

Magnavox

SERVICE MANUAL

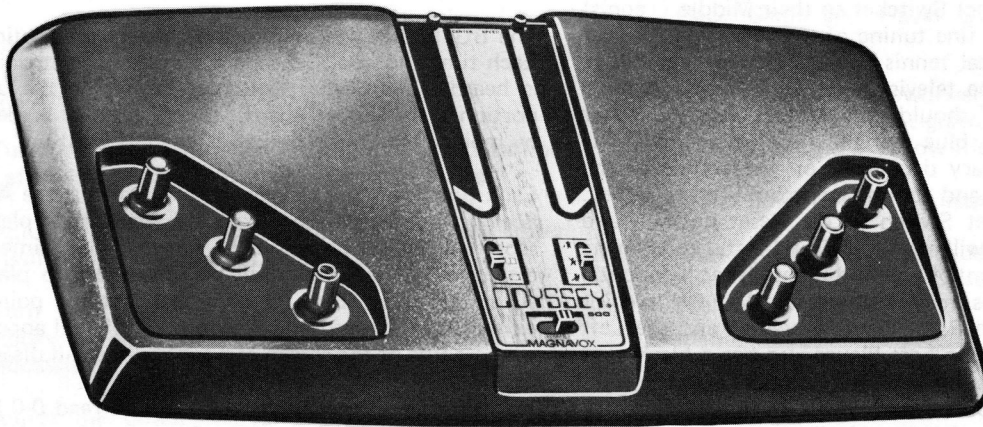
THE MAGNAVOX COMPANY • SERVICE DEPARTMENT
FORT WAYNE, INDIANA

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BG7520 ODYSSEY

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GENERAL INFORMATION

The BG7520 Odyssey is powered by a 9 volt 200 ma AC adaptor. The unit features four games: Hockey, Tennis, Smash, and Soccer, and three different styles of players. As a test of your skill it also incorporates Ball (English)

Controls and a Ball Speed Control.

The BG7520 also features a full color background and color players, automatic "Ball" serve, and digital on-screen scoring.

SPECIFICATIONS

	<u>Minimum</u>	<u>Nominal</u>	<u>Maximum</u>
Regulated Voltage Supply Measured at Pin 3 of IC1	4.5V	5.0V	5.5V
Current Drain BG7520	-----	185 Ma	200 Ma
Vertical Sync Frequency	59 Hz	60 Hz	61 Hz
Pulse Amplitude	2.8V	4.0V	-----
Pulse Width		200.0 usec.	
Horizontal Sync Frequency	15.684 KHz	15.734 KHz	15.784 KHz
Pulse Amplitude	3.5V	4.0V	-----
Pulse Width		5.0 usec.	
RF Carrier Frequency Channel 3	61.22 MHz	61.25 MHz	61.28 MHz
Channel 4	67.22 MHz	67.25 MHz	67.28 MHz
RF Output Into 300 ohms	2000 uV	-----	4000 uV

TYPICAL OPERATION (TENNIS)

Connect the 300 ohm twin lead from the Antenna/Game Switch to the 300 ohm antenna terminals of a properly adjusted and operating television receiver. Connect the game cord cable from the Odyssey Unit to the Antenna/Game Switch and place the Game/TV Switch in the Game position.

Place the Channel Switch on the Odyssey to either channel 3 or 4 and the television VHF Channel Selector to the same channel. The Channel Switch on the BG7520 is located in the upper right portion of the Master Board.

Place the Power/Reset Switch in the "ON" position and the Game and Player Select Switches to their Middle (Tennis) positions. Adjust the fine tuning of the television receiver if necessary. A typical tennis court and two large "W's" should be seen on the television screen. If viewed on a color set, the "Court" should appear light green, the center line and left W light blue and the right W yellow. The specific colors may vary depending on the setting of the color, tint, brightness and contrast controls. To begin play, move the Power/Reset Switch to the Reset position and release it. The score will reset to 0-0 and 2 stylized Players will appear. (Adjustment of Left and Right Player Horizontal and Vertical Controls may be necessary). On a color television receiver, the Right Player is yellow and the Left Player is light blue. The Left Player also has a black spot in the middle which serves to distinguish it from the right player when the BG7520 is used with a black and white set. The "Ball" will be served automatically.

The game is then played by each opponent operating the Vertical Player, Horizontal Player, and Ball Control for his side of the court. A rebound circuit will keep the "Ball" from going off the top and bottom of the screen. When the "Ball" is light blue, only the Ball Control on the left side of the Master Control Unit will affect the "Ball". When the "Ball" is yellow, only the Ball Control on the right side of the Master Control Unit will affect the "Ball".

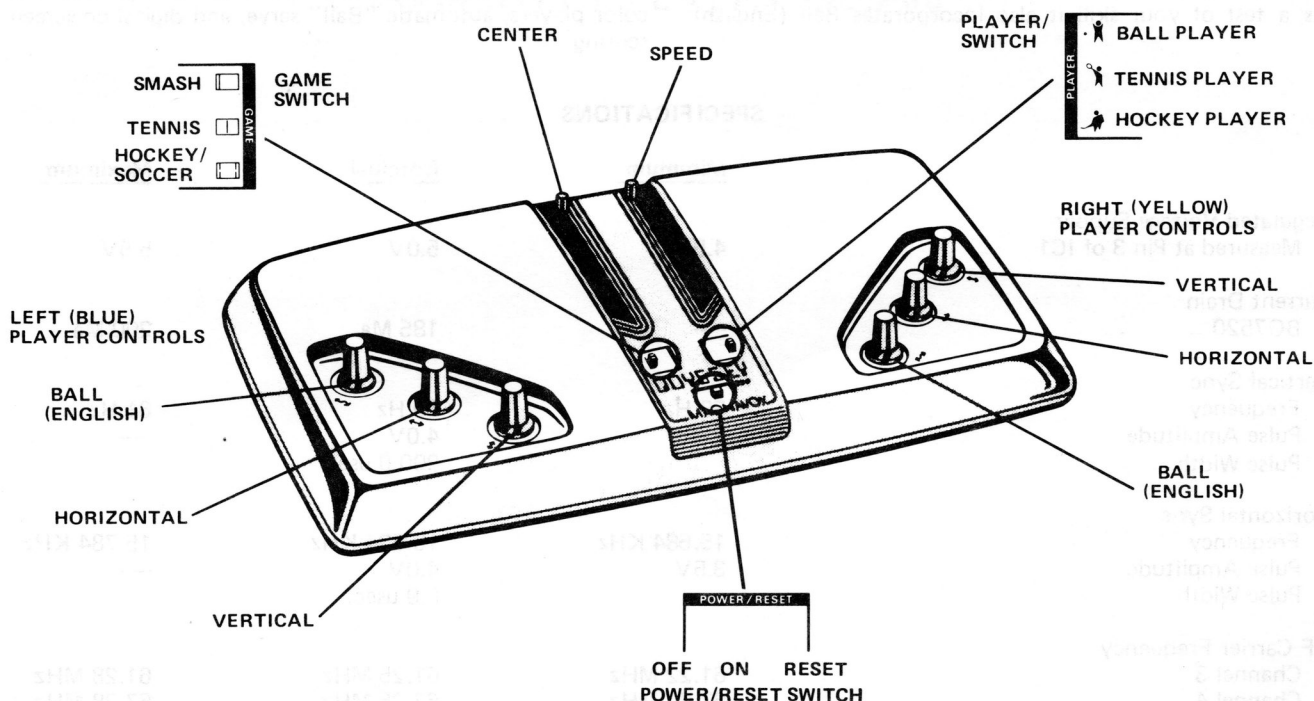
When the Game/Player Switches are in the Soccer position, the Player that has control of the "Ball" will also have control of the Goal opening. The Goal opening can then be made to move vertically by turning the Ball Control.

The BG7520 is also equipped with electronic action sound. Each time the "Ball" strikes a player, an electronic "Beep" is heard. The Sound Switch is located in the upper left portion of the Master Board. The sound may be deactivated by moving the Sound Switch to the Off position.

Each time the "Ball" leaves the playing area, the Automatic Scoring will award a point to the appropriate player. The score will be displayed on the screen a short time and then disappear. The "Ball" will be returned into play by the automatic serve from the side that lost the point. After either player has scored 20 points, a "W" will appear on the winners side of the screen and the players will disappear.

To start a new game, reset the score to read 0-0 by sliding the Power/Reset Switch to the Reset position.

TOP VIEW OF BG7520



SERVICE ADJUSTMENTS

Before attempting to make any service adjustments, check entire board for shorts or cracks. Total current drain should be monitored at all times. Drawing excessive current at any time will necessitate replacement of IC1 regulator, Sync IC.

Score Indicator Position

1. Obtain W-W Win Indicators on the screen by momentarily placing the Power/Reset Switch to the "OFF" position and then back on.
2. Adjust R102 Score Oscillator Adjust to visually center the letters on the raster.

Top and Bottom Rebound Adjustment

1. Connect 3 VDC bias to Pin 3 of IC3.
2. Turn the Right Ball Control, R40, fully clockwise and Left Ball Control, R41, fully counterclockwise.
3. Adjust Upper Rebound Control, R3, until the entire "Ball" is visible at the top edge of the screen.
4. Turn the Right Ball Control, R40, fully counterclockwise and the Left Ball Control, R41, fully clockwise.
5. Adjust the Lower Rebound Control, R2, until the entire "Ball" is visible at the bottom edge of the screen.

Blanking Width and Centering Adjustment

1. Connect an oscilloscope to Pin 5 of IC2.
2. Adjust Blanking Width Control, R43, for a blanking pulse, 14 usec. (+1 usec. -0 usec.) wide. (See Figure 1.)
3. Adjust Blanking Centering Control, R44, for horizontal sync, 3 usec. $\pm$.5 usec, after the leading edge of horizontal blanking.

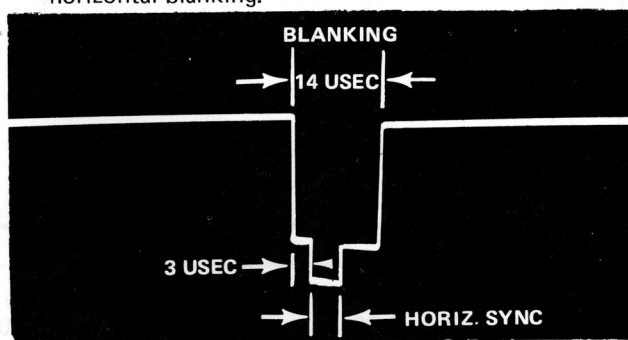


FIGURE 1

At no time shall any adjustments be made concerning RF Filter Alignment, RF Oscillator Alignment, or RF Output Level Adjust. The Video Level Adjustment and 3.58 MHz Oscillator Timing Adjust may be made only after it has been determined that it is absolutely essential.

Video Level Adjustment

1. Adjust Video Level Control, R62, until good contrast in the picture is obtained.

3.58 MHz Oscillator Timing Adjust

1. Place Game and Player Select Switches in Tennis position.
2. Using a plastic screwdriver, adjust the 3.58 MHz. Adjust C41 for a light green background, a light blue Left Player, and a Yellow Right Player.

Background Color Control Adjustment

1. This adjustment can be made only on a color receiver. Place Game and Player Select Switches in the Tennis position.
2. Adjust background Color Control, R54, for a green background. (R54 will affect the background only).
3. Check background in Hockey, Smash and Soccer Switch positions. Hockey should appear Cyan. Smash should appear Magenta. Soccer should appear Red.

Player Size Balance Adjustment

1. Place Player Select Switch in Smash position.
2. Superimpose the Left and Right Player on the screen.
3. Adjust Player Size Balance Control, R67, to obtain equal character size.

Right Wall Horizontal Position

1. Place Game Select Switch in Hockey position.
2. Adjust Right Wall Control R13 until the entire right wall is visible on the right edge of the screen.

Goal Opening Position

1. Place the Game Select Switch in Hockey position.
2. Adjust Goal Position Control, R25, until the goal is positioned vertically in the center of the screen.

IC BASIC FUNCTIONS

IC1

- A. Voltage RFgulator
- B. Horizontal Sync. Generator
- C. Vertical Sync Generator
- D. Right Wall Generator
- E. Rebound Circuitry

IC2

- A. Video Logic Controller

IC3

- A. Left Wall Generator
- B. Ball Generator

IC4

- A. Color Generator
- B. Color Sync Generator
- C. Video Summer

IC5

- A. Character Generator

IC6

- A. Digital Score Generator

IC7

- A. Character Controller

IC8

- A. Input, Gate Generator

VOLTAGE CHARTS

IC1			IC2			IC3			IC4		
PIN	VOLTAGE	NOTE	PIN	VOLTAGE	NOTE	PIN	VOLTAGE	NOTE	PIN	VOLTAGE	NOTE
1	0	----	1	5.25	----	1	.3	----	1	.7 - 4.4	2
2	9.0	----	2	1.3 - 5.25	12	2	5.25	----	2	0	----
3	5.25	----	3	.3	----	3	2.5 - 3.1	1	3	.75 - 1	13
4	0	----	4	0	----	4	1.4 - 2	1	4	2.6	----
5	2.6	----	5	3.7	----	5	2.6	2	5	2.6	----
6	.5 - 1.1	4	6	0	----	6	3.83	----	6	1.4	----
7	1.2 - 1.7	5	7	.1	----	7	1.3	----	7	0	----
8	0	----	8	.1	----	8	.11	----	8	3.7	----
9	.1	----	9	.13	----	9	.2	----	9	0	----
10	.2	----	10	.2	----	10	1.45	----	10	0	----
11	4.01	----	11	0	----	11	5.25	----	11	.3	----
12	2.35	----	12	.7 - 4.5	2	12	1.1 - 3.5	6	12	1.2 - 4.2	14
13	1.7 - 4.7	7	13	.7 - 4.4	2	13	1.5	----	13	1.87	----
14	.05	----	14	0 - 4.6	1	14	1.5 - 3.1	3	14	5.25	----
15	5.25	----	15	5.25	----	15	0	----	15	0	----
16	.3	----	16	.11	----	16	0	----	16	0	----
17	0	----							17	.1	----
18	0	----							18	.11	----
									19	0	----
									20	.2	----

IC5			IC6			IC7			IC8		
PIN	VOLTAGE	NOTE	PIN	VOLTAGE	NOTE	PIN	VOLTAGE	NOTE	PIN	VOLTAGE	NOTE
1	0	----	1	5.25	----	1	3.81	----	1	.2	----
2	0	----	2	.7 - 4.4	2	2	1.3 - 4.5	9	2	1.45	----
3	0	----	3	.1	----	3	1.3	----	3	0	----
4	0	----	4	2.63	----	4	1.3 - 4.5	11	4	0	----
5	0	----	5	0	----	5	1.6	----	5	0	----
6	.2	----	6	.13	----	6	0	----	6	5.25	----
7	.1	----	7	0	----	7	.55 - .61	16	7	0	----
8	0	----	8	0	----	8	.3	----	8	0	----
9	1.7	----	9	.1	----	9	5.25	----	9	0 - 5	1
10	0	----	10	0	----	10	.15	----	10	0	----
11	.07	----	11	0	----	11	.26	16	11	0 - 5	1
12	0	----	12	0	----	12	.3	----	12	2.2 - 3.3	1
13	0	----	13	0	----	13	1.6	----	13	2.2 - 3.3	1
14	0	----	14	1.2 - 1.4	15	14	1.3 - 4.5	10	14	5.25	----
15	1.0	----	15	.9	----	15	2.2	----			
16	0	----	16	.3	----	16	1.3 - 4.5	8			
						17	0	----			
						18	0	----			

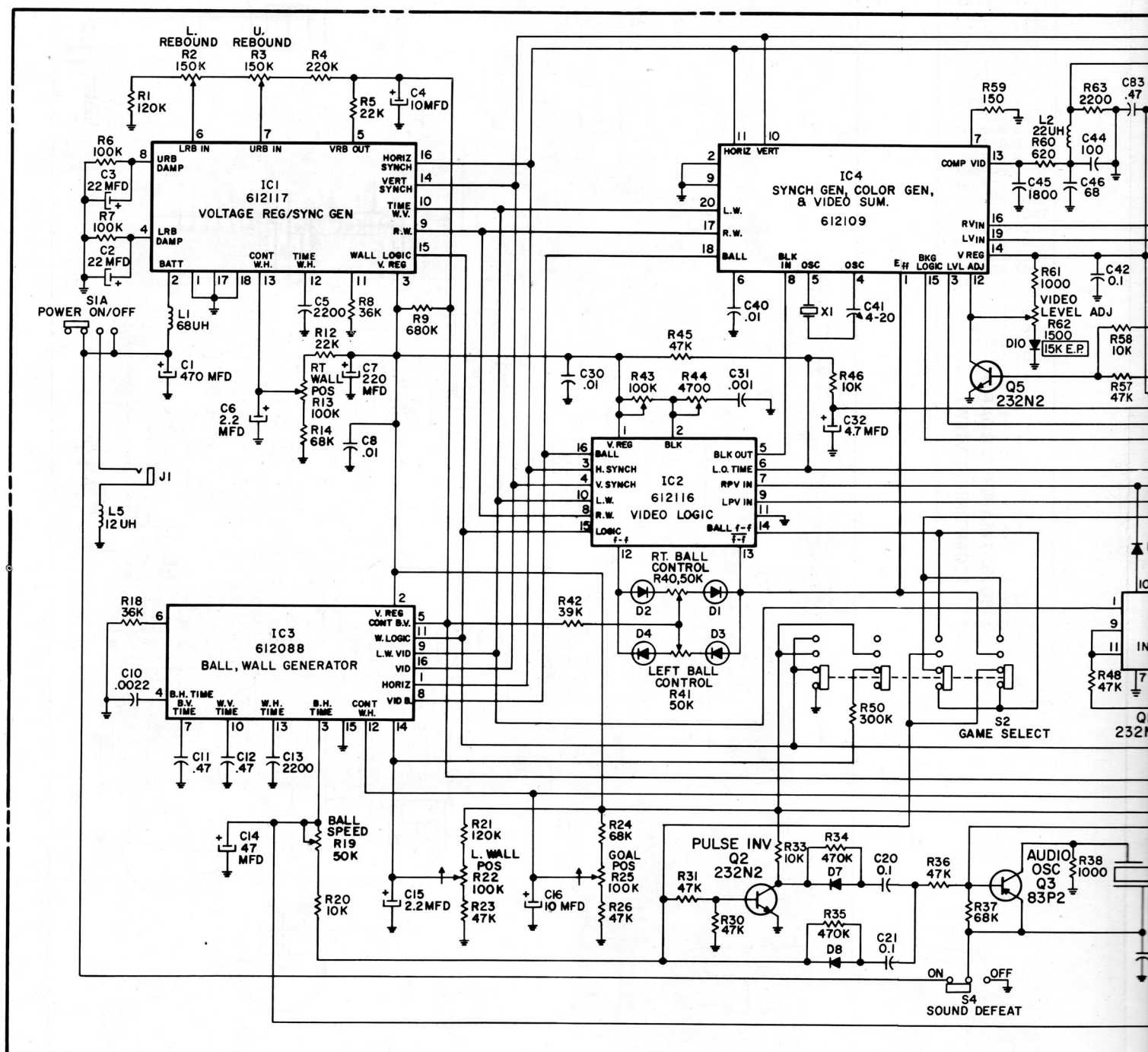
TRANSISTOR	Q1	Q2	Q3	Q4	Q5
VOLTAGE, NOTE	E 0 B 0 - .65V, 1 C 5.25V	E 0 B .3 - .6, 1 C 0 - 5.25, 1	E 9.75 B 9.69 C 0 - .2	E 0 B .64 C 1.15	E 0 B .05 C 1.58

NOTES:

VOLTAGES TAKEN WITH VTVM, LINE VOLTAGE MAINTAINED TO PROVIDE 9 VDC AT PIN 2 OF IC1, OPERATING ON CHANNEL 4, SOUND ON, GAME/PLAYER SWITCHES IN CENTER (TENNIS) POSITION, BALL ADJUSTED FOR LOWEST SPEED, VOLLEYING BETWEEN CENTERED PLAYERS.

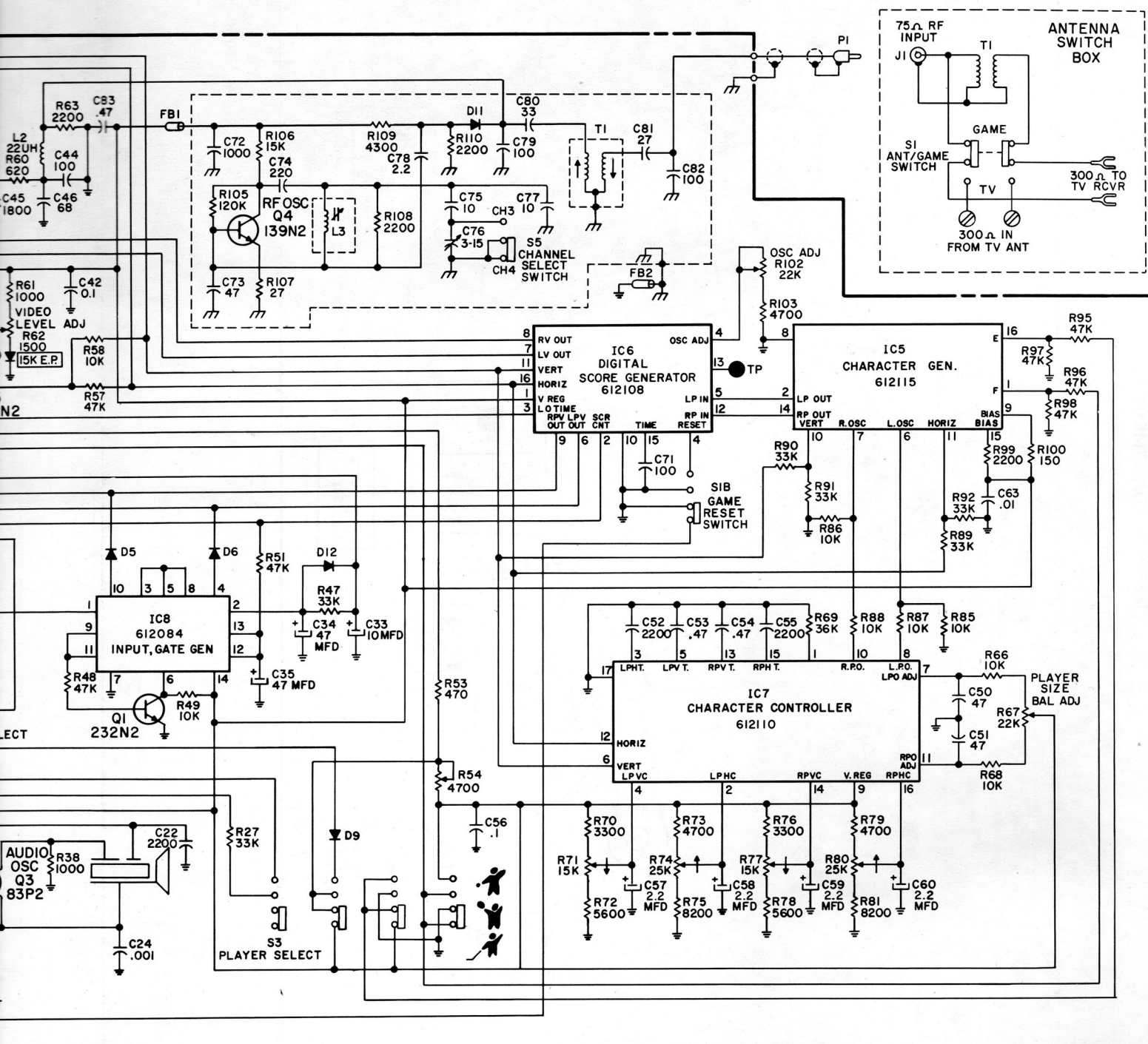
1. Voltage varies with Ball Speed and distance traveled.
2. Voltage varies with Right or Left Ball Control.
3. Voltage varies with Left Wall Position Control.
4. Voltage varies with Lower Rebound Control.
5. Voltage varies with Upper Rebound Control.
6. Voltage varies with Goal Position Control.
7. Voltage varies with Right Wall Position Control.
8. Voltage varies with Right Player Horizontal Position.
9. Voltage varies with Left Player Horizontal Position.
10. Voltage varies with Right Player Vertical Position.
11. Voltage varies with Left Player Vertical Position.
12. Voltage varies with Blanking Centering and Width.
13. Voltage varies with Background Adjust Control.
14. Voltage varies with Video Level Adjust.
15. Voltage varies with Score Oscillator Adjust.
16. Voltage varies with Player Size Balance Adjust.

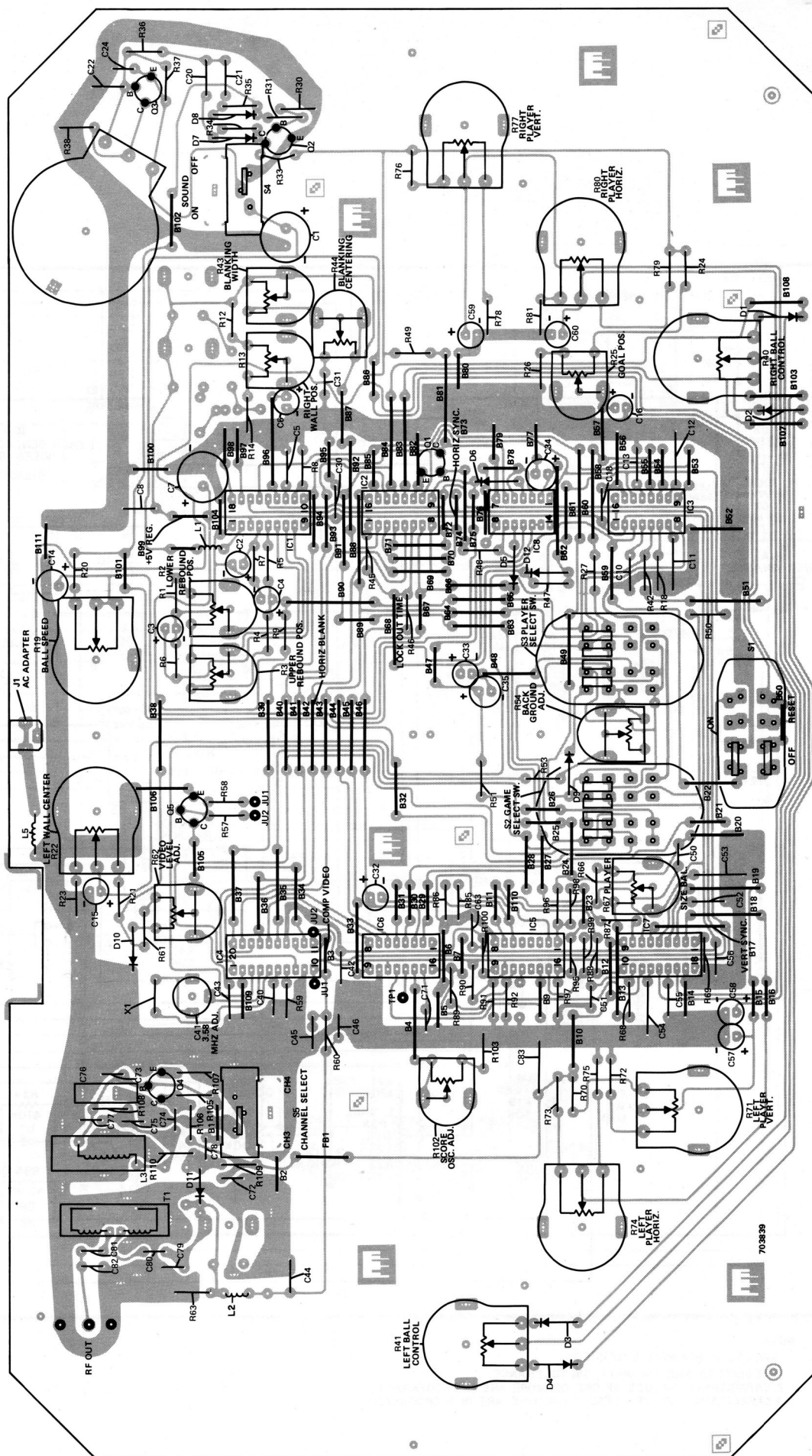
BG7520 SCHEMATIC



NOTES:

- UNLESS OTHERWISE SPECIFIED:
- 1. RESISTORS ARE 1/4 WATT, 5% TOLERANCE.
- 2. CAPACITANCE VALUES OF ONE OR MORE ARE IN PICOFARADS.
- 3. CAPACITANCE VALUES LESS THAN ONE ARE IN MICROFARADS.





REPLACEMENT PARTS LIST

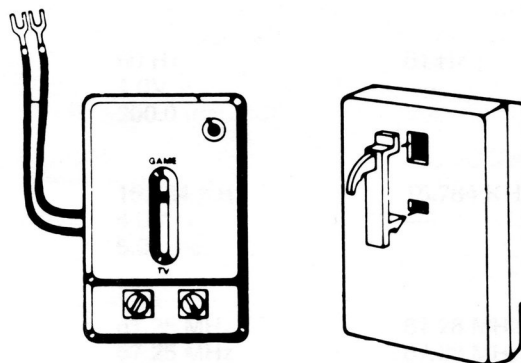
Note: When ordering replacement parts please specify the part number as shown in this list including Description, Chassis, and Model Number. Complete information will help expedite the order. Replacement parts may occasionally differ in part number or value from the Factory installed part. In either event the replacement part has been chosen to provide equal or improved performance.

REF.	DESCRIPTION	PART NO.	REF.	DESCRIPTION	PART NO.
COILS & TRANSFORMERS					
L1	68 uh Peaking Coil	361475-680	R25	100K, Goal Position	220300-1043
L2	22 uh Peaking Coil	361475-220	R40	50K, Right Ball Control	220337-6
L3	Oscillator Coil	361495-2	R41	50K, Left Ball Control	220337-6
L5	12 uh Coil	361425-120	R43	100K, Blanking Width	220300-1043
T1	Adjustable RF Transformer	361467-2	R44	4700, Blanking Centering	220300-4723
CAPACITORS			R54	4700, Background Level Adjust	220300-4723
Values, tolerances and voltage ratings for capacitors not listed are shown on the schematic, or are 10%, 500V.			R62	1500, Video Level Adjust (LP)	220300-1523
C1	Electrolytic, 470 mfd., 16V	270109-5215	R62	15K, Video Level Adjust (EP)	220300-1533
C2	Electrolytic, 22 mfd., 25V	270111-2125	R67	22K, Player Size Balance Adjust	220300-2233
C3	Electrolytic, 22 mfd., 25V	270111-2125	R71	15K, Left Player Vertical	220337-4
C4	Electrolytic, 10 mfd., 25V	270111-1125	R74	25K, Left Player Horizontal	220337-5
C6	Electrolytic, 22 mfd., 50V	270109-2050	R77	15K, Right Player Vertical	220337-4
C7	Electrolytic, 220 mfd., 16V	270109-2215	R80	25K, Right Player Horizontal	220337-5
C11	Polyester, .47 mfd., 5%, 100V	250600-13	R102	22K, RF Osc. Adjust	220300-2233
C12	Polyester, .47 mfd., 5%, 100V	250600-13	S1	Power/On-Off & Game Reset	160546-5
C14	Electrolytic, 47 mfd., 16V	270111-5115	S2	Game Select	160546-2
C15	Electrolytic, 2.2 mfd., 50V	270109-2050	S3	Player Select	160546-2
C16	Electrolytic, 10 mfd., 25V	270111-1125	S4	Sound Defeat	160556-1
C20	Polyester, .1 mfd., 100V	250654-1049	S5	Channel Select	160556-1
C21	Polyester, .1 mfd., 100V	250654-1049	D1	Detector Diode	530065-1002
C31	Polyester, .001 mfd., 5%, 150V	250635-1025	D2	Detector Diode	530065-1002
C32	Electrolytic, 4.7 mfd., 50V	270111-5050	D3	Detector Diode	530065-1002
C33	Electrolytic, 10 mfd., 25V	270111-1125	D4	Detector Diode	530065-1002
C34	Electrolytic, 47 mfd., 16V	270111-5115	D5	Silicon Diode	530181-1001
C35	Electrolytic, 47 mfd., 16V	270111-5115	D6	Silicon Diode	530181-1001
C41	Trimmer, 3-15 pf.	260220-4	D7	Silicon Diode	530181-1001
C42	Polyester, .1 mfd., 100V	250654-1049	D8	Silicon Diode	530181-1001
C53	Polyester, .47 mfd., 100V	250600-13	D9	Silicon Diode	530181-1001
C54	Polyester, .47 mfd., 100V	250600-13	D10	Germanium Diode	530105-1001
C56	Polyester, .1 mfd., 100V	250654-1049	D11	Germanium Diode	530105-1001
C57	Electrolytic, 2.2 mfd., 50V	270109-2050	D12	Silicon Diode	530181-1001
C58	Electrolytic, 2.2 mfd., 50V	270109-2050	IC1	Voltage Regulator/Sync Generator	612117-1
C59	Electrolytic, 2.2 mfd., 50V	270109-2050	IC2	Video Logic	612116-1
C60	Electrolytic, 2.2 mfd., 50V	270109-2050	IC3	Ball/Wall Generator	612088-1
C76	Trimmer, 3-15 pf.	250371-6	IC4	Color Gen. & Video Summer	612109-1
C80	Ceramic, 33 pf., 5%, 500V, NPO	250546-3305	IC5	Character Generator	612115-1
C81	Ceramic, 27 pf., 5%, 500V, NPO	250546-2705	IC6	Score Generator	612108-2
RESISTORS			IC7	Character Controller	612110-1
Values, tolerances and wattages for resistors not listed are shown on the schematic, or are 5%, 1/4W.			IC8	Quad/Dual Input & Gate Generator	612084-1
R2	150K, Lower Rebound Position	220300-1542	Q1	NPN Silicon	610232-2
R3	150K, Upper Rebound Position	220300-1542	Q2	NPN Silicon	610232-2
R13	100K, Right Wall Position	220300-1043	Q3	PNP Silicon	610083-2
R19	50K, Ball Speed	220311-10	Q4	NPN Silicon	610139-2
R22	100K, Left Wall Position	220311-11	Q5	NPN Silicon	610232-2
			MISCELLANEOUS		
			J1	AC Adaptor	701284-6
			FB1,2	External Power Jack	181139-1
			X1	Ferrite Bead	364005-1
				Crystal	560404-2
				Speaker (Ceramic Crystal)	560406-1
				Speaker Housing	181189-1
				Game Cable Assembly	461218-5

ANTENNA/GAME SWITCH REPLACEMENT PARTS LIST

REF.	DESCRIPTION	PART NO.
J1	Phono Socket	180902-4
S1	Antenna/Game Switch	160499-2
T1	Antenna Balun	361108-2
	Case, Top	143676-1
	Case, Bottom	143674-1
	Plastic Hook	143719-1
	Screw Terminal (2 used)	200495-1
	Solderless Terminal (2 used)	200517-1
	Game Cable Assembly	461218-5
	Complete Antenna/Game Sw. Ass'y.	701702-3

ANTENNA/GAME SWITCH



CABINET REPLACEMENT PARTS LIST

Note: When ordering replacement parts, please specify the part number as shown in this parts list including Description, Chassis Number, Model and Run Number. Complete information will help expedite the order.

DESCRIPTION	PART NO.
Case, Top	143670-6
Case, Bottom	143669-6
Control Knob	143689-6
Control Knob	143689-7
Switch Inlay	151449-3
Switch Inlay	151449-5

DESCRIPTION	PART NO.
Top Inlay	151483-3
Knob, Underlay Skirt	151482-1
Foot, Black	141737-3
"O" Ring Retainer	103082-4
Spring Lock Nut	103235-1
Stud, Cover Holding	732953-2

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QUALITY IN EVERY DETAIL