. RF freq. – character adjustment ● Mode : VCR/AV OUT (PB) ● Test signal : Alignment tape (Locked sweep tape) ● Test point : PB RF of Jig (P702 ③ pin) H-SW-P (Trigger) (P702 ② pin) as shown below  ● Adjustment point : R327 (CH-1) R328 (CH-2) ● Specification : 3.58MHz : 5.5MHz = 4:3 ● Instrument : Oscilloscope	1) Before connecting the QCNW-1214TAZZ JiG to connector P702, make sure all the jig's switches are at OFF position. 2) Connect the oscilloscope to PB RF and H-SW-P of Jig. 3) Play back the alignment tape (JiGWR5-6C). 4) Adjust level rate so that 3.58MHz marker point VS. 5.5MHz marker point be 4:3 . CH-1 (High side of H-SW-P): R327 CH-2 (Low side of H-SW-P): R328  Marker point

6-5. AUDIO CIRCUIT

Item	Adjustment procedure
1. Filter adjustment ● Test point : TP601-TP606 ● Mode : Playback ● Adjusting point : R608 ● Specification : 0 ± 20mV ● Instrument : Oscilloscope ● Tape : JiGWR5-5CSP	1) Connect the oscilloscope between TP601 and TP606. 2) Play back the alignment tape and adjust R608 so that the potential difference (A or A' in the figure) of the inner wave's peak be 0 ± 20mV. See the figure below.  Incomplete adjustment 100mV, 0.5µsec/div. Optimum adjustment 100mV, 0.5µsec/div. Incomplete adjustment 100mV, 0.5µsec/div. Waveform at TP606 for filter adjustment
2. Playback level adjustment ● Test point : Audio output terminal ● Mode : Playback ● Adjusting point : R627 ● Specification : – 8dBs ± 0.5dB ● Instrument : VTVM ● Tape : JiGWR5-5CSP	1) Connect the VTVM to the audio output terminal. 2) Play back the alignment tape and adjust R627 so that the voltmeter reading be – 8dBs ± 0.5dB.

Location of test points and controls

● VCR PWB

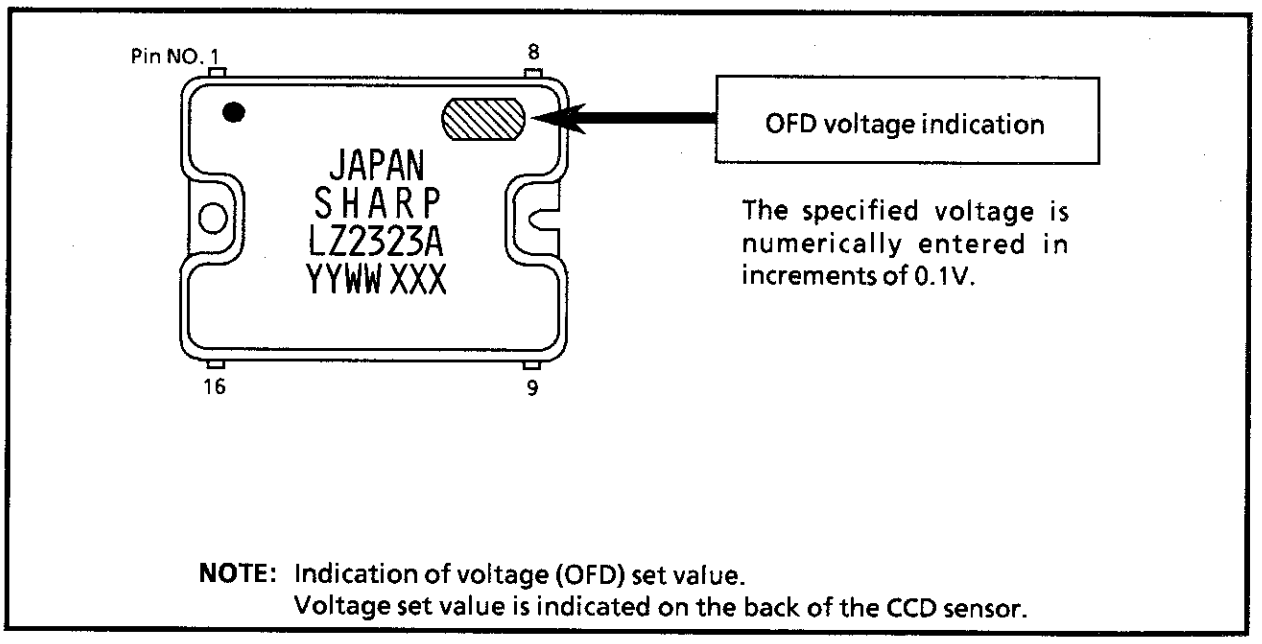


7. ADJUSTMENT OF CAMERA SECTION

7-1. ADJUSTMENT OF CAMERA UNIT

7-1-1. CCD SENSOR REPLACEMENT

- Before replacement
  1) The CCD image sensor is more susceptible to damage caused by static electricity than the C-MOS LSI. Therefore, the Electrostatic Damage Prevention Technique must be thoroughly carried out at replacement.
     - The soldering iron must be grounded.
     - Your 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 attached to the board.
  2) Be careful not to stain, soil, or scar the surface of the glass or optical filter of the CCD sensor. If it is soiled by fingerprints or dust, wipe it off with silicon paper or a clean chamois.
  3) When replacing the CCD sensor, use the grounded soldering iron and do the soldering within a very short period of time.
  4) Before installing the CCD sensor, read the indicated value of OFD voltage shown on the back of the CCD sensor and write it down. As for OFD voltage adjustment, see item 1 of the adjustment procedure.



NOTE: Indication of voltage (OFD) set value.
Voltage set value is indicated on the back of the CCD sensor.

7-1-2. 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

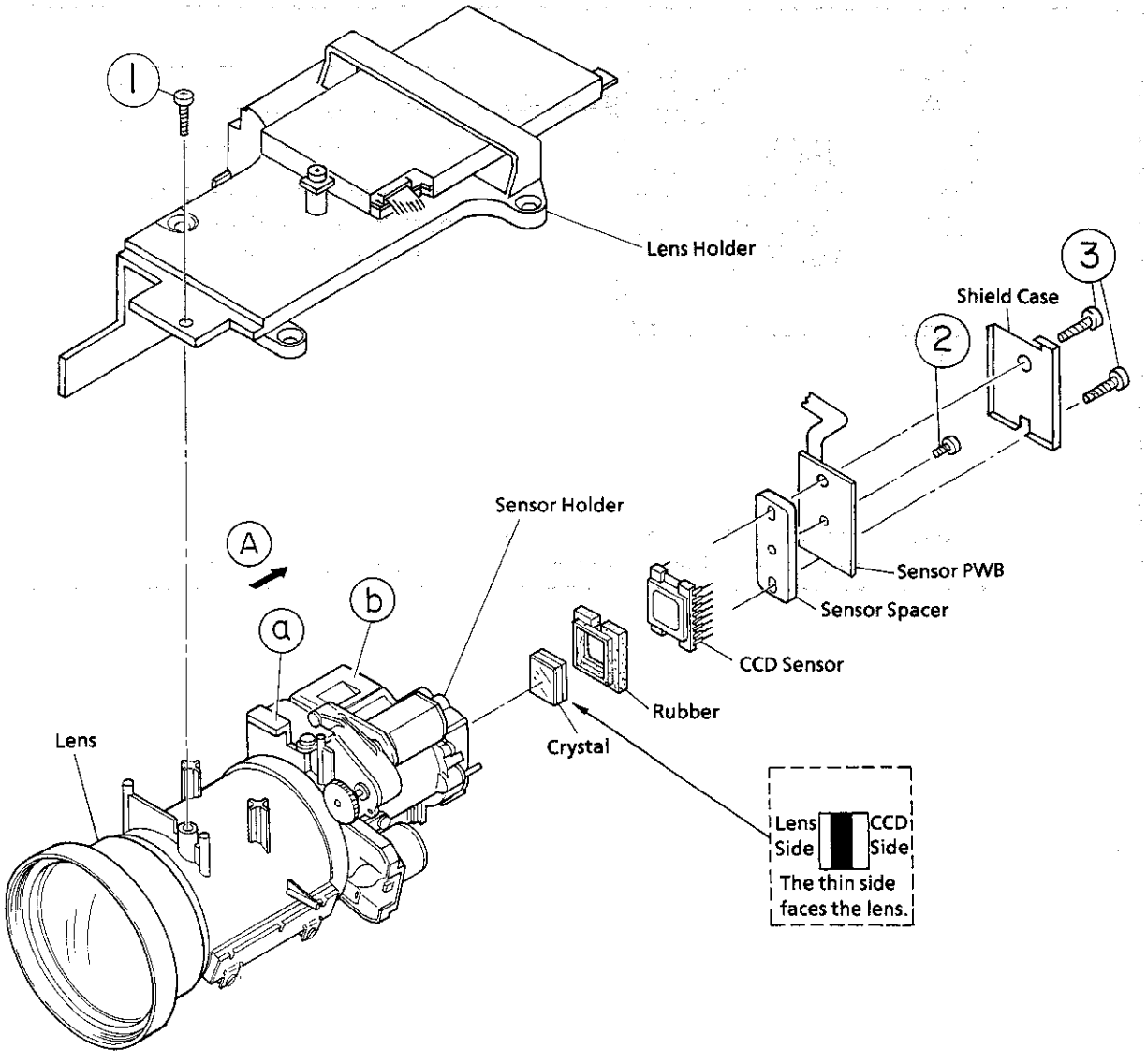
1. Unsolder the shield case off the sensor PWB.
2. Unsolder the CCD sensor off the sensor PWB.
3. Unscrew the screw ② to remove the sensor PWB.
4. Unscrew the two screws ③ to remove the sensor spacer, and then the CCD sensor.

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 sensor holder. Place the crystal in such a way that its thin side faces the lens.
2. Insert the CCD sensor into the sensor holder (along the sensor holder's guide pin).
   Note:
   Insert the CCD sensor in the correct direction.
3. Mount the sensor spacer to the lens with the two screws ③.
   Note:
   Place the sensor spacer 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.
6. Solder the shield case with the sensor PWB.

Notes:

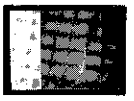
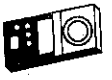
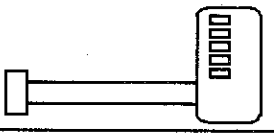
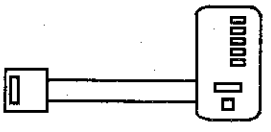
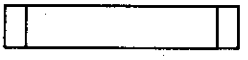
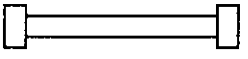
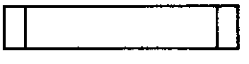
- When handling the lens unit, take care not to touch the part ⓑ and not to remove the screw fixing the part ⓑ.
- The CCD sensor is not resistant to static electricity; avoid working places exposed to static electricity.
- When mounting the CCD sensor, take care not to let dust or any other foreign matter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



7-1-3. ADJUSTING THE CAMERA UNIT

1) Image objects, instruments, and jigs needed for the adjustment

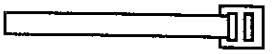
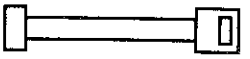
Note: N indicates the new jigs.

No.	Jig Item	Parts Code	Price Code	Configuration	Note
1	Gray Scale Chart (390 x 520mm)	JiGCHART-1	CP		
2	Colour Bar Chart (240 x 320mm)	JiGCHART-4	**		
3	Illuminometer (0~3000Lux)	JiGMETER-1	CT		
4	Colour Thermometer (1600~400000K)	JiGMETER-2	**		
5	Colour Temperature Conversion Filter (3200K → 6800K) (See note.)	JiGHOYA-LB165	BH		
6	Adjustment Switch Board (Connected to VCR (P702))	QCNW-1214TAZZ	BD		N
7	Camera Adjustment Board (Connected to CAMERA ADJ (SC202))	QCNW-1213TAZZ	BD		N
8	Extension Cable (Connected to Lens FPC ↔ SC1501)	QCNW-1215TAZZ	AY		N
9	Extension Cable (Connected to Camera (SC201) ↔ VCR (SC701))	QCNW-1217TAZZ	AL		N
10	Extension Wire (Connected to ZOOM SW↔ P501) (See note.)	QCNW-1216TAZZ	AH		N
11	Extension Cable (Connected to CCD Board↔ SC1) (See note.)	QCNW-1224TAZZ	AH		N

Note: ① Colour temperature convertion filter (jig item No. 5) may be obtained from HOYA Optics in your local market.

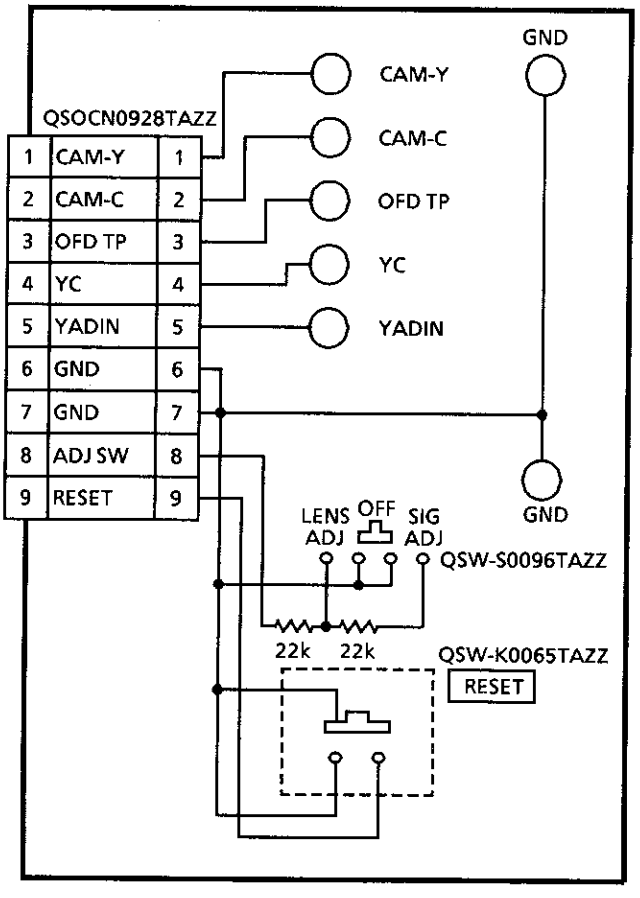
② Jig Nos. 10 and 11 are to be used for extension work at the time of troubleshooting; leave them unused when making regular adjustments.

Note: N indicates the new jigs.

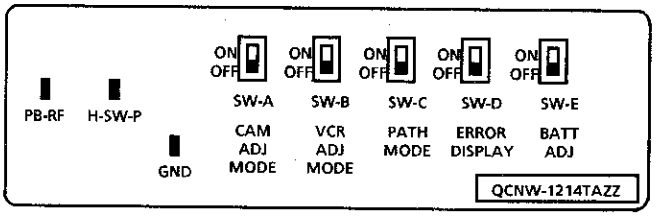
No.	Jig Item	Part Code	Price Code	Configuration	Note
12	Extension Cable (Connected to Camera Operation ↔ VCR (SC702))	QCNW-1218TAZZ	AH		N
13	Extension Cable (Connected to V/F FPC ↔ VCR (SC4401))	QCNW-1221TAZZ	AW		N
14	Extension Wire (Connected to Battery Terminal ↔ VCR (P901))	QCNW-1225TAZZ	AR		N
15	Others ● Oscilloscope ● Vector scope ● Digital voltmeter ● Colour video monitor ● Halogen light, 2 pcs. ● AC adapter ● RCA pin output cable	—	—	—	—

2) Adjustment PWB Unit

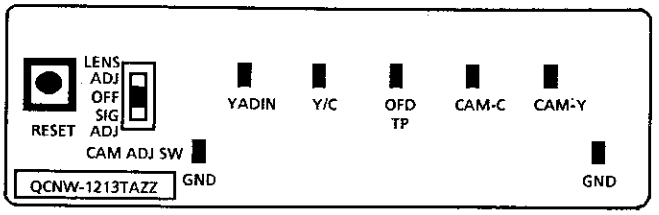
CAMERA ADJUSTMENT BOARD
(QCNW-1213TAZZ)



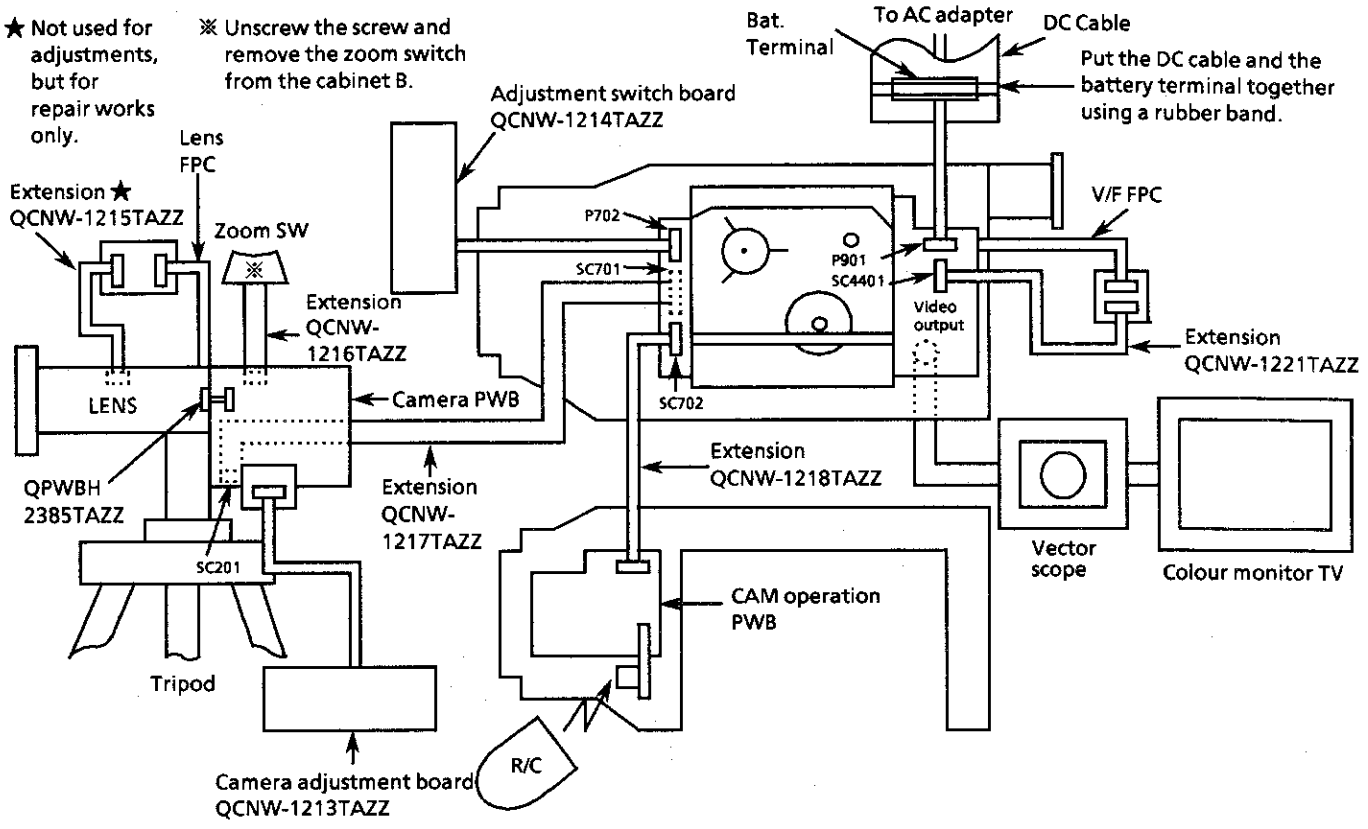
Jig ①: QCNW-1214TAZZ



Jig ①: QCNW-1213TAZZ

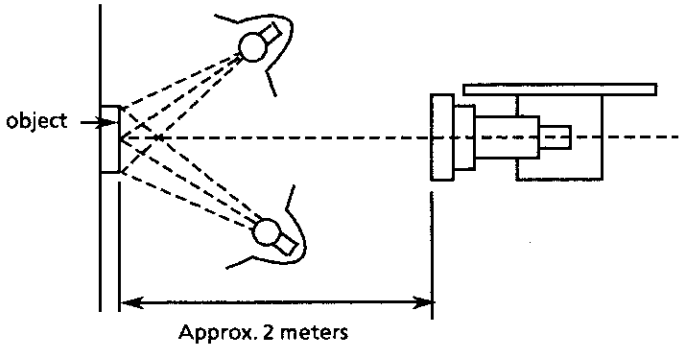


3) Basic connection at camera adjustment



4) Preparations and items to be checked before adjustment

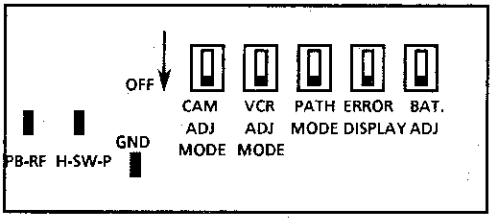
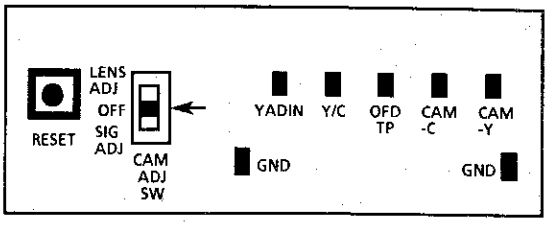
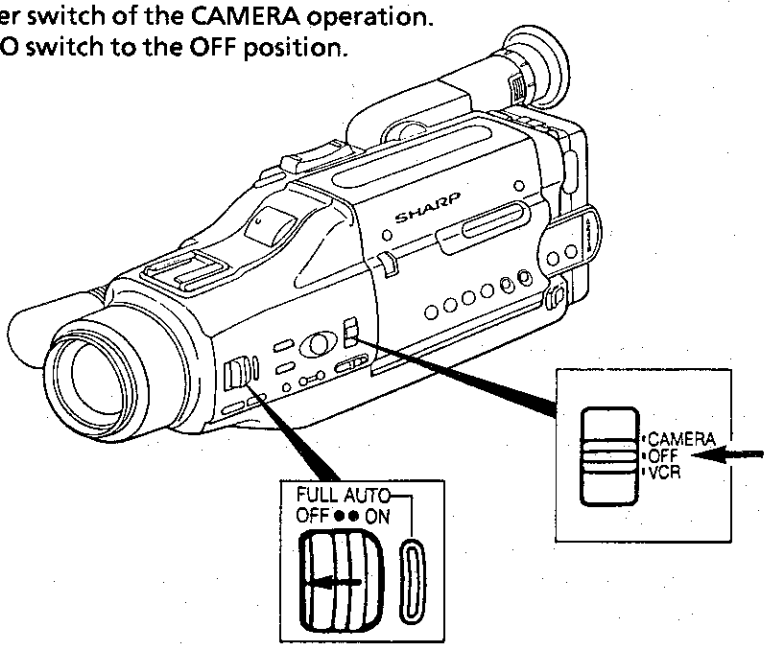
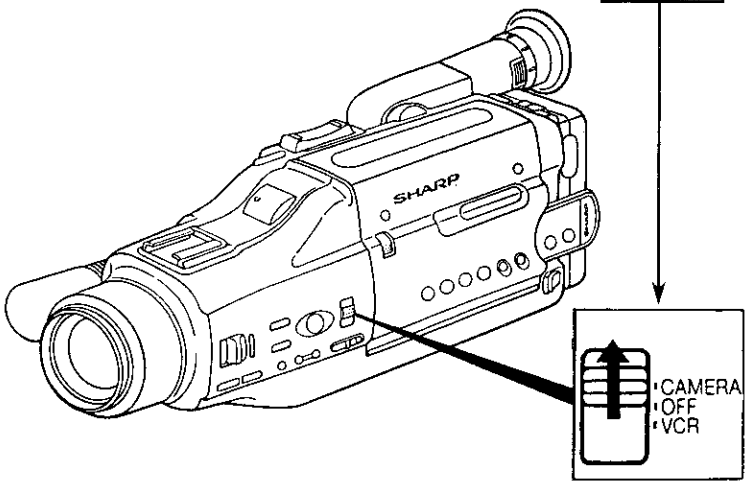
1. Illumination
   Adjust the illuminance so that the entire pattern surface is uniformly exposed to an illumination of some 3000 lux. (It is therefore desirable to use two or more light sources.)
   Colour temperature: 3200K
2. Use a new test pattern that is not stained or faded.
3. In case any electric circuit is found to be defective, be sure to repair or replace it before starting the adjustment. Never touch any adjusting controls or adjustment data without first correcting a problem.
4. The camera unit uses microcomputers to adjust the main camera signal system and the lens system. For microcomputer mode setting, the jig QCNW-1213TAZZ is connected to the SC202 connector (CAMERA ADJ.) of the camera PWB, and QCNW-1214TAZZ to the P702 connector of the VCR PWB. Each mode is selected by an applicable switch setting.



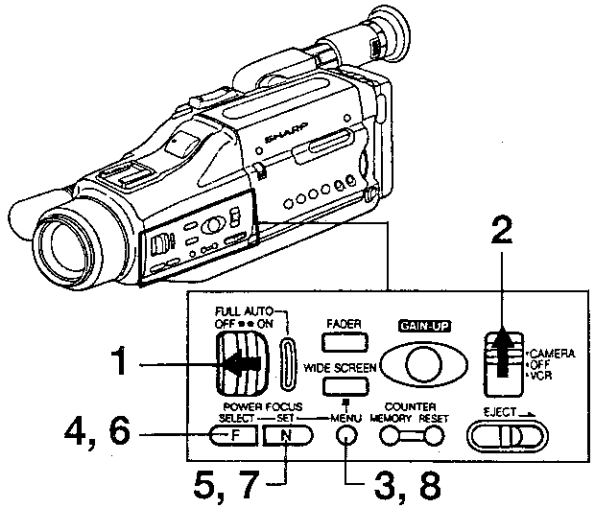
7-1-4. ADJUSTING THE CAMERA SIGNAL SYSTEM

1) Mode selection

To select the camera signal system adjusting mode, follow these steps:

No.	Procedure
1	Turn off all the slide switches on jigs ① and ② before connecting these jigs to the main PCB.  JIG① (QCNW-1214TAZZ)  JIG② (QCNW-1213TAZZ)
2	Turn off the power switch of the CAMERA operation. Set the FULL AUTO switch to the OFF position. 
3	Set the power switch on the CAMERA operation unit to the CAMERA position. 

No.	Procedure
4	By using the MENU SYSTEM, select the manual focus mode. (The menu system lets you set the camcorder's various operating functions by using the menu in the viewfinder.) (1) Set the FULL AUTO switch to OFF. (2) Select Camera mode with the CAMERA/VCR select switch. 3. Press the MENU button. (The menu display appears in the viewfinder.) 4. Press the SELECT button to move the " ▶ " to the "FOCUS". 5. Press the SET button. The "FOCUS" begins flashing. 6. Press the SELECT button to select the "MANUAL" mode. The mode display of the menu item with " ▶" mark will change each time the SELECT button is pressed. 7. Press the SET button. 8. Press the MENU button once again. (The menu display will disappear.)



3, 4

MENU

- FOCU AUTO
- H.S. SHUTTER NORMAL
- W.BALANCE AUTO
- DATE/TIME DISPLAY DATE + TIME
- DATE/TIME SETTING

5

MENU

- FOCUS ≥AUTO≤
- H.S. SHUTTER NORMAL
- W.BALANCE AUTO
- DATE/TIME DISPLAY DATE + TIME
- DATE/TIME SETTING

6, 7

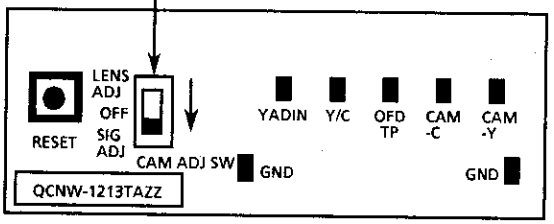
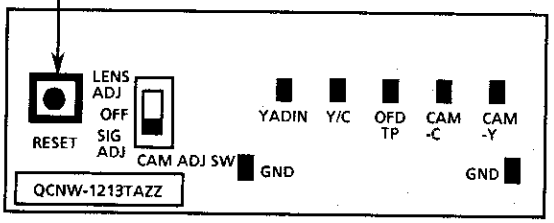
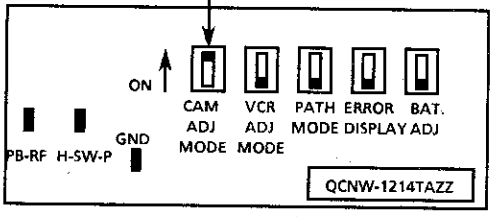
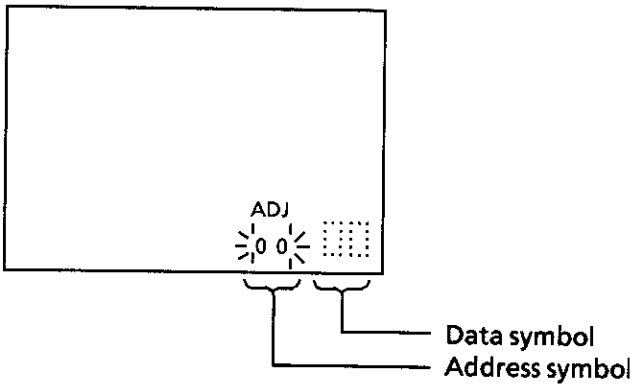
MENU

- FOCUS MANUAL
- H.S. SHUTTER NORMAL
- W.BALANCE AUTO
- DATE/TIME DISPLAY DATE + TIME
- DATE/TIME SETTING

8

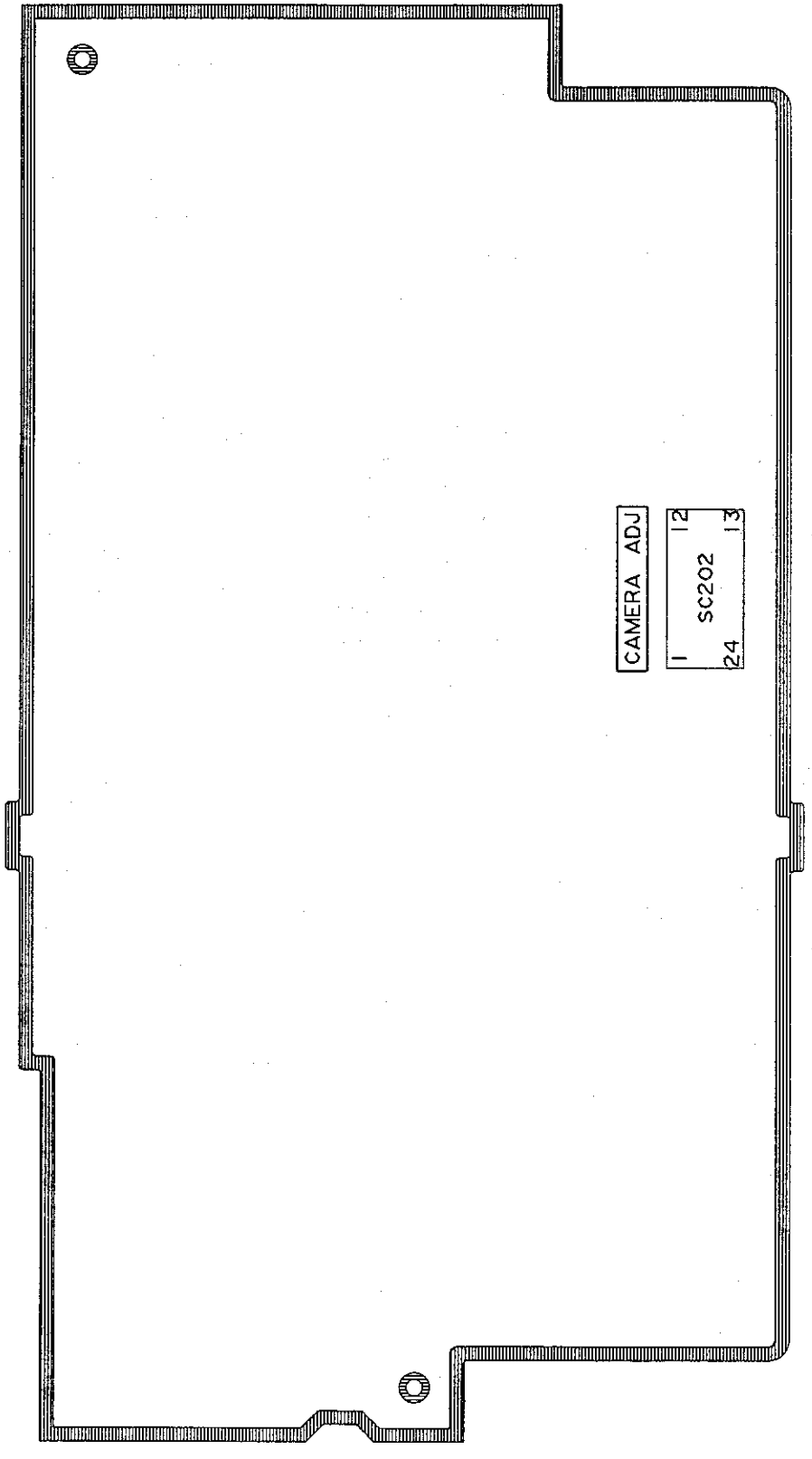
MANUAL FOCUS

Then bring an object into fucus.

No.	Procedure
5	Set the CAM ADJ SW switch on jig ② to the SIG ADJ position. 
6	Press the RESET switch on jig ②.  White balance is changed from automatic to fixed (indoor 3200K) for waveform adjustments.
7	Set the CAM ADJ MODE switch on jig ① to the ON position.  * Camera signal circuit adjustment mode is called up. Symbols appear at the lower right of the monitor screen.  * Once the adjustment mode is set up, make the adjustment given in subsection 7-1-4. 4).

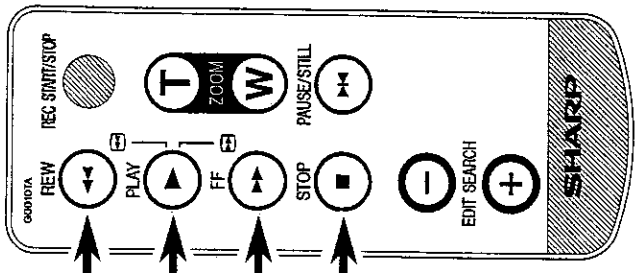
2) Location of test points and connectors

- CAMERA PWB



3) VCR operation key functions for camera signal adjustment

REMOTE CONTROL

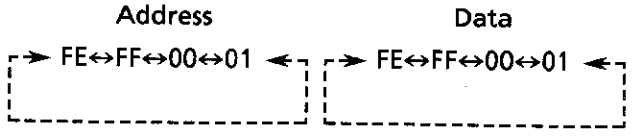


REMOTE CONTROL KEY	REW	PLAY	FF	STOP
Function	Address and data change.	Reading data from a specified address and writing data to a specified address.	Address and data change.	Initialize the display.
Operation	Decrements address or data.	Data is read by pressing this key while the address is blinking. Data is written by pressing this key while the data is blinking.	Increments address or data.	Press this key while either the address or data is blinking.

No.	Adjusting Step	Display in Monitor Screen and Viewfinder (The symbol ≻ ≺ is blinking.)
1	By operating the FF or REW key, select 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 or REW key, select the data and then make the adjustment if necessary. (When the data is changed, 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 at Step 2 or 4, the mode goes back to Step 1 where an item (address) to be adjusted is selectable.	ADJ ≻00≺

Notes:

- When the FF or REW key is pressed and held for longer than 0.3 second, the data display changes repeatedly.
- When the FF or REW key is pressed and held for longer than 2 seconds while setting the data, the display changes rapidly.
- Addresses and data are displayed in hexadecimal 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 viewfinder.)

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

Address	Adjustment Item	Address	Adjustment Item	Address	Adjustment Item
7B	OFD H	3F	AGC CB	53	R-Y G
7C	OFD L	(71)	IRIS H	54	B-Y G
FE	AE MANUAL ADJ	75	SET UP	56	R-Y MAT
79	SYNC	CB	IRIS AE	57	B-Y MAT
0E	CB 1	F7	AGC	4F	OUT DOOR R
0F	CB 2	59	BURST	55	OUT DOOR B
(7D)	GAIN SEL	50	R GAIN		
(7E)	AGC GAIN	51	B GAIN		

Notes:

- Do not rewrite any data other than the data at one of the above addresses.
- In adjusting mode, avoid touching any keys other than adjustment-related keys whenever possible.
  If the function for reading and rewriting the adjustment data becomes disabled, cancel the adjusting mode, and then return to the adjusting mode by following Procedure 1) Mode selection in section 7-1-4. ADJUSTING THE CAMERA SIGNAL SYSTEM.
- When the EEPROM (IC502) or camera microcomputer (IC501) has been replaced, write the preset data to the addresses, as shown in the table below. If the preset data is not properly written, the Auto white balance adjustment will be impossible or the leading-in of the Auto white balance will be imperfect.

EEPROM ADDRESS MAP

(Listed below is the initial data entry.)

ADR	CONTENTS	DATA AREA	DATA
00	Y γ	00~FE	25
01	ditto	00~FE	3B
02	ditto	00~FE	CC
03	ditto	00~FE	90
04	ditto	00~FE	B8
05	ditto	00~FE	9A
06	ditto	00~FE	40
07	ditto	00~FE	0E
08	ditto	00~FE	28
09	ditto	00~FE	5B
0A	ditto	00~FE	BF
0B	YDTL V GIN	00~07	03
0C	YDTL D GIN	00~07	07
0D	YDTL CLPL	00~3F	06
0E	L CLP 0B1	00~7F	03
0F	L CLP 0B2	00~7F	03
10	YFAD GAIN	00~3F	30
11	YFAD LEVEL	00~FE	00
12	RS-232C OUTPUT SELECT	FF	FF
13	YENC STUP	00~7F	42

ADR	CONTENTS	DATA AREA	DATA
14	YENC YBLK	00~7F	46
15	YNEE CMPA D8 (UPPER 1 BIT)	00, 01	00
16	YNEE CMPB D8 (UPPER 1 BIT)	00, 01	00
17	YNEE CMPC D8 (UPPER 1 BIT)	00, 01	00
18	YNEE CMPD D8 (UPPER 1 BIT)	00, 01	01
19	DIG AUTO LSI SET DATA I0	00~FE	DA
1A	DIG AUTO LSI SET DATA I1	00~FE	26
1B	DIG AUTO LSI SET DATA I2	00~FE	DA
1C	DIG AUTO LSI SET DATA I3	00~FE	26
1D	DIG AUTO LSI SET DATA Q0	00~FE	FB
1E	DIG AUTO LSI SET DATA Q1	00~FE	06
1F	DIG AUTO LSI SET DATA Q2	00~FE	FB

ADR	CONTENTS	DATA AREA	DATA
20	DIG AUTO LSI SET DATA Q3	00~FE	06
21	DIG AUTO LSI SET DATA IQ	00~FE	FE
22	REFERENCE I (INDOOR ADJ)	00~FF	FF
23	ditto	00~FF	FF
24	REFERENCE Q (INDOOR ADJ)	00~FF	FF
25	ditto	00~FF	FF
26	AWB RUN SPEED 1	00~FE	01
27	AWB RUN SPEED 2	00~FE	01
28	AWB RUN SPEED 3	00~FE	04
29	AWB RUN SPEED 4	00~FE	10
2A	OUTDOOR 5600K OFFSET R	00~FE	FE
2B	OUTDOOR 5600K OFFSET B	00~FE	01
2C	HI COLOUR TEMP COMPEN B	00~FE	02
2D	HI COLOUR TEMP COMPEN R	00~FE	FC
2E	F2 (FLUORESCENT) SHIFT	00~FE	04
2F	F3 (OUTDOOR) SHIFT	00~FE	0F
30	IRIS OPEN LEVEL for FUZZY	00~FE	50
31	IRIS CLOSE LEVEL for FUZZY	00~FE	80
32	SLOW COUNTER SET AFTER W/B OK	00~FE	10
33	FOR CONDITION DETECT	00~FE	30
34	I DIR. ALLOW LEVEL	00~FE	0A
35	Q DIR. ALLOW LEVEL	00~FE	07
36	I DIR. RESTART LEVEL	00~FE	14
37	Q DIR. RESTART LEVEL	00~FE	18
38		FF	FF
39		FF	FF
3A		FF	FF
3B		FF	FF
3C	COLOUR SUPPRESS START POINT	00~FE	F0
3D	COLOUR SUPPRESS END POINT	00~FE	F7

ADR	CONTENTS	DATA AREA	DATA
3E	COLOUR SUPPRESS MIN LEVEL	00~3F	2A
3F	CARRIER BAL COMPEN AT MAX AGC	00~FF	FF
40	C Y	00~FE	14
41	ditto	00~FE	30
42	ditto	00~FE	72
43	ditto	00~FE	C8
44	ditto	00~FE	86
45	ditto	00~FE	9B
46	ditto	00~FE	40
47	ditto	00~7F	05
48	ditto	00~7F	0E
49	ditto	00~7F	27
4A	ditto	00~7F	5F
4B		FF	FF
4C	(kR)	00~3F	1A
4D	(kB)	00~3F	17
4E	(kG)	00~3F	1E
4F	OUTDOOR W/B R	00~FE	35
50	INDOOR W/B R, (gR)	00~FE	28
51	INDOOR W/B B, (gB)	00~FE	48
52	(gG)	00~FE	25
53	(gR-Y)	00~3F	34
54	(gB-Y)	00~3F	1C
55	OUTDOOR W/B B	00~FE	2C
56	CMAT RYG	00~3F	0C
57	CMAT BYG	00~3F	28
58	CFAD GAIN	00~3F	3F
59	BFMX LEVEL	00~7F	18
5A	CSUP HLGK	00~FE	FE
5B	CSUP EGGK	00~FE	FE
5C	MODE CTL1	B2	
5D	MODE CTL 2	0C	
5E	MODE CTL 3	24	
5F	HI COLOUR TEMP RYG OFFSET	00~3F	06
60	TEST DAT 1	00	00
61	TEST DAT 2	00	00
62	TEST DAT 3	00	00
63	TEST DAT 4	00	00
64	TEST DAT 5	00	00

ADR	CONTENTS	DATA AREA	DATA
65	CSUP EGGK MAX	00~FE	FE
66	CSUP COMPEN START ZOOM POWER	00~0C	03
67	CSUP COMPEN START IRIS LEVEL	00~FE	00
68	MIN APERTURE AT LOW LIGHT	00~07	00
69	HI COLOUR TEMP BYG OFFSET	00~3F	02
6A	PEDESTAL CONTROL (MAX)	00~FE	13
6B	ENCODER SETUP CTL MAX	00~7F	45
6C	AVE BRIGHT AT LO-LIGHT FLAG ON	00~FE	0C
6D	AVE BRIGHT AT LO-LIGHT FLAG OFF	00~FE	2A
6E	GAIN UP ON-OFF HYSTERESIS WIDTH	00~FE	10
6F	GAIN AT SEL STEP 1	00~FE	12
70	GAIN SEL MAX/MIN	00~FE	40
71	IRIS H	00~FE	60
72	IRIS L	00~FE	00
73	IRIS OFFSET	00~FE	80
74	HALL OFFSET	00~FE	80
75	PED CTL	00~FE	4F
76		FF	FF
77		FF	FF
78		FF	FF
79	Y GAIN	00~FE	90
7A	ZOOM OFFSET	00~FE	A0
7B	OFD H	00~FE	90
7C	OFD L	00~FE	C0
7D	H GAIN SEL	00~FE	20
7E	H AGC GAIN	00~FE	25
7F	H PULSE SEL	00~FE	00
80	LENGTH TO SHIELD CENT EDGE 1	00~FE	00

ADR	CONTENTS	DATA AREA	DATA
81	LENGTH TO SHIELD CENT EDGE 1	00~FE	46
82	LENGTH TO SHIELD CENT EDGE 2	00~FE	00
83	ditto	00~FE	55
84	LENGTH TO SHIELD NEAR EDGE	00~FE	00
85	ditto	00~FE	9B
86	SHIELD CENTER WIDTH	00~FE	00
87	ditto	00~FE	0F
88	WIDE END ∞ POS	00~FE	00
89	ditto	00~FE	50
8A	HI-FREQ AF NOISE (AGC CUT)	00~FE	00
8B	ditto	00~FE	20
8C	LO-FREQ AF NOISE (AGC CUT)	00~FE	00
8D	ditto	00~FE	10
8E	NAR-ANGLE AF NOISE (AGC CUT)	00~FE	00
8F	ditto	00~FE	03
90	HI-FREQ AF NOISE (AGC MAX)	00~FE	00
91	ditto	00~FE	79
92	LO-FREQ AF NOISE (AGC MAX)	00~FE	00
93	ditto	00~FE	6A
94	NAR-ANGLE AF NOISE (AGC MAX)	00~FE	00
95	ditto	00~FE	0D
96	HI- AND LO-FREQ PEAK NOISE THRESHOLD	00~FE	18
97	MI-FREQ PEAK NOISE THRESHOLD	00~FE	10
98	TELE END MAIN ZOOM A/D	00~FE	F0
99	75% MAIN ZOOM A/D	00~FE	A9
9A	WIDE END MAIN ZOOM A/D	00~FE	0E
9B	75%-TELE END SUB-ZOOM A/D MAX	00~FE	AC
9C	75%-TELE END SUB-ZOOM A/D MIN	00~FE	20
9D	OVER-∞, OVER-NEAR STEPS	00~FE	04

ADR	CONTENTS	DATA AREA	DATA
9E	MACRO MOVABLE LIMIT (RATIO)	00~FE	52
9F	01···LENS ADJUSTED	00~FE	00
A0	OPTICAL VARIATIONS	00~FE	05
A1	WIDE INF ALLOW BOT LIMIT	00~FE	14
A2	WIDE INF ALLOW TOP LIMIT	00~FE	14
A3	AF DATA SAMPLE FREQ SW	00~FE	A2
A4	ZOOM POS ADV READ AT T→W	00~FE	06
A5	A/D READ INTERVAL AT ZOOM END DETECT	00~FE	09
A6	ZOOM T THRESHOLD RATIO (%)	00~FE	48
A7	ZOOM/FOCUS/SHIFT TARGET	00~FE	00
A8	ZOOM SPEED (0-3) AT LENS ADJUST	00~FE	03
A9	WIDE ∞ POS ADJUST SEL	00~FE	00
AA	HI-FREQ PEAK THRESHOLD MIN	00~FE	04
AB	VAR THRESHOLD MIN	00~FE	20
AC	VAR THRESHOLD MAX	00~FE	60
AD	AVE COEFF MIN	00~FE	80
AE	AVE COEFF MAX	00~FE	40
AF	SEL TYPE	00~FE	01
B0	AF ACTION PARAMETER FLAG	00~FE	03
B1		01	01
B2	VAR DETECT THRESHOLD (UPPER)	00~FE	00
B3	VAR DETECT THRESHOLD (LOWER)	00~FE	10
B4		00~FE	00
B5		00~FE	00
B6		00~FE	00
B7		00~FE	00
B8		00~FE	00
B9		00~FE	00
BA		00~FE	00
BB	IRIS CLOSE ADJ PARAMETER	00~FE	20

ADR	CONTENTS	DATA AREA	DATA
BC		00~FE	68
BD		00~FE	00
BE		00~FE	00
BF		00~FE	00
C0		00~FE	00
C1		00~FE	00
C2	AGC GAIN MAX AT NORMAL	00~FE	99
C3	AGC GAIN MAX AT GAIN-UP	00~FE	9C
C4	NEURO COMPEN (TELE) DEAD ZONE	00~FE	08
C5	NEURO COMPEN (TELE) MAX	00~FE	20
C6	NEURO COMPEN (TELE) LIMITER FUN GAIN	00~FE	04
C7	REF BRIGHT DOWN GAIN	00~FE	01
C8	0-OFF 1-ON	00~FE	00
C9	0-OFF 1-ON	00~FE	01
CA	0-OFF 1-ON	00~FE	02
CB	AE DATA CONV GAIN	00~FE	53
CC	REF BRIGHT DATA	00~FE	36
CD	REF BRIGHT DOWN POINT	00~FE	80
CE	AVE BRIGHT TO NOISE LEVEL	00~FE	18
CF	FLICKER DOWN GAIN (MAX $08)	00~FE	04
D0	LOAD BALANCE COEFF	00~FE	59
D1	ditto	00~FE	01
D2	LOAD AVE/MAX BRIGHT RATIO	00~FE	39
D3	NEURO COMPEN (WIDE) DEAD ZONE	00~FE	0E
D4	NEURO COMPEN (WIDE) MAX	00~FE	18
D5	NEURO COMPEN (WIDE) LIMITER FUN GAIN	00~FE	01
D6	FEEDBACK GAIN CTL PARAMETER	00~FE	0C
D7	ditto	00~FE	10
D8	ditto	00~FE	30
D9	ditto	00~FE	02

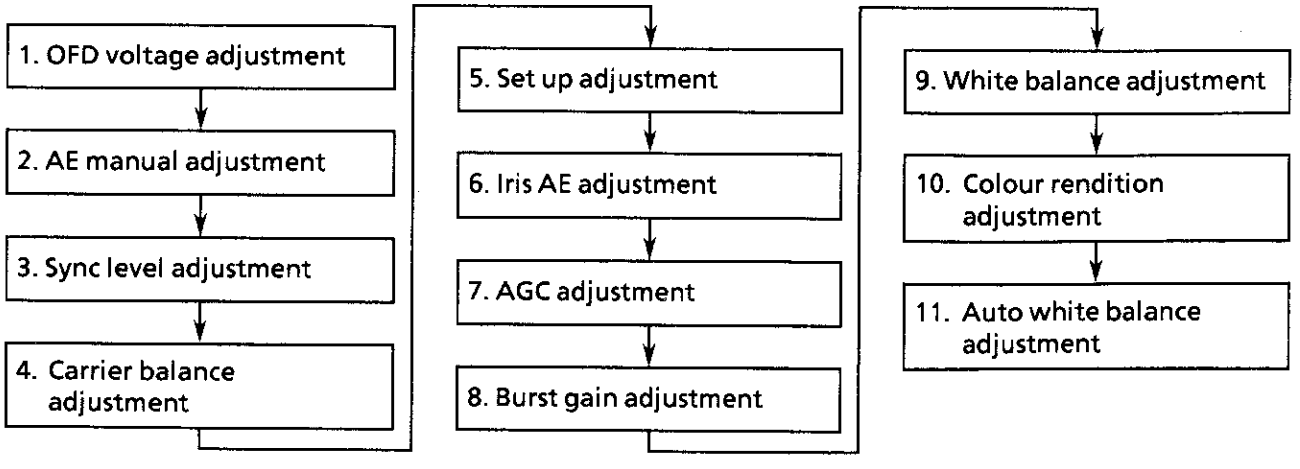
ADR	CONTENTS	DATA AREA	DATA
DA	FEEDBACK GAIN CTL PARAMETER	00~FE	04
DB	ditto	00~FE	06
DC	BRIGHT SUPPRESS THRESHOLD	00~FE	80
DD	BRIGHT SUPPRESS COEFF	00~FE	FE
DE	0-OFF 1-ON	00~FE	00
DF	PEAK CONV PARAMETER	00~FE	02
E0	LO-LEVEL ACCENT COEFF	00~FE	06
E1	ditto	00~FE	0A
E2	ditto	00~FE	18
E3	ditto	00~FE	26
E4	ditto	00~FE	30
E5	ditto	00~FE	30
E6	ditto	00~FE	2C
E7	ditto	00~FE	26
E8	EXPOSURE CTL/IRIS FUN	00~FE	00
E9	ditto	00~FE	38
EA	ditto	00~FE	78
EB	ditto	00~FE	A8
EC	ditto	00~FE	D0

ADR	CONTENTS	DATA AREA	DATA
ED	ditto	00~FE	FE
EE	EXPOSURE CTL/IRIS FUN	00~FE	BE
EF	ditto	00~FE	B1
F0	ditto	00~FE	A3
F1	ditto	00~FE	78
F2	ditto	00~FE	18
F3	ditto	00~FE	18
F4	EXPOSURE CTL/AGC FUN	00~FE	D0
F5	ditto	00~FE	F0
F6	ditto	00~FF	FF
F7	ditto	00~FE	21
F8	ditto	00~FE	B8
F9	ditto	00~FF	FF
FA	IRS1 SET PARAMETER	00~FE	F3
FB	IRS2 SET PARAMETER	00~FE	CE
FC	IRS3 SET PARAMETER	00~FE	A3
FD	AGC2 SET PARAMETER	00~FE	A0
FE	AE MANUAL ADJ READ/WRITE	00~FF	FF
FF	LENS MANUAL ADJ READ/WRITE	00~FF	FF

1. If the DATA is FF, initial input is contained in the microcomputer.
2. Do not make any change, unless otherwise specified, except for the adjusting points and designated addresses.
   If any of the data has been mistakenly modified, the right data (numerical values in the map) should be reentered.

4) Camera unit adjusting procedure

This adjusting procedure shows the steps for thoroughly conducting all the adjustments required after CCD replacement or for any other reason. There are therefore some steps that may be skipped, depending on the specific needs for servicing or adjustment.



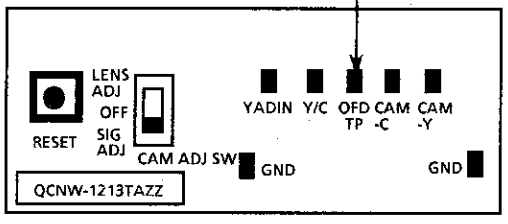
ADJUSTMENT PROCEDURE

In the descriptions that follow, the jig QCNW-1214TAZZ is abbreviated as Jig ① and, the jig QCNW-1213TAZZ as Jig ②.

Item	Adjusting Procedure
1. OFD voltage adjustment	

CAUTION: This adjustment should be done only when the CCD sensor has been replaced or when the OFD voltage circuit has been serviced. There is no need to do this adjustment under any other circumstances.
Follow these steps if the OFD voltage circuit has been repaired.
Disconnect the sensor PWB from the CCD sensor, note the OFD voltage specified on the back of the CCD sensor, reconnect the sensor PWB to the CCD sensor, and readjust the OFD voltage as follows.

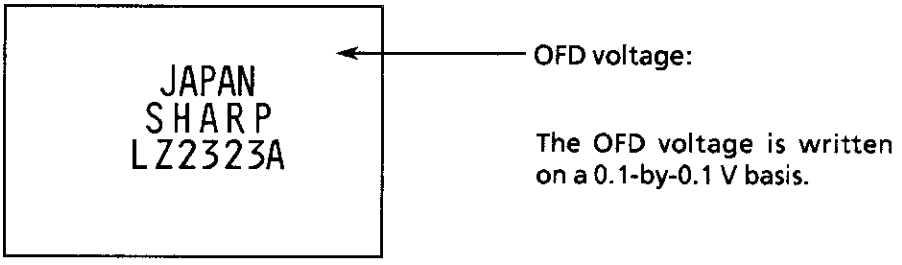
- Measuring terminal: OFD TP of Jig ②

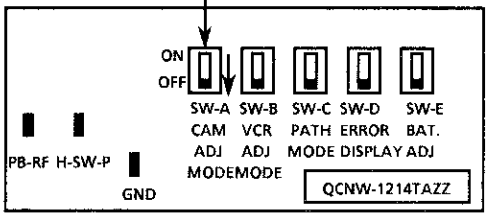
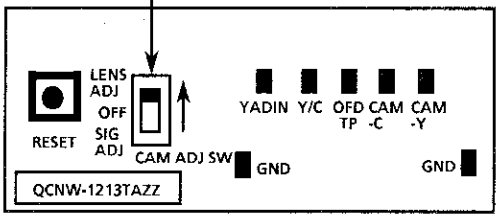
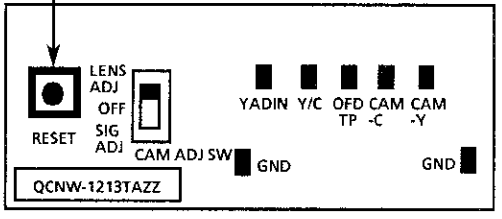
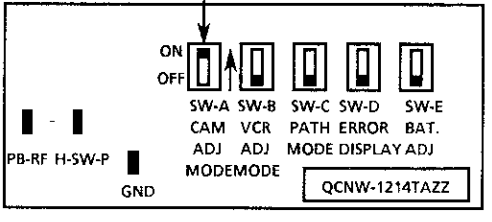


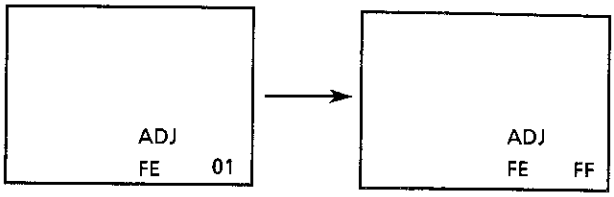
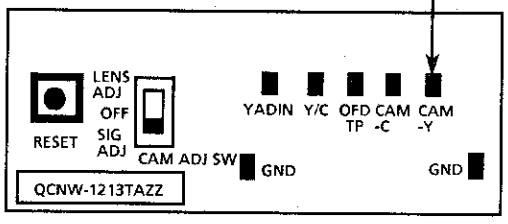
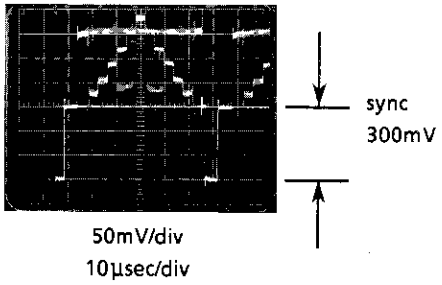
- Adjustment Address: 7B (OFD H), 7C (OFD L)
- Adjustment data area: 00~FE
- Measuring instrument: Digital voltmeter

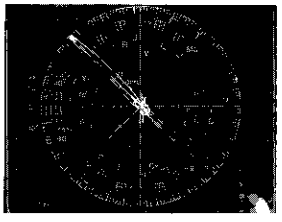
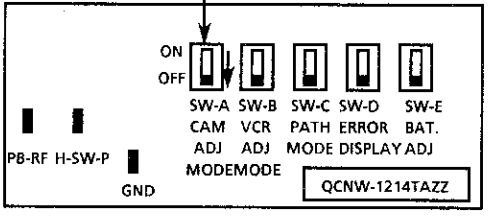
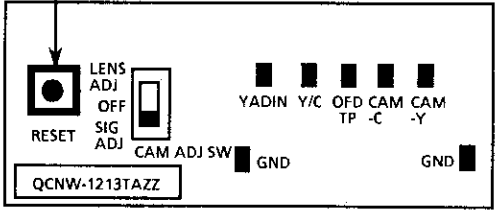
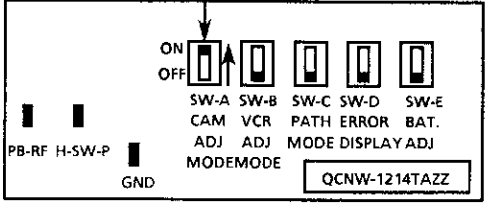
Measure the voltage at the terminal OFD TP of Jig ② by using a digital voltmeter, and rewrite the data of address 7B and 7C so that the voltage is adjusted to:
(Voltage specified on the back of the CCD sensor) ± 0.05 V
Use addresses 7B and 7C for rough and fine adjustments, respectively.

How to read the OFD voltage:



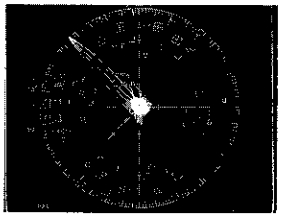
Item	Adjusting Procedure
2. AE manual adjustment	Before starting this adjustment, call up the lens adjustment mode. 1) How to bring forth the lens adjustment mode is described below just in the same way for calling up the signal adjustment mode. ● Set the CAM ADJ MODE switch on jig ①to the OFF position.  ● Set the CAM ADJ SW switch on jig ② to the LENS ADJ position.  ● Press the RESET switch on jig ②.  ● Set the CAM ADJ MODE switch on jig ① to the ON position.  * Lens adjustment mode is called up. Symbols appear at the lower right of the monitor screen.

Item	Adjusting Procedure
• Measuring terminal: monitor screen • Adjustment address: FE (AE manual adj.) • Adjustment data area: 01 • Object: Gray scale (Other object acceptable)	2) AE manual adjustment • Set the data of address FE (AE manual adj.) to 01. The microcomputer takes care of automatic tuning for the Hall offset, iris offset, and iris close adjustments. Call up address FE again and see if "FF" appears. "FF" means that the adjustment is complete, and otherwise it is incomplete.  3) Call back the signal adjustment mode. • Set the CAM ADJ MODE switch on jig ① to the OFF position. • Set the CAM ADJ SW switch on jig ② to the SIG ADJ position. • Press the RESET switch on jig ②. • Set the CAM ADJ MODE switch on jig ① to the ON position.
3. Sync level adjustment • Measuring terminal: CAM-Y of jig ②  • Adjustment address: 79 (Y Gain) • Adjustment data area: 00~FE • Measuring instrument: Oscilloscope (Horizontal synchronization) • Object: Gray scale (Other object acceptable)	Observe the waveform obtained at the terminal CAM-Y of jig ② and adjust the sync level to 300 ± 10mV by rewriting the data of address 79. 

Item	Adjusting Procedure
4. Carrier balance adjustment ● Measuring terminal: EE output ● Adjustment address: 0E (CB1) 0F (CB2) ● Adjustment data area: 00~7F ● Adjustment address: 3F (AGC CB) ● Adjustment data area: 00~FF ● Measuring instrument: Vectorscope (NTSC mode) Oscilloscope (Horizontal synchronization)	1) Call up the ME mode. Set the data of address FE (AE manual adj) to 02. 2) Close the iris. Set the data of address 71 (Iris H) to FE. 3) Set the AGC gain to minimum. Set the data of address 7D (Gain sel) to 00. Set the data of address 7E (AGC gain) to 00. 4) Temporarily adjust the set-up level to 20mV. See Item 5. Set-up adjustment. 5) Get the carrier balance detuned. Set the data of address 0E (CB1) to 20. Set the data of address 0F (CB2) to 03.  6) Make initial settings of the white balance. Read the data of address 50 (R gain). Write this data to address 4F (R outdoor). Read the data of address 51 (B gain). Write this data to address 55 (B outdoor). 7) Set the CAM ADJ MODE switch on jig ① to the OFF position.  8) Press the RESET switch on jig ②.  9) Set the CAM ADJ MODE switch on jig ① to the ON position. 

Item	Adjusting Procedure

10) Reduce the data of address 0E (CB1) from 20 until the spot comes to the center of the vectorscope's screen.



If the spot fails to be in the center even with the data at 00, increase the data of address 0F (CB2) from 00. Now make readjustment.

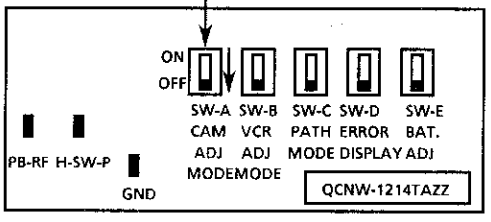
11) Deduct the data of address 0E by 5, and write the resulting value to address 0E.

Example: When the 0E data is 7, 7 - 5 = 2. Enter 02 to address 0E.

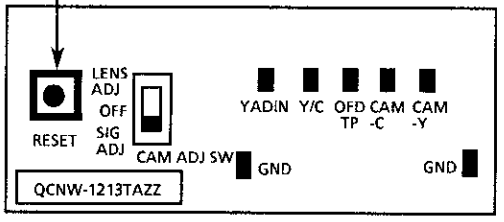
If the 0E data is deducted by 5 and becomes below 0, write 00 to address 0E and write the below-zero value to address 0F.

Example: When the 0E data is 3, 3 - 5 = -2. Enter 02 to address 0F. Enter 00 to address 0E.

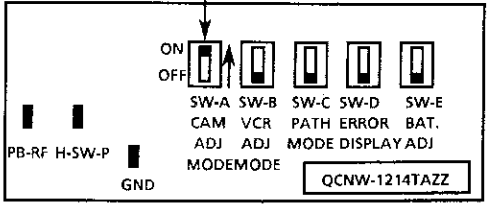
12) Set the CAM ADJ MODE switch on jig ① to the OFF position.

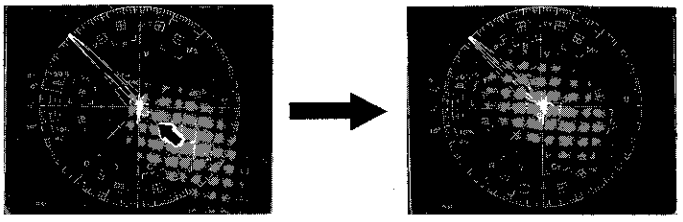
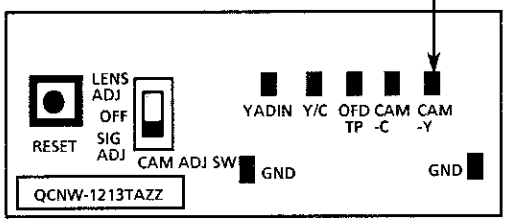
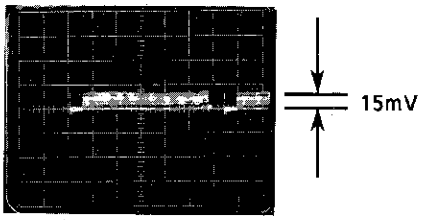
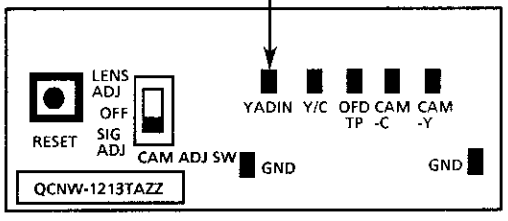
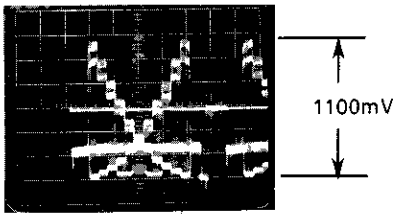


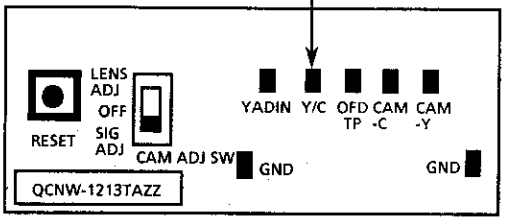
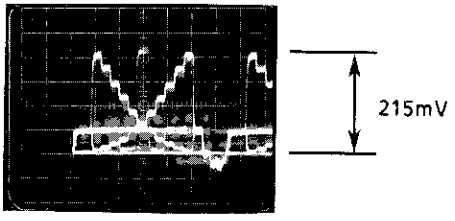
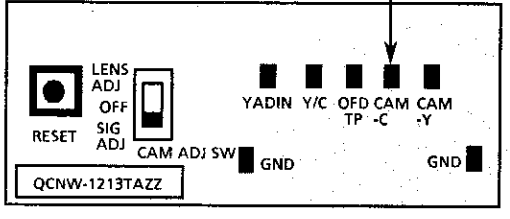
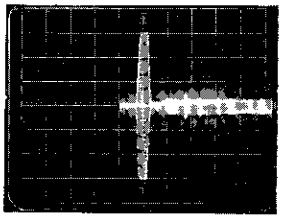
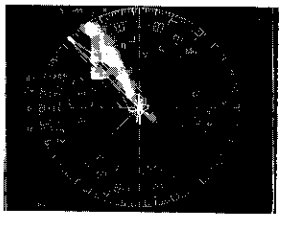
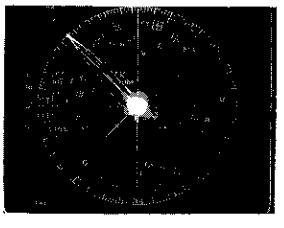
13) Press the RESET switch on jig ②.

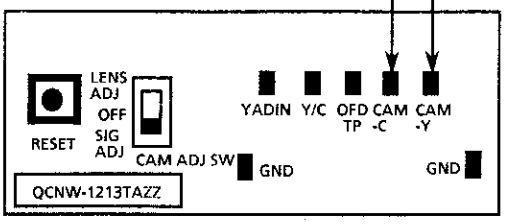
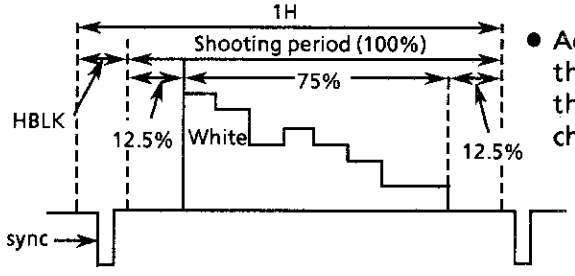
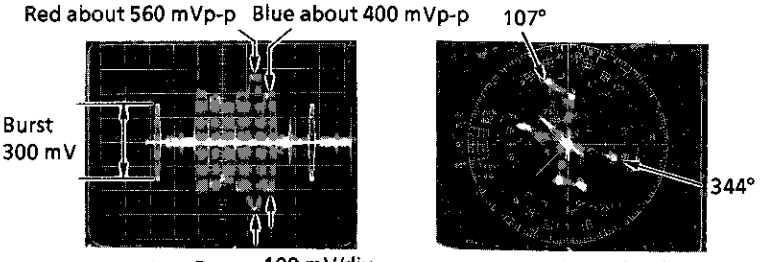
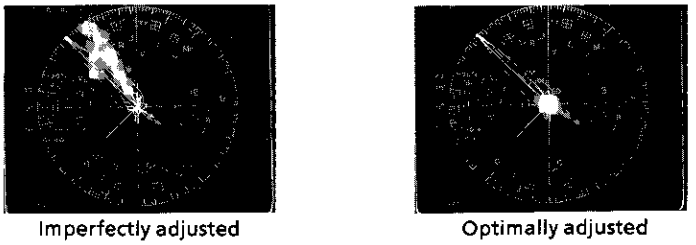


14) Set the CAM ADJ MODE switch on jig ① to the ON position.



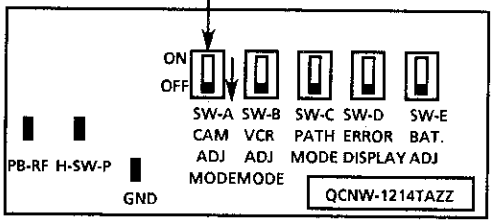
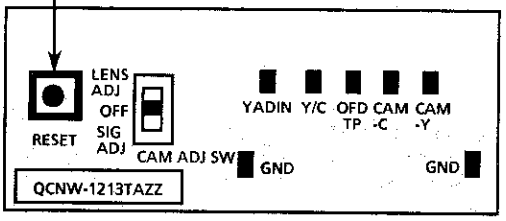
Item	Adjusting Procedure
	15) Set the AGC gain to maximum. Set the data of address 7D (Gain sel) to FF. Set the data of address 7E (AGC gain) to FF. 16) Using the data of address 3F (AGC CB), adjust the spot to the center on the vectorscope's screen.  optimally adjusted 17) Return the AGC gain to the standard level. Set the data of address 7D (Gain sel) to 00. Set the data of address 7E (AGC gain) to 25.
5. Set up adjustment • Measuring terminal: CAM-Y of jig ②  • Adjustment addresses: 75 (Set up) • Adjustment data area: 00~FE • Measuring instrument: Oscilloscope (Horizontal synchronization)	1) Observe the waveform on the oscilloscope obtained at the terminal CAM-Y of jig ②, and rewrite the data of address 75 so that the amplitude is adjusted to 15 ± 5mV.  50mV/div 10µsec/div 2) Set the data of address FE (AE manual adj) to FF.
6. Iris AE adjustment • Mesuring terminal: YADIN of jig ②  • Adjustment address: CB (Iris AE) • Adjustment data area: 00~FE • Measuring instrument: Oscilloscope (Horizontal synchronization) • Object: Gray scale	Shooting the gray scale at the standard angle of view, observe the waveform on the oscilloscope obtained at the terminal YADIN of jig ②, and rewrite the data of address CB so that the amplitude is adjusted to 1100 mVp-p.  200mV/div 10µsec/div

Item	Adjusting Procedure
7. AGC adjustment • Measuring terminal: YC of jig ②  • Adjustment address: F7 (AGC) • Adjustment data area: 00~FE • Measuring instrument: Oscilloscope (Horizontal synchronization) • Object: Gray scale	Shooting the gray scale at the standard angle of view, observe the waveform on the oscilloscope obtained at the terminal YC of jig ②, and rewrite the data of address F7 so that the amplitude is adjusted to 215 ± 10 mVp-p.  50mV/div 10µsec/div
8. Burst gain adjustment • Measuring terminal: CAM-C of jig ②  • Adjustment address: 59 (Burst gain) • Adjustment data area: 00~7F • Measuring instrument: Oscilloscope (Horizontal synchronization)	Observe the waveform obtained at the terminal CAM-C of Jig ② and adjust the amplitude to 300 ± 10 mVp-p by rewriting the data of address 59.  50mV/div 5µsec/div
9. White balance adjustment • Measuring terminal: EE output • Adjustment addresses: 50 (R gain) 51 (B gain) • Adjustment data area: 00~FE • Measuring instrument: Vectorscope 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 3200K by rewriting the data of address 50 and address 51 so that the bright spot comes to the center of the vectorscope.  Imperfectly adjusted  Optimally adjusted

Item	Adjusting Procedure
10. Colour rendition adjustment • Measuring terminal: CAM-Y of Jig ②, CAM-C of Jig ②, EE OUTPUT  • Adjustment address: 53 (R-Y Gain), 54 (B-Y Gain), 56 (R-Y matrix), 57 (B-Y matrix) • Adjustmet data area: 00~3F • Measuring instrument: Oscilloscope (Horizontal synchronization) Vectorscope (NTSC mode) • Object: Color bar chart	1) Adjust the view angle to the standard color bar chart shooting mode. Measure the CAM-Y output of jig ② in the horizontal sync. Adjust the zoom so that the white and blue ends of the color bar chart are equally spaced within the view angle which is 75% of the shooting period -- a period of 1H minus H BLK.  • Adjust the tilting of the view angle so that the color bar chart is centered. 2) Using the CAM-C of jig ②, make these adjustments: red level to 1.9 times (about 560 mVp-p) of the burst by changing the data of address 53 (R-Y Gain), and blue level to 1.3 times (about 400 mVp-p) of the burst by changing the data of address 54 (B-Y Gain). Then, using the EE output vectorscope, make these adjustments: red phase to 107° by changing the data of address 56 (R-Y Matrix), and blue phase to 344° by changing the data of address 57 (B-Y Matrix). (For phase adjustment, preferably adjust the vectorscope's gain control so that the blue and red spots are on the vector circle. Finally, be sure to turn back the gain control so that the burst is 75% amplitude.) 
11. Auto white balance adjustment • Measuring terminal: EE output • Adjustment addresses: 4F (R-Outdoor), 55 (B-Outdoor) Measuring instrument: Vectorscope (NTSC mode) • Adjustmet data area: 00~FE • Object: Gray scale	1) Shooting the gray scale at the standard angle of view, mount the color temperature conversion filter LB165 on the front of the lens. 2) Adjust the vectorscope's gain control so that the burst is on the circle. 3) Adjust the data of address 4F (R-Outdoor) and address 55 (B-Outdoor) so that the bright spot comes to the center of the vectorscope. 

* At the end of the Item 11 adjustment, the white balance mode will go to the outdoor mode.
* To continue the camera signal adjustment, make the mode selection in Item 7-1-4.1). (The white balance mode is switched from the outdoor mode to the indoor (3200K) mode.)
* To end the camera signal adjustment, switch to the normal mode. See below. (The white balance mode goes to the automatic mode.)

To return to the normal mode, follow these steps:

No.	Procedure
1.	Set the CAM ADJ MODE switch on jig ① (QCNW-1214TAZZ) to the OFF position.  Jig ①
2.	Press the RESET switch on jig ② (QCNW-1213TAZZ).  Jig ② * Normal mode is called up. * To continue the lens adjustment, refer to section 7-1-5 ADJUSTING THE LENS SYSTEM.

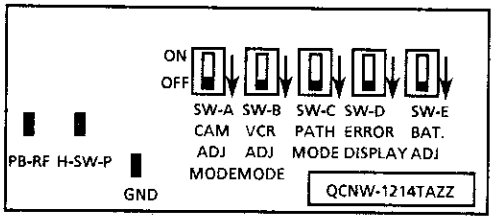
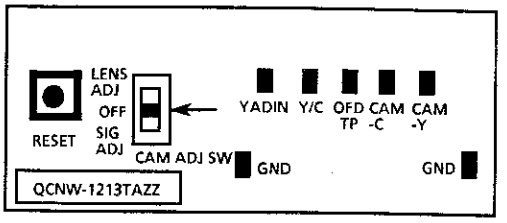
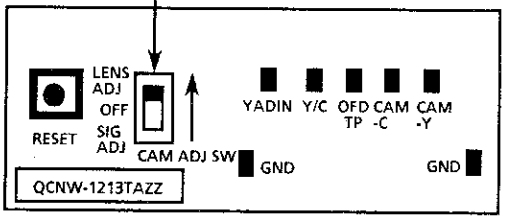
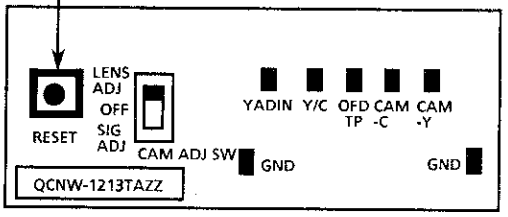
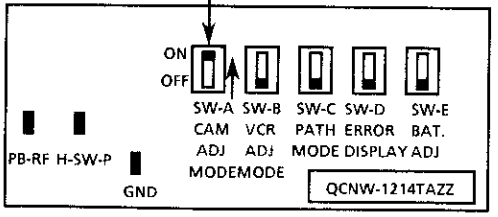
VL-N1 ADJUSTMENT DATA

ITEM	ADDRESS	A	B	C	D	E	F	G
OFD voltage	(V)							
OFD H	7B							
OFD L	7C							
Sync level	79							
CB 1	0E							
CB 2	0F							
AGC CB	3F							
Set up	75							
Iris AE	CB							
AGC	F7							
Burst gain	59							
R gain	50							
B gain	51							
R-Y gain	53							
B-Y gain	54							
R-Y matrix	56							
B-Y matrix	57							
R outdoor	4F							
B outdoor	55							

7-1-5. ADJUSTING THE LENS SYSTEM

1) Mode selection

To select the lens system adjusting mode, follow these steps:

No.	Procedure
1.	Turn off all the slide switches on jigs ① (QCNW-1214TAZZ) and ② (QCNW-1213TAZZ).  Jig ① (QCNW-1214TAZZ)  Jig ② (QCNW-1213TAZZ)
2.	Set the CAM ADJ SW switch on jig ② to the LENS ADJ position. 
3.	Press the RESET switch on jig ②. 
4.	Set the CAM ADJ MODE switch on jig ① to the ON position.  * Lens adjustment mode is called up. Symbols appear at the lower right of the monitor screen. **Notes:** 1. For the lens system adjustment, shoot a contrasted object 50m or more away at the wide-angle end, and fully open the iris. (The light source for the object should be something other than 50-Hz fluorescent light.) 2. The items to be adjusted are automatically selected from one to the next when an adjustment is completed.

2) Lens system adjusting procedure

Here are 6 necessary adjustment items.

(1) Auto focus noise level
(2) Photo-interrupter shield length
(3) WIDE end zoom position
(4) WIDE end focus ∞ position
(5) TELE end zoom position
(6) Zoom intermediate position

The automatic lens adjustment of the camera microcomputer should be made in the following order of adjustment items.

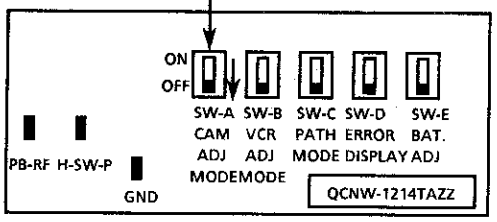
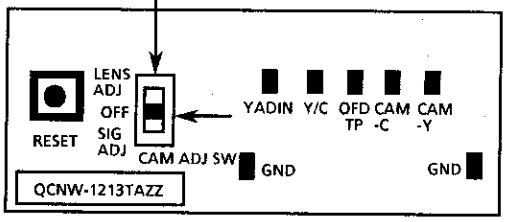
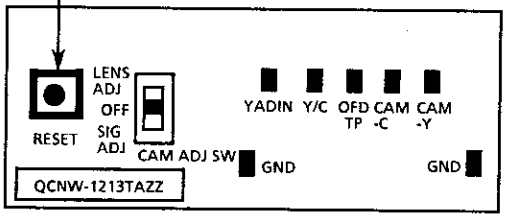
EEPROM-written data and adjustment items

Data	Items
01	Auto focus noise level
02	Shield length
03	WIDE end zoom position
04	WIDE end ∞ position
05	TELE end zoom position
06	Zoom intermediate position

Item	Adjustment procedure
1. Auto focus noise level adjustment	1) Read address FF. Make sure "FF" appears on the screen. 2) Write the adjustment item No. 01 in address FF. Now the adjustment starts. 3) Read address FF again. If the read data is the same as the written data (01), the adjustment is still under way. "FF", if displayed, means the adjustment is complete. **Note:** If "00" appears in Step 3), it means an adjustment error happens for some reasons. This adjustment and those that follow cannot be made. This note applies to all the following adjustment items.
2. Photo-interrupter shield length adjustment	1) Read address FF. Make sure "FF" appears on the screen. 2) Write the adjustment item No. 02 in address FF. Now the adjustment starts. 3) Read address FF again. If the read data is the same as the written data (02), the adjustment is still under way. "FF", if displayed, means the adjustment is complete.
3. WIDE end zoom position adjustment	1) Read address FF. Make sure "FF" appears on the screen. 2) Write the adjustment item No. 03 in address FF. Now the adjustment starts. 3) Read address FF again. If the read data is the same as the written data (03), the adjustment is still under way. "FF", if displayed, means the adjustment is complete.

Item	Adjustment procedure
4. WIDE end focus ∞ position adjustment	1) Read address FF. Make sure "FF" appears on the screen. 2) Write the adjustment item No. 04 in address FF. Now the adjustment starts. 3) Read address FF again. If the read data is the same as the written data (04), the adjustment is still under way. "FF", if displayed, means the adjustment is complete.
5. TELE end zoom position adjustment	1) Read address FF. Make sure "FF" appears on the screen. 2) Write the adjustment item No. 05 in address FF. Now the adjustment starts. 3) Read address FF again. If the read data is the same as the written data (05), the adjustment is still under way. "FF", if displayed, means the adjustment is complete.
6. Zoom intermediate position adjustment	1) Read address FF. Make sure "FF" appears on the screen. 2) Write the adjustment item No. 06 in address FF. Now the adjustment starts. 3) Read address FF again. If the read data is the same as the written data (06), the adjustment is still under way. "FF", if displayed, means the adjustment is complete.

To return to the normal mode, follow these steps:

No.	Procedure
1.	Set the CAM ADJ MODE switch on jig ① (QCNW-1214TAZZ) to the OFF position. 
2.	Set the CAM ADJ SW switch on jig ② to the OFF position. 
3.	Press the RESET switch on jig ②.  * Normal mode is called up. Turn off the power switch on the CAMERA operation unit. Disconnect jigs ① and ②.

7-2. ADJUSTMENT OF THE BLACK-AND-WHITE VIEWFINDER

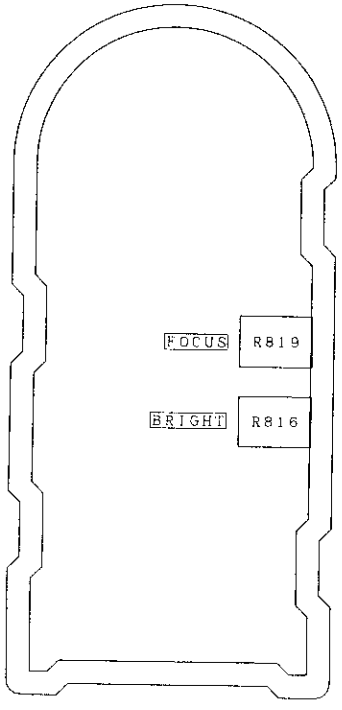
[BLACK/WHITE VIEWFINDER ADJUSTMENT]

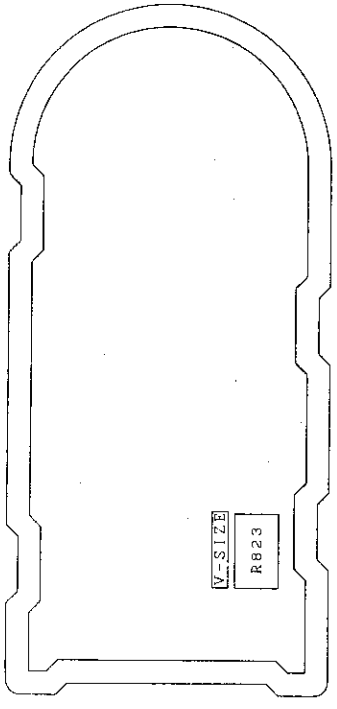
Instruments and tools required for adjustments

- Input signal (monoscope pattern signal) generator
  *Monoscope-recorded tape also applicable
- Hot melting tool (to fix the focus and centering magnet rings)
- Camcorder
- AC adapter (including the DC cable)
- RCA pin jack cable
- Adjusting screwdriver

LOCATION OF TEST POINTS AND CONTROLS

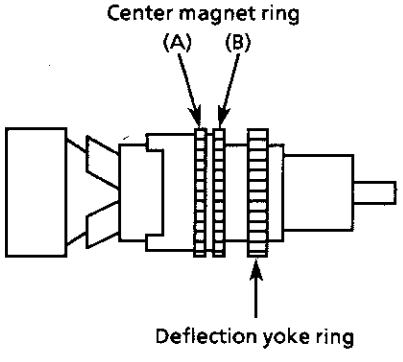
- Viewfinder Circuit





ADJUSTMENTS

1. Initial settings
   Input signal : Monoscope pattern signal
   1) Adjust R816(BRIGHT) until the screen brightness becomes best.
   2) Turning the deflection yoke ring, tilt the deflection yoke with respect to the cathode ray tube so that the on-screen image be in alignment with the mask. (Temporarily fix the ring.)
   3) Adjust R811(V-SIZE)to the center position.



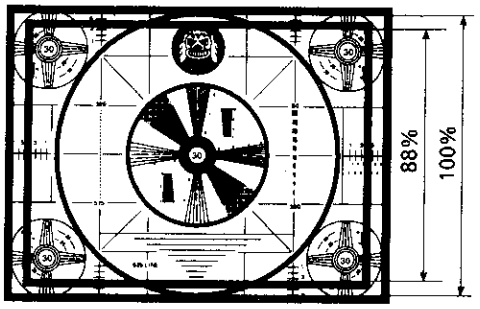
2. Focus adjustment

   Measuring point : Viewfinder display
   Adjusting point : R819(FOCUS)
   Input signal : Monoscope pattern signal (1.0 V-p-p)
   Adjustment R819 (FOCUS) so that the horizontal resolution of the monoscope pattern signal becomes best.

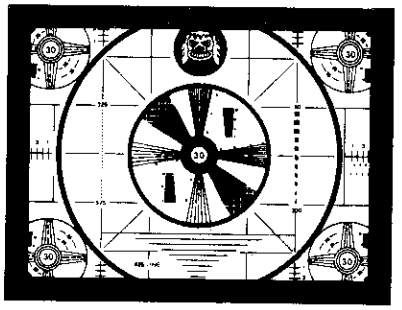
3. On-screen image tilt adjustment
   Measuring point : Viewfinder display
   Adjusting point : Deflection yoke ring
   Input signal : Monoscope pattern signal (1.0 Vp-p)
   Using the deflection yoke ring, set the deflection yoke so that the monoscope pattern on the screen be aligned with the cathode ray tube mask.
   Set the deflection yoke to make the pattern parallel with the mask.

   Note: Insert the deflection yoke until it comes into contact with the mask.

4. V-SIZE adjustment
Measuring point : Viewfinder display
Adjusting point : R811 (V-SIZE)
Input signal : Monoscope pattern signal (1.0 Vp-p)
Adjust R811 (V-SIZE)so that the center circle be as round as possible(so that the over-scan be 12 ± 5%).



5. Centering adjustment
Measuring point : Viewfinder display
Adjusting point : Centering magnet rings (A) and (B)
Input signal : Monoscope pattern signal (1.0Vp-p)
Adjust the centering magnet rings (A) and (B) so that the test pattern be centered vertically and horizontally.
★ Finally fix the deflection yoke and its ring with hot-melt adhesive.

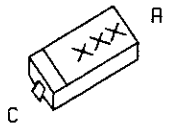


Vertical and horizontal over-scan difference to be within 6%

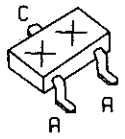
6. Brightness adjustment
Measuring point : Viewfinder display
Adjusting point : R816(BRIGHT)
Input signal : Monoscope pattern signal (1.0 Vp-p)
Adjust R816 (BRIGHT) until the lst and the 2nd dark tones on the 4-tone gray scale can be distinguished from each other. Now turn R817 back to a little brighter level. (The bright tones should not be so bright that the cross-hatch in the monoscope circle is blurry.)

7. V-SIZE,centering and DY slope checkings
Check to see if the above adjustments are as specified below. If out of spec, make reabjustments.
Horizontal resolution : More than 290 lines
Vertical over-scan : 12 ±6%
Horizontal over-scan: 10 ±9%
DY slope ±1°

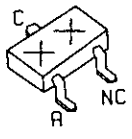
8. SEMICONDUCTOR LEAD IDENTIFICATION



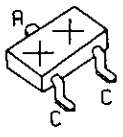
SFPB54
D901



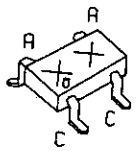
MA132WK
D701, D704, D4403, D6



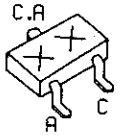
MA132K
D702, D1, D4, D5, D7, D1501



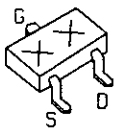
MA132WA
D703, D903, D904, D4421, D3, D101, D501



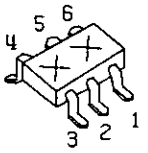
DA227
D902



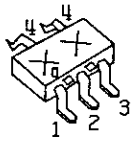
MA133
D4423, D2
MA147
D4342



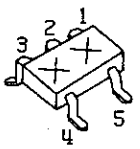
2SK94
Q104
2SK160
Q1001



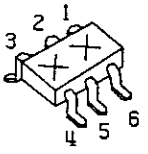
RN4604
Q604, Q712



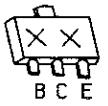
FP101
Q907, Q908, Q909



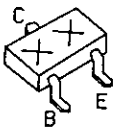
UMA7
Q1504
UMG8
Q1506
XP1213
Q461, Q4401, Q4557, Q1503, Q1508
XP1215
Q1505
XP1501
Q1
RN1701
Q4430
TC4S66F
IC603
TC7S08F
IC703



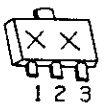
XP4601
Q102, Q203, Q4466
XP6401
Q1510
XP6501
Q2, Q4, Q103, Q105, Q201, Q4465
UMT1
Q1702



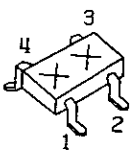
2SB1121T
Q904
2SB1123T
Q914
2SB1132Q
Q1507
2SB1302S
Q901, Q905
2SD874AS
Q1501



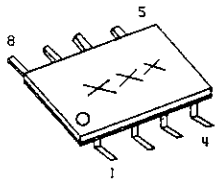
2SA1037
Q1301, Q1302
2SA1298Y
Q902
2SA1455K
Q800
2SA1832Y
Q4360, Q4427, Q4463, Q4483, Q4552
2SB1462
Q3
2SC4132Q
Q801
2SC3938
Q4424, Q4431
2SC4626C
Q106, Q4381, Q4462
2SC4738Y
Q462, Q903, Q911, Q913, Q4461, Q1502, Q1509
2SD2216
Q101, Q202, Q204, Q501
DTC323TK
Q603
RN1102
Q460, Q463
RN1104
Q304, Q421, Q1303, Q4402
RN2104
Q4429, Q4502



NJ79L08U
IC3

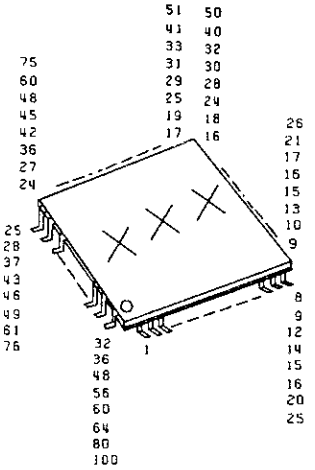


MM1031XM
IC4420
PST592IM
IC503

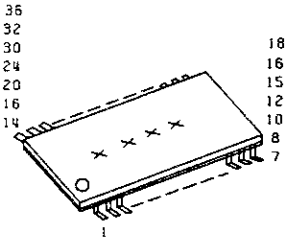


BA9701F
IC902
CT93L56K
IC502
NJM2904M
IC1702

S8420AF
IC702
XRA4558F
IC6601



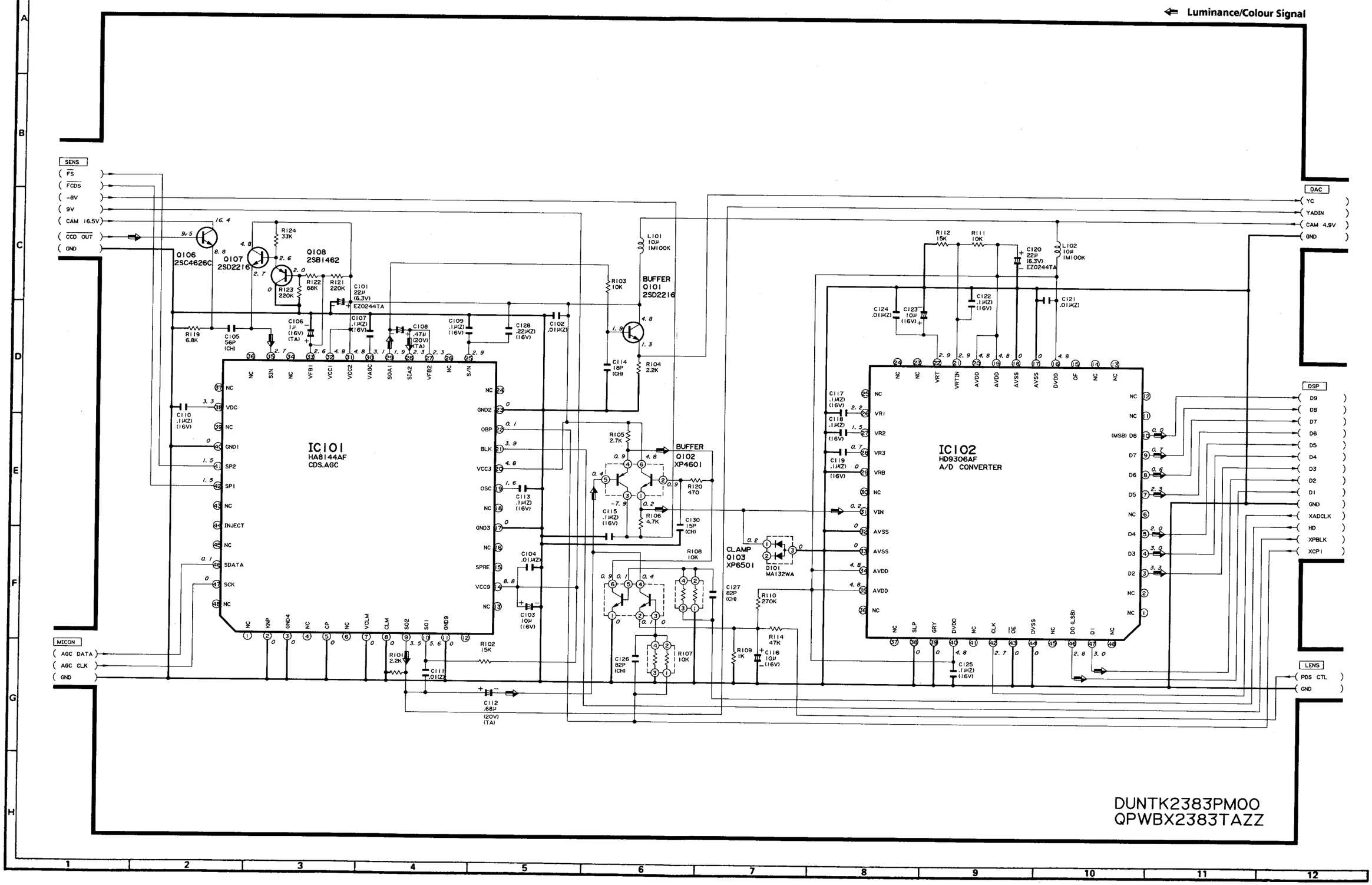
XR10813 (32)
IC1701
CXA1202R (48)
IC301
HA8144AF (48)
IC101
HD9306AF (48)
IC102
LA7454W (48)
IC602
LZ95D56 (48)
IC1
MB3785V (48)
IC901
IX1961CE (56)
IC201
HA118272 (64)
IC401
IX0153TA (80)
IC501
IX0137TA (100)
IC504
IX0157TA (100)
IC701
IX0171TA (100)
IC104



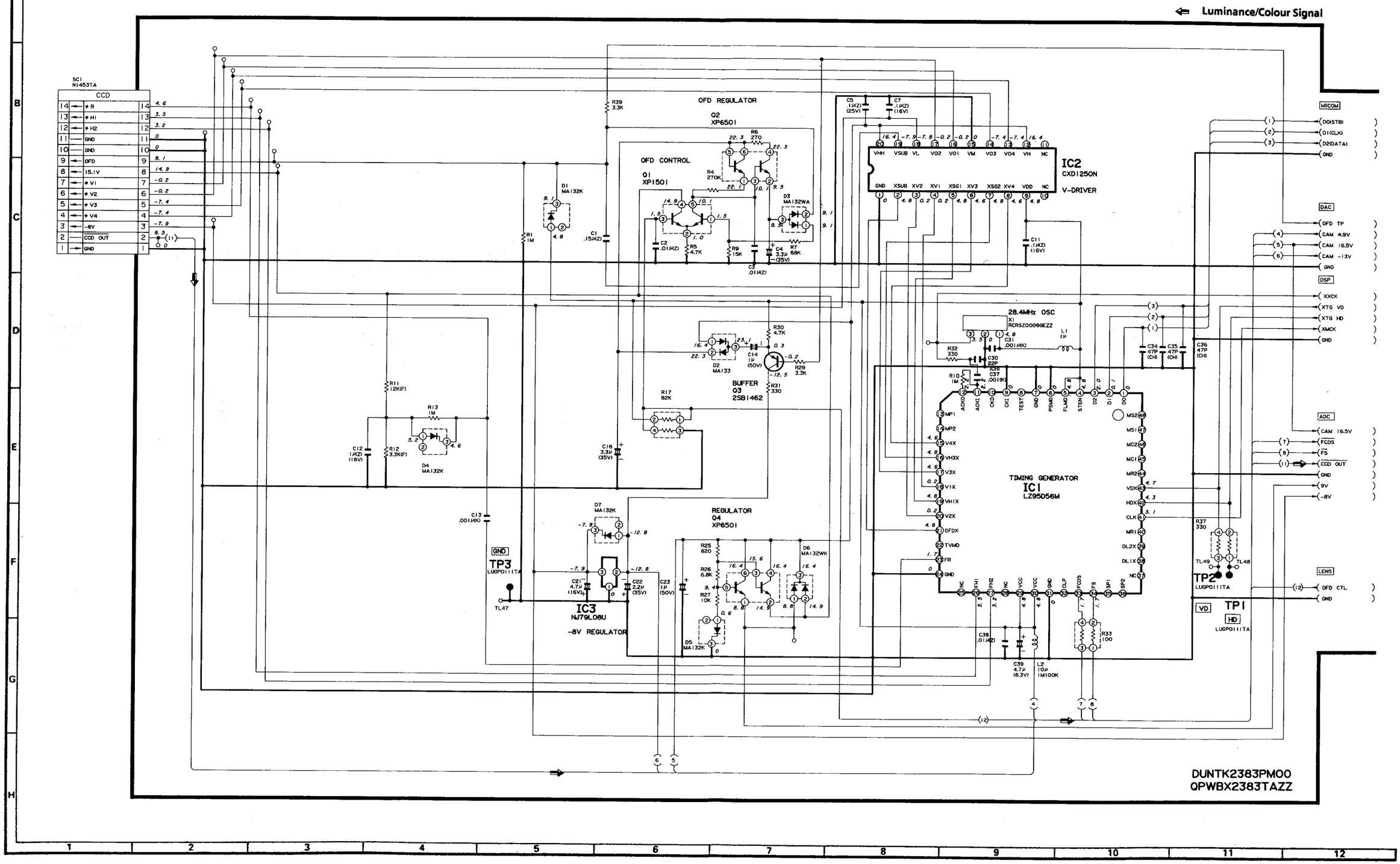
IX1426CE (14)
IC105
NJM2902V (14)
IC1502, IC1504
TCHT707F (14)
IC503
BA7194F (16)
IC800
BA7603F (16)
IC4422
CXL1506M (16)
IC4460
MM1179XF (16)
IC1503

MPC1727V (16)
IC1704
CXD1250N (20)
IC2
IX0158TA (20)
IC704
MB8346BV (20)
IC1501
CXA1203N (24)
IC4501
LB1880M (36)
IC1705

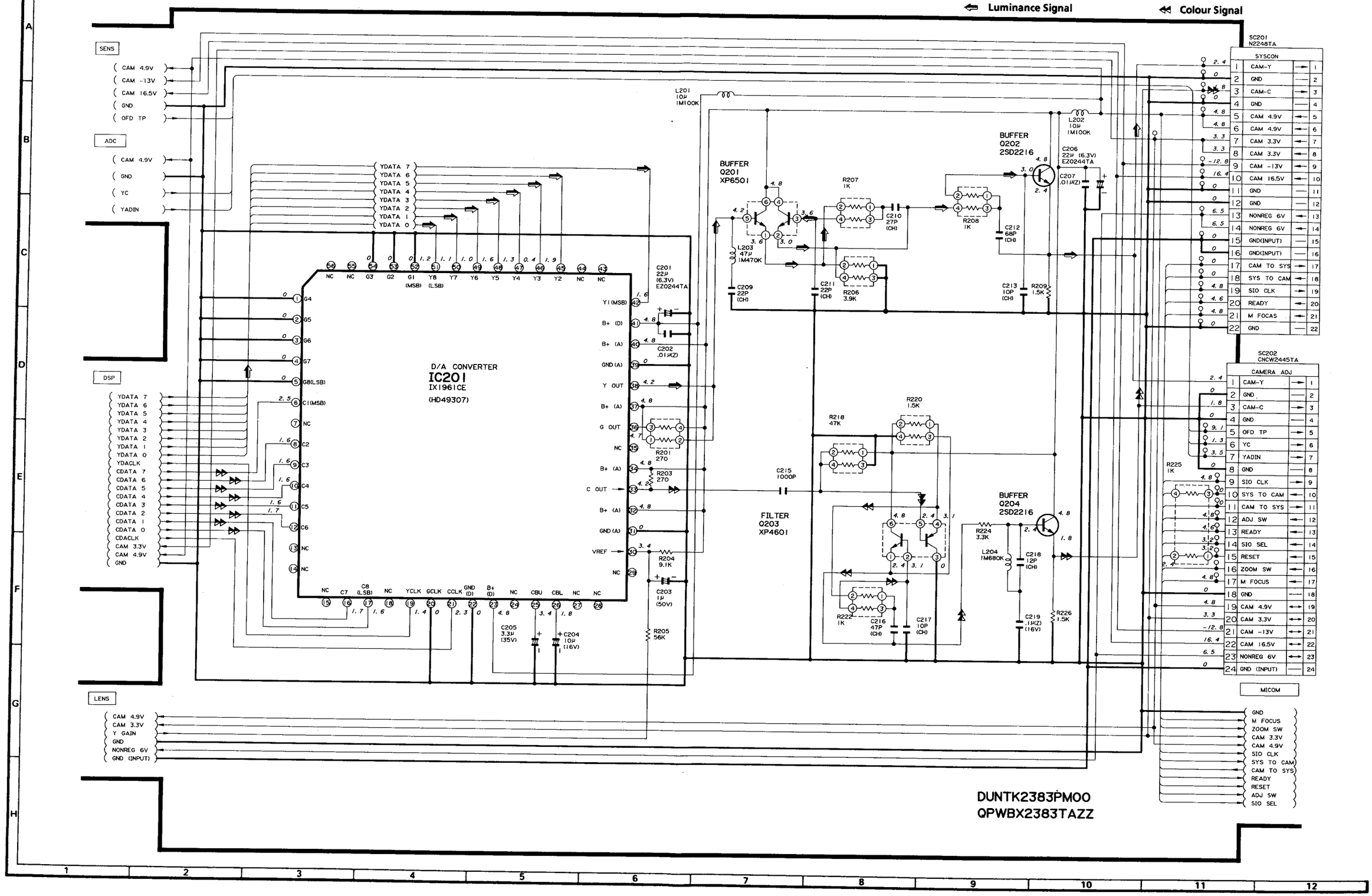
9-5. ADC CIRCUIT SCHEMATIC DIAGRAM



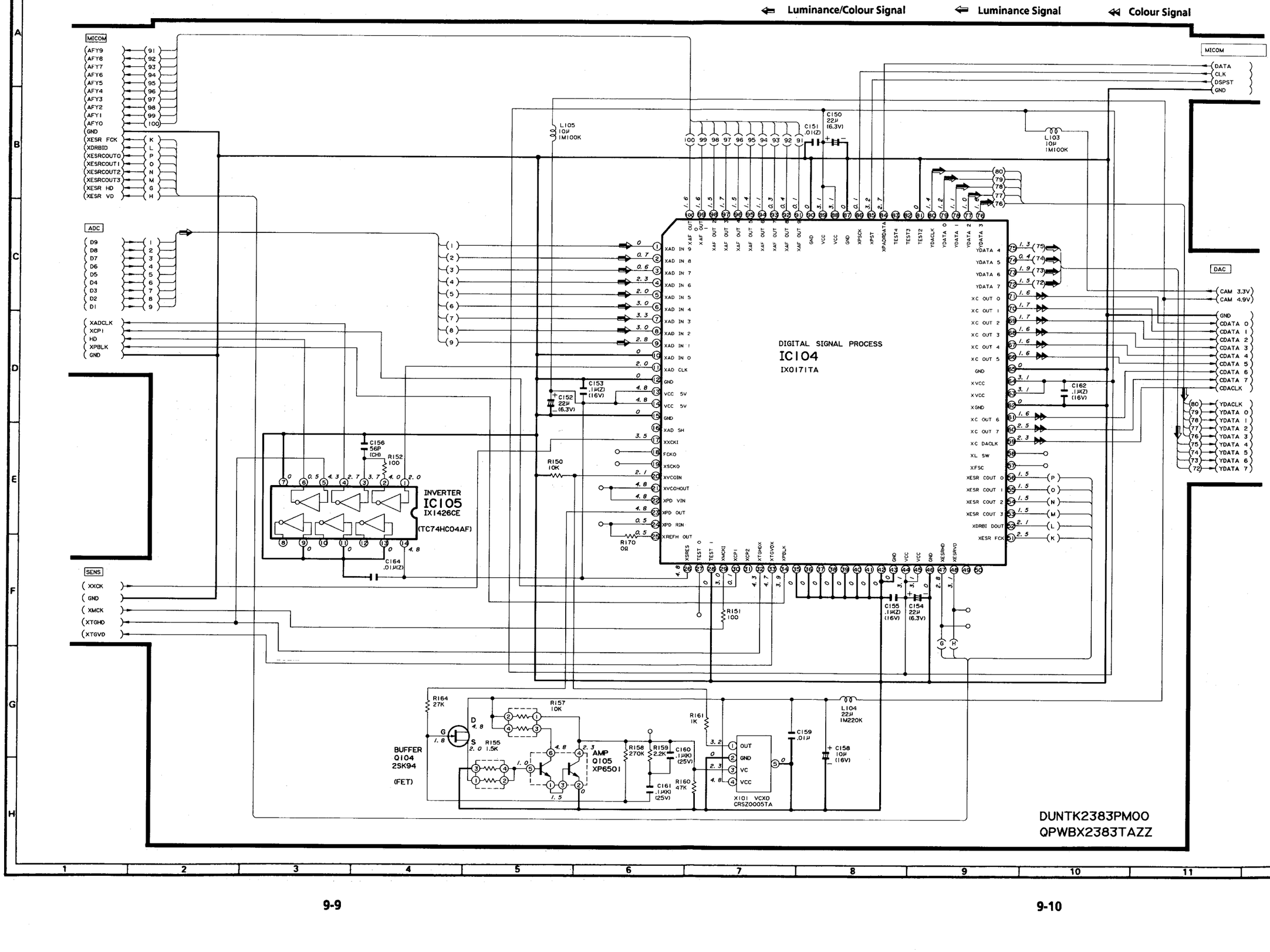
9-4. SENSOR CIRCUIT SCHEMATIC DIAGRAM



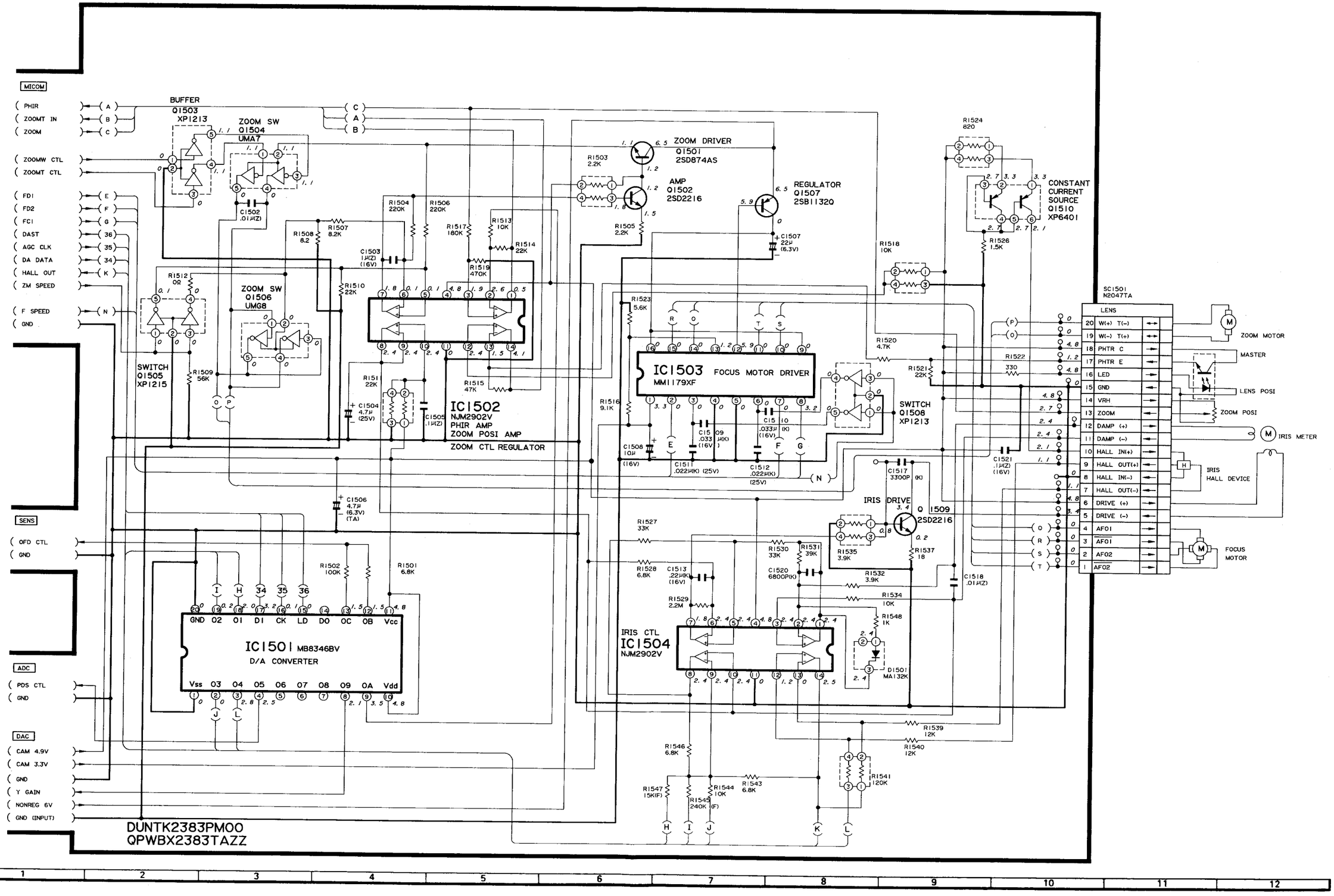
9-7. DAC CIRCUIT SCHEMATIC DIAGRAM



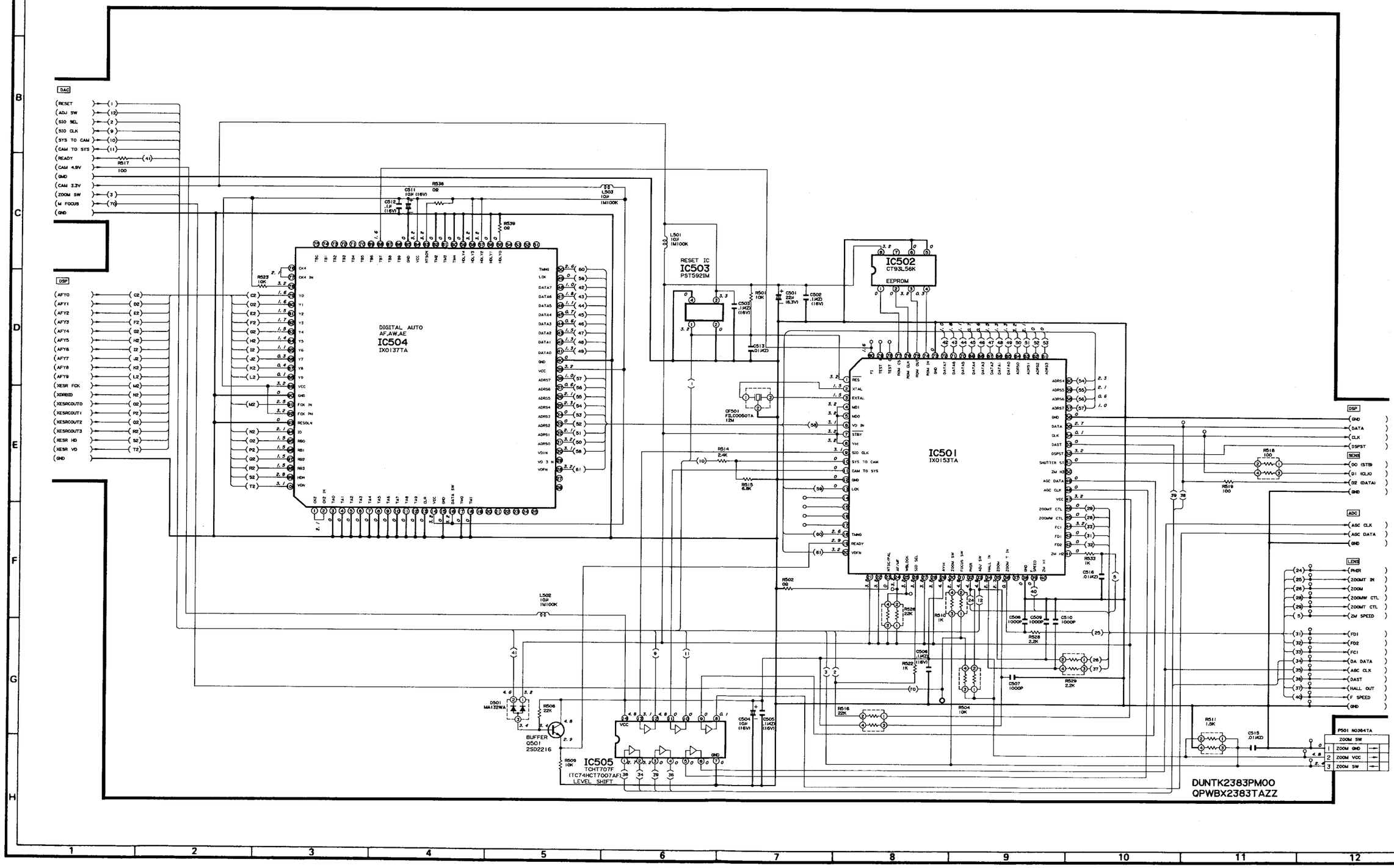
9-6. DSP CIRCUIT SCHEMATIC DIAGRAM



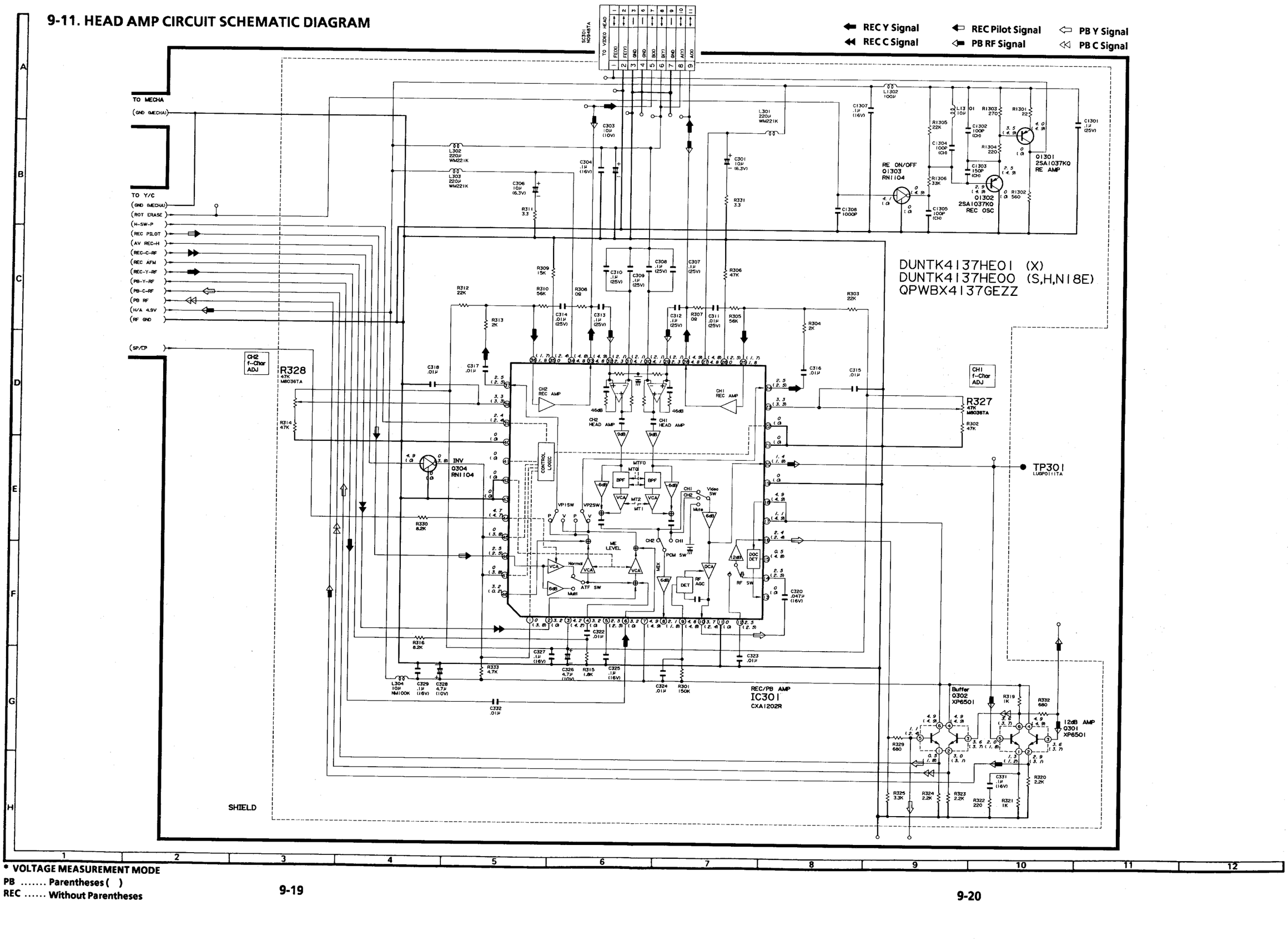
9-9. LENS DRIVE CIRCUIT SCHEMATIC DIAGRAM



9-8. MICOM CIRCUIT SCHEMATIC DIAGRAM

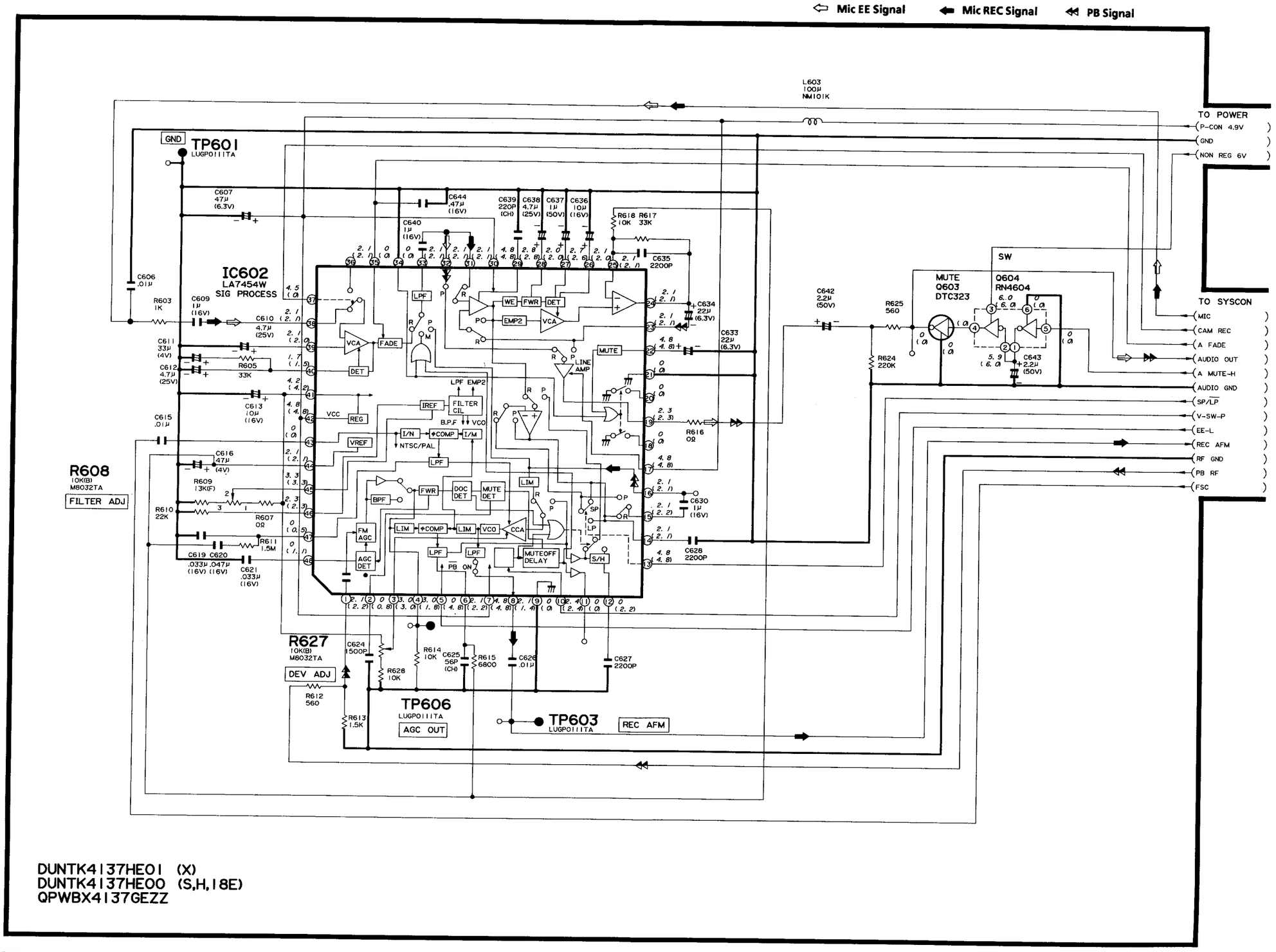


9-11. HEAD AMP CIRCUIT SCHEMATIC DIAGRAM



* VOLTAGE MEASUREMENT MODE
PB ..... Parentheses ( )
REC ..... Without Parentheses

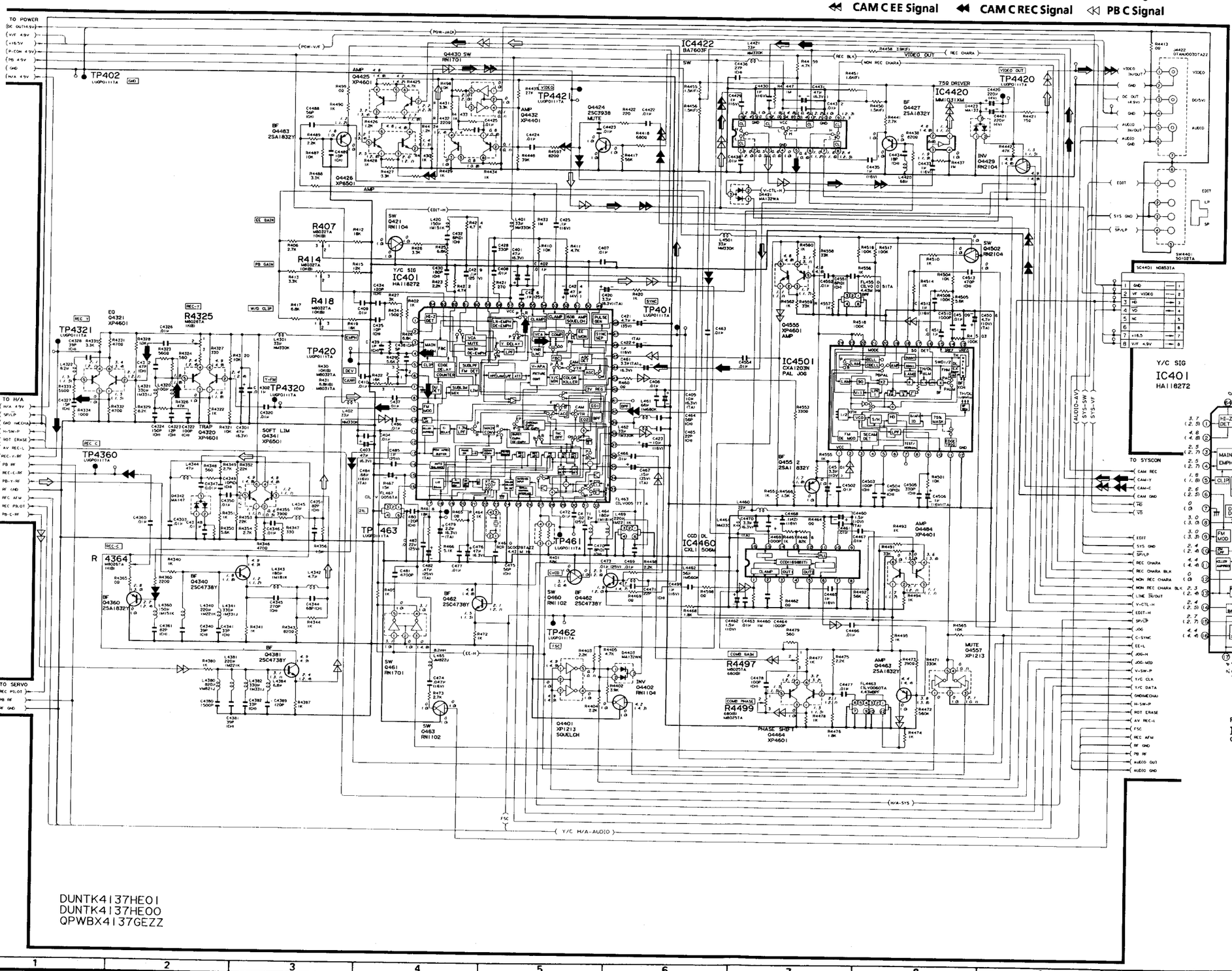
9-13. AUDIO CIRCUIT SCHEMATIC DIAGRAM



* VOLTAGE MEASUREMENT MODE
PB ..... Parentheses ( )
REC ..... Without Parentheses

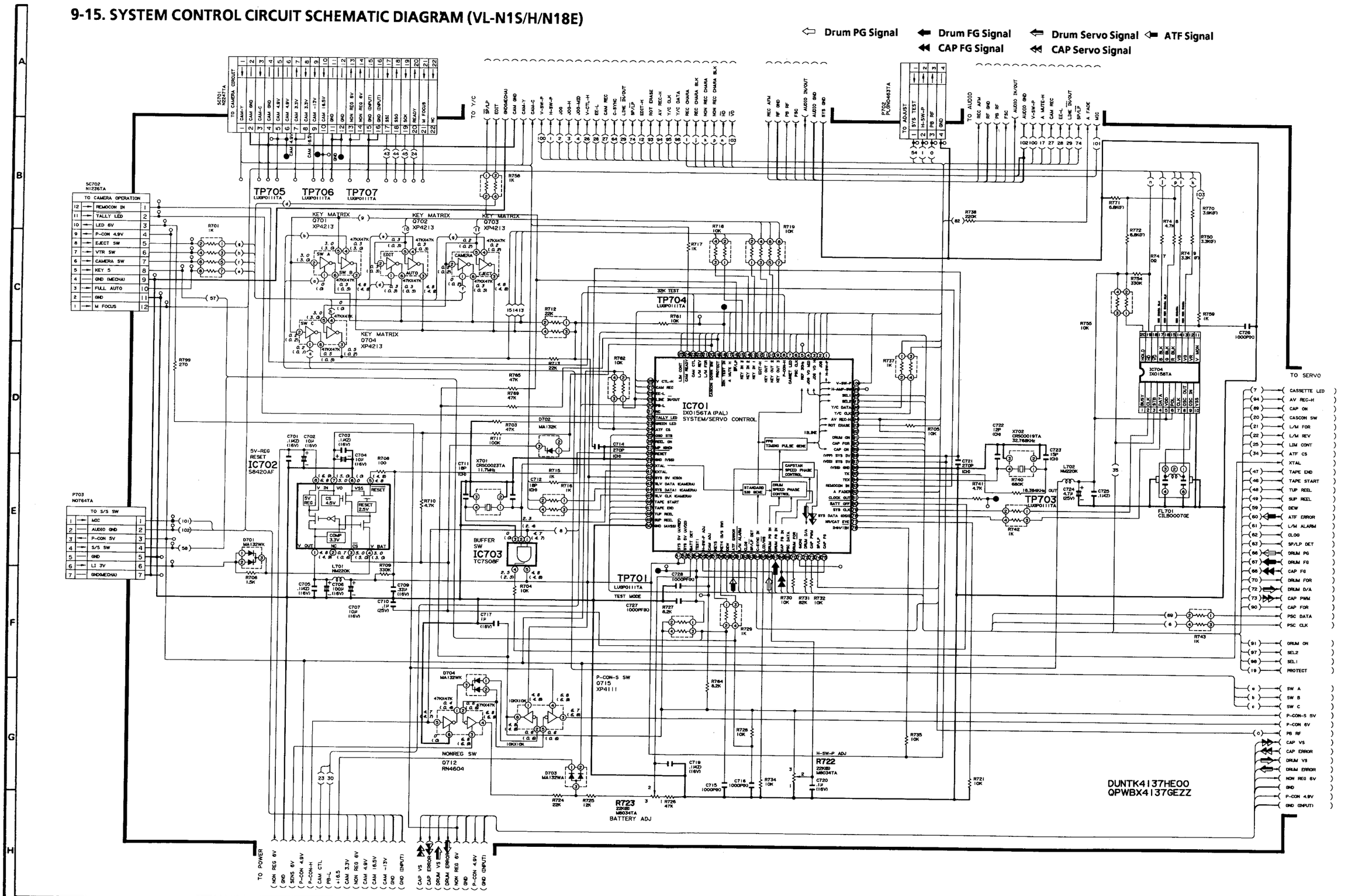
9-12. Y/C CIRCUIT SCHEMATIC DIAGRAM

⇐ CAM Y EE Signal ⇐ CAM Y REC Signal ⇦ PB Y Signal
⇚ CAM C EE Signal ⇚ CAM C REC Signal ⇦ PB C Signal



*** VOLTAGE MEASUREMENT MODE**
PB ..... Parentheses ( )
REC ..... Without Parentheses

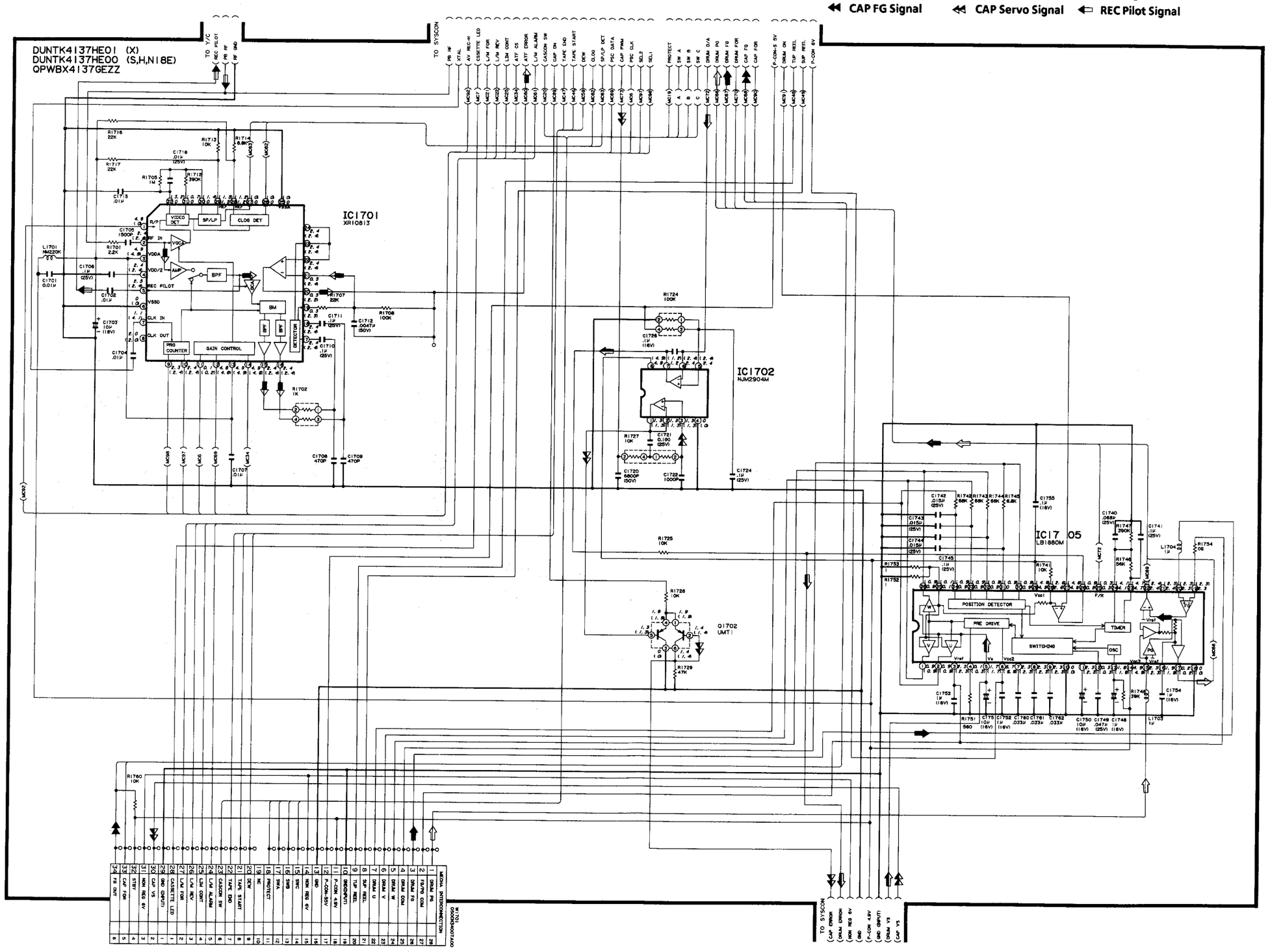
9-15. SYSTEM CONTROL CIRCUIT SCHEMATIC DIAGRAM (VL-N1S/H/N18E)



*** VOLTAGE MEASUREMENT MODE**
PB ..... Parentheses ( )
REC ..... Without Parentheses

9-14. SERVO CIRCUIT SCHEMATIC DIAGRAM

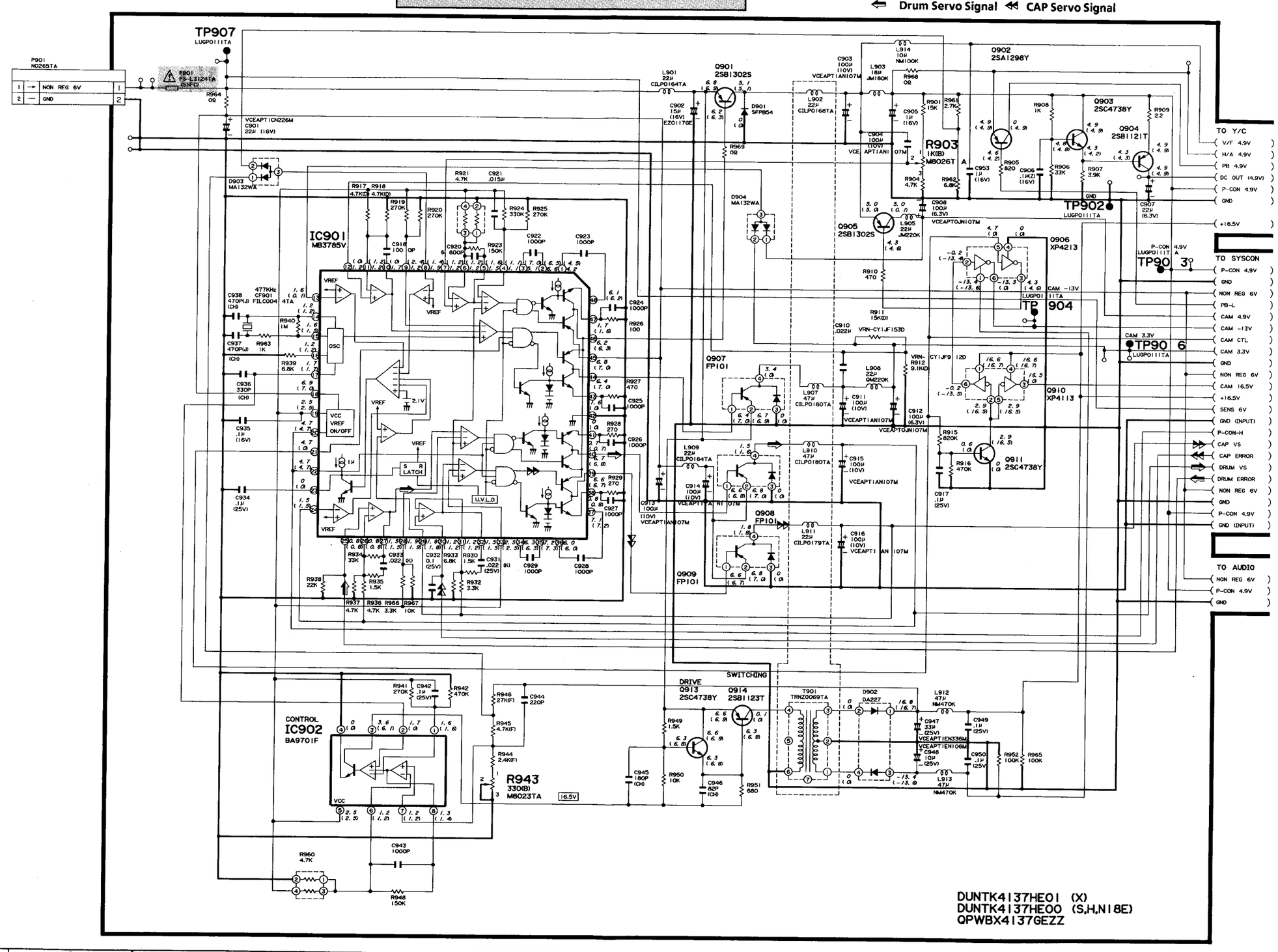
⇦ Drum PG Signal ⬅ Drum FG Signal ⇦ Drum Servo Signal ⇦ ATF Signal
⬅ CAP FG Signal ⇦ CAP Servo Signal ⇦ REC Pilot Signal



* VOLTAGE MEASUREMENT MODE
PB ..... Parentheses ( )
REC ..... Without Parentheses

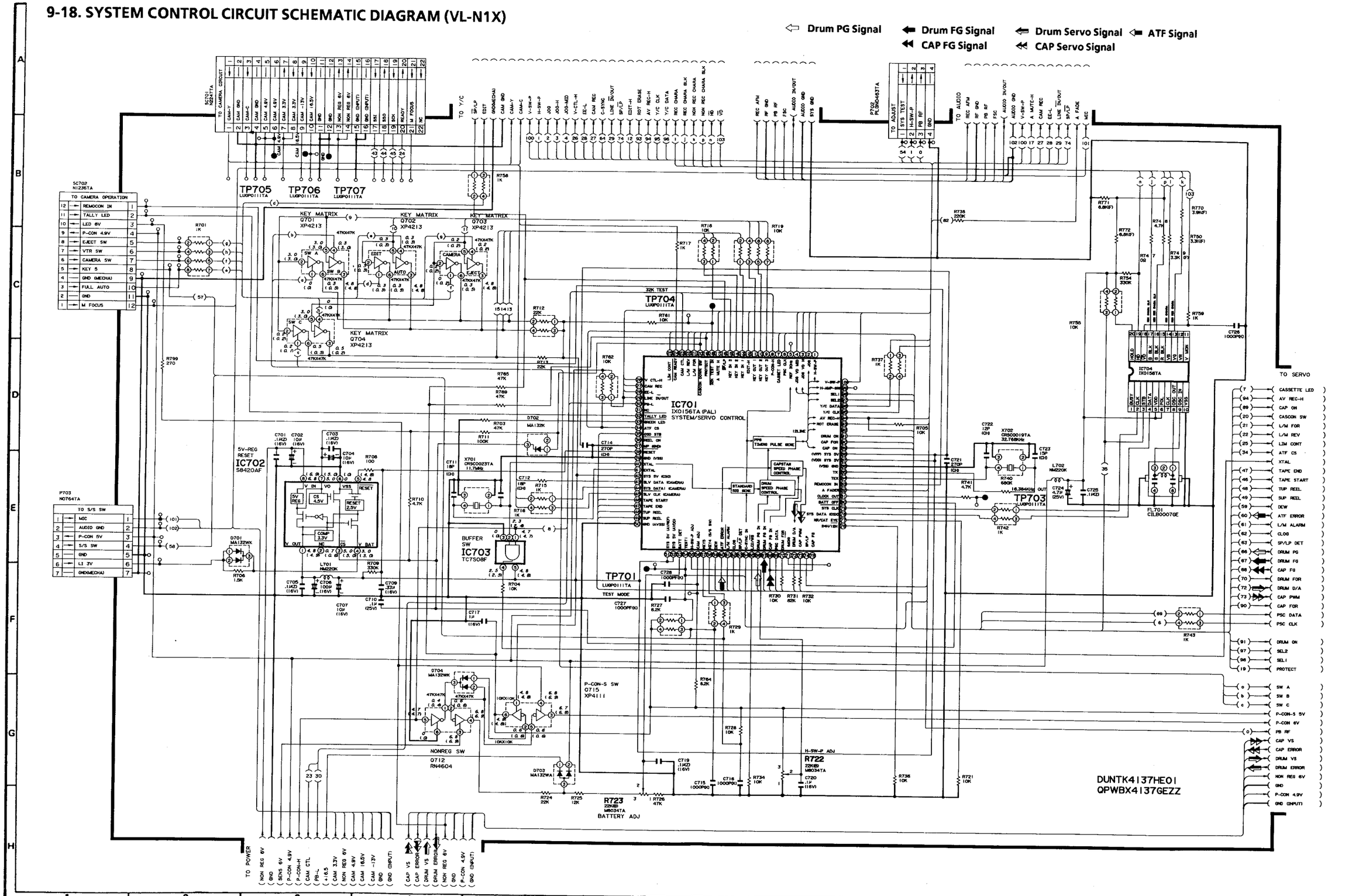
9-19. DC/DC CONVERTER CIRCUIT SCHEMATIC DIAGRAM

⚠ AND SHADED COMPONENTS = SAFETY RELATED PARTS



* VOLTAGE MEASUREMENT MODE
PB ..... Parentheses ( )
REC ..... Without Parentheses

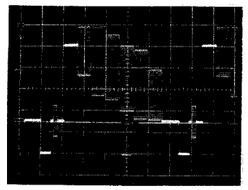
9-18. SYSTEM CONTROL CIRCUIT SCHEMATIC DIAGRAM (VL-N1X)



* VOLTAGE MEASUREMENT MODE
PB ..... Parentheses ( )
REC ..... Without Parentheses

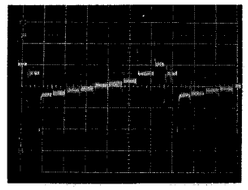
9-20. VCR P.W.B.

• Y/C CIRCUIT



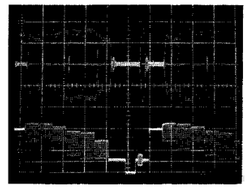
VIDEO INPUT at A/V terminal
200mV, 10µsec/div

(Colour bar input, VCR ADJ (STOP) mode)



TP420
EMPHASIS OUTPUT
200mV, 10µsec/div

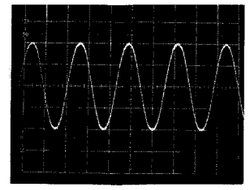
(Colour bar input, VCR ADJ (STOP) mode)



TP4360 (Upper)
REC C SIGNAL
50mV, 10µsec/div

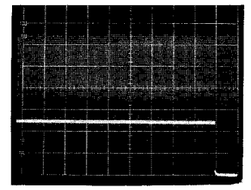
TP4421 (Lower)
VIDEO EE SIGNAL
500mV, 10µsec/div

(Colour bar input, VCR ADJ (STOP) mode)



TP462
f_{SC}
100mV, 0.1µsec/div

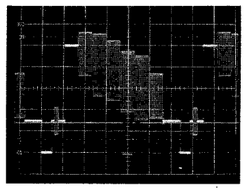
(Colour bar input, VCR ADJ (STOP) mode)



P702 connector pin (3) (Upper)
PB RF SIGNAL
200mV, 2msec/div

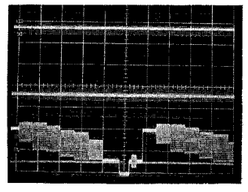
P702 connector pin (2) (Lower)
H-SW-P
2V, 2msec/div

(VCR colour bar PB mode)



TP4421
VIDEO EE SIGNAL
200mV, 10µsec/div

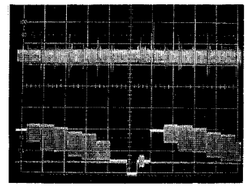
(Colour bar input, VCR ADJ (STOP) mode)



TP4320 (Upper)
REC Y SIGNAL
200mV, 10µsec/div

TP4421 (Lower)
VIDEO EE SIGNAL
500mV, 10µsec/div

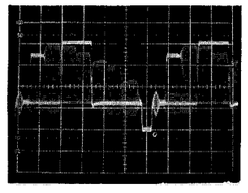
(Colour bar input, VCR ADJ (STOP) mode)



TP461 (Upper)
RESIDUAL CHROMA SIGNAL
50mV, 10µsec/div

TP4421 (Lower)
VIDEO EE SIGNAL
500mV, 10µsec/div

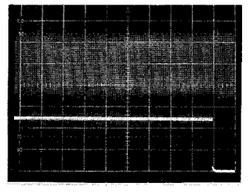
(Colour bar input, VCR ADJ (STOP) mode)



TP4420
PB VIDEO SIGNAL
500mV, 10µsec/div

(Colour bar VCR PB mode)

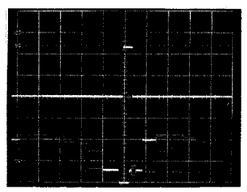
• HEAD AMP CIRCUIT



TP301 (Upper)
PB RF SIGNAL
50mV, 2msec/div

P702 connector pin (2) (Lower)
H-SW-P
2V, 2msec/div

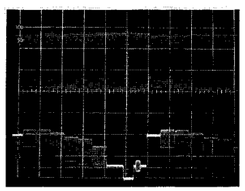
(VCR colour bar PB mode)



TP401 (Upper)
SYNC OUTPUT
2V, 10µsec/div

TP4421 (Lower)
VIDEO EE SIGNAL
500mV, 10µsec/div

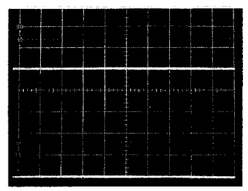
(Colour bar input, VCR ADJ (STOP) mode)



TP4321 (Upper)
REC Y SIGNAL
100mV, 10µsec/div

TP4421 (Lower)
VIDEO EE SIGNAL
500mV, 10µsec/div

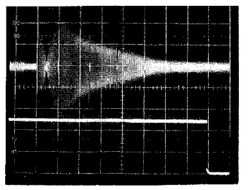
(Colour bar input, VCR ADJ (STOP) mode)



TP463 (Upper)
2f_L VCO VOLTAGE LEVEL
500mV, 10µsec/div

TP402 (Lower)
GND

(Colour bar input, VCR ADJ (STOP) mode)

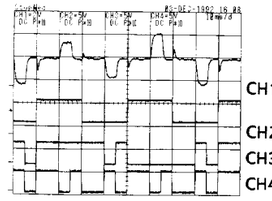


P702 connector pin (3) (Upper)
PB RF SIGNAL
200mV, 2msec/div

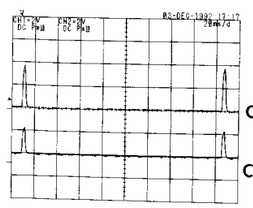
P702 connector pin (2) (Lower)
H-SW-P
2V, 2msec/div

(VCR PB mode, playback alignment tape)

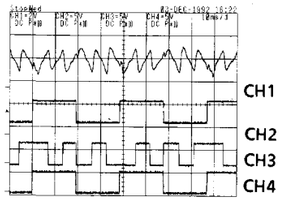
• SYSTEM CONTROL/SERVO CIRCUIT



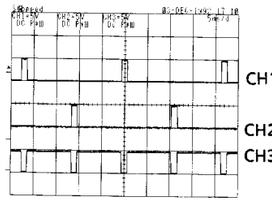
TL1783 (CH1)
ATF ERROR
2V, 10msec/div
TL7782 (CH2)
H-SW-P
5V, 10msec/div
IC701 PIN (97) (CH3)
SEL2
5V, 10msec/div
IC701 pin (98) (CH4)
SEL1
5V, 10msec/div
(VCR PB mode)



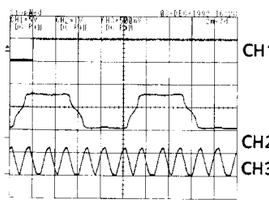
TL1770 (CH1)
TAPE START
2V, 20msec/div
TL1771 (CH2)
TAPE END
2V, 20msec/div



TL1783 (CH1)
ATF ERROR
2V, 10msec/div
TL7782 (CH2)
H-SW-P
5V, 10msec/div
IC701 PIN (97) (CH3)
SEL2
5V, 10msec/div
IC701 pin (98) (CH4)
SEL1
5V, 10msec/div
(VCR VSF mode)

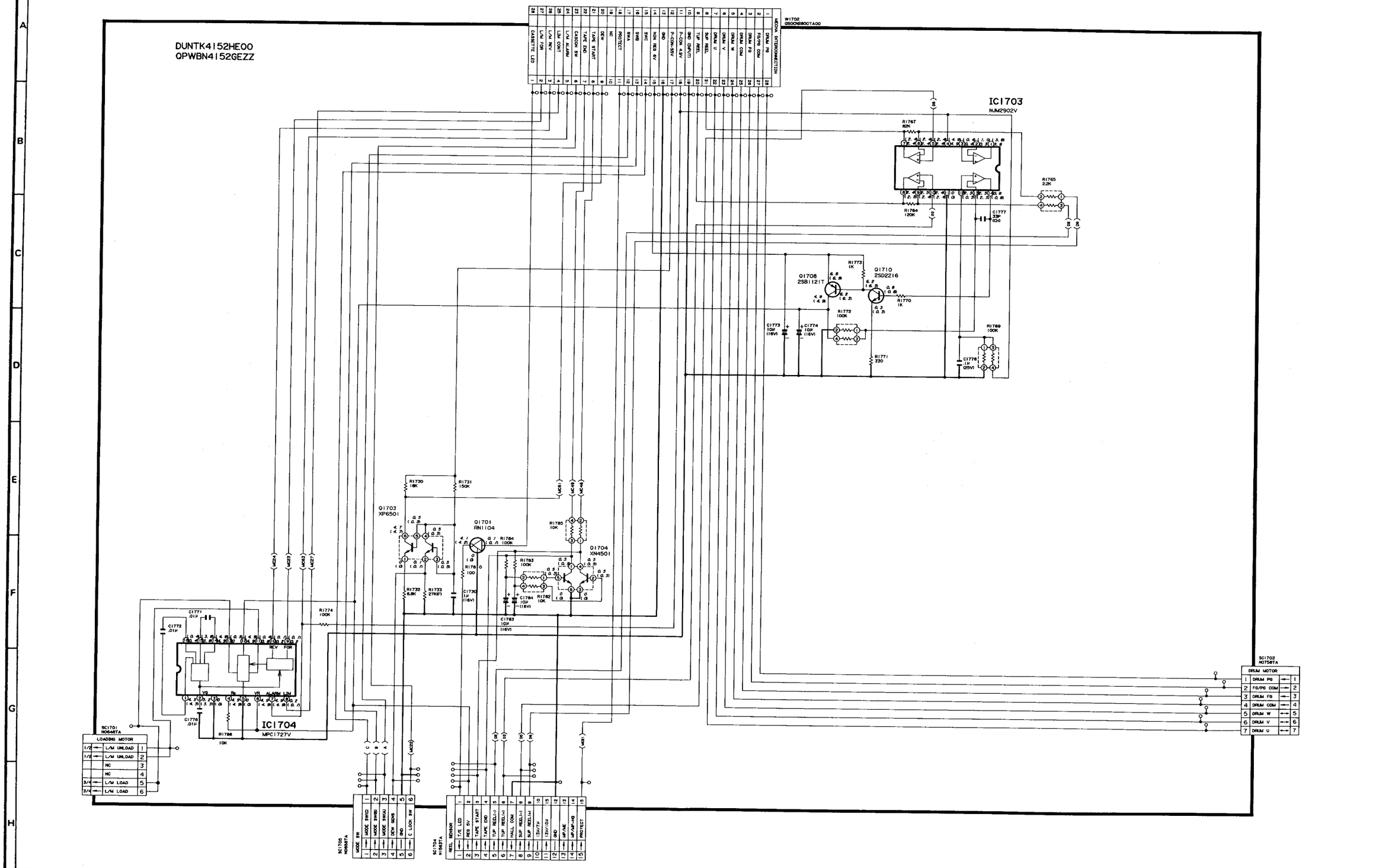


IC701 pin (11) (CH1)
KEY OUT 1
5V, 5msec/div
IC701 pin (10) (CH2)
KEY OUT 2
5V, 5msec/div
IC701 pin (9) (CH3)
KEY OUT 3
5V, 5msec/div



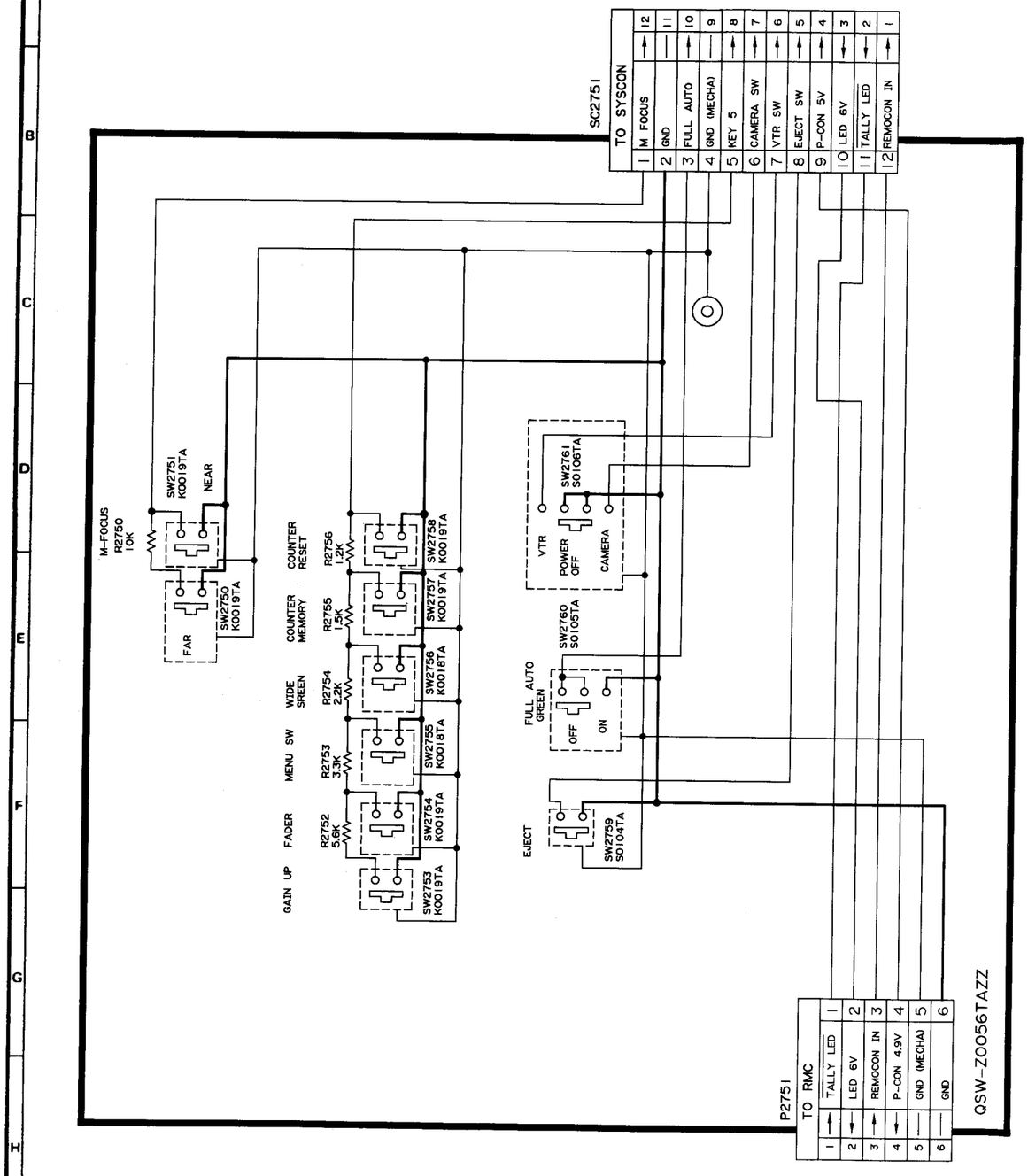
TL7782 (CH1)
H-SW-P
5V, 2msec/div
IC1705 pin (1) (CH2)
DRUM V
1V, 2msec/div
IC1705 pin (12) (CH3)
INT
500mV, 2msec/div

9-21. MECHA INTERCONNECTION CIRCUIT SCHEMATIC DIAGRAM

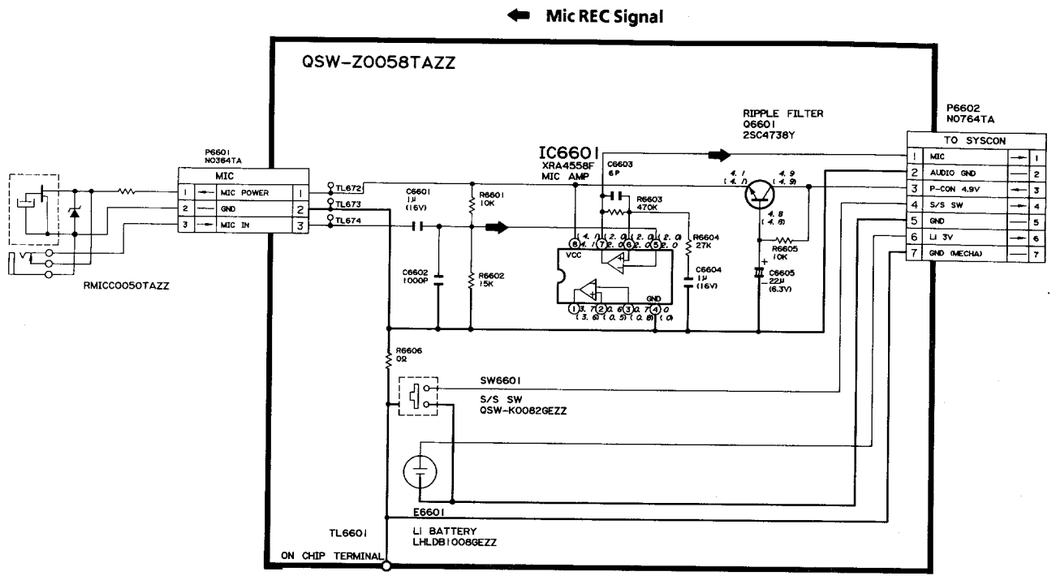


*** VOLTAGE MEASUREMENT MODE**
PB ..... Parentheses ( )
REC ..... Without Parentheses

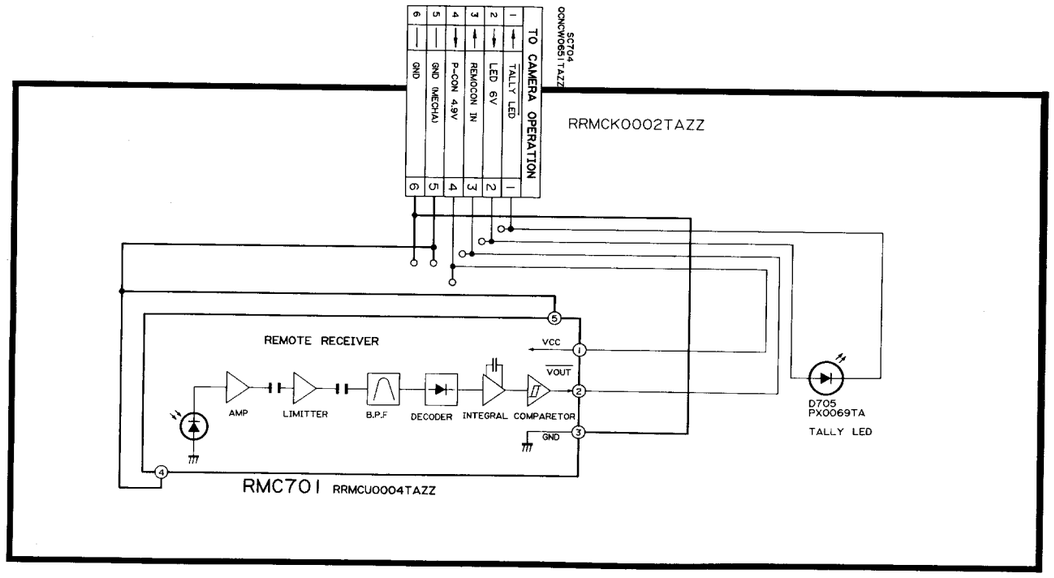
9-25. CAMERA OPERATION CIRCUIT SCHEMATIC DIAGRAM



9-26. MIC AMP/LI HOLDER/START·STOP CIRCUIT SCHEMATIC DIAGRAM

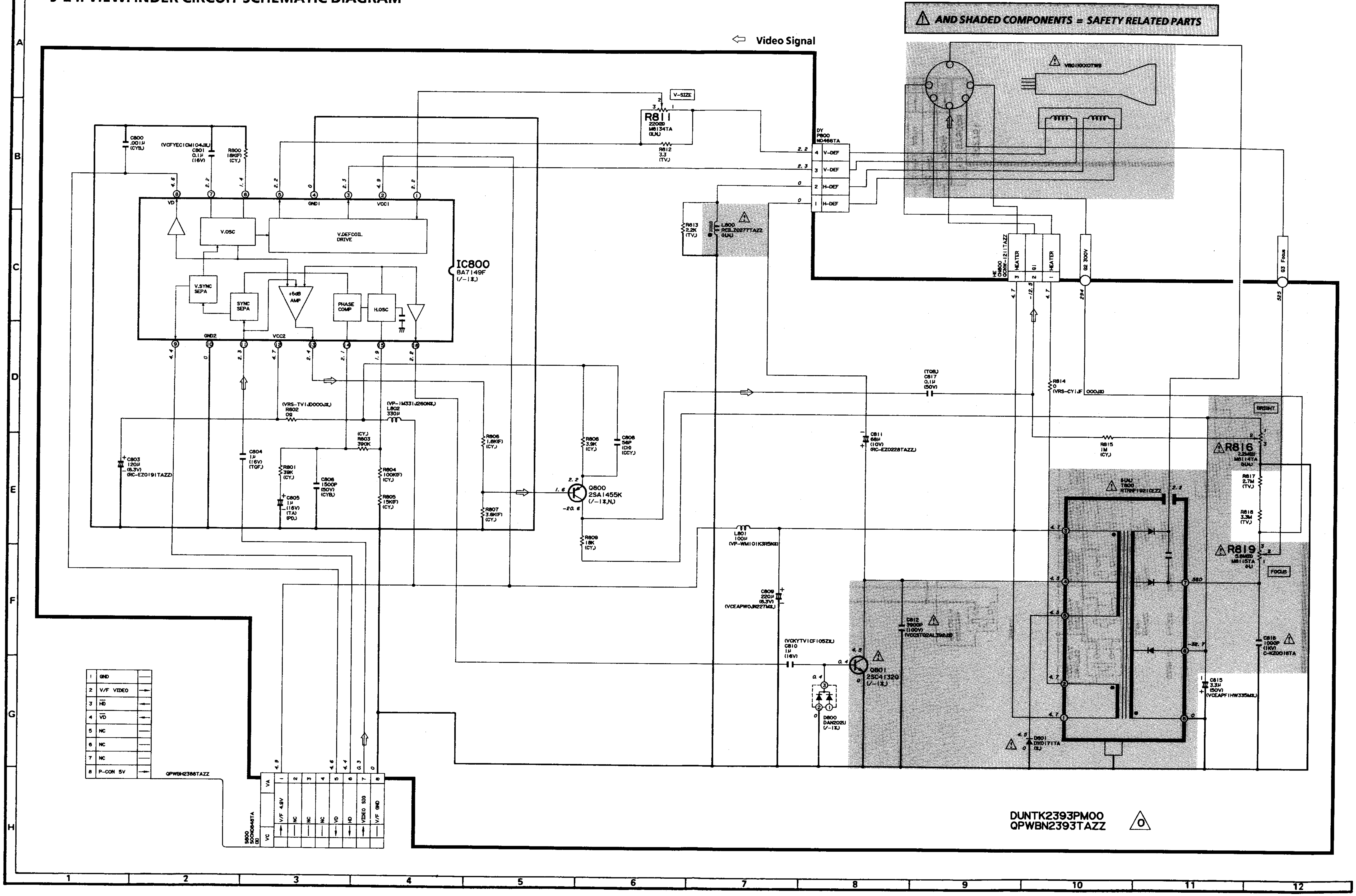


9-27. R/C CIRCUIT SCHEMATIC DIAGRAM



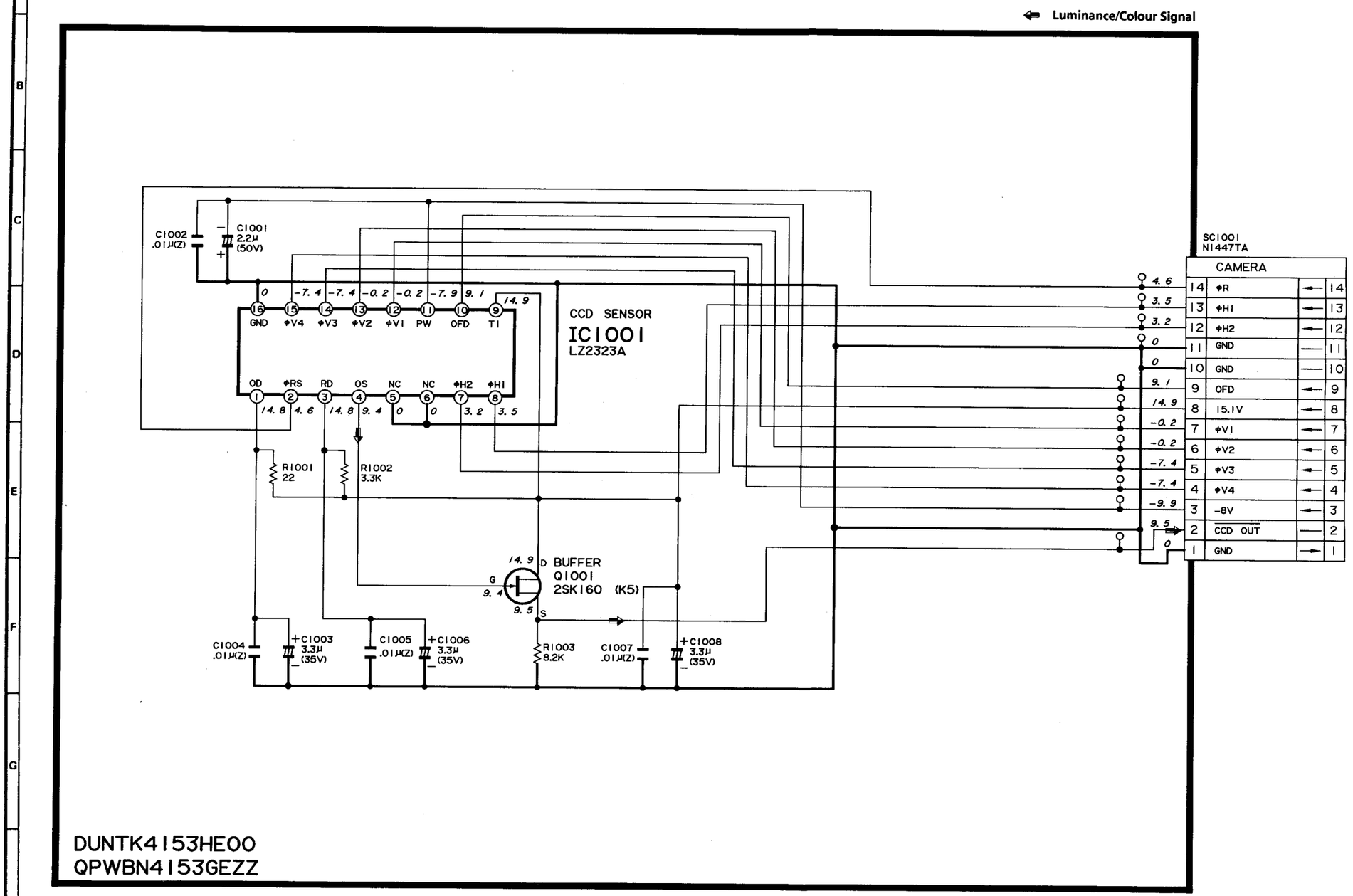
* VOLTAGE MEASUREMENT MODE
PB ..... Parentheses ( )
REC ..... Without Parentheses

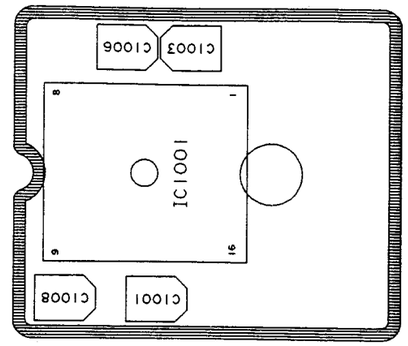
9-24. VIEWFINDER CIRCUIT SCHEMATIC DIAGRAM

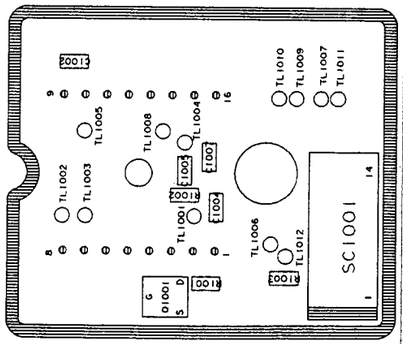


9-2. CCD CIRCUIT SCHEMATIC DIAGRAM

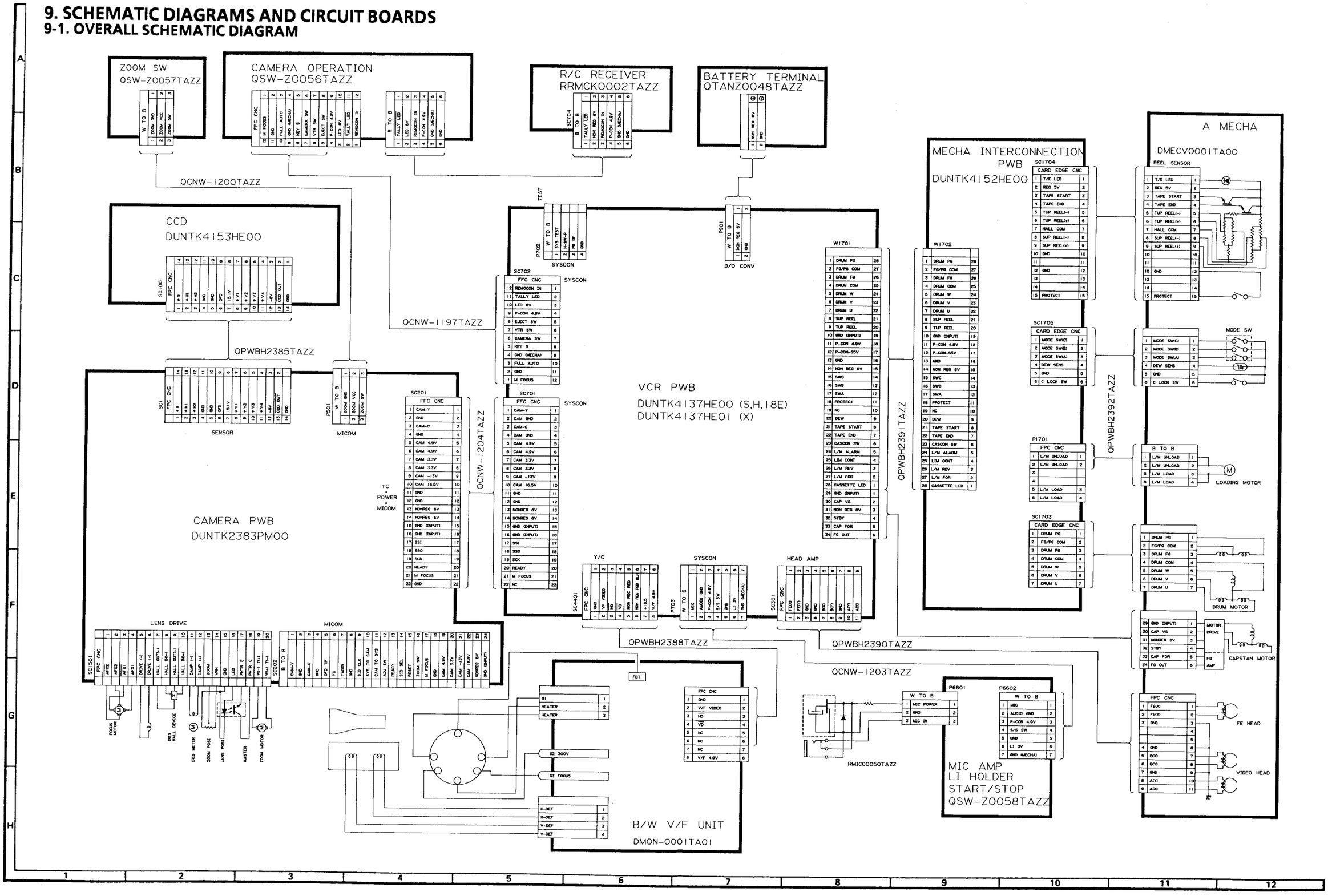
9-3. CCD P.W.B.







9. SCHEMATIC DIAGRAMS AND CIRCUIT BOARDS
9-1. OVERALL SCHEMATIC DIAGRAM



10. REPLACEMENT PARTS LIST/ EXPLODED VIEWS

10-1. ELECTRICAL PARTS LIST

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

⚠ MARK: SAFETY RELATED PARTS

PWB ASSEMBLY IS NOT REPLACEMENT ITEM

Ref. No.	Part No.	★	Description	Code
	DUNTK2383PM00		CAMERA PWB	—
	DUNTK4137HE00		VCR PWB (VL-N1/S/H/N18E)	—
	DUNTK4137HE01		VCR PWB (VL-N1X)	—
	DUNTK4152HE00		MECHA INTERCONNECTION PWB	—
	DUNTK4153HE00		CCD PWB	—
	DUNTK2393PM00		VIEWFINDER PWB	—
	QSW-Z0056TAZZ		CAMERA OPERATION PWB	—
	QSW-Z0058TAZZ		MIC AMP/LI HOLDER/ START • STOP PWB	—
	RRMCK0002TAZZ		R/C PWB	—

Ref. No.	Part No.	★	Description	Code
DUNTK2383PM00 CAMERA PWB				
INTEGRATED CIRCUITS				
IC1	VHiLZ95D56M-1		I.C.	AP
IC2	VHiCXD1250N-1		CXD1250N	AS
IC3	VHiNJ79L08U-1		NJM79L08UA	AD
IC101	VHiHA8144AF-1		HA118144AF	AP
IC102	VHiHD9306AF-1		HD49306AF	AW
IC104	RH-iX0171TAZZ		I.C.	BL
IC105	RH-iX1426CEZZ		TC74HC04AF	AC
IC201	RH-iX1961CEZZ		HD49307	AU
IC501	RH-iX0153TAZZ		I.C.	BA
IC502	VHiCT93L56K-1		I.C.	AM
IC503	VHiPST592iM-1		IC-PST592IMT	AE
IC504	RH-iX0137TAZZ		LR38172	BB
IC505	VHiTCHT707F-1		TC74HCT7007AF	AD
IC1501	VHiMB8346BV-1		MB88346BPFV	AN
IC1502, 1504	VHiNJM2902V-1		NJM2902V	AD
IC1503	VHiMM1179XF-1		I.C.	AK
TRANSISTORS				
Q1	VSXP1501///-1		Transistor	AB
Q2, 4, 103, 105, 201	VSXP6501///-1		Transistor	AB
Q3	VS2SB1462//-1		Transistor	AA
Q101, 202, 204, 501, 1502, 1509	VS2SD2216//-1		Transistor	AA
Q102, 203	VSXP4601///-1		Transistor	AB
Q104	VS2SK94-X3/-1		Transistor	AC
Q106	VS2SC4626C/-1		Transistor	AB
Q1501	VS2SD874AS/-1		Transistor	AC
Q1503, 1508	VSXP1213///-1		Transistor	AB
Q1504	VSUMA7/////-1		Transistor	AC
Q1505	VSXP1215///-1		Transistor	AA
Q1506	VSUMG8/////-1		Transistor	AC
Q1507	VS2SB1132Q/-1		Transistor	AC
Q1510	VSXP6401///-1		Transistor	AB
DIODES AND LED'S				
D1, 4, 5, 7, 1501	VHDMA132K//-1		Diode	AA
D2	VHDMA133///-1		Diode	AB
D3, 101, 501	VHDMA132WA/-1		Diode	AA
D6	VHDMA132WK/-1		Diode	AA

Ref. No.	Part No.	★	Description	Code
PACKAGED CIRCUITS				
X1	RCRSZ0009GEZZ		Crystal	AR
X101	RCRSZ0005TAZZ		Crystal	AU
COIL AND TRANSFORMERS				
CF501	RFiLC0050TAZZ		Filter	AF
L1	VPABM1R0JR82N		Peaking 1µH 5%	AC
L2, 101, 102, 103, 105, 201, 202, 501, 502, 503	VP-1M100K1R6N		Peaking 10µH 10%	AC
L104	VP-1M220K2R9N		Peaking 22µH 10%	AC
L203	VP-1M470K5R4N		Peaking 47µH 10%	AC
L204	VP-1M680K6R9N		Peaking 68µH 10%	AC
CAPACITORS				
C1	VCKYTV1HF154Z		0.15µF 50V Ceramic	AA
C2, 3, 38, 102, 104, 111, 121, 124, 151, 159, 164, 202, 207, 513, 515, 516, 1502, 1518	VCKYCY1HF103Z		0.01µF 50V Ceramic	AA
C4, 16, 205	VCEAPE1VW335M		3.3µF 35V Electrolytic	AB
C5, 1505	VCKYCY1EF104Z		0.1µF 25V Ceramic	AA
C7, 11, 107, 109, 110, 113, 115, 117, 118, 119, 122, 125, 128,	VCKYCY1CF104Z		0.1µF 16V Ceramic	AA
C153, 155, 162, 219, 502, 503, 505, 506, 512, 1521	VCKYCY1CF104Z		0.1µF 16V Ceramic	AA
C12, 1503	VCKYTV1CF105Z		1.0µF 16V Ceramic	AB
C13, 31, 37, 215, 507, 508, 509, 510	VCKYCY1HB102K		1000pF 50V Ceramic	AA
C14, 23, 203	VCEAPE1HW105M		1.0µF 50V Electrolytic	AB
C21	VCEAPE1CW475M		4.7µF 16V Electrolytic	AB
C22	VCEAPE1VW225M		2.2µF 35V Electrolytic	AB
C30, 209, 211	VCCCCY1HH220J		22pF 50V Ceramic	AA
C34, 35, 36, 216	VCCCCY1HH470J		47pF 50V Ceramic	AA
C39, 1506	VCSATA0JJ475M		4.7µF 6.3V Tantalum	AC
C101, 120, 150, 152, 154, 201, 206, 501, 1507	RC-EZ0244TAZZ		Capacitor	AB
C103, 116, 123, 158, 204, 504, 511, 1508	VCEAPE1CW106M		10µF 16V Electrolytic	AB
C105, 156	VCCCCY1HH560J		56pF 50V Ceramic	AA
C106	VCSAPD1CJ105M		1.0µF 16V Tantalum	AC
C108	VCSAPD1DJ474M		0.47µF 20V Tantalum	AD
C112	VCSAPD1DJ684M		0.68µF 20V Tantalum	AC
C114	VCCCCY1HH180J		18pF 50V Ceramic	AA
C126, 127	VCCCCY1HH820J		82pF 50V Ceramic	AA
C130	VCCCCY1HH150J		15pF 50V Ceramic	AA
C160, 161	VCKYTV1EB104K		0.1µF 25V Ceramic	AB
C210	VCCCCY1HH270J		27pF 50V Ceramic	AA
C212	VCCCCY1HH680J		68pF 50V Ceramic	AA
C213,	VCCCCY1HH100D		10pF 50V Ceramic	AA

Ref. No.	Part No.	★	Description	Code
C217	VCCCCY1HH100D		10pF 50V Ceramic	AA
C218	VCCCCY1HH120J		12pF 50V Ceramic	AA
C1504	VCEAPE1EW475M		4.7µF 25V Electrolytic	AB
C1509, 1510	VCKYCY1CB333K		0.033µF 16V Ceramic	AA
C1511, 1512	VCKYTV1EB223K		0.022µF 25V Ceramic	AB
C1513	VCKYTV1CB224K		0.22µF 16V Ceramic	AB
C1517	VCKYCY1HB332K		3300pF 50V Ceramic	AA
C1520	VCKYCY1HB682K		6800pF 50V Ceramic	AA
RESISTORS				
R1, 10, 13	VRS-CY1JF105J		1.0M 0.063W 5% Metal Oxide	AA
R4, 110, 158	VRS-CY1JF274J		270k 0.063W 5% Metal Oxide	AA
R5, 30, 106, 1520	VRS-CY1JF472J		4.7k 0.063W 5% Metal Oxide	AA
R6, 203	VRS-CY1JF271J		270 0.063W 5% Metal Oxide	AA
R7	VRS-CY1JF683J		68k 0.063W 5% Metal Oxide	AA
R9, 102, 112	VRS-CY1JF153J		15k 0.063W 5% Metal Oxide	AA
R11	VRS-CY1JF123F		12k 0.063W 1% Metal Oxide	AA
R12	VRS-CY1JF332F		3.3k 0.063W 1% Metal Oxide	AA
R17	VRS-CA1JF823J		82k 0.063W 5% Metal Oxide	AA
R25	VRS-CY1JF821J		820 0.063W 5% Metal Oxide	AA
R26, 119, 515, 1501, 1528, 1543, 1546	VRS-CY1JF682J		6.8k 0.063W 5% Metal Oxide	AA
R27, 103, 111, 150, 501, 509, 523, 1513, 1534, 1544	VRS-CY1JF103J		10k 0.063W 5% Metal Oxide	AA
R29, 39, 224	VRS-CY1JF332J		3.3k 0.063W 5% Metal Oxide	AA
R31, 32, 1522	VRS-CY1JF331J		330 0.063W 5% Metal Oxide	AA
R33, 518	VRS-CA1JF101J		100 0.063W 5% Metal Oxide	AA
R37	VRS-CA1JF331J		330 0.063W 5% Metal Oxide	AA
R101, 104, 159, 528, 1505	VRS-CY1JF222J		2.2k 0.063W 5% Metal Oxide	AA
R105	VRS-CY1JF272J		2.7k 0.063W 5% Metal Oxide	AA
R107, 108, 157, 504, 1518	VRS-CA1JF103J		10k 0.063W 5% Metal Oxide	AA
R109, 161, 522, 533, 1548	VRS-CY1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R114, 160, 1515	VRS-CY1JF473J		47k 0.063W 5% Metal Oxide	AA
R120	VRS-CY1JF471J		470 0.063W 5% Metal Oxide	AA
R151, 152, 517, 519	VRS-CY1JF101J		100 0.063W 5% Metal Oxide	AA
R155, 220, 511	VRS-CA1JF152J		1.5k 0.063W 5% Metal Oxide	AA
R164	VRS-CY1JF273J		27k 0.063W 5% Metal Oxide	AA
R201	VRS-CA1JF271J		270 0.063W 5% Metal Oxide	AA
R204, 1516	VRS-CY1JF912J		9.1k 0.063W 5% Metal Oxide	AA
R205, 1509	VRS-CY1JF563J		56k 0.063W 5% Metal Oxide	AA
R206, 1535	VRS-CA1JF392J		3.9k 0.063W 5% Metal Oxide	AA
R207, 208, 222, 225, 510	VRS-CA1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R209, 226, 1526	VRS-CY1JF152J		1.5k 0.063W 5% Metal Oxide	AA
R218	VRS-CA1JF473J		47k 0.063W 5% Metal Oxide	AA
R502, 536, 539, 1512	VRS-CY1JF000J		00 0.063W 5% Metal Oxide	AA
R508, 1510, 1514, 1521	VRS-CY1JF223J		22k 0.063W 5% Metal Oxide	AA
R514	VRS-CY1JF242J		2.4k 0.063W 5% Metal Oxide	AA
R516, 526, 1511	VRS-CA1JF223J		22k 0.063W 5% Metal Oxide	AA
R529, 1503	VRS-CA1JF222J		2.2k 0.063W 5% Metal Oxide	AA
R1502	VRS-CY1JF104J		100k 0.063W 5% Metal Oxide	AA
R1504, 1506	VRS-CY1JF224J		220k 0.063W 5% Metal Oxide	AA

Ref. No.	Part No.	★	Description	Code
R1507	VRS-CY1JF822J		8.2k 0.063W 5% Metal Oxide	AA
R1508	VRS-CY1JF8R2J		8.2 0.063W 5% Metal Oxide	AA
R1517	VRS-CY1JF184J		180k 0.063W 5% Metal Oxide	AA
R1519	VRS-CY1JF474J		470k 0.063W 5% Metal Oxide	AA
R1523	VRS-CY1JF562J		5.6k 0.063W 5% Metal Oxide	AA
R1524	VRS-CA1JF821J		820 0.063W 5% Metal Oxide	AA
R1527, 1530	VRS-CY1JF333J		33k 0.063W 5% Metal Oxide	AA
R1529	VRS-CY1JF225J		2.2M 0.063W 5% Metal Oxide	AA
R1531	VRS-CY1JF393J		39k 0.063W 5% Metal Oxide	AA
R1532	VRS-CY1JF392J		3.9k 0.063W 5% Metal Oxide	AA
R1537	VRS-CY1JF180J		18 0.063W 5% Metal Oxide	AA
R1539, 1540	VRS-CY1JF123J		12k 0.063W 5% Metal Oxide	AA
R1541	VRS-CA1JF124J		120k 0.063W 5% Metal Oxide	AA
R1545	VRS-CY1JF244F		240k 0.063W 1% Metal Oxide	AA
R1547	VRS-CY1JF153F		15k 0.063W 1% Metal Oxide	AA

MISCELLANEOUS PARTS

P501	QPLGN0364TAZZ		Plug	AC
SC1	QSOCN1453TAZZ		Socket	AE
SC201	QSOCN2248TAZZ		Socket	AF
SC202	QCNCW2445TAZZ		Connector	AF
SC1501	QSOCN2047TAZZ		Socket	AE

CABINET PARTS

TP1, 2, 3	QLUGP0111TAFW		Lug	AA

DUNTK4137HE00 VCR PWB (VL-N1S/H/N18E)
DUNTK4137HE01 VCR PWB (VL-N1X)

INTEGRATED CIRCUITS

IC301	VHiCXA1202R-1		CXA1202R	AR
IC401	VHiHA118272-1		HA118272F	AX
IC602	VHiLA7454W/-1		LA7454W	AT
IC701	RH-iX0156TAZZ		I.C.	AY
IC702	VHiS8420AF/-1		S-8420AF-T1	AL
IC703	VHiTC7S08F/-1		TC7S08F	AC
IC704	RH-iX0158TAZZ		I.C.	AN
IC901	VHiMB3785V/-1		MB3785APFV	AQ
IC902	VHiBA9701F/-1		BA9701F	AF
IC1701	VHiXR10813/-1		XR10813CQ	AV
IC1702	VHiNJM2904M-1		NJM2904M	AE
IC1705	VHiLB1880M/1E		I.C.	AQ
IC4420	VHiMM1031XM-1		MM1031XMR	AF
IC4422	VHiBA7603F/-1		BA7603F	AF
IC4460	VHiCXL1506M-1		CXL1506ohm	AT
IC4501	VHiCXA1203N-1		CXA1203N	AT

TRANSISTORS

Q301, 302, 4341, 4426	VSXP6501///-1		Transistor	AB
Q304, 421, 1303, 4402	VSRN1104///-1		Transistor	AA
Q460, 463	VSRN1102///-1		Transistor	AA
Q461, 4430	VSRN1701///-1		Transistor	AB
Q462, 903, 911, 913, 4340, 4381, 4462	VS2SC4738Y/-1		Transistor	AA
Q603	VSDTC323TK/-1		Transistor	AB
Q604, 712	VSRN4604///-1		Transistor	AB
Q701, 702, 703, 704, 906	VSXP4213///-1		Transistor	AB
Q715	VSXP4111///-1		Transistor	AB
Q901, 905	VS2SB1302S/-1		Transistor	AD
Q902	VS2SA1298Y/-1		Transistor	AB
Q904	VS2SB1121T/-1		Transistor	AC
Q907, 908, 909	VSFP101////-1		Transistor	AD
Q910	VSXP4113///-1		Transistor	AA
Q914	VS2SB1123T/-1		Transistor	AA
Q1301, 1302	VS2SA1037KQ-1		Transistor	AA
Q1702	VSUMT1/////-1		Transistor	AC
Q4320, 4321, 4425, 4464, 4555	VSXP4601///-1		Transistor	AB
Q4360, 4427, 4463, 4483, 4552	VS2SA1832Y/-1		Transistor	AA
Q4401, 4557	VSXP1213///-1		Transistor	AB
Q4424	VS2SC3938//-1		Transistor	AC
Q4429,	VSRN2104///-1		Transistor	AA

Ref. No.	Part No.	★	Description	Code
Q4502	VSRN2104///-1		Transistor	AA
Q4432, 4484	VSXP4401///-1		Transistor	AB
DIODES AND LED'S				
D701, 704, 4403	VHDMA132WK/-1		Diode	AA
D702	VHDMA132K//-1		Diode	AA
D703, 903, 904, 4421	VHDMA132WA/-1		Diode	AA
D901	VHDSFPB54//2E		Diode	AC
D902	VHDDA227///-1		Diode	AB
D4342	VHDMA147///-1		Diode	AB
D4423	VHDMA133///-1		Diode	AB
PACKAGED CIRCUITS				
X460	RCRSC0028TAZZ		Crystal	AK
X701	RCRSC0023TAZZ		Crystal	AG
X702	RCRSC0019TAZZ		Crystal	AG
COIL AND TRANSFORMERS				
CF901	RFiLC0044TAZZ		Filter	AE
FL463	RCiLV0057TAZZ		Coil	AE
FL467	RCiLV0056TAZZ		Coil	AE
FL701	RCiLB0007GEZZ		Oscillation Coil	AE
FL4463	RCiLV0060TAZZ		Coil	AH
FL4550	RCiLV0051TAZZ		Coil	AE
L301, 302, 303	VP-WM221K8R4N		Peaking 220µH 10%	AB
L304, 914	VP-NM100KR42N		Peaking 10µH 10%	AB
L401, 402, 4301, 4421, 4461, 4501	VP-NM330K1R4N		Peaking 33µH 10%	AB
L420, 4360	VP-1M151K110N		Peaking 150µH 10%	AC
L461	VP-1M680K6R9N		Peaking 68µH 10%	AC
L462	VP-1M330K4R2N		Peaking 33µH 10%	AC
L464, 4343	VP-1M181K130N		Peaking 180µH 10%	AC
L465	VP-JM822J101N		Peaking 8200µH 5%	AD
L469, 4340, 4381	VP-1M221K170N		Peaking 220µH 10%	AC
L603	VP-NM101K4R2N		Peaking 100µH 10%	AC
L701, 702, 1701	VP-NM220K1R0N		Peaking 22µH 10%	AB
L901,	RCiLP0164TAZZ		Coil	AE
L909	RCiLP0164TAZZ		Coil	AE
L902	RCiLP0168TAZZ		Coil	AF
L903	VP-JM180KR27N		Peaking 18µH 10%	AD
L905	VP-JM220KR33N		Peaking 22µH 10%	AD
L907, 910	RCiLP0180TAZZ		Coil	AD
L908	VP-QM220KR64N		Peaking 22µH 10%	AC
L911	RCiLP0179TAZZ		Coil	AD
L912, 913	VP-NM470K2R0N		Peaking 47µH 10%	AB
L1301, 4345	VPABM100J2R6N		Peaking 10µH 5%	AC
L1302, 4320	VPABM101J160N		Peaking 100µH 5%	AC
L1703, 1704	VPAEM1R0KR35N		Peaking 1µH 10%	AB
L4321, 4341, 4382	VP-1M331J260N		Peaking 330µH 5%	AC
L4322	VPABM8R2J2R3N		Peaking 8.2µH 5%	AC
L4342	VPABM4R7J1R7N		Peaking 4.7µH 5%	AC
L4344	VPABM470J8R3N		Peaking 47µH 5%	AC
L4380	VP-VM821J260N		Peaking 820µH 5%	AC
L4384	VPABM6R8J2R0N		Peaking 6.8µH 5%	AC
L4420	VPABM680J120N		Peaking 68µH 5%	AC
L4460	VPABM220J4R1N		Peaking 22µH 5%	AC
L4462	VP-1M560K6R2N		Peaking 56µH 10%	AC
T901	RTRNZ0069TAZZ		Transformer	AG
CONTROLS				
R327, 328	RVR-M8036TAZZ		Variable Resistor	AC
R407, 414, 418, 430, 608, 627	RVR-M8032TAZZ		Variable Resistor	AC
R431	RVR-M8031TAZZ		Variable Resistor	AC
R722, 723	RVR-M8034TAZZ		Variable Resistor	AC
R903, 4325, 4364	RVR-M8026TAZZ		Variable Resistor	AC
R943	RVR-M8023TAZZ		Variable Resistor	AC
R4497, 4499	RVR-M8025TAZZ		Variable Resistor	AC
CAPACITORS				
C301, 306, 405	VCSATA0JJ106M		10µF 6.3V Tantalum	AD
C303	VCSATE1AJ106M		10µF 10V Tantalum	AD
C304, 325, 327, 329, 331, 425,	VCKYCY1CF104Z		0.1µF 16V Ceramic	AA

Ref. No.	Part No.	★	Description	Code
C701, 703, 705, 719, 720, 906, 935, 1307, 1755, 4468	VCKYCY1CF104Z		0.1µF 16V Ceramic	AA
C307, 308, 309, 310, 312, 313, 426, 429, 485, 710, 917, 932, 934, 942, 949, 950, 1301, 1721, 1745	VCKYTV1EB104K		0.1µF 25V Ceramic	AB
C311, 314, 473, 1702, 1715, 1716	VCKYCY1EB103K		0.01µF 25V Ceramic	AA
C315, 316, 317, 318, 322, 323, 324, 332, 402, 404, 406, 407, 408, 409, 410, 437, 463, 466, 469, 472, 477, 486, 606, 615, 626, 1701, 1704, 1707, 4302, 4303, 4320, 4326, 4346, 4347, 4348, 4350, 4360, 4422, 4423, 4424, 4425, 4432, 4438, 4461, 4463, 4466, 4467, 4477, 4502, 4509, 4511, 4552, 4554	VCKYCY1HF103Z		0.01µF 50V Ceramic	AA
C320, 620	VCKYCY1CF473Z		0.047µF 16V Ceramic	AA
C326, 328, 4508	VCSATA1AJ475M		4.7µF 10V Tantalum	AC
C401, 403, 476, 607, 4301, 4431	VCEAPF0JW476M		47µF 6.3V Electrolytic	AB
C420, 461, 4470	VCSAPD0JJ335M		3.3µF 6.3V Tantalum	AC
C421	VCEAPF1VW475M		4.7µF 35V Electrolytic	AB
C422, 1748, 4506	VCSAPD1CJ105M		1.0µF 16V Tantalum	AC
C423	VCEAPF1CW106M		10µF 16V Electrolytic	AB
C424, 616	VCEAPF0GW476M		47µF 4.0V Electrolytic	AB
C428	VCCCTV1HH331J		330pF 50V Ceramic	AA
C430, 945	VCCCCY1HH181J		180pF 50V Ceramic	AA
C432, 4551	VCCCCY1HH6R0D		6.0pF 50V Ceramic	AA
C434, 480, 4389	VCCCCY1HH121J		120pF 50V Ceramic	AA
C435, 4349, 4489, 4504	VCCCCY1HH100D		10pF 50V Ceramic	AA
C438	VCCCCY1HH5R0C		5.0pF 50V Ceramic	AA
C439	VCCCCY1HH1R0C		1.0pF 50V Ceramic	AA
C464, 475, 625, 4488	VCCCCY1HH560J		56pF 50V Ceramic	AA
C465, 4471	VCCCCY1HH220J		22pF 50V Ceramic	AA
C467	VCSAPD1VJ154M		0.15µF 35V Tantalum	AC
C470	VCCCCY1HH8R0D		8.0pF 50V Ceramic	AA
C471, 483, 931, 933	VCKYCY1EB223K		0.022µF 25V Ceramic	AA

Ref. No.	Part No.	★	Description	Code
C474	VCKYCY1CB473K		0.047µF 16V Ceramic	AA
C479	VCSAPD0JJ225M		2.2µF 6.3V Tantalum	AD
C481, 1712	VCKYCY1HB472K		4700pF 50V Ceramic	AA
C482	VCSAPD1EJ474M		0.47µF 25V Tantalum	AD
C484	VCSAPD1CJ684M		0.68µF 16V Tantalum	AC
C609, 630, 640, 644, 717, 905, 953, 1752, 1753, 1754, 4429, 4430, 4433, 4435, 4465, 4499, 4512	VCKYTV1CF105Z		1.0µF 16V Ceramic	AB
C610, 612, 638, 724	VCEAPH1EW475M		4.7µF 25V Electrolytic	AB
C611	VCEAPF0GW336M		33µF 4.0V Electrolytic	AB
C613, 636, 702, 704, 707, 1703, 1750, 1751	VCEAPH1CW106M		10µF 16V Electrolytic	AB
C619, 621	VCKYCY1CF333Z		0.033µF 16V Ceramic	AA
C624, 1705, 4380	VCKYCY1HB152K		1500pF 50V Ceramic	AA
C627, 628, 635	VCKYCY1HB222K		2200pF 50V Ceramic	AA
C633, 634	VCEAPH0JW226M		22µF 6.3V Electrolytic	AB
C637	VCEAPH1HW105M		1.0µF 50V Electrolytic	AB
C639	VCCCCY1HH221J		220pF 50V Ceramic	AA
C642	VCEAPF1HW225M		2.2µF 50V Electrolytic	AB
C643	VCEAPH1HW225M		2.2µF 50V Electrolytic	AB
C706	VCEAPT1CN107M		100µF 16V Electrolytic	AD
C709	VCKYTQ1CB334K		0.33µF 16V Ceramic	AB
C711, 712, 4434	VCCCCY1HH180J		18pF 50V Ceramic	AA
C714, 721, 4345	VCCCCY1HH271J		270pF 50V Ceramic	AA
C715, 716, 726, 727, 728, 918, 922,	VCKYCY1HB102K		1000pF 50V Ceramic	AA
C923, 924, 925, 926, 927, 928, 929, 943, 1308, 1722, 4464, 4469, 4510	VCKYCY1HB102K		1000pF 50V Ceramic	AA
C722, 4323	VCCCCY1HH120J		12pF 50V Ceramic	AA
C723, 4327	VCCCCY1HH150J		15pF 50V Ceramic	AA
C725, 1706, 1710, 1711, 1724, 1741	VCKYCY1EF104Z		0.1µF 25V Ceramic	AA
C901	VCEAPT1CN226M		22µF 16V Electrolytic	AC
C902	RC-EZ0117GEZZ		Capacitor	AE
C903, 904, 911, 913, 914, 915, 916	VCEAPT1AN107M		100µF 10V Electrolytic	AD
C907	VCEAPF0JW226M		22µF 6.3V Electrolytic	AB
C908, 912	VCEAPT0JN107M		100µF 6.3V Electrolytic	AD
C910	VCKYTV1HB223K		0.022µF 50V Ceramic	AB
C920, 1720	VCKYCY1HB682K		6800pF 50V Ceramic	AA
C921	VCKYTV1HB153K		0.015µF 50V Ceramic	AA
C936, 4505	VCCCCY1HH331J		330pF 50V Ceramic	AA
C937, 938, 4513	VCCCCY1HH471J		470pF 50V Ceramic	AA
C944	VCKYCY1HB221K		220pF 50V Ceramic	AA
C946, 4351, 4361	VCCCCY1HH820J		82pF 50V Ceramic	AA
C947	VCEAPT1EN336M		33µF 25V Electrolytic	AC
C948	VCEAPT1EN106M		10µF 25V Electrolytic	AC
C1302, 1304, 1305, 4322, 4478, 4503	VCCCCY1HH101J		100pF 50V Ceramic	AA
C1303, 4324	VCCCCY1HH151J		150pF 50V Ceramic	AA
C1708, 1709	VCKYCY1HB471K		470pF 50V Ceramic	AA
C1726	VCFYEC1CM104J		0.1µF 16V	AD
C1740	VCKYTV1EB683K		0.068µF 25V Ceramic	AB
C1742, 1743, 1744	VCKYCY1EB153K		0.015µF 25V Ceramic	AA
C1749	VCKYTV1EB473K		0.047µF 25V Ceramic	AB
C1760, 1761,	VCKYCY1HF333Z		0.033µF 50V Ceramic	AA

Ref. No.	Part No.	★	Description	Code
C1762	VCKYCY1HF333Z		0.033µF 50V Ceramic	AA
C4321	VCCCCY1HH470J		47pF 50V Ceramic	AA
C4328, 4340, 4381	VCCCCY1HH390J		39pF 50V Ceramic	AA
C4341, 4382	VCCCCY1HH330J		33pF 50V Ceramic	AA
C4344	VCCCCY1HH680J		68pF 50V Ceramic	AA
C4420, 4421	VCEAPF0GW227M		220µF 4.0V Electrolytic	AB
C4436	VCCCCY1HH270J		27pF 50V Ceramic	AA
C4460, 4462	VCSAPD1AJ155M		1.5µF 10V Tantalum	AD
C4501	VCSATA1AJ335M		3.3µF 10V Tantalum	AC
RESISTORS				
R301, 1742, 1743, 1744	VRS-CY1JF683J		68k 0.063W 5% Metal Oxide	AA
R302, 306, 314, 703, 726, 765, 769, 1729, 4326, 4442	VRS-CY1JF473J		47k 0.063W 5% Metal Oxide	AA
R303, 312, 610, 713, 724, 938, 1305, 1707, 1716, 1717, 4352, 4353	VRS-CY1JF223J		22k 0.063W 5% Metal Oxide	AA
R304, 313	VRS-CY1JF202J		2.0k 0.063W 5% Metal Oxide	AA
R305, 310, 1746, 4417, 4492	VRS-CY1JF563J		56k 0.063W 5% Metal Oxide	AA
R307, 308, 460, 465, 499, 607, 616, 747, 964, 968, 969, 1754, 4365, 4413,	VRS-CY1JF000J		00 0.063W 5% Metal Oxide	AA
R4462, 4464, 4469, 4598	VRS-CY1JF000J		00 0.063W 5% Metal Oxide	AA
R309, 467, 901	VRS-CY1JF153J		15k 0.063W 5% Metal Oxide	AA
R311, 331	VRS-CY1JF3R3J		3.3 0.063W 5% Metal Oxide	AA
R315, 4468, 4476	VRS-CY1JF182J		1.8k 0.063W 5% Metal Oxide	AA
R316, 330, 764, 4329	VRS-CY1JF822J		8.2k 0.063W 5% Metal Oxide	AA
R319, 321, 402, 405, 420, 464, 472, 603, 715, 717, 759, 908, 963, 4322, 4340, 4341, 4344, 4351, 4380, 4387, 4428, 4429, 4430, 4433, 4434, 4467, 4474, 4477, 4478, 4490, 4493, 4494, 4495, 4510, 4514, 4551, 4555, 4556, 4557, 4560, 4562	VRS-CY1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R320, 323, 324, 423, 1701, 4403, 4404, 4475, 4489, 4498	VRS-CY1JF222J		2.2k 0.063W 5% Metal Oxide	AA

Ref. No.	Part No.	★	Description	Code
R322, 1304, 4360, 4422, 4432	VRS - CY1JF221J		220 0.063W 5% Metal Oxide	AA
R325, 413, 426, 932, 966, 4335, 4427, 4431, 4488	VRS - CY1JF332J		3.3k 0.063W 5% Metal Oxide	AA
R329, 332, 4418	VRS - CY1JF681J		680 0.063W 5% Metal Oxide	AA
R333, 411, 422, 424, 710, 741, 748, 904, 936, 937, 4405, 4425, 4459	VRS - CY1JF472J		4.7k 0.063W 5% Metal Oxide	AA
R401	VRS - CA1JF683J		68k 0.063W 5% Metal Oxide	AA
R406, 473, 961, 4349, 4354, 4441	VRS - CY1JF272J		2.7k 0.063W 5% Metal Oxide	AA
R410, 498, 614, 618, 628, 704, 705, 721, 728, 730, 732, 734, 735, 736, 761, 950, 967, 1713, 1725, 1728, 1741, 1760, 4320, 4321, 4328, 4487, 4501, 4504, 4565	VRS - CY1JF103J		10k 0.063W 5% Metal Oxide (VL-N1S/H/N18E) (VL-N1X)	AA
R412, 419,	VRS - CY1JF183J		18k 0.063W 5% Metal Oxide	AA
R468	VRS - CY1JF183J		18k 0.063W 5% Metal Oxide	AA
R415, 725	VRS - CY1JF123J		12k 0.063W 5% Metal Oxide	AA
R417, 425, 428, 615, 933, 939, 962, 1714, 1745	VRS - CY1JF682J		6.8k 0.063W 5% Metal Oxide	AA
R421, 799, 1303	VRS - CY1JF271J		270 0.063W 5% Metal Oxide	AA
R427	VRS - CY1JF302J		3.0k 0.063W 5% Metal Oxide	AA
R429, 4350, 4505	VRS - CY1JF562J		5.6k 0.063W 5% Metal Oxide	AA
R432	VRS - CY1JF163J		16k 0.063W 5% Metal Oxide	AA
R433, 940, 1705, 4437, 4447, 4460	VRS - CY1JF105J		1.0M 0.063W 5% Metal Oxide	AA
R434	VRS - CY1JF151J		150 0.063W 5% Metal Oxide	AA
R466	VRS - CY1JF512J		5.1k 0.063W 5% Metal Oxide	AA
R605, 617, 906, 934, 1306, 4491, 4558, 4559	VRS - CY1JF333J		33k 0.063W 5% Metal Oxide	AA
R609	VRS - CY1JF133F		13k 0.063W 1% Metal Oxide	AA
R611	VRS - CY1JF155J		1.5M 0.063W 5% Metal Oxide	AA
R612, 625, 1302, 1751, 4323, 4324, 4333, 4348, 4479	VRS - CY1JF561J		560 0.063W 5% Metal Oxide	AA
R613, 706, 930, 935, 949, 4356, 4566	VRS - CY1JF152J		1.5k 0.063W 5% Metal Oxide	AA
R624	VRS - CY1JF224J		220k 0.063W 5% Metal Oxide	AA
R701	VRS - CB1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R708, 4334	VRS - CY1JF101J		100 0.063W 5% Metal Oxide	AA

Ref. No.	Part No.	★	Description	Code
R709, 754, 924, 4471	VRS-CY1JF334J		330k 0.063W 5% Metal Oxide	AA
R711, 738, 952, 965, 1708, 4503, 4506, 4516, 4517, 4518	VRS-CY1JF104J		100k 0.063W 5% Metal Oxide	AA
R712	VRS-CA1JF223J		22k 0.063W 5% Metal Oxide	AA
R716, 729, 737, 742, 743, 758, 1702	VRS-CA1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R718, 755, 762, 1727	VRS-CA1JF103J		10k 0.063W 5% Metal Oxide	AA
R719	VRS-CB1JF103J		10k 0.063W 5% Metal Oxide	AA
R727	VRS-CA1JF822J		8.2k 0.063W 5% Metal Oxide	AA
R731, 4466	VRS-CY1JF823J		82k 0.063W 5% Metal Oxide	AA
R740	VRS-CY1JF684J		680k 0.063W 5% Metal Oxide	AA
R749, 750	VRS-CY1JF332F		3.3k 0.063W 1% Metal Oxide	AA
R770, 4458	VRS-CY1JF392F		3.9k 0.063W 1% Metal Oxide	AA
R771, 772	VRS-CY1JF682F		6.8k 0.063W 1% Metal Oxide	AA
R905	VRS-TV1JD821J		820 0.063W 5% Metal Oxide	AA
R907, 4402	VRS-CY1JF392J		3.9k 0.063W 5% Metal Oxide	AA
R909	VRS-TV1JD2R2J		2.2 0.063W 5% Metal Oxide	AA
R910, 927	VRS-TV1JD471J		470 0.063W 5% Metal Oxide	AA
R911	VRN-CY1JF153D		15k 0.063W 0.5% Metal Film	AA
R912	VRN-CY1JF912D		9.1k 0.063W 0.5% Metal Film	AA
R915	VRS-CY1JF824J		820k 0.063W 5% Metal Oxide	AA
R916, 942	VRS-CY1JF474J		470k 0.063W 5% Metal Oxide	AA
R917, 918	VRN-CY1JF472D		4.7k 0.063W 0.5% Metal Film	AA
R919, 920, 925, 941	VRS-CY1JF274J		270k 0.063W 5% Metal Oxide	AA
R921, 960	VRS-CA1JF472J		4.7k 0.063W 5% Metal Oxide	AA
R923, 948	VRS-CY1JF154J		150k 0.063W 5% Metal Oxide	AA
R926	VRS-TV1JD101J		100 0.063W 5% Metal Oxide	AA
R928, 929	VRS-TV1JD271J		270 0.063W 5% Metal Oxide	AA
R944	VRS-CY1JF242F		2.4k 0.063W 1% Metal Oxide	AA
R945	VRS-CY1JF472F		4.7k 0.063W 1% Metal Oxide	AA
R946	VRS-CY1JF273F		27k 0.063W 1% Metal Oxide	AA
R951	VRS-TV1JD681J		680 0.063W 5% Metal Oxide	AA
R1301	VRS-CY1JF220J		22 0.063W 5% Metal Oxide	AA
R1712, 1747	VRS-CY1JF394J		390k 0.063W 5% Metal Oxide	AA
R1724	VRS-CA1JF104J		100k 0.063W 5% Metal Oxide	AA
R1748, 4448	VRS-CY1JF393J		39k 0.063W 5% Metal Oxide	AA
R1752, 1753	VRS-TV1JD1R0J		1.0 0.063W 5% Metal Oxide	AA
R4327, 4347, 4553	VRS-CY1JF331J		330 0.063W 5% Metal Oxide	AA
R4331, 4332, 4346	VRS-CY1JF471J		470 0.063W 5% Metal Oxide	AA
R4343, 4438, 4597	VRS-CY1JF821J		820 0.063W 5% Metal Oxide	AA
R4355, 4473	VRS-CY1JF391J		390 0.063W 5% Metal Oxide	AA
R4421	VRS-CY1JF750J		75 0.063W 5% Metal Oxide	AA
R4424, 4426	VRS-CY1JF122J		1.2k 0.063W 5% Metal Oxide	AA
R4435	VRS-CY1JF273J		27k 0.063W 5% Metal Oxide	AA
R4450, 4455, 4456	VRS-CY1JF152F		1.5k 0.063W 1% Metal Oxide	AA
R4451	VRS-CY1JF162F		1.6k 0.063W 1% Metal Oxide	AA
R4472	VRS-CY1JF564J		560k 0.063W 5% Metal Oxide	AA

MISCELLANEOUS PARTS

Ref. No.	Part No.	★	Description	Code
⚠F901	QFS-L3124TAZZ		Fuse 3.15A	AE
P702	QPLGN0463TAZZ		Plug	AC
P703	QPLGN0764TAZZ		Plug	AD
P901	QPLGN0265TAZZ		Plug	AD
SC301	QSOCN0948TAZZ		Socket	AD
SC701	QSOCN2247TAZZ		Socket	AF
SC702	QSOCN1236TAZZ		Socket	AD
SC4401	QSOCN0853TAZZ		Socket	AE

Ref. No.	Part No.	★	Description	Code
CABINET PARTS				
TP301, 401, 402, 420, 461, 462, 463, 601, 603, 606, 701, 703, 704, 705, 706, 707, 902, 903, 904, 906, 907, 4320, 4321, 4360, 4420, 4421	QLUGP0111TAFW		Lug	AA
DUNTK4152HE00 MECHA INTERCONNECTION PWB				
INTEGRATED CIRCUITS				
IC1703	VHiNJM2902V-1		NJM2902V	AD
IC1704	VHiMPC1727V-1		I.C.	AH
TRANSISTORS				
Q1701	VSRN1104///-1		Transistor	AA
Q1703	VSXP6501///-1		Transistor	AB
Q1704	VSXN4501///-1		Transistor	AB
Q1708	VS2SB1121T/-1		Transistor	AC
Q1710	VS2SD2216//-1		Transistor	AA
CAPACITORS				
C1730	VCKYTV1CF105Z		1.0µF 16V Ceramic	AB
C1771, 1772, 1776	VCKYCY1HF103Z		0.01µF 50V Ceramic	AA
C1773, 1774, 1783, 1784	VCEAPH1CW106M		10µF 16V Electrolytic	AB
C1777	VCCCCY1HH330J		33pF 50V Ceramic	AA
C1778	VCKYCY1EF104Z		0.1µF 25V Ceramic	AA

Ref. No.	Part No.	★	Description	Code
RESISTORS				
R1730	VRS-CY1JF183J		18k 0.063W 5% Metal Oxide	AA
R1731	VRS-CY1JF154J		150k 0.063W 5% Metal Oxide	AA
R1732	VRS-CY1JF682J		6.8k 0.063W 5% Metal Oxide	AA
R1733	VRS-CY1JF273F		27k 0.063W 1% Metal Oxide	AA
R1764	VRS-CY1JF124J		120k 0.063W 5% Metal Oxide	AA
R1765	VRS-CA1JF222J		2.2k 0.063W 5% Metal Oxide	AA
R1767	VRS-CY1JF823J		82k 0.063W 5% Metal Oxide	AA
R1769, 1772	VRS-CA1JF104J		100k 0.063W 5% Metal Oxide	AA
R1770, 1773	VRS-CY1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R1771	VRS-TV1JD331J		330 0.063W 5% Metal Oxide	AA
R1774, 1783, 1784	VRS-CY1JF104J		100k 0.063W 5% Metal Oxide	AA
R1780	VRS-CY1JF101J		100 0.063W 5% Metal Oxide	AA
R1782, 1785	VRS-CA1JF103J		10k 0.063W 5% Metal Oxide	AA
R1786	VRS-CY1JF103J		10k 0.063W 5% Metal Oxide	AA
MISCELLANEOUS PARTS				
SC1701	QSOCN0648TAZZ		Socket	AE
SC1703	QSOCN0758TAZZ		Socket	AE
SC1704	QSOCN1563TAZZ		Socket	AG
SC1705	QSOCN0658TAZZ		Socket	AE
DUNTK4153HE00 CCD PWB				
TRANSISTORS				
Q1001	VS2SK160///-1		Transistor	AD
CAPACITORS				
C1001	VCEAPH1HW225M		2.2µF 50V Electrolytic	AB
C1002, 1004, 1005, 1007	VCKYCY1HF103Z		0.01µF 50V Ceramic	AA
C1003, 1006, 1008	VCEAPH1VW335M		3.3µF 35V Electrolytic	AB

Ref. No.	Part No.	★	Description	Code
RESISTORS				
R1001	VRS-CY1JF220J		22 0.063W 5% Metal Oxide	AA
R1002	VRS-CY1JF332J		3.3k 0.063W 5% Metal Oxide	AA
R1003	VRS-CY1JF822J		8.2k 0.063W 5% Metal Oxide	AA
MISCELLANEOUS PARTS				
SC1001	QSOCN1447TAZZ		Socket	AE
DUNTK2393PM00 Viewfinder PWB				
INTEGRATED CIRCUITS				
IC800	VHiBA7149F/-1		BA7149F	AH
TRANSISTORS				
Q800	VS2SB792R//-1		2SB792R	AD
⚠Q801	VS2SC4132Q/-1		2SC4132Q	AD
DIODES AND LED'S				
D800	VHDDAN202U/-1		Diode	AA
⚠D801	RH-DX0171TAZZ		Diode	AC
COIL AND TRANSFORMERS				
⚠L800	RCiLZ0277TAZZ		Coil	AG
L801	VP-WM101K3R5N		Peaking 100µH 10%	AB
⚠T800	RTRNF1921CEZZ		H-VOLT Transformer	AU
CONTROLS				
R811	RVR-M7789TAZZ		Variable Resistor	AC
⚠R816	RVR-M8019TAZZ		Variable Resistor	AD
⚠R819	RVR-M8115TAZZ		Variable Resistor	AD
CAPACITORS				
C800	VCKYCY1HB102K		1000pF 50V Ceramic	AA
C801	VCFYEC1CM104J		0.1µF 16V	AD
C803	RC-EZ0191TAZZ		Capacitor	AC
C804	VCKYTQ1CF105Z		1.0µF 16V Ceramic	AC
C805	VCSAPD1CJ105M		1.0µF 16V Tantalum	AC
C807, 809	VCEAPF0JW107M		100µF 6.3V Electrolytic	AC
C808	VCCCCY1HH560J		56pF 50V Ceramic	AA
C810	VCKYTV1CF105Z		1.0µF 16V Ceramic	AB
C811	RC-EZ0228TAZZ		Capacitor	AB
⚠C812, 813	VCCSTQ2AL272J		2700pF 100V Ceramic	AB
C814	VCKYTV1HB223K		0.022µF 50V Ceramic	AB
C815	VCEAPF1HW335M		3.3µF 50V Electrolytic	AB
⚠C816	RC-KZ0018TAZZ		Capacitor	AA
RESISTORS				
R800	VRS-CY1JF183F		18k 0.063W 1% Metal Oxide	AA
R801	VRS-CY1JF393J		39k 0.063W 5% Metal Oxide	AA
R802	VRS-TV1JD270J		27 0.063W 5% Metal Oxide	AA
R803	VRS-CY1JF394J		390k 0.063W 5% Metal Oxide	AA
R804	VRS-CY1JF104F		100k 0.063W 1% Metal Oxide	AA
R805	VRS-CY1JF153F		15k 0.063W 1% Metal Oxide	AA
R806	VRS-CY1JF162F		1.6k 0.063W 1% Metal Oxide	AA
R807	VRS-CY1JF362F		3.6k 0.063W 1% Metal Oxide	AA
R808	VRS-CY1JF392J		3.9k 0.063W 5% Metal Oxide	AA
R809	VRS-CY1JF183J		18k 0.063W 5% Metal Oxide	AA
R810	VRS-TQ2BD3R3J		3.3 1/8W 5% Metal Oxide	AA
R812	VRS-TV1JD3R9J		3.9 0.063W 5% Metal Oxide	AA
R813	VRS-TV1JD222J		2.2k 0.063W 5% Metal Oxide	AA
R814	VRS-CY1JF120J		12 0.063W 5% Metal Oxide	AA
R815	VRS-CY1JF105J		1.0M 0.063W 5% Metal Oxide	AA
R817, 818	VRS-TV1JD335J		3.3M 0.063W 5% Metal Oxide	AA
MISCELLANEOUS PARTS				
S800	QSOCN0648TAZZ		Socket	AE

Ref. No.	Part No.	★	Description	Code

QSW-Z0056TAZZ CAMERA OPERATION PWB

RESISTORS

R2750	VRD-RA2BE103J	10k 0.2W 5% Carbon	AA
R2752	VRD-RA2BE562J	5.6k 0.2W 5% Carbon	AA
R2753	VRD-RA2BE332J	3.3k 0.2W 5% Carbon	AA
R2754	VRD-RA2BE222J	2.2k 0.2W 5% Carbon	AA
R2755	VRD-RA2BE152J	1.5k 0.2W 5% Carbon	AA
R2756	VRD-RA2BE122J	1.2k 0.2W 5% Carbon	AA

MISCELLANEOUS PARTS

P2751	QCNCM0650TAZZ	CON 1	
SC2751	QSOCN1240TAZZ	CON 2	
SW2750, 2751, 2753, 2754, 2757, 2758	QSW-K0019TAZZ	Low Sound Push SW	
SW2755, 2756	QSW-K0018TAZZ	Normal Push SW	
SW2759	QSW-S0104TAZZ	Self Return Slide SW	
SW2760	QSW-S0105TAZZ	2 Posi. Slide SW	
SW2761	QSW-S0106TAZZ	3 Posi. Slide SW	

QSW-Z0058TAZZ MIC AMP/ LI HOLDER/ START · STOP PWB

INTEGRATED CIRCUIT

IC6601	VHiXRA4558/-1	OP. AMP IC 1	

TRANSISTOR

Q6601	VS2SC4738Y/-1	Transistor Q1	AA

Ref. No.	Part No.	★	Description	Code

CAPACITORS

C6601	VCKYTV1CF105Z	1µF 16V Ceramic	AB
C6602	VCKYTV1HB102K	1000pF 50V Ceramic	AA
C6603	VCCCTV1HH6R0D	6pF 50V Ceramic	AA
C6604	VCKYTV1CF105Z	1µF 16V Ceramic	AB
C6605	RC-EZ0244TAZZ	22µF 6.3V Electrolytic	AB

RESISTORS

R6601	VRS-TQ2BD103J	10k 0.1W 5% Metal Oxide	AA
R6602	VRS-TQ2BD153J	15k 0.1W 5% Metal Oxide	AA
R6603	VRS-TQ2BD474J	470k 0.1W 5% Metal Oxide	AA
R6604	VRS-TQ2BD273J	27k 0.1W 5% Metal Oxide	AA
R6605	VRS-TQ2BD103J	10k 0.1W 5% Metal Oxide	AA
R6606	VRS-TQ2BD000J	00 0.1W 5% Metal Oxide	AA

MISCELLANEOUS PARTS

E6601	LHLDB1008GEZZ	Li Battery Holder	AF
P6601	QPLGN0364TAZZ	Plug P1	AC
P6602	QPLGN0764TAZZ	Plug P2	AD
SW6601	QSW-K0082GEZZ	S/S SW	AD

RRMCK0002TAZZ R/C RECEIVER PWB

DIODE

D705	RH-PX0069TAZZ	Tally LED	

MISCELLANEOUS PARTS

RMC701	RRMCU0004TAZZ	Remote Receiver	AL
SC704	QCNCW0651TAZZ	Connector	