SONY

DIGITAL BETACAM CAMCORDER

DVW-707/707P
DVW-709WS/709WSP
DVW-790WS/790WSP

SDI OUTPUT BOARD
BKDW-702

PICTURE CACHE BOARD
BKDW-703

IMAGE INVERTER BOARD
BKDW-704

Digital BETACAM™

Power HAD

MAINTENANCE MANUAL Part 1

1st Edition (Revised 1)

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

DVW-707 (SY)	Serial No. 10001 and Higher
DVW-707P (SY)	Serial No. 40001 and Higher
DVW-709WS (SY)	Serial No. 10001 and Higher
DVW-709WSP (SY)	Serial No. 40001 and Higher
DVW-790WS (SY)	Serial No. 10001 and Higher
DVW-790WSP (SY)	Serial No. 40001 and Higher

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

Vorsicht!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ.
Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

For the customers in the U.S.A. and Canada

RECYCLING NICKEL-CADMIUM BATTERIES

Nickel Cadmium batteries are recyclable. You can help preserve our environment by returning your unwanted batteries to your nearest point for collection, recycling or proper disposal.
Note: In some areas the disposal of nickel cadmium batteries in household or business trash may be prohibited.

RBRC (Rechargeable Battery Recycling Corporation) advises you about spent battery collection by the following phone number.

Call toll free number: 1-800-822-8837
(United States and Canada only)

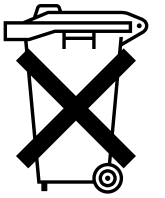
Caution: Do not handle damaged or leaking nickel-cadmium batteries.

Voor de klanten in Nederland

Dit apparaat bevat een MnO_2-Li batterij voor memory back-up.

Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat bij einde levensduur afdankt.

Gooi de batterij niet weg. maar lever hem in als KCA.



Bij dit produkt zijn batterijen geleverd. Wanneer deze leeg zijn, moet u ze niet weggooien maar inleveren als KCA.

Table of Contents

Manual Structure

1. Service Overview

2. Diagnostics

3. Setup Menu

4. Camera System Electrical Alignment (Only for DVW-790WS/790WSP/709WS/709WSP)

5. Camera System Electrical Alignment (Only for DVW-707/707P)

6. Block Diagrams and Circuit Description

7. Periodic Maintenance and Inspection

8. Spare Parts

9. Optional Boards Installation

Manual Structure

Purpose of this manual

This manual is the Maintenance Manual Part 1 of the following models:

Digital Camcorder	DVW-790WS/709WS/707, DVW-790WSP/709WSP/707P
Sony SDI Output Board	BKDW-702
Sony Picture Cache Board	BKDW-703
Sony Image Inverter Board	BKDW-704 (For DVW-790WS/790WSP/709WS/709WSP only)

This manual is intended for use by trained system and service engineers, and provides the information that is required to the primary services, maintenance of this unit and installation of the optional boards (BKDW-702/703/704) .

Contents

This manual is organized by the following sections:

Section 1 Service Overview
Explains the locations of main parts, the functions of printed circuit boards, the removal and reinstallation of cabinet, and the measures against troubles.

Section 2 Diagnostics
Explains the error messages and self-diagnostics.

Section 3 Setup Menu
Explains the setup menu (engineering mode) and VTR (DIAG) menu of this unit.

Section 4 Camera System Electrical Alignment (Only for DVW-790WS/790WSP/709WS/709WSP)
Explains the electrical adjustments after installing/replacing the lens to/of the DVW-790WS/790WSP/709WS/709WSP.

Section 5 Camera System Electrical Alignment (Only for DVW-707/707P)
Explains the electrical adjustments after installing/replacing the lens to/of the DVW-707/707P.

Section 6 Block Diagrams and Circuit Description
Describes the overall block diagrams and circuit description.

Section 7 Periodic Maintenance and Inspection
Explains the cleaning procedures and periodic checks.

Section 8 Spare Parts

Describes the notes on spare parts and list of parts which need the periodic maintenance.

Section 9 Optional Boards Installation

Explains the installation procedure of optional boards (BKDW-702/703/704) to this unit.

Related manuals

Besides this “Maintenance Manual Part 1”, the following manuals are available for this unit:

- **Operation Manual (Supplied with this unit)**
  This manual is necessary for application and operation of this unit.

- **Maintenance Manual Part 2 (available on request)**
  Volume-1 : Service Instructions
  Volume-2 : Parts List and Diagrams
  These manuals describe the information that premises the parts level service (adjustments, board layouts, schematic diagrams, detailed parts list, etc.) for this unit.
  If these manuals are required, contact your local Sony Sales Office/Service Center.

- **BVF-V10/V10CE or BVF-V20W/V20WCE Maintenance Manual (available on request)**
  This manual describes the service information of the supplied viewfinder.
  If this manual is required, contact your local Sony Sales Office/Service Center.

Section 1
Service Overview

1-1. Operating Conditions

Operating temperature : 0 to 40 ˚C
Humidity : 25 to 85 % (Relative humidity)
Storage temperature : −20 to 60 ˚C

User under special environment (Measure for cold area) : The unit is guaranteed its operation under the temperature of 0 to 40 ˚C. When the unit is used under 0 ˚C, cover-cloth (part No. : 3-191-775-01) against the cold is recommended to use.

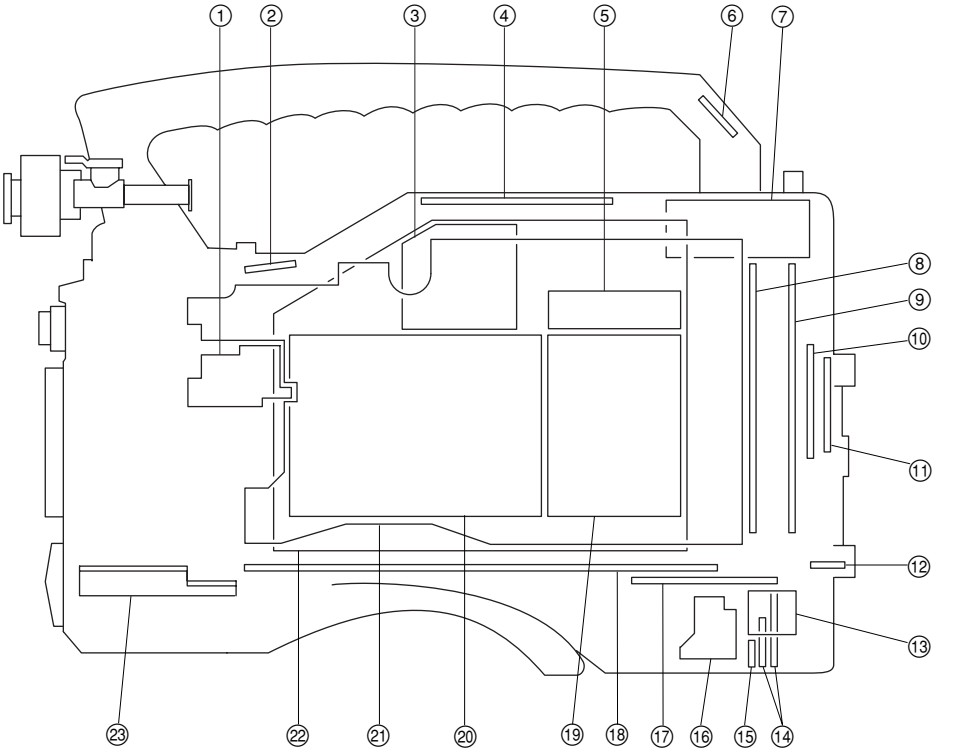
1-2. Supplied Accessories

Description	Part No.	Q'ty
Shoulder Belt Assembly	A-6772-374-B	1
Microphone	1-542-295-11	1
Window Screen	3-709-104-01	1
XLR Cap (1)	3-741-727-01	2
XLR Cap (2)	3-741-726-03	2
Operation Manual	–	1
Maintenance Manual Part 1	–	1

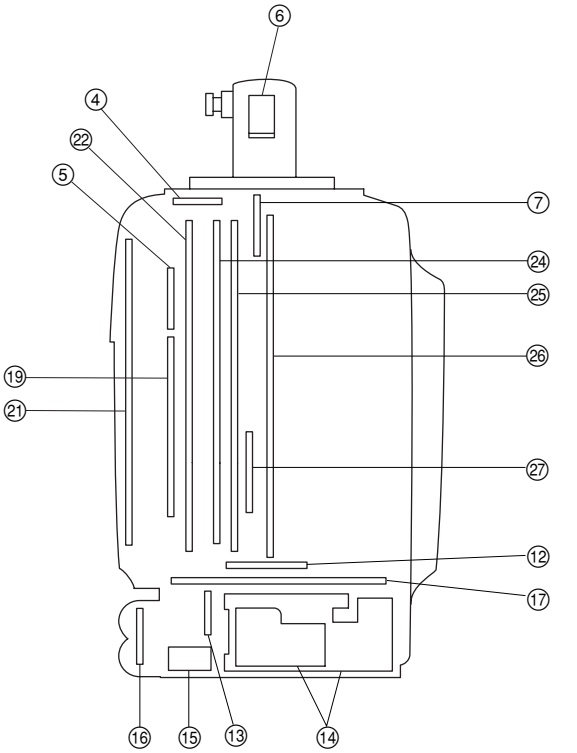
1-3. Main Part Locations and Circuit Functions

1-3-1. Printed Circuit Board Locations

AD-155 ..... ③
AXM-21 ..... ⑭
BC-31*1 ..... ㊱
BC-32*2 ..... ㊱
BF-74 ..... ⑤
BI-96 ..... ㉝
CI-20 ..... ⑪
CI-21 ..... ⑩
CN-1183 ..... ㊽
CN-1573*1 .... ⑲
CNB-11 ..... ⑰
CP-329 ..... ㉓
CTL-10 ..... ㉙
CUE-2 ..... ㊶
DC-101 ..... ⑫
DC-106 ..... ⑬
DCP-17 ..... ㉒
DIF-75 ..... ⑨ (BKDW-702)
DR-387 ..... ㊼
DVP-14 ..... ㉔
DVP-17 ..... ㉕
ES-23 ..... ⑳
FM-65*3 ..... ⑤ (BKDW-704)
HN-260 ..... ㉛
HP-93 ..... ⑯
IF-716 ..... ㊴
IO-178 ..... ㊸
KY-293 ..... ④
LP-109 ..... ⑥
LP-111 ..... ⑮
MA-94 ..... ㊵
MB-810 ..... ⑱
MB-811 ..... ㉖
MY-93 ..... ㉗ (BKDW-703)
PA-228 ..... ㉞
PS-533 ..... ⑦
RC-69*2 ..... ⑲
RC-75*2 ..... ⑲
RE-160 ..... ㊻
RE-161 ..... ㊺
RM-180 ..... ㊹
SE-275 ..... ㉘
SV-210 ..... ⑧
SW-971 ..... ㊲
SW-972 ..... ②
SW-973 ..... ㉚
SW-983 ..... ㊳
TC-101 ..... ㉑
TG-206*1 ..... ㉜
TG-207*2 ..... ㉜
VA-191 ..... ㉟
VR-248 ..... ①
VSE-32 ..... ㊷

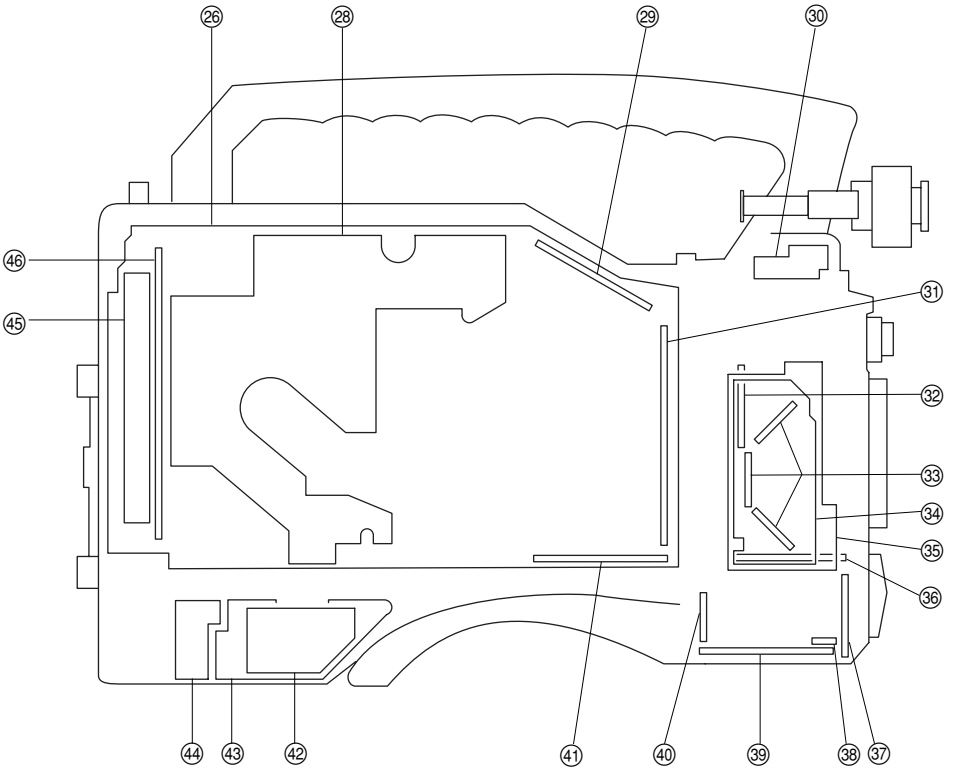


< Inside Panel View >



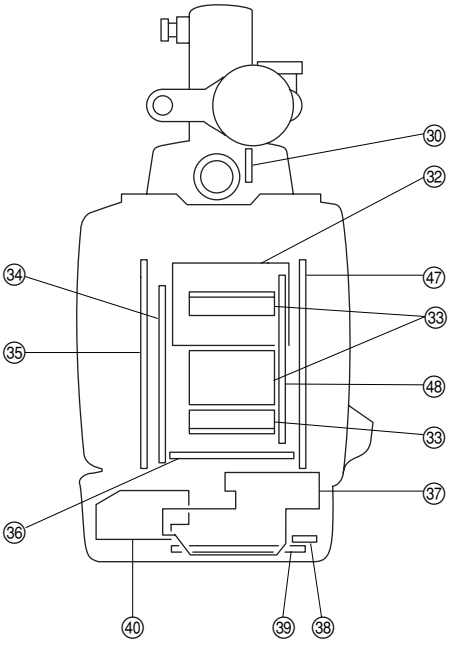
< Rear Panel View >

*1 : For DVW-707/707P only
*2 : For DVW-790WS/790WSP/709WS/709WSP only
*3 : Dedicated optional board for DVW-790WS/790WSP/709WS/709WSP



< Outside Panel View >

Inside Panel View : ① through ㉓
(Some boards are also indicated in the Rear Panel View.)
Rear Panel View : ㉔ through ㉗
Outside Panel View : ㉘ through ㊻
(Some boards are also indicated in the Front Panel View.)
Front Panel View : ㊼ and ㊽



< Front Panel View >

1-3-2. Circuit Functions

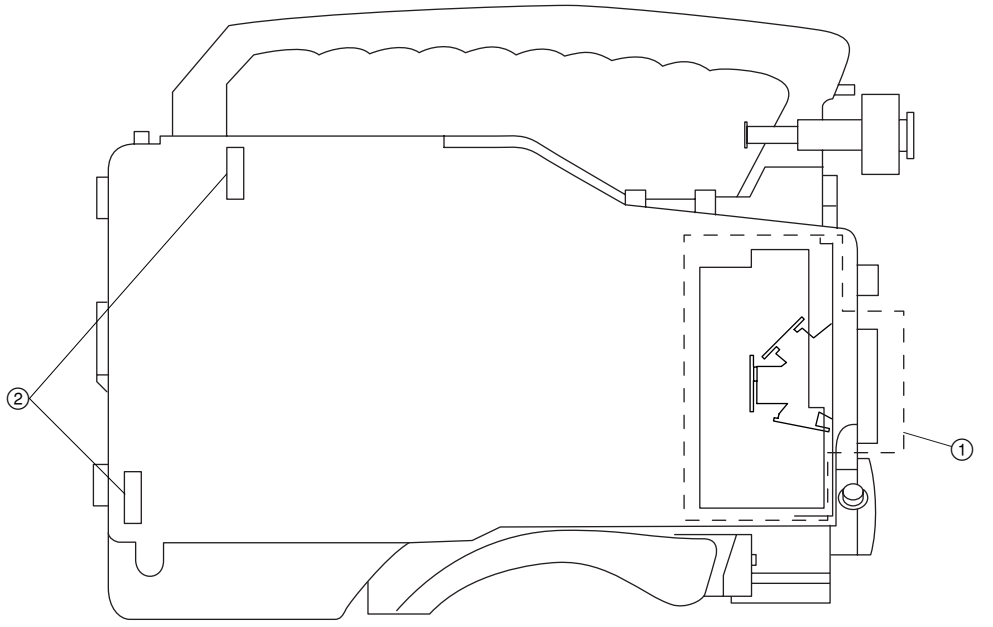
System	Board	Function
CCD BLOCK	BI-96	CCD Imager (R, G, B)
	CN-1183	Connector for BI-96
	DR-387	CCD Driver
	PA-228	Pre-amp (Sample & Hold)
	TG-206*1/TG-207*2	Timing Generator
	VA-191	Video Amp
CAMERA/VIDEO	AD-155	A/D Converter
	BF-74	Connector for DCP-17
	CN-1573*1	Connector for DCP-17
	RC-69*2+RC-75*2	Rate (16:9 to 4:3) Converter
	DCP-17	Camera Processor
	DVP-14	Digital Bit Reduction Decoder, Digital Encoder, Digital Decoder, Timing Clock Generator
	DVP-17	RF, Digital Audio Processor, System Controller for VTR Block
	ES-23	Composite Encoder
	TC-101	Analog Audio Processor, Time Code Generator
HEAD/SERVO	CTL-10	CTL/Erase Head Amp
	CUE-2	CUE Head Amp
	HN-260	Harness, Head Amp (REC Head PB)
	SV-210	Servo Controller
MICROPHONE	IF-716	Lens Control, Mic Amp
	MA-94	Camera Mic Pre-amp
	SW-971	Mic Level, Auto White/Black SW, VTR Start/Stop SW, Shutter On/Off Select SW
POWER SUPPLY	DC-101	Battery DC Filter
	PS-533	Power Supply (Light)
	RE-160	Regulator
	RE-161	Regulator, Switching Control
CONNECTOR BOX	AXM-21	Connector (AUDIO IN/OUT), Audio Pre-amp
	CNB-11	Circuit Breaker
	DC-106	External DC Filter
	IO-178	Connector (GEN LOCK IN, TEST OUT, TC IN, TC OUT)
	LP-111	Rear Tally
	RM-180	Connector (RM)
	VSE-32	GENLOCK IN Filter

*1 : For DVW-707/707P only
*2 : For DVW-790WS/790WSP/709WS/709WSP only

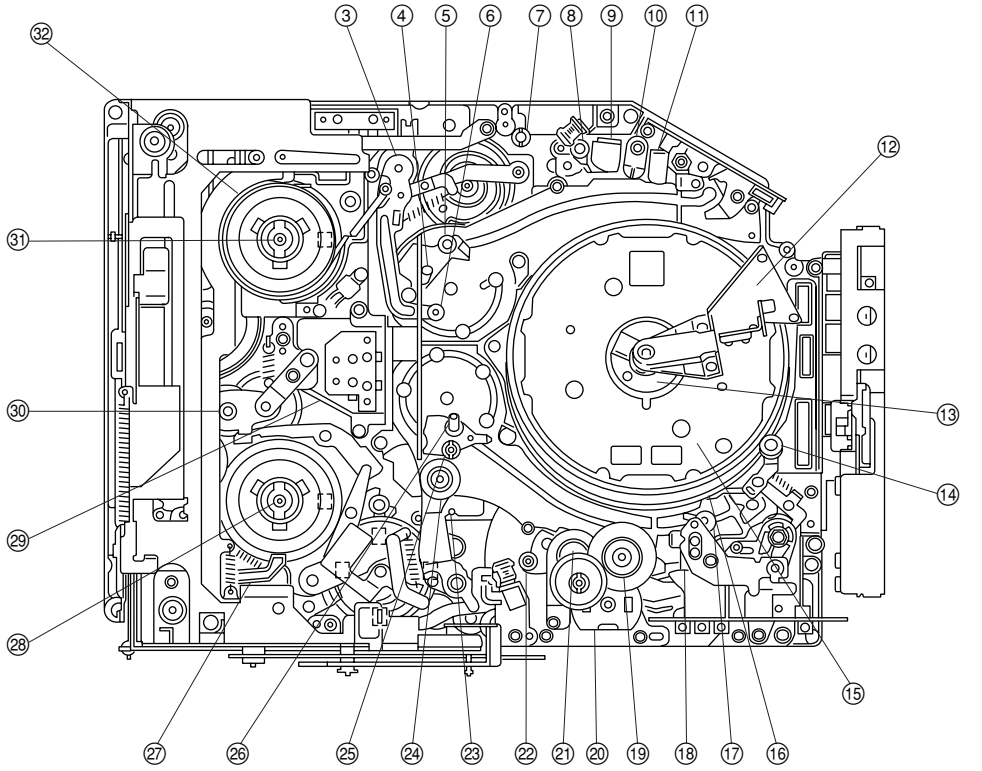
System	Board	Function
OTHERS	CI-20	Connector (40-pin)
	CI-21	40-pin Adaptor Interface
	CP-329	Switch Panel
	HP-93	Earphone
	KY-293	Function Key
	LP-109	Back Tally, Back Tally Switch
	MB-810	Motherboard
	MB-811	Motherboard
	SE-275	Sensor
	SW-972	Turbo Gain Switch
	SW-973	Menu and Light Auto/Manual Switch
	SW-983	Rotary Encoder Switch
	VR-248	Memory Card, Audio Select Switch, Alarm Level, Monitor Level
OPTION	FM-65※3 (BKDW-704)	Image Inverter Board
	DIF-75 (BKDW-702)	SDI Output Board
	MY-93 (BKDW-703)	Picture Cache Board

※3 : Dedicated optional board for DVW-790WS/790WSP/709WS/709WSP.

1-3-3. Mechanical Part Locations

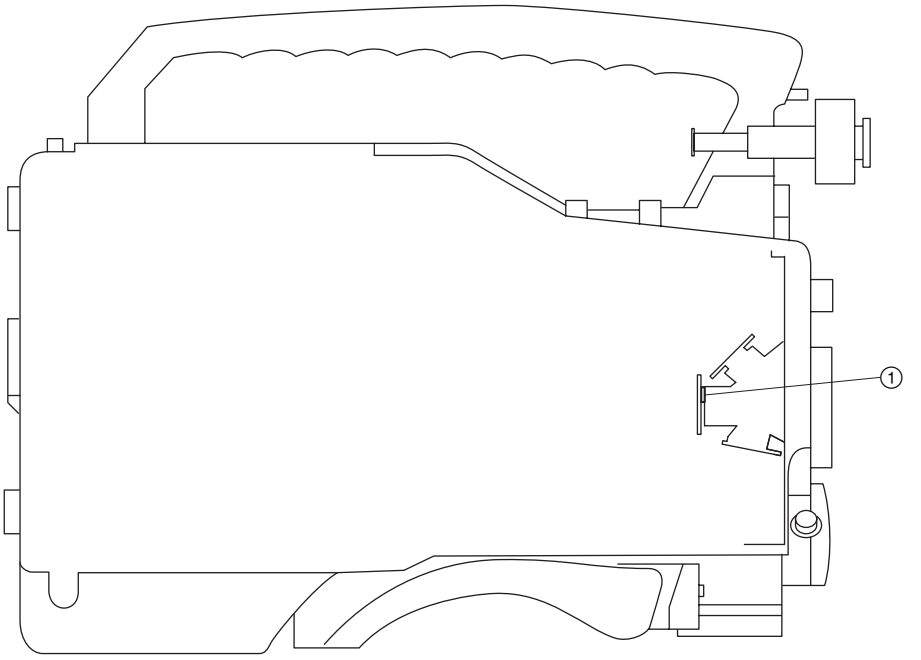


Mechanical Deck

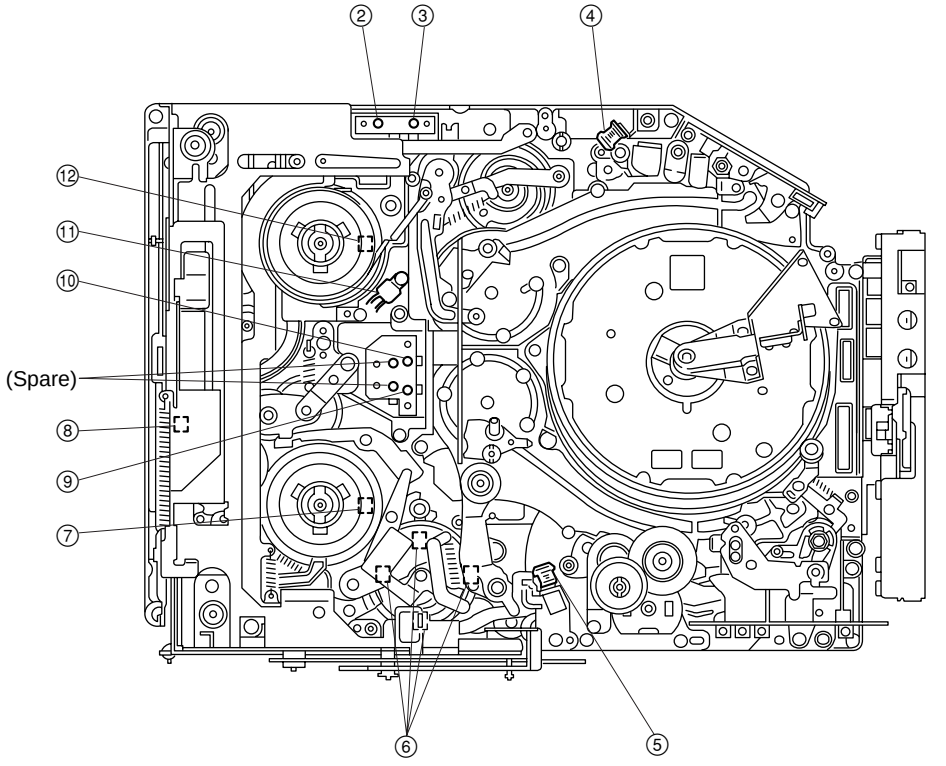


① CCD block
② DC fan motor
③ Tension regulator arm
④ S1 tape guide (on S slider)
⑤ S2 tape guide (on S slider)
⑥ Tension regulator guide (S4 tape guide)
⑦ S5 tape guide
⑧ S3 tape guide
⑨ Full erase head
⑩ Tape cleaner
⑪ CTL head
⑫ Brush
⑬ Slip ring
⑭ Video head cleaner
⑮ Upper drum
⑯ Lower drum
⑰ CUE head cleaner
⑱ CUE/TC head
⑲ Manual eject knob
⑳ Threading motor
㉑ Capstan motor
㉒ T3 tape guide
㉓ T drawer guide
㉔ Pinch roller
㉕ T2 tape guide (on T slider)
㉖ T1 tape guide (on T slider)
㉗ T soft brake
㉘ T reel table
㉙ Timing belt
㉚ Gear
㉛ S reel table
㉜ Brake band

1-3-4. Sensor Locations and Functions



Mechanical Deck



① Temperature Detection Sensor
Detects the temperature, to perform the black correction.
② Cassette-in Sensor
Detects the existence of a cassette.
③ REC INHIBIT Sensor
Detects the REC inhibiting plug of the cassette tape.
④ Tape End Sensor
Detects the end of the tape that runs in the forward direction.
⑤ Tape Top Sensor
Detects the end of the tape that runs in the reverse direction.
⑥ Function Cam Sensor
Detects the rotation position of a cam.
⑦ Take-up Reel Table Rotating Sensor
Detects the rotation of the take-up reel table. The FG output signal of this sensor is input to a servo circuit so as to calculate the winding diameter of the tape.
⑧ Cassette Lock Sensor (Switch)
Detects that the cassette compartment was locked.
⑨ Tape Thickness Sensor
Using a tub on the back side of the cassette tape, this sensor detects the thickness of the tape wound on a cassette tape that is being inserted into the unit.
⑩ Reel Hub Diameter Sensor
The reel hub diameter of a cassette tape varies depending on the length of the tape wound on the cassette tape. The reel hub diameter sensor detects the reel hub diameter by the tab on the back side of the cassette tape. The output signal of this sensor is input to a servo circuit so as to calculate the winding diameter of the tape.
⑪ Condensation Sensor
Detects whether the dew condensation occurs in the unit.
⑫ Supply Reel Table Rotating Sensor
Detects the rotation of the supply reel table. The FG output signal of this sensor is input to a servo circuit so as to calculate the winding diameter of the tape.

1-4. Matching Connectors

When external cables are connected to the connector during maintenance, the hardware listed below (or the equivalents) must be used:

Panel Indication	Matching Connector/Cable	
	Name	**Part No.**
AUDIO IN CH-1/CH-2	XLR 3-pin, male	1-508-084-00
AUDIO OUT	Audio cable (XLR 5-pin – XLR 3-pin, 2 m)	SONY CCXA-53 or equivalent
GENLOCK IN TC IN TC OUT TEST OUT VIDEO OUT	BNC	1-569-370-12
DC IN	XLR 4-pin, female	1-508-362-00
DC OUT 12 V	DIN 4-pin, male	1-566-425-11
MIC IN +48 V	XLR 3-pin, male	1-508-084-00
REMOTE	6-pin, male	1-560-078-00
EARPHONE	Mini jack	Available separately
LIGHT	Power tap [OE]	ANTONBAUER 33710 or equivalent

1-5. Signal Inputs and Outputs

Inputs

GENLOCK IN	1.0 V p-p, 75 Ω
TC IN	0.5 V to 18 V p-p, 10 kΩ

Outputs

TEST OUT	1.0 V p-p, 75 Ω, unbalanced
TC OUT	1.0 V p-p, 75 Ω
VIDEO OUT	1.0 V p-p, 75 Ω, unbalanced
EARPHONE	−∞ to −18 dBu, adjustable, 8 Ω

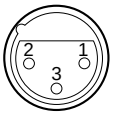
MIC IN : XLR 3-pin, female

<External View>

Pin No.	Signal	Specification
1	MIC IN (G)	−60 dBu High impedance balance
2	MIC IN (X)	
3	MIC IN (Y)	

(0 dBu=0.775 Vrms)

AUDIO IN CH1/CH2 : XLR 3-pin, female

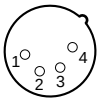


<External View>

Pin No.	Signal	Specification
1	LINE/MIC IN (G)	+4 dBu/−60 dBu High impedance balance
2	LINE/MIC IN (X)	
3	LINE/MIC IN (Y)	

(0 dBu=0.775 Vrms)

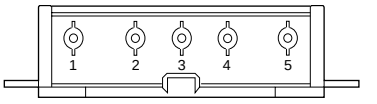
DC IN : XLR 4-pin, male



<External View>

Pin No.	Signal	Specification
1	GND	
2	–	
3	–	
4	EXT DC IN	DC 11 to 17 V

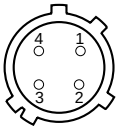
BATT IN : 5-pin, male



<External View>

Pin No.	Signal	Specifications
1	BATT IN (–)	
2	BATT IND IN	
3	BATT REM IN	
4	LIGHT CONT OUT	
5	BATT IN (+)	DC11 to 17 V

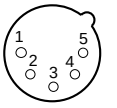
DC OUT 12V : DIN 4-pin, female



<External View>

Pin No.	Signal	Specification
1	UNREG GND	
2	–	
3	–	
4	UNREG +12 V OUT	0.1 A MAX

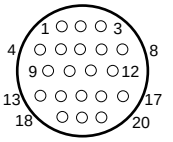
AUDIO OUT : XLR 5-pin, male



<External View>

Pin No.	Signal	Specifications
1	GND	
2	CH1 (X) OUT	0 dBm (Terminated in 600 Ω)
3	CH1 (Y) OUT	
4	CH2 (X) OUT	
5	CH2 (Y) OUT	

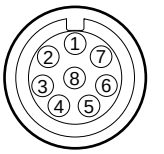
VF : 20-pin, female



<External View>

Pin No.	Signal	Specifications
1	VTR SAVE OUT	L : Light on, OPEN : Light off
2	ABNORMAL OUT	L : Light on, OPEN : Light off
3	16:9/4:3 OUT	H : NORMAL (4:3) L : WIDE (16:9)
4	REC (L) OUT	H : Light on, L : Light off
5	COLOR VF DET IN	H : Color, L : B/W
6	CCIR/EIA OUT	H : CCIR, L : EIA
7	DISPLAY ON IN	OPEN : ON, L : OFF
8	G TALLY OUT	H : Light on, L : Light off
9	–	
10	Y (X) OUT	1 Vp-p, VF : Zi=1 kΩ
11	ZEBRA ON IN	H : OFF, L : ON
12	VIDEO (X) OUT	1 Vp-p, VF : Zi=1 kΩ
13	AUDIO CTL IN	
14	B-Y (Y) OUT	700 mVp-p, VF : Zi=1 kΩ, 75% color-bars
15	R-Y (X) OUT	700 mVp-p, VF : Zi=1 kΩ, 75% color-bars
16	BATT IND OUT	H : Light on, L : Light off
17	REC/TALLY OUT	H : Light on, L : Light off
18	+9.3 OUT	REG +9.3 V
19	GND	
20	UNREG OUT	+11 V to 17 V

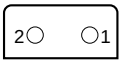
REMOTE : 8-pin, female



<External View>

Pin No.	Signal	Specifications
1	RM TX (+) OUT	
2	RM TX (–) OUT	
3	RM RX (+) IN	
4	RM RX (–) IN	
5	UNREG GND	
6	UNREG +12 V OUT	+11 V to 17 V
7	RM TEST (G) OUT	
8	RM TEST (X) OUT	1 Vp-p, Zo=75 Ω

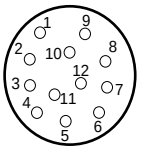
LIGHT : 2-pin, female



<External View>

Pin No.	Signal	Specifications
1	LIGHT +12 V OUT	50 W MAX
2	GND	

LENS: 12-pin, female



<External View>

Pin No.	Signal	Specifications
1	RET(SW) IN	L : ON, OPEN : OFF
2	VTR TRIG IN	L : ON
3	LENS GND	
4	AUTO +5 V IN	AUTO : +5 V MANU : 0 V or OPEN
5	IRIS CONT OUT	+3.4 V (F16) to +6.2 V (F2.8)
6	UNREG +12 V OUT	+11 V to 17 V
7	IRIS POSITION IN	+3.4 V (F16) to +6.2 V (F2.8)
8	REMOTE/LOCAL IN	
9	EXTENDER IN	EX 2 ON : 0 V EX 0.8 ON : +1.8 V OFF : +4.8 V
10	ZOOM POSITION IN	WIDE : 2 V TELE : 7 V
11	N.C	No connection
12	N.C	No connection

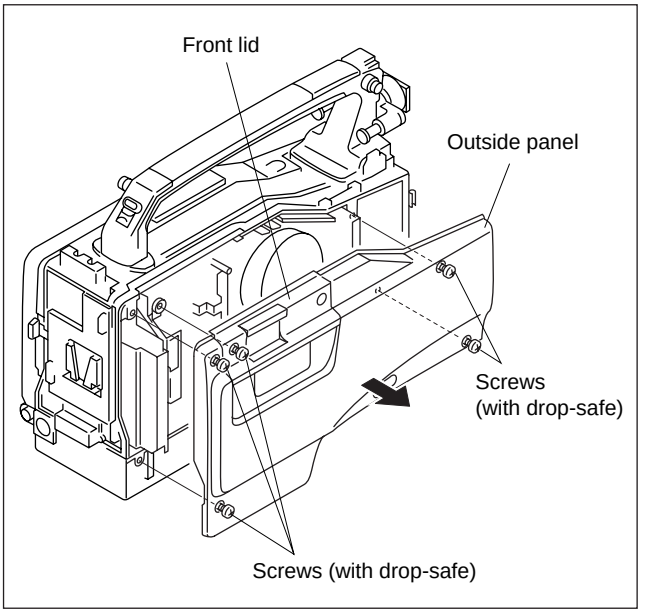
1-6. Removing/Reinstalling Outside Panel

Removing

Note

Be sure to turn off the power, and then disconnect the power cord and/or battery before performing the following steps. If not, damage to internal circuit may result.

1. Fully loosen the left screw (with drop-safe) of the front lid.
2. Fully loosen the four screws of the outside panel to remove the panel.

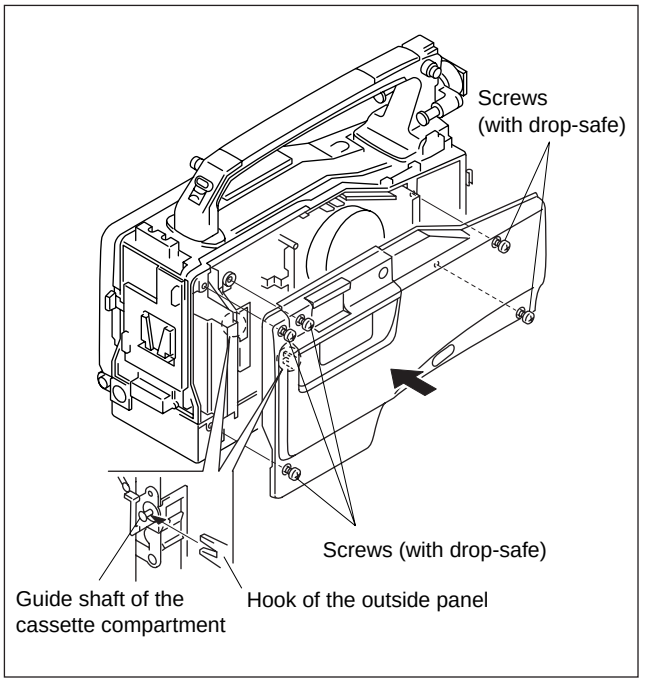


Reinstalling

1. Sliding the hook of the outside panel onto the guide shaft of the cassette compartment, install the outside panel.
2. Fasten the screws of the outside panel.

   Note

   Tightening Torque : 140×10^{-2} N•m {14.3 kgf•cm}



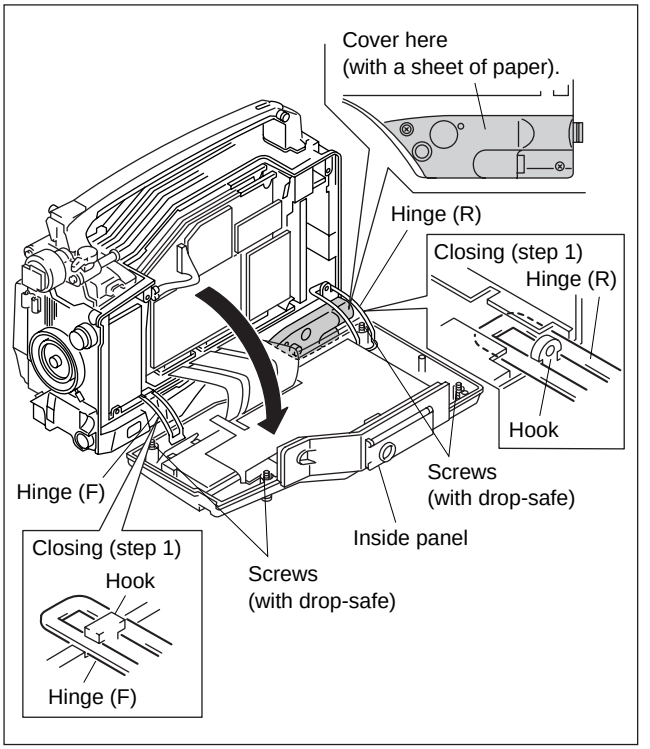
1-7. Opening/Closing Inside Panel

Opening

Notes

- To avoid damage to internal circuit, be sure to turn off the power, and then disconnect the power cord and/or battery before following the steps below.
- To protect the connector box from a damage by rubbing against the hinge, slip in a sheet of paper between the box and hinge when opening the inside panel.

1. Fully loosen the four screws (with drop-safe), and then open the inside panel in the direction of the arrow.
   Note
   Be careful not to bend the flexible wires connected to the TC-101 board intentionally.



Closing

1. Ensure that the hinges (F) and (R) are properly hitched on the hooks of chassis.
2. Close the inside panel, and then fasten the four screws (with drop-safe) to install the panel.
   Notes
   - Tightening Torque : 140×10^{-2} N•m {14.3 kgf•cm}
   - Be careful not to pinch harnesses between the inside panel and chassis.

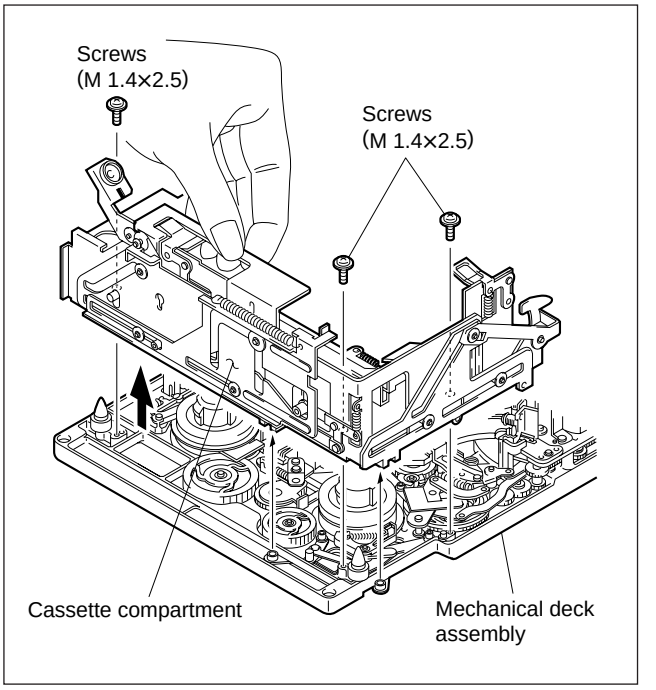
1-8. Removing/Reinstalling Cassette Compartment

Notes

- To avoid damage to internal circuit, be sure to turn off the power, and then disconnect the power cord and/or battery before following the steps below.
- The cassette compartment is removable in either of up or down position.

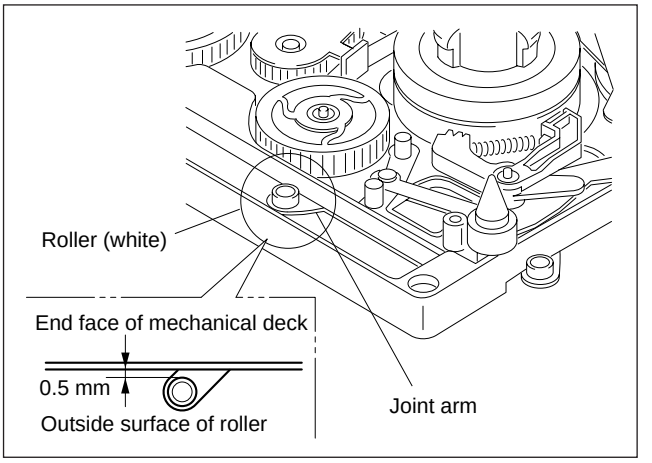
Removing

1. Remove the outside panel. (Refer to Section 1-6.)
2. Remove the three screws of the cassette compartment.
3. Grasp the cassette compartment by the portion shown in the figure and lift it out.

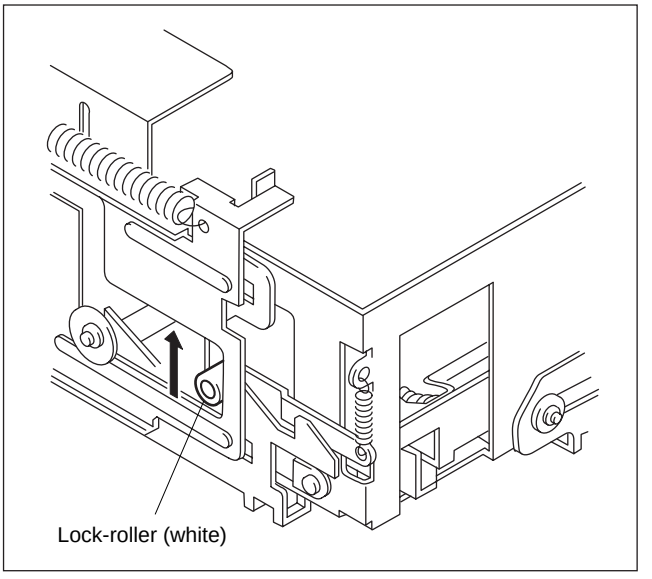


Reinstalling

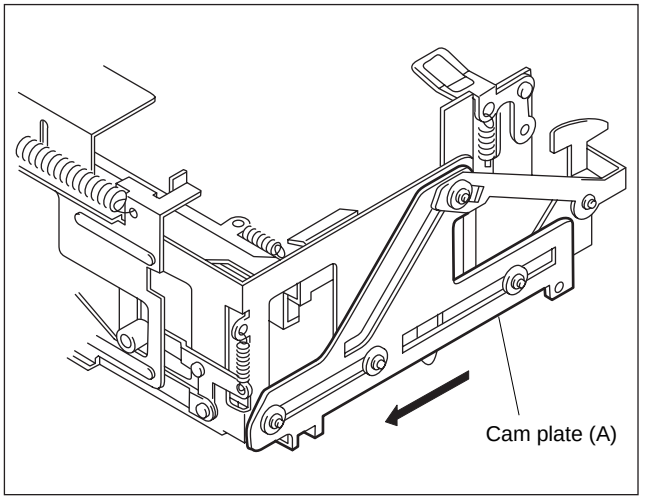
1. To create a clearance of 0.5 mm between the white roller of joint arm and the end face of mechanical deck, adjust the position of the joint arm.



2. Slide the white lock-roller of cassette compartment in an upward direction.



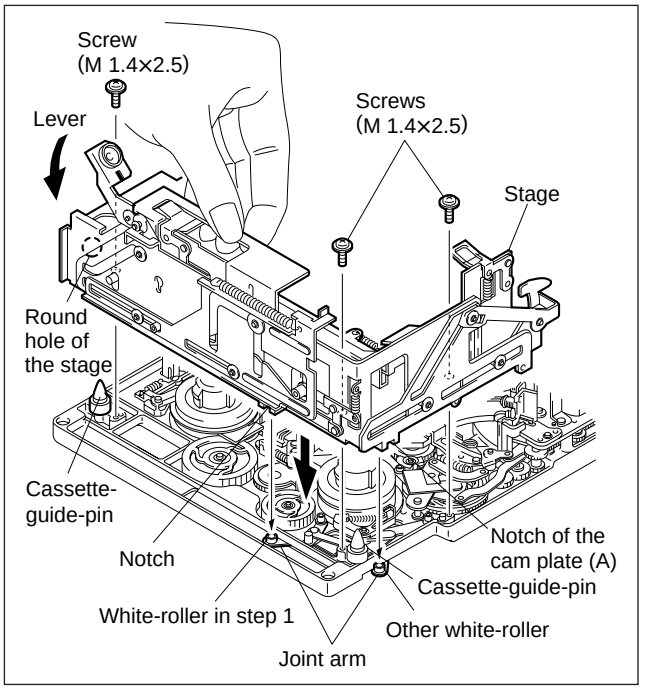
3. Slide the cam plate (A) on the right of the cassette compartment all the way of the arrow until it stops.



4. Grasp the cassette compartment by the portion shown in the figure and set it on the stage to insert the two cassette-guide-pins onto the round hole of the stage. Check that the other white-roller of joint arm positioned in step 1 is put in the notch of the cam plate (A) on the right side.
5. Push down the lever of the cassette compartment and check to see that the stage smoothly moves up and down. If not moved smoothly, recheck the steps 1 through 4.
6. Fasten the cassette compartment using the three screws.

Note

Tightening Torque : 9×10^{-2} N•m {0.9 kgf•cm}



1-9. Removing/Reinstalling Plug-in Boards

Be careful not to damage the board and to position and orient the board correctly when removing/reinstalling the plug-in boards.

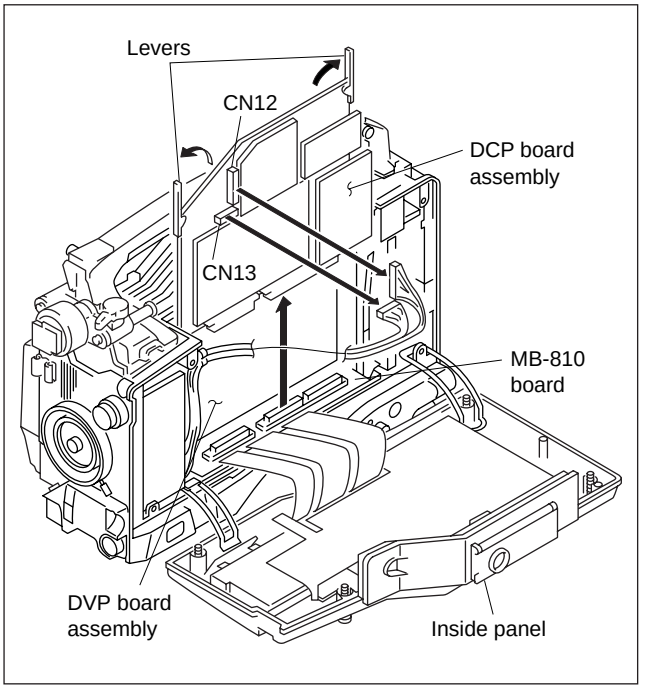
1-9-1. DCP/DVP Board Assembly

Notes

- When replacing the board, set the switches on the new board.
  DCP-17 board : Refer to Section 1-10-3.
  DVP-17 board : Refer to Section 1-10-4.
- After replacing the board, see the Maintenance Manual Part 2 Vol.1 and perform adjustments as follows :
  DCP-17 board : Sec. 7. Camera System Electrical Alignment
  DVP-17 board : Sec. 6-5. Video System Adjustment (Automatic Equalizer Adjustment and REC Current Adjustment)

Removing

1. Open the inside panel. (Refer to Section 1-7.)
2. Remove the harnesses from the connectors CN12 and CN13 on the DCP board assembly.
3. Open the levers to disconnect the DCP or DVP board assembly from the connectors on the MB-810 board.
4. Lift the DCP or DVP board assembly out.

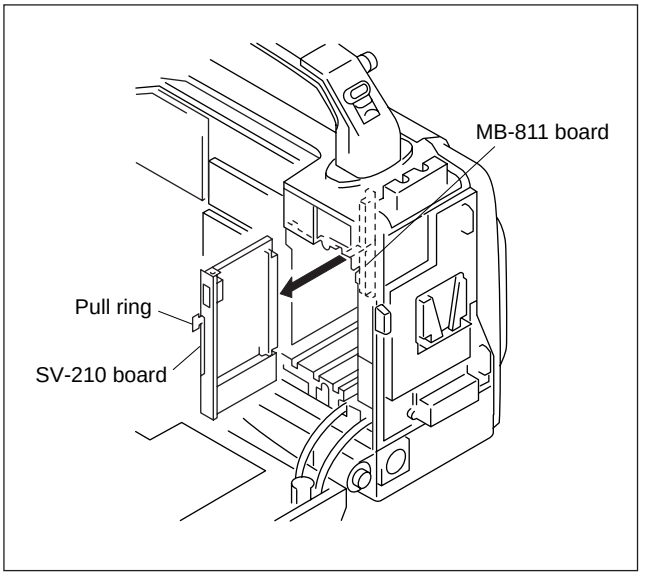


Reinstalling

1. Stay opens the levers of the board in advance.
2. Insert the DCP or DVP board assembly along the board guide rails.
3. After the shafts of levers get into the chassis, close the levers and press in the board to firmly connect it to the connector of the MB-810 board.
4. Reconnect the harnesses to the connectors CN12 and CN13 on the DCP board assembly.

1-9-2. SV-210 Board

1. Open the inside panel. (Refer to Section 1-7.)
2. Grasp the board by the pull ring and pull it out to disconnect the SV-210 board from the connectors of MB-811 board.



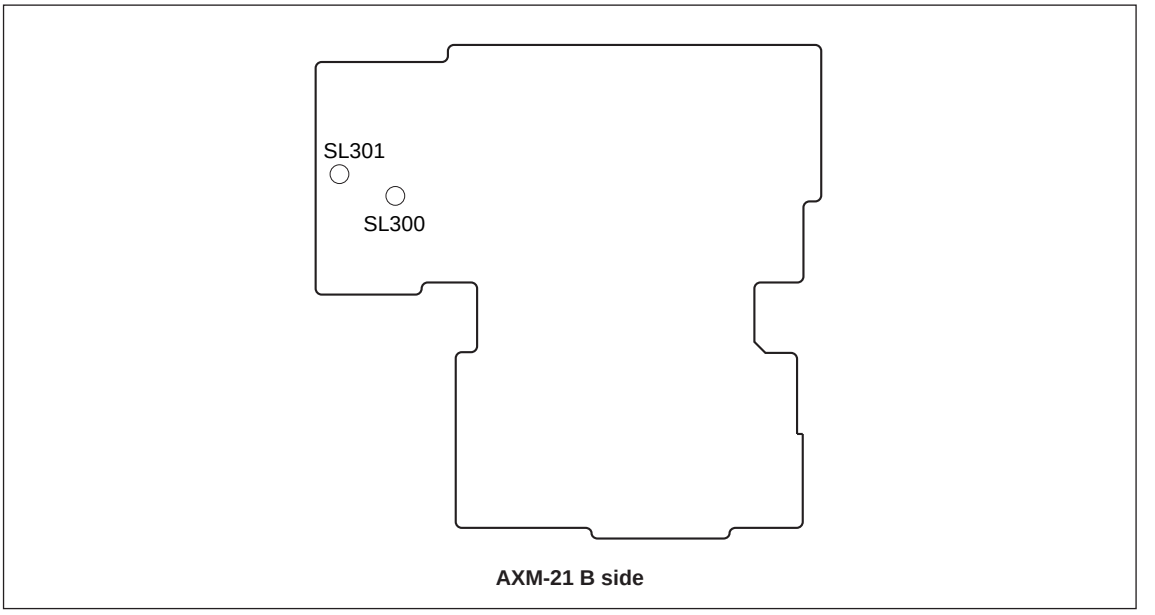
1-10. Switch/Slit Land Settings and LED Functions on the Boards

As for the external-switch settings, see Section “2. Locations and Functions of the Parts and Controls” in the Operation Manual.

Note

Never change the settings of switches specified “Factory use”.

1-10-1. AXM-21 Board



AXM-21 B side

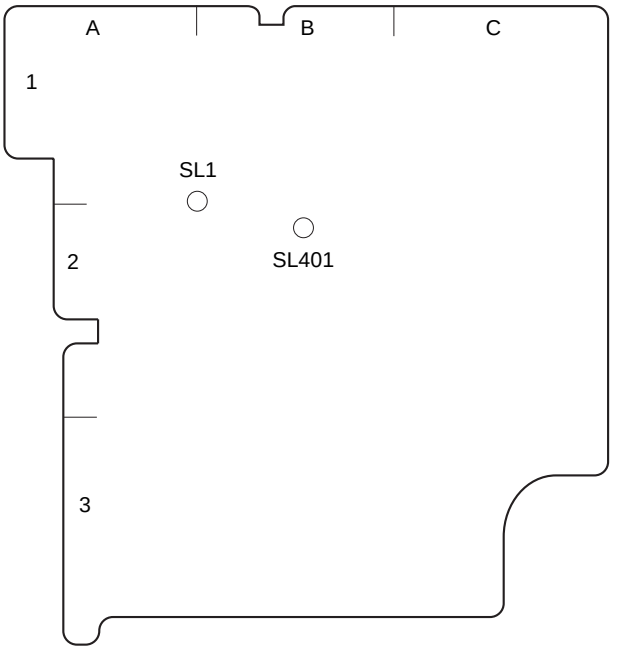
Slit Lands

Ref. No.	Name	Description	Factory setting
SL300	AUDIO OUT Select	OPEN : Output from the XLR 5-pin connector	OPEN
		SHORT : Output from the XLR 3-pin connector *1	
SL301	AUDIO OUT Select	OPEN : Output from the XLR 3-pin connector *1	SHORT *2
		SHORT : Output from the XLR 5-pin connector	

*1 : If the AUDIO OUT connector (XLR 5-pin) is converted to XLR 3-pin connectors, set the slit lands as specified above. (The XLR 3-pin connectors are not supplied. Ready them separately.)

*2 : This slit land is short-circuited by the traces on the board. Therefore, the traces must be cut using a knife when the setting is changed.

1-10-2. CNB-11 Board



CNB-11 A side

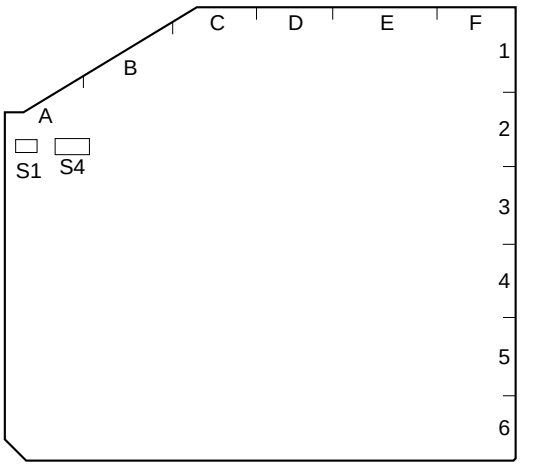
Slit Lands

Note

Set SL1 according to the destination when replacing the board.

Ref. No.	Description	Factory setting
SL1	Selects how the power is derived when the battery and external power supply are used simultaneously : OPEN : Always derived power from the external power supply. SHORT : Automatically derived power from either of the battery or external power supply which is in higher input-voltage.	OPEN
SL401	Destination Select OPEN : For the area except Japan SHORT : For Japan	OPEN (for except Japan) SHORT (for Japan)

1-10-3. DCP-17 Board

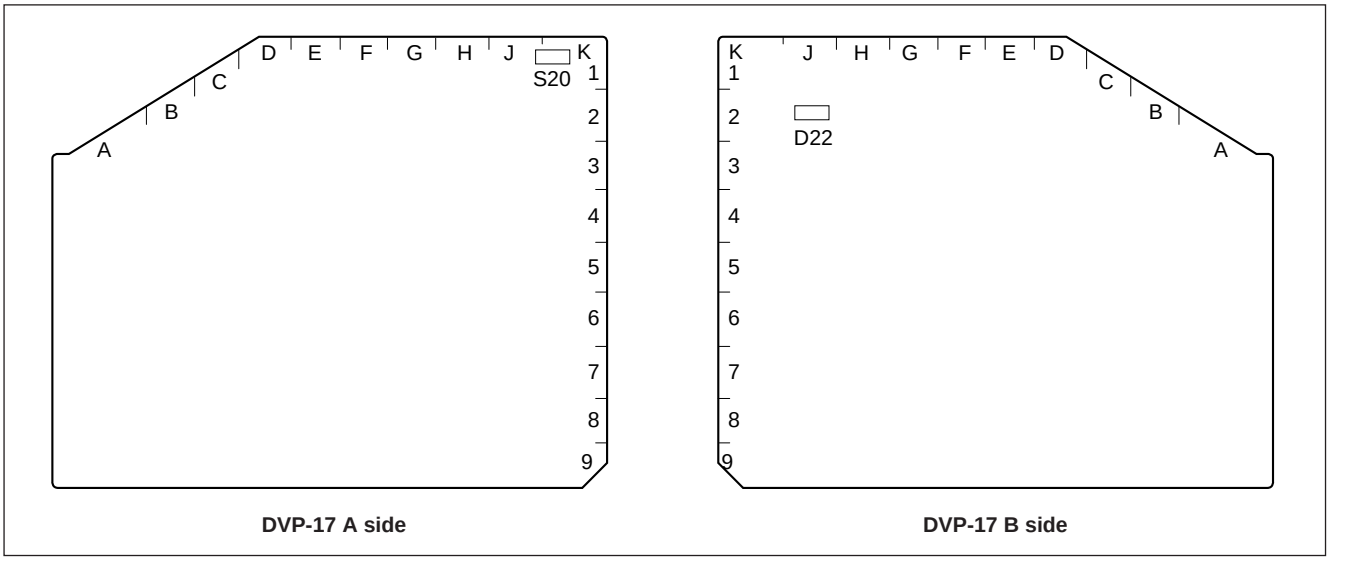


DCP-17 B side

Switches

Ref. No. setting	Name	Description	Factory
S1	ENG Disable Select	Switching ON/OFF of engineer mode ON : Disables OFF : Enables	OFF
S4-1	SVC Enable Select	Switching ON/OFF of service mode ON : Enables OFF : Disables	OFF
S4-2	–	Factory use	OFF
S4-3	VF CAM Select	Output signal selection when the OUTPUT/DCC switch is set to BARS ON : Outputs the camera signal on the viewfinder. OFF : Outputs the color bars signal on the viewfinder.	OFF
S4-4	CA Mode	Function selection of the VTR START button ON : Uses the VTR START button as the RET 2 button. (The VTR SAVE/STBY switch is used as the INCOM TALK ON button.) OFF : Uses the VTR START button as the INCOM TALK ON button.	OFF
S4-5 to 7	–	Not used	OFF
S4-8	Data reset	ON : Resets the setting menu when the power is turned on. OFF : Not resets. (under normal use)	OFF

1-10-4. DVP-17 Board



DVP-17 A side **DVP-17 B side**

Switches

Note

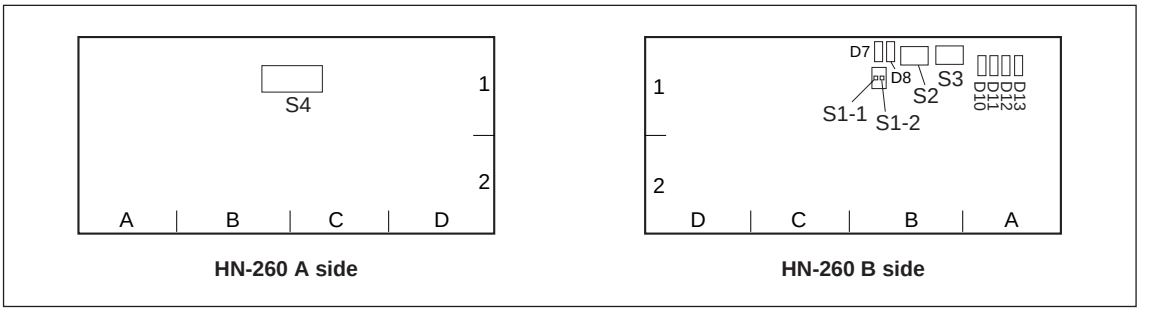
Set the switches S20-7 and S20-8 according to your own unit when replacing the board.

Ref.No.	Name	Description	Factory setting
S20-1 to 2	–	Factory use	OFF
S20-3	–	Not used	OFF
S20-4	EQ Adjust Mode	Set this switch to ON when adjusting equalizer and REC current.	OFF
S20-5 to 6	–	Factory use	OFF
S20-7	Model Select	OFF : DVW-707/707P ON : DVW-790WS/790WSP/ 709WS/709WSP	OFF (for DVW-707/707P) ON (for DVW-790WS/790WSP/ 709WS/709WSP)
S20-8	N/P Select	OFF : NTSC ON : PAL	OFF (for NTSC) ON (for PAL)

LED

Ref.No.	Name	Description	Always
D22	–	Not used	OFF

1-10-5. HN-260 Board



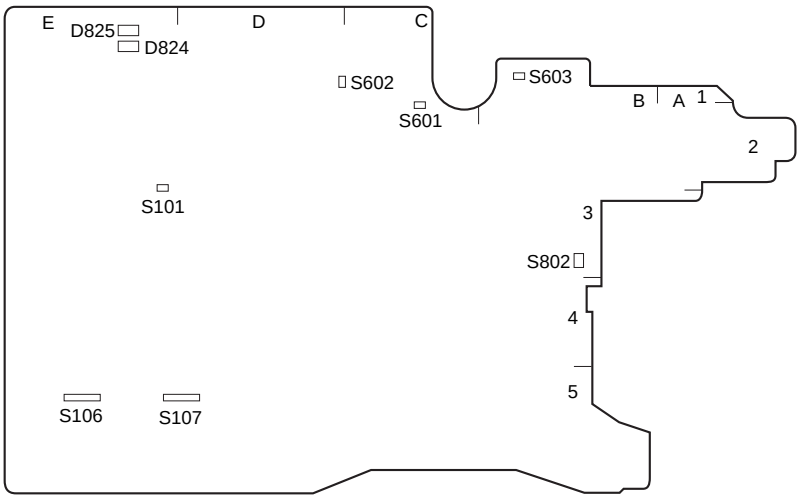
Switches

Ref.No.	Name	Description	Factory setting
S1-1	ADJ	Switching ON/OFF of the adjustment mode	OFF
S1-2	TRK	Switching ON/OFF of the tracking adjustment by tracking VR	OFF
S2	SET	Execution of the automatic servo adjustment (Refer to the Maintenance Manual Part 2 Vol.1, Sec.6 Servo System Adjustment.)	–
S3	NUMBER	Selection of the automatic servo adjustment (Refer to the Maintenance Manual Part 2 Vol.1, Sec.6 Servo System Adjustment.)	–
S4	REC HEAD PB SEL	Selection of NORMAL REC or REC HEAD PB (TEST)	REC

LEDs

Ref. No.	Name	Description	Normal state
D7	–	Lights when S1-1 is turned on.	OFF
D8	–	Lights when S1-2 is turned on.	OFF
D10	–	Lights when the tape is slacked. Lights when the S1-1 is turned on (in the automatic servo adjustment mode).	OFF
D11	–	Lights when the S1-1 is turned on (in the PG adjustment mode).	OFF
D10 to D13	–	Indicates the status of the automatic servo adjustment. (Refer to the Maintenance Manual Part 2 Vol.1, Sec. 6 Servo System Adjustment.)	OFF

1-10-6. TC-101 Board



TC-101 B side

Switches

Ref. No.	Name	Description	Factory setting
S101	CH-1 Front MIC LEVEL Control	Enables to control the audio level of the AUDIO IN CH-1 connector on the rear input with MIC LEVEL volume of the front panel. ON : Enables. OFF : Disables.	OFF
S106	CH-2 Limiter	Switching ON/OFF of CH-2 Limiter	OFF
S107	CH-1 Limiter	Switching ON/OFF of CH-1 Limiter	OFF
S601	CUE ONLY	Factory use (The CUE tone is output to AUDIO OUT all the time during playback.)	OFF
S602	CH-1 Output Limiter	Switching ON/OFF of CH-1 Output Limiter (+10 dB limit)	ON
S603	CH-2 Output Limiter	Switching ON/OFF of CH-2 Output Limiter (+10 dB limit)	ON
S802-1	NTSC/PAL SEL	NP Select OFF : NTSC ON : PAL	OFF (for NTSC) ON (for PAL)
S802-2	–	Factory use	OFF

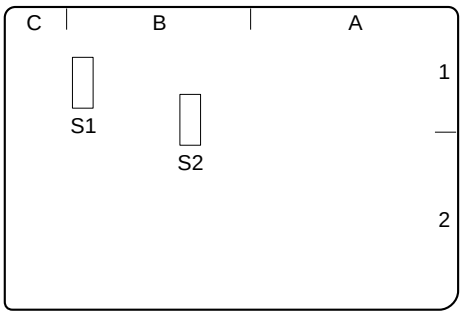
Slit Lands

All the slit lands on the TC-101 board are “Factory use”. Never change the settings.
(Factory setting : OPEN)

LEDs

Ref. No.	Name	Description	Always
D824	–	Factory use	OFF
D825	–	Factory use	OFF

1-10-7. TG-207 Board (for DVW-790WS/790WSP/709WS/709WSP only)



TG-207 B side

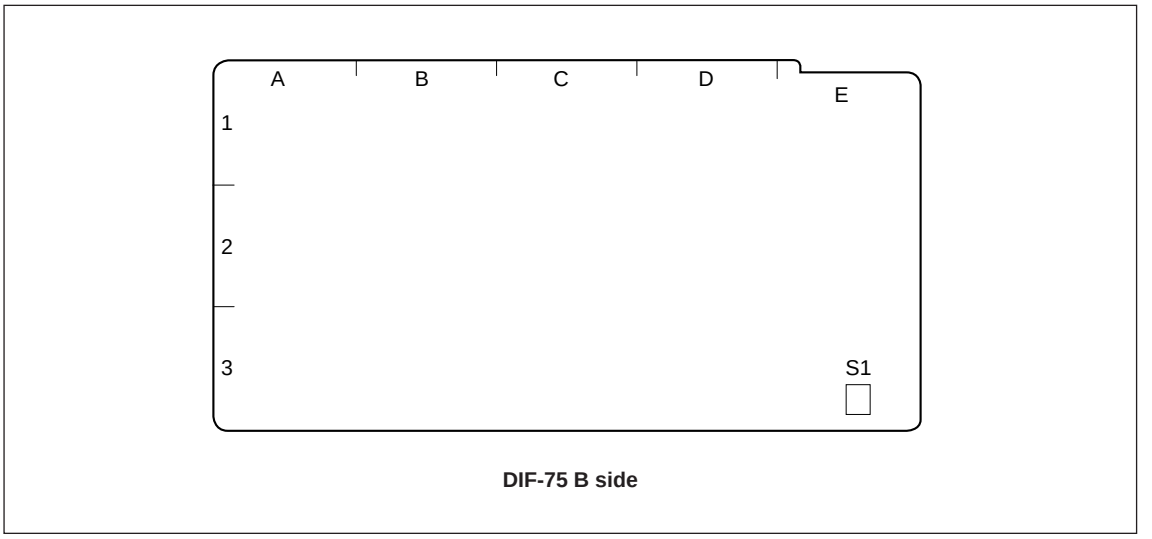
Switches

Note

When replacing the board, set the S2 according to your own unit.

Ref. No.	Name	Description	Factory setting
S1	Model Select	4:3 (No DVW Model) 16:9 (DVW-790WS/790WSP/ 709WS/709WSP)	16:9
S2	Model Select	FIT : DVW-790WS/790WSP IT : DVW-709WS/709WSP	FIT : (For DVW-790WS/790WSP) IT : (For DVW-709WS/709WSP)

1-10-8. DIF-75 Board (BKDW-702)



DIF-75 B side

Switches

Ref. No.	Name	Description	Factory setting
S1-1	VCO ADJ	Set to ON in the free-running adjustment.	OFF
S1-2	–	Reserved	OFF

LEDs

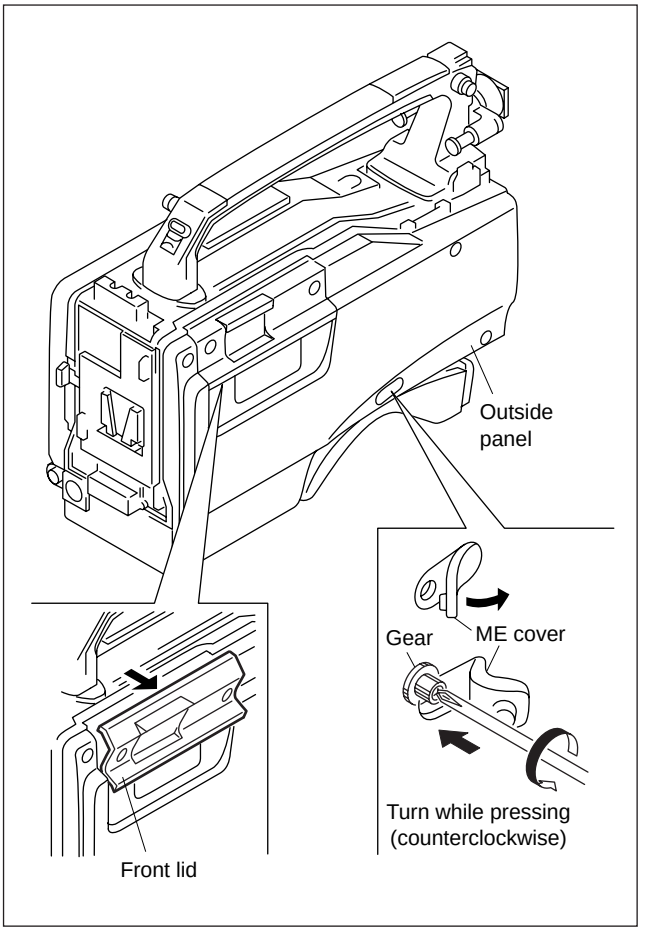
Ref. No.	Name	Description	Normal state
D7	–	Lights when S1-1 is turned on.	OFF
D8	–	Lights when S1-2 is turned on.	OFF
D10	–	Lights when the tape is slacked.	OFF
		Lights when the S1-1 is turned on (in the automatic servo adjustment mode).	
D11	–	Lights when the S1-1 is turned on (in the PG adjustment mode).	OFF
D10 to D13	–	Indicates the status of the automatic servo adjustment. (Refer to the Maintenance Manual Part 2 Vol.1, Sec. 6 Servo System Adjustment.)	OFF

1-11. Ejecting the Cassette Tape Manually

Note

To avoid damage to internal circuit, be sure to turn off the power, and then disconnect the power cord and/or battery before following the steps below.

1. Open the ME cover of the outside panel in the direction of the arrow.
2. Press in the gear and turn it counterclockwise with a Philips screwdriver while pressing the gear in.
   Note
   Check that the tape is taken up the cassette reel while turning the gear.
3. Turn the gear until the front lid opens, and then eject the cassette tape.



Notes

- Never turn the gear no further after the front lid opened. If the gear is turned moreover, gear phase will be out of order, and the operation timing of the cleaning roller will be shifted.
  When adjusting the phase of the gear, refer to Section "4-2-12. Timing Belt (Threading) Replacement" of the Maintenance Manual Part 2 Vol.1.
- Closing the front lid
  If the gear is turned moreover after the front lid opened, the front lid cannot be closed and locked. To close the front lid, turn on the power and close the lid.

If the front lid cannot be opened by turning the gear :

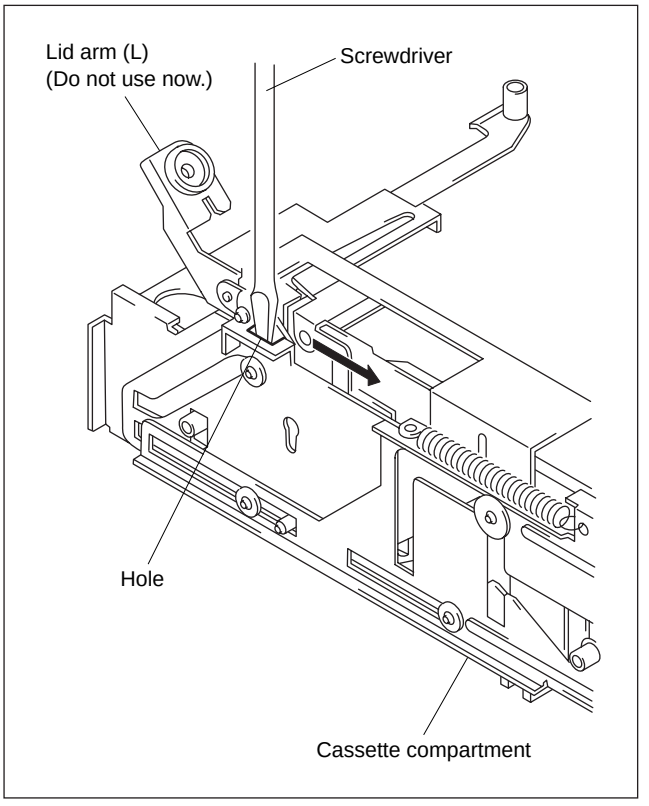
1. Remove the outside panel. (Refer to Section 1-6.)
2. Put the cassette compartment into the up position as the cassette lid of the cassette tape opened.
   (As for the moving up the cassette compartment, refer to Section 1-8.)
3. Being careful not to damage the tape, eject the cassette tape.

1-12. Inserting the Cassette Tape With Outside Panel Removed

1. Put the cassette compartment into the up position. (Refer to Section 1-8.)
2. Insert the cassette tape into the cassette compartment.
3. Insert a screwdriver blade into the hole of the cassette compartment, and then slide it in the direction of the arrow until it locks to put the cassette compartment into the down position.

Note

To avoid deformation of the lid arm (L), never press the lid arm (L) to put the cassette compartment into the down position.
If the lid arm (L) is deformed, the front lid will not be locked when installing the outside panel.



1-13. Cleaning When the Heads are Clogged

If the video heads are clogged, firstly clean them with a cleaning tape as following “Cleaning by a Cleaning Tape”. If it does not help, see Section “6. Cleaning” and clean them with a cleaning cloth.

Cleaning by a Cleaning Tape

Tool

• Cleaning Tape BCT-D12CL

Note

Be sure to use the cleaning tape BCT-D12CL.
The use of other cleaning tape may cause unusual wearing or damage of the video heads.

1. Insert the cleaning tape BCT-D12CL into the unit.
2. Press the PLAY button to start the head cleaning.
3. After the five seconds, press the EJECT button to eject the cleaning tape.

   Note

   To avoid damage to the video heads, be sure to take the cleaning tape out after cleaning.
4. Check to see that the head clog is clear.

1-14. Fixtures and Adjustment Equipment

As for the required fixtures and adjustment equipment for the maintenance of this unit, refer to Section “1-1. Fixtures and Adjustment Equipment” in the Maintenance Manual Part 2 Vol.1.

1-15. Battery for Memory Backup

CAUTION

When replacing the battery, ensure that the battery is installed with “+” and “−” poles connected to the correct terminals.
An improper connection may cause an explosion or leakage of fluid.

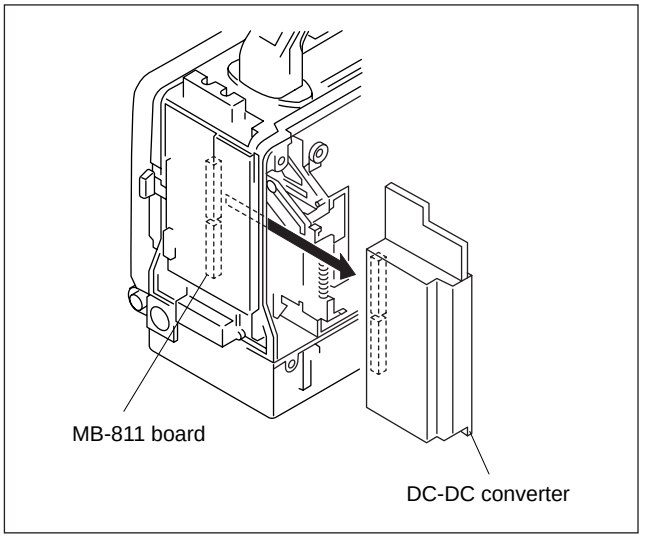
The unit is equipped with a battery (BT801) for the memory backup on the TC-101 board. When replacing, be sure to use the specified part.

Ref. No. : BT801 (B-2/TC-101 board)
Description : CR-2450 (lithium-ion battery)
Part No. : 1-528-229-11
Recommended Replacement Period : Every five years

The memory IC stores the data such as date and time.
If the backup battery is dead or replaced, these data are all cleared.
See Section “4-10. VTR Menu Display in the Display Panel” in the Operation Manual to reset the data.

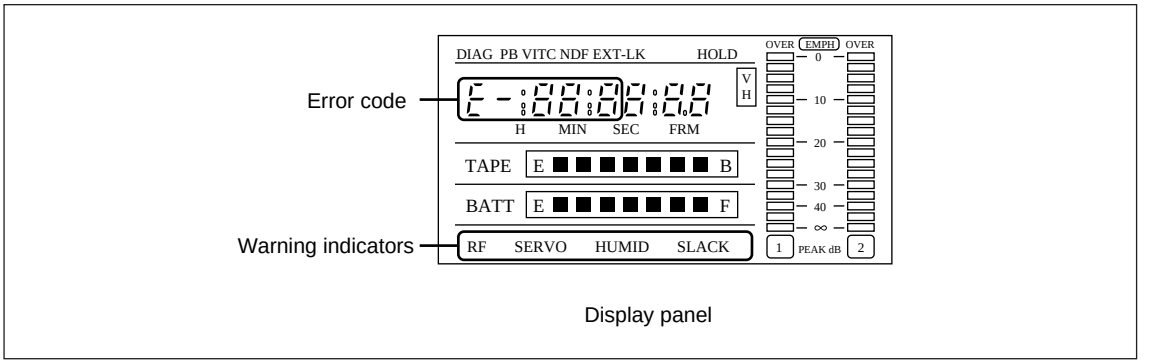
1-16. Replacing the DC-DC Converter

1. Remove the outside panel. (Refer to Section 1-6.)
2. Disconnect the DC-DC converter from the connector of the MB-811 board to remove it.



Section 2
Diagnostics

2-1. Error Code



Display panel

2-1-1. Warning Indicators

The warning indicator on the display panel lights if any fault occurs during the power-on sequence or normal operation. And the tally indicator on the viewfinder, back tally and warning indicators blink at the same time.

RF : Lights if video heads are clogged
SERVO : Lights if the servo fails
Lights if the communication error is occurred between system control IC (DVP-13 board) and servo IC (SV-210 board)
HUMID : Lights if there is condensation in the unit
SLACK : Lights if the tape is not winding properly or the following troubles (shown in “Section 2-1-2”) are occurred

2-1-2. Error Codes

When “SLACK” of the warning indicator lights, error causes and its operating status are displayed on the display panel.

E-xxx

MODE

0: POWER ON
1: REC
2: REC PAUSE
3: THREAD
4: UNTHREAD
5: STOP
8: PLAY
9: FF
A: REW
b: REC REVIEW
C: CUE UP
E: FF SEARCH
F: REW SEARCH

ERROR CAUSE

10: Drum drive voltage abnormality
11: Detects no drum FG
12: Detects no drum PG
20: Capstan drive voltage abnormality
21: Detects no capstan FG-A
22: Detects no capstan FG-B
23: Capstan rotation abnormality in forward and reverse directions
24: Capstan speed abnormality (high speed)
32: Detects no S reel FG
42: Detects no T reel FG
61: Fuction cam rotation overtime in the forward direction
62: Fuction cam rotation overtime in the reverse direction
63: Tape top sensor overtime
64: Full top sensor overtime
65: End sensor overtime
70: Servo NVRAM checksum error
71: Communication error between servo CPUs

2-2. Error Messages

The error message is superimposed on the viewfinder screen if any fault occurs during the power-on sequence or normal operation.

Error message	Operation	Remedy
STORED DATA:NG	Blinks on the viewfinder screen during the power-on sequence	The white and/or black balance memory data have been lost. Adjust the white and black balance again
CAM?	Displayed during the power-on sequence or normal operation	A fault has been detected in the camera Contact your local Sony Sales Office/ Service Center
VTR?	Displayed during the power-on sequence or normal operation	A fault (HUMID or SLACK) has been detected in the VTR Check the warning indicators on the display panel

2-3. Display Panel and Lamp Operation Check

The display panel and all lamps can be checked for all on and all off using the VTR (DIAG) menu of the unit.
Refer to Section “3-2. VTR (DIAG) menu” for details of the VTR (DIAG) menu. Perform the check as follows.

1 Select the page DIAG-8 of the DIAG menu (VF screen : VTR MENU-12 page).
2 Check all on and all off of the display panel and the following lamps.
Every pressing of the SHIFT button toggles between all on and all off. It also toggles between the messages “ALL OFF” and “ALL ON” on the VF screen.

- REW button
- F. FWD button
- PLAY button
- WARNING lamp (on side of display panel)
- Tally lamp (VF)
- Camera-man tally lamp (VF)
- Back tally lamp (VF)
- Rear tally lamp (rear panel)
- Green tally lamp (in VF)
- TALLY/REC lamp (in VF)
- BATT lamp (in VF)
- “!” (error status warning) lamp (in VF)
- Spare lamp (in VF)
- VTR SAVE lamp (in VF)

2-4. Displaying the Servo Adjustment Data

The servo adjustment data can be displayed, using the VTR menu of the unit. (It can not be displayed on the DIAG menu.)
Refer to Section “3-2. VTR (DIAG) menu” for details of the VTR menu. Display the servo adjustment data as follows.

1. Select the page VTR MENU-13 of the VTR menu.

VF screen

```
VTR MENU-13

SERVO MEMORY
1. CAP FREE SP          XX
2. PG PHASE-1           XX
3. PG PHASE-2           XX
4. CFGA DUTY            XX
5. CFGB DUTY            XX
6. EDIT DELAY           XX
7. SLACK
   XXXX XXXX XXXX XXXX
```

1. Displays the capstan free speed adjustment data
2. Displays the low-order bit of drum PG phase adjustment data
3. Displays the high-order bit of drum PG phase adjustment data

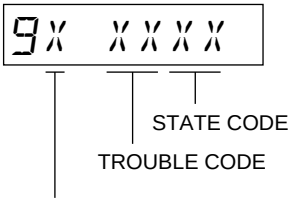
   If the most significant bit is “0” in binary, the PG phase adjustment data including high and low-order bits ranges from 0 to 255. if it is “1”, the PG phase adjustment data range from 256 to 511
4. Displays the capstan FGA offset adjustment data
5. Displays the capstan FGB offset adjustment data
6. Displays the delay adjustment data during back-space editing
7. Slack information (Refer to Section 2-5.)

2-5. Displaying the Slack Information in the Past

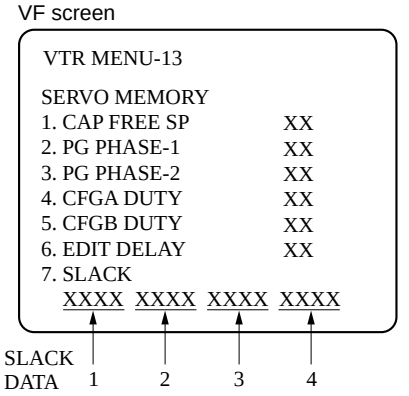
The slack information indicating a maximum of four slacks that have occurred in the past, can be displayed, using the VTR (DIAG) menu of the unit.
Refer to Section “3-2. VTR (DIAG) menu” for details of the VTR (DIAG) menu. Display the slack information as follows.

1 Select the page DIAG-9 of the DIAG menu (VF screen : VTR MENU-13 page, 7. SLACK).
2 Select the SLACK DATA 1 to SLACK DATA 4. (The SLACK DATA 1 is the newest information.)

Display panel



VF screen



Contents of slack trouble code

10 : Abnormal drum drive voltage
11 : No drum FG output
12 : No drum PG output
20 : Abnormal capstan drive voltage
21 : No capstan FG-A output
22 : No capstan FG-B output
23 : Abnormal forward/reverse rotation of capstan
24 : Abnormal capstan speed (high-speed)
32 : No S reel FG output
42 : No T reel FG output
61 : Time over the forward rotation time of function cam
62 : Time over the reverse rotation time of function cam
63 : Time over the tape top sensor
64 : Time over the full top sensor
65 : Time over the end sensor time
70 : Servo NVRAM checksum error
71 : Communication error between servo CPUs

Contents of slack state code

00 : Power-on initialization
1x : No cassette and standby state
2x : Record
3x : Stop
4x : FF/REW
5x : Playback
6x : REC PAUSE
7x : REC REVIEW
8x : Threading/unthreading

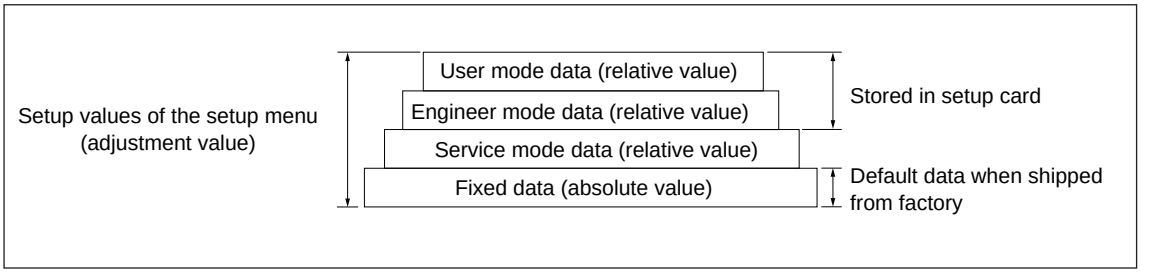
Section 3
Setup Menu

This section describes details of the engineer mode of the setup menu that is displayed on the viewfinder. It also describes the VTR (DIAG) menu that is displayed inside the display panel.

3-1. Engineer Mode (Setup Menu)

When you enter the engineer mode of the setup menu, the engineer-oriented menu appears. Using the engineer-oriented menu, selection of user mode, various setting up and camera system adjustment can be executed.

Data structure of the setup menu is described as shown below.
Setup values of the setup menu = Fixed data (absolute value) + Service mode setup value (relative value) + Engineer mode setup value (relative value) + User mode setup value (relative value)



- When the MENU/ON/OFF switch is set to ON after turning on the main power, the camcorder enters the user mode. When you enter the user mode, the page that is selected by the MENU SELECT page of the engineer mode, and the items that are registered in the camera-man menu registration mode are displayed in a maximum of five pages. (Refer to the operation manual for details of the user mode and of the camera-man menu registration mode.)
- When an item is adjusted in the engineer mode, value of this item in the user mode is reset to 0.
- When a setup data is written in a setup card, the setup value in the user mode and the setup value is the engineer mode are stored separately.
- Refer to the Maintenance Manual, Part 2, Volume 1, Section 2 for details of the service mode.
- When a remote control RM-B150/P9 is selected and the camcorder is operated externally from the remote control, there are some items that cannot be changed of their setup or some items to which setup data is not reflected correctly. Refer to Section “3-1-2 Setup Menu List” for more details.

How to Enter the Engineer Mode

1. Turn off the main power.
2. While pressing the rotary encoder, turn ON the POWER switch.

   Note

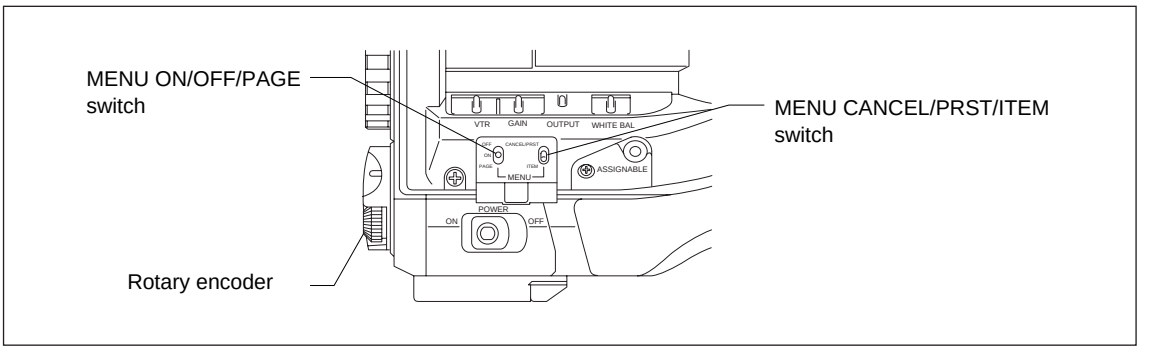
   If you cannot enter the engineer mode, check the switch setting of the DCP-17 board for the following.

   S4-1 → OFF

   S1 → OFF

3-1-1. Fundamental Operation of the Setup Menu

Switch description



1. MENU ON/OFF/PAGE switch

The MENU ON/OFF/PAGE switch is used to display the setup menu or to switch the display items in units of page. When lid is closed, the MENU ON/OFF/PAGE switch is automatically set to the OFF position.

ON : Displays the setup menu.
OFF : Exits from the setup menu.
PAGE : Selects another page of the setup menu

2. MENU CANCEL/PRST/ITEM switch

The MENU CANCEL/PRST/ITEM switch is used to select the desired item or to cancel setting or to recover the default setting when the MENU ON/OFF/PAGE switch is ON.

CANCEL/PRST : Cancels the already executed setting, or returns to the default setting.
ITEM : Selects the desired item.

3. Rotary encoder

Rotate: Moves to another page or to another item, or to change the setup value.
Press: Sets the page, or enters the setup value modification mode.

Operation (Using the MENU switch)

1. Set the MENU ON/OFF/PAGE switch to ON position.
2. To move to another page, set the MENU ON/OFF/PAGE switch to PAGE. (Moves to the next page every time when this switch is set.)
3. To move to another item, set the MENU CANCEL/PRST/ITEM switch to ITEM. (The cursor moves to the next item every time when this switch is set.)
   Press the rotary encoder to enter the setup value modification mode.
4. Rotate the rotary encoder to modify the setup value.
5. To exit from the setup menu, turn OFF the MENU ON/OFF/PAGE switch.

Operation (Using the rotary encoder)

1. Set the MENU ON/OFF/PAGE switch to ON position.
2. To move to another page, rotate the rotary encoder. (A page is set by pressing the rotary encoder.)
3. To move to another item, rotate the rotary encoder. (An item is set by pressing the rotary encoder.)
   Press the rotary encoder to enter the setup value modification mode.
4. To modify the setup value, rotate the rotary encoder .
5. To exit from the setup menu, turn OFF the MENU ON/OFF/PAGE switch.

3-1-2. Contents of Setup Menu

This section describes details of the menu (including the engineer-oriented menu) that appears when the engineer mode is selected.

(Values in square [ ] of the Setup column indicate the default value when shipped from factory.)

No.	Page	Item	Setup	Description
1	MARKER 1/3	SAFETY ZONE	[ON]/OFF	Sets the safety zone marker display to ON or OFF.
		SAFETY AREA	80%/[90%]/100%	Sets the safety zone area to 80 %, 90 % or 100 %.
		CENTER	ON/[OFF]	Sets the center marker display to ON to OFF.
		CENTER H	X ([0])	Moves the center marker horizontally.
		CENTER V	X ([0])	Moves the center marker vertically.
2	MARKER 2/3	BOX CURSOR	ON/[OFF]	Sets the box cursor display to ON or OFF. Note : The box cursor does not appear in the following cases. The WIDE SCREEN page BOX/4:3/14:9 LIMIT is set to any other item than BOX. The WIDE SCREEN page BOX/4:3/14:9 MODE is set to 4:3, while the VF ASPECT is set to 16:9A or 16:9B.
		BOX WIDTH	X ([0])	Changes the width of the box cursor.
		BOX HEIGHT	X ([0])	Changes the height of the box cursor.
		BOX H	X ([0])	Moves the box cursor horizontally.
		BOX V	X ([0])	Moves the box cursor vertically.
3	MARKER 3/3	TEST OUT MIX	ON/[OFF]	Turns ON/OFF the function of outputting the VF marker to TEST OUT.
		RET MIX	ON/[OFF]	Turns ON/OFF the function of mixing the VF marker with return video.
		TEST OUT VF DISP	ON/[OFF]	Turns ON/OFF the function of outputting the character to TEST OUT where the character is displayed on VF when the VF DISPLAY switch is set to ON.
		TEST OUT MENU	ON/[OFF]	Turns ON/OFF the function of outputting the menu to TEST OUT where the menu is displayed on VF when the MENU ON/OFF/PAGE switch is set to ON. Note : When an RM is connected, the menu is forced to be outputted regardless of this menu setting.
		RM VF MENU INH.	[ON]/OFF	ON : The menu is not displayed even through the MENU switch is set to ON when an RM is connected. OFF : The menu is displayed when the MENU switch is set to ON even though an RM is connected.
4	VF DISP 1/2	DISP MODE	1/2/[3]	Set the display mode. (For details, refer to the Operation Manual.)
		EXTENDER	[ON]/OFF	Sets the extender display to ON or OFF.
		ZOOM	[ON]/OFF	Sets the zoom position display to ON or OFF.
5	VF DISP 2/2	FILTER	[ON]/OFF	Sets the filter display to ON or OFF.
		WHITE	[ON]/OFF	Sets the white balance display to ON or OFF.
		GAIN	[ON]/OFF	Sets the gain selection value display to ON or OFF.
		SHUTTER	[ON]/OFF	Sets the shutter speed/mode display to ON or OFF.
		TAPE	[ON]/OFF	Sets the tape remaining display to ON or OFF.
		AUDIO	[ON]/OFF	Sets the CH-1 audio level display to ON or OFF.
		IRIS	[ON]/OFF	Sets the iris value display to ON or OFF.

No.	Page	Item	Setup	Description
6	MASTER GAIN	LOW	–3/[0]/3/6/9/12/18/24/30/36/42/48 dB	Sets the gain corresponding to the LOW, MIDDLE, HIGH and TURBO positions of the GAIN selector switch.
		MID	–3/0/3/6/[9]/12/18/24/30/36/42/48 dB	Note : When the gain selection value is changed, the BLACK SET adjustment is required.
		HIGH	–3/0/3/6/9/12/[18]/24/30/36/42/48 dB	
		TURBO	–3/0/3/6/9/12/18/24/30/36/[42]/48 dB	
7	SHOT ID	ID-1		Shot ID setting (ID1 to ID4)
		ID-2		Sets the shot ID of a maximum of twelve characters using alphanumeric character, symbol, and space.
		ID-3		
		ID-4		
8	SHOT DISP			Selects the shot data to be super-imposed on color-bar signal.
		DATE	ON/[OFF]	Date
		TIME	ON/[OFF]	Time
		MODEL NAME	ON/[OFF]	Model name
		SERIAL NO.	ON/[OFF]	Serial No.
		CASSTTE NO.	ON/[OFF]	Cassette No.
		SHOT NO.	ON/[OFF]	Shot No.
		ID SELECT	[OFF]/ID1/ID2/ID3/ID4	The shot ID number that is selected by the SHOT ID page.
9	SHUTTER			The shutter mode/speed setting that can be selected by the SHUTTER switch, etc.
		EVS	[ON]/OFF	Turns ON/OFF the EVS mode. (DVW-709WS/709WSP/707/707P) Turns ON/OFF the super EVS (Enhanced vertical definition) mode. (DVW-790WS/790WSP)
		CLS	[ON]/OFF	Turns ON/OFF the CLS (clear scan) mode. (DVW-709WS/709WSP/707/707P) Turns ON/OFF the ECS (extended clear scan) mode. (DVW-790WS/790WSP)
		1/100 (NTSC) 1/60 (PAL)	[ON]/OFF	Shutter speed 1/100 (for NTSC) or 1/60 (for PAL) second in the standard mode
		1/125	[ON]/OFF	Shutter speed 1/125 second in the standard mode
		1/250	[ON]/OFF	Shutter speed 1/250 second in the standard mode
		1/500	[ON]/OFF	Shutter speed 1/500 second in the standard mode
		1/1000	[ON]/OFF	Shutter speed 1/1000 second in the standard mode
		1/2000	[ON]/OFF	Shutter speed 1/2000 second in the standard mode
10	!' LED			OFF : The "!" lamp of VF does not turn on. ON : The "!" lamp of VF turns on when the following conditions are satisfied.
		MASTER GAIN	[ON]/OFF	The GAIN value is set to any value other than 0 dB.
		SHUTTER ON	[ON]/OFF	The SHUTTER switch is set to ON.
		WHITE PRESET	ON/[OFF]	The WHITE BAL switch is set to PRST.
		ATW RUN	ON/[OFF]	The ATW (automatic tracing white balance) is operating.
		EXTENDER ON	[ON]/OFF	Lens extender is being used.
		FILTER 2,3,4	ON/[OFF]	Filter is set to any position other than 1.
		FILTER A,C,D	ON/[OFF]	Filter is set to any position other than B. (DVW-790WS/790WSP/709WS/709WSP only)
		A.IRIS OVERRIDE	ON/[OFF]	Reference value of the automatic iris control is et to any value other than the standard value.

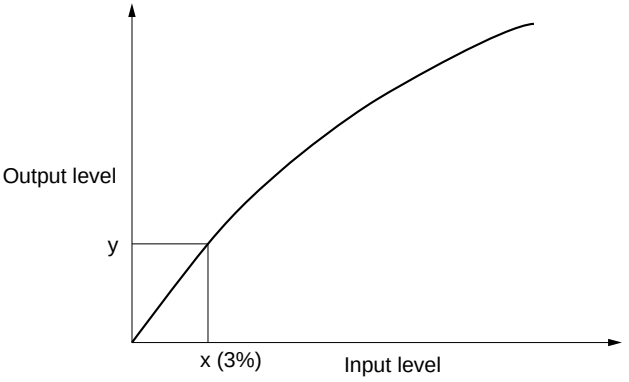
No.	Page	Item	Setup	Description
11	SETUP CARD	READ (→CAM)	To be executed by pressing the rotary encoder.	Reads data from the setup card.
		WRITE (→CARD)	To be executed by pressing the rotary encoder.	Writes data to the setup card
		ID EDIT		The card ID can be set within ten characters using alphanumeric characters and symbols.
		WRITE PROTECT	ON/[OFF]	Turns ON/OFF the write-inhibit function into the setup card.
		WHITE DATA	ON/[OFF]	Turns ON/OFF the function of reading white balance correction value from the setup card.
12	FUNCTION 1/2	TEST OUT	[ENC]/R/G/B	Selection of video signal to be output froth TEST OUT connector. Note : R-G or B-G can be selected when R-G/B-G SEL on the first page of OPERATION is set to ON.
		DETAIL	[ON]/OFF	Turns ON/OFF the function of adding detail signal to video for improving resolution power.
		APERTURE	[ON]/OFF	Sets the aperture correction to ON or OFF.
		SKIN TONE DTL	ON/[OFF]	Turns ON/OFF the skin tone detail function.
		MATRIX	ON/OFF ✻Default value OFF (J) ON (Except J)	Turns ON/OFF the linear matrix correction function. The highly color saturation can be obtained when this item is set to ON.
		GAMMA	[ON]/OFF	Turns ON/OFF the gamma correction function.
		BLACK GAMMA	ON/[OFF]	Turns ON/OFF the black gamma correction function.
		CHROMA	[ON]/OFF	Turns ON/OFF the function to add chroma signal.
		TEST SAW	ON/[OFF]	Turns ON/OFF the function to add the TEST signal to the video signal system forcibly. (Used during the video signal adjustment.)
		CROSS COLOR FLT	ON/[OFF]	Turns ON/OFF the function to reduce the cross-color of video signal. (NTSC only)
13	FUNCTION 2/2	GENLOCK	[ON]/OFF	Turns ON/OFF the function of synchronizing the internal reference signal with the video signal that is input to GENLOCK IN connector.
		CAM RET.	ON/[OFF]	Turns ON/OFF the function of displaying the return video signal that is input to the GENLOCK IN connector, when the RET button on the lens is set to ON.
		FILTER INH.	ON/[OFF]	Turns ON/OFF the function of interlocking the filter with the white balance correction value. ON : The white balance correction value does not interlock with the color temperature conversion filter, but is memorized in the memory A and memory B respectively. OFF : The white balance correction value is memorized in the respective memories of memory A (4 memories) and memory B (4 memories) totaling 8 memories respectively.
		FIELD/FRAME	[FIELD]/FRAME	Sets the CCD read-out method. FIELD : Reading out in units of field. (Normal setting) FRAME : Reading out in units of frame. (Used when the higher vertical resolution is desired) Note : The FRAME reading has a more residual image than the FIELD reading.
		A.IRIS OVERRIDE	ON/[OFF]	Turns ON/OFF the iris override function. When the iris override function is set to ON, reference value of the AUTO iris adjustment can be modified by the rotary encoder when the MENU ON/OFF/PAGE switch is set to OFF. (5 steps: −1/2, −1/4, 0, +1/4, +1/2 steps of iris stop)

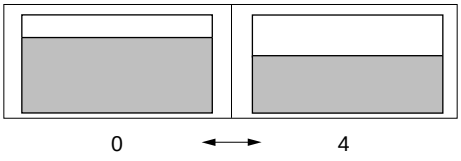
(continued)

No.	Page	Item	Setup	Description
13	FUNCTION 2/2	DCC FUNCTION SEL	FIX/[DCC]	Selects the DCC function modes when the DCC switch is set to ON. DCC : Normal mode (Dynamic range is set by the DCC ADJUSTMENT page.) FIX : Knee is corrected by the fixed dynamic range of 600%.
		REAR BNC OUT	[VBS]/SDI/OFF	Selects the signal to be output from the rear panel VIDEO OUT connector when the SDI output board BKDW-702 is installed. VBS : Outputs the composite video signal. SDI : Outputs the SDI signal. OFF : Set to OFF when power saving is desired.
		VTR MODE	ON/[OFF]	Set to ON when an external VTR is controlled by the VTR START button as it is interlocked with the DVW, when an external VTR is connected via the CA-702.
		REC INHIBIT (CCU)	[ON]/OFF	Set to OFF when the REC control is executed by the VTR START button even though CCU is connected via CA-705/755. Note : When this setup is set to OFF, a viewfinder can not be powered on.
		ASSIGNABLE SW	[OFF]/RET/REC/ TURBO/ AUDIO/ATW/ LOOPR/F.SHT	Selects function of the ASSINABLE button. OFF : During normal use RET : RET button REC : VTR START button TURBO : TURBO GAIN button AUDIO : The ON/OFF switch of the function to display the AUDIO source on VF for each channel. ATW : The ON/OFF switch of the ATW function LOOPR : The ON/OFF switch of the loop recording function. (This item is displayed only when the picture cache board BKDW-703 is installed.) F. SHT : The ON/OFF switch of the frame shutter function. (This item is displayed only when the frame shutter unit BKDW-705 is installed.)
14	WIDE SCREEN			Note : This page is displayed only in DVW-790WS/790WSP/ 709WS/709WSP only
		16:9/4:3 MODE	[16:9]/4:3	Sets the aspect ratio of the video signal output from the VIDEO OUT and TEST OUT connectors.
		VF ASPECT	[AUTO]/4:3/ 16:9A/16:9B	Sets the aspect ratio on the viewfinder. AUTO : Sets the aspect ratio set by 16:9/4:3 MODE setting. 4:3 : Sets the aspect ratio to 4:3 regardless of 16:9/4:3 MODE setting. 16:9A : Sets the aspect ratio to 16:9 regardless of 16:9/4:3 MODE setting (displays the area of 4:3 mode with the marker). 16:9B : Sets the aspect ratio to 16:9 regardless of 16:9/4:3 MODE setting (video level is cut in half out of the safety zone area on the VF screen).
		BOX/4:3/14:9 LIMITS	[BOX]/4:3/14:9	Sets the function of the box cursor. BOX : Operates as the normal cursor function. 4:3 : Displays the 4:3 area when the 16:9/4:3 MODE set to 16:9. 14:9 : Displays the 14:9 area when 16:9 is selected by the above described 16:9/4:3 MODE.
		16:9 BARS ID	ON/[OFF]	Turns ON/OFF the function of adding the 16:9 display to the built-in color bar when 16:9 is selected by the above described 16:9/4:3 MODE.
		16:9 VF ID	ON/[OFF]	Turns ON/OFF the function of adding the 16:9 display to the VF screen when 16:9 is selected by the above described 16:9/4:3 MODE.

No.	Page	Item	Setup	Description
15	VF SETTING	ZEBRA 1 DETECT	20 to 107 % ([70])	Sets the center level of the zebra 1 pattern.
		ZEBRA 1 APERTURE	1 to 20 % ([10])	Sets the width of the zebra 1 pattern.
		ZEBRA 2 DETECT	52 to 109 % ([100])	Sets the ZEBRA2 display level.
		ZEBRA SELECT	[1]/2/BOTH	Selects the zebra patterns.
		TEST OUT ZEBRA	ON/[OFF]	Turns ON/OFF the function of outputting the zebra pattern to TEST OUT.
		VF DTL LEVEL	X ([0])	Sets the VF detail amount.
16	LEVEL 1	DETAIL LVL	X ([0])	Sets the total level of the detail signal.
		H/V RATIO	X ([0])	Sets balance between the H detail signal and the V detail signal.
		DTL FREQ	X ([0])	Sets frequency (thickness) of the H detail signal.
		CRISPENING	X ([0])	Sets the crispening level of the detail signal.
		APT. LEVEL	X ([0])	Sets the high-frequency correction level.
		DTL W.CLP	X ([0])	Sets the white clip level of the V detail signal.
		DTL V B.CLP	X ([0])	Sets the level that clips the excessive level in the negative (–) direction of the V detail signal.
		DTL H B.CLP	X ([0])	Sets the level that clips the excessive level in the negative (–) direction of the H detail signal.
		LVL DEPEND	[ON]/OFF	Turns ON/OFF the level dependent function
		L.DEP.LVL	X ([0])	Sets the level that suppresses the detail signal at the low signal level.
17	LEVEL 2	KNEE APT	ON/[OFF]	Turns ON/OFF the knee aperture function.
		K.APT.LVL	X ([0])	Adjusts the detail signal amount that is added to the high light signal higher than the knee point.
		DTL COMB	X ([0])	Set the signal level at which the comb filter starts working.
		C.C.S.LVL	X ([0])	Sets the chroma suppression level. (NTSC only)
18	LEVEL 1#4:3			Note : This page is displayed only in DVW-790WS/790WSP/ 709WS/709WSP. The following settings are valid when the 16:9/4:3 MODE on the WIDE SCREEN is set to 4:3.
		DETAIL LVL	X ([0])	Sets the overall level of the detail signal.
		H/V RATIO	X ([0])	Sets balance between the H detail signal and the V detail signal.
		DTL FREQ	X ([0])	Sets frequency (thickness) of the H detail signal.
		CRISPENING	X ([0])	Sets the crispening level of the detail signal.
		APT. LEVEL	X ([0])	Sets the high frequency correction level.
		DTL W.CLP	X ([0])	Sets the white clip level of the V detail signal.
		DTL V B.CLP	X ([0])	Sets the level that clips the excessive level in the negative (–) direction of the V detail signal.
		DTL H B.CLP	X ([0])	Sets the level that clips the excessive level in the negative (–) direction of the H detail signal.
		LVL DEPEND	[ON]/OFF	Turns ON/OFF the level dependent function
		L.DEP.LVL	X ([0])	Sets the level that suppresses the detail signal at the low signal level.
19	LEVEL 2#4:3			Note : This page is displayed only in DVW-790WS/790WSP/ 709WS/709WSP. The following settings are valid when the 16:9/4:3 MODE on the WIDE SECREEN is set to 4:3.
		KNEE APT	ON/[OFF]	Turns ON/OFF the knee aperture function.
		K.APT.LVL	X ([0])	Adjusts the detail signal amount that is added to the high light signal higher than the knee point.
		DTL COMB	X ([0])	Set the signal level at which the comb filter starts working.
		C.C.S.LVL	X ([0])	Sets the chroma suppression level. (NTSC only)

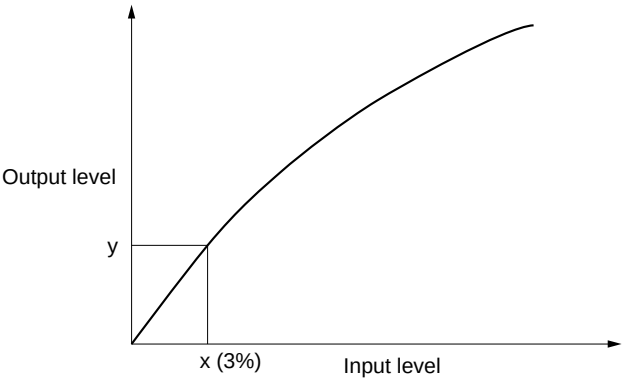
No.	Page	Item	Setup	Description
20	LEVEL 3	SKIN TONE DTL	ON/[OFF]	Turns ON/OFF the skin tone detail function. (Same as the TEST OUT on the 1/2 pages of FUNCTION.)
		SUPPRESS LEVEL	X([0])	Sets signal amount of the skin tone detail.
		SKIN TONE DET	[OFF]/EXEC	Sets to the EXEC position when the range in which skin tone detail function is automatically set. (Shoot a skin tone object that fills the entire gate marker on VF, and press the rotary encoder.)
		SATURATION	X([0])	Sets the range of color saturation in which the skin tone detail function works.
		HUE	X([0])	Sets the range of color hue in which the skin tone detail function works.
		WIDTH	X([0])	Sets the width of color hue in which the skin tone detail function works.
		SKIN AREA IND.	ON/[OFF]	Turns ON/OFF the function of displaying zebra pattern on VF indicating the range detecting the skin tone detail.
21	LEVEL 4	MASTER BLACK	X([0])	Adjusts the master black level.
		MASTER GAMMA	X([0])	Adjusts the master gamma correction curve.
		MASTER BLACK GAMMA	X([0])	Adjusts the master black gamma. It sets the rise-up of the gamma correction curve.
		KNEE POINT	X([0])	Adjusts the master knee point level during MANUAL knee adjustment.
		KNEE SLOPE	X([0])	Adjusts the master knee slope level during MANUAL knee adjustment.
		KNEE SATURATION	X([0])	Adjusts the knee saturation level.
		KNEE	[ON]/OFF	Turns ON/OFF the knee correction function. (The DCC switch setting is ignored.)
		WHITE CLIP	[ON]/OFF	Turns ON/OFF the white clip function. (Used during video signal adjustment.) Note : Video signal that exceeds the signal level of 109% or higher shall not be output even when this setting is set to OFF.
		WHITE CLIP LEVEL	X([0])	Sets the master white clip level.
22	LEVEL 5	BURST LEVEL	X([0])	Sets the burst level of encoder output.
		BURST PHASE	X([0])	Sets the burst phase of encoder output. (PAL only)
		R-Y	[ON]/OFF	Turns ON/OFF the function of outputting the R-Y signal to encoder output. (This function is set to ON automatically when CHROMA is set ON on 1/2 pages of FUNCTION.)
		B-Y	[ON]/OFF	Turns ON/OFF the function of outputting the B-Y signal to encoder output. (This function is set to ON automatically when CHROMA is set ON on 1/2 pages of FUNCTION.)
		R-Y LEVEL	X([0])	Sets the R-Y level of encoder output.
		B-Y LEVEL	X([0])	Sets the B-Y level of encoder output.
				Note : The following items are displayed in DVW-790WS/790WSP/709WS/709WSP only. The following items are valid when the 16:9/4:3 MODE on the WIDE SCREEN page is set to 4:3.
		R-Y LEVEL (4:3)	X([0])	Turns ON/OFF the function of outputting the R-Y signal to encoder output.
		B-Y LEVEL (4:3)	X([0])	Turns ON/OFF the function of outputting the B-Y signal to encoder output.
23	LEVEL 6	RGB LEVEL	X([0])	Sets the video signal level of the RGB output.
		RGB SYNC LVL.	X([0])	Sets the sync signal level of the RGB output.
		RGB SETUP LVL.	X([0])	Sets the setup level of the RGB output.
		ENC Y LEVEL	X([0])	Sets the Y signal level of the encoder output.
		ENC SYNC LVL.	X([0])	Sets the sync signal level of the encoder output.
		ENC SETUP LVL.	X([0])	Sets the setup level of the encoder output.
				Note : The following items are displayed in DVW-790WS/790WSP/709WS/709WSP only. The following items are valid when the 16:9/4:3 MODE on the WIDE SCREEN page is set to 4:3.
		RGB LEVEL (4:3)	X([0])	Sets the video signal level of the RGB output.
		ENC Y LEVEL (4:3)	X([0])	Sets the setup level of the RGB output.

No.	Page	Item	Setup	Description
24	LEVEL 7	R BLACK	X ([0])	Adjusts the black level of the R signal.
		G BLACK	X ([0])	Adjusts the black level of the G signal.
		B BLACK	X ([0])	Adjusts the black level of the B signal.
		R FLARE	X ([0])	Adjusts the flare correction of the R channel.
		G FLARE	X ([0])	Adjusts the flare correction of the G channel.
		B FLARE	X ([0])	Adjusts the flare correction of the B channel.
		FLARE	[ON]/OFF	Turns ON/OFF the flare correction circuit.
		TEST OUT	[ENC]/R/G/B	Sets the type of the video signal output from the TEST OUT connector. (Same as TEST OUT item of the “FUNCTION 1/2” page.)
25	LEVEL 8	GAMMA TABLE	[A]/B/C/D/F	Selects the gamma table.  A : Gamma of x:y = 1:4 B : Gamma of x:y = 1:5 C : Gamma of x:y = 1:4.5 D : Gamma of x:y = 1:0.7 F : Gamma kine film
		MASTER GAMMA	X ([0])	Adjusts the master gamma correction curve.
		R GAMMA	X ([0])	Adjusts the gamma correction curve of the R channel.
		G GAMMA	X ([0])	Adjusts the gamma correction curve of the G channel.
		B GAMMA	X ([0])	Adjusts the gamma correction curve of the B channel.
		BLACK GAMMA RANGE	LOW/MID/[HI]	Sets the range in which black gamma works LOW : 0 to 7.2 % MID : 0 to 14.4 % HI : 0 to 28.8 %
		MASTER BLACK GAMMA	X ([0])	Adjusts the master black gamma correction.
		R BLACK GAMMA	X ([0])	Adjusts the black gamma correction of the R channel.
		G BLACK GAMMA	X ([0])	Adjusts the black gamma correction of the G channel.
		B BLACK GAMMA	X ([0])	Adjusts the black gamma correction of the B channel.

No.	Page	Item	Setup	Description
26	LEVEL 9	MATRIX	ON/[OFF]	Turns ON/OFF the matrix correction function.
		MATRIX TABLE	[A]/B	Selects the matrix table. (Two status of A and B can be saved.) (Same as the MATRIX TABLE on page 10 of LEVEL.)
		DETECT COLOR	[OFF]/EXEC	Sets this item to the EXEC position to detect color of multi matrix. (Align the VF gate marker to any of the color area that is divided into 16 divisions in the direction of hue, and press the rotary encoder.)
		AXIS NUMBER	[B]/B+/MG–/MG/ MG+/R/R+/YL–/ YL/YL+/G–/G/G+/ CY/CY+/B–	Select the desired hue to be corrected.
		SATURATION	X ([0])	Set the range in which multi matrix correction works.
		HUE	X ([0])	Set the hue in which multi matrix correction works.
		MATRIX AREA IND.	ON/[OFF]	Turns ON/OFF the function of indicating zebra pattern on the VF screen indicating the multi matrix correction detect area.
		MATRIX (MULTI)	[ON]/OFF	Selects wheather the matrix correction values set on this page are valid or not.
27	LEVEL 10	MATRIX	ON/[OFF]	Turns ON/OFF the linear matrix correction function. (Same as MATRIX on the FUNCTION 1/2 pages.)
		MATRIX TABLE	[A]/B	Selects the matrix table. (Two status of A and B can be saved.)
		R-G	X ([0])	Sets the matrix coefficient.
		R-B	X ([0])	
		G-R	X ([0])	
		G-B	X ([0])	
		B-R	X ([0])	
		B-G	X ([0])	
		MATRIX (MASTER)	[ON]/OFF	Selects wheather the matrix coefficient set on this page is valid or not.
28	LEVEL 11	H PHASE	X ([0])	Adjust the camera H phase during external sync lock mode.
		SC PHASE	X ([0])	Adjust the camera subcarrier phase during external sync lock mode.
		SC 0/180 SEL.	0/180 ([0])	Inverts the SC phase of the camera in the external genlock mode.
		SC-H	X ([0])	Set the SC-H phase.
29	LEVEL 12	IRIS SET	X ([0])	Sets the auto iris reference level.
		IRIS MODE	X ([0])	Sets sensitivity of AUTO iris. + (PEAK) ↔ – (AVERAGE)
		IRIS WEIGHT	[0]/1/2/3/4	Sets the valid range of the auto iris.  Note : The area shown by oblique lines are weighted during AUTO iris mode.
		IRIS SPEED	0/1/[2]/3/4/5	Set the response speed of AUTO iris in the range of 0 (fast) ↔ 5 (slow).
		CLIP HIGH LIGHT	ON/[OFF]	Limits the auto iris detection to 100% for the subject of high brightness (video level: 100% or more)

No.	Page	Item	Setup	Description
30	W-SHADING G			Used for the G channel white shading adjustment.
		H SAW	X ([0])	Adjusts amount of the H. SAW correction.
		H PARA	X ([0])	Adjusts amount of the H. PARA correction.
		V SAW	X ([0])	Adjusts amount of the V. SAW correction.
		V PARA	X ([0])	Adjusts amount of the V. PARA correction.
		H SAW (EXT)	X ([0])	Adjusts amount of the H. SAW correction when lens extender is in use.
		H PARA (EXT)	X ([0])	Adjusts amount of the H. PARA correction when lens extender is in use.
		V SAW (EXT)	X ([0])	Adjusts amount of the V. SAW correction when lens extender is in use.
		V PARA (EXT)	X ([0])	Adjusts amount of the V. PARA correction when lens extender is in use.
		SHAD COMP.	[ON]/OFF	Turns ON/OFF the G channel white shading correction function.
		TEST OUT	[ENC]/R/G/B	Sets the type of the video signal output from the TEST OUT connector. (Same as TEST OUT item of the “FUNCTION 1/2” page.)
31	W-SHADING R			Used for the R channel white shading adjustment.
		H SAW	X ([0])	Adjusts amount of the H. SAW correction.
		H PARA	X ([0])	Adjusts amount of the H. PARA correction.
		V SAW	X ([0])	Adjusts amount of the V. SAW correction.
		V PARA	X ([0])	Adjusts amount of the V. PARA correction.
		H SAW (EXT)	X ([0])	Adjusts amount of the H. SAW correction when lens extender is in use.
		H PARA (EXT)	X ([0])	Adjusts amount of the H. PARA correction when lens extender is in use.
		V SAW (EXT)	X ([0])	Adjusts amount of the V. SAW correction when lens extender is in use.
		V PARA (EXT)	X ([0])	Adjusts amount of the V. PARA correction when lens extender is in use.
		SHAD COMP.	[ON]/OFF	Turns ON/OFF the R channel white shading correction function.
		TEST OUT	[ENC]/R/G/B	Sets the type of the video signal output from the TEST OUT connector. (Same as TEST OUT item of the “FUNCTION 1/2” page.)
32	W-SHADING B			Used for the B channel white shading adjustment.
		H SAW	X ([0])	Adjusts amount of the H. SAW correction.
		H PARA	X ([0])	Adjusts amount of the H. PARA correction.
		V SAW	X ([0])	Adjusts amount of the V. SAW correction.
		V PARA	X ([0])	Adjusts amount of the V. PARA correction.
		H SAW(EXT)	X ([0])	Adjusts amount of the H. SAW correction when lens extender is in use.
		H PARA(EXT)	X ([0])	Adjusts amount of the H. PARA correction when lens extender is in use.
		V SAW(EXT)	X ([0])	Adjusts amount of the V. SAW correction when lens extender is in use.
		V PARA(EXT)	X ([0])	Adjusts amount of the V. PARA correction when lens extender is in use.
		SHAD COMP.	[ON]/OFF	Turns ON/OFF the B channel white shading correction function.
		TEST OUT	[ENC]/R/G/B	Sets the type of the video signal output from the TEST OUT connector. (Same as TEST OUT item of the “FUNCTION 1/2” page.)
33	DCC ADJUSTMENT	D RANGE	300/350/400/450/ 500/550/[600]	Sets the dynamic range when the DCC switch is set to ON.
		POINT	X ([0])	Setting the lowest knee point when the DCC switch is set to ON.
		GAIN	X ([0])	Setting the knee point when the DCC switch is set to ON.

No.	Page	Item	Setup	Description
34	OFFSET WHT			This page is used to add offset to the AUTO white balance value at all times. Data can be stored in the memory A-CH and the memory B-CH independently. (Refer to the Operation Manual for more details.)
		OFFSET WHITE<A>	ON/[OFF]	Turns ON/OFF the offset white balance function (A-CH) Note : The following settings are not reflected unless the white balance automatic adjustment is performed.
		WARM-COOL<A>	X ([3200])k	Sets the offset value. (A-CH)
		FINE<A>	X ([0])	This item can be used for fine-adjustment of the above described WARM-COOL adjustment. (A-CH)
		OFFSET WHITE<B>	ON/[OFF]	Turns ON/OFF the offset white balance function (B-CH) Note : The following settings are not reflected unless the white balance automatic adjustment is performed.
		WARM-COOL<B>	X ([3200])k	Sets the offset value. (B-CH)
		FINE <B>	X ([0])	This item can be used for fine-adjustment of the above described WARM-COOL adjustment. (B-CH)
35	PRESET WHT			Use this page to set the color temperature by MANUAL adjustment when WHITE preset is selected. (Refer to the Operation Manual for more details.)
		COLOR TEMP.<P>	X ([3200])k	Use this item to obtain the color temperature that is very close to the target color temperature. (The values shown on display are guide line.) Note : The R. GAIN and B. GAIN values also change accordingly.
		FINE<P>	X ([0])	Use this item for fine adjustment of color temperature when the desired color temperature cannot be obtained by the above described COLOR TEMP.
		R GAIN<P>	X ([0])	Use this item to obtain the desired color temperature during the WHITE preset mode, by changing R. GAIN.
		B GAIN<P>	X ([0])	Use this item to obtain the desired color temperature during the WHITE preset mode, by changing B. GAIN.

No.	Page	Item	Setup	Description
36	OPERATION 1	R-G/B-G SEL.	ON/[OFF]	Turns ON/OFF the function of adding the R-G and B-G signal to the video signal that is output from the TEST OUT connector.
		GAMMA TABLE	[A]/B/C/D/F	Selects the characteristics of the gamma correction.  A : Gamma of x:y = 1:4 B : Gamma of x:y = 1:5 C : Gamma of x:y = 1:4.5 D : Gamma of x:y = 1:0.7 F : Gamma kine film
		LOW LIGHT	ON/[OFF]	Turns ON/OFF the LOW LIGHT indication function of VF.
		LOW LIGHT LEVEL	X([0])	Sets the starting level of LOW LIGHT indication when the above described LOW LIGHT function is set to ON. Note : When menu is being displayed, “L” is indicated instead of “LOW LIGHT” indication. (example) LOW LIGHT LEVEL : L 0
		SELECT BARS	SMPTE/EBU/SNG ∗Default value SMPTE (NTSC) EBU (PAL)	Sets the type of built-in color bars signal SMPTE: SMPTE color bars EBU : EBU color bars (PAL)/Full color bars (NTSC) SNG : SNG color bars
		WHITE BCH	ATW/[AWB]	Sets the function of white balance (B-CH) ATW : Auto tracing white balance AWB : Auto white balance
		BATTERY WARNING	[10%]/20%	Sets the blinking (alarm) starting level of the remaining amount of battery in ANTON BAUER Inc., battery. 10% : Starts blinking when the remaining amount of battery voltage reaches about 0.67 V. 20% : Starts showing the 20% display when the remaining amount of battery voltage reaches about 1.33 V, and starts blinking at about 1.0 V.
		WIDE AWB	ON/[OFF]	Turns ON/OFF the function of widening the adjustment range of auto white balance.
		ZEBRA	ON/[OFF]	Turns ON/OFF the zebra pattern indication when a VF that is not equipped with the ZEBRA switch.
		TURBO SW INDEP.	ON/[OFF]	ON : Turns ON/OFF the TURBO GAIN function using the TURBO GAIN button, independent from the GAIN switch (L/M/H). OFF : Set to OFF during normal operation.

No.	Page	Item	Setup	Description
37	OPERATION 2	AWB LEVEL GATE	[ON]/OFF	Selects the desired detection mode for the white balance automatic adjustment. ON : Detects the white level to adjust the white balance. OFF : Detects the signal level around the center of the screen to adjust the white balance.
		REVERSE IMAGE	ON/[OFF]	Turns ON/OFF the image inversion function. (This item is displayed only when the image inverter board BKDW-704 is installed.)
		H DELAY	X ([0])	Adjust the H phase during image inversion mode. (This item is displayed only when the image inverter board BKDW-704 is installed.)
		REC TALLY	[UPPER]/BOTH	Selection of LEDs inside VF to be turned on during REC. UPPER : Only the LED in the top center of VF BOTH : Only the LEDs in the top center and bottom center of VF
		TIME CODE DISP	[OFF]/VF/TEST/BOTH	Turns ON/OFF the function of outputting the time code to TEST OUT and on the VF screen. OFF : Outputs no time code. VF : Outputs the time code to the viewfinder only. TEST : Outputs the time code to the TEST OUT connector only. BOTH : Outputs the time code to the viewfinder and TEST OUT connector.
		LOOP RECORDING	[OFF]/1/2/4/8 (sec)	Turns ON/OFF the loop recording function and selects the loop recording time. (This item is displayed only when the picture cache board BKDW-703 is installed.)
38	FRM SHUTTER			(This page is displayed only when the frame shutter unit BKDW-705 is installed.)
		FRM SHUTTER UNIT	ON/[OFF]	Turns ON/OFF the frame shutter function.
		TOTAL OP TIME		Indicates the running hours of the frame shutter function.
39	SG ADJ.	H BLANKING WIDTH	X ([0])	Sets the H blanking width.
		V BLANKING WIDTH	[20H]/21H	Set the V blanking width (20H/21H). (NTSC only)
40	ENC ADJ.	BURST START	X ([0])	Sets the starting position of the burst signal of the encoder output.
		BURST STOP	X ([0])	Sets the ending position of the burst signal of the encoder output.
		R-Y CAR. BAL.	X ([0])	Adjusts the R-Y carrier balance of the encoder output.
		B-Y CAR. BAL.	X ([0])	Adjusts the B-Y carrier balance of the encoder output.
		SYNC START	X ([0])	Sets the starting position of the sync signal of the encoder output.
		SYNC STOP	X ([0])	Sets the ending position of the sync signal of the encoder output.
		INT SC FREQ.	X ([0])	Adjusts the carrier frequency . (NTSC only)
41	DATA RESET			Returns the setup values and adjustment values of the respective modes to the default setting when shipped from factory.
		User	To be executed by pressing the rotary encoder.	Resets the data set in the user mode.
		Engineer	To be executed by pressing the rotary encoder.	Resets the data that is set by the engineer mode.
42	MENU SEL. 1	MARKER 1/3	[ON]/OFF	Selects the pages to be displayed in the user mode.
		MARKER 2/3	ON/[OFF]	
		MARKER 3/3	ON/[OFF]	
		VF DISP 1/2	[ON]/OFF	
		VF DISP 2/2	[ON]/OFF	
		MASTER GAIN	[ON]/OFF	
		SHOT ID	[ON]/OFF	
		SHOT DATA	[ON]/OFF	
		SHUTTER	ON/[OFF]	
		! LED	ON/[OFF]	

No.	Page	Item	Setup	Description
43	MENU SEL. 2	SETUP CARD	[ON]/OFF	Selects the pages to be displayed in the user mode.
		FUNCTION 1/2	ON/[OFF]	(The WIDE SCREEN page appears when DVW-790WS/790WSP/709WS/709WSP is used.)
		FUNCTION 2/2	ON/[OFF]	
		WIDE SCREEN	ON/[OFF]	
		VF SETTING	ON/[OFF]	
		LEVEL 1<Detail>	ON/[OFF]	
		LEVEL 2<Detail>	ON/[OFF]	
		LEVEL 1<4:3DTL>	ON/[OFF]	
		LEVEL 2<4:3DTL>	ON/[OFF]	
44	MENU SEL. 3	LEVEL 3<SKnDTL>	ON/[OFF]	Selects the pages to be displayed in the user mode.
		LEVEL 4<Knee>	ON/[OFF]	
		LEVEL 5<AdjENC>	ON/[OFF]	
		LEVEL 6<AdjENC>	ON/[OFF]	
		LEVEL 7<BlkFlr>	ON/[OFF]	
		LEVEL 8<Gamma>	ON/[OFF]	
		LEVEL 9<Matrix>	ON/[OFF]	
		LEVEL 10<Matrix>	ON/[OFF]	
		LEVEL 11<SC-H>	ON/[OFF]	
		LEVEL 12<A.Iris>	ON/[OFF]	
45	MENU SEL. 4	W-SHADING G	ON/[OFF]	Selects the pages to be displayed in the user mode.
		W-SHADING R	ON/[OFF]	
		W-SHADING B	ON/[OFF]	
		DCC ADJ.	ON/[OFF]	
		OFFSET WHT	ON/[OFF]	
		PRESET WHT	ON/[OFF]	
		OPERATION 1	ON/[OFF]	
		OPERATION 2	[ON]/OFF	
		FRM SHUTTER	ON/[OFF]	
46	MENU SEL. 5	SG ADJ.	ON/[OFF]	Selects the pages to be displayed in the user mode.
		ENC ADJ.	ON/[OFF]	
		DATA RESET	ON/[OFF]	
		CAMERAMAN 1-5	[ON]/OFF	
47	MEASUREMENT			Turns ON/OFF the functions that implement all the necessary settings to execute measurements of various characteristics. (Various settings are returned to the original values when this item is set to OFF.)
		S/N	ON/[OFF]	Turns ON the necessary settings during S/N measurement. (DETAIL, APERTURE, CHROMA, GAMMA and MATRIX settings are set to OFF.)
		MODULATION	ON/[OFF]	Turns ON the necessary settings during modulation measurement. (DETAIL, APERTURE, GAMMA and MATRIX settings are set to OFF.)
		RESOLUTION	ON/[OFF]	Turns ON the necessary settings during resolution measurement. (MATRIX setting is set to OFF.)
		SENSITIVITY	ON/[OFF]	Turns ON the necessary settings during sensitivity measurement. (WHITE CLIP and KNEE settings are set to OFF.)
		REGISTRATION	ON/[OFF]	Turns ON the necessary settings during registration measurement. (DETAIL and APERTURE settings are set to OFF.)
		MASTER BLACK	X ([0])	Adjusts the master black
		TEST OUT	[ENC]/R/G/B	Selects the type of video signal to be output from the TEST OUT connector. (Same as TEST OUT item of the “FUNCTION 1/2” page)

3-1-3. Setup Menu List

The setup menu items can be written into the setup card. At the same time, turning ON/OFF and adjustment of functions can be implemented using the remote control unit RM-P9/B150.
The engineer-oriented menu that is displayed when the camcorder is switched to the engineer mode, includes the items that can be stored in the setup card, and the items that can be operated from the remote control unit RM-P9/B150.

SETUP C — Yes or No is displayed to indicate whether data can be written in the setup card.

RM-P9 — M, P, or No is displayed to indicate whether this item can be operated when remote control unit RM-P9 is connected.

- M (MENU) : Can be operated at the bottom of the RM-P9.
- P (PANEL) : Can be operated in the front of the RM-P9.
- No : Cannot be operated by the RM-P9.

RM-B150 — M, P, or No is displayed to indicate whether this item can be operated when remote control unit RM-B150 is connected.

- M (MENU) : Can be operated at the bottom of the RM-B150.
- P (PANEL) : Can be operated in the front of the RM-B150.
- No : Cannot be operated by the RM-B150.

F-SET — Sets the factory default value.

C-SET — Write the setting state of the customer.

No.	Page	Item	Setup C	RM-P9	RM-B150	F-SET	C-SET	Remark
1	MARKER 1/3	SAFETY ZONE	YES	M	M	ON		
		SAFETY AREA	YES	M	M	90		
		CENTER	YES	M	M	OFF		
		CENTER H	YES	M	M	0		
		CENTER V	YES	M	M	0		
2	MARKER 2/3	BOX CURSOR	YES	M	M	OFF		
		BOX WIDTH	YES	M	M	0		
		BOX HEIGHT	YES	M	M	0		
		BOX H	YES	M	M	0		
		BOX V	YES	M	M	0		
3	MARKER 3/3	TEST OUT MIX	YES	M	M	OFF		
		RET MIX	YES	M	M	OFF		
		TEST OUT VF DISP	YES	M	M	OFF		
		TEST OUT MENU	YES	M	M	OFF		
		RM VF MENU INH.	YES	M	M	ON		
4	VF DISP 1/2	DISP MODE	YES	M	M	3		
		EXTENDER	YES	M	M	ON		
		ZOOM	YES	M	M	ON		
5	VF DISP 2/2	FILTER	YES	M	M	ON		
		WHITE	YES	M	M	ON		
		GAIN	YES	M	M	ON		
		SHUTTER	YES	M	M	ON		
		TAPE	YES	M	M	ON		
		AUDIO	YES	M	M	ON		
		IRIS	YES	M	M	ON		
6	MASTER GAIN	LOW	YES	M	M/P(*1)	0 dB		
		MID	YES	M	M/P(*1)	9 dB		
		HIGH	YES	M	M/P(*1)	18 dB		
		TURBO	YES	M	M	42 dB		
7	SHOT ID	ID-1	YES	M	M			
		ID-2	NO	M	M			
		ID-3	NO	M	M			
		ID-4	NO	M	M			
8	SHOT DISP	DATE	YES	M	M	OFF		
		TIME	YES	M	M	OFF		
		MODEL NAME	YES	M	M	OFF		
		SERIAL NO.	YES	M	M	OFF		
		CASSTTE NO.	YES	M	M	OFF		
		SHOT NO.	YES	M	M	OFF		
		ID SELECT	YES	M	M	OFF		

*1 : The RM configuration menu of RM-B150 is used.

No.	Page	Item	Setup C	RM-P9	RM-B150	F-SET	C-SET	Remark
9	SHUTTER	EVS	YES	P	P	ON		
		CLS	YES	P	P	ON		
		1/100(NTSC) 1/60(PAL)	YES	P	P	ON		
		1/125	YES	P	P	ON		
		1/250	YES	P	P	ON		
		1/500	YES	P	P	ON		
		1/1000	YES	P	P	ON		
		1/2000	YES	P	P	ON		
10	!' LED	MASTER GAIN	YES	M	M	ON		
		SHUTTER ON	YES	M	M	ON		
		WHITE PRESET	YES	M	M	OFF		
		ATW RUN	YES	M	M	OFF		
		EXTENDER ON	YES	M	M	ON		
		FILTER 2,3,4	YES	M	M	OFF		
		FILTER A,C,D	YES	M	M	OFF		DVW-790WS/790WSP/ 709W/709WSP only
		A.IRIS OVERRIDE	YES	M	M	OFF		
11	SETUP CARD	READ (→ CAM)		M	M			
		WRITE (→ CARD)		M	M			
		ID EDIT		M	M			
		WRITE PROTECT		M	M	OFF		
		WHITE DATA		M	M	OFF		
12	FUNCTION 1/2	TEST OUT	NO	M	M	ENC		
		DETAIL	YES	M	M	ON		
		APERTURE	YES	M	M	ON		
		SKIN TONE DTL	YES	M	M	OFF		
		MATRIX	YES	M	M	OFF (J) ON (except J)		
		GAMMA	YES	M	M	ON		
		BLACK GAMMA	YES	M	M	OFF		
		CHROMA	YES	M	M	ON		
		TEST SAW	YES	P(*2)	P/M(*3)	OFF		
		CROSS COLOR FLT	YES	M	M	OFF		
13	FUNCTION 2/2	GENLOCK	YES	M	M	ON		
		CAM RET.	YES	M	M	OFF		
		FILTER INH.	YES	M	M	OFF		
		FIELD/FRAME	YES	M	M	FIELD		
		A.IRIS OVERRIDE	YES	P	P	OFF		
		DCC FUNCTION SEL	YES	M	M	DCC		
		REAR BNC OUT	YES	M	M	VBS		When BKDW-702 is installed.
		VTR MODE	YES	M	M	OFF		
		REC INHIBIT (CCU)	YES	M	M	ON		
		ASSIGNABLE SW	YES	M	M	OFF		

∗2 : It can be set from the setup menu. However, if the setup menu and the adjustment control of the RM-P9 are used at the same time, the setup value may not be reflected correctly.

∗3 : However, the adjustment items that are set to the absolute mode by the RM configuration menu and the TEST signal output ON/OFF , cannot be changed from the setup menu if RM-B150 is set to the panel-active.

No.	Page	Item	Setup C	RM-P9	RM-B150	F-SET	C-SET	Remark
14	WIDE SCREEN	16:9/4:3 MODE	YES	M	M	16:9		DVW-790WS/790WSP/ 709WS/709WSP only
		VF ASPECT	YES	M	M	AUTO		
		BOX/4:3/14:9 LIMITS	YES	M	M	BOX		
		16:9 BARS ID	YES	M	M	OFF		
		16:9 VF ID	YES	M	M	OFF		
15	VF SETTING	ZEBRA 1 DETECT	YES	M	M	70		
		ZEBRA 1 APERTURE	YES	M	M	10		
		ZEBRA 2 DETECT	YES	M	M	100		
		ZEBRA SELECT	YES	M	M	1		
		TEST OUT ZEBRA	YES	M	M	OFF		
		VF DTL LEVEL	YES	M	M	0		
16	LEVEL 1	DETAIL LVL	YES	P(*2)	P/M(*3)	0		
		H/V RATIO	YES	M	M	0		
		DTL FREQ	YES	M	M	0		
		CRISPENING	YES	M	M	0		
		APT. LEVEL	YES	M	M	0		
		DTL W.CLP	YES	M	M	0		
		DTL V B.CLP	YES	M	M	0		
		DTL H B.CLP	YES	M	M	0		
		LVL DEPEND	YES	M	M	ON		
		L.DEP.LVL	YES	M	M	0		
17	LEVEL 2	KNEE APT	YES	M	M	OFF		
		K.APT.LVL	YES	M	M	0		
		DTL COMB	YES	M	M	0		
		C.C.S.LVL	YES	M	M	0		NTSC only
18	LEVEL 1#4:3	DETAIL LVL	YES	P(*2)	P/M(*3)	0		DVW-790WS/790WSP/ 709WS/709WSP only
		H/V RATIO	YES	M	M	0		
		DTL FREQ	YES	M	M	0		
		CRISPENING	YES	M	M	0		
		APT. LEVEL	YES	M	M	0		
		DTL W.CLP	YES	M	M	0		
		DTL V B.CLP	YES	M	M	0		
		DTL H B.CLP	YES	M	M	0		
		LVL DEPEND	YES	M	M	ON		
		L.DEP.LVL	YES	M	M	0		
19	LEVEL 2#4:3	KNEE APT	YES	M	M	OFF		DVW-790WS/790WSP/ 709WS/709WSP only
		K.APT.LVL	YES	M	M	0		
		DTL COMB	YES	M	M	0		
		C.C.S.LVL	YES	M	M	0		DVW-790WS/709WS only NTSC only

*2 : It can be set from the setup menu. However, if the setup menu and the adjustment control of the RM-P9 are used at the same time, the setup value may not be reflected correctly.

*3 : However, the adjustment items that are set to the absolute mode by the RM configuration menu and the TEST signal output ON/OFF , cannot be changed from the setup menu if RM-B150 is set to the panel-active.

No.	Page	Item	Setup C	RM-P9	RM-B150	F-SET	C-SET	Remark
20	LEVEL 3	SKIN TONE DTL	YES	M	P/M(*4)	OFF		
		SKIN TONE DET	YES	M	M	OFF		
		SUPPRESS LEVEL	YES	M	M	0		
		SATURATION	YES	M	M	0		
		HUE	YES	M	M	0		
		WIDTH	YES	M	M	0		
		SKIN AREA IND.	NO	M	M	OFF		
21	LEVEL 4	MASTER BLACK	YES	P(*2)	P/M(*3)	0		
		MASTER GAMMA	YES	P(*2)	P/M(*3)	0		
		MASTER BLK GAMMA	YES	M	P/M(*4)	0		
		KNEE POINT	YES	P(*2)	P/M(*3)	0		
		KNEE SLOPE	YES	M	M	0		
		KNEE SATURATION	YES	M	M	0		
		KNEE	YES	M	M	ON		
		WHITE CLIP	YES	M	M	ON		
		WHITE CLIP LEVEL	YES	M	M	0		
22	LEVEL 5	BURST LEVEL	YES	M	M	0		
		BURST PHASE	YES	M	M	0		PAL only
		R-Y	YES	M	M	ON		
		B-Y	YES	M	M	ON		
		R-Y LEVEL	YES	M	M	0		
		B-Y LEVEL	YES	M	M	0		
		R-Y LEVEL (4:3)	YES	M	M	0		DVW-790WS/790WSP/ 709WS/709WSP only
		B-Y LEVEL (4:3)	YES	M	M	0		
23	LEVEL 6	RGB LEVEL	YES	M	M	0		
		RGB SYNC LVL.	YES	M	M	0		
		RGB SETUP LVL.	YES	M	M	0		
		ENC Y LEVEL	YES	M	M	0		
		ENC SYNC LVL.	YES	M	M	0		
		ENC SETUP LVL.	YES	M	M	0		
		RGB LEVEL (4:3)	YES	M	M	0		DVW-790WS/790WSP/ 709WS/709WSP only
		ENC Y LEVEL (4:3)	YES	M	M	0		
24	LEVEL 7	R BLACK	YES	P(*2)	P/M(*3)	0		
		G BLACK	YES	M	M	0		
		B BLACK	YES	P(*2)	P/M(*3)	0		
		R FLARE	YES	M	P/M(*4)	0		
		G FLARE	YES	M	M	0		
		B FLARE	YES	M	P/M(*4)	0		
		FLARE	YES	M	M	ON		
		TEST OUT	NO	M	M	ENC		

∗2 : It can be set from the setup menu. However, if the setup menu and the adjustment control of the RM-P9 are used at the same time, the setup value may not be reflected correctly.

∗3 : However, the adjustment items that are set to the absolute mode by the RM configuration menu and the TEST signal output ON/OFF , cannot be changed from the setup menu if RM-B150 is set to the panel-active.

∗4 : It can be allocated to the respective adjustment controls on the RM-B150 using the RM configuration menu.
However, if some items are set to the absolute value mode by the RM configuration menu, the corresponding adjustment items cannot be changed from the setup menu if RM-B150 is set to panel-active.

No.	Page	Item	Setup C	RM-P9	RM-B150	F-SET	C-SET	Remark
25	LEVEL 8	GAMMA TABLE	YES	M	M	A		
		MASTER GAMMA	YES	P(*2)	P/M(*3)	0		
		R GAMMA	YES	M	M	0		
		G GAMMA	YES	M	M	0		
		B GAMMA	YES	M	M	0		
		BLACK GAMMA RANGE	YES	M	M	HI		
		MASTER BLACK GAMMA	YES	M	P/M(*4)	0		
		R BLACK GAMMA	YES	M	M	0		
		G BLACK GAMMA	YES	M	M	0		
		B BLACK GAMMA	YES	M	M	0		
26	LEVEL 9	MATRIX	YES	M	M	OFF		
		MATRIX TABLE	YES	M	M	A		
		DETECT COLOR	NO	M	M	OFF		
		AXIS NUMBER	YES	M	M	B		
		SATURATION	YES	M	M	0		
		HUE	YES	M	M	0		
		MATRIX AREA IND.	NO	M	M	OFF		
		MATRIX (MULTI)	NO	M	M	ON		
27	LEVEL 10	MATRIX	YES	M	M	OFF		
		MATRIX TABLE	YES	M	M	A		
		R-G	YES	M	M	0		
		R-B	YES	M	M	0		
		G-R	YES	M	M	0		
		G-B	YES	M	M	0		
		B-R	YES	M	M	0		
		B-G	YES	M	M	0		
		MATRIX (MASTER)	NO	M	M	ON		
28	LEVEL 11	H PHASE	YES	M	M	0		
		SC PHASE	YES	M	M	0		
		SC 0/180 SEL.	YES	M	M	0		
		SC-H	YES	M	M	0		
29	LEVEL 12	IRIS SET	YES	M	M	0		
		IRIS MODE	YES	M	M	0		
		IRIS WEIGHT	YES	M	M	0		
		IRIS SPEED	YES	M	M	2		
		CLIP HIGH LIGHT	YES	M	M	OFF		

*2 : It can be set from the setup menu. However, if the setup menu and the adjustment control of the RM-P9 are used at the same time, the setup value may not be reflected correctly.

*3 : However, the adjustment items that are set to the absolute mode by the RM configuration menu and the TEST signal output ON/OFF , cannot be changed from the setup menu if RM-B150 is set to the panel-active.

No.	Page	Item	Setup C	RM-P9	RM-B150	F-SET	C-SET	Remark
30	W-SHADING G	H SAW	YES	M	M	0		
		H PARA	YES	M	M	0		
		V SAW	YES	M	M	0		
		V PARA	YES	M	M	0		
		H SAW (EXT)	YES	M	M	0		
		H PARA (EXT)	YES	M	M	0		
		V SAW (EXT)	YES	M	M	0		
		V PARA (EXT)	YES	M	M	0		
		SHAD COMP.	YES	M	M	ON		
		TEST OUT	YES	M	M	ENC		
31	W-SHADING R	H SAW	YES	M	M	0		
		H PARA	YES	M	M	0		
		V SAW	YES	M	M	0		
		V PARA	YES	M	M	0		
		H SAW (EXT)	YES	M	M	0		
		H PARA (EXT)	YES	M	M	0		
		V SAW (EXT)	YES	M	M	0		
		V PARA (EXT)	YES	M	M	0		
		SHAD COMP.	YES	M	M	ON		
		TEST OUT	YES	M	M	ENC		
32	W-SHADING B	H SAW	YES	M	M	0		
		H PARA	YES	M	M	0		
		V SAW	YES	M	M	0		
		V PARA	YES	M	M	0		
		H SAW (EXT)	YES	M	M	0		
		H PARA (EXT)	YES	M	M	0		
		V SAW (EXT)	YES	M	M	0		
		V PARA (EXT)	YES	M	M	0		
		SHAD COMP.	YES	M	M	ON		
		TEST OUT	YES	M	M	ENC		
33	DCC ADJUSTMENT	D RANGE	YES	M	M	600		
		POINT	YES	M	M	0		
		GAIN	YES	P(*2)	P/M(*3)	0		
34	OFFSET WHT	OFFSET WHITE (A)	YES	M	M	OFF		
		WARM-COOL (A)	YES	M	M	3200K		
		FINE (A)	YES	M	M	0		
		OFFSET WHITE (B)	YES	M	M	OFF		
		WARM-COOL (B)	YES	M	M	3200K		
		FINE (B)	YES	M	M	0		

*2 : It can be set from the setup menu. However, if the setup menu and the adjustment control of the RM-P9 are used at the same time, the setup value may not be reflected correctly.

*3 : However, the adjustment items that are set to the absolute mode by the RM configuration menu and the TEST signal output ON/OFF , cannot be changed from the setup menu if RM-B150 is set to the panel-active.

No.	Page	Item	Setup C	RM-P9	RM-B150	F-SET	C-SET	Remark
35	PRESET WHT	COLOR TEMP (P)	YES	M	M	3200K		
		FINE (P)	YES	M	M	0		
		R GAIN (P)	YES	M	M	0		
		B GAIN (P)	YES	M	M	0		
36	OPERATION 1	R-G/B-G SEL.	YES	M	M	OFF		
		GAMMA TABLE	YES	M	M	A		
		LOW LIGHT	YES	M	M	OFF		
		LOW LIGHT LEVEL	YES	M	M	0		
		SELECT BARS	YES	M	M	SMPTE (NTSC) EBU (PAL)		
		WHITE BCH	YES	NO	NO	AWB		
		BATTERY WARNING	YES	M	M	10%		
		WIDE AWB	YES	M	M	OFF		
		ZEBRA	YES	M	M	OFF		
		TURBO SW INDEP.	YES	M	M	OFF		
37	OPERATION 2	AWB LEVEL GATE	YES	M	M	ON		
		REVERSE IMAGE	YES	M	M	OFF		When BKDW-704 is installed.
		H DELAY	YES	M	M	0		When BKDW-704 is installed.
		REC TALLY	YES	M	M	UPPER		
		TIME CODE DISP	YES	M	M	OFF		
		LOOP RECORDING	YES	M	M	OFF		When BKDW-703 is installed.
38	FRM SHUTTER	FRM SHUTTER UNIT	YES	M	M	OFF		When BKDW-705 is installed.
		TOTAL OP TIME				0H		When BKDW-705 is installed.
39	SG ADJ.	H BLANKING WIDTH	YES	M	M	0		
		V BLANKING WIDTH	YES	M	M	20H		NTSC only
40	ENC ADJ.	BURST START	YES	M	M	0		
		BURST STOP	YES	M	M	0		
		R-Y CAR. BAL.	YES	M	M	0		
		B-Y CAR. BAL.	YES	M	M	0		
		SYNC START	YES	M	M	0		
		SYNC STOP	YES	M	M	0		
		INT SC FREQ.	YES	M	M	0		NTSC only
41	DATA RESET	USER		M	M			
		ENGINEER		M	M			
42	MENU SEL. 1	MARKER 1/3	YES	M	M	ON		
		MARKER 2/3	YES	M	M	OFF		
		MARKER 3/3	YES	M	M	OFF		
		VF DISP 1/2	YES	M	M	ON		
		VF DISP 2/2	YES	M	M	ON		
		MASTER GAIN	YES	M	M	ON		
		SHOT ID	YES	M	M	ON		
		SHOT DATA	YES	M	M	ON		
		SHUTTER	YES	M	M	OFF		
		! LED	YES	M	M	OFF		

No.	Page	Item	Setup C	RM-P9	RM-B150	F-SET	C-SET	Remark
43	MENU SEL. 2	Setup CARD	YES	M	M	ON		
		FUNCTION 1/2	YES	M	M	OFF		
		FUNCTION 2/2	YES	M	M	OFF		
		VF SETTING	YES	M	M	OFF		
		WIDE SCREEN	YES	M	M	OFF		DVW-790WS/790WSP/ 709WS/709WSP only
		LEVEL 1<Detail>	YES	M	M	OFF		
		LEVEL 2<Detail>	YES	M	M	OFF		
		LEVEL 1<4:3DTL>	YES	M	M	OFF		
		LEVEL 2<4:3DTL>	YES	M	M	OFF		
44	MENU SEL. 3	LEVEL 3<SKnDTL>	YES	M	M	OFF		
		LEVEL 4<Knee>	YES	M	M	OFF		
		LEVEL 5<AdjENC>	YES	M	M	OFF		
		LEVEL 6<AdjENC>	YES	M	M	OFF		
		LEVEL 7<BlkFlr>	YES	M	M	OFF		
		LEVEL 8<Gamma>	YES	M	M	OFF		
		LEVEL 9<Matrix>	YES	M	M	OFF		
		LEVEL 10<Matrix>	YES	M	M	OFF		
		LEVEL 11<SC-H>	YES	M	M	OFF		
		LEVEL 12<A.Iris>	YES	M	M	OFF		
45	MENU SEL. 4	W-SHADING G	YES	M	M	OFF		
		W-SHADING R	YES	M	M	OFF		
		W-SHADING B	YES	M	M	OFF		
		DCC ADJ.	YES	M	M	OFF		
		OFFSET WHT	YES	M	M	OFF		
		PRESET WHT	YES	M	M	OFF		
		OPERATION 1	YES	M	M	OFF		
		OPERATION 2	YES	M	M	ON		
		FRM SHUTTER	YES	M	M	OFF		
46	MENU SEL. 5	SG ADJ.	YES	M	M	OFF		
		ENC ADJ.	YES	M	M	OFF		
		DATA RESET	YES	M	M	OFF		
		CAMERAMAN 1-5	YES	M	M	ON		
47	MEASUREMENT	S/N		M	M	OFF		
		MODULATION		M	M	OFF		
		RESOLUTION		M	M	OFF		
		SENSITIVITY		M	M	OFF		
		REGISTRATION		M	M	OFF		
		MASTER BLACK	YES	P(*2)	P/M(*3)	0		
		TEST OUT		M	M	ENC		

*2 : It can be set from the setup menu. However, if the setup menu and the adjustment control of the RM-P9 are used at the same time, the setup value may not be reflected correctly.

*3 : However, the adjustment items that are set to the absolute mode by the RM configuration menu and the TEST signal output ON/OFF , cannot be changed from the setup menu if RM-B150 is set to the panel-active.

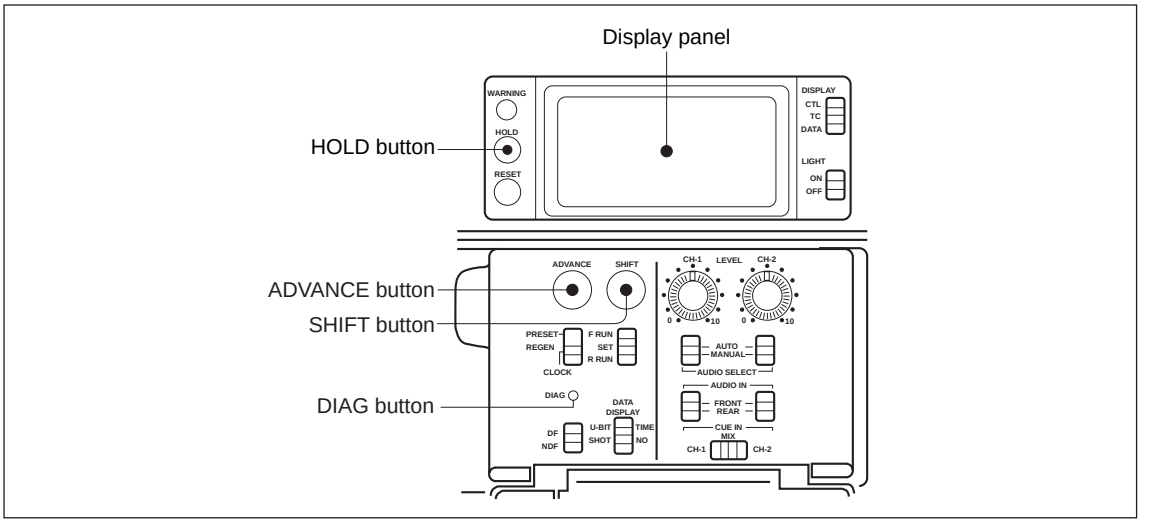
3-2. VTR (DIAG) Menu

The VTR (DIAG) menu is used for setting the maintenance menu of the VTR side and for various diagnostics.

Notes

- Use the VTR (DIAG) menu in the state in which the tape transport stopped.
- Do not execute the VTR (DIAG) menu when remote control RM-P9/B150 is connected. The self-diagnosis function and remote control function are not normally activated when the self-diagnosis is executed.

Switch description



Operation

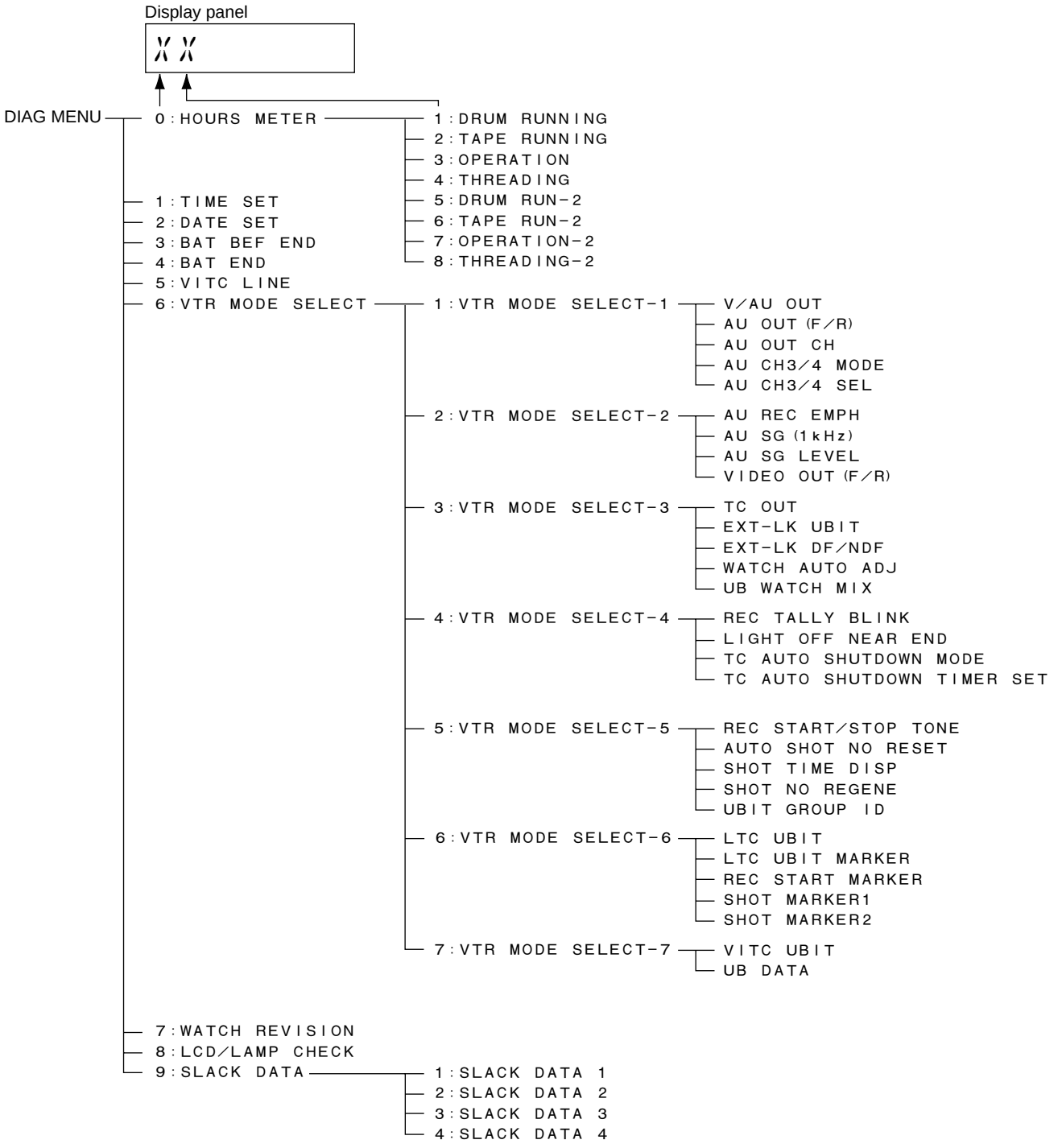
1. VTR (DIAG) menu activation
   Push the DIAG button on the inside panel with the tip of a clip so as to display the DIAG menu on the display panel.
   The VTR menu appears on the VF screen.

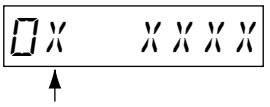
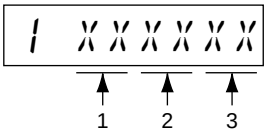
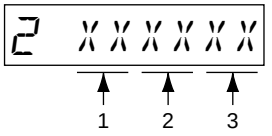
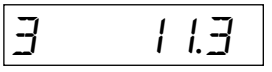
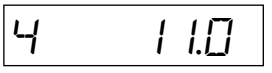
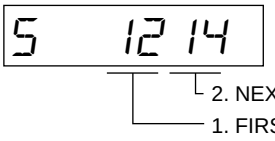
2. PAGE selection
   Press the ADVANCE button and select the PAGE.
   To increment the menu number, press the ADVANCE button.
   To decrement the menu number, press the ADVANCE and HOLD buttons simultaneously.
   After selection, Press the SHIFT button.
   Select the PAGE repeatedly until the desired ITEM is found.

3. ITEM selection
   Press the ADVANCE button and select the ITEM.
   After selection, press the SHIFT button.

4. ITEM setting
   Press the ADVANCE button to change the set value.
   After change, press the SHIFT button.

5. VTR (DIAG) menu termination
   Press the DIAG button.

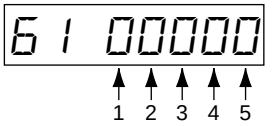

Display panel
XX
DIAG MENU
0:HOURS METER
1:DRUM RUNNING
2:TAPE RUNNING
3:OPERATION
4:THREADING
5:DRUM RUN-2
6:TAPE RUN-2
7:OPERATION-2
8:THREADING-2
1:TIME SET
2:DATE SET
3:BAT BEF END
4:BAT END
5:VITC LINE
6:VTR MODE SELECT
1:VTR MODE SELECT-1
V/AU OUT
AU OUT (F/R)
AU OUT CH
AU CH3/4 MODE
AU CH3/4 SEL
2:VTR MODE SELECT-2
AU REC EMPH
AU SG (1kHz)
AU SG LEVEL
VIDEO OUT (F/R)
3:VTR MODE SELECT-3
TC OUT
EXT-LK UBIT
EXT-LK DF/NDF
WATCH AUTO ADJ
UB WATCH MIX
4:VTR MODE SELECT-4
REC TALLY BLINK
LIGHT OFF NEAR END
TC AUTO SHUTDOWN MODE
TC AUTO SHUTDOWN TIMER SET
5:VTR MODE SELECT-5
REC START/STOP TONE
AUTO SHOT NO RESET
SHOT TIME DISP
SHOT NO REGENE
UBIT GROUP ID
6:VTR MODE SELECT-6
LTC UBIT
LTC UBIT MARKER
REC START MARKER
SHOT MARKER1
SHOT MARKER2
7:VTR MODE SELECT-7
VITC UBIT
UB DATA
7:WATCH REVISION
8:LCD/LAMP CHECK
9:SLACK DATA
1:SLACK DATA 1
2:SLACK DATA 2
3:SLACK DATA 3
4:SLACK DATA 4

Display panel (Default setting)	VF screen (Default setting)	Description
DIAG 0 HOURS METER  1. DRUM RUNNING 2. TAPE RUNNING 3. OPERATION 4. THREADING 5. DRUM RUN-2 6. TAPE RUN-2 7. OPERATION-2 8. THREADING-2	VTR MENU-1 1. DRUM RUNNING xxxxxH 2. TAPE RUNNING xxxxxH 3. OPERATION xxxxxH 4. THREADING xxxxx 5. DRUM RUN-2 xxxxxH 6. TAPE RUN-2 xxxxxH 7. OPERATION-2 xxxxxH 8. THREADING-2 xxxxx	The contents below are displayed. (For more details, refer to 7-2-1, “Hours Meter”.) 1. Total drum rotating hours 2. Total tape running hours 3. Total power-on time 4. Total number of threading 5. Drum rotating hour (Customer-resetable) 6. Tape running hour (Customer-resetable) 7. Power-on time (Customer-resetable) 8. The number of threading (Customer-resetable)
DIAG 1 TIME  	VTR MENU-2 TIME 1. HOUR xxH 2. MIN xxM 3. SEC xxS DATE 1. YEAR xx 2. MONTH xx 3. DAY xx	Internal timer setting. 1. Sets the hour. 2. Sets the minute. 3. Sets the second.
DIAG 2 DATE  		Internal timer date setting. 1. Sets the year. 2. Sets the mouth. 3. Sets the day.
DIAG 3 BATTERY VOLTAGE BEFORE END  	VTR MENU-3 BATTERY VOLTAGE 1. BEFORE END 11.3V 2. END 11.0V VITC INSERT LINE 1. 12LINE 2. 14LINE	Displays and sets the battery before end voltage. Battery before end voltage setting 11.0 to 13.0 V (in units of 0.1 V) “0” is displayed on the display plate when the setting is OK. “E” is displayed on the display plate when the setting is NG.
DIAG 4 BATTERY VOLTAGE END  		Displays and sets the battery end voltage. Battery end voltage setting 10.5 to 11.5 V (in units of 0.1 V) “0” is displayed on the display plate when the setting is OK. “E” is displayed on the display plate when the setting is NG.
DIAG 5 VITC INSERT LINE  		Displays and sets the VITC insertion line. 12 to 19 lines (For NTSC) 9 to 22 lines (For PAL)

Display panel (Default setting)	VF screen (Default setting)	Description

DIAG 6-1

VTR MODE SEL-1



VTR MENU-4

VTR MODE SEL-1

1. V/AU OUT	AUTO
2. AU OUT(F/R)	EE
3. AU OUT CH	CH1/2
4. AU CH3/4 MODE	SEL
5. AU CH3/4 SEL	F/F

1. V/AU OUT : Sets the video and audio output.

   0 (EE) : Outputs the PB/EE signal.
   1 (EE) : Outputs the EE signal.

2. AU OUT (F/R) : Sets the audio output during FF/REW. (Valid when V/AU OUT is set to 0 (AUTO) and VIDEO OUT (F/R) of the VTR MODE SEL-2 is set to 1 (F/R).)

   0 (EE) : Outputs the EE signal.
   1 (CUE) : Outputs the CUE signal.

3. AU OUT CH : Sets the audio output channel.

   0 (CH1/2) : CH1/2
   1 (CH3/4) : CH3/4

4. AU REC CH3/4 : Selects the source during recording in CH3/4.

   0 (CH1/2) : The same input signal as CH1 (or CH2) that is selected by the AUDIO IN switch. (CH3 and CH1 have the same input signal while CH4 and CH2 have the same input signal.)

   1 (SEL) : The input signal that is set by the AU REC CH3/4 SELECT as shown below, is selected. (Manual setting)

   2 (ALL) : The input signal that is opposite to CH1 (or CH2) selected by the AUDIO IN switch is selected. (When CH1 selects “FRONT”, CH3 is automatically set to “REAR (1)”.)

   3 (–) : CH3 and CH4 are not recorded.

5. AU REC CH3/4 SELECT:
   The input signal to be recorded on CH3/4 is selected. (This selection becomes valid when the above described AU REC CH3/4 MODE is set to “1”.)

   0 (F/F) : CH3 CH4 : FRONT

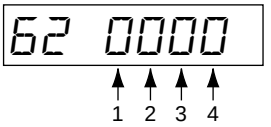
   1 (F/R) : CH3 : FRONT, CH4 : REAR (2)

   2 (R/R) : CH3 : REAR (1), CH4 : REAR (2)

   3 (R/F) : CH3 : REAR (1), CH4 : FRONT

DIAG 6-2

VTR MODE SEL-2



VTR MENU-5

VTR MODE SEL-2

1. AU REC EMPH	OFF
2. AU SG(1KHz)	OFF
3. AU SG LEVEL	−20dB
4. VIDEO OUT(F/R)	EE

1. AU REC EMPH : Sets the audio emphasis (during recording) to ON or OFF.

   0 (OFF) : OFF
   1 (ON) : ON

2. AU SG (1 kHz) : Sets whether to generate a 1 kHz test signal when a color-bar signal is generated from the internal signal generator.

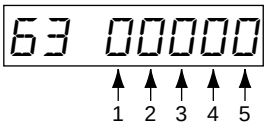
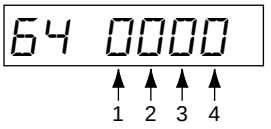
   0 (OFF) : Not generates.
   1 (AUTO) : Generates when the CH1 AUDIO SELECT switch on the inside panel is set to AUTO.
   2 (ON) : Generates.

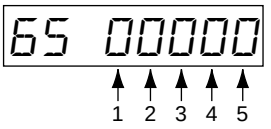
3. AU SG LEVEL : Sets the level of a 1 kHz test signal.

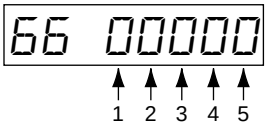
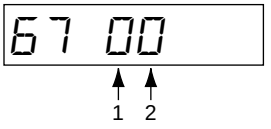
   0 (−20 dBu) : −20 dBu (600 Ω)
   1 (−18 dBu) : −18 dBu (600 Ω)
   2 (−16 dBu) : −16 dBu (600 Ω)

4. VIDEO OUT (F/R) : Video output during FF/REW modes. (This setting becomes valid when V/AU OUT is set 0 “AUTO”.)

   0 (EE) : EE is output.
   1 (F/R) : PB is output.

Display panel (Default setting)	VF screen (Default setting)	Description
DIAG 6-3 VTR MODE SEL-3 	VTR MENU-6 VTR MODE SEL-3 1. TC OUT AUTO 2. EXT-LK UBIT INT 3. EXT-LK DF/NDF SW 4. WATCH AUTO ADJ ON 5. UB WATCH MIX OFF	1. TC OUT : Sets the time code output. 0 (AUTO) : Outputs PB/TCG. 1 (GENE) : Outputs TCG. 2. EXT-LK UBIT : Sets the LTC UB set value when the time code is locked externally. 0 (INT) : Internally set value 1 (EXT) : External LTC value 3. EXT-LK DF/NDF : Sets the DF/NDF (NTSC only). 0 (SW) : Conforms to the DF/NDF switch setting on the inside panel. 1 (EXT) : Conforms to the external LTC setting. 4. WATCH AUTO ADJ : Sets the internal timer automatic time correction (according to the user's bit of the unit connected to TC OUT). 0 (ON) : Corrects. 1 (OFF) : Not correct. 5. UB WATCH MIX : Sets whether to output the time of an internal timer to the LTC UB. 0 (OFF) : Not output. 1 (ON) : Outputs.
DIAG 6-4 VTR MODE SEL-4 	VTR MENU-7 VTR MODE SEL-4 1. REC TALLY BLNK ON 2. LIGHT OFF OFF 3. AUTO SHUTDOWN MODE SEL TIME 1H	1. REC TALLY BLINK : Sets whether the TALLY lamp blinks during battery before end and tape before end. 0 (ON) : Blinks. 1 (OFF) : Lights. 2. LIGHT OFF NEAR END : Sets whether to turn off the light during battery before end. 0 (OFF) : Turns off forcibly. 1 (ON) : Not turn off. 3. TC AUTO SHUTDOWN MODE SELECT: Selection of the auto shutdown mode of time code generator. 0 (SEL) : The auto shutdown mode is determined by the setting established by the TC AUTO SHUTDOWN TIMER SET as described below. 1 (OFF) : When the POWER switch of DVW is set to OFF, the main power of time code generator is interlocked to be turned off. 2 (CONT) : The main power of time code generator is not turned off even through the POWER witch of DVW is turned off. 4. TC AUTO SHUTDOWN TIMER SET: The auto shutdown time of time code generator is set. (This setting becomes valid when the above described TC AUTO SHUTDOWN MODE SELECT Is set to "0".) 0 (1H) : 1 hour 1 (3H) : 3 hours 2 (8H) : 8 hours

Display panel (Default setting)	VF screen (Default setting)	Description
DIAG 6-5 VTR MODE SEL-5  	VTR MENU-8 VTR MODE SEL-5 1. REC START/STOP OFF 2. SHOT NO. RESET OFF 3. SHOT TIME DISP MD:HM 4. SHOT NO REGENE OFF 5. UBIT GROUP ID 000	1. REC START/STOP TONE : Sets whether to output a sound when the REC START/STOP button is pressed. 0 (OFF) : Outputs no sound. 1 (ON) : Outputs a sound. 2. SHOT NO. RESET : Sets whether to reset the shot number automatically during tape-threading. 0 (OFF) : Resets automatically. 1 (ON) : Not reset. 3. SHOT TIME DISP : Sets the format of the time displayed on the display plate. 0 (HD : HM) : Month Day : Hour Minute 1 (DM : HM) : Day Month : Hour Minute 2 (D : HMS) : Day : Hour Minute Second 4. SHOT No. REGENE: 0 (OFF) : The shot No. that is arbitrarily set, is recorded. 1 (ON) : The shot No. that is recorded on tape, is read out. The shot No. is recorded in a way the shot Nos. become the consecutive. 5. UBIT GROUP ID: Selection of the user's bit group ID 0 (000) : 000 1 (101) : 101

Display panel (Default setting)	VF screen (Default setting)	Description
DIAG 6-6 VTR MODE SEL-6  	VTR MENU-9 VTR MODE SEL-6 1. LTC UBIT FIX 2. LTC UB-MARKER SET 3. REC START MARK OFF 4. SHOT MARKER1 OFF 5. SHOT MARKER2 OFF	1. LTC UBIT : Sets the data recorded in the user bits of LTC. 0 (FIX) : Fixed data (Conventional-type user bits) 1 (TIME) : Time of internal timer (in real time) 2 (SHOT) : Shot data 2. LTC UB-MARKER : Sets whether to write the mark below in the user bits of LTC. REC start mark Shot mark 1 Shot mark 2 0 (SET) : Conform to the menu setting below. 1 (ALL) : Writes all marks. 2 (OFF) : Writes nothing. 3. REC START MARKER (Valid when the LTC UB-maker is set to SW.) 0 (OFF) : Writes. 1 (ON) : Not write. 4. SHOT MARKER 1 (Valid when the LTC UB-marker is set to SW.) 0 (OFF) : Writes. 1 (ON) : Not write. 5. SHOT MARKER 2 (Valid when the LTC UB-marker is set to SW.) 0 (OFF) : Writes. 1 (ON) : Not write.
DIAG 6-7 VTR MODE SEL-7  	VTR MENU-10 VTR MODE SEL-7 1. VITC UBIT FIX 2. UBIT DATA SHORT	1. VITC UBIT : Sets the data recorded in the user bits of VITC. 0 (FIX) : Fixed data (Conventional-type user bits) 1 (TIME) : Time of internal timer (in real time) 2 (SHOT) : Shot data 2. SHOT DATA : Sets the data length of the VITC shot data. 0 (SHORT) : Record data of date, time, model ID, serial No., cassette No., shot No. 1 (LONG) : Record data of date, time, model ID, serial No., cassette No., shot No., shot ID 1 to 4.

Display panel (Default setting)	VF screen (Default setting)	Description
DIAG 7 WATCH REVISION 7 XXX	VTR MENU-11 WATCH REVISION 000	Sets the corrected value of an internal timer (the number of frames a day).
DIAG 8 LCD/LAMP CHECK 8	VTR MENU-12 LCD/LAMP CHECK ALL OFF	Display panel check and various indicators check Every pressing of the SHIFT button toggles between all on and all off. (The messages “ALL OFF” and “ALL ON” are alternately displayed on the VF screen.) Refer to section “2-3 Display Panel and Lamp Operation Check” for more details.
DIAG 9 9X XXXX STATE CODE TROUBLE CODE 1. SLACK DATA 1 2. SLACK DATA 2 3. SLACK DATA 3 4. SLACK DATA 4	VTR MENU-13 SERVO MEMORY 1. CAP FREE SP XX 2. PG PHASE-1 XX 3. PG PHASE-2 XX 4. CFGA DUTY XX 5. CFGB DUTY XX 6. EDIT DELAY XX 7. SLACK XXXX XXXX XXXX XXXX SLACK DATA 1 2 3 4	The servo adjustment data and slack information consisting of the last four slack errors, are displayed. Refer to Section “2-4. Displaying the Servo Adjust ment Data” for more details. (Servo adjustment data is displayed on the VF screen only.) Refer to Section “2-5. Displaying the Slack Information in the Past” for more details of the slack trouble codes and the slack status codes. (The SLACK DATA 1 is the newest slack information.)

Section 4
Camera System Electrical Alignment
(Only for DVW-790WS/790WSP/709WS/709WSP)

4-1. General Information for Electrical Adjustment

This section describes adjustments that are required when lens is attached or replaced.

4-1-1. Note for Adjustment

Before adjustment, set the main POWER switch to on and the VTR switch to SAVE, then warm up the camcorder for about 10 minutes.
Be sure to turn off the power before extending the plug-in board using the extension board.

Indication at the Top Right on the Viewfinder Screen

In adjustment on the setup menu, bars sometimes appear at the top right on the viewfinder screen. The bars indicate the current setting state and adjustable range for the selected item.

Screen Mode Setting

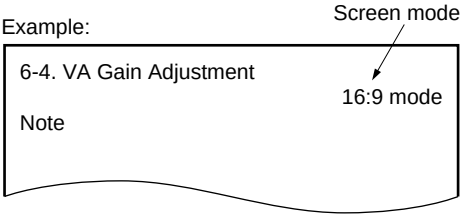
Sets the screen mode as follows before performing the adjustment of the each page.

1. Setup menu
   PAGE : E14∗WIDE SCREEN
   ITEM : 16:9/4:3 MODE

2. Sets the screen mode as in the each page.
   Note
   Some adjustment steps do not give the description of screen mode. In this case, you can select either 16:9 or 4:3 mode during adjustment.

   Screen mode
   4:3 : Perform adjustment after switched to the 4:3 mode.
   16:9 : Perform adjustment after switched to the 16:9 mode.
   16:9 and 4:3 : Perform adjustment after switched first to the 16:9 mode. Upon completion of adjustment in the 16:9 mode, perform adjustment in the 4:3 mode.

Example:



4-1-2. Equipment/Fixtures

- Oscilloscope
  Tektronix 2465 or equivalent
- Waveform/Vector monitor
  Tektronix 1780R/1751 or equivalent
- Color Monitor
  Sony BVM-1410/1411P or equivalent
- Black and white monitor

- Pattern box (PTB-500, 90 - 240 Vac)
  J-6029-140-B
- Grayscale chart (4:3)
  Transparent type : J-6026-130-A
  Reflective type : Commercially available on market (Refer to section 4-1-4.)
- Grayscale chart (16:9)
  Transparent type : J-6394-080-A

4-1-3. Initial Setting for Switches

Execute the camera system alignment by entering the engineer mode of the setup menu. When the engineer mode is entered, set switches as follows.
For details on the setup menu, refer to Section 3.

1. Set the POWER switch to off.
2. While holding down the rotary encoder, turn the power ON.

Note
When an item is adjusted in the engineer mode, the value of this item adjusted in the user mode is reset to 0.

Initial Setting

Before performing adjustment, set switches as follows, If the setting of the GAIN switch is changed from the factory set value, reset it to its original value by referring to the operation manual.

Inside panel :

VTR SAVE/STBY switch	→ STBY
GAIN switch	→ L (0 dB)
OUTPUT/DCC switch	→ CAM/OFF
MENU ON/OFF/PAGE switch	→ OFF
WHITE BAL switch	→ PRST

Front panel :

SHUTTER switch	→ OFF
Filter selector	→ 1B

Lens :

LENS	→ MANU
IRIS	→ (CLOSE)

Setup menu :

- E06∗MASTER GAIN
  - LOW → 0 dB
  - MID → 9 dB
  - HIGH → 18 dB
- E12∗FUNCTION 1/2
  - TEST OUT → ENC
  - DETAIL → ON
  - APERTURE → ON
  - SKIN TONE DETAIL → OFF
  - MATRIX → OFF
  - GAMMA → ON
  - BLACK GAMMA → ON
  - TEST SAW → OFF
  - CHROMA → ON
  - CROSS COLOR FLT. → OFF
- E13∗FUNCTION 2/2
  - GENLOCK → ON
  - CAM RET → OFF
  - FILTER INHBIT → ON
- E21∗LEVEL 4
  - KNEE SATURATION → 0
  - KNEE → ON
  - WHITE CLIP → ON
- E22∗LEVEL 5
  - R-Y → ON
  - B-Y → ON

4-1-4. Maintaining the Grayscale Chart

For the VA gain adjustment, using an 89.9 %-reflective grayscale chart is preferable.
If a reflective chart is not available, use a well-maintained pattern box and a transparent grayscale chart for adjustment.
Before beginning adjustment, set the illumination of the light source (or the luminous intensity on the chart surface) properly proceeding as follows and set the color temperature to 3200 K exactly by adjusting light.

Information on the Reflective Grayscale Chart

Recommended chart

The reflective grayscale chart is commercially available.

Recommended chart: Reflective grayscale chart (with a special case)
MURAKAMI COLOR RESEARCH LABORATORY GS-3 or equivalent

Supplier: MURAKAMI COLOR RESEARCH LABORATORY
Address: 3-11-3, Kachidoki, Chuo-ku, Tokyo, JAPAN
Postcode 104-0054
Phone: 81-3-3532-3011
Fax: 81-3-3532-2056

Handling precautions

- Do not touch the chart's surface.
- Do not subject the surface to dirt, scratches or prolonged exposure to sunlight.
- Protect the chart from excess moisture and harmful gas.
- Avoid resting articles against the case.
- Open the case and dry the chart more an hour for a month in no use long period.

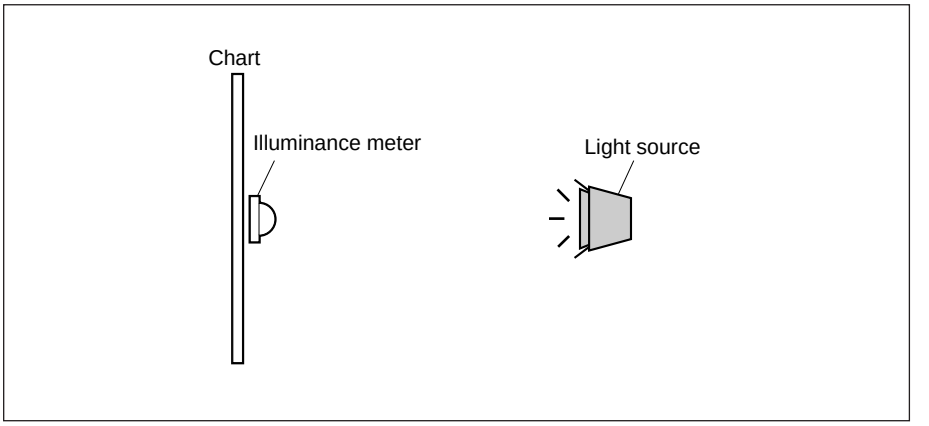
Replacement period when the chart is used as the reference

The reflective grayscale chart should be replaced every two years if it used as the reference. Because the chart deteriorates with time and proper adjustment cannot be achieved.
Replacement period varies according to storage conditions of the chart.

Setting Illumination (when the reflective chart is used)

Equipment: Illuminance meter (Calibrated)

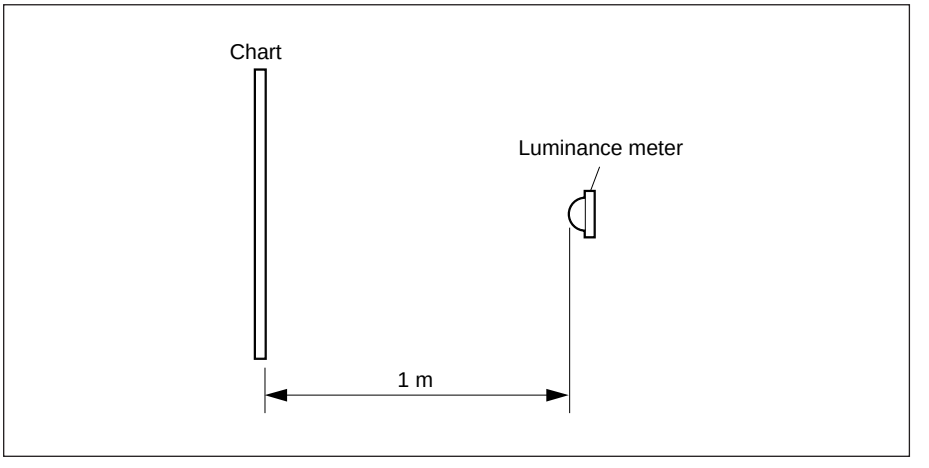
1. Turn on the light source and warm up for about 30 minutes.
2. Place the illuminance meter on the chart surface.
   Adjust the position and angle of the light source so that the whole surface of the chart is evenly 2000 lx.
   Note
   Light the chart from almost the same direction and height as the camera to shoot the chart.



Setting Luminous Intensity (when the transparent chart is used)

Equipment: Luminance meter (Minolta LS-110 or equivalent. Calibrated.)

1. Light the pattern box and warm up for about 30 minutes.
2. Place the pattern box where the chart is not exposed to light, such as a darkroom.
   (Or cover the pattern box with a cover whose inside is painted in black.)
3. Place the luminance meter facing straight to the chart at a distance of 1 m from it.
4. Adjust the luminance control of the pattern box so that the white portion in the center of the chart is 573 ±6 cd/m^2.
   Note
   This corresponds to the luminous intensity on the 89.9 %-reflective chart at 2000 lx.



4-2. ENC Level Adjustment

16:9 and 4:3 modes

Preparation

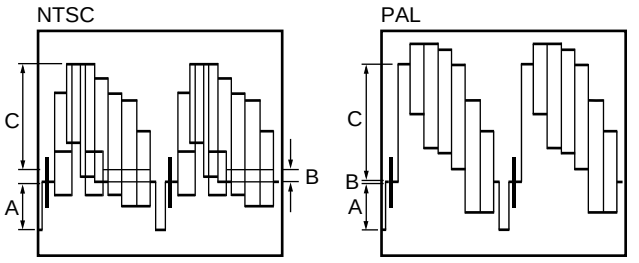
- OUTPUT/DCC switch (inside panel) → BARS
- On the setup menu, set as follows.
  PAGE : E23∗LEVEL 6
  ITEM : TEST OUT → ENC

Adjustment Procedure

Equipment : Waveform monitor
Test point : VIDEO OUT connector

1. Select the 16:9 mode.
   PAGE : E14∗WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 16:9

2. On the setup menu, adjust as follows.
   PAGE : E23∗LEVEL 6
   ITEM : ENC Y SYNC
   Spec. : A = 40 ±1 IRE (NTSC)
   A = 300 ±7 mV (PAL)



3. On the setup menu, adjust as follows.
   PAGE : E23∗LEVEL 6
   ITEM : ENC Y SETUP
   Spec. : B = 7.5 ±0.5 IRE (NTSC)
   B = 0 ±3 mV (PAL)

4. On the setup menu, adjust as follows.
   PAGE : E23∗LEVEL 6
   ITEM : ENC Y LEVEL
   Spec. : C = 100 ±2 IRE (NTSC)
   C = 700 ±14 mV (PAL)

5. Select the 4:3 mode.
   PAGE : E14∗WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 4:3

6. On the setup menu, adjust as follows.
   PAGE : E23∗LEVEL 6
   ITEM : ENC Y LEVLE (4:3)
   Spec. : C = 100 ±2 IRE (NTSC)
   C = 700 ±14 mV (PAL)

4-3. TEST OUT Level Adjustment

16:9 and 4:3 mode

Preparation

- OUTPUT/DCC switch (inside panel) → BARS
- On the setup menu, set as follows.
  PAGE : E23∗LEVEL 6
  ITEM : TEST OUT → R, G or B

Adjustment Procedure

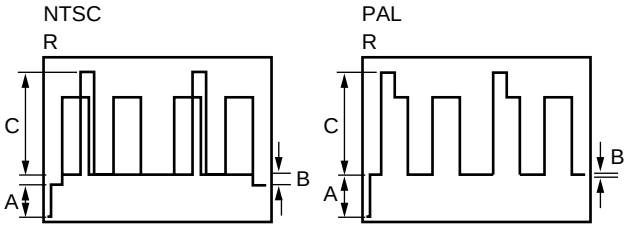
Equipment : Waveform monitor
Test point : TEST OUT connector

1. Select the 16:9 mode.
   PAGE : E14∗WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 16:9

2. On the setup menu, adjust as follows.
   PAGE : E23∗LEVEL 6
   ITEM : RGB SYNC
   Spec. : A = 40 ±2 IRE (NTSC)
   A = 300 ±14 mV (PAL)

3. On the setup menu, adjust as follows.
   PAGE : E23∗LEVEL 6
   ITEM : RGB SETUP
   Spec. : B = 7.5 ±0.5 IRE (NTSC)
   B = 0 ± 3 mV (PAL)

4. On the setup menu, adjust as follows.
   PAGE : E23∗LEVEL 6
   ITEM : RGB LEVEL
   Spec. : C = 100 ±2 IRE (NTSC)
   C = 700 ±14 mV (PAL)



5. Select the 4:3 mode.
   PAGE : E14∗WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 4:3

6. On the setup menu, adjust as follows.
   PAGE : E23∗LEVEL 6
   ITEM : RGB LEVEL
   Spec. : C = 100 ±2 IRE (NTSC)
   C = 700 ±14 mV (PAL)

Setting After Adjustment

- On the setup menu, set as follows.
  PAGE : E23∗LEVEL 6
  ITEM : TEST OUT → ENC

4-4. VA Gain Adjustment

16:9 mode

Note

- Use an 89.9%-reflective chart (Reflection rate: 89.9 %) in this adjustment as possible. (Refer to Section 4-1-4.)
- If a “16:9” chart is not keep on hand, shoot a “4:3” chart so that the chart width is aligned with the underscanned monitor frame.

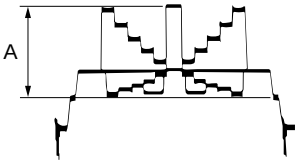
Preparation

- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.
- WHITE BAL switch (inside panel) → PRST
- AUTO W/B BAL switch (front panel) → BLK (Perform the automatic black balance adjustment.)
- On the setup menu, set as follows.
  PAGE : E35∗PRESET WHT
  ITEM : COLOR TEMP <P> : 3200
  ITEM : R GAIN <P> : 0
  ITEM : B GAIN <P> : 0

Adjustment Procedure

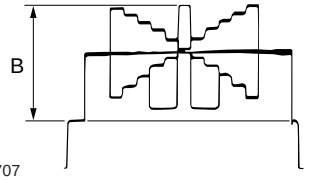
1. Select the 16:9 mode.
   PAGE : E14∗WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 16:9

2. Equipment : Oscilloscope
   Test point : TP1/VA-191
   Setting point : ⊘ Lens IRIS
   Spec. : A = 320 ±8 mV



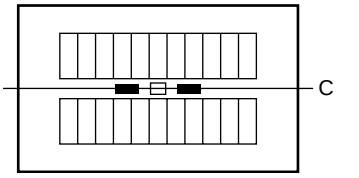
3. On the setup menu, set as follows.
   PAGE : E12∗FUNCTION 1/2
   ITEM : TEST OUT → G

4. Equipment : Waveform monitor
   Test point : TEST OUT connector
   Adj. point : ⊘RV201/VA-191 (G GAIN)
   Spec. : B = 100 ±2 IRE (NTSC)
   B = 700 ±10 mV (PAL)



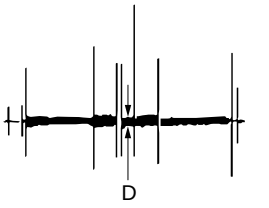
5. On the setup menu, set as follows.
   PAGE : E12∗FUNCTION 1/2
   ITEM : TEST OUT → ENC
   ITEM : GAMMA → OFF

6. Select portion C by using the waveform monitor.



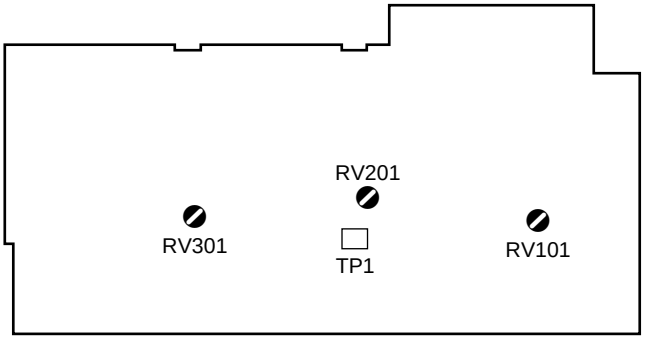
7. Set the waveform monitor to the CHROMA mode.

8. Equipment : Waveform monitor
   Test point : TEST OUT connector
   Adj. point : ⊘RV101/VA-191 (R GAIN)
   ⊘RV301/VA-191 (B GAIN)
   Spec. : Minimize carrier leakage D by using the variable resistors alternately.



Setting After Adjustment

- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : GAMMA → ON



VA-191 Board (A side)

4-5. White Shading Adjustment

Note

This adjustment could not be correctly perfomed if the uneven white pattern is used, luminance is not correct, or lens iris and lens zoom are not in good conditions.

16:9 mode

Preparation

- Lens IRIS → AUTO
- Shoot a fully occupied white area of pattern box in the underscanned monitor frame.
- Waveform monitor setting
  LUM mode
  VOLT FULL SCALE range → 0.5

Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

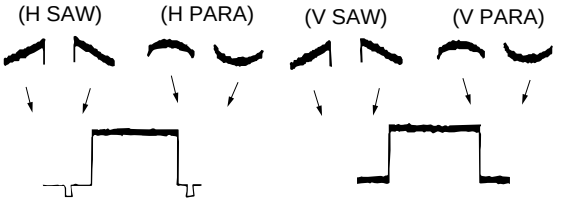
1. Select the 16:9 mode.
   PAGE : E14⁎WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 16:9

2. On the setup menu, set as follows.
   PAGE : E30⁎W-SHADING G
   ITEM : TEST OUT → G

3. Make the waveform flat by setup menu according to the table below.

4. Adjust the shading for R and B channels in the same way.

	TEST OUT	H SAW	V SAW	H PARA	V PARA
G			E30⁎W-SHADING_G		
	TEST OUT → G	H SAW	V SAW	H PARA	V PARA
R			E31⁎W-SHADING_R		
	TEST OUT → R	H SAW	V SAW	H PARA	V PARA
B			E32⁎W-SHADING_B		
	TEST OUT → B	H SAW	V SAW	H PARA	V PARA



5. Select the lens extender and adjust in the same way.

	TEST OUT	H SAW	V SAW	H PARA	V PARA
G			E30⁎W-SHADING G		
	TEST OUT → G	H SAW (EXT)	V SAW (EXT)	H PARA (EXT)	V PARA (EXT)
R			E31⁎W-SHADING R		
	TEST OUT → R	H SAW (EXT)	V SAW (EXT)	H PARA (EXT)	V PARA (EXT)
B			E32⁎W-SHADING B		
	TEST OUT → B	H SAW (EXT)	V SAW (EXT)	H PARA (EXT)	V PARA (EXT)

Setting After Adjustment

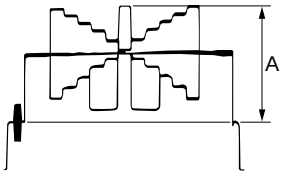
- On the setup menu, set as follows.
  PAGE : E32⁎W-SHADING B
  ITEM : TEST OUT → ENC

4-6. Gamma Correction Adjustment

16:9 mode

Preparation

- Lens IRIS → MAN
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘ Lens IRIS
  Spec. : A (white level) = 100 ±2 IRE (NTSC)
  A (white level) = 700 ±14 mV (PAL)



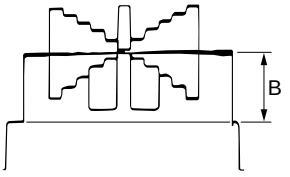
- On the setup menu, set as follows.
  PAGE : E24∗LEVEL 7
  ITEM : TEST OUT → G

Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

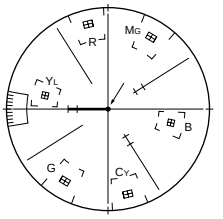
1. Select the 16:9 mode.
   PAGE : E14∗WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 16:9

2. On the setup menu, adjust as follows.
   PAGE : E21∗LEVEL 4
   ITEM : MASTER GAMMA
   Spec. : B = 63 ±2 IRE (NTSC)
   B = 420 ±14 mV (PAL)



3. On the setup menu, set as follows.
   PAGE : E12∗FUNCTON 1/2
   ITEM : TEST OUT → ENC
   ITEM : TEST SAW → ON

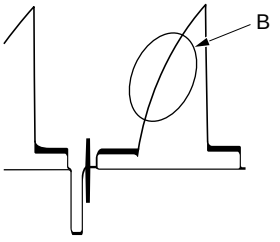
4. On the setup menu, adjust as follows.
   PAGE : E25∗LEVEL 8
   ITEM : R GAMMA
   Spec. : Position the illuminated spot at the center of the vector monitor.



5. On the setup menu, adjust as follows.
   PAGE : E25∗LEVEL 8
   ITEM : B GAMMA
   Spec. : Position the illuminated spot at the center of the vector monitor.

6. Repeat steps 4 and 5 several times, position the illuminated spot at the center of the vector monitor.

7. Make sure that the carrier leakage at the portion B is not observed.



Setting After Adjustment

- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : TEST SAW → OFF

4-7. Black Set Adjustment

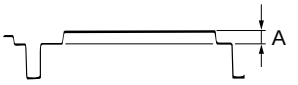
Preparation

- Lens IRIS → CLOSE
- On the setup menu, set as follows.
  PAGE : E24✻LEVEL 7
  ITEM : TEST OUT → G

Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. On the setup menu, adjust as follows.
   PAGE : E21✻LEVEL 4
   ITEM : MASTER BLACK
   Spec. : A = 10 ±1 IRE (NTSC)
   A = 20 ±7 mV (PAL)



Setting After Adjustment

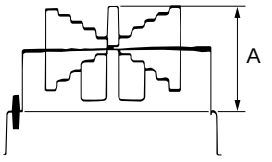
- On the setup menu, set as follows.
  PAGE : E24✻LEVEL 7
  ITEM : TEST OUT → ENC
- AUTO W/B BAL switch (front panel) → BLK
  (Perform the automatic black balance adjustment.)

4-8. Flare Adjustment

16:9 mode

Preparation

- On the setup menu, set as follows.
  PAGE : E24∗LEVEL 7
  ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘ Lens IRIS
  Spec. : Open the lens iris by one step from the reference setting (NTSC : A = 100 ± 2 IRE, PAL : A = 700 ± 14 mV).



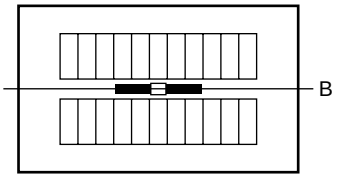
Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

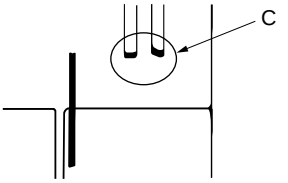
1. Select the 16:9 mode.
   PAGE : E14∗WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 16:9

2. On the setup menu, set as follows.
   PAGE : E24∗LEVEL 7
   ITEM : G FLARE → 0

3. Select portion B by using the waveform monitor.



4. On the setup menu, adjust as follows.
   PAGE : E24∗LEVEL 7
   ITEM : R FLARE
   Spec. : Minimize the carrier leakage at portion C



5. On the setup menu, adjust as follows.
   PAGE : E24∗LEVEL 7
   ITEM : B FLARE
   Spec. : Minimize the carrier leakage at portion C.

6. Repeat steps 4 and 5 several times.

4-9. Manual Knee and White Clip Adjustments

Preparation

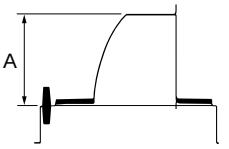
- OUTPUT/DCC switch (inside panel) → CAM/OFF
- WHITE BAL switch (inside panel) → PRST
- GAIN switch (inside panel) → M (9 dB)
- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : TEST SAW → ON
  PAGE : E21∗LEVEL 4
  ITEM : WHITE CLIP → OFF
  ITEM : KNEE → OFF

Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. On the setup menu, set as follows.
   PAGE : E21∗LEVEL 4
   ITEM : KNEE SLOPE → −99

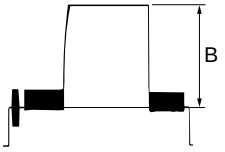
2. On the setup menu, adjust as follows.
   PAGE : E21∗LEVEL 4
   ITEM : KNEE POINT
   Spec. : A = 98 ±2 IRE (NTSC)
   A = 686 ±10 mV (PAL)



3. GAIN switch (inside panel) → H (18 dB)

4. On the setup menu, set as follows.
   PAGE : E21∗LEVEL 4
   ITEM : WHITE CLIP → ON
   ITEM : KNEE SLOPE → 99

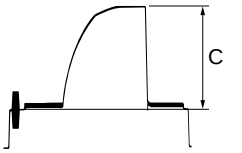
5. On the setup menu, adjust as follows.
   PAGE : E21∗LEVEL 4
   ITEM : WHT CLIP LEVEL
   Spec. : B = 109 ±2 IRE (NTSC)
   B = 763 ±10 mV (PAL)



6. GAIN switch (inside panel) → M (9 dB)

7. On the setup menu, set as follows.
   PAGE : E21∗LEVEL 4
   ITEM : WHITE CLIP → OFF

8. On the setup menu, adjust as follows.
   PAGE : E21∗LEVEL 4
   ITEM : KNEE SLOPE
   Spec. : C = 109 ±2 IRE (NTSC)
   C = 763 ±10 mV (PAL)



Setting After Adjustment

- GAIN switch (inside panel) → L (0 dB)
- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : TEST SAW → OFF
  PAGE : E21∗LEVEL 4
  ITEM : WHITE CLIP → ON

Note

The values used in the above adjustment are for the conditions that the white clip level is set to 109 IRE (763 mV). When the white clip level is set to a value other than 109 IRE (763 mV), use the following table to set the levels of the knee point and knee slope.

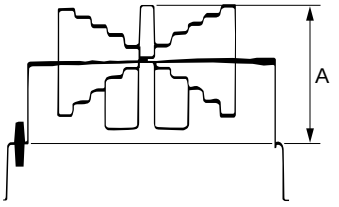
	WHITE CLIP LEVEL (Unit : IRE/mV)			
	109/763	**107/749**	**105/735**	**103/721**
KNEE PONT	98/686	96/686	96/672	96/672
KNEE SLOPE	109/763	107/750	107/750	107/750
WHITE CLIP	109/763	107/750	105/735	103/721

4-10. Crispening Adjustment (16:9)

16:9 mode

Preparation

- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : DETAIL → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘ Lens IRIS
  Spec. : A = 100 ±2 IRE (NTSC)
  A = 700 ±14 mV (PAL)



Adjustment Procedure

Equipment : Black and white monitor
Test point : TEST OUT connector

1. Select the 16:9 mode.
   PAGE : E14∗WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 16:9

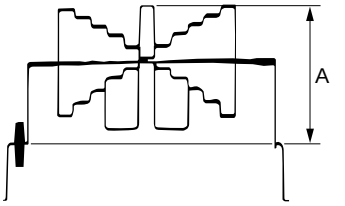
2. On the setup menu, adjust as follows.
   PAGE : E16∗LEVEL 1
   ITEM : CRISPENING
   Spec. : Reduce the noise at gray portion to a permissible level.

4-11. Level Depandent Adjustment (16:9)

16:9 mode

Preparation

- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : DETAIL → ON
  ITEM : TEST OUT → ENC
  PAGE : E16∗LEVEL 1
  ITEM : LVL DEPEND → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘ Lens IRIS
  Spec. : A = 100 ±2 IRE (NTSC)
  A = 700 ±14 mV (PAL)

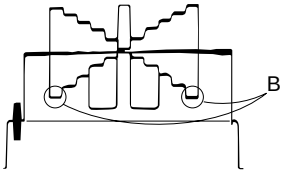


Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. Select the 16:9 mode.
   PAGE : E14∗WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 16:9

2. On the setup menu, adjust as follows.
   PAGE : E16∗LEVEL 1
   ITEM : L.DEP.LVL
   Spec. : Eliminate the detail signal from portion B.



Note

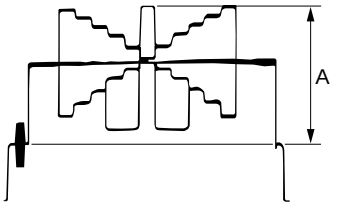
- After this adjustment, be sure to perform Section 4-12 “H/V Ratio Adjustment (16:9)”, and Section 4-13 “Detail Level Adjustment (16:9)”, in that order.

4-12. H/V Ratio Adjustment (16:9)

16:9 mode

Preparation

- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : DETAIL → ON
  ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘ Lens IRIS
  Spec. : A = 100 ±2 IRE (NTSC)
  A = 700 ±14 mV (PAL)

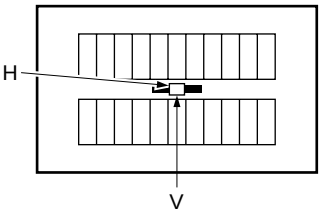


Adjustment Procedure

Equipment : Black and white monitor
Test point : TEST OUT connector

1. Select the 16:9 mode.
   PAGE : E14∗WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 16:9

2. On the setup menu, adjust as follows.
   PAGE : E16∗LEVEL 1
   ITEM : H/V RATIO
   Spec. : Adjust so that the H and V detail amounts which are added are equivalent.



4-13. Detail Level Adjustment (16:9)

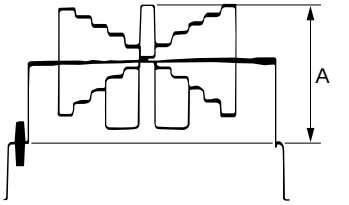
16:9 mode

Note

- Perform this adjustment, if necessary, to suit the customer's preferences.

Preparation

- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : DETAIL → ON
  ITEM : TEST OUT → ENC
- Shoot a grayscale chart (16:9) in the full underscan's picture frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘ Lens IRIS
  Spec. : A = 80 ±2 IRE (NTSC)
  A = 560 ±14 mV (PAL)



Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. Select the 16:9 mode.
   PAGE : E14∗WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 16:9

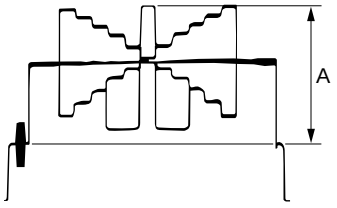
2. On the setup menu, adjust as follows.
   PAGE : E16∗LEVEL 1
   ITEM : DETAIL LVL (Factory setting: 0)
   Spec. : Adjust to the detail amount which is added to each step in the grayscale chart for the customer's preferences.

4-14. Crispening Adjustment (4:3)

4:3 mode

Preparation

- On the setup menu, set as follows.
  PAGE : E12⁎FUNCTION 1/2
  ITEM : DETAIL → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (4:3) in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘ Lens IRIS
  Spec. : A = 100 ±2 IRE (NTSC)
  A = 700 ±14 mV (PAL)



Adjustment Procedure

Equipment : Black and white monitor
Test point : TEST OUT connector

1. Select the 4:3 mode.
   PAGE : E14⁎WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 4:3

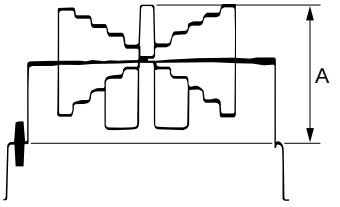
2. On the setup menu, adjust as follows.
   PAGE : E18⁎LEVEL 1#4:3
   ITEM : CRISPENING
   Spec. : Reduce the noise at gray portion to a permissible level.

4-15. Level Dependant Adjustment (4:3)

4:3 mode

Preparation

- On the setup menu, set as follows.
  PAGE : E12⁎FUNCTION 1/2
  ITEM : DETAIL → ON
  ITEM : TEST OUT → ENC
  PAGE : E18⁎LEVEL 1#4:3
  ITEM : LVL DEPEND → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (4:3) in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘ Lens IRIS
  Spec. : A = 100 ±2 IRE (NTSC)
  A = 700 ±14 mV (PAL)

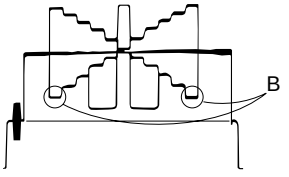


Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. Select the 4:3 mode.
   PAGE : E14⁎WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 4:3

2. On the setup menu, adjust as follows.
   PAGE : E18⁎LEVEL 1#4:3
   ITEM : LEVEL DEPEND
   Spec. : Eliminate the detail signal from portion B.



Note

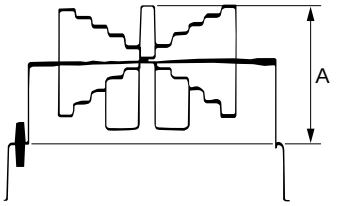
- After this adjustment, be sure to perform Section 4-16 “H/V Ratio Adjustment (4:3)”, and Section 4-17 “Detail Level Adjustment (4:3)”, in that order.

4-16. H/V Ratio Adjustment (4:3)

4:3 mode

Preparation

- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : DETAIL → ON
  ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (4:3) in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘ Lens IRIS
  Spec. : A = 100 ±2 IRE (NTSC)
  A = 700 ±14 mV (PAL)

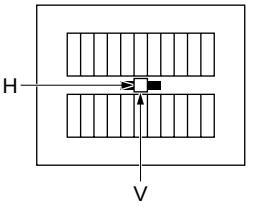


Adjustment Procedure

Equipment : Black and white monitor
Test point : TEST OUT connector

1. Select the 4:3 mode.
   PAGE : E14∗WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 4:3

2. On the setup menu, adjust as follows.
   PAGE : E18∗LEVEL 1#4:3
   ITEM : H/V RATIO
   Spec. : Adjust so that the H and V detail amounts which are added are equivalent.



4-17. Detail Level Adjustment (4:3)

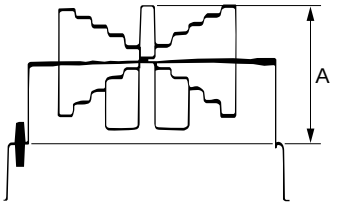
4:3 mode

Note

- Perform this adjustment, if necessary, to suit the customer's preferences.

Preparation

- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : DETAIL → ON
  ITEM : TEST OUT → ENC
- Shoot a grayscale chart (4:3) in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘ Lens IRIS
  Spec. : A = 80 ±2 IRE (NTSC)
  A = 560 ±14 mV (PAL)



Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. Select the 4:3 mode.
   PAGE : E14∗WIDE SCREEN
   ITEM : 16:9/4:3 MODE → 4:3

2. On the setup menu, adjust as follows.
   PAGE : E18∗LEVEL 1#4:3
   ITEM : DETAIL LVL (Factory setting: 0)
   Spec. : Adjust the detail amount which is added to each step in the grayscale chart for the customer's preferences.

4-18. Skin Tone Adjustment

Note

- Perform this adjustment, if necessary, to suit the customer's preferences.

Preparation

- On the setup menu, set as follows.
  PAGE : E20⁎LEVEL 3
  ITEM : SKIN TONE DETAIL → ON
  ITEM : SKIN TONE IND. → ON
- Shoot a person's face.

Adjustment Procedure

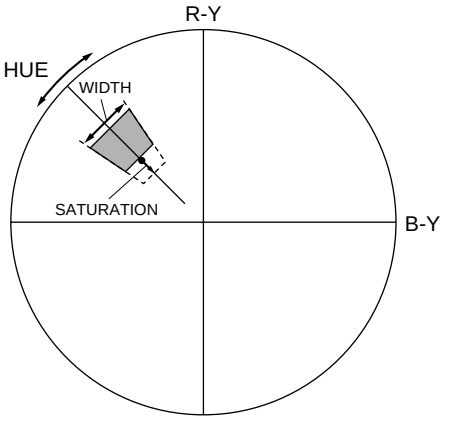
Equipment : Any of color monitor, viewfinder or waveform/vector monitor.
Test point : TEST OUT or VIDEO OUT connector

1. Shoot a person's face in the central of the viewfinder.

2. On the setup menu, set as follows.
   PAGE : E20⁎LEVEL 3
   ITEM : SKIN TONE DET. → ?EXEC

3. Push the rotary encoder.
   (The detection area is displayed in a zebra pattern.)

4. Perform the adjustment in this step, if neccessary.
   On the setup menu, adjust as follows.
   PAGE : E20⁎LEVEL 2
   ITEM : SATURATION
   (Component in the saturation direction)
   HUE (Hue)
   WIDTH
   (Component in the hue direction)



   The skin detail detection area is displayed in a zebra pattern.
   Adjust so that zebra pattern displays only proper area.

5. On the setup menu, adjust as follows.
   PAGE : E20⁎LEVEL 3
   ITEM : SUPPRESS LEVEL (Factory setting: 0)
   Spec. : Set the level to the desired detail level.

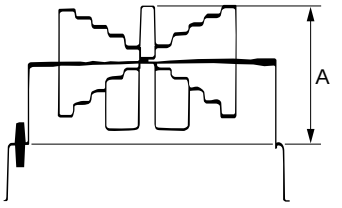
Setting After Adjustment

- On the setup menu, set as follows.
  PAGE : E20⁎LEVEL 3
  ITEM : SKIN TONE DETAIL → OFF
  ITEM : SKIN TONE IND. → OFF
  ITEM : SKIN TONE DET. → OFF

4-19. Zebra Adjustment

Preparation

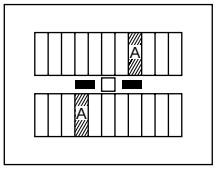
- ZEBRA switch (viewfinder) → ON
- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : TEST OUT → R, G or B
  PAGE : E15∗VF SETTING
  ITEM : ZEBRA SELECT → 1
  ITEM : ZEBRA1 APT. LVL → l%
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ◓ Lens IRIS
  Spec. : A = 100 ±2 IRE (NTSC)
  A = 700 ±14 mV (PAL)



Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. On the setup menu, adjust as follows.
   PAGE : E15∗VF SETTING
   ITEM : ZEBRA1 DET. LVL
   Spec. : Set the condition that zebra pattern appears at the portions A.



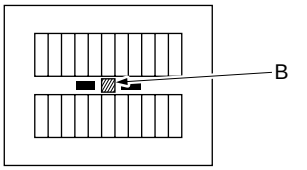
2. On the setup menu, set as follows.
   PAGE : E12∗FUNCTION 1/2
   ITEM : TEST SAW → ON

3. On the setup menu, adjust as follows.
   PAGE : E15∗VF SETTING
   ITEM : ZEBRA1 APT (Factory setting: 10%)
   Spec. : Adjust for the desired width of detection.

4. On the setup menu, set as follows.
   PAGE : E12∗FUNCTION 1/2
   ITEM : TEST SAW → OFF

5. On the setup menu, set as follows.
   PAGE : E15∗VF SETTING
   ITEM : ZEBRA SELECT → 2

6. On the setup menu, adjust as follows.
   PAGE : E15∗VF SETTING
   ITEM : ZEBRA2 DET. LVL
   Spec. : Set the condition that zebra pattern appears at the portion B.



Setting After Adjustment

- On the setup menu, set as follows.
  PAGE : E15∗VF SETTING
  ITEM : ZEBRA SELECT → 1
  PAGE : E12∗FUNCTION 1/2
  ITEM : TEST OUT → ENC

4-20. Automatic Iris Adjustment

16:9 mode

Preparation

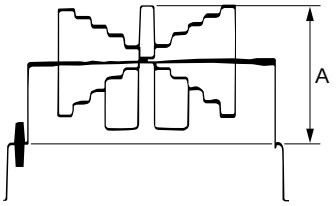
- On the setup menu, set as follows.
  PAGE : E24∗LEVEL 7
  ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.
- Lens IRIS → AUTO

Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. On the setup menu, adjust as follows.
   PAGE : E29∗LEVEL 12
   ITEM : IRIS MODE
   Spec. : Set depending on the application. (Automatic iris operation mode setting can be done from the average level to peak-to-peak level of the video signal.)
   IRIS MODE = MIN → peak-to-peak level
   IRIS MODE = MAX → average level

2. On the setup menu, adjust as follows.
   PAGE : E29∗LEVEL 12
   ITEM : IRIS SET
   Spec. : A = 100 ±2 IRE (NTSC)
   A = 700 ±14 mV (PAL)



3. On the setup menu, set as follows.
   PAGE : E29∗LEVEL 12
   ITEM : IRIS WEIGHT → 0 (MIN)

4. Shoot an area where the auto iris is not wanted to work in the white window chart.

5. On the setup menu, adjust as follows.
   PAGE : E29∗LEVEL 12
   ITEM : IRIS WEIGHT
   Spec. : Increment the IRIS WEIGHT value until the lens iris is open.

6. On the setup menu, adjust as follows.
   PAGE : E29∗LEVEL 12
   ITEM : IRIS SPEED (Factory setting: 2)
   Spec. : Adjust for the desired operation speed of auto iris.

7. On the setup menu, set as follows.
   PAGE : E29∗LEVEL 12
   ITEM : CLIP HIGH LIGHT → ON or OFF
   Spec. : Set the AUTO iris level to the customer's specifications.

Section 5
Camera System Electrical Alignment
(Only for DVW-707/707P)

5-1. General Information for Electrical Adjustment

This section describes adjustments that are required when lens is attached or replaced.

5-1-1. Note for Adjustment

Before adjustment, set the main POWER switch to on and the VTR switch to SAVE, then warm up the camera for about 10 minutes.
Be sure to turn off the power before extending the plug-in board using the extension board.

Indication at the Top Right on the Viewfinder Screen

In adjustment on the setup menu, bars sometimes appear at the top right on the viewfinder screen. The bars indicate the current setting state and adjustable range for the selected item.

5-1-2. Equipment/Fixtures

- Oscilloscope
  Tektronix 2465 or equivalent
- Waveform/Vector monitor
  Tektronix 1780R/1751 or equivalent
- Color Monitor
  Sony BVM-1410/1411P or equivalent
- Black and white monitor

- Pattern box (PTB-500, 90 - 240 Vac)
  J-6029-140-B
- Grayscale chart (4:3)
  Transparent type : J-6026-130-A
  Reflective type : Commercially available on market
  (Refer to section 5-1-4.)

5-1-3. Initial Setting for Switches

Execute the camera system alignment by entering the engineer mode in the setup menu. When the engineer mode is entered, set switches as follows.
For details on the setup menu, refer to Section 3.

1. Set the POWER switch to off.
2. While holding down the rotary encoder, turn the power ON.

Note

When an item is adjusted in the engineer mode, the value of this item adjusted in the user mode is reset to 0.

Initial Setting

Before performing adjustment, set switches as follows, If the setting of the GAIN switch is changed from the factory set value, reset it to its original value by referring to the operation manual.

Inside panel :
- VTR SAVE/STBY switch → STBY
- GAIN switch → L (0 dB)
- OUTPUT/DCC switch → CAM/OFF
- MENU ON/OFF/PAGE switch → OFF
- WHITE BAL switch → PRST

Front panel :
- SHUTTER switch → OFF
- Filter selector → 1

Lens :
- LENS → MANU
- IRIS → C (CLOSE)

Setup menu :
- E06∗MASTER GAIN
  - LOW → 0 dB
  - MID → 9 dB
  - HIGH → 18 dB
- E12∗FUNCTION 1/2
  - TEST OUT → ENC
  - DETAIL → ON
  - APERTURE → ON
  - SKIN TONE DETAIL → OFF
  - MATRIX → OFF
  - GAMMA → ON
  - BLACK GAMMA → ON
  - TEST SAW → OFF
  - CHROMA → ON
  - CROSS COLOR FLT. → OFF
- E13∗FUNCTION 2/2
  - GENLOCK → ON
  - CAM RET → OFF
  - FILTER INHIBIT → ON
- E21∗LEVEL 4
  - KNEE SATURATION → 0
  - KNEE → ON
  - WHITE CLIP → ON
- E22∗LEVEL 5
  - R-Y → ON
  - B-Y → ON

5-1-4. Maintaining the Grayscale Chart

For the VA gain adjustment, using an 89.9 %-reflective grayscale chart is preferable.
If a reflective chart is not available, use a well-maintained pattern box and a transparent grayscale chart for adjustment.
Before beginning adjustment, set the illumination of the light source (or the luminous intensity on the chart surface) properly proceeding as follows and set the color temperature to 3200 K exactly by adjusting light.

Information on the Reflective Grayscale Chart

Recommended chart

The reflective grayscale chart is commercially available.

Recommended chart: Reflective grayscale chart (with a special case)
MURAKAMI COLOR RESEARCH LABORATORY GS-3 or equivalent

Supplier: MURAKAMI COLOR RESEARCH LABORATORY
Address: 3-11-3, Kachidoki, Chuo-ku, Tokyo, JAPAN
Postcode 104-0054
Phone: 81-3-3532-3011
Fax: 81-3-3532-2056

Handling precautions

- Do not touch the chart's surface.
- Do not subject the surface to dirt, scratches or prolonged exposure to sunlight.
- Protect the chart from excess moisture and harmful gas.
- Avoid resting articles against the case.
- Open the case and dry the chart more an hour for a month in no use long period.

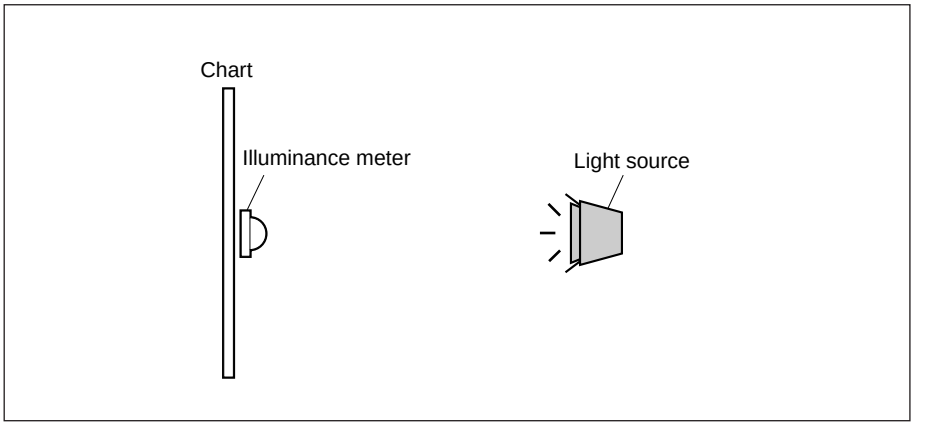
Replacement period when the chart is used as the reference

The reflective grayscale chart should be replaced every two years if it used as the reference. Because the chart deteriorates with time and proper adjustment cannot be achieved.
Replacement period varies according to storage conditions of the chart.

Setting Illumination (when the reflective chart is used)

Equipment: Illuminance meter (Calibrated)

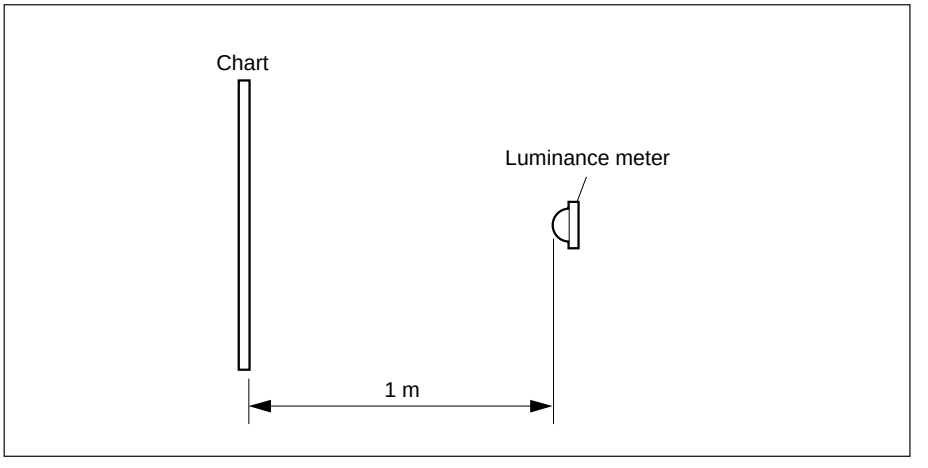
1. Turn on the light source and warm up for about 30 minutes.
2. Place the illuminance meter on the chart surface.
   Adjust the position and angle of the light source so that the whole surface of the chart is evenly 2000 lx.
   Note
   Light the chart from almost the same direction and height as the camera to shoot the chart.



Setting Luminous Intensity (when the transparent chart is used)

Equipment: Luminance meter (Minolta LS-110 or equivalent. Calibrated.)

1. Light the pattern box and warm up for about 30 minutes.
2. Place the pattern box where the chart is not exposed to light, such as a darkroom.
   (Or cover the pattern box with a cover whose inside is painted in black.)
3. Place the luminance meter facing straight to the chart at a distance of 1 m from it.
4. Adjust the luminance control of the pattern box so that the white portion in the center of the chart is 573 ± 6 cd/m^2.
   Note
   This corresponds to the luminous intensity on the 89.9 %-reflective chart at 2000 lx.



5-2. ENC Level Adjustment

Preparation

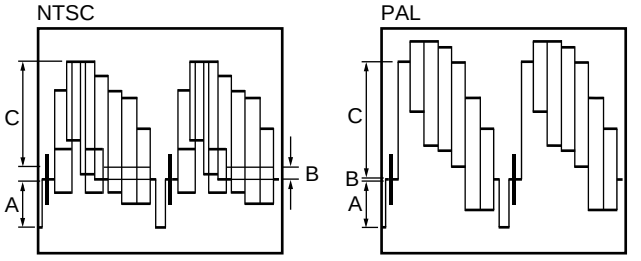
- OUTPUT/DCC switch (inside panel) → BARS
- On the setup menu, set as follows.
  PAGE : E23∗LEVEL 6
  ITEM : TEST OUT → ENC

Adjustment Procedure

Equipment : Waveform monitor
Test point : VIDEO OUT connector

1. On the setup menu, adjust as follows.
   PAGE : E23∗LEVEL 6
   ITEM : ENC Y SYNC
   Spec. : A = 40 ±1 IRE (NTSC)
   A = 300 ±7 mV (PAL)

2. On the setup menu, adjust as follows.
   PAGE : E23∗LEVEL 6
   ITEM : ENC Y SETUP
   Spec. : B = 7.5 ±0.5 IRE (NTSC)
   B = 0 ±3 mV (PAL)



3. On the setup menu, adjust as follows.
   PAGE : E23∗LEVEL 6
   ITEM : ENC Y LEVEL
   Spec. : C = 100 ±2 IRE (NTSC)
   C = 700 ±14 mV (PAL)

5-3. TEST OUT Adjustment

Preparation

- OUTPUT/DCC switch (inside panel) → BARS
- On the setup menu, set as follows.
  PAGE : E23∗LEVEL 6
  ITEM : TEST OUT → R, G or B

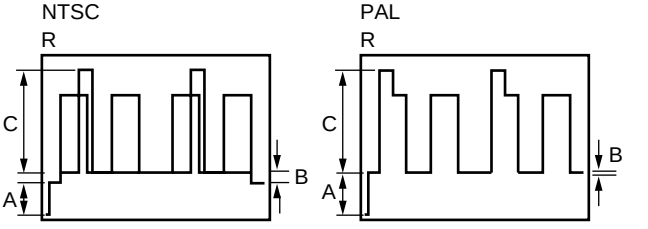
Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. On the setup menu, adjust as follows.
   PAGE : E23∗LEVEL 6
   ITEM : RGB SYNC
   Spec. : A = 40 ±2 IRE (NTSC)
   A = 300 ±14 mV (PAL)

2. On the setup menu, adjust as follows.
   PAGE : E23∗LEVEL 6
   ITEM : RGB SETUP
   Spec. : B = 7.5 ±0.5 IRE (NTSC)
   B = 0 ±3 mV (PAL)

3. On the setup menu, adjust as follows.
   PAGE : E23∗LEVEL 6
   ITEM : RGB LEVEL
   Spec. : C = 100 ±2 IRE (NTSC)
   C = 700 ±14 mV (PAL)



Setting After Adjustment

- On the setup menu, set as follows.
  PAGE : E23∗LEVEL 6
  ITEM : TEST OUT → ENC

5-4. VA Gain Adjustment

Note

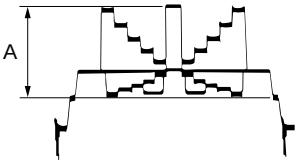
- Use an 89.9%-reflective chart in this adjustment as possible. (Refer to Section 5-1-4.)

Preparation

- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.
- WHITE BAL switch (inside panel) → PRST
- AUTO W/B BAL switch (front panel) → BLK (Perform the automatic black balance adjustment.)
- On the setup menu, set as follows.
  PAGE : E35∗PRESET WHT
  ITEM : COLOR TEMP <P> : 3200
  ITEM : R GAIN <P> : 0
  ITEM : B GAIN <P> : 0

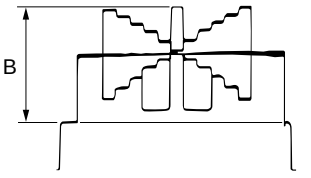
Adjustment Procedure

1. Equipment : Oscilloscope
   Test point : TP1/VA-191
   Setting point : ⊘Lens IRIS
   Spec. : A = 320 ±8 mV



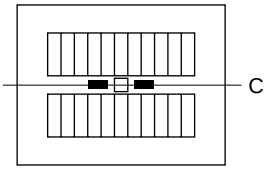
2. On the setup menu, set as follows.
   PAGE : E12∗FUNCTION 1/2
   ITEM : TEST OUT → G

3. Equipment : Waveform monitor
   Test point : TEST OUT connector
   Adj. point : ⊘RV201/VA-191 (G GAIN)
   Spec. : B = 100 ±2 IRE (NTSC)
   B = 700 ±10 mV (PAL)



4. On the setup menu, set as follows.
   PAGE : E12∗FUNCTION 1/2
   ITEM : TEST OUT → ENC
   ITEM : GAMMA → OFF

5. Select portion C by using the waveform monitor.



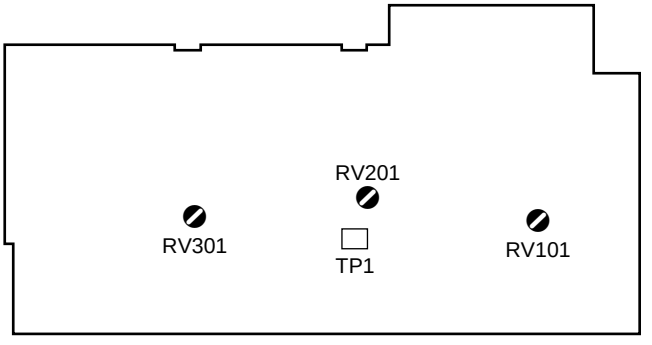
6. Set the waveform monitor to the CHROMA mode.

7. Equipment : Waveform monitor
   Test point : TEST OUT connector
   Adj. point : ⊘RV101/VA-191 (R GIAN)
   ⊘RV301/VA-191 (B GAIN)
   Spec. : Minimize carrier leakage D by using

the variable resistors alternately.

Setting After Adjustment

- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : GAMMA → ON



VA-191 Board (A side)

5-5. White Shading Adjustment

Note

- This adjustment could not be correctly performed if the uneven white patten is used, luminance is not correct, or lens iris and lena zoom are not in good conditions.

Preparation

- Lens IRIS → AUTO
- Shoot a fully occupied white area of pattern box in the underscanned monitor frame.
- Waveform monitor setting
  LUM mode
  VOLT FULL SCALE range → 0.5

Adjustment Procedure

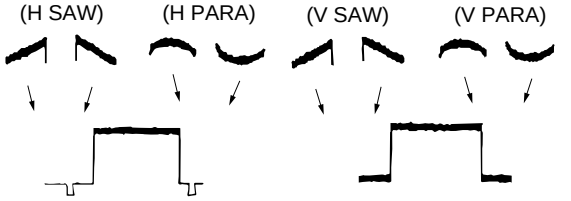
Equipment : Waveform monitor
Test point : TEST OUT connector

1. On the setup menu, set as follows.
   PAGE : E30⁎W-SHADING G
   ITEM : TEST OUT → G

2. Make the waveform flat by setup menu according to the table below.

3. Adjust the shading for R and B channels in the same way.

	TEST OUT	H SAW	V SAW	H PARA	V PARA
G			E30⁎W-SHADING_G		
	TEST OUT → G	H SAW	V SAW	H PARA	V PARA
R			E31⁎W-SHADING_R		
	TEST OUT → R	H SAW	V SAW	H PARA	V PARA
B			E32⁎W-SHADING_B		
	TEST OUT → B	H SAW	V SAW	H PARA	V PARA



4. Select the lens extender and adjust in the same way.

	TEST OUT	H SAW	V SAW	H PARA	V PARA
G			E30⁎W-SHADING G		
	TEST OUT → G	H SAW (EXT)	V SAW (EXT)	H PARA (EXT)	V PARA (EXT)
R			E31⁎W-SHADING R		
	TEST OUT → R	H SAW (EXT)	V SAW (EXT)	H PARA (EXT)	V PARA (EXT)
B			E32⁎W-SHADING B		
	TEST OUT → B	H SAW (EXT)	V SAW (EXT)	H PARA (EXT)	V PARA (EXT)

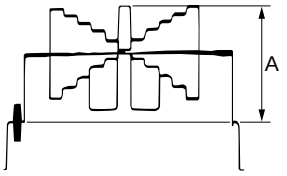
Setting After Adjustment

- On the setup menu, set as follows.
  PAGE : E32⁎W-SHADING B
  ITEM : TEST OUT → ENC

5-6. Gamma Correction Adjustment

Preparation

- Lens IRIS →MAN
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.
- Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘Lens IRIS
  Spec. : A (white level) = 100 ±2 IRE (NTSC)
  A (white level) = 700 ±14 mV (PAL)

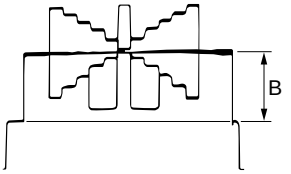


- On the setup menu, set as follows.
  PAGE : E24∗LEVEL 7
  ITEM : TEST OUT → G

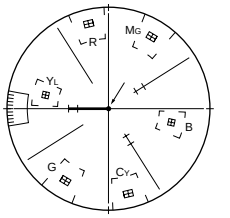
Adjustment Procedure

Equipment : Waveform monitor
Test point : VIDEO OUT connector

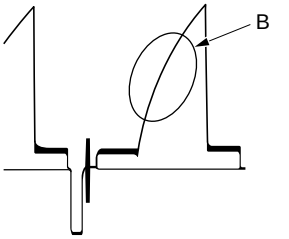
1. On the setup menu, adjust as follows.
   PAGE : E21∗LEVEL 4
   ITEM : MASTER GAMMA
   Spec. : B = 63 ±2 IRE (NTSC)
   B = 420 ±14 mV (PAL)



2. On the setup menu, set as follows.
   PAGE : E12∗FUNCTION 1/2
   ITEM : TEST OUT → ENC
   ITEM : TEST SAW → ON
3. On the setup menu, adjust as follows.
   PAGE : E25∗LEVEL 8
   ITEM : R GAMMA
   Spec. : Position the illuminated spot at the center of the vector monitor.



4. On the setup menu, adjust as follows.
   PAGE : E25∗LEVEL 8
   ITEM : B GAMMA
   Spec. : Position the illuminated spot at the center of the vector monitor.
5. Repeat steps 3 and 4 several times, position the illuminated spot at the center of the vector monitor.
6. Make sure that the carrier leakage at the portion B is not observed.



Setting After Adjustment

- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : TEST SAW → OFF

5-7. Black Set Adjustment

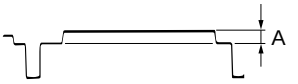
Preparation

- Lens IRIS → CLOSE
- On the setup menu, set as follows.
  PAGE : E24✻LEVEL 7
  ITEM : TEST OUT → G

Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. On the setup menu, adjust as follows.
   PAGE : E21✻LEVEL 4
   ITEM : MASTER BLACK
   Spec. : A = 10 ±1 IRE (NTSC)
   A = 20 ±7 mV (PAL)



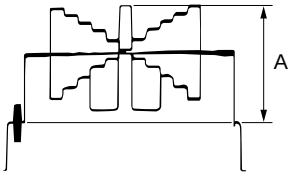
Setting After Adjustment

- On the setup menu, set as follows.
  PAGE : E24✻LEVEL 7
  ITEM : TEST OUT → ENC
- AUTO W/B BAL switch (front panel) → BLK
  (Perform the automatic black balance adjustment.)

5-8. Flare Adjustment

Preparation

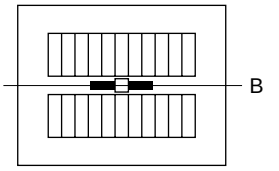
- On the setup menu, set as follows.
  PAGE : E24✻LEVEL 7
  ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘Lens IRIS
  Spec. : Open the iens iris by one step from the reference setting (NTSC : A = 100 ±2 IRE, PAL : A = 700 ±14 mV).



Adjustment Procedure

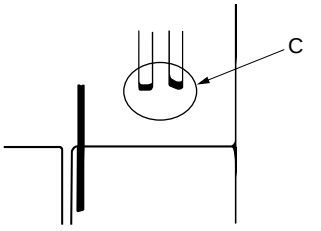
Equipment : Waveform monitor
Test point : TEST OUT connector

1. On the setup menu, set as follows.
   PAGE : E24✻LEVEL 7
   ITEM : G FLARE → 0



2. Select portion B by using the waveform monitor.

3. On the setup menu, adjust as follows.
   PAGE : E24✻LEVEL 7
   ITEM : R FLARE
   Spec. : Minimize the carrier leakage at portion C



4. On the setup menu, adjust as follows.
   PAGE : E24✻LEVEL 7
   ITEM : B FLARE
   Spec. : Minimize the carrier leakage at portion C.

5. Repeat steps 3 and 4 several times.

5-9. Manual Knee and White Clip Adjustments

Preparation

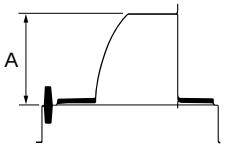
- OUTPUT/DCC switch (inside panel) → CAM/OFF
- WHITE BAL switch (inside panel) → PRST
- GAIN switch (inside panel) → M (9 dB)
- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : TEST SAW → ON
  PAGE : E21∗LEVEL 4
  ITEM : WHITE CLIP → OFF
  ITEM : KNEE → OFF

Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. On the setup menu, set as follows.
   PAGE : E21∗LEVEL 4
   ITEM : KNEE SLOPE → −99

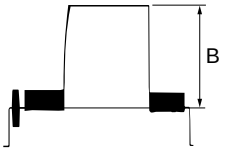
2. On the setup menu, adjust as follows.
   PAGE : E21∗LEVEL 4
   ITEM : KNEE POINT
   Spec. : A = 98 ±2 IRE (NTSC)
   A = 595 ±14 mV (PAL)



3. GAIN switch (inside panel) → H (18 dB)

4. On the setup menu, set as follows.
   PAGE : E21∗LEVEL 4
   ITEM : WHITE CLIP → ON
   ITEM : KNEE SLOPE → 99

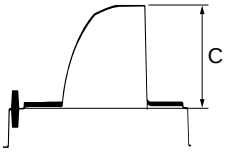
5. On the setup menu, adjust as follows.
   PAGE : E21∗LEVEL 4
   ITEM : WHT CLIP LEVEL
   Spec. : B = 107 ±2 IRE (NTSC)
   B = 735 ±10 mV (PAL)



6. GAIN switch (inside panel) → M (9 dB)

7. On the setup menu, set as follows.
   PAGE : E21∗LEVEL 4
   ITEM : WHITE CLIP → OFF

8. On the setup menu, adjust as follows.
   PAGE : E21∗LEVEL 4
   ITEM : KNEE SLOPE
   Spec. : C = 109 ±2 IRE (NTSC)
   C = 763 ±14 mV (PAL)



Setting After Adjustment

- GAIN switch (inside panel) → L (0 dB)
- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : TEST SAW → OFF
  PAGE : E21∗LEVEL 4
  ITEM : WHITE CLIP → ON

Note

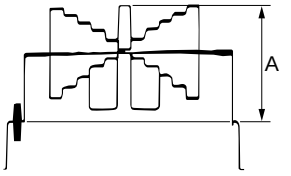
The values used in the above adjustment are for the conditions that the white clip level is set to 109 IRE (763 mV). When the white clip level is set to a value other than 109 IRE (763 mV), use the following table to set the levels of the knee point and knee slope.

	WHITE CLIP LEVEL (Unit : IRE/mV)			
	109/763	**107/749**	**105/735**	**103/721**
KNEE PONT	98/686	96/686	96/672	96/672
KNEE SLOPE	109/763	107/750	107/750	107/750
WHITE CLIP	109/763	107/750	105/735	103/721

5-10. Crispening Adjustment

Preparation

- On the setup menu, set as follows.
  PAGE : E12⁎FUNCTION 1/2
  ITEM : DETAIL → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘Lens IRIS
  Spec. : A = 100 ±2 IRE (NTSC)
  A = 700 ±14 mV (PAL)



Adjustment Procedure

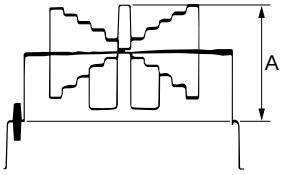
Equipment : Black and white monitor
Test point : TEST OUT connector

1. On the setup menu, adjust as follows.
   PAGE : E16⁎LEVEL 1
   ITEM : CRISPENING
   Spec. : Reduce the noise at gray portion to a permissible level.

5-11. Level Depandent Adjustment

Preparation

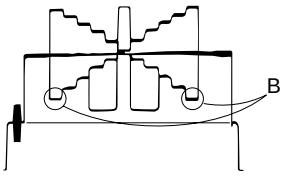
- On the setup menu, set as follows.
  PAGE : E12⁎FUNCTION 1/2
  ITEM : DETAIL → ON
  ITEM : TEST OUT → ENC
  PAGE : E16⁎LEVEL 1
  ITEM : LVL DEPEND → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘Lens IRIS
  Spec. : A = 100 ±2 IRE (NTSC)
  A = 700 ±14 mV (PAL)



Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. On the setup menu, adjust as follows.
   PAGE : E16⁎LEVEL 1
   ITEM : L.DEP.LVL
   Spec. : Eliminate the detail signal from portion B.



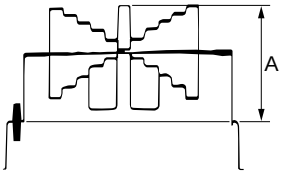
Note

- After this adjustment, be sure to perform Section 5-12 “H/V Ratio Adjustment”, and Section 5-13 “Detail Level Adjustment”, in that order.

5-12. H/V Ratio Adjustment

Preparation

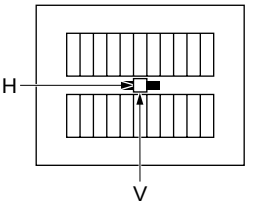
- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : DETAIL → ON
  ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘Lens IRIS
  Spec. : A = 100 ±2 IRE (NTSC)
  A = 700 ±14 mV (PAL)



Adjustment Procedure

Equipment : Black and white monitor
Test point : TEST OUT connector

1. On the setup menu, adjust as follows.
   PAGE : E16∗LEVEL 1
   ITEM : H/V RATIO
   Spec. : Adjust so that the H and V detail amounts which are added are equivalent.



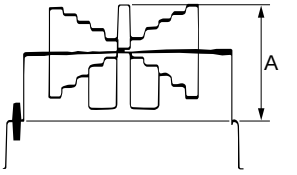
5-13. Detail Level Adjustment

Note

- Perform this adjustment, if necessary, to suit the customer's preferences.

Preparation

- On the setup menu, set as follows.
  PAGE : E12∗FUNCTION 1/2
  ITEM : DETAIL → ON
  ITEM : TEST OUT → ENC
- Shoot a grayscale chart in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘Lens IRIS
  Spec. : A = 80 ±2 IRE (NTSC)
  A = 560 ±14 mV (PAL)



Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. On the setup menu, adjust as follows.
   PAGE : E16∗LEVEL 1
   ITEM : DETAIL LVL (Factory setting : 0)
   Spec. : Adjust to the detail amount which is added to each step in the grayscale chart for the customer's preferences.

5-14. Skin Tone Adjustment

Note

• Perform this adjustment, if necessary, to suit the customer's preferences.

Preparation

• On the setup menu, set as follows.
  PAGE : E20∗LEVEL 3
  ITEM : SKIN TONE DETAIL → ON
  ITEM : SKIN TONE IND. → ON
• Shoot a person's face.

Adjustment Procedure

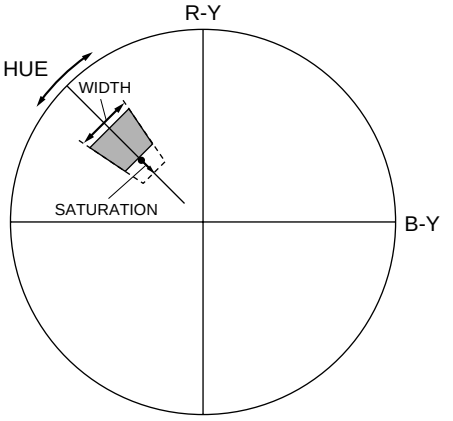
Equipment : Any of color monitor, viewfinder or waveform/vector monitor.
Test point : TEST OUT or VIDEO OUT connector

1. Shoot a person's face in the central of the viewfinder.

2. On the setup menu, set as follows.
   PAGE : E20∗LEVEL 3
   ITEM : SKIN TONE DET. → ?EXEC

3. Push the rotary encoder.
   (The detection area is displayed in a zebra pattern.)

4. Perform the adjustment in this step, if neccessary.
   On the setup menu, adjust as follows.
   PAGE : E20∗LEVEL 3
   ITEM : SATURATION
   (Component in the saturation detection)
   HUE (Hue)
   WIDTH
   (Component in the hue direction)



   The skin detail detection area is displayed in a zebra pattern.
   Adjust so that zebra pattern displays only proper area.

5. On the setup menu, adjust as follows.
   PAGE : E20∗LEVEL 3
   ITEM : SUPPRESS LEVEL (Factory setting : 0)
   Spec. : Set the level to the desired detail level.

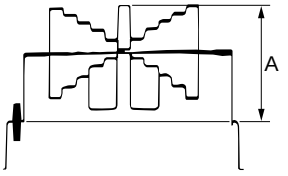
Setting After Adjustment

• On the setup menu, set as follows.
  PAGE : E20∗LEVEL 3
  ITEM : SKIN TONE DETAIL → OFF
  ITEM : SKIN TONE IND. → OFF
  ITEM : SKIN TONE DET. → OFF

5-15. Zebra Adjustment

Preparation

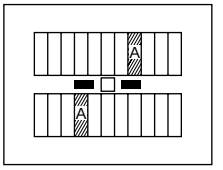
- ZEBRA switch (viewfinder) → ON
- On the setup menu, set as follows.
  PAGE : E12⁎FUNCTION 1/2
  ITEM : TEST OUT → R, G or B
  PAGE : E15⁎VF SETTING
  ITEM : ZEBRA SELECT → 1
  ITEM : ZEBRA1 APT. LVL → 1 %
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.
  Equipment : Waveform monitor
  Test point : TEST OUT connector
  Setting point : ⊘Lens IRIS
  Spec. : A = 100 ±2 IRE (NTSC)
  A = 700 ±14 mV (PAL)



Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. On the setup menu, adjust as follows.
   PAGE : E15⁎VF SETTING
   ITEM : ZEBRA1 DET. LVL
   Spec. : Set the condition that zebra pattern appears at the portions A.



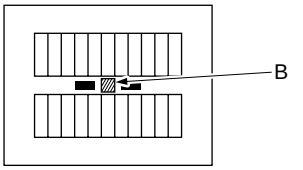
2. On the setup menu, set as follows.
   PAGE : E12⁎FUNCTION 1/2
   ITEM : TEST SAW → ON

3. On the setup menu, adjust as follows.
   PAGE : E15⁎VF SETTING
   ITEM : ZEBRA1 APT (Factory setting : 10 %)
   Spec. : Adjust for the desired width of detection.

4. On the setup menu, set as follows.
   PAGE : E12⁎FUNCTION 1/2
   ITEM : TEST SAW → OFF

5. On the setup menu, set as follows.
   PAGE : E15⁎VF SETTING
   ITEM : ZEBRA SELECT → 2

6. On the setup menu, adjust as follows.
   PAGE : E15⁎VF SETTING
   ITEM : ZEBRA2 DET. LVL
   Spec. : Set the condition that zebra pattern appears at the portion B.



Setting After Adjustment

- On the setup menu, set as follows.
  PAGE : E15⁎VF SETTING
  ITEM : ZEBRA SELECT → 1
  PAGE : E12⁎FUNCTION 1/2
  ITEM : TEST OUT → ENC

5-16. Automatic Iris Adjustment

Preparation

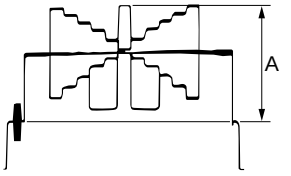
- On the setup menu, set as follows.
  PAGE : E24∗LEVEL 7
  ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.
- Lens IRIS → AUTO

Adjustment Procedure

Equipment : Waveform monitor
Test point : TEST OUT connector

1. On the setup menu, adjust as follows.
   PAGE : E29∗LEVEL 12
   ITEM : IRIS MODE
   Spec. : Set depending on the application. (Automatic iris operation mode setting can be done from the average level to peak-to-peak level of the video signal.)
   IRIS MODE = MIN → peak-to-peak level
   IRIS MODE = MAX → average level

2. On the setup menu, adjust as follows.
   PAGE : E29∗LEVEL 12
   ITEM : IRIS SET
   Spec. : A = 100 ±2 IRE (NTSC)
   A = 700 ±14 mV (PAL)



3. On the setup menu, set as follows.
   PAGE : E29∗LEVEL 12
   ITEM : IRIS WEIGHT → 0 (MIN)

4. Shoot an area where the auto iris is not wanted to work in the white window chart.

5. On the setup menu, adjust as follows.
   PAGE : E29∗LEVEL 12
   ITEM : IRIS WEIGHT
   Spec. : Increment the IRIS WEIGHT value until the lens iris is open.

6. On the setup menu, adjust as follows.
   PAGE : E29∗LEVEL 12
   ITEM : IRIS SPEED (Factory setting : 2)
   Spec. : Adjust for the desired operation speed of auto iris.

7. On the setup menu, set as follows.
   PAGE : E29∗LEVEL 12
   ITEM : CLIP HIGH LIGHT → ON or OFF
   Spec. : Set to the desired position.

Section 6
Block Diagrams and Circuit Description

6-1. Circuit Description

(1) Camera Processing Block (AD-155 board, DCP-17 board, ES-23 board)

AD-155 board

The AD-155 board consists of the A/D converter circuit that converts the RGB analog signals supplied from the CCD block to digital signal.
The analog RGB signals that are input from the CCD block, pass through the respective pre-filters in accordance with the WIDE and NORMAL sampling frequencies. Outputs of the pre-filters are converted to the 12-bit digital RGB signals of either 14 MHz (NORMAL) or 18 MHz (WIDE) by the A/D converters. The digital RGB signals are sent to the DCP-17 board.

DCP-17 board

The DCP-17 board consists of the following four blocks.

- The circuit block where the digital RGB signals that are supplied from the AD-155 board, receive digital signal processing, are converted to digital component signals and are then converted to analog component signals to be sent to the ES-23 board.
- The circuit block where the digital RGB signals that are supplied from the AD-155 board, receive digital signal processing, are converted to digital component signals to be sent to the VTR block in the form of digital signals.
- The driver block that adds characters to the analog composite signal supplied from the ES-23 board, and outputs the analog composite signals with characters.
- The signal processing block that converts the analog composite signals supplied from the ES-23 board to the analog VF signals, and then outputs the analog VF signals to viewfinder.

The digital RGB signal that are input from the AD-155 board, are sent to the shading correction IC where white shading detection, error detection/correction and feedback clamp detection processing are implemented.
At the same time, the white shading correction signals (R WSH, G WSH, B WSH) and the feedback clamp control signals (R FB, G FB, B FB) are sent to the CCD block. Simultaneously, the black shading correction signals (R BSH, G BSH, B BSH) are sent from the back shading correction signal generator circuit to the CCD block, and the test SAW signal is sent from the test SAW signal generator circuit to the CCD block.

The digital RGB signals that are output from the shading correction IC, are buffered by the BF-74 board then sent to the image enhancer IC where the digital RGB signals receive the 1H delay-line processing that generates the various detail signals which are sent to the process IC and other circuit via other signal path than that of the main line RGB signals.
This block contains the sync generator circuit that generates various sync signals.

The digital RGB signals that are output from the image enhancer IC, are sent to the process IC where the digital RGB signals take the following signal paths:

① Up-converted to either 28 MHz (NORMAL) or 36 MHz (WIDE)
② Matrix signal, aperture signal and detail signal are added.
③ Receive pedestal control, knee correction, gamma correction and white/black clip processing
④ Converted to the digital component signals (Y, R-Y, B-Y)

This block contains the built-in color-bar signal generator circuit and switching circuit between color-bar signal and main line signal, and the output circuit of the Y, R, G and B video signals for VF circuit where the video signal for VF circuit is D/A-converted and is sent to the viewfinder or the TEST OUT connector. The VF output circuit has the function that allows the monitor selection IC to switch video signals so that the video signal that is connected to the GENLOCK IN connector can be monitored or the RET video signal can be monitored on VF when CCU is connected.

The digital component signals that are output from the process IC, takes the two signal paths after passing through the RC-69 and RC-75 boards*1. One signal path is connected to the rate converter IC where the digital component signals are converted of the rate to 27 MHz and are sent to the DVP-17 board and the CI-21 board. The other signal path is connected to the D/A converter where the digital component signals are D/A converted and are sent to the ES-23 board as the analog component signals (Y, R-Y, B-Y).

*1 : As for the DVW-707/707P, the CN-1573 board is used.

Average value and peak value of the video signal that are detected by the process IC, are sent to the camera CPU through data bus.
The detected data is processed by the camera CPU and sent to the process IC and to the VA-191 board together with the SDA (CCD signal) or through data bus.

The control CPU implements various controls over the camera block in accordance with the instructions that are memorized in ROM. The control CPU interprets the function switch instructions, analog data etc., and outputs the various control signals. It also writes the status information and self-diagnostics information into the character generator, and outputs them as the character data.
The control CPU allows the RM-P9 (optional) and the VA-DN1 (optional) to be connected through external equipment RM-B150 (optional) or the conversion cable (optional).

ES-23 board

The ES-23 board consists of the following circuits.
- The circuit that encodes that composite signal from the analog component signals which are supplied by the D/A converter in the DCP-17 board.
- PLL circuit for subcarrier clock signal

Most adjustment controls are replaced by electronic controls that allow most of adjustments to be executed using the setup menu.
The ES-23 board contains the sync separator IC and others that synchronizes the entire system with the external input video signal which is input at the GENLOCK IN connector.

RC-69 board, RC-75 board (For DVW-790WS/790WSP/709WS/709WSP only)

The RC-69 board and RC-75 board consist of the circuit that converts signal rate of the digital component signals from the DCP-17 board, that of the VF video signal and that of the detail signal for VF video from the 18 MHz to the 13.5 MHz. The RC-69 board and RC-75 board has the built-in FIFO IC.

(2) RF Processing Block (DVP-17 board (1/3) and Drum assembly)

The Digital Betacam Camcorder records video and audio signals on the tape using the Digital Betacam format.
In a Digital Betacam studio VTR, one pair of heads with an azimuth angle in the opposite direction to each other record two tracks at a time by turns with another one pair of heads on the opposite side of the rotary drum every time the drum rotates by a half turn, and record one-field data every time the drum rotates by 1.5 turns (i.e., on six helical tracks).
As compared with that, to reduce an acoustic noise, the Digital Betacam Camcorder makes the drum rotation 1/2 time as small as the studio VTR and makes the number of heads two times (eight heads) as large. In other words, four-in-a-pair heads record data simultaneously on four tracks by the hour two times as long as usually.
The tape recorded in such a way can be directly played back by the studio VTR. To play back the tape by this VTR, however, eight PB heads are required. This system requires the time-base conversion (rate conversion) for REC/PB data. The RF Processing Block executes the time-base conversion.

In the REC mode, this block converts the two-channel parallel REC data sent from the Digital Processing Block (DVP-14 board) in rate into 1/2 and distributes it to four-channel serial REC data. In the PB mode, this block multiplexes four-channel serial PB data and converts it into the two-channel parallel PB data (CONF DATA) of the normal rate.
The RF processing block also encodes the control data sent from Control Blocks to an MPX signal, sends it to the Drum assembly to control REC/PB amplifiers.

(3) Digital Processing Block (DVP-14 board and DVP-17 board (2/3))

The data processing on the following four digital processor is performed under communication with the System Control CPU (DVP-17 board).

Digital Encoder Block (DVP-14 board)

This block adds VITC data to the parallel video data sent from the Camera Block, then compresses the obtained data into a data rate of approximately 1/2 by a bit rate reduction encoder. The compressed video data is sent to an ECC encoder where it is added to outer ECC data and is track-interleaved.
The serial audio data (ENCODE 1/2 and 3/4) from the DVP-17 board are also sent to the ECC encoder, where it is added to outer ECC data and is field-shuffled.
Then, the video data and audio data are multiplexed, inner ECC-encoded, and are sent to the rate converter IC on the DVP-17 board as two-channel parallel REC DATA.

Digital Decoder Block (DVP-14 board)

First, an inner ECC decoder inner-corrects the two-channel parallel PB data (CONF DATA) sent from the DVP-17 board after rate conversion, de-interleaves and multiplexes the two-channel data, then divides the multiplexed data into V DATA and V/A DATA and sends them to an outer ECC decoder.
In the outer ECC decoder, video data is outer-corrected, then sent to the video decoder block. Audio data is outer-corrected, then error-concealed, transfered the clock rate via FIFO memory, and sent to the audio data processor on the DVP-17 board in the form of serial audio data (CONF AU 1/2 and 3/4) two by two channels.
As for an NTSC system, this block controls the five-field sequence of audio PB data.

Video Decoder Block (DVP-14 board)

This block processes the outer-corrected video data by a bit rate reduction decoder so as to return it to the parallel video data based on the former data rate. Then, if the data contains an error that cannot be corrected by the ECC decoder, it is error-concealed via FIFO memory, and sent to the Camera Block.

Clock Generator Block (DVP-14 board)

The audio clock generator generates various timing signals that are phase-adjusted based on the clock pulse and color frame pulse from the Camera Block, and sends them to the Audio Processing Block, the Servo Control Block, and the Camera Adaptor as well as each board of the Digital Processing Block so as to control the timing of data processing.

Audio Processor Block (DVP-17 board)

The audio data processor takes in the data from the Camera Adaptor or the Audio Processing Block as REC audio data, processes the data as required, and sends it to the DVP-14 board. The audio data processor also processes the PB audio data from the DVP-14 board as required and sends it to the Camera Adaptor and Audio Processing Block. These data items are serial audio data two by two channels, respectively.

(4) Audio Processing Block (AXM-21 board (1/2), CNB-11 board (1/2), TC-101 board (1/2), MA-94 board and IF-716 board)

The audio processing block has the configuration of the input channels front/rear CH-1 and CH-2.
The unit has the AUDIO IN switches which select their input signals from either the LINE/MIC input signals (rear input) coming from the AUDIO IN CH-1/CH-2 connectors on the rear panel, or the camera MIC input signal (front MIC input) coming from the MIC IN connector on the front of the unit, to be recorded on tape.
The CH-3 and CH-4 input signals are menu-selectable from the followings:

- Records the same signals as CH-1 and CH-2 input.
- Forced-records the opposite of the CH-1 and CH-2 input signals. (i.e.; If the CH-1 and CH-2 record the FRONT MIC input signals, the rear input signals are automatically recorded to the CH-3 and CH-4.)
- Forced-records the front MIC input signal.
- Records nothing.

The selected input signal is A/D converted and sent to the audio data processor as the AU A/D data (1/2 and 3/4).
The output signal from the audio data processor is D/A converted. The AUDIO OUT connector on the rear panel outputs each of the CH-1 and CH-2 signals or CH-3 and CH-4 signals (according to the setting of setup menu).
The earphones and internal speakers have the MONITOR switch which selects from CH-1, MIX, or CH-2 signal to be output the earphones and internal speakers.

(5) System Control Block (DVP-17 board (3/3), HN-260 board (1/2) and TC-101 board (2/2))

The system Control Block performs the control for the peripheral boards and the overall system, and the control for its own system including the time code, display, key panel, and the like. Mainly, the DVP-17 board controls the former, and the TC-101 board (2/2) controls the latter.

DVP-17 board

The DVP-17 board mounts the System Control CPU that functions as a leading part in the System Control Block.
The System Control CPU treats large volumes of data (e.g., communication with digital processors). Therefore, this CPU uses a 16-bit high-performance CPU with an operating clock of 14 MHz.
For the communication with digital processor ICs, the parallel bus is shifted in level (5 V/3 V) so as to establish the interface because the parallel interface ICs operate with 3 V.
The serial interface ICs directly interface with the SIO of the CPU. However, the CPU must serial-communicate moreover with SERVO MPU and TC MPU. Therefore, this CPU uses the same SIO in common and selects SCI (DPR), SCI (SV), or SCI (TC) using the SCI SELECTOR so as to communicate with them.
The System Control CPU also serial-communicates with the Camera CPU. However, the CPU interfaces using another SIO because it differs from the VTR Block in a synchronous method.
An I/O EXPANDER covers up an insufficient I/O port.

TC-101 board (2/2)

The TC MPU on the TC-101 board (2/2) controls TC IC (LTC reader and generator) while communicating with the system control CPU in serial communication.
The TC MPU also controls the LCD module, key matrix, and character generator via the I/O expander.
A backup power supply using a lithium battery is provided to back up the generators and real-time data.

(6) Servo Control Block (SV-210 board, SE-210 board, CTL-10 board, and HN-260 board (2/2))

SV-210 board

The SV-210 board mounts two MPUs. MPU1 controls the mode control and capstan servo control while serial-communicating with the System Control CPU. MPU2 controls the drum servo control while interfacing with MPU1. A drum motor and capstan motor are controlled by the PWM switching drive based on the feedback servo of the FG/PG pulses and the FG/CTL pulses, respectively. A threading motor is controlled by a bi-directional motor driver.

(7) Power Supply Block (CNB-11 board (2/2), RE-160 board and RE-161 board)

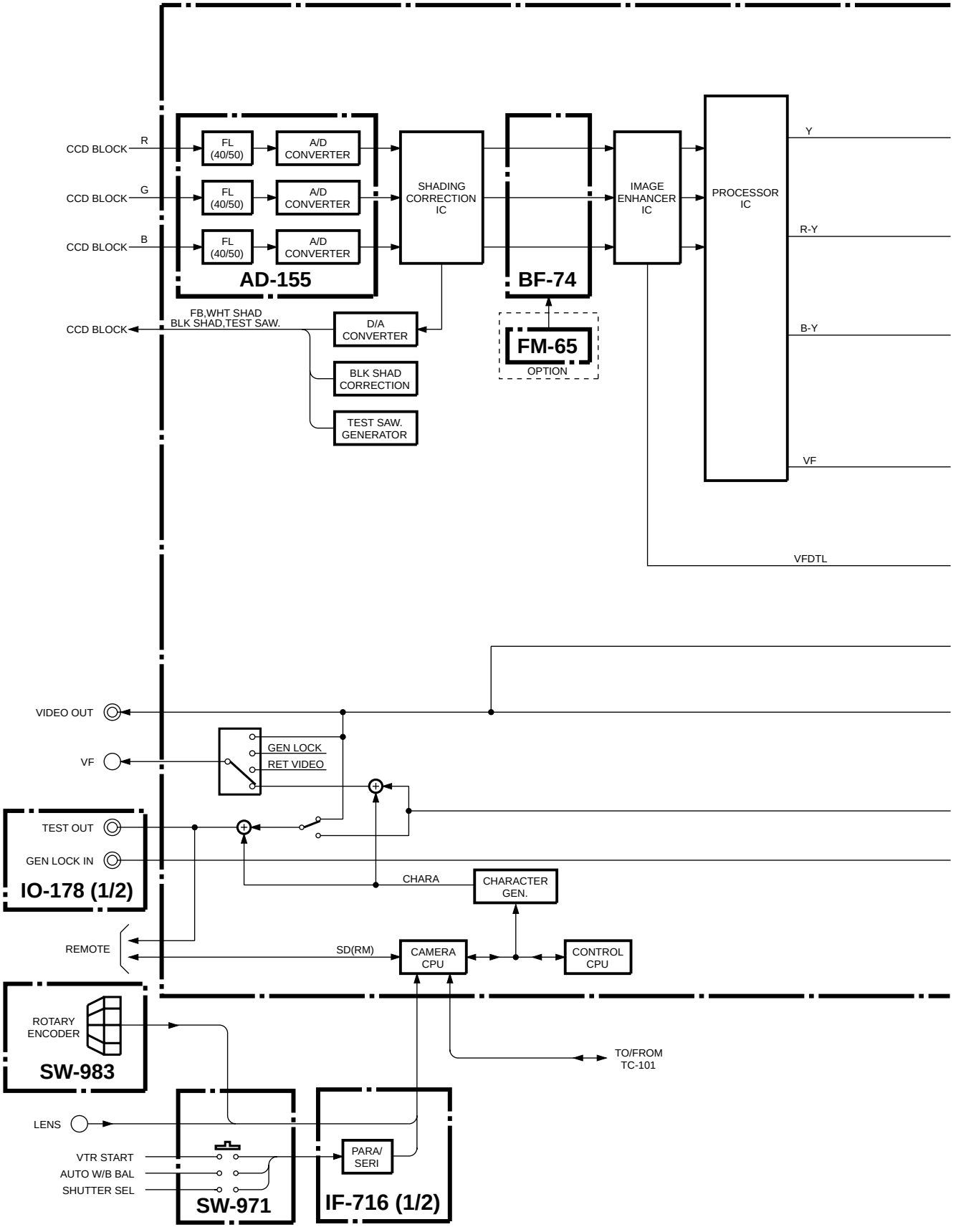
CNB-11 board (2/2)

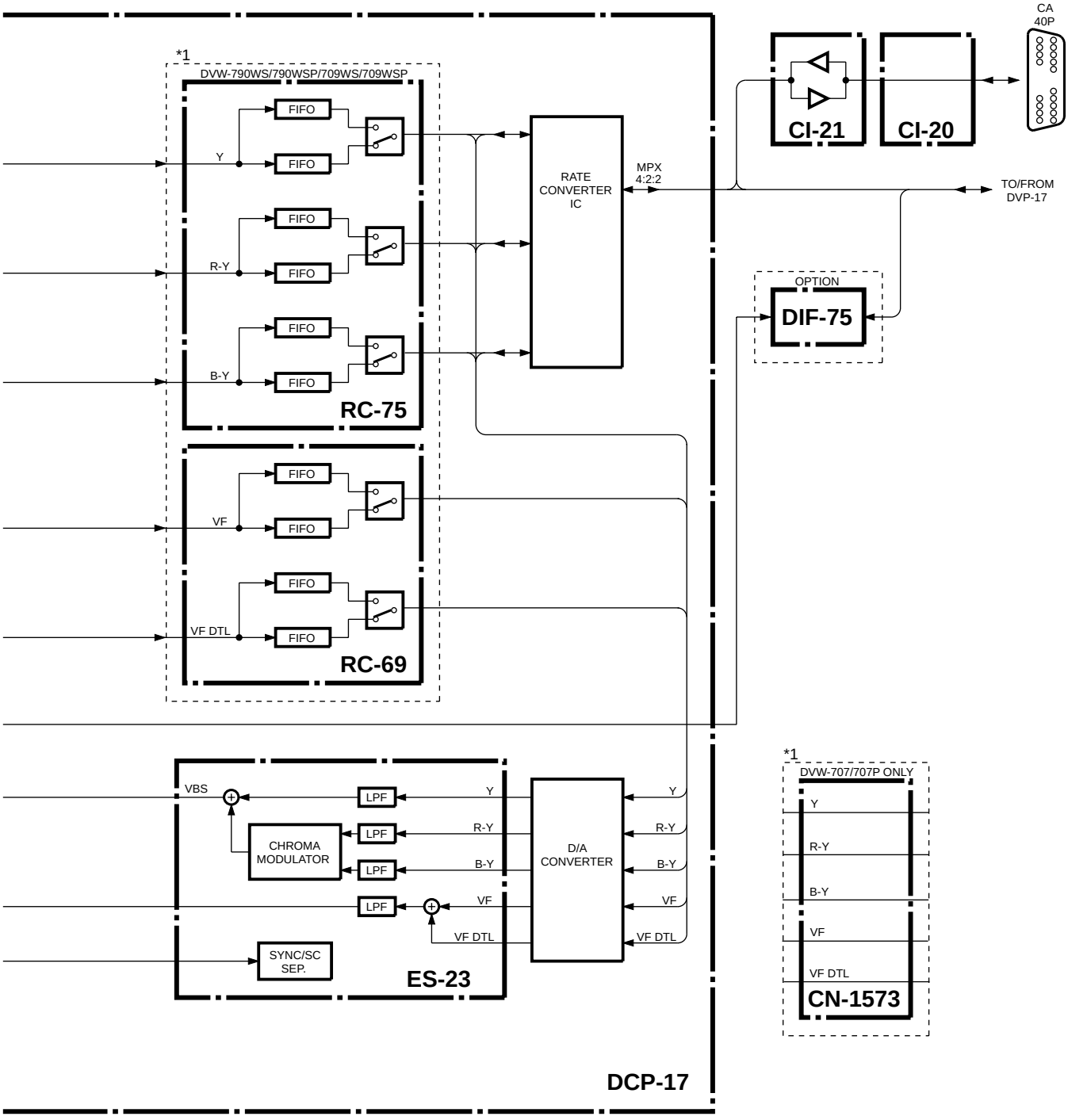
The input DC 12 V from the battery pack or DC IN connector is input to the CNB-11 board (2/2) where the input 12 V passes through a breaker and the POWER switch, then it is output as an UNREG +12 V.
This output voltage is sent not only to the camera and VTR blocks but also to the RE-160 board.

RE-160 and RE-161 boards

The RE-160 and RE-161 boards make up a DC-DC converter.
The UNREG +12 V supplied from the CNB-11 board (2/2) is converted to the various output DC voltages which are sent to the camera and VTR.
The converter system uses an highly efficient synchronous type PWM switching regulator system.
The PWM switching regulator is equipped with a short-circuit protection circuit which turns off all outputs when any of the output power is shorted to GND. The PWM switching regulator is also equipped with the cut-off circuit which shuts down the output power when the input voltage is decreased below the guaranteed operating voltage.

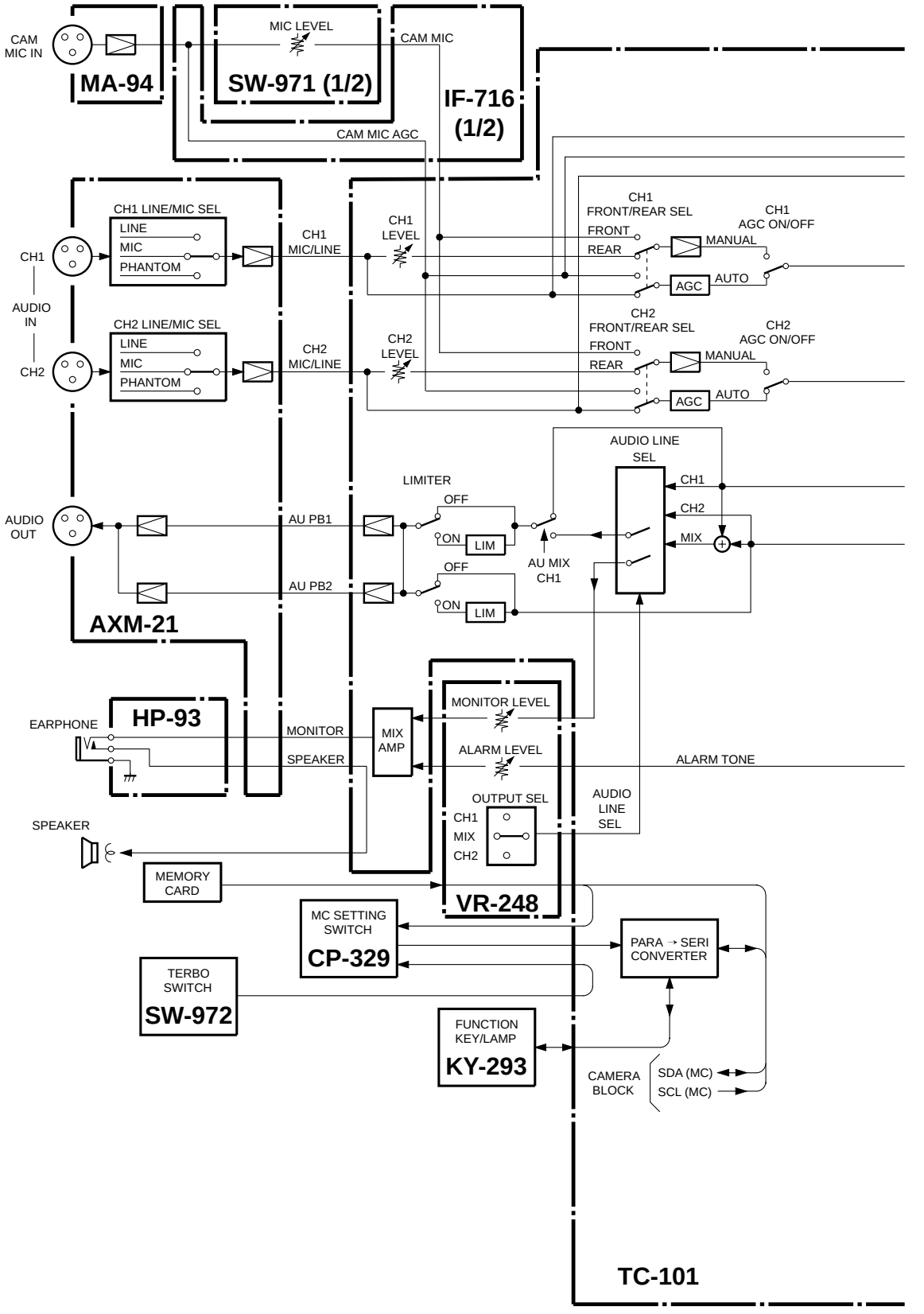
6-2. Camera Overall Block Diagram

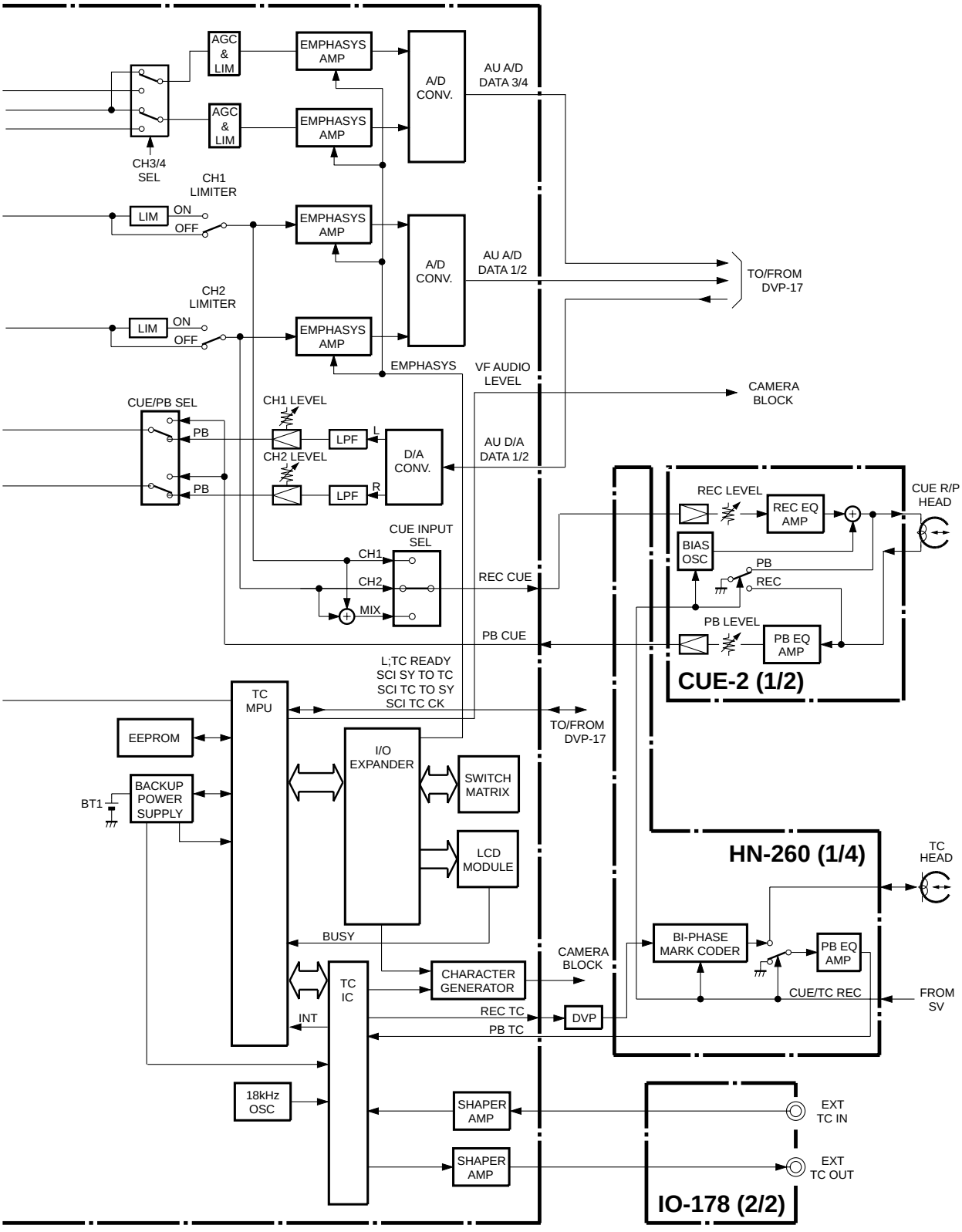




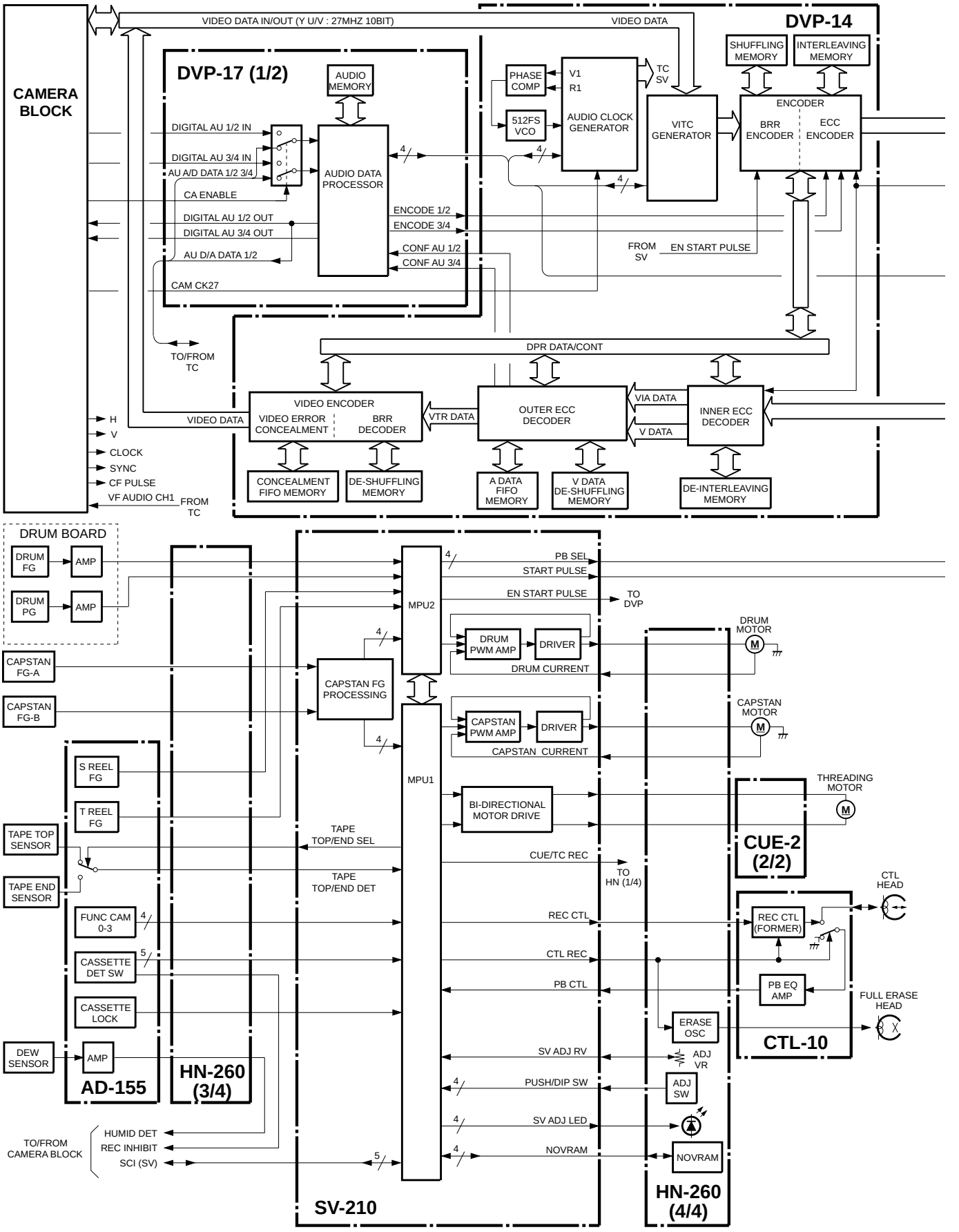
Camera Overall Block

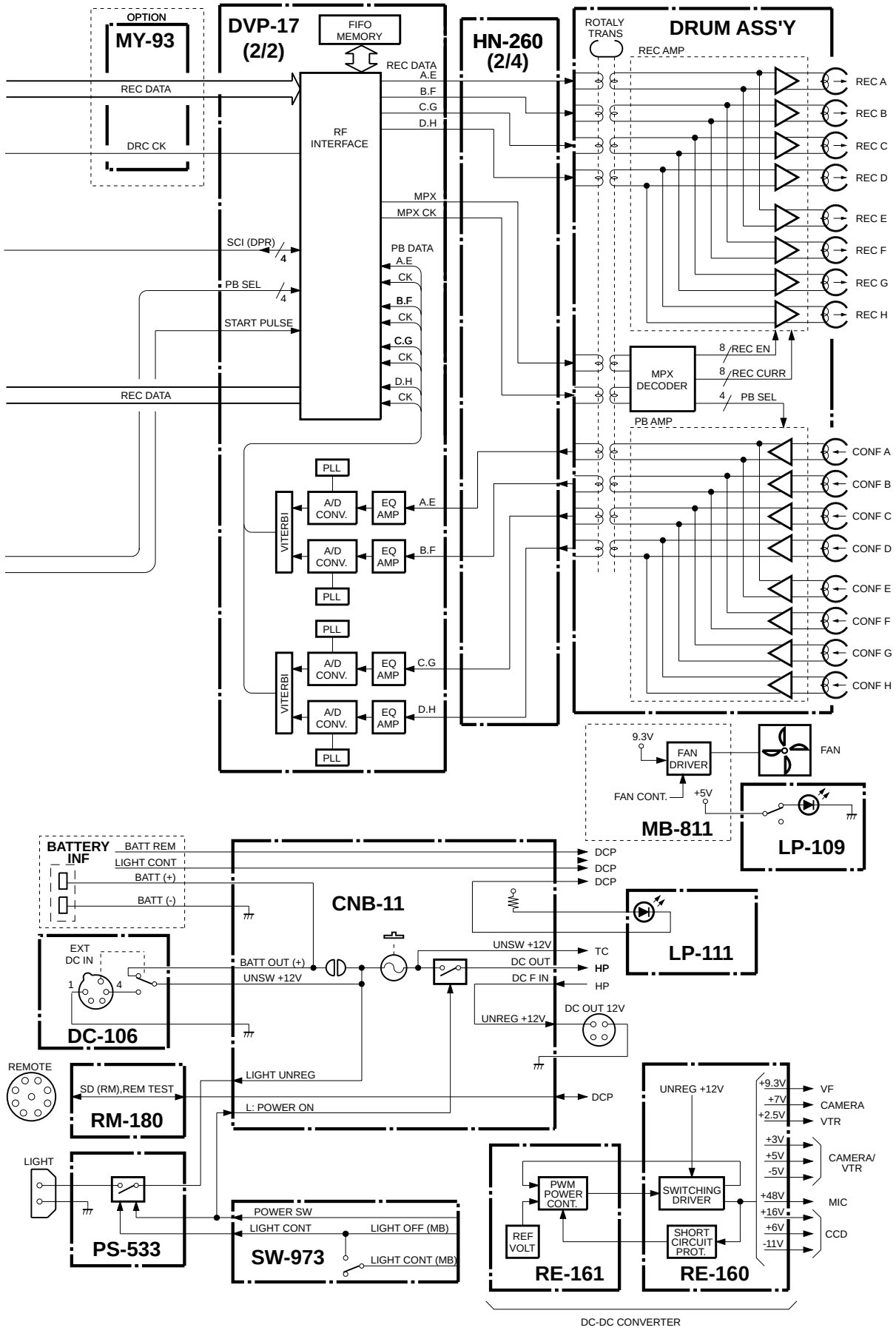
6-3. VTR Overall Block Diagrams





VTR Overall Block (1/2)


CAMERA BLOCK
VIDEO DATA IN/OUT (Y U/V : 27MHZ 10BIT)
VIDEO DATA
DVP-14
SHUFFLING MEMORY
INTERLEAVING MEMORY
ENCODER
BRR ENCODER
ECC ENCODER
DVP-17 (1/2)
AUDIO MEMORY
DIGITAL AU 1/2 IN
DIGITAL AU 3/4 IN
AU A/D DATA 1/2 3/4
CA ENABLE
DIGITAL AU 1/2 OUT
DIGITAL AU 3/4 OUT
AU D/A DATA 1/2
CAM CK27
AUDIO DATA PROCESSOR
ENCODE 1/2
ENCODE 3/4
CONF AU 1/2
CONF AU 3/4
PHASE COMP
512FS VCO
V1
R1
AUDIO CLOCK GENERATOR
TC SV
VITC GENERATOR
FROM SV
EN START PULSE
TO/FROM TC
DPR DATA/CONT
VIDEO ENCODER
VIDEO ERROR CONCEALMENT
BRR DECODER
VIDEO DATA
VTR DATA
OUTER ECC DECODER
VIA DATA
V DATA
INNER ECC DECODER
CONCEALMENT FIFO MEMORY
DE-SHUFFLING MEMORY
A DATA FIFO MEMORY
V DATA DE-SHUFFLING MEMORY
DE-INTERLEAVING MEMORY
H
V
CLOCK
SYNC
CF PULSE
VF AUDIO CH1
FROM TC
DRUM BOARD
DRUM FG
DRUM PG
AMP
CAPSTAN FG-A
CAPSTAN FG-B
CAPSTAN FG PROCESSING
MPU2
MPU1
PB SEL
START PULSE
EN START PULSE
TO DVP
DRUM PWM AMP
DRIVER
DRUM MOTOR
DRUM CURRENT
CAPSTAN PWM AMP
CAPSTAN MOTOR
CAPSTAN CURRENT
BI-DIRECTIONAL MOTOR DRIVE
THREADING MOTOR
CUE-2 (2/2)
S REEL FG
T REEL FG
TAPE TOP SENSOR
TAPE END SENSOR
TAPE TOP/END SEL
TAPE TOP/END DET
CUE/TC REC
TO HN (1/4)
FUNC CAM 0-3
CASSETTE DET SW
CASSETTE LOCK
REC CTL
CTL REC
PB CTL
REC CTL (FORMER)
PB EQ AMP
CTL HEAD
FULL ERASE HEAD
ERASE OSC
CTL-10
DEW SENSOR
AD-155
HN-260 (3/4)
SV ADJ RV
ADJ VR
PUSH/DIP SW
ADJ SW
SV ADJ LED
NOVRAM
TO/FROM CAMERA BLOCK
HUMID DET
REC INHIBIT
SCI (SV)
SV-210
HN-260 (4/4)



VTR Overall Block (2/2)

Section 7
Periodic Maintenance and Inspection

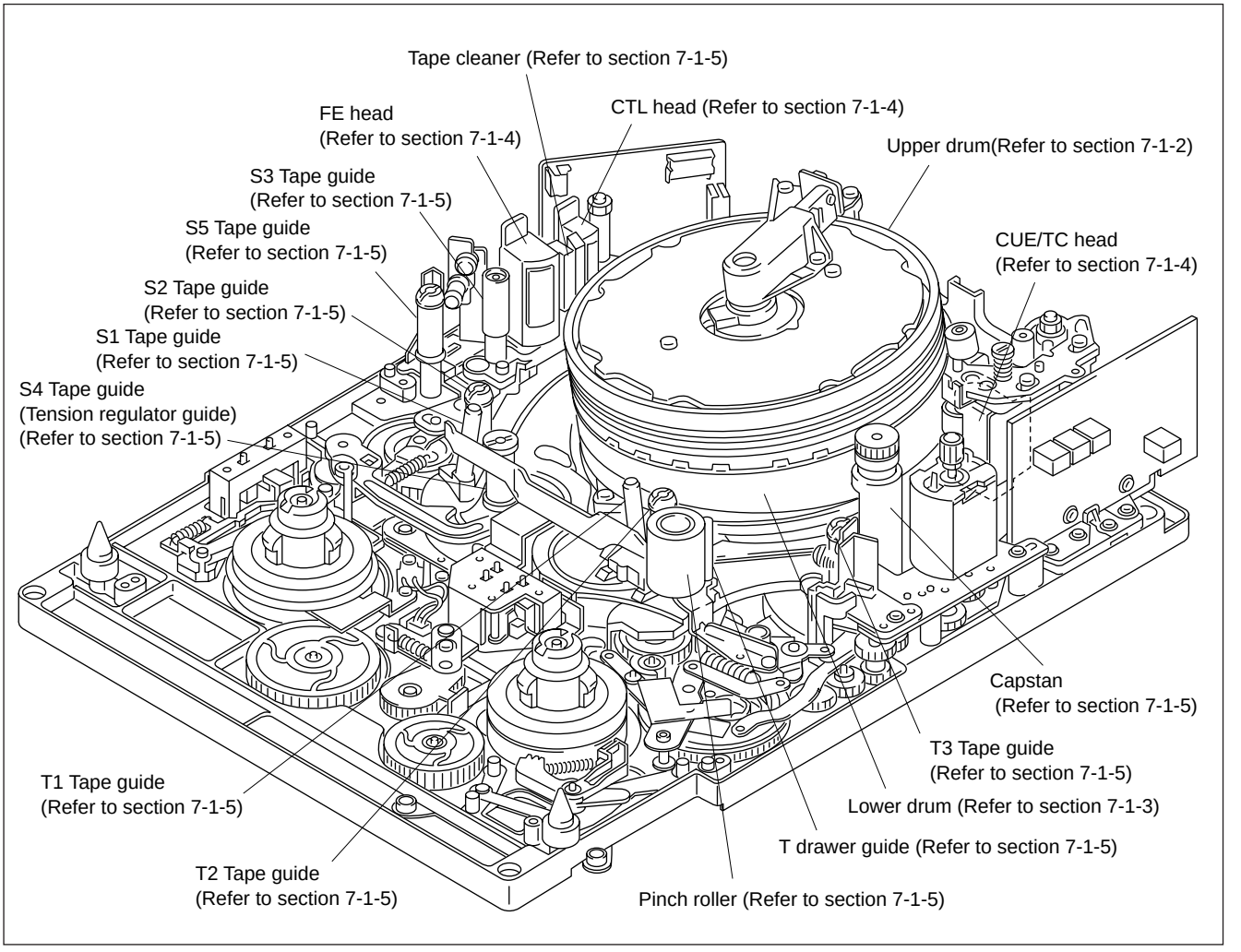
7-1. Cleaning

To make the most of the functions, fully realize the performances of this unit and to lengthen the life of the unit and tape, clean the parts often.

7-1-1. General Information for Cleaning

1. Index

This subsection describes methods of cleaning the blocks that are shown in the following illustration.



2. Notes

- Be sure to turn the power off before cleaning.
- The blocks in the mechanical deck consist of the precision parts, and adjust precisely. Be careful not to damage the parts, and not to apply an excessive force during cleaning.
- Do not touch the greased portions during cleaning. If grease attaches to a cleaning cloth, replace the cleaning cloth by new one. If the cleaning cloth smeared with grease used, grease may attach to the places where it should not.
- Do not insert a cassette tape before cleaning fluid completely evaporates.

3. Preparations

(1) Turn the power off.
(2) Remove the front lid and the outside panel. (Refer to section 1-6.)

7-1-2. Cleaning of Tape Running Surface of Upper Drum and Video Heads

Note

The upper drum and video heads are the parts that can damage easily. Take care not to damage the upper drum and rotary heads during cleaning.

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Note

Never use a cotton swab.

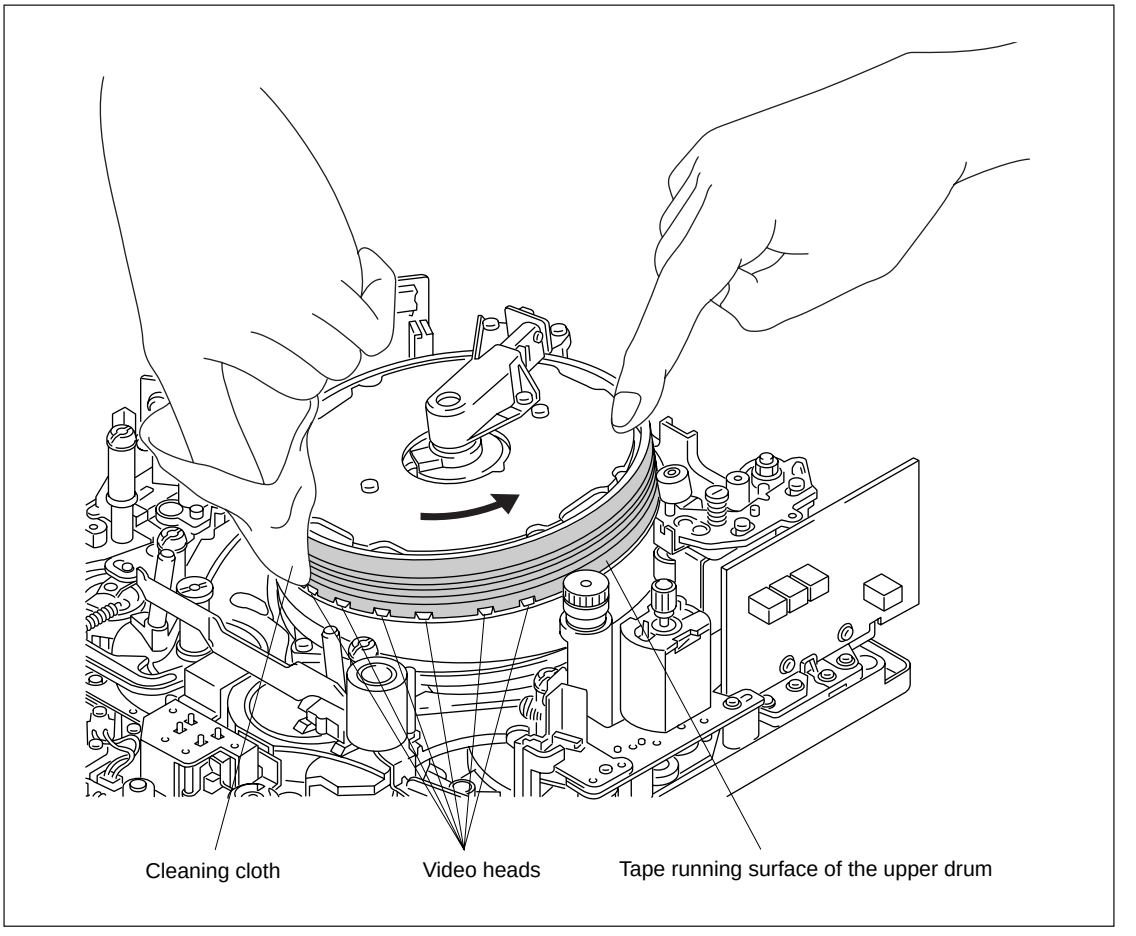
Procedures

1. Press a cleaning cloth moistened with cleaning fluid slightly against the video heads, and rotate the upper drum slowly counterclockwise.
2. Press a cleaning cloth moistened with cleaning fluid slightly against the tape running surface of the upper drum (shaded portion) as shown in the figure.

   Note

   Be sure to rotate the upper drum counterclockwise. Be sure to clean the rotary heads along the circumference. (Do not clean the video heads in the vertical direction. This may damage them.)

3. After cleaning, wipe the rotary heads using a dry cleaning cloth.



7-1-3. Cleaning of Tape Running Surface of Lower Drum and Lead Surface

Note

Take care not to damage the lower drum (specially lead surface) during cleaning. Take care to clean the edge portion above the lower drum because it is near the video heads.

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Skewer or an equivalent (A metallic skewer can not use.)

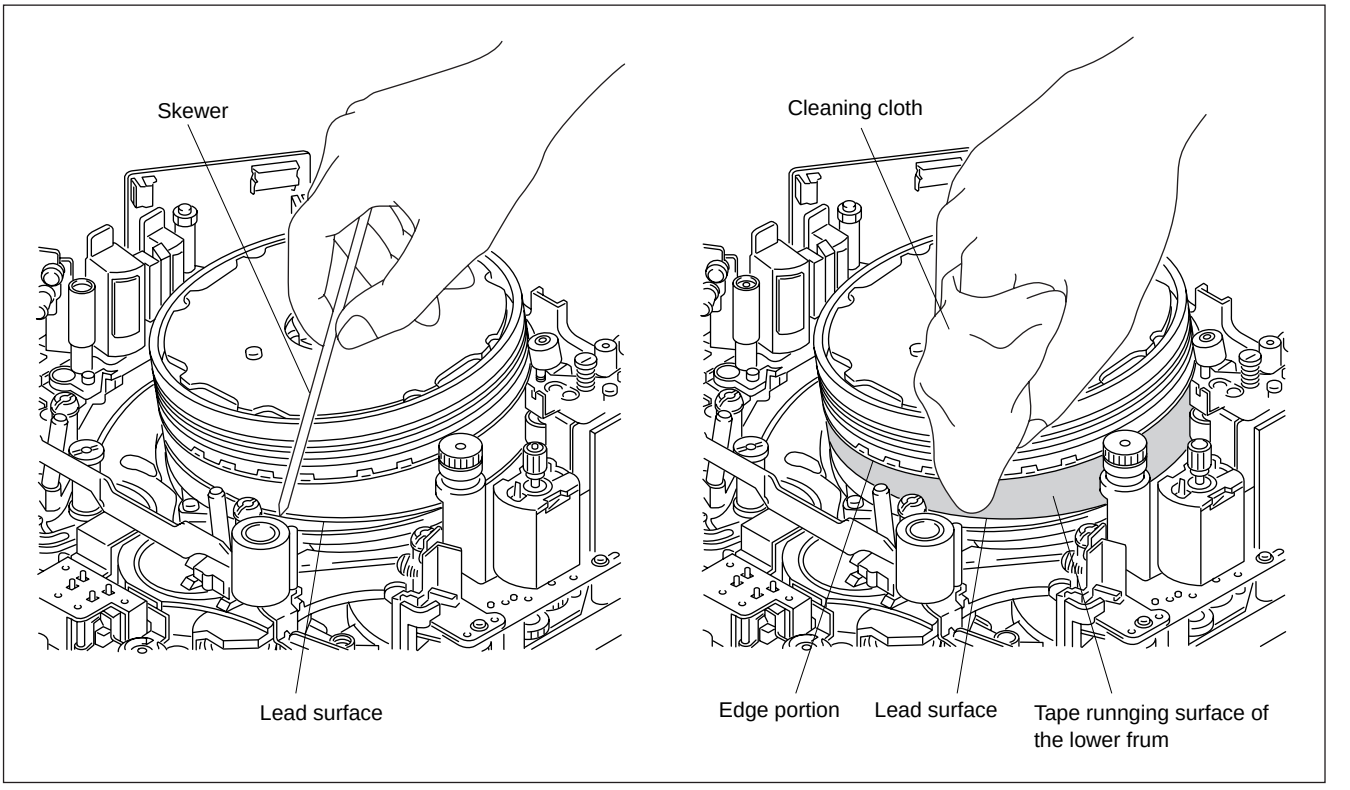
Procedures

1. Put a skewer (or an equivalent) along the drum lead surface and remove magnetic powder as shown in the figure.

   Notes

   - Do not use a metallic skewer instead of a skewer. This may damage the tape running surface.
   - If the magnetic powder attached to the drum lead surface, tracking may badly influence. Remove the magnetic powder completely.

2. Clean the tape running surface of the lower drum and lead surface (shaded portion) using a cleaning cloth moistened with cleaning fluid as shown in the figure.
3. After cleaning, be sure to wipe the tape running surface of the lower drum and lead surface using a dry cleaning cloth.



7-1-4. Stationary Heads Cleaning

Note

Take care not to damage the surfaces of the stationary heads when cleaning.

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

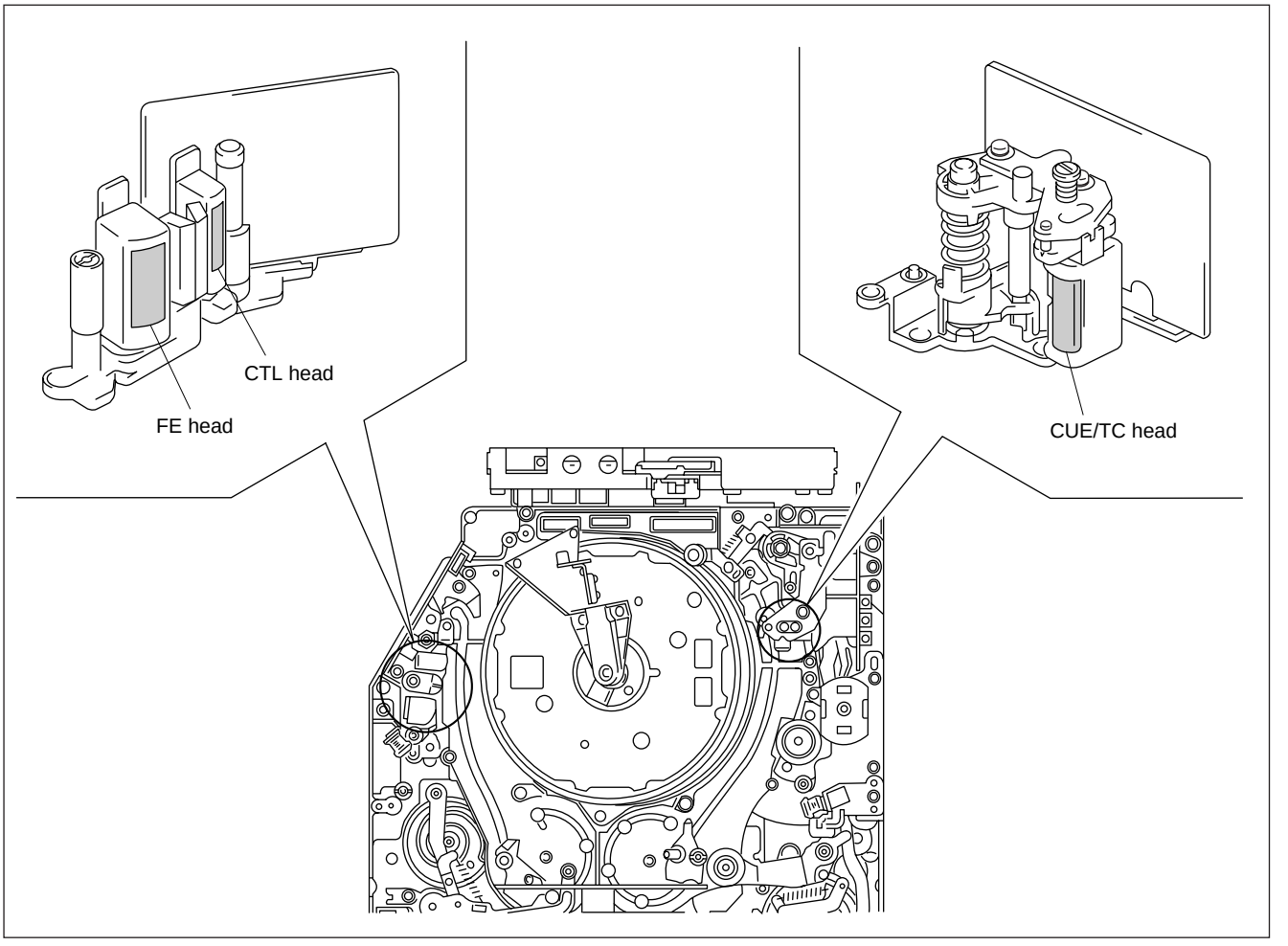
Procedures

1. Clean the tape running surfaces of the FE, CTL and CUE/TC heads in the vertical direction using a cleaning cloth moistened with cleaning fluid.

   Note

   If the magnetic powder attached to the head gap portions of the FE, CTL and CUE/TC heads, an error may occur when the recording or playback. Remove the magnetic powder completely.

2. After cleaning, be sure to wipe the tape running surfaces of the FE, CTL and CUE/TC heads using a dry cleaning cloth.



7-1-5. Cleaning of Tape Running System and Tape Cleaner

Note

Tape cleaner has a sharp edge. Never touch the edge by bare hands. Take care to clean.

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

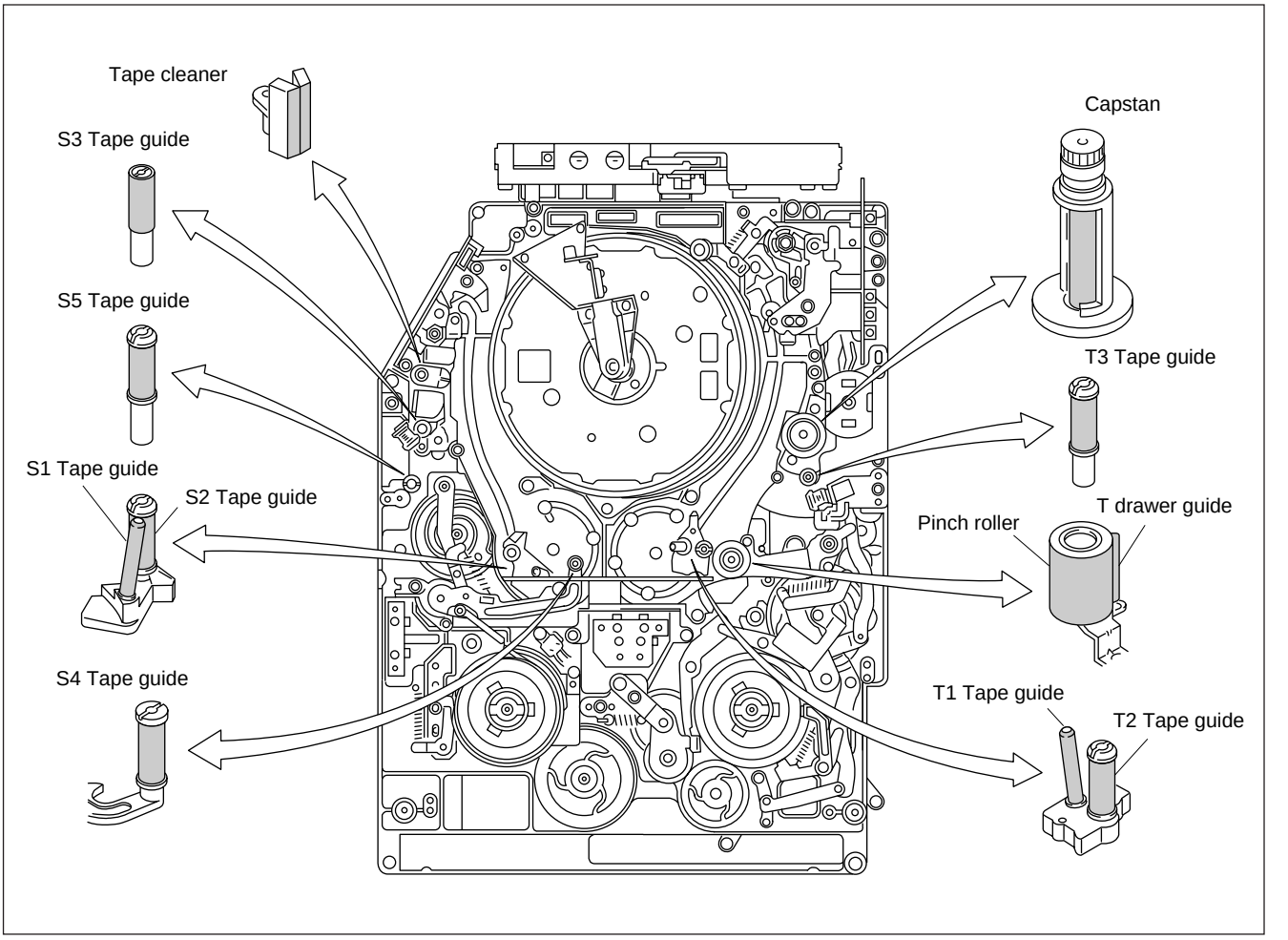
Procedures

1. Clean the tape running surfaces (shaded portions) of the following guides and the edge portion of the tape cleaner using a cleaning cloth moistened with cleaning fluid as shown in the figure.
   S1 guide, S2 guide, S3 guide, S4 guide, S5 guide, T1 guide, T2 guide, T3 guide, T drawer guide, capstan and pinch roller

CAUTION

Never touch the edge portion of the tape cleaner by bare hands.

2. Clean the gap of the tape cleaner that cloggs with the magnetic powder using a paper (or equivalent).
3. After cleaning, be sure to clean the tape running surfaces of the above guides and the edge portion of the tape cleaner using a dry cleaning cloth.



7-1-6. Cares After Using at Special Environment

It is recommended to check the following items after gathering the news at seaside or dust area.

1. Clean off sand and other dust in the unit carefully.
2. Clean the video heads, upper and lower drums and stationary heads.
3. Clean the tape running surfaces (tape guides, capstan shaft and pinch roller).
4. Clean the connectors on the connector panel.
5. Carry out the common operation check (recording or playback) and check that the unit has not an abnormal sound or operation.

If the unit has an abnormal condition, please contact your Sony dealer.

7-2. Periodic Check

To make the most of the functions, fully realize performances of the unit, and to lengthen the life of the unit and tape, a periodic check is recommended.

7-2-1. Hours Meter

This unit can display an hours meter on the view finder, and reset the your requested hours meter.
It is recommendable to carry out the periodic check using this hours meter as a reference.

1. Display procedures

(1) Press the DIAGNOSTIC switch on the side panel to enter the DIAGNOSTIC mode using the tip of a clip.
(2) The view finder changes every pressing the SHIFT button on the side panel.
(3) Press the DIAGNOSTIC switch on the side panel to exit the DIAGNOSTIC mode.

2. Customer reset

The hours meters of “5. DRUM RUN-2”, “6. TAPE RUN-2”, “7. OPERATION-2” and “8. THREADING-2” can reset by a customer.

(1) While checking on the LCD display, select the your requested hours meter by pressing the SHIFT button on the side panel.
(2) Press the RESET button on the side panel, and the total time of the your selected hours meter will reset .

3. Contents of display

Mode			Description
LCD display (Blinking)	View Finder		
01 XXXH	-SELF DIAG. START-		
	↓ After 2 seconds		
02 XXXH	VTR MENU-1		
03 XXXH			
04 XXX	HOURS METER		The following contents are displayed.
	1. DRUM RUNNING	_XXXH	1. Total hours when the drum rotates (Display of the time by an hour)
05 XXXH	2. TAPE RUNNING	_XXXH	2. Total hours when the tape runs (Display of the time by an hour)
	3. OPERATION	_XXXH	3. Total hours when the power of the unit is on (Display of the time by an hour)
06 XXXH	4. THREADING	_XXX	4. Total number of threading time (Display of the threading and unthreading times)
	5. DRUM RUN-2	_XXXH	5. Hours when the drum rotates (Customer-resetable)
07 XXXH	6. TAPE RUN-2	_XXXH	6. Hours when the tape runs (Customer-resetable)
	7. OPERATION-2	_XXXH	7. Hours when the power of the unit is on (Customer-resetable)
08 XXX	8. THREADING-2	_XXX	8. Number of threading time (Customer-resetable)

7-2-2. Periodic Check List

The replacemebt time which show in the following list are not the guarantee term parts. Use this list as guidelines for the maintenance and inspection. The replacement time of the parts vary depending on the operation environment and conditions of the unit.

Note

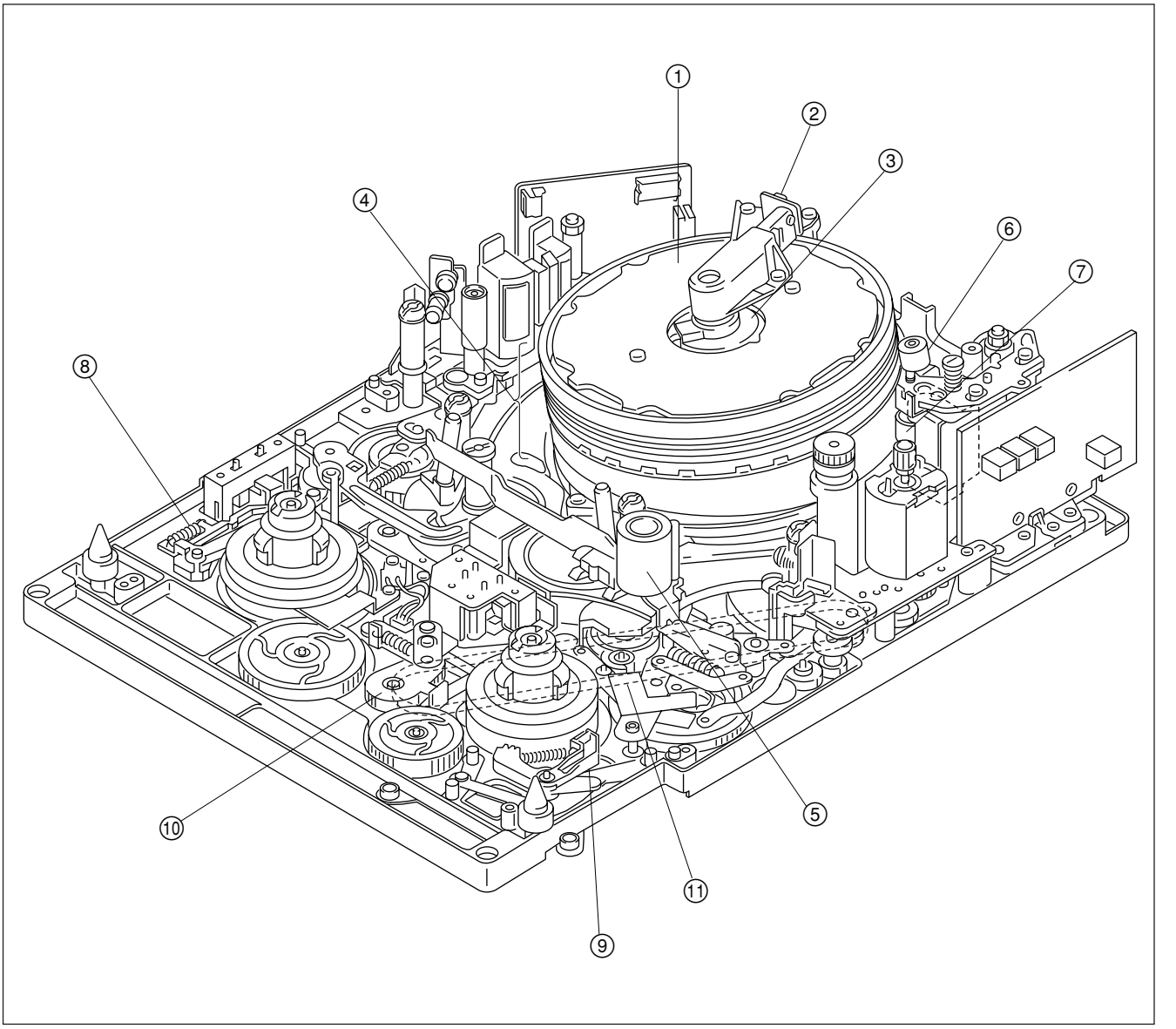
The parts marked by ①, ② and ③ together with drum assembly when the drum assembly ④ is replaced.
Refer to Maintenance Manual Part 2, Volume 1, Section 4 for replacement procedure.

MODE A : DRUM RUNNING METER
MODE B : TAPE RUNNING METER

No	Item	MODE	Inspection Hours(h)								Replacement Parts		
			500	1000	1500	2000	2500	3000	3500	4000	Part Name	Part No.	Q'ty
①	Upper Drum Assembly	A	–	–	–	R	–	–	–	R	UPPER DRUM ASSY DJR-10-R (for PAL) DJR-09-R (for NTSC)	 A-8263-624- A-8263-641-	 1 1
②	Brush Assembly for Slip Ring	A	–	–	–	R	–	–	–	R	BRUSH ASSY (RP)	A-8263-856-	1
③	Slip Ring Assembly	A	–	–	–	R	–	–	–	R	SLIP RING ASSY (RP)	A-8263-855-	1
④	Drum Assembly					R:6000H					DRUM ASSY DJH-10A-R (for PAL) DJH-09A-R (for NTSC)	 A-8263-623- A-8263-628-	 1 1
⑤	Pinch Roller	B	–	–	–	R	–	–	–	R	PINCH ROLLER ASSY	X-3678-926-	1
⑥	HC Roller for Video Head	A	–	R	–	R	–	R	–	R	VF CLEANER ASSY	A-8278-044-	1
⑦	Cleaning Brush for CUE Head	A	–	–	–	R	–	–	–	R	CUE BRUSH	3-681-778-	1
⑧	Tension Regulator Band Assembly	B	–	–	–	R	–	–	–	R	TENSION REGULATOR BAND ASSY	X-3678-114-	1
⑨	T Soft Brake Assembly	B	–	–	–	R	–	–	–	R	T SOFT BRAKE ASSY	X-3678-096-	1
⑩	Swing Gear Assembly	B	–	–	–	R	–	–	–	R	GEAR ASSY	A-8278-034-	1
⑪	Timing Belt	B	–	–	–	–	–	R	–	–	TIMING BELT	3-679-723-01	1

"R" indicates timing of part "replacement"

- Check sometimes the deformation of the eye cap of the view finder, and the deterioration of CRT, shoulder pad and wind screen. Replace them as necessary.
- Replace the lithium battery (1-528-229-11) on the TC-101 board every five years.


1
2
3
4
5
6
7
8
9
10
11

Section 8
Spare Parts

8-1. Notes on Repair Parts

1. Safety Related Components Warning

WARNING

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts list has the present standardized repair parts.

3. Stock of Parts

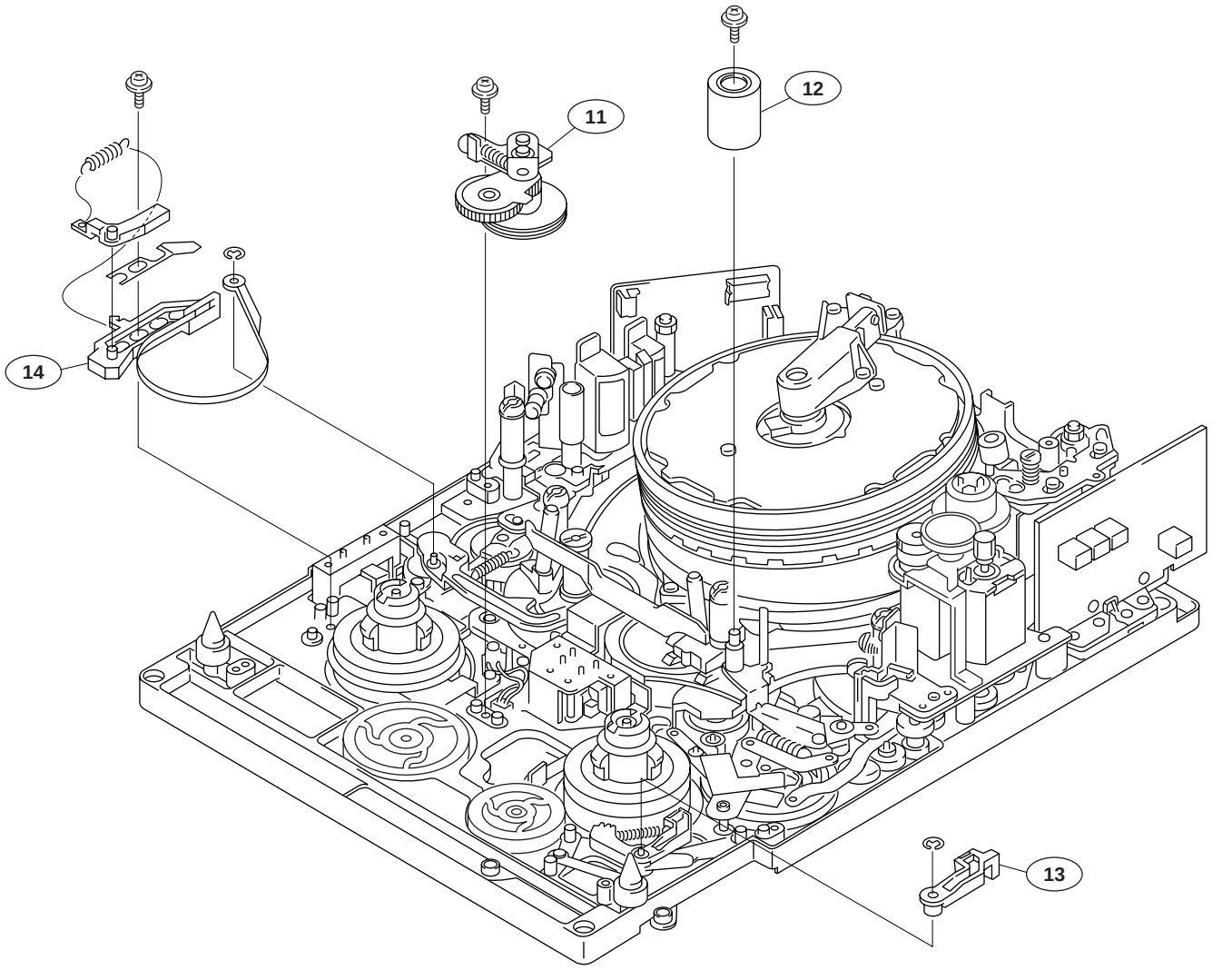
Parts marked with “o” at SP (Supply code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

4. Indication of Part Destination

The parts that have the following indication, are used in the specified destination.
For J : Used in the Japanese models.
For SY : Used in the World-wide models.

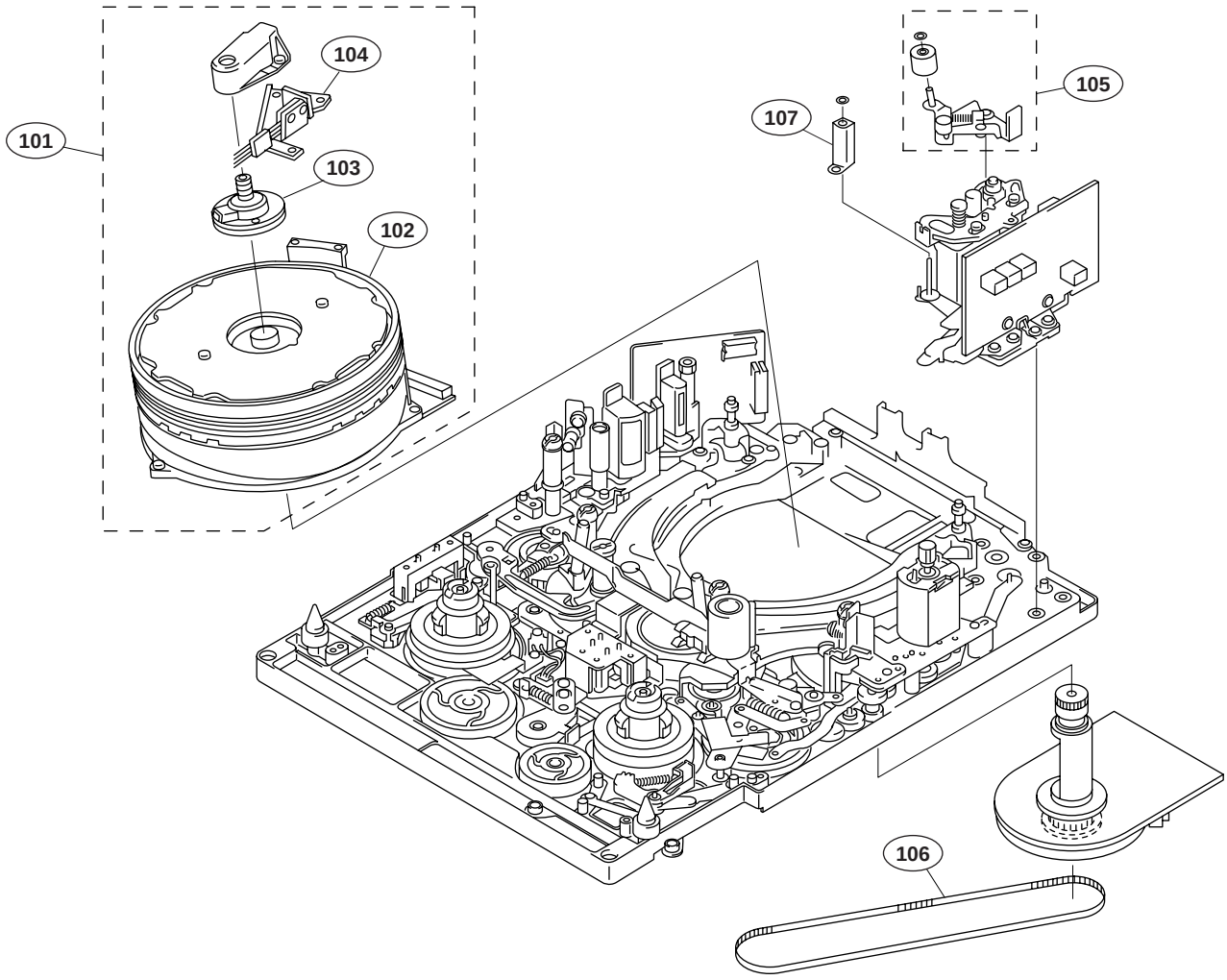
8-2. Recommended Replacement Parts

Mechanical Bolck 1



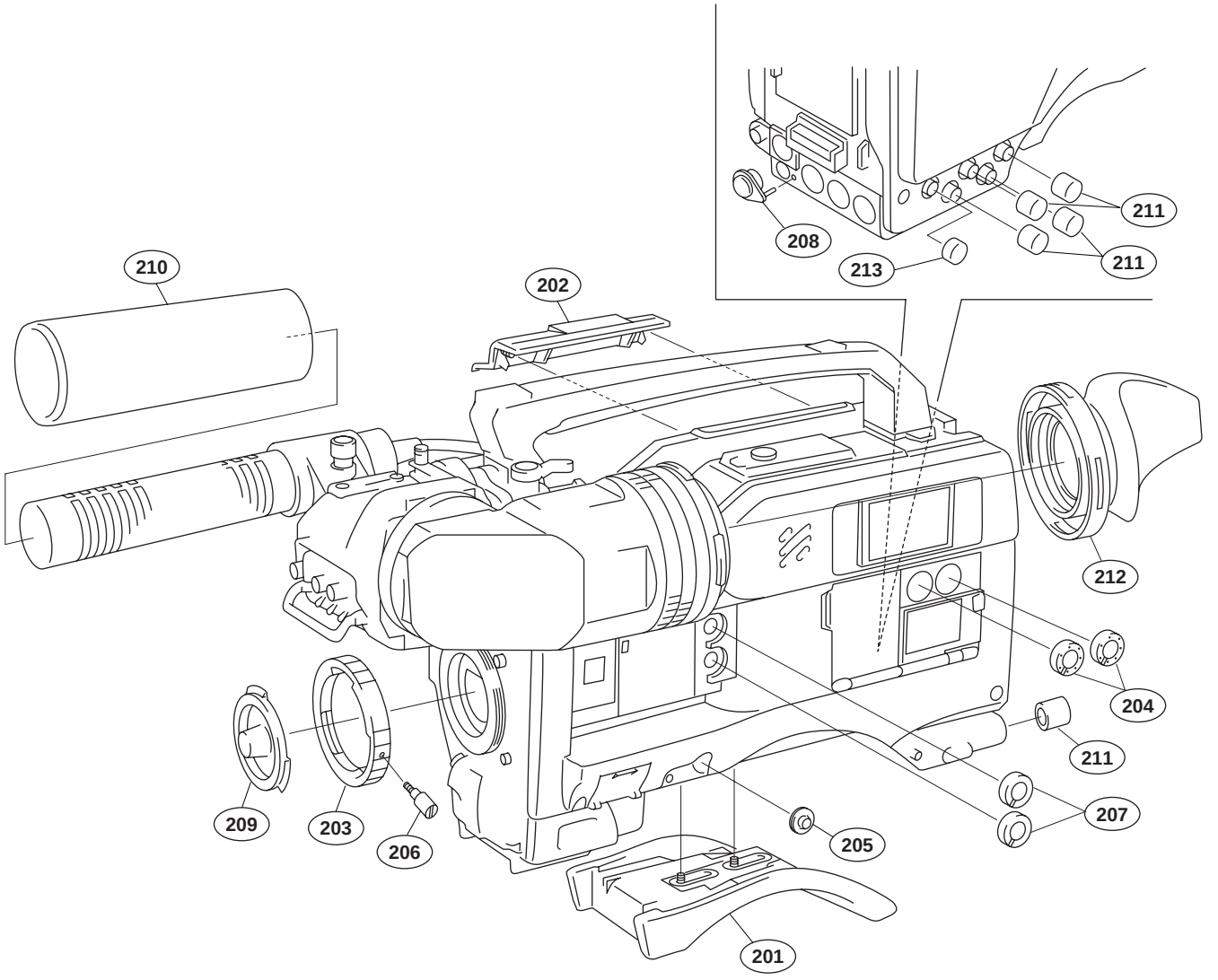
No.	Part No.	SP	Description
11	A-8278-034-F	o	GEAR ASSY
12	X-3678-926-1	s	PINCH ROLLER ASSY
13	X-3678-096-4	s	BRAKE ASSY, T SOFT
14	X-3678-114-2	s	BAND ASSY, TENSION REGULATOR

Mechanical Bolck 2



No.	Part No.	SP	Description
101	A-8263-623-A	s	DJH-10A-R (for PAL)
	A-8263-628-A	s	DJH-09A-R (for NTSC)
102	A-8263-624-A	s	DJR-10-R (for PAL)
	A-8263-641-A	s	DJR-09-R (for NTSC)
103	A-8263-855-A	s	RING ASSY (RP), SLIP
104	A-8263-856-A	s	BRUCH ASSY (RP)
105	A-8278-044-E	s	CLEANER ASSY, VH
106	3-679-723-01	s	BELT, TIMING
107	3-681-778-01	s	BRUSH, CUE

Exterior Part



No.	Part No.	SP	Description
201	A-8279-095-A	s	PAD ASSY, SHOLDER
202	X-3605-336-1	o	LID, FRONT ASSY
203	3-186-442-01	o	RING, MOUNT
204	3-611-740-01	o	KNOB, VR (2)
205	3-676-244-03	s	COVER, SWITCH
206	3-678-629-00	s	LEVER MOUNT
207	3-680-219-02	s	KNOB, VR
208	3-680-269-01	s	RUBBER (D0), DROP PROTECTION
209	3-699-048-01	s	CAP MOUNT
210	3-709-104-01	s	SCREEN, WINDOW
211	3-604-795-01	s	CAP, BNC
212	3-723-079-02	s	EYE CUP
213	3-617-514-01	s	REMOTE CAP

Mounted/Printed Circuit Board

```
Part No.    SP Description

A-8263-156-A o  MOUNTED CIRCUIT BOARD, CTL-10
A-8263-157-A o  MOUNTED CIRCUIT BOARD, CUE-2
A-8277-768-A o  MOUNTED CIRCUIT BOARD, CN-1183
A-8310-898-B o  MOUNTED CIRCUIT BOARD, SE-275
A-8321-221-A o  MOUNTED CIRCUIT BOARD, MB-810

A-8321-223-A o  MOUNTED CIRCUIT BOARD, IF-716
A-8321-224-A o  MOUNTED CIRCUIT BOARD, MA-94
A-8321-251-A o  MOUNTED CIRCUIT BOARD, IO-178
A-8321-255-A o  MOUNTED CIRCUIT BOARD, DC-101
A-8321-256-A o  MOUNTED CIRCUIT BOARD, CI-21

A-8321-452-A o  MOUNTED CIRCUIT BOARD, DVP-17
A-8321-453-A o  MOUNTED CIRCUIT BOARD, HN-260
A-8321-456-A o  MOUNTED CIRCUIT BOARD, MB-811
A-8321-457-A o  MOUNTED CIRCUIT BOARD, CP-329
A-8321-458-A o  MOUNTED CIRCUIT BOARD, VR-248

A-8321-459-A o  MOUNTED CIRCUIT BOARD, HP-93
A-8321-460-A o  MOUNTED CIRCUIT BOARD, CNB-11 (for SY)
A-8321-461-A o  MOUNTED CIRCUIT BOARD, AXM-21 (for SY)
A-8321-462-A o  MOUNTED CIRCUIT BOARD, LP-111
A-8321-464-A o  MOUNTED CIRCUIT BOARD, DC-106

A-8321-465-A o  MOUNTED CIRCUIT BOARD, SV-210
A-8321-470-A o  MOUNTED CIRCUIT BOARD, TC-101
A-8321-474-A o  MOUNTED CIRCUIT BOARD, PS-533
                        (DVW-709WS/709WSP/790WS/790WSP)
A-8321-477-A s  CONVERTER ASSY, DC-DC
A-8321-481-A o  MOUNTED CIRCUIT BOARD, DCP-17

A-8321-482-A o  MOUNTED CIRCUIT BOARD, ES-23
                        (DVW-707/709WS/790WS)
A-8321-483-A o  MOUNTED CIRCUIT BOARD, DVP-14
A-8321-489-A o  MOUNTED CIRCUIT BOARD, DR-387
A-8321-491-A o  MOUNTED CIRCUIT BOARD, VA-191
A-8321-492-A o  MOUNTED CIRCUIT BOARD, TG-207
                        (DVW-709WS/790WS)

A-8321-499-A o  MOUNTED CIRCUIT BOARD, CNB-11B (for J)
A-8321-500-A o  MOUNTED CIRCUIT BOARD, AXM-21B (for J)
A-8321-508-A o  MOUNTED CIRCUIT BOARD, ES-23P
                        (DVW-707P/709WSP/790WSP)
A-8321-509-A o  MOUNTED CIRCUIT BOARD, TG-207P
                        (DVW-709WSP/790WSP)
A-8321-610-A o  MOUNTED CIRCUIT BOARD, AD-155

A-8321-706-A o  MOUNTED CIRCUIT BOARD, RC-69
                        (DVW-709WS/709WSP/790WS/790WSP)
A-8321-707-A o  MOUNTED CIRCUIT BOARD, RC-75
                        (DVW-709WS/709WSP/790WS/790WSP)
A-8321-731-A o  MOUNTED CIRCUIT BOARD, TG-206
                        (DVW-707)
A-8321-732-A o  MOUNTED CIRCUIT BOARD, TG-206P
                        (DVW-707P)
A-8321-733-A o  MOUNTED CIRCUIT BOARD, CN-1573
                        (DVW-707/707P)
```

Section 9
Optional Boards Installation

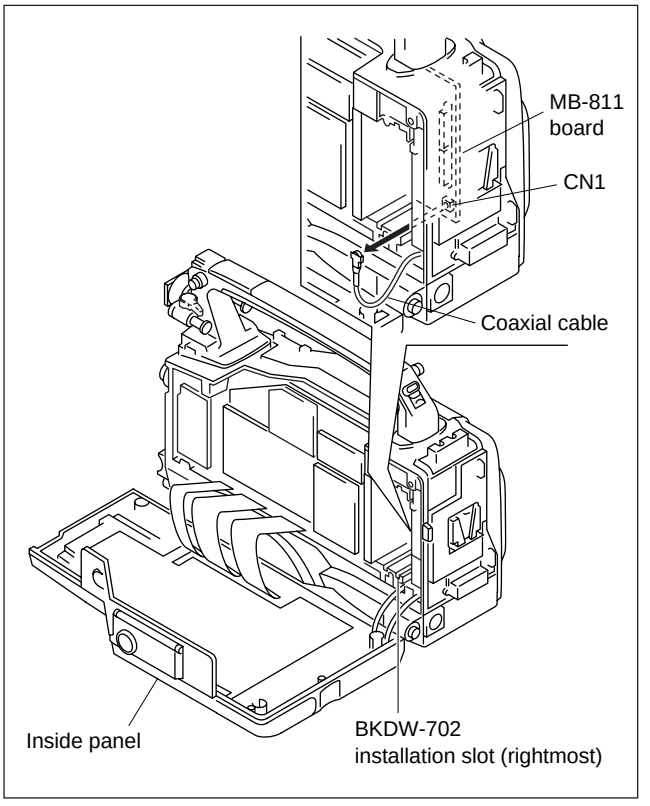
Note

Temperature inside the unit goes high while the main power is on.
For your safety, be sure to turn off the power and wait until inside of the unit cools down before installing the optional board.

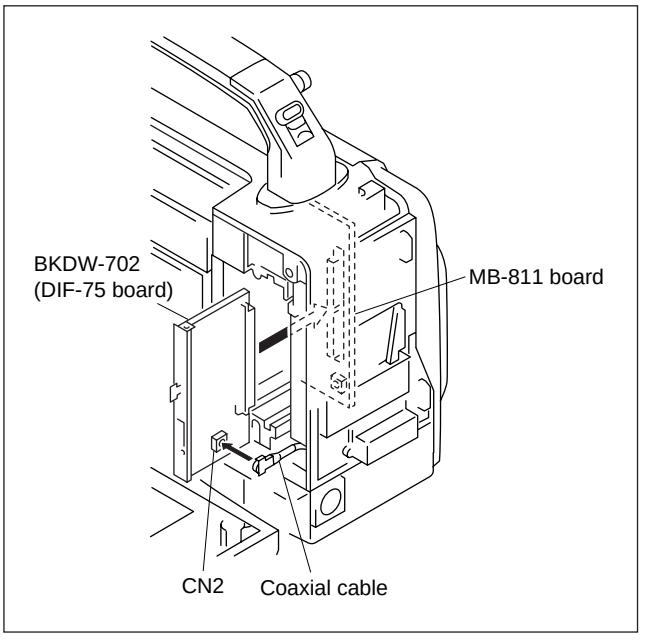
9-1. BKDW-702 (DIF-75 board)

Procedure

1. Open the inside panel. (Refer to Section 1-7.)
2. Remove the coaxial cable connected to CN1 on the MB-811 board behind the BKDW-702 installation slot (in the rightmost slot).



3. Connect the removed coaxial cable to CN2 on the BKDW-702 (DIF-75 board).
4. Insert the BKDW-702 into the rightmost slot.
   Push in the BKDW-702 to the end of the slot to connect it to the connector of the MB-811 board securely.



5. Close the inside panel, and then fasten the four screws (with drop-safe) to install the panel.

   Note

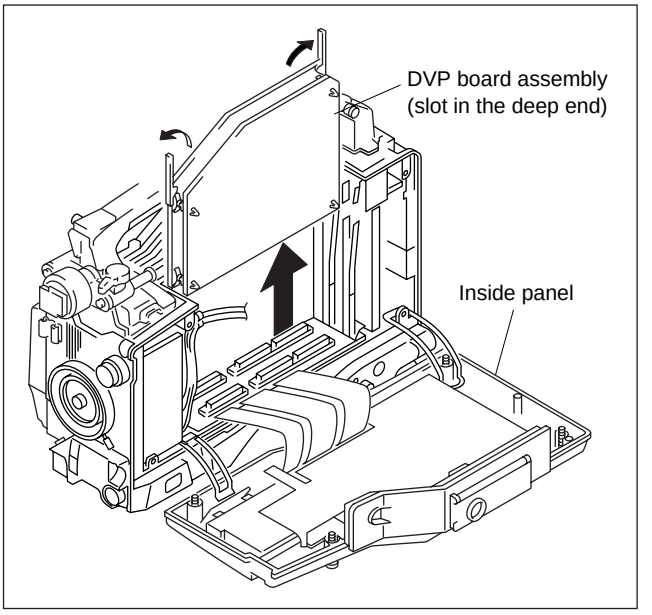
   Be careful not to pinch harnesses between the inside panel and chassis.

9-2. BKDW-703 (MY-93 board)

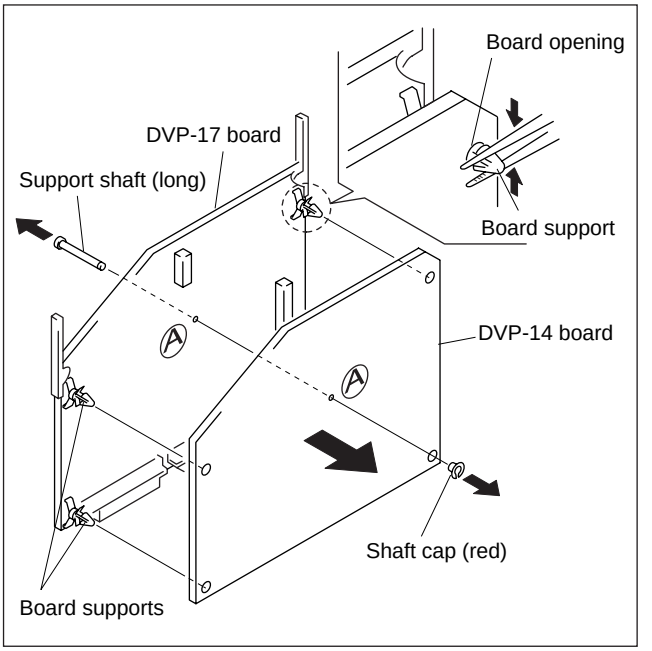
Install the BKDW-703 on side B of the DVP-17 board.

Procedure

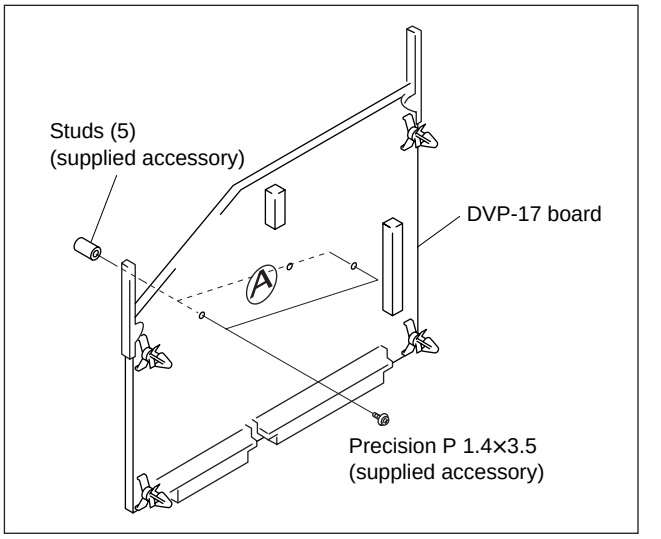
1. Open the inside panel. (Refer to Section 1-7.)
2. Remove the DVP board assembly. (Refer to Section 1-9.)



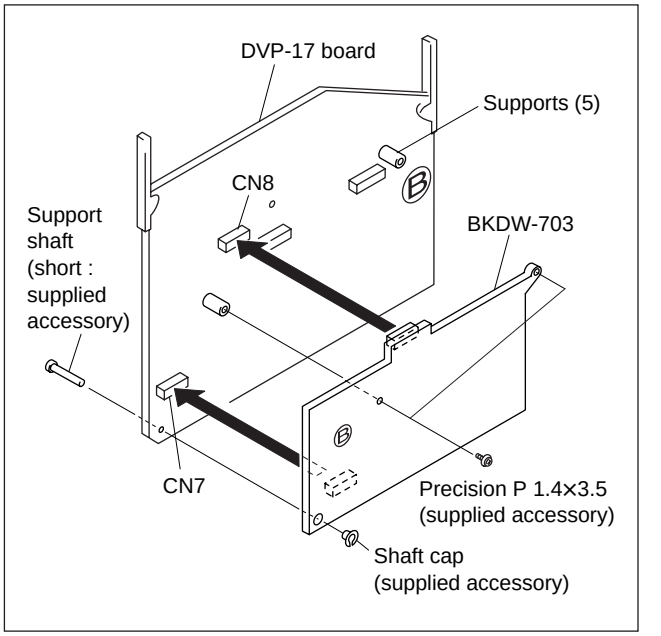
3. Remove the shaft cap and the support shaft (long) from the DVP board assembly.
4. Hold the cap of the board support with tweezers and press it to shrink. Remove the four caps from the four board openings, and then remove the DVP-14 board.



5. Attach the two supports (5) supplied, onto side B of the DVP-17 board with the two precision screws supplied.



6. Insert the connector of the BKDW-703 (MY-93 board) to CN7 and CN8 on side B of the DVP-17 board, and connect them firmly.
7. Use the two precision screws supplied and fasten the BKDW-703 on the supports (5) attached in step 5.
8. Install the supplied support shaft (short) and the shaft cap as shown in the figure.

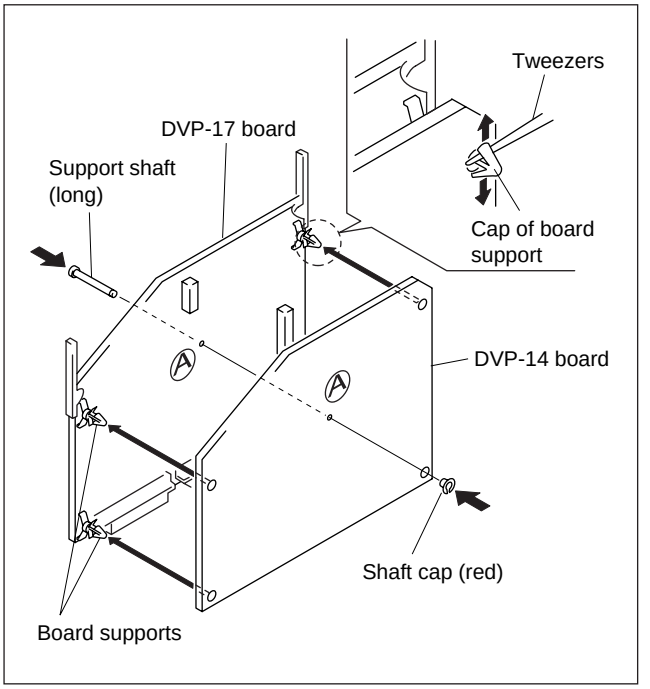


9. Reinstall the DVP-14 board that is removed in step 4.

Note

If the board support is easy to drop from the board opening, unfold the cap of the board support with tweezers' tip or the like.

10. Reattach the support shaft (long) and the shaft cap that are removed in step 3.



11. Reinstall the DVP board assembly.
(Refer to Section 1-9.)
12. Close the inside panel, and then fasten the four screws (with drop-safe) to install the panel.

Note

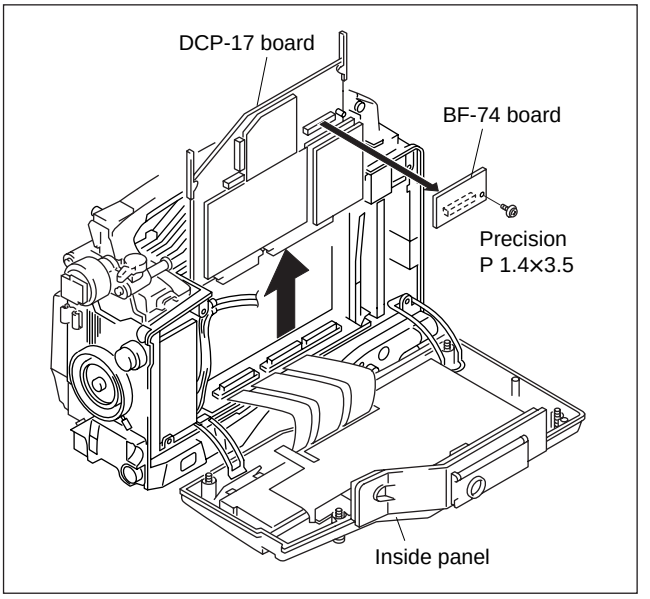
Be careful not to pinch harnesses between the inside panel and chassis.

9-3. BKDW-704 (FM-65 board)

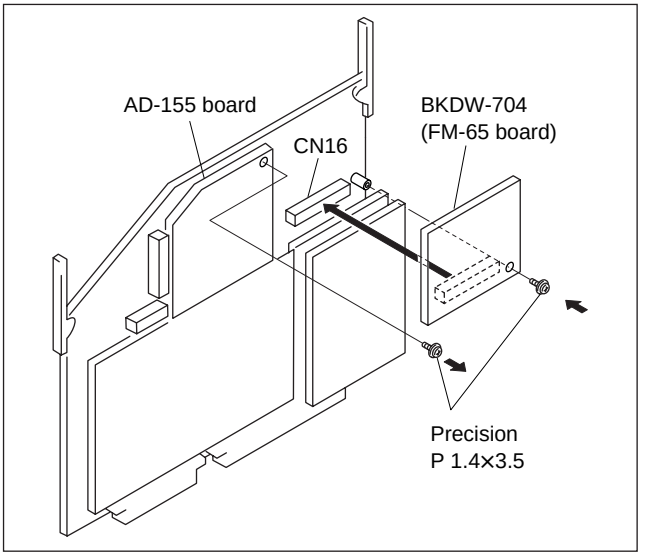
The BKDW-704 is the dedicated optional board for DVW-790WS/790WSP/709WS/709WSP.
(Even when the BKDW-704 board is installed in the DVW-707/707P, image inversion function is not usable.)
Install the BKDW-704 in exchange of the BF-74 board that is attached on the DCP-17 board.

Procedure

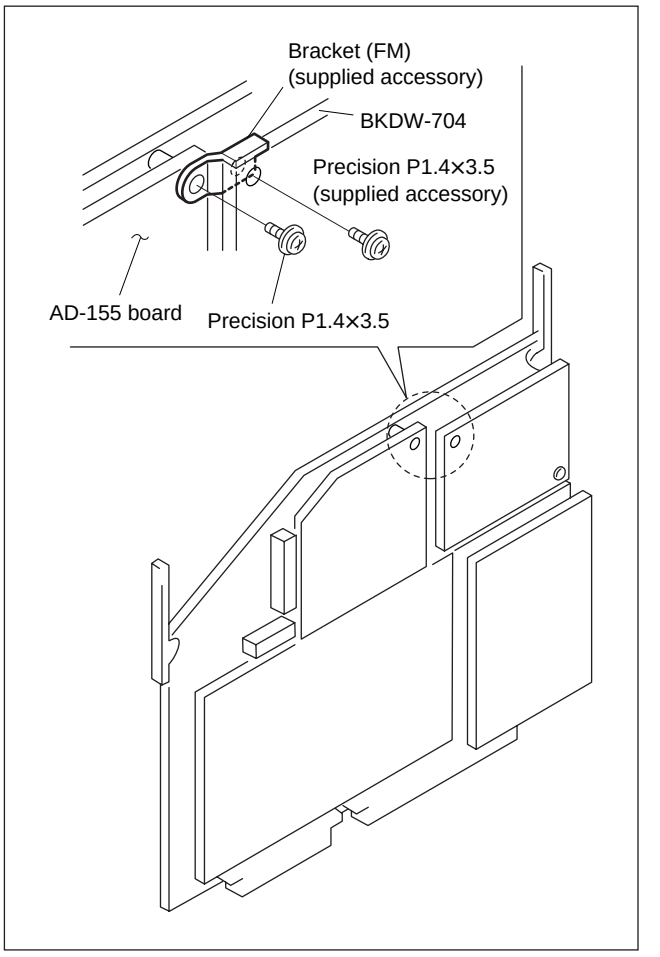
1. Open the inside panel. (Refer to Section 1-7.)
2. Remove the DCP board assembly (Refer to Section 1-9.)
3. Remove the precision screw, and then remove the BF-74 board from the DCP-17 board.



4. Connect the BKDW-704 (FM-65 board) onto CN16 on the DCP-17 board, and fix it with the precision screw that is removed in step 3.
5. Remove the one precision screw from the AD-155 board.



6. Set the supplied bracket (FM) between the BKDW-704 and the AD-155 board as shown in the figure. And then fix it with the supplied precision screw and the precision screw that is removed in step 5.



7. Reinstall the DCP board assembly.
(Refer to Section 1-9.)
8. Close the inside panel, and then fasten the four screws (with drop-safe) to install the panel.

Note

Be careful not to pinch harnesses between the inside panel and chassis.

DVW-707 (SY)
DVW-707P (SY)
DVW-709WS (SY)
DVW-709WSP (SY)
DVW-790WS (SY)
DVW-790WSP (SY) E
3-202-066-02

Sony Corporation
Broadcasting & Professional Systems Company

Printed in Japan
1999. 6 16