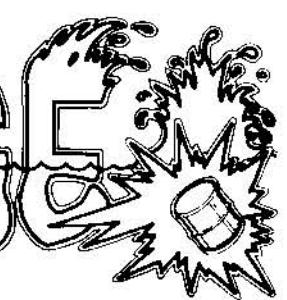


# DEPTHCHARGE



MANUFACTURED BY



## OWNER'S MANUAL

DEPTHCHARGE  
OPERATING INSTRUCTIONS  
AND  
SERVICE MANUAL

GREMLIN INDUSTRIES, INC.  
8401 Aero Drive  
San Diego, CA. 92123

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## INTRODUCTION

DEPTHCHARGE 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 THE 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 the DEPTHCHARGE 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 DEPTHCHARGE has been arranged so that the insertion of a quarter through the coin mechanism will reset the restart in 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.

## WARRANTY/FACTORY SERVICE INFORMATION

### WARRANTY

All Gremlin products are warranted against defective materials and workmanship. This warranty applies for 90 (ninety) days from the date of delivery. This warranty covers defects/failure for all electronic components and connectors (except fuses and lamps, which have no warranty) under normal use. No other warranty is expressed or implied. Permission must be obtained from factory for warranty repair returns. No liability will be accepted if returned without such permission.

### FACTORY SERVICE

Should an assembly become defective, contact your local distributor. Factory authorization to return the assembly will be issued with transportation charges prepaid. If decided upon by factory representative, an advance replacement will be made. No merchandise may be returned to the factory without prior authorization.

The assembly will be repaired and returned, transportation charges prepaid, if still in warranty and no advance replacement made.

If the assembly is found to be damaged by misuse, improper attempts at repair, or abuse, it will be repaired and returned with transportation and repair charges billed.

Out of warranty assemblies, if returned to the factory with transportation charges prepaid, will be repaired and returned with transportation and repair charges billed.

In the instance of a defect of an assembly manufactured by other than GREMLIN INDUSTRIES, INC., every effort will be made to assist the customer in obtaining satisfaction from the original manufacturer.

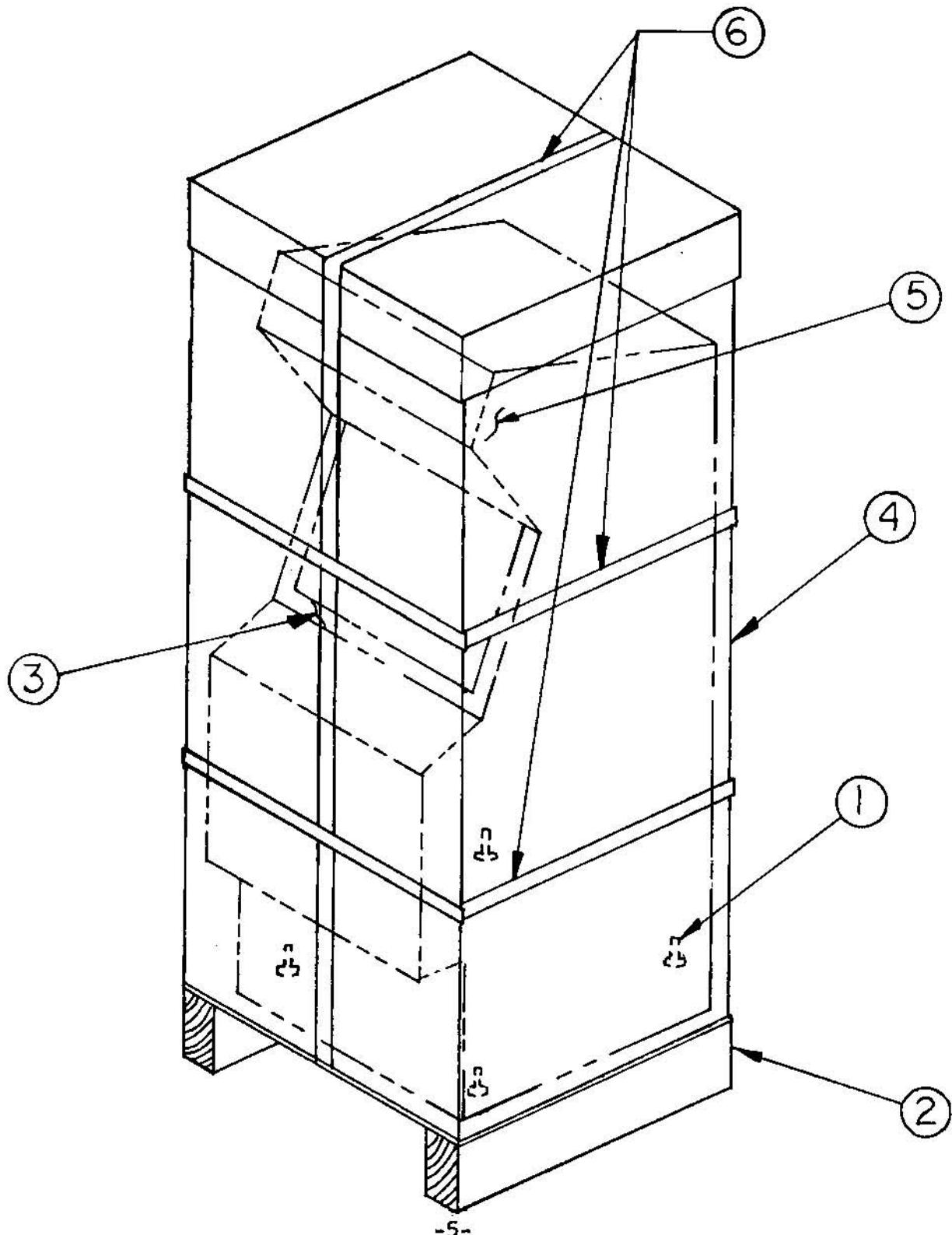
## REPACKAGING INSTRUCTIONS

Should it be necessary to ship this game, the following instructions are provided for game crating.

- A) If the original shipping bolts (Ref. 1) have been discarded, obtain four 5/16"-18" x 1-3/4" hex head bolts with 5/16" flat washer. Lay 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).
- C) After crating is completed, secure package with strapping (Ref. 6).

NOTE: If the game is to be shipped to GREMLIN INDUSTRIES for service or repair, attach a tag identifying the distributor and indicate the service or repair to be accomplished; include the full serial number of the game.

## REPACKAGING INSTRUCTIONS



## DEPTHCHARGE GAME CONCEPT

DEPTHCHARGE is a video game of skill and strategy in which the player attempts to hit as many submarines as possible using depth charges launched from a maneuverable surface ship. Game time runs 90 count.

### PLAYFIELD:

At the top of the screen is a ship which can be moved left or right using two player control buttons. Two additional control buttons launch depth charges from either the right or left side of the ship. The ship movement is necessary both offensively to aim depth charges, and defensively to dodge mines which are released by the submarines and float to the surface. The words TIME and SCORE are displayed in the upper left and upper right of the screen, respectively.

As the game progresses, as many as four submarines appear at different depths, and move at different speeds across the screen. Each submarine has a number on its side, which indicates the point value for sinking that sub.

### DEPTH CHARGES:

The player has six (6) depth charges at his disposal. At the top center of the screen, the number of depth charges in his arsenal is displayed. Every time a depth charge is launched, one of the depth charge counters disappears, and every time a depth charge explodes, one depth charge counter reappears. The depth charge counters thus give a clear indication of how many are available for firing at any time during the game.

### MINES:

As the submarines move across the screen, they randomly release mines which float slowly to the surface and explode. If one of these mines hits the player's ship, a stiff penalty is imposed (See SCORING). The mine explosion is accompanied by a realistic explosion and "spray" sound.

### GRAVEYARD:

Every time a submarine (or the ship) is sunk, a miniature image of it appears at the bottom of the screen. Every hit adds another submarine to the graveyard, so a player can gauge his proficiency with a quick glance at the graveyard. The graveyard images are also used for end-of-game bonus scoring.

## DEPTHCHARGE GAME CONCEPT (Cont'd.):

### SUBMARINES:

Submarines run automatically, and appear at random depths and speeds. There are never more than four subs on the screen at one time. The deep submarines carry higher scores than shallow ones, since they are more difficult to hit. The mines which the subs release are also automatic and random.

### SCORING:

Hitting a submarine scores the value shown on the sub. Anytime the player's ship is sunk by a mine, the player's score is cut in half. At the end of the game, a 30 point bonus is awarded for every submarine in the graveyard.

### HIGH SCORE:

Current high score is displayed at the lower center of the screen during the advertising sequence. It updates with each new higher score. High score can be reset to zero by unplugging the game from line voltage and plugging it back in.

### TIME:

DEPTHCHARGE is set to run for approximately two minutes. This has been found to be an optimum time, and is not adjustable.

### OVERTIME:

If a player manages to score 500 or more points in a game, he is awarded extended time. Extended time runs 45 counts.

### END-OF-GAME:

Wherever DEPTHCHARGE is not being played, an "advertisement" sequence is initiated. The game plays itself to attract attention. To avoid patron confusion, the words "Game Over" appear while the advertising game is being played, and during a thirty (30) second delay thereafter. Following the delay, the advertising sequence repeats.

DEPTHCHARGE GAME CONCEPT (Cont'd.):

E-Z Adjust <sup>TM</sup> control Panel - DEPTHCHARGE has only one adjustment and it is located behind the coin door.

**VOLUME CONTROL** - Set to desired volume for boom and tones during the game. This also affects advertising boom volume if boom switch is "ON".

## MAINTENANCE

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

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## FACTORY ASSISTANCE:

TECHNICAL HELP IS AVAILABLE FROM THE GREMLIN FACTORY. IF A PROBLEM OCCURS WHICH CANNOT BE EASILY RESOLVED BY YOUR DISTRIBUTOR, A PHONE CALL OR LETTER TO THE FACTORY WILL BRING ATTENTION TO YOUR PROBLEM BY A TRAINED REPRESENTATIVE.

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## EQUIPMENT:

1. Oscilloscope - 50 mhz or wider band width
2. DVM (Digital Volt Meter)
3. OHM Meter
4. Logic Probe
5. Solder Station - 75 Watt or less
6. Jumpers

The above list is recommended for anyone attempting to service DEPTHCHARGE.

## OPERATIONAL WAVE FORMS

The following set of scope photographs are intended to aid in the troubleshooting of a malfunctioning Video Logic Board. Although the photos were taken with a four channel scope, the system can be just as easily checked out with a single or dual-channel scope. The important thing to look for is the existence of the signals shown.

### SIGNALS 1-15:

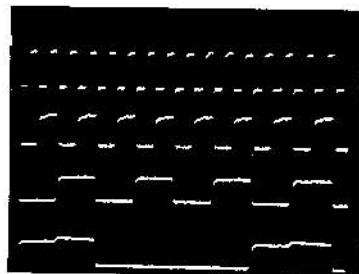
Signals 1-15 show the signals developed by the Video Logic board's master signal sequencer. These signals form the basic timing for the entire board, and therefore, should be checked first. All photos use 5 volt per centimeter vertical sensitivity, and a time base of 200 nanoseconds per division horizontal.

The important thing to check with these photos is the relative shapes of the signals. Don't be concerned with the actual pulse widths and frequencies. If any of the signals are missing (always high or low) check the input side of the 74S175 latch which corresponds to the defective output. If a signal is seen here (don't worry if it is loaded with noise spikes, the 74S175 is there to remove them), the 74S175 should be suspected. Keep in mind that it could also be a line which the 74S175 is driving which is pulling high or low. The best way to check this is to use an exacto knife to cut the trace leaving the proper 74S175 output pin, and again check the 74S175 output. (CAUTION: BEFORE ATTEMPTING ANY REPAIRS REFER TO PAGE 3. FOR WARRANTY CONDITIONS.)

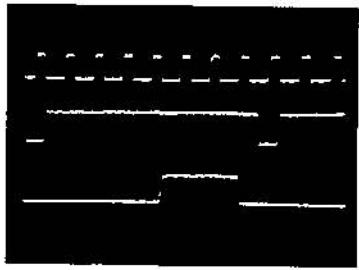
If it is now correct, the problem is on the "downstream" side of the 74S175. DON'T FORGET TO RE-JUMPER THE CONNECTION YOU CUT. If the input side of the 74S175 is also "dead", suspect the PROM (U27 or U28), whichever is applicable.

OPERATIONAL WAVE FORMS (Cont'd.):

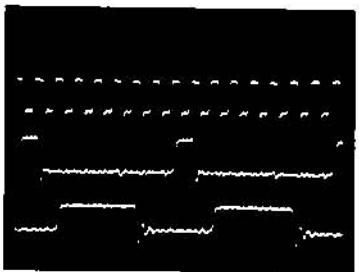
SIGNALS 1-15:



1. (U14-15)
2. (U14-10)
3. M1 (U14-2)
4. M2 (U14-7)



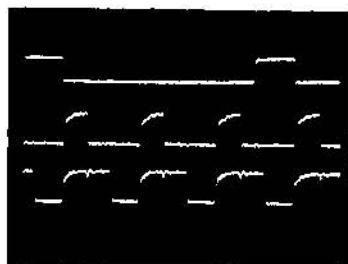
5. (U13-15) SRCK (Shift Register Clock)
6. (U13-2) SRLD (Shift Register Load)
7. M4 (U13-13)



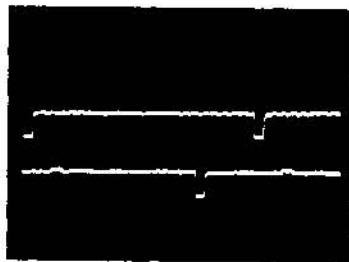
8. (U11-14) Pin 9
9. (U12-15) Processor-Clock Phase 1
10. (U12-10) Processor-Clock Phase 2

OPERATIONAL WAVE FORMS (Cont'd.):

SIGNALS 1-15 (Cont'd.):



11. S1 (U11-17)
12.  $\overline{\text{RAS}}$  (U29-12)
13.  $\overline{\text{CAS}}$  (U11-2)

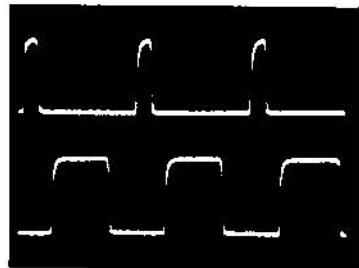


14.  $\overline{\text{RWT}}$  (U11-10)
15.  $\overline{\text{MSB}}$  (U12-7)

OPERATIONAL WAVE FORMS (Cont'd.):

SIGNALS 16 AND 17:

Signals 16 and 17 are the 8080 clocks. Vertical sensitivities are 5 volts per centimeter; horizontal is 200 ns/cm. Make sure that these signals pull up to at least 10.5 volts (they normally drive to 12 volts).



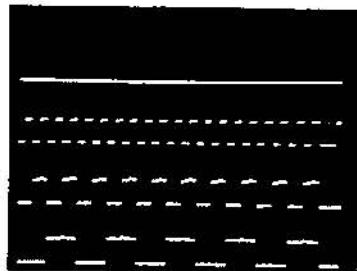
16. 12 Volt  
Phase 1 Clock  
(TP 1)

17. 12 Volt  
Phase 2 Clock  
(TP 2)

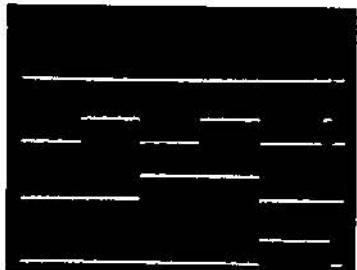
OPERATIONAL WAVE FORMS (Cont'd.):

SIGNALS 18 THROUGH 28:

Signals 18 through 28 show signals from the horizontal timing chain for the CRT timing. The three photos show the top signal as HORIZONTAL RESET, which is a good triggering signal for viewing the other waveforms. The time between horizontal reset pulses should be about 63 microseconds.



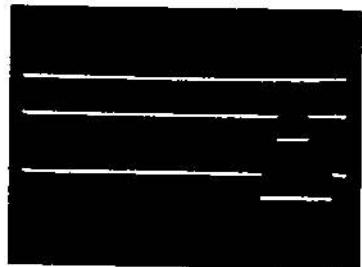
18. Horizontal Reset (U46-2,12)
19. 8H (U46-3)
20. 16H (U46-4)
21. 32H (U46-5)



22. Horizontal Reset (U46-2,12)
23. 64H (U46-6)
24. 128H (U46-11)
25. 256H (U46-10)

OPERATIONAL WAVE FORMS (Cont'd.):

SIGNALS 18 THROUGH 28 (Cont'd.):

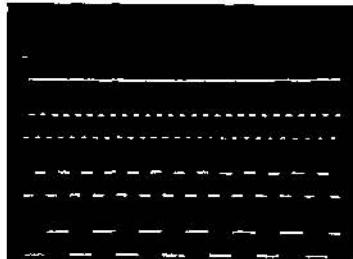


- 26. Horizontal Reset (U46-2,12)
- 27. HSYNC (U36-8)
- 28. HBLANK (U47-1)

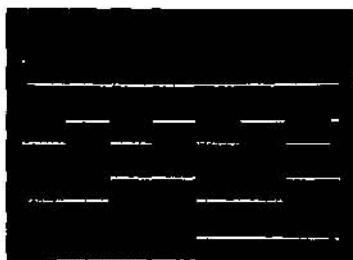
OPERATIONAL WAVE FORMS (Cont'd.):

SIGNALS 29 THROUGH 43:

Signals 29 through 43 show the vertical timing chain waveforms. In these four photos, the top trace is VERTICAL RESET. Note that the horizontal time base for signals 29 through 36 is different than for 37 through 43. The time between vertical reset pulses should be about 16 milliseconds (last two photos).



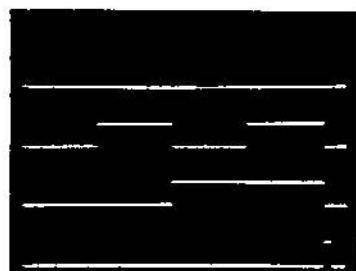
- 29. Vertical Reset (U49-2)
- 30. 1V (U49-3)
- 31. 2V (U49-4)
- 32. 4V (49-5)



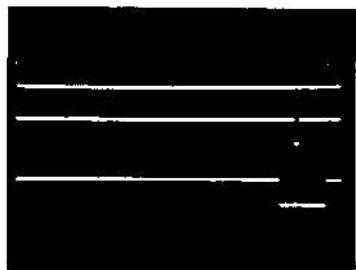
- 33. Vertical Reset (U49-2)
- 34. 8V ( U49-6)
- 35. 16V (U49-11)
- 36. 32V (U49-10)

OPERATIONAL WAVE FORMS (Cont'd.):

SIGNALS 29 THROUGH 43 (Cont'd.):



- 37. Vertical Reset (U49-2)
- 38. 64V (U49-9)
- 39. 128V (U49-8)
- 40. 256V (U60-5)



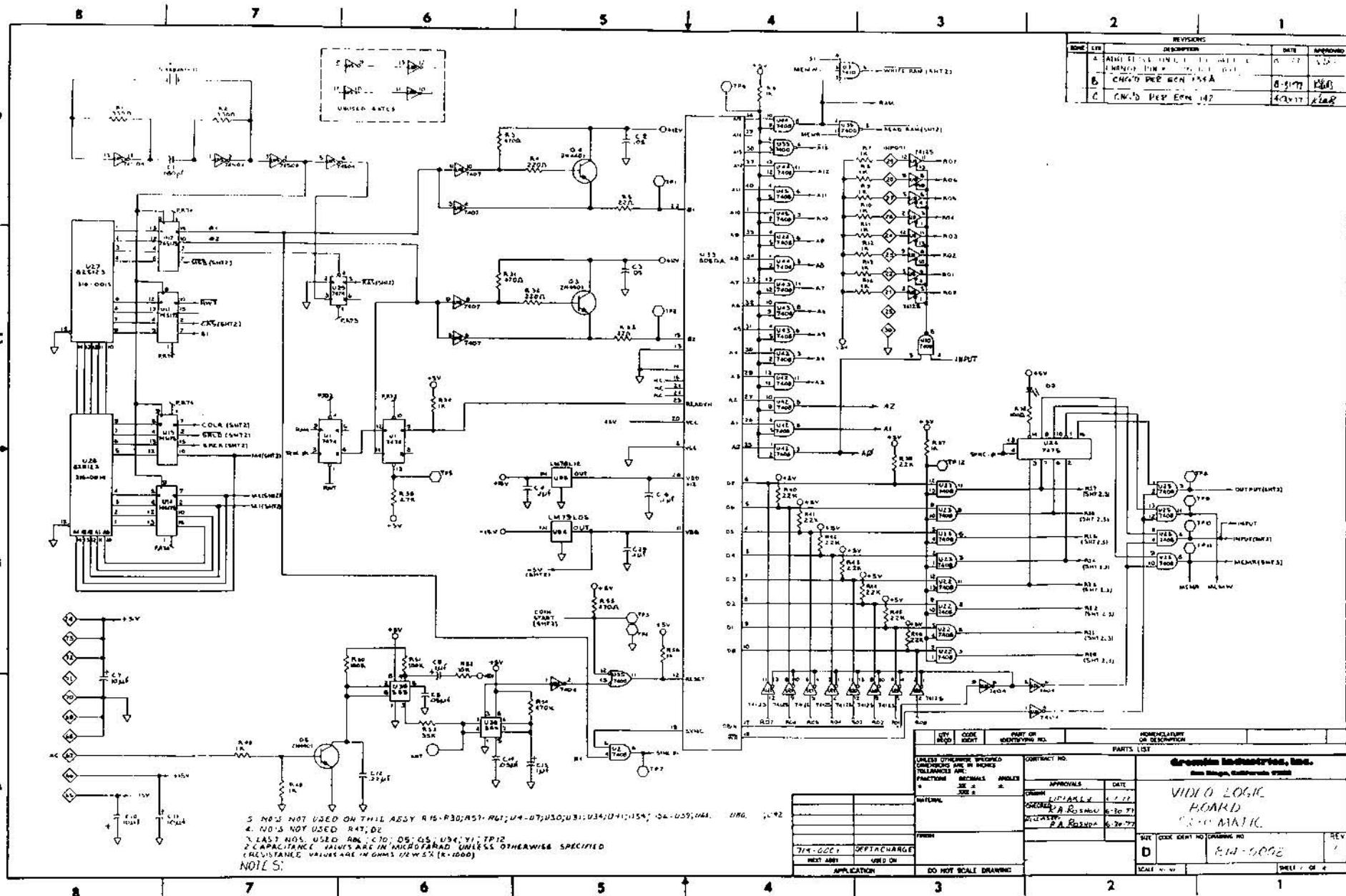
- 41. Vertical Reset (U49-2)
- 42. VSYNC (U47-12)
- 43. VBLANK (U48-5)

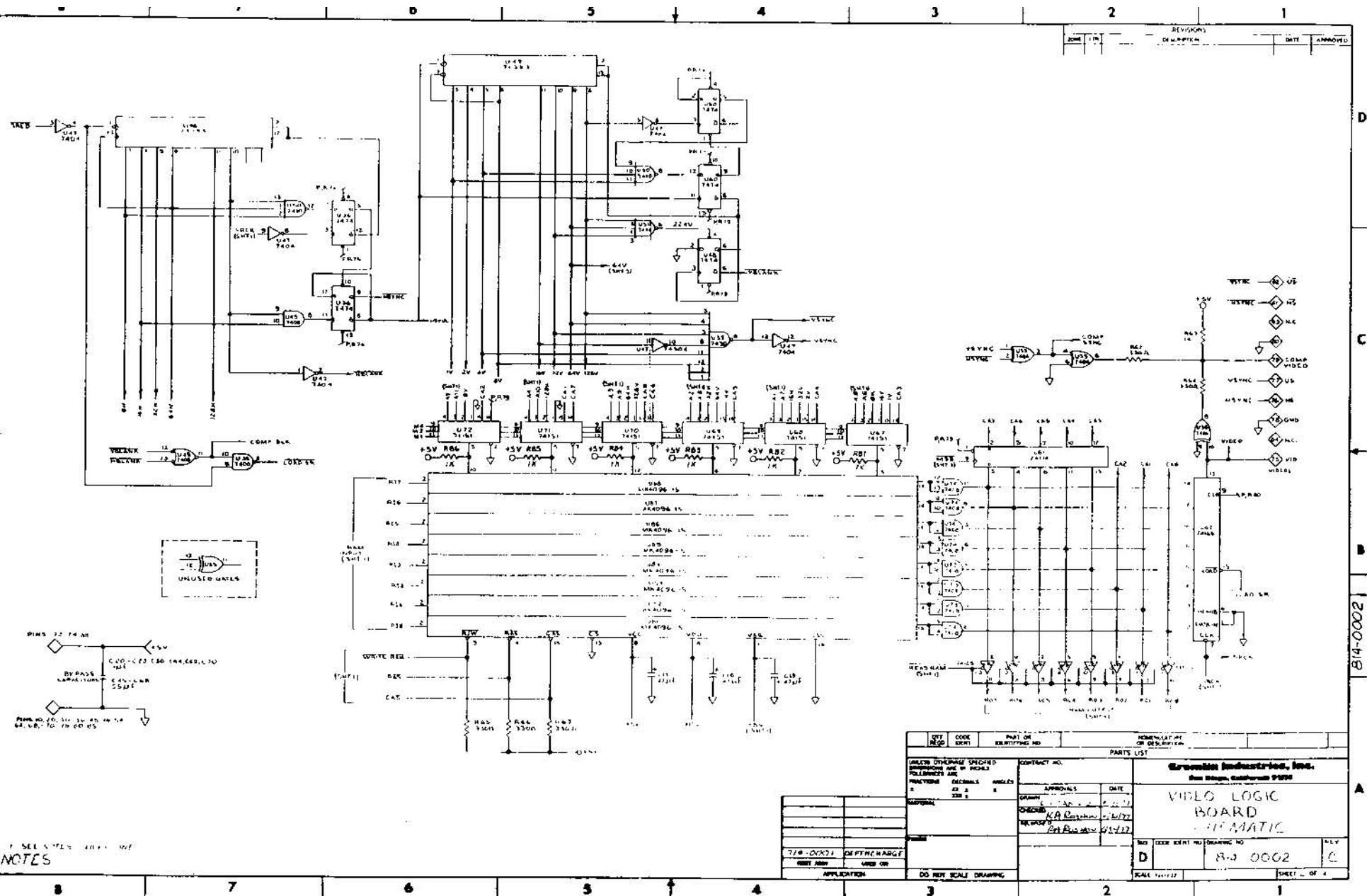
DEPTHCHARGE REPLACEABLE PARTS LIST

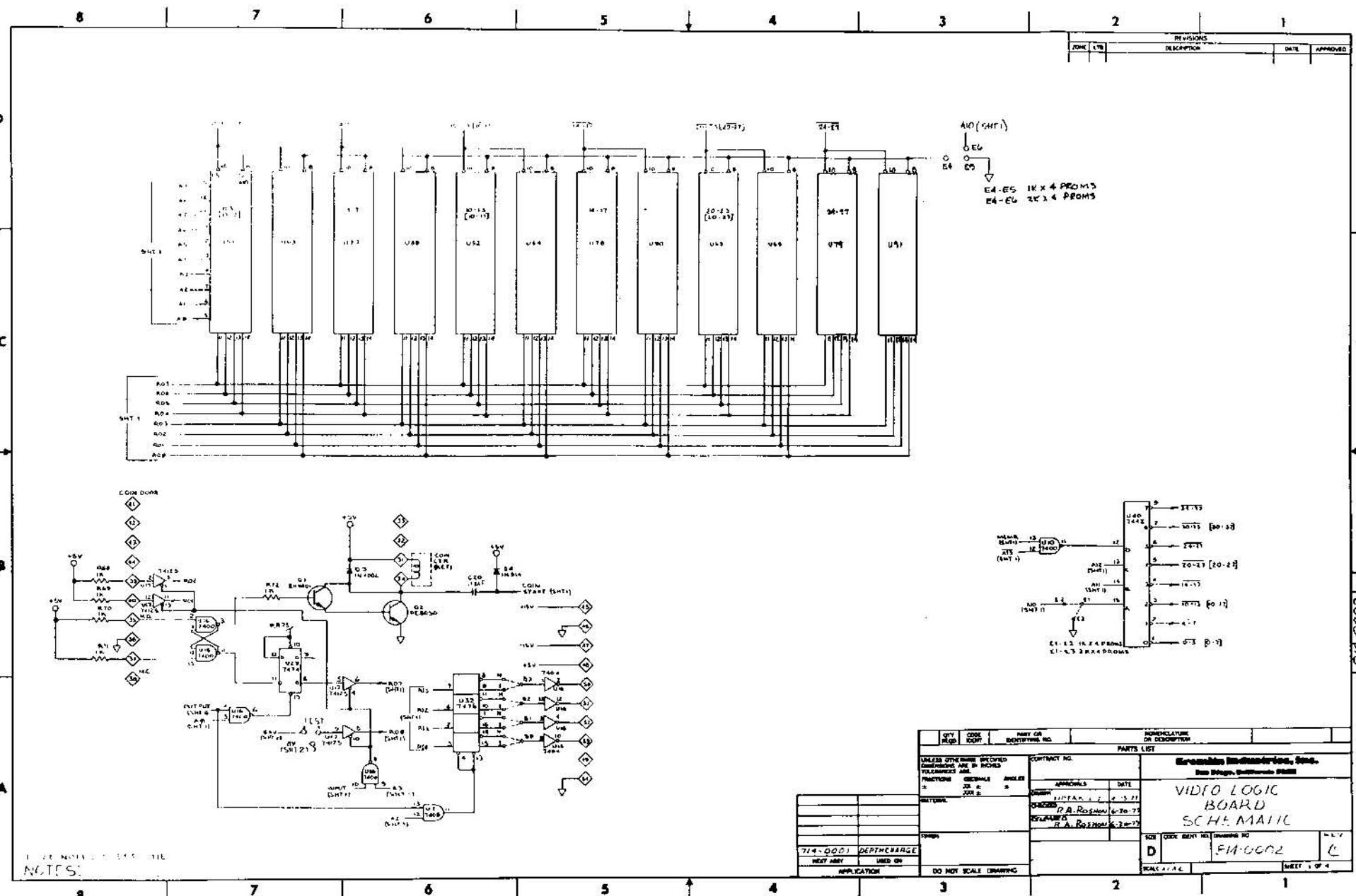
<u>DESCRIPTION</u>	<u>PART NUMBER</u>	<u>QTY USED.</u>
BUSHING S/REL. 3/8"	280-0001	1
BUTTON, PLUNGER RED	240-0006	4
CABINET VIDEO	140-0022	1
CABINET TIE	280-0005	10
CASH BOX, TABLE	220-0013	1
CLIP, SWITCH	250-0048	1
CLIP, WIRE HOLDDOWN	280-0004	35
COIN MECHANISM, DUAL	220-0010	1
CONTROL PANEL	280-0039	1
COVER, SPEAKER 6x9	130-0002	1
DECAL, CAUTION 115V	420-0030	1
DECAL, DEPTHCHARGE	420-0064	1
DECAL, IMPORTANT NOTE	420-0038	2
FEET, CABINET	280-0030	4
FIXT, LAMP FLOUR 18"	390-0012	1
FRAME, BEZEL	250-0032	1
GRAPHIC, FRONT	253-0056	1
GRAPHIC, SIDE LEFT D/C	253-0042	1
GRAPHIC, SIDE RT. D/C	253-0041	1
JUNCTION BOX COVER M	140-0021	1
LAMP, FLUORESCENT 18"	390-0011	1
LID ASSY, COIN BOX	220-0016	1
MANUAL, DEPTHCHARGE	420-0077	1
MASK, SHADOW CABINET	253-0014	1
MONITOR SCREEN	253-0028	1

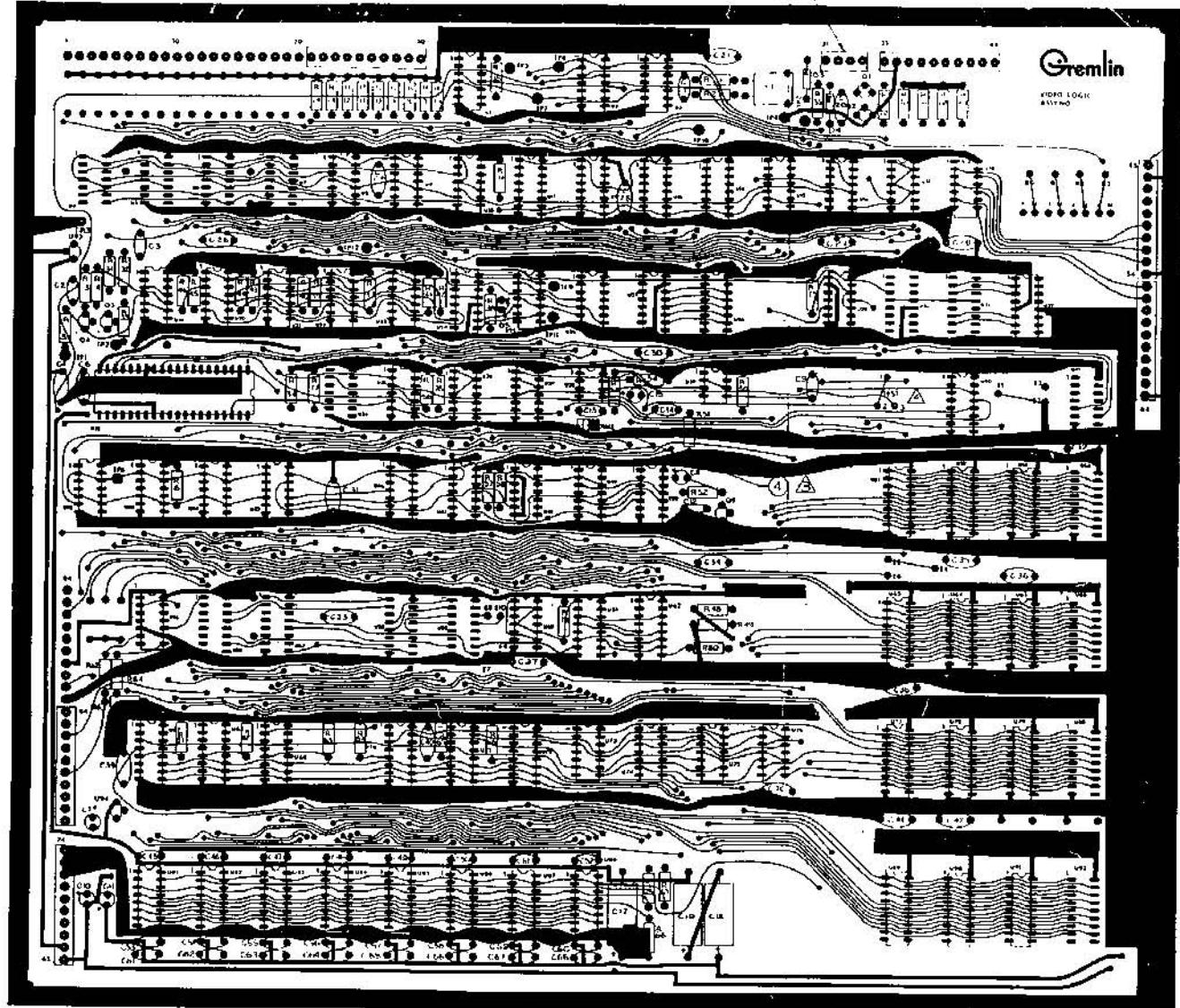
DEPTHCHARGE REPLACEABLE PARTS LIST (Cont'd.):

<u>DESCRIPTION</u>	<u>PART NUMBER</u>	<u>QTY USED.</u>
MONITOR, VIDEO 19"	200-0002	1
NUT, WIRE	280-0010	2
PANEL, DISPLAY UPPER	253-0029	1
PANEL, FRONT SWITCH	250-0103	1
PLATE, COIN RETENSION	250-0062	2
SPEAKER, GAME 6x9	130-0001	1
SPEAKER, COVER 6x9	130-0002	1
SPRING RETAINER	250-0034	1
VOULME CONTROL BRACKET	250-0031	1
VOLUME CONTROL KNOB	240-0001	1
ASSY, COIN COUNTER	814-0011	1
ASSY, JUNCTION BOX	808-0009	1
ASSY, MONITOR HARN.	814-0010	1
ASSY, POWER SUPPLY	814-0005	1
ASSY, SPEAKER CABLE	807-0010	1
DEPTHCHARGE SOUND BOARD	814-0001	1
HARN. COIN MECH. ASSY.	814-0008	1
HARN. JUMPER ASSY.	814-0007	1
POWER SUPPLY ASSY.	814-0003	1
VIDEO LOGIC ASSY.	814-0002	1
HARN. VOL. CONTROL BLK.	814-0009	1
OPERATOR SWITCH ASSY.	814-0006	1



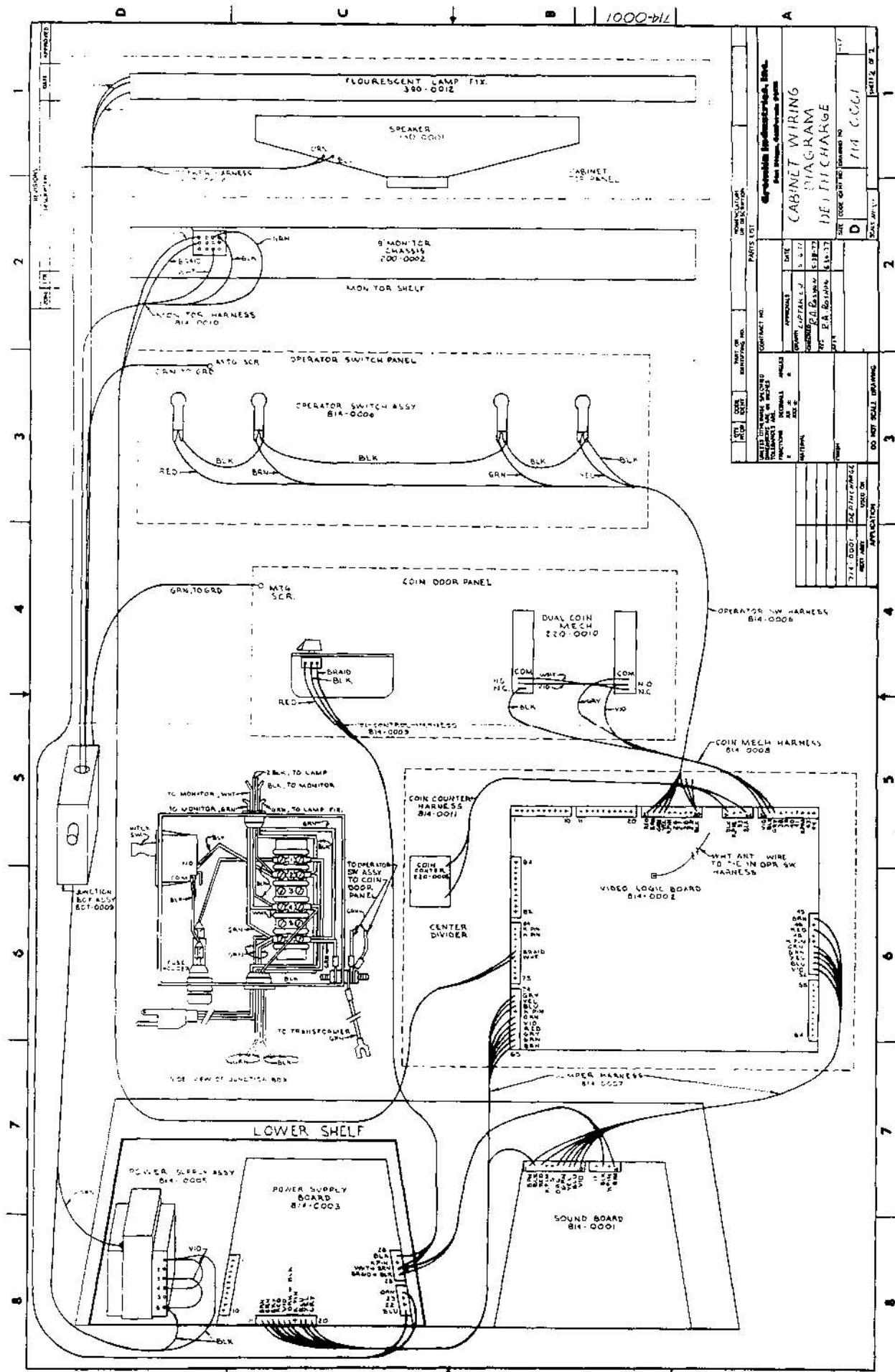


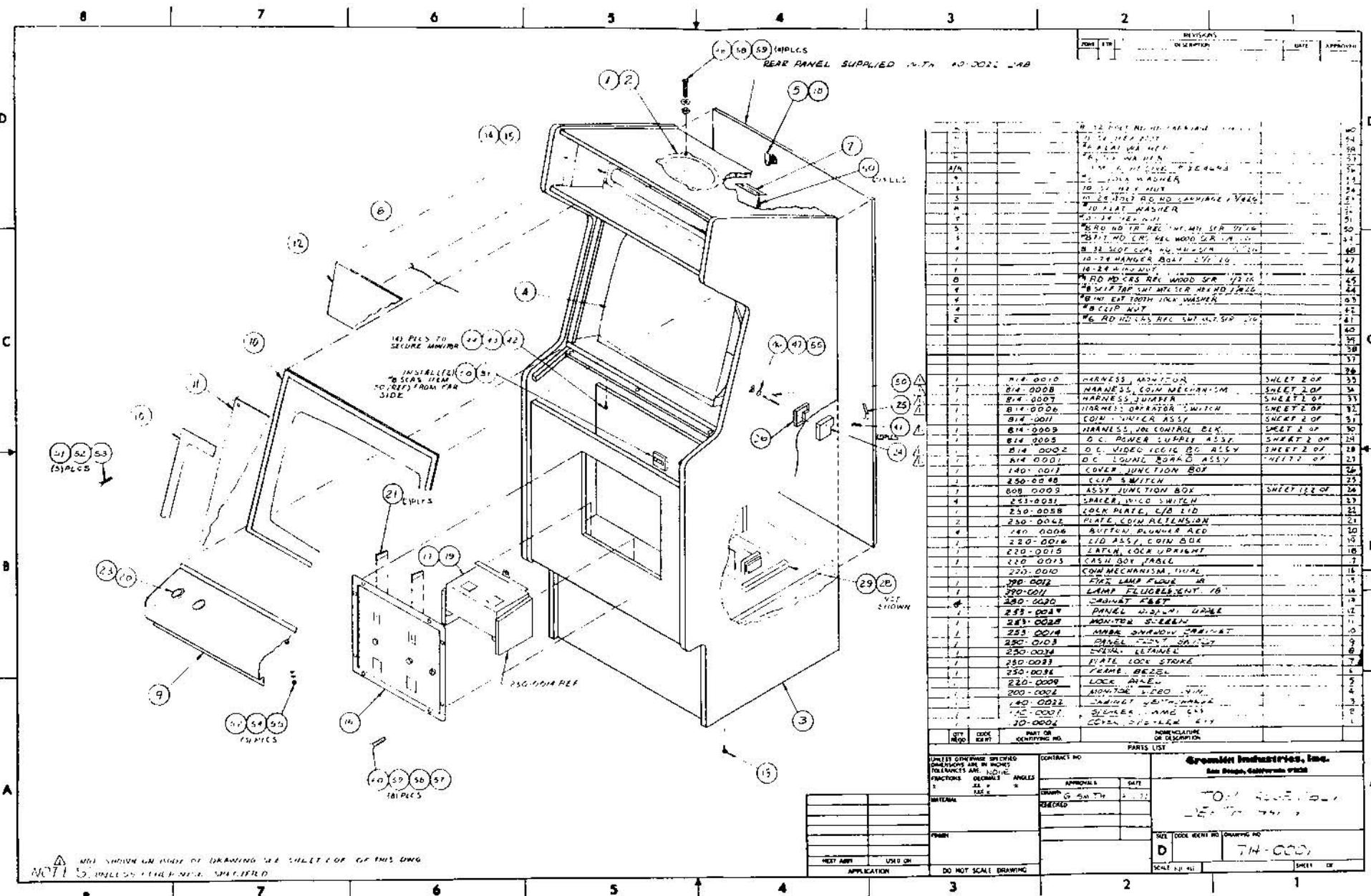


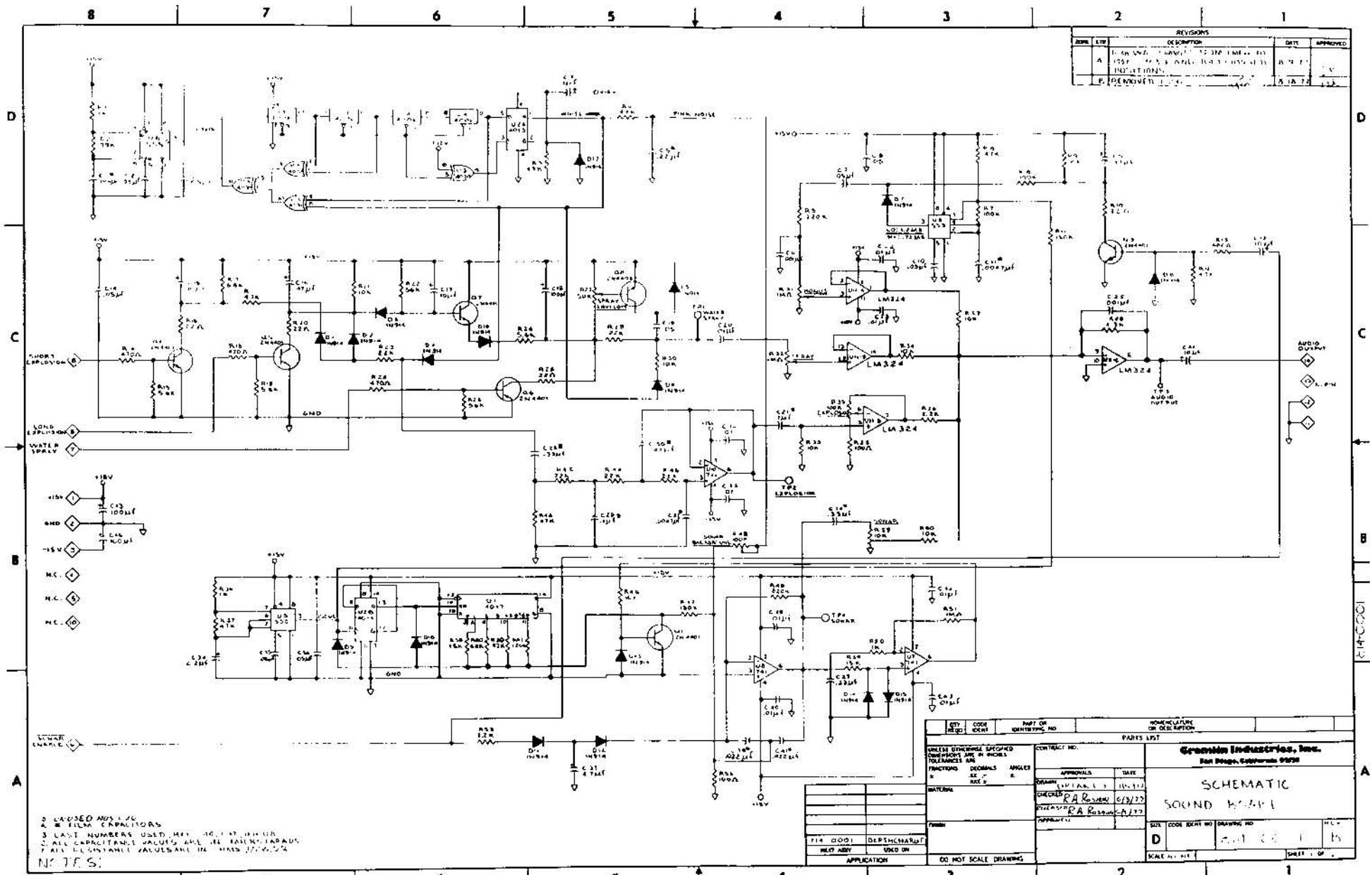


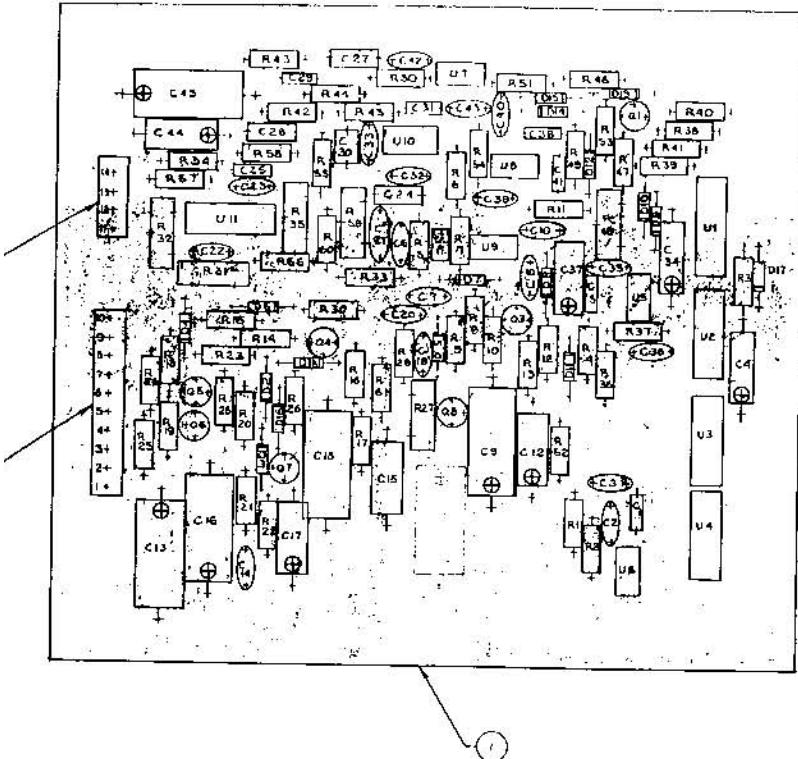
▲ JUMPER TO BE ADDED AFTER FINAL TEST  
▲ ANT WIRE WHT Z 22 GA CONNECTED TO PIN 2 Z-GUIDE  
▲ ALL RESISTANCE VALUES ARE IN MICROOHMS  
▲ ALL RESISTANCE VALUES ARE IN OHMS UNLESS OTHERWISE SPECIFIED

PARTS LIST		PARTS OVERLAY	
ITEM NUMBER	DESCRIPTION	ITEM NUMBER	DESCRIPTION
1	401-0001	1	CAP TANT 100NF 25V
2	401-0002	2	CAP 33UF 100V
3	401-0003	3	C4-C6 C1530 L7109 T0
4	401-0004	4	CAP 10UF 100V
5	401-0005	5	CAP 10UF 100V
6	401-0006	6	CAP 10UF 100V
7	401-0007	7	C1 LM319DS
8	401-0008	8	C1 LM319L2
9	401-0009	9	STAL 4.5MHZ 500Z
10	401-0010	10	CONN FEMALE 5PIN
11	401-0011	11	CONN MALE 5PIN
12	401-0012	12	CONN MALE 10PIN
13	401-0013	13	CONN MALE TEST 5PIN
14	401-0014	14	RELAY
15	401-0015	15	RELAY 12VDC 1A
16	401-0016	16	RELAY 12VDC 1A
17	401-0017	17	RELAY 12VDC 1A
18	401-0018	18	RELAY 12VDC 1A
19	401-0019	19	RELAY 12VDC 1A
20	401-0020	20	RELAY 12VDC 1A
21	401-0021	21	RELAY 12VDC 1A
22	401-0022	22	RELAY 12VDC 1A
23	401-0023	23	RELAY 12VDC 1A
24	401-0024	24	RELAY 12VDC 1A
25	401-0025	25	RELAY 12VDC 1A
26	401-0026	26	RELAY 12VDC 1A
27	401-0027	27	RELAY 12VDC 1A
28	401-0028	28	RELAY 12VDC 1A
29	401-0029	29	RELAY 12VDC 1A
30	401-0030	30	RELAY 12VDC 1A
31	401-0031	31	RELAY 12VDC 1A
32	401-0032	32	RELAY 12VDC 1A
33	401-0033	33	RELAY 12VDC 1A
34	401-0034	34	RELAY 12VDC 1A
35	401-0035	35	RELAY 12VDC 1A
36	401-0036	36	RELAY 12VDC 1A
37	401-0037	37	RELAY 12VDC 1A
38	401-0038	38	RELAY 12VDC 1A
39	401-0039	39	RELAY 12VDC 1A
40	401-0040	40	RELAY 12VDC 1A
41	401-0041	41	RELAY 12VDC 1A
42	401-0042	42	RELAY 12VDC 1A
43	401-0043	43	RELAY 12VDC 1A
44	401-0044	44	RELAY 12VDC 1A
45	401-0045	45	RELAY 12VDC 1A
46	401-0046	46	RELAY 12VDC 1A
47	401-0047	47	RELAY 12VDC 1A
48	401-0048	48	RELAY 12VDC 1A
49	401-0049	49	RELAY 12VDC 1A
50	401-0050	50	RELAY 12VDC 1A
51	401-0051	51	RELAY 12VDC 1A
52	401-0052	52	RELAY 12VDC 1A
53	401-0053	53	RELAY 12VDC 1A
54	401-0054	54	RELAY 12VDC 1A
55	401-0055	55	RELAY 12VDC 1A
56	401-0056	56	RELAY 12VDC 1A
57	401-0057	57	RELAY 12VDC 1A
58	401-0058	58	RELAY 12VDC 1A
59	401-0059	59	RELAY 12VDC 1A
60	401-0060	60	RELAY 12VDC 1A
61	401-0061	61	RELAY 12VDC 1A
62	401-0062	62	RELAY 12VDC 1A
63	401-0063	63	RELAY 12VDC 1A
64	401-0064	64	RELAY 12VDC 1A
65	401-0065	65	RELAY 12VDC 1A
66	401-0066	66	RELAY 12VDC 1A
67	401-0067	67	RELAY 12VDC 1A
68	401-0068	68	RELAY 12VDC 1A
69	401-0069	69	RELAY 12VDC 1A
70	401-0070	70	RELAY 12VDC 1A
71	401-0071	71	RELAY 12VDC 1A
72	401-0072	72	RELAY 12VDC 1A
73	401-0073	73	RELAY 12VDC 1A
74	401-0074	74	RELAY 12VDC 1A
75	401-0075	75	RELAY 12VDC 1A
76	401-0076	76	RELAY 12VDC 1A
77	401-0077	77	RELAY 12VDC 1A
78	401-0078	78	RELAY 12VDC 1A
79	401-0079	79	RELAY 12VDC 1A
80	401-0080	80	RELAY 12VDC 1A
81	401-0081	81	RELAY 12VDC 1A
82	401-0082	82	RELAY 12VDC 1A
83	401-0083	83	RELAY 12VDC 1A
84	401-0084	84	RELAY 12VDC 1A
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87	401-0087	87	RELAY 12VDC 1A
88	401-0088	88	RELAY 12VDC 1A
89	401-0089	89	RELAY 12VDC 1A
90	401-0090	90	RELAY 12VDC 1A
91	401-0091	91	RELAY 12VDC 1A
92	401-0092	92	RELAY 12VDC 1A
93	401-0093	93	RELAY 12VDC 1A
94	401-0094	94	RELAY 12VDC 1A
95	401-0095	95	RELAY 12VDC 1A
96	401-0096	96	RELAY 12VDC 1A
97	401-0097	97	RELAY 12VDC 1A
98	401-0098	98	RELAY 12VDC 1A
99	401-0099	99	RELAY 12VDC 1A
100	401-0100	100	RELAY 12VDC 1A
101	401-0101	101	RELAY 12VDC 1A
102	401-0102	102	RELAY 12VDC 1A
103	401-0103	103	RELAY 12VDC 1A
104	401-0104	104	RELAY 12VDC 1A
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106	401-0106	106	RELAY 12VDC 1A
107	401-0107	107	RELAY 12VDC 1A
108	401-0108	108	RELAY 12VDC 1A
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112	401-0112	112	RELAY 12VDC 1A
113	401-0113	113	RELAY 12VDC 1A
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115	401-0115	115	RELAY 12VDC 1A
116	401-0116	116	RELAY 12VDC 1A
117	401-0117	117	RELAY 12VDC 1A
118	401-0118	118	RELAY 12VDC 1A
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122	401-0122	122	RELAY 12VDC 1A
123	401-0123	123	RELAY 12VDC 1A
124	401-0124	124	RELAY 12VDC 1A
125	401-0125	125	RELAY 12VDC 1A
126	401-0126	126	RELAY 12VDC 1A
127	401-0127	127	RELAY 12VDC 1A
128	401-0128	128	RELAY 12VDC 1A
129	401-0129	129	RELAY 12VDC 1A
130	401-0130	130	RELAY 12VDC 1A
131	401-0131	131	RELAY 12VDC 1A
132	401-0132	132	RELAY 12VDC 1A
133	401-0133	133	RELAY 12VDC 1A
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136	401-0136	136	RELAY 12VDC 1A
137	401-0137	137	RELAY 12VDC 1A
138	401-0138	138	RELAY 12VDC 1A
139	401-0139	139	RELAY 12VDC 1A
140	401-0140	140	RELAY 12VDC 1A
141	401-0141	141	RELAY 12VDC 1A
142	401-0142	142	RELAY 12VDC 1A
143	401-0143	143	RELAY 12VDC 1A
144	401-0144	144	RELAY 12VDC 1A
145	401-0145	145	RELAY 12VDC 1A
146	401-0146	146	RELAY 12VDC 1A
147	401-0147	147	RELAY 12VDC 1A
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151	401-0151	151	RELAY 12VDC 1A
152	401-0152	152	RELAY 12VDC 1A
153	401-0153	153	RELAY 12VDC 1A
154	401-0154	154	RELAY 12VDC 1A
155	401-0155	155	RELAY 12VDC 1A
156	401-0156	156	RELAY 12VDC 1A
157	401-0157	157	RELAY 12VDC 1A
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159	401-0159	159	RELAY 12VDC 1A
160	401-0160	160	RELAY 12VDC 1A
161	401-0161	161	RELAY 12VDC 1A
162	401-0162	162	RELAY 12VDC 1A
163	401-0163	163	RELAY 12VDC 1A
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165	401-0165	165	RELAY 12VDC 1A
166	401-0166	166	RELAY 12VDC 1A
167	401-0167	167	RELAY 12VDC 1A
168	401-0168	168	RELAY 12VDC 1A
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171	401-0171	171	RELAY 12VDC 1A
172	401-0172	172	RELAY 12VDC 1A
173	401-0173	173	RELAY 12VDC 1A
174	401-0174	174	RELAY 12VDC 1A
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181	401-0181	181	RELAY 12VDC 1A
182	401-0182	182	RELAY 12VDC 1A
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185	401-0185	185	RELAY 12VDC 1A
186	401-0186	186	RELAY 12VDC 1A
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192	401-0192	192	RELAY 12VDC 1A
193	401-0193	193	RELAY 12VDC 1A
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195	401-0195	195	RELAY 12VDC 1A
196	401-0196	196	RELAY 12VDC 1A
197	401-0197	197	RELAY 12VDC 1A
198	401-0198	198	RELAY 12VDC 1A
199	401-0199	199	RELAY 12VDC 1A
200	401-0200	200	RELAY 12VDC 1A
201	401-0201	201	RELAY 12VDC 1A
202	401-0202	202	RELAY 12VDC 1A
203	401-0203	203	RELAY 12VDC 1A
204	401-0204	204	RELAY 12VDC 1A
205	401-0205	205	RELAY 12VDC 1A
206	401-0206	206	RELAY 12VDC 1A
207	401-0207	207	RELAY 12VDC 1A
208	401-0208	208	RELAY 12VDC 1A
209	401-0209	209	RELAY 12VDC 1A
210	401-0210	210	RELAY 12VDC 1A
211	401-0211	211	RELAY 12VDC 1A
212	401-0212	212	RELAY 12VDC 1A
213	401-0213	213	RELAY 12VDC 1A
214	401-0214	214	RELAY 12VDC 1A
215	401-0215	215	RELAY 12VDC 1A
216	401-0216	216	RELAY 12VDC 1A
217	401-0217	217	RELAY 12VDC 1A
218	401-0218	218	RELAY 12VDC 1A
219	401-0219	219	RELAY 12VDC 1A
220	401-0220	220	RELAY 12VDC 1A
221	401-0221	221	RELAY 12VDC 1A
222	401-0222	222	RELAY 12VDC 1A
223	401-0223	223	RELAY 12VDC 1A
224	401-0224	224	RELAY 12VDC 1A
225	401-0225	225	RELAY 12VDC 1A
226	401-0226	226	RELAY 12VDC 1A
227	401-0227	227	RELAY 12VDC 1A
228	401-0228	228	RELAY 12VDC 1A
229	401-0229	229	RELAY 1



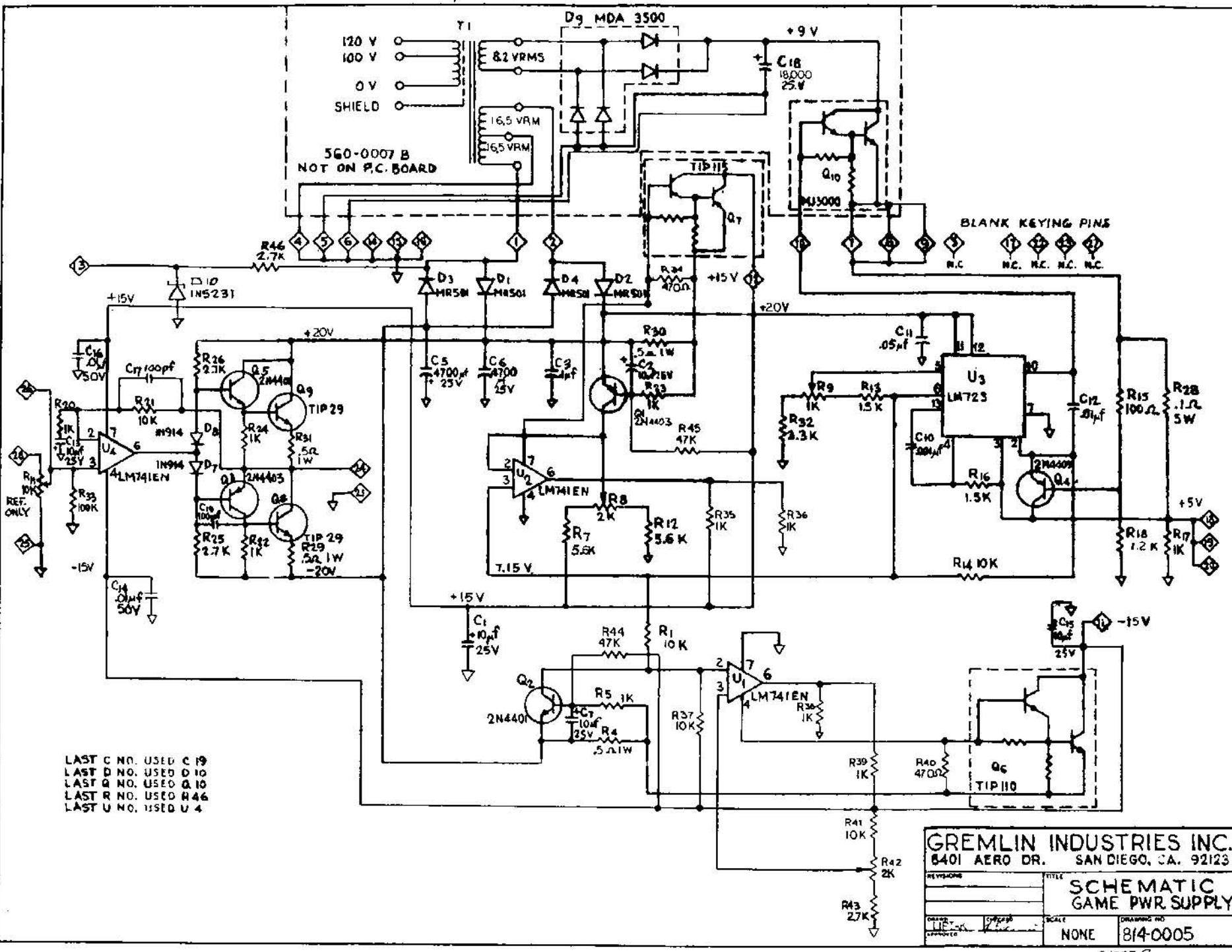






ITEM NO.	CODE OR CRAFT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NUMBER	
				ITEM NO.	ITEM NUMBER
1	131-0000	CAP F. AT&T 100V	C 30		
1	171-0008	CAP F.C. 0.001UF	C6, C25		
1	212-0004	CONN. MALE 4PIN	3		
1	217-0003	CONN. MALE 10 PIN	2		
1	215-0028	IC. 4006	U4		
1	215-0027	IC. 4030	U3		
1	215-0006	IC. 4012	U1		
1	315-0005	IC. 4013	U2		
3	315-0004	IC. LM 741	U8, U7, U10		
1	313-0008	IC. LM 324	UH		
3	314-0001	IC. NE 585	US, UG, U8		
6	482-0014	115VAC 2MA 401	G1, G3, Q7		
1	482-0006	VISOR 2N4403	Q8		
17	481-0006	DIODES .1N319	O1-O7		
1	415-0008	HOF 50K TRIMMER	A27		
2	415-0006	POT 10K TRIMMER	A35, R48		
1	475-0001	POT 10K TRIMMER	R59		
2	475-0002	POT 1MΩ TRIMMER	R31, R32		
1	471-0353	RES. 33K 1/2W 5%	R2		
2	471-0101	RES. 100Ω 1/2W 5%	R53, R55		
2	471-0222	RES. 2.2K 1/2W 5%	R62, R66		
1	471-0224	RES. 820K 1/2W 5%	R49		
1	471-0124	RES. 120Ω 1/2W 5%	R41		
1	471-0683	RES. 6.8K 1/2W 5%	R40		
2	471-0153	RES. 15K 1/2W 5%	R38, R50		
3	471-0111	RES. 470Ω 1/2W 5%	R24, R14, R16		
1	471-0568	RES. 56K 1/2W 5%	R22		
1	471-0682	RES. 6.8K 1/2W 5%	A17		
3	471-0220	RES. 82Ω 1/2W 5%	R16, R20, R28		
4	471-0562	RES. 6.8K 1/2W 5%	R18, R19, R25, R26		
1	471-0105	RES. 1MΩ 1/2W 5%	R47		
1	471-0684	RES. 600Ω 1/2W 5%	R13		
3	471-0472	RES. 4.7KΩ 1/2W 5%	R12, R20, R61		
2	471-0154	RES. 150K 1/2W 5%	R11, R47		
6	471-0233	RES. 2.2K 1/2W 5%	R10, R23, R28, R42, R46, R45		
6	471-0103	RES. 10K 1/2W 5%	R9, R21, R30, R3, R36, R46, R57, R60		
2	471-0104	RES. 100K 1/2W 5%	A7, A9		
1	471-0224	RES. 220K 1/2W 5%	A5		
6	471-0473	RES. 47K 1/2W 5%	R3, R4, R4, R17, R28, R43		
3	471-0102	RES. 1M 1/2W 5%	A1, A16, R50		
1	152-0004	CAP TANT. 4.7μF 25V	C 37		
1	152-0002	CAP TANT. 1μF 25V	C 4		
9	151-0011	CARTRIDGE DYN. 30V	C20, C22, C23, C24-C25, C29, C30, C44, C45		
3	152-0017	CAR. L. 3.52V 100W	C24, C27, C28		
2	152-0007	CAR. P. 0.012F 250V	C 1		
2	152-0006	CAR. P. 0.022F 1100V	C 28, E 41		
2	152-0005	CAR. P. 0.007F 110V	C 10, C 31		
1	152-0002	CAR. P. 1.22F 100V	C 8		
2	152-0001	CAR. P. 1.11F 100V	C 21, C 29		
3	151-0061	CAR. CER. 0.52F 30V	C 23, C 3, C 6, C 10, C 14, C 13, C 35, C 36		
4	153-0003	CAP. INT. 2.2μF 25V	C 34		
1	150-0013	CAP. E. 100NF 25V	C 13, C 45, C 18		
2	150-0012	CAP. L. 47μF 25V	C 9, C 16		
4	153-0001	CAP. PAR. 100μF 25V	C 12, C 15, C 1, C 9		
1	110-0081	PCB			
ITEM NO.	CODE OR CRAFT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.	ITEM NUMBER
PARTS LIST					
Gremlin Industries, Inc. San Bruno, California 94066					
PARTS OVERLAY DEPTHCHARGE SOUND BOARD					
SHEET	CODE IDENT. NO.	DRAWING NO.	REV.		
D	B14-0001		B		
SCALE MM/MM					
SHEET 2 OF 2					

		JX
		XX
MATERIAL		
FINISH		
<u>714-EXCL</u>		<u>EXCHARGE</u>
<u>NOT BASIC</u>	<u>USED ON</u>	
APPLICATION		DO NOT SCALE DRAWING



LAST C NO. USED C 19  
LAST D NO. USED D 10  
LAST Q NO. USED Q 10  
LAST R NO. USED R 46  
LAST U NO. USED U 4

**GREMLIN INDUSTRIES INC.**  
6401 AERO DR. SAN DIEGO, CA. 92123

REVISIONS	TITLE		
	<b>SCHEMATIC</b>		
	<b>GAME PWR SUPPLY</b>		
DRAWN BY LIF-KA APPROVED	CHECKED LIF-KA	SCALE NONE	DRAWING NO. 814-0005

SHEET 2