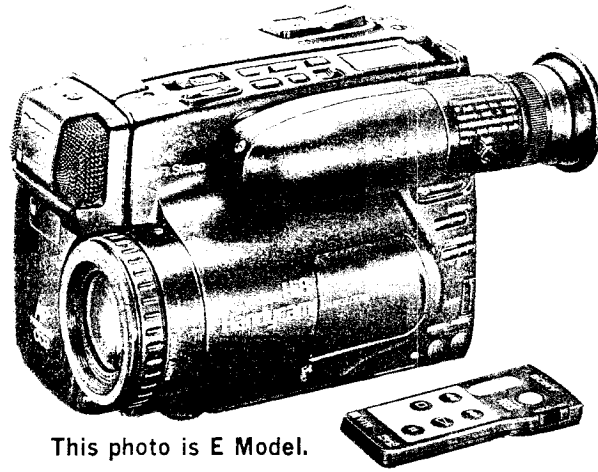


# CCD-TR705E

## RMT-504

## SERVICE MANUAL



This photo is E Model.

Remote commander is available as a unit.

*AEP Model*  
*UK Model*  
*E Model*  
*Australian Model*

**video Hi8**  
**Handycam**

FL MECHANISM

For Service Manuals Contact  
**MAURITRON TECHNICAL SERVICES**  
8 Cherry Tree Rd, Chinnor  
Oxon OX9 4QY  
Tel:- 01844-351694 Fax:- 01844-352554  
Email:- enquiries@mauritron.co.uk

### SPECIFICATIONS

#### System

Video recording system	Four Rotary heads, Helical scanning FM system
Audio recording system	Four Rotary heads, Helical scanning FM system
Video signal	PAL color, CCIR standards
Usable cassette	8 mm video format cassette (Hi8 or Standard 8 mm)
Tape speed	SP mode: Approx. 20.051 mm/sec (13/16 in)/sec. LP mode: Approx. 10.058 mm/sec (13/32 in)/sec.
Recording time	SP mode: 1 hour and 30 minutes (E5/P5-90) LP mode: 3 hours (E5/P5-90)
Playback time	SP mode: 1 hour and 30 minutes (E5/P5-90) LP mode: 3 hours (E5/P5-90)
Fast-forward/rewind time	Approx. 8.5 min. (E5/P5-90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 8 x power zoom lens f= 7.8 — 62.4 mm (5/16 to 2 1/2 inches), F= 1.6 — 2.2 37 mm (1 1/2 inches)

#### Auto focus system

TTL autofocus system inner focus wide macro system

#### Color temperature

Automatic, HOLD,  $\odot$  (indoor) 3,200 K  $\odot$  (outdoor) 5,800 K

#### Minimum illumination

2 lux (F 1.6)

#### Illumination range

2 lux — 100,000 lux

#### Recommended illumination

More than 100 lux

#### Aperture correction

Automatic

#### Input and output connector

S video input/output (AEP/UK model: Output only)

4-pin mini-DIN

Luminance signal: 1 Vp-p,  
75 ohms, unbalanced, sync  
negative

Chrominance signal: 0.3 Vp-p  
75 ohms, unbalanced

Video input/output (AEP/UK model: Output only)

Phono jack, 1 Vp-p, 75 ohms  
unbalanced sync negative

—continued on next page—



**Hi8 VIDEO CAMERA RECORDER**  
**SONY®**

#### Audio input/output (AEP/UK model: Output only)

	Phono jacks
	Input: -7.5 dBs, input impedance more than 47 kilohms
	Output: -7.5 dBs, (at output impedance 47 kilohms) impedance less than 2.2 kilohms
DC OUT	Special minijack, DC 5 V
Headphones jack	Stereo minijack
Remote jack	Stereo mini-minijack
MIC jack	Stereo minijack, -66 dBs, low impedance with 2.5 — 3 V DC output, impedance 6.8 kilohms

#### General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor) 9.0 V (alkaline batteries)
Power consumption	5.5 W (camera recording) including the viewfinder
Installation	Vertically, Horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	-20°C to + 60°C (-4°F to + 140°F)
Dimensions	Approx. 109 x 105 x 178 mm (w/h/d) (4 3/8 x 4 1/4 x 7 1/8)
Weight	Approx. 790 g (1 lb 12 oz) excluding the battery and cassette
Microphone	Electret condenser microphone, stereo type
Supplied accessories	See page 5.



Design and specifications are subject to change without notice.

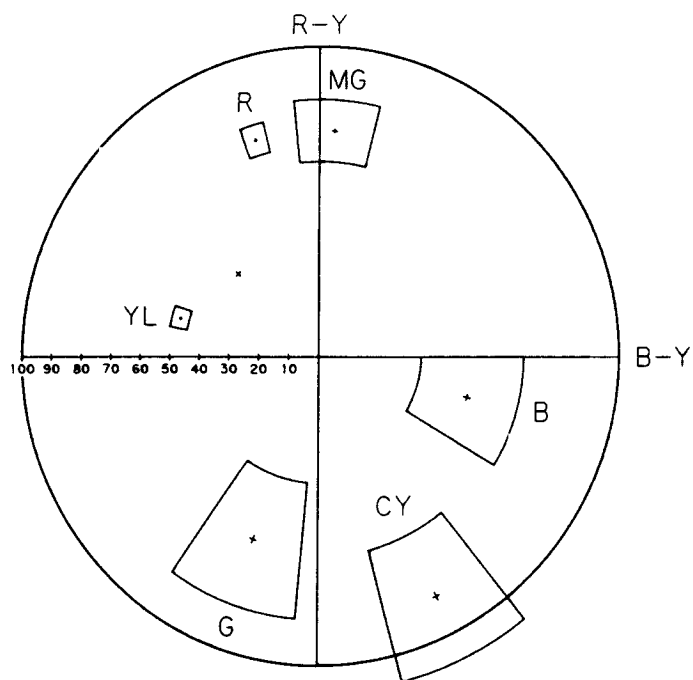
## SAFETY CHECK-OUT

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

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

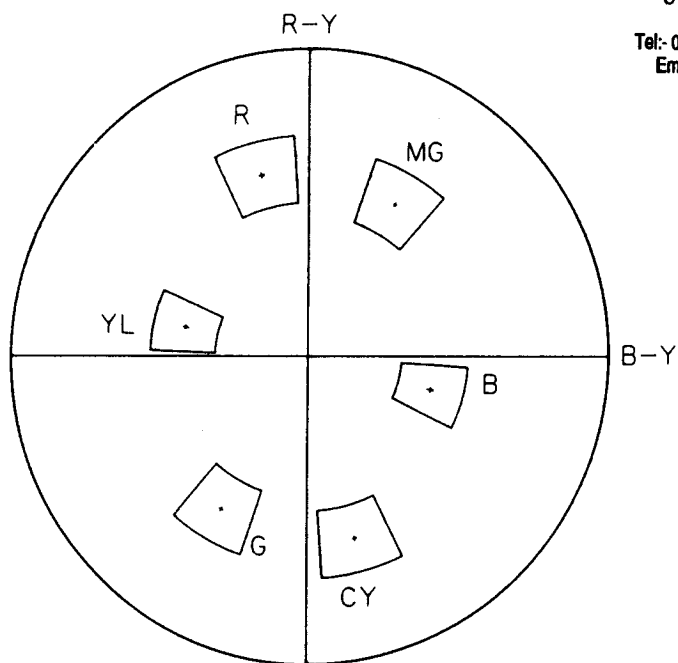
#### SAFETY-RELATED COMPONENT WARNING!!

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



Color Reproducibility Adjustment

For Service Manuals Contact  
**MAURITRON TECHNICAL SERVICES**  
 8 Cherry Tree Rd. Chinnor  
 Oxon OX9 4QY  
 Tel:- 01844-351634 Fax:- 01844-352554  
 Email:- [enquiries@mauritron.co.uk](mailto:enquiries@mauritron.co.uk)



Digital Titler Picture Quality Check



·CCD-TR705E

For Vectorscope

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## Introduction

### Overview of the CCD-TR705E

The CCD-TR705E Video Hi8 Handycam is a compact color video camera/recorder (camcorder). You can use it to shoot the pictures you want and play them back on your television set. It is equipped with a Hi-Fi stereo recording system which offers high quality sound to match the Hi8 picture. The camcorder uses 8 mm video-format cassettes.

### Who This Manual Is for

This manual is for you. You can use this manual to find exactly the information you need, whether you are familiar with video equipment or not.

### How the Manual Is Organized

The first section of the manual explains the preliminary steps necessary to prepare for shooting and playing back.

Other sections include shooting procedures that show you how to use the various features and functions of your camcorder. If you are a beginner, start with "Recording with automatic adjustments." If you are very familiar with camcorders, try to shoot your picture with manual adjustments as well as automatic adjustments. If you want to start recording right away, see p.32 through 38.

The manual also includes information on how to play back a picture on a TV and how to edit your original 8 mm tape onto another video tape.

If you have any problems during operation, see the "Trouble Check" section (page 86).

### How This Manual Works

Use the information below to help you follow the instructions in this manual.

- Controls and settings on the camcorder are shown in capital letters:  
ex. Set **POWER** to **CAMERA**.
- The letters in illustrations correspond to a letter in the text:  
ex. (A-1) or [a]
- Step numbers in all illustrations correspond to the step numbers in the text.
- Notes and cautions are set apart with lines.  
ex.

#### Note on battery life

Battery will not last as long in cold places.

#### Supplied Accessories

The camcorder is packed together with the following units. Check to see that everything is contained in the package.  
(\* Attached to the camcorder.)

- Wireless Remote Commander (1)
- Remote Commander Holder (1)
- AV connecting cable (3 phono to 3 phono) (1)
- S VIDEO connecting cable (4-pin mini DIN to 4-pin mini DIN) (1)
- Battery pack NP-55 (1)
- AC power adaptor AC-V30 (1)
- Lithium battery CR2025 (2)
- RFU adaptor RFU-90AS (1) or RFU-90E (1) or RFU-89EA (1) with an aerial selector and a screwdriver.
- Shoulder strap (1)
- Jack cover (1)\*
- Lens cap (1)\*
- Cassette tape (1)
- Handy Manual

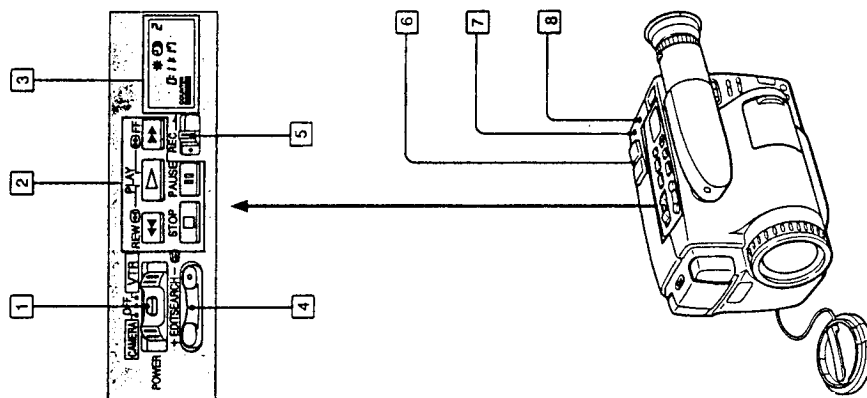
## Identifying the Parts

For details on the use of each control, refer to the pages indicated in the circle.

(A-1)

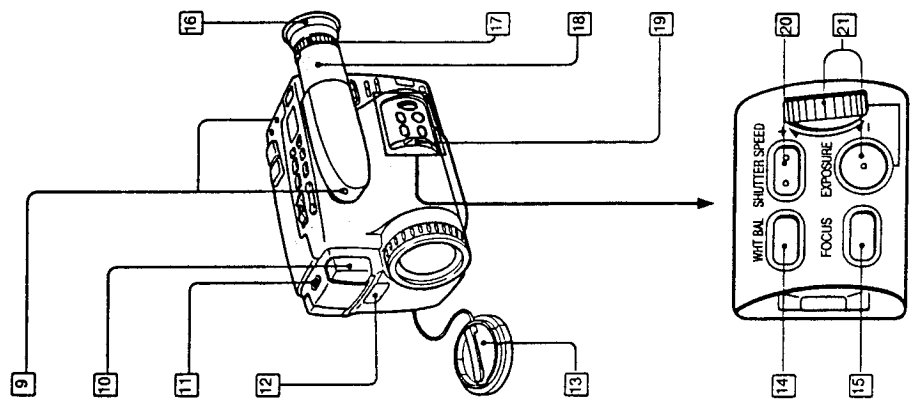
- POWER switch**  
CAMERA: For camera recording  
VTR: For playing back or editing tapes  
OFF: Power off
- Tape transport buttons**  
▷ PLAY (playback)  
▶▶ FF (fast forward)  
◀◀ REW (rewind)  
□ (stop)  
⏏ (pause)
- Display window**
- EDIT SEARCH button**
- REC (recording) switch (E/AUS MODEL)**  
Slide in the direction of the arrow for recording. ②, ①
- POWER ZOOM button**
- RESET button**  
Press to reset the counter zero.
- ZERO MEM (zero memory) button**  
Use to memorize the counter zero point.

(A-1)



For Service Manuals Contact  
MAURITRON TECHNICAL SERVICES  
8 Cherry Tree Rd, Chinnor  
Oxon OX9 4QY  
Tel: 01844-351694 Fax: 01844-352554  
Email: enquiries@mauritron.co.uk

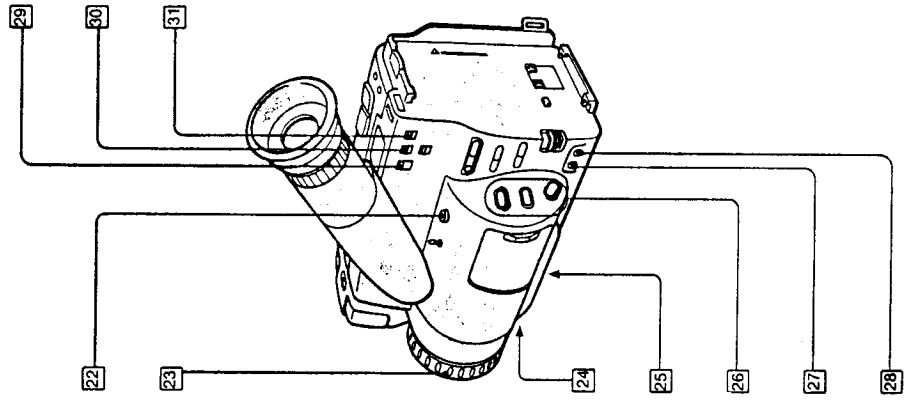
(A-2)



(A-2)

- 9 **Camera recording/battery lamp**  
Lights during camera recording. It flashes when the battery is discharged.
- 10 **Built-in microphone (stereo)**
- 11 **BUILT-IN MIC switch**  
Usually set to the green position. When using the camcorder in a strong wind, set to "WIND".
- 12 **Remote sensor**
- 13 **Lens cap**  
To remove the lens cap, squeeze the sides. Hook it on the grip strap so it will not get lost.
- 14 **WHT BAL (white balance) button**
- 15 **FOCUS button**  
Used for manual focusing.
- 16 **Eyecup**
- 17 **Viewfinder lens adjustment ring**  
Adjust to your eyesight to assure good focus. Be sure to adjust this ring when shooting for the first time.
- 18 **Viewfinder**  
You can monitor the monochrome picture being recorded or played back. The caution indicators and function modes also appear here.
- 19 **AUTO LOCK cover**
- 20 **SHUTTER SPEED button**  
Used to select the shutter speed.
- 21 **EXPOSURE button and EXPOSURE dial**

(A-3)



(A-3)

- 22 **REC START/STOP button**  
Use when recording in a low position.
- 23 **Focus ring**
- 24 **FADER button**
- 25 **Lithium battery compartment**
- 26 **Superimpose buttons** —  
MEMORY button  
COLOR/MODE button  
SUPERIMPOSE ON/OFF button
- 27 **REMOTE (LANC) \* control jack (stereo mini-mini-jack)**  
Connect a wired remote control unit, an editing controller, or other equipment here.
- 28 **PHONES (Headphones) jack (stereo mini-jack)**
- 29 **HI-FI SOUND switch**  
Set to the appropriate position when playing back the tape.
- 30 **REMOTE COMMANDER ON/OFF switch**  
Set to ON when using the supplied Remote Commander.
- 31 **HIB AUTO/OFF switch**  
Usually set to AUTO. When recording with the standard 8 mm video system regardless of the type of the tape which you use, set to OFF.


\*About (LANC)  
(LANC) stands for Local Application Control Bus System. The (LANC) connector is used for controlling the tape transport of video equipment and the peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.


(A-4)


(A-4)

- 32 Recording mode/EDIT switch**    
Switch it depending on the operating mode.

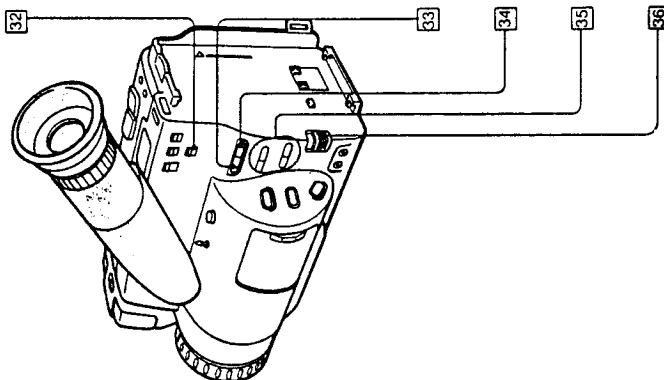
Mode	Recording	Playback	Editing
Setting	EDIT SP REC MODE LP	EDIT REC MODE	EDIT REC MODE
Function	Recording mode switch	EDIT switch	EDIT switch

- 33 SUMMER TIME button**   
Press to set summer time after setting the date and time.

- 34 AREA button**   
Press to set the time of the place where you live or to adjust the time of the place to where you are using the camcorder.

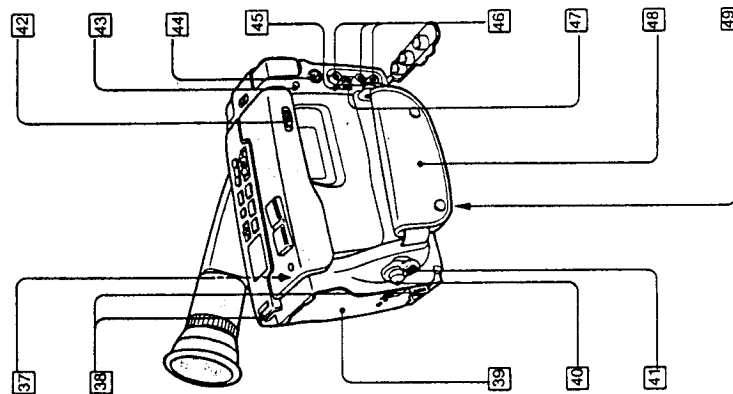
- 35 DATE (+) and TIME (NEXT) buttons**   
Press to display or turn off the date or time.
















- 36 BATT (Battery eject) knob**   
Press to remove the battery.



(A-5)

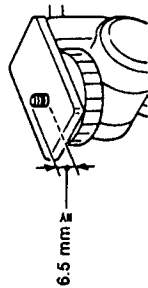
(A-5)



- 37 EJECT button (below the lid)**   
Press to lift up the cassette compartment and to open it automatically.
- 38 Hooks for shoulder strap**  
Attach the shoulder strap.
- 39 Battery mounting surface**
- 40 START/STOP button**   
Press to start and stop camera recording.
- 41 STANDBY switch**   
Turn it up to set the camcorder to the standby mode.
- 42 Lid lock**   
Slide to the left to open the cover.
- 43 MIC jack (PLUG IN POWER)** (stereo minijack)  
To connect an external stereo microphone (not supplied).
- 44 S VIDEO connector** (4-pin mini-DIN connector)  -  ,  , 
- 45 VIDEO/AUDIO INPUT/OUTPUT selector switch**  (E/AUS MODEL)
- 46 VIDEO/AUDIO jacks** (phono jacks)  -  ,  , 
- 47 DC OUT (RFU adaptor DC output) jack (special minijack)**  
Attach the supplied RFU adaptor here if necessary. This jack also supplies power to an external microphone.
- 48 GRIP STRAP**   
Adjust the length so that your thumb can easily manipulate the START/STOP button.
- 49 Tripod receptacle** 



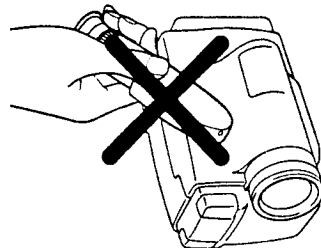
(A-6)



**Note (A-6)**

When attaching a non-SONY tripod, make sure that the length of the camera mounting screw is less than 6.5 mm (9/32 in.). Otherwise, the screw may damage the inner parts of the camcorder.

(A-7)

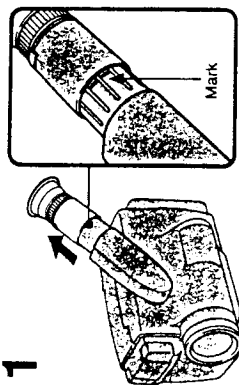


**Caution (A-7)**

Do not pick up the camcorder as shown in the illustration.

(A-8)

**1**



To remove dust from inside the viewfinder (A-8)

**1** Pull out the viewfinder barrel until the mark appears.

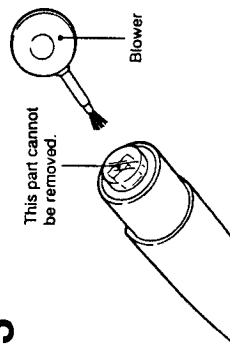
**2** Turn it counterclockwise until it stops **(1)** and pull it out **(2)**.

**3** Clean the surface of the cover with a blower.

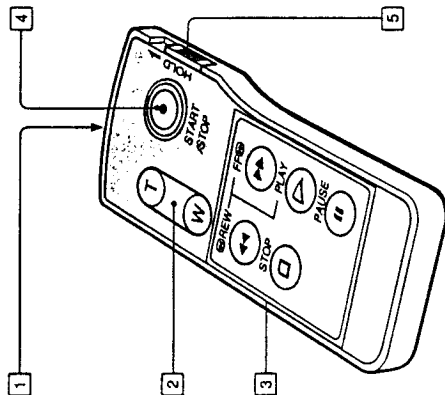
**2**



**3**




(A-9)



### Wireless Remote Commander

You can remotely record or play back a tape. The buttons on the Remote Commander with the same name or same mark as those on the camcorder have the same function.

**When you use the Remote Commander**  
Be sure to set the REMOTE COMMANDER  ON/OFF switch on the camcorder to "ON", and then start operation of the camcorder, with the Remote Commander pointing towards the remote sensor. (See "Remotely controllable area" on page 13.)

(A-9)

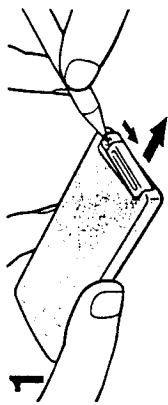
- 1 Transmitter
- 2 Power zoom button
- 3 Tape transport buttons
  - ◀ REW (rewind) button
  - ▶ FF (fast forward) button
  - STOP button
  - ▷ PAUSE button
- 4 START/STOP button
- 5 HOLD switch\*  
Slide in the direction of the arrow to prevent the buttons from being accidentally depressed.

**Note**

The \* indicates a function which is operable only with the Remote Commander.

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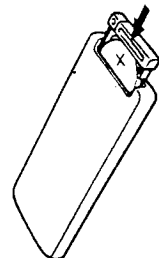
(A-10)



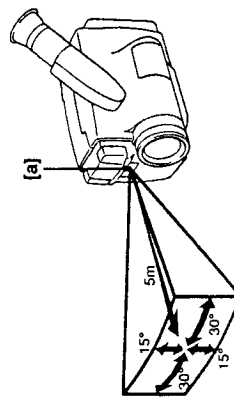
2



3



(A-11)





**Installing the Lithium Battery (A-10)**  
Install the supplied CR2025 lithium battery into the Remote Commander with the polarities positioned correctly.

- 1 Pull out the lithium battery holder from the Commander.
- 2 Install the lithium battery with the + side facing upward.
- 3 Put the lithium battery holder back into the Commander.

**Remotely controllable area (A-11)**  
Point the Remote Commander towards the remote sensor [a].

### Notes on the Remote Commander

- Keep the remote sensor away from strong light sources such as direct sunlight or illumination. Otherwise the Remote control may not be effective.
- Be sure that there is no obstacle between the remote sensor and the Remote Commander.
- The command mode of the Commander is VTR2. Avoid using Sony VTRs with the same command mode at the same time.
- Be sure to set the REMOTE COMMANDER  ON/OFF on the camcorder to OFF when you connect the receiver of a remote control kit (not supplied) to the REMOTE  control jack.

## Connecting the Power Sources

### First, Choose the Power Source.

Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-55 (supplied), NP-77, NP-77H, NP-77HD
Indoors	Alkaline batteries	Battery case EBP-77
In the car	House current 12V or 24V car battery	AC power adaptor AC-V30 (supplied), AC-V55, AC-S10 DC pack DCP-77, AC power adaptor AC-V55 and the car battery cord DCC-16AE

#### Note on power source

Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. In this case supply power again immediately.

#### Lithium battery life

The battery lasts for approximately 6 months under normal operation.

When the Remote Commander does not work, the lithium battery becomes weak or dead.

In this case, replace the battery with a Sony CR2025 or Duracell DL-2025.

Use of any other type of battery may present a risk of fire or explosion.

#### CAUTIONS

- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- The Battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

#### Attaching the Remote Commander to the Remote Commander holder

(A-12)

[a] When attaching the Remote Commander to the Remote Commander holder.

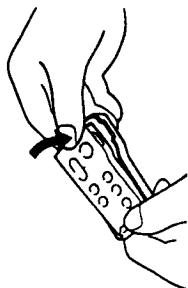
[b] When detaching the Remote Commander from the Remote Commander holder.

You can clip the Remote Commander holder on your coat pocket or belt, or slide it onto a shoulder belt before attaching the Remote Commander to it.

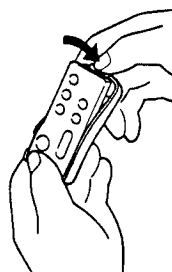
(A-13)

(A-12)

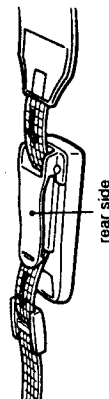
[a]



[b]

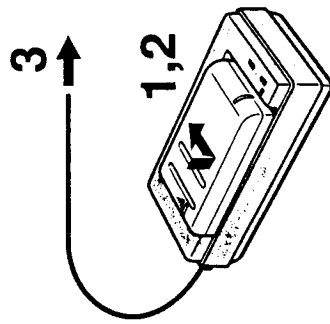


(A-13)



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(B-1)



### Using the Battery Pack

#### Step 1

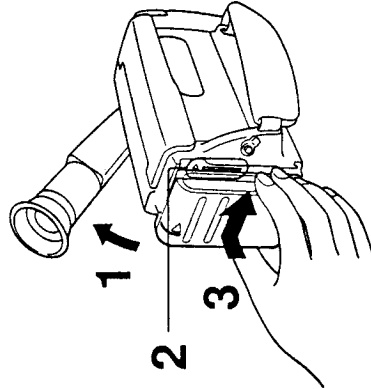
Charge the battery pack. (B-1)

- 1 Align the right side of the battery pack with the line on the AC power adaptor.
- 2 Slide in the battery pack to the right.
- 3 Connect the AC power adaptor to a wall outlet.

	NP-55	NP-77H/77HD	NP-77
Required charging time	60	140	120

(approx. minutes using AC-V30)

(B-2)



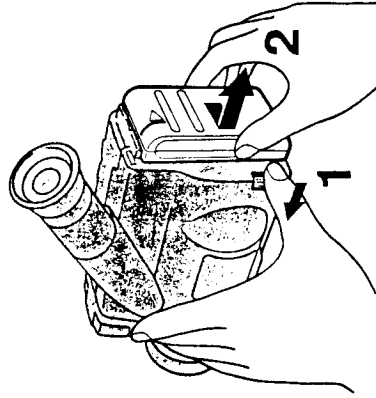
#### Step 2

Mount the battery pack on the camcorder. (B-2)

- 1 Lift up the viewfinder.
- 2 Align the right side of the battery pack with the white line on the camcorder.
- 3 Slide the battery pack to the right.

**Note:** Make sure the battery fits completely on the mounting surface of the camcorder. An imperfect fit may damage the projections on the camcorder.

(B-3)




**To remove the battery pack (B-3)**  
While pressing the BATT knob in the direction of the arrow, slide the battery pack to the left and pull it out as illustrated.

#### Battery life

A fully charged battery pack lasts for:


	NP-55	NP-77H/77HD	NP-77
Battery life	60	150	120

(approx. minutes, continuous recording indoors)

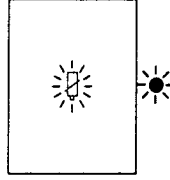
When the battery becomes weak, the  indication and red lamp flash slowly in the viewfinder.

(B-4)

Replace the battery pack with a fully charged one.

The  indication also appears in the display window.

(B-4)



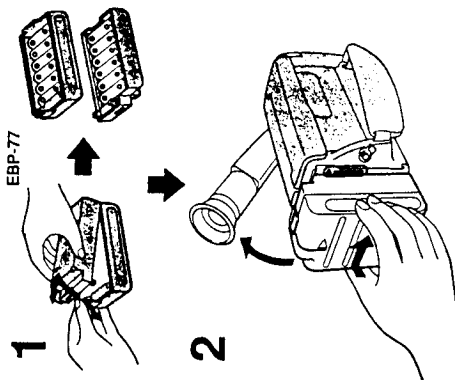
#### Other options for charging

- AC-V55 AC power adaptor:  
You can charge two battery packs simultaneously.
- AC-S10 AC power adaptor:  
This adaptor has a discharging function. When you want charging only, slide the skip switch on the adaptor in the direction of the arrow.
- BC-55 or BC-77 portable battery charger:  
You can charge a battery pack on 100 — 240 V AC.
- DC-V30 car battery charger:  
You can charge a battery pack by connecting the car battery charger to the cigarette lighter socket. This battery charger also supplies power for Sony 8 mm equipment that operates on a battery pack.

#### If you have an NP-4000 battery pack

You can use it for a long outdoor recording.

(B-5)



### Using Alkaline Batteries

(B-5)

The EBP-77 battery case is required (not supplied) to use 12 alkaline batteries.

- 1 Insert the R6 (AA) size alkaline batteries into the battery case.
- 2 Attach the case in the same way as the battery pack.

#### Battery life (when using Sony alkaline batteries)

The battery lasts for approximately 2 hours and 15 minutes under continuous recording indoors. However, when you use non-Sony alkaline batteries, their life may be shorter.

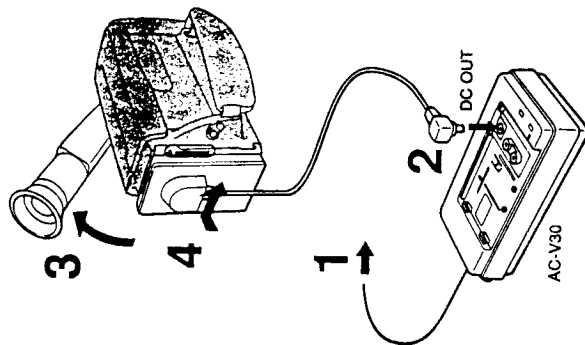
#### Notes on battery life

- Batteries will not last as long in cold places.
- No indication appears in the viewfinder when the batteries are weak.

#### To remove the battery case

Remove it the same way you do the battery pack. See page 17.

(B-6)



### Using House Current

(B-6)

Use the supplied AC-V30 AC power adaptor.

- 1 Connect the AC power adaptor to a wall outlet.
- 2 Insert the connecting cord supplied with the AC-V30 AC power adaptor into the DC OUT Jack on the AC power adaptor.
- 3 Lift up the viewfinder.
- 4 Align the right side of the connecting plate with the white line on the camcorder, and slide it in to the right.

See the instruction manual of the AC power adaptor for details.

#### To remove the connecting plate

Remove it the same way you do the battery pack. See page 17.

#### Other option

You can also use the AC-V55 and AC-S10 AC power adaptor.

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## The Best Way to Use the Battery Pack

### How to Prepare the Rechargeable Battery Pack

Have sufficient battery pack power to do 2 or 3 times as much recording as you have planned. (C-1)

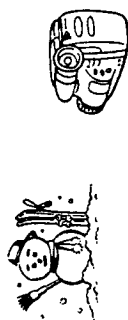


(C-1)

**Battery life is shorter in a cold climate.**

(C-2)

Battery efficiency is decreased and the battery will wear out more quickly.



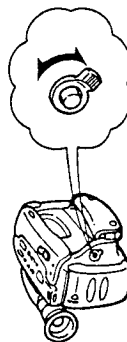
(C-2)

Turn the **STANDBY** switch of the camcorder off when not recording to save battery power.

A smooth recording can be made even if recording is stopped and started again.

(C-3)

While positioning the subject or selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.



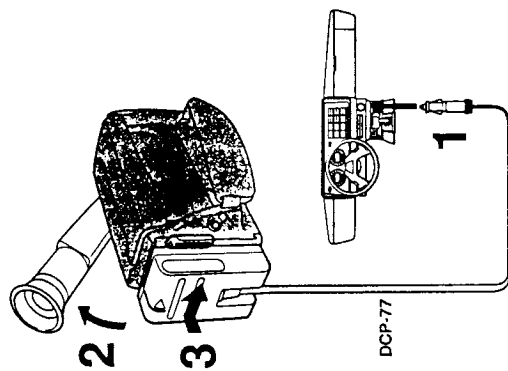
(C-3)

### Using the Car Battery

(B-7)

The DCP-77 DC pack is required (not supplied) to use the car battery.

- 1 Connect the cord to the cigarette lighter socket of a car (12 V or 24 V).
- 2 Lift up the viewfinder.
- 3 Align the right side of the DC pack with the white line on the camcorder, and slide it in to the right.

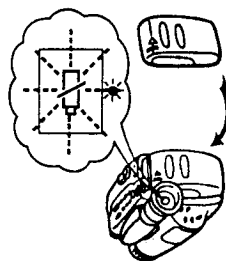


**To remove the DC pack**  
Remove it in the same way as you do with the battery pack. See page 17.

#### Other options


- You can also use the AC-V55 power adaptor and the DCC-16AE car battery cord to operate this camcorder on a 12 V or 24 V car battery.

(C-4)

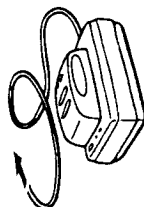


#### When the Rechargeable Battery Pack should be Replaced

(C-4)

When the  mark in the viewfinder changes from slow flashing to rapid flashing and the battery lamp lights in the viewfinder while you are recording. Turn off the power switch of the camcorder and replace the battery pack. Leave the tape in the camcorder in order to obtain a smooth recording after the battery pack is replaced.



(C-5)



#### Notes on Charging

Before using the battery pack, charge it sufficiently. A brand-new battery pack is not charged.

Recharge the battery pack only when it is discharged. (C-5)

- If recording is completed before the  mark appears in the viewfinder, we recommend that you remove the tape, set POWER to CAMERA, turn up STANDBY, and leave the camcorder until the  mark flashes rapidly.
- Repeated charging while some capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you fully charge and discharge the battery again.
- When you use the AC-S10 AC power adaptor, we recommend you to fully discharge the battery first, and then charge it completely.

**Recharge the battery pack before using.**  
If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged. Charge it again but in this case, the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

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#### Keep the Terminals Clean

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.

When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact. Also, wipe the + and - terminals with a soft cloth or paper.

#### Notes on the Rechargeable Battery Pack

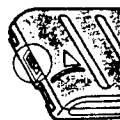
##### Why the battery pack heats up

During charging or recording, the battery pack heats up. This means energy has been generated and a chemical change has occurred inside the battery pack. This is not dangerous.

##### How to care for the battery pack

- Remove the battery pack from the camcorder after using it, and keep it in a cool place.
- When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is turned off.
- It causes over-discharging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Thus it is recommended you charge the battery before using it.

(C-6)



#### How to use the switch on the battery pack

(C-6)

This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is dead.

#### How many times can the battery pack be recharged

It can be fully charged and discharged about 500 times under normal temperatures. When the  $\Delta$  mark flashes rapidly in the viewfinder, even though it is fully charged the battery pack is dead and needs to be replaced with a new fully-charged battery pack.

#### Temperatures during charging

Lower temperatures require a longer charging time. Charging under temperatures ranging from 10°C to 30°C (from 5°F to 85°F) is recommended.

## Setting the Date and Time

### Inserting the Lithium Battery

(D-1)

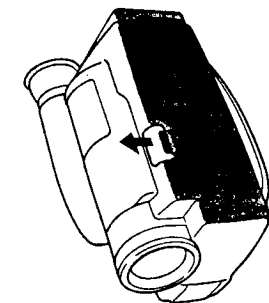
This camcorder uses a lithium battery to activate the clock and to keep a title in memory. Before operating it for the first time, install the supplied lithium battery.

- 1 Pull out the lithium battery holder from the bottom of the camcorder.
- 2 Install the supplied CR2025 lithium battery with the + side facing the (+) on the battery holder.
- 3 Put the lithium battery holder back into the camcorder.

#### To remove the lithium battery

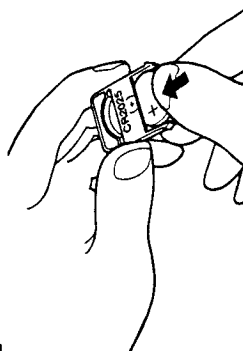
Remove the lithium battery holder from the camcorder, pull out the lithium battery and insert a new one.

(D-1)

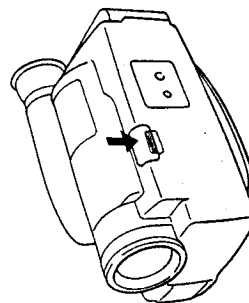


1

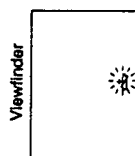
2



3








#### Lithium battery life

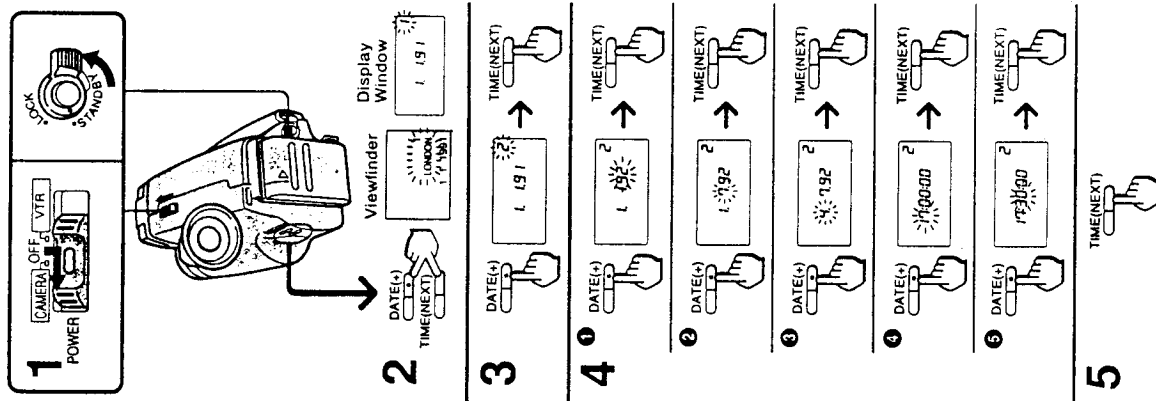
The battery lasts for approximately 1 year under normal operation.

When the lithium battery becomes weak, the  indication will flash on the viewfinder screen for about 5 seconds (when POWER is set to CAMERA). (D-2)

In this case, replace the battery with a Sony CR2025 lithium battery. Use of any other type of battery may present the risk of fire or explosion. While replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, you must readjust the date, time, and title.

#### CAUTIONS

- Keep the lithium battery out of the reach of children.
- Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with the metallic tweezers, otherwise a short-circuit may occur.
- The Battery may explode if mistreated.
- Do not recharge, disassemble, or dispose of in fire.



#### Setting the Date and Time (D-3)

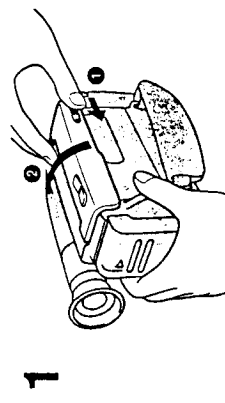
Make sure that a power source and lithium battery are attached.

- 1 Set POWER to CAMERA, and turn STANDBY up.
- 2 Press DATE and TIME simultaneously for more than 2 seconds until "1 LONDON" flashes inside the viewfinder. DATE now functions as + (to advance numbers) and TIME functions as NEXT (to execute).
- 3 While referring to the illustration and the table on page 54 and 55, press + until your area name and number appear and then press NEXT.
- 4 Set the year, month, day, hour and minute, in this order. First adjust the flashing digits with + and then press NEXT.
- 5 Press NEXT to set the second. The clock starts operating.

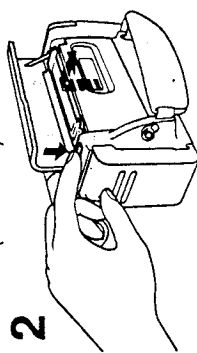
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## Inserting a Cassette

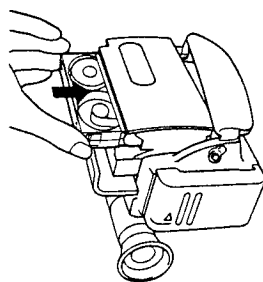
(E-1)



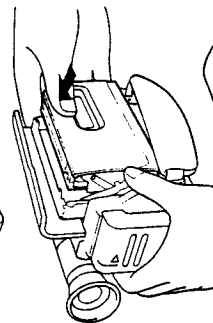
1



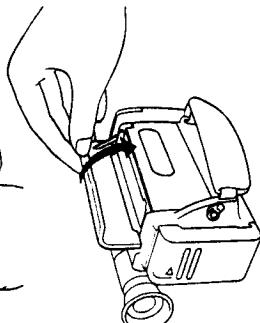
2



3



4



5

**To correct the date and time setting**  
Press NEXT repeatedly until the minute digits stop flashing. Then repeat step 2 to 5.

**To advance the digits faster**  
Keep + pressed.

**To check the preset date and time**  
Press DATE or TIME. When you press the same button again, the indication goes off.

**To set summer time**  
Press SUMMER TIME. The time changes to summer time, and \* indication appears inside the viewfinder and in the display window.  
To set to standard time, press SUMMER TIME again.

## Inserting a Cassette

(E-1)

Make sure that a power source is connected.

1 While sliding the lid lock in the direction of the arrow (A), lift up the lid until it clicks (B).

2 Press EJECT.

The lid of the cassette compartment will automatically lift up and open.

3 Insert a cassette with the window facing out.

4 Press the PUSH mark on the cassette compartment cover to close it.

5 Close the lid.

## Ejecting the Cassette

Make sure that a power source is connected.

1 While sliding the lid lock in the direction of the arrow, lift the lid up until it clicks.

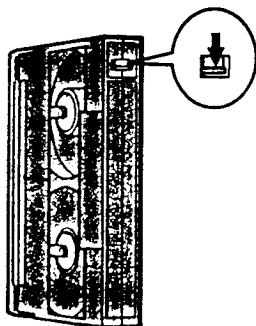
2 Press EJECT.

The lid of the cassette compartment will automatically lift up and open.

3 Take out the cassette and press the PUSH mark on the compartment to close it.

4 Close the lid.

(E-2)





### Preventing Accidental Erasure

(E-2)

Slide the tab on the cassette to expose the red mark. This will prevent accidental recording.

To re-record on this tape, slide the tab back out covering the red mark.

If you try to record with the red mark exposed, the  and  indications flash in the viewfinder.

### Notes on handling cassettes

- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the type of tape, thickness of tape, or if the tab is out or in, etc.
- Store cassettes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.
- Store cassettes in their cases and keep them away from heat, humidity, direct sunlight, magnetic fields, dust and mold.

### Preparing your camcorder 4

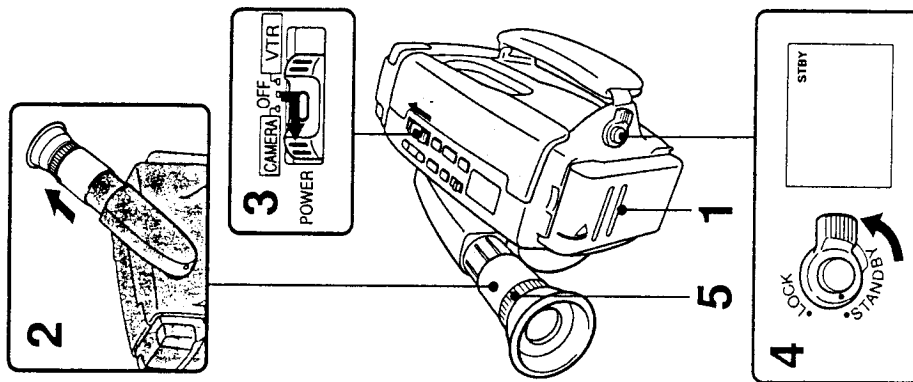
## Adjusting the Viewfinder Lens

The position of the viewfinder lens for optimum vision varies depending on the person. Adjust it when you use the camcorder for the first time, or when you use it after someone else did.

(F)

- 1 Make sure a power source is connected.
- 2 Pull the viewfinder out until it clicks.
- 3 While pressing the green button, set POWER to CAMERA.
- 4 Turn STANDBY up.
- 5 Turn the viewfinder lens adjustment ring so that "STBY" displayed in the viewfinder screen comes into sharp focus.

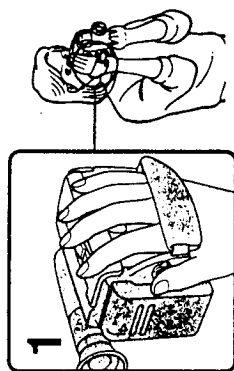
(F)



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## Recording a Picture Using Automatic Adjustments

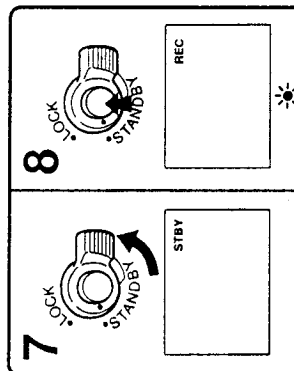
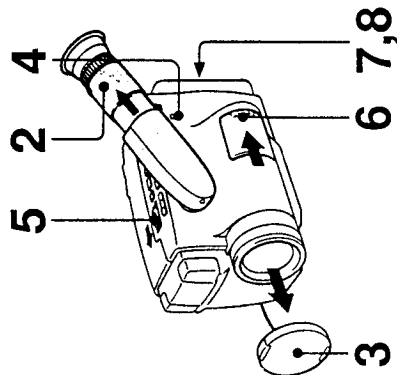
(G-1)



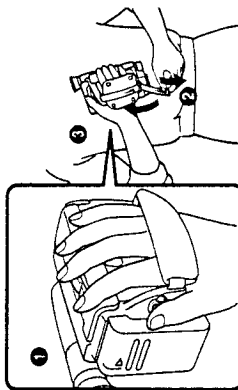
Before recording "once-only" events, we strongly recommend you make a trial recording and check that everything is working properly.  
(G-1)

### Start Recording

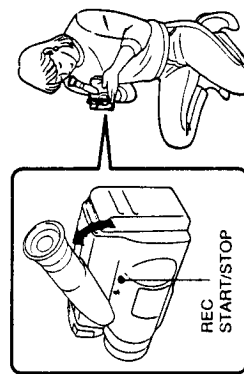
- 1 Hold the camcorder as illustrated. Put your hand through the grip strap and check that your thumb can easily touch START/STOP.
- 2 Make sure that the viewfinder is pulled out.
- 3 Remove the lens cap and clip it on the grip strap.
- 4 Set the Recording mode/EDIT switch to LP (long play) or SP (standard play), according to the length of your planned recording.
- 5 While pressing the green button, set the POWER to CAMERA.
- 6 Make sure that the AUTO LOCK cover is closed.
- 7 Turn STANDBY up. "STBY" appears in the viewfinder. The camcorder is now in the standby mode, and focus is adjusted automatically.
- 8 Press START/STOP. "REC" appears and the red lamp lights up in the viewfinder. The camcorder is now recording.



(G-2)



(G-3)



**To standby (to stop momentarily)**  
Press START/STOP again. "STBY" appears in the viewfinder. The camcorder is in standby mode again.

**To stop**  
Turn STANDBY down and set POWER to OFF.

**To set the **HIS** AUTO/OFF switch**  
See pages 7 and 73.

**Using the supplied Remote Commander**  
You can record yourself with your friends or family.

**How to fit the grip strap (G-2)**  
Looking at step 1 on the previous page, hold the camcorder against your body and pull the grip strap upward.

**For low-position recording (G-3)**  
The viewfinder can be turned 90 degrees upward. It can be used in either the pushed-down or pulled-out position.

- 1 Turn STANDBY up.
- 2 Press REC START/STOP with your left thumb.

### Note on recording

To record from the beginning of the tape, run the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back.

### Note on the standby mode

If you leave the camcorder in the standby mode for 5 minutes or more, the camcorder will turn off automatically. To resume the standby mode, turn STANDBY down once and slide it up again. To start recording, press START/STOP directly.

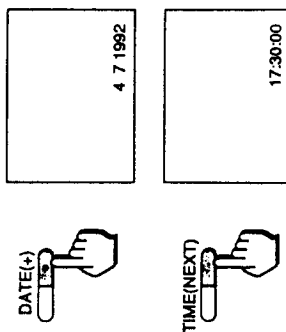
### Recording mode

You can record and play back a picture on a tape in both SP (standard play) and LP (long play) modes. However, the quality of the playback picture in the LP will not be as good as that in the SP mode.

### Note on PCM recording and playback

PCM recording or playback is not possible with this camcorder. The PCM sound recorded or after-recorded with another video recorder cannot be played back with this camcorder.

(G-4)



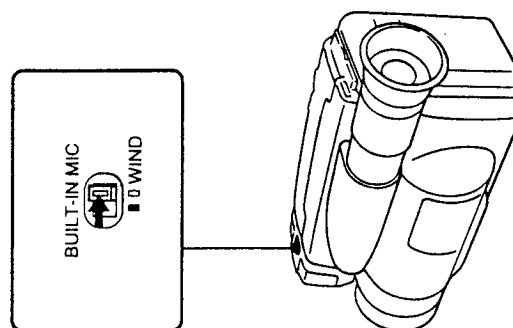
#### To Record Date and Time

(G-4)

During camera recording or when in recording pause mode, press DATE for date indication or TIME for time indication. The date or time displayed in the viewfinder is recorded with the picture.

**To stop recording date and time**  
Press DATE or TIME again. The picture recording continues.

(G-5)



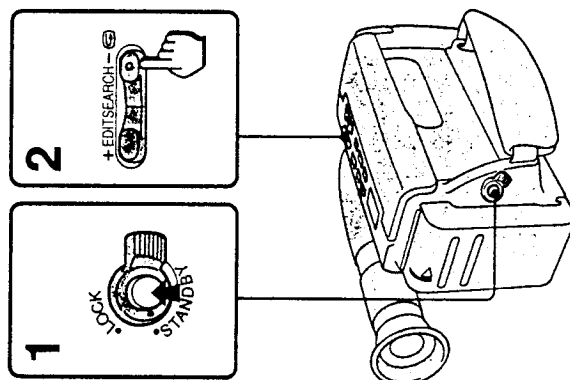
#### When There is a Strong Wind

(G-5)

Set BUILT-IN MIC to "WIND."  
The noise from the wind will be reduced. The (wind) indication appears inside the viewfinder.  
After recording, set it to the green position (green mark).  
If you forget to do this, sound may be recorded unnaturally because of this function.

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(G-6)



#### To Check the Last Portion of the Previous Recording

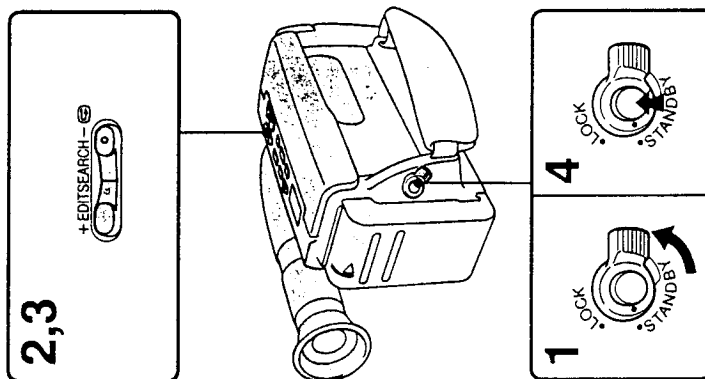
(G-6)

- 1 Set the camcorder in the recording pause mode by pressing START/STOP.
- 2 Press - side of EDITSEARCH ( ) momentarily.  
The last few seconds of the recorded portion are rewound and then the recorded picture appears inside the viewfinder. After a few seconds of playback, the camcorder goes back to recording pause mode.

**If the picture has not recorded**

The video heads may be contaminated. Clean the heads using the Sony V8-25CLH video head cleaning cassette or equivalent.

(G-7)



### To Re-record over a Previously Recorded Portion during Recording

(G-7)

- 1 Turn STANDBY up to set the camcorder to the standby mode.
- 2 Look in the viewfinder and find the point from where you want to begin the recording:  
Keep pressing the + side of EDITSEARCH to advance the picture at a normal playback speed, or the - side to reverse the picture at a normal playback speed.
- 3 At the desired point, release EDITSEARCH.
- 4 Press START/STOP to start recording.

To pause

Press START/STOP again

To stop

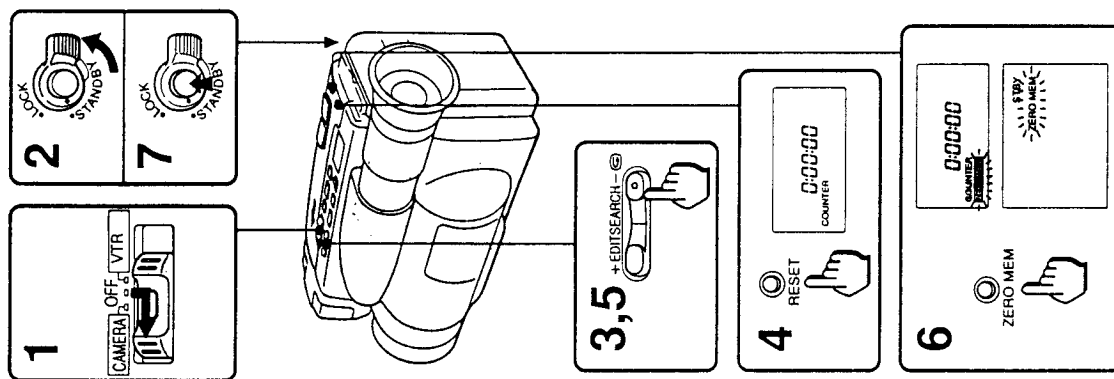
Turn STANDBY down.

#### Note

A smooth transition between scenes can be made even if STANDBY is turned down and up, or even if the power is turned off and on again, provided that the tape is not removed.

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(G-8)



### To Re-record a Picture In the Middle of a Recorded Tape (Insert Recording)

(G-8)

- 1 While pressing the green button, set POWER to CAMERA.
- 2 Turn STANDBY up to set the camcorder to the standby mode.
- 3 While looking in the viewfinder, keep pressing the + or - side of EDITSEARCH and release the button where you want to end the insertion. The camcorder is set to standby mode.
- 4 Press RESET.  
The counter is reset to zero.
- 5 While looking in the viewfinder, keep pressing the - side of EDITSEARCH and release the button at the point where you want to start the insertion.
- 6 Press ZERO MEM.  
The insert ending point is stored in memory.
- 7 Press START/STOP.  
Insert recording begins.  
It stops automatically near the counter zero point.

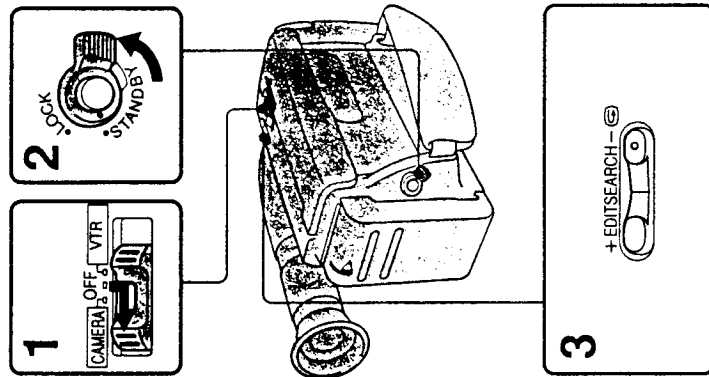
To cancel ZERO MEM

Press ZERO MEM.

#### Note

The picture may be distorted at the end of the inserted portion when played back.

(G-9)



### Playing Back Your Picture Instantly

(G-9)

You can check the recorded picture in the viewfinder.

- 1 While pressing the green button, set **POWER to CAMERA.**
- 2 Turn **STANDBY** up.
- 3 Keep pressing the + or - side of **EDITSEARCH** to play back the picture.  
+ side: to view the playback picture  
- side: to view the playback picture in reverse

To stop playback, release **EDITSEARCH.**

To monitor the sound while viewing the playback picture in the viewfinder

Connect a headphone to the **PHONES** jack.

- 1 While pressing the green button, set **POWER** to **VTR.**
- 2 Press **◀▶** to rewind the tape and press **□** where you want to stop.
- 3 Press **▷** to start playback.

## Selecting the Automatic/Manual Adjustment

When you close the **AUTO LOCK** cover, the focus, white balance, and exposure adjust automatically, and the shutter speed is set at 1/50. The automatic function offers you worry-free operation under most shooting conditions. But under certain circumstances, manual adjustment is better for effective recording. For manual adjustment, open the **AUTO LOCK** cover and select an appropriate setting.

Even if you open the **AUTO LOCK** cover:

The setting of each button is the same as the automatic adjustment until you change it.

### What Each Button Does

(H)

To adjust each item manually, see the page as shown in the table.

Item	See page
Focus	40
White balance	42
Shutter speed	44
Exposure	46

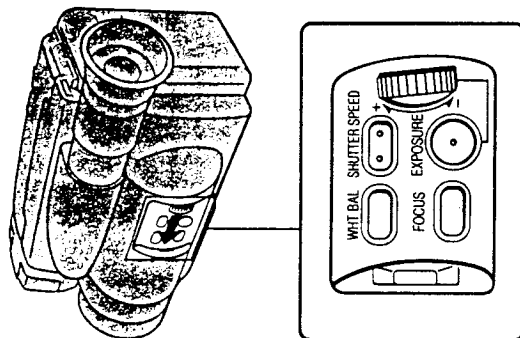
### When you install the battery for the first time

The white balance, focus and exposure automatically adjust and the shutter speed is set at normal speed (1/50) regardless of the position of the **AUTO LOCK** cover.

### About the previous settings

As long as you do not remove the battery, even if you set **POWER** to **OFF**, the previous settings are stored.

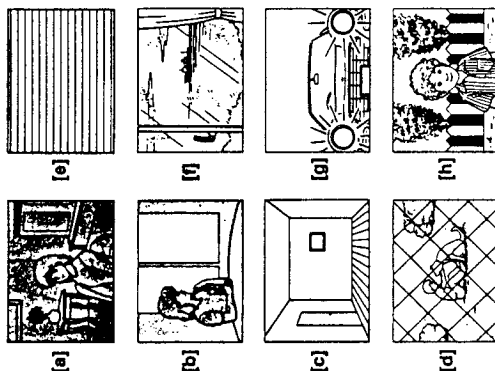
(H)



## Manual Focusing

When you close the AUTO LOCK cover and center the subject through the viewfinder, you can easily get an auto-focused picture under most shooting conditions. But we recommend manual focusing in the following cases.

(I-1)



[a] to [h] correspond to the illustrations (I-1).

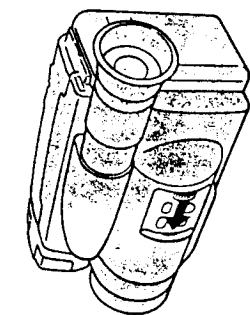
- [a] Insufficient light
- [b] Too much brightness behind the subject
- [c] Subject with little contrast—wall, sky, etc.
- [d] Subjects beyond nets, etc., or another subject passes in front of the camcorder
- [e] Horizontal stripes
- [f] Subject through frosted glass
- [g] Bright subject or subject reflecting light
- [h] High contrast behind the subject (the background may be focused)
- [i] Under the following circumstances
  - When shooting a stationary subject using a tripod
  - To save battery power

**Auto-focusing does not function momentarily when:**

- The setting of the shutter speed is changed.
- Exposure is adjusted manually.
- Lighting conditions change quickly.
- Zooming is changed from wide-range to telephoto.

This camcorder keeps in focus by referring to the picture contrast, which is weak in the above situations.

(I-2)



1

1 Slide open the AUTO LOCK cover.

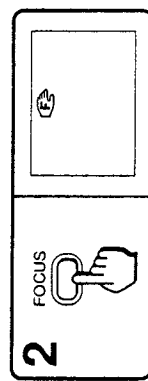
2 Press FOCUS.

The  $\infty$  (manual focusing) indication appears in the viewfinder.

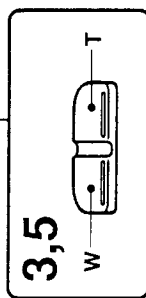
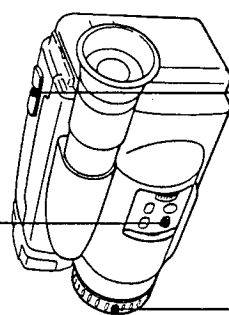
3 Keep pressing the T side of the power zoom button until the zooming stops (telephoto).

4 Turn the focus ring to achieve sharp focus.

5 Set the desired shot length using the power zoom button.

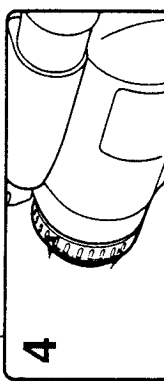


2



3,5

W T



4

**Some helpful hints**

- When shooting in relatively dark places such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles after focusing in telephoto.
- When shooting a scene with lots of movement in bright light, keep pressing the W side of the power zoom button until the zooming stops (wide angle).

**Note**

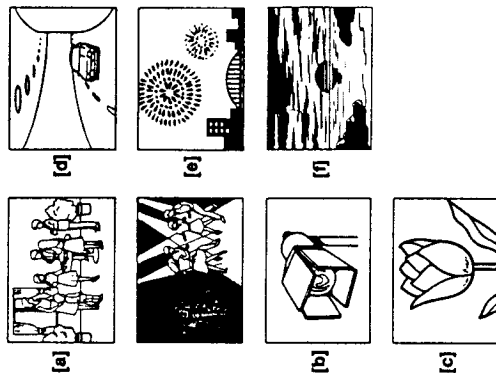
The focus ring does not have a stop position.

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## Adjusting the White Balance

(J-1)

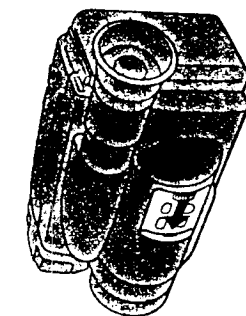


When you close the AUTO LOCK cover, the auto white balance function of this camcorder adjusts the picture to natural colors under most shooting conditions. However, in the conditions listed below, adjust the white balance manually.

[a] to [f] correspond to the illustrations (J-1).

	Conditions	Indication in the viewfinder
[a]	Lighting conditions change quickly	☼
[b]	Too bright, such as in photograph studios	
[c]	Monochromatic subject or background	HOLD
[d]	Under sodium lamp	
	Under mercury lamp	☼
	Under a color matching fluorescent lamp	
[e]	Recording outdoors: a night view, neon signs or fireworks	☼
[f]	Recording outdoors: scenes after sunset or before sunrise	

(J-2)

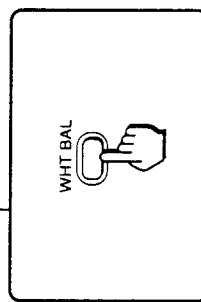
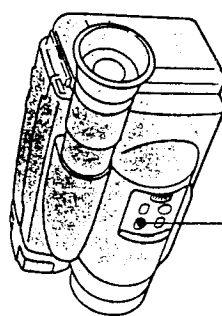


1

- Slide open the AUTO LOCK cover.
- Select the desired white balance mode by pressing WHT BAL. Each time you press the button, the indication changes as follows:

No indication → HOLD → ☼ (auto) → ☼ (outdoors) (indoors)

2



### Note on manual adjustment

When moving from indoors to outdoors or vice versa, close the AUTO LOCK cover and open it again.

### What is the HOLD mode?

In HOLD mode, the camcorder adjusts to the color temperature of the subject's light source automatically and keeps that temperature during recording. When recording some subjects with different color temperature, you can achieve a recording with natural colors without being affected by the surroundings.

To set into the HOLD mode

- Close the AUTO LOCK cover.  
The camcorder enters automatic white balance mode.
- Point at and record a white, flat object such as a white wall or paper.
- Open the AUTO LOCK cover and press WHT BAL to display the HOLD mark in the viewfinder.  
When you change the battery pack or the light source is changed, follow the above procedures again.

## Setting the Shutter Speed

(K-1)



(K-1)

When you record a fast-moving subject, increase the shutter speed so that you can see a clear picture in playback pause mode. The depth of field in proper focus becomes shallow at a higher shutter speed. This is effective to record the main subject in sharp focus and the surroundings out of focus.

### Note

When recording at a high-speed shutter setting, record in a brighter place than usual.

### Recommended setting for your situation

Choose an appropriate shutter speed according to the situation, referring to the following chart.

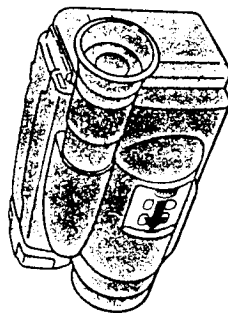
Example use	Recommended shutter speed
<ul style="list-style-type: none"> <li>On clear days, recording a golf or tennis swing (To view the hit ball clearly in the still picture mode, set to 1/4000 or 1/10000)</li> <li>Recording skiers</li> </ul>	1/10000 or 1/4000 or 1/2000
<ul style="list-style-type: none"> <li>On overcast days, recording a moving merry-go-round or roller-coaster</li> <li>Recording outdoors from inside a vehicle (for stable shooting)</li> </ul>	1/1000 or 1/250
<ul style="list-style-type: none"> <li>Instead of the ND2 filter (To reduce the exposure level to about a half)</li> <li>Recording indoor sports (for stable shooting)</li> </ul>	1/120

### When playing back a picture recorded at certain speeds

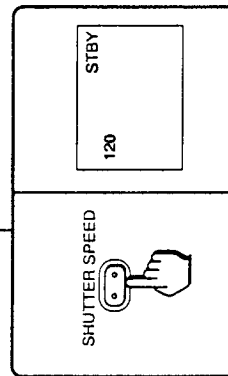
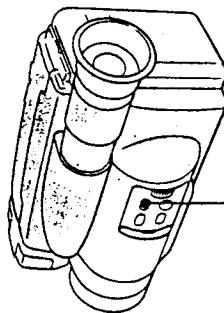
Use 8 mm video equipment with a clean still function to obtain a noiseless still picture.

(K-2)

1



2

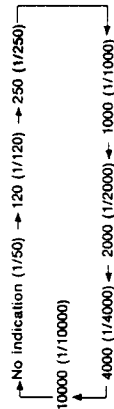


## Selecting the Shutter Speed

(K-2)

- Slide open the AUTO LOCK cover.
- Press SHUTTER SPEED repeatedly until the desired shutter speed indication appears.

Each time you press the button, the indication changes as follows:



### Notes

- When you shoot a very bright subject at a faster shutter speed, a vertical light, belt-like line (smear) may appear on the screen.
- When you record at certain shutter speeds under a light discharge tube, such as a fluorescent lamp, sodium lamp, or mercury lamp, the brightness of the recorded picture may vary (causing the picture to flicker).

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## Adjusting the Exposure

When you close the AUTO LOCK cover, the exposure is automatically controlled in this camcorder. However, in the conditions listed below, adjust the exposure manually.

[a] to [d] correspond to the photographs (L-1).

[a] The background is too bright (backlighting).

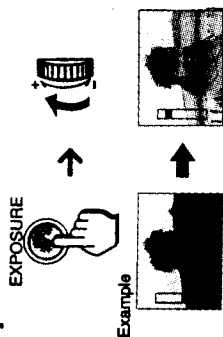
[b] Insufficient light: most of the picture is dark.

[c] Bright subject and dark background

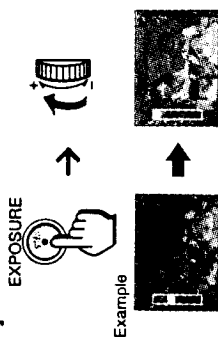
[d] To record the darkness faithfully

(L-1)

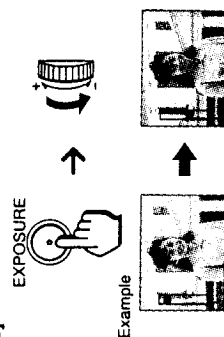
[a]



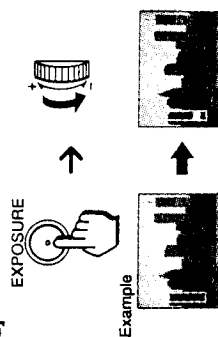
[b]



[c]

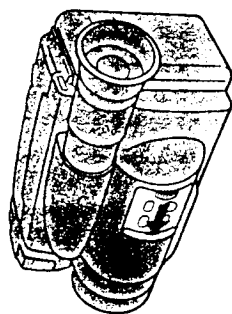


[d]

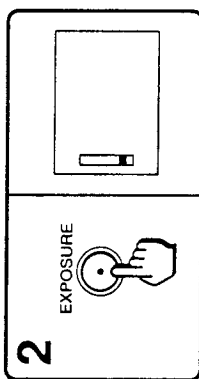


(L-2)

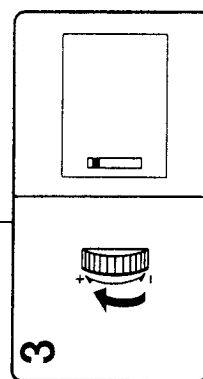
1



2



3



## Adjusting the Exposure Manually (L-2)

- 1 Slide open the AUTO LOCK cover.
- 2 Press EXPOSURE. The exposure indication appears.
- 3 Adjust the exposure by using the EXPOSURE dial.

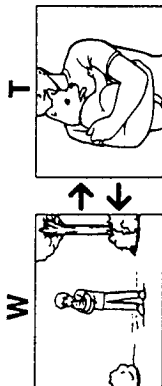
To restore the automatic exposure mode Press EXPOSURE until the exposure indication in the viewfinder disappears.

## Zooming

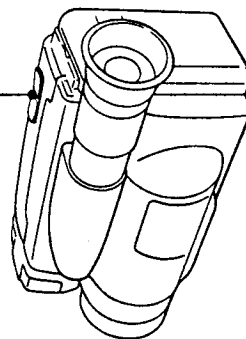
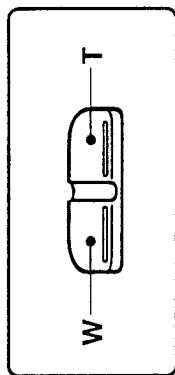
The size of the subject in the screen can be changed. Use "zoom-in" for dramatic close-ups. Use "zoom-out" for panoramic long shots. Also use zooming to focus manually or to decide the shooting angle. (M-1)

You can change the zooming speed. When you press the power zoom button firmly, the zooming speed gets faster, and when you press it softly, the speed gets slower.

(M-1)



(M-2)



## Power Zooming

— For smooth and constant zooming (M-2)

Press the T side of the power zoom button for telephoto (subject appears closer) and the W side for wide-angle (subject appears farther away).

## For more zooming effect

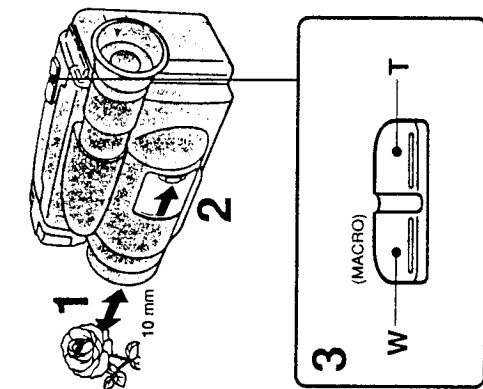
When you use VCL-0637A, VCL-1437A or VCL-TRA (a 37 mm conversion lens/not supplied), you can get more telephoto focus or wider angle.

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## Close-Up (Autofocusing in Macro)

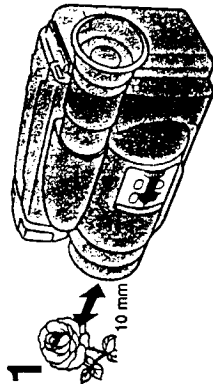
Even small subjects, such as flowers, insects, and images in photographs, can literally fill the screen using autofocusing in macro. (N-1)

(N-1)




- 1 Bring the camcorder as close as necessary to obtain the desired subject size.  
The subject can be as close as a minimum of 10 mm (13/32 in.) from the lens surface.
- 2 Close the AUTO LOCK cover.
- 3 Keep pressing the W (Macro) side of the power zoom button until the zooming stops (wide-angled).

(N-2)



#### Manual focusing in Macro (N-2)

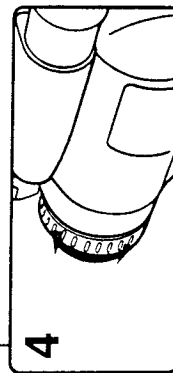
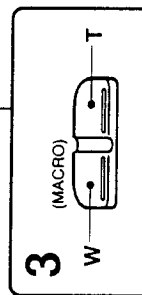
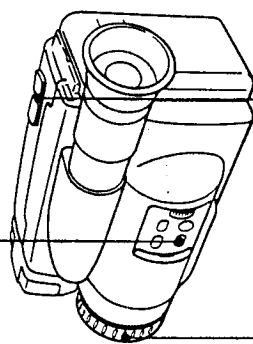
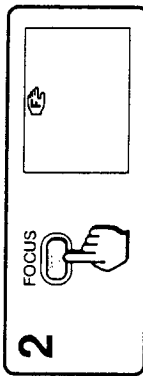
- 1 Slide open the **AUTO LOCK** cover.
- 2 Press **FOCUS**. The  (manual focusing) indication appears in the viewfinder.
- 3 Keep pressing the **W** side of the power zoom button until the zooming stops (wide-angle).
- 4 Turn the focus ring to achieve sharp focus.

#### Recommended accessory

When shooting in macro, the depth of field is very shallow, so pay attention to focusing. To keep the subject in focus, use a tripod.

#### Note

Shoot the subject at the wide-angle position in macro. At the telephoto position, if the subject is closer than 1 m (3 ft. 3 3/8 in.), it cannot be brought into focus.



## Fade-in and Fade-out

(O-1)

You can fade-in or fade-out to give your recording a professional appearance. When fading-in, the picture will gradually appear from black. The sound will also gradually increase. When fading-out, the picture will gradually fade to black. The sound will also gradually decrease.

### To Fade-in

(O-2)

- 1 Turn **STANDBY** up to set the camcorder in the standby mode.
- 2 Press **FADER**. The "FADER" indication appears in the viewfinder.
- 3 Press **START/STOP**. The recording starts fading in.

### To Fade-out

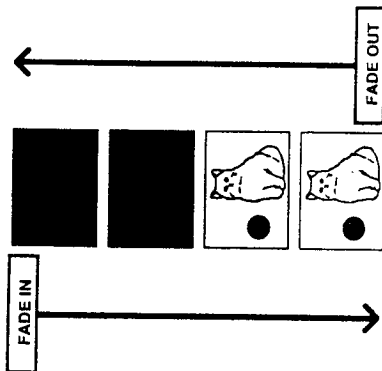
(O-3)

- 1 While recording, press **FADER**. The "FADER" indication appears in the viewfinder.
- 2 Press **START/STOP** to stop the recording. Fade-out is performed and then recording stops.

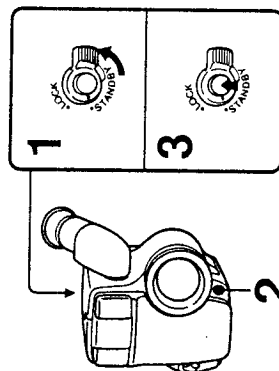
To cancel the fade-in/fade-out function before it is performed  
Before pressing **START/STOP**, press **FADER** again.

If you want to use the fade-in/fade-out function repeatedly  
Start from step 1 each time.

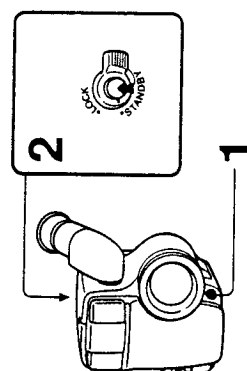
(O-1)



(O-2)




(O-3)



## Using the World Clock

This camcorder has a world clock. While traveling abroad, you can easily adjust to the time of the place where you are using the camcorder by pressing AREA. Before pressing AREA, set the date and time in your country (see page 27). (P-1)

- 1 While pressing the green button, set POWER to CAMERA.
- 2 Turn STANDBY up to set the camcorder in standby mode.
- 3 Press TIME. The time in your country appears.
- 4 Press AREA until the area name and number where you are now using the camcorder appear.

The time where you are using the camcorder appears. The  indication appears in the display window. You can find the area name and number in the "Time zone chart" on page 54.

To check the date

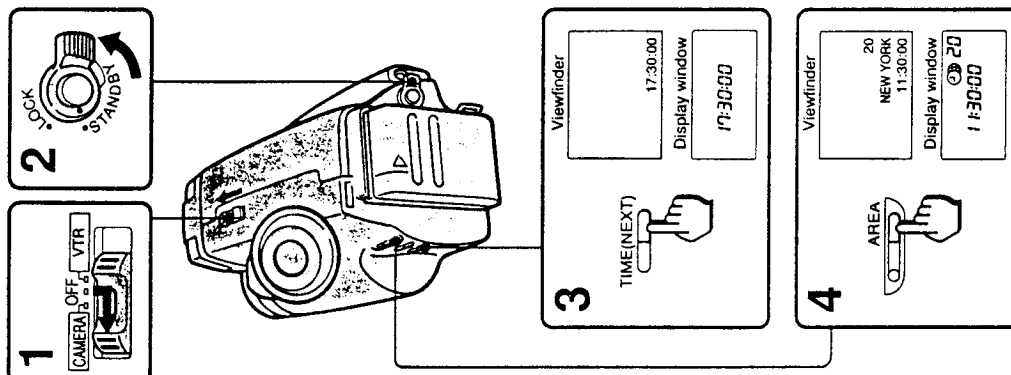
Press DATE.

To turn off the date indication, press DATE again.

To reset to your country area time

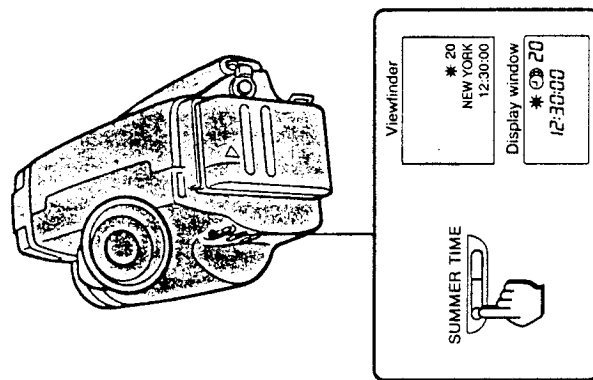
Press AREA until your country area and number appears.


(P-1)



52

(P-2)

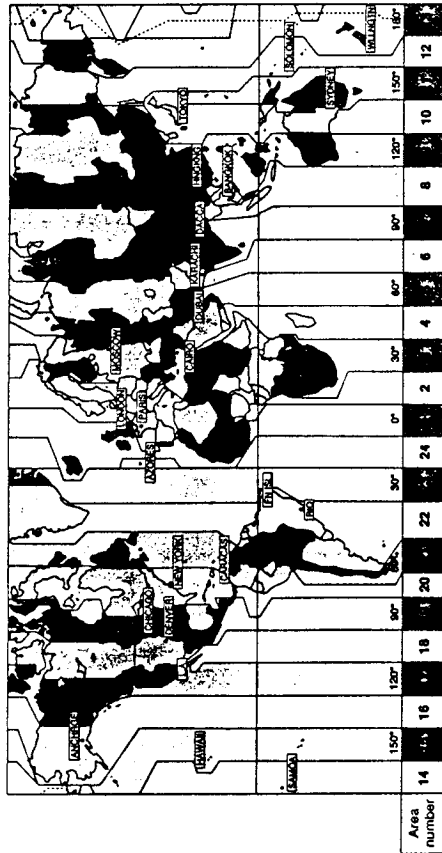


To set summer time  
Press SUMMER TIME. Time changes to summer time. Indication  appears inside the viewfinder and in the display window.  
(P-2)  
To set to standard time, press SUMMER TIME again.

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Time Zone Chart



Area number	Area name	Countries or area*
1	LONDON	England, Morocco, Portugal, GMT (Greenwich Mean Time)
2	PARIS	Austria, France, Germany, Italy, Netherlands, Spain, Sweden, Switzerland, CST (Continental Standard Time), Tunisia
3	CAIRO	Egypt, Finland, Greece, Turkey
4	MOSCOW	Ethiopia, Iraq, Kenya, Mauritius, Saudi Arabia, Seychells, U.S.S.R. (Moscow)
5	DUBAI	United Arab Emirates
6	KARACHI	Moldives, Pakistan
7	DACC	Bangladesh, India, Myanmar
8	BANGKOK	Cambodia, Indonesia (Jakarta), Thailand, Vietnam
9	HONGKONG	Australia (Perth), China, Hong Kong, Indonesia (Bali, Borneo), Malaysia, Philippines, Singapore, Taiwan
10	TOKYO	Japan, Korea
11	SYDNEY	Australia (Sydney)
12	SOLOMON	New Caledonia
13	WLLNGTN	Fiji, New Zealand
14	SAMOA	Western Samoa
15	HAWAII	Hawaii I., Tahiti, HST (Hawaii Standard Time)
16	ANCHRGE	U.S.A. (Alaska), AST (Alaska Standard Time)
17	L.A.	U.S.A. (Los Angeles, San Francisco), PST (Pacific Standard Time)
18	DENVER	U.S.A. (Denver), MST (Mountain Standard Time)
19	CHICAGO	U.S.A. (Chicago), Mexico, CST (Central Standard Time)
20	NEW YORK	Canada (Montreal), Jamaica, Peru, U.S.A. (New York, Washington D.C.), EST (East Standard Time)
21	CARACAS	Chile, Dominica, Venezuela
22	RIO	Argentina, Brazil, Uruguay
23	FN ISL.	Fernando de Noronha
24	AZORES	Azores Islands

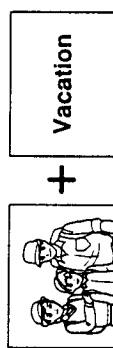
\* These are common names. The formal names may be different.

## Superimposing a Title

You can superimpose your own hand-written message or illustration (title) over the picture while you are recording. (Q-1)

- You can store one title.
- You can select the color of the title from 8 colors.
- Before recording, store the title.

(Q-1)



### Storing a Title

(Q-2)

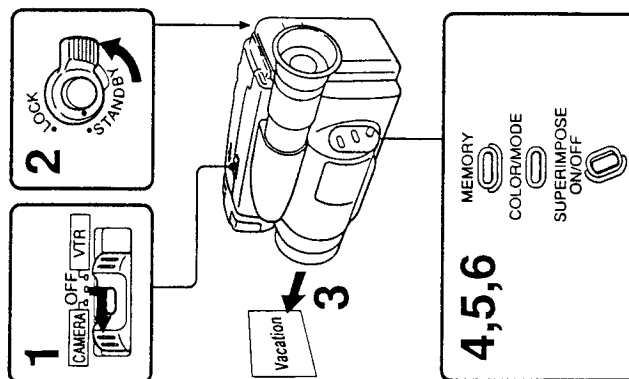
#### Before storing

- Make the desired title card. Use a plain, white card and draw the title in thick, dark letters.
- Make sure the lithium battery is installed (page 25).

#### How to start

- While pressing the green button, set **POWER to CAMERA**.
- Turn **STANDBY** up to set the camcorder in standby mode.

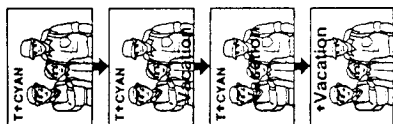
(Q-2)



#### To check the title

Press **SUPERIMPOSE ON/OFF** in the standby mode.  
To turn off the title, press the button again.

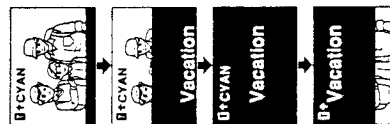
(Q-3)



(Q-4)



(Q-5)



(Q-6)



### About memory back up

The camcorder uses a lithium battery (located on the bottom of the unit) to keep the title in memory. The lithium battery life is approximately 1 year.

### Various Display Modes of the Title

You can scroll your title like in the movies, or reverse the title.  
Select the display mode of the title from the following table.

Display mode	Indication in the viewfinder
Scrolling up the title (Q-3) The title scrolls up.	↑
Reversing the title with the picture (Q-4)	↑↓
Scrolling up the reversed title (Q-5)	↑↑
Normal display mode	No Indication

### Selecting the display mode

Before displaying the title, press **COLOR/MODE** until the indication of the mode you want appears. (Q-6)

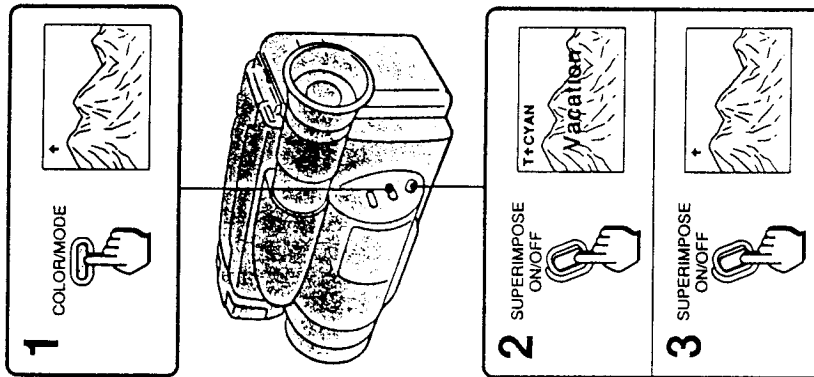
### After selecting the mode

Follow the procedure on page 58 to superimpose the title on the picture in that mode.

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(Q-7)



(Q-8)



### Superimposing a Title on Your Tape

The following shows how to superimpose a title using an example in which the title in cyan scrolls up. (Q-7)

- 1 Press **COLOR/MODE** to select the display mode of the title in the standby mode.
- 2 Press **SUPERIMPOSE ON/OFF** at the point from which you want to insert the title during recording.  
You can change the title color by pressing **COLOR/MODE**. Each time you press the button, the color indication changes.
- 3 Wait for a while and press **SUPERIMPOSE ON/OFF** again.  
The title goes out.

**About the color and the display mode indications**

The color and the display mode indications in the viewfinder are not recorded.

### Function of the COLOR/MODE Button

This button has a double function: one is to select the title color and the other is to select the title display mode. Its function depends on whether the title is displayed or not. (Q-8)

To select the color

- 1 Press **SUPERIMPOSE ON/OFF** to display the title.
- 2 Press **COLOR/MODE**.  
Each time you press the button, the color indication changes as follows:

WHT (white) → BLUE → GRN (green) → CYAN  
↑  
BLK (black) ← YEL (yellow) ← VIO (violet) ← RED  
↓

To select the mode

- 1 If the title is displayed inside the viewfinder, press **SUPERIMPOSE ON/OFF** so that the title disappears.
- 2 Press **COLOR/MODE**.  
Each time you press the button, the mode indication changes as follows:

No indication

(Normal title mode) → ↑ → ↓ → ↑

↑ : Title scroll up mode  
↓ : Title reverse mode  
↑↓ : Title reverse and scroll up mode

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## Connection for Playback

You must connect the camcorder and the TV and/or VTR properly to view the playback picture. Check the following connecting examples and go to the appropriate section to make the necessary connections.

**Case 1:** Connecting the camcorder to a TV with video/audio input jacks.

**Case 2:** Connecting the camcorder to a TV without video/audio input jacks.

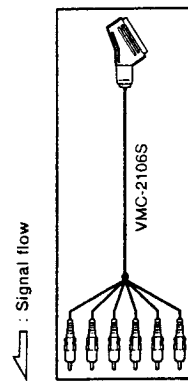
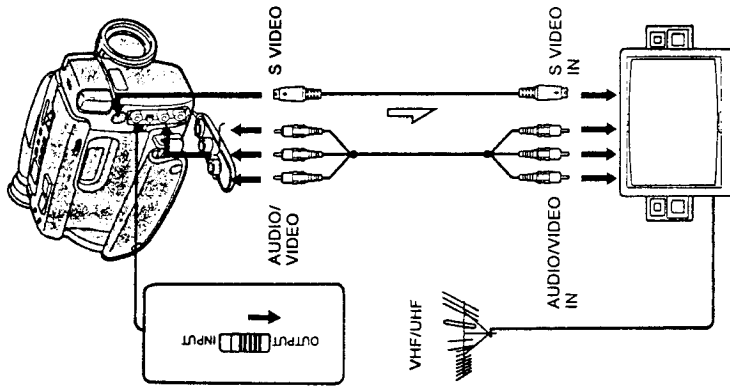
**Case 3:** Connecting the camcorder to a TV via a VTR.

### About the AUDIO/VIDEO jacks

The AUDIO/VIDEO jacks on this camcorder works as both input and output jacks. Set the INPUT/OUTPUT selector as follows. (E/AUS MODEL)

in the OUTPUT position	to view the playback tape/ to edit on another VTR
in the INPUT position	to record from another VTR or TV

(R-1)



## Case 1: Connecting to a TV with Video/Audio Input Jacks

(R-1)

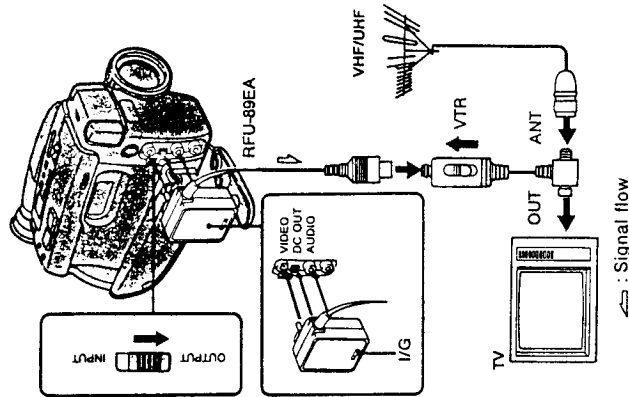
Leave the TV aerial cable connected to the TV.

- 1 Connect the camcorder to the TV using the supplied A/V connecting cable.
  - If your TV has an S video input jack, connect the S video jack on the camcorder and the S video input jack on the TV using the S video connecting cable (supplied). In this case, you need not connect the yellow plug of the AV connecting cable.
  - If your TV is a monaural type, connect only the white plug for audio both on the camcorder and the TV. Set the HI-FI SOUND switch to the "green position". See "Selecting the Monitor Sound" on page 66.
  - If your TV has a 21-pin connector (EUROCONNECTOR), use a connecting cable such as the VMC-2106S (not supplied).
- 2 Set the INPUT/OUTPUT selector on the Camcorder to OUTPUT. (E/AUS MODEL)
- 3 Set the TV/VTR selector button or switch on the TV to VTR.

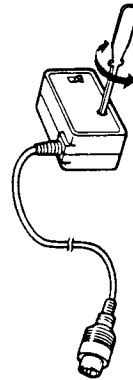
### Notes

- For details on the TV, refer to the instruction manual of the TV.
- If your TV is a stereo type, the sound will be in stereo and when your TV is a monaural type, the sound will be in monaural.

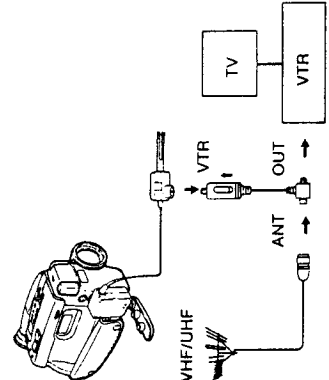
(R-2)



(R-3)



(R-4)



62

## Case 2: Connecting to a TV without Video/Audio Input Jacks

(R-2)

### For the customers supplied with the RFU adaptor RFU-89EA

#### Before you begin

- Use the supplied RFU-89EA RFU adaptor.
- Make sure that the TV is turned off.
- Usually keep the RFU adaptor and the TV connected.

#### Connecting an RFU adaptor and a TV

- 1 Connect the RFU adaptor to the camcorder.
- 2 Set the INPUT/OUTPUT selector on the camcorder to OUTPUT. (E/AUS MODEL)
- 3 Connect the antenna selector supplied with the RFU adaptor to the VHF/UHF antenna and the TV.
- 4 Set the selector switch on the antenna selector to VTR.

#### Adjusting the TV

- 1 Set the I/G selector on the RFU adaptor according to the TV system used in your area.
- 2 Turn on the TV and select a program position that is not used to receive a TV station.
- 3 Set the POWER switch of the camcorder to CAMERA and turn STAND BY up.
- 4 Tune the TV so that the picture and the sound from the camcorder is received.

#### Note

For details on the TV, refer to the instruction manual of the TV.

#### When the playback picture is not free of disturbance

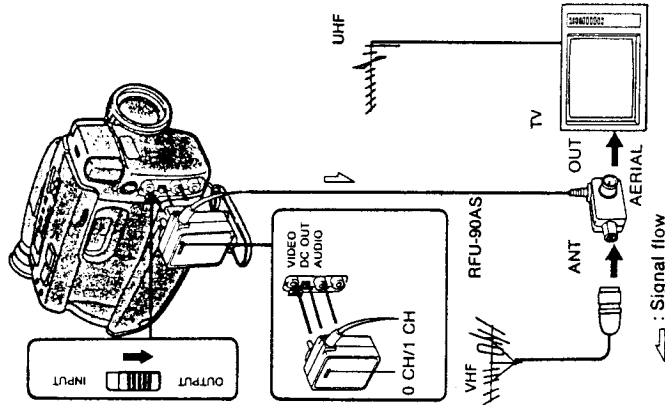
- 1 Set the selector switch on the antenna selector to ANT.
- 2 Select a program position between UHF channels 30 and 39, so that the TV shows no picture and a steady resting sound or no sound is heard.
- 3 Set the selector switch on the antenna selector to VTR.
- 4 Turn the screw on the RFU adaptor slowly with the supplied screwdriver so that the playback picture is clearly displayed on the TV screen. (R-3)

If your TV is connected to a VTR (R-4) Connect the camcorder to the VTR instead of the TV.

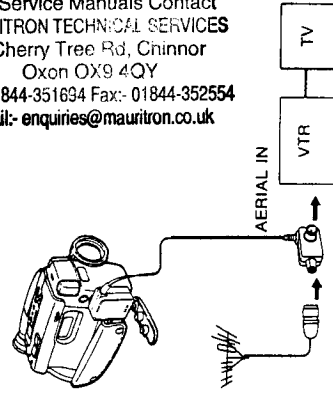
#### Note

In this connection, the sound will be in monaural.

(R-5)



(R-6)



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## For the customers supplied with the RFU adaptor RFU-90AS

(R-5)

#### Before you begin

- Use the supplied RFU-90AS RFU adaptor.
- Make sure that the TV is turned off.
- Usually keep the RFU adaptor and the TV connected.

#### Connecting an RFU adaptor and a TV

- 1 Connect the RFU adaptor to the camcorder.
- 2 Set the INPUT/OUTPUT selector on the camcorder to OUTPUT. (E/AUS MODEL)

#### Adjusting the TV

- 1 Select the RF unit selector of the adaptor to 0CH or 1CH, whichever is not active in your area.
- 2 Turn on the TV and select the 0 position so that you can receive the camcorder's playback signal.

#### If your TV is connected to VTR

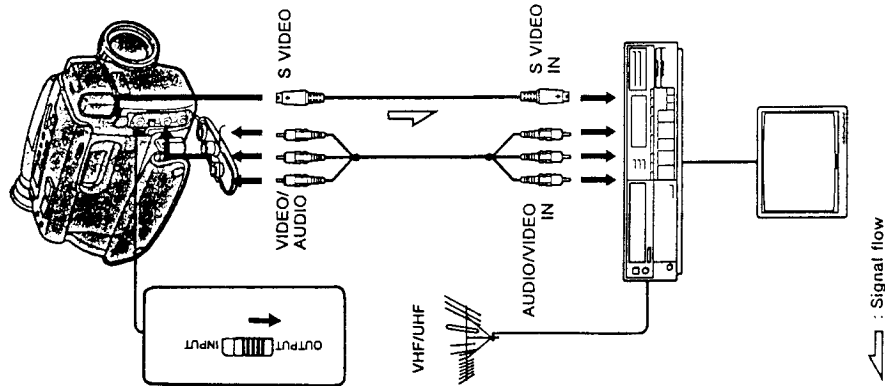
(R-6) Connect the camcorder to the VTR instead of TV.

#### Notes

- Whenever playing back a tape, be sure to set the TV to the 0 position.
- In this connection, the sound will be in monaural.
- When you watch a TV program, turn off the camcorder or disconnect the RFU adaptor from the camcorder.

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(R-7)



### Case 3: Connecting to a TV via a VTR (R-7)

Leave the VTR aerial cable connected to the VTR.

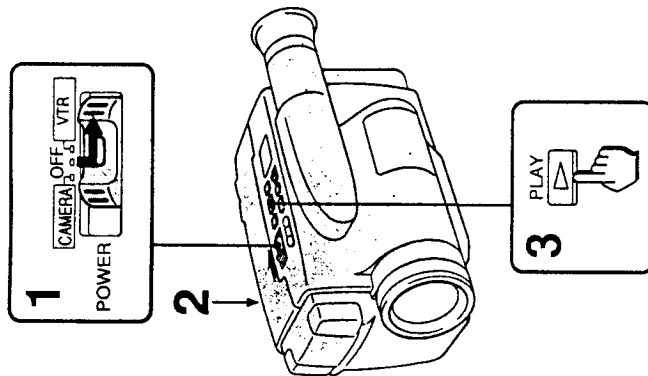
- 1 Connect the camcorder to the VTR using the supplied A/V connecting cable.
  - If your VTR has an S video input jack, connect the S video jack on the camcorder and the S video input jack on the VTR using the S video connection cable (supplied). In this case, you need not connect the yellow plug of the AV connecting cable.
  - If your VTR is a monaural type, connect only the white plug for audio both on the camcorder and the VTR. Set the HI-FI SOUND switch to the "green position". See "Selecting the Monitor Sound" on page 66.

- 2 Set the input selector on the VTR to LINE and set the TV/VTR selector on the TV to VTR.

#### Note

If your VTR is a stereo type, the sound will be in stereo and when your VTR is a monaural type, the sound will be in monaural.

(S-1)



## Playing Back a Tape

Turn on the TV, and select the channel for viewing a playback picture (set the TV/VTR selector to VTR). You can use the supplied Remote Commander.

(S-1)

- 1 While pressing the green button, set the POWER switch to VTR.

- 2 Insert a tape.

- 3 Press  $\triangleright$ . Playback starts.

To view a still picture, press  $\square$  during playback.

To resume playback, press  $\square$  or  $\triangleright$  again.

#### Note

When the still picture mode lasts for 5 minutes or more, the camcorder automatically enters the stop mode.

To rewind the tape, press  $\ll$ .

To advance the tape rapidly, press  $\gg$ .

To stop the tape, press  $\square$ .

To stop the tape momentarily, press  $\square$ .

In playback pause mode, you can view the picture in a sequence of stop-motion images by pressing EDITSEARCH. If you keep pressing EDITSEARCH, you can view the picture playback in forward or reverse direction.

#### Note

Streaks appear and sound is muted in the still picture mode.

## Using the Tape Counter

During recording or playback, the digits on the counter indicate the actual recording or playing time.

### To Index the Whole Tape

(T)

Press RESET at the beginning of the tape so that the counter shows "0:00:00". Write down the counter reading at a particular point so that you can easily find that point later by referring to the tape counter.

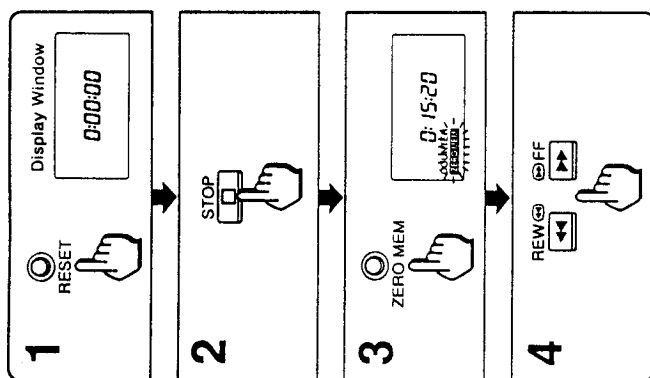
### To Return to a Pre-registered Point

- 1 During playback, press RESET at the point you later want to locate. The counter shows "0:00:00".
- 2 Press ☐ when playback has finished, as usual.
- 3 Press ZERO MEM. The "ZERO MEM" indicator flashes in the display window.  
**Note**  
Be sure to press the ZERO MEM after you stop the tape. It does not function during recording or playback.
- 4 Press  or . The tape rewinds or advances and stops automatically when the counter reaches approximately zero.

### Notes on the tape counter and ZERO MEM

- The counter reading and the point on the tape may not correspond exactly. Use the counter as a guide. There will be a time lag of several seconds especially when you repeat fast-forwarding/rewinding and play back a tape recorded in LP and SP modes mixed.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to the point you pre-registered.

(T)



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### Monitoring a High-Speed Picture

#### To locate a scene (picture search)

Keep pressing  or  during playback. You can monitor the picture at high speed as long as you keep pressing the button.  
To resume normal playback, release the button.

#### To locate a scene quickly (skip scan)

Keep pressing  during rewinding, or  while advancing the tape rapidly. You can monitor the picture at high speed as long as you keep pressing the button.  
To resume a normal fast forwarding or rewinding, release the button.  
To resume normal playback, press .

### Selecting the Monitor Sound

(S-2)

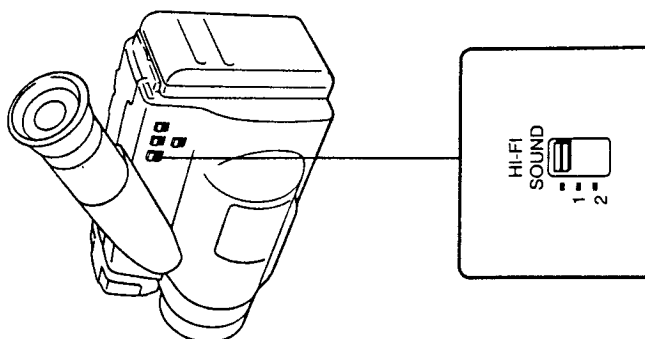
You can select the playback sound with the HI-FI SOUND switch.

When playing back a Hi-Fi stereo sound recorded tape  
Set the switch to "Green position."

When playing back an AFM monaural sound recorded tape  
Set the switch to "Green position."

Monaural sound comes from both audio jacks.

When playing back a dual soundtrack tape  
Set switch to "1" or "2."



(S-2)

## Editing onto Another VTR

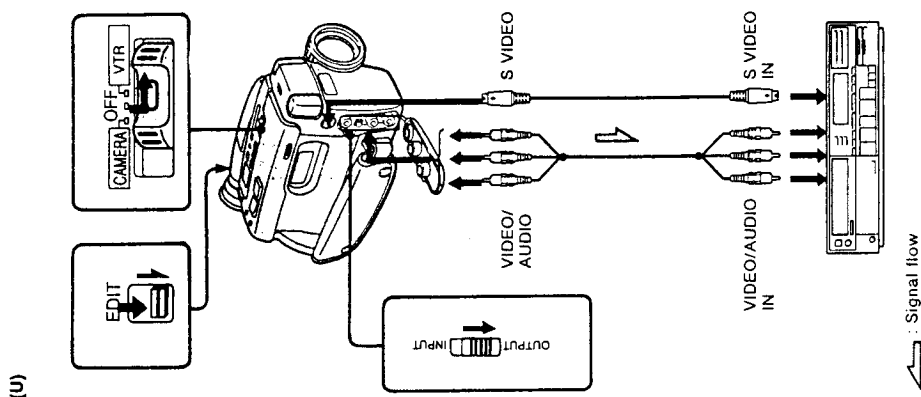
You can create your own video program by editing with any other **8** 8 mm, **H18** Hi8 mm, **VHS**, **Betamax**, **M5** VHS, **S-VHS**, **S-VHS**, **VHS-C**, **S-VHSC**, **S-VHSC** S-VHSC VTRs that has video/audio inputs.

## Before You Begin

- Make connections using the supplied Video/Audio connecting cable. **(U)**
- If your VTR has an S video input jack, connect the S VIDEO jack on the camcorder and the S video input jack on the VTR using the supplied S VIDEO connecting cable. In this case, you do not have to connect the yellow plug.
- Set the input selector of the VTR to LINE, if available.

## Operation

- 1** Insert a tape to be recorded on into the recording VTR.
- 2** Move EDIT on the camcorder in the direction of the arrow. (EDIT ON)
- 3** Make sure that INPUT/OUTPUT is set to OUTPUT. (E/AUS MODEL)
- 4** Set POWER of the camcorder to VTR and insert your recorded tape.
- 5** Playback the tape on the camcorder and locate the point where you want to start editing and set the camcorder to the playback pause mode.
- 6** On the recording VTR, locate the recording start point and set the VTR to the recording pause mode.
- 7** Press [II] on the camcorder and on the VTR simultaneously to start editing.



To stop editing momentarily, press [ ] on the VTR.

**To edit more scenes, repeat steps 5 to 7.**

**To stop editing,** press ☐ on the camcorder and on the VTR.

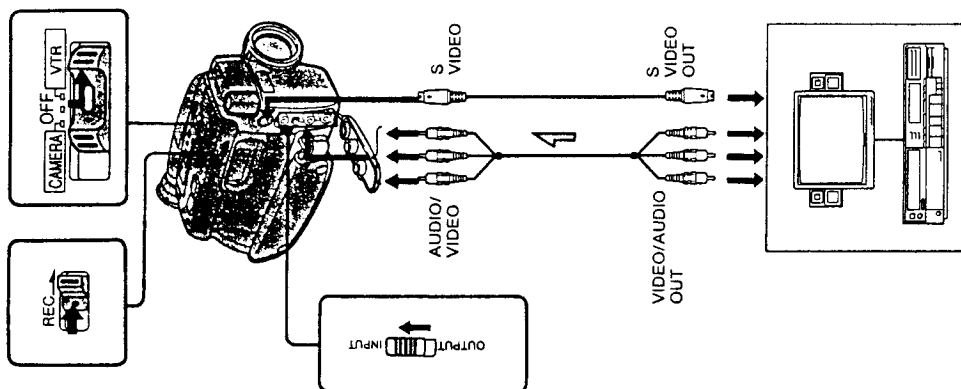
### Use of the EDIT switch

When you set the EDIT switch in the direction of the arrow (EDIT ON), picture deterioration resulting from editing can be kept to a minimum. Don't use the edited tape for multiple generations of editing. After editing, move the EDIT switch in the opposite direction of the arrow (EDIT OFF).

## Recording from Another VTR or a TV

### (E/AUS MODEL)

(V) You can record a tape from another VTR, or a TV program from the TV if both are equipped with video/audio outputs.



➡ : Signal flow

### Before You Begin

- Disconnect the RFU adaptor from the camcorder if it has been connected.
- Make connections using the supplied A/V connecting cable.
- If your TV has an S video output jack, connect the S video jack on the camcorder and the S video output jack on the TV using the S video connecting cable (supplied). In this case, you do not need to connect the yellow (video) plug of the A/V connecting cable.
- If your TV is a monaural type, connect only the white plug for audio both on the camcorder and the TV or the VTR. Do not use the red plug. In this case, the sound will be in monaural.

### Operation

- 1 Make sure that INPUT/OUTPUT is set to INPUT.
- 2 While pressing the small green button on POWER, slide POWER to VTR.
- 3 Insert a tape in the camcorder.
- 4 Turn on the VTR or TV.
- 5 Play back the tape (in another VTR) or select the TV channel to be recorded.
- 6 Slide ● REC in the direction of the arrow. Recording starts. You can monitor the picture being recorded inside the viewfinder.

### Note

You can play back a tape in normal/reverse direction by keep pressing EDITSEARCH during recording standby or playback pause. You can also play back still pictures successively at specific intervals by pressing EDITSEARCH intermittently.

## Insert Editing

### (E/AUS MODEL)

(W) You can insert a new scene from a VTR onto your originally recorded tape by specifying starting and ending points.

### Before You Begin

Connections are the same as in "Recording from another VTR or a TV" (page 60). Before you begin replacing recordings, set the VTR to the playback pause mode at the beginning of the scene to be recorded.

### Operation

- 1 While pressing the small green button on POWER, slide POWER to VTR. The counter appears in the display window.
- 2 Locate the end point where the insert should end by pressing ◀◀ or ▶▶ during playback. The viewfinder screen shows a high-speed playback picture.
- 3 At the end point, press RESET. The counter resets to "0:00:00."
- 4 Locate the start point where the insert should begin by pressing ◀◀.
- 5 At the start point, put the camcorder into recording standby mode.
- 6 Press ZERO MEM. The end point of the insert is stored in memory.
- 7 Press ■ on both the camcorder and the VTR to start insert editing. You can monitor the picture being inserted in the viewfinder screen. The insert recording stops automatically near the zero point on the counter.

### To change the end point

Press ZERO MEM so that the ZERO MEM indication disappears, and begin from step 2.

### Note

You can play back a tape in normal/reverse direction by keep pressing EDITSEARCH during recording standby or playback pause. You can also play back still pictures successively at specific intervals by pressing EDITSEARCH intermittently.

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# Compatibility with Conventional 8 mm Camcorders

You can record and play back a high-quality picture on a tape for the Hi8 video system.

## Recording with this camcorder

Hi8 tape **HI8**

Set **HI8** AUTO/OFF to "AUTO".  
Set **HI8** AUTO/OFF to "OFF".

Tapes are recorded in the Hi8 video system.

Set **HI8** AUTO/OFF to "OFF".

Tapes are recorded in the standard 8 mm video system.

Standard 8 mm tape **8**

Regardless of the position of the **HI8** AUTO/OFF switch,

Tapes are recorded in the standard 8 mm video system.

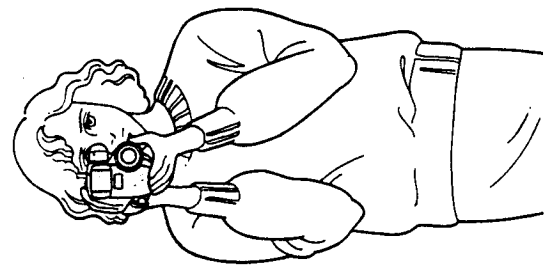
## Playback with this unit

Tapes are recorded in the Hi8 video system.

Tapes are recorded in the standard 8 mm video system.

The recording mode is selected automatically.

(X-1)



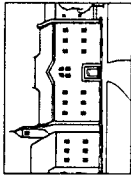
## Hints for Better Shooting

- Assume good posture for shooting (X-1)**  
For hand-held shots, it is important to hold the camcorder properly.
- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the camcorder with your thumb.
  - Place your right elbow against your side.
  - Place your left hand under the camcorder to support it. When adjusting the focus manually, make sure the camcorder does not move.
  - Place your eye firmly against the viewfinder eyecup.

## Use a tripod

If you have a tripod for a still camera, it can also be used with the camcorder. If a tripod is not available, try placing the camcorder on a table top or any other flat surface of suitable height.

(X-2)



## Keep the horizontal plane level (X-2)

The horizontal plane can be easily determined by using the viewfinder frame as a reference.

## Planning Ahead

**If you are going to edit the tape after recording**

Shoot the scene a little longer to make the editing easier.

**If you are not going to edit the tape after recording**

First record a title and then use the START/STOP button to make a smooth recording.



## Lighting

### Shoot with the sun behind you

When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.

- The subject is indoors and there is a window behind the subject.
- Bright light sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background. In this case, the face will be recorded too dark.

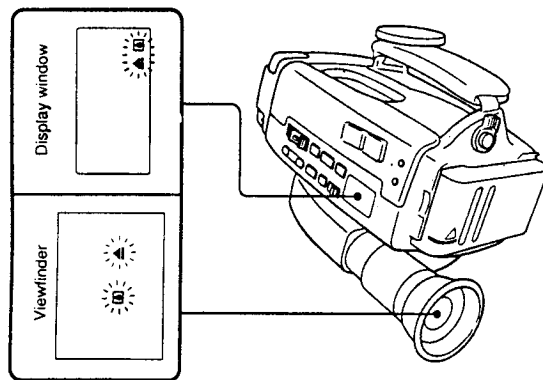
### Use video light in the dark

To get the best colors, a sufficient light level must be maintained.

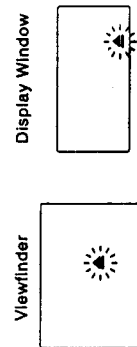
We recommend you use photography lamps or halogen lamps. For best results, use of Sony video lights are recommended because of their weight, low heat output levels.

When using a video light, attach it to this camcorder with a video light attachment (not supplied). For detailed instructions on proper use of light, read the instruction manual of the video light.

(Y-1)



(Y-2)



## Notes and Precautions

### Notes on Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. In this condition, the tape may stick to the head drum and be damaged or the camcorder may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with a moisture sensor. However, take the following precautions:

#### If moisture condenses inside the camcorder (Y-1)

When the and indications inside the viewfinder and in the display window flash, moisture has condensed inside the camcorder. In this case, no function except for cassette ejection will work.

**Eject the tape, turn off the camcorder, and leave it with the cassette holder open for about 1 hour.**

The camcorder can be used again if the indication does not appear when the power is turned on again.

77

#### If moisture condenses on the surface of the tape (Y-2)

If moisture is present on the surface of the tape when the tape is inserted and a tape transport button (, , etc.) is pressed, the indication flashes inside the viewfinder and in the display window.

In such a case, no function except for tape ejection will work.

**Eject the tape and let it sit for about 1 hour.**

The tape can be used again if the indication does not appear when the tape is inserted and a tape transport button is pressed.

#### If moisture condenses on the lens

No indications will appear, but the picture becomes dim. Turn off the power and leave the camcorder unused for about 1 hour.

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(Y-3)



[a]



[b]

### Notes on Video Head Cleaning

(Y-3)

To ensure clear pictures, clean the video heads periodically.

When playback pictures are noisy or hardly visible, the video heads may be contaminated.

[a] Slight contamination

[b] Critical contamination

In such cases,

- 1 Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.
- 2 After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.
- 3 If the picture is still noisy, repeat cleaning (Do not repeat cleaning more than 5 times.)

#### Caution

Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

#### Note

If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

## Using Your Camcorder Abroad

Each country has its own electricity system and TV color system. Before using your camcorder abroad, check the following points.

### Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 100 V to 240 V AC, 50/60Hz.

### Difference in Color Systems

You can view the playback picture in the viewfinder. However, if you want to view the playback picture on a TV, it must be a PAL system based TV as this is a PAL system based camcorder. (Note that Sony also makes NTSC system based camcorders.) Check the alphabetical list following.

#### PAL system countries

Australia, Austria, Belgium, China, Denmark, Finland, Germany (former West Germany), Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

#### PAL-M system country

Brazil

#### PAL-N system countries

Argentina, Paraguay, Uruguay

#### NTSC system countries

Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, The Philippines, U.S.A., Venezuela, etc.

#### SECAM system countries

Bulgaria, France, Guinea, Hungary, Iran, Iraq, Monaco, Poland, Soviet Union, etc.

### Precautions

#### On operation

- Operate the camcorder on 6.0 V (battery pack), 7.5 V (AC power adaptor), or 9.0 V (alkaline batteries).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not hold the camcorder by the viewfinder.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camera.
- Do not wrap the camcorder and operate it because heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- Do not let sand get into the camcorder. When you use the camcorder on a sandy beach or in dusty place, protect it from the sand or dust. Sand or dust may cause the unit to malfunction and sometimes the malfunction cannot be repaired.
- Do not let the camcorder get wet. Keep the camcorder away from rain or sea water. It may cause malfunction and sometimes the malfunction cannot be repaired.

#### On care

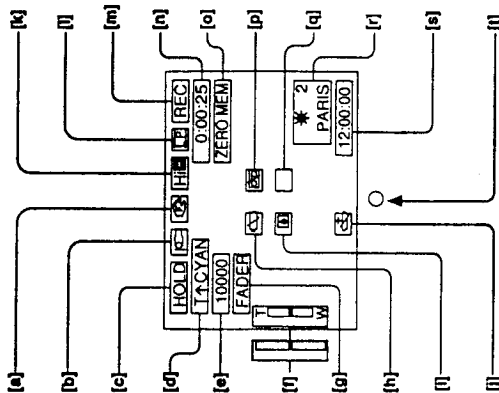
- When the unit is not to be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera section and player section, and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, wipe them off with a soft cloth.
- Clean the camcorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

#### Note on copyright

Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

## Indications in the Viewfinder and the Display Window

(Z-1)



### In the Viewfinder

(Z-1)

- [a] Manual focusing
- [b] WIND is selected. (W)
- [c] White balance mode (A/HOLD)
- [d] Title mode
- [e] Shutter speed
- [f] Power zoom Indicator / Exposure indication
- [g] FADER is pressed.
- [h] "Replace battery."
- [i] "Moisture has condensed."
- [j] "Replace lithium battery."
- [k] Lights up during recording in Hi8 system.
- [l] Recording/Playback mode (LP/SP)
- [m] Tape transport and camera recording mode
- [n] Tape counter
- [o] ZERO MEM is pressed.
- [p] "Exchange tape or no cassette inside."
- [q] "Clean video heads." or other caution (C, A)
- [r] World clock indication
- [s] Date or time
- [t] Shows up during recording.
- [u] When flashing: "Replace battery."

### Notes on DEMONSTRATION mode

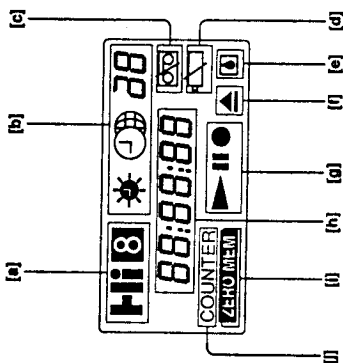
When you set POWER to CAMERA while pressing  $\square$  and  $\square$  simultaneously, the "DEMO" indication appears in the viewfinder or on a TV screen if connected and the camcorder automatically demonstrates area names, area numbers, and title modes. You can monitor the sequence inside the viewfinder or on a TV screen if connected.

To turn off the demonstration indication, set POWER to OFF or VTR.

(Z-2)

### Display Window

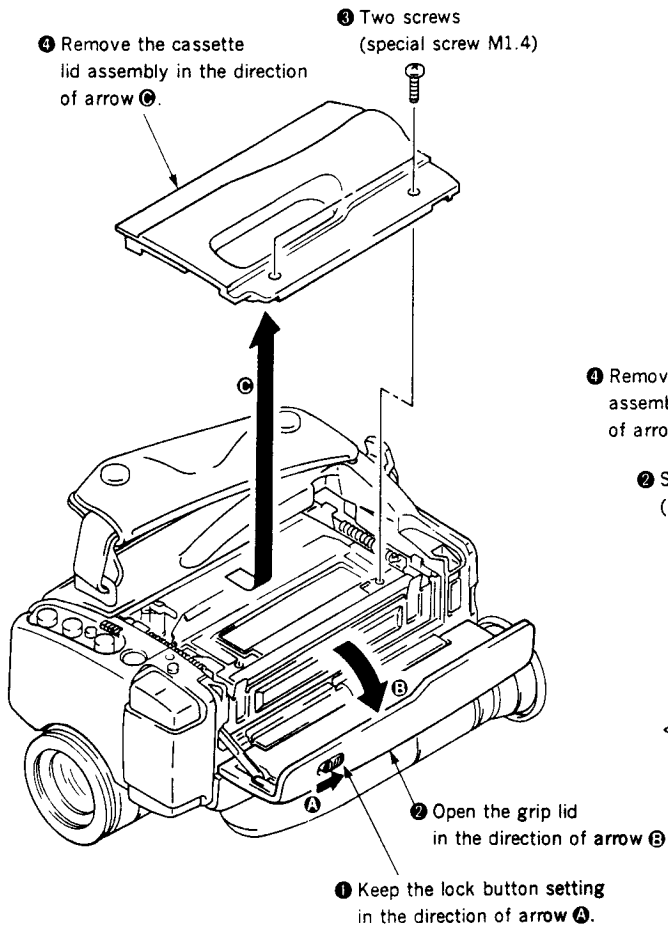
(Z-2)



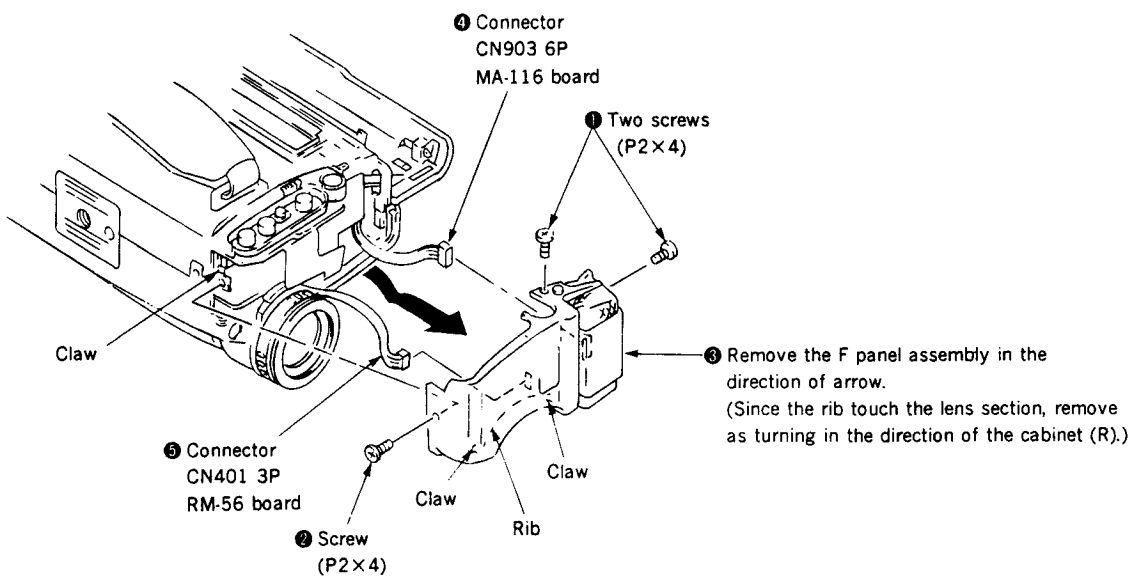
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## SECTION 2 DISASSEMBLY

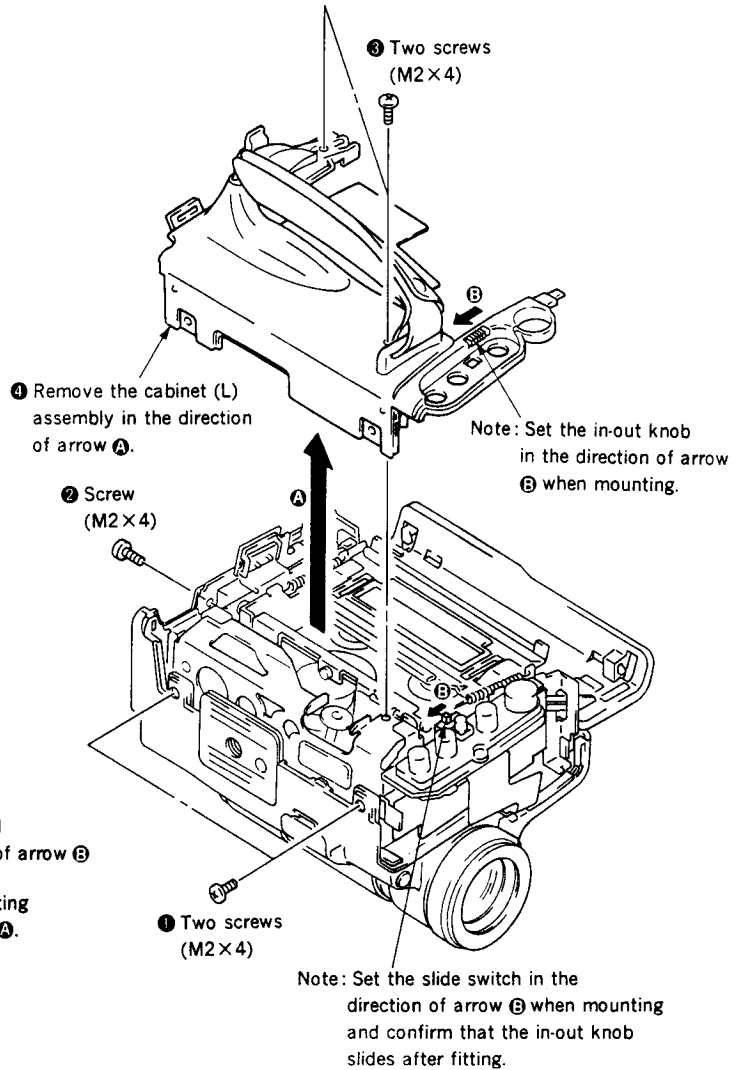
### 2-1. REMOVAL OF CASSETTE LID ASSEMBLY



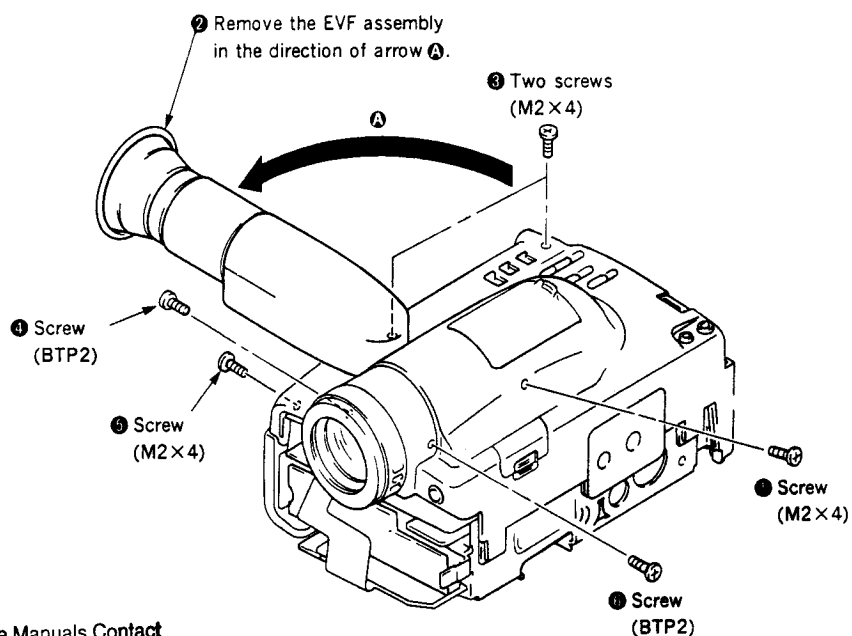
### 2-2. REMOVAL OF F PANEL ASSEMBLY



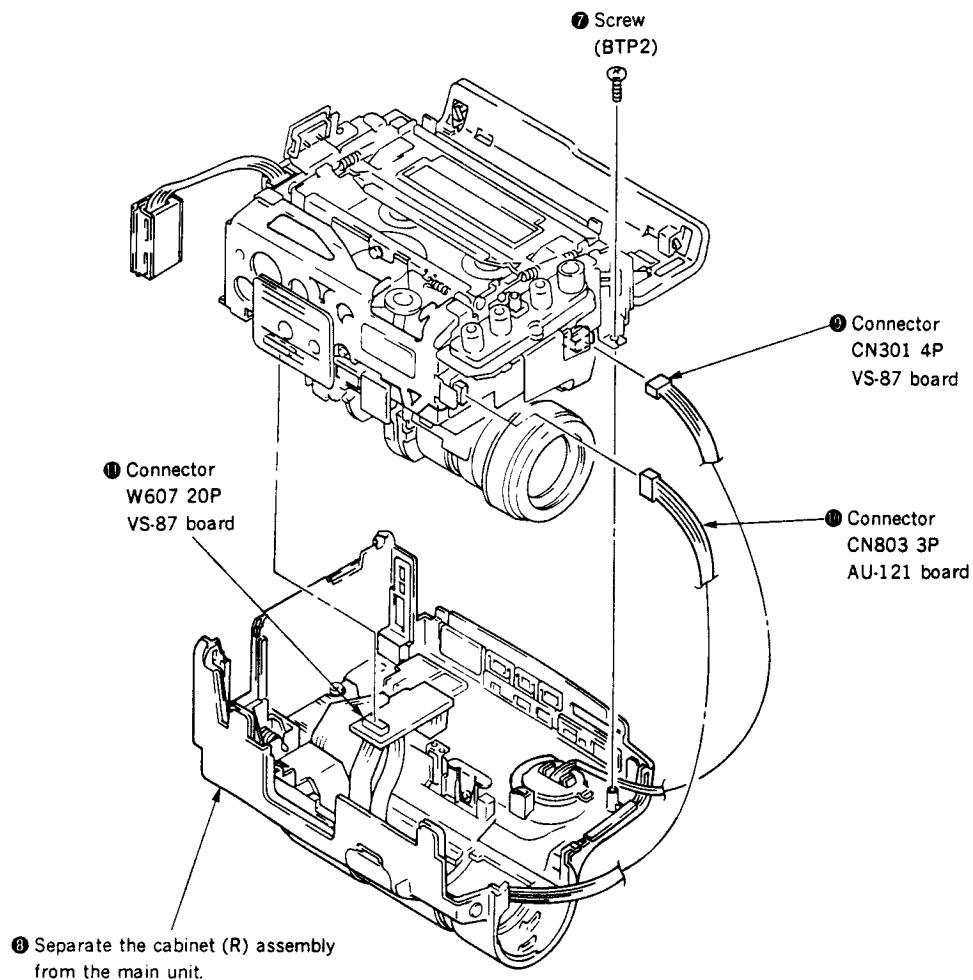
### 2-3. REMOVAL OF CABINET (L) ASSEMBLY



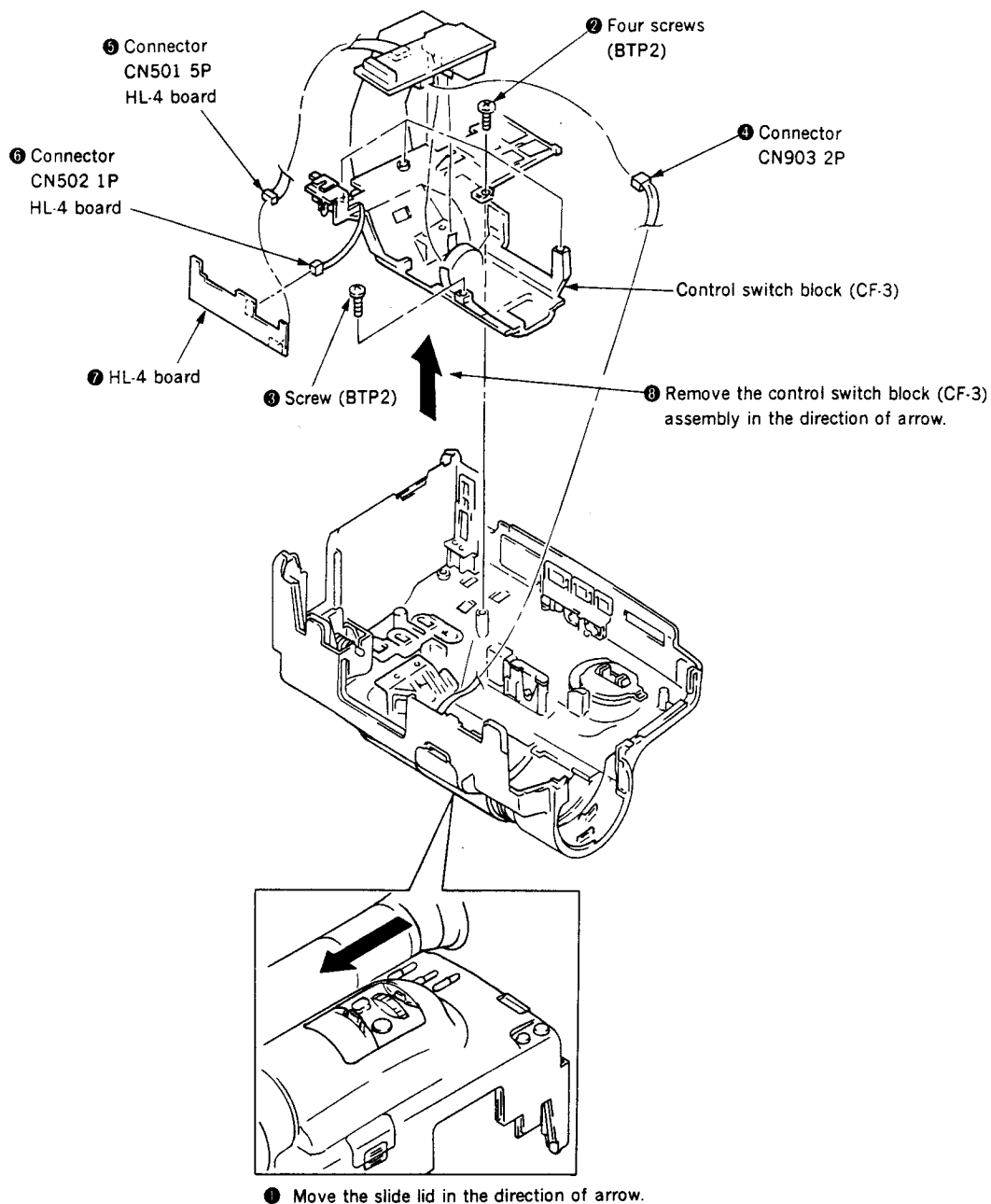
## 2-4. REMOVAL OF CABINET (R) ASSEMBLY



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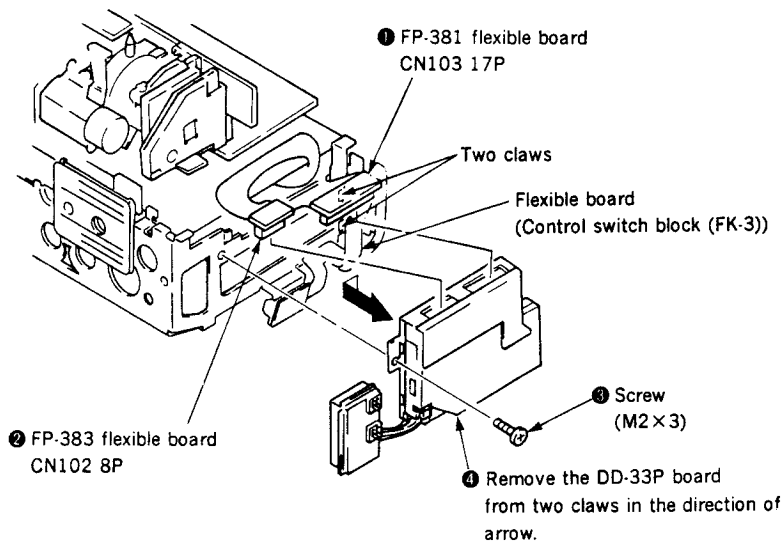


## 2-5. REMOVAL OF CONTROL SWITCH BLOCK(CF-3)



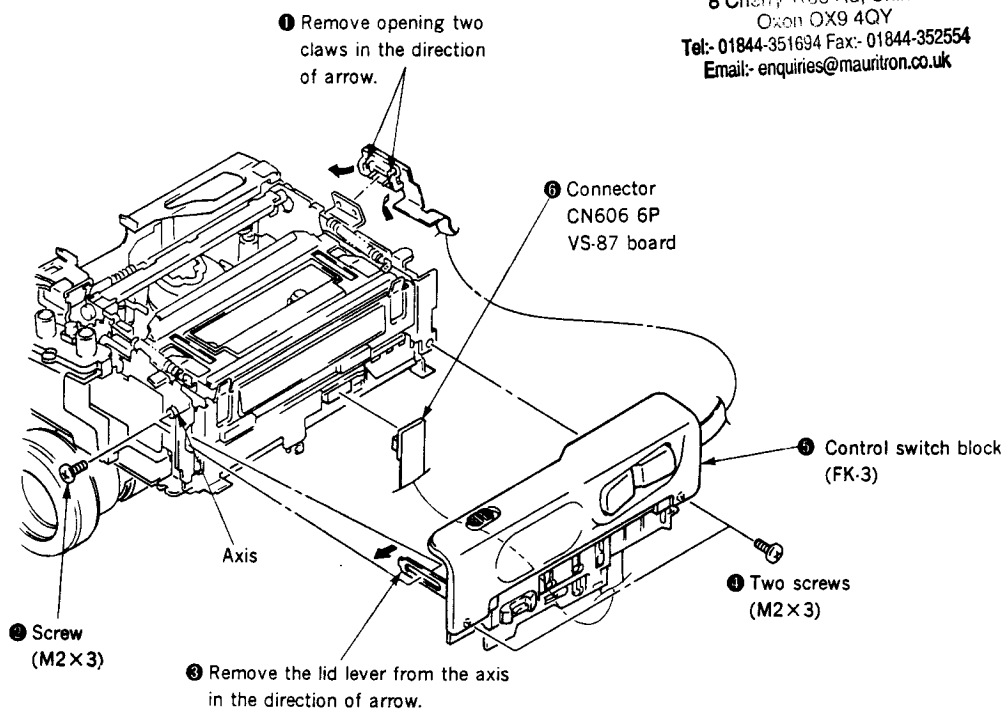
## 2-6. REMOVAL OF DD-33P BOARD

Note: Take care not to damage the flexible board of the control switch block (FK-3) when removing the DD-33P board.



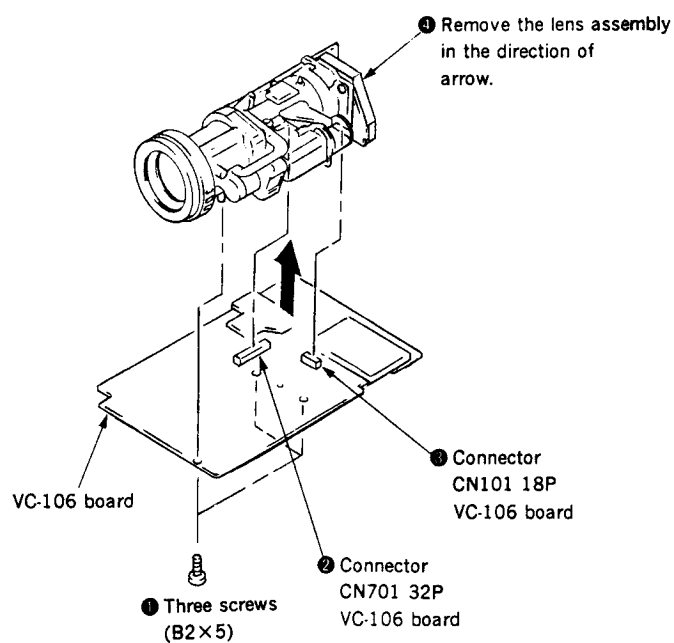
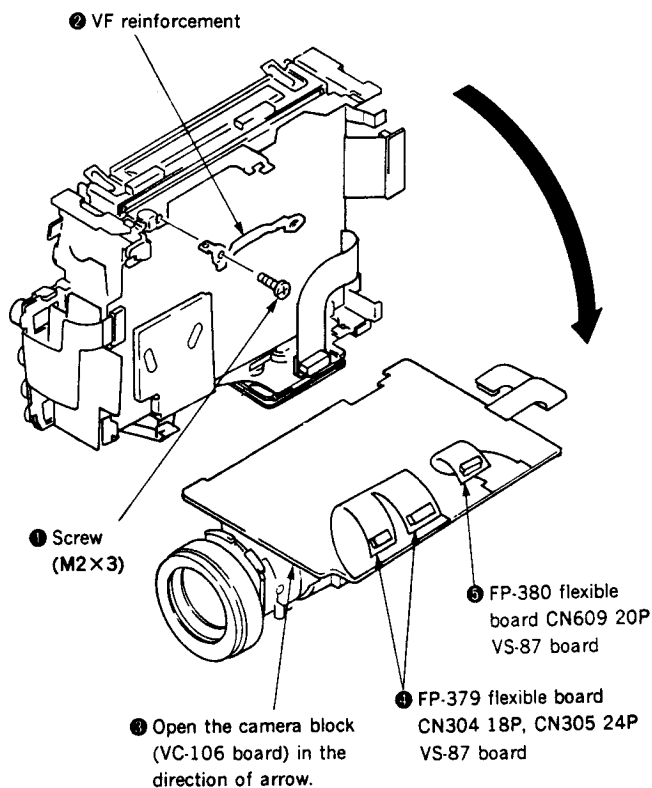
## 2-7. REMOVAL OF CONTROL SWITCH BLOCK(FK-3)

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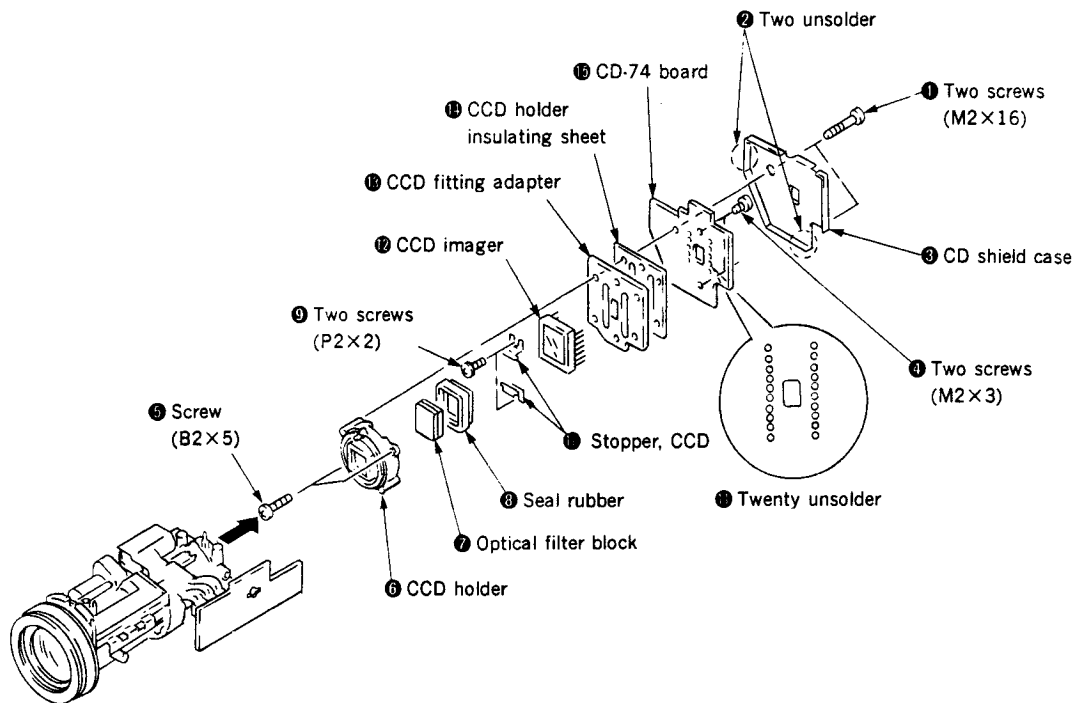


## 2-8. REMOVAL OF CAMERA BLOCK (VC-106 BOARD)

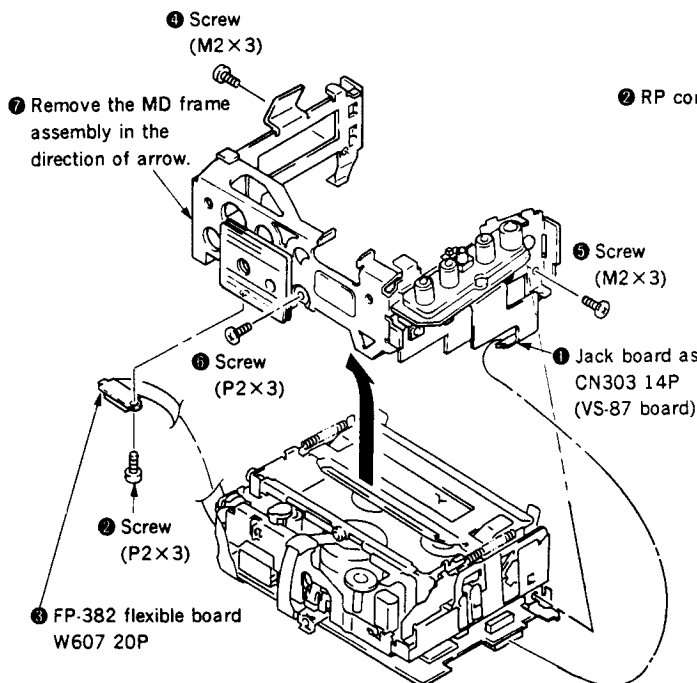
## 2-9. REMOVAL OF LENS ASSEMBLY



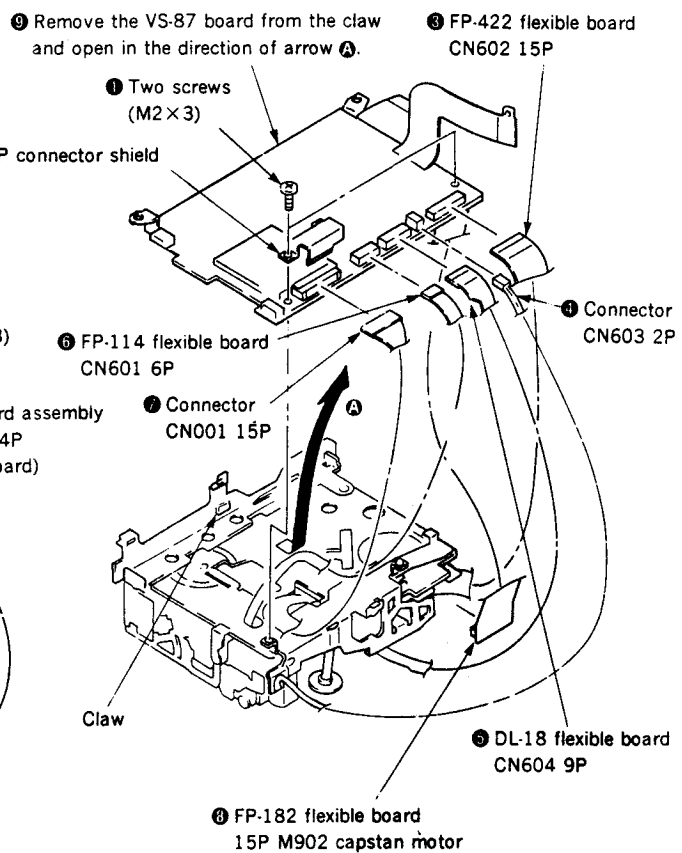
## 2-10. REMOVAL OF CCD IMAGER (CD-74 BOARD)



## 2-11. REMOVAL OF MD FRAME ASSEMBLY

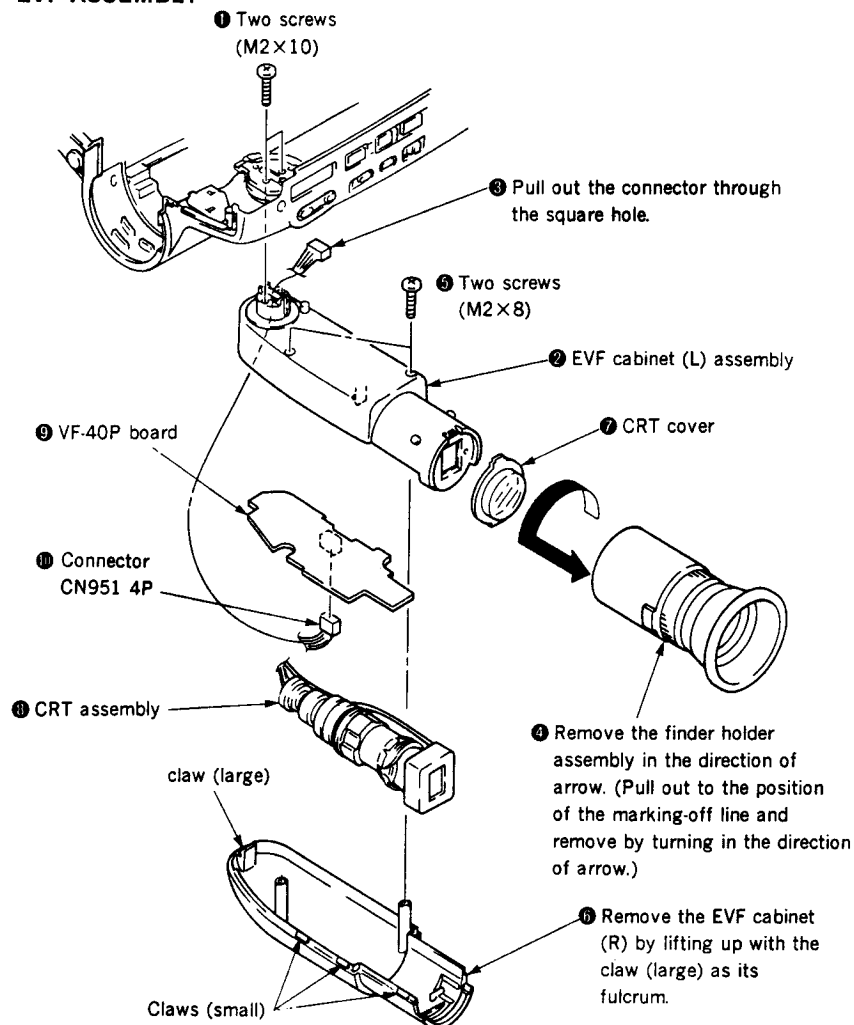


## 2-12. REMOVAL OF VS-87 BOARD





## 2-13. REMOVAL OF EVF ASSEMBLY



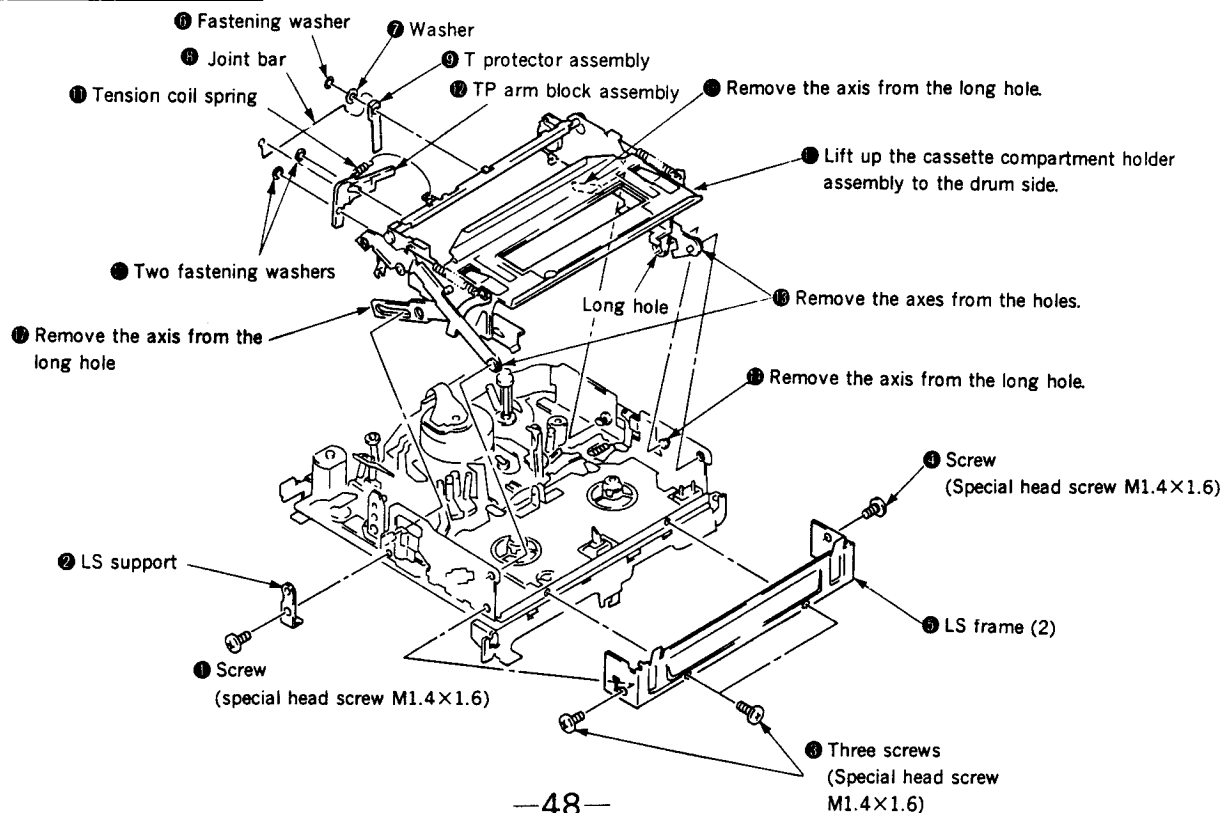
## 2-14. REMOVAL OF CASSETTE COMPARTMENT HOLDER ASSEMBLY

Note: In the beginning set to **USE** mode.

(When setting to **USE** mode, see "1-4. Handling of Mode Selector" in "8 mm video mechanical adjustment manual")

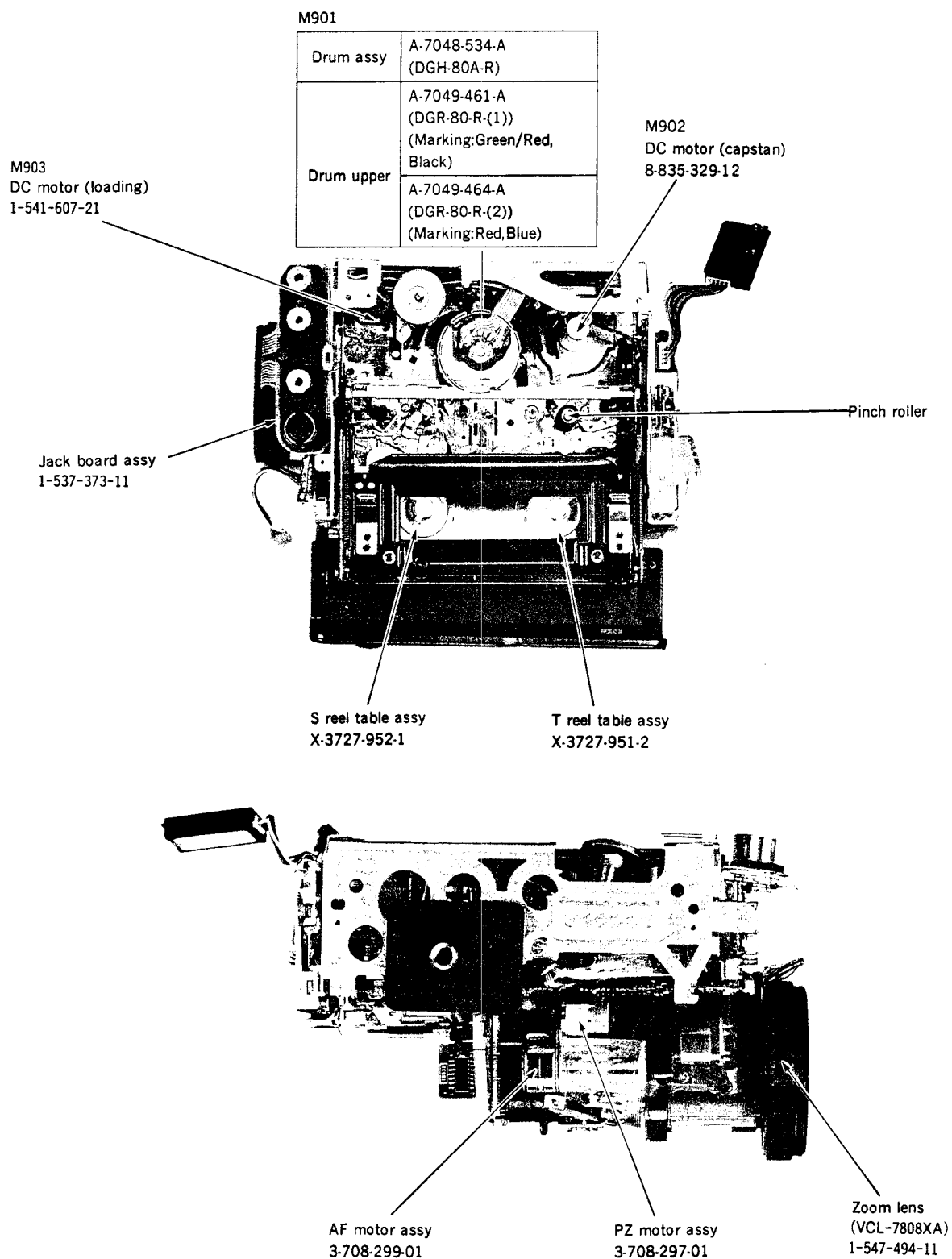
II **FL Mechanism (Q mechanism)** "

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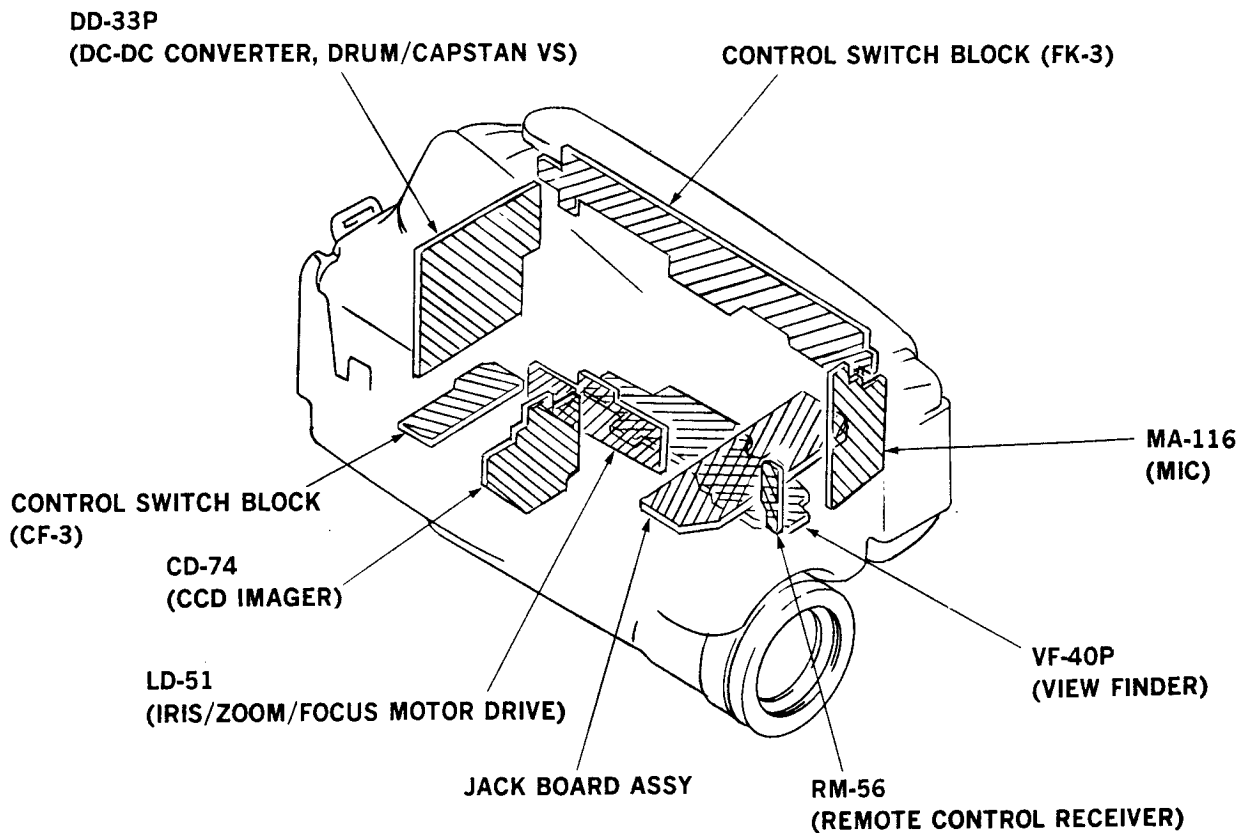
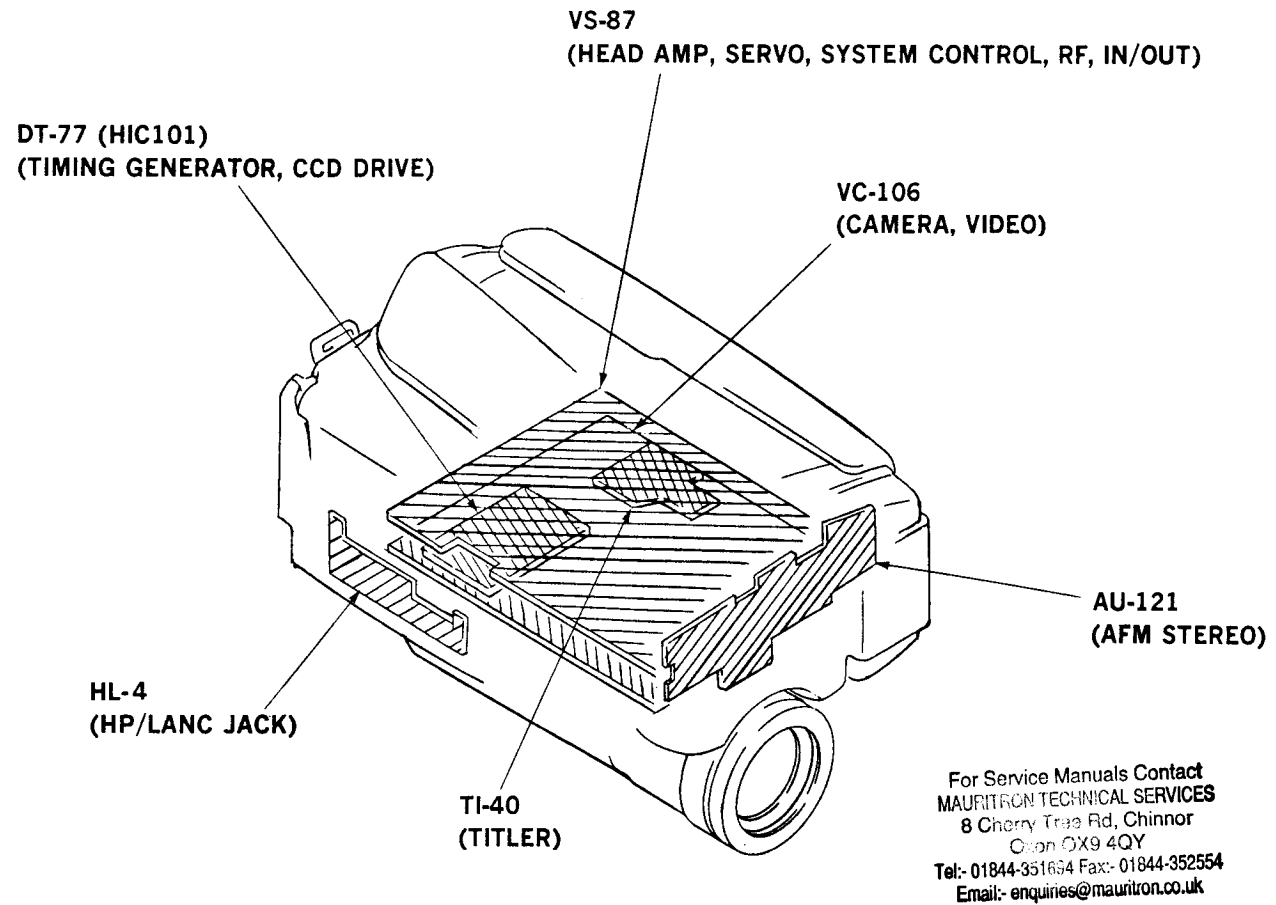
## 2-15. INTERNAL VIEWS

—Right side—



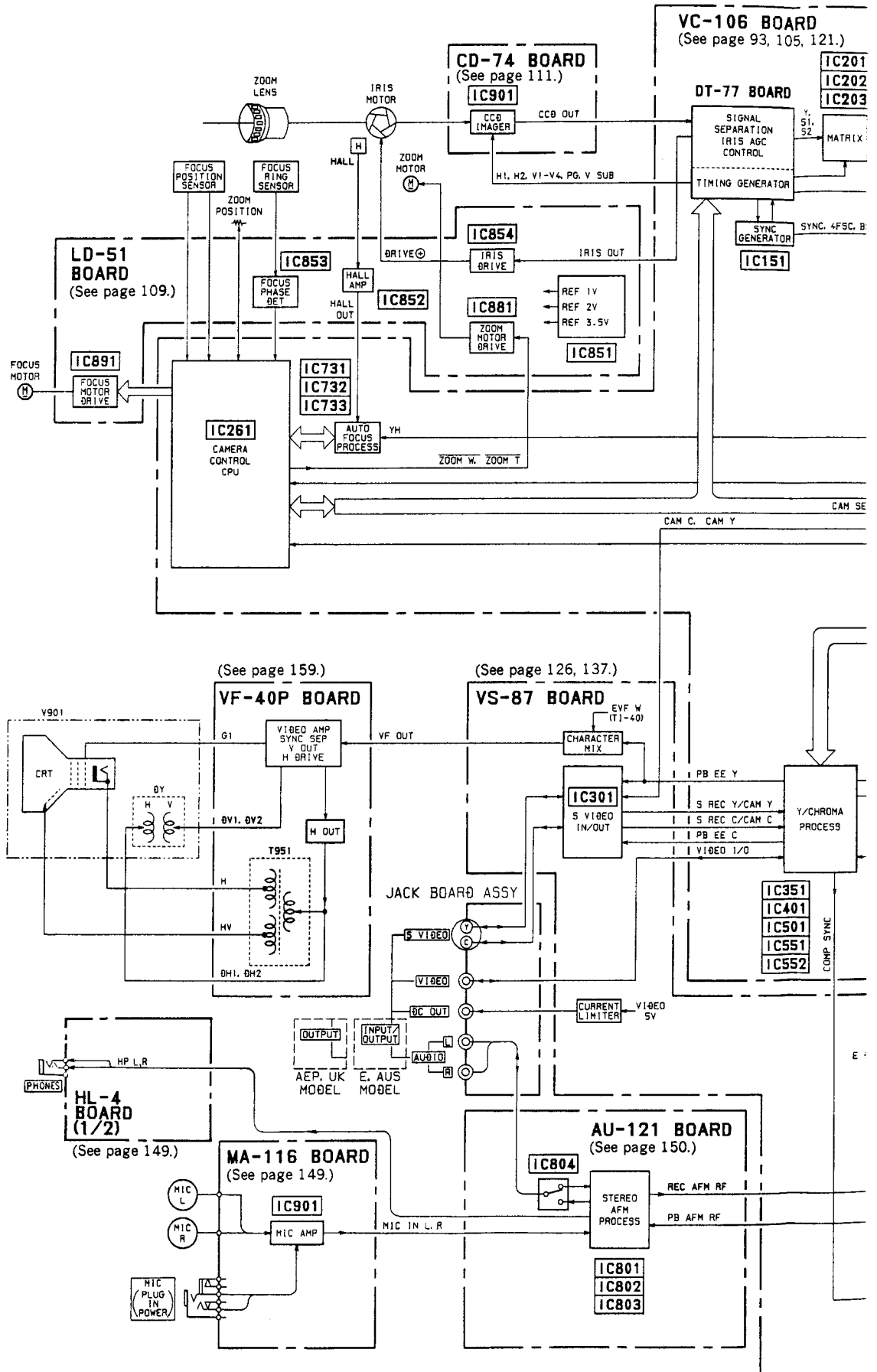
## SECTION 3 DIAGRAMS

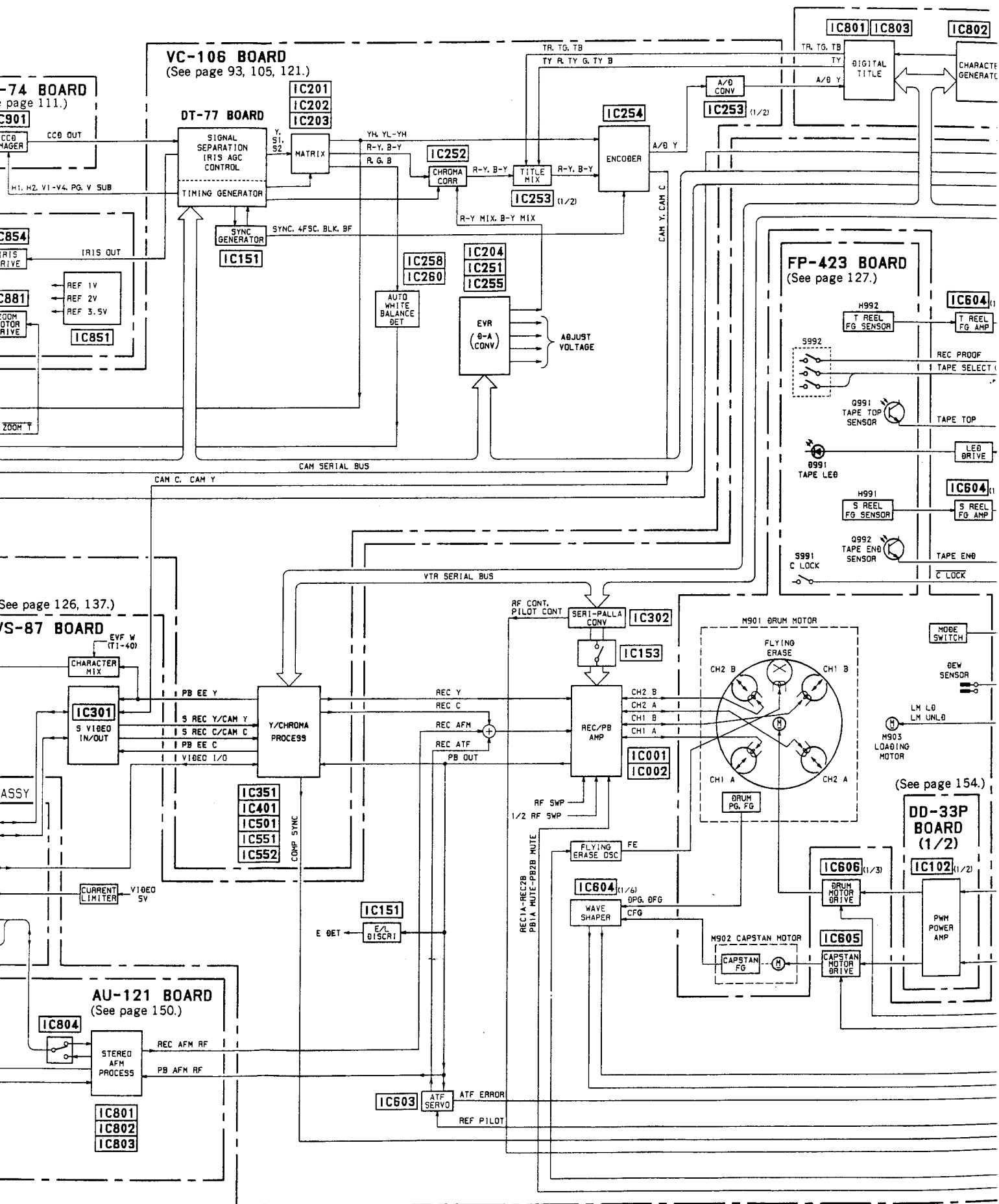
### 3-1. CIRCUIT BOARDS LOCATION



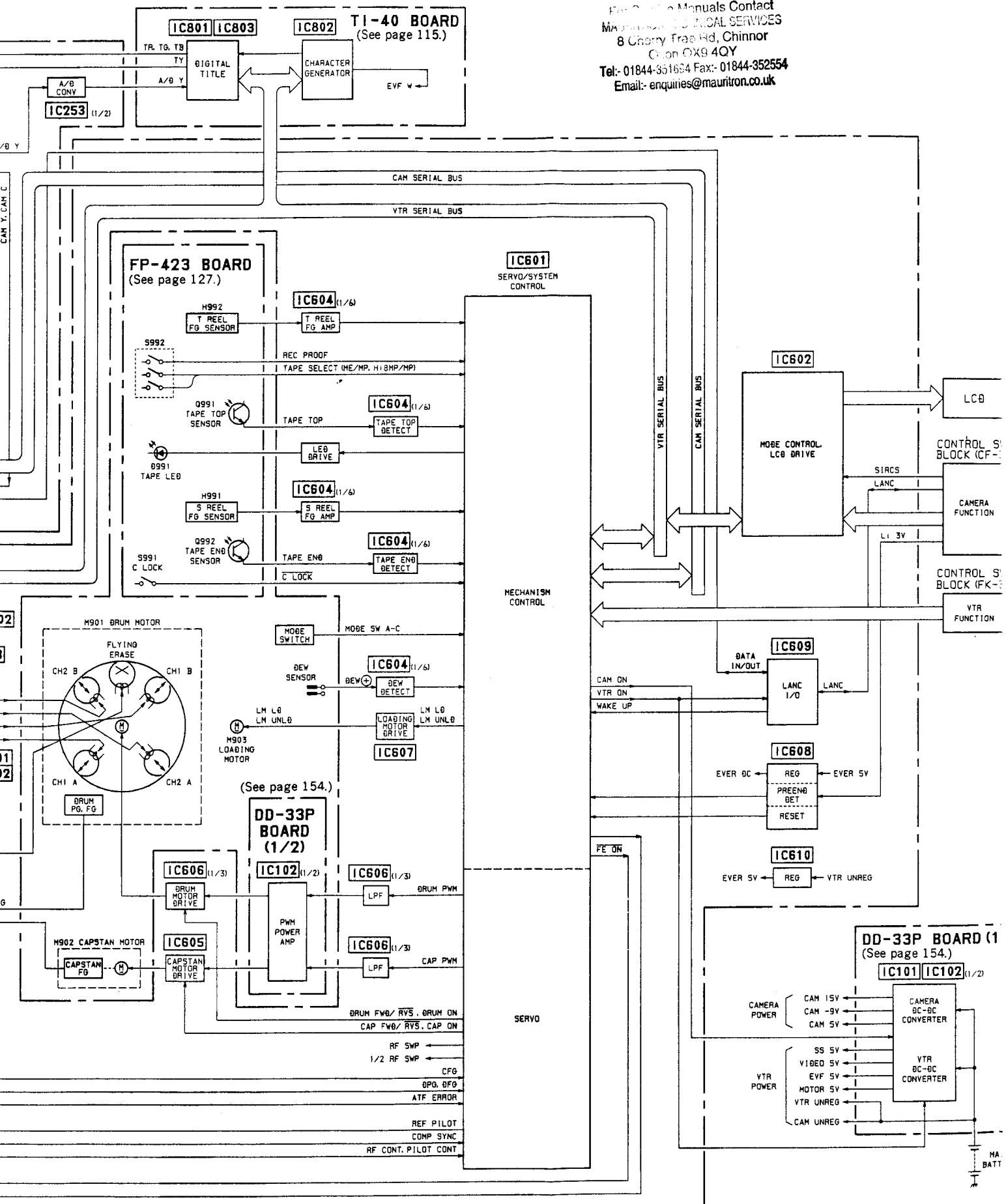
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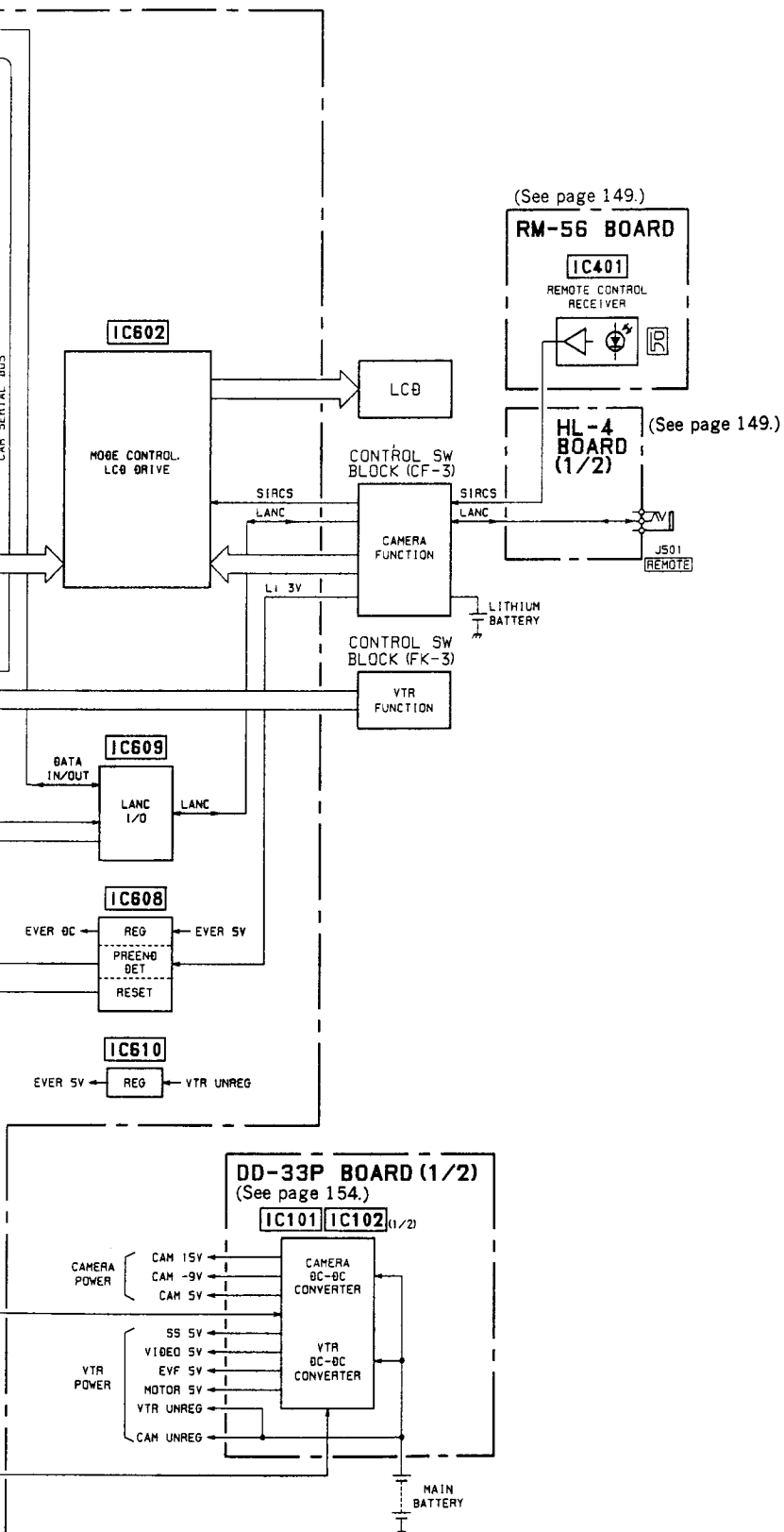
# 3-2. OVERALL BLOCK DIAGRAM





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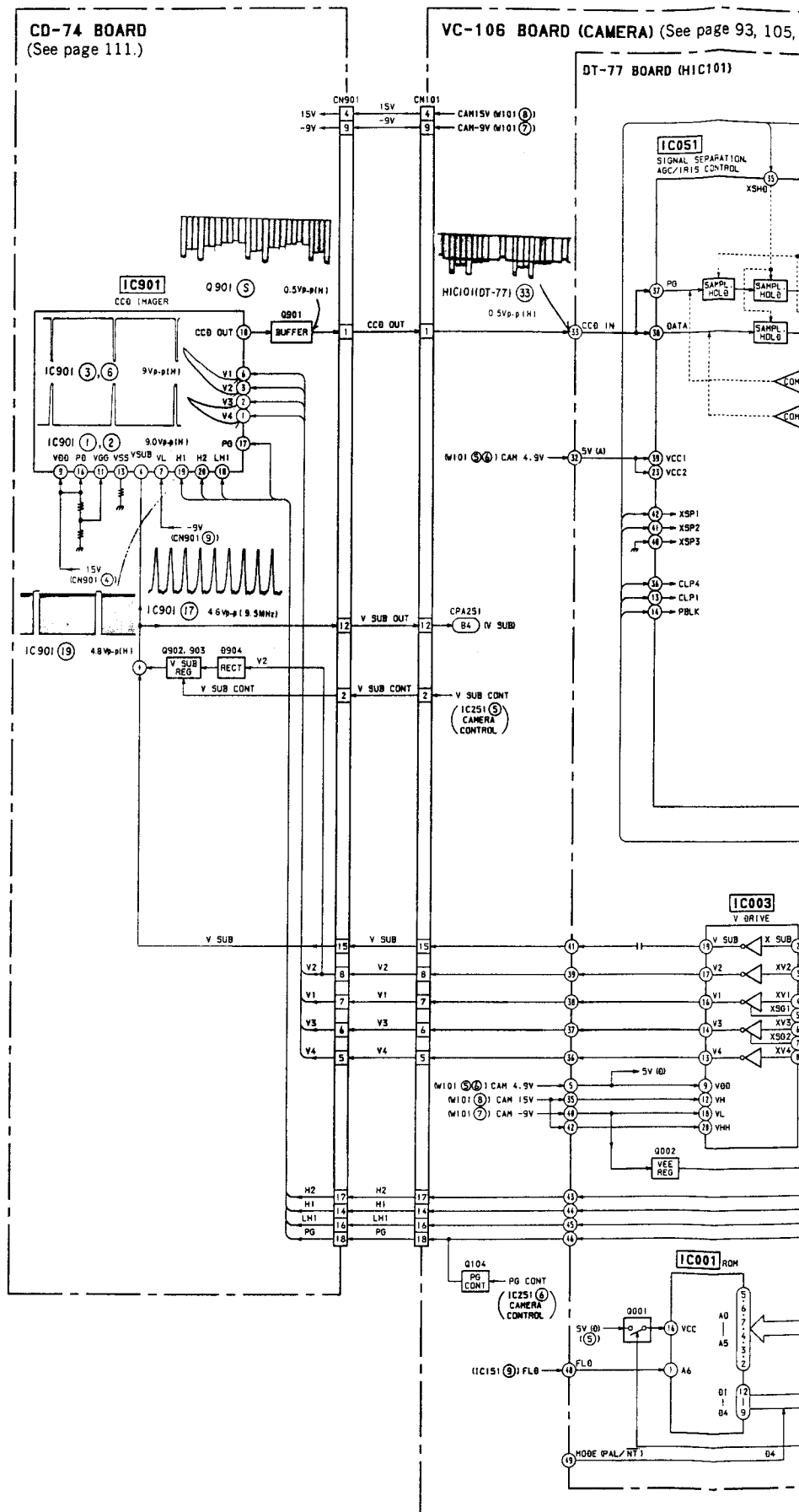


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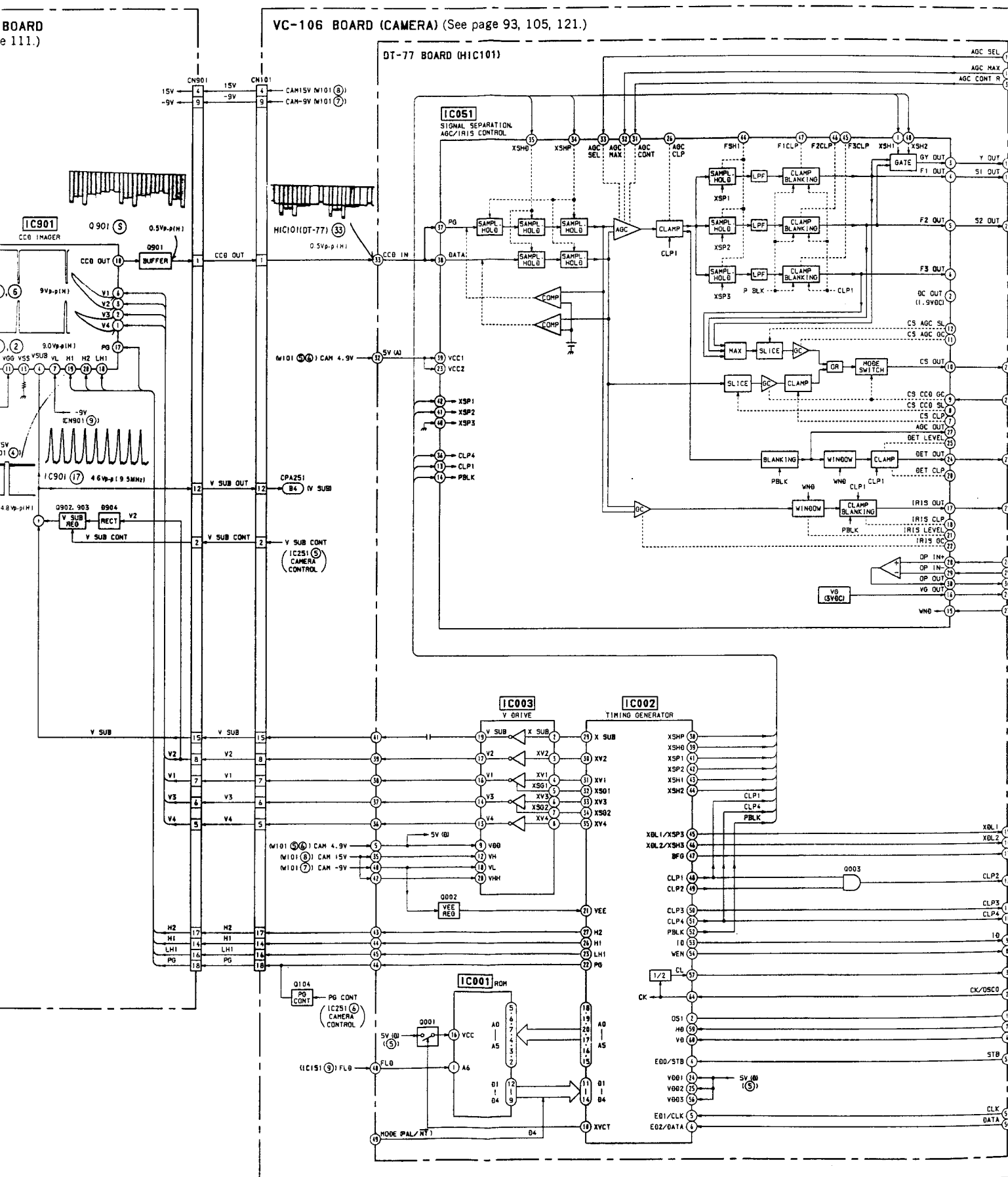


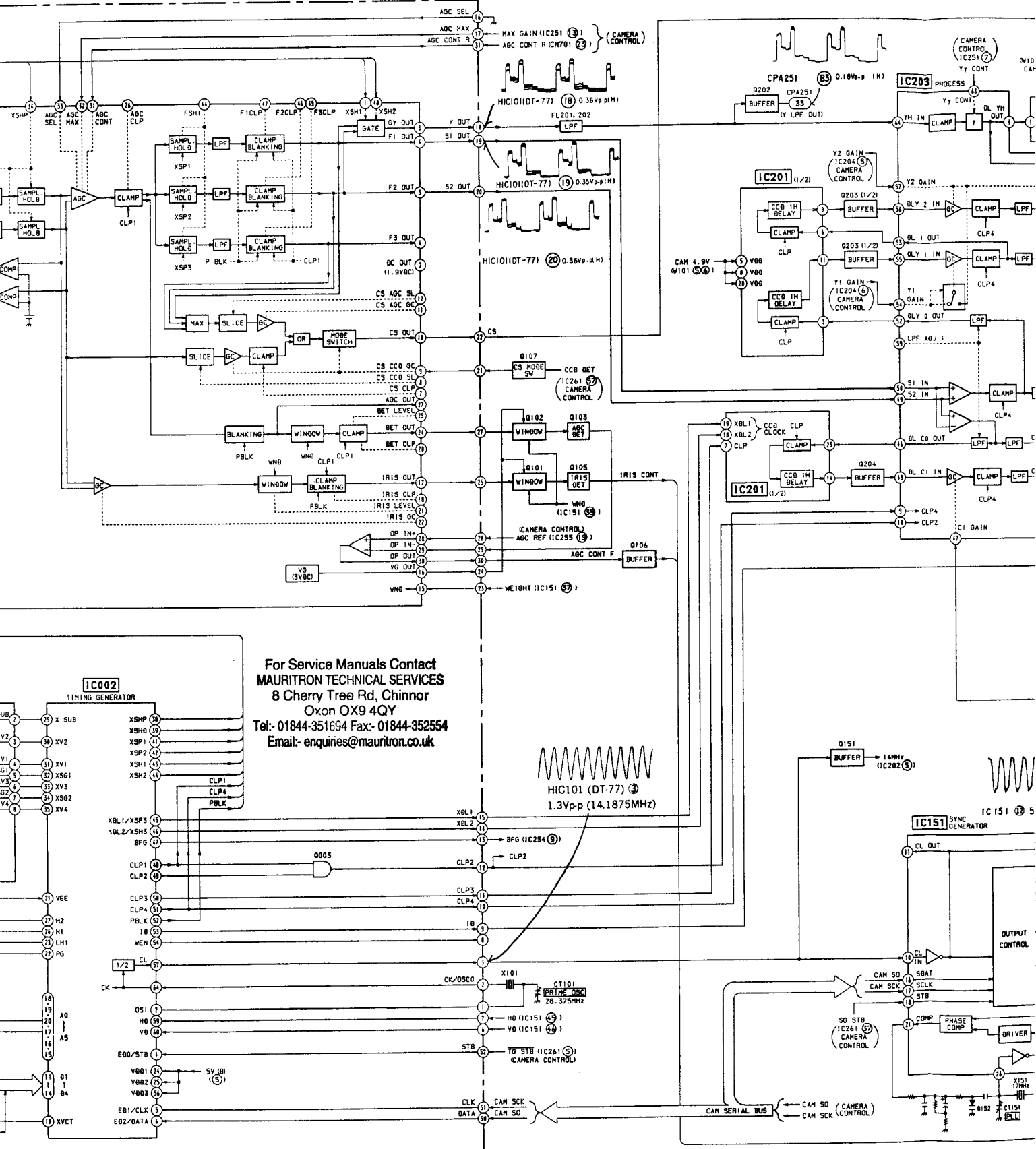
### 3-3. CAMERA BLOCK DIAGRAM




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## VC-106 BOARD (CAMERA) (See page 93, 105, 121.)



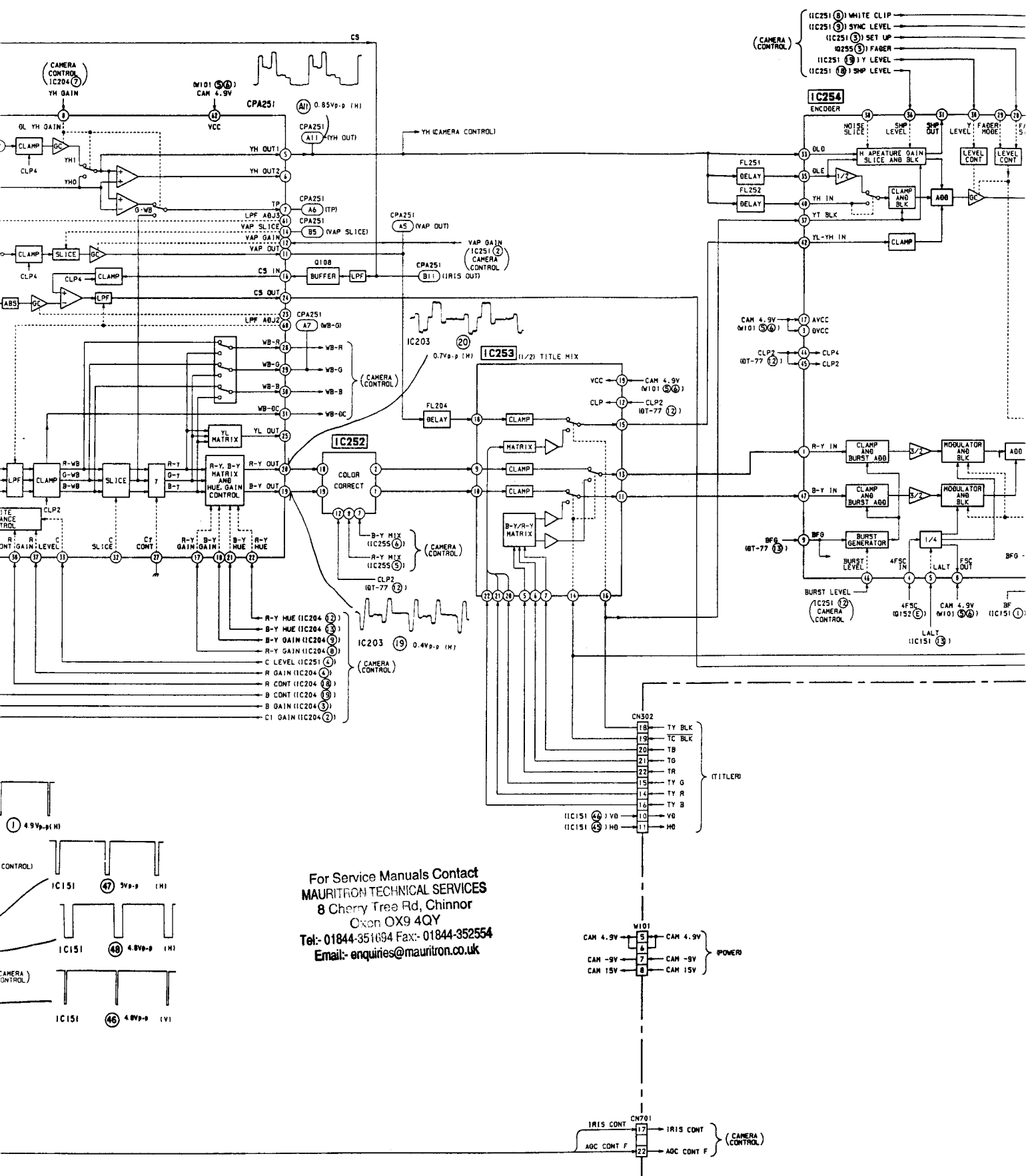


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HIC101 (DT-77) ③  
1.3Vp-p (14.1875MHz)

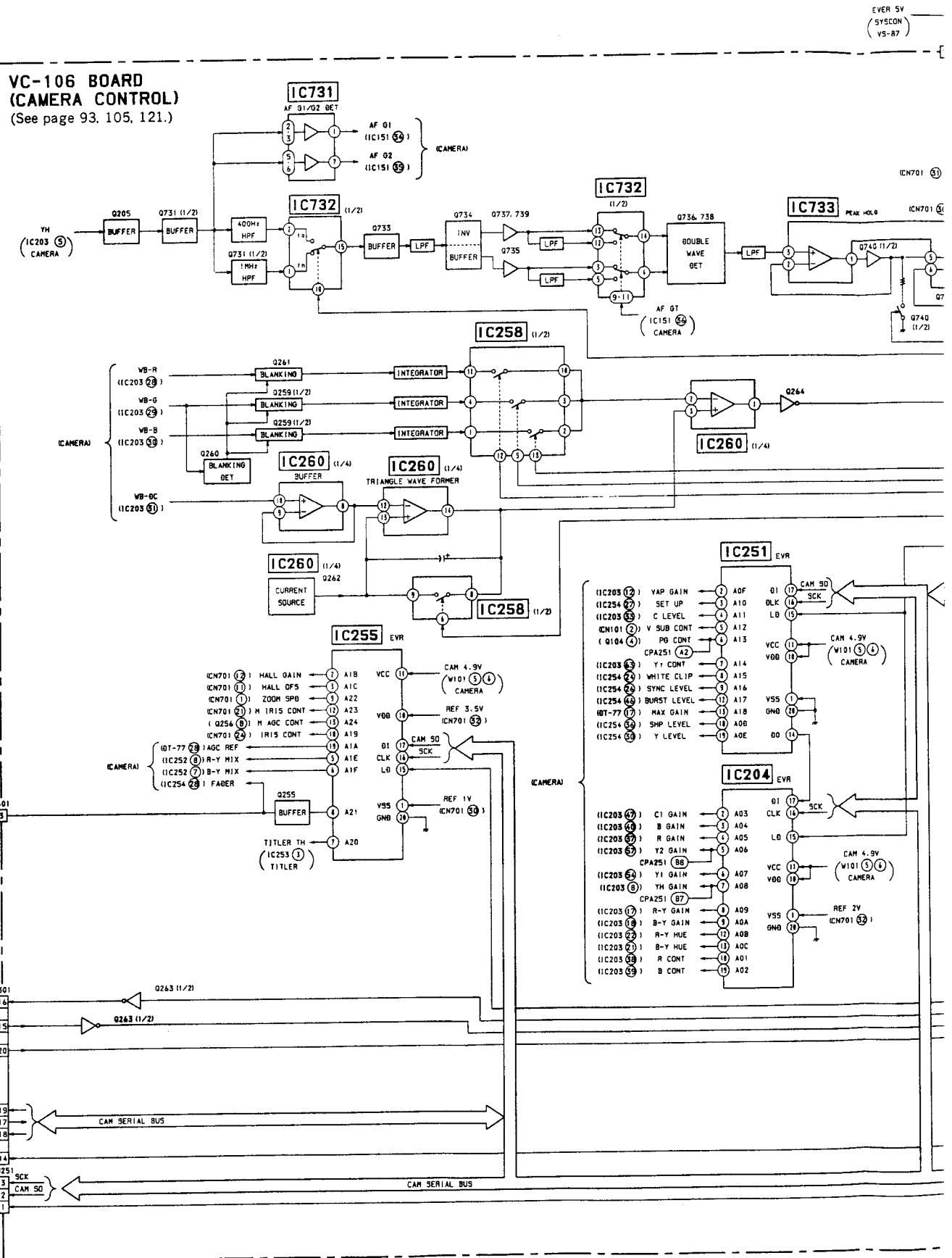






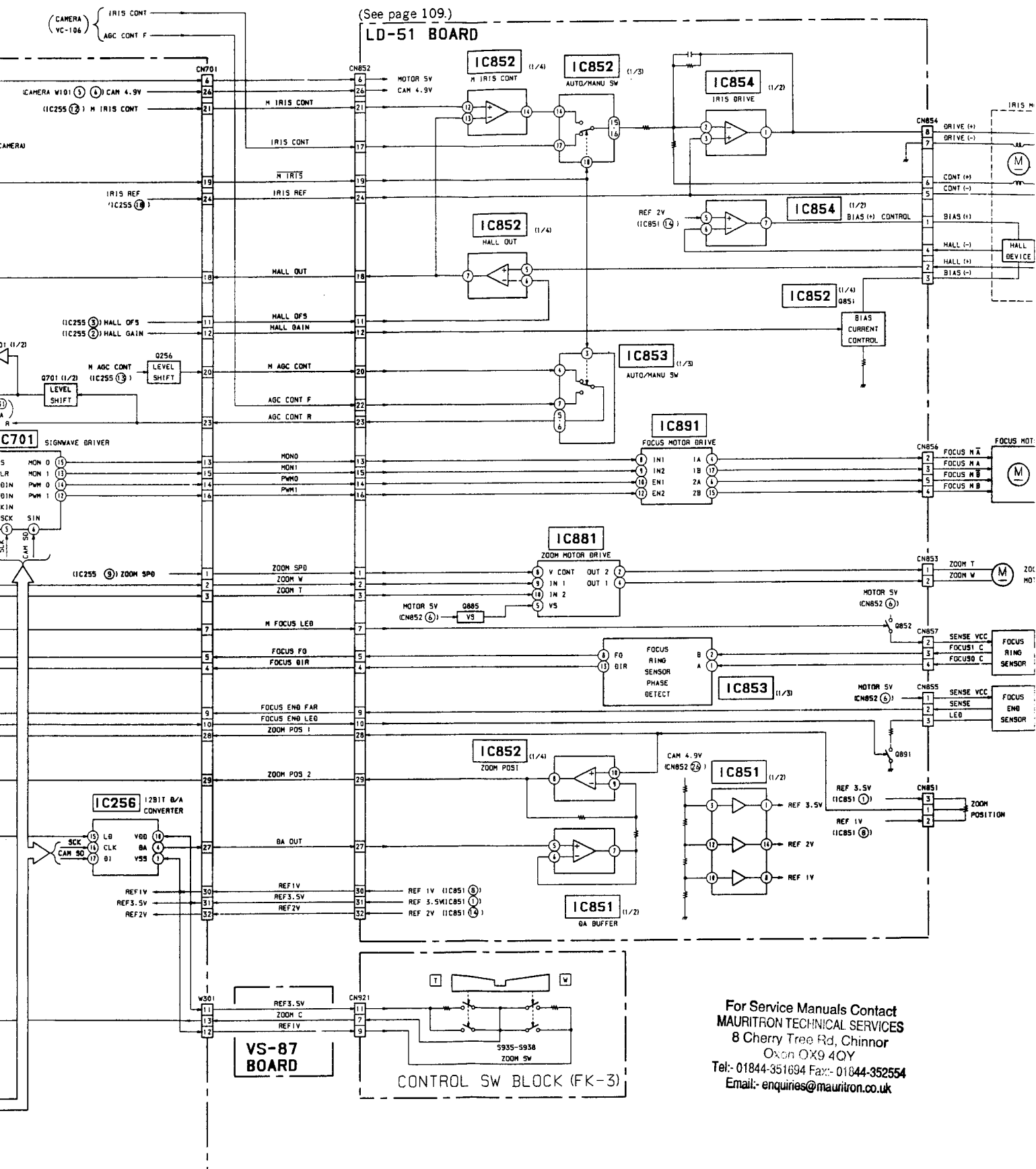
#### 4. CAMERA CONTROL BLOCK DIAGRAM

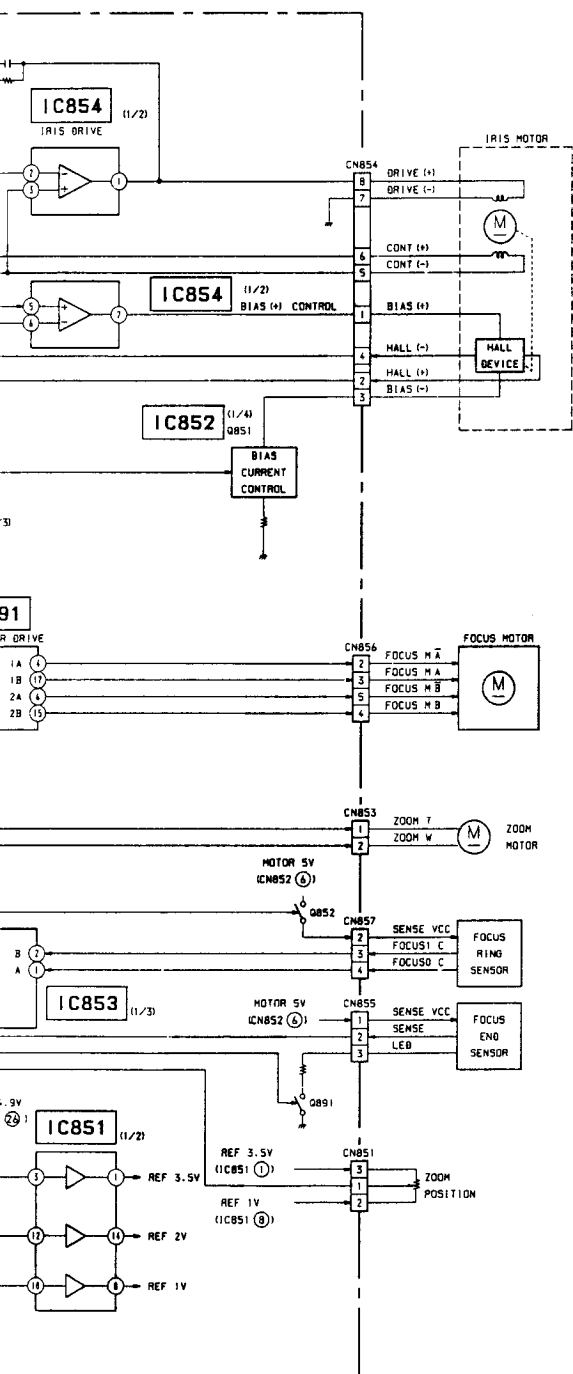
##### VC-106 BOARD (CAMERA CONTROL) (See page 93, 105, 121.)











### 3-5. CAMERA SYSTEM CONTROL TERMINAL DESCRIPTION VC-106 B

Pin No.	Signal Name	I/O	F
1	DISCHG	O	AWB, AE integrating A/D reset pulse, V
2	B SELECT	O	AWB measuring line select pulse (blue)
3	G SELECT	O	AWB measuring line select pulse (green)
4	R SELECT	O	AWB measuring line select pulse (red)
5	TG STB	O	Strobe signal to timing generator Camera mode ... V period "High" pulse. In
6	D/A LD 1	O	Data load command to EVR (IC255), V pe
7	D/A LD 0	O	Data load command to EVR (IC204,205), V
8	AD EN	O	Titler 1-bit A/D converter operation ON/ Normally "High". When MODE button is
9	N.C		
10	N.C		
11	N.C		
12	M FOCUS LED	O	Manual focus sensor ON/OFF control. In
13	N.C		
14	HALL SENS	I	Hall element voltage input (analog input)
15	ZOOM POS 1	I	Zoom position detection voltage input (an
16	ZOOM POS 2	I	Zoom position detection voltage input (an
17	ZOOM KEY	I	Zoom switch voltage input (analog input)
18	N.C		
19	AF A/D	I	AF evaluation value detection input (anal
20	AGC CONT	I	AGC voltage input (analog input)
21	A/D REF (-)	-	Built-in A/D converter lower limit referen
22	A/D REF (+)	-	Built-in A/D converter upper limit referen
23	A VDD	-	SS 5V
24	VSS	-	GND
25	MODE B	-	Pull-up to EVER 5V
26	N.C		
27	N.C		
28	N.C		
29	N.C		
30	EXTAL	I	Clock oscillation
31	XTAL	O	
32	VDD	-	SS 5V
33	D/A LD 2	O	Data load command to 12-bit D/A convert
34	JCS	O	Used for external indicator jig data latch,
35	SD CS	O	Sine wave driver chip select signal
36	SD RESET	O	Sine wave driver reset signal
37	SG STB	O	Sync generator data latch pulse
38	FOC END FAR	I	Focus lens initial position read
39	ZOOM T	O	Zoom motor telephotographic direction ro
40	ZOOM W	O	Zoom motor wide angle direction rotation
41	N.C		
42	N.C		
43	N.C		
44	N.C		

# CONTROL TERMINAL DESCRIPTION VC-106 BOARD IC261 (MC68HC11L6FU)

I/O	Function
O	AWB, AE integrating A/D reset pulse, V period "H" pulse
O	AWB measuring line select pulse (blue)
O	AWB measuring line select pulse (green)
O	AWB measuring line select pulse (red)
O	Strobe signal to timing generator Camera mode ... V period "High" pulse. In VTR mode, this output becomes "Low".
O	Data load command to EVR (IC255), V period "High" pulse
O	Data load command to EVR (IC204,205), V period "High" pulse
O	Titler 1-bit A/D converter operation ON/OFF output. Normally "High". When MODE button is pushed, this becomes 7V period "Low" pulse.
O	Manual focus sensor ON/OFF control. In manual focus mode, this output becomes "Low".
I	Hall element voltage input (analog input)
I	Zoom position detection voltage input (analog input)
I	Zoom position detection voltage input (analog input)
I	Zoom switch voltage input (analog input)
I	AF evaluation value detection input (analog input).
I	AGC voltage input (analog input)
—	Built-in A/D converter lower limit reference voltage (analog input)
—	Built-in A/D converter upper limit reference voltage (analog input)
—	SS 5V
—	GND
—	Pull-up to EVER 5V
I	Clock oscillation
O	
—	SS 5V
O	Data load command to 12-bit D/A converter (IC256), V period "High" pulse
O	Used for external indicator jig data latch, V period "High" pulse
O	Sine wave driver chip select signal
O	Sine wave driver reset signal
O	Sync generator data latch pulse
I	Focus lens initial position read
O	Zoom motor telephotographic direction rotation designation
O	Zoom motor wide angle direction rotation designation

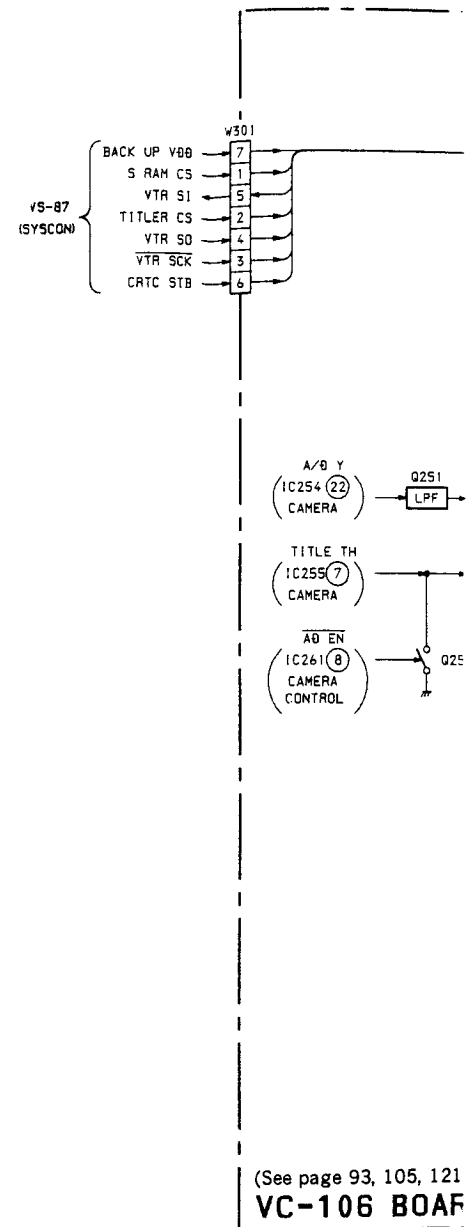
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Pin No.	Signal Name	I/O	
45	RESET	—	Reset.
46	XIRQ	I	Pull-up
47	IRQ	I	Pull-up
48	LANC IN	I	LANC
49	VSS	—	GND
50	LANC OUT	O	LANC
51	CAM SI	I	Serial c
52	CAM SO	O	Serial c
53	SCK	O	Serial c
54	FOC END LED	O	Focus e
55	VDD	—	SS 5V
56	FG	I	Focus r
57	CCD DET	O	CCD DE
58	FA/FH	O	AF dete
59	PH RESET	O	Peak ho
60	MAN IRIS	O	IRIS sys
61	CAM CS	I	Chip sel
62	AW IN	I	Compar
63	DIR	I	Focus ri
64	VSS	—	GND

Pin No.	Signal Name	I/O	Function
45	RESET	—	Reset.
46	XIRQ	I	Pull-up to SS 5V
47	IRQ	I	Pull-up to SS 5V
48	LANC IN	I	LANC input
49	VSS	—	GND
50	LANC OUT	O	LANC output
51	CAM SI	I	Serial data input from servo/system control
52	CAM SO	O	Serial data input to servo/system control and slave
53	SCK	O	Serial clock to servo/system control and slave
54	FOC END LED	O	Focus end LED drive
55	VDD	—	SS 5V
56	FG	I	Focus ring rotational speed input (PWM method)
57	CCD DET	O	CCD DET switch changeover
58	FA/FH	O	AF detection frequency range changeover. FA : 400kHz~ ; FH : 1MHz~.
59	PH RESET	O	Peak hold IC (IC733) reset
60	MAN IRIS	O	IRIS system AUTO/MANUAL changeover
61	CAM CS	I	Chip select signal from servo/system control
62	AW IN	I	Comparator input of integrating A/D converter for auto white balance
63	DIR	I	Focus ring rotation direction input
64	VSS	—	GND

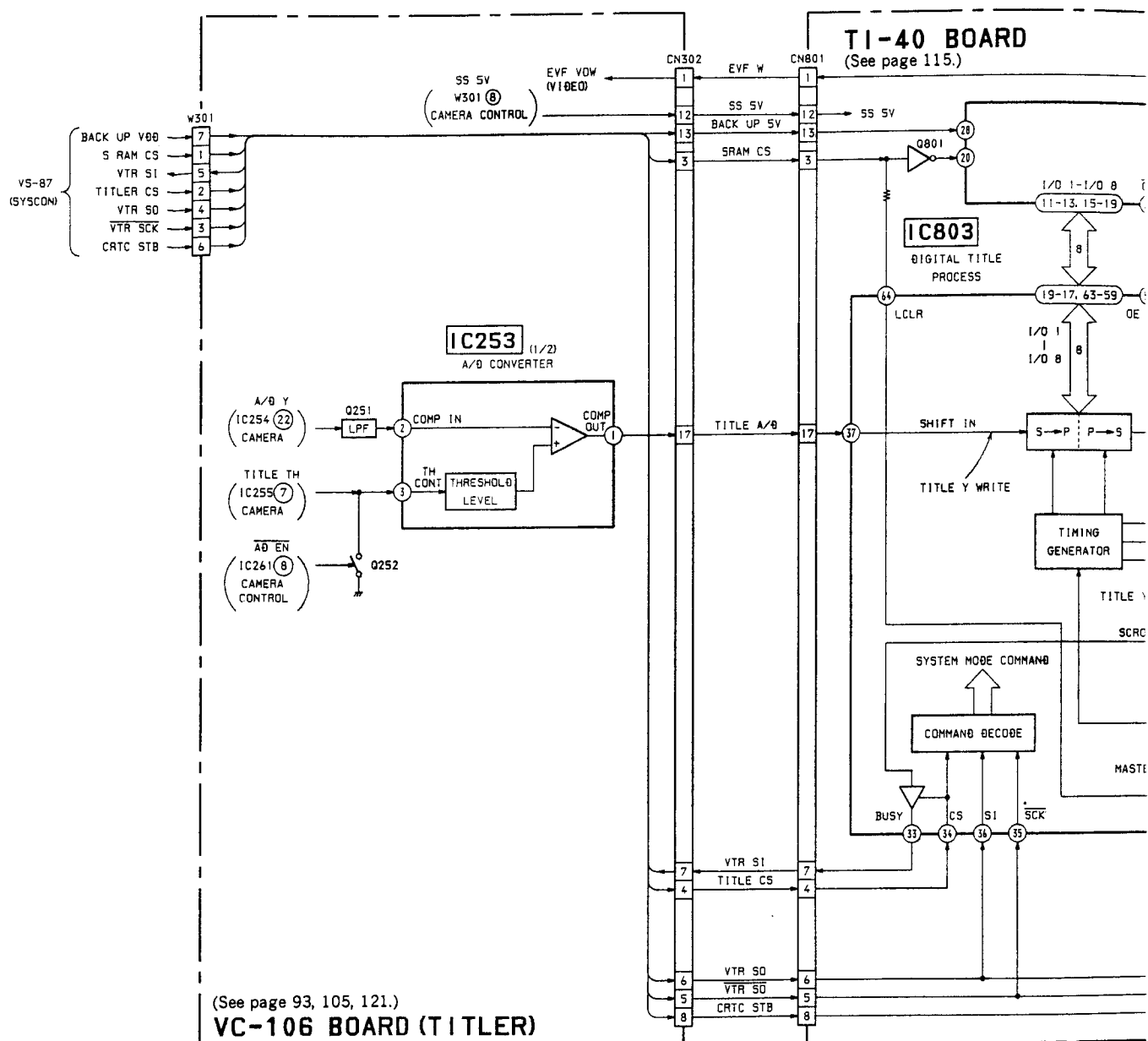
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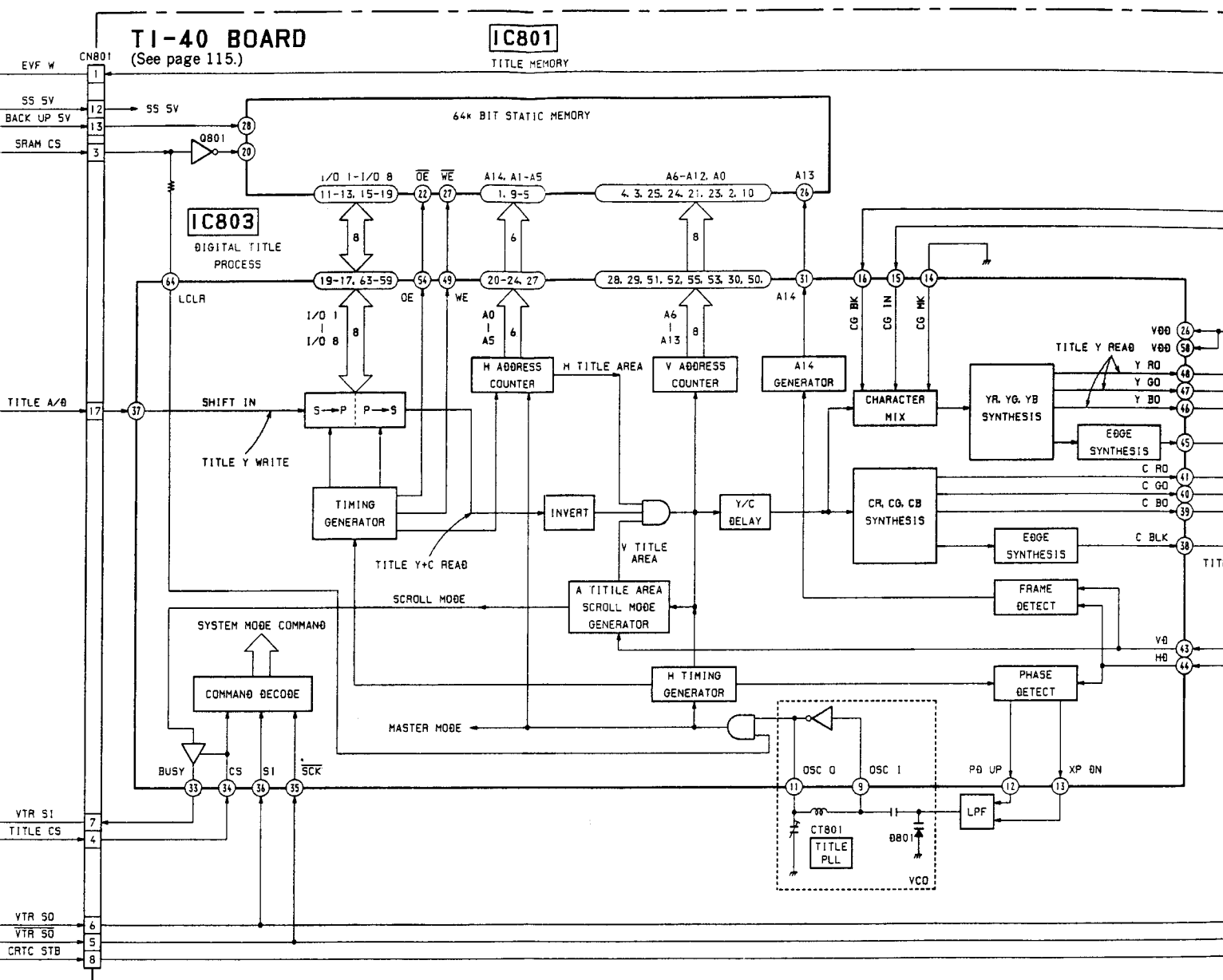
### 3-6. TITLER BLOCK DIAGRAM



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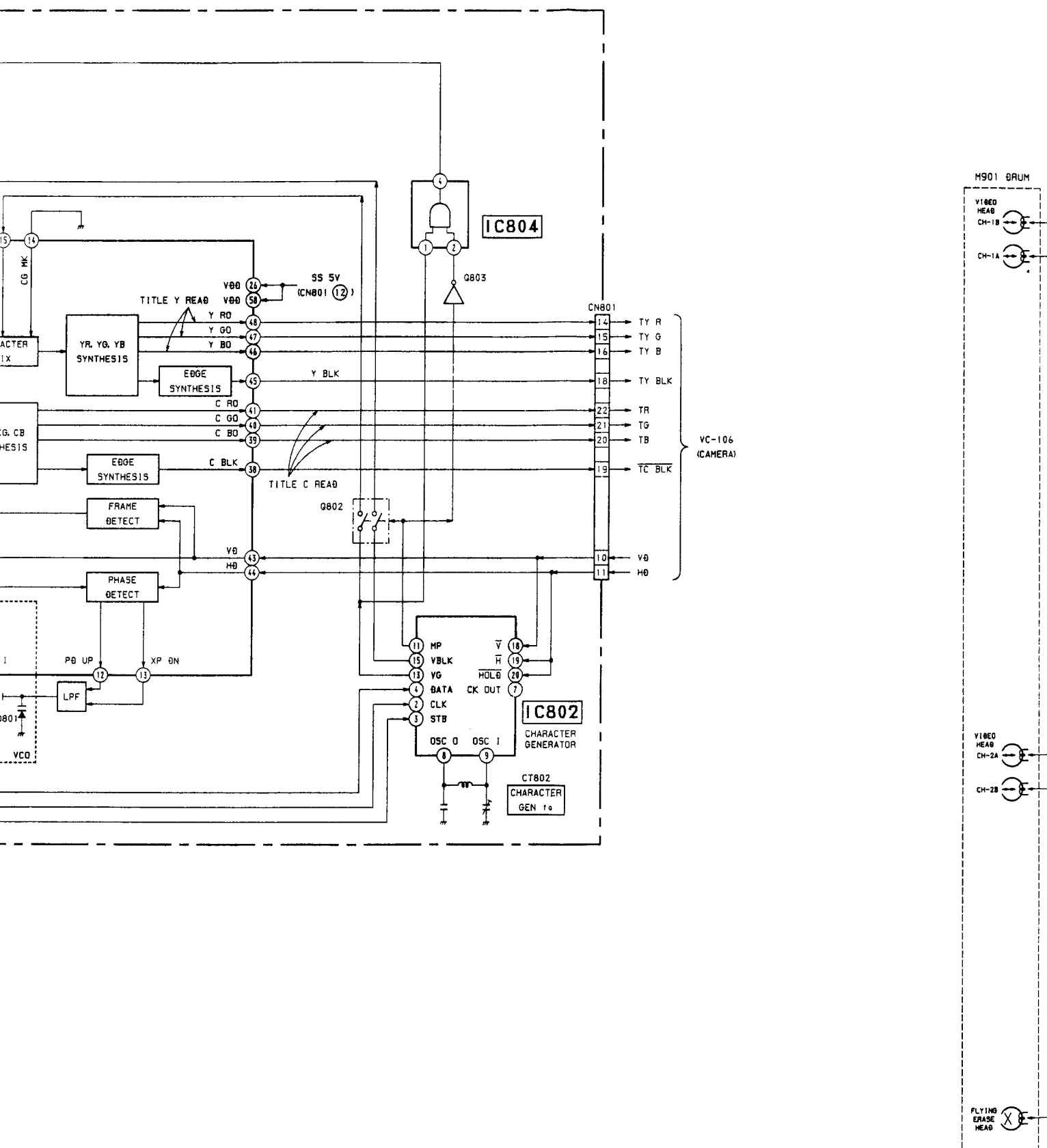
### 3-6. TITLER BLOCK DIAGRAM





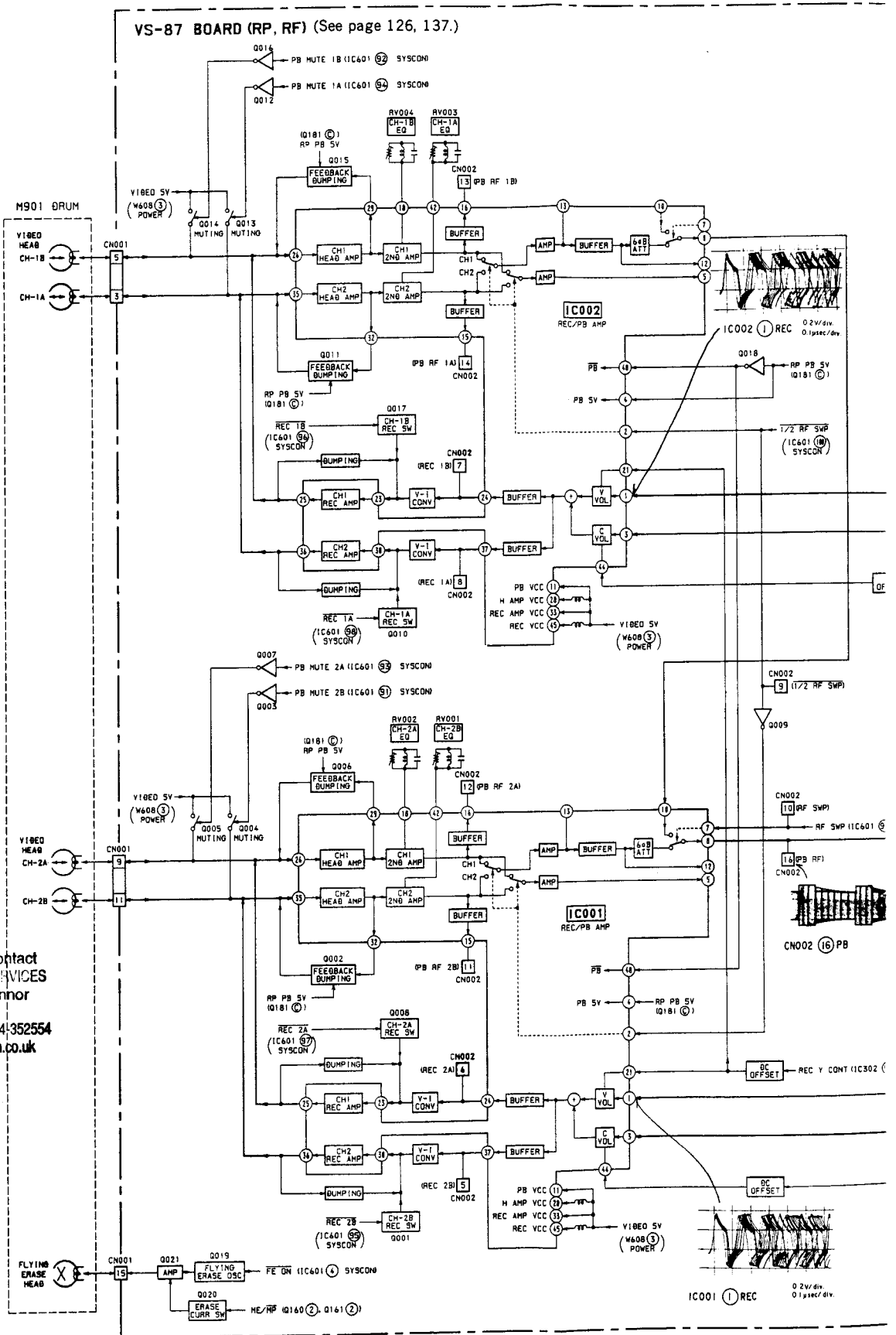
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### 3-7. HEAD AMP, RF BL

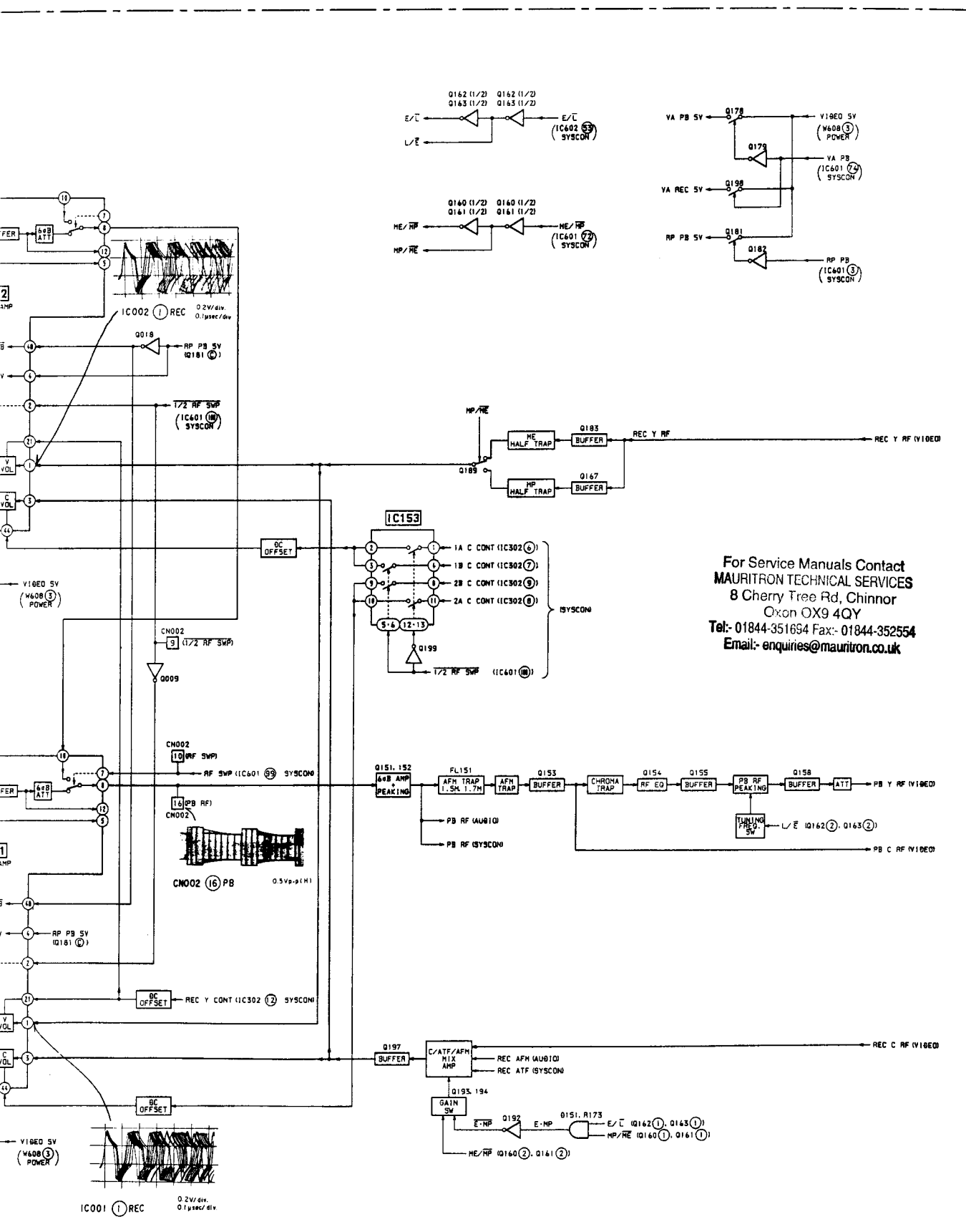




### 3-7. HEAD AMP, RF BLOCK DIAGRAM

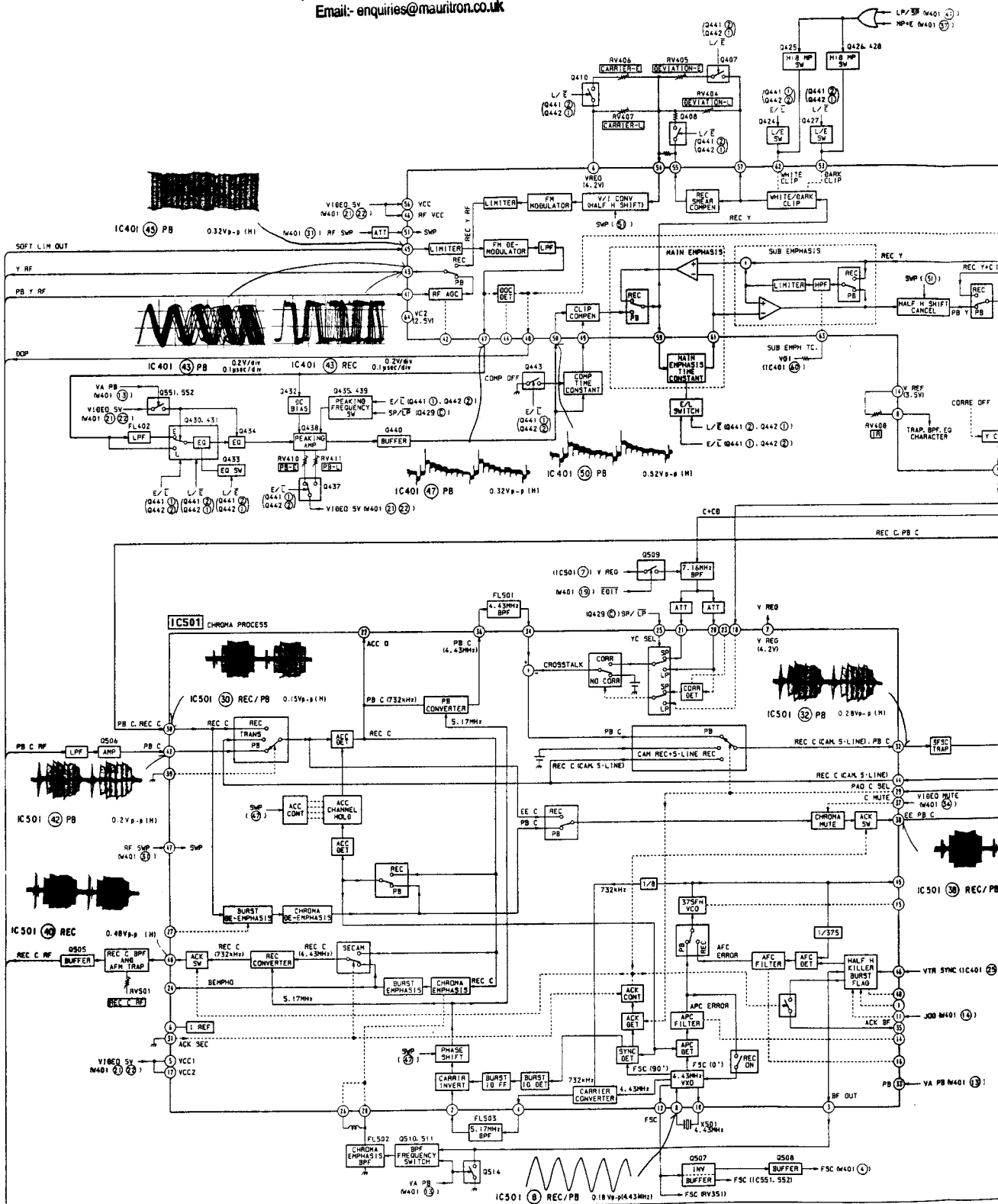


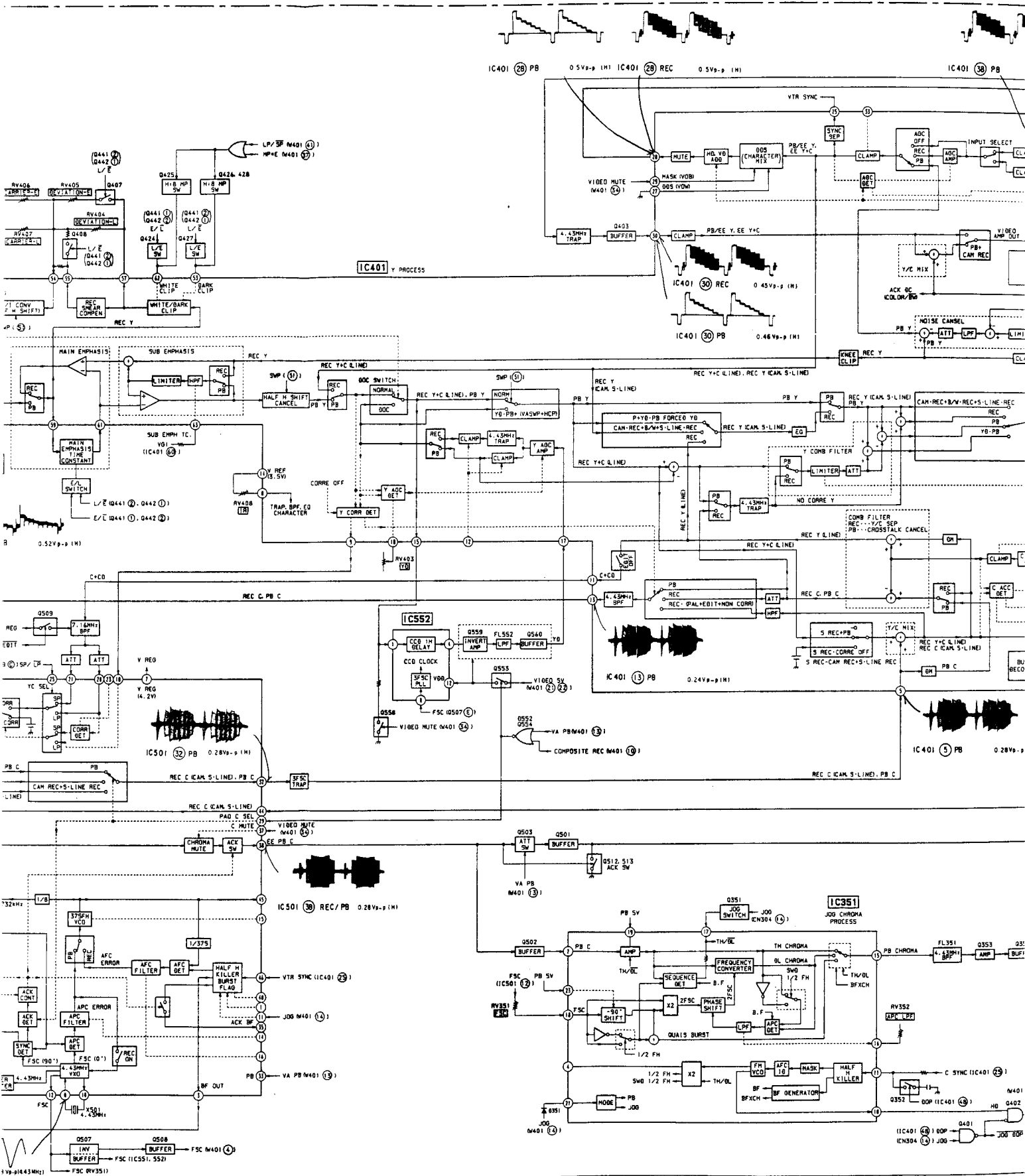
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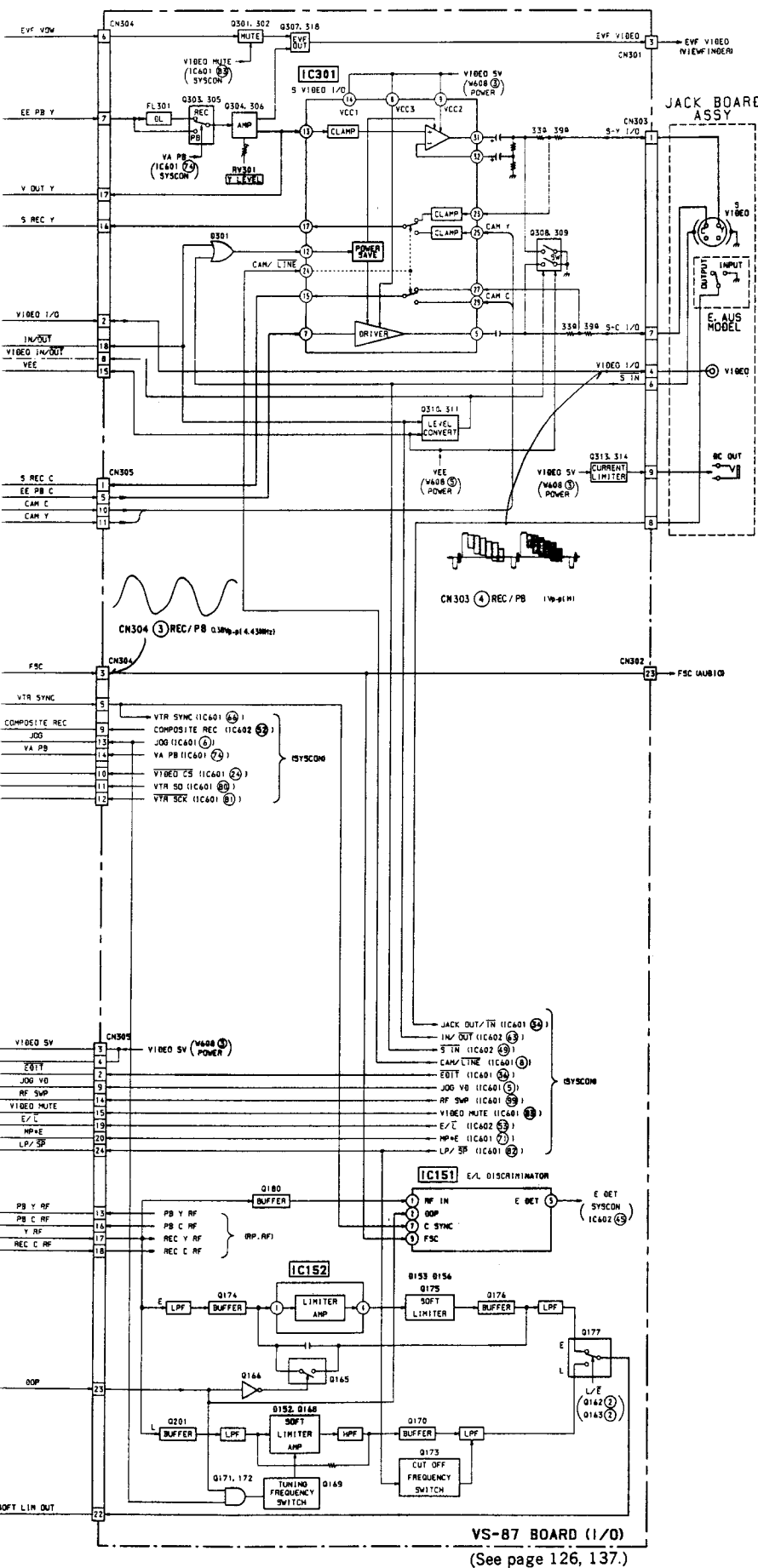
VC-106 BOARD (VIDEO)  
(See page 93, 105, 121.)

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