

Matsushita 14" Color TV Monitor

Operation, Maintenance and Service Manual

Complete with Illustrated Parts List



A Warner Communications Company

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Matsushita 14" Color TV Monitor

Operation, Maintenance and Service Manual

Complete with Parts Lists

Monitor manufactured by Matsushita Electric Industrial Co., Ltd.
Television Products Department
Osaka, Japan

Published by:
ATARI INC
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P. O. Box 427
Sunnyvale, California 94086

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NOTE

If reading through this manual does not lead to solving a certain maintenance problem, call Tele-Help™ at the Atari Customer Service office in your geographical area, as shown in one of the two maps below. Order all parts from the California office.

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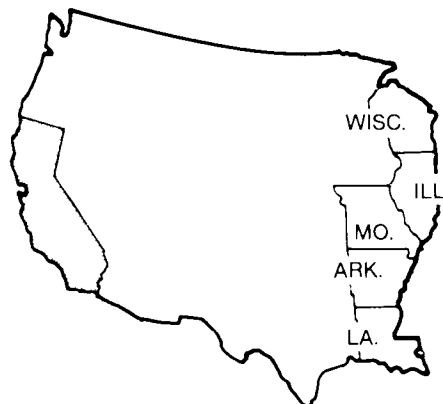
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1 Warnings and Cautions

A. Before You Start...

You should **never attempt** to work on an exposed monitor chassis if you are not familiar with servicing procedures and precautions necessary for high-voltage equipment. Any TV monitor has three sources of possible danger: strong electric shock due to high voltages or unisolated AC line voltages, X-ray radiation, and implosion. Therefore, please read this chapter carefully.

B. Safety Measures

Develop good safety habits, so when you're rushed with repair work, you'll still automatically take precautions.

A good practice when working on any TV monitor is to first ground the chassis and use only one hand when testing circuitry. This will avoid the possibility of carelessly putting one hand on the chassis or ground, and the other on an electrical connection. **Doing so could cause a severe electrical shock.**

If you service this color monitor on a test bench, you must isolate the monitor from AC line voltage! An isolation transformer is **mandatory** for your own safety. The Matsushita monitor does not contain an isolation transformer on its chassis. It is mounted instead on the game power supply. (It may appear like a regular power transformer, but is really also an isolation transformer.)

C. Picture-Tube Handling

Use extreme care when handling the picture tube, since rough handling may cause it to implode, due to a vacuum inside. Do not nick or scratch the glass, or subject it to any undue pressure when removing or installing it.

Wear safety goggles and heavy gloves for protection when handling the picture tube. Keep others without safety goggles away. Do not lift the tube by the neck.

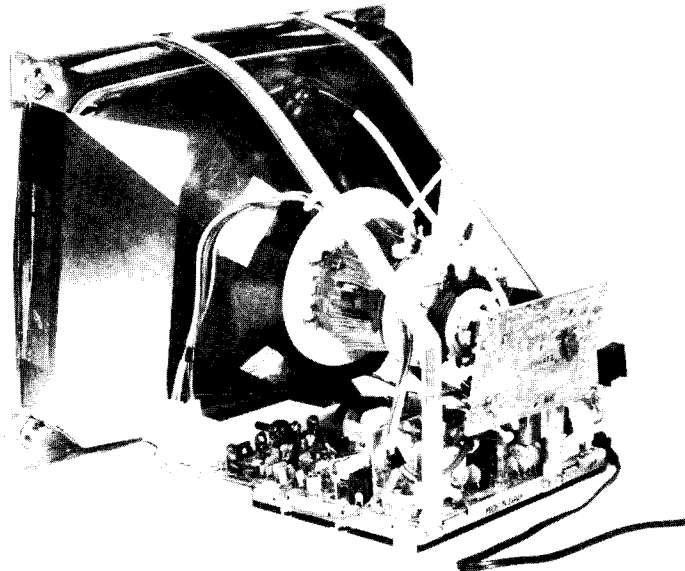


Figure 1 Overview of Matsushita 14" Color TV Monitor

Discharge the high voltage in the picture tube by shorting the anode connection to chassis ground—**not the cabinet or other mounting parts**. When discharging, go from ground to anode, and use a well-insulated piece of wire.

D. Replacing with Proper Components

It is important to maintain the specified values of all components in the horizontal and high-voltage circuits, and anywhere else in the monitor that could cause a rise in high voltage, or in operating supply voltages.

Refer to the parts lists in the back of this manual, and use **only exact replacement parts**, especially for the picture tube, semiconductors, transformers, coils, and fuses.

If you replace the picture tube with another type not specified in the parts list, then avoid prolonged exposure at close range to the unshielded areas of the tube. **You may endanger yourself from unnecessary exposure to X-ray radiation.**

E. Final Testing Before Reinstalling Monitor

Before installing the color monitor back in the game, you must check the following:

1. Inspect all harness wiring on the monitor and be sure none of it is pinched between the chassis and other metal parts in the monitor.
2. Replace all protective devices such as insulating fishpaper, compartment covers and shields.

2 Specifications

A. Power Input and Consumption

Line Voltage	A.C. $100\text{ V} \pm 10\%$
Line Frequency	60/50 Hertz
Power Consumption	46 Watts $\pm 10\%$

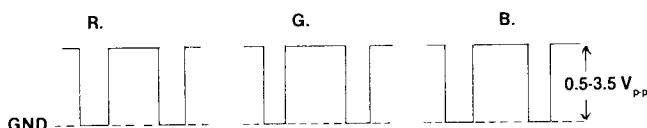
B. Temperatures and Humidity

Environmental Temp.	$0-38^{\circ}\text{C}$ ($32-100^{\circ}\text{F}$)
Environmental Humidity	20-85%
Temp. Inside Game Cabinet	60°C max. (140°F)

C. Monitor Input Signals

1. R.G.B. Video Input Signal

R.G.B. input signals are on test points 46R, 46G, and 46B (signal polarity: positive), as follows:



Note that the brightness of the screen is determined by the R.G.B. video input signal **level**.

2. Sync Signal

The horizontal and vertical synchronization signals are on test point 12. Their amplitude is 1.5 V_{pp} , with a negative polarity. The signal pulse width is 3-5 μs horizontal, and over 3H vertically (1H = 63.5 μs).

D. Currents and Voltages

The CRT anode average current is less than 650 μA .

High voltage is $24 \pm 1.5\text{ KV}$.

B + 1	$115 \pm 1.0\text{ V}$
B + 2	$24 \pm 2.0\text{ V}$
B + 3 (regulated)	$12 \pm 1.0\text{ V}$
B + 4	$11 \pm 2.0\text{ V}$
Heater Voltage	$6.4 \pm 0.2\text{ V (RMS)}$

E. CRT Specifications

Convergence Tolerance—
max. 0.3 mm, center of screen
max. 0.8 mm, corners of screen

Purity—Color impurity should not be found on screen after being degaussed with hand-held degaussing coil

Pull-In Range, Horizontal	$15.734\text{ KHz} \pm 250\text{ Hz}$
Pull-In Range, Vertical	Over 50-60 Hz

Type of CRT #370GHB22, 14-Inch, 90°

Tilt of Deflection Yoke declination is within 4 mm

F. Connectors

3-Pin Connector for R.G.B. Input Signal:

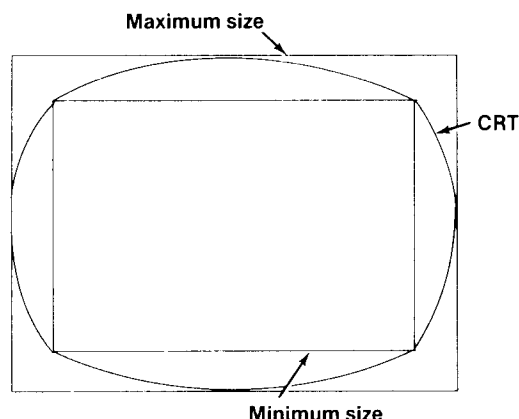
Pin 1 = Red Pin 2 = Green Pin 3 = Blue

2-Pin Connector for Sync Signal:

Pin 1 = Blue (sync) Pin 2 = White (ground)

G. Pattern Size

If the screen is facing north and the yoke is pointing south, you should be able to reproduce the following sizes of patterns:



3 Adjustable Controls

A. Brightness

Remember to observe the precautions regarding high voltages when you make any adjustments on this monitor!

Note that before you adjust the brightness, the monitor should have been turned on for at least 5 minutes. Keep the game in the attract or play mode.

Find the black plastic knob near the top center of the Neck Printed-Circuit Board or PCB, sometimes called the picture-tube socket board (see Figure 2). Turn this brightness (or screen voltage) control until you achieve a pleasing level of brightness.

Too high a brightness causes the retrace lines to show. Too low a brightness causes the entire screen to become dark and obscured.

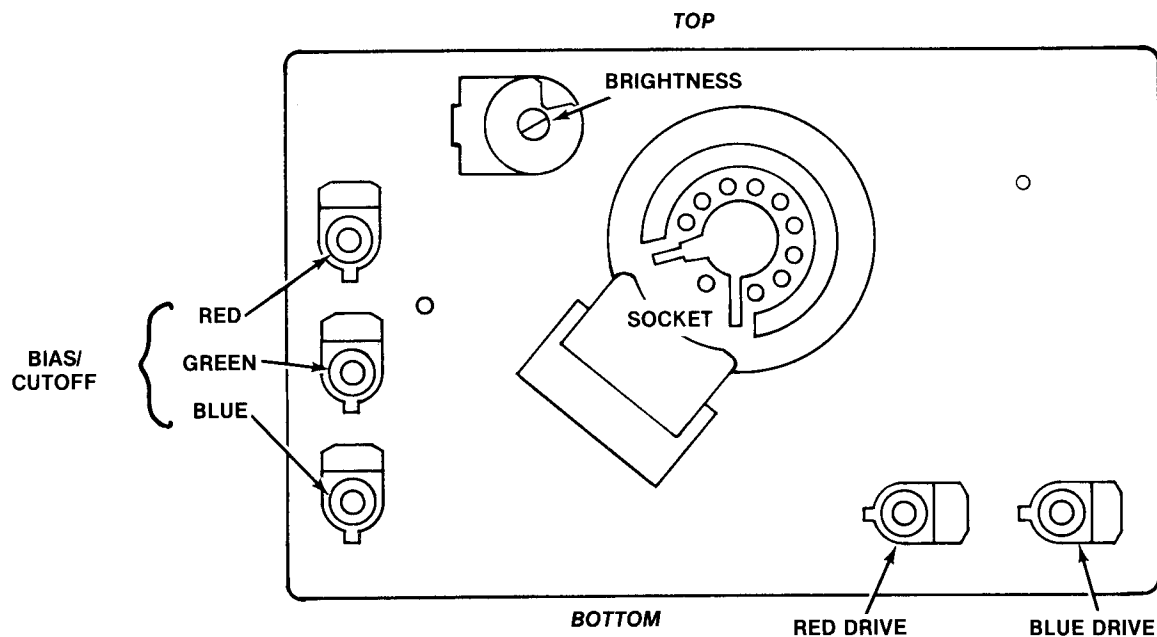


Figure 2 Adjustable Controls on Neck PCB

B. Horizontal Hold

Use this adjustment if the picture drifts sideways across the screen. Find the two potentiometers on the right end of the Main PCB (as you face the monitor's screen)—see Figure 3. Turn the coarse or fine pot until the black lines no longer slant downwards or upwards, and you obtain a normal screen image.

C. Vertical Hold

Use this adjustment if the picture drifts straight up or down on the screen. The vertical hold control is the large black knob, third from the left on the Main PCB (as you face the monitor's screen)—see Figure 3.

Turn this control in either direction until the picture no longer drifts straight up or down on screen.

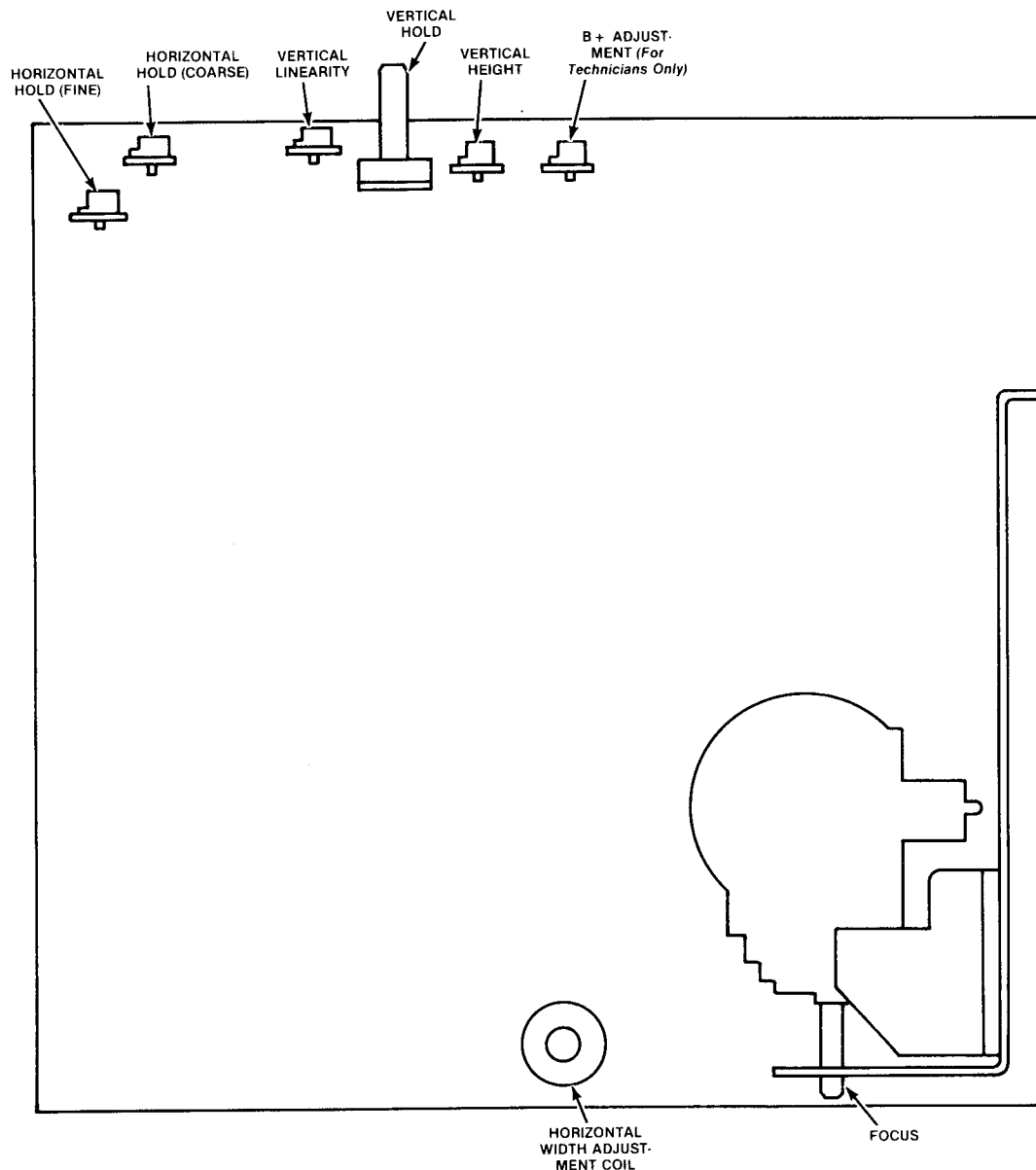


Figure 3 Adjustable Controls on Main PCB

D. Vertical Linearity

Badly adjusted vertical linearity looks like the horizontal raster lines are “squashed” together in certain areas on the screen—usually at the top or bottom. Linearity tends to drift out of adjustment in high-temperature areas after the monitor has been used a long time, or if you replace the picture tube.

The vertical linearity control is located on the Main PCB, fourth from the left as you face the monitor screen. Turn it slowly until all the raster lines are about equally spaced vertically.

E. Vertical Height

If the screen image is not large enough or too large vertically, then you can adjust it very easily with this control. Using this control will stretch or compress the image vertically. The vertical height control affects the spacing between the raster lines equally.

Set the game for the diagnostic that displays the convergence grid and dots. Locate the vertical height control on the monitor's Main PCB: it is the second knob from the left underneath the screen. Turn this control until the top and bottom grid lines run along the edges of the screen. The lines should

not disappear off the edges, which would indicate overscanning.

F. Horizontal Width

Before using this control, be sure the monitor has been turned on for 5 minutes or more. If the screen image is too wide or narrow, you should use this control to adjust it for proper width.

Set the game for the diagnostic that displays the convergence grid and dots. Locate the horizontal width control on the monitor's Main PCB: it is the small coil at the center rear of this board. **Be sure to use only a non-metal Allen wrench (commonly called a “tweaking” tool) for this adjustment!** Turn this control until the right and left grid lines run along the edges of the screen. The lines should not disappear off the edges, which would indicate overscanning.

G. Focus

This control simply changes the sharpness of the screen image. The focus adjustment is above the right rear of the monitor's Main PCB; the black adjustment knob protrudes from the high-voltage housing/heat sink. Turn this control until you get the optimum screen sharpness possible.

4 Supply Voltages

To test for proper + 115V supply, locate the emitter of transistor Q801, which is on top of the high-voltage heat sink. Test with a voltmeter at this point.

Use the potentiometer on the monitor's Main PCB that is labeled "B+ ADJUSTMENT" in Figure 3.

Turn this pot until the meter reads 115V.

The other important voltages found on the Main PCB are + 12V and + 24V. Refer to the schematic in Chapter 9 for the locations of these supply voltages.

5 Signal Test Points

For both of these groups of test points, see "C. Monitor Input Signals," in Chapter 2 for exact descriptions of the signals.

A. RGB Signals

The red, green and blue signals can be tested at points labeled TP46R, TP46G, and TP46B. These are located in the left rear corner of the Main PCB, as seen when you are standing behind the monitor.

B. Horizontal and Vertical Sync

These two synchronization signals can be tested at the point labeled TP12. This test point is located on the Main PCB near the 4th potentiometer from the left, as seen when standing behind the monitor.

6 Troubleshooting

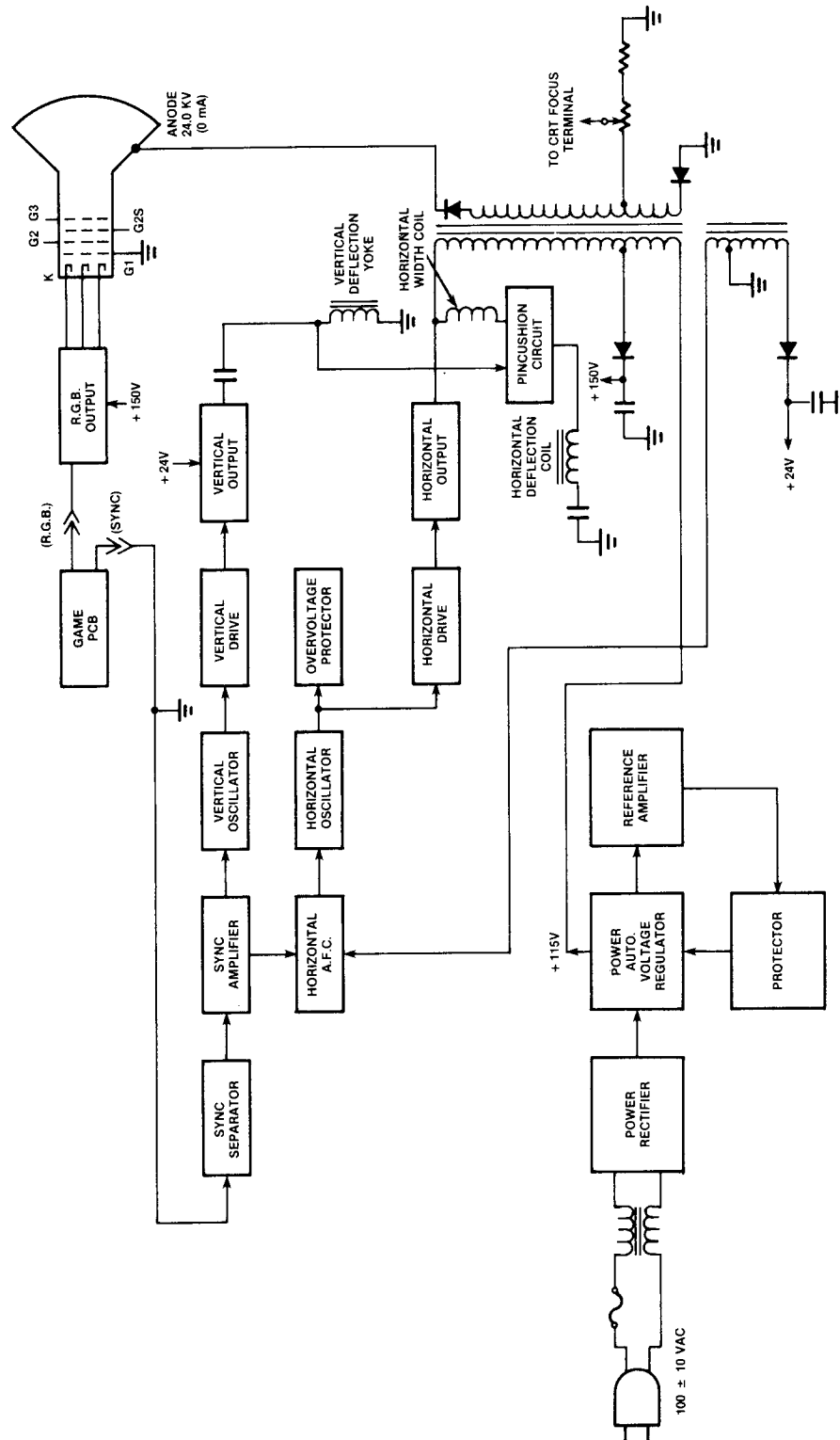


Figure 4 Block Diagram of Matsushita Monitor

7 Repair

A. Picture-Tube Replacement

Be sure to first unplug the power and color-signal connectors. Remove monitor assembly from game.

1. Unplug the degaussing coil 2-pin connector.
2. Discharge the high voltage from the tube. Remove the large high-voltage connector near the top of the picture tube. Unplug the neck board at rear of picture tube.
3. Unplug the 4-wire connector on Main PCB. Unhook the two springs that hold the braided ground wire (near both bottom corners of picture tube).
4. Using a 5/16" hex socket wrench, remove the four screws that hold the metal shields and picture tube in the steel frame. Carefully remove the tube by pulling it out towards the front.

B. Yoke Replacement

First unplug the power and color-signal connectors. Remove monitor assembly from game.

1. Discharge the high voltage from the tube. Unplug the neck board at rear of picture tube.
2. Remove the cloth tapes that hold the three rubber wedges. Using a thin knife or single-edged razor blade, loosen the rubber wedges from the picture-tube surface. You need to reconverge the picture whenever you replace a yoke.
3. Loosen the screws that tighten the two neck clamps around the neck. Now slide the magnet assembly, then the yoke assembly off the end of the picture tube.

C. Flyback Transformer Replacement

First unplug the power and color-signal connectors. Remove monitor assembly from game.

1. Discharge the high voltage from the tube. Remove the large connector at top of picture tube. Also open the white twist-and-tie anode holder and remove the anode wire from this holder.
2. Unplug the neck board at rear of picture tube. Remove the white plastic wire holder from this board, and slide it up along the wires about $\frac{3}{4}$ ".
3. Unsolder the orange wire on this board at "C10." Pull off the white cover next to the socket by spreading apart its sides. Unsolder and remove heavy red wire at the socket.
4. Remove the monitor's bottom cover plate. Remove the 3 screws holding down the transformer, located on circuit side of Main PCB. Then unsolder the 8 connections for the transformer.
5. Remove the 2 screws on outside of aluminum heat sink that hold down the transformer bracket. Now lift out the transformer from its protective housing.
6. When replacing with a new transformer, be sure to check the picture for sharpness. If it's not sharp, adjust the black focus knob on the transformer.

8 Adjustments

A. Purity Adjustments

1. Preliminary

First remove the monitor from the game, but leave the connectors still attached. Turn off power to the game, and discharge the high voltage from the tube.

Slightly loosen the light grey ring-clamp behind the purity and convergence magnets. If you will also be converging the outer area of the picture (see Section 2 that follows), you should also loosen the deflection yoke and magnet mounting screws at this time.

Turn power back on; turn the picture tube so it faces north or south. Then degauss the picture tube with a hand-held degaussing coil.

2. Red Purity Adjustment

Refer to Figure 2 and turn off the green and blue guns with the G and B bias or cutoff controls, located on the neck board. (Leave the **red** gun on.) Display any self-test pattern on the screen that shows solid white. **Keep this display throughout the purity adjustments.**

Rotate and spread the tabs of the purity magnets (the pair farthest towards the front) until you center the screen image vertically and horizontally. You should also obtain a pure red overall.

3. Green Purity Adjustment

Turn off the red and blue guns by using the controls on the neck board; leave the **green** gun on. Readjust the purity magnets if necessary for a uniformly green screen.

4. Blue Purity Adjustment

Turn off the red and blue guns by using the controls on the neck board; leave the **blue** gun on. Repeat the purity adjustment for a uniformly blue screen.

5. Final Check

As a final check for total color purity, turn on all

guns again. Leave the all-white self-test pattern on the screen. The screen should be pure, clean white—not tinted with other hues.

Now turn off the power to the game, and discharge the high voltage from the picture tube. Tighten the screw that holds the clamp near the magnets. Reinstall the monitor in the game.

B. Convergence Adjustments

1. Static Convergence (Center Area)

First remove the monitor from the game, but leave the connectors still attached. Turn off power to the game, and discharge the high voltage from the tube.

Loosen the screw that holds the clamp behind the purity and convergence magnets. If you will also be converging the outer area of the picture (see Section 2 that follows), you should also loosen the deflection yoke mounting screw at this time.

Turn power back on; display the diagnostics pattern that shows black background with white lines and dots. **Keep this display throughout all convergence adjustments.**

Refer to Figure 2 and turn off the green gun with the G bias or cutoff control, located on the neck board. (Leave the red and blue guns on.)

Adjust the angle of the 4-pole or center pair of magnets, and superimpose the red and blue **vertical** lines in the center area of the screen.

Keeping their angles the same, rotate both tabs of the 4-pole magnets to superimpose the red and blue **horizontal** lines in the center area of the screen.

— — —

Turn on the green gun again. Adjust the angle of the 6-pole or rear pair of magnets, and superimpose the green **vertical** lines on the red/blue ones, in the center area of the screen.

Finally, keeping their angles the same, rotate both tabs of the 6-pole magnets to superimpose the green **horizontal** lines on the red/blue ones.

If you do not need to converge the outer screen areas, you are done with the convergence procedure. (Otherwise, immediately proceed with Section 2 below.) Turn off the power for the game, and discharge the high voltage from the picture tube.

Tighten the grey ring-clamp that secures the magnets.

2. Dynamic Convergence (Outer Area)

Be sure to keep the same convergence pattern on the screen—white lines and dots with black background. Carefully remove the three cloth tapes from the picture tube surface. Using a razor blade or thin knife, loosen the glue holding the three rubber wedges and remove them.

Up/down movement of the yoke causes the outer edges of the screen image to swivel clockwise or counterclockwise. Side-to-side movement causes the lines and dots at the outer screen edges to expand and contract.

Move the yoke in the up/down and side-to-side directions until the outer lines and dots on the screen are pure white.

Then secure the deflection yoke by putting the wedges back in between the picture tube and the yoke's white collar. Secure the wedges with glue and the cloth tape. Remove power from the game, and discharge the high voltage from the picture tube. Tighten the screws that secure the deflection yoke clamp and the magnets.

9 Schematic and Illustrated Parts Lists

The purpose of this chapter is to provide you with the necessary information for ordering replacement parts for your Matsushita 14" color monitor. Please note that, for simplicity, **common hardware and certain other parts have been deleted** from this parts list. This includes screws, nuts, washers, certain connectors and tie wraps, in addition to metal parts,

such as heat sinks, shields and supports.

When ordering parts from your distributor, give the part number, part name and serial number of your game. This will help to avoid confusion and mistakes in your order. We hope the results will be less downtime and more profit from your game.



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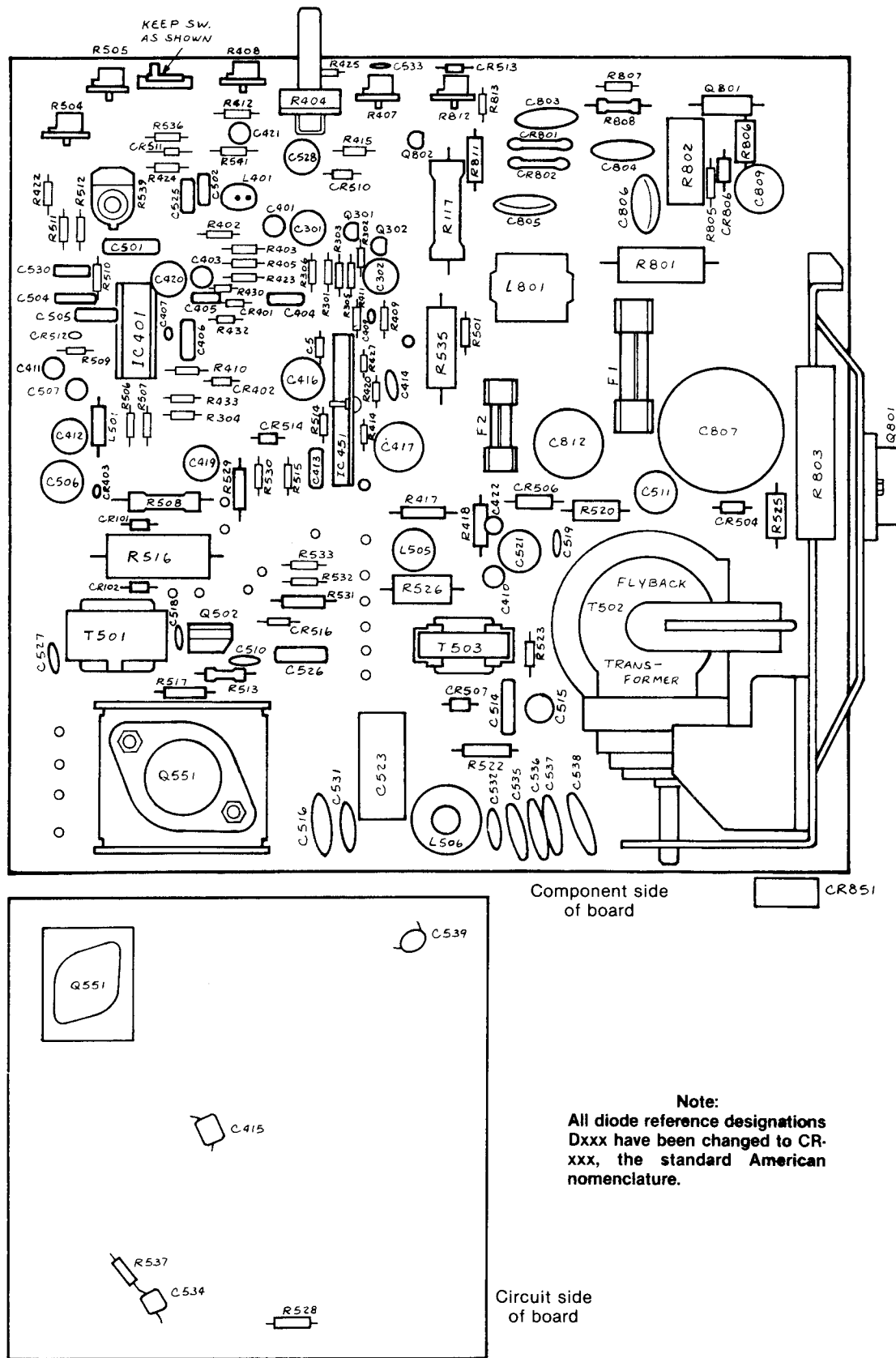


Figure 6 Main PCB Assembly

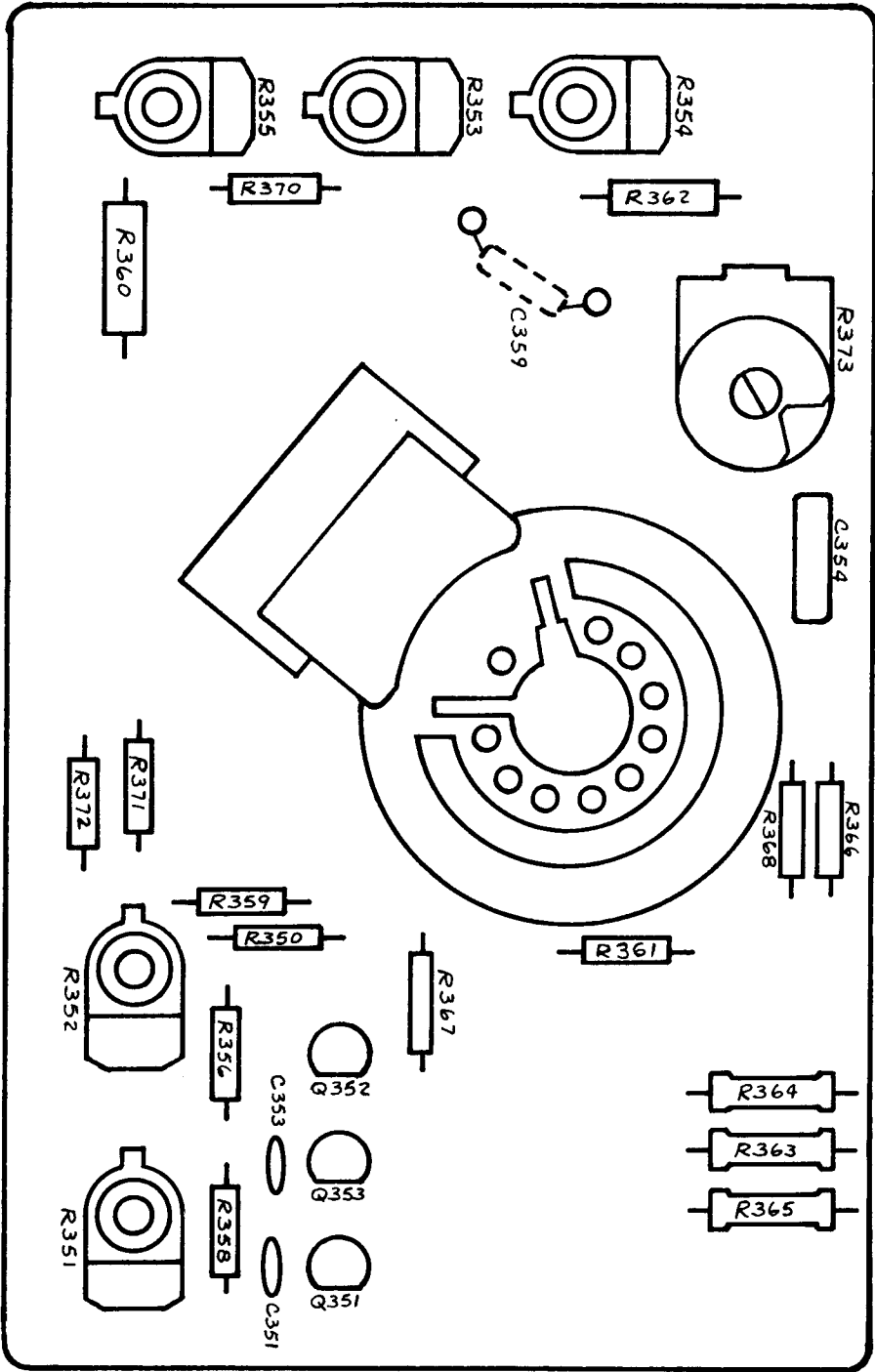


Figure 7 Neck PCB Assembly

Figure 8 Parts List of Matsushita Monitor

Atari Part No.	Description (Reference Designations in Bold)
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★ refers to parts that are not commonly available; they are custom-made for the Matsushita monitor.

Integrated Circuits:

99-150001	Phase-Lock-Loop Circuit (IC401)
99-150002	Vertical Output (IC451)

Transistors:

99-150019	Sync. Inverter Transistor (Q301)
99-150014	Buffer (Q302)
99-150015	Blue Video Output (Q351)
	Red Video Output (Q352)
	Green Video Output (Q353)
99-150016	Horizontal Drive (Q502)
99-150017	Horizontal Output (Q551)
99-150018	B + Regulator (Q801)
99-150020	Reference Amplifier (Q802)

Diodes:

99-150101	6V Zener Diode (CR101, 102)
99-150102	Silicon Diode (CR401, 516)
99-150103	Silicon Diode (CR402)
99-150104	Silicon Diode (CR403, 512)
99-150105	Silicon Diode (CR504)
99-150106	Silicon Diode (CR506)
99-150107	Silicon Diode (CR507, 510, 514)
99-150108	9V Zener Diode (CR511)
99-150109	11V Zener Diode (CR513)
99-150110	Power Stack Diode (CR801)
99-150111	Power Stack Diode (CR802)
99-150112	Zener Diode (CR806)
99-150201 ★	Posistor (CR851)

Resistors:

99-150202 ★	220 Ohm, ± 5%, 3W Resistor (R117)
99-150216	22K Ohm, ± 5%, ¼W Resistor (R301, 303)
99-150217	560 Ohm, ± 5%, ¼W Resistor (R302)
99-150218	2.7K Ohm, ± 5%, ¼W Resistor (R304)
99-150219	680 Ohm, ± 5%, ¼W Resistor (R305)
99-150220	1K Ohm, ± 5%, ¼W Resistor (R306, 412)
99-150221	330 Ohm, ± 5%, ¼W Resistor (R350, 358, 359)
99-150222	120 Ohm, ± 5%, ¼W Resistor (R356)
99-150223	470 Ohm, ± 5%, ½W Resistor (R360)
99-150224	680 Ohm, ± 5%, ¼W Resistor (R361)
99-150203	1.8M Ohm, ± 5%, ½W Resistor (R362)
99-150204	12K Ohm, ± 5%, 1W Resistor (R363-365)
99-150226	2.7K Ohm, ± 5%, ¼W Resistor (R366-368)
99-150227	2.2K Ohm, ± 5%, ¼W Resistor (R370-372)
99-150228	470 Ohm, ± 5%, ¼W Resistor (R401)
99-150229	560K Ohm, ± 5%, ¼W Resistor (R402)
99-150230	10K Ohm, ± 5%, ¼W Resistor (R403)
99-150231	680K Ohm, ± 5%, ¼W Resistor (R405)
99-150232	18K Ohm, ± 5%, ¼W Resistor (R406)
99-150233T	39 Ohm, ± 5%, ¼W Resistor (R409)

Figure 8 Parts List of Matsushita Monitor, continued

<i>Atari Part No.</i>	<i>Description (Reference Designations in Bold)</i>
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★ refers to parts that are not commonly available; they are custom-made for the Matsushita monitor.

99-150234	22 Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R410)
99-150235	82 Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R411)
99-150236	3.9 Ohm, $\pm 5\%$, $\frac{1}{2}$ W Resistor (R413)
99-150237	15K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R414)
99-150238	150K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R415)
99-150239	330 Ohm, $\pm 5\%$, $\frac{1}{2}$ W Resistor (R417)
99-150240	1.8K Ohm, $\pm 5\%$, $\frac{1}{2}$ W Resistor (R418)
99-150241	39K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R420)
99-150242	270 Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R422)
99-150243	56 Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R423)
99-150244	47K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R424)
99-150245	16K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R425)
99-150246	3.3K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R427)
99-150247	180 Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R430)
99-150248	820K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R432)
99-150249	1K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R433)
99-150224	680 Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R501, 507, 537)
99-150250	1.2K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R506, 541)
99-150205	10K Ohm, $\pm 5\%$, 2W Resistor (R508)
99-150251	22K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R509)
99-150232	18K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R510)
99-150252	2.7K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R511, 512)
99-150206	4.7K Ohm, $\pm 5\%$, 1W Resistor (R513)
99-150237	15K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R514)
99-150230	10K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R515)
99-150207	1.2K Ohm, $\pm 5\%$, 3W Resistor (R516)
99-150208	0.27 Ohm, $\pm 10\%$, $\frac{1}{2}$ W Resistor (R517)
99-150209	1 Ohm, $\pm 5\%$, $\frac{1}{2}$ W Fuseable Resistor (R520)
99-150253	22K Ohm, $\pm 2\%$, $\frac{1}{2}$ W Resistor (R522)
99-150238	150K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R523)
99-150254	1 Ohm, $\pm 5\%$, $\frac{1}{2}$ W Resistor (R525)
99-150210	1K Ohm, $\pm 5\%$, 1W Resistor (R526)
99-150255	4.7K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R528, 530)
99-150256	820 Ohm, $\pm 5\%$, $\frac{1}{2}$ W Resistor (R529)
99-150263	470 Ohm, $\pm 5\%$, $\frac{1}{2}$ W Resistor (R531)
99-150220	1K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R532)
99-150257	2.2K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R533)
99-150211 ★	1 Ohm, $\pm 5\%$, 2W Fuseable Resistor (R535)
99-150258	560 Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R536)
99-150212	0.47 Ohm, $\pm 10\%$, 3W Resistor (R801)
99-150213	5.6 Ohm, $\pm 10\%$, 5W Resistor (R802)
99-150214	150 Ohm, $\pm 10\%$, 10W Resistor (R803)
99-150259	15 Ohm, $\pm 5\%$, $\frac{1}{2}$ W Resistor (R804)
99-150260	6.8K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R805)
99-150261	47 Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R806)
99-150262	220K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R807)
99-150215	22K Ohm, $\pm 5\%$, 1W Resistor (R808)
99-150264	47K Ohm, $\pm 5\%$, $\frac{1}{2}$ W Resistor (R811)
99-150255	4.7K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R813)

Figure 8 Parts List of Matsushita Monitor, continued

Atari Part No.	Description (Reference Designations in Bold)
★ refers to parts that are not commonly available; they are custom-made for the Matsushita monitor.	
<i>Controls:</i>	
99-150400	Blue Drive Adjustment, 300 Ohm Potentiometer (R351)
	Red Drive Adjustment, 300 Ohm Potentiometer (R352)
99-150401	Blue Cutoff Adjustment, 10K Ohm Potentiometer (R353)
	Red Cutoff Adjustment, 10K Ohm Potentiometer (R354)
	Green Cutoff Adjustment, 10K Ohm Potentiometer (R355)
99-150402	Screen (Brightness) Adjustment, 4M Ohm Potentiometer (R373)
99-150403	Vertical Hold Adjustment, 100K Ohm Potentiometer (R404)
99-150404 ★	Vertical Height Adjustment, 200K Ohm Potentiometer (R407)
99-150405 ★	Vertical Linearity Adjustment, 10K Ohm Potentiometer (R408)
99-150406 ★	Fine Horizontal Hold Adjustment, 200 Ohm Potentiometer (R504)
99-150407 ★	Coarse Horizontal Hold Adjustment, 1K Ohm Potentiometer (R505)
	Over-Voltage Adjustment, 1K Ohm Potentiometer (R539)
99-150408 ★	B + Adjustment, 2K Ohm Potentiometer (R812)
<i>Capacitors:</i>	
99-150300	10 uf Aluminum Electrolytic Non-Polar 16V Capacitor (C301)
99-150301	100 uf Aluminum Electrolytic 16V Capacitor (C302)
99-150327	330 pf Ceramic-Disc 50V Capacitor (C351-353)
99-150302	2200 pf Metalized Polyester 1000V Capacitor (C354)
99-150303	1500 pf Metalized Polyester 1000V Capacitor (C359)
99-150304	3.3 uf Aluminum Electrolytic 25V Capacitor (C401)
99-150328	820 pf Ceramic-Disc 50V Capacitor (C402)
99-150329	10 uf Aluminum Electrolytic 16V Capacitor (C403)
99-150330	0.039 uf Polyester 50V Capacitor (C404)
99-150331	0.047 uf Polyester 50V Capacitor (C405)
99-150332	0.033 uf Polyester 50V Capacitor (C406)
99-150305	2.2 uf Tantalum 25V Capacitor (C407)
99-150306	1 uf Tantalum 35V Capacitor (C409)
99-150307	22 uf Aluminum Electrolytic Non-Polar 25V Capacitor (C410)
99-150308	0.47 uf Aluminum Electrolytic 50V Capacitor (C411)
99-150333	100 uf Aluminum Electrolytic 16V Capacitor (C412)
99-150330	0.039 uf Polyester 50V Capacitor (C413, 415)
99-150335	220 pf Ceramic-Disc 50V Capacitor (C414)
99-150309	220 uf Aluminum Electrolytic 35V Capacitor (C416)
99-150310	470 uf Aluminum Electrolytic 35V Capacitor (C417)
99-150311	47 uf Aluminum Electrolytic 35V Capacitor (C419)
99-150312	220 uf Aluminum Electrolytic 16V Capacitor (C420)
99-150313	1 uf Aluminum Electrolytic 50V Capacitor (C421)
99-150314	2.2 uf Aluminum Electrolytic 50V Capacitor (C422)
99-150336	0.1 uf Polyester 50V Capacitor (C501)
99-150337	0.012 uf Polyester 50V Capacitor (C502)
99-150314	2.2 uf Aluminum Electrolytic 50V Capacitor (C503)
99-150338	3900 pf Polyester 50V Capacitor (C504)
99-150315	3300 pf Polyester-Film 600V Capacitor (C505)
99-150339	10 uf Aluminum Electrolytic 16V Capacitor (C506)
99-150340	10 uf Aluminum Electrolytic 16V Capacitor (C507)
99-150316	1200 pf Ceramic-Disc 500V Capacitor (C510)
99-150317	4.7 uf Aluminum Electrolytic 250V Capacitor (C511)
99-150341	8200 pf Polyester-Film 400V Capacitor (C514)
99-150318	1 uf Aluminum Electrolytic 250V Capacitor (C515)

Figure 8 Parts List of Matsushita Monitor, continued

<i>Part No.</i>	<i>Description (Reference Designations in Bold)</i>
99-150319	1500 pf Ceramic-Disc 2000V Capacitor (C516)
99-150342	22 pf Ceramic-Disc 500V Capacitor (C518)
99-150343	1200 pf Ceramic-Disc 500V Capacitor (C519)
99-150309	220 uf Aluminum Electrolytic 35V Capacitor (C521)
99-150320	0.27 uf Metalized-Polyester 400V Capacitor (C523)
99-150345	4700 pf Polyester 50V Capacitor (C525)
99-150346	0.15 uf Polyester 50V Capacitor (C526)
99-150347	82 pf Ceramic-Disc 50V Capacitor (C527)
99-150333	100 uf Aluminum Electrolytic 16V Capacitor (C528)
99-150348	0.022 uf Polyester 50V Capacitor (C530)
99-150321	390 pf Ceramic-Disc 2000V Capacitor (C531)
99-150322	560 pf Ceramic-Disc 2000V Capacitor (C532)
99-150349	120 pf Ceramic-Disc 50V Capacitor (C533)
99-150350	3300 pf Polyester 50V Capacitor (C534)
99-150323	1500 pf Ceramic-Disc 2000V Capacitor (C535, 536)
99-150319	1500 pf Ceramic-Disc 2000V Capacitor (C537, 538)
99-150322	560 pf Ceramic-Disc 2000V Capacitor (C539)
99-150351	150 pf Ceramic-Disc 50V Capacitor (C540)
99-150324	0.01 uf Ceramic-Disc 500V Capacitor (C803-806)
99-150325	560 uf Electrolytic 180V Filter (C807)
99-150326	33 uf Aluminum Electrolytic 160V Capacitor (C809)
99-150352	33 uf Aluminum Electrolytic 160V Capacitor (C812)
<i>Transformers and Coils:</i>	
99-150450	4.7 uH Peaking Coil (L401)
99-150451	4.7 uH Peaking Coil (L402)
99-150452	1 uH Coil (L403, 404)
99-150453	1 uH Coil (L501, 503)
99-150454	Linearity Coil (L505)
99-150009 ★	Horizontal Width Adjustment (L506)
99-150010	Line Filter (L801)
99-150013	Horizontal Drive (T501)
99-150011 ★	Flyback Transformer (T502)
99-150012	Pincushion (T503)
<i>Miscellaneous Parts:</i>	
99-150003	Cathode-Ray Tube (Picture Tube)
99-150004	Purity Magnets
99-150005	Deflection Yoke
99-150006 ★	Main Printed-Circuit Board
99-150007 ★	Neck Printed-Circuit Board
99-150479	3-Amp. Slow-Blow Fuse
99-150480	1-Amp. Slow-Blow Fuse

