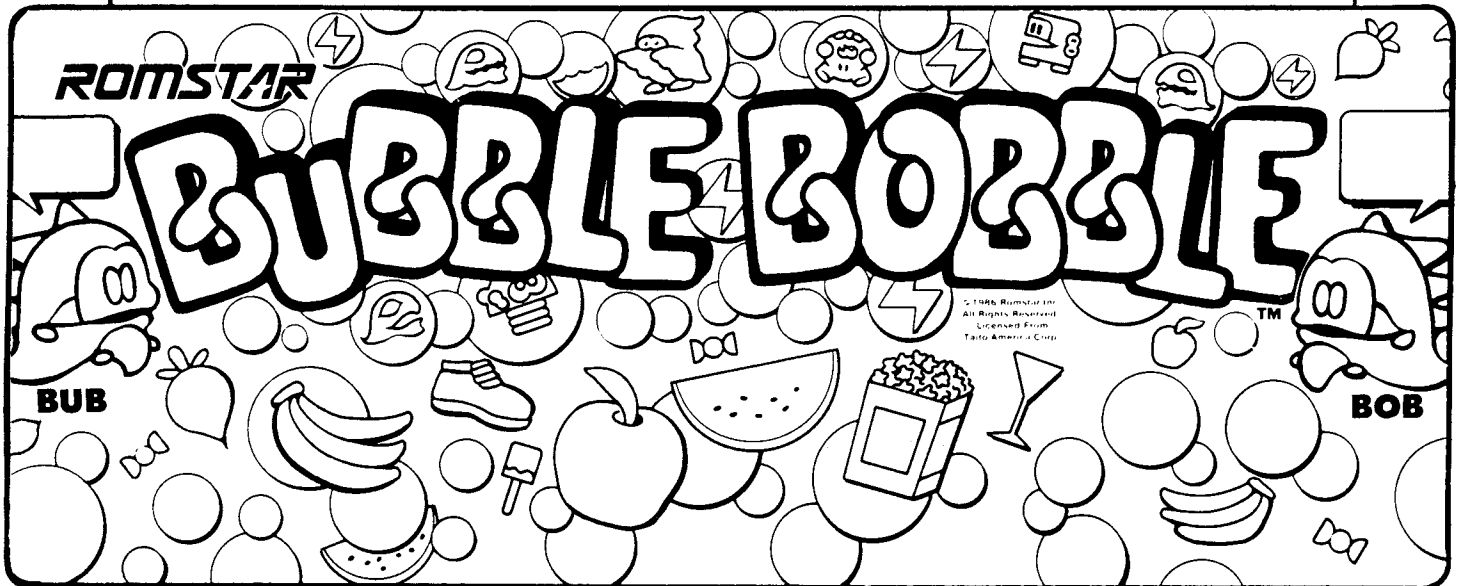


**ROMSTAR™ INC.**

# BUBBLE BOBBLE™

**Instruction Manual**



Romstar, Inc.

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## Before You Get Started . . . Stop!

1. Does your **new game** package include all listed parts? (Is it complete?)
2. Is the game you have chosen to transform able to supply all the required voltages for the **new game**?

**Note:** Some games, (i.e. Ms. Pac Man, Galaxian, etc.) regulate their voltages on the main P.C.B. This makes the existing power supply inefficient. These games will require a change in power supply for your **new game**. Many game supply houses can offer you a switching regulated power supply for a relatively low cost.

3. Is the monitor configuration compatible? In most games it is rather difficult to change the monitor from a vertical mount to a horizontal mount. We recommend you choose a game cabinet with the same mount as your **new game** requires.
4. Do you have the necessary tools? (See the recommended tool list)

## Caution

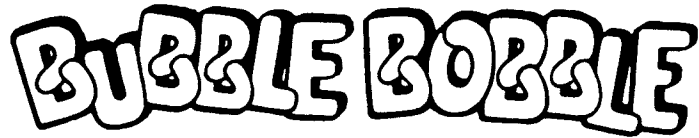
### F.C.C. Regulation Compliance

This is to avoid radio frequency radiation and comply with the limits for a class "A" computing device pursuant to sub-part "J" of part 15 of F.C.C. rules, which are designed to provide reasonable protection against interference when operated in a commercial environment.

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.

Metalized FCC compliance label **must** be attached and visible on the outside of the cabinet (rear) upon completion of installation.

# Installing and Servicing Your



## New Game Package

### Table of Contents

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# BUBBLE BOBBLE

## NEW GAME PACKAGE CONTENTS

|                                    |   |
|------------------------------------|---|
| 1 Main Printed Circuit Board (PCB) | 1 Marquee                                 |
| 1 Set Legs, Bolts, & Spacers       | 1 Control Panel Overlay                   |
| 1 Connecting Wire Harness          | 1 Plex Control Cover                      |
| 2 Two-Way Joystick                 | 1 Set Side Graphics                       |
| 6 Player Button Assemblies         | 1 Set Play Instructions & Function Labels |
|                                    | 1 Service and Installation Manual         |

**Note:** Replacement accessories available through your exclusive **Romstar** distributor.

| POWER REQUIREMENTS |               | MONITOR REQUIREMENTS         |
|--------------------|---------------|------------------------------|
| +5 VDC             | 7 amp minimum | Horizontal Mount Raster Scan |
| +12 VDC            | 1 amp minimum | Negative Composite Sync      |
| -5 VDC             | 1 amp minimum |                              |

# Recommended Tools and Supplies

ROMSTAR **new game** package.  
Phillips and Slot Screwdrivers  
Socket Set  
Enthusiastic Attitude  
Wire Cutters and Strippers  
Pliers or Channel Locks  
Planning and Careful Thought  
Electric Drill  
3/32" • 1/4" • 7/16" Drill Bits  
1/4" Plex Bit  
1-3/16" Chassis or Sheet Metal Punch  
1 1/4" Plex Hole Saw  
Glass of Water and a Snack  
Small File  
Razor Knife and Sharp Blades  
Straight Edge  
Patience  
Common Sense

Painting Supplies (if you do your own painting)  
Paint Brush and Paint (don't forget the primer)  
Paint Roller and Pan  
Sand Paper  
Putty Knife and Wood Putty  
A Good Night's Sleep  
Staple Gun and Staples  
Soldering Iron and 60/40 **Resin Core** Solder  
Vacuum Cleaner  
Assorted Fastening Hardware  
Shrink Tubing: 3/32" • 1/8" • 3/16"  
Masking Tape  
3 1/2" OR 4" Wire Ties  
Spray Window Cleaner and Rags  
(baby diapers work GREAT!)

## Dip Switch Tables

### Optimize Your Profits

**Thorough Research shows that two and a half minute games both satisfy players and also keep the quarters flowing.**

If games aren't running about two and a half minutes long, then collections probably aren't at their peak. You'll want to tailor your game to your location. The trick is to adjust a few DIP switches. (See the chart in this book.) It's easy!

### Dip-Switch Bank A

| Adjustment            | Options         | 1  | 2   | 3   | 4 | 5   | 6   | 7   | 8   |
|-----------------------|-----------------|----|-----|-----|---|-----|-----|-----|-----|
| Screen                | normal          | on | off |     |   |     |     |     |     |
|                       | invert          | on | on  |     |   |     |     |     |     |
| Test Mode (power off) |                 |    |     |     |   |     |     |     |     |
|                       | (power on)      |    |     |     |   |     |     |     |     |
| Pause (while in game) | normal game     |    |     | off |   |     |     |     |     |
|                       | test mode       |    |     | on  |   |     |     |     |     |
| Attract Sounds        | - normal game - |    |     | off |   |     |     |     |     |
|                       | stop game       |    |     | on  |   |     |     |     |     |
| Coin, 1               | 1 coin 1 play   |    |     |     |   | off | off |     |     |
|                       | 1 coin 2 play   |    |     |     |   | on  | off |     |     |
| Coin, 2               | 2 coin 3 play   |    |     |     |   | off | on  |     |     |
|                       | 2 coin 1 play   |    |     |     |   | on  | on  |     |     |
| Coin, 2               | 1 coin 1 play   |    |     |     |   |     |     | off | off |
|                       | 1 coin 2 play   |    |     |     |   |     |     | on  | off |
|                       | 2 coin 3 play   |    |     |     |   |     |     | off | on  |
|                       | 2 coin 1 play   |    |     |     |   |     |     | on  | on  |

### Dip-Switch Bank B

| Adjustment                 | Options                    | 1   | 2   | 3   | 4   | 5   | 6   | 7 | 8 |
|----------------------------|----------------------------|-----|-----|-----|-----|-----|-----|---|---|
| Difficulty                 | - B -                      | off | off |     |     |     |     |   |   |
|                            | A                          | on  | off |     |     |     |     |   |   |
|                            | C                          | off | on  |     |     |     |     |   |   |
|                            | D                          | on  | on  |     |     |     |     |   |   |
| Bonus                      | 1st                        |     |     |     |     |     |     |   |   |
|                            | 2nd                        |     |     |     |     |     |     |   |   |
|                            | 3rd                        |     |     |     |     |     |     |   |   |
|                            | 30,000 / 100,000 / 400,000 |     |     | off | off |     |     |   |   |
| 20,000 / 80,000 / 300,000  |                            |     | on  | off |     |     |     |   |   |
| 40,000 / 200,000 / 500,000 |                            |     | off | on  |     |     |     |   |   |
| 50,000 / 250,000 / 500,000 |                            |     | on  | on  |     |     |     |   |   |
| Number of Plays            | - 3 -                      |     |     |     |     | off | off |   |   |
|                            | 5                          |     |     |     |     | on  | off |   |   |
|                            | 1                          |     |     |     |     | off | on  |   |   |
|                            | 2                          |     |     |     |     | on  | on  |   |   |

# BUBBLE BOBBLE

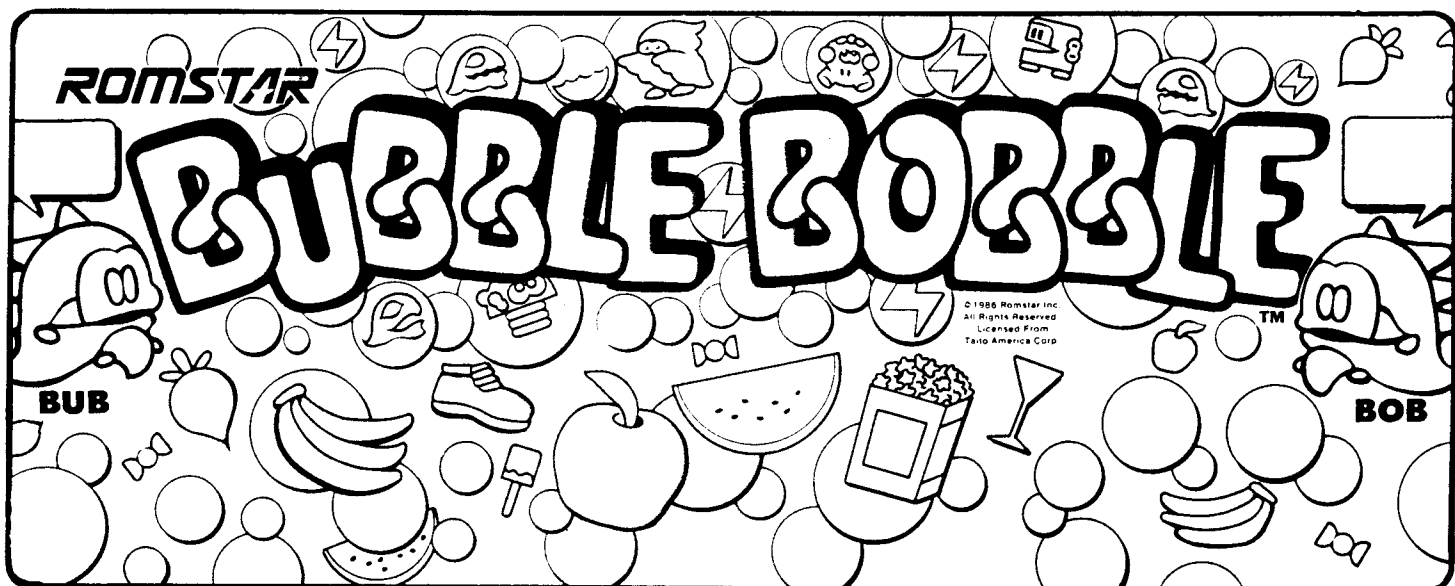
\* CONTROL BUB (1st PLAYER) & BOB (2nd) PLAYER AND DESTROY ALL OF THE BADDIES.

- FIRST: BLOW BUBBLES AT THE BADDIES.
- NEXT: POP THE BADDIE BUBBLES WITH YOUR HORNS OR TAIL SPIKES.
- THEN: COLLECT THE BONUS.



\* HINTS:

- BY POPPING BUBBLES FIRE, LIGHTNING & WATER YOU MAY USE THESE THINGS TO DESTROY BADDIES.
- TO GAIN HEIGHT YOU MAY JUMP ON BUBBLES (EVEN YOUR OWN).
- TO GET SPECIAL POWERS, COLLECT CHARMS (HEARTS, CROSS, ETC.)



# Installation Procedures

## Something To Think About

Your final product will be a **new game**.

You have made a wise decision to transform a game that has seen better days in the all important cash box into a **new game**. This is by far the most cost effective alternative to maximize the return of your initial investment. All you provide is the cabinet with a power supply and a monitor. Oh yes, you will need a touch of elbow grease. And that's it! We provide the rest. The end result is . . . a **new game** at a very low cost.

**Fact:** Spend a little time on the cabinet's appearance (i.e. marquee, control panel and cabinet graphics). With a little paint, some wood putty and new lights, you will raise the profits of any game. . . especially with the introduction of a **new game** package.

The **new game** look should always apply to the inside of your game as well as the outside. A few wire ties and shrink tubing on your harness; some fastening hardware on your subassemblies and a sweep with the ol' vacuum cleaner will ensure that unnecessary *glitches* do not occur.

**Remember:** You are creating a **new game** .

If you have any questions or just need some advice on any of your **new game** transformations, don't hesitate in giving a member of our technical staff a call.

## Let's Get Our Hands Dirty

### Preparing the Original Game for the New Game

Remove the following:

1. Main logic board(s)
2. Control panel
3. Monitor plexiglass
4. Monitor Bezel
5. Marquee
6. Graphics

I would recommend painting your cabinet to give it a fresh new look. (If it is geographically inconvenient to make use of our facilities, you may consider having an auto body shop take care of your painting needs.)

If your cabinet has wood grain sides; remove old graphics and adhesive (adhesive may be removed with **lacquer** thinner).

If you intend to use your original plexiglass, be sure it is in mint condition or it should be replaced.

Thoroughly clean out your cabinet.

# Time To Install Your New Goodies

**Before You Start . . . Remember DO NOT Do This Work With The Power On!**

## Logic P.C.B. Cage

Mount the logic cage securely (away from power supply).

- A Mark and drill pilot holes (3/32").
- B Place the logic cage (bottom) over the holes and secure it with the supplied wood screws.
- C Install the P.C.B. into the logic cage. Use feet and spacers supplied and adjust them so that the screws will go through the slots into the cage bottom.

**Note:** Leave the cage cover off until you have attached the entire wire harness and have tested the game for proper operation.

## Wire Harness

Attach the wire harness connector to the main logic board. **CAUTION:** Sometimes the connector is not keyed and it is very easy to install it reversed on the logic board. Even if it is keyed, always **triple check** to be sure the wire inputs were connected correctly to the connector and the connector to the logic board.

## Connecting the Wire Harness to the Existing Wires

When you hook up the control panel, power supply, monitor or other subassemblies that remain in the game cabinet to your new wire harness, try and use their existing secondary connectors.

1. Cut the original wire approximately three inches from the original connector. Strip off about one half inch of insulation.
2. Solder the new wire designated for that position to the original wire you just stripped.

**Warning:** DO NOT JUST TIE THE WIRES TOGETHER. THIS CAN CAUSE NAGGING INTERMITTENT PROBLEMS THROUGH LOOSE CONNECTIONS OR OXIDATION OR BOTH. **Always take the time to do it right.**

3. Melt shrink tubing around all your in-line wire connections. Do not use electrical tape. Tape could unravel over a period of time due to the cabinet heat and cause you a great deal of trouble.
4. Use wire tie wraps, and secure the cable to the cabinet whenever it seems necessary. Remember this is a **new game**, not a sloppy conversion.

## Power Wires

1. Connect the wires that are designated for your power supply. You will need a supply of +5V, +12V & ground. Your **new game** package may not require all of the voltages that were used in the original game. Tie off any unused wires.
2. You will notice that you probably have more than one wire for each voltage. It is a good idea to use all wires supplied (double up if it is necessary). This will help to ensure that you don't overload the edge connector pins and cause them to "burn".

## Monitor Wires

You will be connecting the wires designated for the RED, GREEN & BLUE video guns along with the SYNC & GROUND wires.

### NOTE . . . CONCERNING SYNC:

Your **new game** only calls for one sync wire connection, this is called **composite sync** (horizontal and vertical tied together). This composite sync is also **negative**. Most monitors have supply positions for both negative and positive sync. You can check your monitor manual or call our technical department for assistance.

## Speaker Wires

Find the two wires that are designated for the speaker and hook 'em on up.

## Coin Door Wires

1. Connect the designated wires to the coin switches and meter.
2. You can connect your door lamps to the unused –5V power supply. Some games have separate power outputs for the coin door lamps.
3. Be sure to clean and lubricate your old coin mechanisms. Keep the money coming in.

## GUESS WHAT?

You are almost done with the electrical connections of your **new game**. All you have left is the control panel wiring. But we are going to hold off on that for right now. We have a few other things we need to do first. So why don't you go ahead and get yourself a drink of water and stretch your legs. When you return, we can take a fresh look at your progress and then move forward.

# Smoke Test

## What Test?

Don't worry. All this means is that you are ready to apply power to the system for the first time and you pray that there will be no smoke from a simple oversight.

You are just about ready to power up the logic board. But first we need to recheck your work.

1. Carefully inspect the game for loose power wires, exposed connections and extra fastening hardware.
2. Make sure the logic board, board cage, monitor and power supply are securely fastened in place.
3. **Double check** the connectors to be sure they are wired and connected properly.
4. Set the dip switches on the logic board to the factory recommendations. (Refer to page 5.) Also, be sure you set the dip switches for "DEMO WITH SOUND". This will enable you to hear as well as see that your new P.C.B. is functional.

## Time to Apply Power:

1. Look and smell for smoke. (TURN OFF IMMEDIATELY IF ANY IS NOTICED)
2. Listen for game sounds.

If after one minute you have not heard any sounds:

- A) Check for proper dip switch settings.
- B) Adjust volume control and check speaker connections.
- C) Check the +12V power supply to the logic board.

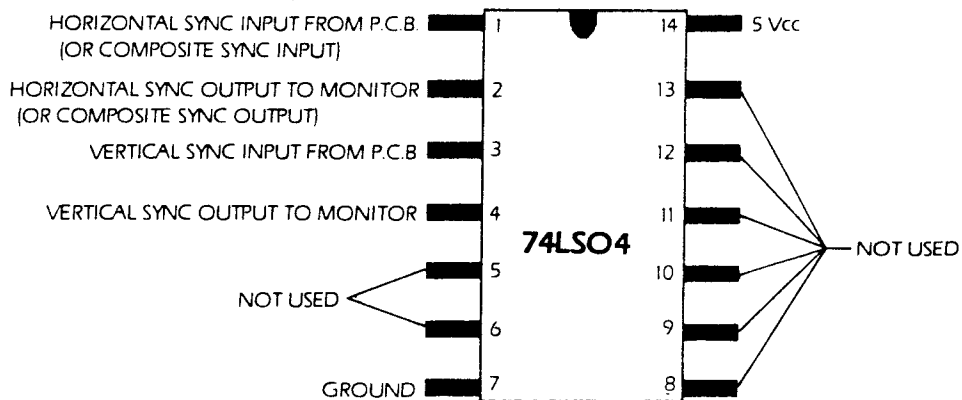
**NOTE:** If you do get sounds, but they are a little fuzzy, switch the wires around on the speaker.

3. How is the monitor image?

### A) Is the picture in sync?

If your picture has the top and bottom halves of the screen reversed and it will not stop rolling, change your sync polarity on the monitor. (Positive to negative).

If your monitor does not have dual polarity positions for sync, then you will need to reverse the sync yourself by installing a simple one I.C. circuit between the logic board and the monitor. (The following illustration shows a hookup for both **composite** and **separate** syncs).



### B) Now how's your picture?

- Is it centered?
- Is it too bright or dim?
- Is it in focus?

Check your monitor manual for these adjustments. If your screen looks "off", then your **new game** transformation may have been in vain. So let's take the time to make the monitor look great.

### C) Is the picture upside-down?

Dip switch 2 on switch bank A should solve your problems.

# Control Panel Assembly

1. Remove the buttons, joysticks and wire harness and put them aside for now. Do not remove the original panel overlay until the new holes have been drilled.
2. Mark positions on the panel for the new holes.

**ROMSTAR** supplies a clear 1/8" thick piece of plexiglass with every **new game** package to cover the control panel. We feel that your **new game** investment is well worth protecting. . . and the control panel is the first place to show wear and tear.

  - You will need to cut this piece to size. Use the control panel as a template.
  - Use a razor knife to score the plexiglass **deeply**. Then use a pair of pliers to break away the extra plexiglass.
3. Now drill the holes in your panel that you have marked off for the *buttons, joystick and bolts*.

**Hint:** For best results, use a chassis or sheet metal punch for button holes.
4. Drill the same holes on your plexiglass panel protector. Once again use your panel as a template.

**Hint:** To avoid chipping while you are drilling the holes, place the plexiglass securely on a soft wood surface and use a plexiglass drill bit and hole cutter.
5. The holes are now all cut. Smooth them out on your panel and plexiglass with a fine toothed file.
6. Remove the original graphics overlay from the panel. Clean up the panel and install your **ROMSTAR** graphics.

**Make It Easier:** Peel the top half of the protective backing off of your graphics. Start from the center and smooth out your overlay. Make sure you have about an inch extra coming off the top. *No bubbles please.* Now peel off the bottom half and do the same as you did for the top.
7. Adhere the instruction and function labels.
8. Install the Plex Control Cover over your completed **new game** panel.

**Note:** Be sure to bolt the plexiglass securely to the panel.
9. Mount the joystick and the buttons to the panel and wire them up. (Use the existing Panel wiring if possible)

# Marquee Installation

Using the original marquee as a template, Center your **new game** marquee graphics and score the new marquee deeply to fit the cabinet. Break off the excess with pliers.

**Be sure** the light behind the marquee works. Everything should **always work** on a new game.

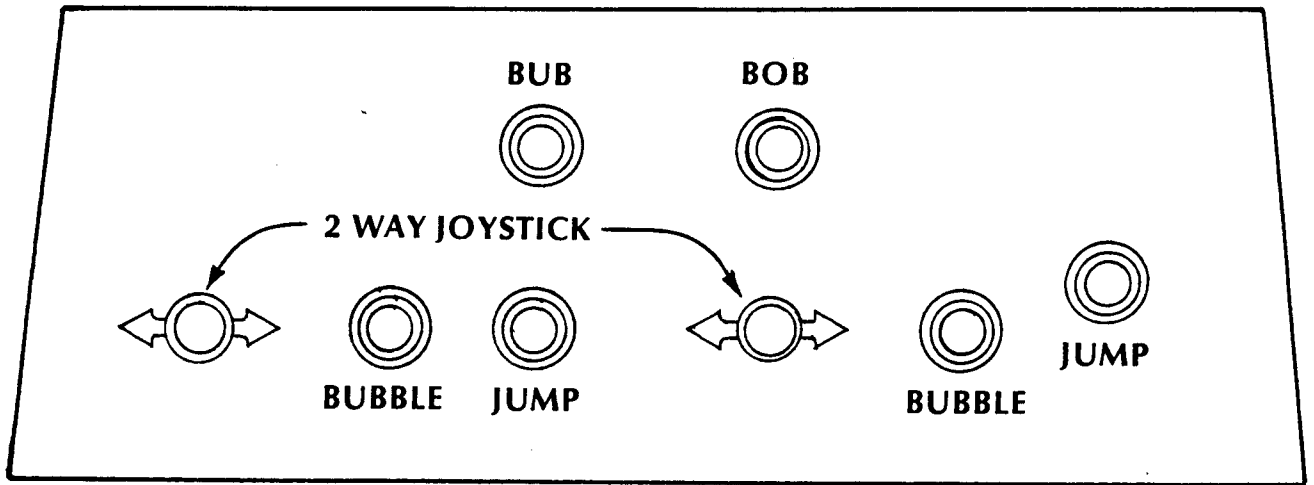
Take your time ... Don't forget this is going to be a **new game**.

# Side Graphic Installation

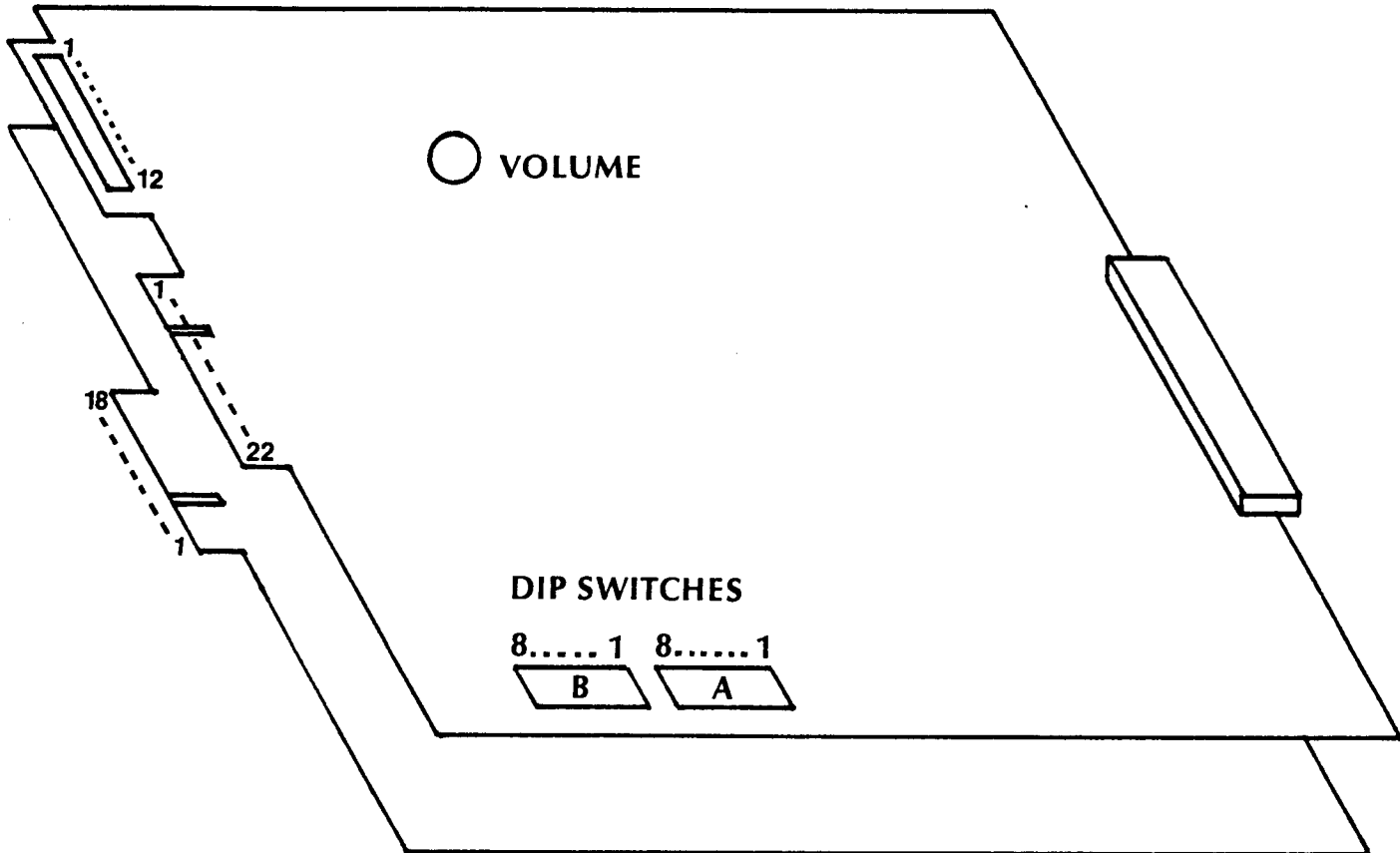
1. Be sure sides of game are clean and free of old adhesive, dust, etc.
2. Mark position of decal with erasable pen or pencil (centered on upper half of cabinet).
3. Peel off top 1/4 of decal backing and apply to cabinet with a smoothing motion (use a soft rag). Continue peeling off backing and smoothing.
4. Remove any small bubbles with a pin or razor blade (pop them!)

# Finishing Touches

1. Check the game inside and out for any imperfections. Secure any loose wiring or fastening hardware.
  2. Make sure the coin door is tight and the coin mechs are well adjusted. A game is no good to anybody if you can't get a coin into it.
  3. Once again go over every step of this **new game** transformation in your mind. Be sure everything is correct and to your liking.
  4. Power up the game.
    - A. Check all the coin switches. (Does the coin meter work?)
    - B. Play your **new game**.
      - Are all the player controls working?
      - Are the game sounds present?
      - Is the volume level proper?
      - Are the dip switches set properly?
- Well, that's about it. Good Luck.



# *Control Panel*



## WARRANTY, REPAIR AND RETURN POLICY

THIS POLICY WILL REMAIN IN EFFECT FOR A PERIOD OF ONE YEAR FROM DATE OF PURCHASE FROM ROMSTAR. UPON EXPIRATION OF THIS ONE YEAR PERIOD, ROMSTAR WILL CONSIDER P.C.B. REPAIRS ON A BOARD—TO—BOARD BASIS, BUT IS NOT RESPONSIBLE FOR REPAIR OR REPLACEMENT.

1. \*45 DAY FULL PARTS WARRANTY.
2. \*60 DAY FULL ELECTRONICS WARRANTY (SEE RMA BELOW).
3. MINIMUM \$40.00 SERVICE CHARGE FOR ALL NON-WARRANTY REPAIRS OR RETURNS.
4. **ANY** UNAUTHORIZED NON-FACTORY REPAIR OR ATTEMPTED REPAIR VOIDS WARRANTY.

(\*ALL WARRANTY PERIODS BEGIN ON THE DATE OF PURCHASE FROM ROMSTAR)

### RETURN MERCHANDISE AUTHORIZATION — (RMA)

1. ALL RETURNED MERCHANDISE MUST HAVE AN RMA NUMBER CLEARLY VISIBLE ON THE OUTSIDE OF THE PACKAGE.
2. ALL RMA NUMBERS MUST BE OBTAINED FROM ROMSTAR BY AN AUTHORIZED ROMSTAR DISTRIBUTOR. (PLEASE HAVE ROMSTAR SERIAL NUMBER AVAILABLE WHEN CALLING FOR AN RMA #).
3. **ALL** PC BOARDS RETURNED TO ROMSTAR WITHOUT AN RMA NUMBER WILL BE SUBJECT TO A MINIMUM CHARGE OF \$40.00.
4. ROMSTAR WILL SHIP ADVANCE REPLACEMENT BOARDS TO DISTRIBUTORS OR AT DISTRIBUTORS REQUEST, DROP-SHIP BOARDS DIRECT TO THE OPERATOR.
5. ADVANCE REPLACEMENT BOARDS WILL BE BILLED TO THE DISTRIBUTOR UNTIL RECEIPT OF A RETURNED BOARD BY ROMSTAR AT WHICH TIME A CREDIT WILL BE ISSUED.
6. ALL REPAIRS AND/OR REPLACEMENTS WILL BE SHIPPED BY ROMSTAR WITHIN 24 HOURS OF RECEIPT OR REQUEST. (SUBJECT TO AVAILABILITY OF BOARDS).
7. FOR ANY ROMSTAR PRODUCT PURCHASED AFTER 3/1/86, A ROMSTAR WARRANTY CARD MUST BE ON FILE FOR EACH BOARD TO FACILITATE REPAIR & RETURN.

ANY QUESTIONS CONCERNING THESE POLICIES SHOULD BE DIRECTED TO DENNIS SABLE, TECHNICAL MANAGER OR SHAWN ZENKER, OPERATIONS OFFICER.

### BUBBLE BOBBLE WIRE HARNESS (G)

| WIRE COLOR | COMPONENT SIDE |    | SOLDER SIDE | WIRE COLOR   |        |
|------------|----------------|----|-------------|--------------|--------|
| Black      | Ground         | 1  | A           | Ground       | Black  |
| Red        | Video Red      | 2  | B           | Video Ground | Brown  |
| Green      | Video Green    | 3  | C           | Video Blue   | Blue   |
| Gray       | Video Sync     | 4  | D           | Not Used     |        |
| White      | Speaker (+)    | 5  | E           | Speaker (-)  | Black  |
|            | Post           | 6  | F           | Post         |        |
|            | N/U            | 7  | H           | N/U          |        |
| Pink       | Coin Switch    | 8  | J           | N/U          |        |
| Yellow     | Coin Meter     | 9  | K           | N/U          |        |
|            | N/U            | 10 | L           | N/U          |        |
| Tan        | Service        | 11 | M           | Slam Switch  | Red    |
| Brown      | 1P Select      | 12 | N           | 2P Select    | Gray   |
|            | N/U            | 13 | P           | N/U          |        |
|            | N/U            | 14 | R           | N/U          |        |
| Yellow     | 1P Right       | 15 | S           | 2P Right     | Yellow |
| Violet     | 1P Left        | 16 | T           | 2P Left      | Violet |
|            | N/U            | 17 | U           | N/U          |        |
|            | N/U            | 18 | V           | N/U          |        |
|            | N/U            | 19 | W           | N/U          |        |
|            | N/U            | 20 | X           | N/U          |        |
| Red        | BUBBLE         | 21 | Y           | BUBBLE       | Red    |
| Orange     | JUMP           | 22 | Z           | JUMP         | Orange |

### BUBBLE BOBBLE WIRE HARNESS (H)

| WIRE COLOR | CONNECTION     |    |
|------------|----------------|----|
| Black      | Ground         | 1  |
| Black      | Ground         | 2  |
| Black      | Ground         | 3  |
| Black      | Ground         | 4  |
| Red        | +5VDC          | 5  |
| Red        | +5VDC          | 6  |
| Red        | +5VDC          | 7  |
| Blue       | -5VDC          | 8  |
| Yellow     | +12VDC (unreg) | 9  |
|            | Key            | 10 |
| Yellow     | +12VDC         | 11 |
| Yellow     | +12VDC         | 12 |

+12VDC (unreg) and +12VDC may be wired together.

### BUBBLE BOBBLE WIRE HARNESS (G)

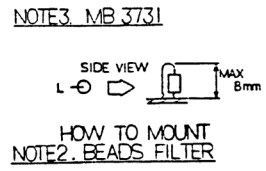
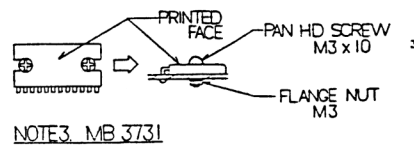
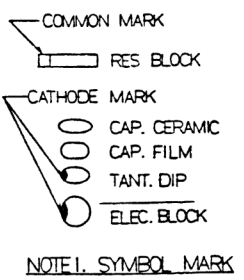
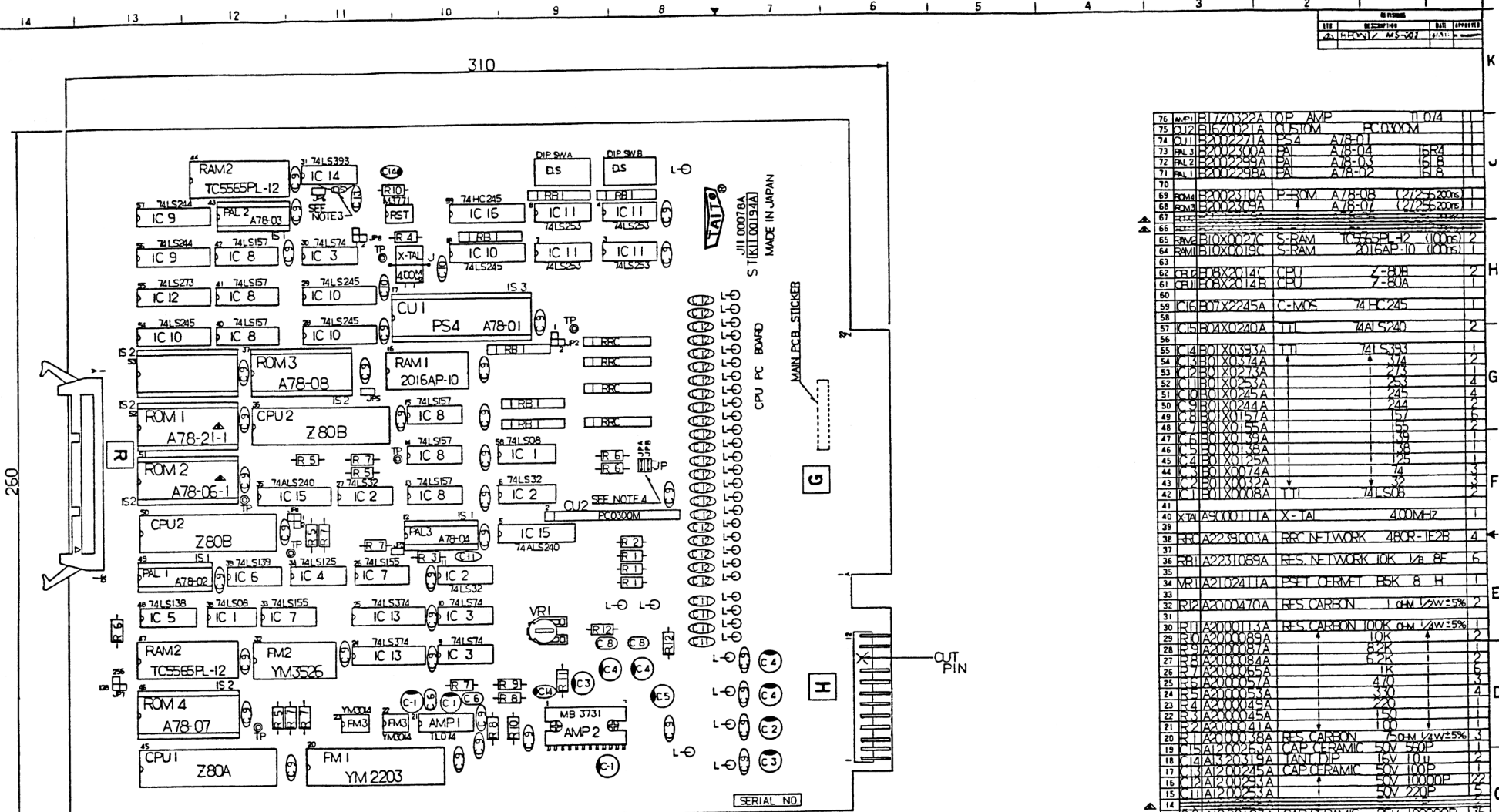
| WIRE COLOR | COMPONENT SIDE |    | SOLDER SIDE | WIRE COLOR |       |
|------------|----------------|----|-------------|------------|-------|
| Black      | Ground         | 1  | A           | Ground     | Black |
| Black      | Ground         | 2  | B           | Ground     | Black |
| Black      | Ground         | 3  | C           | Ground     | Black |
| Black      | Ground         | 4  | D           | Ground     | Black |
|            | N/U            | 5  | E           | N/U        |       |
|            | N/U            | 6  | F           | N/U        |       |
|            | POST           | 7  | H           | POST       |       |
|            | N/U            | 8  | J           | N/U        |       |
|            | N/U            | 9  | K           | N/U        |       |
|            | N/U            | 10 | L           | N/U        |       |
|            | N/U            | 11 | M           | N/U        |       |
|            | N/U            | 12 | N           | N/U        |       |
|            | N/U            | 13 | P           | N/U        |       |
|            | N/U            | 14 | R           | N/U        |       |
| Red        | +5VDC          | 15 | S           | +5VDC      | Red   |
| Red        | +5VDC          | 16 | T           | +5VDC      | Red   |
| Red        | +5VDC          | 17 | U           | +5VDC      | Red   |
| Red        | +5VDC          | 18 | V           | +5VDC      | Red   |

### BUBBLE BOBBLE COIN SWITCH JUMPER

If you wish to use your "B. B." conversion without a coin meter, a small wire jumper must be installed across the points of J7 located near IC 60 (the large brown SIP IC near the "G" connector).

METER HOOK-UP: Connect 1 lead of the meter to terminal 9 of the "G" connector and the other lead to terminal 9 (+12VDC) of the "H" connector.

The coin meter is activated by the voltage (@+6VDC) dropped from the +12VDC through a resistor.



NOTE 3. ADD CAP. NOTE 4. JP

| NO  | SYM | PART NO     | NOMENCLATURE OR DESCRIPTION   | QTY   | NO | SYM | PART NO   | NOMENCLATURE OR DESCRIPTION | QTY |
|-----|-----|-------------|-------------------------------|-------|----|-----|-----------|-----------------------------|-----|
| 95  | IC  | C1101201A   | BEADS FILTER ZB-5035-011A     | 34    | 85 | H   | 00500034A | POST HEADER SIDE 522-12     | 1   |
| 94  | IC  | PC0600403A  | TEST POST CHIP 1=7.8          | 6     | 84 | J   | 02000117A | DIP SW                      | 2   |
| 93  | IC  | PC0600403A  | TEST POST CHIP 1=7.8          | 6     | 83 | J   | 02000117A | DIP SW                      | 2   |
| 92  | IC  | PC0550090A  | IC SOCKET 40P                 | 1     | 82 | IC  | B172531A  | RESET IC MB3771             | 1   |
| 91  | IC  | PC0550090A  | IC SOCKET 28P                 | 5     | 81 | IC  | B172178A  | CPA OPERATOR YM3014         | 2   |
| 90  | IC  | PC0550090A  | IC SOCKET 20P                 | 3     | 80 | IC  | B172014A  | FM OPERATOR YM3525          | 1   |
| 89  | IC  | PC0550052A  | IC SOCKET 20P                 | 3     | 79 | IC  | B172014A  | FM OPERATOR YM3525          | 1   |
| 88  | IC  | PC0550052A  | IC SOCKET 20P                 | 3     | 78 | IC  | B172013A  | FM OPERATOR YM2203          | 1   |
| 87  | R   | 0050555A    | ANGLE PIN HEADER 50mm 50P 19K | 1     | 77 | IC  | B171605A  | POWER AMP MB3731            | 1   |
| 86  | R   | 0050555A    | ANGLE PIN HEADER 50mm 50P 19K | 1     | 76 | IC  | B172013A  | FM OPERATOR YM2203          | 1   |
| 85  | H   | 00500034A   | POST HEADER SIDE 522-12       | 1     | 75 | IC  | B171605A  | POWER AMP MB3731            | 1   |
| 104 | ROM | P20102328A  | P-ROM A78-05-1 (27256-2000)   | 1     | 84 | J   | 02000117A | DIP SW                      | 2   |
| 103 | ROM | P20102329A  | P-ROM A78-21-1 (27512-2000)   | 1     | 83 | J   | 02000117A | DIP SW                      | 2   |
| 102 | W   | CP0700237A  | TINNED COPPER WIRE 1#         | 100mm | 82 | IC  | B172531A  | RESET IC MB3771             | 1   |
| 101 | W   | STG1600270A | PC BOARD STICKER K1100194A    | 1     | 81 | IC  | B172178A  | CPA OPERATOR YM3014         | 2   |
| 99  | W   | STG1600270A | PC BOARD STICKER K1100194A    | 1     | 80 | IC  | B172014A  | FM OPERATOR YM3525          | 1   |
| 98  | N   | P2600006A   | FLANGE NUT M3                 | 2     | 79 | IC  | B172014A  | FM OPERATOR YM3525          | 1   |
| 97  | N   | P26000023A  | PAN HD SCREW M3 X 10          | 2     | 78 | IC  | B172013A  | FM OPERATOR YM2203          | 1   |
| 96  | N   | P26000023A  | PAN HD SCREW M3 X 10          | 2     | 77 | IC  | B171605A  | POWER AMP MB3731            | 1   |

| NO | SYM | PART NO   | NOMENCLATURE OR DESCRIPTION | QTY    |
|----|-----|-----------|-----------------------------|--------|
| 76 | AMP | B1720322A | TOP AMP                     | 11 074 |
| 75 | IC  | B1571021A | CUSTOM PC0300M              | 1      |
| 74 | IC  | B2102271A | PS4 A78-01                  | 1      |
| 73 | IC  | B2102300A | IC 11 A78-04                | 16R4   |
| 72 | IC  | B2102394A | IC 11 A78-03                | 16L8   |
| 71 | IC  | B2102394A | IC 11 A78-02                | 16L8   |
| 70 | IC  | B2102310A | P-ROM A78-08 (27256-2000)   | 1      |
| 69 | IC  | B2102310A | P-ROM A78-07 (27256-2000)   | 1      |
| 68 | IC  | B2102310A | P-ROM A78-07                | 1      |
| 67 | IC  | B2102310A | P-ROM A78-07                | 1      |
| 66 | IC  | B2102310A | P-ROM A78-07                | 1      |
| 65 | IC  | B2102310A | P-ROM A78-07                | 1      |
| 64 | RAM | B10X0027C | S-RAM TC595P-12 (100ns)     | 2      |
| 63 | RAM | B10X0019C | S-RAM 2016AP-10 (100ns)     | 1      |
| 62 | IC  | B07X2014C | CPU Z80B                    | 2      |
| 61 | IC  | B07X2014B | CPU Z80A                    | 1      |
| 60 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 59 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 58 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 57 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 56 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 55 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 54 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 53 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 52 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 51 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 50 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
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| 47 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 46 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 45 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 44 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 43 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 42 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 41 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 40 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 39 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 38 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 37 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 36 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 35 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 34 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 33 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 32 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 31 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 30 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 29 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 28 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 27 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 26 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 25 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 24 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 23 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 22 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 21 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 20 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 19 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 18 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 17 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 16 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 15 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 14 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 13 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 12 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 11 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 10 | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 9  | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 8  | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 7  | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 6  | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 5  | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 4  | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 3  | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 2  | IC  | B07X2245A | C-MOS 74HC245               | 1      |
| 1  | IC  | B07X2245A | C-MOS 74HC245               | 1      |

| NO | SYM | PART NO    | NOMENCLATURE OR DESCRIPTION   | QTY |
|----|-----|------------|-------------------------------|-----|
| 95 | IC  | C1101201A  | BEADS FILTER ZB-5035-011A     | 34  |
| 94 | IC  | PC0600403A | TEST POST CHIP 1=7.8          | 6   |
| 93 | IC  | PC0600403A | TEST POST CHIP 1=7.8          | 6   |
| 92 | IC  | PC0550090A | IC SOCKET 40P                 | 1   |
| 91 | IC  | PC0550090A | IC SOCKET 28P                 | 5   |
| 90 | IC  | PC0550090A | IC SOCKET 20P                 | 3   |
| 89 | IC  | PC0550052A | IC SOCKET 20P                 | 3   |
| 88 | IC  | PC0550052A | IC SOCKET 20P                 | 3   |
| 87 | R   | 0050555A   | ANGLE PIN HEADER 50mm 50P 19K | 1   |
| 86 | R   | 0050555A   | ANGLE PIN HEADER 50mm 50P 19K | 1   |
| 85 | H   | 00500034A  | POST HEADER SIDE 522-12       | 1   |
| 84 | J   | 02000117A  | DIP SW                        | 2   |
| 83 | J   | 02000117A  | DIP SW                        | 2   |
| 82 | IC  | B172531A   | RESET IC MB3771               | 1   |
| 81 | IC  | B172178A   | CPA OPERATOR YM3014           | 2   |
| 80 | IC  | B172014A   | FM OPERATOR YM3525            | 1   |
| 79 | IC  | B172014A   | FM OPERATOR YM3525            | 1   |
| 78 | IC  | B172014A   | FM OPERATOR YM3525            | 1   |
| 77 | IC  | B172013A   | FM OPERATOR YM2203            | 1   |
| 76 | IC  | B172013A   | FM OPERATOR YM2203            | 1   |
| 75 | IC  | B171605A   | POWER AMP MB3731              | 1   |

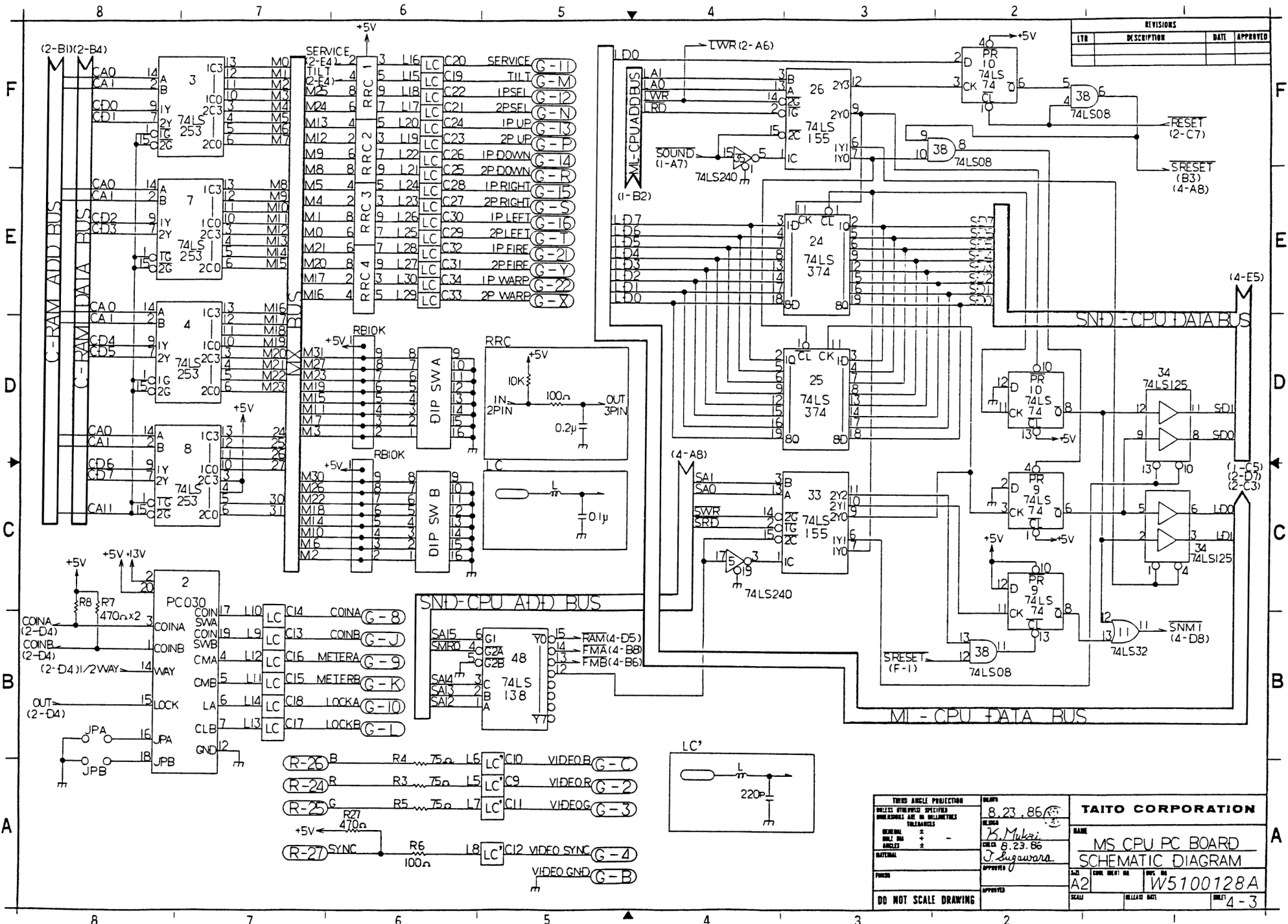
DO NOT SCALE DRAWING

| DATE    | REV | BY | CHK | APP |
|---------|-----|----|-----|-----|
| 8.29.85 |     |    |     |     |

TAITO CORPORATION  
CPU PC BOARD ASSY  
EXP. TAMCO (FROM STAR)  
K1100194A





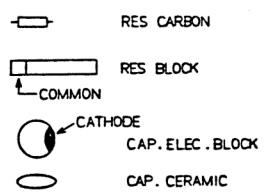
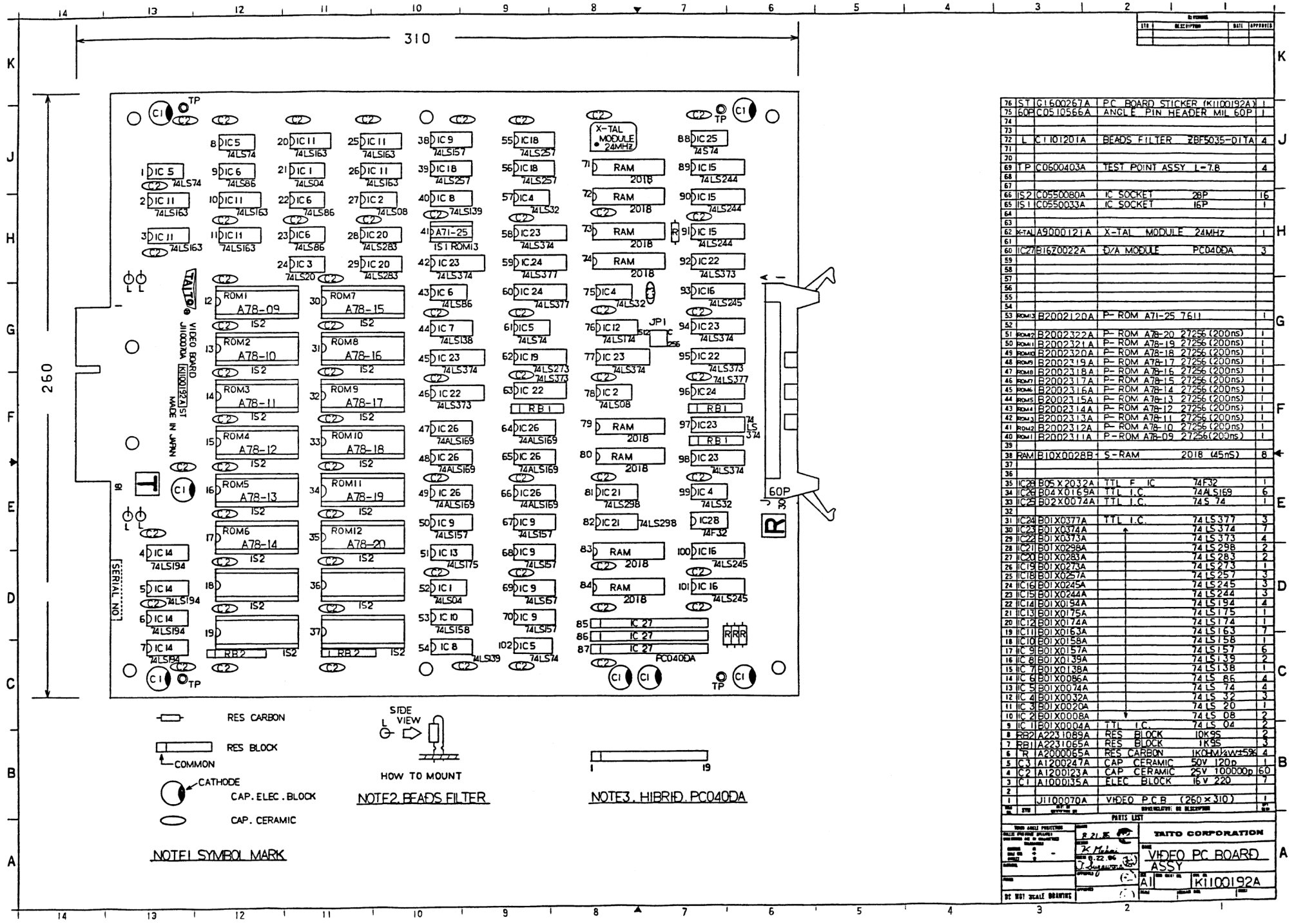


| REVISIONS |             |      |          |
|-----------|-------------|------|----------|
| LTB       | DESCRIPTION | DATE | APPROVED |
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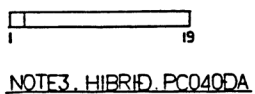
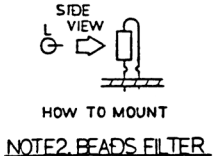
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| THIRD ANGLE PROJECTION | UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS | DATE         | 8.23.86     |
| GENERAL                | SCALE  | DESIGNER     | K. Mukai    |
| FINISH                 | APPROVED   | CHECKER      | T. Sugawara |
| DO NOT SCALE DRAWING   | SCALE  | ILLUSTRATION |             |

|                   |                 |
|-------------------|-----------------|
| TAITO CORPORATION |                 |
| NAME              | MS CPU PC BOARD |
| SCHEMATIC DIAGRAM |                 |
| SIZE              | A2              |
| REV. NO.          | W5100128A       |
| SCALE             | 4-3             |



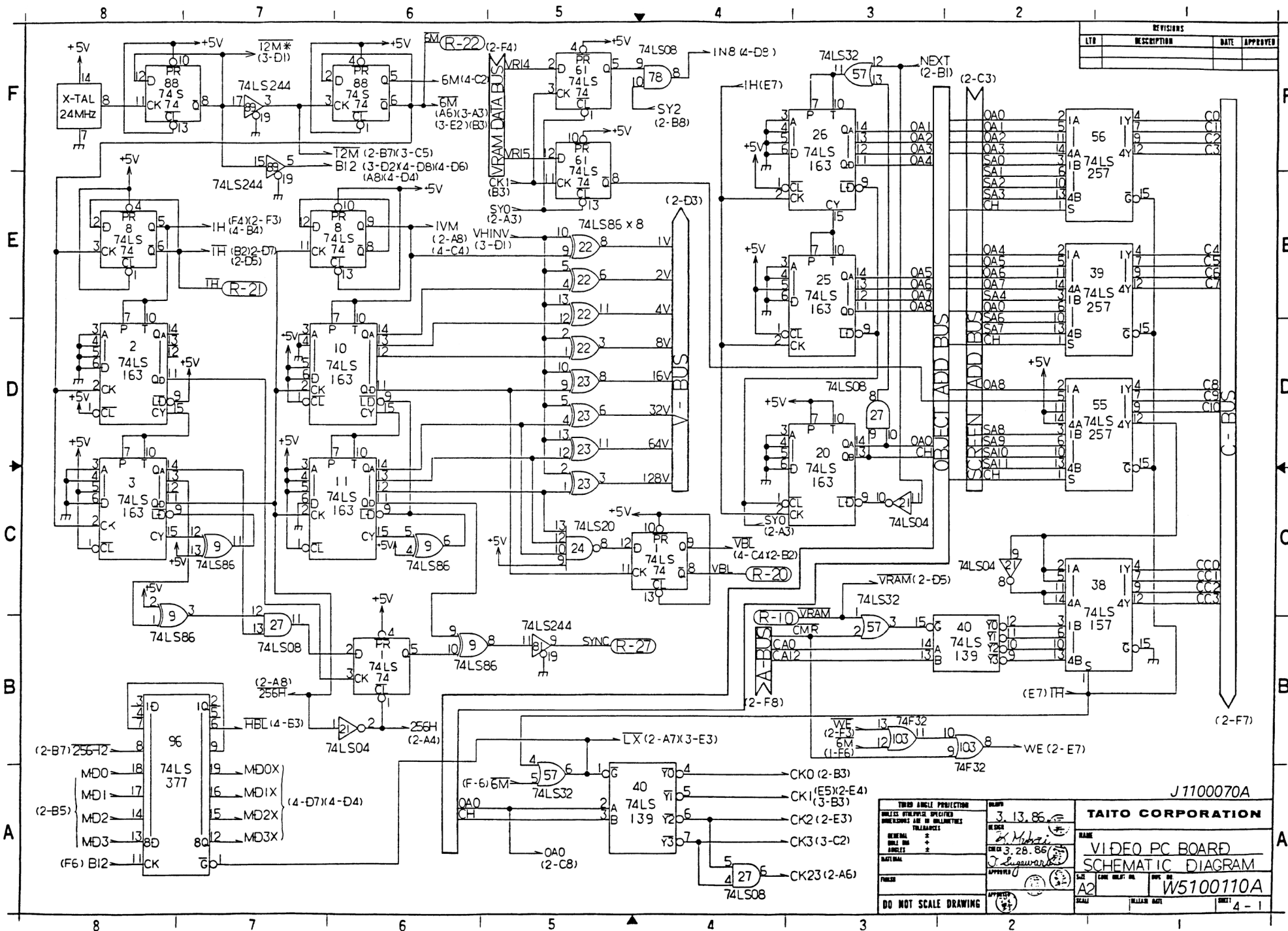


NOTE 1. SYMBOL MARK



| NO. | DESCRIPTION     | DATE                         | APPROVED |
|-----|-----------------|------------------------------|----------|
| 76  | ST G1600267A    | PC BOARD STICKER (K1100192A) | 1        |
| 75  | 60P C0510565A   | ANGLE PIN HEADER MIL 60P     | 1        |
| 74  |                 |                              |          |
| 73  |                 |                              |          |
| 72  | L C1101201A     | BROADS FILTER ZBF5035-011A   | 4        |
| 71  |                 |                              |          |
| 70  |                 |                              |          |
| 69  | P C0500403A     | TEST POINT ASSY L-7.8        | 4        |
| 68  |                 |                              |          |
| 67  |                 |                              |          |
| 66  | IS2 C0550080A   | IC SOCKET 28P                | 16       |
| 65  | IS1 C0550033A   | IC SOCKET 16P                | 1        |
| 64  |                 |                              |          |
| 63  |                 |                              |          |
| 62  | X-TAL A9000121A | X-TAL MODULE 24MHZ           | 1        |
| 61  | C27 B1670022A   | D/A MODULE PC040DA           | 3        |
| 59  |                 |                              |          |
| 58  |                 |                              |          |
| 57  |                 |                              |          |
| 56  |                 |                              |          |
| 55  |                 |                              |          |
| 54  |                 |                              |          |
| 53  | ROM3 B2002120A  | P-ROM A71-25 7611            | 1        |
| 52  |                 |                              |          |
| 51  | ROM2 B2002322A  | P-ROM A78-20 27255 (200ns)   | 1        |
| 50  | ROM1 B2002321A  | P-ROM A78-19 27255 (200ns)   | 1        |
| 49  | ROM4 B2002320A  | P-ROM A78-18 27255 (200ns)   | 1        |
| 48  | ROM5 B2002319A  | P-ROM A78-17 27255 (200ns)   | 1        |
| 47  | ROM6 B2002318A  | P-ROM A78-16 27255 (200ns)   | 1        |
| 46  | ROM7 B2002317A  | P-ROM A78-15 27255 (200ns)   | 1        |
| 45  | ROM4 B2002316A  | P-ROM A78-14 27255 (200ns)   | 1        |
| 44  | ROM5 B2002315A  | P-ROM A78-13 27255 (200ns)   | 1        |
| 43  | ROM4 B2002314A  | P-ROM A78-12 27255 (200ns)   | 1        |
| 42  | ROM4 B2002313A  | P-ROM A78-11 27255 (200ns)   | 1        |
| 41  | ROM4 B2002312A  | P-ROM A78-10 27255 (200ns)   | 1        |
| 40  | ROM1 B2002311A  | P-ROM A78-09 27255 (200ns)   | 1        |
| 39  |                 |                              |          |
| 38  | RAM1 B10X0028B  | S-RAM 2018 (45ns)            | 8        |
| 37  |                 |                              |          |
| 36  |                 |                              |          |
| 35  | IC28 B05 X2032A | TTL F IC 74F32               | 1        |
| 34  | C28 B04 X0169A  | TTL I.C. 74LS169             | 6        |
| 33  | IC28 B02 X0074A | TTL I.C. 74S74               | 1        |
| 32  |                 |                              |          |
| 31  | IC24 B01 X0377A | TTL I.C. 74LS377             | 3        |
| 30  | IC23 B01 X0374A | TTL I.C. 74LS374             | 7        |
| 29  | IC22 B01 X0373A | TTL I.C. 74LS373             | 4        |
| 28  | IC21 B01 X0298A | TTL I.C. 74LS298             | 2        |
| 27  | IC20 B01 X0283A | TTL I.C. 74LS283             | 2        |
| 26  | IC19 B01 X0273A | TTL I.C. 74LS273             | 1        |
| 25  | IC18 B01 X0257A | TTL I.C. 74LS257             | 1        |
| 24  | IC18 B01 X0245A | TTL I.C. 74LS245             | 3        |
| 23  | IC18 B01 X0244A | TTL I.C. 74LS244             | 3        |
| 22  | IC14 B01 X0194A | TTL I.C. 74LS194             | 4        |
| 21  | IC13 B01 X0175A | TTL I.C. 74LS175             | 1        |
| 20  | IC12 B01 X0174A | TTL I.C. 74LS174             | 1        |
| 19  | IC11 B01 X0163A | TTL I.C. 74LS163             | 7        |
| 18  | IC10 B01 X0158A | TTL I.C. 74LS158             | 1        |
| 17  | IC9 B01 X0157A  | TTL I.C. 74LS157             | 6        |
| 16  | IC8 B01 X0139A  | TTL I.C. 74LS139             | 2        |
| 15  | IC7 B01 X0138A  | TTL I.C. 74LS138             | 4        |
| 14  | IC6 B01 X0095A  | TTL I.C. 74LS86              | 1        |
| 13  | IC5 B01 X0074A  | TTL I.C. 74LS74              | 4        |
| 12  | IC4 B01 X0032A  | TTL I.C. 74LS32              | 3        |
| 11  | IC3 B01 X0020A  | TTL I.C. 74LS20              | 1        |
| 10  | IC2 B01 X0008A  | TTL I.C. 74LS08              | 2        |
| 9   | IC1 B01 X0004A  | TTL I.C. 74LS04              | 2        |
| 8   | RB2 A2231089A   | RES BLOCK 10K95              | 2        |
| 7   | RB1 A2231065A   | RES BLOCK 1K95               | 3        |
| 6   | R A2000065A     | RES CARBON 1K0M/MW±5%        | 4        |
| 5   | C3 A120027A     | CAP CERAMIC 50V 100P         | 1        |
| 4   | C2 A1200123A    | CAP CERAMIC 50V 100000P      | 60       |
| 3   | C1 A1000135A    | ELEC BLOCK 16V 220           | 1        |
| 2   |                 |                              |          |
| 1   | J1100070A       | VIDEO P.C.B (260x310)        | 1        |

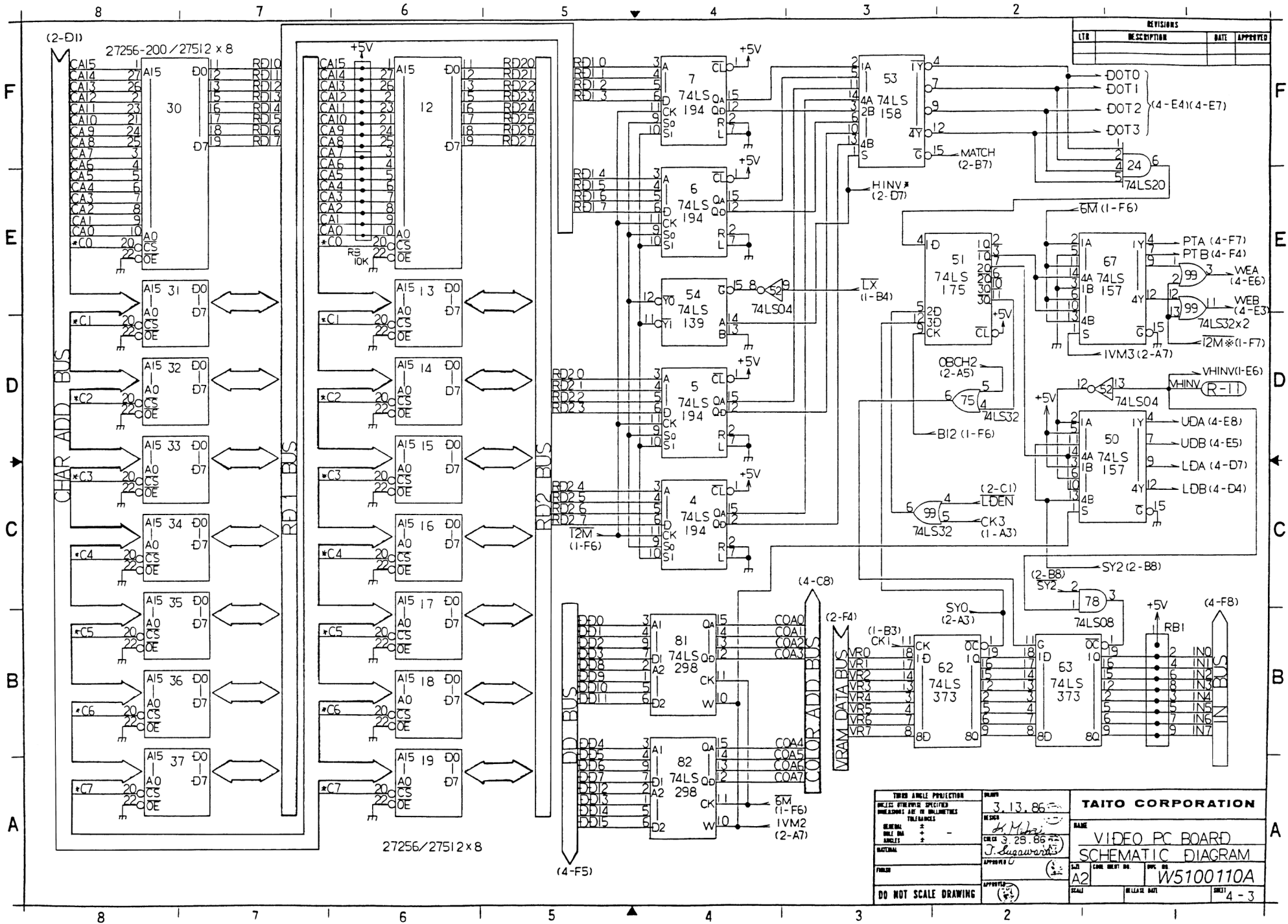
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 CHECKED BY: [Signature]  
 PARTS LIST  
 TAITO CORPORATION  
 VIDEO PC BOARD ASSY  
 K1100192A



| REVISIONS |             |      |          |
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| LT#       | DESCRIPTION | DATE | APPROVED |
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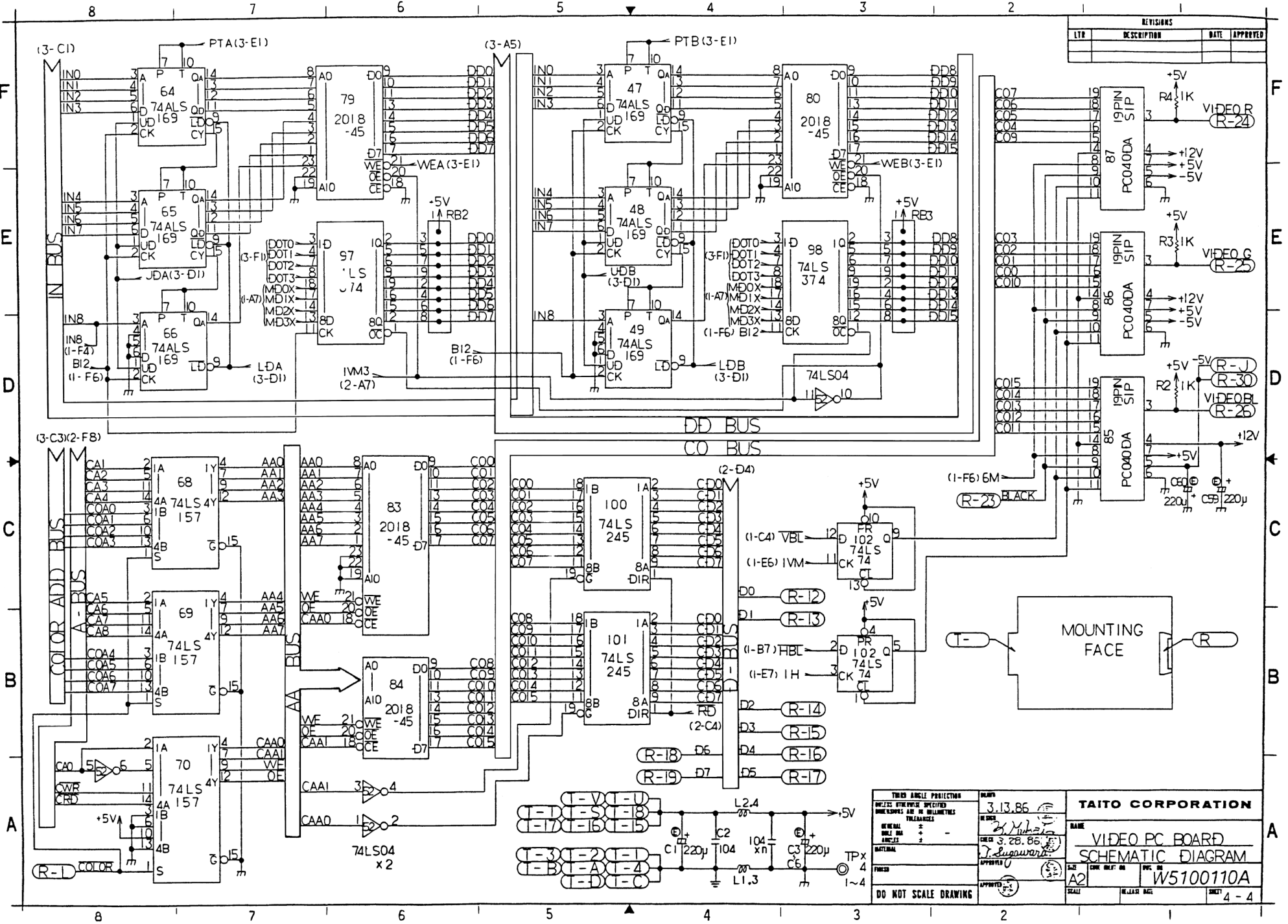
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|---|--|--|
| TITLED SINGLE PROJECTION<br>UNLESS OTHERWISE SPECIFIED<br>DIMENSIONS ARE IN MILLIMETERS<br>TOLERANCES<br>FINISHES<br>MATERIAL<br>FINISH<br>DO NOT SCALE DRAWING | DATE<br>3.13.86<br>DESIGNED BY<br>T. M. M. M.<br>CHECKED BY<br>J. S. S. S.<br>APPROVED BY<br>J. S. S. S.<br>APPROVED BY<br>J. S. S. S. | J1100070A<br><b>TAITO CORPORATION</b><br>NAME<br>VIDEO PC BOARD<br>SCHEMATIC DIAGRAM<br>DATE<br>3.28.86<br>CASE NO.<br>W5100110A<br>SHEET<br>4-1 |
|---|--|--|





| REVISIONS |             |      |          |
|-----------|-------------|------|----------|
| LT#       | DESCRIPTION | DATE | APPROVED |
|           |             |      |          |

|  |  |  |
|--|--|--|
| THIRD ANGLE PROJECTION<br>UNLESS OTHERWISE SPECIFIED<br>DIMENSIONS ARE IN MILLIMETERS<br>TOLERANCES<br>FINISH<br>MATERIAL<br>PARTS<br>DO NOT SCALE DRAWING | PLANT<br>3.13.86<br>DESIGNED<br>CHECKED<br>APPROVED<br>DATE 3.25.86<br>J. Sugawara | <b>TAITO CORPORATION</b><br>NAME<br>VIDEO PC BOARD<br>SCHEMATIC DIAGRAM<br>LTR<br>A2<br>DATE<br>W5100110A<br>SCALE<br>SHEET NO.<br>4-3 |
|--|--|--|



| REVISIONS |             |      |          |
|-----------|-------------|------|----------|
| LTR       | DESCRIPTION | DATE | APPROVED |
|           |             |      |          |

|  |          |             |                   |
|--|----------|-------------|-------------------|
| THIRD ANGLE PROJECTION                                   | DATE     | 3.13.86     | TAITO CORPORATION |
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES | DESIGN   |             |                   |
| GENERAL  | BY       | T. Sugawara | NAME              |
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES | CHECK    |             |                   |
| NATIONAL   | APPROVED | T. Sugawara | VIDEO PC BOARD    |
| FIGURE   | APPROVED |             |                   |
| DO NOT SCALE DRAWING                                     | SCALE    | REL. MAG.   | W5100110A         |
|  |          |             | 4-4               |