



## SEGA CUSTOMER SERVICE OFFICES

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## SPECIFICATIONS (仕様)

- Space Required : 905mm×680mm
- Game Height : 665mm
- Power Source : AC 100V~240V
- Price Per Game : Coin SW. #1  
1~2Coin(s)~1PLAY , Coin SW. #2  
1~2Coin(s)~1~6PLAY(s)
- CRT : 20" Color TV AC 100V
- Power Consumption : w/100V, w/120V, w/200~240V

- Note :
1. Details contained herein may be changed without notice for making improvements.
  2. As a rule, supplies of spare parts will be available for a period of 3 years after the date of manufacture of the game concerned and common parts only will be available for a period of 5 years.
  3. "To enable us to serve our customers more efficiently, we must ask that spare parts orders be consolidated as minimum order must be \$ 5 0.0 0 Per order."

- (註) :
- 1 記載されている内容は改良のため予告なく変更する場合があります。
  - 2 補修用部品の供給期間は原則として3年、それ以降は共通部品に限り5年とする。

# 1 INSTALLATION

1. As the SEGA FROGGER is for “INDOOR USE”, do not install outdoors.
2. When installing, avoid the following places.
  - Near indoor pools or showers
  - Where leaks exist
  - Under direct sunlight
  - Near heaters or other heat emitting devices
  - Where hazardous items (volatile fluids, gas cylinders etc.)
  - Where vibrations are severe (near construction sites where jack hammers etc. are used)
  - Inclined places
  - Near fire extinguishing equipment
  - Near emergency exits
  - Set power transformer changeover switch to 90V in locations where the power is normally below 90V.

1. セガ・ FROGGER は「屋内用」ですので屋外には設置しないでください。

2. 屋内でも次の場所は避けてください。

- 室内プール，シャワーの近辺。
- 雨もりのする所。
- 直射日光の当たる所。
- 暖房器具等の直接熱の当たる所。
- その他危険物（揮発性油，ガスボンベ等）の収納された所。
- 振動の激しい場所（ハンマー，鍛造等の作業場が極めて近い所）。
- 斜面場所。
- 消防設備のある所。
- 非常口の防げになる所。
- 電源が常時AC90V弱の場合は，電源電圧切換えスイッチによって90Vに切換えてください。

# 2 CARE IN OPERATION

## 1. Inspection

- Are the IC boards and other connectors firmly connected.
- Connect ground wire as prescribed. (Never connect to gas pipes, water pipes or electrical conduits)
- Arrange line cords and ground wires in the aisle so they will not be tripped over.

## 2. Care in Handling

- Always turn off the power supply switch before handling.
- Avoid inserting and pulling the plug in rapid succession.
- Do not check the IC board circuit with a tester.

## 3. Care in Usage

- Care should be taken to avoid dragging or dropping the machine when transporting to prevent damage to the CRT.
- Use fuse of stipulated rating.
- As high voltage is present in the monitor and TV PCB, adjustments or repairs should be left up to a serviceman and should never be touched by the layman.

## 1. 点 検

- ICボード、その他のコネクターの接続は完全に差し込まれているか。
- アースの接地、接続は所定の所になされているか。(水道管、ガス管、配電管等には絶対に接続しないでください。
- 電源コード、アース線が通路上に危険な状態で出てないか。

## 2. 作業上の注意

- 作業する前に必ず電源スイッチを切ってください。
- 電源プラグを瞬時に抜き差しするのは避けてください。
- ICボードの回路検査にテスターを使用しないでください。

## 3. 使用上の注意

- TV(ブラウン管) にダメージを与えない為に、持ち運びは引きずったり落さないように注意してください。
- ヒューズは指定された定格のものを使用してください。
- テレビの基板および内部には高圧部分がありますので、サービスマン以外は絶対にさわらないでください。

# 3 TROUBLE SHOOTING

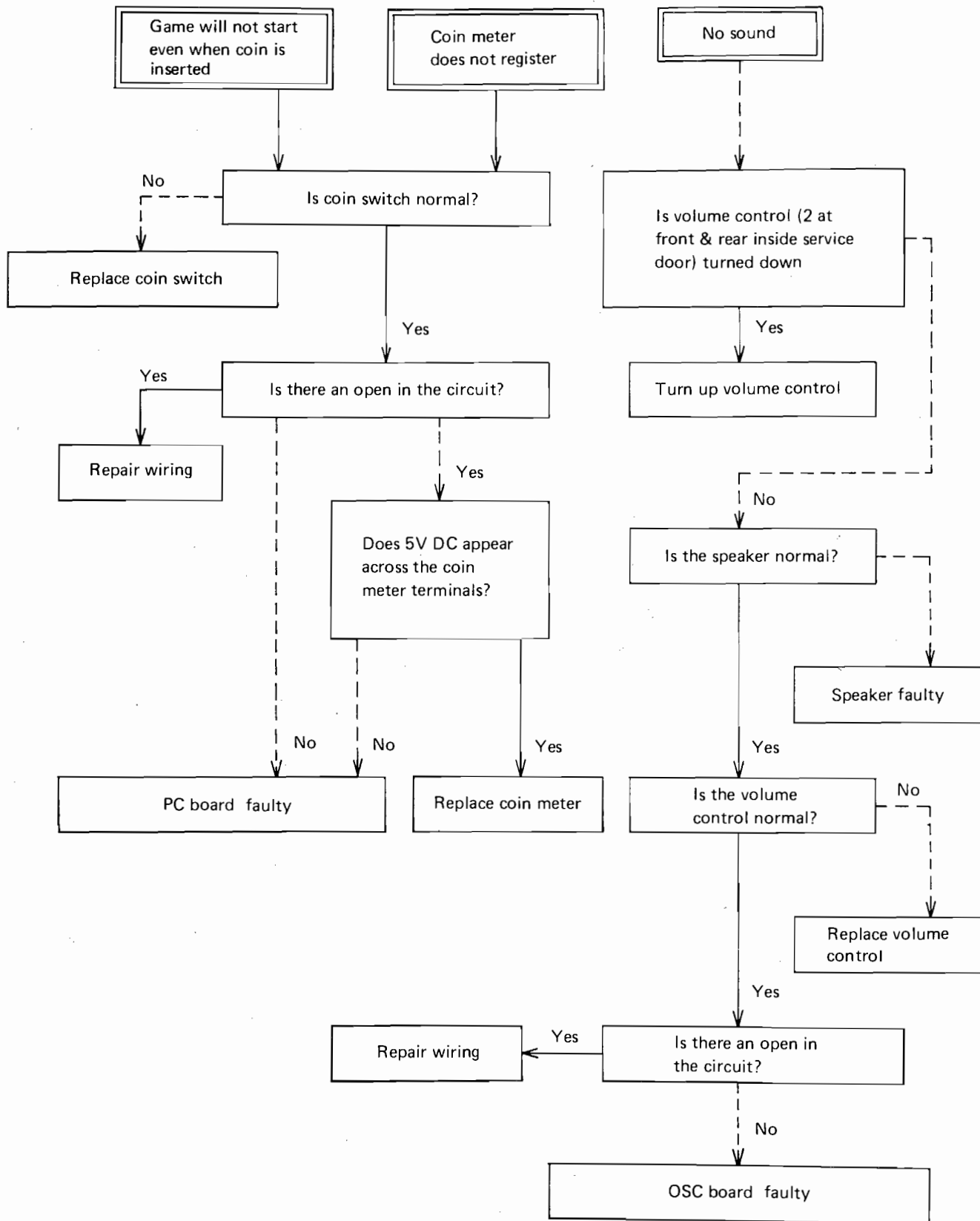
When it is believed that trouble has developed, always confirm the following items.

- Is the fuse intact (Always use fuse of the designated rating). When the replaced fuse burns out again, this will indicate that another component is defective.
- Are there any poor connections (connectors) or open circuits. Special care must be taken to ensure connectors are firmly inserted troubles due to faulty contacts can be considered from various sources.  
Note: Always turn off the power when inserting or removing the connectors.
- There will be times when a normal picture will not appear when the power supply switch is turned on. As this may sometimes be corrected by a setting of the control circuit, turn power supply switch on and off several times.
- When testing meters, switches etc. with a tester, always first pull the IC board connectors.

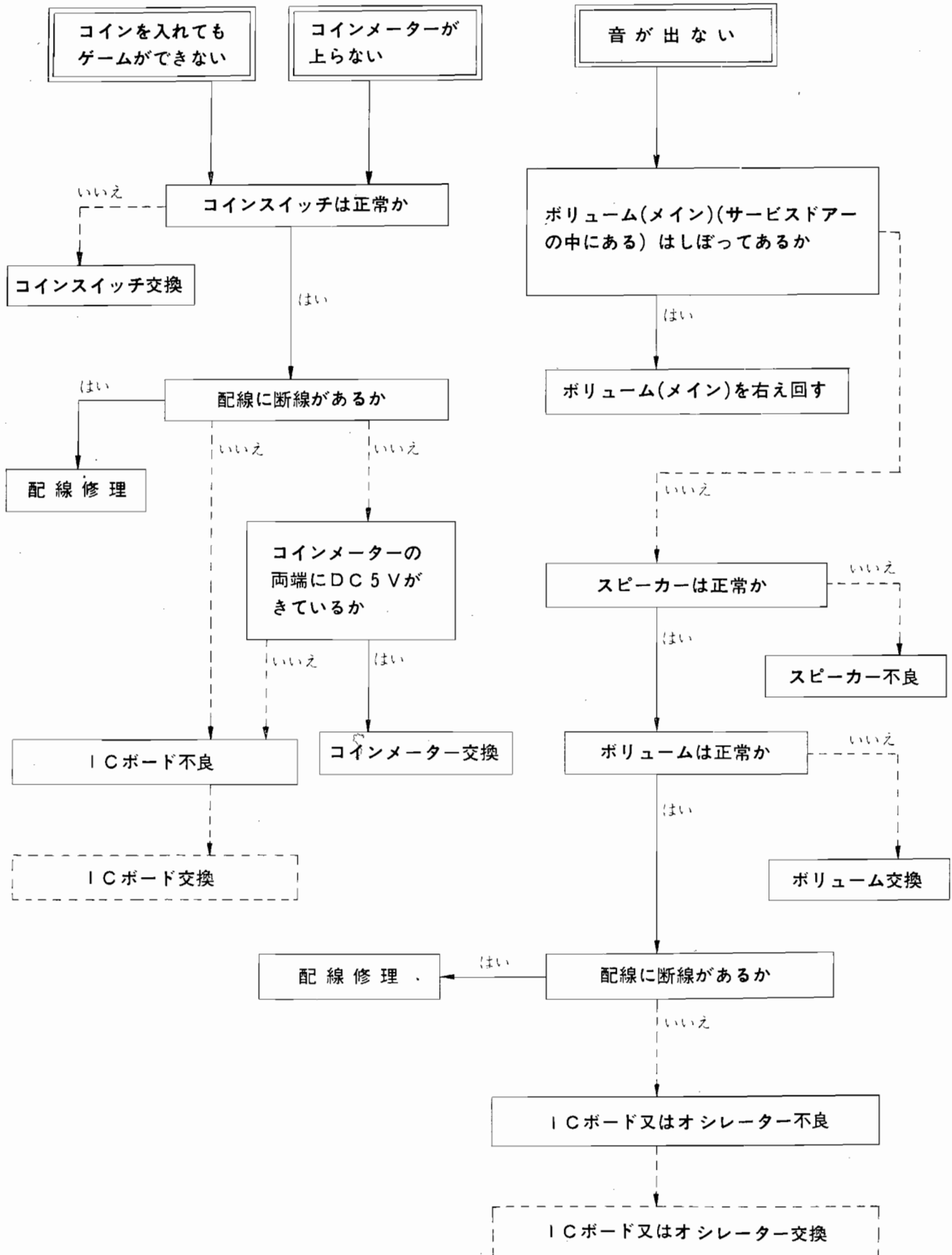
**故障と思われる場合は、必ず次の事項を確認して下さい。**

- ヒューズは切れていないか (必ず表示されたヒューズを入れてください)、1度交換したヒューズがまた切れた場合は、他の部品に故障があります。
- コネクターの接触不良、または断線はないか、コネクターの接触不良による故障はあらゆる症状に対して考えられますので、接触状態を充分確認してください。  
(註) コネクターの抜き差しをする場合は必ず電源を切ってください。
- 電源プラグを“ON”して正常な映像が出ない場合があります。これは制御回路のセットを行うと正常にもどる事がありますので、電源“ON”“OFF”を2・3度繰り返してください。
- メーター、スイッチ等をテスターで調べる場合はICボードのコネクタを抜いて行ってください。

# TROUBLE SHOOTING

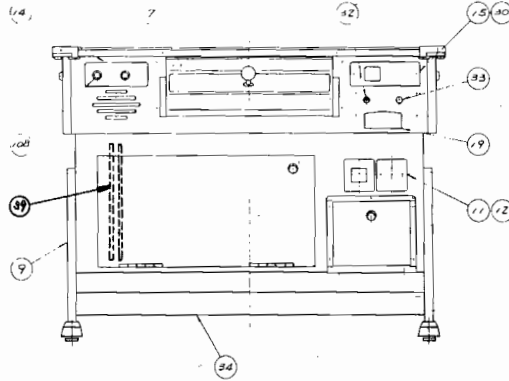
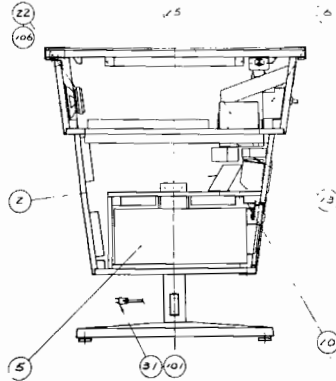
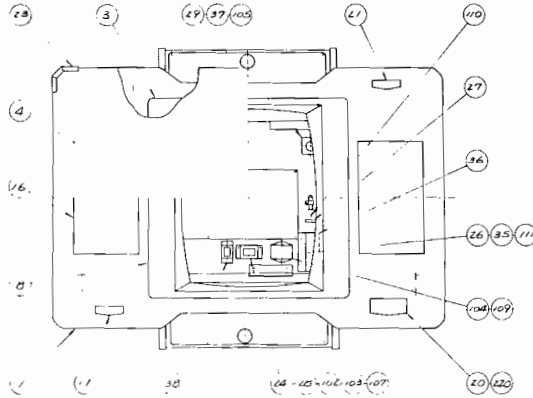
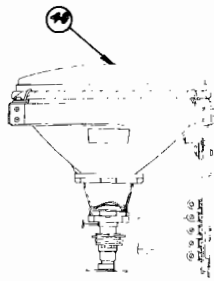


# 故障対策





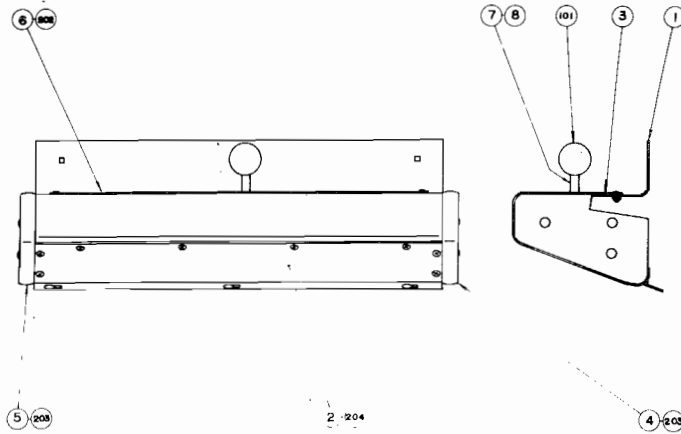
# 4 CABINET ACCESSORY ASSY



- |    |          |  |     |             |  |
|----|----------|--|-----|-------------|--|
| 2  | AB-1149  | Lower Coin Chute   | 30  | 83433       | Denomination Plate, ¥100   |
| 3  | AB-1151  | TV Mask, GRAY SMOKE  |     | 83440X      | Denomination Plate, 1Fr. x2  |
| 4  | AB-1153  | Table Glass, BLACK   |     | 83438X      | Denomination Plate, 5Fr. 3Plays  |
| 5  | AB-1154  | Cash Box   |     | 83443X      | Denomination Plate, 2Fr.   |
| 6  | AB-1155  | COIN CHUTE BRACKET ASSY  |     | 83435       | Denomination Plate, 10Px2  |
|    | GC-2115  | Switch & Actuator Assy   |     | 83437       | Denomination Plate, 1DM  |
|    | AB-1167  | COIN CHUTE BRACKET ASSY, TWIN                                    |     | 83436       | Denomination Plate, 5DM 6Plays   |
| 8  | AB-1166  | TV Mask, 20  |     | 83449       | Denomination Plate, 20¢  |
| 9  | AB-1146  | Leg Assy   |     | 83444       | Denomination Plate, 25¢ (25¢ Type)   |
| 15 | AB-1037Y | Coin Entry Plate, ¥100   |     | 83441       | Denomination Plate, 25¢x2 (25¢x2 Type)                                     |
|    | AB-1038X | Coin Entry Plate, U.S.A. 25¢, Twin<br>(1Fr., 5Fr., 25¢, 1P, 1DM) |     | 83450       | Denomination Plate, 5Fr. x2  |
|    | AB-1049X | Coin Entry Plate, FRANCE 1Fr., 5Fr.<br>(1DM, 5DM, 1Fr., 5Fr.)    |     | 83446       | Denomination Plate, 1Px2   |
|    | AB-1045X | Coin Entry Plate, FRANCE 2Fr., Twin                              |     | 83445       | Denomination Plate, L. 100x4   |
|    | AB-1047X | Coin Entry Plate, ENGLISH 10P, Twin<br>(20¢, 100LIRA)            | 31  | 90759       | Cable & Plug Assy  |
|    |          |  |     | S-95835     | Cable & Plug Assy, W/Earth (U.S.A. 120V)                                   |
|    |          |  |     | S-97660     | Cable & Plug Assy, W/Earth (220~240V)                                      |
| 16 | FR-1004  | Play Instructions Sheet, FROGGER                                 | 32  | AB-1150     | Reject Button Assy   |
|    | FR-1028  | Play Instructions Sheet, FROGGER ENGLISH                         | 39  | S-97804-1-P | IC Board Assy, FROGGER, #/O Controller (KONAMI)                            |
| 20 | GI-1025X | Denomination Sheet, ¥100   |     | S-97804-2-P | Controller, FROGGER (KONAMI)   |
| 22 | TK-1009  | Speaker Guard Plate  | 40  | 97704-P     | COLOR DISPLAY ASSY, 20 Type, 100V  |
| 23 | DO-1030  | Hook   |     | S-97335-P   | Color Display, 20 Type (NANA O D203C-S)                                    |
| 25 | CC-2100  | Coin Chute, Rejector Type, ¥100                                  |     | 200-0037    | Color Display Assy, 20 Type, 100V  |
|    | CC-2209  | Coin Chute, Rejector Type, FRANCE 1Fr. x1                        |     | S-97822     | Color Display, 20 Type (NANA O)  |
|    | CC-2210  | Coin Chute, Rejector Type, FRANCE 5Fr. x1                        | 102 | S-90834     | Switch, Push Button Type, MIYAMA DS-139                                    |
|    | CC-2197  | Coin Chute, Rejector Type, FRANCE 2Fr. x1                        | 103 | S-91649     | Switch Stopper, 12¢ (NKK BP-4002)  |
|    | CC-2192  | Coin Chute, Rejector Type, ENGLISH 10Px1                         | 106 | S-94156     | Speaker, 12x8cm, 8Ω, 3W (MATSSHITA)  |
|    | CC-2191  | Coin Chute, Rejector Type, GERMAN 1MARKx1                        | 107 | S-95657     | C & R Combination Element, 0.1µF & 120n<br>(MATSSHITA ECQ-J0186A)          |
|    | CC-2217  | Coin Chute, Rejector Type, GERMAN 5MARKx1                        | 108 | S-96392     | Push Button Switch, M.1B, Illuminated Type,<br>YELLOW (MULON NUM-IRY-B101) |
|    | CC-2053  | Coin Chute, Rejector Type, AUSTRALIA 20¢x1                       | 109 | S-96634     | Noise Filter, AC 250V, 4A (TOHOKU KINZOKU MR-2043)                         |
|    | CC-2006  | Coin Chute, Rejector Type, 25¢x1                                 |     |             |  |
|    | CC-2196  | Coin Chute, Rejector Type, BELGIUM 5Fr. x1                       |     |             |  |
|    | CC-2193  | Coin Chute, Rejector Type, SPAIN 1PESETAx1                       |     |             |  |
|    | CC-2144  | Coin Chute, Rejector Type, 28.5¢ IRON (ITALY)                    |     |             |  |

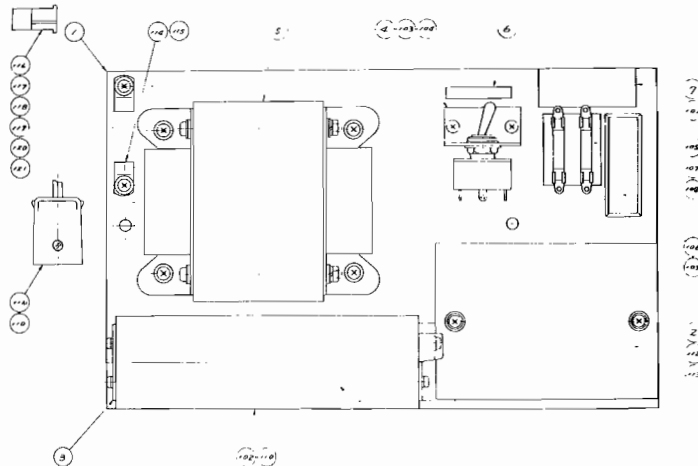
Please refer the separate book called the  
"DISPLAY MANUAL" concerning color monitor.

## CONTROL PANEL ASSY (FR-1001)



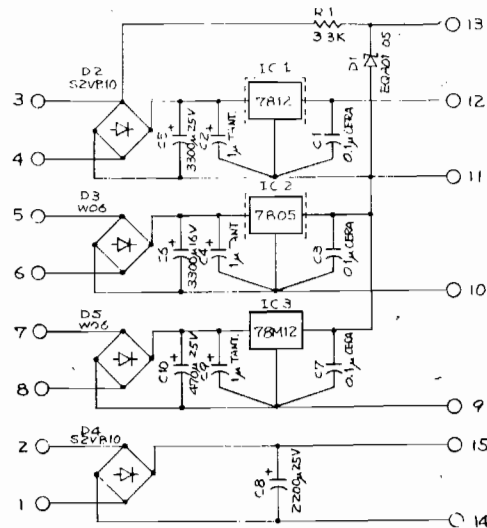
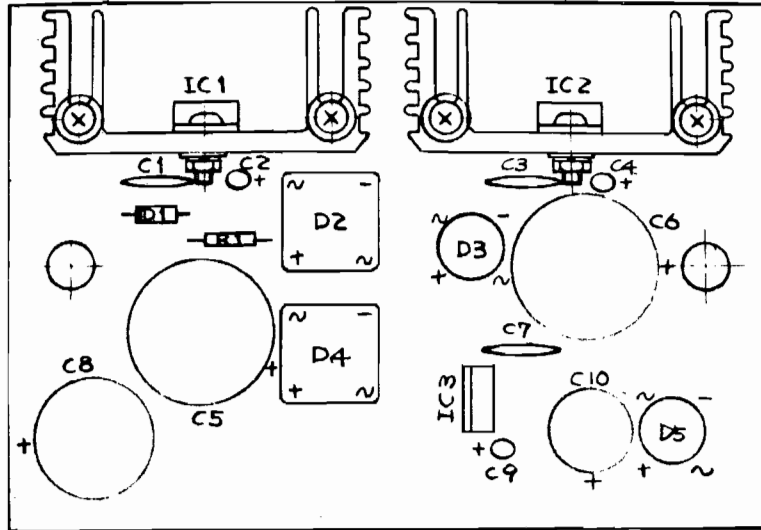
1	AB-1162	Control Panel Base,Upper
2	AB-1163	Control Panel Base,Lower
3	FR-1003	Panel Base,FROGGER
4	AB-1164	Ornament Board,A
5	AB-1165	Ornament Board,B
6	FR-1002	Control Panel Plate,FROGGER
7	BD-1102	Control Unit,4 Way
8	AB-1093	Slider Plate
101	S-83387	Handle Ball,30φ,RED

## POWER SUPPLY ASSY (AB-40004)



2	AH-4002	Regulator Unit
5	96714Y	Power Transformer,90-240V,9.5V,16V,14.5Vx2,100V,120V
102	S-96560	Switching Regulator,AC 100V,5V,6A (YAGISHITA YPU-06A)
103	S-96395	Switch Toggle,SP-DT,15A (NKK S-2A)
105	S-93002	Fuse Holder,2P,125V-10A (SATO-F2)
106	S-91164	Fuse Holder,W/Cover 250V-10A (SATO NO.7101)
107	S-90645	Fuse,1A 6.4φ x 30mm
108	S-90711	Fuse,3A 6.4φ x 30mm
109	S-90661	Fuse,5A 6.4φ x 30mm

## REGULATOR UNIT (AH-4002)



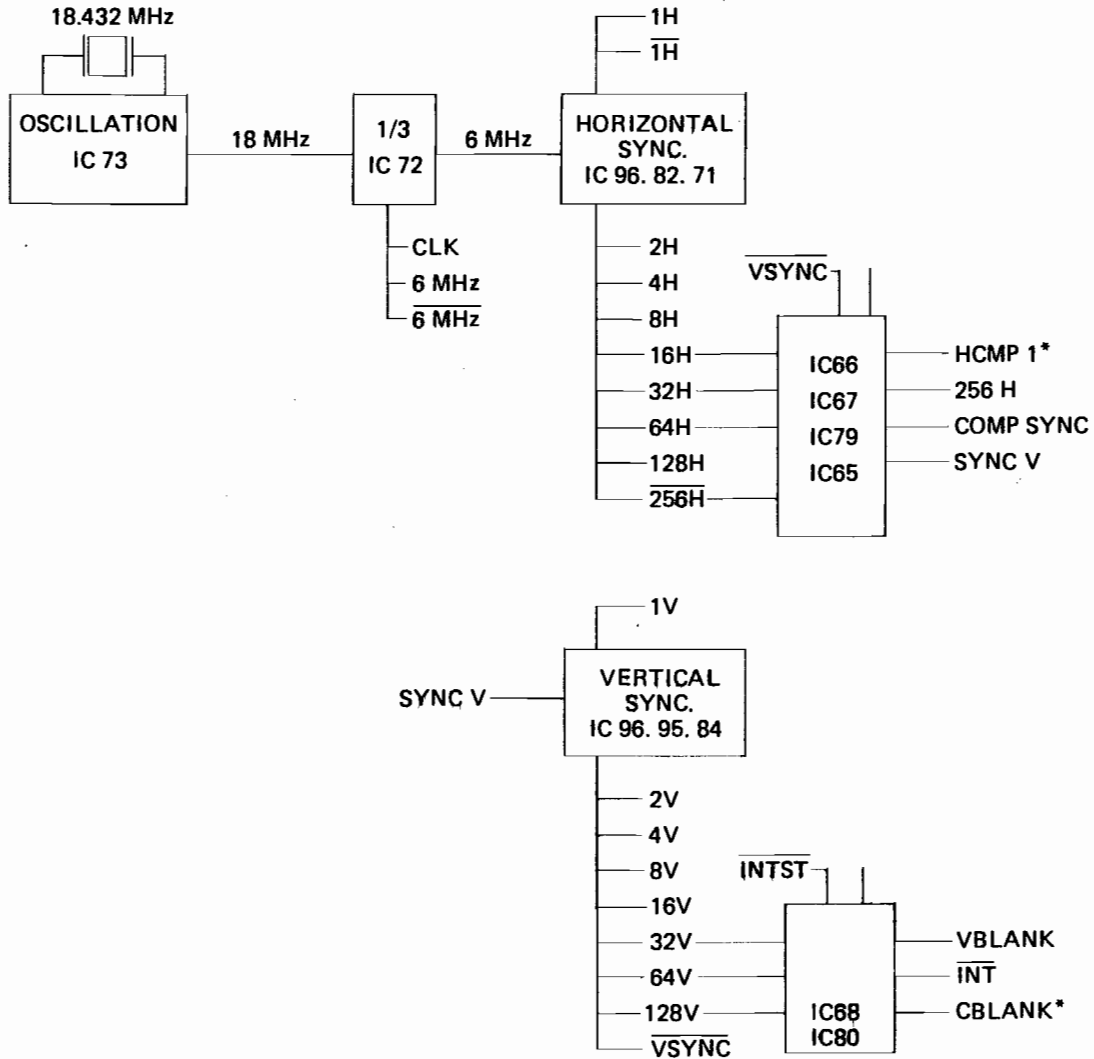
S-95596	IC, $\mu$ A78M12UC (FAIRCHILD)
S-96436	IC, $\mu$ A7812UC (FAIRCHILD)
S-95866	IC, $\mu$ A7805UC (FAIRCHILD)
S-94438	Rectifier, Silicon Diode (GENERAL INST. W06)
S-94843	Rectifier, Silicon Diode (SHINDENGEN S2VB10)
S-94779	Rectifier, Silicon Zener Diode (FUJIDENKI EQA01-05)
S-95961	Condenser, 2200 $\mu$ F, 25WV
S-96388	Condenser, 3300 $\mu$ F, 25WV, CE 04 Type
S-96448	Condenser, 3300 $\mu$ F, 16WV, CE 04 Type
S-93699	Condenser, Solid Tantalum, 1 $\mu$ F, 25WV
S-93634	Condenser, 0.1 $\mu$ F, 25WV, Ceramic
S-93622	Resistor, 3.3K $\Omega$ , 1/4W
S-94033	Condenser, 470 $\mu$ F, 25WV, CE 04 Type

# MEMO

## Note

- o This chapter provides you with the necessary information for ordering replacement parts for your FROGGER™ game.
- o When ordering parts from your distributor, give the part number, part name, applicable figure number of this manual(420-5023) and serial number of your game.
- o This will help to avoid confusion and mistakes in your order.
- o We hope the results will be less downtime and more profit from your game.

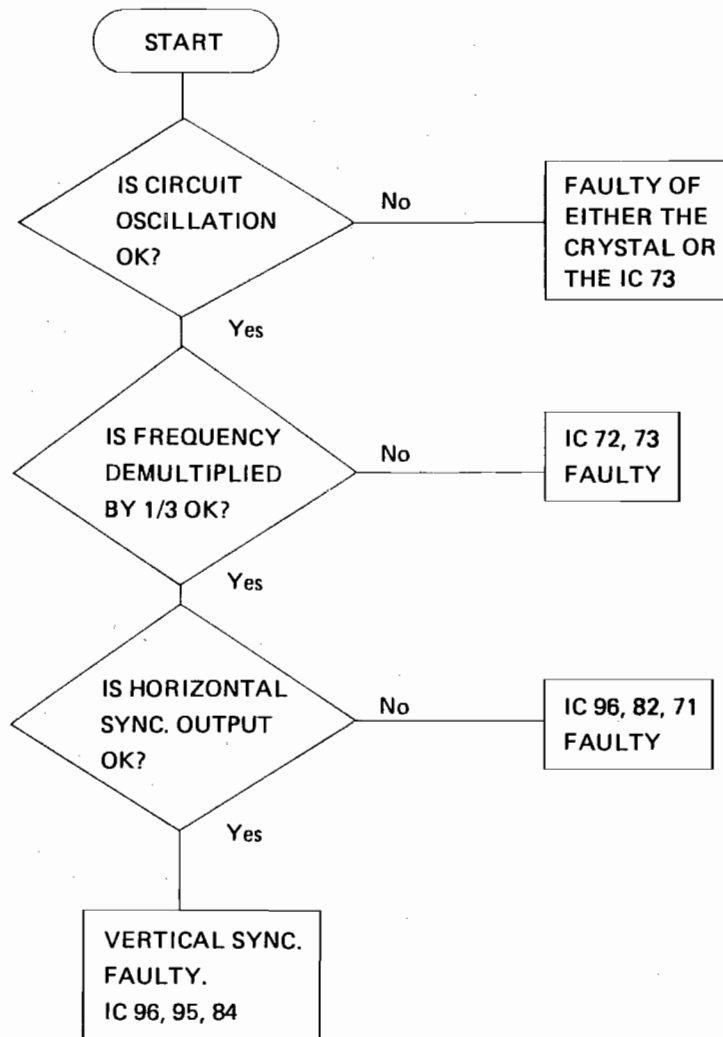
1. KT-4107-1 SYNC. RELATION FAULTY



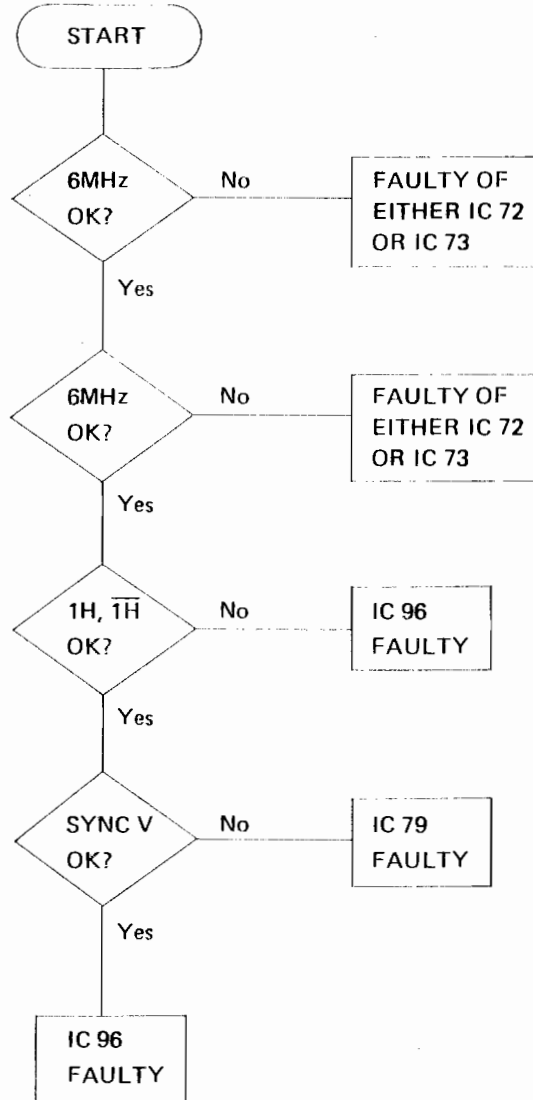
BLOCK DIAGRAM FOR OSCILLATION, HORIZONTAL · VERTICAL SYNC.

a. PICTURE DRIFTS AWAY

IT COULD POSSIBLE BE THE FAULT FROM THE SYNCHRONIZING CIRCUIT.  
FOLLOW THE FLOW CHART BELOW FOR INSPECTION.



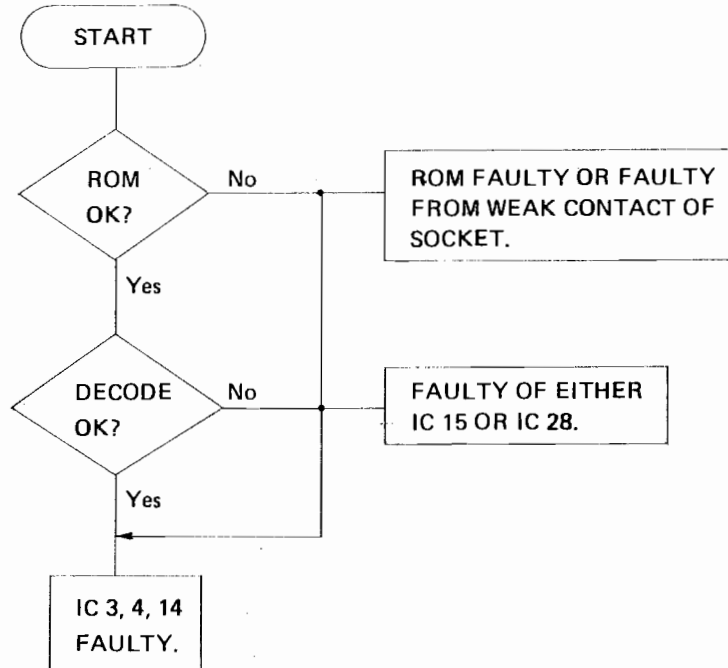
b. PICTURE WILL NOT APPEAR





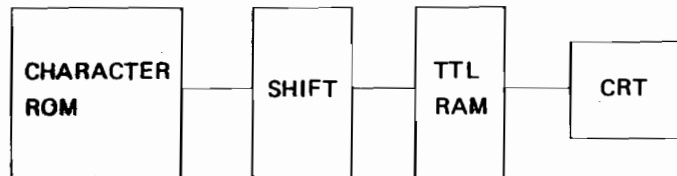
## 2. RESET FAULTY

### a. WHEN GAME STARTS, PICTURE DISAPPEARS.

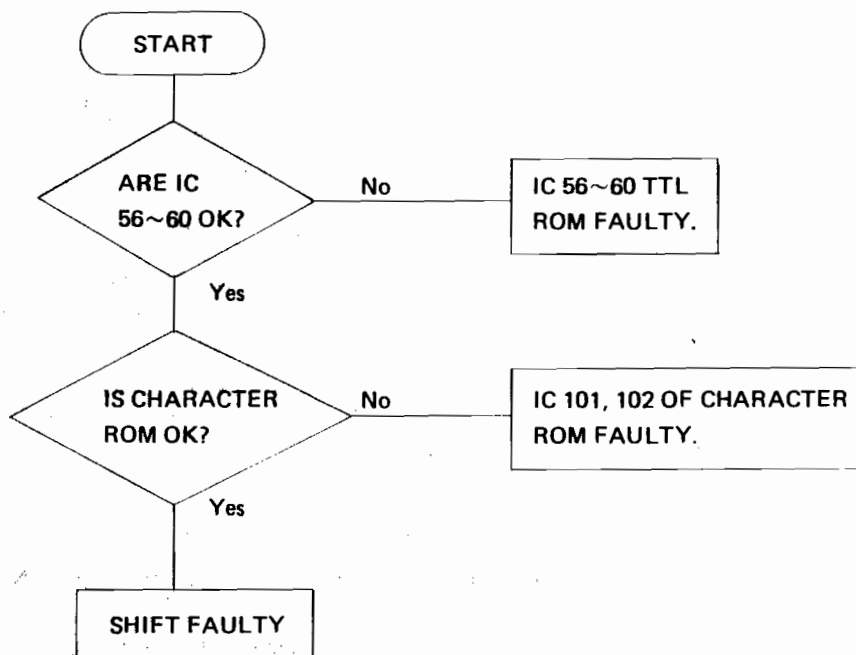


- 1 IS THE CHIP SELECT OF ROM FUNCTIONING PROPERLY?  
IS THE ADDRESS DATA BUS FUNCTIONING PROPERLY?
- 2 ARE THE OUTPUT POWER PIN 12, 13, 14, 15 OF IC 15 FUNCTIONING PROPERLY?  
ARE THE INPUT POWER PIN 1, 2, 3, 4, 5, 6 OF IC 15 FUNCTIONING PROPERLY?  
CHECK ESPECIALLY ON 6TH PIN OF IC 30 TO THE 4TH, 5TH PIN AS WELL.  
ARE PINS 10, 13, 14, 15 OF IC 28 NORMAL.
- 3 BUFFER FOR ADDRESS BUS OF IC 3, 4, 14 FAULTY?  
ESPECIALLY, TOO MUCH FAULTY OF TEMPERATURE.

### 3. COLOR FAULTY



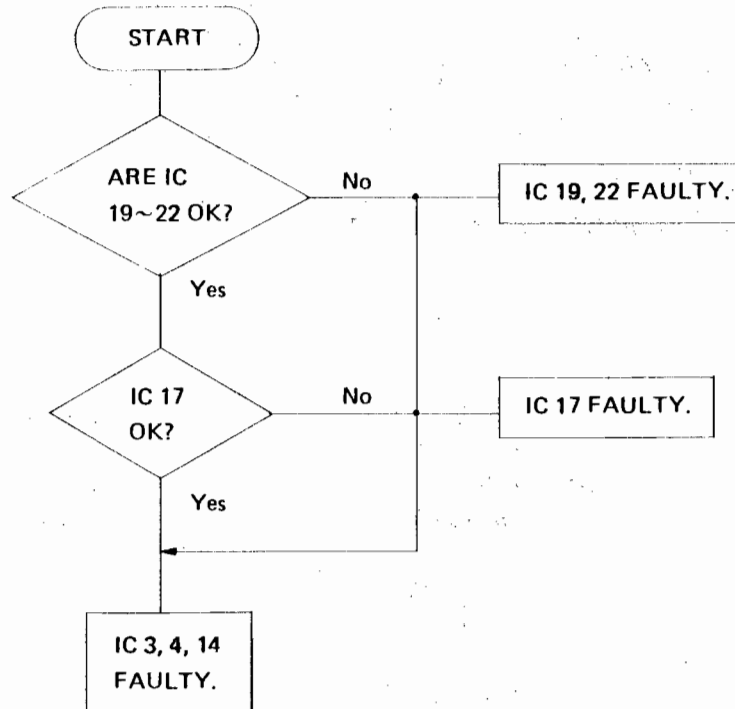
#### 1. COLOR HORIZONTAL LINE APPEARS.



1 MANY TEMPERATURE FAULTY IN TTL-ROM OF IC 56, 57, 58, 59, 60.

2 FAULTY OF EITHER CHARACTER ROM OR WEAK CONTACT OF SOCKET.

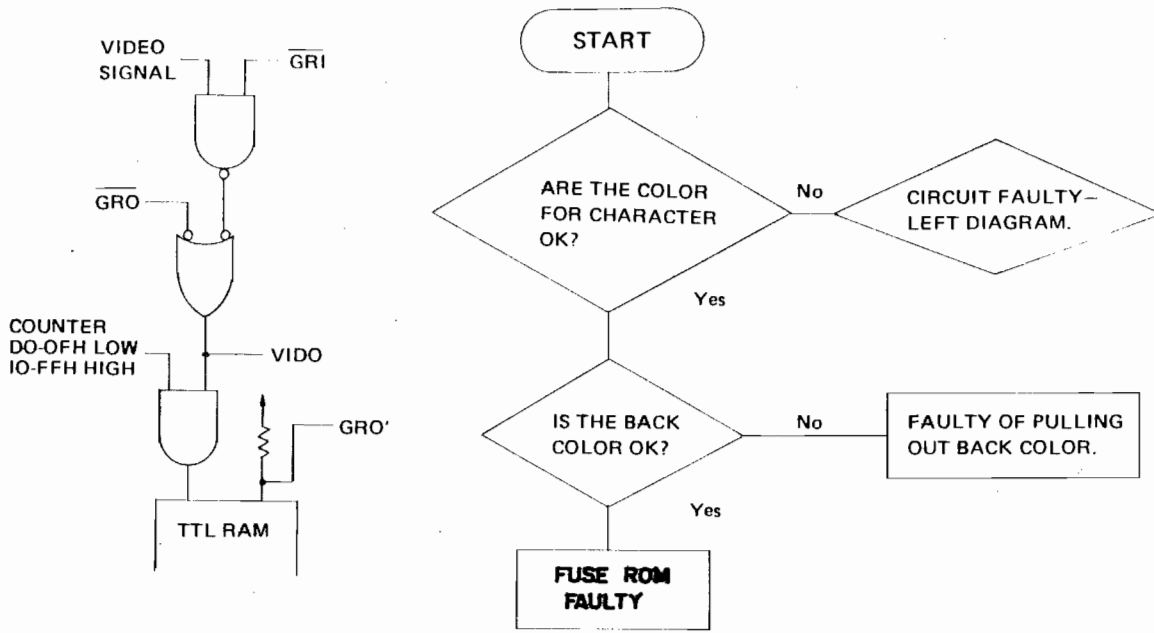
**b. WHEN INSERTING COIN, IT RESETS.**



- 1 IS THE CHIP SELECT (8 PIN) OF IC 19, 20, 21, 22 FUNCTIONING PROPERLY?  
IS THE ADDRESS DATA BUS FUNCTIONING PROPERLY?
- 2 ARE THE INPUT POWER SIDE OF 1, 2, 3, 4, 5, 6 PIN OF IC 17 NORMAL?  
FOR 6 PIN, CHECK ALSO 4, 5 PIN OF IC 30.
- 3 BUFFER FOR ADDRESS BUS OF IC 3, 4, 14 FAULTY.

2. WHEN THE COLOR IS LIGHT OR NO COLOR.  
 FAULTY OF IC 61 FUSE ROM 6331-1.

3. THE WHOLE ENTIRE COLOR IS DIFFERENT.

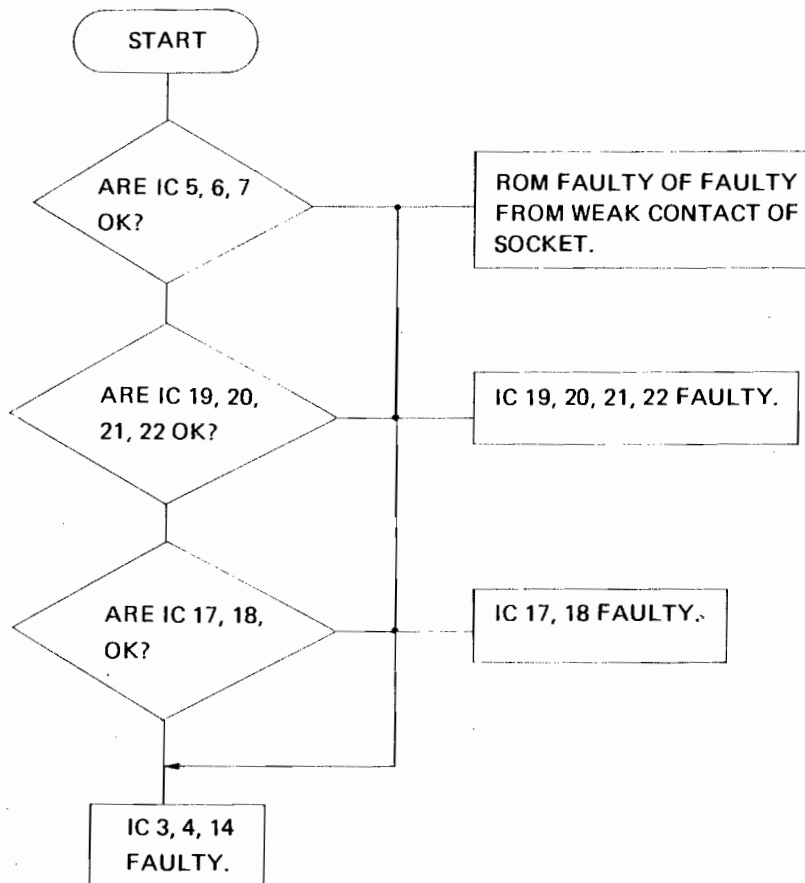


1 IN THIS CIRCUIT DIAGRAM, THE COLOR HAS ALREADY BEEN DECIDED FOR THE CHARACTERS.  
 FOLLOW THE SIGNAL LINES CAREFULLY.  
 THESE ARE THE SIGNAL LINES FROM THE RESULT OF GATES DESTROYED.

2 PULLING OUT OF BACK COLOR CAN BE DONE THROUGH IC 92, 82.

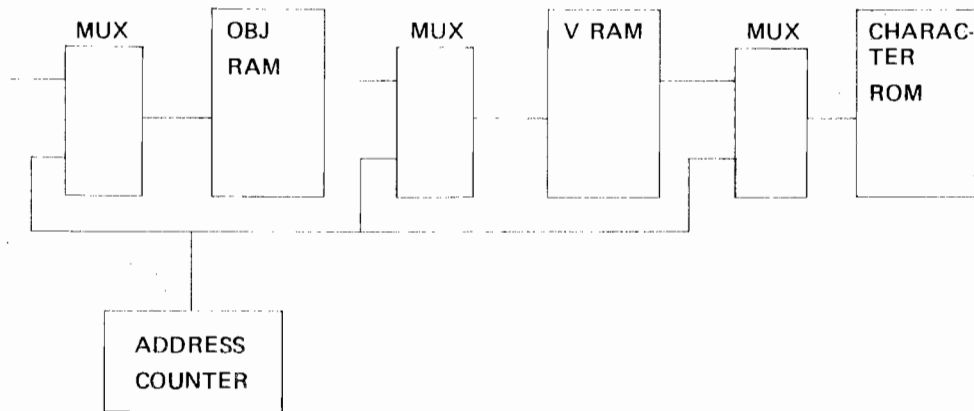
#### 4. VIDEO FAULTY

##### 1. PICTURE MOSAIC



1 2 IS CHIP SELECT WORKING PROPERLY?  
IS THE ADDRESS DATA BUS NORMAL?

3 ARE THE INPUT/OUTPUT POWER OF DECODE NORMAL?  
FOR 6 PIN, CHECK ON 4, 5 PIN OF IC 30.



**2. THE SCREEN IS SHOWN HORIZONTALLY DOUBLED & TRIPLED.**

- V RAM OF MUX – SURROUNDING (CIRCUMFERENCE)  
IC 76, 87, 97, 98, 99
- CHARACTER ROM – SURROUNDING (CIRCUMFERENCE)

**3. THE SCREEN IS SHOWN VERTICALLY DOUBLED, TRIPLED . . . . . ETC.**

- INVERSION FAULTY IC 70, 80

**4. WORDS APPEAR ON SCREEN.**

- OFF-TIMING OF V RAM. IC 74, 75.

**5. INVERSION FAULTY OF WORDS FOR 2 PLAYERS.**

- IC 42, 43, 61, 70, 81.

**6. OFF-POSITIONING OF CHARACTER OR WHEN CHARACTER (SUCH AS PROGS) DO NOT APPEAR.**

- ADDRESS BUS WORKING FROM OBJ-RAM TO TTL ROM FAULTY.  
IC 37, 47, 48, 49.

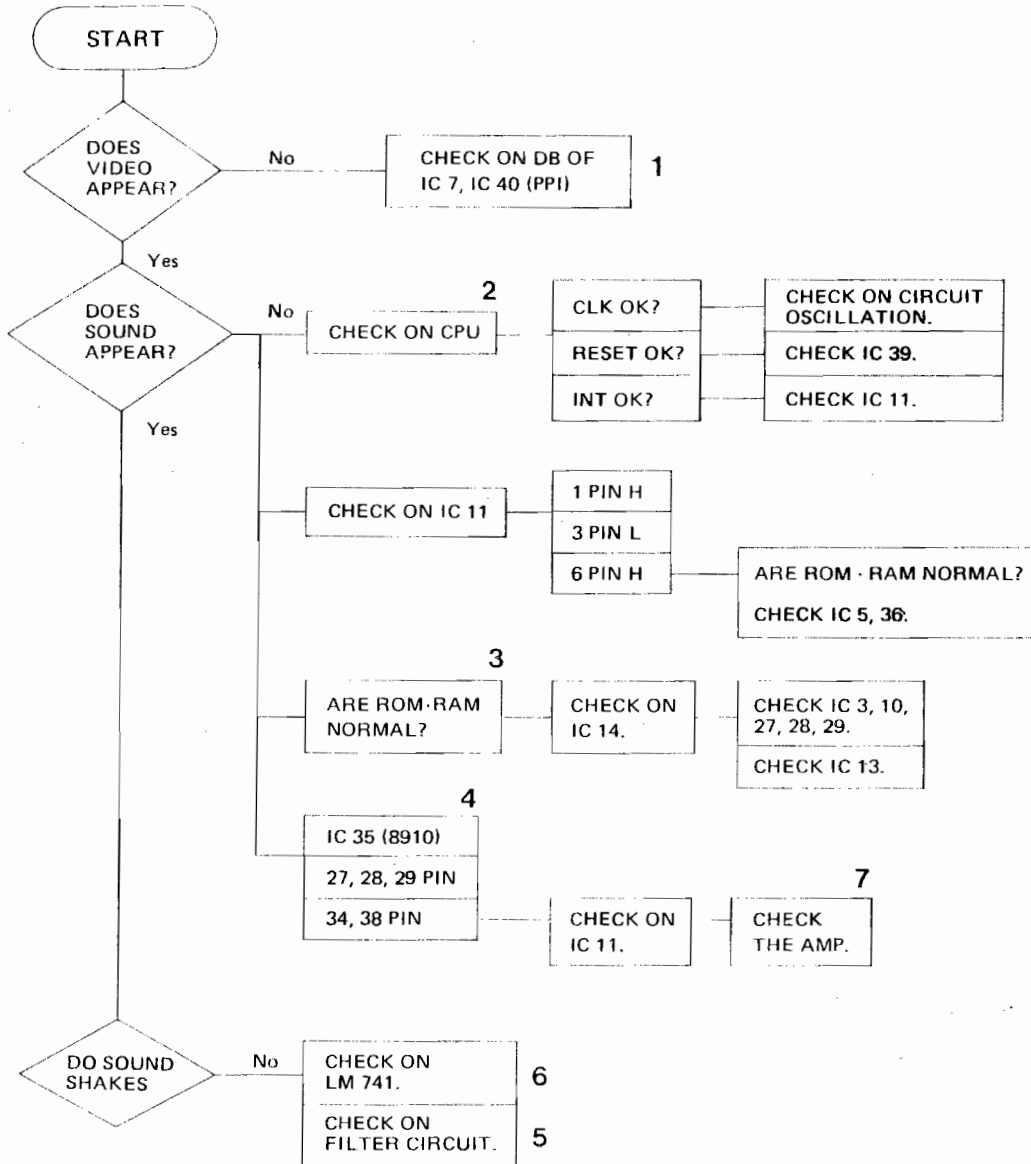
**7. CHARACTER TURNS INTO NUMBER.**

- ADDRESS COUNTER OF TTL RAM FAULTY.  
IC 37, 49.
- OFF-TIMING (V) FAULTY OF V RAM.  
IC 76, 77.

**8. TURNS INTO MOSAIC AT TIMES WHEN SHIFTING THE CHARACTERS.**

- FAULTY OF DATA SELECTOR INSERTED IN CHARACTER ROM.  
IC 88, 89, 90.

KT-4107-2



1 CHECK ON PPI

CHECK ON CHIP SELECTOR (6 PIN)  
CHECK ON RD (5 PIN), WR (36 PIN)

2 CHECK ON CPU SURROUNDING

CHECK CLK ABOUT (APPROXIMATELY) 1.8MHz  
CHECK ON CIRCUIT OSCILLATION  
CHECK ON RESET L→H  
IC 39, 8, 9 PIN  
CHECK ON INT  
IC 11 1PIN H  
3PIN L  
6PIN H  
CHECK IC 5, 36

3 CHECK ON ROM, RAM

CHECK ON CHIP SELECT ROM (20 PIN) RAM (8 PIN)  
CHECK ON ACTION  
CHECK THE ADDRESS DATA BUS  
CHECK THE I/O POWER OF IC 3, 10, 27, 28, 29

4 CHECK ON P.S.G. (8910)

CHECK CLK (22 PIN) ABOUT (APPROXIMATELY) 1.8MHz  
CHECK THE INPUT POWER OF 6, 7, 9, 10 PIN ON PORT B  
CHECK BC1 (29 PIN) BC2 (28 PIN) BD1R SIGNAL  
BC1→L BC2→SIGNAL BD1R→SIGNAL  
CHECK ANALOG (ANALOGUE) OUTPUT POWER CHA (3 PIN)  
CHB (4 PIN) CHC (38 PIN)  
CHA→SIGNAL CHB→SIGNAL

5 CHECK THE FILTER

HOW ABOUT THE JOINING CONDITION TO CAPACITOR  
RESISTANCE?  
IS FILTER CONTROL OK?  
IC 18, 19, 20

6 CHECK THE ACTION TO LM741

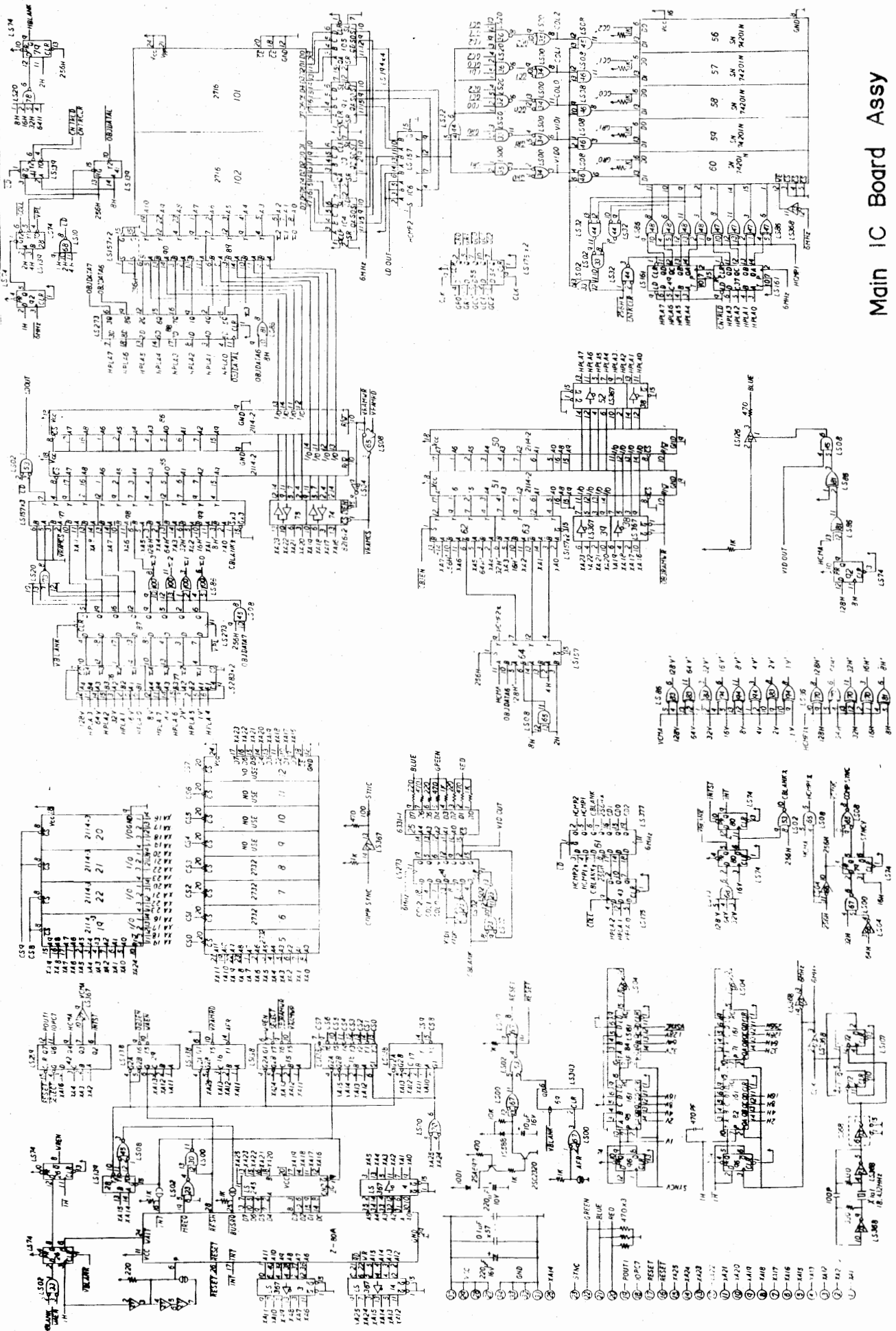
7 CHECK M51516L

HOW ABOUT THE JOINING CONDITION TO CAPACITOR  
RESISTANCE?  
CHECK THE ACTION OF 3 PIN (USUALLY HIGH)  
IS OUTPUT POWER OK? 8, 9 PIN

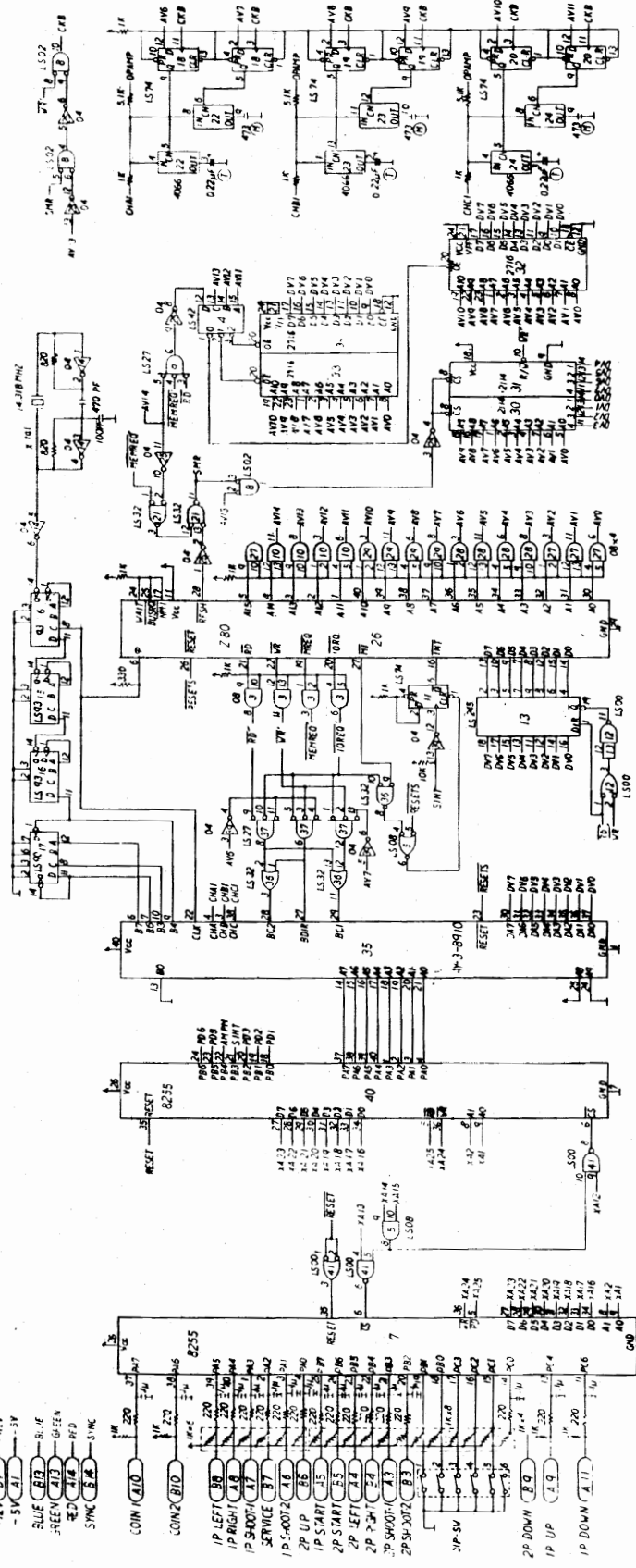
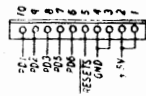
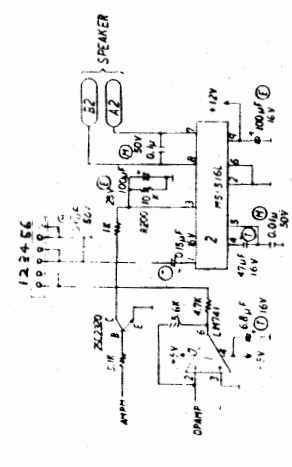


# 5 Schematic Diagram

## Main IC Board Assy

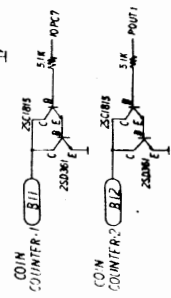


- ① XA1
- ② XA2
- ③ XA3
- ④ XA4
- ⑤ XA5
- ⑥ XA6
- ⑦ XA7
- ⑧ XA8
- ⑨ XA9
- ⑩ XA10
- ⑪ XA11
- ⑫ XA12
- ⑬ XA13
- ⑭ XA14
- ⑮ XA15
- ⑯ XA16
- ⑰ XA17
- ⑱ XA18
- ⑲ XA19
- ⑳ XA20
- ㉑ XA21
- ㉒ XA22
- ㉓ XA23
- ㉔ XA24
- ㉕ XA25
- ㉖ XA26
- ㉗ XA27
- ㉘ XA28
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- ㉝ XA33
- ㉞ XA34
- ㉟ XA35
- ㊱ XA36
- ㊲ XA37
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- ㊵ XA40
- ㊶ XA41
- ㊷ XA42
- ㊸ XA43
- ㊹ XA44
- ㊺ XA45
- ㊻ XA46
- ㊼ XA47
- ㊽ XA48
- ㊾ XA49
- ㊿ XA50



- NOTES —
- ①: TANTALUM ELECTROLYTIC CAPACITOR
  - ②: MYLAR CAPACITOR
  - ③: ELECTROLYTIC CAPACITOR
  - ④: CERAMIC CAPACITOR
  - ⑤: 50 PIN CONNECTOR
  - ⑥: 5V
  - ⑦: GND
  - ⑧: 0V

# Subic Board Assy



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