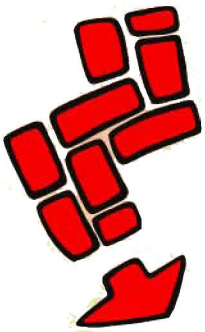

Blockade

PART NO.
707-0001

MANUFACTURED BY

Gremlin
Industries, inc.

OWNER'S MANUAL

BLOCKADE
OPERATING INSTRUCTIONS
AND
SERVICE MANUAL

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

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INTRODUCTION

BLOCKADE 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, TTL digital integrated circuitry and T.V. monitor concepts. Any individual NOT knowledgeable in these area 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

NOTE

An important service note is posted in the BLOCKADE 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 BLOCKADE has been arranged so that the insertion of a quarter thru 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

BLOCKADE is under factory warranty (Parts and Labor) for the following time periods:

A. All electronic components/connectors for one (1) year except:

1. Transformers - 90 days.
2. Fuses/Lamps - No Warranty

This Warranty covers defects/failure under normal use.

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.

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.

UNCRATING AND SET-UP INSTRUCTIONS

"BLOCKADE VIDEO GAME"

NOTE: During the entire uncrating and setting up of this game, a continual inspection should be carried out for cabinet damage and/or any other damage to electronic and mechanical hardware.

The following steps should be taken in uncrating and setting up of this game: (See diagram Page 5.)

A. Remove all strapping (ref. 1)

B. Remove top lid of container (ref. 2)

C. Remove staples on vertical overlap portion of container before removing from cabinet. (ref. 3)

D. Before removing the four corner pads that are taped to cabinet, (ref. 4), carefully lay the cabinet on either of two sides and remove the skid bolts (ref. 5) and skid (ref. 6) and discard.

E. Remove keys (ref. 9) from packet and unlock coin door, then remove shipping screw (ref. 7) from inside of coin box and discard.

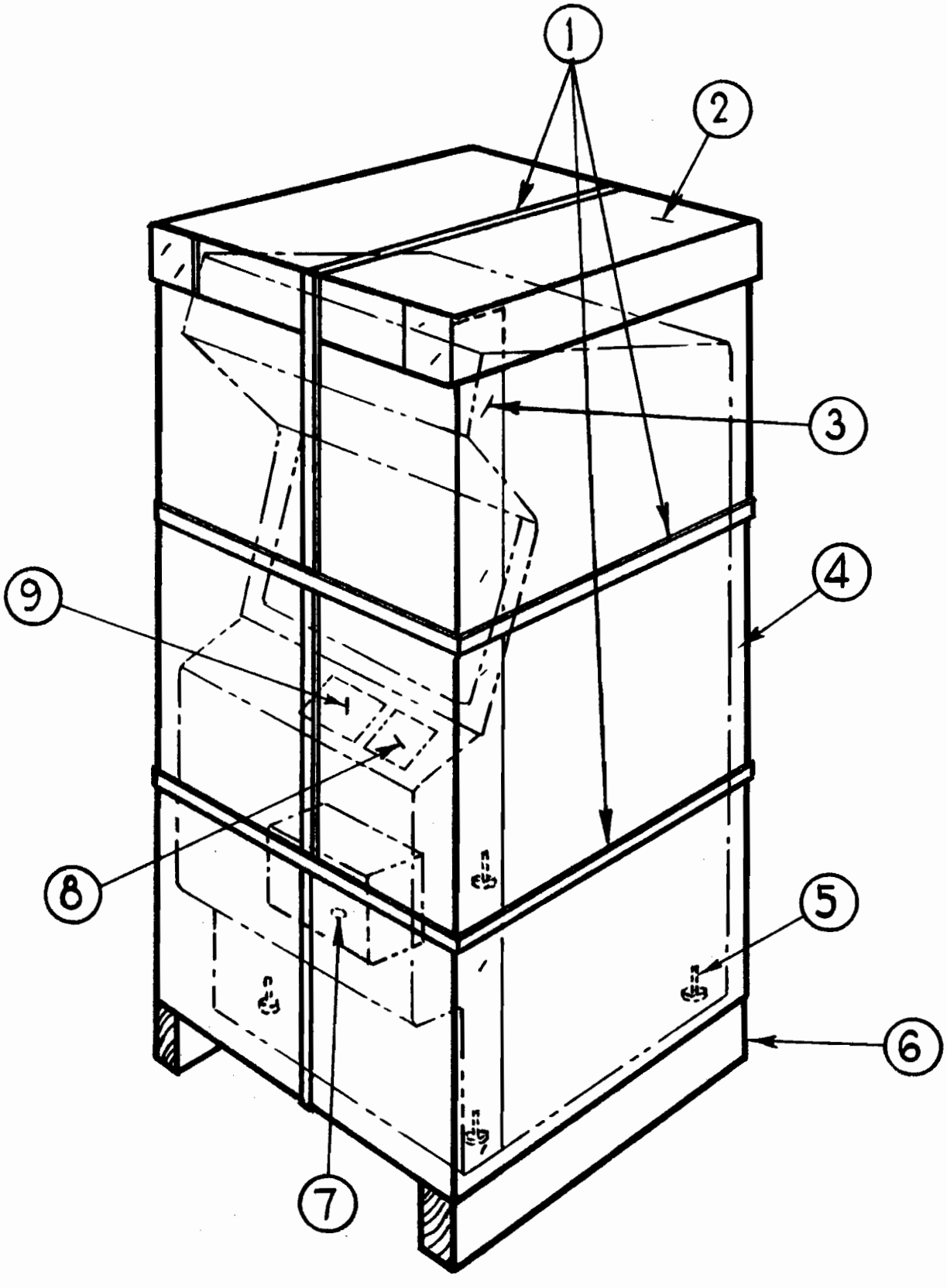
F. Use key (ref. 9) to unlock back panel. After panel has been removed, inspect all electrical and other hardware for damage.

G. If damage has occurred during shipment, the recipient should immediately file a Damage Claim with the carrier.

H. Power Specifications:

AC, 100V-115V-230V, 50/60Hz, 130 W, 3-Wire Cord with safety interlock on the rear gameaccess door; NOTE - grounding is required.

UNCRATING INSTRUCTIONS
BLOCKADE



BLOCKADE

1. GAME CONCEPT -

BLOCKADE is a two player game in which each player controls the direction of an arrow moving on the face of a video display. The perimeter of the display is a barrier, constructed of images which resemble blocks.

Each player utilizes a set of push button controls to change the direction of his moving arrow. As it moves, the arrow leaves a "trail" of block images, which form a continuous wall or barrier.

Anytime a player's arrow collides with a wall, there is an audible explosion and accompanying flashing symbol at the point of impact. A point is awarded to your opponent when your arrow enters an already occupied space (i.e.):

1. the block barrier created by either player
2. the perimeter walls
3. the opponent's arrow
4. reverse direction of your own arrow

After a pre-set number of crashes by either player, the game ends. Example: If the game were set to end after five crashes, the first player to crash five times loses the game.

2. OPERATION -

The arrows move alternately at a fixed rate, approximately two times per second. To change direction of his arrow, a player momentarily presses the push button required for a left or right turn relative to his direction of travel. The arrow will move in the new direction until changed again. A player's reaction time is important as turns must be made at precise moments during the play.

As the arrows move, a series of tones are audible. Every direction for each arrow generates a different pitch (eight in all). The result is an audible change whenever either player makes a turn.

After each collision, the players' scores are briefly displayed. If the game has not been won, all obstacles except the perimeter walls are cleared, and the next segment of the game begins.

Whenever BLOCKADE 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 forty second delay thereafter. Following the delay, the advertising sequence repeats.

E-Z Adjust™ Control Panel - BLOCKADE has three adjustments, all of which are located on the back of the coin door. These three controls are:

1. VOLUME CONTROL -

   Set to desired volume for boom and tones during the game. This also effects advertising boom volume if boom switch is "ON".

2. BOOM SWITCH -

   Switch to "ON" position if boom is desired during advertising.

3. GAME END SWITCH -

   Switch to desired game ending score. (3-4-5- or 6)

SYSTEM DESCRIPTION

1. SEE SYSTEM BLOCK DIAGRAM (Fig. 1)

2. MICROPROCESSOR -

The game microprocessor is a Model 8080A and it functions as the Central Processing Unit (CPU) in the system. The CPU (1) is synchronized by a clock circuit which provides frequencies required by the CPU and the Video Timing Logic (14).

Address Bus (4) selects the memory addresses to be accessed by the CPU. It is routed to three subsystems:

1. Read Write Memory (6): A random Access Memory (Ram) used to form a first in/last out (stack) memory. Used to perform subroutine calls and returns, also used for temporary data storage during program execution.

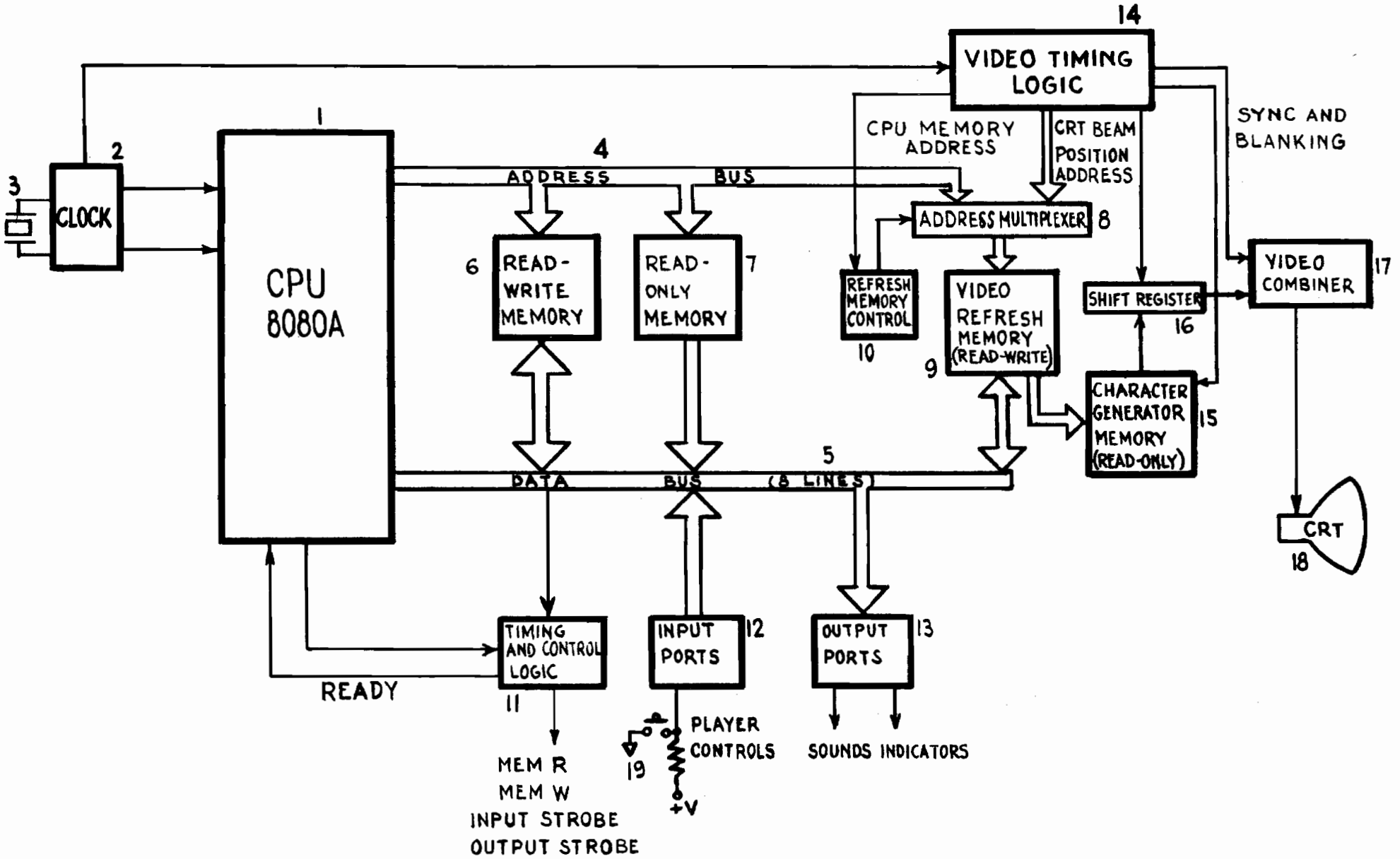
2. Read Only Memory (Rom) (7): Stores program instructions for the CPU.

3. Address Multiplexer (8): Selects either CPU addresses or addresses from the Video Timing Logic. Used to address the Video Refresh Memory (9).

Data Bus (5) carries data to and from the CPU. It receives data from Read Write Memory, Read Only Memory, Video Refresh Memory and Input Ports (12). The Bus transmits data to Read Write Memory, Output Ports and Video Refresh Memory. The Input Ports accept player control data (19). The Output Port (13) initiates sound control and activates any external logic and indicators needed by the game.

Timing and Control Logic (11) generates synchronizing signals to keep system operation synchronized to the CPU. It controls:

1. Memory Read
2. Memory Write
3. Input Port Read
4. Output Port Write



SYSTEM BLOCK DIAGRAM

FIG 1

The remaining elements in Figure 1 convert (CPU) system information into a video display format. The T.V. monitor (18) uses a standard 525 scan line system.

Video Refresh Memory (9) stores information from the CPU which is read out as the CRT beam sweeps across the screen. It is addressed from two sources as controlled by Address Multiplexer (8). During vertical sweep retrace of the CRT, the Video Refresh Memory is addressed by the CPU so information can be updated. During scan time, Video Refresh Memory is addressed by Video Timing Logic (14). Refresh Memory Control (10) insures that address demands from Video Timing Logic and the CPU never occur simultaneously.

Character Generator Memory (15) provides a means for Video Refresh Memory to select 64 dots for each 8 word access. Each image, on the display, will have the dimensions of 8 dots high, and 8 dots wide. Shift register (16) develops this into a video signal. (see Figure 2)

A Tone Generator is driven by Output Ports (13). The CPU controls the frequency of the tone by loading a number (0-255) into the Output Ports (13). A direction change by a player will cause the CPU to load a different number into the Output Port, changing the tone. (see Figure 3)

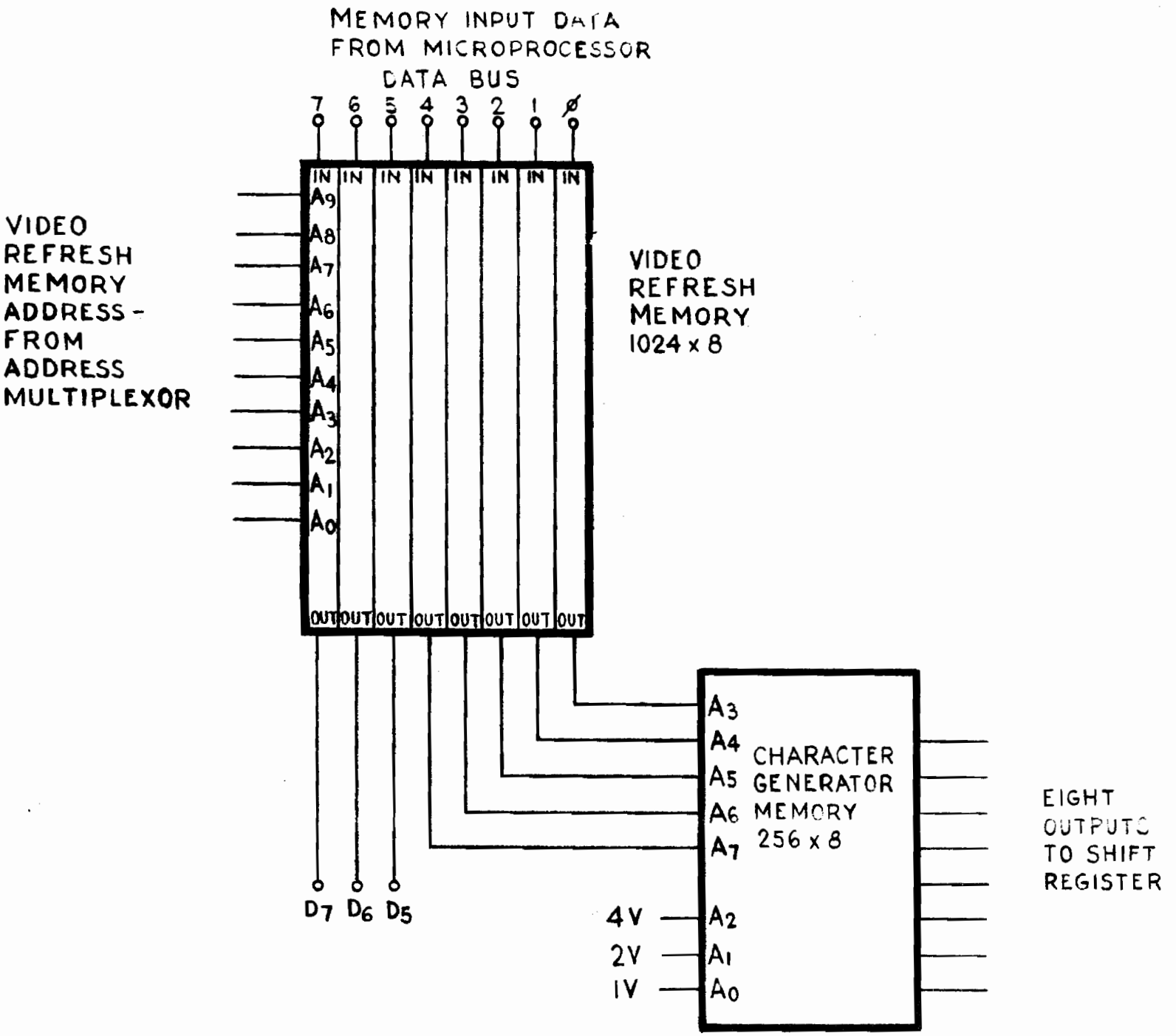
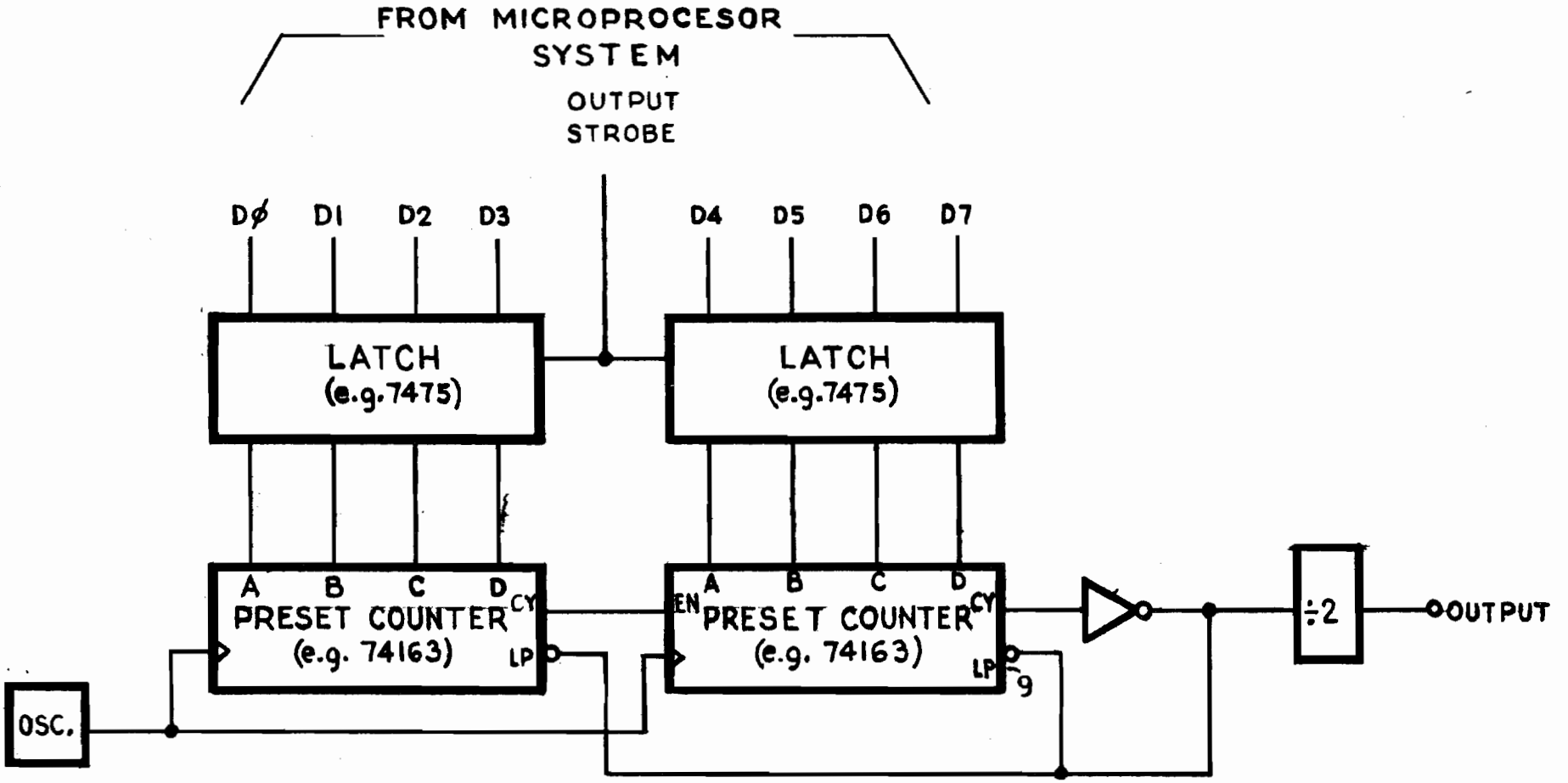

MEMORY INPUT DATA
FROM MICROPROCESSOR
DATA BUS
7 6 5 4 3 2 1 ø
IN IN IN IN IN IN IN IN
A9 A8 A7 A6 A5 A4 A3 A2 A1 A0
OUT OUT OUT OUT OUT OUT OUT OUT
VIDEO
REFRESH
MEMORY
ADDRESS -
FROM
ADDRESS
MULTIPLEXOR
VIDEO
REFRESH
MEMORY
1024 x 8
D7 D6 D5
A3 A4 A5 A6 A7
CHARACTER
GENERATOR
MEMORY
256 x 8
4V 2V 1V
A2 A1 A0
EIGHT
OUTPUTS
TO SHIFT
REGISTER

FIG 2



TONE GENERATOR

FIG 3

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. Oscilliscope - 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
7. Replacement parts including game programs:
   1024 x 4 prom 316-0004 and 316-0003

This is a recommended list for anyone attempting to service BLOCKADE.

MAINTENANCE PROCEDURES

BLOCKADE POWER SUPPLY MALFUNCTION:

1. Remove Output Connectors
2. Initial Tests: (GND lead to C-18 negative terminal located off board.)
   a. +9v at "+" of C-18
   b. +19v at C-6 (4700 mfd)
   c. -19v at C-5 (4700 mfd)
   d. -12v at pin 11
   e. +12v at pin 12
   f. +5v at pins 18-20
   g. zero v (GND) at pins 14-16
3. If adjustments are required, attach meter ground to pins 14, 15 or 16 or equivalent local ground and:
   a. +5v adjust - input lead to pins 18, 19, 20 and adjust R-9 for +5.0 to +5.1 VDC
   b. +12v adjust - input lead to pin 12 and adjust R-8 for 11.5 to -12.1 VDC
   c. -12v adjust - input lead to pin 11 and adjust R-10 for -11.1 to -12.1 VDC
4. If initial test is good, attach output connectors to Video Logic Board. Repeat Step 2.
   a. If readings differ from those previously taken, a loading problem exists on the Video Logic Board.

No -12VDC or 5VDC on the Video Logic Board: (Power Supply Normal)

Video Logic Board Schematic (VLBS)(SH. 2). CHECK U-65, C-29 for open/short. CHECK R-40, C-12, D-2(VLBS) (SH. 1).

No +12VDC at CPU: (Power Supply Normal)

(VLBS)(SH. 2). CHECK U-65, C-28. (VLBS)(SH. 1). CHECK C-23, C-25.

No Ø1, Ø2 CLOCKS: (Ref. Fig. 4A)

(VLBS),(SH. 1). CHECK U-32 pins 1 and 3 for 20.79MHZ. CHECK U-31 pins 14, 13, 12 and 11 for 150 nsec sinewave. CHECK U-17 pins 1, 3, 4, and 10. CHECK latch network U-18 and U-8. CHECK high voltage outputs of U-30 pins 3 and 6. If not present, remove driver transistor. Should U-30 now output, replace driver transistor, if still not present replace U-30. U-45 could load down Ø1 clock.

No Coin Start:

(VLBS)(SH. 1) CHECK output U-9 pin 6. If signal not present, lift U-10 pin 5. Should signal return, replace U-10. If still not present, check output of U-8 pin 3. CHECK D-8 pull up diode and C-18. CHECK U-14. U-32 could be shorting signal to Q_3 and Q_4.

No Coin Meter Action:

(VLBS)(SH. 1). Signal from U-8 pin 11 feeds current limiter R-27 to Q_4. Saturated Q_4 turns on high current transistor Q_5. Either Q_4 or Q_5 faulty, will inhibit meter.

No Player Control:

(VLBS)(SH. 1). Input accepted through U-12 and U-13 via data lines when strobe IND2 signal is generated through U-18 from U-45 and U-51 (status latch). CHECK U-18 pin 11, U-45 pin 8, U-45 pin 11, U-51 pin 10 for strobe pulse.

No Game Time Select:

(VLBS)(SH. 1). Input accepted through U-10 and U-11 via data lines when strobe IND1 signal is generated through U-18 from U-45 and U-51. CHECK U-18 pin 3, U-45 pin 8, U-45 pin 11, U-51 pin 10 for strobe pulse.

Meaningless Display on Screen: (Inserting coin does not correct problem)

There are two probable areas:

1. A program malfunction

    a. Check ROM sockets, U-2 and U-3

2. A data transfer malfunction

   a. Test the CPU Data Bus by ensuring proper voltage levels. Pullup resistors are used to make memory outputs compatible with the 8080A. High State Logic on the Data Bus should be 3.3v minimum. For involved problems in this area contact GREMLIN INDUSTRIES.

Characters on Screen not correct: (Wrong image behaves normally)

(VLBS)(SH. 2). Use character generator code table to isolate possible bad RAM (U-38; U-39; U-40; U-41, or U-42). Also probable are U-22. U-23 (data buffers), U-24, U-25, U-26 (multiplexers), U-29 and U-43, U-49 (shift register).

No Video: (Ref. Fig. 4B, 4C, 4D)

(VLBS)(SH. 2). CHECK U-54, U-53 circuitry for H reset. U-52 pin 1, clock for horiz. scan. U-55, U-58 provides timing for vert. scan. U-56 provides for vert. blanking.

Bad Video:

(VLBS)(Sh. 2). Bad video could be vertical roll or horizontal sliding. CHECK U-55 pin 12 and U-56 pin 4 of horizontal or vertical generators. CHECK U-63 pins 12 and 13 for vertical and horizontal blanking. U-64 develops sync pulses.

Monitor Malfunction:

Refer to Motorola Service Manual (File VP 12). This manual included with BLOCKADE schematics.

Audio Tones; Sour/None:

(VLBS)(SH. 2). U-68, U-61, U-62, U-66, U-67, U-60 comprise tone generator. Amplifier on Power Supply Board (U-4, Q_5, Q_3, QX, Q_9). Could also be problem area.

Boom; Sour/None:

(VLBS)(SH. 1, Sh. 2). D-6, Q_{10}, Q_9, Q_{11}, U-5, Q_7, Q_8, Generates Boom. Amplifier section on Power Supply Board (U-4, Q_5, Q_3, Q_8, Q_9), also probable.

CHARACTER CODE TABLE

U 38	39	40	41	42	
0	0	0	0	0	
0	0	0	0	1	
0	0	0	1	0	
0	0	0	1	1	
0	0	1	0	0	
0	0	1	0	1	
0	0	1	1	0	GI
0	0	1	1	1	
0	1	0	0	0	
0	1	0	0	1	
0	1	0	1	0	
	1	0	1	1	
0	1	1	0	0	
0	1	1	0	1	
0	1	1	1	0	
0	1	1	1	1	

U 38	39	40	41	42	
1	0	0	0	0	0
1	0	0	0	1	1
1	0	0	1	0	2
1	0	0	1	1	3
1	0	1	0	0	4
1	0	1	0	1	5
1	0	1	1	0	6
1	0	1	1	1	7
1	1	0	0	0	8
1	1	0	0	1	9
1	1	0	1	0	(BLANK)
1	1	0	1	1	
1	1	1	0	0	TE
1	1	1	0	1	TI
1	1	1	1	0	JE
1	1	1	1	1	JR

GAME
OVER

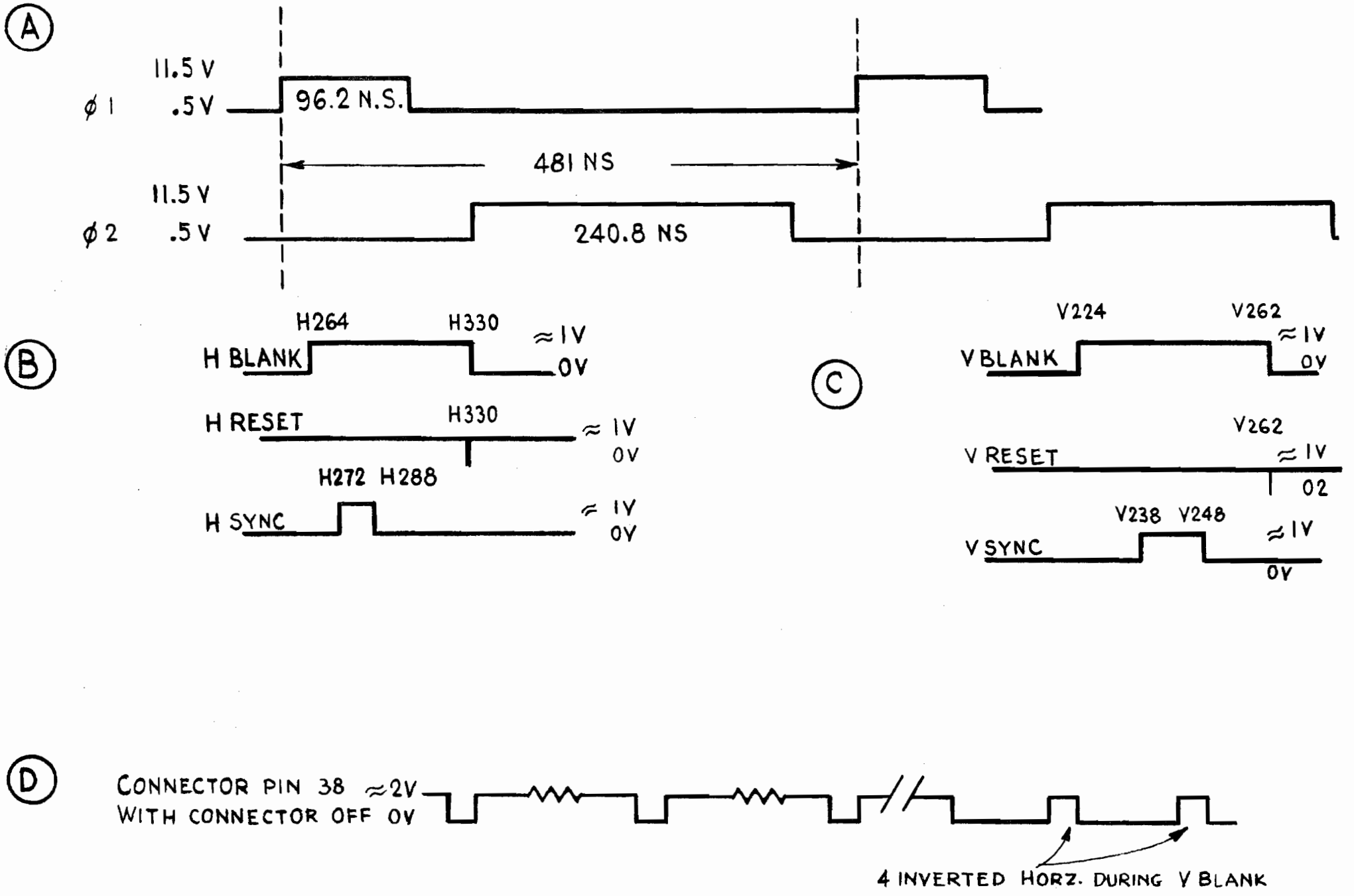

A
11.5 V
φ1 .5 V
96.2 N.S.
481 NS
11.5 V
φ2 .5 V
240.8 NS
B
H264
H330
≈1V
H BLANK
0V
H RESET
H330
≈1V
0V
H272 H288
H SYNC
≈1V
0V
C
V224
V262
≈1V
V BLANK
0V
V262
V RESET
≈1V
02
V238 V248
V SYNC
≈1V
0V
D
CONNECTOR PIN 38 ≈2V
WITH CONNECTOR OFF 0V
4 INVERTED HORZ. DURING V BLANK

FIG. 4

BLOCKADE PARTS LIST

DESCRIPTION	PART NUMBER	QTY. USED
ANCHOR WASHER	280-0028	1
ASSY, CONTROL BLOCK	807-0007	1
CABLE TIE	280-0005	10
CONN, CRIMP COINBOX	211-0001	6
CONN, CRIMP LOCK	211-0005	14
CONN, FEM 4 PIN BLK	212-0005	2
CONN, FSM 10 PIN	212-0016	1
CONN, KEY, POLARIZING	211-0007	4
CONN, SPADE LUG 1/4"	211-0019	2
DECAL, VOLUME CONTROL	420-0031	1
KNOB, VOLUME CONTROL	240-0001	1
POT, 10K	475-0007	1
SWITCH BRACKET	250-0031	1
SWITCH, SINGLE POLE, 4 POS.	511-0003	1
SWITCH, SLIDE, SPOT	510-0014	1
ASSY, JUMPER HARNESS	807-0006	1
CONN, CRIMP LOCK	211-0005	16
CONN, FEM 10 PIN	212-0016	2
CONN, KEY, POLARIZING	211-0007	4
ASSY, JUNCTION BOX	807-0009	1
BUSHING, STRESS/RELIEF	280-0007	2
CONN, QUICK 1/4" FEM	211-0017	2
CONN, QUICK 3/16" FEM	211-0022	4
CONN, SPADE LUG 1/4"	211-0019	14
CORD, LINE, 3 COND.	600-0001	1
FUSE, 2 AMP. 250v SB	514-0001	1
HOLDER, FUSE	514-0005	1
JUNCTION BOX	140-0016	1
JUNCTION BOX COVER	140-0017	1
SWITCH, SPDT CHERRY	510-0013	1
TERMINAL STRIP 6 POS.	280-0011	1
TERMINAL STRIP MARKER	280-0017	1
ASSY, MONITOR HARNESS	807-0005	1
CONN, CRIMP LOCK	211-0005	2
CONN, FEM 4 PIN BLK	212-0005	1
CONN, KEY, POLARIZING	211-0007	2
CONN, PIN CRIMP, FEM	211-0026	5
CONN, SPADE LUG 1/4"	211-0019	3

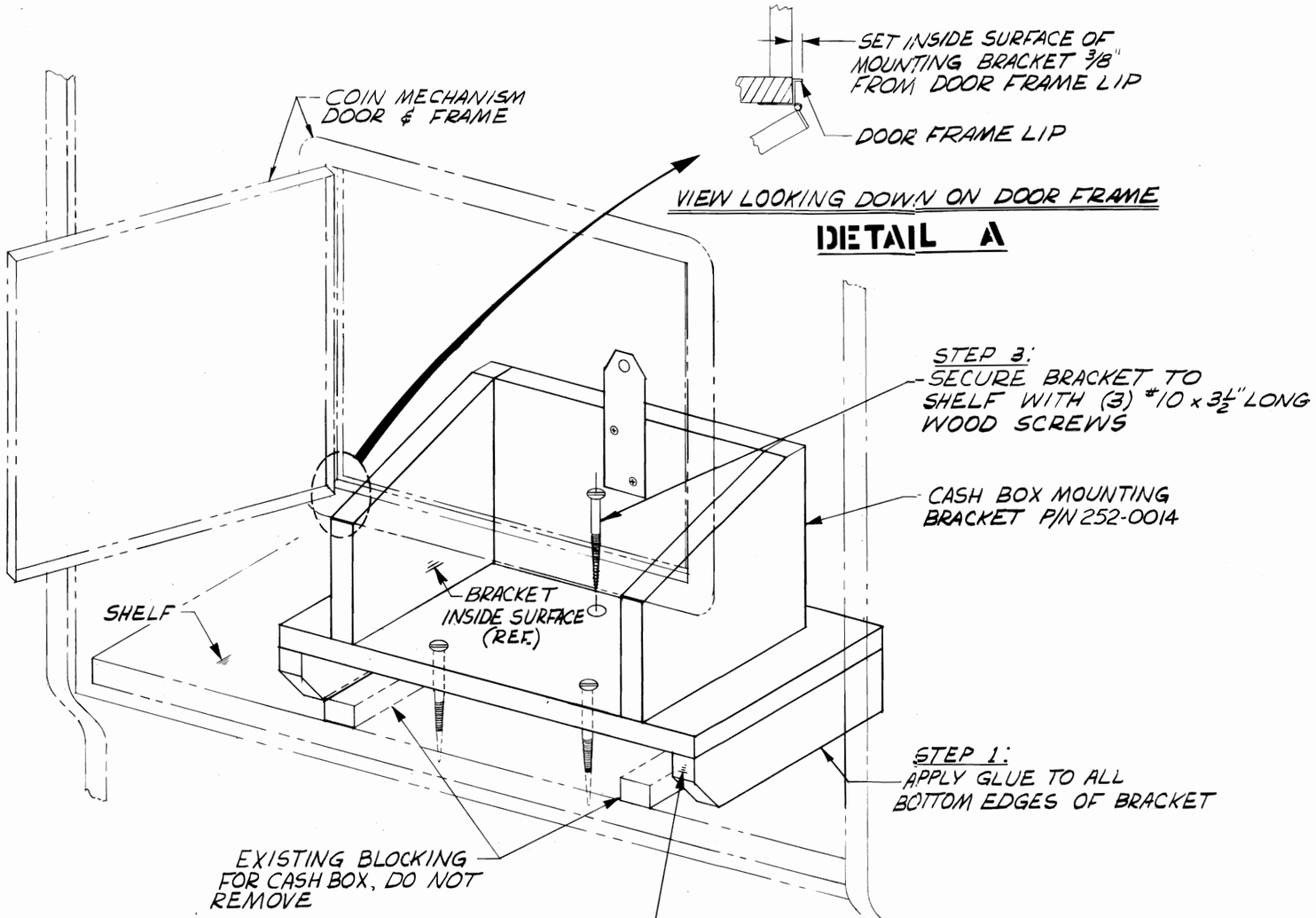
BLOCKADE PARTS LIST (Cont'd.)

DESCRIPTION	PART NUMBER	QTY. USED
ASSY, OPERATOR SWITCH	807-0004	1
CABLE TIE	280-0005	10
CONN, CRIMP LOCK	211-0005	9
CONN, FEM 10 PIN	212-0016	1
CONN, KEY POLARIZING	211-0007	1
CONN, QUICK, 1/4" FEM	211-0017	16
CONN, SPADE LUG 1/4"	211-0019	2
SWITCH, P/BUTTON, UNIMAX	510-0012	8
SWITCH, PLATE	250-0029	2
ASSY, POWER INTERRUPT	807-0012	1
ASSY, POWER SUPPLY	807-0003	1
ASSY, SPEAKER CABLE	807-0010	1
CONN, CRIMP LOCK	211-0005	2
CONN, FEM 4 PIN BLK	212-0005	1
CONN, KEY, POLARIZING	211-0007	2
CONN, QUICK 3/16" FEM	211-0022	2
ASSY, VIDEO LOGIC B/A	807-0001	1
BEZEL FRAME	250-0032	1
CABINET B/A	140-0014	1
CABINET FEET	280-0030	4
CASH BOX	220-0012	1
CASH BOX, LOCKING ASSY	252-0014	1
CLIP, WIRE HOLD DOWN	280-0004	35
COIN COUNTER ASSY	807-0011	1
CONN, CRIMP LOCK	211-0005	2
CONN, FEM 10 PIN	212-0016	1
CONN, KEY, POLARIZING	211-0007	1
COUNTER, DIGITAL	220-0008	1
CORNER STRIP	420-0037	4
DECAL, BLOCKADE	420-0032	1
DECAL, CAUTION 115V	420-0030	1
DECAL, IMPORTANT NOTE	420-0038	2
DECAL, RE-CYCLE	420-0040	1
DECAL, SERIAL NUMBER	420-0028	1
DECAL, SERIAL NUMBER, SMALL	420-0041	1
DECAL, SERVICE	420-0029	1
DRAWINGS, BLOCKADE	420-0042	1
DUAL COIN MECHANISM	220-0010	1
LAMP, FLUORESCENT, 18"	390-0011	1
LAMP, FLUORESCENT, 18", (FIXTURE)	390-0012	1
LATCH, LOCK B/A	220-0015	1

BLOCKADE PARTS LIST (Contd.)

DESCRIPTION	PART NUMBER	QTY. USED
LOCK, PANEL	320-0009	1
MASK, SHADOW CABINET	253-0014	1
MONITOR SCREEN	253-0012	1
NUT, WIRE	280-0010	2
PANEL, DISPLAY UPPER	253-0013	1
PANEL, FRONT SWITCH	250-0030	1
PLATE, LOCK STRIKE	250-0033	1
SPEAKER COVER 6 x 9	130-0002	1
SPEAKER, GAME	130-0001	1
SPRING, RETAINER	250-0034	1
SWITCH, LIP	250-0048	1
SWITCH, SLAM W/PLATE	510-0016	1
TOP COVER	420-0035	1
VIDEO MONITOR 19"	200-0002	1
WRAP AROUND SIDE	420-0034	1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



VIEW LOOKING DOWN ON DOOR FRAME

DETAIL A

STEP 3:
SECURE BRACKET TO SHELF WITH (3) #10 x 3½" LONG WOOD SCREWS

CASH BOX MOUNTING BRACKET P/N 252-0014

STEP 1:
APPLY GLUE TO ALL BOTTOM EDGES OF BRACKET

STEP 2:
SET FRONT EDGE OF BRACKET AGAINEST BACK SIDE OF FRONT PANEL TO DIMENSION SHOWN IN DETAIL "A" ABOVE

VIEW LOOKING AT FRONT OF CAB.

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 ± 1/16" DECIMALS .XX ± .01 .XXX ± .005 ANGLES ± ½°

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO. BLOCKADE

APPROVALS	DATE
DRAWN G. SMITH	3/10/77
CHECKED U. Olsen	3-10-77

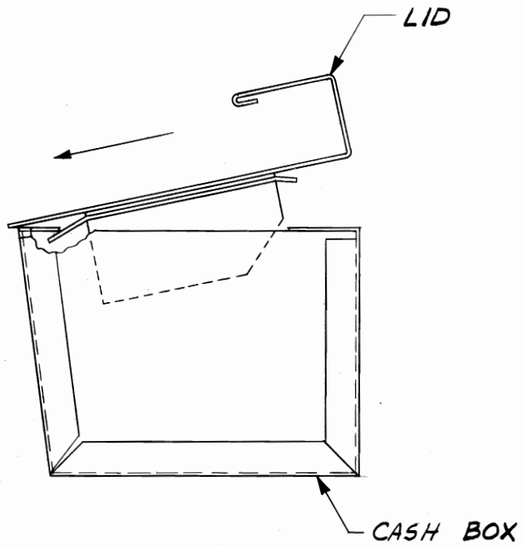
Gremlin Industries, Inc.
San Diego, California 92123

MOUNTING BRACKET INSTALLATION CASH BOX

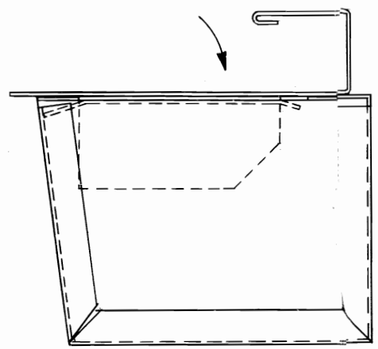
SIZE	CODE IDENT NO.	DRAWING NO.
D		SERVICE NOTE #5

SCALE NONE SHEET / OF 2

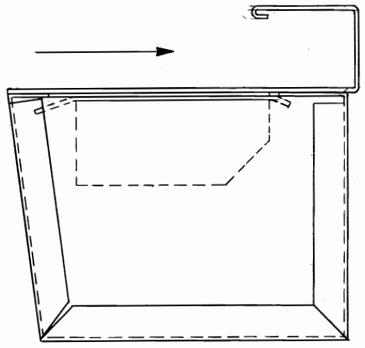
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



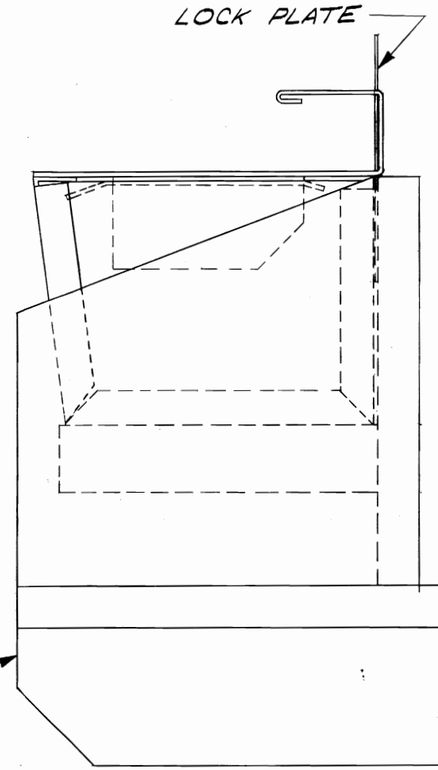
STEP 1: PLACE LID IN POSITION SHOWN OVER CASH BOX AND PUSH DOWN IN DIRECTION OF ARROW



STEP 2: LOWER LID INTO CASH BOX



STEP 3: SLIDE LID IN DIRECTION OF ARROW AS FAR BACK AS POSSIBLE



STEP 4: SET CASH BOX INTO MOUNTING BRACKET MAKING SURE LOCK PLATE FITS INTO SLOT IN CASH BOX LID.

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: NONE
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO. BLOCKADE

APPROVALS	DATE
DRAWN G. SMITH	2/10/77
CHECKED U.O.	2-10-77

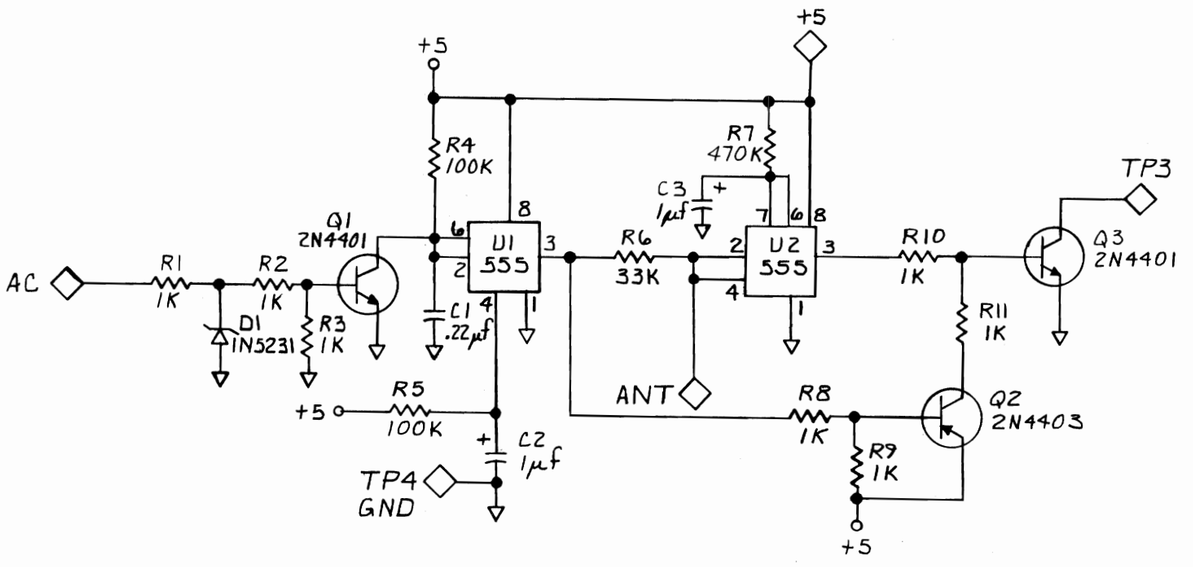
Gremlin Industries, Inc.
San Diego, California 92123

CASH BOX OPERATION

SIZE	CODE IDENT NO.	DRAWING NO.
D		SERVICE NOTE #5

SCALE NONE SHEET 2 OF 2

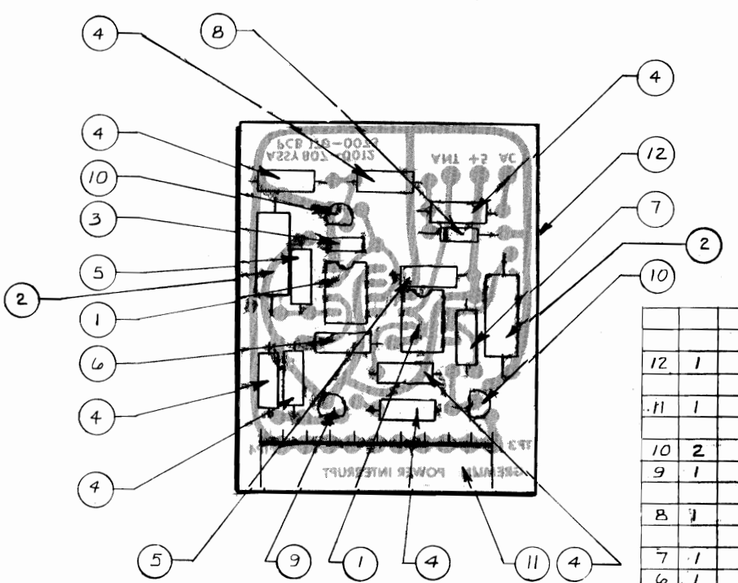
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX ± ± .XXX ±	CONTRACT NO.	GREMLIN INDUSTRIES INC. 8401 AERO DR. SAN DIEGO, CA. 92123	
MATERIAL	APPROVALS / DATE	SCHEMATIC — POWER INTERRUPT	
FINISH	DRAWN Wigmans 12/27/76	SIZE B	CODE IDENT NO.
NEXT ASSY / USED ON	CHECKED	DRAWING NO. 807-0012	
APPLICATION	DO NOT SCALE DRAWING	SCALE NONE	SHEET 1 OF 1

BISHOP GRAPHICS, INC. REORDER NO. 20503

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

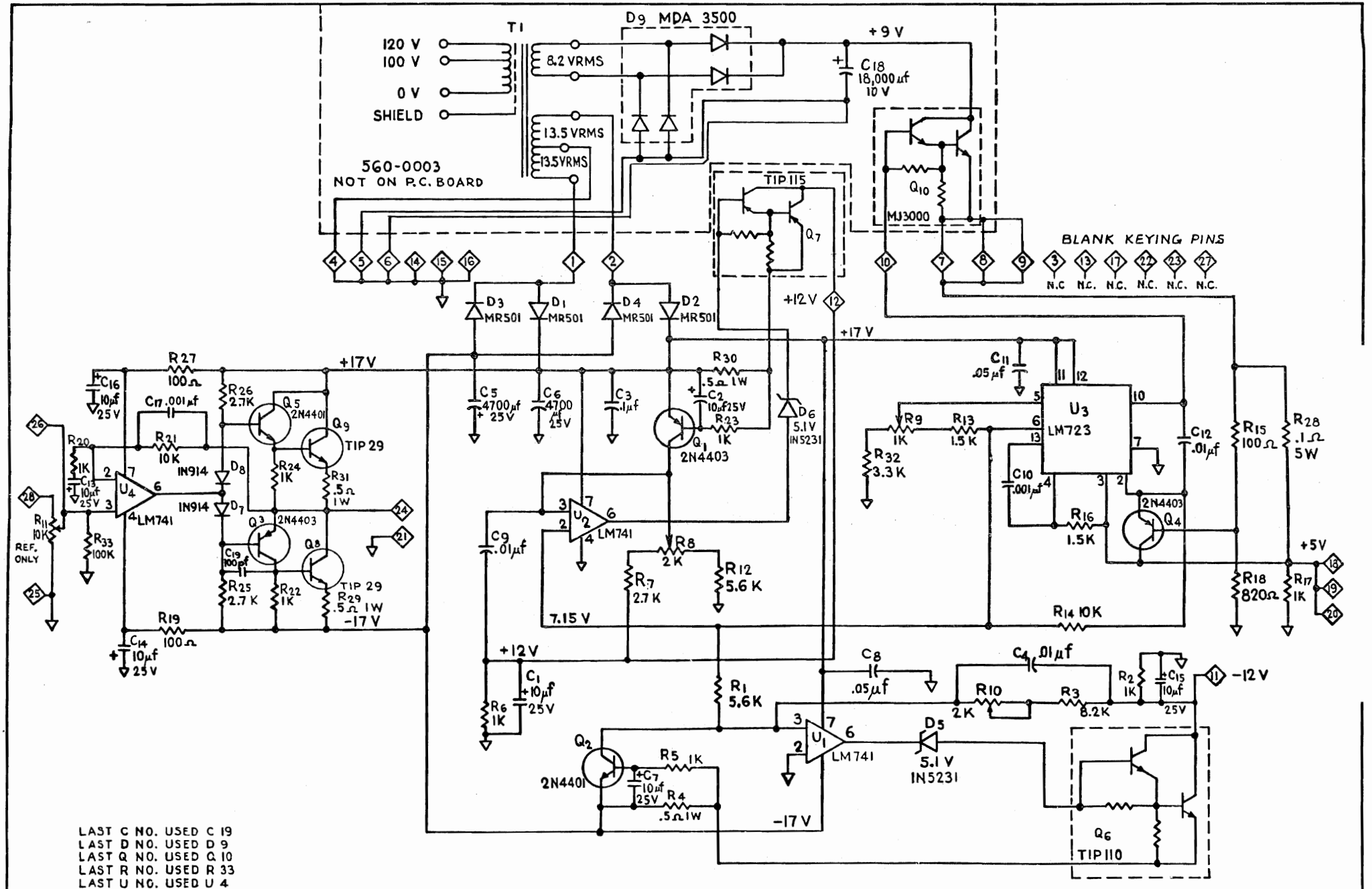


ITEM NO.	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	
12	1		170-0073	P.C. BOARD	
11	1		212-0017	CONN FEMALE 10PIN RT ANGLE	
10	2		482-0014	TRANSISTOR 2N4401	Q1,Q3
9	1		482-0006	TRANSISTOR 2N4403	Q2
8	1		481-0008	DIODE ZENER IN5231	D1
7	1		471-0474	RES. 470K OHM 1/2W 5%	R7
6	1		471-0333	RES. 33K OHM 1/2W 5%	R6
5	2		471-0104	RES. 100K OHM 1/2W 5%	R4,R5
4	7		471-0102	RES. 1K OHM 1/2W 5%	R1-R3,R8-R10
3	1		132-0002	CAP. F. .22M 100V	C1
2	2		150-0016	CAP. E. 1M 16V	C2,C3
1	2		314-0001	IC TIMER NE555	U1,U2

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX ± ± .XXX ±	CONTRACT NO.	GREMLIN INDUSTRIES INC. 8401 AERO DR. SAN DIEGO, CA. 92123	
MATERIAL	APPROVALS / DATE	POWER INTERRUPT ASSY PARTS OVERLAY	
FINISH	DRAWN Wigmans 12/27/76	SIZE C	CODE IDENT NO.
NEXT ASSY / USED ON	CHECKED	DRAWING NO. 807-0012	
APPLICATION	DO NOT SCALE DRAWING	SCALE NONE	SHEET 1 OF 1

BISHOP GRAPHICS, INC. REORDER NO. 20504



LAST C NO. USED C 19
LAST D NO. USED D 9
LAST Q NO. USED Q 10
LAST R NO. USED R 33
LAST U NO. USED U 4

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

REVISIONS	TITLE	
	SCHEMATIC BLOCKADE PWR. SUPPLY	
DRAWN Joe M. CHECKED	SCALE	DRAWING NO.
APPROVED	NONE	807-0002A

REV B PER ECN 63 WJB 2/15/77

T1
120 V
100 V
0 V
SHIELD
8.2 VRMS
13.5 VRMS
13.5 VRMS
560-0003 A
NOT ON P.C. BOARD

D9 MDA 3500

+9 V
C18 9,000 µf 12V

TIP115
Q7
Q10
MJ3000

BLANK KEYING PINS
3 N.C
13 N.C.
17 N.C.
22 N.C.
23 N.C.
27 N.C.

D3 MR501
D1 MR501
D4 MR501
D2 MR501

+12 V
+17 V

R27 100Ω
C16 10µf 25V
C17 .001µf
R26 2.7K
Q5 2N4401
Q9 TIP 29
R20 1K
R21 10K
IN914 D8
IN914 D7
C13 10µf 25V
U4 LM741EN
R24 1K
R31 1Ω 1W
Q3 2N4403
Q8 TIP 29
C19 100pf
R25 2.7 K
R22 1K
R29 1Ω 1W
-17 V
R19 100Ω
C14 10µf 25V
R11 10K REF. ONLY
R33 100K

C5 4700µf 25V
C6 4700µf 25V
C3 .1µf
R30 1Ω 1W
C2 10µf 25V
R23 1K
Q1 2N4403
D6 5.1V IN5231

C11 .05µf
U3 LM723
R9 1K
R13 1.5 K
R32 3.3 K
C10 .001µf
R16 1.5K
2N4403 Q4
C12 .01µf
R15 100Ω
R28 .1Ω 5W
+5V
R18 1.5K
R17 1K
R14 10K

U2 LM741EN
C9 .01µf
R8 2K
R7 2.7 K
R12 5.6 K
7.15 V

+12V
C1 +10µf 25V
R6 1K
R1 5,6K

C8 .05µf
C4 .01µf
R10 2K
R3 8.2K
R2 1K
C15 10µf 25V
-12 V

Q2 2N4401
R5 1K
C7 10µf 25V
R4 1Ω 1W
U1 LM741EN
D5 5.1 V IN5231
-17 V
Q6 TIP110

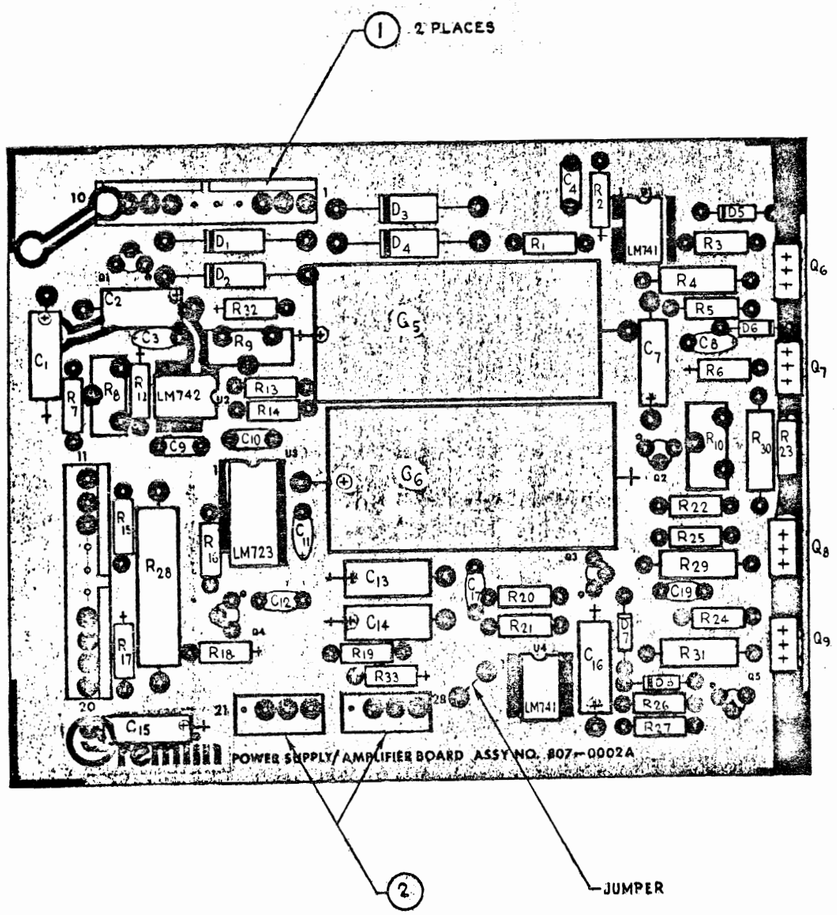
LAST C NO. USED C 19
LAST D NO. USED D 9
LAST Q NO. USED Q 10
LAST R NO. USED R 33
LAST U NO. USED U 4

GREMLIN INDUSTRIES INC.
8401 AERO DR. SAN DIEGO, CA. 2

REVISIONS	TITLE: SCHEMATIC BLOCKADE PWR. SUPPLY
DRAWN Joe M. CHECKED	SCALE: NONE
APPROVED	DRAWING NO. 807-000

BISHOP GRAPHICS Inc. REORDER NO. 20656

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



OMIT R11

ITEM NO.	QTY	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
2	2	212 - 0004	CONN. MALE 4 PIN
1	2	212 - 0003	CONN. MALE 10 PIN
P.C.B. 1	1	170 - 0058A	P.C. BOARD
Q8 Q9	2	482 - 0016	XISTOR TIP 29
Q7	1	482 - 0015	XISTOR TIP 115
Q6	1	482 - 0013	XISTOR TIP 110
Q2 Q5	2	482 - 0014	XISTOR 2N4401
Q1 Q3 Q4	3	482 - 0006	XISTOR 2N4403
D7 D8	2	481 - 0006	DIODE IN914 OR IN4148
D5 D6	2	481 - 0008	DIODE ZENER IN5231
D1-D4	4	481 - 0004	DIODE MR 501
C19	1	151 - 0002	CAP. CER. 100 P 50 V
C10 C17	2	151 - 0008	CAP. CER. .001 M 50 V
C8 C11	2	151 - 0001	CAP. CER. .05 M 50 V
C5 C6	2	150 - 0019	CAP. E. 4700 M 25 V
C4 C9 C12	3	151 - 0011	CAP. CER. .01 M 50 V
C3	1	151 - 0012	CAP. CER. .1 M 50 V
C1 C2 C7 C13 C14-C16	7	150 - 0004	CAP. E. 10 M 25 V
R9	1	475 - 0004	POT. 1 K TRIMMER
R8 R10	2	475 - 0005	POT. 2 K TRIMMER
R28	1	473 - 00R1	RES. .1 OHM 5 W 3%
R18	1	471 - 0821	RES. 820 OHM ½ W 5%
R15 R19 R27	3	471 - 0101	RES. 100 OHM ½ W 5%
R4 R29 - R31	4	472 - 00R5	RES. 0.5 OHM 1 W 5%
R33	1	471 - 0104	RES. 100 K OHM ½ W 5%
R32	1	471 - 0332	RES. 3.3 K OHM ½ W 5%
R14 R21	2	471 - 0103	RES. 10 K OHM ½ W 5%
R13 R16	2	471 - 0152	RES. 1.5 K OHM ½ W 5%
R7 R25 R26	3	471 - 0272	RES. 2.7 K OHM ½ W 5%
R3	1	471 - 0822	RES. 8.2 K OHM ½ W 5%
R2 R5 R6 R17 R20 R22 - R24	8	471 - 0102	RES. 1 K OHM ½ W 5%
R1 R12	2	471 - 0562	RES. 5.6 K OHM ½ W 5%
U3	1	313 - 0001	I.C. LM 723
U1 U2 U4	3	313 - 0004	I.C. LM 741

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 Joe M.	11-18-76
CHECKED	

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

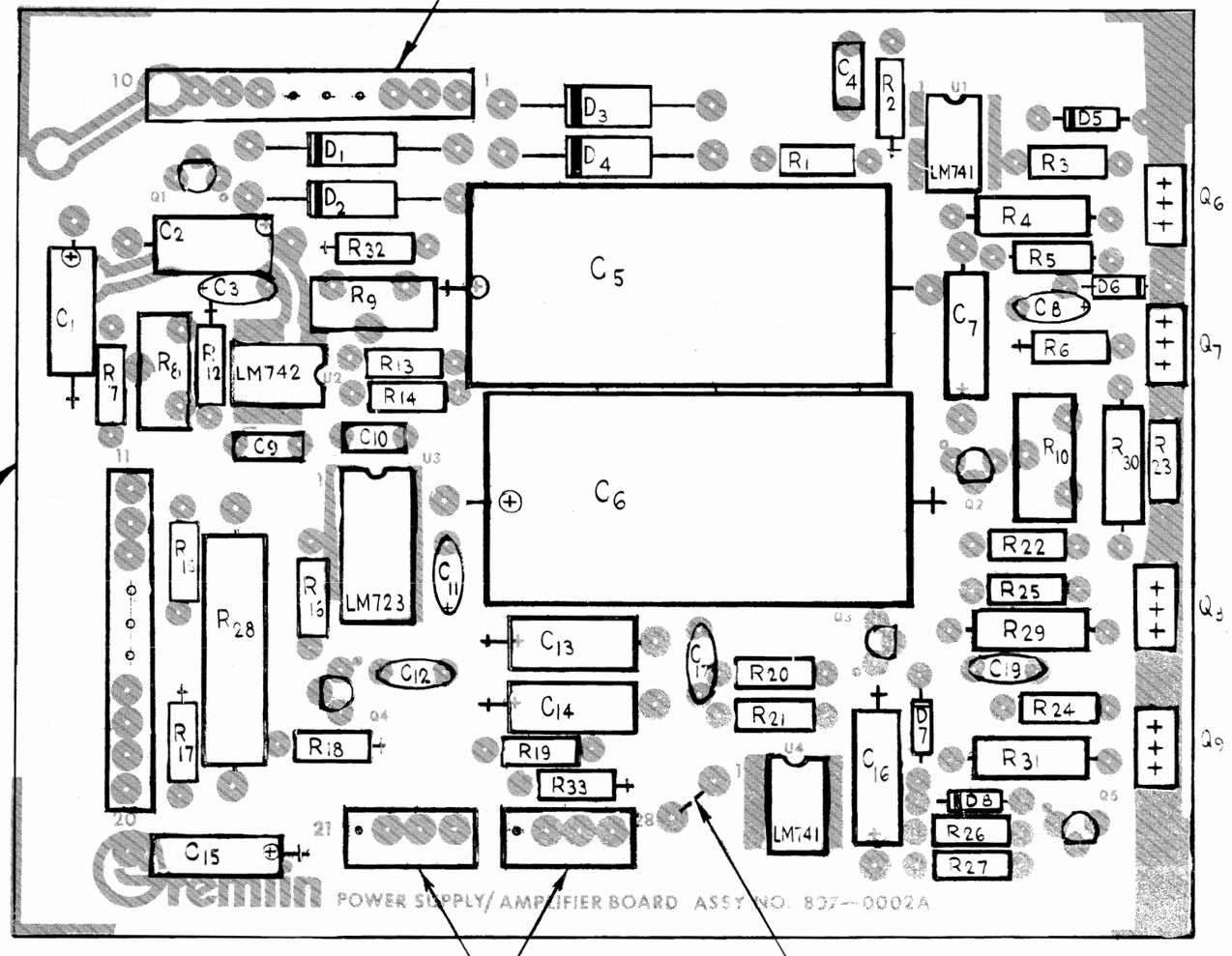
POWER SUPPLY/AMP. BOARD
BLOCKADE
PARTS OVERLAY

SIZE	CODE IDENT NO.	DRAWING NO.
D		807-0002A

SCALE 2 X | SHEET 1 OF 1

807-0002 A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	B	PER ECN 63 WJB	2/15/77	



ITEM NO.	QTY	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
3	2	212 - 0004	CONN. MALE 4 PIN
2	2	212 - 0003	CONN. MALE 10 PIN
1	1	170 - 0058A	P.C. BOARD
Q8Q9	2	482 - 0016	XISTOR TIP 29
Q7	1	482 - 0015	XISTOR TIP 115
Q6	1	482 - 0013	XISTOR TIP 110
Q2Q5	2	482 - 0014	XISTOR 2N4401
Q1Q3Q4	3	482 - 0006	XISTOR 2N4403
D7 D8	2	481 - 0006	DIODE IN914 OR IN4148
D5 D6	2	481 - 0008	DIODE ZENER IN5231
D1-D4	4	481 - 0004	DIODE MR 501
C18	1	151 - 0002	CAP. CER. 100 P 50 V
C16 C17	2	151 - 0008	CAP. CER. .001 M 50 V
C8 C11	2	151 - 0001	CAP. CER. .05 M 50 V
C5 C6	2	150 - 0019	CAP. E. 4700 M 25 V
C4 C9 C12	3	151 - 0011	CAP. CER. .01 M 50 V
C3	1	151 - 0012	CAP. CER. .1 M 50 V
C1C2C7C13 C14-C16	7	150 - 0004	CAP. E. 10 M 25 V
R9	1	475 - 0004	POT. 1 K TRIMMER
R5 R10	2	475 - 0005	POT. 2 K TRIMMER
R23	1	473 - 0081	RES. .1 OHM 5 W 3%
R15 R19 R27	3	471 - 0101	RES. 100 OHM ½ W 5%
R4 R29 - R31	4	472 - 0010	RES. 1 OHM 1 W 5%
R33	1	471 - 0104	RES. 100 K OHM ½ W 5%
R32	1	471 - 0332	RES. 3.3 K OHM ½ W 5%
R14 R21	2	471 - 0103	RES. 10 K OHM ½ W 5%
R13 R16 R18	3	471 - 0152	RES. 1.5 K OHM ½ W 5%
R7 R25 R26	3	471 - 0272	RES. 2.7 K OHM ½ W 5%
R3	1	471 - 0822	RES. 8.2 K OHM ½ W 5%
R2 R8 R17 R20 R22 - R24	8	471 - 0102	RES. 1 K OHM ½ W 5%
R1 R12	2	471 - 0562	RES. 5.6 K OHM ½ W 5%
U3	1	313 - 0001	I.C. LM 723
U1 U2 U4	3	313 - 0004	I.C. LM 741 EN

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 Joe M.	11-18-76
CHECKED	

NEXT ASSY | USED ON
APPLICATION

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

POWER SUPPLY/AMP BOARD
BLOCKADE
PARTS OVERLAY

SIZE	CODE IDENT NO.	DRAWING NO.
D		807-0002E

SCALE 2 X | SHEET 1 OF 1

807-0002 D

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

VIDEO LOGIC CONN.

BLK
KEYING PIN
COIN COUNTER
GND
GRN
GRN
FRONT PANEL CHASSIS GND
BLK
FRONT PANEL
BRN
RED
ORN
YEL
PUR
BLU
KEYING PIN
GRY
WHT
BLK
BRN
RED
ORN
YEL
WHT
BLU
PUR
GRY
KEYING PIN
BLK
GRN
YEL
+5 BLU
KEYING PIN
ORG
VIO
GND RED
KEYING PIN
+12 GRY
-12 BRN
BLK
KEYING PIN
BRN
KEYING PIN
KEYING PIN
KEYING PIN
KEYING PIN
KEYING PIN
KEYING PIN
KEYING PIN
KEYING PIN
N.C.
K.P.
POWER SUPPLY CONN

NO. COM
P1 UP
P1 RIGHT
P1 DOWN
P1 LEFT
P2 UP
P2 RIGHT
P2 DOWN
P2 LEFT

P1 IS THE LEFT PLAYER FACING THE GAME.

P2 IS THE RIGHT PLAYER FACING THE GAME.

COIN MECH GND

OFF
S1
BOOM
ON

S2
3
4
5
6
GAME END

S3
N.O.
COM
BLUE
N.C.
S4
N.O.
COM
N.C.

S1, S2, S3, S4, S5 ARE MOUNTED ON COIN MECH DOOR

GRN
S5
N.O.
WHT

VOLUME CONTROL
1
3
2

SPEAKER
8Ω
5"X 9"
BLK
BRN

SHIELDED WIRE

GRN

TRANSFORMER
120V ③ SMOOTH
100V ②
0V ① RIBBED
SHIELD ⓞ GRN

SMOOTH
RIBBED
TRIGGER START SINGLE
18 INCH FLUORESCENT LAMP

POWER PLUG BACK VIEW
GRN

WHT
BLK
GRN

1 2 3 4 5 6
2 AMP SLO-BLO
N.C.
COM
N.O.
INTERLOCK SWITCH
POWER BOX

1 4 7 10
2 5 8 11
3 6 9 12
211-0025
19 INCH MONITOR

YEL TO TRANSFORMER PIN 8
RED TO +5 END OF R28 ON POWER SUPPLY/AMP. BD

POWER INTERRUPT 807-0012
⑨ TO TP3 ON VIDEO LOGIC BD.
③ TO TP4 ON VIDEO LOGIC BD.

S2
3
4
5
OFF

ALTERNATE WIRING FOR 3 POS-OFF SWITCH

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	11/5/76
CHECKED	

NEXT ASSY | USED ON
APPLICATION

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

SCHEMATIC — BLOCKADE CABINET WIRING

SIZE D | CODE IDENT NO. | DRAWING NO. 707-0001

SCALE NONE | SHEET 1 OF 1

707-0001

POWER SUPPLY ASSY. P/N 807-0002-A

JUNCTION BOX ASSY. P/N 807-0009A

INTLK SWITCH

FUSE

6 VOLT COIN COUNTER P/N 220-0008

19" MONITOR CHASSIS

DUAL COIN MECH. P/N 220-0010

OPERATOR SWITCH ASSY. P/N 807-0004

REAR VIEW

OPERATOR SWITCH ASSY. P/N 807-0004

FLUORESCENT LAMP FIXTURE, 18" P/N 390-0012

SPEAKER, OVAL 6" x 9" P/N 130-0001

2 COND. SHIELDED WIRE

VIDEO LOGIC BOARD ASSY. P/N 807-0001

SINGLE COND. SHIELDED WIRE

SIDE VIEW OF JUNCTION BOX

TO MONITOR, WHT

TO MONITOR, GRN

2 BLK. TO LAMP

BLK TO MONITOR

TO TRANFORMER

TO OPERATOR SWITCH ASSY

TO CONTROL BLOCK ASSY

CONTRACT NO.		GREMLIN INDUSTRIES INC. 8401 AERO DR. SAN DIEGO, CA. 92123	
APPROVALS	DATE	CABINET WIRING BLOCKADE	
DRAWN			
CHECKED Joe M.	11-18-76		
SIZE D	CODE IDENT. NO.	DRAWING NO. 707-0001	
SCALE NONE		SHEET 1 OF 1	