

**ALLEY RALLY
SERVICE MANUAL**

BY EXIDY

WARRANTY

EXIDY warrants all TV monitors and moving mechanical parts for a period of *90 days* from data 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.

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I. GENERAL INFORMATION:

ALLEY RALLY pits the player against the clock and four erratic "drone" cars. The drone cars drive a pseudo-random pattern, change directions, and even skid into the side of the track occasionally. Since they also change speed during all this, it becomes very difficult to drive around the track successfully without crashing into a drone car.

II. OBJECT OF THE GAME:

The object of the game is quite simple. Drive around the track as long and as fast as you can without crashing into a drone car. You can drive either direction to make points, and you get a point each time you drive 1/4 of the way around the track.

III. NORMAL OPERATION:

You drive one of two player cars. If you play a one player game, you drive the bright car which appears on the left side of the track, and you drive from the left side steering wheel. A two-player game adds a darker colored car which appears on the right side of the track, and is driven from the right side steering wheel.

The game is started only after the start button is depressed and the cars may move only after the foot pedal is depressed and the shift lever is in the LOW GEAR position.

When you crash into a drone car, the side of the track, or the other player's car and you are in HIGH GEAR, your car will stop moving until you return the shift lever to the LOW GEAR position. When you crash into a drone car and you are still in LOW GEAR, your car will continue moving with only a slight hesitation. LOW GEAR, however, is slower and you cannot make points very rapidly unless you shift into HIGH GEAR as soon as possible.

If, while you are driving in HIGH GEAR, you lift your foot completely off the foot pedal, you must again shift into LOW GEAR in order to start your car moving again.

When a quarter is inserted, one player is enabled. Add a second quarter and the second player is also enabled. When a player is enabled the game counter will set to 99, ready to count down, and the score counters will set to 00, ready to count up. When the game is started the game counter counts down to 00 and the game ends.

Sound for the cars begins when the quarter is inserted, and ends when the game is over.

IV. SYSTEM FUNCTIONAL DESCRIPTION (Refer to System Block Diagram, Figure 1)

115 VAC power is applied through interlock switch S1 (back door panel) to the power supply, the T.V. monitor, and the light fixtures.

The *Power Supply* converts this to +5 VDC and 24 VAC. The +5 VDC is used to power the LOGIC PCB (printed circuit board), Coin Counter, both steering units, and both foot pedal units (1 microswitch each). The 24 VAC is used to power the audio (sound circuitry located on the LOGIC PCB).

The *Logic PCB* generates all video (T.V. picture), audio (sound), and is the nerve center for all control functions.

The *Coin Mechanism* signals the LOGIC PCB that a one (1) or two (2) player gam can now begin, pending the pressing of the start switch. It also simultaneously signals the coin counter to advance one (1) count for each coin.

The *Start Switch*, when depressed, signals the LOGIC PCB that a game can now begin.

The *Steering Units* for player 1 and player 2 are identical, and each consists of a steering wheel, a shift lever, and a steering control board. The steering control board converts the rotation of the steering wheel into commands which are routed to the LOGIC PCB, which then interprets and executes these commands, causing the driven cars on screen to react accordingly.

The *Pedal Units* for player 1 and player 2 are identical, and each consists of a spring-loaded foot pedal and microswitch. The pedal, when in the "OFF" position (not depressed) does not trip the switch. Depression of the pedal trips the microswitch, telling the LOGIC PCB that the corresponding player is now in high gear. The image on screen will then react accordingly.

The *Speakers*, which are located in the overhead, receive their signal directly from the LOGIC PCB, and are not activated until the coin mechanism has been tripped by a coin. They will remain active only while a game is in progress. When the game ends, so does the sound.

The *Shift Lever* is part of the steering units, and its signal is developed by the microswitch located on the steering board.

V. TROUBLESHOOTING TIPS

NOTE

The single most important factor in the proper operation of your ALLEY RALLY game is the power supply voltage adjustment. Before any troubleshooting can be done in the power supply, voltage must he checked and adjusted, if necessary. See "POWER SUPPLY ADJUSTMENT."

PICTURE NOT PRESENT

Check:

1. 115 VAC system power
2. +5 VDC power supply
3. All harnesses connected
4. T.V. brightness control

ENTIRE PICTURE SCRAMBLED

Check:

1. T.V. horizontal hold control
2. T.V. vertical hold control
3. +5 VDC power supply adjusted
4. 22-pin connector on PCB not on backward.

PICTURE PRESENT BUT PARTIALLY BAD, or CHARACTERS ACT INCORRECTLY

Check:

1. +5 VDC power supply adjusted
2. Nothing external touching LOGIC PCB
3. Harnesses all tightly connected

NO STEERING or BAD STEERING

Check:

1. Red LEDs (lights) on steering boards flash when power is on and wheel is turned.
2. +5 VDC power supply
3. Steering board harness connected

NOTE

If only one player has bad steering, the steering board can be tested by plugging the player 1 connector into the player 2 optical board (and vice versa). If this method is used, be extremely careful to insure the connector is not plugged in backward. Plugging the connector in backward will destroy the optical board. The Red LEDs on the steering board should, however, be an accurate indication of failure. No flash when the steering wheel is turned indicates a bad board or no power.

NO SHIFT

Check:

1. All checks are the same as those listed under "NO STEERING or BAD STEERING," above.

NO ACCELERATION or BAD ACCELERATION

Check:

1. Foot pedals free to operate
2. Microswitches on foot pedals
3. Foot pedal harness connected
4. +5 VDC power supply

NOTE

If only one player has bad acceleration, the foot pedal harnesses can be reversed for checkout of microswitches, if necessary, as outlined for steering problems under "NO STEERING or BAD STEERING" above.

NO GAME START/SOUND PRESENT

Check:

1. Start switch
2. +5 VDC power supply
3. Start switch harness connected

NO GAME START/SOUND NOT PRESENT

Check:

1. Coin Mechanism — NOTE: Coin mechanism functions okay if drop of coin causes cars to reset to start position on opposite sides of the track. Left player should be facing up, right player should be facing down.
2. +5 VDC power supply
3. Harnesses connected

GAME STARTS/NO SOUND

Check:

1. 24 VAC from power supply
2. Speaker harnesses connected
3. +5 VDC on PCB developed from 24 VAC, used for sound.

Any problems which cannot be localized to other units probably indicate a bad LOGIC PCB, since it is the heart of the system. If another is available it should be temporarily placed in the bad game to see if the problem remains.

VI. ADJUSTMENTS

POWER SUPPLY ADJUSTMENT

1. Connect voltmeter leads to +5V and GND traces on PCB, near 6 pin connector.
2. *Adjust potentiometer R8 (Fig. 2) on power supply for +5.0 VDC as measured on the LOGIC PCB. The positive (+) lead of the voltmeter must be touching the large metal area (trace) on the non-component side of the LOGIC PCB which is connected to pins 2 and 5 of the 6-pin connector. The negative (-) lead of the voltmeter must be touching the large metal area (trace) on the component side of the LOGIC PCB, which is connected to pins 1 and 6 of the 6-pin connector.*

NOTE

This voltage measurement must be made at the LOGIC PCB, since voltage losses may occur between the power supply and the LOGIC PCB. 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 PCB.

VOLUME ADJUSTMENTS (Refer to Fig. 3)

Volume controls are located on the LOGIC PCB and are as follows:

1. Player one motor — R82
2. Player two motor — R87
3. Player one crash — R21
4. Player two crash — R33

MOTOR SOUND ADJUSTMENTS (Refer to Fig. 3)

There are three pots each for player one and player two motor sound control. These adjustments are set up initially by the factory and should not be readjusted unless moved accidentally or during troubleshooting. Attempting to readjust the motor sounds by ear can be very difficult and time consuming. It is suggested that if these adjustments must be made, an oscilloscope be used to set up a pulse width on the 566 ICs as follows:

	USING:	SET:	TO:
	Pot R74	2E pin 7 (actually pin 3 of chip)	PW = 40 ms
Plyr 1	Pot R75	2E pin 3	PW = 10 ms
	Pot R88	2F pin 7 (actually pin 3 of chip)	PW = 6 ms
	Pot R80	1E pin 7 (actually pin 3 of chip)	PW = 40 ms
Plyr 2	Pot R81	1E pin 3	PW = 10 ms
	Pot R93	1F pin 7 (actually pin 3 of chip)	PW = 6 ms

It should be noted, however, that these are “ballpark” adjustments and will most likely need some fine tuning to your own taste. Please contact our service department about any problems related to this adjustment procedure.

TONE ADJUSTMENTS (Refer to Fig. 3)

Tone controls are located on the LOGIC PCB and are as follows:

1. Player one — R100
2. Player two — R103

GAME TIME ADJUSTMENTS

A movable jumper wire, located on the LOGIC PCB near IC 4B, allows adjustment of the length of game time. The counter will always begin at 99 and begin to count down to 00 when the START button is depressed after a coin is inserted. The *rate* at which the counter counts down will vary, depending on the location of the jumper wire. Three options are available for a short, medium, and long game time. These are selected by placing the jumper wire on the appropriate terminal post. The approximate times are listed beside the posts on the PCB. These are 1 minute, 1.5 minutes and 2 minutes.

NOTE: GROUNDS SHOWN TO CLARIFY LOGICAL FUNCTIONS.

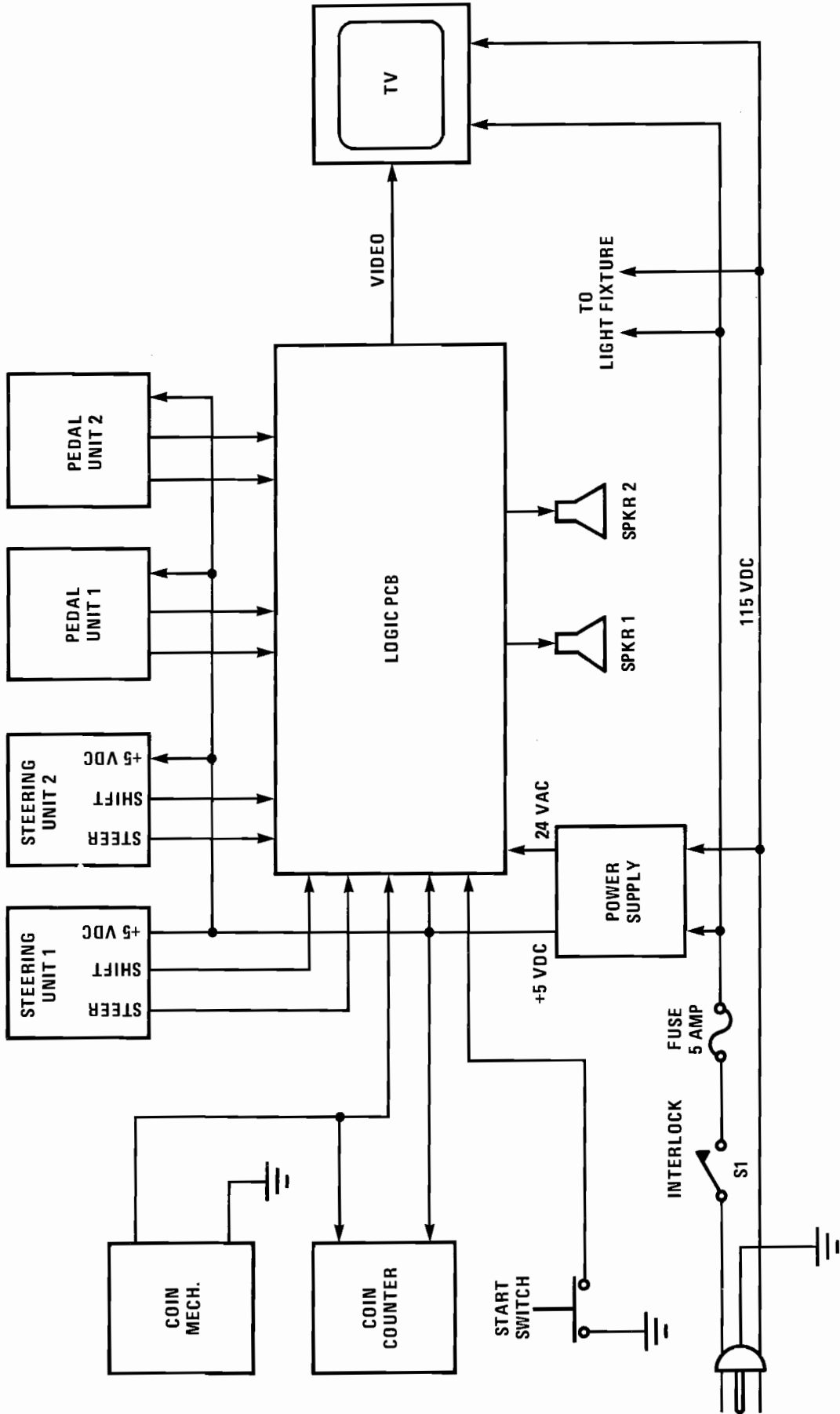


Figure 1. DR System Block Diagram

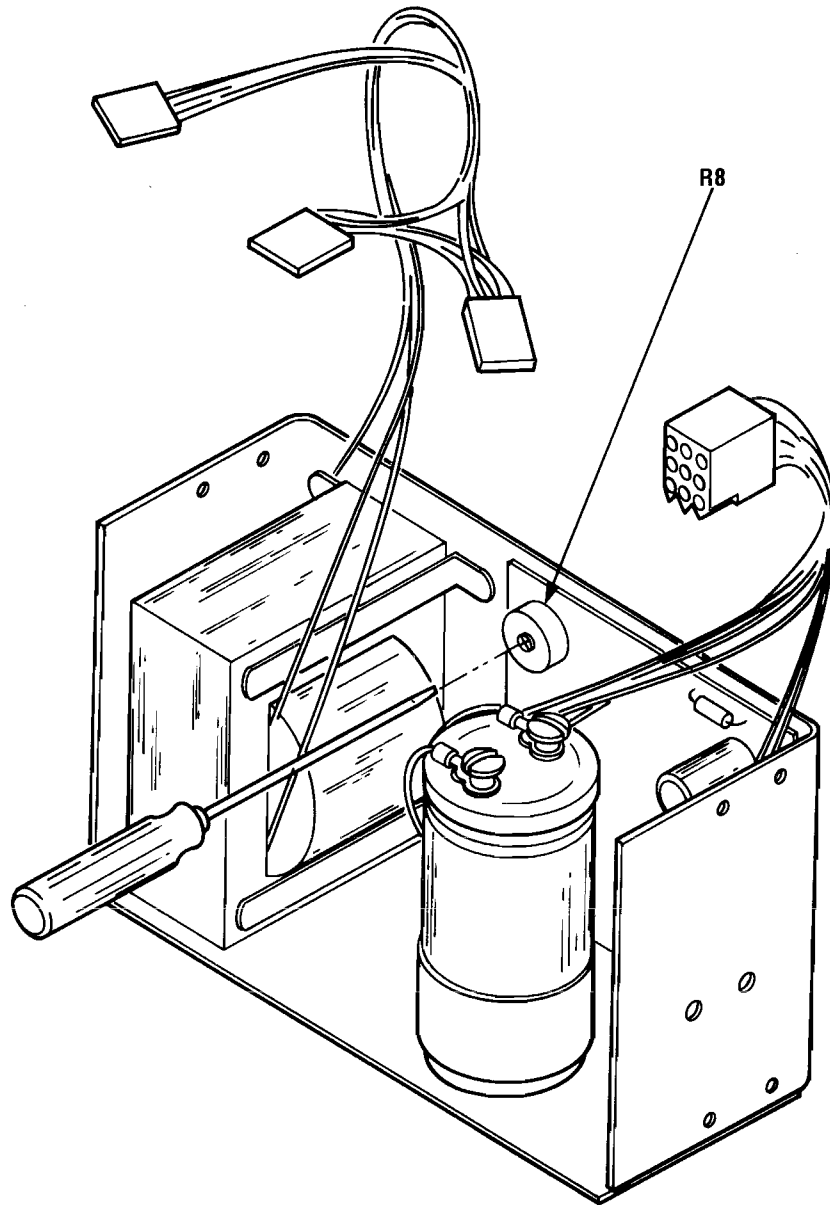


Figure 2. Power Supply (Including Harness)

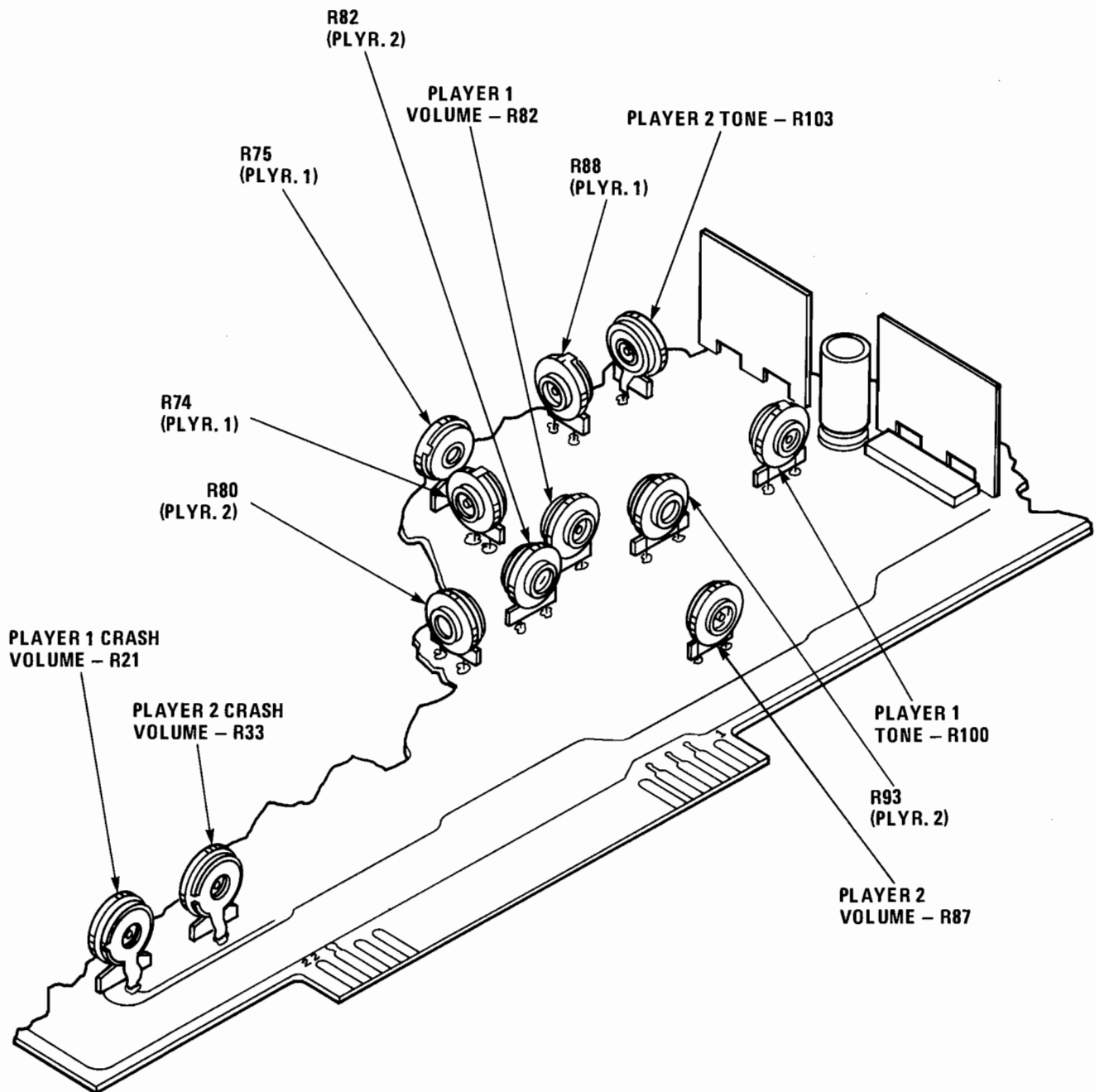


Figure 3. PCB Pot Locations (PCB AR-1A)

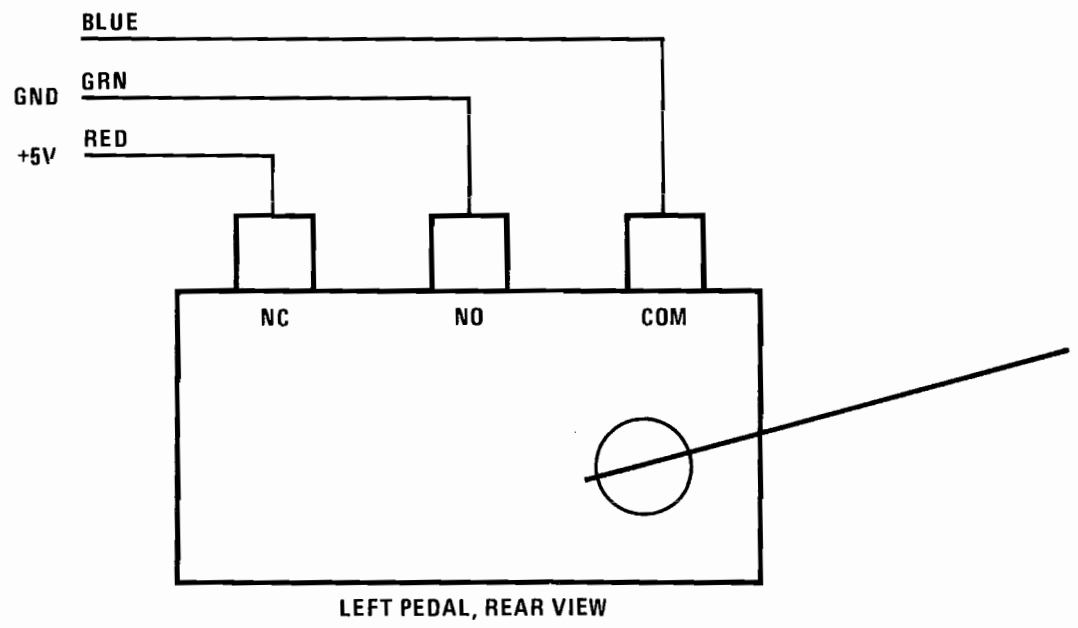
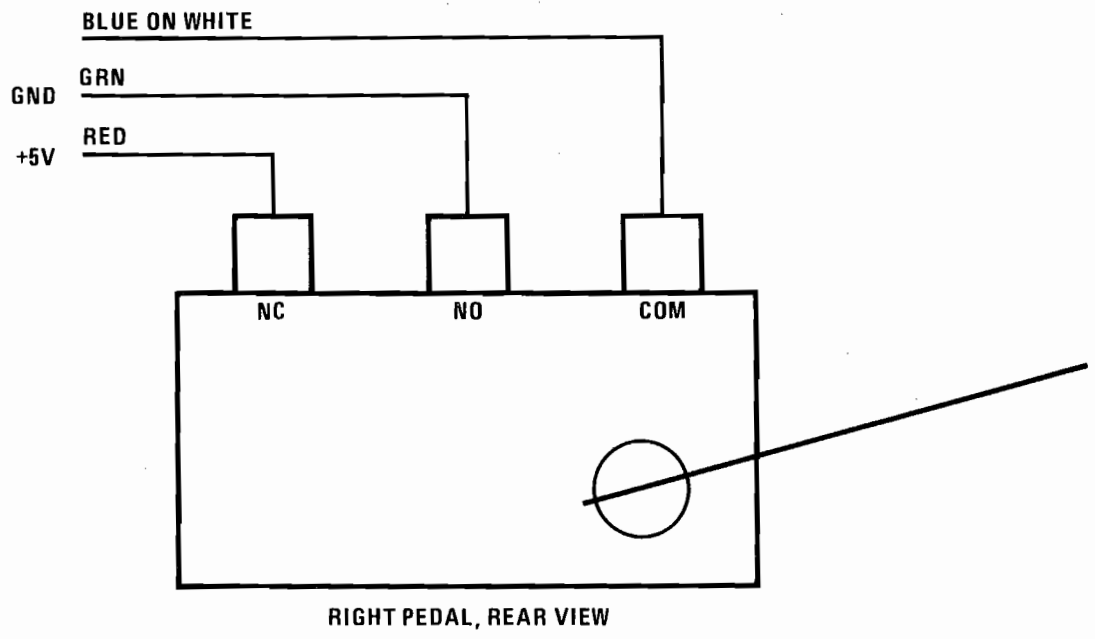


Figure 4. AR-1A Foot Pedal Assembly

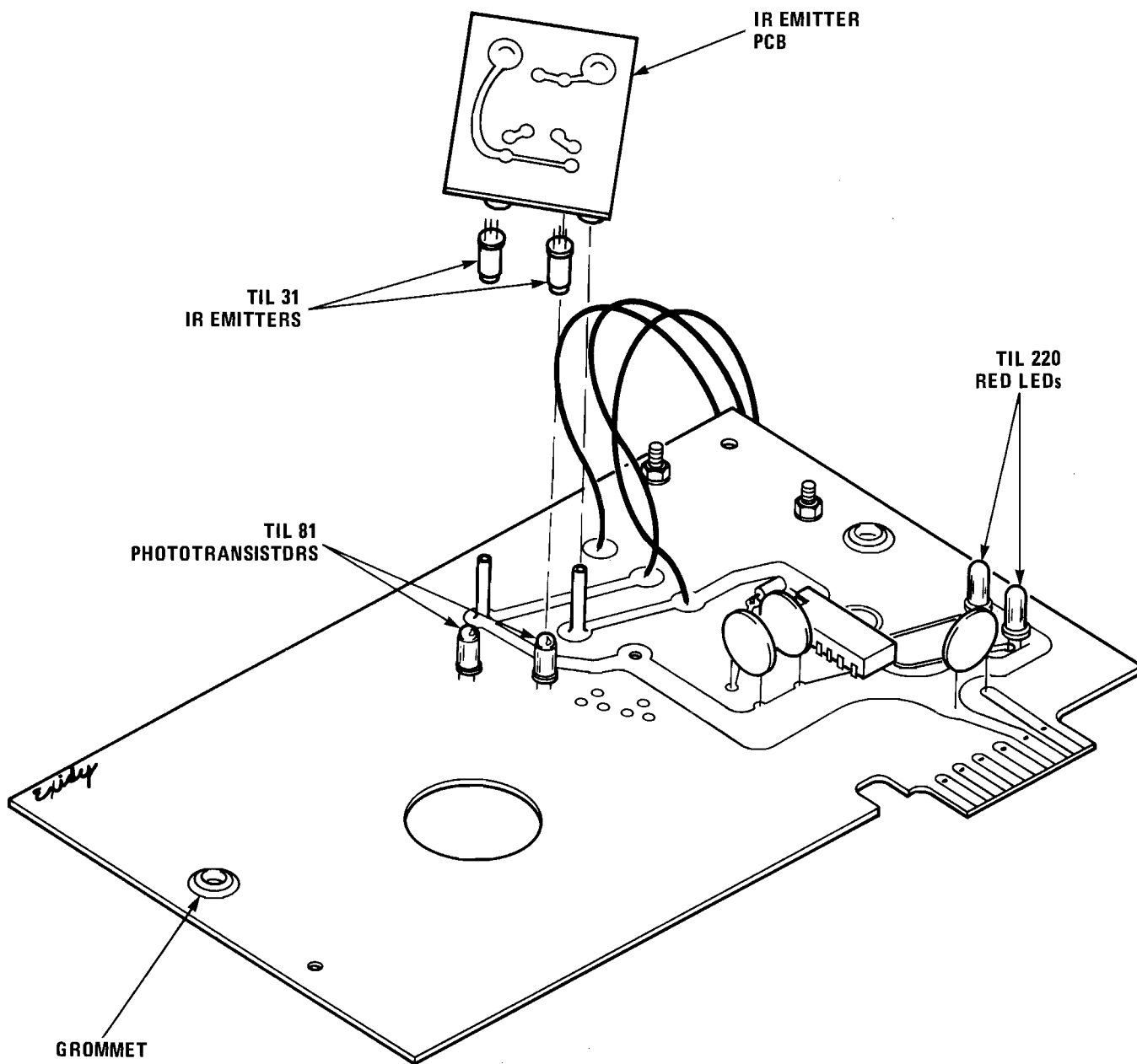


Figure 5. AR-1A Steering Board

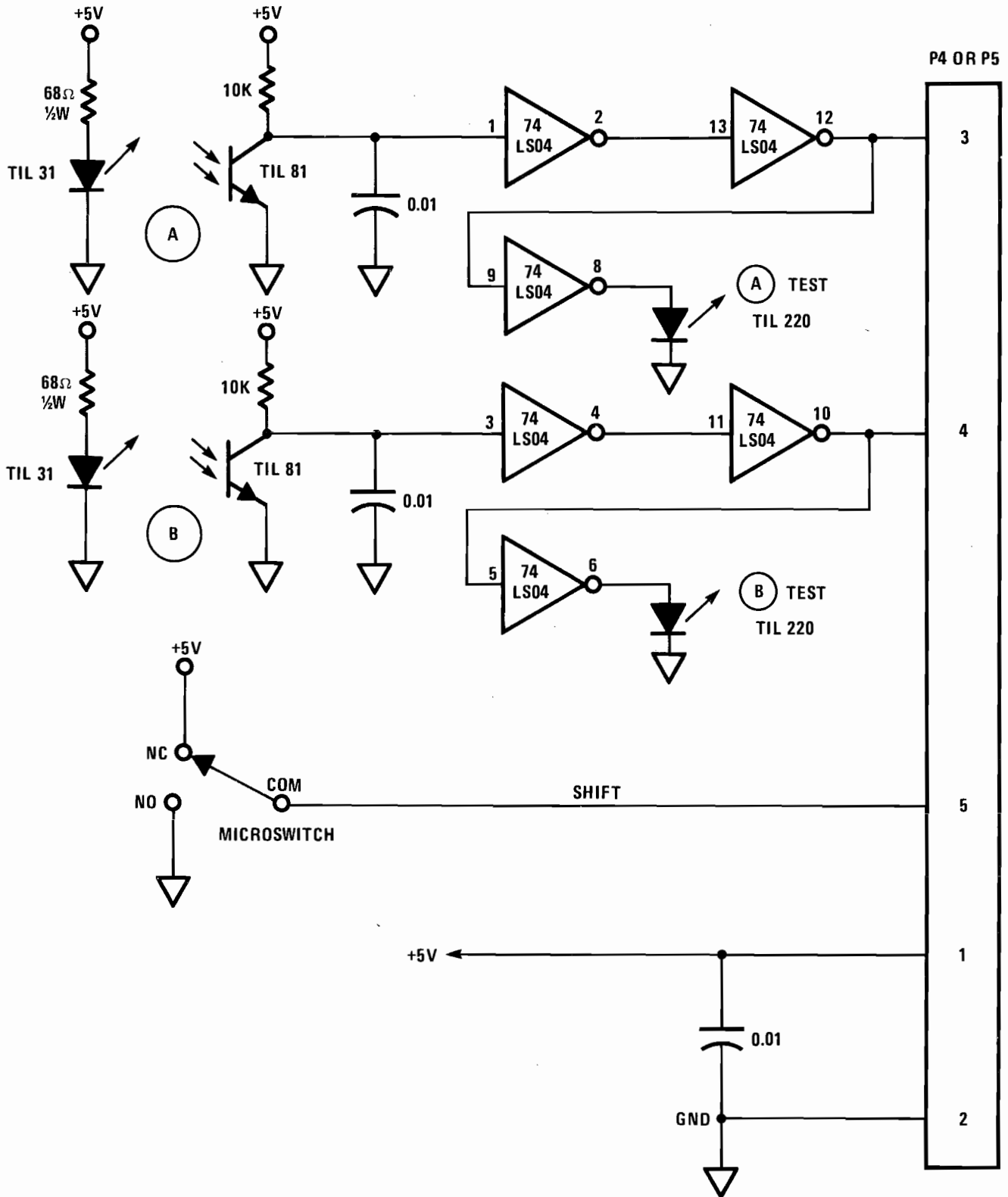


Figure 6. Steering Board Schematic

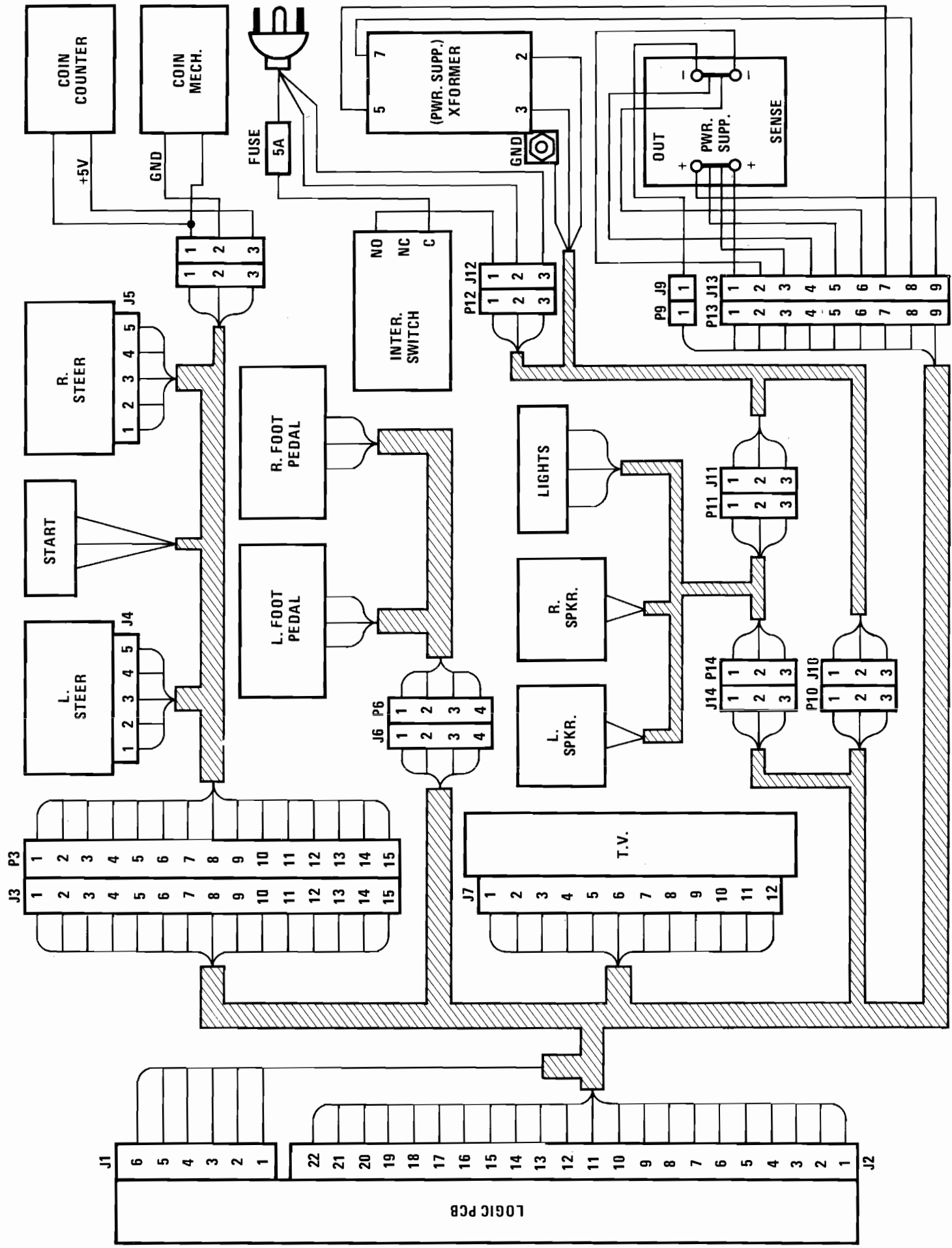


Figure 7. AR-1A Wiring Diagram

AR-1A WIRING LIST

FROM:	TO:	FROM:	TO:	FROM:	TO:
J1 (PIN 1)	J13 (PIN 2)	J9 (PIN 1)	- Out	J4 (PIN 2)	Start
J1 (PIN 2)	J13 (PIN 1)	P3 (PIN 9)	Start	J4 (PIN 1)	J5 (PIN 1)
J1 (PIN 3)	J13 (PIN 7)	P3 (PIN 14)	J8 (PIN 1)	P3 (PIN 1)	J8 (PIN 3)
J1 (PIN 4)	J13 (PIN 8)	P3 (PIN 5)	J4 (PIN 4)	P3 (PIN 2)	J8 (PIN 2)
J1 (PIN 5)	J13 (PIN 9)	P3 (PIN 4)	J4 (PIN 3)	P8 (PIN 3)	+5V Coin counter
J1 (PIN 6)	P9 (PIN 1)	P8 (PIN 1)	Coin counter	P8 (PIN 2)	Ground coin mech.
J2 (PIN 2)	J3 (PIN 11)	P6 (PIN 4)	Foot pedal	P11 (PIN 1)	Light
J2 (PIN 3)	J3 (PIN 10)	P6 (PIN 3)	Foot pedal	P11 (PIN 1)	Light
J2 (PIN 4)	J3 (PIN 13)	P3 (PIN 3)	J4 (PIN 5)	P11 (PIN 2)	Light
J2 (PIN 2)	J14 (PIN 1)	P3 (PIN 8)	J5 (PIN 4)	P11 (PIN 2)	Light
J2 (PIN 3)	J14 (PIN 2)	P3 (PIN 7)	J5 (PIN 3)	P11 (PIN 3)	Light w/safety ground
J2 (PIN 4)	J14 (PIN 3)	P6 (PIN 6)	Foot pedal	P14 (PIN 1)	Left speaker
J2 (PIN 5)	J14 (PIN 4)	P6 (PIN 5)	Foot pedal	P14 (PIN 2)	Left speaker
J3 (PIN 9)	J2 (PIN 6)	P3 (PIN 6)	J5 (PIN 5)	P14 (PIN 3)	Right speaker
J3 (PIN 14)	J2 (PIN 7)	P13 (PIN 5)	+ Out sense	P14 (PIN 4)	Right speaker
J2 (PIN 9)	J3 (PIN 5)	P13 (PIN 6)	- Sense	J12 (PIN 1)	N.O. inter. switch
J2 (PIN 10)	J3 (PIN 4)	P13 (PIN 3)	+ Sense	J12 (PIN 2)	To power cord
J2 (PIN 11)	J6 (PIN 3)	P13 (PIN 4)	- Out	J14 (PIN 3)	To power cord
J2 (PIN 13)	J3 (PIN 3)	J13 (PIN 5)	J8 (PIN 1)	PWR cord	5-amp fuse
J2 (PIN 14)	J3 (PIN 8)	J13 (PIN 6)	J3 (PIN 2)	5A Amp fuse	Com. inter. switch
J2 (PIN 15)	J3 (PIN 7)	J13 (PIN 3)	J6 (PIN 1)	J10 (PIN 1)	J11 (PIN 1)
J2 (PIN 16)	J6 (PIN 4)	J13 (PIN 4)	J6 (PIN 2)	J10 (PIN 2)	J11 (PIN 2)
J2 (PIN 18)	J3 (PIN 6)	J13 (PIN 4)	J6 (PIN 2)	J10 (PIN 3)	J11 (PIN 3)
J7 (PIN 1)	J2 (PIN 20)	P3 (PIN 1)	J4 (PIN 1)	J12 (PIN 3)	Safety ground
J2 (PIN 21)	J7 (PIN 2)	P3 (PIN 2)	J4 (PIN 2)	J12 (PIN 2)	#2 of xformer
P13 (PIN 2)	- Sense (P.S.)	P6 (PIN 1)	Foot pedal +5V	J12 (PIN 1)	#3 of xformer
P13 (PIN 1)	+ Sense (P.S.)	P6 (PIN 2)	Foot pedal GND	J11 (PIN 3)	P12 (PIN 3)
P13 (PIN 7)	#5 of xformer	J7 (PIN 7)	P10 (PIN 3)	J11 (PIN 2)	P12 (PIN 2)
P13 (PIN 8)	#7 of xformer	J7 (PIN 10)	P10 (PIN 2)	J11 (PIN 1)	P12 (PIN 1)
P13 (PIN 9)	+ Out	J7 (PIN 9)	P10 (PIN 1)		

**ALLEY RALLY 76-1040
ILLUSTRATED PARTS BLOW UP
KEY TO LETTER INDEX SYSTEM**

LETTER	STOCK	LETTER	STOCK
A-000	3/4 yellow 6 mil vinyl particle board	F-000	1/2 plywood
B-000	3/4 black vinyl particle board	G-000	2" pine brace
C-000	3/4 plywood	H-000	1½ pine bottom cleat
D-000	3/4 particle board	I-000	1/4 pin cleat
E-000	3/4 mahogany cleat	J-000	Miscellaneous metal part

**ALLEY RALLY 76-1040
ILLUSTRATED PARTS BLOW UP
OVERALL DIMENSIONS IN INCHES**

PART NO.	DIMENSIONS – L x W	PART NO.	DIMENSIONS – L x W
A001	27 3/8 x 17 3/8	I039	15 13/16 (2 ea)
C002	27 3/8 x 18 7/8	E040	2 3/4
A003	27 3/8 x 15	C041	25 7/8 x 3 1/4
E004	12 7/8 (2 ea)	F042	27 3/8 x 1 1/4
C005	27 1/8 x 8 7/8	E043	16 1/4 (2 ea)
C006	10 x 2 (2 ea)	E044	2 (2 ea)
C007	9 3/4 x 8 1/2 (2 ea)	F045	27 3/8 x 2
C008	27 1/8 x 9 5/8	D046	25 3/4 x 16 3/8
C009	27 3/8 x 5 1/2	G047	15 x 1 1/2 (2 ea)
A010	27 3/8 x 1 1/2	C048	23 3/4 x 2 3/8 (2 ea)
C011	7 1/2 x 2	C049	14 5/8 x 4 (2 ea)
E012	7 (5 ea)	D050	27 1/4 x 3 (2 ea)
E013	2 (2 ea)	E051	27 5/16
E014	4 (2 ea)	E052	4 3/4 (2 ea)
C015	7 x 6 (2 ea)	E053	1 1/2 (2 ea)
D016	7 1/2 x 7	J054	1 3/8
B017	27 5/16 x 12	C055	24 1/4
B018	12 x 7 (3 ea)	C056	23 x 2 (2 ea)
E019	7 (3 ea)	H057	21 x 1 1/2 (2 ea)
B020	27 5/16 x 8 7/8	D058	27 3/8 x 25 3/8
F021	3 x 2 3/4 (2 ea)	C059	12 7/8 x 3/4
E022	26 3/8	J060	3 x 1/2
B023	27 3/8 x 3 1/4	D061	23 3/4 x 1
A024	7 1/2 x 7 1/8	D062	23 3/4 x 3
A025	7 1/8 x 5 3/4	E063	2 (2 ea)
A026	27 1/8 x 14 1/16	D064	23 3/4 x 3
J027	14	D065	12 x 4 3/4
A028	67 x 31 1/2	D066	12 x 4 3/4
B029	27 3/8 x 14 3/4	D067	23 3/4 x 3
B030	45 3/16 x 27 5/16	D068	12 x 4 3/4
E031	14 7/8 (2 ea)	D069	4"
A032	67 x 31 1/2	D070	23 3/4 x 1
A033	27 3/8 x 5 15/16	I071	3 7/8
A034	27 3/8 x 2	C072	8 x 2 1/2
G035	6 3/4 x 1 1/2 (2 ea)	C073	27 3/8 x 2 1/8
J036	Lamp Socket (3 ea)	J074	1/8 J mold 27 3/8
F037	27 3/8 x 2	J075	1/4 H mold 27 3/8
C038	27 3/8 x 2 3/4		

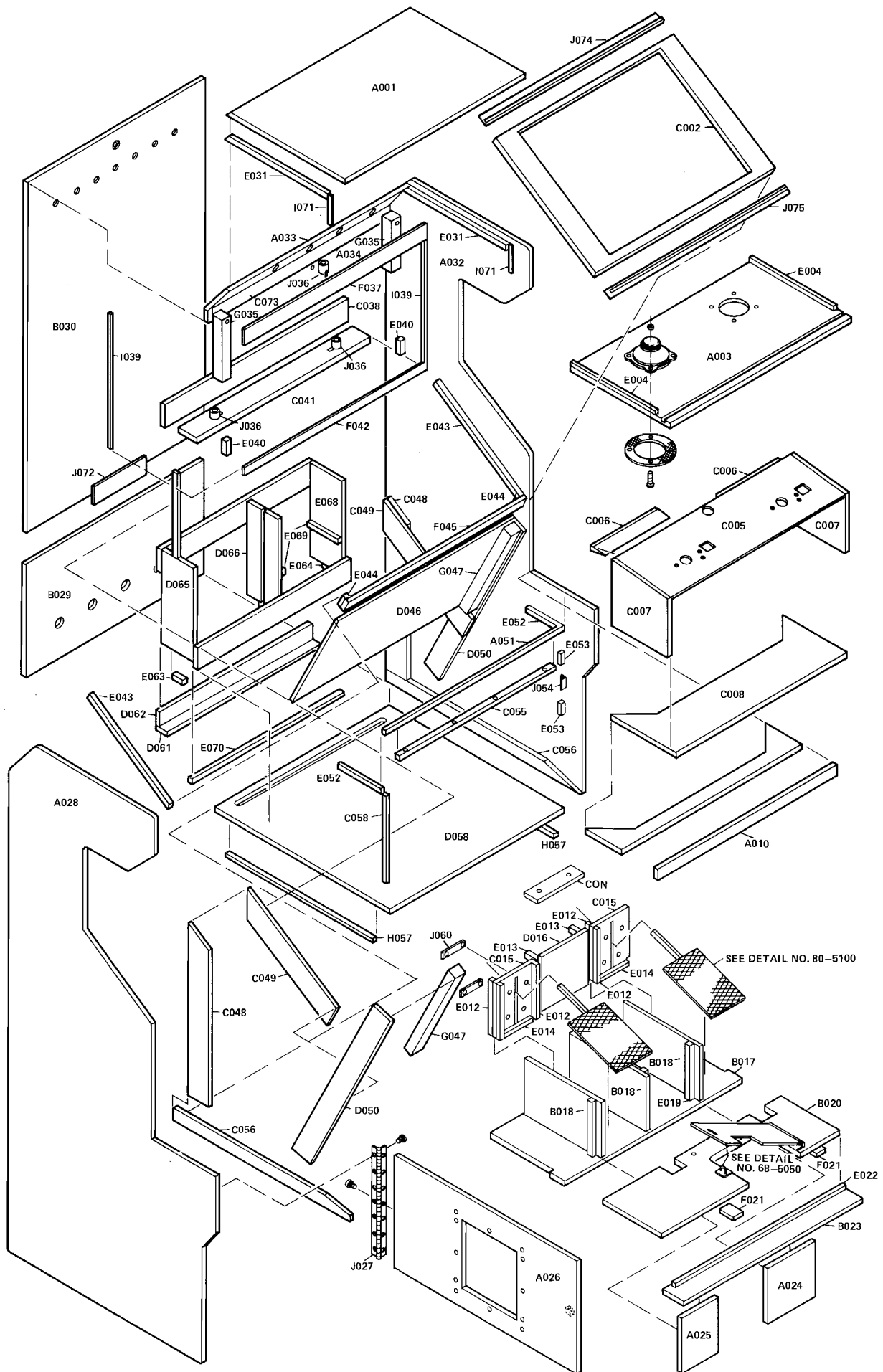


Figure 8. Alley Rally Major Assembly