

JVC®

PRELIMINARY

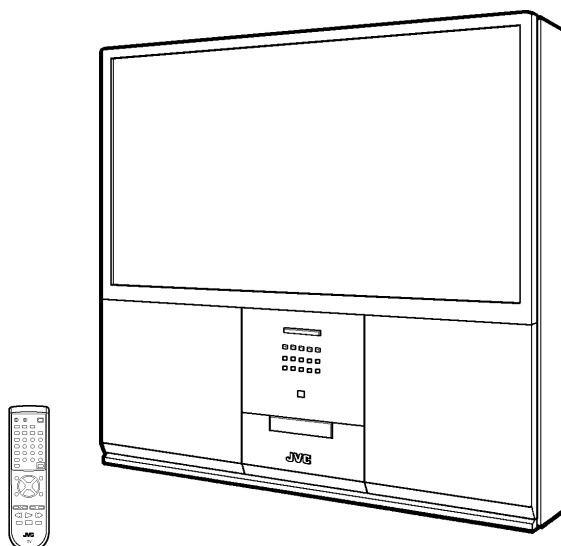
SERVICE MANUAL

ILA® PROJECTION TELEVISION

BASIC CHASSIS
PD

AV-61S902 (US) / (CA)

CD-ROM : No.SML200102



CONTENTS

- SPECIFICATIONS 2
- SAFETY PRECAUTIONS 3
- SPECIFIC SERVICE INSTRUCTIONS 4
- SERVICE ADJUSTMENTS 13

SPECIFICATIONS

Items	Contents
Dimensions (W × H × D)	145.1cm × 150.8cm × 62.9cm (57-1/4" × 59-3/8" × 24-7/8")
Mass	117kg (258 lbs)
TV System and Color system	* 1080i DTV (digital broadcast) ready
TV RF System	CCIR M
Color System	NTSC
Sound System	BTSC (Multi Channel Sound)
TV Receiving Channels and Frequency	
VL Band	02 ~ 06 : 54MHz ~ 88MHz
VH Band	07 ~ 13 : 174MHz ~ 216MHz
UHF Band	14 ~ 69 : 470MHz ~ 806MHz
CATV Receiving Channels and Frequency	54MHz ~ 806MHz
Low Band	02 ~ 06, A-8 (by 02 ~ 06 & 01)
High Band	07 ~ 13 (by 07 ~ 13)
Mid Band	A ~ 1 (by 14 ~ 22)
Super Band	J ~ W (by 23 ~ 36)
Hyper Band	W+1 ~ W+28 (by 37 ~ 64)
Ultra Band	W+29 ~ W+84 (by 65 ~ 125)
Sub Mid Band	A8, A4 ~ A1 (by 01, 96 ~ 99)
TV/CATV Total Channel	181 Channels
Power Input	AC 120V, 60Hz
Power Consumption	430W
Projection System	D-ILA Hologram device 1.22" (1280 × 1028 × 3 pixels)
Light Source Lamp	200W UHP (Ultra High-Pressure mercury) lamp
Screen	Transparent screen (united Fresnel lens & Double lenticular lens), aspect ratio 16:9
Screen Size	61-inch (155cm) : measured diagonally [W: 135.1cm × H: 76cm]
Speaker	Main (full range) : 10cm (3-15/16") Round type ×2 Bass (sub woofer) : 16cm (6-3/10") Round type ×2
Audio Power Output	Main (full range) : 5W+5W Bass (sub woofer) : 10W+10W
Antenna terminal (75Ω VHF/UHF) [INPUT A / INPUT B / SPLIT OUT]	* SPLIT OUT : for CATV box connection 75Ω, F-type connector ×3
Input (INPUT 1 / 2 / 3 / 4 / 5)	* INPUT-5 : Audio (L/R) only
Video	1V(p-p), 75Ω RCA pin jack ×4
Audio (L/R)	500mV(rms) (-4dBs), high impedance RCA pin jack ×10
S-Video	mini-DIN 4-pin connector ×4
Component-Video [INPUT 2 / 3]	Y : 1V(p-p) positive, 75Ω (negative sync. provided) C : 0.286V(p-p), 75Ω (burst signal) RCA pin jack ×6 Y : 1V(p-p) positive, 75Ω (3-values sync. provided) PB / PR : 0.7V(p-p) [±0.35V], 75Ω RCA pin jack
Digital Input (INPUT-5)	DVI (Digital Visual Interface) 25-pin connector ×1
Output (LINE OUT)	
Video	1V(p-p), 75Ω RCA pin jack ×1
Audio (L/R)	500mV(rms) (-4dBs), high impedance RCA pin jack ×2
S-Video	mini-DIN 4-pin jack ×1
Component-Video	Y : 1V(p-p) positive, 75Ω (negative sync. provided) C : 0.286V(p-p), 75Ω (burst signal)
Audio Output (FRONT / SURROUND REAR) [FRONT = Variable / Fix : Selectable] [SURROUND REAR = Fix only]	RCA pin jack ×4 Variable : More than 0 ~ 1550mV(rms) (+6dBs) / Fix : 500mV(rms) (-4dBs) Low impedance (400Hz when modulated 100%)
AV COMPULINK EX Input	3.5mm mini jack (Monaural type)
Remote Control Unit	RM-C308 (Dry cell battery : AA/R6/UM-3 ×2)
Option	Lamp unit [PK-CL200U]

Design & specification are subject to change without notice.

SAFETY PRECAUTIONS

- The design of this product contains special hardware, many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
- Alterations of the design or circuitry of the products should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
- Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. **Electrical components having such features are identified by shading on the schematics and by (Δ) on the parts list in Service manual.** The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list of Service manual may cause shock, fire, or other hazards.
- Use isolation transformer when hot chassis.**
The chassis and any sub-chassis contained in some products are connected to one side of the AC power line. An isolation transformer of adequate capacity should be inserted between the product and the AC power supply point while performing any service on some products when the HOT chassis is exposed.
- Don't short between the LIVE side ground and ISOLATED (NEUTRAL) side ground or EARTH side ground when repairing.**
Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : (\perp) side GND, the ISOLATED(NEUTRAL) : (\updownarrow) side GND and EARTH : (\oplus) side GND. Don't short between the LIVE side GND and ISOLATED(NEUTRAL) side GND or EARTH side GND and never measure with a measuring apparatus (oscilloscope etc.) the LIVE side GND and ISOLATED(NEUTRAL) side GND or EARTH side GND at the same time.
If above note will not be kept, a fuse or any parts will be broken.
- If any repair has been made to the chassis, it is recommended that the B1 setting should be checked or adjusted (See ADJUSTMENT OF B1 POWER SUPPLY).
- The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approved by the manufacturer of the complete product.
- Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a $10k\Omega$ 2W resistor to the anode button.
- When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.

10. Isolation Check

(Safety for Electrical Shock Hazard)

After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, video/audio input and output terminals, Control knobs, metal cabinet, screwheads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

(1) Dielectric Strength Test

The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 1100V AC (r.m.s.) for a period of one second.

(. . . Withstand a voltage of 1100V AC (r.m.s.) to an appliance rated up to 120V, and 3000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.)

This method of test requires a test equipment not generally found in the service trade.

(2) Leakage Current Check

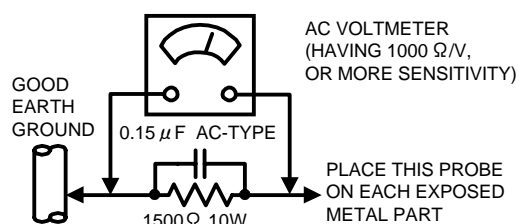
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.).

However, in tropical area, this must not exceed 0.2mA AC (r.m.s.).

● Alternate Check Method

Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1000 ohms per volt or more sensitivity in the following manner. Connect a 1500Ω 10W resistor paralleled by a $0.15\mu F$ AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.). Measure the AC voltage across the resistor with the AC voltmeter. Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.).

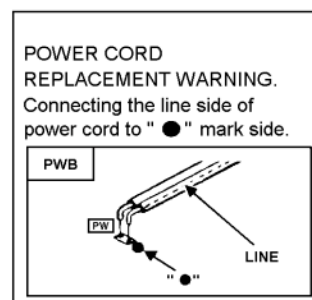
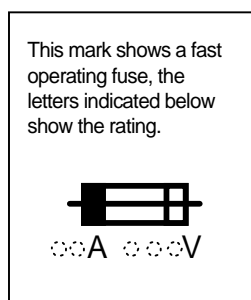
However, in tropical area, this must not exceed 0.3V AC (r.m.s.). This corresponds to 0.2mA AC (r.m.s.).



11. High voltage hold down circuit check.

After repair of the high voltage hold down circuit, this circuit shall be checked to operate correctly.

See item "How to check the high voltage hold down circuit".



SPECIFIC SERVICE INSTRUCTIONS

DISASSEMBLY PROCEDURE

1. FRONT SIDE -1

SPEAKER GRILLE

1) Pull outward and remove 2 adhesive tapes [A]. Take out the SPEAKER GRILLE.

* Both left and right have the same construction.

UPPER FRONT PANEL

● Take out the left and right SPEAKER GRILLES.

1) Remove 4 screws [B] and take out the UPPER FRONT PANEL.

FRONT CONTROL PWB ASS'Y

● Take out the UPPER FRONT PANEL.

1) Disengage interior connectors (X3 / X4).

2) Remove 5 screws [C] and take out the FRONT CONTROL PWB ASS'Y.

LOWER FRONT PANEL

● Take out the UPPER FRONT PANEL.

1) Remove 4 screws [D] and take out the LOWER FRONT PANEL.

FRONT JACK PWB ASS'Y

● Take out the LOWER FRONT PANEL.

1) Disengage interior connectors (AM / F).

2) Remove 2 screws [E] and 2 screws [F]. Take out the FRONT JACK PWB ASS'Y.

FILTER COVER

※ Take out the FILTER COVER when take out the LAMP FILTER COVER and replacing the LAMP UNIT.

● Take out the left SPEAKER GRILLE.

1) Loosen 4 screws [G].

2) Pull upward and take out the FILTER COVER.

ADJUSTMENT COVER

※ Take out the ADJUSTMENT COVER when using a personal computer for adjustment.

● Take out the right SPEAKER GRILLE.

1) Loosen 4 screws [H].

2) Pull upward and take out the ADJUSTMENT COVER.

* When adjustment used the PC, connect the PC to the adjustment terminal (RS-232C control : D-sub 9-pin connector) .

MAIN SPEAKER

● Take out the left and right SPEAKER GRILLES.

1) Remove 4 screws [I].

2) Disengage the connecting wires and take out the MAIN SPEAKER.

* Both left and right have the same construction.

BASS SPEAKER

● Take out the left and right SPEAKER GRILLES.

1) Support the speaker front and take out 4 screws [J].

2) Disengage the connecting wires and take out the BASS SPEAKER.

* Both left and right have the same construction.

* The BASS SPEAKERS are important. Use care not to drop or damage them.

SCREEN ASS'Y

● Take out the left and right SPEAKER GRILLES.

1) Remove 2 screws [K].

2) Pull upward and take out the SCREEN ASS'Y.

* Use care not to scratch the front of the screen

* When transporting, avoid grasping the top of the SCREEN ASS'Y. Grasp the left and right sides or bottom.

* When reassembling, observe the left and right pins of the cabinet are engaged with the rear left and right hooks of the frame at SCREEN ASS'Y. Also check insertion into the 3 slits at the lower front of the cabinet.

MIRROR

* Wear protective gloves to avoid contaminating the MIRROR.

● Take out the SCREEN ASS'Y.

1) Remove 4 left and right screws [L] together with the holder.

2) Support upper part of the MIRROR, remove 6 screws [M] together with the holder and take out the MIRROR.

* The MIRROR is heavy and easily broken. Use care not to impart physical shock.

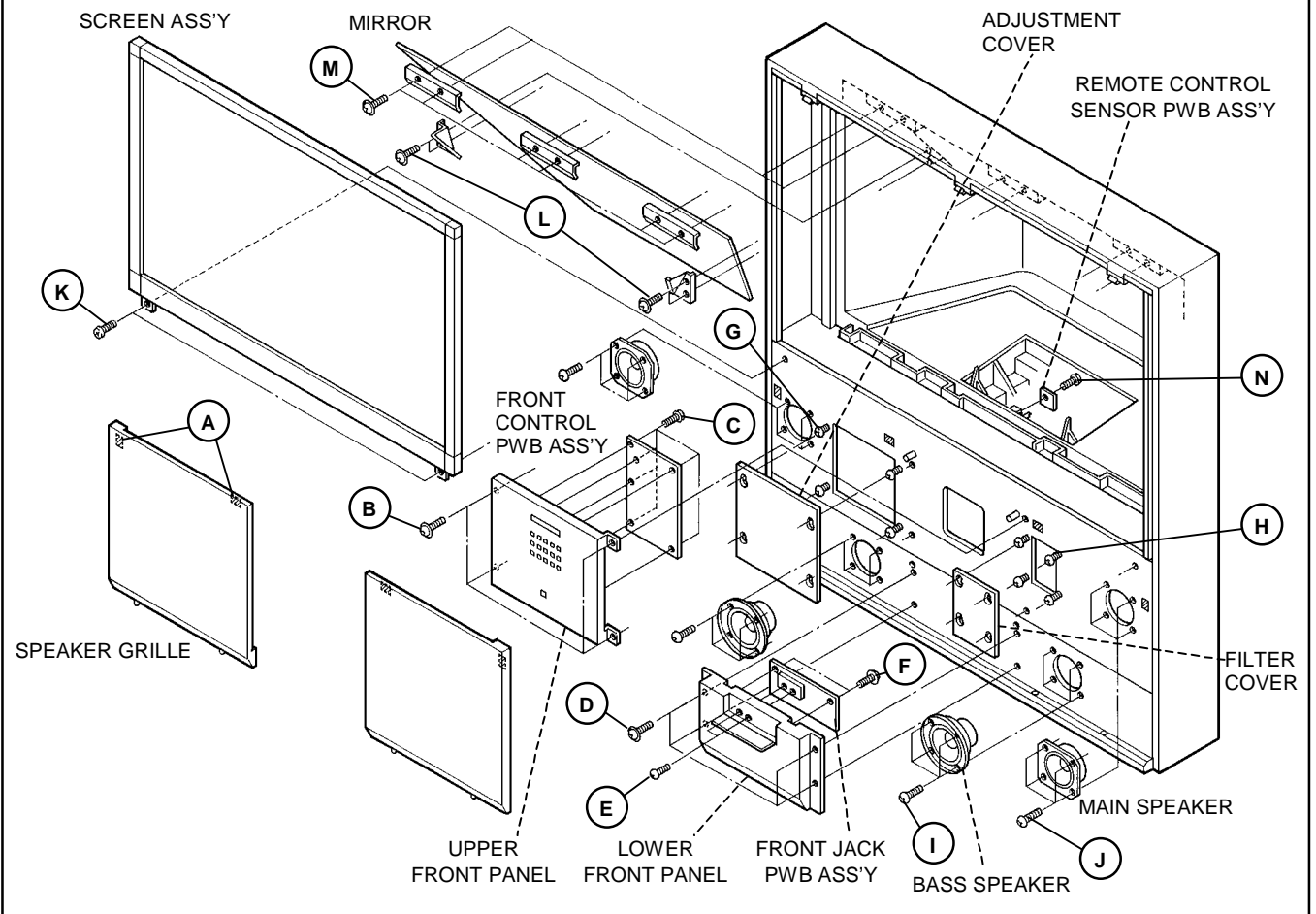
REMOTE CONTROL SENSOR PWB ASS'Y

● Take out the SCREEN ASS'Y.

1) Remove 1 screw [N] and take out the REMOTE CONTROL SENSOR PWB ASS'Y.

* Since the projector lens is nearby, use care not to soil or scratch the lens projection side.

1. FRONT SIDE -1



2. FRONT SIDE -2

FRONT BORAD

- Take out the UPPER FRONT PANEL..
 - Take out the LOWER FRONT PANEL.
 - Take out the SCREEN ASS'Y.
- 1) Remove 14 screws [A]
 - 2) Disengage the MAIN SPEAKER connecting wires outward and take out the FRONT BOARD.

LAMP SECTION FILTER

- ※ The LAMP SECTION FILTER can be replaced by the user.
 - Take out the FILTER COVER.
- 1) Remove 2 screws [B] and 1 screw [C]. Take out the LAMP SECTION FILTER.
- * The filter is coupled with the protector circuit power interlock switch. Be sure to reinstall the dust filter carefully in its proper position. Secure with screws.

LAMP COVER

- Take out the FILTER COVER.
- 1) Remove 2 screws [D] and 1 screw [C]. Take out the LAMP COVER.
- * The LAMP COVER can be disassembled by removing 4 screws [E].

LAMP UNIT

- ※ The LAMP UNIT [PK-CL200U] can be replaced by the user.
 - ※ Allow plenty of time to cool after cutting the power, start the work.
 - Take out the LAMP COVER.
- 1) Use a hex wrench (3mm diameter) to remove 2 screws [F].
 - 2) Grasp and pull the handle outward. Take out the LAMP UNIT.
- * A 3mm hex wrench is provided as an accessory.

DEVICE SECTION FILTER

- ※ The DEVICE SECTION FILTER can be replaced by the user.
 - Take out the ADJUSTMENT COVER.
- 1) Remove 1 screw [G] and take out the DEVICE SECTION COVER.

FILTER PANEL

- ※ The FILTER PANEL is taken out when connecting a personal computer for adjustment.
 - Take out the ADJUSTMENT COVER.
- 1) Take out 2 screws [H] and remove the FILTER PANEL.
- * When adjustment used the PC, connect the PC to the adjustment terminal (RS-232C control : D-sub 9-pin connector) .
 - * The FILTER PANEL can be separated into upper and lower by removing 1 screw [I].

FRONT COVER

- Take out the FRONT BOARD.
- 1) Take out 14 screws [J].
 - 2) Disengage the speaker connector (R). Pull outward and take out the FRONT COVER.
- * When taking out the FRONT COVER, use care not to snag the speaker wire clamp.

INTERLOCK SWITCH & COOLING FAN (INTAKE)

- Take out the FRONT COVER.
- 1) Remove 4 screws [K].
 - 2) Remove 1 screw [L] and take out the switch bracket.
 - 3) Disengage connector (L) and take out the INTERLOCK SWITCH.
 - 4) Remove 2 screws [M] (with washers) .
 - 5) Disengage connector (O) and take out the INTAKE COOLING FAN.
- * When taking out the INTAKE COOLING FAN, use care not to misplace the 2 bushes.

3. OPTICAL BLOCK SECTION

SUB DRIVE PWB ASS'Y

- Take out the FRONT COVER.
- 1) Disengage the connector (017) of the MAIN DRIVE PWB ASS'Y and SUB DRIVE PWB ASS'Y.
- 2) Carefully disengage the device unit connector (018). Extract gradually to avoid damaging the connector.
- 3) Remove 4 screws [A] and take out the SUB DRIVE PWB ASS'Y.
- * The flat wire connecting the DEVICE UNIT is easily damaged. Handle very carefully.

OPTICAL BLOCK

- ※ Allow plenty of time to cool after cutting the power, start the work.
- Take out the LAMP UNIT.
- Take out the FRONT COVER.
- 1) Disengage the connector (017) of the MAIN DRIVE PWB ASS'Y and SUB DRIVE PWB ASS'Y.
- 2) Disengage connectors (AR / AE / AF / AG / AX).
- 3) Remove 3 screws [B].
- 4) While using care not to strike the SUB DRIVE PWB ASS'Y, cabinet or other components, gradually pull the OPTICAL BLOCK outward and set it downward.
- * A spacer (cushion) is attached to the optical block lens section.
- * The OPTICAL BLOCK contains prism, mirrors and other precision components. When handling the OPTICAL BLOCK, use care not to drop it or subject it to strong physical shock.
- * Use care not to directly touch or contaminate the lens projection side.

OPTICAL SECTION COOLING FAN

- Take out the FRONT COVER.
- 1) Remove 8 screws [C] and take out the optical block cover.
- 2) Remove 4 screws [D].
- 3) Disengage connector (AG) and take out the INTAKE FAN.
- 4) Remove 1 screw [E] and take out the fan bracket.
- 5) Remove 2 screws [F].
- 6) Disengage connector (AX) and take out the EXHAUST FAN.
- * When the optical block cover is taken out, the internal components are easily prone to physical shock and contamination. Use care not to damage or soil the internal components.

DEVICE UNIT

- ※ The DEVICE UNIT contains the D-ILA HOLOGRAM device and prism.
- 1) Remove 8 screws [C] and take out the optical block cover.
- 2) Carefully disengage the SUB DRIVE PWB ASS'Y connector (018). Extract gradually to avoid damaging the connector.
- 3) Remove 2 screws [G] and take out the holder.
- 4) While using care not to directly touch the prism, grasp and disengage the bracket from the leaf spring, and take out the DEVICE UNIT.
- * By no means separate the prism and D-ILA HOLOGRAM device. Performance of the laboratory-matched pair is virtually impossible to restore.
- * The flat wire connecting the SUB DRIVE PWB ASS'Y is easily damaged. Handle very carefully.
- * The DEVICE UNIT position is carefully determined and secured to the prism by the leaf spring. During reassemble, precisely insert into the leaf spring.

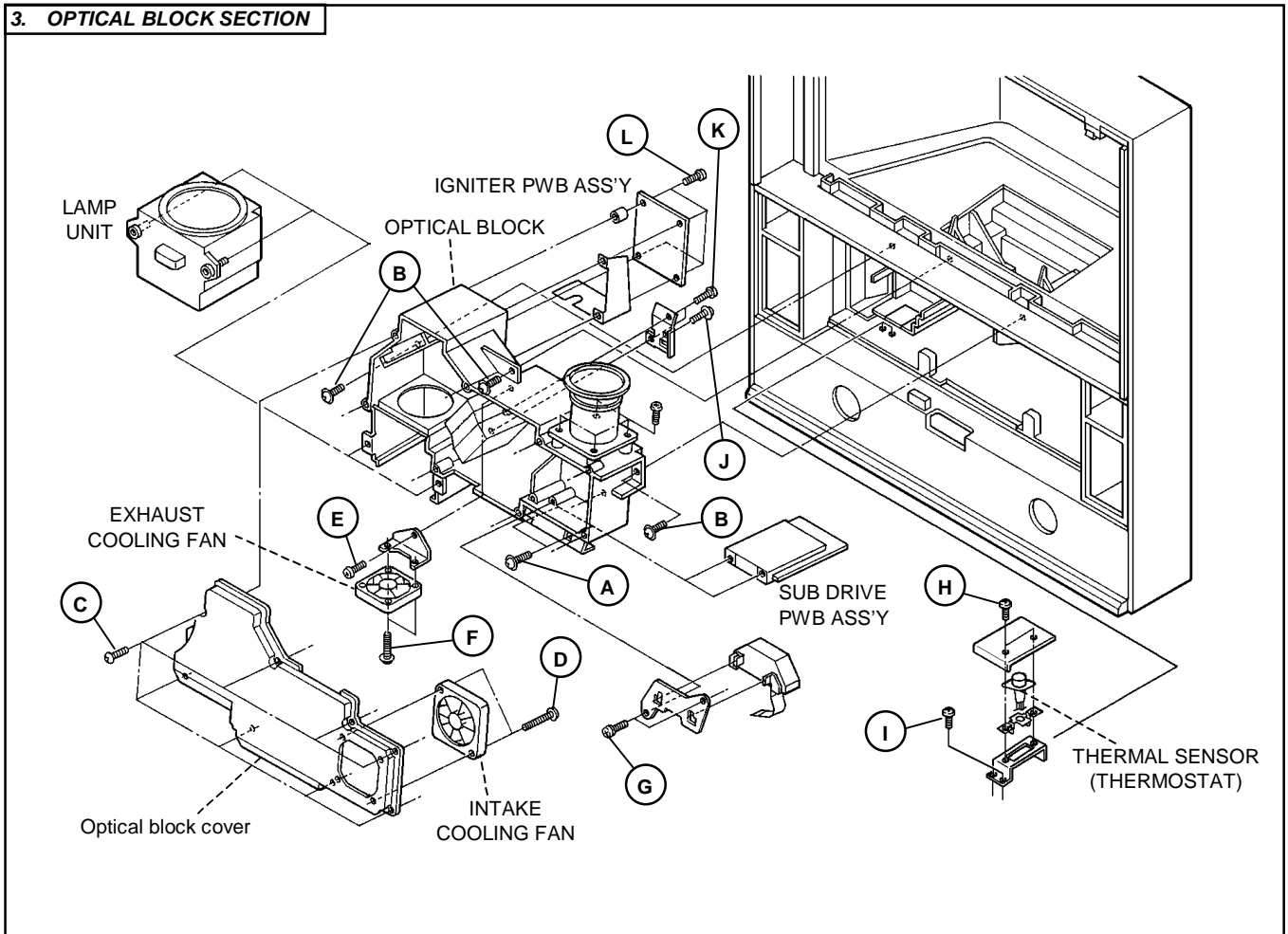
THERMAL SENSOR (THERMOSTAT)

- Take out the LAMP UNIT.
- 1) Remove 2 screws [H] and take out the sensor bracket.
- 2) Remove 2 screws [I] and take out the sensor cover.
- 3) Take out the sensor holder and disengage connector (M). Take out the THERMAL SENSOR.

IGNITER PWB ASS'Y

- Take out the OPTICAL BLOCK.
- 1) Remove 2 screws [J] and 1 screw [K]. Take out the igniter bracket.
- 2) Take out the lamp contactor (electrode section) from the OPTICAL BLOCK.
- 3) Remove 4 screws [L]. Take out the igniter cover together with the IGNITER PWB ASS'Y.
- * Use care not to misplace the 4 bushes when removing the screws.

3. OPTICAL BLOCK SECTION



4. REAR SIDE

REAR COVER

- 1) Remove 17 screws [A] and 6 screws [B].
- 2) Take out the power cord panel and pull out the power cord through the hole. Take out the REAR COVER.

REAR SIDE PANEL

- Take out the REAR COVER.
- 1) Remove 6 screws [C].
- * Both left and right have the same construction.

REAR TERMINAL BOARD

- Take out the REAR COVER.
- 1) Remove 7 screws [D] and 3 screws [E] (with washers).
- 2) Pull outward and take out the REAR TERMINAL BOARD.

DIGITAL INPUT PWB ASS'Y

- Take out the REAR TERMINAL BOARD.
- 1) Remove 2 screws [F] and take out the DIGITAL INPUT PWB ASS'Y.

MAIN CHASSIS EXTRACTION and STANDING

- Take out the REAR COVER.
- Take out the REAR TERMINAL BOARD.
- ※ Where required, take out the REMOTE CONTROL SENSOR PWB ASS'Y and FRONT JACK PWB ASS'Y.
- ※ Prepare a 30cm high by 60cm wide seating for standing the MAIN CHASSIS.
- 1) Where necessary, disengage the clamps at the MAIN CHASSIS perimeter.
- 2) Grasp both sides of the rear and pull the MAIN CHASSIS outward.
- 3) Disengage the MAIN CHASSIS front clamps.
- 4) Disengage 5 tabs [G] at the MAIN CHASSIS bottom and take out the front board base (SYNC. SEPARATION PWB ASS'Y).
- 5) Position the front downward, extract and set the MAIN CHASSIS on its side on the seating with the rear terminal section at the left side in the bottom base.
- * As required for operation checks, attach the FRONT CONTROL PWB ASS'Y, REMOTE CONTROL SENSOR PWB ASS'Y and other components.
- * The MAIN CHASSIS is quite heavy. Care is needed in handling, particularly to prevent toppling over when stood on its side.

POWER SECTION COOLING FAN (EXHAUST)

- Extract the MAIN CHASSIS.
- 1) Remove 2 screws [H].
- 2) Remove 2 screws [I] (with washers).
- 3) Disengage connector (AQ) and take out the smaller EXHAUST COOLING FAN.
- 4) Remove 2 screws [J] and 2 screws [K].
- 5) Remove 2 screws [L].
- 6) Disengage connector (P) and take out the larger EXHAUST COOLING FAN.

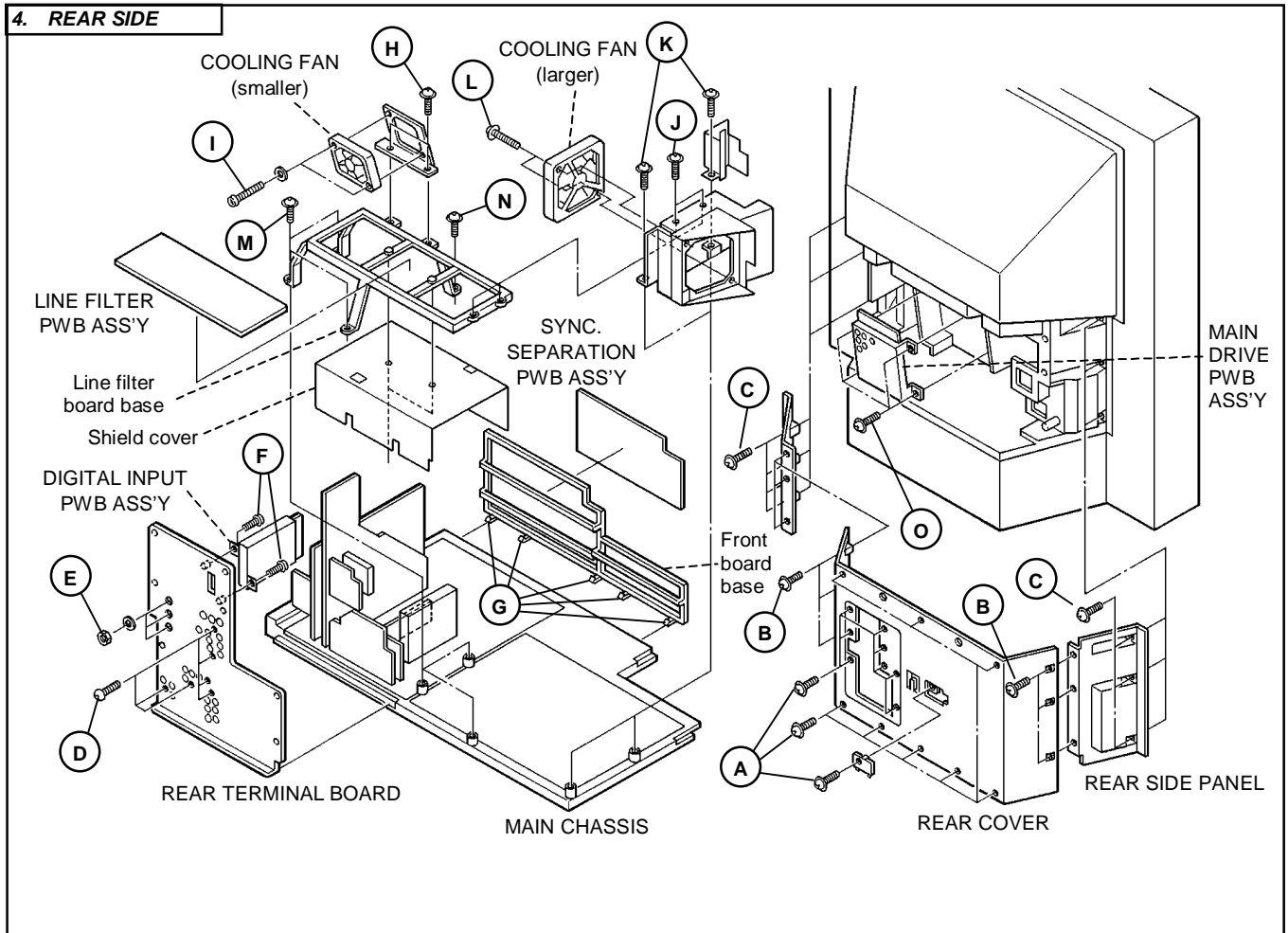
LINE FILTER SECTION

- Extract the MAIN CHASSIS.
- 1) Remove 2 screws [K], 3 screws [M] and 1 screw [N].
- * The LINE FILTER PWB ASS'Y shield cover, power section smaller EXHAUST COOLING FAN and larger EXHAUST COOLING FAN are attached to the line filter board base.

MAIN DRIVE PWB ASS'Y

- Extract the MAIN CHASSIS.
- 1) Disengage connector (017).
- 2) Support the MAIN DRIVE PWB ASS'Y and remove 4 screws [O].
- 3) Disengage connectors (AA/AC/AN/C/W) and take out the MAIN DRIVE PWB ASS'Y.
- * The shield cover is attached by tabs at both sides of the MAIN DRIVE PWB ASS'Y.

4. REAR SIDE



SERVICE REPLACE CORRESPONDENCE

The following service policy is being utilized.

Item	Part number	Service method
MAIN PWB ASS'Y	SPD-1002A	Replace parts
RECEIVER PWB ASS'Y	SPD-0R002A	Replace parts
AV SELECTOR PWB ASS'Y	SPD-0R101A	Replace parts
COMPONENT INPUT PWB ASS'Y	SPD-0J002A	Replace parts
REAR JACK PWB ASS'Y	SPD-0J101A	Replace parts
I-P CONVERT. PWB ASS'Y	SPD-0D001A	Replace (module)
3D YC SEP. MODULE	SHI-0Y021A	Replace (module)
SUB COLOR DEMOD. MODULE	SHI-0V131A	Replace (module)
DIGIAL INPUT MODULE	SPD-7801A	Replace (module)
REB PROCESS MODULE	SPD-0V002A	Replace (module)
SURROUND MODULE	SPD-0A001A	Replace (module)
MAIN DRIVE PWB ASS'Y	SPD-1101A	Replace (module)
SUB DRIVE MODULE	SPD-3001A	Replace (module)
POWER PWB ASS'Y	SPD-9001A	Replace parts
LINE FILTER PWB ASS'Y	SPD-9102A	Replace parts
IGNITER PWB ASS'Y	SPD-9201A	Replace parts
LED PWB ASS'Y	SPD-7001A	Replace parts
FRONT JACK PWB ASS'Y	SPD-7101A	Replace parts
FRONT CONTROL PWB ASS'Y	SPD-7202A	Replace parts
REMO-CON SENSOR PWB ASS'Y	SPD-7301A	Replace parts
OPTICAL BLOCK *	-----	Replace (module)

* : OPTICAL BLOCK is supplied as assembled the SUB DRIVE PWB ASS'Y and 2 memory ICs.

* : OPTICAL BLOCK is included the D-ILA HOLOGRAM device.

* : OPTICAL BLOCK is not included the projection lens.

SERVICE ADJUSTMENTS

ADJUSTMENT PREPARATION

1. You can make the necessary adjustments for this unit with either the remote control unit or with the adjustment equipment and parts as given below. Adjustment with the remote control unit is made on the basis of the initial setting values, however, the new setting values which set the screen to its optimum condition may differ from the initial settings.
2. Turn on the power for the set and test equipment before use, and start the adjustment procedures after waiting at least 30 minutes.
3. Make sure that AC power is turned on correctly.
4. Unless otherwise specified, prepare the most suitable reception or input signal for adjustment.
5. Never touch any adjustment parts, which are not specified in the list for this adjustment-variable resistors, transformers, condensers, etc.
6. Preset the items in the "SETTINGS BEFORE ADJUSTMENTS" with the remote control unit before adjustment.

MEASURING INSTRUMENT

1. DC voltmeter (or Digital voltmeter)
2. Oscilloscope
3. Frequency counter
4. TV audio multiplex signal generator
5. Signal generator (Pattern generator) [NTSC (composite) / NTSC (component) / 480p / 1080i]
6. Remote control unit [RM-C308]

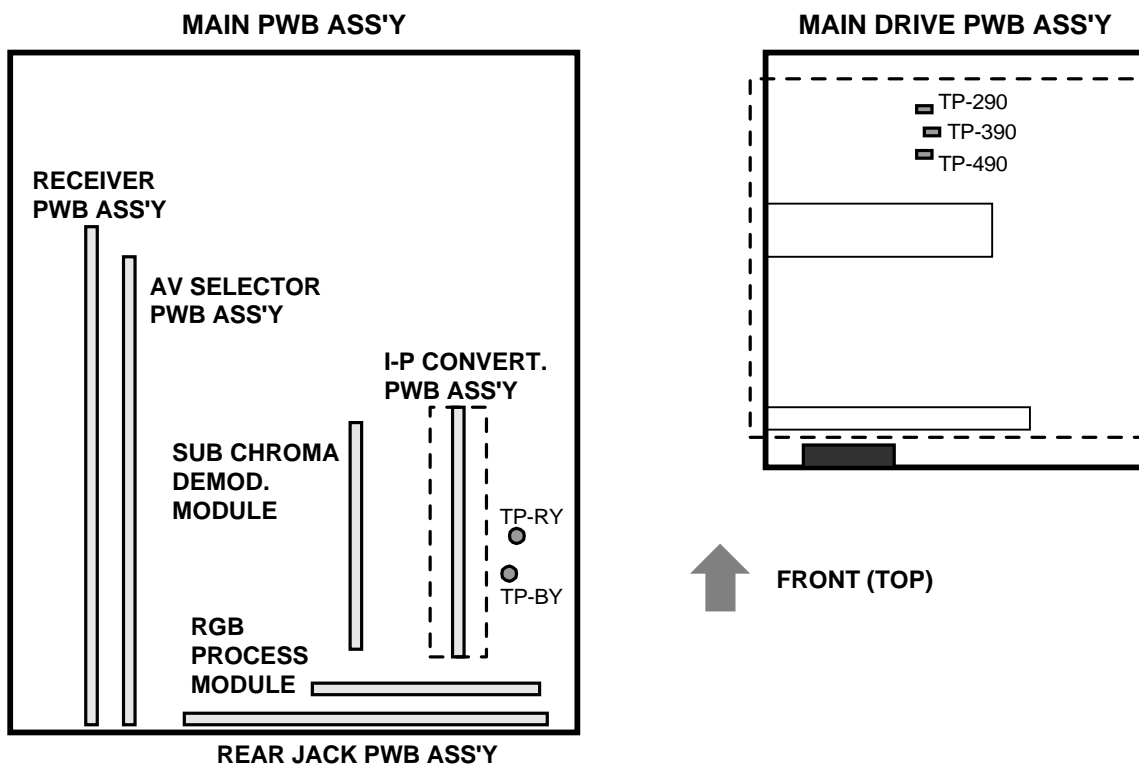
SETTINGS BEFORE ADJUSTMENTS

Be sure to set the items as follows before adjusting.

Setting item	Mode
ASPECT	PANORAMA
VIDEO STATUS	STANDARD
NATURAL CINEMA	OFF
YNR	CENTER
DNR	OFF

Setting item	Mode
SOUND (SURROUND)	OFF
BBE	OFF
BASS	CENTER
TREBLE	CENTER
BALANCE	CENTER
SUPER BASS	MID

ADJUSTMENT LOCATIONS



SERVICE MENU BASIC OPERATION

1. ENTRY

- 1) Press the [SLEEP TIMER] key and set for "0 MIN."
- 2) While "0 MIN." is displayed, simultaneously press the [DISPLAY] and [VIDEO STATUS] keys to display the SERVICE (main) MENU.
- 3) Select the respective adjustment menus with the numeral keys. Return from adjustment to the main menu by pressing the [EXIT] key.

2. RELEASE

At the main menu, press the [EXIT] key to release the service mode.
 The service mode is also released by pressing [EXIT] key at the < 5. I2C BUS CTRL > and the < 9. SELF CHK > adjustment menus.

3. OPERATION

Use the following keys for adjustments.

Change adjustment item	CH+ / CH-
Change adjustment value	VOL+ / VOL- * Adjustment range differs with the item.
Record adjustment value	MUTING

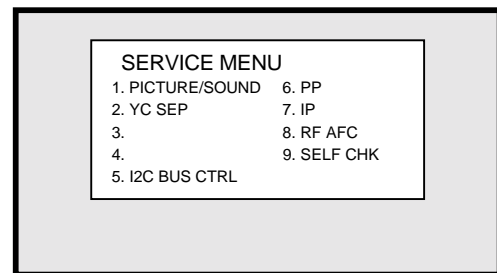
Be sure to press the [MUTING] key after changing the adjustment value. If another operation (e.g., screen size or video select) is selected without pressing the [MUTING] key, the adjustment is cancelled without changing the value.

4. SERVICE MENU OUTLINE

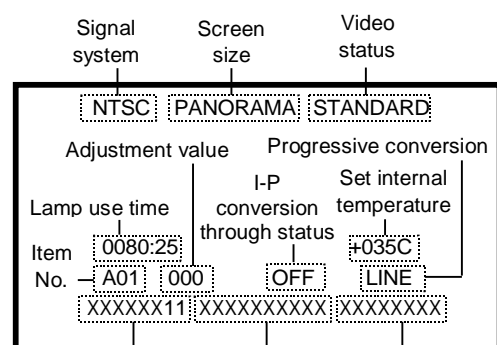
● 1. PICTURE/SOUND

Settings for video, audio, device drive and other adjustments

Signal system	NTSC : 480i composite (or Y/C) signal DVD : 480i component (Y/PB/PR) signal ED : 480p component (Y/PB/PR) signal HD : 1080i component (Y/PB/PR) signal HDCP 480p : Digital-in (DVI) 480p signal HDCP 1080i : Digital-in (DVI) 1080i signal
Screen size	PANORAMA / CINEMA / FULL / REGULAR
Video status	STANDARD / THEATER
Lamp use time	Time projection lamp is used (in minutes)
Set internal temperature	Device drive area temperature
Item number	A : Audio system / B : Video system / D : Device drive / F : Settings (fixed)
Adjustment values	Adjustment status for each item
I-P conversion block through status	ON : Through OFF : Process
Progressive conversion mode	LINE : Inter-line (Internal field) process FRAME : Inter-frame process
MTS status	MTS signal detect status
Signal conversion status	Connection detect at S-video input terminal
Front latch status	Front control latch IC detect status



Main menu



< 1. PICTURE/SOUND >

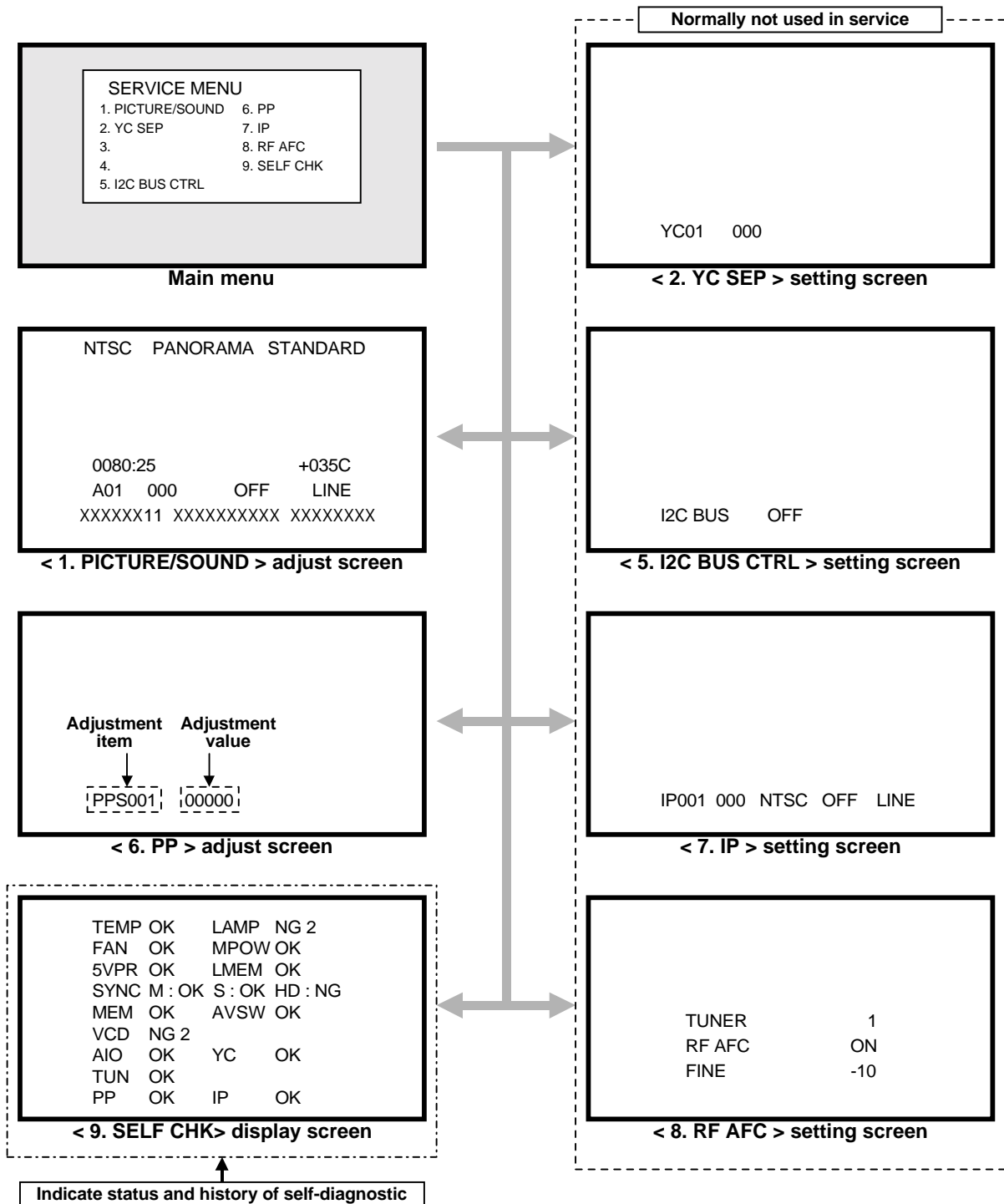
adjustment and setting screen

- **2. YC SEP**
Setting to couple 3-dimensional comb filter (YC separator)
 - **5. I2C BUS STOP**
Inter-IC bus control on/off
 - **6. PP**
Adjustment and setting for twin picture
 - **7. IP**
I-P conversion setting
 - **8. RF AFC**
AFT setting for main and sub tuners
 - **9. SELF CHK**
Present status and history indication detected by self-diagnostic function
- * <2. YC SEP>, <5. I2C BUS STOP>, <7. IP> and <8. RF AFC> are normally not user in service. The setting values are fixed and should not be changed.

SERVICE MENU APPEARANCE

Press the numeral keys to open the adjustment menus.

Return to the main menu by pressing the [EXIT] key. At the <5. I2C BUS CTRL> and <9. SELF CHK> adjustment menus, pressing the [EXIT] key closes the service mode without returning to the main menu.



ADJUSTMENT STEP

■ MULTI-SOUND DEMODULATION SYSTEM

1. MTS INPUT LEVEL check

Instruments	Remote control unit
Test point	MPX connector 2-pin [RECEIVER]
Adjustment location	1. PICTURE/SOUND : A02 (Input level)
Preparation	

1. Select [A02] of the <1. PICTURE/SOUND>.
2. Verify that [A02] is set at its initial setting value "36".

2. MTS STEREO VCO

Instruments	Remote control unit Signal generator : Non modulated sound Frequency counter
Test point	MPX connector 2-pin [RECEIVER]
Adjustment location	1. PICTURE/SOUND : A03 (FH monitor) 1. PICTURE/SOUND : A04 (Stereo VCO)
Preparation	

1. Receive a RF signal (nonmodulated sound signal) from the antenna terminal.
2. Select [A03] of the <1. PICTURE/SOUND> and change the setting value from 0 to 1.
3. Connect the frequency counter to 2-pin of [MPX] connector.
4. Select [A04].
5. Set the initial setting value of [A04].
6. Adjust [A04] so that the frequency counter will display $15.73\text{kHz} \pm 0.1\text{kHz}$.
7. Select [A03] of the <1. PICTURE/SOUND> and reset the setting value from 1 to 0.

3. MTS SAP VCO

Instruments	Remote control unit Signal generator : Non modulated sound Frequency counter
Test point	MPX connector 2-pin / 4-pin [RECEIVER]
Adjustment location	1. PICTURE/SOUND : A09 (5FH monitor) 1. PICTURE/SOUND : A10 (SAP VCO)
Preparation	

1. Receive a RF signal (non-modulated sound signal) from the antenna terminal.
2. Connect between 4-pin of [MPX] connector and GND (3-pin of [MPX] connector) through $1\text{M}\Omega$ Resistor.
3. Select [A09] of the <1. PICTURE/SOUND> and reset the setting value from 0 to 1.
4. Connect the frequency counter to 2-pin (R.OUT) of [MPX] connector.
5. Select [A10].
6. Set the initial setting value of [A10].
7. Adjust [A10] so that the frequency counter will display $78.67\text{kHz} \pm 0.5\text{kHz}$.
8. Select [A09] of the <1. PICTURE/SOUND> and reset the setting value from 1 to 0.

4. MTS FILTER check

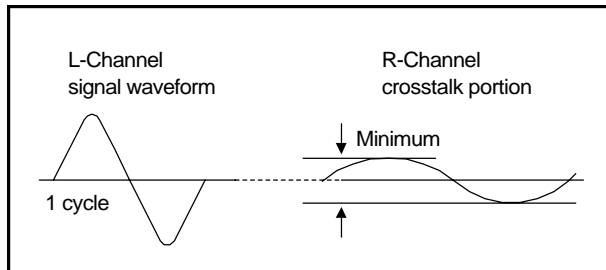
Instruments	Remote control unit
Test point	MPX connector 2-pin [RECEIVER]
Adjustment location	1. PICTURE/SOUND : A06 (Filter)
Preparation	

1. Select [A06] of the <1. PICTURE/SOUND>.
2. Verify that [A06] is set at its initial setting value "27".

5. MTS SEPARATION

Instruments	Remote control unit TV audio multiplex signal generator : Sine wave (300Hz / 3kHz) Oscilloscope
Test point	MPX connector 1-pin / 2-pin [RECEIVER]
Adjustment location	1. PICTURE/SOUND : A07 (Low separation) 1. PICTURE/SOUND : A08 (High separation)
Preparation	

1. Input a stereo L signal (300Hz) from the TV audio multiplex signal generator to the antenna terminal.
2. Connect the oscilloscope to 1-pin (L OUT) of [MPX] connector, and display one cycle portion of the 300Hz signal.
3. Change the connection of the oscilloscope to 2-pin (R OUT) of [MPX] connector, and enlarge the voltage axis.
4. Select [A07] of the <1. PICTURE/SOUND>.
5. Set the initial setting value of [A07].
6. Adjust [A07] so that the stroke element of the 300Hz signal will become minimum.
7. Change the signal to 3kHz, and similarly adjust the [A08].



VIDEO SYSTEM

1. RGB BRIGHTNESS and CONTRAST STANDARD

Instruments	Remote control unit Signal generator : NTSC / 480p / 1080i ◆ Test pattern : Gray scale (including 0% and 100% white peak) Oscilloscope
Test point	TP-390 [MAIN DRIVE]
Adjustment location	1. PICTURE/SOUND : S03 (Brightness) 1. PICTURE/SOUND : S04 (Contrast) 1. PICTURE/SOUND : S16 (G cutoff) 1. PICTURE/SOUND : F33 (Digital enhancer off)
Preparation	See [SETTINGS BEFORE ADJUSTMENTS] and set controls and switches accordingly.

NTSC

1. Supply a gray scale pattern signal input.
2. Set the screen size to "PANORAMA"
3. Connect the oscilloscope to TP-390

STANDARD SETTING

4. Press the [VIDEO STATUS] key and set to "STANDARD".
5. Select <1. PICTURE/SOUND>.
6. Select [S04] and adjust value **A** of the waveform as indicated in the figure.
7. Select [S03] and adjust value **B**.
8. Repeat steps 6 and 7 so that values **A** and **B** are as indicated in the figure.
Make a note of the [S03] and [S04] values.

THEATER SETTING

9. Press the [VIDEO STATUS] key and set to "THEATER".
10. Set [S04] and [S03] to the same values as "STANDARD".
11. Select [S04] and set to the difference with respect to "STANDARD" is as indicated in the table.

- * Adjustment is not necessary for other screen sizes
- * Be sure to press the [MUTING] key after each adjustment.

DVD / ED / HD (I-P through OFF)

Set to the following table conditions and adjust in the same manner as NTSC.

HD THROUGH (I-P through ON)

- ※ To set <HD I-P through on>, set [F33] to "1" and VIDEO STATUS to "THEATER".
Select [S16] and adjust value **B** of the waveform as indicated in the figure.

HDCP 480p / HDCP 1080i

Set to the following table conditions and adjust in the same manner as ED and HD.

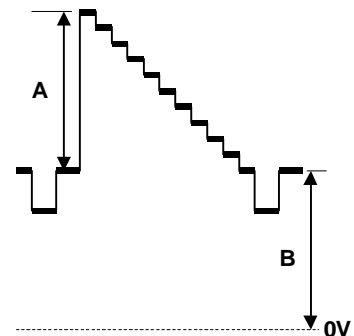
In absence of a signal, copy the data for 480p / 1080i signal input and compensate for optimum status.

SETTING

Mode	A	B
NTSC	1.06	1.47
DVD	1.47	1.51
ED	1.39	1.51
HD	1.35	1.51
HD THROUGH	(no need)	1.51
HDCP 480p	1.39	1.51
HDCP 1080i	1.35	1.51

[Unit : V]

WAVEFORM



Mode	Input terminal	Input signal	Screen size	THEATER <S03> offset	THEATER <S04> offset
DVD	COMPONENT-VIDEO-IN	NTSC component	FULL	0	0
ED	COMPONENT-VIDEO-IN	Analog 480p	FULL	0	0
HD	COMPONENT-VIDEO-IN	Analog 1080i	(FULL)	0	0
HDCP 480p	DIGITAL-IN	Digital RGB 480p	FULL	0	0
HDCP 1080i	DIGITAL-IN	Digital RGB 1080i	(FULL)	0	0

2. WHITE BALANCE

Instruments	Remote control unit Signal generator : NTSC / 480p / 1080i ◆Test pattern : Gray scale (including 0% and 100% white peak) Oscilloscope
Test point	TP-290 / TP-390 / TP-490 [MAIN DRIVE]
Adjustment location	1. PICTURE/SOUND : S10 / S11 (R drive) 1. PICTURE/SOUND : S14 / S15 (R cutoff) 1. PICTURE/SOUND : S12 / S13 (B drive) 1. PICTURE/SOUND : S18 / S19 (B cutoff) 1. PICTURE/SOUND : F33 (Digital enhancer off)
Preparation	Complete the [RGB BRIGHTNESS and CONTRAST STANDARD] adjustments.

NTSC

1. Supply a gray scale pattern signal input.

■ STANDARD SETTING

<< G OUTPUT >>

2. Press [VIDEO STATUS] key and set for "STANDARD".
3. Select <1. PICTURE/SOUND>.
4. Connect the oscilloscope channel 1 to TP-390.

<< R OUTPUT >>

5. Connect the oscilloscope channel 2 to TP-290.
6. Select [S10] and adjust the waveform component **A** to the same value as the G output (see figure).
7. Select [S14] and adjust the waveform component **B** to the same value as the G output.
8. Repeat steps 6 and 7. Adjust the waveform components **A** and **B** to the same value as the G output.

<< B OUTPUT >>

9. Connect the oscilloscope channel 2 to TP-490.
10. Select [S12] and adjust the waveform component **A** to the same value as the G output.
11. Select [S18] and adjust the waveform component **B** to the same value as the G output.

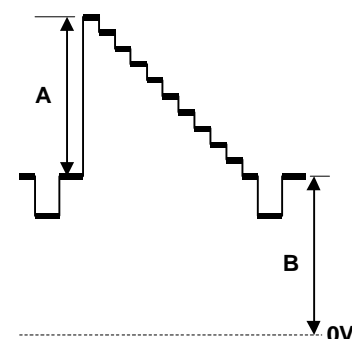
■ THEATER SETTING

12. Press [VIDEO STATUS] key and set for "THEATER".
13. Set [S10], [S14], [S12] and [S18] to the same values as "STANDARD" setting.
14. Repeat steps 10 and 11.

Adjust the waveform components **A** and **B** to the same value as the G output.

- * Since white balance adjustment, be sure to align the RGB waveform amplitudes.
- * Be sure to press the [MUTING] key after adjusting each item.

◆ WAVEFORM



DVD / ED / HD (I-P through OFF) / HD THROUGH (I-P through ON)

Set to the following table conditions and adjust in the same manner as NTSC.

Note the <ED> and <HDCP480p> adjustment items differ.

- ※ To set <HD I-P through on>, set [F33] to "1" and [VIDEO STATUS] to "THEATER".

HDCP 480p / HDCP 1080i

Adjust <HDCP 480p> and <HDCP 1080i> in the same manner as ED and HD.

In absence of a signal, copy the data for 480p / 1080i signal input and compensate for optimum status.

Mode	Input terminal	Input signal	R output (TP-290)		B output (TP-490)	
			Value A adjustment item	Value B adjustment item	Value A adjustment item	Value B adjustment item
DVD	COMPONENT-VIDEO-IN	NTSC component	<S10>	<S14>	<S12>	<S18>
ED	COMPONENT-VIDEO-IN	Analog 480p	<S11>	<S15>	<S13>	<S19>
HD	COMPONENT-VIDEO-IN	Analog 1080i	<S10>	<S14>	<S12>	<S18>
HD THROUGH	COMPONENT-VIDEO-IN	Analog 1080i	<S10>	<S14>	<S12>	<S18>
HDCP 480p	DIGITAL-IN	Digital RGB 480p	<S11>	<S15>	<S13>	<S19>
HDCP 1080i	DIGITAL-IN	Digital RGB 1080i	<S10>	<S14>	<S12>	<S18>

3. SINGLE SCREEN COLOR and TINT

Instruments	Remote control unit Signal generator : NTSC / 480p / 1080i ◆Test pattern : Color bar (75% white peak) Oscilloscope
Test point	TP-290 / TP-490 [MAIN DRIVE]
Adjustment location	1. PICTURE/SOUND : S04 (Contrast) 1. PICTURE/SOUND : S01 (Color) 1. PICTURE/SOUND : S02 (Tint) 1. PICTURE/SOUND : S07 (B-Y gain)
Preparation	See [SETTINGS BEFORE ADJUSTMENTS] and set controls and switches accordingly. Complete the [RGB BRIGHTNESS and CONTRAST STANDARD] and [WHITE BALANCE] adjustments.

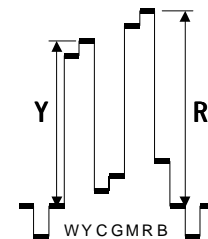
NTSC

1. Supply a color bar pattern signal input.

■ STANDARD SETTING

2. Connect the oscilloscope to TP-290.
3. Press the [VIDEO STATUS] key and set for "STANDARD".
4. Select <1. PICTURE/SOUND>.
5. Select [S04] and apply corrections indicated in the table.
6. Select [S01] and adjust the waveform Y value as indicated in the table.
7. Select [S02] and adjust the waveform R value as indicated in the table.
8. Repeat steps 6 and 7. Adjust Y and R values as indicated in the table.
9. Connect the oscilloscope to TP-490.
10. Select [S07] and adjust the waveform B value as indicated in the table.
11. Select [S04], add the correction value and return to the previous mode.

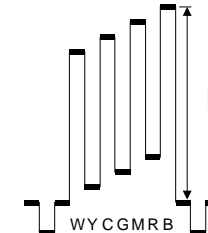
◆ TP-290 WAVEFORM



■ THEATER SETTING

12. Connect the oscilloscope to TP-290.
13. Press the [VIDEO STATUS] key and set to "THEATER".
14. Select [S04] and add the correction value indicated below.
15. Select [S01] and adjust the waveform Y value as indicated in the table.
16. Select [S02] and adjust the waveform R value as indicated in the table.
17. Repeat steps 15 and 16. Adjust Y and R values as indicated in the table.
18. Connect the oscilloscope to TP-490.
19. Select [S07] and adjust the waveform B value as indicated in the table.
20. Select [S04], add the correction value and return to the previous mode.

◆ TP-490 WAVEFORM



DVD / ED / HD

In the same manner as NTSC, adjust the values according to the table.

HDCP 480p / HDCP 1080i

In the same manner as ED and HD, adjust the values according to the table.

In absence of a signal, copy the data for 480p / 1080i signal input and compensate for optimum status.

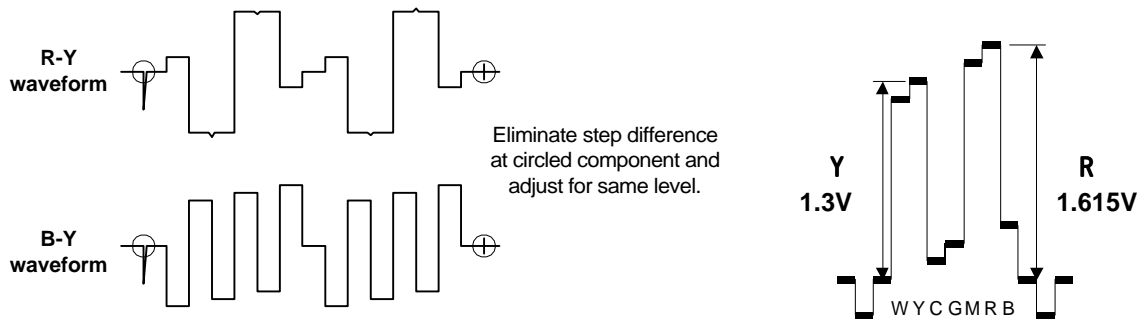
Mode	STANDARD				THEATER			
	Contrast correction <S04>	Y (yellow) adjustment value <S01>	R (red) adjustment value <S02>	B (blue) adjustment value <S07>	Contrast correction <S04>	Y (yellow) adjustment value <S01>	R (red) adjustment value <S02>	B (blue) adjustment value <S07>
NTSC	-5	1.16	1.545	0.95	-5	1.04	1.29	1.515
DVD	-20	1.21	1.39	1.04	-20	1.31	1.395	1.78
ED	-15	1.28	1.48	0.99	-10	1.76	1.73	1.24
HD	-10	1.37	1.47	1.27	-5	1.45	1.18	1.33
HDCP 480p	-15	1.28	1.48	0.99	-10	1.76	1.73	1.24
HDCP 1080i	-10	1.37	1.47	1.27	-5	1.45	1.18	1.33

[Unit : V] (expect contrast correction)

4. TWIN (SPLIT) SCREEN COLOR and TINT

Instruments	Remote control unit Signal generator : NTSC ◆Test pattern : Color bar (75% white peak) / All black (0%) Oscilloscope
Test point	TP-RY / TP-BY [MAIN] TP-290 [MAIN DRIVE]
Adjustment location	6. PP : PPA16 (Main highlight R-Y) 6. PP : PPA13 (Sub highlight R-Y) 6. PP : PPA17 (Main highlight B-Y) 6. PP : PPA14 (Sub highlight B-Y) 6. PP : PPS04 (Sub decoder color) 6. PP : PPS01 (Sub decoder tint) 1. PICTURE/SOUND : S04 (Contrast)
Preparation	See [SETTINGS BEFORE ADJUSTMENTS] and set controls and switches accordingly.

1. Supply an NTSC color bar pattern signal input.
2. Press the [SPLIT] key and set for the twin (split) screen mode.
3. Select <6. PP> and use the [SWAP] key to display the same image in both screens.
4. Connect the oscilloscope to TP-RY (ground at I-P CONVERT. MODULE shield).
5. Select [PPA16] and set to where the left screen color difference center and pedestal are the same.
6. Select [PPA13] and set to where the right screen color difference center and pedestal are the same.
7. Connect the oscilloscope to TP-BY (ground at I-P CONVERT. MODULE shield).
8. Select [PPA17] and set to where the left screen color difference center and pedestal are the same.
9. Select [PPA14] and set to where the right screen color difference center and pedestal are the same.
10. Make a memo of these adjustment values and set the mode that **left screen input is no signal** to the same values.
* **Setting items : [PPA13] / [PPA14] / [PPA16] / [PPA17]**
11. Connect the oscilloscope to TP-290.
12. Supply an all black pattern signal input on the left screen.
13. Select [S04] of the <1. PICTURE/SOUND> and apply correction value "-5".
14. Select [PPS04] and adjust the right screen waveform **Y** value to **1.3V**.
15. Select [PPS01] and adjust the right screen waveform **R** value to **1.615V**.
16. Repeat steps 14 and 15. Adjust for specified **Y** and **R** values.
17. Select [S04], apply correction and return to previous mode.



Waveform adjustment points

JVC SERVICE & ENGINEERING COMPANY OF AMERICA

DIVISION OF JVC AMERICAS CORP.

Head office :	1700 Valley Road, Wayne, New Jersey 07470	(973)315-5000
East Coast :	10 New Maple Avenue, Pine Brook, New Jersey 07058	(973)396-1000
Midwest :	705 Enterprise St. Aurora, Illinois 60504	(630)851-7855
West Coast :	5665 Corporate Avenue, Cypress, California 90630	(714)229-8011
Southwest :	10700 Hammerly, Suite 105, Houston, Texas 77043	(713)935-9331
Hawaii :	2969 Mapunapuna Place, Honolulu, Hawaii 96819	(808)833-5828
Southeast :	1500 Lakes Parkway, Lawrenceville, Georgia 30243	(770)339-2582

JVC CANADA INC.

Head office :	21 Finchdene Square Scarborough, Ontario M1X 1A7	(416)293-1311
Vancouver :	13040 Worster Court Richmond B.C. V6V 2B3	(604)270-1311

JVC[®]