

## SECTION 7 ELECTRICAL ADJUSTMENTS

See adjusting elements location diagram on page 94 for the adjustments.

### 7-1. MEASUREMENT TOOL

- Oscilloscope
- Color monitor TV (NTSC)
- Digital voltmeter
- Audio level meter
- Frequency counter
- Remote control unit (RM-2001)
- Servo checker Jig (J-6166-370-A)
- Alignment disc REF5F-12CAD (8-847-018-00)

Standard disc for adjusting this machine is REF5F-12CAD (8-847-018-00), whereas, the adjusting items without particular notice can be adjusted by the following alignment disc.

REF5A-12CAD	}	(8-847-018-00)
REF5B-6Z079		
REF5C-6Z079		
REF5E-12CAD		

For the adjusting items with notices, follow those indications.

- Signal generator
- Connection harness (J-6082-068-A)

### 7-2. CAUTIONS ON ADJUSTMENT

- Do not open or close the disc table while standing up the player on its side. (Do not press the OPEN button.)
- When standing the player up, set the right side, facing the front panel, downward and turn OFF the power supply.

### 7-3. SERVO CHECKER JIG

The servo checker jig is used for focus and tracking servo adjustments.

- SERVO CHECKER jig (J-6166-370-A)
- Connection harness (J-6082-068-A)

#### 7-3-1. Connection harness (J-6082-068-A)

- 1) Connect the connection harness as shown in the following figure.

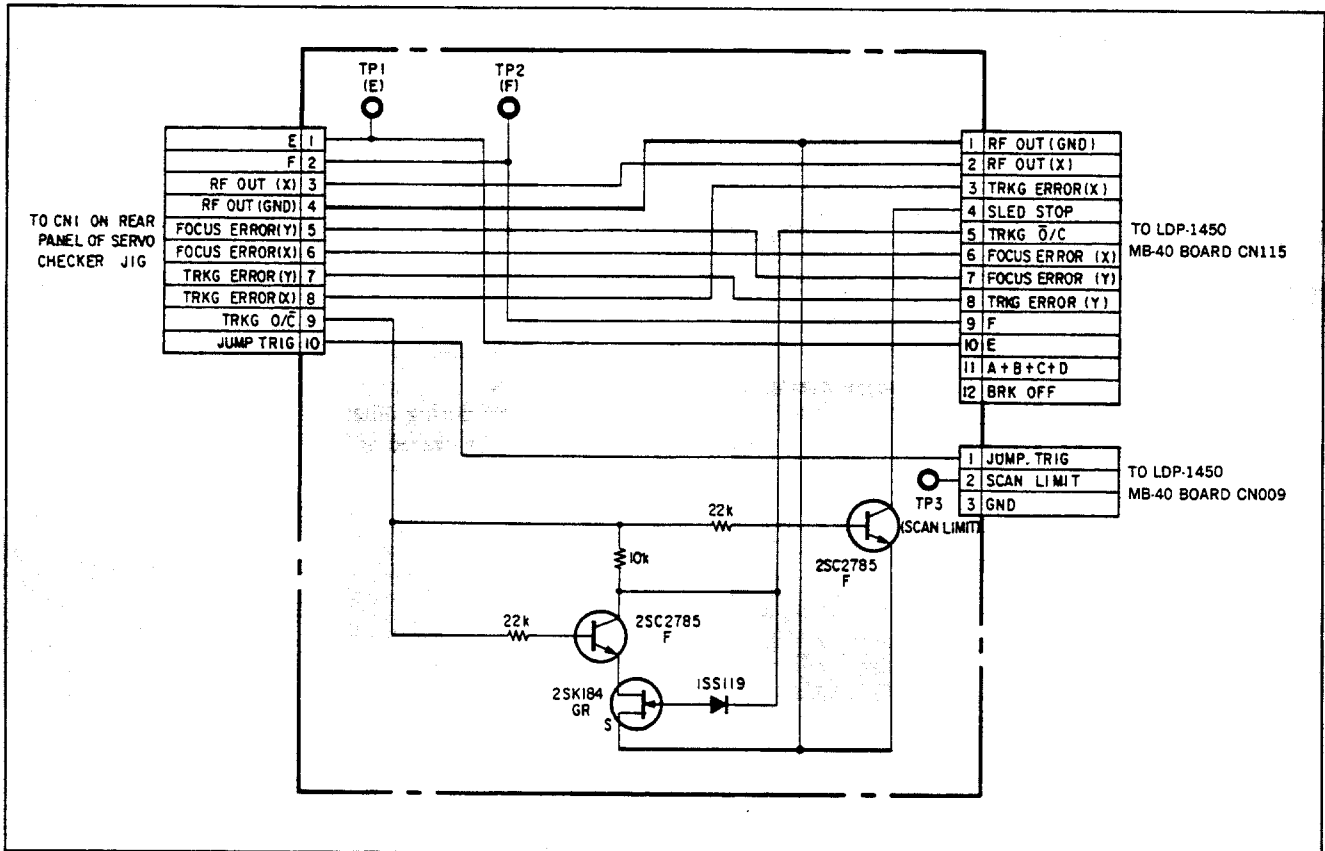


Fig. 7-1. CONNECTION HARNESS SCHEMATIC DIAGRAM

### 7-3-2. Terminals and Switches

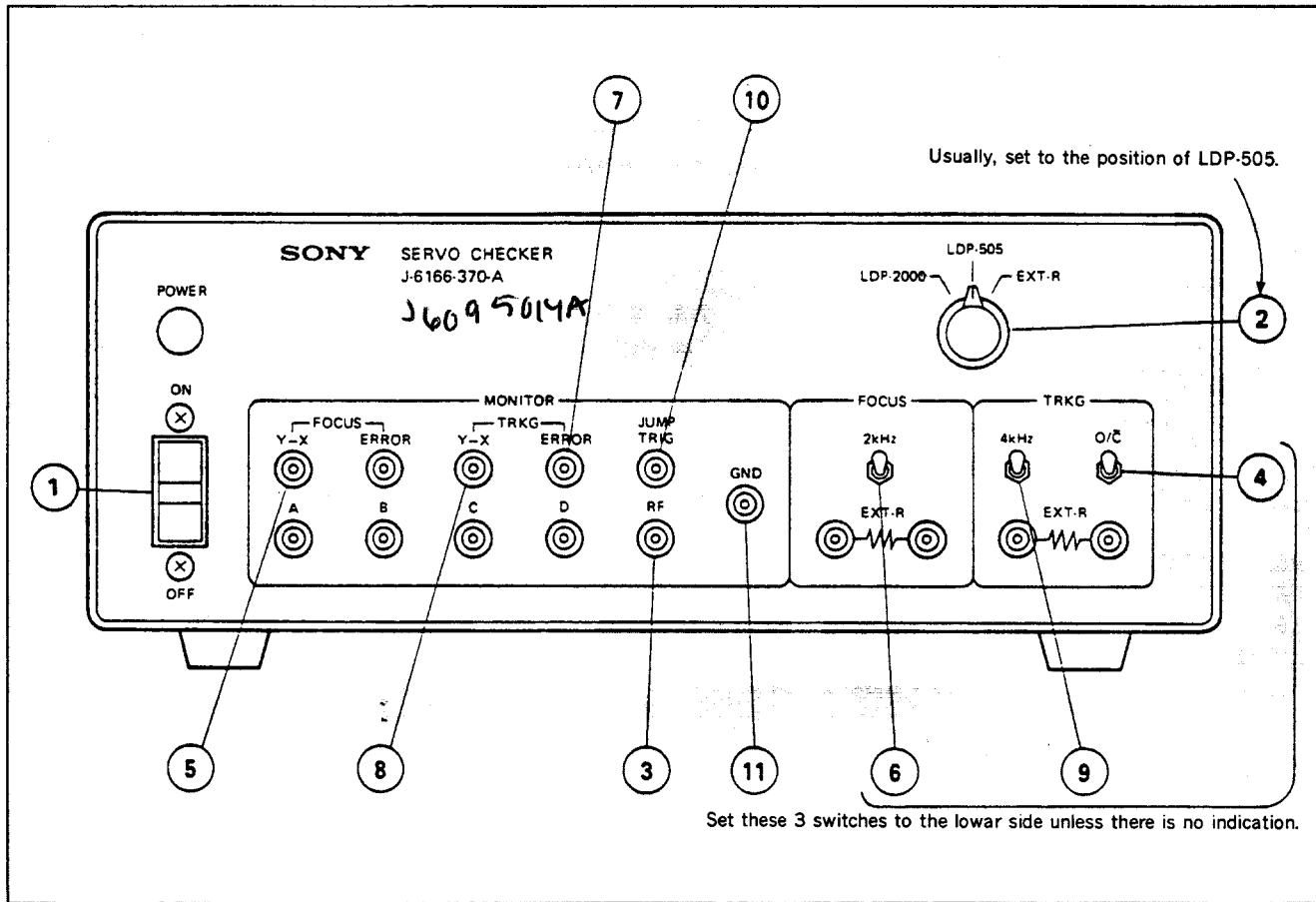
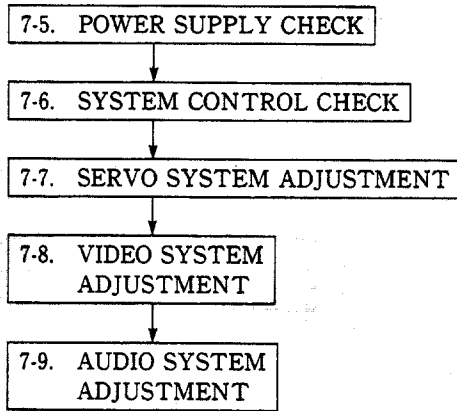


Fig. 7-2.

- ① POWER switch
- ② Mode selector ..... Set to LDP-505 during adjustment.
- ③ RF terminal ..... Connect oscilloscope during focus offset adjustment and RF level one.
- ④ TRKG O/C switch ..... Set to O (open) only during tracking offset adjustment and to C̄ (close) during other adjustments.
- ⑤ FOCUS Y-X terminal ..... Connect oscilloscope during focus gain adjustment.
- ⑥ FOCUS 2kHz switch ..... Turn it on during FOCUS gain adjustment and to off during other adjustments.
- ⑦ TRKG ERROR terminal ... Connect oscilloscope during tracking offset adjustment and tract jump adjustment.
- ⑧ TRKG Y-X terminal ..... Connect oscilloscope during tracking gain adjustment.
- ⑨ TRKG 4kHz switch ..... Turn it on during tracking gain adjustment and to off during other adjustments.
- ⑩ JUMP TRIG terminal ..... Connect oscilloscope during track jump adjustment. (Triggered at TRKG jump)
- ⑪ GND terminal

#### 7-4. ADJUSTMENT SEQUENCE

Make adjustment in the following sequence.



#### 7-5. POWER SUPPLY CHECK (DC-40 BOARD)

##### 7-5-1. Power Supply Voltage Check

Mode	No disc
Measurement instrument	Digital voltmeter
UNREG +15V CHECK	
Measurement point	Pin ① of CN003 (GND: Pin ⑦ of CN003)
Specified value	+17.0±2.0Vdc
UNREG -15V CHECK	
Measurement point	Pin ⑩ of CN003 (GND: Pin ⑦ of CN003)
Specified value	-17.0±2.0Vdc
REG +12V CHECK	
Measurement point	Pin ③ of CN003 (GND: Pin ⑦ of CN003)
Specified value	+11.3±0.4Vdc
REG +9V CHECK	
Measurement point	Pin ④ of CN003 (GND: Pin ⑦ of CN003)
Specified value	+9.0±0.4Vdc
REG -9V CHECK	
Measurement point	Pin ⑨ of CN003 (GND: Pin ⑦ of CN003)
Specified value	-9.0±0.4Vdc
REG +5V CHECK	
Measurement point	Pin ⑤ of CN003 (GND: Pin ⑦ of CN003)
Specified value	+5.0±0.3Vdc
REG -5V CHECK	
Measurement point	Pin ⑧ of CN003 (GND: Pin ⑦ of CN003)
Specified value	-5.0±0.3Vdc

##### [Checking procedure]

- 1) Each power supply voltage shall fulfill the specified value.

##### DC-40 BOARD (COMPONENT SIDE)

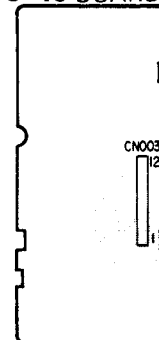


Fig. 7-3.

## 7-6. SYSTEM CONTROL CHECK (MB-40 BOARD)

### 7-6-1. 500kHz Clock Check

Mode	FWD play
Signal	REF 5A/5B/5C/5E/5F
Measurement point	Pin ⑩ of IC313
Measurement instrument	Frequency counter
Specified value	500±20kHz

**Note:** Connect the frequency counter through a buffer amplifier (Oscilloscope, etc.) of high input impedance (1MΩ or more) and low capacity (10pF or less).

#### [Adjustment procedure]

- 1) Set the unit into FWD play mode.
- 2) Check that the frequency is 500±20kHz.

### 7-6-2. Baud Rate Clock Check

Mode	FWD play
Signal	REF 5A/5B/5C/5E/5F
Measurement point	Pin ⑨ of IC903
Measurement instrument	Frequency counter
Specified value	See table 7-1.

**Note:** Connect the frequency counter through a buffer amplifier (Oscilloscope, etc.) of high input impedance (1MΩ or more) and low capacity (10pF or less).

#### [Adjustment procedure]

- 1) Set the unit into FWD play mode.
- 2) Check that the frequency is at the standard value when each switch of SW901 is turned on. (The first two digit numbers should be same as those of standard value)

Switch for turning on	Frequency of Pin ⑨ of IC903
1	19.2kHz
2	38.4kHz
3	76.8kHz
4	153.6kHz

table. 7-1.

## 7-6-3. Function Switch Check

Mode	FWD play
Signal	REF 5A/5B/5C/5E/5F
Measurement point	Pin ⑬ to ⑰ of IC902
Measurement instrument	Digital voltmeter
Specified value	"L" at 0 to 0.5Vdc "H" at 4.5 to 5.0Vdc

#### [Adjustment procedure]

- 1) Set the unit into FWD play mode.
- 2) Turn on or off each switch (1 to 6) of SW902, and check that each voltage of terminal of Pin ⑬ to ⑰ of IC902 becomes "L" or "H".

7-7. SERVO SYSTEM ADJUSTMENT (MB-40 BOARD)  
 7-7-1. REF-H Delay Adjustment (MB-40 Board)

Mode	FWD play
Signal	REF 5A/5B/5C/5E/5F
Measurement point	CH1 : Pin ⑫ of IC203 CH2 : Pin ⑬ of IC203 Trig : CH2
Measurement instrument	Oscilloscope
Adjusting element	RV202
Specified value	$\Delta t = 32 \pm 2 \mu\text{S}$

[Adjustment procedure]

- 1) Adjust with RV202 so that the  $\Delta t$  value becomes  $32 \pm 2 \mu\text{s}$ .

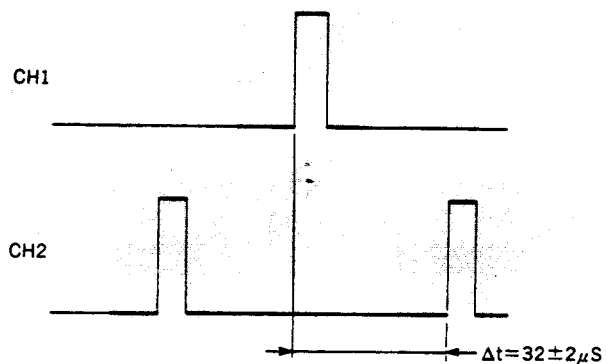


Fig. 7-4.

7-7-2. Tracking Drive Offset Adjustment (MB-40 Board)

Mode	Power ON (No disc)
Signal	No disc
Measurement point	Pin ⑦ of FN001 (TP305)
Measurement instrument	Oscilloscope (DC range)
Adjusting element	RV201
Specified value	$0 \pm 5 \text{mVdc}$

[Adjustment procedure]

- 1) Set the unit into Power ON mode.
- 2) Adjust for  $0 \pm 5 \text{mVdc}$  with RV201.

### 7-7-3. RD Adjustment (MAIN CHASSIS)

Mode	Still
Signal	REF 5A/5B/5C/5E/5F, frame 12000
Measurement point	CH1: Pin ⑨ of CN115 CH2: Pin ⑩ of CN115
Measurement instrument	Oscilloscope (X-Y MODE)
Adjusting element	Guide B ADJ claw
Specified value	A: B=1: 3

**Note:** From this 7-7-8, setting should be performed on the horizontal condition.

#### [Adjustment procedure]

- 1) Perform searching of frame 12000. (Press **SEARCH** **1** **2** **0** **0** **0** **ENTER** of remote control unit.)
- 2) Release the claw A.
- 3) Open tracking servo. (Set TRKG O/C switch of servo checker to O(open) side.)
- 4) Adjust guide B ADJ claw for A: B=1: 3.
- 5) Turn claw A clockwise for 90°, and lock.
- 6) Close the tracking servo, and search the frame 12000, and confirm that the output waveform which trails in the right upper direction. (Refer to Fig. 7-7.)  
(if the waveform trails in the lower left direction, repeat it by returning to 1.)

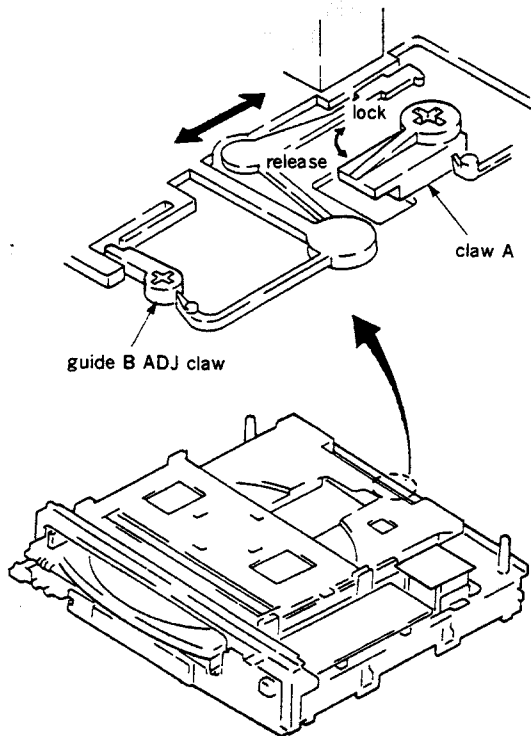
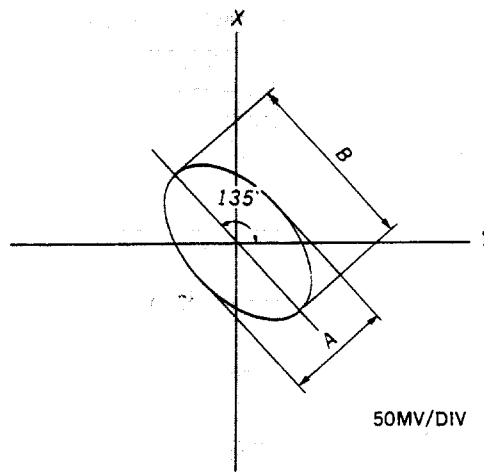


Fig. 7-5.



A: B=1: 3

Fig. 7-6.

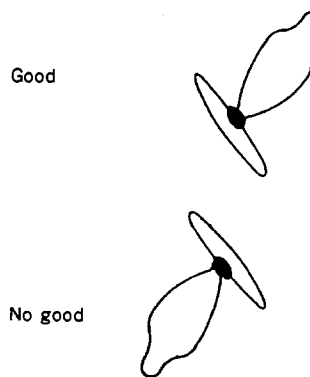


Fig. 7-7.

### 7-7-4. Skew Adjustment (MB-40 Board)

Mode	Still
Signal	REF 5A/5B/5C/5E/5F, frame 9000
Measurement point	Pin ② of CN115
Measurement instrument	Oscilloscope
Adjusting element	RV304
Specified value	Maximum

#### [Adjustment procedure]

- 1) Perform searching of frame 9000. (Press **SEARCH** **9** **0** **0** **0** **ENTER** of remote control unit.)
- 2) Maximize the RF output waveform level with RV304.



Fig. 7-8.

### 7-7-6. Focus Offset Adjustment (MB-40 Board)

Mode	Still
Signal	REF 5A/5B/5C/5E/5F, frame 13501
Measurement point	Pin ② of CN115
Measurement instrument	Oscilloscope
Adjusting element	RV302
Specified value	Maximum

#### [Adjustment procedure]

- 1) Perform searching of frame 13501. (Press **SEARCH** **1** **3** **5** **0** **1** **ENTER** of remote control unit.)
- 2) Maximize the RF output waveform level with RV302.



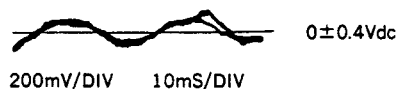
Fig. 7-10.

### 7-7-5. Focus Gain Adjustment (MB-40 Board)

Mode	Still
Signal	REF 5A/5B/5C/5E/5F, frame 13501
Measurement point	FOCUS Y-X terminal (servo checker)
Measurement instrument	Oscilloscope (DC range)
Adjusting element	RV303
Specified value	$0 \pm 0.4Vdc$

#### [Adjustment procedure]

- 1) Perform searching of frame 13501. (Press **SEARCH** **1** **3** **5** **0** **1** **ENTER** of remote control unit.)
- 2) Turn on the FOCUS 2kHz switch of servo checker.
- 3) Adjust with RV303 so that average value of waveform becomes  $0 \pm 0.4Vdc$ .
- 4) Turn off the FOCUS 2kHz switch of servo checker.



Adjust so that average value of waveform becomes  $0 \pm 0.4Vdc$ .

Fig. 7-9.

### 7-7-7. Tracking Gain Adjustment (MB-40 Board)

Mode	Still
Signal	REF 5A/5B/5C/5E/5F, frame 13501
Measurement point	TRKG Y-X terminal (servo checker)
Measurement instrument	Oscilloscope (DC range)
Adjusting element	RV301
Specified value	$0 \pm 0.2Vdc$

#### [Adjustment procedure]

- 1) Perform searching of frame 13501. (Press **SEARCH** **1** **3** **5** **0** **1** **ENTER** of remote control unit.)
- 2) Turn on the TRKG 4kHz switch of servo checker.
- 3) Adjust with RV301 so that average value of waveform becomes  $0 \pm 0.2Vdc$ .
- 4) Turn off the TRKG 4kHz switch of servo checker.



Adjust so that average value of waveform becomes  $0 \pm 0.2Vdc$ .

Fig. 7-11.

### 7-7-8. Tracking Offset Adjustment (MB-40 Board)

Mode	Still
Signal	REF 5A/5B/5C/5E/5F, frame 13501
Measurement point	TRKG ERROR terminal (servo checker)
Measurement instrument	Oscilloscope (DC range)
Adjusting element	RV300
Specified value	A = B

#### [Adjustment procedure]

- 1) Perform searching of frame 13501. (Press **SEARCH** **1** **3** **5** **0** **1** **ENTER** of remote control unit.)
- 2) Open tracking servo.  
(Set TRKG O/ $\bar{C}$  switch of servo checker to O (open side).)
- 3) Set the center voltage of the tracking error signal to 0  $\pm$  0.1Vdc using RV300.
- 4) Close tracking servo.

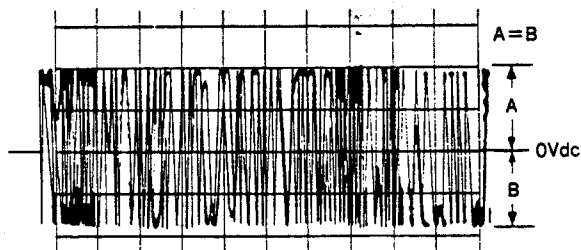


Fig. 7-12.

### 7-7-9. In Limit/Out Limit Adjustment

#### (A) In Limit Check

Mode	Still, REV, X3 (REV Side)
Signal	REF5F, frame 00001
Measurement point	} Monitor
Measurement instrument	
Specified value	⑦ ⑧ ⑨ ⑩ ⑪

#### [Checking procedure]

- 1) Short E001 and TP011 of the FP-300 board, and set the TEST MODE.
- 2) Perform searching of frame 00001. (Press **SEARCH** **0** **0** **0** **0** **1** **ENTER** of remote control unit.)
- 3) Set to **REV**.
- 4) Set to **x3** (REV side).
- 5) Check that the position of the In Limit satisfies with the specified value.
- 6) After the check, check the (B) 12 Inch Disc Out Limit.



Fig. 7-13.



(B) 12 Inch Disc Out Limit Check

Mode	Still, FWD, X3 (FWD Side)
Signal	REF5F, frame 54000
Measurement point	} Monitor
Measurement instrument	
Adjusting element	Fig. 7-15
Specified value	⑥ ⑦ ⑧ ⑨ ⑩

[Checking procedure]

- 1) Perform searching of frame 54000. (Press **SEARCH** 5 4 0 0 0 of remote control unit.)
- 2) Set to **FWD**.
- 3) Set to **×3** (FWD side).
- 4) Check that the position of the 12 Inch Disc Out Limit satisfies with the specified value.



Fig. 7-14.

(C) In Limit/Out Limit Adjustment

- 1) When either or both of (A) In Limit Check or/and (B) 12 Inch Disc Out Limit Check is/are not good, perform the following procedures.
  - ① In case of within the specified value (⑤ and ④, etc.), move a knob in the direction of ① with a press in the direction of arrow A.
  - ② In case of out of the specified value (⑫ and ⑬, etc.), move a knob in the direction of ② with a press in the direction of arrow A.

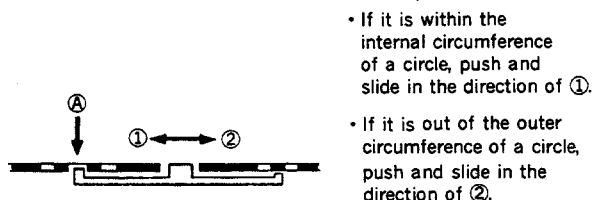
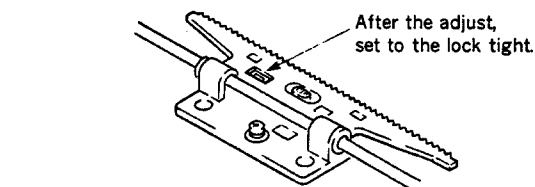


Fig. 7-15.

- 2) Confirm (A) In Limit Check and (B) 12 Inch Disc Out Limit Check again.
- 3) After the adjustment, open E011 and TP011 of the FP-300 board.

7-8. VIDEO SYSTEM ADJUSTMENT

7-8-1. RF Level Check (MB-40 Board)

Mode	Still
Signal	REF 5A/5B/5C/5E/5F, frame 31000
Measurement point	Pin ⑨ of FN001
Measurement instrument	Oscilloscope
Specified value	More than 300mV

[Checking procedure]

- 1) Perform searching of frame 31000. (Press **SEARCH** 3 1 0 0 0 **ENTER** of remote control unit.)
- 2) Check that the RF level is more than 300mV.



Fig. 7-16.

7-8-2. DE-MOD Out Level Adjustment (VP-21 Board)

Mode	Still
Signal	REF 5A/5B/5C/5E/5F, frame 13501
Measurement point	TP101 (Emitter of Q101)
Measurement instrument	Oscilloscope
Adjusting element	RV005
Specified value	$1.00 \pm 0.05V_{p-p}$

[Adjustment procedure]

- 1) Perform searching of frame 13501. (Press **SEARCH** 1 3 5 0 1 **ENTER** of remote control unit.)
- 2) Adjust for  $1.00 \pm 0.05V_{p-p}$  with RV005.

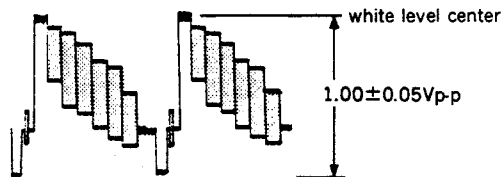


Fig. 7-17.

### 7-8-3. DOC Level Adjustment (VP-21 Board)

Mode	Still
Signal	REF 5A/5B/5C/5E/5F, frame 13501 (color bar)
Measurement point	CH1: Pin ⑦ of IC002 (TP007) CH2: Pin ② of IC002 (TP008)
Measurement instrument	Oscilloscope
Adjusting element	RV006
Specified value	V1 (CH1 Level)=V2 (CH2 Level)

#### [Adjustment procedure]

- 1) Set the unit into still mode.
- 2) Perform searching of frame 13501. (Press **SEARCH** **1 3 5 0 1** **ENTER** of remote control unit.)
- 3) Make adjustment with RV006 so that output levels of CH1 and CH2 are same.

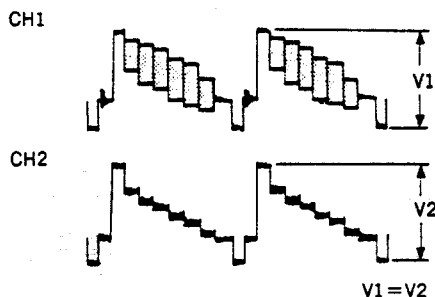


Fig. 7-18.

### 7-8-4. DO-DET Adjustment (VP-21 Board)

Mode	No disc
Signal	Input the sine wave signals of 5.2MHz, 300mVp-p or 5.4MHz, 300mVp-p to Pin ① of CN001 from the signal generator.
Measurement point	Pin ① of IC001
Measurement instrument	Oscilloscope (DC range)
Adjusting element	RV004
Specified value	"H" at 5.2MHz (more than 3Vdc) "L" at 5.4MHz (less than 1Vdc)

#### [Adjustment procedure]

- 1) Input a 5.2MHz, 300mVp-p sine wave.
- 2) Rotate RV004 until a approx. 3.5Vp-p random pulse is output from Pin ① of IC001, and remember the rotational position of RV004 at this time.
- 3) Change the input signal to 5.4MHz, 300mVp-p sine wave.
- 4) Rotate RV004 until a approx. 3.5Vp-p random pulse is output from Pin ① of IC001, and remember the rotational position of RV004 at this time.
- 5) Set RV004 to a center position between the positions noted in 2) and 4).
- 6) Confirm that the level at Pin ① of IC001 is "L" (less than 1Vdc).
- 7) Change the input signal to 5.4MHz, 300mVp-p sine wave.
- 8) Confirm that the level at Pin ① of IC001 is "H" (more than 3Vdc).

### 7-8-5. Fsc Adjustment (MB-40 Board)

Mode	FWD play
Signal	REF 5A/5B/5C/5E/5F
Measurement point	Pin ① of CN002
Measurement instrument	Frequency counter
Adjusting element	CV101
Specified value	3579545±5Hz

**Note:** Connect the frequency counter through a buffer amplifier (Oscilloscope, etc.) of high input impedance (1MΩ or more) and low capacity (10pF or less).

#### [Adjustment procedure]

- 1) Set the unit into FWD play mode.
- 2) Adjust for 3579545±5Hz with CV101.

### 7-8-6. Video Out Level Adjustment (MB-40 Board)

Mode	FWD play
Signal	REF 5A/5B/5C/5E/5F, Chapter 2 (color bar)
Measurement point	Pin ① of CN101
Measurement instrument	Oscilloscope
Adjusting element	RV002
Specified value	$1.00 \pm 0.05V_{p-p}$

#### [Adjustment procedure]

- 1) Perform searching of chapter 2. (Press **REPEAT** **MODE** **2** **ENTER** **10** **ENTER** of remote control unit.)
- 2) Set the unit into FWD play mode.
- 3) Adjust for  $1.00 \pm 0.05V_{p-p}$  with RV002.

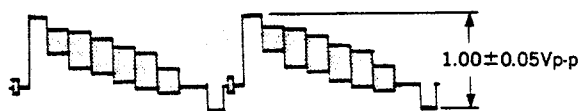


Fig. 7-19.

### 7-8-7. TBC Center Adjustment (VP-21 Board)

Mode	FWD play
Signal	REF 5A/5B/5C/5E/5F, Chapter 2 (color bar)
Measurement point	CH1 : TP101 CH2 : TP102
Measurement instrument	Oscilloscope
Adjusting element	RV104
Specified value	$\Delta t = 6.5 \pm 0.5\mu S$

#### [Adjustment procedure]

- 1) Connect Pin ③ of IC103 to base of Q105 using a jumper wire.
- 2) Perform searching of chapter 2. (Press **REPEAT** **MODE** **2** **ENTER** **2** **ENTER** of remote control unit.)
- 3) Set the unit into FWD play mode.
- 4) Adjust with RV104 so that the  $\Delta t$  value becomes  $6.5 \pm 0.5\mu S$ .
- 5) Remove the jumper wire.

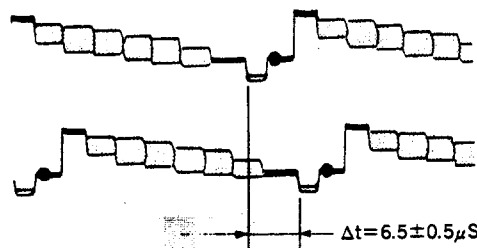


Fig. 7-20.

### 7-8-8. TBC CCD Bias Adjustment (VP-21 Board)

Mode	Still
Signal	REF 5A/5B/5C/5E/5F, frame 15001 (color bar)
Measurement point	TP102 (Emitter of Q102)
Measurement instrument	Oscilloscope (DC range)
Adjusting element	RV101
Specified value	$2.1 \pm 0.05V_{dc}$

#### [Adjustment procedure]

- 1) Perform searching of frame 15001. (Press **SEARCH** **1** **5** **0** **0** **1** **ENTER** of remote control unit.)
- 2) Adjust for  $2.1 \pm 0.05V_{dc}$  with RV101.

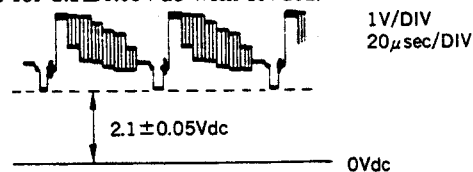


Fig. 7-21.

### 7-8-9. TBC' ED HD Adjustment (VP-21 Board)

Mode	FWD play
Signal	REF 5A/5B/5C/5E/5F, color bar portion (frame 15001 to 16200)
Measurement point	Pin ④ of CN004 (Pin ⑤ of IC102)
Measurement instrument	Oscilloscope
Adjusting element	RV103
Specified value	$5.3 \pm 0.2 \mu\text{S}$

#### [Adjustment procedure]

- 1) Adjust with RV103 so that width of output pulse become  $5.3 \pm 0.2 \mu\text{S}$ .

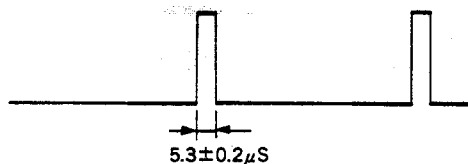


Fig. 7-22.

### 7-8-10. TBC' ED Video Out Level Adjustment (VP-21 Board)

Mode	FWD play
Signal	REF 5A/5B/5C/5E/5F, color bar portion (frame 15001 to 16200)
Measurement point	Pin ① of CN003
Measurement instrument	Oscilloscope
Adjusting element	RV105
Specified value	$0.4 \pm 0.05 \text{V}_{\text{p-p}}$

#### [Adjustment procedure]

- 1) Adjust for  $0.4 \pm 0.05 \text{V}_{\text{p-p}}$  with RV105.

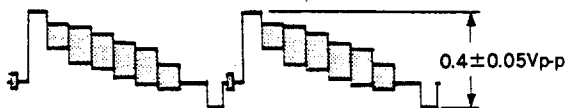


Fig. 7-23.

### 7-9. AUDIO SYSTEM ADJUSTMENT

#### 7-9-1. Audio Output Level Adjustment (AU-80 Board)

Mode	FWD play
Signal	REF 5A/5B/5C/5E/5F, Chapter 6 (1kHz, 100%)
Measurement point	1/L [2/R] terminal of audio line output
Measurement instrument	Audio level meter or oscilloscope
Adjusting element	RV202 [RV201]
Specified value	Audio level meter : $-1.5 \pm 0.3 \text{dBs}$ Oscilloscope : $1.8 \pm 0.1 \text{V}_{\text{p-p}}$

**Note :** Adjusting element for 2/R CH.

#### [Adjustment procedure]

- 1) Search chapter 6, (Press **REPEAT** **6** **ENTER** **9** **ENTER** of remote control unit.)
- 2) Adjust RV202 [RV201] for  $-1.5 \pm 0.3 \text{dBs}$  or  $1.8 \pm 0.1 \text{V}_{\text{p-p}}$ .

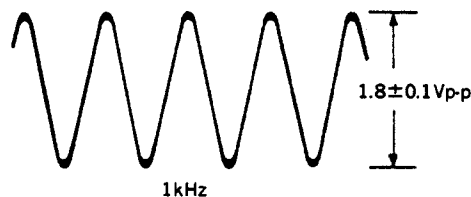


Fig. 7-24.

