
FRONTLINE
TM
TAITO
TAITO AMERICA CORPORATION
©MCMLXXXIII

FRONT LINE

- MANEUVER YOUR SOLDIER TO SHOOT ENEMY SOLDIERS.
- DODGE ENEMY SOLDIERS, BULLETS, AND GRENADES. WATCH OUT FOR LAND MINES.
- USE GRENADES AND TANK BUTTON TO JUMP IN YOUR TANK AND DESTROY ENEMY TANKS ATTACKING.
- WATCH OUT FOR GRENADES BEING THROWN AT YOUR TANK FROM FOX HOLES.
- JUMP IN LARGER TANK FOR EVEN MORE PROTECTION AND HEAVEIR ARTILLERY FIRE.
- DESTROY ENEMY AND TAKE OVER THE FORT.
- USE THE GRENADE/TANK BUTTON TO GET OUT OF THE TANK.

1 COIN 1 CREDIT

FRONT LINE™

TAITO 1982 Trade Marks of Taito America Corporation

72-00034-001

"FRONT LINE"™ UPRIGHT

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1. GAME SET-UP

A. INTRODUCTION

"FRONT LINE"™ upright is Taito America Corporation's newest action war game.

Traveling through enemy territory the player must accomplish the ultimate mission or meet a violent end: capture the enemy fort and win total victory.

The journey begins slowly with the player armed with a gun (special "Gun Control") and hand grenades. Quickly he becomes a target for enemy soldiers who also have guns and grenades. Moving faster, he races past trees that hide the enemy who now unleash an ambush barrage of bullets and bombs. Even the ground he races over has been booby-trapped with land mines.

If the player successfully makes it through this deadly obstacle course, he meets an even greater challenge . . . the enemy is attacking with tanks! His gun now useless, the player can stand and fight with grenades or leap into his own tank (special "Tank" button) and counter attack.

The battle rages on all fronts as the player fights for his life, racing for cover behind brick walls while outrunning grenades thrown by soldiers in fox holes. It's all-out war when the player jumps from his tank into a larger one with greater firepower.

Now comes the final test of victory as the enemy's fort looms in sight. The player must leap from the tank and run through a hail of bullets to throw one final grenade. The white flag heralds total victory!

B. GAME INSPECTION

TAITO AMERICA'S CORPORATION'S "FRONT LINE"™ upright game is ready to play when received. However, careful inspection is necessary to insure your game is in perfect condition. Please verify the following before turning the game on.

* Examine external parts for chips, dents, or broken parts.
* Open the service door and examine the following:
    * Plug-in connectors to make sure they are firmly seated.
    * Speaker
    * Player Controls
    * Printed Circuit Boards making sure there is no damage to the components.
    * Check for loose foreign objects, especially metal objects which may cause electrical problems.
    * Fuses, making sure they are firmly in the holders.
    * Coin Mechanisms

The Video Monitor is properly adjusted before shipping. If there are any adjustments necessary refer to our Video Monitor Manual (72-00035-001).

If problems occur or technical assistance is required, contact our Customer Service Department HOT LINE Toll Free 800-323-0666 (except Illinois). Illinois phone 312 981-1000 X215.

POWER REQUIREMENTS

TAITO AMERICA CORPORATION'S "FRONT LINE"™ upright game is shipped ready for operation at 120VAC, 60Hz with a power consumption of approximately 250 Watts.

CAUTION

For safe operation it is recommended the cabinet be grounded. This game is equipped with a three conductor power cable. The third conductor is the ground conductor and when the cable is plugged into an appropriate receptable, the game is grounded. The offset pin on the power cable's three-prong connector is the ground connection.

LOCATION SPACE REQUIREMENTS

Depth - 35" (87.5cm)
Width - 24" (61cm)
Height - 68" (171cm)
Weight - 300 lbs.
(Packaged Weight)

C. GAME INSTALLATION

The following precautions should be followed when installing the game.

* Avoid rough handling of the game, the picture tube is fragile.
* Install the game on a level surface.
* Avoid installing the game where it may receive excessive sunlight or heat, to prevent the game from rising internal temperature.
* Do not install in a damp or dusty location.
* For a short time after connecting the power to the game, the picture may be temporarily distorted.

D. DIP SWITCH AND VOLUME CONTROL SETTINGS

DIP SWITCHES

Taito America Corporation's "Front Line" game provides the following option switches. See Figure 1. These option switches can be found on the Game Board (99-AA017808).

Dip Switch A

SETTING	POSITION	1	2	3	4	5	6	7	8
Points For Adding one Soldier	10,000	OFF	OFF						
	20,000	ON	OFF						
	30,000	OFF	ON						
	50,000	ON	ON						
Free Play	Normal			OFF					
	Free Play			ON					
No. of Soldiers	3				OFF	OFF			
	5				ON	OFF			
	5				OFF	ON			
	6				ON	ON			
Test Mode	Normal						OFF		
	Test						ON		
Screen Inversion								OFF	
								ON	
Game Style	Table								OFF
	Upright								ON

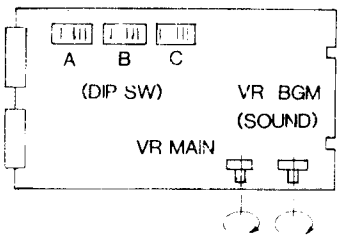
Dip Switch B

	POSITION							
	1 - WAY				2 - WAY			
Play Pricing	1	2	3	4	5	6	7	8
1 Coin - 1 Play	ON	ON	ON	ON	ON	ON	ON	ON
1 Coin - 2 Plays	OFF	ON	ON	ON	OFF	ON	ON	ON
1 Coin - 3 Plays	ON	OFF	ON	ON	ON	OFF	ON	ON
2 Coins - 1 Play	ON	ON	ON	OFF	ON	ON	ON	OFF
3 Coins - 1 Play	OFF	ON	ON	OFF	OFF	ON	ON	OFF
4 Coins - 1 Play	ON	OFF	ON	OFF	ON	OFF	ON	OFF

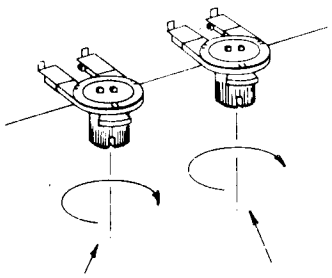
Dip Switch C

SETTING	POSITION	1	2	3	4	5	6	7	8
Coinage Display	With					OFF			
	Without					ON			
Year Display	With						OFF		
	Without						ON		
No Hit	Normal							OFF	
	No Hit							ON	
Coin Way	2-Ways								OFF
	1-WAY								ON

OPTION SWITCH
FIGURE 1



VOLUME CONTROL LOCATIONS
FIGURE 2



VOLUME CONTROL SETTING

The Volume increases by turning the potentiometer as indicated in Figure 2.

2. MAINTENANCE

All games require a certain amount of maintenance to keep them in good condition. A periodic check of mechanical controls would be beneficial to guarantee your game will be profitable.

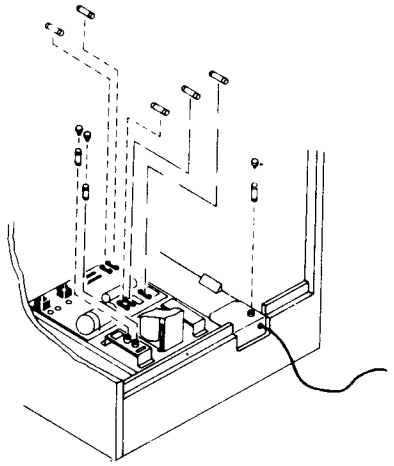
A. CLEANING

The exterior of the game, all metal parts and all plastic parts can be cleaned with an non-abrasive cleanser. Caution should be used when cleaning the plastic, a dry cloth can cause scratches and result in a foggy appearance.

B. FUSE REPLACEMENT

This game contains 8 fuses. Seven of these fuses can be found on the Power Supply Assembly, five (5) are on the PCB and two (2) are on the Power Supply Bracket. One (1) is located at the bracket where the AC line cord comes into the cabinet. See Figure ( ) for location of these fuses.

FUSE REPLACEMENT
FIGURE 3



C. VIDEO MONITOR REMOVAL

If you need to remove the Video Monitor, follow the Instructions listed below.

CAUTION

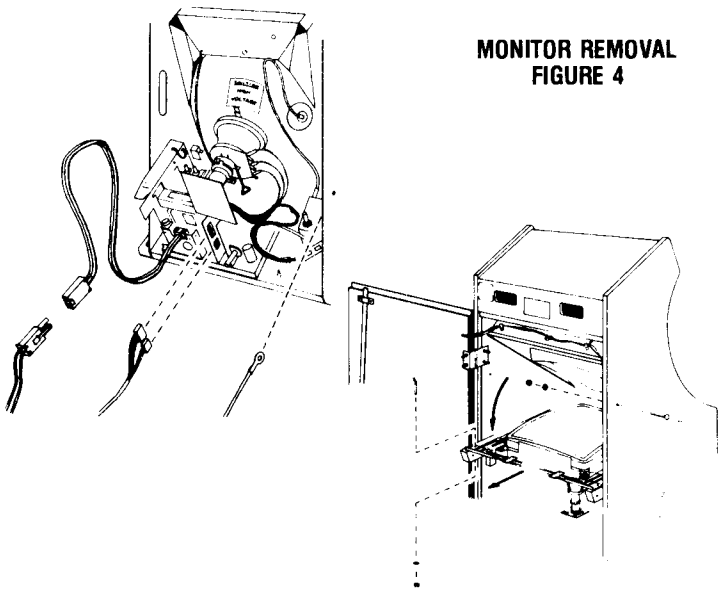
It is recommended the game be left disconnected for at least one hour before removing the Video Monitor. This will probably discharge the Video Tube but EXTREME CAUTION is still necessary.

* Disconnect power from the line voltage.
* Disconnect the Monitor cable connector.
* Remove the wire cable clamp.
* Take out the two side bolts, one on each side of the cabinet.
* Remove the four mounting bolts and disconnect the green ground wire.
* Slide the Monitor out by pulling the Monitor toward you.

CAUTION

Use extreme caution and do not touch electrical parts of the Monitor Yoke area with your hands or with any metal object in your hands! High voltages may exist in any Monitor, even with power disconnected.

MONITOR REMOVAL
FIGURE 4



D. VIDEO MONITOR ADJUSTMENTS

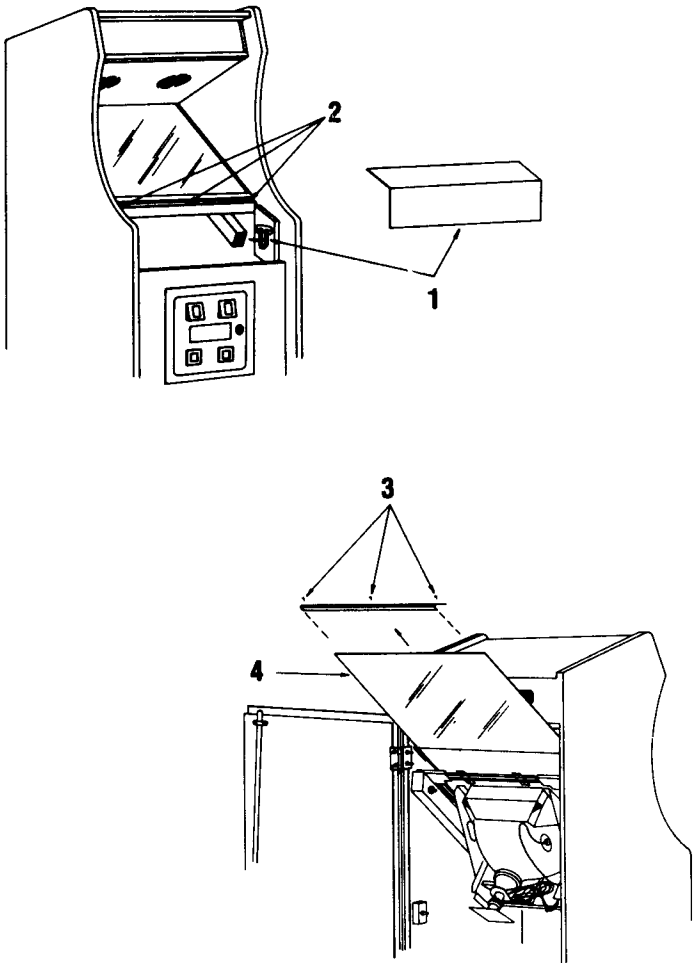
TAITO AMERICA CORPORATION presently uses either a Wells-Gardner or an Electrohome 19" color monitor in the "FRONT LINE"™ game. Refer to Monitor Manual (72-00035-001) for your specific Video Monitor. Be sure to heed all the WARNINGS AND CAUTION INSTRUCTIONS provided before repairing or replacing your Video Monitor.

E. COVER GLASS REMOVAL

To remove the Cover Glass follow the Instructions listed below:

1. Remove the control Panel.
2. Loosen three (3) screws on the Cover Glass, front bracket.
3. Open Service Door and remove the (Rear) Cover Glass Bracket.
4. Slide glass out through the Service Door.

COVER GLASS REMOVAL
FIGURE 5

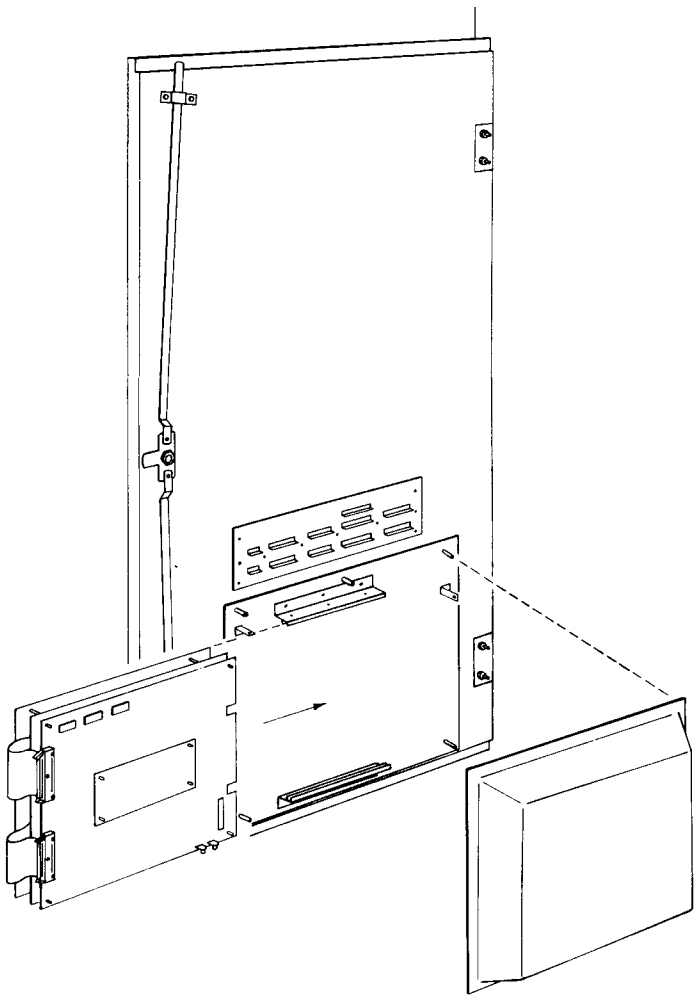


F. PRINTED CIRCUIT BOARD REPLACEMENT

You may wish to remove the "FRONT LINE"™ Printed Circuit Boards for servicing. Refer to Figure 6.
The "FRONT LINE" Printed Circuit Boards are located on the inside of the Rear Service Door for easy access.
To remove the boards the following steps should be followed:

1. Open the rear service door, the power will automatically be removed by the Interlock Switch located on the inside of the door frame.
2. Remove nuts from studs and lift off shield.
3. Disconnect the connector G, H, and T from the boards.
4. Loosen and turn the Stop Bracket and pull the boards toward you out of the board guides.

PRINTED CIRCUIT BOARD REPLACEMENT
FIGURE 6



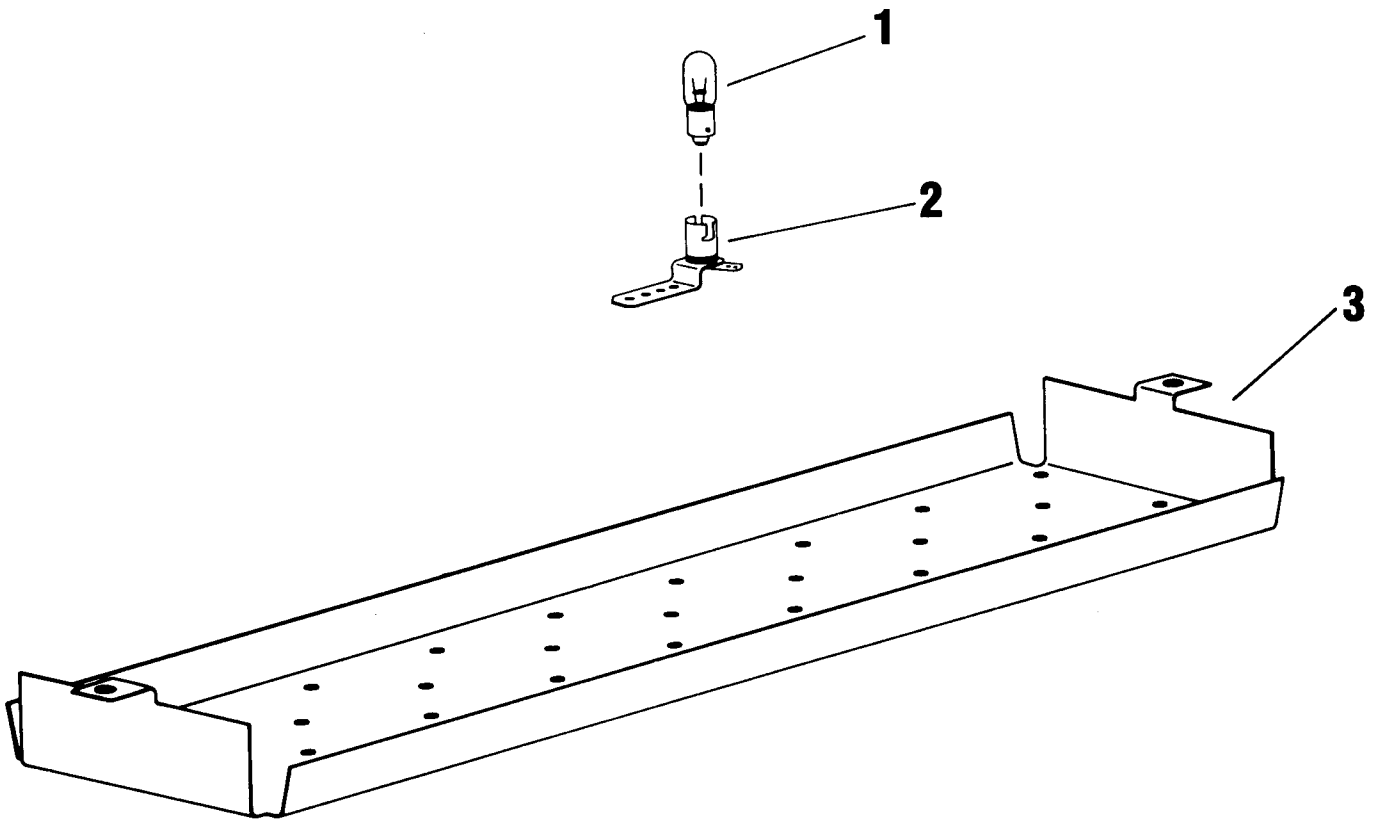
WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. As temporarily permitted by regulation it has not been tested for compliance pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

INCANDESCENT PANEL

FIGURE 7

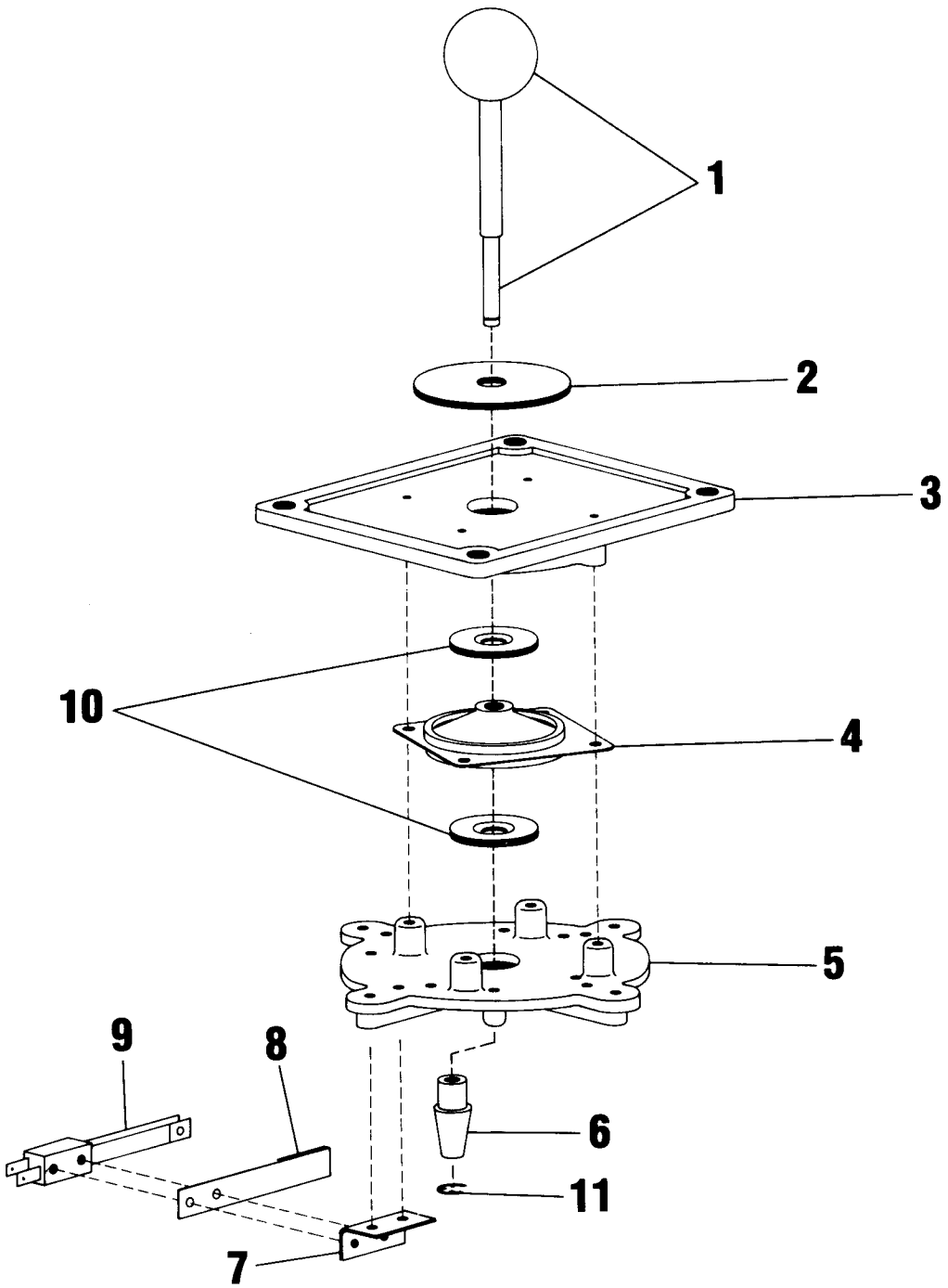
ITEM	TAITO PART NO.	DESCRIPTION
1	27-00006-001	LAMP #47
2	26B00009-001	BAYONET BASE SOCKET
3	61D00112-001	MARQUEE LIGHTING PLATE



8-WAY JOYSTICK

FIGURE 8

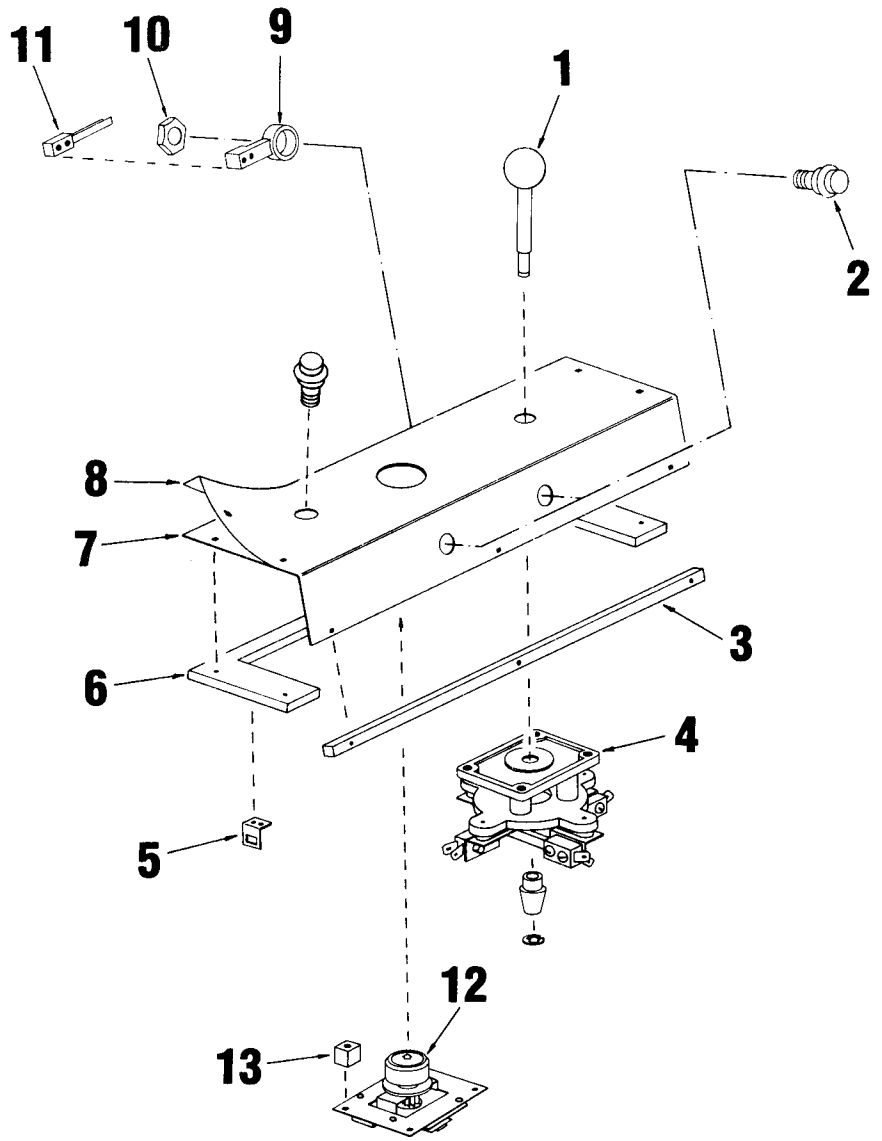
ITEM	TAITO PART NO.	DESCRIPTION
1	63B00031-001	Ball & Shaft
2	63A00033-001	Mask
3	63C00027-001	Mounting Plate
4	62A00002-001	Shock Mount Pad
5	63A00028-001	Switch Plate
6	63A00030-001	Actuator
7	61A00078-001	"L" Ring
8	63C00029-001	Switch Spacer
9	29B00018-001	Leaf Switch
10	63A00029-001	Spacer
11	59B00020-017	"E" Ring



CONTROL PANEL

FIGURE 9

ITEM	TAITO PART NO.	DESCRIPTION
1	63B00031-001	Ball & Shaft
2	63B00024-001	Push Button White
3	42B00108-001	Cleat, Wood
4	63D00032-006	8-Way Control
5	61A00015-001	Strike Hook
6	42D00017-001	Control Panel, Wood
7	61D00240-001	Control Panel, Metal
8	63D00120-001	Lexan Decal
9	63-00025-001	Switch Suppoet
10	54A07001-008	Nut, Stamped ⅝-11
11	29B00020-001	Switch, Push Button
12	07-00136-001	Control Assy, Revolving
13	42B00132-001	Stand Off Control Assembly



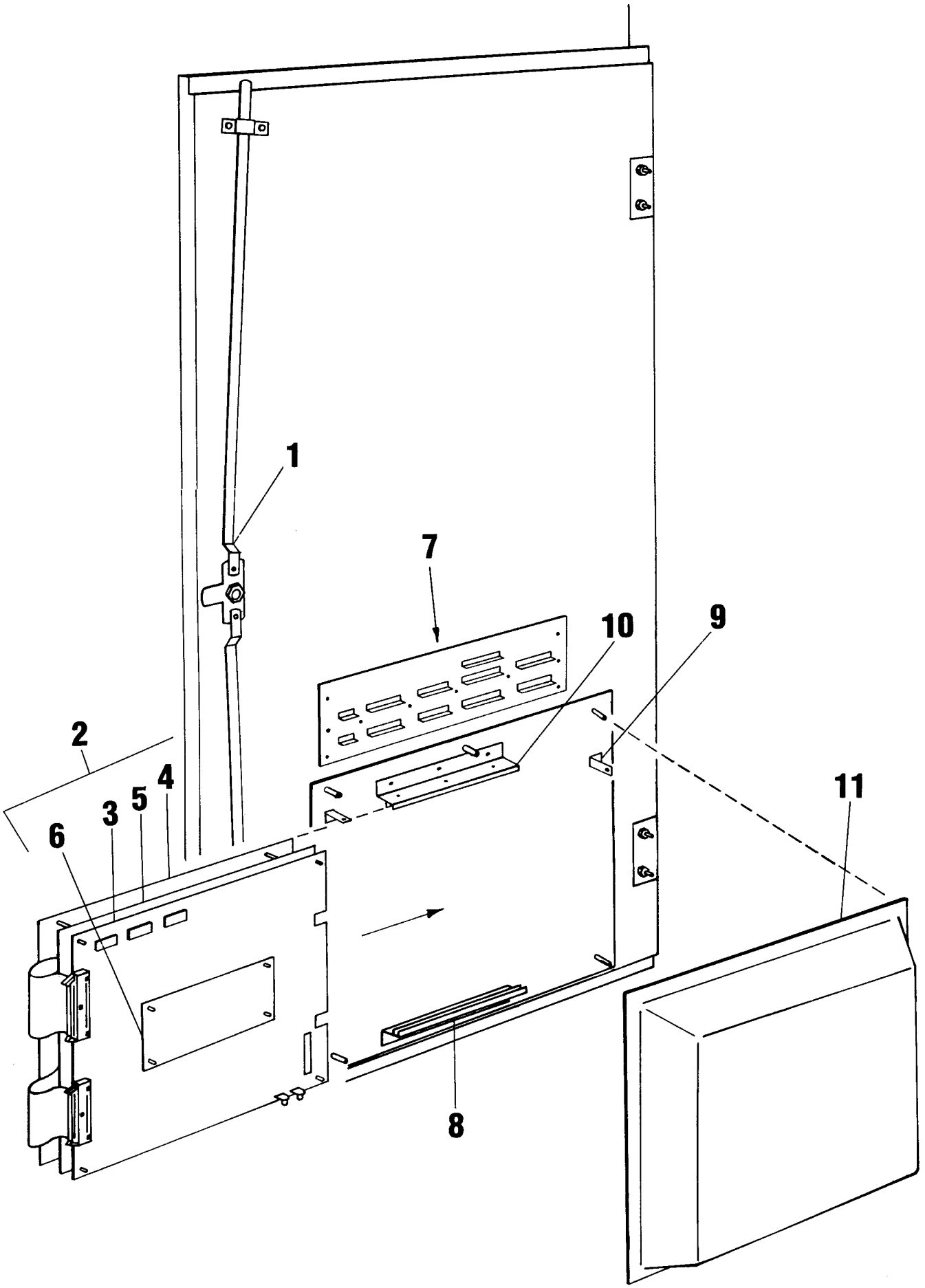
DOOR ASSEMBLY

FIGURE 10

ITEM	TAITO PART NO.	DESCRIPTION
1	61A00111-001	Bracket, Lock Rod
2	08-00104-001	Game Board Set
3	99-AAO17808	Game P.C.B
4	99-AAO17809	CPU P.C.B.
5	99-AAO17810	Video P.C.B.
6	99-AAO17811	ROM P.C.B.
7	08-00017-001	Filter P.C.B.
8	07C00131-001	Bracket P.C. Board
9	61A00014-001	"L" Bracket
10	07-00248-001	Bracket P.C. Board
11	63-00121-001	P.C.B. Shield

DOOR ASSEMBLY

FIGURE 10



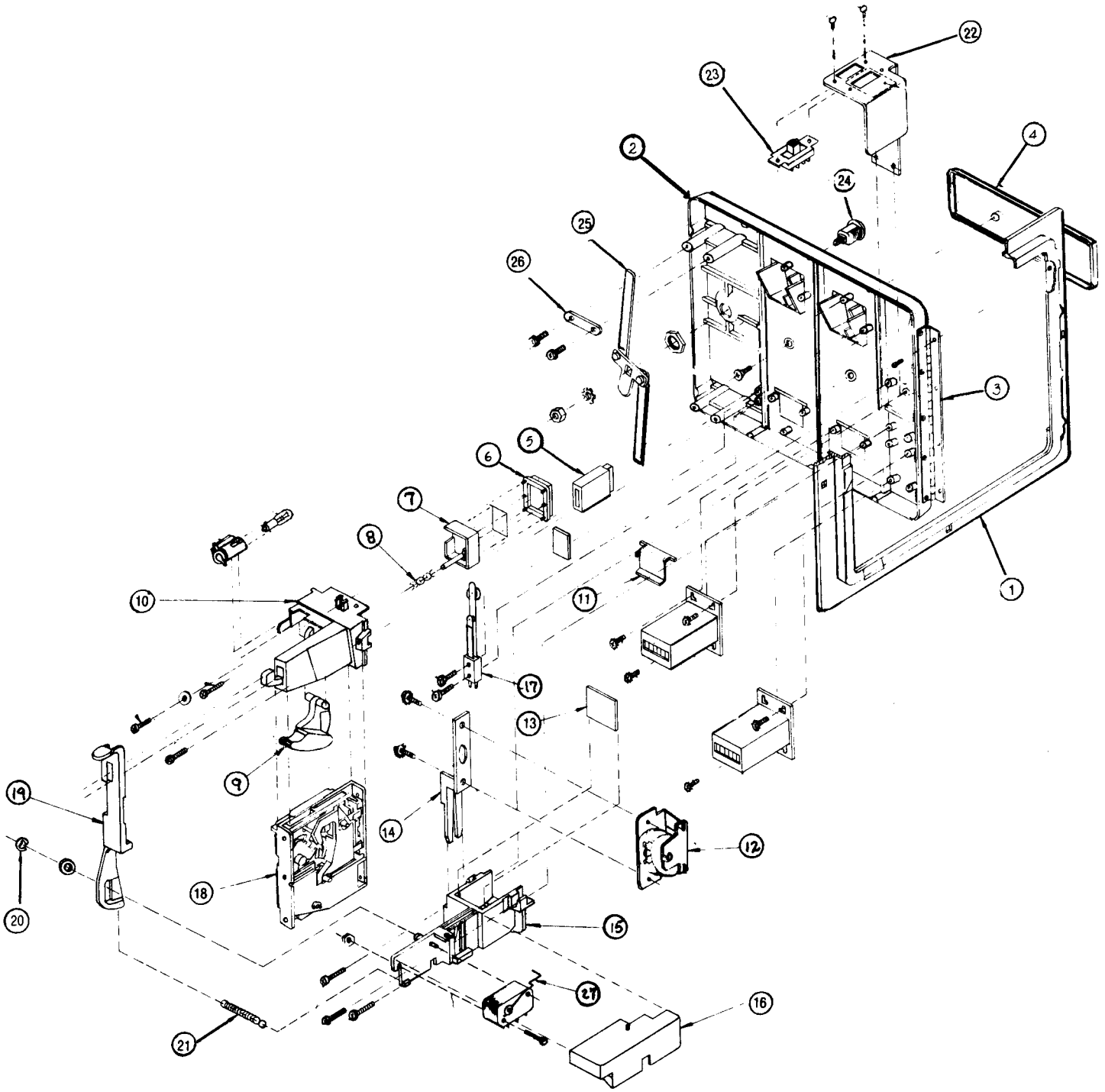
COIN DOOR

FIGURE 11

ITEM	TAITO PART NO.	DESCRIPTION	REFERENCE
1	61-00270-001	Door Frame	15-8039
2	61-00271-001	Door	15-8038
3	61-00272-001	Hinge	30-9125
4	61-00273-001	Taito Name Plate	15-8115
5	63-00124-001	Coin Entry Slot	15-8074
6	63-00125-001	Push Button Cover	15-8072
7	63-00126-001	Push Button	15-8071
8	58-00007-001	Compression Spring	30-7722
9	63-00127-001	Reject Lever	15-8084
10	61-00274-001	Coin Chute	15-8075
11	63-00128-001	Coin Return Door	15-8083
12	61-00275-001	Coin Box	15-8081
13	61-00276-001	Guard	15-8092
14	63-00129-001	Coil Bracket	15-8080
15	23-00003-001	Coil Assortment	15-8091
16	63-00130-001	Switch Cover	15-8043
17	29-00036-001	Slam Switch	15-1255
18	59-00055-001	Plastic 85¢ Coin Acceptor	31-4014
19	63-00131-001	Coin Acceptor Retainer	15-8086
20	59-00020-025	¼" "E" Ring	30-0731
21	58-00008-001	Extension Spring	30-7372
22	61-00277-001	Service Switch Bracket (Switchcraft No. 46311 Mar.)	15-8030
23	29-00037-001	Service Switch	23-1339
24	07-00242-001	Lock ⅝" Assembly	34-1855
25	07-00243-001	Lock Cam Assembly	55-2909
26	61-00278-001	Lock Cam Plate	55-2909
27	61-00279-001	Wire Form (Coin Switch)	23-1348
28	09-00258-001	Door Cable Assembly	15-0868

COIN DOOR

FIGURE 11



COIN DOOR

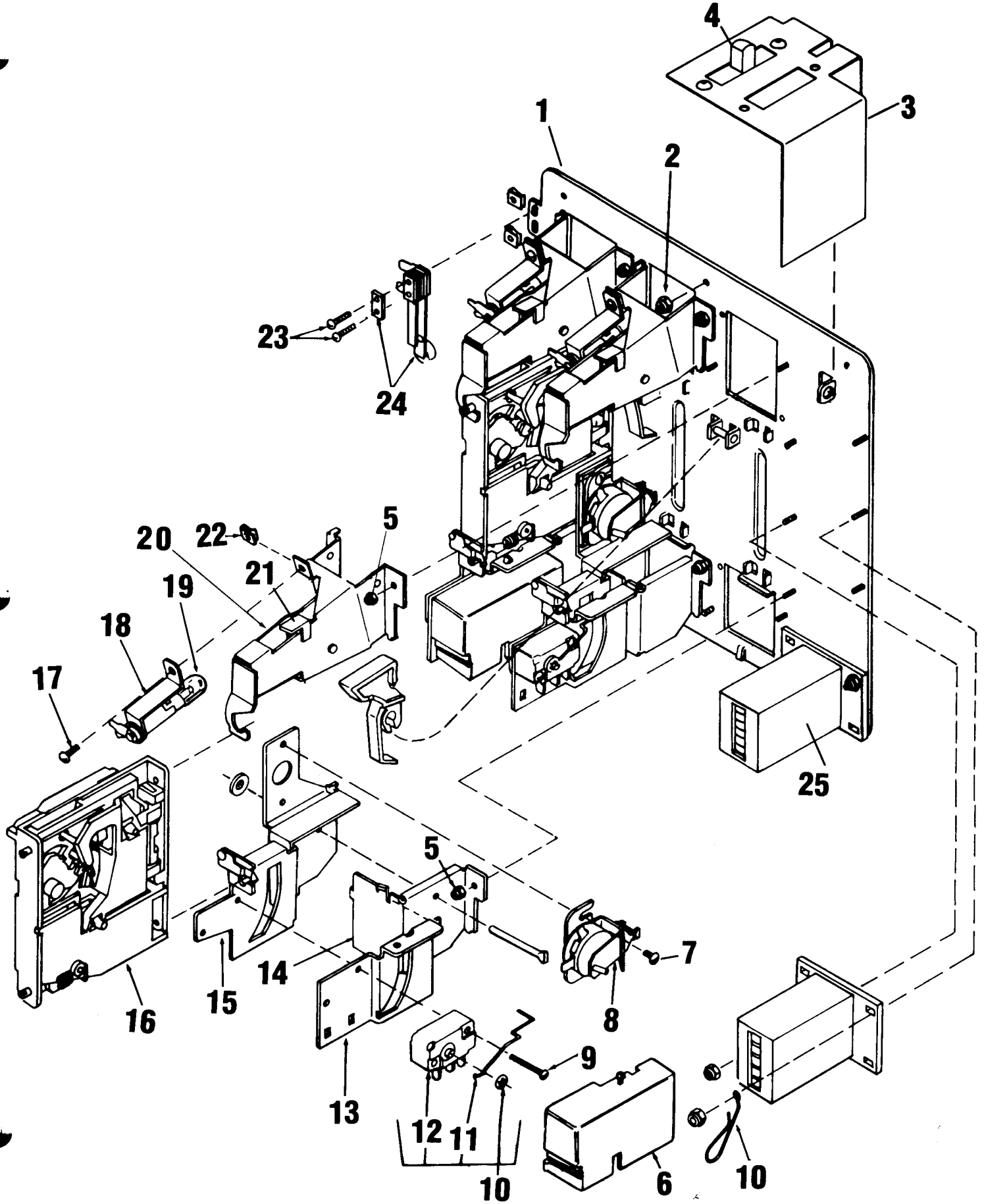
FIGURE 12

ITEM	TAITO PART NO.	DESCRIPTION	REFERENCE
1	07-00027-001	Inner Panel With Levers Sub Assembly	404429
2	54-03013-001	Nut #8-32	400-8
*	09-00017-001	Custom Harness Assembly (SHL Coin)	
*	09-00017-002	Custom Harness Assembly (Dual Coin)	
3	61B00113-001	Service Switch Bracket	
4	29-00022-001	Service Switch	
5	54-03011-001	Nut #4-40	
6	63-00014-001	Switch Cover	904762
7	51-02052-001	Screw #6-32 x 3/16 SS ph	100-6-3
8	23-00001-001	C.R.E.M. Coil Assembly	404354
9	51-02052-001	Screw #6-32 x 3/16 SS ph	100-4-12
10	59-00019-001	Retainer	900651
11	28-00029-001	Silver Switch Wire for U.S. 25¢	904710-1
12	29-00007-001	Switch	904845
13	61-00044-001	Coin Chute	904701
14	61-00045-001	Coin Return Box	904598
15	61-00025-001	Switch & C.R.E.M. Coil Bracket	404428
16	59-00018-001	25¢ Acceptor	5301-10
17	51-02051-006	Screw 4-40 x 3/8 SS ph	110-4-6
18	27-00003-001	Miniature Bayonet Base Lamp	904717
*	26-00006-001	Lamp Socket	
19	27-00003-001	#47 Lamp (6.3 Volt)	904716
20	61-00048-001	Coin Inlet Chute	904418
21	61-00047-001	Right Half of Coin Inlet Chute	904594
22	54-00001-001	"U" Type Fastener	904712
23	51-02051-006	Screw 4-40 x 1/2 SS ph	116-4-8
24	29-00006-001	Slam Switch Assembly	904704
25	998325	Coin Meters	

*Item not shown on drawing.

COIN DOOR

FIGURE 12



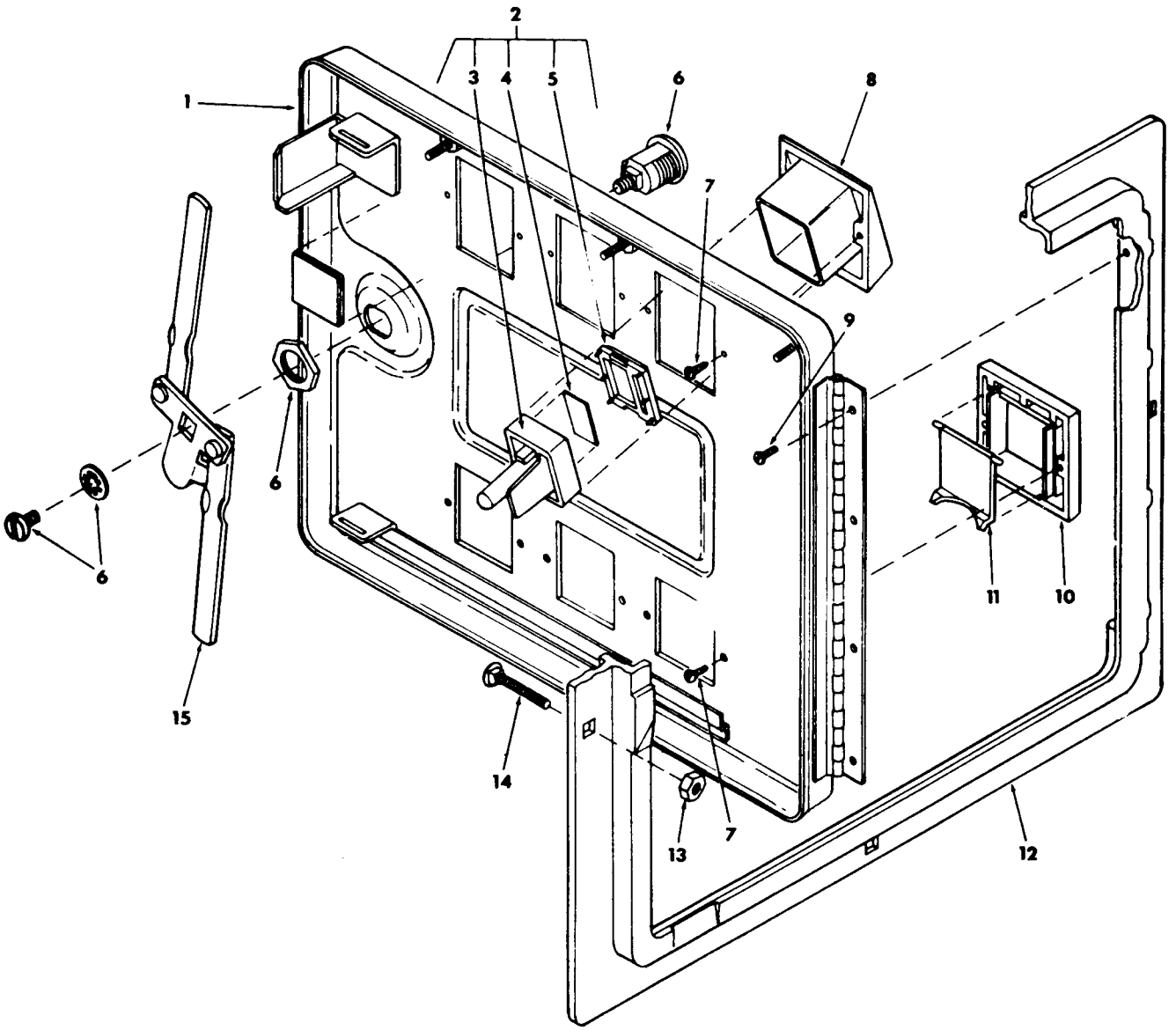
COIN DOOR

FIGURE 13

ITEM	TAITO PART NO.	DESCRIPTION	REFERENCE
1	61-00042-001	Coin Door Only (2 Coin)	404341
2	07-00023-001	Coin Return Button Assembly For U.S. 25¢ Coin	404348-1
3	63-00015-001	Coin Return Button	904591
4	79-50004-001	U.S. 25¢ Price Decal	904703
5	63-00016-001	Coin Return Button Cover for U.S. 25¢ Coin	
6	07-00025-001	Lock Assembly	904707-1
6A	07-00025-001	Lock Assembly	904707-1
7	51-01051-003	Screw #4 x 5/16 SL ph Type B	345-4-5
7A	51-01051-003	Screw #4 x 5/16 SL ph Type B	345-4-5
8	63-00011-001	Coin Button Housing	904588
9	51-02051-002	Screw #4-40 x 1/4 SL ph	325-4-4
10	63-00012-001	Coin Return Bezel	904590
11	63-00013-001	Coin Return Cover	904599
12	61-00040-001	Coin Door Frame 11 5/8 x 13 3/8	904581
		Mounts in a 10 3/8 x 12 3/16 Opening	
13	54-01005-001	Hex Nut 1/4-20	406-416
14	51A03003-113	Carriage Bolt	904734
15	07-00026-001	Lock Arm Assembly	404357

COIN DOOR

FIGURE 13



CABINET ASSEMBLY FRONT VIEW

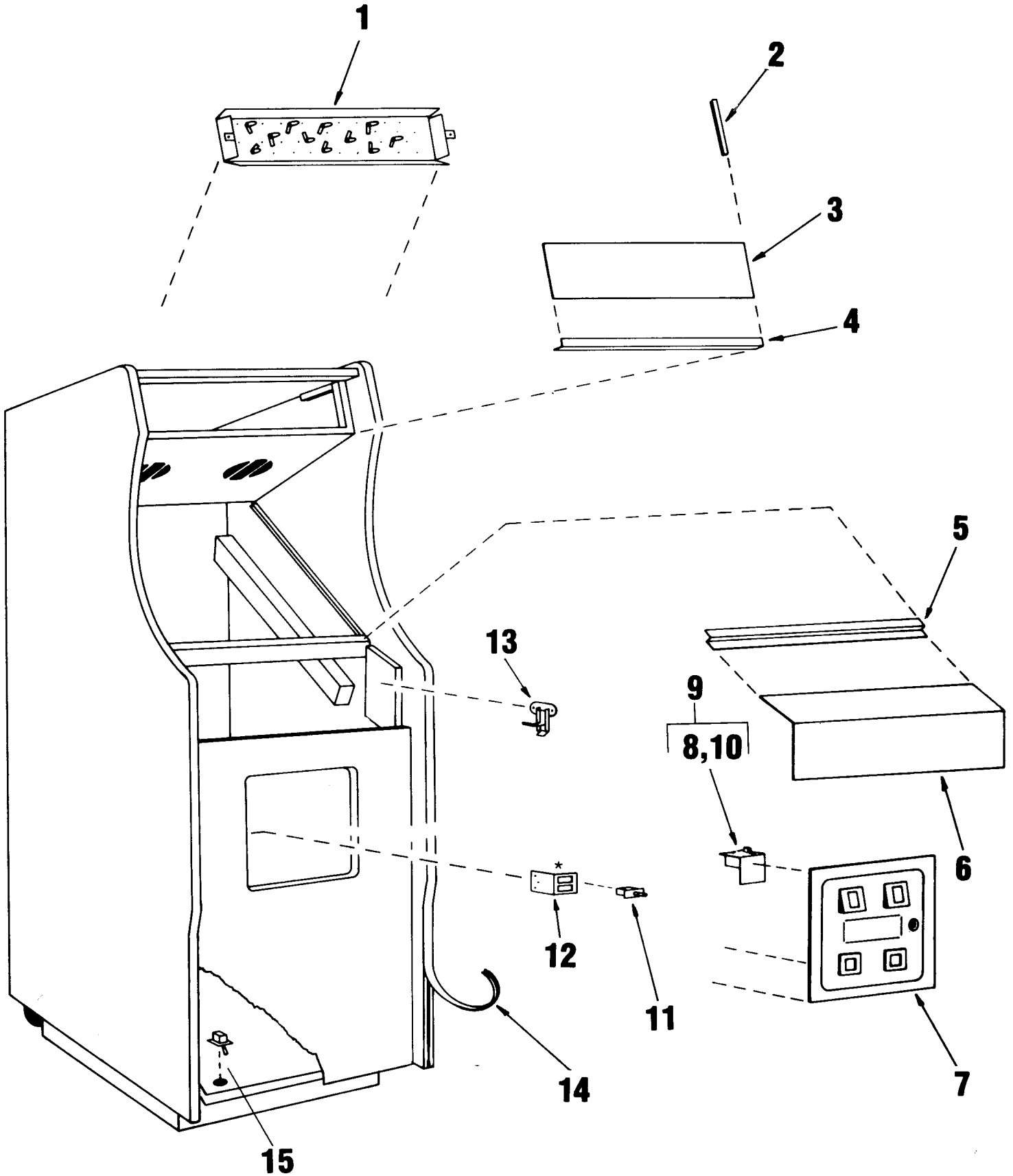
FIGURE 14

ITEM	TAITO PART NO.	DESCRIPTION
1	07M00055-002	Incandescent Panel
2	63B00006-003	"U" Channel Bracket
3	47D00012-015	Marquee
4	61C00115-001	Marquee Retaining Bracket
5	61D00012-001	Lower Coverglass Bracket
6	07-00240-001	Control Panel Assembly
7	07-00114-001	Coin Door
8*	61B00113-001	Switch Bracket
9*	07-00118-001	Service Switch Assembly
10*	29-00022-001	Slide, Center Return Switch
11	29B00015-001	Interlock Switch
12	61B00114-001	Interlock Switch Bracket
13	59-00008-001	Latching Clamp
14	63B00002-001	"T" Molding
15	29A00023-001	Power ON/OFF Switch
16	41-00015-009	Finished Cabinet

***NOTE:** Supplied on Wico Door.

CABINET ASSEMBLY FRONT VIEW

FIGURE 14



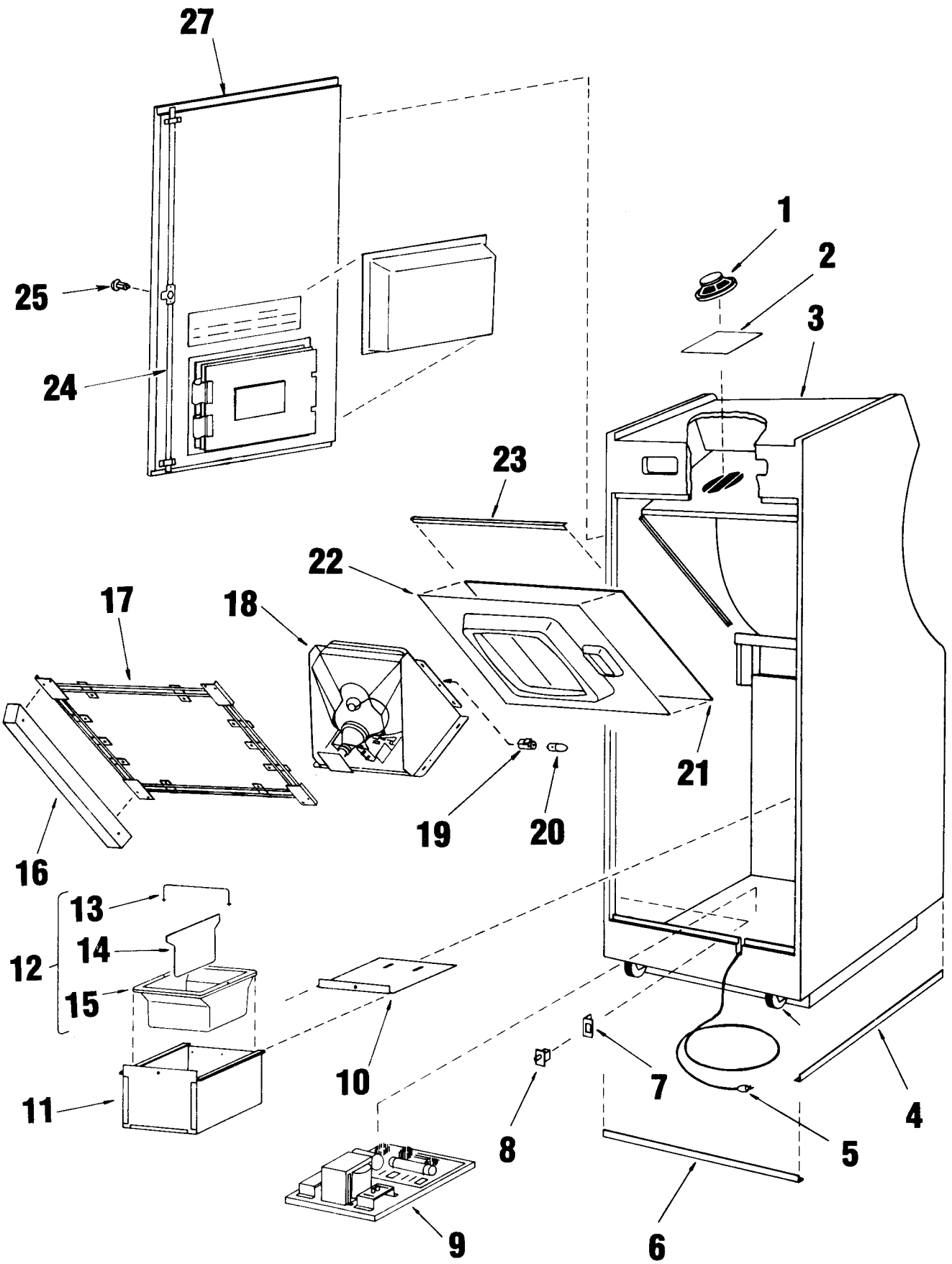
CABINET ASSEMBLY REAR VIEW

FIGURE 15

ITEM	TAITO PART NO.	DESCRIPTION
1	07-00083-001	Speaker
2	61B00038-001	Speaker Grill
3	41D00015-009	Finished Cabinet
4	63C00005-004	(L) Molding
5	07M00042-001	A/C Line Cord Assembly
6	63C00005-002	"L" Molding
7	61B00030-002	Interlock Bracket
8	29B00015-001	Interlock Switch
9	17M00039-001	Power Supply
10	61C00054-001	Cash Box Lid
11	61D00060-001	Cash Box
12	07M00054-001	Cash Tray Assembly
13	63R00010-001	Cash Tray (only)
14	63-00019-001	Cash Tray Separator
15	61B00039-001	Cash Tray Handle
16	42C00013-001	Monitor Support Cleat
17	61D00208-001	Mounting Bracket
18	31-00012-001	19" Color Monitor
19	26-00010-001	Socket Lamp Clip-on Mini-Bay
20	27-00006-001	#47 Bulb
21	47M00013-011	Coverglass
22	63C00035-001	Monitor Shroud
23	61C00006-001	Upper Cover Glass Bracket
24	61-00142-001	Lock Rod Assembly
25	04-00037-002	Lock Assembly
26	44-00001-001	Wheel Assembly
27	42-00134-001	Back Door

CABINET ASSEMBLY REAR VIEW

FIGURE 15



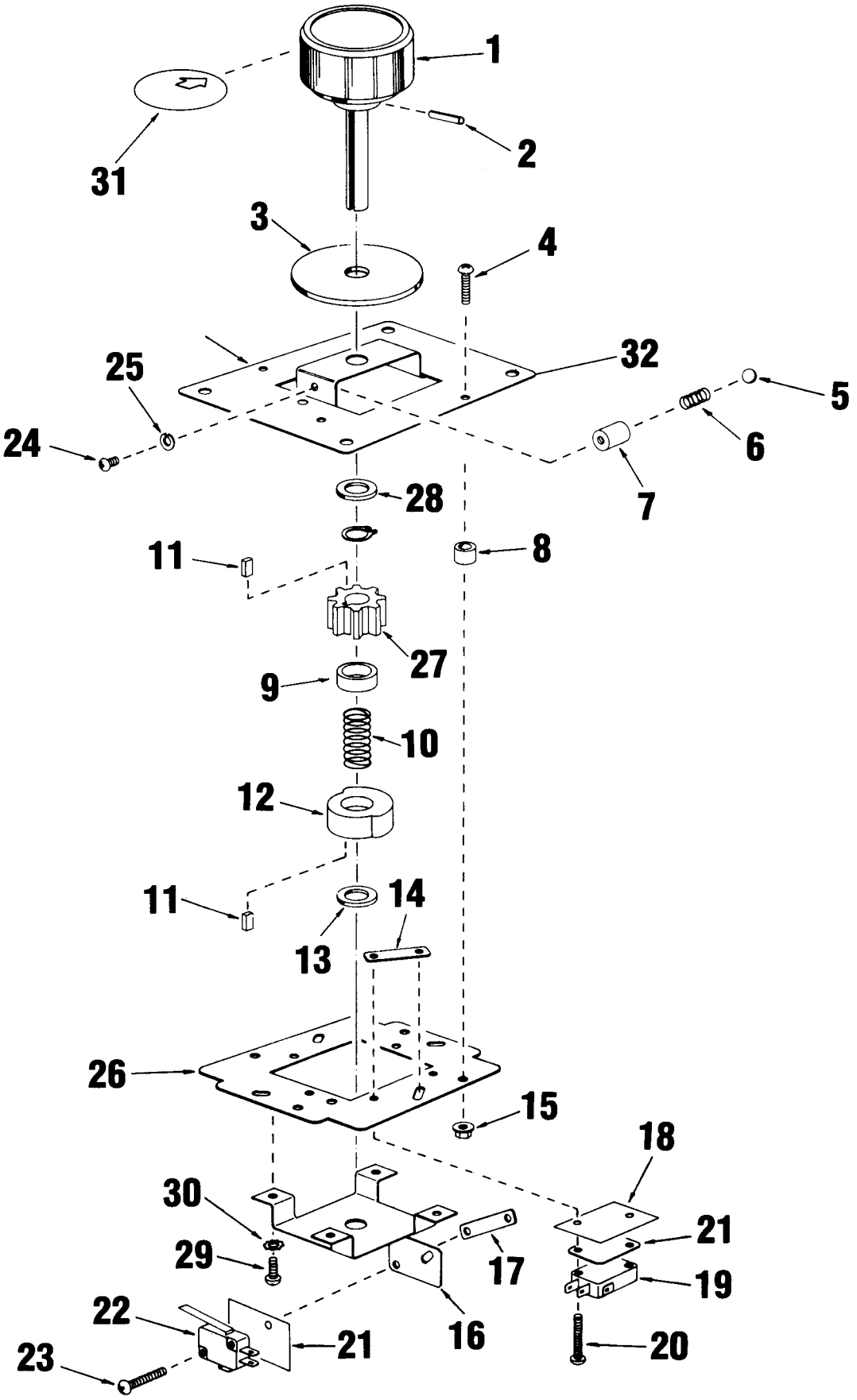
REVOLVING CONTROL ASSEMBLY (WWK00003)

FIGURE 16

ITEM	TAITO PART NO.	DESCRIPTION
1	99-WW090002	Knob
2	99-WW020006	Roll Pin
3	99-AA019609	Plastic Washer
4		Pan Hd. Screw M4 x 14
5	99-WW020004	¼" Steel Ball
6	99-WW050002	Spring
7	99-WW020003	Spring Guide
8	99-AA012510	Spacer
9	99-WW020005	Adjust Pipe
10	99-WW050001	Spring
11	99-WW020002	Parallel Key
12	99-WW040002	CAM
13		Plain Washer
14	99-AA013658	Tap Plate
15		Flange Nut M4
16	99-WW030002	Base Bracket "B"
17	99-AA013658	Tap Plate
18	99-AA019504	Insulator
19	99-AA052532	Micro Switch V10FL22-1C28
20		Bind Hd. Screw M 3 x 16
21	99-AA019504	Insulator
22	99-AA052531	Micro Switch
23		Bind Hd. Screw M3 x 16
24		Pan Hd. Screw M4 x 6
25		Lock Washer 4M
26	99-WW030003	M.S. Base
27	99-WW040001	Gear
28		Plain Washer 9.5 dia x 15 dia x 1.6 thick
29		Screw M4 x 6
30		Spring Washer 4M
31	61A-00244-001	Inlay Knob
32	99-WW030001	Base Bracket "A"

REVOLVING CONTROL ASSEMBLY (WWK00003)

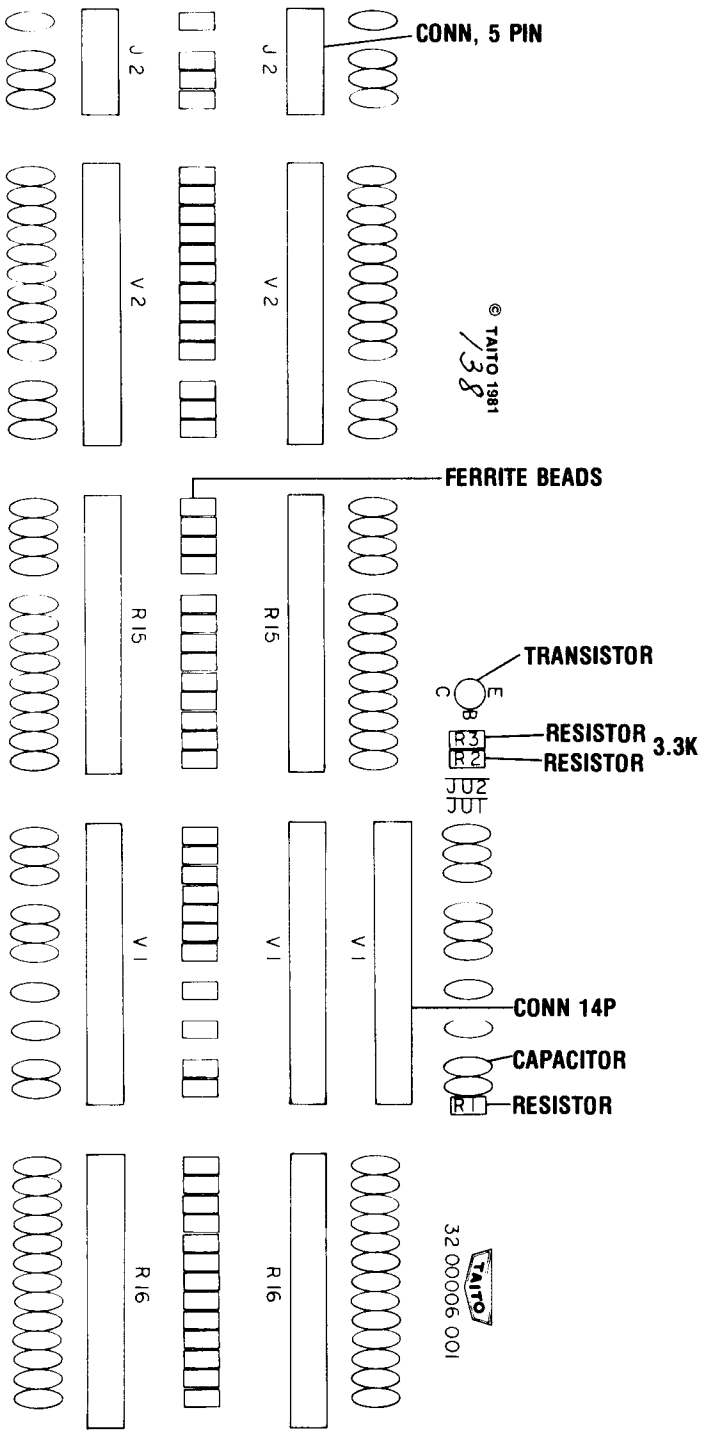
FIGURE 16



FILTER BOARD

FIGURE 17

ITEM	TAITO PART NO.	DESCRIPTION	QUANITY
1	12-10003-471	Cap, 470pf ± 10% Axial Lead	74
2	17-00001-001	Ferrite Bead Assembly	42
3	25-00002-014	Connector 14P	9
4	25-00002-005	Connector 5P	2
5	14-23904-001	Transistor NPN 2N3904	1
6	11-00001-102	Resistor 1K ohm ¼W	1
7	11-00001-332	Resistor 3.3 ohm ¼W	2
8	63B00068-001	Stand Off	6



POWER SUPPLY

FIGURE 18

SYM	TAITO PART NO.	DESCRIPTION
R1	11-00001-102	Resistor 1.0K 5% ¼W 5%
R2	11-00001-512	Resistor 5.1K ¼W 5%
R3	11-00001-183	Resistor 18K ¼W 5%
R4	11-00001-224	Resistor 220K ¼W 5%
R5	11-00001-020	Resistor 2ohm ¼W ± 5%
R6	11-00001-222	Resistor 2.2K ¼W 5%
R7	11-10001-101	Resistor 100K ¼W 5%
R8	11-00001-102	Resistor 10K ¼W 5%
R9	11-00001-472	Resistor 4.7K ¼W 5%
R10	11-10001-101	Resistor 100K ½W 5%
R11	11-30001-015	Resistor .15 4W 5%
R12	11-30001-015	Resistor .15 4W 5%
R13	11-00001-472	Resistor 4.7K ¼W 5%
R14	11-00001-222	Resistor 2.2K ¼W 5%
R15	11-00001-222	Resistor 2.2K ¼W 5%
R16	11-60001-252	Pot 2.5K ¼W 20%
R17	11-00001-222	Resistor 2.2K ¼W 5%
R18	11-60001-102	Pot 1.0K ¼W 20%
R19	11-00001-511	Resistor 510K ¼W 5%
R20	11-10001-470	Resistor 47K ½W 5%
R21	11-00001-162	Resistor 1.6K ¼W 5%
R22	11-00001-103	Resistor 10K ¼W 5%
R23	11-00001-472	Resistor 4.7K ¼W 34
R24	11-00001-222	Resistor 2.2K ¼W 5%
R25	11-60001-102	Pot 1.0K ¼W 5%
R26	11-00001-472	Resistor 470K ¼W 5%
R27	11-00001-222	Resistor 2.2K ¼W 5%
R28	11-60001-252	Pot 2.5K ¼W 20%
R29	11-00001-472	Resistor 4.7K ¼W 5%
R30	11-00001-122	Resistor 1.2K ¼W 5%
R31	11-10001-470	Resistor 47K ¼W 5%
R32	11-30001-015	Resistor .15K 4W 5%
R33	11-00001-222	Resistor 2.2K ¼W 5%
R34	11-00001-122	Resistor 1.2K ¼W 5%
R35	11-00001-511	Resistor 510 ¼W 5%
R36	11-00001-222	Resistor 2.2K ¼W 5%
R37	11-00001-104	Resistor 100K
R38	11-00001-103	Resistor 10K ¼W 5%
R39	11-00001-224	Resistor 220L ¼W 5%
C1	12-30001-225	Capacitor, Tantalum 2.2uf 25V
C2	12-10004-103	Capacitor, Ceramic .01uf
C3	12-10004-103	Capacitor, Ceramic .01uf
C4	12-30001-105	Capacitor, Tantalum 1.uf 35V

SYM	TAITO PART NO.	DESCRIPTION
C5	12-10001-102	Capacitor, .001uf
C6	12-30001-106	Capacitor, Tantalum 10uf
C7	12-20003-509	Capacitor, Electrolytic 50,000uf
C8	12-30001-105	Capacitor, Tantalum 1.uf 35V
C9	12-20003-209	Capacitor, Electrolytic 20,000uf
C10	12-10001-332	Capacitor, Ceramic .0033uf
C11	12-30001-476	Capacitor, Tantalum 47uf
C12	12-30001-105	Capacitor, Tantalum 1.uf 35V
C13	12-10004-103	Capacitor, Ceramic .01uf
C14	12-10001-102	Capacitor, .001uf
C15	12-30001-476	Capacitor, Tantalum 47uf
C16	12-20002-108	Capacitor, Electrolytic 1,000uf
C17	12-30001-225	Capacitor, Tantalum 2.2uf 25V
C18	12-30001-225	Capacitor, Tantalum 2.2uf 25V
C19	12-30001-105	Capacitor, Tantalum 1.uf 35V
F1	24-00003-010	10A Fuse
F2	24-00003-010	10A Fuse
F3	24-00003-003	Fuse, 2A
F4	24-00003-004	Fuse, 4A
F5	24-00003-004	Fuse, 4A
BR1	13-00100-025	Diode Bridge 25A, 100V
BR2	13-00100-012	Diode Bridge 12A, 100V
BR3	13-00100-002	Diode Bridge 2A, 100V
D1	13-14002-001	Diode IN4002
D2	13-14002-001	Diode IN4002
D3	13-10752-001	Diode, Zener IN4002
D4	13-14002-001	Diode IN4002
D5	13-14002-001	Diode IN4002
D6	13-14002-001	Diode IN4002
D7	13-10964-001	Diode, Zener IN4002
D8	13-14002-001	Diode IN4002
D9	13-14002-001	Diode IN4002
D10	13-14002-001	Diode IN4002
D11	13-14002-001	Diode IN4002
D12	13-14002-001	Diode IN4002
D13	13-16276-001	Transorb (IN6276)
D14	13-16281-001	Transorb (IN6281)
D15	13-14002-001	Diode IN4002
D16	13-14002-001	Diode IN4002
D17	13-16267-001	Transorb (IN6267)
LED1	13-00001-001	LED (Red)
LED2	13-00001-001	LED (Red)
LED3	13-00001-001	LED (Red)
LED4	13-00001-001	LED (Red)

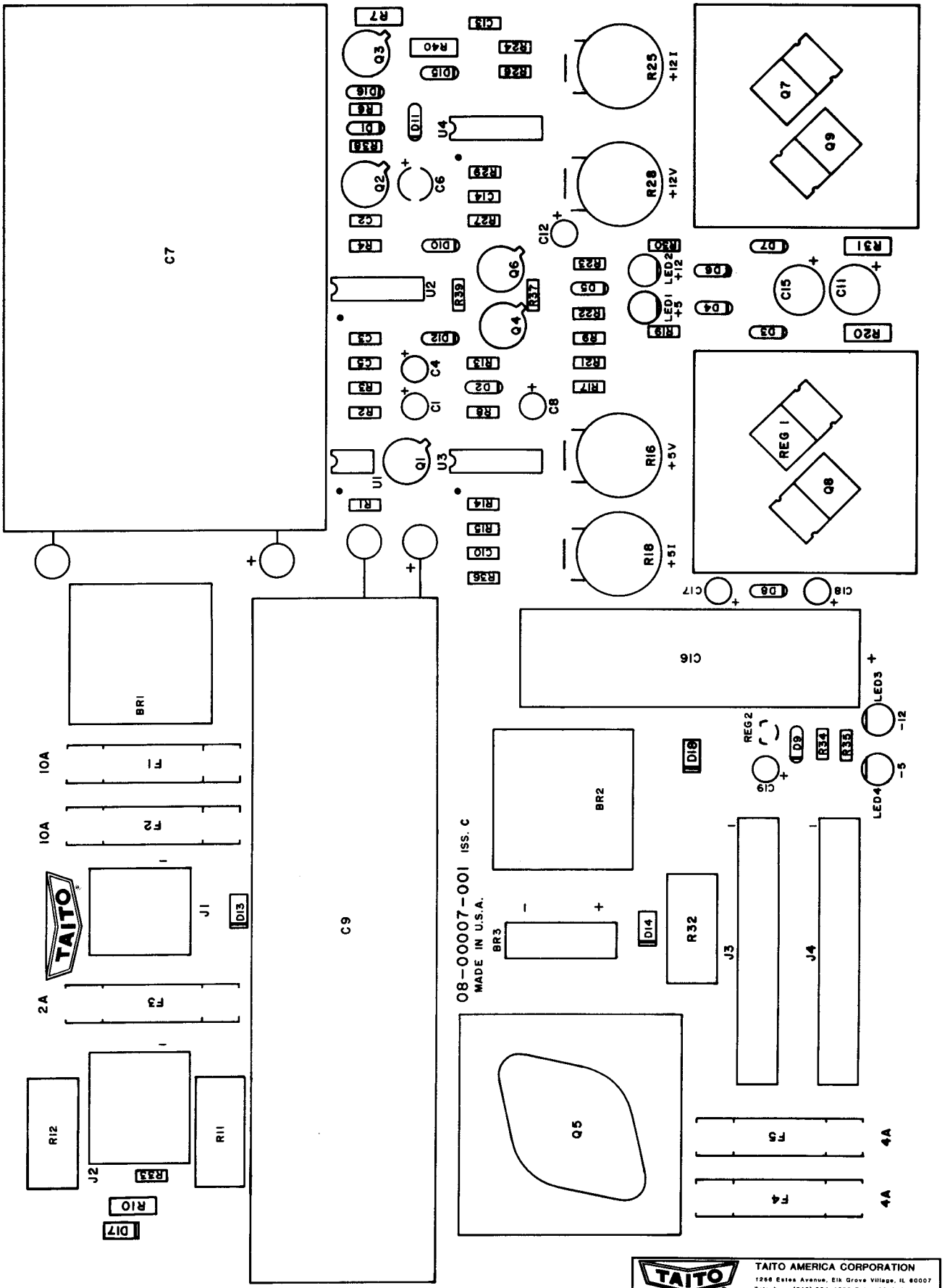
POWER SUPPLY

FIGURE 18

SYM	TAITO PART NO.	DESCRIPTION
U1	15-62500-001	Opto Coupler H11AA2
U2	15-50556-001	Timer (Dual) 556
U3	15-50723-001	Voltage Regulator 723
U4	15-50723-001	Voltage Regualtor 723
REG1	15-57912-001	Voltage Regualtor 7912
REG2	15-57905-001	Voltage Regualtor 79L05
Q1	14-22905-001	Transistor 2N2905
Q2	14-22905-001	Transistor 2N2905
Q3	14-22905-001	Transistor 2N2905
Q4	14-22905-001	Transistor 2N2905
Q5	14-23055-001	Transistor 2N3055
Q6	14-22905-001	Transistor 2N2905
Q7	14-20030-001	Transistor TIP-30A
Q8	14-26401-001	SCR 2N6401
Q9	14-26401-001	SCR 2N6401
J1	25-00022-006	Connector, 1-380999-0 6Pin
J2	25-00022-008	Connector, 350212-1 8Pin
J3	25-00002-014	Connector, 09-60-1141 14Pin
J4	25-00002-014	Connector, 09-60-1140 14Pin
	24-10001-001	Fuse Clips
	30-00220-002	Heat Sink Dual To-220
	30-00003-001	Heat Sink Single To-3

POWER SUPPLY COMPONENT LAYOUT

FIGURE 18



TAITO AMERICA CORPORATION
1266 Estes Avenue, Elk Grove Village, IL 60007
Telephone (312) 981-1000 Telex 25-3280

FRONT LINE™
Power Supply Board Layout

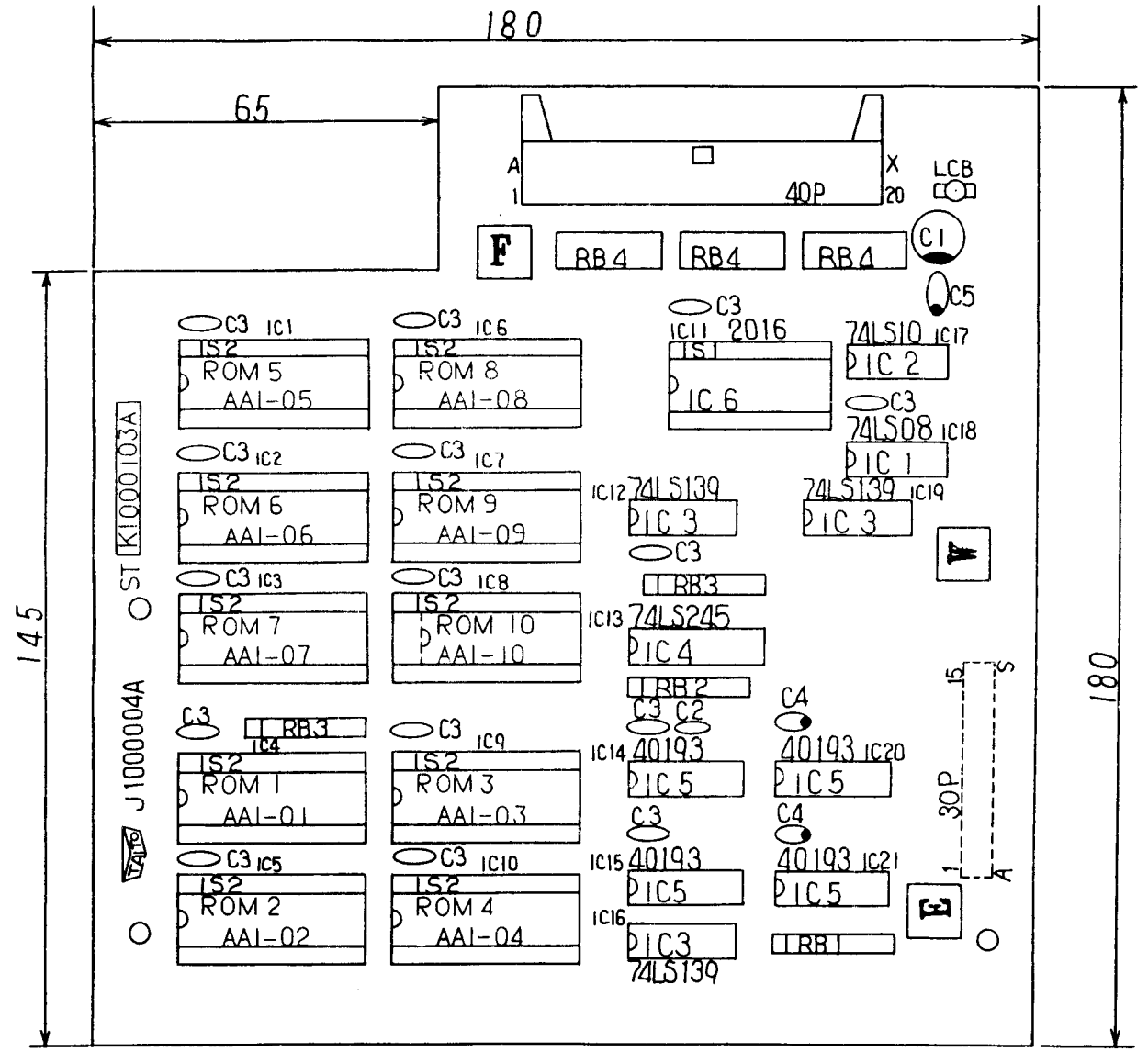
ROM BOARD

FIGURE 19

ITEM	REF	TAITO PART NO.	DESCRIPTION
1	C1	99-A1000035A	Elect. Block 16VB220
2	C2	99-A1200257A	Cap, Ceramic 330P 50V
3	C3	99-A1200317A	Cap, Ceramic 100000P 50V
4	C4	99-A1320507A	Tant Dip 25V1
5	C5	99-A1320519A	Tant Dip 25V10
6			Not Used
7	RB1	99-A2231065A	Res Block 1K 9S
8	RB2	99-A2231081A	Res Block 4.7K 9S
9	RB3	99-A2231089A	Res Block 10K 9S
10	RB4	99-B2239002A	Res Array 100 1/4W ± 5%
11			Not Used
12	IC1	99-B01X0008A	TTL 74LS08
13	IC2	99-B01X0010A	TTL 74LS10
14	IC3	99-B01X0139A	TTL 74LS139
15	IC4	99-B01X0245A	TTL 74LS245
16	IC5	99-B07X0193A	C-MOS 40193
17	IC6	99-B10X0019A	S-RAM 2016 C, D, F, G
18			Not Used
19	ROM 1	99-B2000239A	P-ROM AA1-01 2764
20	ROM 2	99-B2000240A	P-ROM AA1-02 0764
21	ROM 3	99-B2000241A	P-ROM AA1-03 0764
22	ROM 4	99-B2000242A	P-ROM AA1-04 0764
23	ROM 5	99-B2000243A	P-ROM AA1-05 0764
24	ROM 6	99-B2000244A	P-ROM AA1-06 0764
25	ROM 7	99-B2000245A	P-ROM AA1-07 0764
26	ROM 8	99-B2000246A	P-ROM AA1-08 0764
27	ROM 9	99-B2000247A	P-ROM AA1-09 0764
28	ROM 10	99-B2000248A	P-ROM AA1-10 0732
29			Not Used
30	40P	99-C0510514A	Angle Pin Header FC40
31	30P	99-C0510552A	Connector Socket HKP30P
32	IS1	99-C0550072A	IC Socket 24P
33	IS2	99-C0550080A	IC Socket 28P
34	LCB	99-F9000439A	CBSS CBSS-10N
35	ST	99-G1010277A	P.C. Board Sticker K1000103A

ROM BOARD COMPONENT LAYOUT

FIGURE 19



RES BLOCK
COMMON MARK
CATHODE MARK
ELEC BLOCK
TANT DIP
CAP CERAMIC

NOTE 1. SYMBOL MARK

MOUNTING FACE
SOCKET
MOUNT ON SOLDER FACE.

NOTE 2. CONNECTOR SOCKET

TAITO AMERICA CORPORATION
1268 Estes Avenue, Elk Grove Village, IL 60007
Telephone (312) 981-1000 Telex 25-3280

UNLESS OTHERWISE SPECIFIED
DRAWN BY
DATE
SCALE
APPROVED BY
DATE
DESCRIPTION:
FRONT LINE™
ROM Board Layout
USED ON:
SIZE
DRAWING NUMBER
SHEET OF

CPU BOARD

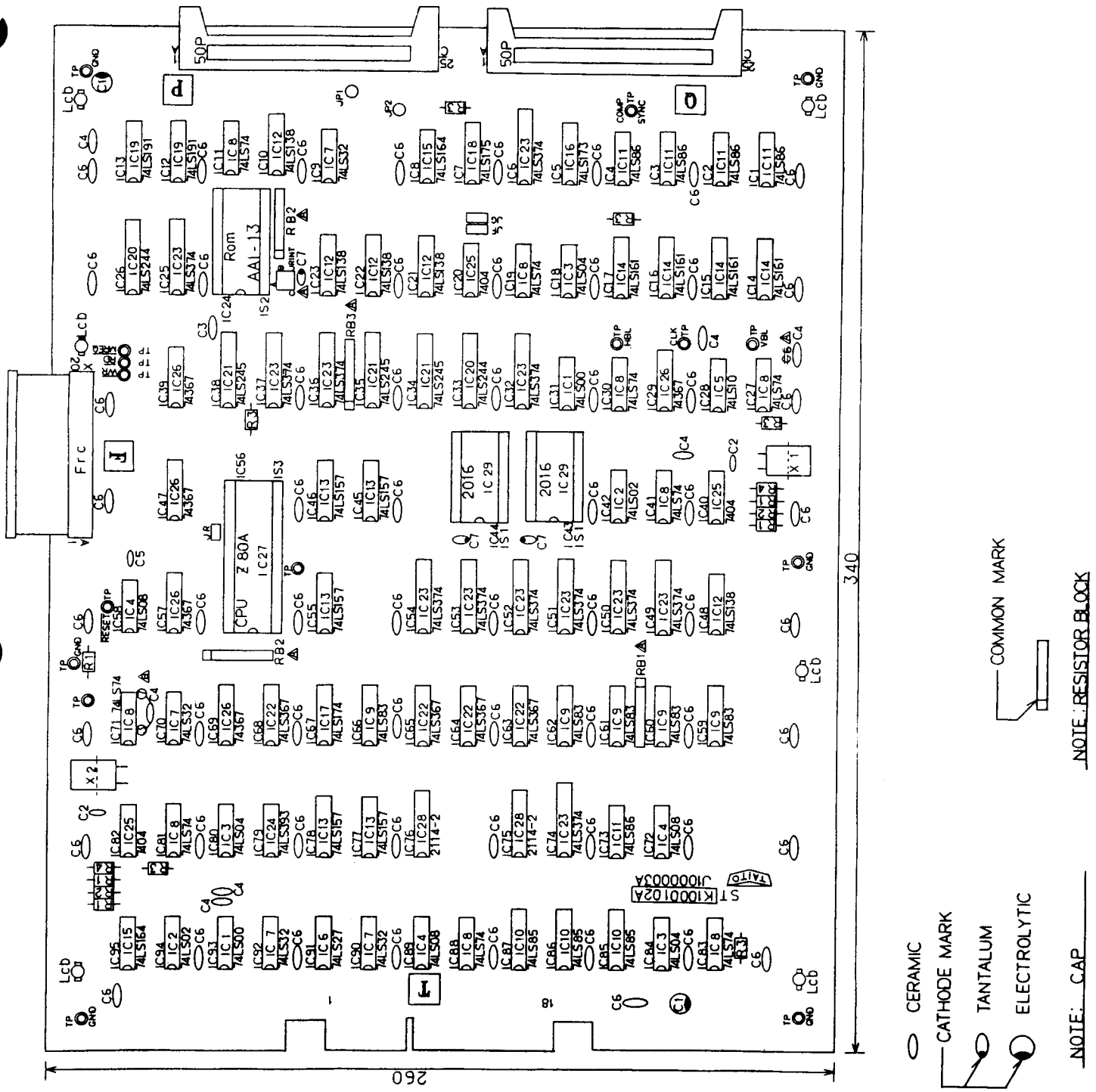
FIGURE 20

ITEM	REF	TAITO PART NO.	DESCRIPTION
1			Not Used
2	C1	99-A1000135A	Elec, Block 16VB-220
3	C2	99-A1200229A	Cap, Ceramic 50V 22P
4	C3	99-A1200245A	Cap, Ceramic 50V 100P
5	C4	99-A1200251A	Cap, Ceramic 50V 180P
6	C5	99-A1200257A	Cap, Ceramic 50V 330P
7	C6	99-A1200317A	Cap, Ceramic 50V 100000P
8	C7	99-A1320507A	Tant Dip 25V1
9	R1	99-A2000049A	Res, Carbon 220 ¼W ± 5%
10	R2	99-A2000059A	Res, Carbon 560 ¼W ± 5%
11	R3	99-A2000065A	Res, Carbon 1K ¼W ± 5%
12	R4	99-A2000071A	Res, Carbon 18K ¼W ± 5%
13	RB1	99-A2231065A	Res, Block 1K 9S
14	X1	99-A9000070A	X-TAL 12Mhz
15	X2	99-A9000072A	X-TAL 8Mhz
16	RB2	99-A2231081A	Res, Block 4.7K 9S
17	RB3	99-A2231089A	Res, Block 10K 9S
18	IC1	99-B01X0000A	TTL 74LS00
19	IC2	99-B01X0002A	TTL 74LS02
20	IC3	99-B01X0004A	TTL 74LS04
21	IC4	99-B01X0008A	TTL 74LS08
22	IC5	99-B01X0010A	TTL 74LS10
23	IC6	99-B01X0027A	TTL 74LS27
24	IC7	99-B01X0032A	TTL 74LS32
25	IC8	99-B01X0074A	TTL 74LS74
26	IC9	99-B01X0083A	TTL 74LS83 A,B,C
27	IC10	99-B01X0085A	TTL 74LS85
28	IC11	99-B01X0086A	TTL 74LS86
29	IC12	99-B01X0138A	TTL 74LS138 A,B,C
30	IC13	99-B01X0157A	TTL 74LS157

ITEM	REF	TAITO PART NO.	DESCRIPTION
31	IC14	99-B01X0161A	TTL 74LS161 A,B,C
32	IC15	99-B01X0164A	TTL 74LS164
33	IC16	99-B01X0173A	TTL 74LS173
34	IC17	99-B01X0174A	TTL 74LS174
35	IC18	99-B01X0175A	TTL 74LS175
36	IC19	99-B01X0191A	TTL 74LS191
37	IC20	99-B01X0244A	TTL 74LS244
38	IC21	99-B01X0245A	TTL 74LS245
39	IC22	99-B01X0367A	TTL 74LS367 A,B,C
40	IC23	99-B01X0374A	TTL 74LS374
41	IC24	99-B01X0393A	TTL 74LS393
42			Not Used
43	IC25	99-B03X0004A	TTL 7404
44	IC26	99-B03X0367A	TTL 74367
45			Not Used
46	IC27	99-B08X2014B	CPU Z-80A
47			Not Used
48	IC28	99-B10X0016C	S RAM 2114-2
49	IC29	99-B10x0019A	S RAM 2016 C,D,F,G
50			Not Used
51	ROM	99-B2000251A	ROM AA1-13
52			Not Used
53	50P	99-C0510515A	Angle Pin Header FC50
54	IS1	99-C0550072A	IC Socket 24P
55	IS2	99-C0550080A	IC Socket 28P
56	IS3	99-C0550090A	IC Socket 40P
57	TP	99-C0600403A	Test Point Chip L=7816
58			Not Used
59	Lcb	99-F9000127A	Locking Support LCB-8
60	ST	99-G1010276A	PC Board Sticker K1000102A

CPU BOARD COMPONENT LAYOUT

FIGURE 20



TAITO AMERICA CORPORATION
1258 Estes Avenue, Elk Grove Village, IL 60007
Telephone (312) 981-1000 Telex 25-3280

DESCRIPTION: FRONT LINE™
CPU Board Layout

VIDEO BOARD

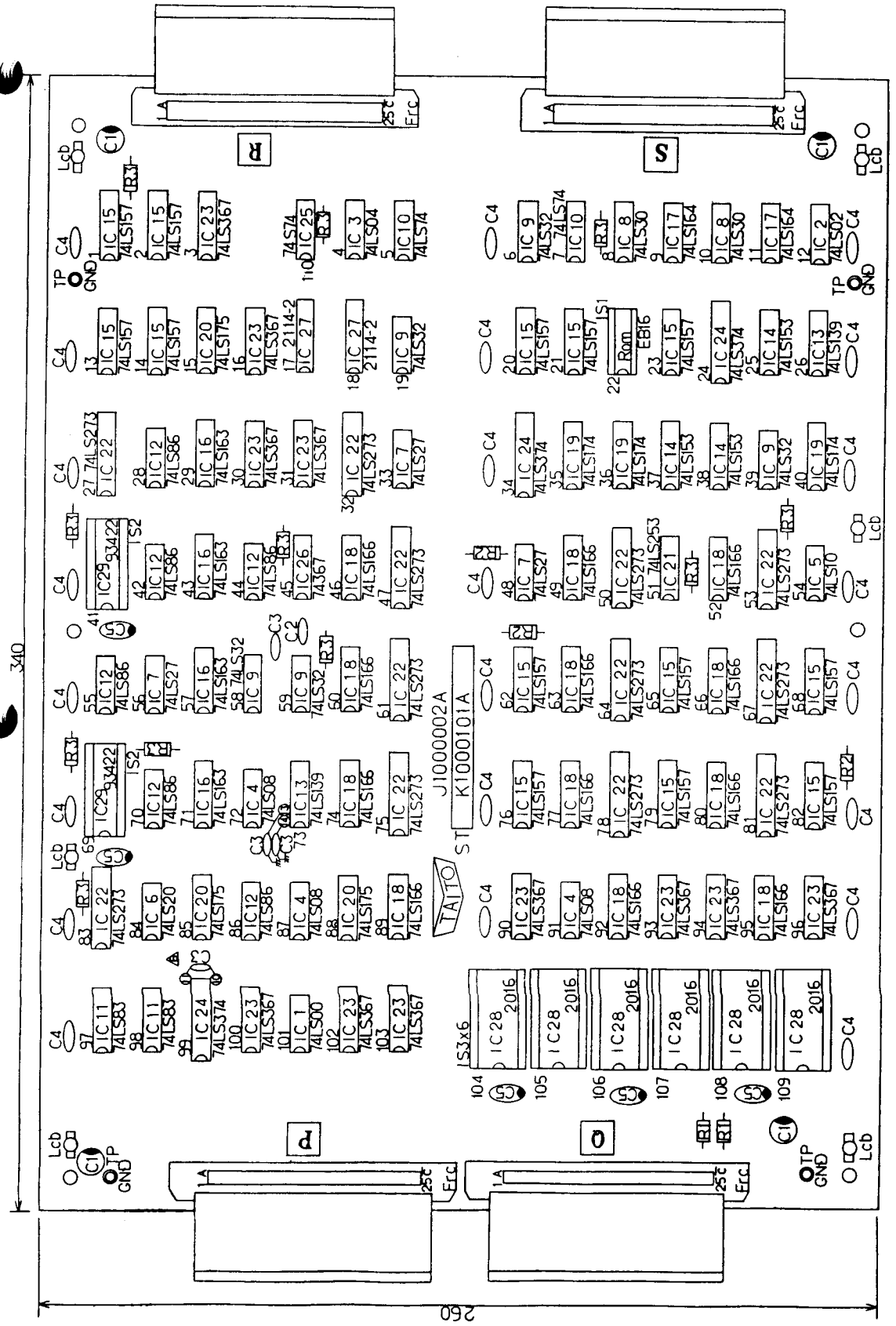
FIGURE 21

ITEM	REF	TAITO PART NO.	DESCRIPTION
1	C1	99-A1000135A	Elec, Block 16VB 220
2	C2	99-A1200245A	Cap, Ceramic 50V 100P
3	C3	99-A1200251A	Cap, Ceramic 50V 180P
4	C4	99-A1200317A	Cap, Ceramic 50V 100000P
5	C5	99-A1320607A	Tant Dip 35V1
6			Not Used
7	R1	99-A2000041A	Res, Carbon 100 ¼W ± 5%
8	R2	99-A2000057A	Res, Carbon 470 ¼W ± 5%
9	R3	99-A2000065A	Res, Carbon 1K ¼W ± 5%
10			Not Used
11	IC1	99-B01X0000A	TTL 74LS00
12	IC2	99-B01X0002A	TTL 74LS02
13	IC3	99-B01X0004A	TTL 74LS04
14	IC4	99-B01X0008A	TTL 74LS08
15	IC5	99-B01X0010A	TTL 74LS10
16	IC6	99-B01X0020A	TTL 74LS20
17	IC7	99-B01X0027A	TTL 74LS27
18	IC8	99-B01X0030A	TTL 74LS30
19	IC9	99-B01X0032A	TTL 74LS32
20	IC10	99-B01X0074A	TTL 74LS74
21	IC11	99-B01X0083A	TTL 74LS83
22	IC12	99-B01X0086A	TTL 74LS86
23	IC13	99-B01X0139A	TTL 74LS139
24	IC14	99-B01X0153A	TTL 74LS153
25	IC15	99-B01X0157A	TTL 74LS157
26	IC16	99-B01X0163A	TTL 74LS163
27	IC17	99-B01X0164A	TTL 74LS164

ITEM	REF	TAITO PART NO.	DESCRIPTION
28	IC18	99-B01X0166A	TTL 74LS166
29	IC19	99-B01X0174A	TTL 74LS174
30	IC20	99-B01X0175A	TTL 74LS175
31	IC21	99-B01X0253A	TTL 74LS253
32	IC22	99-B01X0273A	TTL 74LS273
33	IC23	99-B01X0367A	TTL 74LS367
34	IC24	99-B01X0374A	TTL 74LS374 A,B,C
35			Not Used
36	IC25	99-B02X0074A	TTL 74LS74
37			Not Used
38	IC26	99-B03X0367A	TTL 74367
39			Not Used
40	IC27	99-B10X0016C	S RAM 2114-2
41	IC28	99-B10X0019A	S RAM 2016 C,D,F,G
42	IC29	99-B11J0006A	BIP RAM 93422
43			Not Used
44	ROM	99-B2000074A	ROM EB16 74S287
45			Not Used
46	IS1	99-C0550033A	IC Socket 16P
47	IS2	99-C0550061A	IC Socket 22P
48	IS3	99-C0550072A	IC Socket 24P
49			Not Used
50	TP	99-C0600403A	Test Point Chip L=7.8
51			Not Used
52	Lcb	99-F9000146A	Locking Support 1CB-16
53	ST	99-G1010275A	PC Board Sticker K1000101A

VIDEO BOARD COMPONENT LAYOUT

FIGURE 21



TAITO AMERICA CORPORATION
1258 Estes Avenue, Elk Grove Village, IL 60007
Telephone (312) 981-1000 Telex: 25-3280

FRONT LINE™
Video Board Layout

GAME BOARD

FIGURE 22

ITEM	REF	TAITO PART NO.	DESCRIPTION
1	TR1	99-A0100012A	TR 2SA 473
2		99-P0600021A	Pan Hd Screw M3X6
3		99-P2000006A	Nut M3-1
4	TR2	99-A0100143A	TR 2SD635
5		99-P0600021A	Pan Hd Screw M3X6
6		99-P2000006A	Nut M3-1
7	D1	99-A0200029A	Diode V03C
8	D2	99-A0210034A	Zener RD27EB1
9	D3	99-A0210045A	Zener RD9A-1
10			Not Used
11	C1	99-A1000123A	Elec Block 16VB22
12	C2	99-A1000135A	Elec Block 16VB220
13	C3	99-A1100147A	Cap, Film 50V0.01 1H103
14	C4	99-A1100155A	Cap, Film 50V0.022 1H223
15	C5	99-A1100162A	Cap, Film 50V0.047 1H473
16	C6	99-A1200229A	Cap, Ceramic 50V 22P
17	C7	99-A1200237A	Cap, Ceramic 50V 47P
18	C8	99-A1200249A	Cap, Ceramic 50V 150P
19	C9	99-A1200251A	Cap, Ceramic 50V 180P
20	C10	99-A1200261A	Cap, Ceramic 50V 470P
21	C11	99-A1200317A	Cap, Ceramic 50V 100000P
22	C12	99-A1320519A	Tant Dip 25V10
23	C13	99-A1320601A	Tant Dip 35V0.1
24	C14	99-A1320607A	Tant Dip 35V1
25			Not Used
26	R1	99-A2000033A	Res, Carbon 47 ¼W ± 5%
27	R2	99-A2000041A	Res, Carbon 100 ¼W ± 5%
28	R3	99-A2000049A	Res, Carbon 220 ¼W ± 5%
29	R4	99-A2000051A	Res, Carbon 270 ¼W ± 5%
30	R5	99-A2000053A	Res, Carbon 330 ¼W ± 5%
31	R6	99-A2000057A	Res, Carbon 470 ¼W ± 5%
32	R7	99-A2000059A	Res, Carbon 560 ¼W ± 5%
33	R8	99-A2000065A	Res, Carbon 1K ¼W ± 5%
34	R9	99-A2000071A	Res, Carbon 1.8K ¼W ± 5%
35	R10	99-A2000072A	Res, Carbon 2K ¼W ± 5%
36	R11	99-A2000075A	Res, Carbon 2.7K ¼W ± 5%
37	R12	99-A2000079A	Res, Carbon 3.9K ¼W ± 5%
38	R13	99-A2000081A	Res, Carbon 4.7K ¼W ± 5%
39	R14	99-A2000089A	Res, Carbon 10K ¼W ± 5%
40	R15	99-A2000096A	Res, Carbon 20K ¼W ± 5%
41	R16	99-A2000097A	Res, Carbon 22K ¼W ± 5%
42	R17	99-A2000103A	Res, Carbon 39K ¼W ± 5%
43	R18	99-A2000111A	Res, Carbon 82K ¼W ± 5%
44	R19	99-A2000117A	Res, Carbon 150K ¼W ± 5%
45	R20	99-A2000123A	Res, Carbon 270K ¼W ± 5%
46	R21	99-A2000125A	Res, Carbon 330K ¼W ± 5%

ITEM	REF	TAITO PART NO.	DESCRIPTION
47	R22	99-A2000127A	Res, Carbon 390K ¼W ± 5%
48	R23	99-A2000129A	Res, Carbon 470K ¼W ± 5%
49	R24	99-A2000133A	Res, Carbon 680K ¼W ± 5%
50	R25	99-A2000137A	Res, Carbon 1M ¼W ± 5%
51	R26	99-A2000145A	Res, Carbon 2.2M ¼W ± 5%
52	R27	99-A2000147A	Res, Carbon 2.7M ¼W ± 5%
53	R28	99-A2000470A	Res, Carbon 1K ¼W ± 5%
54	R29	99-A2002361A	Res, Carbon 15K ¼W ± 1%
55	R30	99-A2002395A	Res, Carbon 30K ¼W ± 1%
56	R31	99-A2002571A	Res, Carbon 1M ¼W ± 1%
57			Not Used
58	VR	99-A2102509A	RSET B50K 1.0
59	RB4	99-A2231065A	Res, Block 1K 9S
60	RRC	99-A2239003A	R.R.C 48CRIE 2B
61	R32	99-A2251669A	Res Wire 6 OHM 2W ± 10%
62	XTAL	99-A9000066A	X-TAL 6 MHz
63			Not Used
64	IC1	99-B01X0000A	TTL 74LS00
65	IC2	99-B01X0002A	TTL 74LS02
66	IC3	99-B01X0004A	TTL 74LS04
67	IC4	99-B01X0008A	TTL 74LS08
68	IC5	99-B01X0032A	TTL 74LS32 A,B
69	IC6	99-B01X0074A	TTL 74LS74
70	IC7	99-B01X0096A	TTL 74LS96
71	IC8	99-B01X0138A	TTL 74LS138 A,B,C
72	IC9	99-B01X0153A	TTL 74LS153
73	IC10	99-B01X0155A	TTL 74LS155
74	IC11	99-B01X0174A	TTL 74LS174
75	IC12	99-B01X0253A	TTL 74LS253
76	IC13	99-B01X0257A	TTL 74LS257
77	IC14	99-B01X0259A	TTL 74LS259 A,B,C
78	IC15	99-B01X0367A	TTL 74LS367
79	IC16	99-B01X0374A	TTL 74LS374
80	IC17	99-B01X0393A	TTL 74LS393
81	IC18	99-B03X0004A	TTL 7404
82	IC19	99-B03X0016A	TTL 7416
83	IC20	99-B03X0017A	TTL 7417
84	IC21	99-B03X0074A	TTL 7474
85	IC22	99-B03X0273A	TTL 74273
86	IC23	99-B03X0367A	TTL 74367
87	IC24	99-B07X0584A	C-MOS MC 14584B
88			Not Used
89			Not Used
90	CPU	99-B08X2014B	CPU Z-80A
91	RAM 1	99-B10X0016C	S RAM 2114-2
92	RAM 2	99-B11X0002A	BIPRAM 93419

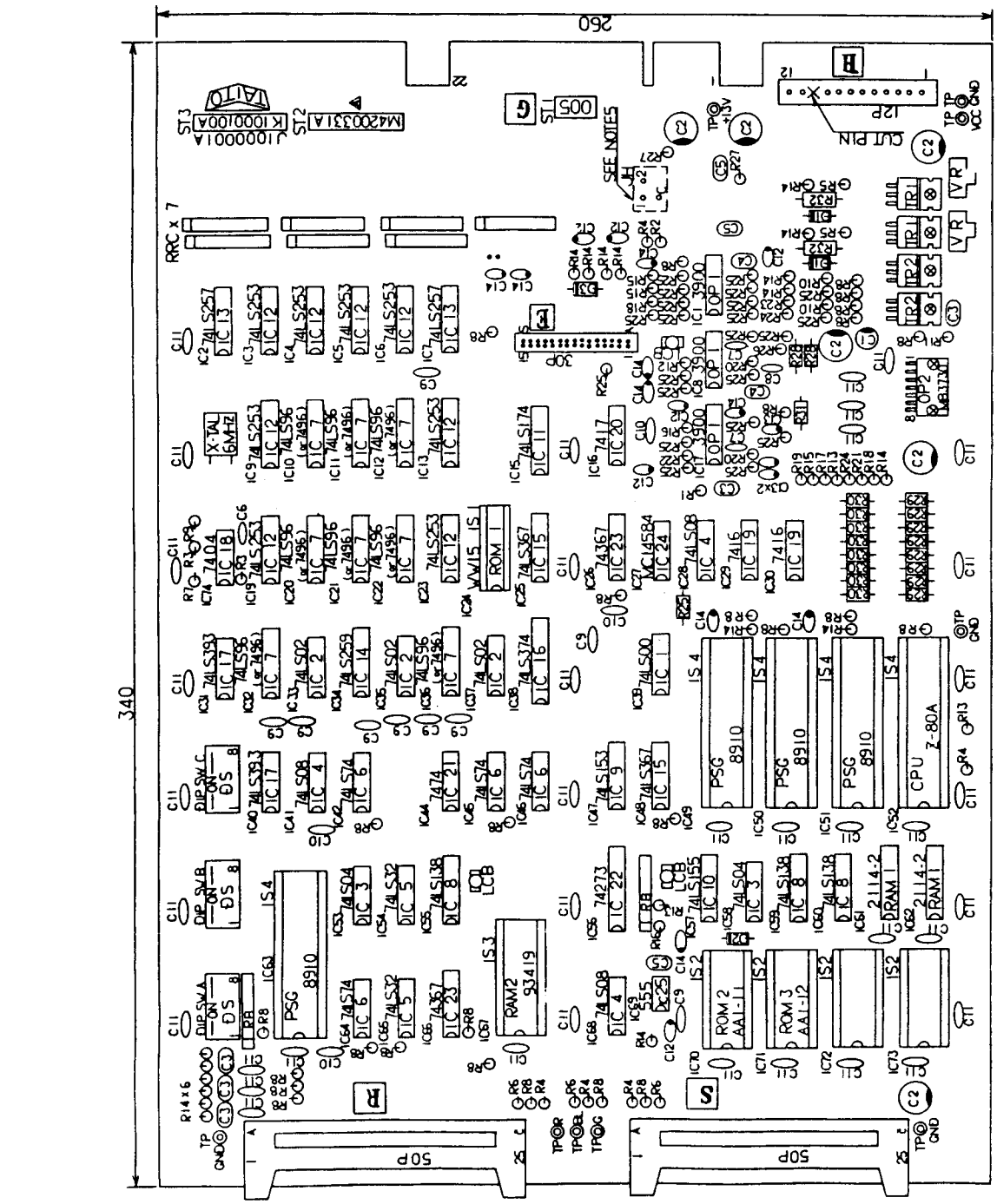
GAME BOARD

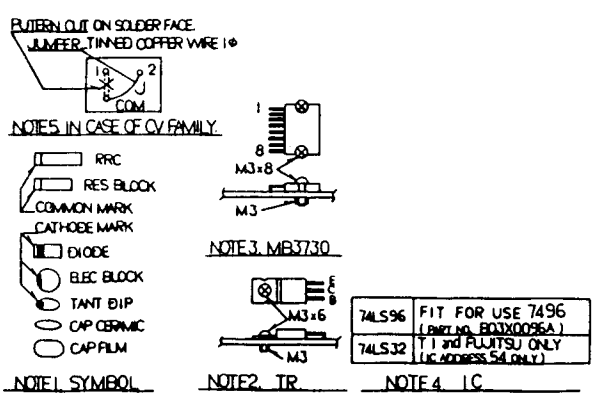
FIGURE 22

ITEM	REF	TAITO PART NO.	DESCRIPTION
93	OP1	99-B17Z0440A	OP AMP 3900 or HA17301
94	OP2	99-B17Z1605A	Power Amp MR 3730
95		99-P0600022A	Pan Hd Screw M3X8
96		99-P2000006A	Nut M3-1
97	PSG	99-B17Z2001A	Sound Gene AY-3-8910
98	IC25	99-B17Z2526A	Timer 555
99			Not Used
100	ROM 1	99-B2000053A	P-ROM WW15
101	ROM 2	99-B2000249A	P-ROM AA1-11 2732
102	ROM 3	99-B2000250A	P-ROM AA1-12 2732
103			Not Used
104			Not Used
105			Not Used

GAME BOARD COMPONENT LAYOUT

FIGURE 22

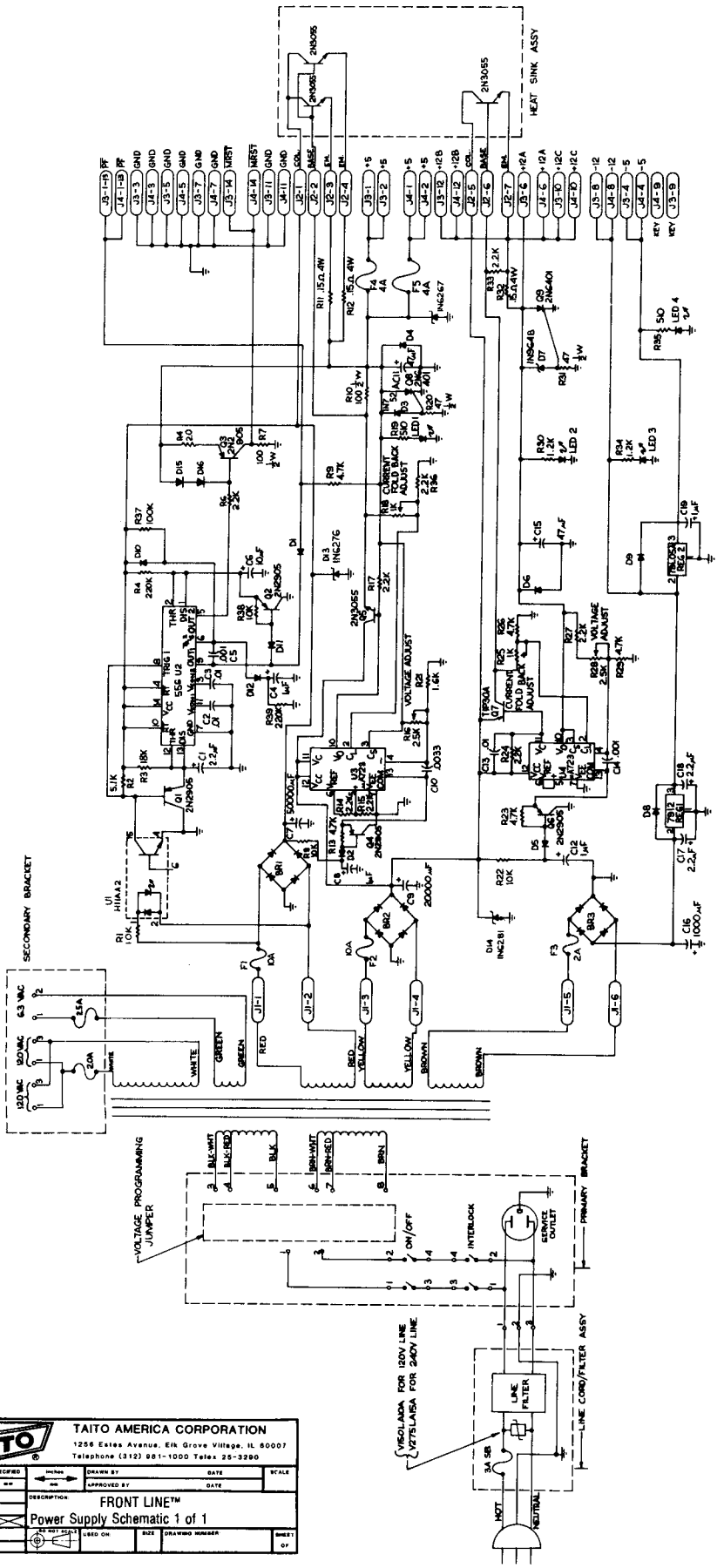






POWER SUPPLY SCHEMATIC 1 of 1

FIGURE 23

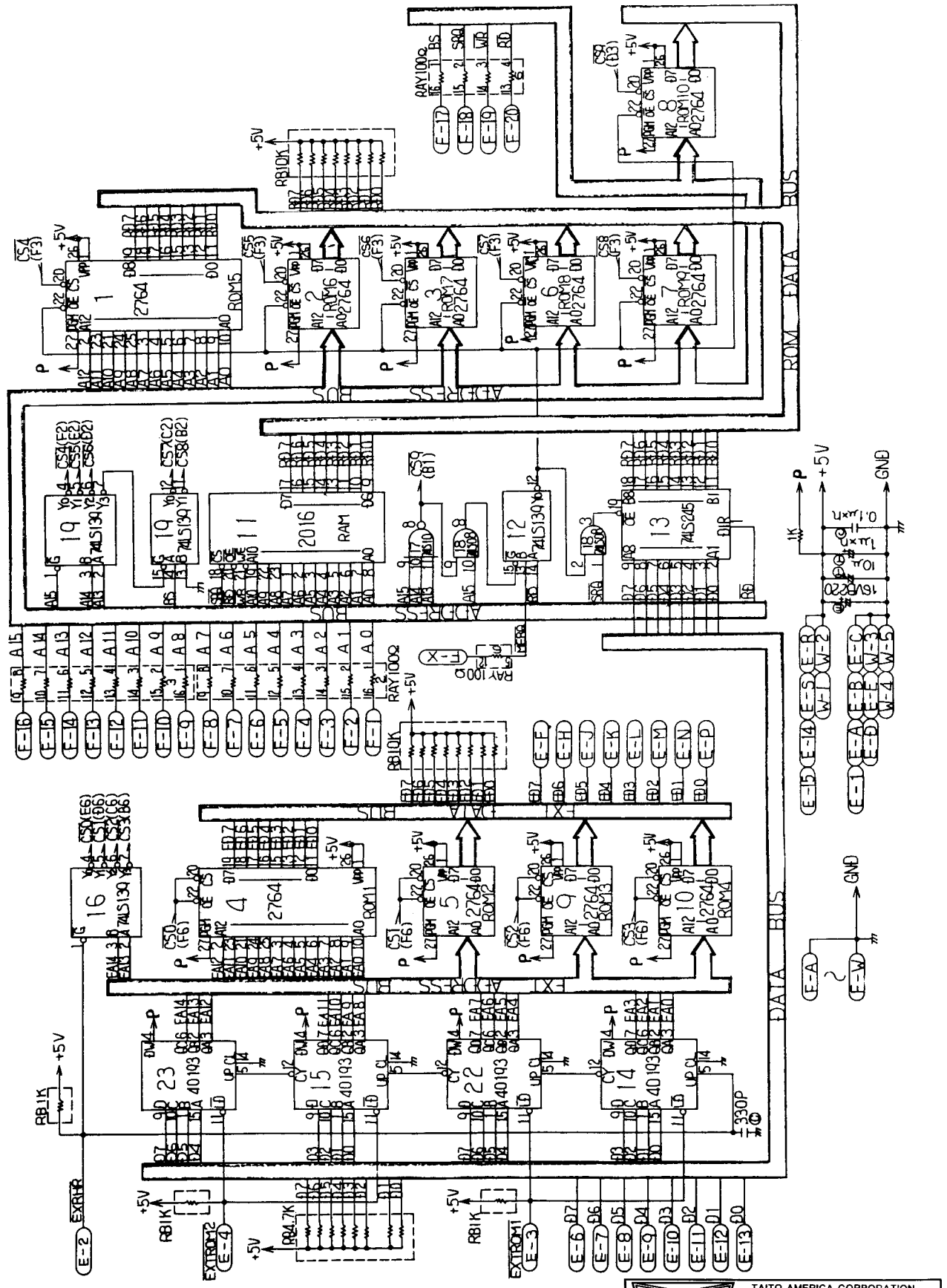


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DESCRIPTION: FRONT LINE™
Power Supply Schematic 1 of 1

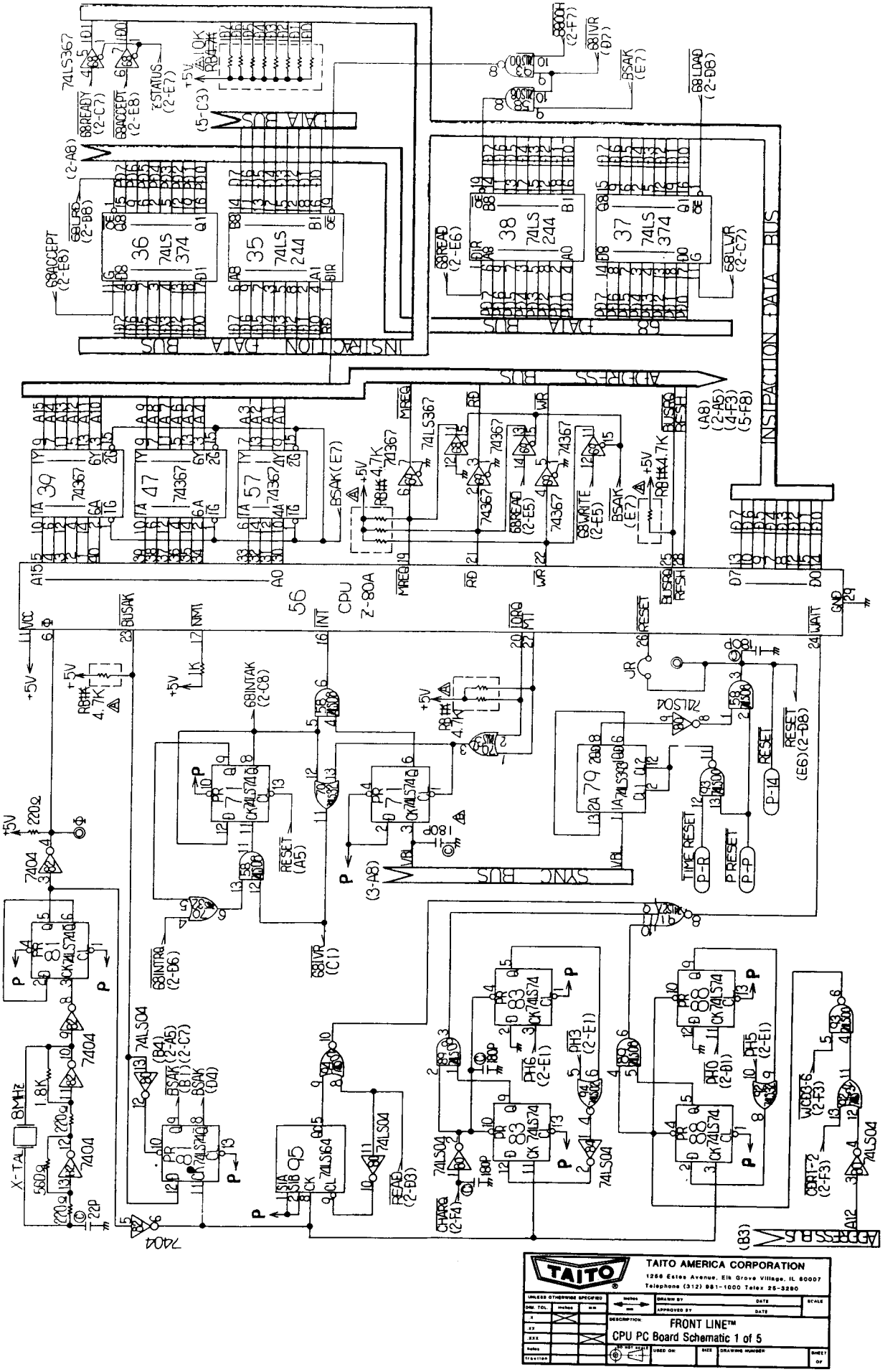
ROM PC BOARD SCHEMATIC 1 of 1

FIGURE 24



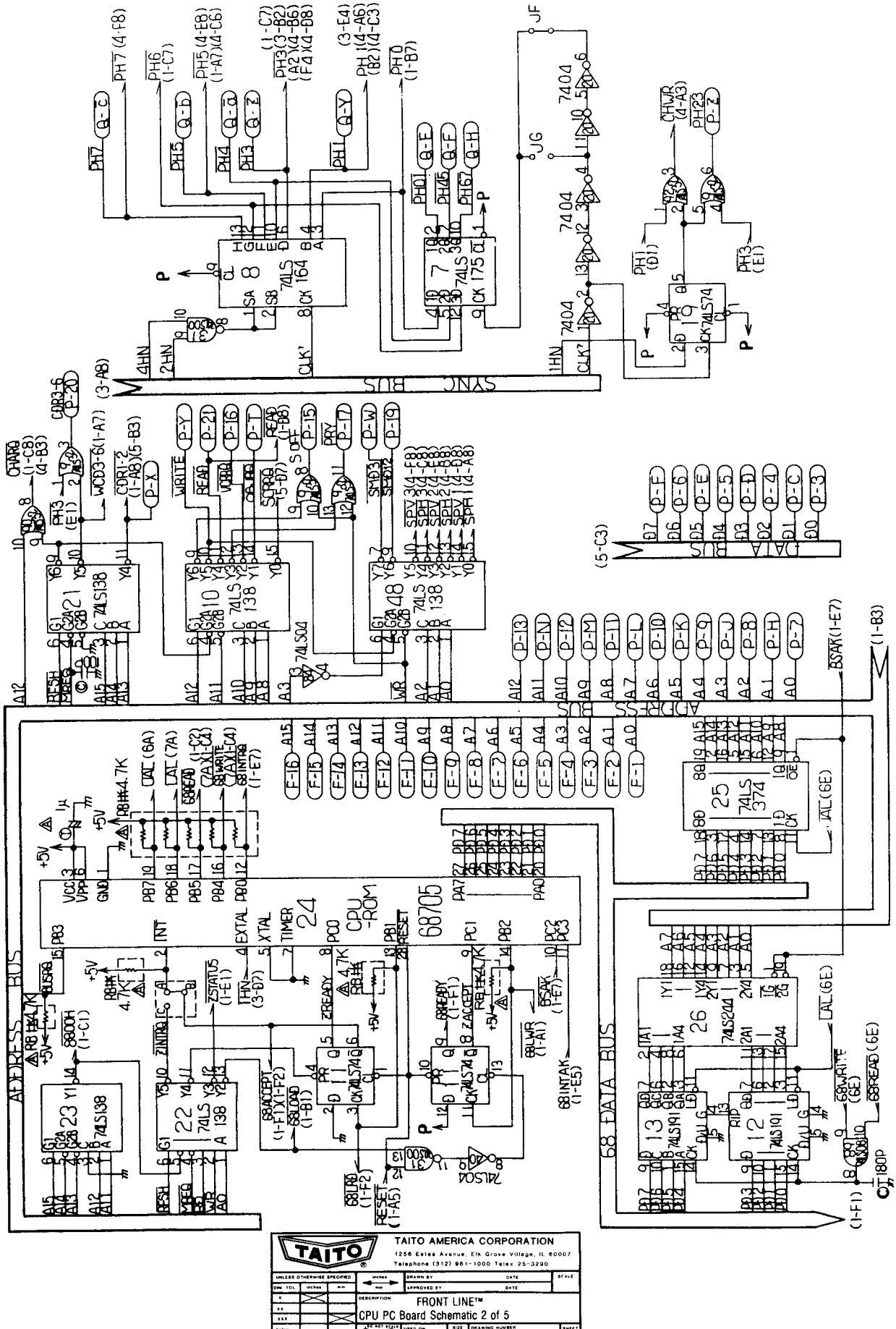
CPU PC BOARD SCHEMATIC 1 of 5

FIGURE 25



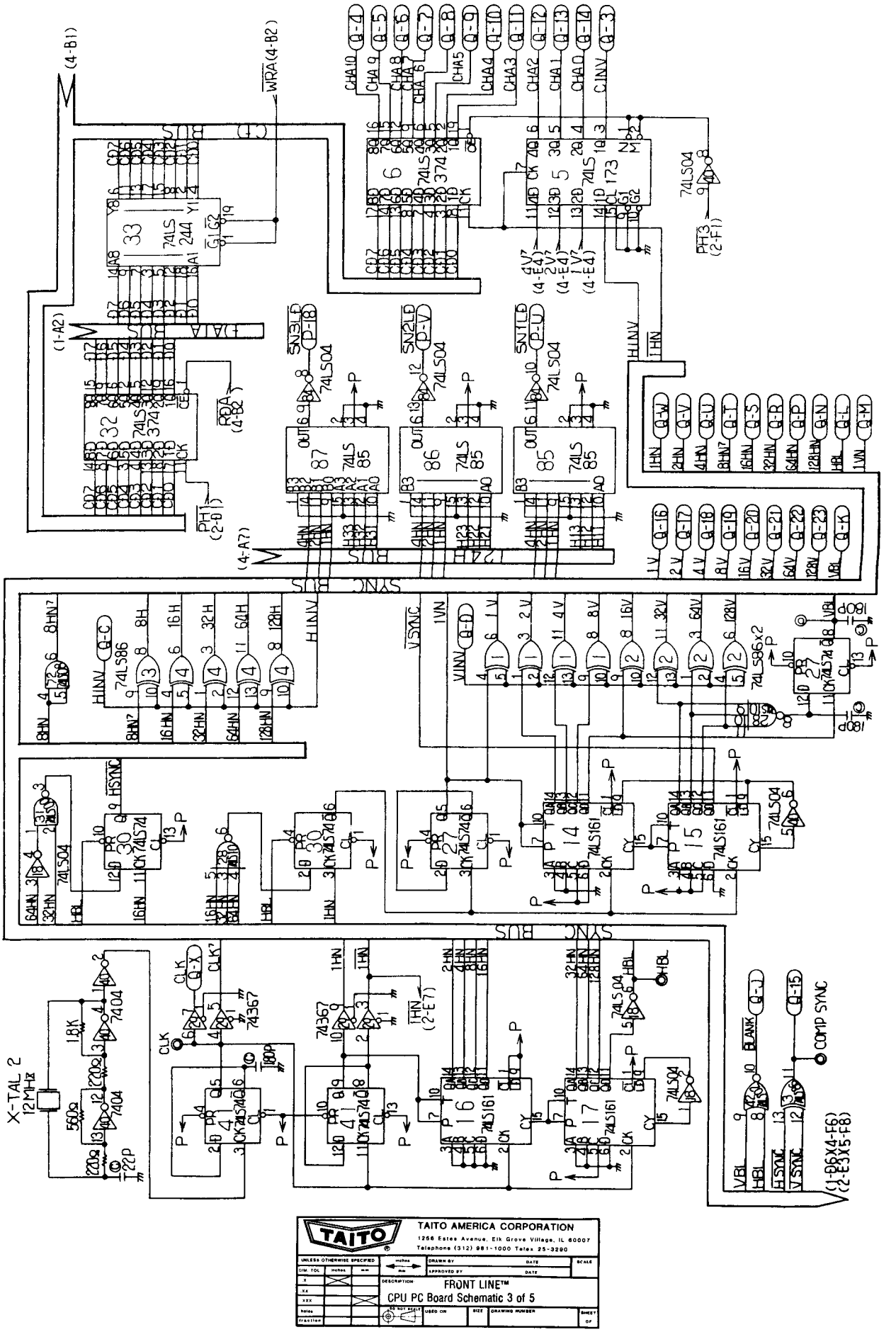
CPU PC BOARD SCHEMATIC 2 of 5

FIGURE 26



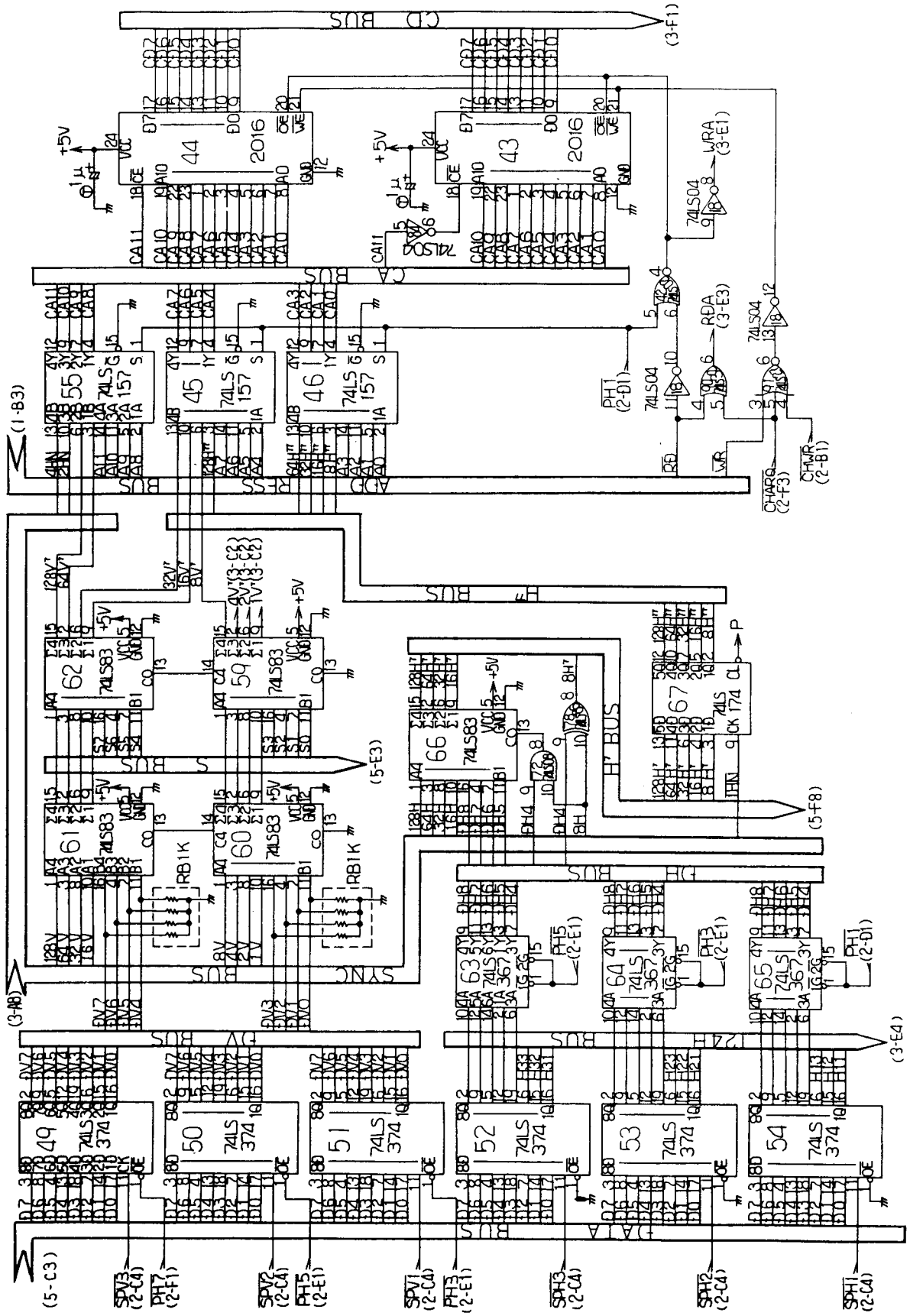
CPU PC BOARD SCHEMATIC 3 of 5

FIGURE 27



CPU PC BOARD SCHEMATIC 4 of 5

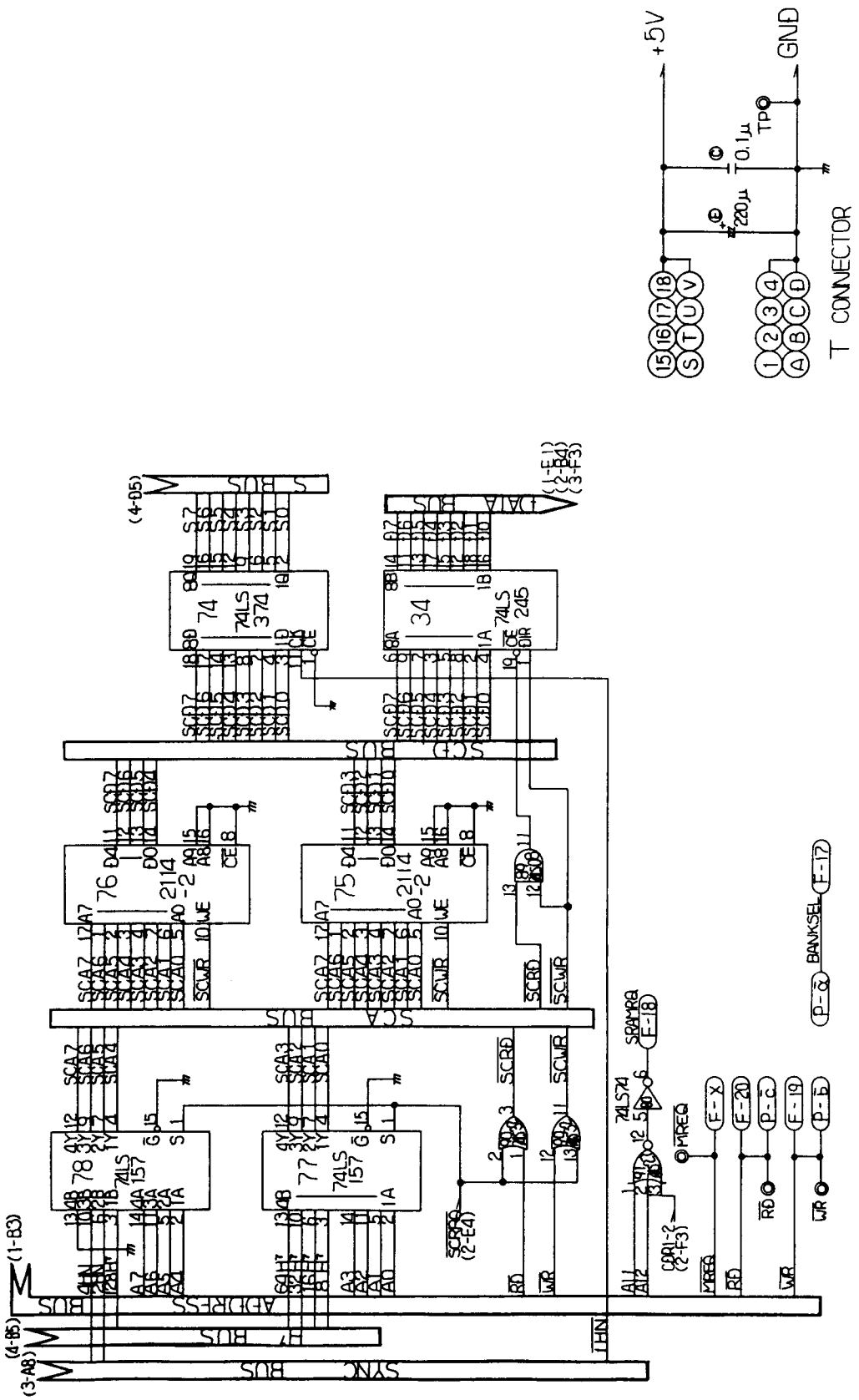
FIGURE 28



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UNLESS OTHERWISE SPECIFIED	DRAWN BY	DATE
DIM. TOL. inches mm	APPROVED BY	DATE
.X	DESCRIPTION: FRONT LINE™	
.XX	CPU PC Board Schematic 4 of 5	
.XXX	USED ON	SIZE A4
holes	DRAWING NUMBER	SHEET OF
fraction		

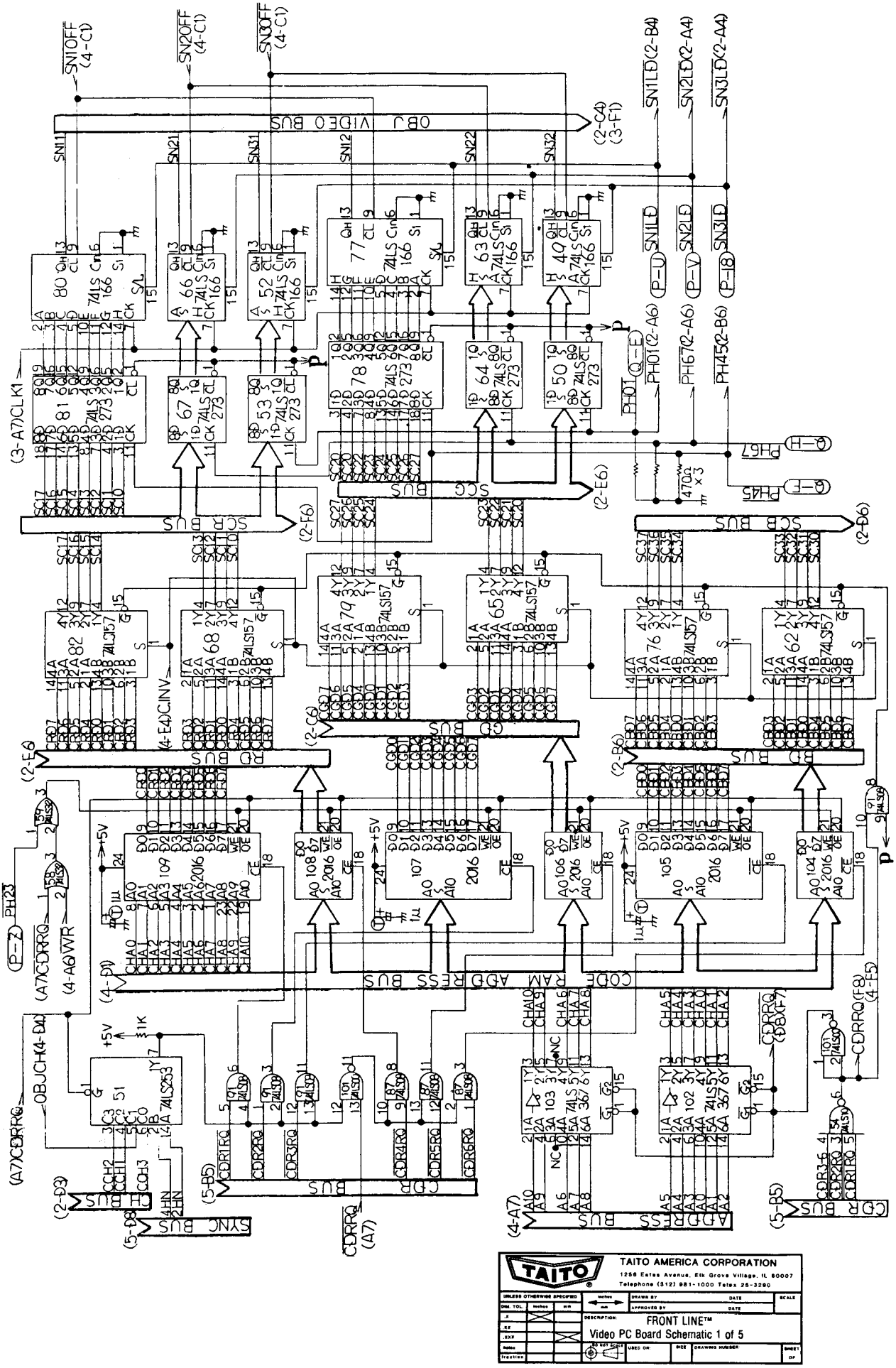
CPU PC BOARD SCHEMATIC 5 of 5

FIGURE 29



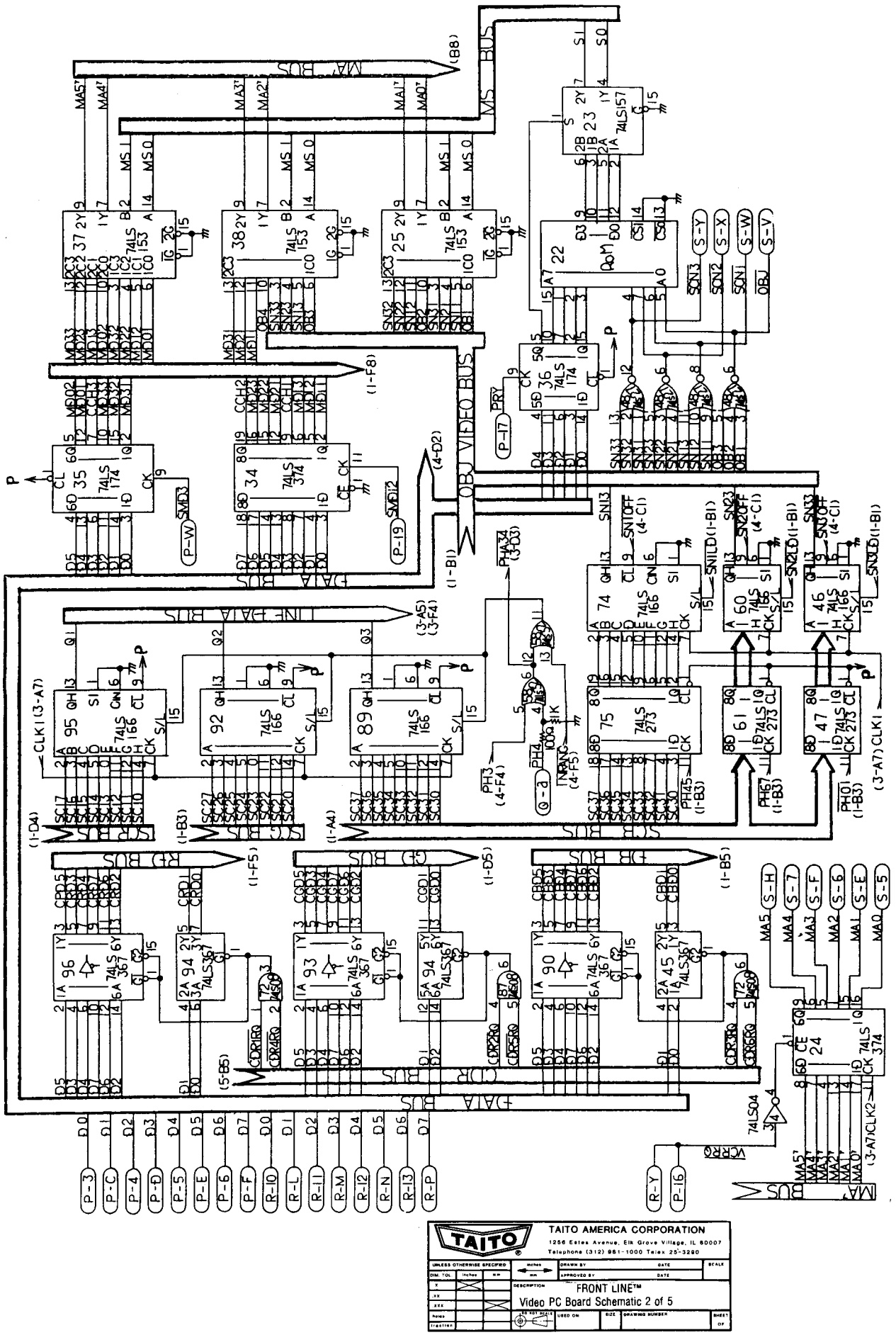
VIDEO PC BOARD SCHEMATIC 1 of 5

FIGURE 30



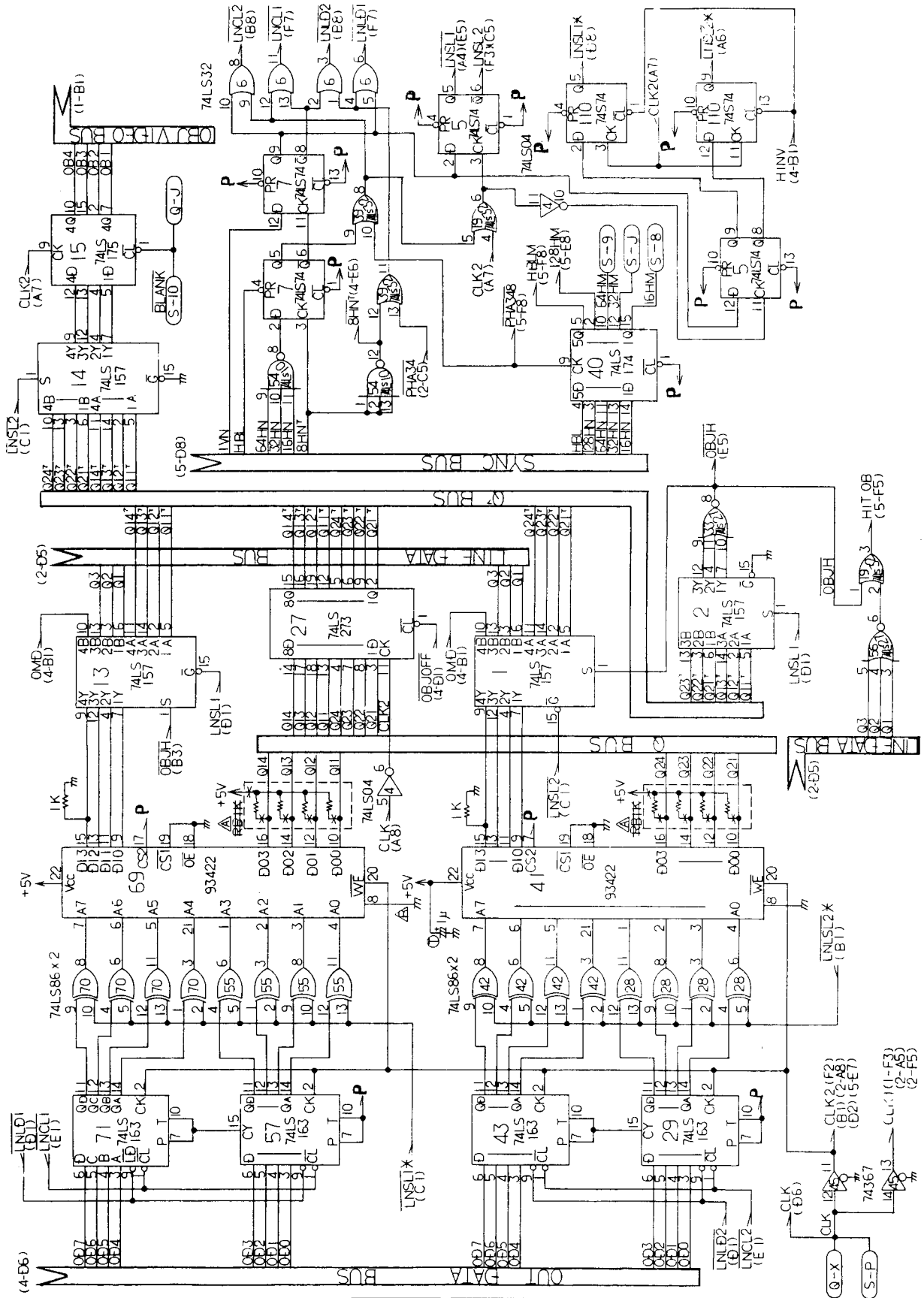
VIDEO PC BOARD SCHEMATIC 2 of 5

FIGURE 31



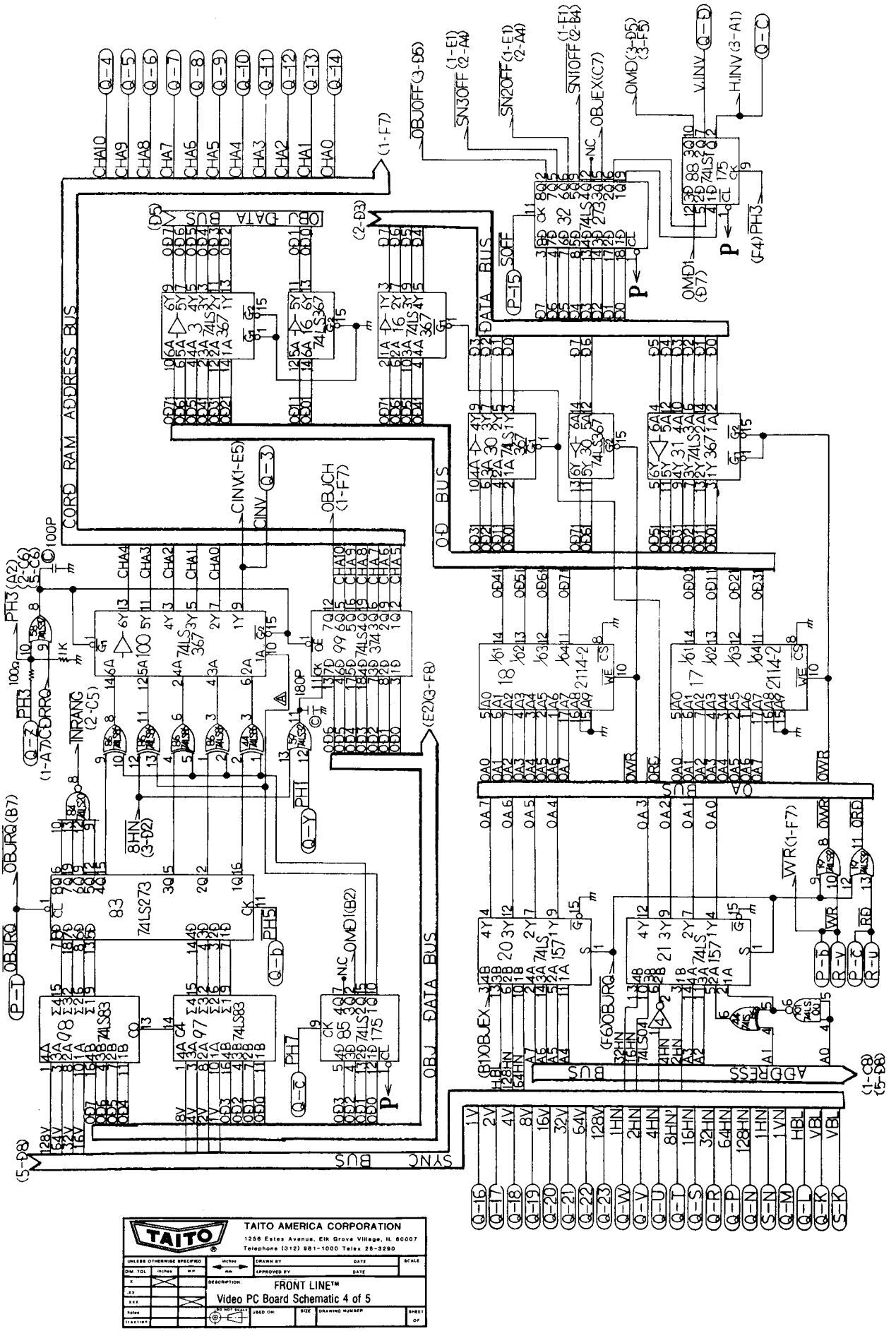
VIDEO PC BOARD SCHEMATIC 3 of 5

FIGURE 32



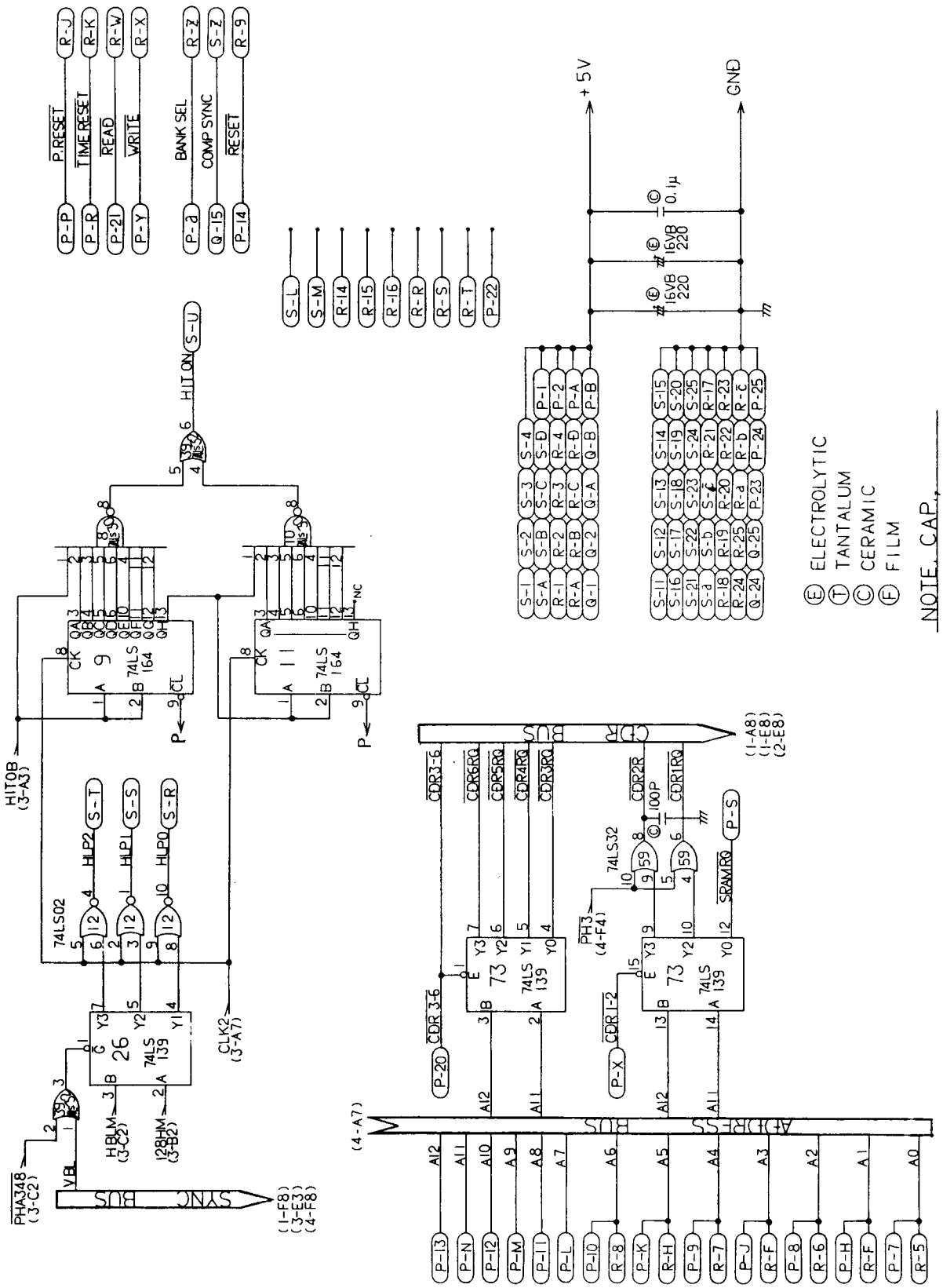
VIDEO PC BOARD SCHEMATIC 4 of 5

FIGURE 33



VIDEO PC BOARD SCHEMATIC 5 of 5

FIGURE 34

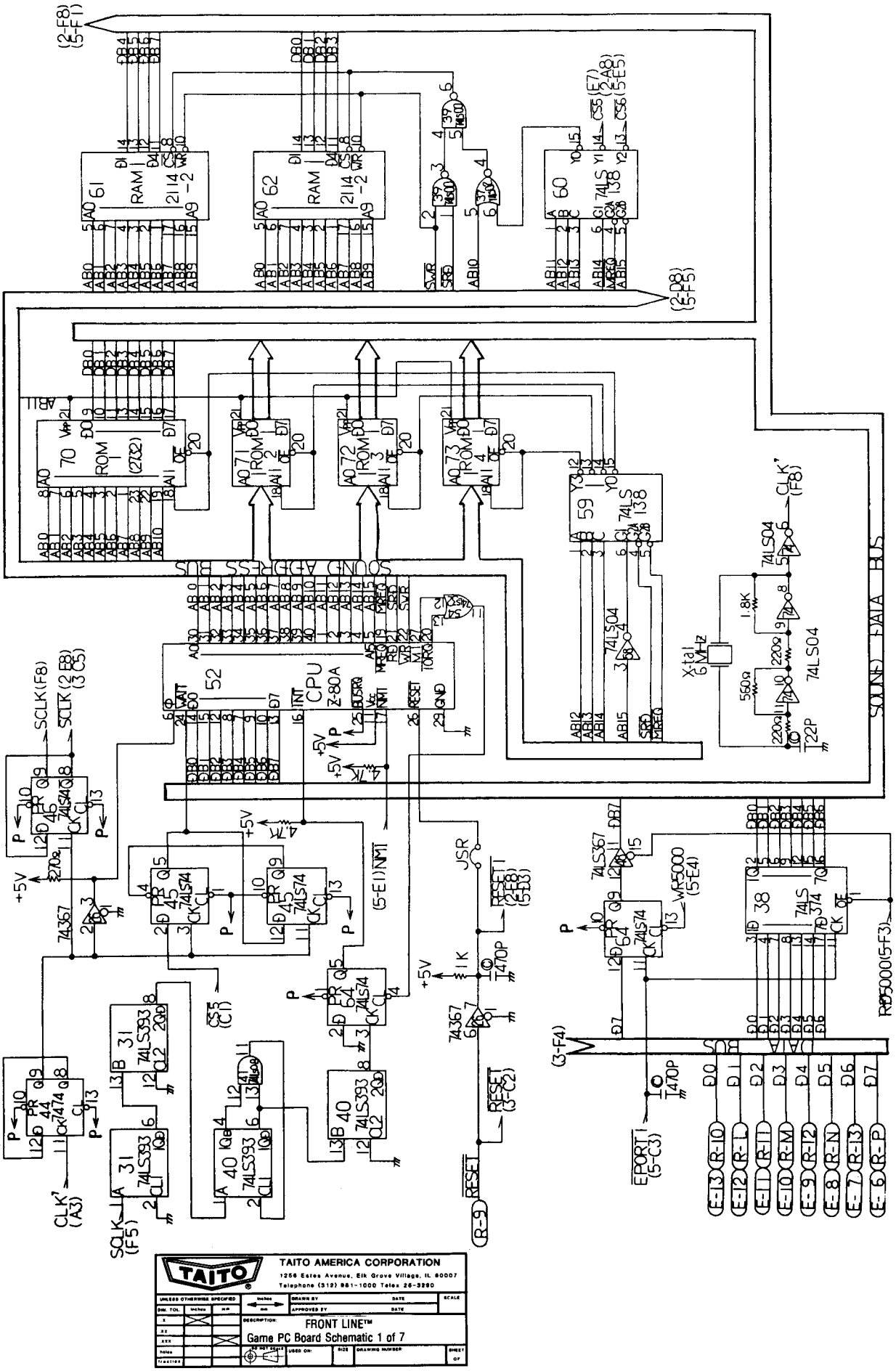


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Video PC Board Schematic 5 of 5

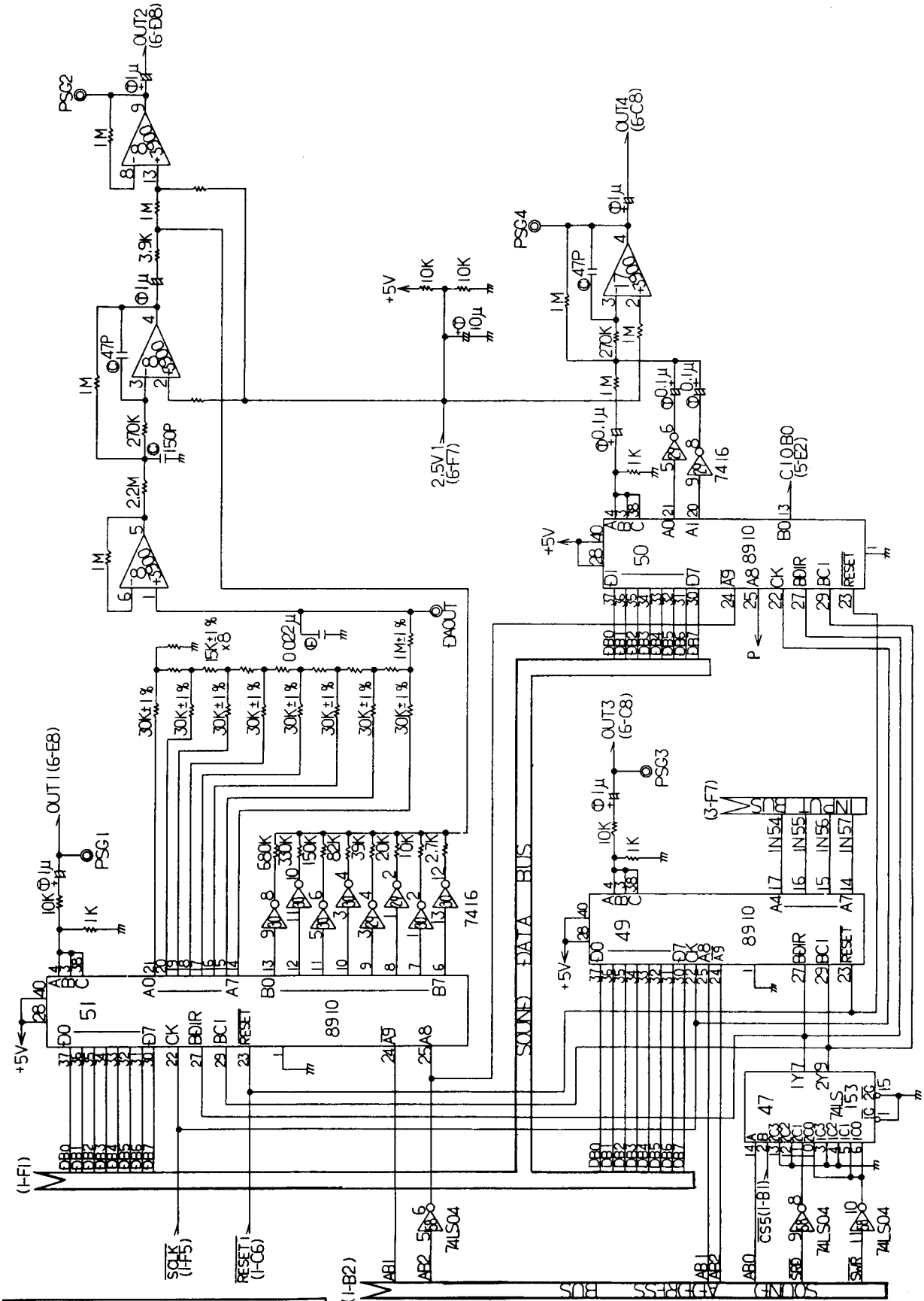
GAME PC BOARD SCHEMATIC 1 of 7

FIGURE 35



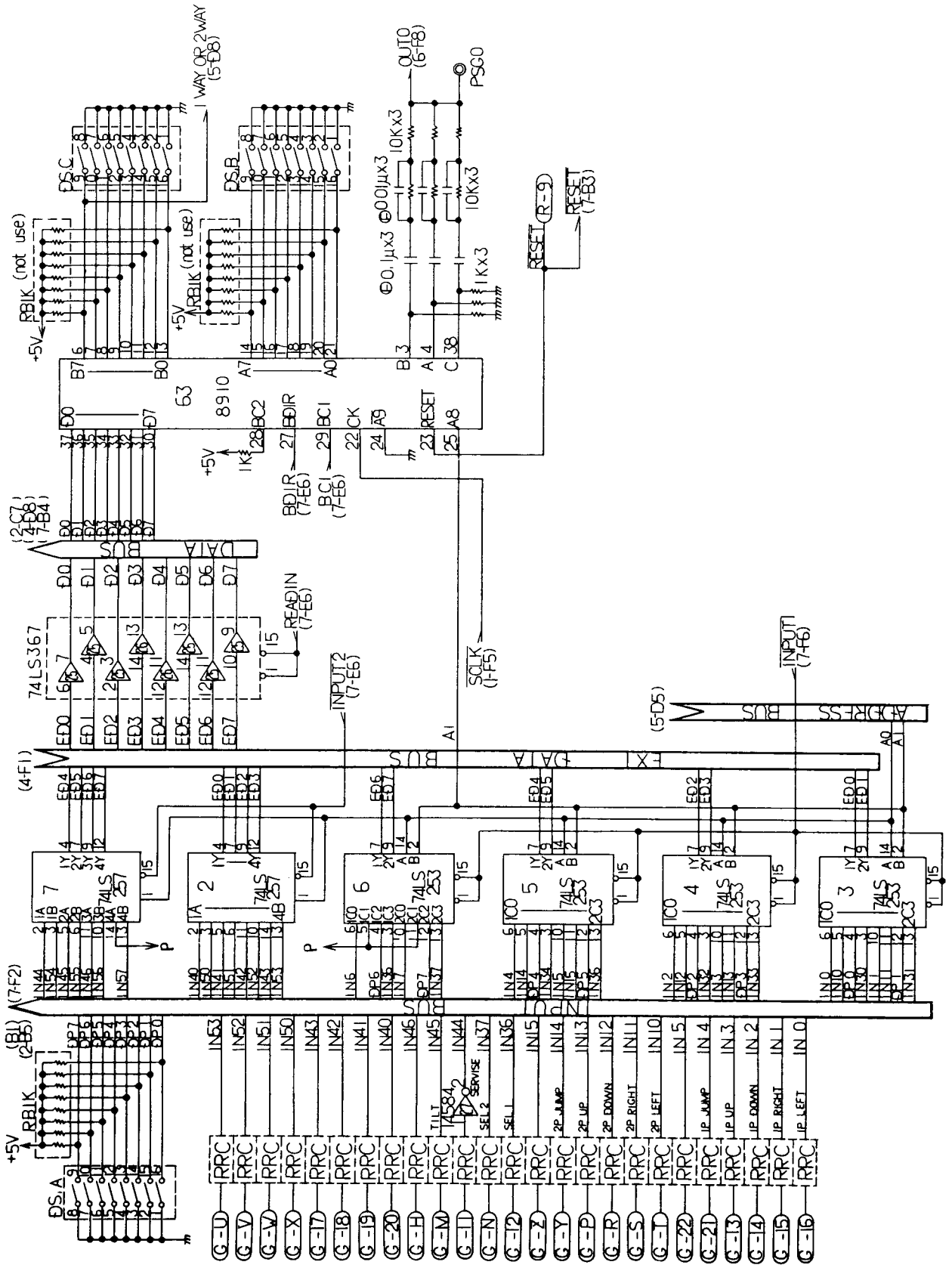
GAME PC BOARD SCHEMATIC 2 of 7

FIGURE 36



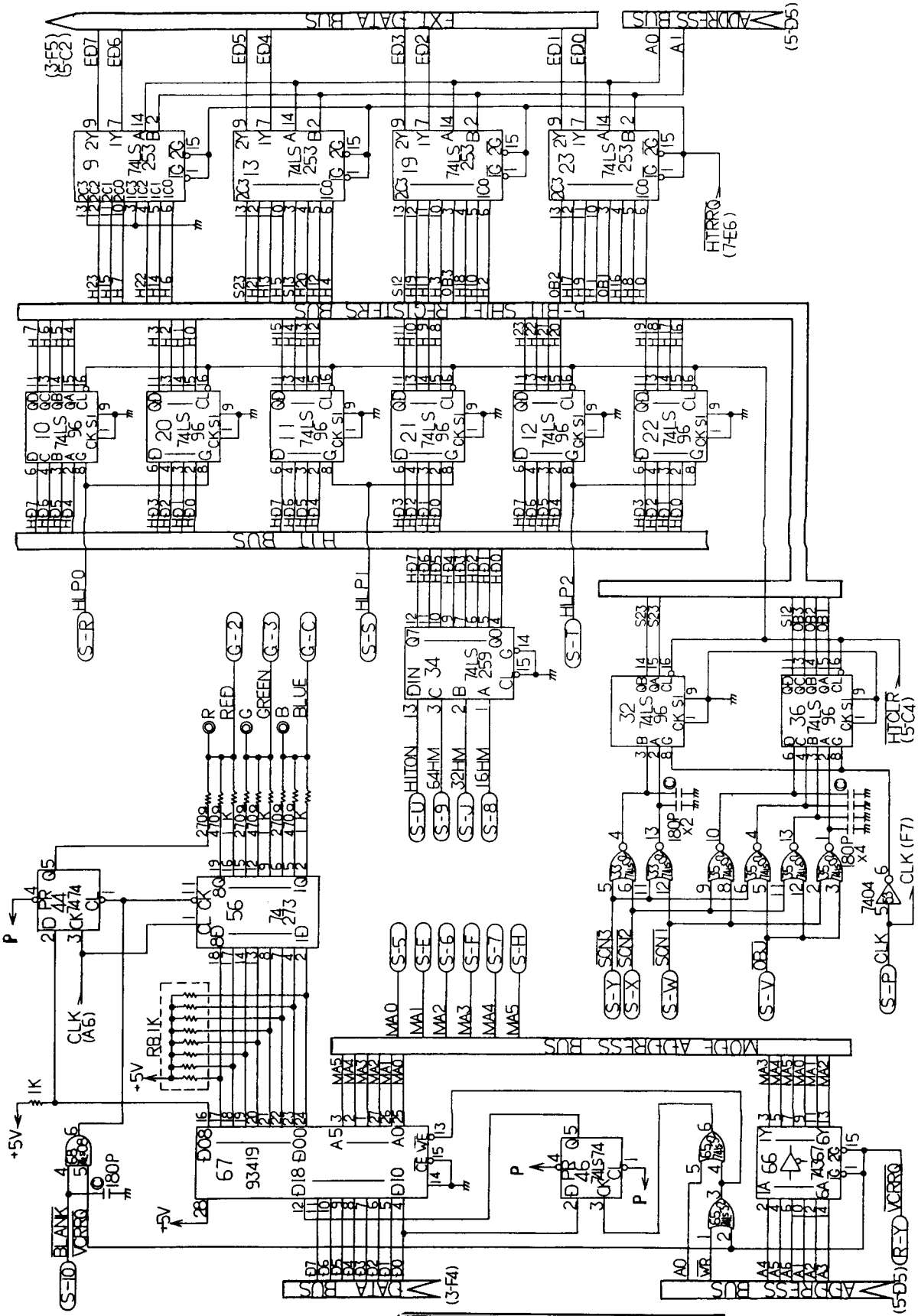
GAME PC BOARD SCHEMATIC 3 of 7

FIGURE 37



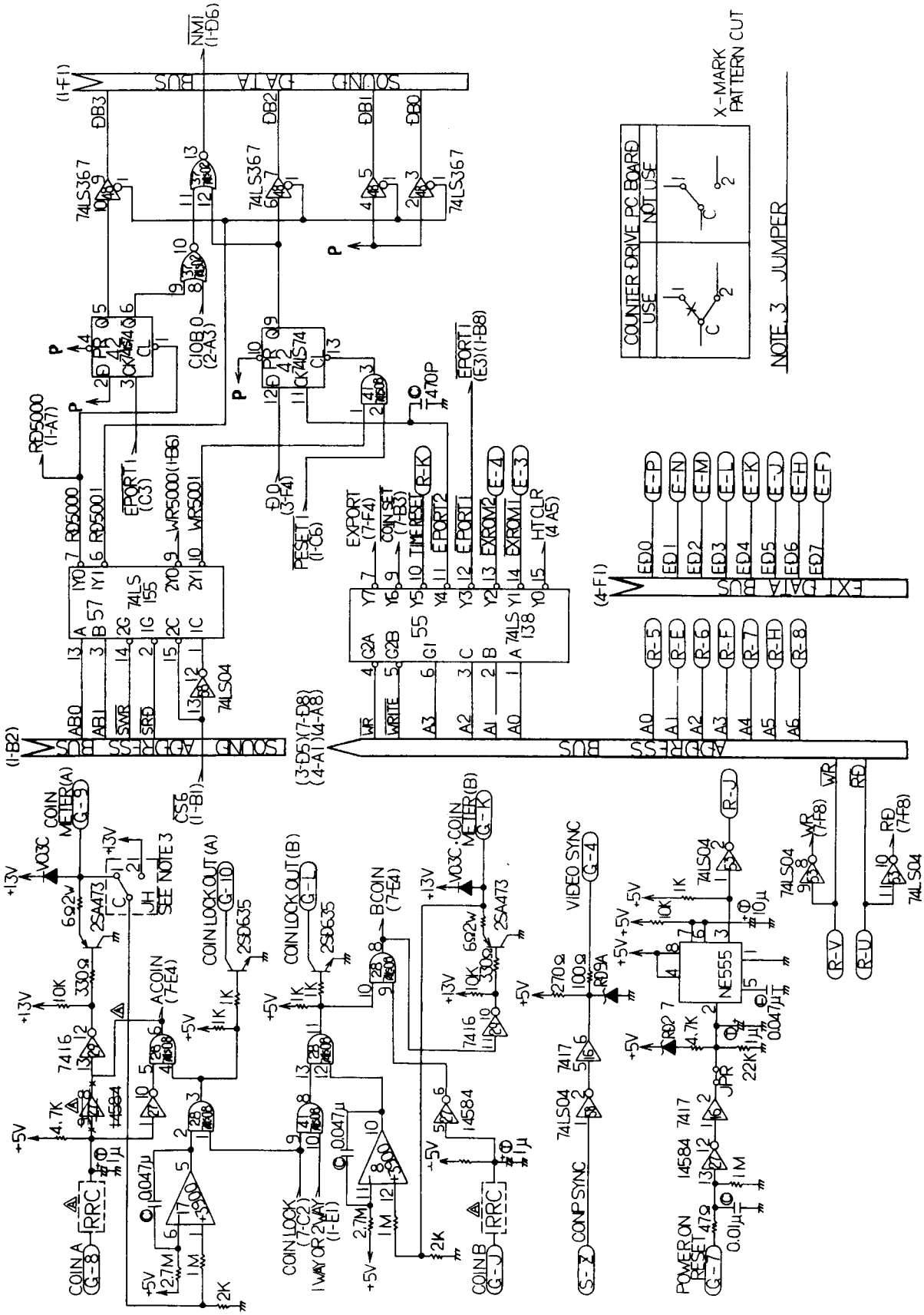
GAME PC BOARD SCHEMATIC 4 of 7

FIGURE 38



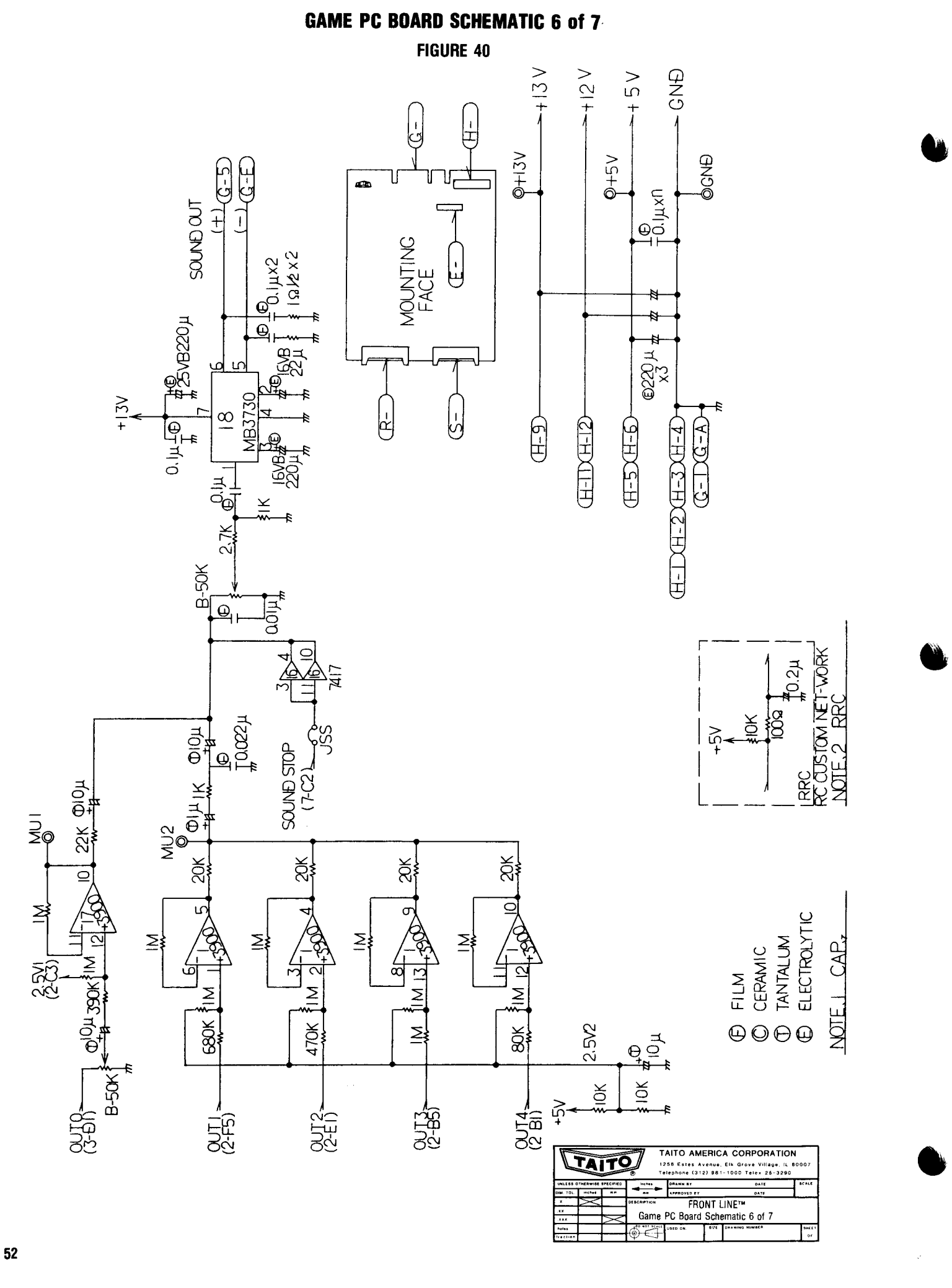
GAME PC BOARD SCHEMATIC 5 of 7

FIGURE 39



GAME PC BOARD SCHEMATIC 6 of 7

FIGURE 40



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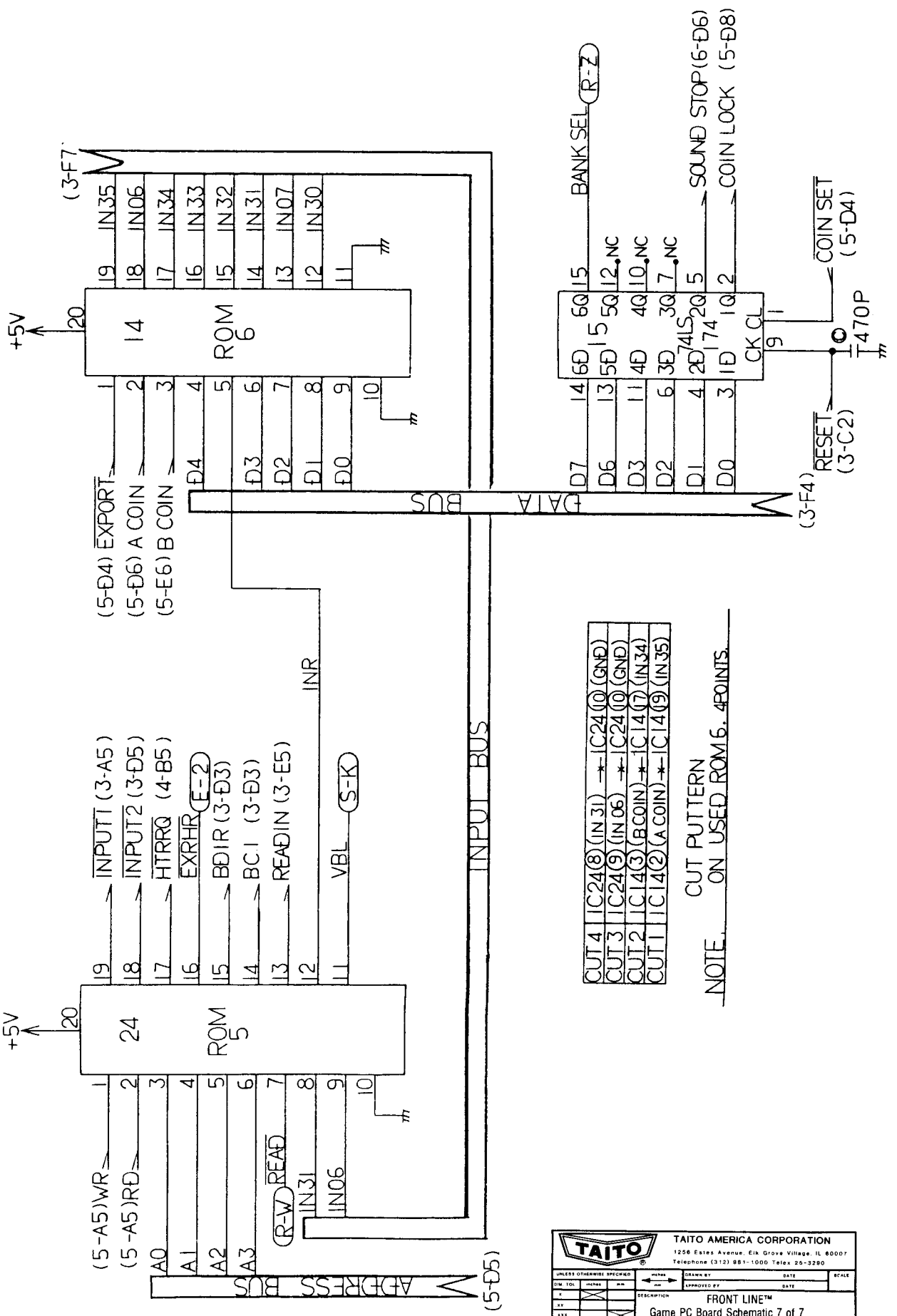
UNLESS OTHERWISE SPECIFIED — DRAWN BY — DATE — APPROVED BY — DATE — SCALE

DESCRIPTION: FRONT LINE™
Game PC Board Schematic 6 of 7

USED ON — SIZE — DRAWING NUMBER — SHEET OF

GAME PC BOARD SCHEMATIC 7 of 7

FIGURE 41

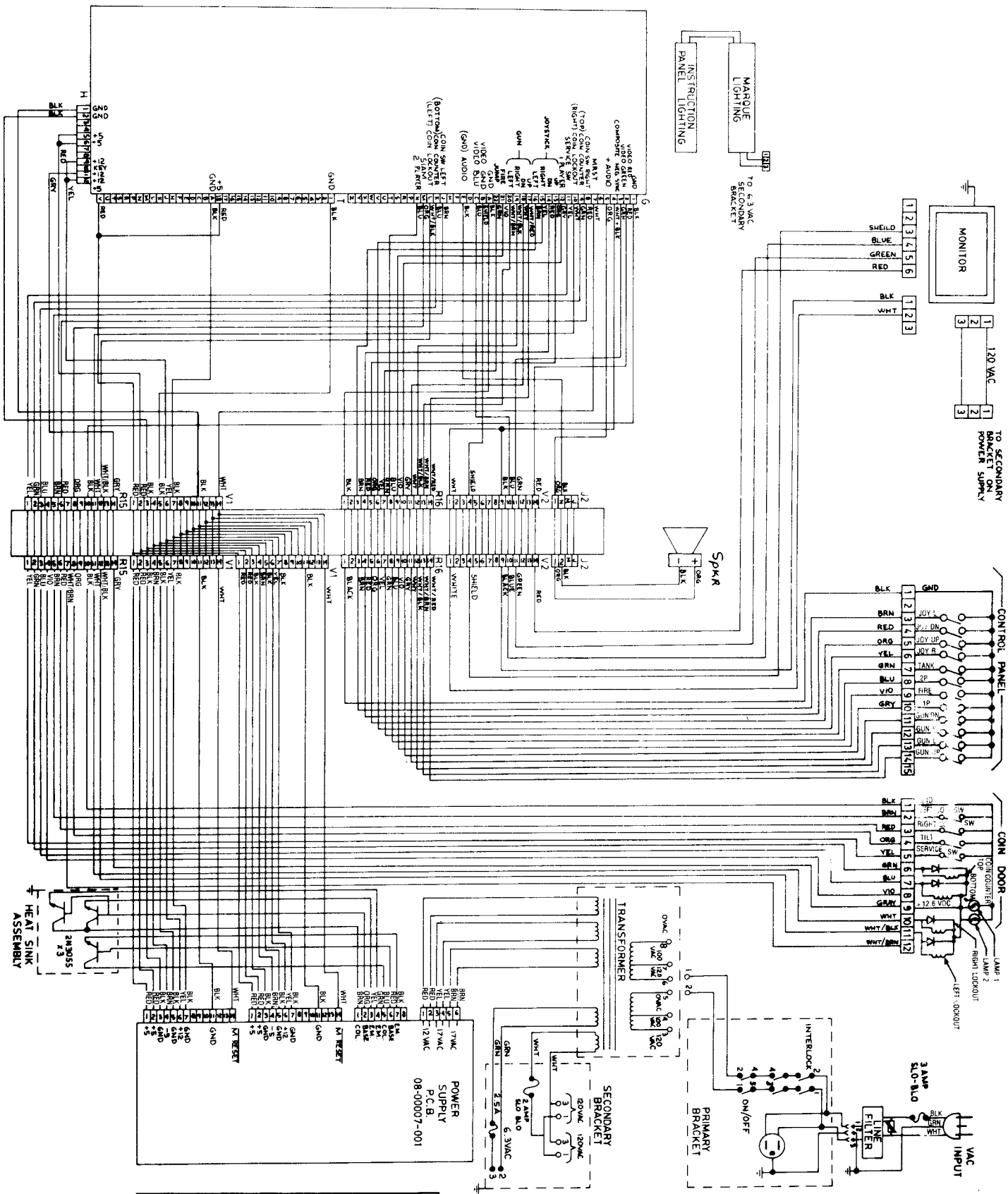


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WIRING DIAGRAM

FIGURE 42



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Wiring Diagram



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