

Magnavox

SERVICE MANUAL

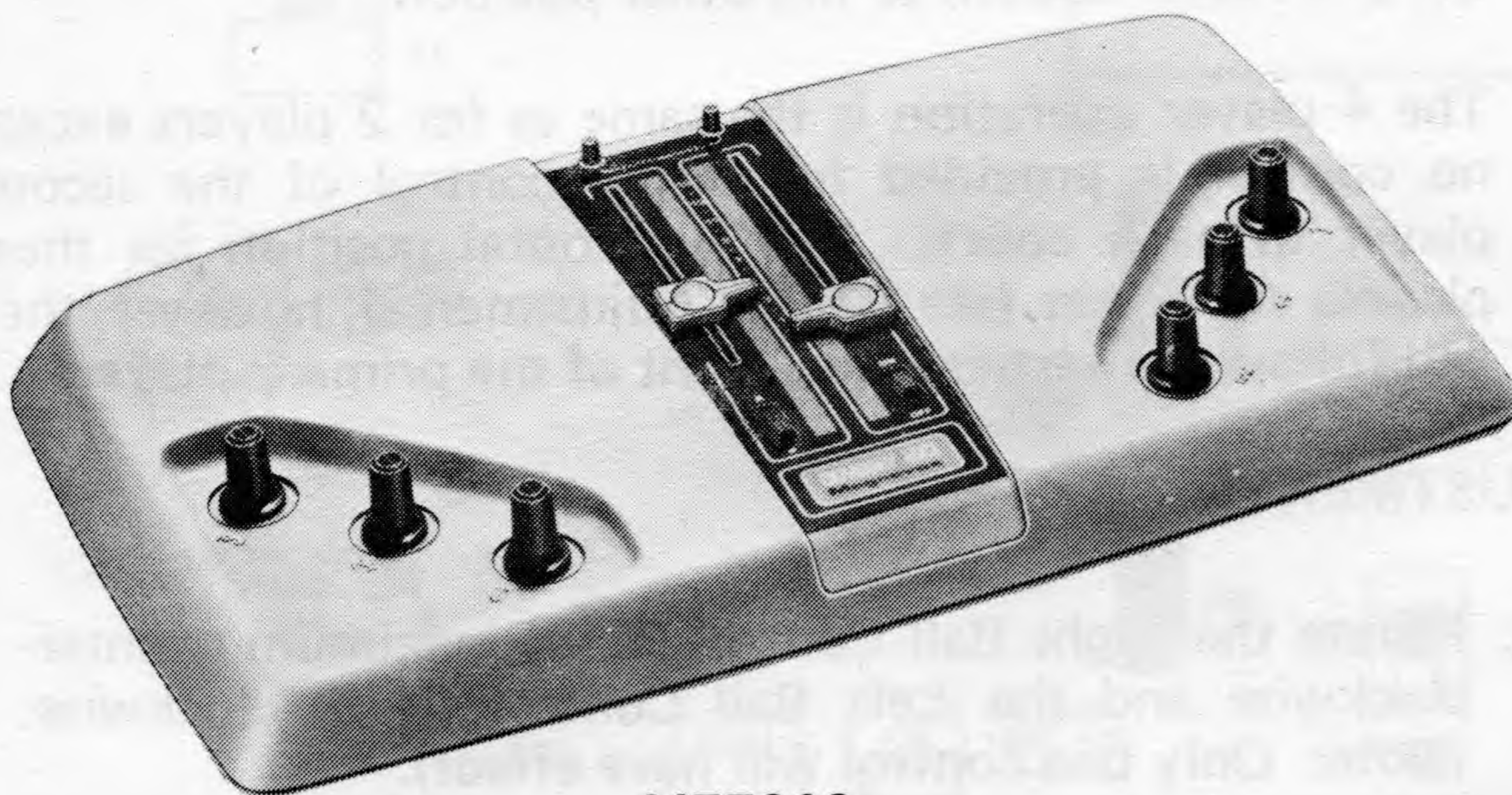
THE MAGNAVOX COMPANY • SERVICE DEPARTMENT
FORT WAYNE, INDIANA

Manual No. 6503

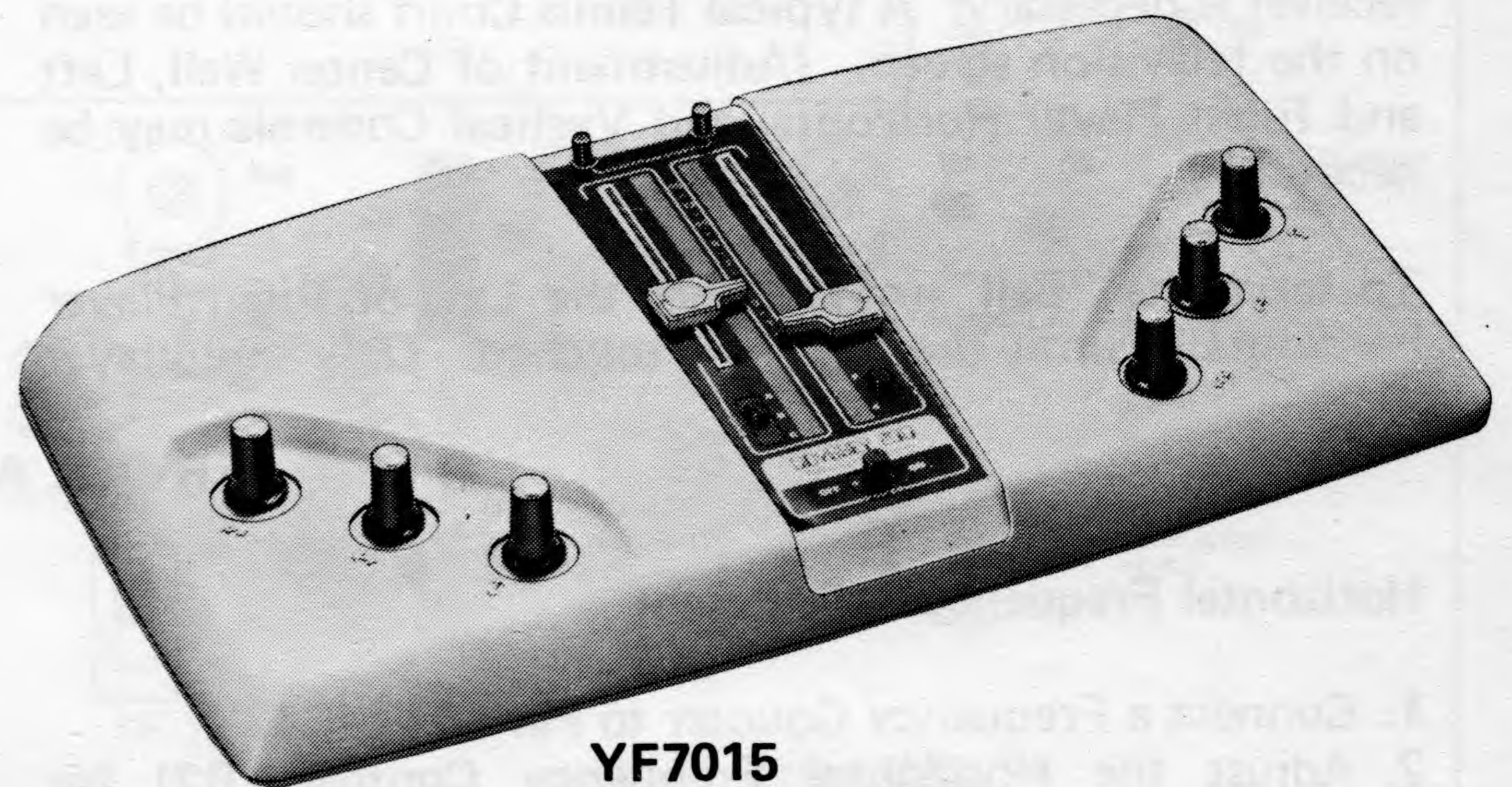
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YF7010 & YF7015 ODYSSEY



YF7010



YF7015

GENERAL INFORMATION

The YF7010 and YF7015 can be powered by either 6 "C" cells or an optional AC to DC 9 volt adapter. The basic operation of these units are the same, however, the features differ slightly.

The YF7015 has three games, electronic and mechanical

scoring, and the option of two or four players with Tennis and Hockey.

The YF7010 has two games, mechanical scoring, and two players.

SPECIFICATIONS

	Minimum	Nominal	Maximum
Regulated Voltage Supply Measured at Pin 3 of IC1	4.5V	5.0V	5.5V
Current Drain			
YF7010	----	45 Ma	----
YF7015	----	65 Ma	----
Vertical Sync			
Frequency	59 Hz	60 Hz	61 Hz
Pulse Amplitude	3.5V	----	----
Pulse Width	180 usec	210 usec	250 usec
Horizontal Sync			
Frequency	15.704 KHz	15.734 KHz	15.784 KHz
Pulse Amplitude	3.5V	----	----
Pulse Width	4.0 usec	----	7.0 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	1100 uv	----	1600 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 Odyssey is located to the right of the battery compartment).

Place the Power Switch in the "On" position, the Game Switch to Game "B" (Tennis), and fine tune the television receiver if necessary. A typical Tennis Court should be seen on the television screen. (Adjustment of Center Wall, Left and Right Player Horizontal and Vertical Controls may be necessary).

To serve the "Ball" move either the Left or Right Player horizontally until the "Net" is touched. Only one player

will cause the "Ball" to be served.

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 keeps the "Ball" from going off of the top and bottom of the screen.

If the YF7015 is being used Electronic Scoring Marks will appear in the lower left area of the television screen. These marks will move horizontally to the right each time a point is made indicating which player is ahead. The top mark represents the player in the right court and the bottom mark the left player. After 15 points have been scored the winners mark will disappear. To reset the score marks place the 2/4 Player Switch to the other position.

The 4 player operation is the same as for 2 players except no control is provided for direct control of the second player in each court. The horizontal position for these players are preset (see Service Adjustments), however, they will follow the vertical movement of the primary player.

SERVICE ADJUSTMENTS

Horizontal Frequency Adjustment

1. Connect a Frequency Counter to Pin 16 of IC1.
2. Adjust the Horizontal Frequency Control (R2) for 15,734 Hz + or - 30 Hz.

Vertical Frequency Adjustment

1. Connect a Frequency Counter to Pin 14 of IC1.
2. Adjust the Vertical Frequency Control (R4) for 60 Hz + or - 1 Hz.

Blanking Width & Centering Adjustment

1. Connect an oscilloscope to the Composite Video Output at Pin 5 of IC5.
2. Apply +3 VDC bias to Pin 8 of IC5.
3. Adjust the Blanking Width Control (R70) for 16 usec. width (see Figure 1).
4. Adjust the Blanking Centering Control (R71) for 6 usec before horizontal sync (see Figure 1).

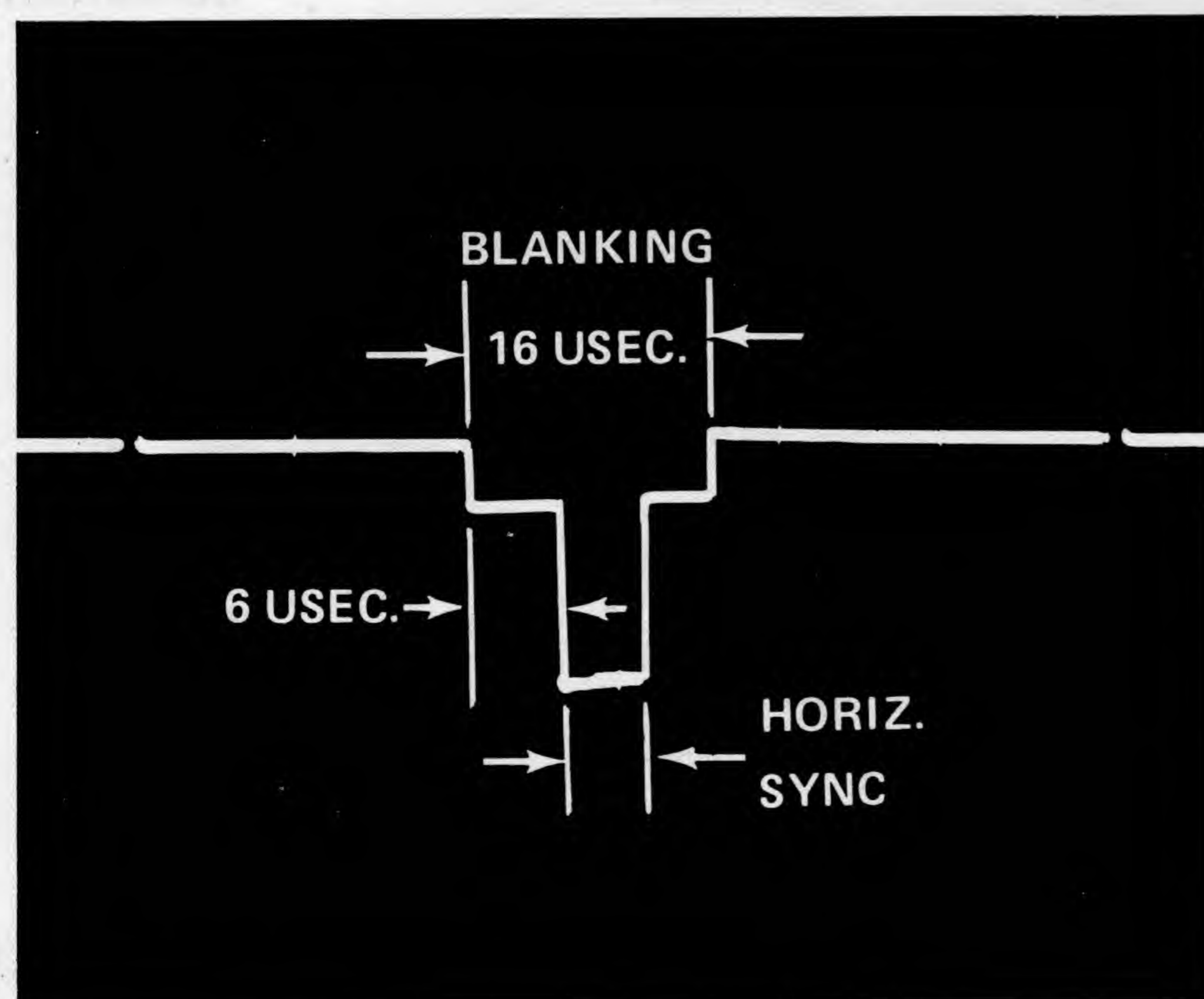


FIGURE 1

Top & Bottom Rebound Adjustment

1. Connect +3 VDC bias to Pin 3 of IC3.

2. Rotate the Right Ball Control (R74) maximum counter-clockwise and the Left Ball Control (R75) clockwise. (**Note: Only one control will have effect.**)
3. Adjust the Lower Rebound Control (R10) until the entire "Ball" is visible at the bottom of the screen.
4. Turn the Right Ball Control (R74) maximum clockwise and the Left Ball Control (R75) maximum counter-clockwise.
5. Adjust the Upper Rebound Control (R9) until the entire "Ball" is visible at the top of the screen.

Note: Place the Game Switch to "C" (Hockey) and the Players switch to "4" for the following adjustments.

Right Wall Horizontal Position

1. Adjust the Right Wall Horizontal Control (R6) until the Right Wall is as close as possible to the right side of the screen and still fully visible.

Goal Opening Position

1. Adjust the Goal Opening Control (R14) until the goal openings in both walls are centered vertically.

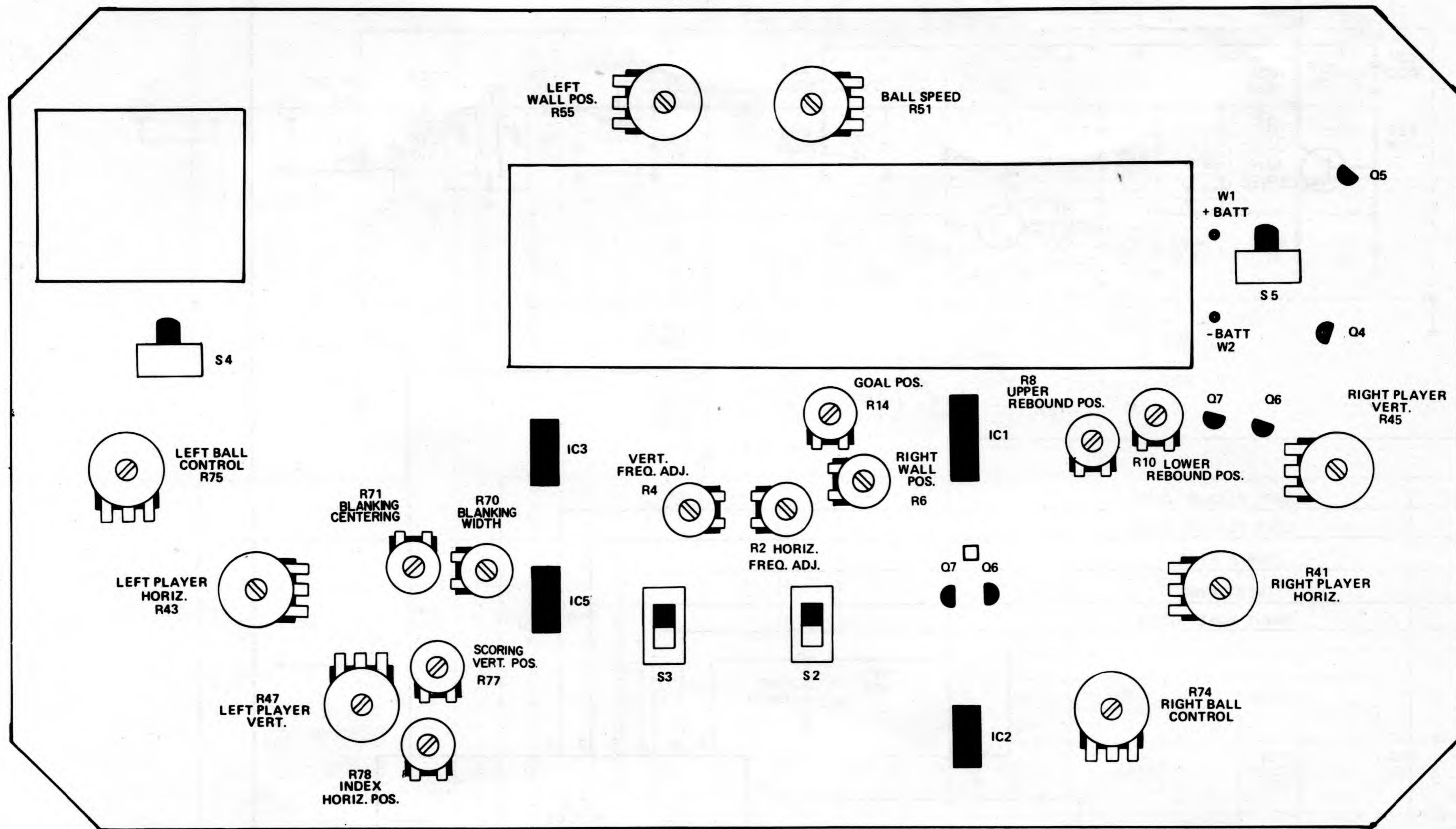
Score Indicator Position

1. Adjust the Horizontal Score Control (R78) until the indicators are approximately 1" to the right of the Left Hockey Wall.
2. Adjust the Vertical Score Control (R77) until the lowest part of the score indicator is approximately 1½" from the bottom of the screen.

Right & Left Fixed Player Adjustment

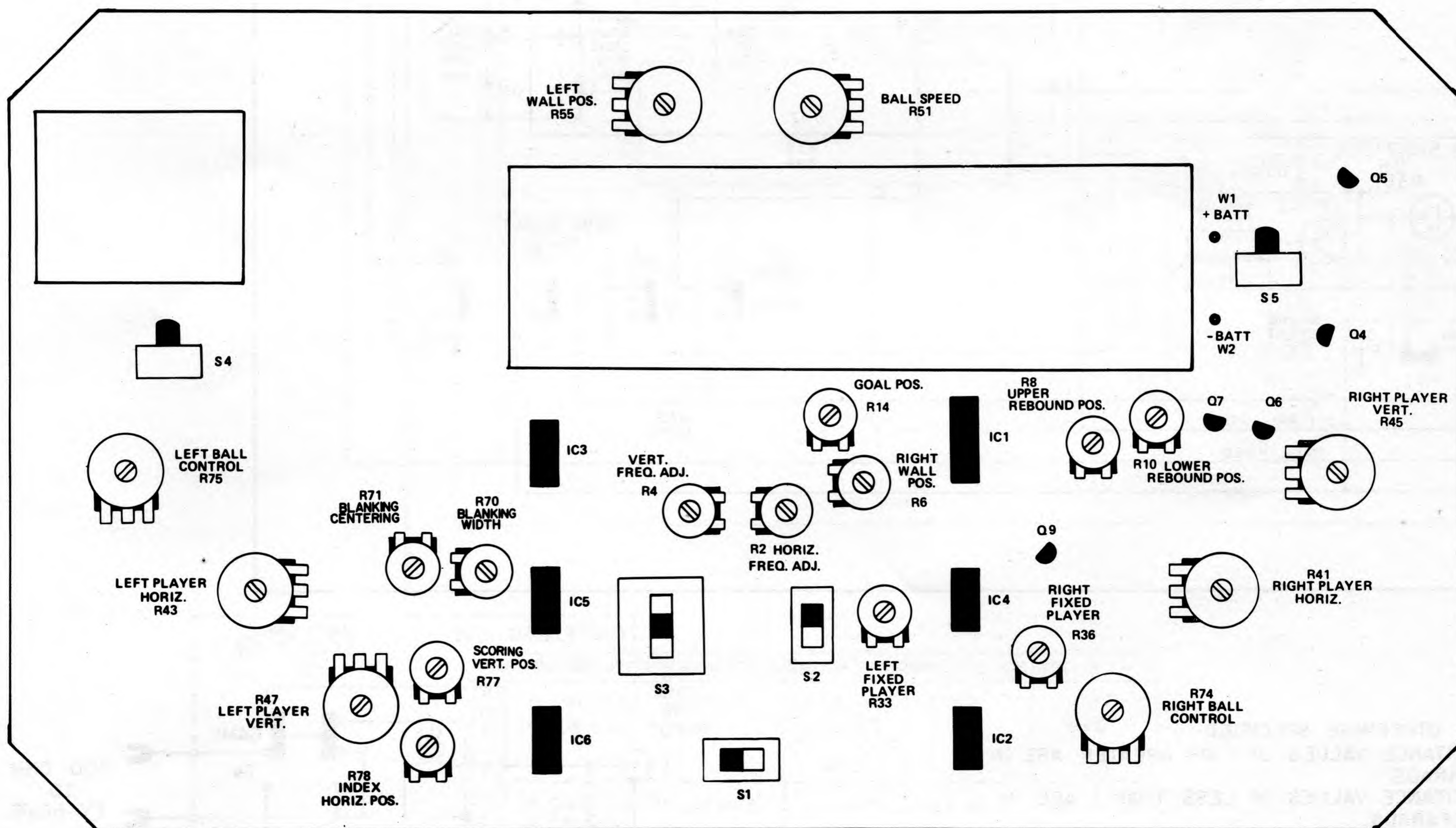
1. Adjust the Left Fixed Player Horizontal Control (R33) until the player is approximately its width to the right of the left wall.
2. Adjust the Right Fixed Player Horizontal Control (R36) until the player is approximately its width to the left of the left wall.

YF7010 TOP VIEW



□ EARLY PRODUCTION LOCATIONS

YF7015 TOP VIEW



N
V
C
1
2
3
4
5
6
7
8

YF7010 & YF7015 VOLTAGE CHARTS

IC1		
PIN	VOLTAGE	NOTE
1	0V	----
2	4.4V	----
3	5.2V	----
4	0V	----
5	2.7V	----
6	.9V to 1.3V	4
7	2.1V to 2.7V	5
8	0V	----
9	.08V	----
10	4.7V	----
11	1V	----
12	2.4V	----
13	2V to 4.5V	7
14	.10V	----
15	5.2V	----
16	.40V	----
17	3.0V	----
18	2.1V	----

IC2		
PIN	VOLTAGE	NOTE
1	.4V	----
2	5.2V	----
3	1.7V to 3.1V	8
4	2.0V	----
5	1V to 4.5V	10
6	0V	----
7	1.3V	----
8	.07V	----
9	.08V	----
10	1.3V	----
11	0V	----
12	1V to 4.5V	11
13	.9V	----
14	1.7V to 3.1V	9
15	0V	----
16	.15V	----

IC3		
PIN	VOLTAGE	NOTE
1	.4V	----
2	5.2V	----
3	2.2V to 2.9V	1
4	.9V to 1.7V	1
5	1.7V to 3.7V	2
6	0V	----
7	1.4V	----
8	0V	----
9	.15V	----
10	4.7V	----
11	5.2V	----
12	1.1V to 3.5V	6
13	1.4V	----
14	1.9V to 3.3V	3
15	0V	----
16	.15V	----

IC4		
PIN	VOLTAGE	NOTE
1	.4V	----
2	5.2V	----
3	2.1V to 3.8V	12
4	2.2V	----
5	1V to 4.5V	10
6	0V	----
7	1.4V	----
8	.07V	----
9	.08V	----
10	1.1V	----
11	.2V	----
12	1V to 4.5V	11
13	.8V	----
14	1.5V to 3.1V	13
15	0V	----
16	.15V	----

IC5		
PIN	VOLTAGE	NOTE
1	5.2V	----
2	1.3V to 5.2V	14
3	.4V	----
4	.15V	----
5	1.4V	----
6	.03V	----
7	.07V	----
8	.08V	----
9	.08V	----
10	.15V	----
11	0V	----
12	.6V to 4.4V	1
13	.6V to 4.4V	1
14	.2V to 5.1V	1
15	5.2V	----
16	0V	----

IC6		
PIN	VOLTAGE	NOTE
1	3V to 5.2V	15
2	.6V to 4.4V	1
3	.03V	----
4	2V	----
5	4.6V	----
6	1.3V	----
7	1.4V	----
8	1.4V	----
9	1.4V	----
10	0V	----
11	.15V	----
12	2.2V	----
13	3V to 4.6V	16
14	2.8V	----
15	.7V	----
16	.4V	----

TRANSISTOR		VOLTAGE	NOTE
Q4	E	0V	----
	B	.3V to .7V	1
	C	0V to 5.2V	1
Q5	E	8.0V	----
	B	8.0V	----
	C	0V to 3.7V	1
Q6	E	0V	----
	B	.08V	----
	C	5.1V	----
Q7	E	0V	----
	B	.65V	----
	C	.15V	----
Q9	E	5.2V	----
	B	6.0V	----
	C	9.0V	----

NOTES:

VOLTAGES TAKEN WITH VTVM, GAME SWITCH IN "B" POSITION (TENNIS), PLAYERS SWITCH IN "4", SOUND ON, PLAYERS ENTERED AND "BALL" VOLLEYING BETWEEN.

VOLTAGE VARIES WITH BALL SPEED & DISTANCE TRAVELED.
 VOLTAGE VARIES WITH RIGHT OR LEFT BALL CONTROL.
 VOLTAGE VARIES WITH LEFT WALL POSITION CONTROL.
 VOLTAGE VARIES WITH LOWER REBOUND CONTROL.
 VOLTAGE VARIES WITH UPPER REBOUND CONTROL.
 VOLTAGE VARIES WITH GOAL POSITION CONTROL.
 VOLTAGE VARIES WITH RIGHT WALL POSITION CONTROL.
 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 RIGHT FIXED PLAYER POSITION.
 13. VOLTAGE VARIES WITH LEFT FIXED PLAYER POSITION.
 14. VOLTAGE VARIES WITH BLANKING CENTERING & WIDTH.
 15. VOLTAGE VARIES WITH HORIZONTAL SCORE POSITION.
 16. VOLTAGE VARIES WITH VERTICAL SCORE POSITION.

IC BASIC FUNCTIONS

IC1

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

IC2

- A. Right Player Generator
- B. Left Player Generator

IC3

- A. Left Wall Generator
- B. Ball Generator

IC4*

- A. Right Back Court Player Generator
- B. Left Back Court Player Generator

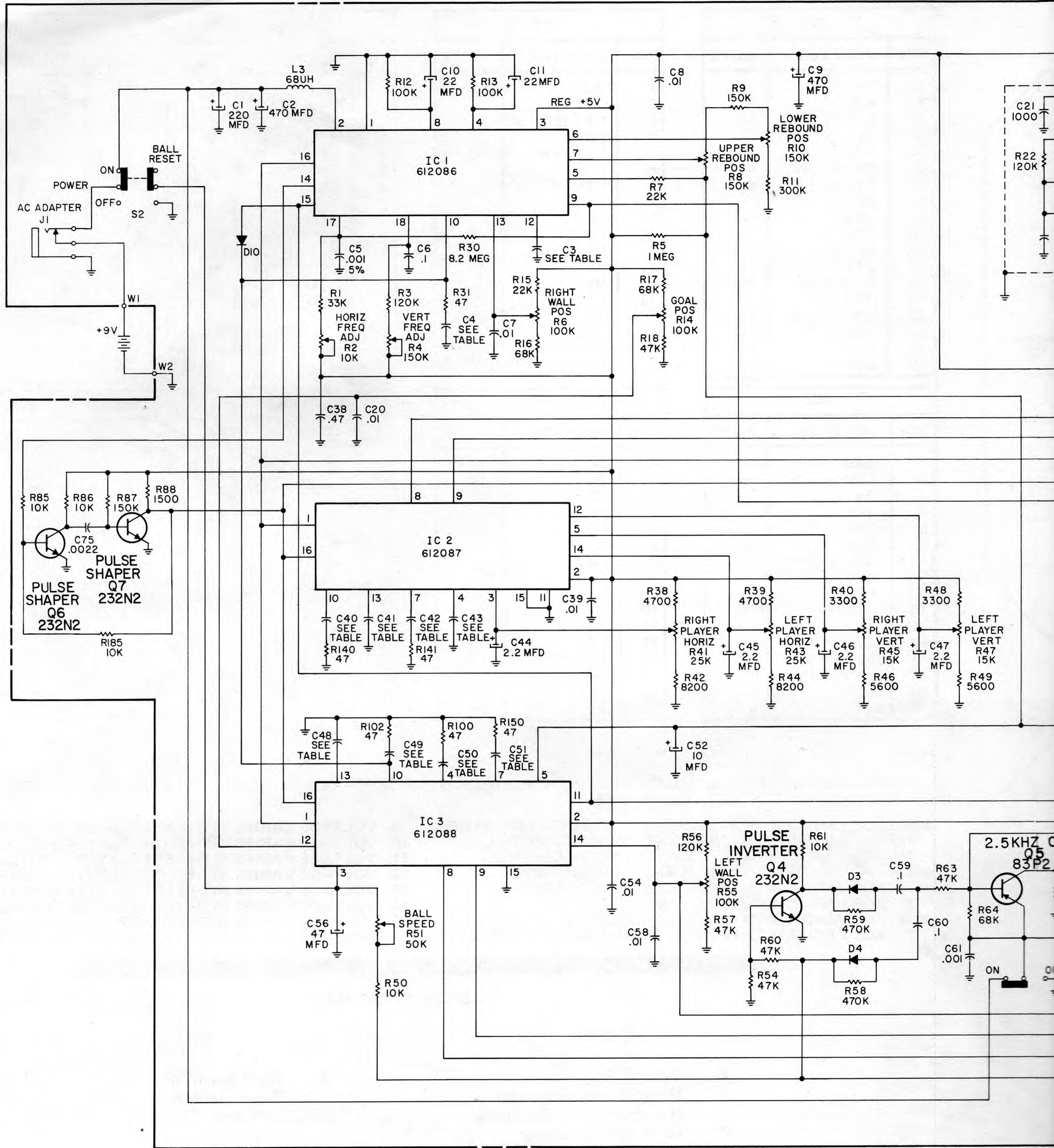
IC5

- A. Video Summer
- B. Video Output
- C. Audio Pulse Generator
- D. Logic Circuitry

IC6*

- A. Automatic Scoring Circuitry

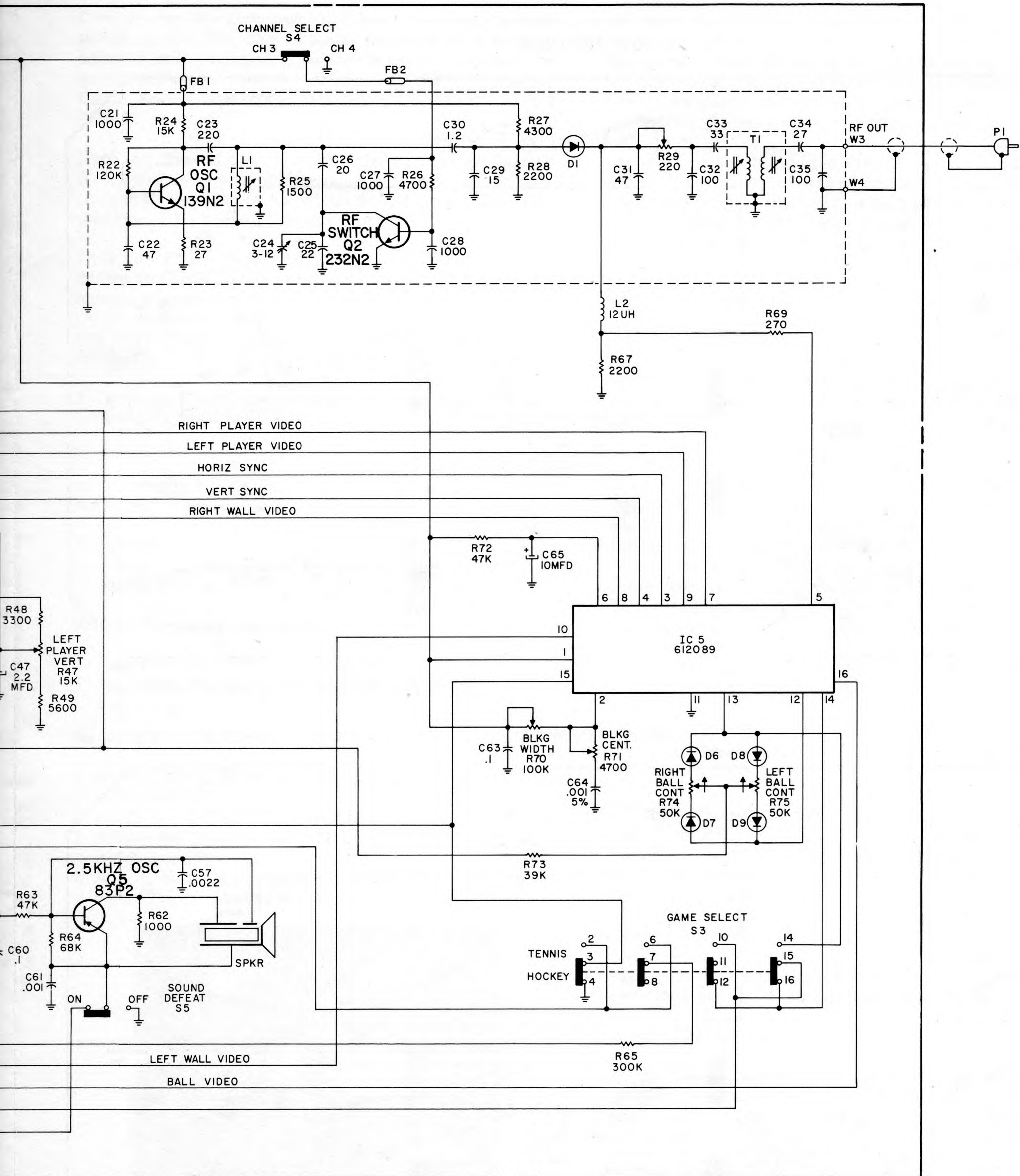
* Not used in YF7010



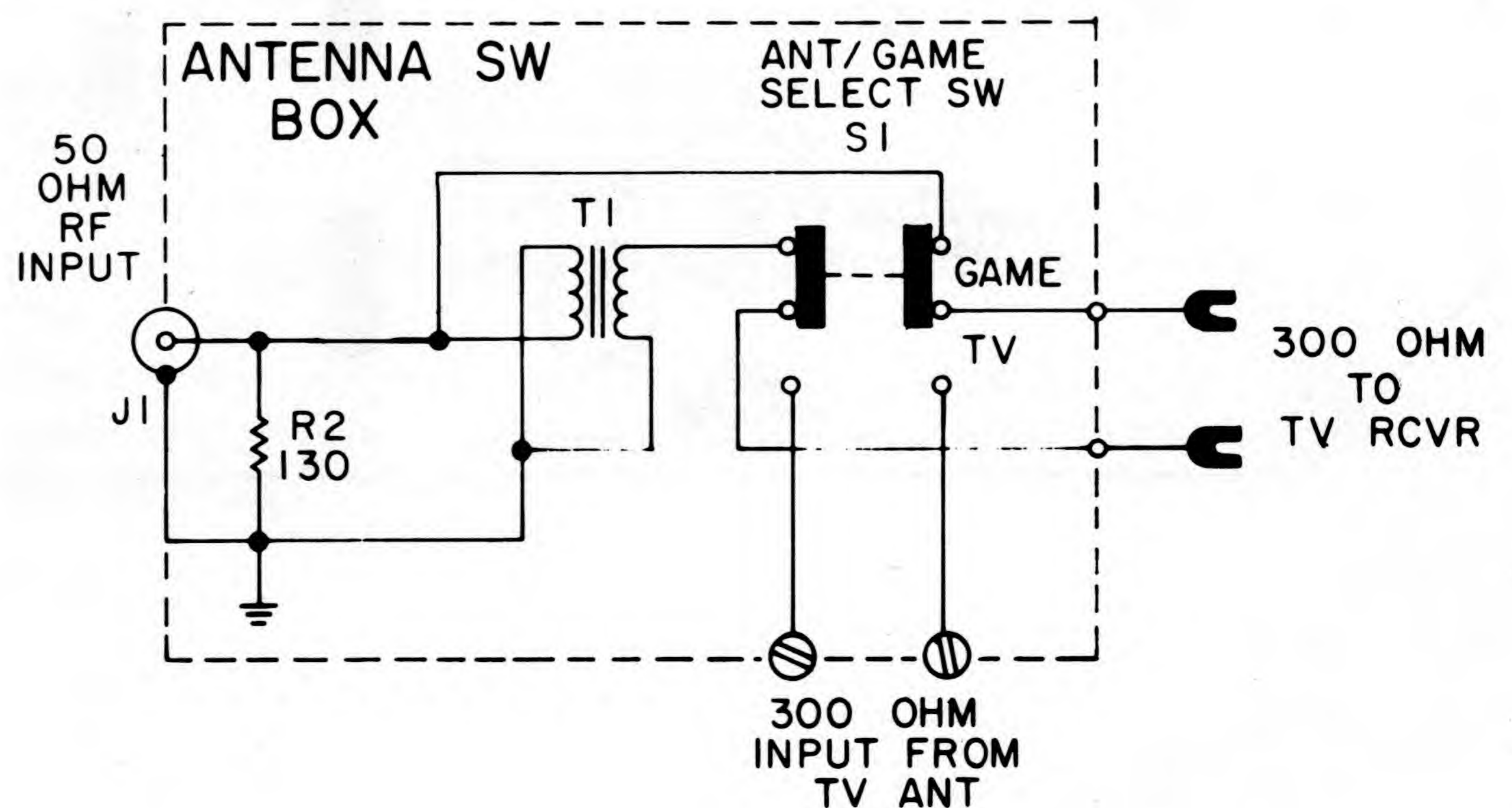
	TIMING CAPACITORS	GROUP 1 IC'S	GROUP 2 IC'S	GROUP 3 IC'S	GROUP 4 IC'S
HORIZ	C3, C41, C43, C48, & C50	.0022 MFD	.0027 MFD EXCEPT C3 = .0022 MFD	.0018 MFD	.0027 MFD
VERT	C4, C40, C42, C49, & C51	.47 MFD	.56 MFD	.39 MFD	.68 MFD

NOTES:
 UNLESS OTHERWISE SPECIFIED:
 1. CAPACITANCE IN PICO FARADS.
 2. CAPACITANCE IN MICRO FARADS.
 3. RESISTORS IN OHMS.

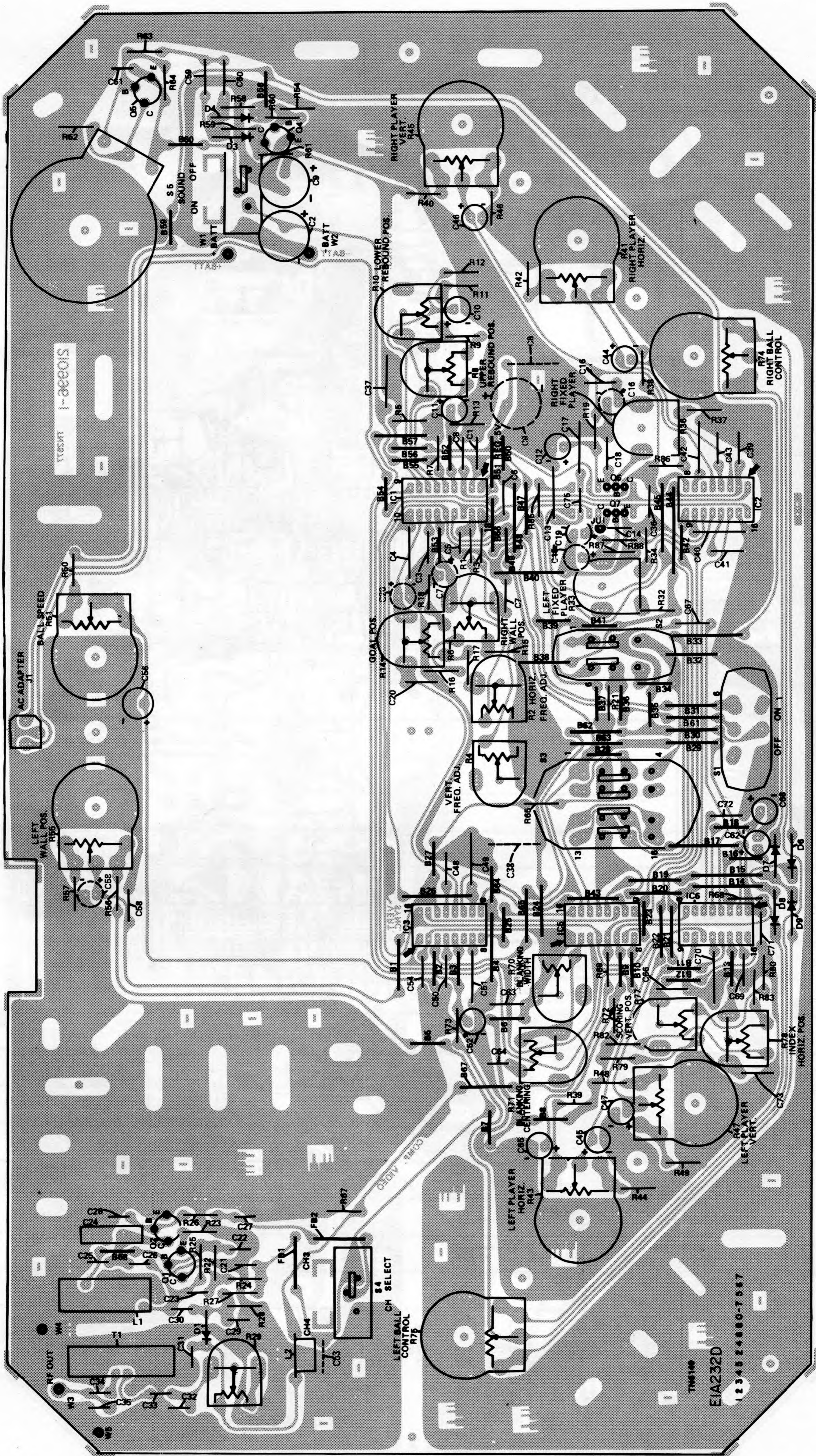
SCHEMATIC DIAGRAM



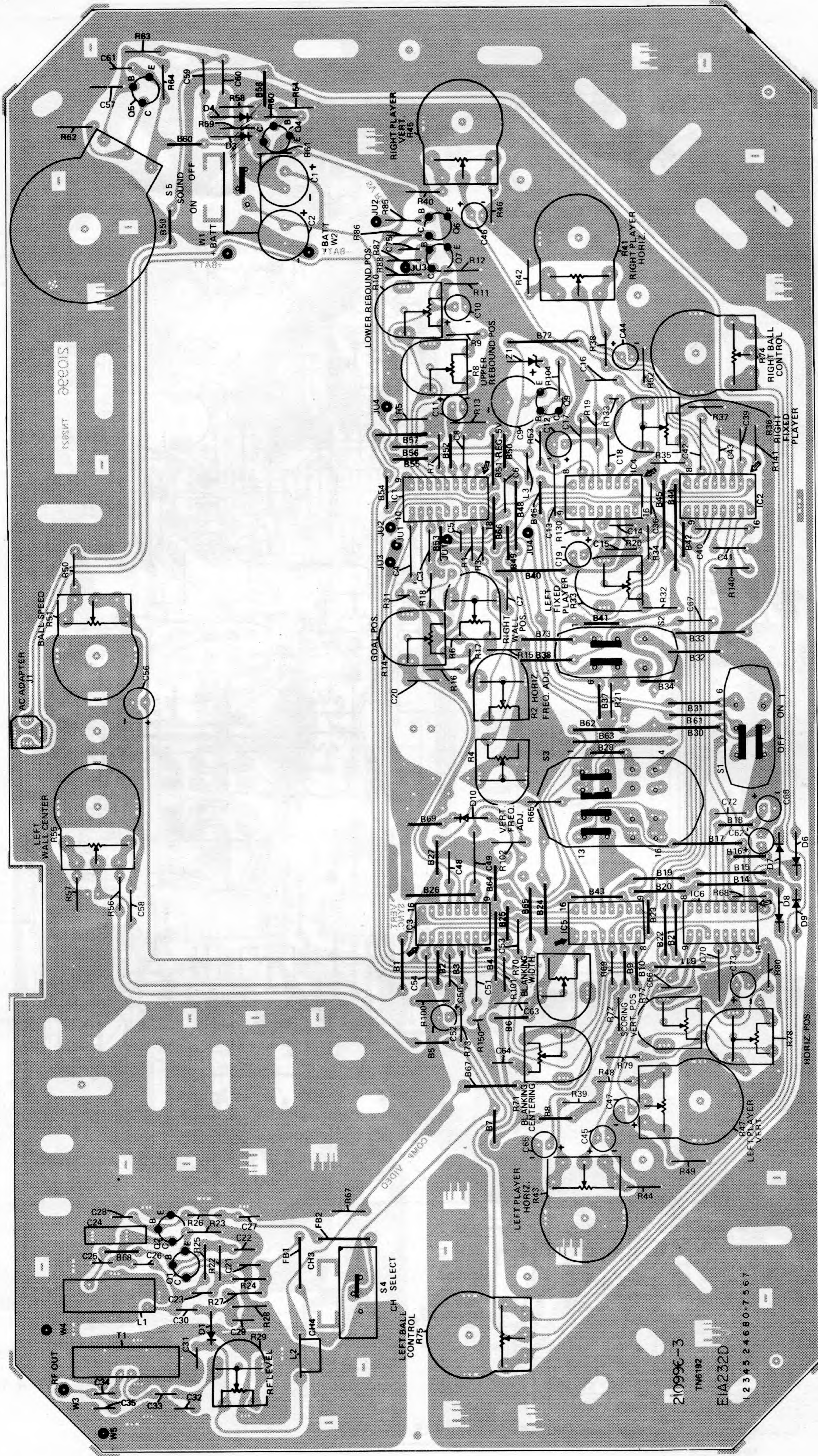
- NOTES:
 UNLESS OTHERWISE SPECIFIED:
 1. CAPACITANCE VALUES OF 1 OR GREATER ARE IN PICO FARADS.
 2. CAPACITANCE VALUES OF LESS THAN 1 ARE IN MICROFARADS.
 3. RESISTORS ARE 1/4 WATT, 10%.



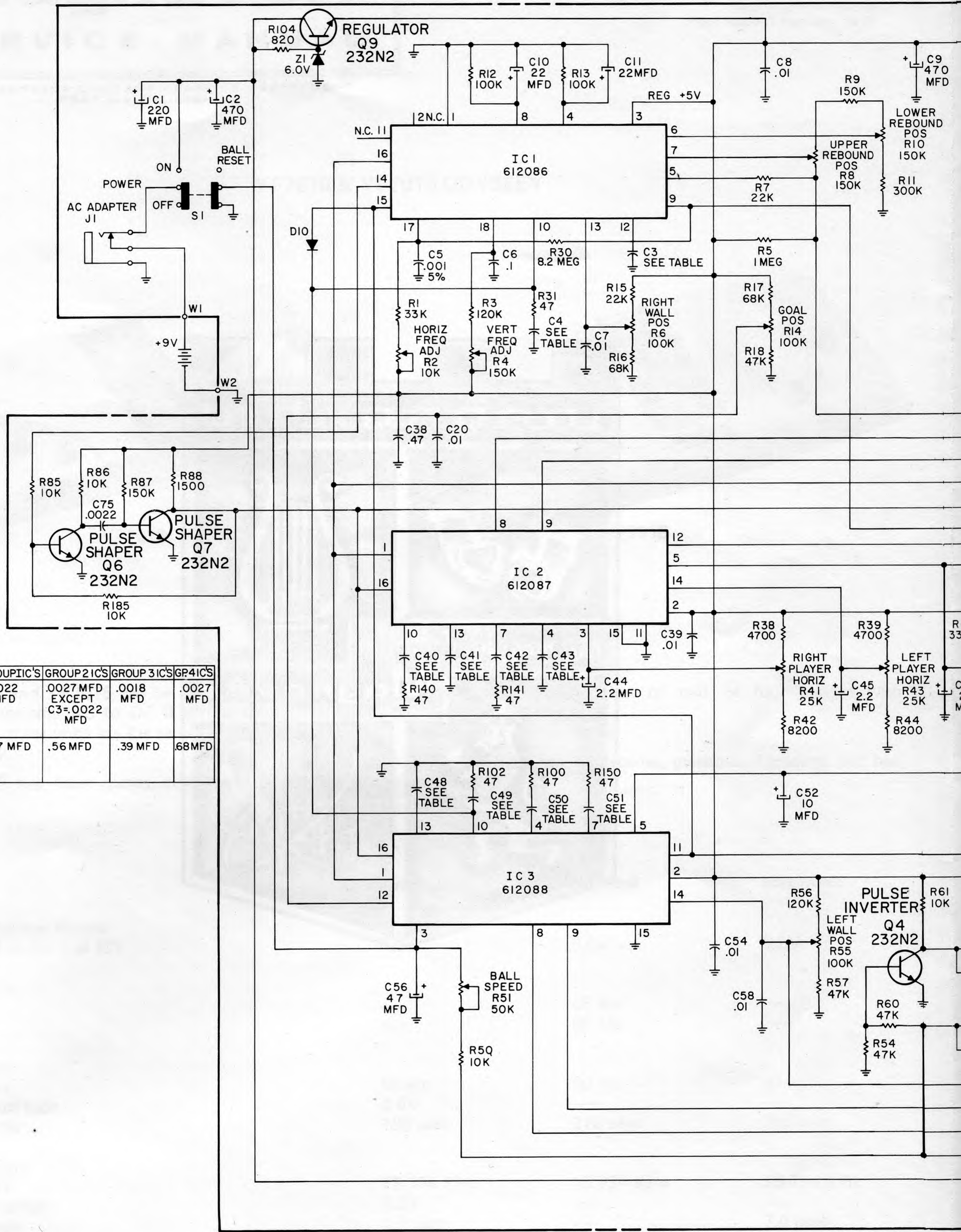
YF7010 MAIN P.C. BOARD (COMPONENT VIEW)



YF7015 MAIN P.C. BOARD (COMPONENT VIEW)

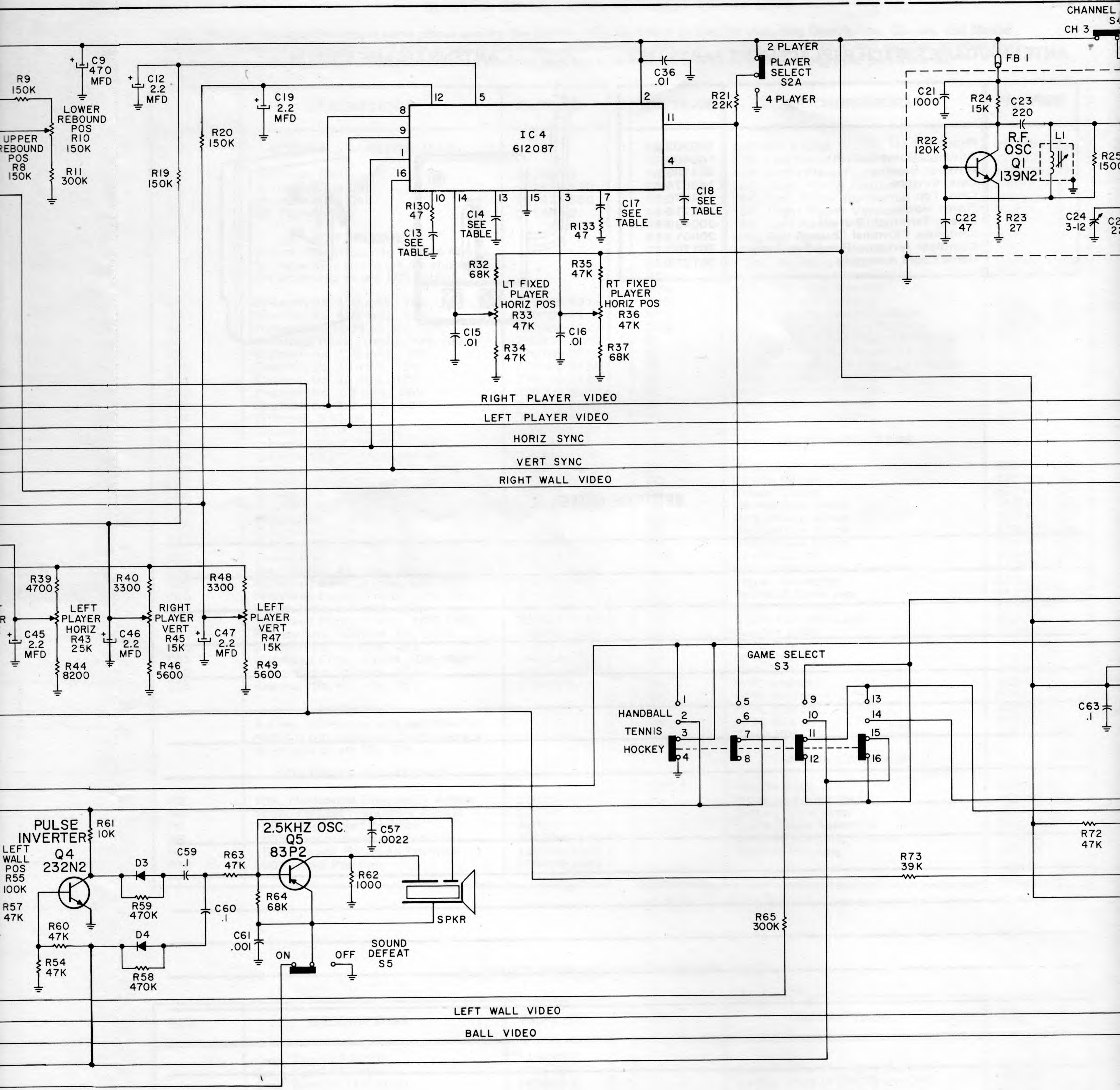


210996-3
 TN6192
 EIA232D
 1 2 3 4 5 2 4 6 8 0 - 7 5 6 7



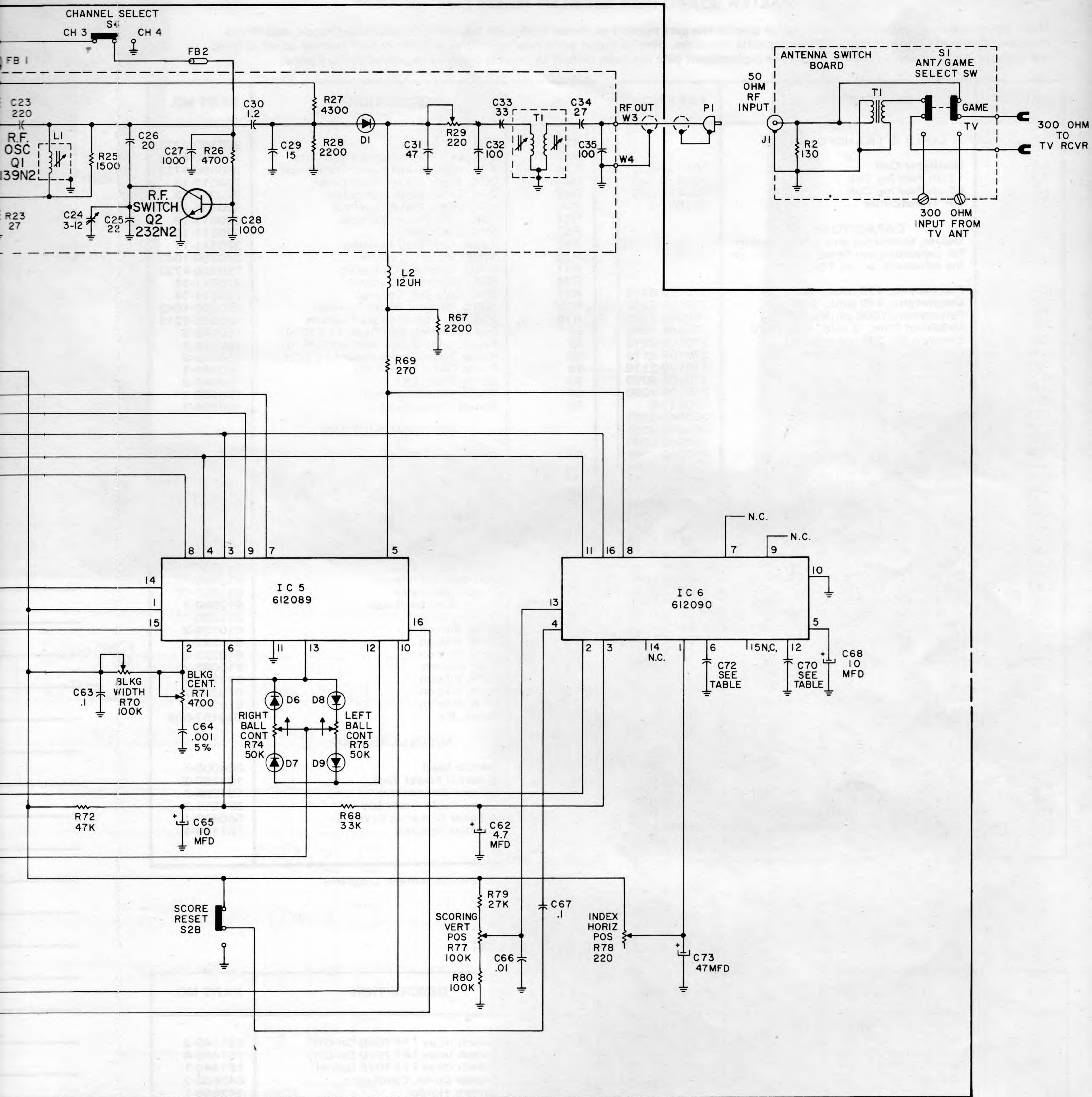
	TIMING CAPACITORS	GROUP 1 IC'S	GROUP 2 IC'S	GROUP 3 IC'S	GROUP 4 IC'S
H O R I Z	C3, C14, C18, C41, C43, C48, C50, & C72.	.0022 MFD	.0027 MFD EXCEPT C3=.0022 MFD	.0018 MFD	.0027 MFD
V E R T	C4, C13, C17, C40, C42, C49 C51 & C70	.47 MFD	.56 MFD	.39 MFD	.68 MFD

YF7015 SCHEMATIC DIAGRAM



NOTES:

- 1. UNLESS OTHERWISE SPECIFIED: CAPACITANCE VALUES OF 1 OR GREATER ARE IN PICO FARADS.
- 2. CAPACITANCE VALUES OF LESS THAN 1 ARE IN MICRO FARADS.
- 3. RESISTORS ARE 1/4 WATT, 10%.



MASTER BOARD 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	Oscillator Coil	361495-2	R29	220, RF Adjust	220300-2213
L2	12 uh Peaking Coil	361425-120	R33	47K, Left Fixed Player Horizontal	220300-4733
L3	68 uh Peaking Coil	361475-680	R36	47K, Right Fixed Player Horizontal	220300-4733
T1	RF Transformer	361467-2	R41	25K, Right Player Horizontal	220311-13
CAPACITORS					
Values, tolerances and voltage ratings for capacitors not listed are shown on the schematic or are 10%, 500V.					
C1	Electrolytic, 470 mfd., 16V	270109-5215	R43	25K, Left Player Horizontal	220311-13
C2	Electrolytic, 470 mfd., 16V	270109-5215	R45	15K, Right Player Vertical	220311-12
C5	Polystyrene, 1000 pf., 5%, 150V	250589-1025	R47	15K, Left Player Vertical	220311-12
C6	Metalized Film, .1 mfd., 10%, 100V	250654-1049	R51	50K, Ball Speed	220311-10
C9	Electrolytic, 220 mfd., 16V	270109-2215	R55	100K, Left Wall Position	220311-11
C10	Electrolytic, 22 mfd., 10V	270109-2110	R70	100K, Blanking Width	220300-1043
C11	Electrolytic, 22 mfd., 10V	270109-2110	R71	4700, Blanking Centering	220300-4723
C12	Electrolytic, 2.2 mfd., 50V	270109-2050	R74	50K, Right Ball Control	220311-14
C19	Electrolytic, 2.2 mfd., 50V	270109-2050	R75	50K, Left Ball Control	220311-14
C24	Trimmer, 3-15 pf.	250371-6	R77	100K, Vertical Score Position	220300-1043
C25	Ceramic, 22 pf., 5%, 500V, NPO	250546-2205	R78	220, Horizontal Score Position	220300-2213
C26	Ceramic, 20 pf., 5%, 500V, NPO	250546-2005	S1	Pwr./On-Off & Ball Reset (YF7015)	160546-3
C29	Ceramic, 15 pf., 10%, 500V, NPO	250546-1509	S2	Pwr./On-Off & Ball Reset (YF7010)	160546-3
C30	Ceramic, 1.2 pf., 10%, 500V, NPO	250546-1296	S2	Player Select/Score Reset (YF7015)	160546-3
C33	Ceramic, 33 pf., 5%, 500V, NPO	250546-3305	S3	Game Select (YF7010)	160546-1
C34	Ceramic, 27 pf., 5%, 500V, NPO	250546-2705	S3	Game Select (YF7015)	160546-2
C44	Electrolytic, 2.2 mfd., 50V	270109-2050	S4	Channel Select Switch	160556-1
C45	Electrolytic, 2.2 mfd., 50V	270109-2050	S5	Sound Defeat Switch	160556-1
C46	Electrolytic, 2.2 mfd., 50V	270109-2050	SEMICONDUCTORS		
C47	Electrolytic, 2.2 mfd., 50V	270109-2050	D1	Germanium Diode	530105-1001
C52	Electrolytic, 10 mfd., 25V	270111-1125	D3	Silicon Diode	530181-1001
C56	Electrolytic, 47 mfd., 16V	270111-5115	D4	Silicon Diode	530181-1001
C59	Metalized Film, .1 mfd., 10%, 100V	250654-1049	D6	Germanium Diode	530065-1002
C60	Metalized Film, .1 mfd., 10%, 100V	250654-1049	D7	Germanium Diode	530065-1002
C62	Electrolytic, 4.7 mfd., 50V	270111-5050	D8	Germanium Diode	530065-1002
C63	Metalized Film, .1 mfd., 10%, 100V	250654-1049	D9	Germanium Diode	530065-1002
C64	Polystyrene, 1000 pf., 5%, 150V	250589-1025	D10	Silicon Diode	530181-1001
C65	Electrolytic, 10 mfd., 25V	270111-1125	IC1	*Voltage Reg./Sync Generator	612086-**
C67	Metalized Film, .1 mfd., 10%, 100V	250654-1049	IC2	Player Generator	612087-**
C68	Electrolytic, 10 mfd., 25V	270111-1125	IC3	Ball/Wall Generator	612088-**
C73	Electrolytic, 47 mfd., 16V	270109-5115	IC4	Player Generator	612087-**
RESISTORS			IC5	Video Summer/Logic	612089-1
Values, tolerances, and wattages for resistors not listed are shown on the schematic or are 5%, 1/4W.			IC6	Scoring Logic	612090-**
CONTROLS & SWITCHES			Q1	NPN, Silicon	610139-2
R2	10K, Horizontal Frequency Adjust	220300-1032	Q2	NPN, Silicon	610232-2
R4	150K, Vertical Frequency Adjust	220300-1543	Q4	NPN, Silicon	610232-2
R6	100K, Right Wall Position	220300-1043	Q5	PNP, Silicon	610083-2
R8	150K, Upper Rebound Position	220300-1543	Q6	NPN, Silicon	610232-2
R10	150K, Lower Rebound Position	220300-1543	Q7	NPN, Silicon	610232-2
R14	100K, Goal Position	220300-1043	Q9	NPN, Silicon	610232-2
			Z1	Zener, 6V	530157-609
			MISCELLANEOUS		
			FB1,2	Ferrite Bead	364005-1
			J1	External Power Jack	181139-2
				Battery Connector	181096-3
				Game Cable Assembly	361218-3
				Speaker (Ceramic Crystal)	560406-1
				Speaker Housing	181189-1

** Refer to Charts on Schematic Diagrams

CABINET REPLACEMENT PARTS LIST

REF.	DESCRIPTION	PART NO.	REF.	DESCRIPTION	PART NO.
	Case, Top (YF7010)	143670-2		Switch Inlay (YF7015 On-Off)	151449-2
	Case, Top (YF7015)	143670-1		Switch Inlay (YF7010 On-Off)	151449-4
	Case, Bottom (YF7010)	143669-2		Switch Inlay (YF7015 Game)	151449-1
	Case, Bottom (YF7015)	143369-1		Chassis Cover, Cardboard	643602-2
	Score Pointer (YF7010)	143675-2		Battery Holder	142658-1
	Score Pointer (YF7015)	143675-1		Foot, Black	141737-3
	Retainer, Score Pointer	732937-1		Spring Lock Nut	103235-1
	Knob, Control (YF7010)	143689-4		Stud, Cover Holding	732953-1
	Knob, Control (YF7015)	143689-3		Cross Pin (for Stud)	103236-1
	Score Overlay (YF7010)	151448-2		Customer Operating Booklet (YF7010)	1B2899-1
	Score Overlay (YF7015)	151448-1		Customer Operating Booklet (RF7015)	1B2900-2
	Switch Inlay (YF7010 Game & YF7015 Players)	151449-3			

