

# DEPTHCHARGE



MANUFACTURED BY

**Gremlin**  
Industries, inc.

## OWNER'S MANUAL

**DEPTHCHARGE  
OPERATING INSTRUCTIONS  
AND  
SERVICE MANUAL**

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

## TABLE OF CONTENTS

	<u>PAGE NOS.</u>
INTRODUCTION .....	1
IMPORTANT NOTE .....	2
WARRANTY .....	3
REPACKAGING INSTRUCTIONS .....	4
REPACKAGING DIAGRAM .....	5
DEPTHCHARGE GAME CONCEPT .....	6 - 8
MAINTENANCE .....	9
OPERATIONAL WAVEFORMS .....	10 - 17
REPLACEABLE PARTS LIST .....	18 - 19
RETURNED MATERIAL AUTHORIZATION .....	20
SCHEMATICS .....	21

## 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.

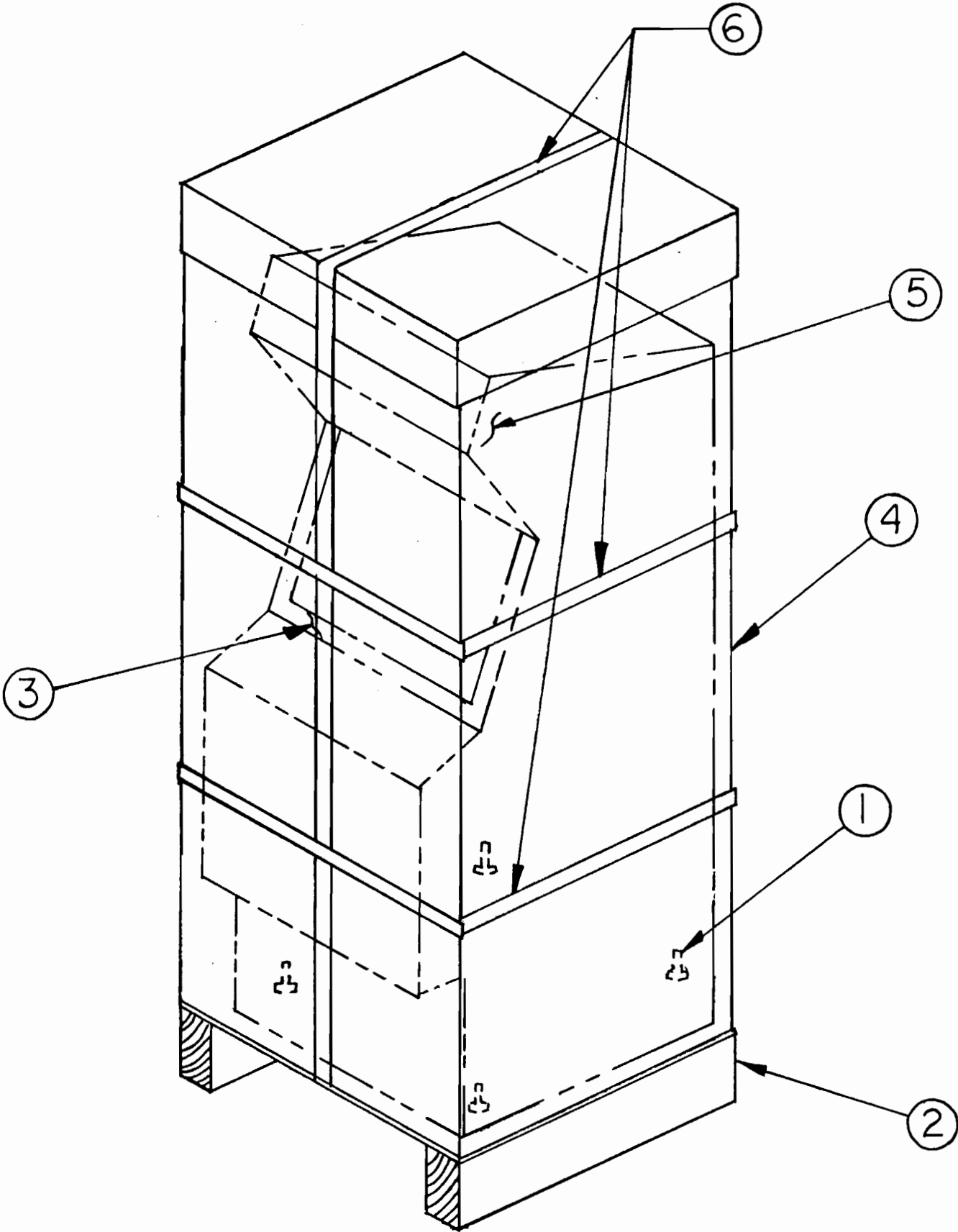
## REPACKAGING INSTRUCTIONS

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:

Whenever 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.

-----

### 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.

-----

### 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:

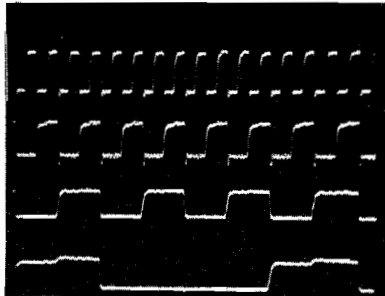
Signals 1-15 show the signals developed by the Video Logic board's master signal sequencer. These signals form the basic timing for the entire board, and therefore, should be checked first. All photos use 5 volt per centimeter vertical sensitivity, and a time base of 200 nanoseconds per division horizontal.

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.)

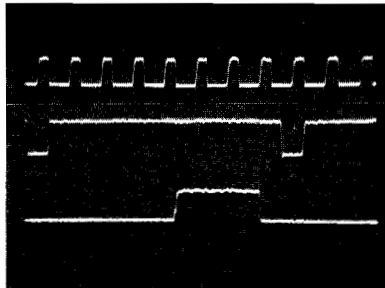
If it is now correct, the problem is on the "downstream" side of the 74S175. DON'T FORGET TO RE-JUMPER THE CONNECTION YOU CUT. If the input side of the 74S175 is also "dead", suspect the PROM (U27 or U28), whichever is applicable.

OPERATIONAL WAVE FORMS (Cont'd.):

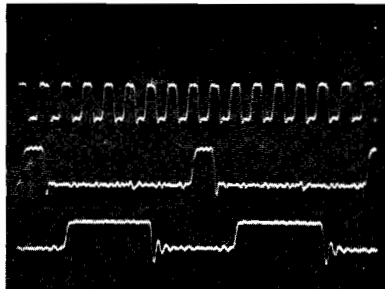
SIGNALS 1-15:



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



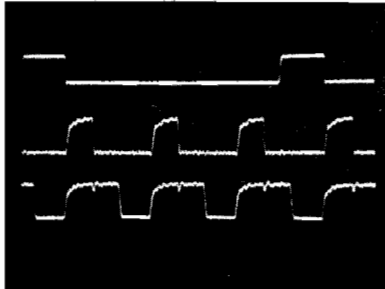
5. (U13-15) SRCK (Shift Register Clock)
6. (U13-2) SRLD (Shift Register Load)
7. M4 (U13-13)



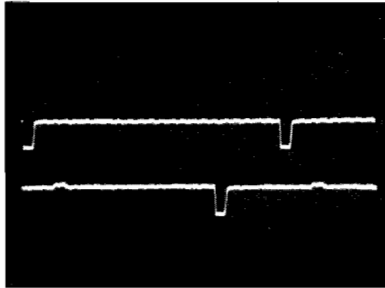
8. (U11-14) Pin 9
9. (U12-15) Processor-Clock Phase 1
10. (U12-10) Processor-Clock Phase 2

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)

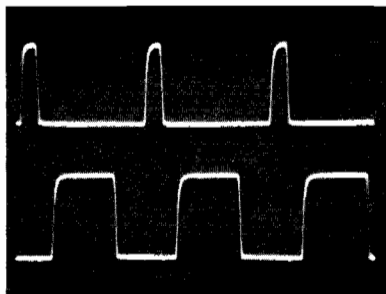


- 14.  $\overline{\text{RWT}}$  (U11-10)
- 15.  $\overline{\text{MSB}}$  (U12-7)

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)

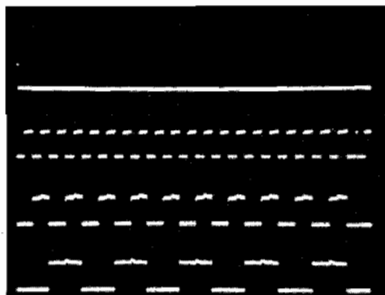
17. 12 Volt  
Phase 2 Clock  
(TP 2)



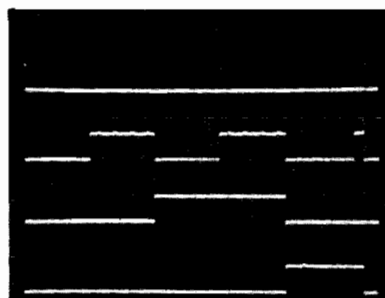
OPERATIONAL WAVE FORMS (Cont'd.):

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.



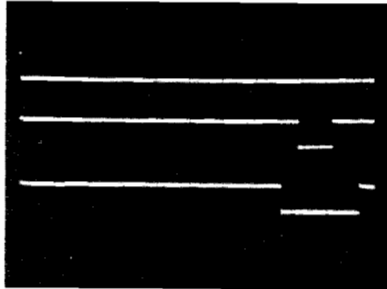
- 18. Horizontal Reset (U46-2,12)
- 19. 8H (U46-3)
- 20. 16H (U46-4)
- 21. 32H (U46-5)



- 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.):

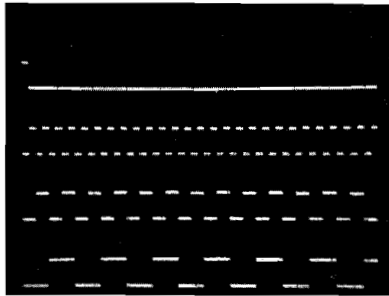


- 26. Horizontal Reset (U46-2,12)
- 27. HSYNC (U36-8)
- 28. HBLANK (U47-1)

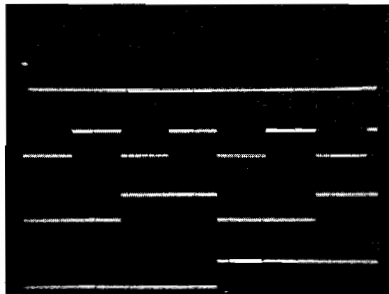
OPERATIONAL WAVE FORMS (Cont'd.):

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).



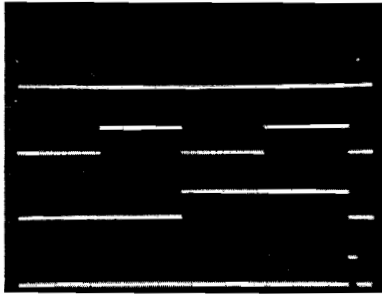
- 29. Vertical Reset (U49-2)
- 30. 1V (U49-3)
- 31. 2V (U49-4)
- 32. 4V (49-5)



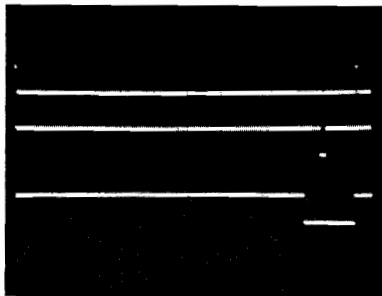
- 33. Vertical Reset (U49-2)
- 34. 8V ( U49-6)
- 35. 16V (U49-11)
- 36. 32V (U49-10)

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

Customer ship prepaid to:

Distributor: \_\_\_\_\_

**GREMLIN INDUSTRIES, INC.**

8401 Aero Drive

San Diego, CA. 92123

### FAILED PARTS RETURN

1. Name of game: \_\_\_\_\_

2. Serial number: \_\_\_\_\_

3. Component: Logic Board \_\_\_\_\_ CPU Board \_\_\_\_\_ Latch Board \_\_\_\_\_  
Power/Sound Board \_\_\_\_\_ Power Supply \_\_\_\_\_  
XMTR \_\_\_\_\_ RCVR \_\_\_\_\_ Complete Game \_\_\_\_\_  
Other \_\_\_\_\_

Board serial number \_\_\_\_\_

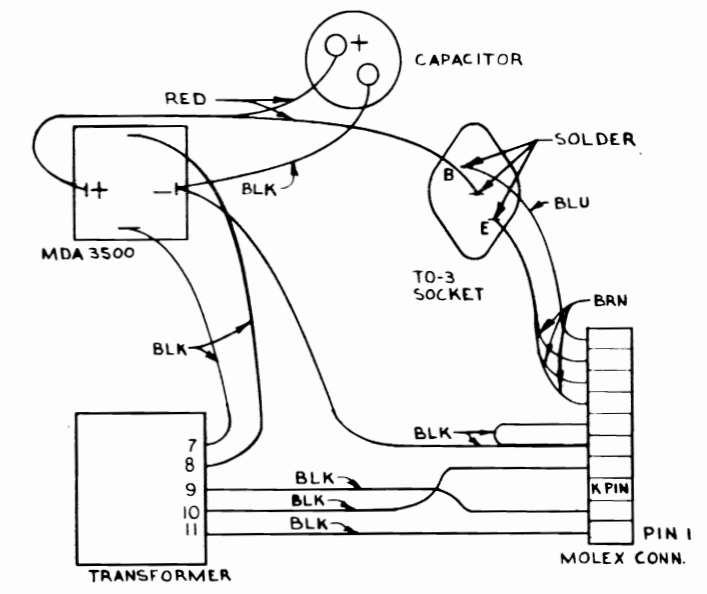
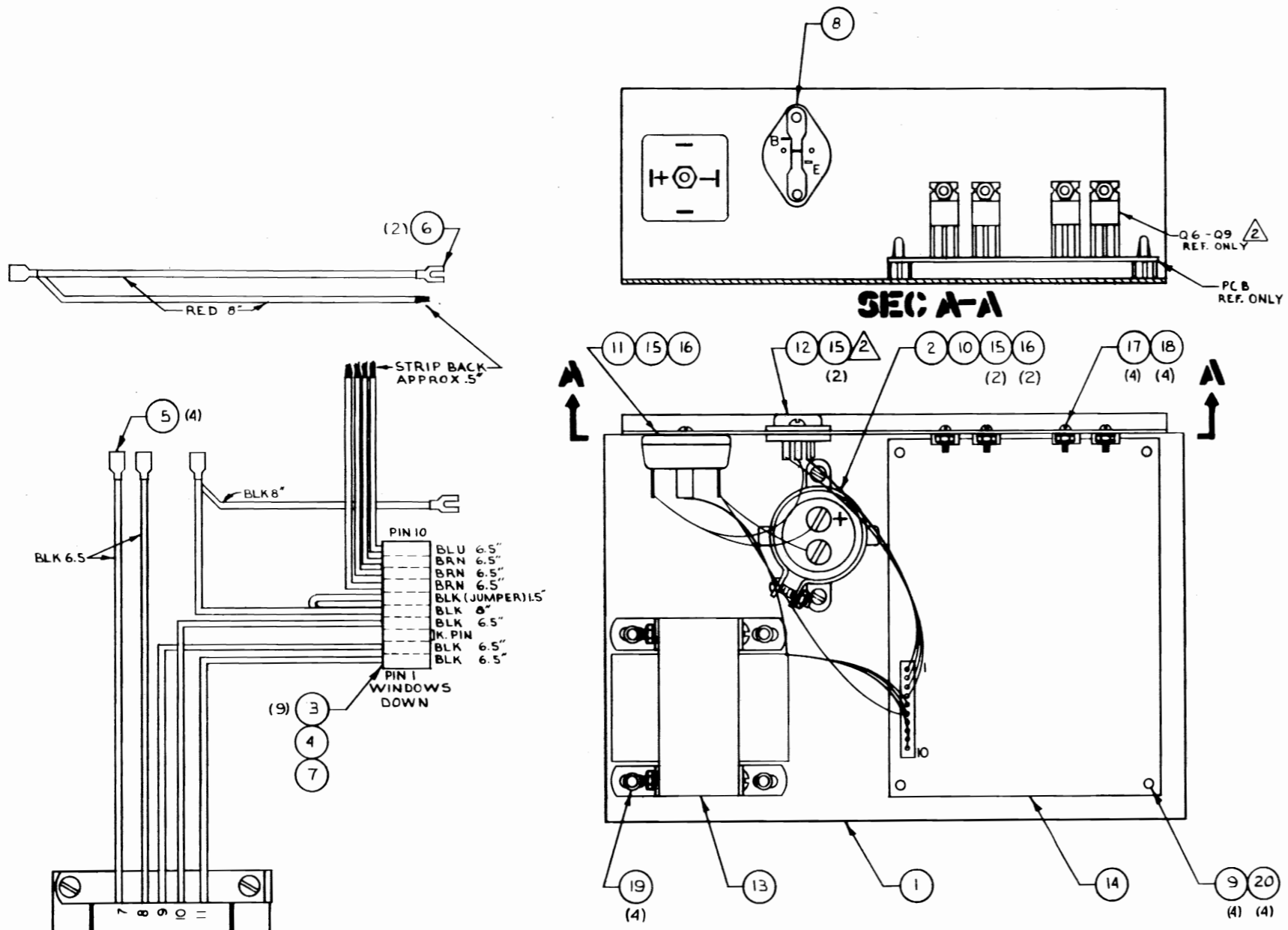
4. Specify malfunction in detail: \_\_\_\_\_  
\_\_\_\_\_

5. Factory representative who authorized return: \_\_\_\_\_

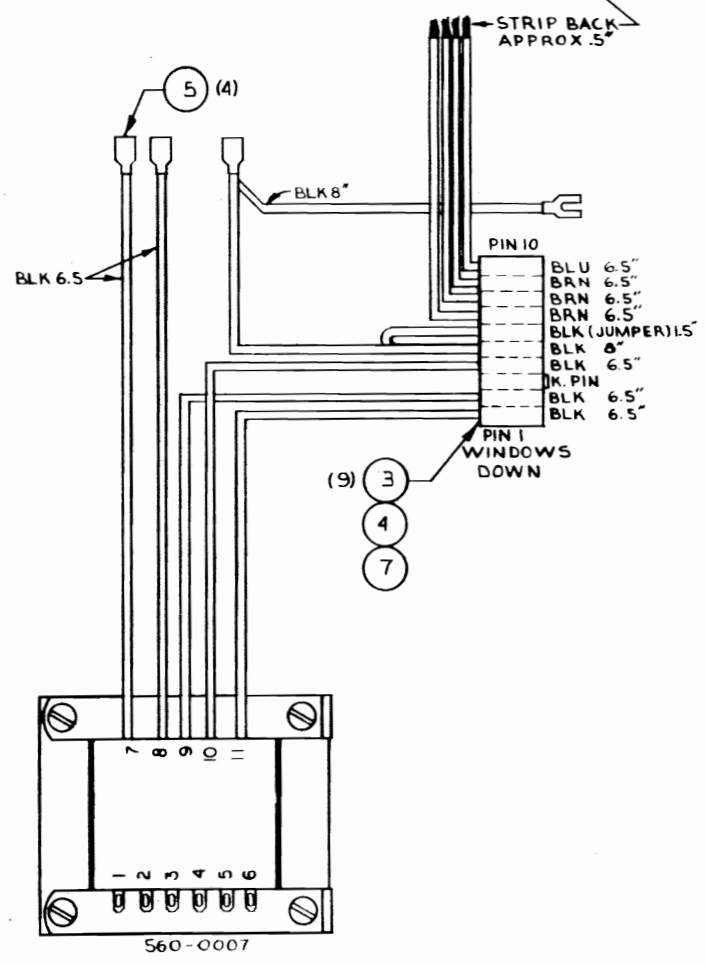
Additional information contact: \_\_\_\_\_

Phone number: \_\_\_\_\_

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		INITIAL RELEASE	8-1-77	



WIRING DIAGRAM



⚠ ALL POWER TRANSISTORS TO BE MOUNTED WITH HEAT SINKING PASTE & INSULATING HARDWARE  
 1. ALL NON TRANSFORMER WIRE TO BE AWG #22  
 NOTES: UNLESS OTHERWISE SPECIFIED

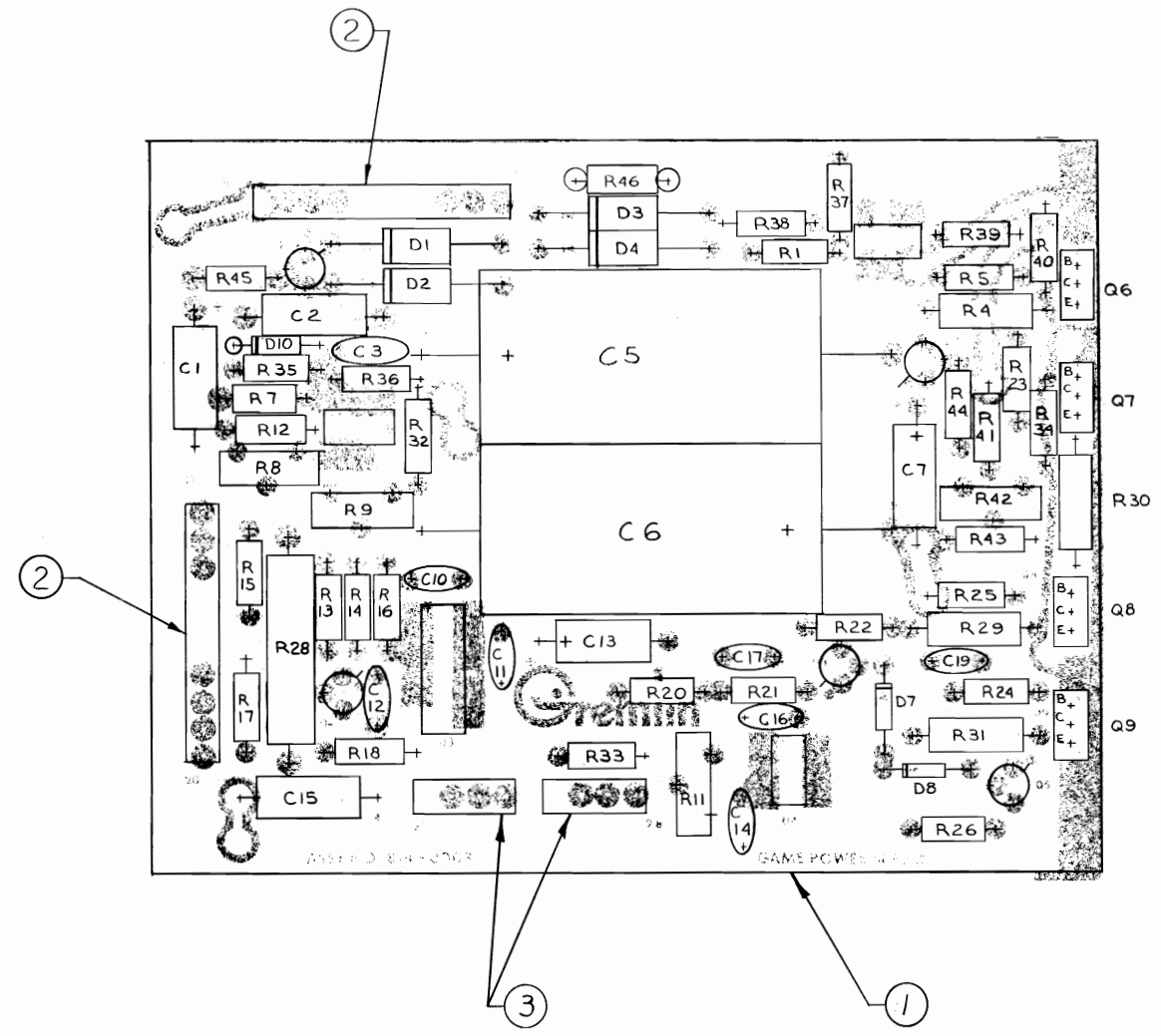
SEE DETACHED PARTS LIST 814-0005				
QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		CONTRACT NO.		
FRACTIONS	DECIMALS	ANGLES	APPROVALS	
±	.XX ±	±	DATE	
	.XXX ±		DRAWN	LEE ALIPTAN 1-27-77
MATERIAL		CHECKED		
FINISH		RELEASED		
		RABASHOV 8-1-77		
714-0001 DEPTH CHARGE		SIZE CODE IDENT NO. DRAWING NO.		
NEXT ASSY USED ON		D 814-0005 A		
APPLICATION		DO NOT SCALE DRAWING		
		SCALE 1:1		
		SHEET 3 OF 3		

**Graham Industries, Inc.**  
 San Diego, California 92108

ASSY  
 POWER SUPPLY



REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

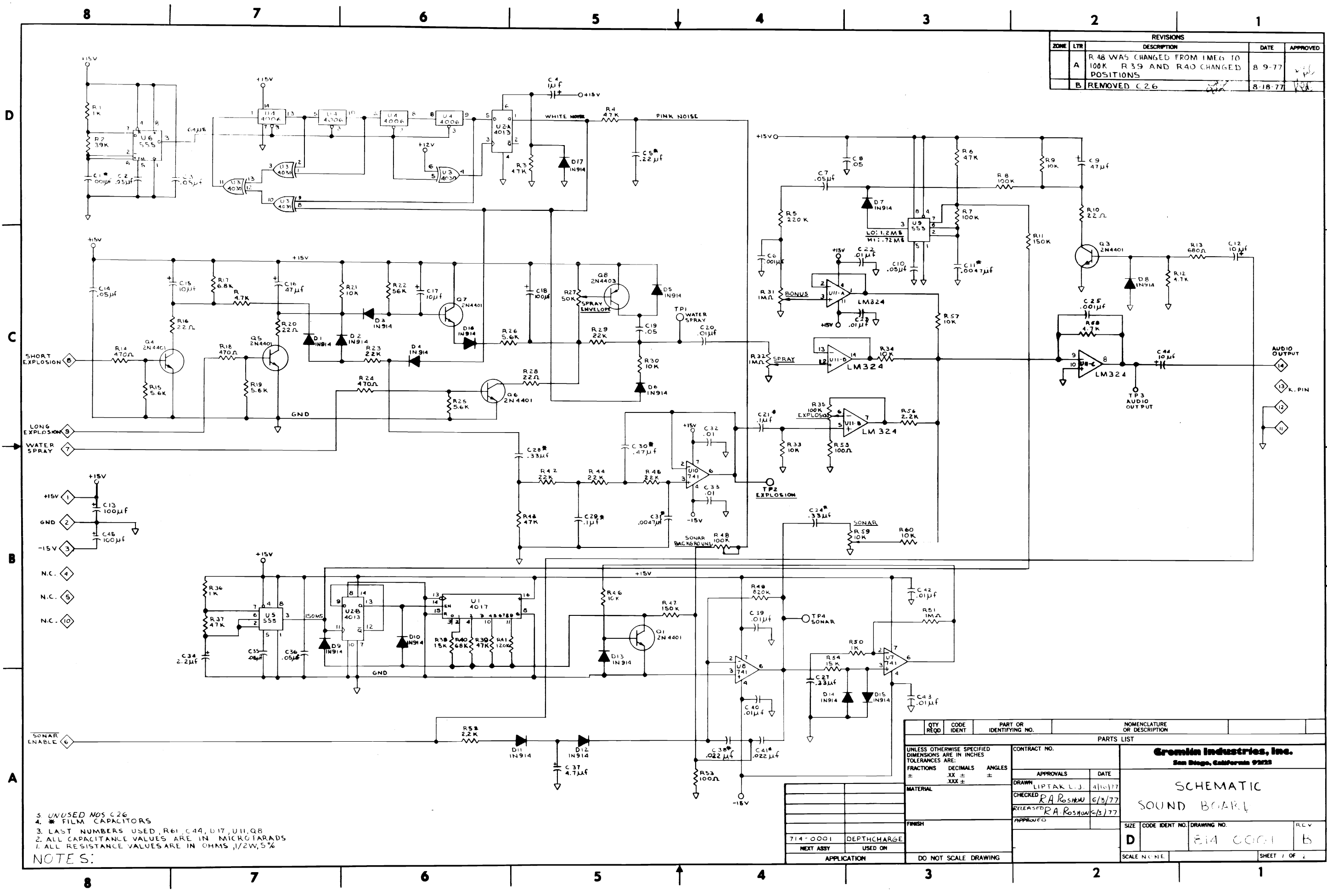


QTY	CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NUMBER
2		482-0016	XISTOR TIP 29	Q8, Q9
1		482-0015	XISTOR TIP 115	Q7
2		482-0014	XISTOR 2N4401	Q2, Q5
1		482-0013	XISTOR TIP 110	Q6
3		482-0006	XISTOR 2N4403	Q1, Q3, Q4
1		481-0008	DIODE ZENER 1N5231	D10
2		481-0006	DIODE 1N914	D8, D7
4		481-0004	DIODE, MR501	D-D4
2		475-0005	POT 2K TRIMMER	R8, R42
1		475-0004	POT 1K TRIMMER	R9
1		475-0001	POT. CER. 10K	R11
1		473-00R1	RES 0.1Ω 5W 3%	R28
4		472-00R5	RES 0.5Ω 1W 5%	R4, R29-R31
2		471-0562	RES 5.6K 1/2W 5%	R7, R12
2		471-0473	RES 47K 1/2W 5%	R44, R45
2		471-0471	RES 470Ω 1/2W 5%	R34, R40
1		471-0332	RES 3.3K 1/2W 5%	R32
4		471-0272	RES 2.7K 1/2W 5%	R25, R26, R43, R46
2		471-0152	RES 1.5K 1/2W 5%	R13, R16
1		471-0122	RES 1.2K 1/2W 5%	R18
1		471-0104	RES 100K 1/2W 5%	R33
5		471-0103	RES 10K 1/2W 5%	R1, R14, R21, R37, R41
10		471-0102	RES 1K 1/2W 5%	R5, R17, R20, R22-R24, R35, R36, R38, R39
1		471-0101	RES 100Ω 1/2W 5%	R15
3		313-0004	I.C. LM741EN	U1, U2, U4
1		313-0001	I.C. LM723	U3
2		212-0004	CONN. MALE 4 PIN	3
2		212-0003	CONN. MALE 10 PIN	2
5		153-0001	CAP. TANT. 10μf 25V	C1, C2, C7, C13, C15
1		151-0012	CAP. CER. .1μf 50V	C3
3		151-0011	CAP. CER. .01μf 50V	C12, C14, C16
1		151-0008	CAP. CER. .001μf 50V	C10
2		151-0002	CAP. CER. 100pf 50V	C17, C19
1		151-0001	CAP. CER. .05μf 50V	C11
2		150-0019	CAP E 4700μf 25V	C5, C6
1		170-0082	PCB	1

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NUMBER
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX ± ±				
MATERIAL		CONTRACT NO.		
FINISH		APPROVALS DATE		
NEXT ASSY USED ON		DRAWN LIPTAK L. J. 5-27-77		
APPLICATION		CHECKED R. A. ROSSHOW 6-1-77		
DO NOT SCALE DRAWING		RELEASED R. A. ROSSHOW 6-1-77		
		APPROVED		
		SIZE CODE IDENT NO. DRAWING NO. REV.		
		D 814-0003		
		SCALE 2 X 1 SHEET 1 OF 1		

NOTES:  
 2. ALL CAPACITANCE VALUES ARE IN MICROFARAD UNLESS OTHERWISE SPECIFIED  
 1. ALL RESISTANCE VALUES ARE IN OHMS 1/2W 5% UNLESS OTHERWISE SPECIFIED (K=1000)

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
A		R 48 WAS CHANGED FROM 1MEG TO 100K R 39 AND R40 CHANGED POSITIONS	8-9-77	
B		REMOVED C 26	8-18-77	



5 UNUSED NOS C26  
 4. \* FILM CAPACITORS  
 3. LAST NUMBERS USED, R61, C44, D17, U11, Q8  
 2. ALL CAPACITANCE VALUES ARE IN MICROFARADS  
 1. ALL RESISTANCE VALUES ARE IN OHMS, 1/2W, 5%

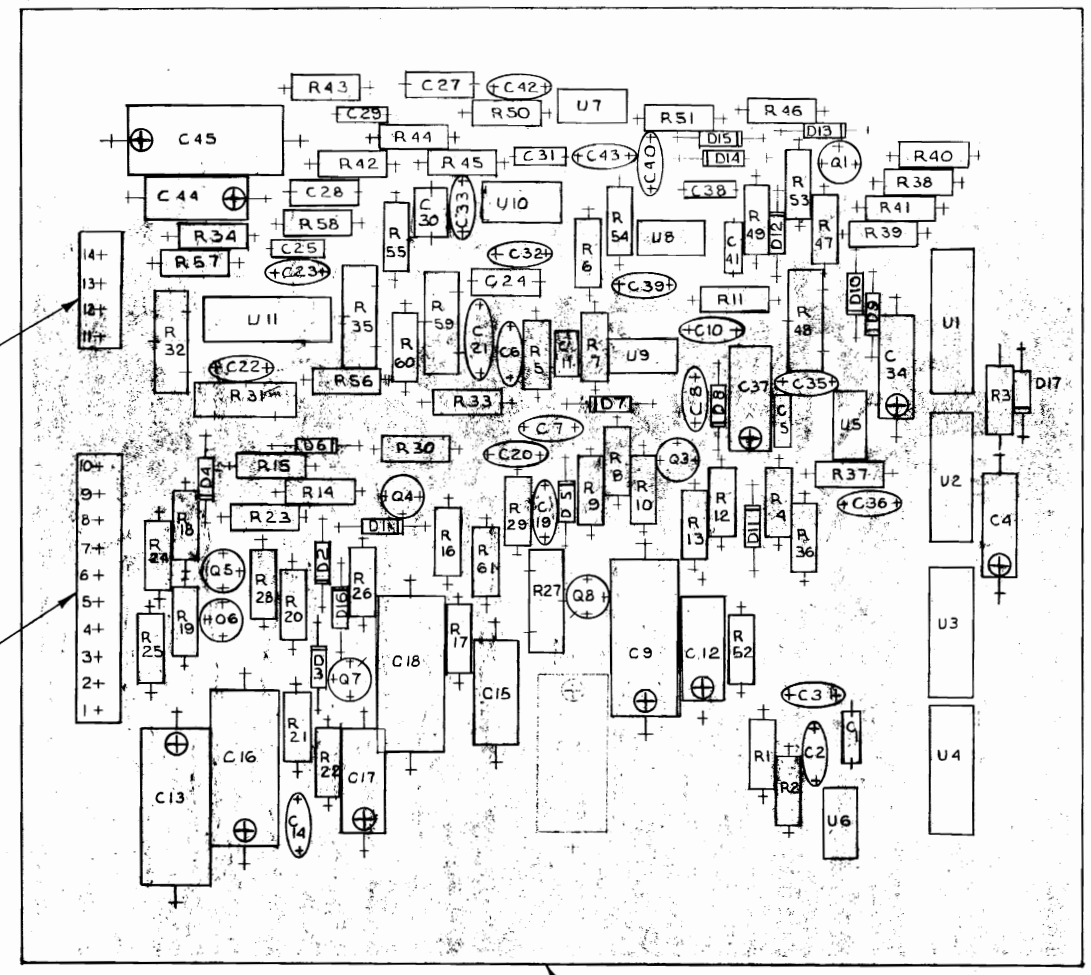
**NOTES:**

QTY REQD		CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:				<b>Gremlin Industries, Inc.</b> San Diego, California 92123
FRACTIONS	DECIMALS	ANGLES		
±	.XX ±	±		
	.XXX ±			
MATERIAL				CONTRACT NO. APPROVALS DATE DRAWN LIPTAK L.J. 4/10/77 CHECKED R.A. ROSHOW 6/3/77 RELEASED R.A. ROSHOW 6/3/77 APPROVED
FINISH				<b>SCHMATIC</b> <b>SOUND BOARD</b>
714-0001		DEPTHCHARGE		SIZE CODE IDENT NO. DRAWING NO. REV D E14 0001 B
NEXT ASSY		USED ON		SCALE NONE SHEET 1 OF 2
APPLICATION				DO NOT SCALE DRAWING

814-0001

8 7 6 5 4 3 2 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



1	152-0020	CAP. F. 47µf 100V	C 30
2	151-0008	CAP. CER. .001µf 50V	C6, C25
1	212-0004	CONN. MALE 4PIN	3
1	212-0003	CONN. MALE 10PIN	2
1	315-0028	I.C. 4006	U4
1	315-0027	I.C. 4030	U3
1	315-0006	I.C. 4017	U1
1	315-0005	I.C. 4013	U2
3	313-0004	I.C. LM 741	U8, U7, U10
1	313-0008	I.C. LM 324	U11
3	314-0001	I.C. NE 555	U5, U6, U9
6	482-0014	XISTOR 2N4401	Q1, Q3, Q7
1	482-0006	XISTOR 2N4403	Q8
17	481-0006	DIODES 1N914	D1-D17
1	475-0008	POT 50K TRIMMER	R27
2	475-0006	POT 100K TRIMMER	R35, R48
1	475-0001	POT 10K TRIMMER	R59
2	475-0002	POT 1MΩ TRIMMER	R31, R32,
1	471-0393	RES. 39K 1/2W 5%	R2
2	471-0101	RES. 100Ω 1/2W 5%	R53, R55
2	471-0222	RES. 2.2K 1/2W 5%	R52, R56
1	471-0824	RES. 820K 1/2W 5%	R49
1	471-0124	RES. 120K 1/2W 5%	R41
1	471-0683	RES. 68K 1/2W 5%	R40
2	471-0153	RES. 15K 1/2W 5%	R38, R54
3	471-0471	RES. 470Ω 1/2W 5%	R24, R14, R18
1	471-0563	RES. 56K 1/2W 5%	R22
1	471-0682	RES. 68K 1/2W 5%	R17
3	471-0220	RES. 22Ω 1/2W 5%	R16, R20, R28
4	471-0562	RES. 56K 1/2W 5%	R15, R19, R25, R26
1	471-0105	RES. 1MΩ 1/2W 5%	R51
1	471-0681	RES. 680Ω 1/2W 5%	R13
3	471-0472	RES. 47K 1/2W 5%	R12, R58, R61
2	471-0154	RES. 150K 1/2W 5%	R11, R47
6	471-0223	RES. 22K 1/2W 5%	R10, R23, R29, R42, R44, R45
8	471-0103	RES. 10K 1/2W 5%	R9, R21, R30, R33, R34, R46, R57, R60
2	471-0104	RES. 100K 1/2W 5%	R7, R8
1	471-0224	RES. 220K 1/2W 5%	R5
6	471-0473	RES. 47K 1/2W 5%	R3, R4, R6, R37, R39, R43
3	471-0102	RES. 1K 1/2W 5%	R1, R36, R50
1	153-0004	CAP. TANT. 4.7µf 25V	C37
1	153-0002	CAP. TANT. 1µf 25V	C4
9	151-0011	CAP. CER. 0.1µf 50V	C20, C22, C23, C32, C33, C39, C40, C42, C43
3	152-0017	CAP. F. 33µf 100V	C24, C27, C28
3	152-0007	CAP. F. .001µf 250V	C1,
2	152-0006	CAP. F. .022µf 100V	C38, C41
2	152-0005	CAP. F. .0047µf 50V	C11, C31
1	152-0002	CAP. F. 2.2µf 100V	C5
2	152-0001	CAP. F. .1µf 100V	C21, C29
9	151-0001	CAP. CER. .05µf 50V	C2, C3, C7, C8, C10, C14, C19, C35, C36
1	153-0003	CAP. TANT. 2.2µf 25V	C34
4	150-0013	CAP. E. 100µf 25V	C13, C45, C18
2	150-0012	CAP. E. 47µf 25V	C9, C16,
4	153-0001	CAP. TANT. 10µf 25V	C12, C15, C17, C44
1	170-0081	PCB	/

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NUMBER
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		CONTRACT NO.		
FRACTIONS ±	DECIMALS .XX ±	ANGLES ±	Gremlin Industries, Inc.	
MATERIAL			San Diego, California 92123	
FINISH			PARTS OVERLAY	
714-0001 DEPTHCHARGE			DEPTHCHARGE	
NEXT ASSY USED ON			SOUND BOARD	
APPLICATION			DO NOT SCALE DRAWING	
			SCALE NONE	
			SHEET 2 OF 2	

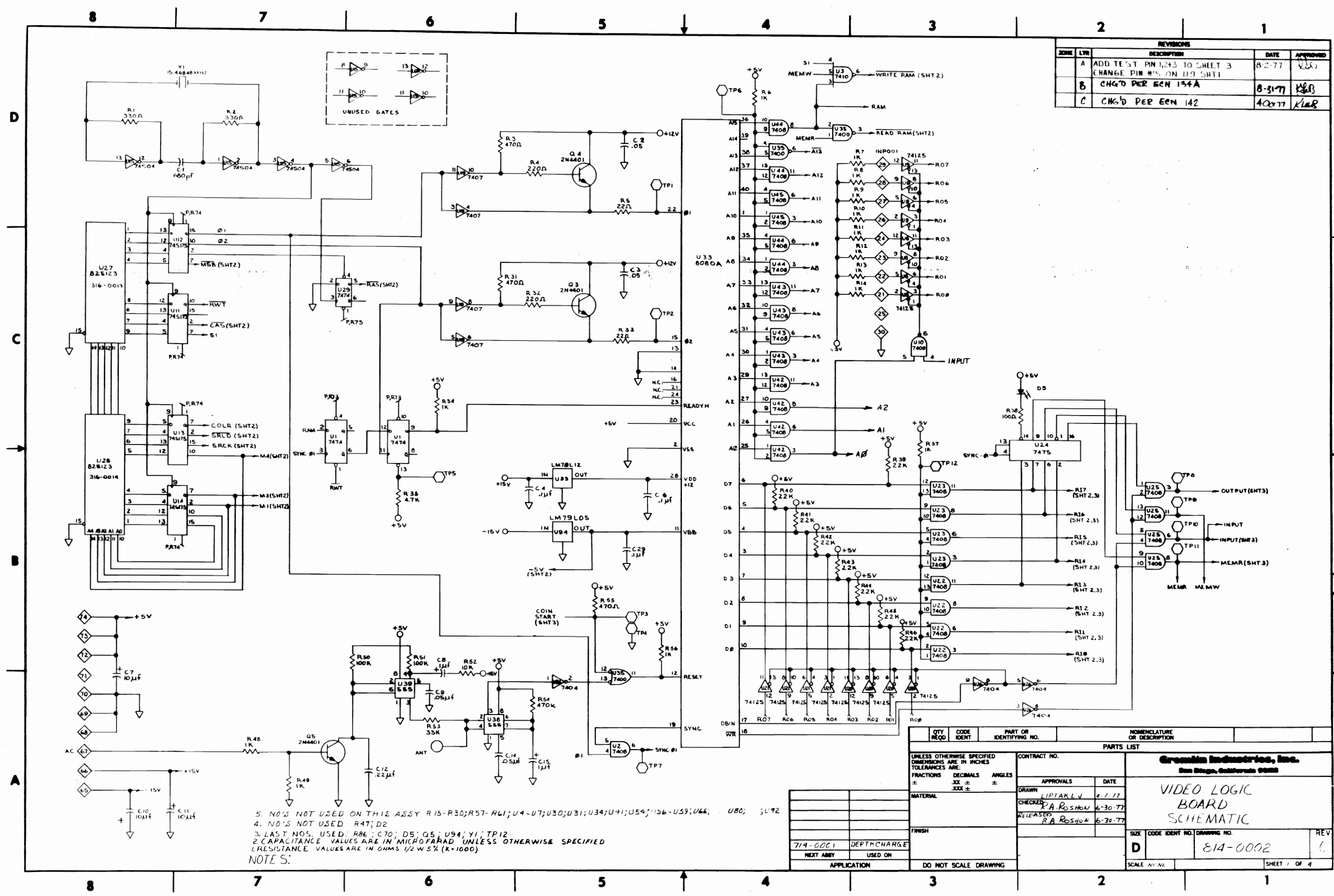
NOTES:

8 7 6 5 4 3 2 1

814-0001

A

REVISIONS			
REV	DATE	DESCRIPTION	APPROVED
A	8-2-77	ADD TEST PIN 1,2,3 TO SHEET 3 CHANGE PIN #15 ON U9 SHT1	KLB
B	8-31-77	CHG'D PER ECN 134A	KLB
C	10-27-77	CHG'D PER ECN 142	KLB



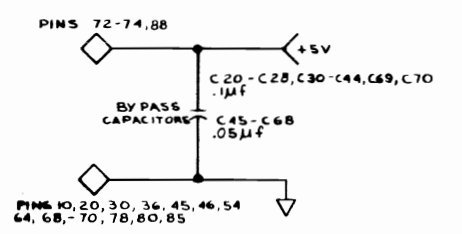
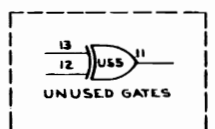
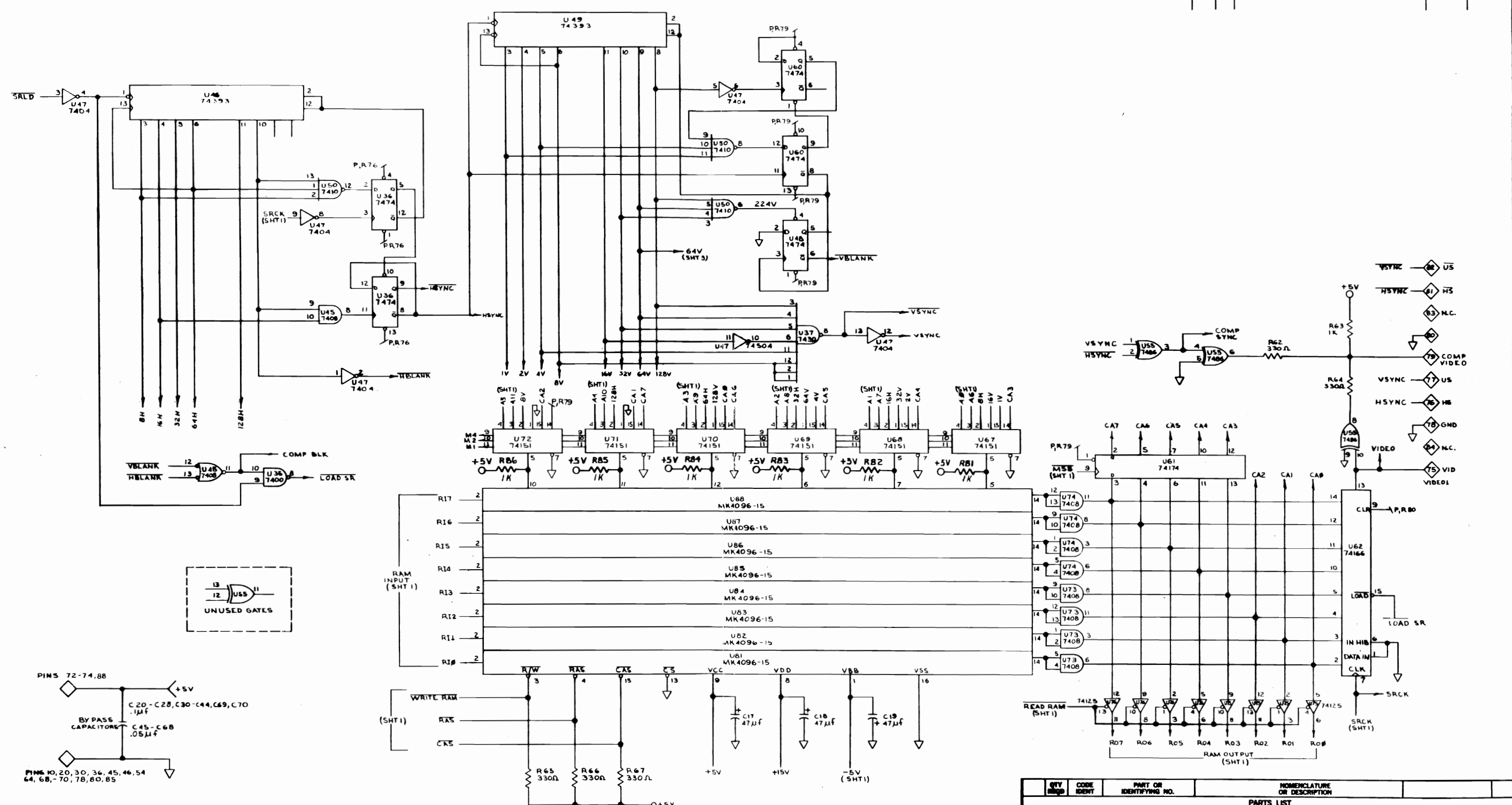
5. NO'S NOT USED ON THIS ASSY R15-R30; R57-R61; U4-U7; U30; U31; U34; U41; U54; U56-U59; U64; U80; U92  
 4. NO'S NOT USED R47; D2  
 3. LAST NOS. USED: R86; C70; D5; Q5; U94; Y1; TP12  
 2. CAPACITANCE VALUES ARE IN MICROFARAD UNLESS OTHERWISE SPECIFIED  
 1. RESISTANCE VALUES ARE IN OHMS 1/2 W 5% (K=1000)

NOTES:

QTY	CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
PARTS LIST			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		CONTRACT NO.	
FRACTIONS	DECIMALS	ANGLES	APPROVALS
±	.XX ±	±	DATE
±	.XXX ±	±	
MATERIAL		DRAWN LIPTAKLV 4-7-77	
FINISH		CHECKED RA ROSHON 6-30-77	
714-0001 DEPTHCHARGE		RELEASED RA ROSHON 6-30-77	
NEXT ASSY USED ON		SIZE CODE IDENT NO. DRAWING NO.	
APPLICATION DO NOT SCALE DRAWING		D 814-0002	
		REV C	
		SHEET 1 OF 4	

814-0002

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



1. SEE NOTES SHEET ONE  
NOTES:

QTY	CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST		CONTRACT NO.	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:			
FRACCTIONS	DECIMALS	ANGLES	
±	±	±	

DATE	APPROVALS	DATE

DATE	DESCRIPTION
4/11/77	LIPTAK L.J.
6/30/77	RA ROBERTSON
4/30/77	RA ROBERTSON

SIZE	CODE IDENT NO.	DRAWING NO.	REV
D		814-0002	C

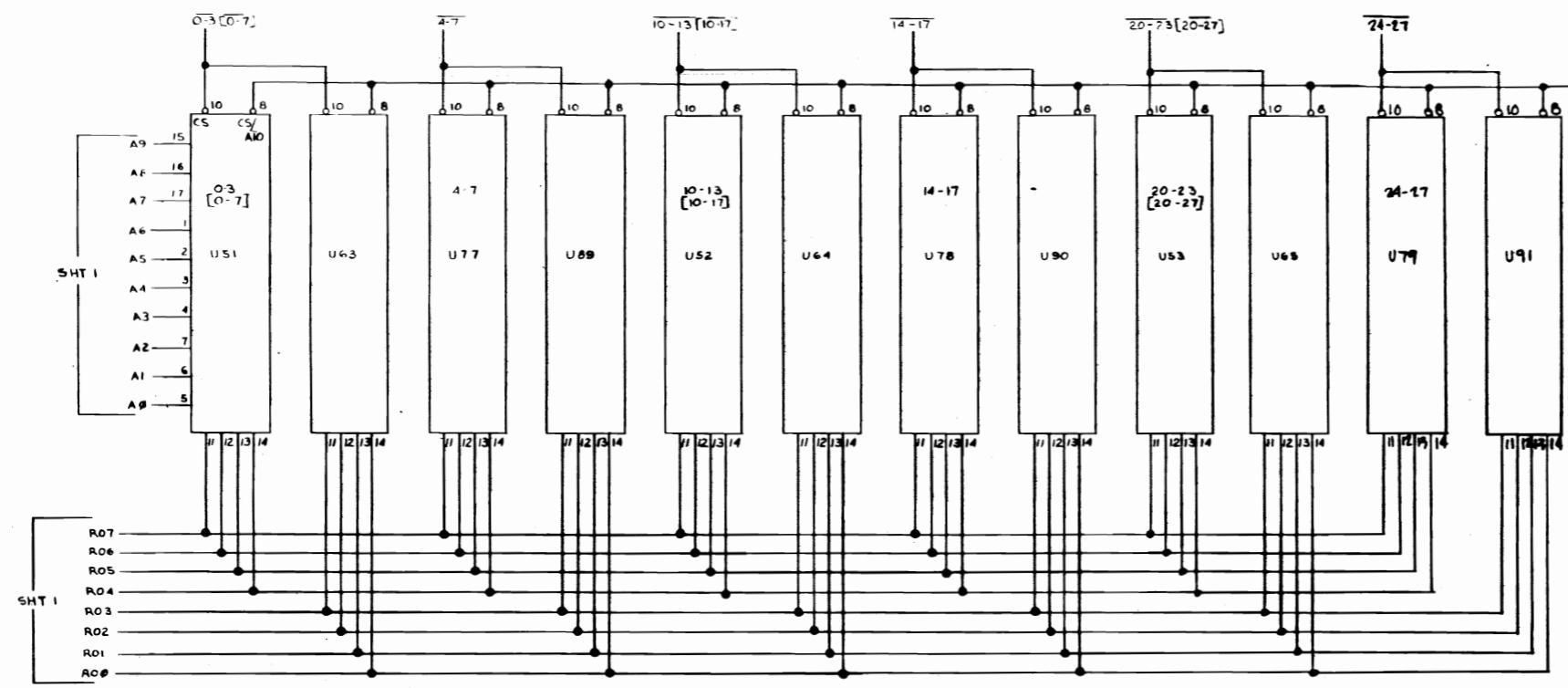
APPLICATION	DATE

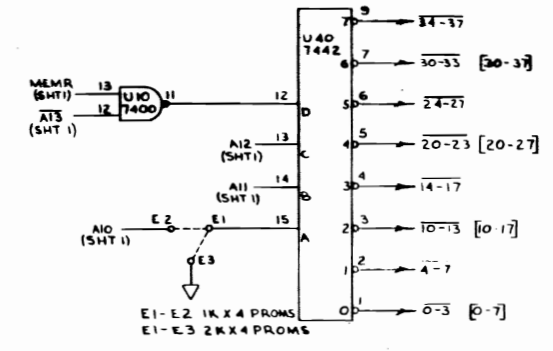
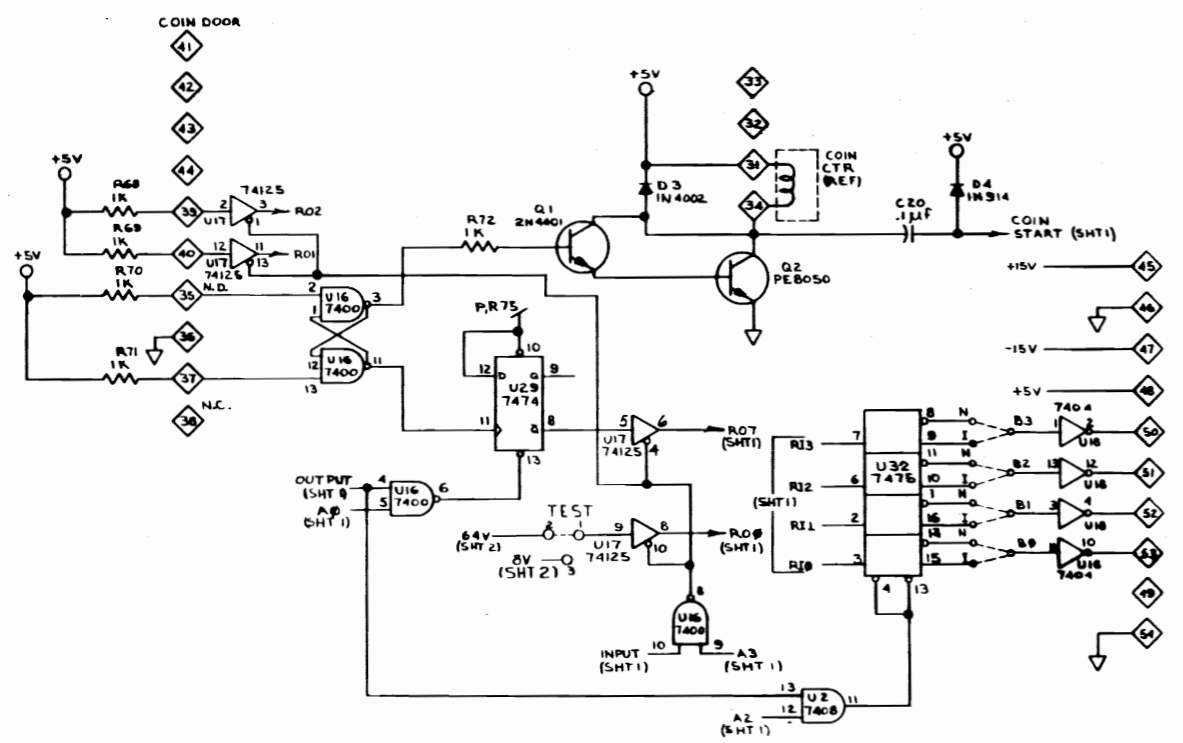
SCALE	SHEET	TOTAL SHEETS
NONE	2	4

814-0002

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



E4-E5 1K X 4 PROMS  
E4-E6 2K X 4 PROMS

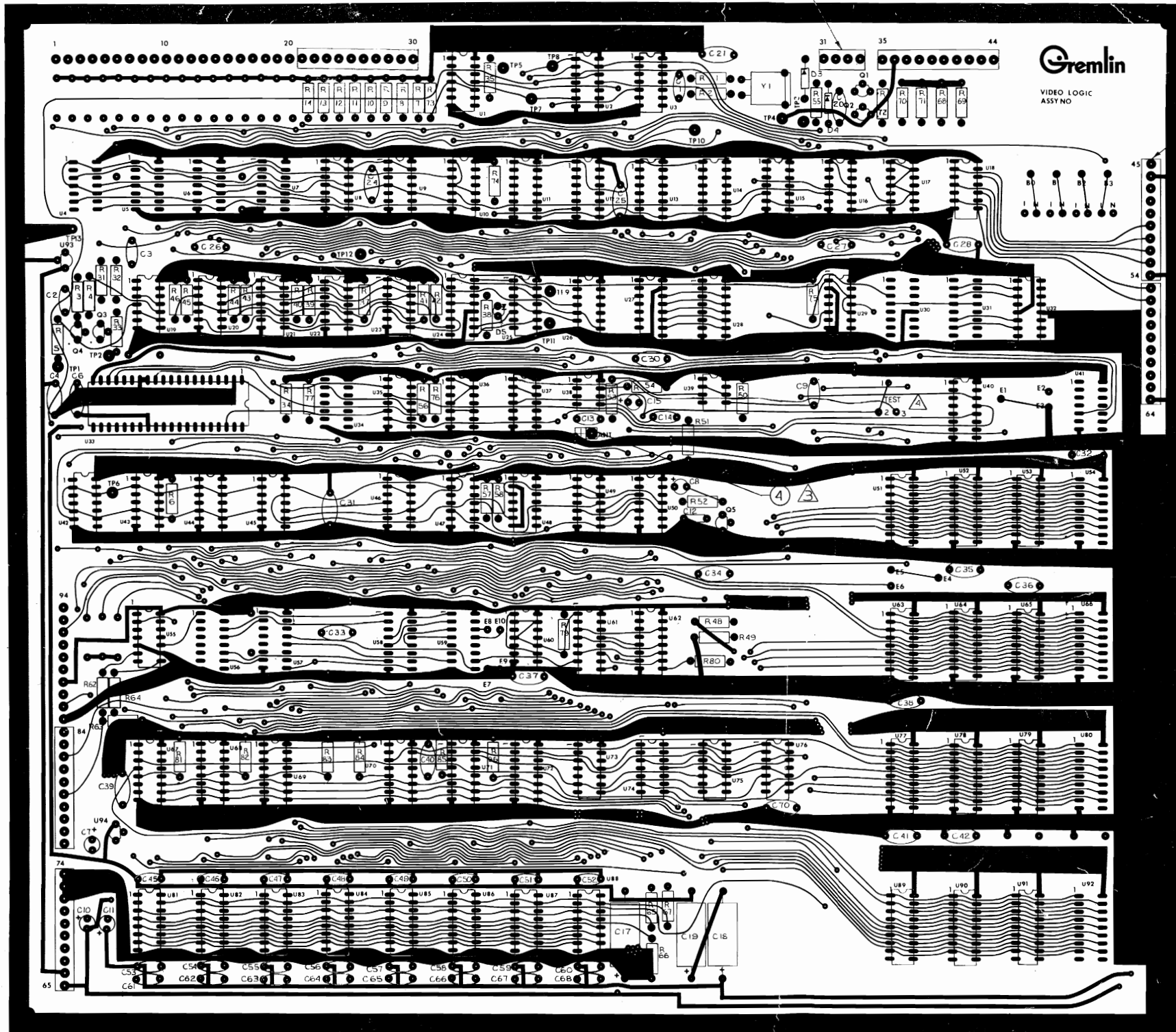


1 SEE NOTES SHEET ONE  
NOTES:

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
PARTS LIST			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		CONTRACT NO.	
FRACTIONS	DECIMALS	ANGLES	
±	.XX ±	±	
MATERIAL		APPROVALS    DATE	
		DRAWN LIPTAK L.J. 4-13-77	
		CHECKED R.A. ROSSMAN 6-30-77	
		RELEASED R.A. ROSSMAN 6-30-77	
FINISH			
714-0001 DEPTHCHARGE			
NEXT ASSY USED ON			
APPLICATION		DO NOT SCALE DRAWING	
		Gromin Industries, Inc. San Diego, California 92108	
		VIDEO LOGIC BOARD SCHEMATIC	
SIZE	CODE IDENT NO.	DRAWING NO.	KLV
D		E14-0002	C
SCALE A1:A2		SHEET 3 OF 4	

814-0002

REVISIONS		DATE	APPROVED
ZONE	TR	DESCRIPTION	



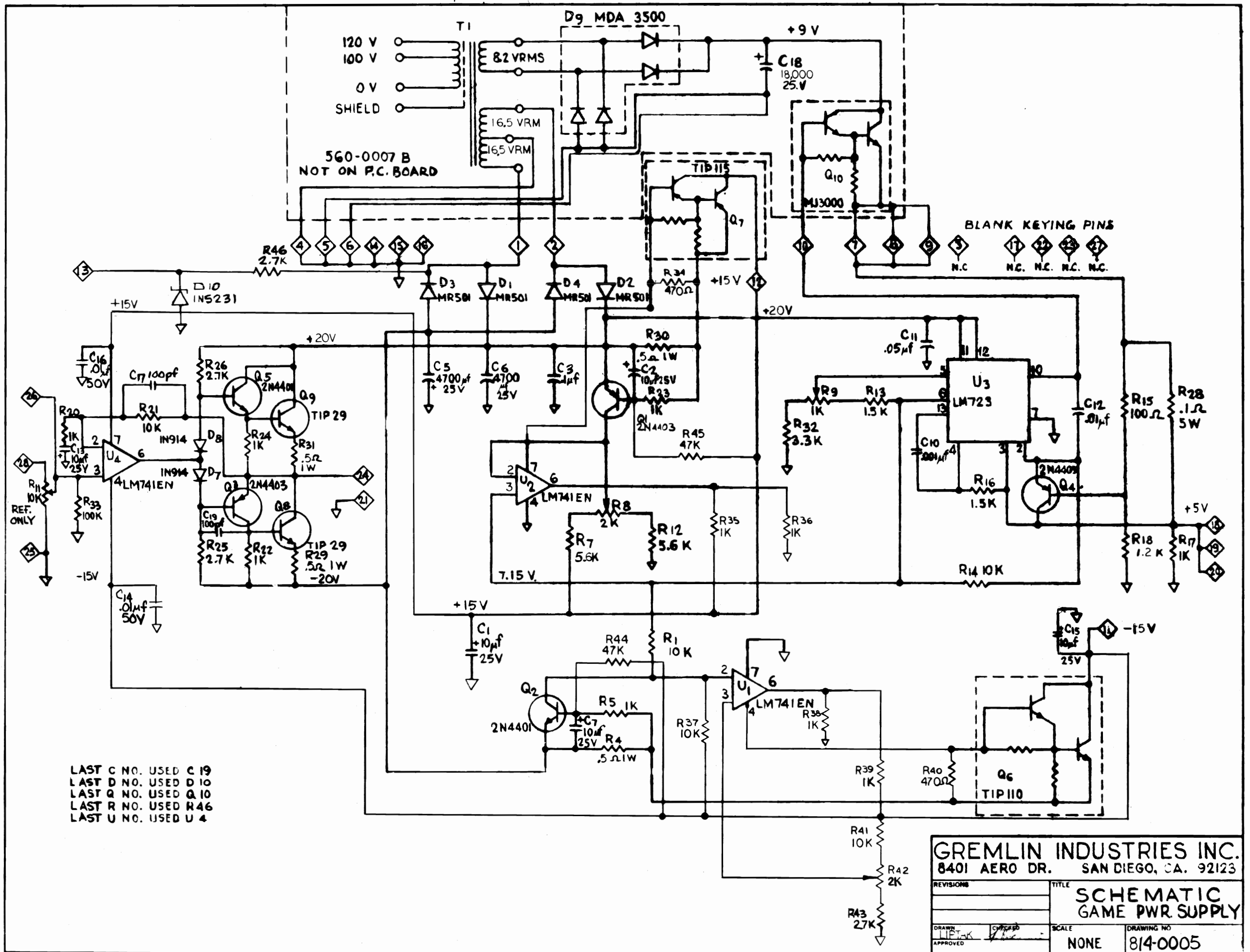
② (6 PLCS)

2	213-0004	SOCKET	XU27-XU28
12	213-0002	SOCKET	XU29-XU33, XU34-XU35, XU77-XU79, XU89-XU91
4	482-0014	XISTOR 2N4401	Q1 Q3-Q5
1	482-0010	XISTOR PE8050	Q2
1	481-0006	DIODE 1N914	D4
1	481-0001	DIODE 1N4002	D3
1	471-0474	RES 470 K 1/2W 5%	R54
1	471-0472	RES 4.7K 1/2W 5%	R35
3	471-0471	RES 470 Ω 1/2W 5%	R3, R31, R55
1	471-0333	RES 33K 1/2W 5%	R53
7	471-0331	RES 330 Ω 1/2W 5%	R12, R62, R64-R67
8	471-0223	RES 22K 1/2W 5%	R39-R46
2	471-0221	RES 220 Ω 1/2W 5%	R4, R32
2	471-0220	RES 22 Ω 1/2W 5%	R5, R33
3	471-0104	RES 100K 1/2W 5%	R50, R51
3	471-0103	RES 10K 1/2W 5%	R52, R57, R58
32	471-0102	RES 1K 1/2W 5%	R6-R14, R34, R37, R48, R49, R56, R63, R68-R76, R79, R80-R86
1	471-0101	RES 100 Ω 1/2W 5%	R58
1	316-0049	PROM D/C U91	U91
1	390-0003	LED RED	D5
1	316-0048	PROM D/C U79	U79
1	316-0031	PROM D/C U90	U90
1	316-0030	PROM D/C U89	U89
1	316-0029	PROM D/C U78	U78
1	316-0028	PROM D/C U77	U77
1	316-0027	PROM D/C U65	U65
1	316-0026	PROM D/C U64	U64
1	316-0025	PROM D/C U63	U63
1	316-0024	PROM D/C U53	U53
1	316-0023	PROM D/C U52	U52
1	316-0022	PROM D/C U51	U51
1	316-0014	PROM SEC 32 X8	U28
1	316-0013	PROM CONT 32 X8	U27
8	315-0024	MOSTEXMK4096-15	U81-U88
1	314-0014	I.C. 8080A CPU	U81
4	314-0053	I.C. 74S175	U11-U14
1	314-0047	I.C. 74174	U61
1	314-0046	I.C. 74504	U15
1	314-0043	I.C. 7407	U19
1	314-0039	I.C. 74166	U62
6	314-0035	I.C. 74151	U67-U72
2	314-0030	I.C. 74393	U46, U49
1	314-0022	I.C. 7486	U55
2	314-0021	I.C. 7475	U24, U32
1	314-0020	I.C. 7430	U37
7	314-0017	I.C. 74125	U8, U9, U17, U20, U21, U75, U76
3	314-0015	I.C. 7404	U18, U26, U47
10	314-0012	I.C. 7408	U2, U22, U23, U25, U42-U45, U73, U74
1	314-0011	I.C. 7442	U40
2	314-0010	I.C. 7410	U3, U50
3	314-0009	I.C. 7400	U10, U16, U35
5	314-0006	I.C. 7474	U1, U2, U9, U36, U48, U60
2	314-0001	I.C. NE555	U38, U39
1	313-0017	I.C. LM79L05	U94
1	313-0016	I.C. LM78L12	U93
1	230-0005	XTAL 15.46848 MHZ	Y1
1	212-0011	CONN FEMALE 2 PIN	①
1	212-0004	CONN MALE 4PIN	②
6	211-0003	CONN MALE 10 PIN	③
14	211-0004	CONN MALE TEST PT.	TP1-TP13, ANT
1	170-0083	P.C.B.	④
3	153-0001	CAP. TANT. 10 μF 25V	C7, C10, C11
1	152-0002	CAP. .22 μF 100V	C12
29	151-0012	CAP CER. 100P 50V	C4, C6, C13, C20-C44, C69, C70
1	151-0005	CAP CER. 680P 50V	C1
28	151-0001	CAP CER. 05 μF 50V	C2, C3, C9, C14, C45-C66
3	150-0012	CAP. E. 47 μF 25V	C17-C19

QTY	PART NUMBER	DESCRIPTION	ITEM NUMBER
PARTS LIST			
GREMLIN IND. INC. SAN DIEGO CALIFORNIA 92123			
APPROVALS		DATE	
DRAWN L. J. LIPTAK		7-25-77	
CHECKED			
RELEASED P. A. Egan		8-2-77	
APPROVED			
714-0001 DEPTH CHARGE		SIZE	REV
NEXT ASSY USED ON		E	814-0002 B
APPLICATION		SCALE: 2X1	SHEET 4 OF 4

△ JUMPER TO BE ADDED AFTER FINAL TEST  
 △ ANT. WIRE IS WHT. 12" 22GA. CONNECTED TO P/N 212-0011  
 2. ALL CAPACITANCE VALUES ARE IN MICROFARADS  
 1. ALL RESISTANCE VALUES ARE IN OHMS 1/2W 5% (K=1000)

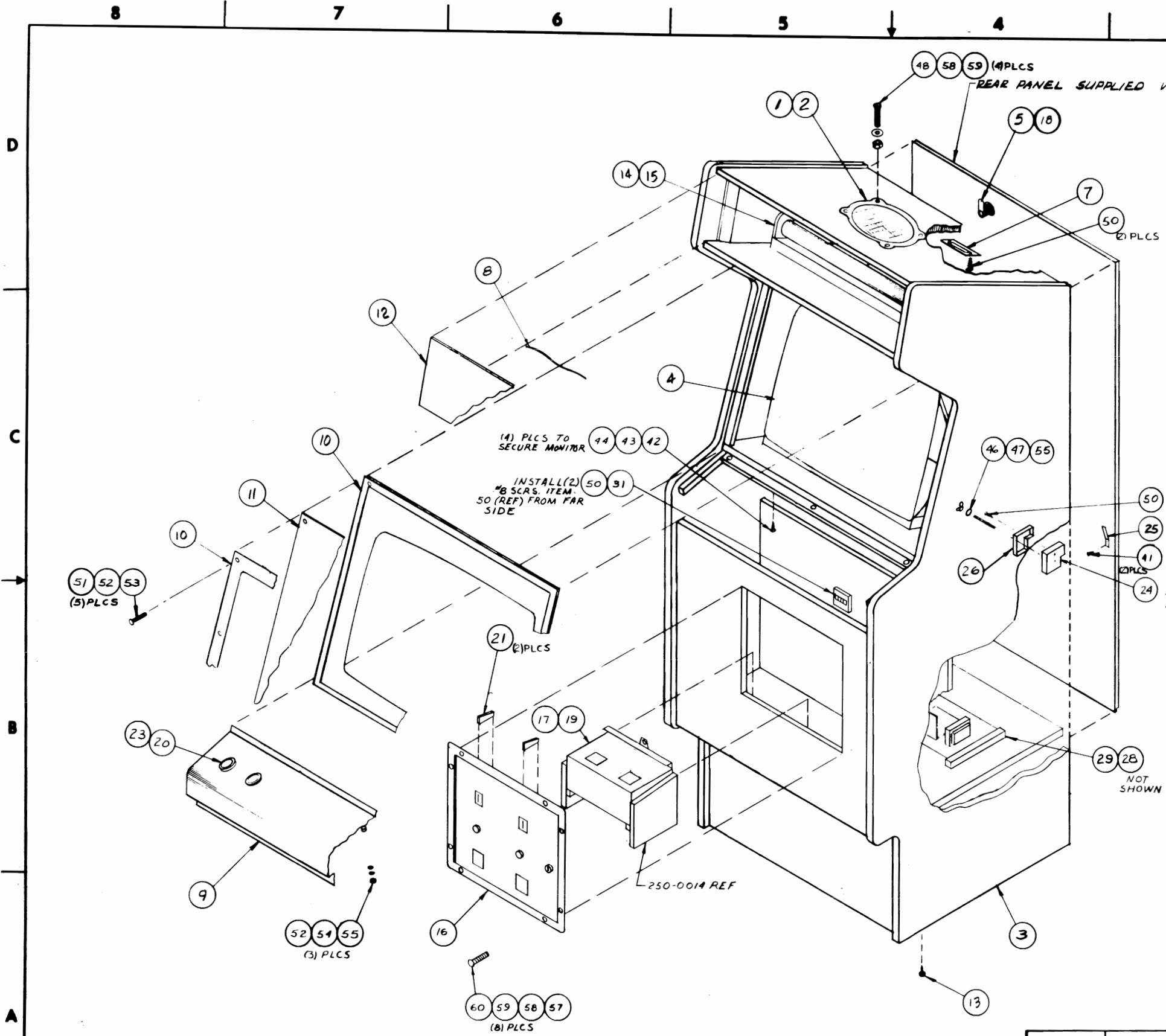
NOTES: UNLESS OTHERWISE SPECIFIED



**GREMLIN INDUSTRIES INC.**  
8401 AERO DR. SAN DIEGO, CA. 92123

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





REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

8		8-32 BOLT RD. HD. CARRIAGE 1/4 LG	60
8		8-32 HEX NUT	59
8		#8 FLAT WASHER	58
8		#8 LOCK WASHER	57
A/R		3M ADHESIVE #XE4693	56
4		#10 LOCK WASHER	55
3		10-32 HEX NUT	54
5		10-24 BOLT RD. HD. CARRIAGE 1 3/4 LG	53
8		#10 FLAT WASHER	52
5		#10-24 HEX NUT	51
5		#8 RD HD CR. REC. SHT. MTL. SCR. 1/2 LG	50
3		#8 FLT HD. CRS. REC WOOD SCR 1/4 LG	49
4		8-32 SLOT OVAL HD. MACH. SCR. 1/2 LG	48
1		10-24 HANGER BOLT 2 1/2 LG	47
1		10-24 WING NUT	46
8		#4 RD HD CRS REC WOOD SCR 1/2 LG	45
4		#8 SELF TAP SHT. MTL. SCR. HEX. HD. 1/4 LG	44
4		#8 INT. EXT. TOOTH LOCK WASHER	43
4		#8 CLIP NUT	42
2		#6 RD HD. CRS. REC. SHT. MTL. SCR. 1/2 LG	41
			40
			39
			38
			37
			36
1	814-0010	HARNES, MONITOR	SHEET 2 OF 39
1	814-0008	HARNES, COIN MECHANISM	SHEET 2 OF 34
1	814-0007	HARNES, JUMPER	SHEET 2 OF 33
1	814-0006	HARNES, OPERATOR SWITCH	SHEET 2 OF 32
1	814-0011	COIN COUNTER ASSY	SHEET 2 OF 31
1	814-0009	HARNES, VOL CONTROL BLK.	SHEET 2 OF 30
1	814-0005	D.C. POWER SUPPLY ASSY.	SHEET 2 OF 29
1	814-0002	D.C. VIDEO LOGIC BD. ASSY.	SHEET 2 OF 28
1	814-0001	D.C. SOUND BOARD ASSY.	SHEET 2 OF 27
1	140-0017	COVER, JUNCTION BOX	26
1	250-0048	CLIP SWITCH	25
1	808-0009	ASSY JUNCTION BOX	SHEET 1 OF 24
4	253-0031	SPACER, WICO SWITCH	23
1	250-0058	LOCK PLATE, C/B LID	22
2	250-0062	PLATE, COIN RETENSION	21
4	240-0006	BUTTON, PLUNGER RED	20
1	220-0016	LID ASSY, COIN BOX	19
1	220-0015	LATCH, LOCK UPRIGHT	18
1	220-0013	CASH BOX, TABLE	17
1	220-0010	COIN MECHANISM, DUAL	16
1	390-0012	FIX. LAMP FLOUR 18"	15
1	390-0011	LAMP FLUORESCENT, 18"	14
4	250-0030	CABINET FEET	13
1	253-0029	PANEL DISPLAY UPPER	12
1	253-0028	MONITOR SCREEN	11
1	253-0014	MASK, SHADOW CABINET	10
1	250-0103	PANEL, FRONT SWITCH	9
1	250-0034	SPRING RETAINER	8
1	250-0033	PLATE LOCK STRIKE	7
1	250-0032	FRAME, BEZEL	6
1	220-0009	LOCK, PANEL	5
1	200-0002	MONITOR, VIDEO 19IN	4
1	140-0022	CABINET DEPTH-MASK	3
1	130-0001	SPEAKER, GAME 6x9	2
1	130-0002	COVER, SPEAKER 6x9	1

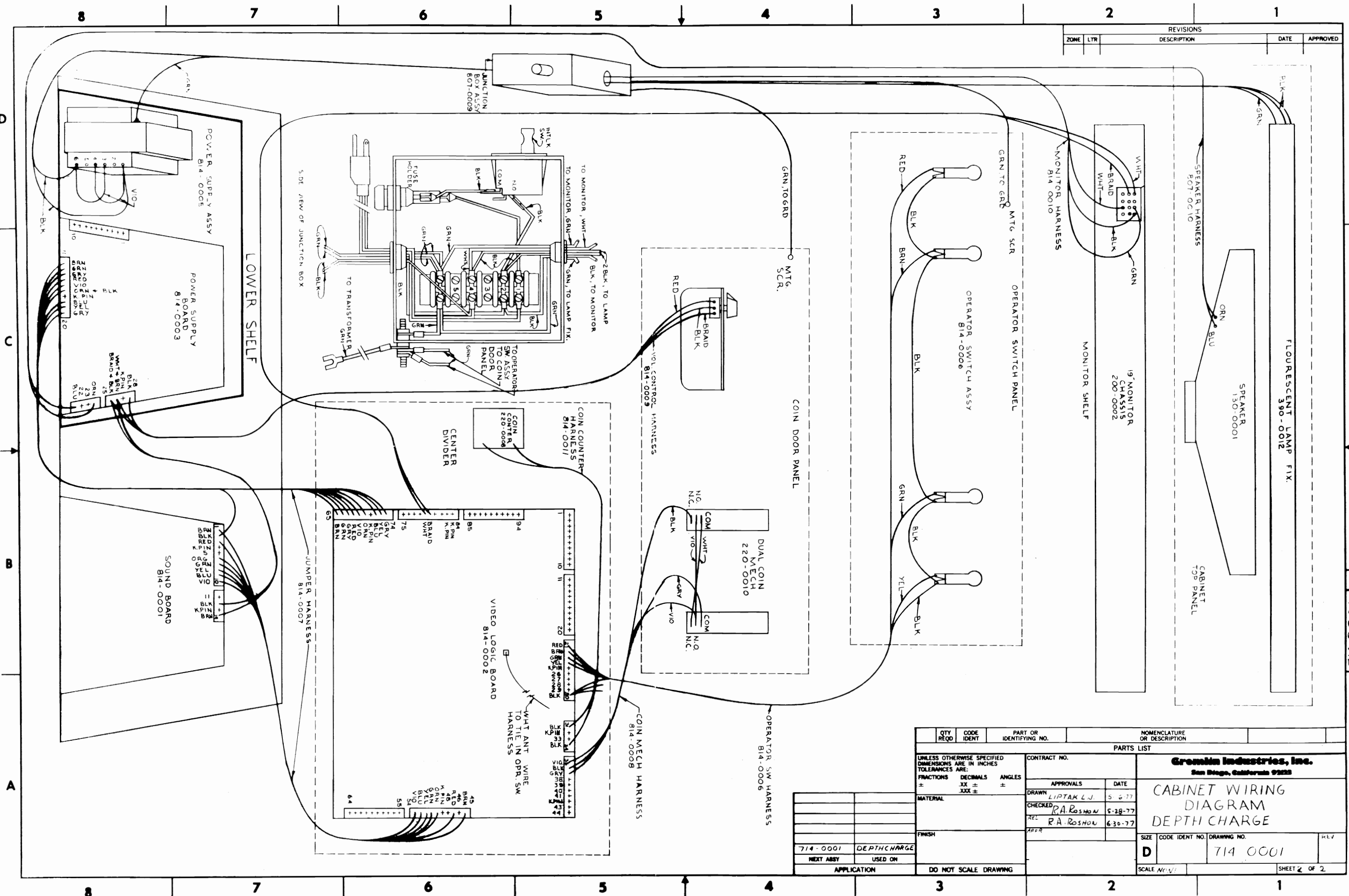
QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
PARTS LIST			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: NONE FRACTIONS DECIMALS ANGLES ± .XX ± ± .XXX ± ±			
MATERIAL		CONTRACT NO.	
FINISH		APPROVALS DATE	
NEXT ASSY		DRAWN G. SMITH 4-12-77	
USED ON		CHECKED	
APPLICATION		SIZE CODE IDENT NO. DRAWING NO.	
DO NOT SCALE DRAWING		D 714-0001	
		SCALE NONE SHEET 1 OF 1	

**Gremlin Industries, Inc.**  
San Diego, California 92108

TOP ASSEMBLY  
DET 714-0001

NOT SHOWN ON BODY OF DRAWING SEE SHEET 2 OF THIS DWG  
NOTES, UNLESS OTHERWISE SPECIFIED

ZONE		LTR	REVISIONS	DATE	APPROVED
			DESCRIPTION		



QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
			<b>CONTRACT NO.</b>
			<b>APPROVALS</b>
			<b>DATE</b>
			<b>DRAWN</b> LIPTAK L.J. 5-6-77
			<b>CHECKED</b> R.A. ROSHOW 5-28-77
			<b>REL</b> R.A. ROSHOW 6-30-77
			<b>APP</b>
			<b>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:</b>
			FRACTIONS DECIMALS ANGLES
			± .XX ± ±
			± .XXX ± ±
			<b>MATERIAL</b>
			<b>FINISH</b>
			<b>SIZE</b> CODE IDENT NO. DRAWING NO.
			<b>D</b> 714 0001
			<b>SCALE</b> N.P.V.
			<b>SHEET 2 OF 2</b>

APPLICATION	DO NOT SCALE DRAWING
714-0001 DEPTHCHARGE	
NEXT ASSY USED ON	

714-0001