

Service Manual

General Description

Adjustment Procedures

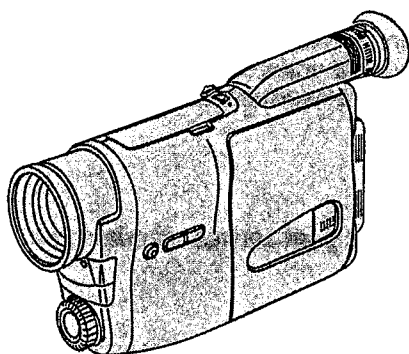
Block / Schematic Diagrams

Exploded Views / Parts List

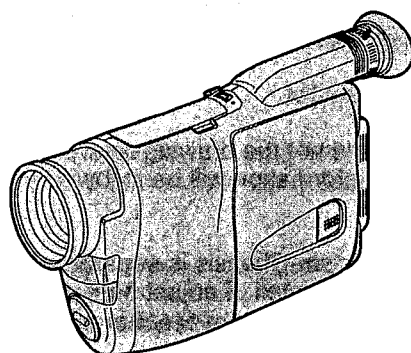
Panasonic **VHS** PAL

HQ

VHS-C Movie



NV-RX19
NV-RX20



NV-RX9
NV-RX10

NV-RX9B
NV-RX10^{EG/A}_{EN/EU}
NV-RX19B
NV-RX20^{EG/EN}_{EU}

DL-MECHANISM

SPECIFICATIONS

| ITEM | SPECIFICATION | ITEM | SPECIFICATION |
|------------------------|--|---|---|
| POWER | Source: Battery Pack; 4.8 V DC AC Adaptor; 6.0 V DC Consumption; 6.0 W (Battery operation) | VIDEO | HEADS: 4 rotary heads, 1 flying erase head |
| VIDEO RECORDING SYSTEM | 4 rotary heads, helical scanning system PAL | OUTPUT: PHONO CONNECTOR; 1.0 Vp-p 75Ω unbalanced | |
| TAPE FORMAT | VHS-C Cassette Tape (Tape width 12.7 mm) | AUDIO | HEAD: 1 Stationary head (Normal-Mono) |
| TAPE SPEED | SP mode: 23.39 mm/s LP mode: 11.7 mm/s (Except NV-RX10EG/20EG) Record/Playback Time: SP mode: 1 hour with EC60 LP mode: 2 hours with EC60 (Except NV-RX10EG/20EG) | OUTPUT: PHONO CONNECTOR; -6 dB, 47 kΩ loaded/less than 1kΩ | |
| | | OPERATING TEMPERATURE | 0 ~ 40°C |
| CAMERA | PICK-UP ELEMENT: CCD (Charge Coupled Device) | OPERATING HUMIDITY | 10 ~ 80% |
| | STANDARD ILLUMINATION: 1,400 lux | WEIGHT | Approx. 730 g (without Battery Pack): NV-RX9/10 Approx. 750 g (without Battery Pack): NV-RX19/20 |
| | MINIMUM REQUIRED ILLUMINATION: 0.5 Lux (Low Light Mode) | DIMENSIONS | 74 (W)×143 (H)×260 (D) mm |
| | LENS: 14 : 1 Wide-angle Power Zoom Lens with Digital AI Auto Focus, Auto Iris, Auto Focus System, F1.4 (3.9~ 54.6 mm), Filter Diameter 43 mm | STANDARD ACCESSORIES | 1 pc. AC Adaptor 1 pc. Battery Pack 1 pc. Cassette Adaptor 1 pc. Shoulder Strap 1 pc. DC Input Cable 1 pc. Battery for Cassette Adaptor Operation 1 pc. AC Cable 1 pc. AV Output Cable |
| | IMAGE SENSOR: 1/4 inch CCD Image Sensor | | |
| | VIEWFINDER: 0.5 inch Electronic Viewfinder | | |

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Panasonic

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△ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

INTRODUCTION 1

This service manual contains technical information which will allow service personnel's to understand and service this model.

Section 1 Presents you with some general information of features and controls, enabling you to become familiar with each function.

Section 2 Contributes to your electrical adjustment as well disassemble and replacement procedures.

Section 3 Contain block diagram which offers you information for checking and understanding each circuit. Schematic diagrams which give you detailed information such as waveforms, voltage data, function e.t.c...

Section 4 Contain exploded views and parts list.

Please place orders using the parts list and not the drawing reference numbers.

If the circuit is changed or modified, this information will be followed by supplement service manual to be filed with original service manual.

Note 1 : Adjustment procedure for Mechanism-Chassis is separate volume.

Please refer to following manual for detail of adjustment procedure for Mechanism-Chassis.

Order number for adjustment procedure of Mechanism-Chassis :VMD9412M130

Note 2 : Please use the following TATSUJIN's software for adjustment of these movie cameras.

TATSUJIN software Part number for adjustment procedure :

| MODEL No. | SUFFIX | PART No. | MODEL No. | SUFFIX | PART No. |
|-----------|--------|--------------|-----------|--------|--------------|
| NV-RX9 | B | VFK1164T007T | NV-RX19 | B | VFK1164T008T |
| NV-RX10 | EG | VFK1164T004T | NV-RX20 | EG | VFK1164T009T |
| NV-RX10 | A | VFK1164T003T | NV-RX20 | EN | VFK1164T010T |
| NV-RX10 | EN | VFK1164T005T | NV-RX20 | EU | VFK1164T011T |
| NV-RX10 | EU | VFK1164T006T | | | |

These will be uploaded on CS-Net until the end of December in 1996.

Also if you require it with a floppy disk, please order it as usual spare parts route.

Note 3 : This movie camera uses AC Adaptor is VSK0317D.

The Service manual for AC Adaptor is separate volume.

Order number for AC Adaptor is VSK0317D :VMD9612M146

INTRODUCTION 2

NOTE 1 : NV-RX10EN

NV-RX10EN series has to versions depends on countries.
Detail as follows.

| Model-No(Version) | NV-RX10EN | NV-RX10ENH |
|-------------------|-----------|------------|
| | | |
| PACKING CASE | VP8837 | VP8838 |
| AC-CABLE | VJA0998 | VJA0940 |

NOTE 2 : NV-RX20EN

NV-RX20EN series has to versions depends on countries.
Detail as follows.

| Model-No(Version) | NV-RX20EN | NV-RX20ENH |
|-------------------|-----------|------------|
| | | |
| PACKING CASE | VP8844 | VP8845 |
| AC-CABLE | VJA0998 | VJA0940 |

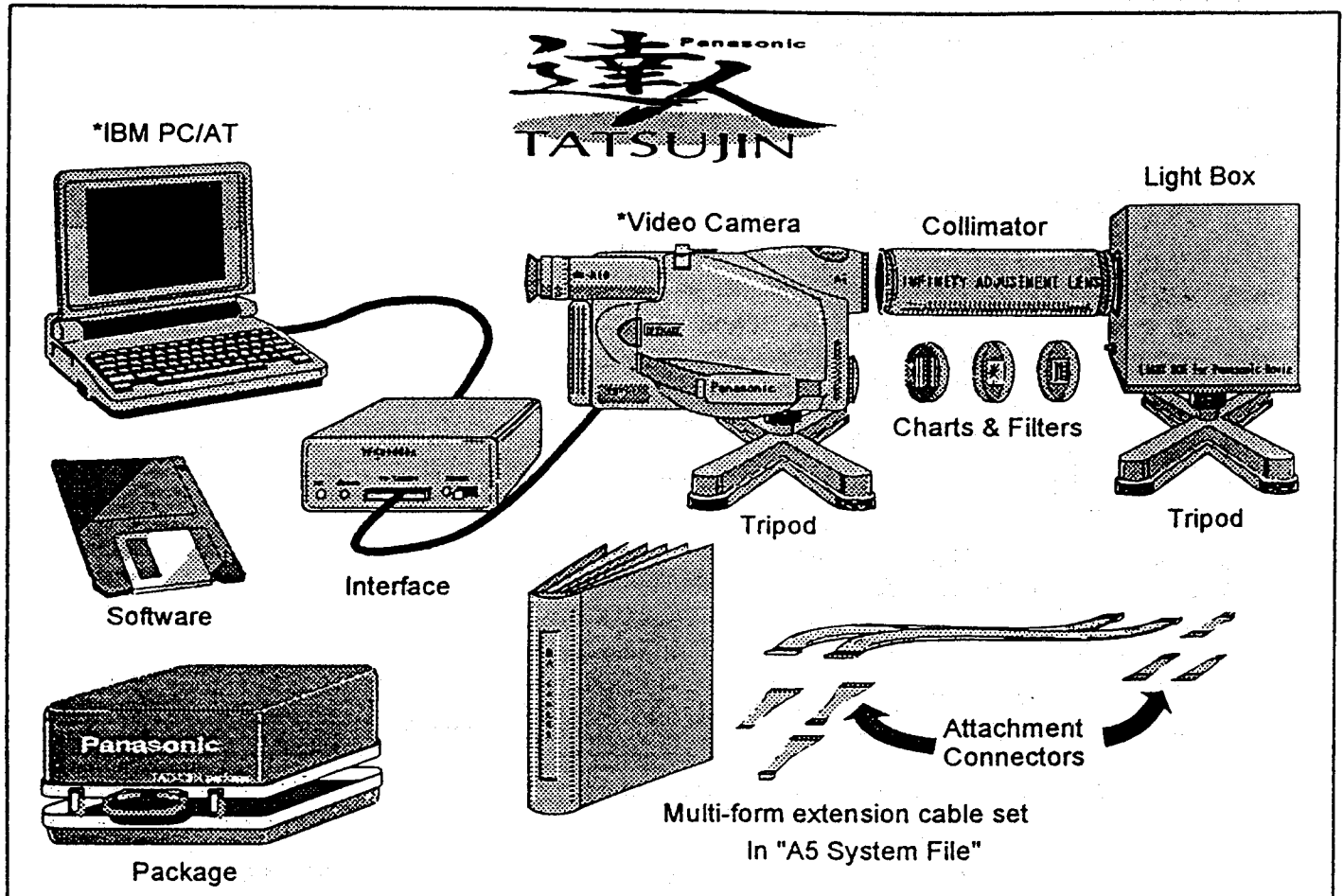
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Technical Information

Subject: Introduction of new service device kit "TATSUJIN"(VED95TTJ).



A new service device kit for Video Camera, "TATSUJIN" Kit, is now available from Panasonic.

"TATSUJIN" is a Japanese word which means a specialist, expert, or master in English.

This naming was made because the kit will make you a "TATSUJIN" of Panasonic Video Camera servicing.

The "TATSUJIN" kit consists of the following 3 items which are simply organized in a small package.

All of which will drastically improve your productivity of Video Camera servicing in terms of Diagnosis, Adjustment, and Confirmation.

1. PC-EVR. (Interface, Software, Connecting Cables)

It connects a Camera to your IBM PC/AT so that the adjustment and trouble-shooting can be done easily on PC screen.

The time used to be taken by the camera adjustment will be reduced more than 60%. In addition, its diagnosis support function helps you to improve the service efficiency drastically.

The conventional EVR(VFK0644) will be replaced by this new computer-aided system.

Note: *PC and *Camera are not included in the kit. The minimum requirement of the PC is 80286 CPU, 1MB RAM, and MS-DOS 3.2. For further information, please contact Video Equipment Division.

2. Optical Set. (Collimator, Charts & Filters, Light Box, Tripods)

All of the optical devices which are indispensable to service a camera but used to take a huge space to set up, are now drastically shrunk into a compact "Desk-top space".

Now you can easily aim various charts, COLOR-BAR, GRAY-SCALE, HUNTING, and WHITE, by simply attaching them to the collimator which is inserted in a compact light box.

So that you do not have to worry about restricting external light and measuring the distance from the chart.

3. Multi-form Extension Cable Set.

Now you can make any kind of extension cable required, by simply changing the attachment connectors.

All of the connectors which cover all extension cables since 1990, are simply organized in a "A5 System file".

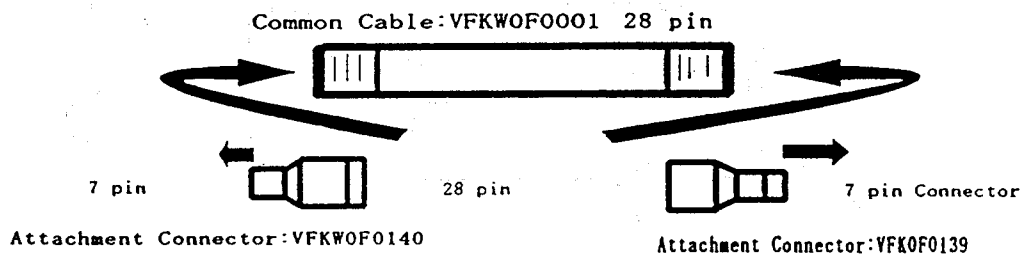
When you need a new connector for a new model it can be purchased at extremely low price.

Note: Example for new type extension cables.

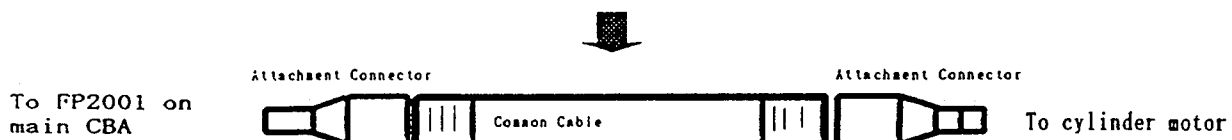
How to use the new type extension cables are as follows.

(This model requires new extension cables between FP2001 (Main) and CYLINDER.)

1. Attach the attachment connector (VFKW0F0139 & VFKW0F0140) to Common Cable (VFKW0F0001) as follows. Please check the direction of conductors between attachment connector and Common Cable.



2. Connect the attachment connector (VFKW0F0139) to the Cylinder Motor.
3. Connect the attachment connector (VFKW0F0140) to the FP2001 on Main C. B. A.



SERVICE CAUTION

1-1. Service Extension Cables.

Use the following extension cables when checking or adjusting individual circuit boards.

| Ref. | Part No. | PIN | Part name | Connection | Q'ty | Remarks |
|------|------------|-----|----------------------|------------------------|------|--------------------------|
| (a) | VFK0670 | 18 | Flat Cable | FP6001 - Mech.Chassis | 1 | |
| (b) | VFK0670 | 18 | Flat Cable | FP2002 - Capstan Motor | 1 | |
| (c) | VFK0978 | 6 | Flat Cable | FP6002 - Mech.Chassis | 1 | |
| (d) | VFK0929 | 12 | Flat Cable | PP201 - CCD | 1 | |
| (e) | VFK0980 | 9 | Flat Cable | FP4001 - A/C HEAD | 1 | |
| (f) | VFK0913 | 18 | Flat Cable | FP701 - LENS UNIT | 1 | |
| (g) | VFKW0F0139 | 7 | Attachment Connector | FP2001 - CYLINDER | 1 | Included in Tatsujin-Kit |
| | VFKW0F0140 | 7 | Attachment Connector | | 1 | |
| | VFKW0F0001 | 28 | Common Cable | | 1 | |
| (h) | VFK0668 | 24 | Extension Cable | PS1001 - PP1601 | 1 | |

How to use extension cables.

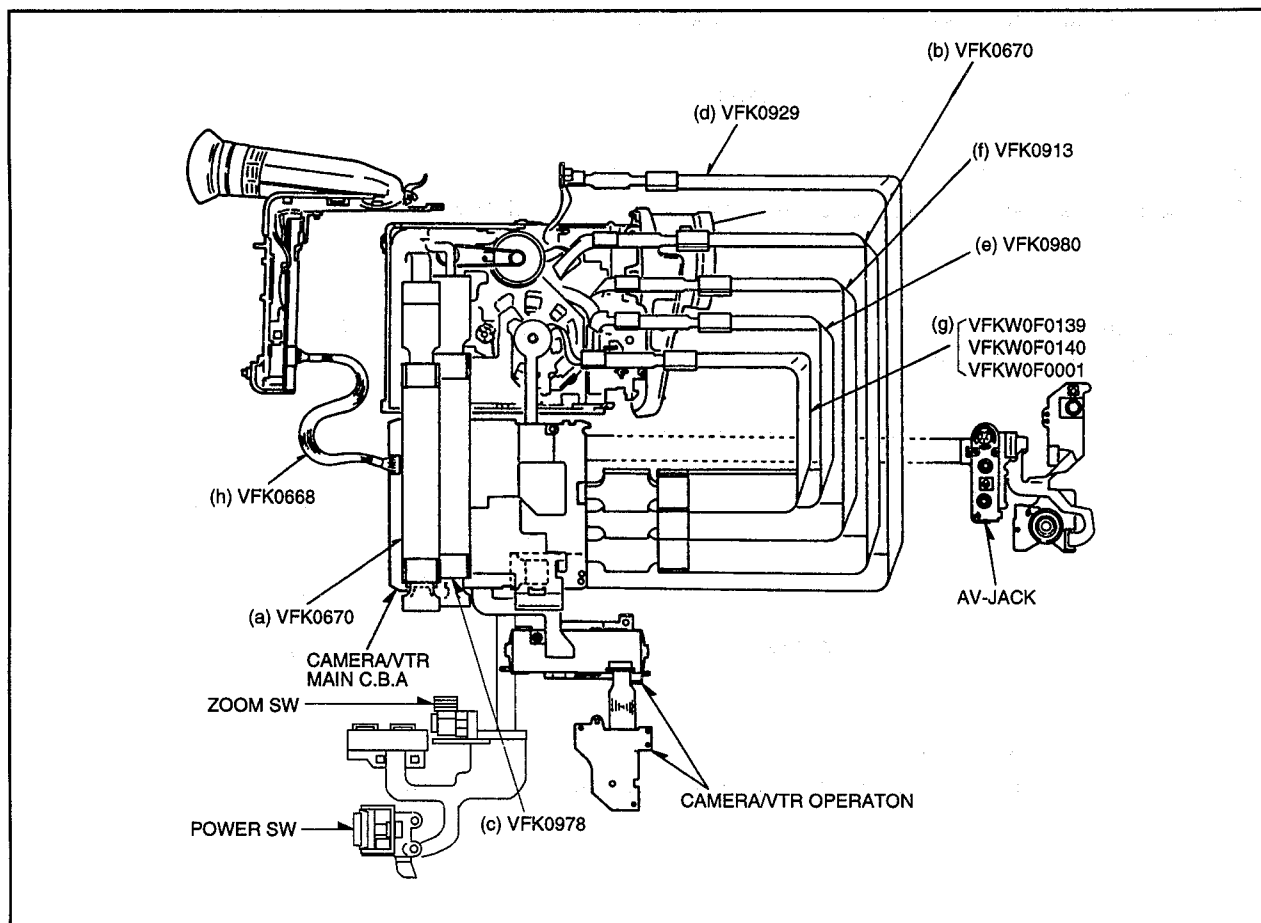


Fig.T1

Note : For servicing, remove the 4 parts from the side case(L).

- 1).AV-JACK.
- 2).POWER SW.
- 3).ZOOM SW.
- 4).CAMERA/VTR OPERATION.

1-2. Service Extension Cables. (In case of Tatsujin Cable)

Use the following extension cables when checking or adjusting individual circuit boards.

| Ref. | Part No. | PIN | Part name | Connection | Q'ty | Remarks |
|------|------------|-----|----------------------|------------------------|------|-----------------------------|
| (a) | VFKW0F0033 | 18 | Attachment Connector | FP6001 - Mech.Chassis | 1 | Included in Tatsujin-Kit |
| | VFKW0F0055 | 18 | Attachment Connector | | 1 | |
| | VFKW0F0001 | 28 | Common Cable | | 1 | |
| (b) | VFKW0F0033 | 18 | Attachment Connector | FP2002 - Capstan Motor | 1 | |
| | VFKW0F0055 | 18 | Attachment Connector | | 1 | |
| | VFKW0F0001 | 28 | Common Cable | | 1 | |
| (c) | VFKW0F0128 | 6 | Attachment Connector | FP6002 - Mech.Chassis | 1 | |
| | VFKW0F0127 | 6 | Attachment Connector | | 1 | |
| | VFKW0F0001 | 28 | Common Cable | | 1 | |
| (d) | VFKW0F0118 | 12 | Attachment Connector | PP201 - CCD | 1 | |
| | VFKW0F0117 | 12 | Attachment Connector | | 1 | |
| | VFKW0F0001 | 28 | Common Cable | | 1 | |
| (e) | VFKW0F0132 | 9 | Attachment Connector | FP4001 - A/C HEAD | 1 | |
| | VFKW0F0131 | 9 | Attachment Connector | | 1 | |
| | VFKW0F0001 | 28 | Common Cable | | 1 | |
| (f) | VFKW0F0111 | 18 | Attachment Connector | FP701 - LENS UNIT | 1 | |
| | VFKW0F0112 | 18 | Attachment Connector | | 1 | |
| | VFKW0F0001 | 28 | Common Cable | | 1 | |
| (g) | VFKW0F0139 | 7 | Attachment Connector | FP2001 - CYLINDER | 1 | |
| | VFKW0F0140 | 7 | Attachment Connector | | 1 | |
| | VFKW0F0001 | 28 | Common Cable | | 1 | |
| (h) | VFK0668 | 24 | Extension Cable | PS1001 - PP1601 | 1 | |

How to use extension cables.

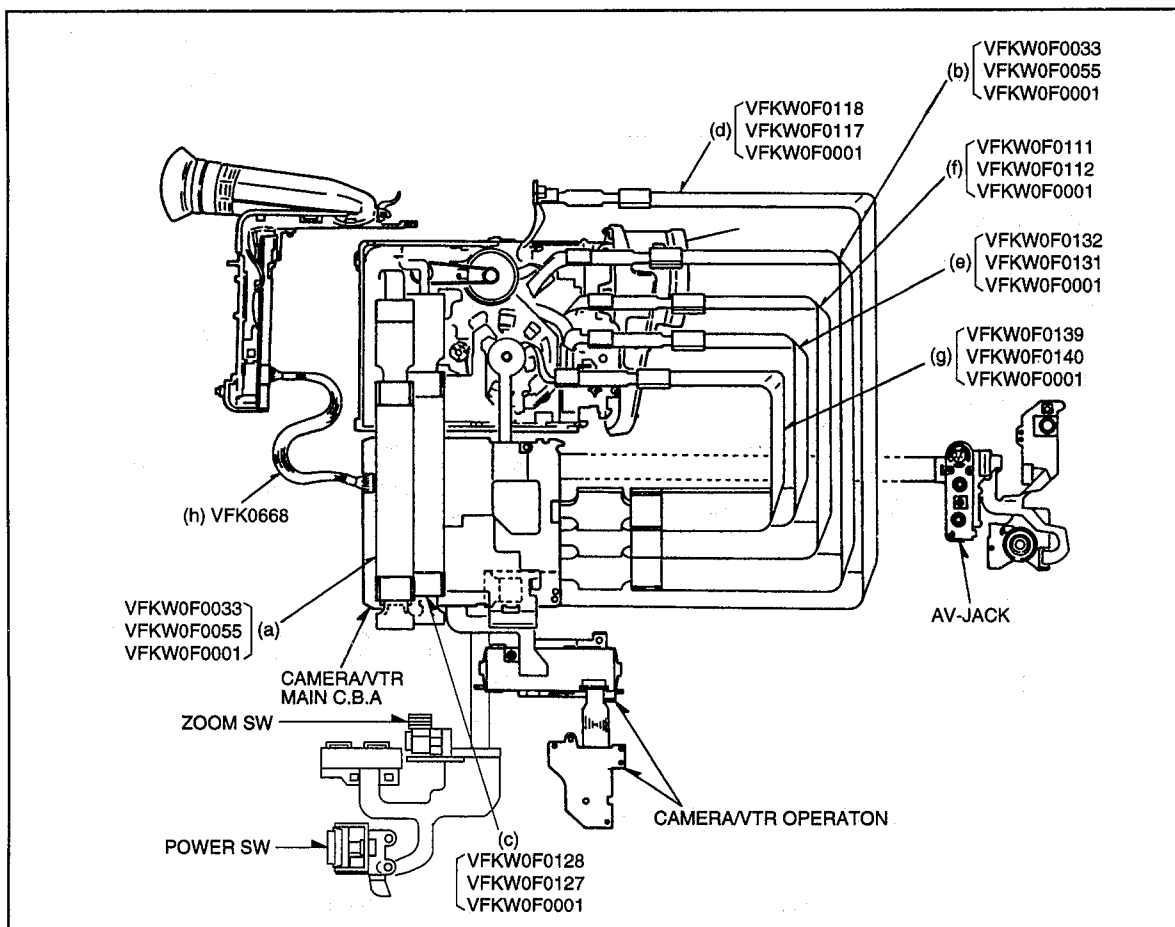


Fig.T2

1-3. Service Extension Cables. (Service Position for Movement of Mechanism)

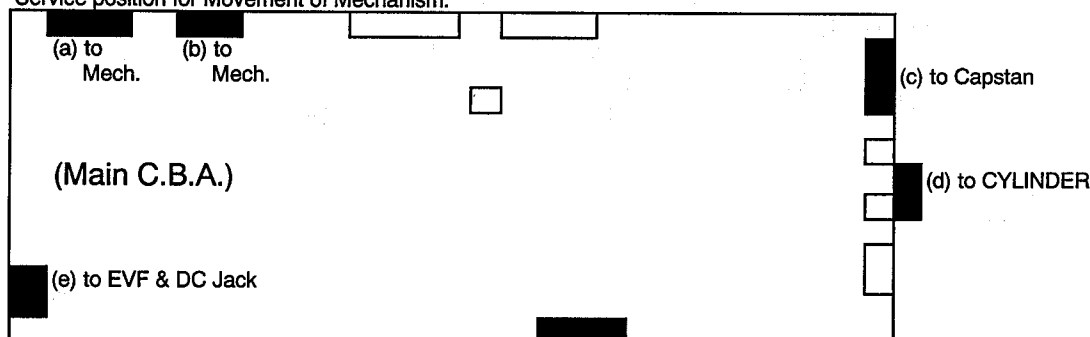
Use the following extension cables when checking the Mechanism.

| Ref. | Part No. | PIN | Part name | Connection | Q'ty | Remarks |
|------|------------|-----|----------------------|------------------------|------|--------------------------|
| (a) | VFK0670 | 18 | Flat Cable | FP6001 - Mech.Chassis | 1 | |
| (b) | VFK0978 | 6 | Flat Cable | FP6002 - Mech.Chassis | 1 | |
| (c) | VFK0670 | 18 | Flat Cable | FP2002 - Capstan Motor | 1 | |
| (d) | VFKW0F0139 | 7 | Attachment Connector | FP2001 - CYLINDER | 1 | Included in Tatsujin-Kit |
| | VFKW0F0140 | 7 | Attachment Connector | | 1 | |
| | VFKW0F0001 | 28 | Common Cable | | 1 | |
| (e) | VFK0668 | 24 | Extension Cable | PS1001 - PP1601 | 1 | |

In case of Tatsujin Cable.

| Ref. | Part No. | PIN | Part name | Connection | Q'ty | Remarks |
|------|------------|-----|----------------------|------------------------|------|--------------------------|
| (a) | VFKW0F0033 | 18 | Attachment Connector | FP6001 - Mech.Chassis | 1 | Included in Tatsujin-Kit |
| | VFKW0F0055 | 18 | Attachment Connector | | 1 | |
| | VFKW0F0001 | 28 | Common Cable | | 1 | |
| (b) | VFKW0F0128 | 6 | Attachment Connector | FP6002 - Mech.Chassis | 1 | |
| | VFKW0F0127 | 6 | Attachment Connector | | 1 | |
| | VFKW0F0001 | 28 | Common Cable | | 1 | |
| (c) | VFKW0F0033 | 18 | Attachment Connector | FP2002 - Capstan Motor | 1 | |
| | VFKW0F0055 | 18 | Attachment Connector | | 1 | |
| | VFKW0F0001 | 28 | Common Cable | | 1 | |
| (d) | VFKW0F0139 | 7 | Attachment Connector | FP2001 - CYLINDER | 1 | |
| | VFKW0F0140 | 7 | Attachment Connector | | 1 | |
| | VFKW0F0001 | 28 | Common Cable | | 1 | |
| (e) | VFK0668 | 24 | Extension Cable | PS1001 - PP1601 | 1 | |

Service position for Movement of Mechanism.



The Built-in Lithium Battery

Charging the Built-in Lithium Battery

The internal clock works even when the Movie Camera is turned off, and it consumes power from the built-in lithium battery. When the Movie Camera is in operation, it automatically charges this battery. However, if the Movie Camera is not used for a very long time, the lithium battery can become discharged. The discharged battery can be charged in the following way:

■ How to Determine Whether the Built-in Lithium Battery Is Discharged

1 Turn out the [POWER] Switch to turn the Movie Camera on.

- If the [] Indication in the Finder flashes the built-in lithium battery is discharged.

■ Charging the Built-in Lithium Battery and Other Required Operations

2 Connect the AC Adaptor to the Movie Camera.

3 Leave the Movie Camera in this condition for approximately 4 hours. Power is supplied for charging even with the [POWER] Switch turned in.

- The Charge Indications Lamps on the AC Adaptor do not flash or light. After charging for 4 hours, the built-in lithium battery can power the clock for approximately 3 months.

4 Set the clock to the current date and time.

Be sure to turn the Movie Camera off before removing the Battery or disconnecting the AC Adaptor. Disconnecting the power supply while the Movie Camera is on erases the Date/Time/Title Indication stored in memory.

5. HOW TO REPLACE THE LITHIUM BATTERY (PROCEDURE)

1. Remove the EVF C.B.A. from Rear Case.

(Remove the 4 Screw from Rear Frame)

2. Unsolder the Lithium battery "VLF2330/1HF" and then replace the new one. (See Fig.B1)

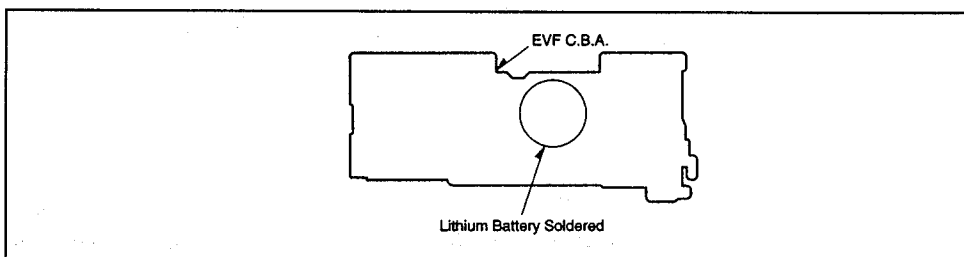


Fig.B1

NOTE:

The lithium battery is a critical component (Type No.: VL2330/1HF Manufactured by Panasonic.)

It must never be subjected to excessive heat or discharge.

It must therefore only be fitted in equipment designed specifically for its use.

Replacement batteries must be of the same type and manufacture.

They must be fitted in the same manner and location as the original battery, with the correct polarity contacts observed.

Do not attempt to re-charge the old battery or re-use it for any other purpose.

It should be disposed of in waste products destined for burial rather than incineration.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the equipment manufacturer.

Discard used batteries according to manufacturer's instructions.

VARNING

Explosionsfara vid felaktigt batteribyte.

Använd samma batterityp eller en ekvivalent

typ som rekommenderas av apparattillverkaren.

Kassera använt batteri enligt fabrikantens
instruktion.

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.

Udskiftning må kun ske med batteri

af samme fabrikat og type.

Levér det brugte batteri tilbage til leverandøren.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.

Vaihda paristo ainoastaan laitevalmistajan suosittelemaan

tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden

mukaisesti.

SERVICE INFORMATION

1. SERVICE INFORMATION DISPLAY

General Description

This Movie Camera has SERVICE INFORMATION DISPLAY function which facilitates quick trouble-shooting. You can turn on the Service Information Display, by performing the following procedures.

This causes the Service Information to be displayed on the EVF. (There are 4 kinds of SERVICE MODE, as shown below.) In the OSD Line Output Mode, Service Information can also be viewed on the TV.

| MODE NAME | FUNCTION | How to turn it ON. (Push following keys simultaneously for at least 2 sec.) | | |
|-----------------------------|--|---|----------------------|------------------------------|
| <u>OSD Line Output MODE</u> | Checking the EVF information on the TV monitor. | DATE/TIME SET (TOP PANEL) | RESET (TOP PANEL) | DATE TIME (SIDE PANEL) |

| MODE NAME | FUNCTION | How to turn it ON. (Push following keys simultaneously for at least 2 sec.) | | |
|---------------------------|---|---|----------------------|------------------------------|
| <u>SERVICE MODE 1</u> | Remaining Battery A/D Value • Safety Device Capstan/Cylinder injections | DATE/TIME SHIFT (TOP PANEL) | RESET (TOP PANEL) | DATE TIME (SIDE PANEL) |

| MODE NAME | FUNCTION | How to turn it ON. (After chosing SERVICE MODE 1 , Push [DATE/TIME] key. (SIDE PANEL) | | |
|---------------------------|---|---|--|--|
| <u>SERVICE MODE 2</u> | Reference Voltage A/D Value Mechanism position Serial key code. | DATE/ TIME | | |

| MODE NAME | FUNCTION | How to turn it ON. (After chosing SERVICE MODE 2 , Push [DATE/TIME] key. (SIDE PANEL) | | |
|---------------------------|--------------------|---|--|--|
| <u>SERVICE MODE 3</u> | ERROR CODE Display | DATE/ TIME | | |

| MODE NAME | FUNCTION | How to turn it ON. (After chosing SERVICE MODE 3 , Push [DATE/TIME] key. (SIDE PANEL) | | |
|---------------------------|-------------------------|---|--|--|
| <u>SERVICE MODE 4</u> | • PG SHIFTER ADJUSTMENT | DATE/ TIME | | |

ERROR CODE DISPLAY

When undesirable conditions occur, the "ERROR CODE" will automatically be displayed on the EVF. Also the CAMERA LED will flash for a short time, then the power will be turned off.

By turning on Service Mode 3, you can check to see what kind of undesirable condition occurred, even after the ERROR CODE has disappeared (To perform the Service Mode 3, do not disconnect the AC adaptor or battery pack, after undesirable condition occurred.)

To clear the ERROR CODE, disconnect the AC Main Lead or the battery has been diconnected.

This movie camera has the built in Rechargeble Lithum Battery.

It maintain the operation of the built-in clock and error code for the Service Mode when the Movie camera turn off.

To clear the error code, make shoot the IC6001 pin 25 to GND for reset the IC6001.

Indication for built in clock return to initial condition make make reset the IC6001.

Note 1: Contents of all Service Mode (Service Mode 1~Service Mode 4) same as previous models.
 So we will issue Technical information for Service Mode.
 Order Number for this document is as follows.
 Order Number for Technical Information : VMD9512M138

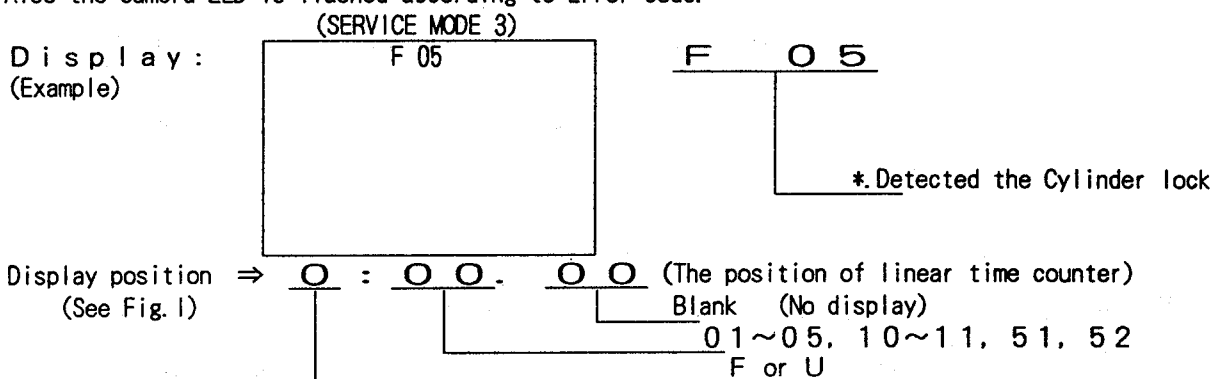
Note 2 : Contents of all Service Mode (Service Mode 1~Service Mode 4) same as previous models.
 We will issue Technical information for Service Mode.
 But Service Mode 3 is Error code Display. It is important for Service.
 So this service manual contain for this information.

SERVICE MODE 3

After undesirable conditions occurred, you can see what kind of error occurred by turning on the Service Mode 3.

When you turn on the service mode 3, the error code is displayed on E.V.F.

Also the Camera LED is flashed according to Error code.



| DISPLAY | CONDITION | The Power off timing |
|---------|------------------|-------------------------------------|
| F 0 1 | T - REEL LOCK | After 1 minute (flashing the LED) |
| F 0 2 | S - REEL LOCK | |
| F 0 3 | UNLOADING LOCK | |
| F 0 4 | LOADING LOCK | |
| F 0 5 | CYLINDER LOCK | |
| F 5 1 | FOCUS MOTOR LOCK | ----- |
| F 5 2 | ZOOM MOTOR LOCK | ----- |
| U 1 0 | DEW DETECTION | After 18 minutes (flashing the LED) |
| U 2 0 | HEAD CLOGGING | Not turning off |

Fig. I Error Code


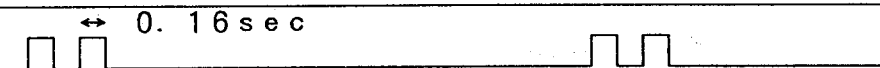

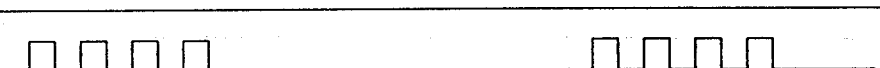

| Lock Condition | Power LED Flashing Timming |
|-------------------------|---|
| T - REEL LOCK (F01) |  2.56 sec |
| S - REEL LOCK (F02) |  0.16 sec |
| UNLOADING LOCK (F03) |  |
| LOADING LOCK (F04) |  |
| CYLINDER LOCK (F05) |  |
| OTHERS (U10 & U11) | Power LED is flashed at 1 Hz timing |

Fig. J LED Flashing Timming