

SERVICE MANUAL

ECHO CAMERA

SSD-500

1 / 1

English Edition

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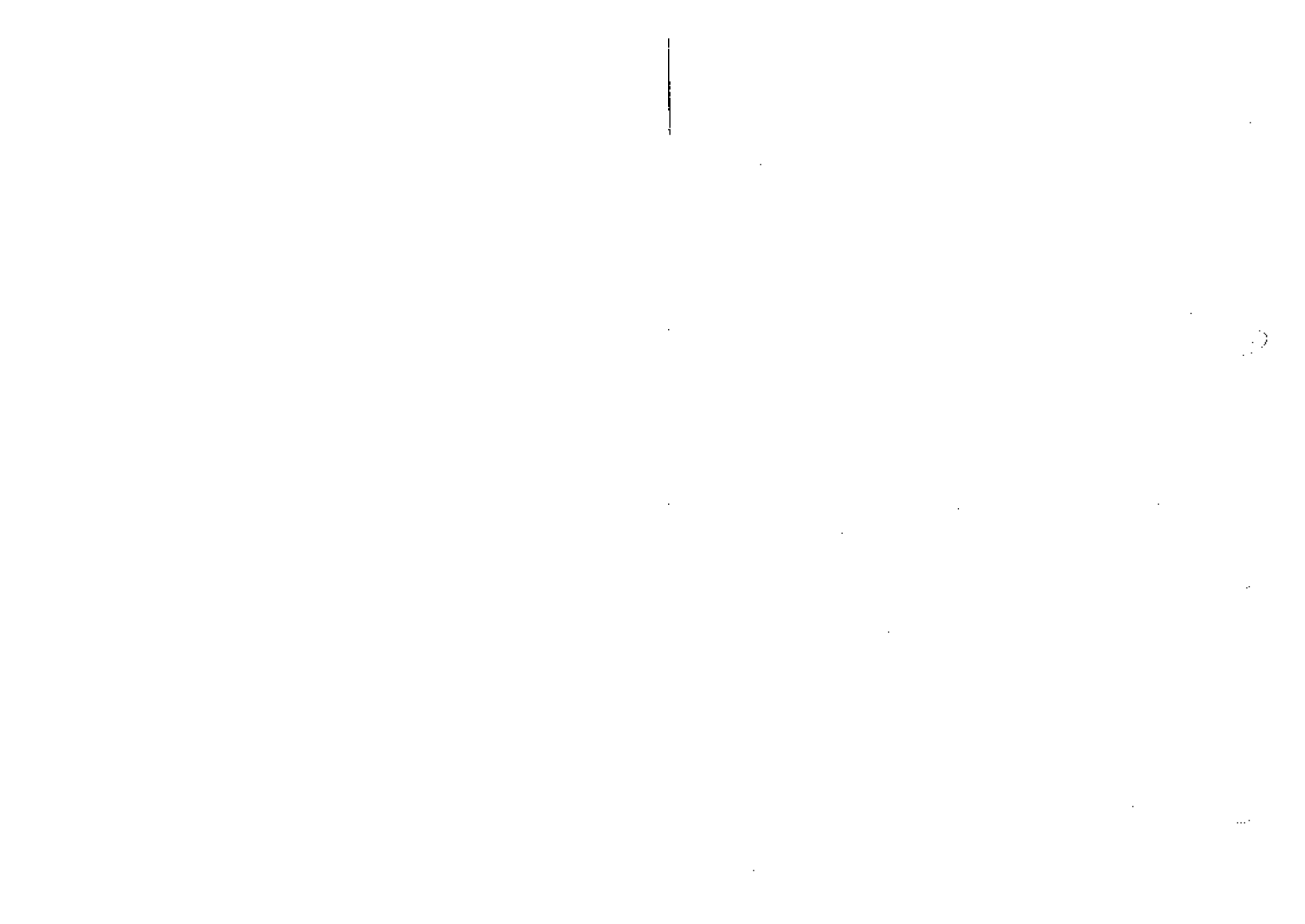
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1-1 Service Manual

- 1) This service manual has been prepared for persons in charge of servicing SSD-500.
- 2) This service manual is compiled according to the following basic principle.
"For service, pick out a faulty PCB and replace it with a new PCB."

1-2 Best Use of Service Manual

Make the best use of this service manual, making also reference to available technical support information such as "Modification technology note."

1-3 Contents of Service Manual

- 1) SSD-500 is the equipment in which the surface mount technology (S.M.T.) is incorporated.

Most of the printed circuit boards (PCB) in this equipment use the surface mount devices (S.M.D.)

It is impossible to repair PCBs including S.M.C. Any trouble cause by a faulty PCB must be repaired by replacement of the PCB as a unit. From this point of view, no PCB wire connection diagram is included in this service manual.

- 2) The manual version 3.0 contains descriptions of products as of July 1992.
- 3) Later products may somewhat deviate from the description of this manual because products are subject to change in specifications and other matters.

For changes and modifications of as well as additions to specifications, if any, prompt information will be given to you by means of "Manual change information" which is to be inserted into the manual.

1-4 Construction of This Manual

To facilitate revisions according to the above mentioned "Manual change information," this service manual is divided into several sections.

Important : Always observe the manner specified for replacement, addition, or deletion of "Manual Change" to prevent missing of necessary information and keeping of erroneous information.

The structure of Service Manual is as follows:

- 1) Service instructions
- 2) Parts list
- 3) Principle of operation

1-5 Contents of Each Section

- SECTION 1 How to Use this Service Manual
Describes the purpose of the Service Manual.
- SECTION 2 Precautions
Describes general precautions and preparations for maintenance service. Be sure to follow working procedures if mentioned.
- SECTION 3 Before repairing
Gives information peculiar to SSD-500 and care to be taken before starting repair work.
- SECTION 4 Disassembling Procedure
Disassembly Procedure illustrates the disassembly and assembly of main components. Be sure to follow working procedures if specified.
- SECTION 5 System Block Diagram
Gives the convenience of grasping flow of major signals and mutual communication between units in the whole system.
- SECTION 6 Block Diagrams
Gives outline of individual PCBs, and block diagrams showing test points (TP) and waveforms in PCBs.
- SECTION 7 Schematic Diagrams
Gives the casing connection diagram including all cables used.
- SECTION 8 Trouble Shooting
Describes precautions on actual repair work and shows the necessary tools and measuring instruments. Also, includes many hints on primary diagnosis and measures to be taken in the field.
- SECTION 9 Adjustments
Gives guides of adjustments of PCBs and units which some PCBs need when they are replaced.

SECTION 10 Performance Check

Describes the procedure of checking for proper operation after repair and provides the forms of check sheet.

SECTION 11 Maintenance Information

Provides technical information about maintenance service.

SECTION 12 History of Improvement

Describes in tabular form the history of modifications of SSD-500.

SECTION 13 Parts List

Lists the mechanical parts and electrical parts.

SECTION 14 Outline of System

Describes the structure and operation of the equipment seen in broad perspective.

SECTION 15 Principle of Operation (SYSTEM)

Describes the principle of system operation.

SECTION 16 Principle of Operation (Hardware)

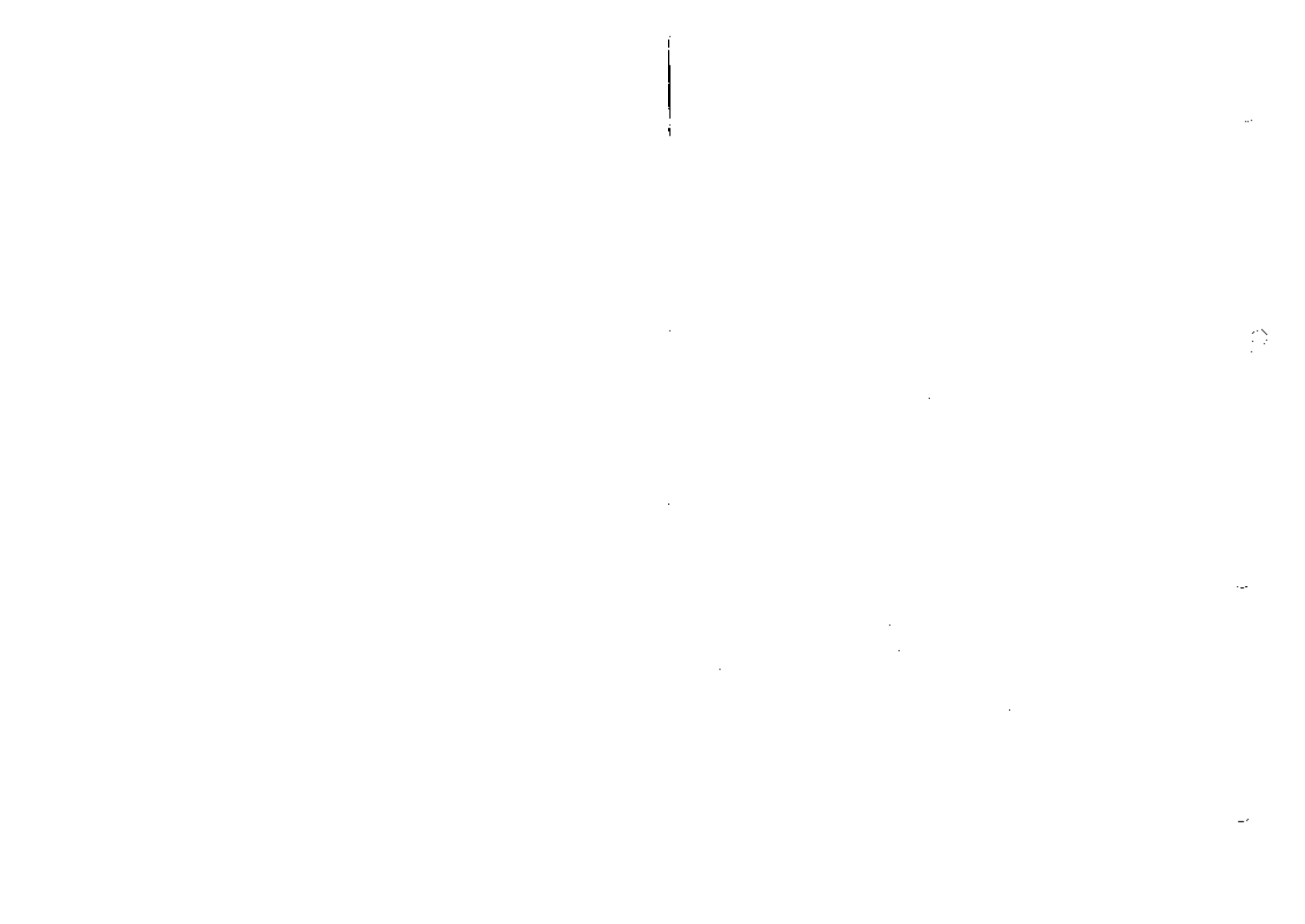
Describes the microscopical views of structure and operation of the equipment.

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2-6	Precautions for keeping chemical safety of SSD-500	2 - 2
2-7	Preparation to be made at service center	2 - 2
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2-1 Precautions Against Electrical Hazards to Serviceman

When disassembling the SSD-500 after checking it for trouble symptoms, give care to the following:

- 1) Be sure to unplug the equipment before disassembly.
- 2) Be sure to turn off the main switch on the equipment when removing electrical parts such as PCBs, probe, and cable.

2-2 Precautions Against Mechanical Hazards to Serviceman

When disassembling the equipment, give care to the following:

- 1) Keep the working environment neat.
- 2) Wear working gloves to protect your hands from getting injured by burrs on the unit and casing.
- 3) Use only proper tools suited to work being made.
- 4) Be sure to observe the specified disassembly procedure.
- 5) Take sufficient care not to damage component with undue load.

2-3 Precautions Against Germ Hazards to Serviceman

- 1) When it is necessary to touch the SSD-500 equipment, options and/or other peripheral devices at a customer who uses body cavity probes that need sterilization, take special care to protect your hands against germs, irrespective of the usage of the SSD-500; whether it is used in the operation room or not.
- 2) Service tools are subject to germ pollution in hospitals and, therefore, need periodical sterilization.
- 3) Be careful not to directly touch anything assumable to have germ pollution. If necessary, ask the customer for effective protection against germs.

2-4 Precautions for Keeping Electrical Safety of SSD-500

- 1) Be sure to ground the equipment securely.
- 2) Perfectness in grounding, screw tightening, and cover installation is essential. Negligence of it could cause a possibility of leak current from outer fitting which may lead to serious damage to a patient being diagnosed.

2-5 Precautions for Keeping Mechanical Safety of SSD-500

Take care to the following to prevent the equipment from being damaged or broken during disassembly and reassembly work.

- 1) Be sure to observe the specified disassembly procedure.
- 2) Take care not to damage component parts by undue load.
- 3) When reassembling the equipment, carefully check every part for loosening, distortion and creak.
- 4) Use only the specified screws and nuts. Using any other screws and/or nuts would affect not only mechanical performance, but also electrical performance of the equipment.

2-6 Precautions for Keeping Chemicals Safety of SSD-500

Whenever grease, oil or other chemicals is used for maintenance service of the SSD-500, options and/or peripheral devices, be sure to clean the equipment and/or devices after service work.

2-7 Preparation to be Made at Service Center

- 1) When called by a customer on the telephone, note the following:
 - [1] Name of equipment
 - [2] Serial number of equipment
 - [3] Name of hospital
 - [4] Telephone number
 - [5] Name of person in charge
 - [6] Detail of trouble symptom as far as possible
 - [7] State of connection to optional devices
- 2) Go over the "Modification technology note" to see whether the complained trouble can be mended by means of regular repairing method.

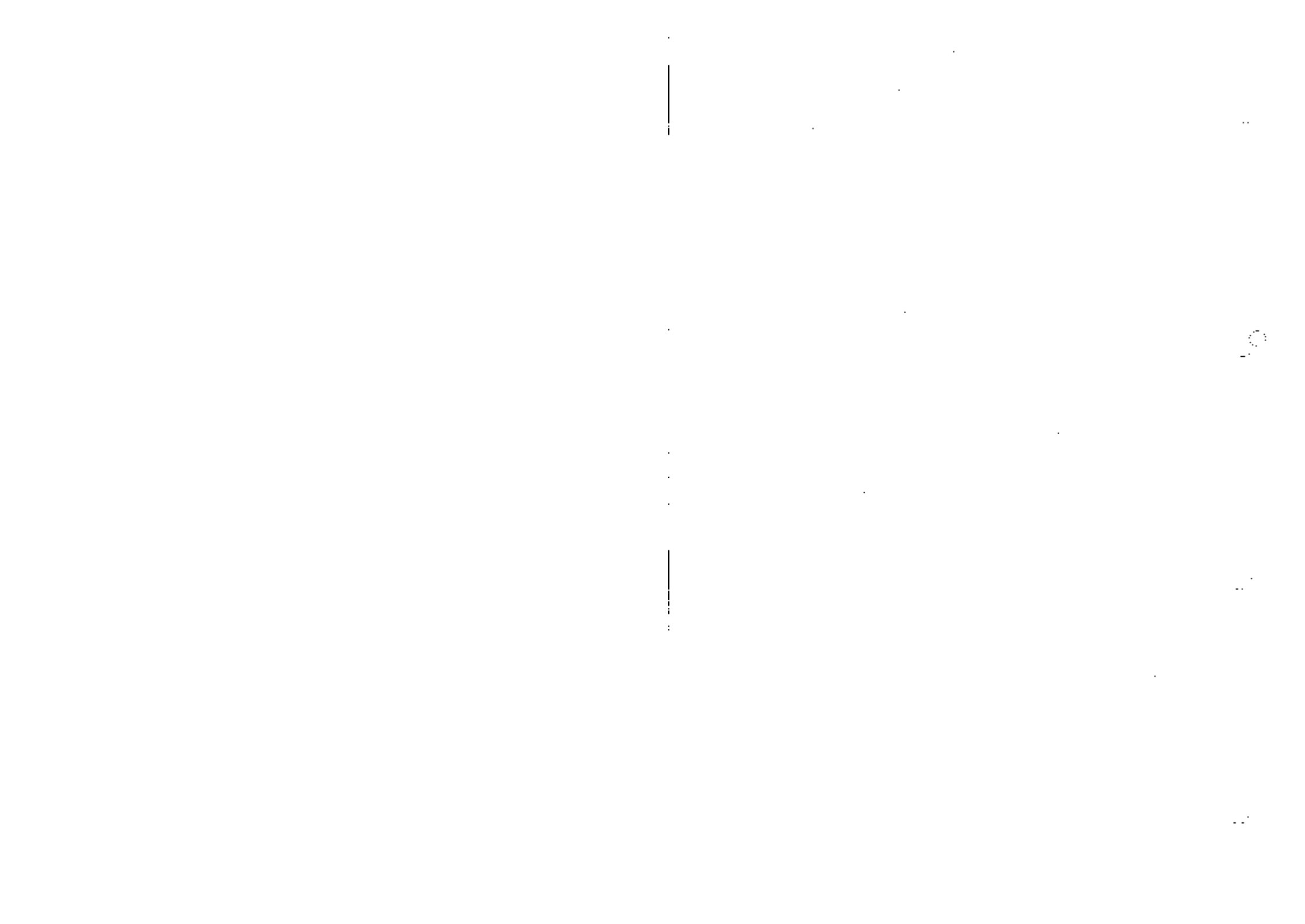
2-8 Care to be Taken in the Field

- 1) Check for trouble symptoms.
- 2) Check for connection to optional devices and other peripheral devices.
- 3) Record the contents of the battery backup memory.
- 4) After working, reset the equipment according to the above mentioned contents of memory.
- 5) After completion of work, put back the peripheral devices to the original condition.

SECTION 3 BEFORE REPAIR

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3-1 Repair work on the description of Service Manual

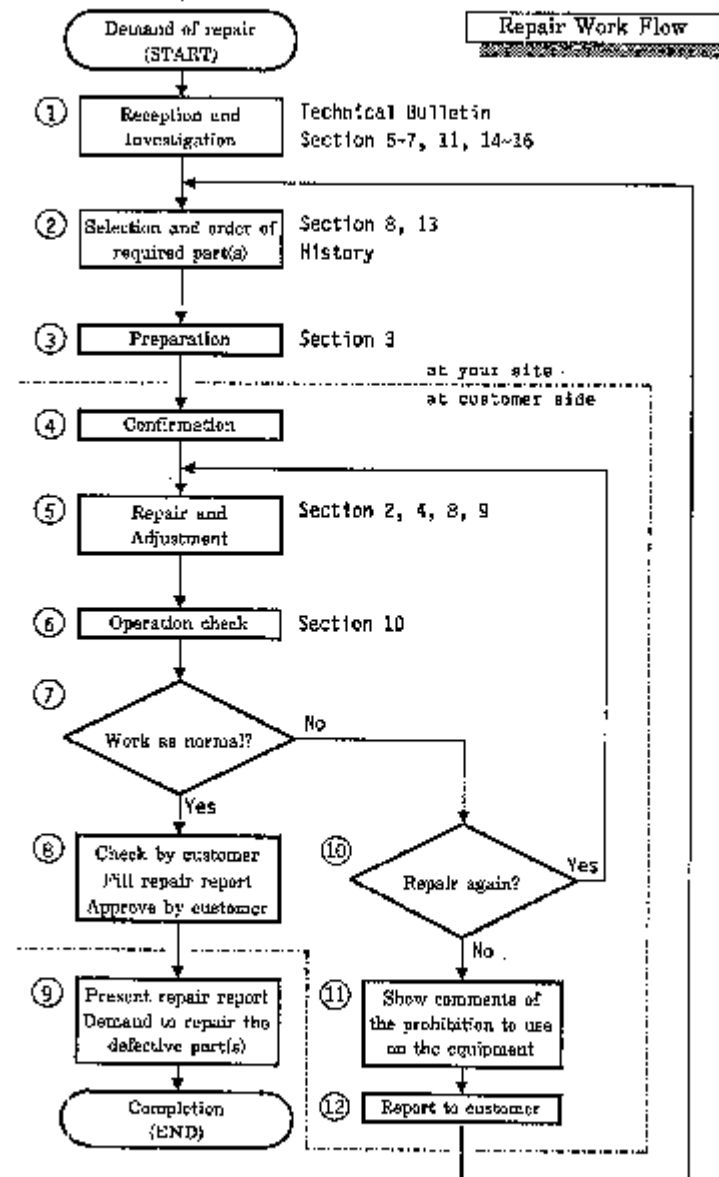
The typical processes for the repair work are shown as the Flow Chart on the next page. Do the repair work according to this procedure. In the case of modification of the Technical Bulletin or Upgrade Kit, see the next item 3-2.

Each procedure of flow chart are numbered to refer its detail shown from page 3-3. Furthermore, the Flow Chart and its explanation show the time when each section of service manual are required on repair work. This is a guide for the usage of service manual.

The service manual is very important for the repair work, especially readjustment and performance check after completion of repair work. This is to keep the safety and quality of equipment. If you make them, you have to describe that the treatment has been done according to the applied section of service manual, on the repair report or the like.

The circled numbers shown in the Flow Chart on next page, are corresponded to the procedure number shown from page 3-3.

SECTION 3 BEFORE REPAIR



Procedure 1 Reception of repair and investigation

Accept the repair request from the customer or distributor. At this time, the following points have to be confirmed and checked,

- Model name/number, and serial number
- Name of customer, address, phone number, and name of person in charge
- Configuration of the connection of peripheral devices
- Software version or the like shown on the boot up display (if possible)
- Detail of phenomenon appeared on the function of equipment

Make an examination what circuit may be defective as the function of equipment based on the above information. If you need to know about the basic operation and special information for the maintenance, refer to the following sections, or ask to the *Technical Support*,

- ▶ Section 5 System Block Diagram
- ▶ Section 6 PCB Block Diagram
- ▶ Section 7 Schematics
- ▶ Section 11 Maintenance Information
- ▶ Section 14 System Outline
- ▶ Section 15 Principle of System Operation
- ▶ Section 16 Principle of Hardware Operation

The reported phenomenon may be the original problem on the equipment. Because, refer to the *Technical Bulletin* separately issued to check it whether defectiveness or not. If it has been reported as the original problem, make a work according to the *Technical Bulletin*.

Procedure 2 Selection of required parts and order

If you find the doubtful circuit, order the necessary parts. Then check the delivery date and decide the date to visit on the consultation with the customer. For the selection and order of parts, refer to the following sections,

- ▶ Section 8 TROUBLESHOOTING
- ▶ Section 13 PARTS LIST

For the electrical parts such as PCB, check the history information on the *HISTORY* of this equipment separately issued.

SECTION 8 BEFORE REPAIR

Procedure 3 Preparation of visiting the customer

Check the required tools, measuring devices and parts to be replaced before the visiting the customer. Then check the special information for the equipment reference with the following section.

- ▶ Section 9 BEFORE REPAIR

Procedure 4 Confirmation of phenomenon

Confirm the appeared phenomenon and condition to happen it with the customer. If you don't know about the operation of equipment, refer to the *Operation Manual* attached to the equipment.

Procedure 5 Repair and readjustment

Repair the defective circuit with the brought parts. For the repair work, read the following section carefully.

- ▶ Section 2 PRECAUTIONS

And, examine the trouble reason depending on the situation with following section.

- ▶ Section 3 TROUBLESHOOTING

The electrical or mechanical readjustment may be requested depending on the replaced parts. Because, refer to the following section after completion of repair.

- ▶ Section 9 ADJUSTMENT

Procedure 6 Operation check

Check the system behavior to keep its condition as same as before in trouble, reference with the following section. Be sure to do according to the description because check items are depending on the portion to be treated.

- ▶ Section 10 PERFORMANCE CHECK

Procedure 7 Judgment of the operation quality

If the result of "Procedure 6" is passed to the all standards, do the next "Procedure 8". On the other side, if not, make a judgment of "Procedure 10".

Procedure 8 Confirm by customer, make repair report and approve

Reconfirm the solution of trouble phenomenon with the customer. Then make a repair report and obtain approval of customer.

The repair report shows not only the treatment but also the method of readjustment and operation check. If they have been done according to the service manual, the followings have to be shown.

"Readjusted according to the Section 9 of service manual."

"Checked according to the Section 10 of service manual, and passed."

Procedure 9 Presentation of report and order to repair parts

Fill the repair report with necessary item, and present it according to the certain procedure.

If the defective parts that trouble cause included is available to use again by repair, make an order to do. If you cannot judge whether the part can be used again or not, ask to the Technical Support.

Procedure 10 Judgment of possibility to repair again

As the result of judgment on "Procedure 7", if the trouble is not solved, judge the possibility to make the repair work again.

If available, return to "Procedure 5" and continue to work.

If unavailable, go to "Procedure 11".

Procedure 11 Indication of the prohibition to use

As the result of judgment on "Procedure 10", if you judge that it is impossible to continue the repair work at this time, indicate that the equipment is still out of order, and also show the prohibition to use, on the equipment.

SECTION 3 BEFORE REPAIR

Procedure 12 Report to the customer

Report the reason why the trouble cannot be solved to the customer. Then consult about the plan of next repair work. And do the same way from "Procedure 2".

3-2 Modification work on the description of Service Manual

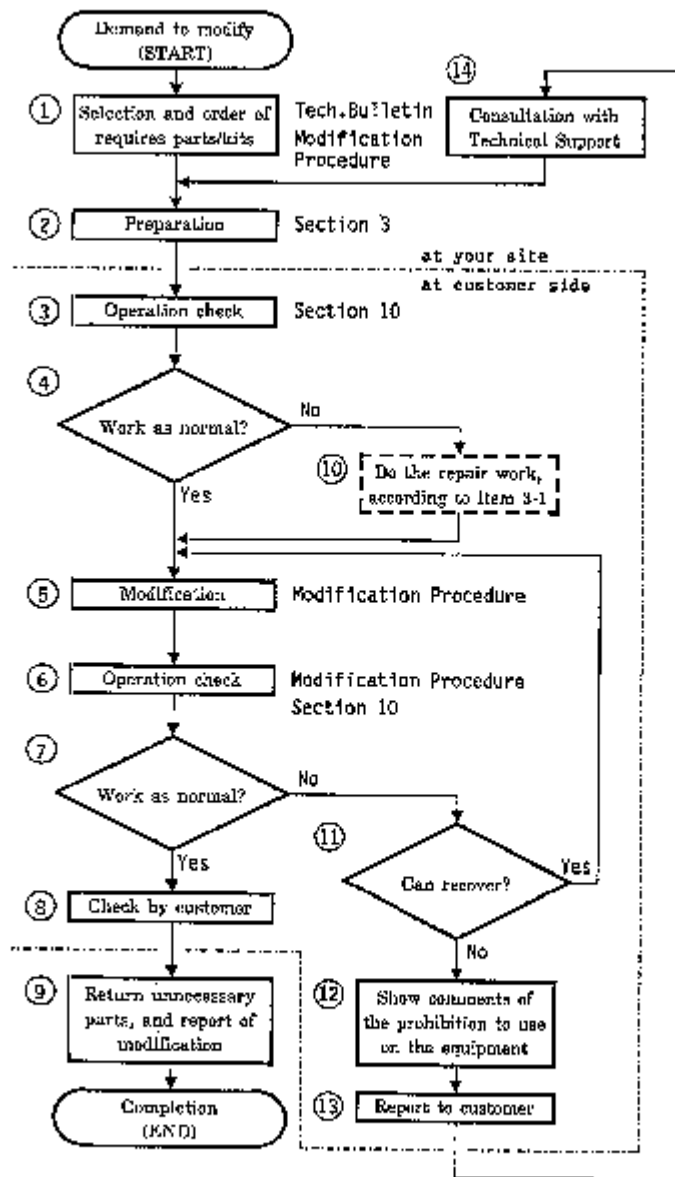
The typical processes for the modification work are shown as the Flow Chart on the next page. Do the modification work according to this procedure. In the case of repair work, see the previous item 3-1.

Each procedures of flow chart are numbered to refer its detail shown from page 3-9. Furthermore, the Flow Chart and its explanation show the time when each section of service manual are required on modification work. This is a guide for the usage of service manual.

The service manual is very important for the modification work, especially readjustment and performance check after completion of modification work. This is to keep the safety and quality of equipment.

The circled numbers shown in the Flow Chart on next page, are corresponded to the procedure number shown from page 3-9.

SECTION 3 BEFORE REPAIR



Procedure 1 Selection of required parts / kits and order

Accept the modification request from the customer, distributor or person in charge of sales. At this time, the following points have to be confirmed and checked to decide the parts and kits,

- Document name that announced the modification or kit requested
- Model name/number, and serial number
- Name of customer, address, phone number, and name of person in charge
- Configuration of the connection of peripheral devices
- Software version or the like shown on the boot up display

Make an examination what parts or kits are required based on the above information. For the selection, refer to the following document separately issued, or ask to the *Technical Support*,

- ▶ *Technical Bulletin*

To confirm the detail of modification, see the *Modification Procedure* attached with applied *Technical Bulletin*.

Depending on the modification, hardware, or software, the other modification may be required. Check it with the *Technical Bulletin*.

Then, confirm the delivery date of required parts or kits, and decide the date to visit on the consultation with the customer.

Procedure 2 Preparation of visiting the customer

Check the required tools, measuring devices and parts or kits to be used before the visiting the customer. Then check the special information for the equipment reference with the following section and document.

- ▶ Section 3 BEFORE REPAIR
- ▶ *Technical Bulletin* and/or *Modification Procedure*

Procedure 3 Operation check before modification

On the basis of work, the modification to the defective equipment is prohibited. Because, before modification work, check the behavior of equipment whether normal or not according to following section and document,

- ▶ Section 10 PERFORMANCE CHECK
- ▶ *Operation Manual*

SECTION 3 BEFORE REPAIR

Procedure 4 Judgment of the operation quality

If the result of "Procedure 3" is passed to the all standards, do the next "Procedure 5". On the other side, if not, go to "Procedure 10".

Procedure 5 Modification work

Do the modification work according to the following document,

- ▶ *Modification Procedure* attached with kit or *Technical Bulletin*

Procedure 6 Operation check after modification

Check the system behavior to keep its condition as same as before the modification, reference with the following section. Be sure to do according to the description because check items are depending on the portion to be treated.

- ▶ Section 10 PERFORMANCE CHECK
- ▶ *Modification Procedure*

Procedure 7 Judgment of the operation quality

If the result of "Procedure 6" is passed to the all standards, do the next "Procedure 8". On the other side, if not, make a judgment of "Procedure 11".

Procedure 8 Confirmation by customer

Reconfirm any functions of equipment with the customer. Then, if need, introduce and explain about the new functions and specification added by this modification.

Furthermore, if need, make a report to be approved by the customer. The report shows not only the treatment but also the method of operation check. If it has been done according to the service manual, the following has to be shown,

"Checked according to the Section 10 of service manual, and passed."

Procedure 9 Return of unnecessary parts and report of completion

According to the *Technical Bulletin*, return the unnecessary replaced or unused parts as soon as possible if suggested.

And, if the report of modification is suggested on the same document, report it with the information required.

Procedure 10 Work for the abnormal behavior of equipment

On the result of judgment in "Procedure 4", if the equipment does not work normal, solve the problem according to item 3-1 "Repair work on the description of service manual" shown in this section.

When the problem is solved, return to "Procedure 5" of this item and continue to do the modification work.

Procedure 11 Judgment of possibility to recover

As the result of judgment on "Procedure 7", if the problem has been made by this modification, judge the possibility to recover it.
If available, return to "Procedure 5" and continue to work.
If unavailable, go to "Procedure 12".

Procedure 12 Indication of the prohibition to use

As the result of judgment on "Procedure 11", if you judge that it is impossible to recover at this time, indicate that the equipment is the out of order, and also show the prohibition to use, on the equipment.

Procedure 13 Report to the customer

Report to the customer that the modification has not been completed because of the problem on the modification work. Then make a schedule to fix and complete it.

SECTION 3 BEFORE REPAIR

Procedure 14 Asking to the Technical Support

Report to the *Technical Support* about the happening of problem on the modification work, make an examination to solve and order the additional parts. Before the asking, check the following points.

- Name of kit, or the issue number of *Technical Bulletin* showing the modification
- Model name/number, and serial number
- Configuration of the connection of peripheral devices
- Software version or the like shown on the boot up display
- Indication of equipment such as Modification or History Label
- Detail of phenomenon appeared on the function of equipment

3-3 Handling of SMT (Surface Mount Technology) and SMD (Surface Mount Device)

The PCBs should not be repaired with any devices as a rule in the service field.

- Do not touch pins of IC mounted on PCB unless it is necessary.

Since the pitch between leads is smaller, ICs involve the possibility of rusting by dirt and sweat from hands. Also, it involves the possibility of shorting due to fine solder chips jammed between leads.

- Do not apply excessive shocks

When replacing ROM (Read Only Memory) on a PCB, do not insert ROM into its socket forcibly. Undue force applied to ROM would cause the following various troubles:

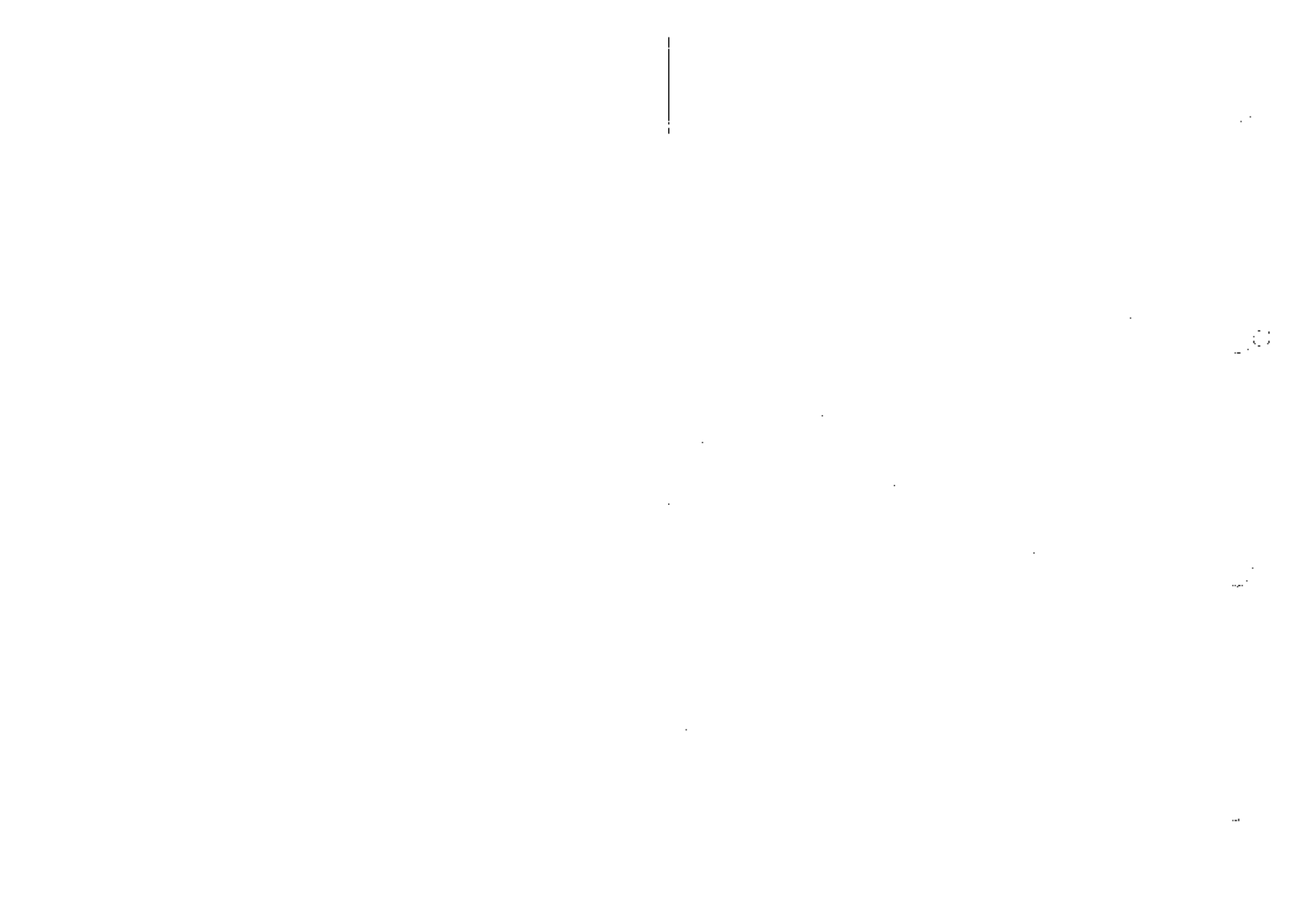
- ▶ Damage to wiring patterns on intermediate layers of PCB.
- ▶ Flaking and falling of chip devices (resistor, condenser, diode, etc.)
- ▶ Damage to electrodes in chip devices.
- ▶ Flaking of land which is made smaller than before.
- ▶ Flaking and falling of parts on the back surface.

Also, take care to install PCBs improperly or to install warped PCBs. Although newly shipped equipment does not involve such problem as falling off of chip devices due to shocks, such a problem may occasionally arise in the reconditioned or modified equipment because of re-soldering needed.

Reuse of chip devices (including resistor, capacitor, diode, etc.) for S.M.D. is strictly avoided. Since chip devices do not have pure leads such as found on conventional parts, heat caused by soldering of reuse chip device could transmit directly to the inside, without thermal dumping by leads, and burn it.

- PCBs have finer wiring pattern. Handle them with special care.

Be sure to observe this caution to prevent the secondary hazards caused by the damage to wiring pattern.



SECTION 4 DISASSEMBLING PROCEDURE

CONTENTS

4-1	SSD-500 Disassembling Procedure	4 - 1
4-2	JB-172 Disassembling Instruction	4 - 17
4-3	JB-172 (PROBE SWITCHING BOX FOR SSD-500) INSTALLATION PROCEDURE	4 - 27
4-4	PTU-018 INSTALLATION PROCEDURE	4 - 39
4-5	RMT-500 INSTALLATION PROCEDURE	4 - 43
4-6	DIS-3 INSTALLATION PROCEDURE	4 - 61
4-7	RMT-500-35 (CABLE HANGER) INSTALLATION PROCEDURES	4 - 59
4-8	MP-PH300-3 INSTALLATION PROCEDURE	4 - 55
4-9	MP-PX500-3 INSTALLATION PROCEDURE	4 - 57
4-10	MP-PX500-4 INSTALLATION PROCEDURE	4 - 61
4-11	MP-PH172-2 INSTALLATION PROCEDURE	4 - 65

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4-i SSD-500 Disassembling Procedure

Refer this 'Disassembling Procedure' in order to disassemble correctly in the case of repair, modification or readjustment.

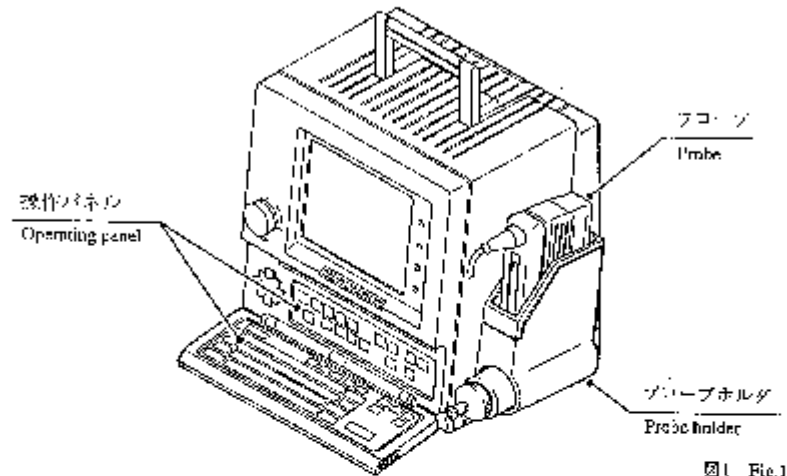
SSD-500 分解要領	Disassembling Instructions
--------------	----------------------------

- | | |
|--|---|
| 1. 各部の名称 | 1. Parts identification |
| 2. 各ユニットの配置 | 2. Individual unit layout |
| 3. 分解・組立上の注意点及び、分解フローチャート | 3. Cautions on disassembling and reassembling, and Disassembling flow chart |
| 4. プローブホルダの取り外し方法 | 4. Probe holder dismantling procedure |
| 5. コネクタカバーの取り外し方法 | 5. Connector cover dismantling procedure |
| 6. リアカバーの取り外し方法 | 6. Rear cover dismantling procedure |
| 7. フロントカバーの取り外し方法 | 7. Front cover dismantling procedure |
| 8. PC板の取り外し方法 | 8. PC board dismantling procedure |
| 9. 操作パネルアセンブリー (L-KEY-14*/L-KEY-58*)の取り外し方法及び、PC板の取り外し方法 | 9. Operating panel assembly and PC board dismantling procedure |
| 10. 背面接柱 PC 板 (EP-2882*, EP-2881*)の取り外し方法 | 10. Rear blocking PC boards dismantling procedure |
| 11. CRT PC 板の引き出し方法 | 11. CRT-PC pull-out procedure |
| 12. 電源ユニット (PSU-5500*)の取り外し方法 | 12. Power supply unit dismantling procedure |

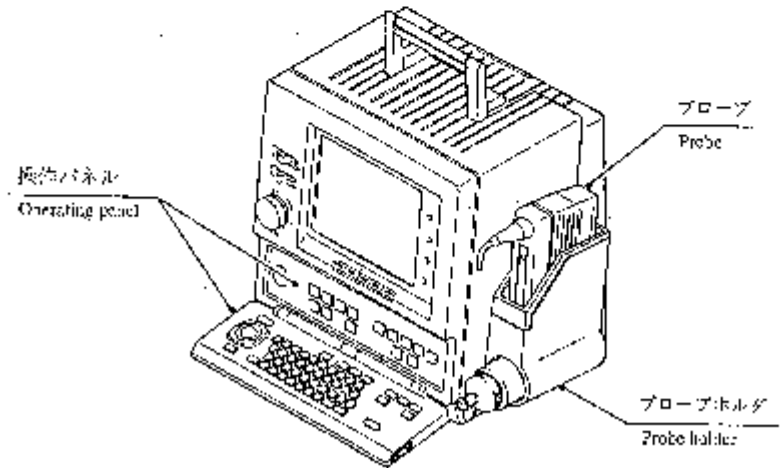
1.各部の名称

1.Parts identification

適用 S/N ①: 91M03778～31M1170E
 Applicable
 Serial Numbers ②: 3300001～3300367, 3320001～3320388
 3322564～3323601, 3610001～3610245



適用 S/N ①: 3300368--
 Applicable
 Serial Numbers ②: 3323039～3323563,
 3323602--



2.各ユニットの配置

2. Individual units layout

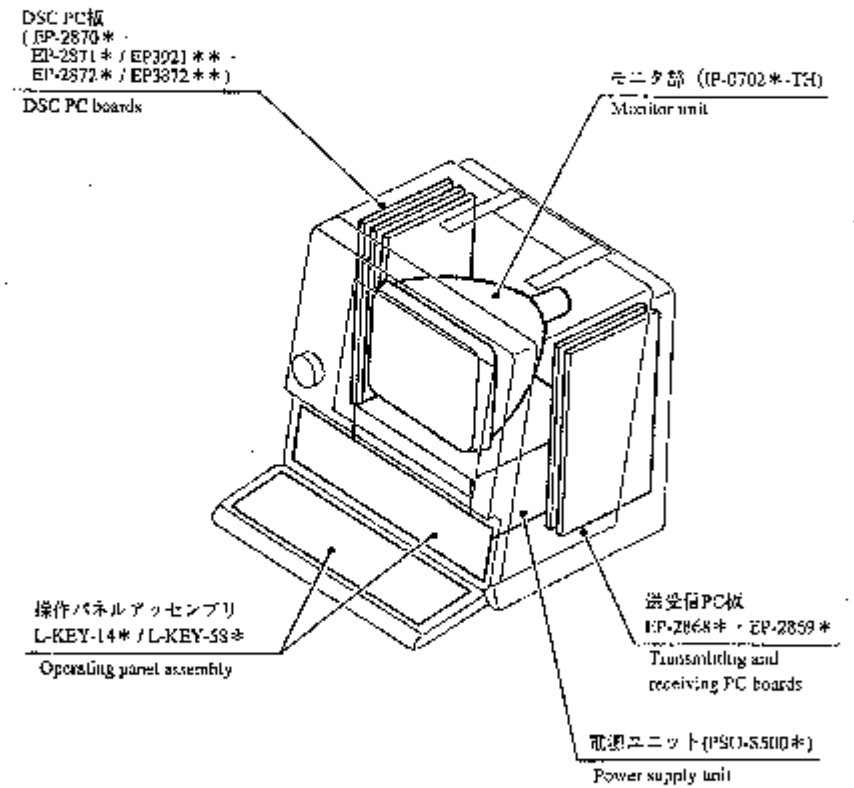


図3 Fig.3

3. 分解・組み立て上の注意
及び分解フローチャート

3. Cautions on disassembling and reassembling
and Disassembling Flow Chart

必要な工具

ME・M4用プラスドライバー	1本
小型マイナスドライバー	1本

分解・組立上の注意点

カバー類はプラスチック製である為、再組立時必要以上にねじを締め付け過ぎると割れる恐れがある。ねじの締め付けは、下記を目安に実施の事。

- 指3本で締め付ける程度で目安は充分。手のひらでドライバー柄を握り、締め付けることしない。(図4参照)

Required Tools

Phillips type screw-driver.	1
Small flat-blade screw driver	1

Cautions on Disassembling and Reassembling

When fastening the screws of the plastic covers, use caution so as to not apply more than adequate force in order not to damage the covers.

- Use the following rule when fastening screws.
- To turn the screwdriver gripping the handle: using your thumb and two fingers will provide sufficient fastening force. Do not fully grip the handle using the palm of the hand. (See Fig.4)

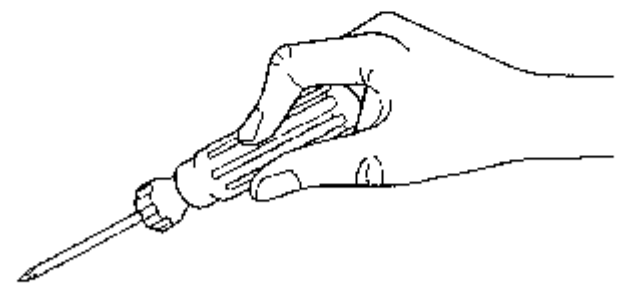


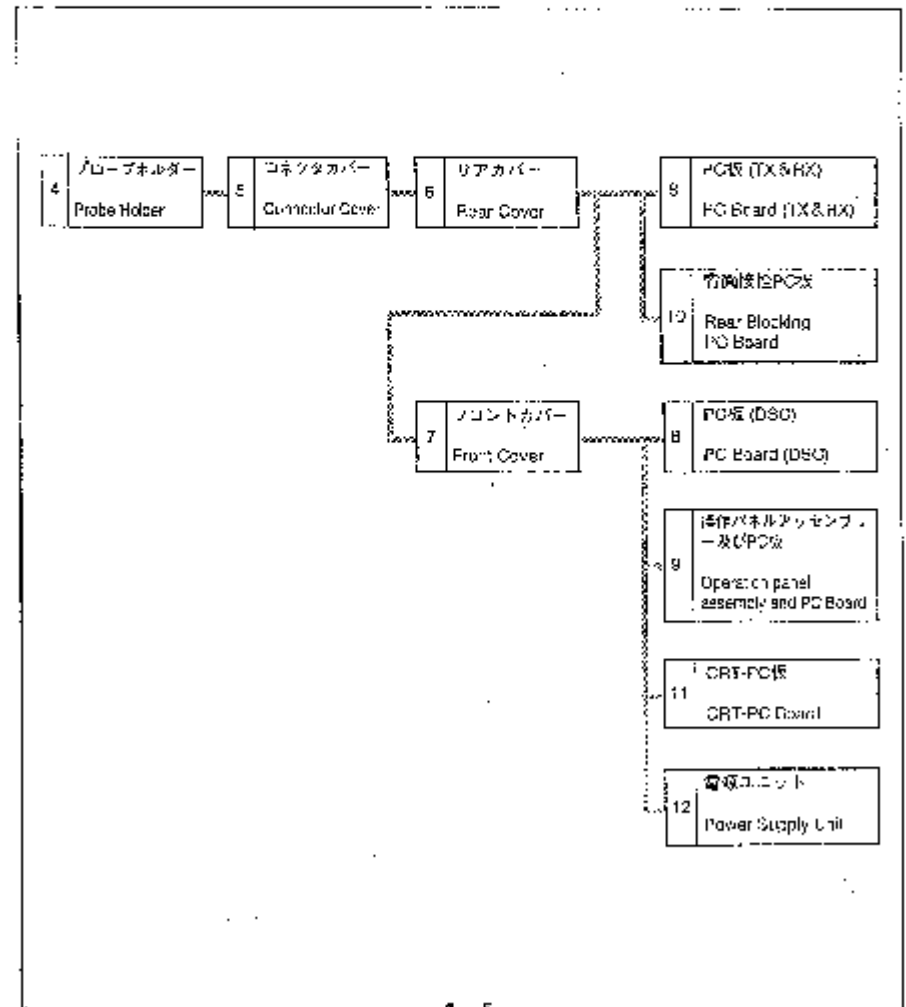
図4 Fig.4

分解フローチャート

Dismounting Flow Chart

本分解要書は分解フローチャートに基づき構成されていますので、
その流れに従って作業を進めてください。
分解フローチャートのNo.に本文の番号が対応しています。

This disassembly procedures are made based on the Dismounting Flow Chart
conduct operations in accordance with the flow.
Number in this paper is corresponding to No. in the flow chart.



4.プローブホルダの取り外し方法

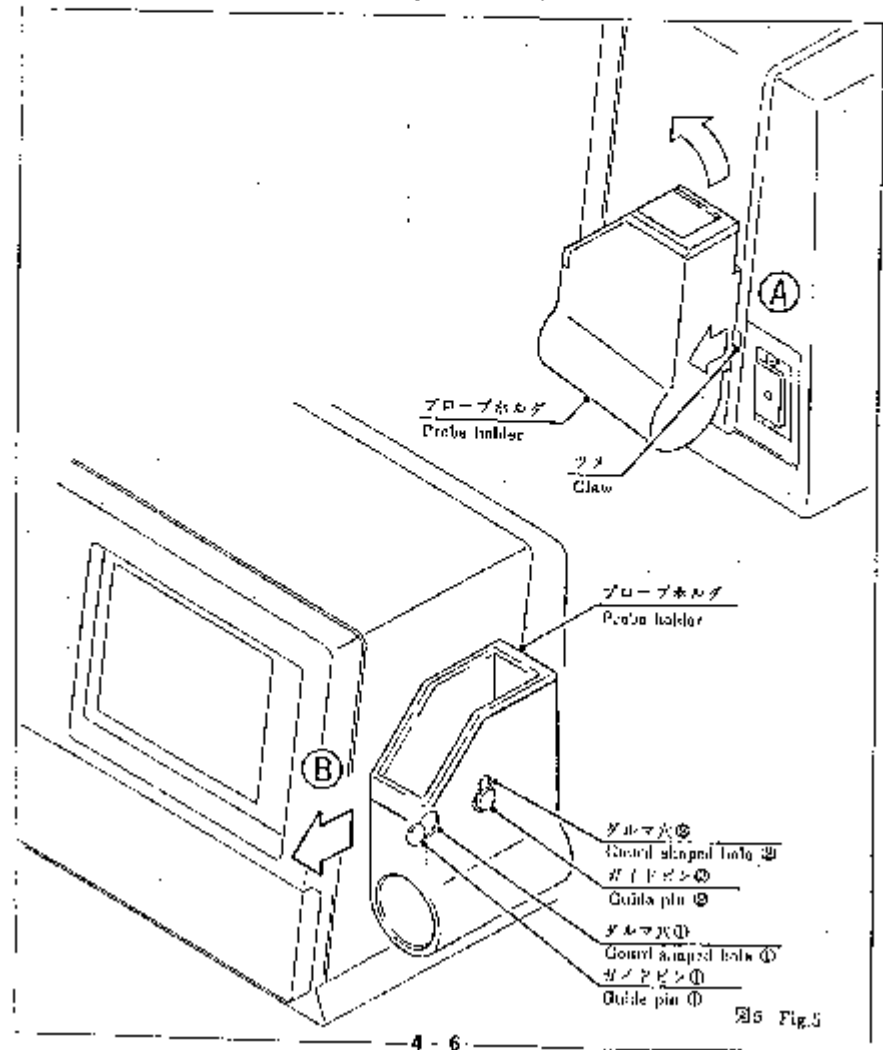
4. Probe holder dismantling procedure

(1) プローブホルダのツメを、引きながら上向き方向に持ち上げるとガイドピン②と
 グルマ穴③が外れる。(同④)

(2) 装置前面側へスライドさせて、ガイドピン①とグルマ穴④を外す。(同⑤)

(1) Lift the probe holder while pulling the claw of the holder. Then the
 guide pin ② is released from the guard shaped hole ③. (④ in Fig.)

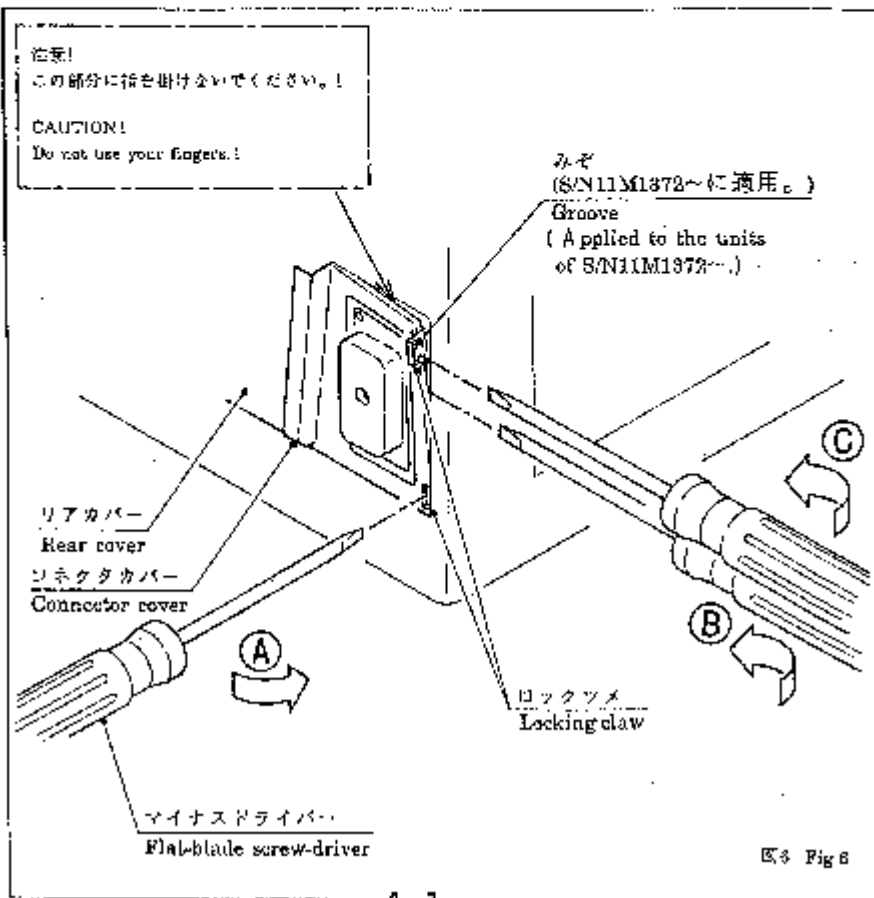
(2) Slide the holder forward of the device and remove the guide pin ① from
 the guard shaped hole ④. (⑤ in Fig.)



5. コネクタカバーの取り外し方法

5. Connector cover dismounting procedure

- (1) コネクタカバーのロックツメ2ヶ所をマイナスドライバーで解除する。(図中Ⓐ)
- (2) マイナスドライバーをロックツメ以外の部分に差し込み、リアカバーからコネクタカバーを抜き出す。(図中Ⓑ) (~S/N 11M1371に適用。)
- (2) マイナスドライバーをみぞに差し込み、リアカバーからコネクタカバーを抜き出す。(図中Ⓒ) (S/N 11M1372~に適用。)
- (1) Loosen two locking claws of the cover with a flat-blade screw-driver. (Ⓐ in Fig.)
- (2) Insert the flat-blade screw-driver into the portion without locking claws and extract the connector cover from the rear cover. (Ⓑ in Fig.) (Applied to the units of ~S/N 11M1371.)
- (2) Insert the flat-blade screw-driver into the groove and extract the connector cover from the rear cover. (Ⓒ in Fig.) (Applied to the units of S/N 11M1372~.)



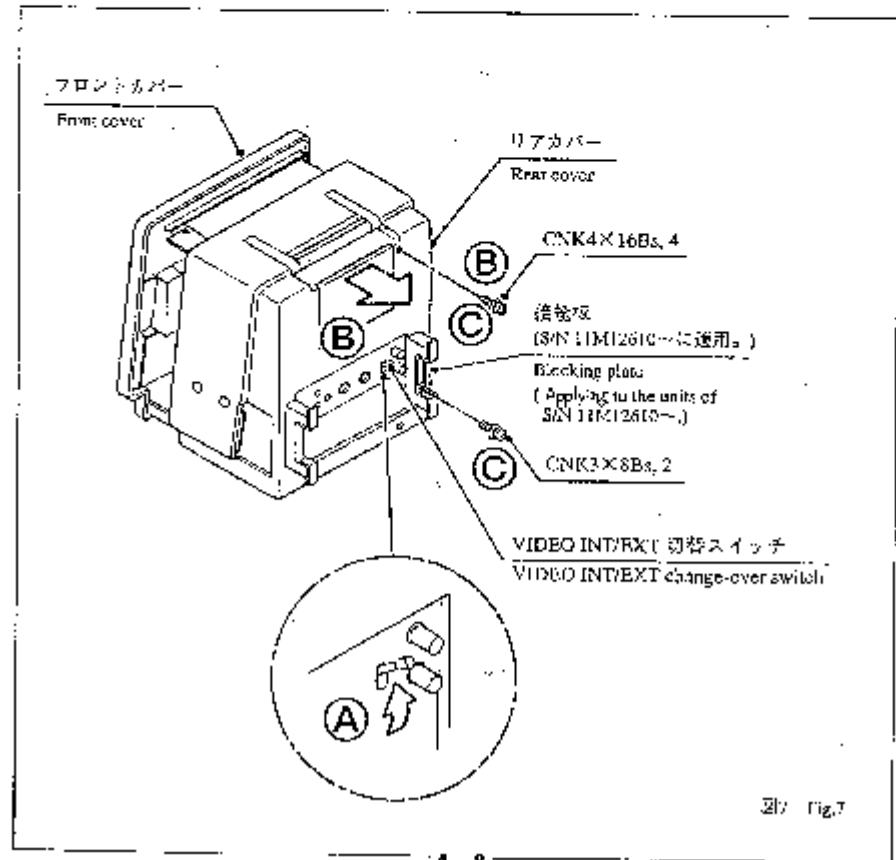
5. リアカバーの取り外し方法

6. Rear cover dismantling procedure

- (1) 本体背面のVIDEO INT/EXT切替スイッチを上昇させる。(図中Ⓐ)
 - (2) リアカバーをねじ4本を外して後方に引き抜く。(図中Ⓑ)(→S/N11M12509に適用。)
 - (3) リアカバーを接続板のねじ2本とリアカバーのねじ4本を外して後方に引き抜く。(図中Ⓒ)(S/N11M12510→に適用。)
- 注：再組立の際はフロントカバーとリアカバーが確実にかみ合っている事を確認の上ねじ固定する事。

- (1) Turn up the VIDEO INT/EXT change-over switch on the back of the body. (Ⓐ in Fig.)
- (2) Remove four screws and extract the rear cover backwards. (Ⓑ in Fig.)
(Applied to the units of → S/N11M12509.)
- (3) Remove four screws of the rear cover and two screws of the rear blocking plate and extract the rear cover backwards. (Ⓒ in Fig.)
(Applied to the units of S/N11M12510→.)

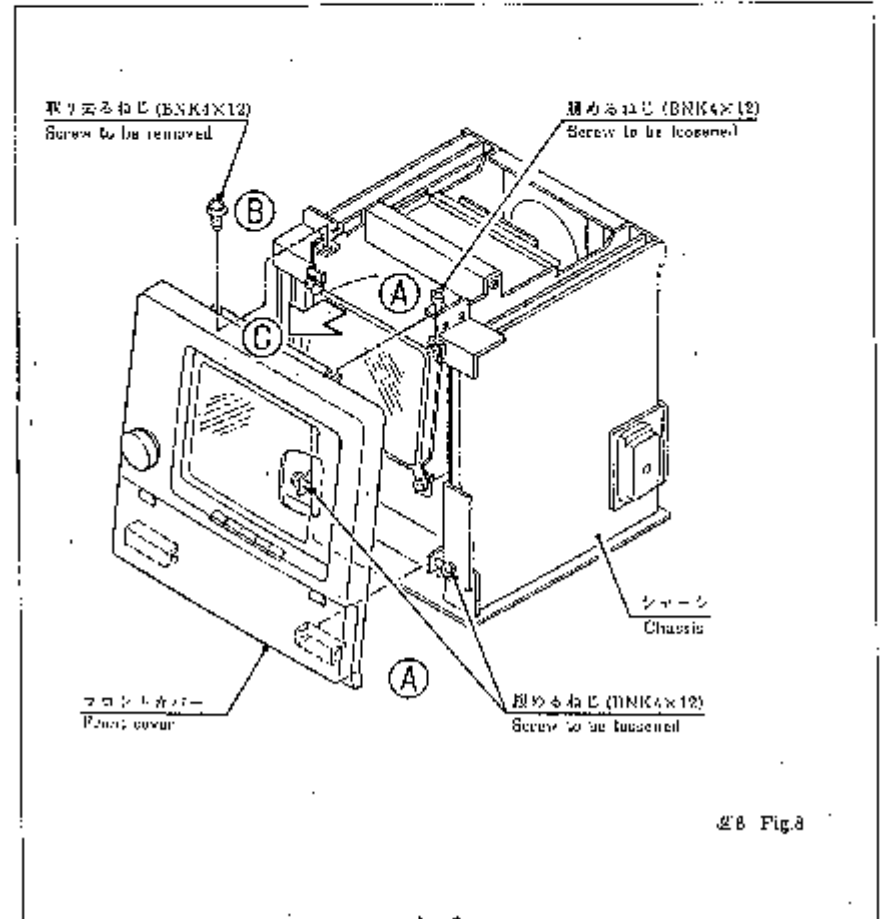
NOTE: In re-assembling, confirm that the front cover and the rear cover are completely engaged, and screw in Fig.



7. フロントカバーの取り外し方法

7. Front cover dismantling procedure

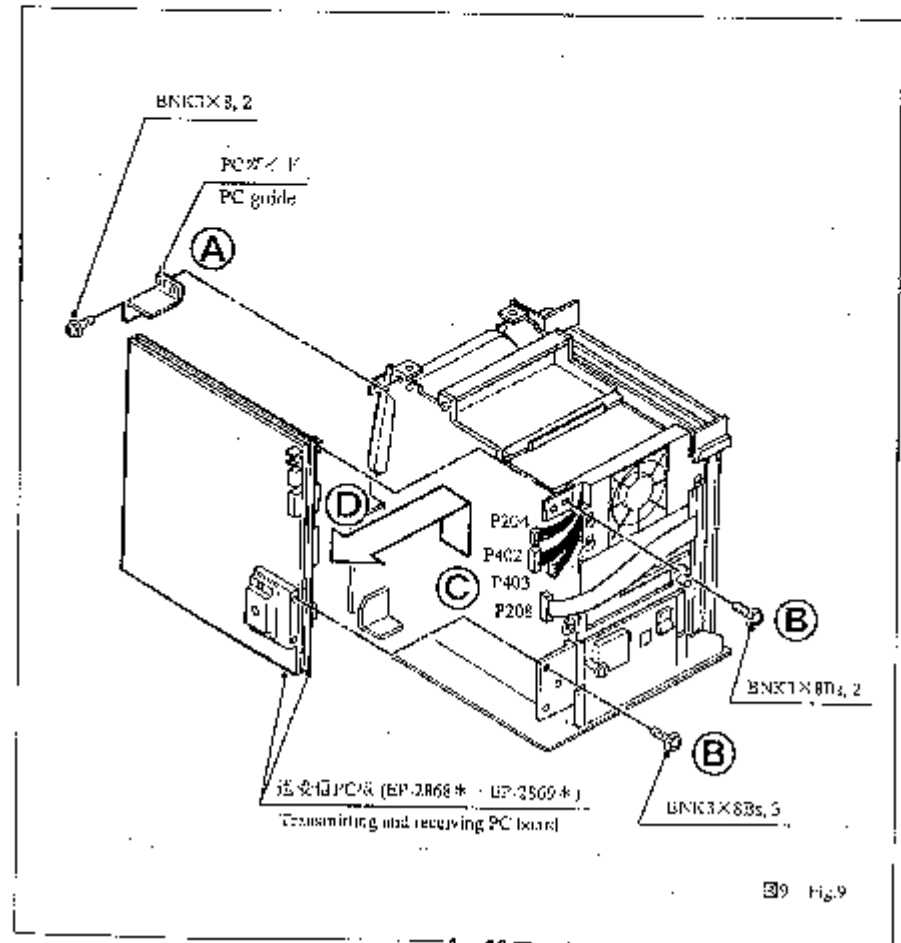
- (1) フロントカバーはねじ4本でシャーシに固定されている。上側2本と下側両サイド2本計4本を緩める。(図中Ⓐ)
- (2) フロントカバーが倒れない様、手で押さえながら残る1本のねじを取り去る。(図中Ⓑ)
- (3) フロントカバーを空気に気をつけながら前側に引き抜く。(図中Ⓒ)
- (1) The front cover is fixed with four screws to the chassis, loosen the three screws, namely one of the upper two screws and the screws on both sides at the bottom. (Ⓐ in Fig.)
- (2) While keeping the front cover from falling downward by holding it with the hand, remove the one remaining screw. (Ⓑ in Fig.)
- (3) Extract the front cover forwards while locking wiring. (Ⓒ in Fig.)



3. PC板の取り外し方法

3. PC board dismounting procedure

- 送受信PC板 (EP-2868*・EP-2869*) の取り外し方法。
 - (1) PCガイドをおじ2本を外して取りはずす。(図中Ⓐ)
 - (2) PC板を固定しているおじ上方2本下方3本を外す。(図中Ⓑ)
 - (3) PC板に接続されているコネクタ(P204・P208・P402・P403)4本を外す。(図中Ⓒ)
 - (4) PC板を上方に行ち上げるようにして取り外す。(図中Ⓓ)
- Transmitting and receiving PC boards (EP-2868*・EP-2869*) dismounting procedure.
 - (1) Remove two screws and remove the PC guide. (Ⓐ in Fig.)
 - (2) Remove two upper screws and three lower screws which fix the PC board. (Ⓑ in Fig.)
 - (3) Remove four connectors (P204・P208・P402・P403) connected to the PC board. (Ⓒ in Fig.)
 - (4) Remove the PC board so as to lift the board. (Ⓓ in Fig.)

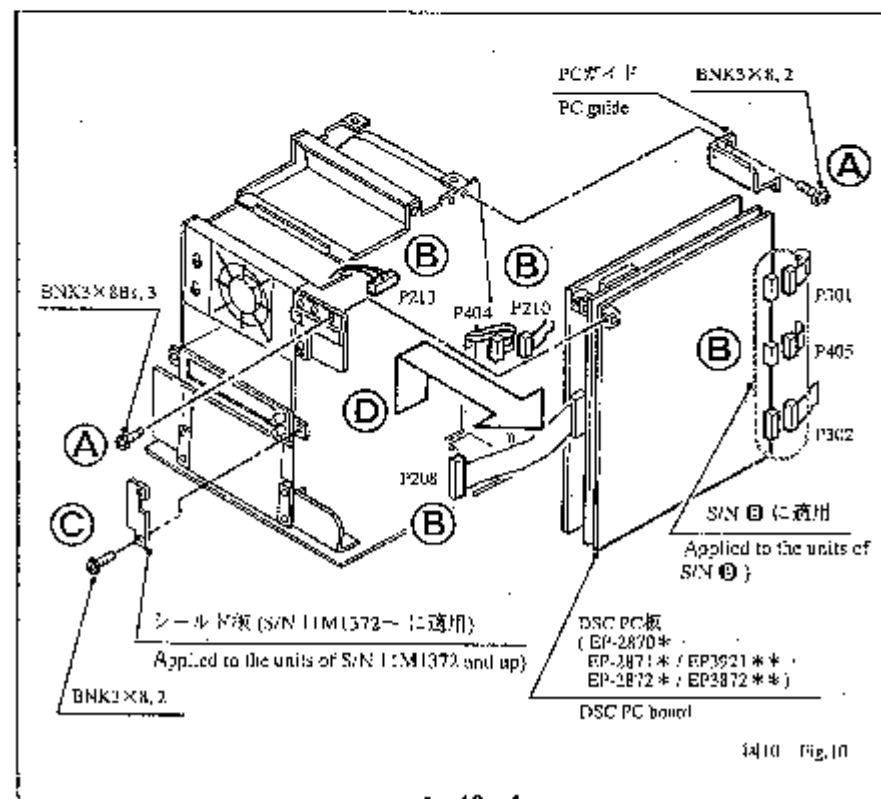


●DSC PC板 (EP-2870*・EP-2871* / EP3921**・EP-2872* / EP3872**) の取り外し方法

- (1) PCガイドをねじ2本を外して取り外し、PC板を固定しているねじ3本を取り外す。(図中 ㉑)
- (2) PC板に接続されているコネクタ7本(P210・P213・P208・P301・P302・P404・P405)をそれぞれ外す。(図中 ㉒) (P301・P302・P405 はS/N ㉓ (1項参照) に適用。)
- (3) シールド板をねじ2本を外して取り外す。(図中 ㉔) (S/N 11M1372～に適用。)
- (4) PC板を上方に持ち上げるようにして取り外す。(図中 ㉕)

●DSC PC board (EP-2870*・EP-2871* / EP3921**・EP-2872* / EP3872**) disassembling procedure

- (1) Remove two screws and remove the PC guide, and remove three screws which fix the PC board. (㉑ in Fig.)
- (2) Remove seven connectors (P210・P213・P208・P301・P302・P404・P405), connected to the PC board respectively (㉒ in Fig.) (P301, P302 and P405 are not applicable to Serial Numbers ㉓ (of. index 1).)
- (3) Remove two screws and remove the shield plate (㉔ in Fig.) (Applied to the units of S/N 11M1372～.)
- (4) Remove the PC board from the body so as to tilt the board. (㉕ in Fig.)



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9.操作パネルのアンゼンブリー、及び、PC板の取り外し方法

9. Operating panel assembly, and PC board dismounting procedure

- S/N ① (1項参照) : 9-1~9-4, 9-7~9-9の作業を行なう。
- S/N ② (1項参照) : 9-3~9-9の作業を行なう。

9-1 PC板(EP-2873*)取り外し方法

- (1) PC板固定金具のねじ2本を取り外す。(区中 ㊸) (S/N 91M18295~に適用。)
- (2) PC板(PC-2873*)をケーブル6本(P601・P304・P405・P307・P210・P505)とフラットケーブルを外し、ねじ2本を外して取り外す。(区中 ㊹)

9-2 操作パネルアッセンブリー(L-KEY-14*-B*)の取り外し方法

操作パネルアッセンブリー(L-KEY-14*-B*)をねじ2本を外して取り外す。(区中 ㊺)

- S/N ① (cf. index 1) : Carry out operations 9-1 thru 9-4, and 9-7 thru 9-9.
- S/N ② (cf. index 2) : Carry out operations 9-3 thru 9-9.

9-1 PC board (EP-2873*) dismounting procedure

- (1) Remove the two screws of the PCB fixing metal fitting. (㊸ in Fig.)
(Applied to the units of S/N 91M18295~.)
- (2) Remove six cables (P601・P304・P405・P307・P210・P505) and the flat cable of the PC board (PC-2873*) and remove two screws, and remove the board. (㊹ in Fig.)

9-2 Operating panel assembly (L-KEY-14*-B*) dismounting procedure

Remove two screws and remove the operating panel assembly (L-KEY-14*-B*). (㊺ in Fig.)

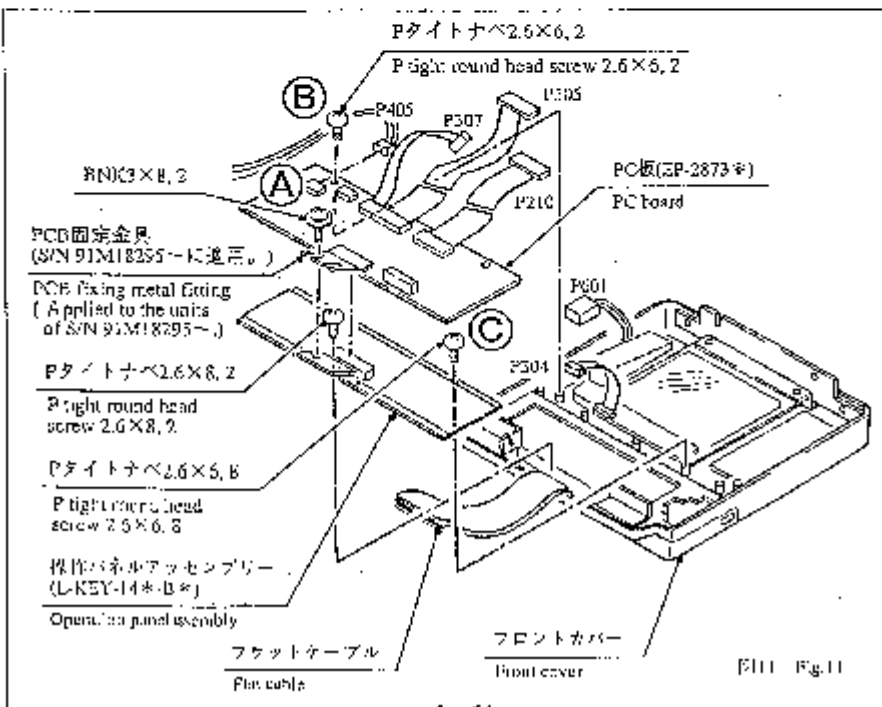


FIG. 11 Fig. 11

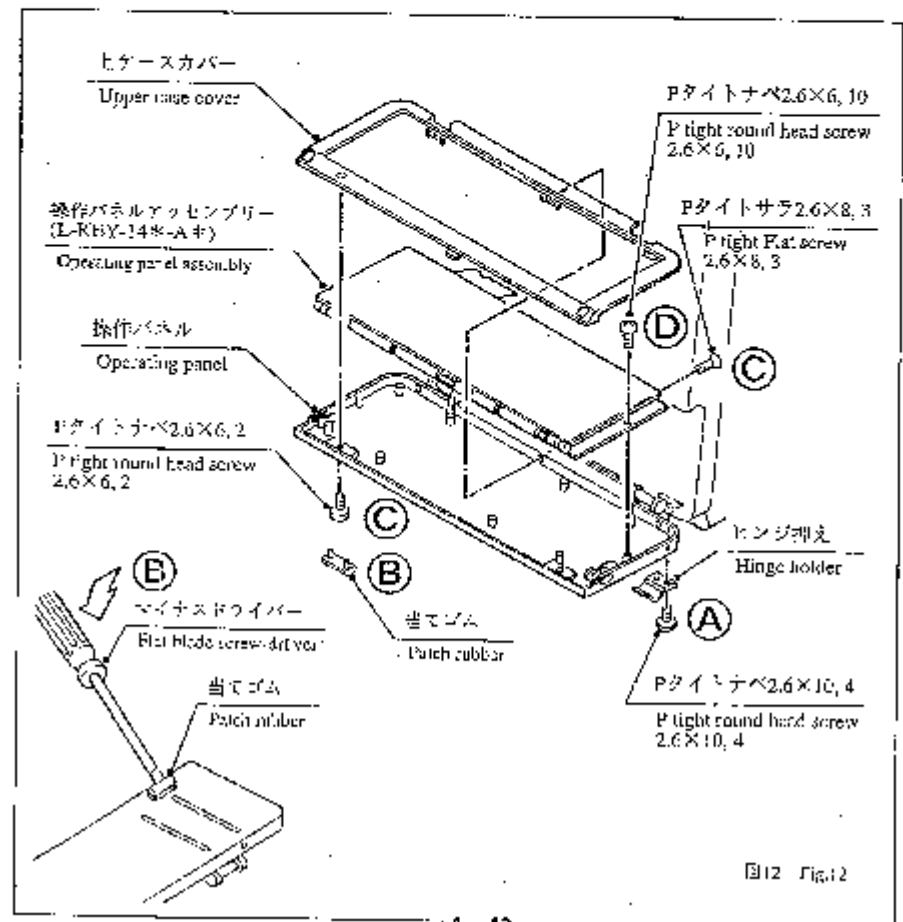
SECTION 4 DISASSEMBLING PROCEDURE

9-3 操作パネルアセンブリー (L-KEY-14※-A※) の取り外し方法

- (1) 操作パネルをフロントカバーよりヒンジ押え2個をそれぞれ、ねじ2本ずつ外して取り外す。(図中Ⓐ)
- (2) 当てゴム3個をマイナスドライバーなどでこじり取る。(図中Ⓑ)
- (3) 上ケースカバーをねじ5本を外して取り外す。(図中Ⓒ)
- (4) 操作パネルアセンブリー(L-KEY-14※-A※)をねじ10本を外して取り外す。(図中Ⓓ)

9-3 Operation panel assembly (L-KEY-14※-A※) dismantling procedure

- (1) Loosen respective two hinge holders and remove them from the front cover, and remove the operating panel (Ⓐ in Fig.)
- (2) Scrape out two patch rubber with a flat-blade screw driver (Ⓑ in Fig.)
- (3) Remove five screws of the upper case cover and remove the cover (Ⓒ in Fig.)
- (4) Remove ten screws and remove the operating panel assembly (L-KEY-14※-A※) (Ⓓ in Fig.)



9-4 操作パネル接続アースケーブルの取り外し方法

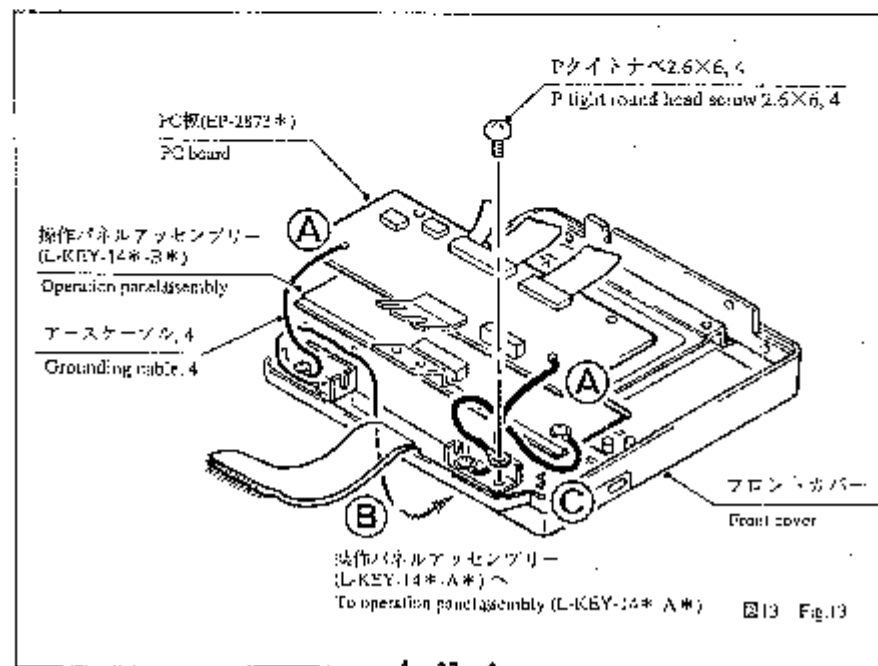
本作業は、S/N 3322474～3322573, 3322514～3323038, 3323564～3323601の230V、PAL生成の装置にのみ適用。

- PC板(EP-2873*) 接続アースケーブルの取り外し方法
 - (1) フロントカバーの金具に共締めしてあるねじ2本を取り外す。(図11㉔)
- 操作パネルアッセンブリ(L-KEY-14*-A*) 接続アースケーブルの取り外し方法
 - (1) フロントカバーの金具に共締めしてあるねじ1本を取り外す。(図10㉔)
- 操作パネルアッセンブリ(L-KEY-14*-B*) 接続アースケーブルの取り外し方法
 - (1) フロントカバーの金具に共締めしてあるねじ1本を取り外す。(図9㉔)

9-4 Grounding Cable Connected to Operation panel dismantling procedure

Operations referred to on this apply to PAL Type 230V Equipment Serial Nos. 3322474 thru 3322573, 3322514 thru 3323038, and 3323564 thru 3323601.

- Grounding cable connected to PC board (EP-2873*) dismantling procedure
 - (1) Unfasten two screws tightened with frontcover hardware. (㉔ in Fig.)
- Grounding cable connected to operation panel assembly (L-KEY-14*-A*) dismantling procedure.
 - (1) Unfasten one screw tightened with frontcover hardware. (㉔ in Fig.)
- Grounding cable connected to operation panel assembly (L-KEY-14*-B*) dismantling procedure.
 - (1) Unfasten one screw tightened with frontcover hardware. (㉔ in Fig.)



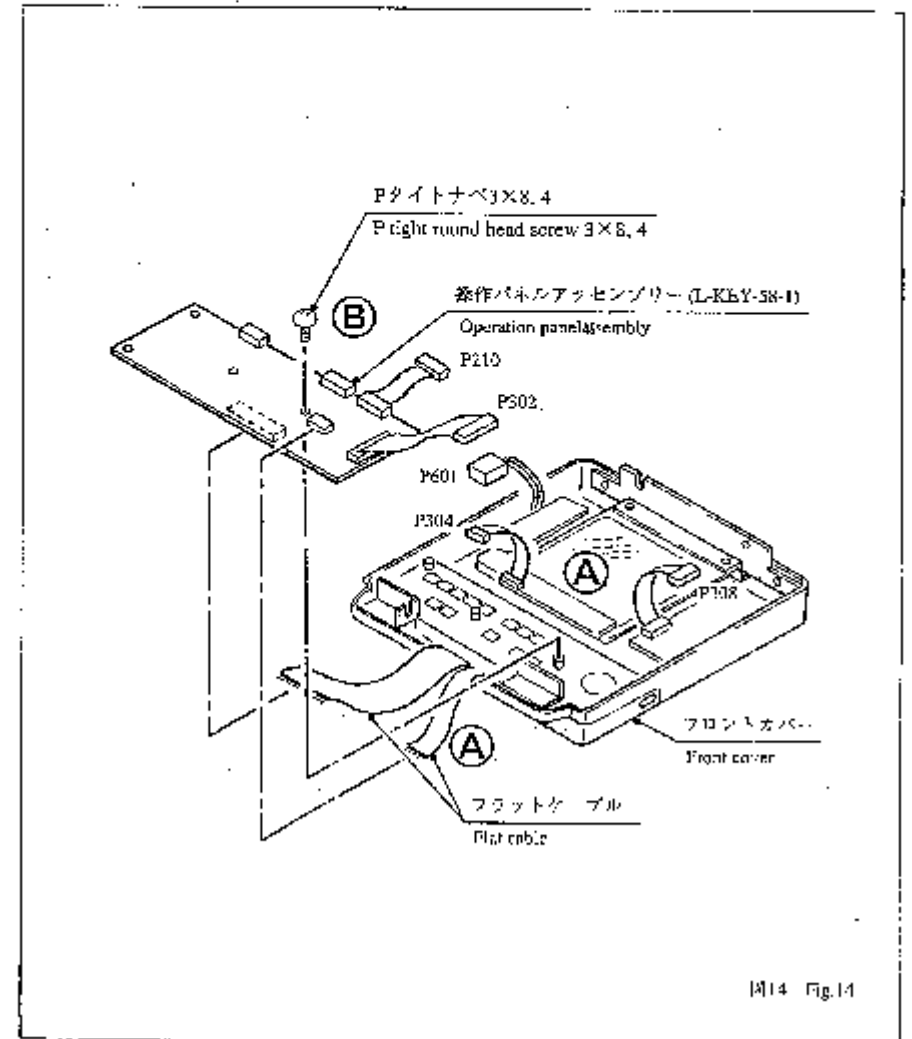
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9-5 操作パネルアッセンブリー(L-KEY-58-1)の取り外し方法

- (1) ケーブル5本 (P210・P302・P304・P308・P601) とフラットケーブル2本を、操作パネルアッセンブリー (L-KEY-58-1) から取り外す。(図14 ㉔)
- (2) 操作パネルアッセンブリー (L-KEY-58-1) を、ねじ4本を外して取り外す。(図14 ㉕)

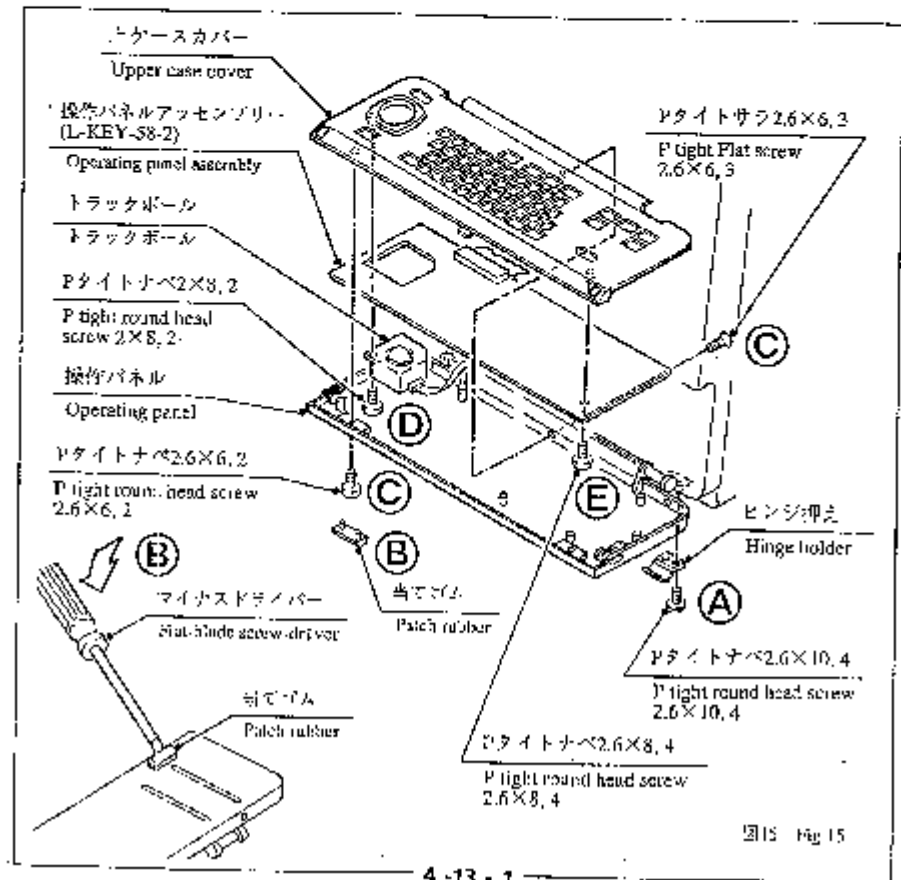
9-5 Operation panel assembly (L-KEY-58-1) dismantling procedure

- (1) Remove five cables (P210, P302, P304, P308, and P601) and two flat cables from operation panel assembly (L-KEY-58-1). (㉔ in Fig.)
- (2) Remove operation panel assembly (L-KEY-58-1) by removing four screws. (㉕ in Fig.)



SECTION 4 DISASSEMBLING PROCEDURE

- 9 6 操作パネルアッセンブリー(L-KEY-58-2)の取り外し方法
- (1) 操作パネルをフロントカバーよりヒンジ押え2個をそれぞれ、ねじ2本ずつ外して取り外す。(図中 ㉔)
 - (2) 当てゴム2個をマイナスドライバーを以てこじりとる。(図中 ㉕)
 - (3) トケースカバーをねじ5本を外して取り外す。(図中 ㉖)
 - (4) トラックボールをねじ2本を外して取り外す。(図中 ㉗)
 - (5) 操作パネルアッセンブリー(L-KEY-58-2)をねじ4本を外して取り外す。(図中 ㉘)
- 9 6 Operation panel assembly (L-KEY-58-1) dismounting procedure
- (1) Loosen respective two hinge holders and remove them from the front cover, and remove the operating panel. (㉔ in Fig.)
 - (2) Scraps out two patch rubber with a flat blade screw -driver. (㉕ in Fig.)
 - (3) Remove five screws of the upper case cover and remove the cover. (㉖ in Fig.)
 - (4) Remove two screws of the trackball and remove the trackball. (㉗ in Fig.)
 - (5) Remove four screws and remove the operating panel assembly (L-KEY-58-2). (㉘ in Fig.)



9-1 PC板(EP-2878* / L-KEY-S8-3)取り外し方法

PC板(EP-2878* / L-KEY-S8-3)をフロントカバー前側のツマミ柄を外し、ねじ2本を外して取り外す。(図中㉑)

9-2 PC板(EP-2879*)取り外し方法

PC板(EP-2879*)をねじ2本を外して取り外す。(図中㉒)

9-3 PC板(EP-2880*)取り外し方法

シールド板をねじ2本を外して取り外し、PC板(EP-2880*)をねじ2本を外して取り外す。(図中㉓)

9-1 PC board (EP-2878* / L-KEY-S8-3) dismounting procedure

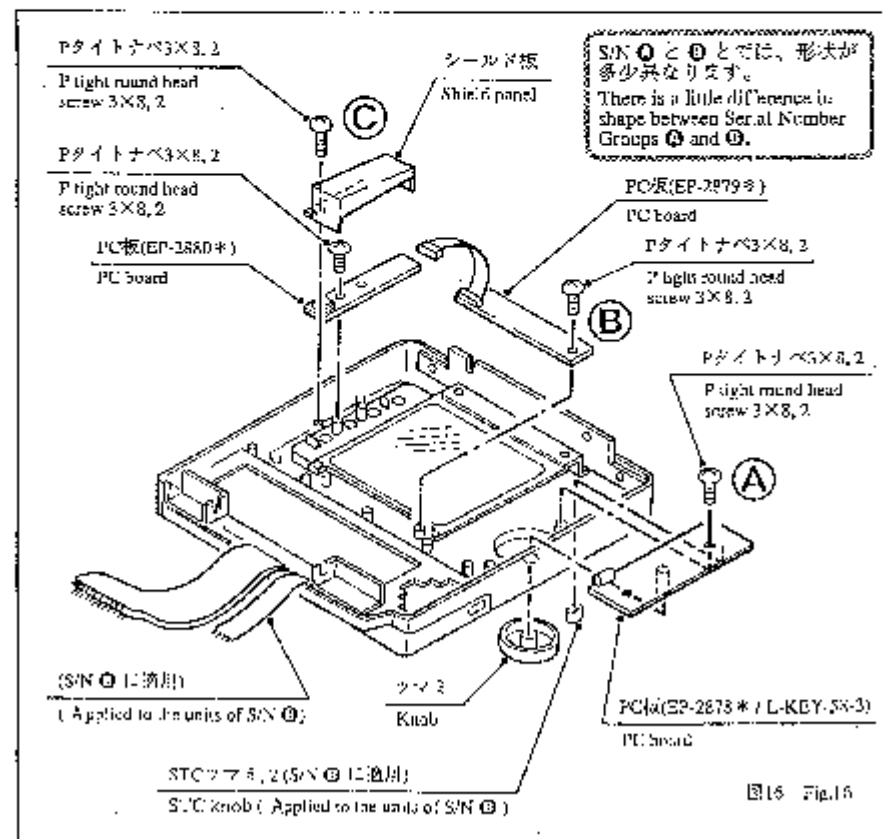
Remove the knob on the front side of the front cover, and remove two screws of the PC board (EP-2878*) and remove the board. (㉑ in Fig.)

9-2 PC board (EP-2879*) dismounting procedure

Remove two screws of the PC board (EP-2879*) and remove the board. (㉒ in Fig.)

9-3 PC board (EP-2880*) dismounting procedure

Remove two screws of the shield panel and remove the panel, and remove two screws of the PC board (EP-2880*) and remove the board. (㉓ in Fig.)



10. 背面接続PC板(EP-2882*, EP-2881*)の
取り外し方法

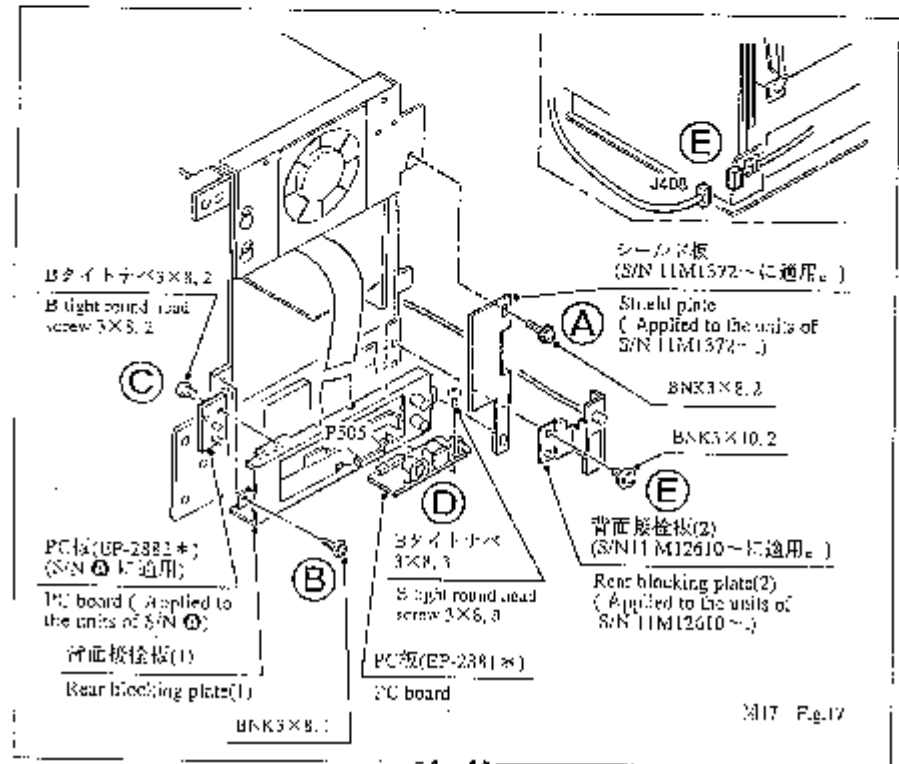
10. Rear blocking PC boards
dismounting procedure

※S/N ① (1項参照) は(3)の作業は不要

- (1) シールド板をねじ2本を外して取り外す。(図中 ②) (S/N 11M1372〜に適用。)
- (2) 背面接続板(1) をねじ1本を外して取り外す。(図中 ③)
- (3) PC板(EP-2881*) をねじ2本を外して取り外す。(図中 ④) (S/N ① (1項参照) に適用。)
- (4) PC板(EP-2881*) をねじ3本を外し、コネクタ(P505)も外して取り外す。(図中 ⑤)
- (5) 背面接続板(2) をねじ2本を外しコネクタ(J408)も外して取り外す。(図中 ⑥)
(S/N 11M12610〜に適用。)

※Operation (3) is not required for equipment S/N ① (cf. index 1)

- (1) Remove two screws and remove the shield plate. (② in Fig.)
(Applied to the units of S/N 11M1372~.)
- (2) Remove one screw and of the rear blocking plate (1) and remove the plate. (③ in Fig.)
- (3) Remove two screws and remove the PC board (EP-2882*). (④ in Fig.)
(Applied to the units of S/N ①.)
- (4) Remove three screws and the connector (P505), and remove the PC board (EP-2881*). (⑤ in Fig.)
- (5) Remove two screws and the connector (J408), and remove the rear blocking plate(2). (⑥ in Fig.)
(Applied to the units of S/N 11M12610~.)



M17 Fig.17

11.CRT PC板の引き出し方法

11.CRT-PC pull-out procedure

- (1) シールド板をおじ2本を外して取り外す。(図中 ㊸) (S/N 11M1372 ~ に適用。)
- (2) PC板に接続されているコネクタ(P208)を外す。(図中 ㊹)
- (3) 背置板検板をおじ1本を外して取り外す。(図中 ㊺)
- (4) ファン取付板をおじ2本を締め、ダレンマ穴が外れるように上方にずらして取り外す。(図中 ㊻)
- (5) CRT PC板を引き出す。(図中 ㊼)

- (1) Remove two screws and remove the shield plate. (㊸ in Fig.)
(Applied to the units of S/N 11M1372 ~.)
- (2) Remove one connector (P208) connected to the PC board. (㊹ in Fig.)
- (3) Remove one screw of the rear blocking plate and remove plate. (㊺ in Fig.)
- (4) Loosen two screws and shift the fan fitting panel upward so that the gourd shaped holes are released, and remove the fan fitting plate. (㊻ in Fig.)
- (5) Pull out the CRT-PC. (㊼ in Fig.)

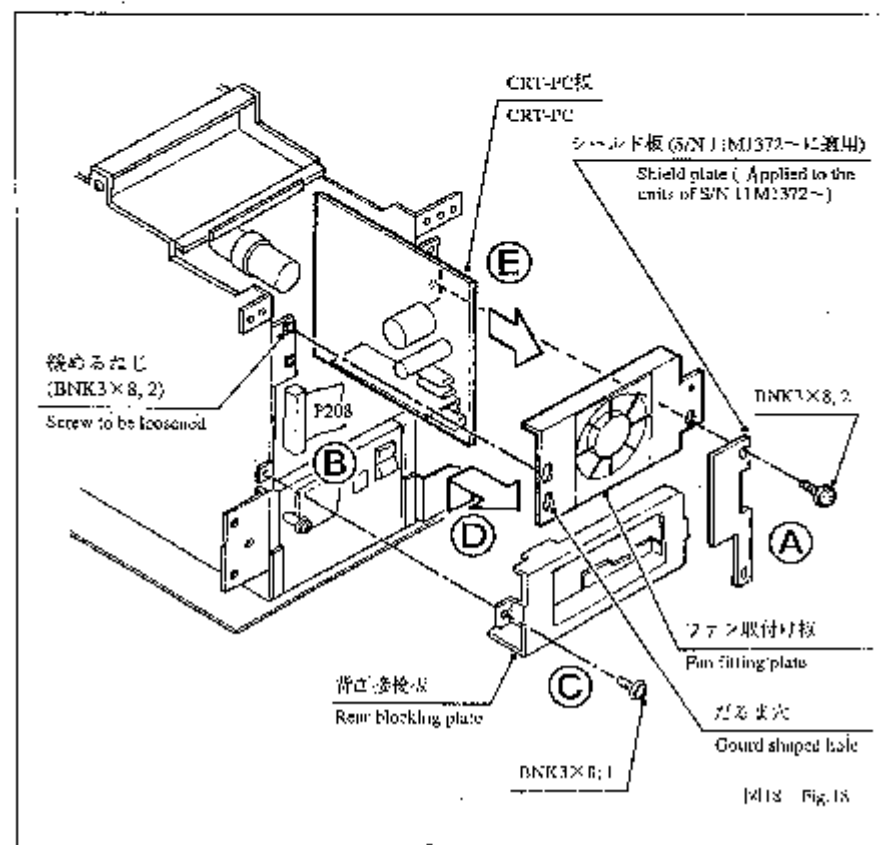


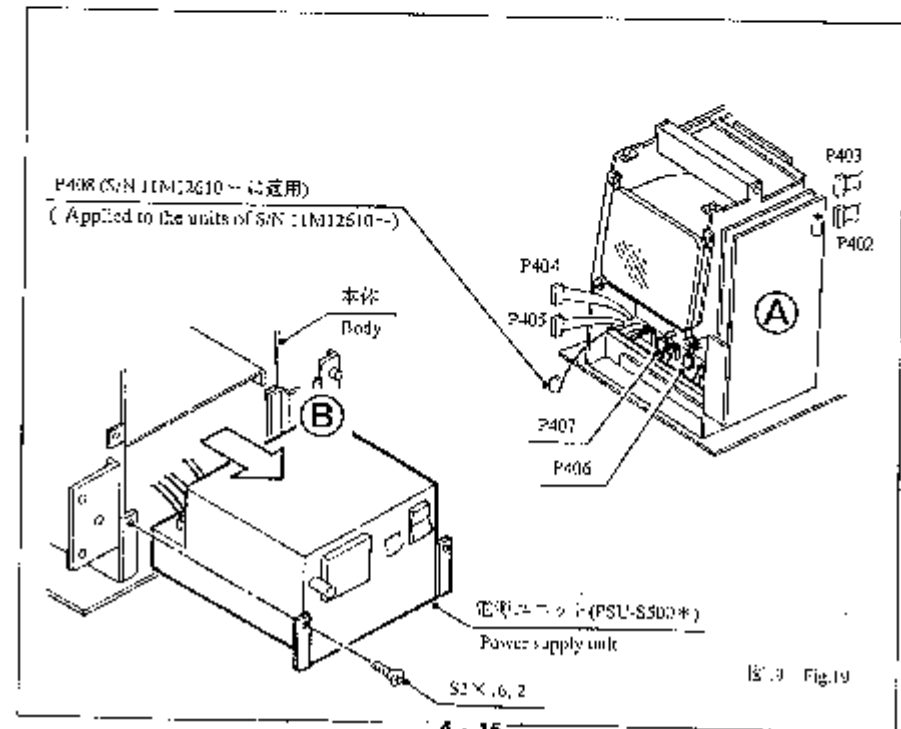
Fig. 18

12. 電源ユニットの取り外し方法

12. Power supply unit dismounting procedure

- (1) 本体前面にあるコネクタ(P407・P406)2本を電源ユニットより取り外す。(図中㉑)
- (2) 送受信PC板(EP-2868*, EP-2869*)に接続されているコネクタ(P402, P403)2本を取り外す。(図中㉒)
- (3) DSC-PC板(EP-2870*)に接続されているコネクタ(P404)を取り外す。(図中㉓)
- (4) パネルコントロールPC板(EP-2873*)もしくはDSC-PC板(EP-2872*)に接続されているコネクタ(P405)を取り外す。(図中㉔)
- (5) 背面受け板に接続されているコネクタ(P408)を取り外す。(図中㉕) (S/N 11M12610~に適用。)
- (6) 電源ユニットをねじ2本を外して本体から引き出す。(図中㉖)

- (1) Remove two connectors (P407, P406) on the front side of the body from the power supply unit. (㉑ in Fig.)
- (2) Remove two connectors (P402, P403) connected to Transmitted and Receiving PCB boards (EP-2868*, EP-2869*) (㉒ in Fig.)
- (3) Remove one connector (P404) connected to DSC board (EP-2870*) (㉓ in Fig.)
- (4) Remove one connector (P405) connected to Panel control PCB board (EP-2873*) or DSC-PCB board (EP-2872*) (㉔ in Fig.)
- (5) Remove one connector (P408) connected to the rear blocking plate (㉕ in Fig.) (Applied to the units of S/N 11M12610--)
- (6) Remove two screws and pull out the power supply unit from the body. (㉖ in Fig.)



4-2 JB-172 Disassembling instruction

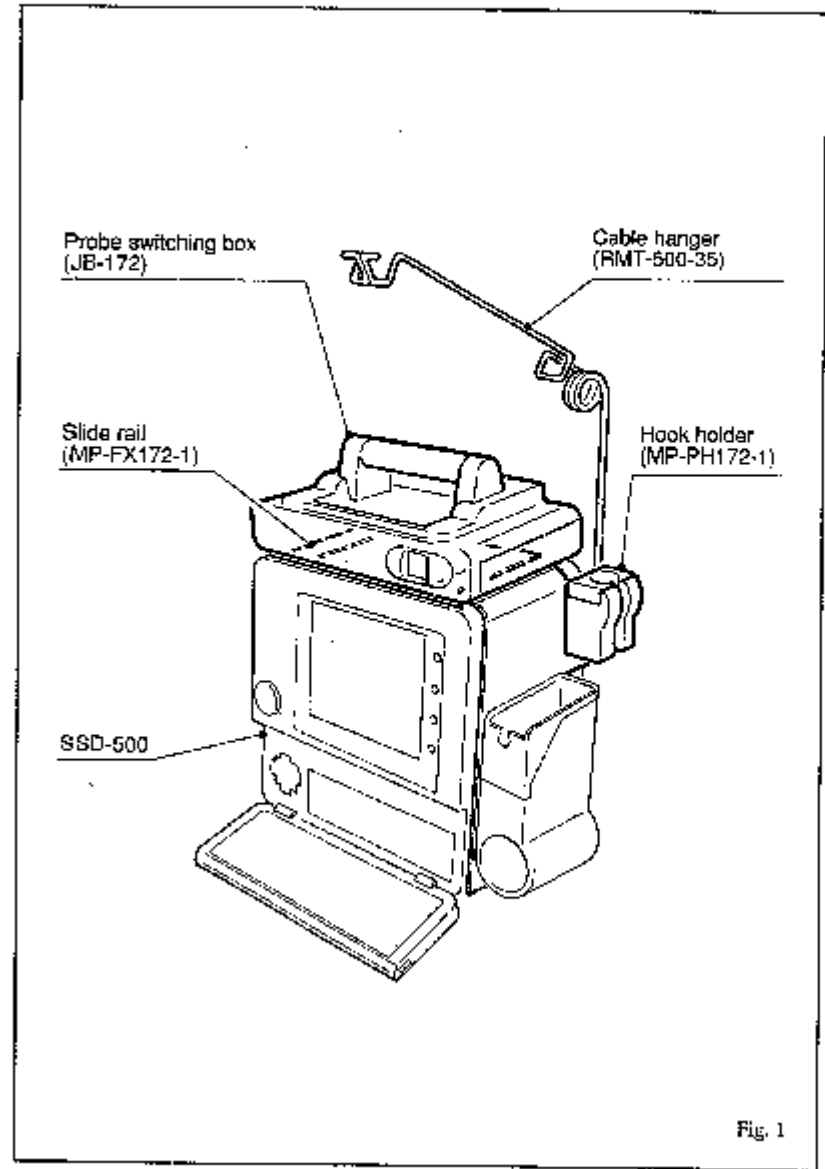
Refer this "disassembling Procedure" in order to disassemble correctly in the case of repair, modification or readjustment.

JB-172 Disassembling Instructions

1. Parts Identification
2. Individual PC Board Layout
3. Dismounting Flow Chart
4. Removing of Probe Switching Box (JB-172)
5. Removing of Covers
6. Removing of PC Boards (EP-3429* , EP-3430* , EP-3428*),
Switch PC Board (L-KEY-40)
7. Removing of US Cable (CABLE-4)

1

Parts Identification



2 Individual PC Boards Layout

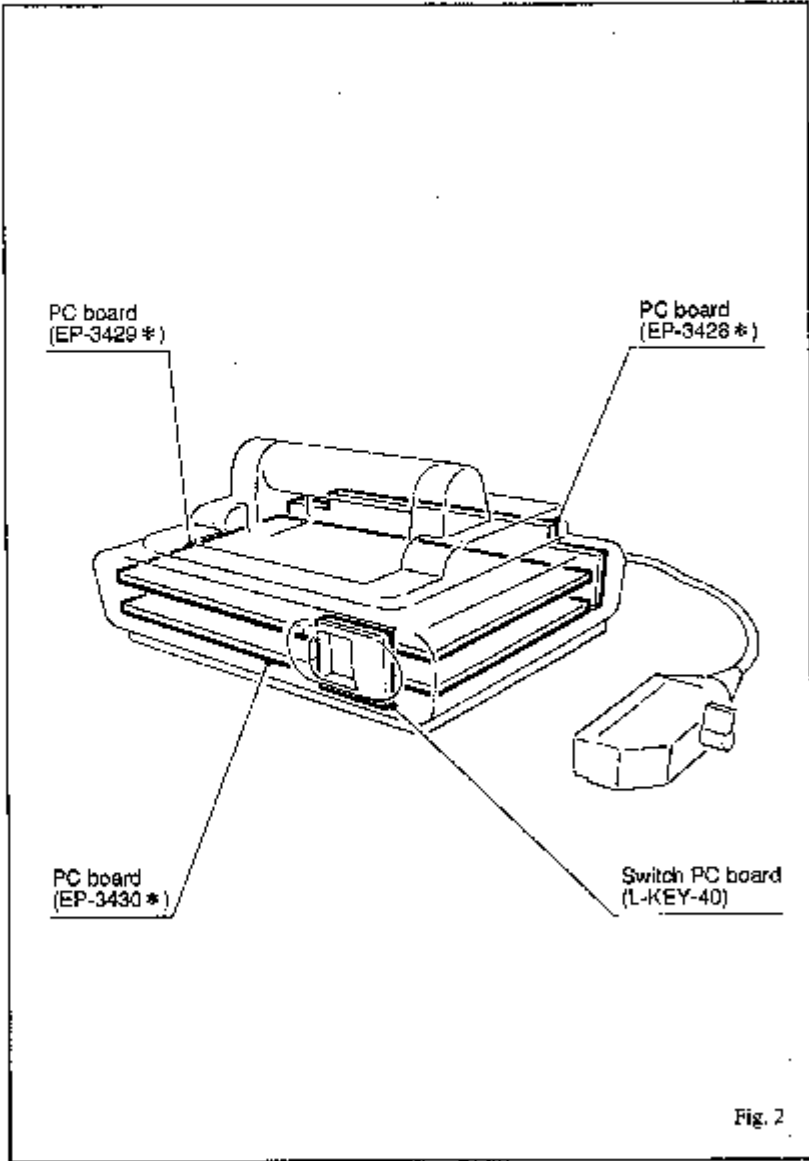
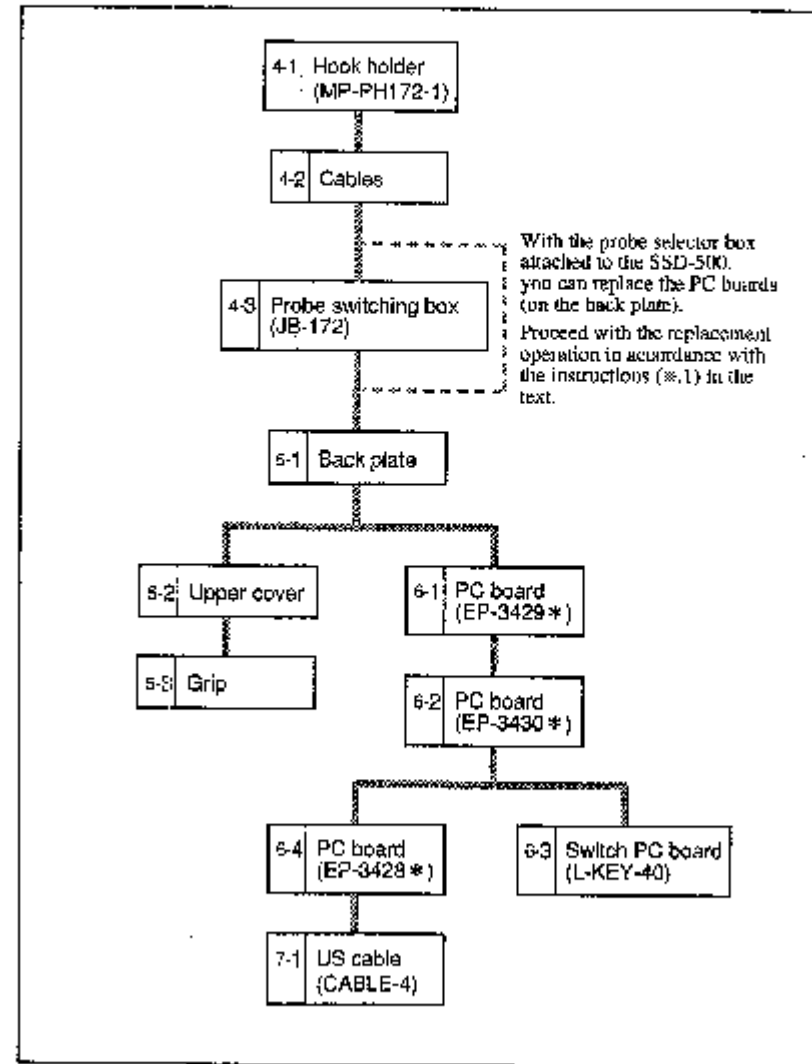


Fig. 2

3 Dismounting Flow Chart

The disassembly procedures are made based on the Dismounting Flow Chart.
 Conduct operations in accordance with the flow.
 Number in this paper is corresponding to No. in the flow chart.



4 Removing of Probe Switching Box (JB-172)

- 4-1. Hook holder Remove 5 screws and remove the hook holder. (A in Fig.)
- 4-2. Cables (1) Remove the probe connector. (B in Fig.)
(2) Remove the connector on the probe switching box side of the power supply cable. (C in Fig.)
- 4-3. Probe switching box Remove 2 screws and let the box slide backward as illustrated. (D in Fig.)

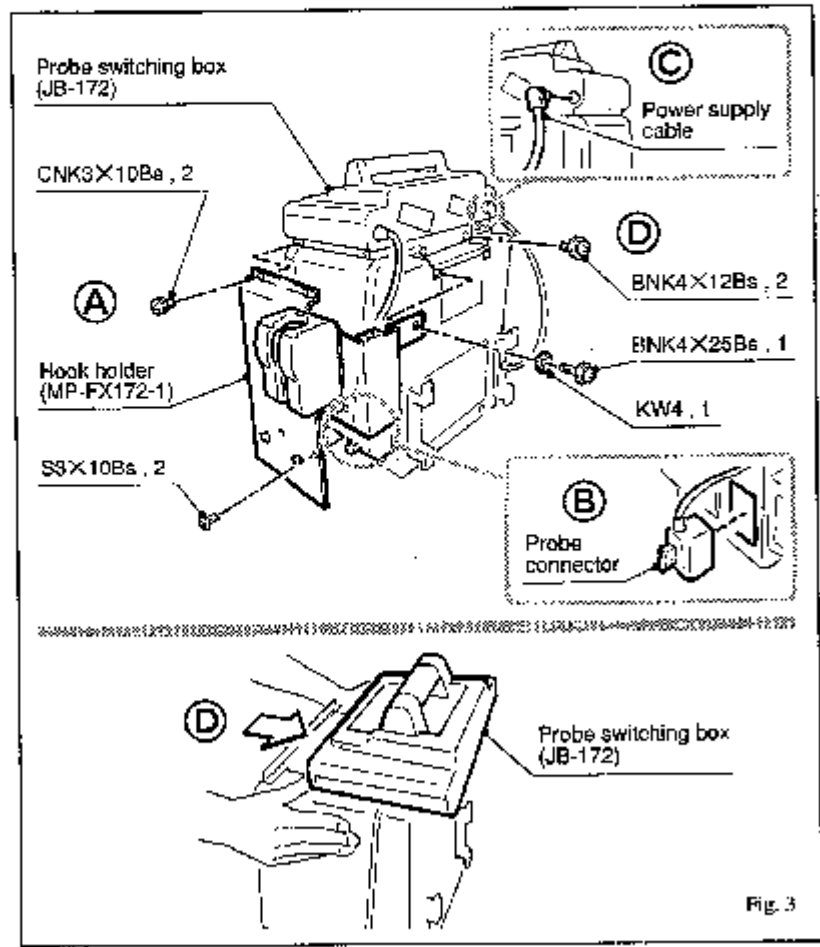
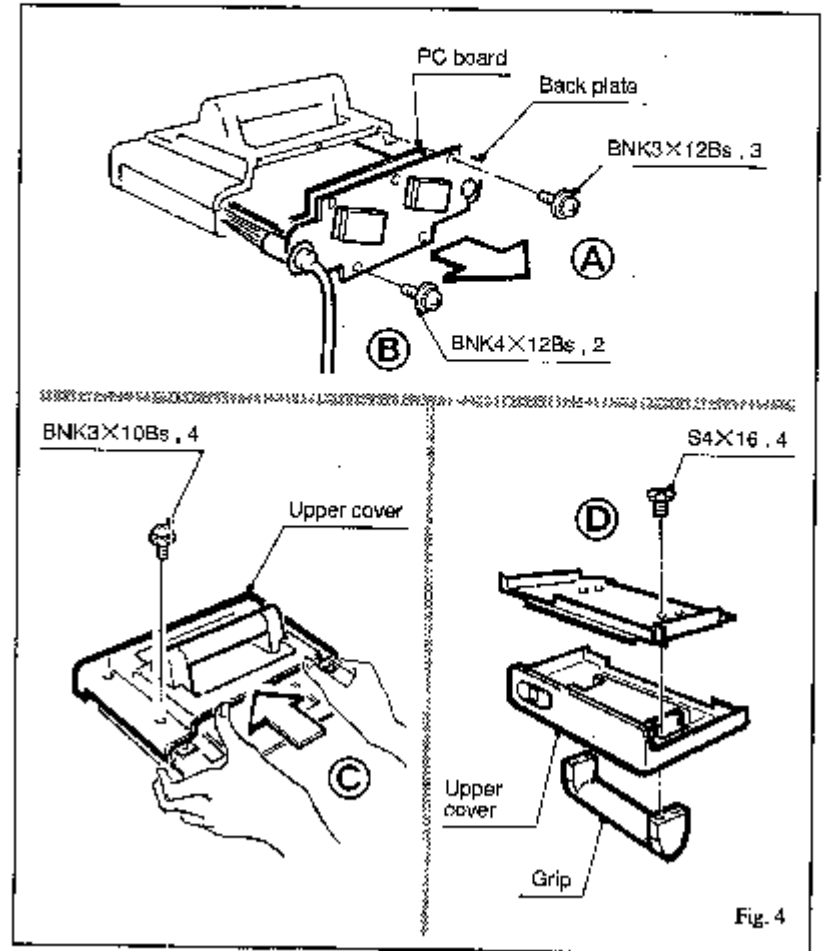


Fig. 3

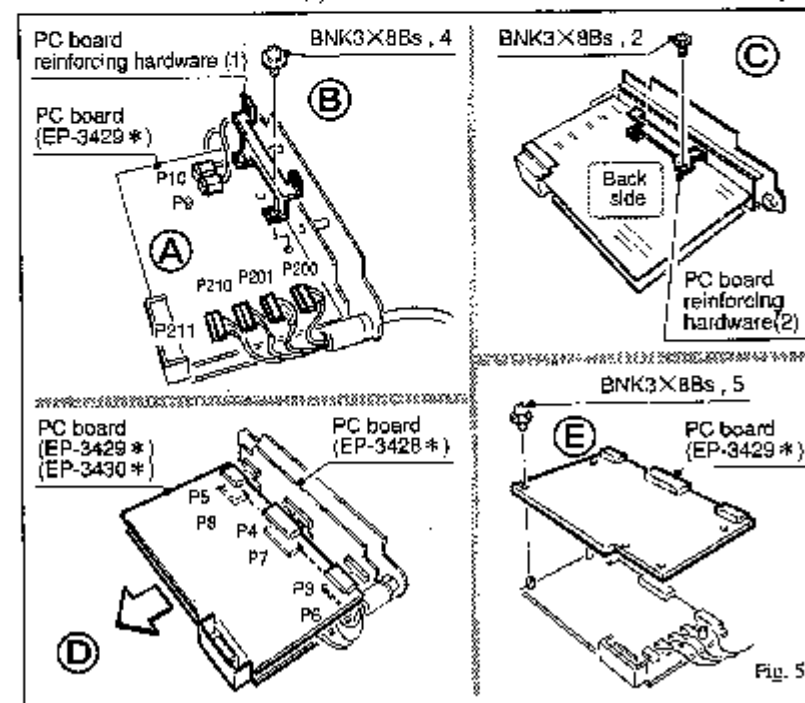
5 Removing of Covers

- 5-1. Back plate Remove 3 screws and pull out the back plate together with the PC boards. (Ⓐ in Fig.)
 - Ⓜ.1 Remove 2 screws to pull out the back plate, with the probe switching box remaining attached to the SSD-500. (Ⓜ in Fig.)
- 5-2. Upper cover Remove 4 screws and slide the upper cover backward as illustrated. (Ⓒ in Fig.)
- 5-3. Grip Remove 4 screws and remove the grip. (Ⓓ in Fig.)

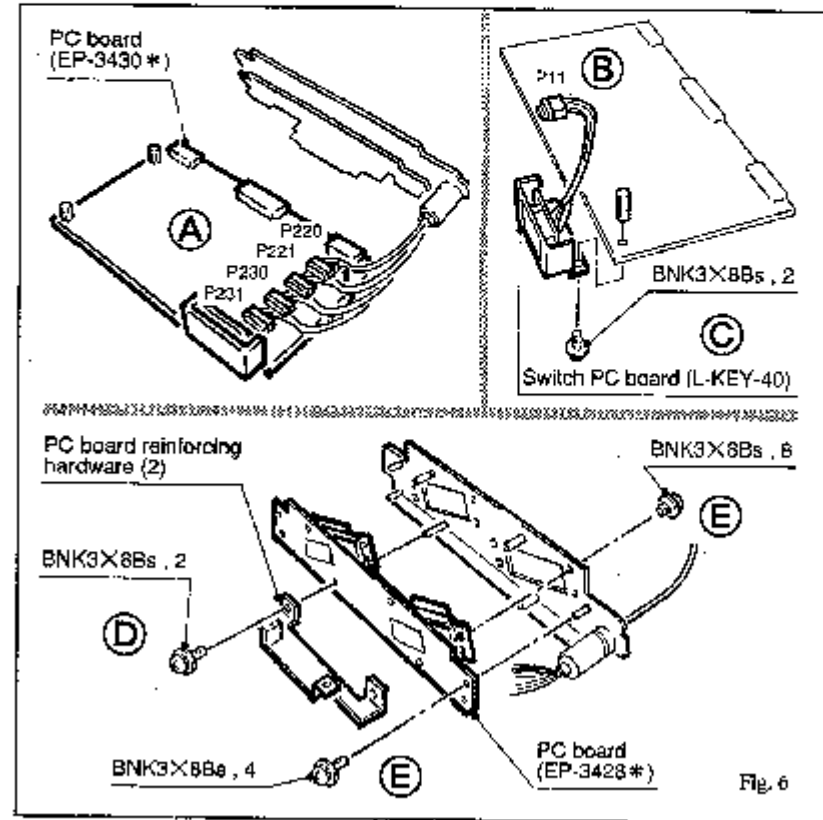


6 Removing of PC Boards (EP-3429*, EP-3430*, EP-3428*), Switch PC Board (L-KEY-4C)

- a-1. PC board (EP-3429*)
- (1) Remove the connectors. (Ⓐ in Fig.)
 - Connectors to be removed
[P211, P210, P201, P200, P9 and P10]
 - NOTE: Be cautions not to cut off the connectable cable which is thin.
 - (2) Remove 4 screws and remove the PC board reinforcing hardware (1). (Ⓑ in Fig.)
 - (3) Remove 2 screws from the PC board reinforcing hardware (2) on the back side of the PC board. (Ⓒ in Fig.)
 - (4) Pull the connectors on the 2 PC boards (EP-3429* and -3430*) out of the connectors on the PC board (EP-3428*). (Ⓓ in Fig.)
 - The PC boards (EP-3429* and -3430*) are secured with screws.
 - Connectors to be removed
[P3, P4, P5, P6, P7 and P8]
 - NOTE: Be cautions not to cut off any of the thin connector cables attached to the PC boards.
 - (5) Remove 5 screws and remove the PC board. (Ⓔ in Fig.)

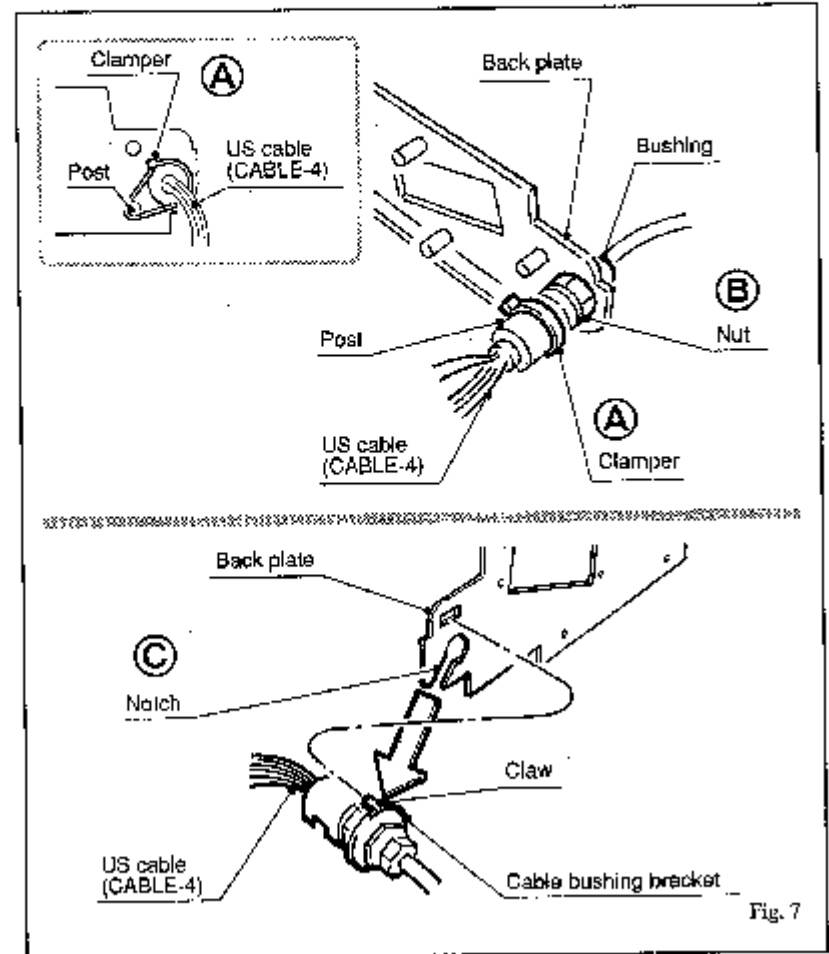


- 6-2. PC board (EP-3430*) Remove the connectors and remove the PC board. (Ⓐ in Fig.)
 ● Connectors to be removed [P220, P221, P230 and P231]
 NOTE: Be cautious not to cut off the connectable cable which is thin.
- 6-3. Switch PC board (L-KEY-40) (1) Remove the connectors. (Ⓑ in Fig.)
 ● Connectors to be removed [P11]
 (2) Remove 2 screws and remove the switch PC board. (Ⓒ in Fig.)
- 6-4. PC board (EP-3428*) (1) Remove 2 screws and remove PC Board reinforcing hardware (2). (Ⓓ in Fig.)
 (2) Remove 12 screws (4 on the rear and 8 on the front) and remove the PC board. (Ⓔ in Fig.)



7 Removing of US Cable (CABLE-4)

- 7-1. US cable (1) Remove the clumper with which the US cable is secured onto a post. (A in Fig.)
 NOTE: Do not cut off the clumper.
 (2) Loosen the nut on the bushing. (B in Fig.)
 (3) Remove the claw on the cable bushing bracket from the back plate and take off the US cable in line with a notch. (C in Fig.)



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4-3

JB-172 (SSD-500用探触子切り替えボックス) 据付要領書 JB-172 (PROBE SWITCHING BOX FOR SSD-500) INSTALLATION PROCEDURES

この据付要領書は、JB-172 の納品等の際、据付の資料としてご使用ください。

適用: S/N 11M12610～の装置に適用します。

S/N 11M12609 以前の装置には別途PM-500-13の改造が必要となります。

必要な工具: M3, M4 プラスドライバー 小型マイナスドライバー (据付先で用意すること)

These installation procedures are provided for reference in installation of the JB-172.

Application: Applicable to S/N 11M12610～

PM-500-13 modification is required for devices before S/N 11M12609

Tools required: M3, M4 Phillips screwdrivers, Small flat-blade screwdriver. (Prepared by assembler)




00

付属部品リスト

List of Accessory Parts

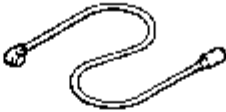






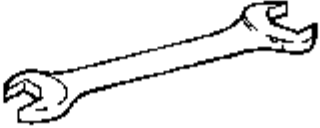
下記の付属品が揃っているか確認してください。

Check to assure all the below-listed accessory parts to have been included in the shipping case.

No.	品名 Parts Name	外観 Appearance	個数 Quantity
1	探触子切り替えボックス (JB-172) Probe switching box (JB-172)		1
2	本体取付け用アダプタ (MP-FX172-1) Main body mounting adapter (MP-FX172-1)		1
3	フックホルダ (MP-PH172-1) Hook holder (MP-PH172-1)		1

MS5-0306

4 - 27

No.	品名 Parts Name	外観 Appearance	個数 Quantity
4	電源ケーブル (Cable 2) Power supply cable (Cable-2)		1
5	付属ねじ (BNK 4×25 Bs) Accessory screw (BNK 4×25 Bs)		2
6	付属ねじ (BNK 4×12 Bs) Accessory screw (BNK 4×12 Bs)		2
7	付属ねじ (CNK 4×16 Bs) Accessory screw (CNK 4×16 Bs)		2
8	付属ねじ (CNK 3×10 Bs) Accessory screw (CNK 3×10 Bs)		2
9	付属ねじ (S 3×10 Bs) Accessory screw (S 3×10 Bs)		2
10	付属ワッシャー (KW4) Accessory washer (KW4)		2
11	スパナ (TS-15) Spanner (TS-15)		1

01 プローブホルダ、コネクタカバーの取り外し方法 Removing Probe Holder and Connector Cover

- (1) プローブホルダを次の手順で取り外す。
 ○ ツメを、矢印方向に引きながら、プローブホルダを上方向に持ち上げる。(図1㉔)
 ○ プローブホルダを、SSD-500前面にスライドさせて取り外す。(図1㉕)
- (2) コネクタカバーを次の手順で取り外す。
 ○ コネクタカバーのロックツメ2ヶ所を、マイナスドライバーを用いて図のように外す。(図2㉔)
 ○ コネクタカバーとリアカバーの隙間にマイナスドライバーを差し込み、コネクタカバーを抜き出す。(図2㉕)
- 注意** コネクタカバーとリアカバーの隙間に、指を入れないこと。(図2㉔)

- (1) Remove the probe holder in the following procedures.
 ○ Lift the probe holder while pulling the claw in the arrow mark direction. (㉔ in Fig.1)
 ○ Slide the probe holder to the front face of SSD-500 and remove. (㉕ in Fig.1)
- (2) Remove the connector cover in the following procedures.
 ○ Release 2 lock claws of the connector cover with a flat blade screwdriver as shown in the figure. (㉔ in Fig.2)
 ○ Insert the flat-blade screwdriver into the gap between the connector cover and the rear cover, and extract the connector cover. (㉕ in Fig.2)
- CAUTION** Do not put the finger into the gap between the connector cover and the rear cover. (㉔ in Fig.2)

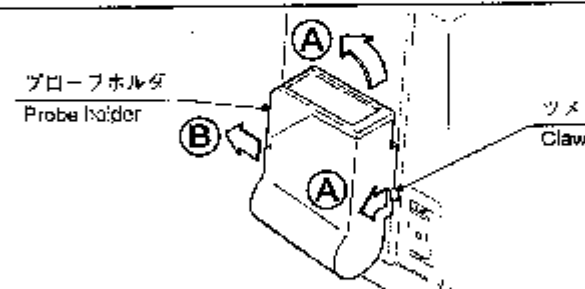


図1 Fig.1

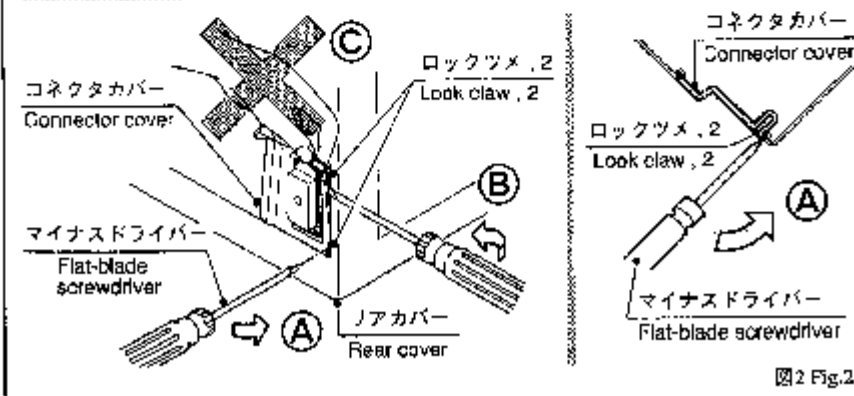


図2 Fig.2

02

リアカバーの取り外し方法

Removing Rear Cover

(1) SSD-500背面のVIDEO INT / EXT 切り替えスイッチを上側 (INT側) にし、リアカバーを、ねじ6本を外して後方に引き抜いて取り外す。(図3②)

注: 外したねじ(CNK3×8B) 2本は再度使用するのだからなくさないようにすること。

(2) コマ2個を、ねじ各1本を外してそれぞれ取り外す。(図3③)

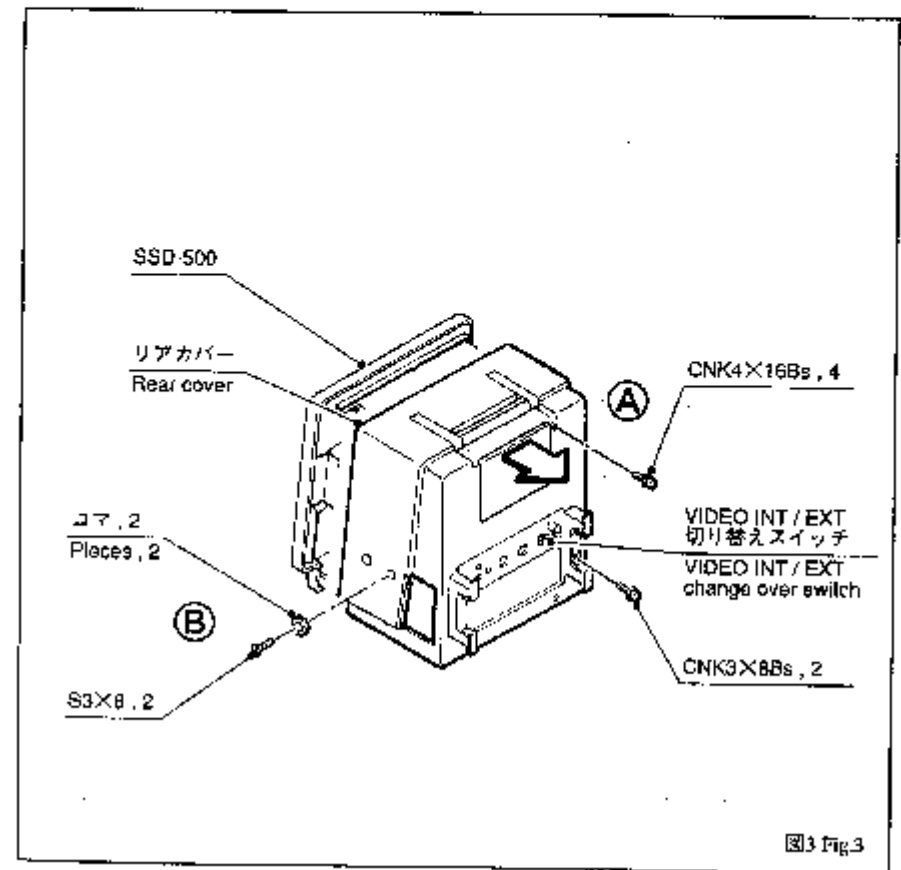
* 取り外したコマは今後不要。

(1) Turn the VIDEO INT / EXT change over switch on the back face of SSD-500 to the upper side (INT side), and remove 6 screws and draw the rear cover and remove. (② in Fig.3)

Note: Be sure not to lose the 2 screws (CNK3×8Bs) removed as they are used again.

(2) Remove 1 screw and remove 2 pieces respectively. (③ in Fig.3)

* Pieces removed are not required.



03

把手の取り外し方法

Removing Handle

(1) 把手を、ボルト2本を外して取り外す。(図4④)

注: 外したボルト2本は再度使用するのでもなくさないようにすること。

※ 取り外した把手は今後不要。

S/N11M11288 以前の装置は、まれにボルトが空回りして把手が外れない事があるのでその場合は、保守パーツとしてリアカバーを交換して取付けるようにすること。

(1) Remove 2 bolts and remove the handle. (④ in Fig.4)

Note: Be sure not to lose the bolts removed as they are used again.

※ Handle removed is not required.

On the units of which S/N is 11M11288 and smaller, in rare cases, the bolt spins endlessly and the handle cannot be removed.

To the Users

If the above trouble happens, please consult with your local distributor.

To the Distributors

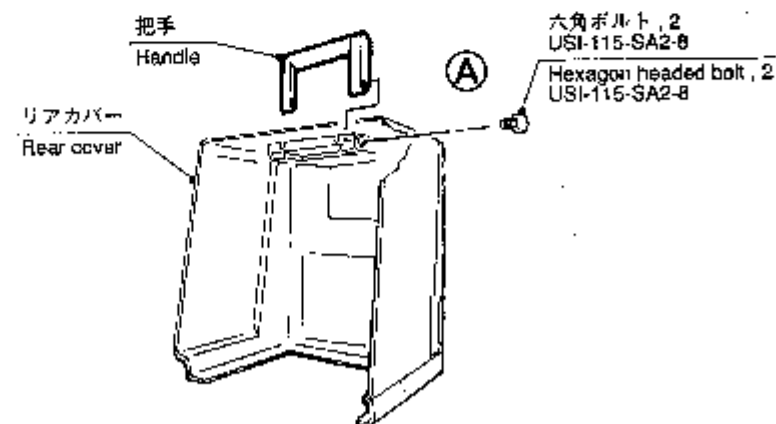
If the above trouble happens, we will supply a substitutive rear cover free of charge.

Ask the cover by the same route as that of ordinary maintenance parts with information about the serial number and the power voltage.

First of all, we will send a rear cover and a blank label.

Write the serial number and the power voltage on it, and stick it to the cover. You are requested to send back the cover to us immediately.

We will send a plate on which the serial number and the power voltage is engraved within a month. Adhere the plate instead of the label.

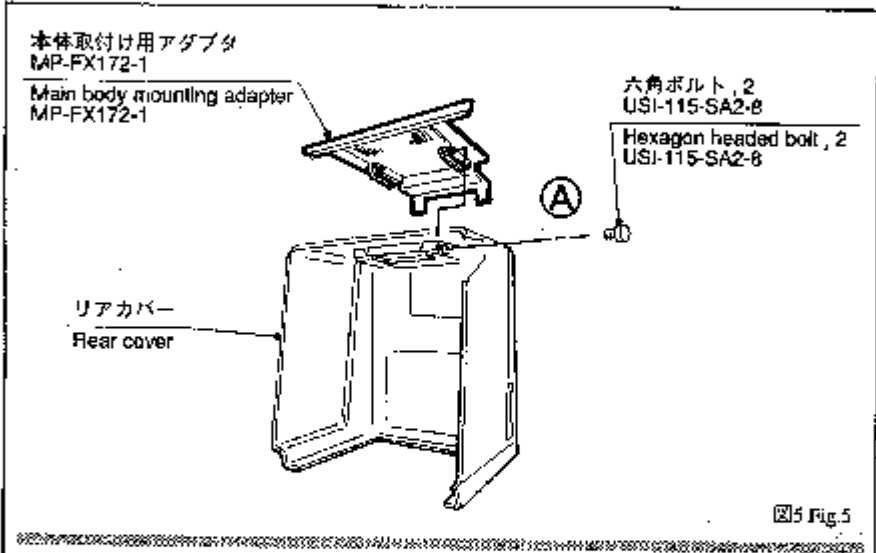


④ Fig.4

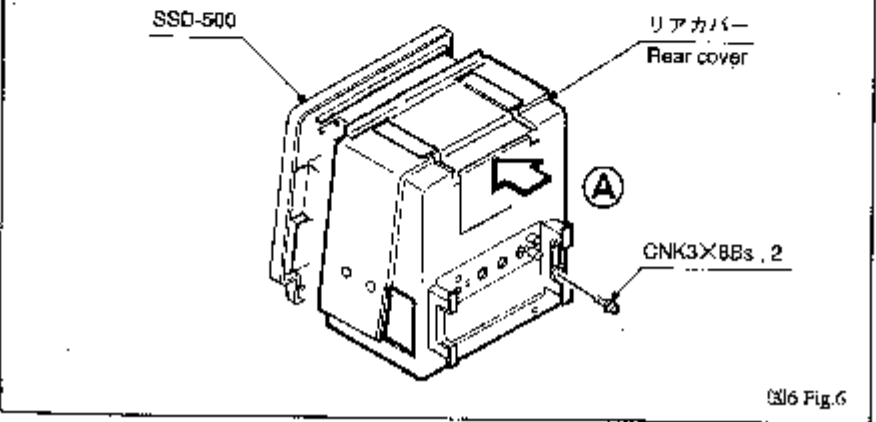
04 本体取付け用アダプタ(MP-FX172-1)の取付け方 Mounting of the Main Body Mounting Adapter (MP-FX172-1)

- (1) 本体取付け用アダプタを、把手を外したボルト2本で取付ける。(図5②)
 - (2) リアカバーを、取り外したねじ2本を使用して取付ける。(図6②)
- 注: フロントカバーとリアカバーが確実に装着されているか確認すること。

- (1) Mount the main body mounting adapter with 2 bolts removed from the handle. (② in Fig.5)
 - (2) Mount the rear cover with 2 screws removed. (② in Fig.6)
- Note: Check the front cover and the rear cover are surely mounted.



⑤ Fig.5



⑥ Fig.6

05 探触子切り替えボックス(JB-172)の取付け方法 Mounting of the Probe Switching Box (JB-172)

(1) 探触子切り替えボックスを、レールを本体取付け用アダプタのレールに合わせ、取付ける。
(図中Ⓐ)

(1) Match the rail of the probe switching box to the rail of the main body mounting adapter,
and mount the probe switching box. (Ⓐ in Fig.)

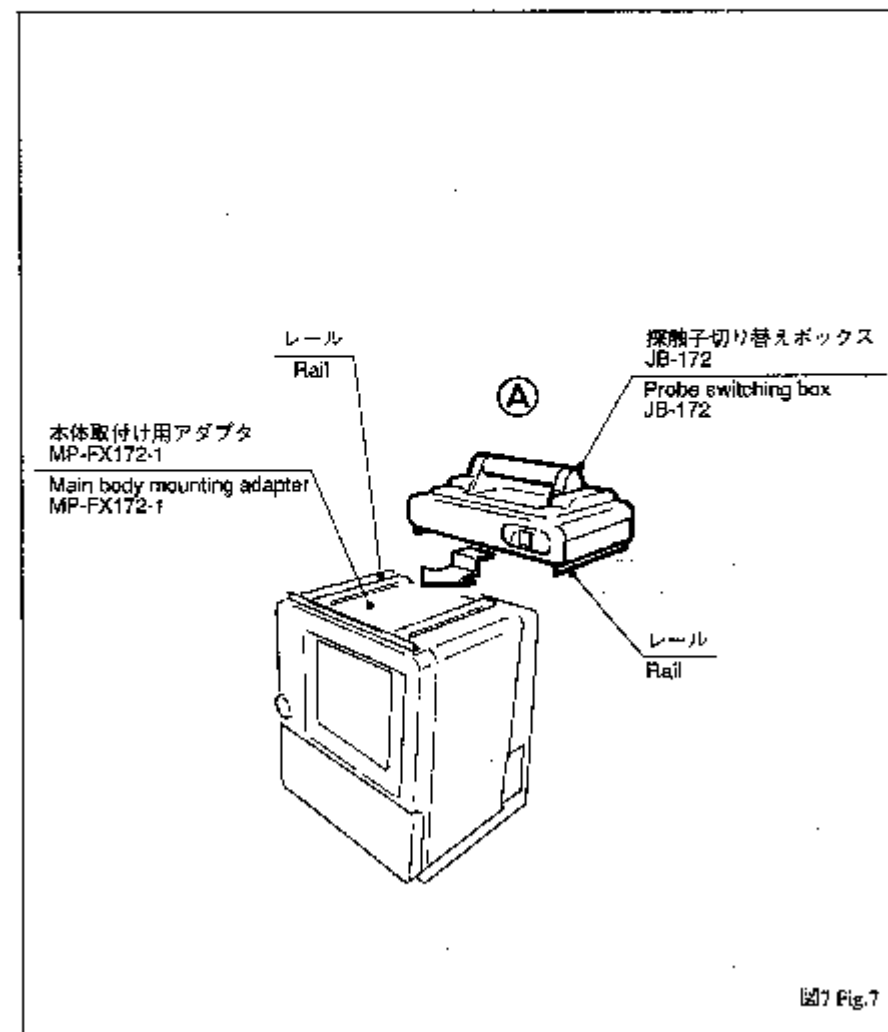
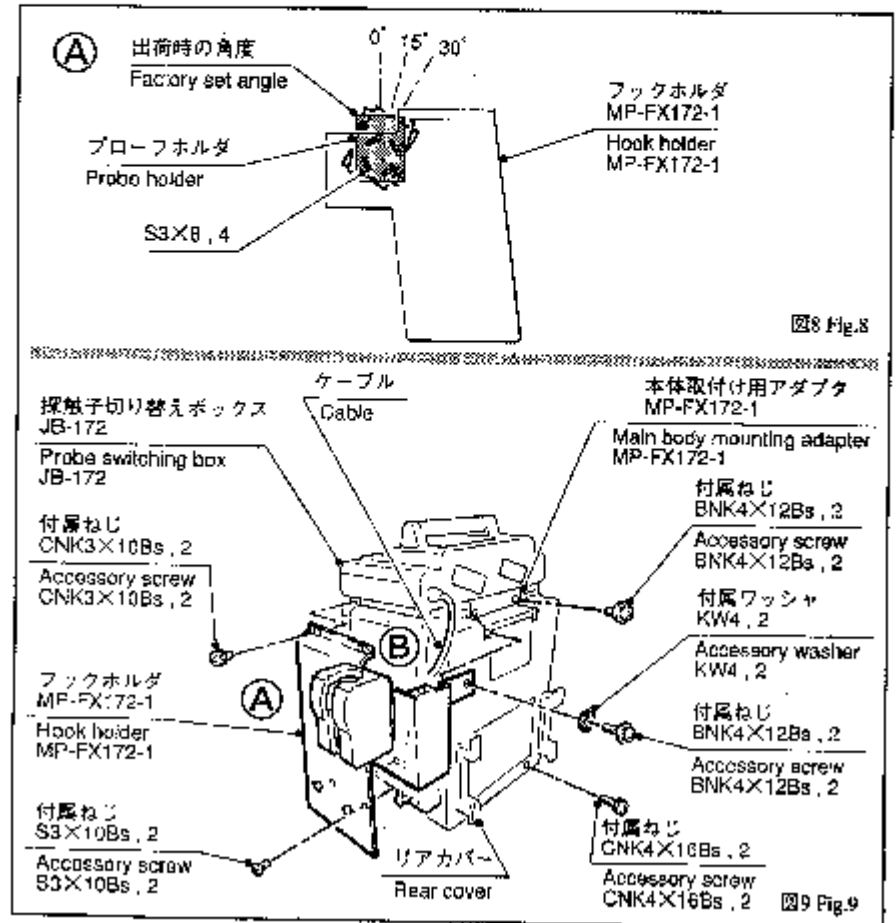


図7 Fig.7

06 フックホルダ(MP-FX172-1)の取付方法 Mounting of the Hook Holder (MP-FX172-1)

- ※ プローブホルダの角度は、3段階に調整可能。
 出荷時の角度以外に設定する場合のみ(1)の作業が必要。
- (1) プローブホルダを、ねじ4本を外し、任意の角度に設定し取付ける。(図8⑧)
- (2) フックホルダを、付属ねじ10本、付属ワッシャ2個で探触子切り替えボックス、本体取付け用アダプタ、リアカバーと共締めにする。(図9⑨)
- 注: ケーブルはSSD-500とフックホルダの間に挿すこと。(図9⑩)

- ※ 3 probe holder angles are available.
 Work (1) is required when you wish to change the factory set angle.
- (1) Remove 4 screws, set the probe holder to any desired angle, and mount. (⑧ in Fig.8)
- (2) Clamp the hook holder together with the probe switching box, main body mounting adapter and the rear cover with 10 accessory screws and 2 accessory washers. (⑨ in Fig.9)
- Note: Pass the cable through SSD-500 and the hook holder. (⑩ in Fig.9)



07 コネクタカバーの取付け方法 Mounting of the Connector Cover

- (1) コネクタカバーを、次の手順でリアカバーに取付ける。
 - コネクタカバーの溝を、リアカバーの出っ張りには合わせる。(図10㉔)
 - コネクタカバーのロックツメ2ヶ所が、リアカバーにカチッとハマるまで押し込む。(図10㉕)
- (2) 探触子切り替えボックスのコネクタを、SSD-500に接続する。(図11㉔)
- (3) 電源ケーブルを、一方を探触子切り替えボックスに、もう一方をSSD-500に接続する。(図11㉕)

- (1) Mount the connector cover in the following procedures.
 - Mate the groove of the connector cover to the projection of the rear cover. (㉔ in Fig.10)
 - Push 2 lock claws of the connector cover to the rear cover until the claws are linked in the rear cover. (㉕ in Fig.10)
- (2) Connect the connector of the probe switching box to SSD-500. (㉔ in Fig.11)
- (3) Connect 1 end of the power supply cable to the probe switching box and the other to SSD-500. (㉕ in Fig.11)

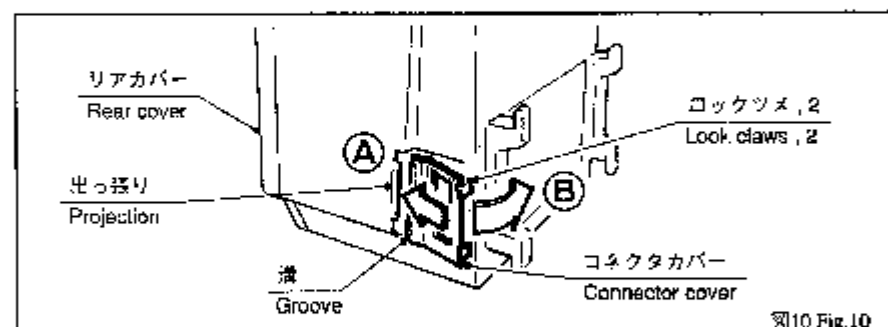


図10 Fig.10

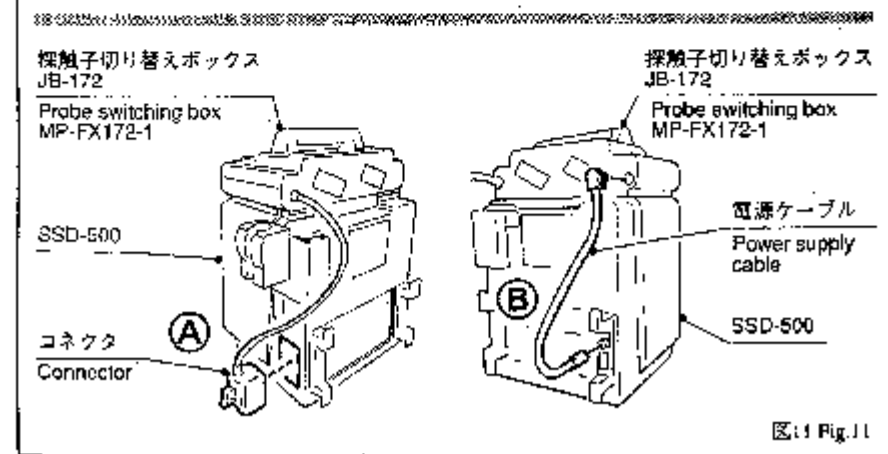


図11 Fig.11

08

プローブホルダの取付け方法

Mounting of the Probe Holder

(1) プローブホルダを、次の手順で取付ける。

- SSD-500(側面)のガイドピン①に、プローブホルダのダルマ穴②を合わせて後方にスライドさせる。(図中②)
 - ガイドピン①を、中心にプローブホルダを下方方向に回転させるとガイドピン①にダルマ穴②が納まる。(図中③)
- この時、カチッと音がして確実に装着されたことを確認すること。

(1) Mount the probe holder in the following procedures.

- Mate the bell shape hole ② of the probe holder to the guide pin ① of the side face of SSD-500, and slide backwards. (② in Fig.)
- Place the guide pin ① in the center and turn the probe holder in the lower direction, the bell shape hole ② is accommodated in the guide pin ②. (③ in Fig.)

This time, be sure to check that the hold is surely accommodated by clicking.

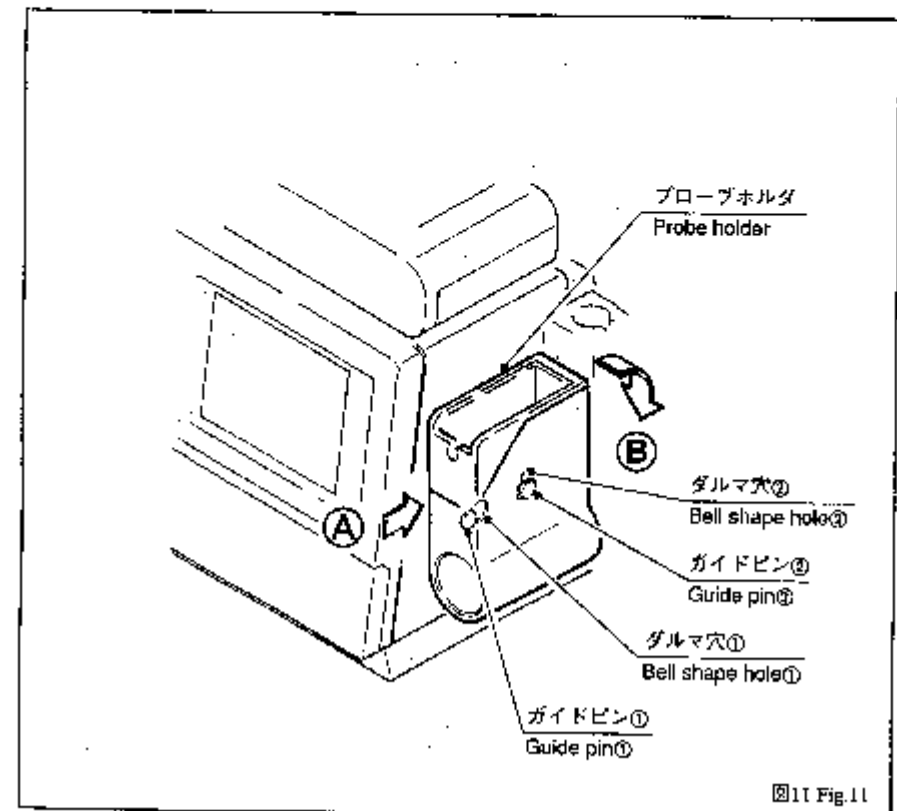


図11 Fig.11

09 フックホルダアダプタの使用方法 Using of the Hook Holder Adaptor

※ プローブホルダは、各プローブに対応しているが、マイクロコンベックス(20R)を収納する
場合のみ下記の作業が必要。

(1) プローブホルダアダプタを、プローブホルダに取付ける。(図中Ⓐ)

※ The probe holder is fit for each probe.
However, the following work is required when accommodating microconvex (20R).

(1) Mount the probe holder adaptor on the probe holder. (Ⓐ in Fig.)

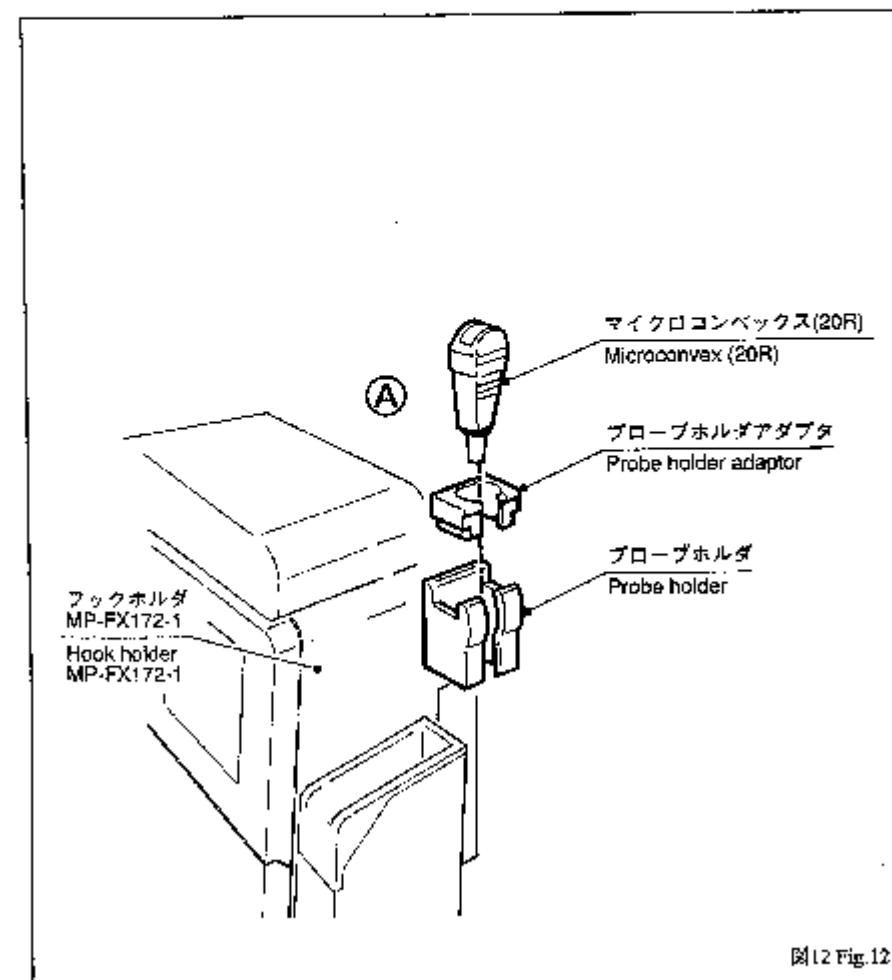


図12 Fig.12

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付属部品リスト

下記の付属部品が揃っているか確認して下さい。

必要な工具

M4 Phillips スクリュードライバー (組立て先で御用意下さい。)

List of Attached Parts

Check to assure all the below-listed accessory parts to have been included in the shipping case.

Tool Required

M4 Phillips screwdriver (Please prepare by yourself)

No.	品名 Parts Name	外 観 Appearance	個数 Quantity
1	アイソレーション トランス (PTU-019) Isolation transformer (PTU-019)		1
2	電源ケーブル (CP-107) Power supply cable (CP-107)		1
3	付属ねじ M4×12 Accessory screw M4×12		4
4	予備ヒューズ (326-010) Spare Fuse (326-010)		2

- (1) 固定金具2個を、各ねじ1本を外してそれぞれ取り外し、ケーブル用カゴを取り外す。(図中㉔)
- (2) 付属ねじ2本を、RMT-500ベース部の図の位置に仮止めしておく。(図中㉕)

- (1) Remove 2 fixing metal fittings by taking out each screw respectively, and remove the cable basket. (㉔ in Fig.)
- (2) Fit 2 accessory screws temporarily to the positions of the RMT-500 base in the figure. (㉕ in Fig.)

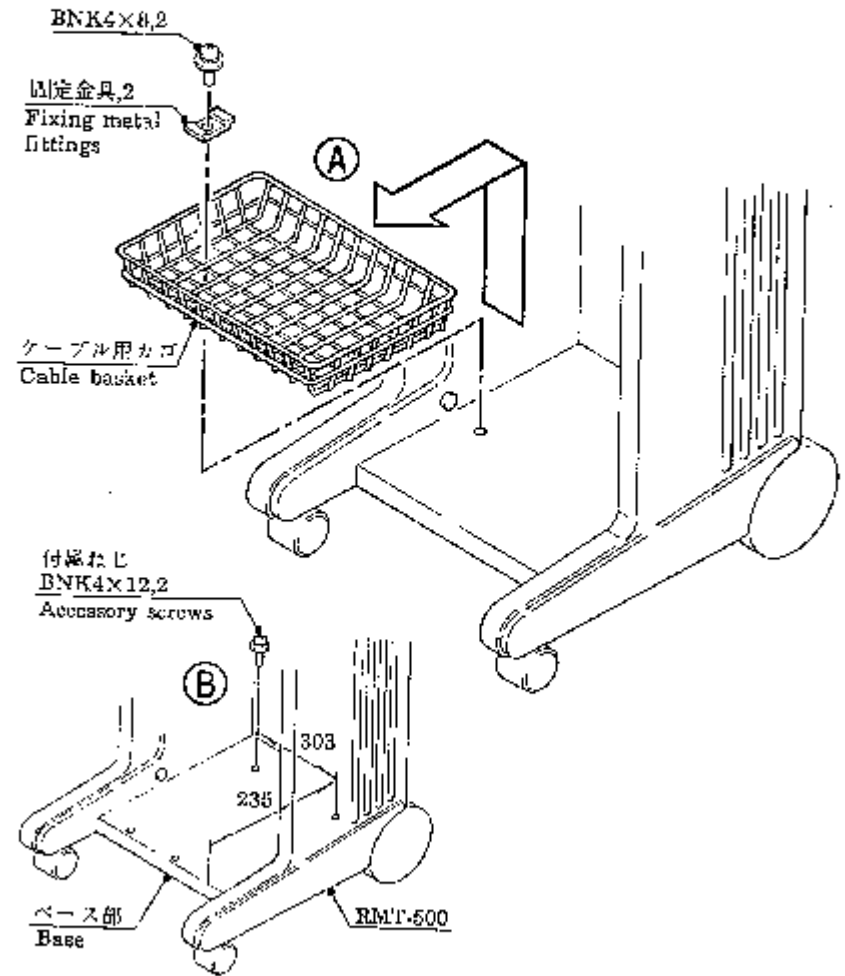


図1 Fig.1

- (3)アイソレーショントランスを、切りかきを(2)で取り付けたものに合わせ、ベース部に嵌せよ。(図中③)
- (4)付属ねじ2本を、アイソレーショントランス前面に仮止めする。(図中④)
- (5)アイソレーショントランスを、(2)及び、(4)で仮止めしておいたねじ4本を締めつけ固定する。(図中⑤)

- (3)Fit the notch to the screw mounted in (2) and place the isolation transformer on the base. (③ in Fig.)
- (4)Fit 2 accessory screws temporarily to the front side of the isolation transformer. (④ in Fig.)
- (5)Clamp 4 screws fit temporarily in (2) and (4), and fix the isolation transformer. (⑤ in Fig.)

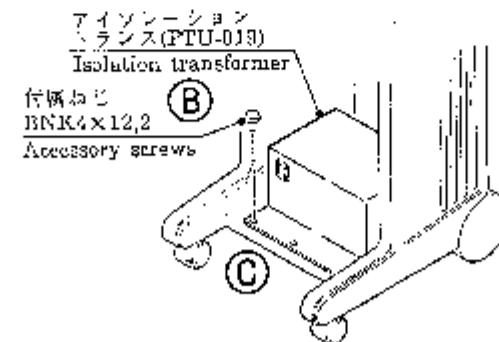
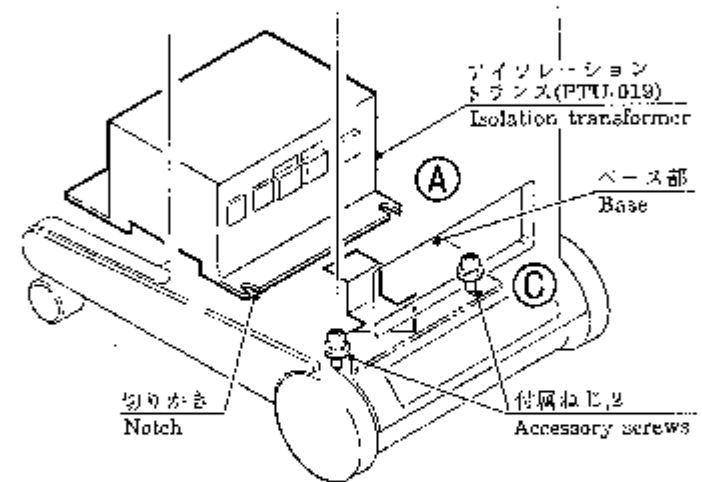


図2 Fig.2

(6)SSD-500の電源ケーブルを、アイソレーショントランスの電源コンセントに接続する。(図中⑥)

(7)付属の電源ケーブルの一方を、アイソレーショントランスの電源コネクタに接続し、もう一方を、外部電源コンセントに接続する。(図中⑦)

※たるんだケーブルは、RMT-500の棚にしまってください。(図中⑧)

(6)Connect the power supply cable of SSD-500 to the power supply receptacle of the isolation transformer. (⑥ in Fig.)

(7)Connect one of the accessory power supply cable to the power supply connector of the isolation transformer, and connect the other to the external power supply receptacle. (⑦ in Fig.)

※Put up the loose cable on the rack of RMT-500. (⑧ in Fig.)

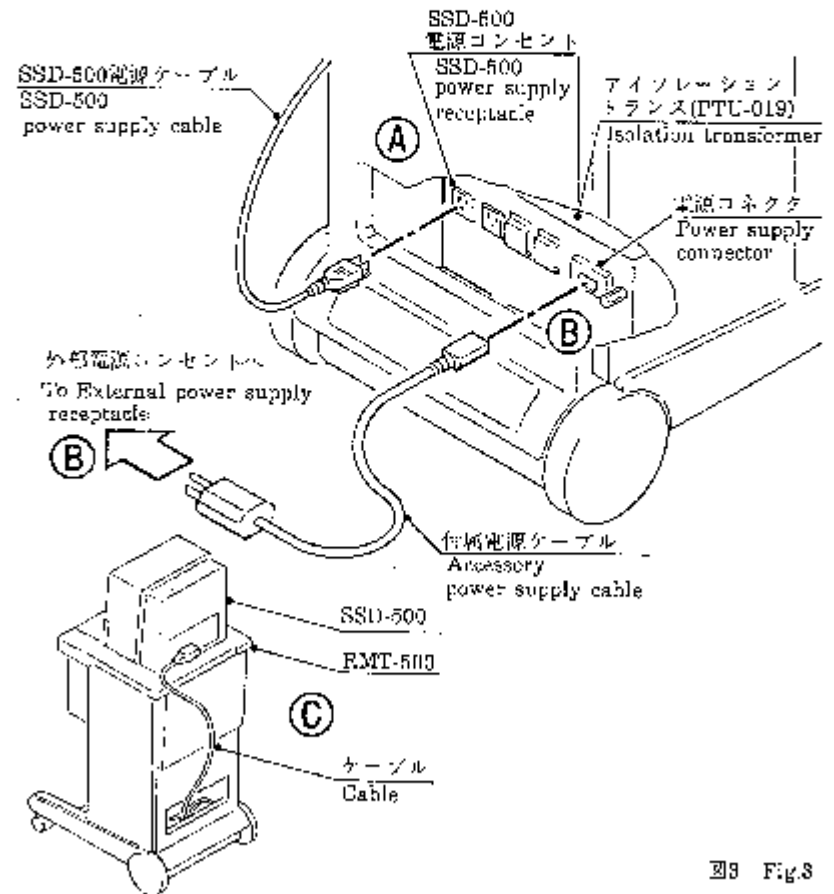


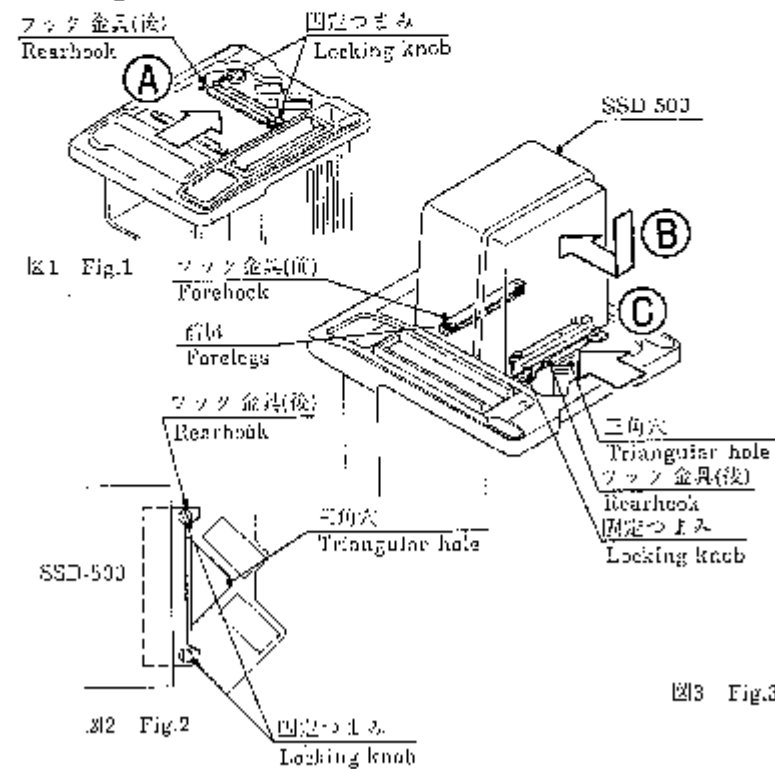
図8 Fig.8

1. SSD 500の取り付け方法

- (1) 固定つまみ2個をゆるめ、フック金具(後)を後方一杯までスライドさせる。(図1②)
- (2) SSD-500を天板に載せて、前脚がフック金具(前)の切り欠きに入る様に、前方へ移動させる。(図2④)
- (3) フック金具(後)を図2のようにスライドさせ、固定つまみを2本締め付け固定する。(図3③)
注: フック金具の端面に三角穴の端がそろう位置で固定する。

1. Installing SSD-500

- (1) Loosen the two locking knobs, and slide the rearhook backward to the extreme end. (② in fig.1)
- (2) Place the SSD-500 on the ceiling plate, and move it forward so that its forelegs fit the notches in the forehook. (④ in fig.2)
- (3) Slide the rearhook as shown in figure 2, and secure it in position with two locking knobs. (③ in fig.3)
Note: Fix the rearhook in such a position that the end of the triangle hole is aligned to the end face of the rearhook.

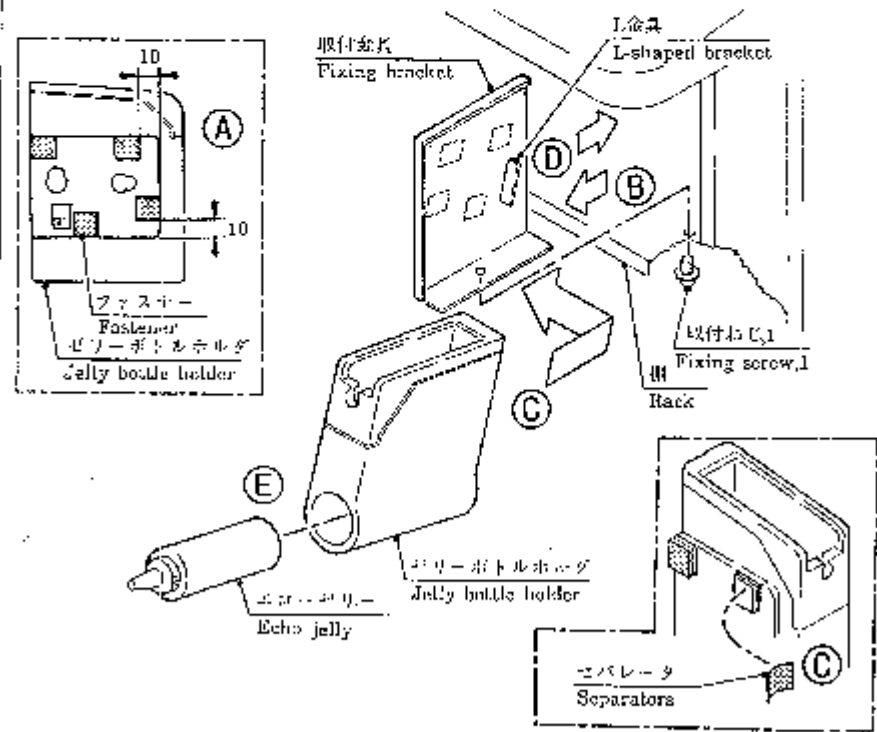


2.ゼリーボトルホルダの取り付け、及び、エコーゼリーの収納方法

- (1)ゼリーボトルホルダに付属のファスナーのセパレータをはがし、図の様に4ヶ所貼り付ける。(図中②)
- (2)取付ねじ1本を外し、取付金具を机から取り外す。(図中③)
- (3)ファスナーのセパレータをはがし、ゼリーボトルホルダを取付金具にL金具の傾斜に合わせて取り付ける。(図中④)
- (4)取付金具を取付ねじ1本にて、再び取り付ける。(図中⑤)
- (5)エコーゼリーをゼリーボトルホルダへ収納する。(図中⑥)

2.Installing jelly bottle holder and loading echo jelly

- (1)Peel off the separators of the fastener attached to the jelly bottle holder, and put them to 4 positions. (② in fig.)
- (2)Remove 1 fixing screw, and remove the clamp from the rack. (③ in fig.)
- (3)Peel off the separators from the other side of the fasteners, and install the holder according to the inclination of the L-shaped bracket. (④ in fig.)
- (4)Mount the clamp again with 1 fixing screw. (⑤ in fig.)
- (5)Load the echo jelly in the jelly bottle holder. (⑥ in fig.)



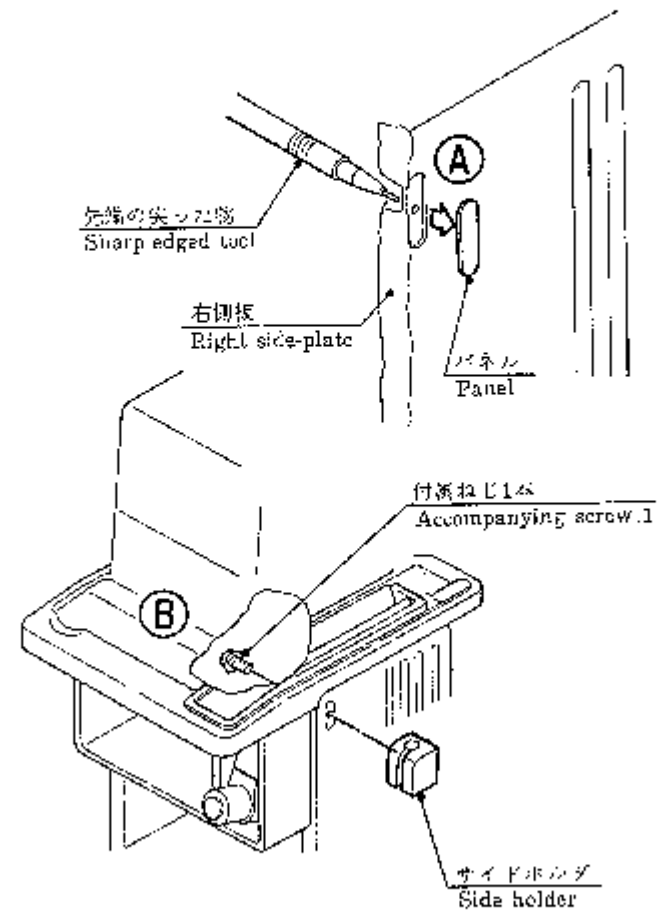
EX4 Fig.4

3. サイムホルダの取り付け方法

- (1) 右側板のパネル(両面テープで貼り付けてある)を、右側板内部より先端の尖った
場で押し返す。(途中③)
- (2) サイムホルダ付属ねじ1本で固定する。(④中⑤)

3. Installing Side Holder

- (1) Push out the panel, fixed with double-sided tape in the right side-plate,
with a sharp-edged tool from the inside of the right-side plate. (③ in Fig.)
- (2) Fix the side holder with one accompanying screw. (⑤ in fig)

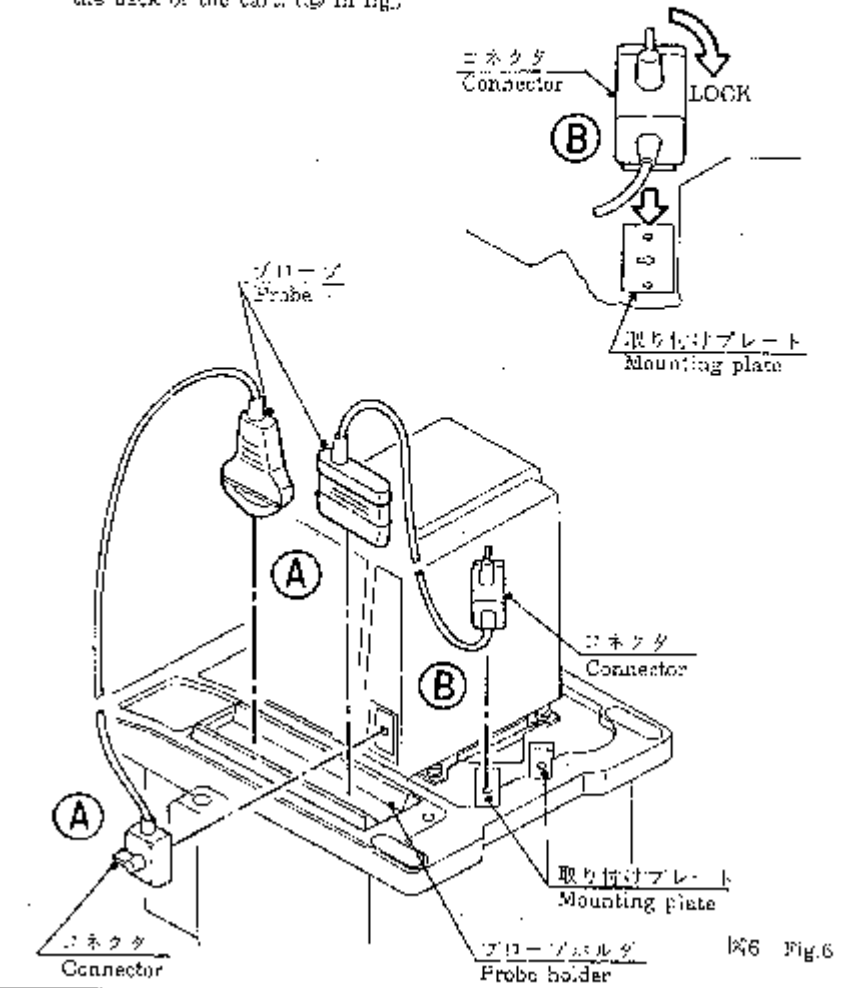


4.プローブの取り付け方法

- (1)使用するプローブのコネクタを、装置のコネクタへ接続し、プローブをプローブホルダへ入れる。(図中②)
- (2)使用しないプローブのコネクタは、台車後部にある取り付けプレートに固定する。(図中③)

4.Installing Probe

- (1)Fit the connector for the probe to be used to the connector on the SSD-500, and put the probe into the holder. (② in fig.)
- (2)Fix the connector for the probe not to be used to the mounting plates on the back of the cart. (③ in fig.)



146 Fig.6

3. ケーブルハンガの取り付け及びケーブルの引き廻し方法

(1) ケーブルハンガを、天板の取り付け穴に差し込む。(図中㉔)

(2) プロブのケーブルを、図の様に引き回す。(図中㉕)

3. Installing Cable Hanger and laying Cables

(1) Insert the cable hanger into the mounting hole in the ceiling plate.

(2) Lay the probe cables as shown in the figure. (3 in fig.)

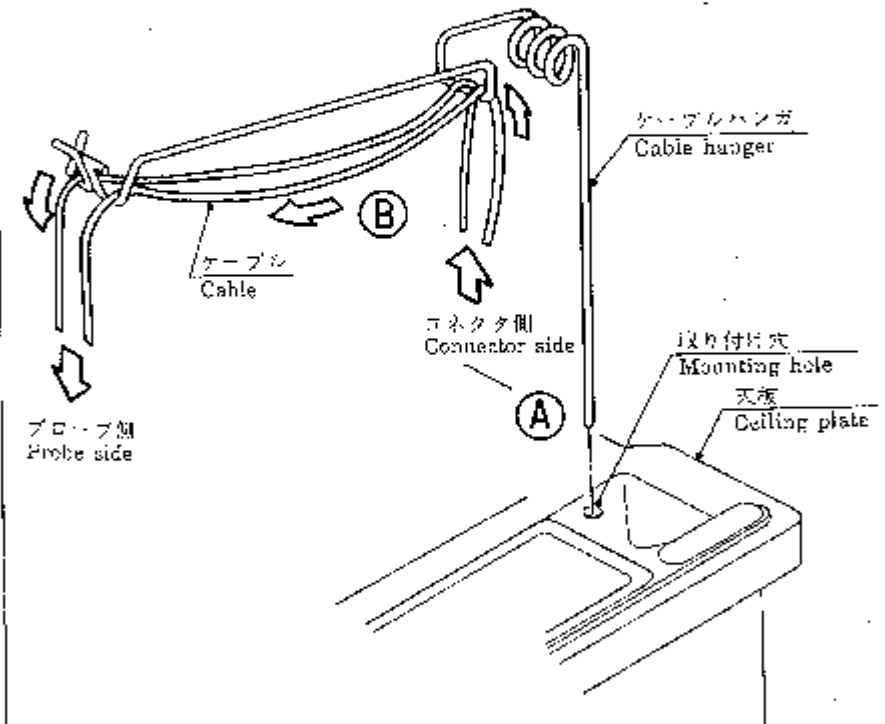


図7 Fig.7

6.VTR(AG-6400)の取り付け方法

- (1)付属のファスナーのセパレータを、はがしVTRの底面の4か所に区の様貼り付ける。(図中②)
- (2)バッテリーパックを、VTRに挿入する。(図中③)
- (3)ファスナーのセパレータをはがし、VTRを棚(F)に搭載する。(図中④)
- (4)VTRの信号ケーブルを、天板の三角穴を通しSSD-500に接続する。(図中⑤)
- (5)のVTRの電源ケーブルを、サービスコンセント(オプション)に接続する。(図中⑥)

6.Installing VTR (AG-6400)

- (1)Apply accompanying fasteners to the four places on the bottom of the VTR. (② in fig.)
- (2)Insert the battery pack into the VTR. (③ in fig.)
- (3)Remove separators from the fasteners and mount the VTR on the shelf (lower). (④ in fig.)
- (4)Connect the VTR signal cables to the SSD-500 through the triangular hole in the ceiling plate. (⑤ in fig.)
- (5)Connect the VTR power cable to the service receptacle (optional). (⑥ in fig.)

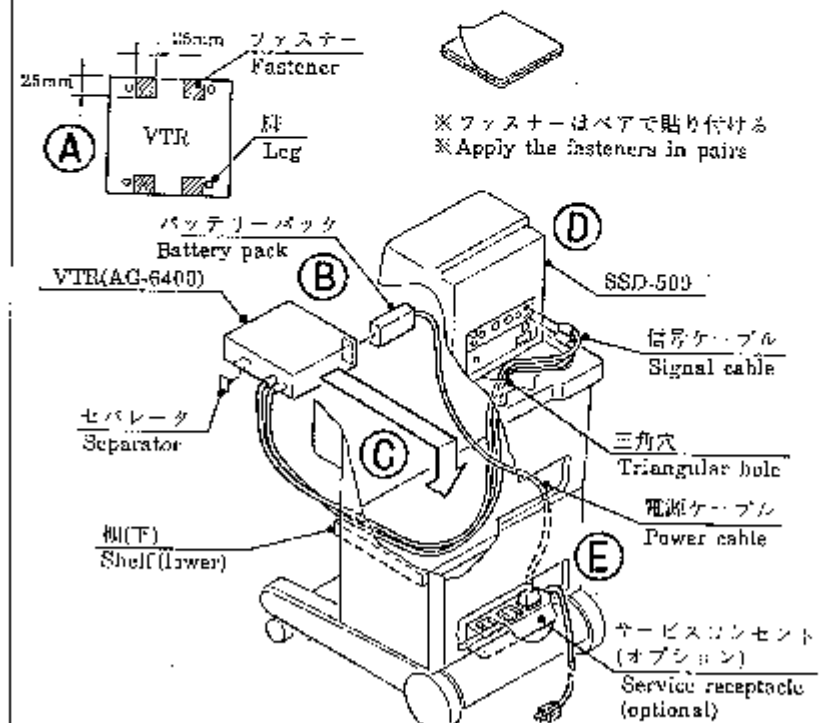


図8 Fig.8

7.ビデオプリンターの取り付け方法

- (1)付属のファスナーのセパレータを、はがしビデオプリンターの底面の4か所に
矢の跡に貼り付ける。(図中①)
- (2)ファスナーのセパレータをはがし、ビデオプリンターを棚(上)に搭載する。
(図中②)
- (3)ビデオプリンターの信号ケーブルを、天板の三角穴を差しSSD-500に接続
する。(図中③)
- (4)ビデオプリンターの電源ケーブルを、サービスコンセント(オプション)に接続
する。(図中④)

7.Installing Video Printer

- (1)Apply accompanying fasteners to the bottom of the video printer as shown
in the figure. (① in fig.)
- (2)Remove separators from the fasteners, and mount the printer on the
shelf (upper). (② in fig.)
- (3)Connect the video printer signal cable to the SSD-500 through the
triangular hole in the ceiling plate. (③ in fig.)
- (4)Connect the video printer power cable to the service receptacle (optional).
(④ in fig.)

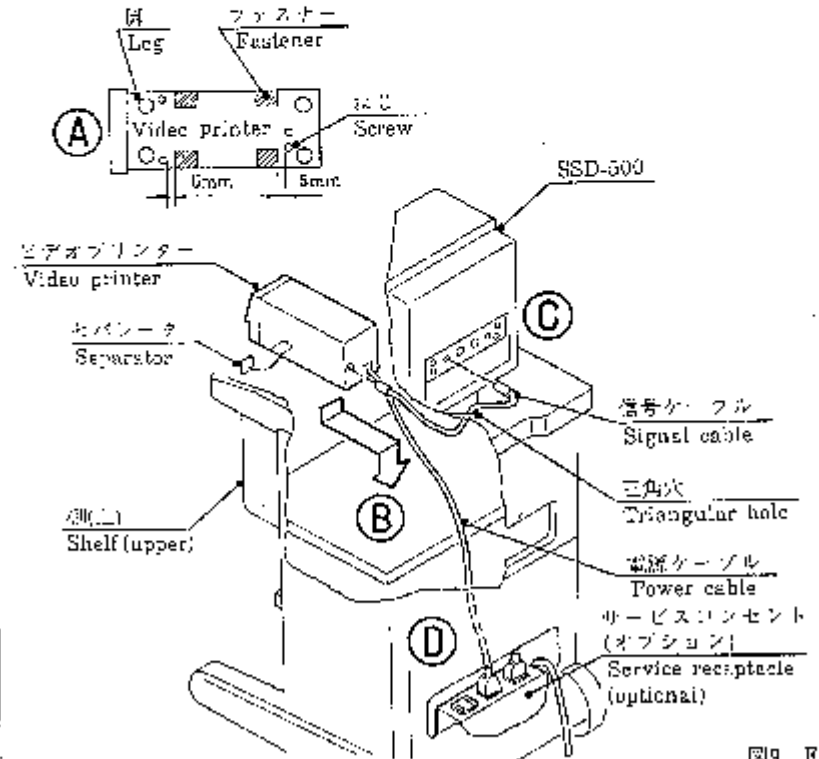


図9 Fig.9

観測用モニタの取り付け方法

- (1) 経路ホルダを、天井から引き抜く。(図中Ⓐ)
- (2) モニタアーム受けを、付属ねじ3本で固定する。(図中Ⓑ)
- (3) アームホルダを、モニタアーム受けに差し込み付属ねじ1本で固定する。(図中Ⓒ)

Installing the Monitor

- (1) Pull out the vaginal holder from the ceiling plate. (Ⓐ in fig.)
- (2) Fix the monitor arm support with three accompanying screws. (Ⓑ in fig.)
- (3) Insert the arm holder into the monitor arm support, and fix it with one accompanying screw. (Ⓒ in fig.)

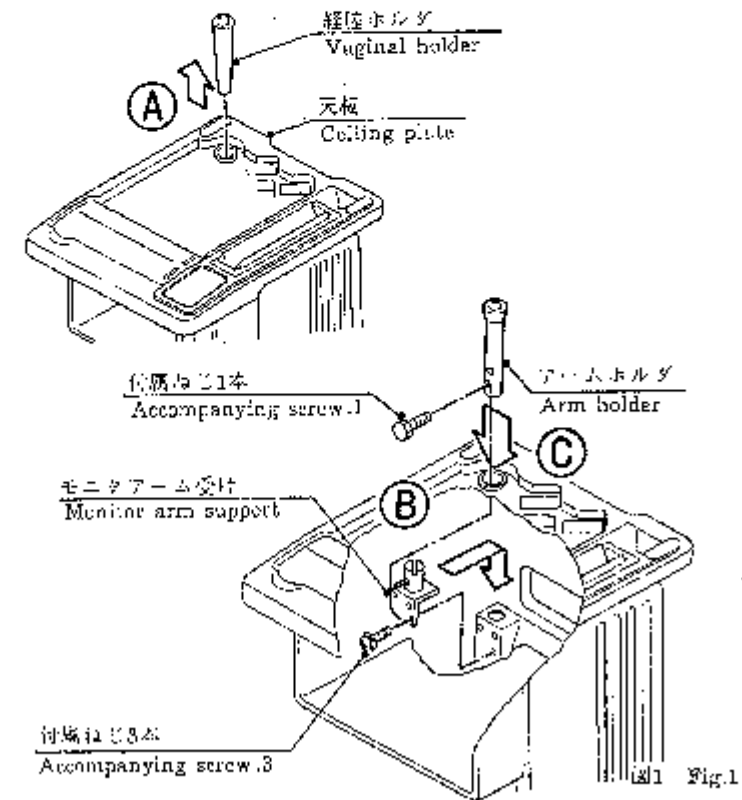


Fig.1

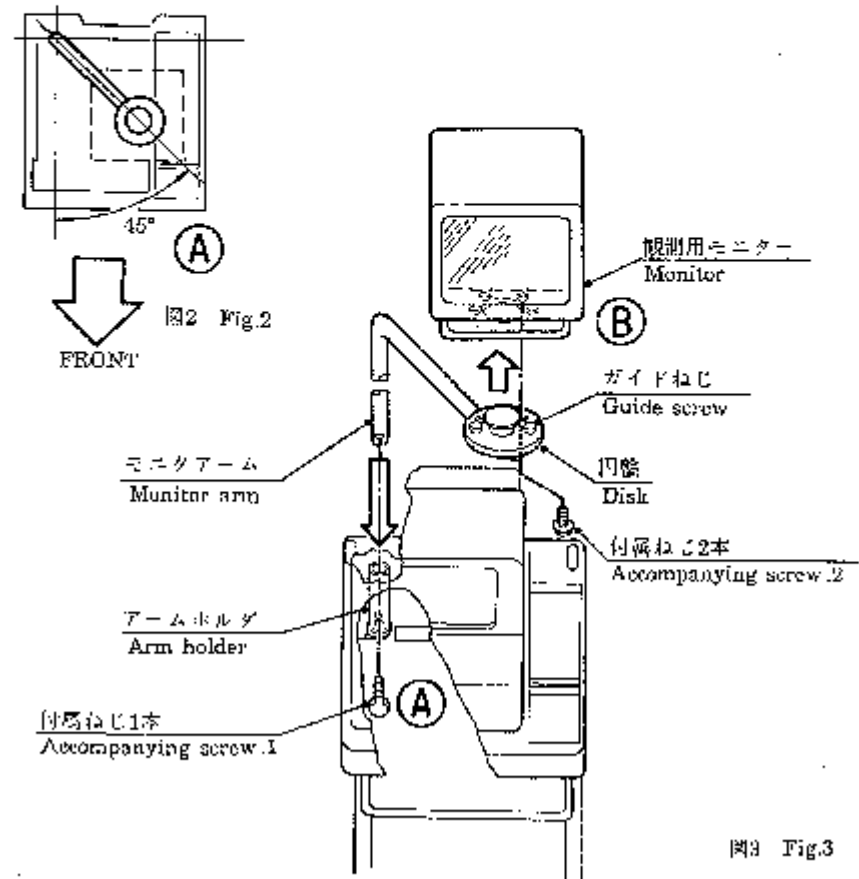
- (4) モニタアームを、図2に示す向きでアームホルダに差し込み付属ねじ1本で固定する。(図3A)
- (5) モニタを、モニタアーム先端の円盤のガイドねじに合わせて載せ付属ねじ2本で固定する。(図3B)

[注] このモニタアームは固定式で成回しない。

(4) Insert the monitor arm into the arm holder in the direction shown in Figure 2, and fix it with an accompanying screw. (A in fig.3)

(5) Place the monitor on the disk on the tip of the monitor arm with the guide screws fitted, and fix the monitor with two screws. (B in fig.3)

[Note] This monitor arm does not swivel, being fixed.



この据付要領書は、RMT-500-35の納品等の際、据付の資料としてご使用ください。
 These installation procedures are provided for reference in installation of the RMT-500-35.

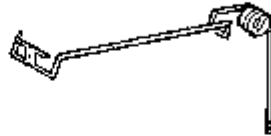
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付属部品リスト

List of Accessory Parts

下記の付属品が揃っているか確認してください。

Check to assure all the below-listed accessory parts to have been included in the shipping case.

No.	品名 Parts Name	外観 Appearance	個数 Quantity
1	ケーブルハンガ (RMT-500-35) Cable hanger (RMT-500-35)		1

01

ケーブルハンガ(RMT-500-35)据付方法

How To Mount the Cable Hanger (RMT-500-35)

- (1)ケーブルハンガを、フックホルダの穴に差し込む。(図1参照)
 (1) Insert the cable hanger into the hole of the hook holder. (See Fig.1)

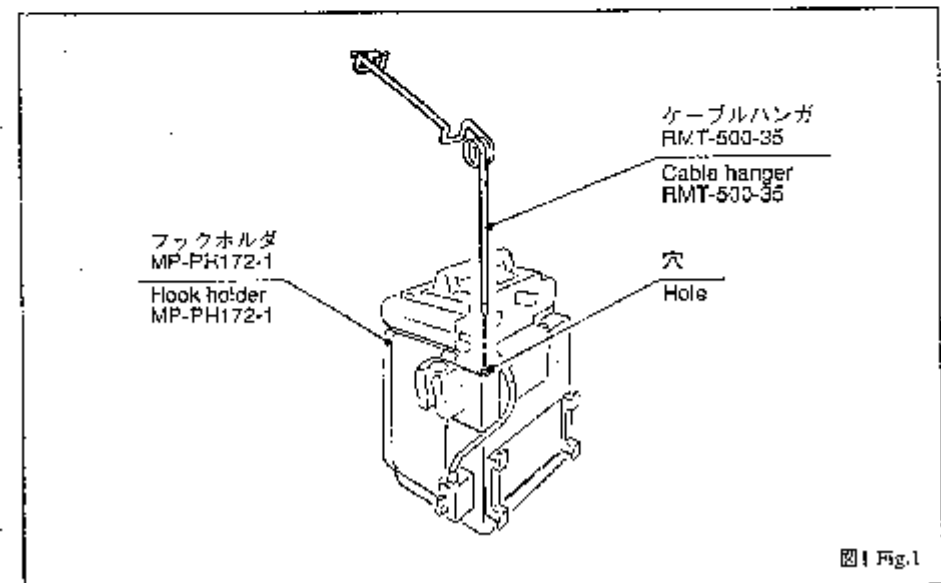


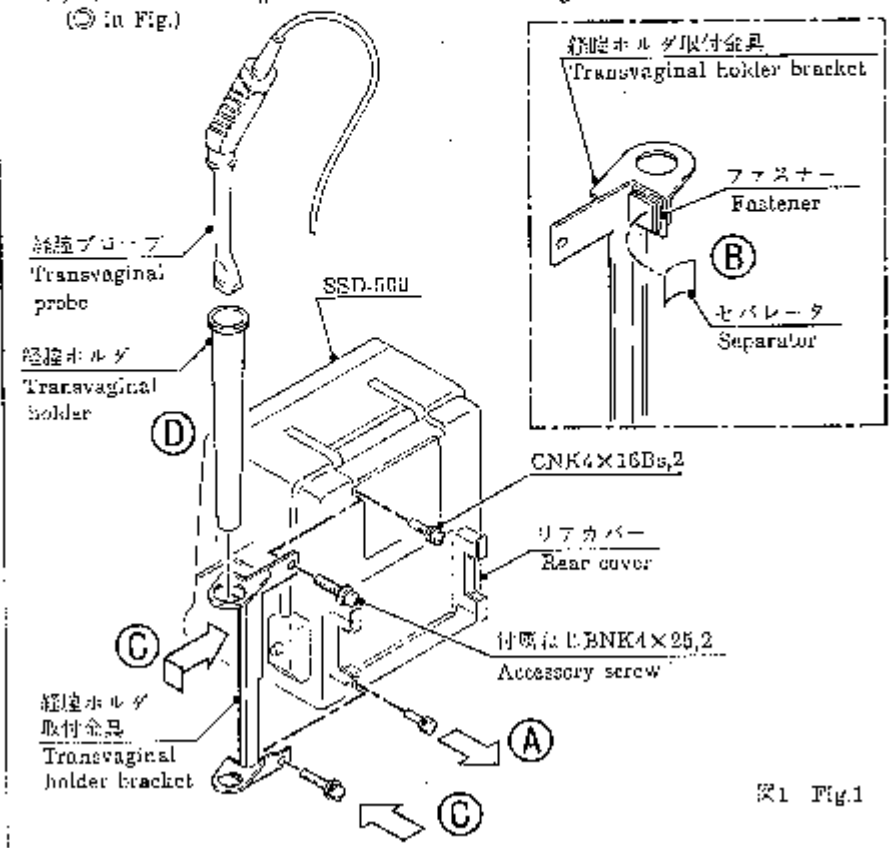
図1 Fig.1

経膣ホルダ取付金具の取付方法

- (1) SSD-500本体のリアカバーを組付けているカビ2本を外す。(図中②)
- (2) 経膣ホルダ取付金具を、ファスナーのセパレータ2ヶ所を剥がし(図中③)、付属ねじ2本で本体に取り付ける。(図中④)
- (3) 経膣ホルダを経膣ホルダ取付金具へ差し込む。(図中⑤)

Installing transvaginal holder bracket

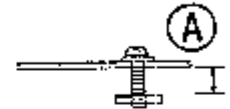
- (1) Loosen to remove 2 screws which fix the rear cover of the SSD-500 body.
(② in Fig.)
- (2) Peel off the 2 separators of the fastener (③ in Fig.) and mount the transvaginal holder bracket to the body with 2 accessory screws. (④ in Fig.)
- (3) Insert the transvaginal holder into the transvaginal holder bracket.
(⑤ in Fig.)



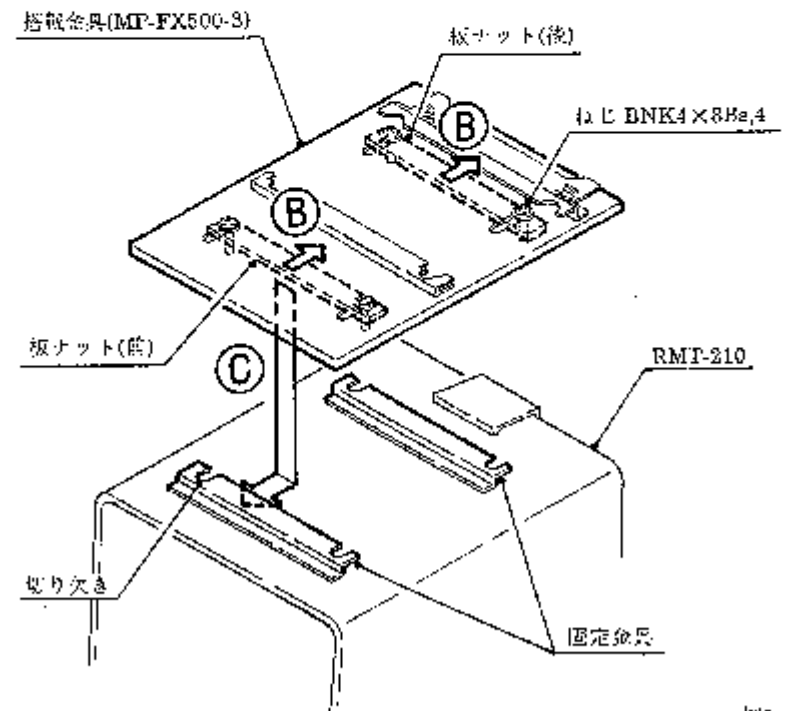
必要な工具:M4プラスドライバー(組立先で用意すること)

1. SST-500搭載金具(MP-FX500-3)の取付け方法

- (1) 搭載金具の板ナット(前,後)のねじを2本を、ゆるめる。(図中Ⓐ)
- (2) 板ナット(前,後)を、それぞれ後方にずらす。(図中Ⓑ)
- (3) 板ナット(前,後)を、RMT-210天板上の固定金具のすきまに差し込む。(図中Ⓒ)
注:板ナットのねじが、固定金具の切り欠きに合うように差し込むこと。

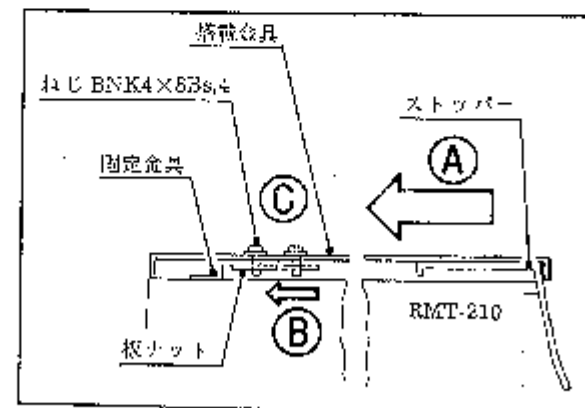
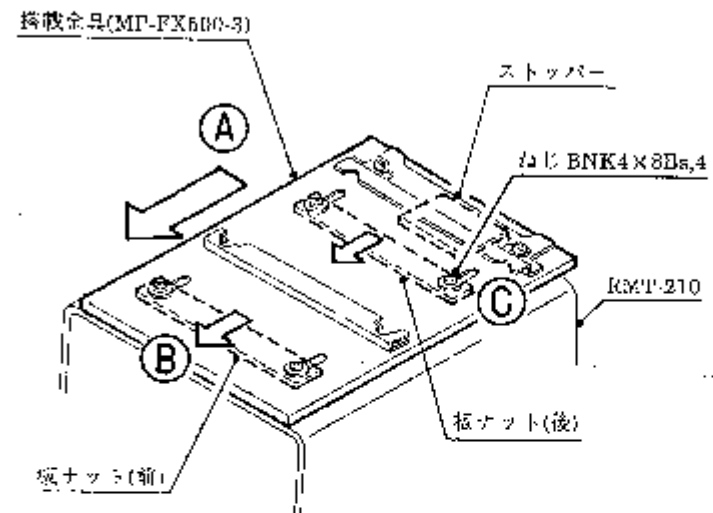


搭載金具のベース部と板ナットのすきまを充分にあける。



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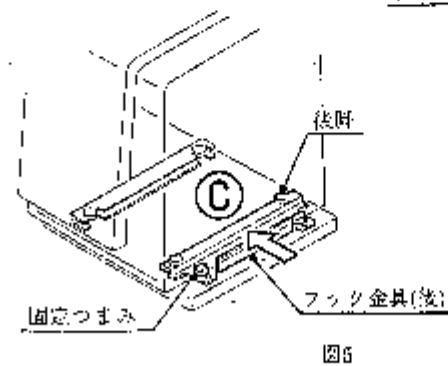
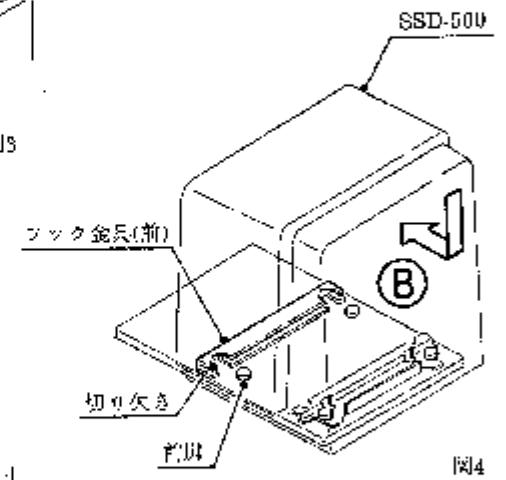
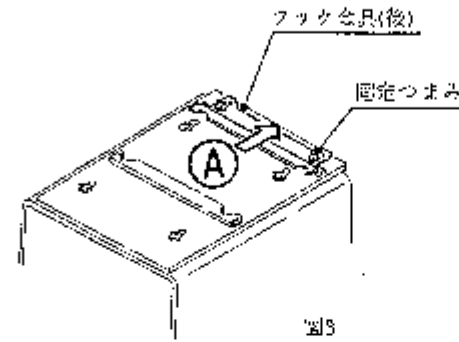
- (4) 搭載金具を、RMT-210背面のストッパーに当たるまで前方に寄せる。(図中③)
- (5) 搭載金具の板ナット(前後)を、前方に北まるまでずらす。(図中④)
- (6) 板ナット(前後)のねじ各2本を締めて、搭載金具を固定する。(図中⑤)
- ※(6)の作業の後搭載金具に、がたがないか確認すること。



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2.SSD-500の取付け方法

- (1) 固定つまみ2個を、ゆるめて、フック金具(後)を後方一杯までスライドさせる。(図3①)
- (2) SSD-500を、搭載金具に載せて、前脚がフック金具(前)の切り欠きにはまるように前方に移動させる。(図4②)
- (3) フック金具(後)を、SSD-500の後脚がフック金具(後)の切り欠きにはまるまで前方にスライドさせ、固定つまみ2個を締め付けて固定する。(図5③)



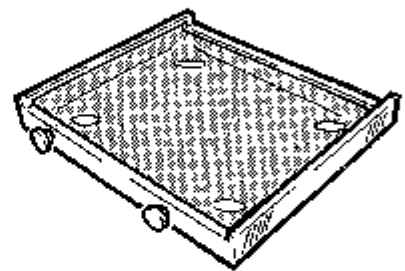
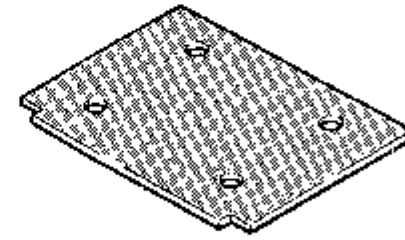


MP-FX500-4 (防塵フィルタユニット)据付要領書
 MP-FX500-4 (Dustproof Filter Unit)
 INSTALLATION PROCEDURES

この据付要領書は MP-FX500-4の納品等の際、据付の資料としてご使用ください。
 These installation procedures are provided for reference in installation of MP-FX500-4.

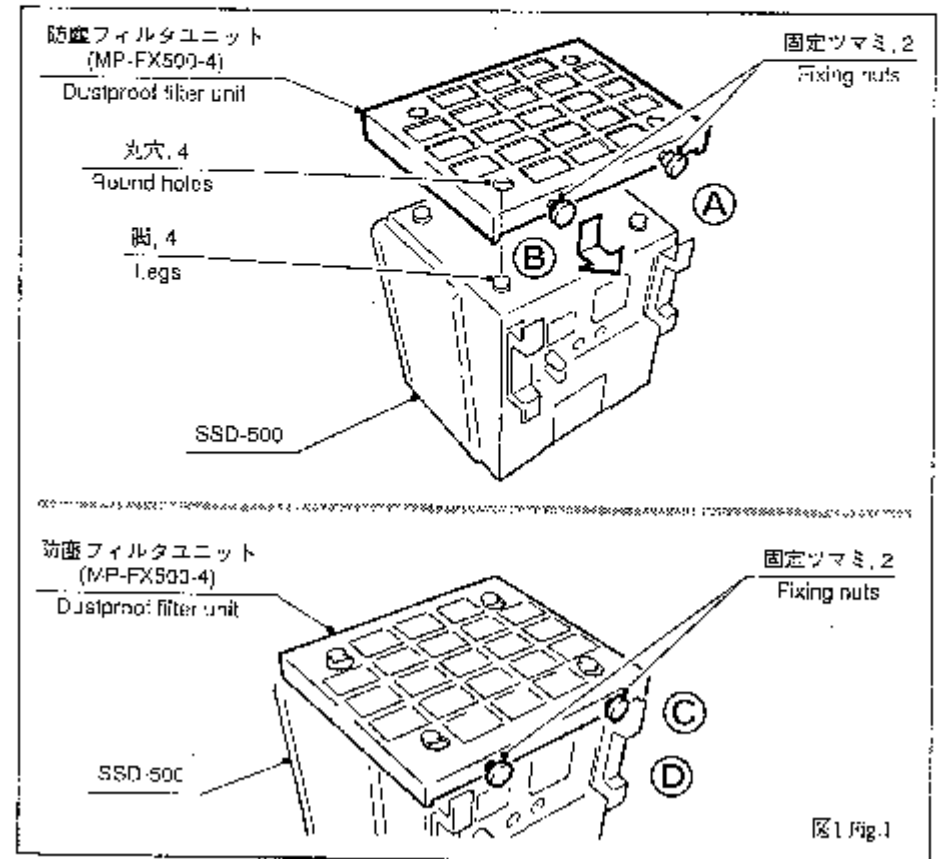
00 付属部品リスト List of Accessory Parts

下記の付属品が揃っているか確認してください。
 Check to assure all the below-listed accessory parts to have been included in the shipping case.

No.	品名 Parts Name	外観 Appearance	個数 Quantity
1	防塵フィルタユニット (MP-FX500-4) ※フィルタ1枚装着済み。 Dustproof filter unit (MP-FX500-4) ※1 filter has been installed.		1
2	フィルタ (予備) (MP-FX500-4-4) Filter (Spare) (MP-FX500-4-4)		5

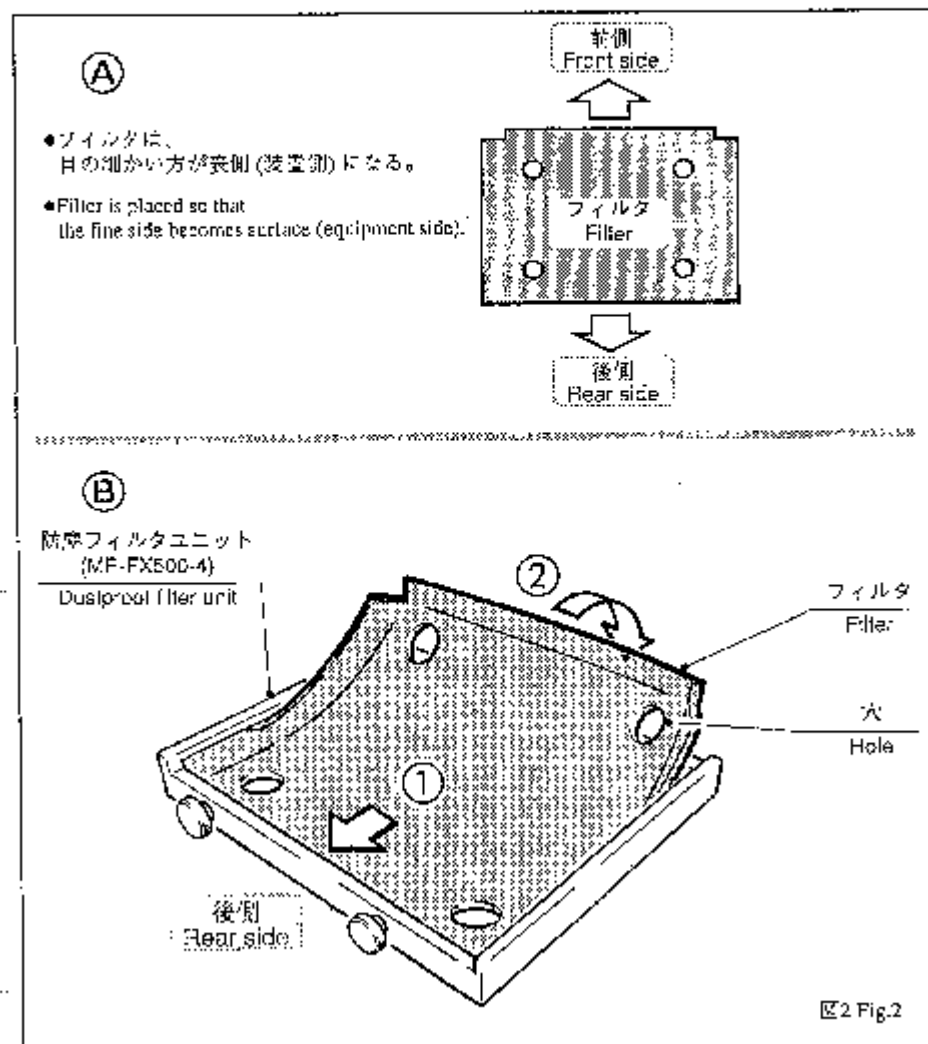
- (1) SSD-500を、接続しているプローブを外し、底面を上にして置く。
- (2) 防塵フィルタユニットの固定ツマミ2個を緩める。(図中Ⓐ)
- (3) 防塵フィルタユニットを、丸穴4ヶ所をSSD-500の脚4個に合わせ、下方へ押しながら後方にスライドさせる。(図中Ⓑ)
- (4) 防塵フィルタユニットの固定ツマミ2個を、軽く締める。(図中Ⓒ)
- (5) SSD-500に対し防塵フィルタユニットがねじれて成り付いてないか確認し、固定ツマミ2個を締めつけ、固定する。(図中Ⓓ)

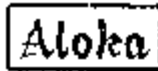
- (1) Remove the probe attached, and place SSD-500 with the bottom face up.
- (2) Loosen 2 fixing nuts of the dustproof filter unit. (Ⓐ in Fig.)
- (3) Fit the 4 round holes in the 4 legs of SSD-500 and slide the dustproof filter unit backwards while pressing it down. (Ⓑ in Fig.)
- (4) Tighten 2 fixing nuts of the dustproof filter unit lightly. (Ⓒ in Fig.)
- (5) Check SSD-500 if the dustproof filter unit is mounted with torsion, and if not, clamp the 2 fixing nuts and secure. (Ⓓ in Fig.)



- (1) フィルタの裏表、前後を確認する。(列中①)
 (2) フィルタを、穴を防塵フィルタユニットの穴と合わせ、後側からはめ込む。
 (図中②)

- (1) Check the surface and the back, front and rear of the filter. (① in Fig.)
 (2) Fit the hole of the filter to the hole of the dustproof filter unit, and fit the filter from the back side. (② in Fig.)





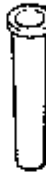




MP-PH172-2 (SSD-500用経膣ホルダ) 据付要領書
 MP-PH172-2 (TRANSVAGINAL HOLDER FOR SSD-500)
 INSTALLATION PROCEDURES

この据付要領書は、MP-PH172-2 の純品等の際、据付の資料としてご使用ください。
 必要な工具: M3, M4 プラスドライバー (据付先で用意すること)

These installation procedures are provided for reference in installation of the MP-PH172-2.
 Tools required: M3, M4 Phillips screwdrivers. (Prepared by assembler)

D0 付属部品リスト List of Accessory Parts

下記の付属品が揃っているか確認してください。
 Check to assure all the below-listed accessory parts to have been included in the shipping case.

No.	品名 Parts Name	外観 Appearance	個数 Quantity
1	経膣ホルダ Transvaginal holder		1
2	経膣ホルダ取付金具(上) Transvaginal holder mounting bracket (upper)		1
3	経膣ホルダ取付金具(下) Transvaginal holder mounting bracket (lower)		1
4	付属ねじ BNK 3×8 Bs Accessory screw BNK 3×8 Bs		2
5	付属ねじ CNK 4×25 Bs Accessory screw CNK 4×25 Bs		1

- (1) 経膈ホルダ取付金具(上)を、フックホルダに付属ねじ2本で取付ける。(図中Ⓐ)
- (2) リアカバーを取付けているねじ1本を取り外す。(図中Ⓑ)
- (3) 経膈ホルダ取付金具(下)を、ファスナーのセパレータをはがして取り付け、(1)で外したねじ穴に行属ねじ1本で取付ける。(図中Ⓒ)
- (4) 経膈ホルダを、経膈ホルダ取付金具(上,下)に差し込む。(図中Ⓓ)

- (1) Mount the transvaginal holder mounting bracket (upper) on the hook holder with 2 accessory screws. (Ⓐ in Fig.)
- (2) Remove 1 screw mounting the rear cover. (Ⓑ in Fig.)
- (3) Peel the separator of the fastener and put the transvaginal holder mounting bracket (lower), and mount to the screw hole removed in (1) with 1 accessory screw. (Ⓒ in Fig.)
- (4) Insert the transvaginal holder into the transvaginal holder mounting bracket (upper),(lower). (Ⓓ in Fig.)

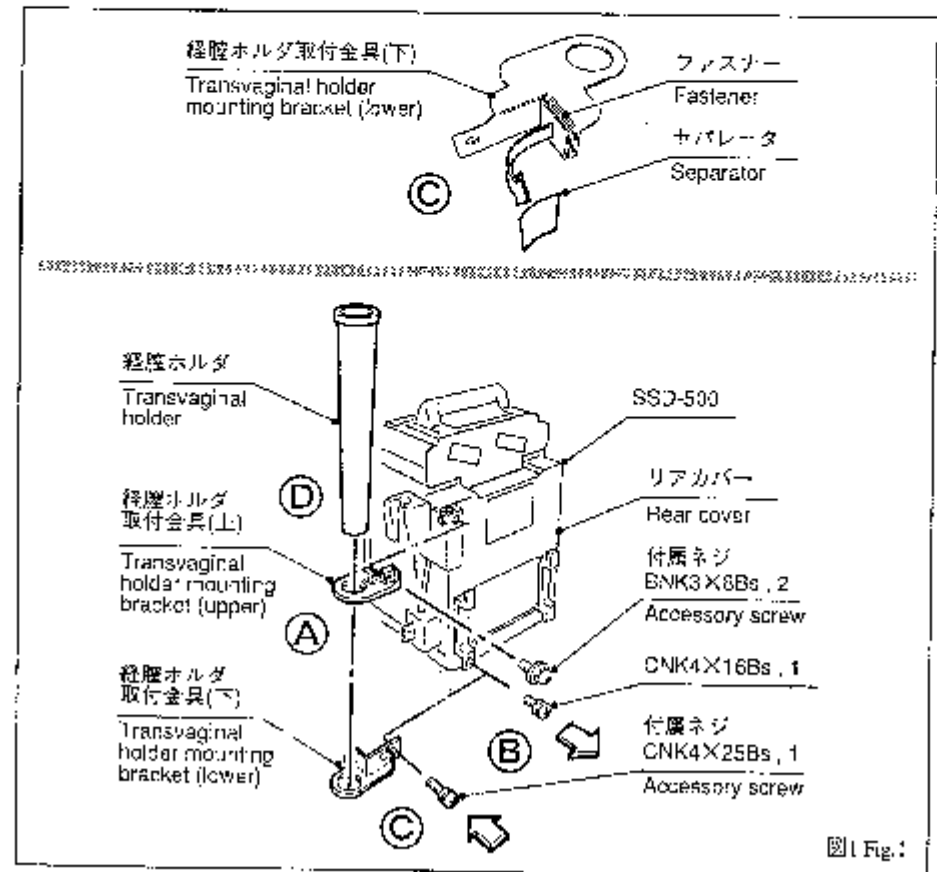


図1 Fig.1

SECTION 5 SYSTEM BLOCK DIAGRAM

CONTENTS		Page
5-1	Explanation of System	5 1
5-2	System block diagram	5 - 1

1

2

3

4

5

5-1 Explanation of SYSTEM

This system consists of the probe selector (option) , the Tx-Rx unit, the interface unit, the DSC unit, the panel unit which includes the keyboard, switches, joy pad (SSD-500), sound trackball (SD-500 Ver. E3.0 onwards), etc, the monitor unit, and the power supply unit.

Timing signals of the electric scanning is generated in the interface part. Tx & Rx part accept these signals and generates the pulse for transmission. This pulse vibrates the transducer element of the probe and generates the ultrasound wave. This ultrasound wave reaches to inside of human body and the echo wave returns to transducer again. After that, the echo signal is processed and is outputted to DSC part.

At DSC part, the ultrasound data which is coming from Tx & Rx part is memorized into the frame memory after passing through the A/D converter. The memorized data is read out by the TV system timing, and pass through the Post Processor. After that, the TV Composite signal is generated by this ultrasound data, Character and Graphic. Finally, TV Composite signal is outputted to the viewing monitor.

At Panel part, any information, for example, Mode Information, MAG information and so on, are gathered and outputted to the interface part.

Monitor part is organized by 7 inches monitor and the knobs for contrast and brightness. This switching is done by the switch which is located on EP-2850 Contrast & Brightness PCB.

This power supply unit has the protector against increasing current beyond the normal. And also, the high voltage is controlled by the switch which is mounted on EP-2870 IIF PCB.

5-2 System Block Diagram

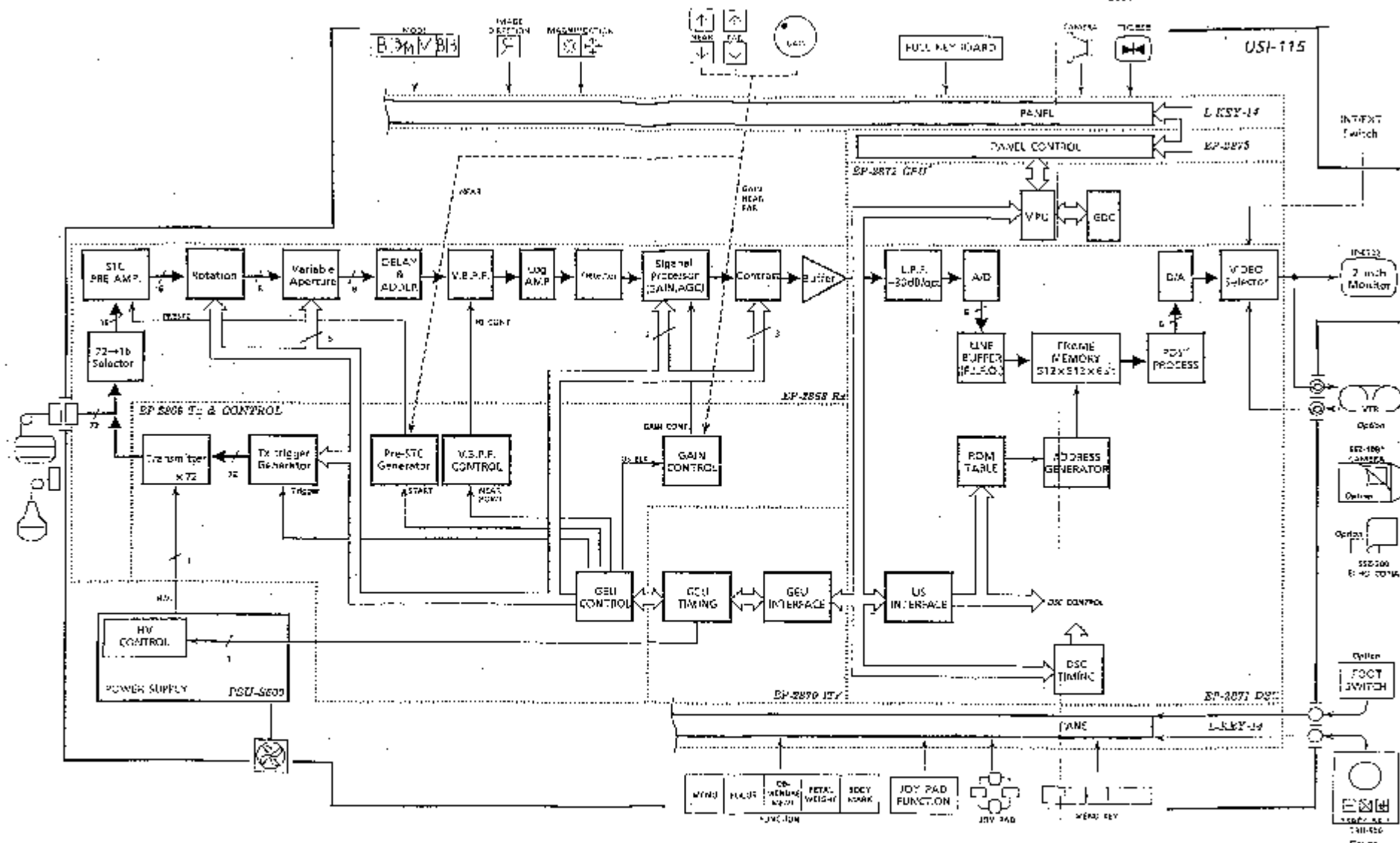
The system Block Diagram is shown on next page.

Please use it for studying the operation of system and judgment on repairing.

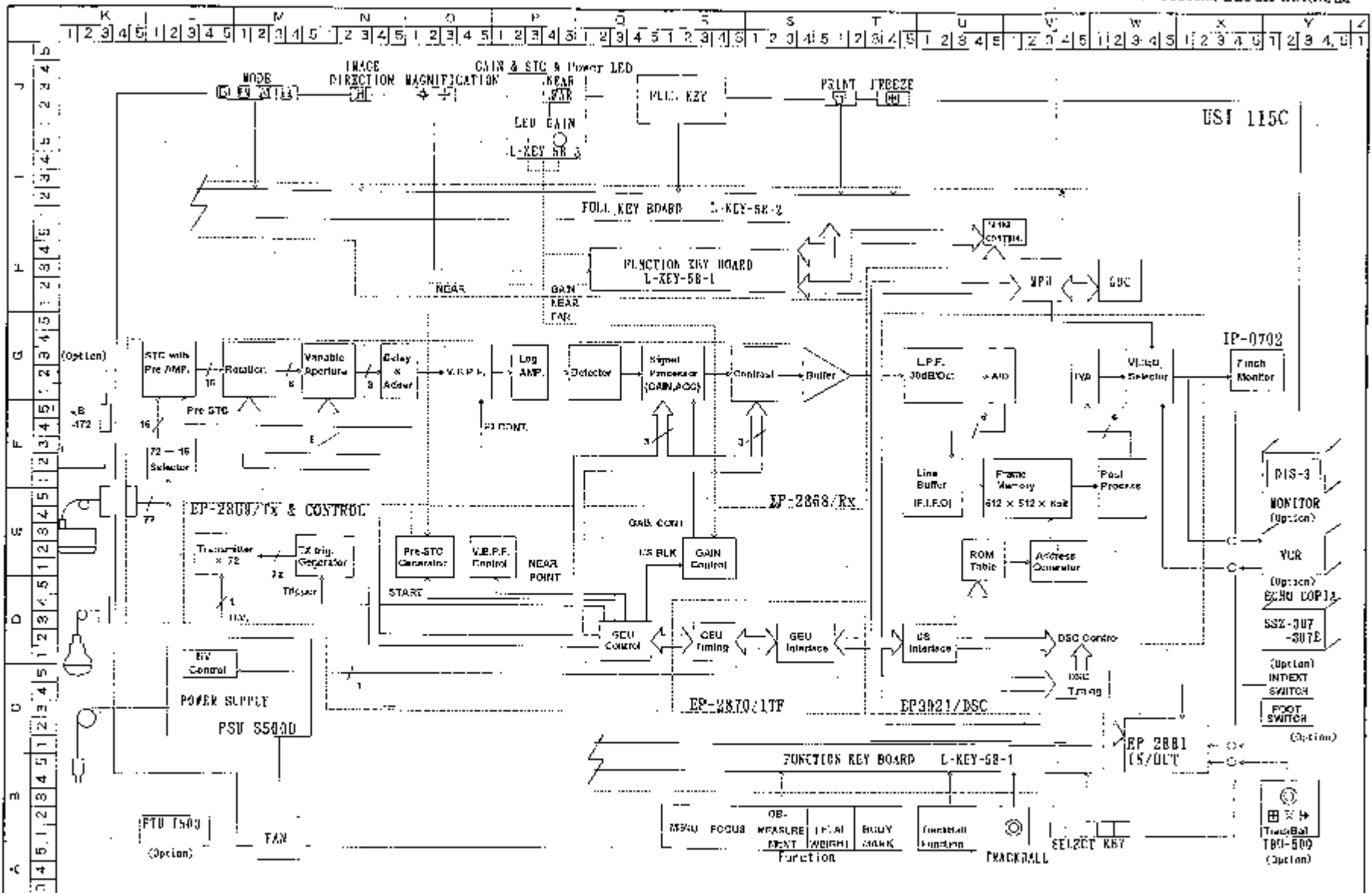
Probe selector	:	JB-172	
Tx & Rx	:	EP-2868*	Rx
	:	EP-2869*	Tx & Control
Interface	:	EP-2870*	IIF
DSC (SSD-500)	:	EP-2871*	DSC
	:	EP-2872*	CPU
DSC (SSD-500 Ver.E1.0~Ver. E3.0)	:	EP3821***	DSC
	:	EP3871***	MPU & IIF
DSC (SSD-500 Ver.E3.0 onwards)	:	EP4533***	DIU
	:	EP4530***	UPI

M42-0206 Rev. 12
SECTION 5 SYSTEM BLOCK DIAGRAM

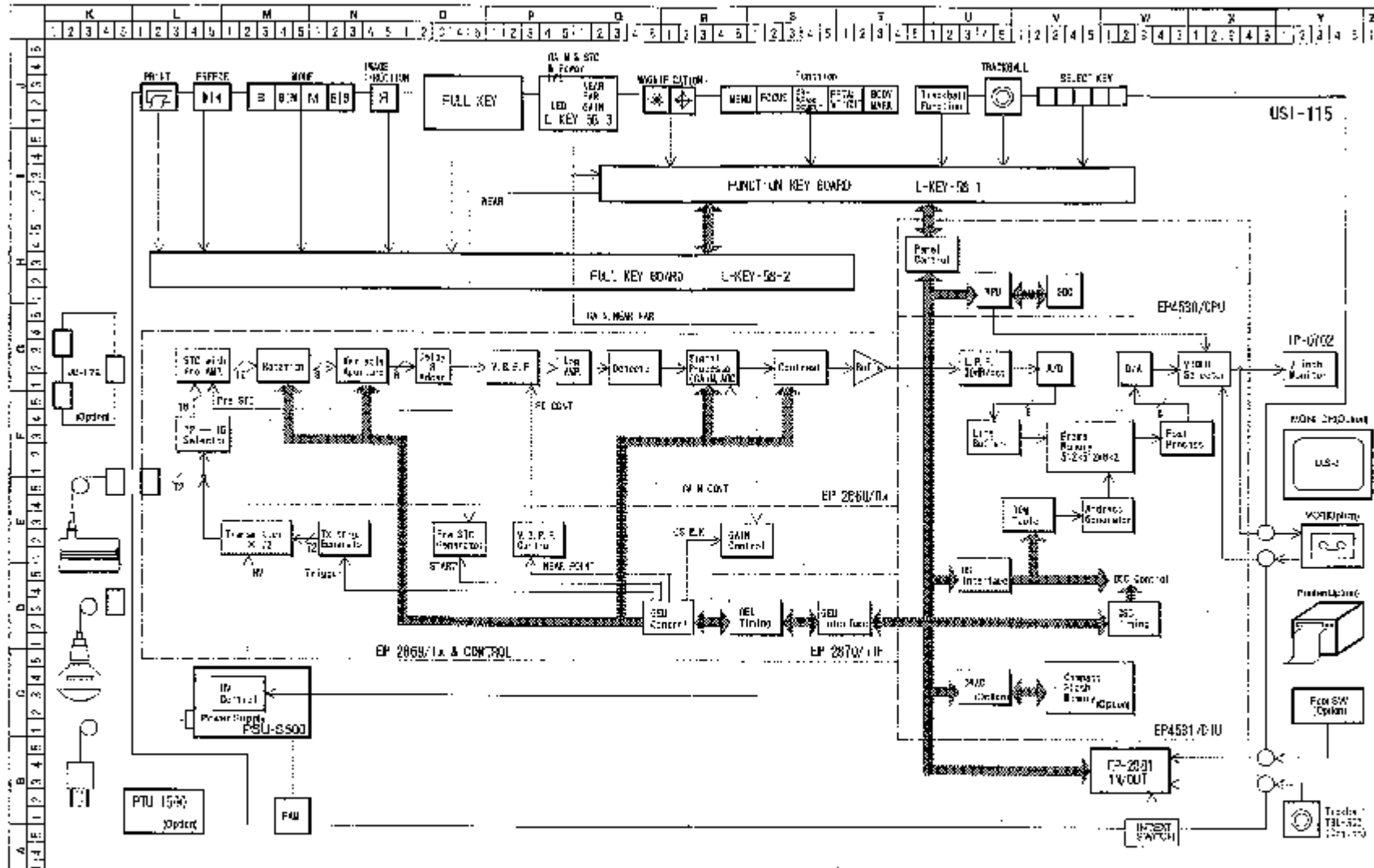
Panel (SSD-300)	:	EP-2873*	Panel Control
		L-KFY-14-A, B	Panel Board
		EP-2875*	Gain & Power LED
		EP-2879*	Select Key
		EP-2881*	In / Out
		EP-2882*	Photo Cont. / Bright
Panel (SSD-300 Ver. E1.0 onwards)	:	L-KEY-58-1, 2	Panel Board
		L-KFY-58-3	Gain & STC & Power LED
		EP-2879*	Select Key
		EP-2881*	In / Out
Monitor	:	EP-0702*TH	Viewing Monitor
		EP-2880*	Contrast & Brightness (SSD-300)
		EP-2880*-2	Contrast & Brightness (SSD-300 Ver. E1.0 onwards are included in the monitor)
Power supply	:	PSU-S300*	Power supply



Aloka	TITLE SYSTEM BLOCK DIAGRAM	PART NO. SSD-500	1 / 1
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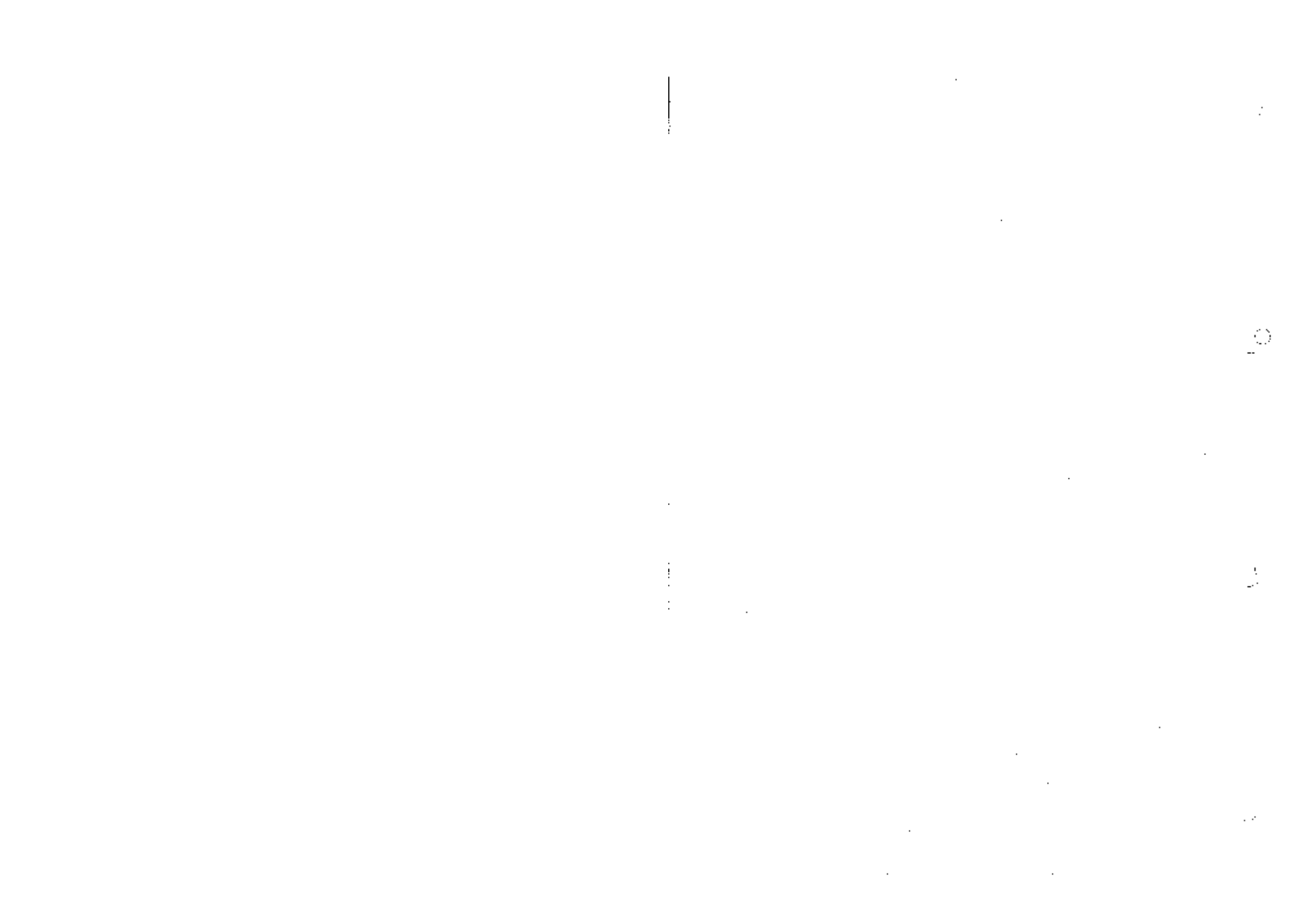
REVISIONS SHEET	T.T.T.F 名称		MODEL 型号	1/1
	SYSTEM BLOCK		SSD-500 (MICRUS)	
	第3角法		MA4-0024	



REVISIONS Δ PROPRIETARY © 1988	Ver. E3.0 onwards				TITLE SYSTEM BLOCK DIAGRAM		MODEL SSD-500		1/1
	DRAWN		DESIGN		CHECKED		APPROVED		DRAWING NO.
	SCALE		DATE						
									MA4-0024

SECTION 6 PCB BLOCK DIAGRAM

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6-2	Panel Control	EP-2873	6 - 2
6-3	Rx	EP-2876	6 - 4
6-4	Tx & Control	MP-2880	6 - 6
6-5	ITF	EP-2870	6 - 8
6-6	DSC	EP-2871/EP3921	6 - 10
6-7	CPU	EP 2872	6 - 12
6-8	Panel Board	L-KRY 14 A, B	6 - 15
6-9	Gain & Power LED	EP-2878	6 - 16
6-10	Select Key	EP-2879	6 - 18
6-11	Contrast & Brightness	MP-2880	6 - 20
6-12	In / Out	EP-2881	6 - 22
6-13	Photo Cont. / Bright.	EP-2882	6 - 24
6-14	Panel Unit	L-KRY-68	6 - 26
6-15	Contrast & Brightness	EP-2880-2	6 - 30
6-16	MPL & ITF	MP2872	6 - 32



6-1 Introduction

In this section, the simple explanations of PCB block diagrams are described.

Please refer "PCB REFERENCE TABLE" as below because there are used PCBs which are different between SSD-500 and SSD-500 Ver. E1.0 onwards.

PCB REFERENCE TABLE IN SECTION 6

No.	TITLE	MODEL (1) ※1	MODEL (2) ※2	MODEL (3) ※3
6-2	Panel Control	EP-2873	×	×
6-3	Rv	EP-2868	+	+
6-4	Ex & Control	PP-2869	+	+
6-5	IFF	EP-2870	+	+
6-6	DSC	EP-2871	EP2872	+
6-7	MPU	EP-2872	+	+
6-8	Panel Board	L-KEY-14	×	×
6-9	Gain & Power LED	EP-2878	×	×
6-10	Select key	EP-2879	+	+
6-11	Contrast & Brightness	EP-2880	×	+
6-12	In / Out	EP-2881	+	+
6-13	Photo Control / Bright	EP-2882	×	×
6-14	Panel Unit	+	L-KEY-58	+
6-15	Contrast & Brightness	×	EP-2880 2	+
6-16	MPU & I/F	×	EP3872	×
6-17	DIC	×	×	hPM531
6-18	MPU	×	×	EP4530

++ means that used PCB is same to left column

× means that PCB is not used.

※ 1 MODEL (1) means part No. of PCB which is used in SSD-500

S/N of SSD-500 is as below.

Unit S/N 91M09778~31M41758 3360061~3360367 3323001~3323158
3323564~3323601 3610061~3610345

※ 2 MODEL (2) means part of No. of PCB which is used in SSD-500 Ver. E1.0 ~E3.0

S/N of SSD-500 (Ver. E1.0~E3.0) is as below.

Unit S/N 3300368~3300712 M00101~M02450
3323009~3323563 3323602~3325447

※ 3 MODEL (3) means part of No. of PCB which is used in SSD-500 Ver. E3.0 onwards.

S/N of SSD-500 (Ver. E3.0) is as below.

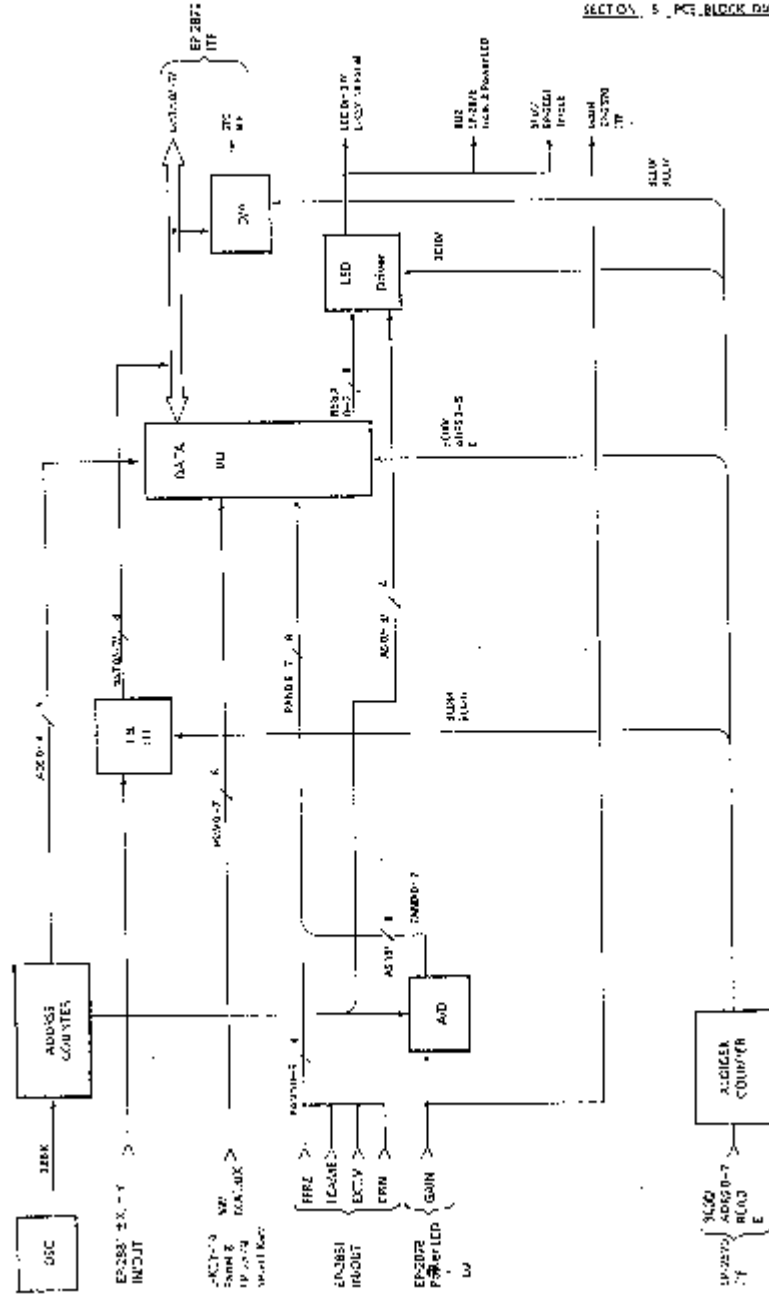
Unit S/N MD4451~

6-2 EP-2873 Panel Control

This PCB is used for the control panel and others switches.
It acts as an interface between EP-2872 CPU and L-KEY-14 or so on.

Function which this PCB covers are as follows:

- (1) Data I/O
- (2) Clock generator
- (3) LED driver
- (4) Track ball interface



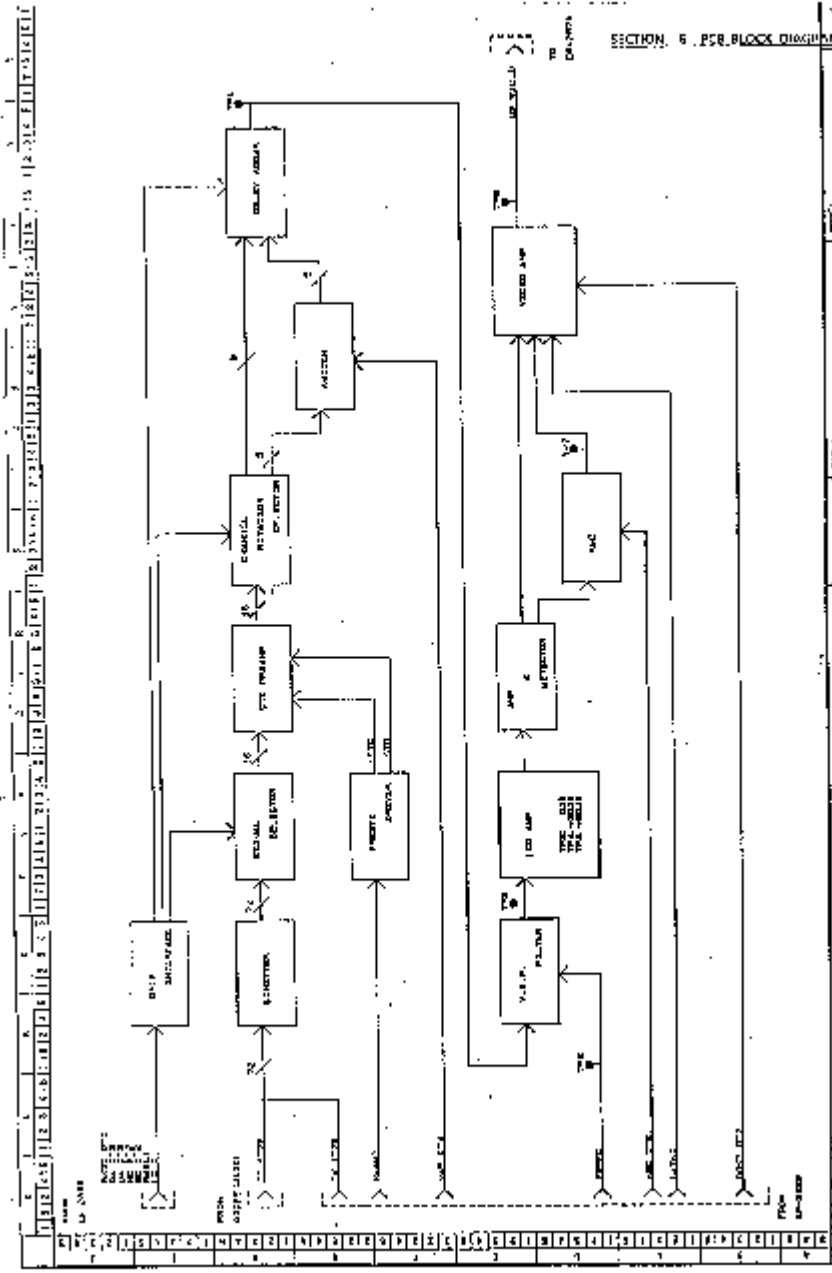
SECTION 5 - PANEL CONTROL

SECTION 6 PCB BLOCK DIAGRAM

6-3 EP-2868 Rx

This PCB is connected to probe directly. Ultrasound transmission signal is made by EP-2869 TX & Control and pass through this PCB before it reach to probe. Probe connector is attached this PCB directly. Receiving signal is processed at this PCB. Major processes made in this PCB are as follows:

- (1) STC preamp
- (2) Delay and adder
- (3) Band pass filter
- (4) Log amp
- (5) AGC circuit (fixed)
- (6) Video amp (fixed)
- (7) Data interface



SECTION 6 . PCB BLOCK DIAGRAM

NAME		EP-2988*	
BLOCK DIAGRAM		EP-2988*	
DESIGN	DATE	REVISED	BY
1	10/1/64	2	10/1/64
3	10/1/64	4	10/1/64
5	10/1/64	6	10/1/64
7	10/1/64	8	10/1/64
9	10/1/64	10	10/1/64
11	10/1/64	12	10/1/64
13	10/1/64	14	10/1/64
15	10/1/64	16	10/1/64
17	10/1/64	18	10/1/64
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95	10/1/64	96	10/1/64
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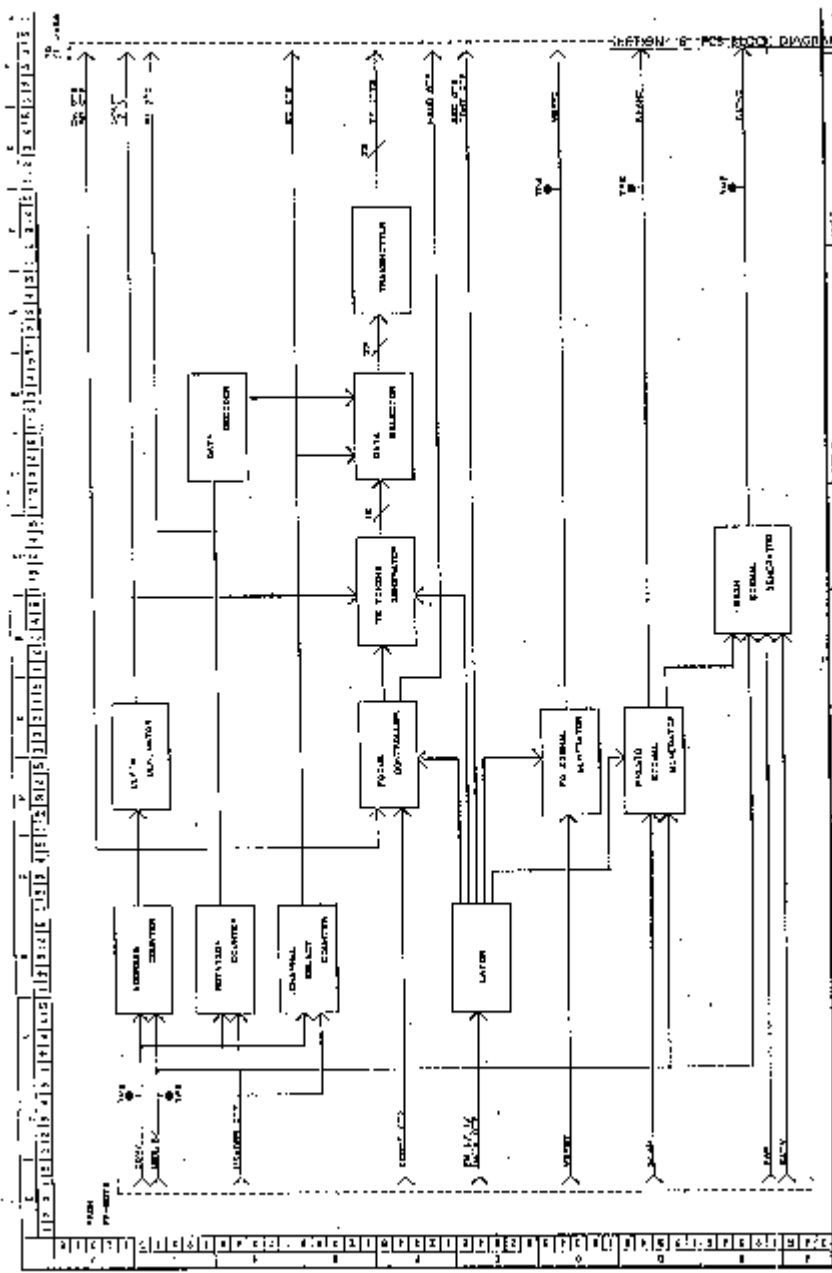
SECTION 6 PCB BLOCK DIAGRAM

6-4 EP-2869 Tx & Control

This PCB generates ultrasound transmission signal and control signal which is used for the received signal processing circuit in EP-2868 Rx.

Also, signals from various gain controls arrange on the panel and in front of equipment are sent to this PCB and converted into control signals which the receiver circuit needs. Major processes made in this PCB are as follows:

- (1) Tx/Rx system basic clock generation
- (2) Focus control
- (3) Oscillator drive circuit
- (4) Band pass filter control signal generation
- (5) PRE STC signal generation
- (6) Gain signal generation



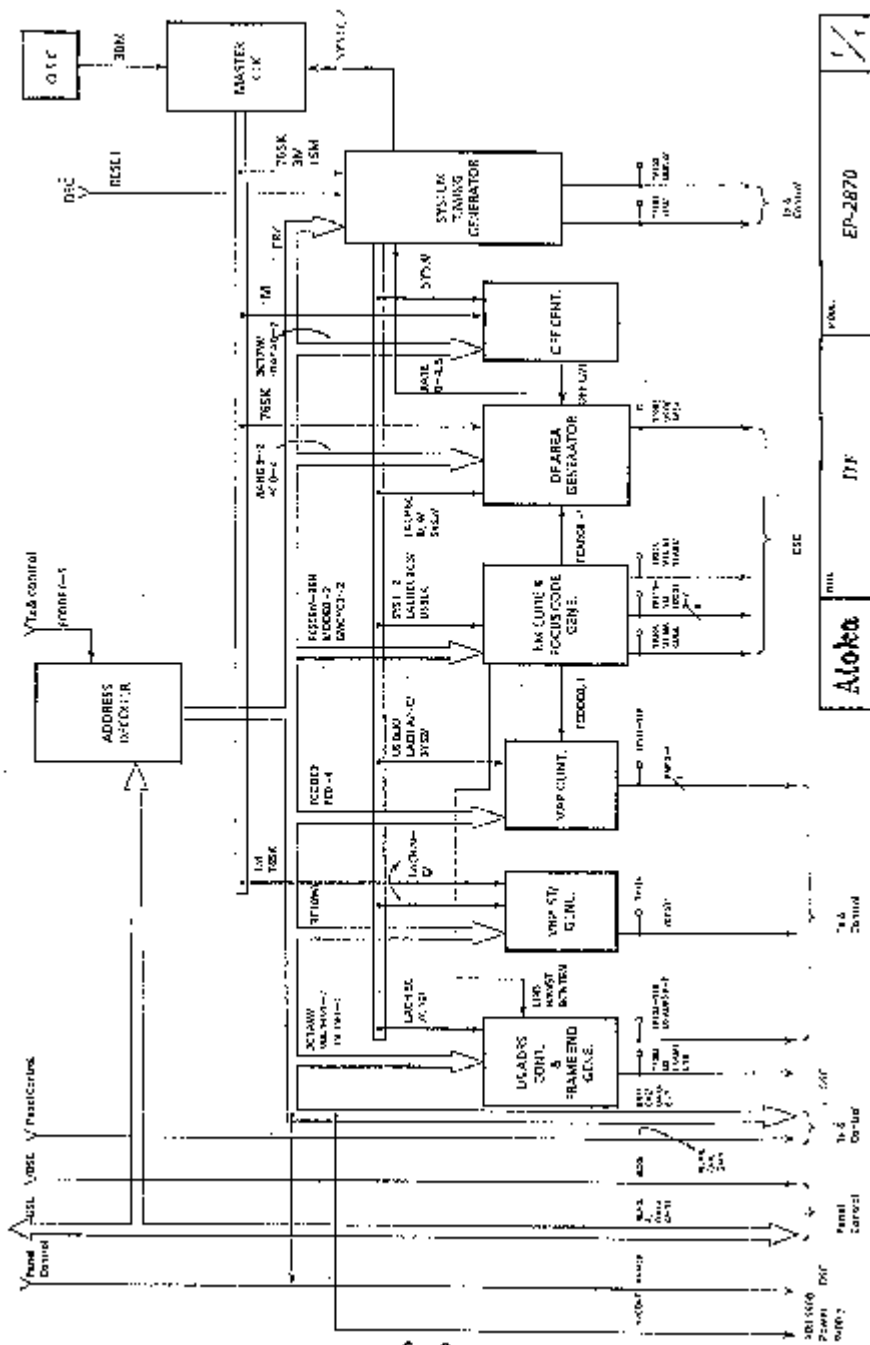
Alora		TITLE		BLOCK DIAGRAM		NO. 5	
DESIGNED BY	W. J. P.	CHECKED BY	W. J. P.	DATE	11/17/54	REVISED BY	W. J. P.
APPROVED BY	W. J. P.	DATE	11/17/54	QUANTITY	100	REVISION	1
L-275		M-1					
490187-93							

6-5 EP-2870 ITE

This PCB functions as an interface between the Tx/Rx unit, DSC and MPJ. It also includes a part which generates Tx/Rx unit control signal.

Processes which this PCB carries out are as follows:

- (1) Tx/Rx unit basic clock generation
- (2) Signal interface between the Tx/Rx unit and DSC
- (3) Controlling the variable band pass filter
- (4) Generation of control signal for variable aperture



Alcoa

EP-2870

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IF YOU WOULD PREPARE THIS BLOCK DIAGRAM WHEN YOU USE THIS PCB IS USED FOR 502-500.
Please use this BLOCK diagram when you use this PCB.

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SECTION 6 PCB BLOCK DIAGRAM

G-6 EP 2871 DSC

This PCB is used for drafting the image of Ultrasound echo. In SSD-500, only one piece of this PCB serves for storage of images, TV synchronization, and display.

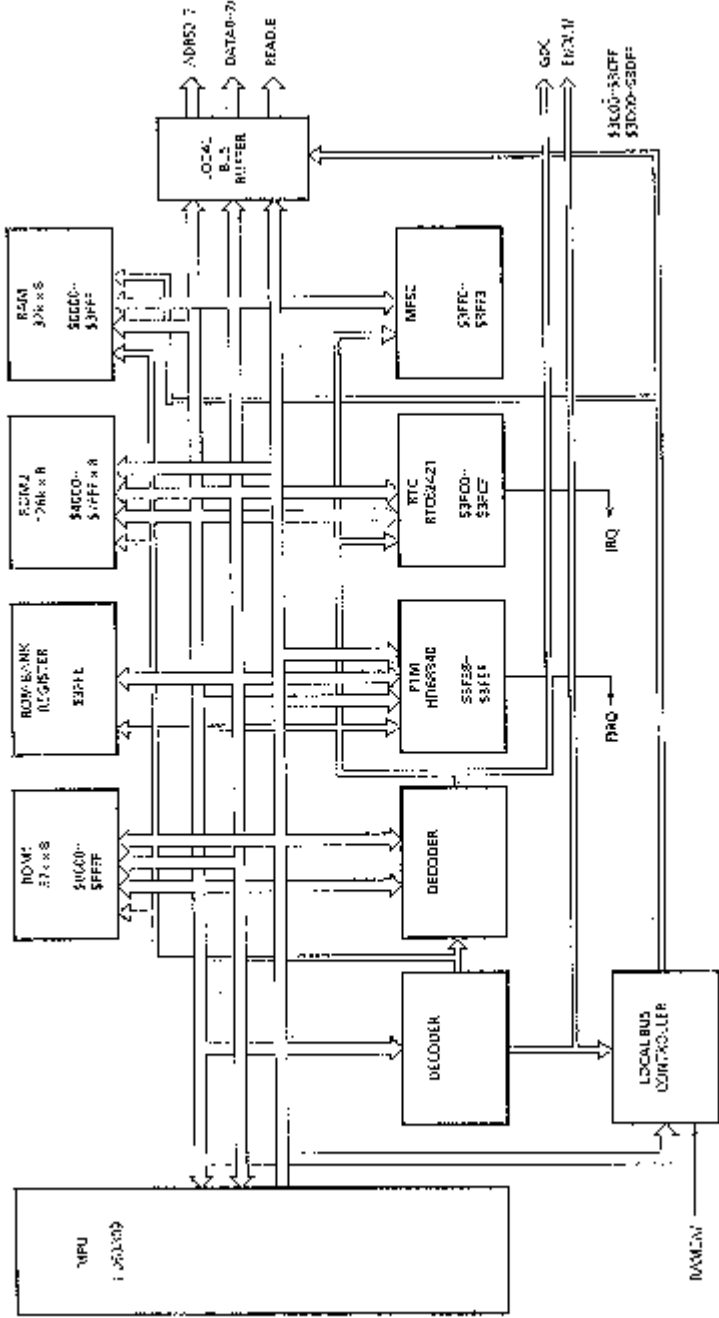
Ultrasound images are stored in the frame memory basically in the same method as used for SSD-620 and SSD-630. However, there is a considerably large difference as viewed in detail because of a reduction in function and in number of parts used.

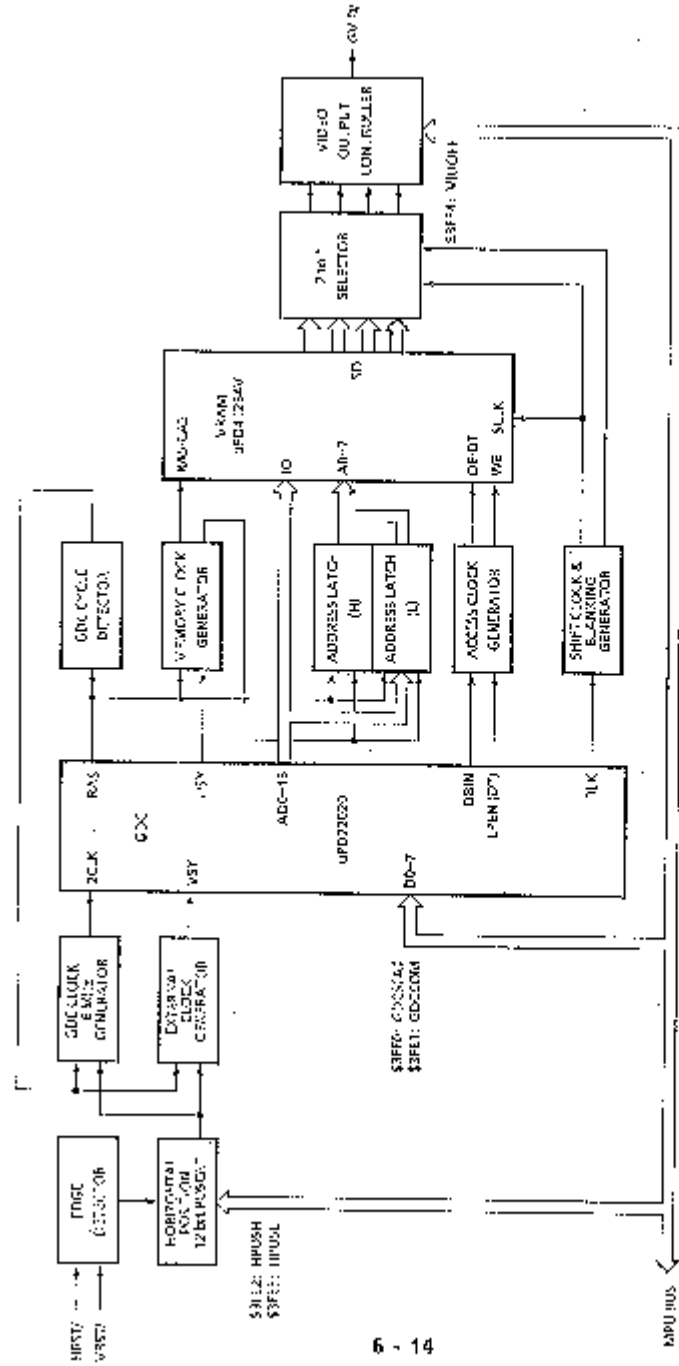
Also, consolidation of DSC function has been achieved by the use of many custom ICs.

6-1 EP-2872 CPU

This PCB consists of the microprocessor, which controls the whole of SSD-500, attendant peripheral circuits, and graphic controller.

Since SSD-500 uses only one MPU (Micro Processor Unit), it is not provided with any system bus. Used for graphic control the GDC (Graphic Display Controller) makes high speed drafting without eating into memory space of MPU.





6-8 L-KEY-14 A,B Panel Board

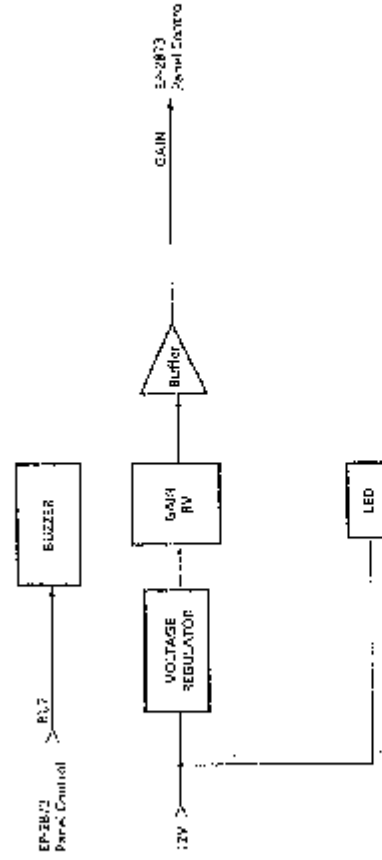
This PCB gathers control panel switches. It is divided into two sections. L-KEY-14A is the PCB located on the moving side and it gathers the full keyboard, etc.

The PCB consists of the switch matrix, having 58 pieces of key switches, and the diode array, and is connected to EP-2873 PANEL CONTROL. Lighting of LEDs is controlled by LED 10/17, 20/26 signals.

L-KEY-14B is the PCB fixed to the SSD-500 body. The PCB consists of the switch matrix, having 15 pieces of key switches and a tray pad, and the diode array, and is connected to EP-2873 PANEL CONTROL. Lighting of LEDs is controlled by LED 0/4, 6/7 signals.

6-9 EP-2878 Gain & Power LED

Voltage applied to the volume for 0 MDDF gain signal generator is the stabilized reference voltage of +5V stepped down from +12V power source.
Output signal is sent through a buffer to EP-2878 PANEL CONTROL and fed to the A/D converter. Also, the signal is fed to the Tx/Rx unit through EP-2870 :TF
The LED connected to +12V power source is lit when power is ON.
The buzzer having no drive circuit is controlled by EP-2878 PANEL CONTROL.

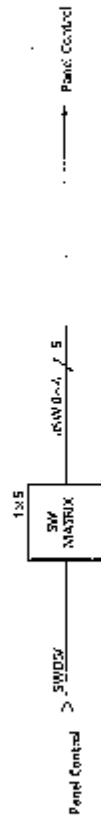


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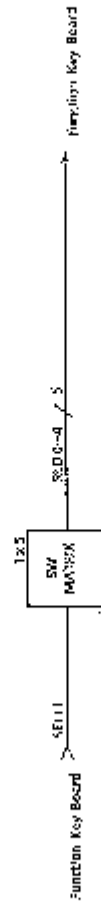
<p>Altolec</p>	<p>Gain & Power LED</p>	<p>EP-2872</p>	<p>1 / 1</p>
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6-10 Select Key

1. General
This PCB is a keyboard used for selecting equipment menus.
2. Operation
This PCB consists of 5 key switches and a diode array. The key switches form a matrix and signals for selecting lines and rows of matrix are sent out of Panel Control or MPU & ITF.



* このPCBは\$SD-500MIC\$に適用しな。 In case of using this PCB to \$SD-500MIC\$.



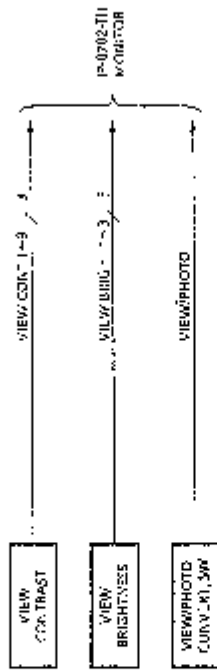
* このPCBは\$SD-500MIC\$に適用しな。 In case of using this PCB to \$SD-500MIC\$.

Alto	Select Key	EP-2879
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6-11 EP-7880 Contrast & Brightness

Parts connected to the monitor unit are the contrast and brightness volumes for the monitor screen as well as the selector switch has a position to be selected for setting of the monitor screen and another position to be selected for photography.

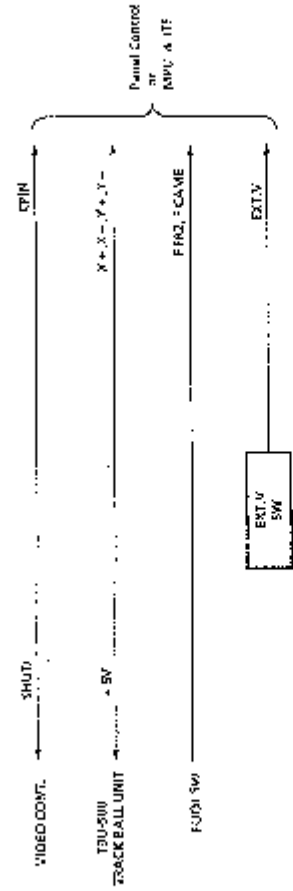
The photography position of the foregoing selector switch is effective only when using the photographic apparatus ACR-500. It is ineffective for other photographic apparatuses (SSZ-300, SSZ 108L, etc.)



6.12 In/Out

1. General

The foot switch, track-ball unit, video camera signal, and video signal internal / external switching-over signal passes through this PCB and is finally connected to Panel Control or MPU & I/F.



Aloko	In / Out	EP-288T	T
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6-13 EP-2882 Photo Cont. / Bright.

The contrast and brightness volumes for photography are connected to the main control unit.

Setting with the foregoing volumes is effective only when the selector switch on EP-2880 Brightness & Contrast is set properly, that is only when ACR-500 photographic apparatus is used.



	Photo Cont. / Bright.	EP2882	1 / 1
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16-1-8 Panel Unit

1. Composition

This PCB consists of Function Key Board, Full Key Board, GAIN & STC & Power LED, small trackball.

2. Genera

Function Key Board

This unit consists of the function switch and buzzer which generates alarm and a part which connects to Sect. Key, Full Key Board, GAIN & STC Power LED, MPU & ITT, ITF, small trackball.

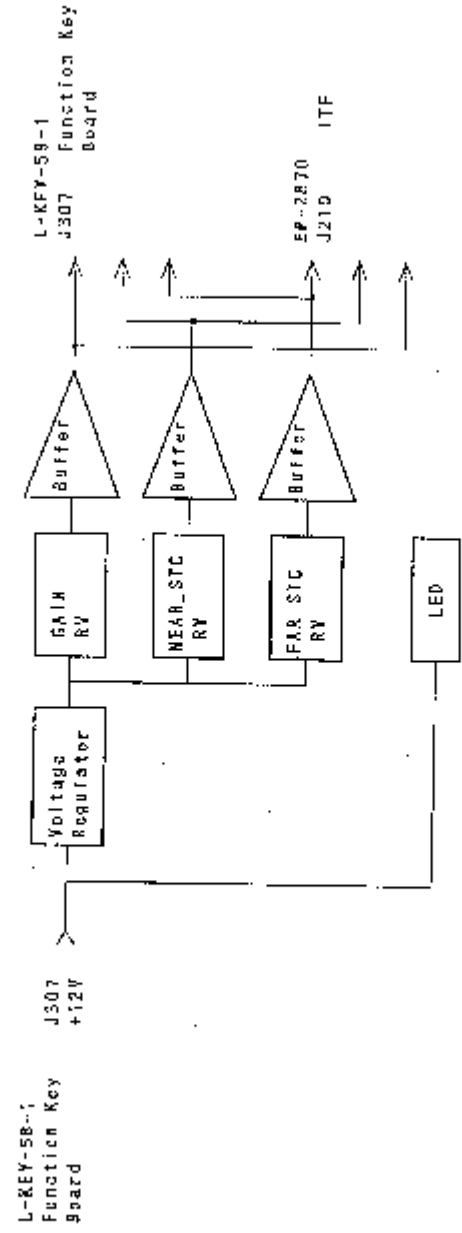
Full Key Board

This unit consists of Full Key switch, mode-selected switch and a part which connects to Function Key Board.

GAIN & STC & Power LED

This unit consists of the volume of GAIN, NEAR STC, FAR STC for adjustment of US image, LED which lights when the system starts up.

These are the purchased unit.



GAIN & STC & POWER LED L-KEY-58 3

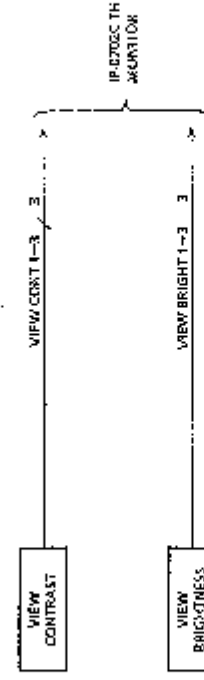
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6-15 Contrast & Brightness

1 General

This PCB consists of the control for 550-500 monitor contrast and brightness.

This PCB is included in the components of monitor IP-0702C TH.



Aloha	VIEW Contrast & Brightness	VIEW EP-2880-2	1 / 1
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6-16 MPU & I/F

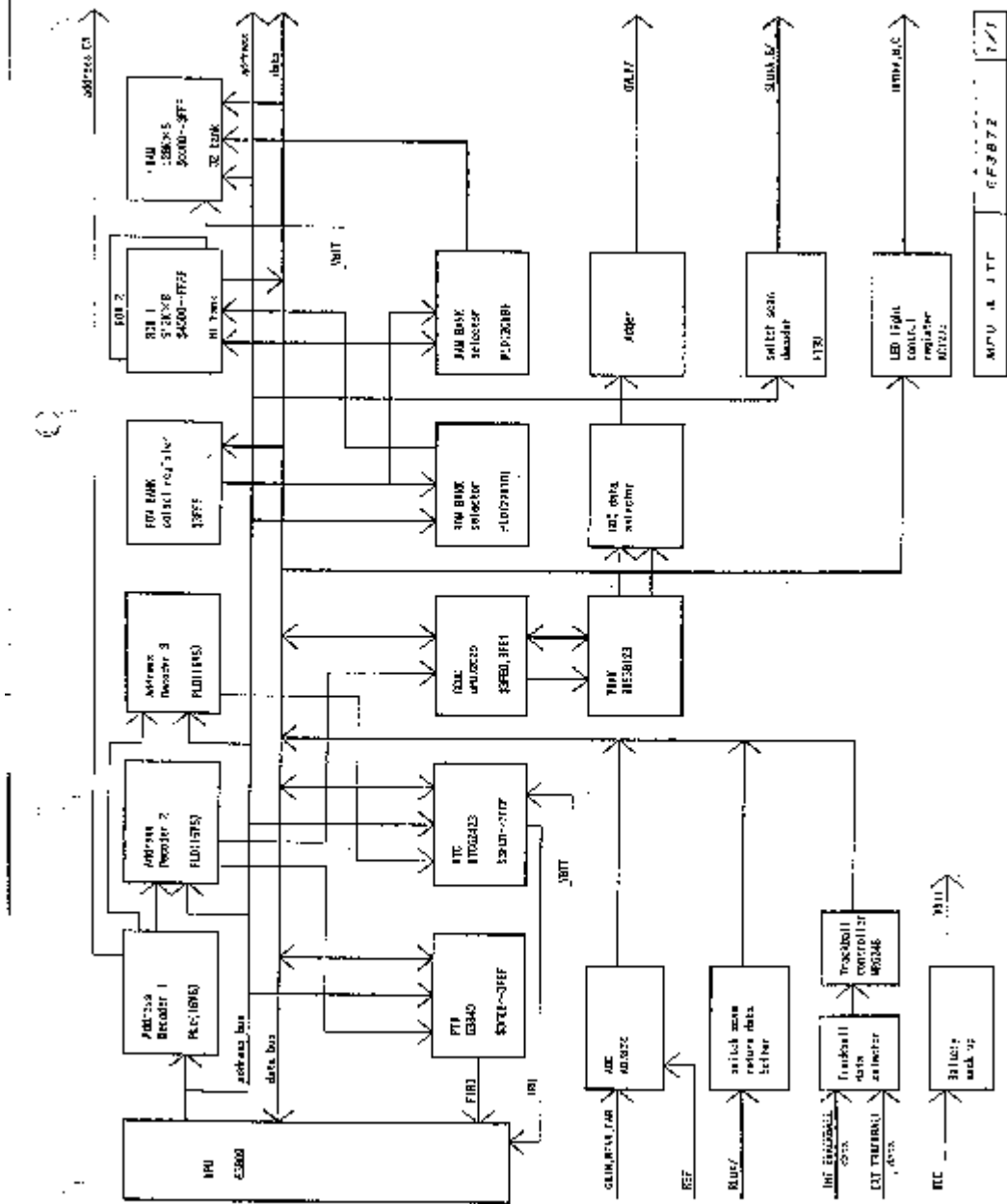
1. General

This PCB consists of micro processor, its peripheral circuit and graphic controller. Surface mount devices are employed for most of parts and result the size to be small.

SSD-590MICRUS dose not use system bus owing to single processor.

Graphic controller realize high speed display of graphics using GDC without decreasing the memory space of MPU.

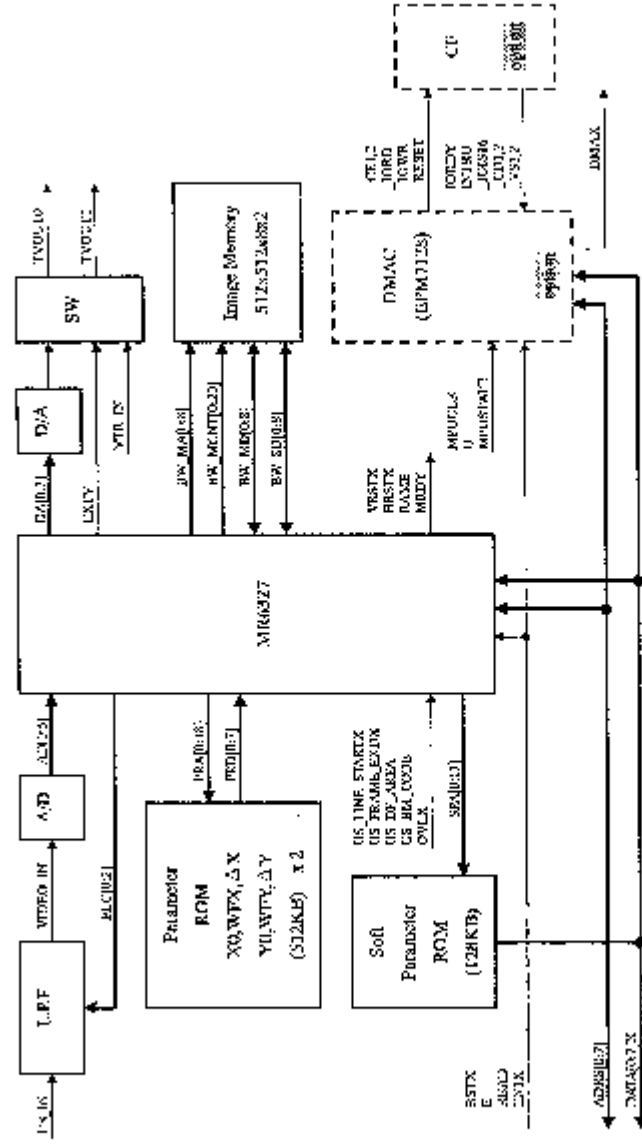
And, this PCB serves as an interface between the MPU (Micro Processing Unit) and the panel board.



6-17 DDU

This block performs conversion of the ultrasound signal to digital signal, then takes the data into the line buffer memory in synchronized with DDP's timing, then stores the data into image memory by means of X-Y sampling writing system, and reads out the data according to TV scanning. And then, performs post-process such the gradient conversion of display data, addition of attribute, addition of character and graphics, then outputs TV displaying signal by adding the TV synchronizing signal after convert digital to analog signal.

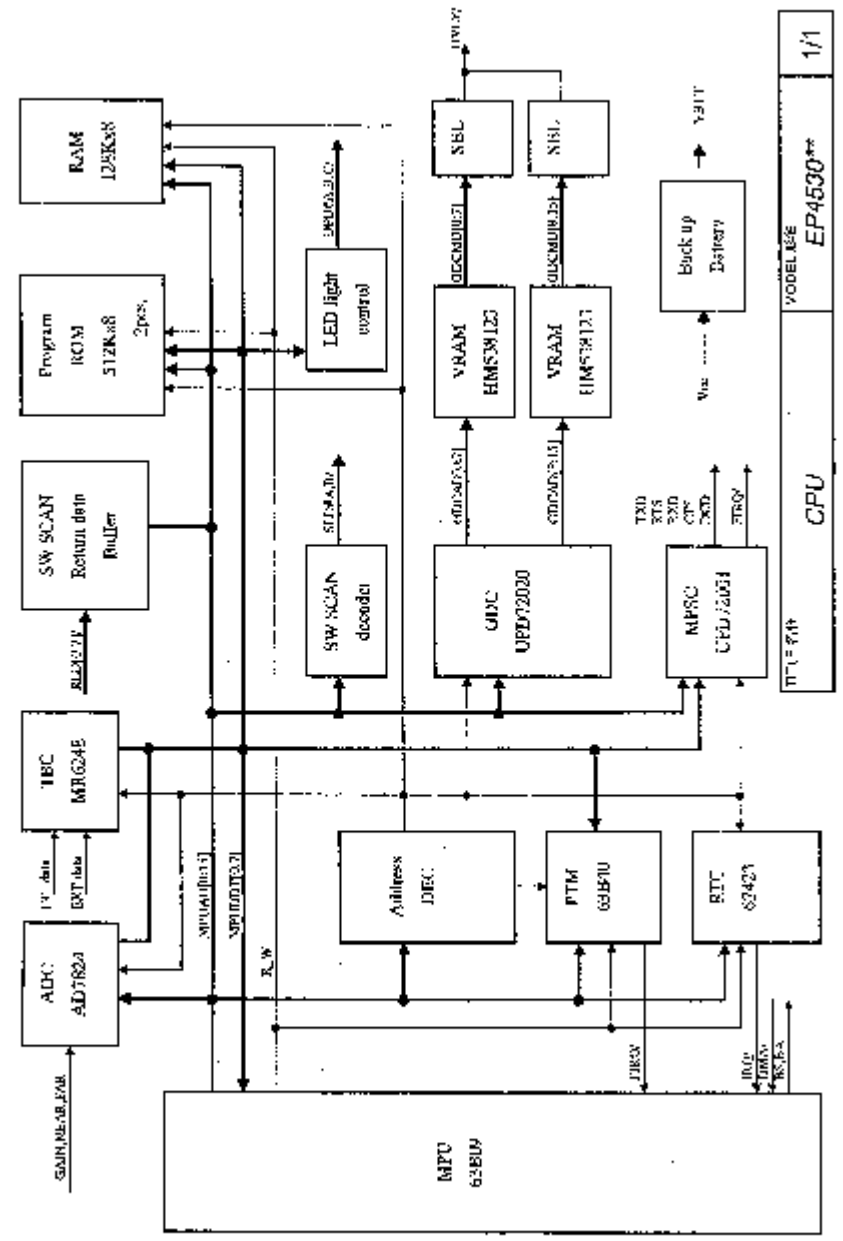
1. CPU interface block
2. Line buffer block
3. Main memory block
4. Writing control block
5. Display control block
6. Compact flash memory



TITLE 番号	MODEL 番号	1/1
DIU	EP4531AA	

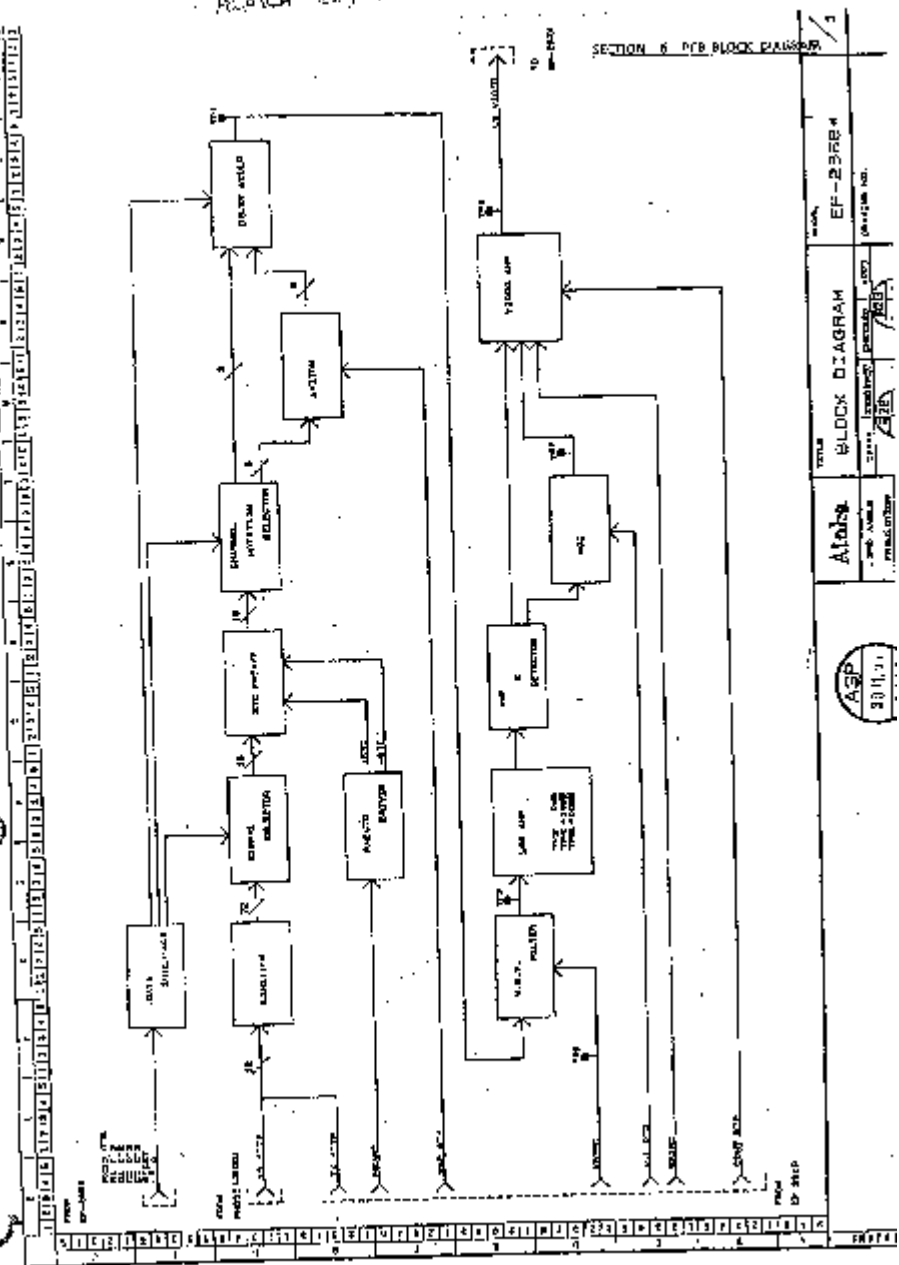
6-18 MPU

This board consists of microprocessor, its peripheral circuit and graphic controller.



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01 11/30 TRI 11:14 FAX 0429 82 3155 ALOKA ME Section ... ALOKA 500 2-4 16
 To: Mr. SAC Mr. K. P. KARMAKAR
 From: Y. UMAREKARTI, SAAI TRI K. C.
 ALOKA S. page
 Total 4 pages



SECTION 6 THE BLOCK DIAGRAM	
TITLE	BLOCK DIAGRAM
NO.	EF-25884
DATE	
BY	
CHECKED	
APPROVED	
DESIGNED	
MANUFACTURED	



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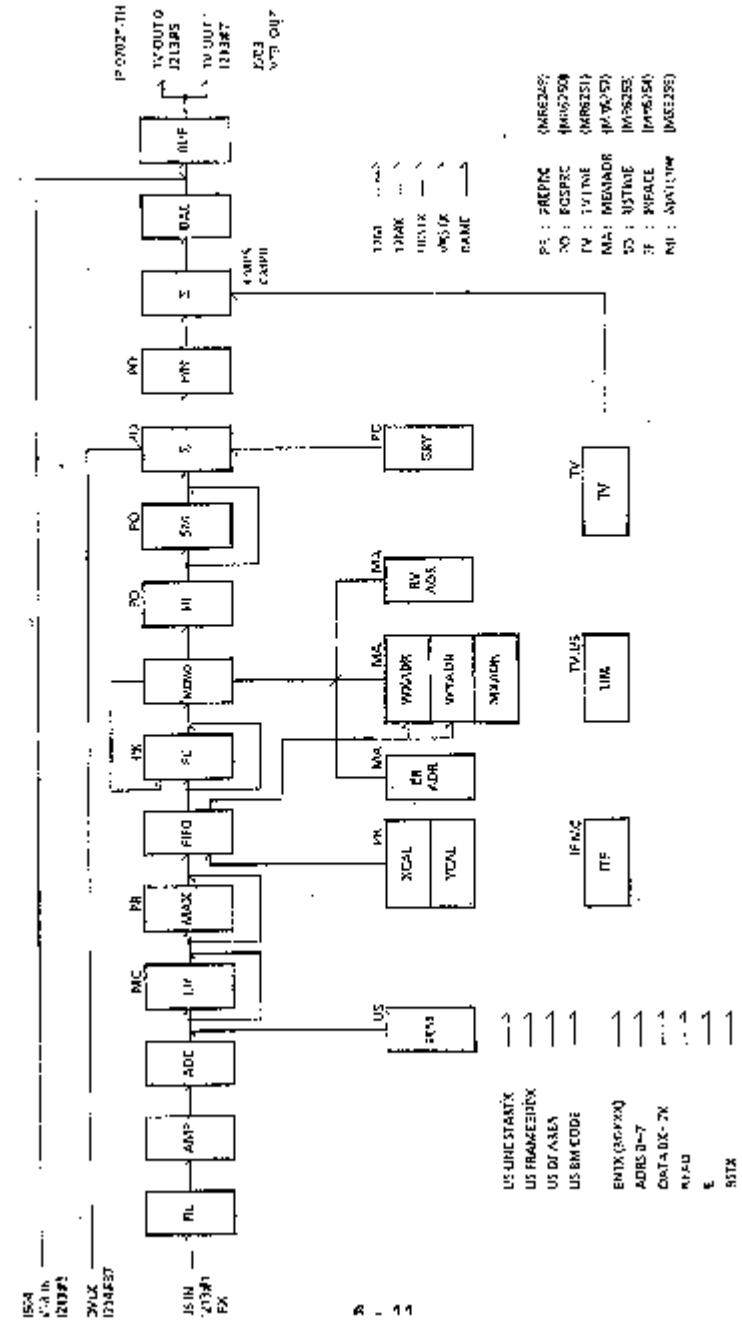
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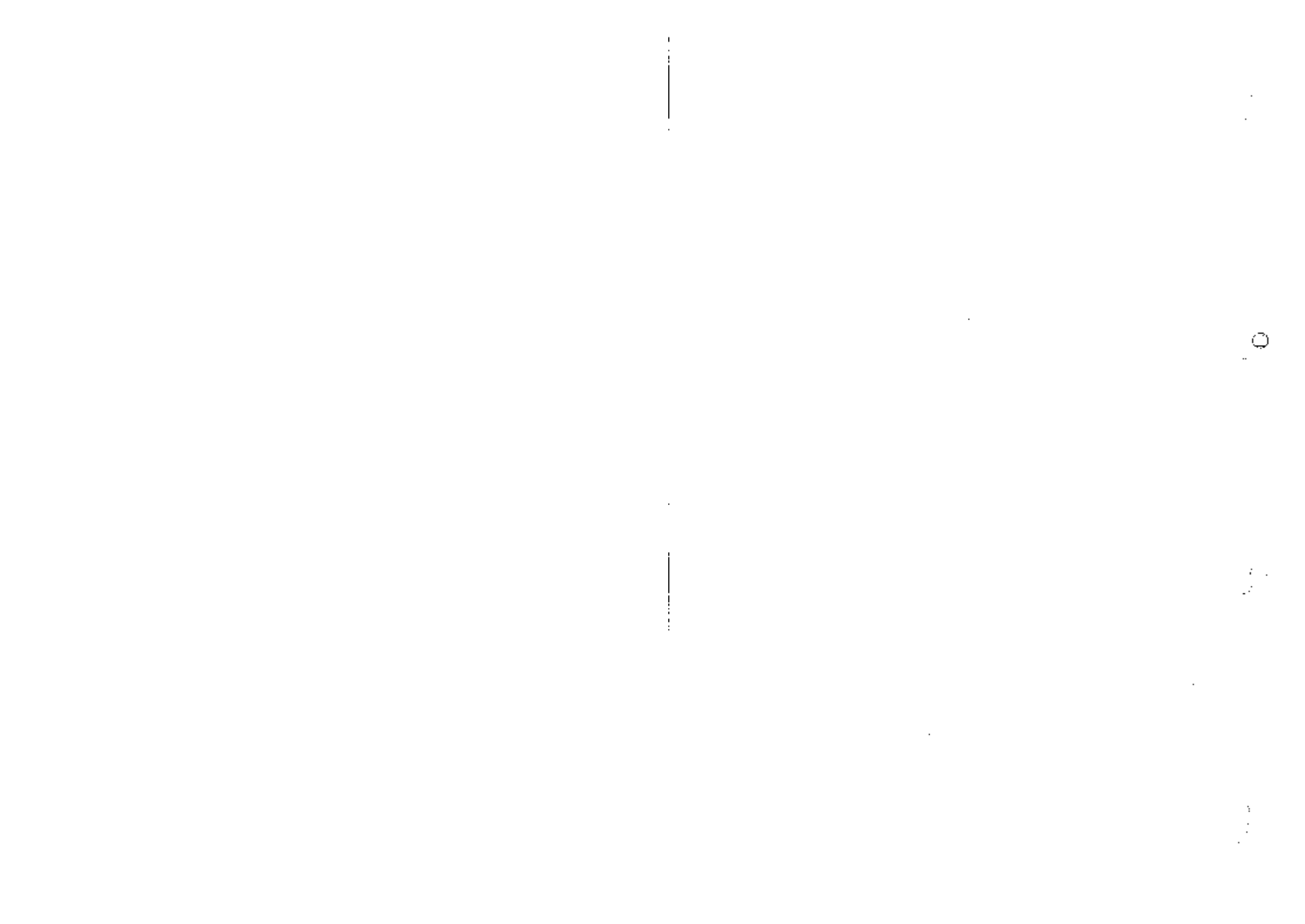
SECTION 3 PCB BLOCK DIAGRAM



Block Diagram

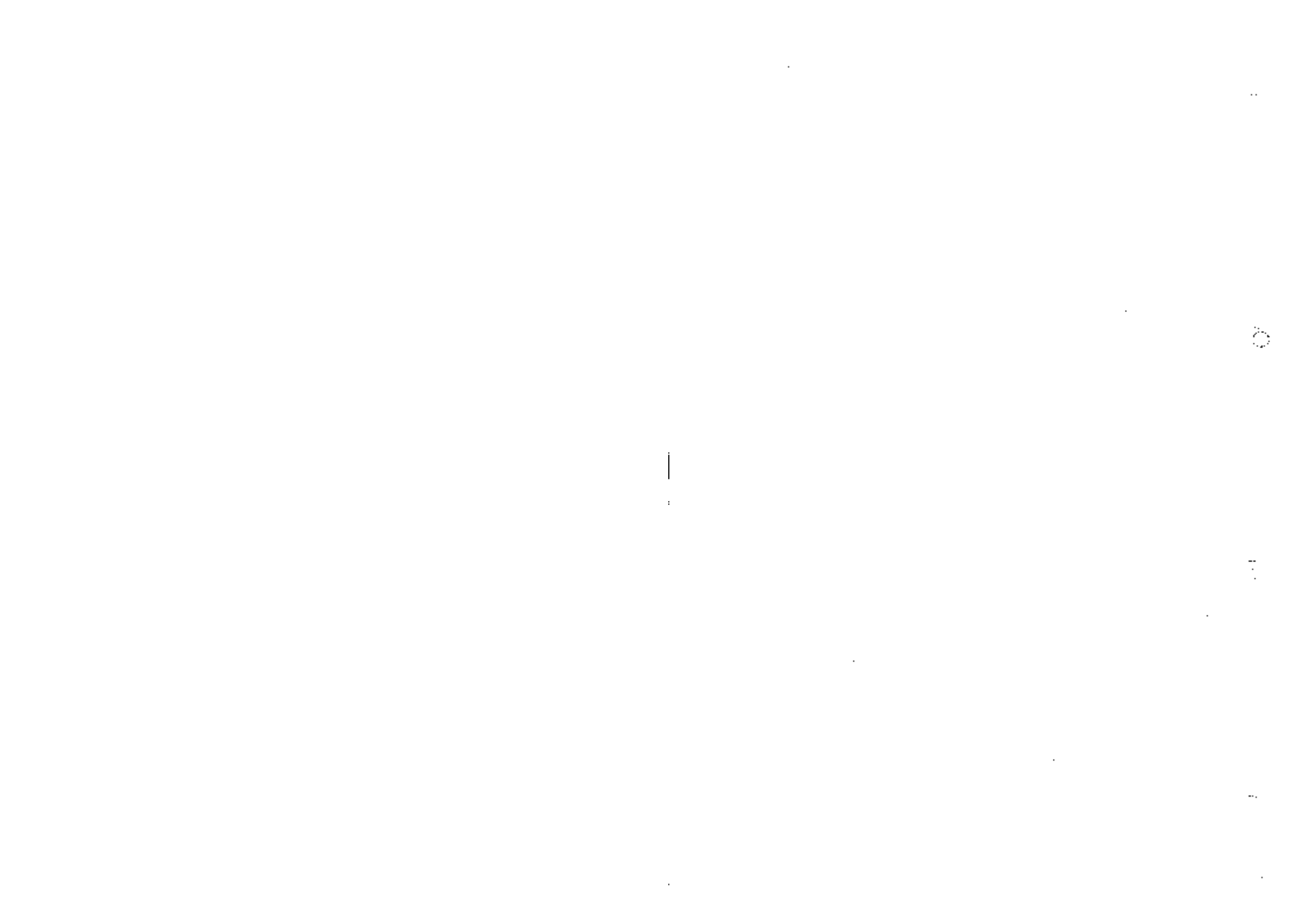
Altek
 EP-2877 / EP3921
 DISC

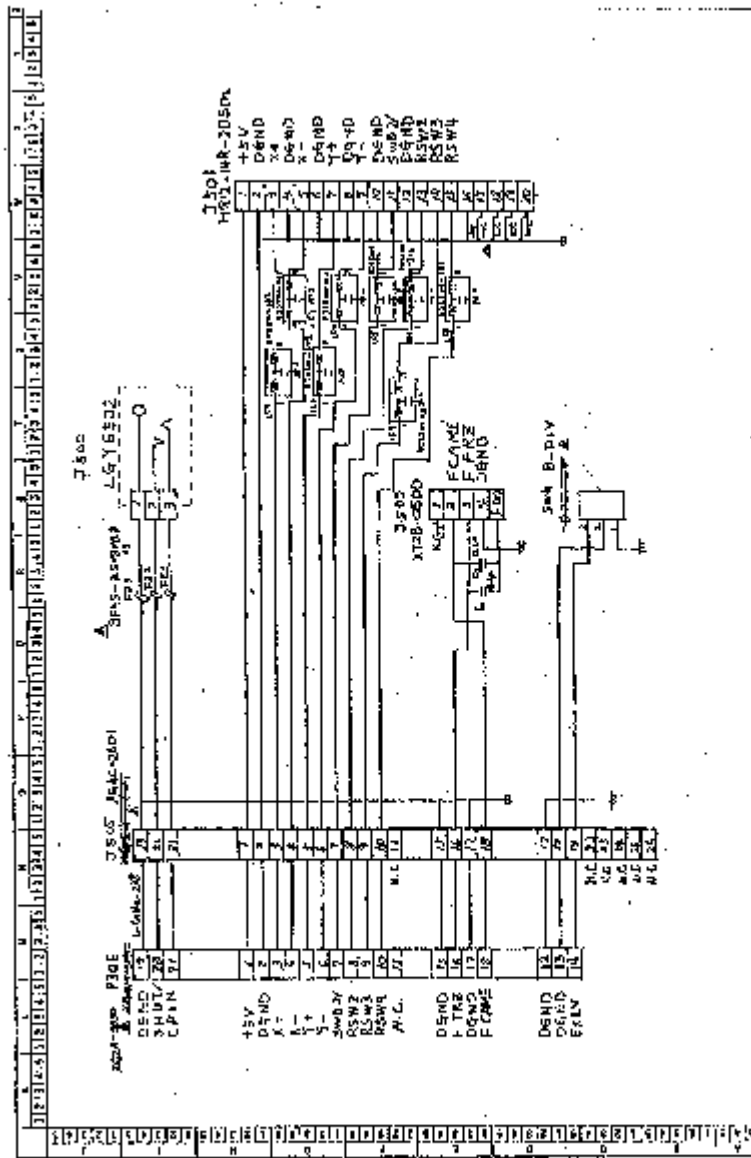




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REVISIONS: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

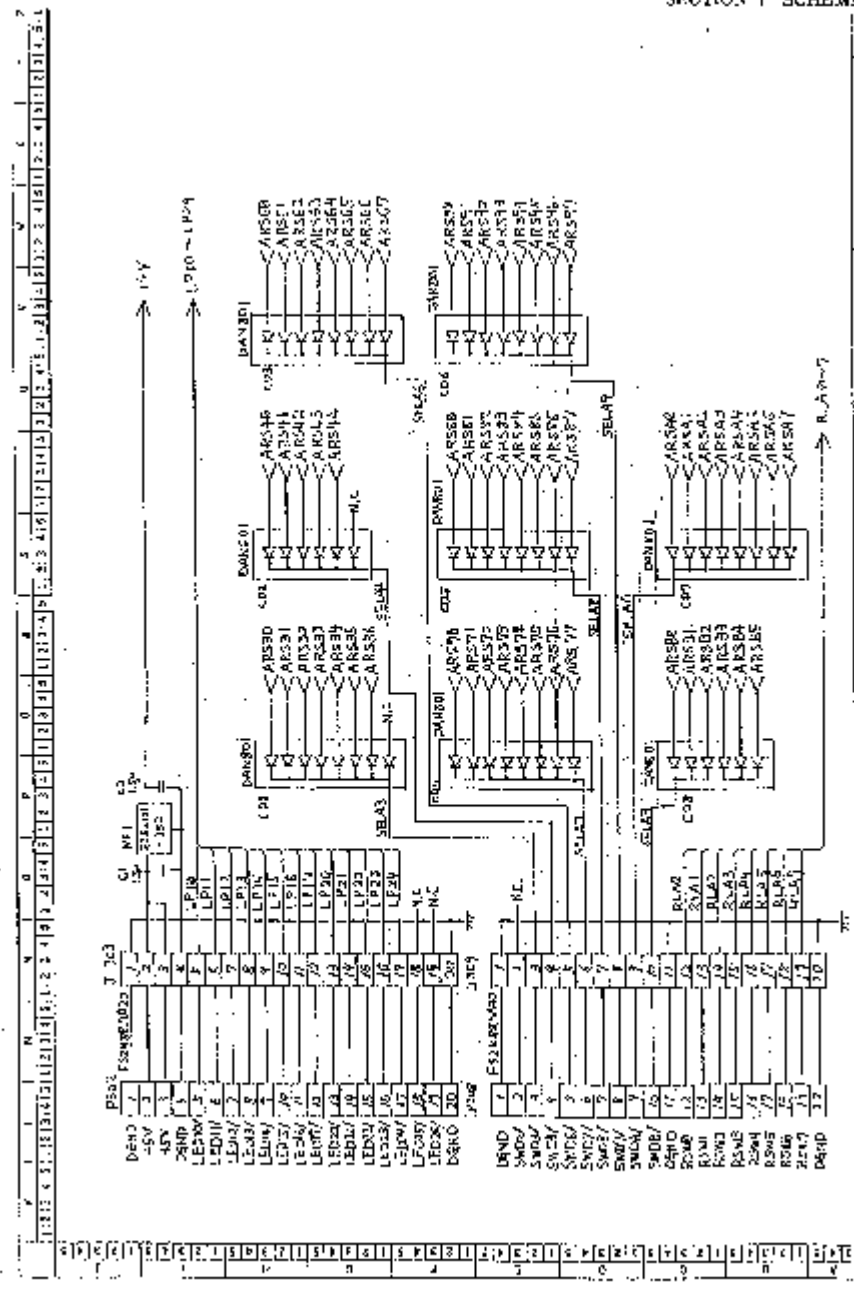
Alpha 1-OUT

EP-288

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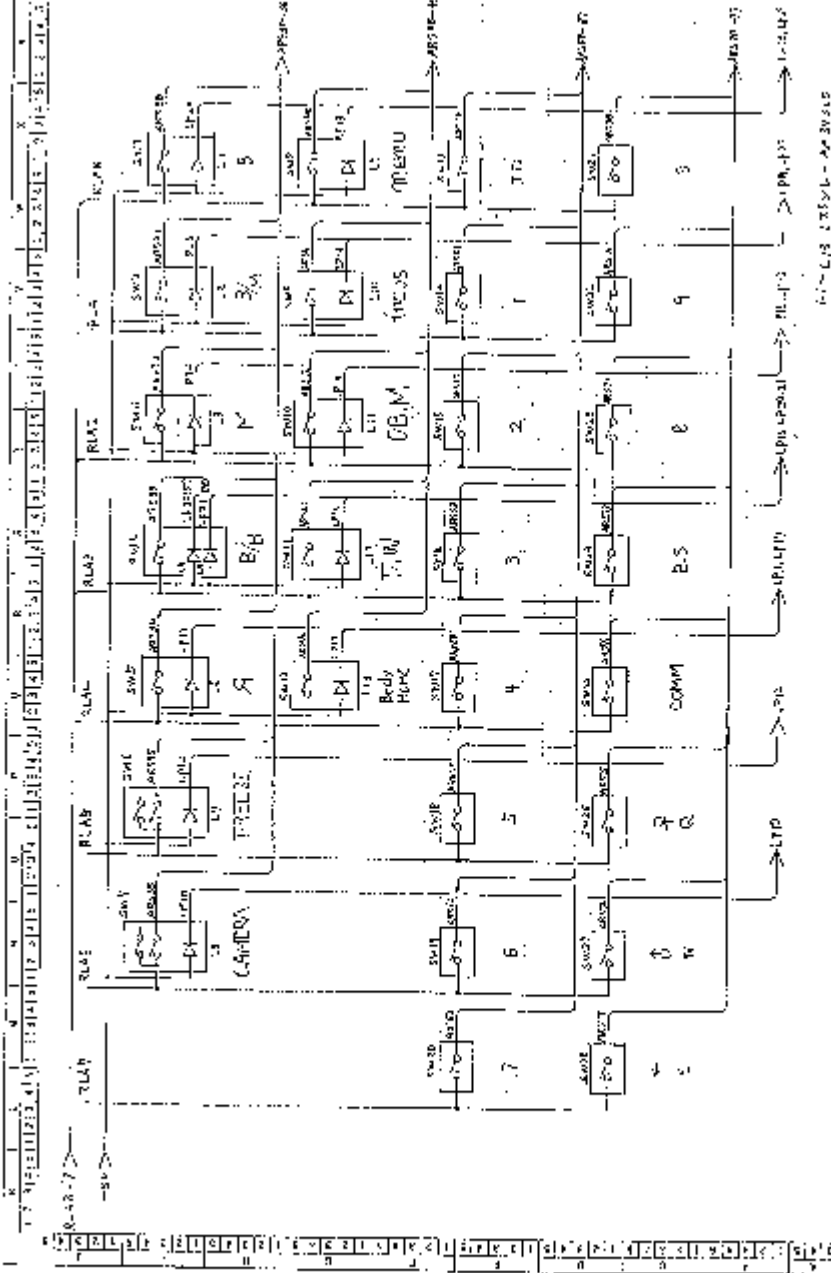
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Alto **1-KEY-14-A (*)**
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SECTION 7 SCHEMATICS



Alotek

1-KEY-12-A (*)

SWITCHES: 12, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10

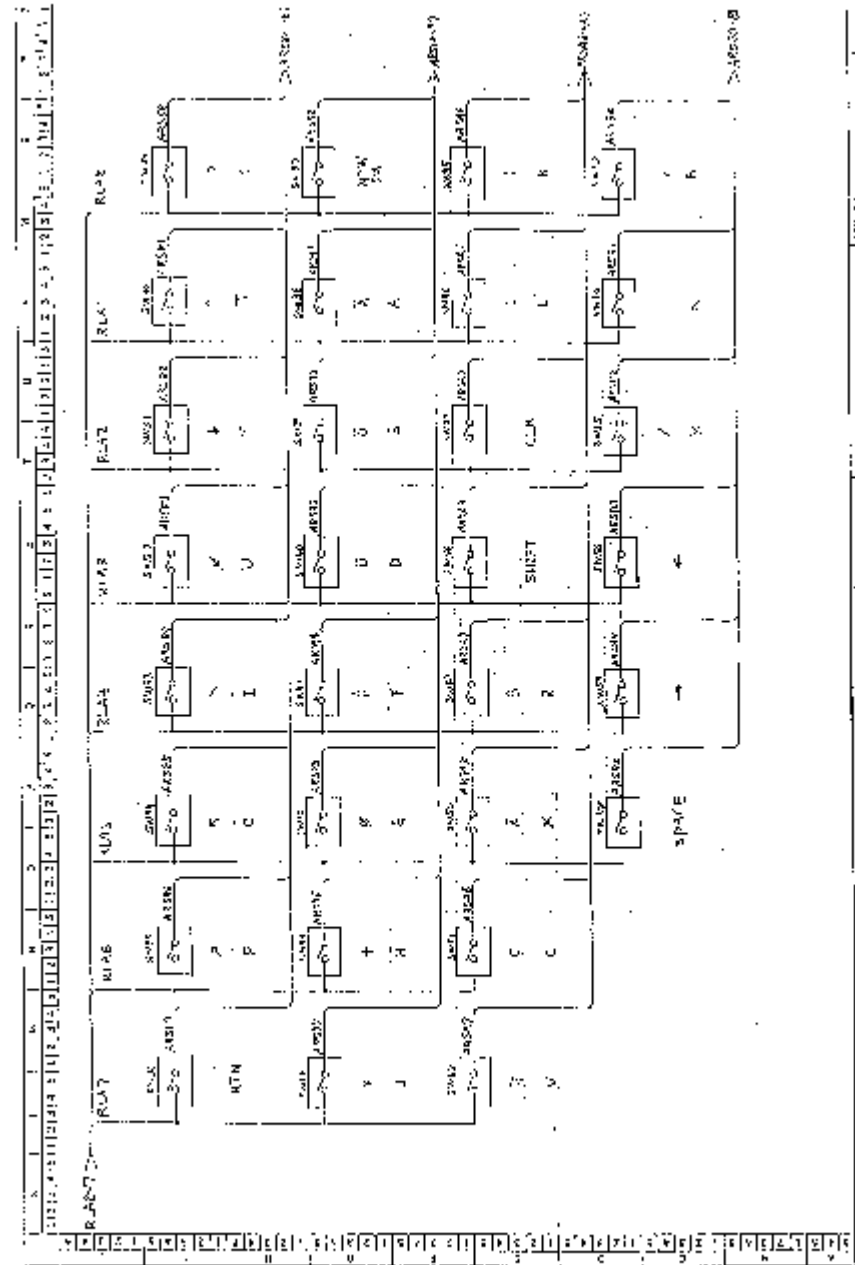
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DATE: 10/10/10

DESIGNER: [Signature]

REVISION: [Signature]



Altoha

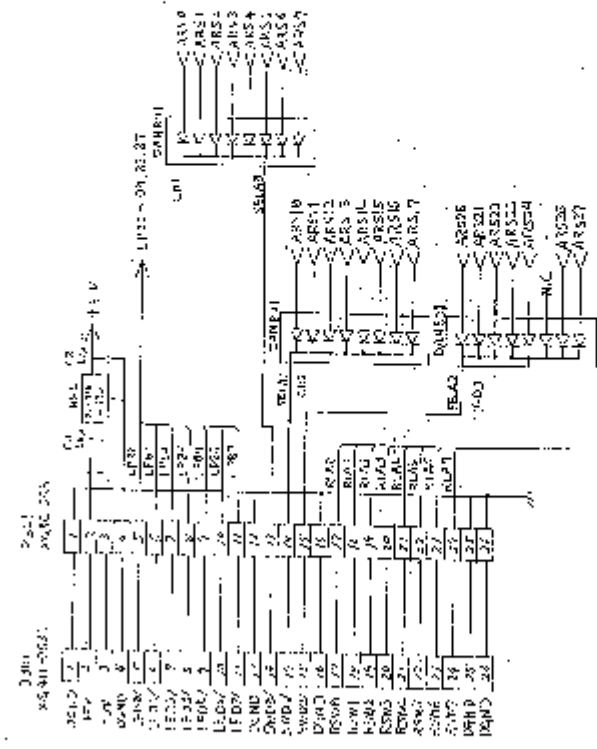
MM2-0206 Rev. 10

SECTION 7 SCHEMATICS

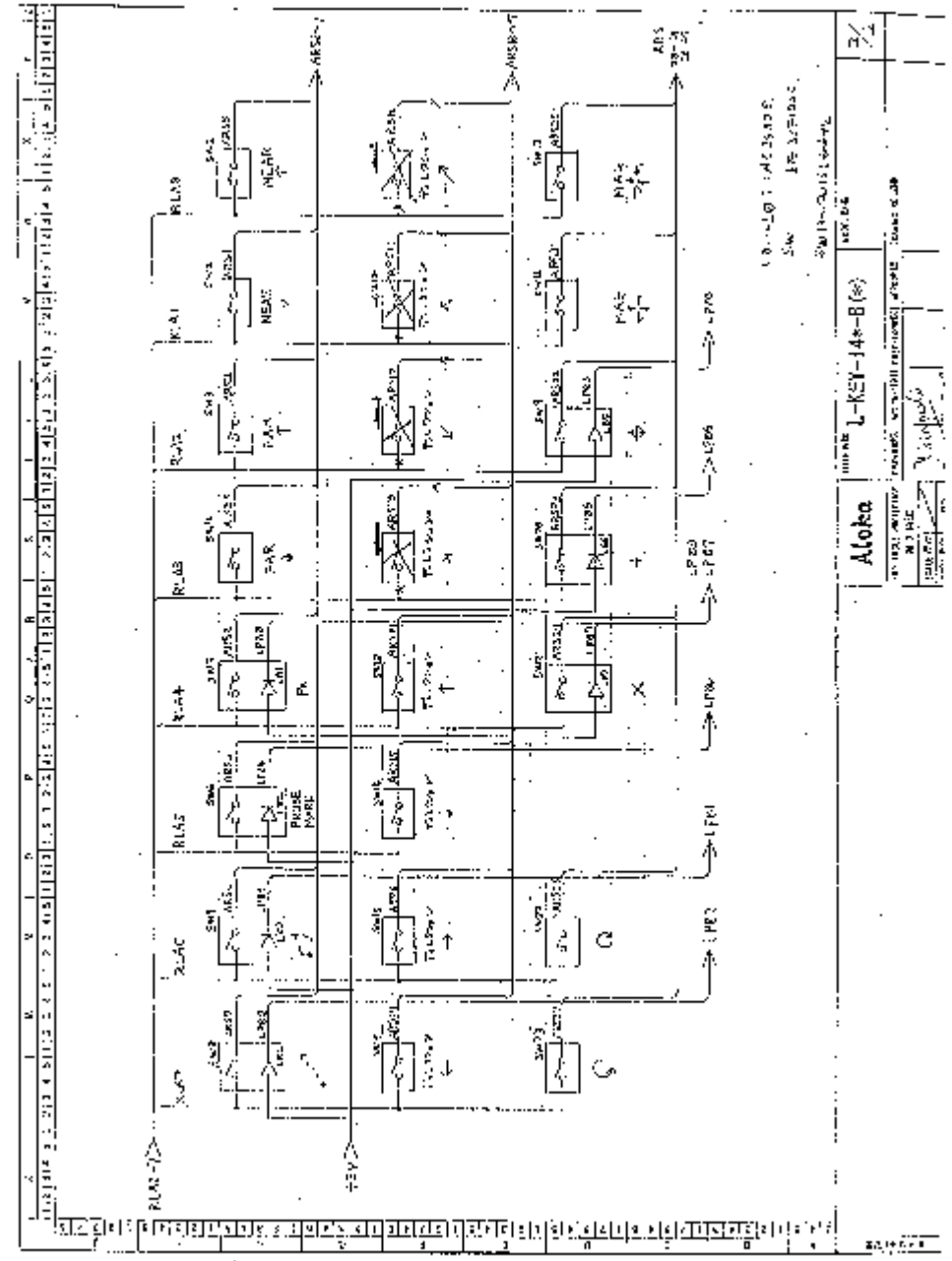
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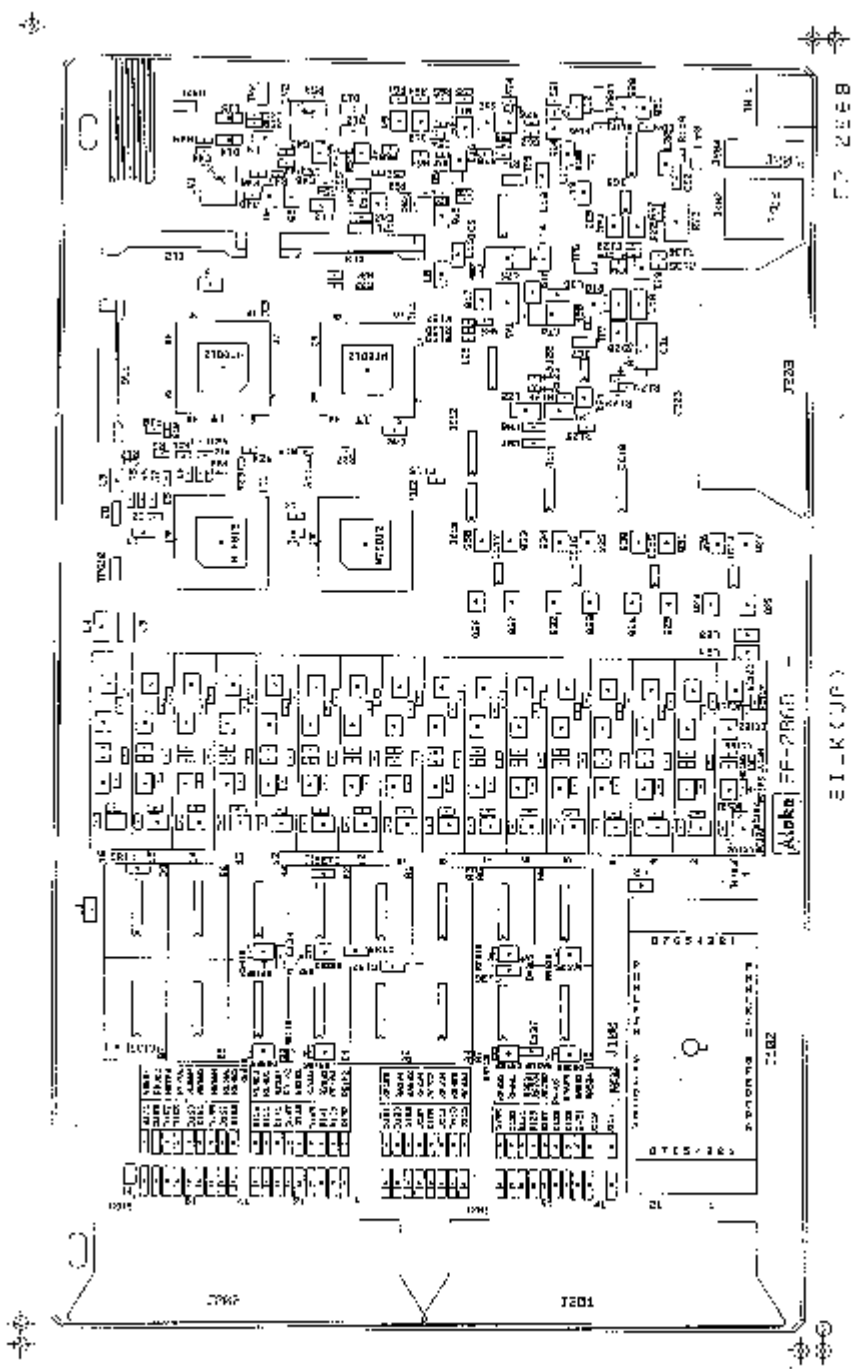
BY: [Signature]

REVISION: 1



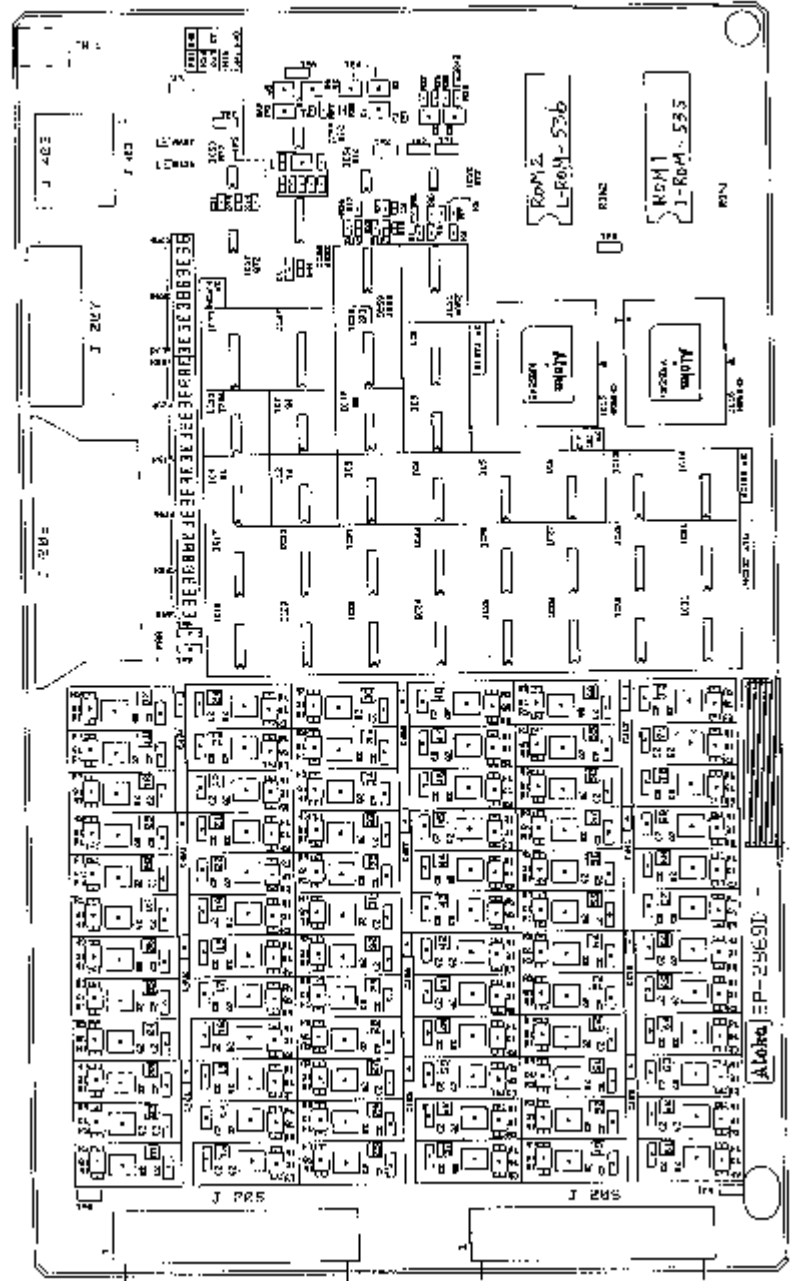
REVISE	DATE	BY	CHKD	APPD	SCALE
1	11/12				





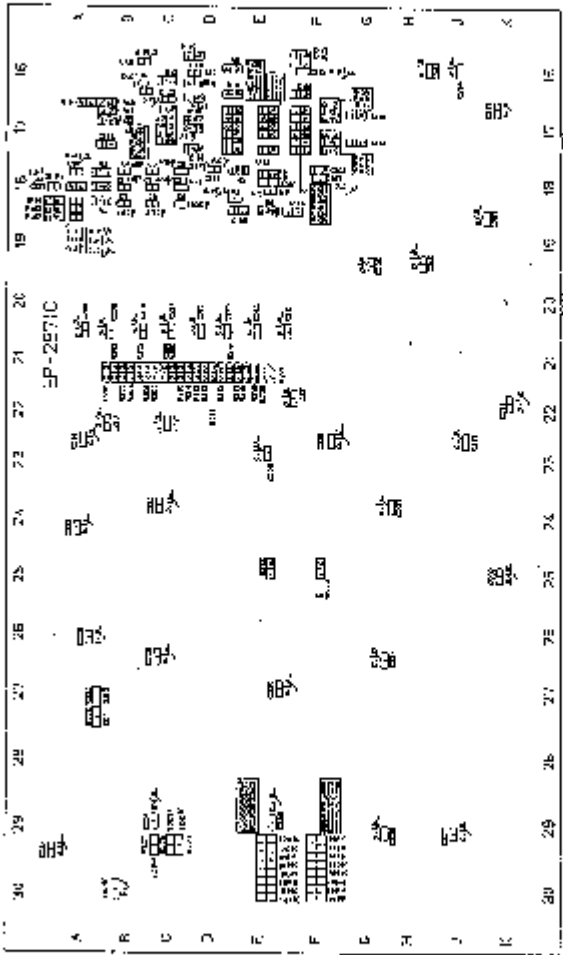
7-2258

Alaska FF-2766
EI-KCJP



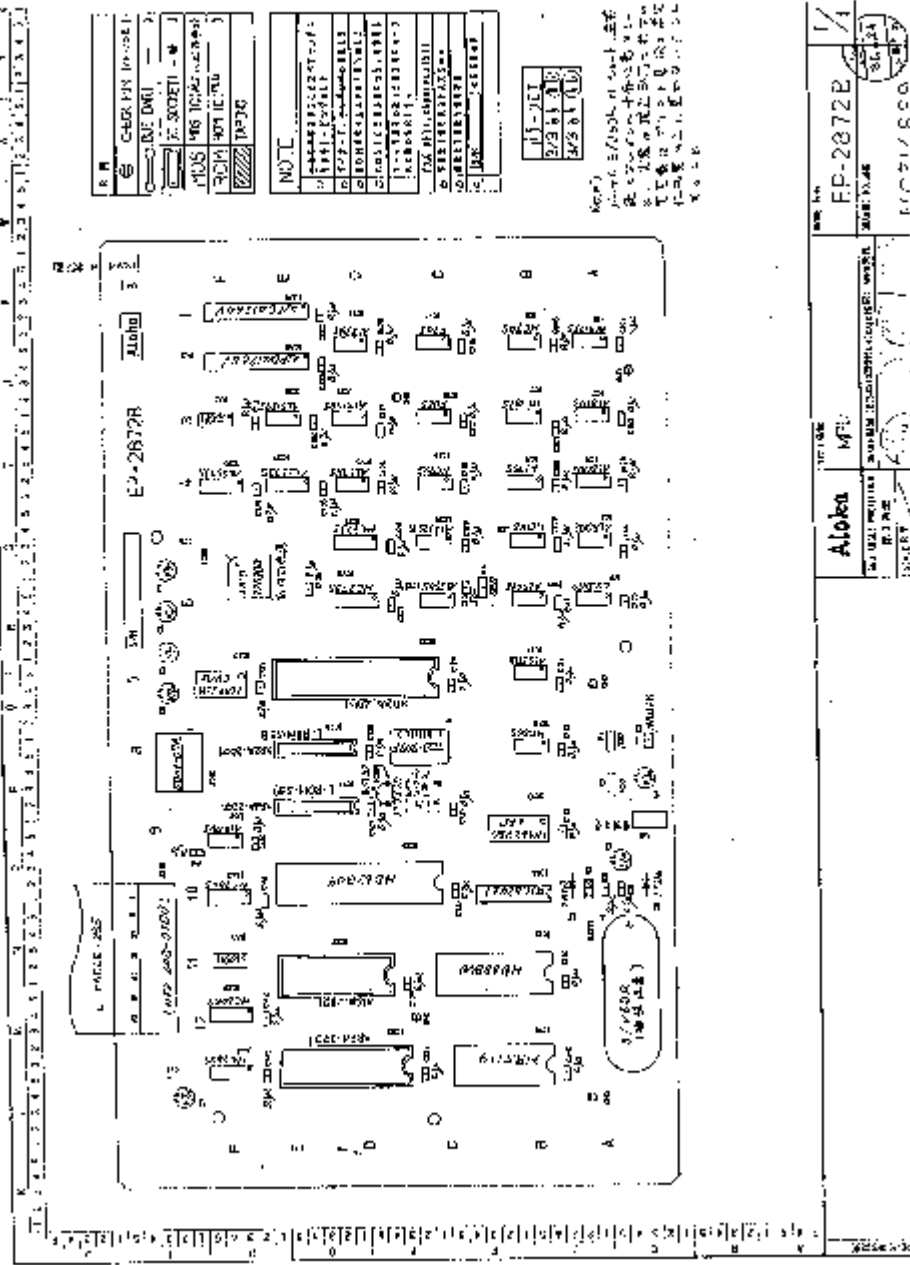
EP-2869D

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 A B C D E F G H J K



Scale: 1/4" = 1'-0"
 Date: 10/1/58
 Drawn: J. H. [unclear]
 Checked: [unclear]
 Title: [unclear]

FOR ALL MATERIALS SEE SPECIFICATIONS AND DRAWINGS	TITLE D&C	WORK NO. EP 2671C	SHEET NO. 1/1
	ALOKA	GENERAL CONTRACTOR M.C. JENSEN & SONS 1000 15th St. S.W. SEASIDE, CALIF.	PROJECT NO. MC3155



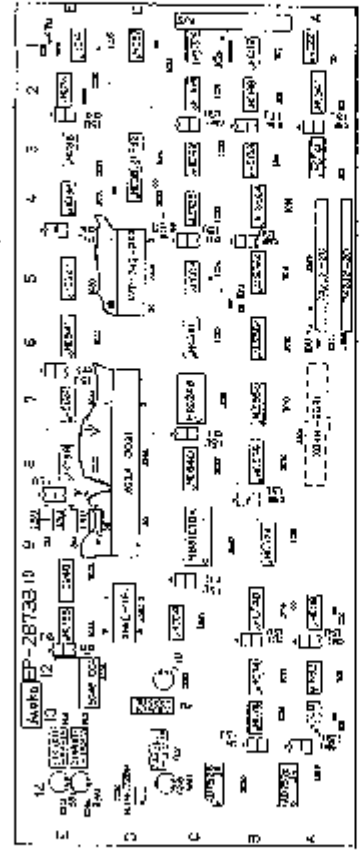
NAME	CHARLES HANSEL
DATE	1/11/50
PROJECT	1455.14
NO.	100
BY	CHH
CHECKED	
DATE	
SCALE	1/4" = 1'-0"
NOTES	

1/11/50
1455.14

NOTE: This plan is for the building shown on the site plan. It is not to be used for any other purpose without the approval of the architect.

PROJECT	ALPHA	DATE	1/11/50
BY	CHH	SCALE	1/4" = 1'-0"
CHECKED		DATE	
DATE		SCALE	

1 2 3 4 5 6 7 8 9 10 11 12 A B C D E



1	INSTRUMENT
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3	INSTRUMENT
4	INSTRUMENT
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8	INSTRUMENT
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10	INSTRUMENT
11	INSTRUMENT
12	INSTRUMENT

NOTE

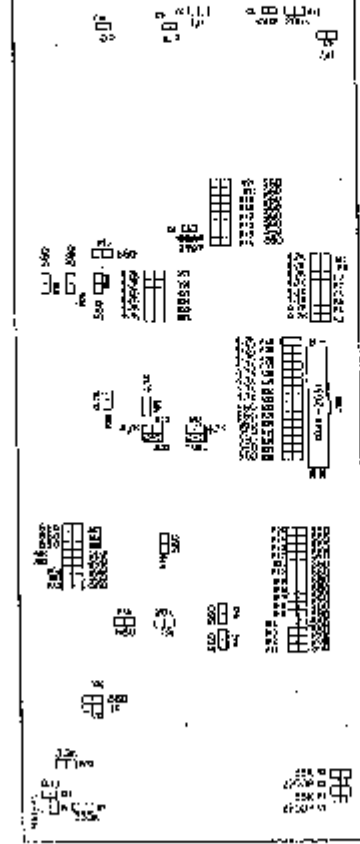
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10-10-40
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SEE DRAWING SHEET NO.

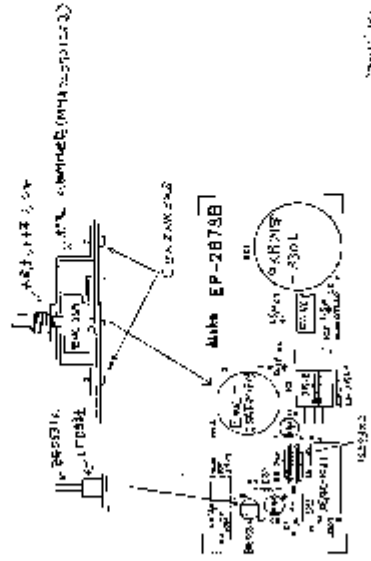
WORKS	EP-28733	1/2
Aloko Panel Control		
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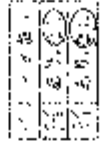


12 FBI REC
 2.4.7.8

TITLE Alcho		M.F. No. FP-2973B	21 22
DRAWN BY J. J. [Signature]		CHECKED BY [Signature]	DATE 11/1/54
PROJECT MC 314544		100-44388-100	



① 基板のレイアウトは、この図に準じてください。
 ② 基板のレイアウトは、この図に準じてください。
 ③ 基板のレイアウトは、この図に準じてください。



この図のレイアウトは、この図に準じてください。

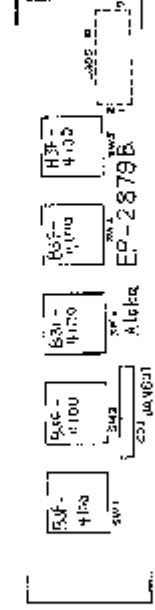
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<input type="checkbox"/>	IC SOCKET
<input type="checkbox"/>	MOS
<input type="checkbox"/>	ROM
<input type="checkbox"/>	TAPING

NOTE	
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Alaka	
DATE	2002.05.10
DESIGNER	Y. YAMASHITA
CHECKER	K. YAMASHITA
APPROVED	
PROJECT NO.	EP-28788
REVISION	1/3
MICROPROCESSOR IC 814492	

e CHECK PRNCP-10B	
KICKSTART :	
KICKNETC :	
MOS	MOS ICF
ROM	ROM ICF
TAPING	

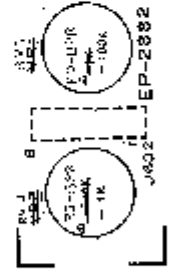
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5. 予備品	6. 予備品
7. 予備品	8. 予備品
9. 予備品	10. 予備品

Alpha	Serial Key	TABLE 8
EP-2879B	EP-2879B	1/1
491	495	

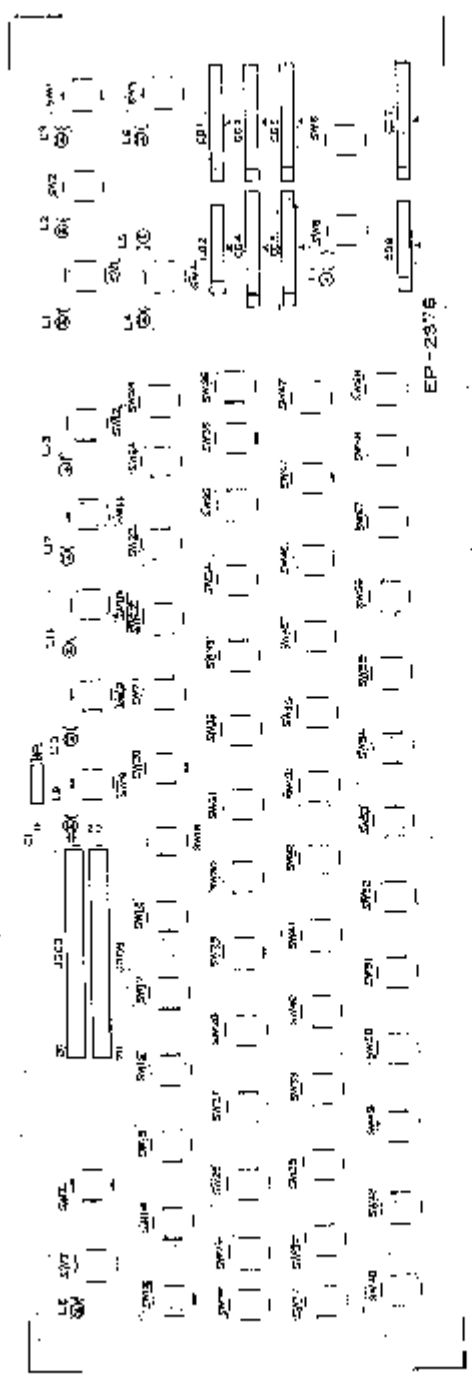
Aloka



1982 02 27

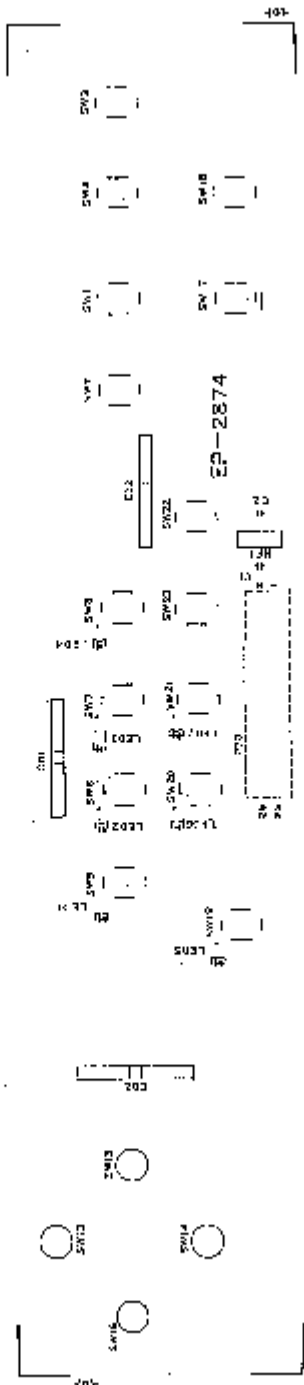
1982 02 27

Aloka Tokyo, Japan	Auto Control	1/4
Model No. EP-2882	Serial No. MC 314017	

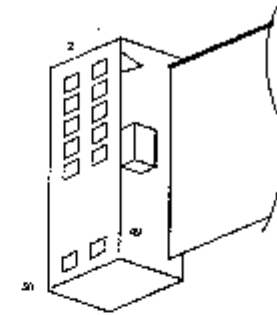
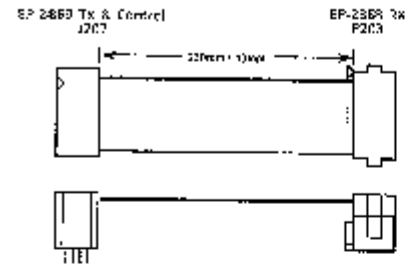


EP-2376

1-KEY-14A



L-KEY-143



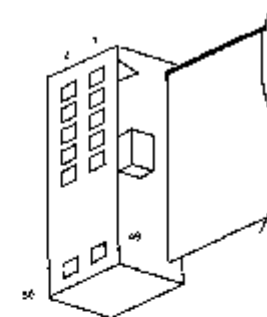
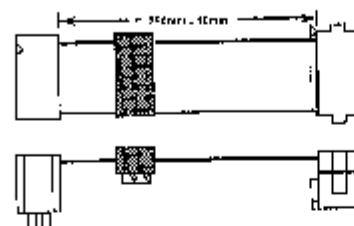
Pin No.	Signal
1	GND
2	GAIR L
3	GND
4	VREF C
5	GND
6	NEAR C
7	GND
8	COVT0
9	COVT1
10	COVT2
11	ASC0
12	ASC1
13	ACC2
14	SD0
15	SD1
16	SD2
17	RD0
18	RD1
19	RD2
20	PA0
21	PA1
22	PA2
23	PA3
24	GND
25	LC0
26	GND
27	RXDD0
28	RXDD1
29	RXDD2
30	RXDD3

Pin No.	Signal
31	RXDD4
32	RXDD5
33	RESET
34	DADDR0
35	DADDR1
36	DADDR2
37	GND
38	VAF0
39	VAF1
40	VAF2
41	VAF3
42	VAF4
43	SV0
44	FC0
45	FC1
46	FC2
47	FC3
48	FC4
49	FC5
50	GND

Aloka	L-Cable-233
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EP-7870 I/F
J209

EP-2069 Tx & Control
J208



F208 J209

Pin No.	Signal
1	GND
2	ISM
3	TSW
4	GND
5	USBLK
6	GND
7	USADRS 0
8	USADRS 1
9	USADRS 2
10	USADRS 3
11	USADRS 4
12	USADRS 5
13	USADRS 6
14	USADRS 7
15	FOODE 0
16	FOODE 1
17	FOODE 2
18	GND
19	EN 0
20	GR 0
21	EN 1
22	GND
23	DATA 0
24	DATA 1
25	DATA 2
26	DATA 3
27	DATA 4
28	DATA 5
29	DATA 6
30	DATA 7

F208 J209

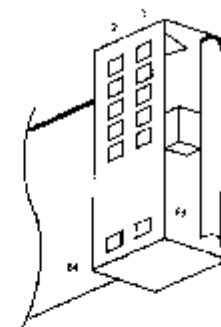
Pin No.	Signal
31	VAPS
32	N.C.
33	GND
34	VAP 0
35	VAP 1
36	VAP 2
37	VAP 3
38	VAP 4
39	GND
40	N.C.
41	GAIN
42	NEAR
43	FAR
44	PC 0
45	PC 1
46	PC 2
47	PC 3
48	PC 4
49	PC 5
50	N.C.

Aloka

L-Cable-234

DA-2872 CA-J
J215

DF-2871 D5C
P214



P214 J215

Pin No.	Signal
1	V.C.
2	V.C.
3	A.C.
4	A.C.
5	R.C.
6	R.C.
7	R.C.
8	R.C.
9	GND
10	GND
11	GND
12	GND
13	GND
14	GND
15	GND
16	GND
17	GND
18	GND
19	5V
20	5V
21	5V
22	5V
23	5V
24	5V
25	5V
26	5V
27	5V
28	5V
29	GND
30	GND
31	12V
32	GND
33	12VX
34	GND
35	115TX

P214 J215

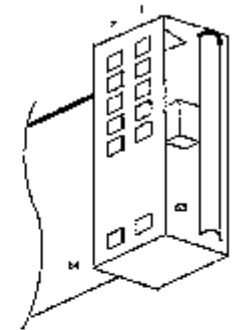
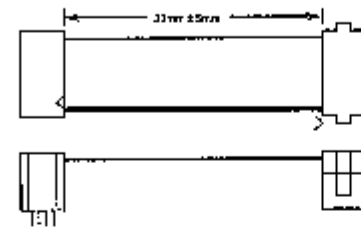
Pin No.	Signal
36	VRS7X
37	OVLX
38	GND
39	E
40	GND
41	READ
42	WRITE
43	RSTX
44	RAM E
45	EV IX
46	EV IX
47	ADDR 7
48	ADDR 6
49	ADDR 5
50	ADDR 4
51	ADDR 3
52	ADDR 2
53	ADDR 1
54	NRSD
55	DATA 7X
56	DATA 6X
57	DATA 5X
58	DATA 4X
59	DATA 3X
60	DATA 2X
61	DATA 1X
62	DATA 0X
63	GND
64	GND

Aloka

L-Cable-235

EP 2870 DSC
J211

EP 2870 DSC
P212



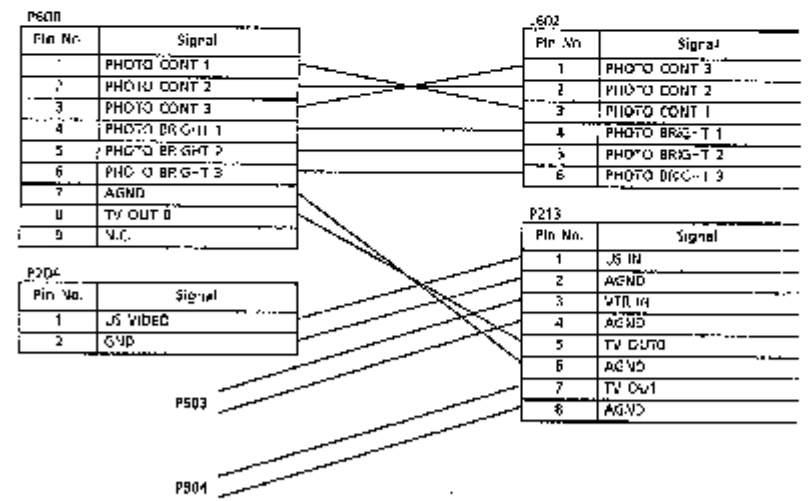
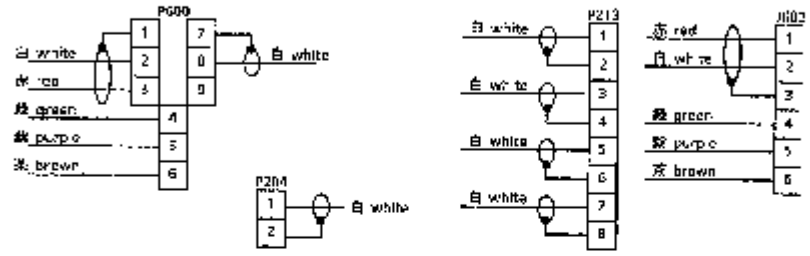
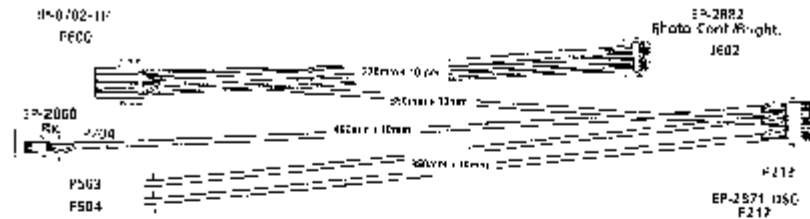
P212 J211

Pin No.	Signal
1	GND
2	GND
3	DATA 0X
4	DATA 1X
5	DATA 2X
6	DATA 3X
7	DATA 4X
8	DATA 5X
9	DATA 6X
10	DATA 7X
11	ADRS 0
12	ADRS 1
13	ADRS 2
14	ADRS 3
15	ADRS 4
16	ADRS 5
17	ADRS 6
18	ADRS 7
19	EN 0X
20	EN 1X
21	ENMK
22	BSTX
23	NNBX
24	READ
25	GND
26	E
27	GND
28	LS LINE STARTX
29	GND
30	JS FRAME ENDX
31	GND
32	IIS OF AREA
33	GND
34	IIS DM CODE
35	GND

P212 J211

Pin No.	Signal
36	GND
37	5V
38	5V
39	5V
40	5V
41	5V
42	5V
43	5V
44	5V
45	5V
46	5V
47	GND
48	GND
49	GND
50	GND
51	GND
52	GND
53	GND
54	GND
55	GND
56	GND
57	-12V
58	-12V
59	AGND
60	AGND
61	12V
62	12V
63	AGND
64	AGND

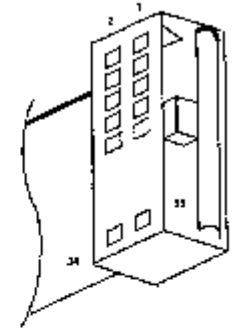
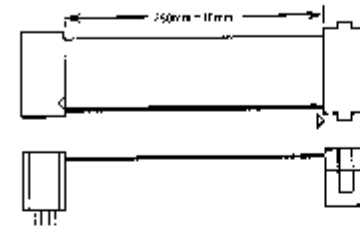
Aloka L-Cable-235



Aloha L-Cable-236

F210 Panel Control
J300

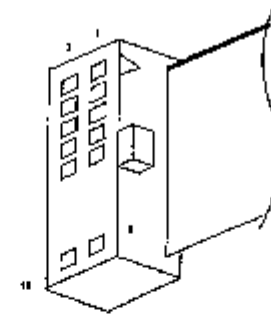
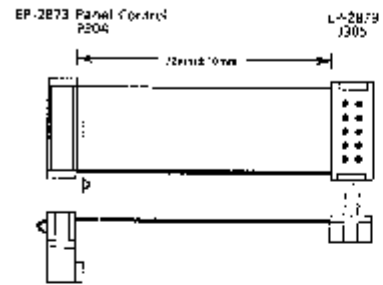
44-2870 (TF)
D310



F210 J300

Pin No.	Signal
1	GND
2	DTA 0f
3	DTA 1f
4	DTA 2f
5	DTA 3f
6	DTA 4f
7	DTA 5f
8	DTA 6f
9	DTA 7f
10	GND
11	E
12	GND
13	READ
14	RAME
15	ADRS 0
16	ADRS 1
17	ADRS 2
18	ADRS 3
19	ADRS 4
20	ADRS 5
21	ADRS 6
22	ADRS 7
23	ECDD
24	GND
25	N.C.
26	GMI
27	GAIR
28	NLA
29	FAR
30	GND
31	N.C.
32	N.C.
33	N.C.
34	N.C.

Alaka L-Cable-237



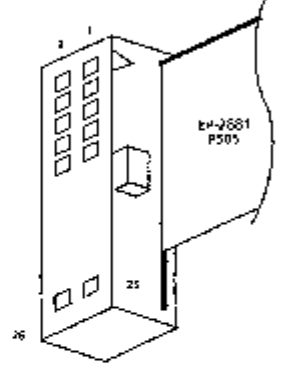
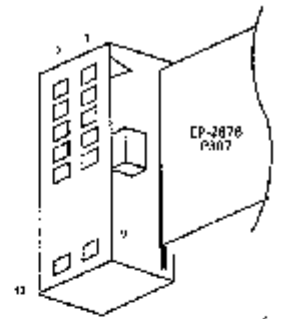
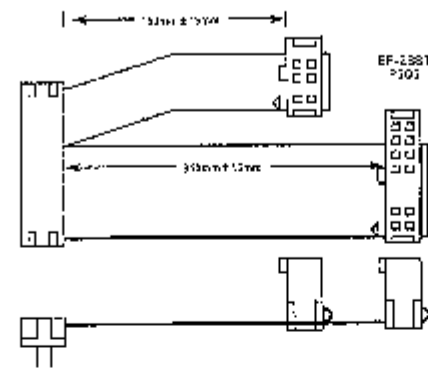
P304 - J305

Pin No.	Signal
1	DGND
2	SWD 5V
3	DGND
4	RSW 0
5	RSW 1
6	RSW 2
7	RSW 3
8	RSW 4
9	DGND
10	DGND

Aloka L-Cable-238

EP-2673 Panel Control
P306

EP-2678
P307



EP-2681 P305

Pin No.	Signal	Pin No. of J306
1	+5V	1
2	DGND	2
3	X+	3
4	X-	4
5	Y-	5
6	Y+	6
7	SWD 2/	7
8	RSW 2	8
9	RSW 1	9
10	RSW 4	10
11	N.C.	11
12	CGND	12
13	CGND	13
14	FRT V	14
15	DGND	15
16	F-RC	16
17	DGND	17
18	PCAME	18
19	CGND	19
20	SHL V	20
21	CHIN	21
22	N.C.	
23	N.C.	
24	N.C.	
25	N.C.	
26	N.C.	

EP-2678 P307

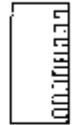
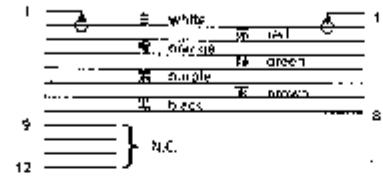
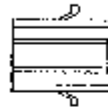
Pin No.	Signal	Pin No. of J306
1	CGND	23
2	SUX	23
3	AGND	24
4	N.C.	25
5	+12V	16
6	-12V	27
7	CGND	28
8	GAIN	29
9	AGND	30
10	N.C.	

Atoka L-Cable-239

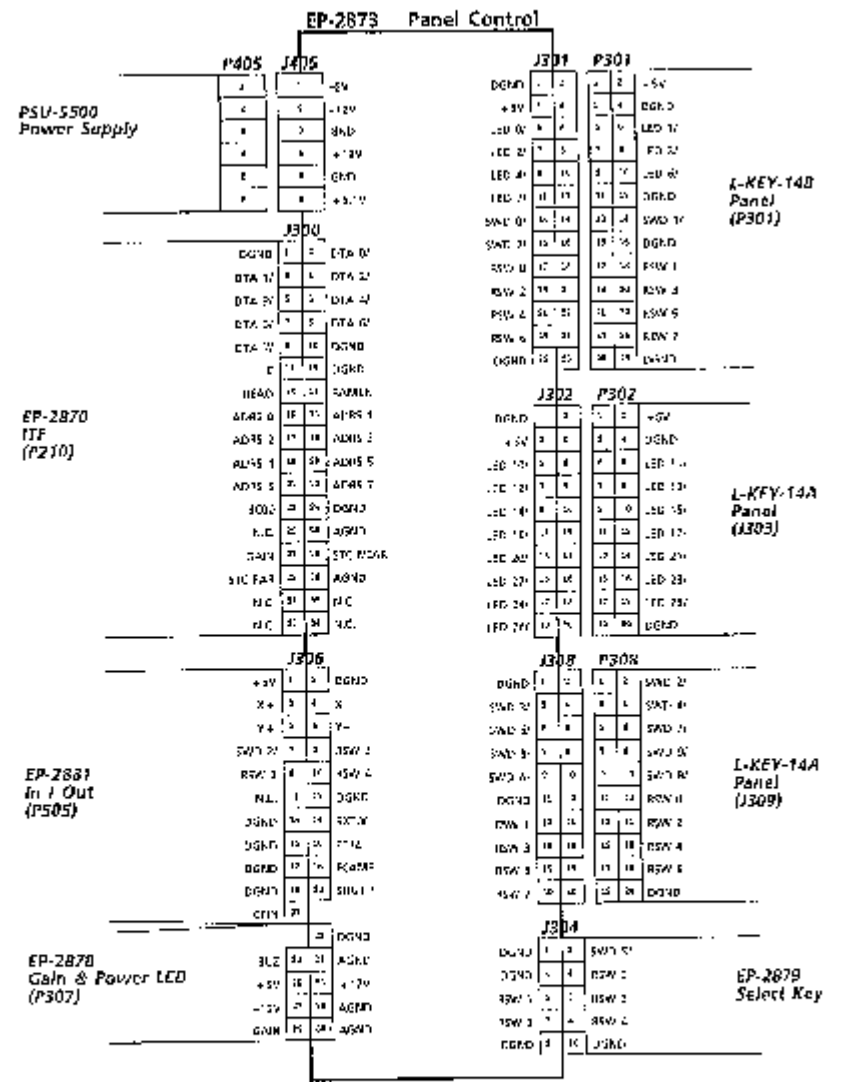
HP-2080-4
1401

HP-2080
Contrast & brightness
J609

200cm ± 10mm

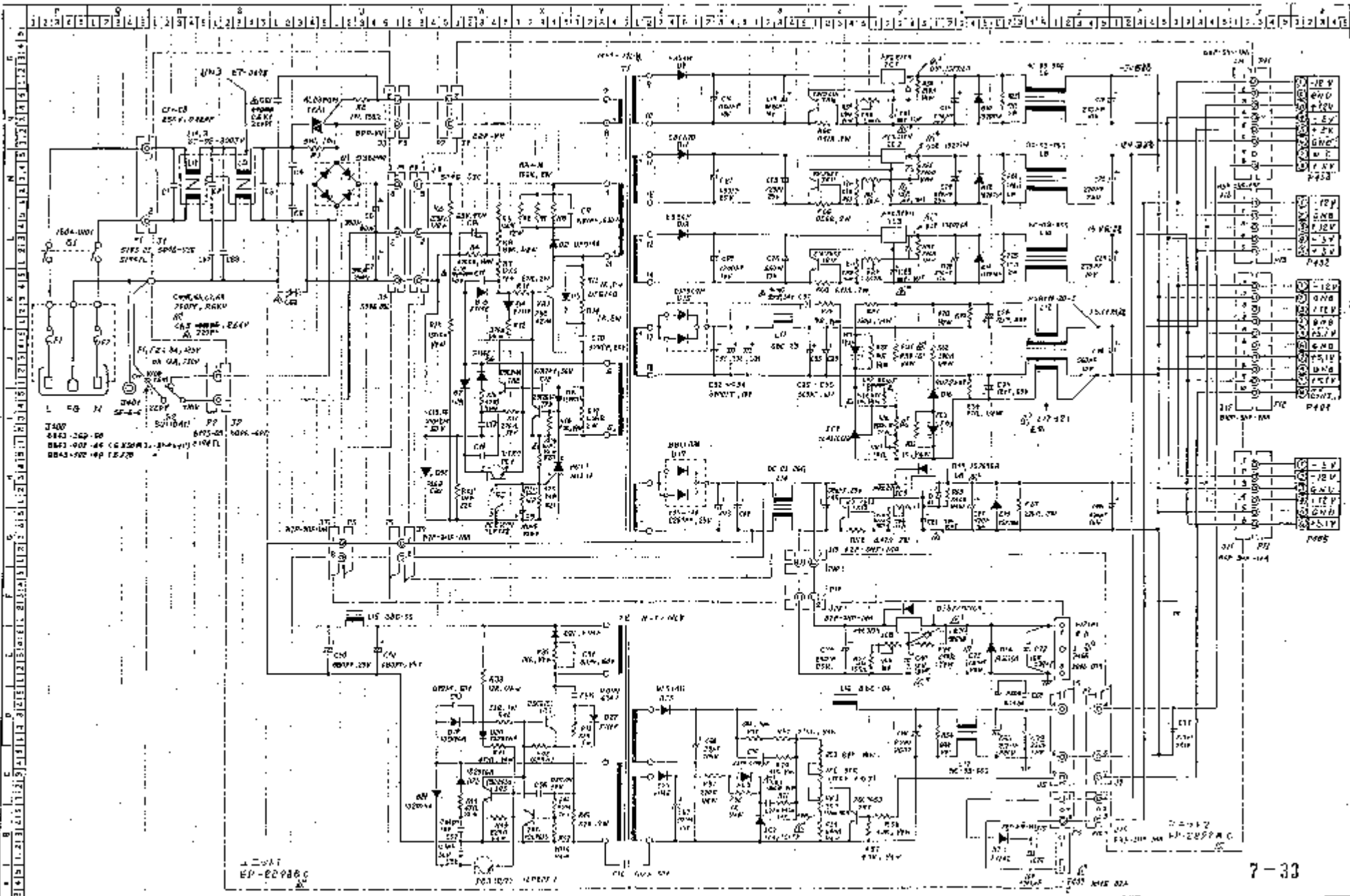


Aloka L-Cable-240



Aloka Cable Connection of EP-2873 Panel Control

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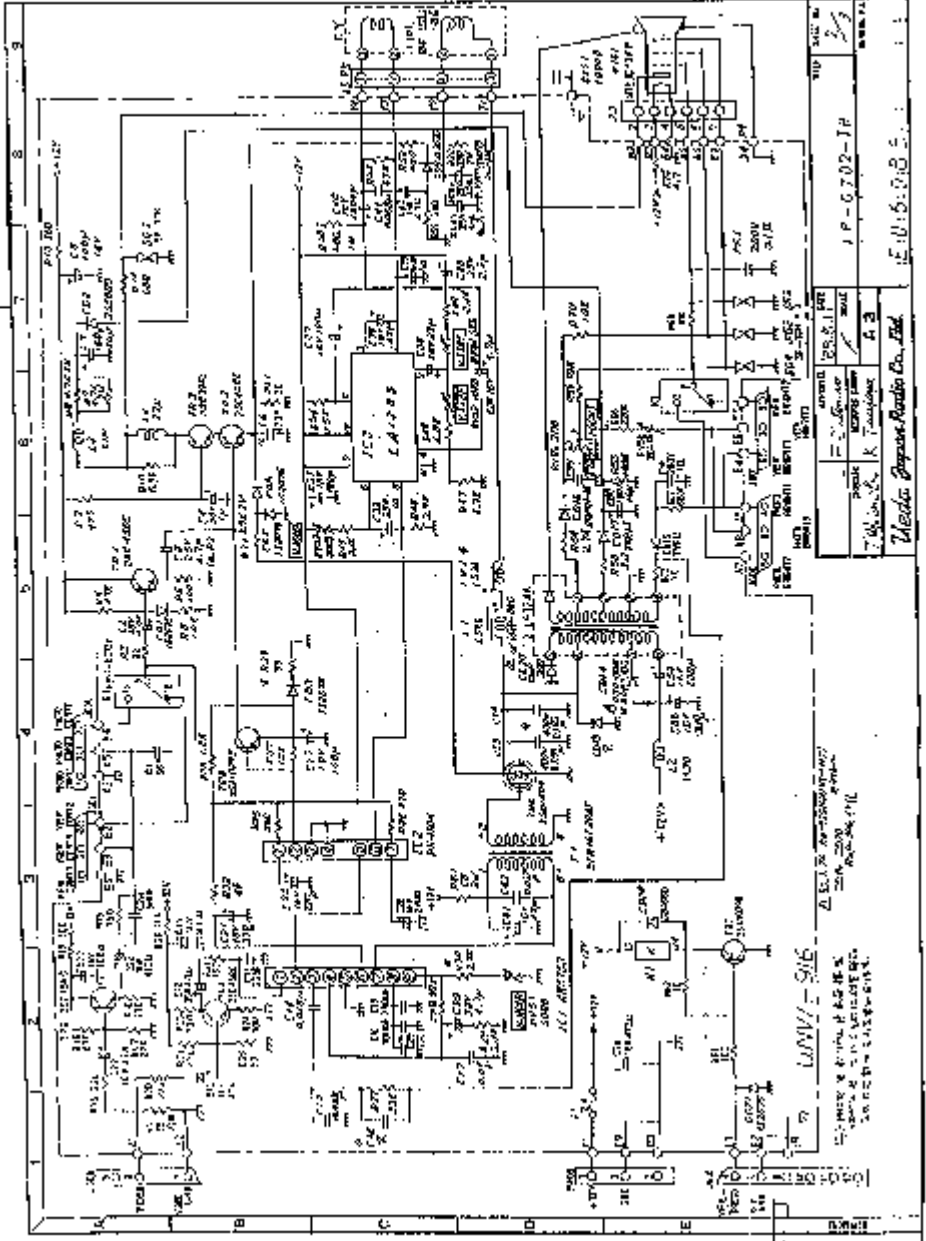


7400
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 8663-900-44
 8663-900-49
 8663-900-49

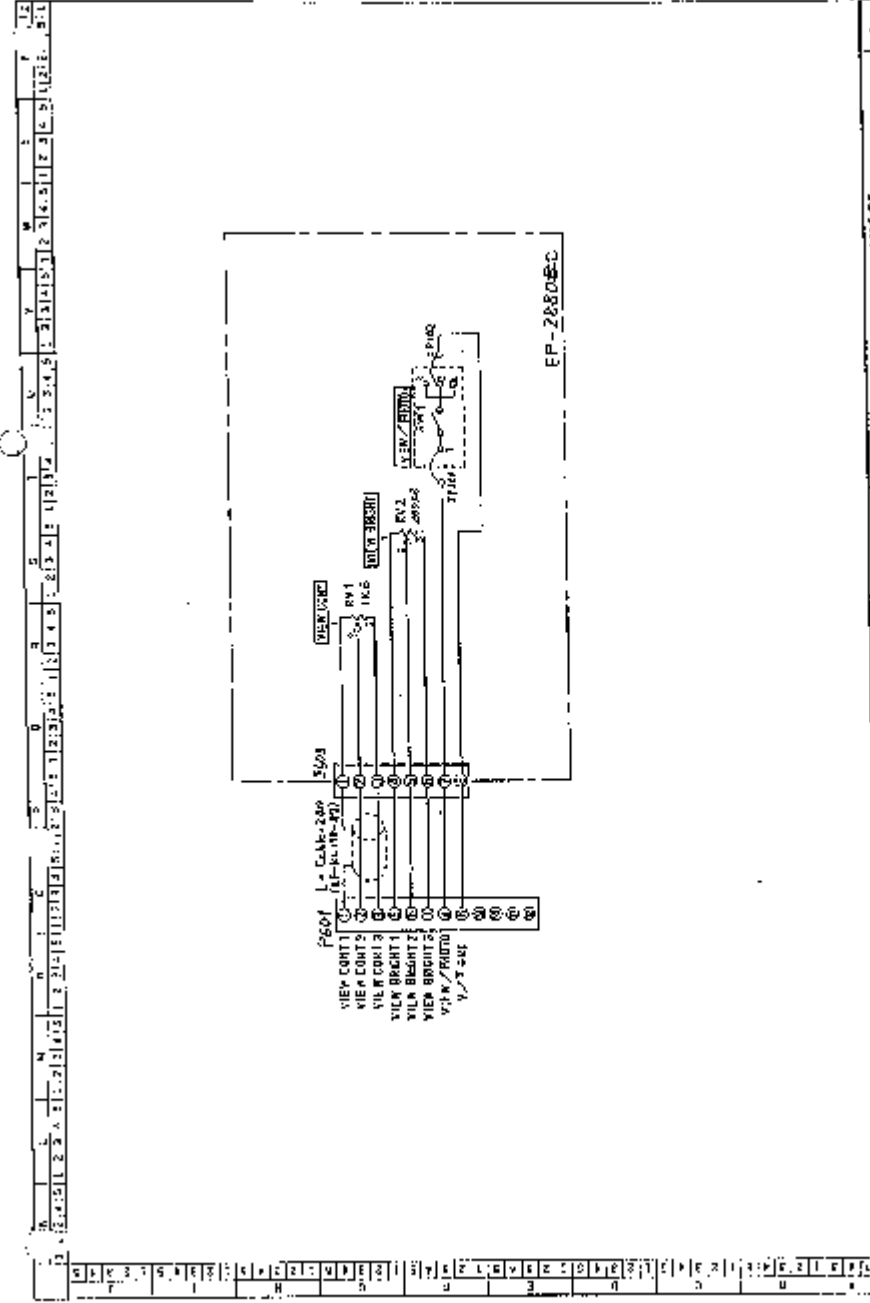
EP-82986C

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

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| Aloha | | PRU-55000 | |
| 100 AMP | 5000 W | 100 AMP | 5000 W |
| 100 AMP | 5000 W | 100 AMP | 5000 W |
| 100 AMP | 5000 W | 100 AMP | 5000 W |



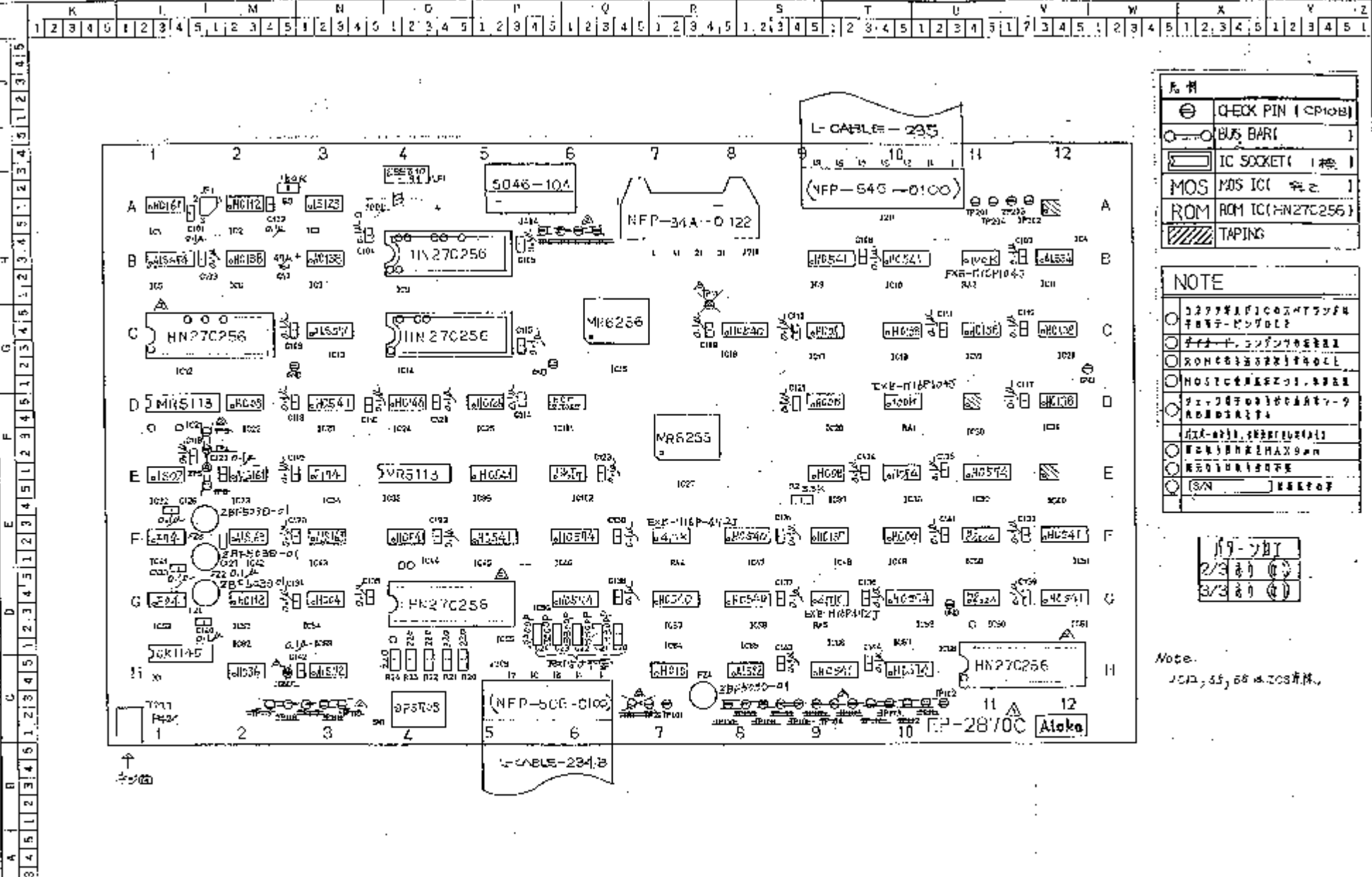
1 P-6702-1P
 Medco Research Co. Inc.
 E. U. S. P. B. 5



| | | | |
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| REV. 2 (10/76) 1-2880BC-2880BC-11 1-2880BC-11 1-2880BC-11 | REV. 2
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EP-2880BC 接合部 | REV. 2
1P-0702-TH | REV. 2
EU 6588 |
| EP-2880BC-11 1-2880BC-11 1-2880BC-11 | REV. 2
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1-2880BC-11 1-2880BC-11 1-2880BC-11 |

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凡例

| | |
|----------|-----------------------|
| [Symbol] | CHECK PIN (CPI00) |
| [Symbol] | BUS BAR |
| [Symbol] | IC SOCKET (1挿) |
| [Symbol] | MOS MOS IC (92) |
| [Symbol] | ROM ROM IC (HN270256) |
| [Symbol] | TAPING |

NOTE

| | |
|----------|-----------------|
| [Symbol] | 3277型PIC0547チップ |
| [Symbol] | チップ-ピンソケット |
| [Symbol] | チップ-コンデンサ |
| [Symbol] | ROMチップ(4096ビット) |
| [Symbol] | ホストチップ(31, 32) |
| [Symbol] | ピンソケット(ピン9) |
| [Symbol] | ROMチップ |
| [Symbol] | チップ |
| [Symbol] | チップ |
| [Symbol] | チップ |
| [Symbol] | チップ |
| [Symbol] | チップ |

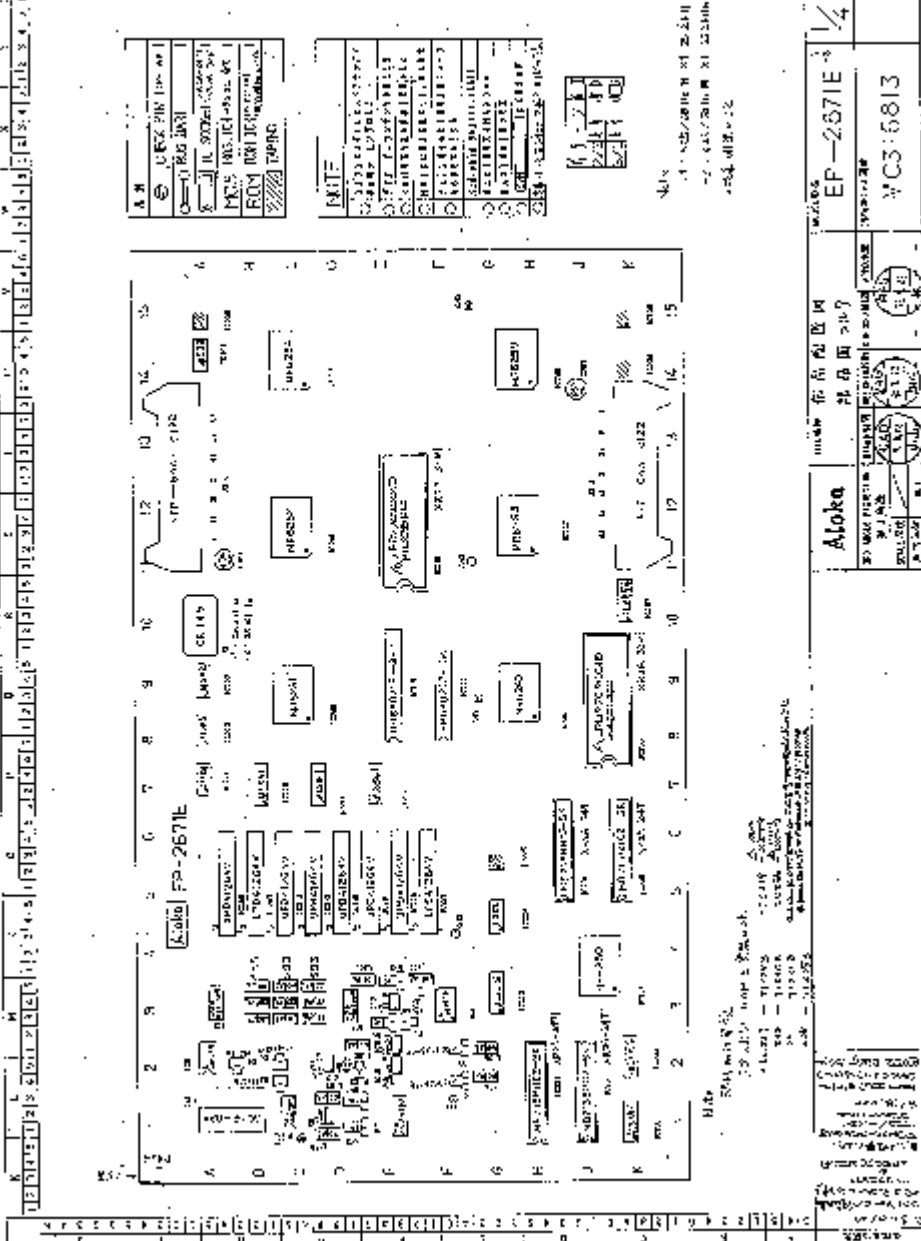
1/9-707
 2/3
 3/3

Note: IC12, 55, 66 は 209 仕様.

7-40

REVISION
 70.12
 1/21-825
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 175/1-999
 176/1-1000

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| Aloka | | 部品配線図 | | MOC3494 | |
| 部品別シルック | | EP-2870BC | | 1/3 | |
| 3/20 | 3/26 | 3/26 | 3/26 | 3/26 | 3/26 |
| SCALE UNIT | 1:4.18 | 1:5.0 | 1:5.0 | 1:5.0 | 1:5.0 |
| MOC3494 | MOC3494 | | MOC3494 | | MOC3494 |
| DRAWING NO. 33 | | | | | MOC3494 |



Notes:
 1. REFER TO THE ARCHITECTURAL DRAWINGS FOR THE EXACT LOCATION OF THE BUILDING.
 2. THE BOUNDARY OF THE SITE IS INDICATED BY A DOTTED LINE.
 3. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.



Legend:
 ■ ROOM (房間)
 ▬ WALL (牆)
 ▬ WINDOW (窗)
 ▬ DOOR (門)
 ▬ STAIR (樓梯)
 ▬ ELEVATOR (電梯)
 ▬ CORRIDOR (走廊)
 ▬ BALCONY (陽台)
 ▬ UTILITY (機房)
 ▬ MECHANICAL (機械房)
 ▬ ELECTRICAL (電機房)
 ▬ TELECOMMUNICATIONS (通訊機房)
 ▬ STORAGE (儲藏室)
 ▬ OFFICE (辦公室)
 ▬ CONFERENCE (會議室)
 ▬ RESTROOM (廁所)
 ▬ BREAK ROOM (休息室)
 ▬ RECEPTION (接待室)
 ▬ WAITING AREA (等候區)
 ▬ LOBBY (大堂)
 ▬ ENTRANCE (入口)
 ▬ EXIT (出口)

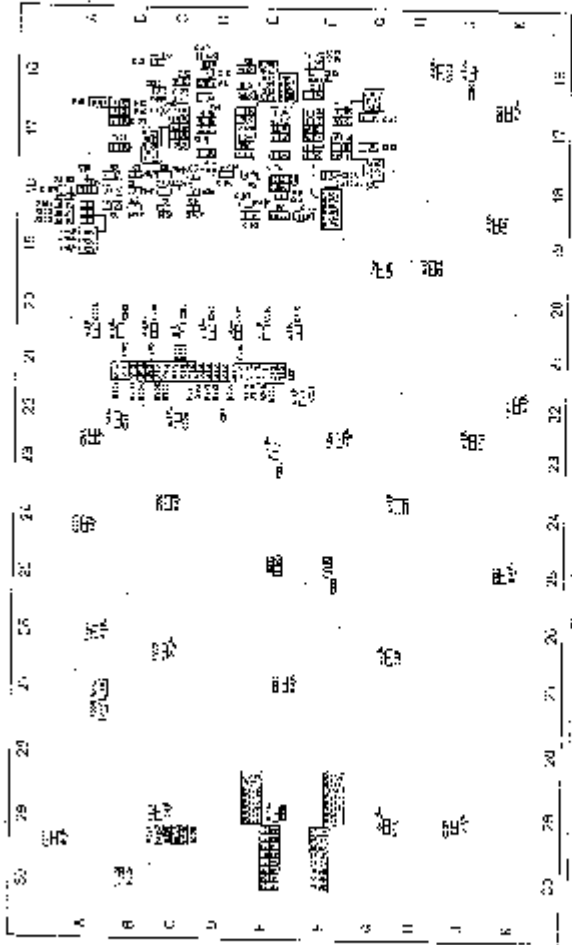
Atoka

在 高 地 區 區
 地 區 圖 51/7

WGS84
 WGS84
 WGS84
 WGS84
 WGS84

EP-2671E
 WC3:6813

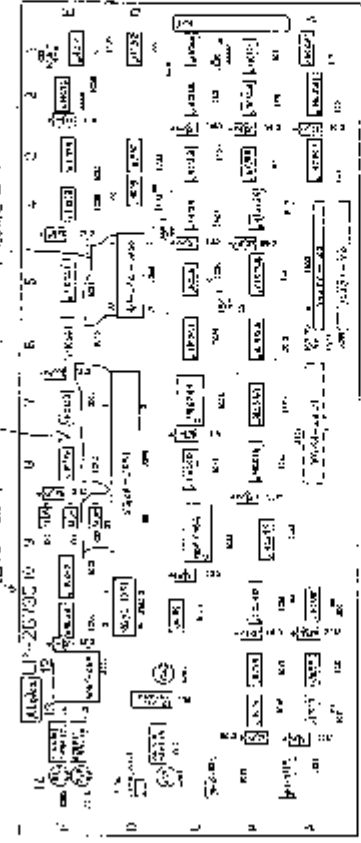
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 |
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| | | | |
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| ALOHA
50 WATT PULSED
LASER
MODEL
6316814 | HILSKER 北非位機文
50 WATT PULSED
LASER
MODEL
6316814 | SERIAL NO.
EP-2671E-2
2/4 | MODEL NO.
WC316814 |
|--|--|---------------------------------|-----------------------|

7 6 5 4 3 2 1 0 P Q R S T U V W X Y Z

1 Cable-237



| | | | |
|---|------|------|---|
| ① | OVER | 1 | 3 |
| ② | REL | 1001 | 3 |
| ③ | REL | 1002 | 1 |
| ④ | REL | 1003 | 1 |
| ⑤ | REL | 1004 | 1 |
| ⑥ | REL | 1005 | 1 |
| ⑦ | REL | 1006 | 1 |
| ⑧ | REL | 1007 | 1 |
| ⑨ | REL | 1008 | 1 |
| ⑩ | REL | 1009 | 1 |
| ⑪ | REL | 1010 | 1 |
| ⑫ | REL | 1011 | 1 |
| ⑬ | REL | 1012 | 1 |
| ⑭ | REL | 1013 | 1 |
| ⑮ | REL | 1014 | 1 |
| ⑯ | REL | 1015 | 1 |
| ⑰ | REL | 1016 | 1 |
| ⑱ | REL | 1017 | 1 |
| ⑲ | REL | 1018 | 1 |
| ⑳ | REL | 1019 | 1 |
| ㉑ | REL | 1020 | 1 |

NOTE:
 1. ALL RELAYS ARE TO BE INSTALLED IN THE RELAY RACK.
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| Alcatel | | TEL: 44 93 50 50 50 | | HP-2670C | | OWNER: ICHE | |
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| 97 | | 98 | | 99 | | 100 | |

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ALOTEA
 8800 W. 90th Ave. Suite 100
 Denver, CO 80231
 Phone: (303) 751-1111
 Fax: (303) 751-1112
 Website: www.alotea.com

8800 W. 90th Ave. Suite 100
 Denver, CO 80231
 Phone: (303) 751-1111
 Fax: (303) 751-1112
 Website: www.alotea.com

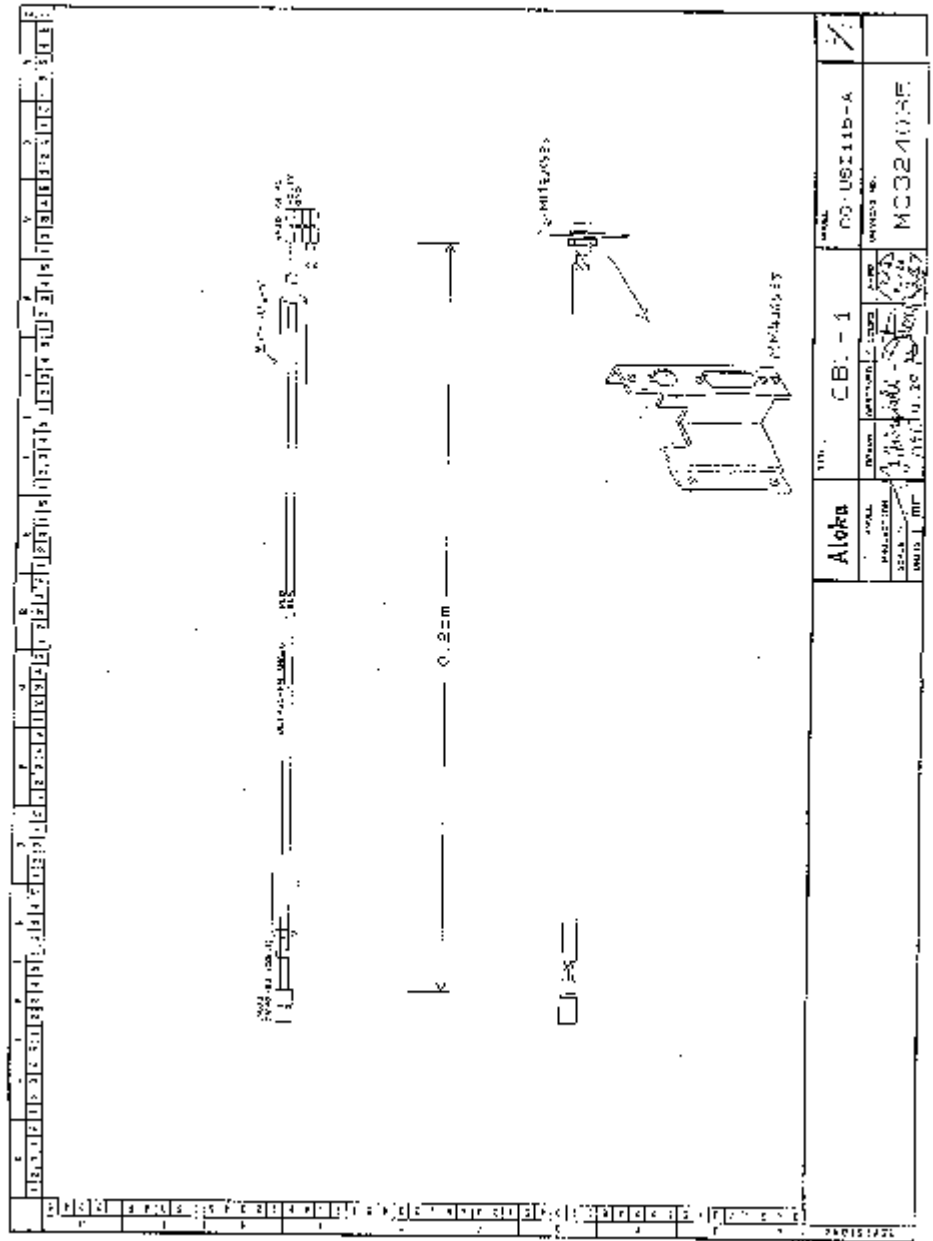
8800 W. 90th Ave. Suite 100
 Denver, CO 80231
 Phone: (303) 751-1111
 Fax: (303) 751-1112
 Website: www.alotea.com

MODEL NO. **EP-2013SD**
 SERIAL NO. **M0317250**

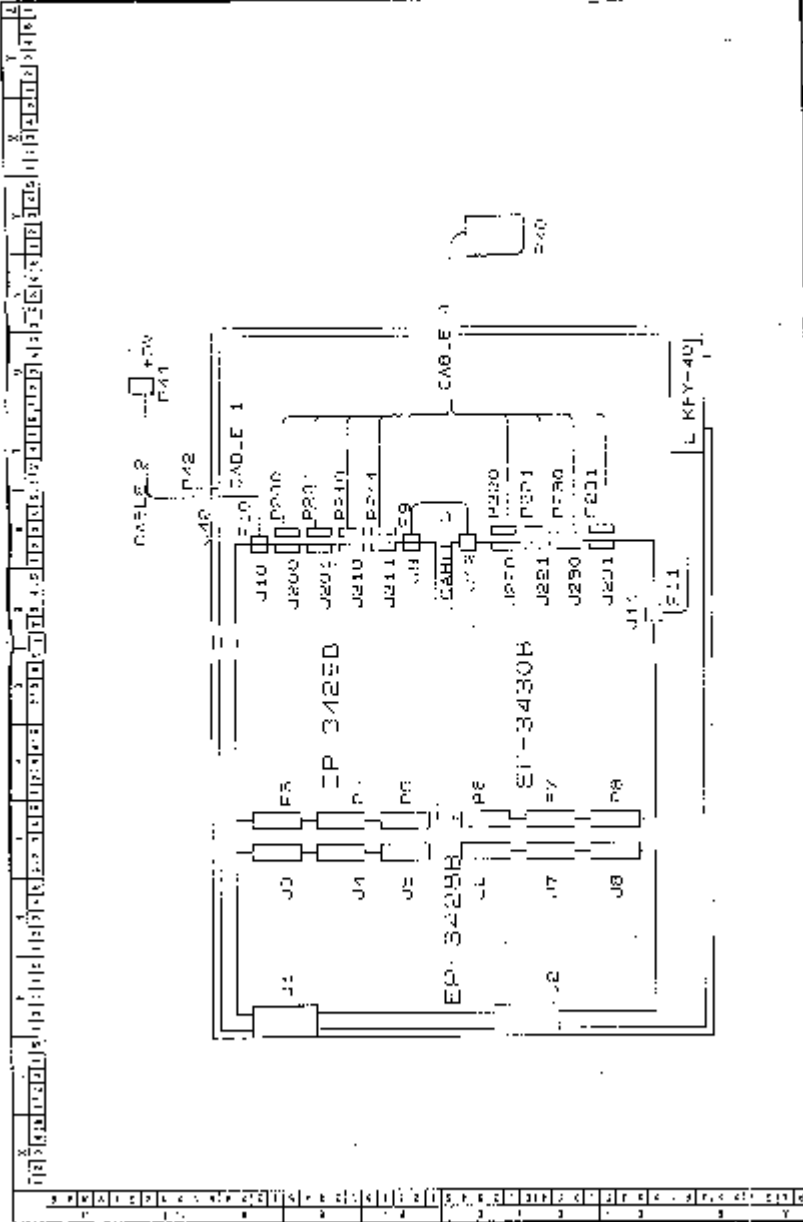
Alotea
 J.A.F.

2/4

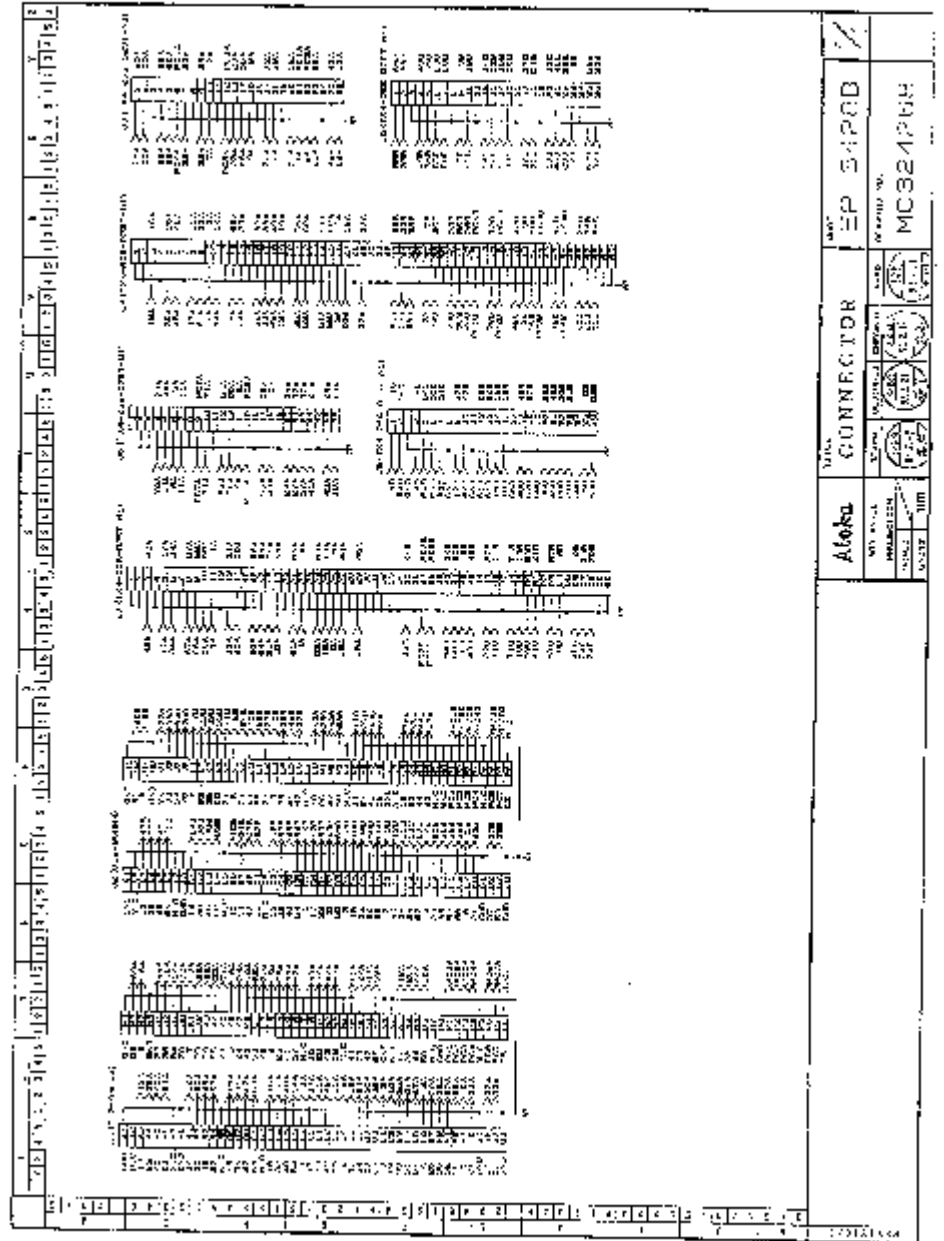
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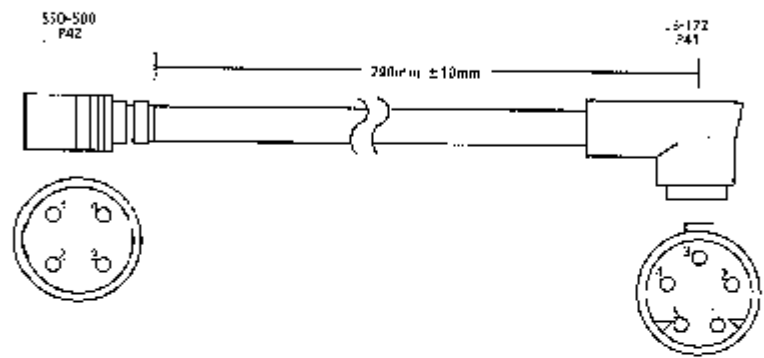
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|--------|----------|-----------|------|------|-------------|
| Aloka | | NO. | CB-1 | REV. | 00-US1115-A |
| DESIGN | DATE | BY | CHKD | APPD | REVISED BY |
| 1000 | 10/10/57 | W. J. ... | ... | ... | MCC2403F |
| SCALE | UNIT | | | | |
| 1:1 | MM | | | | |



| | | | | | | | |
|-----------------|--|-----------------------------|--|-----------|--|----------|--|
| Atotaka | | 総合接続図 | | JB-172 | | 1/1 | |
| SHEET NO. | | REV. 01 (REV. 02) (REV. 03) | | DRAWN NO. | | MC324273 | |
| PRODUCTION DATE | | DATE | | DRAWN BY | | DATE | |



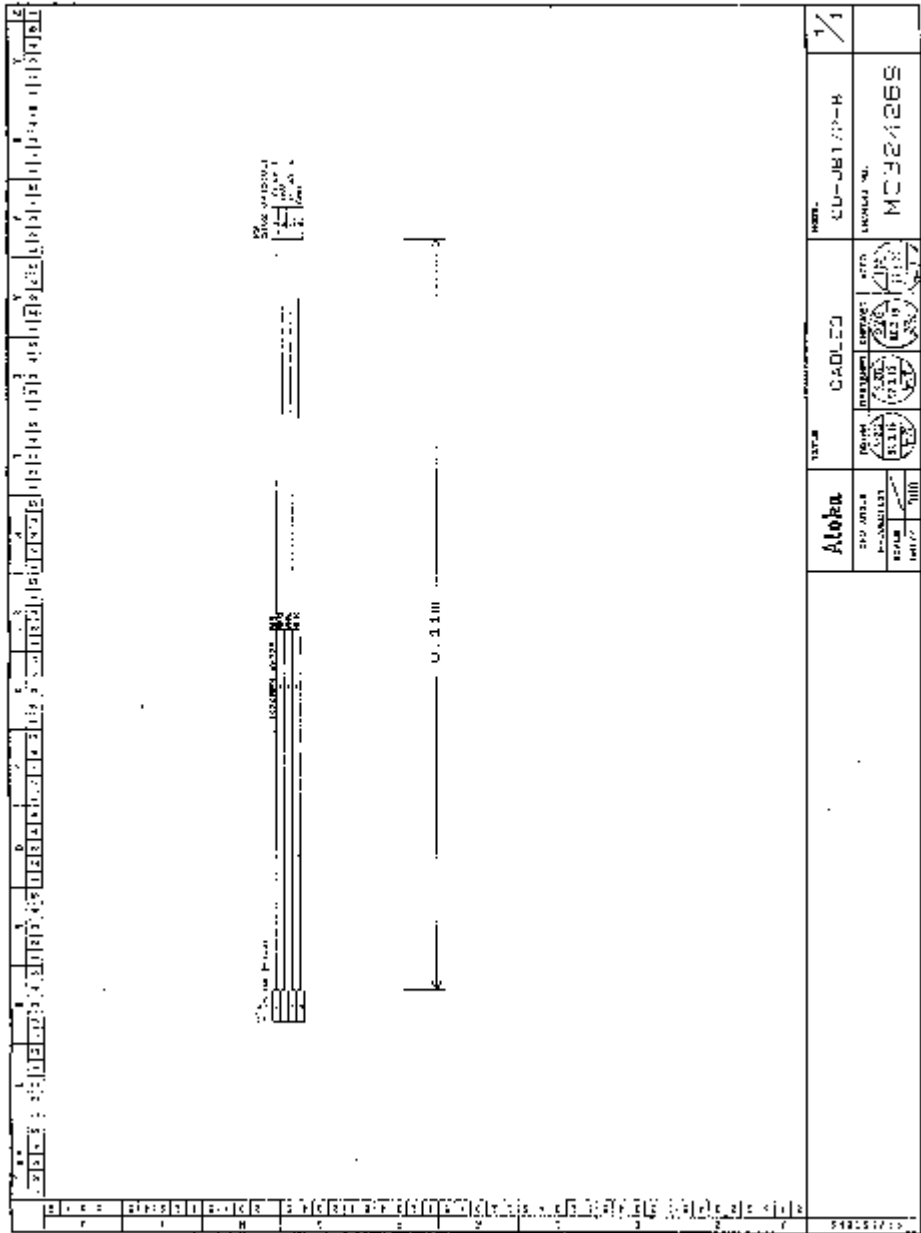
| | | | | | |
|-------------|--|-----------|--|----------|--|
| Alcoa | | CONNECTOR | | EP 5420D | |
| DRAWING NO. | | REV. | | DATE | |
| MC82426H | | 1 | | 1964 | |
| MATERIAL | | SPEC. | | QTY. | |
| ALUMINUM | | ALUMINUM | | 100 | |
| FINISH | | ANODIZED | | 100 | |
| TOLERANCE | | ±0.005 | | 100 | |
| MATERIAL | | SPEC. | | QTY. | |
| ALUMINUM | | ALUMINUM | | 100 | |
| FINISH | | ANODIZED | | 100 | |
| TOLERANCE | | ±0.005 | | 100 | |

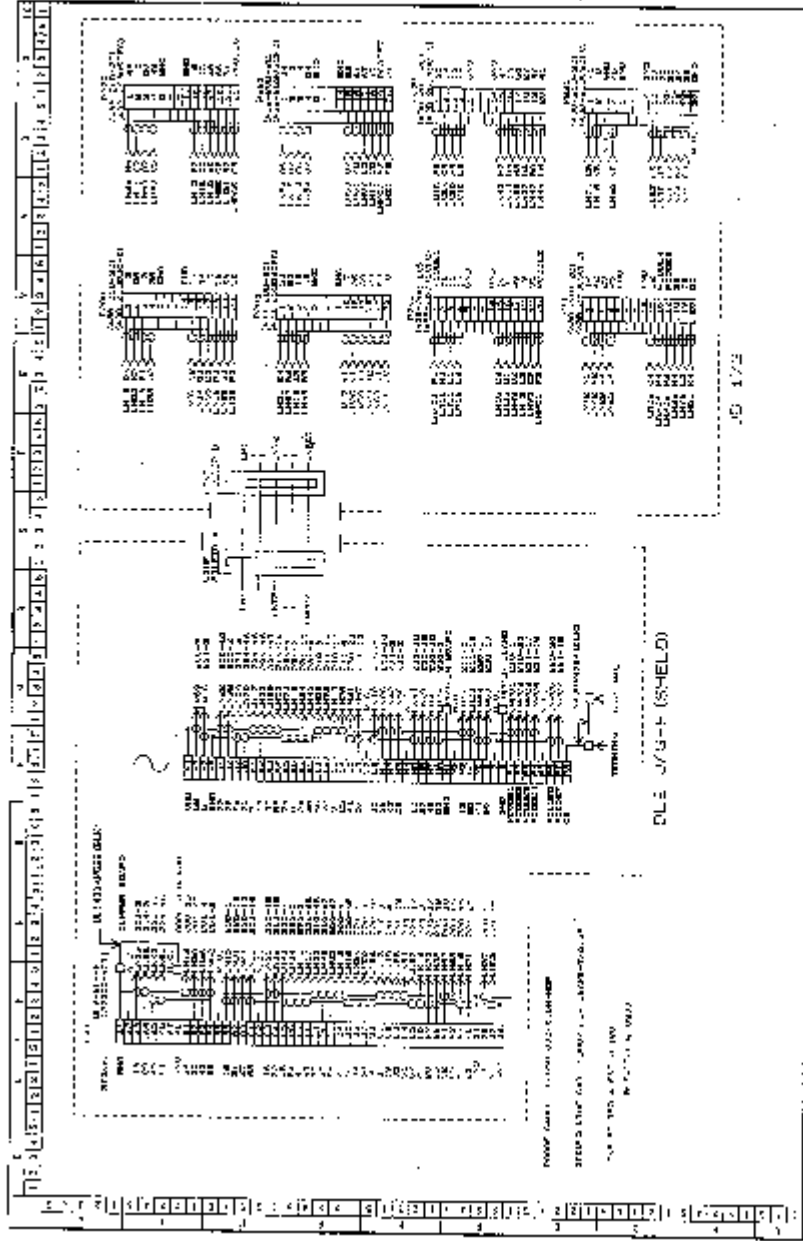


| SSQ-500 P42 | |
|-------------|--------|
| Pin No. | Signal |
| 1 | +5.1V |
| 2 | NC |
| 3 | GNB |
| 4 | NC |

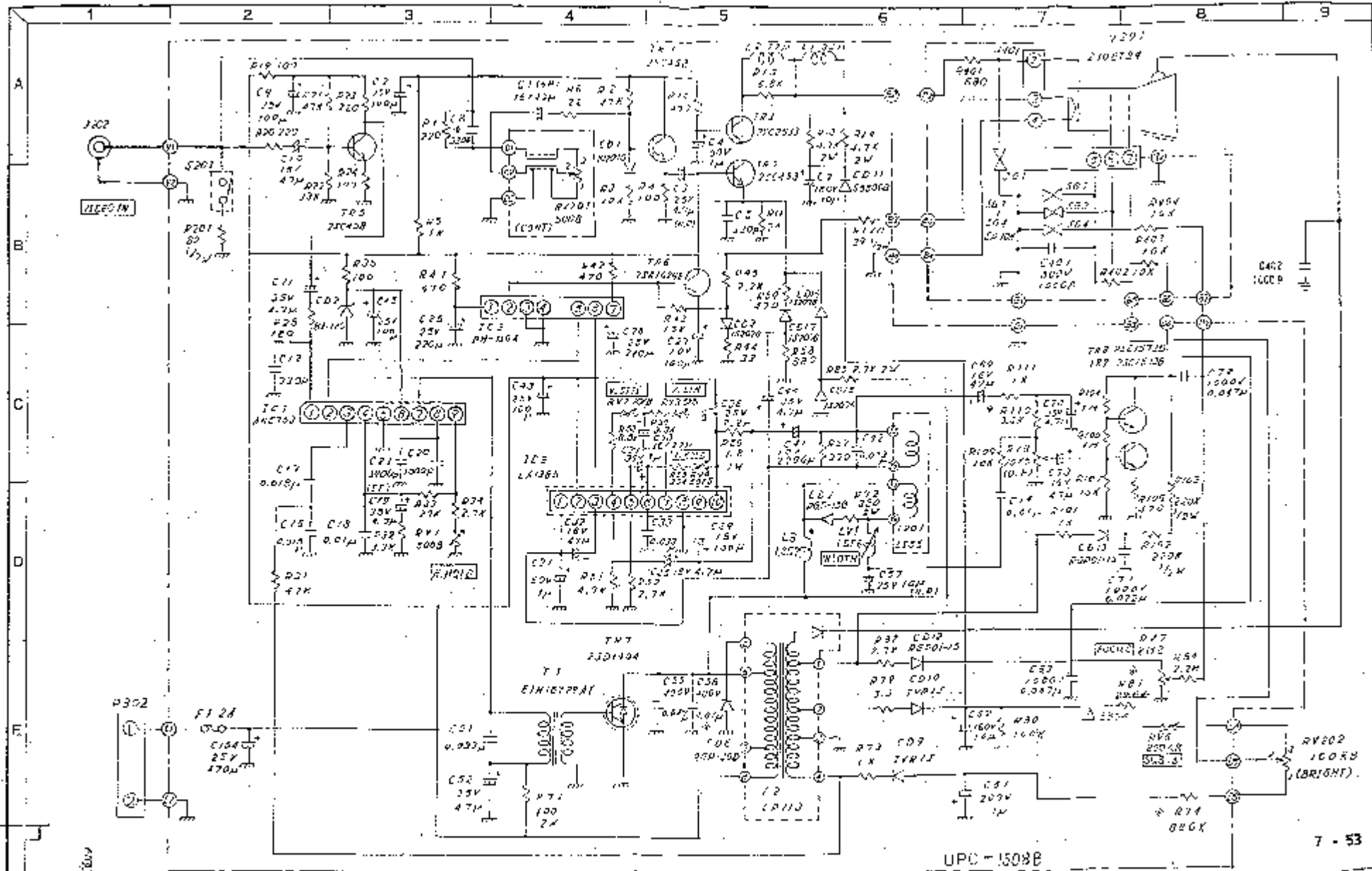
| JA-172 P41 | |
|------------|--------|
| Pin No. | Signal |
| 1 | +5.1V |
| 2 | NC |
| 3 | GND |
| 4 | NC |
| 5 | NC |

Aloka L-Cable-455/ CABLE 2





| | | | | | | | | | | | | | | | | | | | | |
|--|-----|-------|----|-------------|-------|-----|-----|------|----|------|-------|-----|---|--|--|--|--|--|--|----------|
| Alpha | | TABLE | | CC JBL/10-F | | 1/1 | | | | | | | | | | | | | | |
| REV | NOV | DATE | BY | CHKD | APP'D | QTY | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <td>REV</td> <td>NOV</td> <td>DATE</td> <td>BY</td> <td>CHKD</td> <td>APP'D</td> <td>QTY</td> </tr> <tr> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | | | | | REV | NOV | DATE | BY | CHKD | APP'D | QTY | 1 | | | | | | | MO324271 |
| REV | NOV | DATE | BY | CHKD | APP'D | QTY | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | |





WAVE NO.

REVISIONS
 1. 10/15/53
 2. 11/14/53
 3. 1/14/54
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 99. 1/14/54
 100. 1/14/54

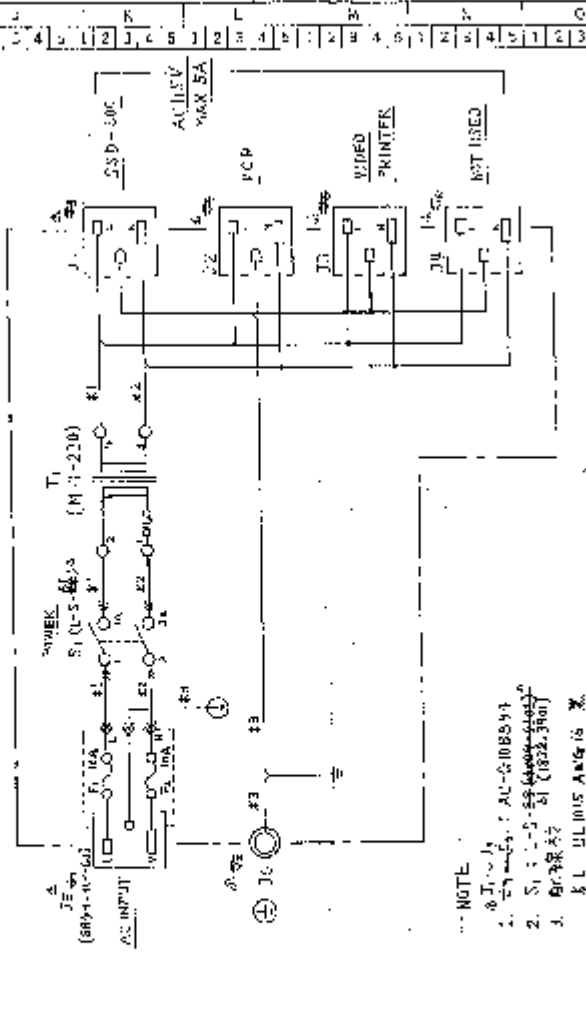
3rd Angle System Dimension mm

| | | | | |
|----------------------------|----------|-------------|------------------|------|
| APPROVED | DATE | DESIGNED BY | DRWING NO. | REV. |
| T. Shimizu | 10/15/53 | T. Shimizu | FD-0021-11/14/53 | 1 |
| CHECKED BY | DATE | DESIGNED BY | DRWING NO. | REV. |
| T. Shimizu | 10/15/53 | T. Shimizu | FD-0021-11/14/53 | 1 |
| Ueda Japan Radio Co., Ltd. | | | FU6058 | |

| | | | |
|--------------------------------------|------------------------|--------------------------------|---|
| Aloka
747L-200V トランスコンバーター | | MODEL NO.
PTU-819 |   |
| 250 VOLT PROTECTION
電圧保護 | 250V 200W
250V 200W | SERIAL NO.
MC 401435 | |

保証書等
 保証書等
 保証書等

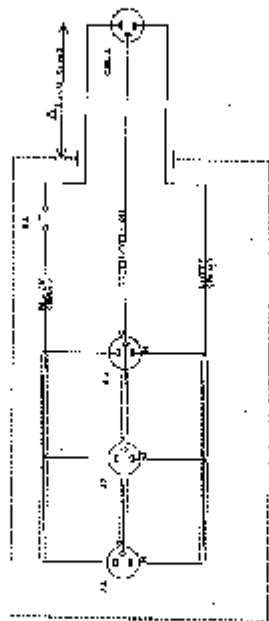
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 B 1 2 3 4 5
 C 1 2 3 4 5
 D 1 2 3 4 5
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 H 1 2 3 4 5
 I 1 2 3 4 5



- NOTE
1. 部品名: AL-210B547
 2. 部品名: SI (10-5-66)
 3. 部品名: SI (1822.380)
 4. 部品名: UL 1015 AM 15 %
 5. 部品名: UL 1015 AM 15 %
 6. 部品名: UL 1015 AM 15 %
 7. 部品名: UL 1015 AM 15 %

1. 保証書等
 2. 保証書等
 3. 保証書等
 4. 保証書等
 5. 保証書等
 6. 保証書等
 7. 保証書等

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

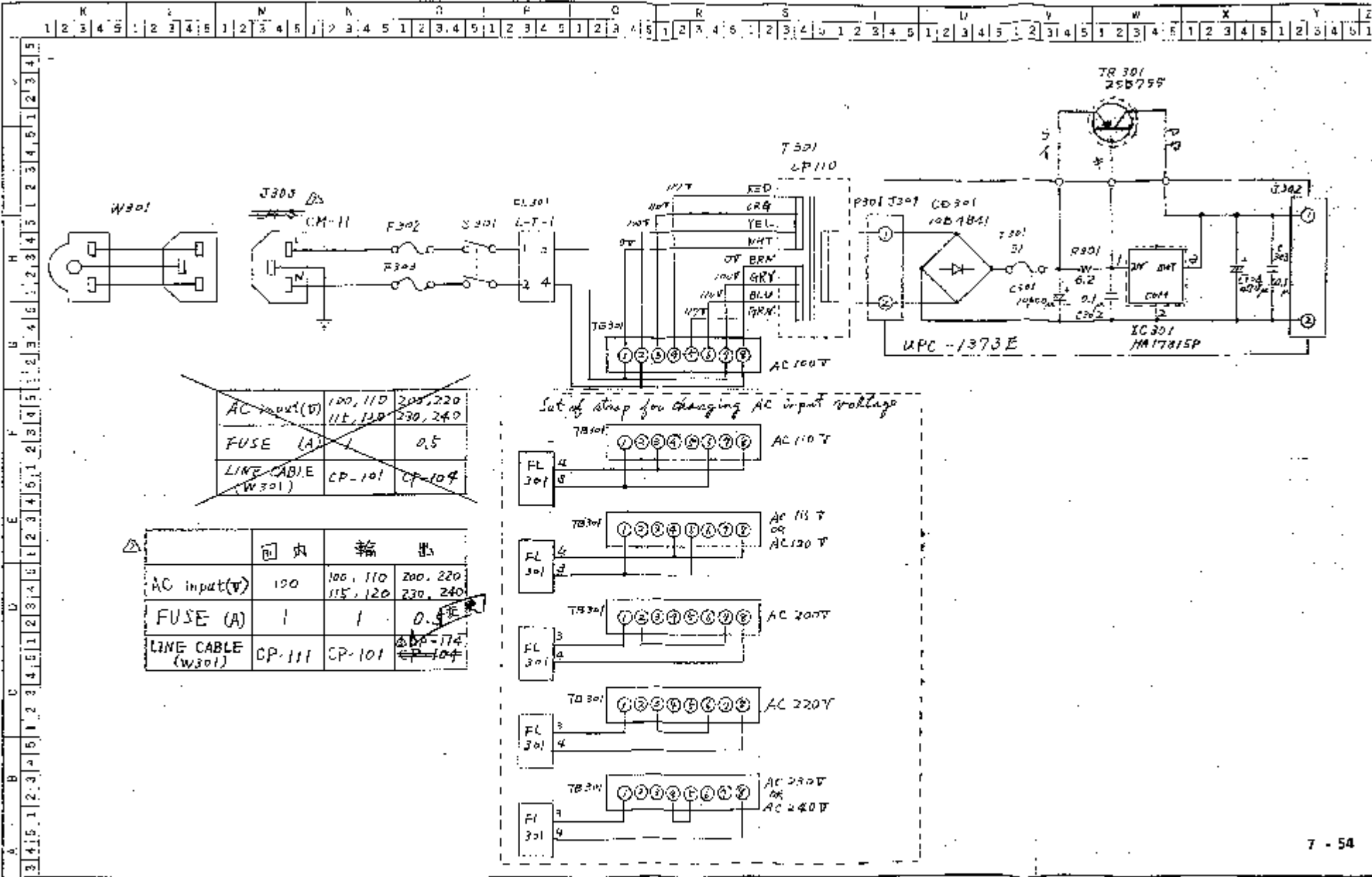


NOTE

1. This diagram is for reference only. It is not to be used for construction purposes.
 2. The diagram is for reference only. It is not to be used for construction purposes.
 3. The diagram is for reference only. It is not to be used for construction purposes.
 4. The diagram is for reference only. It is not to be used for construction purposes.
 5. The diagram is for reference only. It is not to be used for construction purposes.

此圖為參考用，不可作為施工之根據。
 此圖為參考用，不可作為施工之根據。
 此圖為參考用，不可作為施工之根據。

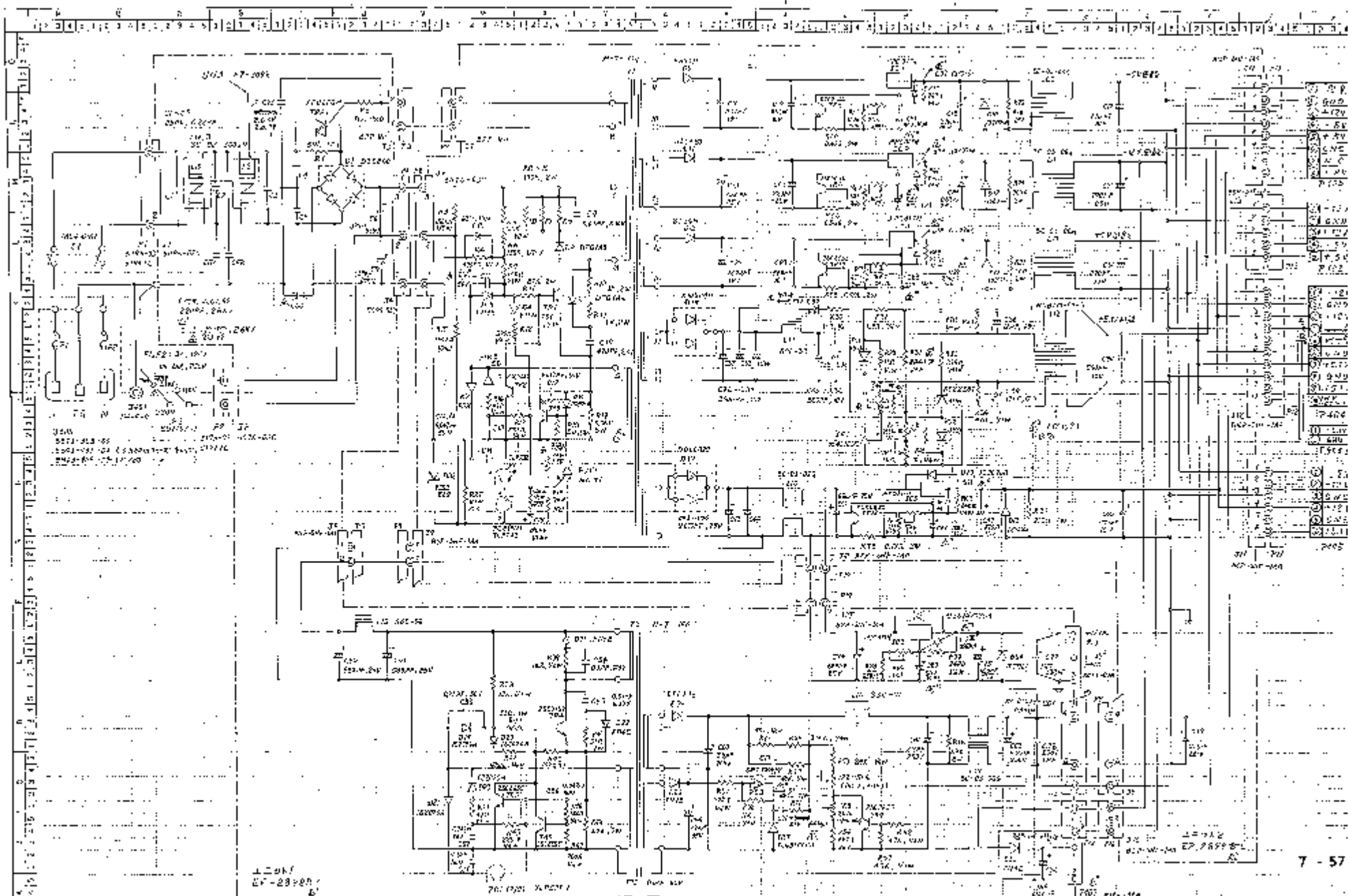
| | | | |
|--------------|-------|-------|-------|
| MP-2722/2720 | 圖 | Alpha | Alpha |
| VC310036 | Alpha | Alpha | Alpha |



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 3. 1980.02
 4. 1980.03
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 6. 1980.05
 7. 1980.06
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 20. 1981.07
 21. 1981.08
 22. 1981.09
 23. 1981.10
 24. 1981.11
 25. 1981.12

| | | | | |
|---------------------------------|--|--|--|-----|
| Aloka
9" T.V. MONITOR | | MODEL NO. IP-0921-TV/TV
IP-0921-TV/TV | | 2/2 |
| | | DRAWING NO. EUC6058
CHECKED BY: [Signature]
APPROVED BY: [Signature] | | |
| SCALE: 1/10
DATE: 1980-11-18 | | DRAWING NO. EUC6058
EUC6058 | | |

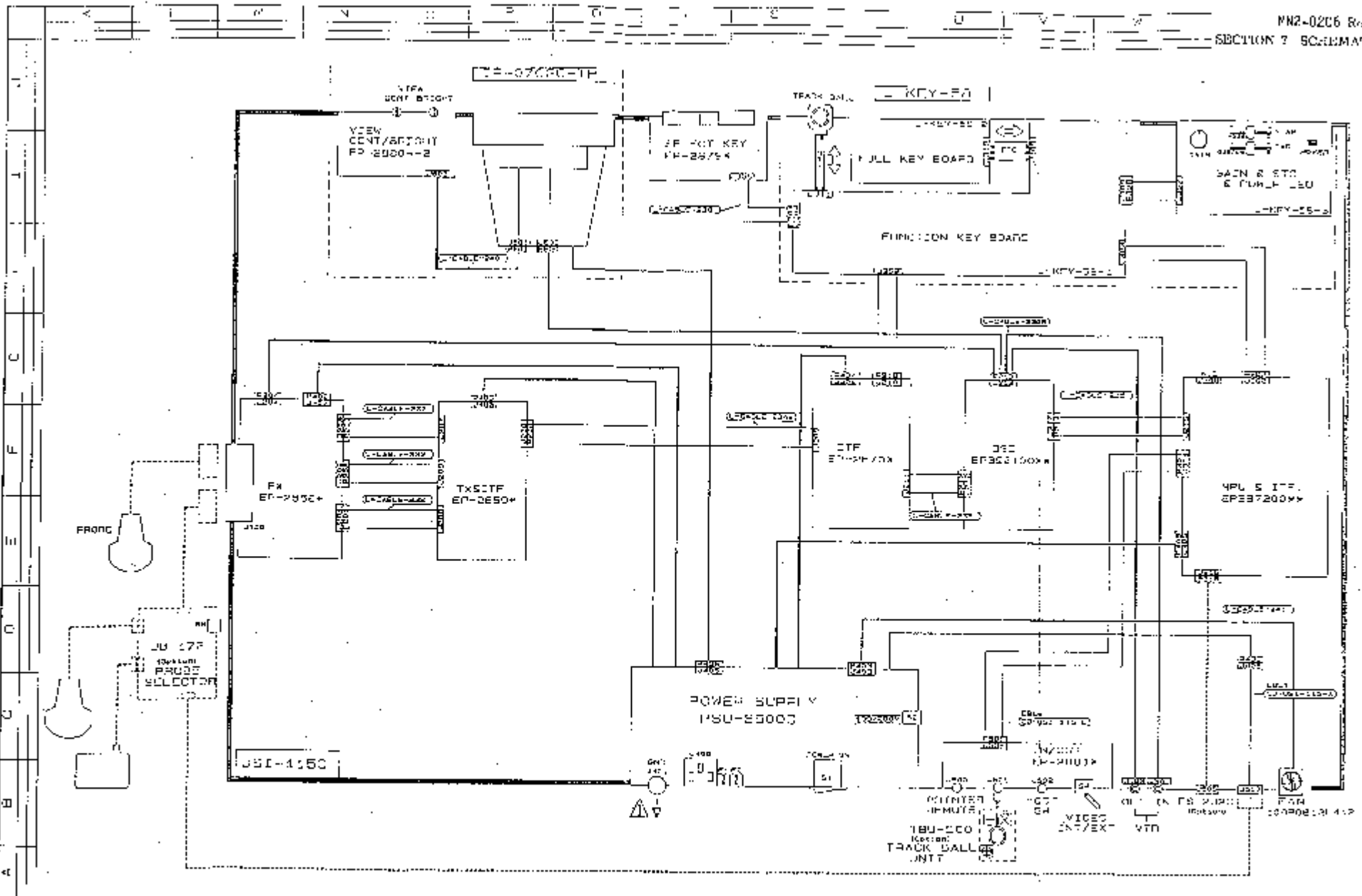




1. ALL DIMENSIONS ARE IN MILLIMETERS.
 2. DIMENSIONS ARE GIVEN TO THE CENTER OF HOLES UNLESS OTHERWISE SPECIFIED.
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| | | | |
|-----------|----------|-----------|----------|
| Alpha | | PSU-8500B | |
| REV. 1 | REV. 2 | REV. 3 | REV. 4 |
| DATE | DATE | DATE | DATE |
| BY | BY | BY | BY |
| CHECKED | CHECKED | CHECKED | CHECKED |
| APPROVED | APPROVED | APPROVED | APPROVED |
| NO 202021 | | NO 202021 | |



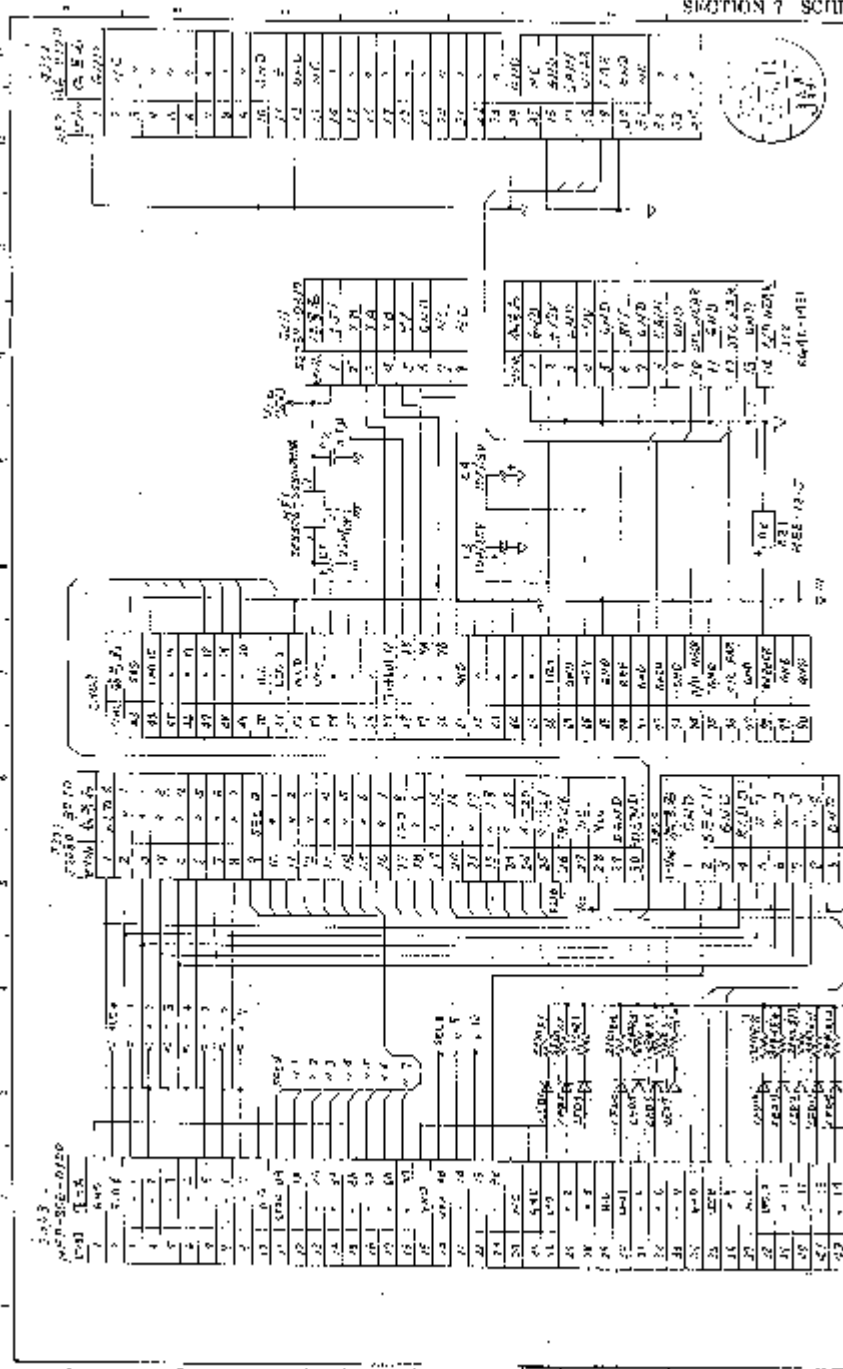
REV. 10/82
 10/82
 10/82

| | | | | |
|----------|-----------|----------|----------|--------------|
| Aloka | TITLE # | 650-500 | RECORD # | 1/2 |
| | MAIN UNIT | | USI-115C | |
| DATE | SCALE | DESIGNER | APPROV | AWING NO. 88 |
| UNIT NO. | 10/82 | 10/82 | 10/82 | 40038699 |



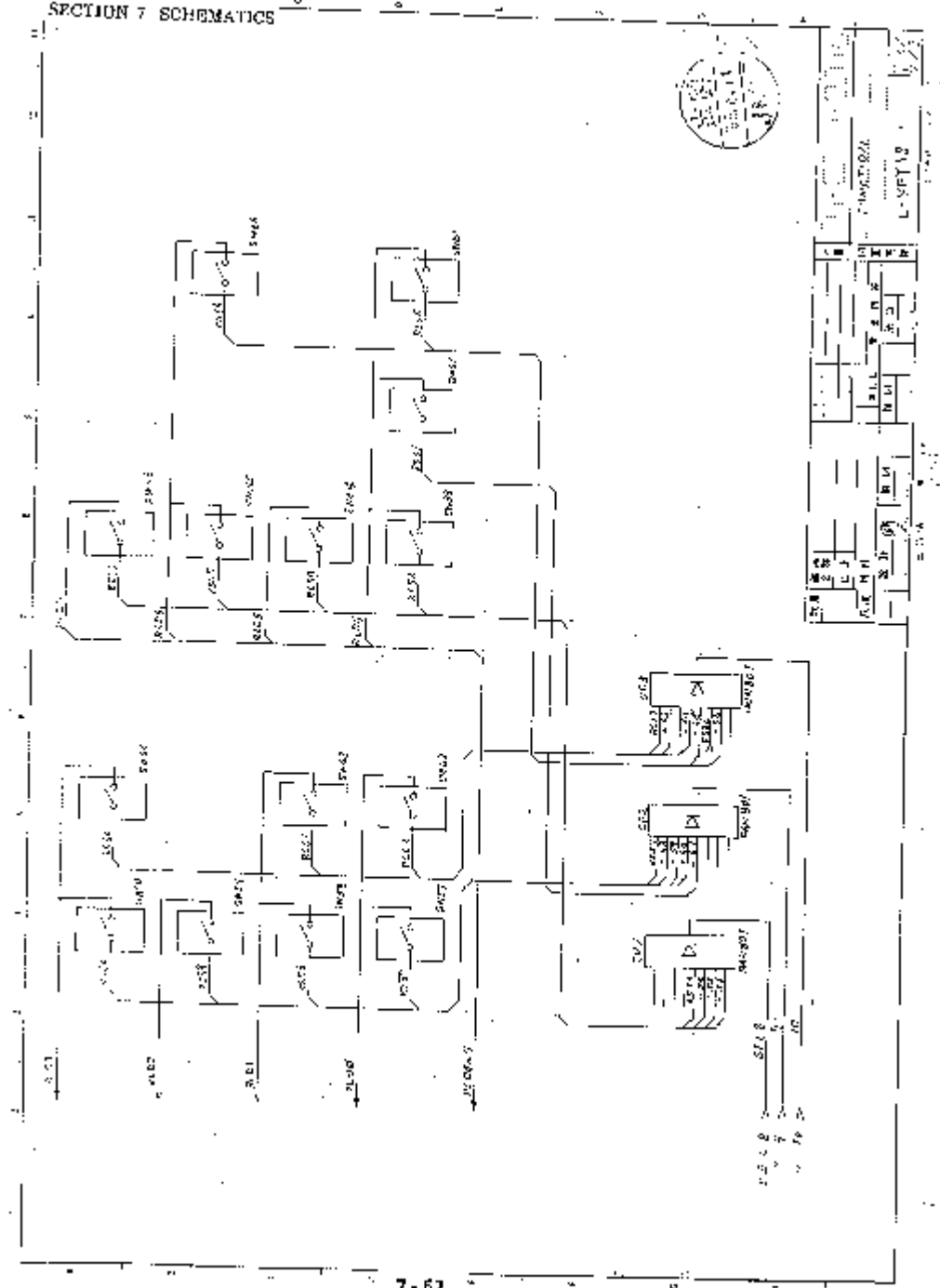
1-92-31-1-1-1

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|

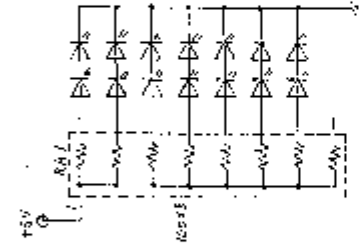


100V-110V

| Terminal | Component | Value | Notes |
|----------|-----------|-------|-------|
| 1 | 100V-110V | 100V | |
| 2 | 100V-110V | 110V | |
| 3 | 100V-110V | 100V | |
| 4 | 100V-110V | 110V | |
| 5 | 100V-110V | 100V | |
| 6 | 100V-110V | 110V | |
| 7 | 100V-110V | 100V | |
| 8 | 100V-110V | 110V | |
| 9 | 100V-110V | 100V | |
| 10 | 100V-110V | 110V | |
| 11 | 100V-110V | 100V | |
| 12 | 100V-110V | 110V | |
| 13 | 100V-110V | 100V | |
| 14 | 100V-110V | 110V | |
| 15 | 100V-110V | 100V | |
| 16 | 100V-110V | 110V | |
| 17 | 100V-110V | 100V | |
| 18 | 100V-110V | 110V | |
| 19 | 100V-110V | 100V | |
| 20 | 100V-110V | 110V | |
| 21 | 100V-110V | 100V | |
| 22 | 100V-110V | 110V | |
| 23 | 100V-110V | 100V | |
| 24 | 100V-110V | 110V | |
| 25 | 100V-110V | 100V | |
| 26 | 100V-110V | 110V | |
| 27 | 100V-110V | 100V | |
| 28 | 100V-110V | 110V | |
| 29 | 100V-110V | 100V | |
| 30 | 100V-110V | 110V | |
| 31 | 100V-110V | 100V | |
| 32 | 100V-110V | 110V | |
| 33 | 100V-110V | 100V | |
| 34 | 100V-110V | 110V | |
| 35 | 100V-110V | 100V | |
| 36 | 100V-110V | 110V | |
| 37 | 100V-110V | 100V | |
| 38 | 100V-110V | 110V | |
| 39 | 100V-110V | 100V | |
| 40 | 100V-110V | 110V | |
| 41 | 100V-110V | 100V | |
| 42 | 100V-110V | 110V | |
| 43 | 100V-110V | 100V | |
| 44 | 100V-110V | 110V | |
| 45 | 100V-110V | 100V | |
| 46 | 100V-110V | 110V | |
| 47 | 100V-110V | 100V | |
| 48 | 100V-110V | 110V | |
| 49 | 100V-110V | 100V | |
| 50 | 100V-110V | 110V | |
| 51 | 100V-110V | 100V | |
| 52 | 100V-110V | 110V | |
| 53 | 100V-110V | 100V | |
| 54 | 100V-110V | 110V | |
| 55 | 100V-110V | 100V | |
| 56 | 100V-110V | 110V | |
| 57 | 100V-110V | 100V | |
| 58 | 100V-110V | 110V | |
| 59 | 100V-110V | 100V | |
| 60 | 100V-110V | 110V | |
| 61 | 100V-110V | 100V | |
| 62 | 100V-110V | 110V | |
| 63 | 100V-110V | 100V | |
| 64 | 100V-110V | 110V | |
| 65 | 100V-110V | 100V | |
| 66 | 100V-110V | 110V | |
| 67 | 100V-110V | 100V | |
| 68 | 100V-110V | 110V | |
| 69 | 100V-110V | 100V | |
| 70 | 100V-110V | 110V | |
| 71 | 100V-110V | 100V | |
| 72 | 100V-110V | 110V | |
| 73 | 100V-110V | 100V | |
| 74 | 100V-110V | 110V | |
| 75 | 100V-110V | 100V | |
| 76 | 100V-110V | 110V | |
| 77 | 100V-110V | 100V | |
| 78 | 100V-110V | 110V | |
| 79 | 100V-110V | 100V | |
| 80 | 100V-110V | 110V | |
| 81 | 100V-110V | 100V | |
| 82 | 100V-110V | 110V | |
| 83 | 100V-110V | 100V | |
| 84 | 100V-110V | 110V | |
| 85 | 100V-110V | 100V | |
| 86 | 100V-110V | 110V | |
| 87 | 100V-110V | 100V | |
| 88 | 100V-110V | 110V | |
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| 91 | 100V-110V | 100V | |
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| 93 | 100V-110V | 100V | |
| 94 | 100V-110V | 110V | |
| 95 | 100V-110V | 100V | |
| 96 | 100V-110V | 110V | |
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| 99 | 100V-110V | 100V | |
| 100 | 100V-110V | 110V | |



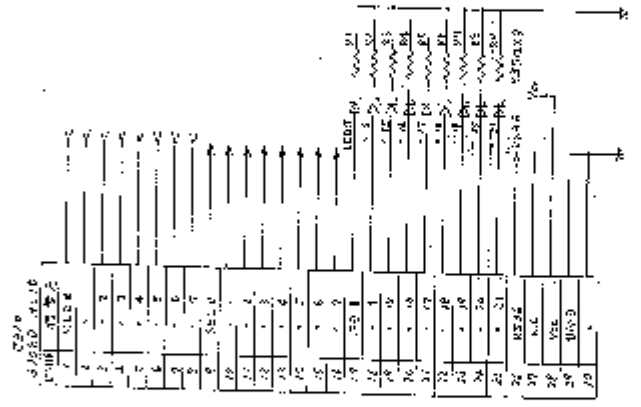
SECTION 7 SCHEMATICS

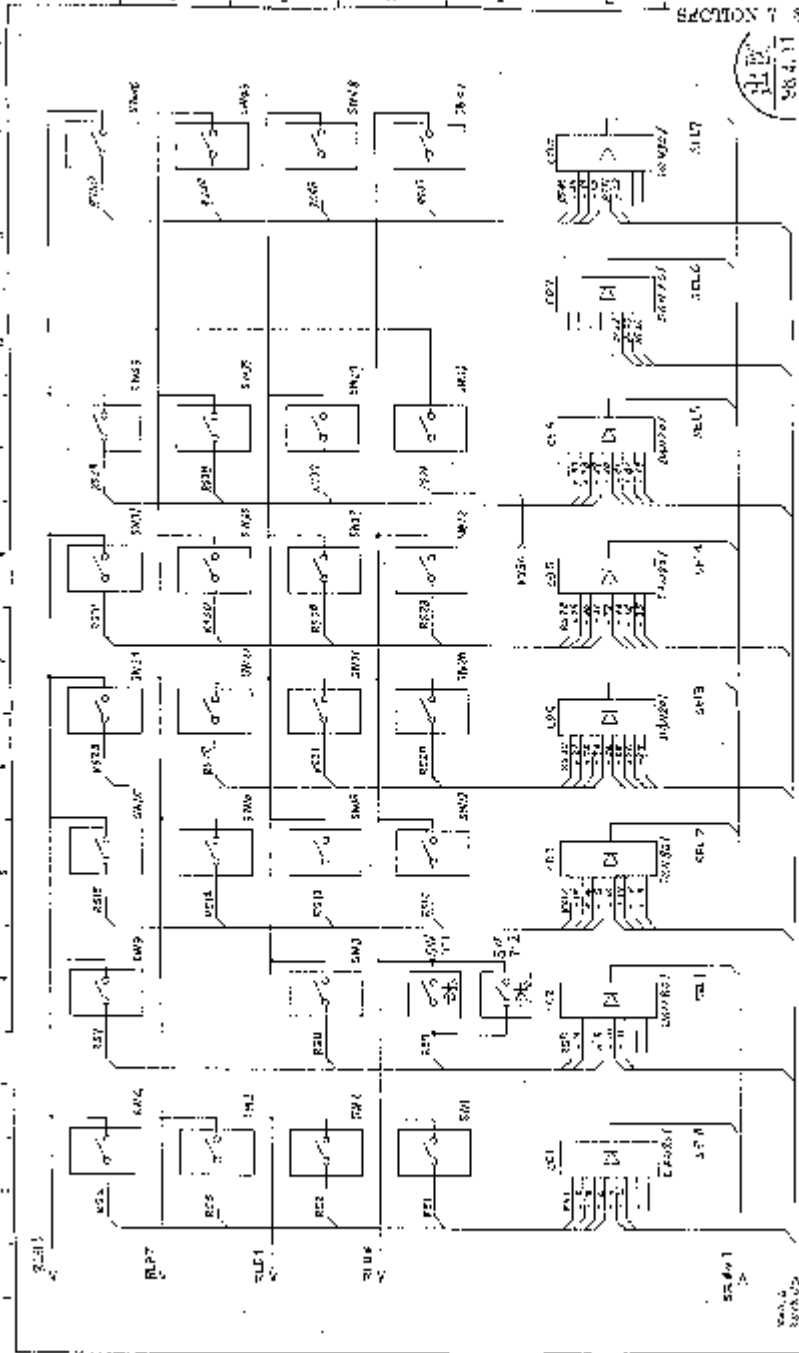


- 注) 1. 本図は、スイッチ内蔵 (LED) 基板に対する接続例を示す。
- 2. スイッチ (S1-H1) を組込時に端子を差込みます。

| | | | | | |
|------|----------|----|-----|-----|-------------|
| REV | DATE | BY | CHK | APP | DESCRIPTION |
| 1.0 | 92.11.11 | | | | SWITCH |
| 2.0 | | | | | REVISED |
| 3.0 | | | | | REVISED |
| 4.0 | | | | | REVISED |
| 5.0 | | | | | REVISED |
| 6.0 | | | | | REVISED |
| 7.0 | | | | | REVISED |
| 8.0 | | | | | REVISED |
| 9.0 | | | | | REVISED |
| 10.0 | | | | | REVISED |

SECTION 7 SCHEMATICS



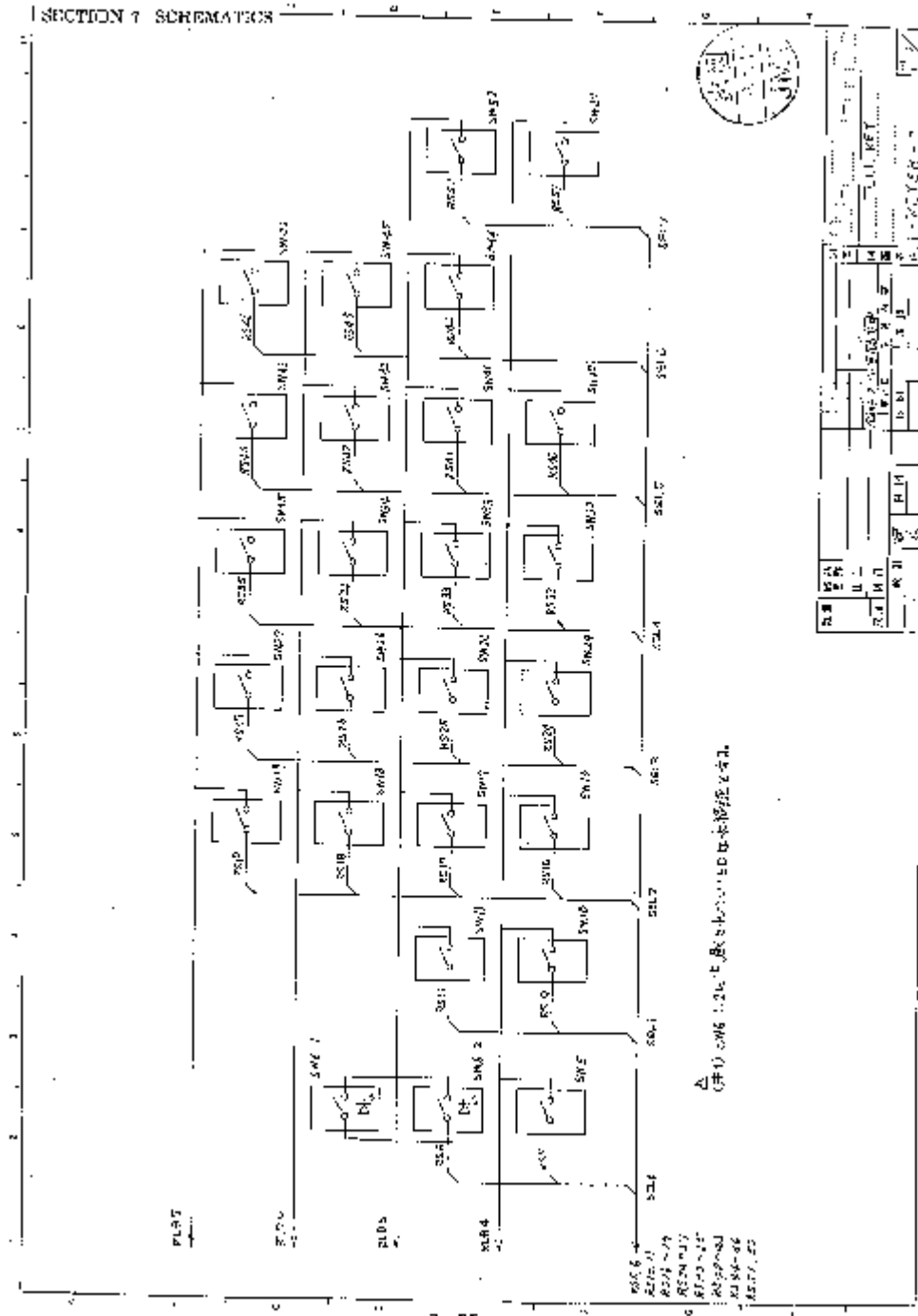


REV 10
1984.11
3/21

① SW-1 200V AC 10A TILDA 本機用 1.5A

| 記号 | 名称 | 数量 | 規格 | 備考 |
|------|-----|----|-------|----|
| R1 | リレー | 1 | 12VDC | |
| R2 | リレー | 1 | 12VDC | |
| R3 | リレー | 1 | 12VDC | |
| R4 | リレー | 1 | 12VDC | |
| R5 | リレー | 1 | 12VDC | |
| R6 | リレー | 1 | 12VDC | |
| R7 | リレー | 1 | 12VDC | |
| R8 | リレー | 1 | 12VDC | |
| R9 | リレー | 1 | 12VDC | |
| R10 | リレー | 1 | 12VDC | |
| R11 | リレー | 1 | 12VDC | |
| R12 | リレー | 1 | 12VDC | |
| R13 | リレー | 1 | 12VDC | |
| R14 | リレー | 1 | 12VDC | |
| R15 | リレー | 1 | 12VDC | |
| R16 | リレー | 1 | 12VDC | |
| R17 | リレー | 1 | 12VDC | |
| R18 | リレー | 1 | 12VDC | |
| R19 | リレー | 1 | 12VDC | |
| R20 | リレー | 1 | 12VDC | |
| R21 | リレー | 1 | 12VDC | |
| R22 | リレー | 1 | 12VDC | |
| R23 | リレー | 1 | 12VDC | |
| R24 | リレー | 1 | 12VDC | |
| R25 | リレー | 1 | 12VDC | |
| R26 | リレー | 1 | 12VDC | |
| R27 | リレー | 1 | 12VDC | |
| R28 | リレー | 1 | 12VDC | |
| R29 | リレー | 1 | 12VDC | |
| R30 | リレー | 1 | 12VDC | |
| R31 | リレー | 1 | 12VDC | |
| R32 | リレー | 1 | 12VDC | |
| R33 | リレー | 1 | 12VDC | |
| R34 | リレー | 1 | 12VDC | |
| R35 | リレー | 1 | 12VDC | |
| R36 | リレー | 1 | 12VDC | |
| R37 | リレー | 1 | 12VDC | |
| R38 | リレー | 1 | 12VDC | |
| R39 | リレー | 1 | 12VDC | |
| R40 | リレー | 1 | 12VDC | |
| R41 | リレー | 1 | 12VDC | |
| R42 | リレー | 1 | 12VDC | |
| R43 | リレー | 1 | 12VDC | |
| R44 | リレー | 1 | 12VDC | |
| R45 | リレー | 1 | 12VDC | |
| R46 | リレー | 1 | 12VDC | |
| R47 | リレー | 1 | 12VDC | |
| R48 | リレー | 1 | 12VDC | |
| R49 | リレー | 1 | 12VDC | |
| R50 | リレー | 1 | 12VDC | |
| R51 | リレー | 1 | 12VDC | |
| R52 | リレー | 1 | 12VDC | |
| R53 | リレー | 1 | 12VDC | |
| R54 | リレー | 1 | 12VDC | |
| R55 | リレー | 1 | 12VDC | |
| R56 | リレー | 1 | 12VDC | |
| R57 | リレー | 1 | 12VDC | |
| R58 | リレー | 1 | 12VDC | |
| R59 | リレー | 1 | 12VDC | |
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| R61 | リレー | 1 | 12VDC | |
| R62 | リレー | 1 | 12VDC | |
| R63 | リレー | 1 | 12VDC | |
| R64 | リレー | 1 | 12VDC | |
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| R67 | リレー | 1 | 12VDC | |
| R68 | リレー | 1 | 12VDC | |
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| R99 | リレー | 1 | 12VDC | |
| R100 | リレー | 1 | 12VDC | |

- SWA-10
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- SWE-10
- SWF-10
- SWG-10
- SWH-10
- SWI-10
- SWJ-10
- SWK-10
- SWL-10
- SWM-10
- SWN-10
- SWO-10
- SWP-10
- SWQ-10
- SWR-10
- SWS-10
- SWT-10
- SWU-10
- SWV-10
- SWW-10
- SWX-10
- SWY-10
- SWZ-10

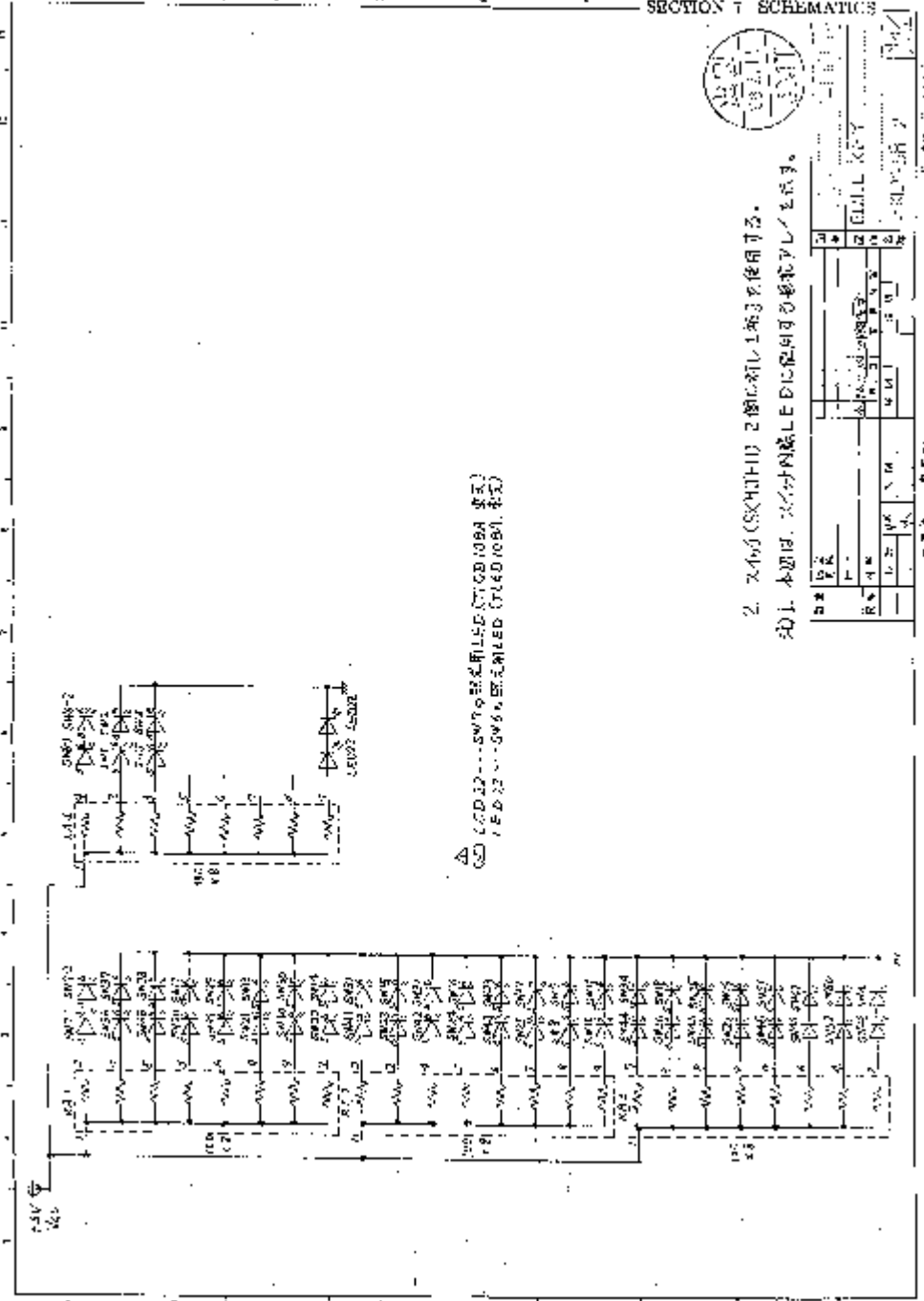


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| RELAY | | | | | | |
| FUSE | | | | | | |
| TERMINAL | | | | | | |
| OTHER | | | | | | |

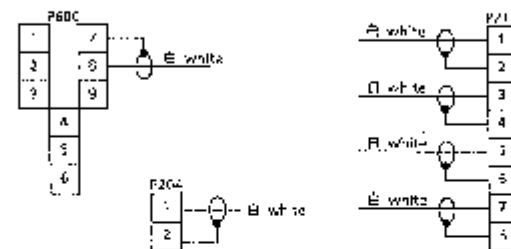
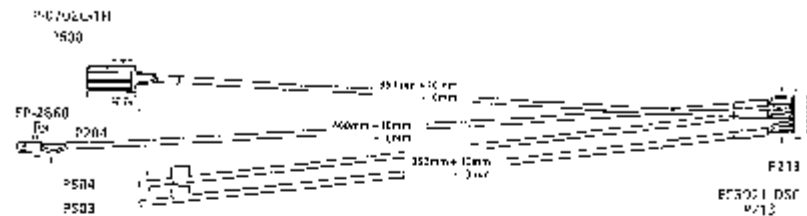


SECTION 7 SCHEMATICS



2. スケッチ (SKETCH) の値に初値 1 を割り当て使用する。
 知し、本図は、スキャン可能な LED に使用可能な構成を示している。

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| Pin No. | Signal |
|---------|-----------|
| 1 | N.C. |
| 2 | N.C. |
| 3 | N.C. |
| 4 | N.C. |
| 5 | N.C. |
| 6 | N.C. |
| 7 | AGND |
| 8 | TV OUT II |
| 9 | N.C. |

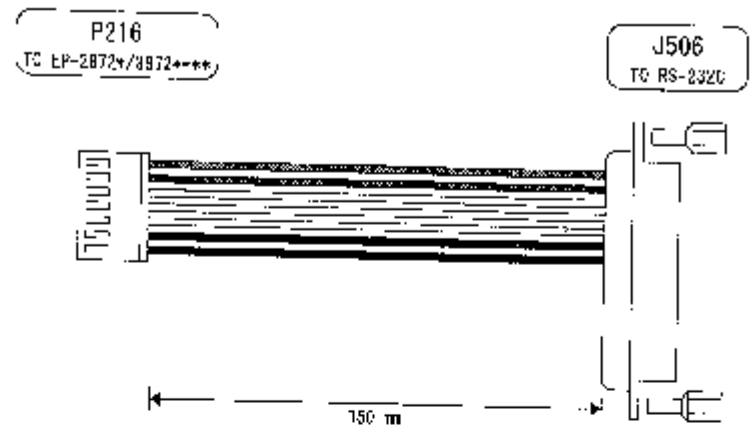
| Pin No. | Signal |
|---------|----------|
| 1 | US VIDEO |
| 2 | AGND |

| Pin No. | Signal |
|---------|-----------|
| 1 | US IN |
| 2 | AGND |
| 3 | STR IN |
| 4 | AGND |
| 5 | TV OUT I |
| 6 | AGND |
| 7 | TV OUT II |
| 8 | AGND |

P504

P503

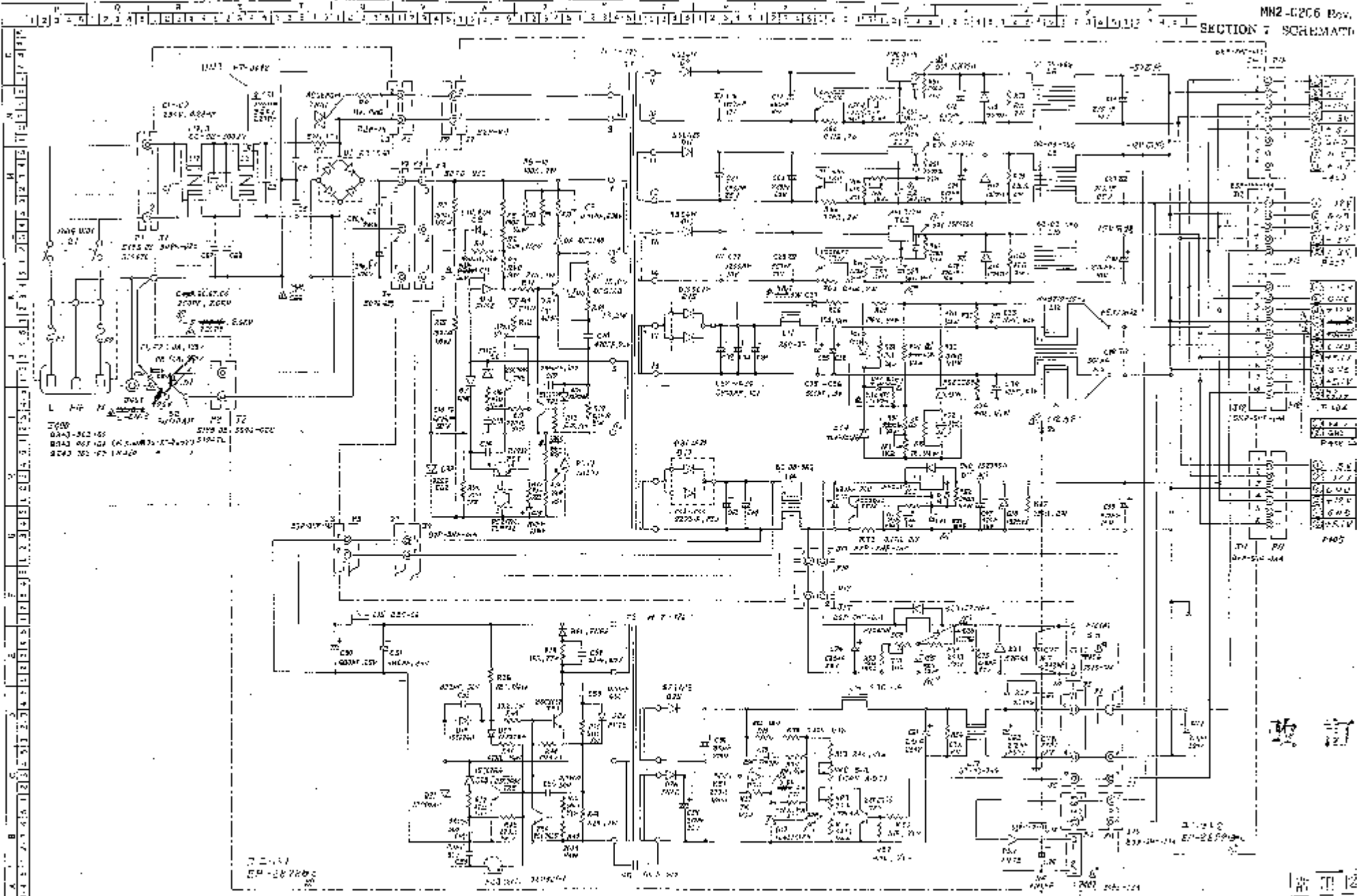
Aloka L-CABLE-2368



| P216 | |
|---------|--------|
| Pin No. | SIGNAL |
| 1 | TXD |
| 2 | RTS |
| 3 | RXD |
| 4 | CTS |
| 5 | DCD |
| 6 | -5V |
| 7 | GND |

| P216
5051-07 | | J506
3M20 2501 | |
|-----------------|--------|-------------------|--|
| 1 | RED | 3 | |
| 2 | BLUE | 5 | |
| 3 | YELLOW | 7 | |
| 4 | WHITE | 4 | |
| 5 | GRAY | FC | |
| 6 | BROWN | 1 | |
| 7 | BLACK | 7 | |

Aloka L-CABLE-241

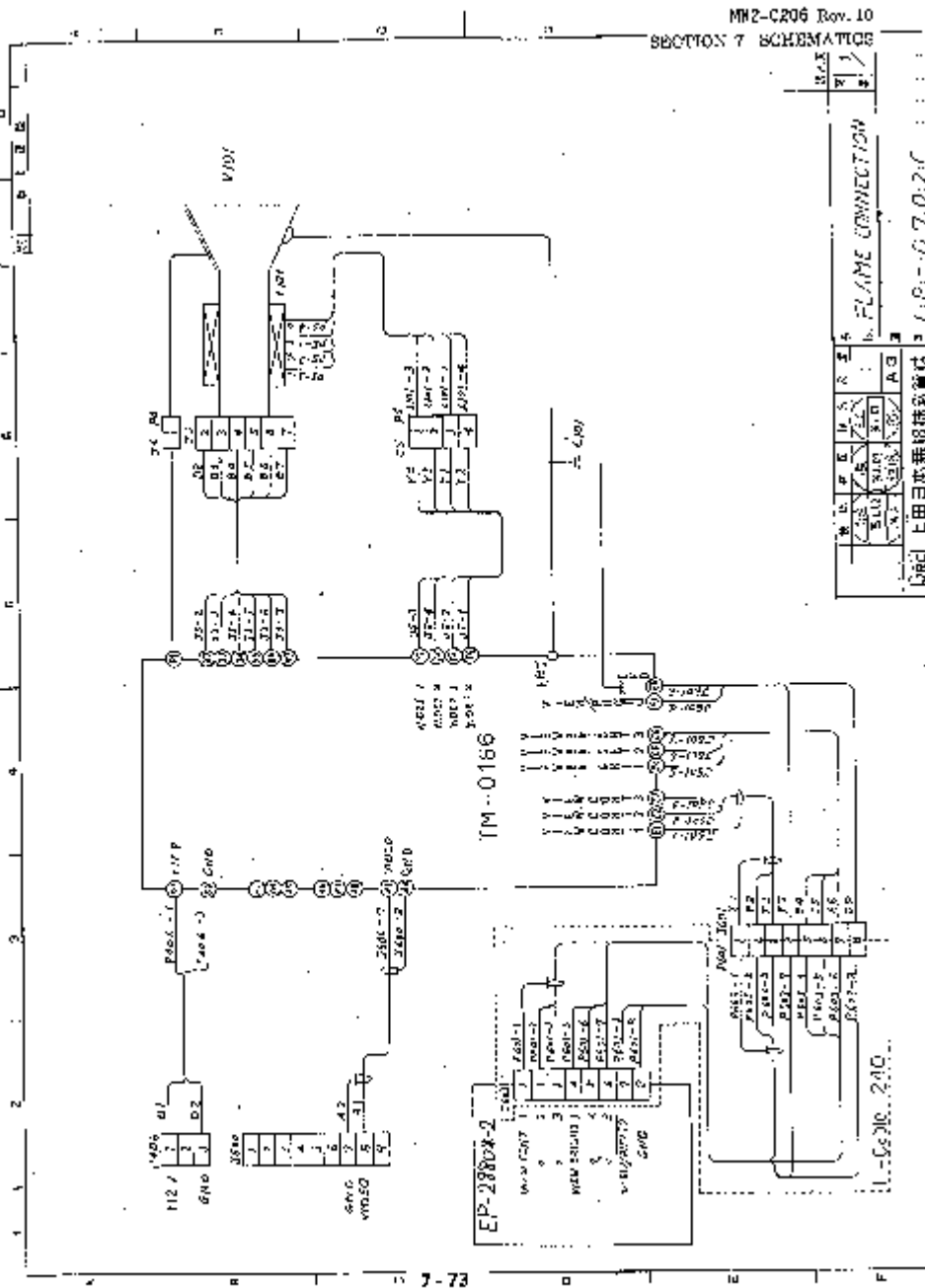


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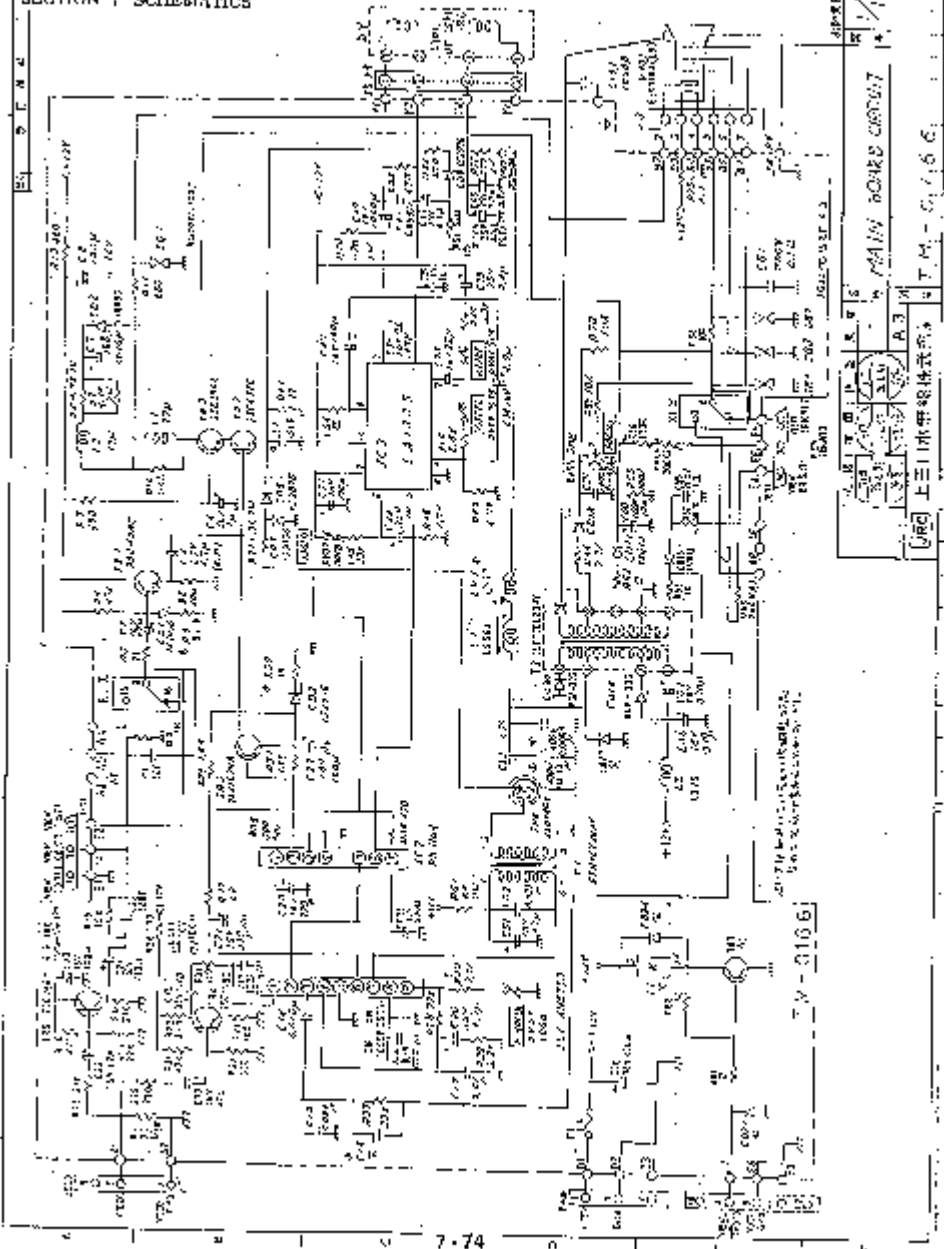
Aloka
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 19. 2018
 20. 2019





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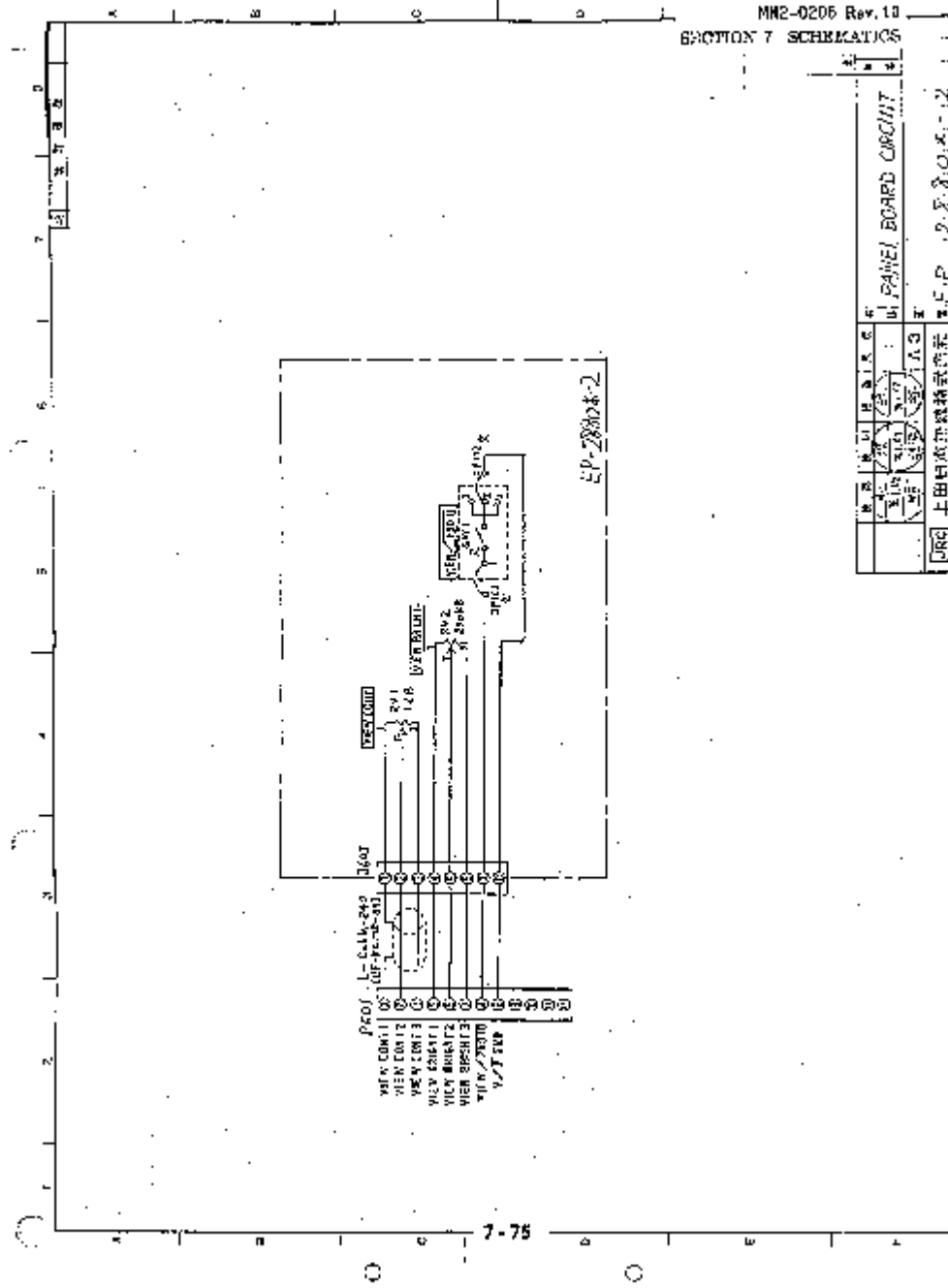
7V-0106

MAIN BOARD CIRCUIT

T.M. - C.1.6.6

上三口水母線板電路

SECTION 7 SCHEMATICS



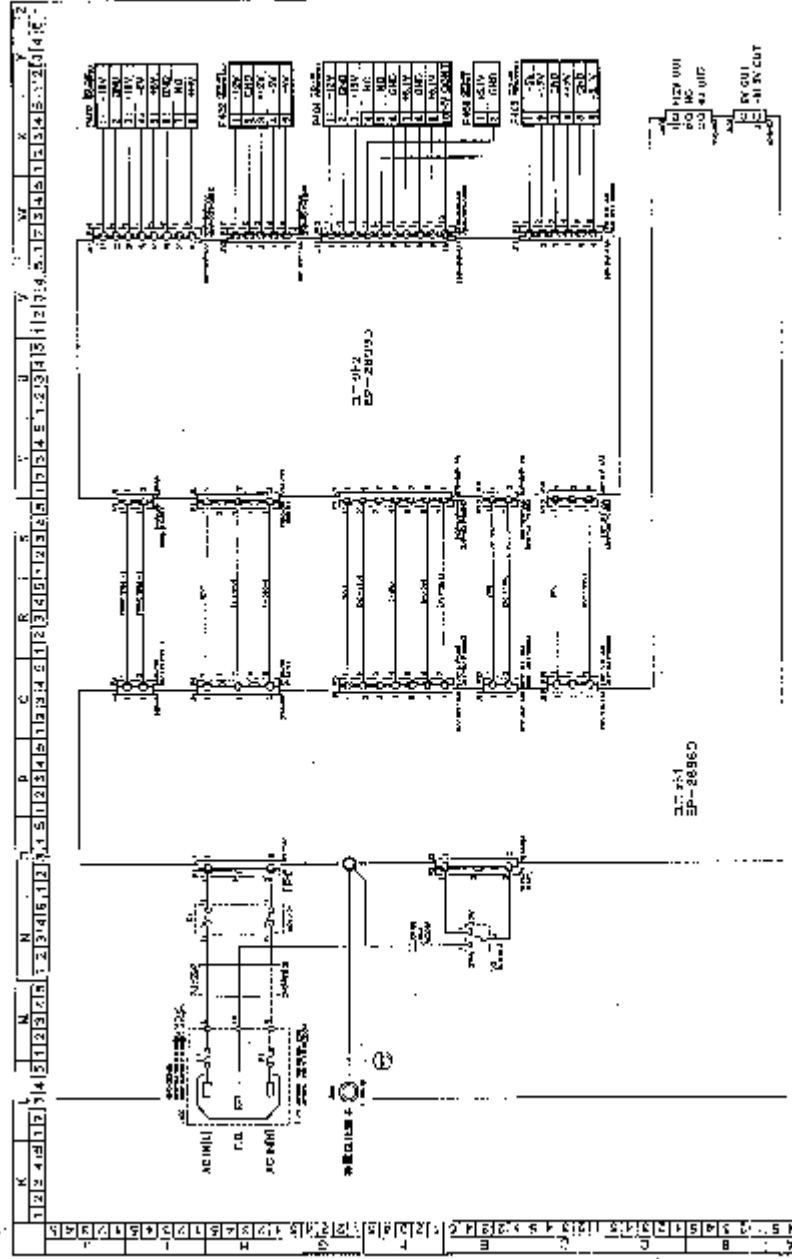
PROJ. I-Call-242
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 VIEW UNIT 100

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| REV | NO. | DATE | BY | CHKD | APPV |
| 1 | 1 | 10/10/00 | MM | MM | MM |
| 2 | 2 | 10/10/00 | MM | MM | MM |
| 3 | 3 | 10/10/00 | MM | MM | MM |
| 4 | 4 | 10/10/00 | MM | MM | MM |
| 5 | 5 | 10/10/00 | MM | MM | MM |
| 6 | 6 | 10/10/00 | MM | MM | MM |
| 7 | 7 | 10/10/00 | MM | MM | MM |
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| 10 | 10 | 10/10/00 | MM | MM | MM |

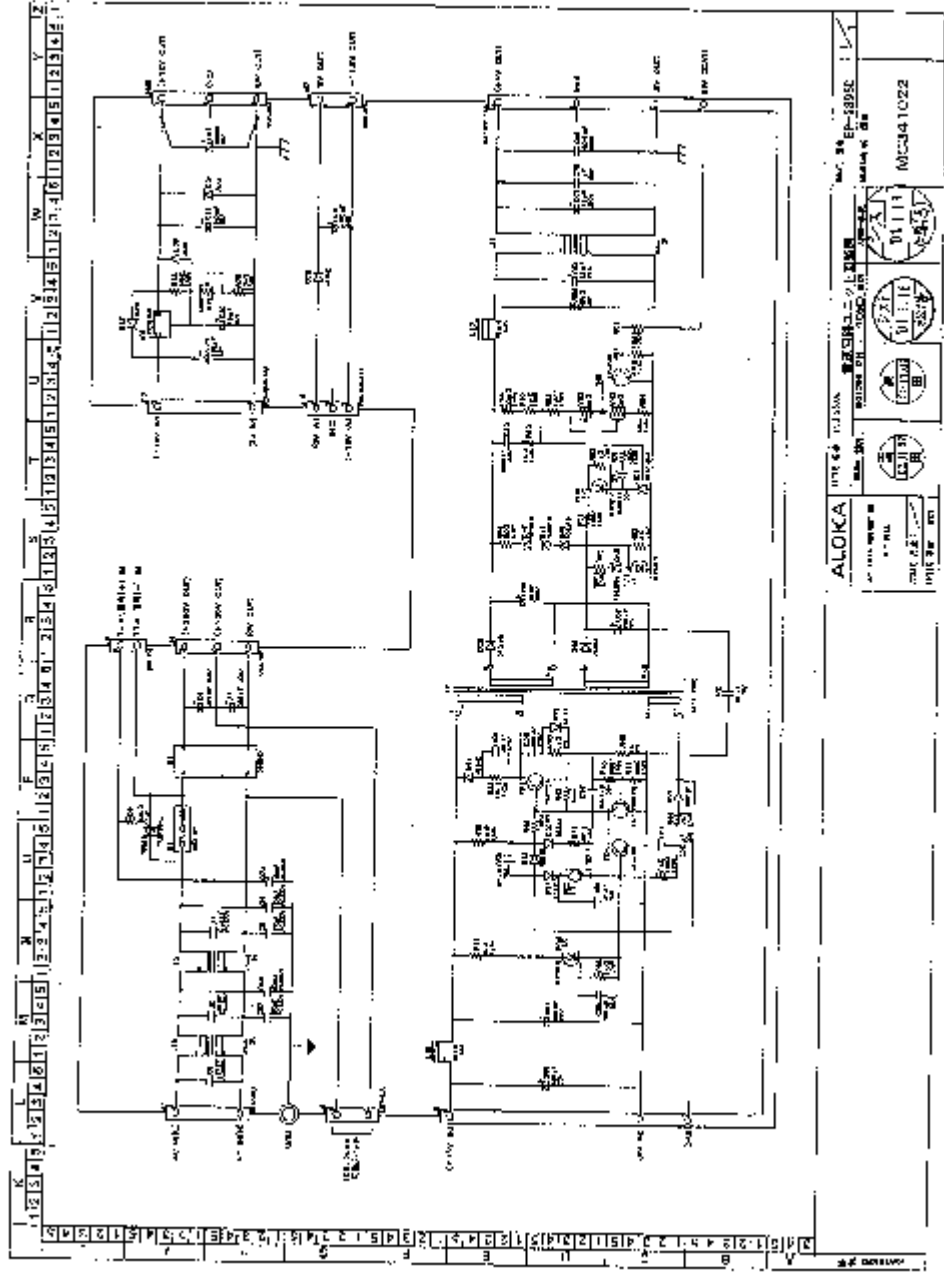
上田昌広 機械設計部 課長 上田昌広

01 PANEL BOARD CIRCUIT

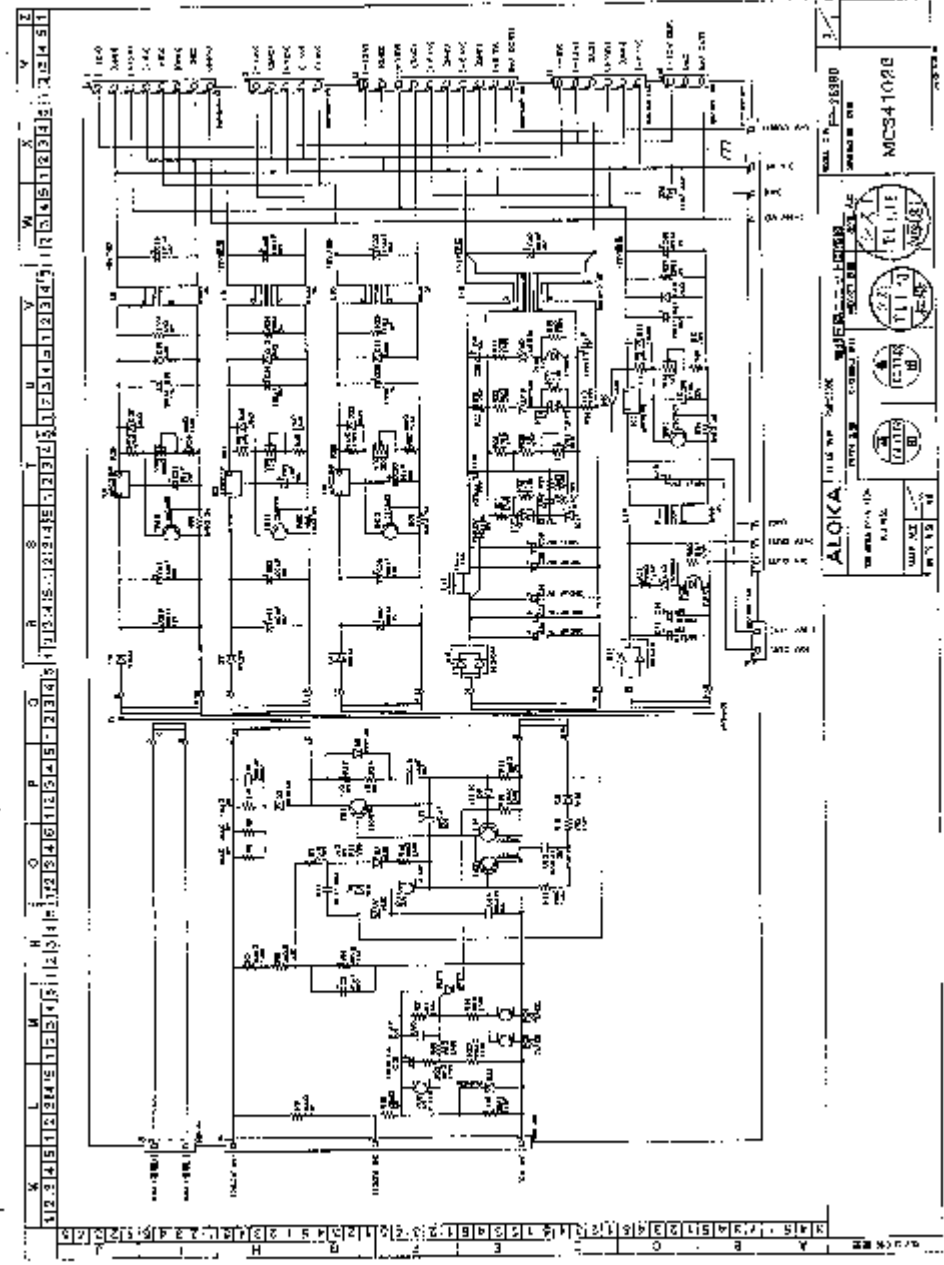
DATE: 10/10/00

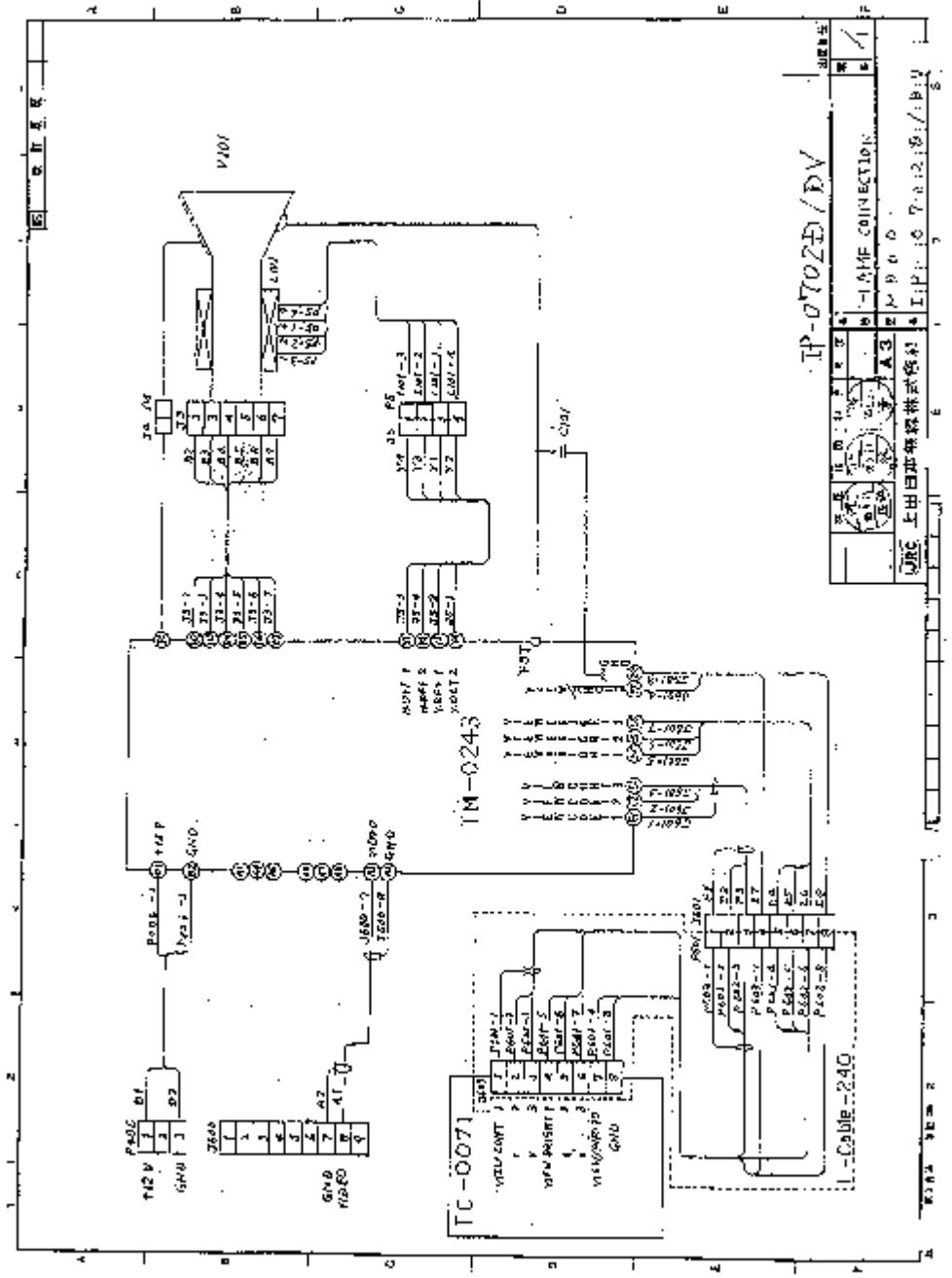


| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | | | | |
| <p>ALOKA</p> <p>DATE: 12/1/50</p> <p>BY: [Signature]</p> <p>CHECKED: [Signature]</p> <p>APPROVED: [Signature]</p> | | | | | | | | | | | | <p>REV. NO.</p> <p>1</p> | | <p>REV. DATE</p> <p>12/1/50</p> | | <p>REV. BY</p> <p>[Signature]</p> | | <p>REV. REASON</p> <p>[Signature]</p> | | <p>REV. NO.</p> <p>1</p> | | <p>REV. DATE</p> <p>12/1/50</p> | | <p>REV. BY</p> <p>[Signature]</p> | | <p>REV. REASON</p> <p>[Signature]</p> | |



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| ALOKA | | TYPE 64 TELEVISION | | EP-5395E | |
| MCC341022 | | MCC341022 | | MCC341022 | |
| MCC341022 | | MCC341022 | | MCC341022 | |
| MCC341022 | | MCC341022 | | MCC341022 | |

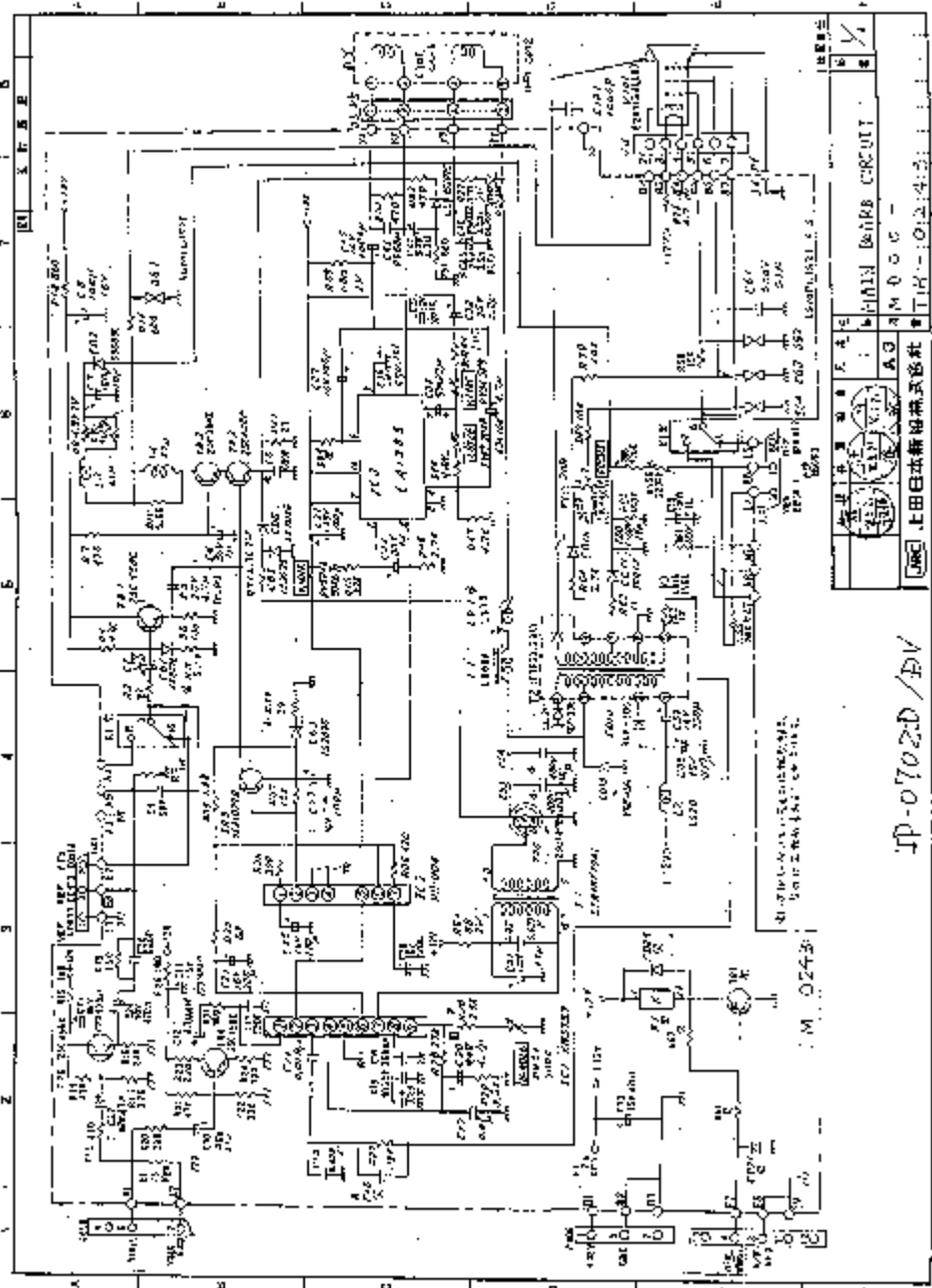




IP-0702B/DV

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| NAME CONNECTION | |
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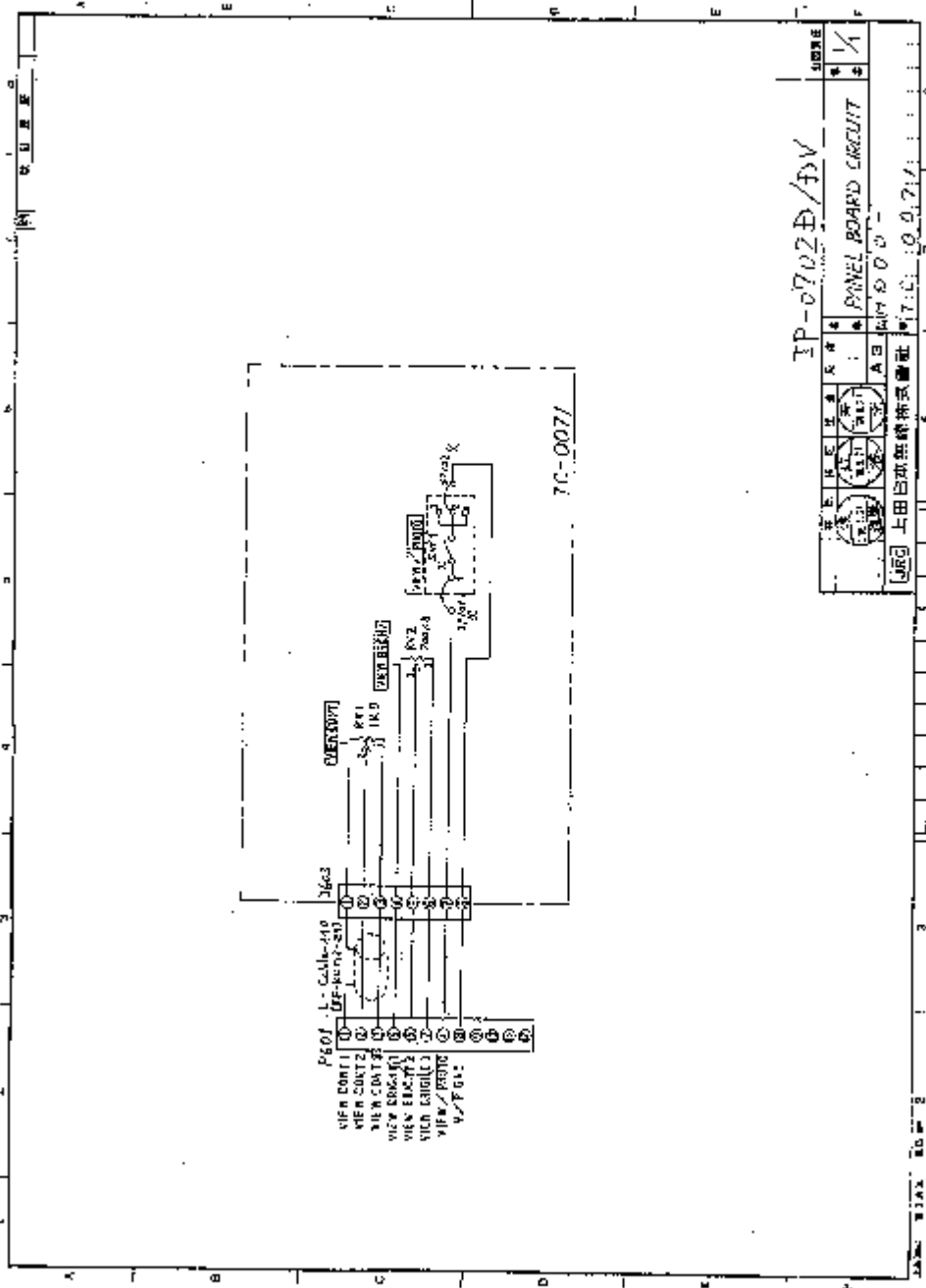
JBC 上田印事株式会社
I.P. 10 7-a 12; 8; / 11 V



TP-0702D/BN

M. 0243

上田電機株式会社
M D C
T.H. - 01243
MAIN BANK CIRCUIT



IP-0702B/F3V
PANEL BOARD CIRCUIT
上田無線株式会社
訂定 0.0.711

SECTION 8 TROUBLESHOOTING

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8-1 Introduction

This trouble shooting makes integral part of the Service Manual. And it has been prepared for the persistent purpose of providing for repairing guidelines.

What has been described herein, moreover, is subject to the prerequisite for a repair to be made by replacing a PCB.

8-2 Precautions

To prevent a new problem (secondary disaster) from taking place in the process of trouble shooting as described herein, every engineer concerned should duly take the following precautions:

- (1) Never remove any part from the electric system, including PCBs, probe, cable, etc., before powering off the equipment.
- (2) Do not proceed to a disassembly of equipment without observing the established disassembly procedure. Be careful enough for wrongly disassembling the equipment would damage or break it down.
- (3) To make certain of a voltage and/or a signal waveform, it is necessary to thoroughly know the specification and handling procedure relating to a measuring instrument employed.
- (4) To ground a measuring instrument probe or the like, it is naturally necessary to know where a signal to determine is grounded. Before using the instrument, moreover, make certain for which the grounding terminal is intended, analog, digital, alternating current, direct current, high voltage or low voltage.

● Caution ● Failure to ground properly might result in an incapability of observing an accurate voltage or waveform or in a probability of burning out the measuring instrument or ultrasound diagnostic equipment or both.

- (5) Do not fit a measuring instrument probe or the like to a measuring point before turning off the ultrasound diagnostic equipment.

SECTION 8 TROUBLESHOOTING

●Caution● To determine an especially high voltage, it might rupture a circuit in the ultrasound diagnostic equipment. Besides, it might endanger a engineer or engineers concerned.

- (6) To replace or repair a PCB, make certain of its compatibility, etc. in accordance with the "History of SSD-2000".

If a wrong ROM should be mounted on a PCB, employ the ROM originally employed in the user's equipment or select an appropriate one in accordance with the History.

●Caution● If an incompatible PCB should be inserted into the equipment, there are possibilities that the equipment may be burnt out. If such incompatible PCB should remain inserted in the equipment after completion of a repair, moreover, it should be fully noted that another problem may take place newly.

- (7) Without definitively knowing that failure has taken place, do not unnecessarily change any controls and/or switches on a PCB from their original settings.

To determine whether or not a problem is the failure, see Section 10 "Performance Check."

If a readjustment is required, see Section 9 "Alignment Procedure."

●Caution● An unnecessary change of controls' or switches' settings might bring about a new problem, probably making the equipment unrepairable.

- (8) While you are shooting trouble in accordance with the present procedure, it may be necessary to consult with Technical Support. In such a case, provide at least the following information:

- i) Equipment model number,
- ii) Equipment serial number,
- iii) History of equipment (repairs and/or modifications so far made), and software version, and
- iv) Specific problem situations (Send a photo or photos.)

8-3 Tools and Measuring Instruments Required

The tools and measuring instruments which are required for a repair on a standard basis are as follows:

1. Oscilloscope

| | | |
|-----------------------|---|--------------|
| Sensitivity | : | 5mV/div. |
| Frequency band | : | 100-50MHz |
| Maximum input voltage | : | 400V or more |
2. Multi Meter

| | | |
|-------|---|-------------------------|
| Class | : | 0.5 class |
| Range | : | ACV, DCV, UCA, Ω |
3. Test Piece:

| | | |
|--|--|--|
| made by RMI (Radiation Measurements, INC.) | | |
| RMI-412 | | |
4. Probe

| | | | |
|--------|---|---------------|----|
| Convex | : | UST-884N-3.5 | or |
| Linear | : | UST-5021N-3.5 | |

8-4 (this clause has been deleted on Version 8)

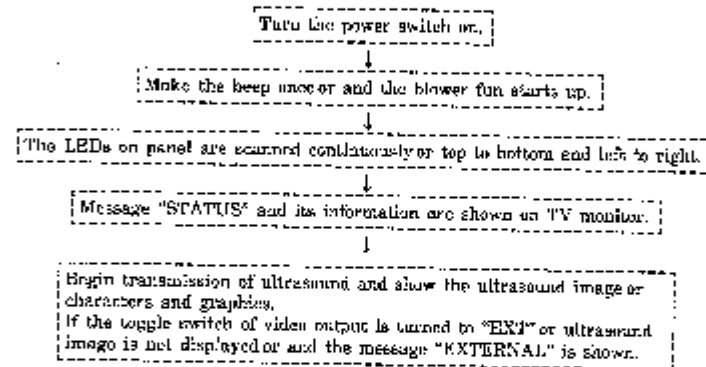
8-5 Information for repair work

In the SS0-500 various settings of function are controlled by the MPU (Micro Processing Unit). Some of them are able to be defined by the customer using operation panel. On the other side there are something available just for engineer.

The following description shows them to avoid the missing of judge whether the specification or failure, and also shows how to change them.

8-5-1 Automatic Starting Up

When turning the power switch on or the MPU is in the initialization. The followings are proceeded on the behavior basis until the making of ultrasound transmission and its image or

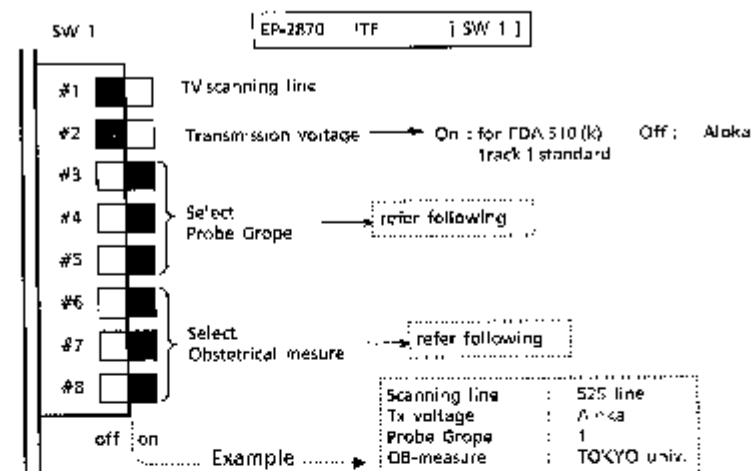


8-5.2 Switch Settings on PCB

On the PCBs or many switches are prepared to make an initialization and various kinds of configuration. If these are set abnormally or the normal functions must be spoiled or it may make a trouble. When you have changed them unwillingly or correct them according to Page 8-5-1~8-5-6.

Caution:

1. When making a change of setting of dip-switchs, be sure to cut off power supply to the equipment.
Otherwise, setting of switches will remain unvaried even after dip switches are switched over.
2. After making a change of setting of SW1 in EP-2820, make sure that "STATUS" appearing as a part of opening message at the start of the system has been revised.



"Probe Grope"

| Probe Grope | | | | | | | | |
|-------------|----|-----|-----|-----|-----|-----|-----|-----|
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |
| 3 | On | Off | On | Off | On | Off | On | Off |
| 4 | On | On | Off | Off | On | On | Off | Off |
| 5 | On | On | On | On | Off | Off | Off | Off |

CAUTION : In the case of changing of it is necessary to replace the ROM at position EP-2871 DSC additionally. (The detail is shown in "Section 8-5-7 Location of ROM")

"Obstetrical Measurement"

| Obstetrical Measurement | | | | | | | | |
|-------------------------|------|-----|-----------|-----|----------|-----|-----|---------|
| | 美国人式 | 欧大陆 | SONY/SONY | USA | PARAZELL | | | De' way |
| 6 | On | Off | On | Off | On | Off | On | Off |
| 7 | On | On | Off | Off | On | On | Off | Off |
| 8 | On | On | On | On | Off | Off | Off | Off |

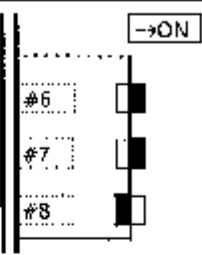
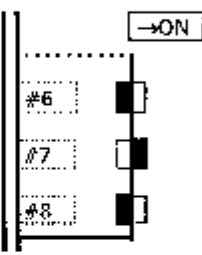
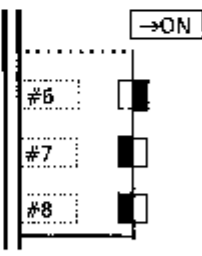
NOTE : In this case it is not necessary to replace any more.
 If a setting can use only SSD-800MICRUS.
 There are 2 kinds of SSD 500V CRUS as below.
 ① A type which this table can use when Probe Grope setting is No.② (Only type for USA for animal of initial product type 1)
 ② A type which this table can use when DIP SW1 #6-8 of Obstetrical Measurement setting are all off.

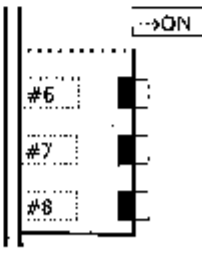
| EP-287D Dip switch1 table | | |
|---------------------------|--|-------|
| Switch #1 | TV lines | State |
| #1 : ON | 625 lines
*EP-2871-2(625LINES) | |
| #1 : OFF | 525 lines
*EP-2871-1(525LINES)
This set up is domestic | |
| Switch #2 | Transmission voltage | State |
| #2 : ON | FDA 510(k) Track 1 standard | |
| #2 : OFF | ALOKA standard | |

| EP-287D Dip-switch1 table | | |
|---------------------------------|---------------|-------|
| Switch #3,4,5 | Probe group | State |
| #3 : ON
#4 : ON
#5 : ON | PROBE GROUP ① | |
| #3 : OFF
#4 : ON
#5 : ON | PROBE GROUP ② | |
| #3 : ON
#4 : OFF
#5 : ON | PROBE GROUP ③ | |
| #3 : OFF
#4 : OFF
#5 : ON | PROBE GROUP ④ | |

| EP-2870 Dip-switch1 table | | |
|---------------------------------|------------------------|-------|
| switch #6,7,8 | obstetrics measurement | state |
| #6 : ON
#7 : ON
#8 : ON | Tokyo univ. | |
| #6 : OFF
#7 : ON
#8 : ON | Osaka univ. | |
| #6 : ON
#7 : OFF
#8 : ON | HANSMANN | |
| #6 : OFF
#7 : OFF
#8 : ON | USA Version | |

EP 2870 Dip-switch1 table

| Switch No.6,7,8 | obstetrics measurement | state |
|----------------------------------|---|---|
| #6 : ON
#7 : ON
#8 : OFF | CAMPBELL |  |
| #6 : OFF
#7 : ON
#8 : OFF | Be for nothing in status |  |
| #6 : ON
#7 : OFF
#8 : OFF | Be for nothing in status |  |
| #6 : OFF
#7 : OFF
#8 : OFF | ANIMAL

This setting can use on only SSD-500MICRUS.
There are 2 kinds of SSD-500MICRUS as below.
① A type which this table can use when Probe Group setting is No.* (Only type for USA for animal of initial product type.)
② A type which this table can use on this setting. |  |

SSD-500 MICRUS can arrange the OS measurement parameter, fetal growth table data and pregnancy week.

B-5-3 How to use the user function

On the PCB are switches corresponding to initialization and various specifications of the equipment. If those switches are not in the proper set positions, it would not only cause erroneous operation of the equipment, but also involve additional failures. If tampering with any switches has necessarily been made, refer to SECTION 11-3 Technical Information.

[Reference] The backup RAM is mounted on EP-2872 CPU/EP3877 MPU & I/F.
The backup battery is also on this PCB.
The contents to be backed up and the method of resetting the backup RAM are on pages 8.7~8.9.

Method of setting of hospital name

The equipment up to software version 2.0 does not have this function.

For software version 3.0 and up, the first line in the comment area is kept in as a backup line which may be used for hospital name area.

DATE & TIME (FORMAT)

- 1 Push the "MENU" switch.
- 2 Change the page or and select [DATE].
- 3 If date or select [DATE]. If time or select [TIME].
- 4 Input the correct data or time from full key board.
- 5 Select [set].

PRESET FUNCTION

This function is not available.

OBSTETRICAL MEASUREMENT TABLE

The table is set by switch which is inside of equipment. The customer cannot choose which kind of table.

GESTATIONAL TABLE OBSTETRICAL MEASUREMENT TABLE

- 1 Push the "DB-MEASURE" switch.
- 2 Change the page and select function switch which corresponds to [OB-PRO].
- 3 Move the cursor to GESTATIONAL TABLE by trackball.
- 4 Input any number from full key board.
- 5 Select [set].

OBSTETRICAL MEASUREMENT ITEM IN MENU, DATA OF OBSTETRICAL MEASUREMENT TABLE

- 1 Push the "OB-MEASURE" switch.
- 2 Change the page n° and select function switch which corresponds to [OB-PRO].
- 3 Move the cursor to the item number which you want to register the measurement item in menu by trackball.
- 4 Select [set].
- 5 - How to register OBSTETRICAL MEASUREMENT item(the internal item) in OBSTETRICAL MEASUREMENT menu.
Ⓐ Move the cursor to [INTERNAL] by trackball and select [set].
Ⓑ Select and register OBSTETRICAL MEASUREMENT item which you want to use.
- 6 - How to change and register OBSTETRICAL MEASUREMENT item or data of OBSTETRICAL MEASUREMENT TABLE.
Ⓐ Move the cursor to [USEREDIT] by trackball and select [set].
Ⓑ Change and register OBSTETRICAL MEASUREMENT item or data of OBSTETRICAL MEASUREMENT TABLE.
- 7 - How to delete OBSTETRICAL MEASUREMENT item.
Ⓐ Move the cursor to [CLEAR] by trackball and select [set].
Ⓑ Select OBSTETRICAL MEASUREMENT item which you want to delete.

8-5-4 Contents to be Backed UP

(1) "Backup" is the function that stores the state of panel just before power supply is cut off so that the same state of panel can be restored when power is supplied again.

(2) The backup menus are as follows:

| | |
|--|--|
| MODE switch | B or B/B, B/M or M selective |
| MAGNIFICATION switch | x0.75, x1.0 or x1.5 selective |
| ※1 NEAR GAIN switch | 0~ -45dB selective |
| ※1 FAR GAIN switch | 0~5dB selective |
| FOCUS switch | F1~F4 or B selective |
| BODY MARK selective switch | ON or OFF selective |
| Comment area | 1st line (40 characters) |
| BODY-IVK (In the menu) | ※1 ABDOM, OBST, HEAD, OTHER selective
※2 ABDOM, OB/GYN, TY/HD, BREAST, CARDIO, LIMB, DOG, CAT selective |
| DATE (In the menu) | JAPAN, EUROPE or AMERICA selective |
| DT-DSP (In the menu) | ON or OFF selective |
| FRM-CO (In the menu) | ※1 AUTO, ON or OFF selective
※2 AUTO, LOW, MID, HIGH, OFF selective |
| IMG-DI (In the menu) | △ or ▽ selective |
| IMAG-PO (In the menu) | POS. or NEGA selective |
| PUNC (In the menu) | ON or OFF selective |
| DOT OF PUNCTURE
(In the sub-menu of PUNC) | 1 or 0.5cm selective |
| COH1 (In the menu) | 1~8 selective |
| AGC (In the menu) | OFF or 1~4 selective |
| ※2 SWEEP SPD (In the menu) | 1, 2, 4, 8 second selective |
| ※2 DIRECTION switch | ON or OFF selective |

※1 Only in case of SSD-500.

※2 Only in case of SSD 500MICRUS.

8-5-5 Method of Resetting Backup Memory (RAM)

(1) SSD-500 has the backup function to eliminate the possibility of erasing the whole contents by mistake during ordinary use of it. In a special case such as below, however, it is necessary to reset the backup RAM:

- 1-1 When a modification such as version-up modification of software is to be made.
- 1-2 When some unnecessary (erroneous) characters (or code) slip into an indication of time and date.
- 1-3 When the system does not start even after the power switch is ON. (In this case, resetting the backup RAM should be used only as a temporary expedient. Also, in this case the contents of previous setting are scarcely stored.)

(2) Resetting of the backup RAM is made in two different ways, which are dependant on software version, regardless of hardware structure.

Caution : Before resetting the backup RAM, keep a record of the contents of setting to be erased ("Format" of date, etc.) as far as possible.

- 2-1 Regardless of hardware structure, the method shown in either Fig. 8.3 or Fig. 8.3.1 may be used for the equipment with software version 3.0 and up.
But, in case of SSD-500MICRUS (The equipment of software version "E1.0" and after), please clear the backup RAM by the method shown in Fig. 8.3.
- 2-2 Regardless of hardware structure, the method shown in Fig. 8.3.1 should be used for the equipment with software version 1.0, 1.1 or 2.0.
- 2-3 For the equipment with software version 3.0 and up, it is possible to clear the backup RAM by means of a switch on the operation panel. (Fig. 8.3)

Fig. 8.3 Resetting the Backup RAM

- 1 Pressing both the SHIFT key and ALL CLEAR key, turn on the power switch. Continue to press the two keys for 30 seconds.



SSD-500



SSD-500MICRUS

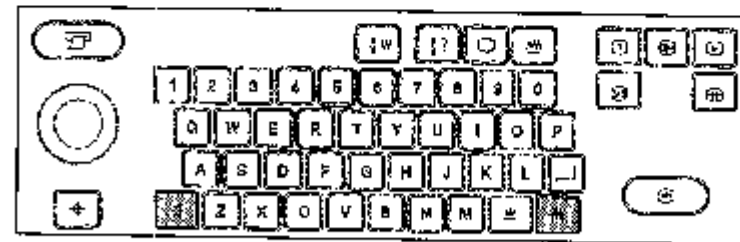
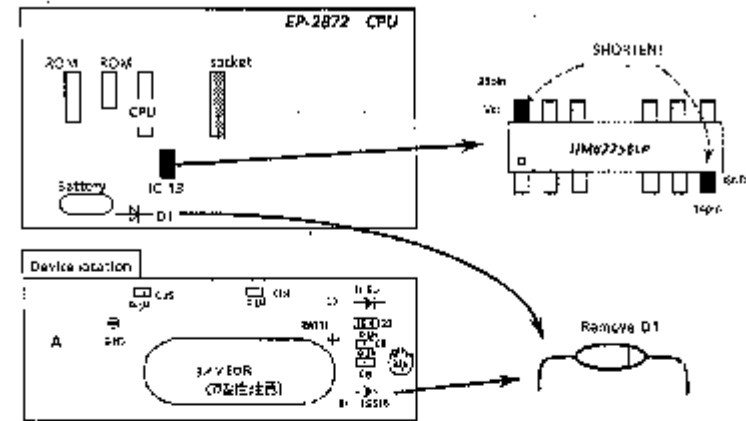


Fig.8.3.1 How to reset the RAM



Reset the RAM according to followings.

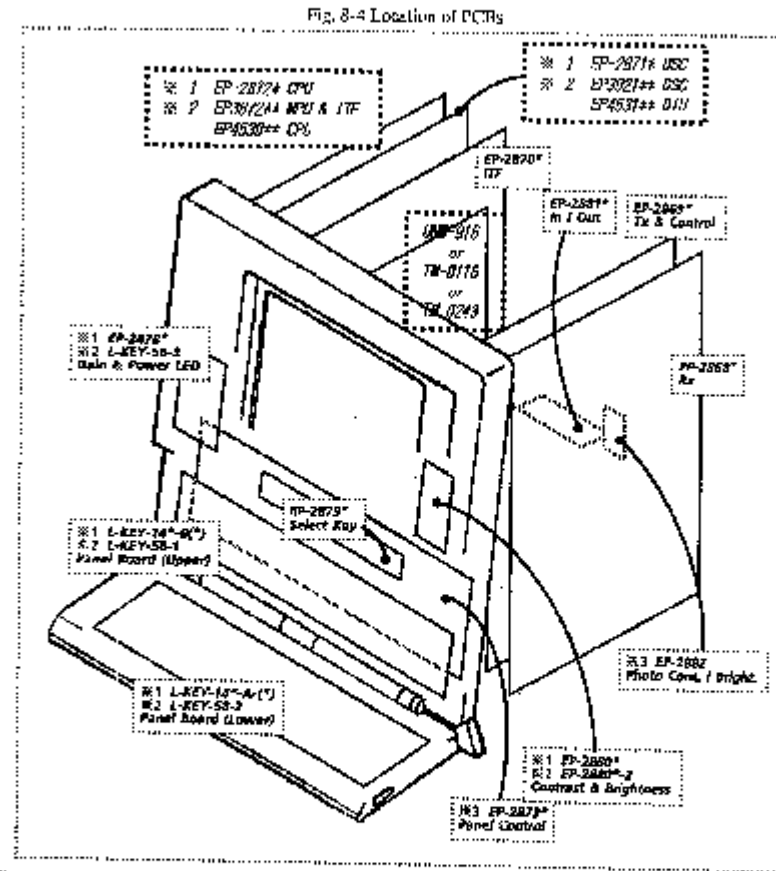
At first, turn the power switch off.

1. Remove the equipment cover. (See the disassembling procedure.)
2. Remove diode D1 from EP-2872.
3. Short-circuit 14pin (GND) and 28pin (Vcc) to each other on IC13 on EP-2872 for a moment.
4. Install the equipment cover. (See the disassembling procedure.)

Caution : ◆ Absolutely avoid making a short circuit of the backup RAM without removing the diode.
 ■ Should the RAM be short-circuit with the diode lift installed, the backup battery may be damaged.

8-5-6 Location of PCBs

The location of PCBs are shown in Fig.8-4. Please refer for repair or modification.

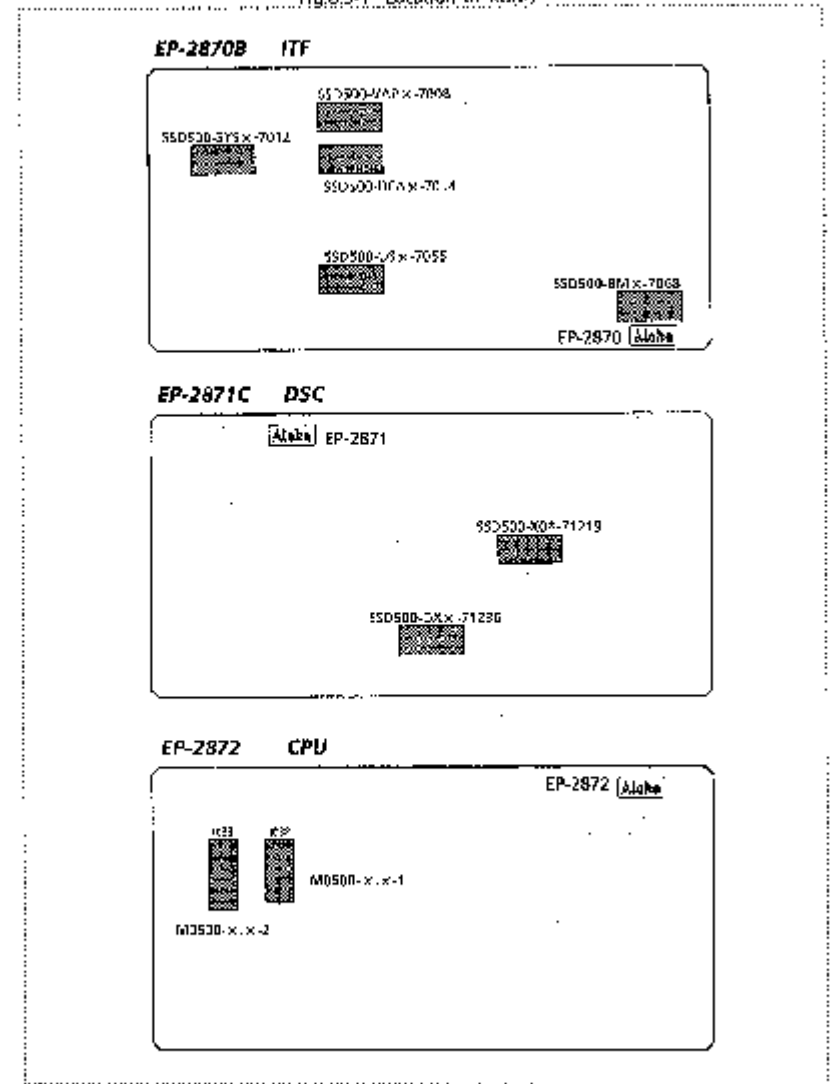


- ※1 Only in case of SSD-500, this PCB is used.
- ※2 Only in case of SSD-500 Ver. E1.0 onwards, this PCB is used.
- ※3 Only in case of SSD-500, this PCB is used. (In case of SSD-500 Ver. E1.0 onwards, this is deleted)

8-5-7 Location of ROMs

The location of ROMs is shown in fig. 8.5-1 and 8-5-2.
Please refer for replacing the ROMs on modification.

Fig. 8.5-1 Location of ROMs



ROMs with the socket are shown. The location may be different by version of PCB.

Fig. B.5-2 Location of ROMs

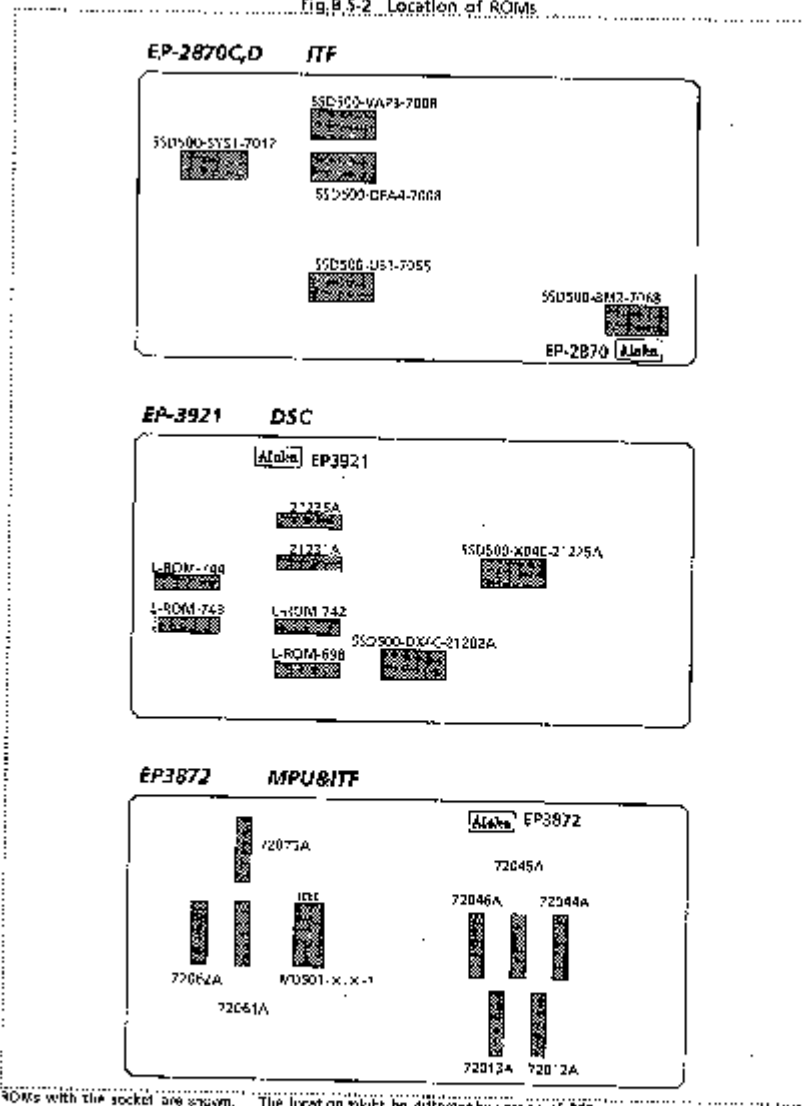
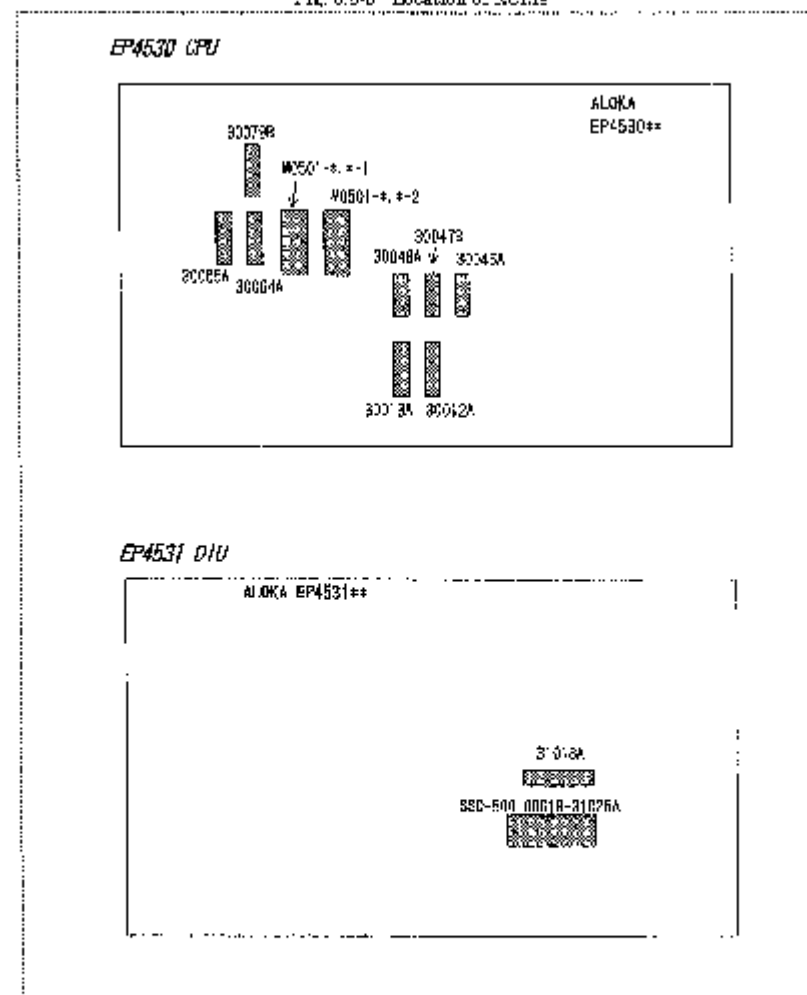


Fig. 8.5-3 Location of ROMs



ROMs with the stipples are shown. The location might be different by version of PCB.

(Blank page.)

R-5-6 Disposition of locking up

If this system does not work or work abnormally, this trouble shooting is meaningless. In this case, referring the following items, please try to repair it.

(1) First, check the output voltage from the power supply unit.

This systems of this equipment is controlled by MPU which is mounted on EP-2872 CPU, or EP-3872 MPU & ITF, or EP4530 CPU. If +5V for MPU is not applied to MPU, it never works and whole of system also does not work.

And if the output voltage is normal, the breaking of the power supply cable can be thought. So the checking on PCB is recommend.

The PCB which has MPU is following.

| | | |
|---------|-----------|-----------------------------|
| EP-2872 | CPU | (SSD-500) |
| EP3872 | MPU & ITF | (SSD-500 Ver. E1.0~E2.0) |
| EP4530 | CPU | (SSD-500 Ver. E3.0 onward.) |

(2) Trouble of BUS signal

If BUS signal occurs abnormal, it is difficult to find defective point. In the case of locking up of the system, please try to repair it referring the following table (tbl. 8.2). And we advice you to contact to technical support as soon as possible.

The followings are explanation of signals which are shown to the table.

| | |
|------|--|
| ADRS | : Address bus of MPU which controls whole system |
| DATA | : Data bus of MPU which controls whole system. |
| DTA | : Data bus for operation panel |
| GEUD | : Data bus which controls Tx & Rx. |

Tbl. 8.2 BUS signals

| PCB | Name | ADRS | DATA | DTA | GEUD |
|------------|---------------|------|------|-----|------|
| ※1 EP-2673 | Panel Control | | | ← | |
| ※1 EP-2872 | CPU | → | ↔ | | |
| ※1 EP-2671 | DSC | ← | ↔ | | |
| EP-2670 | ITF | ← | ↔ | → | ← |
| EP-2669 | Tx & Control | | | | ← |
| EP-2668 | Rx | | | | ← |
| ※2 EP3872 | MPU & ITF | → | ↔ | ↔ | |
| ※2 EP3821 | DSC | ← | ↔ | | |
| ※3 EP4530 | CPU | → | ↔ | ↔ | |
| ※3 EP4531 | DIU | ← | ↔ | | |

→ : BUS signal is outputted from this PCB

← : BUS signal is inputted to this PCB

↔ : BUS signal is bi-directional

※ 1 : Only SSD-500 uses it.

※ 2 : Only SSD-500 Ver. E1.0~E2.0 uses it.

※ 3 : Only SSD-500 Ver. E3.0 onwards uses it.

8-5-9 Power Supply (PSU-S500 or B or C or D)

Check that the voltage measured at power-supply output terminals meets the values shown in Table.

Test conditions:

- 1) Measure the power-supply unit independently. (No-load condition)
- 2) After power ON, wait for about 30minutes (until part temperature increases satisfactory) before taking measurement.
- 3) Set the voltage of AC input to the power supply unit to a value within the range of specified voltage $\pm 1\%$.

Tbl. B.3 Power-Supply Unit Output Voltage

| Connector No. | Test | GND | Reference voltage |
|------------------|------|-----|-------------------|
| P403 | 1 | 2 | -12V |
| P403 | 3 | 2 | +12 |
| P403 | 4 | 6 | -5.1V |
| P403 | 5 | 6 | +5.1V |
| P403 | 8 | 6 | * +160V/+120V |
| P405 | 6 | 5 | +5V |
| P406 | 1 | 3 | +12V |
| P407 | 2 | 1 | -12V |
| P408 (PSU-S500C) | 1 | 2 | +5.1V |

* : +160V output when HVS CONT input is "H".
 +120V output when HVS CONT input is "L".

For each connector, refer to fig. 8.6.

Fig. B.6 Connector pin list of Power supply

| PSU-S500 or B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--------|--------|--|--------|-------|-------|---|--------|-------|---|--------|-------|---|-------|-------|---|--------|-----|---|-------|---|---|-------|--|--------|-------|--------|--------|--------|-------|---|-------|---------|----|-------|---|---|--------|---|--------|-------|--------|--------|-------|-------|---|-------|------|---|-------|---|--|--|--------|--------|-------|-------|---|--------|-----|---|-------|-------|---|------|-----|---|-------|-------|---|-----|-----|---|-------|-------|---|-----|-----|---|-------|-------|---|-----|---------|----|-------|
| Rx
P402 <table border="1"> <thead> <tr> <th>Signal</th> <th>Pin no</th> <th>color</th> </tr> </thead> <tbody> <tr> <td>- 12V</td> <td>1</td> <td>Yellow</td> </tr> <tr> <td>GND</td> <td>2</td> <td>Black</td> </tr> <tr> <td>+ 12V</td> <td>3</td> <td>Blue</td> </tr> <tr> <td>+ 5V</td> <td>4</td> <td>Purple</td> </tr> <tr> <td>+5V</td> <td>5</td> <td>Red</td> </tr> </tbody> </table> | | | Signal | Pin no | color | - 12V | 1 | Yellow | GND | 2 | Black | + 12V | 3 | Blue | + 5V | 4 | Purple | +5V | 5 | Red | Tx & ITF
P403 <table border="1"> <thead> <tr> <th>Signal</th> <th>Pin no</th> <th>color</th> </tr> </thead> <tbody> <tr> <td>- 12V</td> <td>1</td> <td>Yellow</td> </tr> <tr> <td>GND</td> <td>2</td> <td>Black</td> </tr> <tr> <td>+ 12V</td> <td>3</td> <td>Blue</td> </tr> <tr> <td>- 5V</td> <td>4</td> <td>Purple</td> </tr> <tr> <td>+ 5V</td> <td>5</td> <td>Red</td> </tr> <tr> <td>GND</td> <td>6</td> <td>Black</td> </tr> <tr> <td>NC</td> <td>7</td> <td></td> </tr> <tr> <td>+ HV</td> <td>8</td> <td>Brown</td> </tr> </tbody> </table> | | | Signal | Pin no | color | - 12V | 1 | Yellow | GND | 2 | Black | + 12V | 3 | Blue | - 5V | 4 | Purple | + 5V | 5 | Red | GND | 6 | Black | NC | 7 | | + HV | 8 | Brown | ITF
P404 <table border="1"> <thead> <tr> <th>Signal</th> <th>Pin no</th> <th>color</th> </tr> </thead> <tbody> <tr> <td>- 12V</td> <td>1</td> <td>Yellow</td> </tr> <tr> <td>GND</td> <td>2</td> <td>Black</td> </tr> <tr> <td>+ 12V</td> <td>3</td> <td>Blue</td> </tr> <tr> <td>GND</td> <td>4</td> <td>Black</td> </tr> <tr> <td>+ 5.1</td> <td>5</td> <td>Red</td> </tr> <tr> <td>GND</td> <td>6</td> <td>Black</td> </tr> <tr> <td>+ 5.1</td> <td>7</td> <td>Red</td> </tr> <tr> <td>GND</td> <td>8</td> <td>Black</td> </tr> <tr> <td>+ 5.1</td> <td>9</td> <td>Red</td> </tr> <tr> <td>HV CONT</td> <td>10</td> <td>White</td> </tr> </tbody> </table> | | | Signal | Pin no | color | - 12V | 1 | Yellow | GND | 2 | Black | + 12V | 3 | Blue | GND | 4 | Black | + 5.1 | 5 | Red | GND | 6 | Black | + 5.1 | 7 | Red | GND | 8 | Black | + 5.1 | 9 | Red | HV CONT | 10 | White |
| Signal | Pin no | color | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - 12V | 1 | Yellow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 2 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 12V | 3 | Blue | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 5V | 4 | Purple | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| +5V | 5 | Red | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Signal | Pin no | color | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - 12V | 1 | Yellow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 2 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 12V | 3 | Blue | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - 5V | 4 | Purple | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 5V | 5 | Red | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 6 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NC | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + HV | 8 | Brown | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Signal | Pin no | color | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - 12V | 1 | Yellow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 2 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 12V | 3 | Blue | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 4 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 5.1 | 5 | Red | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 6 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 5.1 | 7 | Red | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 8 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 5.1 | 9 | Red | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HV CONT | 10 | White | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PANEL CONTROL
P405 <table border="1"> <thead> <tr> <th>Signal</th> <th>Pin no</th> <th>color</th> </tr> </thead> <tbody> <tr> <td>- 5V</td> <td>1</td> <td>Purple</td> </tr> <tr> <td>+ 12V</td> <td>2</td> <td>Yellow</td> </tr> <tr> <td>GND</td> <td>3</td> <td>Black</td> </tr> <tr> <td>+ 12V</td> <td>4</td> <td>Blue</td> </tr> <tr> <td>GND</td> <td>5</td> <td>Black</td> </tr> <tr> <td>+ 5.1</td> <td>6</td> <td>Red</td> </tr> </tbody> </table> | | | Signal | Pin no | color | - 5V | 1 | Purple | + 12V | 2 | Yellow | GND | 3 | Black | + 12V | 4 | Blue | GND | 5 | Black | + 5.1 | 6 | Red | IP-0702-TH
P406 <table border="1"> <thead> <tr> <th>Signal</th> <th>Pin no</th> <th>color</th> </tr> </thead> <tbody> <tr> <td>+ 12V</td> <td>1</td> <td>Blue</td> </tr> <tr> <td>NC</td> <td>2</td> <td></td> </tr> <tr> <td>GND</td> <td>3</td> <td>Black</td> </tr> </tbody> </table> | | | Signal | Pin no | color | + 12V | 1 | Blue | NC | 2 | | GND | 3 | Black | FAN
P407 <table border="1"> <thead> <tr> <th>Signal</th> <th>Pin no</th> <th>color</th> </tr> </thead> <tbody> <tr> <td>- 12V</td> <td>1</td> <td>Red</td> </tr> <tr> <td>GND</td> <td>2</td> <td>Blue</td> </tr> </tbody> </table> | | | Signal | Pin no | color | - 12V | 1 | Red | GND | 2 | Blue | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Signal | Pin no | color | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - 5V | 1 | Purple | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 12V | 2 | Yellow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 3 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 12V | 4 | Blue | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 5 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 5.1 | 6 | Red | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Signal | Pin no | color | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 12V | 1 | Blue | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NC | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 3 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Signal | Pin no | color | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - 12V | 1 | Red | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 2 | Blue | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PSU-S500C, D | | | * The same as the PSU-S500B, C, D except for the following | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ITF
P404 <table border="1"> <thead> <tr> <th>Signal</th> <th>Pin no</th> <th>color</th> </tr> </thead> <tbody> <tr> <td>- 12V</td> <td>1</td> <td>Yellow</td> </tr> <tr> <td>GND</td> <td>2</td> <td>Black</td> </tr> <tr> <td>+ 12V</td> <td>3</td> <td>Blue</td> </tr> <tr> <td>NC</td> <td>4</td> <td></td> </tr> <tr> <td>NC</td> <td>5</td> <td></td> </tr> <tr> <td>GND</td> <td>6</td> <td>Black</td> </tr> <tr> <td>+ 5.1</td> <td>7</td> <td>Red</td> </tr> <tr> <td>GND</td> <td>8</td> <td>Black</td> </tr> <tr> <td>+ 5.1</td> <td>9</td> <td>Red</td> </tr> <tr> <td>HV CONT</td> <td>10</td> <td>White</td> </tr> </tbody> </table> | | | Signal | Pin no | color | - 12V | 1 | Yellow | GND | 2 | Black | + 12V | 3 | Blue | NC | 4 | | NC | 5 | | GND | 6 | Black | + 5.1 | 7 | Red | GND | 8 | Black | + 5.1 | 9 | Red | HV CONT | 10 | White | JB-172
P408 <table border="1"> <thead> <tr> <th>Signal</th> <th>Pin no</th> <th>color</th> </tr> </thead> <tbody> <tr> <td>+ 5.1</td> <td>1</td> <td>Red</td> </tr> <tr> <td>GND</td> <td>2</td> <td>Black</td> </tr> </tbody> </table> | | | Signal | Pin no | color | + 5.1 | 1 | Red | GND | 2 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Signal | Pin no | color | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - 12V | 1 | Yellow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 2 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 12V | 3 | Blue | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NC | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NC | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 6 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 5.1 | 7 | Red | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 8 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 5.1 | 9 | Red | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HV CONT | 10 | White | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Signal | Pin no | color | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + 5.1 | 1 | Red | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GND | 2 | Black | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

fig. 8.6 Connector pin list of Power supply

| PSU-S500,B | | | | | | | | | |
|-------------------------------|--------|--------|--|--------|--------|------------------------|--------|--------|--|
| Rx
P402 | | | Tx & I/F
P403 | | | I/F
P404 | | | |
| Signal | Pin no | color | Signal | Pin no | color | Signal | Pin no | color | |
| - 12V | 1 | Yellow | - 12V | 1 | Yellow | - 12V | 1 | Yellow | |
| GND | 2 | Black | GND | 2 | Black | GND | 2 | Black | |
| + 12V | 3 | Blue | + 12V | 3 | Blue | + 12V | 3 | Blue | |
| - 5V | 4 | Purple | - 5V | 4 | Purple | GND | 4 | Black | |
| + 5V | 5 | Red | + 5V | 5 | Red | + 5.1 | 5 | Red | |
| | | | GND | 6 | Black | GND | 6 | Black | |
| | | | NC | 7 | | + 5.1 | 7 | Red | |
| | | | + HV | 8 | Brown | GND | 8 | Black | |
| | | | | | | + 5.1 | 9 | Red | |
| | | | | | | HV CONT | 10 | White | |
| PANEL CONTROL
P405 | | | IP-0702-TH
P406 | | | FAN
P407 | | | |
| Signal | Pin no | color | Signal | Pin no | color | Signal | Pin no | color | |
| - 5V | 1 | Purple | + 12V | 1 | Blue | - 12V | 1 | Red | |
| - 12V | 2 | Yellow | NC | 2 | | GND | 2 | Blue | |
| GND | 3 | Black | GND | 3 | Black | | | | |
| + 12V | 4 | Blue | | | | | | | |
| GND | 5 | Black | | | | | | | |
| + 5.1 | 6 | Red | | | | | | | |
| PSU-S500C | | | * The same as the PSU-S500B, except for the following: | | | JB-172
P408 | | | |
| I/F
P404 | | | Signal | | | Signal | | | |
| Signal | Pin no | color | Pin no | color | Pin no | color | Pin no | color | |
| - 12V | 1 | Yellow | | | + 5.1 | 1 | Red | | |
| GND | 2 | Black | | | GND | 2 | Black | | |
| + 12V | 3 | Blue | | | | | | | |
| NC | 4 | | | | | | | | |
| NC | 5 | | | | | | | | |
| GND | 6 | Black | | | | | | | |
| + 5.1 | 7 | Red | | | | | | | |
| GND | 8 | Black | | | | | | | |
| + 5.1 | 9 | Red | | | | | | | |
| HV CONT | 10 | White | | | | | | | |

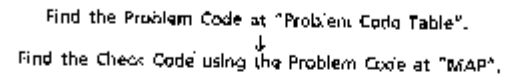
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B-6 PCB (Check) List Map

PCS (Check) List Map has four items. These are "Problem Code Table", "MAP", "Check Procedure" and "Wave form diagram".

In this "Problem Code Table", any case of trouble are coded as Problem Code. And in "MAP", that Problem Code shows PCB or check point which has possibility to make the trouble.

These should be used according to following procedure.



"Problem Code Table" is divided by followings, and each table are named after its function.

| | | |
|------------------------------------|---|----|
| Ultrasound Image | — | US |
| Character & Graphic | — | CG |
| Timing & Monitor | — | TM |
| Power supply, Recording and Volume | — | PM |
| Total function | — | FU |
| Physiological unit | — | EU |
| Doppler unit | — | DP |
| Color displaying | — | CD |

In "Problem Code Table", mark ○ means that the phenomenon is applied to this diagnostic equipment.

And in "MAP", mark ● shows the supposed check point.

B-6-1 Problem Code Table

This table has some case of trouble. Some trouble which may be frank of you do not exist in this table according to circumstances. In that case, using any informations that are written in this manual and your brain, try to solve the problem.

Ultrasound Image

| Problem Code | Aply. | Problems |
|--------------|-------|--|
| US-1 | 1 | <input type="checkbox"/> US Image is not all displayed. |
| | 2 | <input type="checkbox"/> US Image is not all displayed in a particular MODE. |
| | 3 | <input type="checkbox"/> US Image is not all displayed only for LINEAR (or CONVEX). |
| | 4 | <input type="checkbox"/> US Image is not all displayed only for MECHANICAL SECTOR. |
| | 5 | <input type="checkbox"/> US Image is not all displayed only for PHASED ARRAY. |
| | 6 | <input type="checkbox"/> Only particular US Image is not displayed in multiple US Image display. |
| US-2 | 1 | <input type="checkbox"/> Display of US Image area becomes white. |
| US-3 | 1 | <input type="checkbox"/> Unwanted dots or lines are displayed in US Image area. |
| | 2 | <input type="checkbox"/> Regular horizontal or vertical stripes are displayed in US Image area. |
| US-4 | 1 | <input type="checkbox"/> Lacks of ECHO are displayed in LINEAR (or CONVEX). |
| | 2 | <input type="checkbox"/> Lacks of ECHO are displayed in MECHANICAL SECTOR. |
| | 3 | <input type="checkbox"/> Lacks of ECHO are displayed in PHASED ARRAY. |
| US-5 | 1 | <input type="checkbox"/> Noises are seen on the US Image in LINEAR (or CONVEX). |
| | 2 | <input type="checkbox"/> Noises are seen on the US Image in MECHANICAL SECTOR. |
| | 3 | <input type="checkbox"/> Noises are seen on the US Image in PHASED ARRAY. |
| | 4 | <input type="checkbox"/> Noises are seen on the US Image in all US Images. |
| US-6 | 1 | <input type="checkbox"/> Sensitivity of US Image is low in LINEAR (or CONVEX). |
| | 2 | <input type="checkbox"/> Sensitivity of US Image is low in MECHANICAL SECTOR. |
| | 3 | <input type="checkbox"/> Sensitivity of US Image is low in PHASED ARRAY. |
| | 4 | <input type="checkbox"/> Sensitivity of US Image is low in all US Images. |
| US-7 | 1 | <input type="checkbox"/> Same as depth band is difference brightness in US Image. |
| US-8 | 1 | <input type="checkbox"/> Image varies as if enhanced, without gradation. |
| | 2 | <input type="checkbox"/> US Image becomes noice in BRIGHT (MECHANICAL, PHASED ARRAY, CONVEX). |
| US-9 | 1 | <input type="checkbox"/> Form of US Image is abnormally displayed. |
| US-10 | 1 | <input type="checkbox"/> Unwanted multiples of US Image are displayed in LINEAR (or CONVEX). |
| | 2 | <input type="checkbox"/> Unwanted multiples of US Image are displayed in MECHANICAL SECTOR. |
| | 3 | <input type="checkbox"/> Unwanted multiples of US Image are displayed in PHASED ARRAY. |
| | 4 | <input type="checkbox"/> Unwanted multiples of US Image are displayed in all US Images. |

Marked items are effective on this system.

Character, Graphic

| Problem Code | Aply. | Problems |
|--------------|-------|---|
| CG-1 | 1 | <input type="checkbox"/> Characters are displayed in the entire screen. |
| CG-2 | 1 | <input type="checkbox"/> Only Caliper, Graphic are not displayed. |
| | 2 | <input type="checkbox"/> Only Caliper, Graphic are abnormally displayed. |
| CG-3 | 1 | <input type="checkbox"/> The entire screen becomes white. |
| | 2 | <input type="checkbox"/> Unwanted dots or stripes are displayed in all or parts of image. |
| CG-4 | 1 | <input type="checkbox"/> FDCB and DATE are abnormally displayed. |
| CG-5 | 1 | <input type="checkbox"/> Characters are not displayed, key is cannot be made. |
| | 2 | <input type="checkbox"/> Characters are abnormally displayed. |
| CG-6 | 1 | <input type="checkbox"/> Measured value is not correct. |

Marked items are effective on this system.

Timing, Monitor

| Problem Code | | Aply. | Problems |
|--------------|---|--------------------------|--|
| TM-1 | 1 | <input type="checkbox"/> | All images are not displayed in any Monitor. |
| | 2 | <input type="checkbox"/> | Image is not displayed in a particular Monitor. |
| TM-2 | 1 | <input type="checkbox"/> | All images are not synchronized in any Monitor. |
| | 2 | <input type="checkbox"/> | Image is not synchronized in a particular Monitor. |
| TM-3 | 1 | <input type="checkbox"/> | Picture image shakes. Abnormality is seen when brightness varies in any Monitor. |
| | 2 | <input type="checkbox"/> | Picture image shakes in a particular Monitor. Abnormality is seen. |

:Marked items are effective on this system.

Function

| Problem Code | | Aply. | Problems |
|--------------|---|--------------------------|--|
| FU-1 | 1 | <input type="checkbox"/> | System locks up, or found information is not accepted. |

:Marked items are effective on this system.

Power supply, Record, Switch, Control

| Problem Code | | Aply. | Problems |
|--------------|---|--------------------------|--|
| PM-1 | 1 | <input type="checkbox"/> | Power output is not present, or abnormally outputted. |
| PM-2 | 1 | <input type="checkbox"/> | Switches and/or Controls are inoperative. |
| | 2 | <input type="checkbox"/> | Switches and/or Controls are abnormally operated. |
| | 3 | <input type="checkbox"/> | Camera shutter is inoperative. |
| PM-3 | 1 | <input type="checkbox"/> | Photographed picture is not actual (Monitor is normal). |
| | 2 | <input type="checkbox"/> | Playbacked image is abnormally displayed (usual image is normal). |
| PM-4 | 1 | <input type="checkbox"/> | All images are not recorded in Recorder (Recorder is normal). |
| | 2 | <input type="checkbox"/> | All images are not recorded in Recorder (Recorder is abnormal). |
| | 3 | <input type="checkbox"/> | Image is abnormally recorded in Recorder (Recorder is normal). |
| | 4 | <input type="checkbox"/> | Image is abnormally recorded in Recorder (Recorder is abnormal). |

:Marked items are effective on this system.

8-6-2 MAP

In this "Problem Code" of "MAP", the blank columns are not applied to this diagnostic equipment.

8-7 Wave form diagram for trouble shooting

8-7-1 Introduction

This wave form diagram is shown as reference in order to find the defective PCB in a stage of trouble shooting.

All of wave form can be observed at check point which is named "TP".

8-7-2 Attention

This is only reference for trouble shooting. Therefore this wave form must not be used for readjustment.

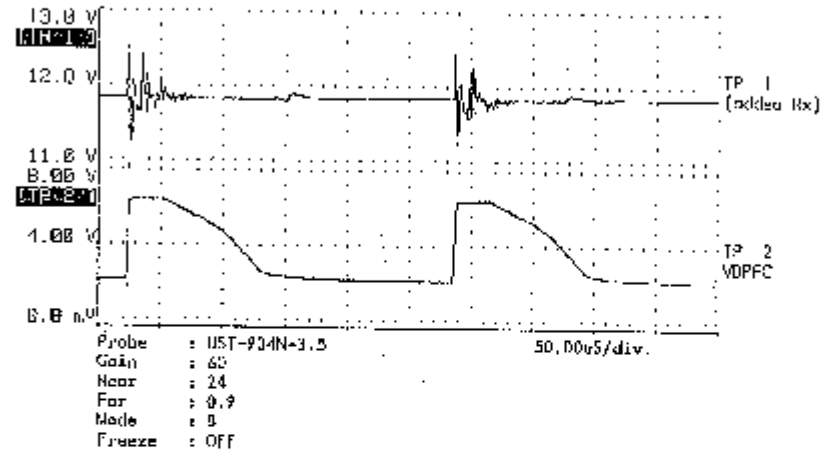
This wave form have observed by Logic Analyzer. Therefore it is different from the wave form which is observed by oscilloscope.

The location of check point is shown in "Section 13 PARTS LIST".

8-7-3 Rx

EP-2868

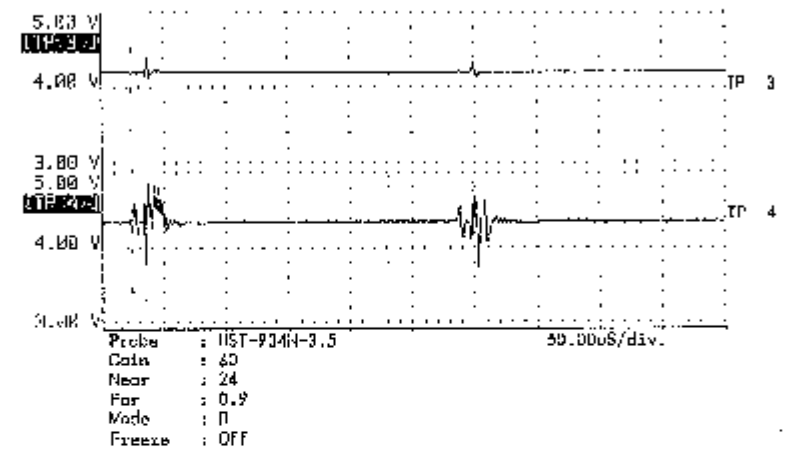
Condition is shown under the wave form.



Memo.

Rx EP-2868

Condition is shown under the wave form.

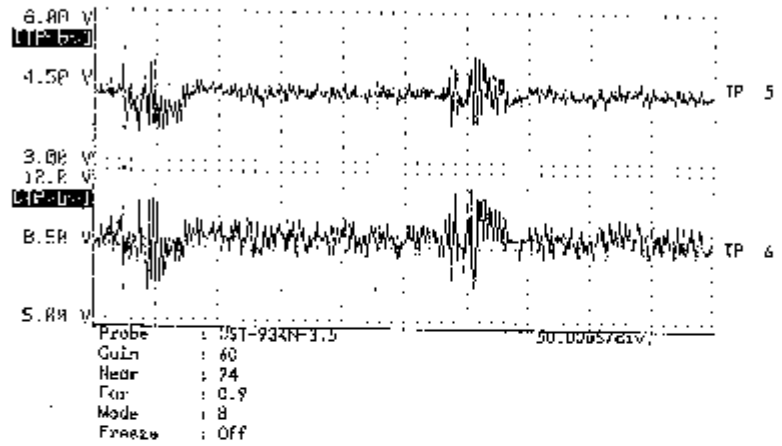


Memo.

Rx

EP-2868

Condition is shown under the wave form.

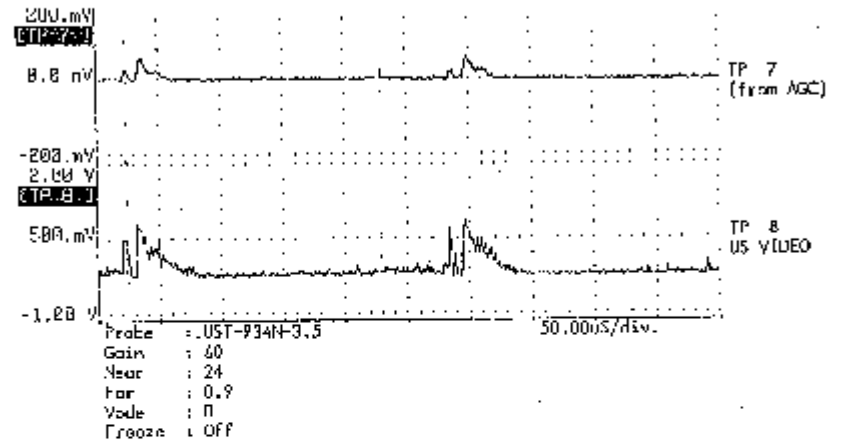


Memo.

Rx

EP-2068

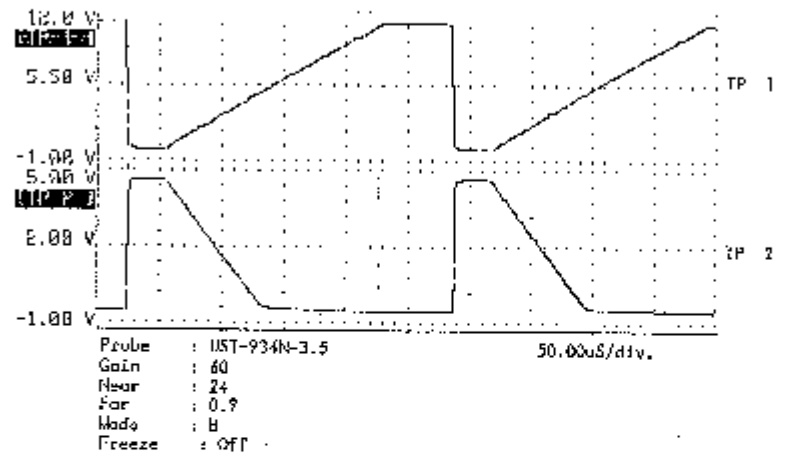
Condition is shown under the wave form.



Memo.

8-7-4 Tx & Control EP-2869

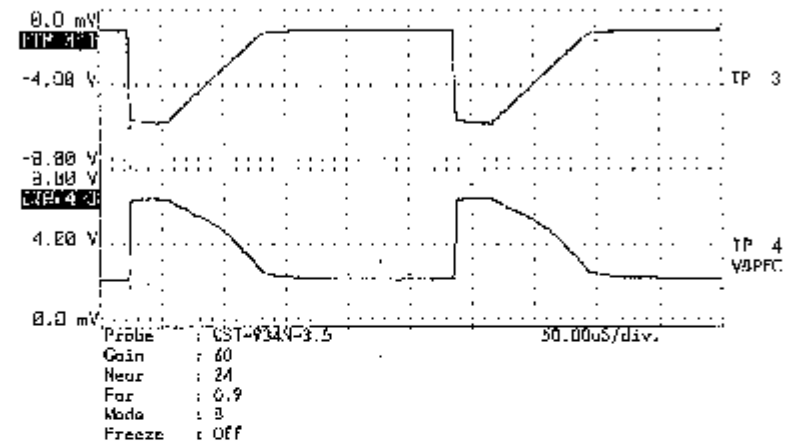
Condition is shown under the wave form.



Memo.

Tx & Control EP-2869

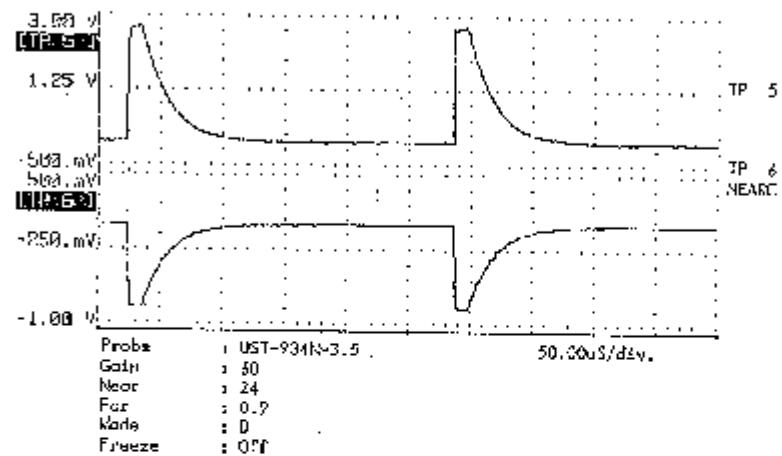
Condition is shown under the wave form.



Memo.

Tx & Control EP-2869

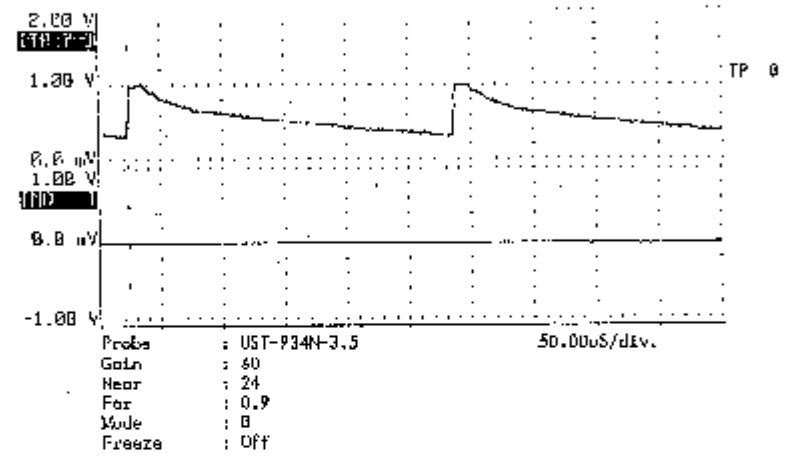
Condition is shown under the wave form.



Memo.

Tx & Control EP-2B69

Condition is shown under the wave form.

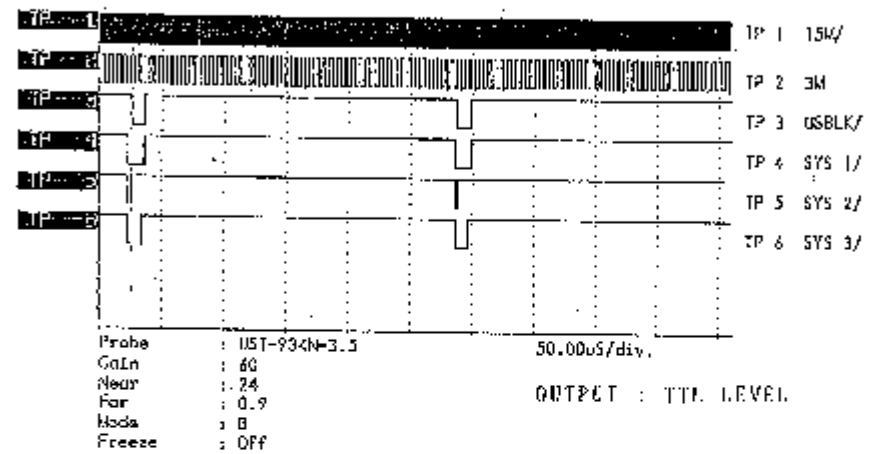


Memo.

8-7-5 ITP

EP-287D

Condition is shown under the wave form.

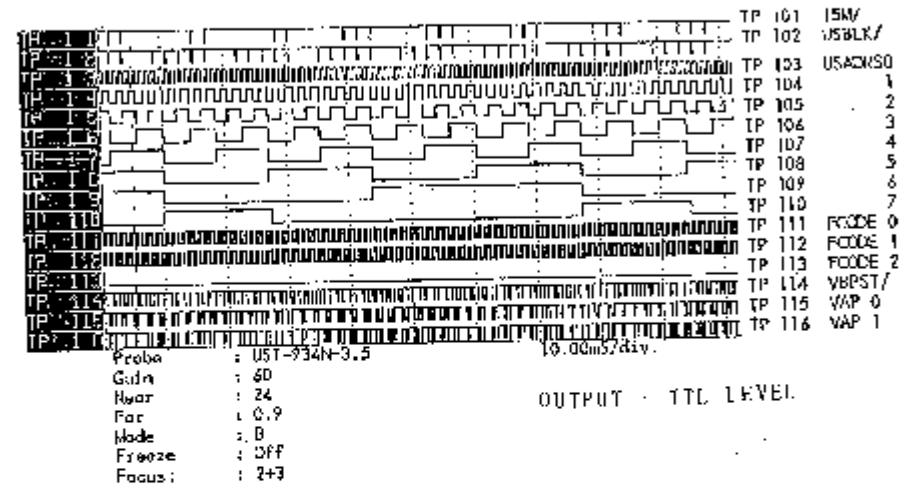


Menu

ITF

EP-2870

Condition is shown under the wave form.



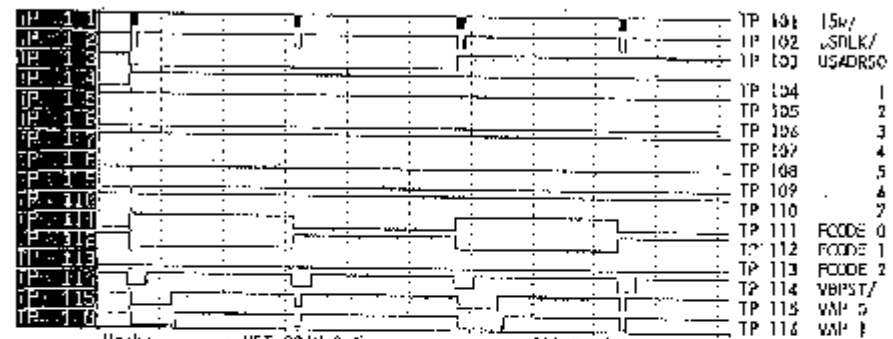
OUTPUT - TTL LEVEL

Memo.

ITF

EP-2870

Condition is shown under the wave form.



Probe : HST-9344-3.5 100.0us/div.
 Gain : 80
 Name : 24
 Par : 0.9
 Mode : B
 Freeze : Off
 Focus : 213

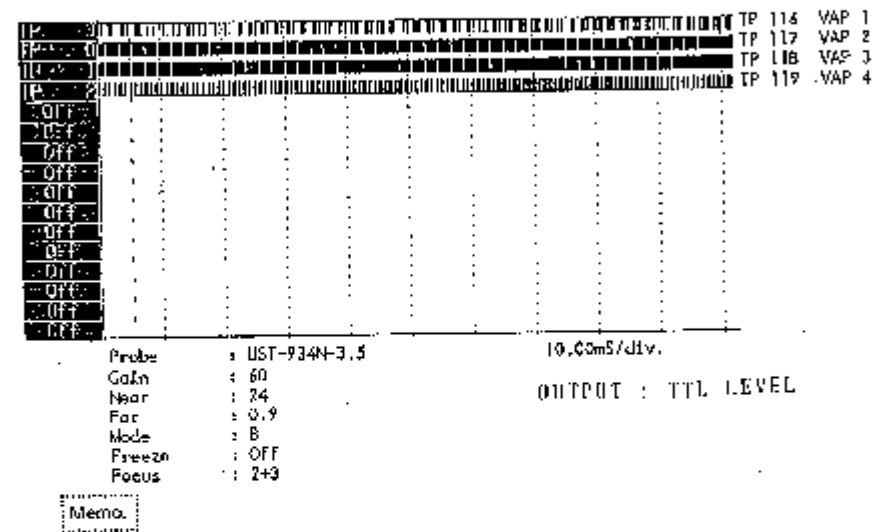
OUTPUT : TTL LEVEL

Memo.

ITF

EP-2870

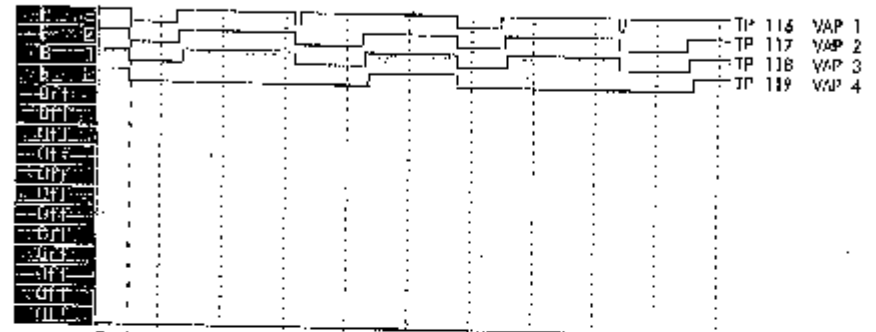
Condition is shown under the wave form.



RTF

EP-2870

Condition is shown under the wave form.



Probe : UST-934N-1.5
 Gain : 60
 Horz : 24
 Pos : 0.9
 Mode : 5
 Freeze : Off
 Focus : 2+3

100.0ns/div.

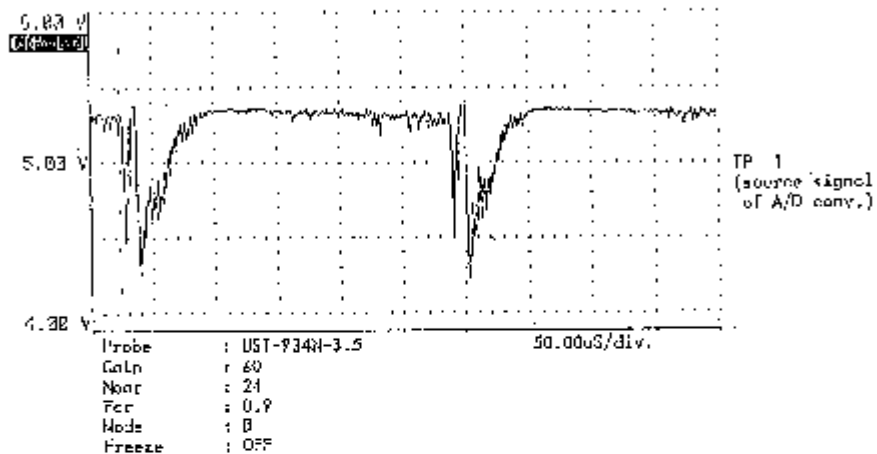
OUTPUT : TTL LEVEL

Menu

8-7-6 DSC

EP-2871/EP3921

Condition is shown under the wave form.

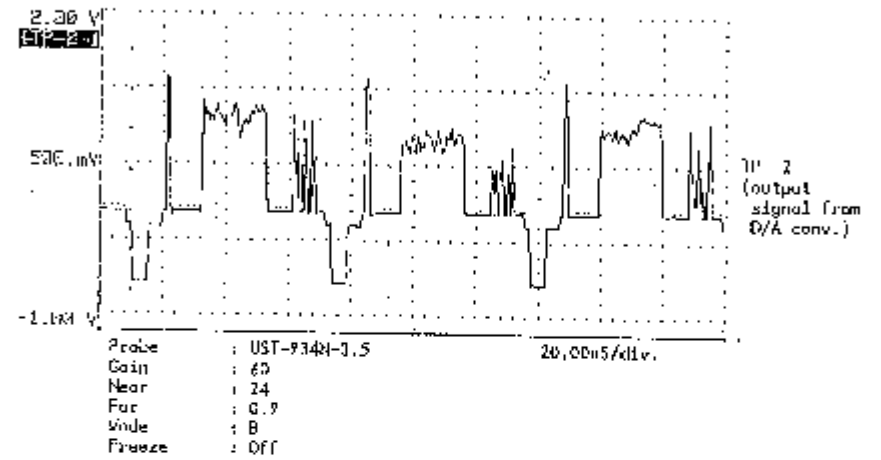


Memo.

DSC

EP-2871/EP3921

SSD-500 の設定に、波形図の下に記載した通りです。



※ 参照

SECTION 9 ALIGNMENT PROCEDURE

CONTENTS

| | | |
|-------|---------------------|-------|
| 9-1 | Introduction | 9 - 1 |
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| 9-3 | Tools and measures | 9 - 1 |
| 9-4 | Alignment procedure | 9 - 1 |
| 9-4-1 | EP-38GB Rx | 9 - 2 |

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9-1 Introduction

This Alignment procedure adjust the ultrasound image directly.

9-2 Attention

The engineer who has attended to Aloka's training course and has the high electronic knowledge can use this Alignment procedure.

In the case of using this Alignment procedure, please take care the following items.

- (1) It should be done, after a equipment is warm up.
- (2) The unnecessary force against to PCB may destroy it.
- (3) The small variable register and capacitor are used in the PCB according to the S.M.T. (Surface Mount Technology). It is necessary to be prepared the screw drivers which can vary them.
- (4) The variable register and capacitor which have never been described in this Alignment procedure must not be varied. It is possible to make another trouble which nobody can repair it.

At the our factory, a most of PCBs are adjusted by Function Checker automatically.

9-3 Tools and Measures

The prepared tools and measures are followings.

1. Oscilloscope

| | | |
|-----------------|---|----------------|
| Sensitivity | : | 5mV / div. |
| Frequency width | : | DC-50MHz |
| Input voltage | : | more than 400V |
2. Digital Volt meter

| | | |
|-------|---|------------------|
| Range | : | ACV, DCV, DCA, Ω |
|-------|---|------------------|
3. Probe

| | | | |
|--------|---|----------------|----|
| Convex | : | US1-934N -3.5 | or |
| Linear | : | US1-6024N -3.5 | |
4. Screw driver

| | |
|-----------------------------|--|
| + M2.6 | |
| For adjustment screw driver | |

9-4 Alignment Procedure

All of the adjustment should be done with Convex probe (US1-934N-3.5) or Linear probe (US1-6024N-3.5).

9-4-1 EP-2868 Rx

Purpose

Adjust the total noise level of the Image processor.

| Item | Condition | Adjust point | Observation | Standard |
|-------------|---|--------------|---|---|
| Noise level | Connect the standard Probe.
MODE : B
MAG. : 1.0
GAIN : MAX.
NFOK : MAX.
PAR : MAX
FOCUS : F4
Frame Correlation : Off | RV2 | At the
Ultrasound
image on the
monitor | The noise in the
ultrasound image is
seen slightly. |
| | Brightness of monitor :
The base of monitor
is seen slightly

Contrast of monitor :
Immediately before
the saturation of the
highest level of gray
scale bar. | | | |

SECTION 10 PERFORMANCE CHECK

| CONTENTS | | Page |
|----------|---------------------------------------|---------|
| 10-1 | Introduction | 10 - 1 |
| 10-2 | Precastion | 10 - 1 |
| 10-3 | Making Entries in Repair Report | 10 - 1 |
| 10-4 | Performance Check | 10 - 2 |
| 10-4-1 | Function Check | 10 - 3 |
| 10-4-2 | Image Quality Check | 10 - 3 |
| 10-4-3 | Safety Check | 10 - 10 |

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4

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10-1 Introduction

"Performance Check" describes the items to be confirmed for the maintenance of equipment quality and safety under the circumstances referred to below.

- Once a repair work has been done.
- Once a modification, for a problem or the like, has been made.
- Once a change as to upgrade the functions and/or specifications has been made.
- When a periodic inspection is made.

10-2 Precautions

Unless otherwise specified, this performance check must be conducted with all coverings attached in place and under the following environments:

- 30 minutes or more have passed after throwing the power switch ON.

If the performance check specified herein should be conducted after a repair or modification, make certain of the following:

- All the PCN's removed are reconnected properly.
- All the connectors removed are reconnected properly.
- The replaced ROM and others are mounted in place on a printed circuit board. The power pin, in particular, should never be mistaken for the GND pin.
- The unnecessary ROM is not left behind inside the equipment.
- Tool, measuring probe, and the like are not left behind inside the equipment.
- Optional components and grounding cable are properly reconnected.
- Screws and the like are not left behind inside the equipment.

10-3 Making Entries in Repair Report

Upon completion of the check, enter findings thereof in such a form as repair report or the like. And present it to the user. Keep a copy thereof in custody.

10.4 Performance check

These items which are covered by a performance check vary, in principle, with what is done for the operation requiring the check. In accordance with the chart given below, identify an item or items required (those marked with ● in the chart). And check each of the items so marked.)

The terms referred to in the chart, meanwhile, are defined, respectively, as follows:

- "Power Supply Unit" Power supply body, isolation transformer, and power switch.
- "Other units than above" Units other than the power supply unit and PCBs.

| Check Requiring Operation | CHECK ITEM | | | REMARKS |
|---|------------|---------------|--------|--------------------------------|
| | Function | Usage quality | Safety | |
| Replacing parts or modification inside power supply unit. | ● | ● | ● | Including PCB replacement. |
| Replacing the power supply unit as a whole. | ● | ● | | |
| Replacing a PCB in units other than that the above. | ● | ● | | |
| Replacing parts or modification on PCB in other units. | ● | ● | | Including ROM replacement. |
| Replacing units other than that referred to above as a whole. | ● | ● | | Including a probe and scanner. |
| Performance check before the modification. | ● | ● | | |
| Periodic inspection. | ● | ● | ● | |

What to be checked in each of the check items, meanwhile, is given on the pages described below, to which you are requested to refer.

- Functional Check Item 10-1-1 from Page 10-3 and on.
- Usage quality Check Item 10-4-2 from Page 10-8 and on.
- Safety Check Item 10-4-3 from Page 10-10 and on.

If a specified performance or rating should be found unsatisfied as a result of the check, the equipment should be deemed failed.

Now, refer to Section 6 "Troubleshooting" to dissolve the failure.

10-4-1 Checking for function

Operate the equipment on the operation panel to make certain that the equipment is operating properly subject to each function related with the panel switches.

(1) Checking a Panel Switch to Make Certain:

① In case of SSU 500

Once a PCB around the panel or a switch or the like mounted on the panel has been replaced, make certain of the key top (cap) status, in particular. If a key top should be out of place, the switch may not operate properly.

An LED on the panel, moreover, will come on in orange when the function related with that switch is selected.

| | | |
|------------------------|---|--|
| <i>POSITION</i> | : | available only for linear probes |
| <i>BODY MARK</i> | : | select by function key |
| <i>AREA-E</i> | : | area calculation with ellipse |
| <i>DIST / VEL.</i> | : | distance and velocity calculation |
| <i>CALIPER</i> | : | |
| <i>LEFT TURN</i> | : | left rotation for probe mark or body mark |
| <i>RIGHT TURN</i> | : | right rotation for probe mark or body mark |
| <i>MARK REFERENCE</i> | : | |
| <i>NEAR STC</i> | : | sensitivity adjust for shallow part |
| <i>FAR STC</i> | : | sensitivity adjust for deep part |
| <i>MAGNIFICATION</i> | : | ×0.75, ×1, ×1.5 |
| <i>MODE</i> | : | B, B/M, M, EB |
| <i>IMAGE DIRECTION</i> | : | Left or Right |
| <i>FREEZE</i> | : | |
| <i>CAMERA</i> | : | |
| <i>FOCUS</i> | : | select by function key |

② In case of SS10-500MICRUS

Once a PCB around the panel or a switch or the like mounted on the panel has been replaced, make certain of the key-top (cap) status, in particular. If a key top should be out of place, the switch may not operate properly.

An LED on the panel, moreover, will come on in orange when the function related with that switch is selected.

| | | |
|------------------|---|--|
| <i>POSITION</i> | : | available only for linear probes |
| <i>BODY MARK</i> | : | select by function key |
| <i>AREA-E</i> | : | area calculation with ellipse |
| <i>AREA-T</i> | : | area calculation with distance of circumference by caliper mark and arc. |

DIST / VEL : distance and velocity calculation
CALIBER
MARK REFERENCE
MAGNIFICATION : X0.75, X1, X1.5
MODE : B, BM, M, 2B
IMAGE DIRECTION : left or Right
FREEZE
PRINT
FOCUS : select by function key

(2) Check for Menu

Check the following functions assigned with the items belonged to MENU.

| | |
|----------------|-------------------------------------|
| <i>FRM-CO</i> | Frame Correlation |
| <i>IMG-PO</i> | Image Polarity (Positive/Negative) |
| <i>PUNC</i> | Puncture Guide Line |
| <i>BDY-MK</i> | Body Mark |
| <i>DATE</i> | Date and Time |
| <i>INF-DSP</i> | Information Display |
| <i>IMG-DI</i> | Image Direction |
| <i>M-CURS</i> | M Mode Cursor |
| <i>H-RATE</i> | Heart Rate Calculation |
| <i>M-SWEEP</i> | Moving Speed of the Image on M mode |

(3) Check for Focus

The setting of transmission dynamic focus is able to be confirmed with the information display shown on the viewing TV monitor.

If the all of focus steps are turned off, it is especially called as "Broad Focus", and the mark 'B' is indicated on the information display.

In the case of B mode, the sequential focus area is just available. For example, F1-F4, F1-F3 and F2-F4, the settings of skipped area are unavailable.

On the other side, M mode image always requires the single area focus.

The focus settings can be changed even though the ultrasound image is already frozen. However, the change will be available after releasing the frozen image.

(4) Check for selection from Body Mark Group

The following body mark groups can be selected. Press the Body Mark switch of "Myppal Function", then check that all of body marks in all groups can be displayed on the monitor.

① In case of SSD-500

| | |
|-------|---|
| ABDOM | for abdominal application |
| OBST | for obstetric application |
| HEAD | for application around human head |
| OTHRK | for application of ophthalmic, cardiac, etc |

② In case of SSD-500MICRUS

| | |
|--------|-------------------------------------|
| ABDOM | for abdominal application |
| OB/GYN | for obstetric application |
| TY/RED | for application of thyroid and head |
| BREAST | for application of breast |
| CARDIO | for cardiac application |
| LIMB | for application of legs and arms |
| DOG | for animal application (dog) |
| CAT | for animal application (cat) |

(5) Check for obstetrical measurement

Check the accuracies of following measurement with the result of calculation using the sample values.

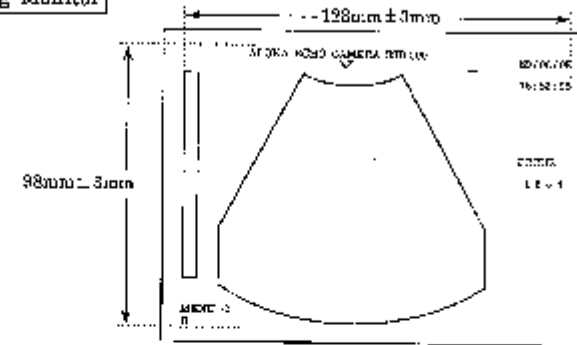
| | |
|--------|----------------------------------|
| BPD | Biparietal Diameter |
| CRL | Crown Rump Length |
| GS | Gestational Sac |
| LV | Length of Vertebrae |
| F (FL) | Femur Length |
| FTA | Fetal Trunk Cross Sectional Area |
| HL | Humerus Length |
| AC | Abdominal Circumference |
| HC | Head Circumference |

SECTION 10 PERFORMANCE CHECK

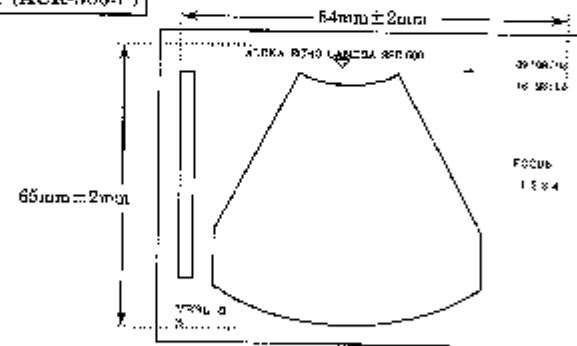
(6) Check for the image display size

Measure the sizes on the viewing monitor and picture taken by camera. Then check the permission with the figure shown below. The check for camera unit must be done with ACR-500.P option unit.

Viewing Monitor



Camera (ACR-500.P)



(7) Check for Contrast and Brightness

The control knobs for Contrast and Brightness for viewing monitor are located right side of CRT.

On the other side, they are located on the rear panel for camera. These are just available when the gun type camera is in use.

(8) Check for Ultrasound Scanning

(Conditions) MODE : B Mode
 MAG. : $\times 1.0$
 FREEZE : OFF

(Method) Put the thin metal bar such as pin of resistor, crossing on the surface of probe, then move along the edge.

(Check) There is no skipping or duplication of echo from the metal bar while moving on the probe from side to side.
 And, check the change of image shape of metal bar depending on the focus setting.

(Caution) Do not scratch the surface of probe.

(9) Coincidence of direction on between Front Mark and display

(Condition) MODE : B Mode
 MAG. : $\times 1.0$
 Phantom : RMI 412

(Method) Put the probe on RMI-412 to describe the target inside.

(Check) Check the coincidence with the front mark of probe, ultrasound image of phantom and arrow mark.

10-4-2 Checking for image quality

To make certain of an ultrasound image quality, make a checkout by the use of a test piece

(1) Checking the Focus

| | | |
|--------------|---------|-----------|
| (Conditions) | MODE | B mode |
| | MAG. | : ×1.0 |
| | FREEZE | : OFF |
| | PHANTOM | : RMI-412 |

(Method) Apply a probe so that targets will be drawn at horizontal intervals of 2 centimeters in the interior of the RMI-412.

(Confirmation) With a focal setting changed, the target must change at the position (depth) where the echo turns out clear.

(2) Check for the distance accuracy of axial direction

| | | |
|--------------|------------|-------------------------------|
| (Conditions) | MODE | : B Mode |
| | MAG. | : ×0.75, ×1.0, ×1.5 |
| | FOCUS | : Turn on 2nd. and 3rd. steps |
| | Test Piece | : ETH-2 (Stainless) |

(Method) Put the probe on test piece.

(Check) Confirm 50mm±1mm gap between B1 and B2 refs, having high intensity.
Check it on all of magnification variation.

(3) Check for Noise Level

(Conditions) MODE : B Mode
 MAG. : $\times 1.0$
 FOCUS : Turn on just 4th. step
 GAIN : Maximum
 STC : Maximum of both NEAR and FAR
 Frame Correlation : OFF

(Method) Leave the probe in the air.

(Check) Check few noises are seen in the ultrasound image, and they are randomly scattered in image area.

(4) Check for Total Sensitivity

(Conditions) MODE : B Mode
 MAG. : $\times 1.0$
 FOCUS : All steps are turned on
 GAIN : Maximum
 STC : Maximum of both NEAR and FAR
 Phantom : RMI-112

(Method) Put the probe on phantom

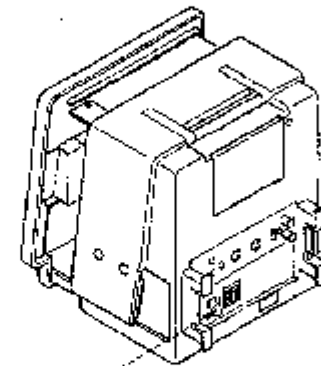
(Check) Check the echo of target, existing at fifth position from the surface of phantom, can be detected.

10-4-3 Checking for Safety

"Electrical Safety Checks" confirm for the safety under the circumstances.
For detail of safety checking procedure, please refer to the Electrical Safety Checking Manual (MN2-0235).

○ IMPORTANT ○

1. In Electrical Safety Checks, the method and rating of checks differ in the degree of protection against electric shock. SSD-500 belongs to "Type BF Applied part" in the degree of protection against electric shock.
2. Position of Protected earth terminal or Potential equalization terminal for checking Safety, refer to following picture.



Protected earth terminal / Potential equalization terminal

10-4-8 Checking for Safety

Every confirmation item shown herein is intended to make certain of the protection performance relative to an insulation of the equipment and to an electric shock suffered by the subject (patient).

(I) Provisions

The provisions required for the check are as enumerated below. Provide them in advance.

(a) Digital Multi-meter

A meter, which has a resistance or a continuity test function, and is capable of determining an AC voltage of up to 1 mV.

(b) Megger

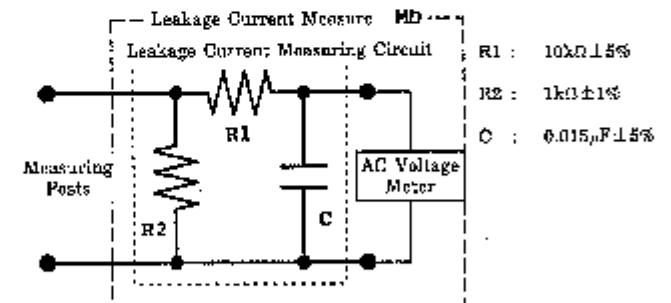
A tester capable of determining a test (applied) voltage of up to 100 MΩ at 500 VDC.

(c) Leakage Current Measuring Instrument

A measuring instrument capable of determining a leakage current from a medical electric appliance, or a combination of Leakage Current Measuring Circuit (d) below with Digital Multi-meter (a) above.

(d) Leakage Current Measuring Circuit

A circuit is illustrated below.



(e) Metal Foil

This foil is to be used to determine a patient leakage current at the probe. An area enough to cover the surface of a probe is required.

(f) Weight

500g × 2 pieces

- The description below is given with (a) thru (e) used as the names of the provisions referred to above.

SECTION 10 PERFORMANCE CHECK

- A meter or measuring device may be separated into two or more components as long as each of them satisfies the specifications (standards) shown, respectively.
- Each of the measuring devices and circuits requires a calibration once a year. Besides, keep the calibration records in custody.

(2) Precautions

(2)-1 Environments

To make a check, set up the same goods or environments as those which the user are normally using in terms of the following

- Power and grounding cable, and method of interconnecting them,
- Probe and scanner,
- Cables and optional features, among others, required for diagnosis.

(2)-2 Handling a Measuring Device, etc.

Before putting a measuring device or a measuring circuit into operation, make certain of their respective usage and of the precautions to be taken during the operation.

(2)-3 Calibration

Any measuring device or leakage current measuring circuit that may have had a calibration period expired is prohibited from being used to conduct a check. Do not fail to employ a measuring device properly calibrated.

(2)-4 Power Cable

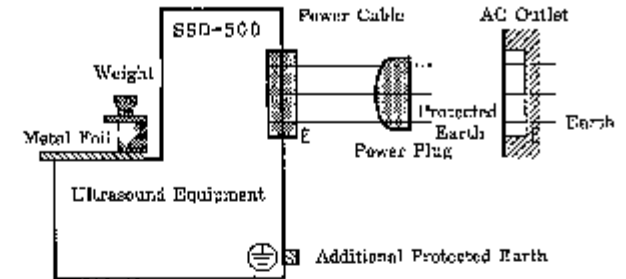
Unless otherwise specified, the power cable should be unplugged out of a power outlet to do an operation. In the case of a removable power cable, meanwhile, make certain that it has been normally connected to the equipment on the body.

(2)-5 Power Switch

Unless otherwise specified, keep the equipment power switch at the OFF position.

(2)-6 Connection Diagram

A connection diagram is given below for the check in which a measuring device is to be employed. The diagram, meanwhile, is expressed in a common format, which has meanings as follows.



(3) Appearance Inspection

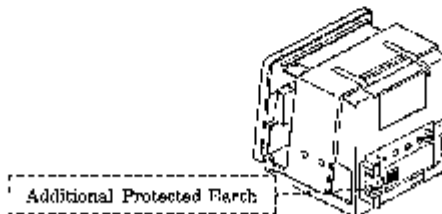
Check the equipment enclosure to make certain that it is free from a remarkable concave or distortion.

- If the enclosure should have a concave or a distortion, observe it in the interior and make certain that any metal part does not come in abnormal contact.
- ▶ If the metal should be in abnormal contact, discontinue checking subsequent hereto and dissolve the problem involved.

(4) Checking Protected Earth Cable for Continuity

According as the equipment is installed, use a digital multi-meter to make certain that the protected earth cable is electrically connected. Nevertheless, it is necessary to make certain that every cable existing in the system which must be checked for continuity is tensioned properly enough not to invite a disconnection of cable.

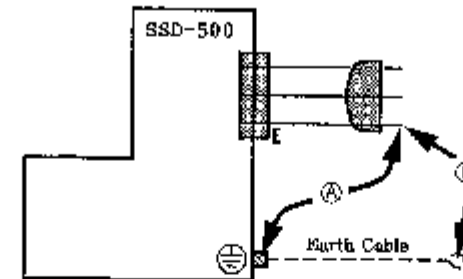
- In case where the equipment is grounded through the power cable:
Between power cable plug earth pin and the additional protected earth terminal on the equipment body (E as illustrated)



- In case where the equipment is grounded through the earth cable:
Between earth pin on the plug side of the power cable and the other end

SECTION 10 PERFORMANCE CHECK

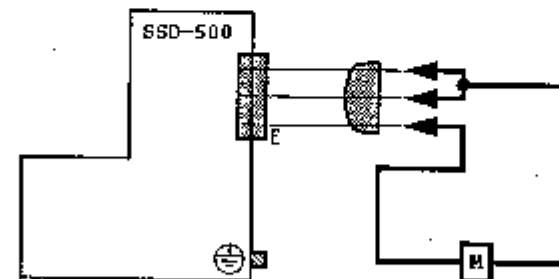
of the earth cable connected to the additional protected grounding terminal (Ⓜ as illustrated)



- ▶ If you cannot check the protected earth cable for continuity, discontinue testing subsequent hereto and dissolve the related problem.

(5) Measuring an Insulation Resistance

As illustrated below, employ a megger to determine the insulation resistance between the power input line and the protected earth cable. "M" in the illustration, moreover, relates to a megger.



Rating : 10M Ω or more

- ▶ If the insulation resistance tester should fail to satisfy the standards, make contact with our Technical Support before proceeding to a subsequent checkout.

(8) Leakage Current

Use the digital multi-meter and the leakage current measuring circuit to determine the values of "Earth leakage current", "Enclosure leakage current" and "Patient leakage current."

All the leakage currents are to be determined, with the power switch ON.

When the leakage current measuring circuit shown on page 10-11 is in use, the relation between the indication of AC Volt meter and leakage current is as follow,

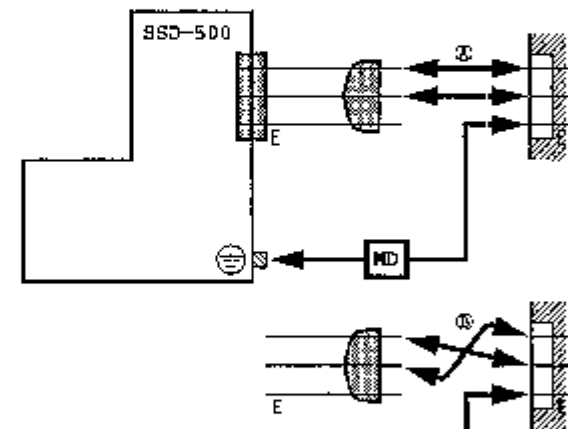
$$(\text{Leakage Current}) = (\text{Indication of AC Volt meter}) - 1000$$

Accordingly, if the AC Volt meter shows 1mV, the leakage current must be 0.001mA.

(6)-1 Ground leakage current

① Normal conditions

Referring to the illustration given below, connect a measured unit with a leakage current measuring device (MD).

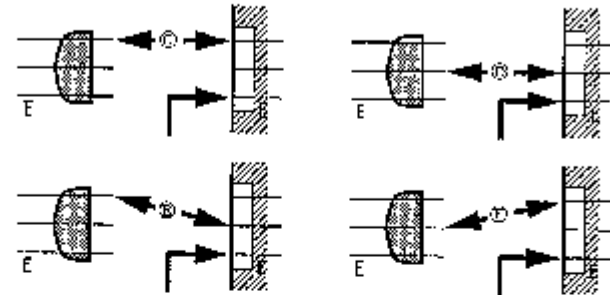


Using Connection Methods ① and ②, determine their respective leakage currents. And take the higher one for the value under the "Normal conditions".

Rating : Not to exceed 0.5mA

③ Single Fault Condition

Based on Normal Connection Method ①, determine the leakage current at each of Connections ⑥ thru ⑩. And take the highest leakage current for the "Single Fault Condition".



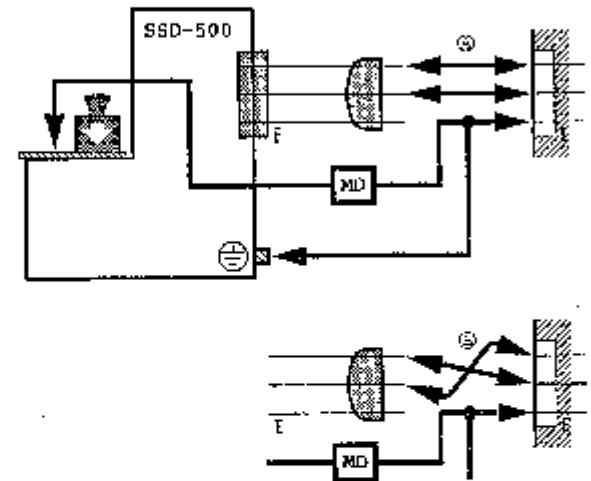
Rating . Not to exceed 1mA

(6)-2 Enclosure leakage current (a)
(Between the enclosure and the earth)

① Normal conditions

Referring to the illustration given below, connect a measured unit with a leakage current measuring device (MD).

With the metal foil (10 cm × 20 cm) placed on the enclosure, put a weight thereon. Then, connect the leakage current measuring device (MD) between the metal foil piece and the earth.



Using Connection Methods ② and ③, determine their respective leakage currents. And take the higher one for the value under the "Normal conditions".

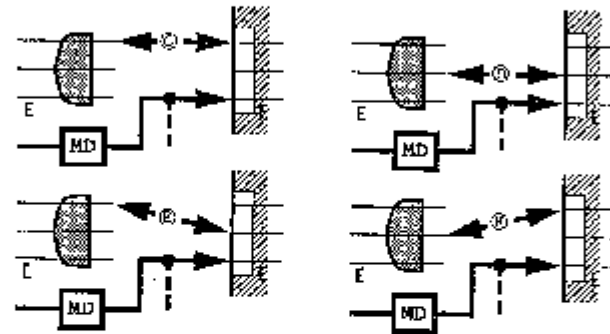
Rating : Not to exceed 0.1 μ A

② Single Fault Condition

Measure the leakage current without grounding based on ④ and ⑤ of Normal Connection Method ①.

Furthermore, based on Normal Connection Method ②, determine the leakage current at each of Connections ② thru ④. In each connection, moreover, determine the leakage currents, respectively in the two cases where the equipment is and is not grounded (as indicated with broken lines in the illustration).

Then, take the highest leakage current of above for the "Single Fault Condition".

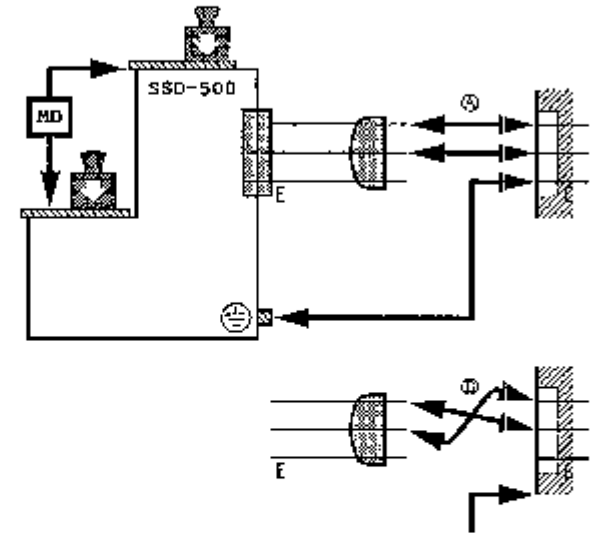


Rating : Not to exceed 0.5 mA

(6)-3 Enclosure leakage current (b)
(Between the enclosures)

① Normal conditions

Referring to the illustration given below, connect a measured unit with a leakage current measuring device (MD).
With two pieces of metal foil (10 cm × 20 cm per piece) placed separately on the enclosure, put weights thereon. Then, connect the leakage current measuring device (MD) to these metal foil pieces.



Using Connection Methods ① and ②, determine their respective leakage currents. And take the higher one for the value under the "Normal conditions".

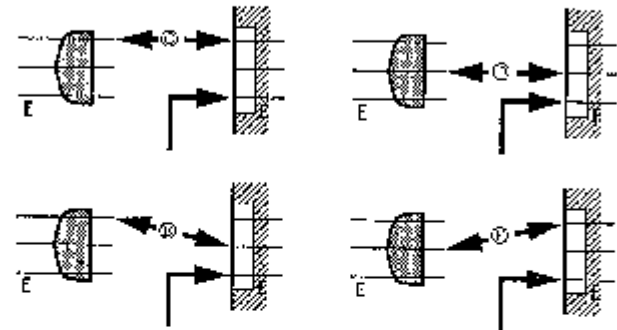
Rating : Not to exceed 0.1 mA

② Single Fault Condition

Measure the leakage current without grounding based on ② and ③ of Normal Connection Method ①.

Furthermore, based on Normal Connection Method ②, determine the leakage current at each of Connections ④ thru ⑤.

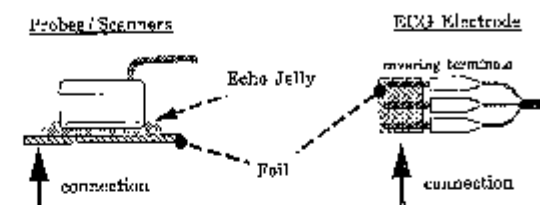
Then, take the highest leakage current of above for the "Single Fault Condition".



Rating : Not to exceed 0.5 mA

(6)-4 Patient leakage current

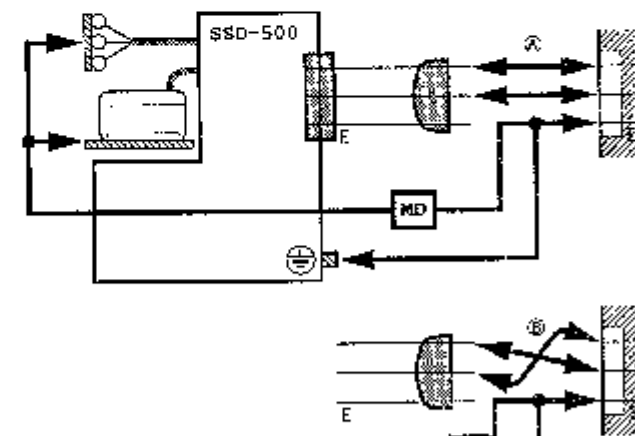
Connect all serviceable probes to the measured equipment. If the physiological signal display unit is installed, moreover, connect the ECG cable, likewise. For the connection method to determine their leakage currents, refer to the illustration below.



Ⓒ Normal conditions

Referring to the illustration given below, connect a measured unit with a leakage current measuring device (MD).

The leakage current measuring device (MD), meanwhile, should be connected between the point where all the applied parts (probe, scanner, and ECG cable) are connected and the earth.



Using Connection Methods Ⓒ and Ⓓ, determine their respective leakage currents. And take the higher one for the value under the "Normal conditions".

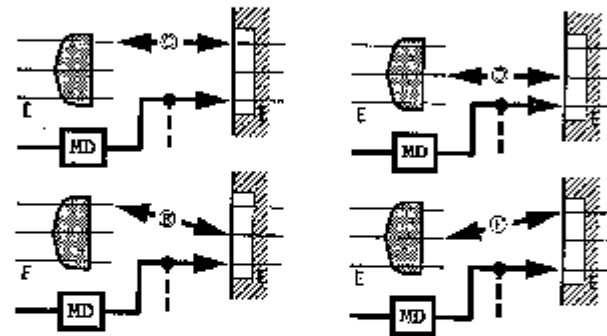
Rating: Not to exceed 0.1 mA

② Single Fault Condition

Measure the leakage current without grounding based on ⑥ and ⑦ of Normal Connection Method ①.

Furthermore, based on Normal Connection Method ①, determine the leakage current of each of Connections ③ thru ⑤. In each connection, moreover, determine the leakage currents, respectively in the two cases where the equipment is and is not grounded (as indicated with broken lines in the illustration).

Then, take the highest leakage current of above for the "Single Fault Condition".



Rating : Not to exceed 0.5 mA.

SECTION 11 MAINTENANCE INFORMATION

| CONTENTS | | Page |
|----------|--|---------|
| 11-1 | Introduction | 11 - 1 |
| 11-2 | Attention | 11 - 1 |
| 11-3 | Technical Information | 11 - 2 |
| 11-3-1 | Description of Messages Appearing
at the Time of Start | 11 - 2 |
| 11-3-2 | Description of "Status" | 11 - 3 |
| 11-3-3 | <i>(Deleted: Method of Changing the Number
of TV Scanning Lines)</i> | 11 - 4 |
| 11-3-4 | Description of Setting of Transmission Voltage | 11 - 5 |
| 11-3-5 | Description of "Probe Group" | 11 - 5 |
| 11-3-6 | Setting of Switches on PCB | 11 - 5 |
| 11-3-7 | Caution of exchange and cleaning
of trackball on SSD-600MICRUS | 11 - 9 |
| 11-3-8 | <i>(Deleted: Method of Changing Power Supply
Input Voltage)</i> | 11 - 10 |
| 11-4 | Manual Revision Information | 11 - 12 |

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11-1 Introduction

In this Maintenance Information, very useful information for repair and so on are described.

11-2 Attention

The information which is described in this section are shown as the original of SSD-500. If the update or modification are done to SSD-500, it is possible not to agree with this information.

11-3 Technical Information

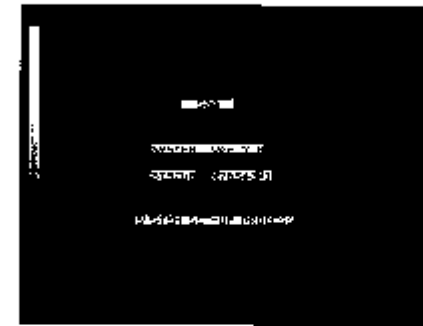
11-3-1 Description of Message Appearing at the Time of Start

When the equipment is started, a message will appear.

The message indicates the actual state of setting of dip-switch block SW1 on the PCB, EP-2870 ITF inside the equipment.

Two examples of message - one applies to SSD-500 and the other applies to SSD-500V - for domestic users are shown below.

The displaying message of SSD-500 and SSD-500MICRUS at starting up are same except displaying " SYSTEM Ver E^A " (For example, E1.0) in case of SSD-500MICRUS.



SSD-500 (for domestic users)



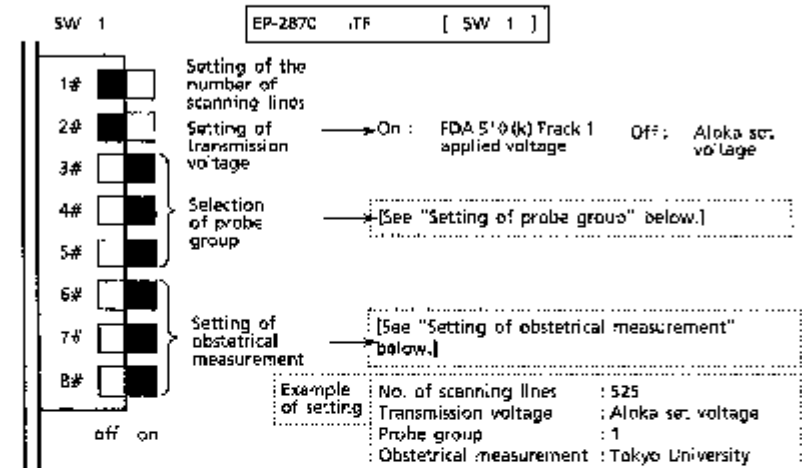
SSD-500V (for domestic users)

STATUS indicates the state of setting of SW1 on EP-2871* ITF.
Dip-switch ON : White digit on black ground : [1]
Dip-switch OFF: Ordinary black digit : 0

11-3-2 Description of "Status"

SSD-500 has something called "Status" which indicates the state of setting of the equipment. "Status" is written on the surface of package and, also, appears in the equipment-start message. Those indications of "Status" represent the actual state of setting of dip-switch block SW1 on the PCB, EP-2879 I/F.

Each dip-switch is identified as illustrated below. For more details, refer to SECTION 11-3 Technical Information



Caution: When making a change of setting, take the following matters into consideration:

Setting of the probe group

For SSD 500 of S/N 91M03778~01M01749 or software version 1.0~5.4, there is the necessity of replacing ROM on the PCB, EP-2871 DSC, in addition to a change of setting of switches. For details, refer to the ROM layout drawing.

For SSD-500 of S/N 01M17550 and up or software version 6.0 and up, only a change of setting of switches is necessary. Replacing ROM on the PCB is unnecessary.

Setting of obstetrical measurement

When making a change of the method of obstetrical measurement, only a change of setting of these switches is necessary. Replacing ROM on the PCB is unnecessary.

But, the obstetrical table for animal can use at Probe Group setting No.⑤ on SSD-500MICRUS (for ALOKA America for animal diagnosis type) which was taken at only early lot.

11-3.3 (This clause has been deleted on the revision 10.)

11-3-4 Description of Setting of Transmission Voltage

Excepting USA, all SSD-500s are set to Alope standard transmission voltage. Only for SSD-500 of USA specification, make a change of setting of its switch so that the value of transmission voltage can meet the FDA 510 (k)Track 1 standard of USA.

11-3-5 Description of "Probe Group"

SSD-500 is available in various kinds of specifications, namely, for human, for animals, for domestic, and for overseas. Accordingly, a large variety of optional probes are also available. To make it possible to connect many kinds of probes, the equipment must store those probe codes in its ROM. In SSD-500 available optional probes for each specification are limited to a group.

- ▶ The prepared probe groups are shown in Table 11.1
- ▶ Refer to History of SSD-500 for the probes registered to each probe group

(1) Since the equipment S/N 91M03378~01M17549 (Software Ver.1.0~5.0)

These systems are restricted in storage capacity of its ROM. Grouped probe code is classified as ROM for group 1, ROM for group 2, or ROM for group 3. If necessary, available probes may be changed by reclassification of probe groups.

◆Method of change for setting probe groups◆

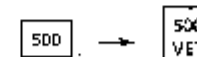
1. Exchange ROM on the EP-2871* DSC referring fig 11.2 "ROM arranged map".
[Caution] The ROM is changed according to software version.
2. Change setting Dip-switches #3, #4 and #5 on the EP-2870* TF referring to Section 8-5-2 "Dip-switch1 table".

(2) For equipment S/N 01M17549 ~ (after Software Ver.6.0)

For these systems, a large-capacity ROM is used for a directory of probe codes so that it can cover all of probe groups. Therefore, a change of "Probe group" becomes possible only by changing the setting of dip-switches on the PCB EP-2870* TF. Method of setting Dip-switches is the same as the above (1). No replacement of ROM is necessary.

(3) Among various kinds of information displayed for system initialization when group 3 is set up, the indication of "model" has been changed as shown below.

Note: Regardless of replacement of ROM on the equipment which needs replacement of a ROM for a change of setting, only the indication is changed to "VET".



On SSD-500 at the same time, the obstetrical measurement function and the fetal weight measurement function are inhibited by software.

On SSD-500MICRUS, the only fetal weight measurement function are inhibited by software. Never mistake this matter for a system trouble or software bug.

fig 11.1 Probe groups table

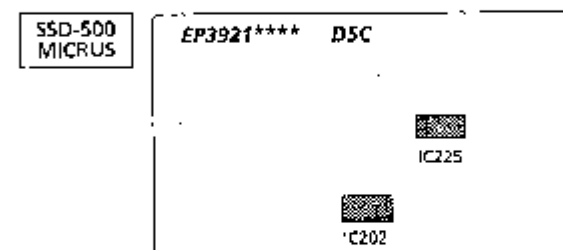
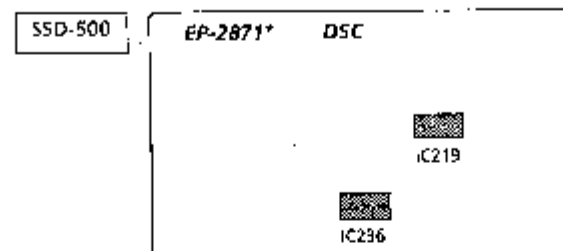
| Equipment | division | Soft ware version | | | | | | | | |
|--|------------|-------------------|-----|-----|-----|-----|-----|-----|-----|---|
| | | 1.0 | 1.1 | 2.0 | 3.0 | 3.1 | 4.0 | 4.1 | 5.0 | |
| For domestic user | SSD-500 | ① | ① | ① | ① | ① | ① | ① | ① | ① |
| For fujidaira (use for meet quality judge) | SSD-500SEM | ② | ② | ② | ② | ② | ② | ② | ② | ② |
| For fujidaira (use for animal diagnosis) | SSD-500SE | - | - | - | ③ | ③ | ③ | ③ | ③ | ③ |
| For export user | SSD-500 | ① | ① | ① | ① | ① | ① | ① | ① | ① |
| For export (use for animal diagnosis) | SSD-500V | - | - | - | ④ | ④ | ④ | ④ | ④ | ④ |
| For corometrics user | ALOKA500 | - | - | - | ① | ① | ① | ① | ① | ① |
| For corometrics (use for animal diagnosis) | ALOKA500V | - | - | - | ③ | ③ | ③ | ③ | ③ | ③ |
| For aloka America | SSD-500 | - | - | - | ① | ① | ① | ① | ① | ① |

①②③④ indicate are group number.

| Equipment | Division | Soft ware version | | | | | | | |
|--|------------|-------------------|-----|-----|-----|-----|-----|------|---|
| | | 6.0 | 7.0 | 8.0 | 8.1 | 9.0 | 9.1 | E1.0 | |
| For domestic user | SSD-500 | ① | ① | ① | ① | ① | ① | ① | ① |
| For fujidaira (use for meet quality judge) | SSD-500SEM | ② | ② | ② | ② | ② | ② | ② | ② |
| For fujidaira (use for animal diagnosis) | SSD-500SE | ③→① | ① | ① | ① | ① | ① | ① | ① |
| For export user | SSD-500 | ① | ① | ① | ① | ① | ① | ① | ① |
| For export (use for animal diagnosis) | SSD-500V | ③ | ③ | ③ | ③ | ③ | ③ | ③ | ③ |
| For corometrics user | ALOKA500 | ③ | ④ | ④ | ④ | ④ | ④ | ④ | ④ |
| For corometrics (use for animal diagnosis) | ALOKA500V | ③ | ③ | ③ | ③ | ③ | ③ | ③ | ③ |
| For aloka America | SSD-500 | ④ | ④ | ④ | ④ | ④ | ④ | ④ | ④ |
| For aloka America (use for animal diagnosis) | SSD-500V | - | - | - | - | - | - | - | ⑤ |

①②③④⑤ Indicate are group number

117 ROM layout m20



| Software Version | | Pin Group | | | | | | | |
|-----------------------|-------|-----------|------|------|------|---|---|---|---|
| | | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |
| 1.0, 1.1 | IC219 | X0 | X0 | - | - | - | - | - | - |
| | IC236 | DX1 | DX2 | - | - | - | - | - | - |
| 2.0 | IC219 | X01B | X02B | - | - | - | - | - | - |
| | IC236 | DX1B | DX2B | - | - | - | - | - | - |
| 3.0, 5.1,
4.0, 5.0 | IC219 | X01B | X02B | X03C | - | - | - | - | - |
| | IC236 | DX1B | DX2B | DX3C | - | - | - | - | - |
| 5.0 | IC219 | X04 | X04 | X04 | X04 | - | - | - | - |
| | IC236 | DX4 | DX4 | DX4 | DX4 | - | - | - | - |
| 7.0 | IC219 | X04B | X04B | X04B | X04B | - | - | - | - |
| | IC236 | DX4B | DX4B | DX4B | DX4B | - | - | - | - |
| 8.0, 8.1,
9.0, 9.1 | IC219 | X04C | X04C | X04C | X04C | - | - | - | - |
| | IC236 | DX4C | DX4C | DX4C | DX4C | - | - | - | - |
| E1.0 | IC219 | X04C | X04C | X04C | X04C | - | - | - | - |
| | IC202 | DX4C | DX4C | DX4C | DX4C | - | - | - | - |

11-3-6 Setting of Switches on PCB

Switches on the PCB are used for initialization and for making the equipment applicable to various kinds of specification. If those switches are not in the proper set. positions, it would not only cause erroneous operation of the equipment, but also invite additional failures. If tampering with any switches has necessarily been made, refer to SECTION 11.3 Technical Information, for resetting, refer to Section B-5-2.

Location of the PCB on which those switches are mounted is shown in Fig. 11.3.

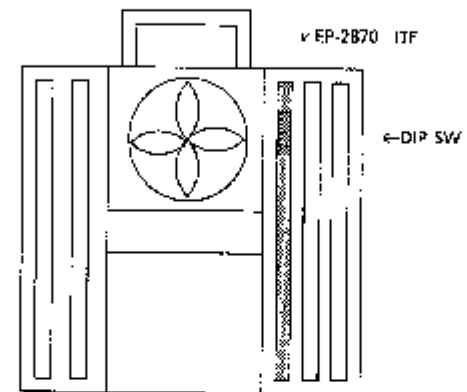


Fig 11.3 Rear View of SSD-300

11-3-7 Caution about exchange or cleaning the trackball of SSD-500MICRUS

In case of exchange or cleaning the trackball in L-KEY-58-1 Function Key Board, the micro driver is necessary for removing small screws. Please take it at maintenance.

11-3-B (This clause has been deleted on the revision 10.)

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11-4 Manual Change Information

| Ver. | Date | Contents | Page | Note |
|------|------------|--|---|------|
| 1 | 04,Nov.,93 | Section 11
"Manual change information" | | |
| 2 | 24,Jul.,90 | Section 7
Schematic "Power supply unit" added
Schematic "TV monitor" added | 7-23
7-25-7-37 | |
| | | Section 13
"Parts list" added | 13-15-13-56 | |
| | | Section 11
"Manual change information" added | 11-2-11-6 | |
| 3 | 08,Jul.,90 | Cover: Replaced
contents Replaced | 1-4 | |
| | | Section 1 | Contents
1-1-1-4 | |
| | | Section 4
"Disassembling procedure of the main body" replaced
"Reassembling procedure of the JB-172" added
"Installation procedure of the J-172" added | Contents
4-1-4-16
4-1-4-38 | |
| | | Section 5
"System block diagram" Replaced | Contents
5-1-5-3 | |
| | | Section 7
"L-Cable-237" Replaced
"L-Cable-239" Replaced
"IP-0702-Tu" Replaced
"US1-133" Schematic diagram added
"EP-2870C" Device location added
"EP-2871E" Device location added
"EP-2872C" Device location added
"EP-2873D" Device location added
"Cable (JB-172 Correspondence)" added
"Power selector JB-172" Schematic diagram added
"EP-3425B" Schematic diagram added
"Cable (set JB-172)" added
"TV monitor P-0901-YHTV" Schematic diagram added
"TV monitor IP-0501u-YHTV" Schematic diagram added
"Isolation transformer unit" Schematic diagram added
"Receptacle (AC outlet)" Schematic diagram added
"PSU-5500C" Schematic diagram added | Contents
7-27-7-30
7-27-7-38
7-29-7-37 | |
| | | Section 8
"Method of resetting Backup Memory" added
"Power supply unit" added | Contents
8-1-8-12 | |

| Ver. | Date | Contents | Page | Notes |
|------|------------|--|----------------------------|--|
| 3 | 06.Jul.92 | Section 11
"Description of message appearing at the time of start" added
"Description of setting of transmission voltage" added
"Setting of switches on PCB" added
"Table of setting of D's switches" added
"Manual change information" added | Contents
11-11~11-10 | |
| | | Section 14
"System construction" Replaced | Contents
14-1~14-4 | |
| | | Section 15
"Safety standard" added | Contents
15-1~15-8 | |
| | | Section 16
"Block diagram" added | Contents
16-1~16-34 | |
| 4 | 20,Dec.,92 | Cover Replaced | | |
| | | Section 11
"Manual change information" Replaced | 11-17~11-18 | |
| | | Section 13
"Parts list" Replaced | 13-5~13-52 | Please take out page 13-52~13-56 |
| 5 | 16,Feb.,93 | Cover Replaced | | |
| | | "Locable-233" added
"Locable-234" Replaced
"Locable-235" added
"Locable-236" Replaced
"Locable-237" Replaced
"Locable-238" Replaced
"Locable-239" Replaced
"Locable-240" Replaced
"Cable Connection" Replaced | 7-24~7-21-2 | Deleted and added page 7-21~7-21 of Range Ver.4, and note revision sheets page 7-31~7-31-2 |
| | | Section 11
"Manual change information" Replaced | 11-17~11-18 | |
| 6 | 20,Apr.,93 | Cover Replaced | | |
| | | Section 6
"6-3 F~2263 BX" Replaced | 6-3~6-4 | |
| | | Section 7
"LSI-15" Replaced | 7-1~7-2 | |
| | | Section 8
"Location of ROMs" Replaced
"Map" Replaced | 8-11~8-11-1
8-17~8-18 | |
| | | Section 11
"Manual change information" Replaced
Added | 11-17~11-18
11-19~11-20 | |

| Ver. | Date | Version | | Page | Note |
|------|-----------|---|----------|---|---|
| | | Contents | Replaced | | |
| 6 | 3-Apr-96 | Section 13
"Parts List" | Replaced | 13-7~13-26
13-25~13-26
13-29~13-36
13-39~13-40
13-43~13-45
13-49~13-52 | Take out and throw away page from '2 55 to 13-56 by Ver. 5 Service Manual |
| | | Section 16
"CPU EP 2872" | Replaced | 16-11~16-32 | |
| 7 | 17-Mar-94 | Cover | Replaced | | |
| | | Section 11
"Manual change information" | Replaced | 11-15~11-20 | |
| | | Section 13
"Parts List" | Replaced | 13-15~13-52 | |
| 8 | 20-May-94 | Replacement of <i>Title Page</i>
Replacement of <i>Back Page</i>
Replacement of <i>Contents</i> | | 1~4 | with 1~5 |
| | | Section 3
Replacement of <i>Section Contents</i>
Replacement of all pages | | 3-1~3-2 | with 3-1~3-4 |
| | | Section 8
Replacement of <i>Section Contents</i>
Revision of item 8-1 to 8-4 | | 8-1~8-4 | |
| | | Section 10
Replacement of <i>Section Contents</i>
Replacement of all pages | | 10-1~10-8 | with 10-1~10-20 |
| | | Section 11
Replacement of <i>Manual Change Information</i> | | 11-17~20 | |
| | | "Version" is used for above, "Revision" for below.
"Revision 8" is not existing. | | | |

| Rev. | Date | Revisions | | Note |
|------|-----------|---|--|------|
| | | Contents | Page | |
| 9 | 21-Jul-84 | Replacement of Title Page
Replacement of Back Page
Replacement of Contents | 1-6 | |
| | | Section 4
Replacement of Section Contents
Replacement of
4-1 Disassembling Procedure for
Main body
Addition of following
Installation procedures | 4-16~4-18
4-39~4-42
4-43~4-50
4-51~4-54
4-55~4-58
4-57~4-60
4-61~4-64
4-65~4-68 | |
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| 11 | 17-Jan-'99 | Replacement of "Title page"
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| 12 | 16-Jul-'01 | "Title page" Replaced
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Section 5
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• "Block Diagram for EP4031" Added
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Section 7
• "USF-115C" Schematic Diagram" Replaced
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Section 8
• "8-5-6 Location of PCB" Replaced
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| 6 | 2/Apr/93 | Section 13
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| | | Section 16
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| 7 | 17/Mar/94 | Cover Replaced | | |
| | | Section 11
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| | | Section 13
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| 8 | 20/May/94 | Replacement of Title Page
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| | | "Version" is used for above, "Revision" for below.
"Revision 8" is not existing. | | |

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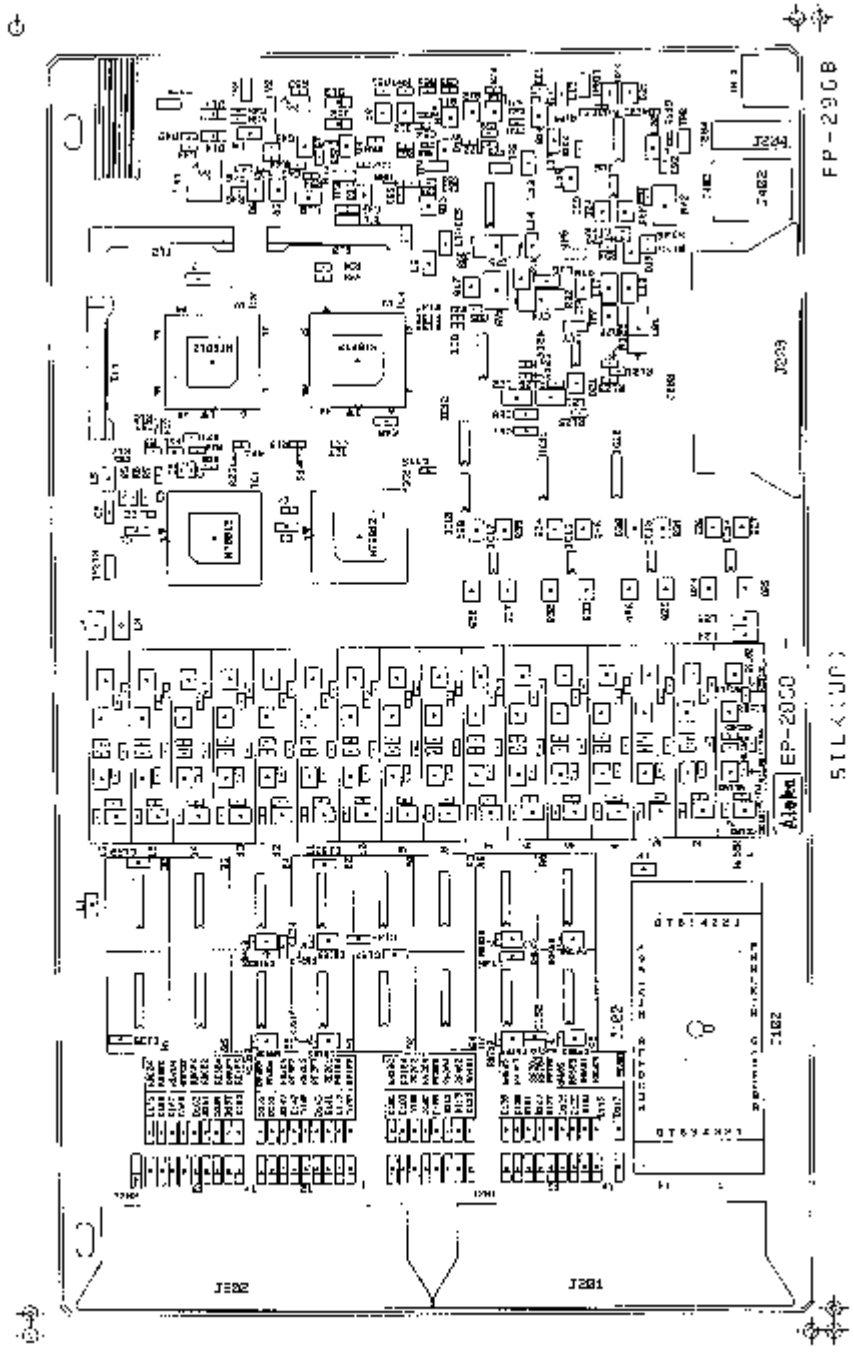
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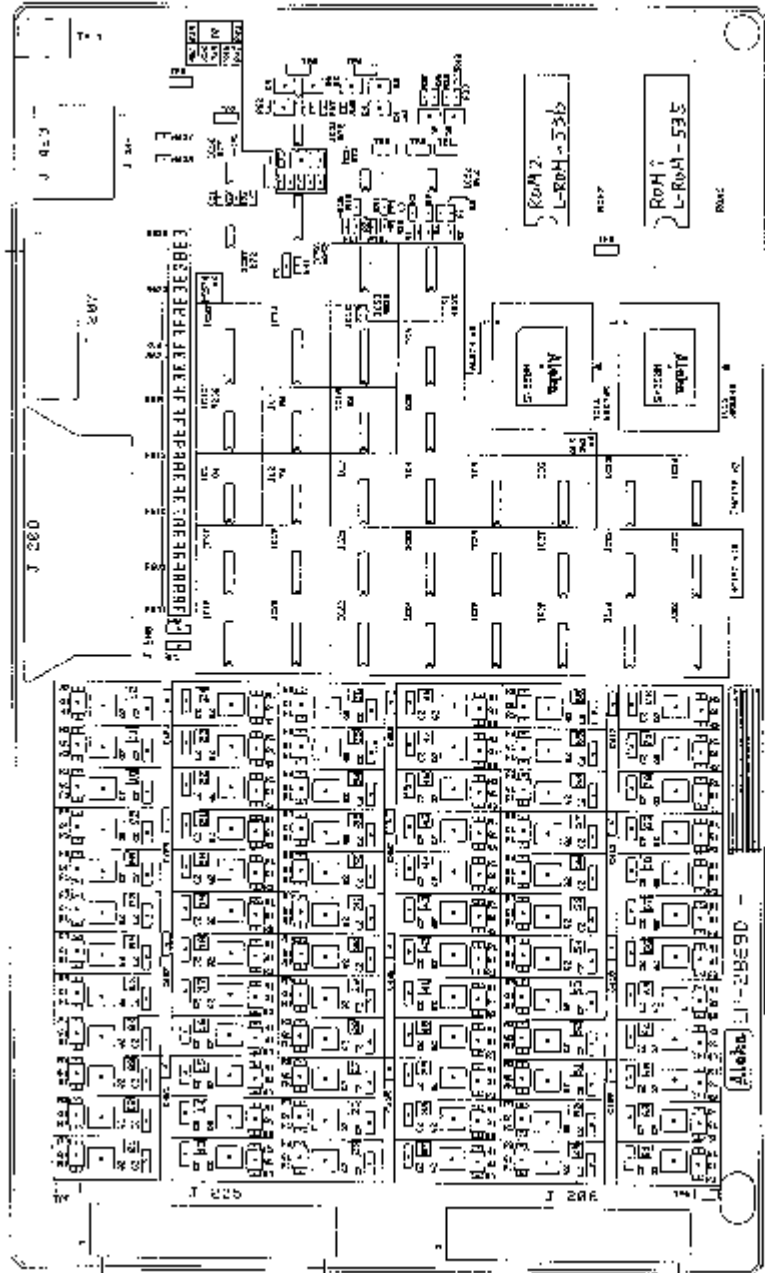
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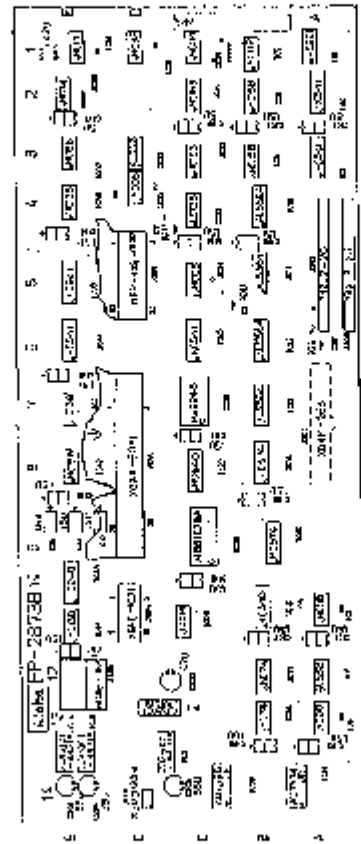
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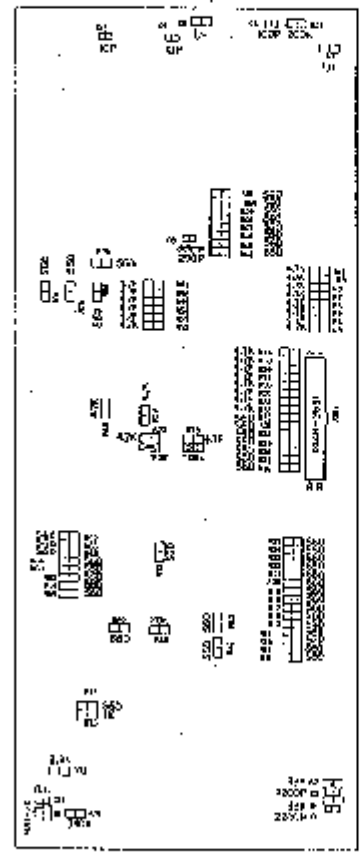
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|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|

CP-7873B
 2873B
 2873B

IS CONTROL PANEL

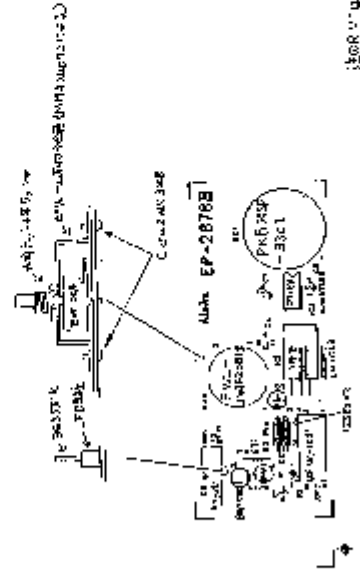
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50



3 R51 R47
R4/R

| | | |
|--|-------------|----------|
| Aloted | mask | mask |
| NO. AND QUANTITY
OF THIS PART
REQUIRED | PART NUMBER | MARKING |
| 1 | MC 314644 | EP-28733 |
| DATE | REV | REV |
| 1964 | 1 | 1 |



FOR USE IN THE FIELD ONLY. THIS IS NOT A SERVICE MANUAL. IT IS NOT TO BE USED FOR REPAIR OR MAINTENANCE PURPOSES. IT IS FOR INFORMATION ONLY. IT IS NOT TO BE USED FOR REPAIR OR MAINTENANCE PURPOSES.

| | | |
|---|---|-------------------|
| R | 例 | CHECK PIN(CP-108) |
| ① | | BUSBAR () |
| ② | | CAPACITOR () |
| ③ | | MOS IC () |
| ④ | | ROM IC () |
| ⑤ | | TAPING |

| | |
|------|---------------------------|
| NOTE | 1. 必ず電源が切れている状態で作業してください。 |
| | 2. 作業前に必ず電源を切ってください。 |
| | 3. 作業前に必ず電源を切ってください。 |
| | 4. 作業前に必ず電源を切ってください。 |
| | 5. 作業前に必ず電源を切ってください。 |
| | 6. 作業前に必ず電源を切ってください。 |
| | 7. 作業前に必ず電源を切ってください。 |
| | 8. 作業前に必ず電源を切ってください。 |
| | 9. 作業前に必ず電源を切ってください。 |
| | 10. 作業前に必ず電源を切ってください。 |

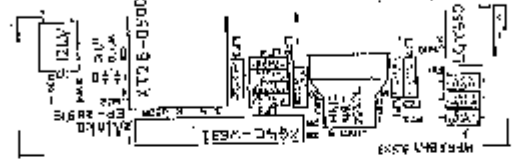
二番の電源は電源用です。

① 電源用
② 電源用
③ 電源用

| | | | |
|------------|----------|----------|-----|
| Alpha | Model | EP-2878B | 1/3 |
| Serial No. | MC 34472 | | |
| Part No. | | | |
| Rev. | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|

5

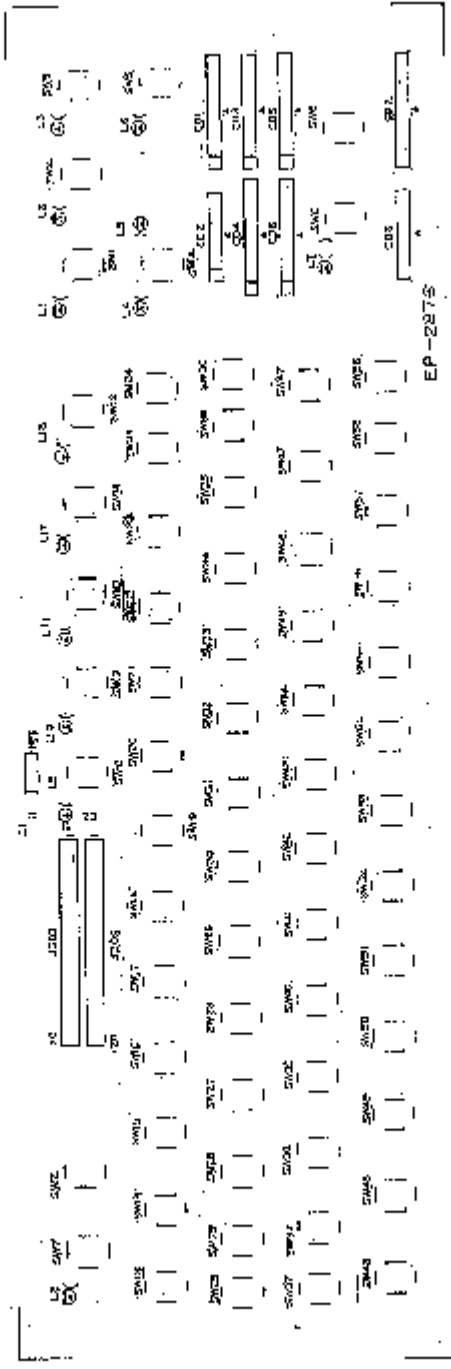


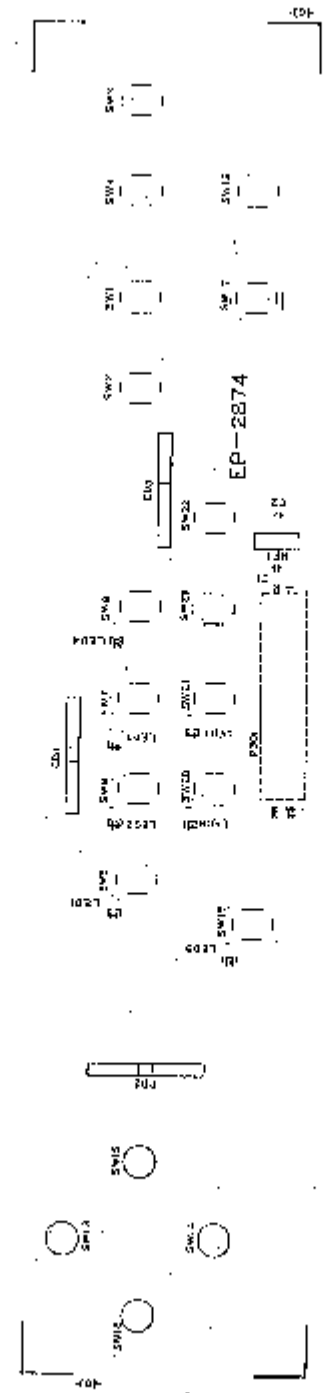
| | |
|---------|-----------|
| DATE | 10/10/53 |
| BY | W. J. ... |
| TEST | ... |
| REMARKS | ... |
| TESTER | ... |
| DATE | ... |
| BY | ... |
| TEST | ... |
| REMARKS | ... |
| TESTER | ... |

10/10/53
W. J. ...

| | | | |
|---|--------------------------------|----------------------|-----------------------|
| Aloka
<small>THE BELL SYSTEM
 TELEPHONE LABORATORIES
 BELL SYSTEM</small> | MODEL
In/Out | PART NO.
EP-2881E | REV.
K |
| | MANUFACTURED
BY
MIC 3168 | DATE
10/10/53 | DRAWN BY
W. J. ... |

①

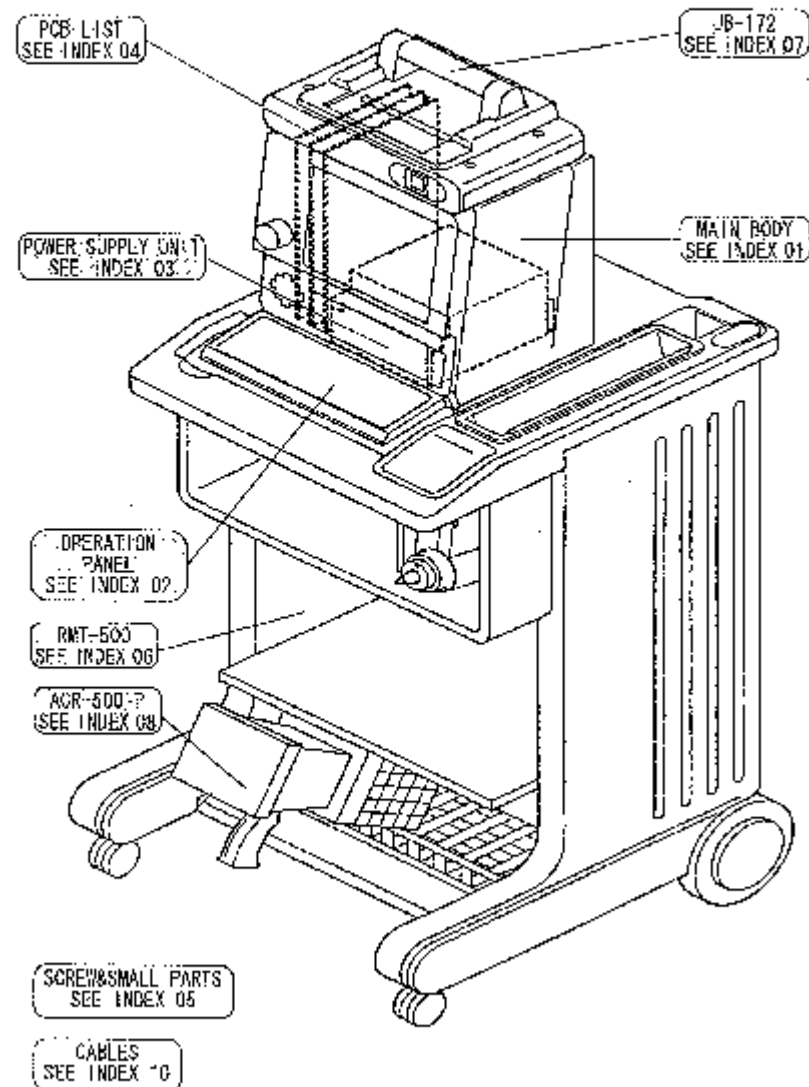




L-KEY-14B

13-1 Contents of Parts List

Parts are separately shown as each portion of equipment. When you find the part, finally choose the portion the part belongs to, then open the page suggested with "INDEX".



13-2 Appliance of Parts List

This Parts List consists of the parts for technical service and maintenance. Therefore, the parts model name (PARTS No.) is only valid to the technical support. When you order the parts shown in the List, please apply to our technical support section.

Before you find the parts with this Parts List, please note that nobody can use any description in this List for the other purpose.

13-3 Outline of Parts List

This Parts List shows many parts which are selected for the technical support and maintenance, and made with the illustrations and Lists. These parts are selected with one of the basis as below.

- ◆ For the surface of the equipment such as Cover and Controller
- ◆ Machinery and things to be broken without difficulty
- ◆ Operation panel including the Knob and Switch
- ◆ Cables
Including one soldered to the other part directly
- ◆ PCB
Please refer to the History which has been issued separately, because almost of the PCBs have the revisions.
- ◆ The things to be replaced frequently such as the variable resistor for the panel
- ◆ General small parts such as screws and cable clamps
The location are not shown in the illustration.
- ◆ Things to be needed additionally for the technical support.

13-4 Explanation of Parts List:

This Parts List is divided by some blocks (INDEX), and each block consists of the illustration and list.

| INDEX | | Name of block | | UNIT model of block | UNIT | S/N |
|-------|---------|---------------|-------------------------|---------------------|---------|-----|
| - 01 | | MAIN BODY | | | USE-140 | |
| ITEM | CODE No | PARTS No | DESCRIPTION | SERIAL No | | |
| 1 | A144058 | SAP-14001-01 | COVER TOP | | | |
| 2 | A120026 | PSC-116A7 | INTERMEDIATE DISK COVER | ~900035 | | |
| 2 | A120027 | PSC-116B7 | INTERMEDIATE DISK COVER | 960051~ | | |
| 3 | A80004 | L-CABLE-216 | CABLE FAN-J607 | | OPTION | |

| PARTS No model | | DESCRIPTION | SERIAL No |
|--|---------|------------------------------|--------------|
| CODE No code number | | SERIAL No | |
| ITEM Indication number to illustration | | SPEC specification and notes | |
| 6 | A120125 | TR-1375B | TRCSE HOLDER |

ASSEMBLY PARTS : Please apply to our Dedicated support for details.
 アセンブリ部品 : 詳細の情報はテクニカルサポートまでお問い合わせください。

comments for the assembly parts

INDEX The number of the division for each Parts List (Illustrations and Lists). This is indicated in the illustration for whole equipment at the beginning.

UNIT The name of this block (or unit) indicated by INDEX.
 If the same block or unit will be revised, it will be distinguished with this and next S/N.

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SECTION 4 PARTS LIST

- S/N If the same block or unit will be revised, it will be distinguished with (NN), and this allows the beginning of production change.
- ITEM Relation numbers between illustration and List.
- CODE No Code number applied out by row to each part. However, at this time (July '96), it is not acceptable to code.
- Parts No Parts number.
- SERIAL No Applied serial number.
If it shows "X X X X ~", the part is available to serial number or after. On the other side, "~ X X X X" means valid to the serial number and before. If the blank, it is not depended on the serial number.
The parts which are written " [A] " to the columns of SERIAL No. are used in SSD-500 and confirmed to group [A] in Table 1.
The parts which are written " [B] " to the columns of SERIAL No. are used in SSD-500MICRUS and confirmed to group [B] in Table 2.
The parts of group [A] and group [B] are not interchangability each other.

| Group [A] | |
|------------|------------------------------------|
| | 91M03778~31M11798 |
| Applicable | 3300001~3300367 |
| S/N | 3320001~3320038
3320564~3320601 |

Table 1 Applicable S/N in SSD-500

| Group [B] | |
|------------|-----------------------------|
| Applicable | 3300368~ |
| S/N | 3320039~3320563
3320602~ |

Table 2 Applicable S/N in SSD-500MICRUS

SPEC The specification, some differences on alignment, and the other remarks are shown.

13-5 Attention

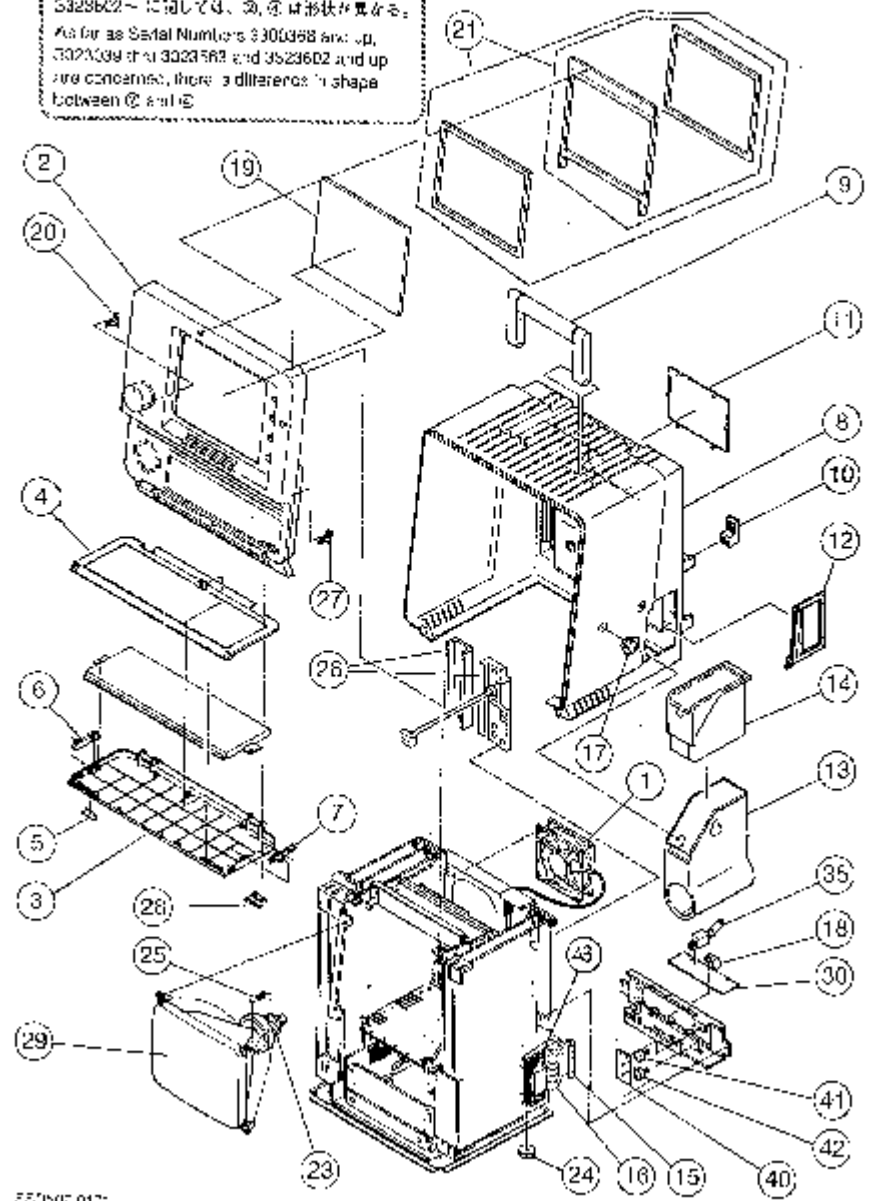
- Prohibition to use both previous and current format of Parts List.
In the current rev. the model names of some parts are different from previous.
- Reference with "History" for the order of PCBs.
This Parts List does not show the PCB version (or not follow the each revision).
Therefore, when you order the PCBs, please see the "History" issued separately.

13-6 Parts List

The parts List is shown from next page. It consists of "INDEX". For the portion of equipment suggested with "INDEX", refer to the figure described in page 13-1.

| | | |
|--------------|-------------------|-----|
| 01 MAIN BODY | Unit
L.SI-115* | Qty |
|--------------|-------------------|-----|

S/N 3300357~、3323039~3323563、
3323602~ については、㉑、㉒ は形状が異なる。
As far as Serial Numbers 3300357 and up,
3323039 thru 3323563 and 3323602 and up
are concerned, there is difference in shape
between ㉑ and ㉒



| INDEX
01 | MAIN BODY | | | UNIT
US1-115 | S/N |
|-------------|-----------|---------------------|----------------------|-----------------|--|
| ITEM | CODE No. | PARTS No. | DESCRIPTION | SERIAL No. | SPEC. |
| 1 | A025002 | T00P08:2L412 | FAN | | |
| 2 | A000055 | SAP-500-01-02B | COVER : FRONT | [A] | EXCEPT USA |
| 2 | A000056 | SAP-500-01-02C | COVER : FRONT | [B] | EXCEPT USA |
| 2 | A000057 | SAP-500-01-02B-USA | COVER : FRONT | [A] | FOR USA |
| 2 | A000058 | SAP-500-01-02C-USA | COVER : FRONT | [B] | FOR USA |
| 3 | A0200303 | SAP-500-01-03 | COVER: PANEL, LOWER | | |
| 4 | A0200304 | SAP-500-01-04 | COVER : PANEL, UPPER | [A] | |
| 4 | A0200305 | SAP-500-01-04B | COVER : PANEL, UPPER | [B] | |
| 5 | A110072 | US1-115-8A385 | RUBBER | | |
| 6 | A100076 | US1-115-8A382 | FOOT: LEFT | | |
| 7 | A100077 | US1-115-8A383 | FOOT: RIGHT | | |
| 8 | A0200306 | SAP-500-01-08 | COVER : REAR | *1 | 3322474-3322475
EXCEPT USA |
| 8 | A0200305 | SAP-500-01-08-A.A. | COVER : REAR | | 3322473
FOR USA(A.A.) |
| 8 | A0200302 | SAP-500-01-08B-PAL | COVER : REAR | *2 | 3322474-3322475
3322564-3322565
FOR 230V PAL |
| 8 | A0201027 | SAP-500-01-08B | COVER : REAR | *1, *2 | 3322474-3322475
3322564-3322565
FOR JAPAN |
| 8 | A0201025 | SAP-500-01-08B-NTSC | COVER : REAR | *2 | 3322474-3322475
3322564-3322565
FOR NTSC |
| 8 | A0201024 | SAP-500-01-08B-A.A. | COVER : REAR | *2 | 3322474-3322475
3322564-3322565
FOR USA |
| 8 | A0201025 | SAP-500-01-08C | COVER : REAR | *2 | [B]
FOR JAPAN |
| 8 | A0201026 | SAP-500-01-08C-NTSC | COVER : REAR | *2 | [B]
FOR NTSC |
| 8 | A0201027 | SAP-500-01-08C-PAL | COVER : REAR | *2 | [B]
FOR 230V PAL |
| 8 | A0201028 | SAP-500-01-08C-A.A. | COVER : REAR | *2 | [B]
FOR USA |

* ASSEMBLED PARTS : Please apply to our Technical Support for detail.
アセンブリ : 詳細についてはテクニカルサポートまでお問い合わせ下さい。

[A], [B] の表記については、13・17ページを参照ください。

See page 13 - 17 about these descriptions [A], [B].

*1: SAP-500-01-08とSAP-500-01-08Bは互換性あり。

There is bi-directional interchangeability between SAP-500-01-08 and SAP-500-01-08B.

*2: SAP-500-01-08B-***とSAP-500-01-08C-***は互換性なし。

There is no interchangeability between SAP-500-01-08B-*** and SAP-500-01-08C-***.

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SECTION 13 PARTS LIST

| INDEX | MAIN BODY | | | LN T. | S/N |
|-------|-----------|----------------|-------------------------|----------------------|----------------------|
| | | | | JSI-11a | |
| ITEM | CODE No. | PARTS No. | DESCRIPTION | SER. AL. No. | SPEC. |
| 9 | A120053 | USI-115-SA2#2 | HANDLE | | |
| 10 | A120064 | USI-115-SA2#3 | CABLE FORK | | |
| 11 | A120055 | USI-115-SA2#5 | COVER: FAN | | |
| 12 | *A200305 | SAP-500-01-12 | COVER: CONNECTOR | | |
| 13 | *A200307 | SAP-500-01-13 | PROBE HOLDER | | |
| 14 | A200058 | VP-24E00-12P | JIBBER CUSHION | | |
| 15 | A100378 | USI-115#14 | GROUND SPRING | | |
| 16 | A100379 | USI-115#15 | GROUND SPRING | | |
| 17 | A100151 | VP-FE00-1#3 | WASHER | | |
| 18 | A100073 | USI-115#3 | GROUND SPRING | | |
| 19 | A620045 | L-K1-257 | FILTER | | EXCEPT USA |
| 19 | A150105 | L-K1-257-LA7 | FILTER | FOR USA, S~ | TOUGHENED GLASS TYPE |
| 20 | A110074 | USI-115-SA1#2 | HOOK: PANEL, LEFT | | |
| 20 | *A200308 | SAP-500-01-21A | FILTER MOUNTING BRACKET | | EXCEPT USA |
| 21 | *A200309 | SAP-500-01-21B | FILTER MOUNTING BRACKET | FOR USA, S~ | TOUGHENED GLASS TYPE |
| 23 | A700042 | UP-LS85-9E | GRIP FORK | | |
| 24 | *A200310 | SAP-500-01-24 | LEG | | |
| 25 | A110075 | P-0501-TV#15 | COIL SPRING | | |
| 26 | A110120 | USI-115-SA2#3 | BLIND PLATE | | |
| 26 | A600635 | GC-USI-115-A | CABLE: J4C5~J507 | T1N12603
T1N12610 | |
| 27 | A110076 | USI-115-SA1#2H | HOOK: PANEL, RIGHT | | |
| 28 | A110077 | US-115-SA1#3 | HINGE SUPPORT | | |

** ASSEMBLED PARTS : Please apply to our Technical Support for detail.
アセンブリ : 仕様についてはテクニカルサポートまで問い合わせ下さい。

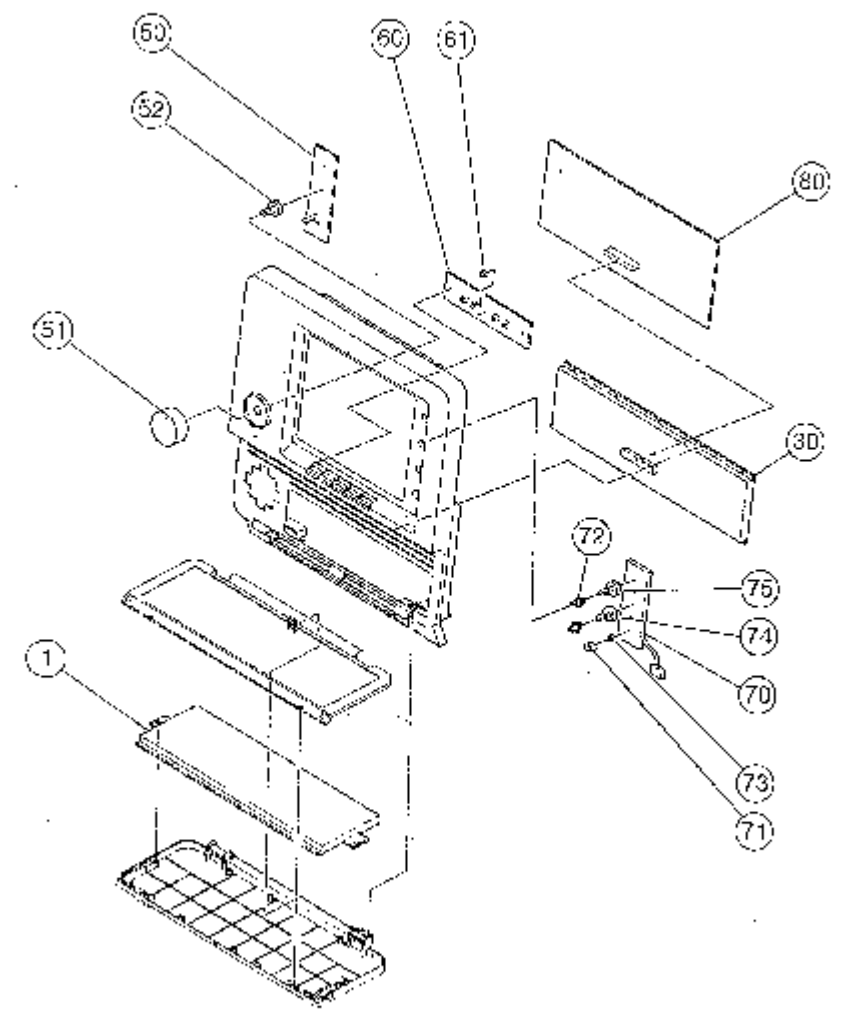
| INDEX | MAIN BODY | | | UNIT | S/N |
|-------|-----------|---------------|---------------------------|------------|-------|
| 01 | | | | USI-1.5 | |
| ITEM | CODE No. | PARTS No. | DESCRIPTION | SERIAL No. | SPEC. |
| 29 | A603000 | W18JCB36M | CRT | 31H38501 | |
| 29 | A603004 | E291794(LB) | CRT | 31H38502 | |
| 30 | A801360 | EP-2881* | PCB:IN / OUT | | |
| 35 | A81038 | B-12LV | SWITCH | | |
| 40 | A801361 | EP-2882* | PCB : PHOTO CONT / BRIGHT | | |
| 41 | A140075 | DJ-13P2-200K | RESISTOR VARIABLE ROTATE | | |
| 42 | A140074 | R.-182R-1K | RESISTOR VARIABLE ROTATE | | |
| 43 | *A200482 | SAP-500-01-43 | CONTACT SPRING | | |

* ASSEMBLED PARTS : Please apply to our Technical Support; for detail.
 アセンブリ : 詳細についてはテクニカルサポートまで問い合わせ下さい。

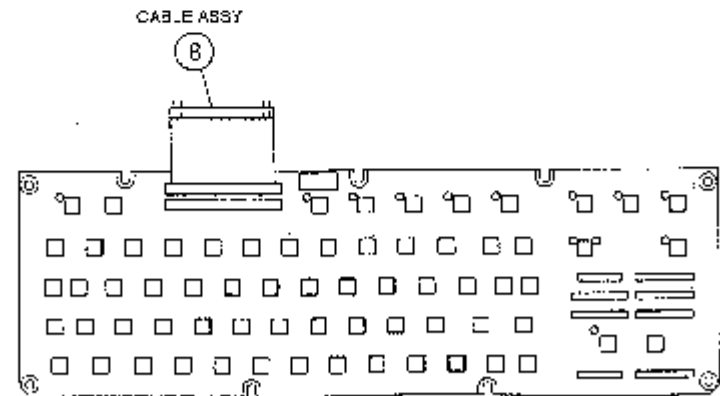
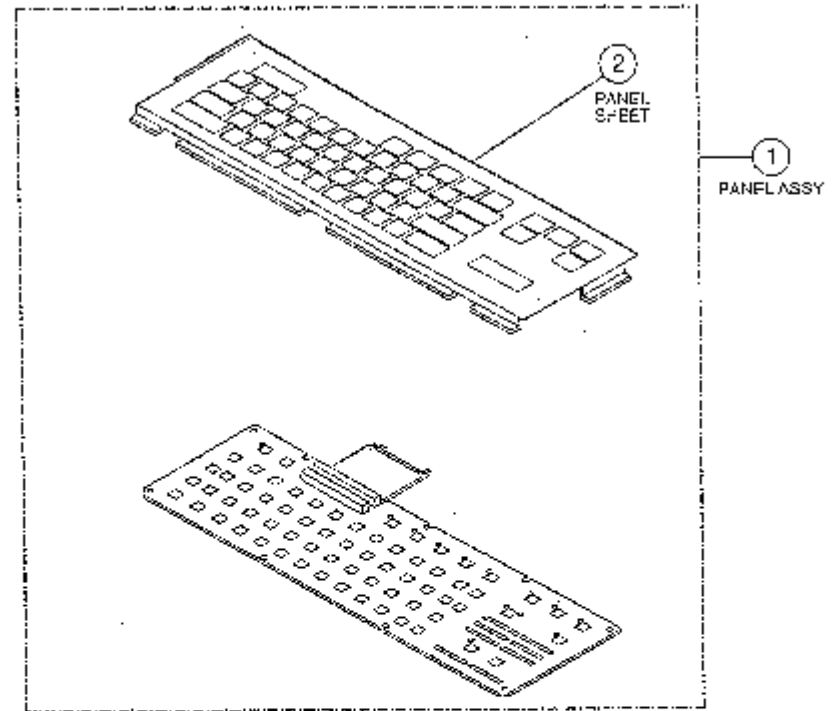
02 OPERATION PANEL

UNIT

870 8 428274 -1101100 037000-1000207
881071 - 030700 882004 - 030700
891001 - 851026

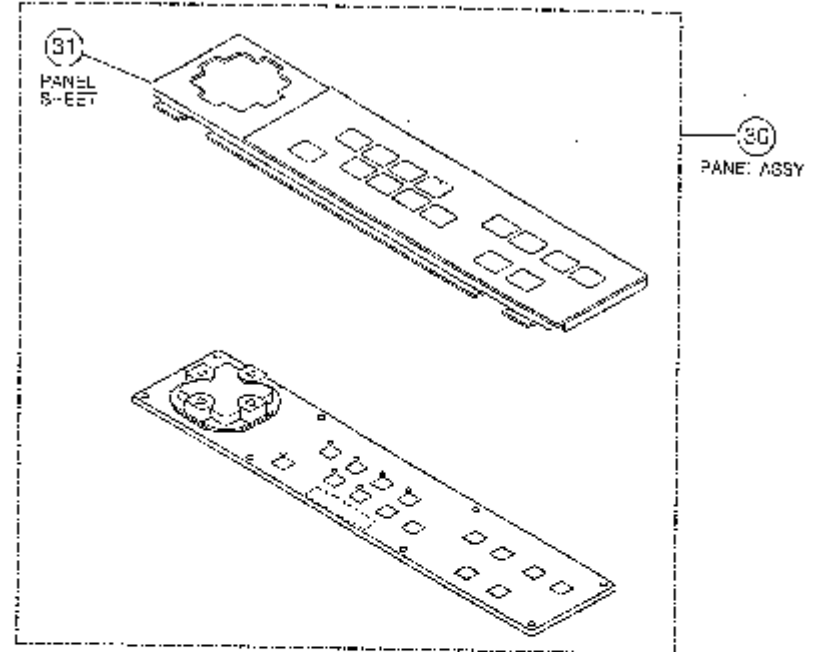


| | | | | |
|---------------------|-----|----------------|----|----------------------------------|
| 02. OPERATION PANEL | UPN | 1-KEY-14 *-A * | SN | 21010378-41011/04 0150021-31*007 |
| | | | | 252.001-130104 2020164-1020031 |
| | | | | 50 200-16122-5 |



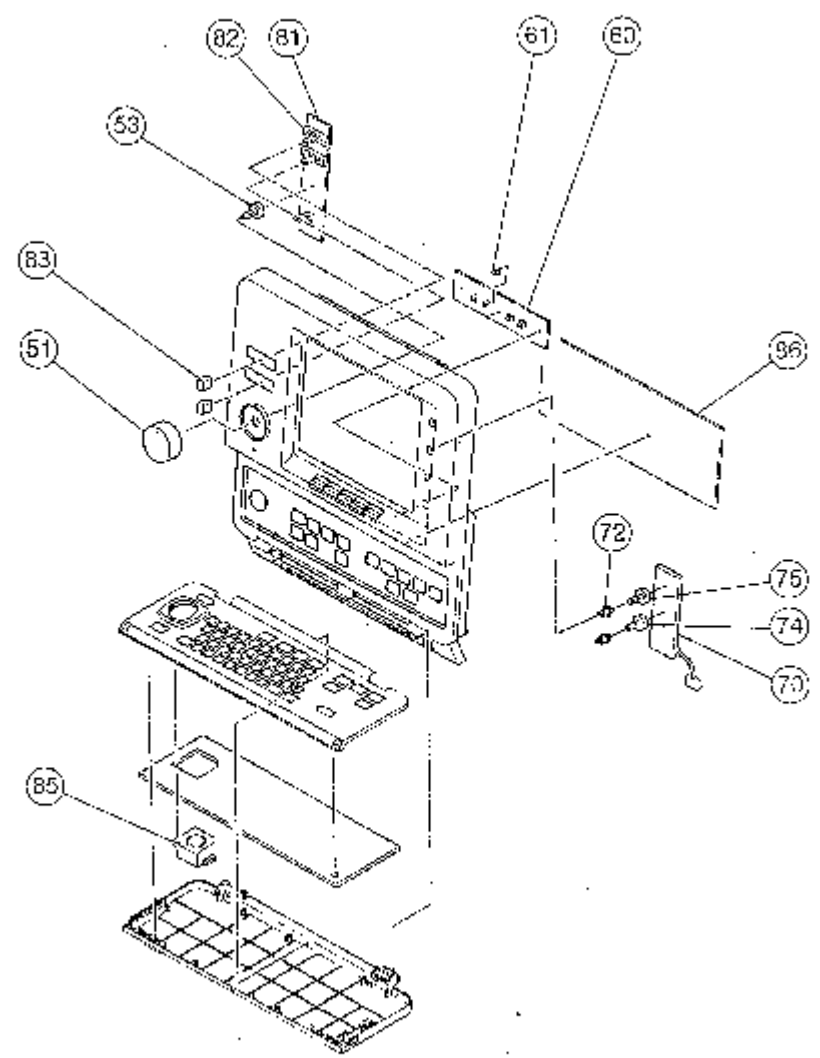
NN2-0206 Rev.10
SECTION 13 PARTS LIST

| | | |
|--------------------|-----------------------|---|
| 02 OPERATION PANEL | UNIT
L-KEY-14 *-B* | S/N:
21403770-3-41179 382481-1-222767
2182201-9-222128 2722514-202106
2810231-07,10,14 |
|--------------------|-----------------------|---|



02 OPERATION PANEL

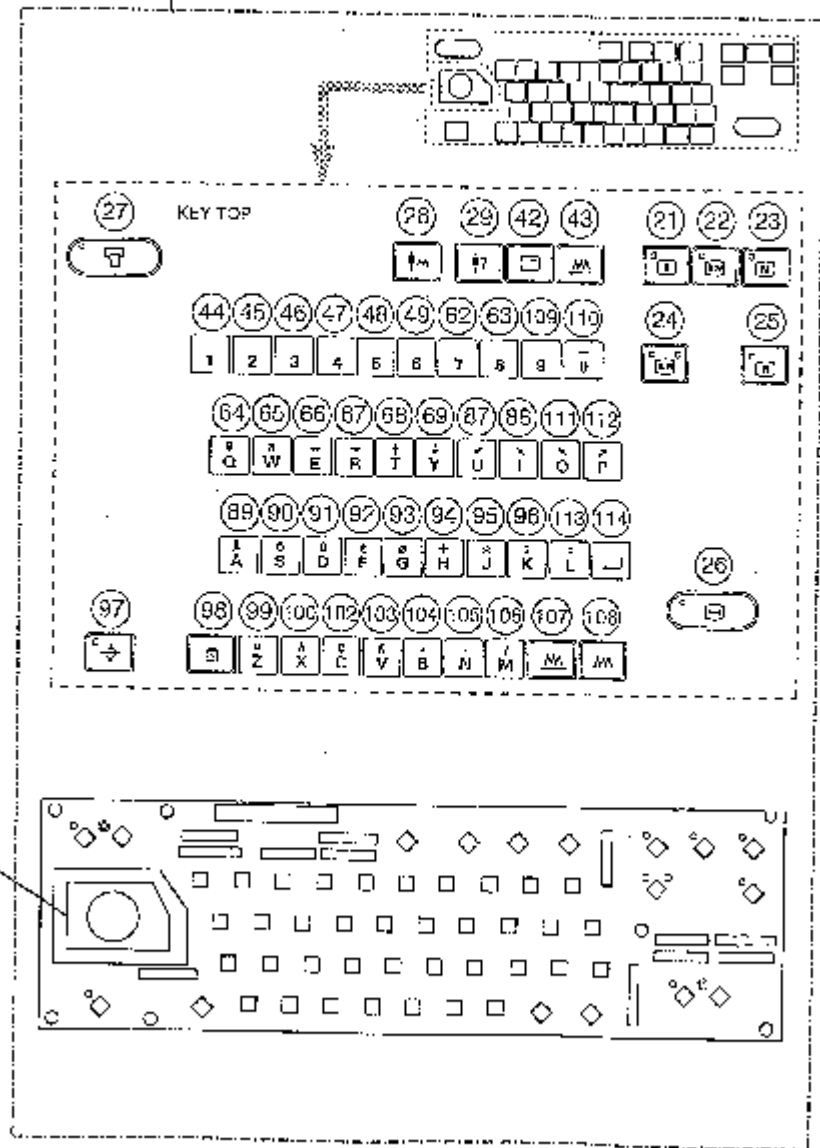
| | | |
|------|-----|---|
| UNIT | S/N | 1507507~
1527012 - 1528042
1542002~ |
|------|-----|---|



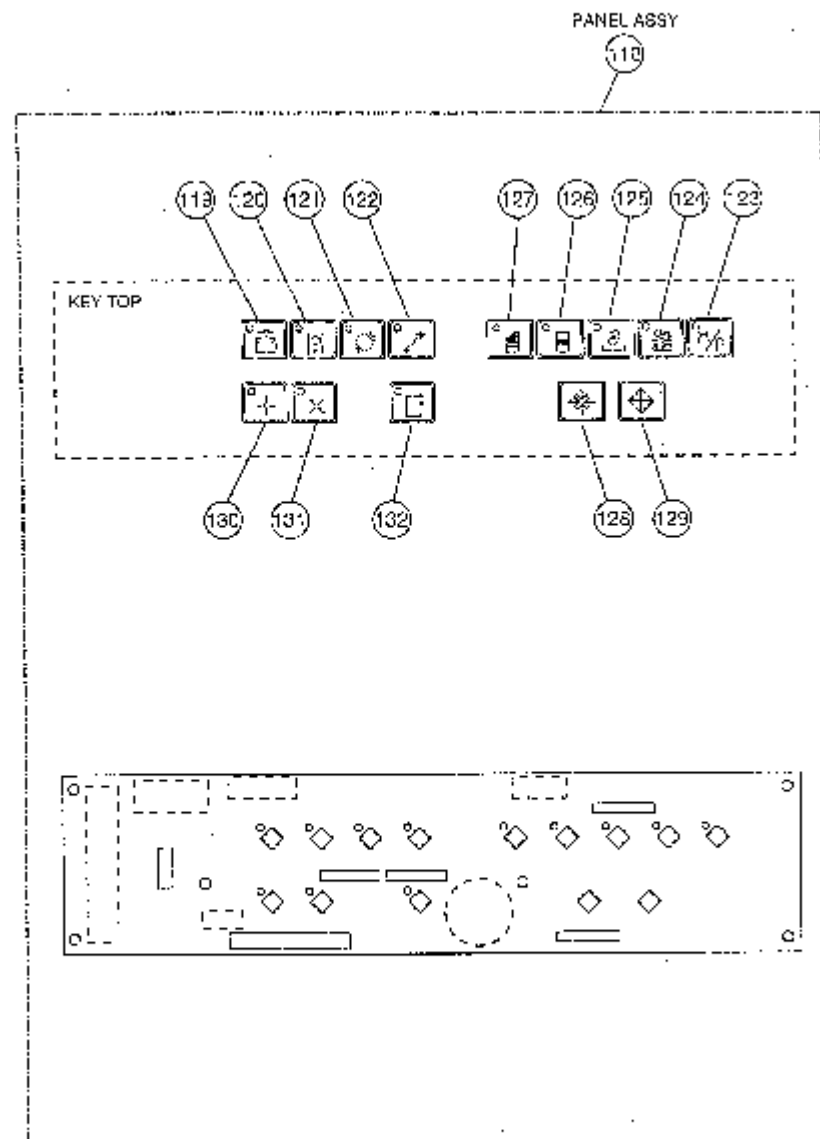
| | | |
|---------------------|--------------------|--|
| 02: OPERATION PANEL | UNIT
L-KEY-58-2 | S/N
3202183-
3202184-3222183
3222184- |
|---------------------|--------------------|--|

PANEL ASSY

20



| | | | |
|--------------------|------------|------|---------------------------|
| 02 OPERATION PANEL | UNIT | QNTY | 330156~ |
| | L-KEY-58-1 | | 332157~ 332158
332159~ |



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SECTION 13 PARTS LIST

| INDEX
CZ | OPTIONAL PANEL | | | UNIT
4E-11 | 3/8 |
|-------------|----------------|------------------------|--------------|---------------|------|
| TCN | CODE No. | PARTS No. | DESCRIPTION | SERIAL No. | SFD. |
| 1 | 4A200488 | L-KEY-14-A(1) | PANEL ASSY | | |
| 1 | 4A200925 | L-KEY-143-A(1) | PANEL ASSY | | |
| 2 | 4A200011 | L-KEY-14-6(Y)#1, 2, 3 | PANEL SHEET | | |
| 2 | 4A200926 | L-KEY-14B-6(Y)#1, 2, 3 | PANEL SHEET | | |
| 8 | A800607 | 182A89, 9A20 | JUMPER CABLE | | |
| 20 | 4A200927 | L-KEY-58-2 | PANEL ASSY | | |
| 21 | 4A200529 | L-KEY-58-2#31 | KEY TOP | | |
| 22 | 4A200929 | L-KEY-58-2#32 | KEY TOP | | |
| 23 | 4A200930 | L-KEY-58-2#33 | KEY TOP | | |
| 24 | 4A200931 | L-KEY-58-2#34 | KEY TOP | | |
| 25 | 4A200932 | L-KEY-58-2#35 | KEY TOP | | |
| 26 | 4A200933 | L-KEY-58-2#36 | KEY TOP | | |
| 27 | 4A200934 | L-KEY-58-2#37 | KEY TOP | | |
| 28 | 4A200935 | L-KEY-58-2#38 | KEY TOP | | |
| 29 | 4A200936 | L-KEY-58-2#39 | KEY TOP | | |
| 30 | 4A200490 | L-KEY-14-B(1) | PANEL ASSY | | |
| 30 | 4A200937 | L-KEY-143-B(1) | PANEL ASSY | | |
| 31 | 4A200013 | L-KEY-14-3(Y)#1, 2, 3 | PANEL SHEET | | |
| 31 | 4A200938 | L-KEY-14B-3(Y)#1, 2, 3 | PANEL SHEET | | |
| 42 | 4A200939 | L-KEY-58-2#310 | KEY TOP | | |
| 43 | 4A200940 | L-KEY-58-2#311 | KEY TOP | | |
| 44 | 4A200941 | L-KEY-58-2#312 | KEY TOP | | |

* ASSEMBLED PARTS : Please apply to our Technical Support for detail.
 アセンブリ : 詳細についてはテクニカルサポートまで問い合わせ下さい。

| INDEX
62 | D BATTERY PANEL | | | CHK T
L KEY-11/53 | S/N |
|-------------|-----------------|----------------|--------------------------|----------------------|-------|
| ITEM | CODE No. | PARTS No. | DESCRIPTION | SE-21A No. | SPEC. |
| 45 | *A200942 | L-KEY-58-24S13 | KEY TOP | | |
| 46 | *A200943 | L-KEY-58-24S14 | KEY TOP | | |
| 47 | *A200944 | L-KEY-58-24S15 | KEY TOP | | |
| 48 | *A200945 | L-KEY-58-24S16 | KEY TOP | | |
| 49 | *A200946 | L-KEY-58-24S17 | KEY TOP | | |
| 50 | A801474 | EP-2878* | PCB : GAIN & POWER LEC | | |
| 51 | A120066 | US1-115-SA114 | KnOB | | |
| 52 | A020025 | LMC 2SAF20B13 | REGISTER VARIABLE ROTATE | | |
| 53 | A020026 | EVJ060F03B13 | RUS STOR VARIABLE ROTATE | | |
| 54 | A301475 | EP-2879* | PCB : SELECT KEY | | |
| 55 | A811040 | RXF-4100 | SWITCH PLS. | | |
| 56 | *A200947 | L-KEY-58-24S18 | KEY TOP | | |
| 57 | *A200948 | L-KEY-58-24S19 | KEY TOP | | |
| 58 | *A200949 | L-KEY-58-24S20 | KEY TOP | | |
| 59 | *A200950 | L-KEY-58-24S21 | KEY TOP | | |
| 60 | *A200951 | L-KEY-58-24S22 | KEY TOP | | |
| 61 | *A200952 | L-KEY-58-24S23 | KEY TOP | | |
| 62 | *A200953 | L-KEY-58-24S24 | KEY TOP | | |
| 63 | *A200954 | L-KEY-58-24S25 | KEY TOP | | |
| 64 | A801476 | EP-2830* | PCB : VIEW CONT / BRIGHT | | |
| 65 | A120067 | US1-115-SA115 | SWITCH CAP | | |
| 66 | A120068 | US1-115-SA116 | KnOB | | |

* ASSEMBLED PARTS : Please apply to our Technical Support for detail.
アッセンブリ : 詳細についてはテクニカルレポートまで問い合わせ下さい。

MMZ-0206 Rev. 10
SECTION 3 PARTS LIST

| INDEX
02 | OPERATION NAME | | UNIT
L-KEY-14/58 | S/N | |
|-------------|----------------|----------------|--------------------------|------------|------|
| ITEM | CODE No. | PARTS No. | DESCRIPTION | SERIAL No. | QTY. |
| 73 | A61641 | LS-200-011 | SWITCH PUSH | | |
| 74 | A140074 | RJ-13PH-1A | RESISTOR VARIABLE ROTATE | | |
| 75 | A140073 | RJ-13PH-200K | RESISTOR VARIABLE ROTATE | | |
| 80 | A801477 | EF-26701 | PCB PART CONTROL | | |
| 81 | A631478 | L-KEY-58-3 | PCB STG | | |
| 82 | A623067 | FRANKS15353 | PRESISTOR VARIABLE SLIDE | | |
| 83 | A510034 | SP-4112 | RNO3 | | |
| 90 | AR16207 | TRB-POSC1(BUN) | TRACK BALL | | |
| 87 | *A200955 | L-KEY-58-24325 | KEY TOP | | |
| 88 | *A200955 | L-KEY-58-24327 | KEY TOP | | |
| 89 | *A200957 | L-KEY-58-24328 | KEY TOP | | |
| 90 | *A200958 | L-KEY-58-24329 | KEY TOP | | |
| 91 | *A200959 | L-KEY-58-24330 | KEY TOP | | |
| 92 | *A200960 | L-KEY-58-24331 | KEY TOP | | |
| 93 | *A200961 | L-KEY-58-24332 | KEY TOP | | |
| 94 | *A200962 | L-KEY-58-24333 | KEY TOP | | |
| 95 | *A200963 | L-KEY-58-24334 | KEY TOP | | |
| 96 | *A200964 | L-KEY-58-24335 | KEY TOP | | |
| 97 | *A200965 | L-KEY-58-24336 | KEY TOP | | |
| 98 | *A200966 | L-KEY-58-24337 | KEY TOP | | |
| 99 | *A200937 | L-KEY-58-24338 | KEY TOP | | |
| 100 | *A200968 | L-KEY-58-24339 | KEY TOP | | |

* ASSEMBLED PARTS : Please apply to our Technical Support for detail.
 アクセサリー : 詳細についてはテクニカルサポートまでお問い合わせ下さい。

| INDEX
02 | OPERATION PANEL | | | UNIT
L-KEY-14/ES | S/N |
|-------------|-----------------|----------------|-------------------|---------------------|-------|
| ITEM | CODE No. | PARTS No. | DESCRIPTION | SERIAL No. | SPEC. |
| 102 | #A200569 | L-KEY-56-24340 | KEY TOP | | |
| 103 | #A200570 | L-KEY 56 24341 | KEY TOP | | |
| 104 | #A200571 | L-KEY 56 24342 | KEY TOP | | |
| 105 | #A200572 | L-KEY 56 24343 | KEY TOP | | |
| 106 | #A200573 | L-KEY-56-24344 | KEY TOP | | |
| 107 | #A200574 | L-KEY-56-24346 | KEY TOP | | |
| 108 | #A200575 | L-KEY-56-24346 | KEY TOP | | |
| 109 | #A200576 | L-KEY-56-24347 | KEY TOP | | |
| 110 | #A200577 | L-KEY-56-24348 | KEY TOP | | |
| 111 | #A200578 | L-KEY-56-24349 | KEY TOP | | |
| 112 | #A200579 | L-KEY-56-24350 | KEY TOP | | |
| 113 | #A200580 | L-KEY-56-24351 | KEY TOP | | |
| 114 | #A200581 | L-KEY-56-24352 | KEY TOP | | |
| 116 | #A200582 | L-KEY-55-1 | PCB FUNCTION ASSY | | |
| 119 | #A200583 | L-KEY-58-14353 | KEY TOP | | |
| 120 | #A200584 | L-KEY-58-14354 | KEY TOP | | |
| 121 | #A200585 | L-KEY 58 14355 | KEY TOP | | |
| 122 | #A200586 | L-KEY-58-14356 | KEY TOP | | |
| 123 | #A200587 | L-KEY 58 14357 | KEY TOP | | |
| 124 | #A200588 | L-KEY-58-14358 | KEY TOP | | |
| 125 | #A200589 | L-KEY-58-14359 | KEY TOP | | |
| 126 | #A200590 | L-KEY-58 14360 | KEY TOP | | |

* ASSEMBLED PARTS : Please apply to our Technical Support for details.
 アクセサリー : #38についてはテクニカルサポートまでお問い合わせ下さい。

MN2-0206 Rev.10
SECTION 12 PARTS LIST

| INDEX
02 | | OPERATION SYMBOL | | UNIT
L KEY 14/59 | QTY |
|-------------|----------|------------------|-------------|---------------------|-------|
| ITEM | CODE No. | PARTS No. | DESCRIPTION | SERIAL No. | SPEC. |
| 127 | 4200981 | L-KEY-58-13551 | KEY TOP | | |
| 128 | 4200982 | L-KEY-58-13562 | KEY TOP | | |
| 129 | 4200993 | L-KEY-58-13563 | KEY TOP | | |
| 130 | 4200994 | L-KEY-58-13534 | KEY TOP | | |
| 131 | 4200985 | L-KEY-58-13565 | KEY TOP | | |
| 132 | 4200986 | L-KEY-58-13566 | KEY TOP | | |

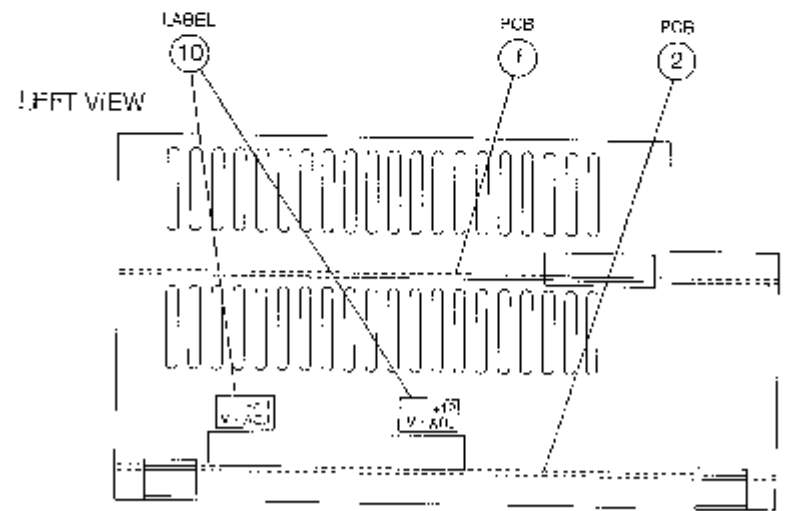
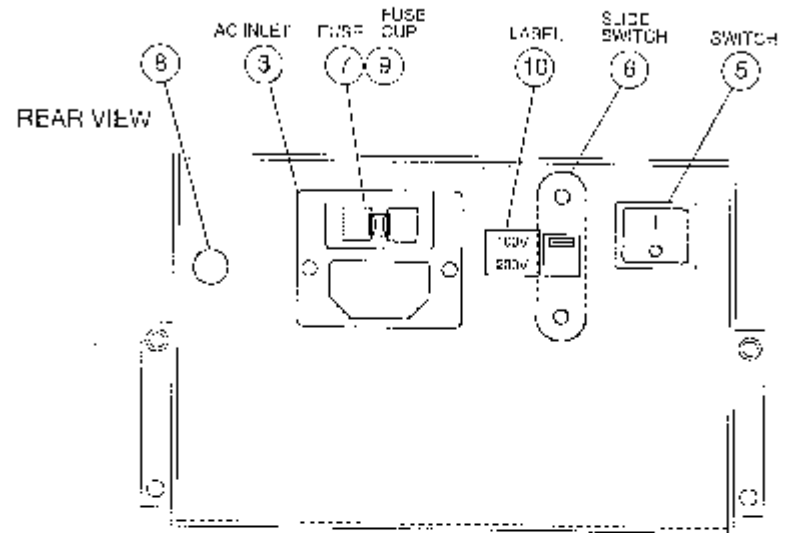
* ASSEMBLED PARTS : Please apply to our Technical Support for detail.
 アセンブリ : 詳細についてはテクニカルサポートまで問い合わせ下さい。

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| | | | |
|----|-------------------|------------------|-----|
| 03 | POWER SUPPLY UNIT | UNIT
PSU-S500 | S/N |
|----|-------------------|------------------|-----|

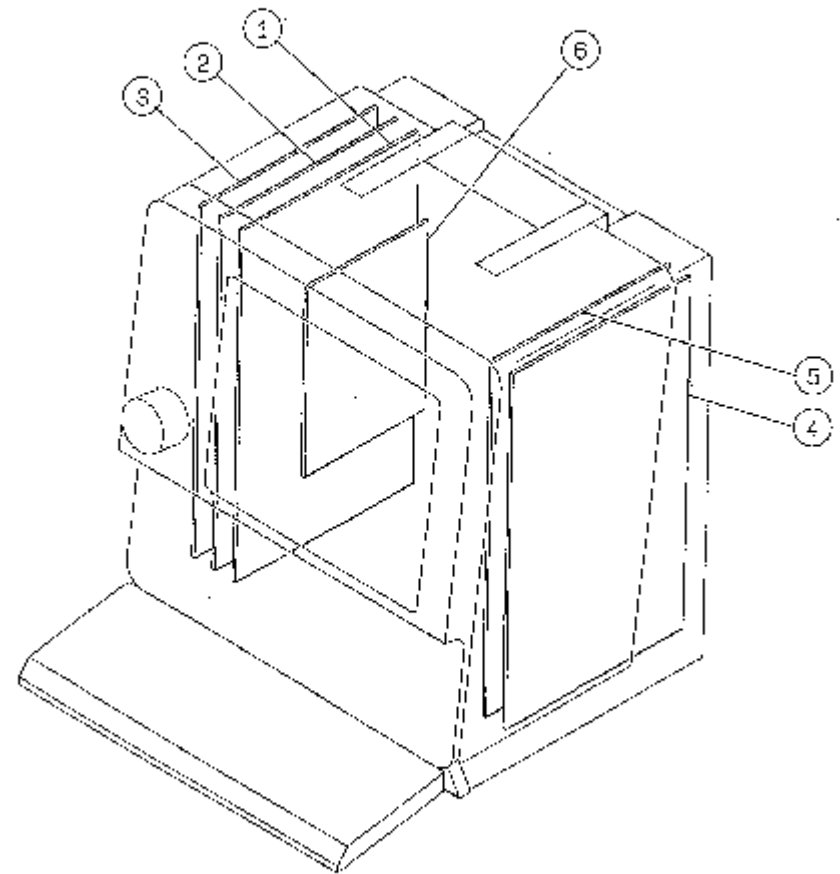
POWER SUPPLY UNIT



| INDEX
GS | POWER SUPPLY | | UNIT
PSU-S500 | S/N | |
|-------------|--------------|-------------|----------------------|----------------------|-----------------|
| ITEM | QTY No. | PARTS No. | DESCRIPTION | SERIAL No. | SPEC. |
| 1 | A601470 | E7-2898* | PCB | | |
| 2 | A601460 | E7-2895A | PCB | | |
| 3 | A301038 | 8942-862.60 | AC INLET | | |
| 4 | A611042 | 1F04.0.31 | SWITCH | | |
| 5 | A611014 | 6U110611 | SWITCH SLIDE | | |
| 7 | A621025 | 413 000 | FUSE | | FOR 100V SYSTEM |
| 7 | A100458 | 21801.6 | FUSE | | FOR 200V SYSTEM |
| 8 | A100148 | 0E 5 6 | GROUND TERMINAL | ~3300365
~3323063 | |
| 8 | A100454 | 1-CN 3R | EQUAL POTENTIAL STUD | 3300366~
3323064~ | |
| 9 | A621026 | 8842-901.64 | FUSE CAP | | FOR 100V SYSTEM |
| 9 | A621053 | 8842-902.44 | FUSE CAP | | FOR 200V SYSTEM |
| 10 | A300114 | P 33 3500 5 | LABEL | | |
| 11 | A090251 | PSU-S500* | POWER SUPPLY UNIT | | |

※ ASSEMBLED PARTS : Please apply to our Technical Support for detail.
アセンブリ : 詳細についてはテクニカルサポートまでお問い合わせ下さい。

| | | | |
|----|----------|------|-----|
| 04 | PCB LIST | UNIT | S/N |
|----|----------|------|-----|



| INDEX
No. | PCBs | | UNIT | SN | |
|--------------|---------|-------------|---------------------|---------------|--------------|
| Item | Code | Part Number | Description | Serial Number | Serial Code |
| 1 | A801401 | EP-2870* | PCB:ITF | | |
| 2 | A801402 | EP-2871* | PCB:DCO | | |
| 2 | A801403 | EP2871*** | PCB:DCO | | |
| 2 | A802906 | EP453190** | PCB:DU | M4751 - | FOR 628 JNES |
| 2 | A802907 | EP453190** | PCB:DU | M4751 - | FOR 628 JNES |
| 5 | A801484 | EP-2872* | PCB:CPU | | |
| 3 | A801485 | EP3872*** | PCB:MPU & ITF | | |
| 3 | A802805 | EP453000** | PCB:CPU | M4457 - | FOR 628JA |
| 4 | A801490 | EP 2868* | PCB:RX | | |
| 5 | A801467 | EP-2869* | PCB:TX CONTROL | | |
| 6 | A801847 | TM-0118 | PCB-MONITOR CONTROL | M40802 | |
| 6 | A801804 | TM-0165 | | M00286 - | |
| 6 | A802606 | TM-0243 | PCB-MAIN BOARD | M0446 - | |
| 6 | A800012 | UNW-916 | PCB-MONITOR CONTROL | | M40801 |

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(Page for addition and revision)

| QTY | Screws & Small Parts | | UNIT | S/N | |
|------|----------------------|------------|--------------------------|------------|--------|
| ITEM | CODE NO. | PARTS NO. | DESCRIPTION | SERIAL NO. | RQFC |
| | A301403 | ANK3-8 | SCREW:ANK3-8 | | |
| | A303311 | BNK3-10 | SCREW:BNK3-10 | | |
| | A303320 | BNK3-30 | SCREW:BNK3-30 | | |
| | A303308 | BNK3-8 | SCREW:BNK3-8 | | |
| | A304308 | BNK3-25e | SCREW:BNK3-25e | | |
| | A303412 | BNK4-12 | SCREW:BNK4-12 | | |
| | A140079 | DF150 | CF FASTNER:INDEX 01 | | |
| | A622005 | GN-05 | CABLE CLAMP : INDEX 01 | | |
| | A305303 | GNK2-83e | SCREW:GNK2-83e | | |
| | A535416 | GNK4-16Ee | SCREW:GNK4-16Ee | | |
| | A620042 | EDS-1 | EDGE SADDL: INDEX 01 | | |
| | A620057 | EDS-1209h | EDGE SADDLE:INDLK 01 | | |
| | A100121 | EMR-16-VST | ELASTOMER VLSH: INDEX 01 | | L=85.1 |
| | A100121 | EMR-16-VST | ELASTOMER MESH: INDEX 01 | | L=80 |
| | A3E1103 | H5 | NUT HEXAGONAL:K3 | | |
| | A3-1268 | HK2-6-6 | SCREW:HK2-6-6 | | |
| | A311203 | HK3-6 | SCREW:HK3-6 | | |
| | A600027 | P-4211 | LABEL:INDEX 01 | | |
| | A583203 | PN3 | WASHER:PN3 | | |
| | A571310 | S3-10 | SCREW FLAT HEAD:S3-10 | | |
| | A321312 | S3-12 | SCREW FLAT HEAD:S3-12 | | |
| | A391315 | S3-15 | SCREW FLAT HEAD:S3-15 | | |
| | A321308 | S3-8 | SCREW FLAT HEAD:S3-8 | | |

Section 13 PARTS LIST

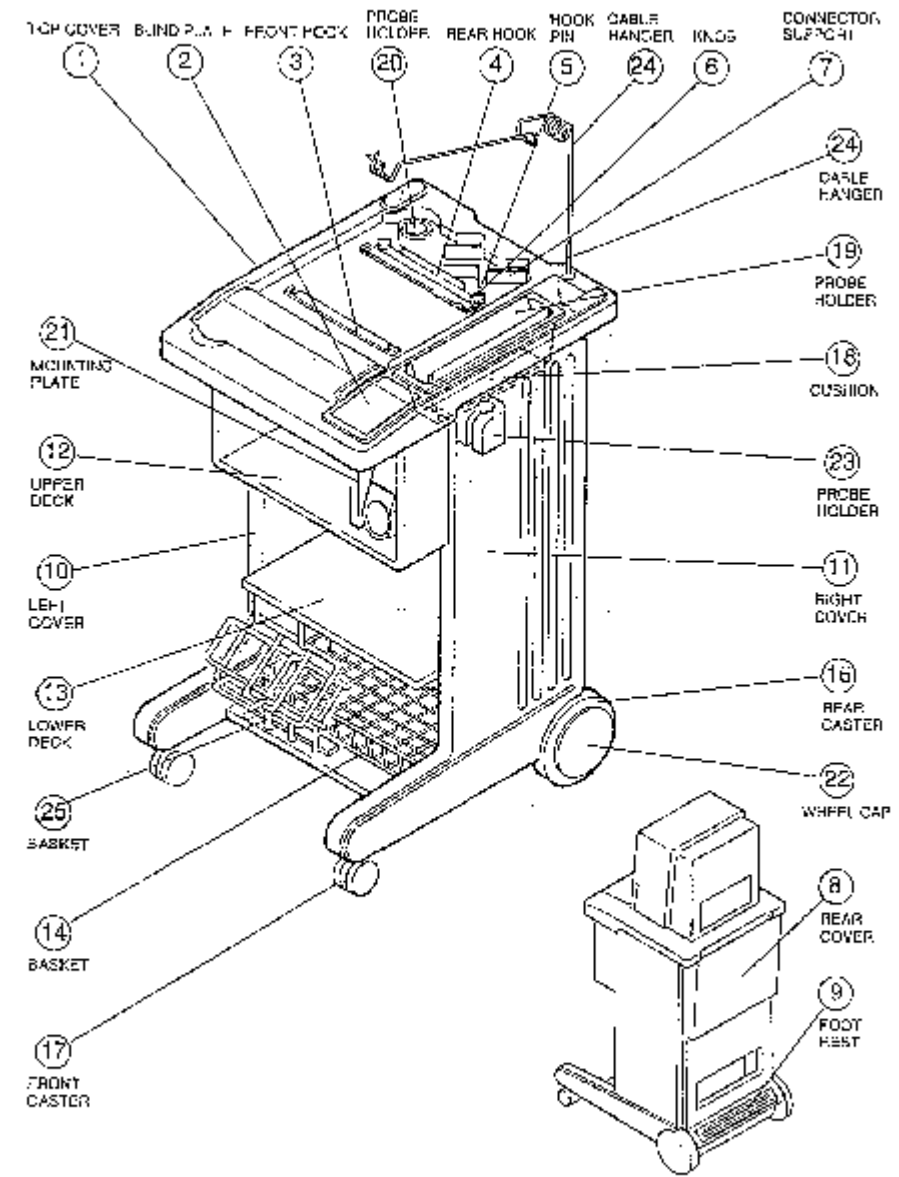
| PLN | CODE NO. | PARTS NO. | DESCRIPTION | SERIAL NO. | Spec. |
|-----|----------------------|-----------|-------------------------|------------|-------|
| 05 | Screws & Brsl. Parts | | | JMT | S/A |
| | A32230B | S2-80c | SOFTW FLAT HEAD: S3+80c | | |
| | A10603R | SP-8302 | GROUND STRIP: INDEX C: | | |
| | A383303 | SM2 | WASHER: SM2 | | |
| | A622001 | LAMS 07-0 | CABLE CLAMP: INDEX 01 | | |
| | A522000 | JL-13 | CABLE CLAMP: INDEX 01 | | |

* name: ASSEMBLY PARTS
アセンブリパーツ

(Page for addition and revision)



| | | | |
|----|----------|---------|-----|
| 06 | CARRIAGE | RMT-500 | REV |
|----|----------|---------|-----|



SSD-520 0501

| INDEX NO. | CARRIAGE | | | UNIT RHT-500 | S/N |
|-----------|-----------|---------------|----------------------------|--------------|-------|
| ITEM | CONF. No. | PARTS No. | DESCRIPTION | SERIAL No. | SPEC. |
| 1 | A120060 | RHT-500*1 | COVER-TOP | | |
| 2 | 44200323 | SAP-500-06-03 | BLIND PLATE | | |
| 3 | A100320 | RHT-500H12 | BRACE-HOOK, FRONT | | |
| 4 | A100381 | RHT-500-14 | BRACE-HOOK, REAR | | |
| 5 | A100382 | RHT-500*13 | HOCK PIN | | |
| 6 | A100383 | RHT-500H19 | SPCB | | |
| 7 | A100384 | RHT-500H15 | CONDUCTOR SUPPORT | | |
| 8 | A120070 | RHT-500H2 | CURVE-REAR | | |
| 9 | A120071 | RHT-500*10 | POST REST | | |
| 10 | A120072 | RHT-500H4 | COVER-LEFT | | |
| 11 | 44200324 | SAP-500-03-11 | COVER-RIGHT | | |
| 12 | A120073 | RHT-500*21 | DECK-UPPER | | |
| 13 | 44200325 | SAP-500-06-13 | DECK-LOWER | | |
| 14 | A120074 | RHT-500H7 | BASKET | | |
| 15 | A140075 | EH-100 | CASTER-REAR | | |
| 17 | A140076 | WMS-03K | CASTER-FRONT | | |
| 18 | A120075 | RHT-500*15 | CUSHION | | |
| 19 | A120076 | RHT-500H17 | PROBE HOLDER | | |
| 20 | A120077 | RHT-500H20 | PROBE HOLDER | | |
| 21 | 44200326 | SAP-500-06-21 | HOUSING PLATE-JELLY HOLDER | | |
| 22 | A120078 | RHT-500*6 | WHEEL CAP | | |
| 23 | A120079 | RHT-500H35 | PROBE HOLDER | | |

* ASSEMBLED PARTS : Please apply to our Technical Support for detail.
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Section 13 PARTS LIST

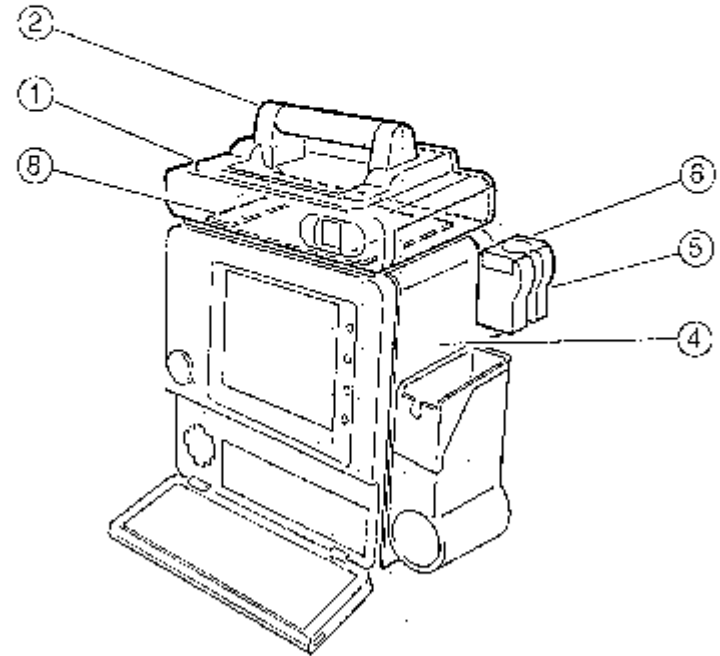
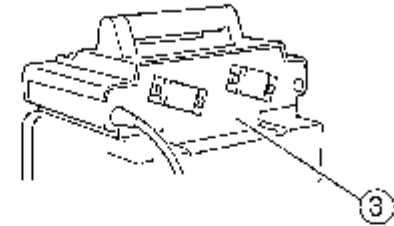
| INDEX
NO. | CABLEAGE | | | INCT
EXT-330 | S/21 |
|--------------|----------|------------|---------------------|-----------------|-------|
| ITEM | CODE No. | PARTS No. | DESCRIPTION | SERIAL No. | SPEC. |
| 24 | A120280 | EXT-530P25 | CABLE FMIG33 | | |
| 25 | A140077 | HP-FX500-2 | BASSET-ACP-500-P | | |
| | A303310 | BK43-10 | SCREW+BK43-10 | | |
| | A303308 | BK23-8 | SCREW+BK23-8 | | |
| | A303412 | BK44-12 | SCREW+BK44-12 | | |
| | A303408 | BK44-8 | SCREW+BK44-8 | | |
| | A303512 | BK45-12 | SCREW+BK45-12 | | |
| | A347310 | B65-10 | SCREW+B65-10 | | |
| | A383205 | FV5 | WASHER INDEX 01, 04 | | |
| | A321305 | S3-5 | SCREW INDEX 03 | | |
| | A383305 | S45 | WASHER INDEX 01 | | |

* ASSIGNED PARTS : Please apply to our Technical Support for detail.
 プックションブリ : 詳細についてはテクニカルサポートまでお問い合わせ下さい。

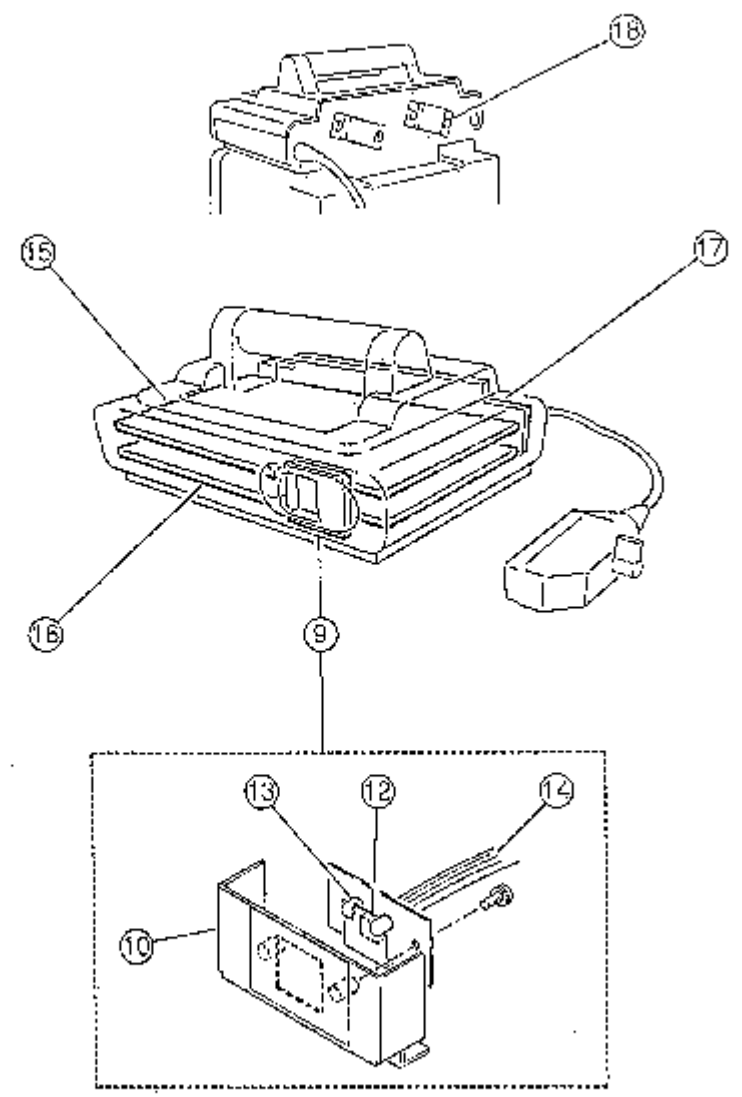
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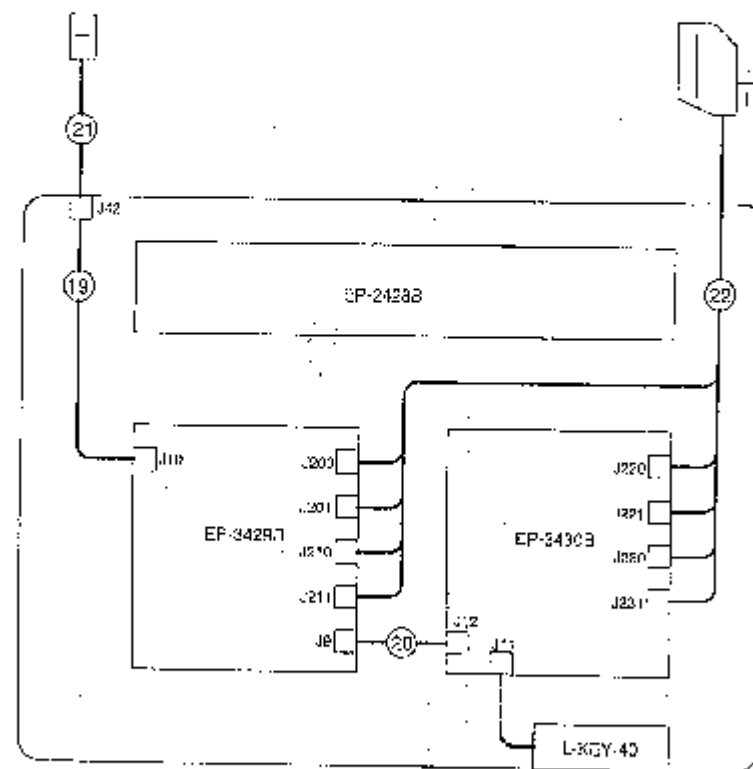
| | | | |
|----|--------------|---------------|-----|
| 07 | JUNCTION BOX | JWB
JB-172 | S/A |
|----|--------------|---------------|-----|



| | | | |
|----|--------------|---------------|-----|
| 07 | JUNCTION BOX | UN-
JR-172 | S/M |
|----|--------------|---------------|-----|



| | | | |
|----|--------------|----------------|-----|
| 07 | JUNCTION BOX | UNIT
JR-172 | S/N |
|----|--------------|----------------|-----|



| REF. No. | PROBE EXCHANGE BOX | | UNIT | S/N | |
|----------|--------------------|--------------------|-----------------------------|------------|-----------------|
| 07 | | | JB-472 | | |
| ITEM | CODE No. | PARTS No. | DESCRIPTION | SERIAL No. | QTY |
| | *A200377 | SAP-500-07-01 | COVER : JH1CR | | EXCEPT 230V PAL |
| 1 | A000064 | SAP-500-07-01D-PAL | COVER : JH1FR | | FOR 230V PAL |
| 2 | A120031 | JD-1724S | HANDLE | | |
| 3 | *A200328 | SAP-500-07-03 | COVER : RLAR | | EXCEPT 230V PAL |
| 3 | A000066 | SAP-500-07-02B-PAL | COVER : RLAR | | FOR 230V PAL |
| 4 | *A200829 | SAP-500-07-04 | PROBE HOLDER MOUNTING BRACE | | EXCEPT 230V PAL |
| 4 | A000059 | SAP-500-07-04D PAL | PROBE HOLDER MOUNTING BRACE | | FOR 230V PAL |
| 5 | *A200330 | SAP-500-07-05 | HOOK HOLDER (1) | | |
| 6 | A120082 | HP-PH172-1A0 | HOOK HOLDER (2) | | |
| 6 | *A200331 | SAP-500-07-08 | SLICE RAIL | | |
| 9 | *A200332 | L-KEY-40 | PANEL ASSY | | |
| 10 | *A200333 | L-KEY-40#1, 2, 3 | PANEL SWEL | | |
| 12 | A611013 | 25F-1050 | SWITCH PUSH | | |
| 13 | A615004 | VR8658158 | LED | | |
| 14 | *A200335 | L-KEY-40#7 | CABLE ASSY | | |
| 15 | A800887 | EP-2420 | PCB:RELAY . A | | |
| 16 | A800883 | EP-2430 | PCB:RELAY . B | | |
| 17 | A900884 | EP-5428 | PCB:CONNECTOR | | |
| 18 | *A200482 | SAP-500-31-43 | CONTACT SPRING | | |
| 19 | A800616 | CD-JB172-A | CABLE:J12~J10 | | |
| 20 | A800617 | CD-JB172-B | CABLE:J12~J9 | | |
| 21 | A800618 | L-CABLE-450 | CABLE:J47~J47 | | |

* ASSEMBLED PARTS : Please apply to our Technical Support for detail.
アッセンブリ : 詳細についてはテクニカルサポートまでお問い合わせ下さい。

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SECTION 18 PARTS LIST

| ITEM | CODE No. | PARTS No. | DESCRIPTION | SERIAL No. | QTY |
|------|----------|-----------------|---|------------|-----|
| 22 | A304355 | GAP-500-07-02 | CABLE:PC
-J200, 201, 210, 211, 220, 221, 230 | | |
| | A304359 | ENK2-105a | SCREEN:ENK2-105a | | |
| | A304310 | ENK3-103a | SCREEN:ENK3-103a | | |
| | A304312 | ENK3-120a | SCREEN:ENK3-120a | | |
| | A304308 | ENK3-85a | SCREEN:ENK3-85a | | |
| | A800073 | P-32-60-3F | LABEL:INDICATION | | |
| | A800074 | P-42-JB172-1-UL | LABEL:CAUTION | | |
| | A321300 | 03-8 | SCREEN:INDEX:03 | | |
| | A383302 | SWP | WASHER:SWP | | |
| | A822015 | T1.5R | TIE WRAP:INDEX:01 | | |
| | A101119 | SA5, 5-13mm | POST | | |
| | A100449 | NMK-8310 | GROUND SPRING | | |

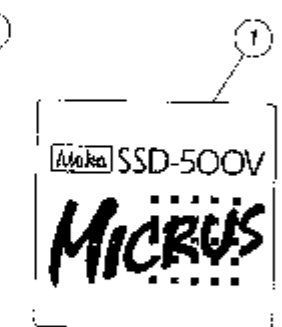
* ASSEMBLED PARTS : Please apply to our Technical Support for detail.
アッセンブリ : 詳細についてはテクニカルサポートまで問い合わせ下さい。

| | | | |
|----|-----------------|-------------------|-----|
| 39 | SUN TYPE CAMERA | UNIT
ACR-500-P | S/N |
|----|-----------------|-------------------|-----|

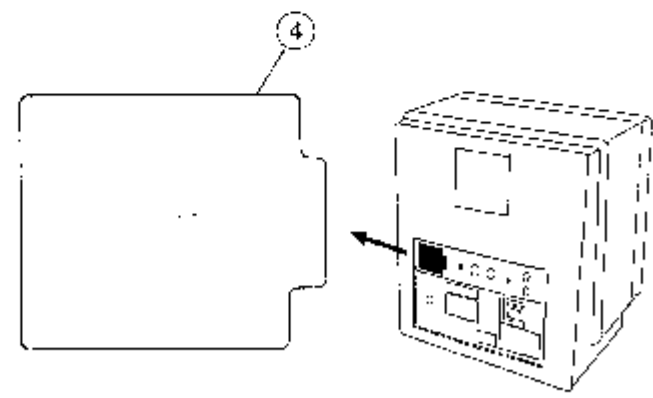
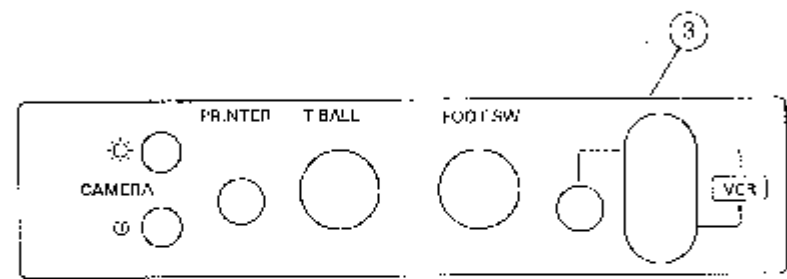
| TEN | SUC. NO. | PARTS NO. | DESCRIPTION | SERIAL NO. | SPEC. |
|-----|----------|-----------|-------------------|------------|-------|
| 1 | A310000 | ACR 500A1 | HOOD | | |
| 2 | AC10001 | ACR-500A2 | GRIP ASSY. | | |
| 2 | A310002 | ACR 500A3 | CAMERA BODY ASSY. | | |
| 4 | AC 0005 | ACR 500A4 | TRIGGER BAMP ASSY | | |

* means ASSEMBLY PARTS.
アッセンブリパーツ

| QTY | LABEL | UNIT | QTY |
|-----|-------|------|-----|
|-----|-------|------|-----|



| | | |
|----------|-----|----|
| 09 LABEL | UNT | SM |
|----------|-----|----|



MVZ-D205 Rev. 10
SECTION 13 PARTS LIST

| INDEX
C3 | LABEL | | UNIT | S/N | |
|-------------|----------|------------------|---|------------|-----------------------|
| QTY | CODE No. | PARTS No. | DESCRIPTION | SERIAL No. | SPEC. |
| 1 | A60008 | P-32-530000 | TYPE NAMEPLATE | [A] | FOR CIRCUMETRICS |
| 1 | A60010 | P-32-530010 | LABEL NAME PLATE | [A] | FOR CIRCUMETRICS |
| 1 | A60010B | P-32-530000EV-B | LABEL NAME PLATE | [A] | FOR JAPAN |
| 1 | A60010P | P-32-530000SC | LABEL NAME PLATE | [A] | FOR JAPAN (SINCE FY7) |
| 1 | A60010M | P-32-530000V | LABEL NAMEPLATE | [A] | EXCEPT JAPAN & USA |
| 1 | A60017 | P-32-530000E | LABEL NAMEPLATE | [B] | |
| 1 | A60017E | P-32-530000EV | LABEL NAMEPLATE | [B] | EXCEPT JAPAN |
| 2 | A60028 | P-32-530500-1UL | FUSE SPECIFICATION INDICATION NAMEPLATE | 9742814 | |
| 2 | A60028 | P-32-530500-1L10 | FUSE SPECIFICATION INDICATION NAMEPLATE | 0101556 | |
| 3 | A60019 | P-32-530000-2 | BACK CONNECTOR BOARD LABEL | 9100004 | |
| 4 | A60017 | HS1-1152P19 | LABEL NO. | [B] | |

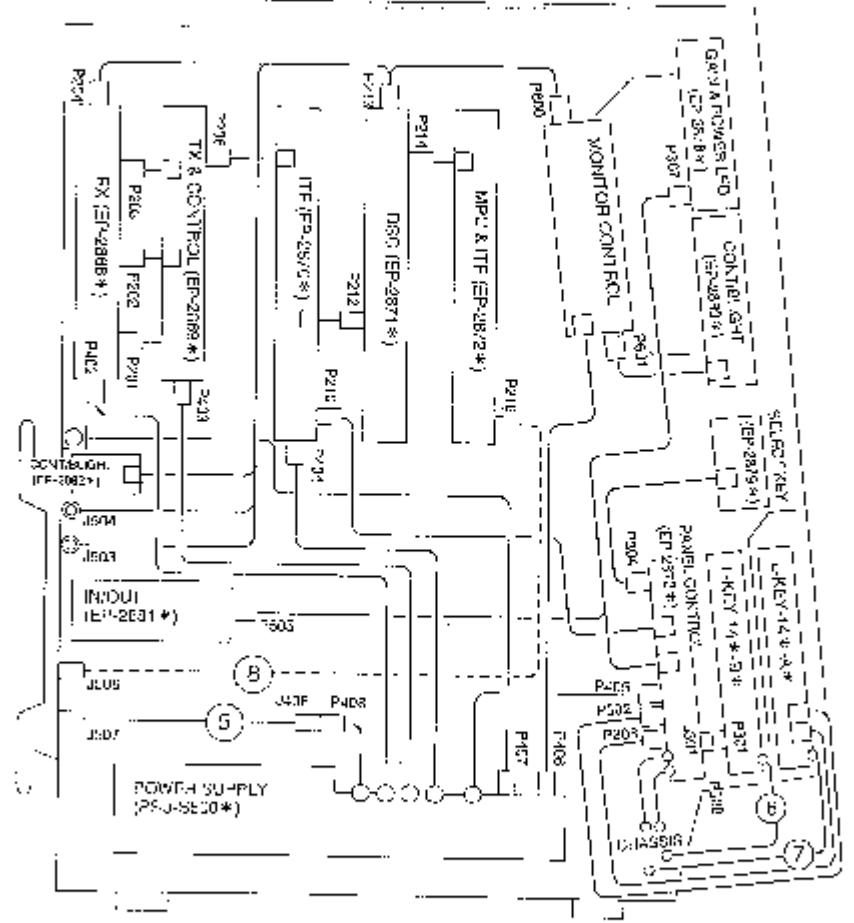
* ASSEMBLED PARTS : Please refer to our Technical Sheet for details.
 アセンブリ : 詳細についてはテクニカルリポートまで問い合わせ下さい。
[A], **[B]** の表記については、13 - 17ページを参照ください。
 See page 13 - 17 about these descriptions **[A]**, **[B]**.

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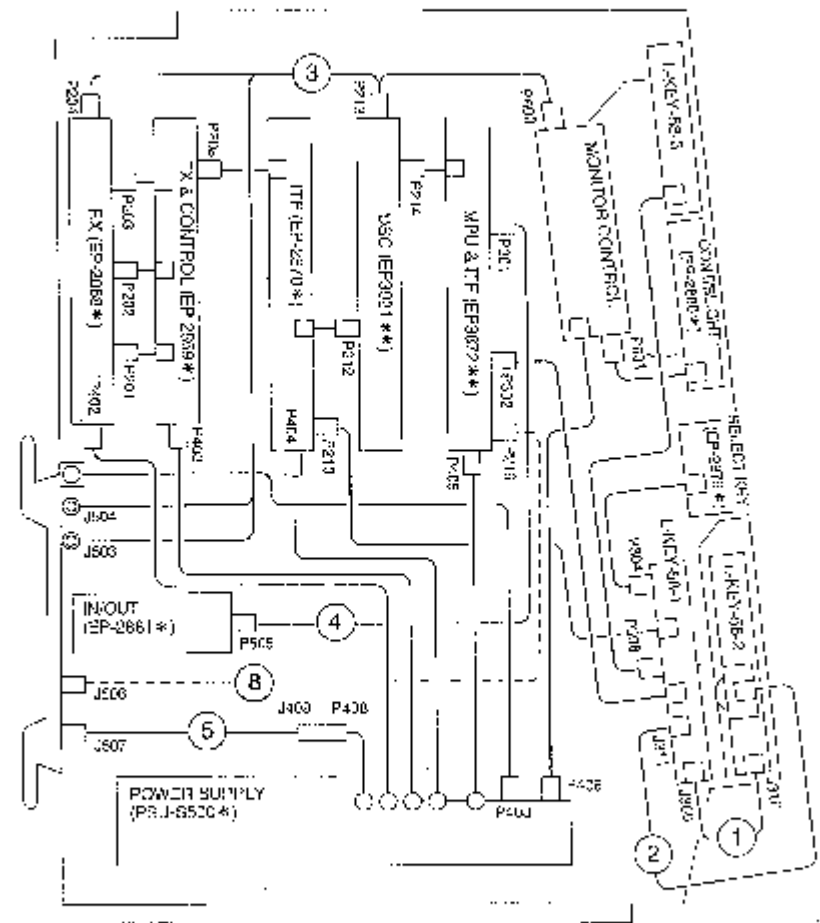
5

5

| | | | |
|----------|------|-------|--|
| 10 CABLE | JR T | QTY 1 | 10001-10001
10001-10001
10001-10001
10001-10001 |
|----------|------|-------|--|



| | | | |
|----|-------|------|-----|
| 10 | CABLE | UNIT | 824 |
|----|-------|------|-----|



MN2-0206 Rev. 1D
SECTION 13 PARTS LIST

| INDEX TO | CABLES | | UNIT | SYM | |
|----------|----------|-------------------|-------------------------------------|--------------|----------------------|
| ITEM | CODE No. | PARTS No. | DESCRIPTION | SER. AL. No. | SPEC. |
| 1 | A801463 | KLT-39-2824 | CABLE : J3C9~J310 | | |
| 2 | A801489 | L-KEY-E3-2422; 22 | CABLE (WITH FILL) : J31~T302; BALL | | |
| 3 | A801490 | L-CABLE-2366 | CABLE : J21C~F204, J503, J504, P600 | | |
| 4 | A801431 | CO-US1-115-E | CABLE : P30~F506 | | |
| 5 | A801493 | CO-US1-115-A | CABLE : J438~J507 | | |
| 6 | A801402 | CO-US1-115-1 | CABLE : L-KEY-146
-B(Y)~CHASSIS | | FOR 230V PAL |
| 7 | A801482 | CO-US1-115-2 | CABLE : L-KEY-142
-A(Y)~CHASSIS | | FOR 230V PAL |
| 8 | A801494 | L-CABLE-241 | CABLE : J21E~J430 | | OPTION
FOR Q3-500 |

* ASSEMBLED PARTS : Please apply to our Technical Support for details.
アッセンブリ : 詳細についてはテクニカルサポートまでお問い合わせください。

SECTION 14 OUTLINE OF SYSTEM

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| 14-1-1 | Tx & Rx | 14 - 1 |
| 14-1-2 | DSC | 14 - 2 |
| 14-1-3 | TV(Viewing Monitor) | 14 - 3 |
| 14-1-4 | Image Recording Method | 14 - 3 |
| 14-1-5 | AC Input Voltage & Power Consumption | 14 - 3 |
| 14-1-6 | Size & Weight | 14 - 3 |
| 14-2 | Features of Equipment | 14 - 3 |
| 14-2-1 | Multi Coated Probe | 14 - 4 |
| 14-2-2 | Electronic Linear Scanning Method | 14 - 5 |
| 14-2-3 | Electronic Convex Scanning Method | 14 - 5 |

1.

2.

3.

4.

5.

6.

14-1 Specification of SSD-500

14-1-1 Tx & Rx

| | | |
|--------------------|---|--|
| Scanning Method | : | Electrical Convex Scanning
Electrical Linear Scanning |
| Image Display | : | B mode
M mode
B/M mode |
| Number of Image | : | B mode : 1 or 2
M mode : 1
B/M mode : 1 |
| Standard Probe | : | Type : Convex
Model : UST-934-N 3.5
Frequency : 3.5MHz
Curv. and Angle : 60R, 60degree
Max. depth : 22cm |
| Simultaneous Probe | : | 1 (when JB-172 connected, possible two probes connect.) |
| Image adjustment | : | GAIN : Continuous
SIC : NEAR, FAR
Contrast : fixed
Image Processor : Frame Correlation
Line Interpolation
Smoothing
Gamma correction |
| Magnification | : | on B, 2B, M mode
x0.75, x1.0, x1.5 3 steps

on B/M mode
x1.0 fixed |
| M mode | : | Method : Moving Bar
Sweep Speed : 4 second fixed
(In case of SSD-500)
1,2,4,8 second variable
: M mode
2,4,8 second variable
: B/M mode
(In case of SSD-500MICRUS)
Sample Position : Set by MENJ |

14-1-2 DSC

- Frame Memory : B. W mode Common Use
- Character & Graphic :
 - UI : 10character x 2column
 - Date & Time : Automatically
 - Focus Setting : Automatically
 - Probe Frequency : Automatically
 - Gain Value : Automatically
 - Comment : 40character x 28column
(In case of SSD-500)
39character x 29column
(In case of SSD-500MICRUS)
First line only memorize
for hospital name
 - Measurement : Automatically
 - Depth Position : displayed with "cm"
 - Scale Mark
 - Direction Mark
 - Guide Line for Puncture
 - M Cursor, M time mark
 - Active Mark
 - Body Mark
- Reverse Image : available on B mode before freezing
up and down, right and left
- Image Polarity : available
- Measurement : Method : by Joy Pad
(In case of SSD-500)
by Track Ball
(In case of SSD-500MICRUS)
 - Kinos : distance
area, circumference
velocity
heart rate
gestation week
fetal weight

14-1-3 TV (Viewing Monitor)

TV method : 3W 525lines/60Hz or
625lines/50Hz
Viewing Monitor : 7-inch TV monitor

14-1-4 Image Recording Method

Black and White Instant Film Camera SSZ-108-P
35mm Camera Adapter SSZ-108-35
Gun Type Camera ACV-500
(Only SSZ-500)
ECHO COPIA SSZ-300, 300E,
SSZ-300S, 300SE,
SSZ-303, 303E,
SSZ-305, 305E,
SSZ-307, 307E
Video Cassette Recorder
Multi Format Camera SSZ-111

14-1-5 AC Input Voltage & Power Consumption

| | | | |
|----------------------|---------|----------------|-------------|
| For domestic | AC 100V | (50 / 60 Hz) | below 160VA |
| For General purpose | AC 115V | (50 / 60 Hz) | below 160VA |
| For export | AC 220V | (50 / 60 Hz) | below 160VA |
| For animals | AC 220V | (50 / 60 Hz) | below 160VA |
| For domestic animals | AC 100V | (50 / 60 Hz) | 130VA ± 10% |

14-1-6 Size & Weight

W 270mm x D 250mm x H 320mm 10 kg

14-2 Features of Equipment

This equipment using electronic linear scanning and electronic convex scanning is suited to diagnosis in the abdominal region and obstetric and gynecology region.

The compact, light weight equipment can be transported easily and does not need large space for installation.

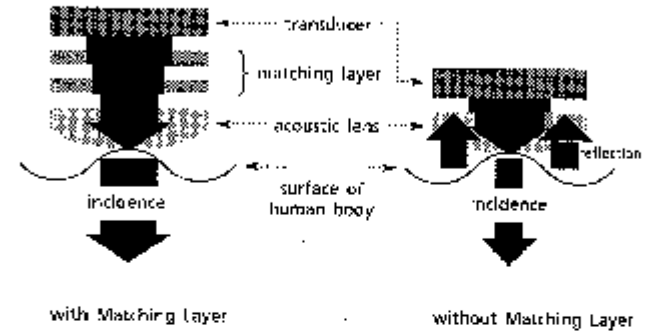
Its small track ball makes it easy to measure distance, area and others. A variety of optional probes and the complete measuring and computing functions ensure accurate diagnosis. (The outside track ball and the cart are also available as options.)

The equipment is able to display B mode, B-mode two images, B/M mode, and M mode; to measure distances and areas; and to process computation of the weeks gone in pregnancy and the weight of unborn child.

14-2-1 Multi Coated Probe

When an ordinary probe is directly put against the surface of the human body, most part of ultrasonic wave is reflected at the body surface because of a large difference in acoustic impedance between the oscillator and body.

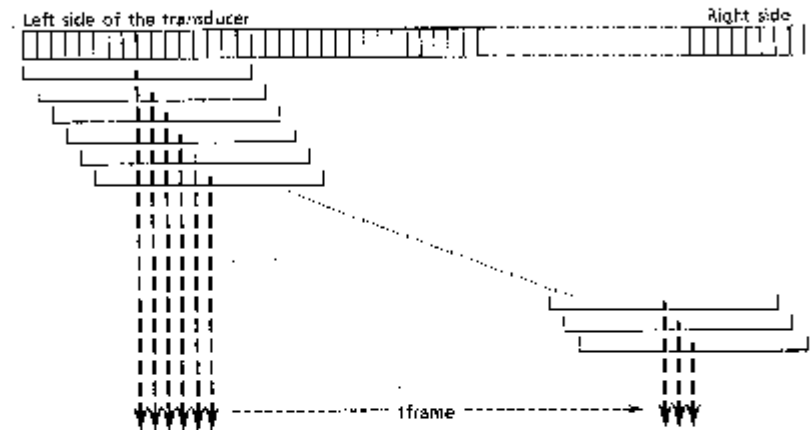
To minimize reflection loss, the multi coated probe (M.C.P.) is provided with two stages of matching layers which vary acoustic difference step by step so that ultrasonic wave can be transmitted smoothly from the body to the oscillator and from the oscillator to the body.



14-2-2 Electronic Linear Scanning Method

This scanning method is used when an electronic linear probe is connected to the equipment.

The probe has several oscillators arranged in line and a beam of ultrasonic wave is formed by two or more oscillators acting together. An array of oscillators is divided into several blocks from one end to another so that a fixed number of oscillators included in each block act together. Those blocks are driven one after another under electronic control to cause electronic linear scanning.



14-2-3 Electronic Convex Scanning Method

This scanning method is used when an electronic convex probe is connected to the equipment.

Using the same scanning manner as mentioned in the case of electronic linear scanning method, the electronic convex probe causes electronic scanning, electronic focusing, transmission dynamic focusing, receiving dynamic focusing, and dynamic frequency scanning.

Since the oscillators are arranged convexly, the beam of ultrasonic wave is in the shape of sector.

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SECTION 15 PRINCIPLE OF SYSTEM OPERATION

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| System of SED-500 | | 15 - 1 |
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| 15-2 Main Signal Flow | | 16 - 1 |
| 15-3 Panel Information | | 15 - 2 |
| 15-4 Digital Scan Converter | | 15 - 3 |
| 15-5 Monitor | | 15 - 4 |
| 15-6 Power Supply Unit | | 15 - 4 |

System of SSD-500

15-1 Explanation of System

This system consists of the transmitter/receiver unit, the interface unit, DSC unit, the panel unit including the key board, Joy pad(In case of SSD-500), switching small track ball(In case of SSD-500MICRUS), etc., the monitor unit, and the power supply unit.

The interface unit generates timing signal necessary for electronic scanning. The transmitter/receiver unit generates a transmission pulse timely using the said timing pulse. This timing pulse drives the oscillator to radiate ultrasonic wave into human body. Echo signal from the body returns to the oscillator and is received and amplified, and then is output to the DSC unit.

In the DSC unit, ultrasound signal is sent through the A/D converter to the memory and stored in it. Stored ultrasound signal is read out at TV timing and processed through post processing and character indication processing to create COMPOSITE TV signal which is output to the monitor.

The panel unit gathers the switch input external conditions (MODE, MAG, etc.) and key board input character data and sends the gathered information to the interface unit.

The monitor unit consists of the 7-inch CRT, the contrast and brightness knobs for screen control, and the selector switch for getting the optimum contrast and brightness of screen for photograph. In case of SSD-500MICRUS, this selector switch is deleted.

The power supply unit is wholly composed of switching regulators. High voltage control is possible by software when so specified.

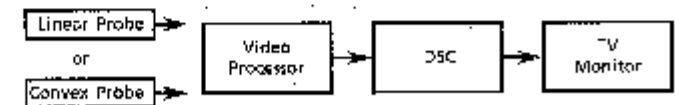
15-2 Echo Signal Flow

In the case of the Electronic Scanning Probe, the transmission pulse which is generated from the transmission trigger vibrates the transducer element.

Echo signal which is received by the probe is amplified at the receiving circuit and is sent to the video processor.

Video Processor has Filter, Logarithmic Amplifier, Detector and any processing circuits.

Finally, it is applied to DSC, and TV Composite signal is generated and outputted to the viewing monitor.



15-3 Panel Information

• In case of SSD-500

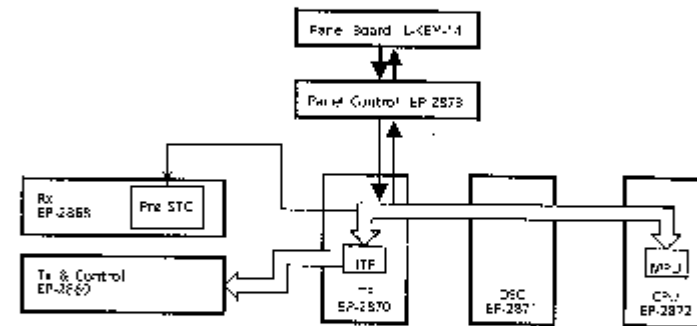
The information of panel switches, Joy Pad, Gain and full key board is applied to DATA BUS of MPU (Micro Processor Unit) which is located on EP-2872 CPU PCB via EP-2873 Panel Control PCB.

The signals which control to light LEDs are coming from EP-2872 CPU PCB. The drivers for LEDs are in EP-2873 Panel Control PCB.

The A/D converter for automatic displaying of Gain value is in EP-2873 Panel Control PCB. This signal is also applied to EP-2872 CPU PCB.

The setting of NEAR and FAR is also one of the panel information. These signals which control the ultrasound image directly are applied to Tx & Rx via EP-2870 ITF.

Joy Pad Information has some of switches. So it is thought that this information is one of the panel information.



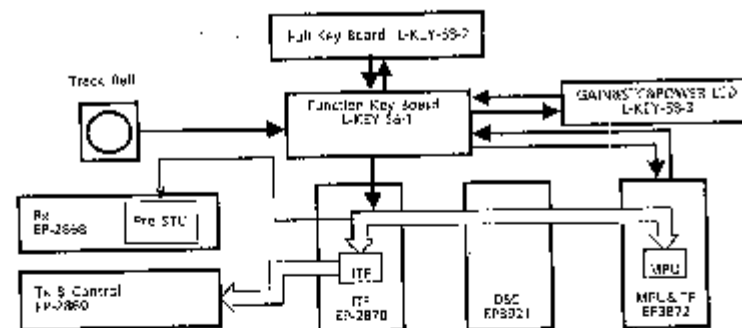
• In case of SSD-500MICRJS

The information of panel switches, Track Ball, Gain, NEAR/FAR STC volume and full key board is applied to DATA BUS of MPU (Micro Processor Unit) which is located on EP3872 MPU&ITF PCB via Function Key Board L-KEY-58-1.

The signals which control to light LEDs are coming from EP3872 MPU&ITF PCB. The drivers for LEDs are in EP3872 MPU&ITF PCB.

The A/D converter for automatic displaying of Gain and NEAR/FAR STC value is in EP3872 MPU&ITF PCB. This signal is also applied to MPU.

The setting of NEAR and FAR is also one of the panel information. These signals which control the ultrasound image directly are applied to Tx & Rx via EP-2870 ITF.



15-4 Digital Scan Converter (D.S.C.)

The X-Y type DSC which can be accessed quickly is used in order to display the ultrasound image. This DSC can be written the ultrasound vector which has any factors of direction and velocity, and is read out according to the TV Scanning timing.

The memory of DSC has many Pixels which are divided something like a matrix.

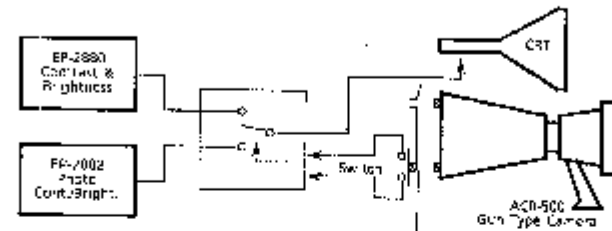
In the case of writing the information to the memory pixels, it can be defined according to choose the address of row and column. Then, the images of Linear, Convex and any mode images can be memorized into a same frame memory.

15-5 Monitor

- In case of SSD-500

SSD-500 has a 7 inch monitor.
This monitor unit is composed with 7 inch monitor, EP-2850 Contrast & Brightness PCB and UNW-916 or TM-6116.

The switch which switches the contrast and brightness to the setting for photograph is located on EP-2880. This switch is available in using ACR-500-P.



- In case of SSD-500MICRUS

SSD-500MICRUS has a 7 inch monitor.
This monitor unit is composed with 7 inch monitor, EP-2880-2 Contrast & Brightness PCB and TM-0116.



15-6 Power Supply Unit

In this power supply unit, the +5.1V output circuit of has the circuit of over current protector. If this protector is working, the output is stopped for a moment.

It can be resumed to turn the power switch on again 10 seconds later after turning it off.

The output terminals are followings.

| | |
|-------------|------|
| + 5.1 V | 4A |
| + 5.0 V | 0.5A |
| - 5 V | 0.5A |
| + 12 V | 1.5A |
| - 12 V | 0.3A |
| - 12 V | 0.1A |
| 120 / 150 V | 20mA |

15-2-3 Electronic Convex Scanning Method

This scanning method is used when an electronic convex probe is connected to the equipment.

Using the same scanning manner as mentioned in the case of electronic linear scanning method, the electronic convex probe causes electronic scanning, electronic focusing, transmission dynamic focusing, receiving dynamic focusing, and dynamic frequency scanning.

Since the oscillators are arranged convexly, the beam of ultrasonic wave is in the shape of sector.

15-3 System of SSD-500

15-3-1 Explanation of System

This system consists of the transmitter/receiver unit, the interface unit, DSC unit, the panel unit including the key board, switching joy pad, etc., the monitor unit, and the power supply unit.

The interface unit generates timing signal necessary for electronic scanning. The transmitter/receiver unit generates a transmission pulse timely using the said timing pulse. This timing pulse drives the oscillator to radiate ultrasonic wave into human body. Echo signal from the body returns to the oscillator and is received and amplified, and then is output to the DSC unit.

In the DSC unit, ultrasound signal is sent through the A/D converter to the memory and stored in it. Stored ultrasound signal is read out at TV timing and processed through post processing and character indication processing to create COMPOSITE TV signal which is output to the monitor.

The panel unit gathers the switch input external conditions (MODE, MAG, etc.) and key board input character data and sends the gathered information to the interface unit.

The monitor unit consists of the 7-inch CRT, the contrast and brightness knobs for screen control, and the selector switch for getting the optimum contrast and brightness of screen for photograph.

The power supply unit is wholly composed of switching regulators. High voltage control is possible when so specified.

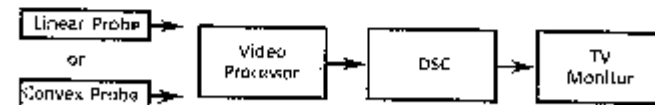
15-3-2 Echo Signal Flow

In the case of the Electronic Scanning Probe, the transmission pulse which is generated from the transmission trigger vibrates the transducer element.

Echo signal which is received by the probe is amplified at the receiving circuit and is sent to the video processor.

Video Processor has Filter, Logarithmic Amplifier, Detector and any processing circuits.

Finally, it is applied to DSC, and TV Composite signal is generated and outputted to the viewing monitor.



15-3-3 Panel Information

The information of panel switches, Joy Pad, Gain and fish key board is applied to DATA BUS of MPU (Micro Processor Unit) which is located on EP-2872 CPU PCB via EP-2873 Panel Control PCB.

SECTION 16 PRINCIPLE OF HARDWARE OPERATION

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| 16-1-3 | Gain & Power LED | EP-2876 16 - 6 |
| 16-1-4 | Select Key | EP-2879 16 - 8 |
| 16-1-5 | Contrast & Brightness | EP-2880 16 - 10 |
| 16-1-6 | In / Out | EP-2881 16 - 12 |
| 16-1-7 | Photo Cont. / Bright. | EP-2882 16 - 14 |
| 16-1-8 | Panel Unit | L-KEY-58 16 - 15 - 1 |
| 16-1-9 | Contrast & Brightness | EP-2880 2 16 - 15 - 6 |
| 16-2 | Tx/Rx Unit and DSC Unit | 16 - 16 |
| 16-2-1 | Rx | EP-2863 16 - 16 |
| 16-2-2 | Tx & Control | EP-2869 16 - 20 |
| 16-2-3 | ITF | EP-2870 16 - 24 |
| 16-2-4 | DSC | EP-2871/EP3921 16 - 26 |
| 16-2-5 | CPC | EP-2872 16 - 32 |
| 16-2-5 | MPU & ITF | EP2872 16 - 34 |

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PCB REFERENCE TABLE IN SECTION 16

| No. | TITLE | MODEL (1) ※1 | MODEL (2) ※2 | MODEL (3) ※3 |
|--------|--------------------------|--------------|--------------|--------------|
| 16-1-1 | Panel Control | EP-2873 | × | × |
| 16-1-2 | Panel Board | L-KEY-14 | × | × |
| 16-1-3 | Gain & Power
LED | EP-2878 | × | × |
| 16-1-4 | Select Key | EP-2879 | + | + |
| 16-1-5 | Contrast &
Brightness | EP-2880 | × | × |
| 16-1-6 | In / Out | EP-2881 | + | + |
| 16-1-7 | Photo Contr. /
Bright | EP-2882 | + | × |
| 16-1-8 | Panel Unit | × | L-KEY-58 | + |
| 16-1-9 | Contrast &
Brightness | × | EP-2881.2 | + |
| 16-2-1 | KX | EP-2868 | + | + |
| 16-2-2 | Tx & Control | EP-2869 | + | + |
| 16-2-3 | ITF | EP-2870 | + | + |
| 16-2-4 | DSC | EP-2871 | EP3921 | + |
| 16-2-5 | NPU | EP-2872 | × | × |
| 16-2-6 | MPU & ITF | × | EP3872 | × |
| 16-2-7 | DIU | × | × | EP4531 |
| 16-2-8 | MPI | × | × | EP4530 |

+- means that used PCB is same to left column.

× means that PCB is not used.

※ 1 MODEL (1) means part No. of PCB which is used in SSD-500

S/N of SSD-500 is as below:

| | | | |
|----------|-------------------|-----------------|-----------------|
| Unit S/N | 91M43778~31M11708 | 3503001~3503567 | 3920301~3923098 |
| | 3923564~3925601 | 3610001~3610345 | |

※ 2 MODEL (2) means part of No. of PCB which is used in SSD-500 Ver. B1.0~E2.0

S/N of SSD-500 (Ver. B1.0~E2.0) is as below:

| | | |
|----------|-----------------|-----------------|
| Unit S/N | 3300368~3300712 | M00101~M04450 |
| | 3323059~3323503 | 3323602~3325447 |

※ 3 MODEL (3) means part of No. of PCB which is used in SSD-500 Ver. E3.0 onwards.

S/N of SSD-500 (Ver. E3.0) is as below:

Unit S/N M04451~

16-1 Panel Unit

16-1-1 Panel Control EP-2873

1. Outline

This PCB serves as an interface between the MPU (Micro Processing Unit) and the panel board.

The panel board consists of switch matrix. To read information of these switches without increasing the number of signal lines, there is the necessity of dynamically scanning these switches. Such scanning is controlled by this PCB.

2. Operation

(1) DATA I/O

The READ register reads data from the switch matrix of L-KEY-14-A/B, switch matrix of SELECT KEY, FOOT SWITCH, and A/D converter.

The WRITE register sends data of LED ON/OFF signal, camera shutter, and buzzer to the LED driver.

These signals are temporarily stored in the memory of I/O unit and are accessible from MPU.

(2) TIMING GENERATOR

The TIMING GENERATOR divides the clock signal of several KHz in transmission frequency to generate the main clock and address clock used in this PCB.

(3) LED DRIVER

Upon receipt of information from MPU, the LED DRIVER generates signals for switching on or off the LED, buzzer and shutter.

(4) A/D and D/A converter

The A/D converter analog B-mode gain information into digital data and sends it to the MPU.

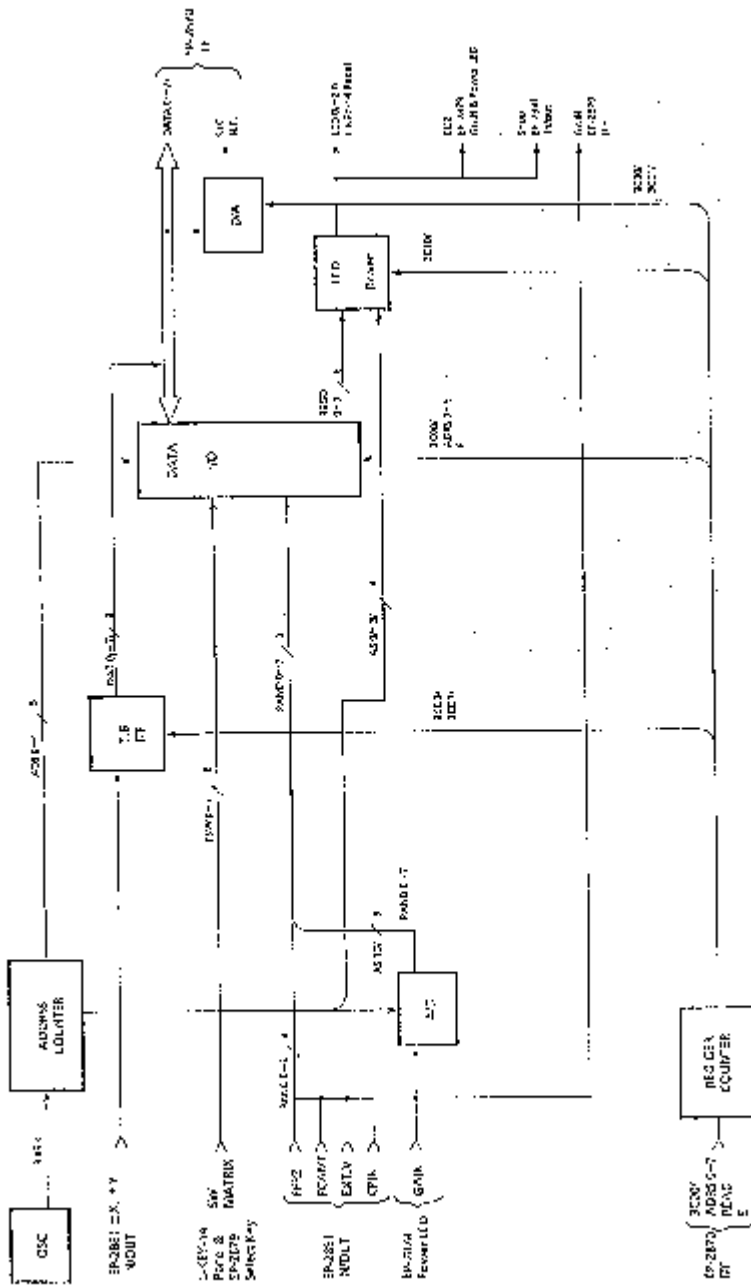
The D/A converter receives digital signal of STC information (NEAR and FAR in the case of this equipment) from the MPU through data bus, and converts it into analog signal which is sent to the Tx/Rx unit through the CPU, EP-2870 I/F.

(5) ADDRESS DECODER

Makes addressing for each register which is set by the MPU.

(6) TRACKBALL INTERFACE

Transfers information to the MPU by converting $\pm X$, $\pm Y$ signal from the track-ball unit and sending it directly to the data bus.



16-1-2 Panel Board

L-KEY-14A, B

1. General

This PCB consists of part A and part B. L-KEY-14 A indicates the panel of open/close part including the full-keyboard, while L-KEY-14 B indicates a part fixed to the body of SSD-500.

Either PCB is composed of switch matrix. Matrix control signal is sent from EP-2873 Panel Control. They are the purchased PCBs.

2. Operation

L-KEY-14A consists of the switch matrix, which is composed of 58 key switches, and the diode array and is connected to EP-2873 PANEL CONTROL. Lighting of LEDs is controlled by LED 10/~17/, 20/~26/ signals.

L-KEY-14B consists of the switch matrix, which is composed of 15 key switches and joy stick, and the diode array and is connected to EP-2873 PANEL CONTROL. Lighting of LEDs is controlled by LED 0/~4/, 6/~7/ signals.

The joy stick comprises several switches, unlike the conventional joy sticks and track balls. Therefore, it is basically regarded as one of the sources of panel information.

Panel Board L-KEY-14 A(Y), B(Y)

This PCB is the same in function and operation as L-KEY-14A, B.

Only the color of LEDs is changed to yellow from amber. This PCB is used for equipment S/N 91M18402 and up.

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16-1-3 Gain & Power LED EP-2878

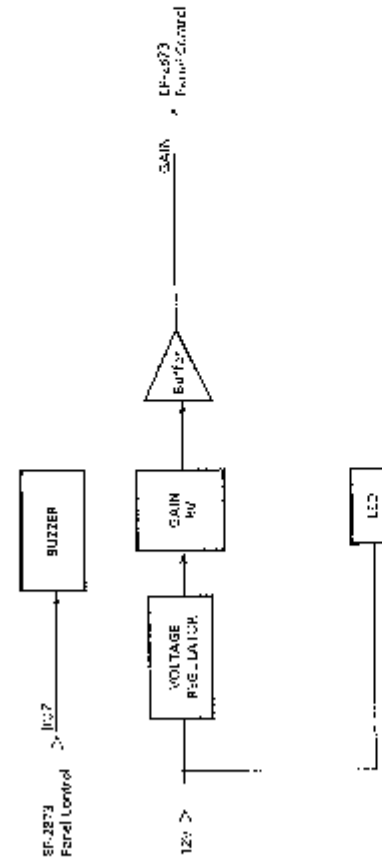
1. Outline

This PCB consists of the gain knob for ultrasonic image control, the LED (Light Emitting Diode) which lights up when the equipment power switch is ON, and the buzzer which sounds to warn various kinds of alarms. For SSD-500, any mode of ultrasonic image can be adjusted with a single gain knob.

2. Operation

Power supply input of +12 V is stepped down to a stabilized reference voltage of +5 V, which is applied to the volume for B-mode gain signal generation. Output is sent through the buffer to EP-2873 Panel Control and, then, is fed to the A/D unit. Output is also supplied to the Tx/Rx unit through EP-2870 ITF.

The LED connected to +12 V power supply lights up when power is supplied. The buzzer having no drive circuit is controlled by EP-2873 Panel Control.



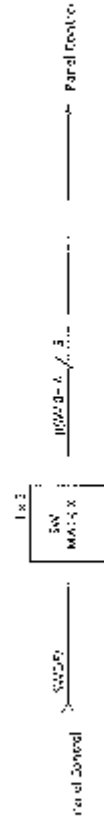
16-1-4 Select Key

i. General

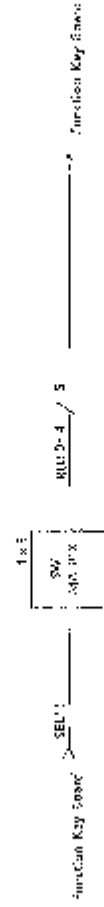
This PCB is a keyboard used for selecting equipment menus.

2. Operation

This PCB consists of 5 key switches and a diode array. The key switches form a matrix and signals for selecting lines and rows of matrix are sent out of Panel Control or MPI. & ITC.



※ RPU20-4はSD-JOBに使用し、CPU2。
 ※ 1 case of CPU1 this PCB to SD-500.



※ RPU20-4はSD-JOBに使用し、CPU1。
 ※ 1 case of CPU1 this PCB to SD-500/CELL.

| | | | | |
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| Atolca | Select Key | SWCPU | EP 7177J | 1 / 1 |
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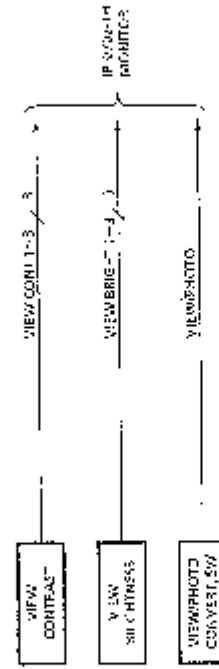
16-1-5 Contrast & Brightness EP-2880

1. General

This PCB consists of the control for SSD-500 monitor contrast and brightness and the selector switch for selecting the monitor brightness suited to monitor use or camera use.

Contrast and brightness suited to camera use are set by EP-2882 Photo Cont./Bright. This selective operation is effective only when the instant-film direct photographing hood (gun type camera) ACR-500 is used.

This PCB is not used in the components of monitor IP-0702.

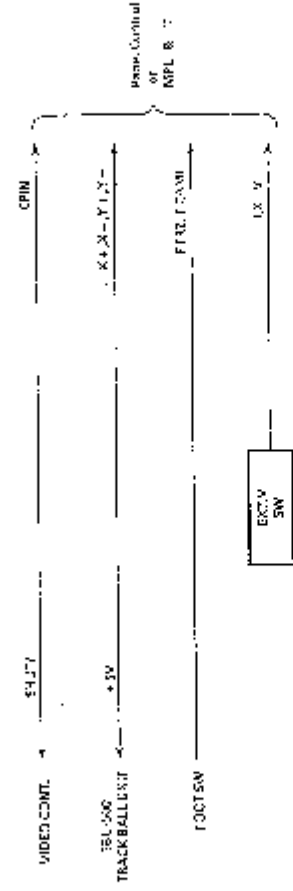


16-1-6 In / Out

1. General

The foot switch, track-ball unit, video camera signal, and video signal internal / external switching-over signal passes through this PCB and is finally conducted to Panel Control or MPU & I/F.

CP

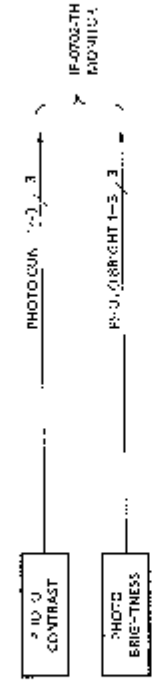
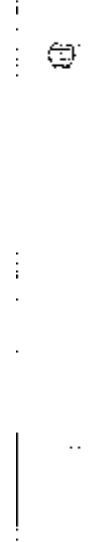


| | | | |
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| Alloc | In / Out | EP-205? | 1 / 1 |
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16-1-7 Photo Cont. / Bright. EP-2882

1. General

When the instant-film direct photographing hood (gun type camera) ACR-300 is used, the object of photographing is the monitor screen. As ACR-500 is set to the monitor, setting of contrast and brightness of the monitor are switched over to those set by this PCB. The PCB in charge of this switching over is EP-2880 Contrast & Brightness.



| | | |
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| Alaka | Photo Cont. / Bright. | EP2882 |
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16-1-8 Panel Unit

1. Composition

This PCB consists of Function Key Board, Full Key Board, GAIN & STC & Power LED, small trackball.

2. General

Function Key Board

This unit consists of the function switch and buzzer which generates alarm and a part which connects to Select Key, Full Key Board, GAIN & STC Power FD, MPU & TF, ITF, small trackball.

Full Key Board

This unit consists of Full Key switch, mode-selected switch and a part which connects to Function Key Board.

GAIN & STC & Power LED

This unit consists of the volume of GAIN, NEAR STC, FAR STC for adjustment of US image, LED which lights when the system starts up.

3. Operation

Function Key Board

This unit consists of the function switch matrix and diode array.

The switch information is scanned by the switch scan circuit.

ON/OFF of switch information returns to MPU DATA BUS as the return data.

The lighting control of LED on the switch is directly controlled from MPU register in MPU & ITF.

This unit connects to small trackball.

+5V, XA, XB, YA, and YB signal of trackball are connected by FPC.

Full Key Board

This unit consists of Full Key switch, Freeze switch, mode-selected switch matrix and diode array.

The switch information is scanned by the switch scan circuit.

ON/OFF of switch information returns to MPU DATA BUS as the return data.

The lighting control of LED on the switch is directly controlled from MPU register in MPU & ITF.

GAIN & STC & Power LED

The regular voltage which is stabilized to +5V from +12V is supplied to the volumes which are generated GAIN, NEAR STC, FAR STC signal.

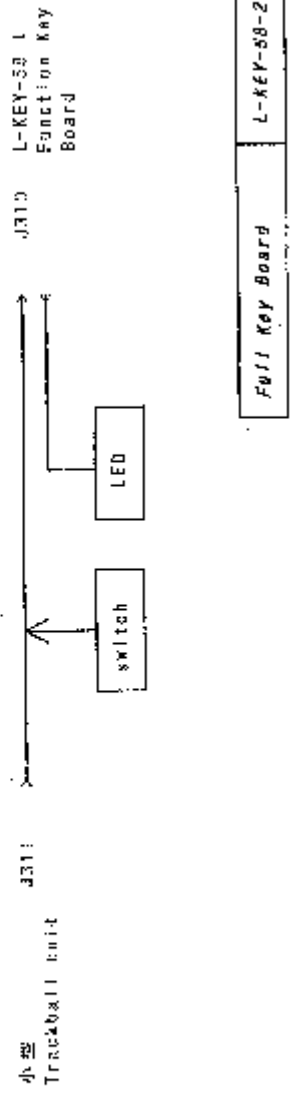
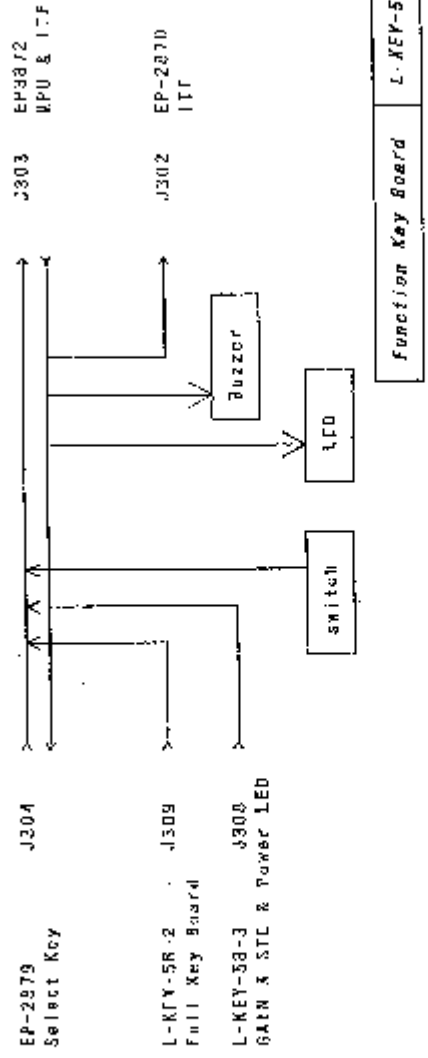
The output of all volumes are separated via buffer.

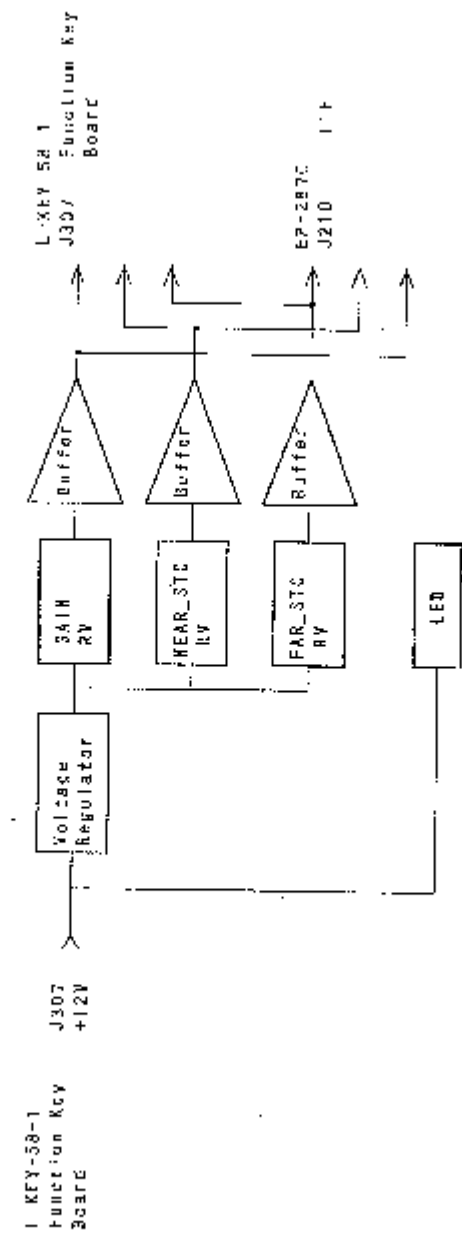
One is outputted to MPU & ITF via Function Key Board, and is supplied to ADC

another one is supplied to Tx & Control via Function Key Board, ITF.

LED is supplied +12V, and LED lights at the same time, when the system starts up.

These are the purchased unit





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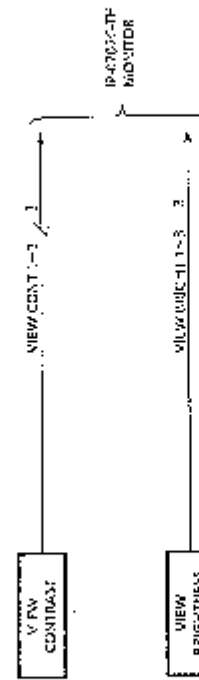


16-1-9 Contrast & Brightness

1. General

This PCB consists of the controls for SSD 500 monitor contrast and brightness.

This PCB is included in the components of monitor IP-0/02C-TH.



| | | | |
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| Alcoa | CONTRAST & BRIGHTNESS | EP-2880-2 | 3 / 1 |
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16-2 Tx/Rx Unit and DSC Unit

16-2-1 Rx EP-2868

1. General

This PCB serves to receive ultrasound signal. Unlike SSD-500 series, SSD-500 does not use the HVS (High Voltage Switch) system for the reason that it is easier to adopt the system without HVS (such as found in SSD-256 and SSD-280) for getting improved part integration, rather than making the HVS itself into SMD (Surface Mount Device).

Therefore, the ultrasound signal Tx and Rx circuits used are the same in number as the transducers in the probe used.

2. Operation

(1) LIMITER

The limiter circuit is set in such a manner of cutting the signal received from the transducer at levels of $\pm 0.6V$.

(2) SIGNAL SELECTOR

The signal selector consists of 16 pieces of 8-channel multiplexer to select an echo-reception signal line among all signal lines from transducers.

(3) STC PREAMP

The variable-gain STC PREAMP is used for initial-stage amplification. Its gain can be varied by the signal from (13) PRE STC DRIVER.

(4) CHANNEL ROTATION SELECTOR

Comprising IC 1 and IC 2, this circuit can reduce the number of signal lines succeeding to this circuit to a half of that preceding to this circuit. This process is based on the bi-symmetry of delay time which each of received signals needs. That is, two signals which need the same delay time are summed up previously.

(5) SWITCH

Comprising several blocks, this circuit has the function of ON / OFF control of summation of signals in the same number as the circuit blocks. The number of signals subjected to ON / OFF control by this circuit corresponds to the minimum number of Rx transducers. The excess signals from transducers arranged bi-symmetrically off the center of reception of ultrasound signal are not subjected to ON / OFF control of summation.

(6) DELAY ADDER

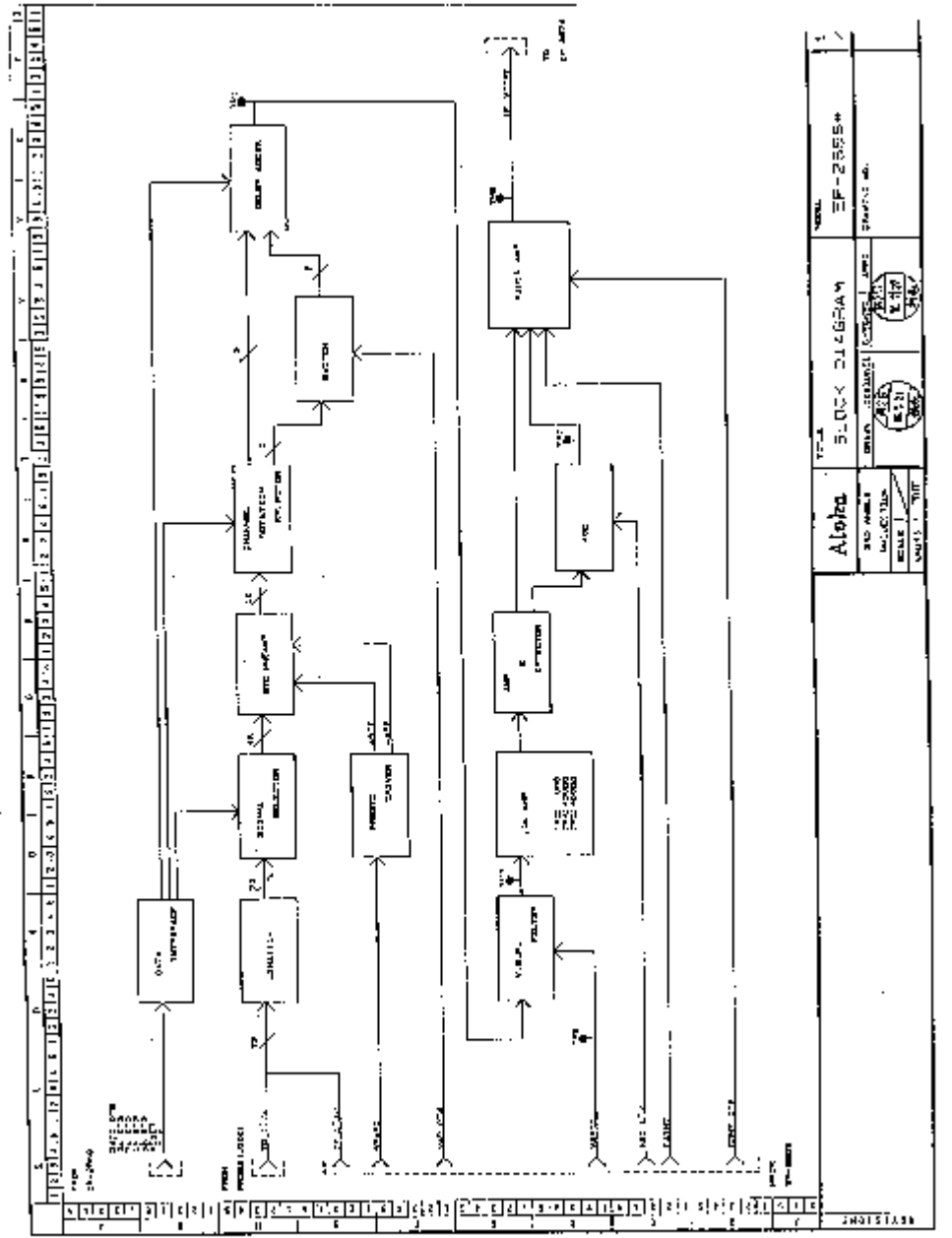
This circuit has the function of delaying and summing up (reception focus) signals from (5) SWITCH circuit and generates one-line output of received signal.

(7) V.B.P. FILTER

This filter allows the probe and reception-signal to pass through it only in the frequency band most suited to penetrate into the optimum depth from body surface.

- (8) LOG AMP
Composed of 2 stages of 30dB amplifiers and a Logarithmic Amp., LOG AMP performs logarithmic compression of received signals.
- (9) AMP & DETECTOR
The amplifier-and-detector circuit converts the received AC signal into DC signal.
- (10) AGC
AGC is composed of the delay circuit and its output signal is used for subtraction of delayed received signal in (11) VIDEO AMP. Although it is structurally possible to switch over AGC into eight stages (incl. OFF) with AGC 0~2, no external adjustment of setting is practically possible.
- (11) VIDEO AMP
Composed of DC-AMP which can vary the gain into eight stages, the VIDEO AMP adjusts the gain of signal received from (9) AMP & DETECTOR to a desired stage and sends its output to EP-2871 DSC. Although it is structurally possible to switch over contrast into eight stages with CONT 0~2, no external adjustment of setting is practically possible.
- (12) DATA INTERFACE
It has the function of distributing the control signal from EP-2869 Tx & Control to and among the blocks in EP-2868 Rx.
- (13) PRESTC DRIVER
Receives the signal NEA&C from EP-2869 Tx & Control, converts the received signal into another form of signal (\pm STC) equalized in positive and negative voltage, and sends the output signal to (3) STC PREAMP.

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16-2-2 Tx & Control

EP-2869

1. General

This PCB consists of a circuit which generates transmission pulses to drive the transducers and a circuit which generates a receiver-circuit control signal. These two circuits are under control of EP-2870 IFF.

2. Operation

(1) ADDRESS COUNTER

The 8-bit counter generates main address which is in conjunction with all of control systems.

(2) CLOCK GENERATOR

Generates timing clock for data latch covering the whole of EP-2868 Rx and EP-2869 Tx & Control.

(3) ROTATION COUNTER

On the basis of USADRS 0-7 and address from (1) ADDRESS COUNTER, it generates data necessary for making rearrangement at CHANNEL ROTATION SELECTOR in EP-2868 Rx.

(4) CHANNEL SELECT COUNTER

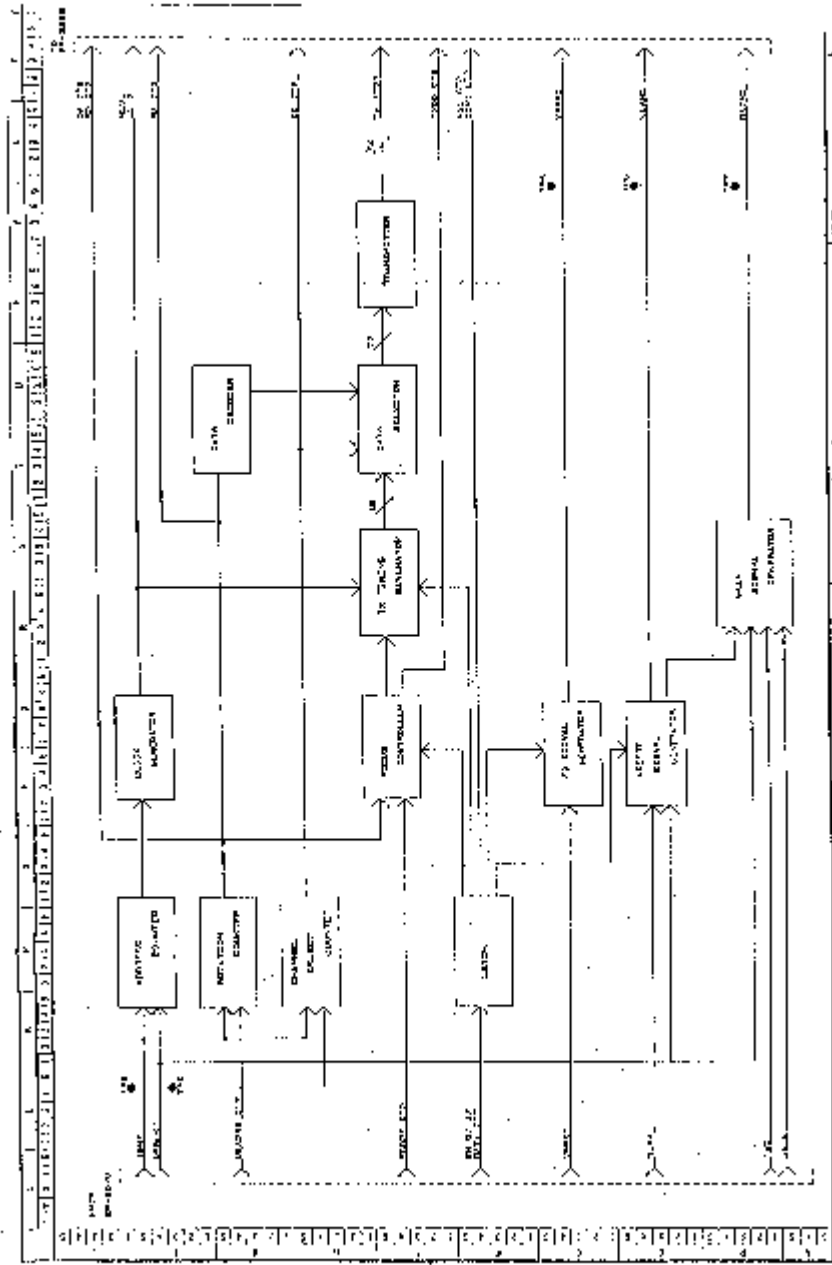
On the basis of USADRS 0-7 and address from (1) ADDRESS COUNTER, it generates data to be used for selecting the necessary signal among all transducer signals.

(5) FOCUS CONTROLLER

Composed of ROM 1 for transmission and ROM 2 for reception, the controller generates delay data output to be used for focus control.

- (6) **Tx TIMING GENERATOR**
Composed of the gate array, it generates transmission triggers for the maximum number of transmission transducers.
- (7) **DATA SELECTOR**
Composed of 16 8-channel multiplexers, it delivers each of transmission triggers from (6) Tx TIMING GENERATOR to a corresponding transducer according to ultrasound address.
- (8) **TRANSMITTER**
It is composed of the same number of transmission circuits as the total number of transducers in the probe and each circuit generates transmission waveform output to the related transducer.
- (9) **DATA DECODER**
On the basis of a signal from (3) ROTATION COUNTER, the decoder generates data set timing signal output to (7) DATA SELECTOR.
- (10) **LATCH**
In the 16-bit latch, necessary panel information and probe information are set up by software.
- (11) **F0 SIGNAL GENERATOR**
It generates the analog signal necessary for controlling the variable band pass filter (V.B.P.F.) in EP-2868 Rx. A high frequency is set for a near object and its band is varied with penetration depth of ultrasound. The center frequency is shifted to low side as distance to object increases.
- (12) **PRESTC SIGNAL GENERATOR**
It generates analog signal necessary for controlling the gain of STC-PREFAMP in EP-2868 Rx. By means of the control of STC (NEAR) on the panel, signal voltage can be adjusted to get a low gain for a near target and a high gain for a far target.
- (13) **GAIN SIGNAL GENERATOR**
On the basis of panel gain volume signal, it generates the image-gain control signal output to VIDEO AMP in EP-2868 Rx. By means of the control of STC (FAR) on the panel, gain output can be increased with distance to the target.

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| Alpha | Block Array | EP-200SK |
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ACCOMPLISHED
OUR
DUTY | WE HAVE
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DUTY |

80112-244

16-2-3 ITF

1. General

This PCB generates the basic timing signals and fundamental control signals for the Tx/Rx unit. It is interposed between the Tx/Rx unit and DSC so that data exchange is carried out through this PCB. Additionally, this PCB connects with VPU (53B09) through the data bus for generation and transmission of basic timing signals.

Furthermore, in case of SSD-500, this PCB has the power-supply line to DSC and CPU and the data bus which connects PANEL CONTROL and CPU to each other.

In case of SSD-500MICRUS, this PCB has the power-supply line to DSC and CPU.

2. Operation

(1) O.S.C. & MASTER CLOCK GENERATOR

It generates master clock to divide 30.6 MHz crystal oscillator output into basic clock frequencies of 15 MHz, 3 MHz, 1 MHz, and 765 KHz and also to obtain various kinds of timing signals.

(2) SYSTEM TIMING GENERATOR

It generates US BLANK and SYS 1~3/ to be used by US BLANK GENERATOR as a reference of period of repeated transmission. These signals are made by incorporating conditions of operation, mode, display amplification, and probe code into the previously programmed 32 basic conditions and they are used for switching over the signals RATE 0~4. The selected signals RATE 0~4 are used for switching over 32 kinds of timing signals.

(3) B/M CODE & FOCUS CODE GENERATOR

Based on three signals - B/M CODE, FOCUS CODE, and LINE START, it generates the signal US LINE START/ which is used for starting single-image ultrasound signal to DSC; the signal B/M CODE which switches over B MODE and M MODE of DSC; and the signal FCODE 0~2 which indicates the type of transmission focus.

(4) DF AREA GENERATOR

It generates the signal US DFAREA to determine permission or inhibit of writing into the memory of ultrasound video signal which is subjected to A/D conversion in DSC.

(5) VBP ST GENERATOR

It generates the V.B.P. filter start signal VBP ST/.

(6) US ADDRESS CONTROL

It generates the ultrasound-line Tx/Rx address signal US ADRS 0~7.

(7) FRAME END GENERATOR

It generates the US FRAME END signal which indicates the end of address of B MODE.

(8) OFF CENTER CONTROL

It generates the DF AREA signal start / enable signal.

(9) VAP CONTROL

It generates the signal VAP 0~4 which restricts the number of reception transducers at the variable-aperture portion.

(10) ADDRESS DECODER

It serves to make setting of address data for each register which is set up by MPU (53B09).

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16 2-4 DSC

1. General

The DSC stores ultrasound image signals from the Tx/Rx unit in the memory, reads out the information according to TV scanning, and displays the image on the TV screen.

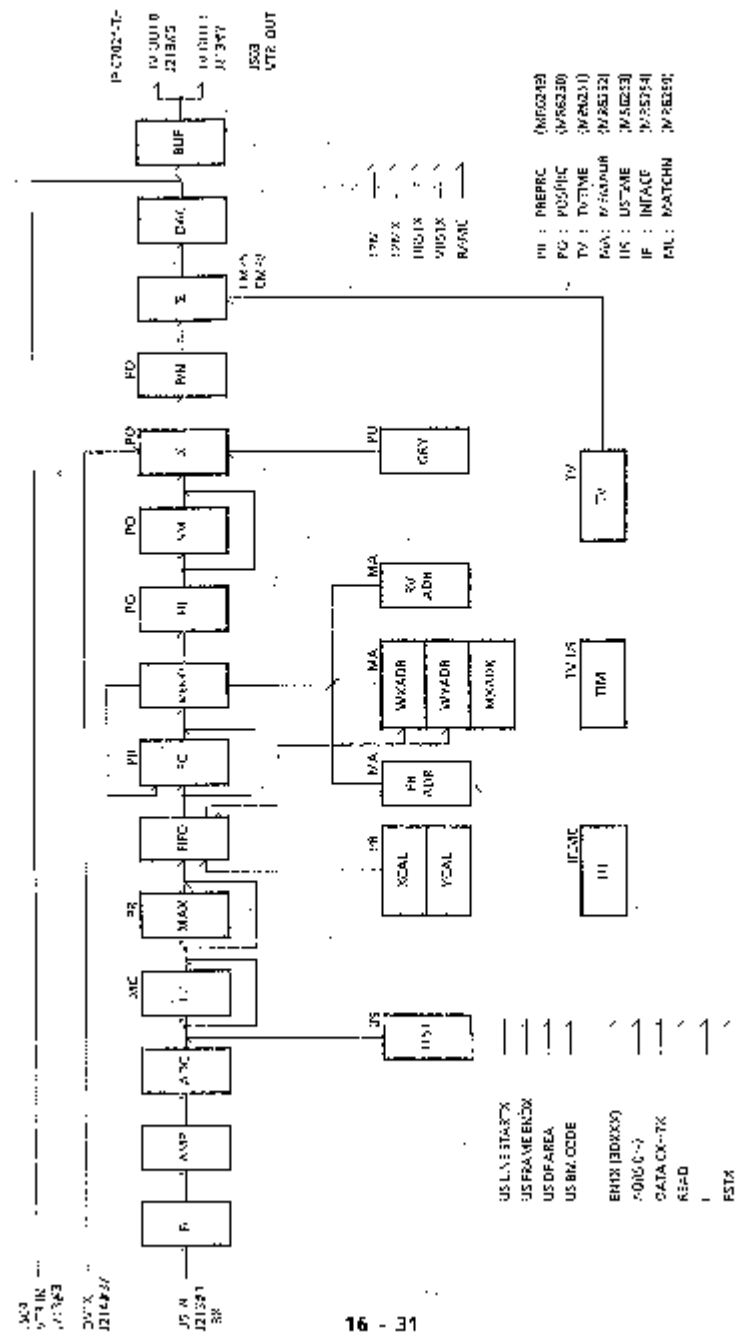
Although the data storing method used is basically the same as that found on SSD-620 or SSD-630, there are some differences in detail between them.

2. Operation

- (1) Filter (FIL)
The low-band pass filter is provided for the succeeding A/D conversion operation.
- (2) Amplifier (AMP)
This amplifier is used for compensating the attenuation of ultrasound image signal caused by the foregoing low-band pass filter to keep the signal level required for the succeeding A/D conversion.
- (3) A/D converter (ADC)
To store image data in the memory, it is necessary to convert analog signals into digital signals. In this circuit, ultrasound image signal is sampled by a high-speed clock of 32 MHz to execute the analog to digital conversion. Output from ADC is in the form of 6-bit signal and, therefore, the digital output of ultrasound image signal is divided into 64 steps.
- (4) Max / Point Sampling (MAX)
For the single-image ultrasound signal, data output from ADC is a quotient of time spent for sampling of single-image signal divided by sampling frequency.
On the other hand, since the number of pixels in the image memory is smaller than the number of output data from ADC, it is necessary to select some data from such an extensive quantity of information. The means of meeting this requirement is "Max / Point Sampling."
"Max sampling" uses data which indicates a peak value in a fixed duration, while "Point sampling" always samples data at fixed intervals.
For SSD-500 system, this function is fixed to "Point sampling."
- (5) F.I.F.O. (First In First Out)
Transmission and reception of ultrasound is not synchronized with TV scanning. Data readout from the memory has priority over write of data in the memory. Therefore, when ultrasound image data is read out in the memory, data write-in timing is dependent on the actual state. This circuit is used for compensating such a time lag. The memory used here is of the First In First Out type suited to write-in and read-out of data. By using this memory, the peripheral control circuit can be made simpler than that used for SSD-620 or SSD-630.
- (6) Frame Correlation (FC)
When ultrasound image data is written in the memory, the data is correlated with one-image preceding data so that the data to be written in the memory is able to keep a relation to the preceding image. This function is effective to erase or suppress unforeseen noises.

- (7) Frame Memory (MEMO)
The memory is controlled by means of the X-Y system. Each of ultrasound image data is stored in the same form as that taken for visual display. Four pixels are selected for each memory address.
- (8) Horizontal Interpolation and Smoothing (H, SM)
For the SSD-500 system, the convex type probe is also included in the available probes. When ultrasound image signal from a convex type probe is stored in the memory, stored data will scatter radially, making it impossible to get the intended display of the image. In such a case, the horizontal interpolation method provides necessary interpolations between image data.
- (9) Character Graphic Addition (Σ)
In the SSD-500 system, character signal and graphic signal generated in CPU or MPU & I/F are added in the digital form to the image signal. The level of character / graphic signals is fixed to the 4th gray scale of the ultrasound image.
- (10) Negative / Positive Selection (P/N)
In the SSD-500 system, the polarity of TV signal is switched over in the digital form. In the SSD-620 or SSD-630 system, switching of polarity is applied to the TV composite signal.
- (11) Gray-scale Bar Addition (Σ)
The information of gray-scale bar is added to the image signal to indicate a gray-scale bar at the left side end of the ultrasound image screen. This signal does never mix up with the information of the ultrasound image.
- (12) D/A Conversion (DAC)
Since the digital signal passed through the previous processing stages is unable to display the proper image on the TV monitor, the signal is finally converted into the analog signal by this DAC.

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Block Diagram

16-2-5 CPU

EP-2872

1. General

This PCB consist of micro processor, its peripheral circuit and graphic controller. Surface mount devices are employed for most of parts and result the size to be small.

SSD-500 dose not use system bus owing to single processor.

Graphic controller realize high speed display of graphics using GDC without decreasing the memory space of MPU.

2. Operation

- (1) MPU (Micro Processing Unit)
MPU is HD63B09P which is high speed version of MC6809.
- (2) ROM (Read Only Memory)
It has 48K byte for program space. HN27C256 is used as ROM chip.
- (3) RAM (Random Access Memory)
In assigned address, higher 1K byte is used for I/O space.
- (4) PTM (Programmable Timer Module)
HD66840 is used.
- (5) RTC (Real Time Clock)
RTC6242* which is built in crystal LSI is used. Output of the LSI is to input IRQ terminal of MPU and it will be master clock for time and date display.
- (6) MPSC (Multi protocol Serial controller)
μPD7901 is used. This IC control RS-232C serial data link control data line for communicate with external system.
- (7) Battery
This PCB install the 3.6V 60mAh battery.

16-2-6 MPU & I/F

1. General

This PCB consists of microprocessor, its peripheral circuit and graphic controller. Surface mount devices are employed for most of parts and result the size to be small.

SSSD-500 (software Ver. E3.0) and higher system) does not use system bus owing to single processor.

Graphic controller realizes high speed display of graphics using GDC without decreasing the memory space of MPU.

And, this PCB serves as an interface between the MPU (Micro Processing Unit) and the panel board.

2. Operation

- (1) MPU (Micro Processing Unit)
MPU is HD63B19P that is high-speed version of MC6809.
- (2) ROM (Read Only Memory)
It has 48k bytes for program space. J1N27C256 is used as ROM chip.
- (3) RAM (Random Access Memory)
Is assigned address, higher 1k bytes are used for I/O space.
- (4) PTM (Programmable Timer Module)
HD68B40 is used.
- (5) RTC (Real time Clock)
RTC62421 that is built in crystal TSI is used. Out put of the TSI is to input IRQ terminal of MPU and it will be master clock for time and date display.
- (6) Battery
This PCB installs the 3.6V 60mA/h battery.
- (7) GDC (Graphic Display Controller)
nPD72020 is used as the controller. Memory (128k x 8 bits) is used as V-RAM for displaying. This GDC has 4 screens. (1 screen has the screen of 320 x 240 dots)
- (8) ADC (Analog to Digital Converter)
AD7824 is used.
The A/D converter converts the signals of GAIN, NEAR SIC, BAR STC from the panel and the output voltage from the volume into digital signal. After that, the digital signal is sent to MPU.
- (9) ADDRESS DECODER
Makes addressing for each registers which is set by the MPU.
- (10) TRACKBALL INTERFACE
Transfers information to the MPU by converting +/-X, +/-Y signal from the trackball unit and sending it directly to the data bus.

16-2-7 DIU

This block performs conversion of the ultrasound signal to digital signal, then takes the data into the line buffer memory in synchronized with DIU's timing, then stores the data into image memory by means of X-Y sampling writing system, and reads out the data according to TV scanning. And then, performs post process such the gradation conversion of display data, addition of attribute, addition of characters and graphics, then outputs TV displaying signal by adding the TV synchronizing signal after convert digital to analog signal.

This board uses DDU1 chip gate array (MRG327), and provides a compact flash memory unit as option.

GEU Interface block

This block controls the parameter data to take the ultrasound data into DIU. And also controls the operation and freeze.

1) Parameter ROM

This ROM has each vector information (parameter) for ultrasound scanning lines.

2) Parameter ROM for software

The system includes parameter ROM for reference by software. It is accessible by the CPU at any time.

3) Scanning area display

This function makes the B mode image display area narrow and increase the frame rate.

4) Freeze function

This function stops the writing of image data to the image memory.

Line buffer block

This block consists of the line memory and its controller to synchronize the data of DIU with the write cycle of the main memory.

The line memory can store one ultrasound line data as 2-bit data including both the boundary passing signal and ultrasound data taken by means of the X-Y sampling writing system, and performs the read-out of the data to main memory within the range of written data.

1) Means of the X-Y sampling writing system

The ultrasound scanning line data is regarded as the scanning line vector. And the DIU writes freely one line according to both the initial coordinate (X0 and Y0) which indicates a vector and the boundary passing time (ΔX and ΔY) of a vector into the main memory.

2) Dynamic focus

To correspond to the multi-level dynamic focus, this performs writing of the ultrasound image data into image memory by sampling the data synchronized with the area signal sent from GEU. The focus points are controlled by GEU.

Main memory block

This is an image memory to store the image data read out from line buffer.

To increase the memory write speed of the ultrasound image data, the memories are configured by 4 chips (2 x 2). It writes two consecutive pixels data simultaneously, not write four pixels data at a stretch. Two pixels are always written side by side when writing sequentially. Therefore, it provides two memory cycle systems, and which realize a half of write cycle period (160ns/cycle) by mixing each write cycle time when continuous writing occurs.

It provides 2 screens of 512 x 512 pixels x 8 bits by using 1MB dual port memory configured by 256 x 512 pixels x 8 bits, because the memory is configured 2 x 2 chips. The system assigns these 2 screens to left side and right side of images when a complex mode is selected.

Writing control block

This block is configured from a block which generates write control signals and address when image data read from the line buffer is written to display memory and which controls crasing of display memory.

Image data (8-bit) read from the line buffer contain pixel border passing signals (INCX, INCY) in the X and Y directions. Write address are generated by operating the address counter for each direction by means of this signal. Setting of this address counter's initial value and controlling the up/down count makes it possible to control the image direction.

Display control block

This block reads image data written in main memory in synchronized with the TV signal and carries out TV display.

Since main memory uses dual port memory, writing to RAM and reading from SAM is done asynchronously. Therefore, TV display of image data can be done according to the predetermined display format, reading of the contents of the SAM block can be executed and can be displayed by serial reading.

Compact flash memory

The compact flash memory unit for image data storage is provided as option.

The compact flash memory unit consists of a compact flash memory and DMAC (PTD) to control the DMS communication between image memory and compact flash memory.

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16-2-8 MPU

This board consists of microprocessor, its peripheral circuit and graphic controller.

1. MPU

MPU is "62B09". And it uses 8MHz of the crystal oscillator and 9MHz of bus clock. The outputs of interrupt of PFM and MPSC are connected with the terminal of PFRQ, and the output of interrupt of RTC is connected with the terminal of IRQ. Also, the output from DTU board is connected with the terminal of DMA (Direct Memory Access) and which is corresponding for DMA communication between image memory and compact flash memory in DTU board.

2. Program ROM

Two EPROMs (1Mbit, 512k x8) are used. And they are used by dividing the bank to fit to address area of 64kbytes.

3. RAM

1Mbit (128k x 8) SRAM is used.

4. RTC

RTC62423 that is built-in crystal LSI is used. Its output inputs to IRQ terminal (Interrupt Request) of MPU and it becomes a master clock for time and date display.

5. PFM

HD63B40 is used and which mainly uses to infer a timer.

6. MPSC

6PD72003 is used.

7. GDC

6PD72020 is used for graphic controller. Two FMS98223 of VRAMs are used for display, and they consist of 2 planes for characters and 4 planes for graphics.

8. Address Decoder

This block assigns the setting of the address to each register, which access by MPU.

9. Battery

This board installs the 3.6V 60mAh battery.

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