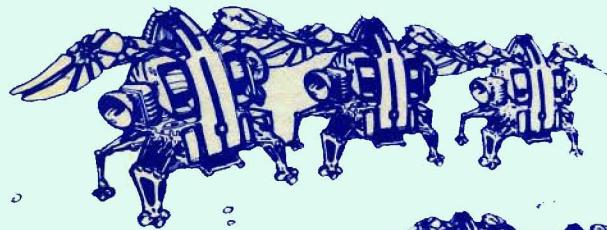




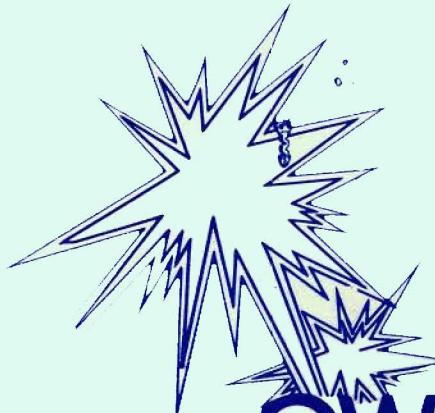
# SUPER SPACE ATTACK



ART NO.  
**420-0272**

MANUFACTURED BY

**Gremlin**  
Industries, Inc.



**OWNER'S MANUAL**

SUPER SPACE ATTACK  
OPERATING INSTRUCTIONS  
AND  
SERVICE MANUAL

SUPER SPACE ATTACK OWNER'S MANUAL

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## TABLE OF CONTENTS

	PAGE
INTRODUCTION	1
IMPORTANT NOTE	2
REPACKAGING INSTRUCTIONS	3
GAME CONCEPT	4
OPTION SELECTION INSTRUCTIONS	6
MAINTENANCE PROCEDURES	7
TRANSFORMER VOLTAGE CONVERSION INSTRUCTIONS	Following Pages
SCHEMATICS	Following Pages

## INTRODUCTION

This is an electronic game that makes extensive use of digital integrated circuitry and television monitor circuitry. This manual assumes the maintenance technician possesses a general knowledge of solid state circuitry, microprocessor, TTL digital integrated circuitry and T.V. monitor concepts. Any individual NOT knowledgeable in these areas SHOULD NOT attempt repair of the electronic portion of this game. IT SHOULD BE NOTED THAT ANY ATTEMPT TO REPAIR THE GAME IN THE FIELD WITHOUT EXPRESS CONSENT OF THE FACTORY WILL IMMEDIATELY VOID THE WARRANTY!!!

### IMPORTANT NOTES:

- NEVER replace any components with anything other than exact replacement parts. (See Parts List located on Service Schematics.)
- NEVER remove circuit boards/connections while power is on.
- DO NOT replace the fuse with anything other than the proper value. A blown fuse indicates an overload condition within the game. Replacing the fuse with a higher value can cause severe damage to internal components if an overload occurs.
- ALWAYS consult the manual before attempting repairs.
- CORRESPONDENCE regarding this game should be addressed to:

GREMLIN INDUSTRIES, INC.

8401 Aero Drive

San Diego, California 92123

(714) 277-8700

IMPORTANT NOTE

An important service note is posted in this game and is repeated here for emphasis:

IF AT ANY TIME THE T. V. SCREEN SHOWS A MEANINGLESS DISPLAY  
OR THE GAME OTHERWISE MALFUNCTIONS, SIMPLY DROP A COIN INTO  
THE COIN MECHANISM. THIS SHOULD CORRECT THE PROBLEM. IF  
NOT, THE GAME REQUIRES SERVICE.

The circuitry in this game has been arranged so that the insertion of a quarter through the coin mechanism will reset the system. This clears up temporary problems caused by power line disturbances, static, etc.

SERVICE TECHNICIAN NOTE:

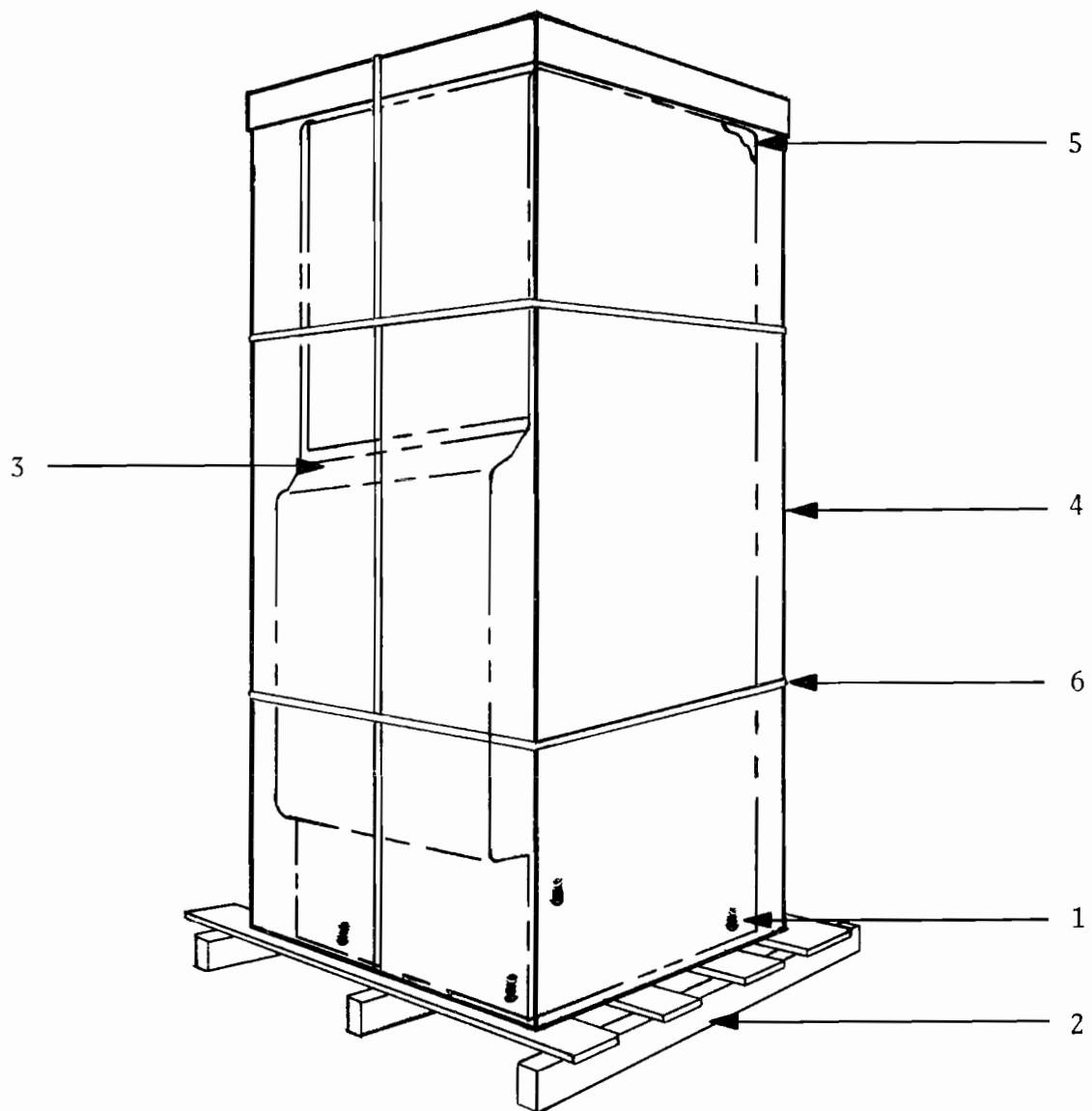
The system reset circuitry described above requires that the coin counter is attached to the system. If there is a coin counter problem and no replacement is available, the game will function properly if a 10K Ohm resistor is connected across the coin counter input pins to the video logic board.

## REPACKAGING INSTRUCTIONS

Should it be necessary to ship this game, follow the instructions below for game recrating:

- A) If the original shipping bolts have been discarded (Ref.1), obtain four 5/16-18x1 3/4" hex head bolts with 5/16" flat washers. Carefully lay the game on its side and attach skid (Ref.2).
- B) Place game upright. Tape game keys to upper flange of operator's panel (Ref.3). Crate the game using appropriate shock-absorbent packing material (Ref.4). Include padding on all four corners of the game (Ref.5). After crating is completed, secure package with strapping (Ref.6).

NOTE: If the game is to be shipped to GREMLIN for service or repair, attach a tag identifying the distributor and indicate the service or repair to be made; include the full serial number of the game. GAME MUST BE SHIPPED PREPAID.



## SUPER SPACE ATTACK- GAME CONCEPT

SUPER SPACE ATTACK is a one or two player game, in which players defend their laser bases from the attacking space creatures. When the game begins, five rows of creatures line up on the screen. The lowest row begins firing at the player's laser base which the player moves left or right across the screen. The player positions his base and fires at the creatures above, scoring 100 points for any creature hit in the lower two rows, 200 points for a hit in the third and fourth rows, and 300 points for a hit in the highest row. As more creatures are hit, the rest begin to move faster toward the bottom of the screen. Also, the creatures' missiles are released at a faster rate.

To prevent his base from being hit, the player can move it under the cover offered by four force fields, just above the base. The first few laser bursts penetrate the force field, but do not pass through. Then, when a path is cut through the field, the laser fire can pass. Likewise, the creatures' projectiles destroy part of the force field, until a path is cut for them to pass. Toward the end of a game, the force fields are usually destroyed; the game then becomes even more challenging.

A small enemy UFO floats across the top of the screen during game play, to provide another target. When hit, the UFO explodes, scoring 1000, 1200, 1500, or 1800 points. This first UFO appears only during game play. A second one appears after each time the player clears the screen of creatures. This bonus UFO zig-zags from the top of the screen toward the bottom. If the player hits it, bonus points are awarded and the player gains an additional laser base.

When the player's laser base is destroyed the first time, a new one is added, and the action resumes. Each time all the creatures are destroyed and the screen resets, the five rows of creatures are arranged closer and closer to the player's base. The number of bases with which a player starts is operator adjustable. The game is shipped with the three laser base option selected; four, five, or six bases can be selected by internal jumpers. Also operator selectable is the number of points, 10,000 or 15,000, at which a free laser base is awarded. The game is shipped with the 10,000 point option enabled.

## SUPER SPACE ATTACK- GAME CONCEPT- cont'd

A final option is available to display, or not to display, on the screen the number of credits accepted. The maximum number of credits counted by the game is 99. This information is displayed in the bottom right corner of the screen. Instructions for selecting these options are included in this manual.

In the two player mode, the game action is the same as in the one player, except that the game allows players to take turns. The game then remembers where each player leaves off at the end of his turn. It also displays the three highest scores at the top of the screen for players to challenge.

## SELECTING OPTIONS FOR SUPER SPACE ATTACK

The following describes the procedure for selecting any of the game options.

1. Locate the Molex pin connector labelled P3 on the logic board.
2. To select any of the options, simply connect one or both jumper wires, as necessary, to the pin connector. See the chart, below:

### TO SELECT:

3 laser bases at game start  
4 laser bases at game start  
5 laser bases at game start  
6 laser bases at game start  
Extra base awarded when second  
UFO hit

No base awarded  
Bonus (extra base) at 10,000  
points

Bonus at 15,000 points  
Display number of credits  
Do not display credits  
(Ground

### CONNECT JUMPER TO PIN #:

no jumper (game shipped this way)	
2	
3	
4	
no jumper (game shipped this way)	
1	
no jumper (game shipped this way)	
6	
no jumper (game shipped this way)	
9	
10)	

## MAINTENANCE PROCEDURES- SPACE ATTACK

- I. POWER SUPPLY (refer to drawing #815-0020, sheet 4)
  1. Remove output connectors from power supply.
  2. Make these initial tests: (GND to BLACK lead on C18, 9000 mfd capacitor)
    - a) +9 V DC on POSITIVE terminal of C18
    - b) +17-19 V on C6 (4700 mfd. cap.)
    - c) -17-19 V on C5 (4700 mfd. cap.)
    - d) -12 V at pin 11 (adjustable by trim pot R42)
    - e) +12 V at pin 12 (adjustable by trim pot R8)
    - f) +5 V at pins 18-20 (adjustable by trim pot R9)
    - g) GND (ground, 0 V) at pins 14-16
    - h) 2-3 V AC at pin 13 (Don't forget to change meter scale to AC)
  3. Check these voltages again with the logic board connected. If any are wrong, a loading problem exists in the logic board, most likely. Possible causes of a short on the logic board could be: U73, C21, C25, or C26.
  
- II. SOUND BOARD (refer to drawing #826-0002)
  1. If no sounds are produced:
    - a) check connections between logic board (labelled "Sound Out") and sound board and between the sound board and power supply.
    - b) If these are good, check IC U16 on the logic board, pins 2,5,6,9,12, 15,16, and 19 for outputs when each sound is produced.
    - c) If the outputs are present, check the output of the sound board, pin 22. If the signals are present here (use an oscilloscope for best results) check the amplifier circuit on the power supply, specifically, U4, Q8 and Q9.
  2. If some sounds are produced, but not all:
    - a) repeat steps a and b, above.
    - b) If these prove OK, check the specific circuit for each sound:

SOUND TYPE	SOUND BOARD PIN #	CHECK THESE PARTS
Ship hit	Pin 2	U8, U9, U10
UFO hit	Pin 3	U17, U18, U19, Q9

MAINTENANCE PROCEDURES- cont'd.

Laser	Pin 4	U14, U4, U15, U16, Q5, U9, U10
UFO #1	Pin 6	U1, U2, U3, Q1, Q2
UFO #2	Pin 7	U11, U5, Q3, Q4, U6
Saucer	Pin 8	U24, U25, Q11, U20

III. LOGIC BOARD (refer to drawing #826-0004)

1. Game does not reset at power on: (see sheet 5)
  - a) Check connector pin 3 on logic board for 3V AC signal. Also, check Q10, Q11, U55, U54, and U71.
2. No video: (see sheet 5)
  - a) Check U48 (part #315-0042) for video signals. Also, check U41, Q6 and Q7 for the video signals.
3. Game does not coin on: (see sheet 5)
  - a) Check coin switch connections to the logic board; make sure the coin switch is wired correctly.
  - b) Check U12, pins 3 and 11 for a pulse each time the coin switch is activated. Also, check U11 and U13.
  - c) Check also for the 4 msec. pulses at pin 7 of U10. These pulses serve as timing for the video circuit. Also, pin 5, U11; pin 6, U13.
  - d) If a game is started only occasionally when a coin is deposited, the coin switch wire may need to be adjusted for a lighter, or heavier, tension.
  - e) If the coin counter does not activate, check U12, pin 3 for a pulse each time a coin is inserted; also, check Q1 and Q2. (see sheet 5)
4. No Ø1 clock pulses to the microprocessor: (see sheet 4)
  - a) check for pulses at the crystal, Y1.
  - b) check for pulses at pin 6 of U68; at pin 6 of U49; and at pin 4 of U54.
5. No player control: (see sheet 5)
  - a) Make sure the player control connections from the switches to the logic board are intact. Ensure that each switch is connected.
  - b) If these are good, check for an output from U1 as you push each switch.
6. Random display on the screen:
  - a) If the screen shows what appears to be a meaningless display, and

MAINTENANCE PROCEDURES- cont'd.

it cannot be cleared by activating the coin switch, several different parts of the circuit should be considered:

One or more RAM's, U56 through U63 (sheet 5)

One of the programmed IC's, or EPROM's (sheet 6) Check their sockets first.

The reset circuit is not working. (see #1, above)

The microprocessor is bad. (sheet 4)

Data or address bus problem (e.g. U33 or U34, sheet 4, could be bad.)

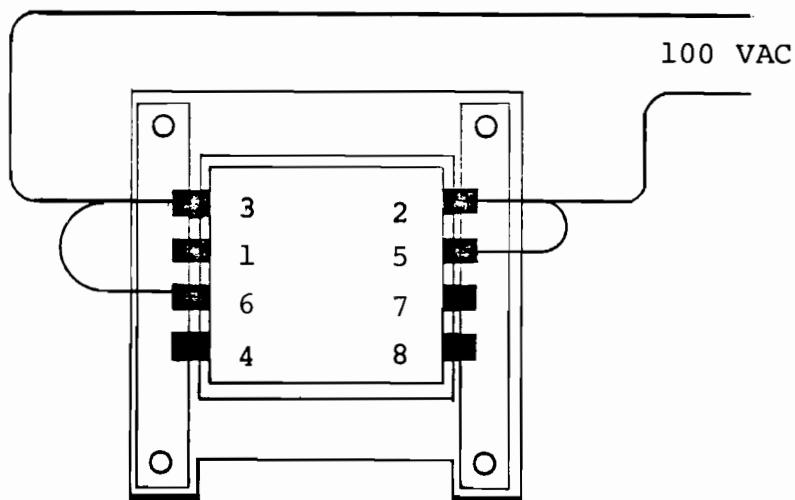
## SPECIAL VOLTAGE CONVERSION INSTRUCTIONS

To operate this game on voltages of 100, 115, or 230 VAC, the following changes must be made in the power supplies of BOTH the game AND video monitor:

### 1. Game Power Supply

First determine which terminal configuration is used on your transformer. There are 3 different configurations, as shown below:

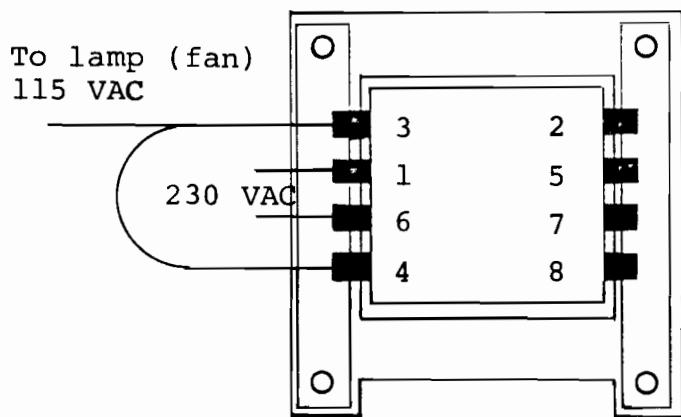
TO CONVERT TO 100 VAC refer to Figures 1, 2, & 3:



(Terminals 9, 10, & 11  
located on far side)

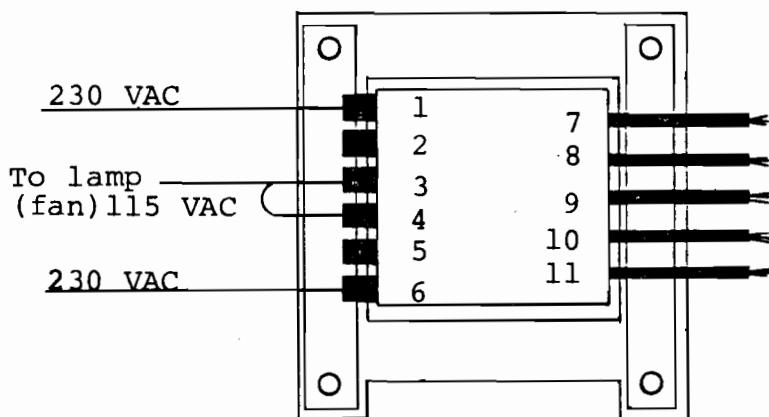
Fig. 1

TO CONVERT TO 230 VAC refer to Figures 7, 8, 9:



(Terminals 9, 10 & 11 located on far side)

Fig. 7



NOTE: Terminals  
3 & 4 must be  
connected if there  
is no lamp or fan.

Fig. 8

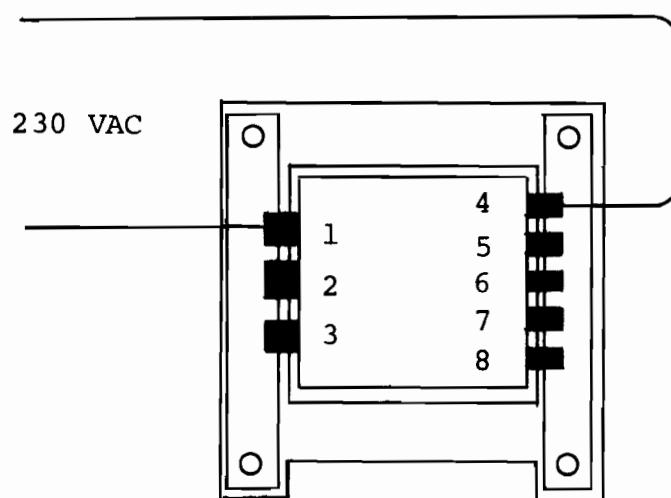


Fig. 9

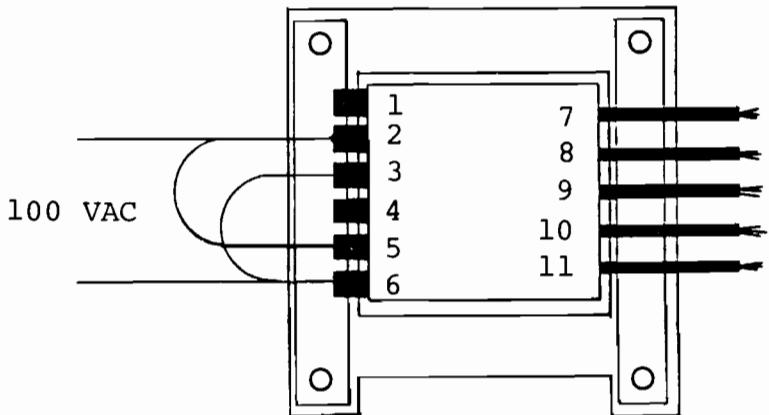


Fig. 2

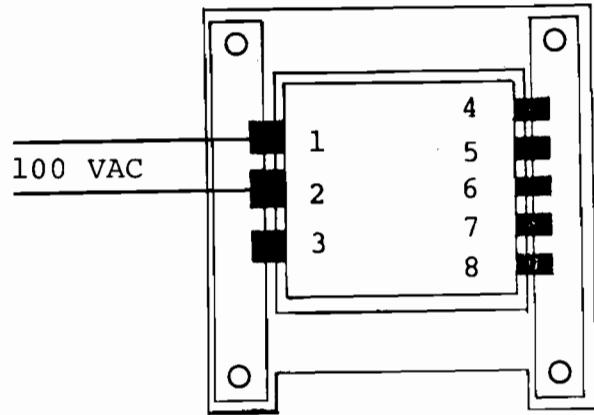
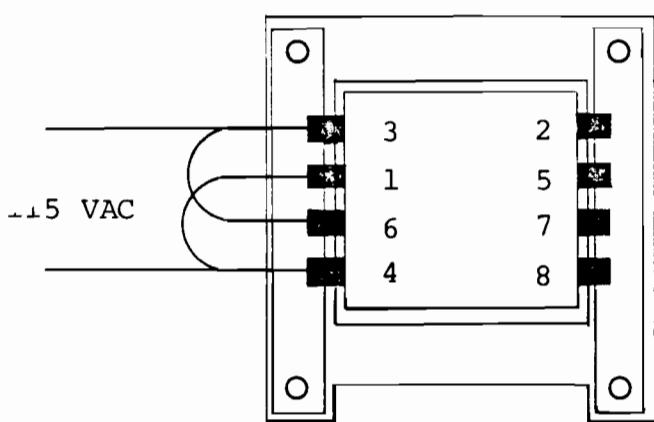


Fig. 3

TO CONVERT TO 115 VAC refer to Figures 4, 5, 6:



(Terminals 9, 10 & 11  
located on far side)

Fig. 4

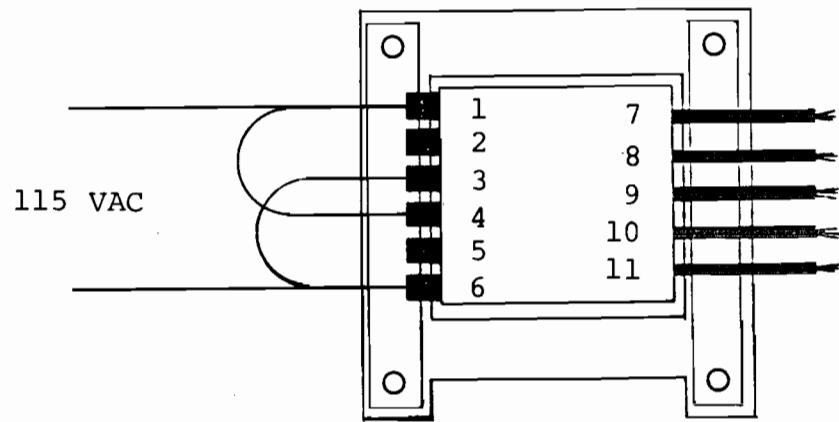


Fig. 5

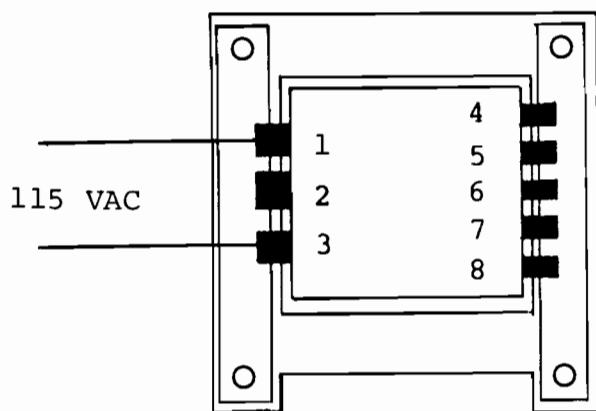


Fig. 6

## 2. Video Monitor Power Supply

In addition to the above changes, the transformer in the video monitor must also be converted to either 100, 115, or 230 VAC. This is done simply by removing the terminal cover in the back of the monitor chassis (located to the side of the power transformer, and labelled "VOLTAGE SELECTION TAPS"). Then, move the jumper wire to the proper voltage terminal.

Gremlin Industries, Inc. San Diego, California 92123		PARTS LIST	TITLE TOP ASSEMBLY SUPER SPACE ATTACK	726-0001	SH / OF 10	A REV
SHTS. 6, 7, 8, 9, 10 "D" SIZE		DRAWN S. MAGNOLIA	ENGR			
		CHECK <i>Steve J. Fay</i> 3-15-79	APPR			
LTR	DATE	REVISION DESCRIPTION	DRAFT	CHECK	APPR	
A	3-5-79	RELEASED	3-15-79	S. M.	<i>J. J.</i>	

**Gremlin Industries, Inc.**  
San Diego, California 92123

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	TITLE	
				TOP ASSEMBLY	SUPER SPACE ATTACK
				DWG NO	SH 3 OF 10 REV A
26	280-0005	10	CABLE TIE		
27	280-0010	4	NUT WIRE		
28	280-0014	5	STANDOFF CLIPS		
29	280-0075	2	WIRE NUTS LARGE		
30	280-0112	2	EDGING U CHANNEL		
31	320-0020	4	SEALANT FOAM 1FT IR		
32	420-0028	1	DECAL S/N		
33	420-0030	1	DECAL CAUTION 115V.		
34	420-0038	2	DECAL IMPORT. NOTE		
35	420-0040	1	DECAL RECYCLE		
36	420-0041	1	DECAL S/N SMALL		
37	420-0060	1	DECAL TIP-N-TELL		
38	420-0071	1	INSTRUCTION UNCRATING		
39	420-0116	1	WRAPAROUND SIDE		
40	420-0117	1	TOP COVER		
41	420-0124	4	CORNER STRIP		
42	420-0158	1	MANUAL WELLS GARD		
43	815-0008	1	HARN. COIN COUNTER		
44	815-0010	1	HARN. SPEAKER		
45	815-0011	1	HARN. POWER		
46	815-0016	1	ASS'Y FLR LIGHT		
47	815-0020	1	ASS'Y PWR / SUP.		
48	815-0028	1	HARN. COIN MECH.		
49	815-0030	1	ASSY J-BOX		
50	816-0014	1	HARN. MONITOR		

## Gremlin Industries, Inc.

San Diego, California 92113

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	REF DES	TITLE	TOP ASS'Y	SUPER SPACE ATTACK	726-0001	SH 2 OF 10	A REV
					PARTS LIST	ASS'Y	DWG NO			
1	130-0001	1	SPKR GAME 6X9							
2	130-0002	1	SPKR COVER 6X9							
3	140-0021	1	COVER JUNCTION BOX							
4	140-0029	1	CABINET INDIRECT(MODIFIED)							
5	200-0002	1	VIDEO MONITOR ASS'Y 19 IN							
6	220-0008	1	COUNTER DIGITAL							
7	220-0035	1	LOCK FORT LOCK IR							
8	220-0066	2	COIN MECHANISM							
9	250-0048	1	CLIP SWITCH							
10	250-0243	2	BRACKET							
11	250-0244	1	PLATE MIRROR BOT							
12	250-0336	2	ANGLE BRKT LIGHT MOUNT.							
13	250-0263	1	MOLDING TRIM							
14	250-0285	1	FR CASH DOOR MOD.							
15	250-0286	1	CON PANEL TRIM LNR							
16	250-0333	2	BRKT CRT REAR							
17	250-0334	1	BRKT CRT FRONT							
18	250-0335	2	BRKT CRT CHASSIS							
19	252-0053	1	RETAINER MIRROR TOP							
20	252-0064	1	MIRROR SUPPORT UPPER							
21	253-0095	2	WINDOW SACH							
22	253-0096	2	WINDOW SACH SIDE							
23		2								
24	275-0004	1	HALF MIRROR							
25	280-0004	25	CLIP WIRE HOLDOWN							

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San Diego, California 92123

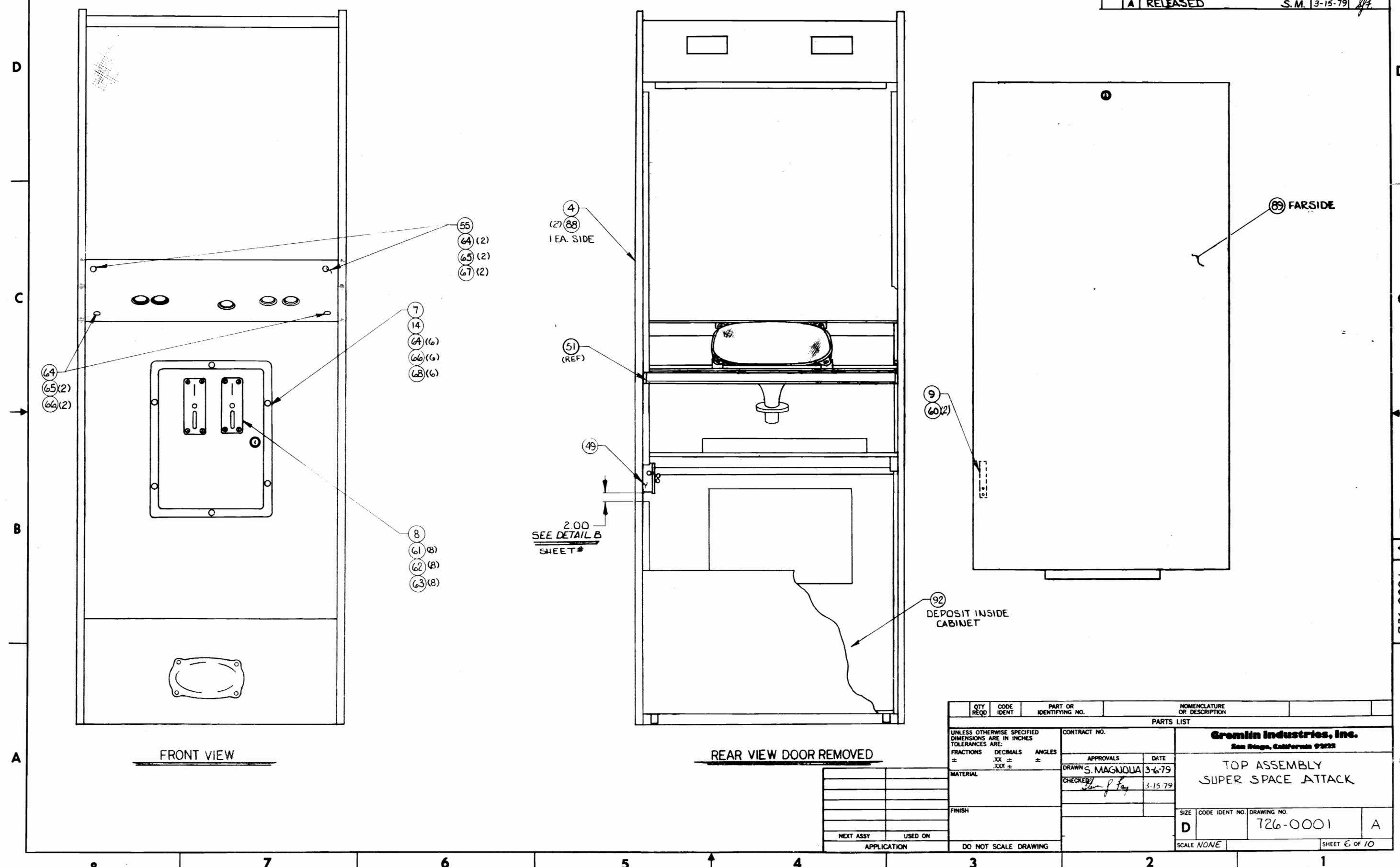
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51	821-00010	1	ASS'Y BLACK LIGHT		
52	826-0002	1	ASS'Y SOUND BOARD		
53	826-0004	1	ASS'Y CVC LOGIC		
54	826-0030	1	HARN. OPTIONS		
55	826-0031	1	ASS'Y CONTROL PANEL		
56	826-0032	1	HARN CONTROL PANEL		
57	826-0033	1	HARN PWR SD.		
58	826-0034	1	HARN VOL CONT		
59	253-0102	1	MON. PLEXIGLASS		
60		18	*6X 1/2 SCR SHT MTL PHL PAN HD.		
61		8	SCR 8X32 X 3/4 CREST TAMPER PROOF		
62		14	#8-32 NUT HEX		
63		12	#8 WASHER LOCK SPLIT		
64		10	*10-24 BOLT CARRIAGE X 1 1/4		
65		12	WASHER FLAT #10		
66		10	NUT HEX #10-24		
67		11	NUT WING #10-24		
68		6	WASHER LOCK SPLIT #10		
69		4	SCR MACH HEX HD 10-32 X 1016		
70		4	WASHER 1/4 ID X 3/4 OD FLAT		
71		4	NUT HEX 10-32		
72		6	#8X 1/2 SHT MTL SCR PHL PANHD		
73		2	#6X 1/2 SHT MTL SCR PHL PANHD		
74		8	10-24X 2.0 CARR BOLTS		
75		5	#6X 1.0 MACH SCR PHL PANHD		

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San Diego, California 92123

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	TITLE TOP ASSEMBLY		DWG NO	SH5 OF 10	REV A
				PARTS LIST	SUPER SPACE ATTACK			
76	252-0062	2	BRKT SUPPORT BLOCK					
77	252-0063	2	BRKT MIRROR SUP. SIDE					
78	252-0066	1	CHASSIS SHELF					
79	252-0065	2	SHELF SUPPORT BLKS					
80	420-0265	1	SHADOW MASK					
81	420-0266	1	BAFFEL FLDR. LIGHT					
82		4	#6 X 2" SH METAL SCR					
83		4	*8X 1 1/4 SHT MIL SCR PHL					
84		2	*8-32X 1.0 MACH SCR					
85		2	#8 FLAT WASHER					
86		2	NUT WING #8-32					
87	211-0027	2	SOLDER LUG #10					
88	420-0267	2	SIDE GRAPHIC					
89	420-0268	1	INTERIOR GRAPHIC CENTER					
90	420-0269	1	INTERIOR GRAPHIC LEFT					
91	420-0270	1	INTERIOR GRAPHIC RIGHT					
92	420-0272	1	MANUAL SS/A					
93	420-0274	1	BLACK LIGHT BAFFLE					
94	420-0275	1	COLOR OVERLAY YELLOW					
95	420-0276	1	COLOR OVERLAY ORANGE					
96	420-0277	1	COLOR OVERLAY GREEN					
97	800-0026	2	GROUND STRAP 40"					
98	800-0027	1	GROUND STRAP 40"					

8 7 6 5 4 3 2 1

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A	RELEASED	S.M.	3-15-79	JF	



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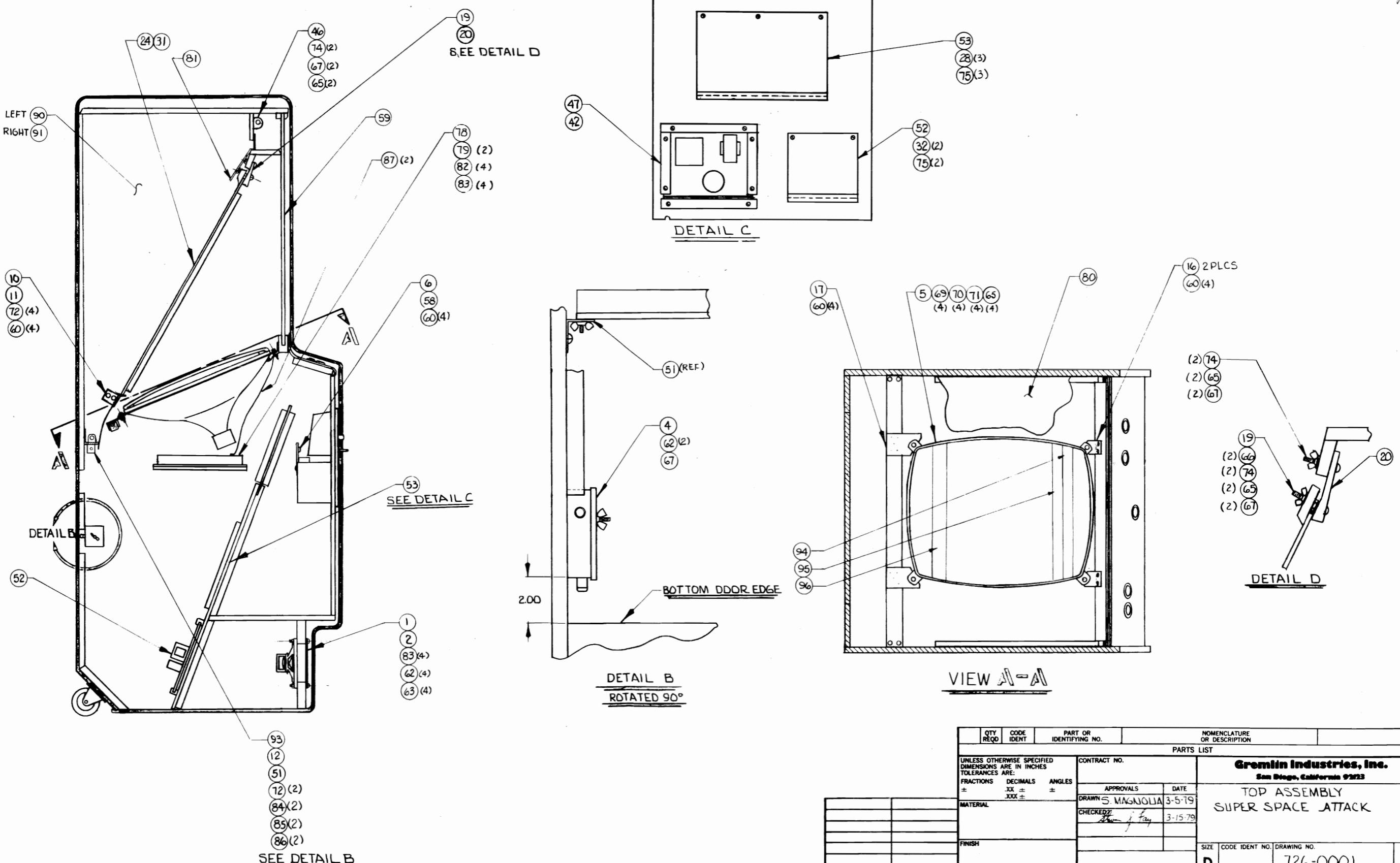
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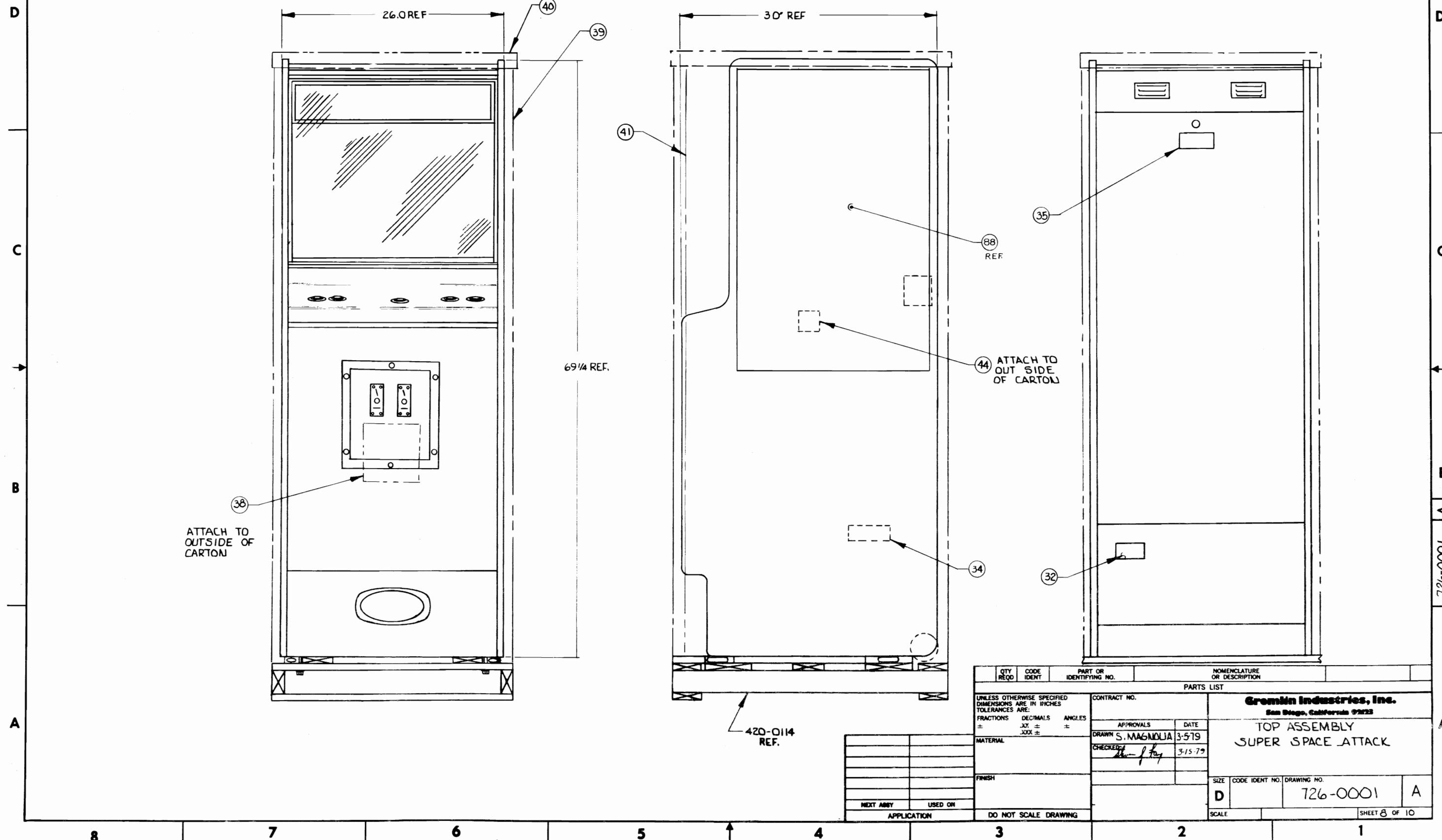
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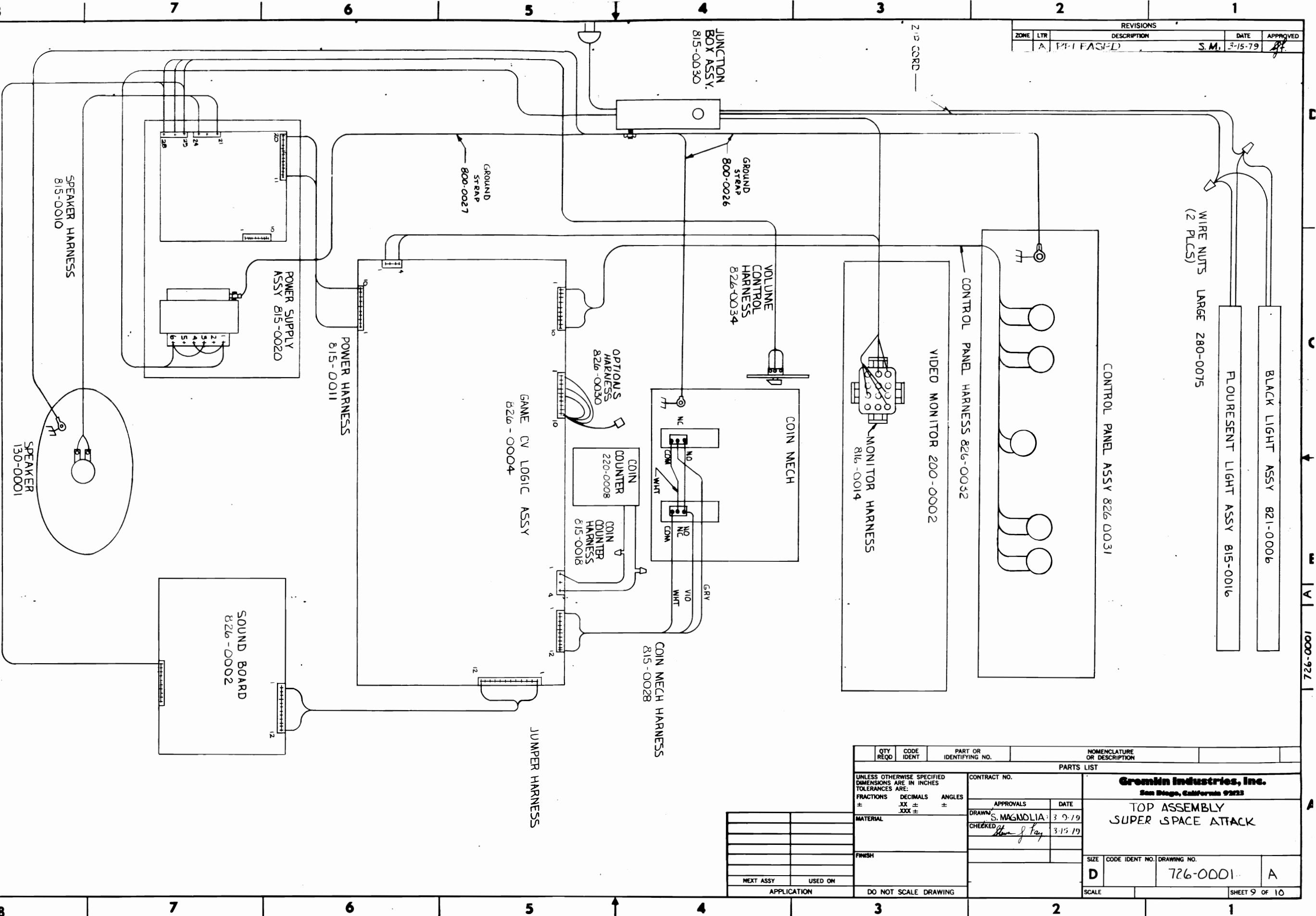


QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION																						
PARTS LIST																									
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS      DECIMALS      ANGLES		CONTRACT NO.		<b>Gremlin Industries, Inc.</b> <i>San Diego, California 92123</i>																					
<table border="1"> <tr> <td colspan="2"></td> <td>APPROVALS</td> <td>DATE</td> </tr> <tr> <td colspan="2"></td> <td>S. MAGNOLIA</td> <td>3-5-79</td> </tr> <tr> <td colspan="2"></td> <td>CHECKED <i>John J. Fay</i></td> <td>3-15-79</td> </tr> <tr> <td colspan="2"></td> <td></td> <td></td> </tr> <tr> <td colspan="2"></td> <td></td> <td></td> </tr> </table>				APPROVALS	DATE			S. MAGNOLIA	3-5-79			CHECKED <i>John J. Fay</i>	3-15-79											<b>TOP ASSEMBLY</b> <b>SUPER SPACE ATTACK</b>	
		APPROVALS	DATE																						
		S. MAGNOLIA	3-5-79																						
		CHECKED <i>John J. Fay</i>	3-15-79																						
MATERIAL																									
FINISH				SIZE	CODE IDENT NO.	DRAWING NO.	<b>D</b> <b>726-0001</b> <b>A</b>																		
NEXT ASSY	USED ON			SCALE	NONE																				
APPLICATION		DO NOT SCALE DRAWING					SHEET 7 OF 10																		

8 7 6 5 4 3 2 1

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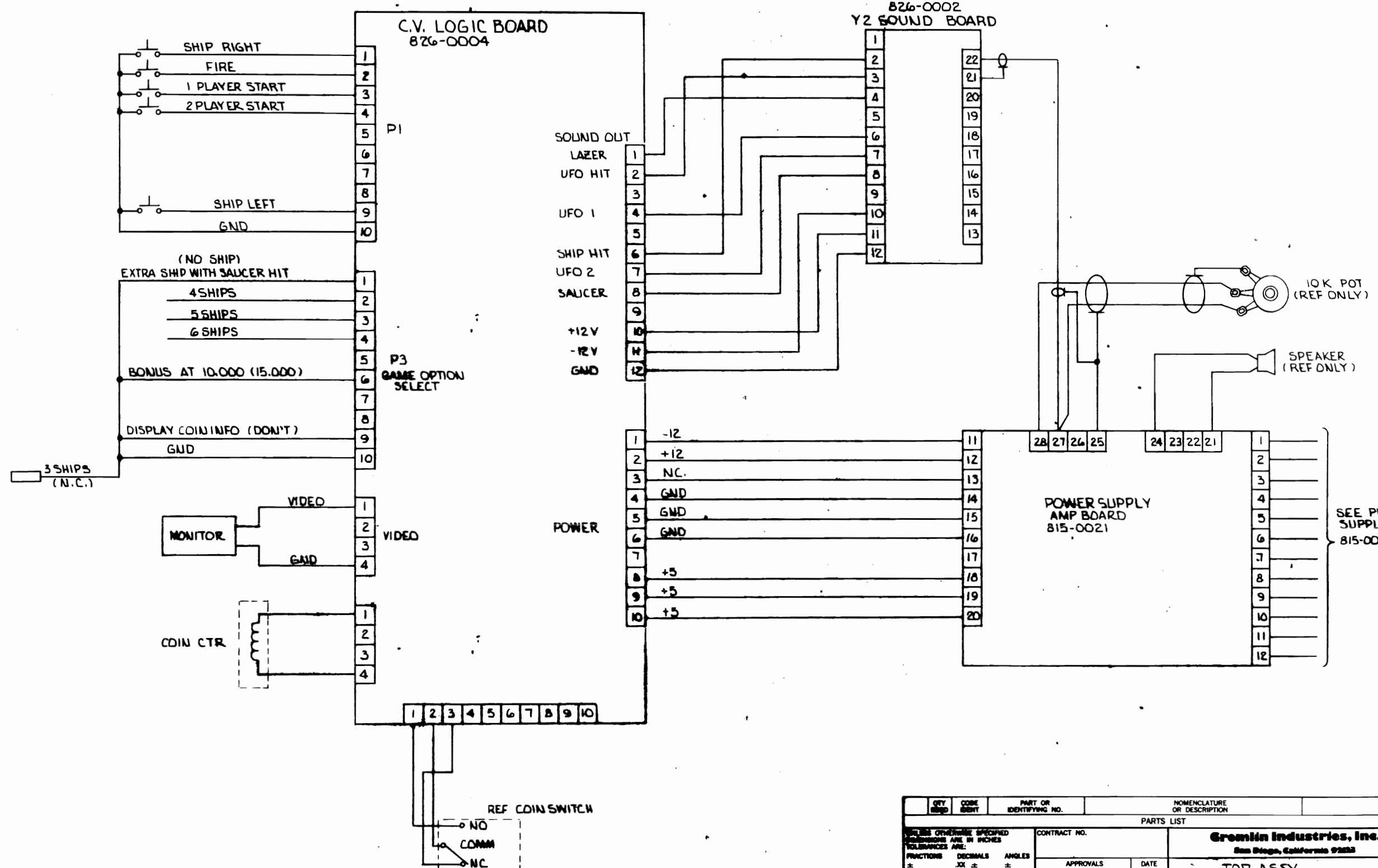
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A	RELEASED	S.M.	1-29-79	89



QTY ITEM	CODE ITEM	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
PARTS LIST			
NOTED OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS      DECIMALS      ANGLES ±      XX ±      XXX ±      °      °      °		CONTRACT NO.	
MATERIAL		APPROVALS      DATE	
DRAWN S. MAGNOLIA 1-29-79		CHECKED <i>John F. Fay</i> 1-15-79	
FINISH		TOP ASSY. SUPER SPACE ATTACK	
SIZE	CODE IDENT NO.	DRAWING NO.	
D		726-0001	A
SCALE			
SHEET 1 OF 10			

**Gremilln Industries, Inc.**  
San Diego, California 92123

**PARTS LIST**

**TITLE ASSEMBLY CONTROL PANEL  
(SPACE ATTACK)**

**826-0031  
DWG NO**

**SH / OF 3 REV**

**DRAWN S. MAGNOLIA**

**CHECK**

**ENGR**

**APPR**

<b>LTR</b>	<b>DATE</b>	<b>REVISION DESCRIPTION</b>	<b>DRAFT</b>	<b>CHECK</b>	<b>APPR</b>
A	2-14-79	RELEASED	2-19-79	S.M.	JH JH

<b>ITEM NO</b>	<b>PART NO</b>	<b>QTY PER ASSY</b>	<b>DESCRIPTION</b>	<b>REF DES</b>
1	252-0061	1	SUB-PANEL WOOD	
2	250-0332	1	SUB-PANEL METAL	
3	253-0101	1	GRAPHIC, CONTROL PANEL	
4	510-0023	5	SWITCH ASSEMBLY, WICO	
5	240-0009	3	BUTTON, PLUNGER, YELLOW	
6	240-0008	2	BUTTON PLUNGER, WHITE	

**FORM NO. 001-1500**

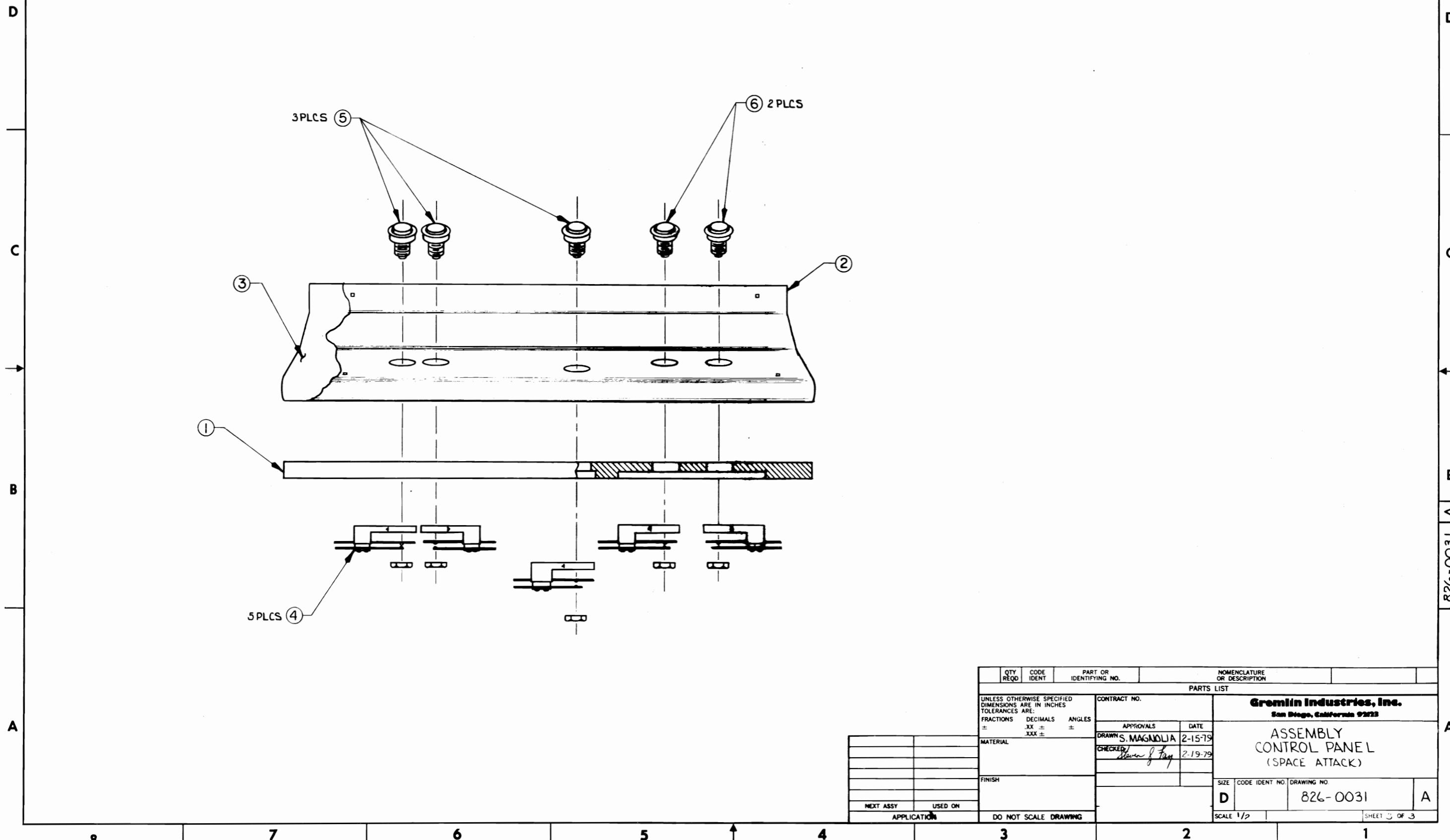
<b>Gremilln Industries, Inc.</b> San Diego, California 92123		<b>PARTS LIST</b>	<b>TITLE ASSEMBLY CONTROL PANEL (SPACE ATTACK)</b>	<b>826-0031 DWG NO</b>	<b>SH 2 OF 3 REV</b>
<b>ITEM NO</b>	<b>PART NO</b>	<b>QTY PER ASSY</b>	<b>DESCRIPTION</b>	<b>REF DES</b>	
1	252-0061	1	SUB-PANEL WOOD		
2	250-0332	1	SUB-PANEL METAL		
3	253-0101	1	GRAPHIC, CONTROL PANEL		
4	510-0023	5	SWITCH ASSEMBLY, WICO		
5	240-0009	3	BUTTON, PLUNGER, YELLOW		
6	240-0008	2	BUTTON PLUNGER, WHITE		

FORM NO. 001-1500

51-1601

8 7 6 5 4 3 2 1

REVISIONS			
ZONE	LTR	DESCRIPTION	DATE
A	RELEASED	S.M. 2-19-79	JL



GREMLIN IND. INC. SAN DIEGO CA. 92123		PARTS LIST	TITLE ASSY, POWER SUPPLY	815-0020 DWG NO	SH 2 OF 3	A REV
ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION		REF DES	
1	140-0015	1	CHASSIS, POWER SUPPLY			
2	150-0022	1	CAP, E, 9000UF 12V			
3	211-0005	9	CONN CRIMP LOCK			
4	211-0007	1	CONN,KEY, POLARIZING			
5	211-0017	4	CONN,QUICK, 1/4" FEM			
6	211-0019	2	CONN, SPADE LUG 1/4"			
7	212-0016	1	CONN. FEM 10 PIN			
8	213-0006	1	SOCKET, TO-3			
9	280-0014	4	STAND-OFFS, CLIPS			
10	280-0056	1	CLAMP,CAP. VR4 1 1/2"			
11	481-0009	1	DIODE, MDA 3500			
12	482-0007	1	XISTOR, 2N3055			
13	560-0003	1	XFMR,MODEL 9-10345B			
14	815-0021	1	POWER SUPPLY ASSY (PCB)			
	815-0020		SCHEM. ASSY-PWR. SUPP. (REFERANCE)			
15	5	SCREW-MACH P.HD#6-32 X.5				
16	4	NUT HEX #6-32				
17	4	SCREW-MACH RD,HD#4-40 X.37				
18	4	NUT HEX #4-40				
19	4	RIVET,POP 3/16				
20	4	SCR,MACH,HEX,WASH,HD 1/4-20 X		5/8"		
21	1	SCR,MACH,P.HD. #6-32 X 1.0"				

**Gremm Industries, Inc.**  
San Diego, California 92113

PARTS  
LIST

TITLE

PC ASSY -  
POWER SUPPLY

815-0021

SH 3  
OF  
REV

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	REF DES
26	471-0562	1	RES 5.6KΩ, 1/2W, 5%	R12
27	472-0025	4	RES 0.5, 1W, 5%	R4, R29 - R31
28	473-0021	1	RES 0.1, 5W, 3%	R28
29				
30	475-0004	1	POT 1K TRIMMER	R9
31	475-0005	2	POT 2K TRIMMER	R8, R42
32				
33	481-0004	4	DIODE MRS501	D1 - D4
34	481-0006	2	DIODE IN914	D7, D8
35	481-0008	1	DIODE ZENER IN5231	D10
36				
37	482-0006	3	TRANSISTOR 2N4403	Q1, Q3, Q4
38	482-0013	1	TRANSISTOR TIP110	Q6
39	482-0014	2	TRANSISTOR 2N4401	Q2, Q5
40	482-0015	1	TRANSISTOR TIP115	Q7
41	482-0016	2	TRANSISTOR TIP29	Q8, Q9
42				
43	471-0133	1	RES 13K OHMS 1/2W 5%	R41
44				
45	815-0020	REF	SCHEMATIC	
46				
47				
48				
49				
50				

**Gremlin Industries, Inc.**  
San Diego, California 92123

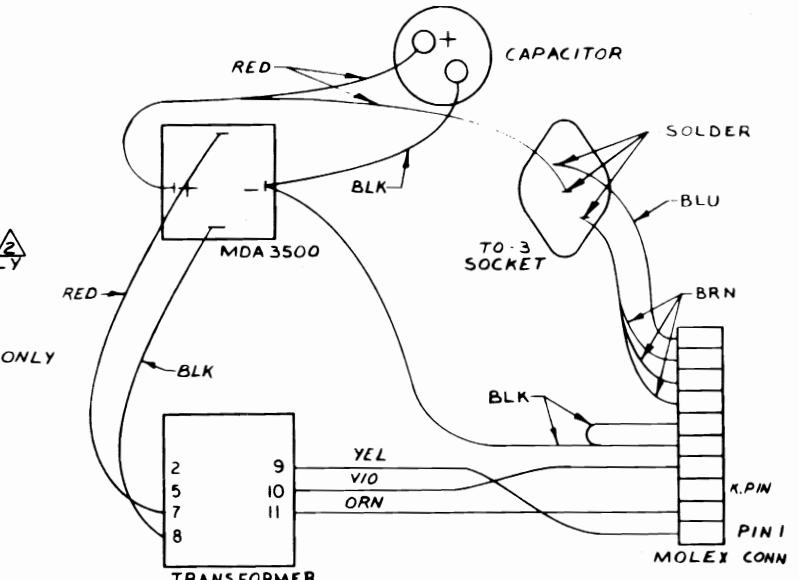
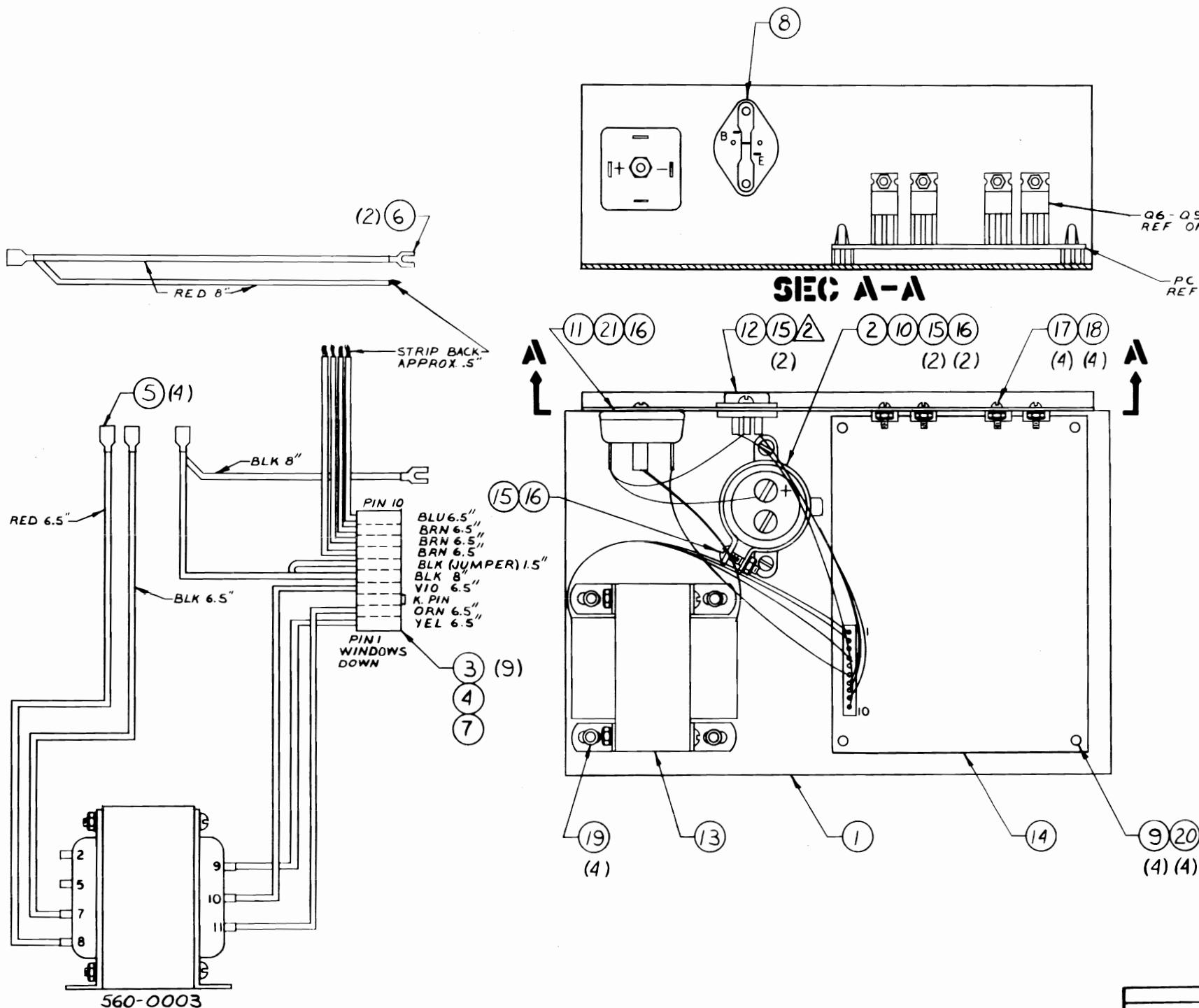
ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	TITLE PC ASSY -		DWG NO	SH 1 OF	B REV
				POWER	SUPPLY			
1	170-0082	1	PCB - POWER SUPPLY					
2	150-0019	2	CAP. E 4700uF, 25V				C5, C6	
3	151-0001	1	CAP. CER .05uF, 50V				C11	
4	151-0002	2	CAP. CER 100PF, 50V				C17, C19	
5	151-0008	1	CAP. CER .001uF, 50V				C10	
6	151-0011	3	CAP. CER .01uF, 50V				C12, C14, C16	
7	151-0012	1	CAP. CER .01uF, 50V				C3	
8	153-0001	5	CAP. TANT 10uF, 25V				C1, C2, C7, C13, C15	
9								
10	212-0003	2	CONN M 10 PIN					
11	212-0004	2	CONN M 4 PIN					
12								
13	313-0001	1	IC LM723				U3	
14	313-0004	3	IC LM741EN				U1, U2, U4	
15								
16	471-0101	1	RES 100uL, 1/2W, 5%				R15	
17	471-0102	10	RES 1KuL, 1/2W, 5%				R5, R17, R20, R22-24, R35, R36, R38, R39	
18	471-0103	4	RES 10KuL, 1/2W, 5%				R1, R14, R21, R37	
19	471-0104	1	RES 100KL, 1/2W, 5%				R33	
20	471-0122	1	RES 1.2KL, 1/2W, 5%				R18	
21	471-0152	2	RES 1.5KL, 1/2W, 5%				R13, R16	
22	471-0272	5	RES 2.7KL, 1/2W, 5%				R7, R25, R26, R43, R46	
23	471-0332	1	RES 3.3KL, 1/2W, 5%				R32	
24	471-0471	2	RES 470uL, 1/2W, 5%				R34, R40	
25	471-0473	2	RES 47KL, 1/2W, 5%				R44, R45	

8 7 6 5 4 3 2 1

REVISIONS		DESCRIPTION	DATE	APPROVED
ZONE	LTR			

D

D



QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	HOMENCLATURE OR DESCRIPTION
<b>PARTS LIST</b>			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS   DECIMALS   ANGLES $\pm$ $JX \pm$ $\pm$ $JXJ \pm$			CONTRACT NO.
MATERIAL			APPROVALS   DATE
DRAWN Lee J. Lippert			CHECKED
REV A			SHEET 3 OF 4
SIZE CODE IDENT NO. DRAWING NO.			REV
D 815-0020 A			
SCALE FULL			

**ASSY  
POWER SUPPLY**

Grovitt Industries, Inc.  
San Diego, California 92126

Gremlin Industries, Inc. San Diego, California 92103		PARTS LIST	TITLE Y-2 SOUND BOARD	826-0002	SH 1 OF 6	F REV
SHTS 5 & 6 ARE "D" SIZE		DRAWN CHECK Have J. T.	DWG NO			
ENGR	APPR					
A 12/8/78 RELEASED						
B 12/20/78 ECN 264						
C 1/9/79 REVISED & REDRAWN PER ECN 266						
D 1/15/79 ECN 271						
E 1-16-79 ECN 272						
F 1-31-79 ECN 276						

LTR	DATE	REVISION	DESCRIPTION	DRAFT	CHECK	APPR
A	12/8/78					
B	12/20/78					
C	1/9/79					
D	1/15/79					
E	1-16-79					
F	1-31-79					

FORM NO. 001-1500

ITEM NO	PART NO	PARTS LIST	TITLE Y-2 SOUND BOARD	826-0002	SH 2 OF 6	F REV
		QTY PER ASSY	DESCRIPTION	REF DES		
1	151-0001	10	CAP CER .05 $\mu$ f 50V	C3,13,15,21,28,34,41, 43,45,52		
2	151-0012	12	CAP CER .1 $\mu$ f 50V	C2,14,20,27,33,38		
3	152-0001	2	CAP FILM .1 $\mu$ f 100V	C5,17		
4	152-0002	1	CAP FILM .22 $\mu$ f 100V	C4		
5	152-0011	2	CAP FILM .15 $\mu$ f 100V	C36,37		
6	152-0007	2	CAP FILM .001 $\mu$ f 250V	C30,31		
7	152-0010	2	CAP FILM .022 $\mu$ f 100V	C1B,25		
8	152-0012	1	CAP FILM .047 $\mu$ f 200V	C42		
9	152-0017	1	CAP FILM .033 $\mu$ f 100V	C7		
10	152-0018	1	CAP FILM .01 $\mu$ f 250V	C55		
11	152-0020	1	CAP FILM .47 $\mu$ f 100V	C54		
12	153-0002	4	CAP TANT 1 $\mu$ f 25V	C6,26,32,49		
13	153-0003	1	CAP TANT 2.2 $\mu$ f 25V	C16		
14	153-0004	1	CAP TANT 4.7 $\mu$ f 25V	C9		
15	153-0006	3	CAP TANT 33 $\mu$ f 25V	C11,12,19		
16	170-D110	1	P.C. BOARD			
17	212-0021	1	CONN MALE 10 PIN			
18	212-0031	1	CONN MALE 12 PIN			
19	313-0004	10	1C LM741 EN	U2,3,5-7,9,10,15,16,18		

GROMM INDUSTRIES, INC. San Diego, California 92108		PARTS LIST	TITLE Y-2 SOUND BOARD	B26-0002 DWG NO	SH 3 OF 6	F REV
ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION		REF DES	
20	314-0001	9	1C TIMER LM555		U1,8,11,14,17,19,20,24,25	
21	315-0035	1	1C MM5837		J14	
22	471-0102	10				
			RES 1K OHM 1/2W 5%	R3,5,9,12,16,30,43,49, 78,77		
23	471-0103	15	RES 10K OHM 1/2W 5%	R6,8,13,15,21-25,		
24	471-0104	2	RES 100K OHM 1/2W 5%	44-48,75		
25	471-0153	1	RES 15K OHM 1/2W 5%	R20,80		
26	471-0154	3	RES 150K OHM 1/2W 5%	R59		
27	471-0183	6	RES 18K OHM 1/2W 5%	R1,19,28,41,53,72		
28	471-0223	4	RES 22K OHM 1/2W 5%	R27,52,60,83		
29	471-0225	1	RES 2.2M OHM 1/2W 5%	R56		
30	471-0272	1	RES 2.7K OHM 1/2W 5%	R62		
31	471-0473	2	RES 47K OHM 1/2W 5%	R50,58		
32	471-0682	1	RES 6.8K OHM 1/2W 5%	R17		
33	471-0683	4	RES 68K OHM 1/2W 5%	R4,63,76,54		
34						
35	471-0823	1	RES 82K OHM 1/2W 5%	R29		
36	475-0008	5	POT CARBON 50K OHM	R10,24,51,61,81		
37	481-0006	9	DIODE IN914/IN4148	D1-D9		

**Gremmin Industries, Inc.**  
San Diego, California 92123

**PARTS  
LIST**

**TITLE**  
Y-2 SOUND BOARD

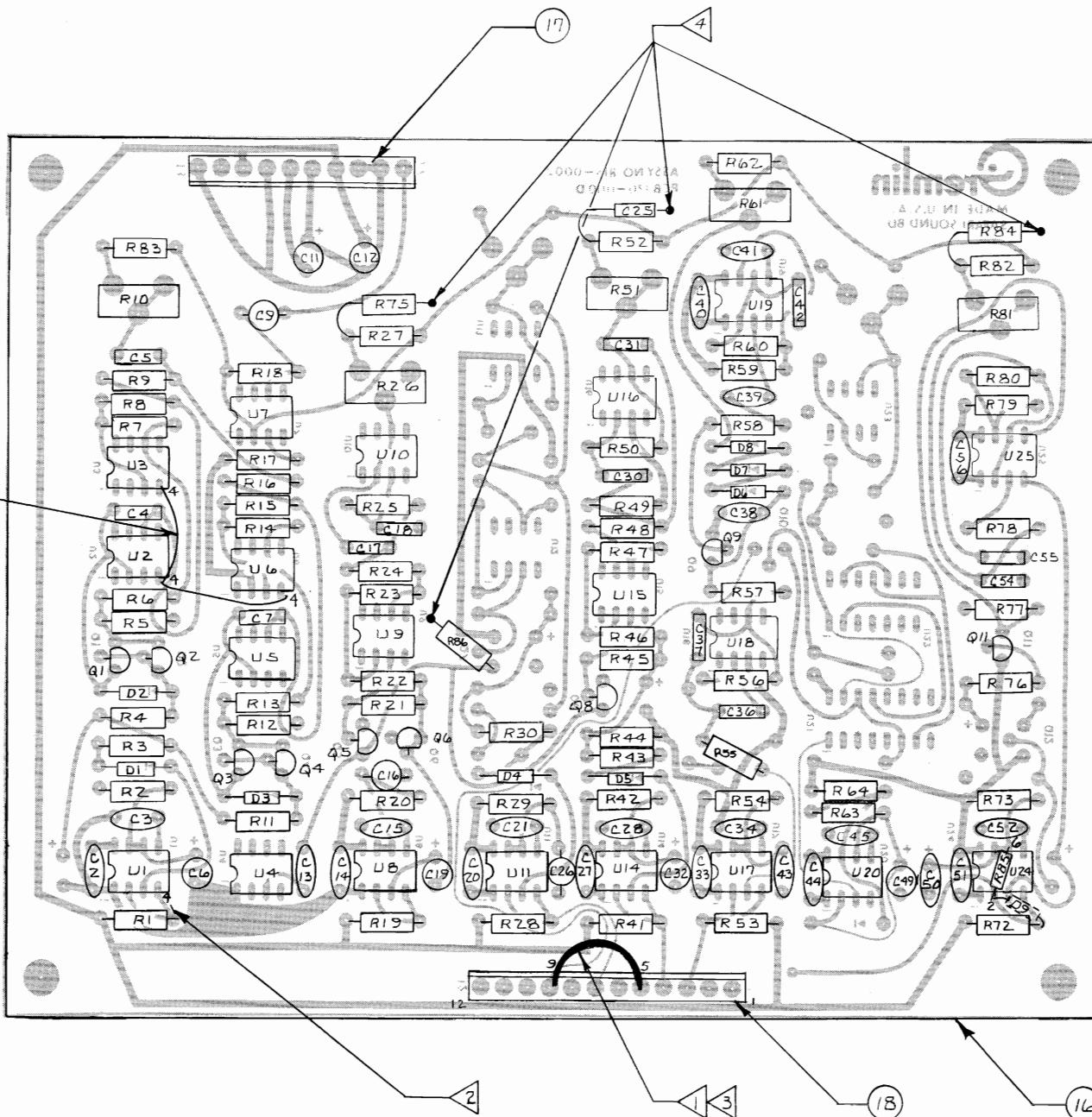
**826-0002**  
**DWG NO**

**SH 4  
OF 6**  
**F  
REV**

<b>ITEM NO</b>	<b>PART NO</b>	<b>QTY PER ASSY</b>	<b>DESCRIPTION</b>	<b>REF DES</b>
38	482-0006	1	X15TOR 2N4403	Q9
39	482-0014	6	X15TOR 2N4401	Q1-4,6,11
40	482-0023	2	X15TOR 2N4093	Q5,B
41	471-0331	1	RES 330 OHM 1/2W 5% R55	
42	471-0332	2	RES 3.3K OHM 1/2W 5% R64,84	
43	471-0561	1	RES 560 OHM 1/2W 5% R57	
44	471-0563	4	RES 56K OHM 1/2W 5% R7,11,14,18	
45	471-0623	1	RES 62K OHM 1/2W 5% R79	
46	471-0105	3	RES 1M OHM 1/2W 5% R73, R85, R86	

8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

REVISIONS			
ZONE	LTR	DESCRIPTION	DATE
C	C	REVISED & REDRAWN PER ECN 266	WJB 1-8-79
D	D	PER ECN 271	KB 1-15-79
E	E	PER ECN 272	WJB 1-16-79
F	F	PER ECN 276	KB 1-31-79



SEE DETACHED PARTS LIST

- 4 SOLDER TO GND PLANE
- 3 INSTALL ON BACK OF BOARD
- 2 CUT CLAD FROM U1, PIN 4 TO R1
- 1 JUMPER

NOTES:

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS   DECIMALS   ANGLES $\pm .XX \pm .XXX \pm .XXX$		CONTRACT NO.	Gremlin Industries, Inc. San Diego, California 92123	
MATERIAL		APPROVALS	DATE	
726-0005		DRAWN,	1-8-79	
726-0004		CHECKED,	1-9-79	
726-0003		APPROVED,		
NEXT ASSY		FINISH		
USED ON				
APPLICATION		DO NOT SCALE DRAWING		
SCALE 2/1				
SHEET 5 OF 6				

8

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D

C

B

826-0002/F

A

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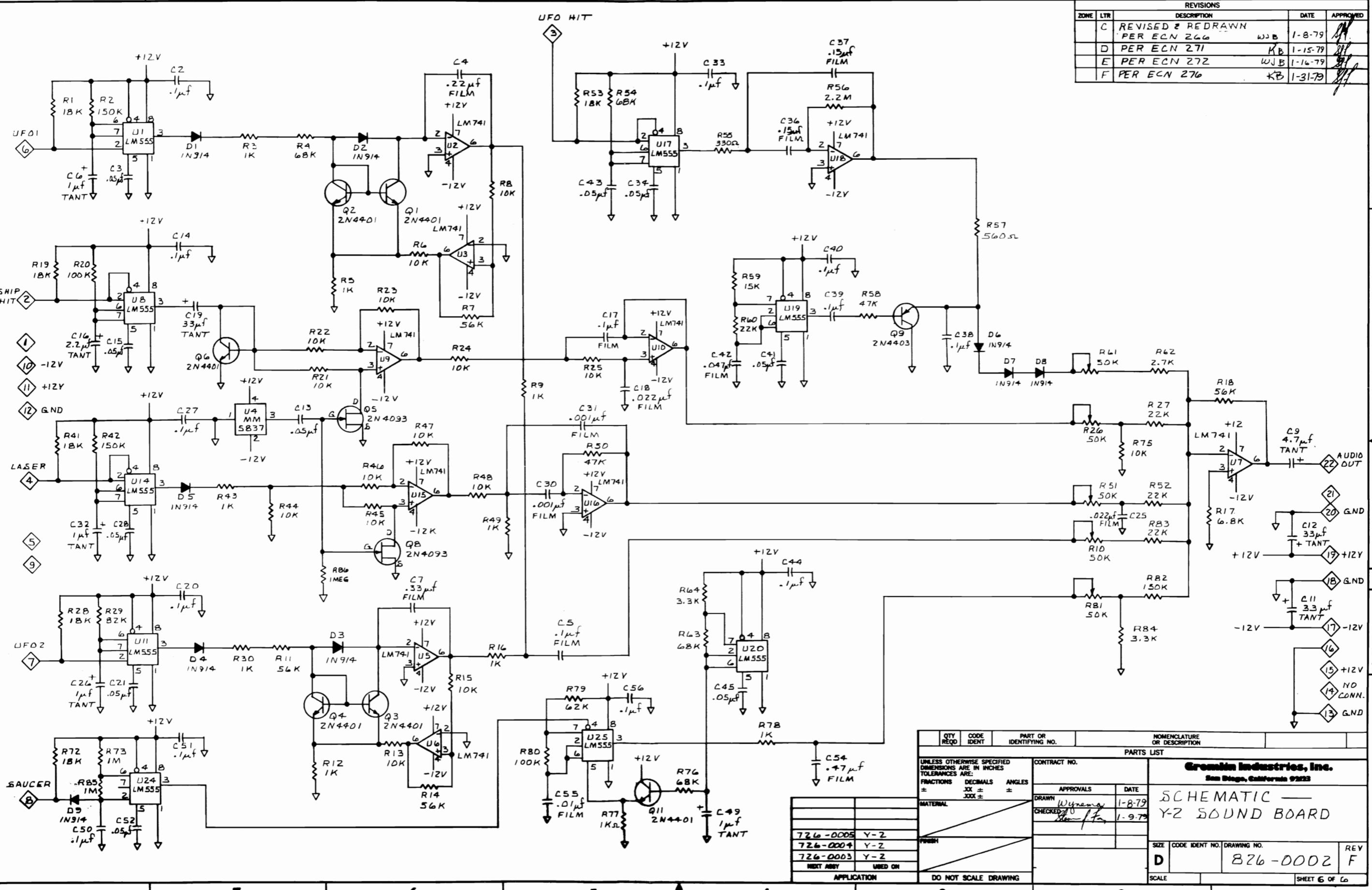
5

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A

D

C

B

A

A

A

Grendel Industries, Inc. 2200 Plaza, Sacramento 95823		PARTS LIST	TITLE ASSY SPACE ATTACK C.V. LOGIC	826-0004	SH 1 OF 6	A REV
SHT 3 "E" SIZE SHT 4,5,6 "D" SIZE		DRAWN CHECK	Wynne 1-17-79 Sht 4 1-19-79	ENGR APPR		
LTR	DATE	REVISION DESCRIPTION		DRAFT	CHECK	APPR
A	1-19-79	RELEASED		WJB	JF	JF 1/22/79

Grenadian Industries, Inc. San Bruno, California 94066		PARTS LIST	TITLE ASSY BASIC V.I.C.BD.	300-0031	SH 1 OF 5	A REV
SHT 5 "E" SIZE		DRAWN Wynema 11-20-78	DWG NO	ENGR		
		CHECK <i>Jew. J. Taylor</i> 12-22-78		APPR		
LTR	DATE	REVISION DESCRIPTION	DRAFT	CHECK	APPR	
A	12-22-79	RELEASED	WJB	<i>JT</i>	<i>JT</i>	

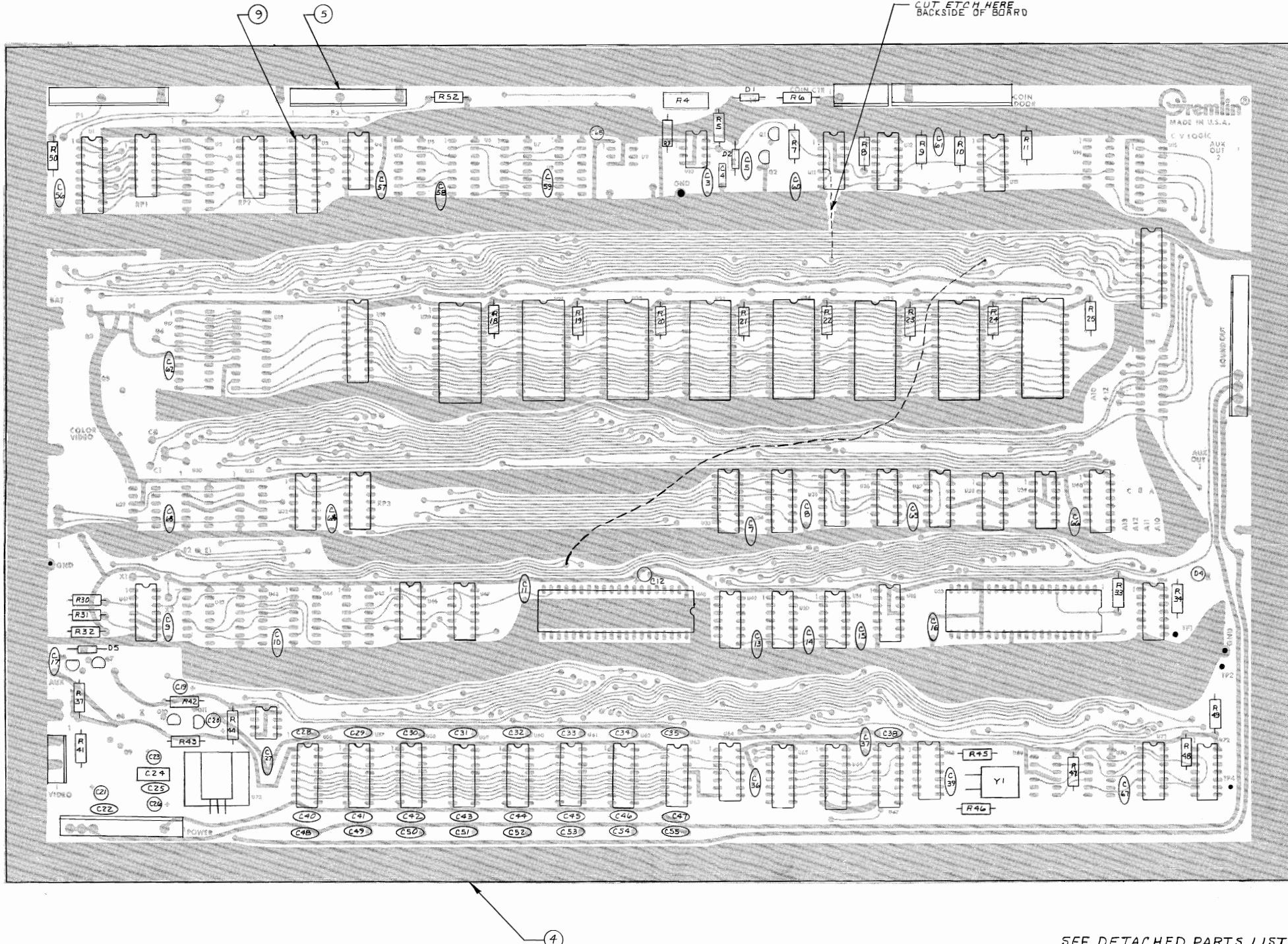
**Gremillen Industries, Inc.**  
San Diego, California 92123

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	TITLE ASSY BASIC V.I.C.BD.	
				DWG NO	SH 3 OF 5 REV
19	314-0015	1	1C 7404	U54	
20	314-0018	3	1C 74LS00	U4, U12, U32	
21	314-0019	2	1C 74LS04	U35, U64	
22	314-0040	3	1C 74LS125	U13, U46, U47	
23	314-0046	1	1C 74S04	U68	
24	314-0053	4	1C 74S175	U49-U51, U67	
25	314-0055	2	1C 74LS244	U1, U19	
26	314-0058	5	1C 74LS08	U37-U39, U41, U71	
27	314-0059	1	1C 74LS10	U52	
28	314-0061	1	1C 74LS42	U40	
29	314-0062	2	1C 74LS74	U11, U72	
30	314-0078	1	1C 74LS02	U36	
31	314-0092	2	1C 8216	U33, U34	
32	315-0039	B	1C 4K RAM 12V	U56-U63	
33	315-0031	1	1C 280 MK3880	U53	
34	315-0042	1	1C VID INTERFACE	U48	
35	314-0093	1	1C 74LS374	U16	
36	316-0042	1	1C PROM 32X8 SEQ	U66	
37	316-0043	1	1C PROM 32X8 CTL	U65	
38	390-0003	1	LED RED	D4	
39	471-0011	1	RES 10 OHM 1/2W 5%	R50	
40	471-0102	7	RES 1K OHM 1/2W 5%	R7-R11, R32, R37	
41	471-0103	1	RES 10K OHM 1/2W 5%	R6	

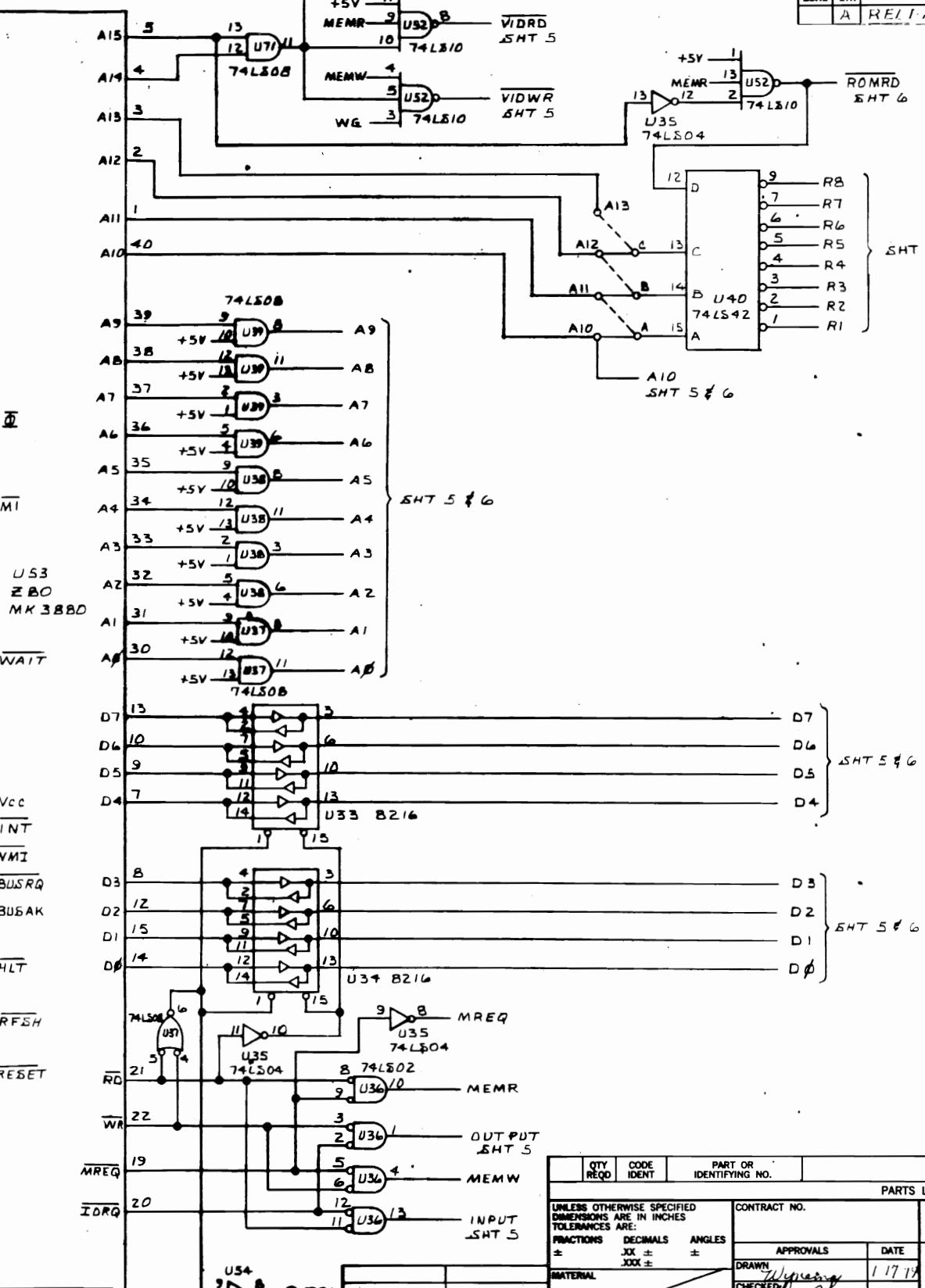
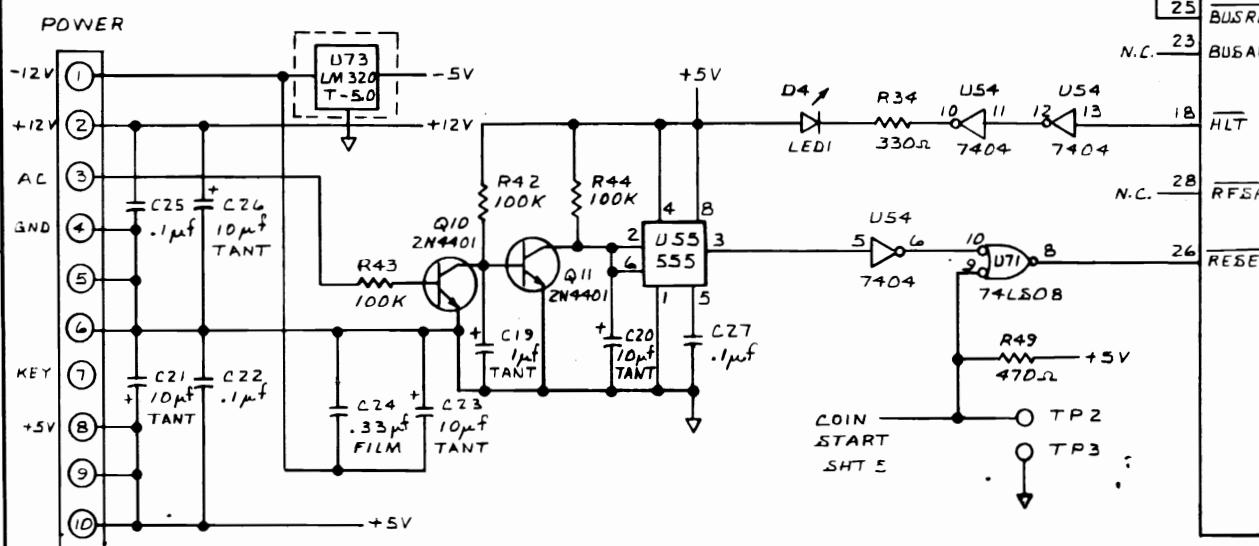
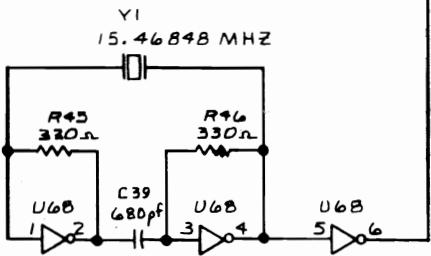
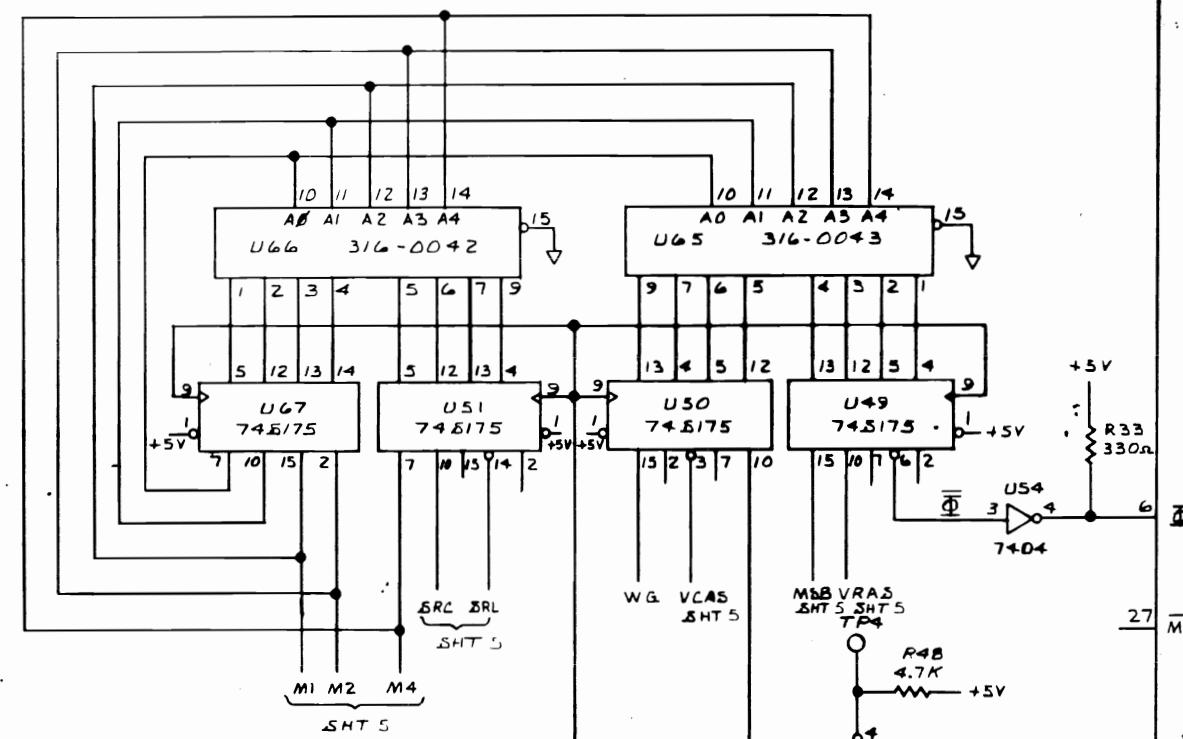
Gremm Industries, Inc. San Bruno, California 94033		PARTS LIST	TITLE ASSY BASIC V.I.C.BD.	800-0031 DWG NO	SH 4 OF 5	A REV
ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION		REF DES	
42	471-0104	3	RES 100K OHM 1/2W 5%		R42 - R44	
43	471-0222	6	RES 2.2K OHM 1/2W 5%		R20 - R25	
44	471-0223	1	RES 22K OHM 1/2W 5%		R3	
45	471-0331	6	RES 330 OHM 1/2W 5%		R30,R31,R33,R34,R45,R46	
46	471-0471	1	RES 470 OHM 1/2W 5%		R49	
47	471-0472	3	RES 4.7K OHM 1/2W 5%		R5,R47,R48	
48	471-0750	1	RES 75 OHM 1/2W 5%		R41	
49	475-0001	1	POT 10K PC MTV		R4	
50	477-0002	2	RES PACK 15 X 2.2K		RPI, RP3	
51	481-0006	3	DIODE IN914/IN4148		D1,D2,D5	
52	482-0006	1	XSTR 2N4403		Q6	
53	482-0010	1	XSTR PE8050		Q2	
54	482-0014	4	XSTR 2N4401		Q1,Q7,Q10,Q11	
55	530-0006	1	HEATSINK 295-1			

Gromm Industries, Inc. See Page, Drawing No.		PARTS LIST	TITLE ASSY BASIC U.I.C.BD	800-0031 DWG NO	SH 2 OF 5	A REV
ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION		REF DES	
1	151-0005	1	CAP CER 680pf 50V		C 39	
2	151-0012	54	CAP CER .1μf 50V		C3,5,7-11,13-17,22,25, C27-38,C40-67	
3	152-0001	1	CAP FILM .1μf 100V		C 4	
4	152-0017	1	CAP FILM .33μf 100V		C 24	
5	153-0001	6	CAP TANT 10μf 25V		C12,29,21,23,26,68	
6	153-0002	1	CAP TANT 1μf 25V		C19	
7	170-0150	1	PCB C.V. LOGIC			
B	211-0004	6	CONN PIN TEST PT	TP1-TP4, GND		
9	212-0004	2	CONN M 4 PIN			
10	212-0021	3	CONN M 10 PIN			
11	212-0031	1	CONN M 12 PIN			
12	213-0001	6	SKT 24 PIN DUAL INLN	XU22-XU27		
13	213-0004	12	SKT 16 PIN DUAL INLN	XU33,XU34,XU56-XU63, XU65,XU66		
14	213-0005	2	SKT 40 PIN DUAL INLN	XU48,XU53		
15	213-0008	3	SKT 20 PIN DUAL INLN	XU1,XU16,XU19		
16	230-0009	1	XTAL CLK 15.46848	Y1		
17	313-0023	1	IC 320T-5.0	U73		
18	314-0001	2	IC NE 555	U10,U55		

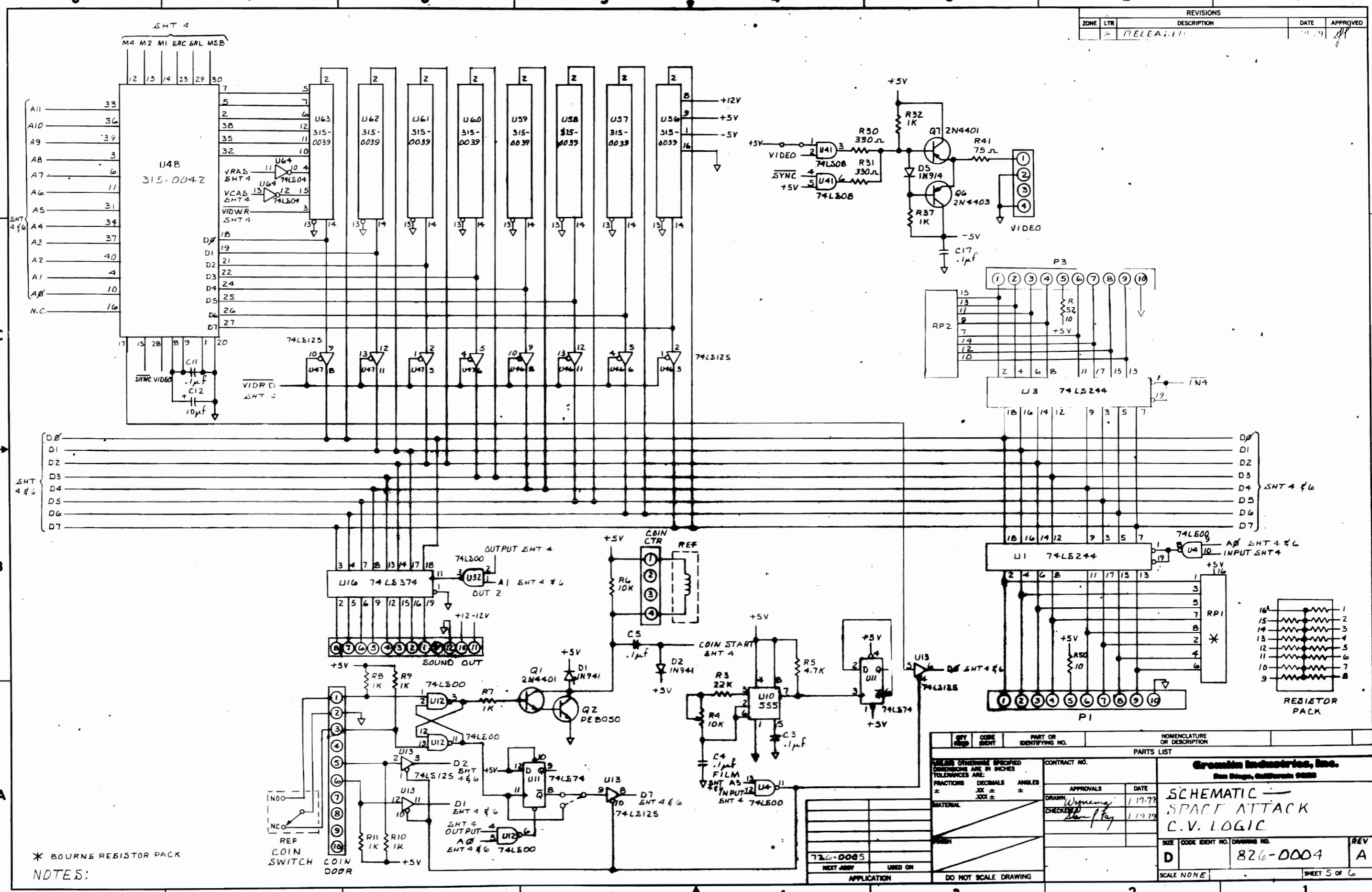




PARTS LIST		
CITY NO.	CODE IDENT.	PART OR IDENTIFYING NO.
NOMENCLATURE OR DESCRIPTION		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS   DECIMALS   ANGLES ±   ±   ± XX.X		
CONTRACT NO.		
Gremlin Industries, Inc. San Diego, California 92125		
APPROVALS   DATE		
DRAWN W. Johnson 1-18-79	CHECKED M. J. Tay 1-19-79	REVIEWED J. M. Taylor 1-19-79
MATERIAL		
726-0005		
NEXT AMRY USED ON		
APPLICATION		
DO NOT SCALE DRAWING		
ASSEMBLY — SPACE ATTACK C.Y. LOGIC		
SIZE	CODE IDENT. NO.	DRAWING NO.
E		826-0004 REV A
SHEET 3 OF 6		



QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES		CONTRACT NO.		<b>Grenlin Industries, Inc.</b> San Diego, California 92123
$\pm$ $JXX \pm$ $JXX \pm$		APPROVALS	DATE	
MATERIAL		DRAWN <i>Wm. Gray</i>	1/17/79	
FINISH		CHECKED <i>Tom Gray</i>	1/19/79	
DO NOT SCALE DRAWING		SCALE NONE	SHEET 4 OF 6	REV A



REVISED		DESCRIPTION		DATE	APPROVED
ZONE	LTR				
A	RELEASED			1-19-79	SP

