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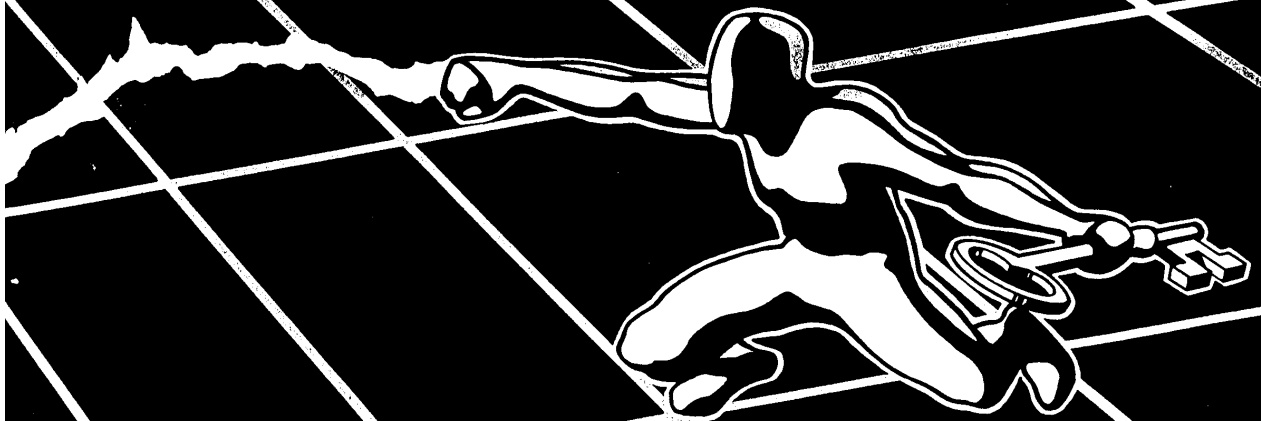
FLIPPERSPILL.COM

Gremlin/SEGA®

PULSAR™

Owner's Manual

Manual Part No. 420-0601



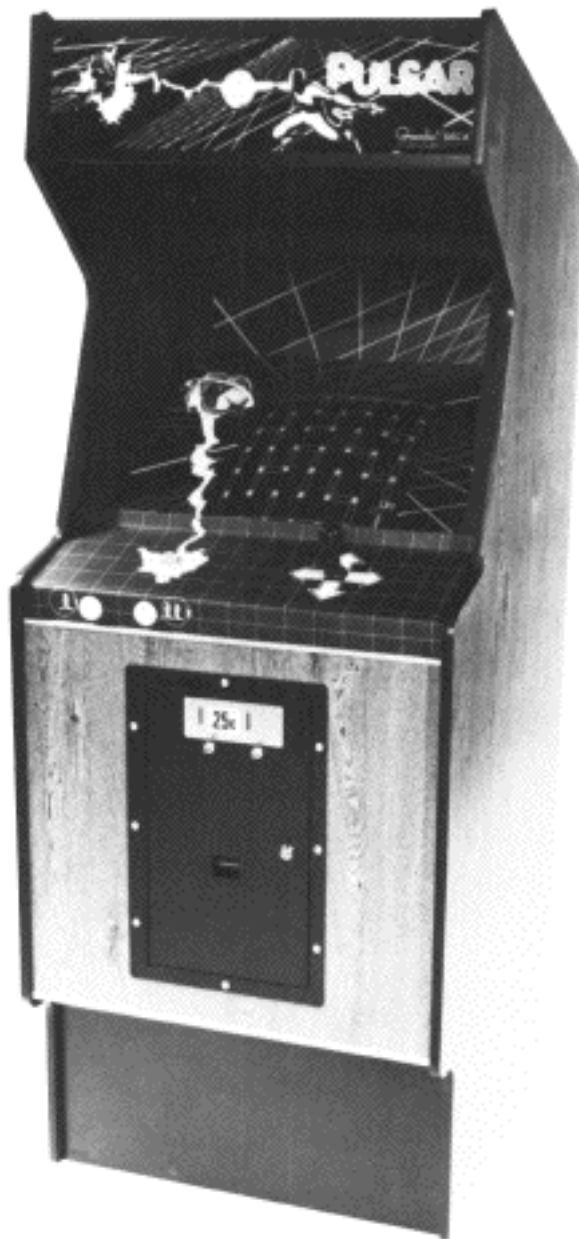
PULSAR™

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

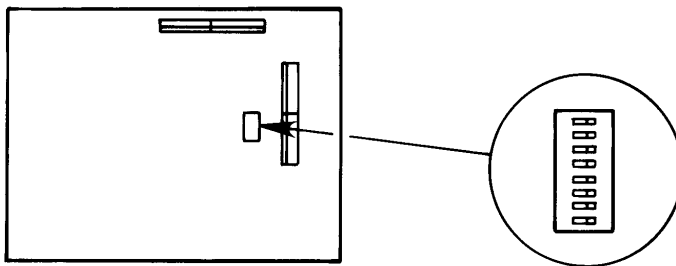
As players travel through the mazes, they are attacked by aliens. There are three distinct aliens and they can be destroyed to assure safe passage through the maze. The first round starts with two keys required to unlock the gate and each successive maze has another key added. The keys must be transported 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						

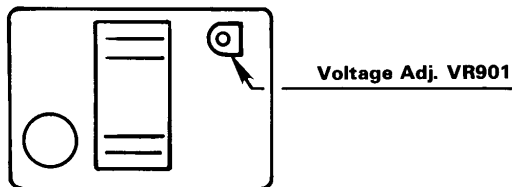
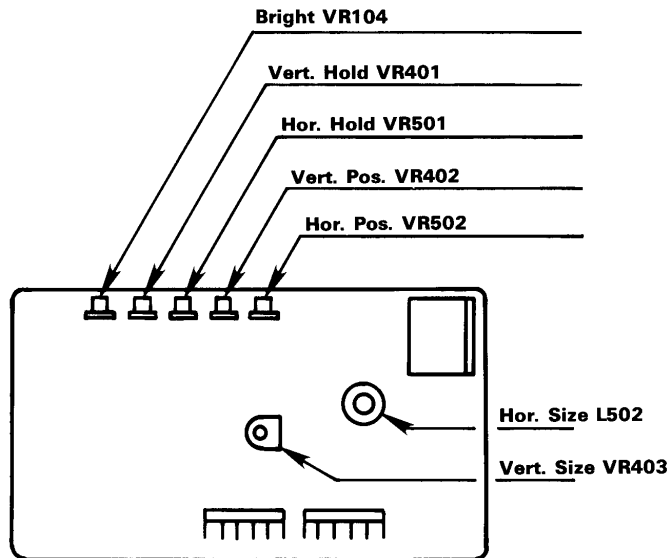
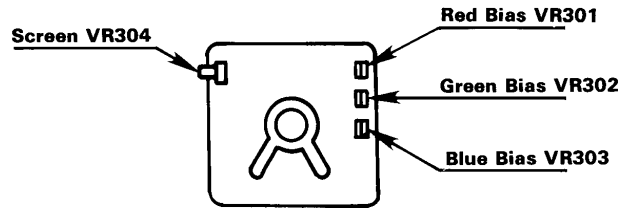


Important Notes

The following note is included in compliance with FCC rules:

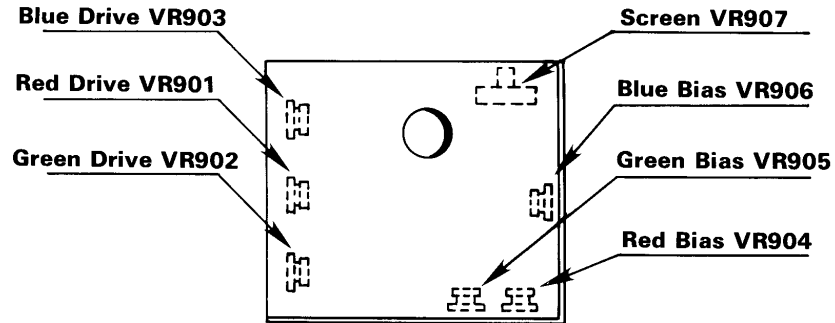
WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. As temporarily permitted by regulation, it has not been tested for compliance with the limits for Class 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")

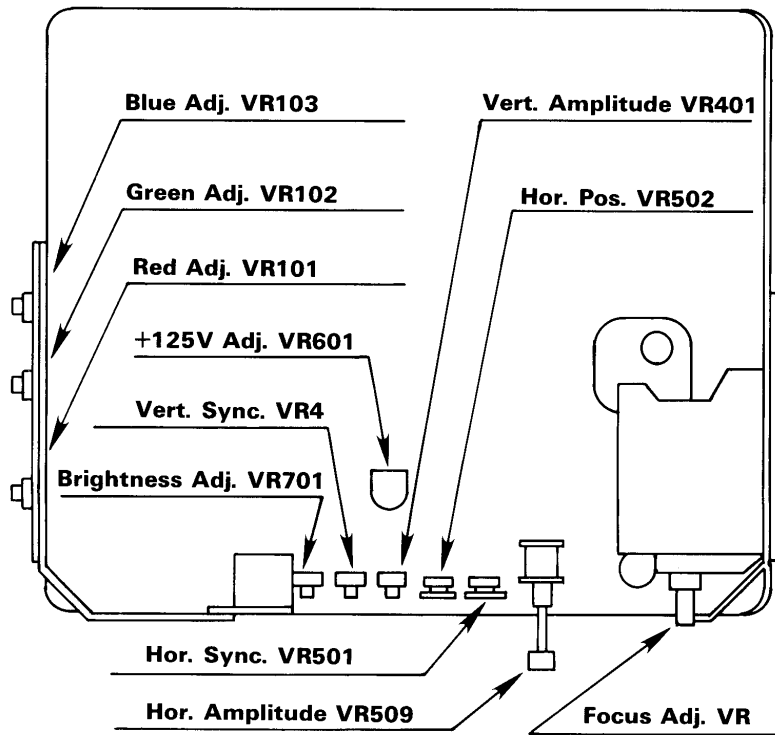


Color Monitor Adjustments (NEC 19")

Adjustable Controls on Neck PCB



Adjustable Controls on Main PCB



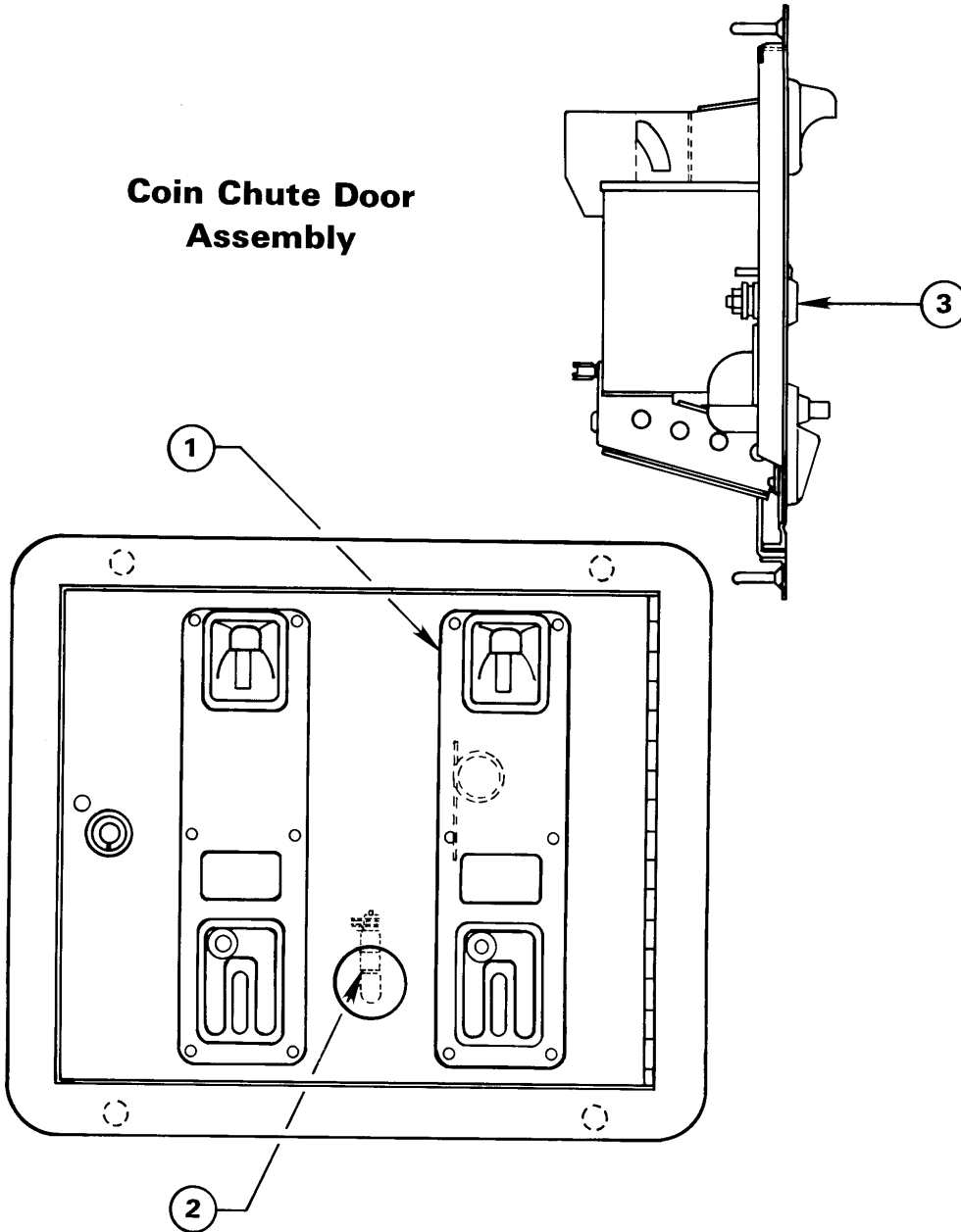
Color Monitor Adjustments (NEC 19")

- 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



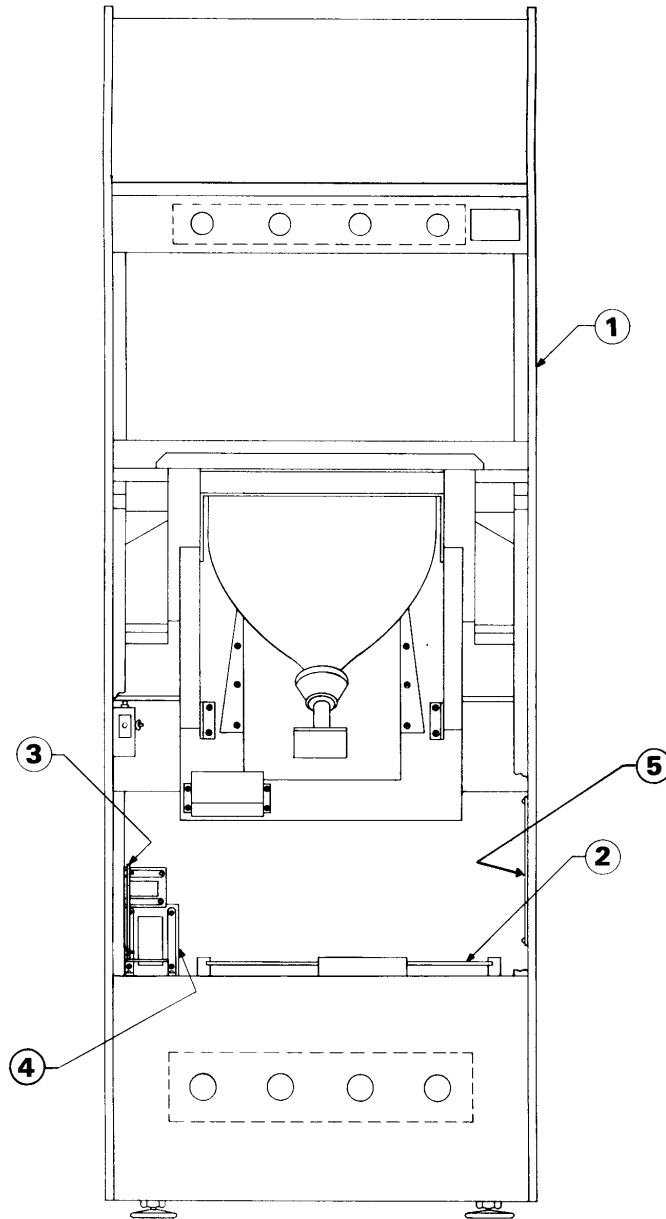
CONTROL PANEL ASSEMBLY

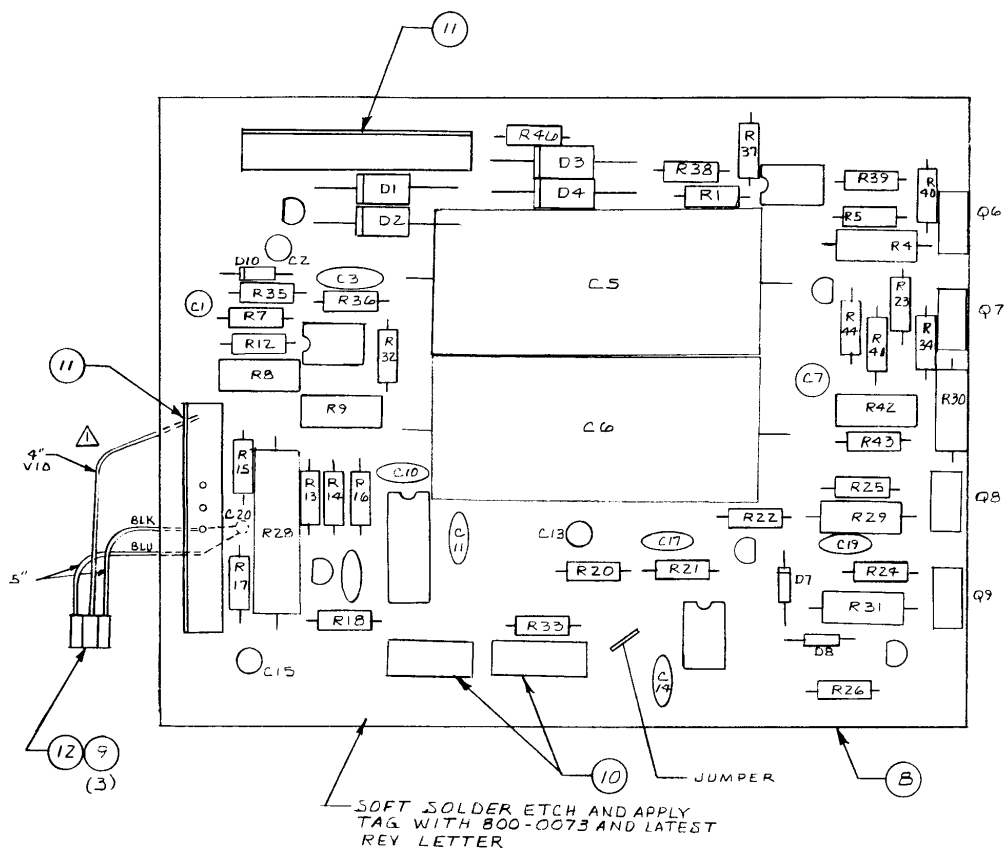
<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>SEGA NO.</u>	<u>GREMLIN NO.</u>
1	Control Panel, Pulsar Control Panel Graphic	PL-2002 PL-2002-B	250-0478 253-0210
2	Button Housing	FE-2002	601-0603
3	Push Button, Red	FL-1010	240-0108
4	Switch Base, B	MR-2003	102-0029
5	Handle Ball, Red	MP-1025	109-0007
6	Diaphragm, 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

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>GREMLIN NO.</u>
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

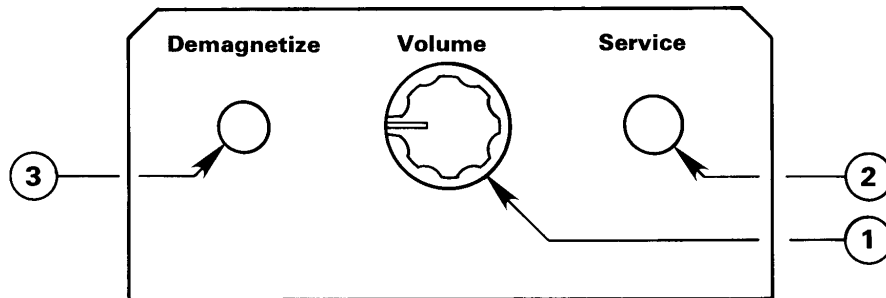




Power Supply Assembly

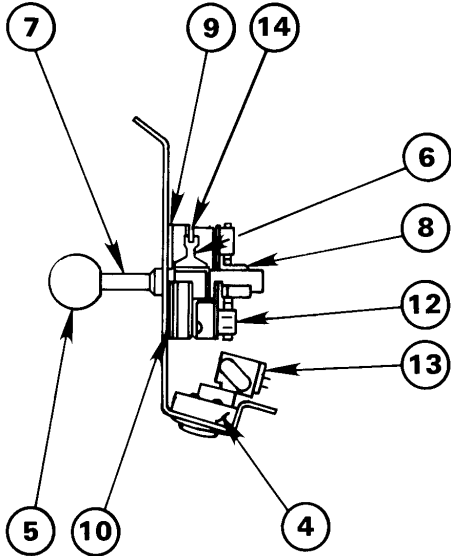
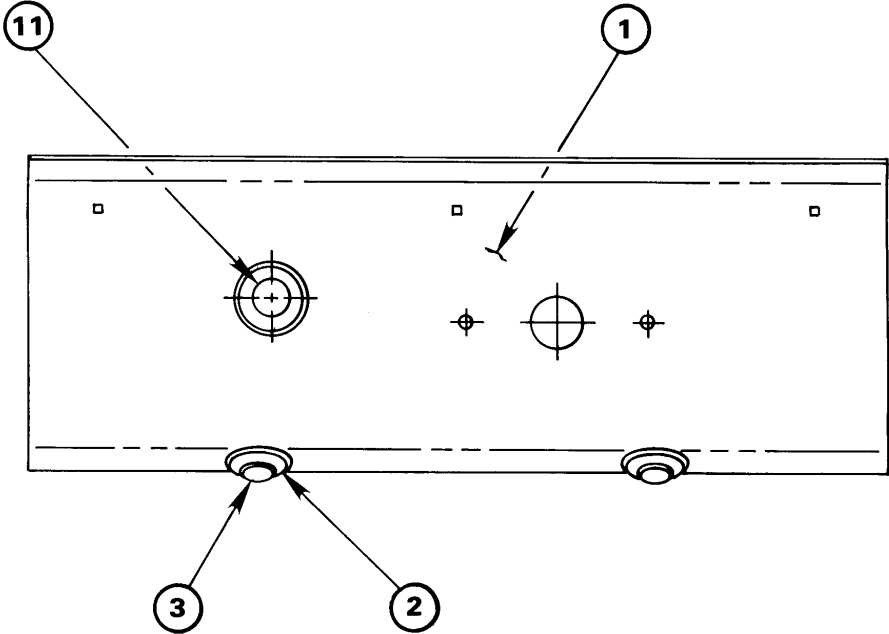
OPERATOR PANEL ASSEMBLY

<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



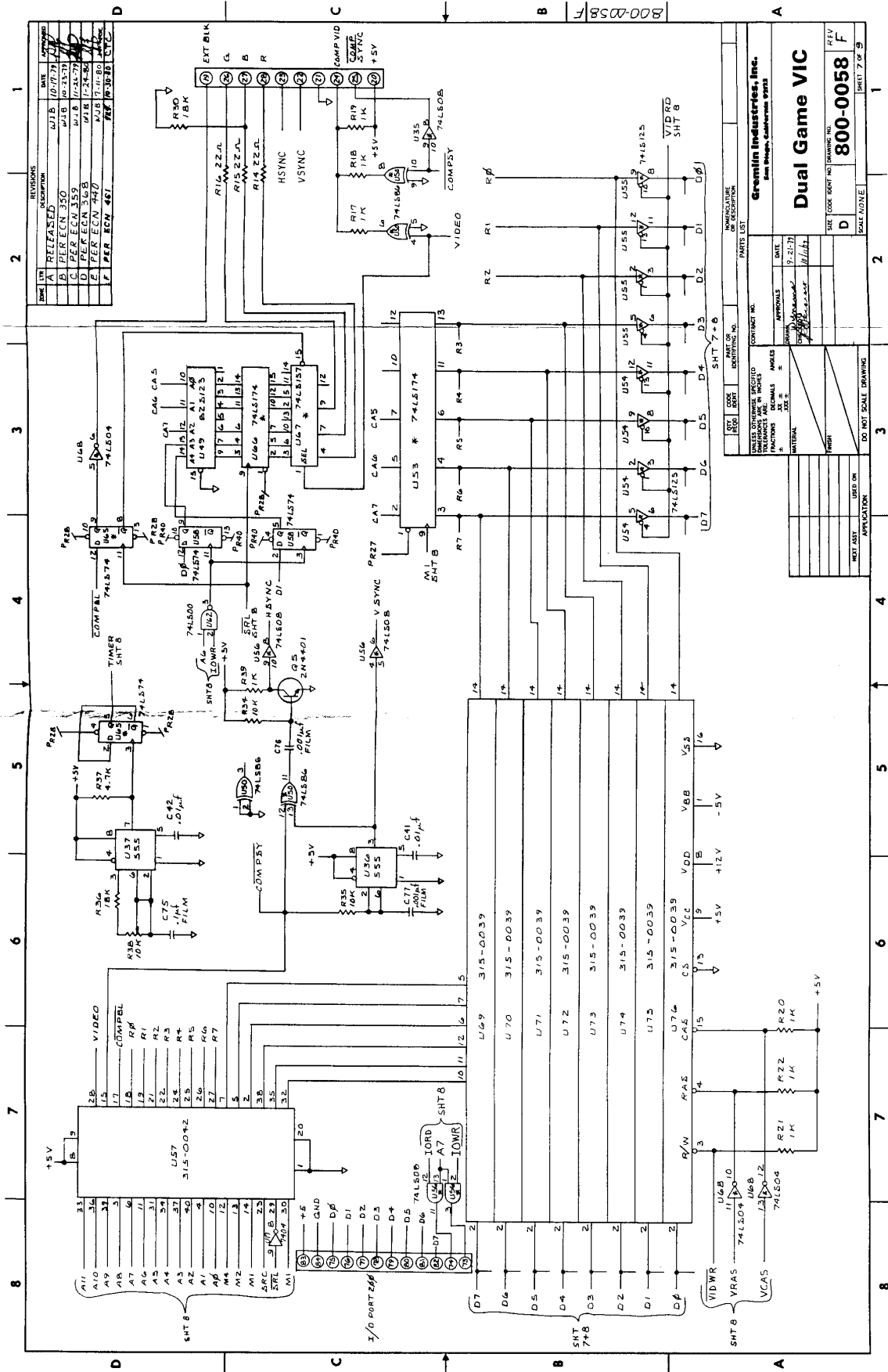
Operator Panel Assembly

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	



ZONE	REV	DESCRIPTION	DATE	APPROVED
A	1	RELEASED	10-17-79	UJ
B	1	PER ECN 350	10-18-79	UJ
C	1	PER ECN 359	11-23-79	UJ
D	1	PER ECN 360	11-23-79	UJ
E	1	PER ECN 361	11-23-79	UJ
F	1	PER ECN 467	10-30-80	UJ

REV	DESCRIPTION	DATE	APPROVED
D	SEE LOCK IDENT NO DRAWING NO.		
E	SEE LOCK IDENT NO DRAWING NO.		
F	SEE LOCK IDENT NO DRAWING NO.		

REV	DESCRIPTION	DATE	APPROVED
D	SEE LOCK IDENT NO DRAWING NO.		
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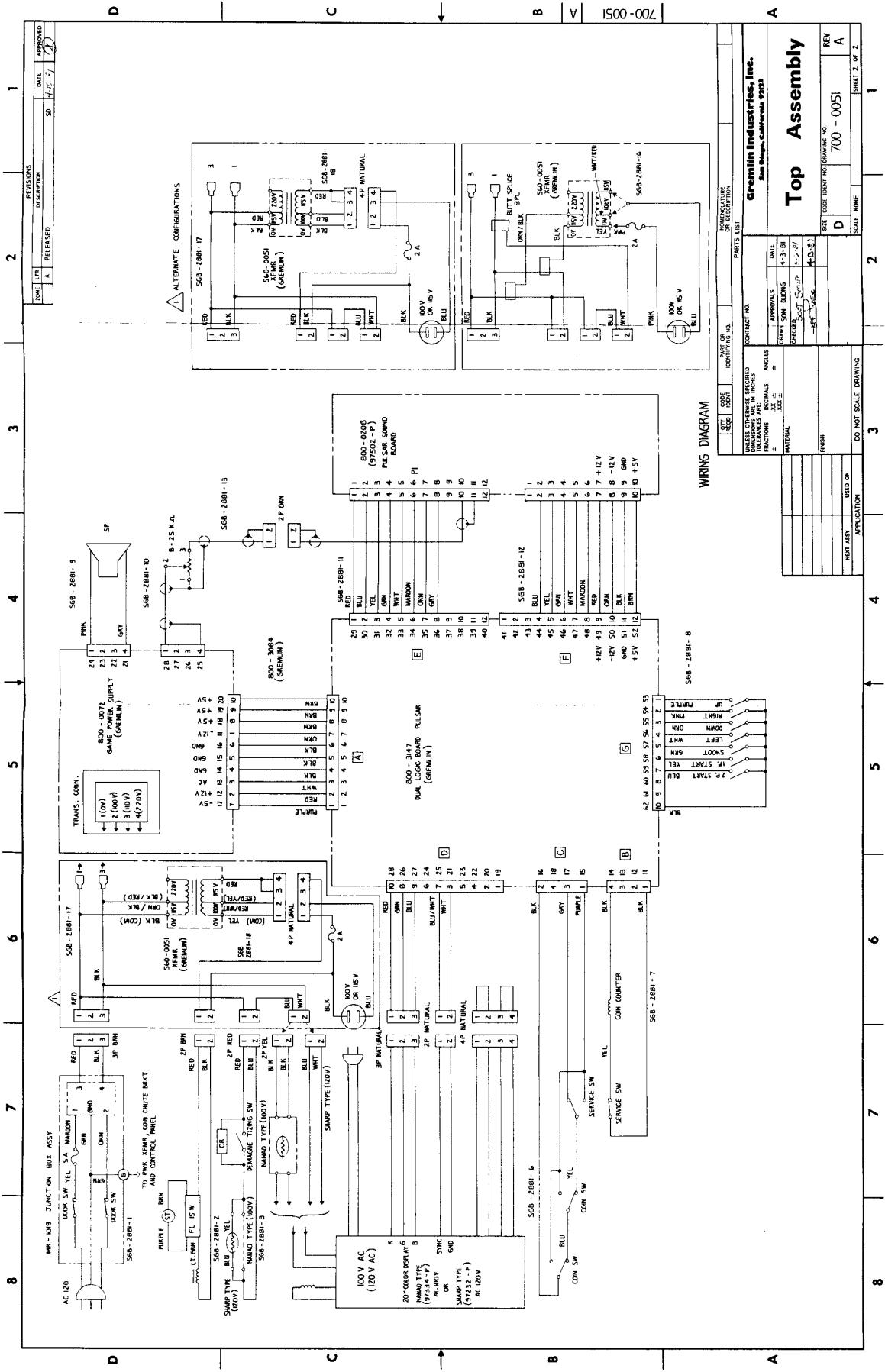
800-0058 F

Gremlin Industries, Inc.
San Diego, California 92133

Dual Game VIC

800-0058 F

REV 7/8/79



Gremlin Industries, Inc.
San Diego, California 92133

Top Assembly

CONFIDENTIAL NO. _____
 ORIGINALS 4-3-81
 DRAWN BY _____
 CHECKED BY _____
 DATE 4-13-81

SIZE 100% IDENT NO. DRAWING NO. 700-0051
 SCALE NONE
 SHEET 2 OF 2

WIRING DIAGRAM

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
 FRACTIONS 16/32
 DECIMALS .001
 TOLERANCES .005

MATERIAL _____
 FINISH _____

DO NOT SCALE DRAWING
 WIRE ASSY USED SW APPLICATION

100V AC (120V AC)
 20" COLOR RGR #6
 WAGO TYPE (97334-P)
 AC 200V
 SHARP TYPE (57334-P)
 AC 120V

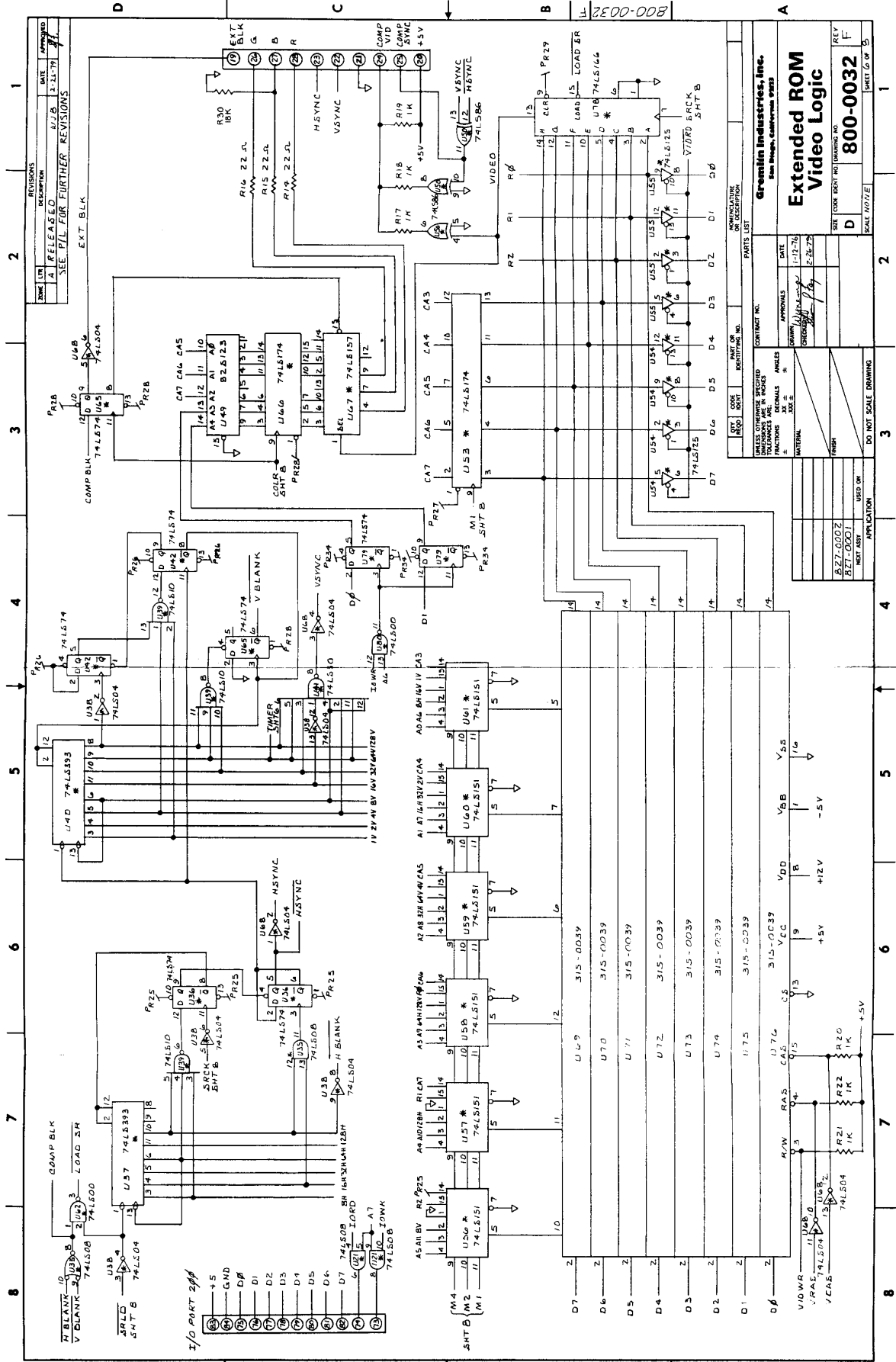
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100V AC (120V AC)
 20" COLOR RGR #6
 WAGO TYPE (97334-P)
 AC 200V
 SHARP TYPE (57334-P)
 AC 120V

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100V AC (120V AC)
 20" COLOR RGR #6
 WAGO TYPE (97334-P)
 AC 200V
 SHARP TYPE (57334-P)
 AC 120V

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

Gremlin Industries, Inc.
 EXTENDED ROM
 Video Logic

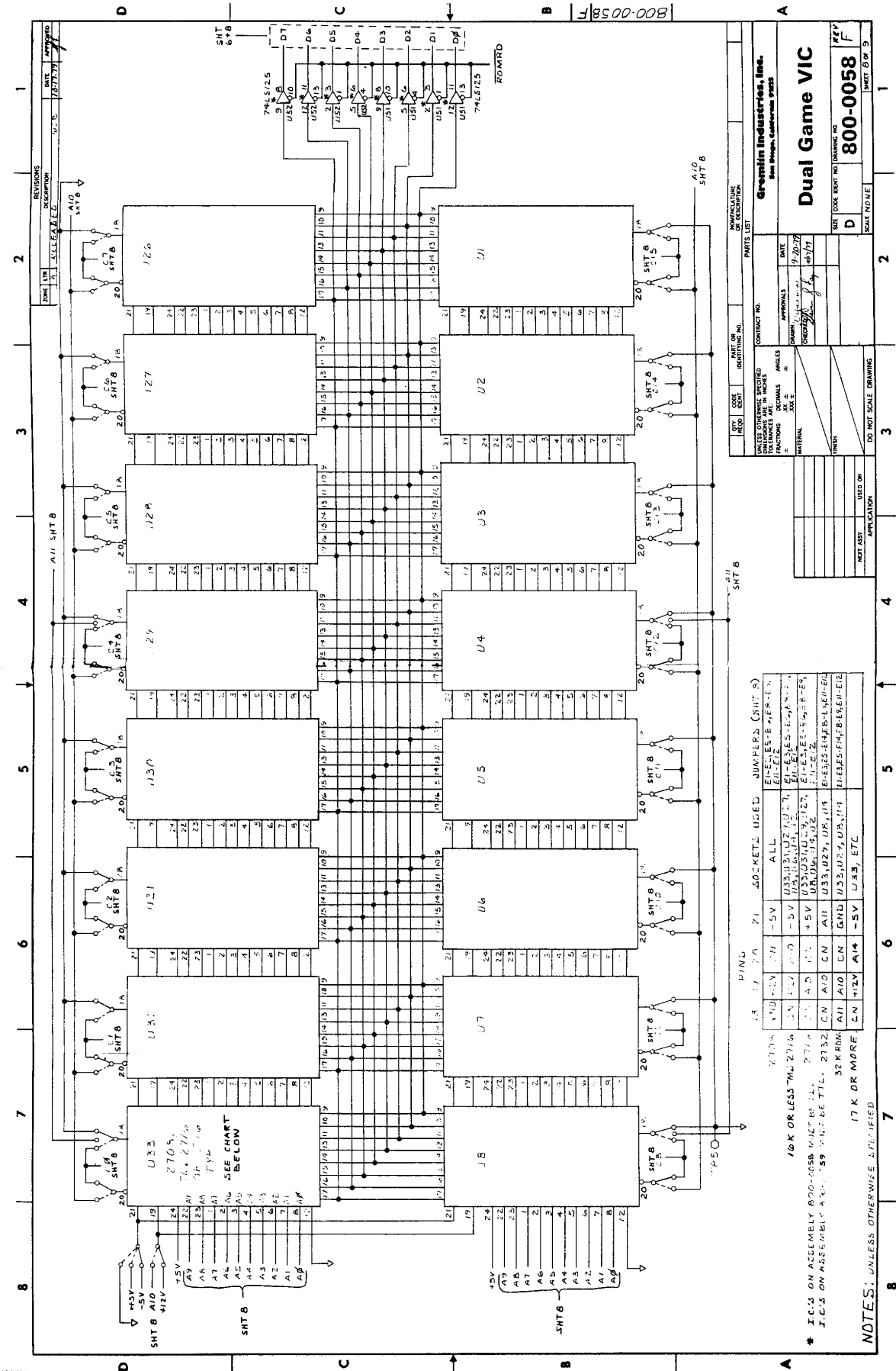
DATE: 1-12-79
 APPROVALS: [Signature]
 CHECKED: [Signature]

CONTRACT NO. [Blank]
 PARTS LIST: [Blank]

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 DECIMALS ARE TO 0.005
 FRACTIONS ARE TO 1/32

SCALE: 100%
 SHEET 6 OF 5

QTY	DESCRIPTION	MANUFACTURER	PARTS LIST
1	U40 74LS151	74LS151	
1	U41 74LS151	74LS151	
1	U42 74LS151	74LS151	
1	U43 74LS151	74LS151	
1	U44 74LS151	74LS151	
1	U45 74LS151	74LS151	
1	U46 74LS151	74LS151	
1	U47 74LS151	74LS151	
1	U48 74LS151	74LS151	
1	U49 74LS151	74LS151	
1	U50 74LS151	74LS151	
1	U51 74LS151	74LS151	
1	U52 74LS151	74LS151	
1	U53 74LS151	74LS151	
1	U54 74LS151	74LS151	
1	U55 74LS151	74LS151	
1	U56 74LS151	74LS151	
1	U57 74LS151	74LS151	
1	U58 74LS151	74LS151	
1	U59 74LS151	74LS151	
1	U60 74LS151	74LS151	
1	U61 74LS151	74LS151	
1	U62 74LS151	74LS151	
1	U63 74LS151	74LS151	
1	U64 74LS151	74LS151	
1	U65 74LS151	74LS151	
1	U66 74LS151	74LS151	
1	U67 74LS151	74LS151	
1	U68 74LS151	74LS151	
1	U69 74LS151	74LS151	
1	U70 74LS151	74LS151	
1	U71 74LS151	74LS151	
1	U72 74LS151	74LS151	
1	U73 74LS151	74LS151	
1	U74 74LS151	74LS151	
1	U75 74LS151	74LS151	
1	U76 74LS151	74LS151	
1	U77 74LS151	74LS151	
1	U78 74LS151	74LS151	
1	U79 74LS151	74LS151	
1	U80 74LS151	74LS151	
1	U81 74LS151	74LS151	
1	U82 74LS151	74LS151	
1	U83 74LS151	74LS151	
1	U84 74LS151	74LS151	
1	U85 74LS151	74LS151	
1	U86 74LS151	74LS151	
1	U87 74LS151	74LS151	
1	U88 74LS151	74LS151	
1	U89 74LS151	74LS151	
1	U90 74LS151	74LS151	
1	U91 74LS151	74LS151	
1	U92 74LS151	74LS151	
1	U93 74LS151	74LS151	
1	U94 74LS151	74LS151	
1	U95 74LS151	74LS151	
1	U96 74LS151	74LS151	
1	U97 74LS151	74LS151	
1	U98 74LS151	74LS151	
1	U99 74LS151	74LS151	
1	U100 74LS151	74LS151	



800-0058 F

Greenlin Industries, Inc.
San Diego, California 92161

Dual Game VIC

SIZE (SEE RIGHT) DRAWING NO. **800-0058 F**
SCALE NO. 1

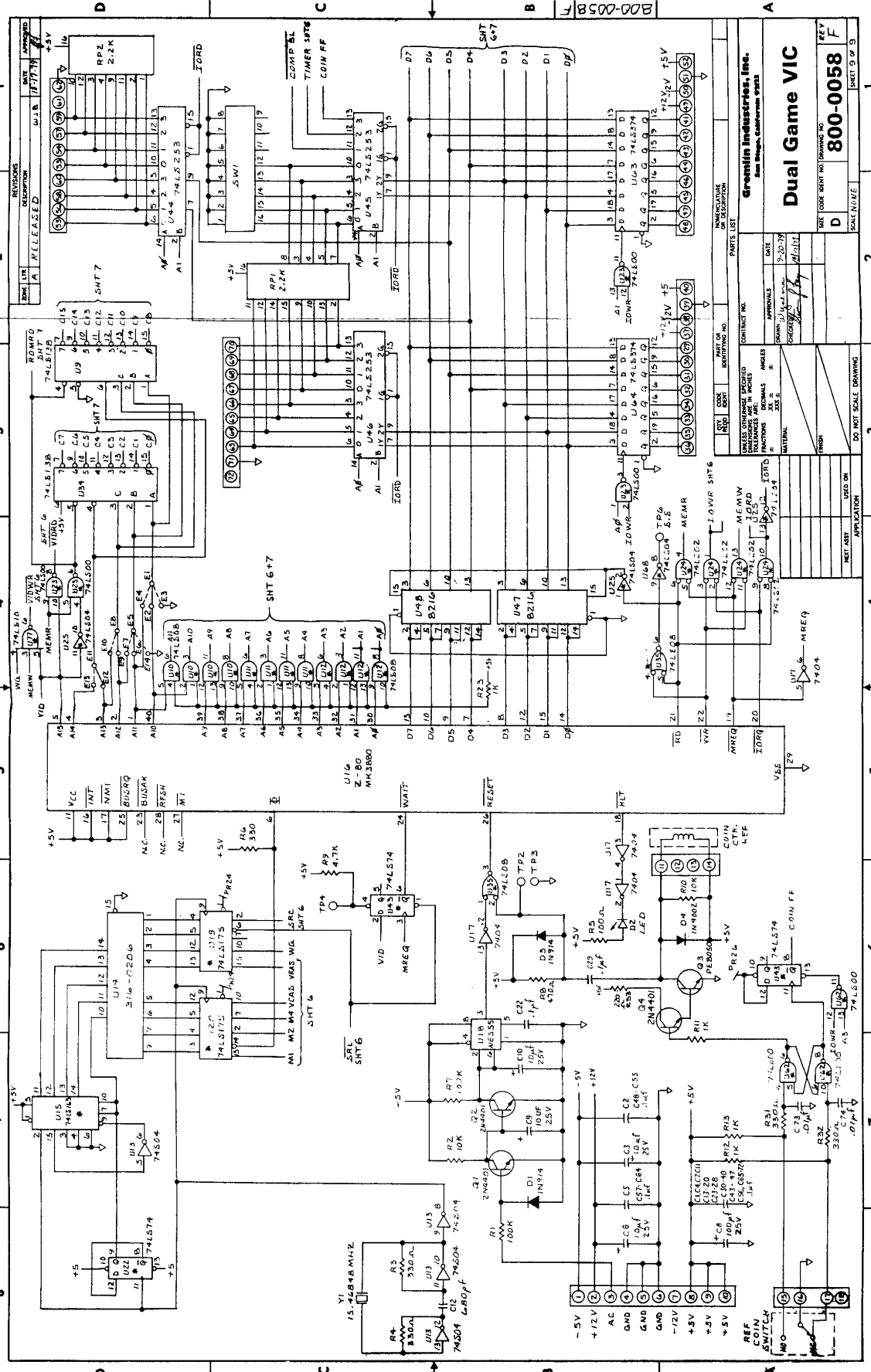
REV.	DATE	DESCRIPTION
1	07/75	ISSUE

QTY.	CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	PAGES LIST
1	IC	74LS125	MONOMONITOR	1
1	IC	74LS123	MONOMONITOR	1
1	IC	74LS125	MONOMONITOR	1
1	IC	74LS123	MONOMONITOR	1
1	IC	74LS125	MONOMONITOR	1
1	IC	74LS123	MONOMONITOR	1
1	IC	74LS125	MONOMONITOR	1
1	IC	74LS123	MONOMONITOR	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DECIMALS	FRACTIONS	ANGLES	DATE
FRAC.	0.1	1/16	30°	9/2/77
DEC.	0.01			
MATERIAL	SEE DRAWING			
FINISH	SEE DRAWING			
TEST ASY.	SEE DRAWING			
USED ON	SEE DRAWING			
DO NOT SCALE DRAWING	SEE DRAWING			

PINS	SOCKETS USED		JUMPERS (SHT. 8)
	U1	U2	
1	U1	U2	ALL
2	U1	U2	U1-2, U2-2
3	U1	U2	U1-3, U2-3
4	U1	U2	U1-4, U2-4
5	U1	U2	U1-5, U2-5
6	U1	U2	U1-6, U2-6
7	U1	U2	U1-7, U2-7
8	U1	U2	U1-8, U2-8
9	U1	U2	U1-9, U2-9
10	U1	U2	U1-10, U2-10
11	U1	U2	U1-11, U2-11
12	U1	U2	U1-12, U2-12
13	U1	U2	U1-13, U2-13
14	U1	U2	U1-14, U2-14
15	U1	U2	U1-15, U2-15
16	U1	U2	U1-16, U2-16
17	U1	U2	U1-17, U2-17
18	U1	U2	U1-18, U2-18
19	U1	U2	U1-19, U2-19
20	U1	U2	U1-20, U2-20

* I.C.'S ON ASSEMBLY 800-0058 MUST BE 74LS125 OR 74LS123.
I.C.'S ON ASSEMBLY 800-0059 MUST BE 74LS125 OR 74LS123.
32 K OHM
17 K OHM OR MORE
NOTES: UNLESS OTHERWISE SPECIFIED



Dual Game VIC
 Gremlin Industries, Inc.
 San Diego, California 92161

REV	DATE	DESCRIPTION
1	9-20-79	INITIAL DESIGN
2	10-10-79	REVISED FOR MANUFACTURE
3	11-15-79	REVISED FOR MANUFACTURE
4	12-15-79	REVISED FOR MANUFACTURE
5	1-15-80	REVISED FOR MANUFACTURE
6	2-15-80	REVISED FOR MANUFACTURE
7	3-15-80	REVISED FOR MANUFACTURE
8	4-15-80	REVISED FOR MANUFACTURE

REV	DATE	DESCRIPTION
1	9-20-79	INITIAL DESIGN
2	10-10-79	REVISED FOR MANUFACTURE
3	11-15-79	REVISED FOR MANUFACTURE
4	12-15-79	REVISED FOR MANUFACTURE
5	1-15-80	REVISED FOR MANUFACTURE
6	2-15-80	REVISED FOR MANUFACTURE
7	3-15-80	REVISED FOR MANUFACTURE
8	4-15-80	REVISED FOR MANUFACTURE

REV	DATE	DESCRIPTION
1	9-20-79	INITIAL DESIGN
2	10-10-79	REVISED FOR MANUFACTURE
3	11-15-79	REVISED FOR MANUFACTURE
4	12-15-79	REVISED FOR MANUFACTURE
5	1-15-80	REVISED FOR MANUFACTURE
6	2-15-80	REVISED FOR MANUFACTURE
7	3-15-80	REVISED FOR MANUFACTURE
8	4-15-80	REVISED FOR MANUFACTURE

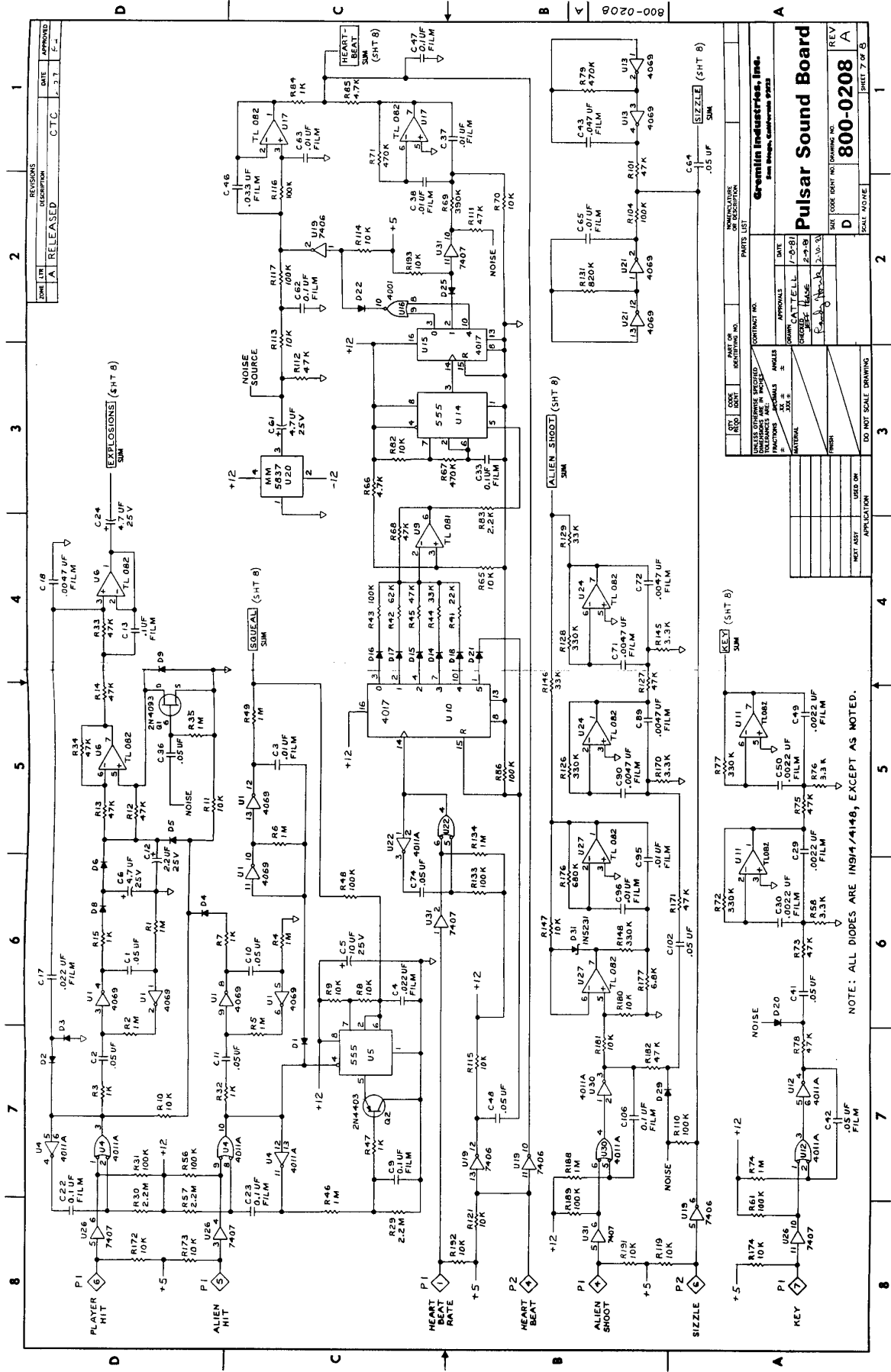
REV	DATE	DESCRIPTION
1	9-20-79	INITIAL DESIGN
2	10-10-79	REVISED FOR MANUFACTURE
3	11-15-79	REVISED FOR MANUFACTURE
4	12-15-79	REVISED FOR MANUFACTURE
5	1-15-80	REVISED FOR MANUFACTURE
6	2-15-80	REVISED FOR MANUFACTURE
7	3-15-80	REVISED FOR MANUFACTURE
8	4-15-80	REVISED FOR MANUFACTURE

REV	DATE	DESCRIPTION
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2	10-10-79	REVISED FOR MANUFACTURE
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6	2-15-80	REVISED FOR MANUFACTURE
7	3-15-80	REVISED FOR MANUFACTURE
8	4-15-80	REVISED FOR MANUFACTURE

REV	DATE	DESCRIPTION
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6	2-15-80	REVISED FOR MANUFACTURE
7	3-15-80	REVISED FOR MANUFACTURE
8	4-15-80	REVISED FOR MANUFACTURE

REV	DATE	DESCRIPTION
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5	1-15-80	REVISED FOR MANUFACTURE
6	2-15-80	REVISED FOR MANUFACTURE
7	3-15-80	REVISED FOR MANUFACTURE
8	4-15-80	REVISED FOR MANUFACTURE

800-0058
 SHEET 9 OF 9



ZONE LIST	DESCRIPTION	DATE	APPROVED
A	RELEASED	3.1	E.

REVISIONS		PARTS LIST	
NO.	DATE	DESCRIPTION	QUANTITY
1			

MANUFACTURER OF DESCRIPTION	DATE
Greenlin Industries, Inc.	1/0-81
CONTRACT NO.	1/0-81
DESIGNER	W. J. TULL
CHECKER	W. J. TULL
DATE	2-3-81
SCALE	1:1
REV	A

Pulsar Sound Board

NOTE: ALL DIODES ARE 1N914/4148, EXCEPT AS NOTED.

DO NOT SCALE DRAWING

APPLICATION

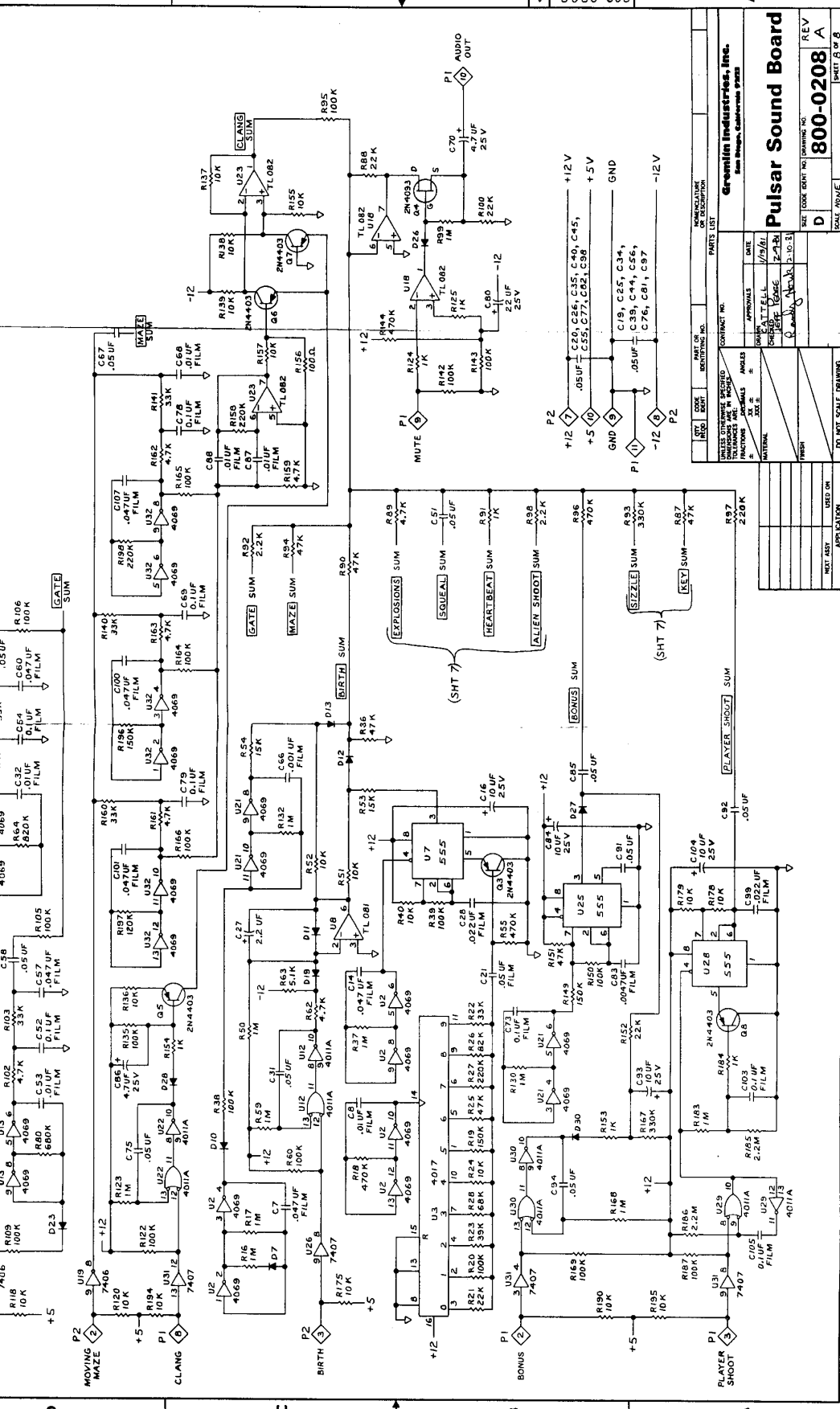
NOT ASY

USED ON

800-0208

800-0208

REV	DATE	APPROVED	BY
1	3.10.81	RL	
2	RELEASED	CTC	



REV	DATE	APPROVED	BY
1	3.10.81	RL	
2	RELEASED	CTC	

Pulsar Sound Board

800-0208

REV A

SHEET 5 OF 5

Geremian Industries, Inc.
San Diego, California 92108

REV	DATE	APPROVED	BY
1	3.10.81	RL	
2	RELEASED	CTC	

REV	DATE	APPROVED	BY
1	3.10.81	RL	
2	RELEASED	CTC	

REV	DATE	APPROVED	BY
1	3.10.81	RL	
2	RELEASED	CTC	

REV	DATE	APPROVED	BY
1	3.10.81	RL	
2	RELEASED	CTC	

REV	DATE	APPROVED	BY
1	3.10.81	RL	
2	RELEASED	CTC	

REV	DATE	APPROVED	BY
1	3.10.81	RL	
2	RELEASED	CTC	

REV	DATE	APPROVED	BY
1	3.10.81	RL	
2	RELEASED	CTC	

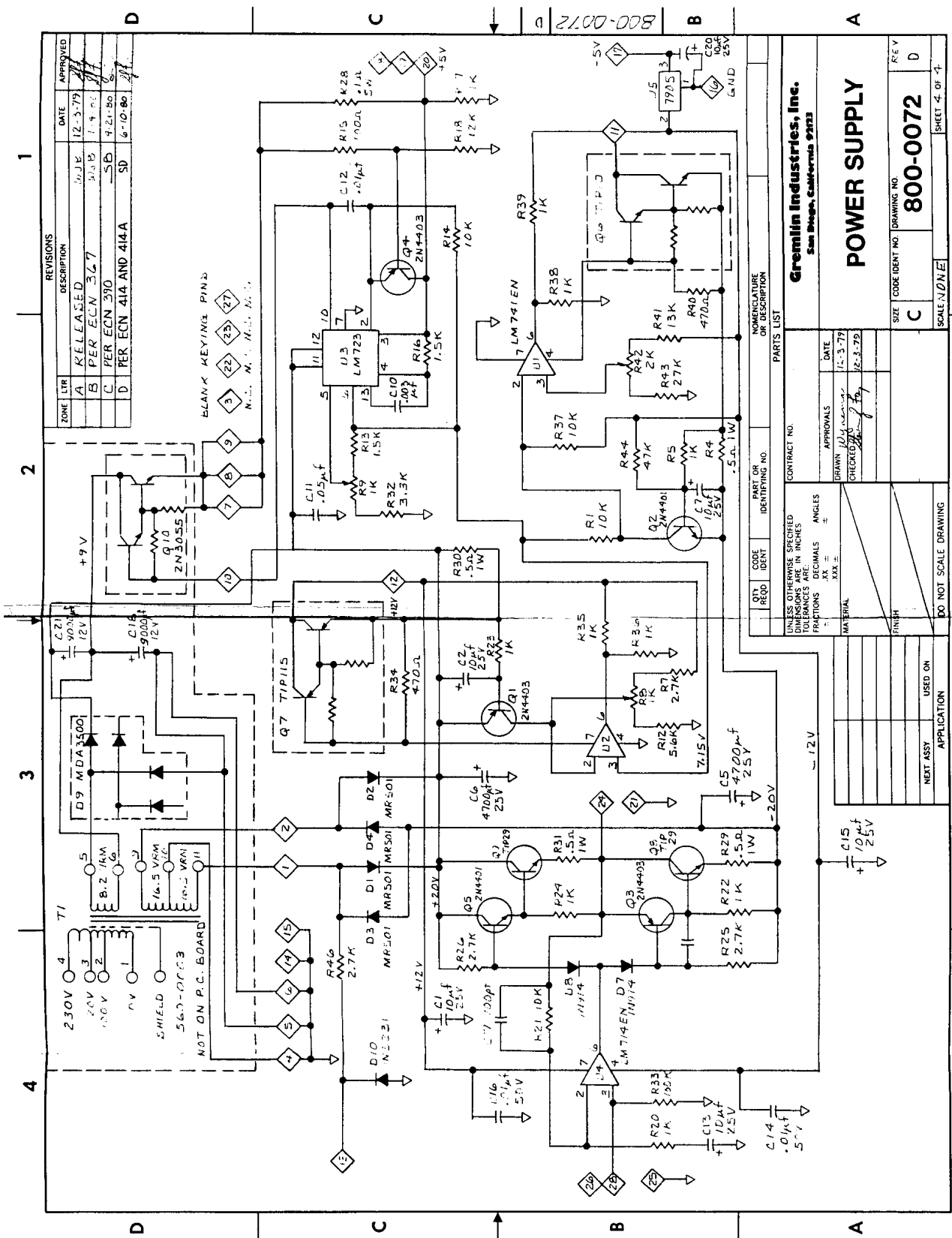
REV	DATE	APPROVED	BY
1	3.10.81	RL	
2	RELEASED	CTC	

DO NOT SCALE DRAWING

APPLICATION

DO NOT SCALE DRAWING

DO NOT SCALE DRAWING



REVISIONS			DATE	APPROVED
ZONE	DESCRIPTION			
A	RELEASED	12-3-79		
B	PER ECN 327	1-4-80		
C	PER ECN 390	4-21-80		
D	PER ECN 414 AND 414A	6-10-80		

BLANK KEYING PINS
 3 (22) (23) (27)
 N.C. N.C. N.C. N.C.

QTY		CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
REQD.	IDENT			

PARTS LIST		CONTRACT NO.	
UNLESS OTHERWISE SPECIFIED IN INCHES			
FRACTIONS	DECIMALS	ANGLES	
XXX =			

APPROVALS		DATE
DRAWN	CHECKED	12-3-79
		12-3-79

SIZE	CODE IDENT NO.	DRAWING NO.	REV
C		800-0072	D

SCALE: NONE	
SHEET 4 OF 4	

Gremlin Industries, Inc.
 San Diego, California 92133

POWER SUPPLY

DO NOT SCALE DRAWING
 NEXT ASSY USED ON APPLICATION