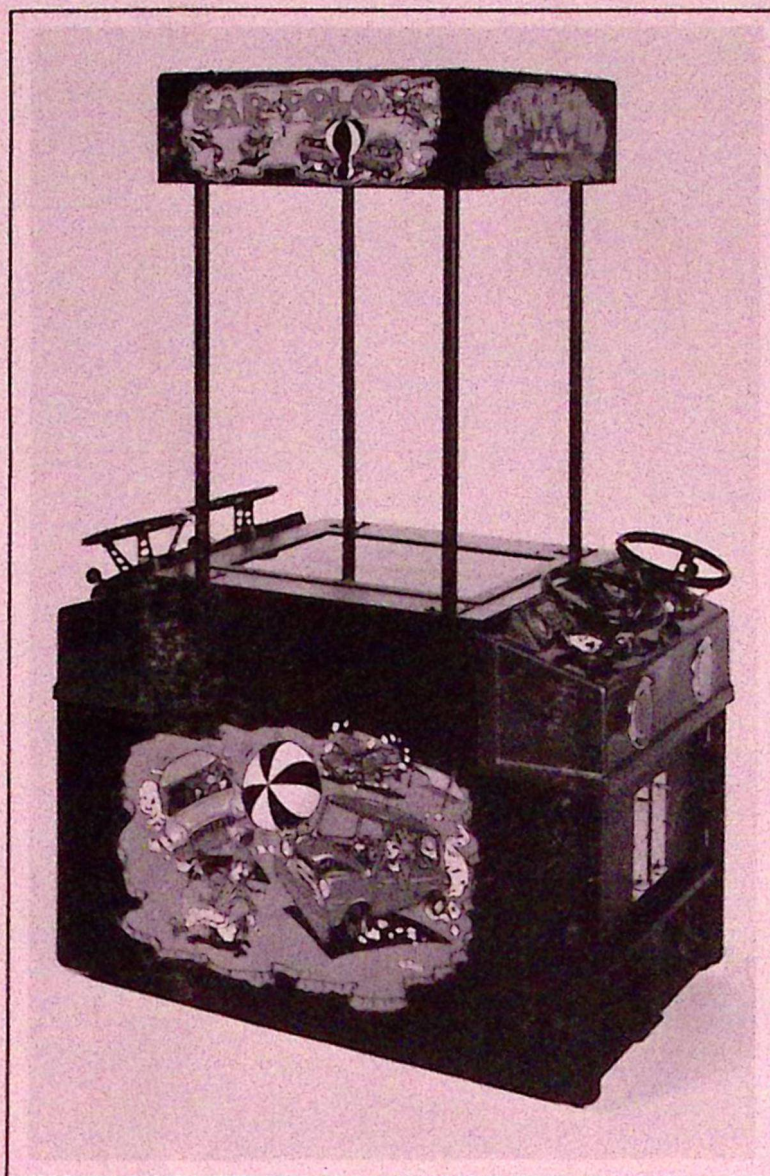


CAR POLO



**EXIDY
SERVICE
MANUAL**

PART ONE

CAR POLO
WARRANTY

EXIDY warrants all power supplies and moving mechanical parts for a period of *90 days* from date of purchase.

All printed circuit boards are warranted for a period of *one full year* from date of purchase.

Any questions regarding part replacement or service on failed parts will be dealt with on an individual basis.

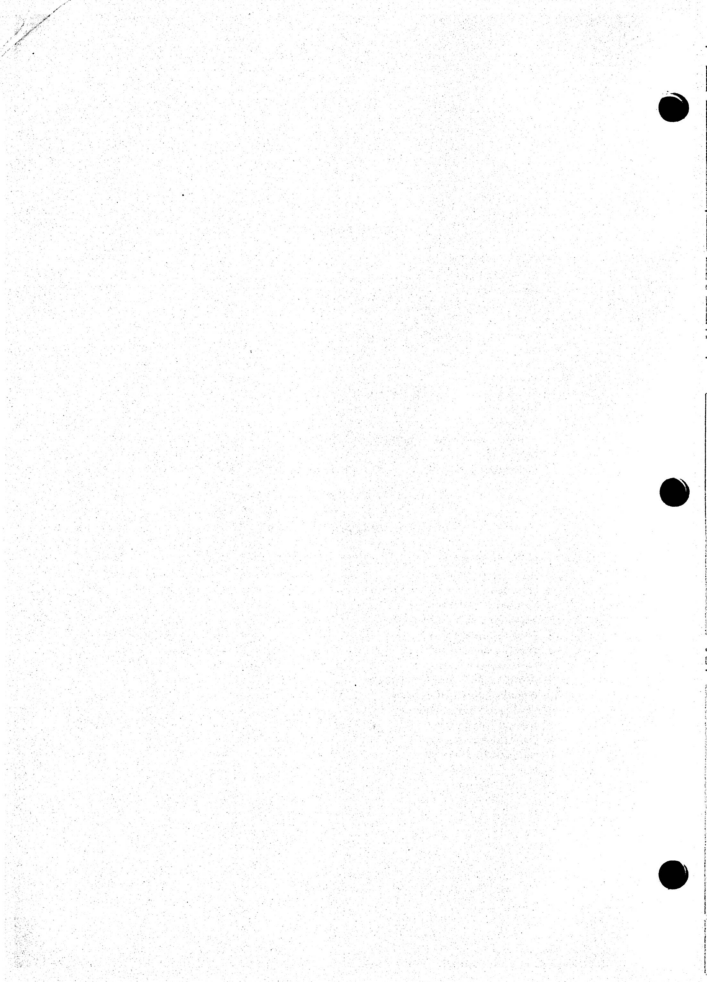
Please contact your local EXIDY distributor for service. Our distributors are authorized to deal directly with the EXIDY service and parts departments.

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CAR POLO

1. GENERAL INFORMATION

CAR POLO is a color four-player game which allows either "player vs. player" or "player vs. machine" operation. Unlike most games, the CAR POLO game, in the "player vs. machine" mode, does not simply repeat an action or sequence, but actually "sees," "thinks" and "acts" intelligently (and even more rapidly) than would another player. This action is accomplished by a small computer chip called a microprocessor.

2. OBJECT OF THE GAME

The object of CAR POLO is simple; to knock the ball into the goal. The cars are divided into two teams - a red team (red and pink cars) and a blue team (blue and light blue cars).

CAR POLO is a one to four player game. If one player elects to play, the other 3 players will be controlled by the microprocessor, one assisting the player, the other two opposing the player. (Example: If the red car is selected by the player, the pink car will assist him and the blue and light blue cars will oppose him.) Any cars not selected will be controlled by the microprocessor.

3. NORMAL OPERATION

The screen consists of a green play field surrounded by a white border. There is a blue goal with a yellow net, a red goal with a yellow net, four colored cars, and a brown ball. When the game is idle (in the "attract" mode), the screen flashes "GAME OVER, DEPOSIT COIN" in four colors. When a car is selected by dropping a coin (for example, player two: blue car) the game prints, "PLAYER TWO READY" and "RED GOAL" and "BLUE GOAL" over the respective goals and "GAME STARTING IN 15 SECONDS" at the top of the game. The 15 seconds then counts down to zero, allowing the other players time to deposit their coins before the game actually starts. The game will accept a coin and enable a player any time during the active game time. During the countdown time, the steering on the cars is enabled, but the cars are not allowed to move until the countdown is over.

The players are supplied with a steering wheel, a forward/reverse lever and a foot pedal assembly. When the foot pedal is not depressed, the car will turn on its axis as the steering

wheel is turned, but will not move forward or reverse. When the foot pedal is depressed slightly, the car will move (either forward or reverse) at low gear speed and when the foot pedal is fully depressed, the car moves at high gear speed.

When a car collides with another car, a goal or the side boundaries, it bounces off at a slightly different angle and continues on at the same speed. This allows the players to escape from a collision in a minimum of time to keep the game fast moving.

When the car collides with the ball, one of two actions occurs. If the collision occurs on the bumper of the car, the ball changes direction and accelerates (bounces.) The angle that the ball bounces depends on where on the bumper the collision occurred. If the collision occurred at the center of the bumper, the ball is deflected 0° (bounces straight off.) If the collision occurs near either end of the bumper, the ball is deflected at 90° (bounces left or right.) If the ball hits the car anywhere but the bumper, it deflects without gaining any speed. NOTE: By going into reverse, a player can control the ball by pushing it around the playfield instead of bouncing it.

The ball bounces off of the borders and the back and sides of the goal at the reflection of the angle of collision. (The angle of incidence equals the angle of reflection.) When the ball is knocked into the blue goal, a point is scored for the blue team (regardless of who actually pushed the ball in) and when the ball enters the red goal, a point is scored for the red team.

Each time a point is scored, the cars jump back to their starting positions, the game writes "RED SCORE" or "BLUE SCORE" on the screen, and the referee resets the ball. When the ball is reset, he runs off the screen, announces "GET READY" and as soon as he is off, the play resumes.

The players have 99 "seconds" (pre-settable by the operator) in which to make as many points as possible. The scores and time are written at the top of the screen and remain visible throughout the game. The game clock is stopped while the referee is resetting the ball.

Each player has a motor sound and a crash which are only enabled when the player is selected. There is also a sound for a car and ball collision and a siren to announce a score.

4. SYSTEM FUNCTIONAL DIAGRAM (refer to figure 1)

115VAC power is applied through interlock switch S1 to the power supply, color television and fan.

The POWER SUPPLY converts the 110VAC to +5VDC and 24VAC. The +5VDC is used to power the logic board, the audio and video interface board, the steering and shift assemblies, the coin mechanisms and coin counter, and the foot pedal assembly.

The LOGIC BOARD contains the microprocessor and all the logic necessary to generate the video, sync and audio control signals. It is the nerve center for the game.

The AUDIO AND VIDEO INTERFACE BOARD is located in the back of the color television. The video portion of this board receives TTL level video and sync information from the main logic board and converts it to RGB format signals for the television.

The audio portion of the board contains four separate motor noise circuits, crash circuits, and audio amplifiers (one for each player,) a ball hit sound generator, and a score sound generator. The audio circuitry has its own +5VDC power supply which is derived from the 24VAC from the power supply.

The COIN MECHANISM signals the logic P.C.B. when a coin has been inserted. The logic P.C.B. uses that information to enable the car and advance the coin counter. The COIN COUNTER receives its control signal from the logic P.C.B. A coin drop from any of the four coin mechanisms advances this count.

The STEERING and SHIFT ASSEMBLIES for all four players are identical. Each consists of a steering wheel, a shift lever and an optical control board. The optical control board converts the rotation of the steering wheel into a series of pulses by breaking a beam between an infrared light emitting diode and phototransistor with a slotted mask. The operation of this board is easily checked by observing the two

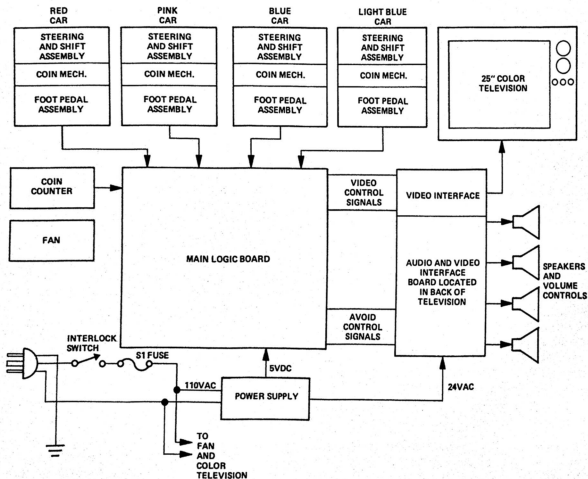


FIGURE 1. SYSTEM BLOCK DIAGRAM

red lights on the optical control board as the steering wheel is rotated. If these lights flash in sequence, then the O.C.B. is operating correctly.

The forward/reverse switch is also located on the optical control board. This microswitch converts the motion of the shift lever into an electrical signal for the logic board to process.

The SPEAKERS and VOLUME CONTROLS are located inside the steering module near the steering units. The volume control is located closest to its respective speaker.

The FOOT PEDAL ASSEMBLIES for all four players are identical and each consists of a spring loaded foot pedal and two (2) microswitches. The pedal, when in the "off" position (not depressed) trips the top microswitch and does not trip the bottom switch. Depressing the pedal down slightly allows both the top and bottom microswitch to be in an "untripped" state, which tells the logic P.C.B. that the corresponding player is now in low gear. Further depression of the pedal trips the bottom microswitch, telling the logic P.C.B. that the corresponding player is now in high gear. The image on the screen will then react accordingly.

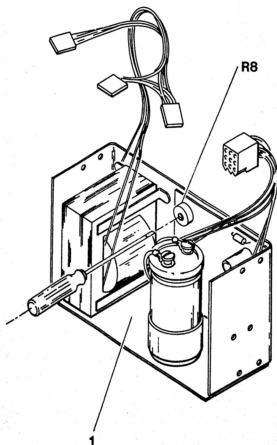


FIGURE 2. POWER SUPPLY ADJUSTMENT

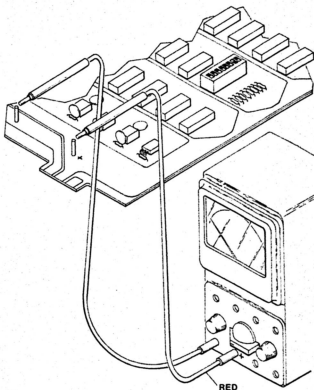


FIGURE 3. LOGIC BOARD VOLTAGE MEASUREMENT

5. ADJUSTMENTS

POWER SUPPLY ADJUSTMENT

1. Connect voltmeter leads to logic P.C.B. as shown in Figure (3.)
2. Adjust potentiometer R8 (see Figure 2) on power supply for $+5.0\text{VDC} \pm .1\text{VDC}$ as measured on the logic P.C.B. per above diagram.

NOTE: This voltage measurement must be made at the logic P.C.B., since voltage losses may occur between the power supply and the logic P.C.B. Adjustment of the power supply voltage directly on the power supply terminals will not necessarily insure proper voltage to be presented on the logic P.B.C. Adjustment of the power supply voltage made while measuring the voltage directly on the power supply terminals will not necessarily insure proper voltage to be present on the logic P.C.B.

VOLUME ADJUSTMENTS

Volume controls are located inside the steering modules immediately adjacent to the active speaker. These controls can be reached from the bottom of the steering module with the coin mechanism door open.

GAME TIME ADJUSTMENTS

An 8 position switch located on the main logic board at location 3V is used to set the game time. Figure (4) shows some standard settings.

NOTE: Switches 1 & 2 are used to control the on board bar/dot generator and should be left off when not aligning the color TV.

AUDIO ADJUSTMENTS

There are five (5) audio adjustments per car. They are: (referenced to Figure 5)

PLAYER	1	2	3	4
VOLUME	CC	X	S	M
tone	EE	Z	U	O
CRASH	D	E	F	G
MOTOR 1	AA	V	P	N
MOTOR 2	BB	W	R	K
IDLE SPEED	DD	Y	T	L

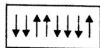
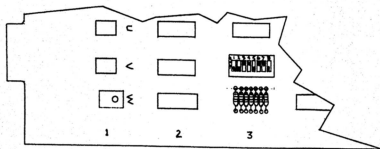
In addition, there are controls for ball volume (B) and score volume (C.)

ALL OF THESE CONTROLS ARE SET AT THE FACTORY AND SHOULD NEVER NEED ADJUSTMENT, unless parts are replaced in the motor noise circuitry. If adjustment becomes necessary, the following procedure should be followed:

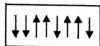
NOTE: Adjustments to the audio board can be made with the board removed from the back of the color television. However, the board should not be removed or replaced, or the 22 pin connector disconnected with power on.

The following adjustments are for one player only. If more than one player needs adjustment, it will be necessary to go through this procedure for each player.

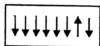
1. Set all of the VOLUME, TONE and IDLE SPEED controls fully CCW.
2. Set the CRASH, MOTOR 1 and MOTOR 2 controls approximately mid-range.



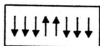
3 MINUTES
(FACTORY SETTING)



4 MINUTES



5 MINUTES



6 MINUTES

FIGURE 4. TIME SWITCH SETTINGS

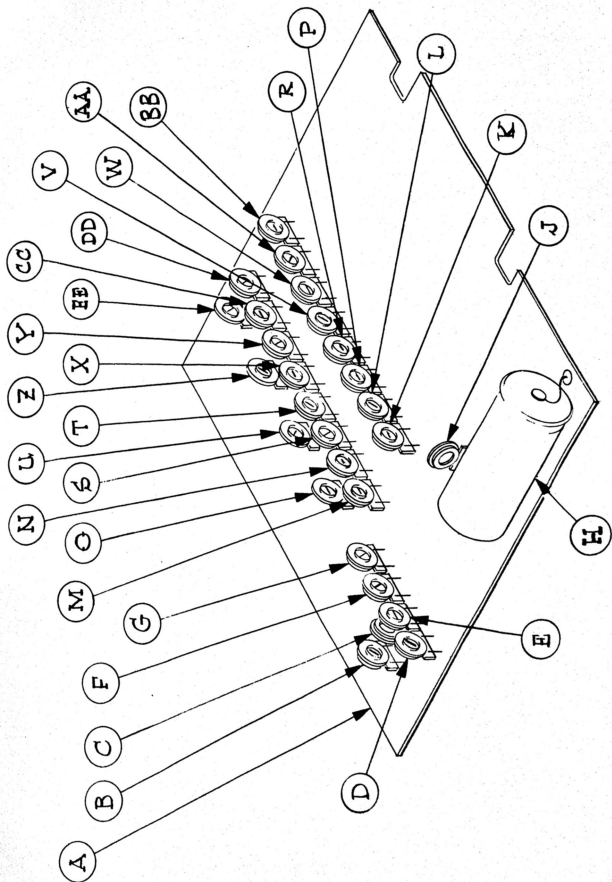


FIGURE 5. AUDIO BOARD ADJUSTMENTS

3. Enable the car being adjusted (using the coin mechanism.)
4. Adjust the IDLE SPEED CONTROL for a realistic idle sound (usually fully CCW or close to it.)
5. Fully depress the accelerator pedal and allow time for the car to reach maximum speed. While the car is traveling full speed, adjust the motor 1 and motor 2 controls for the most realistic motor sound (usually close to mid-range.)
6. Allow the car to crash into the border and adjust the crash control for a comfortable level.
7. Hit the ball with the car several times and set the level of the ball sound to a comfortable level.
8. Knock the ball into the goal and set the score pulse to a comfortable level.
9. Adjust the tone for the most pleasing sound (usually fully CCW.)

NOTE: The volume controls on the audio board are left at maximum and the volume is then adjusted at the speaker.

6. TELEVISION MAINTENANCE AND OPERATION

1. GENERAL:

Exidy's CAR POLO game uses a General Electric color television with 25YM chassis converted for use as an RGB monitor. This conversion is implemented by removing the tuner, I.F. module, audio amplifier and chroma board, and inserting the audio/video interface in place of the chroma board. All other modules remain as original, and should be adjusted and repaired in accordance with factory publicized technical literature. (G.E. Technical Training Manual #29-1901-76.)

The CAR POLO game uses the television as an RGB Monitor (see Figure 6.) Video is brought from the logic board as a TTL level binary code (3 bits for red and green, 2 bits for blue) and is converted to an analog signal using a digital to analog converter. This analog signal is then applied to the RGB module.

Sync is brought into the interface board at a TTL level, where it is level shifted and applied to the sync separation portion of the horizontal sync board.

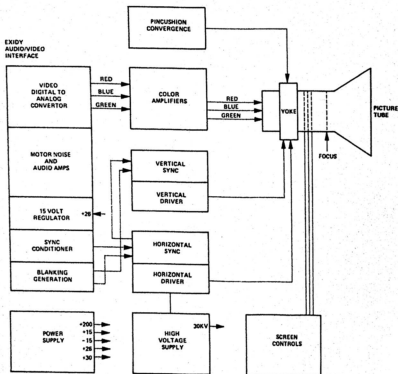


FIGURE 6. TELEVISION BLOCK DIAGRAM

Blanking is generated on the interface board using signals generated by the television. Horizontal and vertical blanking are combined, amplified, and applied to the video driver transistor (on the RGB amplifier) to shut off the video during horizontal and vertical retrace.

II. ADJUSTMENTS:

NOTE: All factory adjustments are made with the monitor in a horizontal position, with the top of the picture tube facing magnetic north. It is recommended that on location, the game be oriented first facing north, then rotated 30 degrees either direction until the best picture is obtained. If adjustments are necessary, the television must be facing north and be in a horizontal position. It is necessary that the picture tube be *degaussed* before attempting any adjustments, as this alone will often cure any apparent problems. Degaussing coils are available at most electronic supply stores.

HORIZONTAL AND VERTICAL ADJUSTMENTS (Figure 7)

1. Adjust the horizontal (U) and vertical sync (M) to obtain a stable picture.

2. Adjust the horizontal size control (B) until both sides of the playing field are visible (pincushioning can occur if it is adjusted too far.)
3. Adjust the vertical size control (N) until both the top alphanumerics and the bottom line are visible.
4. Adjust the horizontal (P) and vertical positioning until the picture is centered on the screen.

COLOR ADJUSTMENTS

1. Turn all drive and screen controls to midrange.
2. Turn front panel custom picture and brightness controls fully clockwise.
3. Adjust the red drive (item R on Figure 7) and screen controls (G) until the red car and goal are an acceptable brightness.

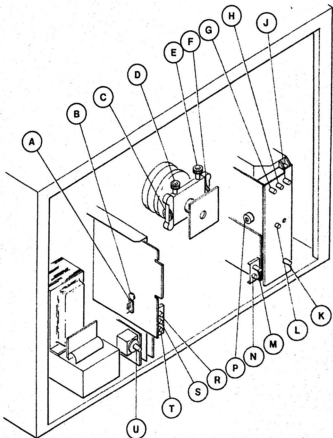


FIGURE 7. TELEVISION ADJUSTMENTS

4. Repeat step 3 for blue controls.
5. Adjust green controls for a prominent green playfield.
6. Adjust front panel custom picture control for an overall bright picture without retrace visible.

CONVERGENCE ADJUSTMENTS

This adjustment is made to converge the three color guns at the center of the picture. To assist in convergence adjustments, a bar/dot generator has been built into the CAR POLO logic board. The bar/dot is enabled by turning switch 2 at location 3V on the main logic board ON. (See Figure 4.) Switch 1 then controls whether bars or dots are displayed.

1. Turn the bar/dot generator ON to display dots.

2. Adjust the ring magnets on the neck of the picture tube so that the green playfield is a consistent color over its entire area.
3. Using the red vertical convergence control (D) (Located on the neck of the picture tube) adjust the red dot until it is immediately over the green dot.
4. Using the red horizontal control (C,) adjust the red dot until it is immediately over the green dot. (Note the horizontal and vertical convergence controls are interacting, and adjustment of one may disturb the adjustment of the other.)
5. Repeat steps 2 and 3 for the blue convergence. (Note: There are no adjustments for green convergence.)
6. Adjust the focus control for the sharpest picture.

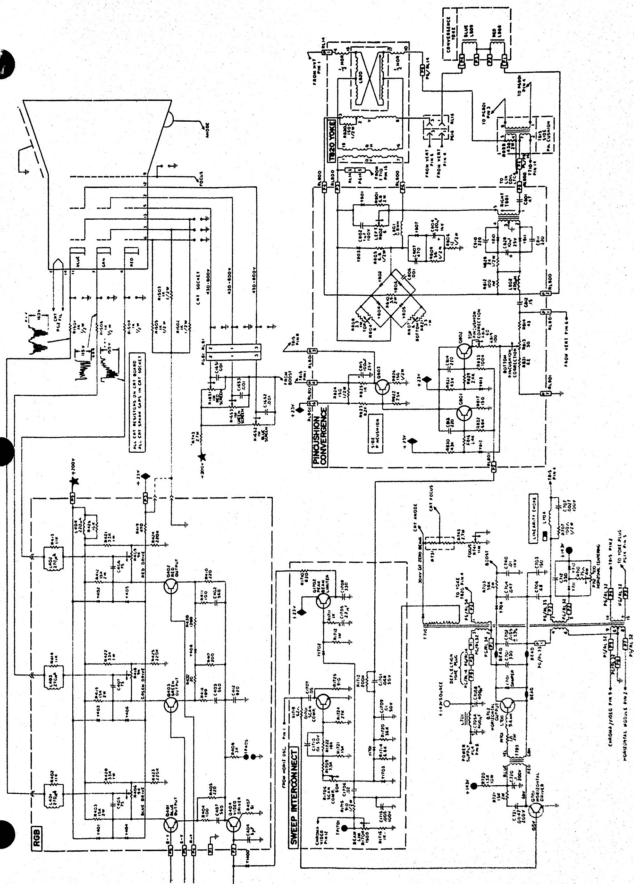


FIGURE 10. TELEVISION MAIN CHASSIS SCHEMATIC

FIGURE 12. CAR POLO — MAIN HARNESS

FROM:	TO:	SIGNAL:	FROM:	TO:	SIGNAL:
J1-PIN 1		GROUND	J1-PIN A		GROUND
J1-PIN 2		VCC (+5 VOLTS)	J1-PIN B		VCC (+5 VOLTS)
J1-PIN 3	J6-PIN 4	PLAYER 4 STEERING — PHASE 2	J1-PIN C	J6-PIN 3	PLAYER 4 STEERING — PHASE 1
J1-PIN 4	J14-PIN 10	PLAYER 3 REVERSE	J1-PIN D	J6-PIN 5	PLAYER 4 REVERSE
J1-PIN 5	J14-PIN 8	PLAYER 3 STEERING — PHASE 1	J1-PIN E	J14-PIN 9	PLAYER 3 STEERING — PHASE 2
J1-PIN 6	J6-PIN 9	PLAYER 2 STEERING — PHASE 2	J1-PIN F	J6-PIN 8	PLAYER 2 STEERING — PHASE 1
J1-PIN 7	J14-PIN 5	PLAYER 1 REVERSE	J1-PIN H	J6-PIN 10	PLAYER 2 REVERSE
J1-PIN 8	J14-PIN 3	PLAYER 1 STEERING — PHASE 1	J1-PIN J	J14-PIN 4	PLAYER 1 STEERING — PHASE 2
J1-PIN 9	J4-PIN 21	SCORE PULSE	J1-PIN K		
J1-PIN 10	J4-PIN 7	PLAYER 4 ACTIVE	J1-PIN L	J4-PIN Y	BALL HIT
J1-PIN 11	J4-PIN 8	PLAYER 2 ACTIVE	J1-PIN M	J4-PIN J	PLAYER 1 ACTIVE
J1-PIN 12	J4-PIN C	PLAYER 1 AUDIO BIT 2	J1-PIN N	J4-PIN K	PLAYER 3 ACTIVE
J1-PIN 13	J4-PIN 3	PLAYER 1 AUDIO BIT 0	J1-PIN P	J4-PIN B	PLAYER 1 AUDIO BIT 1
J1-PIN 14	J7-PIN 6	PLAYER 2 SPEED BIT 0	J1-PIN R	J18-PIN 4	PLAYER 1 SPEED BIT 0
J1-PIN 15	J7-PIN 4	PLAYER 4 SPEED BIT 0	J1-PIN S	J18-PIN 6	PLAYER 3 SPEED BIT 0
J1-PIN 16	J7-PIN 5	PLAYER 2 SPEED BIT 1	J1-PIN T	J18-PIN 3	PLAYER 1 SPEED BIT 1
J1-PIN 17	J7-PIN 3	PLAYER 4 SPEED BIT 1	J1-PIN U	J18-PIN 5	PLAYER 3 SPEED BIT 1
J1-PIN 18	J4-PIN N	PLAYER 3 AUDIO BIT 1	J1-PIN V	J4-PIN 12	PLAYER 3 AUDIO BIT 2
J1-PIN 19	J4-PIN 5	PLAYER 2 AUDIO BIT 2	J1-PIN W	J4-PIN 11	PLAYER 3 AUDIO BIT 0
J1-PIN 20	J4-PIN 4	PLAYER 2 AUDIO BIT 0	J1-PIN X	J4-PIN D	PLAYER 2 AUDIO BIT 1
J1-PIN 21	J4-PIN 13	PLAYER 4 AUDIO BIT 1	J1-PIN Y	J4-PIN R	PLAYER 4 AUDIO BIT 2
J1-PIN 22	J4-PIN 20	PLAYER 1 CRASH PULSE	J1-PIN Z	J4-PIN P	PLAYER 4 AUDIO BIT 0

FIGURE 12. CAR POLO – MAIN HARNESS (CONTINUED)

FROM:	TO:	SIGNAL:	FROM:	TO:	SIGNAL:
J2-PIN 1	J4-PIN M	GROUND	J2-PIN A		GROUND
J2-PIN 2	J11-PIN 5	VCC (+5 VOLTS)	J2-PIN B		VCC (+5 VOLTS)
J2-PIN 3			J2-PIN C	J4-PIN X	PLAYER 2 CRASH PULSE
J2-PIN 4			J2-PIN D	J4-PIN W	PLAYER 3 CRASH PULSE
J2-PIN 5			J2-PIN E		STATIC ANTENNA*
J2-PIN 6		VIDEO GROUND OUT (B & W)	J2-PIN F		VIDEO GROUND OUT (B & W)
J2-PIN 7		COMPOSITE VIDEO OUT (B & W)	J2-PIN H		COMPOSITE VIDEO OUT (B & W)
J2-PIN 8			J2-PIN J	J4-PIN 19	PLAYER 4 CRASH PULSE
J2-PIN 9	J15-PIN 4	PLAYER 1 COIN DROP	J2-PIN K	J11-PIN 3	PLAYER 2 COIN DROP
J2-PIN 10			J2-PIN L	J15-PIN 3	PLAYER 3 COIN DROP
J2-PIN 11			J2-PIN M	J11-PIN 4	PLAYER 4 COIN DROP
J2-PIN 12			J2-PIN N	J11-PIN 6	COIN COUNTER
J2-PIN 13			J2-PIN P	J4-PIN A	COMPOSITE SYNC
J2-PIN 14			J2-PIN R	J4-PIN F	BLUE, MSB
J2-PIN 15		+TL LEVEL VIDEO (ADVENT)	J2-PIN S	J4-PIN H	BLUE, LSB
J2-PIN 16			J2-PIN T		DELAYED COMPOSITE SYNC (ADVENT)
J2-PIN 17			J2-PIN U	J4-PIN 18	GREEN, LSB
J2-PIN 18			J2-PIN V	J4-PIN T	RED, CSB
J2-PIN 19			J2-PIN W	J4-PIN 16	RED, LSB
J2-PIN 20			J2-PIN X	J4-PIN 15	RED, MSB
J2-PIN 21			J2-PIN Y	J4-PIN 17	GREEN, CSB
J2-PIN 22			J2-PIN Z	J4-PIN U	GREEN, MSB

*STATIC ANTENNA is a 2' length of wire wrapped into the harness – other end is not connected.

FIGURE 12. CAR POLO – MAIN HARNESS (CONTINUED)

FROM:	TO:	SIGNAL:	FROM:	TO:	SIGNAL:
J3-PIN 1	J8-PIN 9	GROUND			
J3-PIN 2	J8-PIN 10	GROUND			
J3-PIN 3	J8-PIN 3	+5 VOLTS			
J3-PIN 4	J8-PIN 4	+5 VOLTS			
J3-PIN 5	J8-PIN 9	GROUND			
J3-PIN 6	J8-PIN 10	GROUND			
J4-PIN 1	J14-PIN 6	PLAYER 1 SPEAKER	J4-PIN A	J2-PIN P	COMPOSITE SYNC
J4-PIN 2	J14-PIN 7	PLAYER 1 SPEAKER	J4-PIN B	J1-PIN P	PLAYER 1 AUDIO BIT 1
J4-PIN 3	J1-PIN 13	PLAYER 1 AUDIO BIT 0	J4-PIN C	J1-PIN 12	PLAYER 1 AUDIO BIT 2
J4-PIN 4	J1-PIN 20	PLAYER 2 AUDIO BIT 0	J4-PIN D	J1-PIN X	PLAYER 2 AUDIO BIT 1
J4-PIN 5	J1-PIN 19	PLAYER 2 AUDIO BIT 2	J4-PIN E	J6-PIN 11	PLAYER 2 SPEAKER
J4-PIN 6	J6-PIN 12	PLAYER 2 SPEAKER	J4-PIN F	J2-PIN R	BLUE, MSB
J4-PIN 7	J1-PIN 10	PLAYER 4 ACTIVE	J4-PIN H	J2-PIN S	BLUE, LSB
J4-PIN 8	J1-PIN 11	PLAYER 2 ACTIVE	J4-PIN J	J1-PIN M	PLAYER 1 ACTIVE
J4-PIN 9	J14-PIN 11	PLAYER 3 ACTIVE	J4-PIN K	J1-PIN N	PLAYER 2 ACTIVE
J4-PIN 10	J8-PIN 5	5 VOLTS	J4-PIN L	J12-PIN 12	PLAYER 3 SPEAKER
J4-PIN 11	J1-PIN W	PLAYER 3 AUDIO BIT 0	J4-PIN M	J2-PIN 1	VIDEO GROUND
J4-PIN 12	J1-PIN V	PLAYER 3 AUDIO BIT 2	J4-PIN N	J1-PIN 18	PLAYER 3 AUDIO BIT 1
J4-PIN 13	J1-PIN 21	PLAYER 4 AUDIO BIT 1	J4-PIN P	J1-PIN Z	PLAYER 4 AUDIO BIT 0
J4-PIN 14	J6-PIN 6	PLAYER 4 SPEAKER	J4-PIN R	J1-PIN Y	PLAYER 4 AUDIO BIT 2
J4-PIN 15	J2-PIN X	RED, MSB	J4-PIN S	J6-PIN 7	PLAYER 4 SPEAKER
J4-PIN 16	J2-PIN W	RED, LSB	J4-PIN T	J2-PIN V	RED, CSB
J4-PIN 17	J2-PIN Y	GREEN, CSB	J4-PIN U	J2-PIN Z	GREEN, MSB
J4-PIN 18	J2-PIN U	GREEN, LSB	J4-PIN V	J8-PIN 11	POWER SUPPLY GROUND
J4-PIN 19	J2-PIN J	PLAYER 4 CRASH PULSE	J4-PIN W	J2-PIN D	PLAYER 3 CRASH PULSE
J4-PIN 20	J1-PIN 22	PLAYER 1 CRASH PULSE	J4-PIN X	J2-PIN C	PLAYER 2 CRASH PULSE
J4-PIN 21	J1-PIN 9	SCORE PULSE	J4-PIN Y	J1-PIN L	BALL PULSE
J4-PIN 22	J8-PIN 1	25 VAC	J4-PIN Z	J8-PIN 2	25 VAC
J5-PIN 1	J9-PIN 1	110 VAC			
J5-PIN 2	J9-PIN 2	110 VAC			

FIGURE 12. CAR POLO — MAIN HARNESS (CONTINUED)

FROM:	TO:	SIGNAL:	FROM:	TO:	SIGNAL:
J6-PIN 1 J6-PIN 2 J6-PIN 3 J6-PIN 4 J6-PIN 5 J6-PIN 6 J6-PIN 7 J6-PIN 8 J6-PIN 9 J6-PIN 10 J6-PIN 11 J6-PIN 12	J8-PIN 6 J8-PIN 12 J1-PIN C J1-PIN 3 J1-PIN D J4-PIN 14 J4-PIN S J1-PIN F J1-PIN 6 J1-PIN H J4-PIN E J4-PIN 6	+5 VOLTS GROUND PLAYER 4 STEERING — PHASE 1 PLAYER 4 STEERING — PHASE 2 PLAYER 4 REVERSE PLAYER 4 SPEAKER PLAYER 4 SPEAKER PLAYER 2 STEERING — PHASE 1 PLAYER 2 STEERING — PHASE 2 PLAYER 2 REVERSE PLAYER 2 SPEAKER PLAYER 2 SPEAKER	J8-PIN 13 J8-PIN 14 J8-PIN 15 J9-PIN 1 J9-PIN 2 J11-PIN 1 J11-PIN 2 J11-PIN 3 J11-PIN 4 J11-PIN 5 J11-PIN 6 J11-PIN 7 J11-PIN 8 J11-PIN 9	J11-PIN 2- J7-PIN 2 J15-PIN 2- J18-PIN 2 J11-PIN 7- J15-PIN 5 J5-PIN 1- FAN J5-PIN 2- FAN J8-PIN 7 J8-PIN 13 J2-PIN K J2-PIN M J2-PIN 2 J2-PIN N J8-	GROUND GROUND POWER SUPPLY GROUND 110 VAC 110 VAC +5 VOLTS GROUND PLAYER 2 COIN DROP PLAYER 4 COIN DROP +5 VOLT COIN COUNTER COIN COUNTER POWER LINE GROUND
J7-PIN 1 J7-PIN 2 J7-PIN 3 J7-PIN 4 J7-PIN 5 J7-PIN 6	J8-PIN 7 J8-PIN 13 J1-PIN 17 J1-PIN 15 J1-PIN 16 J1-PIN 14	+5 VOLTS GROUND PLAYER 4 SPEED BIT 1 PLAYER 4 SPEED BIT 0 PLAYER 2 SPEED BIT 1 PLAYER 2 SPEED BIT 0	J14-PIN 1 J14-PIN 2 J14-PIN 3 J14-PIN 4 J14-PIN 5 J14-PIN 6 J14-PIN 7 J14-PIN 8 J14-PIN 9 J14-PIN 10 J14-PIN 11 J14-PIN 12	J8-PIN 6 J8-PIN 12 J1-PIN 8 J1-PIN J J1-PIN 7 J4-PIN 1 J4-PIN 2 J1-PIN 5 J1-PIN E J1-PIN 4 J4-PIN 9 J4-PIN L	+5 GROUND PLAYER 1 STEERING — PHASE 1 PLAYER 1 STEERING — PHASE 2 PLAYER 1 REVERSE PLAYER 1 SPEAKER PLAYER 1 SPEAKER PLAYER 3 STEERING — PHASE 1 PLAYER 3 STEERING — PHASE 2 PLAYER 3 REVERSE PLAYER 3 SPEAKER PLAYER 3 SPEAKER
J8-PIN 1 J8-PIN 2 J8-PIN 3 J8-PIN 4 J8-PIN 5 J8-PIN 6 J8-PIN 7 J8-PIN 8 J8-PIN 9 J8-PIN 10 J8-PIN 11 J8-PIN 12	J4-PIN 22 J4-PIN Z J3-PIN 3 J3-PIN 4 J4-PIN 10 J6-PIN 1- J14-PIN 1 J11-PIN 1- J7-PIN 1 J15-PIN 1- J18-PIN 1 J3-PIN 1 & 5 J3-PIN 2 & 6 J4-PIN V J6-PIN 1- J14-PIN 1	25 VAC 25 VAC 5 VOLTS 5 VOLTS 5 VOLTS 5 VOLTS 5 VOLTS 5 VOLTS GROUND GROUND GROUND GROUND	J15-PIN 1 J15-PIN 2 J15-PIN 3 J15-PIN 4 J15-PIN 5 J15-PIN 6 J15-PIN 7 J15-PIN 8 J15-PIN 9	J8-PIN 8 J8-PIN 14 J2-PIN 6 J2-PIN 9 J8	+5 VOLTS GROUND PLAYER 3 COIN DROP PLAYER 1 COIN DROP POWER LINE GROUND
J15-PIN 1 J15-PIN 2 J15-PIN 3 J15-PIN 4 J15-PIN 5 J15-PIN 6 J15-PIN 7 J15-PIN 8 J15-PIN 9	J8-PIN 8 J8-PIN 14 J2-PIN 6 J2-PIN 9 J8	+5 VOLTS GROUND PLAYER 3 COIN DROP PLAYER 1 COIN DROP POWER LINE GROUND	J18-PIN 1 J18-PIN 2 J18-PIN 3 J18-PIN 4 J18-PIN 5 J18-PIN 6	J8-PIN 8 J8-PIN 14 J1-PIN T J1-PIN R J1-PIN U J1-PIN S	+5 VOLTS GROUND PLAYER 1 SPEED BIT 1 PLAYER 1 SPEED BIT 0 PLAYER 3 SPEED BIT 1 PLAYER 3 SPEED BIT 0

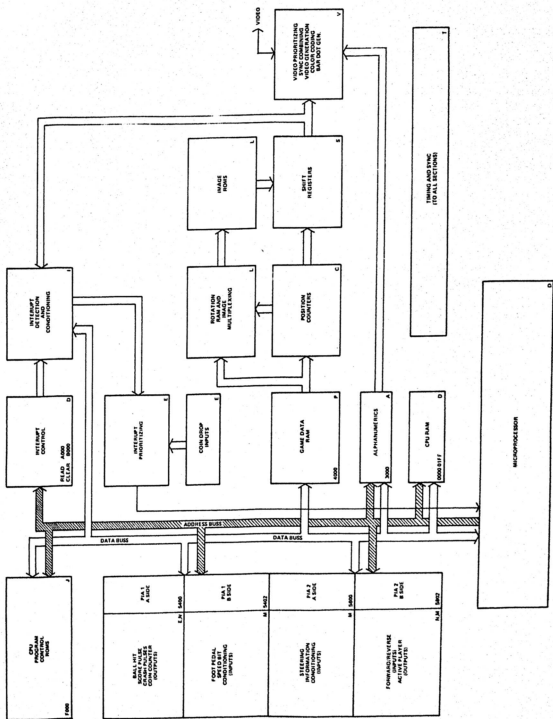


FIGURE 13. LOGIC BOARD BLOCK DIAGRAM

FIGURE 14
CAR POLO
ILLUSTRATED
PARTS
BLOW-UP

A.	CANOPY	75-4125
B.	CANOPY SUPPORT BRACKETS	68-8001
C.	VIEW PLATE FRAME	68-8003
D.	VIEW PLATE GASKET	82-1003
E.	GLASS VIEW PLATE	83-1001
F.	BEZEL	75-4022
G.	CONTROL MODULE	76-1051, 76-1052
H.	STEERING WHEEL	75-4120
J.	SPEAKER GRILL	62-7010
K.	SHIFT KNOB	75-4050
L.		
M.	MAIN SHAFT	80-5080
N.	SHIFT MECH	80-5090
O.	OCB	77-2021
P.	OCB LIGHT MASK	75-4010
R.	COIN MECH	66-4000
S.	DOOR	
T.	LOCK & KEY ASSY.	67-5000
U.	25" MONITOR	79-2302
V.	FOOT CONTROL MODULE	
W.	MAIN CABINET ASSY.	76-1050
X.	MICRO SWITCH	72-3010
Y.	VOLUME CONTROL POT	54-5022

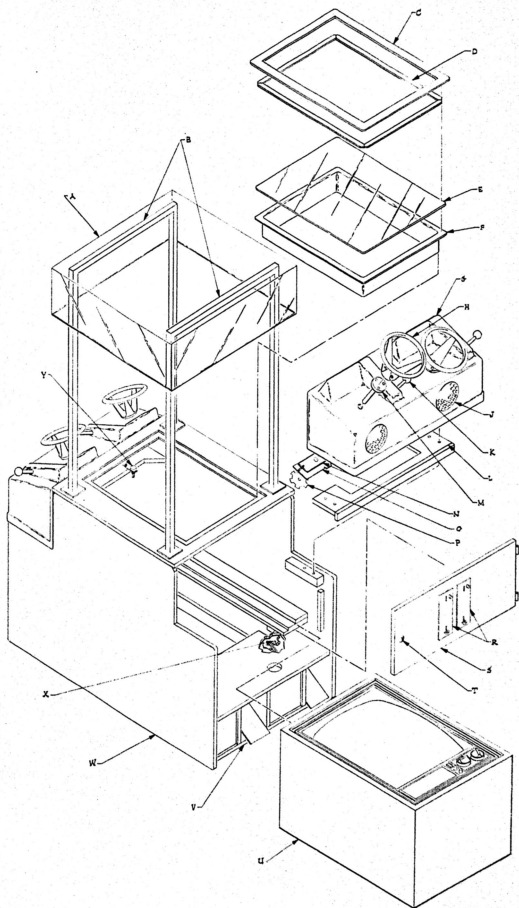
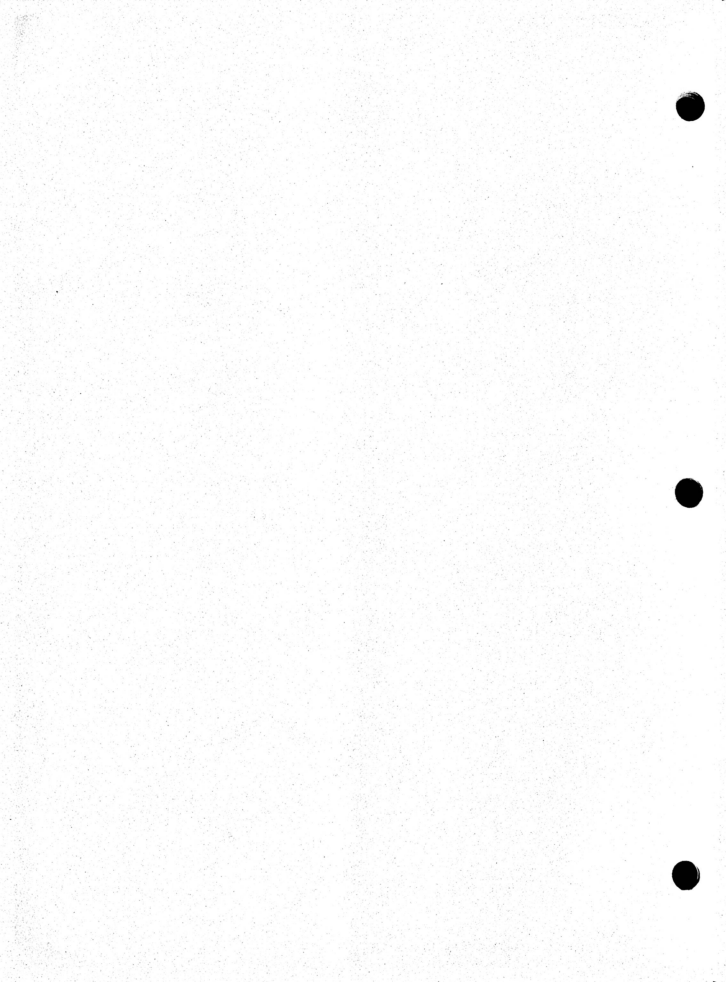


FIGURE 14. ILLUSTRATED PARTS BLOW UP



NOTES

