# SERVICE MANUAI

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SERVICE DEPARTMENT/MAGNAVOX CONSUMER ELECTRONICS COMPANY FORT WAYNE, INDIANA 46804

#### ODYSSEY<sup>2</sup> (BJ/BK7600) VIDEO GAME SYSTEM



Model BJ/BK7600

#### **GENERAL INFORMATION**

The Odyssey  $^2$  (Model BJ/BK7600) is a programmable video game system using integrated circuits. The basic Odyssey  $^2$ system consists of two plug-in Player Hand Controls, a

alpha-numeric Keyboard, Antenna/Game Switch Box. external AC Adapter, and a Game Cartridge.

#### **INSTALLATION INSTRUCTIONS**

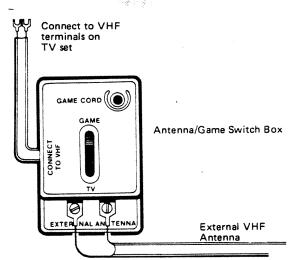


Figure 1

Your Odyssey<sup>2</sup> will interconnect with any color or black and white television set. All-you need is a flat-head screwdriver.)

1. The Antenna/Game Switch Box (see Figure 1) is provided as a convenience to allow selection of either Odyssey<sup>2</sup> or regular television viewing, without having to disturb antenna connections.

Locate the VHF antenna terminals on the back of the the television set. Disconnect the VHF antenna leads and reconnect these leads to the terminals on the Antenna/Game Switch box.

Connect the flat twin-lead wire from the Antenna/ Game Switch box to the VHF terminals on the back of your television set.

If your VHF antenna cable is round with a screw-type connector (75 ohm), you will need to purchase a 75 ohm to 300 ohm Balun to permit connection of your TV antenna to the Odyssey<sup>2</sup> Antenna/Game Switch box.

DMEMP1270

Flectronics Co. 1979

If you are using a 75 ohm round cable, your TV will probably have a set of jumper plates or a switch which must be moved to select the VHF 300 ohm terminals. (See your TV's Owner's Manual for information).

If you have only a UHF antenna, do not disconnect it from your television set. Just connect the flat twinlead wire from the Antenna/Game switch box to the VHF terminals on the back of your television set.

Use the plastic mounting hook supplied to hang the Antenna/Game Switch box from the back of your television set. First insert the hook in the back of the switch box, then insert the end through one of the ventilating holes on the back of your TV.

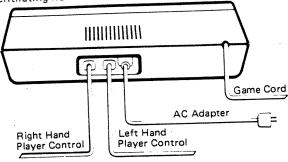
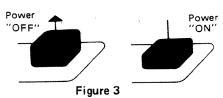


Figure 2

- 2. Plug the Left and Right Player Hand Control Cables into the rear of the console (see Figure 2).
- Plug the GAME CORD from the console into the socket on the top of the Antenna/Game Switch box marked "GAME CORD".



4. Check to make sure that the POWER button on the console is on the OFF position (see Figure 3).

Plug the AC ADAPTOR into any standard 120 volt electrical outlet.

Place the switch on the Antenna/Game switch box to the GAME position.

Set the channel of your TV set to the unused channel (3 or 4) in your area.

Your Odyssey<sup>2</sup> is normally set at the factory for operation on channel 3 of your television set. If a TV station is transmitting on channel 3 in your area, you can switch your Odyssey<sup>2</sup> to channel 4 for operation.

This can be accomplished by turning the console over with the cartridge slot facing away from you. Remove the three screws from the bottom of the Console.

Carefully remove the bottom panel of the Console. You will find the channel selector switch in a metal box located to the upper right of the printed circuit at the upper right hand corner of the console. Slide the switch from the channel 3 position to the channel 4 position. Then replace and secure the bottom panel of the Console.

#### CHECKOUT PROCEDURE

 Visually inspect the Console Unit, Player Hand Control Units, and the AC Adaptor for breakage, cracks, broken or bent connector pins, broken wires, foreign material, corrosion or other damage.

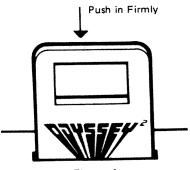


Figure 4

Make sure that the Power button on the console is in the OFF position. This will protect the electronic components of both the console and the cartridge.

Hold the Odyssey<sup>2</sup> Cartridge so that the label side is facing you and reads right side up. (See Figure 4).

Insert the Cartridge carefully in the cartridge slot on the top of the console. (Note: When you remove the

Cartridge, always make sure that the Power button on the Console is in the OFF position.)

3. Press the Power button on the console to the ON position.

"SELECT GAME" will appear on your TV screen. If it should not appear, press the Reset Key on the Console Keyboard. If "SELECT GAME" still does not appear on the screen, check to make sure the AC Adaptor jack is completely plugged into the console and that the cartridge being used is properly inserted.

The sounds of the game will be coming from the speaker on your TV. Adjust your volume control on the TV to a comfortable level.

If necessary, adjust the fine tuning control on your TV to get the best possible picture.

See the Official Game Rules booklet that accompanies each cartridge for specific game instructions.

(NOTE: When you want to return to regular TV programming, push the Power Button of the console to the OFF position and place the switch on the Antenna/Game switch box to the TV position.

CAUTION: UNDER NO CIRCUMSTANCES ATTEMPT TO MAKE ADJUSTMENTS OF THE RESCULLATOR LOCATED INSIDE THE METAL SHIELD. THESE ARE PRESET AT THE FACTORY IN TEST FIXTURES TO MAGNAVOX STANDARDS, AND STRICT FCC REQUIREMENTS.

BEFORE ATTEMPTING TO MAKE ANY SERVICE ADJUSTMENTS, CHECK ENTIRE BOARD FOR SHORTS OR CRACKS. TOTAL CURRENT DRAIN SHOULD BE MONITORED AT ALL TIMES.

THE 3.58 MHz CLOCK, MICROPROCESSOR CLOCK AND THE VIDEO LEVEL ADJUSTMENTS MAY BE MADE ONLY AFTER IT HAS BEEN DETERMINED THAT IT IS ABSOLUTELY ESSENTIAL.

#### 3.58 MHz Clock Adjustment

Connect a high impedance counter to Pin 1 of IC5 and adjust trimmer C6 for 3,579,545  $\pm$  50 Hz.

#### Microprocessor Clock Adjustment

Connect a scope to Pin 2 of IC7 and adjust L2 for maximum amplitude and symmetry.

(NOTE: This adjustment must be made after the 3.58 MHz Clock Adjustment is made).

#### Video Level Adjustment

Adjust the Video Level control, R4, until a good contrast in the picture is obtained.

#### IMPORTANT SAFEGUARDS

- DO NOT remove or insert cartridges unless the console is turned OFF.
- Guide the cartridges into the cartridge slot of the console. DO NOT use force.
- Clean exterior parts of the console and cartridges with a soft, slightly damp cloth. DO NOT immerse them into water or spill liquids on them.
- Keep the console, cartridges and Player Hand Controls away from extreme heat.
- Avoid puncturing the keyboard. DO NOT use pencils, penpoints or other sharp objects to press keys.

- Always place the Power button of the console in the OFF position when not in use.
- Only connect the console to a standard AC electrical outlet.
- Always turn OFF your Odyssey<sup>2</sup> each time you have finished playing the games. Then unplug the AC Adaptor from the 120 volt outlet.

(Note: If you leave the same game pattern on your TV screen for more than 6-8 hours continuously, there is a possibility that the game pattern could be permanently imprinted on the picture tube screen.)

#### ODYSSEY2 TROUBLESHOOTING

#### No Game Image on TV

- a. Check the Antenna/Game switch to see if the switch is set in the Game position.
- b. Check to see that the Game Cord is plugged into the Antenna/Game switch box.
- c. Check the connections of the Antenna/Game switch box to the VHF terminals in back of the TV.
- d. The Cartridge may have been inserted when the console was turned On. Place the Power button in the OFF position.
- e. Interference may be caused by a particularly strong broadcast or cable TV station in your area. Disconnect the antenna or cable wire from the Antenna /Game Switch box.

#### No TV Program Reception

- a. Check the Antenna/Game switch to see if the switch is set in the TV position.
- b. Check the antenna connections to the Antenna/ Game Switch box.

#### Game Image Weak or Blurry

- a. Check for poor connections at the antenna terminals of the TV set and the Antenna/Game switch box.
- Be sure the fine tuning control of the TV is properly adjusted.
- c. Interference may be caused by a particularly strong broadcast of cable station in your vicinity. Disconnect the antenna or cable wire from the Antenna /Game switch box.

#### No Game Sounds

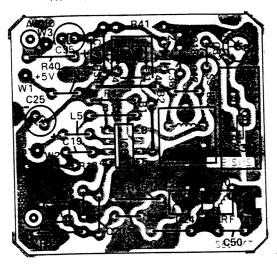
a. Check the volume setting of your TV.

# Right or Left Side of Game Area Does Not Appear on Screen

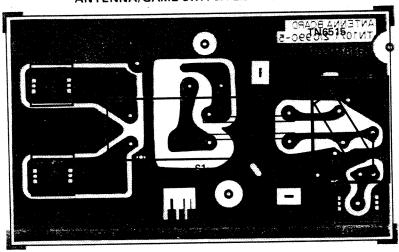
a. Adjust the Horizontal Hold control on your TV.

#### Player Hand Control Does Not Work

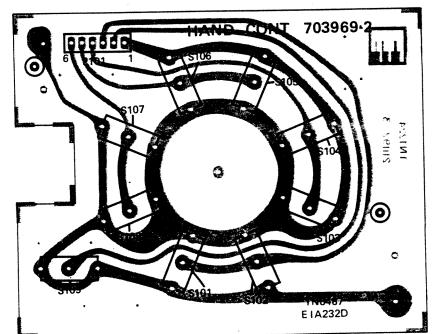
- a. Check to see if the Player Hand Control is properly plugged into the rear of the console.
- b. Defective Player Hand Control.

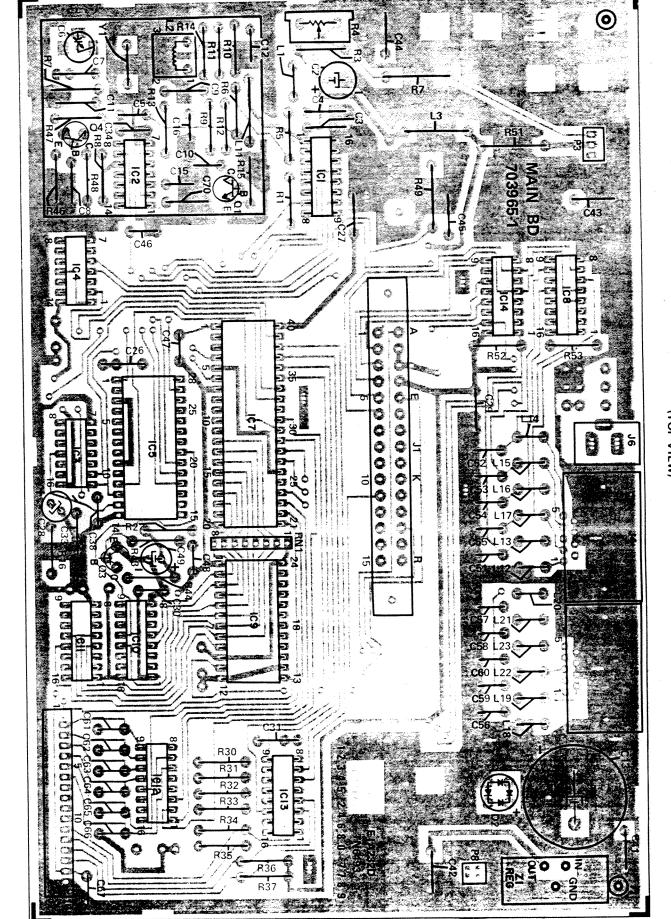


ANTENNA/GAME SWITCH BOX P.C. BOARD

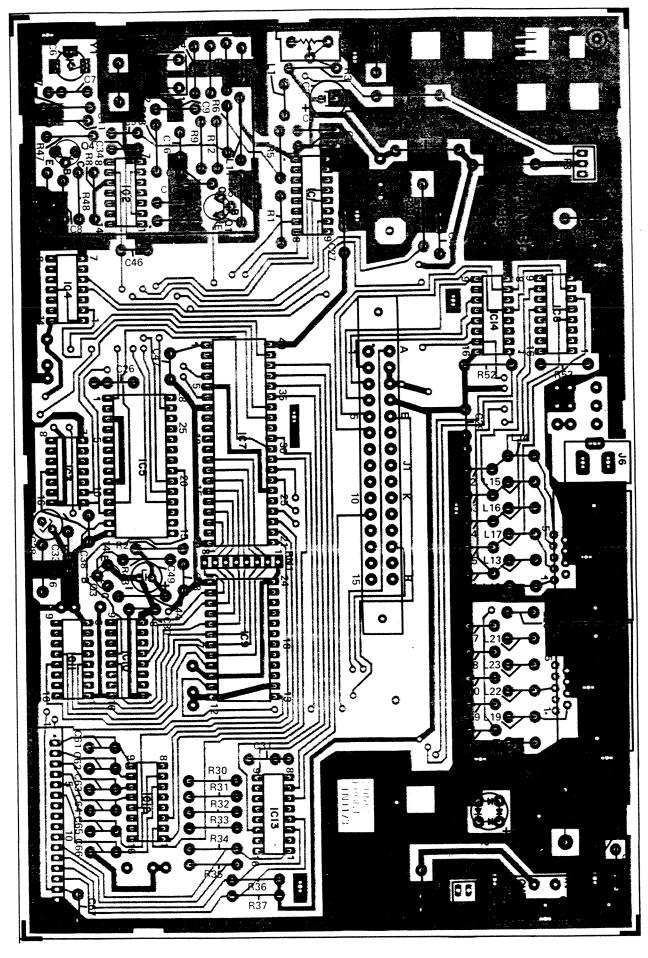


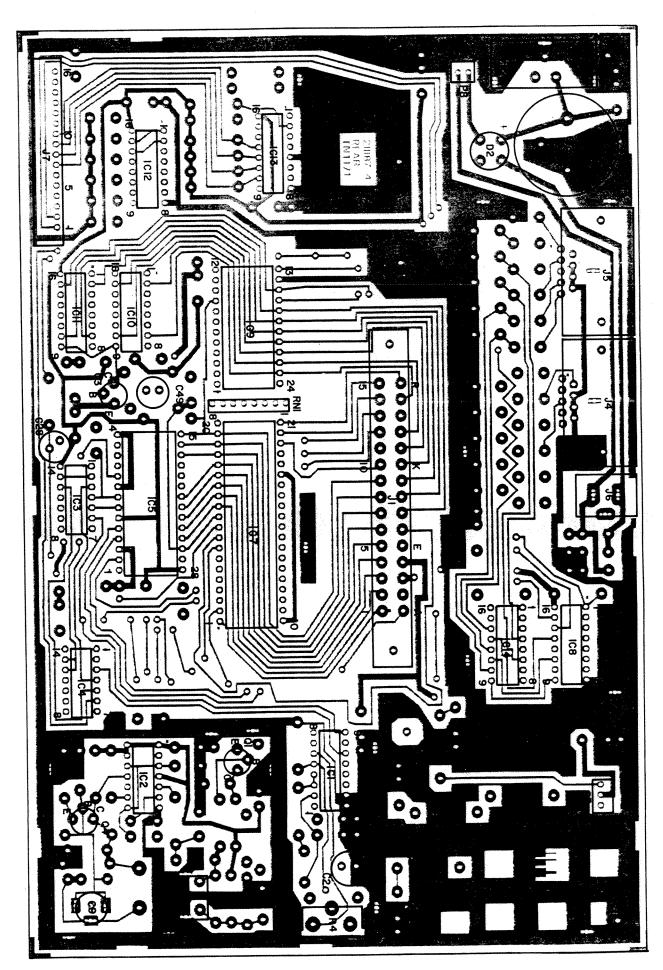
HAND CONTROL P.C. BOARD

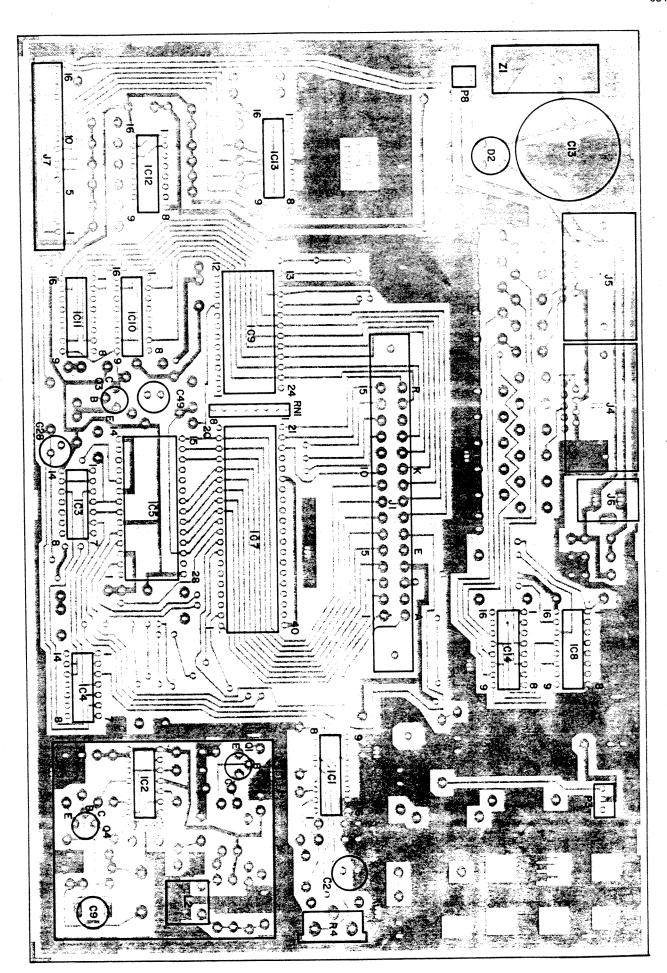




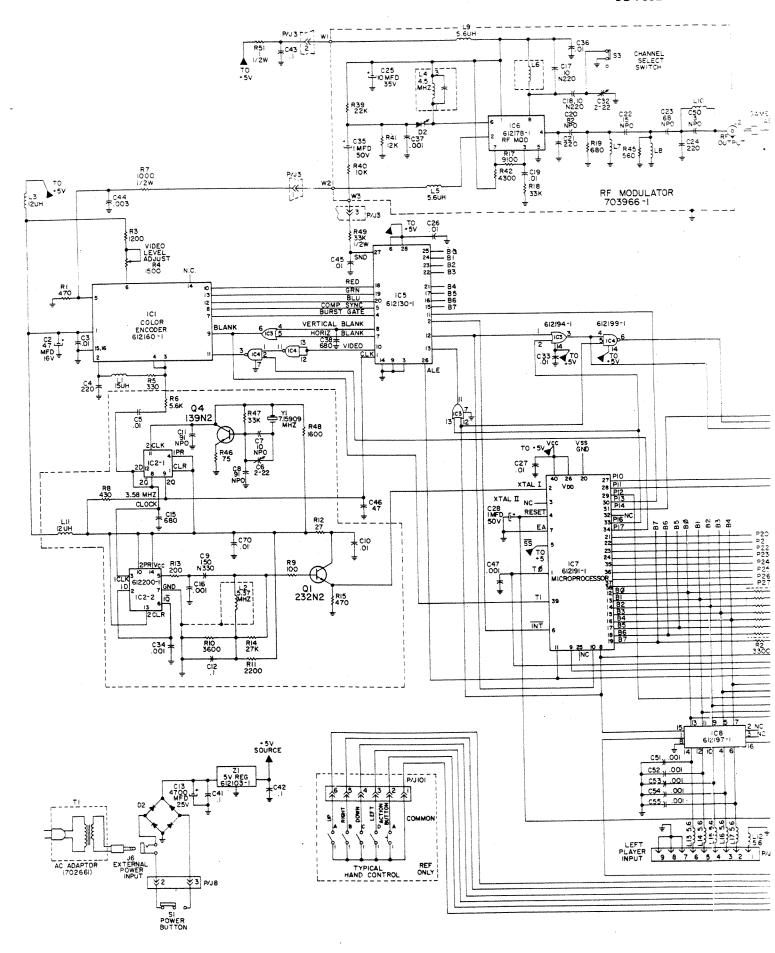
MAIN P.C. BOARD (TOP VIEW)

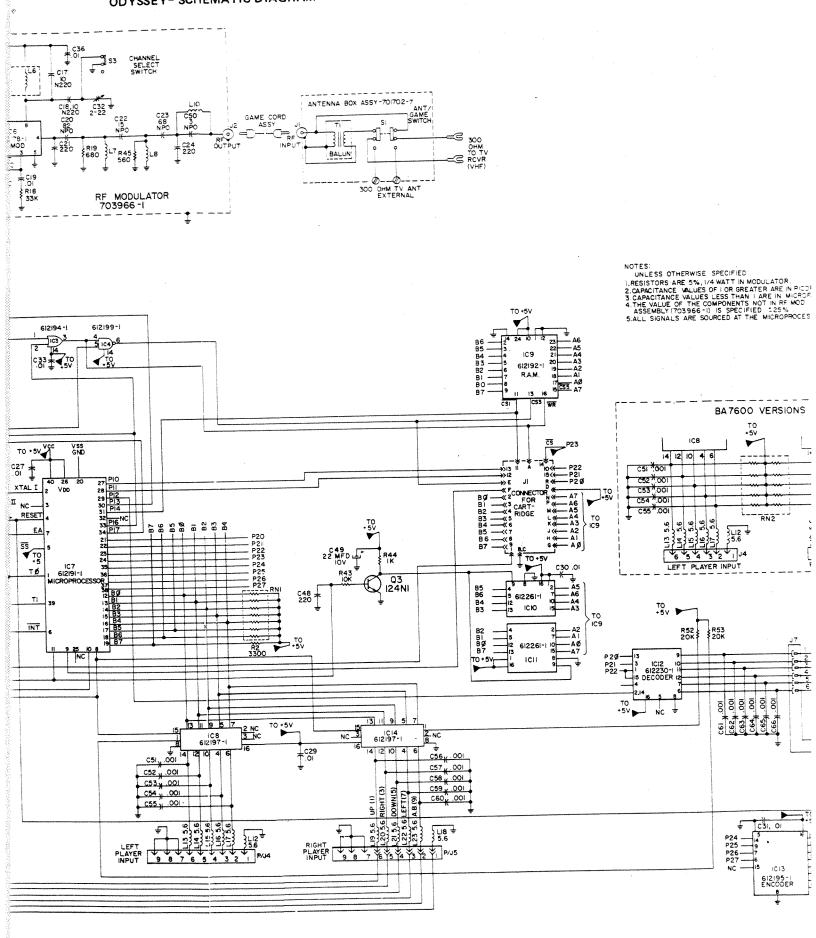


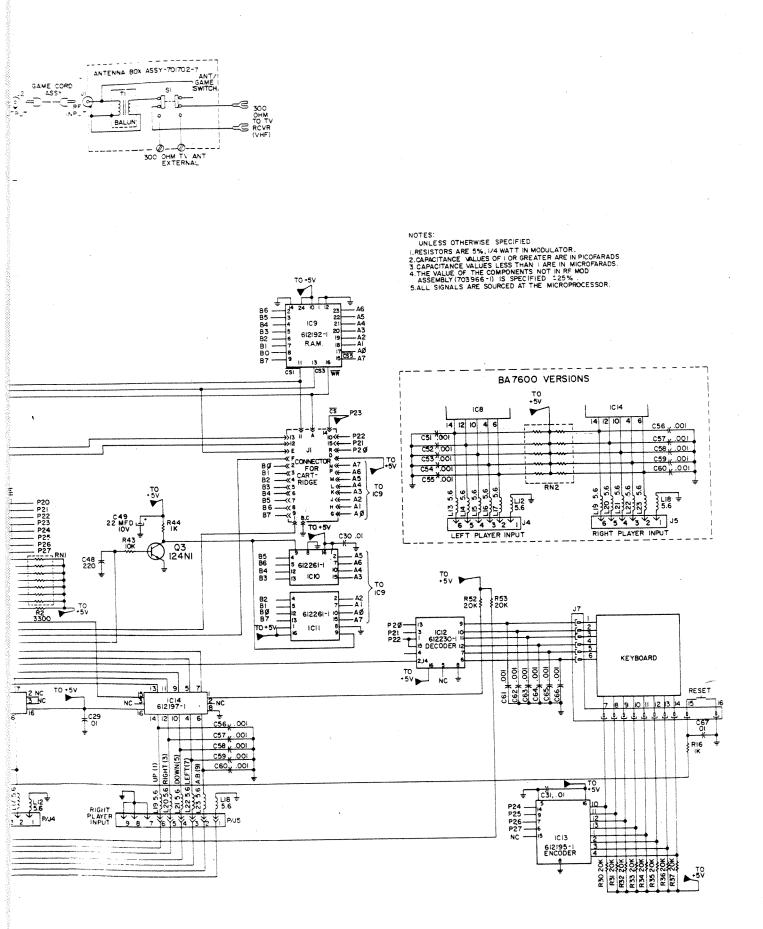




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#### **IMPORTANT**

It is against Federal Communications Commission regulations to cause any interference to nearby television sets.

- Please do not use any longer twin-lead wire from the Antenna/Game Switch Box to your TV set than is supplied.
- Please do not make a direct connection from the Antenna/Game Switch Box to any TV antenna or cable TV outlet.
- Do not attach loose wires to your TV antenna terminals when your Odyssey<sup>2</sup> is turned ON.

#### 703966 "RF MODULATOR" ASSEMBLY REPLACEMENT PARTS LIST

REF.	DESCRIPTION	PART NO.	REF.	DESCRIPTION
L4 L5 L6 L7 L8 L9	COILS  4.5 MHz Coil Peaking Coil, 5.6 uh Coil Filter Coil Filter Coil Peaking Coil, 5.6 uh Filter Coil	361441-2 361444-5690 361398-22 361558-4 361558-4 361444-5690 361558-4	R17 R18 R19 R39 R40 R41 R42 R45	Carbon Film,9.1K oh Carbon Film,33K ohr Carbon Film,680 ohn Carbon Film,12K ohr Carbon Film,10K ohr Carbon Film,12K ohr Carbon Film,4.3K oh Carbon Film,560 ohn
C17 C18 C19 C20 C21 C22 C23 C24 C25 C35 C36 C37 C50	CAPACITORS  Ceramic, 10 pf.,5%,500V,N220 Ceramic, 10 pf.,5%,500V,N220 Ceramic, 01 mfd.,+80-20%,100V Ceramic, 82 pf.,5%,500V,NPO Ceramic, 220 pf.,5%,500V Ceramic, 15 pf.,5%,500V,NPO Ceramic, 68 pf.,5%,500V,NPO Ceramic, 220 pf.,5%,500V Electrolytic, 10 mfd.,35V Trimmer, 2-22 pf. Electrolytic, 1 mfd.,50V Ceramic, .01 mfd.,+80-20%,100V Ceramic, .001 mfd.,20%,500V Ceramic, .001 mfd.,20%,500V Ceramic, 3 pf.,±1 pf.,500V,NPO	250666-1005 250666-1005 250660-2009 250546-8205 250551-2215 250546-1505 250546-6805 250551-2215 270109-1135 260220-5 270109-1050 250660-2009 250546-3096	D2 IC6	Channel Select Switch SEMICON Silicon Diode RF Modulator IC MISCELL RF Output Jack 3 Pin Connector Shield (f/L6) RF Module Box Bottom Shield Top Shield

REF.	DESCRIPTION	PART NO.		
R17 R18 R19 R39 R40 R41 R42 R45	Carbon Film,9.1K ohm,5%,½W Carbon Film,33K ohm,5%,½W Carbon Film,680 ohm,5%,½W Carbon Film,22K ohm,5%,½W Carbon Film,10K ohm,5%,½W Carbon Film,12K ohm,5%,½W Carbon Film,4.3K ohm,5%,½W Carbon Film,560 ohm,5%,¼W	230214-9125 230214-3335 230214-6815 230214-2235 230214-1035 230214-1225 230214-4325 230214-5615		
	SWITCHES			
S3	Channel Select Switch	160556-2		
	SEMICONDUCTORS			
D2 IC6	Silicon Diode RF Modulator IC	530104-2 612178-1		
	MISCELLANEOUS			
J2 J3	RF Output Jack 3 Pin Connector Shield (f/L6) RF Module Box Bottom Shield Top Shield	181095-1 181252-3 636734-30 733292-1 733293-6 733293-7		

#### 702669 "CONSOLE" UNIT REPLACEMENT PARTS LIST

REF.	DESCRIPTION	PART NO.
J8 S1	Connector (f/Power Button) Power Button Knob (f/Power Button) Keyboard Cabinet Top Cabinet Bottom Keyboard Frame Case Overlay	181252-2403 160590-3 144132-1 160624-101 144087-1 144088-3 144089-1 151649-1

REF.	DESCRIPTION	PART NO.
	Foot, 4 used Game Cord Assembly —Plug (Inserted into Ant/Game Switch Box) —Plug (Inserted in Console Unit) —Cable AC Adaptor (BJ7600 only) AC Adaptor (BK7600 only)	141737-3 461218-7 180903-1 181235-9 461263-1 702661-1 702661-2

702667 "PLAYER HAND CONTROL" REPLACEMENT PARTS LIST

REF.	DESCRIPTION	PART NO.	REF.	DESCRIPTION	PART NO.
	Case Top Case Bottom Joy Stick Joy Stick Knob Joy Stick Retainer Cover Actuator Plate Action Button Dirt Shield Cable Assembly —9 Pin Housing, J101 —Connector, P4/P5 —Cable Guard —Strain Relief Clip, 2 used —Contacts, 6 used —Contacts, 3 used —Flat Cable	144093-3 144094-1 733300-3 143977-2 143977-2 144082-2 144083-1 144098-1 644395-1 702597-2 181305-1 181252-6 144177-1 103383-1 181306-1 181306-2 461281-4		Hand Control P.C. Board Assembly —6 Pin Wafer Assembly —Momentary Switch Button, 9 used —Momentary Switch, 8 used —Momentary Switch Spring Actuator Pin Spring	703969-2 181253-6 160599-1 160599-6 160599-7 733497-1 733305-1

### 703965 "MAIN" P.C. BOARD ASSEMBLY REPLACEMENT PARTS LIST

	703965 WAIN F.C. C	CAND AGGENT			
REF.	DESCRIPTION	PART NO.	REF.	DESCRIPTION	PART NO.
	COILS		R13	Carbon Film,200 ohm,5%,¼W	230214-2015
	00120		R14	Carbon Film, 27K ohm, 5%, 4W	230214-2735
L1	Peaking Coil, 15 uh	361475-150	R15	Carbon Film,470 ohm,5%,1/4W	230214-4715
L2	5.37 MHz Coil	361441-7	R16	Carbon Film, 1K ohm, 5%, 1/4W	230214-1025 230214-2035
L3	RF Choke Coil, 12 uh	360676-25	R30	Carbon Film, 20K ohm, 5%, 4W Carbon Film, 20K ohm, 5%, 4W	230214-2035
L11	RF Choke Coil, 12 uh	360676-25 361444-5690	R31 R32	Carbon Film, 20K ohm, 5%, 14W	230214-2035
L12-23	Peaking Coil, 5.6 uh	361444-3030	R33	Carbon Film 20K ohm, 5%, 4W	230214-2035
ŀ	CAPACITORS	1	R34	Carbon Film, 20K ohm, 5%, 4W	230214-2035
ĺ			R35	Carbon Film, 20K ohm, 5%, 4W	230214-2035
C2	Electrolytic, 47 mfd.,16V	270109-5115	R36	Carbon Film, 20K ohm, 5%, 1/4W	230214-2035
C3	Ceramic01 mfd., +80-20%,100V	250660-2009	R37	Carbon Film,20K ohm,5%,¼W Carbon Film,10K ohm,5%,¼W	230214-2035
C4	Caramic 220 pf., 5%, 500V	250551-2215	R43 R44	Carbon Film, 1K ohm, 5%, 4W	230214-1025
C5	Ceramic, .01 mfd.,+80-20%,100V	260220-5	R46	Carbon Film,75 ohm,5%,¼W	230214-7505
C6	Trimmer, 2-22 pf. Ceramic, 10 pf., 10%, 500 V, NPO	250546-1009	R47	Carbon Film,33K ohm,5%,¼W	230214-3335
C7	1 Caramic 91 nf. 5%.500V.NPO	250546-9105	R48	Carbon Film, 1.6K ohm, 5%, 1/4W	230214-1625
C8	Caramic 150 of 10% . 500 V . N330	250528-1519	R49	Carbon Film, 33K ohm, 5%, 1/4W	230212-3335 230212-1095
C10	Ceramic .01 mfd.,+80-20%,100V	250660-2009	R51 R52	Carbon Film,1 ohm,10%,½W Carbon Film,20K ohm,5%,¼W	230214-2035
C11	Ceramic, 91 of., 5%, 500V, NPO	250546-9105 250642-1049	R53	Carbon Film, 20K ohm, 5%, 14W	230214-2035
C12	Mylar, .1 mfd., 10%, 50V	270132-5	1100		
C13	Electrolytic, 4700 mfd.,25V Ceramic, 680 pf.,20%,500V	250551-6810		CONTROLS	· ·
C15	Mica, 1000 pf.,10%,100V	250607-6973			
C16 C26	Ceramic .01 mfd.,+80-20%,100V	250660-2009	R4	Video Level Adjust, 1500 ohm	220299-1522
C27	Ceramic, 01 mfd.,+80-20%,100V	250660-2009			
C28	Flectrolytic, 1 mfd., 50V	270109-1050 250660-2009		SEMICONDUCTORS	
C29	Ceramic, .01 mfd.,+80-20%,100V	250660-2009		AUDAL Ciliana	610232-2
C30	Ceramic, .01 mfd.,+80-20%,100V Ceramic, .01 mfd.,+80-20%,100V	250660-2009	01	NPN Silicon NPN, Silicon	610124-1
C31	Ceramic, .01 mfd.,+80-20%,100V	250660-2009	Q3 Q4	NPN, Silicon	610139-2
C33	Ceramic, 1000 pf.,20%,500V	250551-1020	D2	Bridge Rectifier	530204-1
C38	Ceramic, 680 pf., 20%, 500 V	250551-6810	Z1	Regulator, 5 Volt	612103-3
C41	Polyester, .1 mfd.,20%,100V	250555-184 250555-184	Y1	Crystal	560404-3 612160-3
C42	Polyester, .1 mfd., 20%, 100V	250555-184	IC1	Color Encoder IC Dual D-Type Positive-Edge-Triggered	0121000
C43	Polyester, .1 mfd.,20%,100V Ceramic, 3000 pf.,5%,500V	250551-3025	IC2	IC	612200-1
C44 C45	Ceramic, .01 mfd.,+80-20%,100V	250660-2009	103	Quad 2 Input Positive or Gate	
C46	L Ceramic, 47 pf.,10%,500V	250551-4709	1.00	IC	612194-1
C47	Ceramic, 1000 pf.,20%,500V	250551-1020 250551-2219	IC4	Quad 2 Input Positive IC	612199-1 612130-1
C48	Ceramic, 220 pf., 10%, 500V	270109-2110	1C5	Graphics Display IC Microprocessor IC	612191-1
C49	Electrolytic, 22 mfd.,10V Ceramic, 1000 pf.,20%,500V	250551-1020	IC7 IC8	Gated Input IC	612197-1
C51 C52	Ceramic, 1000 pf.,20%,500V	250551-1020	109	RAMIC	612192-1
C53	Ceramic, 1000 pf., 20%, 500V	250551-1020	IC10	Quad Positive-Edge-Triggered D	
C54	Ceramic, 1000 pf.,20%,500V	250551-1020 250551-1020		Type IC	612261-1
C55	Ceramic, 1000 pf., 20%, 500V	250551-1020	IC11	Quad Positive-Edge-Triggered D	612261-1
C56	Ceramic, 1000 pf.,20%,500V Ceramic, 1000 pf.,20%,500V	250551-1020	1010	Type IC Decoder IC	612230-1
C57 C58	Ceramic, 1000 pf., 20%, 500V	250551-1020	IC12 IC13	Encoder IC	612195-1
C59	Ceramic, 1000 pf., 20%, 500V	250551-1020	1014	Gated Input IC	612197-1
C60	Ceramic, 1000 pf.,20%,500V	250551-1020 250551-1020			1
C61	Ceramic, 1000 pf.,20%,500V	250551-1020		MISCELLANEOUS	
C62	Ceramic, 1000 pf.,20%,500V Ceramic, 1000 pf.,20%,500V	250551-1020		Cartridge Connector	181257-1
C63	Ceramic, 1000 pf.,20%,500V	250551-1020	J1 J4	Left Player Input Plug,9-Pin	
C64 C65	Ceramic, 1000 pf.,20%,500V	250551-1020	J. <del></del>	(BJ7600 only)	181307-1
C66	Coromic 1000 of 20% 500V	250551-1020	J4	Left Player Input Plug, 9-Pin	404007.0
C67	Ceramic .01 mfd.,+80-20%,100V	250660-2009		1 (BK7600 only)	181307-3
C70	Ceramic, .01 mfd.,+80-20%,100V	250660-2009	J5	Right Player Input Plug, 9-Pin	181307-1
	RESISTORS		۱۱	(BJ7600 only) Right Player Input Plug, 9-Pin	10.00
	11.25.51.51.5	1	J5	[ (BK7600 only)	181307-3
RN1	Resistor Network	254003-3325	J6	AC Adaptor Input Jack (BJ7600 only	) 181250-1
R1	Carbon Film,470 ohm,5%,1/4W	230214-4715	J6	AC Adaptor Input Jack	181328-1
R2	Carbon Film,3.3K ohm,5%,/4W	230214-3325 230214-1225	1 1	(BK7600 only)	181309-2
R3	Carbon Film,1.2K ohm,5%,¼W Carbon Film,330 ohm,5%,¼W	230214-3315	J7	Keyboard Connector 3-Pin Wafer Assembly	181254-3
R5	Carbon Film, 330 ohm, 5%, 74V Carbon Film, 5.6K ohm, 5%, 74V	230214-5625	P3	2-Pin Wafer Assembly	181254-2
R6 R7	Carbon Film 1K ohm 5% %W	230212-1025	1 1	IC Socket (f/IC5)	181214-1
R8	Carbon Film,430 ohm,5%,¼W	230214-4315		IC Socket (f/IC7)	181214-2 733539-1
R9	Carbon Film.100 ohm.5%,/4W	230214-1015		Heat Sink (f/Z1)	733539-1
R10	Carbon Film, 3.6K ohm, 5%, 1/4W	230214-3625 230214-2225		Heat Sink (f/Z1) Shorting Clip	733683-1
R11	Carbon Film,2.2K ohm,5%,¼W Carbon Film,27 ohm,5%,¼W	230214-2705		Shorting Chip	
R12	Caroun France / Onthi, 070,7444		<i></i>		

## 701702-7 "ANTENNA/GAME SWITCH BOX" ASSEMBLY REPLACEMENT PARTS LIST

REF.	DESCRIPTION	PART NO.
	Antenna Box Bottom Antenna Box Top Plastic Hook Antenna Unit —Antenna/Game Switch, S1 —Game Cord Socket, J1 —Balun Antenna, T1 —Terminal (2 used) —Cable Assembly, Twin Lead —Solderless Terminal, 2 used (f/782237) —300 ohm wire (f/782237) —Antenna Board Shield	143674-1 143676-1 143719-1 703748-6 160499-3 180902-4 361108-2 200495-1 782237-2 200517-1 461144-1 733573-1