

# VPH-D50Q/D50QM

## RM-PJ1000

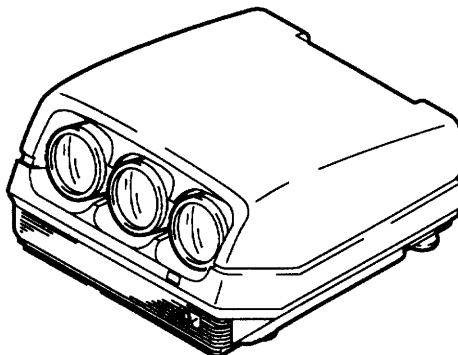
## SERVICE MANUAL

*US Model*  
*Canadian Model*

VPH-D50Q  
Chassis No. SCC-K78A-A

*AEP Model*

VPH-D50QM  
Chassis No. SCC-K79A-A



### SPECIFICATIONS

#### Optical characteristics

Projection system	3 picture tubes, 3 lenses, horizontal inline system
Picture tube	7-inch high luminance, with coolant sealed
Projection lens	HACC (High-resolution Aspherical and Color Corrected) multicoating lenses
Projected picture size	Factory-adjusted to 120 inches (diagonal measure) Range: 60 to 250 inches (diagonal measure) adjustable
Light output	ANSI lumen <sup>1)</sup> (color temperature: 6500°K) 160 lm (fH: 64 kHz, fV: 50 Hz) 135 lm (fH: 15 kHz, fV: 60 Hz) Peak white: 800 lm All white: 200 lm

#### Electrical characteristics

Color system	NTSC, PAL, SECAM, NTSC <sub>443</sub> , and PAL-M switched automatically
Resolution	700 TV lines (video input) 1000 TV lines (HDTV input) 1280 × 1024 pixels (RGB input at fH: 64 kHz, fV: 60 Hz)
RGB inputs	Horizontal frequency: 15 kHz to 64 kHz Vertical frequency: 38 Hz to 150 Hz
Test signal	Various test pattern generators incorporated

— Continued on next page —

## MULTISCAN PROJECTOR

# SONY®

## Input/Output

VIDEO	VIDEO IN: BNC type (1) Composite video input, 1 Vp-p $\pm$ 2 dB, sync negative, 75 ohms terminated
	VIDEO OUT: BNC type (1) Loop-through output of VIDEO IN
S VIDEO	Y IN: BNC type (1) Luminance signal, 1 Vp-p $\pm$ 2 dB, sync negative, 75 ohms terminated
	C IN: BNC type (1) Chrominance signal, 1 Vp-p $\pm$ 2 dB, sync negative, 75 ohms terminated
	S VIDEO IN: 4-pin mini-DIN (1) Y (luminance) signal: 1 Vp-p $\pm$ 2 dB, sync negative, 75 ohms terminated
	C (luminance) signal: 0.286 Vp-p $\pm$ 2 dB, 75 ohms terminated (NTSC) 0.3 Vp-p $\pm$ 2 dB, 75 ohms terminated (PAL)
	S VIDEO OUT: 4-pin mini-DIN (1) Loop-through output of S VIDEO IN
INPUT A	BNC type (5) Analog RGB/Component: R/R-Y: 0.7 Vp-p $\pm$ 2 dB, 75 ohms terminated, positive G: 0.7 Vp-p $\pm$ 2 dB, 75 ohms terminated, positive G with sync/Y: 1 Vp-p $\pm$ 2 dB, 75 ohms terminated, sync negative B/B-Y: 0.7 Vp-p $\pm$ 2 dB, 75 ohms

	terminated, positive SYNC/HD: Composite sync: 0.6–8 Vp-p high impedance, sync positive/negative Vertical sync width: wider than horizontal scanning interval (1H)
	VD: Vertical sync: 0.6–8 Vp-p high impedance, sync positive/negative Vertical sync width: Wider than horizontal scanning interval (1H)
	HDTV Y/Pb/Pr: Y: 1 Vp-p $\pm$ 2 dB, 75 ohms terminated Tri-level sync: $\pm$ 0.3 Vp-p, Bi-level sync: 0.3 Vp-p Pb/Pr: 0.35 Vp-p $\pm$ 2 dB, 75 ohms terminated
	HDTV GBR: G with sync: 1 Vp-p $\pm$ 2 dB, 75 ohms terminated, Tri-level sync: $\pm$ 0.3 Vp-p, Bi-level sync: 0.3 Vp-p B/R: 0.7 Vp-p $\pm$ 2 dB, 75 ohms terminated
CONTROL S	IN/PLUG IN POWER: Stereo minijack type (1) 5 Vp-p, plug in power, DC 5 V maximum output 60 mA OUT: stereo minijack type (1) Loop-through output of CONTROL S IN
TRIGGER	Minijack type (1) POWER ON: DC 5 V, output impedance 4.7 kilohms POWER OFF: 0 V
ABL LINK	IN: minijack (1) OUT: minijack (1)
RS-422A	D-sub 9-pin DIN type (1)

1) ANSI lumen is a measuring method of American National Standard IT 7.215.

### WARNING!!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS. THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

### SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK  $\Delta$  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

### ATTENTION!!

AFIN D'EVITER TOUT RISQUE D'ELECTROCUTION PROVENANT D'UN CHÂSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISÉ LORS DE TOUT DÉPANNAGE. LE CHÂSSIS DE CE RÉCEPTEUR EST DIRECTEMENT RACCORDÉ À L'ALIMENTATION SECTEUR.

### ATTENTION AUX COMPOSANTS RELATIFS À LA SÉCURITÉ!!

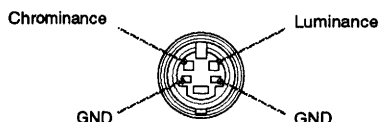
LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET PAR UNE MAPQUE  $\Delta$  SUR LES SCHÉMAS DE PRINCIPE, LES VUES EXPLOSÉES ET LES LISTES DE PIÉCES CONT D'UNE IMPORTANCE CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT. NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMÉRO DE PIÉCE EST INDIQUÉ DANS LE PRÉSENT MANUEL OU DANS DES SUPPLÉMENTS PUBLIÉS PAR SONY. LES RÉGLAGES DE CIRCUIT DONT L'IMPORTANCE EST CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT SONT IDENTIFIÉS DANS LE PRÉSENT MANUEL. SUIVRE CES PROCÉDURES LORS DE CHAQUE REMPLACEMENT DE COMPOSANTS CRITIQUES, OU LORSQU'UN MAUVAIS FONCTIONNEMENT EST SUSPECTÉ.

## General

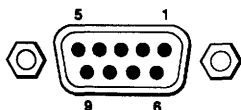
Dimensions	603 × 345 × 671 mm (23 3/4 × 13 19/32 × 26 13/32 inches) (w/h/d)
Mass	Approx. 54.2 kg (119 lb 8 oz)
Power requirements	VPH-D50Q: 120 V AC, 50/60Hz VPH-D50QM: AC 220 – 240 V, 50/60 Hz
Power consumption	Max. 450 W Standby mode: 7 W Power saving mode: 185 W
Operating temperature	0°C to 40°C (32°F to 104°F)
Operating humidity	35% to 85% (no condensation)
Storage temperature	–20°C to 60°C (–4°F to 140°F)
Storage humidity	10% to 90%
Supplied Accessories	Remote control RM-PJ1000 (1) Size AA (R6) batteries (3) Remote control cable (15 m (49.5 feet) long) (1) AC Power cord (1) Power plug adaptor (1) Lens cap (3) Screws with hexagonal hole (6) Operating Instructions (1)

## Pin assignment

### S VIDEO connector (4-pin, mini-DIN)



### RS-422A connector (D-sub 9-pin, female)



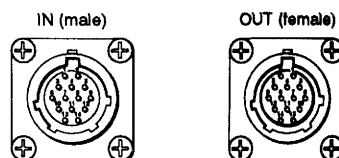
Pin No.	Signal	
1	GND	Ground
2	TX	Receive
3	RX	Transmit
4	GND	Ground
5	Not used	
6	GND	Ground
7	TX	Receive
8	RX	Transmit
9	GND	Ground

## Optional accessories

Signal Interface Switcher	PC-1271/1271M
Signal Interface Unit	IFU-1271/1271M
Projector Suspension Support	PSS-70, PSS-10
Interface Board	IFB-12/20/21/30/1000
Signal Interface Cable	SIC-10/20A/20B/20C/21/22/23/24/24A/24B/25/26/26A/30/31/M1/5/15/25/50 CCQ-BRS2/5/10/25/50
Extension Board	EXB-DS10 (Internal IDTV board)
Remote Commander	RM-PJM800
Remote Control Unit	RM-PJ10
Mouse Receiver Unit	RM-PJ20
Signal Adaptor	ADP-10/20
HD D-sub 15-pin to 5 BNC cable	SMF-400
HD D-sub 15-pin to HD D-sub 15-pin cable	SMF-401
9-pin remote cable for RS-422A	RCC-5G/10G/30G
Screen	VPS-80FH (80" flat) VPS-100FH (100" flat) VPS-120FH (120" flat) VPS-80FM (80" flat, powered) VPS-100FM (100" flat, powered) VPS-120FM (120" flat, powered)

Some items may not be available in certain areas. For details, please consult your nearest Sony office.

## REMOTE 1 connectors on IFB-40



Pin No.	Signal	Signal level
1	GND	Ground
2	HD/C. sync	1 Vp-p ± 3 dB
3	SIRCS	5 Vp-p ± 1 dB
4	N.C.	Non connection
5	GND (SIRCS)	Ground
6	B/C	B: 0.7 Vp-p ± 3 dB, 75-ohm C (NTSC): 0.286 Vp-p ± 3 dB, 75-ohm C (PAL): 0.3 Vp-p ± 3 dB, 75-ohm
7	GND (B.R)	Ground
8	GND (G)	Ground
9	G/Y	G: 0.7 Vp-p (sync-on-green: 1 Vp-p) ± 3 dB, 75-ohm Y: 1 Vp-p ± 3 dB, 75-ohm
10	RGB/Video	5V / 0V
11	R/C. video	R: 0.7 Vp-p ± 3 dB, 75-ohm C. Video: 1 Vp-p ± 3 dB, 75-ohm
12	C. Video/YC	5V / 0V
13	Audio	500 mVrms, output impedance 1 kohm
14	V. sync	1 Vp-p ± 3 dB, 75-ohm

# SAFETY CHECK-OUT

## (US Model only)

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

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the condition of the monopole antenna (if any).  
Make sure the end is not broken off, and has the plastic cap on it. Point out the danger of impalement on a broken antenna to the customer, and recommend the antenna's replacement.
8. Check the B+ and HV to see they are at the values specified. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.
9. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

## LEAKAGE

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

## HOW TO FIND A GOOD EARTH GROUND

A cold-water pipe is guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth-ground, verify that it is at ground by measuring the resistance between it and a coldwater pipe with an ohmmeter. The reading should be zero ohms. If a cold-water pipe is not accessible, connect a 60-100 watts trouble light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side of the line, the lamp should light at normal brilliance if the screw is at ground potential. (See Fig. B)

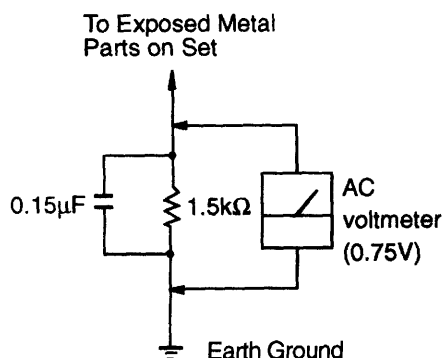


Fig. A. Using an AC voltmeter to check AC leakage.

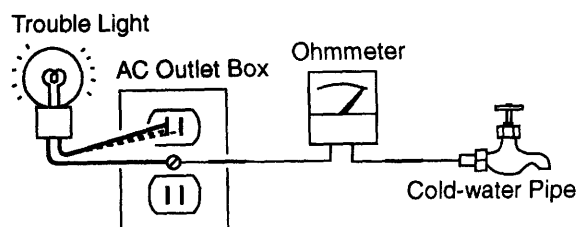


Fig. B. Checking for earth ground.

# TABLE OF CONTENTS

## 1. GENERAL

1-1. OPERATING INSTRUCTIONS .....	1-1
Precautions .....	1-1
Features .....	1-2
Location and Function of Controls .....	1-3
Projecting .....	1-8
Adjusting the Picture .....	1-9
Adjusting the Size and Shift of the Picture .....	1-9
Centering Adjustment .....	1-10
Using the Menu .....	1-11
The INPUT SELECT Menu .....	1-12
The PIC CTRL (Picture Control) Menu .....	1-12
The INPUT SETTING Menu .....	1-13
The SET SETTING Menu .....	1-15
The INPUT INFO (Information) Menu .....	1-16
The OPTION Menu .....	1-17
Installation Examples .....	1-17
Installation 1 Floor Installation Using Front Projection	
Flat Screen .....	1-17
Installation 2 Ceiling Installation Using Front Projection	
Flat Screen .....	1-18
Connection Examples .....	1-18
Connecting Directly to the Projector .....	1-18
Using the Signal Interface Switcher .....	1-19
Troubleshooting .....	1-19
1-2. INSTRUCTION MANUAL FOR DEALERS .....	1-20
Installation Procedures .....	1-20
Installation Diagrams .....	1-20
Necessary Clearance for Installation and Maintenance .....	1-20
Using the Handles to Carry the Projector .....	1-22
Floor Installation Using Front Projection Flat Screen .....	1-22
Ceiling Installation Using Front Projection Flat Screen .....	1-22
Floor Installation Using Rear Projection Flat Screen .....	1-23
Notes on Screen .....	1-24
Modifying Parts .....	1-25
Removing the Upper Cover .....	1-27
Changing the Polarity .....	1-27
Adjusting the CRT Conversion Angle .....	1-27
Location and Function of Connectors .....	1-29
Connecting Directly to the Projector .....	1-30
Using the Signal Interface Switcher .....	1-31
Connecting Multiple Projectors .....	1-31
Using the Linked ABL Function .....	1-33
Adjustment Procedures .....	1-36
For Remote Control .....	1-36
Preparation .....	1-36
Keys on the Remote Control .....	1-38
Using the Menu .....	1-39
Basic Menu Operation .....	1-39
The INPUT SELECT Menu .....	1-40
The PIC CTRL (Picture Control) Menu .....	1-40

The INPUT SETTING Menu .....	1-41
The SET SETTING Menu .....	1-43
The INPUT INFO (Information) Menu .....	1-44
The SERVICE SETTING Menu .....	1-45
The SET INFO (Information) Menu .....	1-45
The FOCUS ADJUST menu .....	1-46
The REGI (Registration) ADJUST Menu .....	1-46
The W/B (White Balance) ADJUST Menu .....	1-46
The ABL (Automatic Brightness Limiter) LINK Menu .....	1-46
The OPTION Menu .....	1-47
Test Patterns .....	1-47
Test Patterns .....	1-47
Test Patterns in Each Mode .....	1-48
Adjusting the Focus .....	1-48
Focus Adjustment Procedure .....	1-48
Adjusting the Green Focus .....	1-49
Adjusting the Red and Blue Focus .....	1-51
Adjusting the Registration .....	1-52
Procedure .....	1-52
Preparation .....	1-52
Keys for Adjusting .....	1-53
Adjusting the Green Registration .....	1-53
Adjusting the Red Registration .....	1-58
Adjusting the Blue Registration .....	1-62
Saving the Standard Registration Data .....	1-63
Fine Adjustment for Each Input Signal .....	1-63
Adjusting the Video Input Signal .....	1-63
Adjusting the RGB Input Signal .....	1-64
Adjusting the White Balance .....	1-66
Saving the Adjustment Data .....	1-67
Resetting the Data .....	1-68
Resetting the Data .....	1-68
Protecting the Setting .....	1-69
Adjusting the Picture Quality .....	1-69
Changing the Initialization Period .....	1-70
About Error Codes .....	1-70
List of the Projection Distance by Angle of Optical Axis .....	1-70

## 2. DISASSEMBLY

2-1. Cover Removal .....	2-1
2-2. Lens Removal .....	2-1
2-3. G Board Removal .....	2-2
2-4. PA Board Removal .....	2-2
2-5. PB Board Removal .....	2-3
2-6. A Board Removal .....	2-3
2-7. H and L Boards Removal .....	2-4
2-8. DE Block Open .....	2-4
2-9. EB Board Removal .....	2-5
2-10. Fan Removal .....	2-5
2-11. Picture Tube Removal .....	2-6
2-12. High-Voltage DC Block .....	2-6
2-13. M and QM Boards Removal .....	2-7

### 3. ADJUSTMENTS

3-1. Basic adjustments .....	3-1
3-2. Safety Related Adjustments .....	3-13
3-3. Electrical Adjustments .....	3-15

### 4. DIAGRAMS

4-1. BLOCK DIAGRAMS .....	4-1
• A (1/3), AA, AC, AD and BH Board Block Diagrams .....	4-1
• A (2/3), AB Board Block Diagrams .....	4-9
• A (3/3) Board Block Diagram .....	4-11
• Y Board Block Diagram .....	4-15
• E, EA and EB Board Block Diagrams .....	4-19
• D, DB and DP Board Block Diagrams .....	4-24
• DA Board Block Diagram .....	4-27
• PA, K, CR, CG and CB Board Block Diagrams .....	4-32
• G, GA, GB, GC, N, CF, H and L Board Block Diagrams .....	4-37
• IFB-40 Board Block Diagram .....	4-43
4-2. FRAME SCHEMATIC DIAGRAMS .....	4-45
4-3. CIRCUIT BOARDS LOCATION .....	4-49
4-4. Printed Wiring Boards and Schematic Diagrams .....	4-50
• A Board .....	4-51
• BH Board .....	4-56
• AA Board .....	4-81
• AB Board .....	4-83
• AD Board .....	4-84
• AC Board .....	4-85
• Y Board .....	4-88
• YO Board .....	4-96
• CR Board .....	4-103
• CG Board .....	4-107
• CB Board .....	4-111
• D Board .....	4-115
• DA Board .....	4-122
• DFH Board .....	4-132
• DFV Board .....	4-132
• DP Board .....	4-132
• DB Board .....	4-135
• EB Board .....	4-143
• E Board .....	4-145
• EA Board .....	4-151
• N Board .....	4-158
• L Board .....	4-159
• H Board .....	4-161
• PA Board .....	4-165
• PB Board .....	4-171
• K Board .....	4-172
• G Board .....	4-176
• GA Board .....	4-182
• GB Board .....	4-183
• GC Board .....	4-185
• CF Board .....	4-186
• QM Board .....	4-187
• M Board .....	4-189
• IFB-40 Board .....	4-194
4-5. SEMICONDUCTOR LOCATIONS .....	4-201

### 5. EXPLODED VIEWS

5-1. Cover, Control Panel Block .....	5-1
5-2. HA, PA, Power Block .....	5-2
5-3. DE Block .....	5-3
5-4. Picture Tube Block .....	5-4
5-5. Focus, HVF, Fan, A Block .....	5-5
5-6. Base Block .....	5-6
5-7. IFB-40 Block .....	5-7

### 6. ELECTORICAL PARTS LIST .....

6-1