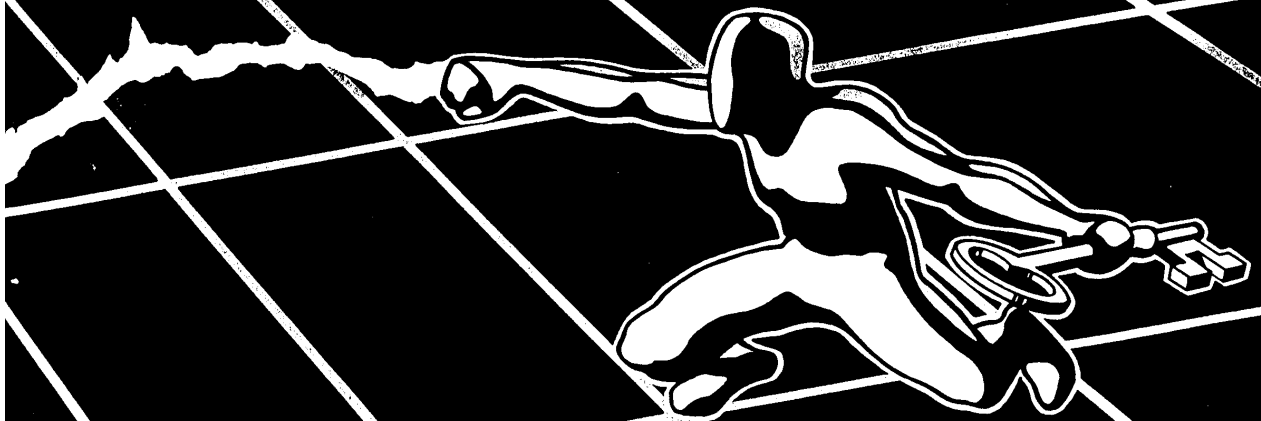


Gremlin/SEGA®

# PULSAR™

Owner's Manual

Manual Part No. 420-0601



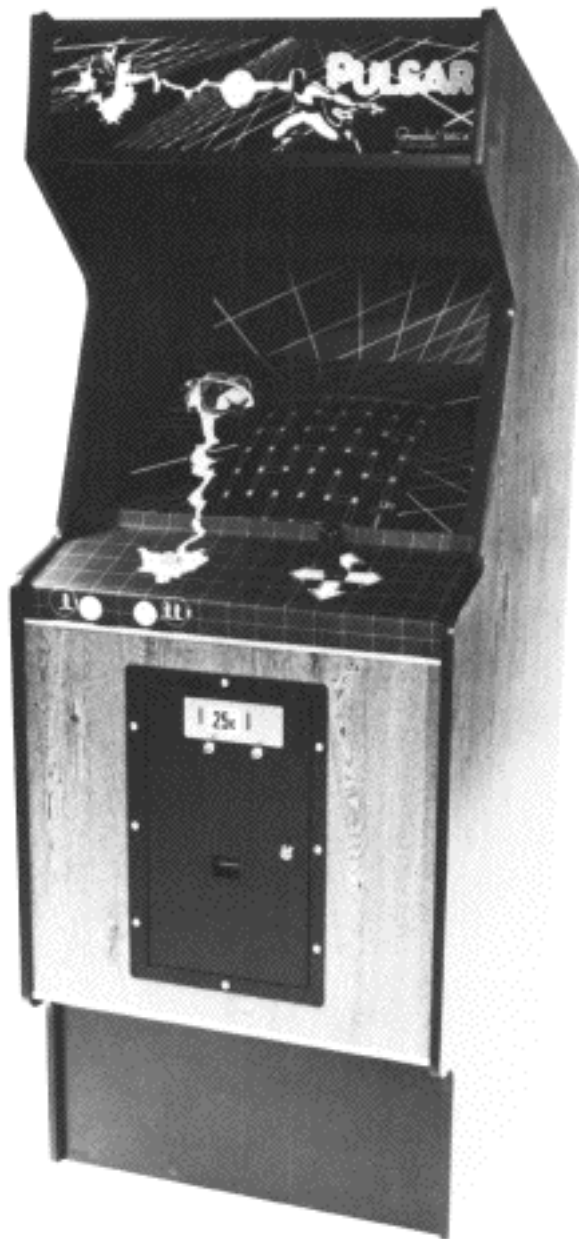
# **PULSAR™**

## **Owner's Manual**

**Manufactured By**

**Gremlin/SEGA®**  
TLX 910-335-1621

**PULSAR OWNER'S MANUAL**  
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# Game Concept

Pulsar is a one or two player game in which players maneuver their tank through a maze in an effort to secure keys necessary to unlock the gate to the next round. Players can move their tank up/down or right/left to maneuver through the maze.

## Game Play

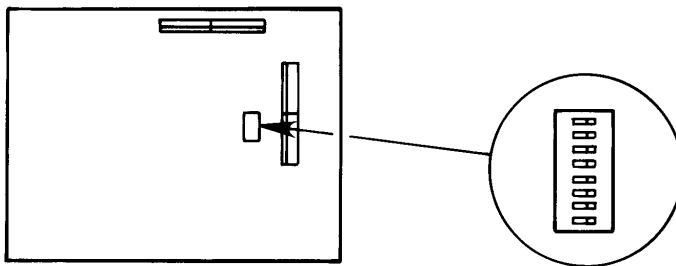
As players travel through the mazes, they are attacked by aliens. There are three distinct aliens and they can be destroyed to assure safe passage through the maze. The first round starts with two keys required to unlock the gate and each successive maze has another key added. The keys must be transported individually. To add further excitement, there is a force field that appears randomly, blocking passageways. If a player's tank is stationary and gets caught in the force field, it will be destroyed. As long as a player keeps his tank moving, it cannot be destroyed by the force field. Players must also keep track of their fuel status. Fuel decreases during the game play. When fuel is completely expended, the tank is destroyed. Players receive fuel when they destroy an alien and are completely refueled when they enter a new round.

## Scoring

Each alien ship destroyed is worth 100 points. Every key deposited in the proper lock scores 50 points (which increases with each round). Also if the keys are deposited in order (1 through 5), players receive a double bonus. With a two player game, players alternate after each tank. Players receive 2 to 5 tanks, which is operator adjustable. The game is over when all player's tanks are destroyed. The game ranks players from 1 to 30.

# Options Selection

Number of Ships	1	2	3	4	5	6	7	8
2 ships	OFF	OFF						
3 ships	OFF	ON						
4 ships	ON	OFF		Not Used			Not Used	
5 ships	ON	ON						

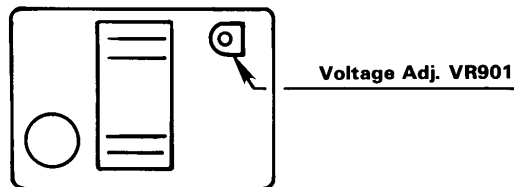
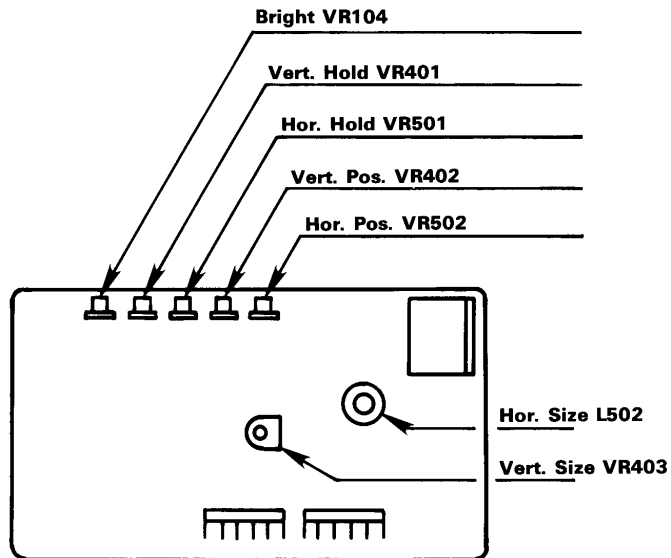
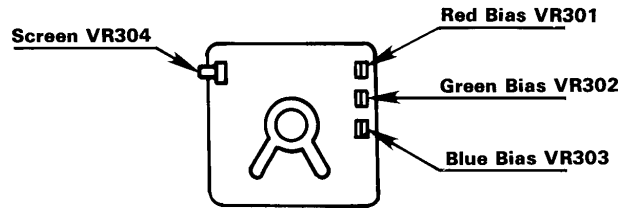


## Important Notes

The following note is included in compliance with FCC rules:

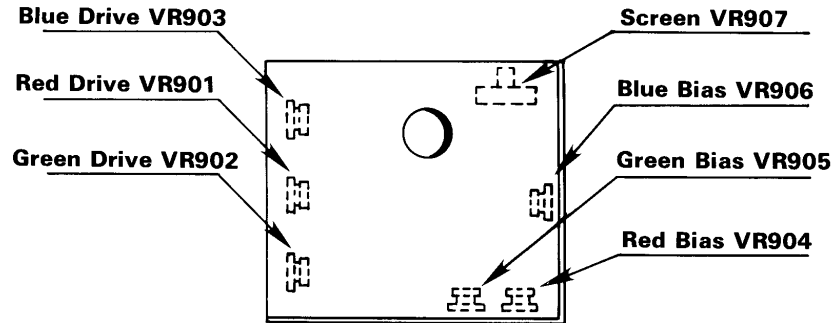
**WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. As temporarily permitted by regulation, it has not been tested for compliance with the limits for Class A computing devices pursuant to Subpart J of Part 15 FCC Rules, which are designed to provide reasonable protection against interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.**

# Color Monitor Adjustments (Nanao 19")

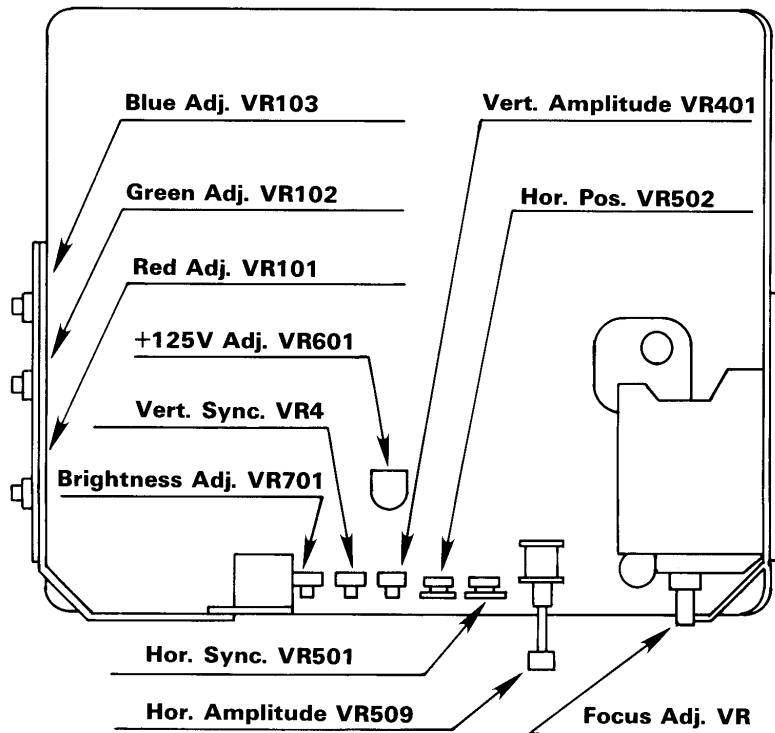


# Color Monitor Adjustments (NEC 19")

Adjustable Controls on Neck PCB



Adjustable Controls on Main PCB



## **Color Monitor Adjustments (NEC 19")**

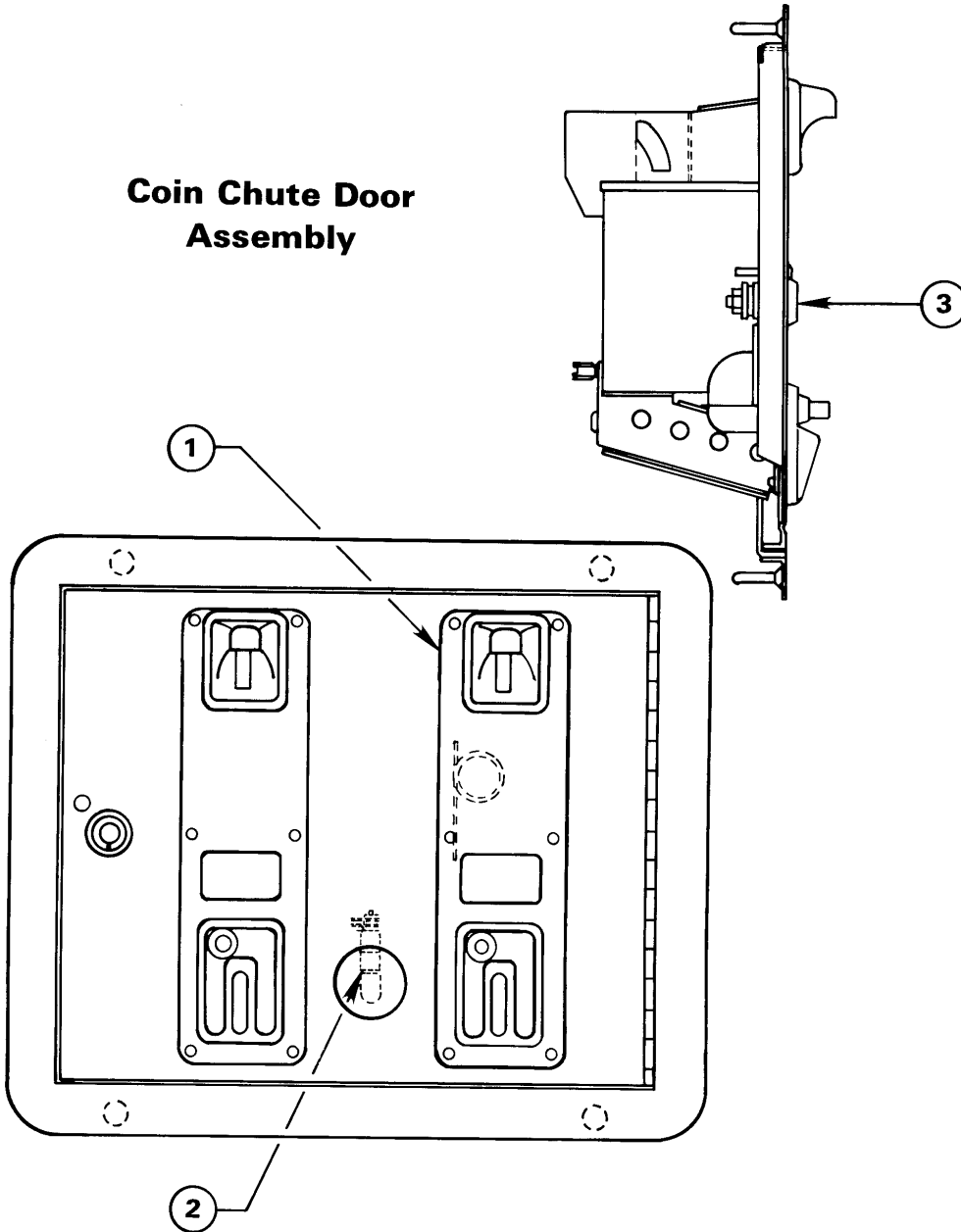
- 1. Brightness Adjustment (Sub-Bright R701)**  
The CRT beam current will increase brightness when turned clockwise.
- 2. Horizontal Amplitude (Amplitude in vertical direction as the H-size VR509 CRT is in the vertical direction)**  
Turn coil core clockwise to increase amplitude. Amplitude will be minimum when the core is turned counter clockwise and is at the top of the bobbin.
- 3. Vertical Amplitude (Amplitude in horizontal direction as the V-size VR401 CRT is in the horizontal direction)**  
Turn dual directional horizontal amplitude control clockwise to increase amplitude.
- 4. Vertical Position Adjustment (Horizontal position adjustment as the CRT is in the vertical direction)**  
If the chip inserted in K502 is inserted in K501, the center of the picture will shift to the right. If this chip is inserted in K503, the center of the picture will shift to the left.)
- 5. Vertical Sync. (Horizontal sync. as the V-Hold VR4 CRT is in the vertical direction)**  
This V-Hold control will stop flow of picture from left to right or right to left.
- 6. Horizontal Sync. (Vertical position adjustment as the H-Hold VR501 is in the vertical direction)**  
This control is to obtain synchronization when the horizontal oscillations or frequency drifts and slanted lines appear.  
Picture can be shifted down by turning this control clockwise within the range in which the picture will not commence to flow.
- 7. Setting the +B Voltage (VR601)**  
Adjust to the 125V line (TP91) is 15V. Turn clockwise to raise voltage.
- 8. Red Drive (R-Drive VR901), Blue Drive (B-Drive VR903)**  
Adjust mainly for bright white to white. When turned clockwise, it will be greenish (or bluish) white.
- 9. Red Bias (R-Bias VR904), Green Bias (G-Bias VR905), Blue Bias (B-Bias VR906)**  
These 3 controls are used mainly to adjust intermediate tones and white balance in the dark portions. When turned clockwise, this color will turn dark gray.  
If the white balance adjustments in 8 and 9 are carried out while changing green and blue drive instead of independently, not only will the bright white change but the color tone of the gray portion will also change. Conversely, even if the red, green and blue drives are changed, the color tone of the bright white portion will change.
- 10. Screen Adjustment (Screen VR907)**  
As in the case of the brightness adjustment, beam current will increase brightness when this control is turned clockwise. However, as white balance will be destroyed if the screen adjustment control is moved excessively, it would be advisable to adjust brightness with the brightness control. After completing brightness white balance adjustments in 7, 8 and 9, check and confirm that the beam current setting (DC voltage across) does not exceed -7.0V.
- 11. Focus**  
Adjust for clearest picture. It will always be desirable to carry out focus adjustments after brightness adjustments.



# COIN CHUTE ASSEMBLY

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>SEGA NO.</u>	<u>GREMLIN NO.</u>
1	Coin Mechanism, USA, 25¢	SGM-2862-2	220-0176
2	Bulb, 6-8v	S-91002	390-0037
3	Ace Cylinder Lock	LS-1064	220-0097

## Coin Chute Door Assembly



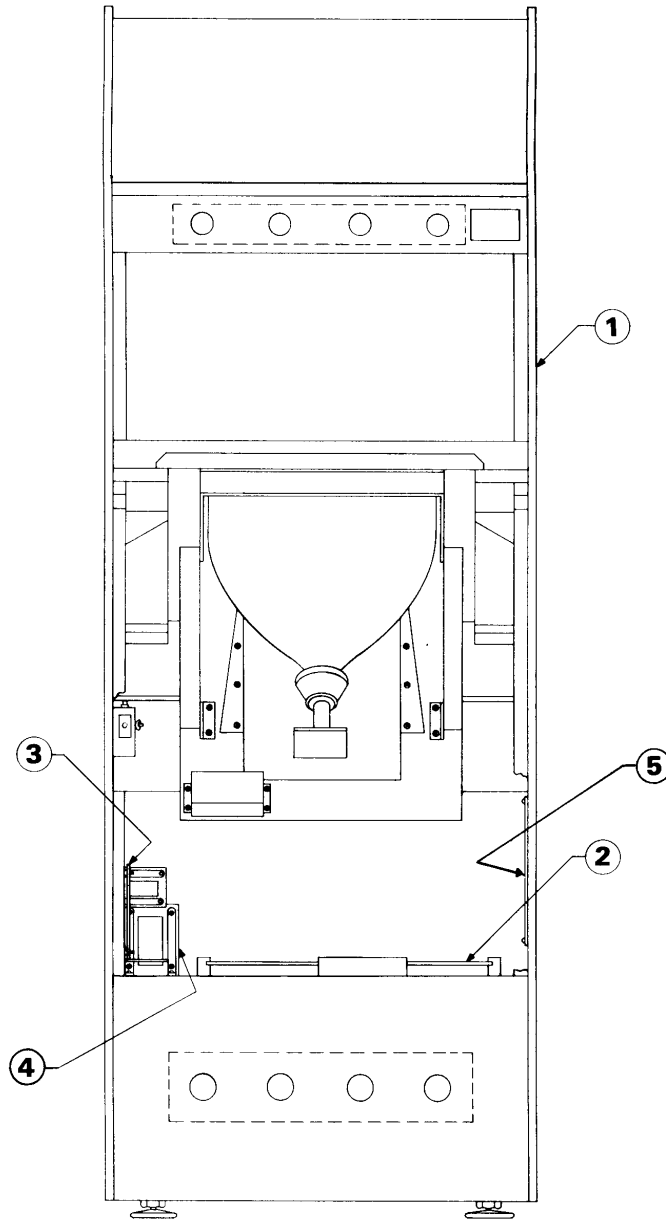
## **CONTROL PANEL ASSEMBLY**

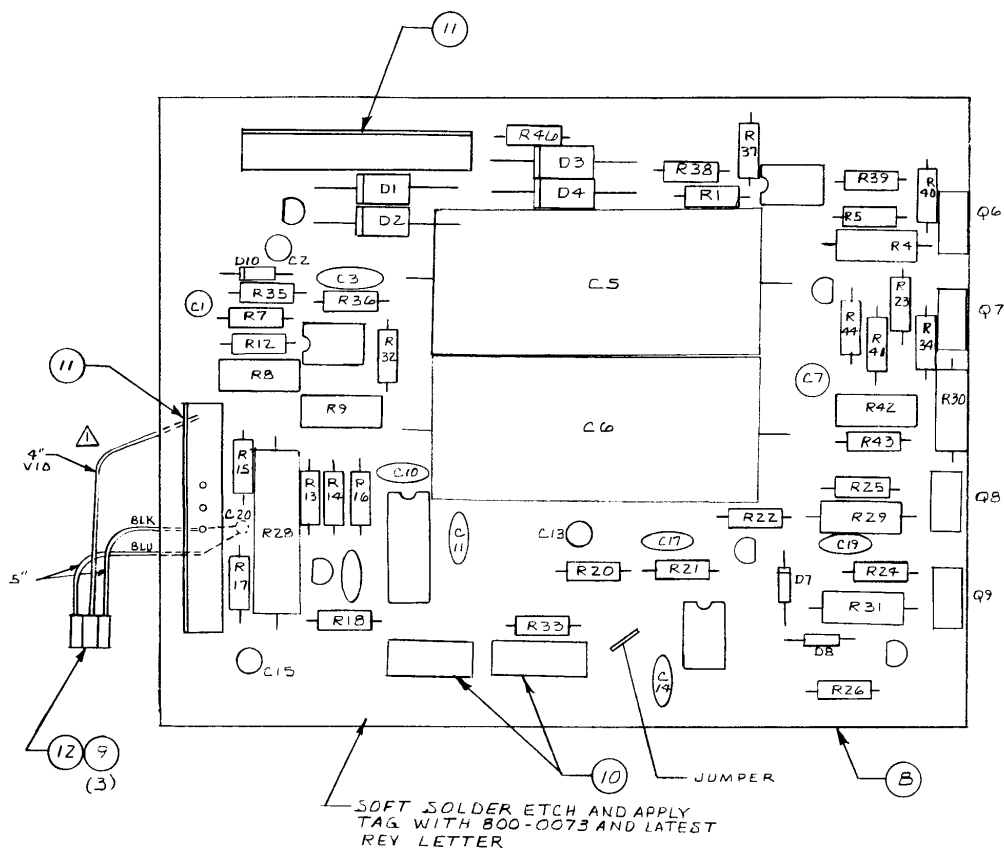
<b><u>ITEM NO.</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>SEGA NO.</u></b>	<b><u>GREMLIN NO.</u></b>
1	Control Panel, Pulsar Control Panel Graphic	PL-2002 PL-2002-B	250-0478 253-0210
2	Button Housing	FE-2002	601-0603
3	Push Button, Red	FL-1010	240-0108
4	Switch Base, B	MR-2003	102-0029
5	Handle Ball, Red	MP-1025	109-0007
6	Diaphragm, Rubber	FG-2005X	601-0397
7	Shaft	FG-2006	123-0058
8	Hub	FG-2007	601-0398
9	Slider Plate	TK-2008	117-0160
10	Spacer	TK-2009	280-0358
11	Push Button, Yellow	FL-1070	240-0107
12	Switch, Micro Type	S-91421	509-0048
13	Switch, Micro Type	S-96561	509-0114
14	Feather Key	S-82871	601-0623

## **UPRIGHT CABINET ASSEMBLY**

<b><u>ITEM NO.</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>GREMLIN NO.</u></b>
1	PULSAR UPRIGHT GAME	734-0039
2	ASSY DUAL LOGIC BOARD PULSAR	800-3147
3	ASSY GAME POWER SUPPLY	800-0072
4	TRANSFORMER ISOLATION	560-0051
5	ASSY SOUND BOARD PULSAR	800-0208

# Cabinet Assembly

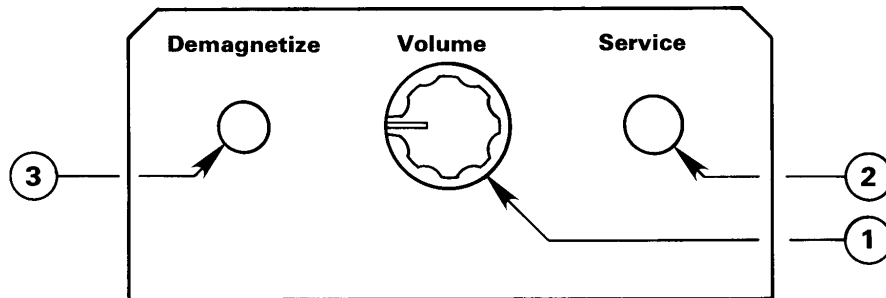




**Power Supply Assembly**

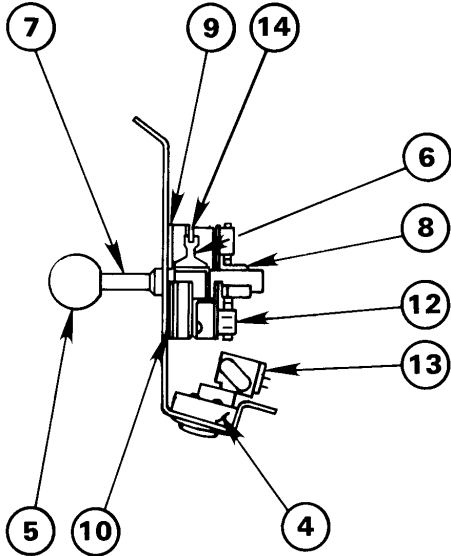
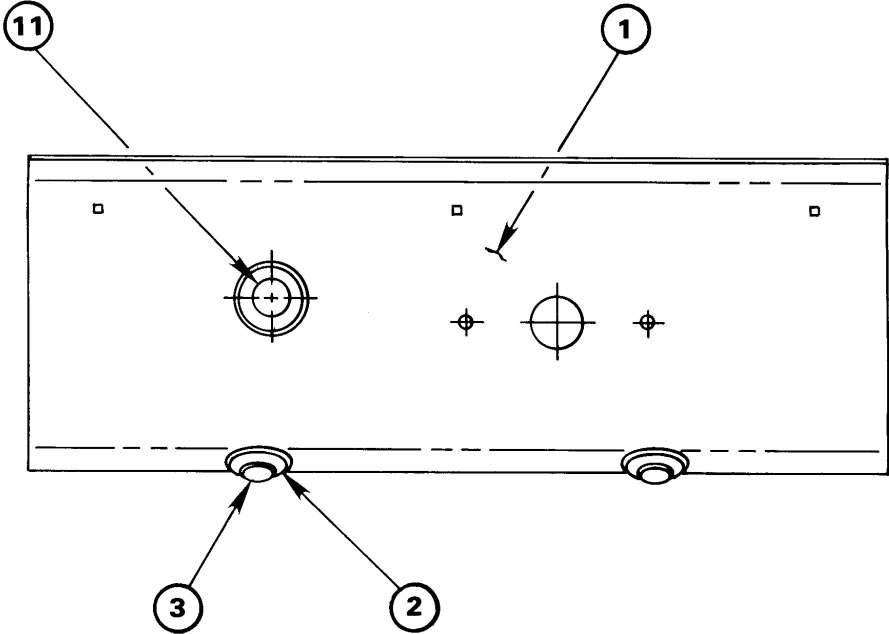
## OPERATOR PANEL ASSEMBLY

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>SEGA NO.</u>	<u>GREMLIN NO.</u>
1	Volume Control, B-25K ohm	S-93157	220-0111
2	Push Button Switch	S-93697	240-0105
3	Push Button Switch	S-96477	509-0119
	Noise Filter	S-96634	601-0429



**Operator Panel Assembly**

# Control Panel Assembly

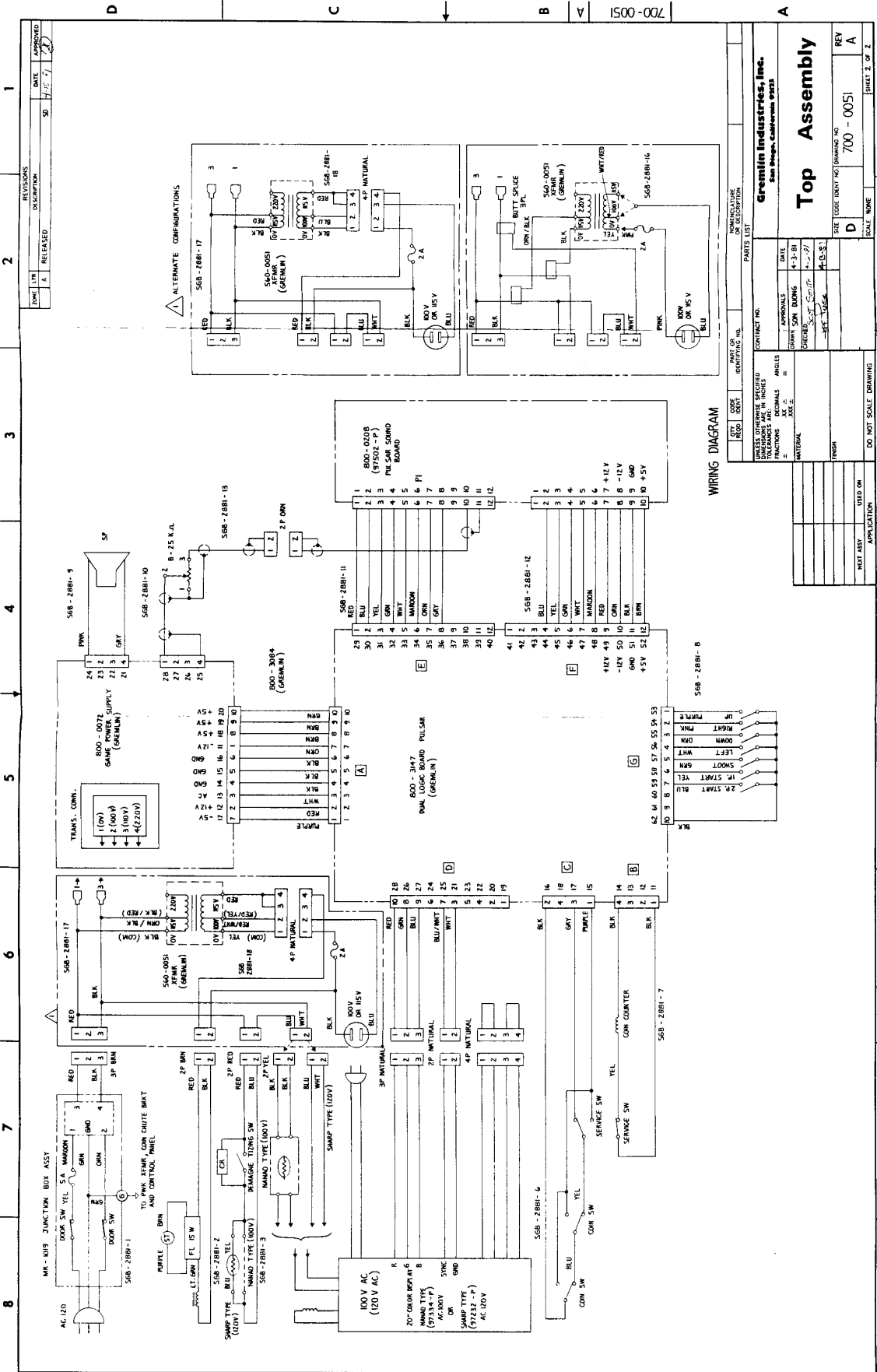


## POWER SUPPLY ASSEMBLY

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>GREMLIN NO.</u>	<u>REF DES</u>
1	CAP E 4700 uf 25V	150-0019	C 5, C 6
2	CAP CER .05 uf 50V	151-0001	C 11
3	CAP CER 100 pf 50 V	151-0002	C 17, C 19
4	CAP CER .001 uf 50 V	151-0008	C 10
5	CAP CER .01 uf 50 V	151-0011	C 12, C 14, C 16
6	CAP CER .1 uf 50 V	151-0012	C 3
7	CAP 10 uf 25 V	150-0088	C 1, C 2, C 7, C 13, C 15, C 20
8	PCB POWER SUPPLY	170-0082	
9	CONN CRIMP	211-0056	
10	CONN M 4 PIN	212-0004	
11	CONN M 10 PIN	212-0021	
12	CONN 3 CIR XSTR	212-0085	
13	1 C LM 723	313-0001	U 3
14	1 C LM 741 EN	313-0004	U 1, U 2, U 4
15	RES 100 OHM ½ W 5%	471-0101	R 15
16	RES 1 K OHM ½ W 5%	471-0102	R 5, 13, 17, 20, 22-24, 35, 36, 38, 39
17	RES 10 K OHM ½ W 5%	471-0103	R 1, R 4, R 21, R 37
18	RES 100 K OHM ½ W 5%	471-0104	R 33
19	RES 1.2 K OHM ½ W 5%	471-0122	R 18
20	RES 13 K OHM ½ W 5%	471-0133	R 41
21	RES 1.5 K OHM ½ W 5%	471-0152	R 16
22	RES 2.7 K OHM ½ W 5%	471-0272	R 7, R 25, R 26, R 43, R 46
23	RES 3.3 K OHM ½ W 5%	471-0332	R 32
24	RES 470 OHM ½ W 5%	471-0471	R 34, R 40
25	RES 47 K OHM ½ W 5%	471-0473	R 44
26	RES 5.6 K OHM ½ W 5%	471-0562	R 12
27	RES 0.5 OHM 1 W 5%	472-00R5	R 4, R 29-R 31
28	RES 0.1 OHM 5 W 5%	473-00R1	R 28
29	POT 1 K CAR PCMTV	475-0004	R 9
30	POT 2 K CAR PCMTV	475-0005	R 8, R 42
31	DIODE MR 501	481-0004	D 1-D 4
32	DIODE IN 914	481-0006	D 7, D 8
33	DIODE ZENER IN 5231	481-0008	D 10
34	XSTR 2 N 4403	482-0006	Q 1, Q 3, Q 4
35	XSTR TIP 110	482-0013	Q 6
36	XSTR 2 N 4401	482-0014	Q 2, Q 5
37	XSTR TIP 115	482-0015	Q 7
38	XSTR TIP 29	482-0016	Q 8, Q 9
39	SCHEMATIC	800-0072	







REV	DATE	APPROVED	REVISIONS	
			DESCRIPTION	BY

<b>Gremlin Industries, Inc.</b> San Diego, California 92131	
<b>Top Assembly</b>	REV A
700-0051	REVISION NO.
100V AC	SCALE
SHEET 2 OF 2	

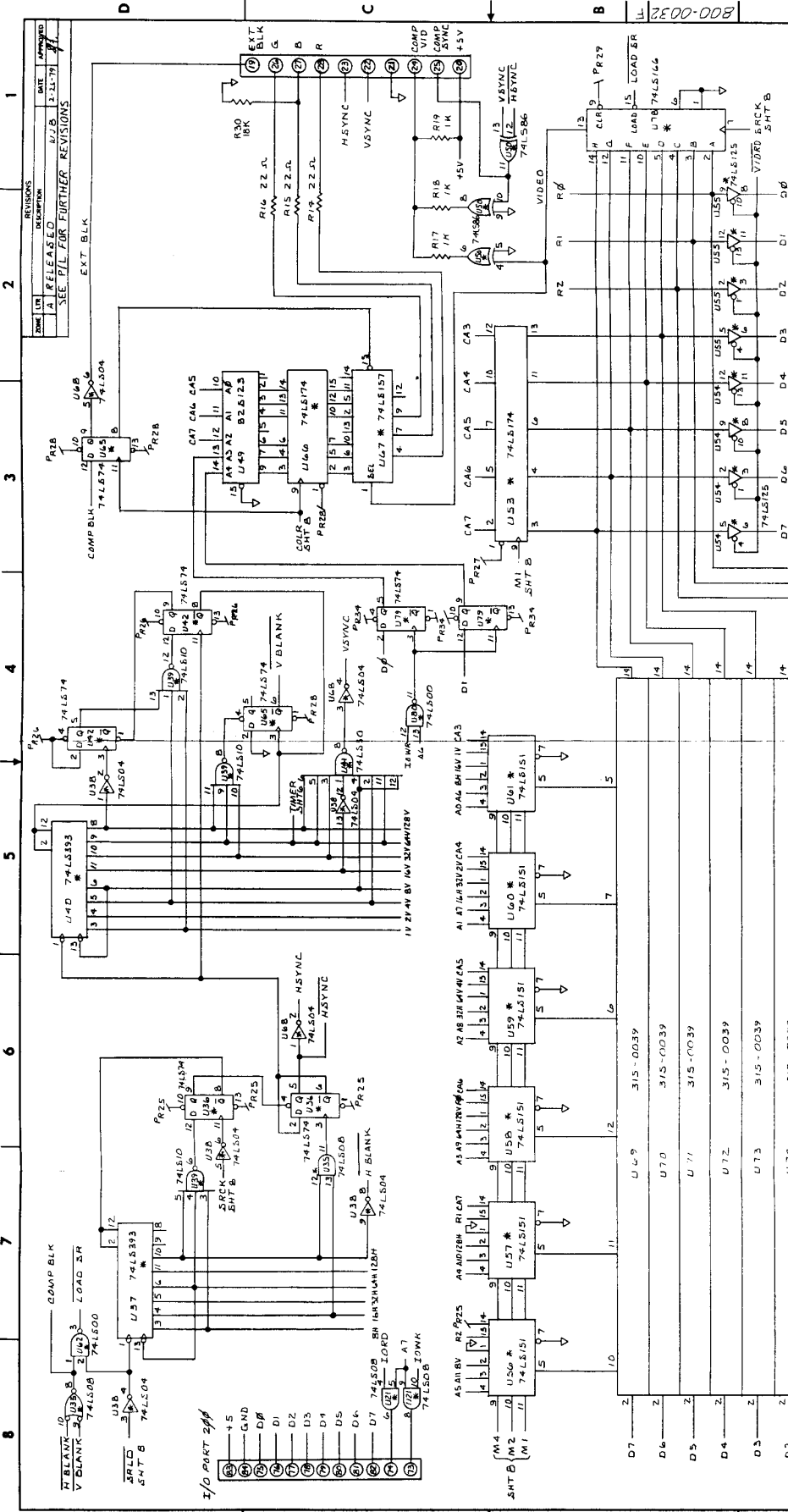
CONFERENCE NO.	DATE
4-3-81	
REVISIONS	BY
4-3-81	
APPROVED	DATE

UNIT	QTY	CODE	PART OR DESCRIPTION	NOMINATION OR DESCRIPTION	PARTS LIST	
					QTY	DESCRIPTION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	
FRACTIONS	DECIMALS
1/16"	0.0625"
1/8"	0.125"
1/4"	0.25"
3/8"	0.375"
1/2"	0.5"
3/4"	0.75"
1"	1.0"
1 1/8"	1.125"
1 1/4"	1.25"
1 3/8"	1.375"
1 1/2"	1.5"

DO NOT SCALE DRAWING
REVISIONS
USED SW
APPLICATION

700-0051



**Revisions Table:**

REV.	DESCRIPTION	DATE	APPROVED
1	RELEASED	10/8	2-11-79
2	SEE P/L FOR FURTHER REVISIONS		

**Part Specifications:**

REF. DESIGNATION	DESCRIPTION	MANUFACTURER
U01 - U100	74LS10	74LS10
U1 - U100	74LS00	74LS00
U31 - U100	74LS16	74LS16
U41 - U100	74LS04	74LS04

**Power Connections:**

Terminal	Label	Voltage
1	V SW	+5V
2	GND	0V
3	V SW	+5V
4	V SW	+5V
5	V SW	+5V
6	V SW	+5V
7	V SW	+5V

**Manufacturer and Model:**

**Greenlin Industries, Inc.**  
**Extended ROM Video Logic**

**Model Number:** 800-0032

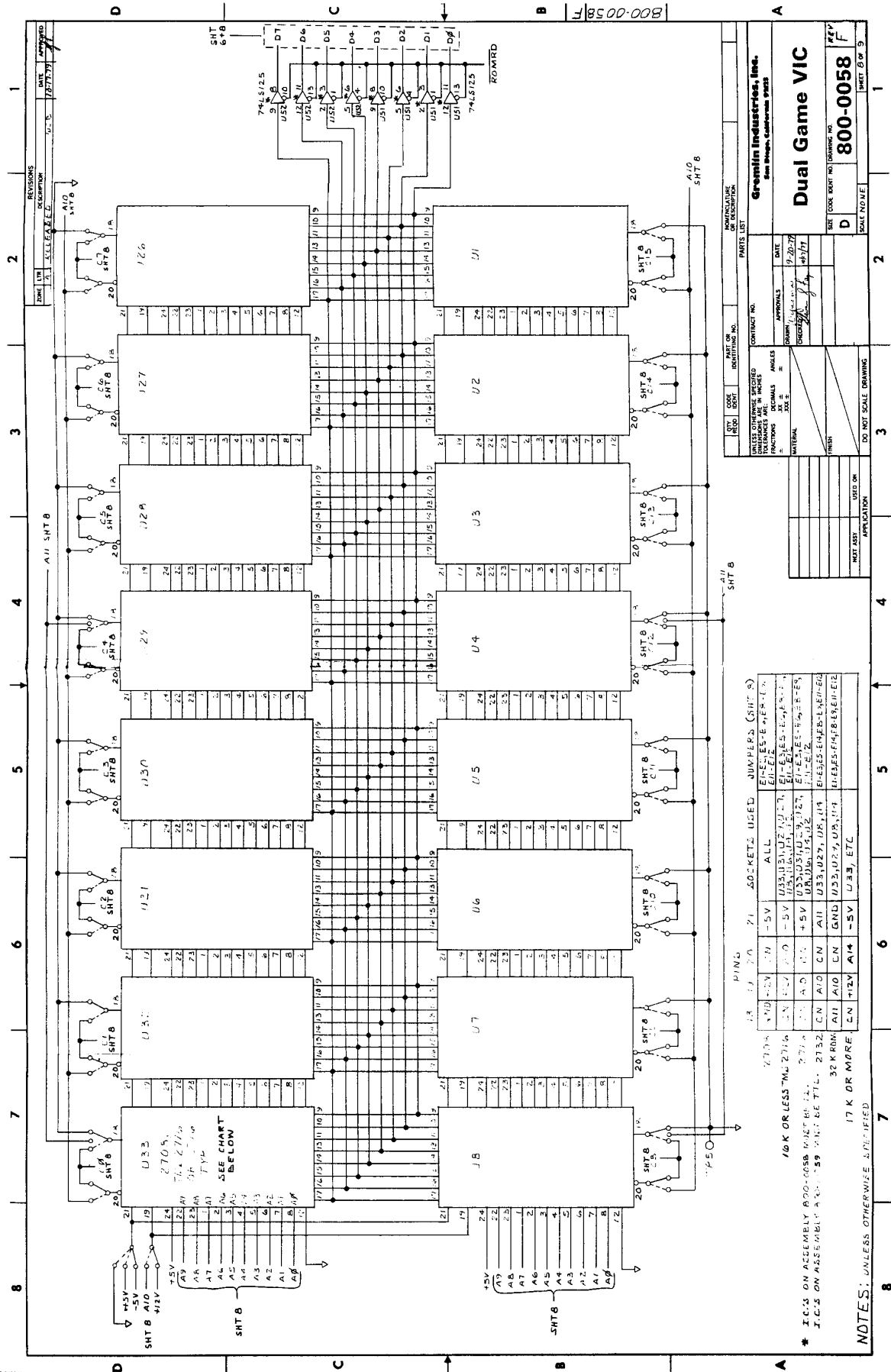
**Part Number:** 800-0032

**Date:** 1-11-76

**Scale:** NOT SCALE DRAWING

**Do Not Scale Drawing:** YES

**Application:** VIDEO LOGIC



REV.	DATE	DESCRIPTION	BY	APP'D.
1	10/7/79	REVISED		

QTY.	CODE	PART OR IDENTIFYING NO.	NOMINATING OR DESCRIPTION	PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DECIMALS	ANGLES	DATE
FRACTIONS	3/16		9/20/79
TOLERANCES			
MATERIAL			
FINISH			

CONTRACT NO.	ISSUED	REVISED	DATE

SIZE	LOOK RIGHT NO.	DRAWING NO.	REV.
D		800-0058	F
SCALE			
DO NOT SCALE DRAWING			

QTY.	CODE	PART OR IDENTIFYING NO.	NOMINATING OR DESCRIPTION	PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DECIMALS	ANGLES	DATE
FRACTIONS	3/16		9/20/79
TOLERANCES			
MATERIAL			
FINISH			

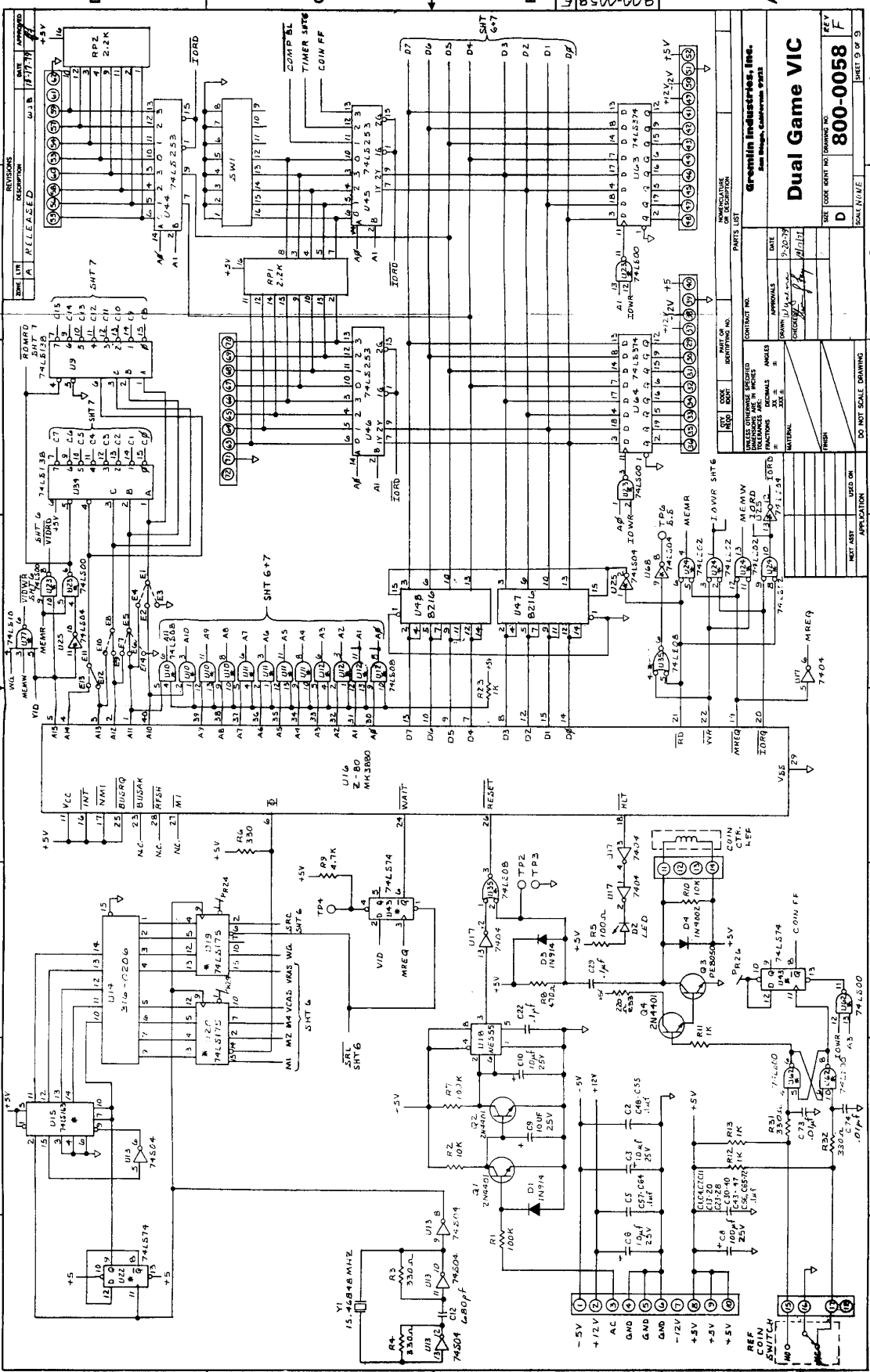
CONTRACT NO.	ISSUED	REVISED	DATE

SIZE	LOOK RIGHT NO.	DRAWING NO.	REV.
D		800-0058	F
SCALE			
DO NOT SCALE DRAWING			

**NOTES:** UNLESS OTHERWISE SPECIFIED:

PINS	JUMPERS (SHT. 8)		SOCKETS USED	
	13	14	71	72
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

\* I.C.'S ON ASSEMBLY 800-0058 MUST BE 12V.  
 I.C.'S ON ASSEMBLY 800-0059 MUST BE 77V.  
 32 K OHM;  
 17 K OHM OR MORE



REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

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REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

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REV	DATE	DESCRIPTION	BY	APP'D
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REV	DATE	DESCRIPTION	BY	APP'D
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REV	DATE	DESCRIPTION	BY	APP'D
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1	1/17/78	A. RELEASED		

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1	1/17/78	A. RELEASED		

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1	1/17/78	A. RELEASED		

REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

**Dual Game VIC**  
Gremlin Industries, Inc.  
San Diego, California 92123

REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

REV	DATE	DESCRIPTION	BY	APP'D
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REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

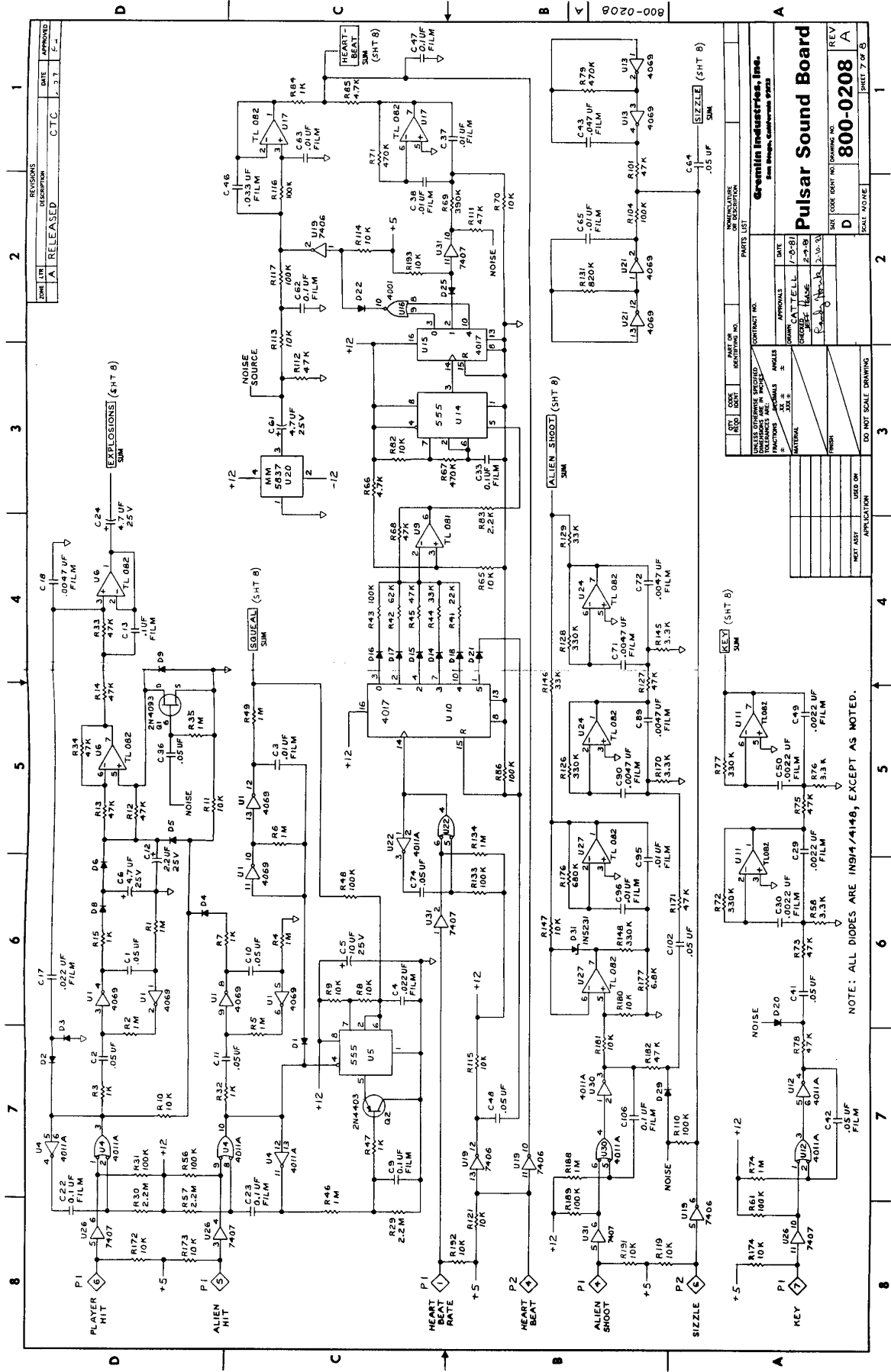
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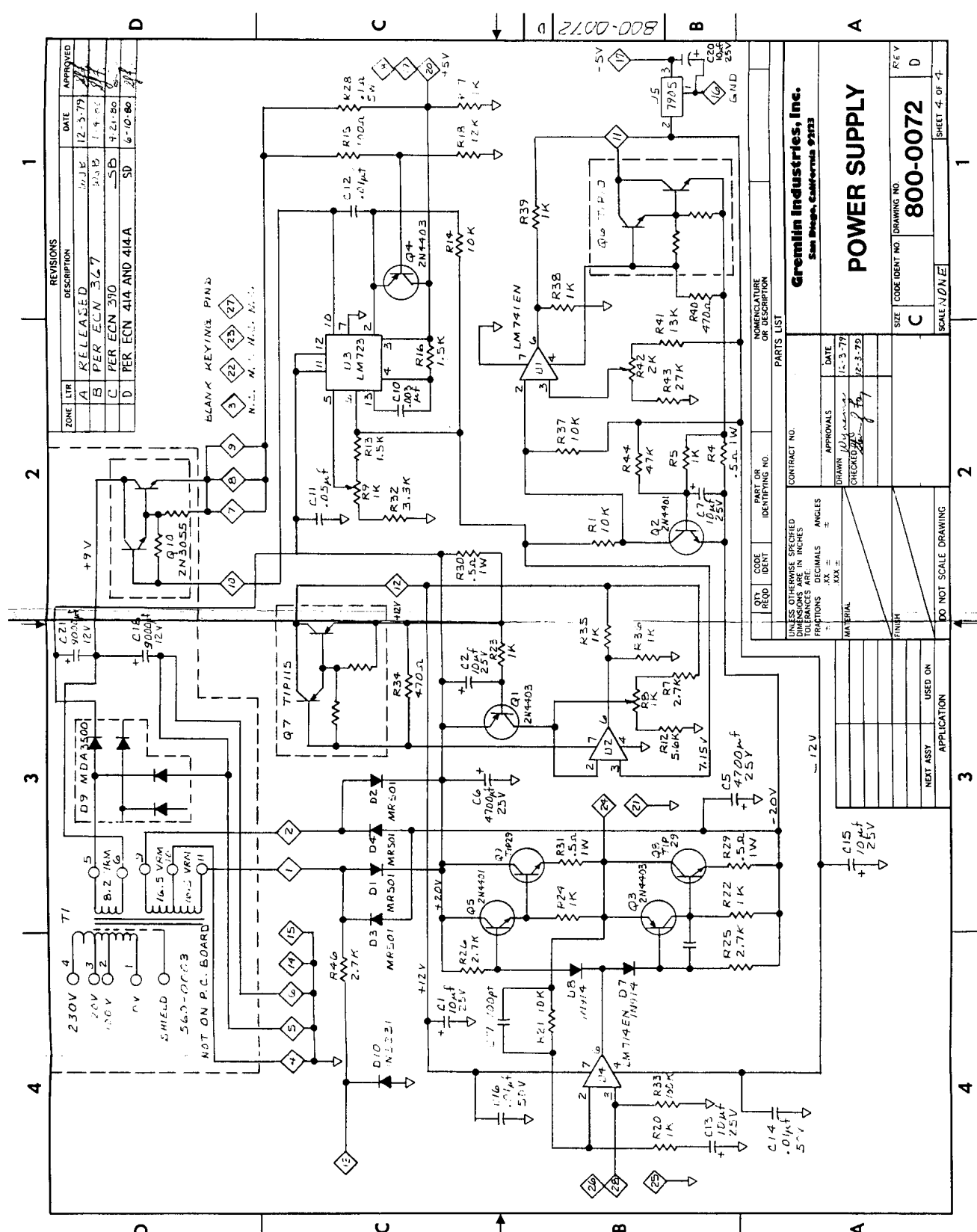
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REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		

REV	DATE	DESCRIPTION	BY	APP'D
1	1/17/78	A. RELEASED		







REVISIONS

ZONE LTR	DESCRIPTION	DATE	APPROVED
A	RELEASED	12-3-79	[Signature]
B	PER ECN 367	1-4-80	[Signature]
C	PER ECN 390	4-21-80	[Signature]
D	PER ECN 414 AND 414A	6-10-80	[Signature]

BLANK KEYING PINS  
 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30

800-0072

**Gremlin Industries, Inc.**  
 San Diego, California 92133

**POWER SUPPLY**

CONTRACT NO. \_\_\_\_\_  
 APPROVALS \_\_\_\_\_ DATE 12-3-79  
 DRAWN \_\_\_\_\_  
 CHECKED \_\_\_\_\_

SIZE	CODE IDENT NO.	DRAWING NO.	REV
		<b>800-0072</b>	<b>D</b>
SCALE	NONE		SHEET 4 OF 4

UNLESS OTHERWISE SPECIFIED  
 DIMENSIONS ARE IN INCHES  
 TOLERANCES ARE:  
 FRACTIONS .XXX  
 DECIMALS .XX  
 ANGLES .XXX

QTY	CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
REQD			

DO NOT SCALE DRAWING

FINISH	USED ON	APPLICATION