Owner's Manual

DIGGER
Operating Instructions
and
Service Manual

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INTRODUCTION...

This is an electronic game that makes extensive use of digital integrated circuitry and television monitor circuitry. This manual assumes the maintenance technician possesses a general knowledge of solid state circuitry microprocessor, TTL digital integrated circuitry and T.V. monitor concepts. Any individual **not** knowledgeable in these areas **should not** attempt repair of the electronic portion of this game. **It should be noted that any attempt to repair the game in the field without the express consent of the factory will immediately void the warranty!!!**

IMPORTANT NOTES...

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

> **If at any time the T.V. screen shows a meaningless display or the game otherwise malfunctions, simply drop a coin into the coin mechanism. This should correct the problem. If not, the game requires service.**

The circuitry in this game has been arranged so that the insertion of a quarter through the coin mechanism will reset the 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.

ALSO...

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.

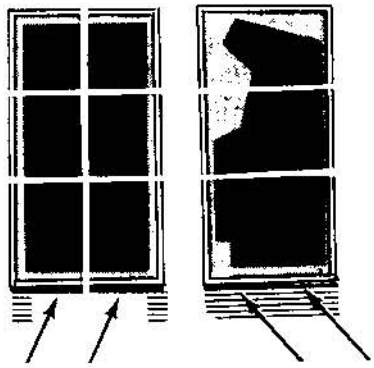
Always consult the manual before attempting repairs.

Correspondence regarding this game should be addressed to:

Gremlin/SEGA
8401 Aero Drive
San Diego, California 92123
(714) 277-8700

REPACKAGING INSTRUCTIONS...

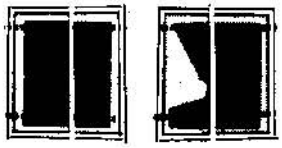
Arcade
25¼" W x 67" H x 28" D
64.77cm W x 170.18cm H x 71.12cm D
280 lbs./132 kg.



Arcade Version

1. Carefully lay game on its side.
2. Attach pallet with **four** 5/16" - 18 x 1-3/4" bolts, as shown.
3. See Final Recrating Instructions, below.

MiniVideo
22" H x 21" W x 30" D
55.88cm H x 53.34cm W x 50.8cm D
80 lbs./36 kg.



Mini-Video Version

1. Place game upright inside bottom cover.
2. Slide cover over game. Add protective packing material.
3. Place top cover over side cover.
4. See Final Recrating Instructions, below.

Cocktail
22" W x 34" L x 24½" H
55.88cm W x 93.98cm L x 62.23cm H
80 lb./36 kg.

Cocktail Version

1. Place game inside carton.
2. Add protective packing material.
3. Place inside protective top cover over unit.
4. Close flaps and secure with shipping tape.
5. See Final Recrating Instructions, below.

FINAL RECRATING INSTRUCTIONS...

Place game upright. Tape down game keys. Then, crate the game using appropriate shock-absorbent packing material. Include packing on edges of game. **Secure package with strapping.**

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 done. Include the full serial number of the game.

All items must be shipped prepaid.

GAME CONCEPT...

DIGGER is a new Gremlin/SEGA game that requires you to dig strategically placed holes within a maze format so you can capture and fill in over the invading creatures before they can attack and destroy your man.

You maneuver your man around the maze with a four-directional joystick. Two push-button controls are used for your shoveling action: one, for the DIG function and another for the FILL function. The maze format changes with every round played.

DIGGER is a Gremlin Multi-Phase^{tm} game that becomes increasingly challenging as your skills improve, as you will see.

The creatures are confined behind a wall. In the first of three rounds of game play, four creatures are let out of the holding area through a gate. You must conquer these four before advancing to the next round, where you face six creatures. Your third round has you battling eight creatures. This process is repeated and the point value increased with each three-round victory. Also, the creatures' speed increases each round. Any contact at all with the creatures will be fatal to your man.

While you are busy digging holes and entrapping creatures, the rest are behind the retaining wall scurrying back and forth. After about three minutes, the gates at each end will open and all of the remaining creatures will stream into the play area at once. However, a skillful player will conquer all of the creatures of each round and the gate will not be a threat.

A DOUBLE SCORE BONUS is awarded if you capture and fill in over the RED creature before any of the GREEEN ones. But, this must be the FIRST creature defeated, or the RED creature becomes GREEN and no bonus is awarded.

The point value per creature increases with each three-round phase. The first phase awards 300 points per creature, decreasing to 100 points if not filled over promptly. The second phase awards 500 points per creature, decreasing to 300. And, the third phase awards 700 points, decreasing to 500 points.

A 1000 POINT BONUS is given if you capture four creatures in a row at full point value during any one round.

An EXTRA MAN is given at 5000 points.

When a creature is captured, eight squeaking sounds are heard before the creature escapes from the hole. Five squeaks are required to cover a creature, so you must hurry to the hole and FILL before the fourth squeak, or the creature will emerge and devour your man.

If your FILL is incomplete and another creature passes along the same path, it will pull the other out and your man may be eaten. If a hole is incomplete, it will delay creatures somewhat, depending on the size of the partially dug hole.

On the DIGGER upright and Mini-Video games, two players alternate turns. A player loses his turn when the round is complete, not just when he loses a man.

On the slimline and cocktail tables, DIGGER can be a two-player SIMULTANEOUS PLAY, or ALTERNATE PLAY, as described above. In the SIMULTANEOUS PLAY option, the sum of Player 1 and Player 2 scores are used as one final score. The game play is the same as one-player and either man may FILL a hole, regardless which one dug it. If you select ALTERNATE PLAY action, it is the same as the upright or Mini-Video.

A unique feature of Gremlin/SEGA's DIGGER game is the personalization of HI SCOREs. At the end of the game in which the highest score of the machine is topped, the player uses the DIG and FILL buttons to run through the alphabet selecting his three initials. These will remain until that score is topped by another player. In SIMULTANEOUS PLAY, Player 1 enters his initials first, and then Player 2 enters his. Both initials are displayed until their score is beat.

DIGGER SOUNDS

BACKGROUND SOUND is used anytime creatures are present in the maze. This sound speeds up with the creatures' speed.
An ESCAPE SOUND is used as the creatures rush through the gate into the maze area.
A DOUBLE BONUS SOUND is used when the red creature is the first captured.
Another BONUS SOUND is heard when the 1000 POINT BONUS is awarded.
A beeping CREATURE SOUND that squeaks when a creature falls into a hole.
A SCORING SOUND accompanies the flashing score display after a creature is buried.
A SCREECH SOUND is used when your man is eaten by a creature.
A RELEASE SOUND is used when a creature leaves a hole.
A GAME-OVER BOOM is heard at the end of the game.

OPTIONS SELECT...

	DIP SWITCH # 1	DIP SWITCH # 2	No. of Men
UPRIGHT	off	off	3
	on	off	4
	off	on	5
	on	on	6

	DIP SWITCH # 1	DIP SWITCH # 2	No. of Men
COCKTAIL	off	off	5
	on	off	4
	off	on	3
	on	on	2

NEW GAME BOARDS AND NEW EPROMS...

The following chart shows the two kinds of logic boards Gremlin will use in future games. These will be either a SINGLE VIC board or a DUAL VIC board. Also shown are the possible combinations of Eprom types that Gremlin will be using. The 2 Eprom types are:

1) 2708 (holds 8K of memory)
2) 2716 (holds 16K of memory).

Obviously, the 2716 holds twice as much information as the 2708, **but the 2 Eproms are not directly compatible**—in other words, you have to replace a 2716 with another 2716, and a 2708 with another 2708. In addition, the 2716 Eprom socket is modified slightly to accept the 2716 Eprom. If it is ever necessary to replace a new Eprom, be sure to specify **2708** or **2716** . These numbers are printed on the Eprom package.

Logic Board Type	Possible Eprom Types Used	Where Used
SINGLE VIC board	1) All 2708's	HEAD-ON 1 HEAD-ON 2 Future games
	2) 2708's and one 2716 (used in combination)	INVINCO DEEP SCAN Future games

The two Eprom types are used since some game programs require a larger memory than that provided with a set of 2708's. Usually, one 2716 provides enough additional memory space to hold a longer program.

POWER SUPPLY MODIFICATIONS...

For VIC Logic Boards Only

In order to supply – 5 volts to the VIC logic board, it was necessary to modify the game power supply. The modification simply adds a 7905 – 5 volt regulator (Gremlin part #313-0023) to the power supply chassis; the 7905 is connected into the – 12 volt line at pin 11 of the power supply output connector. **PIN 17 OF THIS CONNECTOR NOW BECOMES THE – 5 VOLT OUTPUT.** The other pins remain the same:

pin 11 = – 12v
pin 12 = + 12v
pin 13 = 2-3 V AC signal
pins 14, 15, 16 = GROUND
pin 17 = – 5v
pins 18, 19, 20 = + 5v

Also, a 8900 ufd filter capacitor has been added to the power supply to provide better + 12 volt regulation.

TRANSFORMER VOLTAGE CONVERSION INSTRUCTIONS...

To convert the game transformer to 100, 115, or 230 VAC, refer to the following chart:

*For 100 volts: Connect the voltage INPUT lines to transformer terminals 1 and 2.

*For 115 volts: Connect the voltage INPUT lines to transformer terminals 1 and 3.

*For 230 volts: Connect the voltage INPUT lines to transformer terminals 1 and 4. The fluorescent lamp line must be connected to transformer terminal 3.

ALSO, THE TV MONITOR MUST BE CONVERTED TO THE SAME VOLTAGE INPUT AS THE GAME TRANSFORMER. REFER TO THE MONITOR MANUAL IN THE GAME.

MAINTENANCE PROCEDURES

SINGLE games

I. Power Supply (Refer to drawing #800-0072, sheet 4)

1. Remove output connectors from power supply.
2. Make these initial tests: (GND to BLACK lead on C18, 9000 ufd capacitor)
   a. +9 VDC on POSITIVE terminal of C18
   b. +17-19 V on C6 (4700 ufd cap.)
   c. -17-19 V on C5 (4700 ufd cap.)
   d. -12 V at output pin 11 (adjustable by trim pot R42)
   e. +12 V at output pin 12 (adjustable by trim pot R8)
   f. +5 V at output pins 18,19,20 (adjustable by trim pot R9)
   g. GND (ground, 0 V) at pins 14,15,16
   h. 2-3 V AC at pin 13 (Don't forget to change meter scale to AC)
   i. -5 V at pin 17
3. Check these voltages again with the logic board connected. If any are wrong, a loading condition exists in the logic board, most likely.

II. Logic Board

The following instructions will help you trace down and find most problems associated with the logic board. The procedures are listed by the more common kinds of problems that could arise. Read through all the steps first, then apply them one at a time. The necessary equipment are an oscilloscope and AC/DC voltmeter.

1. NO PICTURE; TV TUBE AND FLUORESCENT LAMP ARE OFF
   a. Plug the game in and check to see that it is receiving 115 (230) VAC. Measure 115 VAC at the input terminals of the game transformer. If it is not present here, proceed to next step.
   b. Check the fuse; if it is good, proceed to next step.
   c. Remove the cover of the junction box in back of the game. Measure 115 VAC on the output of the line filter. If it is not present, the line filter may be bad. Or, one of the AC line connections in the junction box may be loose. UNPLUG the game and re-check these connections.
   d. If the fluorescent lamp still does not operate, turn off game and on again. This usually re-starts the lamp. If it doesn't, turn the lamp in its socket; this will re-seat it for a better connection. Sometimes the lamp works loose during shipment.
   e. An ON/OFF switch for the TV monitor is located on the TV chassis, below the neck of the picture tube. Make sure it is ON.
2. NO PICTURE; TV TUBE AND FLUORESCENT LAMP ARE ON. SCREEN BLACK.
   a. First, make a quick check of the monitor-to-logic board connections: Are all wires making contact with the pin connector? Are the wires secure on the monitor plug-in connector?

b. Check to be sure U65 is seated in its socket properly, and that no pins are bent. This IC is a Prom that develops the necessary video timing sequences. Usually, if one pin on the chip is out of the circuit, the screen will appear black. Proceed to the next step if this chip is seated correctly.

c. Inspect the high-voltage lead coming off the monitor's high-voltage transformer. This lead attaches directly to the TV tube. Sometimes, during shipment, this wire is jostled out of contact with the transformer. Turn off the game, and carefully push the wire down toward the transformer to reseat it. Now, check to see if the picture comes on. If it doesn't, proceed to step d.

d. Using a voltmeter, measure the three voltages powering the logic board. These voltages are: +5v, -5v, +12v, and can be easily measured at the power supply-to-logic board connection. If all voltages are present, go to the next step.

e. Using an oscilloscope, test for clock signals at the points listed below. For the moment, don't worry about what each signal should look like. We're concerned with finding floating signals, and/or signals that are not present when they should be...and why they are not. The scope setting is .2v/div. @ 5usec with a 10:1 probe. All clock signals, except the video signal, are about 5 volts in amplitude.

* Check pins 8, 11 of U41. Look for a 1½ volt video signal. If not there, check pin 12 of U41. If it is there, U41 is probably bad.
* If the signal is not at pin 12 of U41, suspect U48, U42 and U32.
* Check the following IC's and pins for any floating, or missing signals:

U68 pin 6	U65 pins 1-7,9
U67 pin 5	U49 pins 2,6,10,15
U60 pins 11,12,13,14	U50 pins 2,7,10,14,15.

These chips make up thevideo timing circuit. Make sure there are no floating, or missing, signals on any of these chips. If there are, suspect the chip is bad.

3. PICTURE APPEARS: COLOR IS DISTORTED; SOME COLORS MISSING

Check the red, blue and green output signals on U42, pins 4,7, and 9, respectively. If no signals are present, suspect U67, U49, U43, U45, U44, U30 or U66.

4. INCOMPLETE PICTURE: RANDOM DISPLAY

Sometimes the game appears on the screen with parts of the picture showing incorrect information. For example, the "HI SCORE" listings display jumbled information, while the rest of the picture is normal. The most likely cause of this problem is one of the 8 RAM IC's U56 through U63. The quickest way to find the bad RAM is simply to replace each IC, one at a time, with aRAM that is known to be good. Be sure not to bend any pins when replacing the IC's. Also, don't overlook the possibility that one of the RAM sockets is bad.

5. RANDOM DISPLAY WHEN GAME IS TURNED ON

a. Activate the coin switch a few times to see if this clears the picture. If not, turn the game off, then on again. If the jumbled display still appears, proceed to step b.

b. Check the reset circuit on the logic board (Refer to the schematic). When power is first applied to the game, a reset circuit consisting of Q10, Q11, U55 and U71 is triggered on to reset the microprocessor. This reset signal forces the microprocessor to start at the beginning of the game program. If the microprocessor is not reset, it will still operate...it just won't operate on the right program instructions or data, and will continually display a jumbled pattern on the screen. So, begin by checking for a 3-4 VAC signal at pin 3 of the power supply-to-logic board connector. Follow the signal through Q10 where, at the collector, a sawtooth wave appears. Then, when power is first applied, observe pin 2 of U55 as capacitor C20 slowly discharges to about 3 volts. When this level is reached, U55 is triggered to change states, causing pin 3 to go high, then low. This change is inverted by U54 and, finally, reaches pin 26 of the Z80. Check pin 26 of the Z80 for a low-to-high signal change. If not present, one or more of the reset circuit components are bad. If it is present, proceed to step c.

c. The following lists some probable causes of the jumbled display pattern:
*one or more RAM's
*one of the Eproms, U1-8, U20-27

*the microprocessor, U53, is bad
*U33 or U34 (74LS245) is bad
*U19 is bad
*check the three operating voltages, +5v, -5v and +12v VDC.

6. GAME DOES NOT COIN UP

a. A common problem with a game that does not coin up is that the coin switch trip wire is out of adjustment. Usually, all that is necessary is to bend the trip wire up or down, depending on whethter a heavier or lighter tension is needed.

b. There may be a problem in the coin circuit on the logic board. Check U12, pins 3,11, for pulses each time the coin switch is tripped. Also, U11 and/or U12 may be bad. Suspect U45, also.

c. It is possible that one of the coin counter transistors, Q1 and Q2, is bad. Determine whether or not the counter advances each time the coin switch is tripped.

d. Don't overlook the possibility of an incorrect, or faulty, coin switch-to-logic board connection; sometimes, these wires work loose from the coin switches.

7. PLAYER CONTROLS NOT WORKING

a. Check first to be sure all control switch connections are secure. This includes checking the black wires, or ground leads.

b. If these connections are good, make sure the control panel leads are intact inside the Molex ™ connector to the logic board.

c. If the controls still do not work, suspect U1 on the logic board. However, U1 could be good but might not be receiving the activating pulses from U36, pin 13, or U4, pin 8.

8. GAME SOUNDS NOT HEARD

a. Check to be sure the sound board output lead is making good contact with the power supply/amplifier connector. Refer to the game wiring schematic.

b. If these connections are good, check the power supply/amplifier board for any audio signals. Specifically, check U4, Q8 and Q9 on the amplifier board for any game sounds.

c. If there are none there, suspect U16 on the logic board. Also, check U32 for the pulses that turn on U16.

d. If these chips appear good, the sound boards are probably bad. Refer to the sound board schematics for each sound's circuit.

RECOMMENDED SPARE PARTS for SINGLE games

GREMLIN PART NO.	WHERE USED	DESCRIPTION	QTY. PER 10 GAMES
130-0001	a	speaker	1
130-0002	a	speaker cover	1
200-0014	u	19" color monitor	1
200-0015	s	color monitor	1
200-0013	c	13" color monitor	1
253-0104	u	plexi, front monitor panel	1
390-0011	u	fluorescent lamp	2
220-0035	u	coin door lock & key	2
220-0097	s	cylinder lock }	2
117-0126	s	coin entry plate, USA	1
220-0066	u	coin mechanism, complete	2
800-0103	cs	coin mechanism, complete	2
220-0071	u	coin reject button & spring	3
240-0097	s	reject button assy.	3
220-0072	u	coin return stop (u-bolt)	3
800-0076	a	photo-coin accumulator assy.	1
270-0008	a	coin counter	1
510-0014		slide switch	1
220-0148	s	cash box	1
	u	cash box	1
601-0546	s	tv mask	1
601-0032	s	color mask	1
103-0043	c	leg arm	1
601-0504	c	leg	1
104-0005	c	handle	1
504-0118	cs	switch, micro (joystick)	5
109-0032	cs	handle ball, black	3
109-0033	cs	handle ball, red	3
509-0048	cs	switch (l-r)	5
509-0052	cs	switch (fr/acc)	5
240-0107	c	push button, acc.	1
510-0041	u	switch, joystick	5
510-0023	u	push button mounting/contacts	3
240-0009	u	yellow push button plunger	3
240-0109	u	orange push button plunger	3
240-0105	s	pushbutton switch	3
240-0106	s	push button knob	3
509-0119	s	push button, red	3
800-0056	u	complete joystick	2
240-0091	u	joystick knob	3
250-0289	u	threaded rod	3
250-0291	u	upper sleeve	3
601-0158	cs	switching regulator	1
560-0052	c	power transformer	1
560-0053	s	power transformer	1
270-0001	u	line filter, junction box	1
514-0001	a	fuse, 2A slo	5

a = all versions
u = upright
c = cocktail
s = slimline

600-0001	a	ac power cord	1
800-0072	a	dual power supply	1
482-0013	a	xstr TIP 110	5
482-0014	a	2N4401	10
482-0015	a	xstr TIP 115	5
482-0016	a	xstr TIP 29	5
313-0001	a	LM 723 DIP	5
313-0004	a	LM 741 DIP	5
315-0019	a	2708 EPROM, blank specify number on EPROM	1 set
315-0050	a	2716 EPROM, blank specify number on EPROM	1 set
316-0507	a	color prom DIGGER	1
314-0001	a	555IC	5
314-0093	a	74 LS 374 IC	3
314-0099	a	74 LS 245 IC	3
314-0104	a	74 LS 138 IC	3
314-0105	a	74 LS 253 IC	3
315-0031	a	Z80 microprocessor	2
315-0039	a	RAM IC	10
315-0042	a	video interface chip (VIC)	3
316-0206	a	video timing prom	3
475-0002	a	resistor pack	3
482-0010	a	PE 8050 transistor	3
510-0043	a	6-position DIP switch	2
314-0042	a	7406 IC	5
481-0006	a	1N914 diode	10
481-0008	a	1N5231 Zener diode	10
482-0006	a	2N4403 transistor	10
482-0023	a	2N4093 transistor	10
312-0145	a	CMOS 4006 IC	2
312-0146	a	CMOS 4070 IC	2
312-0069	a	LM3900	2
312-0147	a	94560 IC	2

Gremlin/SEGA San Diego, California 92123	PARTS LIST	TITLE TOP ASSEMBLY DIGGER UPRIGHT ENGLISH, WHITE	700-0019 DWG NO	SH 1 OF 5	A REV
USE WITH 800-3070 FOR PARTS LOCATIONS.		DRAWN MAHONEY	ENGR		
		CHECK A. AMBROSE 6-2-80	APPR		

LTR	DATE	REVISION DESCRIPTION	DRAFT	CHECK	APPR
A	6-9-80	RELEASED	J.M.	AFA	AFA
		REFER TO HEXAGON CALL-OUTS ON DRAWINGS FOR THE LOCATION OF PARTS LISTED HERE.			

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE TOP ASSEMBLY DIGGER UPRIGHT ENGLISH, WHITE	700-0019 DWG NO	SH 2 OF 5	A REV

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	REF DES
1	800-3070	1	ASSY BASIC KIT DIGGER	
2	800-3066	1	ASSY VIC LOGIC DIGGER ENG	
3	140-0048	1	CABINET BASIC WHITE	
4	420-0490	1	GRAPHIC SIDE RIGHT	
5	420-0489	1	GRAPHIC SIDE LEFT	
6	800-0122	1	ASSY SHIPPING KIT	

Gremlin/SEGA San Diego, California 92123	PARTS LIST	TITLE ASSY DIGGER COCKTAIL ENGLISH	700-0015 DWG NO	SH 1 OF 8	A REV
SHEET 5 THRU 7 IS "D" SIZE SHT 8 IS "C" SIZE.		DRAWN SON DUONG	ENGR		
		CHECK A. AMBROSE 6-9-80	APPR		

LTR	DATE	REVISION DESCRIPTION	DRAFT	CHECK	APPR
A	4-23-80	RELEASED	SD	AFA	AFA

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE ASSY, DIGGER COCKTAIL ENGLISH	700-0015 DWG NO	SH 2 OF 8	A REV

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	REF DES
1	420-0446	2	TABLE GRAPHIC	
2	420-0370	1	DECAL COIN ENTRY	
3	420-0371	1	DECAL COIN INFO	
4	253-0163	1	PLAYER SELECT PANEL	
5	253-0164	2	CONTROL PANEL GRAPHIC	
6	252-0082	2	BLOCK, STANDOFF	
7	560-0051	1	TRANSFORMER, ISOLATION	
8	800-0072	1	ASSY POWER SUPPLY	
9	800-3043	1	ASSY HARN SOUND DIGGER	
10	800-3033	1	ASSY DIGGER SOUND BD	
11	800-0103	1	COIN MECH (MODIFIED)	
12				
13	834-0010	1	ASSY SPCL DL JAPAN	
14	800-3056	1	ASSY POWER HARNESS	
15	800-3044	1	ASSY HARN CONT PANEL #1	
16	800-3045	1	ASSY HARN CONT PANEL #2	
17				
18	370-0002	1	TIL 139 OPTO ISOLATOR	
19	800-3049	1	ASSY PHOTO COIN CALC MOUNT	
20	280-0005	10	CABLE TIE	
21	800-3051	1	ASSY HARN VIDEO	
22	800-3048	1	ASSY LOGIC DIGGER ENG	
23	280-0064	2	SPACER 3/8" LNG PVC	
24	800-3055	1	ASSY GROUND CABLE	
25	420-0453	1	MANUAL DIGGER	

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE ASSY DIGGER COCKTAIL ENGLISH	700-0015 DWG NO	SH 3 OF 8	A REV

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	REF DES
26	800-0076	1	PHTO CN CALC BOARD	
27	800-3054	1	ASSY SPEAKER HARN	
28	211-0045	1	CONN PLUG AMP 6 PIN	
29	211-0042	5	CONN SOCKET AMP	
30	250-0412	1	PS LOCKING BRACKET	
31	800-3064	1	ASSY VOL CONTROL BLOCK	
32	270-0001	1	EMI FILTER	
33	800-3026	1	ASSY FUSE BLOCK	
34	211-0038	2	CONN QUICK 3/16"	
35		8	SCREW PHL.PN HD 6 X1/2 SH MTL	
36	250-0048	1	CLIP SWITCH	
37		1	PNHD SCREW 4-40, 1/2"	
38		2	#4 WASHER FLAT	
39		1	#4 WASHER SPLIT	
40		1	#4-40 NUT	
41		10	#6 PHL 3/4" PAN SHT METAL	
42		4	#8 FLAT WASHER	
43		2	#6-32 X 1/4 FLT HD PHL SCREW	
44		2	#10 X1/2" PHLPS RND HD SCREW	
45		4	#8 x 1/2" PAN SHT METAL	
46	252-0083	3	SUPPORT BLOCK POWER SUPPLY	
47		6	#10 X 1 1/4" PHLPS FLT HD SCREW	
48	280 0075	4	NUT WIRE LARGE	
49	280 0010	7	NUT WIRE SMALL	
50		2	#10 x 3/8" PN HD SH MTL SCREW	

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE ASSY DIGGER COCKTAIL ENGLISH	700 - 0015 DWG NO	SH 4 OF 8	A REV

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	REF DES
51	800 - 3086	1	ASSY HARNESS SOUND INVINCO	
52	834 - 0007	1	ASSY SOUND BOARD INVINCO	

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE ASSEMBLY BASIC COIN MECH - DUAL	800-0074 DWG NO	SH 1 OF 3	A REV
SHEET 3 IS "D" SIZE		DRAWN Ron Hawtree CHECK	ENGR APPR		

LTR	DATE	REVISION DESCRIPTION	DRAFT	CHECK	APPR
A	1-24-80	RELEASED			

FORM NO. 001-1500

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE ASSEMBLY BASIC COIN MECH – DUAL	800-0074 DWG NO	SH 2 OF 3	A REV

ITEM NO	PART NO	QTY PER ASSY					DESCRIPTION	REF DES
1	250-0285	1					CASH DOOR MODIFIED	
2	220-0066	2					COIN MECHANISM	
3	220-0095	1					LOCK FORT LOCK IR	
4	370-0002	2					OPTO-ISOLATOR TIL139	
5	800-0085	1					ASSY. PHOTO CALCULATOR	
6	240-0001	1					KNOB, VOL. CONTROL	
7	250-0068	1					BRACKET	
8	420-X046	1					DECAL, VOLUME CONTROL	
9	475-0007	1					POTENTIOMETER 10KΩ CAR. PNL MT.	
10	510-0014	1					SWITCH, SLIDE, SPDT	
11		8					SCREW 8-32 x ½" TAMPER-PROOF	
12		2					SCREW, MACH. P.H. PHL 4-40 x ½"	
13		4					SCREW, SHT. MTL. P.H. PHL. #6	
14		2					SCREW, MACH. P.H. PHL 6-32 x ½"	
15		2					WASHER, FLAT #6	
16		2					WASHER, LOCK SPLIT #6	
17		2					WASHER, LOCK #4	
18		8					WASHER. LOCK SPLIT #8	
19		8					NUT HEX 8-32	
20		2					NUT HEX 6-32	
21		2					NUT HEX 4-40	
22		4					ALUMINUM RIVETS 1/8"	
23	510-0051	1					SWITCH PUSH BUTTON SLIDE	
24		2					WASHER, FLAT #4	

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE ASSY PHOTO COIN CALC	830-0076 DWG NO	SH 1 OF 5	B REV
SHT 4 & 5 ARE 'C' SIZE		DRAWN Wyman 11-29-79	ENGR		
		CHECK	APPR		

LTR	DATE	REVISION DESCRIPTION	DRAFT	CHECK	APPR
A	12-14-79	RELEASED	WJB	12-18-79	
B	1-2-80	PER ECN 366	WJB	1-14-80	

FORM NO. 001-1500

Gremlin Industries, Inc.	PARTS LIST	TITLE ASSY PHOTO COIN CALC.	800-0076 DWG NO	SH 2 OF 5	B REV

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	REF DES
1	151-0008	1	CAP CER .001µf 50V	C9
2	151-0011	5	CAP CER .01µf 50V	C1,C3,C5,C7,C8
3	153-0001	1	CAP TANT 10µf 25V	C6
4	152-0001	1	CAP FILM .1µf 100V	C4
5	153-0003	1	CAP TANT 2.2µf 25V	C2
6	170-0179	1	P C BOARD	
7				
8	314-0001	3	I C NE555 DIP	U1,U5,U7
9	314-0062	1	I C 74LS74	U2
10	314-0074	2	I C 74LS191	U3,U6
11	314-0078	1	I C 74LS02	U4
12	471-0103	1	RES 10K OHM 1/2W 5%	R9
13	471-0102	3	RES 1K OHM 1/2W 5%	R3,R6,R8
14	471-0105	2	RES 1MEG OHM 1/2W 5%	R1,R12
15	471-0221	1	RES 220 OHM 1/2W 5%	R7
16	471-0331	2	RES 330 OHM 1/2W 5%	R2,R5
17	471-0334	1	RES 330K OHM 1/2W 5%	R4
18	471-0820	2	RES 82 OHM 1/2W 5%	R10,R11

Gremlin Industries, Inc.
San Diego, California 92123

LIST | PHOTO COIN CALC | 500-0016 DWG NO | SH 3 OF 5 | B REV

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	REF DES
19	481-0001	2	DIODE IN4002	D1, D3
20	481-0006	1	DIODE IN914/IN4148	D2
21	482-0010	1	XSTR PE8050	Q2
22	482-0014	2	XSTR 2N4401	Q1, Q3
23	511-0004	2	SW MINIATURE	SW1, SW2

FORM NO. 001-1501

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE P C. ASSY POWER SUPPLY DUAL	800-0073 DWG NO	SH 1 OF 4	B REV
SHT 4 IS "C" SIZE		DRAWN Wynema 11-27-79	ENGR		
		CHECK Steven J. Fay 12-3-79	APPR		

LTR	DATE	REVISION DESCRIPTION	DRAFT	CHECK	APPR
A	12-3-79	RELEASED	WJB	SJF	SJF
B	1-4-80	PER ECN 367 1-7-80	WJB	SJF	SJF

FORM NO 001-1500

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	PC ASSY POWER SUPPLY DUAL	800-0073 DWG NO	SH 2 OF 4	B REV

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	REF DES
1	150-0019	2	CAP E 4700 µf 25 V	C5, C6
2	151-0001	1	CAP CER .05 µf 50V	C11
3	151-0002	2	CAP CER 100 pf 50V	C17, C19
4	151-0008	1	CAP CER .001 µf 50V	C10
5	151-0011	3	CAP CER .01 µf 50V	C12, C14, C16
6	151-0012	1	CAP CER .1 µf 50V	C3
7	153-0001	6	CAP TANT 10 µf 25V	C1, C2, C7, C13, C15, C20
8	170-0082	1	PCB POWER SUPPLY	
9	211-0056	3	CONN CRIMP	
10	212-0004	2	CONN M 4 PIN	
11	212-0021	2	CONN M 10 PIN	
12	212-0085	1	CONN 3 CIR XSTR	
13	313-0001	1	IC LM723	U3
14	313-0004	3	IC LM741EN	U1, U2, U4
15	471-0101	1	RES 100 OHM 1/2 W 5%	R15
16	471-0102	10	RES 1K OHM 1/2 W 5%	R5, 17, 20, 22-24, 35, 36, 38, 39
17	471-0103	4	RES 10K OHM 1/2 W 5%	R1, R4, R21, R37
18	471-0104	1	RES 100K OHM 1/2 W 5%	R33
19	471-0122	1	RES 1.2K OHM 1/2 W 5%	R18
20	471-0133	1	RES 13K OHM 1/2 W 5%	R41
21	471-0152	2	RES 1.5K OHM 1/2 W 5%	R13, R16

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE PC ASSY POWER SUPPLY DUAL	800-0073 DWG NO	SH 3 OF 4	B REV

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	REF DES
22	471-0272	5	RES 2.7K OHM 1/2W 5%	R7,R25,R26,R43,R46
23	471-0332	1	RES 3.3K OHM 1/2W 5%	R32
24	471-0471	2	RES 470 OHM 1/2W 5%	R34,R40
25	471-0473	1	RES 47K OHM 1/2W 5%	R44
26	471-0562	1	RES 5.6K OHM 1/2W 5%	R12
27	472-00R5	4	RES 0.5 OHM 1W 5%	R4, R29-R31
28	473-00R1	1	RES 0.1 OHM 5W 5%	R28
29	475-0004	1	POT 1K CAR PCMTV	R9
30	475-0005	2	POT 2K CAR PCMTV	R8, R42
31	481-0004	4	DIODE MR501	D1-D4
32	481-0006	2	DIODE IN914	D7, D8
33	481-0008	1	DIODE ZENER IN5231	D10
34	482-0006	3	XSTR 2N4403	Q1, Q3, Q4
35	482-0013	1	XSTR TIP110	Q6
36	482-0014	2	XSTR 2N4401	Q2, Q5
37	482-0015	1	XSTR TIP115	Q7
38	482-0016	2	XSTR TIP29	Q8, Q9
39	800-0072	REF	SCHEMATIC	

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE ASSY POWER SUPPLY DUAL	800-0072 DWG NO	SH 1 OF 4	D REV
SHT 3 IS 'D' SIZE SHT 4 IS 'C' SIZE		DRAWN [illegible] 11-30-79	ENGR		
		CHECK Steve J. Fay 12-3-79	APPR		

LTR	DATE	REVISION DESCRIPTION	DRAFT	CHECK	APPR
A	12-3-79	RELEASED	WJB	[signature]	[signature]
B	1-4-80	PER ECN 367 1-7-80	WJB	[signature]	[signature]
C	4-21-80	CHG'D PER ECN 390 4-21-80	SB	[signature]	[signature]
D	6-6-80	CHG'D PER ECN 414 AND 414 A	SD	[signature]	[signature]

FORM NO. 001-1500

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE ASSY POWER SUPPLY DUAL	800-0072 DWG NO	SH 2 OF 4	D REV

ITEM NO	PART NO	QTY PER ASSY					DESCRIPTION	REF DES
1	140-0015	1					CHASSIS, POWER SUPPLY	
2	150-0022	2					CAP E 9000 µf 12V	C18, C21
3	211-0005	9					CONN CRIMP LOCK	
4	211-0007	1					CONN KEY, POLARIZING	
5	211-0017	4					CONN QUICK, 1/4" FEM	
6	211-0019	5					CONN SPADE LUG 1/4"	
7	212-0016	1					CONN FEM 10 PIN	
8	213-0006	1					SOCKET, TO-3	
9	280-0014	4					STAND-OFF, CLIPS	
10	280-0056	2					CLAMP CAP VR4 1 1/2"	
11	313-0023	1					IC 320-T5	U5
12	481-0009	1					DIODE MDA 3500	D9
13	482-0007	1					XISTOR 2N3055	Q10
14	800-0072	REF					SCHEM. ASSY PWR. SUPP.	
15	800-0073	1					POWER SUPPLY ASSY (PCB)	
25		3					WASHER FLAT #10	
16		8					SCREW-MACH P HD #6-32 X .5	
17		7					NUT HEX #6-32	
18		5					SCREW-MACH RD HD #4-40 X .37	
19		5					NUT HEX #4-40	
20		4					RIVET POP 3/16	
21		4					SCR #6 X 1/2 SHT METAL	
22		1					SCR MACH P HD #6-32 X 1"	
23	280-0117	2					TAB RIVET	
24	560-0003	1					TRANSFORMER POWER 10345B	T1

Precision Industries, Inc.
San Diego, California 92112

LIST | ASSY BASIC V.I.C.BD. | 800-0031 DWG NO | SH 3 OF 8 | E REV

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	REF DES
26	314-0015	1	IC 7404	U54
27	314-0018	3	IC 74LS00	U4, U12, U32
28	314-0019	2	IC 74LS04	U35, U64
29	314-0040	3	IC 74LS125	U13, U46, U47
30	314-0046	1	IC 74S04	U68
31	314-0073	3	IC 74LS175	U45, U49, U50
32	314-0055	3	IC 74LS244	U1, U3, U19
33	314-0058	5	IC 74LS08	U 37-39, 41, 71
34	314-0059	1	IC 74LS10	U52
35	314-0061	1	IC 74LS42	U40
36	314-0062	4	IC 74LS74	U11, U31, U67, U72
37	314-0078	1	IC 74LS02	U36
38	314-0092	2	IC 8216	U33, U34
39	315-0039	8	IC 4K RAM 12V	U56-U63
40	315-0031	1	IC Z80 MK 3880	U53
41	314-0086	1	IC 74LS163	U66
42	314-0093	2	IC 74LS374	U16, U28
43				
44	316-0206	1	IC PROM 32X8 CTL	U65
45				
46	340-0003	1	LED RED	D4
47	471-0220	3	RES 22 OHM 5%	R26-28
48	471-0011	5	RES 10 OHM 1/2 W 5%	R50-53, R29
49	471-0102	10	RES 1K OHM 1/2 W 5%	R7-11, 32, 37, 56-58
50	471-0103	1	RES 10K OHM 1/2 W 5%	R6

Cromemco Industries, Inc. San Diego, California 92122	PARTS LIST	TITLE ASSY BASIC V.I.C. BD.	800-0031 DWG NO	SH 1 OF 8	E REV
SHT 5,6,7,8 "D" SIZE		DRAWN Wynema 11-20-78	ENGR		
		CHECK Steven L. Fay 12-22-78	APPR		

LTR	DATE	REVISION DESCRIPTION	DRAFT	CHECK	APPR
A	12-22-79	RELEASED	WJB		
B	5-10-79	CHG'D PER ECN 310	SB		
C	7-5-79	CHG'D PER ECN 318 & 321 8-8-79	WJB		
—	9-4-79	CHG'D RES. FROM 22K TO 18K, ITEM #53 (ECN 326)	SB		
D	11-13-79	CHG'D PER ECN 354 U3 & RP2 ADDED FOR OPTION	WJB		
E	4-30-80	CHG'D PER ECN 394	SD		

FORM NO 001-1500

...lin Industries, Inc.
...n Diego, California 92123

LIST | ASSY BASIC V.C.O.D. | 800-0[illegible]31 DWG NO | SH 2 OF 8 | E REV

PART NO	QTY PER ASSY	DESCRIPTION	REF DES
...1-0005	1	CAP CER 680 pf 50V	C39
...1-0012	54	CAP CER .1 μf 50V	C3,5,7-11,13-17,22,25, C27-38, C40-67
...2-0001	1	CAP FILM .1 μf 100V	C4
...2-0017	1	CAP FILM .33μf 100V	C24
...3-0001	6	CAP TANT 10 μf 25V	C12,20,21,23,26,68
...3-0002	1	CAP TANT 1μf 25V	C19
...1-0011	2	CAP CER .01μf 50V	C69,C70
70-0150	1	PCB C.V. BASIC	
...1-0004	7	CONN PIN TEST PT	TP1 - TP4, GND
...2-0063	4	CONN M 4 PIN PLZD	
...2-0021	7	CONN M 10 PIN	
...2-0031	2	CONN M 12 PIN	
...3-0003	5	SKT 14 PIN DIP	XU14,30,69,70,29
...3-0001	8	SKT 24 PIN DUAL INLN	XU20-XU27
...3-0004	20	SKT 16 PIN DUAL INLN	XRP2,XU5-8,33,34,44,49, XU56-63,65,66,50
...3-0005	2	SKT 40 PIN DUAL INLN	XU43,XU53
...3-0008	7	SKT 20 PIN DUAL INLN	XU1-3,15,16,19,28
...3-0011	2	SKT 22 PIN DUAL INLN	XU17, XU18
...3-0010	1	SKT 8 PIN DIP	XU9
...0-0009	1	XTAL CLK 15.4684m	Y1
...3-0023	1	IC 320T-5.0	U73
...4-0001	2	IC NE555	U10, U55

...1501

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE ASSEMBLY DIGGER SOUND	800-3033 DWG NO	SH 4 OF 6	A REV

ITEM NO	PART NO	QTY PER ASSY	DESCRIPTION	REF DES
44	471-0223	1	RES 22K OHM 1/2W 5%	R1
45	471-0334	1	RES 330K OHM 1/2W 5%	R5

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED W38	4-14-80	

PLAYER ONE

PLAYER TWO

FREE PLAY

COIN COUNTER

PHOTO SENSOR

PHOTO CALCULATOR

2 XFMR. OPTIONS

100V

110V

220V

HARNESS 800-3044

HARNESS 800-3045

HARNESS 800-3050

P1

P2

+5

NO C NC

DEGAUSING COIL

THERMISTER

HARNESS 800-3051

COLOR VIDEO

VIDEO

C.V. LOGIC BOARD

HARNESS 800-3043

DIGGER SOUND

HARNESS 800-3086

INV SOUND

SEGA MONITOR

SYNC

GND

RED

BLUE

GREEN

PRI BLK

SEC YEL

BLK/RED 115 AC

BLK/WHT 230AC

RED / YEL 100 V

RED 115 V

ISOLATION XFMR 560-0051

SMOOTH SIDE

GND EMI FILTER

+5 +5 +5 GND GND AC 12 -12

HARNESS 800-3056

POWER SUPPLY

XFMR 2

P/O HARNESS 800-3043

HARNESS 800-3054

SPEAKER

VOLUME CONTROL

4.7K

4.7K

INPUT

P/O HARNESS 800-3043

1 TRUTH TABLE OPTIONS

SWITCH 2	SWITCH 1	# OF MEN
OFF	OFF	5
OFF	ON	4
ON	OFF	3
ON	ON	2

WIRING DIAGRAM

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

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

NEXT ASSY | USED ON

APPLICATION

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN Wyxema	3-27-80
CHECKED A. AMBROSE	6-9-80
T.J. Liskowiak	

Gremlin Industries, Inc.
San Diego, California 92123

ASSY DIGGER COCKTAIL ENGLISH

SIZE	CODE IDENT NO.	DRAWING NO.	REV
D		700-0015	A

SCALE NONE | SHEET 7 OF 8

700-0015 A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED	J.M. 4/7/80	

1 PLAYER
2 PLAYER
S1 FILL
S2 DIS
S3
S4
S5
UP
DN
LEFT
RIGHT
A
B
C
D
BLK
RED
YEL
ORN
GRY
VIO
BLU
BRN
GRN
WHT
PHOTOCALCULATOR #1
PHOTOCALCULATOR #2
JUMPER BOARD
OPTIONAL ASSEMBLY
TO JUNCTION BOX GROUND
REF HARNESS 800-0086
GND
TO PHOTO SENSOR #1
TO PHOTO SENSOR #2
+5
+5V
FREE PLAY SWITCH
NC
NO
COM
REF HARNESS 800-3069
P1
CONN COUNTER
COIN DOOR
SOUND OUT
AUX OUT 1
HARNESS 800-3067
DIGGER SOUND
INV. SOUND
VIC LOGIC
250-0430 GROUND STRAP
COLOR VIDEO
HARNESS 800-0117
560-0051
(ZONE C-1)
(22) (6)
ELECTRO HOME 607-901
LINE
LINE
LAMP
ZIP CORD
JUNCTION BOX
INTER LOCK
FUSE
EMI
L1
POWER
HARNESS 822-0007
HARNESS 800-0119
HARNESS 800-0120
TRANSFORMER
GAME POWER SUPPLY
ZIP CORD
HARNESS 800-3091
SPEAKER
P/O HARNESS 800-3067
INPUT
4.7K
VOLUME CONTROL
CW
HARNESS 830-0005

SW #1	SW #2	NO. OF MEN
OFF	OFF	3
ON	OFF	4
OFF	ON	5
ON	ON	6

TRUTH TABLE OPTIONS

TRANSFORMER OPTIONS
180V
110V
220V

NOTES:

NOTES CONTINUED:
(3) OPTIONAL TRANSFORMER P/N 560-0046

115 VAC
230 VAC
BLK/RED
BLK
BLK/YEL
BLK/GRN
ISOLATION XFMR P/N 560-0046
RED

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

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±
MATERIAL
FINISH
NEXT ASSY | USED ON
APPLICATION
DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN MAHONEY	4-14-80
CHECKED A. AMBROSE	6-2-80

Gremlin Industries, Inc.
San Diego, California 92123

WIRING DIAGRAM
DIGGER
UPRIGHT

SIZE	CODE IDENT NO.	DRAWING NO	REV
D		700-0019	A

SCALE NONE | SHEET 5 OF 5

700-0019 A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED	5-7-80	

SQUEAK 8 — Q5 — R17 10K — R61 100K — R60 750K — U9 4011 — U5 4069 — C12 .47µf FILM — R56 47K — R20 56K — D4 — R6 2.7 MEG — D2 — C3 .1µf FILM — U1 348 — R22 47K — D5 — C4 .0047µf FILM — U1 348 — D3 — R2 100K — R1 22K — U1 348 — C1 .1µf — 10

R59 750K — U9 4011 — U5 4069 — C13 1µf TANT

Q6 — Q7 — R21 10K — R37 1K — R38 5.1K — U5 4069 — U5 4069 — R39 1 MEG — R40 470K — R23 750K

ESCAPE 4 — Q3 — R13 10K — R14 100K — R27 750K — U2 4011 — U3 4069 — R57 4.7K — D10 — R58 5.1K — C5 .01µf FILM — U4 348 — D11 — R41 2.2 MEG — C7 2.2µf TANT — R18 220K — D1

C11 .047µf FILM — U4 348 — R48 2 MEG — R33 1 MEG — R47 680K — U3 4069 — R32 1 MEG — R56 150K — D12 — C15 .0047µf FILM — U4 348 — Q10 — Q11 — R64 10K — R63 1K — R53 5.1K — U6 4069 — R62 1 MEG — D7 — R3 100K — D6 — R4 100K — R52 750K — R29 750K — R51 390K — R31 1 MEG — U3 4069 — R46 5.1K — R34 82K — C6 .0047µf FILM — U4 348 — D8 — Q9 — Q8 — R55 1K — R54 10K — U8 4069 — R67 1 MEG — C17 .1µf FILM — D16 — R42 750K — U5 4069 — R35 1 MEG — C8 680pf — R19 270K — R5 330K — R66 56K

SCORE 2 — Q1 — R9 10K — R10 100K — R26 750K — U2 4011 — U6 4069 — C18 .05µf — D13 — R50 100Ω

SPECIAL SCORE 3 — Q2 — R11 10K — R12 100K — R24 750K — U2 4011 — U6 4069 — C9 .05µf — D9 — R44 100Ω

C14 6.8µf TANT — R30 390K — C10 6.8µf TANT

CATCH 5 — R8 2.7K — R7 1K — C2 .1µf — D14 — R16 47K — D15 — Q4 — R15 10K — U8 4069 — R65 10K — C16 .047µf FILM — R68 10K

1 — C20 10µf — C19 .1µf — +12
6 — C21 10µf — C22 .1µf — GND, -12
9
7 — N.C.

U9 4011 — U8 4069 — U9 4011 — U8 4069

U7 NM 5837 — +12, -12

2. ALL TRANSISTORS ARE 2N4401
1. ALL DIODES ARE IN914

NOTES:

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

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± — DECIMALS .XX ± .XXX ± — ANGLES ±

CONTRACT NO.

APPROVALS	DATE
DRAWN	2-28-80
CHECKED	4/4/80

MATERIAL

FINISH

DO NOT SCALE DRAWING

NEXT ASSY — USED ON — APPLICATION

Gremlin Industries, Inc.
San Diego, California 92123

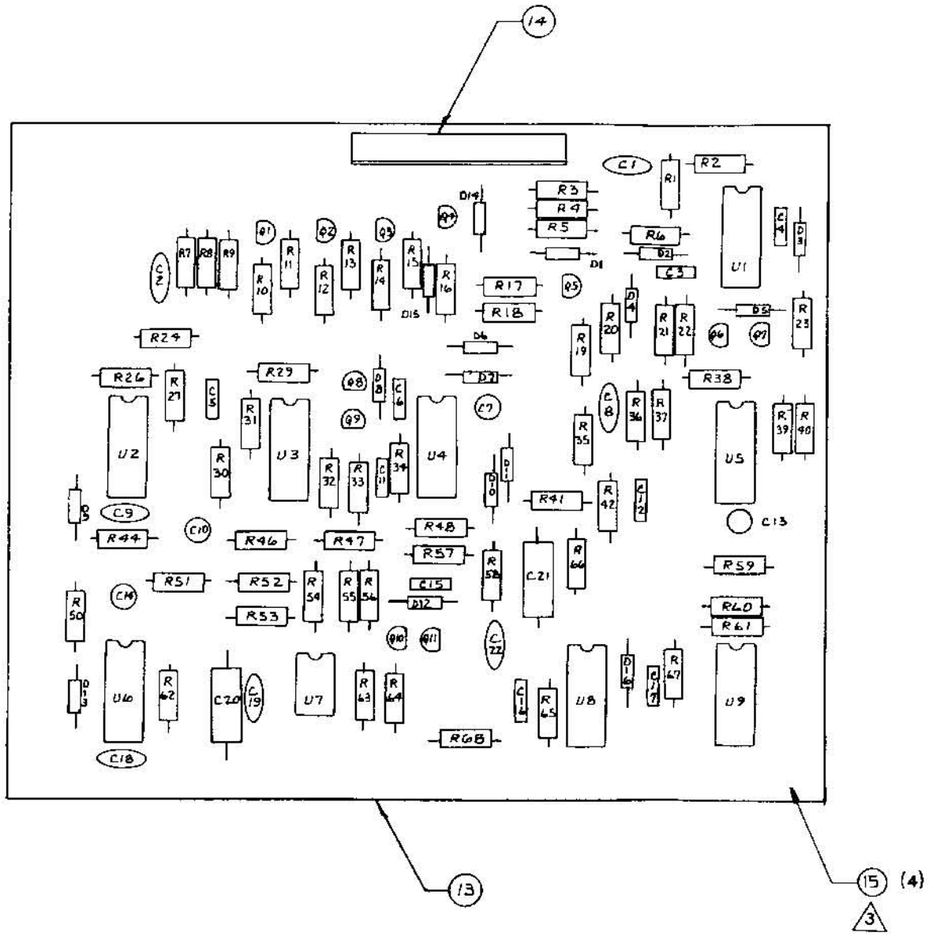
SCHEMATIC — DIGGER SOUND BD.

SIZE	CODE IDENT NO.	DRAWING NO.	REV
D		800-3033	A

SCALE NONE — SHEET 6 OF 6

800-3033 A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED WJB	9-15-80	



SEE DETACHED PARTS LIST

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

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN	3-26-80
CHECKED	4/14/80

Gremlin Industries, Inc.
San Diego, California 92123

ASSEMBLY — DIGGER SOUND

SIZE	CODE IDENT NO.	DRAWING NO	REV
D		800-3033	A

SCALE 2/1 SHEET 5 OF 6

NEXT ASSY	USED ON
APPLICATION	

800-3033 A

△3 INSTALL FROM CIRCUIT SIDE.
2. LAST USED: C22, U9, R68, D16, Q11
1. R25 R28 R43 R45 R49 NOT USED
NOTES:

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

R1 RZ5 2.2K +5V
R2 RZ4 2.2K +5V
R3 RZ3 2.2K +5V
R4 RZ2 2.2K +5V
R5 RZ1 2.2K +5V
R6 RZ0 2.2K +5V
R7 R19 2.2K +5V
R8 R18 2.2K +5V

U27 2708
U26 2708
U25 2708
U24 2708
U23 2708
U22 2708
U21 2708
U20 2708

+5V
-5V
+5V
A10
+12V
A9
A8
A7
A6
A5
A4
A3
A2
A1
AØ
RP3

U19 74LS244
D7
D6
D5
D4
D3
D2
D1
DØ
ROMRD

COIN DOOR
REF
N.O.
N.C.
COIN SWITCH
R60 330Ω
R59 330Ω
R8 1K
R9 1K
R11 1K
R10 1K
C10 .01μf
U12 74LS00
U13 74LS125
U11 74LS74
R7 1K
Q1 2N4401
R57 220Ω
D1 IN914
Q2 PE8050
D6 IN914
U54 PIN6
R6 10K
COIN CTR
REF
C5 .1μf
COIN START
D2 IN914
SET R4 FOR 4MS SQ AT PIN 7
R3 18K
R4 10K
C4 .1μf FILM
U10 555
R5 4.7K
C3 .1μf
U13
DØ
74LS125
INPUT
A5
U4 74LS00
74LS00
OUTPUT
AØ
U12
74LS00
D7
74LS125

PINS	18	19	20	21	SOCKETS USED	JUMPERS (SHT 4)
2708	GND	+12	RN	-5	ALL	E1-E2, E3-E4, E5-E6
TMS2716	RN	+12	A10	-5	ALL	E1-E4, E3-E6, E5-E7
2716	RN	A10	RN	+5	ALL	E1-E4, E3-E6, E5-E7
2732	RN	A10	RN	A11	U27, U25, U23, U21	E1-GND, E3-E6, E5-E7
32K ROM	A11	A10	RN	GND	U27, U25, U23, U21	E1-GND, E3-E6, E5-E7
1 TMS2716 / 7 2708'S	R1 / GND	+12	A13 / RN	-5	U27 / U26, 25, 24, 23, 22, 21, 20	E1-E2, E3-E4, E5-E6

NEXT ASSY	USED ON
826-0004	
822-0011	
822-0001	
814-0019	
APPLICATION	

NOTES:
3. CUT ETCH TO PIN 9 OF SOUND OUT CONNECTOR. JUMPER PIN 9 TO +5V FOR 829-0001 ONLY.
4. CUT ETCH BETWEEN U11-5 & U13-5 JUMPER BETWEEN U13-5 & U48-17 FOR 826-0004 ONLY

74LS00
AØ
A1
A2
U4
IN1
IN2
IN4
INPUT

74LS00
OUTPUT
A4
U14
74LS374
U15
D7 D6 D5 D4 D3 D2 D1 DØ
+5V
R53 10Ω
B 7 6 5 4 3 2 1 9 10

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

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±
MATERIAL
FINISH
DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN	1-31-79
CHECKED	2-7-79

Gremlin Industries, Inc.
San Diego, California 92123

SCHEMATIC — COMPLETE CV LOGIC

SIZE D | CODE IDENT NO. | DRAWING NO. 800-0031 | REV E
SCALE NONE | SHEET 8 OF 8

800-0031 E

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

NOTES:

1. CUT ETCH AT JUMPER FROM U44 PIN 14 TO GND. ADD R54 FOR 822-0001 & 822-0011 ONLY.
2. CUT ETCH AT JUMPER FROM U44 PIN 13 & 14 TO GND. FOR ASSY'S 822-0001 & 830-0001 ADD JUMPERS FROM U44 PINS 13 & 14 TO C0 & C1.

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
		826-0004	
		822-0011	
		822-0001	
		814-0019	

PARTS LIST

NEXT ASSY | USED ON | APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS ±, DECIMALS .XX ±, .XXX ±, ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN	2-5-79
CHECKED	2-7-79

Gremlin Industries, Inc.
San Diego, California 92126

SCHEMATIC
COMPLETE C.V. LOGIC

SIZE	CODE IDENT NO.	DRAWING NO.	REV
D		800-0031	E

SCALE NONE | SHEET 7 OF 8

800-0031 E

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

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

B26-0004	
B22-0011	
B22-0001	
B14-0019	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN Wynema	2-6-79
CHECKED Jim Fay	2-7-79

Cromlin Industries, Inc.
San Diego, California 92123

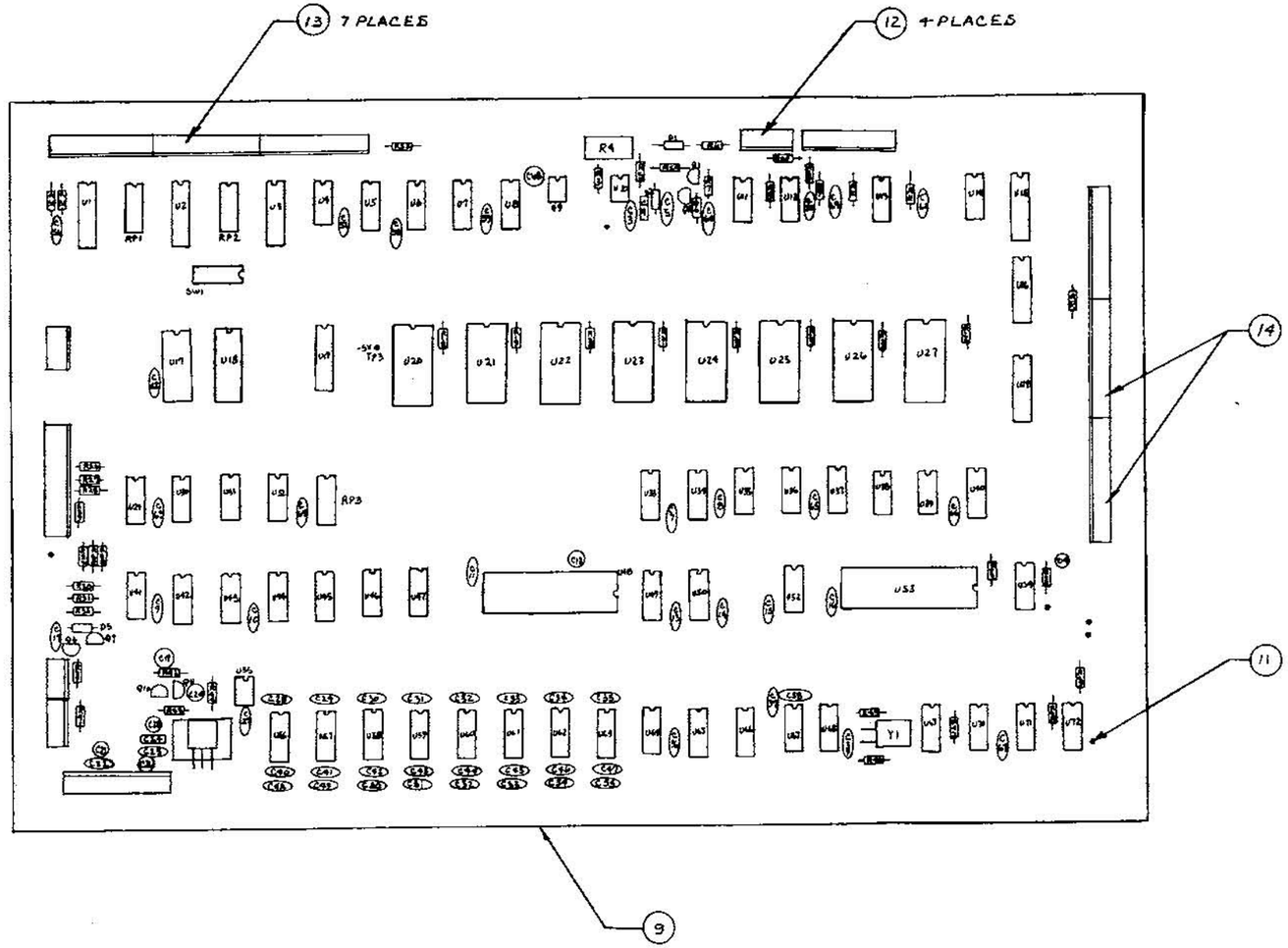
SCHEMATIC — COMPLETE C.V. LOGIC

SIZE	CODE IDENT NO.	DRAWING NO.	REV
D		800-0031	E

SCALE NONE SHEET 6 OF 8

800-0031 E

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED	12-22-78	
	B	PER ECN 310	5-29-79	
	C	PER ECN 318 & 321	8-8-79	
	—	PER ECN 326 (SEE P/L) SB	9-4-79	
	D	PER ECN 354 WJD	11-13-79	
	E	PER ECN 394 SD	4-30-80	



SEE DETACTED PARTS LIST

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
			PARTS LIST
		826-0004	
		814-0019	
		822-0011	
		822-0001	

NEXT ASSY | USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± | DECIMALS .XX ± .XXX ± | ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN Wjmaney	11-20-78
CHECKED	12-22-78

ASSEMBLY —
BASIC V.I.C. BOARD

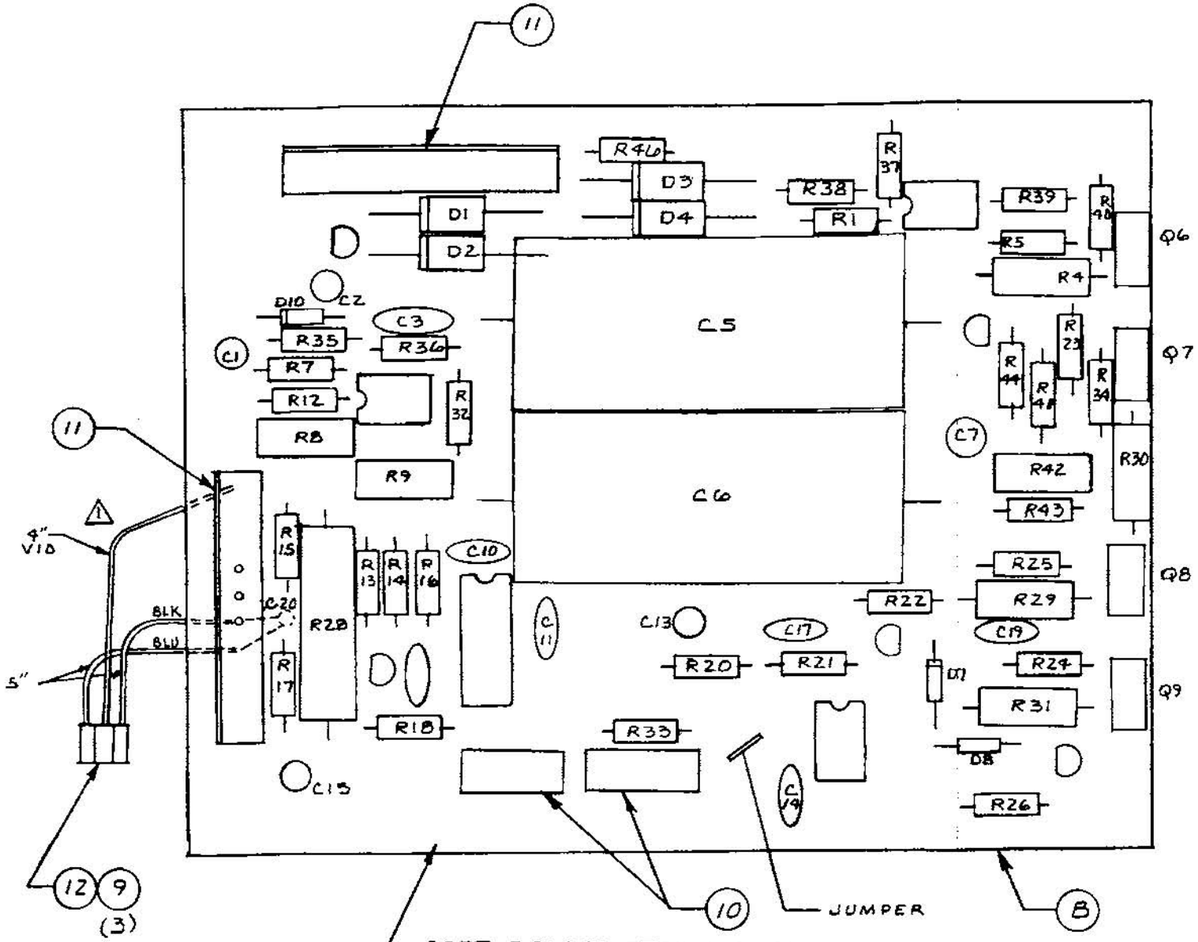
SIZE	CODE IDENT NO.	DRAWING NO.	REV
D		800-0031	E

SCALE 1/1 SHEET 5 OF 8

800-0031 E

© BISHOP GRAPHICS INC. DUPLEX
NUMBER NO. 70988

REVISIONS					
ZONE	LTR	DESCRIPTION		DATE	APPROVED
	A	RELEASED	WJB	12-3-79	
	B	PER ECN 367	WJB	1-4-80	



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

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

NEXT ASSY	USED ON
800-0072	

APPLICATION

CONTRACT NO.

APPROVALS	DATE
DRAWN Wymore	11-29-79
CHECKED	12-3-79

Gremlin Industries, Inc.
San Diego, California 92123

P.C. ASSY
POWER SUPPLY
DUAL GAMES

SIZE	CODE IDENT NO	DRAWING NO.	REV
C		800-0073	B

SCALE 2/1 SHEET 4 OF 4

800-0073 B

⚠1 ALL WIRES 22 GA SOLDER TO BOTTOM OF CONNECTOR PINS (CIRCUIT SIDE)

NOTES:

REVISIONS					
ZONE	LTR	DESCRIPTION		DATE	APPROVED
	A	RELEASED	WJB	12-3-79	
	B	PER ECN 367	WJB	1-4-80	
	C	PER ECN 390	SD	9-21-80	
	D	PER ECN 414 AND 414A	SD	6-10-80	

T1
230V
120V
100V
0V
SHIELD
560-0003
NOT ON P.C. BOARD
6.2 VRM
16.5 VRM
16.5 VRM
D9 MDA3500
C21 9000µf 12V
C18 9000µf 12V
+9V
Q10 2N3055
BLANK KEYING PINS
N.C. N.C. N.C. N.C.
Q7 TIP115
R46 2.7K
D10 IN5231
D3 MR501
D1 MR501
D4 MR501
D2 MR501
R34 470Ω
+12V
C11 .05µf
R9 1K
R13 1.5K
R32 3.3K
U3 LM723
C10 .003µf
R16 1.5K
Q4 2N4403
C12 .01µf
R15 100Ω
R28 .1Ω 5W
R14 10K
R18 12K
R17 1K
+5V
C1 10µf 25V
+20V
C16 .01µf 50V
C17 100pf
R21 10K
R26 2.7K
Q5 2N4401
Q9 TIP29
C6 4700µf 25V
C2 10µf 25V
R23 1K
Q1 2N4403
R30 .5Ω 1W
LM741EN
R39 1K
R38 1K
R37 10K
R1 10K
R44 47K
R42 2K
R43 27K
R41 13K
R40 470Ω
Q6 TIP10
-5V
U5 7905
GND
C8 25V
Q2 2N4401
R5 1K
C7 10µf 25V
R4 .5Ω 1W
U4 LM714EN
D8 IN914
D7 IN914
R24 1K
R31 .5Ω 1W
Q3 2N4403
Q8 TIP 29
R20 1K
R33 100K
C13 10µf 25V
C14 .01µf 50V
R25 2.7K
R22 1K
R29 .5Ω 1W
C5 4700µf 25V
-20V
U2
R35 1K
R8 1K
R36 1K
R12 5.6K
R7 2.7K
7.15V
-12V
C15 10µf 25V

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

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

NEXT ASSY | USED ON

APPLICATION

DO NOT SCALE DRAWING

CONTRACT NO.

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

Gremlin Industries, Inc.
San Diego, California 92123

SCHEMATIC — POWER SUPPLY DUAL GAMES

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

SCALE NONE | SHEET 4 OF 4

800-0072 D

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED WJB	12-18-79	
	B	PER ECN 366 WJB	1-2-80	

+5V
R7 220Ω
D3 IN4002
R6 1K
Q1 2N4401
Q2 PE8050
R8 1K
U4 74LS02
SW2 BCD SWITCH COIN'S/UNIT
U6 74LS191
R5 330Ω
C5 .01µf
R10 82Ω
R11 82Ω
U7 555
R12 1MEG
C9 .001µf
C8 .01µf
R1 1MEG
D1 IN4002
U1 555
C2 2.2µf
C1 .01µf
R9 10K
SW1 BCD SWITCH CREDITS/UNIT
U2 74LS74
Q3 2N4401
C6 10µf TANT
+5V
GND
U3 74LS191
R2 330Ω
C3 .01µf
R3 1K
D2 IN914
R4 330K
U5 555
C4 .1µf FILM
C7 .01µf

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

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS XX ± XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN Wynema	11-29-79
CHECKED	12/10/79

NEXT ASSY | USED ON
APPLICATION

Gremlin Industries, Inc.
San Diego, California 92123

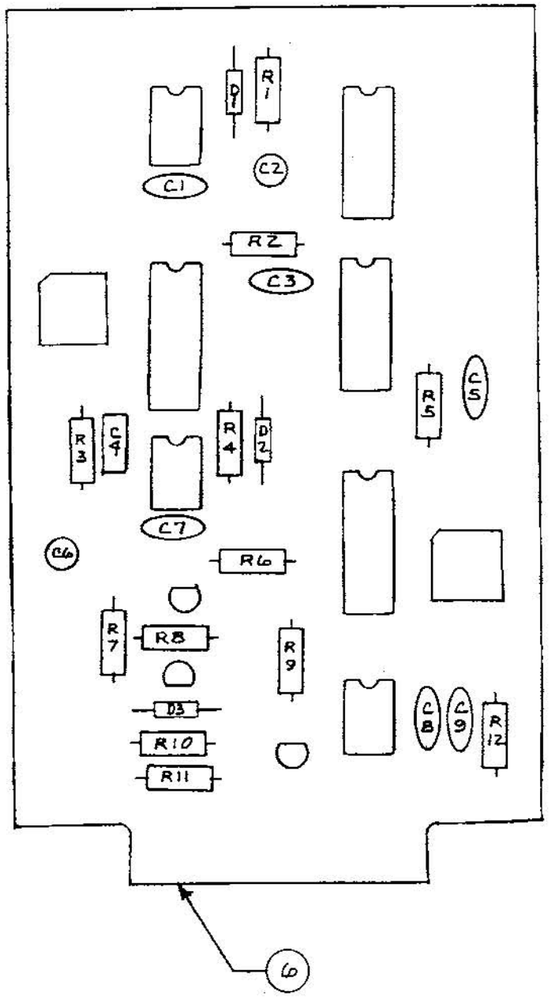
SCHEMATIC —
PHOTO COIN CALC.

SIZE	CODE IDENT NO.	DRAWING NO.	REV
C		800-0076	B

SCALE NONE | SHEET 5 OF 5

800-0076 B

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED WJB	12-18-79	
	B	PER ECN 366 WJB	1-2-80	



SEE DETACHED PARTS LIST

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

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

NEXT ASSY | USED ON

APPLICATION

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN Wyzema	12-14-79
CHECKED	12/19/79

Gremlin Industries, Inc.
San Diego, California 92123

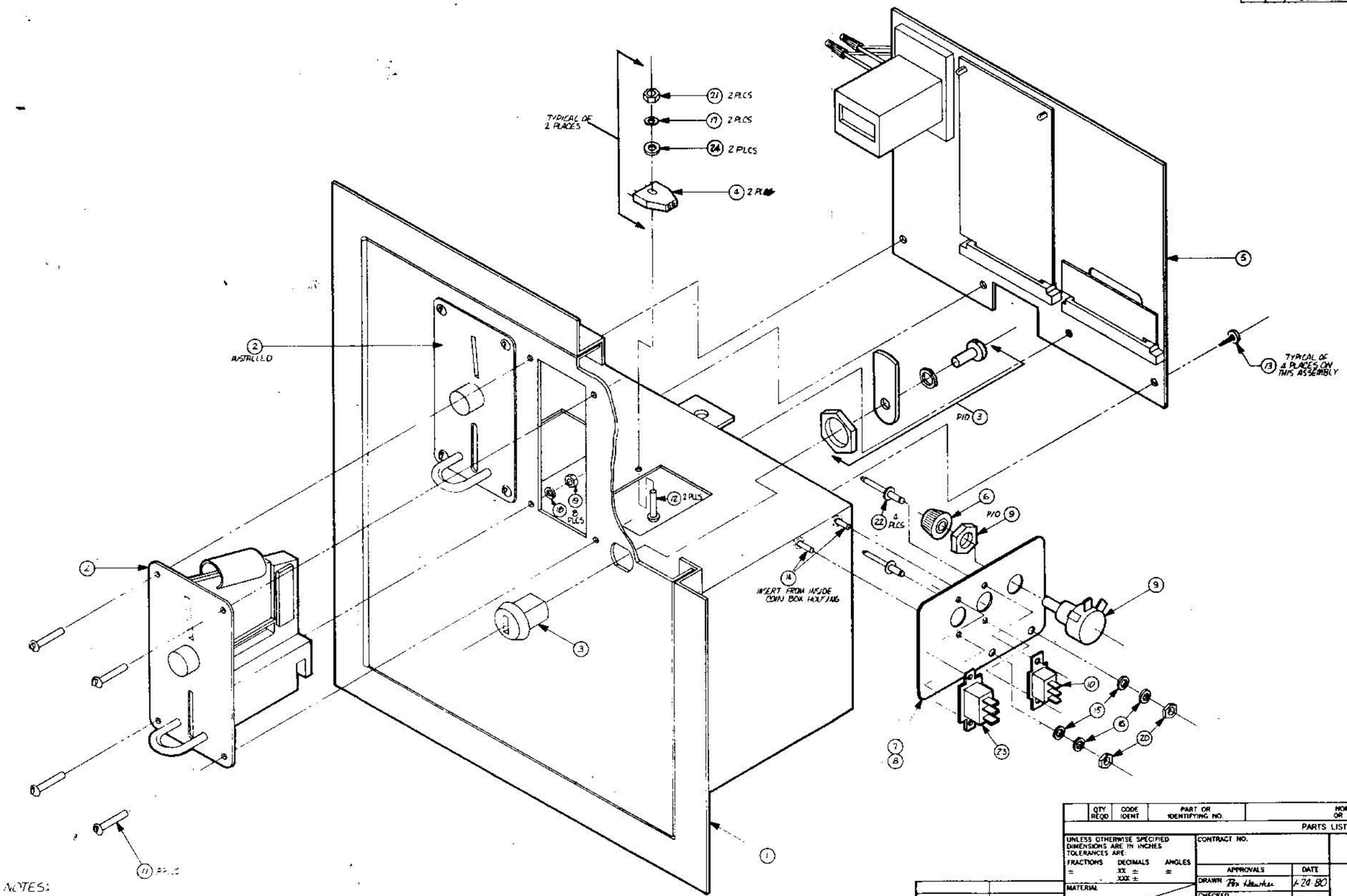
P.C. ASSEMBLY
PHOTO COIN CALC

SIZE	CODE IDENT NO	DRAWING NO.	REV
C		800-0076	B

SCALE 2/1 SHEET 4 OF 5

800-0076 B

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED	1-24-80	



NOTES:

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

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS XX ± XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN Pete Hamilton	1-24-80
CHECKED	1-24-80

Cromlin Industries, Inc.
San Diego, California 92123

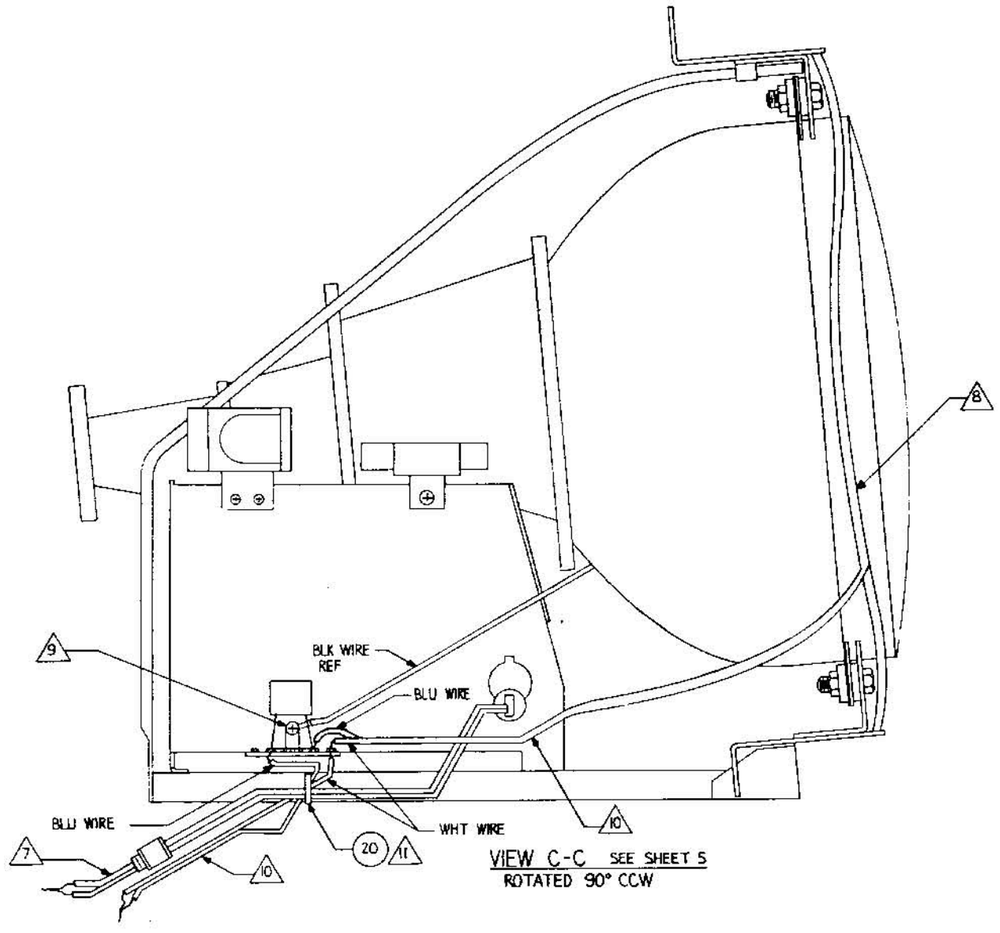
ASSEMBLY
BASIC COIN MECH
DUAL

SIZE	CODE IDENT NO	DRAWING NO	REV
D		800-0074	A

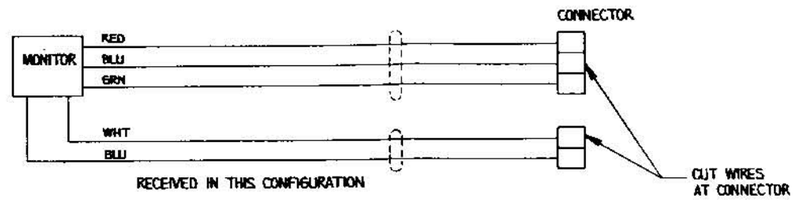
SCALE NONE | SHEET 3 OF 3

NEXT ASSY	USED ON
APPLICATION	

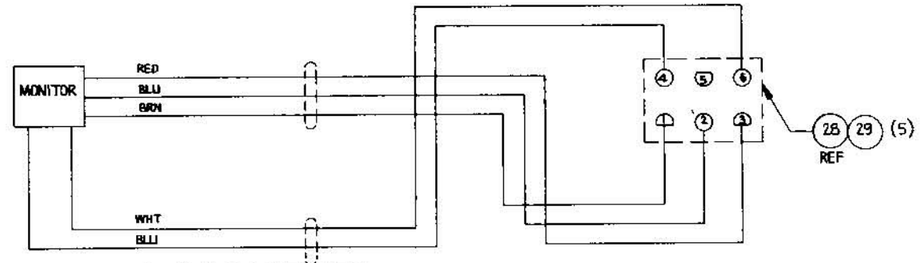
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED SD	6-9-80	



VIEW C-C SEE SHEET 5
ROTATED 90° CCW



RECEIVED IN THIS CONFIGURATION



CHANGE TO THIS CONFIGURATION

12. USE CABLE TIES, ITEM 20, TO DRESS WIRING AS NEEDED.
11. CLAMP WIRE TO CHASSIS USING CABLE TIE, ITEM 20, THRU EXISTING HOLE.
10. CUT WIRES TO LENGTHS SHOWN ON SHEET 8 AND SOLDER TO TERMINAL STRIP.
9. USE HARDWARE HOLDING BLK WIRE TO CHASSIS TO MOUNT THERMISTOR TERMINAL STRIP WITH THERMISTER.
8. REMOVE DEGAUSING COIL, ROTATE 180° AND RESECURE.
7. CUT POWER CORD TO LENGTH SHOWN ON SHEET 8.

NOTES: CONTINUED FROM SHEET 5

MONITOR MODIFICATION

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

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

NEXT ASSY | USED ON
APPLICATION

CONTRACT NO.

APPROVALS	DATE
DRAWN SON DUONG	5-30-80
CHECKED A. AMBROSE	6-9-80

Gremlin Industries, Inc.
San Diego, California 92123

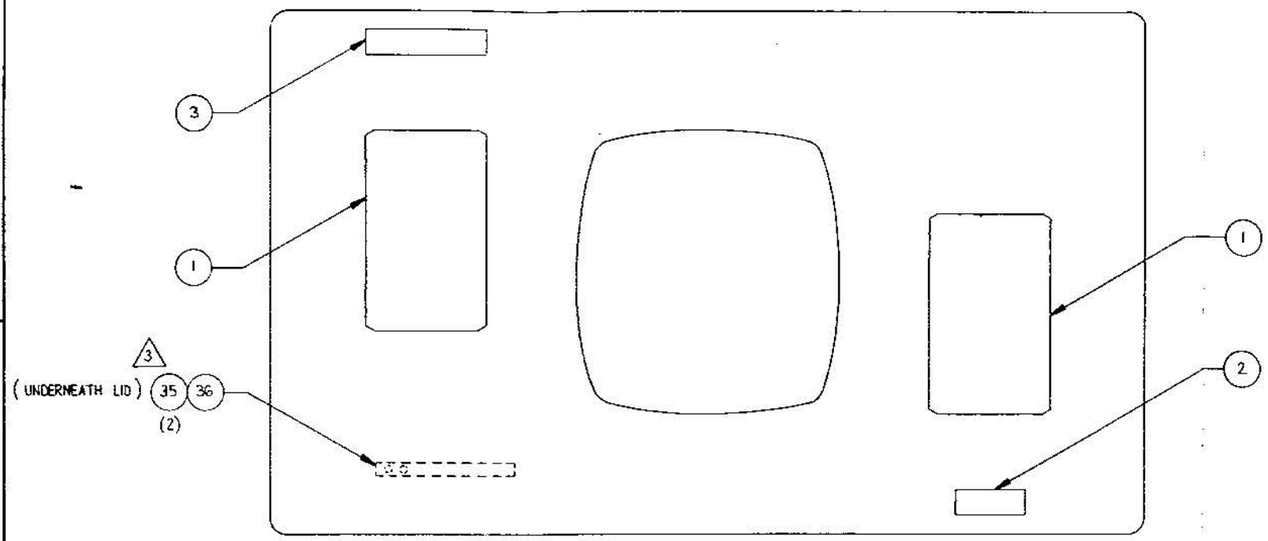
ASSY DIGGER COCKTAIL
ENGLISH

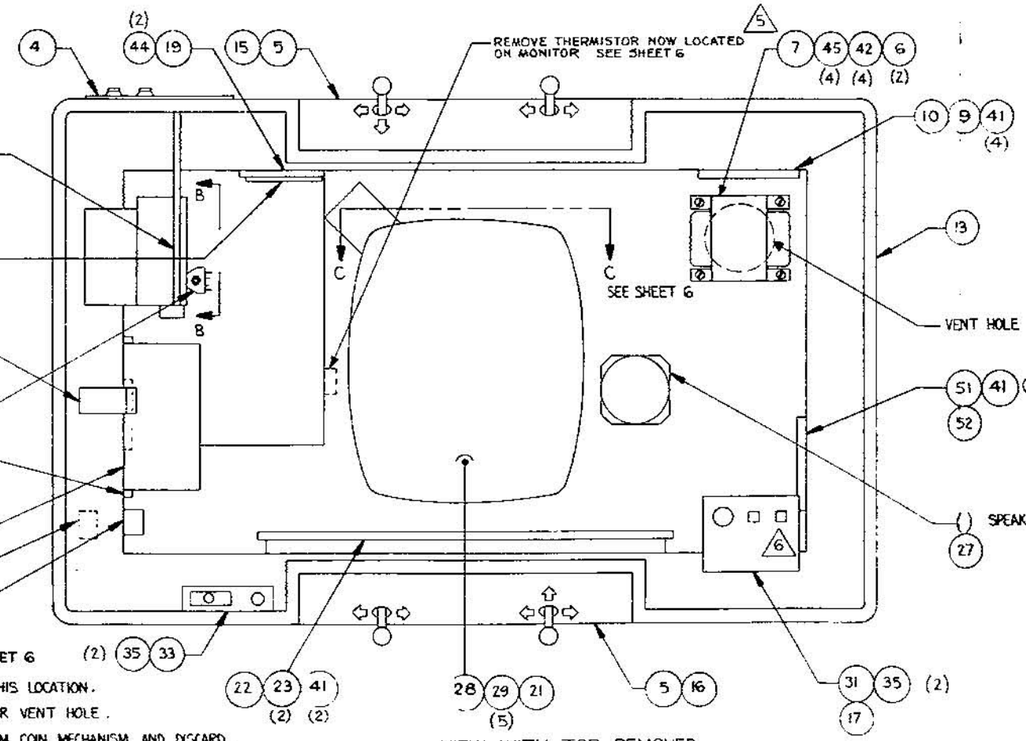
SIZE	CODE IDENT NO.	DRAWING NO.	REV.
D		700 - 0015	A

SCALE NONE SHEET 6 OF 8

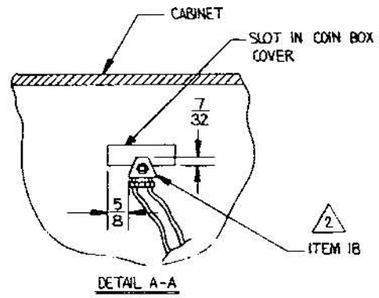
700 - 0015 A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED 3D	6-9-80	

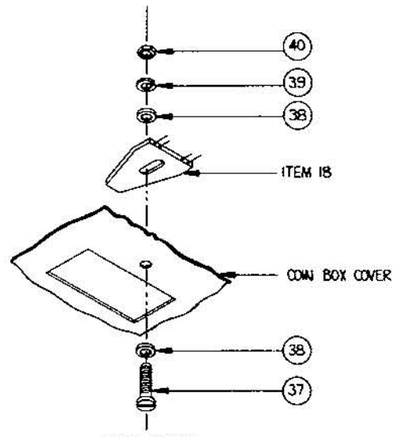




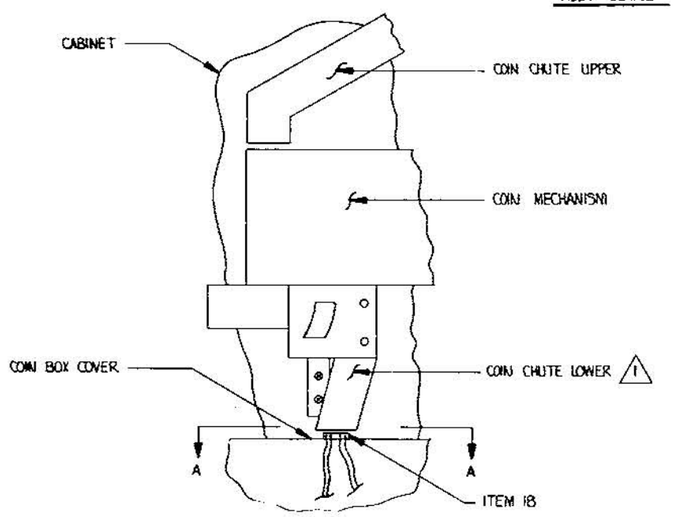
VIEW WITH TOP REMOVED



DETAIL A-A



ASSY DETAIL



DETAIL B-B

NOTES CONTINUED ON SHEET 6

6 STAMP FREEPLAY ABOVE THIS LOCATION.

5 INSTALL TRANSFORMER OVER VENT HOLE.

4 REMOVE MICRO SWITCH FROM COIN MECHANISM AND DISCARD.

3 INSTALL CLIP SWITCH 1 3/4" FROM FRONT EDGE AND 8" FROM SIDE EDGE OF LID.

2 INSTALL PHOTO CELL WITH ITEM 37 BY DRILLING A PILOT HOLE .128 DIAMETER IN THE COIN BOX COVER.

1 REMOVE LOWER COIN CHUTE AND MOUNT FLUSH WITH BOTTOM OF COIN MECHANISM AS SHOWN TO MAKE ROOM FOR PHOTO CELL.

NOTES:

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

PARTS LIST

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN SON DUONG	3-28-80
CHECKED A AMBROSE	6-9-80

Gremlin Industries, Inc.
San Diego, California 92123

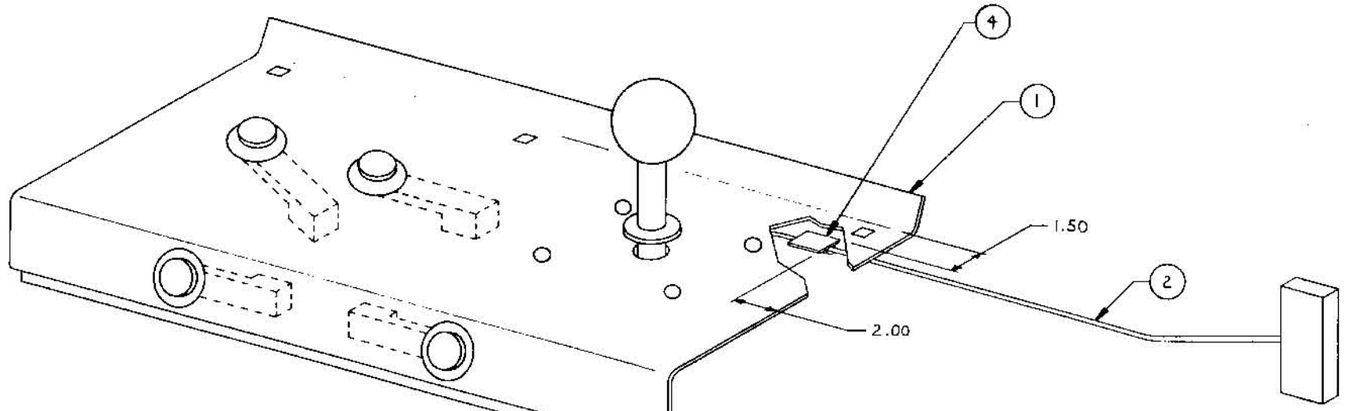
TOP ASSEMBLY
DIGGER COCKTAIL

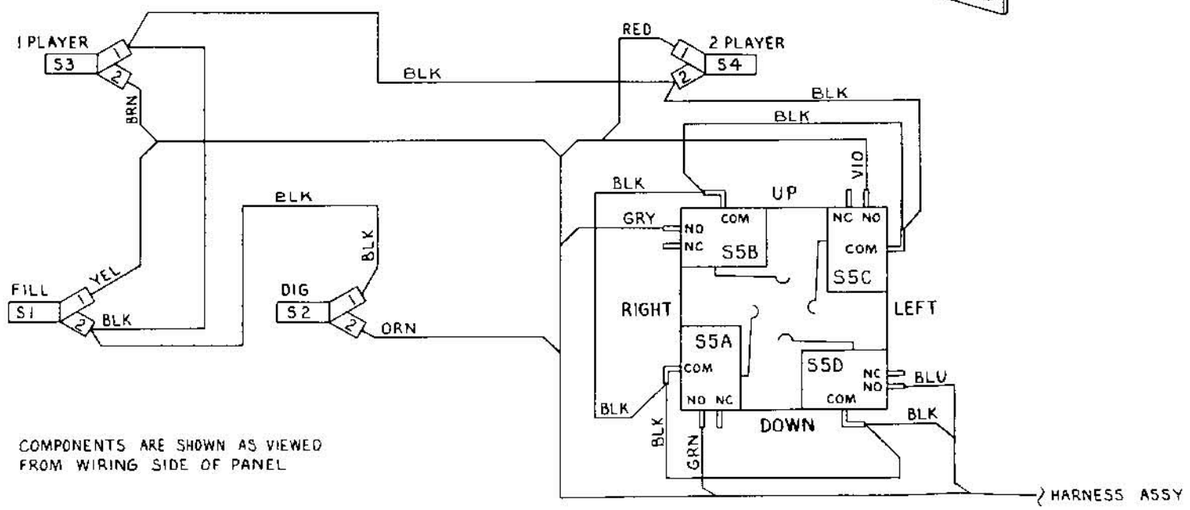
SIZE	CODE IDENT NO	DRAWING NO	REV
D		700 - 0015	A

SCALE NONE SHEET 5 OF 8

700 - 0015

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED J.M.	6-9-80	AFA





COMPONENTS ARE SHOWN AS VIEWED FROM WIRING SIDE OF PANEL

ITEM NO.	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
4	1		280-0004	CLIP, WIRE HOLD DOWN
3				
2	1		800-3069	HARNESS ASSY
1	1		800-3068	CONTROL PANEL ASSY

PARTS LIST

NEXT ASSY	USED ON
800-3070	DIGGER

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN MAHONEY	5-12-80
CHECKED A. AMBROSE	5-23-80

Gremlin Industries, Inc.
San Diego, California 92123

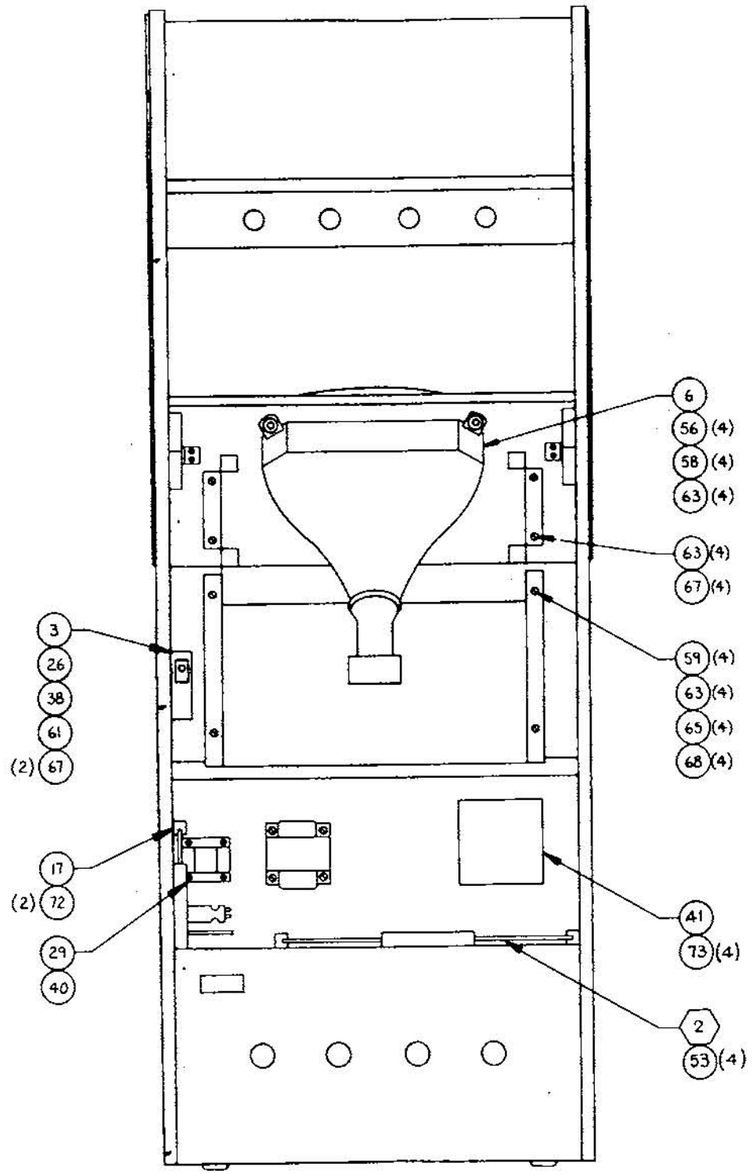
CONTROL PANEL
COMPLETE, DIGGER UPRIGHT

SIZE	CODE IDENT NO.	DRAWING NO.	REV
D		800-3074	A

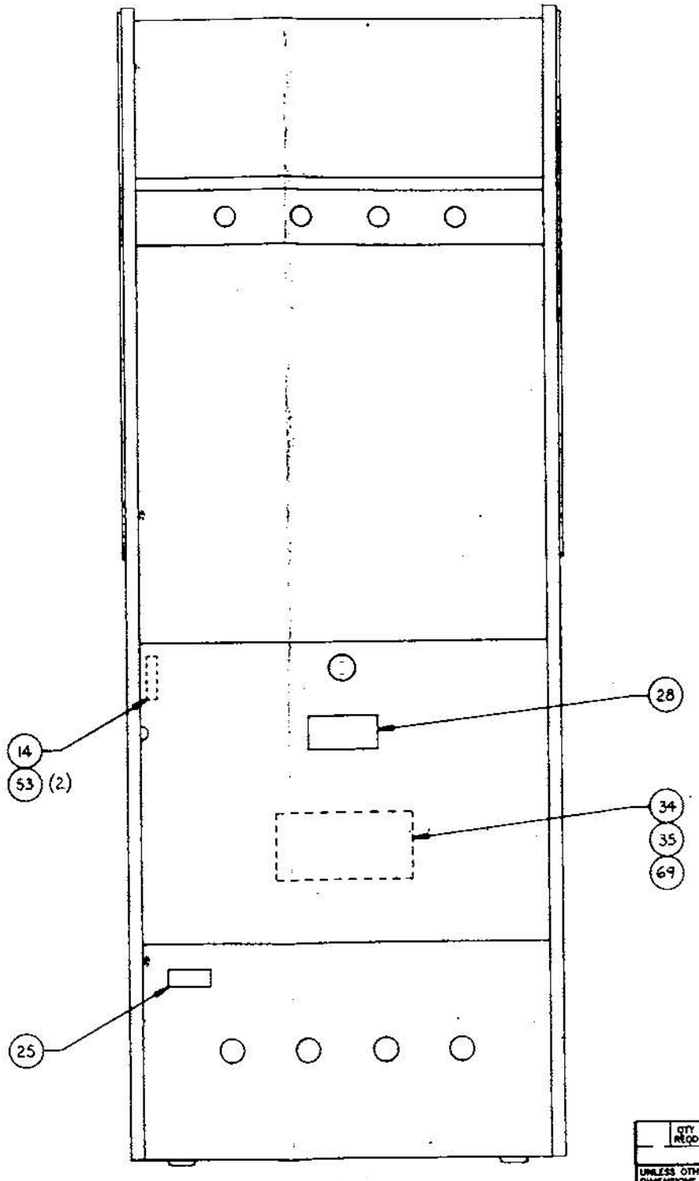
SCALE NONE SHEET 1 OF 1

800-3074 A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED J.M.	6-9-80	AFA



VIEW B-B
(REAR PANEL AND DOOR REMOVED)



VIEW B-B

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

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS XX ± XXX ± ANGLES ±

MATERIAL

FINISH

NEXT ASSY | USED ON

APPLICATION

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN MAHONEY	5-21-80
CHECKED A. AMBROSE	6-2-80

Gremlin Industries, Inc.
San Diego, California 92123

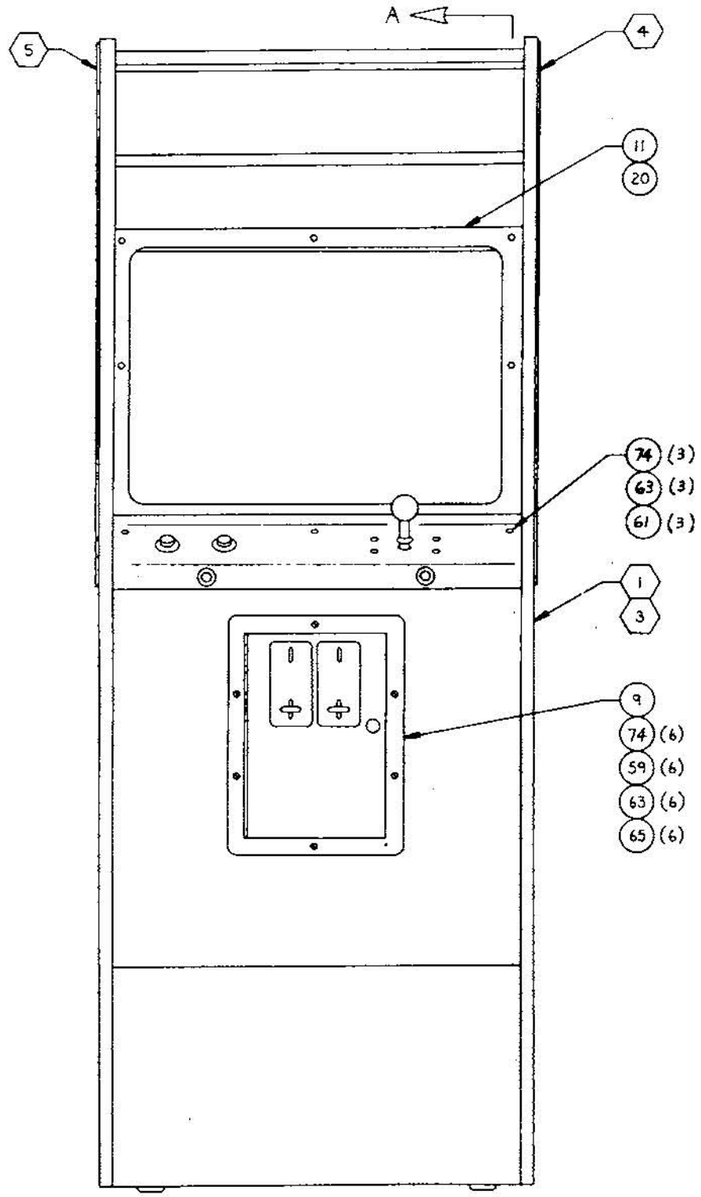
TOP ASSY
DIGGER UPRIGHT

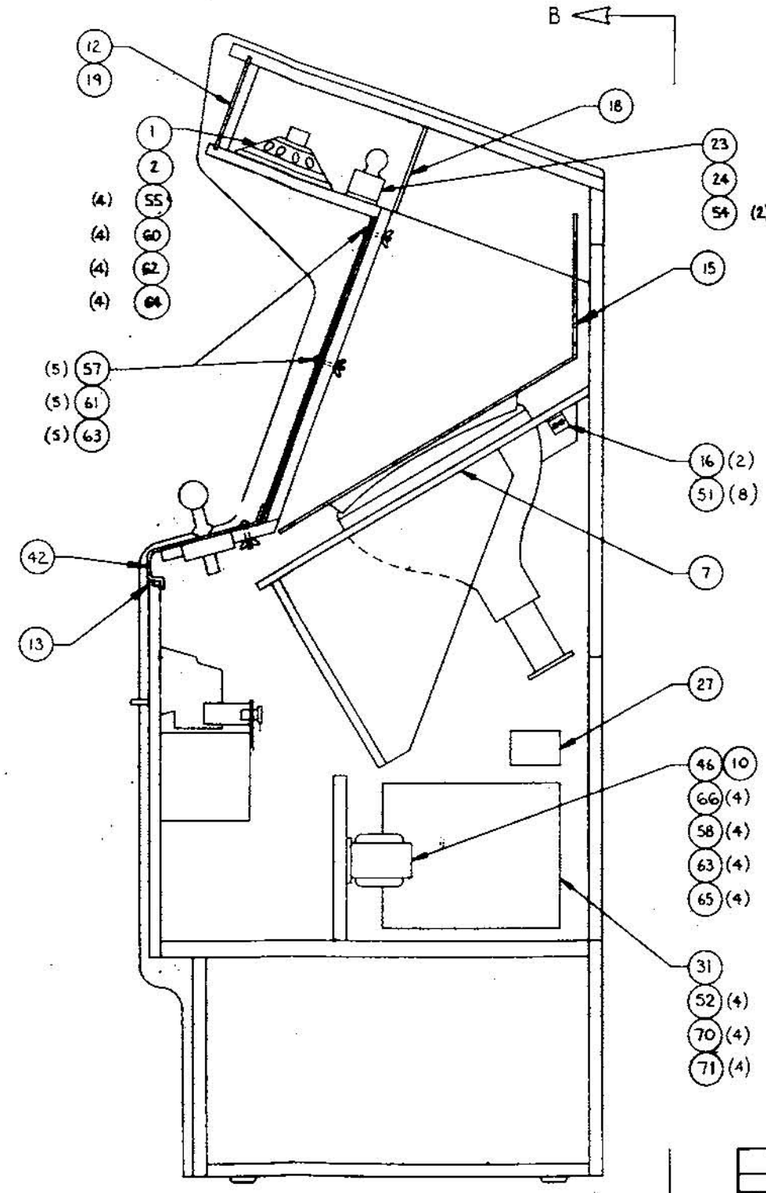
SIZE	CODE IDENT NO	DRAWING NO.	REV
D		700-0019	A

SCALE NONE | SHEET 4 OF 5

700-0019 A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED J.M.	6-9-80	AFA





SECTION A-A

NOTES:
1. INSTALL WIRE HOLD DOWN CLIPS, ITEM 21, APPROX. AS SHOWN ON PRODUCTION MOCK-UP.
2. INSTALL CABLE TIES, ITEM 5, AS REQD TO DRESS WIRING.
3. INSTALL GROUND STRAP, ITEM 39, AS SHOWN ON PRODUCTION MOCK-UP.

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

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

NEXT ASSY | USED ON

APPLICATION

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN MAHONEY	5-21-80
CHECKED A. AMBROSE	6-2-80

Granlin Industries, Inc.
San Diego, California 92126

TOP ASSY
DIGGER UPRIGHT

SIZE	CODE IDENT NO.	DRAWING NO	REV
D		700-0019	A

SCALE NONE | SHEET 3 OF 5

700-0019 A