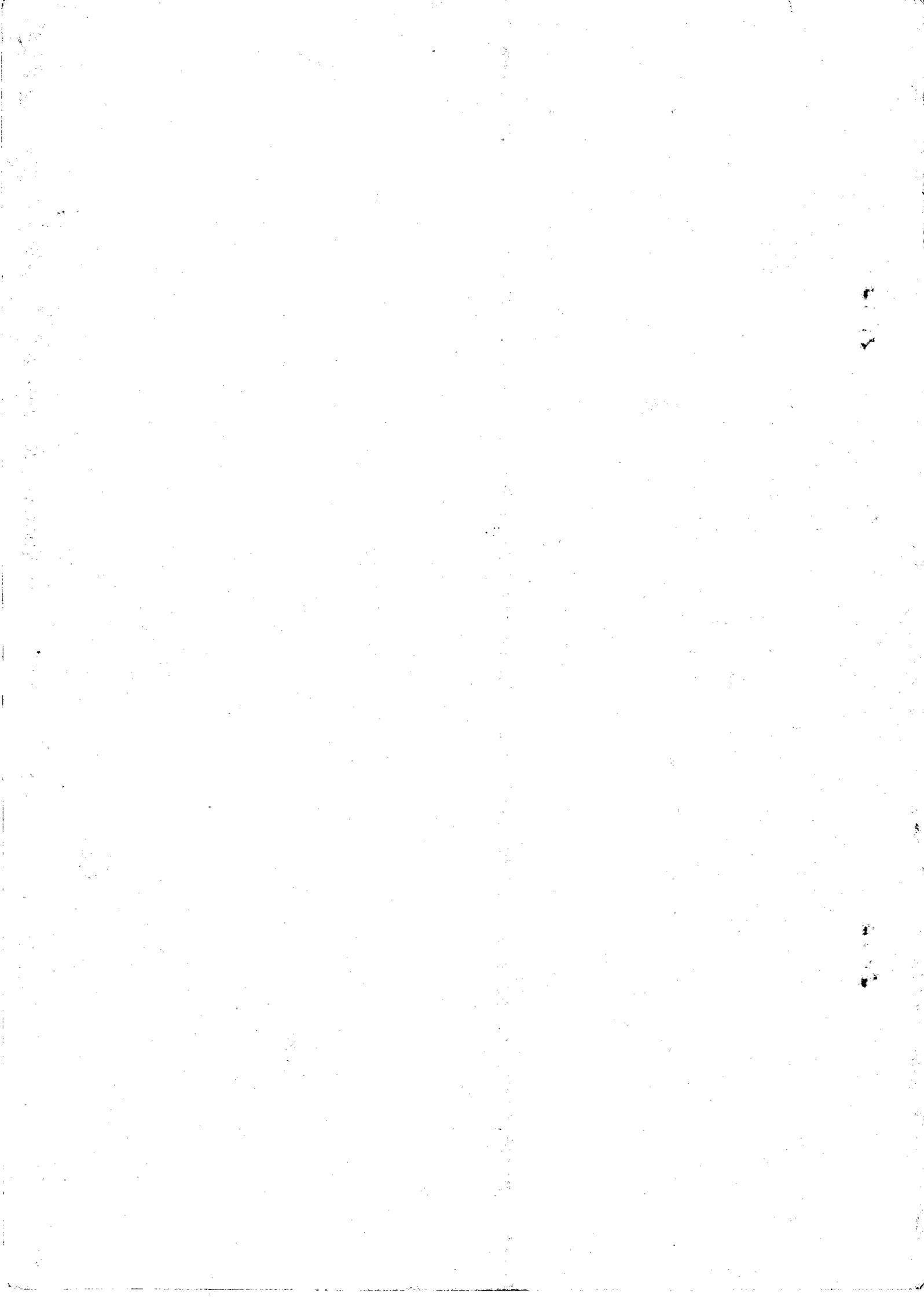


INSTRUCTIONS

OF

GALACTICA



1. SPECIFICATION:

Working power source	AC 220V \pm 15V (50/60 Hz)	
Power consumption	120 W	
Charge for game	1 game _____ (1 game; _____, 2 games; _____, changeable to free play)	
Dimension	Width mm	
	Depth mm	
	Height mm	
Weight	kg	
Cathode-ray tube	inchi color monitor	
Assessories	key	6 pieces
	Glass-bulb fuse 5A(slow blow)	1
	instructions	1
	Instructions on monitor	1

Note:

This specification may be altered without notice.

Also, we are not responsible for troubles caused by unauthorized reconstruction of this machine.

3. HOW TO PLAY:

- Either 1 or 2 persons can play this machine.
- Charge is for 1 game 1/person and for
1 game/2 persons (changeable).
- ◎ Atract mode:

Fig. 1-1 shows the picture of this machine immediately after applying power. A score table of alien appears on the picture and then aliens and galaxips in formation begin to fight through a computer (score and high score show the condition in the completion of game just before played).

- An example of picture displayed in the application of power.

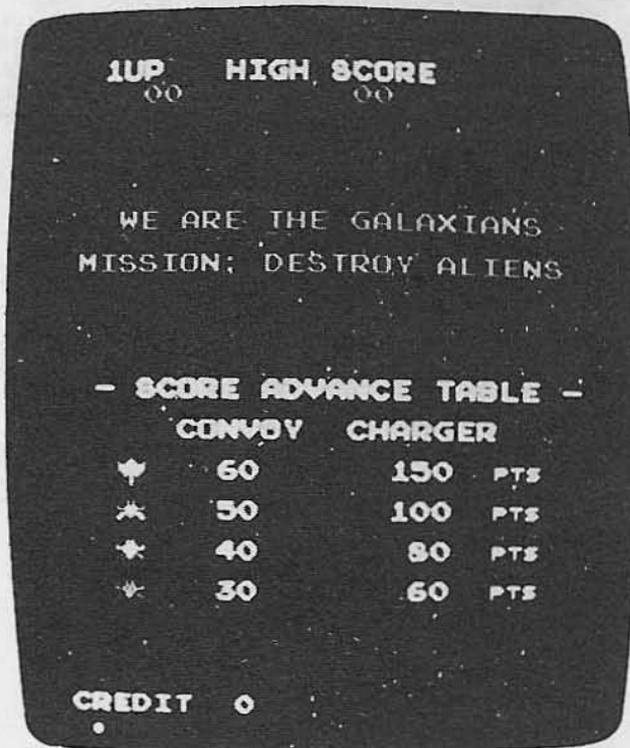
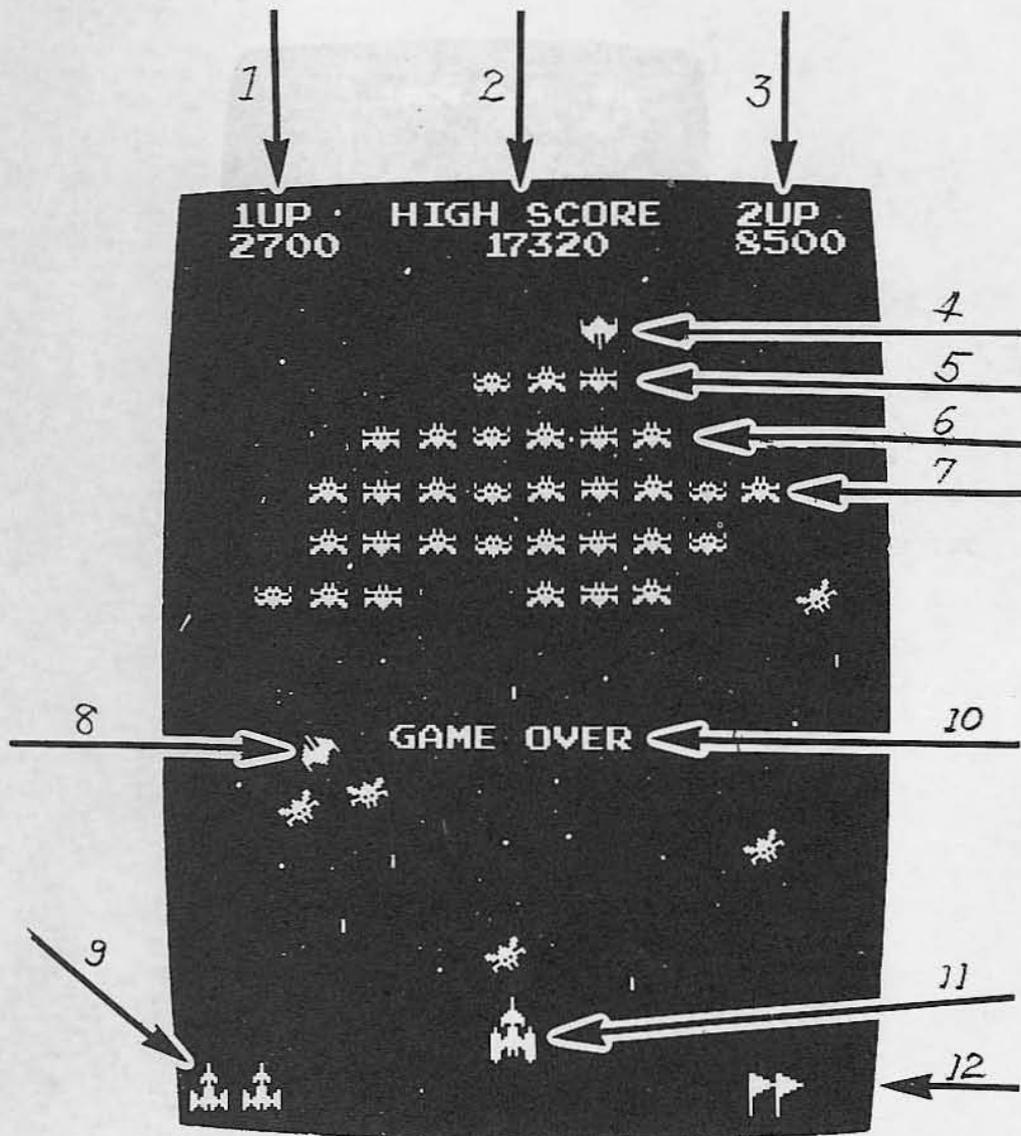


Fig. 1-1 Attract mode

© DESCRIPTION OF PICTURE:

- | | |
|-------------------------|---|
| 1... 1UP score display | 7... green alien (including 2 lower stages) |
| 2... High score display | 8... attacking alien |
| 3... 2UP score display | 9... number of remaining planes |
| 4... yellow alien | 10 ... Game-over display |
| 5... red alien | 11 ... space rocket galaxip |
| 6... violet alien | |



12 ... flag showing number of times of clears

o Put required numbers of coins into the coin inlet.

© CREDIT MODE:

Fig. 1-3 shows the picture when two coins are put into the coin inlet. The picture displays bonus score and urges the selection of start button (for 1 or 2 persons). It also displays the credit number (the credit number is displayed up to the mx.99 to permit up to 9 coins to be put).

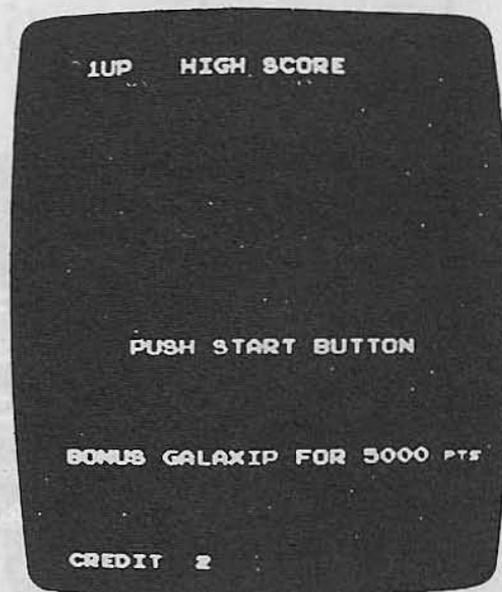


Fig. 1-3 Credit mode

© PLAY MODE:

The depression of a start button for 1 person reduces the credit number by 1 and makes the picture like Fig. 1-4 (the high score display is hold as it is).

The depression of a start button for 2 persons reduces the credit number by 2 and makes the picture like Fig. 1-5.

The depression of the start button starts the game. The state of the picture during game is called play mode in which the game effect and score are detected.

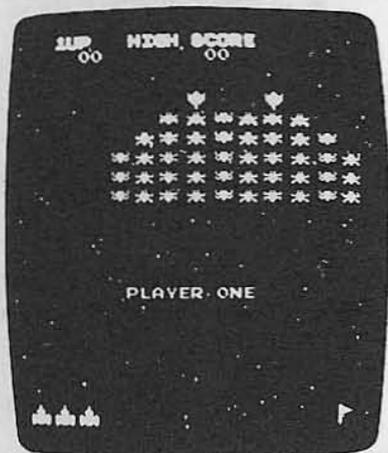


Fig. 1-4 Play mode

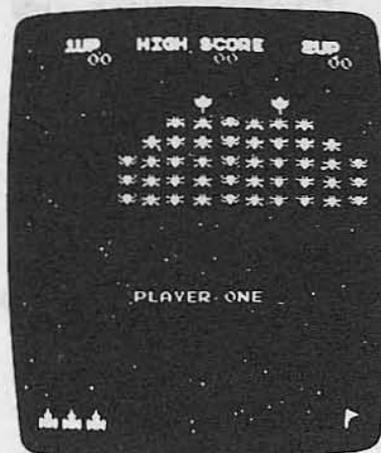


Fig. 1-5 Play mode

4. OPERATION AND SCORE OF GAME:

- Move galaxip  left and right by moving control lever.
- Avoid attacking alien by a dodge and shoot it with feather gun through shoot button.
- Alien provides different score according to color and also the score when the alien is in a fleet differs from that when it is attacking.

Each score is as follows:

		in fleet	while attacking
yellow alien		60	?
red alien		50	100
violet alien	"	40	80
green alien	"	30	60

Further, the attacking yellow alien provides respectively 150, 200, 300 or 800 of score according to the attacking condition which is displayed on the picture.

When one attacking alien is overlooked, it does not appear until it is cleared. When it is cleared, it is incorporated in a new formation within the extent of total 4 aliens.

A small flag  appears for 1 picture at the lower left portion of the picture to indicate the clear number of time.

When the number of pictures reaches 10, a large flag  appears in place of the small one.

The number of galaxips is 3 (changeable to 5 by option switch).

(See P. 10)

When the score reaches 5,000 points, one galaxip is added. This can be changed by a option switch to when the score reaches 4,000, 7,000 or zero points. (See P.10)

5. ADJUSTMENT:

(1) Demagnetizing switch

Since a color cathode-ray tube is used and chromatic aberration may be caused in the installment and removal of housing, use the switch for demagnetization. Since the demagnetization is carried out about 15 seconds after turning on this switch, always turn off the switch thereafter. Also, leave about 10-minute interval between the turning-off and subsequent turning-on.

(2) Service button

The use of this button can increase the credit number without opening the counter. Use this button in repair and adjustment.

(3) Self-test

The self-test is the same as the inspection at the start of automobile and, if possible, preferably carried out every day. The existing self-test functions permit each portion to be tested by the test switch.

1. Automatic self-test

The self-test is started automatically by the application of power.

The self-test mode is shifted as it is to the attract mode if PC board has no abnormalities. However, the self-test is repeated to show and erase the characters of BAD RAM and BAD ROM on the picture if the PC board has some abnormalities. Also, always carry out "self-test by (2) test switch" even if the PC board has no abnormalities, since switches and volume knobs of each portion are not tested.

* Further, contact a seller if any abnormalities are found as a result of the self-test.

2. Self-test by test switch

The test switch is a slide switch which is found on the front by opening the selector door.

Turn "ON" the test switch to start the self-test (the test switch is turned "OFF" in the normal condition).

- A. The test mode is carried out about 3 seconds on the picture with respect to numerals, characters, etc. PC board is checked internally during the test mode. Next, a picture is projected as shown in the drawing below.

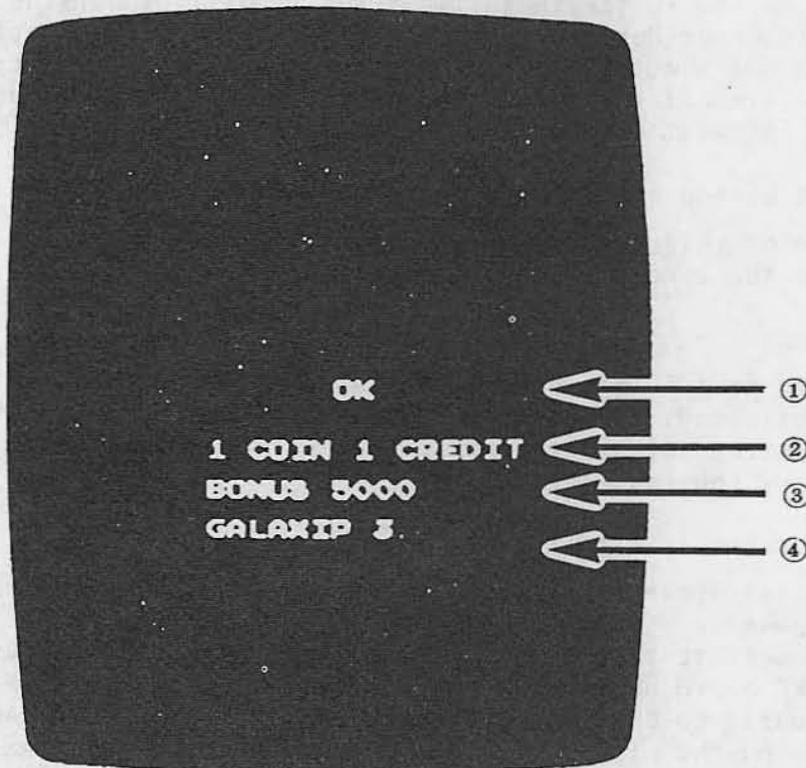


Fig. 2-1 Test mode

- (1) ROM, RAM test

The character OK means the normal condition and the numeral abnormality.

- (2) Display of charge for game

In this case is displayed for 1 game.

- (3) Bonus score

In this case is displayed the score by 5,000.

- (4) Number of galaxips

In this case is displayed the number by 3.

Further, (2)-(4) can be changed by the option switch (see P.).

B. Switch test

Confirm the normal condition with sound produced by the depression of shoot button, start buttons (for 1 person and 2 persons) and microswitch for coin.

In this case, turn "OFF" the test switch.

C. Lock-out coil test

The normal condition is proved by the lock-out coil which is disengaged for an instant by turning "OFF" the test switch and then operates again.

A grid-like pattern is displayed about 1 second by turning "OFF" the test switch.

Turn "ON" the test switch immediately after turning "OFF" same when this pattern is desirably maintained.

This pattern may be used for the adjustment of monitor.

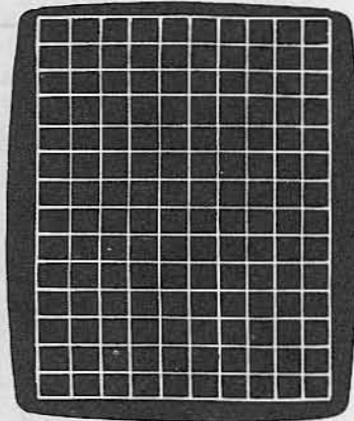


Fig. 2-2 Test pattern

(4) Adjustment of sound volume

The adjustment of sound volume is carried out by opening the selector door and turning the sound volume knob on the front. Also, the sound volume knob on the PC board permits the sound volume to be adjusted.

The counterclockwise turning of the knob increases the sound volume and the clockwise turning decreases same.

Set the sound volume at a proper one.

(5) Change-over of game charge and bonus score

The number of galaxips, game charge and bonus score for 1 game can be changed over by an option switch provided in the game PC board.

Also, the game can be simply reset by a reset switch on the PC board. Further, change over the option switch after turning off power.

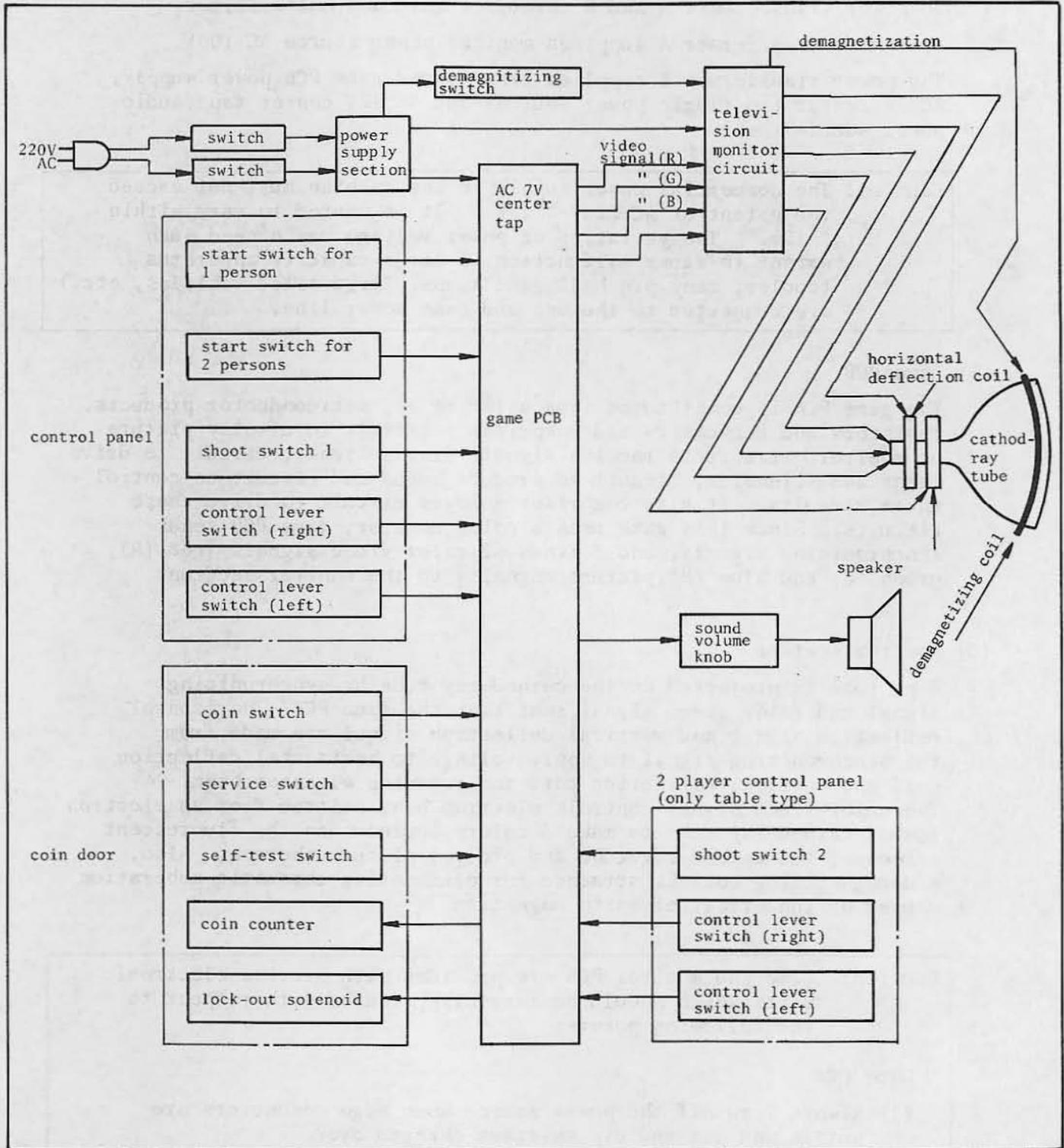
(Switch chart)

Content	Condition of switch					
	1	2	3	4	5	6
<u>Game charge</u>						
Free play	ON	ON				
1 coin/2 plays	OFF	OFF				
2 coins/1 play	ON	OFF				
1 coin/1 play	OFF	OFF				
<u>Bonus score</u>						
None			OFF	OFF		
4,000			ON	OFF		NO USE
5,000			OFF	ON		
7,000			ON	ON		
<u>Number of galaxip</u>						
3					OFF	
5					ON	

* Thick characters imply the condition of switch at shipping.

9. BRIEF OPERATION OF EACH SECTION:

Fig. 3-1 shows the constitution of galactica.



(1) Power supply section

The commercial power supply AC 220V (50/60 Hz) is introduced from a socket outlet through a plug into the machine. AC 220V power is applied to the machine by turning on the power switch and supplied to power transformers A and B through a fuse and noise filter.

The power transformer A supplies monitor power source AC 100V.

The power transformer B supplies transformed game PCB power supply, AC 7V center tap (logic power source) and AC 12V center tap (audio power source).

Caution: The commercial power supply to the machine must not exceed the extent of AC 220V \pm 15%. It is wanted to vary within \pm 15%. The variation of power voltage may exceed such extent to cause malfunction if large capacity apparatus (cooler, many pin ball game means, large-sized vehicles, etc.) are connected to the one and same power line.

(2) Game PCB

The game PCB is constituted from a lot of IC, semiconductor products, resistors and capacitors and comprises a circuit to display picture on monitor, circuit to receive signals from switches, circuit to drive lamps and solenoids, circuit to produce sound and circuit to control these circuits. It also comprises a power circuit to drive these circuits. Since this game uses a color monitor, game PCB sends synchronizing signals, and 3 kinds of color video signals [red (R), green (G) and Blue (B) picture signals] to the monitor section.

(3) Monitor section

A picture is projected on the cathod-ray tube by synchronizing signal and color video signal sent from the game PCB. Horizontal deflection signal and vertical deflection signal are made from the synchronizing signal to apply voltage to horizontal deflection coil and vertical deflection coil for scanning electron beam. The color video signal controls electron beam emitted from an electron gun of cathod-ray tube to make 3 colors luminous on the fluorescent screen of the cathod-ray tube and project picture thereon. Also, a demagnetizing coil is attached for eliminating chromatic aberration caused by the effect of earth magnetism.

Caution: Game and monitor PCB are provided with precise electronic parts which should be carefully treated with respect to the following points;

Game PCB

- (1) Always turn off the power source when edge connectors are put in and out and dip switches changed over.

- (2) Use carefully metal drivers and the like and do not apply irrational force when the volume knob and reset switch are treated.

Game and monitor PCB

- (1) Pack PCB with sponges, air caps, etc, in a corrugated cardboard box for transportation so that the external force is not directly applied.
- (2) The game and monitor PCB may be covered with dirt and dust not to be normally operated when they are used for a long time (particularly in the monitor it may cause the leakage of high voltage). Remove the dust about once a year with soft brush or air blast.
- (3) Do not place them in high temperature and humidity and cold places (under the direct rays of the sun, near heater, outdoors in cold place, outdoor skating rink, etc.).
- (4) Electrical check of the PCB should be carried out by a person who has sufficient electrical knowledge and experience. The monitor should be carefully measured by meter and the like since it has many high voltage portions.

10. CORRECTIVE MEASURE AGAINST TROUBLES:

Confirm the following matters and then contact the seller of the machine when something is assumed to be a trouble.

Generally the video game is electrically divided into 4 sections, i.e. a monitor section, game PCB, operational section and power supply section respectively connected to each other by wiring. Whichever section has a trouble, the game machine does not work normally. When the condition of the machine is found somewhat abnormal, check the machine simply before consulting the seller. Then it may be found that simple unexpected mistake and misunderstanding of operation have brought about such condition which can be corrected by simple repair. When any troubles are found, it is to be first determined which of 4 sections and wirings has troubles. When failed sections can be deduced, check each section. Check other associated sections if such sections have no abnormalities.

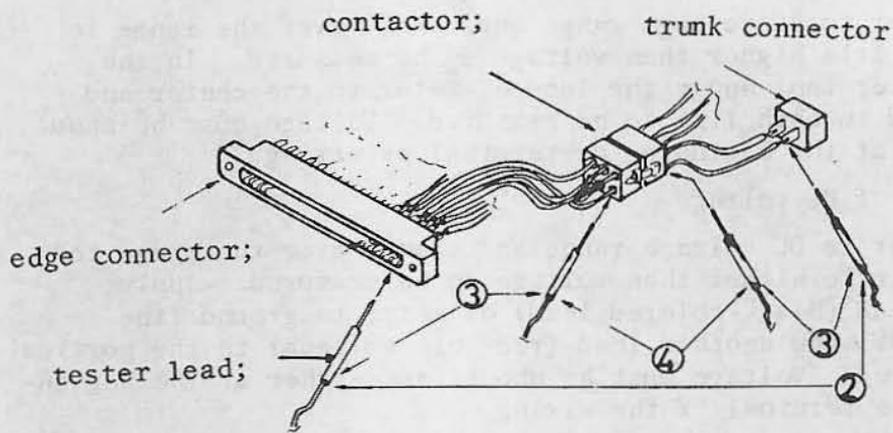
(1) Check of each section

Prepare meters for checking each section and confirm the number of edge connector connected with parts, the number of trunk connector, color of wiring, etc. referring to the wiring diagram on P . Next, check each section according to the method of check (2). The following A continuity check and B voltage check should be fully understood since they are often used.

A. Continuity check

Each part is connected to the edge connector of game PCB through wiring and trunk connector. Normal continuity through this connection should be checked by the following procedures;

1. Prepare a meter such that the resistance is within the range ($\times 10$, $\times 100$).
2. Connect a lead wire of the meter to a contactor of the edge connector and another lead wire to a terminal of connected part (if the part does not have any terminals, to a contactor of the nearest connector) and then measure whether or not 0Ω is obtained.
3. When 0Ω is not obtained, measure wirings from the edge connector to the trunk connector, from the trunk connector to the next trunk connector and from the trunk connector to the terminal of parts in the same way as (2) to check the continuity.
4. Check the trunk connector when the wiring has no abnormalities. Apply tester lead wire to the terminal of wiring connected to the checked trunk connector to measure whether or not the meter shows 0Ω even by pulling lightly the wiring of connector portion. 0Ω in all cases means the continuity condition is OK.



3-2 Continuity check

B. Voltage check

1. Measurement of AC voltage

Set the meter to AC voltage range and change over the range to a range a little higher than voltage to be measured. In the case of center tap, apply the lead of meter to the center and another lead to each line to be measured. Voltage must be about same either at the beginning or terminal of wiring.

2. Measurement of DC voltage

Set the meter to DC voltage range and change over the range to a range a little higher than voltage to be measured. Apply the minus lead (black-colored lead) of meter to ground line (wiring of 0V) and another lead (red-colored lead) to the portion to be measured. Voltage must be about same either at the beginning or at the terminal of the wiring.

(2) Method of check

1. Method for checking operational section and coin section.

Check by the self-test whether or not switch, speaker, coin counter and lock-out coil work normally. Carry out the following check if any abnormalities are found;

A. Check of switches

The switches to be checked comprises ones for coin, start by 1 person, start by 2 person, shoot, right and left control levers, service and self test.

Set the meter to a resistance range (x10, x100) and apply the lead of the meter to the number of edge connector connected to the switch, referring to the wiring diagram. Determine that 0Ω is obtained from turning on the switch and $\infty\Omega$ is obtained from turning off the switch.

NO

YES

Replace game PCB since it has some troubles.

Apply the lead of meter to the terminal of switch and determine in the same way as above mentioned that 0Ω is obtained from turning on the switch and $\infty\Omega$ is obtained from turning off the switch.

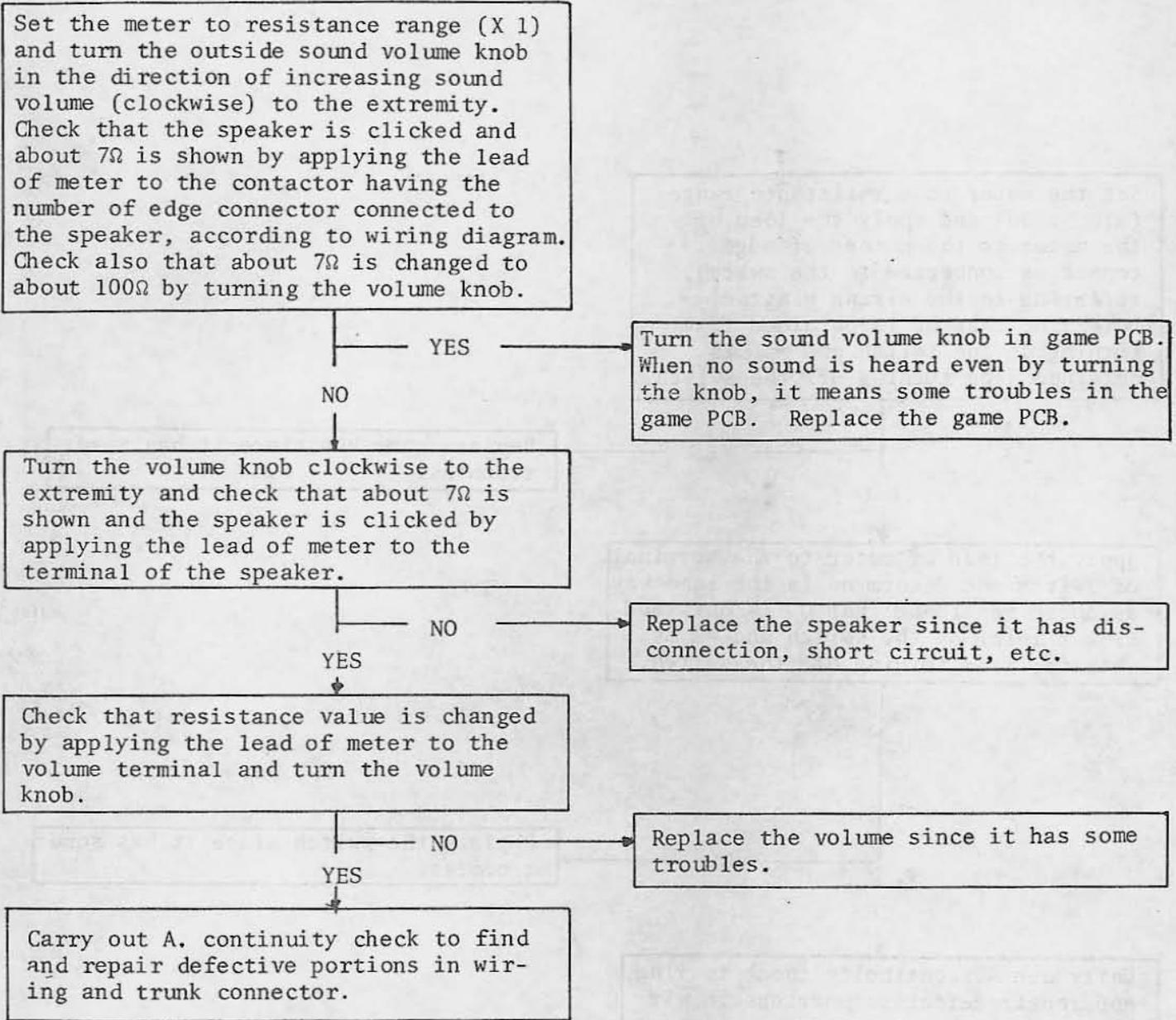
NO

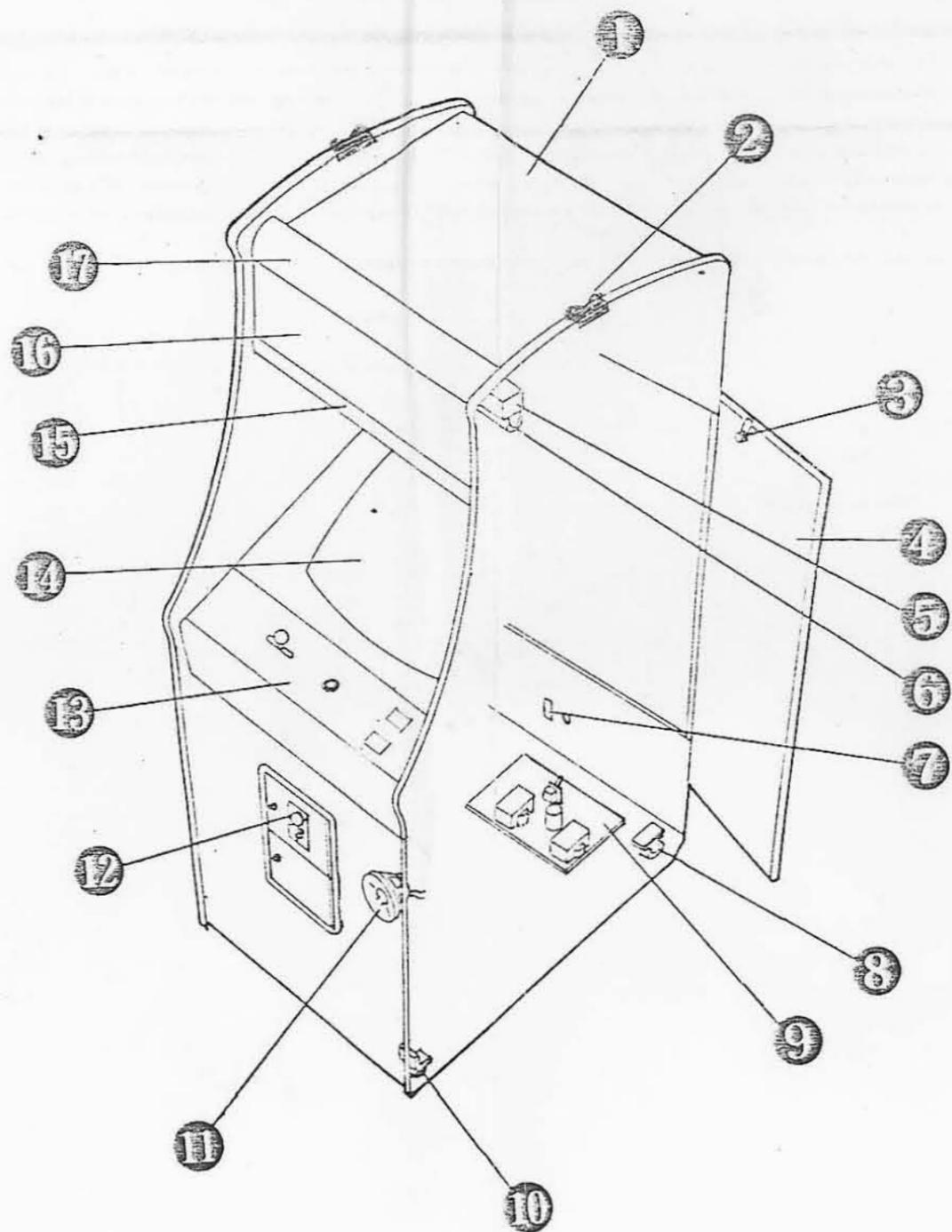
Replace the switch since it has some troubles.

YES

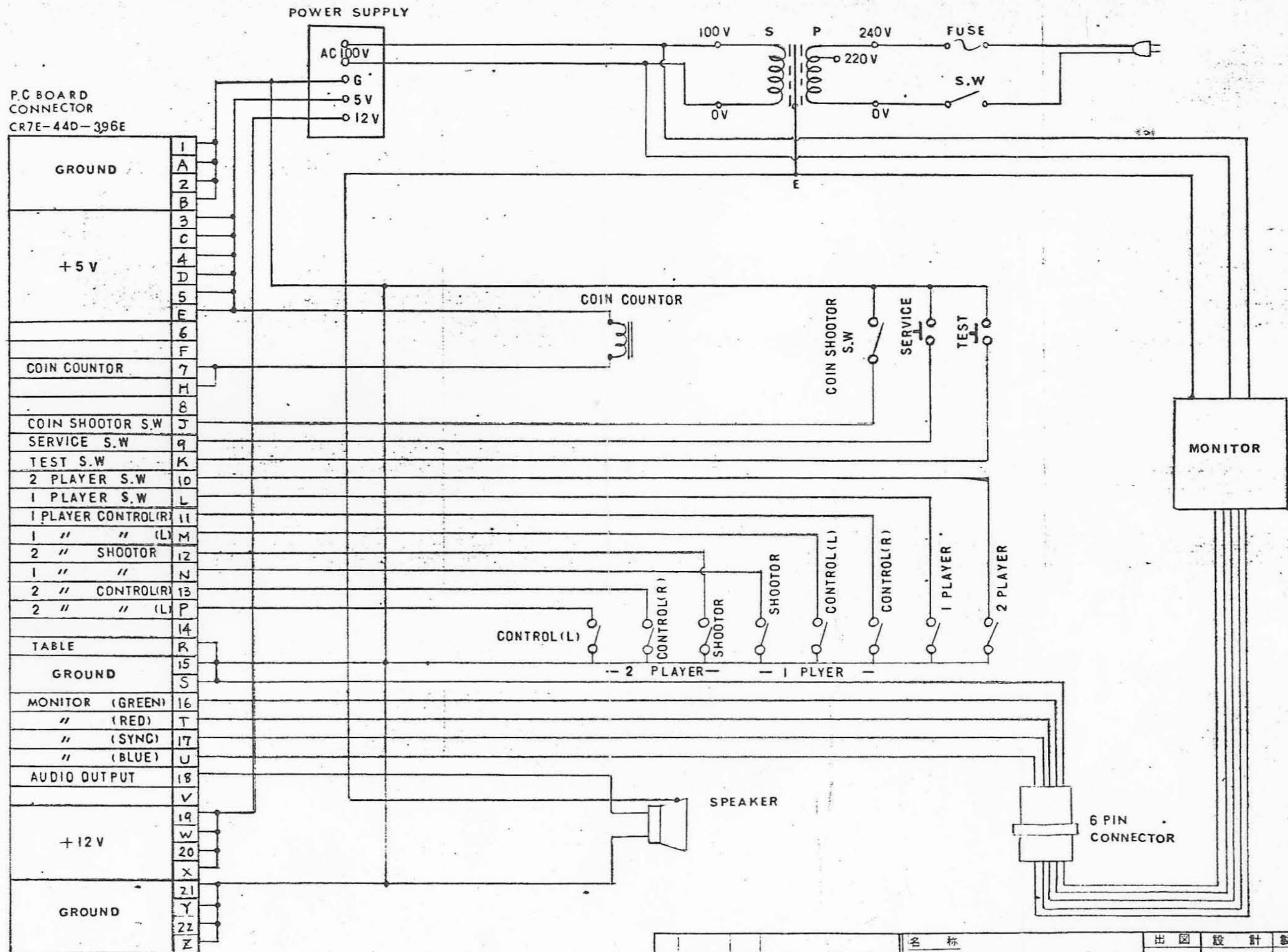
Carry out A. continuity check to find and repair defective portions in wirings and trunk connectors.

(B) Check of speaker





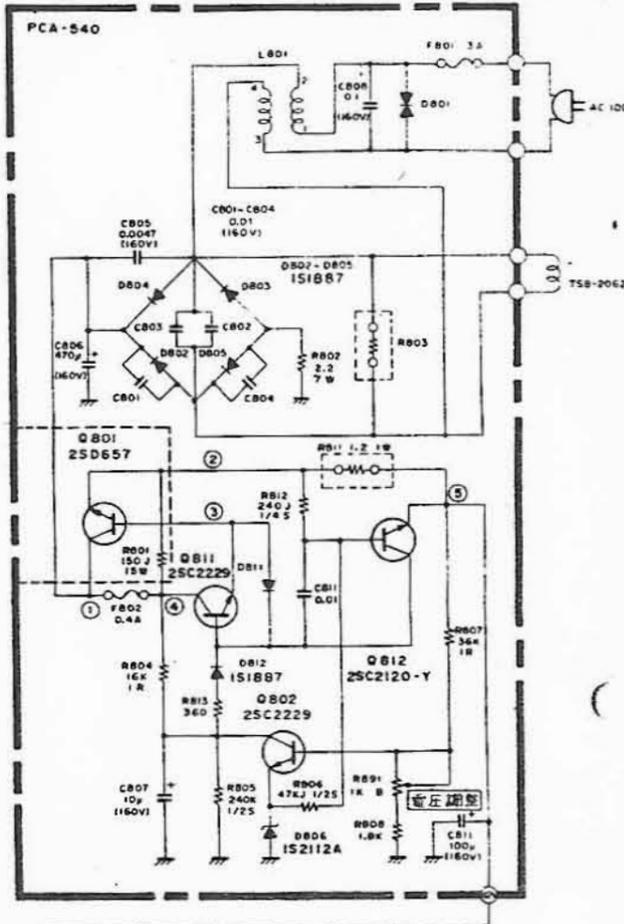
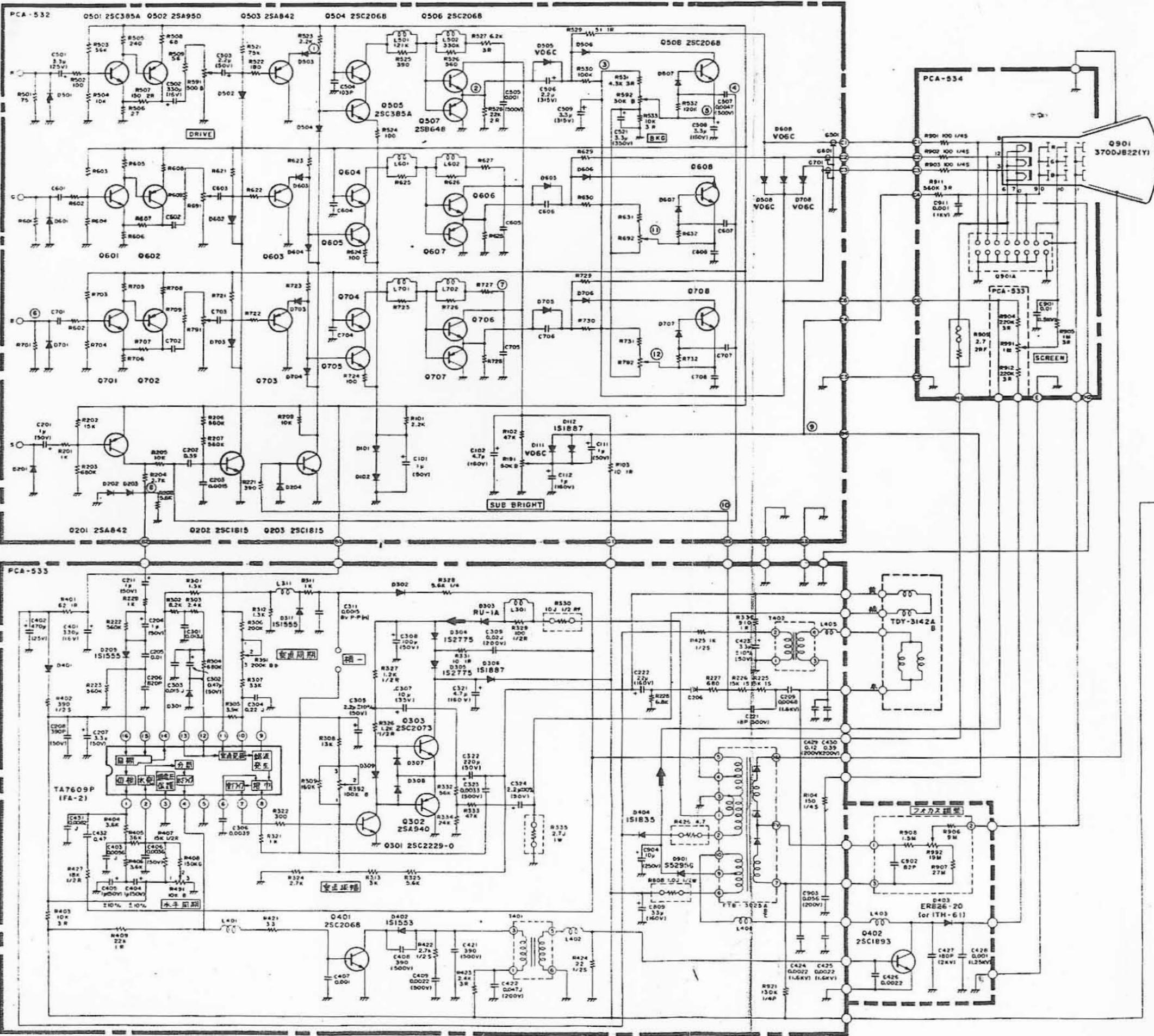
No.	Name	Type & rating	Number of unit	Parcs No.
1	Cabinet		1	23021011 ②
2	Rope Fuck		2	20001004 ①
3	Coin lock		1	
4	Back Door		1	
5	Fluorescence Utensil		1	
6	Fluorescence	15 W White	1	
7	Earth Terminal		1	20001003 ①
8	Caster	420 R-N-φ65	2	
9	Power Supply Board		1	23024000
10	Leg		2	23021020
11	Speaker		1	
12	Coin Assembly		1	81050001
13	Control Panel Assembly		1	23022000
14	Monitor Assembly		1	23023000
15	Lower Letainer		1	23021012 ②
16	Title Panel		1	23021013 ①
17	Upper Letainer		1	23021012 ①



WIRING PLAN

名称	出图	设计	製图	承認
品名	日付	図面番号 A—		
	尺度	仕様番号 SM—		
		試作番号 O—		
年月日	記号			

MONITOR PLAN



Symbol	Value	Notes
R501	75	
R502	100	
R503	56k	
R504	10k	
R505	240	
R506	27	
R507	150	
R508	56	
R509	10k	
R510	10k	
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R841	10k	
R842	10k	
R843	10k	
R844	10k	
R845	10k	
R846	10k	
R847	10k	
R848	10k	
R849	10k	
R850	10k	
R851	10k	
R852	10k	
R853	10k	
R854	10k	
R855	10k	
R856	10k	
R857	10k	
R858	10k	
R859	10k	
R860	10k	
R861	10k	
R862	10k	
R863	10k	
R864	10k	
R865	10k	
R866	10k	
R867	10k	
R868	10k	

注意
図面寸法は記入寸法と異なること
があるから同形を真似しないこと

市・N・P・S

工場
地区
未定

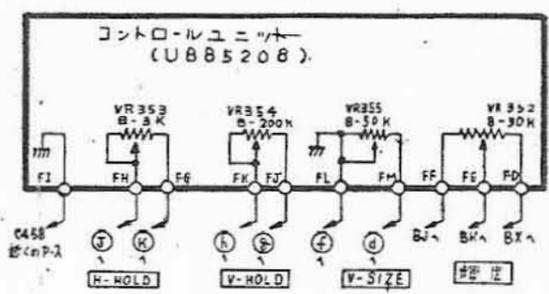
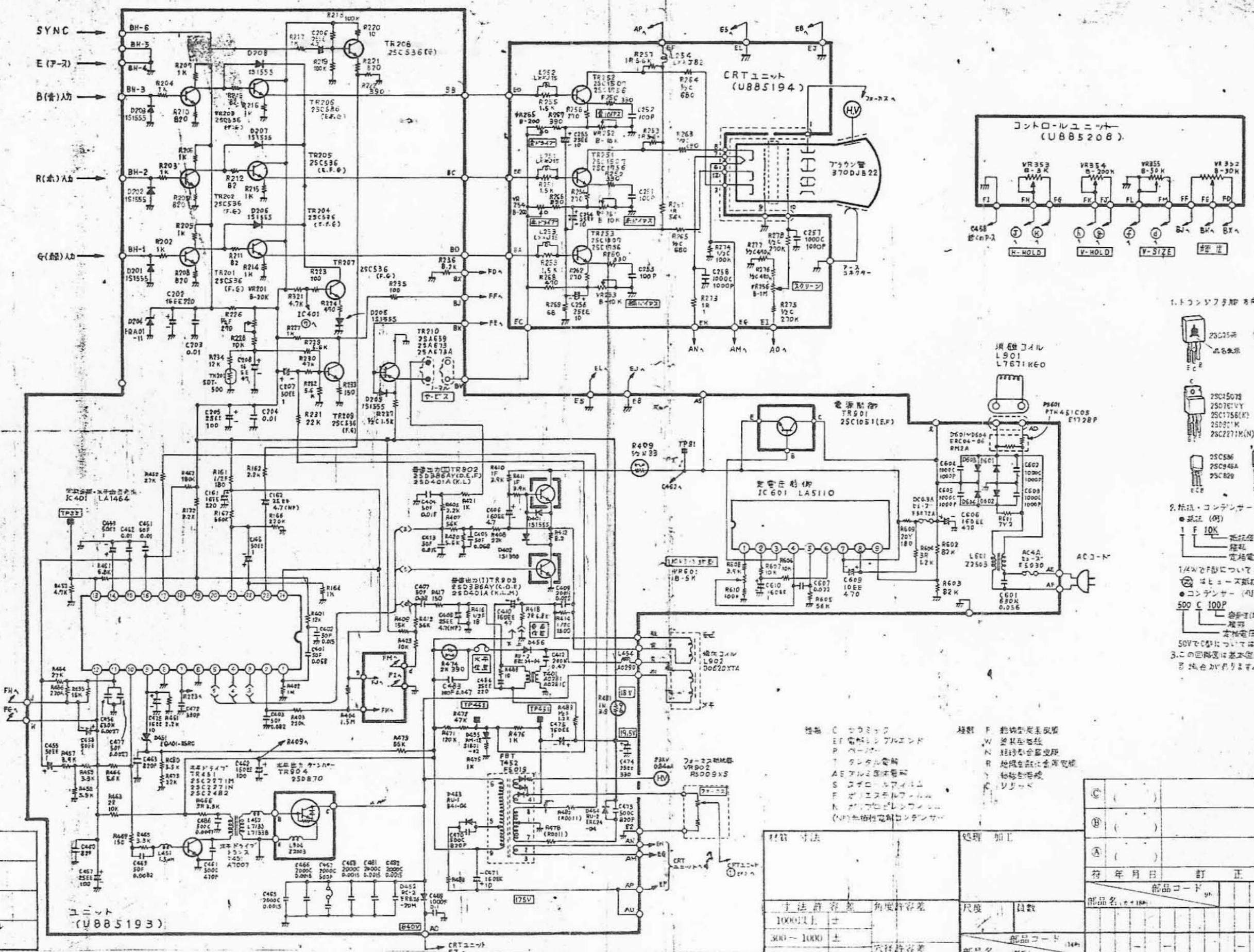
全形取数
取量

承認
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4

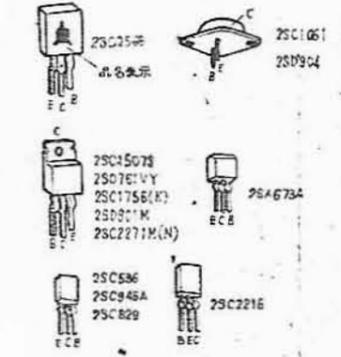
1 TV技術
1 検定 08
大澤

54-4
設計
佐藤

製図
図面ファイル



1. トランスワタ部方向図



2. 抵抗・コンデンサの表示内容

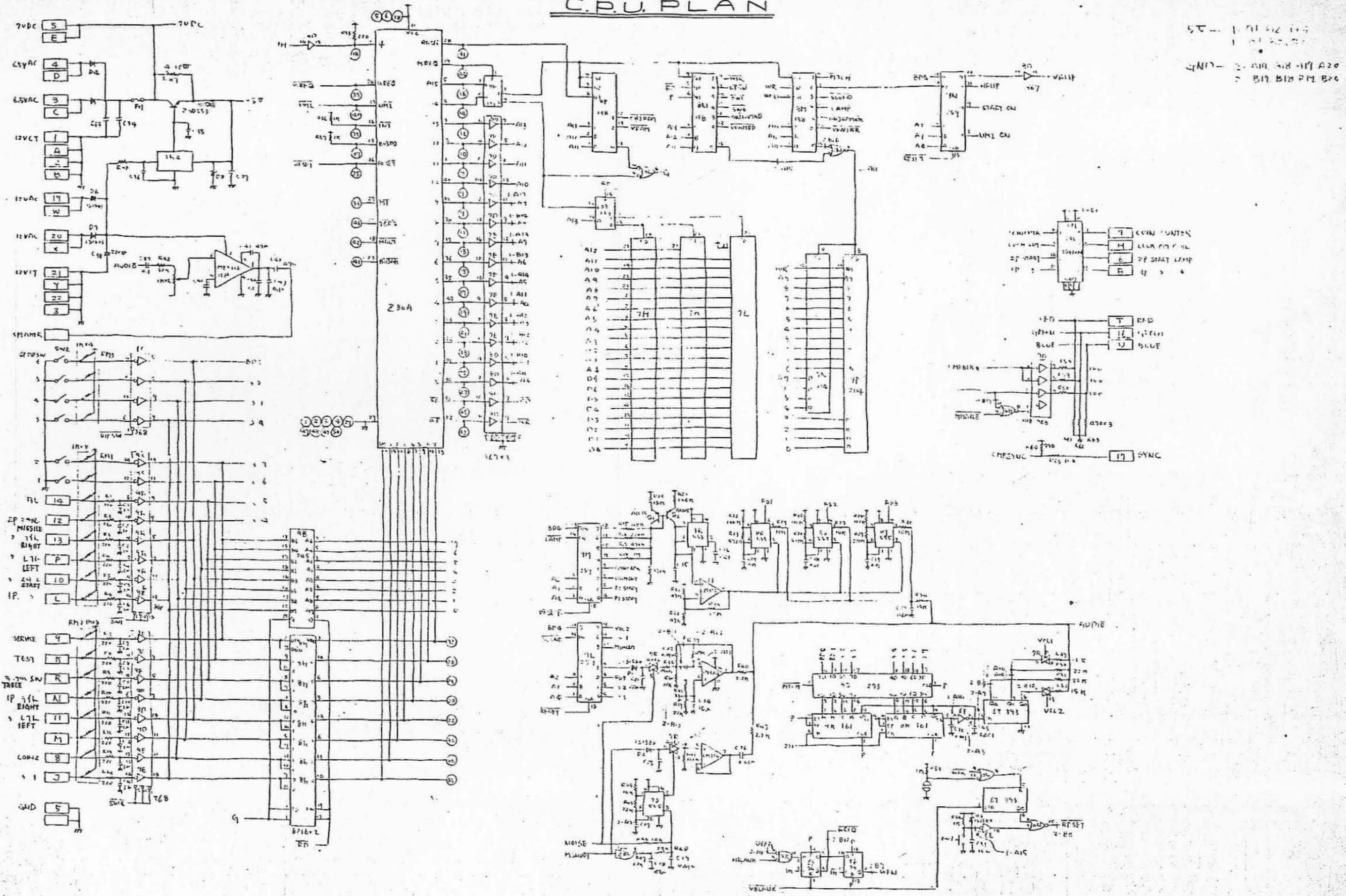
- 記法 (例)
- 1 F 10K 抵抗値 (E 色の色帯)
- 1000 定価電力 (単位 W は省略)
- 1/4W の F 部については抵抗値のみ表示。
- ⊕ はヒューズ接続
- コンデンサー (例)
- 500 C 100P 容量値 (単位 P は省略)
- 記法 (例)
- 50V 定格電圧 (単位 V は省略)
- 50V の C 部については容量値のみ表示。
- 3. C の回極性は基本回路図につき、実線と異なる場合は XV 印します。

種類 C トリスタ
EF 電解コンデンサ
P 抵抗
T スケール電圧
A E アルミ電解コンデンサ
S ショットキーダイオード
F ゴムエラストマー
N プラチナシリコンダイオード
(N) 無極性電解コンデンサ

種類 F 絶縁型炭素抵抗
W 炭素型抵抗
P 有機合成樹脂
R 絶縁合成樹脂
R 絶縁合成樹脂
R 絶縁合成樹脂
R リッド

材料寸法	処理加工	符号	年月日	訂正	内容
寸法許容差	角度許容差	尺数	員数	部品名	部品コード
1000以上 ±					
300-1000 ±					

C.P.U. PLAN



50 - 101 512 100
 101 512 100
 512 100 101 A20
 512 100 101 B20

