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DEPTHCHARGE

The word "DEPTHCHARGE" is written in a bold, outlined, blocky font. The letters are white with a black outline. A horizontal line runs through the middle of the letters. To the right of the word, there is a stylized illustration of a hand holding a dynamite stick. The hand is drawn with simple lines, and the dynamite stick has a lit fuse with a flame and a small explosion at the end.

MANUFACTURED BY

Gremlin
Industries, inc.

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.

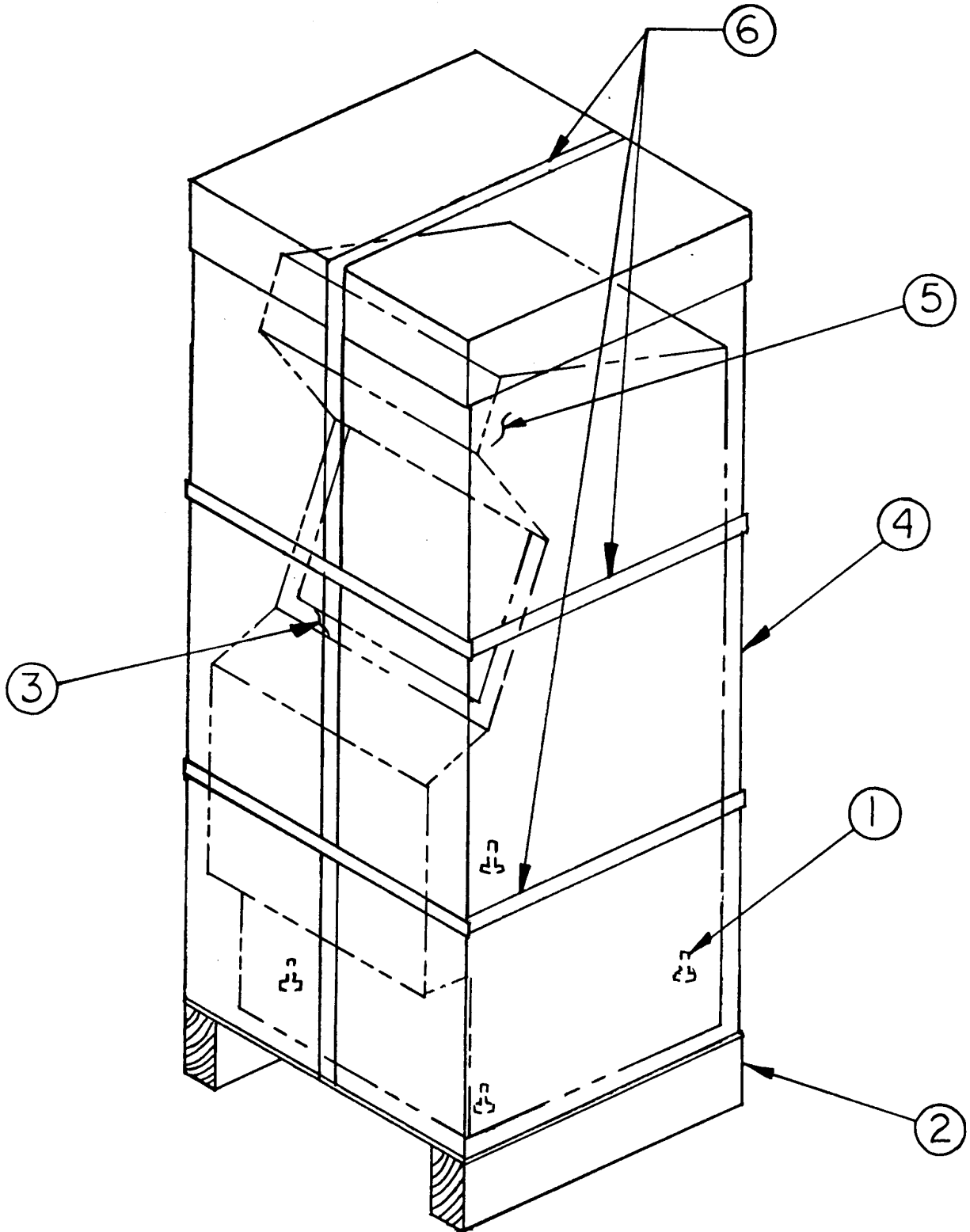
REPACKAGING INSTRUCTIONS

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 TM 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:

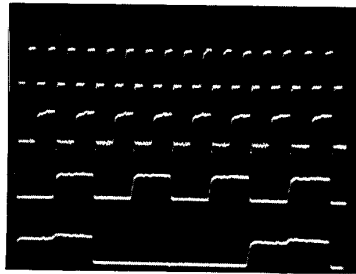
Signals 1-15 show the signals developed by the Video Logic board's master signal sequencer. These signals form the basic timing for the entire board, and therefore, should be checked first. All photos use 5 volt per centimeter vertical sensitivity, and a time base of 200 nanoseconds per division horizontal.

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.)

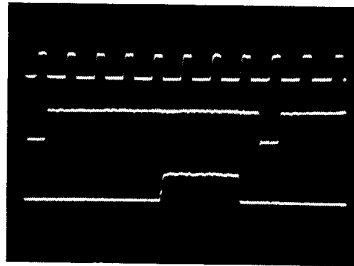
If it is now correct, the problem is on the "downstream" side of the 74S175. DON'T FORGET TO RE-JUMPER THE CONNECTION YOU CUT. If the input side of the 74S175 is also "dead", suspect the PROM (U27 or U28), whichever is applicable.

OPERATIONAL WAVE FORMS (Cont'd.):

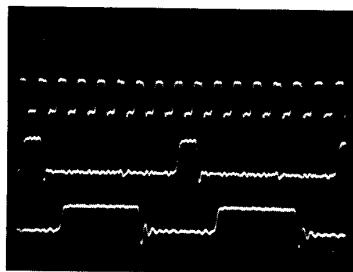
SIGNALS 1-15:



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



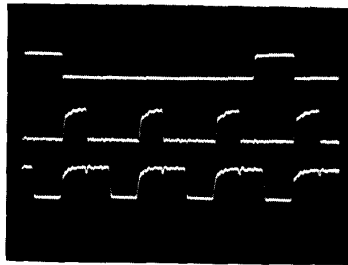
5. (U13-15) SRCK (Shift Register Clock)
6. (U13-2) SRLD (Shift Register Load)
7. M4 (U13-13)



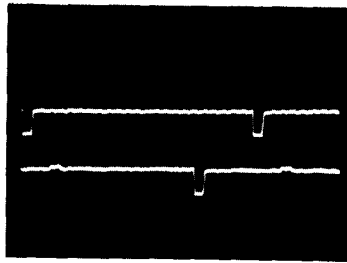
8. (U11-14) Pin 9
9. (U12-15) Processor-Clock Phase 1
10. (U12-10) Processor-Clock Phase 2

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)

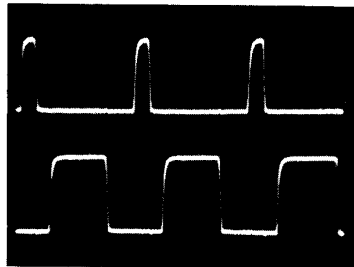


- 14. $\overline{\text{RWT}}$ (U11-10)
- 15. $\overline{\text{MSB}}$ (U12-7)

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).



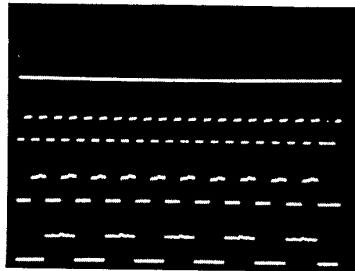
16. 12 Volt
Phase 1 Clock
(TP 1)

17. 12 Volt
Phase 2 Clock
(TP 2)

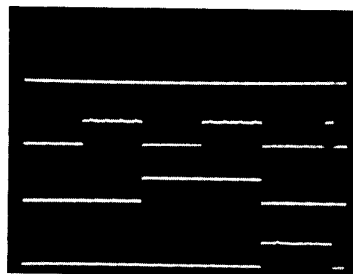
OPERATIONAL WAVE FORMS (Cont'd.):

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.



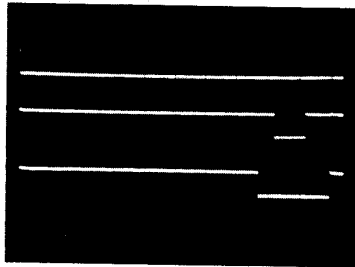
- 18. Horizontal Reset (U46-2,12)
- 19. 8H (U46-3)
- 20. 16H (U46-4)
- 21. 32H (U46-5)



- 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.):

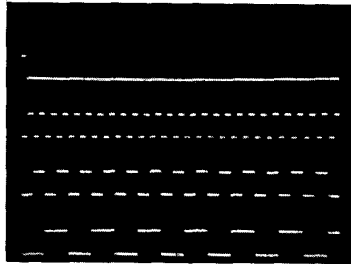


- 26. Horizontal Reset (U46-2,12)
- 27. HSYNC (U36-8)
- 28. HBLANK (U47-1)

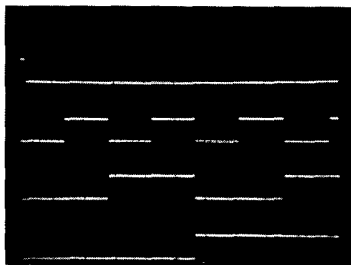
OPERATIONAL WAVE FORMS (Cont'd.):

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).



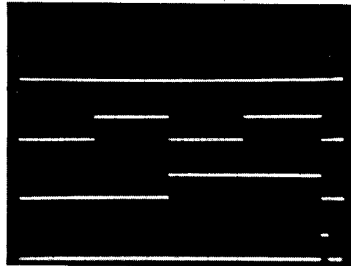
- 29. Vertical Reset (U49-2)
- 30. 1V (U49-3)
- 31. 2V (U49-4)
- 32. 4V (49-5)



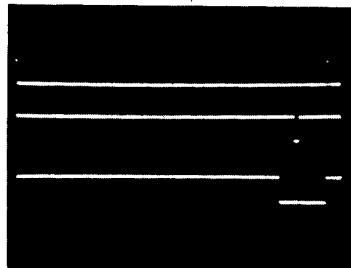
- 33. Vertical Reset (U49-2)
- 34. 8V (U49-6)
- 35. 16V (U49-11)
- 36. 32V (U49-10)

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)

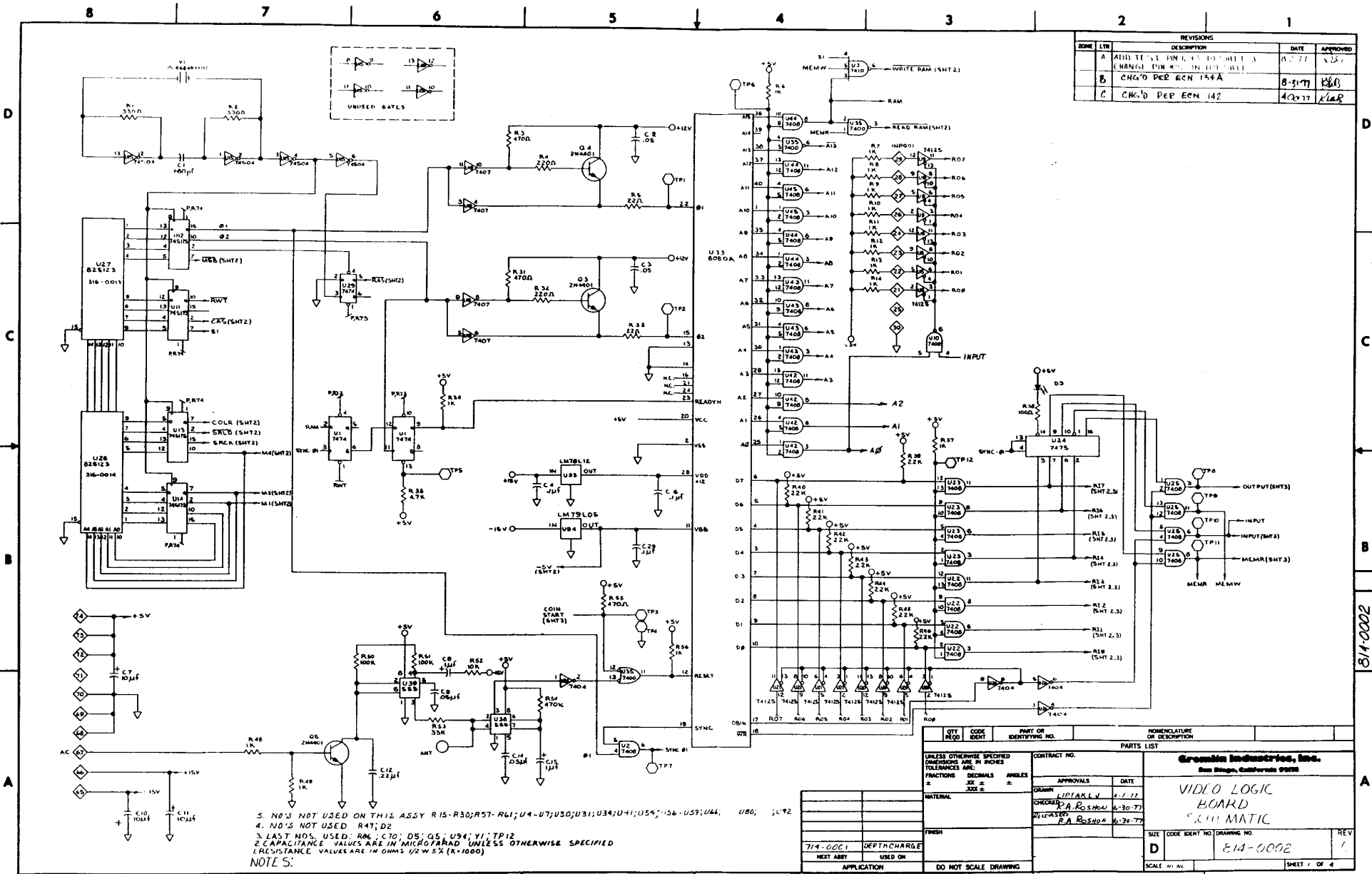
DEPTHCHARGE REPLACEABLE PARTS LIST

<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

REVISIONS				
ZONE	LTB	DESCRIPTION	DATE	APPROVED
A		ADD TEST POINTS TO SHEET 3 (CHANGE FROM 400-3M TO 100-3M)	8-7-77	V.S.
B		CHG'D PER ECN 154A	8-31-77	R.B.
C		CHG'D PER ECN 142	4-29-77	K.L.R.



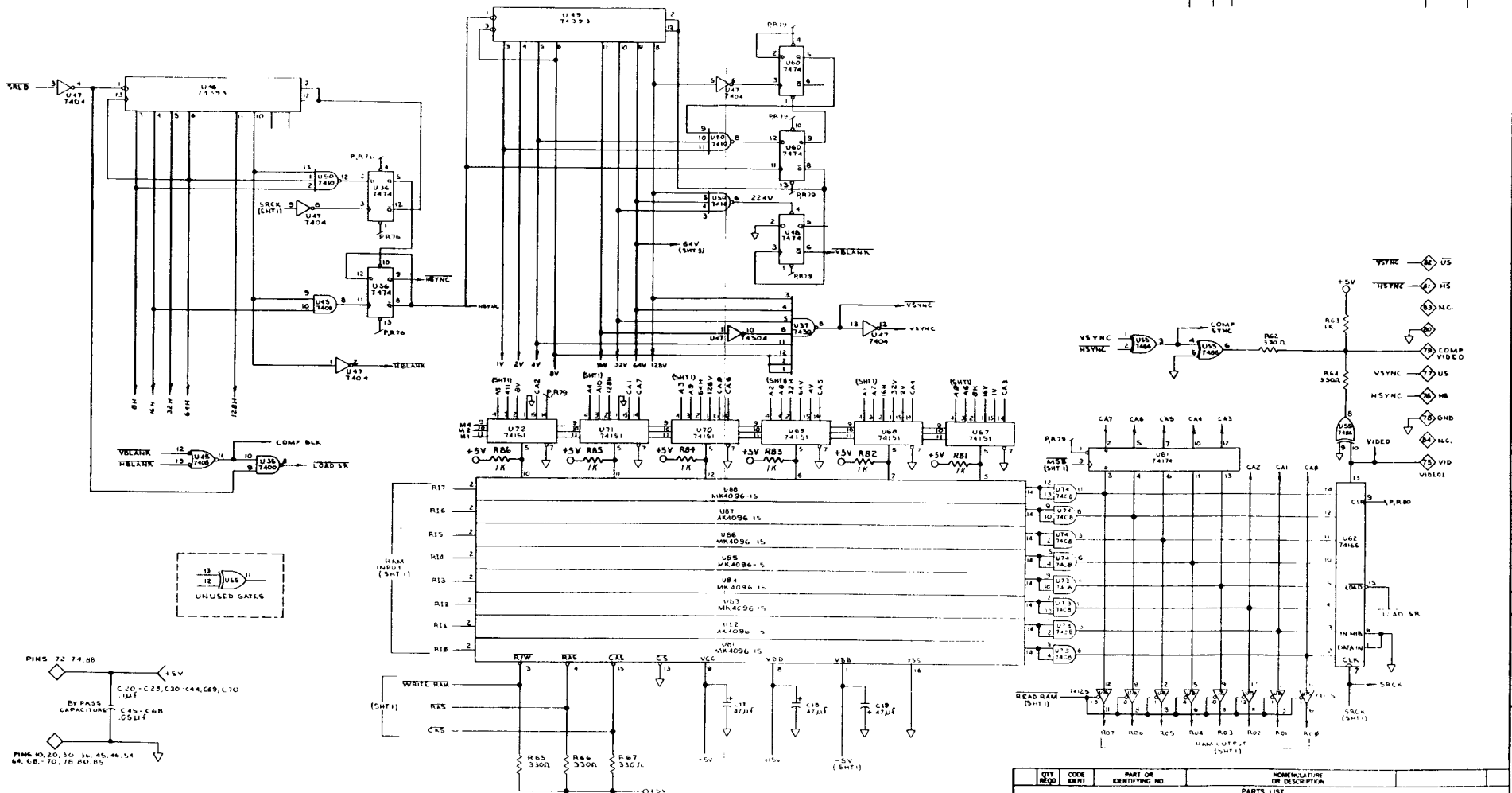
5. NO'S NOT USED ON THIS ASSY R15-R30; R57-R61; U4-U7; U30; U31; U33; U41; U54; U56-U59; U60; J1; J2
 4. NO'S NOT USED R47; D2
 3. LAST NO'S USED: R86; C10; D5; Q5; U94; Y1; TP12
 2. CAPACITANCE VALUES ARE IN MICROFARAD UNLESS OTHERWISE SPECIFIED
 1. RESISTANCE VALUES ARE IN OHMS UNLESS OTHERWISE SPECIFIED
 NOTE 5:

QTY	CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
			PARTS LIST
			UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES
			MATERIAL FINISH
			CONTRACT NO.
			APPROVALS DATE
			CHECKED RELEASED
			SIZE CODE IDENT NO. DRAWING NO.
			D 814-0002
			SCALE REV
			SHEET 7 OF 4

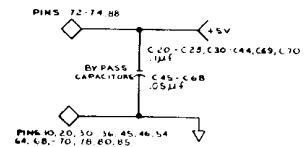
814-0002

A

REVISIONS			
REV#	DATE	DESCRIPTION	APPROVED



13
12
11
U45
UNUSED GATES



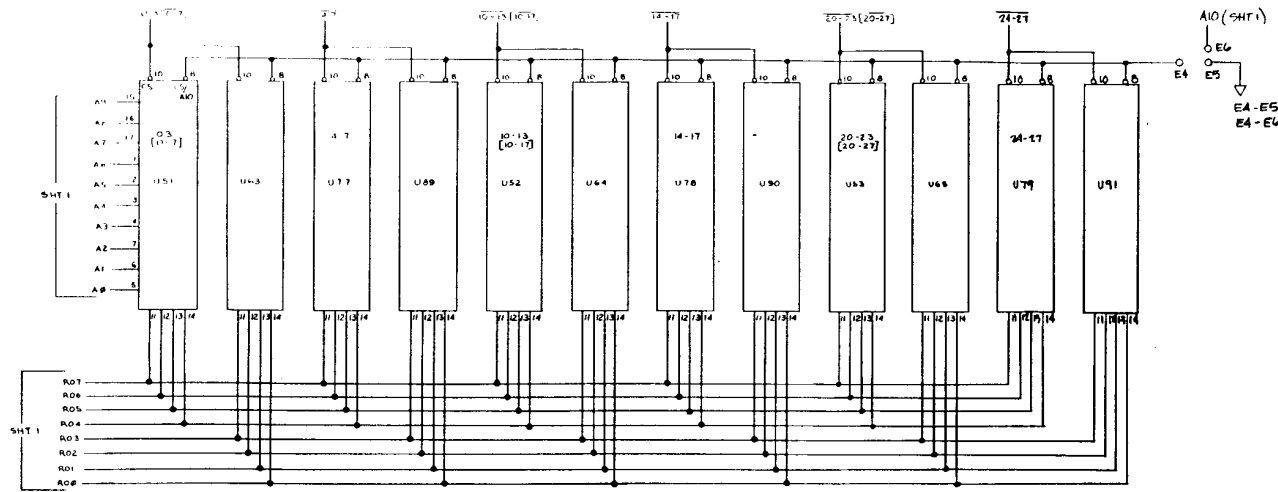
QTY	CODE	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION
2	R17	288	MK4096-15
2	R16	UB7	AK4096-15
2	R15	UB6	MK4096-15
2	R14	UB5	MK4096-15
2	R13	UB4	MK4096-15
2	R12	UB3	MK4096-15
2	R11	UB2	AK4096-15
2	R10	UB1	MK4096-15
2	R9	UB0	MK4096-15

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				
MATERIAL		CONTRACT NO.		
FINISH		APPROVALS DATE		
		DRAWN BY: J.A.P. / J. J. 11		
		CHECKED BY: R.A. ROSS / C/B/77		
		REWORKED BY: R.A. ROSS / 4/77		
714-0001 DEPTH CHARGE		SIZE CODE IDENT NO DRAWING NO		
MFGT AGENCY		D 814-0002		
APPLICATION		SCALE: 1:1		
DO NOT SCALE DRAWING		SHEET 2 OF 4		

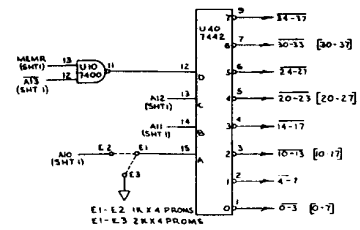
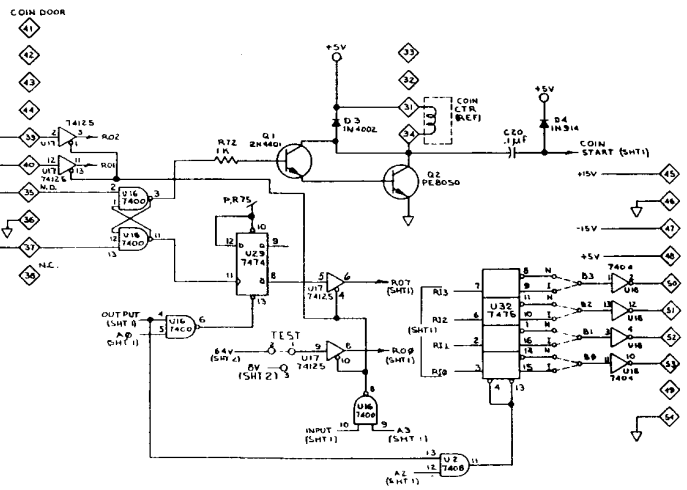
1. SEE NOTES SHEET ONE
NOTES.

814-0002

ZONE		REVISONS		DATE	APPROVED
LTR		DESCRIPTION			



A10 (SHT 1)
 E4
 E5
 EA-E5 1K x 4 PROMS
 E4-E6 2K x 4 PROMS



SEE NOTES SHEET 1
 NOTES:

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

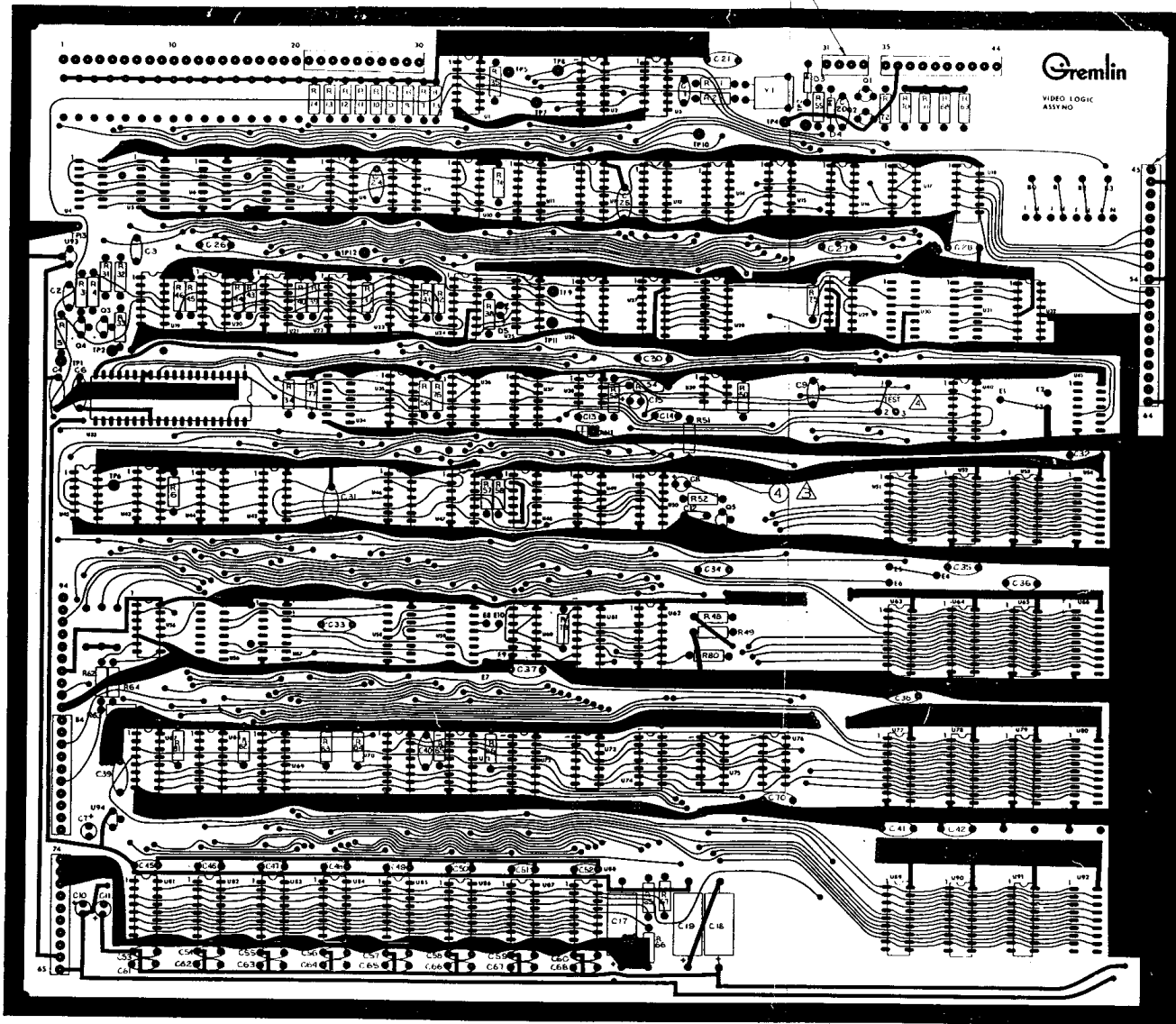
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES		CONTRACT NO.	
±	.01	°	
MATERIAL		DESIGNED BY L. J. TAYLOR 4-13-77	APPROVED DATE
FINISH		CHECKED BY R. A. ROSSMAN 6-20-77	
T14-0001 DEPTHCARGE		RELEASED BY R. A. ROSSMAN 6-30-77	
NEXT APPY USED ON		SIZE CODE IDENT NO. DRAWING NO.	SCALE A:1 = 1"
APPLICATION		D	E14-0002

Grossman Industries, Inc.	
San Diego, California 92108	
VIDEO LOGIC BOARD SCHEMATIC	
D	CLV
SHEET 1 OF 4	

E14-0002

REVISIONS		DATE	INITIALS
1	DES. RLP/SLM		

Gremlin
VIDEO LOGIC
ASSTNO



② (PLCS)

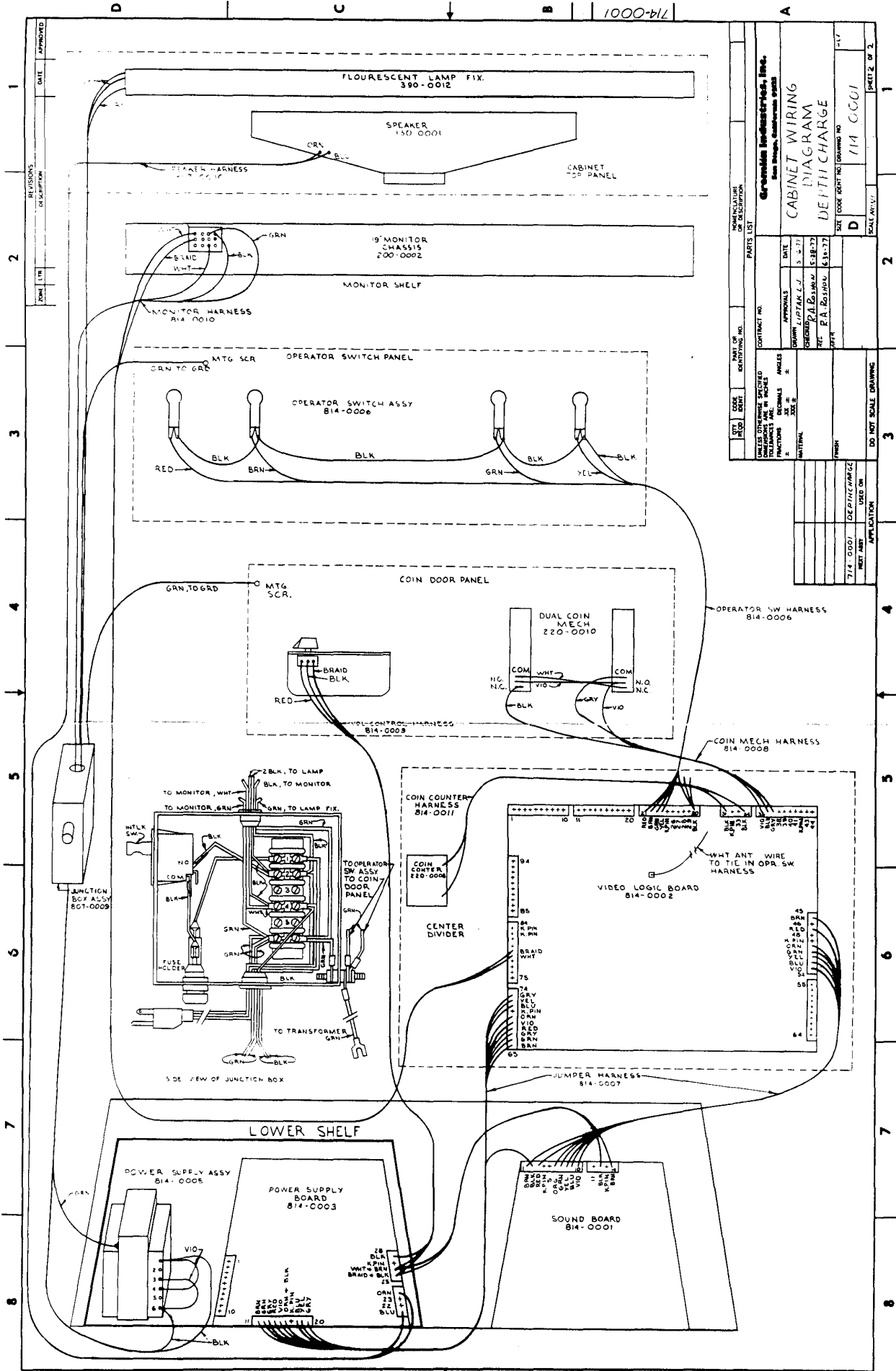
QTY	PART NUMBER	DESCRIPTION	ITEM NUMBER
2	215-0004	SOCKET	U177, X0E6
16	215-0002	SOCKET	X0M1, X0S3, X0A3, X0G5, X0T7, X0J2
			X0B6, X0U1
			R1, R3, R5
4	482-0014	1K5TOR 2N4401	C2
1	482-0010	1K5TOR PEBO50	C2
1	481-0006	DIODE 1N31A	D4
1	481-0001	DIODE 1N4002	D3
1	471-0414	RES 470K 1/2W 5%	R54
1	471-0412	RES 47K 1/2W 5%	R35
1	471-0411	RES 470 1/2W 5%	R3, R31, R55
1	471-0333	RES 33K 1/2W 5%	R53
1	471-0331	RES 330 1/2W 5%	R1, R2, R6, R64, R67
8	471-0223	RES 22K 1/2W 5%	R32, R46
1	471-0221	RES 220 1/2W 5%	R4, R12
1	471-0220	RES 22 1/2W 5%	R5, R33
2	471-0104	RES 100K 1/2W 5%	R50, R51
3	471-0103	RES 10K 1/2W 5%	R52, R57, R58
12	471-0102	RES 1K 1/2W 5%	R6, R14, R34, R37, R45, R49, R56
			R63, R68, R76, R15, R80, R86
1	471-0101	RES 100 1/2W 5%	R38
1	316-0044	PROM D/C U18	U11
1	316-0003	LED RED	D5
1	316-0005	PROM D/C U19	U12
1	316-0031	PROM D/C U90	U90
1	316-0030	PROM D/C U89	U89
1	316-0029	PROM D/C U18	U18
1	316-0028	PROM D/C U17	U17
1	316-0027	PROM D/C U6	U6
1	316-0026	PROM D/C U4	U4
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 SLD 32 X8	U28
1	316-0015	PROM COUNT 32 X8	U27
8	315-0014	MOSFET 1N4004-15	U1, U2, U3, U4, U5, U6, U7, U8, U9
1	315-0014	IC 8026A CPU	U11
4	314-0053	IC 74S175	U11, U14
1	314-0047	IC 7414	U61
1	314-0046	IC 74504	U15
1	314-0043	IC 7407	U16
1	314-0039	IC 74166	U62
6	314-0035	IC 74151	U61, U72
2	314-0030	IC 74393	U46, U49
1	314-0022	IC 7486	U55
2	314-0021	IC 7415	U24, U32
1	314-0020	IC 7430	U37
1	314-0011	IC 74125	U8, U9, U11, U20, U21, U35, U76
3	314-0015	IC 7404	U18, U26, U41
10	314-0012	IC 7408	U2, U22, U23, U25, U42, U45, U13, U74
1	314-0011	IC 7442	U40
2	314-0010	IC 7410	U3, U50
3	314-0009	IC 7400	U10, U16, U35
2	314-0008	IC 7417	U1, U2, U36, U48, U60
2	314-0001	IC NE555	U34, U38
1	313-0017	IC LM79L05	U34
1	313-0016	IC LM78L12	U93
1	230-0008	ITAL 15.46848 MHZ	Y1
1	212-0011	CONN FEMALE 2 PIN	①
1	212-0004	CONN MALE 4 PIN	②
6	212-0005	CONN MALE 10 PIN	③
14	211-0004	CONN MALE TEST PT	TP1-TP13, ANT
1	170-0083	R.C.B.	①
3	153-0001	CAP TANT 10 MF 25V	C7, C10, C11
1	152-0002	CAP 22 20T 100V	C12
1	151-0012	CAP CER 100 50V	C4, C6, C13, C20, C44, C69, C70
1	151-0005	CAP CER 680P 50V	C1
1	151-0001	CAP CER 05 50V	C8, C32, C39, C43, C45, C68
3	150-0012	CAP CER 25V	C11, C19

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

NOTES: UNLESS OTHERWISE SPECIFIED

714-0001	DEPT CHARGE
HEAT ASSY	VIDEO CON
APPLICATION	

APPROVALS		DATE	PARTS LIST GREMLIN IND INC. SAN DIEGO CALIFORNIA 92123	PARTS OVERLAY VIDEO LOGIC BOARD	REV
DRAWN	L. J. LIPMAN	7.25.73			
CHECKED					
RELEASED	P. L. P. P.				
APPROVED					
SIZE	E		DRAWING NO.	8M-0002	REV
SCALE: 2X1			SHEET 4 OF 4		



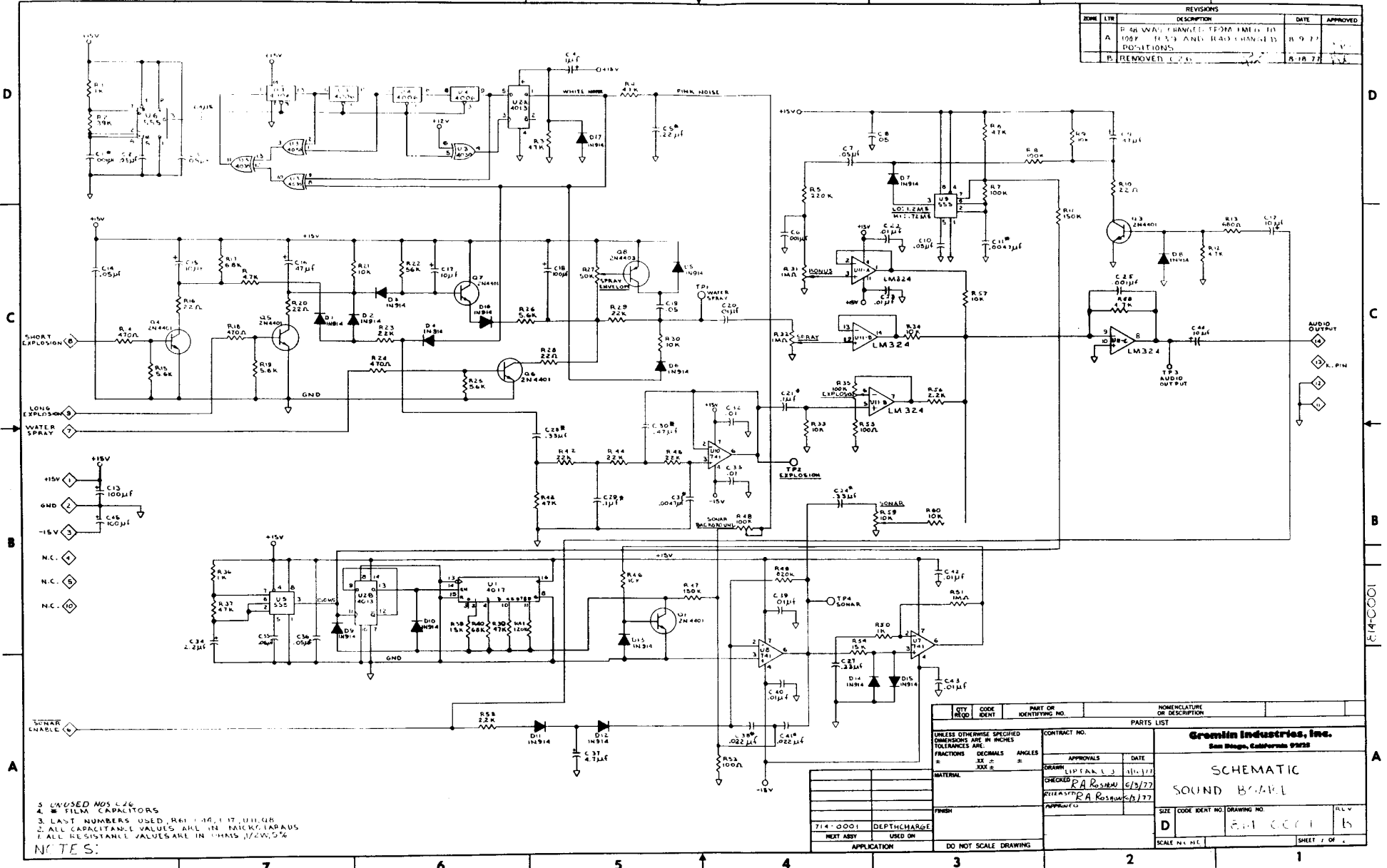
PARTS LIST			
QTY.	CODE	IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
1	1		MONITOR HARNESS 814-0010
1	2		OPERATOR SWITCH ASSY 814-0006
1	3		COIN DOOR PANEL 814-0009
1	4		COIN MECH HARNESS 814-0008
1	5		JUNCTION BOX ASSEMBLY 807-0009
1	6		VIDEO LOGIC BOARD 814-0002
1	7		POWER SUPPLY BOARD 814-0003
1	8		SOUND BOARD 814-0001

DATE	APPROVED
DATE	APPROVED
DATE	APPROVED
DATE	APPROVED
DATE	APPROVED
DATE	APPROVED
DATE	APPROVED
DATE	APPROVED

CONTRACT NO.	
DATE	5-2-77
DESIGNED BY	LIPYAK, L.J.
DRAWN BY	P. A. BOLANOV
CHECKED BY	P. A. BOLANOV
DATE	6-13-77
SCALE	D
SCALE	1/4" = 1"
SCALE	1/4" = 1"
SCALE	1/4" = 1"
SCALE	1/4" = 1"

714-0001	DEPTH CHANGE	USED ON
714-0001	DEPTH CHANGE	USED ON
714-0001	DEPTH CHANGE	USED ON
714-0001	DEPTH CHANGE	USED ON
714-0001	DEPTH CHANGE	USED ON
714-0001	DEPTH CHANGE	USED ON
714-0001	DEPTH CHANGE	USED ON
714-0001	DEPTH CHANGE	USED ON

ZONE		REVISONS		DATE	APPROVED
LETTER	DESCRIPTION	DATE	APPROVED	DATE	APPROVED
A	REWORK DRAWING FROM 11-11-77 TO 105P 14.50 AND 14.50 CHANNEL POSITIONS.	8-9-77			
B	REMOVED	8-18-77			



3. UNUSED NOS 276
 4. * FILM CAPACITORS
 3. LAST NUMBERS USED, R41, 10, 17, U1, U2
 2. ALL CAPACITANCE VALUES ARE IN MICROFARADS
 1. ALL RESISTANCE VALUES ARE IN OHMS UNLESS OTHERWISE SPECIFIED

NOTES:
 7
 6
 5
 4
 3
 2
 1

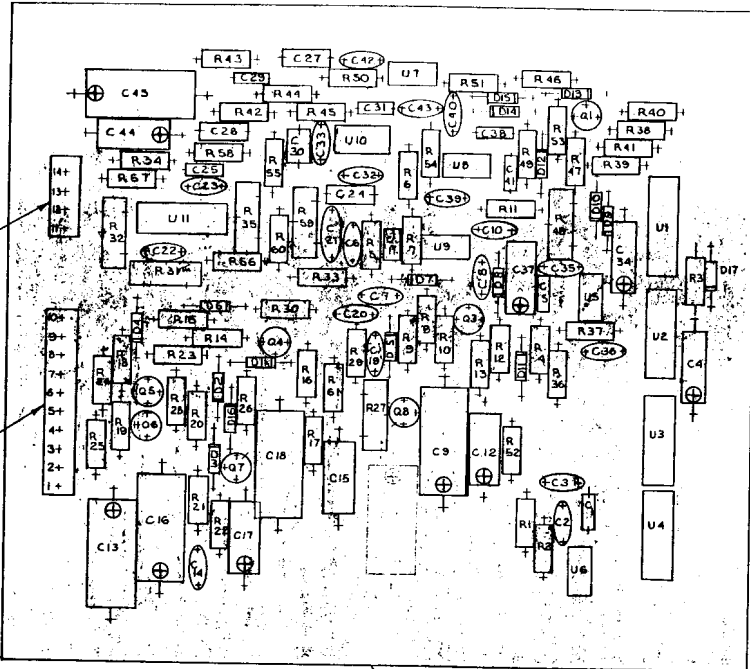
QTY		CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
REQD	IDENT			
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE FRACTIONS DECIMALS ANGLES 3X ± .005 ±				
MATERIAL		CONTRACT NO.		
FINISH		DRAWN: LIP (AKL) 3/11/77		
NEXT ASST		CHECKED: P.A. ROSEMAN 6/13/77		
APPLICATION		APPROVED: P.A. ROSEMAN (AK)		
DO NOT SCALE DRAWING				SCALE N. C. 1:1
714-0001 DEPTCHARGE			SIZE CODE IDENT NO DRAWING NO	ALL
NOT ASST USED ON			D	2-1 CCCC 1 b
SHEET 1 OF 1				

Grenin Industries, Inc.
 San Diego, California 92122

SCHEMATIC
 SOUND BREAK

814-0001

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



1	152-0020	CAP. F. 47µF 100V	C 30
2	151-0008	CAP. CER. 0.001µF 50V	C6, C25
1	212-0004	CONN. MALE 4PIN	3
1	212-0003	CONN. MALE 10 PIN	2
1	315-0028	IC. 4006	U4
1	315-0027	IC. 4030	U3
1	315-0006	IC. 4017	U1
1	315-0005	IC. 4013	U2
3	315-0004	IC. LM 741	U8, U7, U10
1	313-0006	IC. LM 324	U11
3	314-0001	IC. NE 555	U5, U6, U9
6	482-0014	RESISTOR 2M4401	Q1, Q3, Q7
1	481-0006	RESISTOR 2M4403	Q8
17	481-0005	DIODESST 1N414	D1-D17
1	415-0008	POT 50K TRIMMER	R27
2	415-0006	POT 100K TRIMMER	R35, R48
1	415-0001	POT 10K TRIMMER	R59
2	415-0002	POT 1MΩ TRIMMER	R31, R32
1	471-0393	RES. 39K 1/2W 5%	A2
2	471-0101	RES. 100Ω 1/2W 5%	A53, A55
2	471-0222	RES. 2.2K 1/2W 5%	A62, A56
1	471-0824	RES. 820K 1/2W 5%	A49
1	471-0124	RES. 120K 1/2W 5%	A41
1	471-0683	RES. 68K 1/2W 5%	A40
2	471-0153	RES. 15K 1/2W 5%	A38, A54
3	471-0471	RES. 470Ω 1/2W 5%	A24, R14, R18
1	471-0563	RES. 56K 1/2W 5%	A22
1	471-0682	RES. 68K 1/2W 5%	A17
3	471-0220	RES. 2.2K 1/2W 5%	R16, R20, R28
4	471-0562	RES. 56K 1/2W 5%	R18, 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, R41
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
3	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
2	152-0007	CAP. F. .001µF 250V	C1
2	152-0006	CAP. F. 0.022µF 100V	C38, C41
1	152-0005	CAP. F. 0.001µF 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. 0.05µF 50V	C2, C3, C7, C8, C10, C14, C18, 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	1

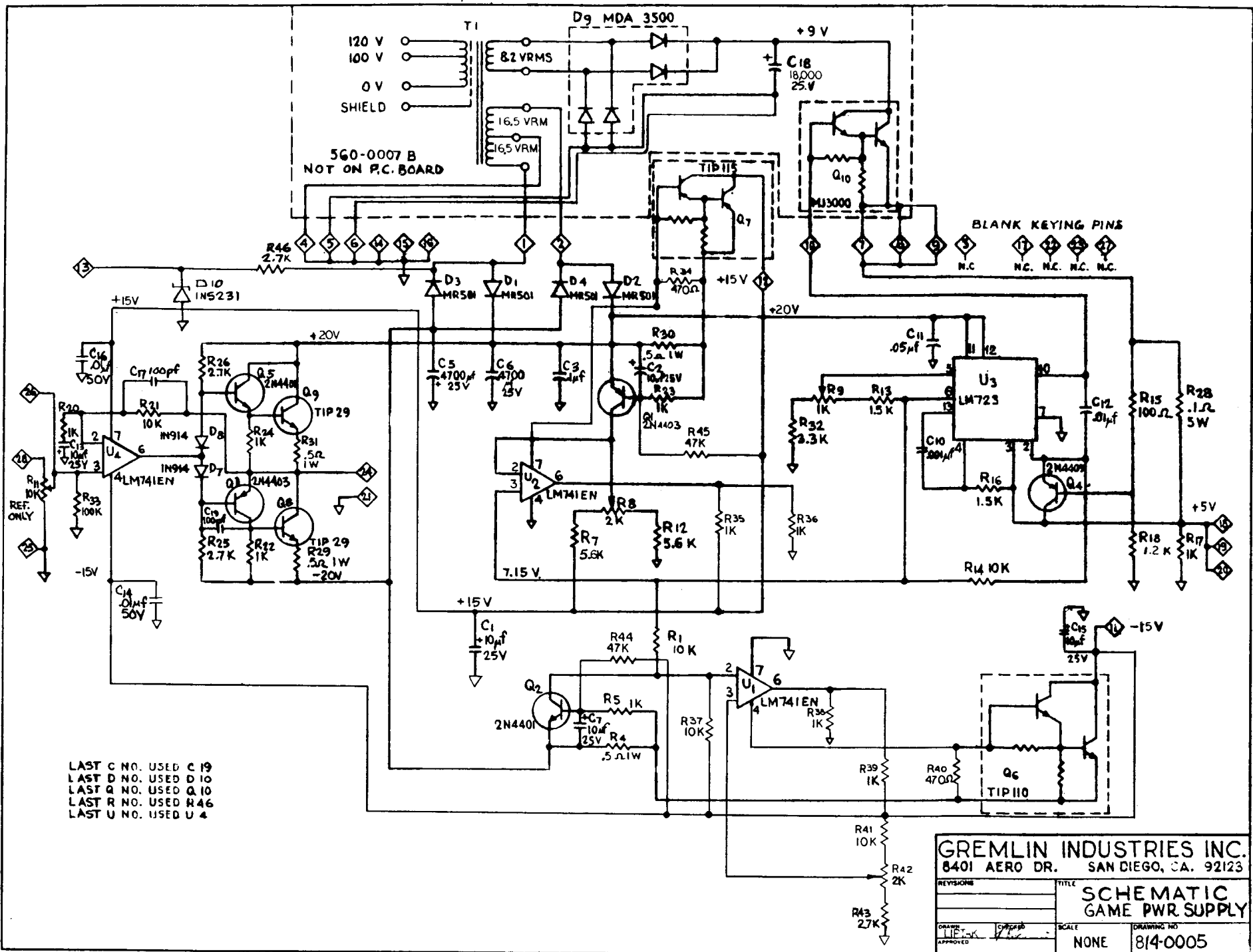
QTY	CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NUMBER
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE				
FRACTIONS	DECIMALS	ANGLES		
=	±	±		
MATERIAL				
FINISH				
APPLICATION				
DO NOT SCALE DRAWING				

CONTRACT NO. **Gremlin Industries, Inc.**
San Diego, California 92121

APPROVALS: DRAWN: LIPYAK L.J. 5-9-77
CHECKED: R.A. ROSSMAN 6-8-77
R.A. ROSSMAN 6-3-77

PARTS OVERLAY
DEPTHCHARGE
SOUND BOARD

SEE CODE IDENT NO. DRAWING NO. REV
D 814-0001 B



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.
 8401 AERO DR. SAN DIEGO, CA. 92123

REVISIONS	TITLE
	SCHEMATIC
	GAME PWR SUPPLY
DRAWN BY	SCALE
APPROVED	NONE
	DRAWING NO. 814-0005