MC160MFP

Maintenance Manual

011710A

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Document Revision History

Rev. No	Date	Corrected items			Person in charge
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1	2009-07-03			Issue	PED1 K. Aida

Rev. No	Date	Corrected items			Person in charge
		No.	Page	Description of change	

PREFACE

This manual provides an overview of method for maintaining the MC160n.

This manual is intended for maintenance staff. For more information about how to operate the MC160n, please refer to User 's manual.

Note!
- Manual may be revised and updated at any time without notice.
- Unexpected mistakes may exist in the manual.
  OKI will not assume any responsibility whatsoever for damage to the equipmentrepaired/adjusted/changed by the user etc with this manual.
- The parts used for this printer may be damaged when handling inappropriately. We strongly recommend maintaining this machine by our registration maintenance staff.
- Please operate the machine after removing static electricity.

CONTENTS

SAFETY AND IMPORTANT WARNING ITEMS

Read carefully the Safety and Important Warning Items described below to understand them before doing service work.

IMPORTANT NOTICE

Because of possible hazards to an inexperienced person servicing this product as well as the risk of damage to the product, Okidata Corporation (hereafter called the ODC) strongly recommends that all servicing be performed only by ODC-trained service technicians.

Changes may have been made to this product to improve its performance after this Service Manual was printed. Accordingly, ODC does not warrant, either explicitly or implicitly, that the information contained in this Service Manual is complete and accurate.

The user of this Service Manual must assume all risks of personal injury and/or damage to the product while servicing the product for which this Service Manual is intended.

Therefore, this Service Manual must be carefully read before doing service work both in the course of technical training and even after that, for performing maintenance and control of the product properly.

Keep this Service Manual also for future service.

DESCRIPTION ITEMS FOR DANGER, WARNING AND CAUTION

In this Service Manual, each of three expressions "⚠DANGER", "⚠WARNING", and "⚠CAUTION" is defined as follows together with a symbol mark to be used in a limited meaning.

When servicing the product, the relevant works (disassembling, reassembling, adjustment, repair, maintenance, etc.) need to be conducted with utmost care.

⚠ **DANGER: Action having a high possibility of suffering death or serious injury**

⚠ **WARNING: Action having a possibility of suffering death or serious injury**

⚠ **CAUTION: Action having a possibility of suffering a slight wound, medium trouble and property damage**

Symbols used for safety and important warning items are defined as follows:

△ :Precaution when using the copier.	⚠ **General precaution**	⚡ **Electric hazard**	🔺 **High temperature**
⊘ :Prohibition when using the copier.	⊘ **General prohibition**	🚫 **Do not touch with wet hand**	🚫 **Do not disassemble**
● :Direction when using the copier.	❗ **General instruction**	⚡ **Unplug**	⏚ **Ground/Earth**

SAFETY WARNINGS

[1] MODIFICATIONS NOT AUTHORIZED BY OKI DATA CORPORATION

Okidata brand products are renowned for their high reliability. This reliability is achieved through high-quality design and a solid service network.

Product design is a highly complicated and delicate process where numerous mechanical, physical, and electrical aspects have to be taken into consideration, with the aim of arriving at proper tolerances and safety factors. For this reason, unauthorized modifications involve a high risk of degradation in performance and safety. Such modifications are therefore strictly prohibited. The points listed below are not exhaustive, but they illustrate the reasoning behind this policy.

Prohibited Actions

⚠DANGER

- Using any cables or power cord not specified by ODC.

- Using any fuse or thermostat not specified by ODC. Safety will not be assured, leading to a risk of fire and injury.

- Disabling fuse functions or bridging fuse terminals with wire, metal clips, solder or similar object.

- Disabling relay functions (such as wedging paper between relay contacts)

- Disabling safety functions (interlocks, safety circuits, etc.) Safety will not be assured, leading to a risk of fire and injury.

- Making any modification to the product unless instructed by ODC

- Using parts not specified by ODC

[2] POWER PLUG SELECTION

In some countries or areas, the power plug provided with the product may not fit wall outlet used in the area. In that case, it is obligation of customer engineer (hereafter called the CE) to attach appropriate power plug or power cord set in order to connect the product to the supply.

Power Cord Set or Power Plug

⚠ WARNING

- Use power supply cord set which meets the following criteria:
  - provided with a plug having configuration intended for the connection to wall outlet appropriate for the product's rated voltage and current, and
  - the plug has pin/terminal(s) for grounding, and
  - provided with three-conductor cable having enough current capacity, and
  - the cord set meets regulatory requirements for the area.

  Use of inadequate cord set leads to fire or electric shock.

  AC230V
  AC208V～240V
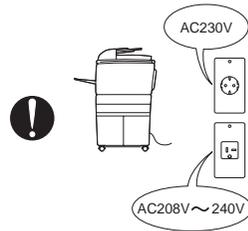
- Attach power plug which meets the following criteria:
  - having configuration intended for the connection to wall outlet appropriate for the product's rated voltage and current, and
  - the plug has pin/terminal(s) for grounding, and
  - meets regulatory requirements for the area.

  Use of inadequate cord set leads to the product connecting to inadequate power supply (voltage, current capacity, grounding), and may result in fire or electric shock.

- Conductors in the power cable must be connected to terminals of the plug according to the following order:
  - Black or Brown: L (line)
  - White or Light Blue: N (neutral)
  - Green/Yellow: PE (earth)

  Wrong connection may cancel safeguards within the product, and results in fire or electric shock.

[3] CHECKPOINTS WHEN PERFORMING ON-SITE SERVICE

Okidata brand products are extensively tested before shipping, to ensure that all applicable safety standards are met, in order to protect the customer and CE from the risk of injury. However, in daily use, any electrical equipment may be subject to parts wear and eventual failure. In order to maintain safety and reliability, the CE must perform regular safety checks.

1. Power Supply

Connection to Power Supply

⚠ WARNING

- Check that mains voltage is as specified.

  Connection to wrong voltage supply may result in fire or electric shock.

  ? V
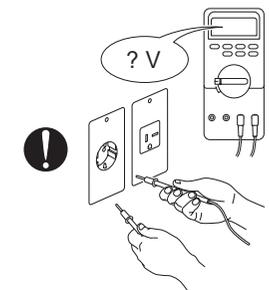
- Connect power plug directly into wall outlet having same configuration as the plug.

  Use of an adapter leads to the product connecting to inadequate power supply (voltage, current capacity, grounding), and may result in fire or electric shock.

  If proper wall outlet is not available, advice the customer to contact qualified electrician for the installation.

  ～ kw

- Plug the power cord into the dedicated wall outlet with a capacity greater than the maximum power consumption.

  If excessive current flows in the wall outlet, fire may result.

- If two or more power cords can be plugged into the wall outlet, the total load must not exceed the rating of the wall outlet.

  If excessive current flows in the wall outlet, fire may result.

- Make sure the power cord is plugged in the wall outlet securely.

  Contact problems may lead to increased resistance, overheating, and the risk of fire.

Connection to Power Supply

⚠ WARNING

- Check whether the product is grounded properly.

  If current leakage occurs in an ungrounded product, you may suffer electric shock while operating the product.

  Connect power plug to grounded wall outlet.

Power Plug and Cord

⚠ WARNING

- When using the power cord set (inlet type) that came with this product, make sure the connector is securely inserted in the inlet of the product.
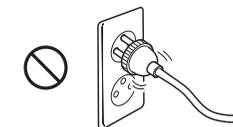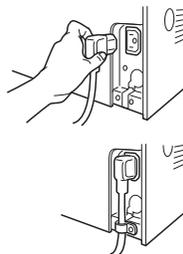 When securing measure is provided, secure the cord with the fixture properly.

  If the power cord (inlet type) is not connected to the product securely, a contact problem may lead to increased resistance, overheating, and risk of fire.

- Check whether the power cord is not stepped on or pinched by a table and so on.

  Overheating may occur there, leading to a risk of fire.

- Check whether the power cord is damaged. Check whether the sheath is damaged.

  If the power plug, cord, or sheath is damaged, replace with a new power cord or cord set (with plug and connector on each end) specified by ODC.

  Using the damaged power cord may result in fire or electric shock.
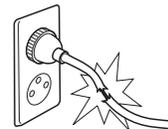
- Do not bundle or tie the power cord.

  Overheating may occur there, leading to a risk of fire.
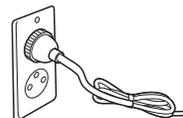
Power Plug and Cord

⚠ WARNING

- Check whether dust is collected around the power plug and wall outlet.

  Using the power plug and wall outlet without removing dust may result in fire.
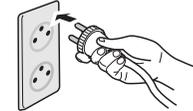
- Do not insert the power plug into the wall outlet with a wet hand.

  The risk of electric shock exists.

- When unplugging the power cord, grasp the plug, not the cable.

  The cable may be broken, leading to a risk of fire and electric shock.
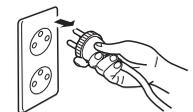
Wiring

⚠ WARNING

- Never use multi-plug adapters to plug multiple power cords in the same outlet.

  If used, the risk of fire exists.
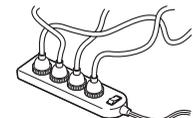
- When an extension cord is required, use a specified one. Current that can flow in the extension cord is limited, so using a too long extension cord may result in fire.

  Do not use an extension cable reel with the cable taken up. Fire may result.

2. Installation Requirements

Prohibited Installation Places

⚠️WARNING

- Do not place the product near flammable materials or volatile materials that may catch fire.

  A risk of fire exists.

- Do not place the product in a place exposed to water such as rain.

  A risk of fire and electric shock exists.

When not Using the Product for a long time

⚠️WARNING

- When the product is not used over an extended period of time (holidays, etc.), switch it off and unplug the power cord.

  Dust collected around the power plug and outlet may cause fire.

Ventilation

⚠️CAUTION

- The product generates ozone gas during operation, but it will not be harmful to the human body.

  If a bad smell of ozone is present in the following cases, ventilate the room.
  a. When the product is used in a poorly ventilated room
  b. When taking a lot of copies
  c. When using multiple products at the same time

Fixing

⚠️CAUTION

- Be sure to lock the caster stoppers.

  In the case of an earthquake and so on, the product may slide, leading to a injury.

3. Servicing

Inspection before Servicing

⚠️CAUTION

- Before conducting an inspection, read all relevant documentation (service manual, technical notices, etc.) and proceed with the inspection following the prescribed procedure in safety clothes, using only the prescribed tools. Do not make any adjustment not described in the documentation.

  If the prescribed procedure or tool is not used, the product may break and a risk of injury or fire exists.

- Before conducting an inspection, be sure to disconnect the power plugs from the product and options.

  When the power plug is inserted in the wall outlet, some units are still powered even if the POWER switch is turned OFF. A risk of electric shock exists.

- The area around the fixing unit is hot.

  You may get burnt.

Work Performed with the Product Powered On

⚠️WARNING

- Take every care when making adjustments or performing an operation check with the product powered.

  If you make adjustments or perform an operation check with the external cover detached, you may touch live or high-voltage parts or you may be caught in moving gears or the timing belt, leading to a risk of injury.

- Take every care when servicing with the external cover detached.

  High-voltage exists around the drum unit. A risk of electric shock exists.

Safety Checkpoints

⚠ WARNING

- When taking a report of problems from a user, check each part and repair properly.

  A risk of product trouble, injury, and fire exists.

- Check the exterior and frame for edges, burrs, and other damages.

  The user or CE may be injured.

- Do not allow any metal parts such as clips, staples, and screws to fall into the product.

  They can short internal circuits and cause electric shock or fire.

- Check wiring for squeezing and any other damage.

  Current can leak, leading to a risk of electric shock or fire.

- Carefully remove all toner remnants and dust from electrical parts and electrode units such as a charging corona unit.

  Current can leak, leading to a risk of product trouble or fire.

- Check high-voltage cables and sheaths for any damage.

  Current can leak, leading to a risk of electric shock or fire.

- Check electrode units such as a charging corona unit for deterioration and sign of leakage.

  Current can leak, leading to a risk of trouble or fire.

- Before disassembling or adjusting the write unit (P/H unit) incorporating a laser, make sure that the power cord has been disconnected.

  The laser light can enter your eye, leading to a risk of loss of eyesight.
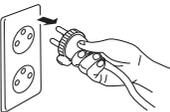
Safety Checkpoints

⚠ WARNING

- Do not remove the cover of the write unit. Do not supply power with the write unit shifted from the specified mounting position.

  The laser light can enter your eye, leading to a risk of loss of eyesight.

- When replacing a lithium battery, replace it with a new lithium battery specified in the Parts Guide Manual. Dispose of the used lithium battery using the method specified by local authority.

  Improper replacement can cause explosion.
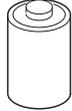
- After replacing a part to which AC voltage is applied (e.g., optical lamp and fixing lamp), be sure to check the installation state.

  A risk of fire exists.

- Check the interlock switch and actuator for loosening and check whether the interlock functions properly.

  If the interlock does not function, you may receive an electric shock or be injured when you insert your hand in the product (e.g., for clearing paper jam).
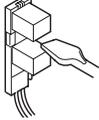
- Make sure the wiring cannot come into contact with sharp edges, burrs, or other pointed parts.

  Current can leak, leading to a risk of electric shock or fire.

- Make sure that all screws, components, wiring, connectors, etc. that were removed for safety check and maintenance have been reinstalled in the original location. (Pay special attention to forgotten connectors, pinched cables, forgotten screws, etc.)

  A risk of product trouble, electric shock, and fire exists.

Handling of Consumables

⚠WARNING

- Toner and developer are not harmful substances, but care must be taken not to breathe excessive amounts or let the substances come into contact with eyes, etc. It may be stimulative.

  If the substances get in the eye, rinse with plenty of water immediately. When symptoms are noticeable, consult a physician.

- Never throw the used cartridge and toner into fire.

  You may be burned due to dust explosion.

Handling of Service Materials

⚠CAUTION

- Unplug the power cord from the wall outlet.

  Isopropyl alcohol and acetone are highly flammable and must be handled with care. A risk of fire exists.
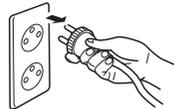
- Do not replace the cover or turn the product ON before any solvent remnants on the cleaned parts have fully evaporated.

  A risk of fire exists.

- Use only a small amount of cleaner at a time and take care not to spill any liquid. If this happens, immediately wipe it off.

  A risk of fire exists.

- When using any solvent, ventilate the room well.

  Breathing large quantities of organic solvents can lead to discomfort.

4. Fuse

Fuse

⚠CAUTION

- CAUTION
  Double pole / neutral fusing

- ATTENTION
  Double pôle / Fusible sur le neutre

5. Used Batteries Precautions

Handling of batteries

⚠CAUTION

- ALL Areas
  CAUTION
  Danger of explosion if battery is incorrectly replaced.
  Replace only with the same or equivalent type recommended by the manufacturer.
  Dispose of used batteries according to the manufacturer's instructions.

- Germany
  VORSICHT!
  Explosionsgefahr bei unsachgemäßem Austausch der Batterie.
  Ersatz nur durch denselben oder einen vom Hersteller empfohlenen gleichwertigen Typ.
  Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

- France
  ATTENTION
  Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.
  Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
  Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

- Denmark
  ADVARSEL!
  Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
  Udskiftning må kun ske med batteri af samme fabrikat og type.
  Levér det brugte batteri tilbage til leverandøren.

- Finland, Sweden
  VAROITUS
  Paristo voi räjähtää, jos se on virheellisesti asennettu.
  Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
  Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.
  VARNING
  Explosionsfara vid felaktigt batteribyte.
  Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.
  Kassera använt batteri enligt fabrikantens instruktion.

- Norway
  ADVARSEL
  Eksplosjonsfare ved feilaktig skifte av batteri.
  Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten.
  Brukte batterier kasseres i henhold til fabrikantens instruksjoner.

[4] LASER SAFETY

- This is a digital machine certified as a Class 1 laser product. There is no possibility of danger from a laser, provided the machine is serviced according to the instruction in this manual.

4.1 Internal Laser Radiation

semiconductor laser	
Maximum power of the laser diode	20 mW
Maximum average radiation power (*)	13.3 µW
Wavelength	775 - 800 nm

*at laser aperture of the Print Head Unit

- This product employs a Class 3B laser diode that emits an invisible laser beam. The laser diode and the scanning polygon mirror are incorporated in the print head unit.
- The print head unit is NOT A FIELD SERVICEABLE ITEM. Therefore, the print head unit should not be opened under any circumstances.

Laser Aperture of the Print Head Unit

A0HFP0C502DA
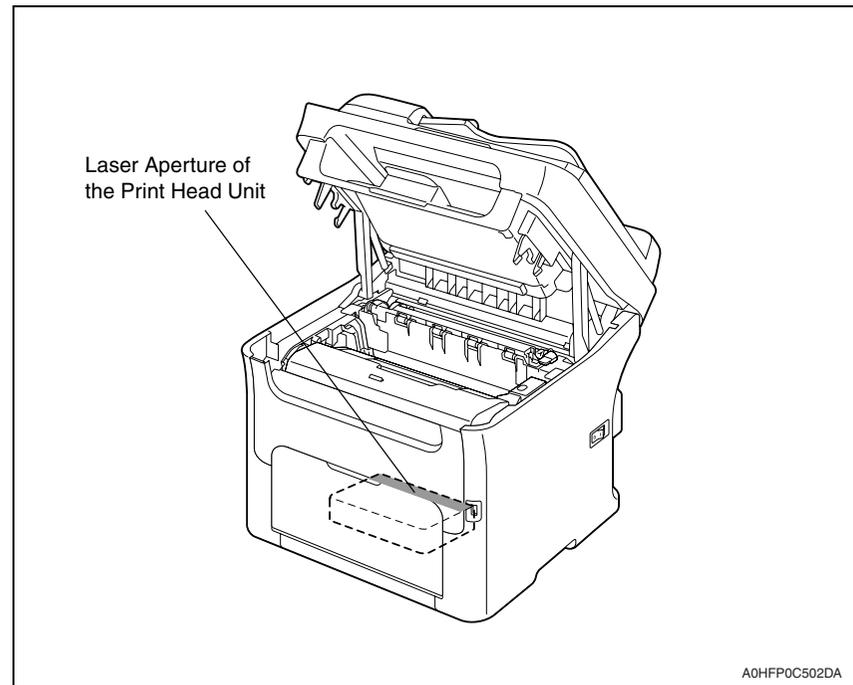
U.S.A., Canada
(CDRH Regulation)

- This machine is certified as a Class 1 Laser product under Radiation Performance Standard according to the Food, Drug and Cosmetic Act of 1990. Compliance is mandatory for Laser products marketed in the United States and is reported to the Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration of the U.S. Department of Health and Human Services (DHHS). This means that the device does not produce hazardous laser radiation.

- The label shown on page S-16 indicates compliance with the CDRH regulations and must be attached to laser products marketed in the United States.

CAUTION
- **Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.**

semiconductor laser	
Maximum power of the laser diode	20 mW
Wavelength	775 - 800 nm

All Areas

CAUTION
- **Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.**

semiconductor laser	
Maximum power of the laser diode	20 mW
Wavelength	775 - 800 nm

Denmark

ADVARSEL
- **Usynlig laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling. Klasse 1 laser produkt der opfylder IEC60825-1 sikkerheds kravene.**

halvlederlaser	
Laserdiodens højeste styrke	20 mW
bølgelængden	775 - 800 nm

Finland, Sweden

> **LUOKAN 1 LASERLAITE**
> **KLASS 1 LASER APPARAT**

> **VAROITUS!**
> • **Laitteen käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.**

puolijohdelaser	
Laserdiodin suurin teho	20 mW
aallonpituus	775 - 800 nm

> **VARNING!**
> • **Om apparaten används på annat sätt än i denna bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.**

halvledarlaser	
Den maximala effekten för laserdioden	20 mW
våglängden	775 - 800 nm

> **VARO!**
> • **Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.**

> **VARNING!**
> • **Osynlig laserstråining när denna del är öppnad och spärren är urkopplad. Betrakta ej stråien.**

Norway

> **ADVERSEL**
> • **Dersom apparatet brukes på annen måte enn spesifisert i denne bruksanvisning, kan brukeren utsettes för unsynlig laserstrålning, som overskrider grensen for laser klass 1.**

halvleder laser	
Maksimal effekt till laserdiode	20 mW
bølgelengde	775 - 800 nm

4.2 Laser Safety Label

• A laser safety label is attached to the inside of the machine as shown below.

COMPLIES WITH 21 CFR 1040.10 AND 1040.11 EXCEPT FOR DEVIATIONS PURSUANT TO LASER NOTICE NO.50, DATED JUNE 24, 2007.

or/and

CLASS 1 LASER PRODUCT
LASER KLASSE 1 PRODUKT
PRODUCTO LASER DE CLASE 1

A0HFP0C500DA
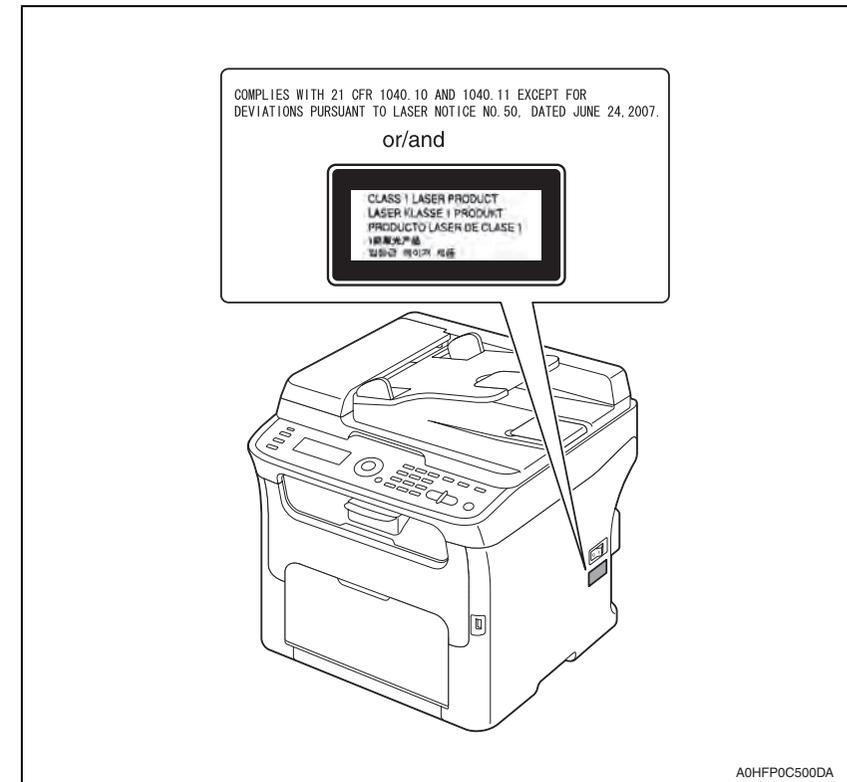
4.3 Laser Caution Label

• A laser caution label is attached to the outside of the machine as shown below.

A0HFP0C501DA
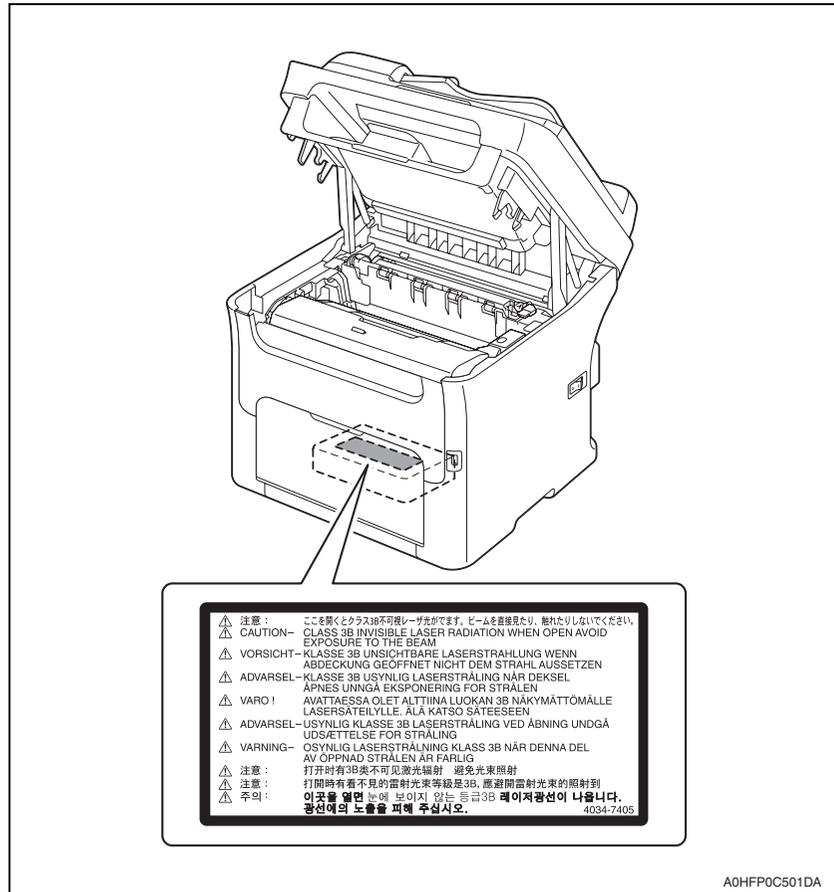
4.4 PRECAUTIONS FOR HANDLING THE LASER EQUIPMENT

• When laser protective goggles are to be used, select ones with a lens conforming to the above specifications.
• When a disassembly job needs to be performed in the laser beam path, such as when working around the printerhead and PC Drum, be sure first to turn the printer OFF.
• If the job requires that the printer be left ON, take off your watch and ring and wear laser protective goggles.
• A highly reflective tool can be dangerous if it is brought into the laser beam path. Use utmost care when handling tools on the user's premises.
• The Print Head is not to be disassembled or adjusted in the field. Replace the Unit or Assembly including the Control Board. Therefore, remove the Laser Diode, and do not perform Control Board trimmer adjustment.

SAFETY INFORMATION

IMPORTANT NOTICE

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products manufactured since August 1, 1976. Compliance is mandatory for products marketed in the United States.

This copier is certified as a "Class 1" laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. Since radiation emitted inside this copier is completely confined within protective housings and external covers, the laser beam cannot escape during any phase of normal user operation.

INDICATION OF WARNING ON THE MACHINE

Caution labels shown below are attached in some areas on/in the machine.
When accessing these areas for maintenance, repair, or adjustment, special care should be taken to avoid burns and electric shock.

⚠ **CAUTION**

- **The area around the Fuser Unit is extremely hot. Touching any part other than those indicated may result in burns.**

195°C
383°F
20min.

⚡ **High voltage**

- **This area generates high voltage.
  Be careful not to touch here when the power is turned ON to avoid getting an electric shock.**

A0HFP0503DA

⚡ **High voltage**

- **This area generates high voltage.
  Be careful not to touch here when the power is turned ON to avoid getting an electric shock.**

A0HFP0C504DA
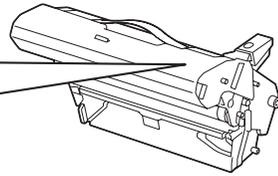
⚠ **WARNING**

- **Do not burn used Imaging Cartridge.**
  Toner expelled from the fire is dangerous.
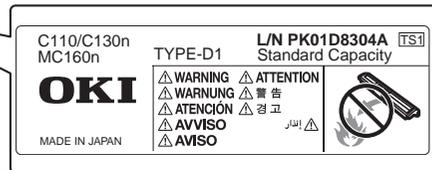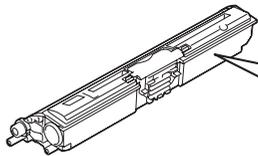
⚠ **WARNING**

- **Do not burn used Toner Cartridges.**
  Toner expelled from the fire is dangerous.

A0HFP0505DA

⚠ **CAUTION:**

- **You may be burned or injured if you touch any area that you are advised by any caution label to keep yourself away from. Do not remove caution labels. And also, when the caution label is peeled off or soiled and cannot be seen clearly, replace it with a new caution label.**

MEASURES TO TAKE IN CASE OF AN ACCIDENT

1. If an accident has occurred, the distributor who has been notified first must immediately take emergency measures to provide relief to affected persons and to prevent further damage.
2. If a report of a serious accident has been received from a customer, an on-site evaluation must be carried out quickly and ODC must be notified.
3. To determine the cause of the accident, conditions and materials must be recorded through direct on-site checks, in accordance with instructions issued by ODC.
4. For reports and measures concerning serious accidents, follow the regulations specified by every distributor.

Composition of the service manual

This service manual consists of Theory of Operation section and Field Service section to explain the main machine and its corresponding options.

Theory of Operation section gives, as information for the CE to get a full understanding of the product, a rough outline of the object and role of each function, the relationship between the electrical system and the mechanical system, and the timing of operation of each part.

Field Service section gives, as information required by the CE at the site (or at the customer's premise), a rough outline of the service schedule and its details, maintenance steps, the object and role of each adjustment, error codes and supplementary information.

The basic configuration of each section is as follows. However some options may not be applied to the following configuration.

<Theory of Operation section>

OUTLINE: Explanation of system configuration, product specifications, unit configuration, and paper path

COMPOSITION/OPERATION: Explanation of configuration of each unit, operating system, and control system

<Field service section>

OUTLINE: Explanation of system configuration, and product specifications

MAINTENANCE: Explanation of service schedule, maintenance steps, service tools, removal/reinstallation methods of major parts, and firmware version up method etc.

ADJUSTMENT/SETTING: Explanation of utility mode, service mode, and mechanical adjustment etc.

TROUBLESHOOTING: Explanation of lists of jam codes and error codes, and their countermeasures etc.

APPENDIX: Parts layout drawings, connector layout drawings, timing chart, overall layout drawing are attached.

Notation of the service manual

A. Product name
In this manual, each of the products is described as follows:

(1) MC160n — Main body

(2) Microsoft Windows NT 4.0: — Windows N T 4.0 or Windows NT

Microsoft Windows 2000: — Windows 2000

Microsoft Windows XP: — Windows XP

Microsoft Windows Vista: — Windows Vista

When the description is made in combination of the OS's mentioned above:

Windows NT 4.0/2000

Windows NT/2000/XP/Vista

B. Brand name
The company names and product names mentioned in this manual are the brand name or the registered trademark of each company.

C. Feeding direction
- When the long side of the paper is parallel with the feeding direction, it is called short edge feeding. The feeding direction which is perpendicular to the short edge feeding is called the long edge feeding.
- Short edge feeding will be identified with [S (abbreviation for Short edge feeding)] on the paper size. No specific notation is added for the long edge feeding.
  When the size has only the short edge feeding with no long edge feeding, [S] will not be added to the paper size.

<Sample notation>

Paper size	Feeding direction	Notation
A4	Long edge feeding	A4
	Short edge feeding	A4S
A3	Short edge feeding	A3

MC160n Main body

THEORY OF OPERATION

CONTENTS

MC160n Main body

OUTLINE

1. System configuration

A0HFT1C500AA

[1] MC160n

[2] Lower Feeder Unit (Option)

[3] Duplex Option Attachment (Option)

[4] Duplex Option (Option)

2. Product specifications

A. Type

Type	Desktop full-color laser beam printer
Printing system	Semiconductor laser and electrostatic image transfer to plain paper
Exposure system	2 laser diodes and polygon mirror
PC drum type	OPC (organic photo conductor)
Photoconductor cleaning	Blade cleaning system
Resolution	1200 x 600 dpi, 600 x 600 dpi
Media feeding system	One-way system (Tray 1: 200 sheets) * Expandable to a two-way system by adding an optional Lower Feeder Unit.
Developing system	Single-element developing system
Charging system	DC comb electrode scorotron system
Image transfer system	Intermediate transfer belt system
Media separating system	Curvature separation + Charge-neutralizing system
Fusing system	Roller fusing
Media exit system	Face down (Output tray capacity: 100 sheets)

B. Functions

Warm-up time	Average 30 seconds (time to return to Ready mode from Energy Save mode)	
Process speed	Plain paper	126.78 mm/second
	Thick stock	63.39 mm/second
First-Page-Out Time (A4/letter, Plain paper)	Full color	1-sided: 21 seconds
	Monochrome	1-sided: 12 seconds
First copy time (A4/Letter, Plain paper)	Full color	1-sided: 52 seconds (600 x 300 dpi)
	Monochrome	1-sided: 23 seconds (600 x 300 dpi)
Print speed (A4/Letter, Plain paper)	Full color	1-sided: 5 pages/minute
	Monochrome	1-sided: 20 pages/minute
Custom media sizes	Paper width: 92 to 216 mm (3.6" to 8.5")	
	Paper length: 195 to 356 mm (Plain paper) 184 to 297 mm (Thick paper)	
Media types	• Plain paper (60 to 90 g/m^2) • Thick stock 1 (91 to 163 g/m^2) • Thick stock 2 (164 to 209 g/m^2) • Postcards • Envelopes • Letterhead • Label stock	
Tray capacities	Plain paper and letterhead :200 sheets Thick stock, postcards, labels stock, and glossy stock :50 sheets Envelopes :10 sheets	

Lower Feeder Unit: Only plain paper and recycled paper weighing 60 to 90 g/m^2
(16 to 24 lb) can be loaded.
Duplex Option: Only plain paper and recycled paper weighing 60 to 90 g/m^2
(16 to 24 lb) can be fed through the unit.

C. Maintenance

Machine durability	50,000 prints or 5 years, whichever comes first

D. Machine specification

Power requirements	voltage:	AC 120 V ± 10 % AC 220 to 240 V ± 10%
	Frequency:	60 Hz ± 3 Hz (for North america) 50/60 Hz ± 3 Hz (for Europe)
Max power consumption	990 W or less (120 V) 1060 W or less (220 V to 240 V)	
Dimensions	405 mm (W) x 427 mm (D) x 432 mm (H)	
Weight	21.0 kg (including the consumables)	
Operation noise	During standby	38 dB (A)
	During printing	49 dB (A): monochrome

E. Operating environment

Temperature	10 to 35 °C / 50 to 95 °F (with a fluctuation of 10 °C / 18 °F or less per hour)
Humidity	15% to 85% (with a fluctuation of 20% or less per hour)

F. Controller

Type	Built-in type controller
Standard memory	128MB
Interfaces	USB 2.0 (High Speed) compliant, 10Base-T/100Base-TX Ethernet, Host USB (for scan to USB memory)
Support	- Microsoft Windows Vista Home Basic/Home Premium/Ultimate/Business/ Enterprise, Windows Vista Home Basic/Home Premium/ Ultimate/ Business/Enterprise x64 Edition, Windows XP Home Edition/ Professional (Service Pack 2 or later), Windows XP Professional x64 Edition, Windows Server 2003, Windows Server 2003 x64 Edition, Windows 2000 (Service Pack 4 or later) . Mac OS X (10.2.8 or later; We recommend installing the latest patch)

NOTE
• **These specifications are subject to change without notice.**

3. Center cross section

Auto document feeder section

Scanner section

Imaging cartridge section

Toner cartridge section

Write section

Media feed section

Fusing section

2nd transfer section

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4. Media path

<Auto document feeder section>

A0HFT2C516AA

<Main body>

A0HFT2C517AA
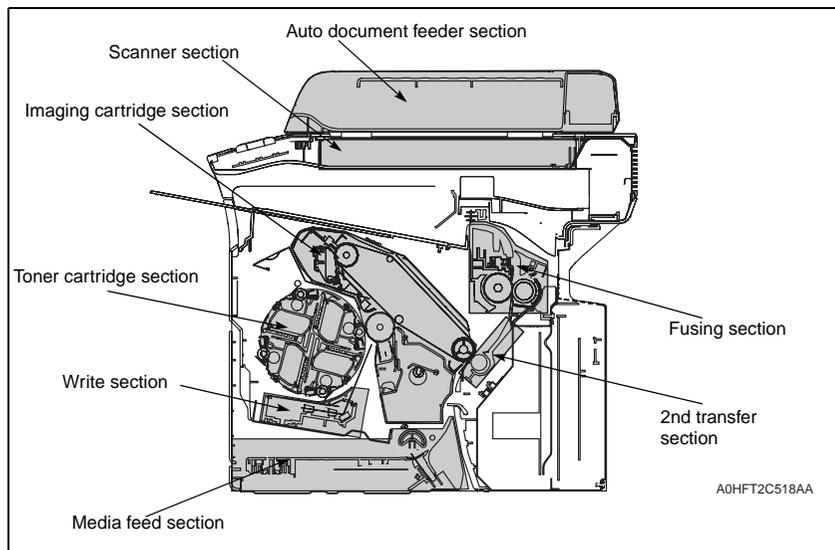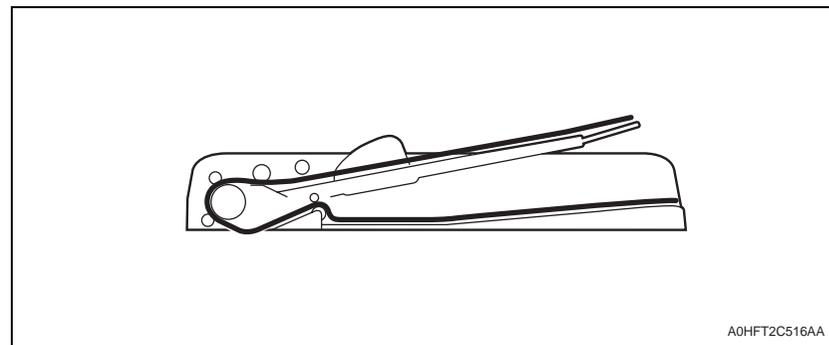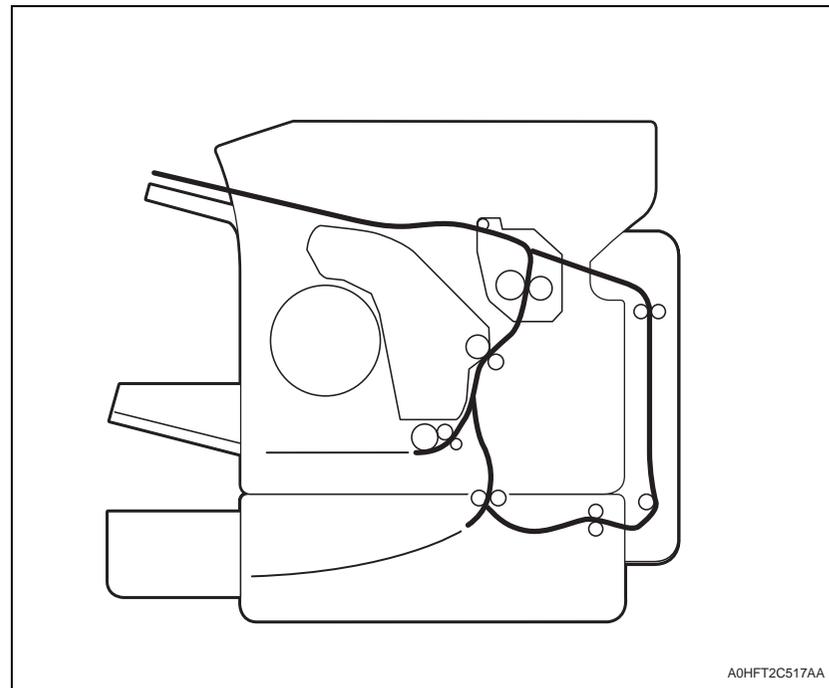
COMPOSITION/OPERATION

5. Overall composition

5.1 Control block diagram

A0VTT2C500AA
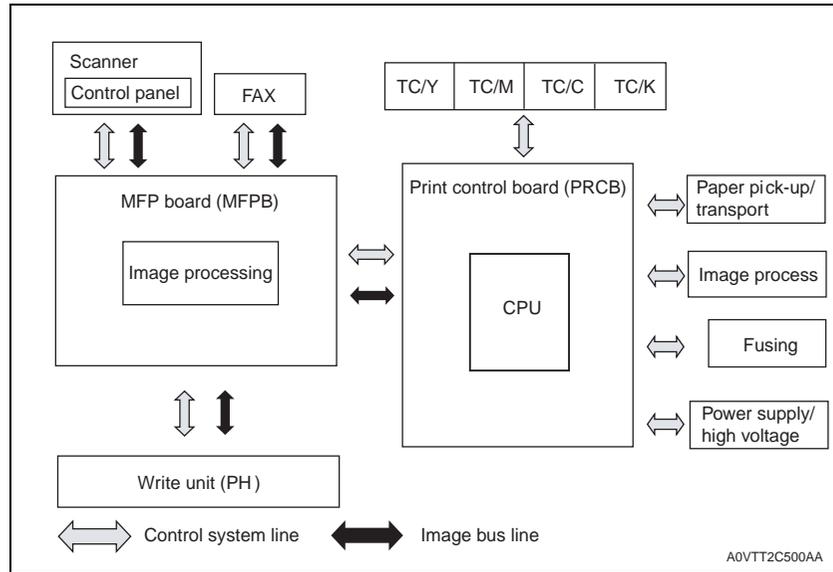
5.2 Image creation process

A00VT1C005AA

[1]	Printer image processing	• The intensity of the laser light is controlled by the image signal sent from the host computer.
[2]	Photo conductor	• The image projected onto the surface of the photo conductor is converted to a corresponding electrostatic latent image.
[3]	Photo conductor charging	• A negative DC charge layer is formed on the surface of the photo conductor.
[4]	Laser exposure	• The surface of the photo conductor is irradiated with the laser light and an electrostatic latent image is thereby formed.
[5]	Developing	• The toner, negatively charged in the Hopper, is attracted onto the electrostatic latent image formed on the surface of the photo conductor. It is thereby changed to a visible, developed image. • A DC negative bias voltage is applied to the Developing roller, thereby preventing toner from sticking to the background image portion.
[6]	1st image transfer	• A DC positive voltage is applied to the backside of the transfer belt, thereby allowing the visible, developed image on the surface of the photo conductor to be transferred onto the transfer belt.
[7]	2nd image transfer	• A DC positive voltage is applied to the backside of the media, thereby allowing the visible, developed image on the surface of the transfer belt to be transferred onto the media.
[8]	Media separation	• The media, which has undergone the 2nd image transfer process, is neutralized.
[9]	Transfer belt cleaning	• A charge is applied to the transfer belt. By potential difference, residual toner on the surface of the transfer belt is collected for cleaning.
[10]	Photo conductor cleaning	• The residual toner left on the surface of the photo conductor is scraped off.

5.3 Operation sequence

	Print request	Polygon motor	Transport motor	Transfer belt position detection	/TOD	Registration sensor	Registration roller solenoid	Rack motor	Developing motor	2nd transfer output	2nd image transfer pressure/retraction solenoid	Cleaning blade pressure/retraction solenoid	1st transfer output

A034T2E579AA
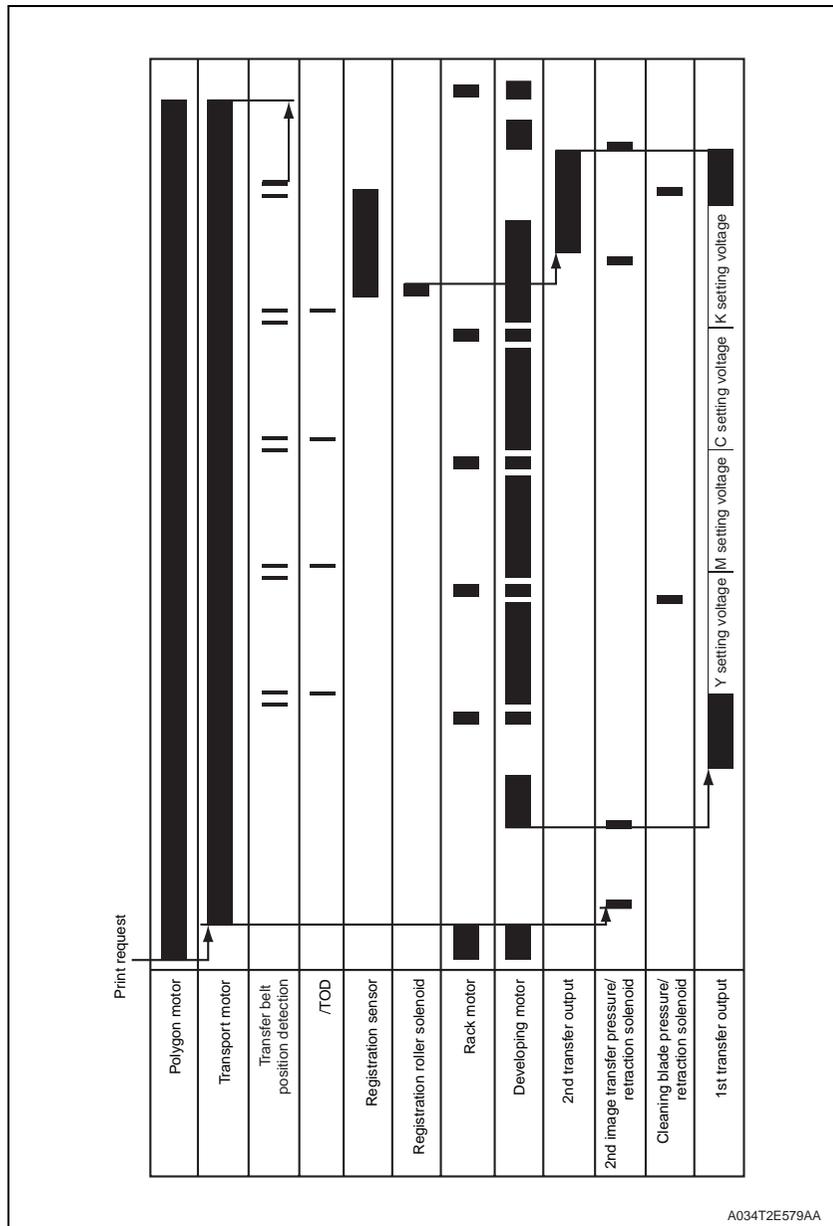
6. Interface section

6.1 Composition

TEL (telephone) jack

LINE (telephone line) jack

USB port

10Base-T/100Base-TX (IEEE 802.3) Ethernet Interface port

A0VTT2C501AA

USB memory port

A0HFT2C506AA
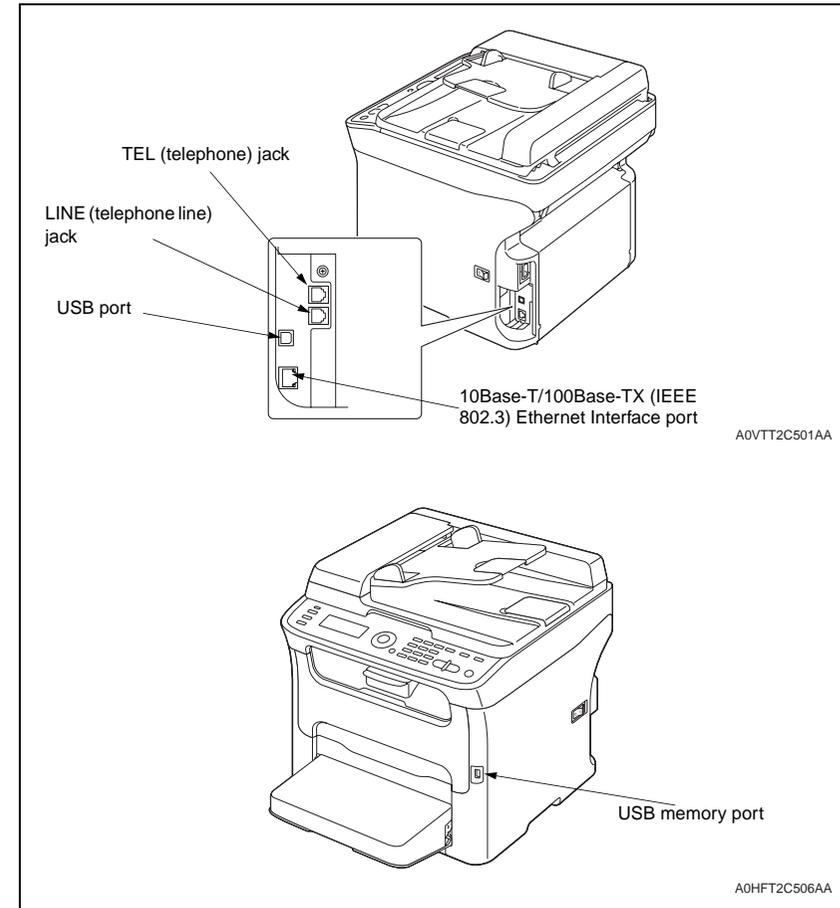
Type	Application
TEL (telephone) jack	For telephone connection
LINE (telephone line) jack	For fax machine connection
USB port	For PC to printer connection
10Base-T/100Base-TX (IEEE802.3) Ethernet Interface port	For network
USB memory port	For USB memory

7. Scanner section

7.1 Composition

A0HFT2C502AA

A0HFT2C501AA

Scanner motor (M101)

A0HFT2C512AA

Exposure unit

7.2 Drive

A0HFT2C505AA
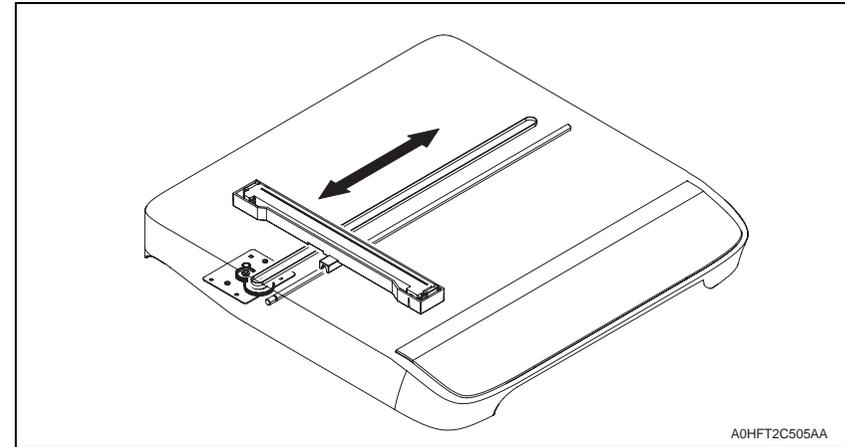
7.3   Operation

7.3.1   When the Start key is pressed

A. Original reading mode

(1) Original cover mode
1. Press the start key, and the LED lights ON.
2. The exposure units moves from the home position (stand-by position) reading the shading sheet to make a shading compensation.
3. The exposure units moves to the stand-by position.
4. Original image reading starts from the start position of original reading.
5. When the original reading completes, it moves to scanner stop position.
6. After the reading completes, the exposure lamp lights OFF and it moves to the stand-by position.
7. It moves again to detect the reference position.
8. It moves to the stand-by position and stops there.

A034T2C564AA
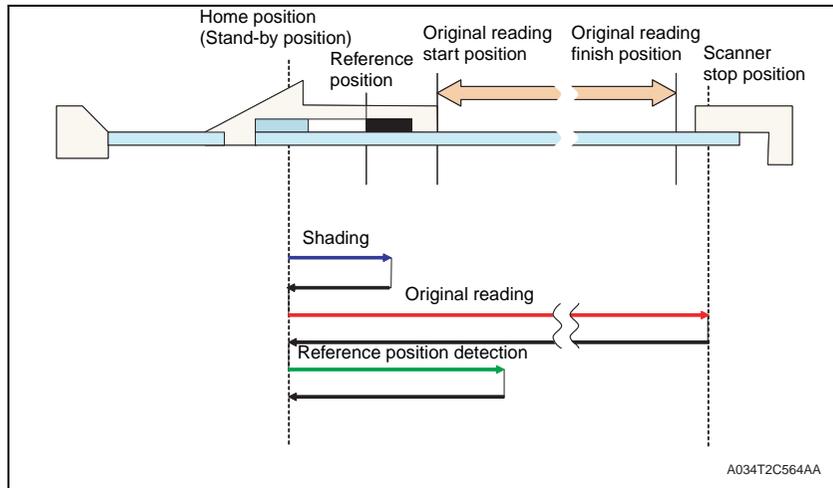
(2) DF mode
1. Press the start key, and the LED lights ON.
2. The exposure units moves from the home position (stand-by position) reading the shading sheet to make a shading compensation.
3. The exposure units moves to the stand-by position.
4. It moves to ADF reading position and original image reading starts.
5. After the reading completes, the exposure lamp lights OFF and it moves to the stand-by position.
6. After it moves again to detect the reference position, it moves to the stand-by position and stops there.

A034T2C565AA
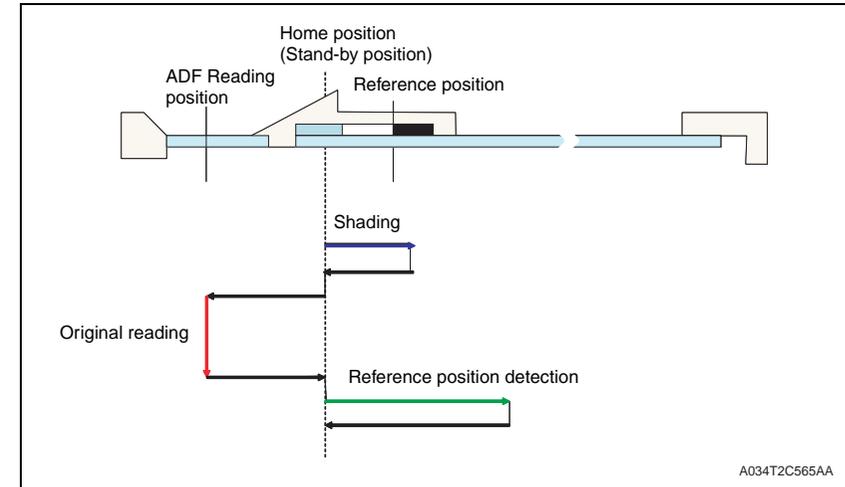
7.3.2   Home position detection

- Reading parts doesn't have a sensor to detect the home position of the scanner.
- Therefore the green LED lights on while the scanner is moving so that the reference potions to be the boarder between the white and black of the shading sheet is searched and the scanner moves from that position to the home position where locates far to the given distance. Home position detection is conducted when power is On and the scan completes its moving.

7.3.3   Shading compensation

- This shading compensation function compensates reading quality dispersion due to sensitivity uniformity of image element of each CIS sensor or LED light distribution irregularity.
- Shading compensation is carried out immediately before the original glass reading and ADF original reading.

8. Write section (PH section)

8.1 Composition

A034T2C574AA

SOS mirror
Return mirror
G2 lens
SOS sensor
G1 Lens
Semiconductor laser
Polygon mirror

A034T2C504AA
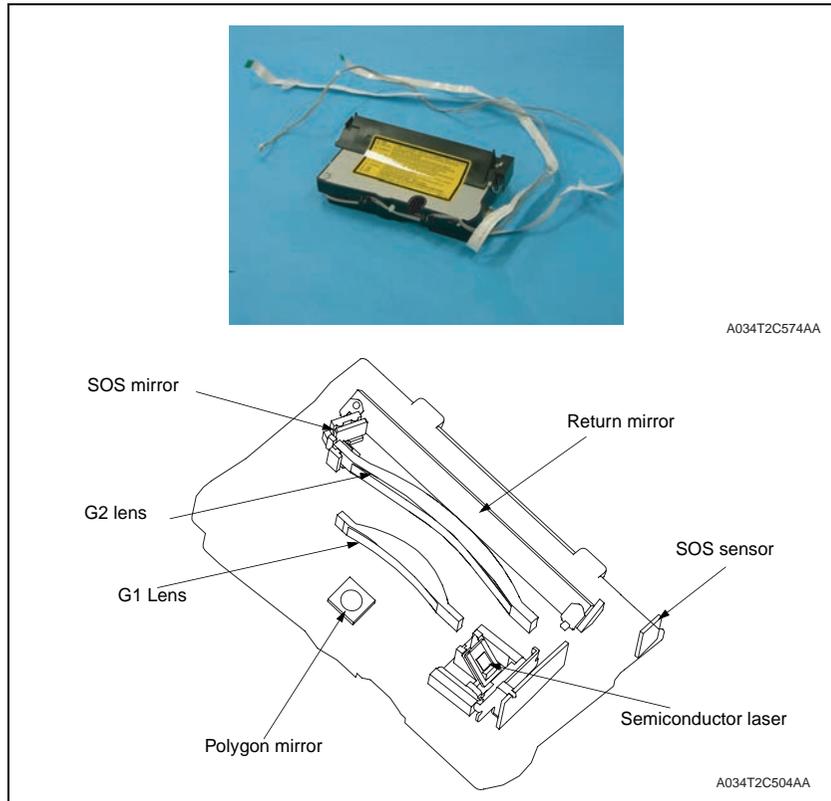
8.2 Operation

8.2.1 Outline

- The surface of the photo conductor is irradiated with a laser light and an electrostatic latent image is thereby formed.
- The polygon mirror has four faces. The machine uses a two-beam array LD to inhibit the speed of the polygon mirror from increasing because of the decreased number of faces the polygon mirror has as compared with the conventional models.
- The two-beam array LD consists of two LD elements arranged vertically. Two lines are scanned with two laser beams emitted from these two LD elements through a single face of the polygon mirror.

Photo conductor surface

Beam A
Beam B

Two lines are scanned in a single scan motion.

Beam A
Beam B

Photo conductor

Direction of rotation of photo conductor

Laser diode

G1 lens   G2 lens

Polygon mirror   Return mirror

Direction of rotation of photo conductor

A034T2E582AA
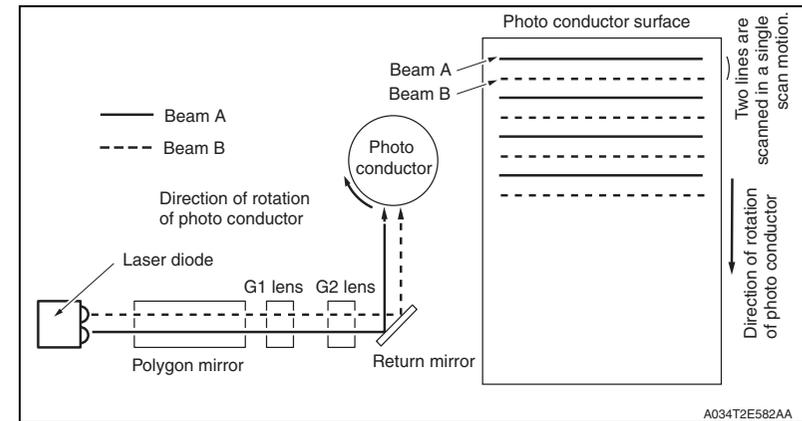
8.2.2 Laser exposure process

1. The laser light emitted from the Semiconductor laser strikes the polygon mirror.
2. The polygon mirror with four faces is rotated at high speeds by the polygon motor.
3. The SOS sensor ensures that the laser light emission start timing remains constant for each line of main scan.

Photo conductor
SOS sensor
Semiconductor laser
Return mirror
SOS mirror
G2 Lens
G1 Lens
Polygon mirror

A034T2C505AA
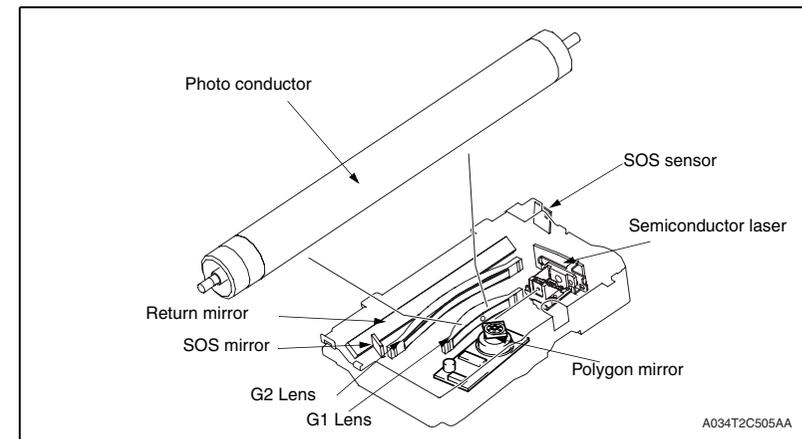
8.2.3 Laser emission area

A. Main scan direction (CD)

- The print start position in the CD direction is determined by the CD print start signal (/HSYNC) that is output from the MFP board (MFPB) and the width of the media.
- The laser emission area is determined by the media size. The area of 4 mm on both edges of the media is, however, the void image area.

B. Sub scan direction (FD)

- The print start position in the FD direction is determined by the Image write start signal (/TOD) that is output from the MFP board (MFPB) and the length of the media.
- The laser emission area is determined by the media size. The area of 4 mm on both leading and trailing edges of the media is, however, the void image area.

4138to2595c0
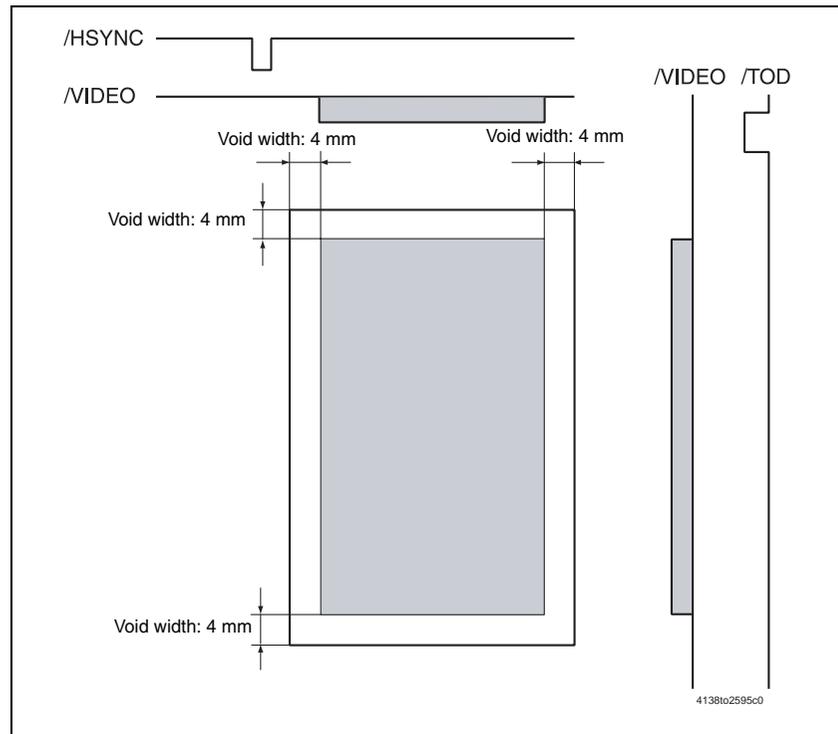
8.2.4 Image stabilization control item

- LD intensity control

9. Imageing cartridge section

9.1 Composition

A034T2C554AA

A034T2C506AA

9.2 Drive

A034T2C508AA
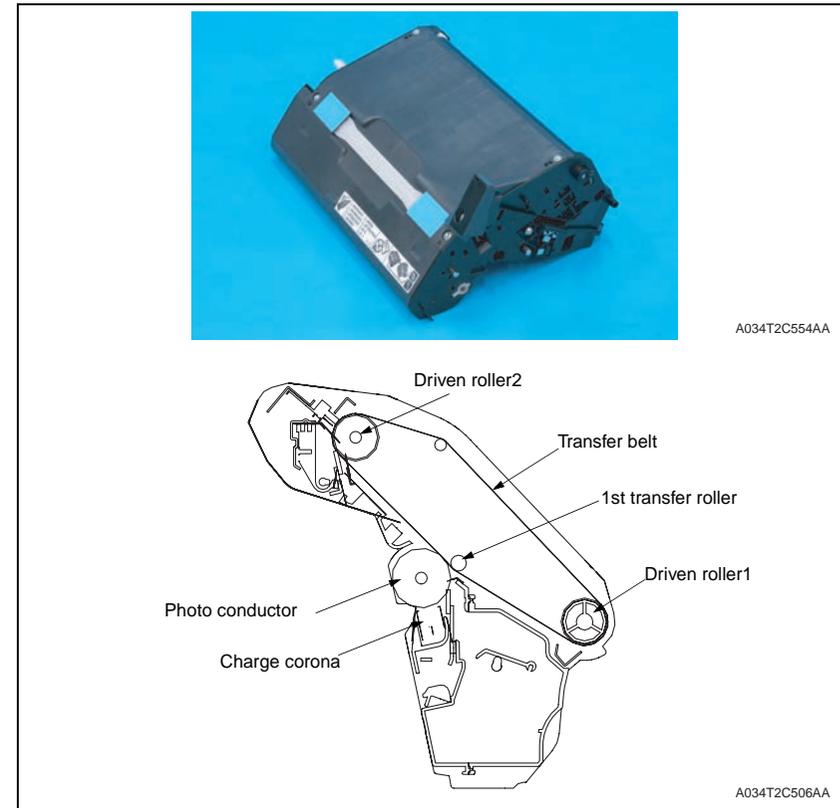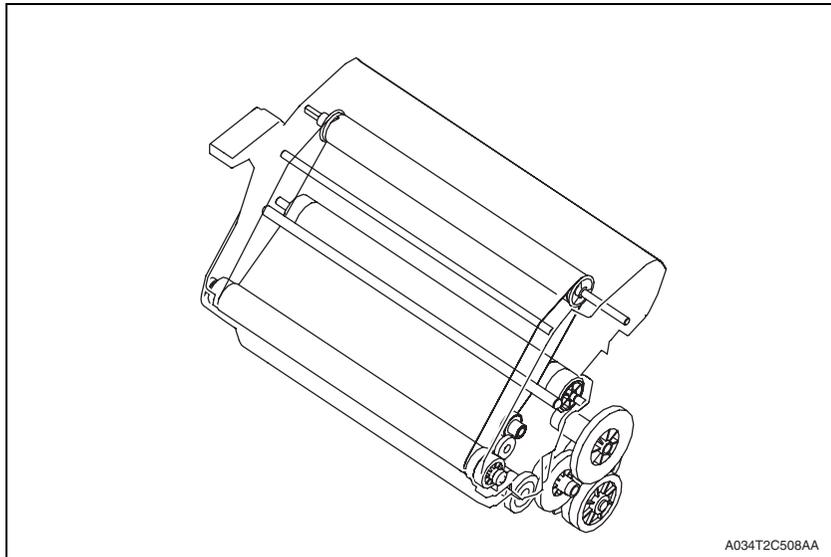
9.3 Operation

9.3.1 Imaging cartridge (IC) life control

A. New DC detection
- The machine attempts to perform a new IC detection sequence when the power switch is turned OFF and ON, or the Front door is closed.
- If no new IC is detected, the image stabilization sequence is not carried out.
- If a new IC is detected, the image stabilization sequence is carried out.
- The imaging cartridge shipped with the machine does not have the function to detect a new IC.

B. Reaching the life
- The life counter is reset when a new IC is detected.
- The machine gives a warning message when the life value is reached (printing will be continued). When the Waste toner reaches its full level, the initiation of any new print cycle will be prohibited. The machine then prompts the user to replace the IC.

10. Photo conductor section

10.1 Composition

Photo conductor

Charge generating layer

Charge transport layer

Aluminum base

A034T2C555AA

4139to2057e1

10.2 Drive

Photo conductor

Transport motor

A034T2C507AA
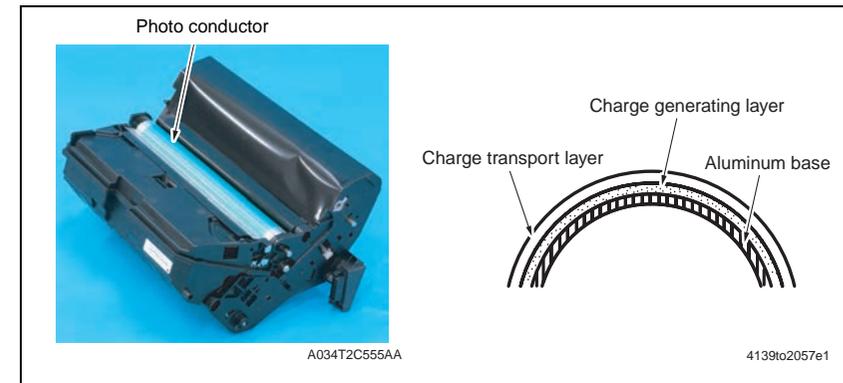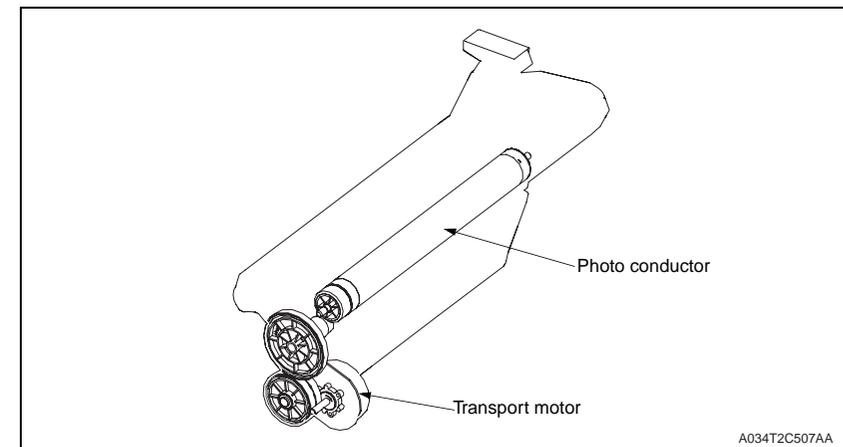
10.3 Operation

10.3.1 Photo conductor drive mechanism

A. Photo conductor drive
- The photo conductor is driven by the Main motor (M1).

10.3.2 Photo conductor cleaning mechanism

- The cleaning blade is pressed up against the surface of the photo conductor, scraping residual toner off the surface.
- The toner scraped off the surface of the photo conductor is collected in the drum cartridge.

A034T2C509AA
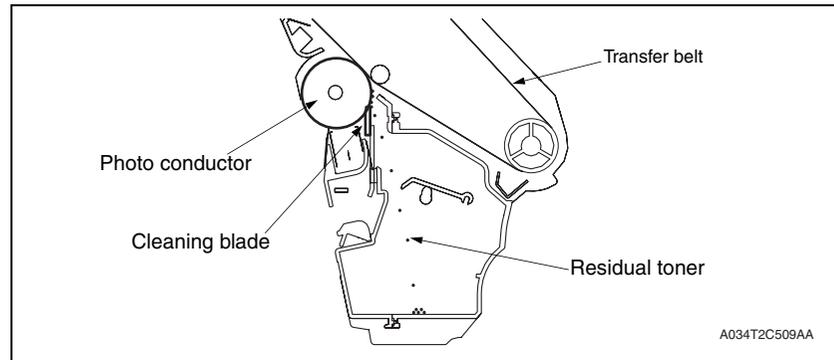
11. Charge corona section

11.1 Composition

A034T2C570AA
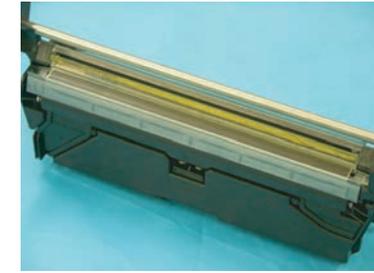
A034T2C569AA

A034T2C510AA
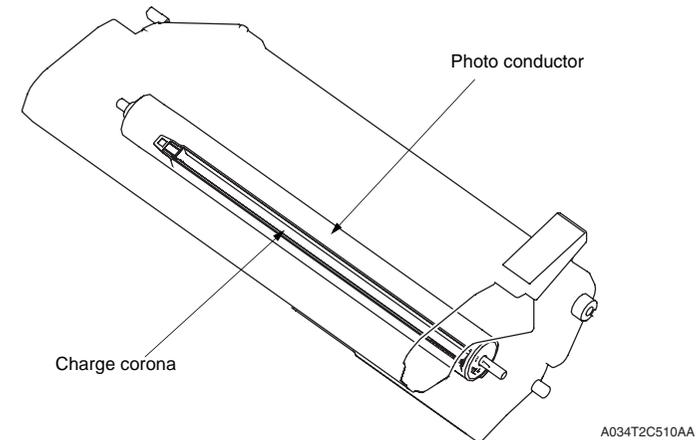
11.2 Operation

11.2.1 Charge corona control

A. Charging grid
- The photo conductor is charged through corona discharge from the photo conductor charge corona.
- The photo conductor is charged via a grid mesh, which ensures that an even charge is applied to the entire surface of the photo conductor.
- The photo conductor charge corona of a comb electrode type discharges only to the grid mesh side, involving a smaller amount of ozone produced as compared with the wire electrode.
- Charge corona output rating: -500uA

12. Developing section

12.1 Composition

A034T2C571AA

A034T2C513AA

Hopper section   Supply section

Developing roller

Supply roller

Y Developing roller

Transfer belt

Photo conductor

Agitating screw

Y

K

M

C

M Developing roller

C Developing roller

K Developing roller

A034T2C512AA

12.2 Drive

Imaging cartridge

Transport motor

Rack motor

A034T2C511AA
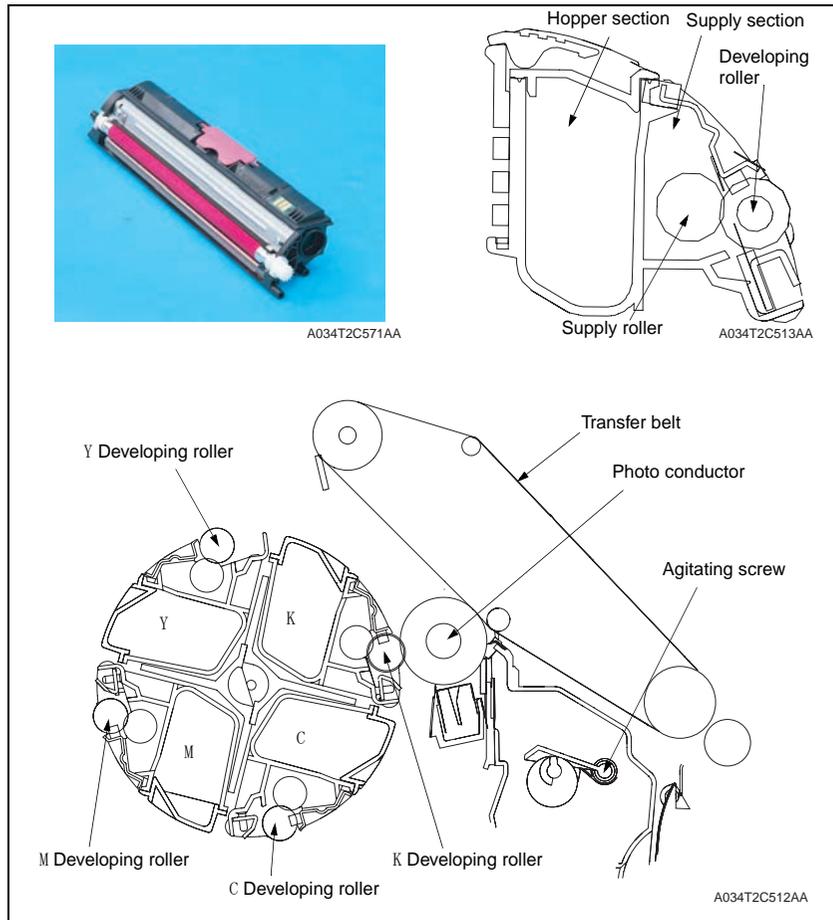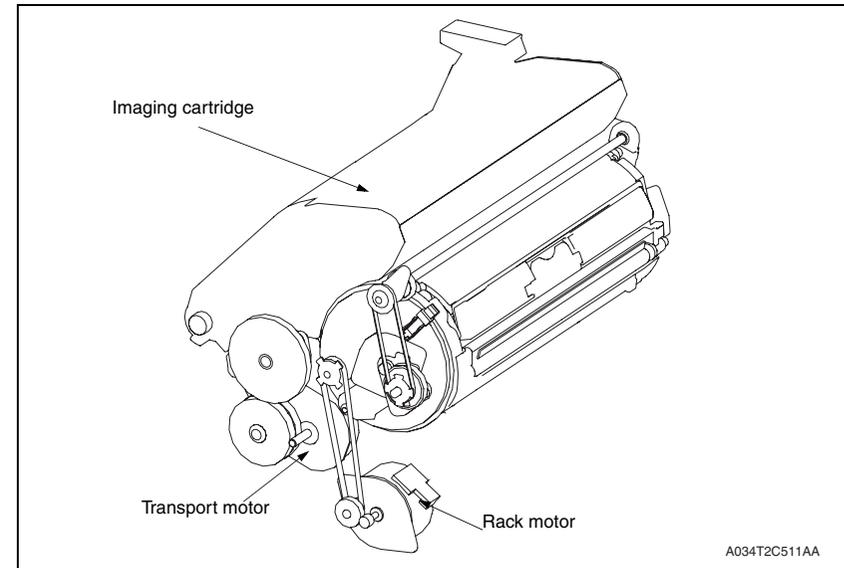
12.3 Operation

12.3.1 Toner flow

- Toner stored in the hopper is conveyed into the toner supply portion through rotation of the toner cartridge rack.
- The toner conveyed into the toner supply portion is conveyed by the supply roller onto the developing roller.
- Toner then sticks to the electrostatic latent image formed on the surface of the photo conductor. That part of toner left on the surface of the developing roller is returned to the toner supply portion.

Developing roller

Supply roller

A034T2C514AA
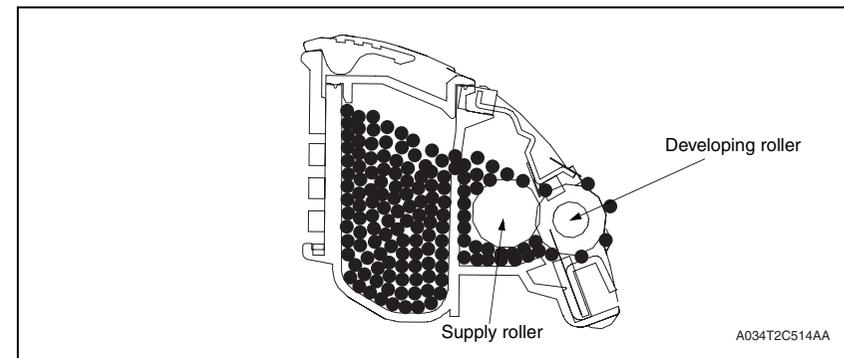
12.3.2 Toner Cartridge Rack

- The toner cartridge rack is mounted with four toner cartridges. The rack employs a rotary system.
- Development of the image of each color of toner is performed by rotating the toner cartridge rack.

C Toner cartridge
K Toner cartridge
Y Toner cartridge
M Toner cartridge

A034T2C524AA

A034T2C566AA
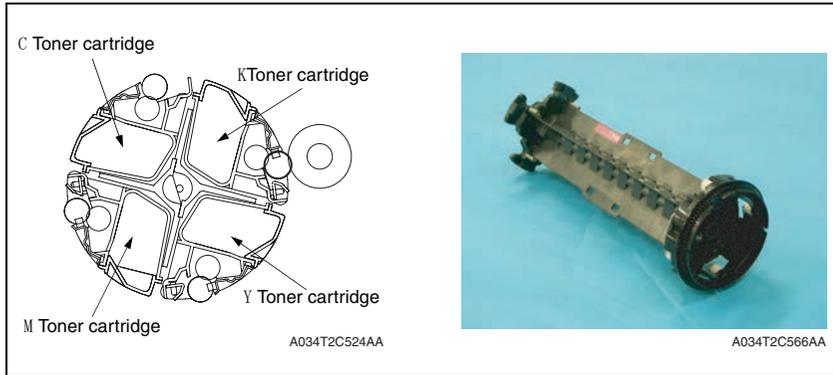
A. Toner cartridge rack drive

- The toner cartridge rack is driven by the Rack motor (M2).

Rack motor (M2)

Photo conductor

A034T2C525AA

A034T2C567AA
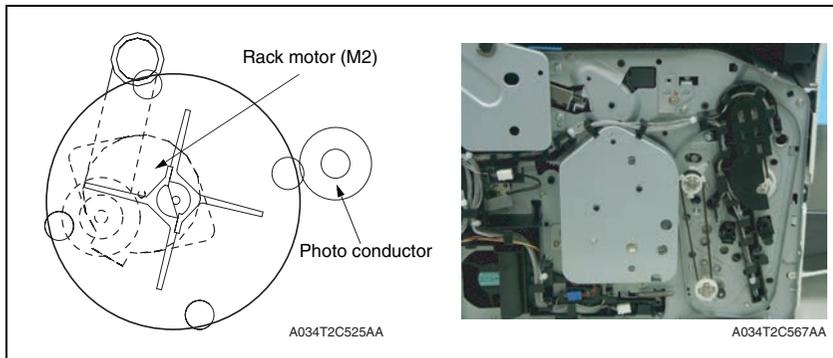
B. Toner cartridge rack stop position

- The toner cartridge rack must be brought to a stop so that the toner cartridge of each color of toner is located at its correct position. To accomplish this task, three stop positions are established: the standby (reference) position, the developing position, and the cartridge replacement position.
- The standby position refers to the position at which the toner cartridge rack is stationary when the machine is in the standby state. The toner cartridge rack is located at this standby position when the machine completes a warm-up cycle or waits for a print command.
- The development position refers to the position at which the toner cartridge rack stops during development of a specific color of toner. The development of a specific color of toner takes place at the development position.
- The cartridge replacement position refers to the position at which the toner cartridge rack is stopped for replacement of the toner cartridge of a specific color of toner.

(1) Standby (reference) position

- The standby position is 28° before the developing position of the M toner cartridge.

C
M
K
Y
28°

Standby position

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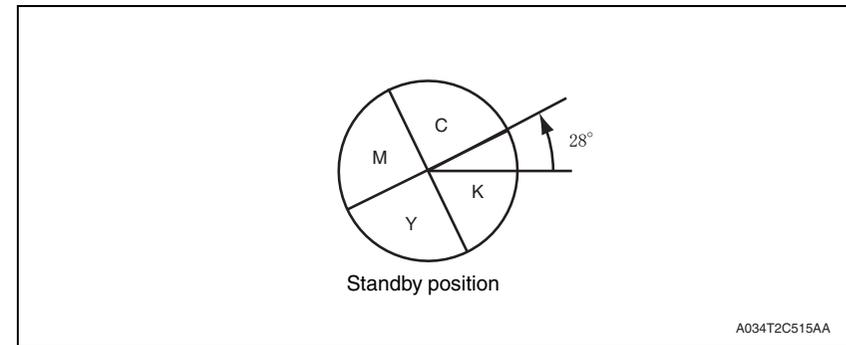
(2) Developing position

- The developing position is where the toner cartridge rack is rotated 62° from the standby position.

For developing of K

Photo conductor

C
M
Y
K

Standby position

C   K
M   Y
0°

Developing position

A034T2C516AA
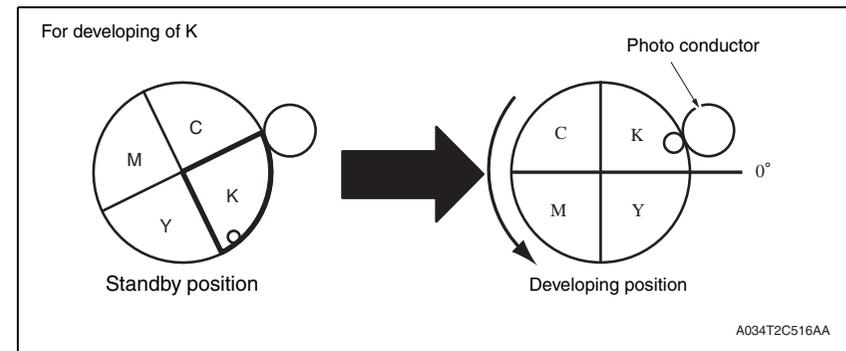
(3) Cartridge replacement position
- The cartridge replacement position is where the toner cartridge rack is rotated 90° from the developing position.

A034T2C517AA
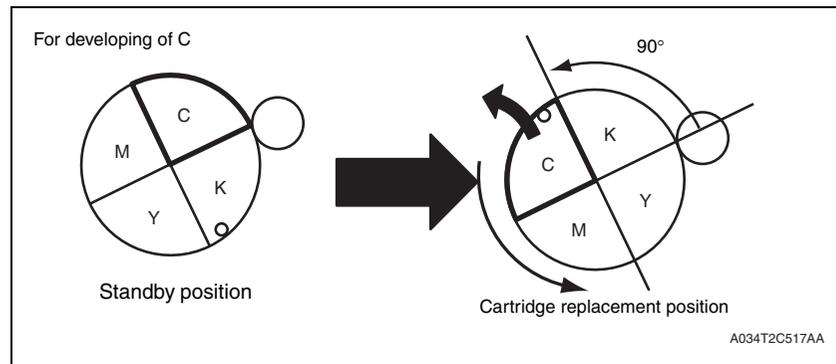
C. Monochrome printing process
(1) Operation sequence
1. The toner cartridge rack is stationary at the standby position.
2. When a print request is received from the controller, the toner cartridge rack is rotated to bring the K toner cartridge to its developing position.
3. Development of monochrome printing is started.
4. When the development is completed, the toner cartridge rack is rotated in the opposite direction and brought to a stop at the standby position.

A034T2C518AA
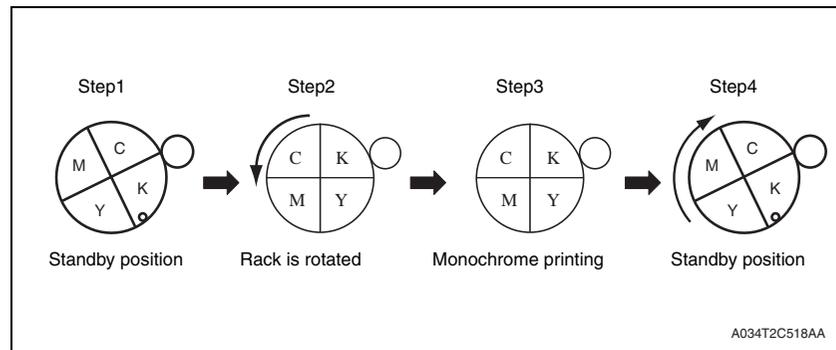
D. Color printing process
(1) Operation sequence
1. The toner cartridge rack is stationary at the standby position.
2. When a print request is received from the controller, the toner cartridge rack is rotated and temporarily stopped at the K developing position. The toner cartridge rack is then rotated again to bring the Y toner cartridge to its developing position.
3. Development of Y is carried out.
4. When development of Y is completed, the toner cartridge rack is rotated to bring the M toner cartridge to its developing position.
5. Development of M is carried out.
6. Similarly, the toner cartridge rack is rotated and development of C is carried out.
7. Similarly, the toner cartridge rack is rotated and development of K is carried out.
8. When development of K is completed, the toner cartridge rack is rotated in the opposite direction and brought to a stop at the standby position.

A034T2C519AA
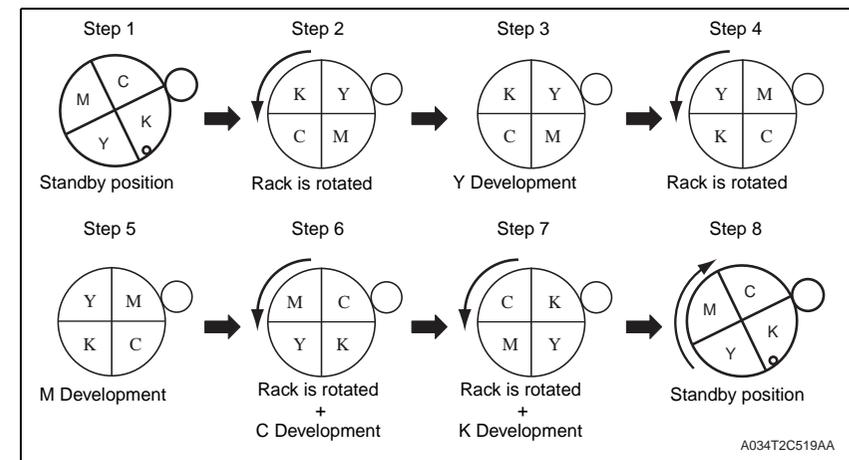
E. Toner cartridge rack stop position detection

- The toner cartridge rack stop position for each color of toner is detected by the Rack motor (M2) and the Rack positioning sensor (PS5).
- The toner cartridge rack is provided with slits, each for a specific color of toner. When the rack rotates, the Rack positioning sensor (PS5) is blocked and unblocked.
  A specific stop position is detected when the Rack positioning sensor (PS5) is blocked and unblocked.

Rack positioning sensor (PS5)

Slits

A034T2C520AA

A034T2C568AA
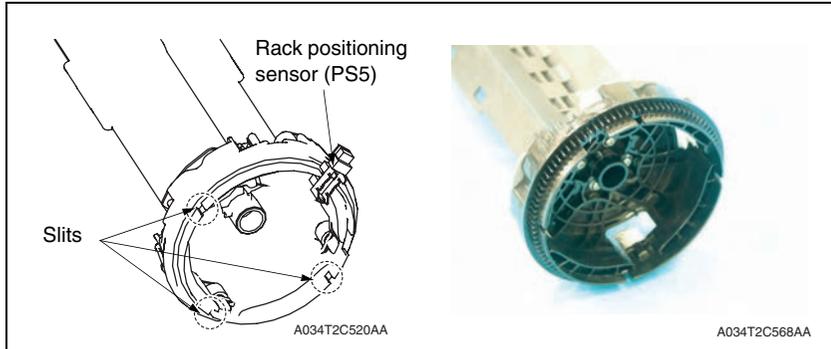
(1) Toner cartridge rack standby position

- The M toner cartridge is provided with a slit for detecting the standby position.
- When the toner cartridge rack is rotated, the Rack positioning sensor (PS3) moves past the slit for detecting the standby position. This allows the machine to determine that the toner cartridge rack is currently at the standby position. Through pulse control of the rack motor, the machine then successfully brings the toner cartridge rack to its exact standby position.

Y

Detection of M developing position

K

Detection of Y developing position

C

Rack positioning sensorÅiPS5Åj

Detection of K developing position

Direction of rotation of the Toner cartridge rack

M

Standby position detecting position

Photo conductor

Detection of C developing position

Standby position

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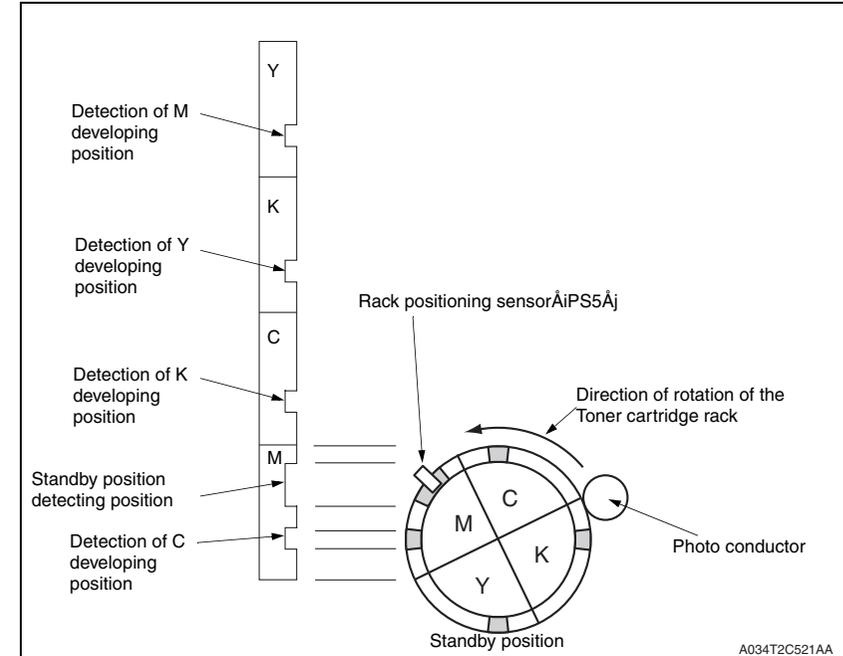
(2) Toner cartridge rack developing position

- To bring the toner cartridge rack to a stop at the corresponding developing position, the rack is rotated from the standby position 62° through pulse control of the rack motor.

(3) Cartridge replacement position

- When a request is made for replacing the toner cartridge of a specific color of toner (by means of an input from the control panel, upon a toner empty condition, or through an input made via the printer driver), the toner cartridge rack is rotated 70° from the developing position through pulse control of the rack motor.

12.3.3 Developing Roller drive

- The developing roller is driven by the Developing motor (M3) and Intermediate gear.
- When the toner cartridge rack is stationery at the developing position, the developing roller drive gear comes into mesh with the Intermediate gear. The developing roller is then rotated through the drive provided by the Developing motor (M3) and Intermediate gear.

Intermediate gear

Developing roller

Developing motor (M3)

Developing roller drive gear

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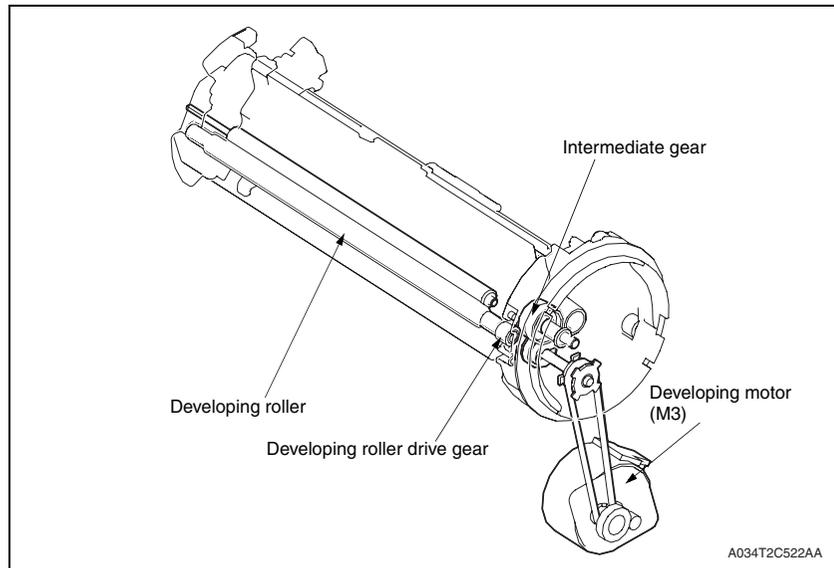
12.3.4 Developing bias

- The developing bias voltage (Vb) is applied to the developing roller so that an adequate amount of toner is attracted onto the surface of the photo conductor.
- The developing bias voltage (Vb) is supplied by the High voltage unit (HV).
- The developing bias voltage is applied to the developing roller via the supply roller.
- The developing bias voltage is also applied to the doctor blade.
- The developing bias voltage is turned ON at the same time that the developing motor is energized and turned OFF at the same time that the developing motor is deenergized.

Developing bias

A034T2C556AA
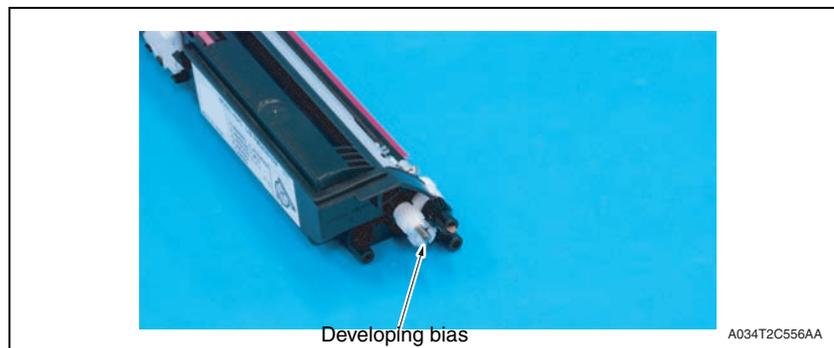
12.3.5 Developing system

- The machine employs the single-component, non-contact developing system.
- In the non-contact, single-component developing system, the magnetic brush does not rub the surface of the photo conductor (or the image). This prevents a foggy image from occurring and the photo conductor from being worn.

Developing roller

Photo conductor

4139to2063e2
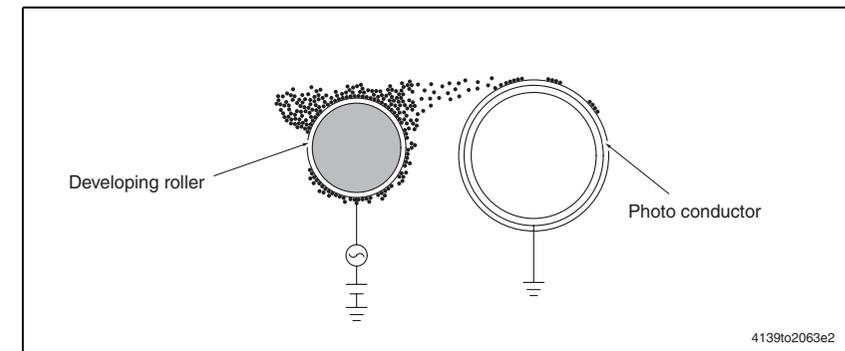
12.3.6 Toner cartridge (TC) life control

A. Toner cartridge detection and new cartridge detection timing
- The machine attempts to perform a detection sequence when the front door is closed.

B. Toner cartridge detection
- The machine accesses the TC detection board (CSIC) to check for data stored in it. Using that data, the machine determines whether or not a toner cartridge is loaded.

C. New Toner cartridge detection
- After a toner cartridge has been detected, the machine determines whether it is new or not based on the data acquired.

D. Toner cartridge near empty and empty condition detection
- The amount of toner consumed is calculated from the number of dots produced for one printed page by the controller. A toner near empty condition and a toner empty condition are thereby detected.

<Toner near empty decision>
- The machine determines that there is a toner near empty condition when the image counter and dot counter reach the life value.

<Toner empty decision>
- The machine determines that there is a toner empty condition when a predetermined number of printed pages are produced after the toner near empty condition has been detected.

12.3.7 Image refresh mode

- The supply roller of the toner cartridge contacts the developing roller and is thereby deformed during a long period of shelf time.
- If a photo image or a solid image is printed after the supply roller is deformed, faint lines can at times occur at a pitch of 24 mm in the main scanning direction.
- The image refresh mode is made available to lessen this phenomenon.
- Use of this mode helps make less noticeable the faint lines occurring at a pitch of 24 mm in the main scanning direction.
- Executing the image refresh mode rotates the toner cartridge rack.

(1) Operation overview

- The operation of the image refresh mode varies depending on the condition of the toner cartridge.

Toner cartridge evaluation		Operation overview
If there is at least one toner cartridge, with which 30 or less printed pages have been produced since the detection of a new toner cartridge?	No	• The developing roller is rotated for the toner cartridges of toner of all colors. • The developing roller is to be rotated for the period of time corresponding to producing ten printed pages.
	Yes	• The developing roller is rotated for the specific toner cartridge in question. The developing roller is to be rotated for the period of time corresponding to producing 40 printed pages. • If there are toner cartridges of toner of two or more colors involved, the image refresh mode is carried out for the toner cartridge of toner of one color before that for the toner cartridge of toner of another color is started.

- The developing roller is rotated for about two minutes for one color of toner.

13. 1st transfer section

13.1 Composition

A034T2C570AA

A034T2C527AA

Driven roller 2

1st transfer roller

IDC sensor (IDC)

Transfer belt

Toner collecting screw

Driven roller 1

Cleaning blade

Belt positioning sensor (PS6)

Waste toner near full sensor (PS7)

A034T2C526AA

13.2 Drive

A034T2C508AA
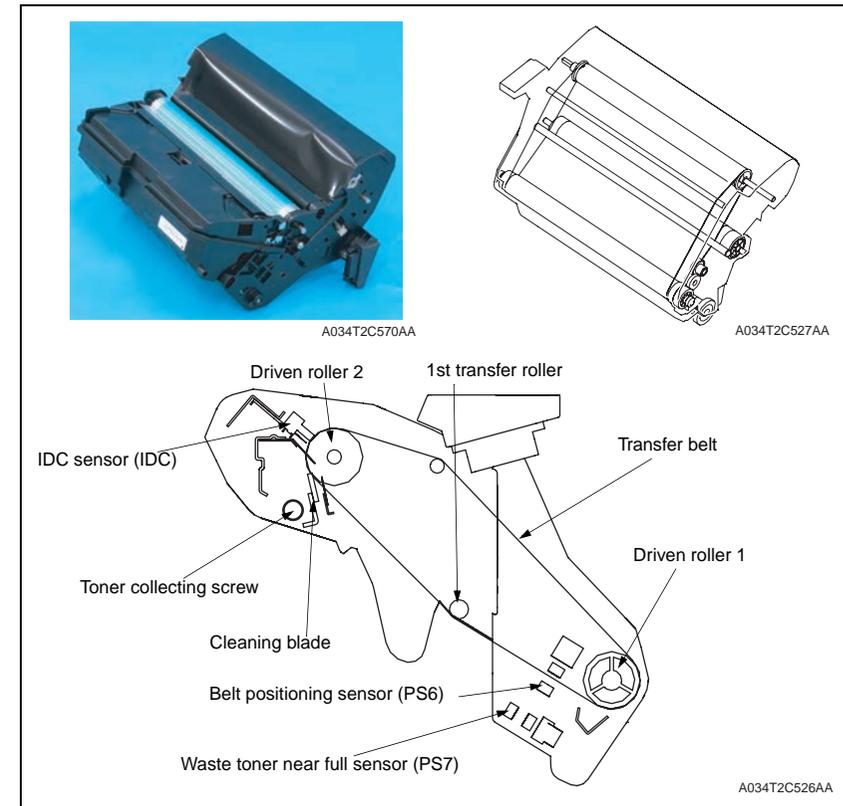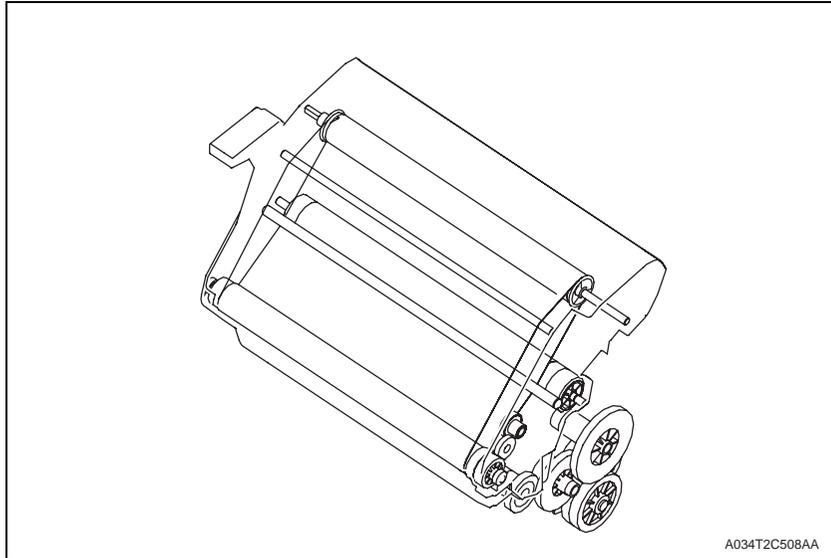
13.3 Operation

13.3.1 1st transfer output control

- The 1st image transfer roller is not equipped with a pressure/retraction mechanism and presses the transfer belt up against the photo conductor drum.
- The 1st transfer voltage is determined during the image stabilization control in consideration of the machine condition, environment, and print mode.

13.3.2 Transfer belt cleaning mechanism

- To scrape residual toner off the surface of the transfer belt, there is a cleaning blade provided.
- The cleaning blade is pressed up against the transfer belt, thereby scraping residual toner off the surface of the transfer belt.
- The toner collecting screw conveys toner scraped off by the cleaning blade into the imaging cartridge.
- The prevention seal is affixed to prevent waste toner from leaking through a gap above the cleaning blade.

Prevention seal

Driven roller 2

Cleaning blade

Toner collecting screw

A034T2C528AA
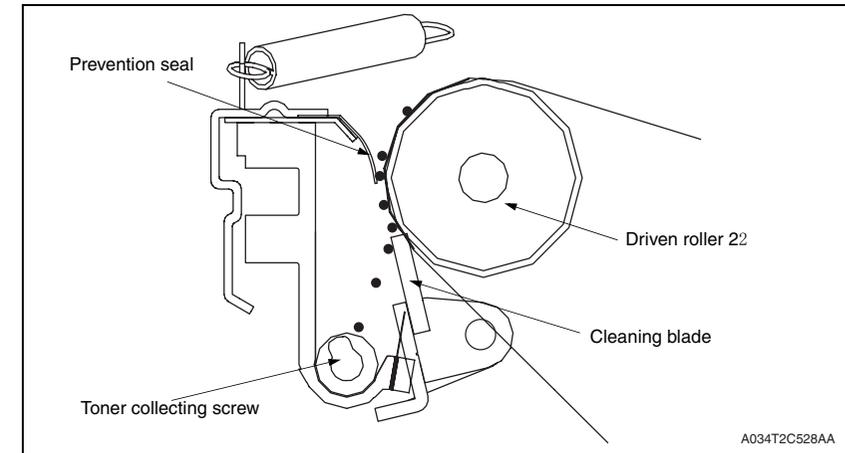
13.3.3 Cleaning blade pressure/retraction mechanism

- In color printing, an image is formed on the transfer belt for each color of toner. The cleaning blade is therefore provided with a pressure/retraction mechanism.
- The machine is not, however, provided with a pressure/retraction sensor. Instead, the IDC sensor detects a sample image on the transfer belt to control the pressure/retraction operation.
- In monochrome printing, no retraction sequence is carried out.
- The cleaning blade is normally in pressed contact with the transfer belt.

A. Pressure/retraction operation

- The cleaning blade pressure/retraction operations are performed by the Transport motor (M1), Cleaning blade pressure/retraction solenoid (SD5), pressure cam, and the lever.
- When the Cleaning blade pressure/retraction solenoid (SD5) is energized, drive from the Transport motor (M1) is transmitted to the pressure cam.

A034T2C529AA

B. Operation timing

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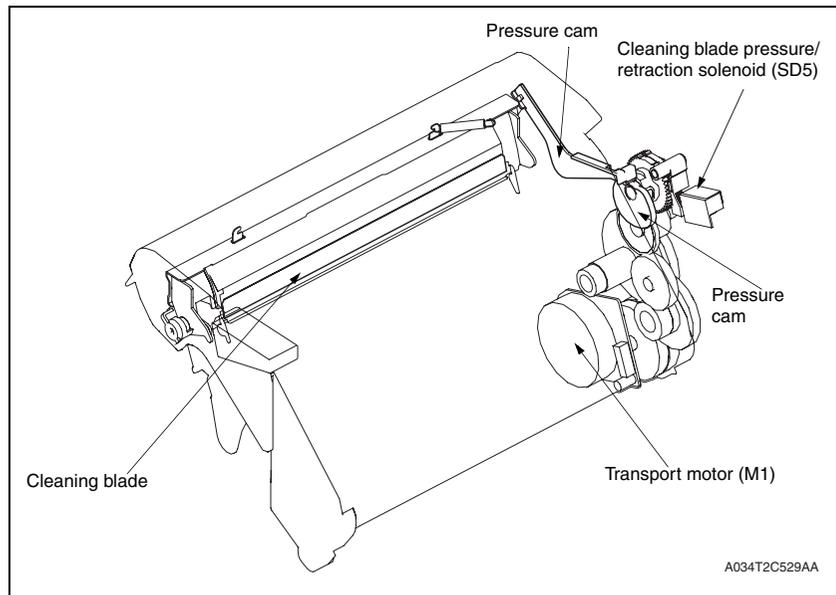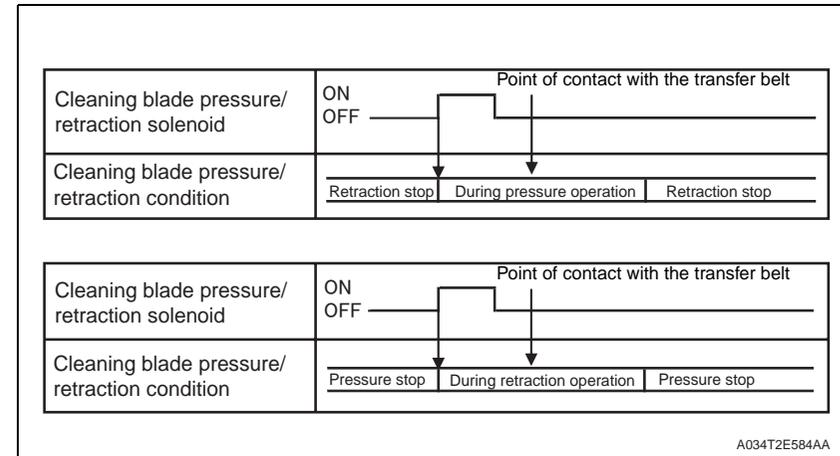
C. Retraction sequence

1. Drive from the Transport motor (M1) is transmitted to the drive gear.
2. Rotation of the drive gear is transmitted to the pressure cam.
3. When the Cleaning blade pressure/retraction solenoid (SD5) is energized, the half-moon-shaped pressure cam rotates a half turn to push the lever forward.
4. When the lever is pushed forward, the cleaning blade is retracted.
5. When the cleaning blade is retracted, it results in the cleaning blade being retracted from the transfer belt.

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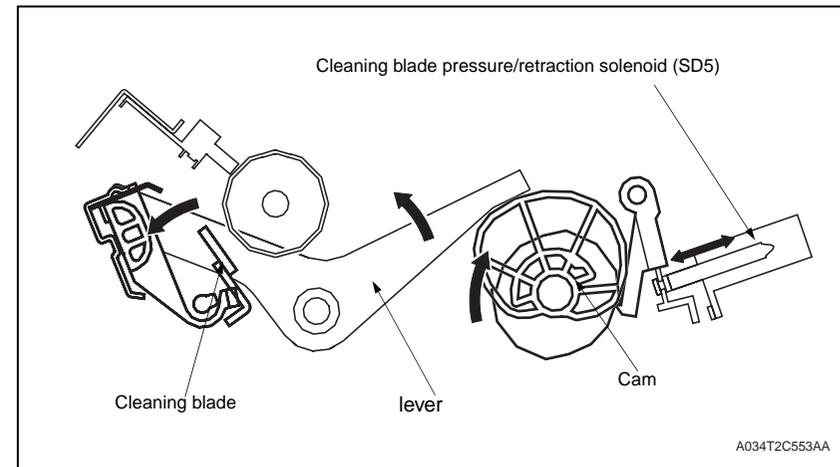
D. Pressure sequence
1. When the Cleaning blade pressure/retraction solenoid (SD5) is energized in the condition, in which the cleaning blade is retracted from the transfer belt, the pressure cam rotates a half turn. This pushes the lever backward.
2. When the lever is pushed backward, the cleaning blade is returned. Then, the cleaning blade is pressed against the transfer belt.

A034T2C531AA
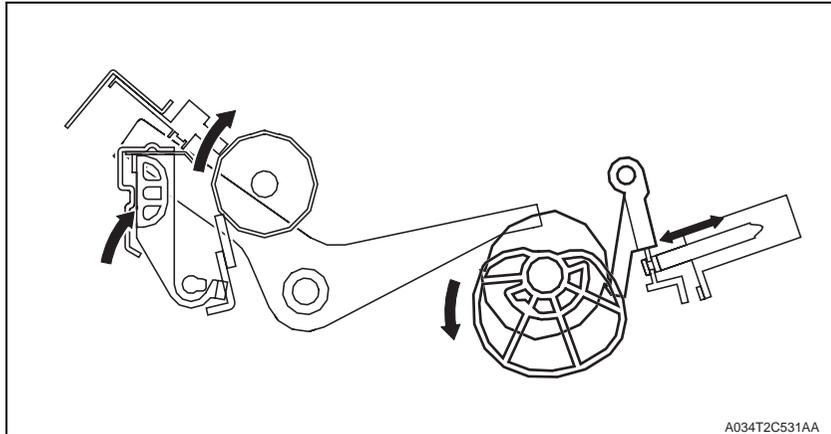
13.3.4 Belt Positioning Sensor

- When development takes place in this machine, the image of each color of toner is formed on the surface of the transfer belt. The leading edge of the image of each color of toner must therefore be aligned correctly with each other on the surface of the transfer belt.
- The position of the transfer belt is detected when the Belt positioning sensor (PS6) detects detection holes provided in the transfer belt.
- There are two detection holes provided in the transfer belt. The image write start position is varied according to the media size. For a media size of A4 or smaller, the image write start position is aligned with detection hole A. For a Media size greater than A4, detection hole B serves as the reference for the image write start position.

Detection hole A   Belt positioning sensor (PS6)

Detection hole B

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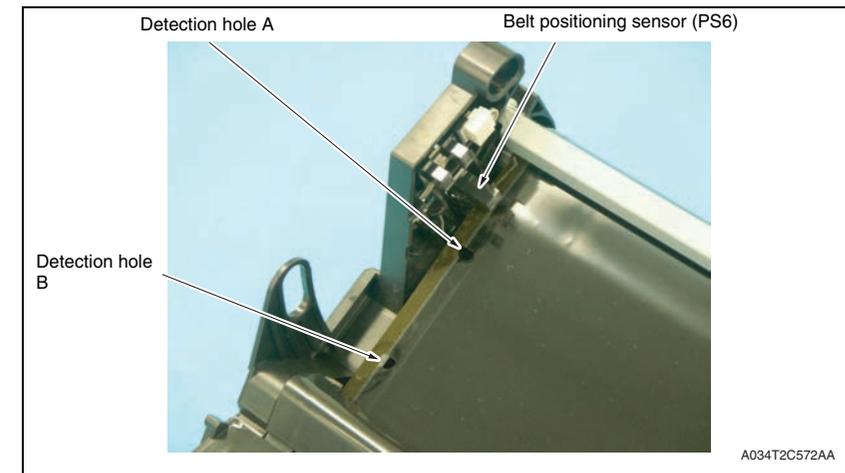
13.3.5   ATVC (Auto transfer voltage control)

- The ATVC, or Auto transfer voltage control, is for optimizing the transfer output. A constant current is made to flow through each of the transfer rollers. From the voltage thereby detected, the resistance of each of the 1st transfer roller, 2nd transfer roller, and transfer belt is measured. The ATVC then automatically adjusts the appropriate image transfer output voltage to be applied to the 1st transfer roller and the 2nd transfer roller during the print cycle.
- The 1st transfer ATVC operation is performed mainly through the image stabilization control.
- The 2nd transfer ATVC operation is performed when, for example, environmental conditions change during a print cycle.

A.   Overview of ATVC operation
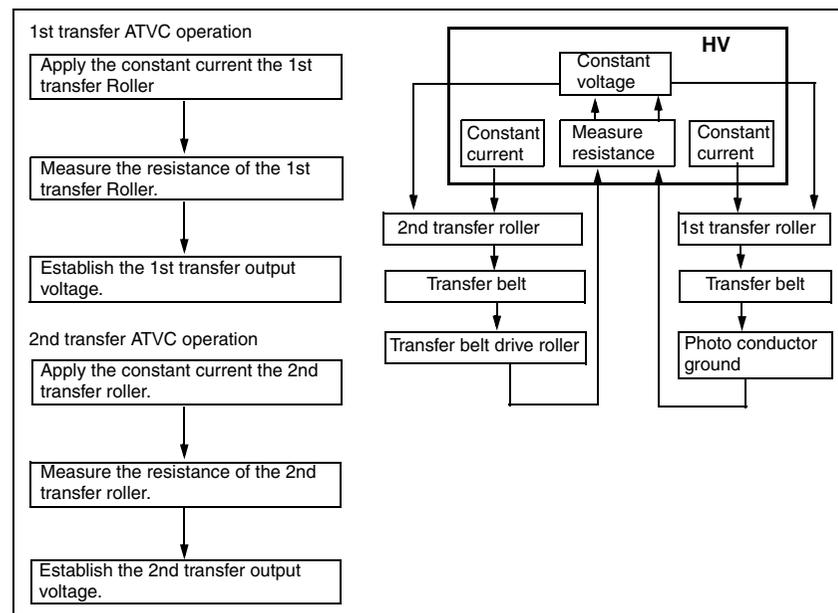
B.   1st transfer ATVC operation
1. The data on the 1st transfer constant current for each color of toner output from the High voltage unit (HV) is fed back to the High voltage unit via the 1st transfer roller, transfer belt, and the photo conductor ground. The resistance of the transfer belt is thereby measured.
2. Based on the measured resistance value, the optimum 1st transfer voltage is established.

C.   2nd transfer ATVC operation
1. The data on the 2nd transfer constant current output from the High voltage unit (HV) is fed back to the High voltage unit via the 2nd transfer roller, transfer belt, and the transfer belt drive roller. The resistance of the transfer belt is thereby measured.
2. Based on the measured resistance value and inconsideration of the environmental conditions and print color, the optimum 2nd transfer voltage is established.

13.3.6   Image stabilization control item

- IDC sensor LED intensity control
- Transfer belt surface correction control
- Control of the maximum amount of toner sticking
- Laser intensity adjustment control
- γ correction control

14. 2nd transfer section/ media separation

14.1 Composition

2nd transfer roller

2nd transfer roller

Pressure/
Retraction slider

A034T2C557AA

A034T2C533AA

2nd image transfer pressure/
retraction solenoid

2nd transfer roller

A0HFT2C507AA

14.2 Drive

2nd transfer roller

Transport motor (M1)

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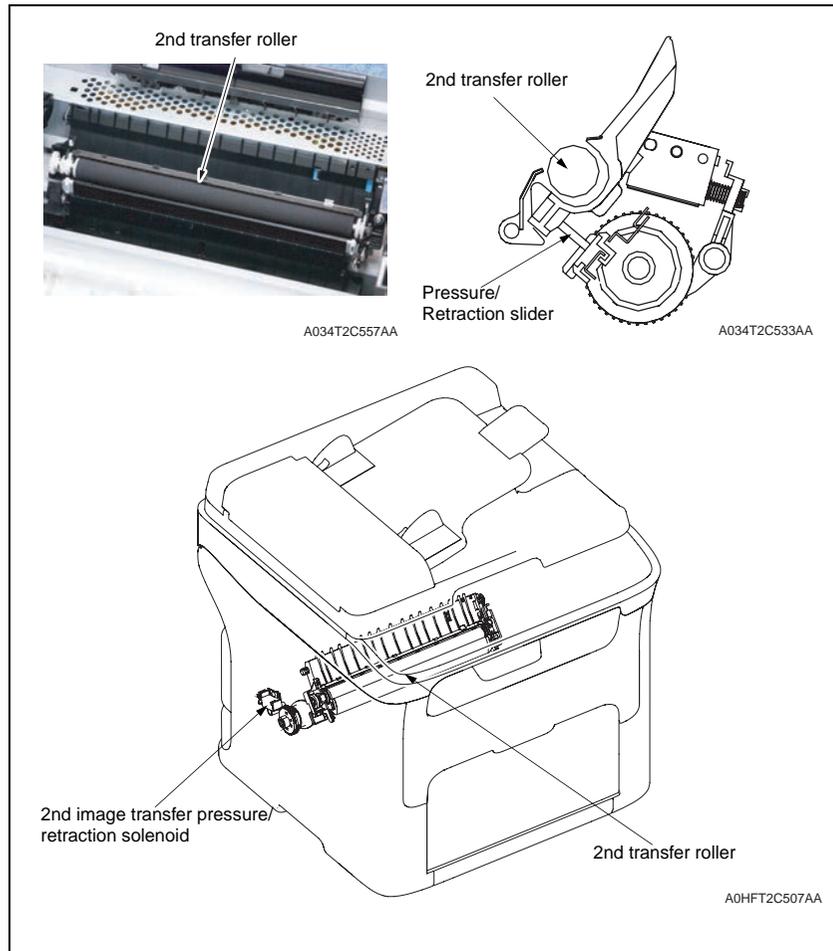
14.3 Operation

14.3.1 2nd transfer roller pressure/retraction control

- In color printing, the toner image of each color of toner is transferred to the transfer belt (thus a total of four times to cover the four colors of toner). Pressure/retraction control with respect to the transfer belt is therefore provided for the 2nd transfer roller.
- In the standby state, the 2nd transfer roller is in a position retracted from the transfer belt.
- The pressure/retraction operation is performed by the Transport motor (M1), 2nd image transfer pressure/retraction solenoid (SD4), and the pressure/retraction clutch.
- When the 2nd image transfer pressure/retraction solenoid (SD4) is energized, drive from the Transport motor (M1) is transmitted to the pressure/retraction clutch.

A. Pressure sequence

1. Drive from the Transport motor (M1) is transmitted to the drive gear.
2. Rotation of the drive gear is transmitted to the Pressure/retraction clutch.
3. When the 2nd image transfer pressure/retraction solenoid (SD4) is energized, the Pressure/retraction clutch rotates a half turn. This moves the Pressure slider.
4. When the Pressure slider is moved, ribs on the Pressure slider push up the 2nd transfer assy.
5. When the 2nd transfer assy is pushed up, the 2nd transfer roller is pressed up against the transfer belt.

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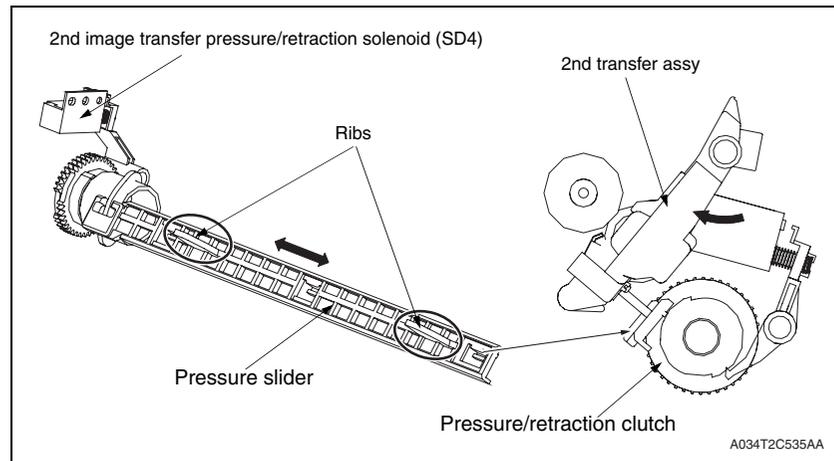
(1) Retraction sequence

1. When the 2nd image transfer pressure/retraction solenoid (SD4) is energized in the condition in which the 2nd transfer roller is pressed against the transfer belt, the Pressure/retraction clutch rotates a half turn. This moves the Pressure slider.
2. When the Pressure slider is moved, the 2nd transfer assy, which has been pushed up by the ribs on the Pressure slider, lowers.
3. When the 2nd transfer assy lowers, it allows the 2nd transfer roller to be retracted from the transfer belt.

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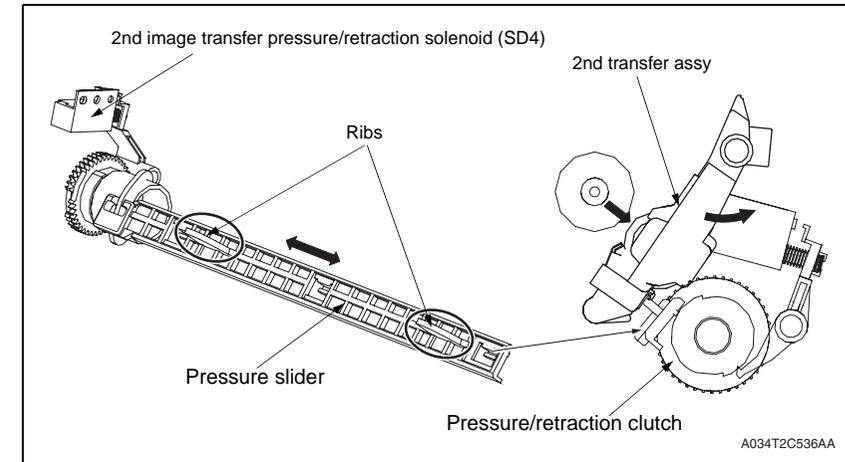
14.3.2 2nd transfer roller cleaning

- DC positive and negative transfer bias voltages are alternately applied to the 2nd transfer roller. This allows toner residue on the surface of the 2nd transfer roller to be transferred back to the transfer belt, thus cleaning the 2nd transfer roller.
- The toner transferred back to the transfer belt is collected by the cleaning blade.

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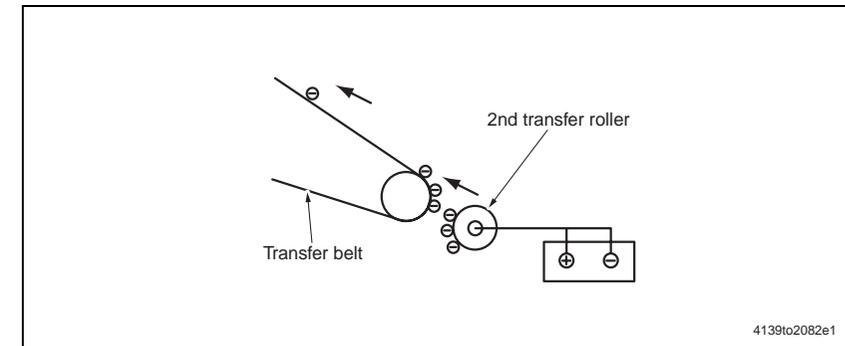
A. Operation timing

- The machine performs a cleaning sequence if it detects a sheet of paper having a length shorter than the length of the specified paper type.
- The cleaning sequence is also carried out during a resetting sequence following a paper misfeed and the opening of the door during a print cycle.

14.3.3 Neutralization and separation of media

- To neutralize the media that has undergone the 2nd transfer process, a Charge neutralizing cloth is provided for the guide plate after the 2nd transfer roller.

Charge neutralizing cloth

Charge neutralizing cloth

Transfer belt

2nd transfer roller

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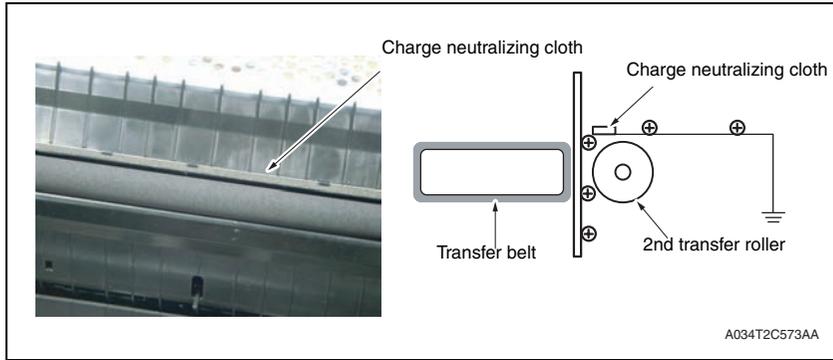
15. Toner collecting section

15.1 Composition

Toner collecting screw 1

Toner collecting screw 2

A034T2C537AA

15.2 Drive

Toner collecting screw 1

Waste toner near full sensor

Toner collecting screw 2

Toner agitating screw

Transport motor (M1)

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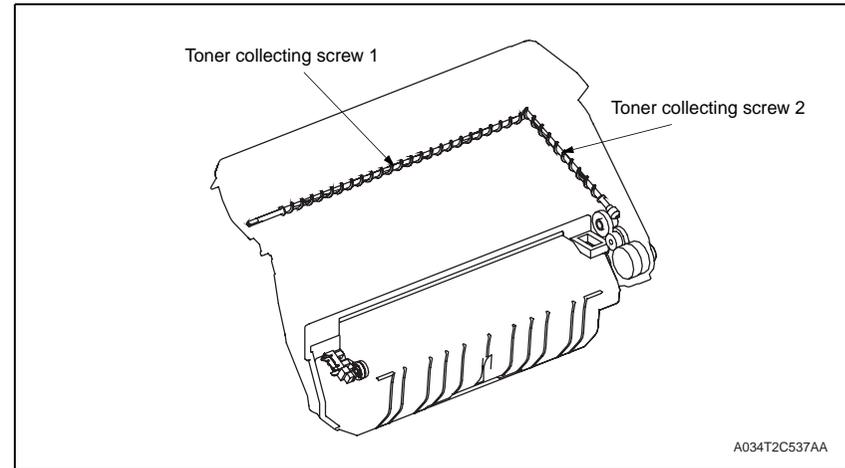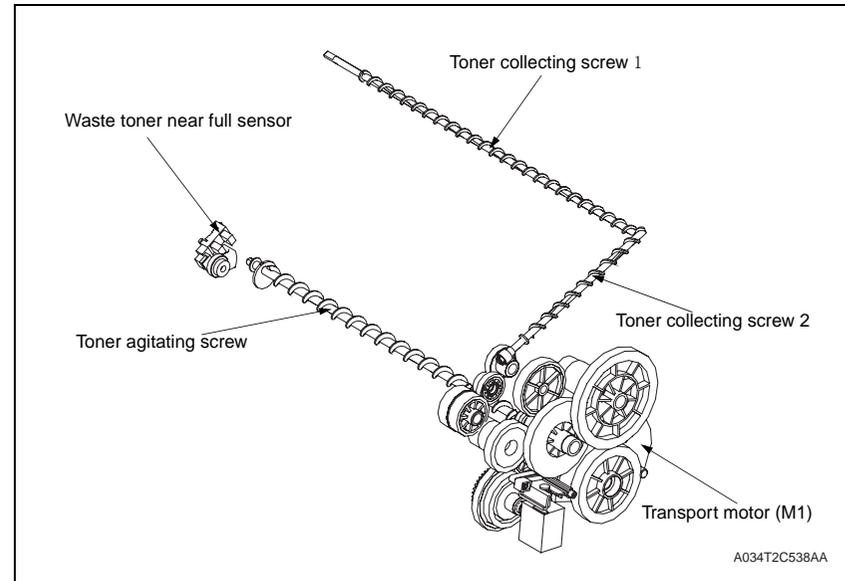
15.3 Operation

15.3.1 Toner collecting mechanism

• Waste toner scraped off by the cleaning blade of the transfer belt and that scraped off by the cleaning blade of the photo conductor are conveyed by each of the toner collecting screws into the drum cartridge.

A. Transfer belt

• Waste toner scraped off by the cleaning blade is collected by the toner collecting screws 1/2 for transfer belt.
• The waste toner collected by the toner collecting screw is conveyed to the waste toner box by way of the toner collecting screw 2.

Toner collecting screw 1

Toner collecting screw 2

West toner box

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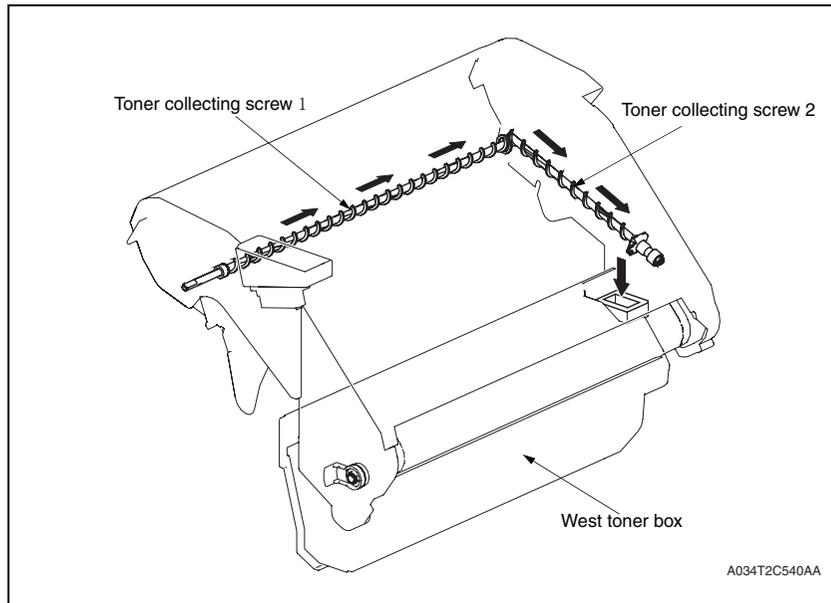
15.3.2 Waste toner near full detection system

• Waste toner near full and waste toner full conditions are detected through the control performed using the Waste toner near full sensor, toner agitating screw, and the internal counter.

A. Waste toner near full condition detection control

• Rotation of the toner agitating screw causes the actuator to move up and down via the float plate, so that the Waste toner near full sensor detects "H" and "L" signals alternately.
• When the amount of waste toner in the waste toner box exceeds a predetermined level, the toner agitating screw no longer rotates. This results in the Waste toner near full sensor detecting either the "H" or "L" signal only.
• The machine determines that the waste toner box is in the waste toner near full condition.

Float plate

Waste toner near full sensor

Toner agitating screw

Actuator

A034T2C539AA
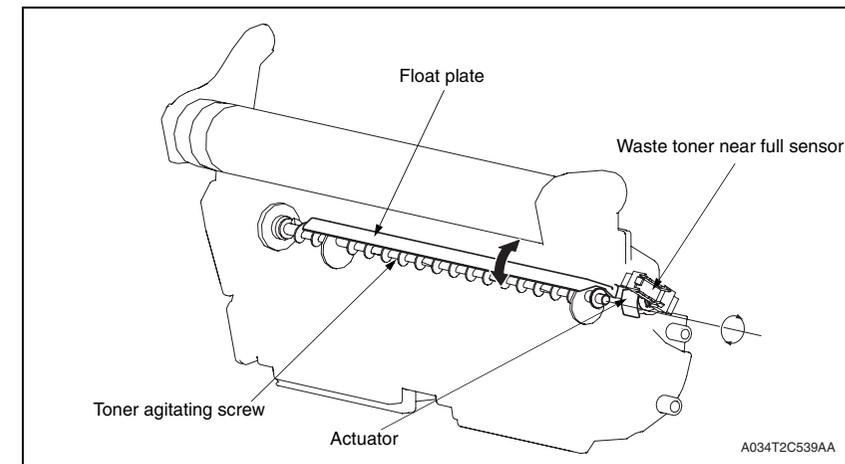
B. Waste toner full detection control

• The machine determines that there is a waste toner full condition when 200 images are reached after a waste toner near full condition has been detected.
• The counter is automatically cleared to reset the waste toner full condition when the imaging cartridge is replaced with a new one.

16. Media feed section

16.1 Composition

Media feed roller

A034T2C558AA

A034T2C559AA

Media feed roller

Tray1 media feed solenoid (SD1)

A0HFT2C508AA

16.2 Drive

Transport motor (M1)

Media feed roller

Tray1 media feed solenoid (SD1)

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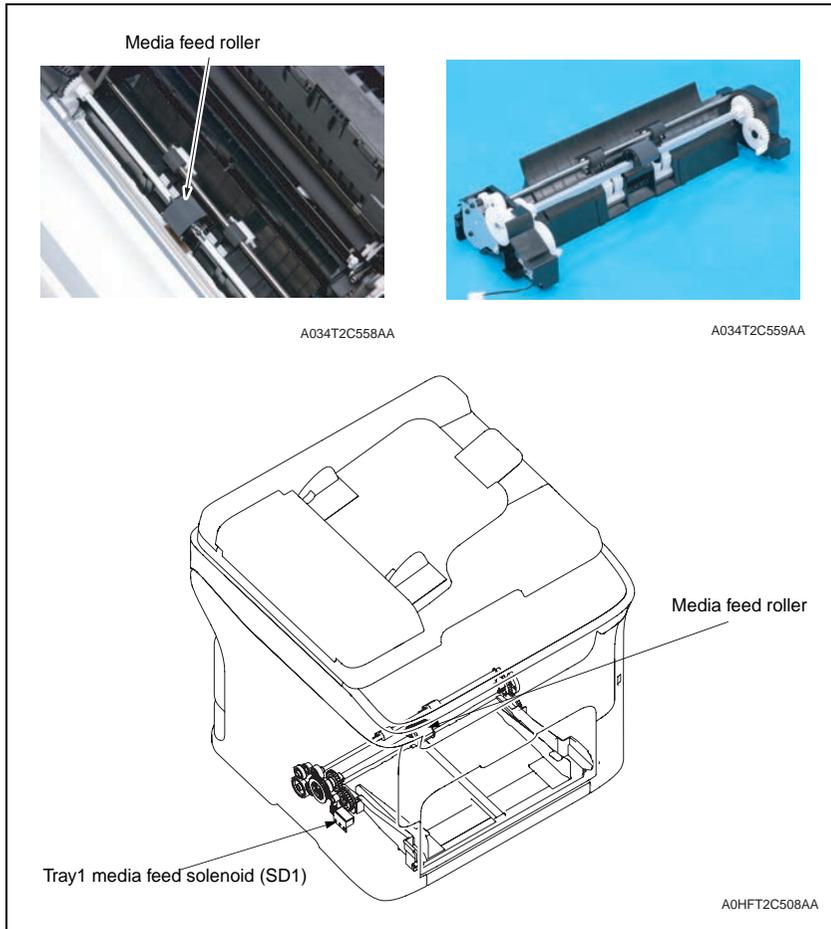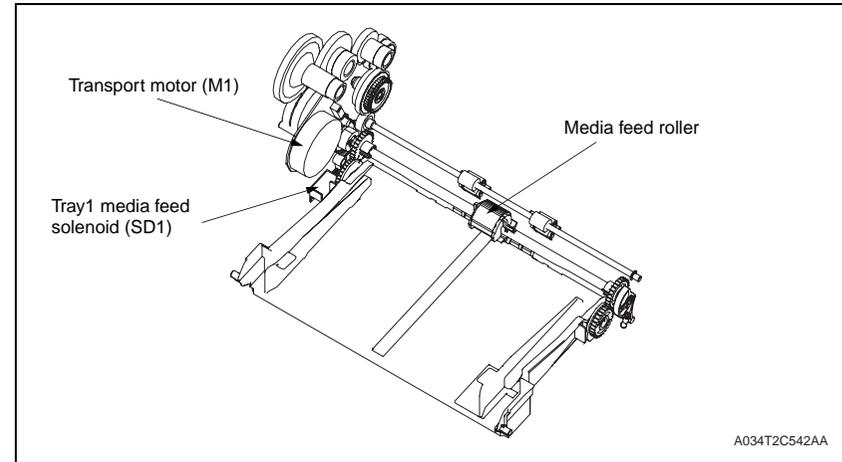
16.3 Operation

16.3.1 Up/down control

A. Up/down operation

- When the Tray1 Paper pick-up solenoid (SD1) is energized, drive from the Main motor (M1) is transmitted to the Pick-up roller via the Paper pick-up clutch. The Pick-up roller is thereby rotated.
- At the same time, the Lift cam is rotated, which raises the media lift plate. This allows the media to be taken up and fed in by the Pick-up roller.

Cam

Media lift plate

A034T2C543AA

Cam

Media lift plate

Media feed sequence started

Media feed sequence completed

A034T2C544AA

B. Operation timing

Transport motor						
Belt positioning sensor						
/TOD						
Tray1 media feed solenoid						
Registration sensor						
Registration roller solenoid						

A034T2E580AA
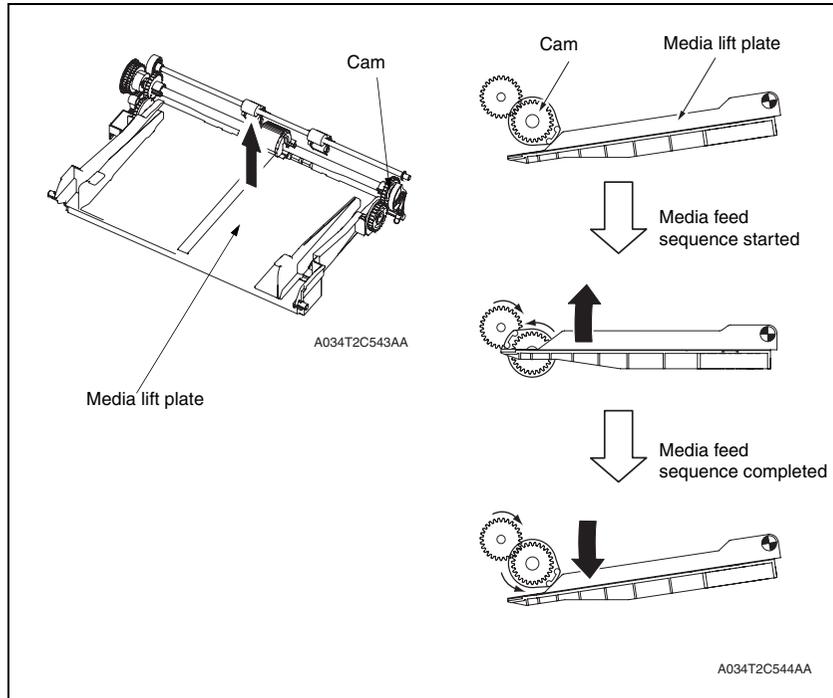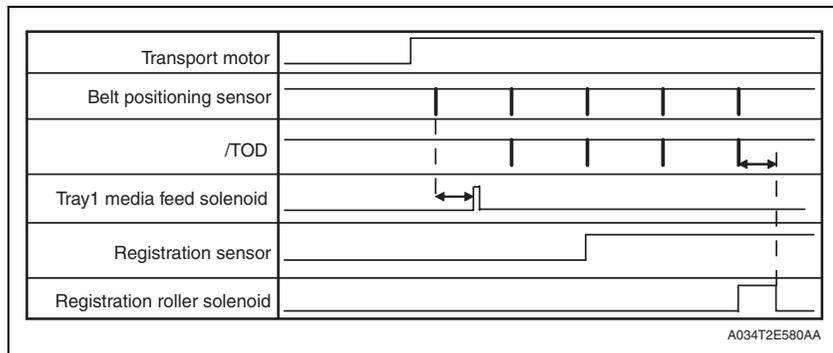
16.3.2 Paper feed control

A. Pick-up/separation control

- When the Tray 1 media feed solenoid (SD1) is energized, drive from the Transport motor (M1) is transmitted to the pick-up roller via the paper pick-up clutch and the pick-up roller is rotated.

16.3.3 Double feed prevention mechanism

- The fixed separation pad system plus the claw stoppers are used for media separation. This ensures that only the first sheet of media is taken up and fed in.

Media feed roller

Separation pad

Claw stoppers

A034T2C583AA
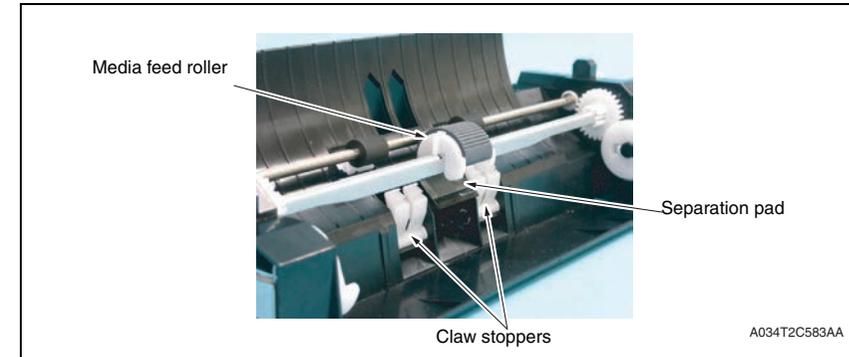
16.3.4 Remaining media detection control

A. Media empty detection

- The machine is not provided with any paper empty sensor.
- A media empty/misfeed condition is detected if the Registration sensor is not activated after the lapse of a predetermined period of time after a media feed sequence is started.

Registration sensor (PS2)

A034T2C545AA
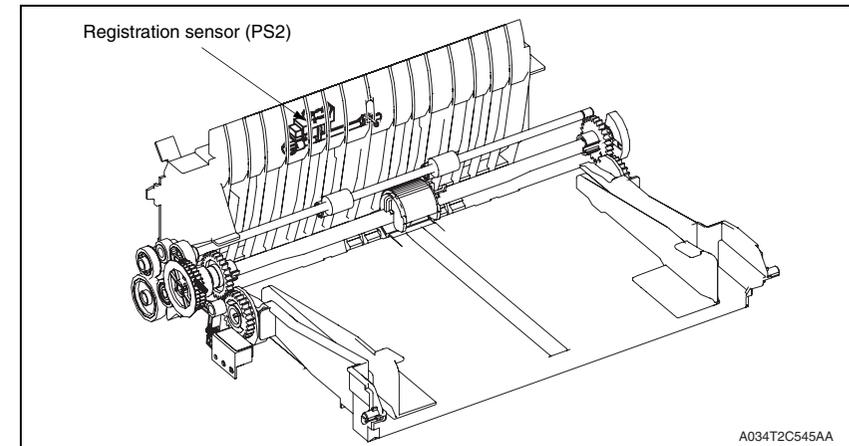
16.3.5   Media feed retry function

- To reduce the number of media misfeeds detected due to failure to take up and feed in media properly during color printing, another media feed sequence is carried out if the Registration sensor (PS1) is not unblocked and blocked within a predetermined period of time.
- The media feed retry sequence takes place only once.
- If the Registration sensor is not blocked and unblocked even after the second media feed sequence, the machine detects a media empty/misfeed condition.

17. Fusing section

17.1   Composition

A034T2C575AA

A034T2C561AA

Thermistor (TH1)

Thermostat

Exit sensor (PS7)

Heater lamp

Pressure roller

Fusing roller

A034T2C551AA

17.2 Drive

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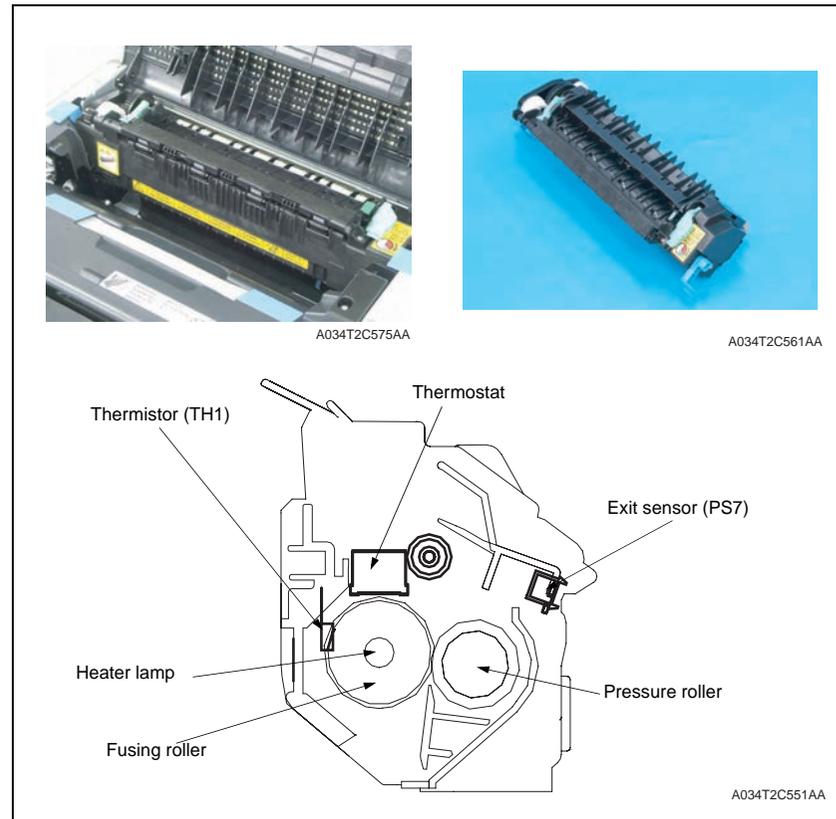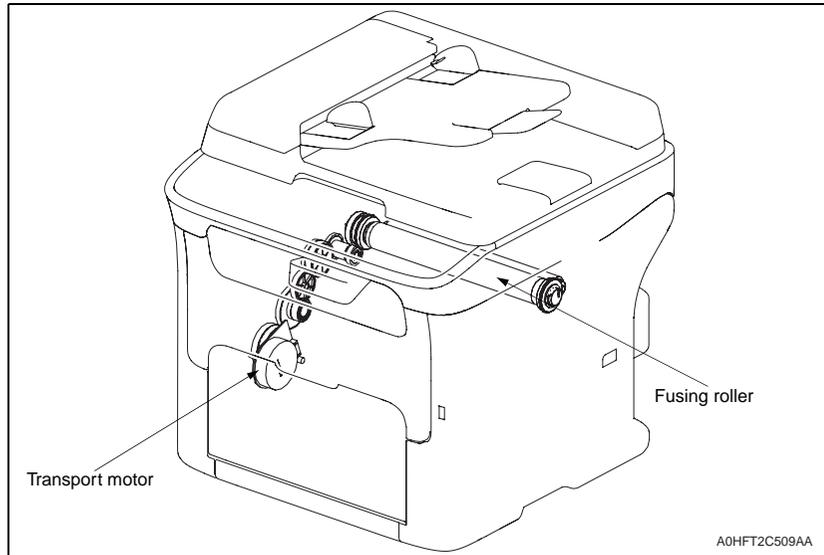
17.3 Operation

17.3.1 Fusing temperature control

- To fuse the toner image on the media (image yet to be permanently fixed) properly into the media, the heater lamps are turned ON and OFF as necessary to bring the fusing temperature to an appropriate level.
- Thermistors are used to detect the surface temperature of the Fusing roller. The heater lamps are then turned ON and OFF as necessary to achieve the set temperature.

A011T2C544AA
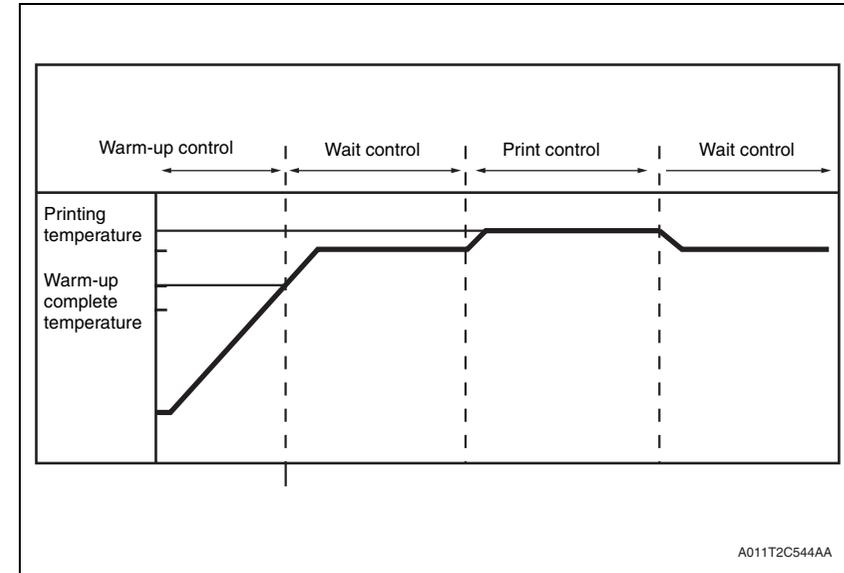
A. Warm-up control
Control is provided until the Fusing roller reaches the predetermined level.

B. Control start timing
- The power switch is turned ON.
- A malfunction or media misfeed is reset.
- The main body leaves the power save mode.
- A door is closed.

C. Control termination timing
- The Fusing roller reaches a predetermined temperature.
- A malfunction or media misfeed is reset.
- A door is opened.

D. Control start decision
• Either of the following two control start decisions is made according to the temperature detected by the temperature/humidity sensor. The fusing temperature during the print cycle varies depending on the type of the start control carried out, either low temperature start control or ordinary start control.

Control start decision	Environment upon start
Low temperature start control	The temperature/humidity sensor detects a temperature lower than the predetermined value.
Ordinary start control	The temperature/humidity sensor detects a temperature equivalent to, or higher than, the predetermined value.

17.3.2   Wait control
• Control is provided to ensure that the temperatures at different parts of the fusing unit reach a constant level during the wait state.

A. Control start timing
• At the end of the warm-up control
• At the end of the post-print cycle control (print start control)

B. Control termination timing
• The front cover is opened and closed.
• A malfunction or media misfeed occurs.

17.3.3   Print control
• To ensure a good fixing level and light transmission performance of the OHP transparencies, the fusing speed and fusing roller temperature are controlled.

A. Control start timing
• A print request is received.

B. Control termination timing
• A malfunction or media misfeed occurs.

C. Print control temperatures
• The fusing roller temperature is set according to the type of media, main body interior temperature (as measured by the temperature/humidity sensor), and warm-up start decision.
• For types of media other than plain paper, the fusing speed is controlled at the 1/2 speed.

D. Print control temperature adjustments
• The temperature during print control is adjusted using the menu available from the control panel. The temperature can, however, be decreased only.
• Adjustment steps are 0°C, -5°C, and -10°C.

17.3.4   Protection against abnormally high temperature
• The machine provides protection at three different stages to prevent abnormally high temperature of the Fusing unit.

A. Soft protection
• If the Thermistor (TH1) detects a temperature exceeding a predetermined value, the malfunction code representing abnormally high temperature is displayed. At this time, the power supply line is shut down.
• If the temperature of the fusing roller does not reach a predetermined value within a predetermined period of time after the start of the warm-up cycle, the power supply line is shut down.

B. Hard protection
• If the CPU overruns and the output level of the CPU of the Mechanical control board becomes a HIGH or LOW level, and not a pulse output, and a predetermined temperature or higher is detected, a circuit within the Mechanical control board turns OFF the relay to shut down each power supply line.

C. Thermostat protection
• If detection of abnormally high temperatures by soft protect or hard protect cannot be made due to a faulty Thermistor (TH), the thermostat operates at a predetermined temperature to shut down the power supply line.
• If detection of abnormally high temperatures by soft protect or hard protect cannot be made due to a faulty Thermistor (TH), the thermostat operates at a predetermined temperature to shut down the power supply line.

17.3.5   PPM control
• PPM control is provided to prevent the temperature on edges of the heating roller from increasing during a multi-print cycle using plain media of a small size.
• The distance between sheets of media is widened according to the number of printed pages set to be produced and the media length. This evens out the temperature of the heating roller and thus stabilizes fusing performance of the printed toner image.
• The PPM control is provided at 20 ppm for a multi-print cycle of producing 20 pages. The number of printed pages per minute is established as detailed below for each media size for the 21st and subsequent pages.
• No PPM control is provided for a multi-print cycle of color printing, as it is 1/4 of the monochrome printing.

Media conditions	PPM
A5, invoice	14ppm
Media having a narrower width and longer length than above	8ppm

18. Media exit section

18.1 Composition

A0HFT2C513AA

Media full sensor (PS16) Media exit roller Media exit roll

A0HFT2C514AA

18.2 Drive

Exit roller

Transport motor

A0HFT2C510AA
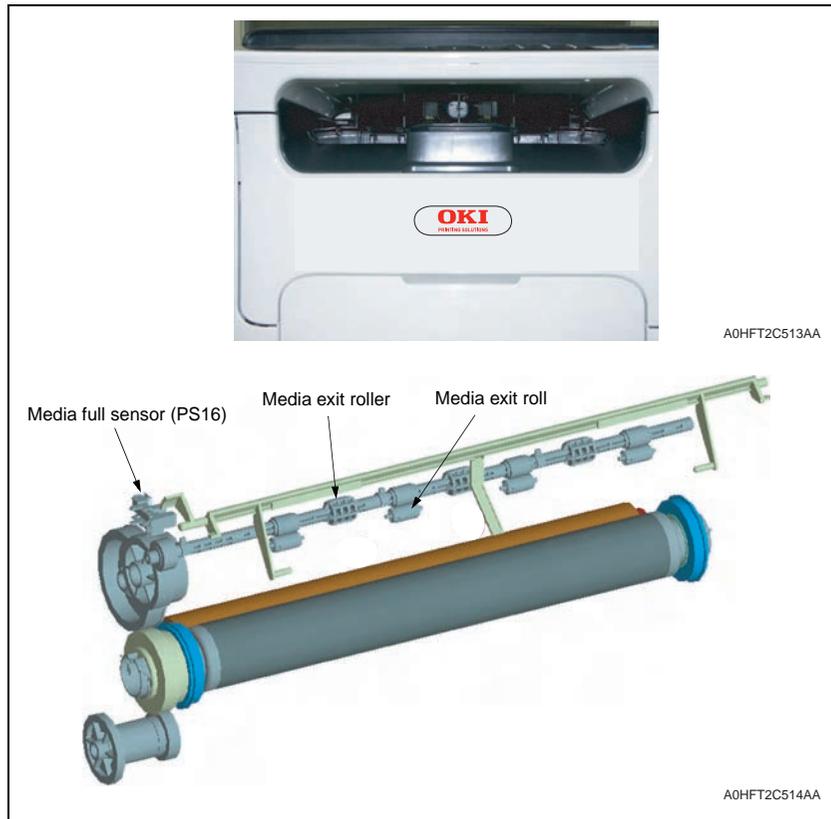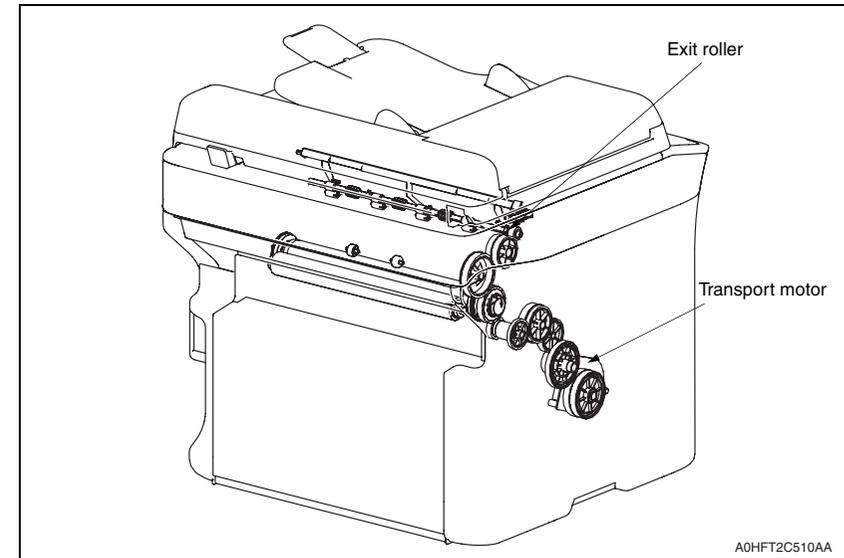
18.3 Operation

18.3.1 Conveyance control

A. Reverse/paper exit switch control
- The exit roller is driven by the transport motor.
- During 1-sided printing, the exit roller rotates in the forward direction and feeds the media transported from the fusing section out onto the media exit tray.
- If the machine is mounted with an optional Duplex unit, the exit roller is driven by the transport motor of the Duplex unit.
- The exit roller is rotated in the forward or backward direction by the transport motor of the Duplex unit to convey the media into the Duplex unit.

18.3.2 Media exit full detection control

- The exit sensor detects a full condition of the media exit tray.
- If the exit sensor is not blocked within a predetermined period of time after it has been unblocked, the machine detects a media exit full condition and displays the corresponding message on the control panel.

19. Image stabilization control

19.1 Overview

- To ensure that a stabilized output image is produced at all times, the following image stabilization controls are provided.

Purpose	Control	Detection
To ensure stabilized transfer output	ATVC * Described in the section dealing with the transfer Section	Temperature/ humidity sensor (TEM/ HUMS)
To ensure stabilized image density; to ensure good tone reproduction	IDC control • Leak detection control • IDC intensity control • Transfer belt surface correction control • Control of the maximum amount of toner sticking • Laser intensity adjustment control • γ correction control	IDC sensor (IDC) Temperature/ humidity sensor (TEM/ HUMS)

* An explanation is given of the control for each section.

A034T2E583AA
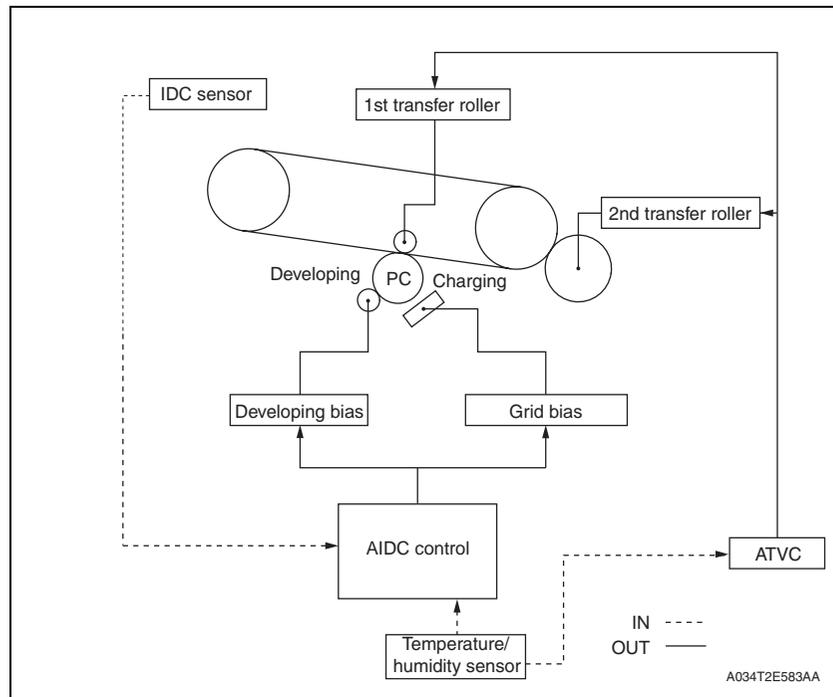
19.2 Operation

19.2.1 Leak detection control

- For the clearance between the photo conductor and developing roller, an optimum developing bias voltage is established that does not result in a leak image or uneven density.

19.2.2 IDC sensor LED intensity control

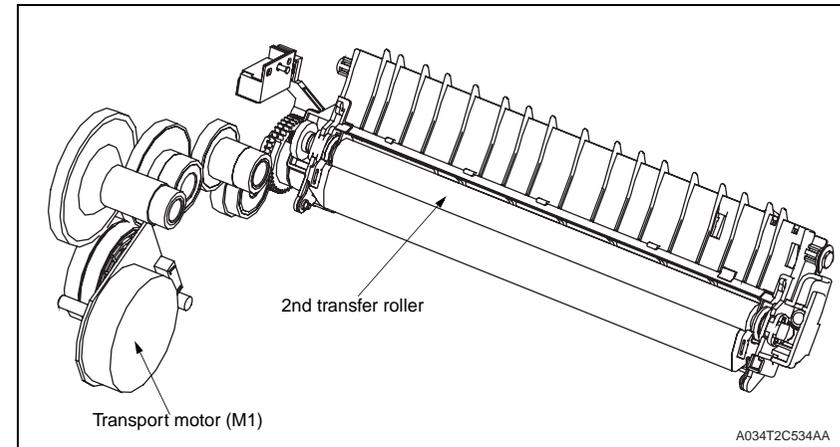- The following adjustment is made to correct any changes in characteristics occurring due to change with time and contamination of the IDC sensor (IDC): the intensity of the LED is adjusted for the surface of the transfer belt on which no toner sticks, so that the output value of the IDC sensor (IDC) becomes constant.

19.2.3 Transfer belt surface correction control

- The reflectance of the Image transfer belt is measured using the ADIC sensor (IDC). One measurement is taken for one complete turn of the Image transfer belt.
- The measured value is corrected during the laser intensity adjustment control and γ correction control.

19.2.4 Control of the maximum amount of toner sticking

- The developing bias setting value is adjusted to keep constant the amount of toner sticking to the surface of the photo conductor with reference to the 100% solid image.

19.2.5 Laser intensity adjustment control

- Characteristics of the photo conductor, developing, and charging change as affected by changes with time and in environment. The intensity of the laser light is adjusted so that fine lines and gradations of a predetermined level are reproduced at all times.

19.2.6 γ correction control

- A gradation pattern is produced on the surface of the Image transfer belt. The IDC sensor (IDC) measures the density of the pattern and sends the measured result to the controller for gradation adjustment.

19.3 Operation timing

Mode	Operation timing
Mode 1	• The environment in which the power switch is turned ON is different from the environment the machine was in when the power switch was turned OFF last. • The environment in which the Energy saver mode is canceled is different from the environment the machine was in when it entered the Energy saver mode last. • The power switch is turned OFF and ON or the Energy saver mode is canceled after a predetermined number of printed pages have been produced. • A new drum cartridge or toner cartridge is detected.
Mode 2	• The power switch is turned OFF and ON or the Energy saver mode is canceled after a predetermined number of printed pages have been produced.

19.4 Operation flow

A034T2E581AA
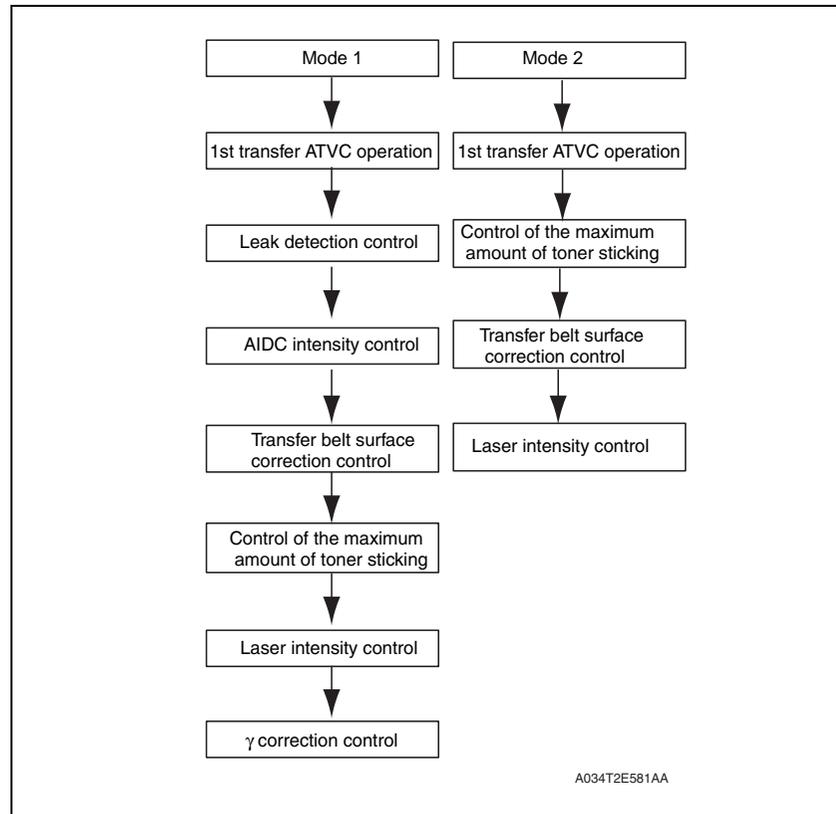
20. Fan control

20.1 Composition

A0HFT2C511AA
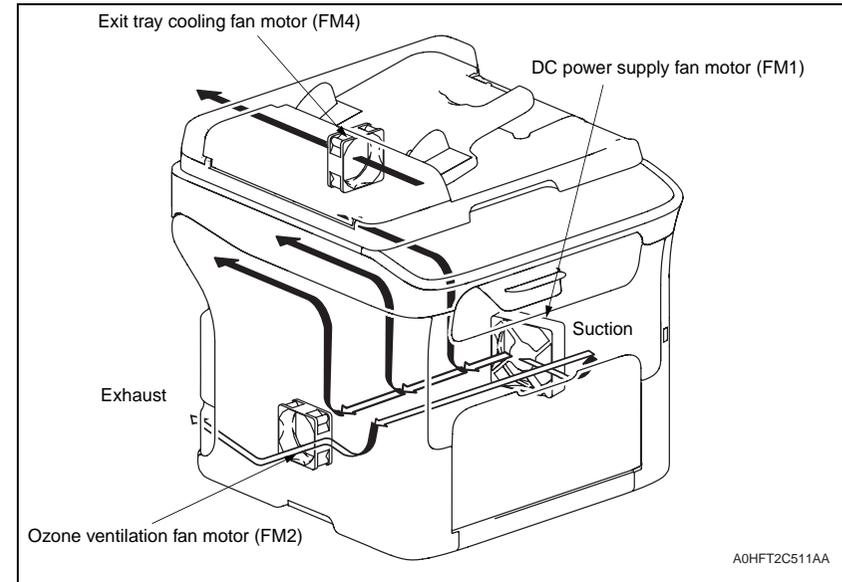
20.2 Operation

20.2.1 Function

Motor name	Function (purpose)
DC power supply fan motor (FM1)	To discharge heat stagnant inside the machine to the outside to prevent the temperature of the DC power supply from rising.
Ozone ventilation fan motor (FM2)	To recover toner powder in the imaging cartridge. To draw ozone produced in the imaging cartridge to the outside.
Exit tray cooling fan motor (FM4)	To prevent the temperature on the exit tray from increasing.

20.2.2 Control conditions

Motor name	Condition	Control conditions
DC power supply fan motor (FM1)	ON (high speed)	• For a predetermined period of time after the power is turned ON • For a predetermined period of time after the end of the Energy save mode • At the start of a print cycle (full-speed rotation after a predetermined period of time of half-speed rotation) • At the start of pre-drive
	ON (low speed)	• During standby • At the end of a print cycle (half-speed rotation after a predetermined period of time of full-speed rotation)
	OFF	• During the Energy save mode • When a malfunction occurs • During firmware upgrading
Ozone ventilation fan motor (FM2)	ON	• During transport motor drive
	OFF	• Other than above
Exit tray cooling fan motor (FM4)	ON (high speed)	• For a predetermined period of time after the power is turned ON • For a predetermined period of time after the end of the Energy save mode • At the start of a print cycle (full-speed rotation after a predetermined period of time of half-speed rotation) • At the start of pre-drive
	ON (low speed)	• During standby • At the end of a print cycle (half-speed rotation after a predetermined period of time of full-speed rotation)
	OFF	• During the Energy save mode • When a malfunction occurs • During firmware upgrading

Auto Document Feeder Unit

THEORY OF OPERARTION

CONTENTS

Auto Document Feeder Unit

OUTLINE

1. Product Specifications

A. Type

Name	Automatic Document Feeder	
Installation	Inserted at upper-rear side of main body	
Document alignment	Center	
Document loading	Face up	
Scan speed	Color (600 x 300 dpi)	3.0 opm
	Monochrome (600 x 300 dpi)	10 opm
	Monochrome (300 x 300 dpi)	20 opm

OPM: Originals per minutes

B. Functions

Modes	1-Sided Mode / 2-Sided Mode

C. Paper

Type of document	1-Sided mode: 50 g/m^2 to 128 g/m^2	
	2-Sided mode: 50 g/m^2 to 128 g/m^2	
Detectable document size	A5S, B5S, A4S, LegalS (8.5 x 14), LetterS (8.5 x 11), Invoice (8.5 x 5.5)	
	Width	140 to 216 mm
	Length	148 to 355.6 mm
Capacity	35 sheets (80 g/m^2) or load height of 6 mm or less.	

D. Maintenance

Machine durability	50,000 originals feed or 5 years, whichever comes first

E. Paper feed prohibited originals
· The following types of originals should not be used.

Types of document	Possible malfunctions
Original that is stapled or clipped.	Feed failure, damage to the original, or drive failure due to clip clogging
Pasted originals	Misfeed, broken original, or folded paste-up edges
Book original	Feed failure, damage to the original, or drive failure
Original weighing less than 35 g/m^2 or 210 g/m^2 or more	Feed failure
Torn original	Feed failure, damaged sheet
Highly curled original (15 mm or more)	Original misfeed due to dog-ear or skew
OHP transparencies	Feed failure
Label Sheet	Feed failure
Photographic paper, gloss enamel paper, or other gloss original	Feed failure, damage to the original, or drive failure
Offset master	Feed failure
Sheets clipped or notched	Damaged sheet
Less-than-0.05-mm-thick thin paper	Misfeed
More-than-0.15-mm-thick thin paper	Misfeed

F. Paper feed not guaranteed originals
· If fed, paper feed will be possible to some extent but trouble occurrence will be possible.

Type of original	Possible trouble
Sheets lightly curled (Curled amount: 10 - 15 mm)	Dog-eared, exit failure
Heat sensitive paper	Edge folded, exit failure, transport failure
Translucent paper	Take-up failure, transport failure
Paper immediately after paper exit from the main unit	Take-up failure, transport failure
Paper with many punched holes (e.g., loose leaf) limited to vertical feeding	Multi-page feed due to flashes from holes
Sheets with 2 to 4 holes	Transport failure
Sheets two-folded or Z-folded	Transport failure, image deformation
Sheets folded	Image deformation, multi-page feed, take-up failure

G. Machine specifications

Power requirements	DC 24 V (supplied from the main body)
	DC 5 V (supplied from the main body)
Dimensions	404 mm (W) x 318 mm (D) x 60.5 mm (H) (without the original tray)
Weight	2.0 kg

H. Operating
· Conforms to the operating environment of the main body.

NOTE
These specifications are subject to change without notice.

COMPOSITION/OPERATION

2. Composition

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Relay board/1 (REYB/1)

DF transport motor (M100)

Registration roll/1

Registration roller

Media feed roller

Pick-up roller
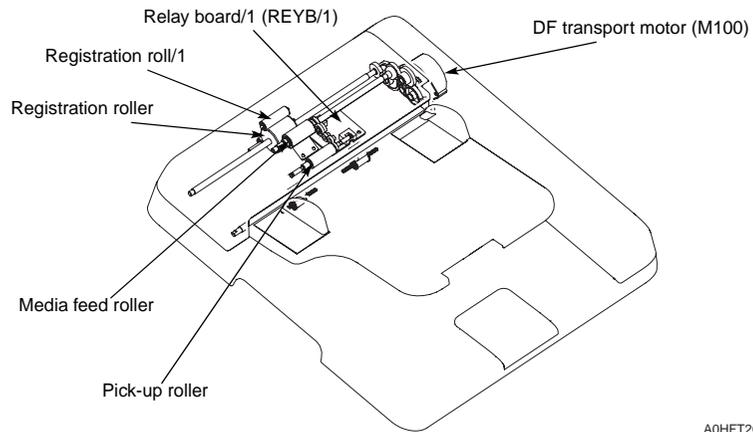
A0HFT2C506AA

3. Drive
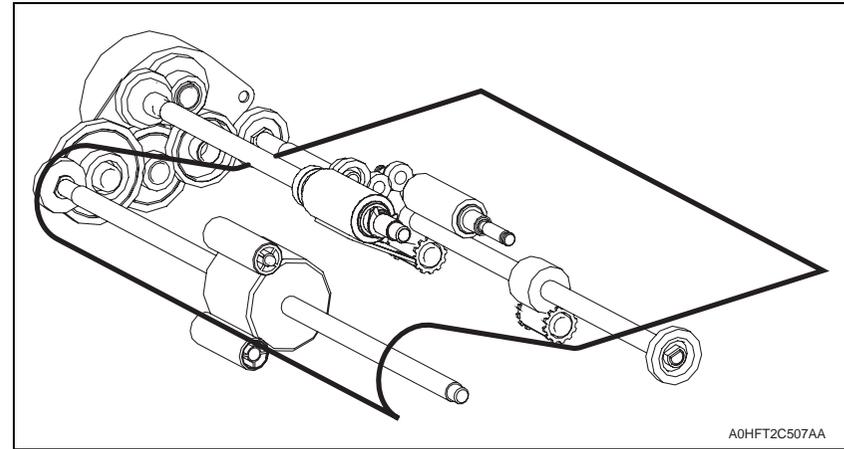
A0HFT2C507AA

4. Mechanical operations

4.1 Document feed mechanism

- The media feed sensor detects a document that has been properly loaded in the document feeder.
- The document stopper establishes the leading edge position of the document loaded in the document feeder. The stopper is lowered in the standby state and raised when the document is taken up and fed in.
- The document stopper is raised and lowered in synchronism with the raising and lowering motion of the pick-up roller.
- The pick-up roller and media feed roller turn to take up and feed the original properly.
- The pick-up roller transports the original up to the media feed roller.
- The DF transport motor drives the pick-up roller and media feed roller through a gear train.

Relay board/1 (REYB/1)
DF transport motor (M100)
Media feed sensor
Media feed roller
Pick-up roller

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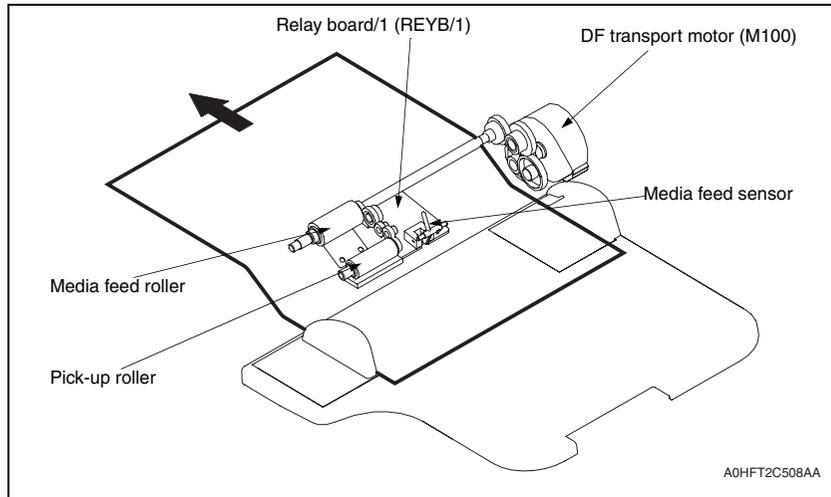
4.1.1 Document separation mechanism

- Double feeding of paper is prevented using coefficient of friction between the media feed roller and separator pad.

Media feed roller
Separator pad

A0HFT2C509AA
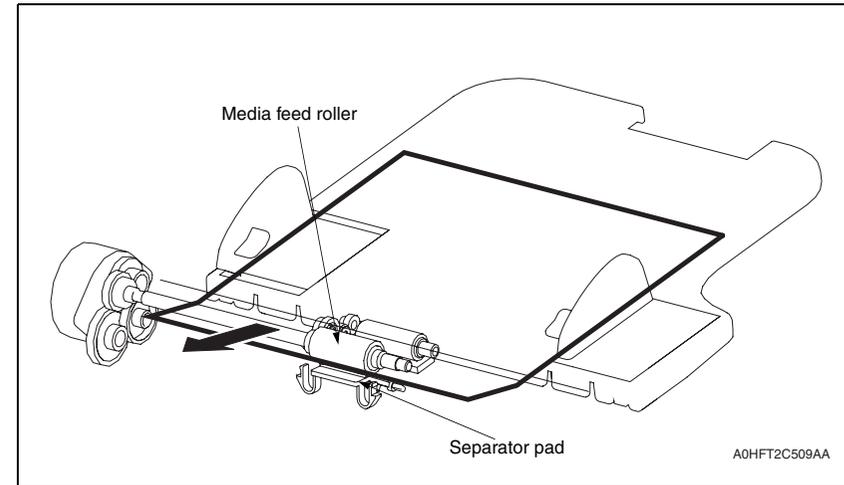
Single sheet feeding : The coefficient of friction on the front side of the paper fed between the media feed roller and separator pad is equal to that on the backside of the paper. This allows the media feed roller to transport the paper.

Multiple sheet feeding : The coefficient of friction between the paper and separator pad is greater than that between sheets of paper. This allows only the first sheet of paper to be transported by the media feed roller.

Single sheet feeding   Multiple sheet feeding

1382M009AA
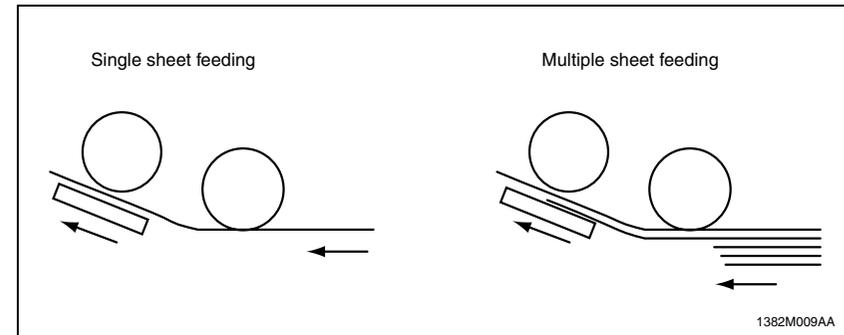
4.2 Document transport/exit mechanism

4.2.1 Document transport mechanism

- The registration roller is rotated by the drive from the DF transport motor and transports the original that has been taken up to the document scanning position of the printer.
- The DF transport motor drives the transport roller through a gear train.
- Activation of the registration sensor establishes the document scan start timing.
- eactivation of the registration sensor establishes the document scan end timing and timing to de-energize the DF transport motor.

DF transport motor (M100)

Registration sensor

Registration roll/1

Registration roller

Registration roll/2

A0HFT2C510AA
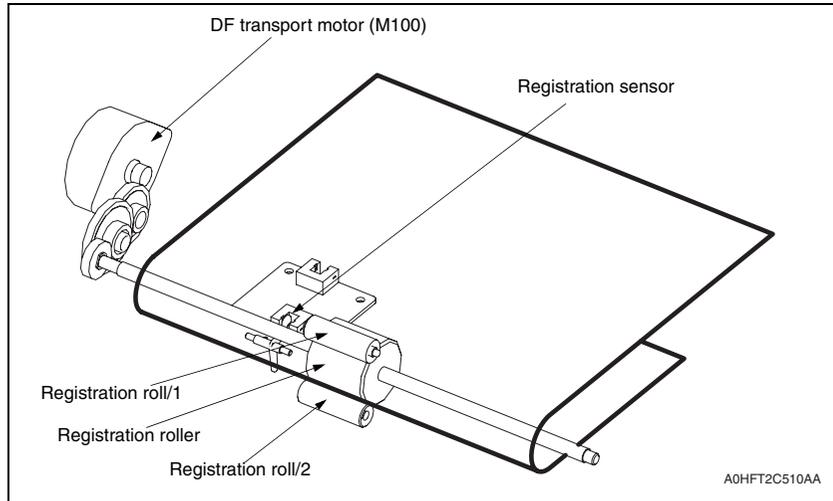
4.2.2 Document exit mechanism

- The exit roller turns to feed the original out of the document feeder. The original is fed onto the document exit tray.
- The DF transport motor turns the exit roller through a gear train.

DF transport motor (M100)

Cleaning pad can be substitued with the lint-free cloth.

Exit roller

A0HFT2C511AA

MC160n Main body

FIELD SERVICE

CONTENTS

MC160n Main body

OUTLINE

1. System configuration

A0HFT1C500AA

[1]   MC160n

[2]   Lower Feeder Unit (Option)

[3]   Duplex Option Attachment (Option)

[4]   Duplex Option (Option)

2. Product specifications

A. Type

Type	Desktop full-color laser beam printer
Printing system	Semiconductor laser and electrostatic image transfer to plain paper
Exposure system	2 laser diodes and polygon mirror
PC drum type	OPC (organic photo conductor)
Photoconductor cleaning	Blade cleaning system
Resolution	1200 x 600 dpi, 600 x 600 dpi
Media feeding system	One-way system (Tray 1: 200 sheets) * Expandable to a two-way system by adding an optional Lower Feeder Unit.
Developing system	Single-element developing system
Charging system	DC comb electrode scorotron system
Image transfer system	Intermediate transfer belt system
Media separating system	Curvature separation + Charge-neutralizing system
Fusing system	Roller fusing
Media exit system	Face down (Output tray capacity: 100 sheets)

B. Functions

Warm-up time	Average 30 seconds (time to return to Ready mode from Energy Save mode)	
Process speed	Plain paper	126.78 mm/second
	Thick stock	63.39 mm/second
First-Page-Out Time (A4/letter, Plain paper)	Full color	1-sided: 21 seconds
	Monochrome	1-sided: 12 seconds
First copy time (A4/Letter, Plain paper)	Full color	1-sided: 52 seconds (600 x 300 dpi)
	Monochrome	1-sided: 23 seconds (600 x 300 dpi)
Print speed (A4/Letter, Plain paper)	Full color	1-sided: 5 pages/minute
	Monochrome	1-sided: 20 pages/minute
Custom media sizes	Paper width: 92 to 216 mm (3.6" to 8.5")	
	Paper length: 195 to 356 mm (Plain paper) 184 to 297 mm (Thick paper)	
Media types	• Plain paper (60 to 90 g/m^2) • Thick stock 1 (91 to 163 g/m^2) • Thick stock 2 (164 to 209 g/m^2) • Postcards • Envelopes • Letterhead • Label stock	
Tray capacities	Plain paper and letterhead :200 sheets Thick stock, postcards, labels stock, and glossy stock :50 sheets Envelopes :10 sheets	

Lower Feeder Unit: Only plain paper and recycled paper weighing 60 to 90 g/m^2
(16 to 24 lb) can be loaded.
Duplex Option: Only plain paper and recycled paper weighing 60 to 90 g/m^2
(16 to 24 lb) can be fed through the unit.

C. Maintenance

Machine durability	50,000 prints or 5 years, whichever comes first

D. Machine specification

Power requirements	voltage:	AC 120 V ± 10 % AC 220 to 240 V ± 10%
	Frequency:	60 Hz ± 3 Hz (for North america) 50/60 Hz ± 3 Hz (for Europe)
Max power consumption	990 W or less (120 V) 1060 W or less (220 V to 240 V)	
Dimensions	405 mm (W) x 427 mm (D) x 432 mm (H)	
Weight	21.0 kg (including the consumables)	
Operation noise	During standby	38 dB (A)
	During printing	49 dB (A): monochrome

E. Operating environment

Temperature	10 to 35 °C / 50 to 95 °F (with a fluctuation of 10 °C / 18 °F or less per hour)
Humidity	15% to 85% (with a fluctuation of 20% or less per hour)

F. Controller

Type	Built-in type controller
Standard memory	128MB
Interfaces	USB 2.0 (High Speed) compliant, 10Base-T/100Base-TX Ethernet, Host USB (for scan to USB memory)
Support	• Microsoft Windows Vista Home Basic/Home Premium/Ultimate/Business/ Enterprise, Windows Vista Home Basic/Home Premium/ Ultimate/ Business/Enterprise x64 Edition, Windows XP Home Edition/ Professional (Service Pack 2 or later), Windows XP Professional x64 Edition, Windows Server 2003, Windows Server 2003 x64 Edition, Windows 2000 (Service Pack 4 or later) • Mac OS X (10.2.8 or later; We recommend installing the latest patch)

NOTE
• **These specifications are subject to change without notice.**

MAINTENANCE

3. Periodical check

3.1 Maintenance items

3.1.1 Parts to be replaced by users (CRU)

Class	Part to be replaced	Number of prints	Clean	Replace
Processing section	Standard in-box toner cartridge (C, M, Y)	500 (Continuous printing)		●
	Standard in-box toner cartridge (K)	1,000 (Continuous printing)		●
	Standard-capacity toner cartridge (C, M, Y)	1,500 (Continuous printing)		●
	High-capacity toner cartridge (C, M, Y, K)	2,500 (Continuous printing)		●
	Imaging cartridge	Monochrome 45,000 (Continuous printing) *1		●
		Monochrome 10,000 (1P/J) *1		
		Full Color 11,250 (Continuous printing) *1		
		Full Color 7,500 (1P/J) *1		
	PH window	When a malfunction occurs	●	
Fusing section	Fuser unit	50,000		●
Tray 1 media feed section	Media feed roller	When malfunction occurs	●	
Tray 2 media feed section	Media feed roller	When malfunction occurs	●	
ADF document feed section	Media feed roller	When malfunction occurs	●	
Duplex option transport section	Transport roller	When malfunction occurs	●	
	Media feed roller *2		●	

*1: In case of single side printing for normal paper of A4/Letter size
*2: Only when the duplex option attachment is installed.

3.2 Concept of parts life

Description		Near life value	Life value	Max. life value
Toner cartridge	The consumption rates are calculated from the dot counter and the image counter and the life is reached when the consumption rate, whichever is greater, reaches 100%.	High-capacity toner cartridge (C, M, Y, K)	2,350 pages	2,500 pages	3,500 pages *1
		Standard-capacity toner cartridge (C, M, Y)	1,350 pages	1,500 pages	2,100 pages *1
		Standard in-box toner cartridge (K)	850 pages	1,000 pages	1,400 pages *1
		Standard in-box toner cartridge (K) / Standard in-box toner cartridge (C, M, Y)	350 pages	500 pages	700 pages *1
Imaging cartridge	The imaging cartridge drive time count is compared with the printed page count and whichever reaching its life value is detected.		—	45,000 images	48,500 images
Waste toner bottle (inte-grated in I/C)	Detected with the waste toner near full sensor. A waste toner full condition is detected when 200 more images are produced after a waste toner near-full condition has been detected.		—	—	—
Fuser unit	The fuser unit drive time is counted based on the transport motor drive time. The consumption rates of the fuser unit drive time count and the printed page count are calculated and the life value is reached when the consumption rate, whichever is greater, reaches 100%.		—	50,000 prints	—
Transfer roller	The number of printed pages is counted.		—	50,000 prints	—

*1: The machine prohibits the initiation of any new print cycle when the maximum life value is reached.

A. Conditions for life specifications values
• The life specification values represent the number of pages printed or figures equivalent to it when the given conditions (see the table given below) are met. They may be more or less, depending on the machine operating conditions of each individual user.

Item	Description
Job type	Monochrome: 3 consecutive pages (3 pages/job) Full Color: 2 consecutive pages (2 pages/job)
Media size	A4S or LetterS
Color ratio	Black to Color = 1 : 1
Original density	ISO chart C/W ratio = 5% each color

3.3 Maintenance Procedure (periodical check parts)

3.3.1 Toner cartridge (C/M/Y/K)

A. Periodically replaced parts/cycle
- Standard in-box toner cartridge (C, M, Y): Every 500 prints
- Standard in-box toner cartridge (K): Every 1,000 prints
- Standard-capacity toner cartridge (C,M,Y): Every 1,500 prints
- High-capacity toner cartridge (C,M,Y,K): Every 2,500 prints

B. Removal procedure
1. Check the color of the toner cartridge to be replaced on the control panel.
2. Select [PRINTER MODE] - [T/C CHANGE] - [REPLACE MODE] from the menu and select the toner cartridge of the specific color of toner to be replaced.

A0HFF2C502DA
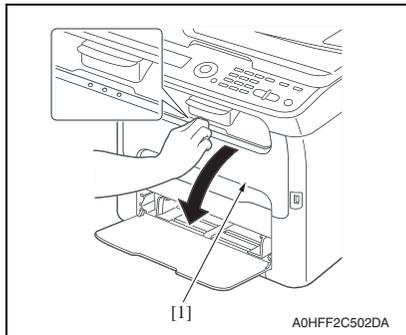
3. Open the front cover [1] and make sure that the specific toner cartridge to be replaced is in the front.

A0HFF2C503DA
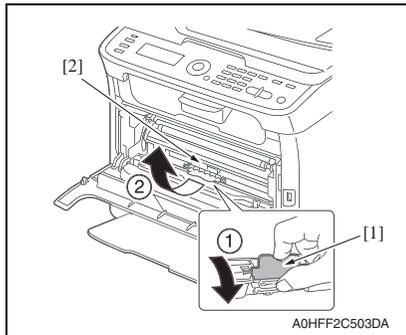
4. Hold onto the handle [1] of the toner cartridge, pull it and remove the toner cartridge [2].

NOTE
- **When all toner cartridges need to be removed and replaced manually, select [PRINTER MODE] - [T/C CHANGE] - [EJECT MODE].**

C. Reinstallation procedure

A034F2C509DA
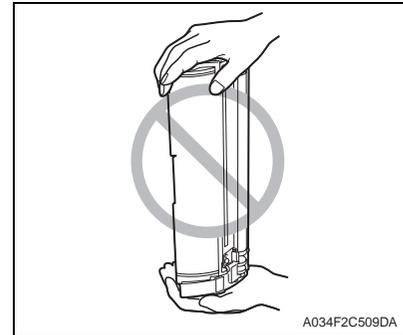
NOTE
Do not let the toner cartridge stand upright or keep it in that upright position.

A034F2C510DA
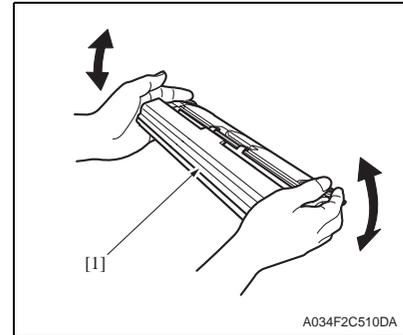
1. Shake the toner cartridge [1] a few times to distribute the toner.

A00VF2C502DA
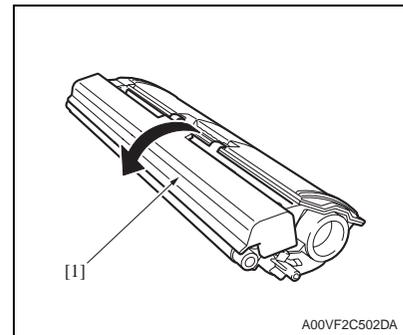
2. Remove the protective cover [1].

A0HFF2C504DA
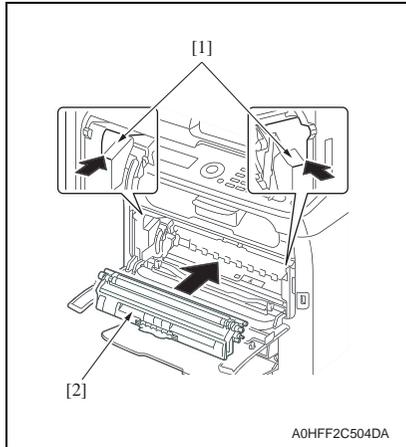
3. Aligning the shaft [1] on both sides of the toner cartridge with the rails in the machine, install the toner cartridge [2].

A0HFF2C505DA

4. Press in the toner cartridge until [1] it locks into place.
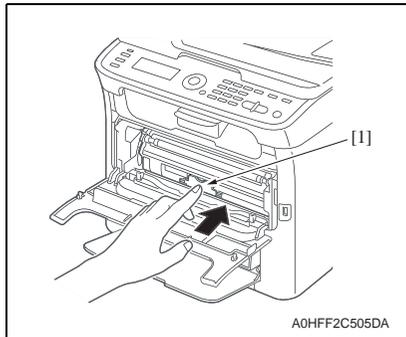
5. Close the front cover.
6. Press the Clear key.

3.3.2 Imaging cartridge

A. Periodically replaced parts/cycle
- Imaging cartridge (Monochrome continuous printing): Every 45,000 counts
  Imaging cartridge (Monochrome 1P/J): Every 10,000 counts
  Imaging cartridge (Full color continuous printing): Every 11,250 counts
  Imaging cartridge (Full color 1P/J): Every 7,500 counts

B. Replaced procedure

A0HFF2C506DA

1. Open the top cover [1].

A0HFF2C507DA
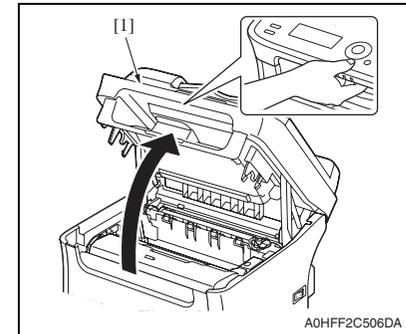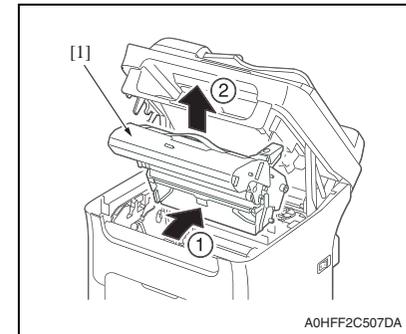
2. Hold onto the handle [1] of the imaging cartridge [2], pull it up slowly to remove the imaging cartridge as shown in the picture.

3. To reinstall, reverse the order of removal.

4. Service tool

4.1 Service material list

Tool name	Shape	Material No.	Remarks
Cleaning pad			Cleaning pad can be substituted with the lint-free cloth.
Isopropyl alcohol			
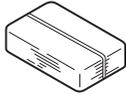
5. Firmware upgrade

5.1 Preparations for firmware upgrading

NOTE
- **Make sure that the scanner driver has been installed in the PC.**
- **Before updating the firmware, print Configuration Page to confirm the current Firmware Version.**

5.2 Upgrading procedure

5.2.1 Boot Rom firmware rewriting

1. Connect the machine and PC using the USB cable.
2. Turn ON the machine's main switch pressing Select key.
3. Confirm that [AMBER-AIO BOOTROM] appears on the screen.


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2008/08/06 V0.12
＊4IN1 BOOTROM MODE
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2008/08/06 V0.12
AMBER-AIO BOOTROM
```
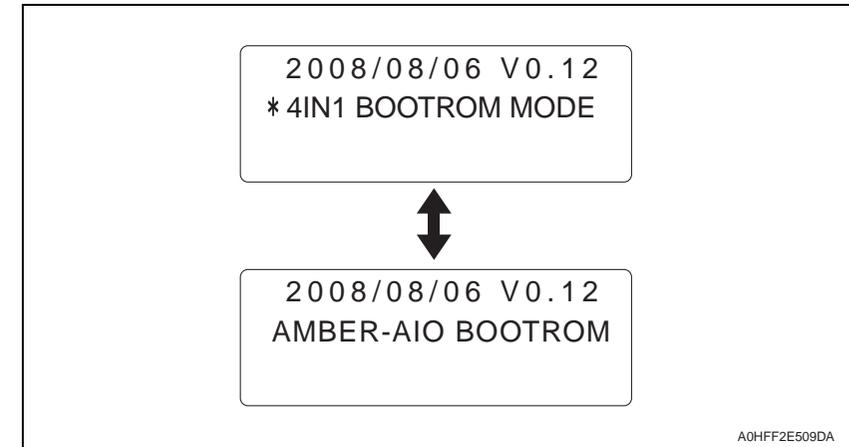
A0HFF2E509DA

4. Copy the firmware data and upgrading program in any arbitrary directory of the PC.
5. Double-click "UpdateFW.exe".
6. Click [Browse] and select File path, "XXXXX.bin".
7. Click [Update].

Update F/W - V5.00

File path : C:\............bin [Browse]

[Update] [Exit]
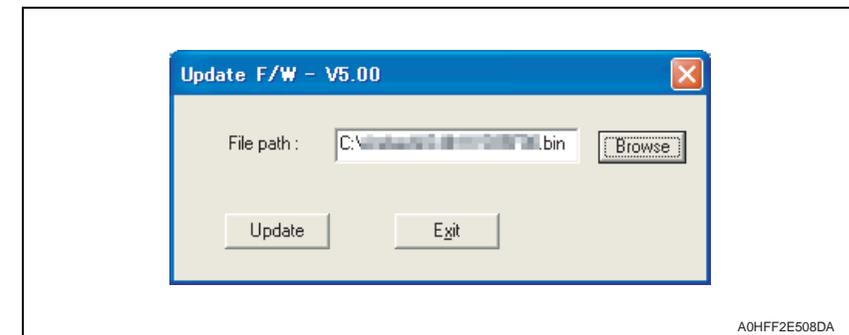
A0HFF2E508DA

8. Firmware updating starts.

9. When [Transfer Successfully!] message appears on the screen, click [OK] to close the execution tool.

A0FDF2C530DA

10. Confirm that [FIRMWARE UPDATE OK] message has been displayed, and turn OFF/ON the machine's main switch.

FIRMWARE UPDATE
  FIRMWARE UPDATE OK
MACHINE POWER OFF/ON
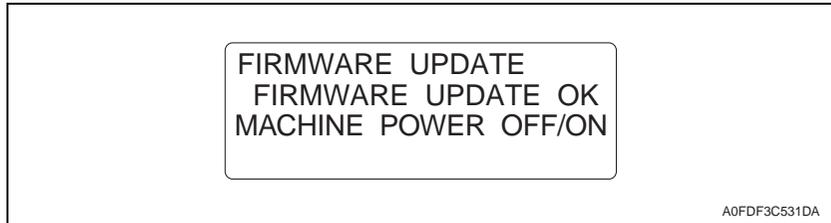
A0FDF3C531DA

11. Print [CONFIGURATION PAGE] to confirm the Boot Code Firmware Version.

5.2.2　　　Controller firmware upgrading

1. Connect the machine and PC using the USB cable.
2. Copy the firmware data and upgrading program in any arbitrary directory of the PC.
3. Double-click "UpdateFW.exe".
4. Click [Browse] and select File path, "XXXXX.bin".
5. Click [Update].
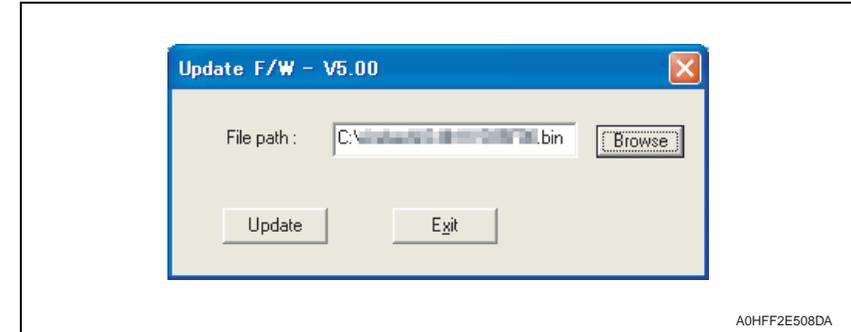
A0HFF2E508DA

6. Firmware updating starts.

7. When [Transfer Successfully!] message appears on the screen, click [OK] to close the execution tool.

A0FDF2C530DA

8. Confirm that [FIRMWARE UPDATE OK] message has been displayed, and turn OFF/ON the machine's main switch.

```
┌─────────────────────────────────┐
│   ┌─────────────────────────┐   │
│   │   FIRMWARE  UPDATE       │   │
│   │    FIRMWARE  UPDATE  OK  │   │
│   │  MACHINE  POWER  OFF/ON  │   │
│   │                         │   │
│   └─────────────────────────┘   │
│                    A0FDF3C531DA  │
└─────────────────────────────────┘
```
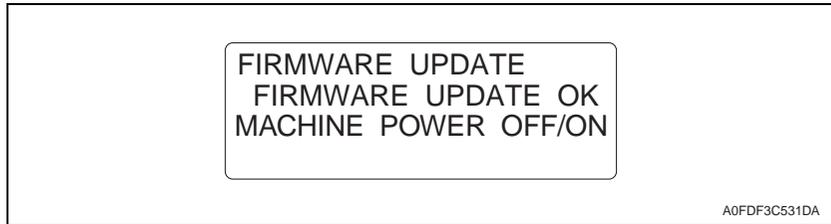
9. Print [CONFIGURATION PAGE] to confirm the Controller Firmware Version.

6.   Other

6.1   Disassembly/adjustment prohibited items

A. Paint-locked screws

NOTE
*   **To prevent loose screws, a screw lock in blue or green series color is applied to the screws.**
*   **The screw lock is applied to the screws that may get loose due to the vibrations and loads created by the use of machine or due to the vibrations created during transportation.**
*   **If the screw lock coated screws are loosened or removed, be sure to apply a screw lock after the screws are tightened.**

B. Red-painted screws

NOTE
*   **The screws which are difficult to be adjusted in the field are painted in red in order to prevent them from being removed by mistake.**
*   **Do not remove or loosen any of the red-painted screws in the field. It should also be noted that, when two or more screws are used for a single part, only one representative screw may be marked with the red paint.**

C. Variable resistors on board

NOTE
*   **Do not turn the variable resistors on boards for which no adjusting instructions are given in Adjustment/Setting.**

D. Removal of PWBs

⚠ CAUTION
*   **When removing a circuit board or other electrical component, refer to "Handling of PWBs" and follow the corresponding removal procedures.**
*   **The removal procedures given in the following omit the removal of connectors and screws securing the circuit board support or circuit board.**
*   **Where it is absolutely necessary to touch the ICs and other electrical components on the board, be sure to ground your body.**

6.2 Disassembly/assembly/cleaning list (other parts)

6.2.1 Disassembly/assembly parts list

Section	Part name	Ref.Page
Exterior parts	Rear cover	P.76
	Left cover	P.76
	Right cover	P.76
	ADF rear cover	P.76
	Operation panel	P.77
	Original glass assy	P.77
Boards and etc.	Print control board (PRCB)	P.78
	MFP board (MFPB)	P.79
	FAX control board (FAXB)	P.80
	USB board (USB)	P.80
	DC power supply (DCPU)	P.81
	High voltage unit (HV)	P.82
Units	Transfer roller unit	P.82
	Fuser unit	P.83
	PH unit	P.83
	Media feed driving unit	P.84
	IR unit	P.85
	Scanner unit	P.86
	Auto document feeder unit (ADF)	P.87
Other Parts	Transport motor (M1)	P.88
	Developing motor (M3)	P.88
	Scanner motor assy	P.89
	DC power supply fan motor (FM1)	P.90
	Ozone ventilation fan motor (FM2)	P.90
	Exit tray cooling fan motor (FM4)	P.91
	Tray1 media feed solenoid (SD1)	P.91
	Registration roller solenoid (SD2)	P.92
	2nd image transfer pressure/retraction solenoid (SD4)	P.92
	Cleaning blade pressure/retraction solenoid (SD5)	P.93
	Speaker (SP)	P.93
	Tray1 media feed roller	P.93
	Separation pad	P.93
	ADF Separation pad	P.94

6.2.2 Cleaning parts list

Section	Part name	Ref.Page
Tray 1	Tray1 media feed roller	P.95
Processing section	Print head window	P.95
ADF	ADF media feed roller	P.95

6.3 Disassembly/assembly procedure

6.3.1 Rear cover

A0HFF2C514DA
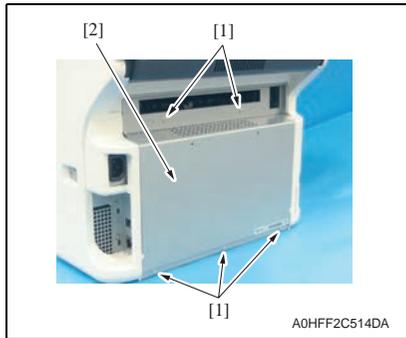
1. Remove five screws [1], and remove the rear cover [2].

6.3.2 Left cover

⚠ WARNING
• **Make sure to remove the rear cover before mounting the left cover in order to prevent the gasket attached to the cover from coming off. The gasket removing may lead electric leakage, which could cause electric shock during the machine operation. Or if the gasket flakes off into the machine, it may cause abnormal heat generation.**

1. Remove the rear cover.
   See P.76
2. Open the top cover.
3. Open the front cover.

A034F2C060DA
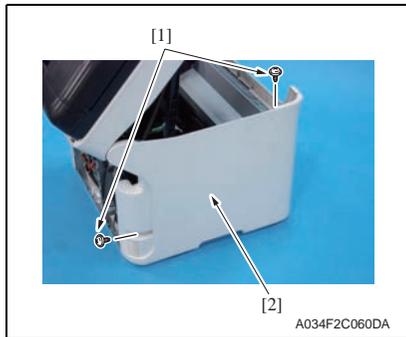
4. Remove two screws [1], and remove the left cover [2].

6.3.3 Right cover

1. Open the top cover.
2. Open the front cover.

A0HFF2C515DA
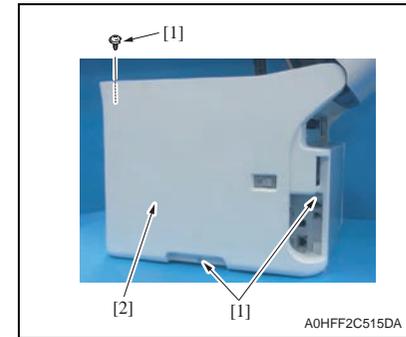
3. Remove three screws [1], and remove the right cover [2].

6.3.4 ADF rear cover

A034F2C062DA

1. Open the ADF top cover [1].

A034F2C063DA
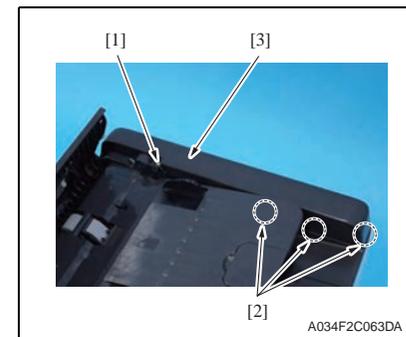
2. Remove the screw [1] and unhook three tabs [2], and remove the ADF rear cover [3].

6.3.5 Operation panel

A034F2C064DA
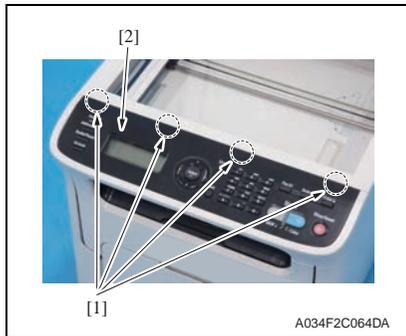
1. Unhook four tabs [1], and remove the operation panel sheet [2].

A034F2C065DA
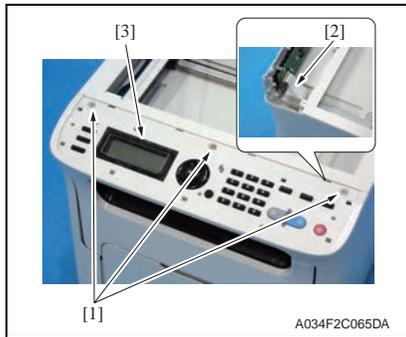
2. Remove three screws [1] and disconnect the flat cable [2], and remove the operation panel [3].

6.3.6 Original glass assy

1. Remove the auto document feeder unit. See P.87
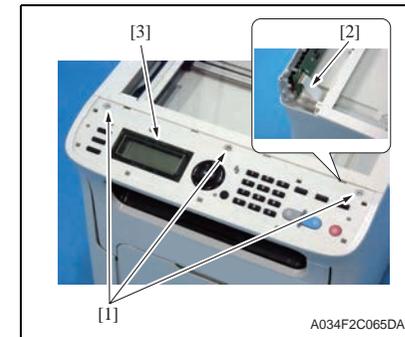
A034F2C065DA

2. Remove three screws [1] and disconnect the flat cable [2], and remove the operation panel [3].

A034F2C112DA
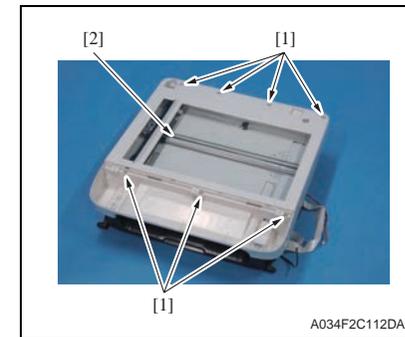
3. Remove seven screws [1], and remove the original glass [2].

6.3.7 Print control board (PRCB)

1. Remove the rear cover.
   See P.76
2. Remove the left cover.
   See P.76
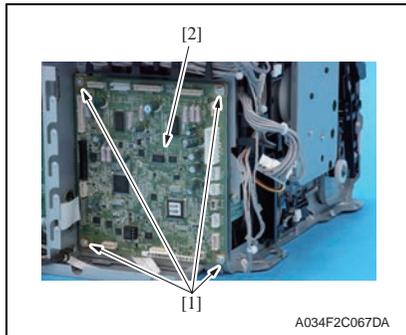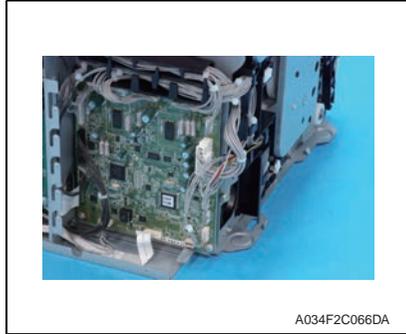
A034F2C066DA

3. Disconnect all connectors and flat cables from the printer control board.

[2]

[1]

A034F2C067DA

4. Remove four screws [1] and remove the printer control board [2].

5. Remove parameter chip (IC9) [1] from the printer control board.

NOTE
- **When the printer control board (PRCB) has been replaced, be sure to remount parameter chip (IC9). Remove parameter chip (IC9) from the old printer control board and mount it on the new printer control board.**

[1]

A034F2C008DA

A

A

4138fs2544c0
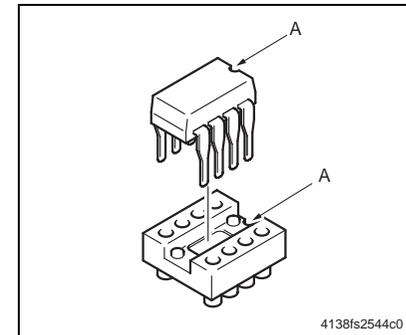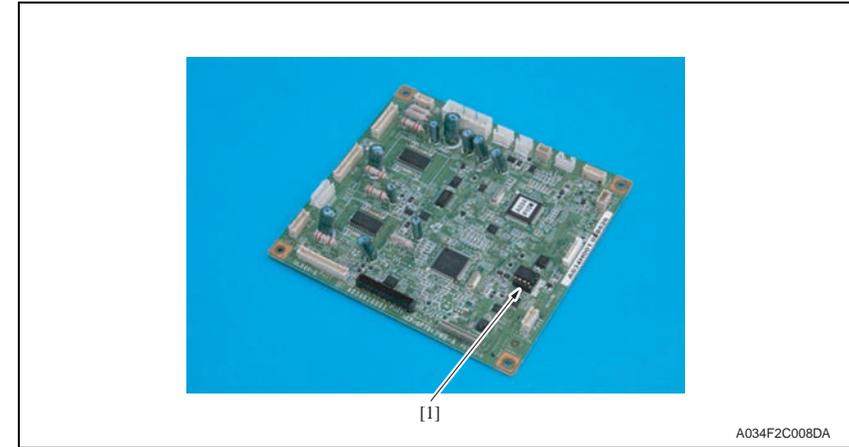
NOTE
- **When mounting parameter chip (IC9), align the notches (indicated by "A" in the illustration).**

NOTE
- **When the printer control board is replaced with a new one, be sure to execute [BK CLEAR].**
   See P.129

6.3.8 MFP board (MFPB)

NOTE
- **For MC160n, boot data is written to the MFP board and firmware data is written to the FAX control board. To avoid any problem, be sure to replace both the MFP board and FAX control board at one time.**
- **When the MFP board is replaced, the setting values for the following items are cleared. Enter new setting values in the service mode.**
  For the new setting values, refer to the values set at the shipment, which is shown on the back side of the label located inside of the front door.

Items for adjustment	
CIS MAIN ZOOM	O
CIS SUB ZOOM	O
CIS MAIN REGIST	O
CIS SUB REGIST	O
ADF SUB ZOOM	O
ADF MAIN REG	O

1. Remove the rear cover.
   See P.76
2. Remove the right cover.
   See P.76
3. Remove the printer control board.
   See P.78
4. Remove the FAX control board.
   See P.80

A034F2C068DA

5. Remove two screws [1], and remove the plate [2].

A034F2C069DA

A034F2C070DA
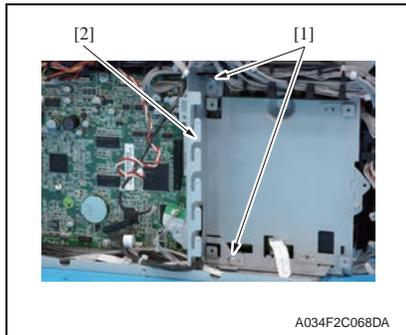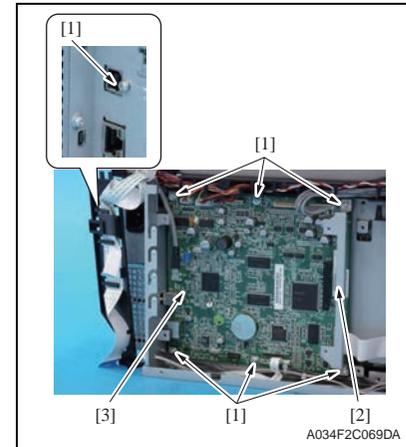
6. Disconnect all connectors and flat cables from the MFP board.

7. Remove seven screws [1], and remove the plate [2] and the MFP board [3].
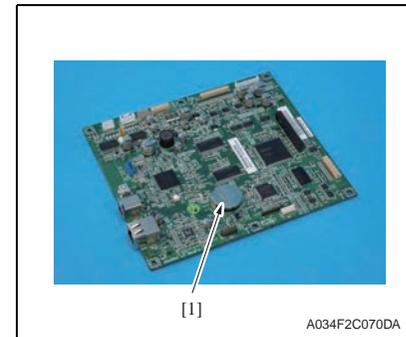
8. Remove the back up battery [1] on the MFP board.

NOTE
- **When the MFP board is replaced, upgrade the firmware to the latest version.**
  See P.73
- **When the MFP board is replaced with a new one, be sure to execute [BK CLEAR].**
  See P.129

6.3.9   FAX control board (FAXB)

NOTE

- **For MC160n, boot data is written to the MFP board and firmware data is written to the FAX control board. To avoid any problem, be sure to replace both the MFP board and FAX control board at one time.**

1. Remove the rear cover.
2. Remove the right cover.

A034F2C071DA
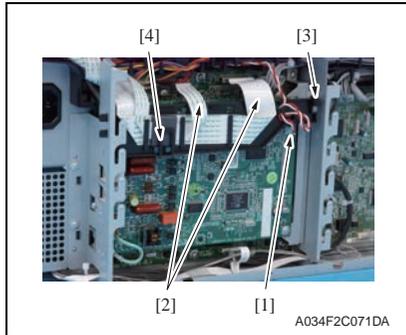
3. Disconnect the connector (P1) [1].
4. Disconnect two flat cables (P6, P7) [2].
5. Unhook the tab [3], remove the harness guide [4].

A034F2C072DA
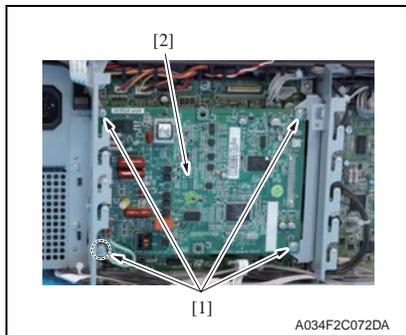
6. Remove four screws [1], and remove the FAX control board [2].

NOTE

- **When installing the FAX control board, each of the screws indicated by the arrows also fixes an earth terminal.**

6.3.10   USB board (USB)

1. Remove the rear cover.
2. Remove the right cover.
3. Remove the FAX control board.

A034F2C073DA
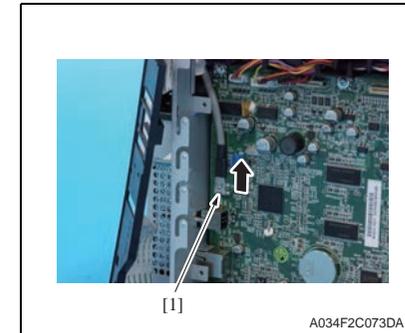
4. Disconnect the connector (CN1) [1] from the MFP board.

A0HFF2C518DA
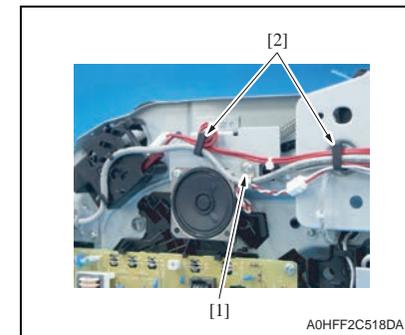
5. Remove the harness [2] from two wire saddles [1].

A034F2C075DA
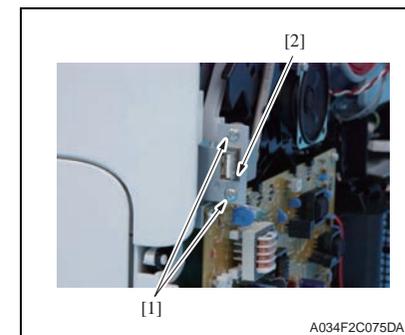
6. Remove two screws [1], and remove the USB board [2].

6.3.11 DC power supply (DCPU)

1. Remove the printer control board.
   See P.78
2. Remove the FAX control board.
   See P.80
3. Remove the MFP board.
   See P.79

A0HFF2C516DA
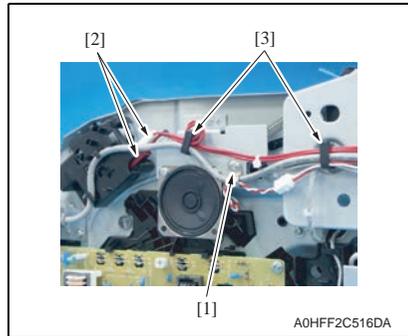
4. Remove the screw [1].
5. Disconnect two connectors [2] (Red and white), remove the harness from two wire saddles [3].

A034F2C525DA

6. Remove two screws [1], and remove the main switch [2].

A034F2C526DA
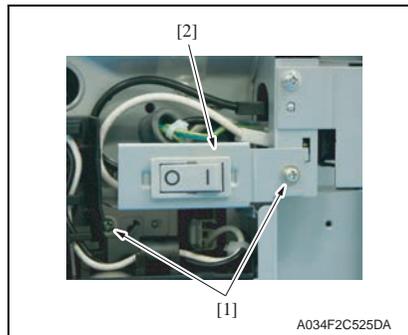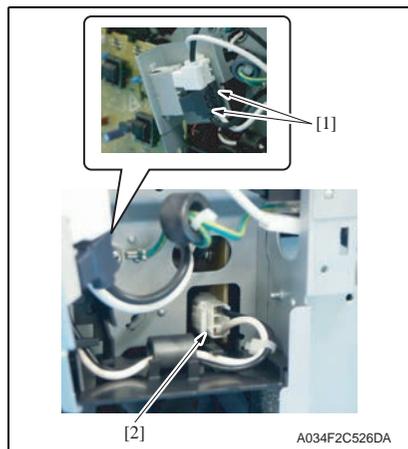
7. Disconnect two connectors (black) [1].
8. Disconnect the connector [2].

A0HFF2C517DA
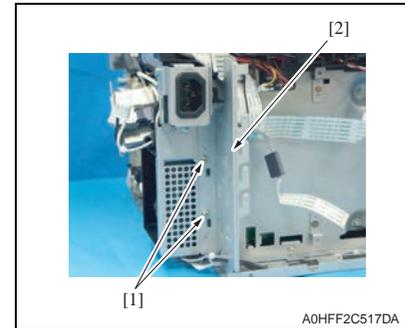
9. Remove two screws [1], and remove the plate [2].

A034F2C085DA
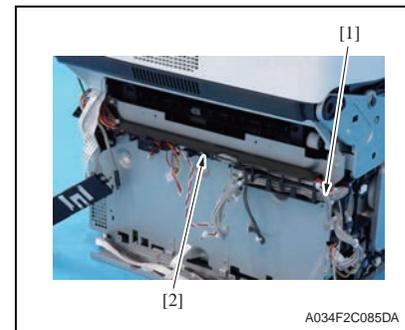
10. Remove the harness [1], and remove the harness guide [2].

A034F2C086DA
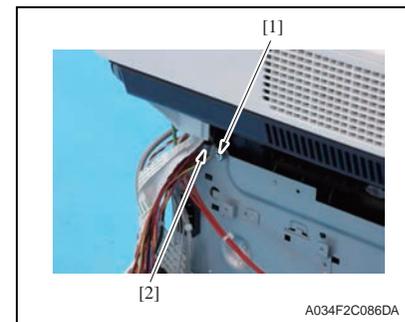
11. Remove the screw [1], and remove the harness band [2].

A034F2C087DA
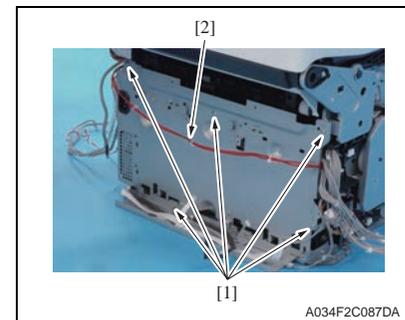
12. Remove five screws [1] to pull out the DC power unit assy [2].

A0HFF2C500DA
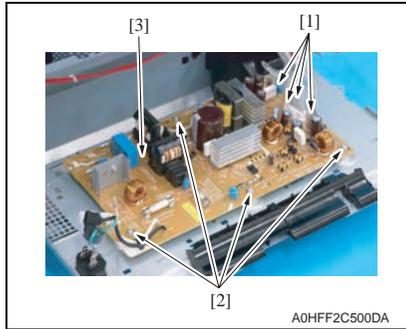
13. Disconnect four connectors [1] and remove four screws [2], and remove the DC power supply assy [3].

6.3.12   High voltage unit (HV)

1. Remove the right cover.
See P.76

A034F2C019DA
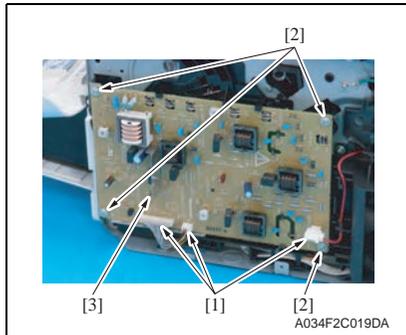
2. Disconnect three connectors [1] and remove four screws [2], and remove the high voltage unit [3].
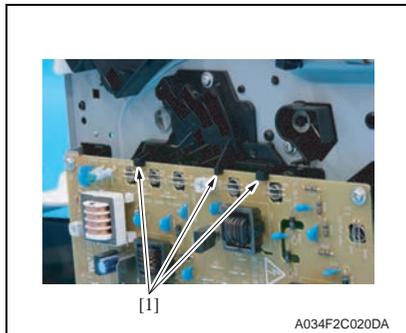
Precautions for reinstallation of the high voltage unit
* **Make sure that the high voltage unit fits into the tab [1] at the location shown on the left.**
* **During the reinstallation procedure, make sure that the high voltage terminal is not deformed or left loose.**

A034F2C020DA

6.3.13   Transfer roller unit

1. Remove the imaging cartridge.
See P.71

A034F2C021DA
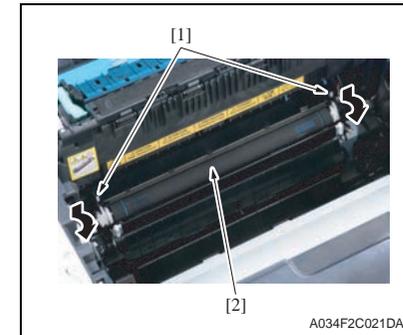
2. Press and pull the levers [1] at both sides forward to remove the transfer roller unit [2].

NOTE
* **Use care not to lose the two springs of the transfer roller unit. They can easily come off.**

3. To reinstall, reverse the order of removal.

NOTE
* **When the transfer roller unit is replaced with a new one, it is necessary to reset the maintenance counter.**
See P.129
* **Make calibration after replacing the transfer roller unit.**
See P.105

6.3.14 Fuser unit

⚠ CAUTION
⚠ • **The temperature gets high in the vicinity of the fuser unit. You may get burned when you come into contact with the area. Before replacement operations, make sure that more than 20 minutes have elapsed since the main and sub power switches were turned off.**

1. Turn OFF the power switch, unplug the power cord from the power outlet, and let the machine to stand idle for about 20 min.

A0HFF2C506DA

2. Open the top cover [1].

A0HFF2C510DA
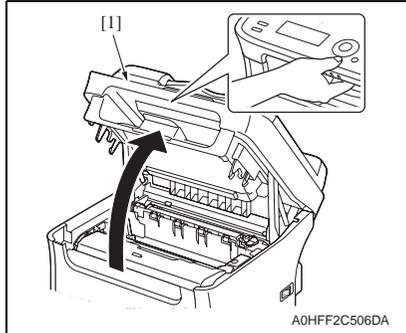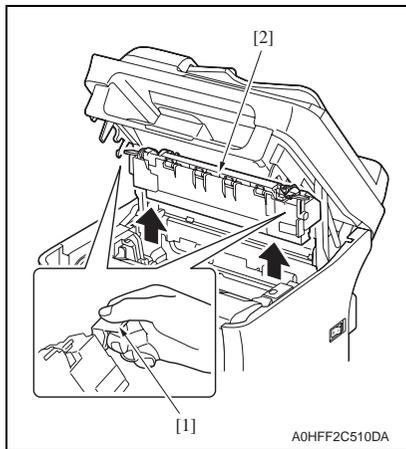
3. Pull up the lever [1] to remove the fuser unit [2].

4. To reinstall, reverse the order of removal.

NOTE
• **When the fuser unit is replaced with a new one, it is necessary to reset the maintenance counter.**
  See P.129

6.3.15 PH unit

⚠ CAUTION
⚠ • **Do not replace the printer head unit while the power is ON. Laser beam generated during the above mentioned activity may cause blindness.**
⊘ • **Do not disassemble or adjust the printer head unit. Laser beam generated during the above mentioned activity may cause blindness.**

1. Remove the imaging cartridge.
   See P.71
2. Remove the rear cover.
   See P.76
3. Remove the right cover.
   See P.76
4. Remove the left cover.
   See P.76
5. Remove the operation panel.
   See P.77
6. Remove the high voltage unit.
   See P.82

A034F2C088DA
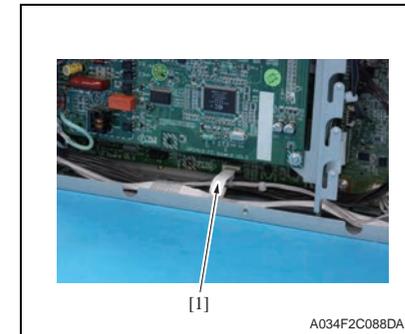
7. Disconnect the flat cable (P8) [1] on the MFP board.

A034F2C501DA
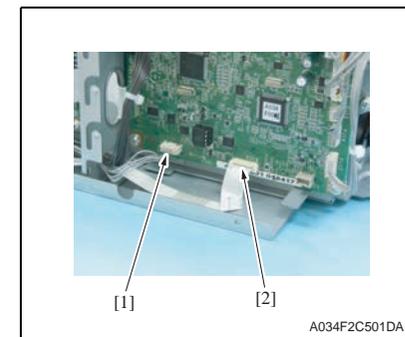
8. Disconnect the connector (PJ19) [1] and flat cable (PJ18) [2] on the printer control board.

A034F2C022DA
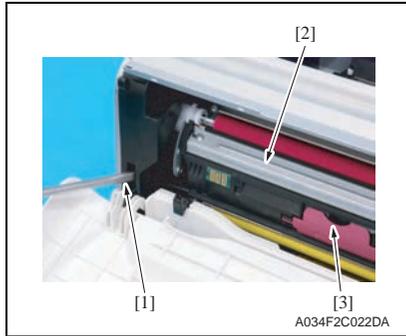
9. Press the rack release lever [1] and then rotate the rack [2] so that the toner cartridge [3] is moved to a position, at which the toner cartridge can be easily removed.

NOTE
- **When rotating the rack, use care not to touch the developing roller.**

A034F2C023DA
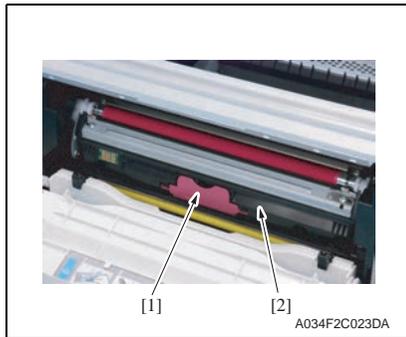
10. Hold onto the handle [1], pull it and remove the toner cartridge [2].
11. Repeat steps *9.* and *10.* to remove all toner cartridges.

A034F2C024DA
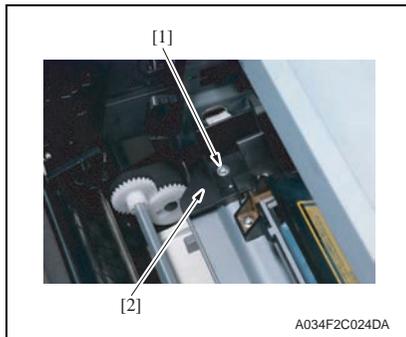
12. Remove the screw [1], and remove the cover [2].

A034F2C025DA
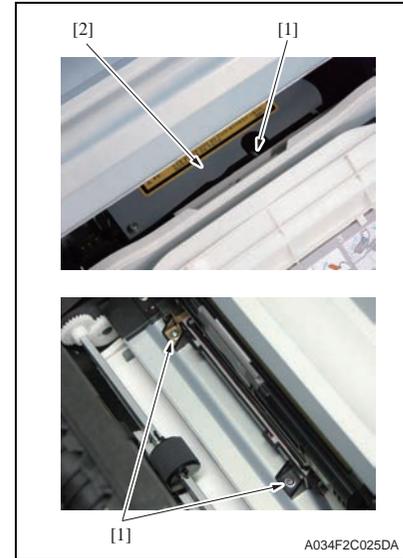
13. Remove three screws [1], and remove the PH unit [2].

NOTE
- **To remove the front screw, move the rack to the position where the screw can be removed easier and remove the screw using a short driver.**

6.3.16 Media feed driving unit

1. Remove the IR unit.

A034F2C089DA

2. Lay the main body of the printer on its back.

NOTE
- **Put the printer on the flat place such as a desk for this work, not to impose unreasonable force on the machine.**

A034F2C027DA

3. Remove four screws [1], and remove the plate [2].

NOTE
- **Use care not to lose the two springs.**

[3]　　　[2]

[1]

A034F2C090DA

4. Remove two screws [1] and open the front cover [2] to remove the media feed tray unit [3].

[1]

A034F2C029DA
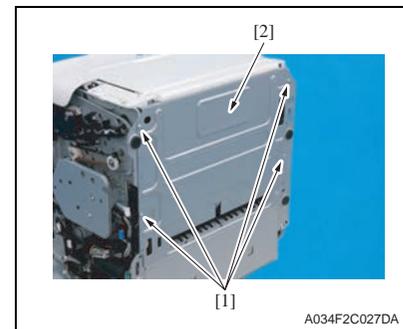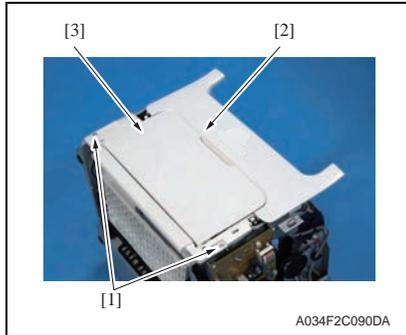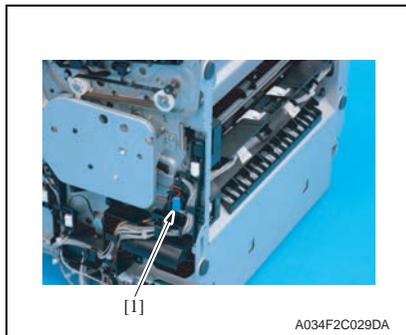
5. Disconnect the connector [1] of the tray1 media feed solenoid.

[1]

A034F2C030DA
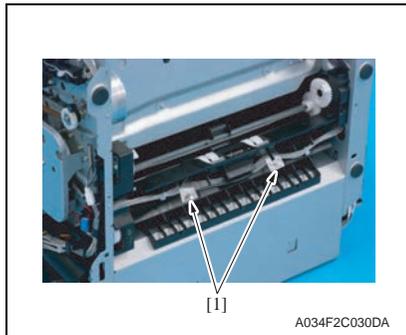
6. Remove the tapes [1] at two positions.

[2]

[1]

[1]

A034F2C031DA
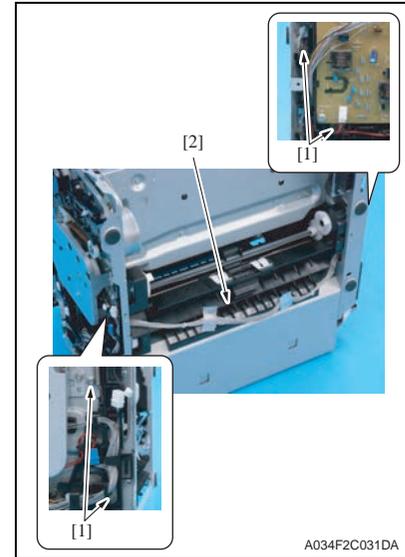
7. Remove four screws [1], and remove the media feed driving unit [2].

6.3.17   IR unit

1. Remove the rear cover.
See P.76
2. Remove the right cover.
See P.76
3. Remove the left cover.
See P.76

[4]　　[1]　　[2]

[3]

A034F2C091DA
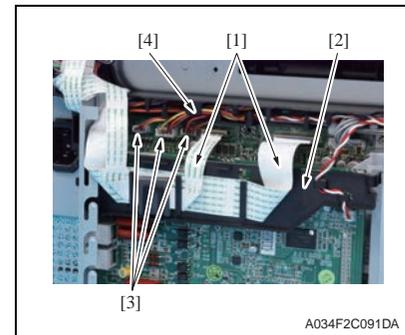
4. Remove two flat cables [1] (P6, P7) from the MFP board and remove them from the guide [2].
5. Remove three connectors [3] (P1, P2, P4) from the MFP board. Remove their harness from the harness guide [4].

A034F2C092DA
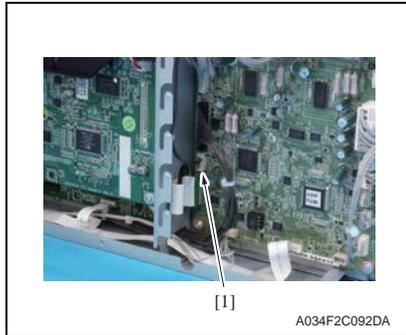
6. Remove the connector (PJ24) [1] from the printer control board and remove its harness from the harness guide.

A034F2C093DA

7. Remove the screw [1], and remove the harness band [2].

A034F2C094DA
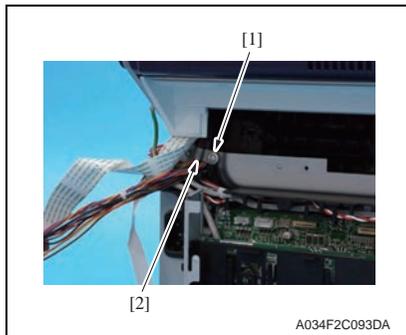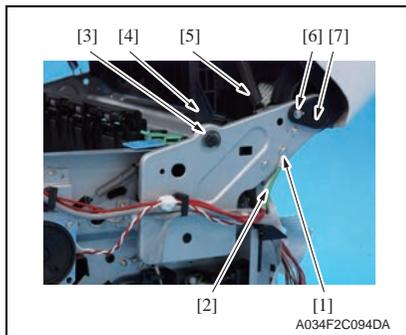
8. Remove the screws [1], and remove the earth cable [2].
9. Remove the E-ring [3] from the right of the main body and remove the arm [4].
10. Remove the spring [5] from the notch on the plate.

NOTE
• **When removing the spring [5], the IR unit moves down, posing a danger of your hands getting caught under the IR unit. Be sure to securely hold the IR unit and prevent it from moving down.**

11. Remove the screw [6], and remove the right stopper [7].

A034F2C095DA

A034F2C096DA
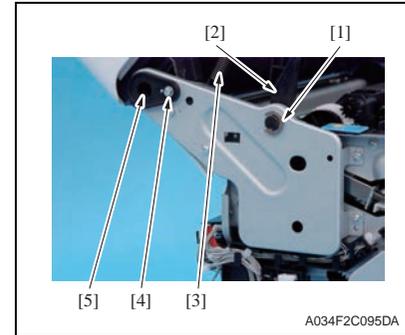
12. Remove the E-ring [1] from the left of the main body and remove the arm [2].
13. Remove the spring [3] from the notch on the plate.

NOTE
• **When removing the spring [3], the IR unit moves down, posing a danger of your hands getting caught under the IR unit. Be sure to securely hold the IR unit to prevent it from moving down.**

14. Remove the screw [4], and remove the left stopper [5].
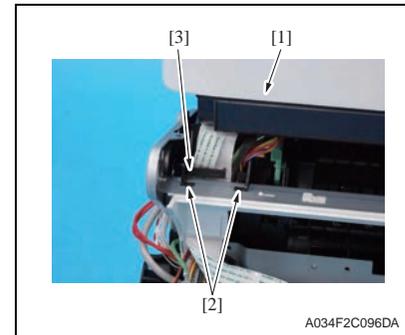
15. Raise the IR unit [1] a little.
16. Unhook the tab [2], and remove the harness guide [3].
17. Pull out all harnesses and flat cables and remove the IR unit [1].

6.3.18   Scanner unit

1. Remove the original glass.

A034F2C097DA
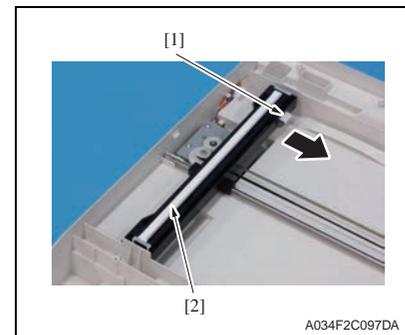
2. Disconnect the flat cable [1], and remove the scanner unit [2].

6.3.19 Auto document feeder unit (ADF)

1. Remove the IR unit.
   See P.85

A034F2C098DA

A034F2C099DA

A034F2C105DA
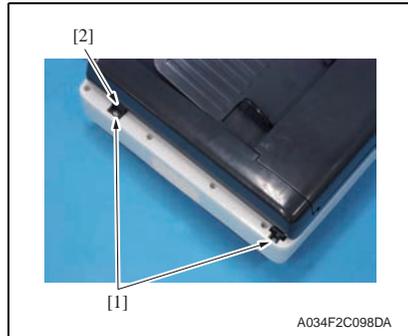
2. Remove two screws [1], and remove the stopper [2].
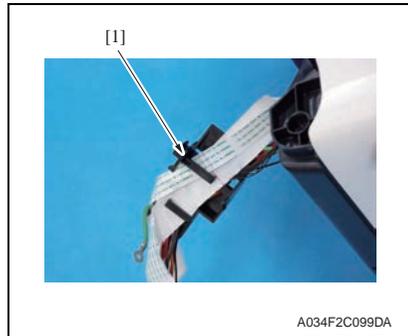
3. Remove the harness from the harness guide [1].
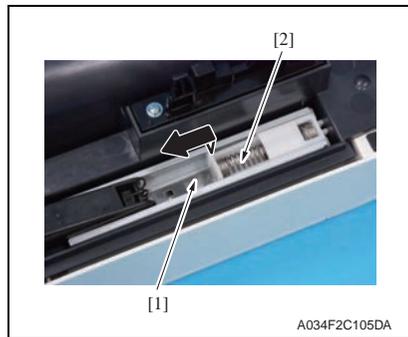
4. While pressing down the plate [1], move the spring assy [2] in the direction of the arrow.

A034F2C106DA

A0HFF2C522DA

A034F2C107DA

A034F2C100DA
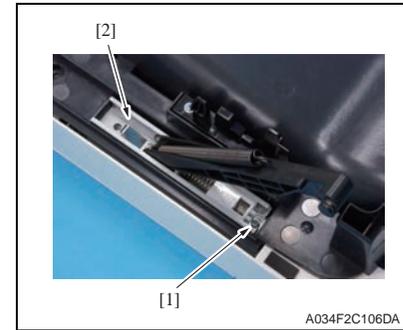
5. Remove the screw [1], and remove the arm unit [2].
6. Repeat the steps 4 and 5 to remove the arm unit located on the opposite side.
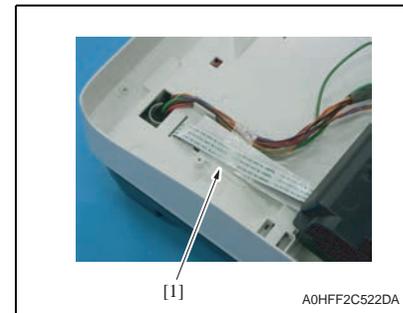
7. Remove the tape [1].
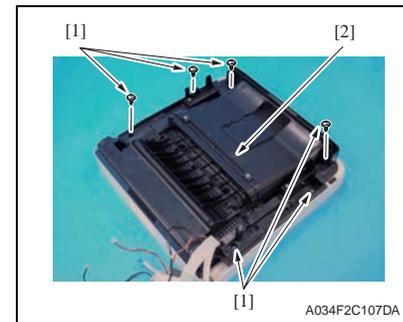
8. Remove six screws [1], and remove the IR unit lower cover assy [2].
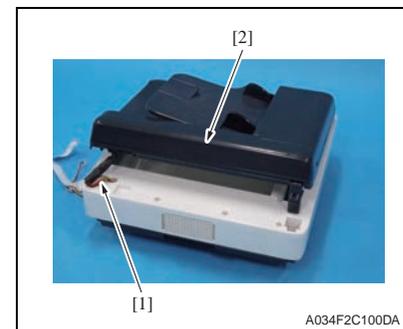
9. Pull out all harnesses [1] and remove the auto document feeder unit [2].

6.3.20 Transport motor (M1)

1. Remove the left cover.
   See P.76
2. Remove all toner cartridges.
   See P.70

[1]

A034F2C101DA

3. Remove the harness from two wire saddles [1].

[1] [2]

[1]

A034F2C036DA
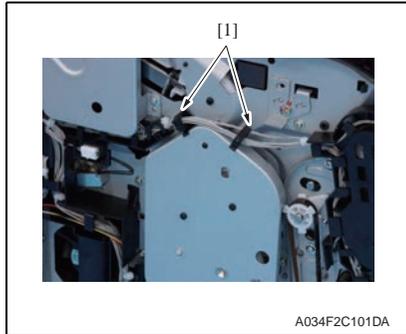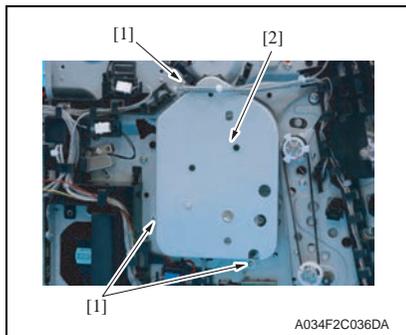
4. Remove three screws [1], and remove the plate [2].

[2]

[1]

A034F2C037DA
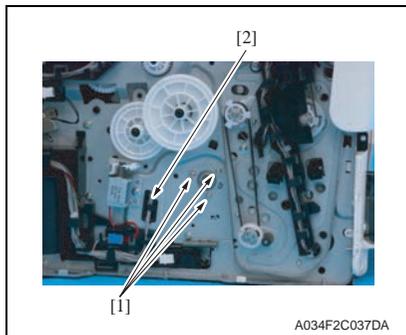
5. Remove three screws [1].
6. Remove the harness [2] from the harness guide.

[1]

[2]

A034F2C038DA
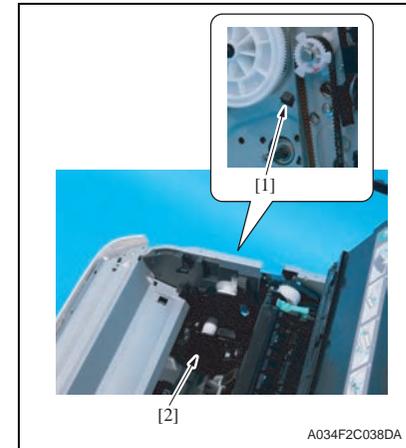
7. Unlock the tab [1], and remove the motor cover [2].

[2]

[1]

A034F2C039DA
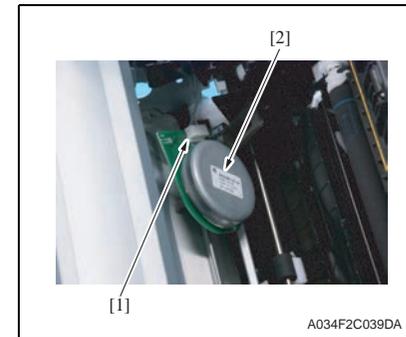
8. Disconnect the connector [1], and remove the transport motor [2].

6.3.21 Developing motor (M3)

1. Remove the left cover.
   See P.76

[2]

[1]

A034F2C046DA
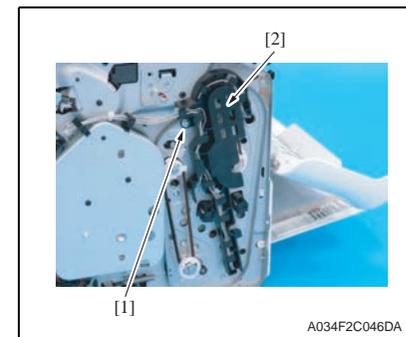
2. Remove the screw [1], and remove the harness guide [2] by taking out the harness.

A034F2C047DA

3. Remove the spring [1].

[1] [3] [4] [2]

[3]

A034F2C048DA
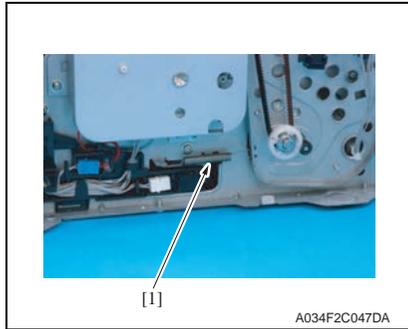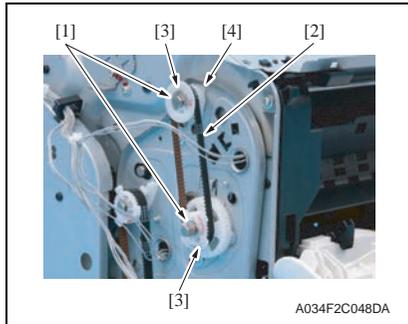
4. Remove two E-rings [1], belt [2], two gears [3] and bearing [4].

NOTE
- **Make sure to pull out the belt [2] and gears [3] forward parallel together.**
- **Use care not to lose the shaft.**

[1]

A034F2C049DA
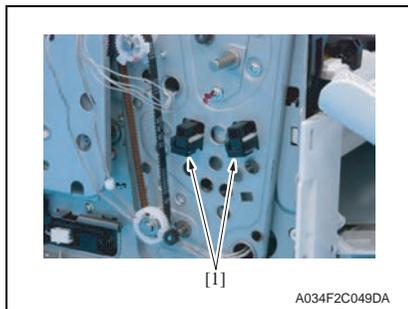
5. Remove two covers [1] by taking out the hooks at both sides.

[1]

A034F2C050DA
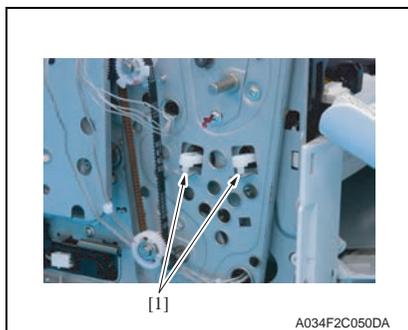
6. Remove two levers [1].

[1]

A034F2C523DA
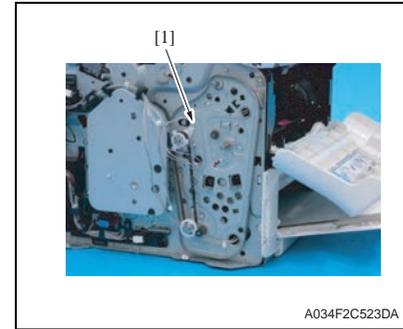
7. Slide out the motor assy [1].

[1]

[2]   [3]

A034F2C053DA
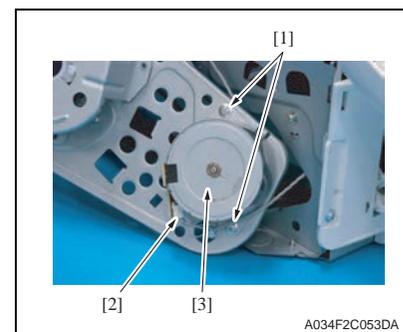
8. Remove two screws [1] and disconnect the connector [2], and remove the developing motor [3].

6.3.22   Scanner motor assy

1. Remove the original glass assy.
See P.77

[2]   [3]

[1]

A034F2C103DA
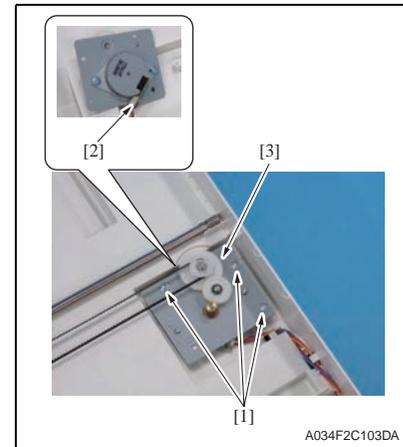
2. Remove three screws [1] and disconnect the connector [2], and remove the scanner motor assy [3].

6.3.23 DC power supply fan motor (FM1)

1. Remove the rear cover.
   See P.76
2. Remove the right cover.
   See P.76
3. Remove the high voltage unit.
   See P.82
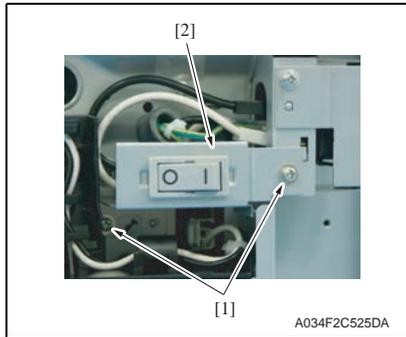
A034F2C525DA

4. Remove two screws [1], and remove the main switch [2].

A034F2C014DA

5. Disconnect the connector [1].

A034F2C041DA
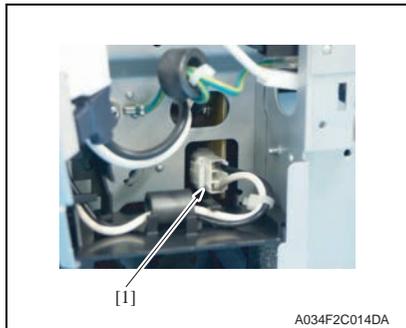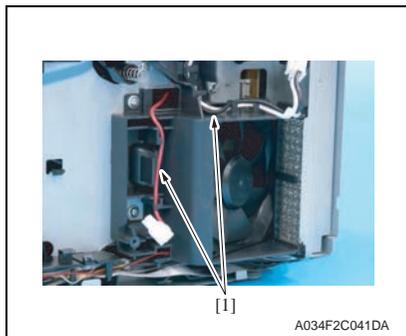
6. Remove the harness [1] from the wire saddle.

A034F2C042DA
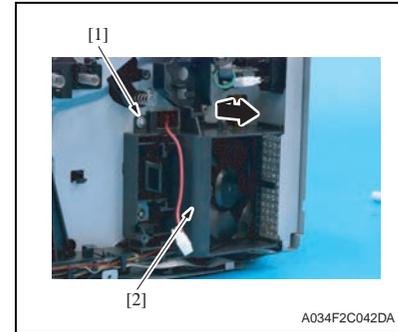
7. Remove the screw [1] to take out the DC power unit motor assy [2] as shown in the picture.

A034F2C043DA
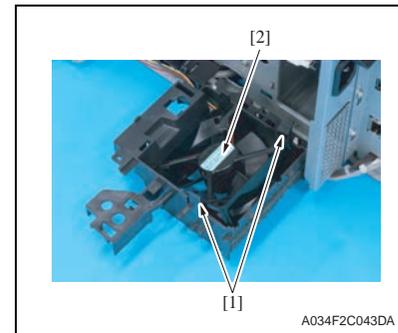
8. Unhook two tabs [1], remove the DC power supply fan motor [2].

6.3.24 Ozone ventilation fan motor (FM2)

1. Slide out the DC power supply assy.
   See step 1 to 9 of P.81

A034F2C044DA
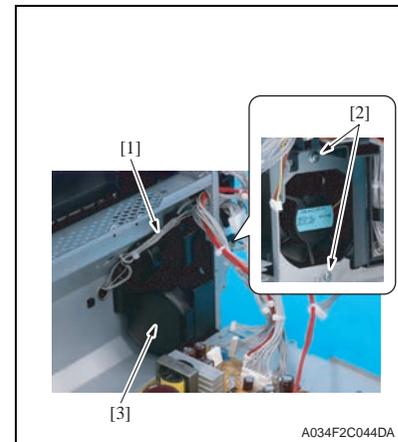
2. Remove the harness [1] from the harness guide.
3. Remove the screw [2], remove the ozone ventilation fan motor assy [3].

A034F2C045DA

6.3.25 Exit tray cooling fan motor (FM4)

1. Remove the IR unit.
   See P.85
2. Remove the auto document feeder unit.
   See P.87

A034F2C105DA

A034F2C106DA

5. Repeat the steps 3 and 4 to remove the arm unit located on the opposite side.
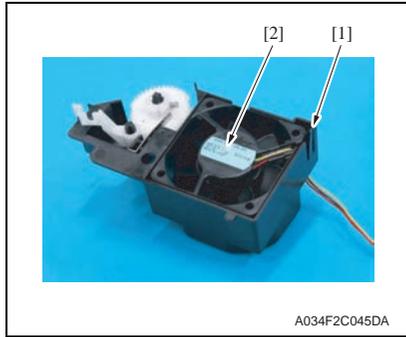
4. Unhook the tab [1], remove the ozone ventilation fan motor [2].
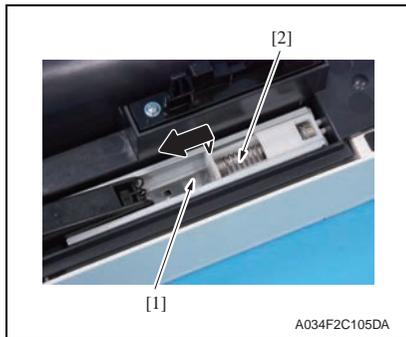
3. While pressing down the plate [1], move the spring assy [2] in the direction of the arrow.

4. Remove the screw [1], and remove the arm unit [2].

A034F2C107DA

A034F2C108DA

6.3.26 Tray1 media feed solenoid (SD1)

1. Remove the media feed driving unit.
   See P.84

A034F2C054DA
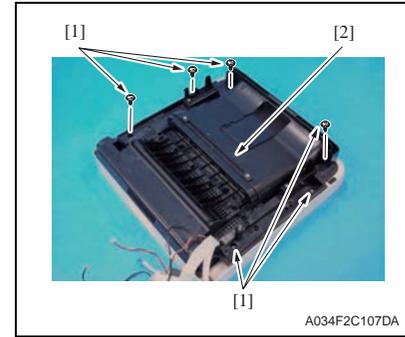
6. Remove six screws [1], and remove the IR unit lower cover assy [2].
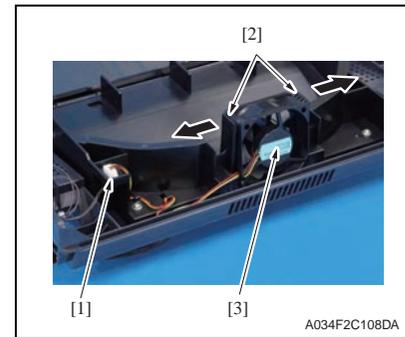
7. Remove the connector [1] and move the fixing members [2] in the direction of the arrow to remove the exit tray cooling fan motor [3].
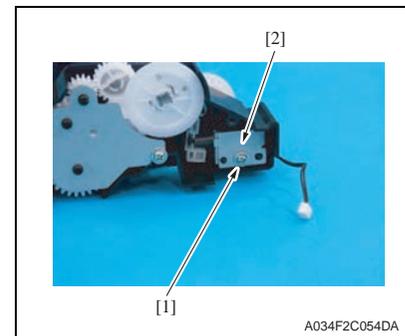
2. Remove the screw [1], and remove the tray1 media feed solenoid [2].

NOTE
* **Use care not to lose the two springs.**

6.3.27   Registration roller solenoid (SD2)

1. Remove the left cover.
See P.76
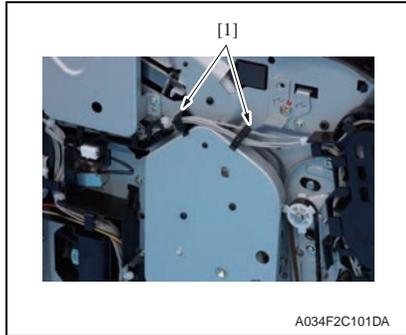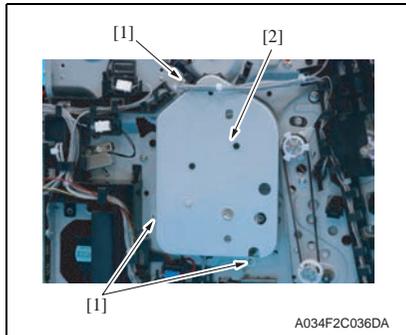
A034F2C101DA

2. Remove the harness from two wire saddles [1].

A034F2C036DA

3. Remove three screws [1], and remove the plate [2].

A034F2C055DA
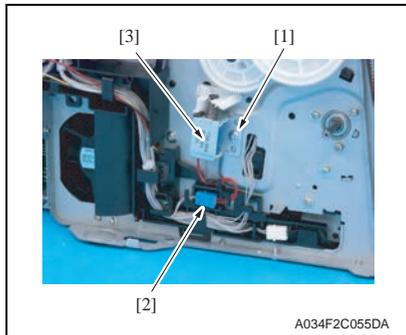
4. Remove the screw [1] and disconnect the connector [2], and remove the registration roller solenoid [3].
NOTE
• **Use care not to lose the two springs.**

6.3.28   2nd image transfer pressure/retraction solenoid (SD4)

1. Remove the rear cover.
See P.76
2. Remove the left cover.
See P.76
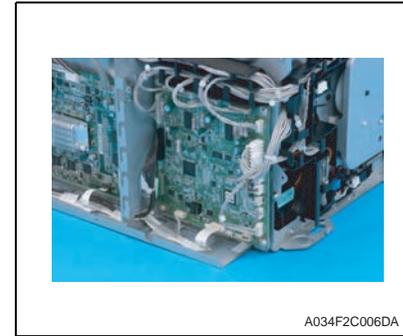
A034F2C006DA

3. Disconnect all connectors and flat cables from the printer control board.

A034F2C057DA
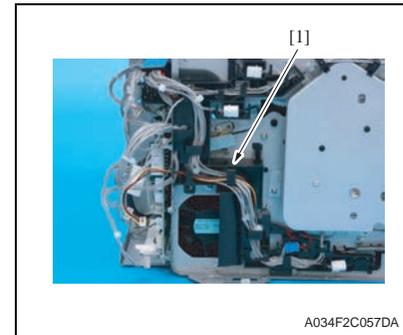
4. Remove the harness from the harness guide [1] to remove it.

A034F2C058DA
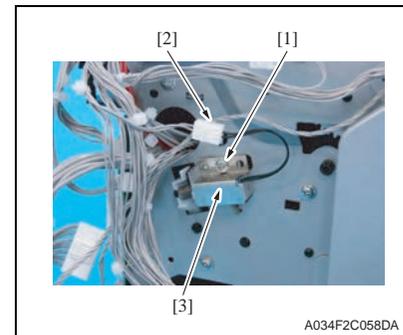
5. Remove the screw [1] and disconnect the connector [2], and remove the 2nd image transfer pressure/ retraction solenoid [3].
NOTE
• **Use care not to lose the two springs.**

6.3.29　Cleaning blade pressure/retraction solenoid (SD5)

1. Remove the left cover.
   See P.76

[1]　[3]

[2]

A034F2C056DA
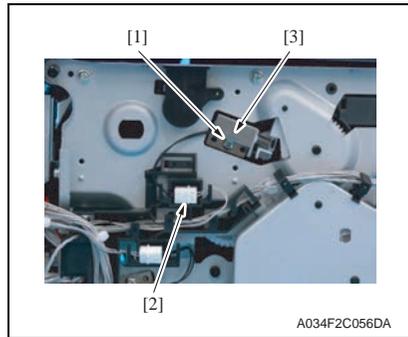
2. Remove the screw [1] and disconnect the connector [2], and remove the cleaning blade pressure/retraction solenoid [3].

NOTE
- **Use care not to lose the two springs.**

6.3.30　Speaker (SP)

1. Remove the right cover.
   See P.76

[3]　[1]

[4]　[2]

A0HFF2C519DA
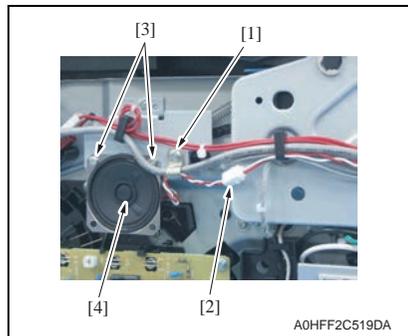
2. Remove the screw [1].
3. Disconnect the connector [2] and remove two screws [3], and remove the speaker [4].

6.3.31　Tray 1 media feed roller

1. Open the top cover.
2. Remove the imaging cartridge.
   See P.71

[1]

[2]

A034F2C032DA
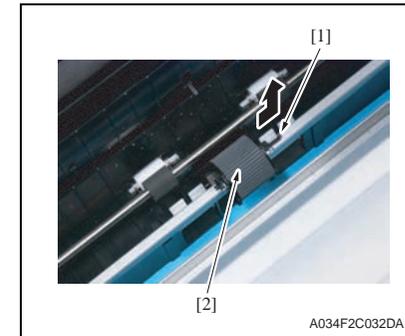
3. Remove the media feed roller [2] pulling up the hook [1].

6.3.32　Separation pad

1. Remove the IR unit.
   See P.85

A034F2C089DA

2. Lay the main body of the printer on its back.

NOTE
- **Put the printer on the flat place such as a desk for this work, not to impose unreasonable force on the machine.**

[2]

[1]

A034F2C027DA

3. Remove four screws [1], and remove the plate [2].

NOTE
- **Use care not to lose the two springs.**

A034F2C090DA

4. Remove two screws [1] and open the front cover [2] to remove the media feed tray unit [3].

A034F2C033DA
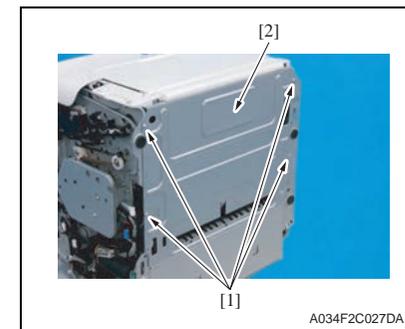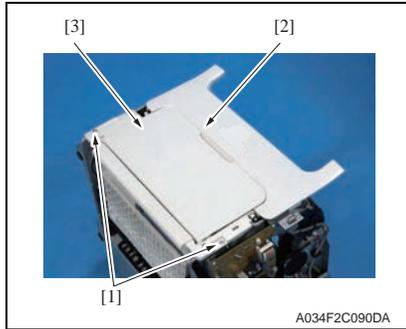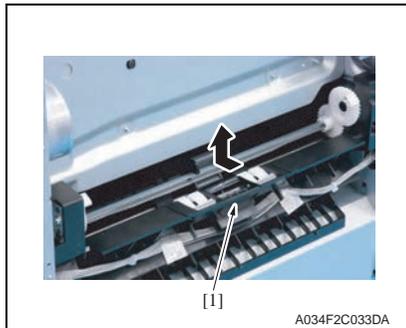
5. Remove the separation pad [1].

A034F2C034DA

6. Remove the spring [1].

6.3.33 ADF separation pad

A034F2C062DA

1. Open the ADF top cover [1].

A034F2C113DA
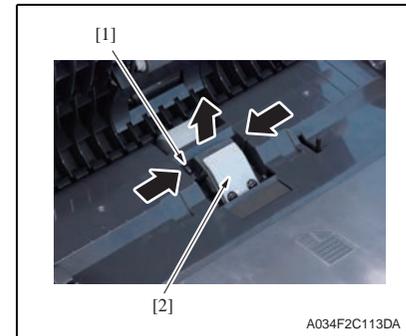
2. Unhook the tab [1], and remove the ADF separation pad [2].

6.4 Cleaning procedure

NOTE
• **The alcohol described in the cleaning procedure represents the isopropyl alcohol.**

6.4.1 Tray 1 media feed roller

1. Open the top cover.
2. Remove the imaging cartridge.
   See P.71

A0HFF2C511DA
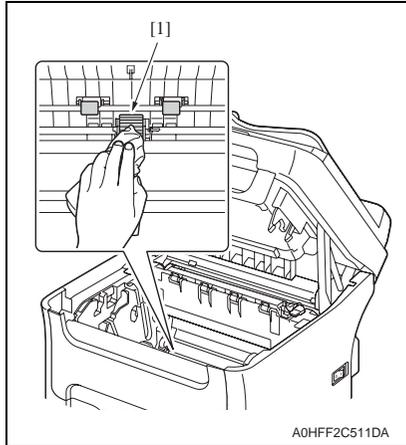
3. Using a cleaning pad dampened with alcohol, wipe the tray1 media feed roller [1] clean of dirt.

6.4.2 Printer head window

1. Enter the [P/H CLEAN UP] mode.
   See P.98
2. Open the top cover.
3. Remove the imaging cartridge.
   See P.71

A0HFF2C512DA
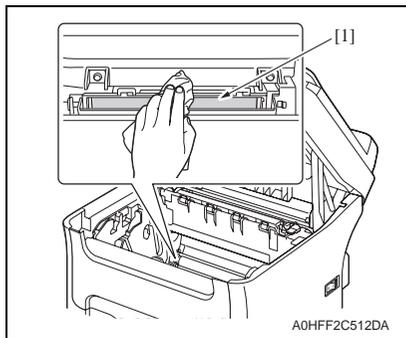
4. Clean P/H window [1] with soft cloth.

6.4.3 ADF media feed roller

A034F2C062DA

1. Open the ADF top cover [1].

A0HFF2C513DA
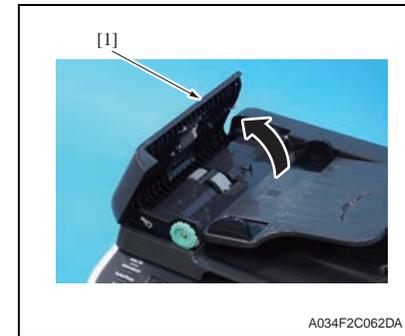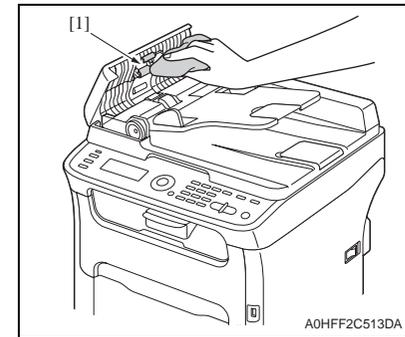
2. Clean the media feed rollers by wiping them with a soft, dry cloth.

ADJUSTMENT/SETTING

7. How to use the adjustment section

- "Adjustment/Setting" contains detailed information on the adjustment items and procedures for this machine.
- Throughout this "Adjustment/Setting," the default settings are indicated by " ".

Advance checks
Before attempting to solve the customer problem, the following advance checks must be made. Check to see if:

- The power supply voltage meets the specifications.
- The power supply is properly grounded.
- The machine shares the power supply with any other machine that draws large current intermittently (e.g., elevator and air conditioner that generate electric noise).
- The installation site is environmentally appropriate: high temperature, high humidity, direct sunlight, ventilation, etc.; levelness of the installation site.
- The original has a problem that may cause a defective image.
- The density is properly selected.
- The original glass, slit glass, or related part is dirty.
- Correct media is being used for printing.
- The units, parts, and supplies used for printing (developer, PC drum, etc.) are properly replenished and replaced when they reach the end of their useful service life.
- Toner is not running out.

⚠ **CAUTION**
- **Be sure to unplug the power cord of the machine before starting the service job procedures.**
- **If it is unavoidably necessary to service the machine with its power turned ON, use utmost care not to be caught in the scanner cables or gears of the exposure unit.**
- **Special care should be used when handling the fusing unit which can be extremely hot.**
- **The developing unit has a strong magnetic field. Keep watches and measuring instruments away from it.**
- **Take care not to damage the PC drum with a tool or similar device.**
- **Do not touch IC pins with bare hands.**

8. Description of the control panel

8.1 Control panel display

8.1.1 Copy mode main screen

A0HFF3E503DA
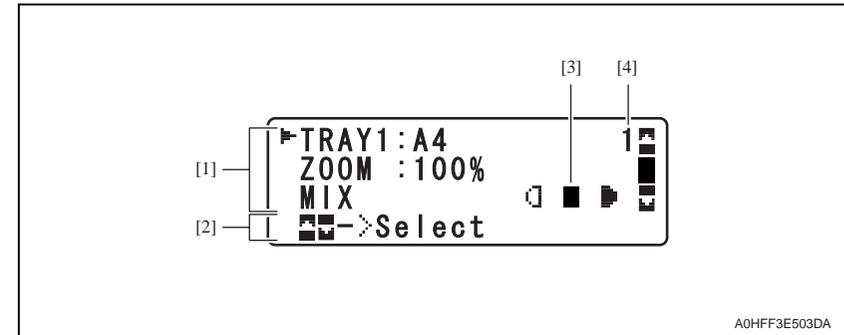
No.	Name	Description
[1]	Copy settings	• Indicates the media tray and media size that is selected. • Displays the zoom ratio currently set. • Displays the type of the document currently set.
[2]	Status	Allows the current settings to be checked and the various settings to be changed. Depending on the situation, the machine status or an error message may appear in the fourth line.
[3]	Copy density	Displays the copy density currently set.
[4]	Number of copies	Displays the number of copies currently set to be made.

8.1.2 Print mode main screen

A0HFF3E502DA
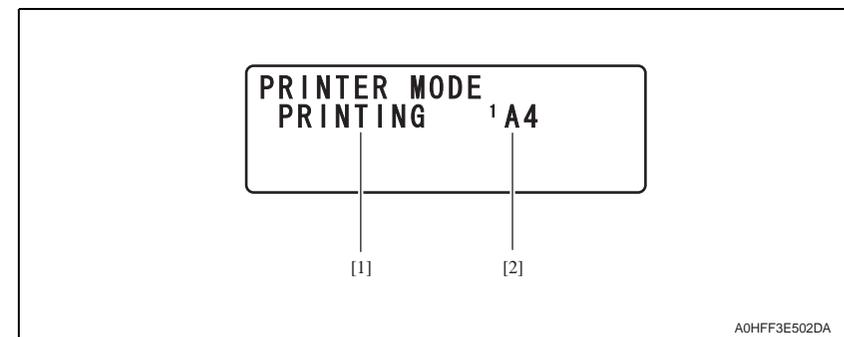
No.	Name	Description
[1]	Status	Displays messages indicating operations such as printing.
[2]	Media tray/media size	Indicates the media tray and media size that is selected.

8.1.3   FAX mode main screen

A0HFF3E504DA
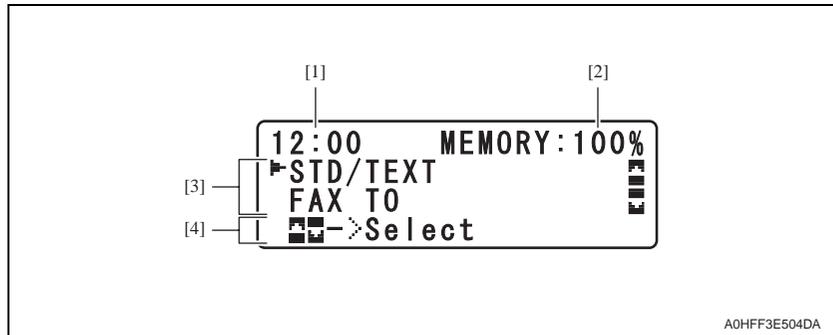
No.	Name	Description
[1]	Time	Displays the time currently specified with [ADMIN. MANAGEMENT] - [USER SETTING] - [DATE&TIME] in the UTILITY menu.
[2]	Available memory	Indicates the percentage of memory available for fax operations.
[3]	Fax settings	• Indicates the fax quality that is selected. • Indicates the specified fax destination. • Indicates the fax transmission mode that is selected.
[4]	Status	Depending on the situation, the machine status or an error message may appear.

9.   PRINTER MODE

9.1   PRINTER MODE function tree

• With the main screen displayed, press the ◀ key to display the [PRINTER MODE] screen.

PRINTER MODE			Ref. page
TONER REMAINING			P.97
T/C CHANGE	REPLACE MODE	Y TONER	
		M TONER	P.97
		C TONER	
		K TONER	
	EJECT MODE		P.98
	P/H CLEAN MODE		P.98

9.2   TONER REMAINING

Function	• Displays the amount of toner of each color still available for use.
Use	• For maintenance control of toner cartridges.
Setting/procedure	*1.* Select [PRINTER MODE] → [TONER REMAINIG] and press the Select key to display [TONER REMAINING] screen. • Pressing the Stop/Reset key will cause the main screen to reappear.

9.3   T/C CHANGE

9.3.1   REPLACE MODE

Function	• Moves the specified color of toner cartridge into replacement position, so it can be replaced.
Use	• To replace the specified color of toner cartridge.
Setting /procedure	*1.* Select [PRINTER MODE] → [T/C CHANGE] → [REPLACE MODE] and the specific color of toner to be replaced. *2.* Press the Select key. *3.* The rack rotates to bring the specified color of toner cartridge to the replacement position. When the rack stops moving, the message [REPLACE MODE CHANGE X TONER] appears on the display. *4.* Open the front cover and replace the toner cartridge. *5.* Close the front cover. The initial screen will then reappear.

9.3.2 EJECT MODE

Function	• To remove (or replace) every toner cartridge in order and move the position where the removal is available so that all toner cartridges can be removed (or replaced).
Use	• To remove (or replace) all toner cartridges.
Setting /procedure	1. Select [PRINTER MODE] → [T/C CHANGE] → [EJECT MODE] and press the Select key. 2. The rack rotates to bring the first color toner cartridge to the replacement position. When the rack stops moving, the message [EJECT MODE REMOVE M TONER] appears on the display. 3. Open the front cover and remove the magenta toner. (Or replace the magenta toner.) 4. Close the front cover. then, the message [EJECT MODE REMOVE C TONER] appears on the display. 5. Repeating the same steps, remove the remaining toner cartridges. **NOTE** • **The toner cartridges are to be removed in the order of M → C → K → Y → M.** 6. Close the top cover. the initial screen will then reappear.

9.3.3 P/H CLEAN MODE

Function	• To move the toner cartridge (Magenta) to the position where it can be removed so that the printer head window can be cleaned.
Use	• To clean the printer head window.
Setting /procedure	1. Select [PRINTER MODE] → [T/C CHANGE] → [P/H CLEAN UP] and press the Select key. 2. The rack rotates to bring the first color toner cartridge to the replacement position. When the rack stops moving, the message [REMOVE M TONER CLOSE COVER] appears on the display. 3. Open the front cover and remove the toner cartridge (M). 4. Close the front cover. 5. When [REMOVE I/C CLEAN GLASS] is displayed, open the top cover and remove the imaging cartridge. 6. Clean the print head window by wiping it with a soft, dry cloth. 7. Close the top cover. 8. When [CLEAN COMPLETE PRESS STOP KEY] is displayed, press the Stop/Reset key. 9. When [INSTALL M TONER CLOSE COVER] is displayed, install the toner cartridge (M) and close the front cover.

10. REPORT/STATUS mode

10.1 REPORT/STATUS mode function tree

1. Press the ▲ and ▼ key to select [REPORT/STATUS], and then press the Select key.

REPORT/STATUS mode		Ref. page
TOTAL PRINT	TOTAL PRINT	P.99
	MONO COPY	P.99
	COLOR COPY	P.99
	MONO PRINT	P.99
	COLOR PRINT	P.99
	FAX PRINT	P.99
	TOTAL SCAN	P.99
SUPPLIES STATUS	C TONER	P.99
	M TONER	P.99
	Y TONER	P.99
	K TONER	P.99
	I/C	P.99
TX/RX RESULT		P.100
REPORT	TX RESULT REPORT	P.100
	RX RESULT REPORT	P.100
	ACTIVITY REPORT	P.100
	MEMORY DATA LIST	P.100
	MEMORY IMAGE PRINT	P.100
	FAVORITE LIST	P.100
	SPEED DIAL LIST	P.100
	GROUP DIAL LIST	P.100
	UTILITY MAP	P.100
	CONFIGURATION PAGE	P.100
	DEMO PAGE	P.102

10.2 TOTAL PRINT

- The total number of pages for each of the following can be checked.

10.2.1 TOTAL PRINT

Function	• This counter shows the total number of pages printed.
Use	

10.2.2 MONO COPY

Function	• This counter shows the total number of pages copied in black-and-white.
Use	

10.2.3 COLOR COPY

Function	• This counter shows the total number of pages copied in color.
Use	

10.2.4 MONO PRINT

Function	• This counter shows the total number of pages printed in black-and-white.
Use	

10.2.5 COLOR PRINT

Function	• This counter shows the total number of pages printed in color.
Use	

10.2.6 FAX PRINT

Function	• This counter shows the total number of pages that were faxed.
Use	

10.2.7 TOTAL SCAN

Function	• This counter shows the total number of document pages that were scanned.
Use	

10.3 SUPPLIES STATUS

- The remaining amount of toner in the toner cartridges and the remaining service life of the imaging units can be displayed as a percentage.

10.3.1 C TONER

Function	• Displays the remaining amount of toner in the cyan (C) toner cartridge as a percentage.
Use	

10.3.2 M TONER

Function	• Displays the remaining amount of toner in the magenta (M) toner cartridge as a percentage.
Use	

10.3.3 Y TONER

Function	• Displays the remaining amount of toner in the yellow (Y) toner cartridge as a percentage.
Use	

10.3.4 K TONER

Function	• Displays the remaining amount of toner in the black (K) toner cartridge as a percentage.
Use	

10.3.5 I/C

Function	• Displays the remaining service life of the ~~cyan (C)~~ imaging unit as a percentage.
Use	

10.4 TX/RX RESULT

Function	• The results of a maximum of 60 fax transmissions/receptions can be viewed.
Use	• When the Start key is pressed, details of the report displayed in the message window can be printed.

10.5 REPORT

• The machine settings, lists and reports related to fax can be printed.
1. Press the ▲ and ▼ key to select [REPORT/STATUS], and then press the Select key.
2. Select [REPORT], and press the Select key.
3. Press the ▲ and ▼ key to select the desired report, press the Select key, and then Start key.
The report is printed

10.5.1 TX RESULT REPORT

Function	• The [SESSION], [FUNCTION], [NO.], [DESTINATION STATION], [DATE], [TIME], [PAGE], [DURATION], [MODE], and [RESULT] are printed.
Use	

10.5.2 RX RESULT REPORT

Function	• The [SESSION], [FUNCTION], [NO.], [DESTINATION STATION], [DATE], [TIME], [PAGE], [DURATION], [MODE], and [RESULT] are printed.
Use	

10.5.3 ACTIVITY REPORT

Function	• The [NO.], [SESSION], [DATE], [TIME], [TX/RX], [DESTINATION STATION], [PAGE], [DURATION], [MODE], and [RESULT] are printed.
Use	

10.5.4 MEMORY DATA LIST

Function	• This is a list of documents waiting to be sent, and documents specified for timer transmission.
Use	The [SESSION], [FUNCTION], [TIME], [NO.], [DESTINATION STATION], and [PAGE] are printed.

10.5.5 MEMORY IMAGE PRINT

Function	• A reduced image of the first page of the document waiting to be sent in addition to the [SESSION], [FUNCTION], [NO.], [DESTINATION STATION], [DATE], [TIME], and [PAGE] are printed.
Use	

10.5.6 FAVORITE LIST

Function	• The destinations registered in the favorite list are printed in the order that they appear in the favorite list.
Use	

10.5.7 SPEED DIAL LIST

Function	• The recipients programmed for the speed dial numbers are printed in numerical order.
Use	

10.5.8 GROUP DIAL LIST

Function	• The group dialing settings specified for one-touch dial keys are printed in numerical order of the keys.
Use	

10.5.9 UTILITY MAP

Function	• Prints the current machine setting.
Use	

10.5.10 CONFIGURATION PAGE

Function	• Prints the current machine configuration.
Use	It is used to confirm the following settings. • Supplies Status • Coverage Information • Counter • Paper • Machine Setting • Network Setting • Firmware Version • Options • Fax Setting • Fax Maintenance

A. Sample of Configuration Page

```
                                          Product Name:KONICA MINOLTA magicolor 1690MF
                                   Configuration Page
 DATE:24.NOV.2008 03:59
 - Supplies Status -          Status        Remaining %         Cartridge Type

   Toner Cartridge Cyan       Empty            0%               Standard
   Toner Cartridge Magenta    Low              4%               Standard
   Toner Cartridge Yellow     Ready           88%               High Capacity
   Toner Cartridge Black      Ready           90%               High Capacity
   Image Cartridge            Ready           80%


 - Coverage Information -   Normalization:All sizes converted to A4 equivalent.
   Normalized Total Faces Counter       Normalized Coverage Information
     Color Faces Printed      xxxxxx       Color Average %    xxxxxx    Monochrome Average % xxxxxx
     Monochrome Faces Printed xxxxxx
     Total                    xxxxxx     Normalized Coverage Information
                                         <Color Faces>      <Current Toner Cartridge> <Last Job>
   Normalized Total Faces Coverage         Copy    xxxxxx      Average % C  xxxxxx       Average % C  xxxxxx
     Copy              xxxx               Printer xxxxxx      Average % M  xxxxxx       Average % M  xxxxxx
     Printer           xxxx             <Monochrome Faces>    Average % Y  xxxxxx       Average % Y  xxxxxx
                                         Copy    xxxxxx      Average % K  xxxxxx       Average % K  xxxxxx
                                         Fax     xxxxxx

 - Counter -
   Total Faces Counter:   xxxxxx  Total Duplex Counter:   xxxxxx   Fax Counter
     Color Faces Counter            Color Sheets Counter          TX Counter          xxxxxx
       Copy              xxxxxx       Copy            xxxxxx        RX Counter          xxxxxx
       Printer           xxxxxx       Printer         xxxxxx        Scan Counter        xxxxxx
     Monochrome Faces Counter       Monochrome Sheets Counter     Sheets Printed by Paper tray
       Copy              xxxxxx       Copy            xxxxxx        Tray1               xxxxxx
       Printer           xxxxxx       Printer         xxxxxx        Tray2               xxxxxx
       Fax               xxxxxx

 - Paper-
   Sheets Printed by Paper Size          Sheets Printed by Paper Type
     A4              xxxxxx               Plain Paper      xxxxxx      Letterhead     xxxxxx
     B5(JIS)         xxxxxx               Thick1           xxxxxx      Postcard       xxxxxx
     A5              xxxxxx               Thick2           xxxxxx      Label          xxxxxx
     Legal           xxxxxx               Envelope         xxxxxx
     Letter          xxxxxx
     Others          xxxxxx

 - Machine Setting -              - Network Setting -
     Serial Number     xxxxxxxxxxxxx       Network Interface  Ethernet 10Base T/100Base TX
     Auto Panel Reset(min)  1             Host Name           mcxxxxMF xxxxxxx
     Energy Save Mode(min)  15            Bonjour Discovery   ENABLE
     Language          ENGLISH            DHCP                ENABLE
     Auto Continue     ON                 BOOTP               DISABLE
     Toner Out Stop    OFF                HTTP                ENABLE
                                          SNMP                ENABLE
 - Firmware Version -                     IP Address          172. 18. 17. 251
     Engine            4139-50G2-0900     Subnet Mask         255.255.255.0
     Boot Code         2007/07/16 V0.03   Gateway Address     172. 16. 0. 1
     Controller        V1.1               MAC Address         00:20:6B:CB:A4:F0

 - Options -                      - Fax Setting -
     Tray2          Not Installed         Fax Number          xxxxxxxxxxxxxxxxxxxx
     Duplex         Installed             Tone/Pulse          Tone
                                          No. Of Rings        2
                                          Header              ON
                                          Def.Res             STD/TEXT
                                          Def.Bright          0
                                          Line Monitor        LOW
                                          Def.Tx Report       ON
                                          Def.Rx Report       OFF
                                          Footer              OFF

                                  - Fax Maintenance -
                                          TX Speed            33.6 kbps
                                          RX Speed            33.6 kbps
                                          TX Level            -9 dBm
                                          RX Level            -43 dBm
                                          DTMF Level          -9 dBm
                                          CNG Level           -11 dBm
                                          CED Level           -11 dBm
                                          ECM Mode            ON
                                          Coding scheme       JBIG
                                          Toner Empty Report  OFF
                                          Protocol            OFF

 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/   7L06
 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/

                                                              A0HFF3E500DA
```

B. Supplies Status

- Display the estimated percent of life remaining in the toner cartridge and print unit.
  The type of the toner cartridges that are installed in the printer is also displayed (See the table below).

Types of toner cartridges	
Starter	Starter-capacity toner cartridge: 1.0 K
Standard	Standard-capacity toner cartridge: 1.5 K
High	High-capacity toner cartridge: 2.5 K

NOTE

- **The percent of life remaining in the toner cartridge or print unit can be used as a guide, but may not exactly reflect the amount that has been used in the toner cartridge or print unit.**

C. Coverage Information

- The total number of pages that have been printed is counted and displayed based on the description shown in the following table.

Types of count	Count condition
Color Faces Printed	• Counts by converting the size outputted in color to a value corresponding to A4 pages. 1-sided (A4): Counts +1; 2-sided (A4): Counts +2
Monochrome Faces Printed	• Counts by converting the size outputted in monochrome to a value corresponding to A4 pages. 1-sided (A4): Counts +1; 2-sided (A4): Counts +2
Total	• Total count of the above printed pages in color and monochrome

D. PM parts information

- The lower right part of the configuration page shows numerical values that represent consumable/periodic replacement parts (units) counter information.
  The table below explains counter information that is provided by each numerical data.

(1) Display on the configuration page

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Display	0/	0/	0/	0/	0/	0/	0/	0/	0/	0/	0/	0/	0/	0/

No.	15
Display	8B01/

No.	16	17	18	19	20	21	22	23	24	25
Display	0/	0/	0/	0/	0/	0/	0/	0/	0/	0/

(2) Meaning of counter value

No.		Contents
1		Number of times a High-capacity toner cartridge (K) has been replaced
2		Number of times a Standard-capacity toner cartridge (K) has been replaced
3		Number of times a High-capacity toner cartridge (C) has been replaced
4	Replace	Number of times a Standard-capacity toner cartridge (C) has been replaced
5		Number of times a High-capacity toner cartridge (M) has been replaced
6		Number of times a Standard-capacity toner cartridge (M) has been replaced
7		Number of times a High-capacity toner cartridge (Y) has been replaced

No.		Contents
8	Replace	Number of times a Standard-capacity toner cartridge (Y) has been replaced
9		Rate of transfer roller remaining (%)
10		Number of times a transfer roller has been replaced
11		Rate of fusing unit remaining (%)
12		Number of times a fusing unit has been replaced
13		Imaging cartridge consumption
14		Number of times a imaging cartridge has been replaced
15	Machine setting date	Year (e.g. The year 2008 is displayed as 8.)
		Month (e.g. January is displayed as A. February is B. March is C. and December is L.)
		Day (e.g. The day 1 is displayed as 01.)
16	Application counter	Copy print
17		Fax Reception print
18		Report output print
19		PC Print
20		Fax Transmitting pages
21		Scan to E-mail
22		Scan to FTP
23		Scan to SMB
24		Scan to USB
25		Twain

10.5.11 DEMO PAGE

Function	• Prints the demo page.
Use	**NOTE** • **Demo page only print from Tray1.**

11. UTILITY mode

11.1 UTILITY mode function tree

・ A menu is display by select [UTILITY] item on the standby mode.

NOTE
・ **<*1>: Displayed only when the duplex unit is installed**

UTILITY mode				Ref. page
MACHINE SETTING	AUTO PANEL RESET			P.104
	ENERGY SAVE MODE			P.104
	LCD CONTRAST			P.104
	KEY SPEED	TIME TO START		P.104
		INTERVAL		P.104
	LANGUAGE			P.105
	BUZZER VOLUME			P.105
	INITIAL MODE			P.105
	TONER OUT STOP			P.105
	TONER LOW			P.105
	AUTO CONTINUE			P.105
	IMAGE REFRESH			P.105
	DUPLEX SPEED <*1>			P.105
	CALIBRATION			P.105
TRAY1 PAPER SETUP	PLAIN PAPER			
	LETTERHEAD			
	THICK 1			
	THICK 2			P. 106
	LABELS			
	ENVELOPE			
	POSTCARD			
ADMIN. MANAGEMENT	ADMINISTRATOR NO.			P. 106
	NETWORK SETTING	TCP/IP		P. 106
		IP ADDR. SETTING		P. 106
			SUBNET MASK	P. 107
			GATEWAY	P. 107
		DNS CONFIG.		P. 107
		DHCP		P. 107
		BOOTP		P. 107
		ARP/PING		P. 107
		HTTP		P. 107
		FTP		P. 107
		SMB		P. 108

UTILITY mode			Ref. page
		BONJOUR	P. 108
		IPP	P. 108
		SLP	P. 108
		SNMP	P. 108
		SPEED/DUPLEX	P. 108
	E-MAIL SETTING	SMTP	P. 108
		SENDER NAME	P. 108
		E-MAIL ADDRESS	P. 108
		DEFAULT SUBJECT	P. 108
		SMTP SERVER ADDR.	P. 108
		SMTP PORT NO.	P. 108
		SMTP TIMEOUT	P. 109
		TEXT INSERT	P. 109
		POP BEFORE SMTP	DISABLE/ENABLE	P. 109
			POP3 SERVERADDR.	P.109
			POP3 PORT NO.	P. 109
			POP3 TIMEOUT	P. 109
			POP3 ACCOUNT	P. 109
			POP3 PASSWORD	P. 109
		SMTP AUTH.	DISABLE/ENABLE	P. 109
			SMTP USER NAME	P.109
			SMTP PASSWORD	P.109
	LDAP SETTING	DISABLE/ENABLE	P.110
		LDAP SERVER ADDR.	P.110
		LDAP PORT NO.	P.110
		SSL SETTING	P.110
		SEARCH BASE	P.110
		ATTRIBUTE	P.110
		SEARCH METHOD	P.110
		LDAP TIMEOUT	P.110
		MAX. SEARCH RESULTS	P.110
		AUTHENTICATION METHOD	P.110
		LDAP ACCOUNT	P.110
		LDAP PASSWORD	P.111
		DOMAIN NAME	P.111

UTILITY mode			Ref. page
		USB SETTING	P.111
		COMM. SETTING	TONE/PULSE	P.111
			LINE MONITOR VOLUME	P.111
			PSTN/PBX	P.111
		USER SETTING	PTT SETTING	P.111
			DATE&TIME	P.111
			DATE FORMAT	P.111
			PRESET ZOOM	P.112
			USER FAX NUMBER	P.112
			USER NAME	P.112
		AUTO REDIAL	NUMBER OF REDIAL	P.112
			INTERVAL	P.112
COPY SETTING	PAPER PRIORITY		P.112
	QUALITY PRIORITY		P.112
	DENSITY PRIORITY		P.112
	DENSITY LEVEL	AUTO	P.112
		MANUAL	P.112
	OUTPUT PRIORITY		P.113
	DUPLEX COPY		P.113
DIAL REGISTER	FAVORITE		P.113
	SPEED DIAL		P.113
	GROUP DIAL		P.113
FAX TX OPERATION	DENSITY LEV EL		P.113
	QUALITY PRIORITY		P.113
	DEFULT TX		P.113
	HEADER		P.114
FAX RX OPERATION	MEMORY RX MODE		P.114
	NO. of RINGS		P.114
	REDUCTION RX		P.114
	RX PRINT		P.117
	RX MODE		P.117
	FORWARD		P.117
	FOOTER		P.117
	SELECT TRAY		P.118
REPORTING	ACTIV ITY REPORT		P.118
	TX RESULT REPORT		P.118
	RX RESULT REPORT		P.118

UTILITY mode		Ref. page
SCAN SETTING	RESOLUTION	P. 118
	IMAGE FORMAT	P. 118
	CODING METHOD	P. 118
	FILE SIZE	P. 118
	QUALITY PRIORITY	P. 118
	DENSITY LEVEL	P.119

11.2 MACHINE SETTING

11.2.1 AUTO PANEL RESET

Function	• Sets the period of time after which the initial screen reappears after the last print job is received or the last panel key is operated.
Use	• To set the period of time by executing auto panel reset.
Setting/ procedure	• The default setting is 1min.
	OFF / 30sec / "1min" / 2min / 3min / 4min / 5min

11.2.2 ENERGY SAVE MODE

Function	• To specify the time until the machine enters energy save mode after a copy cycle has been completed or after the last key operation.
Use	
Setting/ procedure	• The default setting is 30 min.
	5min / 15min / "30min" / 60min

11.2.3 LCD CONTRAST

Function	• Sets the brightness of the LCD display.
Use	• To set the brightness of the LCD display.
Setting/ procedure	• The default setting is ◄□■□□► .
	(LIGHT) -1 / "0" / +1 / +2 (DARK)

11.2.4 KEY SPEED

A. TIME TO START

Function	• To specify the length of time until the cursor begins to move continuously when a key is held down.
Use	
Setting/ procedure	• The default setting is 1.0sec.
	0.1sec / 0.3sec / 0.5sec / "1.0sec" / 1.5sec / 2.0sec / 2.5sec / 3.0sec

B. INTERVAL

Function	• To specify the length of time until the cursor continuously moves between settings or characters.
Use	
Setting/ procedure	• The default setting is 0.1sec.
	"0.1sec" / 0.3sec / 0.5sec / 1.0sec / 1.5sec / 2.0sec / 2.5sec / 3.0sec

11.2.5 LANGUAGE

Function	• Sets the language of the control panel display.
Use	• To change the language of the control panel display.

Setting/ procedure	• The default setting is ENGLISH.
	
	  "ENGLISH" / FRENCH / GERMAN / ITALIAN / SPANISH / PORTUGUESE
	  RUSSIAN / CZECH / SLOVAK / HUNGARIAN / POLISH / JAPANESE
	
	NOTE
	• **The default setting of language is subject to the setting of [PTT SETTING].**

11.2.6 BUZZER VALUME

Function	• To set the volume of alarms and the beep sounded when a key is pressed.
Use	
Setting/ procedure	• The default setting is LOW. OFF / "LOW" / HIGH

11.2.7 INITIAL MODE

Function	• To set the mode (Copy mode or Fax mode) that the machine starts up in or returns to after the Control Panel is reset.
Use	
Setting/ procedure	• The default setting is COPY. "COPY" / FAX

11.2.8 TONER OUT STOP

Function	• Specifies whether to stop or continue printing when a toner empty condition is detected.
Use	• To permit printing upon a toner empty condition.
Setting/ procedure	• The default setting is ON. "ON" / OFF **NOTE** • **If [ON] is selected, printing, copying and faxing stop when the toner runs out.**

11.2.9 TONER LOW

Function	• To set whether to display a message when a toner near empty state is detected.
Use	• Use this setting to display a message when a toner near empty state is detected.
Setting/ procedure	• The default setting is ON. "ON" / OFF

11.2.10 AUTO CONTINUE

Function	• Select whether or not printing continues when a size error occurs during printing.
Use	• If [OFF] is selected, an error occurs if the size of paper being printed on is different from the size of paper specified in the printer driver. • If [ON] is selected, no error occurs if the size of paper being printed on is different from the size of paper specified in the printer driver.
Setting/ procedure	• The default setting is OFF. ON / "OFF"

11.2.11 IMAGE REFRESH

Function	• Use this function to perform aging of the toner cartridge, thereby making less noticeable the faint lines extending in parallel with the main scanning direction occurring at a pitch of 24 mm.
Use	**NOTE** • **Execution of the image refresh mode consumes toner.** • **This function does not help uneven density at a pitch of 25 mm.**
Setting/ procedure	• The default setting is OFF. ON / "OFF"

11.2.12 DUPLEX SPEED

Function	• To set print speed and image quality for duplex printing.
Use	• If AUTOMATIC is selected, the print speed is automatically selected. • If SPEED is selected, the print speed has priority; however, the print quality may decrease. • If QUALITY is selected, the print quality has priority; therefore, the print speed will decrease while the print quality may increase.
Setting/ procedure	• The default setting is AUTOMATIC. "AUTOMATIC" / SPEED / QUALITY

11.2.13 CALIBRATION

Function	• Executes the image stabilization sequence.
Use	• To calibrate the engine when there are print image quality problems. • To calibrate the engine when the imaging cartridge and 2nd transfer roller are replaced with new ones.
Setting/ procedure	• The default setting is OFF. ON / "OFF" *1.* Select [MACHINE SETTING] and then [CALIBRATION], and press the Select key. *2.* Select [ON] and press the Select key. *3.* Image stabilization is executed.

11.3 TRAY1 PAPER SETUP

Function	• Sets the type and size of the paper loaded in tray1.
Use	• When the type and size of the paper loaded in tray1 have been changed • The default setting varies according to the voltage of the printer.

Setting/
procedure
	TRAY1 PAPER TYPE
	• The default setting is PLAIN PAPER.
	
	    "PLAIN PAPER" / LETTERHEAD / THICK 1 / THICK 2 / LABELS /
	    ENVELOPE / POSTCARD
	
	TRAY1 PAPER SIZE
	• Default setting of paper size depend on the marketing area setting.
	  USA and Canada: "LETTER", Other country: "A4"
	
	<PLAIN PAPER>
	"A4" / B5 / A5 / LEGAL / "LETTER" / G LETTER / STATEMENT / EXECUTIVE / FOLIO /
	OFICIO / G LEGAL / CUSTOM(PLAIN)
	NOTE
	• **If [CUSTOM (PLAIN)] is selected as the paper size, specify settings for LENGTH
	(195 to 356 mm) and WIDTH (92 to 216 mm) separately.**
	
	<LETTERHEAD>
	"A4" / B5 / A5 / "LETTER" / G LETTER / STATEMENT / EXECUTIVE
	
	<THICK 1, THICK 2>
	"A4" / B5 / A5 / "LETTER" / G LETTER / STATEMENT / EXECUTIVE / CUSTOM(THICK)
	NOTE
	• **If [CUSTOM (THICK)] is selected as the paper size, specify settings for LENGTH
	(184 to 294 mm) and WIDTH (92 to 216 mm) separately.**
	
	<LABELS>
	"A4" / B5 / A5 / "LETTER" / G LETTER / STATEMENT / EXECUTIVE
	
	<ENVELOPE>
	"C6" / DL
	
	<POSTCARD>
	"J-POSTCARD"

11.4 ADMIN. MANAGEMENT

• The ADMIN. MANAGEMENT menu is accessible only by the administrator.
To display the settings for this menu, select [ADMIN. MANAGEMENT], use the keypad to type in the 6-digit administrator access code, and then press the Select key.

11.4.1 ADMINISTRATOR NO.

Function	• Use to change the ADMINISTRATOR NO.
Use	
Setting/ procedure	• The default setting is 000000. 1. Select [ADMINISTRATOR NO.] and press the Select key. 2. Enter the existing 6-digit administrator number and press the Select key. 3. Enter the new 6-digit administrator number and press the Select key.

11.4.2 NETWORK SETTING

A. TCP/IP

Function	• Enables TCP/IP

Use	• To specify that the printer is connected to a TCP/IP network.
	  ENABLE: Print can be made at TCP/IP environment.
	  DISABLE: Print cannot be made at TCP/IP environment.

Setting/ procedure	• The default setting is ENABLE. DISABLE / "ENABLE"

B. IP ADDR. SETTING

Function	• Sets the IP address of the printer used for the network.
Use	• To set the printer's IP address.
Setting/ procedure	• The default setting is AUTO. "AUTO" / SPECIFY • If AUTO is selected, the IP address is automatically acquired from the DHCP server. **NOTE** • **AUTO is only enabled if there is a DHCP server available on the network.** • **When AUTO is selected, there is no need to set the SUBNET MASK or GATEWAY setting.** • If SPECIFY is selected, the screen for entering the IP address appears.

(1) SUBNET MASK

Function	• This function is used to specify the subnet mask value for the network.
Use	**NOTE** • **Please consult customer's network administrator for information about the sub-net mask to use.**
Setting/procedure	• Setting LAN connect to WAN the net mask address. **NOTE** • **If Auto is selected for [IP ADDR. SETTING], the items of [SUBNET MASK] and [GATEWAY] are automatically set. Key entry is therefore disabled for [SUBNET MASK] and [GATEWAY].**

(2) GATEWAY

Function	• This function is used to specify the default gateway (IP address) of a router on the net-work.
Use	**NOTE** • **Please consult customer's network administrator for information about the gate-way to use.**
Setting/procedure	• Setting LAN address. **NOTE** • **If Auto is selected for [IP ADDR. SETTING], the items of [SUBNET MASK] and [GATEWAY] are automatically set. Key entry is therefore disabled for [SUBNET MASK] and [GATEWAY].**

C. DNS CONFIG.

Function	• Sets whether or not the DNS server setting is to be specified.
Use	• If specifying the DNS server setting, the SMTP server can be specified as a host name when using network scanning. • If [ENABLE] is selected, type in the IP address of the DNS server. • If [DISABLE] is selected, the DNS server cannot be referenced.
Setting/procedure	• The default setting is DISABLE. "DISABLE" / ENABLE

(1) ENABLE

Function	• Sets the DNS server address (up to three addresses).
Use	
Setting/procedure	• The default setting is 0.0.0.0. DNS1 / DNS2 / DNS3

D. DHCP

Function	• Automatically acquires an IP address from the DHCP server, if there is one in the net-work, and specifies whether to load other network information.
Use	• To automatically acquire an IP address and load other network information.
Setting/procedure	• The default setting is ENABLE. DISABLE / "ENABLE" **NOTE** • **When setting the IP address manually, the [DHCP] setting is changed to [DIS-ABLE].**

E. BOOTP

Function	• Automatically acquires an IP address from BOOTP and specifies whether to load other network information.
Use	• To automatically acquire an IP address and load other network information.
Setting/procedure	• The default setting is DISABLE. "DISABLE" / ENABLE **NOTE** • **When setting the IP address manually, the [BOOTP] setting is changed to [DIS-ABLE].**

F. ARP/PING

Function	• Automatically acquires an IP address from ARP/PING and specifies whether to load other network information.
Use	• To automatically acquire an IP address and load other network information.
Setting/procedure	• The default setting is DISABLE. "DISABLE" / ENABLE **NOTE** • **When setting the IP address manually, the [ARP/PING] setting is changed to [DIS-ABLE].**

G. HTTP

Function	• Select whether or not to enable HTTP.
Use	• If [ENABLE] is selected, HTTP is enabled. • If [DISABLE] is selected, HTTP is disabled.
Setting/procedure	• The default setting is ENABLE. DISABLE / "ENABLE"

H. FTP

Function	• Select whether or not to enable the FTP server.
Use	• If [ENABLE] is selected, FTP server is enabled. • If [DISABLE] is selected, FTP server is disabled.
Setting/procedure	• The default setting is ENABLE. DISABLE / "ENABLE"

I. SMB

Function	• Select whether or not to enable SMB.
Use	• If [ENABLE] is selected, SMB is enabled. • If [DISABLE] is selected, SMB is disabled.
Setting/ procedure	• The default setting is ENABLE. DISABLE / "ENABLE"

J. BONJOUR

Function	• Select whether or not to use the bonjour setting.
Use	• To use when operating under the bonjour service environment. • If [ENABLE] is selected, Bonjour is enabled. • If [DISABLE] is selected, Bonjour is disabled.
Setting/ procedure	• The default setting is ENABLE. DISABLE / "ENABLE"

K. IPP

Function	• Select whether or not to enable IPP.
Use	• If [ENABLE] is selected, IPP is enabled. • If [DISABLE] is selected, IPP is disabled.
Setting/ procedure	• The default setting is ENABLE. DISABLE / "ENABLE"

L. SLP

Function	• Select whether or not to enable SLP.
Use	• If [ENABLE] is selected, SLP is enabled. • If [DISABLE] is selected, SLP is disabled.
Setting/ procedure	• The default setting is ENABLE. DISABLE / "ENABLE"

M. SNMP

Function	• Select whether or not to enable SNMP.
Use	• If [ENABLE] is selected, SNMP is enabled. • If [DISABLE] is selected, SNMP is disabled.
Setting/ procedure	• The default setting is ENABLE. DISABLE / "ENABLE"

N. SPEED/DUPLEX

Function	• Sets the communication speed and method of network.
Use	• To set the network communication speed and method.
Setting/ procedure	• The default setting is AUTO. "AUTO" / 10BASE-T FULL / 10BASE-T HALF / 100BASE-TX FULL / 100BASE-TX HALF

11.4.3 E-MAIL SETTING

A. SMTP

Function	• Select whether or not to enable SMTP.
Use	• If [ENABLE] is selected, SMTP is enabled. • If [DISABLE] is selected, SMTP is disabled.
Setting/ procedure	• The default setting is ENABLE. DISABLE / "ENABLE"

B. SENDER NAME

Function	• This function is used to specify the sender's name.
Use	
Setting/ procedure	• The default setting is OKI-MC160n. • Up to 20 characters can be entered for the sender name.

C. E-MAIL ADDRESS

Function	• This function is used to specify the e-mail address of the sender.
Use	**NOTE** • **Please consult customer's network administrator for information about the e-mail address to use.**
Setting/ procedure	• Up to 64 characters can be entered for the sender address. • If customer does not receive e-mail on the copier, enter the e-mail address of the customer's administrator.

D. DEFAULT SUBJECT

Function	• This function is used to specify the default subject line, when sending scan data as an e-mail attachment.
Use	
Setting/ procedure	• The default setting is from From OKI-MC160n. • Up to 20 characters can be entered for the default subject.

E. SMTP SERVER ADDR.

Function	• This function is used to enter the IP address or host name of an SMTP server.
Use	**NOTE** • **Please consult customer's network administrator for information about the IP address to use.**
Setting/ procedure	• Up to 64 characters can be entered for the host name. • The DNS settings must have been specified before specifying the host name for the SMTP server.

F. SMTP PORT NO.

Function	• This function is used to enter the port number (1 to 65535) for the SMTP server.
Use	**NOTE** • **Please consult customer's network administrator for information about the port number to use.**
Setting/ procedure	• The port number can be set between 1 and 65535. • Normally, port number 25 is used.

G. SMTP TIMEOUT

Function / Use	• This function is used to specify the length of time (in seconds) before the connection to the SMTP server times out. (30 to 300 seconds)
Setting/ procedure	• The default setting is 60sec. • The time out period can be between 30 and 300 seconds.

H. TEXT INSERT

Function / Use	• This function is used to specify whether or not to insert text explaining that an image has been attached to an e-mail message, when sending scan data as an E-mail attachment.
Setting/ procedure	• The default setting is OFF. "OFF" / ON • OFF: If OFF is selected, a blank e-mail message will be sent. • ON: If ON is selected, the following text is inserted in the e-mail message.

I. POP BEFORE SMTP
(1) DISABLE/ENABLE

Function / Use	• This function is used to set whether or not to use POP before SMTP.
Setting/ procedure	• The default setting is DISABLE. "DISABLE" / ENABLE • When [ENABLE] is selected, set the time (second) for POP BEFORE SMTP. The default setting is "5sec". (0 - 60sec)

(2) POP3 SERVER ADDR.

Function	• This function is used to enter the IP address or host name of an POP3 server.
Use	**NOTE** • **Please consult customer's network administrator for information about the IP address to use.** • **The [DNS] must have been specified before specifying the host name for the POP3 server.**
Setting/ procedure	• Up to 64 characters can be entered for the host name.

(3) POP3 PORT NO.

Function	• This function is used to enter the port number for the POP3 server.
Use	**NOTE** • **Please consult customer's network administrator for information about the port number to use.**
Setting/ procedure	• The default setting is "110". (1 - 65535)

(4) POP3 TIMEOUT

Function / Use	• This function is used to specify the length of time (in seconds) before the connection to the POP3 server times out.
Setting/ procedure	• The default setting is "30sec". (30 - 300sec)

(5) POP3 ACCOUNT

Function	• This function is used to enter the account name used to log on to the POP3 server.
Use	**NOTE** • **Please consult customer's network administrator for information about the account name to use.**
Setting/ procedure	• Up to 64 characters can be entered for the account name.

(6) POP3 PASSWORD

Function	• This function is used to enter the password associated with the account name used to log in to the POP3 server.
Use	NOTE • **Please consult customer's network administrator for information about the password to use.**
Setting/ procedure	• Up to 32 characters can be entered for the password.

J. SMTP AUTH.
(1) DISABLE/ENABLE

Function / Use	• If [ENABLE] is selected, SMTP Authentication is enabled.
Setting/ procedure	• The default setting is ENABLE. DISABLE / "ENABLE"

(2) SMTP USER NAME

Function / Use	• Type in the user name used for authentication with SMTP Authentication.
Setting/ procedure	• The default setting is Blank. • Up to 63 characters can be entered for the SMTP user name.

(3) SMTP PASSWORD

Function / Use	• Type in the password used for authentication with SMTP Authentication.
Setting/ procedure	• The default setting is Blank. • Up to 15 characters can be entered for the password.

11.4.4 LDAP SETTING

A. DISABLE/ENABLE

Function	• This function is used to set whether or not to use LDAP.
Use	
Setting/ procedure	• The default setting is ENABLE. DISABLE / "ENABLE"

B. LDAP SERVER ADDR.

Function	• To set the LDAP server address.
Use	• To enter LDAP server address.
Setting/ procedure	• The default setting is 0.0.0.0. 1. Select the [LDAP SERVER ADDR.], then press Select key. 2. Type in the IP address or host name for the LDAP server, then press Select key. • The host name can contain a maximum of 64 characters.

C. LDAP PORT NO.

Function	• To set the LDAP server port number.
Use	• To enter the LDAP server port number.
Setting/ procedure	• When SSL Setting is disable, the default value is 389. • When SSL Setting is enable, the default value is 636. 1. Select the [LDAP PORT NO.], then press Select key. 2. Type in the port number (1 - 65535), then press Select key.

D. SSL SETTING

Function	• To set whether to use SSL (data encryption) for connecting to LDAP server.
Use	• To use SSL (data encryption) for connecting to LDAP server.
Setting/ procedure	• The default setting is DISABLE. "DISABLE" / ENABLE

E. SEARCH BASE

Function	• To set the directory path for LDAP server.
Use	• To enter the directory path for LDAP server.
Setting/ procedure	1. Select the [SEARCH BASE], then press Select key. 2. Specify the database where the LDAP server is searched, then press Select key. • The search base can contain a maximum of 64 characters.

F. ATTRIBUTE

Function	• To set a search attribute that is used to search a destination from LDAP server.
Use	• To enter a search attribute that is used to search a destination from LDAP server.
Setting/ procedure	1. Select the [ATTRIBUTE], then press Select key. 2. Type in the attribute, then press Select key. • The attribute can contain a maximum of 32 characters.

G. SEARCH METHOD

Function	• To set a search method that is used to search a destination.
Use	• To change a search method that is used to search a destination.
Setting/ procedure	• The default setting is CONTAIN. BEGIN / "CONTAIN" / END

H. LDAP TIMEOUT

Function	• To set the Max. time-out period for LDAP search.
Use	• To change the Max. time-out period for LDAP search.
Setting/ procedure	• The default setting is 60 sec. (5 - 300 sec.) 1. Select the [LDAP TIMEOUT], then press Select key. 2. Type in the length of time (in seconds) until the LDAP search times out, then press Select key.

I. MAX. SEARCH RESULTS

Function	• To set the Max. results of address for LDAP search.
Use	• To change the Max. results of address for LDAP search.
Setting/ procedure	• The default setting is 100 (5 - 100) 1. Select the [MAX. SEARCH RESULTS], then press Select key. 2. Type in the maximum number of items, then press Select key.

J. AUTHENTICATION

Function	• To set the authentication method to logon to LDAP server.

Use	• To change the authentication method to logon to LDAP server.
	  [ANONYMOUS]: User name and password are not necessary (Dynamic authentication will be invalid when anonymous is selected.)
	  [SIMPLE]: Simple method which needs the user name and the password
	  [DIGEST-MD5]: Method available with normal LDAP server. When failing to authenticate with Digest-MD5, it automatically switches to CRAMMD5.
	  [GSS-SPNEGO]: Method available with Windows active directory (Kerberos authentication).

Setting/ procedure	• The default setting is ANONYMOUS. "ANONYMOUS" / SIMPLE / DIGEST-MD5 / GSS-SPNEGO

K. LDAP ACCOUNT

Function	• To set the account name to connect to LDAP server.
Use	• To set the account name to connect to LDAP server.
Setting/ procedure	1. Select the [LDAP ACCOUNT], then press Select key. 2. Type in the account name for the LDAP server, then press Select key. • The account name can contain a maximum of 64 characters.

L. LDAP PASSWORD

Function	• To set the password for connecting to LDAP server.
Use	• To set the password for connecting to LDAP server.
Setting/ procedure	1. Select the [LDAP PASSWORD], then press Select key. 2. Type in the password, then press Select key. • The password can contain a maximum of 32 characters.

M. DOMAIN NAME

Function	• To set the domain name for connecting to LDAP server.
Use	• To set the domain name for connecting to LDAP server.
Setting/ procedure	1. Select the [DOMAIN NAME], then press Select key. 2. Type in the domain name, then press Select key. • The domain name can contain a maximum of 64 characters.

11.4.5 USB SETTING

Function	• To set the operating system of the PC to which this machine is connected with a USB cable.
Use	
Setting/ procedure	• The default setting is Windows. "Windows" / Mac

11.4.6 COMM. SETTING

A. TONE/PULSE

Function	• This function can be used to specify the dialing system. If this function is not correctly set to the type of dialing system used, faxes cannot be sent. Select the correct setting after checking which type of dialing system is used by your telephone line. • There are two types of telephone dialing systems: tone dialing (PB) and pulse dialing (DP10pps or DP20pps). Faxes cannot be sent if this machine is not set to the system used by your telephone line. Select the correct setting after checking which type of dialing system is used. **NOTE** • **If [PTT SETTING] in the [USER SETTING] menu is set to U.S.A, CANADA or NEW ZEALAND, the settings cannot be changed.**
Use	

Setting/ procedure	• The default setting is TONE.
	
	    "TONE": Tone line
	    PULSE 10pps: Pulse line of 10 pps
	    PULSE 20pps: Pulse line of 20 pps

B. LINE MONITOR

Function	• This function can be used to set the volume when monitoring communication to [HIGH], [LOW] or [OFF].
Use	
Setting/ procedure	• The default setting is LOW. OFF / "LOW" / HIGH

C. PSTN/PBX

Function	• This function can be used to set whether the connected telephone wiring is a public switched telephone network (PSTN) or a private branch exchange (PBX). For a PBX system, the outside line access number (or extension number) must be specified.
Use	• The connected wiring system can be set to either PSTN (Public Switched Telephone Network) or PBX (Private Branch Exchange). For a PBX system, the outside line access number (or extension number) must be specified. The outside line access number (or extension number) is programmed in the [#] key.

Setting/ procedure	• The default setting is PSTN.
	
	    "PSTN": Public Switched Telephone Network
	    PBX: Private Branch Exchange

11.4.7 USER SETTING

A. PTT SETTING

Function	• Sets the country where this machine is installed.
Use	• To change the country where this machine is installed.

Setting/ procedure	• The default setting is USA.
	
	    "U.S.A" / UNITED KINGDOM / VIETNAM / ARGENTINA / AUSTRALIA
	    AUSTRIA / BELGIUM / BRAZIL / CANADA / CHINA / CZECH / DENMARK
	    EUROPE / FINLAND / FRANCE / GERMANY / GREECE / HONG KONG
	    HUNGARRY / IRELAND / ISRAEL / ITALY / KOREA / MALAYSIA / MEXICO
	    THE NETHERLANDS / NEW ZEALAND / NORWAY / PHILIPPINES / POLAND
	    PORTUGAL / RUSSIA / SAUDI ARABIA / SINGAPORE / SLOVAKIA /
	    SOUTH AFRICA / SPAIN / SWEDEN / SWITZERLAND / TAIWAN / TURKEY
	
	NOTE
	When this setting was changed, the following settings will return to their default automatically.
	• **[LANGUAGE]**
	• **[PAPER SETUP]**
	• **[DATE FORMAT]**
	• **[PRESET ZOOM]**
	• **[SOFT SWITCH]**

B. DATE & TIME

Function	• Sets the date and time to be indicated on the output of print report.
Use	• At the installation or when date and time need to be changed.

C. DATE FORMAT

Function	• Sets the format of the date to be indicated on the output of PRINT REPORT.
Use	• To change the format of the date to be indicated on the output of PRINT REPORT
Setting/ procedure	• The default setting is MM/DD/YY. "MM/DD/YY" / DD/MM/YY / YY/MM/DD

D. PRESET ZOOM

Function	• Sets the type of paper for fixed zoom ratio setting.
Use	• To change the type of paper for fixed zoom ratio setting
Setting/ procedure	• The default setting is "INCH" (for the inch areas) or "METRIC" (for the metric areas). "INCH" / "METRIC"

E. USER FAX NUMBER

Function	• Enter user fax number.
Use	• The specified number is printed in the header of sent faxes.
Setting/ procedure	• Max. 20 digits. • The characters which can be inputted are "numbers from 0 to 9", "Space", "+" and "-."

F. USER NAME

Function	• The User Name is used for the indication of destination station at the time of the communication between same models.
Use	
Setting/ procedure	• Maximum 32 digits character can be inputted.

11.4.8   AUTO REDIAL

A. NUMBER OF REDIAL

Function	• To specify the number of times a redial is attempted if there is no answer, for example, when the line is busy.
Use	
Setting/ procedure	• 1 - 10 (Default: Depends on [PTT SETTING])

B. INTERVAL

Function	• To specify the interval between redial attempts.
Use	
Setting/ procedure	• 1 - 99 (Default: Depends on [PTT SETTING])

11.5   COPY SETTING

11.5.1   PAPER PRIORITY

Function	• Selects the priority tray.
Use	• To change the priority tray
Setting/ procedure	• The default setting is TRAY2. TRAY1 / "TRAY2" **NOTE** • **If Tray 2 is not installed, [TRAY1] and [TRAY2] does not appear.**

11.5.2   QUALITY PRIORITY

Function	• To set the priority image quality mode that is selected when the power switch is turned ON.
Use	
Setting/ procedure	• The default setting is MIX. "MIX" / TEXT / PHOTO / FINE/MIX / FINE/TEXT / FINE/PHOTO

11.5.3   DENSITY PRIORITY

Function	• To set the priority density that is selected when the power switch is turned ON
Use	
Setting/ procedure	• The default setting is AUTO. "AUTO" / MANUAL

11.5.4   DENSITY LEVEL

A. AUTO

Function	• To set the density level when the Auto density is selected.
Use	
Setting/ procedure	• The default setting is ◁▢▢▣▢▷ . (LIGHT) -1 / "0" / +1 (DARK) **NOTE** • **Valid only if [TEXT] or [FINE/TEXT] is selected for [QUALITY PRIORITY]**

B. MANUAL

Function	• To set the density level when the Manual density is selected.
Use	
Setting/ procedure	• The default setting is ◁▢▢▢▣▢▢▢▷ . (LIGHT) -3 / -2 / -1 / "0" / +1 / +2 / +3 (DARK)

11.5.5 OUTPUT PRIORITY

Function	• To set the priority finishing function, either non-sort, sort, or group.
Use	
Setting/ procedure	• The default setting is NON-SORT. "NON-SORT" / SORT

11.5.6 DUPLEX COPY

Function	• When conditions necessary for crisscross sorting are met, crisscross sorting can be set to OFF, LONG EDGE or SHORT EDGE.
Use	
Setting/ procedure	• The default setting is OFF. "OFF" / LONG EDGE / SHORT EDGE

11.6 DIAL REGISTER

11.6.1 FAVORIT

Function	• Frequently used speed dial and group dial destinations (maximum of 20) can be registered on the favorite list to allow the fax number to quickly be recalled.
Use	**NOTE** • **Before registering destinations in the favorite list, register them as [SPEED DIAL] or [GROUP DIAL] destinations.**
Setting/ procedure	1. Press the Address Book key, and then press the ▲ and ▼ key to quickly select the desired destination.

11.6.2 SPEED DIAL

Function	• Frequently specified fax numbers (maximum of 220) can be registered as speed dial destinations. In addition, batch transmission settings can be specified.
Use	
Setting/ procedure	• The contents of registration. • Destination name: 20 characters. • Dial No.: 30 digits. E-mail address: 64 characters. • Registered data: Automatically.

11.6.3 GROUP DIAL

Function	• Fax numbers frequently specified for broadcast transmission can be registered as a group dial destination. A maximum of 50 destinations can be registered together as one group.
Use	**NOTE** • **Before registering a group dial destination, register the destinations as [SPEED DIAL] destinations.**
Setting/ procedure	• The contents of registration. • Group name: 20 characters. • Information of destination station: The contents of speed dial.

11.7 FAX TX OPERATION

11.7.1 DENSITY LEVEL

Function	• This function can be used to set the default scanning contrast level to one of three settings between [LIGHT] and [DARK].
Use	• For dark-colored paper (media), select a setting towards [LIGHT]. For faint or colored text, select a setting toward [DARK].
Setting/ procedure	• The default setting is ◁▢▢▣▢▷ . (LIGHT) -1 / "0" / +1 (DARK)

11.7.2 QUALITY PRIORITY

Function	• This function can be used to set the default scanning resolution (image quality) to one of the following.
Use	
Setting/ procedure	• The default setting is STD/TEXT. "STD/TEXT" / FINE/TEXT / S-FINE/TEXT / STD/PHOTO / FINE/PHOTO S-FINE/PHOTO

11.7.3 DEFULT TX

Function	• This function can be used to set the default of TX mode.
Use	
Setting/ procedure	• The default setting is MEMORY TX. "MEMORY TX" / DIRECT TX

11.7.4 HEADER

Function	• This function can be used to set the default setting (ON or OFF) for adding the header (date sent, sender's name and fax number, etc.) when sending faxes.
Use	
Setting/ procedure	• The default setting is ON. "ON": Add header OFF: No header **NOTE** • **If [PTT SETTING] in the [USER SETTING] menu is set to U.S.A, CANADA, or KOREA, this setting cannot be changed.** The contents of registration. • TX data and time. • Transmitter's own name. • Transmitter's own tel number. • Session number. • Page number. • Total page number (only displayed by use the memory TX job). It is selectable by soft switch to transmit only pages which have failed to transmit, if communication error occurs on the way transmitting document. In this case, page number on Header Print is continued from the page number of the document successfully transmitted. Whether user setting is allowed or not is selectable with Soft switch. Attaching Header Print: • Image within 4 mm (1/4 in.) top margin of transmitting document is not transmitted and Header print data is attached.

11.8 FAX RX OPERATION

11.8.1 MEMORY RX MODE

Function	• This function can be used to set whether to allow [ON] memory reception or not [OFF]. In cases when confidential faxes are being received, the received document can be stored in the memory and printed at a specified time or when memory reception is set to [OFF]. A password can be set to specify the starting time or ending time of memory reception, or to cancel the function. The set starting time and ending time are valid every day until memory reception is turned off.
Use	
Setting/ procedure	• The default setting is OFF. ON: Enable memory RX mode "OFF": Disable memory RX mode

11.8.2 NO. of RINGS

Function	• This function can be used to set the number of rings between 1 and 16 until the call is answered.
Use	
Setting/ procedure	• Default: Depends on [PTT SETTING]. • Depend on soft switch setting of marketing area. **NOTE** • **When PTT setting is New Zealand, the setting range is 7-10.** 1: 1 time "2": 2 times 3: 3 times 4: 4 times 5: 5 times 6: 6 times 7: 7 times 8: 8 times 9: 9 times 10: 10 times 11: 11 times 12: 12 times 13: 13 times 14: 14 times 15: 15 times 16: 16 times

11.8.3 REDUCTION RX

Function	• This function can be used to set whether documents longer than the paper are printed reduced [ON], split [OFF], or discarded [CUT]. However, when sending a document more than 24 mm (1 inch) longer than the paper, [CUT] is not available. (In this case, the document is split.)
Use	
Setting/ procedure	• The default setting is ON. OFF: 100% RX mode "ON": Reduction print mode CUT: Cut mode

A. Reduction print mode
- It reduces (only the FD direction) and prints so that receiving data will in a recording media.

Recording media size	Footer	Length of received image	Printing
A4	OFF	Less than 289 mm	1 page with 100%
		290 mm to 313 mm	1 page with (289 mm / image length)% reduction
		314 mm to 570 mm	Divide into 2 pages with 100%
		571 mm to 851 mm	Divide into 3 pages with 100%
		852 mm or more	Divide into 4 pages (or more) with 100%
	ON	Less than 285 mm	1 page with 100%
		286 mm to 309 mm	1 page with (285 mm / image length)% reduction
		310 mm to 562 mm	Divide into 2 pages with 100%
		563 mm to 839 mm	Divide into 3 pages with 100%
		840 mm or more	Divide into 4 pages (or more) with 100%
Letter	OFF	Less than 271 mm	1 page with 100%
		272 mm to 295 mm	1 page with (271 mm / image length)% reduction
		296 mm to 534 mm	Divide into 2 pages with 100%
		535 mm to 797 mm	Divide into 3 pages with 100%
		798 mm or more	Divide into 4 pages (or more) with 100%
	ON	Less than 267 mm	1 page with 100%
		268 mm to 291 mm	1 page with (267 mm / image length)% reduction
		292 mm to 526 mm	Divide into 2 pages with 100%
		527 mm to 785 mm	Divide into 3 pages with 100%
		786 mm or more	Divide into 4 pages (or more) with 100%
Legal	OFF	Less than 348 mm	1 page with 100%
		349 mm to 371 mm	1 page with (347 mm / image length)% reduction
		372 mm to 688 mm	Divide into 2 pages with 100%
		689 mm to 1,028 mm	Divide into 3 pages with 100%
		1,029 mm or more	Divide into 4 pages (or more) with 100%
	ON	Less than 344 mm	1 page with 100%
		345 mm to 367 mm	1 page with (343 mm / image length)% reduction
		368 mm to 680 mm	Divide into 2 pages with 100%
		681 mm to 1,016 mm	Divide into 3 pages with 100%
		1,017 mm or more	Divide into 4 pages (or more) with 100%

Recording media size	Footer	Length of received image	Printing
Oficio	OFF	Less than 335 mm	1 page with 100%
		336 mm to 359 mm	1 page with (335 mm / image length)% reduction
		360 mm to 662 mm	Divide into 2 pages with 100%
		663 mm to 989 mm	Divide into 3 pages with 100%
		990 mm or more	Divide into 4 pages (or more) with 100%
	ON	Less than 331 mm	1 page with 100%
		332 mm to 355 mm	1 page with (331 mm / image length)% reduction
		356 mm to 654 mm	Divide into 2 pages with 100%
		655 mm to 977 mm	Divide into 3 pages with 100%
		978 mm or more	Divide into 4 pages (or more) with 100%

B. 100% RX mode
- All receiving data is divided into 2 pages or more, and is printed.

Recording media size	Footer	Length of received image	Printing
A4	OFF	Less than 289 mm	1 page
		290 mm to 570 mm	Divide into 2 pages
		571 mm to 851 mm	Divide into 3 pages
		852 mm or more	Divide into 4 pages or more
	ON	Less than 285 mm	1 page
		286 mm to 562 mm	Divide into 2 pages
		563 mm to 839 mm	Divide into 3 pages
		840 mm or more	Divide into 4 pages or more
Letter	OFF	Less than 271 mm	1 page
		272 mm to 534 mm	Divide into 2 pages
		535 mm to 797 mm	Divide into 3 pages
		798 mm or more	Divide into 4 pages or more
	ON	Less than 267 mm	1 page
		268 mm to 526 mm	Divide into 2 pages
		527 mm to 785 mm	Divide into 3 pages
		786 mm or more	Divide into 4 pages or more
Legal	OFF	Less than 348 mm	1 page
		349 mm to 688 mm	Divide into 2 pages
		689 mm to 1,028 mm	Divide into 3 pages
		1,029 mm or more	Divide into 4 pages or more
	ON	Less than 344 mm	1 page
		345 mm to 680 mm	Divide into 2 pages
		681 mm to 1,016 mm	Divide into 3 pages
		1,017 mm or more	Divide into 4 pages or more
Oficio	OFF	Less than 335 mm	1 page
		356 mm to 662 mm	Divide into 2 pages
		663 mm to 989 mm	Divide into 3 pages
		990 mm or more	Divide into 4 pages or more
	ON	Less than 331 mm	1 page
		332 mm to 654 mm	Divide into 2 pages
		655 mm to 977 mm	Divide into 3 pages
		978 mm or more	Divide into 4 pages or more

C. Cut mode
- The data that is larger than 1-page record area is cut and not recorded (to 24 mm).

Recording media size	Footer	Length of received image	Printing
A4	OFF	Less than 289 mm	1 page
		290 mm to 313 mm	Print into 1 page. 1 mm to 24 mm of end is cut.
		314 mm to 570 mm	Divide into 2 pages
		571 mm to 594 mm	Divide into 2 pages. 1 mm to 24 mm of end is cut.
		595 mm to 851 mm	Divide into 3 pages
		852 mm or more	Divide into 3 pages (or more). 1 mm to 24 mm of end is cut.
	ON	Less than 285 mm	1 page
		286 mm to 309 mm	Print into 1 page. 1 mm to 24 mm of end is cut.
		310 mm to 562 mm	Divide into 2 pages
		563 mm to 586 mm	Divide into 2 pages. 1 mm to 24 mm of end is cut.
		587 mm to 839 mm	Divide into 3 pages
		840 mm or more	Divide into 3 pages (or more). 1 mm to 24 mm of end is cut.
Letter	OFF	Less than 271 mm	1 page
		272 mm to 295 mm	Print into 1 page. 1 mm to 24 mm of end is cut.
		296 mm to 534 mm	Divide into 2 pages
		535 mm to 558 mm	Divide into 2 pages. 1 mm to 24 mm of end is cut.
		559 mm to 797 mm	Divide into 3 pages
		798 mm or more	Divide into 3 pages (or more). 1 mm to 24 mm of end is cut.
	ON	Less than 267 mm	1 page
		268 mm to 291 mm	Print into 1 page. 1 mm to 24 mm of end is cut.
		292 mm to 526 mm	Divide into 2 pages
		527 mm to 550 mm	Divide into 2 pages. 1 mm to 24 mm of end is cut.
		551 mm to 785 mm	Divide into 3 pages
		786 mm or more	Divide into 3 pages (or more). 1 mm to 24 mm of end is cut.
Legal	OFF	Less than 348 mm	1 page
		349 mm to 371 mm	Print into 1 page. 1 mm to 24 mm of end is cut.
		372 mm to 688 mm	Divide into 2 pages
		689 mm to 712 mm	Divide into 2 pages. 1 mm to 24 mm of end is cut.
		713 mm to 1,028 mm	Divide into 3 pages
		1,029 mm or more	Divide into 3 pages (or more). 1 mm to 24 mm of end is cut.
	ON	Less than 344 mm	1 page
		345 mm to 367 mm	Print into 1 page. 1 mm to 24 mm of end is cut.
		368 mm to 680 mm	Divide into 2 pages
		681 mm to 704 mm	Divide into 2 pages. 1 mm to 24 mm of end is cut.
		705 mm to 1,016 mm	Divide into 3 pages
		1,017 mm or more	Divide into 3 pages (or more). 1 mm to 24 mm of end is cut.

Recording media size	Footer	Length of received image	Printing
Oficio	OFF	Less than 335 mm	1 page
		336 mm to 359 mm	Print into 1 page. 1 mm to 24 mm of end is cut.
		360 mm to 662 mm	Divide into 2 pages
		663 mm to 686 mm	Divide into 2 pages. 1 mm to 24 mm of end is cut.
		687 mm to 989 mm	Divide into 3 pages
		990 mm or more	Divide into 3 pages (or more). 1 mm to 24 mm of end is cut.
	ON	Less than 331 mm	1 page
		332 mm to 355 mm	Print into 1 page. 1 mm to 24 mm of end is cut.
		356 mm to 654 mm	Divide into 2 pages
		655 mm to 678 mm	Divide into 2 pages. 1 mm to 24 mm of end is cut.
		679 mm to 977 mm	Divide into 3 pages
		978 mm or more	Divide into 3 pages (or more). 1 mm to 24 mm of end is cut.

11.8.4 RX PRINT

Function	• This function can be used to set whether the fax is only printed after all document pages have been received [MEMORY RX] or printing begins as soon as the first page of the document is received [PRINT RX].
Use	

Setting/ procedure	• The default setting is MEMORY RX.
	
	  "MEMORY RX": Printed after all document pages have been received.
	  PRINT RX: Printing begins as soon as the first page of the document is received.

11.8.5 RX MODE

Function	• This function can be used to set the reception mode to automatic reception [AUTO RX] or manual reception [MANUAL RX].
Use	• Automatic reception: Automatically begins receiving after the set number of rings. • Manual reception: Does not automatically receive the fax. Reception begins after making a connection by picking up the telephone receiver or pressing the On hook key, then pressing the Start key.

Setting/ procedure	• The default setting is AUTO RX.
	
	  "AUTO RX": Automatic reception
	  MANUAL RX: Manual reception

11.8.6 FORWARD

Function	• This function can be used to set whether or not the received document is forwarded.
Use	**NOTE** • **In order to forward the document to an e-mail address, the optional image controller or network interface card is required.**
Setting/ procedure	• The default setting is OFF. "OFF" / ON / ON (PRINT) ON: The received document is forwarded to the specified fax number or e-mail address. ON (PRINT): The received document is printed by this machine at the same time that it is forwarded to the specified fax number or e-mail address.

11.8.7 FOOTER

Function	• This function can be used to set whether or not the reception information (date received, number of pages, etc.) is printed at the bottom of each received document.
Use	

Setting/ procedure	• The default setting is OFF.
	
	  "OFF": No footer
	  ON: Add footer

A. Attaching footer print

When footer is selected ON, it is printed at the end of printable area. 4 mm line area from the end of printable area is kept for printing footer. It should be attached on footer area regardless of image length. If the received image is divided into 2 pages or more, footer is printed in the specified location of all the recording sheets of media printed.

Image data area:
The received image data is printed on the area except for 12 mm from recording media size. (No printable area: 8 mm ($1/_3$ in) + footer area: 4 mm ($1/_4$ in)) The following table is the image printable area of each recording media size due to setting of footer print.

Media length		Footer OFF	Footer ON	
		Image data area	Image data area	Footer area
A4S	297 mm	289 mm	285 mm	+4 mm
LetterS	279 mm	271 mm	267 mm	+4 mm
Legal	356 mm	348 mm	344 mm	+4 mm
Oficio	343 mm	335 mm	331 mm	+4 mm

11.8.8 SELECT TRAY

Function	• Select which paper tray can be used to supply paper when printing received documents
Use	or transmission reports.
Setting/procedure	• The default setting is TRAY1. "TRAY1" / TRAY2

11.9 REPORTING

11.9.1 ACTIVITY REPORT

Function	• Every 60 transmissions/receptions, a report can be printed to show the results of the
Use	transmissions/receptions. This function can be used to set whether the report is printed automatically when the 60th transmission/ reception is reached.
Setting/procedure	• The default setting is ON. "ON" / OFF

11.9.2 TX RESULT REPORT

Function	• This function can be used to set whether the report showing the result of a transmission
Use	is printed automatically after the transmission is finished.
Setting/procedure	• The default setting is ON (ERROR). ON / "ON (ERROR)" / OFF ON: Prints the report after each transmission. ON (ERROR): Prints the report after a transmission only if an error occurred. OFF: Does not print the report after each transmission, even if an error has occurred.

11.9.3 RX RESULT REPORT

Function	• This function can be used to set whether the report showing the result of a reception is
Use	printed automatically after mailbox reception is finished. (If regular reception is not finished normally, a report will always be printed, regardless of the selected setting.)
Setting/procedure	• The default setting is ON (ERROR). ON / "ON (ERROR)" / OFF ON: Prints the report after each reception. ON (ERROR): Prints the report after a reception only if an error occurred. OFF: Does not print the report after each reception, even if an error has occurred.

11.10 SCAN SETTING

11.10.1 RESOLUTION

Function	• The default settings for resolution used by the scan functions can be specified.
Use	
Setting/procedure	• The default setting is 150x150dpi. "150x150dpi" / 300x300dpi

11.10.2 IMAGE FORMAT

Function	• The default settings for data format used by the scan functions can be specified.
Use	
Setting/procedure	• The default setting is PDF. TIFF / "PDF" / JPEG

11.10.3 CODING METHOD

Function	• The default settings for coding method, used by the scan functions can be specified.
Use	
Setting/procedure	• The default setting is MH. "MH" / MR / MMR **NOTE** • **These settings are available only if B&W was selected for the color setting during the e-mail transmission.**

11.10.4 FILE SIZE

Function	• Specify the maximum data size (in Mb) for scan data sent by e-mail.
Use	
Setting/procedure	• The default setting is NO SPLIT. "NO SPLIT" / SPLIT • If SPLIT is selected, specify the maximum size between 1 and 10 Mb.

11.10.5 QUALITY PRIORITY

Function	• Select the scan data quality that is used as a default.
Use	
Setting/procedure	• The default setting is MIX. "MIX" / TEXT / PHOTO

11.10.6 DENSITY LEVEL

Function	• Select the scan data density that is used as a default.
Use	
Setting/ procedure	• The default setting is ◄□□□■□□►. (LIGHT) -2 / -1 / "0" / +1 / +2 (DARK)

12. User service mode

12.1 User service mode function tree

A. Procedure
1. Select [UTILITY] with the ▲/▼ key and press the Select key.
2. Keep on pressing ◄ key over two seconds.

B. Exiting
• Press the Stop/Reset key.

NOTE
• **<*1>: If engine is EU type, this item doesn't display.**

MAINTENANCE			Ref. page
FAX MAINTENANCE	TX SPEED		P.120
	RX SPEED		
	TX LEVEL		
	RX LEVEL		
	DTMF LEVEL		
	CNG LEVEL		
	CED LEVEL		
	ECM MODE		
	CODING SCHEME		
	TONER EMPTY REPORT		
	PROTOCOL REPORT		
	GDI TIMEOUT		
	TWAIN TIMEOUT		
	ENERGY SAVE MODE <*1>		
ADJUST	CIS MAIN ZOOM		P.120
	CIS SUB ZOOM		
	CIS MAIN REGIST		
	CIS SUB REGIST		
	ADF SUB ZOOM		
	ADF MAIN REG		
	ADF SUB REG		
	FLICKER		
	TOP ADJUSTMENT	PLAIN PAPER	
		THICK	
		ENVELOPE	
	LEFT ADJ. (FRONT)	LEFT ADJ TRAY1	
		LEFT ADJ TRAY2	
	LEFT ADJ. (BACK)	LEFT ADJ TRAY1	
		LEFT ADJ TRAY2	

MAINTENANCE			Ref. page
TRANSFER POWER	SIMPLEX PASS	PLAIN PAPER	P.120
		THICK1	
		THICK2	
		POSTCARD	
		ENVELOPE	
		LABEL	
	DUPLEX PASS	PLAIN PAPER	
IMAGE ADJ PRAM			

12.2 FAX MAINTENANCE

12.3 ADJUST

13. SERVICE MODE

13.1 SERVICE MODE entry procedure

NOTE
• **Ensure appropriate security for the Service Mode entry procedure. It should NEVER be given to any unauthorized person.**

A. Procedure
1. On the initial screen, press the following keys in this order.
   Select → Stop/Reset → 0 → 0 → Stop/Reset → 0 → 1

B. Exiting
• Press the Stop/Reset key.

13.2 SERVICE MODE function tree

NOTE
• **The function tree is shown to comply with the format displayed on the screen.**
• **<*1>: If engine is EU type, this item doesn't display.**
• **<*2>: Displayed only when the lower feeder unit is installed.**

SERVICE MODE			Ref. page
SERVICE'S CHOICE	TX SPEED		P.122
	RX SPEED		P.122
	TX LEVEL		P.122
	RX LEVEL		P.122
	DTMF LEVEL		P.122
	CNG LEVEL		P.123
	CED LEVEL		P.123
	ECM MODE		P.123
	CODING SCHEME		P.123
	TONER EMPTY REPORT		P.123
	PROTOCOL REPORT		P.123
	GDI TIMEOUT		P.123
	TWAIN TIMEOUT		P.124
	ENERGY SAVE MODE <*1>		P.124
	ENABLE WARNING	T/C LOW	P.124
		I/C LOW	P.124

SERVICE MODE				Ref. page
ADJUST	CIS MAIN ZOOM			P.124
	CIS SUB ZOOM			P.125
	CIS MAIN REGIST			P.125
	CIS SUB REGIST			P.126
	ADF SUB ZOOM			P.126
	ADF MAIN REG			P.127
	ADF SUB REG			P.127
	FLICKER			P.128
	TOP ADJUSTMENT	PLAIN PAPER		P.128
		THICK		
		ENVELOPE		
	LEFT ADJ. (FRONT)	TRAY1		P.128
		TRAY2		
	LEFT ADJ. (BACK)	TRAY1		P.128
		TRAY2		
	TRANSFER POWER	SIMPLEX PASS	PLAIN PAPER	P.128
			THICK1	
			THICK2	
			POSTCARD	
			ENVELOPE	
			LABEL	
		DUPLEX PASS	PLAIN PAPER	P.128
	IMAGE ADJ PARAM			P.128
	TEMPERATURE	PLAIN PAPER		P. 129
		THICK		
		ENVELOPE		
	SUPPLIES REPLACE	FUSER UNIT		P.129
		TRANSFER ROLLER		P.129
	BK CLEAR			P.129
COUNTER	TOTAL PRINT	TOTAL FACE		P.129
		COLOR COPY		P.129
		COLOR PRINT		P.129
		MONO COPY		P.129
		MONO PRINT		P.129
		FAX PRINT		P.129
		TOTAL DUP.		P.129
		D COLOR COPY		P.129
		D COLOR PRN		P.129
		D MONO COPY		P.129
		D MONO PRN		P.130

SERVICE MODE			Ref. page
	FAX COUNTER	TX JOB	P.130
		RX JOB	
	SCAN COUNTER	IR	P.130
		ADF	
	TRAY COUNTER	TRAY1	P.130
		TRAY2	
	PAPER SIZE COUNTER		P.130
	PAPER TYPE COUNTER		P.130
	APPLICATION COUNT.	COPY PRINT	P.130
		FAX RX PRN.	
		REPORT PRN.	
		PC PRINT	
		FAX TX	
		MAIL TX	
		SCAN TO FTP	
		SCAN TO SMB	
		SCAN TO USB	
		TWAIN	
		PICTBRIDGE	
		USB TO PRN.	
	SUPPLIES STATUS	C TONER	P.130
		M TONER	
		Y TONER	
		K TONER	
		I/C	
	CRU USAGE	TRASNFER BELT	P.130
		FUSER UNIT	
		TRANSFER ROLLER	
		DRUM UNIT	
	JAM COUNTER	PRINTER	P.130
		ADF	
	TROUBLE COUNTER	TOTAL	
DISPLAY	MAIN F/W VER.		P.131
	ENGINE F/W VER.		P.131
	MAIN RAM SIZE		P.131
	SERIAL NO.		P.131
	BB CPLD VERSION		P.131

SERVICE MODE			Ref. page
FUNCTION	PAPER FEED TEST	TRAY1	P.131
		TRAY2 <*2>	
	PRN TEST PATTERN	TRAY1 / PATTERN1	P.131
		PATTERN2	
		TRAY2 <*2> / PATTERN1	
		PATTERN2	
	ADF FEED TEST		P.132
	COPY ADF GLASS		P.132
	FAX RES. COPY TEST		P.132
	SCAN TEST		P.132
SOFT SWITCH			P.132
REPORT	SERVICE DATA LIST		P.132
	ERROR CODE LIST		P.134
	T.30 PROTOCOL LIST		P.134
ADMIN. REGISTRATION			P.135
FIXED ZOOM CHANGE	REDUCTION2		P.135
	REDUCTION1		
	EXPANSION1		
	EXPANSION2		
FACTORY TEST	SIGNAL TEST		P.135
	RELAY TEST		
	SENSOR TEST		
	DIAL TEST		
	VOLUME TEST		
	PANEL BUZZER TEST		
	RAM TEST		
CLEAR DATA	SRAM CLEAR		P.135
	MEMORY CLEAR		P.135

13.3 SERVICE'S CHOICE

13.3.1 TX SPEED

Function	• Transmit start speed setting. Choose the mode from among the following.
Use	

Setting/ procedure	• The default setting is V.34 33600bps.
	
	   "V.34": "33600", 31200, 28800, 26400, 24000, 21600, 19200, 16800
	   V.17: 14400, 12000, 9600, 7200
	   V.29: 9600, 7200
	   V.27: 4800, 2400

13.3.2 RX SPEED

Function	• Reception start speed setting. Choose the mode from among the following.
Use	

Setting/ procedure	• The default setting is V.34 33600bps.
	
	   "V.34": "33600", 31200, 28800, 26400, 24000, 21600, 19200, 16800
	   V.17: 14400, 12000, 9600, 7200
	   V.29: 9600, 7200
	   V.27: 4800, 2400

13.3.3 TX LEVEL

Function	• PSK/FSK signal output level.
Use	
Setting/ procedure	• The default setting is -9 dBm. -17 to -10 dBm ~ "-9 dBm" ~ -8 to -2 dBm

13.3.4 RX LEVEL

Function	• Reception sensitivity level.
Use	
Setting/ procedure	• The default setting is -43 dBm. -49 to -44 dBm ~ "-43 dBm" ~ -42 to -36 dBm

13.3.5 DTMF LEVEL

Function	• Dual tone output level.
Use	
Setting/ procedure	• The default setting is -9 dBm. -17 to -10 dBm ~ "-9 dBm" ~ -8 to -2 dBm

13.3.6 CNG LEVEL

Function	• Calling tone output level.
Use	
Setting/ procedure	• The default setting is -11 dBm. -17 to -12 dBm ~ "-11 dBm" ~ -10 to -2 dBm

13.3.7 CED LEVEL

Function	• Answer tone output level.
Use	
Setting/ procedure	• The default setting is -11 dBm. -17 to -12 dBm ~ "-11 dBm" ~ -10 to -2 dBm

13.3.8 ECM MODE

Function	• Select error correction mode.
Use	

Setting/ procedure	• The default setting is ON.
	
	  "ON": When an error occurs during communication, re-send the frame where the error occurs.
	  OFF: Any error is ignored during communication.

13.3.9 CODING SCHEME

Function	• Select compression method in TX/ RX mode.
Use	

Setting/ procedure	• The default setting is JBIG.
	
	  MMR: A compression method.
	  MR: A compression method.
	  MH: The simplest compression method.
	  "JBIG": The most complex compression method that generates the smallest code than any of following ones.

13.3.10 TONER EMPTY REPORT

Function	• Select to generate a report to a specific destination when toner empty status occurs in the engine.
Use	

Setting/ procedure	• The default setting is OFF.
	
	  ON: Generate a report to report destination.
	  "OFF": Not to generate report.
	• If "ON" is selected, select generate report and send to remote side when toner runs out.
	• Enter the telephone number for which the report is to be produced.
	• Fax number specifications: An up-to-20-digit number that may consist of [0-9], [*], [#], [pause], and [space]. (0-9, #, *, pause, _)
	• The report will generate after 20 minutes, 24 hours, 48 hours, or 72 hours after the event has occurred or until the condition is gone.

A. Toner empty report (example)

```
                                    ┌─────────────────┐
                                    │  SERVICE REPORT │
                                    └─────────────────┘
NAME:ABC 123
TEL:1234567
DATE: Jun 10.2008 15:12

The Fax's following conditions were appears, the machine may be can not work correctly, the Fax
already send a report to your dealer automatically. They will contact with you soon.

Toner Cartridge Cyan     : Empty
Toner Cartridge Magenta  : Full
Toner Cartridge Yellow   : Full
Toner Cartridge Black    : Full
```

A0FDF3C500DA

13.3.11 PROTOCOL REPORT

Function	• Print communication report.
Use	• Choose one from among the following.

Setting/ procedure	• The default setting is OFF.
	
	  "OFF": Disable T.30 communication report.
	  ON: Print T.30 communication report.
	  ON (ERROR): Print T.30 communication report when an error occurs.

13.3.12 GDI TIMEOUT

Function	• To specify the time for GDI time out.
Use	
Setting/ procedure	• The default setting is 60 sec. 5 sec / 10 sec / 20 sec / 30 sec / 40 sec / 50 sec / "60 sec"

13.3.13 TWAIN TIMEOUT

Function	• To specify the time for TWAIN time out.
Use	
Setting/ procedure	• The default setting is 6 min. 2min / 4min / "6min" / 8min / 10min / 12min / 14min / 16min / 18min

13.3.14 ENERGY SAVE MODE

Function	• Set weather to activate Energy Save mode when print job receiving or panel operation have not been made for a given period.
Use	
Setting/ procedure	• The default setting is ON. "ON" / OFF

13.3.15 ENABLE WARNING

A. T/C LOW

Function	• Specifies whether or not a warning appears when the toner is about to run out.
Use	
Setting/ procedure	• The default setting is ON. "ON" / OFF

B. I/C LOW

Function	• Specifies whether or not a warning appears when the print unit is about to reach the end of its service life.
Use	
Setting/ procedure	• The default setting is ON. "ON" / OFF

13.4 ADJUST

• Different adjust items are applicable and the corresponding adjust values become valid according to the specific sub-function of the main function (Copy, Fax, Twain, or NetScan) as detailed below.

Adjust item	Function							
	Copy		Fax		Twain		Scan	
	CIS	ADF	CIS	ADF	CIS	ADF	CIS	ADF
CIS MAIN ZOOM	O	O	O	O	X	X	X	X
CIS SUB ZOOM	O	X	O	X	X	X	X	X
CIS MAIN REGIST	O	X	O	X	O	X	O	X
CIS SUB REGIST	O	X	O	X	O	X	O	X
ADF SUB ZOOM	X	O	X	O	X	X	X	X
ADF MAIN REG	X	O	X	O	X	O	X	O
ADF SUB REG	X	O	X	O	X	O	X	O

13.4.1 CIS MAIN ZOOM

Function	• To adjust for variations in the accuracy of IR parts and their mounting accuracy by varying the scanning zoom ratio in the main scanning direction.
Use	• When the MFP board has been replaced. • When the scanner unit has been replaced. **NOTE** • **When the MFP board is replaced, the setting value is cleared. Re-entering a new setting value is necessary.**
Adjustment Specification	• Adjust the width of D in the copy of the test pattern1 so that the following specification is met. • 100 ± 0.5% (Zoom Ratio = Full Size:100%) 4139F3C548DA
Adjustment Range	• The default setting is 0%. • -2.0% ~ "0%" ~ +2.0% • Step: 0.2%
Setting/ Procedure	1. Print the test pattern1. See P.131 2. Enter the [ADJUST] menu in the service mode. 3. Select [CIS MAIN ZOOM] of [ADJUST] and press the Select key. 4. Place the test pattern1 on the Original Glass and make a test copy. **NOTE** • **The test pattern1 should be positioned vertically.** • **Use A4 or Letter paper loaded into tray1 to make the test copy.** 5. Check that the width of D in the copy of the test pattern1 meets the specification. Calculation: (1 - Width of D in the document ÷ Width of D in the copy) × 100 If the width of D is out of specification, adjust it according to the following procedure. 6. Press the Select key. 7. Using the ▲/▼ key, change the setting value and then press the Select key. 8. Place the test pattern1 on the Original Glass. Then, make a test copy again and check it.
Adjustment Instructions	• If the width of D in the test pattern is longer than the specified width ..... Decrease the setting. • If the width of D in the test pattern is shorter than the specified width ..... Increase the setting.

13.4.2   CIS SUB ZOOM

Function	• To adjust for variations in the accuracy of IR parts and their mounting accuracy by varying the scanning zoom ratio in the sub-scanning direction.
Use	• When the MFP board has been replaced. • When the Scanner unit has been replaced **NOTE** • **When the MFP board is replaced, the setting value is cleared. Re-entering a new setting value is necessary.**
Adjustment Specification	• Adjust the width of E in the copy of the test pattern1 so that the following specification is met. • 200 ± 0.5% (Zoom Ratio = Full Size:100%) E 4139F3C549DA
Adjustment Range	• The default setting is 0%. • -2.0% ~ "0%" ~ +2.0% • Step: 0.2%
Setting/ Procedure	*1.* Print the test pattern1. See P.131 *2.* Enter the [ADJUST] menu in the service mode. *3.* Select [CIS SUB ZOOM] of [ADJUST] and press the Select key. *4.* Place the test pattern1 on the Original Glass and make a test copy. **NOTE** • **The test pattern1 should be positioned vertically.** • **Use A4 or Letter paper loaded into tray1 to make the test copy.** *5.* Check that the width of E in the copy of the test pattern1 meets the specification. Calculation: (1 - Width of E in the document ÷ Width of E in the copy) × 100 If the width of E is out of specification, adjust it according to the following procedure. *6.* Press the Select key. *7.* Using the ▲/▼ key, change the setting value and then press the Select key. *8.* Place the test pattern1 on the Original Glass. Then, make a test copy again and check it.
Adjustment Instructions	• If the width of E in the test pattern is longer than the specified width ..... Decrease the setting. • If the width of E in the test pattern is shorter than the specified width ..... Increase the setting.

13.4.3   CIS MAIN REGIST

Function	• To adjust for variations in the accuracy of IR parts and their mounting accuracy by varying the scanning start position in the main scanning direction.
Use	• When the MFP board has been replaced. • When the original glass is replaced. • When the Scanner unit has been replaced **NOTE** • **When the MFP board is replaced, the setting value is cleared. Re-entering a new setting value is necessary.** • **After the [CIS MAIN ZOOM] adjustments have been performed**
Adjustment Specification	• Adjust the amount that widths A and B in the copy of the test pattern1 so that the following specification is met. • 0 ± 2.0 mm B A 4139F3C546DA
Adjustment Range	• The default setting is 0. • -5.0 (-5.0 mm) ~ "0.0 (0.0 mm)" ~ +5.0 (+5.0 mm) • Step: 0.5 mm
Setting/ Procedure	*1.* Print the test pattern1. See P.131 *2.* Enter the [ADJUST] menu in the service mode. *3.* Select [CIS MAIN REGIST] of [ADJUST] and press the Select key. *4.* Place the test pattern1 on the Original Glass and make a test copy. **NOTE** • **The test pattern1 should be positioned vertically.** • **Use A4 or Letter paper loaded into tray1 to make the test copy.** *5.* Check the amount that widths A and B in the copy of the test pattern are shifted. If the shift is out of specification, adjust it according to the following procedure. *6.* Press the Select key. *7.* Using the ▲/▼ key, change the setting value and then press the Select key. *8.* Place the test pattern1 on the Original Glass. Then, make a test copy again and check it.
Adjustment Instructions	• If the width of A is less than the width of B..... Increase the setting. • If the width of B is less than the width of A..... Decrease the setting.

13.4.4 CIS SUB REGIST

Function	• To adjust for variations in the accuracy of IR parts and their mounting accuracy by varying the scanning start position in the sub-scanning direction.
Use	• When the MFP board has been replaced. • When the original glass is replaced. • When the Scanner unit has been replaced **NOTE** • **When the MFP board is replaced, the setting value is cleared. Re-entering a new setting value is necessary.** • **After the [CIS SUB ZOOM] adjustments have been performed**
Adjustment Specification	• Adjust the width of C in the copy of the test pattern1 so that the following specification is met. • 20 ± 2.5 mm C 4139F3C547DA
Adjustment Range	• The default setting is 0. • -5.0 (-5.0 mm) ~ "0 (0 mm)" ~ +5.0 (+5.0 mm) • Step: 0.5 mm

Setting/ Procedure	*1.* Print the test pattern1.
	  See P.131
	2. Enter the [ADJUST] menu in the service mode.
	3. Select [CIS SUB REGIST] of [ADJUST] and press the Select key.
	4. Place the test pattern1 on the Original Glass and make a test copy.
	NOTE
	• **The test pattern1 should be positioned vertically.**
	• **Use A4 or Letter paper loaded into tray1 to make the test copy.**
	
	5. Check that the width of C in the copy of the test pattern are shifted.
	  If the width of C is out of specification, adjust it according to the following procedure.
	6. Press the Select key.
	7. Using the ▲/▼ key, change the setting value and then press the Select key.
	8. Place the test pattern1 on the Original Glass. Then, make a test copy again and check it.

Adjustment Instructions	• If the width of C in the test pattern is longer than the specified width
	  ..... Increase the setting.
	• If the width of C in the test pattern is shorter than the specified width
	  ..... Decrease the setting.

13.4.5 ADF SUB ZOOM

Function	• To adjust for variations in the accuracy of all parts and their mounting accuracy by varying the scanning zoom ratio in the sub-scanning direction (1-side) when using the Automatic Document Feeder.
Use	• When the MFP board has been replaced. • When the original glass is replaced. • When a new Auto Document Feeder Unit is mounted **NOTE** • **When the MFP board is replaced, the setting value is cleared. Re-entering a new setting value is necessary.** • **After the [CIS SUB ZOOM] adjustments have been performed**
Adjustment Specification	• Adjust the length of E in the copy of the test pattern so that the following specification is met. • 200 ± 0.5 % (Zoom Ratio = Full Size: 100 %) E 4139F3C549DA
Adjustment Range	• -2.0% ~ "0%" ~ +2.0% • Step: 0.4%

Setting/ Procedure	*1.* Print the test pattern1.
	  See P.131
	2. Enter the [ADJUST] menu in the service mode.
	3. Select [ADF SUB ZOOM], and press the Select key.
	4. Place test pattern 1 in the ADF with its printed surface up.
	5. Select [TEST COPY] and press the Select key to make a test copy.
	NOTE
	• **The test pattern1 should be positioned vertically.**
	• **Use A4 or Letter paper loaded into tray1 to make the test copy.**
	
	6. Check that the width of E in the copy of the test pattern1 meets the specification.
	  Calculation: (1 - Width of E in the document ÷ Width of E in the copy) × 100
	  If the width of E is out of specification, adjust it according to the following procedure.
	7. Select [ADJUST], and press the Select key.
	8. Using the ▲/▼ key, change the setting value and then press the Select key.
	9. Place the test pattern1 into the Automatic Document Feeder. Then, make a test copy again and check it.

Adjustment Instructions	• If the width of E in the test pattern is longer than the specified width
	  ..... Decrease the setting.
	• If the width of E in the test pattern is shorter than the specified width
	  ..... Increase the setting.

13.4.6 ADF MAIN REG

Function	• To adjust for variations in the accuracy of all parts and their mounting accuracy by varying the scanning start position in the main scanning direction (1-side) when using the Automatic Document Feeder.
Use	• When the MFP board has been replaced. • When the original glass is replaced. • When a new Auto Document Feeder Unit is mounted **NOTE** • **When the MFP board is replaced, the setting value is cleared. Re-entering a new setting value is necessary.** • **After the [CIS SUB ZOOM] adjustments have been performed** • **After the [ADF SUB ZOOM] adjustments have been performed**
Adjustment Specification	• Adjust the amount that widths A and B in the copy of the test pattern1 so that the following specification is met. • 0 ± 2.0 mm 4139F3C546DA
Adjustment Range	• -5.0 (-5.0 mm) ~ "0.0 (0.0 mm)" ~ +5.0 (+5.0 mm) • Step: 0.5 mm
Setting/ Procedure	1. Print the test pattern1. See P.131 2. Enter the [ADJUST] menu in the service mode. 3. Select [ADF MAIN REG], and press the Select key. 4. Place test pattern 1 in the ADF with its printed surface up. 5. Select [TEST COPY] and press the Select key to make a test copy. **NOTE** • **The test pattern1 should be positioned vertically.** • **Use A4 or Letter paper loaded into tray1 to make the test copy.** 6. Check the amount that widths A and B in the copy of the test pattern are shifted. If the shift is out of specification, adjust it according to the following procedure. 7. Select [ADJUST], and press the Select key. 8. Using the ▲/▼ key, change the setting value and then press the Select key. 9. Place the test pattern1 into the Automatic Document Feeder. Then, make a test copy again and check it.
Adjustment Instructions	• If the width of A is less than the width of B..... Increase the setting. • If the width of B is less than the width of A..... Decrease the setting.

13.4.7 ADF SUB REG

Function	• To adjust for variations in the accuracy of all parts and their mounting accuracy by varying the scanning start position in the sub-scanning direction (1-side) when using the Automatic Document Feeder.
Use	• When the MFP board has been replaced. • When the original glass is replaced. • When a new Auto Document Feeder Unit is mounted **NOTE** • **When the MFP board is replaced, the setting value is cleared. Re-entering a new setting value is necessary.** • **After the [CIS SUB ZOOM] adjustments have been performed** • **After the [ADF SUB ZOOM] adjustments have been performed**
Adjustment Specification	• Adjust the width of C in the copy of the test pattern1 so that the following specification is met. • 20 ± 2.5 mm 4139F3C547DA
Adjustment Range	• -5.0 (-5.0 mm) ~ "0 (0 mm)" ~ +5.0 (+5.0 mm) • Step: 0.5 mm
Setting/ Procedure	1. Print the test pattern1. See P.131 2. Enter the [ADJUST] menu in the service mode. 3. Select [ADF SUB REG], and press the Select key. 4. Place test pattern 1 in the ADF with its printed surface up. 5. Select [TEST COPY] and press the Select key to make a test copy. **NOTE** • **The test pattern1 should be positioned vertically.** • **Use A4 or Letter paper loaded into tray1 to make the test copy.** 6. Check that the width of C in the copy of the test pattern are shifted. If the width of C is out of specification, adjust it according to the following procedure. 7. Select [ADJUST], and press the Select key. 8. Using the ▲/▼ key, change the setting value and then press the Select key. 9. Place the test pattern1 into the Automatic Document Feeder. Then, make a test copy again and check it.
Adjustment Instructions	• If the width of C in the test pattern is longer than the specified width ..... Increase the setting. • If the width of C in the test pattern is shorter than the specified width ..... Decrease the setting.

13.4.8 FLICKER

Function	• Eliminates flickers of a room fluorescent light when it occurs due to power source use environment or similar reason.
Use	• Use when the fluorescent light flickers due to power source use environment or similar reason.
Setting/ procedure	• The default setting is 0. "0": Flicker control is determined according to an area code. 1: Flicker control is always on. 2: Flicker control is always off.

13.4.9 TOP ADJUSTMENT

Function	• Adjusts the top margin of media for single-sided printing.

Use	• To correct a misaligned print image.
	  PLAIN PAPER : Adjust the head margin of plain paper.
	  THICK : Adjust the head margin of thick paper.
	  ENVELOPE : Adjust the head margin of envelope.

Setting /procedure	1. Select [TOP ADJUSTMENT] and press the Select key. 2. Select desired paper type and press the Select key. 3. Select desired adjustment amount with the up key▲/down key▼ and press the Select key. -15 to +15 (1 step: 0.21 mm)

13.4.10 LEFT ADJ. (FRONT)

Function	• Adjusts the left margin of media for single-sided printing.

Use	• To correct a misaligned print image.
	  TRAY 1: Adjust the left margin of media fed from tray 1 (manual tray.)
	  TRAY 2: Adjust the left margin of media fed from tray 2.

Setting /procedure	1. Select [LEFT ADJ. (FRONT)] and press the Select key. 2. Select desired tray and press the Select key. 3. Select desired adjustment amount with the up key▲/down key▼ and press the Select key. -15 to +15 (1 step: 0.21 mm)

13.4.11 LEFT ADJ. (BACK)

Function	• Adjusts the left margin of media for double-sided printing.

Use	• To correct a misaligned print image.
	  TRAY 1: Adjust the left margin of duplex print media fed from tray 1 (manual tray.)
	  TRAY 2: Adjust the left margin of duplex print media fed from tray 2.

Setting /procedure	1. Select [LEFT ADJ. (BACK)] and press the Select key. 2. Select desired tray and press the Select key. 3. Select desired adjustment amount with the up key▲/down key▼ and press the Select key. -15 to +15 (1 step: 0.21 mm)

13.4.12 TRANSFER POWER

A. SIMPLEX PASS

Functions	• Adjust the 2nd image transfer output (ATVC) on the single-sided pages for each media type.
Use	• To use when the transfer failure at the trailing edge occurs.
Adjustment Range	• The default setting is 0. -8 ~ +7
Adjustment Instructions	To increase the ATVC value (in the direction of a foggier image), decrease the setting value. To decrease the ATVC value (in the direction of a less foggy image), increase the setting value.
Setting/ Procedure	1. Select [TRANSFER POWER] and press the Select key. 2. Select [SIMPLEX PASS] and press the Select key. 3. Select desired media type with the up key▲/down key▼ and press the Select key. 4. Select desired setting value with the up key▲/down key▼ and press the Select key.

B. DUPLEX PASS

Functions	• Adjust the 2nd image transfer output (ATVC) on the duplexed pages for each media type.
Use	• To use when the transfer failure at the trailing edge occurs.
Adjustment Range	• The default setting is 0. -8 ~ +7
Adjustment Instructions	To increase the ATVC value (in the direction of a foggier image), decrease the setting value. To decrease the ATVC value (in the direction of a less foggy image), increase the setting value.
Setting/ Procedure	1. Select [TRANSFER POWER] and press the Select key. 2. Select [DUPLEX PASS] and press the Select key. 3. Select desired media type with the up key▲/down key▼ and press the Select key. 4. Select desired setting value with the up key▲/down key▼ and press the Select key.

13.4.13 IMG ADJ PARAM

Function	• Adjusts the printer in case of an image quality problem (uneven density)
Use	• To correct image quality problems (uneven density) due to the printer being operated at a high altitude.
Setting /procedure	• The default setting is 0. "0": 0 V 1: -100 V 2: -200 V 3: -300 V **NOTE** • **When the setting has been changed, be sure to run a [CALIBRATION] process.** See P.105

13.4.14 TEMPERATURE

Function	• To adjust the fusing heating temperature individually for each paper type so as to ensure good fusing performance that varies with varying environmental conditions.
Use	• When fusing performance is poor, or wax streak or offset occurs when the type of paper is changed or environmental conditions change. • Use this function when curled paper, or paper misfeed as a result of the curled paper, occurs under varying environmental conditions or depending on the type of paper used.
Adjustment Range	PLAIN PAPER: -10 °C / -5 °C / 0 °C THICK: -10 °C / -5 °C / 0 °C ENVELOPE: -10 °C / -5 °C / 0 °C
Adjustment Instructions	If fusing performance is poor, increase the setting. If wax streaks occur, decrease the setting. If offset is poor, decrease the setting. If curling of the paper occurs, decrease the setting.
Setting /procedure	1. Select [TEMPERATURE] and press the Select key. 2. Select the type of paper and press the Select key. 3. Select desired setting value with the up key▲/down key▼ and press the Select key.

13.4.15 SUPPLIES REPLACE

A. FUSER UNIT

Function	• Resets the fuser unit counter.
Use	• To use when the fuser unit has been replaced.
Setting /procedure	1. Select [SUPPLIES REPLACE] → [FUSER UNIT]. 2. Press the Select key. 3. Press the Select key and reset the counter.

B. TRANSFER ROLLER

Function	• Resets the transfer roller counter.
Use	• To use when the transfer roller has been replaced.
Setting /procedure	1. Select [SUPPLIES REPLACE] → [TRANSFER ROLLER]. 2. Press the Select key. 3. Press the Select key and reset the counter.

13.4.16 BK CLEAR

Function	• To clear engine information backup data
Use	• Use when the engine information backup data is cleared. **NOTE** • **Execute this function to synchronize data when the MFP board or the printer control board is replaced with a new one.**
Setting /procedure	1. Select [BK CLEAR] and press the Select key. 2. Press the Select key and clear the backup data.

13.5 COUNTER

13.5.1 TOTAL PRINT

A. TOTAL FACE

Function	• Displays the total number of face.
Use	• When checking the total number of face.

B. COLOR COPY

Function	• Displays the number of color copies made.
Use	• When checking the number of color copies made.

C. COLOR PRINT

Function	• Displays the number of color printed pages produced.
Use	• When checking the number of color printed pages produced.

D. MONO COPY

Function	• Displays the number of monochrome copies made.
Use	• When checking the number of monochrome copies made.

E. MONO PRINT

Function	• Displays the number of monochrome printed pages produced.
Use	• When checking the number of monochrome printed pages produced.

F. FAX PRINT

Function	• Displays the number of FAX printed pages produced.
Use	• When checking the number of FAX printed pages produced.

G. TOTAL DUP.

Function	• Displays the total number of sheets of duplex copy or duplex print.
Use	• When checking the total number of sheets of duplex copy or duplex print.

H. D COLOR COPY

Function	• Displays the number of duplex color printed pages produced.
Use	• When checking the number of duplex color printed pages produced.

I. D COLOR PRN

Function	• Displays the number of duplex monochrome copies made.
Use	• When checking the number of duplex monochrome copies made.

J. D MONO COPY

Function	• Displays the number of duplex monochrome copies made.
Use	• When checking the number of duplex monochrome copies made.

K. D MONO PRN

Function	• Displays the number of duplex monochrome printed pages produced.
Use	• When checking the number of duplex monochrome printed pages produced.

13.5.2 FAX COUNTER

Function	• Displays the number of FAX printed pages produced.
Use	• When checking the number of FAX printed pages produced. TX JOB: Counter the number of transmission job. RX JOB: Counter the number of reception job.

13.5.3 SCAN COUNTER

Function	• To display the count of the scan counter.
Use	• When checking the number of scans made. IR: Count one when one time of IR action completed. ADF: Count the number of sheet of ADF scanning.

13.5.4 TRAY COUNTER

Function	• Displays the number of sheets of paper used for each tray.
Use	• The element to count is as follows. TRAY1, TRAY2

13.5.5 PAPER SIZE COUNTER

Function	• Displays the number of sheets of paper used for each size and type.
Use	• A paper size counter is as follows. A4, B5, A5, LEGAL, LETTER, OTHERS

13.5.6 PAPER TYPE COUNTER

Function	• Displays the number of sheets of paper used for each paper type.
Use	• A paper type counter is as follows. PLAIN PAPER, THICK, THICK2, ENVELOPE, LETTERHEAD, POSTCARD, LABEL

13.5.7 APPLICATION COUNT.

Function	• To display the count of the number of sheets of paper used for each of different applica-tions.
Use	• When checking the number of sheets of paper used for each of different applications. COPY PRINT: Number of copies made FAX RX PRN.: Number of printed pages received by Fax REPORT PRN.: Number of printed report pages PC PRINT: Number of printed pages produced from PC FAX TX: Number of transmitting to Fax. MAIL TX: Number of transmitting to mail server. SCAN TO FTP: Number of transmitting to FTP server. SCAN TO SMB: Number of transmitting to SMB. SCAN TO USB: Number of transmitting to USB memory. TWAIN: Number of transmitting to PCl. PICTBRIDGE: Number of sheets counts at the time of the completion of printing. * This machine is not supporting PictBridge. USB TO PRN.: Number of sheets counts at the time of the completion of USB printing.

13.5.8 SUPPLIES STATUS

Function	• Display toner and image unit status. C TONER: Displays the remaining amount of toner in the cyan (C) toner cartridge as a percentage. M TONER: Displays the remaining amount of toner in the magenta (M) toner cartridge as a percentage. Y TONER: Displays the remaining amount of toner in the yellow (Y) toner cartridge as a percentage. K TONER: Displays the remaining amount of toner in the black (K) toner cartridge as a percentage.
Use	I/C: Displays the remaining service life of the imaging unit as a percentage.

13.5.9 CRU USAGE

Function	• Displays the remaining life of the maintenance service parts.
Use	• To check the remaining life of the maintenance service parts. TRANSFER BELT: Displays the remaining life of the transfer belt. FUSER UNIT: Displays the remaining life of the fusing unit. TRANSFER ROLLER: Displays the remaining life of the transfer roller. DRUM UNIT: Displays the remaining life of the drum unit.

13.5.10 JAM COUNTER

Function	• Displays the number of misfeeds that have occurred.
Use	• When checking for the number of misfeeds that have occurred PRINTER, ADF

13.5.11 TROUBLE COUNTER

Function	• Displays the number of malfunctions detected.
Use	• When checking for the number of malfunctions detected TOTAL: Total numbers of all malfunctions detected.

13.6 DISPLAY

13.6.1 MAIN F/W VER.

Function	• Displays the version of the controller firmware.
Use	• When upgrading the firmware • When the image processing board has been replaced with a new one

13.6.2 ENGINE F/W VER.

Function	• Displays the version of the engine firmware.
Use	• When the printer control board has been replaced with a new one

13.6.3 MAIN RAM SIZE

Function	• Displays the size of the main memory.
Use	• When checking for the memory size

13.6.4 SERIAL NO.

Function	• Displays the serial number of the printer engine.
Use	• When checking for the printer serial number

13.6.5 BB CPLD VERSION

Function	• Displays the version of the BB CPLD firmware.
Use	

13.7 FUNCTION

13.7.1 PAPER FEED TEST

Function	• To check the paper feeding in the paper take-up/transport sections without printing on the paper.
Use	• When a paper misfeed occurs
Setting/ procedure	1. Select the [TRAY1] or [TRAY2]. 2. Press the Select key to begin testing paper feeding. 3. Press the Stop/Reset key to stop testing paper feeding. **NOTE** • **It cannot be operated at the time of warming up.** • **Don't count.**

13.7.2 PRN TEST PATTERN

A. PATTERN1

Function	• To print the test pattern for adjusting the image.
Use	• If there is tilt or when registration or zoom ratio adjustments are performed
Setting/ procedure	1. Select the [TRAY1] or [TRAY2]. 2. Select the [PATTERN1]. 3. Press the Select key to print the test pattern. 4139F3C550DA
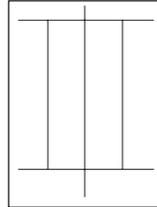
B. PATTERN2

Function	• To print the test pattern for halftones and gradations.
Use	• When checking density and pitch irregularities • When checking reproducibility of gradations
Setting/ procedure	1. Select the [TRAY1] or [TRAY2]. 2. Select the [PATTERN2]. 3. Press the Select key to print the test pattern. 4139F3C551DA
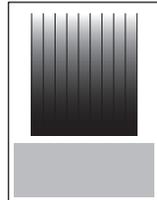
13.7.3 ADF FEED TEST

Function	• To check the paper feeding in the paper take-up/transport sections in the Automatic Document Feeder.
Use	• When a document misfeed occurs
Setting/ procedure	1. Load paper into the Automatic Document Feeder. 2. Press the Select key to begin testing paper feeding. 3. Press the Stop/Reset key to stop testing paper feeding.

13.7.4 COPY ADF GLASS

Function	• To check for dirt in the scanning section of the Automatic Document Feeder.
Use	• If spots appear in the copies
Setting/ procedure	1. Load A4S or LetterS paper into Tray1. 2. Press the Select key to start the [COPY ADF GLASS] function. 3. Two copy samples are fed out. 4. Check that no spots appear in the copy samples. 5. Press the Stop/Reset key to stop the [COPY ADF GLASS] function.

13.7.5 FAX RES. COPY TEST

Function	• Fax resolution copy test
Use	• To check whether the encoding/ decoding process is correct
Setting/ procedure	• The paper source is fixed to Tray1. (Tray cannot be changed.) • When A4 or Letter is not loaded in Tray1, operation of printing is not performed.

13.7.6 SCAN TEST

Function	• To check the lighting of the Exposure Lamp and the movement of the scanner.
Use	• If the scanner malfunctions
Setting/ procedure	1. Press the Select key to begin the scanner test. 2. Press the Stop/Reset key to stop the scanner test.

13.8 SOFT SWITCH

NOTE
- Refer to the chapter of soft switch for the explanation of soft switch.
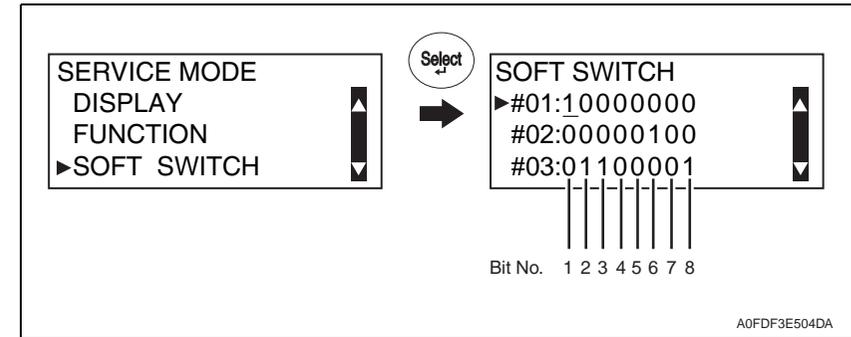
13.8.1 KEY DEFINITION FOR SOFT SWITCH

Key	Definition
▼	Soft Switch Number Forward.
▲	Soft Switch Number Backward.
▶	Bit No. Forward.
◀	Bit No. Backward.
1 or 0	Bit No. is changed.
Select	The setting value of Soft Switch Number is defined.

13.9 REPORT

13.9.1 SERVICE DATA LIST

Function	• Print service data list report and Error log history list.
Use	Service Data list includes the following items: • SOFT SWITCH • COMMUNICATION HISTORY & COUNTER • ADJUST • RX IN MEMORY • ADMINISTRATOR PASSWORD • MAIN RAM SIZE • ROM ID Error log history list includes the following items: • Index: Index number from 0 - 9999 • Error: Error code number • Maker: NSF frame maker code • Tell.: Remote side or TX side telephone number for that transaction
Setting/ procedure	1. Enter the [SERVICE MODE]. 2. Select [REPORT] and press the Select key. 3. Select [SERVICE DATA LIST] and press the Select key.

(1) SERVICE DATA LIST

```
                    SERVICE DATA LIST

NAME:Amber AIO
TEL :1234567
DATE:JUL.02.2005 11:55

--SOFT  SWITCH --
SW01-SW16      00 20 80 0C 00 00 07 61 00 81 00 80 10 00 01 03
SW17-SW32      00 00 68 00 80 06 00 00 00 28 00 A7 14 68 00 00
SW33-SW48      C0 82 10 8A 00 C1 00 08 00 00 00 04 00 06 00 89
SW49-SW64      01 00 00 00 00 B0 00 00 00 00 00 21 0F 00 80 10

--COMMUNICATION HISTORY & COUNTER --
000001: ECM RX TIME          000000: ECM TX TIME
000008: G3 RX TIME           000000: G3 RX PAGE
000000: V.17 14.4K           000000: V.17 12K
000000: V.17 9.6K            000000: V.17 7.2K
000000: V.29 9.6K            000000: V.29 7.2K
000000: V.27 4.8K            000001: V.27 2.4K
000001: G3 TX TIME           000000: G3 TX PAGE
000000: V.17 14.4K           000000: V.17 12K
000000: V.17 9.6K            000000: V.17 7.2K
000000: V.29 9.6K            000000: V.29 7.2K
000000: V.27 4.8K            000000: V.27 2.4K
000027: V.34 RX TIME         000007: V.34 RX PAGE
000002: 33.6K                000005: 31.2K
000000: 28.8K                000000: 26.4K
000000: 24.0K                000000: 21.6K
000000: 19.2K                000000: 16.8K
000000: 9.6K                 000000: 7.2K
000000: 4.8K                 000000: 2.4K
000000: V.34 TX TIME         000015: V.34 TX PAGE
000000: 33.6K                000006: 31.2K
000000: 28.8K                000000: 26.4K
000000: 24.0K                000000: 21.6K
000000: 19.2K                000000: 16.8K
000000: 9.6K                 000000: 7.2K
000000: 4.8K                 000000: 2.4K
000007: JBIG TX TIME         000007: JBIG RX TIME
000000: TOTAL COUNTER
000849: COPY PRINT           000000: FAX PRINT
000127: REPORT PRINT         000000: PC PRINT

-- ADJUST --
CIS MAIN ZOOM    : 0   LEFT ADJ BACK          IMAGE ADJ PARAM   : 0
CIS SUB ZOOM     : 0     TRAY1          : 0
CIS MAIN REGIST  : 0     TRAY2          : 0   TEMPERATURE
CIS SUB REGIST   : 0                            PLAIN PAPER       : 0
                       TRANSFER POWER            THICK PAPER       : 0
ADF MAIN REGIST  : 0     SIMPLEX PASS            ENVELOPE          : 0
ADF SUB ZOOM     : 0       PLAIN PAPER    : 0
ADF SUB REGIST   : 0       THICK1         : 0
                          THICK2         : 0
FLICKER          : 0       POSTCARD       : 0
                          ENVELOPE       : 0
TOP ADJUSTMENT            LABEL          : 0
 PLAIN PAPER     : 0     DUPLEX PASS
 THICK PAPER     : 0       PLAIN PAPER    : 0
 ENVELOPE        : 0

LEFT ADJ FRONT
 TRAY1           : 0
 TRAY2           : 0

RX IN MEMORY      :
ADMIN. PASSWORD  :000000
MAIN RAM SIZE    : 128Mb

-- ROM ID --
MAIN  : 06/14/2007 V001
BOOT  : 07/16/2007 V0.03
ENGINE: A00F-50F0-0302-00

                                          A0HFF3E505DA
```

(2) ERROR LOG HISTORY LIST (example)

- The following table is the error log history. The table keeps the last 40 records only.

```
                    ERROR LOG HISTORY LIST
```

Index	Error	Maker	Tele.
0001	:00A0	4230	88634733507
0002	:00A0	49EE	
0003	:0070	0000	
0004	:0070	0000	
0005	:0070	0000	
0006	:0070	0000	
0007	:0070	0000	
0008	:0070	0000	
0009	:0070	0000	123

NSF signal 3rd. and 4th byte   Keep 20 digits of TSI or CSI

4139F3E552DA

13.9.2 ERROR CODE LIST

Function	• Print error code (CODE) and error occurrence time (ERROR TIMES).
Use	
Setting/ procedure	1. Enter the [SERVICE MODE]. 2. Select [REPORT] and press the Select key. 3. Select [ERROR CODE LIST] and press the Select key.

(1) ERROR CODE LIST (example)

ERROR CODE LIST

CODE	ERROR TIMES	CODE	ERROR TIMES	CODE	ERROR TIMES
0001	00000000	0002	00000000	0003	00000000
0004	00000000	0005	00000000	0006	00000000
0007	00000000	0008	00000000	0009	00000000
000A	00000000	000B	00000000	000C	00000000
000D	00000000	000E	00000000	000F	00000000
0010	00000000	0011	00000000	0012	00000000
0013	00000000	0014	00000000	0015	00000000
0016	00000000	0017	00000000	0018	00000000
0019	00000000	001A	00000000	001B	00000000
001C	00000000	001D	00000000	001E	00000000
001F	00000000	0020	00000000	0021	00000000
0022	00000000	0023	00000000	0024	00000000
0025	00000000	0026	00000000	0027	00000000
0028	00000000	0029	00000000	002A	00000000
002B	00000000	002C	00000000	002D	00000000
002E	00000000	002F	00000000	0030	00000000
0031	00000000	0032	00000000	0033	00000000
0034	00000000	0035	00000000	0036	00000000
0037	00000000	0038	00000000	0039	00000000
003A	00000000	003B	00000000	003C	00000000
003D	00000000	003E	00000000	003F	00000000
0040	00000000	0041	00000000	0042	00000000
0043	00000000	0044	00000000	0045	00000000
0046	00000000	0047	00000000	0048	00000000
0049	00000000	004A	00000000	004B	00000000
004C	00000000	004D	00000000	004E	00000000
004F	00000000	0050	00000000	0051	00000000
0052	00000000	0053	00000000	0054	00000000
0055	00000000	0056	00000000	0057	00000000
0058	00000000	0059	00000000	005A	00000000
005B	00000000	005C	00000000	005D	00000000
005E	00000000	005F	00000000	0060	00000000
0061	00000000	0062	00000000	0063	00000000
0064	00000000	0065	00000000	0066	00000000
0067	00000000	0068	00000000	0069	00000000
006A	00000000	006B	00000000	006C	00000000
006D	00000000	006E	00000000	006F	00000000
0070	00000000	0071	00000000	0072	00000000
0073	00000002	0074	00000000	0075	00000000
0076	00000000	0077	00000000	0078	00000017
0079	00000000	007A	00000000	007B	00000000
007C	00000000	007D	00000000	007E	00000000
007F	00000000	0080	00000000	0081	00000000
0082	00000000	0083	00000001	0084	00000000
0085	00000000	0086	00000000	0087	00000000
0088	00000000	0089	00000000	008A	00000000
008B	00000000	008C	00000000	008D	00000000
008E	00000000	008F	00000000	0090	00000000
0091	00000001	0092	00000000	0093	00000000
0094	00000000	0095	00000000	0096	00000000
0097	00000000	0098	00000000	0099	00000000
009A	00000000	009B	00000000	009C	00000000
009D	00000000	009E	00000000	009F	00000000
00A0	00000024	00A1	00000000	00A2	00000000
00A3	00004558	00A4	00000002	00A5	00000000
00A6	00000001	00A7	00000000	00A8	00000000
00A9	00000001	00AA	00000000	00AB	00000000
00AC	00000000	00AD	00000000	00AE	00000000
00AF	00000000	00B0	00000000	00B1	00000000
00B2	00000000	00B3	00000000	00B4	00000000
00B5	00000000	00B6	00000000	00B7	00000000
00B8	00000000	00B9	00000000	00BA	00000000
00BB	00000000	00BC	00000000	00BD	00000000
00BE	00000000	00BF	00000000	00C0	00000000
00C1	00000000	00C2	00000000	00C3	00000000
00C4	00000000	00C5	00000000	00C6	00000000
00C7	00000000	00C8	00000000	00C9	00000000
00CA	00000000	00CB	00000000	00CC	00000000
00CD	00000000	00CE	00000000	00CF	00000000
00D0	00000000	00D1	00000000	00D2	00000000
00D3	00000000	00D4	00000000	00D5	00000000
00D6	00000000	00D7	00000000	00D8	00000000
00D9	00000000	00DA	00000000	00DB	00000000
00DC	00000000	00DD	00000000	00DE	00000000
00DF	00000000	00E0	00000000	00E1	00000000
00E2	00000000	00E3	00000000	00E4	00000000
00E5	00000000	00E6	00000000	00E7	00000000
00E8	00000000	00E9	00000000	00EA	00000000
00EB	00000000	00EC	00000000	00ED	00000000
00EE	00000000	00EF	00000000	00F0	00000000
00F1	00000000	00F2	00000000	00F3	00000000
00F4	00000000	00F5	00000000	00F6	00000000
00F7	00000000	00F8	00000000	00F9	00000000
00FA	00000000	00FB	00000000	00FC	00000000
00FD	00000000	00FE	00000006	00FF	00000002

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13.9.3 T.30 PROTOCOL LIST

Function	Print out T.30 or V8 protocol after communication.
Use	• SESSION: Session number • FUNCTION: Function Name • DESTINATION STATION: Destination Name/Tel. No. • DATE/TIME: Communication Date & Time • PAGE: Total page number for this session • MODE: Communication speed and ECM mode • RESULT: Communication result • TX: T.30 command sent by local Fax • RX: T.30 command received from remote Fax • DATA: T.30 frame that include address & control & Data
Setting/ procedure	1. Enter the [SERVICE MODE]. 2. Select [REPORT] and press the Select key. 3. Select [T.30 PROTOCOL LIST] and press the Select key.

(1) V.17 Communication (example)

PROTOCOL MONITOR REPORT

NAME:TMFP
TEL :886 3 4733507
DATE:APR.10.2008 12:20

SESSION	FUNCTION	NO.	DESTINATION STATION	DATE	TIME	PAGE	DURATION	MODE	RESULT
0001	RX	001	ABC_ABC_ABC 35353535353535353535	MAY.29	14:51	001	00h00min35s	ECM -14.4	OK

TX	RX	DATA
CED		
NSF		FF 03 20 64 00 00 00 A0 88 CB 04 00 18 20 00 00 00 10 01 00
NSF		FF 03 20 64 00 00 00 A0 88 CB 00 00 00 00 00 00 00 10 01 00 00 01 06
DIS		FF 13 80 00 EE AA C4 80 91 80 80 20
	NSS	FF 03 23 64 00 00 00 A0 88 CB 04 00 00 00 00 00 00 00 02 0B 41 42 43 5F 41 42 43 5F 41 42 43
	NSS	FF 03 23 64 00 00 00 A0 88 CB 00 00 00 00 00 00 00 10 01 00 00
	TSI	FF 03 43 35 33 35 33 35 33 35 33 35 33 35 33 35 33 35 33
	DCS	FF 13 83 00 22 F0 84 80 80 80 80 80 20
	►TCF	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
CFR		FF 13 84
	►PIX	BF 13 BF 2F 00 00 51
	PPS-EOP	FF 13 8C
MCF		FF 13 8C
	DCN	FF 13 FB

TRAINING PHASE

DATA PHASE

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(2) V.34 Communication (example)

```
                    ┌─────────────────────────────┐
                    │   PROTOCOL MONITOR REPORT   │
                    └─────────────────────────────┘
NAME:TMFP
TEL :886 3 4733507
DATE:APR.10.2008 12:20
```

SESSION	FUNCTION	NO.	DESTINATION STATION	DATE	TIME	PAGE	DURATION	MODE	RESULT
0001	TX	010	27187480	OCT.27	17:19	008	00h00min03s	ECM	OK
								-33.6	

TX	RX	DATA
	ANS	
CM	JM	V.8 PROTOCOL DUMP
CJ	NSF	FF 03 20 00 00 25 00 00 00 12 10 6D 02 00 58 00 28 B8 A4 A0 80 91 60
	NSF	FF 03 20 00 00 25 01 45 43 4E 45 59 45 4B
	CSI	FF 03 40 30 38 34 37 38 31 37 32 20 20 20 20 20 20 20 20 20
	DIS	FF 13 80 20 EE A8 C4 80 98 81 80 80 60
DCS		FF 13 83 00 02 F0 84 80 80 80 80 80 20
►PIX	CFR	FF 13 84
PPS-EOP		FF 13 BF 2F 00 00 7F
	MCF	FF 13 8C
DCN		FF 13 FB

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13.10 ADMIN. REGISTRATION

Function	• Use to display or change the current Administrator number.
Use	
Setting/ procedure	• Administrator number: 000000 to 999999 1. Enter the [SERVICE MODE]. 2. Select [ADMIN. REGISTRATION] and press the Select key. 3. Check that the current ADMIN. No. is displayed and then press the [Back] key. 4. Enter the new ADMIN. No. from the 10-key pad and press the Select key.

13.11 FIXED ZOOM CHANGE

Function	• The fixed zoom ratios can be changed.
Use	
Setting/ procedure	1. Enter the [SERVICE MODE]. 2. Select [FIXED ZOOM CHANGE] and press the Select key. 3. Select the fixed zoom ratio that you wish to change and press the Select key. 4. Use the 10-Key Pad to type in the desired fixed zoom ratio.

• Default fixed zoom ratios and setting ranges according to marketing area
<Metric>

Setting name	Initial fixed zoom ratio	Setting range
REDUCTION2	70%	51% to 70%
REDUCTION1	81%	71% to 99%
EXPANSION1	115%	101% to 140%
EXPANSION2	141%	141% to 199%

<Inch>

Setting name	Initial fixed zoom ratio	Setting range
REDUCTION2	64%	51% to 64%
REDUCTION1	78%	65% to 99%
EXPANSION1	129%	101% to 153%
EXPANSION2	154%	154% to 199%

13.12 FACTORY TEST

• This test is for factory adjustment only and should NOT be used.

	Functions/Use
SIGNAL TEST	• This test is for factory adjustment only and should NOT be used.
RELAY TEST	• This test is for factory adjustment only and should NOT be used.
SENSOR TEST	• This test is for factory adjustment only and should NOT be used.
DIAL TEST	• This test is for factory adjustment only and should NOT be used.
VOLUME TEST	• To check the volume of the speaker.
PANEL BUZZER TEST	• To check the operation of the display and all indicators and buttons. • When the panel buzzer test are finish, press the panel reset key twice.
RAM TEST	• To test reading and writing of the memory.

13.13 CLEAR DATA

13.13.1 SRAM CLEAR

Function	To clear the settings for the functions listed at the right and return the functions to their default settings.
Use	The following items are cleared (initialization). • Menu mode (Except for [ADMIN. MANAGEMENT] - [USER SETTING] - [DATE&TIME] that keeps its setting value): • Only [USER SERVICE MODE] of the user service mode: Set to default • Only [TX/RX Result] of the Display mode: Clear • Only [SERVICE'S CHOICE] and [SOFT SWITCH] of the Service mode: Set to default
Setting/ procedure	**NOTE** • **Before executing [SRAM CLEAR], be sure to record the setting values that are to be initialized through [SRAM CLEAR].** • **For the record of the setting values, it is a good idea to have reports and lists printed.** • **Some setting values are not included any of these reports or lists. Be sure to make a note of them separately.** • **After [SRAM CLEAR] has been executed, make necessary entries of data again based on the setting values recorded.**

13.13.2 MEMORY CLEAR

Function	To clear the settings for the functions listed at the right and return the functions to their default settings.
Use	The following items are cleared (initialization). • Only [SERVICE'S CHOICE] and [FIXED ZOOM CHANGE] of the Service mode: Set to default
Setting/ procedure	**NOTE** • **Before executing [MEMORY CLEAR], be sure to record the setting values that are to be initialized through [MEMORY CLEAR].** • **For the record of the setting values, it is a good idea to have reports and lists printed.** • **Some setting values are not included any of these reports or lists. Be sure to make a note of them separately.** • **After [MEMORY CLEAR] has been executed, make necessary entries of data again based on the setting values recorded.**

14. SOFT SWITCH set

14.1 Description

This machine is equipped with totally 64 soft switches that are used for fax adjustment in order to conform to the standard of each country.
The default setting is changeable.

The default setting of soft switch is automatically changed according to the following settings.
• The marketing area is set in procedures of [UTILITY] → [ADMIN. MANAGEMENT] → [USER SETTING] → [PTT SETTING].
• The marketing area is set at [PTT Setting] by using LSU utility software.
• When the setting is made in the procedures of [SERVICE MODE] → [CLEAR DATA] → [SRAM CLEAR], the default setting is defined according to the current setting of marketing area.

Bit No. can be changed with the following way.
• [SOFT SWITCH] of [SERVICE MODE].

SERVICE MODE
 DISPLAY
 FUNCTION
▶SOFT SWITCH

Select

SOFT SWITCH
▶#01:10000000
 #02:00000100
 #03:01100001

Bit No. 1 2 3 4 5 6 7 8

A0FDF3E504DA
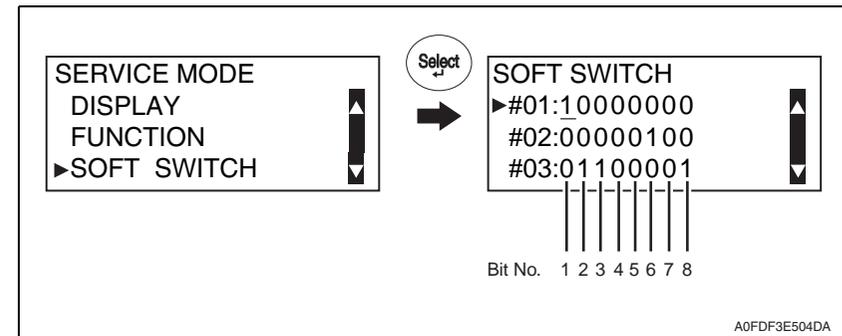
Hex-binary conversion list		HEX															
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Bit No.	4 (8)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	3 (7)	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
	2 (6)	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
	1 (5)	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1

14.2 Default setting

14.2.1 Country for each marketing area

NOTE
• **A different country may be applicable depending on the communications standard.**
• **The marketing area settings is set in the procedure of [UTILITY] → [ADMIN. MANAGEMENT] → [USER SETTING] → [PTT SETTING].**

14.2.2 Soft switch list

Soft Switch No.	Bit No.	Designation	Page No.
#01	2/1	V.34 CI signal byte number	P.150
#02	8/7	Time between phase C to phase D signal in V.17	P.150
	6	Header TX selection open to user	
	3/2	Transmit RTN signal level criteria	
#03	8	Send out NSF frame with station ID	P.151
	7	Number of Pause within phone number	
	6	Re-dial prohibit for NO ANSWER	
	4/3/2/1	RX level setting	
#04	4	Visible alarm for RTN signal	P.151
	3	Audible alarm for RTN signal	
#05	8/7	Push button ON/OFF Timing (PB)	P.152
	6/5	Relation between 10 key # & No.of dial pulse	
	3	10PPS/20PPS	
	2/1	PPS ratio	
#06	8/7	Ring on time to ignore ring off time at 1st cycle	P.152
	4/3	Ring off time at 1st cycle to approve incoming ring	
#07	8	Dial tone or busy tone detection	P.152
	7	PSTN/PBX setting	
	6	PBX dial tone detect	
	5	Dial mode select	
	4/3/2/1	TX level select for PSK/FSK	
#08	7	Detect busy tone after dialing	P.153
	6	Sending CED signal after connection	
#09	8/7	Ringer frequency detection	P.153
	5	TSI/CSI append "+"	
	2/1	Time from RX DIS signal to send DCS signal	
#10	8	Print out RTN page report	P.153
	7	Confirmation report result field	
	6/5	Get gap time between digit for pulse dial	
	4	RX PIP T.30 command after send out MPS command	
	3	Received DIS signal within reception	
	2	Transmission time limitation	
	1	Audio alarm after communication fail	
#11	7	Detect dial tone after pre-fix number	P.154
	6	Pulse dial allowed to select	
	5	Protocol signal display mode	
	2	USB port number fixed	
	1	DTMF low frequency compensation	

Soft Switch No.	Bit No.	Designation	Page No.
#12	8	ECM mode capability	P.154
	7/6	V.34 fall back counter for V.34 TX	
	5	Send CTC after 4th PPR	
	3	Send EOR after lowest speed	
	2/1	TCF transmission timing after DCS signal	
#13	8	MR capability for G3	P.155
	7/6	Delay time between transaction	
	5	Super fine printing capability for receiving	
	3	DTS mode	
	2	Send DTC signal if RX DIS signal in manual RX mode (no function on G4)	
#14	6	Memory size level to RX	P.155
	3/2/1	Time between V.34 ANSam signal and FSK DIS signal	
#15	8	IPSEL1	P.155
	7	DCSEL	
	6	DCLIM	
#16	2/1	Fax communication coding method	P.155
#17	6	CED frequency	P.156
	5/4/3	Pause between off hook and CED signal	
	2/1	Inactivity timer [T5]	
#18	6/5	G3 mode training quality level	P.156
	4/3/2/1	Redefine re-dial attempts counter	
#19	8/7/6/5	CNG signal level	P.157
	4/3/2/1	DTMF high frequency level	
#20	—	Reserved	P.157
#21	8	NSS signal before DCS	P.157
	7/6	CNG sending duration after dialing	
	5	T4 timer	
	4	VOIP (Voice over IP)	
	3	DIS signal length	
	2/1	Increase default T1 timing during calling (Only for TX function)	
#22	4/3/2/1	CED signal output level	P.158
#23	4/3/2/1	DTMF low frequency level	P.158
#24	7/6/5/4/3/2/1	Re-dial interval	P.158
#25	4/3	Flash key time	P.159
#26	8/7	Dial tone detection time before disconnected	P.160
#27	—	Reserved	P.160
#28	8/7/6/5	Time to dial after dial tone on the line	P.160
	4/3/2/1	CED duration time within calling period	
#29	5/4/3/2/1	Time to dial after seize the line when dial tone detection	P.161

Soft Switch No.	Bit No.	Designation	Page No.
#30	8/7	Pause delay time within digits	P.161
	6/5/4/3/2/1	Signal tone insensitivity (dBm) after dial for busy tone	
#31	7/6/5	Min re-dial interval	P.162
	4/3/2/1	Max. re-dial attempts	
#32	—	Reserved	P.162
#33	7	V.17 Echo protection tone	P.162
	6	V.29 Echo protection tone	
	5	Compromise equalize enable (CEQ) in the transmit path (TCEQ)	
	4	Compromise equalize enable (CEQ) in the receiver path (RCEQ)	
#34	—	Reserved	P.162
#35	8/7	Dial tone table switch time	P.163
	6/5/4	Dial tone frequency upper range index	
	3/2/1	Dial tone frequency low range index	
#36	8	Re-dial attempts continue fail counter (Using for detect line problem error)	P.163
	4/3/2/1	Re-dial attempts fail limitation counter (Using for detect line problem error)	
#37	7	Auto dial learning for V.34 modem	P.164
	6/5/4	RX start symbol rate for V.34 modem	
	3/2/1	TX start symbol rate for V.34 modem	
#38	7	Set/Reset V.34 transmit level deviation	P.164
	6/5	V.34 flag number between ECM frame	
	4	Phase 2 guard tone power level (V.34)	
	1	V.8 /V.34 capability	
#39	8	Disable V.34 TX for V.34 modem	P.164
	7	Disable V.34 RX for V.34 modem	
	6/5	Flags number in FSK frame for V.34 modem	
	4	Manual TX mode for V.34 modem	
	3	Switch from V.17 to V.34 if DIS Bit 6 set after received DIS	
	2/1	Delay time in primary channel for V.34 transmit after CFR or MCF signal	
#40	8/7/6/5	V.17 RX start speed select receiving start speed for V.17	P.165
	3/2/1	V.34 RX start speed prohibit V.34 mode when upper speed less	
#41	8/7/6/5	V.17 TX start speed select receiving start speed for V.17	P.165
	3/2/1	V.34 TX start speed prohibit V.34 mode when upper speed less	
#42	8/7/6/5/4/3/2/1	Reserved	P.166
#43	8/7/6/5/4/3/2/1	Reserved	P.166
#44	—	Reserved	P.166

Soft Switch No.	Bit No.	Designation	Page No.
#45	5	Call transfer	P.166
	4/3/2/1	No. of call transfer	
#46	8	Daylight savings timer	P.166
	4	RX print mode	
	3	Default TX mode	
	2	Header for FAX TX	
	1	Print model name on top of TX page if name not register	
#47	6	RX mode	P.167
	5	Footer	
#48	8	Activity report	P.167
	7/6	TX result report	
	5/4	RX result report	
#49	5	Re-dial method if Comm. Fail	P.167
	4/3/2/1	No. of rings	
#50	8	Transmit or cancel after time out in "Memory TX"	P.167
#51	4/3	T30 monitor report selection	P.168
	2	Send unsent page mode for memory transmission	
#52	—	Reserved	P.168
#53	—	Reserved	P.168
#54	8	Report Date/Time type	P.168
	7/6	Report Date/Time format	
	5/4	Memory near full capacity for Fax and I-Fax scanning	
	3/2	Memory near full capacity for N-Scan scanning	
#55	—	Reserved	P.169
#56	—	Reserved	P.169
#57	—	Reserved	P.169
#58	8	Time out from PSK to FSK delay time	P.169
#59	6/5/4/3/2/1	Time Between GMT (Greenwich Mean Time)	P.170
#60	6	Quick memory TX	P.171
	2	Off hook alarm after communication	
	1	Display destination selection within TX phase C	
#61	4/3/2/1	Max. No. of ring	P.171
#62	—	Reserved	P.172
#63	8	"#" key definition in PBX mode	P.172
	2	Fax TX image adjust	
	1	TX result report with image	
#64	6	Print RX error report in RX side if no any FAX signal detected	P.172
	5	10 PPS & 20 PPS selectable by user	

14.2.3 Default soft switch setting for each market area

A. Market area 1

Soft Switch No.	U.S.A Bit No.								United Kingdom Bit No.								Argentina Bit No.								Australia Bit No.							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
#01	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#02	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
#03	0	1	1	0	0	0	0	1	0	1	1	0	0	0	1	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	1	1
#04	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0
#05	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
#06	0	0	1	1	0	0	1	0	0	0	1	1	0	0	1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	1	0
#07	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0	1
#08	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0
#09	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
#10	1	0	0	0	0	1	0	1	1	1	1	1	0	1	1	1	1	0	0	0	0	1	0	1	1	1	1	1	1	1	0	1
#11	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#12	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
#13	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0
#14	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
#15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
#16	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0
#17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#18	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
#19	0	0	0	1	0	1	1	0	1	1	0	1	0	1	1	0	1	1	0	1	0	1	1	0	0	0	0	1	0	1	1	0
#20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#21	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
#22	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0
#23	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0
#24	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
#25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#28	1	1	1	0	0	1	0	1	1	1	1	0	1	0	1	0	1	1	1	0	0	1	0	1	1	1	1	0	1	0	1	1
#29	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0
#30	0	0	0	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	0	1	1	0
#31	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	1	0	0
#32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#33	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
#34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#35	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1
#36	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1
#37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Soft Switch No.	U.S.A Bit No.								United Kingdom Bit No.								Argentina Bit No.								Australia Bit No.							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
#38	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0
#39	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#46	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
#47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#48	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1
#49	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#54	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1
#55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#59	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	1	0	1	0	0	0
#60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#61	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0
#62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#63	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
#64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

B. Market area 2

Soft Switch No.	Austria Bit No. 1-2-3-4-5-6-7-8	Belgium Bit No. 1-2-3-4-5-6-7-8	Brazil Bit No. 1-2-3-4-5-6-7-8	Canada Bit No. 1-2-3-4-5-6-7-8
#01	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#02	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0	0 0 0 0 0 0 0 0
#03	0 1 1 0 0 0 1 1	0 1 1 0 0 0 1 1	0 1 1 0 0 0 0 1	0 1 1 0 0 0 0 1
#04	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0
#05	0 1 0 0 0 0 1 1	0 1 0 0 0 0 1 1	0 1 0 0 0 0 1 1	0 0 0 0 0 0 0 0
#06	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0
#07	0 0 0 1 0 0 0 1	0 0 0 1 0 0 0 1	0 0 0 1 0 0 0 0	1 1 1 0 0 0 0 0
#08	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0
#09	0 0 0 0 1 0 0 0	0 0 0 0 1 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#10	1 1 1 1 0 1 1 1	1 1 1 1 0 1 1 1	1 0 0 0 0 1 0 1	1 0 0 0 0 1 0 1
#11	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 1 0 0
#12	0 0 1 0 0 0 0 1	0 0 1 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1
#13	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 0 0 1 0 0 0	0 0 0 0 1 0 0 0
#14	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#15	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#16	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0
#17	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#18	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#19	1 1 0 1 0 1 1 0	1 1 0 1 0 1 1 0	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0
#20	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#21	0 0 0 0 0 0 1 1	0 0 0 0 0 0 1 1	0 0 0 0 0 0 1 1	0 0 0 0 0 0 0 1
#22	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0
#23	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 0 1 0 0 0 0 0	0 0 1 0 0 0 0 0
#24	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#25	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#26	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#27	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#28	1 1 1 0 1 0 1 0	1 1 1 0 1 0 1 0	1 1 1 0 0 1 0 1	1 1 1 0 0 1 0 1
#29	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0
#30	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0
#31	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0
#32	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#33	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0
#34	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#35	0 0 0 0 0 1 0 1	0 0 0 0 0 1 0 1	0 0 0 0 1 0 0 1	0 0 0 0 0 1 0 1
#36	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1
#37	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#38	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0

Soft Switch No.	Austria Bit No. 1-2-3-4-5-6-7-8	Belgium Bit No. 1-2-3-4-5-6-7-8	Brazil Bit No. 1-2-3-4-5-6-7-8	Canada Bit No. 1-2-3-4-5-6-7-8
#39	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#40	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#41	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#42	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#43	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#44	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#45	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#46	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 1
#47	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#48	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1
#49	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#50	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#51	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#52	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#53	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#54	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1
#55	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#56	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#57	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#58	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#59	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 1 0 0 1 0 0	0 1 0 1 0 1 0 0
#60	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#61	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0
#62	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#63	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1
#64	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0

C. Market area 3

Soft Switch No.	China Bit No. 1 2 3 4 5 6 7 8	Czech Bit No. 1 2 3 4 5 6 7 8	Denmark Bit No. 1 2 3 4 5 6 7 8	Europe Bit No. 1 2 3 4 5 6 7 8
#01	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#02	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0
#03	0 1 1 0 0 0 0 1	0 1 1 0 0 0 1 1	0 1 1 0 0 0 1 1	0 1 1 0 0 0 1 1
#04	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0
#05	1 0 0 0 0 0 1 1	0 1 0 0 0 0 1 1	0 1 0 0 0 0 1 1	0 1 0 0 0 0 1 1
#06	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0
#07	0 0 0 1 0 0 0 0	0 0 0 1 0 0 0 1	0 0 0 1 0 0 0 1	0 0 0 1 0 0 0 1
#08	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0
#09	0 0 0 0 1 0 0 0	0 0 0 0 1 0 0 0	0 0 0 0 1 0 0 0	0 0 0 0 1 0 0 0
#10	1 1 1 1 0 1 0 1	1 1 1 1 0 1 1 1	1 1 1 1 0 1 1 1	1 1 1 1 0 1 1 1
#11	0 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#12	0 0 0 0 1 0 0 1	0 0 1 0 0 0 0 1	0 0 1 0 0 0 0 1	0 0 1 0 0 0 0 1
#13	0 0 0 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0
#14	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#15	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1
#16	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0
#17	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#18	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#19	0 0 0 1 0 1 1 0	1 1 0 1 0 1 1 0	1 1 0 1 0 1 1 0	1 1 0 1 0 1 1 0
#20	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#21	0 0 0 0 0 0 0 1	0 0 0 0 0 0 1 1	0 0 0 0 0 0 1 1	0 0 0 0 0 0 1 1
#22	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0
#23	0 0 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0
#24	1 0 1 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#25	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#26	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#27	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#28	1 1 1 0 0 1 0 1	1 1 1 0 1 0 1 0	1 1 1 0 1 0 1 0	1 1 1 0 1 0 1 0
#29	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0
#30	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0
#31	0 1 0 1 1 0 1 0	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0
#32	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#33	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0
#34	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#35	0 0 0 0 0 1 0 1	0 0 0 0 0 1 0 1	0 0 0 0 0 1 0 1	0 0 0 0 0 1 0 1
#36	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1
#37	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#38	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0

Soft Switch No.	China Bit No. 1 2 3 4 5 6 7 8	Czech Bit No. 1 2 3 4 5 6 7 8	Denmark Bit No. 1 2 3 4 5 6 7 8	Europe Bit No. 1 2 3 4 5 6 7 8
#39	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#40	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#41	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#42	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#43	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#44	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#45	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#46	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0
#47	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#48	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1
#49	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#50	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#51	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#52	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#53	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#54	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1
#55	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#56	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#57	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#58	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#59	0 0 0 0 1 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#60	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#61	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0
#62	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#63	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1
#64	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0

D. Market area 4

Soft Switch No.	Finland Bit No.								France Bit No.								Germany Bit No.								Greece Bit No.							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
#01	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#02	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
#03	0	1	1	0	0	0	1	1	0	1	1	0	0	0	1	1	0	1	1	0	0	0	1	1	0	1	1	0	0	0	1	1
#04	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0
#05	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1
#06	0	0	1	1	0	0	1	0	0	0	1	1	0	0	1	0	0	0	1	1	0	0	1	0	0	0	1	1	0	0	1	0
#07	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1
#08	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0
#09	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0
#10	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1
#11	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#12	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1
#13	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0
#14	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
#15	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
#16	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0
#17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#18	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
#19	1	1	0	1	0	1	1	0	1	1	0	1	0	1	1	0	1	1	0	1	0	1	1	0	1	1	0	1	0	1	1	0
#20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#21	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
#22	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0
#23	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0
#24	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
#25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#28	1	1	1	0	1	0	1	0	1	1	1	0	1	0	1	0	1	1	1	0	1	0	1	0	1	1	1	0	1	0	1	0
#29	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0
#30	0	0	0	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	0	1	1	0
#31	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0
#32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#33	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
#34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#35	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1
#36	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1
#37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#38	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0
#39	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#46	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
#47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#48	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1
#49	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#54	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1
#55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#59	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
#60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#61	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0
#62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#63	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
#64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

E. Market area 5

Soft Switch No.	Hong Kong Bit No. 1 2 3 4 5 6 7 8	Hungary Bit No. 1 2 3 4 5 6 7 8	Ireland Bit No. 1 2 3 4 5 6 7 8	Israel Bit No. 1 2 3 4 5 6 7 8
#01	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#02	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0
#03	0 1 1 0 0 0 0 1	0 1 1 0 0 0 1 1	0 1 1 0 0 0 1 1	0 1 1 0 0 0 1 1
#04	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0
#05	0 0 0 0 0 0 0 0	0 1 0 0 0 0 1 1	0 1 0 0 0 0 1 1	0 1 0 0 0 0 1 1
#06	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0
#07	1 1 1 0 0 0 0 0	0 0 0 1 0 0 0 1	0 0 0 1 0 0 0 1	0 0 0 1 0 0 0 1
#08	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0
#09	0 0 0 0 0 0 0 0	0 0 0 1 0 0 0 0	0 0 0 1 0 0 0 0	0 0 0 1 0 0 0 0
#10	1 0 0 0 0 1 0 1	1 1 1 1 0 1 1 1	1 1 1 1 0 1 1 1	1 1 1 1 0 1 1 1
#11	0 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#12	0 0 0 0 0 0 0 1	0 0 1 0 0 0 0 1	0 0 1 0 0 0 0 1	0 0 1 0 0 0 0 1
#13	0 0 0 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0
#14	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#15	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1
#16	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0
#17	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#18	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#19	0 0 0 1 0 1 1 0	1 1 0 1 0 1 1 0	1 1 0 1 0 1 1 0	1 1 0 1 0 1 1 0
#20	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#21	0 0 0 0 0 0 1 1	0 0 0 0 0 0 1 1	0 0 0 0 0 0 1 1	0 0 0 0 0 0 1 1
#22	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0
#23	0 1 0 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0
#24	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#25	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#26	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#27	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#28	1 1 1 0 0 1 0 1	1 1 1 0 1 0 1 0	1 1 1 0 1 0 1 0	1 1 1 0 1 0 1 0
#29	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0
#30	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0
#31	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0
#32	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#33	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0
#34	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#35	0 0 0 0 1 0 0 1	0 0 0 0 0 1 0 1	0 0 0 0 0 1 0 1	0 0 0 0 0 1 0 1
#36	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1
#37	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#38	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0

Soft Switch No.	Hong Kong Bit No. 1 2 3 4 5 6 7 8	Hungary Bit No. 1 2 3 4 5 6 7 8	Ireland Bit No. 1 2 3 4 5 6 7 8	Israel Bit No. 1 2 3 4 5 6 7 8
#39	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#40	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#41	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#42	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#43	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#44	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#45	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#46	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0
#47	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#48	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1
#49	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#50	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#51	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#52	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#53	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#54	0 0 0 1 0 1 0 0	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1
#55	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#56	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#57	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#58	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#59	0 0 0 0 1 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#60	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#61	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0
#62	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#63	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1
#64	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0

F. Market area 6

Soft Switch No.	Italy Bit No. 1 2 3 4 5 6 7 8	Korea Bit No. 1 2 3 4 5 6 7 8	Malaysia Bit No. 1 2 3 4 5 6 7 8	Mexico Bit No. 1 2 3 4 5 6 7 8
#01	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#02	0 0 0 0 0 1 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0
#03	0 1 1 0 0 0 1 1	0 1 1 0 0 0 0 1	0 1 1 0 0 0 0 1	0 1 1 0 0 0 0 1
#04	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0
#05	0 1 0 0 0 0 1 1	1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#06	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0
#07	0 0 0 1 0 0 0 1	0 0 0 1 0 0 0 0	1 1 1 0 0 0 0 0	0 0 0 1 0 0 0 0
#08	0 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0
#09	0 0 0 0 1 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#10	1 1 1 1 0 1 1 1	1 0 0 0 0 1 0 1	1 0 0 0 0 1 0 1	1 0 0 0 0 1 0 1
#11	1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#12	0 0 1 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1
#13	0 0 1 0 1 0 0 0	0 0 0 0 1 0 0 0	0 0 0 0 1 0 0 0	0 0 0 0 1 0 0 0
#14	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#15	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#16	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0
#17	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#18	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#19	1 1 0 1 0 1 1 0	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0
#20	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#21	0 0 0 0 0 0 1 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 1 1	0 0 0 0 0 0 1 1
#22	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0
#23	0 1 1 0 0 0 0 0	0 0 1 0 0 0 0 0	0 0 1 0 0 0 0 0	0 0 1 0 0 0 0 0
#24	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#25	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#26	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#27	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#28	1 1 1 0 1 0 1 0	1 1 1 0 0 1 0 1	1 1 1 0 0 1 0 1	1 1 1 0 0 1 0 1
#29	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0
#30	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0
#31	0 1 0 1 0 1 0 0	0 1 0 1 1 0 0 0	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0
#32	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#33	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0
#34	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#35	0 0 0 0 0 1 0 1	0 0 0 0 1 0 0 1	0 0 0 0 1 0 0 1	0 0 0 0 1 0 0 1
#36	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1
#37	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#38	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0

Soft Switch No.	Italy Bit No. 1 2 3 4 5 6 7 8	Korea Bit No. 1 2 3 4 5 6 7 8	Malaysia Bit No. 1 2 3 4 5 6 7 8	Mexico Bit No. 1 2 3 4 5 6 7 8
#39	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#40	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#41	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#42	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#43	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#44	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#45	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#46	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0
#47	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#48	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1
#49	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#50	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#51	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#52	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#53	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#54	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 0	0 0 0 1 0 1 0 1
#55	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#56	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#57	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#58	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#59	0 1 0 0 0 0 0 0	0 1 0 0 1 0 0 0	0 0 0 0 1 0 0 0	0 0 1 1 0 1 0 0
#60	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#61	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0
#62	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#63	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1
#64	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0

G. Market area 7

Soft Switch No.	Netherlands Bit No.								New Zealand Bit No.								Norway Bit No.								Philippines Bit No.							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
#01	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#02	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
#03	0	1	1	0	0	0	1	1	0	1	1	0	0	0	1	1	0	1	1	0	0	0	1	1	0	1	1	0	0	0	0	1
#04	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0
#05	0	1	0	0	0	0	1	1	0	0	0	0	0	1	1	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	0	0
#06	0	0	1	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	1	0	0	0	1	1	0	0	1	0
#07	0	0	0	1	0	0	0	1	0	1	1	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0
#08	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0
#09	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
#10	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	0	0	0	0	1	0	1
#11	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#12	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1
#13	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0
#14	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
#15	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
#16	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0
#17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#18	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
#19	1	1	0	1	0	1	1	0	0	0	0	1	0	1	1	0	1	1	0	1	0	1	1	0	0	0	0	1	0	1	1	0
#20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#21	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
#22	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0
#23	0	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0
#24	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
#25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#28	1	1	1	0	1	0	1	0	1	1	1	0	0	1	0	1	1	1	1	0	1	0	1	0	1	1	1	0	0	1	0	1
#29	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0
#30	0	0	0	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	0	1	1	0
#31	0	1	0	1	0	1	0	0	0	1	0	1	1	0	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0
#32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#33	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
#34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#35	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	1
#36	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1
#37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#38	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0

Soft Switch No.	Netherlands Bit No.								New Zealand Bit No.								Norway Bit No.								Philippines Bit No.							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
#39	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#46	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
#47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#48	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1
#49	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#54	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1
#55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#59	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
#60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#61	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0
#62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#63	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
#64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

H. Market area 8

Soft Switch No.	Poland Bit No. 1 2 3 4 5 6 7 8	Portugal Bit No. 1 2 3 4 5 6 7 8	Russia Bit No. 1 2 3 4 5 6 7 8	Saudi Arabia Bit No. 1 2 3 4 5 6 7 8
#01	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#02	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0
#03	0 1 1 0 0 0 1 1	0 1 1 0 0 0 1 1	0 1 1 0 0 0 1 1	0 1 1 0 0 0 1 1
#04	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0
#05	0 1 0 0 0 0 1 1	0 1 0 0 0 0 1 1	0 1 0 0 0 0 1 1	0 1 0 0 0 0 1 1
#06	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0
#07	0 0 0 1 0 0 0 1	0 0 0 1 0 0 0 1	0 0 0 1 0 0 0 1	0 0 0 1 0 0 0 1
#08	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0
#09	0 0 0 0 1 0 0 0	0 0 0 0 1 0 0 0	0 0 0 0 1 0 0 0	0 0 0 0 1 0 0 0
#10	1 1 1 1 0 1 1 1	1 1 1 1 0 1 1 1	1 1 1 1 0 1 1 1	1 1 1 1 0 1 1 1
#11	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#12	0 0 1 0 0 0 0 1	0 0 1 0 0 0 0 1	0 0 1 0 0 0 0 1	0 0 1 0 0 0 0 1
#13	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0
#14	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#15	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1
#16	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0
#17	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#18	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#19	1 1 0 1 0 1 1 0	1 1 0 1 0 1 1 0	1 1 0 1 0 1 1 0	1 1 0 1 0 1 1 0
#20	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#21	0 0 0 0 0 0 1 1	0 0 0 0 0 0 1 1	0 0 0 0 0 0 1 1	0 0 0 0 0 0 1 1
#22	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0
#23	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0
#24	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#25	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#26	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#27	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#28	1 1 1 0 1 0 1 0	1 1 1 0 1 0 1 0	1 1 1 0 1 0 1 0	1 1 1 0 1 0 1 0
#29	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0
#30	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0
#31	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0
#32	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#33	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0
#34	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#35	0 0 0 0 0 1 0 1	0 0 0 0 0 1 0 1	0 0 0 0 0 1 0 1	0 0 0 0 0 1 0 1
#36	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1
#37	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#38	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0
#39	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#40	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#41	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#42	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#43	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#44	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#45	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#46	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0
#47	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#48	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1
#49	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#50	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#51	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#52	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#53	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#54	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1
#55	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#56	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#57	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#58	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#59	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#60	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#61	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0
#62	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#63	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1
#64	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0

I. Market area 9

Soft Switch No.	Singapore Bit No. 1 2 3 4 5 6 7 8	Slovakia Bit No. 1 2 3 4 5 6 7 8	South Africa Bit No. 1 2 3 4 5 6 7 8	Spain Bit No. 1 2 3 4 5 6 7 8
#01	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#02	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0	0 0 0 0 0 1 0 0
#03	0 1 1 0 0 0 0 1	0 1 1 0 0 0 1 1	0 1 1 0 0 0 0 1	0 1 1 0 0 0 1 1
#04	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0	0 0 1 1 0 0 0 0
#05	1 0 0 0 0 0 0 0	0 1 0 0 0 0 1 1	0 0 0 0 0 0 0 0	0 1 0 0 0 0 1 1
#06	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0	0 0 1 1 0 0 1 0
#07	0 0 0 1 0 0 0 1	0 0 0 1 0 0 0 1	0 1 0 1 0 0 0 0	0 0 0 1 0 0 0 1
#08	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0	0 0 0 0 0 1 1 0
#09	0 0 0 0 0 0 0 0	0 0 0 0 1 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 1 0 0 0
#10	1 0 0 0 0 1 0 1	1 1 1 1 0 1 1 1	1 0 0 0 1 1 0 1	1 1 1 1 0 1 1 1
#11	0 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#12	0 0 0 0 0 0 0 1	0 0 1 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 1 0 0 0 0 1
#13	0 0 0 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 0 0 1 0 0 0	0 0 1 0 1 0 0 0
#14	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#15	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1
#16	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0	1 1 0 0 0 0 0 0
#17	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#18	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#19	1 1 0 1 0 1 1 0	1 1 0 1 0 1 1 0	1 1 0 1 0 1 1 0	1 1 0 1 0 1 1 0
#20	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#21	0 0 0 0 0 0 1 1	0 0 0 0 0 0 1 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 1 1
#22	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0
#23	1 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0	1 1 1 0 0 0 0 0	0 1 1 0 0 0 0 0
#24	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 1 0 0 0 0 0 0
#25	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#26	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#27	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#28	1 1 1 0 0 1 0 1	1 1 1 0 1 0 1 0	1 1 1 0 0 1 0 1	1 1 1 0 1 0 1 0
#29	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0	0 0 1 0 1 0 0 0
#30	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 0	0 0 0 1 0 1 1 1	0 0 0 1 0 1 1 0
#31	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0	0 1 0 1 0 1 0 0
#32	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#33	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0	0 0 0 0 0 0 1 0
#34	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#35	0 0 0 0 1 0 0 1	0 0 0 0 0 1 0 1	0 0 0 0 1 0 0 1	0 0 0 0 0 1 0 1
#36	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1	0 1 0 1 0 0 0 1
#37	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#38	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0	1 0 0 0 0 1 1 0
#39	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#40	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#41	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#42	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#43	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#44	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#45	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#46	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0	0 1 0 1 0 0 0 0
#47	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#48	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1
#49	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0
#50	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#51	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#52	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#53	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#54	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1	0 0 0 1 0 1 0 1
#55	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#56	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#57	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#58	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#59	0 0 0 0 1 0 0 0	0 1 0 0 0 0 0 0	0 0 1 0 0 0 0 0	0 1 0 0 0 0 0 0
#60	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#61	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0	1 1 1 1 0 0 0 0
#62	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
#63	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1
#64	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0

J. Market area 10

Soft Switch No.	Sweden Bit No.								Switzerland Bit No.								Taiwan Bit No.								Turkey Bit No.							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
#01	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#02	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
#03	0	1	1	0	0	0	1	1	0	1	1	0	0	0	1	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	1	1
#04	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0
#05	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
#06	0	0	1	1	0	0	1	0	0	0	1	1	0	0	1	0	0	0	1	1	0	0	1	0	0	0	1	1	0	0	1	0
#07	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1
#08	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0
#09	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
#10	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	0	0	0	0	1	0	1	1	1	1	1	0	1	1	1
#11	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#12	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
#13	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0
#14	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
#15	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
#16	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0
#17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#18	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
#19	1	1	0	1	0	1	1	0	1	1	0	1	0	1	1	0	1	1	0	1	0	1	1	0	1	1	0	1	0	1	1	0
#20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#21	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
#22	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0
#23	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0
#24	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
#25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#28	1	1	1	0	1	0	1	0	1	1	1	0	1	0	1	0	1	1	1	0	0	1	0	1	1	1	1	0	1	0	1	0
#29	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0
#30	0	0	0	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	0	1	1	0
#31	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0	0
#32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#33	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
#34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#35	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1
#36	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1
#37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#38	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0
#39	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#46	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
#47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#48	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1
#49	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
#50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#54	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1
#55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#59	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
#60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#61	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0
#62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#63	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
#64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

K. Market area 11

Soft Switch No.	Marketing area Vietnam Bit No.							
	1	2	3	4	5	6	7	8
#01	1	0	0	0	0	0	0	0
#02	0	0	0	0	0	1	0	0
#03	0	1	1	0	0	0	1	1
#04	0	0	1	1	0	0	0	0
#05	1	0	0	0	0	0	1	1
#06	0	0	1	1	0	0	1	0
#07	0	0	0	1	0	0	0	1
#08	0	0	0	0	0	1	1	0
#09	0	0	0	0	1	0	0	0
#10	1	1	1	1	0	1	1	1
#11	1	0	0	0	0	0	0	0
#12	0	0	0	0	0	0	0	1
#13	0	0	1	0	1	0	0	0
#14	0	1	0	0	0	0	0	0
#15	0	0	0	0	1	1	0	1
#16	1	1	0	0	0	0	0	0
#17	0	0	0	0	0	0	0	0
#18	0	1	0	0	0	0	0	0
#19	1	1	1	0	0	1	1	0
#20	0	0	0	0	0	0	0	0
#21	0	0	0	0	0	0	1	1
#22	0	1	1	0	0	0	0	0
#23	1	1	0	0	0	0	0	0
#24	0	1	0	0	0	0	0	0
#25	0	0	0	0	0	0	0	0
#26	0	0	0	0	0	0	0	0
#27	0	0	0	0	0	0	0	0
#28	1	1	1	0	1	0	1	0
#29	0	0	1	0	1	0	0	0
#30	0	0	0	1	0	1	1	0
#31	0	1	0	1	0	1	0	0
#32	0	0	0	0	0	0	0	0
#33	0	0	0	0	0	0	1	0
#34	0	0	0	0	0	0	0	0
#35	0	0	0	0	0	1	0	1
#36	0	1	0	1	0	0	0	1
#37	0	0	0	0	0	0	0	0
#38	1	0	0	0	0	1	1	0

Soft Switch No.	Marketing area Vietnam Bit No.							
	1	2	3	4	5	6	7	8
#39	1	0	0	0	0	0	0	0
#40	0	0	0	0	0	0	0	0
#41	0	0	0	0	0	0	0	0
#42	0	0	0	0	0	0	0	0
#43	0	0	0	0	0	0	0	0
#44	0	0	0	0	0	0	0	0
#45	0	0	0	0	0	0	0	0
#46	0	1	0	1	0	0	0	0
#47	0	0	0	0	0	0	0	0
#48	0	0	0	1	0	1	0	1
#49	1	0	0	0	0	0	0	0
#50	0	0	0	0	0	0	0	0
#51	0	0	0	0	0	0	0	0
#52	0	0	0	0	0	0	0	0
#53	0	0	0	0	0	0	0	0
#54	0	0	0	1	0	1	0	1
#55	0	0	0	0	0	0	0	0
#56	0	0	0	0	0	0	0	0
#57	0	0	0	0	0	0	0	0
#58	0	0	0	0	0	0	0	0
#59	0	1	1	1	0	0	0	0
#60	0	0	0	0	0	0	0	0
#61	1	1	1	1	0	0	0	0
#62	0	0	0	0	0	0	0	0
#63	0	0	0	0	0	0	0	1
#64	0	0	0	0	0	0	0	0

14.3 Soft switch definition

NOTE

[shaded] : Default settings of U.S.

14.3.1 SOFT SWITCH: #01

Bit No.	Designation	Function						Initial Setting	
								Bit	HEX
8	Reserved	Reserved						0	0
7								0	
6								0	
5								0	
4								0	1
3								0	
2	V.34 CI signal byte number	Byte number	30 bytes	**15 bytes**	9 bytes	60 bytes		0	
		Bit No. 2	0	**0**	1	1			
1		Bit No. 1	0	**1**	0	1		1	

14.3.2 SOFT SWITCH: #02

Bit No.	Designation	Function					Initial Setting	
							Bit	HEX
8	Time between phase C to phase D signal in V.17	RX Insensitivity	**70 ms**	120 ms	180 ms	60 ms	0	0
		Bit No. 8	**0**	0	1	1		
7	Example: Image → EOP	Bit No. 7	**0**	1	0	1	0	
6	Header TX selection open to user	**0: No**					0	
		1: Yes						
5	Reserved	Reserved					0	
4							0	0
3	Transmit RTN signal level criteria	Percentage of error line	**10%**	15%	20%	25%	0	
		Bit No. 3	**0**	0	1	1		
2		Bit No. 2	**0**	1	0	1	0	
1	Reserved	Reserved					0	

• Bit 2-3: In G3 mode, if error line for each page, machine will send RTN instead of RTN, in this case, some machine will resend the same page again. The retry times depend on other end.

• Bit 6: If this bit set to "0", the header select function can not change by user, only changeable by serviceman in service mode.

14.3.3 SOFT SWITCH: #03

Bit No.	Designation	Function						Initial Setting Bit	Initial Setting HEX
8	Send out NSF frame with station ID	**1: Yes**						1	8
		0: No							
7	Number of Pause within phone number	**0: No any limitation**						0	
		1: Max. up to 2 "P" within inputted telephone number							
6	Re-dial prohibit for NO ANSWER	**0: Continue to dial**						0	
		1: Not allowed to re-dial if no any FAX signal or detected busy tone after dialing							
5	Reserved	Reserved						0	
4	RX level setting	RX level	-49 dB	-48 dB	-47 dB	-46 dB	-45 dB	0	6
		Bit No. 4	0	0	0	0	0		
		Bit No. 3	0	0	0	0	1		
		Bit No. 2	0	0	1	1	0		
		Bit No. 1	0	1	0	1	0		
3		RX level	-44 dB	**-43 dB**	-42 dB	-41 dB	-40 dB	1	
		Bit No. 4	0	**0**	0	1	1		
		Bit No. 3	1	**1**	1	0	0		
		Bit No. 2	0	**1**	1	0	0		
		Bit No. 1	1	**0**	1	0	1		
2		RX level	-39 dB	-38 dB	-37 dB	-36 dB		1	
		Bit No. 4	1	1	1	1			
		Bit No. 3	0	0	1	1			
		Bit No. 2	1	1	0	0			
		Bit No. 1	0	1	0	1			
1		RX level	Reserved					0	
		Bit No. 4	1	1					
		Bit No. 3	1	1					
		Bit No. 2	1	1					
		Bit No. 1	0	1					

- Bit 8: This bit set to 1, the answer machine will send machine name by NSF frame after connection.
- Bit 7: Can input Pause key to insert pause time between digits, this can put more than one "P" at the end of telephone number to increase calling time (T) after calling. In this case can use "P" to increase T1 time during calling to other parties.

14.3.4 SOFT SWITCH: #04

Bit No.	Designation	Function	Initial Setting Bit	Initial Setting HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5			0	
4	Visible alarm for RTN signal	0: No	1	C
		1: Yes - display message while sending / receiving RTN signal (RTN= Retrain Negative).		
3	Audible alarm for RTN signal	0: No	1	
		1: Yes - alarm for sending or receiving RTN signal.		
2	Reserved	Reserved	0	
1			0	

- Bit 3: The duration of alarm last 3 second after detect negative signal in G3 mode.
- Bit 4: The display message will keep on LCD 3 seconds or until next incoming T30 signal.

14.3.5 SOFT SWITCH: #05

Bit No.	Designation	Function					Initial Setting Bit	HEX
8	Push button ON/OFF Timing (PB)	Timing (ms)	ON: 100 OFF: 140	ON: 70 OFF: 70	ON: 70 OFF: 140	ON: 90 OFF: 90	0	
		Bit No. 8	0	0	1	1		
7		Bit No. 7	0	1	0	1	0	
6	Relation between 10 key # & No.of dial pulse	#1	1	2	9		0	0
		#2	2	3	8			
		#3	3	4	7			
		#4	4	5	6			
		#5	5	6	5	Reserved		
		#6	6	7	4			
		#7	7	8	3			
		#8	8	9	2			
		#9	9	10	1			
5		#0	10	1	10		0	
		Bit No. 6	0	0	1	1		
		Bit No. 5	0	1	0	1		
4	Reserved	Reserved					0	
3	10PPS/20PPS	0: 10PPS					0	
		1: 20PPS						
2	PPS ratio	PPS ratio (%)	33	40	30	Reserved	0	0
		Bit No. 2	0	0	1	1		
1		Bit No. 1	0	1	0	1	0	

14.3.6 SOFT SWITCH: #06

Bit No.	Designation	Function					Initial Setting Bit	HEX
8	Ring on time to ignore ring off time at 1st cycle	Timing (ms)	50 ms	100 ms	150 ms	800 ms	0	
		Bit No. 8	0	0	1	1		
7		Bit No. 7	0	1	0	1	1	4
6	Reserved	Reserved					0	
5							0	
4	Ring off time at 1st cycle to approve incoming ring	Timing (ms)	100 ms	250 ms	500 ms	1000 ms	1	
		Bit No. 4	0	0	1	1		
3		Bit No. 3	0	1	0	1	1	C
2	Reserved	Reserved					0	
1							0	

14.3.7 SOFT SWITCH: #07

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Dial tone or busy tone detection	0: Disable	0	
		1: Enable - Detect dial tone before dial		
7	PSTN/PBX setting	0: PSTN	0	
		1: PBX - Select PBX line type		0
6	PBX dial tone detect	0: Not to detect dial tone before pre-fix number	0	
		1: Detect dial tone before the pre-fix number in PBX mode		
5	Dial mode select	0: DTMF - PB	0	
		1: Pulse - DP		

TX level select for PSK/FSK:

Level (dBm)	-17	-16	-15	-14	-13	-12	-11	-10
Bit No. 4	0	0	0	0	0	0	0	0
Bit No. 3	0	0	0	0	1	1	1	1
Bit No. 2	0	0	1	1	0	0	1	1
Bit No. 1	0	1	0	1	0	1	0	1

Level (dBm)	-9	-8	-7	-6	-5	-4	-3	-2
Bit No. 4	1	1	1	1	1	1	1	1
Bit No. 3	0	0	0	0	1	1	1	1
Bit No. 2	0	0	1	1	0	0	1	1
Bit No. 1	0	1	0	1	0	1	0	1

Bit 4: Initial 0; Bit 3: Initial 1; Bit 2: Initial 1; Bit 1: Initial 1; HEX 7

14.3.8 SOFT SWITCH: #08

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Reserved	Reserved	0	6
7	Detect busy tone after dialing	0: Not to detect **1: Detect busy tone after dialing**	1	
6	Sending CED signal after connection	0: Not to send **1: Send CED signal before DIS signal after connection**	1	
5	Reserved	Reserved	0	0
4			0	
3			0	
2			0	
1			0	

14.3.9 SOFT SWITCH: #09

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Ringer frequency detection	Ringer frequency range (Hz): **10 to 75** / 20 to 57.5 / 20 to 75 / 10 to 75 Bit No. 8: **0** / 0 / 1 / 1	0	0
7		Bit No. 7: **0** / 1 / 0 / 1	0	
6	Reserved	Reserved	0	
5	TSI/CSI append "+"	**0: Not append "+" before send out TSI/CSI** 1: Automatically insert "+"	0	
4	Reserved	Reserved	0	
3			0	
2	Time from RX DIS signal to send DCS signal	Description: **70 ms** / 120 ms / 180 ms / 240 ms Bit No. 2: **0** / 0 / 1 / 1	0	0
1		Bit No. 1: **0** / 1 / 0 / 1	0	

- Bit 5: This bit set to "1", the "+" character will put in the first position on CSI and TSI command.

14.3.10 SOFT SWITCH: #10

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Print out RTN page report	0: Not to print **1: Print out RTN page report after transaction for TX/ RX RTN signal**	1	A
7	Confirmation report result field	**0: Print "OK"** 1: Print "NG" in case of sending or receiving RTN signal	0	
6	Get gap time between digit for pulse dial	Value (ms): 550 / 650 / **750** / 850 Bit No. 6: 0 / 0 / **1** / 1	1	
5		Bit No. 5: 0 / 1 / **0** / 1	0	
4	RX PIP T.30 command after send out MPS command	**0: Send DCS at current speed** 1: Return to Tx phase B waiting for DIS signal	0	1
3	Received DIS signal within reception	**0: Repeat sending DIS/DTC again until time out** 1: Disconnected after sending DCN signal	0	
2	Transmission time limitation	1: Limit to 8 minutes from data phase **0: No any limitation until document jam**	0	
1	Audio alarm after communication fail	0: Not to alarm after transaction fail **1: Alarm 3 seconds after disconnected**	1	

- Bit 8: If this bit set to 1, machine will print out confirmation report after each transaction.
- Bit 7: If this bit set to 1, the result field will show "NG" instead of "OK" in the confirmation report and activity report or checking the result on the LCD.
- Bit 2: This for manual TX only.

14.3.11 SOFT SWITCH: #11

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Reserved	Reserved	0	2
7	Detect dial tone after pre-fix number	**0: No** 1: Yes	0	
6	Pulse dial allowed to select	0: Yes **1: Not allowed**	1	
5	Protocol signal display mode	**0: Not to display** 1: Display V8 or T30 command within communication.	0	
4	Reserved	Reserved	0	0
3			0	
2	USB port number fixed	**0: OFF** 1: ON	0	
1	DTMF low frequency compensation	**0: Base on SW23 (1 to 4)** 1: High 0.5 dB	0	

- Bit 6: If this bit set to 1, not allowed user to select pulse dial, and this function open serviceman to change.
- Bit 5: Bit set to 1, LCD will show the command between each party, the detail specification see service mode specification.

14.3.12 SOFT SWITCH: #12

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	ECM mode capability	**1: Yes** 0: No - also disable V.34 modem capability	1	8
7	V.34 fall back counter for V.34 TX	(see sub-table)	0	
6		(see sub-table)	0	
5	Send CTC after 4th PPR	**0: Send CTC (Continue To Correct)** 1: Send EOR (End Of Transmission)	0	0
4	Reserved	Reserved	0	
3	Send EOR after lowest speed	**0: Send DCN (Re-dial)** 1: Send EOR_xxx [Germany PTT]	0	
2	TCF transmission timing after DCS signal	(see sub-table)	0	
1		(see sub-table)	0	

Bit 6-7 sub-table:

Counter	**1**	2	3	4
Bit No. 7	**0**	0	1	1
Bit No. 6	**0**	1	0	1

Bit 1-2 sub-table:

Description (ms)	**70**	80	90	100
Bit No. 2	**0**	0	1	1
Bit No. 1	**0**	1	0	1

- Bit 1-2: Delay time from FSK mode to PSK mode, this use for G3 mode only, V.34 do not need this setting.
- Bit 6-7: If counter equal "1", machine will down to next lower speed for next data phase.

14.3.13 SOFT SWITCH: #13

Bit No.	Designation	Function					Initial Setting Bit	HEX
8	MR capability for G3	0: Yes					0	
		1: No						
7	Delay time between transaction	Description (sec)	20	60	120	240	0	1
		Bit No. 7	0	0	1	1		
6		Bit No. 6	0	1	0	1	0	
5	Super fine printing capability for receiving	0: No					1	
		1: Yes						
4	Reserved	Reserved					0	
3	DTS mode	0: No					0	
		1: Yes						
2	Send DTC signal if RX DIS signal in manual RX mode (no function on G4)	1: No - send DIS again					0	0
		0: Yes						
1	Reserved	Reserved					0	

- Bit 7-6: If set to 1, the time between each transaction will become longer, in this case machine will wait more time before start to dial next transaction.

14.3.14 SOFT SWITCH: #14

Bit No.	Designation	Function									Initial Setting Bit	HEX
8	Reserved	Reserved									0	
7											0	0
6	Memory size level to RX	1: Up to 128 KB									0	
		0: Base on system configuration										
5	Reserved	Reserved									0	
4											0	
3											0	
2	Time between V.34 ANSam signal and FSK DIS signal	Timer (ms)	430	440	450	460	470	480	490	500	1	2
		Bit No. 3	0	0	0	0	1	1	1	1		
		Bit No. 2	0	0	1	1	0	0	1	1		
1		Bit No. 1	0	1	0	1	0	1	0	1	0	

- Bit 6: If set to 1, machine will become manual RX mode if available memory size less than 128 K

14.3.15 SOFT SWITCH: #15

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	IPSEL1	0: Close the IPSEL1 port	0	
		1: Active the IPSEL1 port		
7	DCSEL	0: Close the DCSEL port	0	0
		1: Active the DCSEL port		
6	DCLIM	0: Close the DCLIM port	0	
		1: Active the DCLIM port		
5	Reserved	Reserved	0	
4			0	
3			0	0
2			0	
1			0	

14.3.16 SOFT SWITCH: #16

Bit No.	Designation	Function					Initial Setting Bit	HEX
8	Reserved	Reserved					0	
7							0	0
6							0	
5							0	
4							0	
3							0	
2	Fax communication coding method	Coding method	MMR	MR	MH	JBIG	1	3
		Bit No. 2	0	0	1	1		
1		Bit No. 1	0	1	0	1	1	

14.3.17 SOFT SWITCH: #17

Bit No.	Designation	Function		Initial Setting Bit	HEX
8	Reserved	Reserved		0	
7				0	
6	CED frequency	**0: 2100 Hz**		0	0
		1: 1100 Hz			
5	Pause between off hook and CED signal	Time (T): **T=1.8 sec to 2.5 sec** / T+ 100 ms / T+ 200 ms / T+ 300 ms — Bit No. 5: **0** 0 0 0		0	
4		Bit No. 4: **0** 0 1 1 ; Bit No. 3: **0** 1 0 1		0	
3		Time (T): T+ 400 ms / T+ 500 ms / T+ 600 ms / T+ 700 ms — Bit No. 5: 1 1 1 1 ; Bit No. 4: 0 0 1 1 ; Bit No. 3: 0 1 0 1		0	0
2	Inactivity timer [T5]	Description: **T5** / T5 + 20 sec / T5 + 40 sec / T5 + 60 sec — Bit No. 2: **0** 0 1 1		0	
1		Bit No. 1: **0** 1 0 1		0	

- T5: 60 ± 5 sec. in ITU-T standard

14.3.18 SOFT SWITCH: #18

Bit No.	Designation	Function		Initial Setting Bit	HEX
8	Reserved	Reserved		0	
7				0	
6	G3 mode training quality level	Definition / **Level1** / Level2 / Level3 / Level4 — Bit No. 6: **0** 0 1 1		0	0
5		Bit No. 5: **0** 1 0 1		0	
4	Redefine re-dial attempts counter	Counter: **1** 2 3 4 5 6 7 8 9 10 — Bit No. 4: **0** 0 0 0 0 0 0 0 1 1 1		0	
3		Bit No. 3: **0** 0 0 1 1 1 1 0 0 0 ; Bit No. 2: **0** 1 1 0 0 1 1 0 0 1 ; Bit No. 1: **1** 0 1 0 1 0 1 0 1 0		0	1
2		Counter / Reserved — Bit No. 4: 1 1 1 1 1		0	
1		Bit No. 3: 0 1 1 1 1 ; Bit No. 2: 1 0 0 1 1 ; Bit No. 1: 1 0 1 0 1		1	

- Bit 5-6: Level 1 training check phases are not so severe than level 2,3,4. Level 2,3,4 can keep higher RX speed communication than level 1 for poor line condition.

14.3.19 SOFT SWITCH: #19

Bit No.	Designation	Function									Initial Setting Bit	HEX
8	CNG signal level	Level (dBm)	-17	-16	-15	-14	-13	-12	-11	-10	0	6
		Bit No. 8	0	0	0	0	0	0	0	0		
7		Bit No. 7	0	0	0	0	1	1	1	1	1	
		Bit No. 6	0	0	1	1	0	0	1	1		
		Bit No. 5	0	1	0	1	0	1	0	1		
6		Level (dBm)	-9	-8	-7	-6	-5	-4	-3	-2	1	
		Bit No. 8	1	1	1	1	1	1	1	1		
		Bit No. 7	0	0	0	0	1	1	1	1		
5		Bit No. 6	0	0	1	1	0	0	1	1	0	
		Bit No. 5	0	1	0	1	0	1	0	1		
4	DTMF high frequency level	Level (dBm)	-17	-16	-15	-14	-13	-12	-11	-10	1	8
		Bit No. 4	0	0	0	0	0	0	0	0		
3		Bit No. 3	0	0	0	0	1	1	1	1	0	
		Bit No. 2	0	0	1	1	0	0	1	1		
		Bit No. 1	0	1	0	1	0	1	0	1		
2		Level (dBm)	-9	-8	-7	-6	-5	-4	-3	-2	0	
		Bit No. 4	1	1	1	1	1	1	1	1		
		Bit No. 3	0	0	0	0	1	1	1	1		
1		Bit No. 2	0	0	1	1	0	0	1	1	0	
		Bit No. 1	0	1	0	1	0	1	0	1		

14.3.20 SOFT SWITCH: #20

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5			0	
4			0	0
3			0	
2			0	
1			0	

14.3.21 SOFT SWITCH: #21

Bit No.	Designation	Function					Initial Setting Bit	HEX
8	NSS signal before DCS	0: Not to send NSS signal for self mode in TX mode					1	8
		1: Send NSS signal if remote side is same model						
7	CNG sending duration after dialing	Duration (unit=sec)	**40**	60	70	120	0	
		Bit No. 7	**0**	0	1	1		
6		Bit No. 6	**0**	1	0	1	0	
5	T4 timer	**0: 3.0 sec. Normal case**					0	0
		1: 4.5 sec.						
4	VOIP (Voice over IP)	**0: Disable**					0	
		1: Enable						
3	DIS signal length	**0: Normal length (Bit 1 to 64)**					0	
		1: 4 bytes DIS command. bit 1 to 32 only						
2	Increase default T1 timing during calling (Only for TX function)	Description (sec)	**T1**	T1 + 30	T1 + 40	T1 + 60	0	
		Bit No. 2	**0**	0	1	1		
1		Bit No. 1	**0**	1	0	1	0	

- Bit 1-2: T1 indicate the calling time after dialing, can adjust the T1 time more long by change the default value. The default T1 timer depends on each country regulation.
- Bit 3: Some old machine can not accept DIS command over 4 bytes, and every time will become fail. In this case can set this bit to 1. If this bit set to 1, JBIG and V8 capability will disable automatically.
- Bit 8: Sender machine's name will show on the other party's LCD or print on the report if remote side is the same model.

14.3.22 SOFT SWITCH: #22

Bit No.	Designation	Function									Initial Setting Bit	Initial Setting HEX
8	Reserved	Reserved									0	0
7											0	
6											0	
5											0	
4	CED signal output level	Level (dBm)	-17	-16	-15	-14	-13	-12	**-11**	-10	0	6
		Bit No. 4	0	0	0	0	0	0	**0**	0		
3		Bit No. 3	0	0	0	0	1	1	**1**	1	1	
		Bit No. 2	0	0	1	1	0	0	**1**	1		
		Bit No. 1	0	1	0	1	0	1	**0**	1		
2		Level (dBm)	-9	-8	-7	-6	-5	-4	-3	-2	1	
		Bit No. 4	1	1	1	1	1	1	1	1		
		Bit No. 3	0	0	0	0	1	1	1	1		
1		Bit No. 2	0	0	1	1	0	0	1	1	0	
		Bit No. 1	0	1	0	1	0	1	0	1		

14.3.23 SOFT SWITCH: #23

Bit No.	Designation	Function									Initial Setting Bit	Initial Setting HEX
8	Reserved	Reserved									0	0
7											0	
6											0	
5											0	
4	DTMF low frequency level	Level (dBm)	-15	-14	-13	-12	**-11**	-10	-9	-8	0	4
		Bit No. 4	0	0	0	0	**0**	0	0	0		
3		Bit No. 3	0	0	0	0	**1**	1	1	1	1	
		Bit No. 2	0	0	1	1	**0**	0	1	1		
		Bit No. 1	0	1	0	1	**0**	1	0	1		
2		Level (dBm)	-7	-6	-5	-4	-3	-2	-1	0	0	
		Bit No. 4	1	1	1	1	1	1	1	1		
		Bit No. 3	0	0	0	0	1	1	1	1		
1		Bit No. 2	0	0	1	1	0	0	1	1	0	
		Bit No. 1	0	1	0	1	0	1	0	1		

14.3.24 SOFT SWITCH: #24 (Part 1)

Bit No.	Designation	Function											Initial Setting Bit	Initial Setting HEX
8	Reserved	Reserved											0	0
7	Re-dial interval	Interval (min.)	Reserved		2	3	4	5	6	7	8	9	10	0	2
		Bit No. 7	0	0	**0**	0	0	0	0	0	0	0	0		
		Bit No. 6	0	0	**0**	0	0	0	0	0	0	0	0		
		Bit No. 5	0	0	**0**	0	0	0	0	0	0	0	0		
		Bit No. 4	0	0	**0**	0	0	0	0	0	1	1	1		
		Bit No. 3	0	0	**0**	0	1	1	1	1	0	0	0	0	
6		Bit No. 2	0	0	**1**	1	0	0	1	1	0	0	1		
		Bit No. 1	0	1	**0**	1	0	1	0	1	0	1	0		
		Interval (min.)	11	12	13	14	15	16	17	18	19	20		0	
		Bit No. 7	0	0	0	0	0	0	0	0	0	0			
		Bit No. 6	0	0	0	0	0	0	0	0	0	0			
		Bit No. 5	0	0	0	0	0	0	1	1	1	1			
5		Bit No. 4	1	1	1	1	1	0	0	0	0	0			
		Bit No. 3	0	1	1	1	1	0	0	0	0	1		0	
		Bit No. 2	1	0	0	1	1	0	0	1	1	0			
		Bit No. 1	1	0	1	0	1	0	1	0	1	0			
		Interval (min.)	21	22	23	24	25	26	27	28	29	30			
		Bit No. 7	0	0	0	0	0	0	0	0	0	0			
		Bit No. 6	0	0	0	0	0	0	0	0	0	0			
4		Bit No. 5	1	1	1	1	1	1	1	1	1	1		0	
		Bit No. 4	0	0	0	1	1	1	1	1	1	1			
		Bit No. 3	1	1	1	0	0	0	0	1	1	1			
		Bit No. 2	0	1	1	0	0	1	1	0	0	1			
		Bit No. 1	1	0	1	0	1	0	1	0	1	0			
		Interval (min.)	31	32	33	34	35	36	37	38	39	40			
		Bit No. 7	0	0	0	0	0	0	0	0	0	0			
3		Bit No. 6	0	1	1	1	1	1	1	1	1	1		0	
		Bit No. 5	1	0	0	0	0	0	0	0	0	0			
		Bit No. 4	1	0	0	0	0	0	0	0	0	1			
		Bit No. 3	1	0	0	0	0	1	1	1	1	0			
		Bit No. 2	1	0	0	1	1	0	0	1	1	0			
		Bit No. 1	1	0	1	0	1	0	1	0	1	0			
2		Interval (min.)	41	42	43	44	45	46	47	48	49	50		1	
		Bit No. 7	0	0	0	0	0	0	0	0	0	0			
		Bit No. 6	1	1	1	1	1	1	1	1	1	1			
		Bit No. 5	0	0	0	0	0	0	0	1	1	1			
		Bit No. 4	1	1	1	1	1	1	1	0	0	0			
1		Bit No. 3	0	0	0	1	1	1	1	0	0	0		0	
		Bit No. 2	0	1	1	0	0	1	1	0	0	1			
		Bit No. 1	1	0	1	0	1	0	1	0	1	0			

14.3.25 SOFT SWITCH: #24 (Part 2)

Designation: Re-dial interval (Bit No. 7–1)

Interval (min.)	51	52	53	54	55	56	57	58	59	60
Bit No. 7	0	0	0	0	0	0	0	0	0	0
Bit No. 6	1	1	1	1	1	1	1	1	1	1
Bit No. 5	1	1	1	1	1	1	1	1	1	1
Bit No. 4	0	0	0	0	0	1	1	1	1	1
Bit No. 3	0	1	1	1	1	0	0	0	0	1
Bit No. 2	1	0	0	1	1	0	0	1	1	0
Bit No. 1	1	0	1	0	1	0	1	0	1	0

Interval (min.)	61	62	63	64	65	66	67	68	69	70
Bit No. 7	0	0	0	1	1	1	1	1	1	1
Bit No. 6	1	1	1	0	0	0	0	0	0	0
Bit No. 5	1	1	1	0	0	0	0	0	0	0
Bit No. 4	1	1	1	0	0	0	0	0	0	0
Bit No. 3	1	1	1	0	0	0	0	1	1	1
Bit No. 2	0	1	1	0	0	1	1	0	0	1
Bit No. 1	1	0	1	0	1	0	1	0	1	0

Interval (min.)	71	72	73	74	75	76	77	78	79	80
Bit No. 7	1	1	1	1	1	1	1	1	1	1
Bit No. 6	0	0	0	0	0	0	0	0	0	0
Bit No. 5	0	0	0	0	0	0	0	0	0	1
Bit No. 4	0	1	1	1	1	1	1	1	1	0
Bit No. 3	1	0	0	0	0	1	1	1	1	0
Bit No. 2	1	0	0	1	1	0	0	1	1	0
Bit No. 1	1	0	1	0	1	0	1	0	1	0

Interval (min.)	81	82	83	84	85	86	87	88	89	90
Bit No. 7	1	1	1	1	1	1	1	1	1	1
Bit No. 6	0	0	0	0	0	0	0	0	0	0
Bit No. 5	1	1	1	1	1	1	1	1	1	1
Bit No. 4	0	0	0	0	0	0	0	1	1	1
Bit No. 3	0	0	0	1	1	1	1	0	0	0
Bit No. 2	0	1	1	0	0	1	1	0	0	1
Bit No. 1	1	0	1	0	1	0	1	0	1	0

Interval (min.)	91	92	93	94	95	96	97	98	99
Bit No. 7	1	1	1	1	1	1	1	1	1
Bit No. 6	0	0	0	0	0	1	1	1	1
Bit No. 5	1	1	1	1	1	0	0	0	0
Bit No. 4	1	1	1	1	1	0	0	0	0
Bit No. 3	0	1	1	1	1	0	0	0	0
Bit No. 2	1	0	0	1	1	0	0	1	1
Bit No. 1	1	0	1	0	1	0	1	0	1

Initial Setting (Bit): Bit 7 = 0, Bit 6 = 0, Bit 5 = 0, Bit 4 = 0, Bit 3 = 0, Bit 2 = 1, Bit 1 = 0; HEX = 2

14.3.26 SOFT SWITCH: #24 (Part 3)

Designation: Re-dial interval (Bit No. 7–1)

Interval (min.)	Reserved										
Bit No. 7	1	1	1	1	1	1	1	1	1	1	1
Bit No. 6	1	1	1	1	1	1	1	1	1	1	1
Bit No. 5	0	0	0	0	0	0	0	0	0	0	0
Bit No. 4	0	0	0	0	1	1	1	1	1	1	1
Bit No. 3	1	1	1	1	0	0	0	0	1	1	1
Bit No. 2	0	0	1	1	0	0	1	1	0	0	
Bit No. 1	0	1	0	1	0	1	0	1	0	1	

Interval (min.)	Reserved									
Bit No. 7	1	1	1	1	1	1	1	1	1	1
Bit No. 6	1	1	1	1	1	1	1	1	1	1
Bit No. 5	0	0	1	1	1	1	1	1	1	1
Bit No. 4	1	1	0	0	0	0	0	0	0	0
Bit No. 3	1	1	0	0	0	0	1	1	1	1
Bit No. 2	1	1	0	0	1	1	0	0	1	1
Bit No. 1	0	1	0	1	0	1	0	1	0	1

Interval (min.)	Reserved								
Bit No. 7	1	1	1	1	1	1	1	1	1
Bit No. 6	1	1	1	1	1	1	1	1	1
Bit No. 5	1	1	1	1	1	1	1	1	1
Bit No. 4	1	1	1	1	1	1	1	1	1
Bit No. 3	0	0	0	0	1	1	1	1	
Bit No. 2	0	0	1	1	0	0	1	1	
Bit No. 1	0	1	0	1	0	1	0	1	

Initial Setting (Bit): Bit 7 = 0, Bit 6 = 0, Bit 5 = 0, Bit 4 = 0, Bit 3 = 0, Bit 2 = 1, Bit 1 = 0; HEX = 2

14.3.27 SOFT SWITCH: #25

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5			0	
4	Flash key time	(see table below)	0	0
3			0	
2	Reserved	Reserved	0	
1			0	

Flash key time:

Flash time (ms)	100	80	60	50
Bit No. 4	0	0	1	1
Bit No. 3	0	1	0	1

14.3.28 SOFT SWITCH: #26

Bit No.	Designation	Function					Initial Setting Bit	HEX
8	Dial tone detection time before disconnected	Time (unit=sec)	10	15	20	25	0	
		Bit No. 8	0	0	1	1		
7		Bit No. 7	0	1	0	1	0	0
6	Reserved	Reserved					0	
5							0	
4							0	
3							0	0
2							0	
1							0	

14.3.29 SOFT SWITCH: #27

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Reserved	Reserved	0	
7			0	
6			0	0
5			0	
4			0	
3			0	
2			0	0
1			0	

14.3.30 SOFT SWITCH: #28

Bit No.	Designation	Function									Initial Setting Bit	HEX
8	Time to dial after dial tone on the line	Time (ms)	0	100	200	300	400	500	600	700	1	
		Bit No. 8	0	0	0	0	0	0	0	0		
7		Bit No. 7	0	0	0	0	1	1	1	1	0	
		Bit No. 6	0	0	1	1	0	0	1	1		
		Bit No. 5	0	1	0	1	0	1	0	1		A
6		Time (ms)	800	900	1000	1100	1200	1300	1400	1500	1	
		Bit No. 8	1	1	1	1	1	1	1	1		
		Bit No. 7	0	0	0	0	1	1	1	1		
5		Bit No. 6	0	0	1	1	0	0	1	1	0	
		Bit No. 5	0	1	0	1	0	1	0	1		
4	CED duration time within calling period	Time (ms)	0	100	200	300	400	500	600	700	0	
		Bit No. 4	0	0	0	0	0	0	0	0		
		Bit No. 3	0	0	0	0	1	1	1	1		
3		Bit No. 2	0	0	1	1	0	0	1	1	1	
		Bit No. 1	0	1	0	1	0	1	0	1		7
2		Time (ms)	800	900	1000	1100	1200	1300	1400	1500	1	
		Bit No. 4	1	1	1	1	1	1	1	1		
		Bit No. 3	0	0	0	0	1	1	1	1		
1		Bit No. 2	0	0	1	1	0	0	1	1	1	
		Bit No. 1	0	1	0	1	0	1	0	1		

- Bit 1-4: The CED duration time level for automatic transmation

14.3.31 SOFT SWITCH: #29

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Reserved	Reserved	0	
7			0	
6			0	1
5	Time to dial after seize the line when dial tone detection (Unit= 200 msec)	(see tables below)	1	
4			0	
3			1	
2			0	4
1			0	

Time (sec)	0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8
Bit No. 5	0	0	0	0	0	0	0	0	0	0
Bit No. 4	0	0	0	0	0	0	0	0	1	1
Bit No. 3	0	0	0	0	1	1	1	1	0	0
Bit No. 2	0	0	1	1	0	0	1	1	0	0
Bit No. 1	0	1	0	1	0	1	0	1	0	1

Time (sec)	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8
Bit No. 5	0	0	0	0	0	0	1	1	1	1
Bit No. 4	1	1	1	1	1	1	0	0	0	0
Bit No. 3	0	0	0	1	1	1	0	0	0	0
Bit No. 2	1	1	0	0	1	1	0	0	1	1
Bit No. 1	0	1	0	1	0	1	0	1	0	1

Time (sec)	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.8
Bit No. 5	1	1	1	1	1	1	1	1	1	1
Bit No. 4	0	0	0	0	1	1	1	1	1	1
Bit No. 3	1	1	1	1	0	0	0	0	1	1
Bit No. 2	0	0	1	1	0	0	1	1	0	0
Bit No. 1	0	1	0	1	0	1	0	1	0	1

Time (sec)	6.0	6.2
Bit No. 5	1	1
Bit No. 4	1	1
Bit No. 3	1	1
Bit No. 2	1	1
Bit No. 1	0	1

14.3.32 SOFT SWITCH: #30

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Pause delay time within digits Ex. 002Pxxxxxx	(see table below)	0	
7			1	
6	Signal tone insensitivity (dBm) after dial for busy tone	(see tables below)	1	6
5			0	
4			1	
3			0	8
2			0	
1			0	

Time (sec)	2.0	2.5	3.0	3.5
Bit No. 8	0	0	1	1
Bit No. 7	0	1	0	1

Level (dBm)	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
Bit No. 6	0	0	0	0	0	0	0	0	0	0	0
Bit No. 5	0	0	0	0	0	0	0	0	0	0	0
Bit No. 4	0	0	0	0	0	0	0	0	1	1	1
Bit No. 3	0	0	0	0	1	1	1	1	0	0	0
Bit No. 2	0	0	1	1	0	0	1	1	0	0	1
Bit No. 1	0	1	0	1	0	1	0	1	0	1	0

Level (dBm)	-11	-12	-13	-14	-15	-16	-17	-18	-19	-20
Bit No. 6	0	0	0	0	0	0	0	0	0	0
Bit No. 5	0	0	0	0	0	1	1	1	1	1
Bit No. 4	1	1	1	1	1	0	0	0	0	0
Bit No. 3	0	1	1	1	1	0	0	0	0	1
Bit No. 2	1	0	0	1	1	0	0	1	1	0
Bit No. 1	1	0	1	0	1	0	1	0	1	0

Level (dBm)	-21	-22	-23	-24	-25	-26	-27	-28	-29	-30
Bit No. 6	0	0	0	0	0	0	0	0	0	0
Bit No. 5	1	1	1	1	1	1	1	1	1	1
Bit No. 4	0	0	0	1	1	1	1	1	1	1
Bit No. 3	1	1	1	0	0	0	0	1	1	1
Bit No. 2	0	1	1	0	0	1	1	0	0	1
Bit No. 1	1	0	1	0	1	0	1	0	1	0

Level (dBm)	-31	-32	-33	-34	-35	-36	-37	-38	-39	-40
Bit No. 6	0	1	1	1	1	1	1	1	1	1
Bit No. 5	1	0	0	0	0	0	0	0	0	0
Bit No. 4	1	0	0	0	0	0	0	0	0	1
Bit No. 3	1	0	0	0	0	1	1	1	1	0
Bit No. 2	1	0	0	1	1	0	0	1	1	0
Bit No. 1	1	0	1	0	1	0	1	0	1	0

Level (dBm)	-41 to -50
Bit No. 6-1	Setting disable

14.3.33 SOFT SWITCH: #31

Bit No.	Designation	Function												Initial Setting Bit	HEX
8	Reserved	Reserved												0	
7	Min re-dial interval													0	2
6		Interval	1	2	3	4	5	Reserved						1	
		Bit No. 7	0	0	0	1	1	1	1						
		Bit No. 6	0	1	1	0	0	1	1						
5		Bit No. 5	1	0	1	0	1	0	1					0	
4	Max. re-dial attempts	Attempts	1	2	3	4	5	6	7	8	9	10		1	A
		Bit No. 4	0	0	0	0	0	0	0	0	1	1			
3		Bit No. 3	0	0	0	1	1	1	1	0	0	0		0	
		Bit No. 2	0	1	1	0	0	1	1	0	0	1			
		Bit No. 1	1	0	1	0	1	0	1	0	1	0			
2		Attempts	Reserved											1	
		Bit No. 4	1	1	1	1	1								
		Bit No. 3	0	1	1	1	1								
1		Bit No. 2	1	0	0	1	1							0	
		Bit No. 1	1	0	1	0	1								

14.3.34 SOFT SWITCH: #32

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5			0	
4			0	0
3			0	
2			0	
1			0	

14.3.35 SOFT SWITCH: #33

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Reserved	Reserved	0	4
7	V.17 Echo protection tone	0: off / **1: On**	1	
6	V.29 Echo protection tone	**0: Off** / 1: On	0	
5	Compromise equalize enable (CEQ) in the transmit path (TCEQ)	**0: No** / 1: Yes	0	0
4	Compromise equalize enable (CEQ) in the receiver path (RCEQ)	**0: No** / 1: Yes	0	
3	Reserved	Reserved	0	
2			0	
1			0	

• Bit 4-5: V.17, V.29 and V.27 only

14.3.36 SOFT SWITCH: #34

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5			0	
4			0	0
3			0	
2			0	
1			0	

14.3.37 SOFT SWITCH: #35

Bit No.	Designation	Function					Initial Setting Bit	HEX
8	Dial tone table switch time	Time (sec)	1	2	3	4.5	1	A
		Bit No. 8	0	0	1	1		
7		Bit No. 7	0	1	0	1	0	
6	Dial tone frequency upper range index	See Bit No. 1 to 3					1	
5							0	
4							0	
3	Dial tone frequency low range index	Frequency range (Hz)	210 to 580	360 to 690	210 to 580		0	0
		Bit No. 3	0	0	0			
2		Bit No. 2	0	0	1		0	
		Bit No. 1	0	1	0			

Frequency range (Hz)	360 to 690	210 to 580	Reserved		
Bit No. 3	0	1	1	1	1
Bit No. 2	1	0	0	1	1
Bit No. 1	1	0	1	0	1

(Bit No. 1 Initial Setting Bit: 0)

14.3.38 SOFT SWITCH: #36

Bit No.	Designation	Function										Initial Setting Bit	HEX
8	Re-dial attempts continue fail counter (Using for detect line problem error)	0: No any limitation										1	8
		1: limit up to bit 1 to 4											
7	Reserved	Reserved										0	
6												0	
5												0	
4	Re-dial attempts fail limitation counter (Using for detect line problem error)	Counter	0	1	2	3	4	5	6	7		1	A
		Bit No. 4	0	0	0	0	0	0	0	0			
3		Bit No. 3	0	0	0	0	1	1	1	1		0	
		Bit No. 2	0	0	1	1	0	0	1	1			
		Bit No. 1	0	1	0	1	0	1	0	1			
2		Counter	8	9	10	11	12	13	14	15		1	
		Bit No. 4	1	1	1	1	1	1	1	1			
		Bit No. 3	0	0	0	0	1	1	1	1			
		Bit No. 2	0	0	1	1	0	0	1	1			
1		Bit No. 1	0	1	0	1	0	1	0	1		0	

14.3.39 SOFT SWITCH: #37

Bit No.	Designation	Function						Initial Setting Bit	Initial Setting HEX
8	Reserved	Reserved						0	0
7	Auto dial learning for V.34 modem	**0: Yes - skip V.34 handshaking with remote side**						0	
		1: No - retry from V.8 handshake							
6	RX start symbol rate for V.34 modem	See Bit No. 1 to 3						0	
5								0	
4								0	0
3	TX start symbol rate for V.34 modem	Symbol rate (sym/s)	**3429**	3200	3000	2800	2400	0	
		Max. speed (kbps)	**33.6**	31.2	28.8	26.4	21.6		
		Bit No. 3	**0**	0	0	0	1		
2		Bit No. 2	**0**	0	1	1	0	0	0
		Bit No. 1	**0**	1	0	1	0		
1		Symbol rate	Reserved					0	
		Max. speed							
		Bit No. 3	1	1	1				
		Bit No. 2	0	1	1				
		Bit No. 1	1	0	1				

14.3.40 SOFT SWITCH: #38

Bit No.	Designation	Function					Initial Setting Bit	Initial Setting HEX
8	Reserved	Reserved					0	
7	Set/Reset V.34 transmit level deviation	0: Reset					1	
		1: Set						
6	V.34 flag number between ECM frame						1	6
5		Flags number	1	2	**3**	15	0	
		Bit No. 6	0	0	**1**	1		
		Bit No. 5	0	1	**0**	1		
4	Phase 2 guard tone power level (V.34)	**0: normal power level**					0	
		1: -7 db of normal power level						
3	Reserved	Reserved					0	1
2							0	
1	V.8 /V.34 capability	0: No					1	
		1: Yes						

14.3.41 SOFT SWITCH: #39

Bit No.	Designation	Function					Initial Setting Bit	Initial Setting HEX
8	Disable V.34 TX for V.34 modem	1: Yes					0	
		0: No						
7	Disable V.34 RX for V.34 modem	1: Yes					0	
		0: No						0
6	Flags number in FSK frame for V.34 modem						0	
5		Flags number	**1**	2	3	4	0	
		Bit No. 6	**0**	0	1	1		
		Bit No. 5	**0**	1	0	1		
4	Manual TX mode for V.34 modem	**0: V.8 - start handshake from V.8**					0	
		1: V.17						
3	Switch from V.17 to V.34 if DIS Bit 6 set after received DIS	**0: Yes - start V.8 handshaking. but only first time**					0	
		1: No - Continue start with.17						1
2	Delay time in primary channel for V.34 transmit after CFR or MCF signal						0	
1		Delay time (ms)	100	**200**	300	500	1	
		Bit No. 2	0	**0**	1	1		
		Bit No. 1	0	**1**	0	1		

14.3.42 SOFT SWITCH: #40

Bit No.	Designation	Function					Initial Setting Bit	Initial Setting HEX
8		Speed (bps)	**V.17 14400**	V.17 12000	V.17 9600	V.17 7200	0	
		Bit No. 8	**0**	0	0	0		
		Bit No. 7	**0**	0	0	0		
7	V.17 RX start speed select receiving start speed for V.17	Bit No. 6	**0**	0	1	1	0	
		Bit No. 5	**0**	1	0	1		
		Speed (bps)	V.29 9600	V.29 7200	V.27 4800	V.27 ter 2400		0
		Bit No. 8	0	0	0	0		
6		Bit No. 7	1	1	1	1	0	
		Bit No. 6	0	0	1	1		
		Bit No. 5	0	1	0	1		
5		Speed Bit No. 8	1 1 1 1 1 1 1 1			Reserved	0	
		Bit No. 7	0 0 0 0 1 1 1 1					
		Bit No. 6	0 0 1 1 0 0 1 1					
		Bit No. 5	0 1 0 1 0 1 0 1					
4	Reserved	Reserved					0	
3		Speed (bps)	**V.34 33600**	V.34 31200	V.34 28800	V.34 26400	0	
		Bit No. 3	**0**	0	0	0		
2	V.34 RX start speed prohibit V.34 mode when upper speed less	Bit No. 2	**0**	0	1	1	0	
		Bit No. 1	**0**	1	0	1		0
		Speed (bps)	V.34 24000	V.34 21600	V.34 19200	V.34 16800		
1		Bit No. 3	1	1	1	1	0	
		Bit No. 2	0	0	1	1		
		Bit No. 1	0	1	0	1		

14.3.43 SOFT SWITCH: #41

Bit No.	Designation	Function					Initial Setting Bit	Initial Setting HEX
8		Speed (bps)	**V.17 14400**	V.17 12000	V.17 9600	V.17 7200	0	
		Bit No. 8	**0**	0	0	0		
		Bit No. 7	**0**	0	0	0		
7	V.17 TX start speed select receiving start speed for V.17	Bit No. 6	**0**	0	1	1	0	
		Bit No. 5	**0**	1	0	1		
		Speed (bps)	V.29 9600	V.29 7200	V.27 4800	V.27 ter 2400		0
		Bit No. 8	0	0	0	0		
6		Bit No. 7	1	1	1	1	0	
		Bit No. 6	0	0	1	1		
		Bit No. 5	0	1	0	1		
5		Speed Bit No. 8	1 1 1 1 1 1 1 1			Reserved	0	
		Bit No. 7	0 0 0 0 1 1 1 1					
		Bit No. 6	0 0 1 1 0 0 1 1					
		Bit No. 5	0 1 0 1 0 1 0 1					
4	Reserved	Reserved					0	
3		Speed (bps)	**V.34 33600**	V.34 31200	V.34 28800	V.34 26400	0	
		Bit No. 3	**0**	0	0	0		
		Bit No. 2	**0**	0	1	1		
		Bit No. 1	**0**	1	0	1		0
2	V.34 TX start speed prohibit V.34 mode when upper speed less	Speed (bps)	V.34 24000	V.34 21600	V.34 19200	V.34 16800	0	
		Bit No. 3	1	1	1	1		
		Bit No. 2	0	0	1	1		
1		Bit No. 1	0	1	0	1	0	

14.3.44 SOFT SWITCH: #42

Bit No.	Designation	Function	Initial Setting Bit	Initial Setting HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5			0	
4			0	
3			0	0
2			0	
1			0	

14.3.45 SOFT SWITCH: #43

Bit No.	Designation	Function	Initial Setting Bit	Initial Setting HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5			0	
4			0	
3			0	0
2			0	
1			0	

14.3.46 SOFT SWITCH: #44

Bit No.	Designation	Function	Initial Setting Bit	Initial Setting HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5			0	
4			0	
3			0	0
2			0	
1			0	

14.3.47 SOFT SWITCH: #45

Bit No.	Designation	Function	Initial Setting Bit	Initial Setting HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5	Call transfer	0: Off / 1: On	0	
4	No. of call transfer	(see value table)	0	3
3			0	
2			1	
1			1	

No. of call transfer value table:

Value	0	1	2	3	4	5	6	7	8	9
Bit No. 4	0	0	0	0	0	0	0	0	1	1
Bit No. 3	0	0	0	0	1	1	1	1	0	0
Bit No. 2	0	0	1	1	0	0	1	1	0	0
Bit No. 1	0	1	0	1	0	1	0	1	0	1

Value	Reserved					
Bit No. 4	1	1	1	1	1	1
Bit No. 3	0	0	1	1	1	1
Bit No. 2	1	1	0	0	1	1
Bit No. 1	0	1	0	1	0	1

14.3.48 SOFT SWITCH: #46

Bit No.	Designation	Function	Initial Setting Bit	Initial Setting HEX
8	Daylight savings timer	0: No / **1: Yes**	1	8
7	Reserved	Reserved	0	
6			0	
5			0	
4	RX print mode	0: RX one page then print one page. (PRINT RX) / **1: Start to print after receiving all pages. (MEMORY RX)**	1	A
3	Default TX mode	**0: Memory TX** / 1: ADF TX	0	
2	Header for FAX TX	0: Off / **1: On - transmit header at top of each page**	1	
1	Print model name on top of TX page If name not register	**0: No** / 1: Yes	0	

- Bit 1: If machine name not registered, the model name will print at the top of each receiving page. The default is not to print. (base on custom ID)
- Bit 2: Some country such as U.S.A PTT regulation, must be send header at top of each page.

14.3.49 SOFT SWITCH: #47

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Reserved	Reserved	0	
7			0	
6	RX mode	**0: Auto RX mode**	0	0
		1: Manual RX mode		
5	Footer	**0: Off**	0	
		1: On - Print footer information at each of received page		
4	Reserved	Reserved	0	
3			0	0
2			0	
1			0	

• Bit 5: The footer shows machine number, receiving time, remote side TSI number, session and page number. The details show on the report specification.

14.3.50 SOFT SWITCH: #48

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Activity report	0: No	1	
		1: Yes		
7	TX result report	(see table below)	0	A
6			1	
5	RX result report	(see table below)	0	
4			1	8
3	Reserved	Reserved	0	
2			0	
1			0	

TX result report:

Description	ON	ON (Error)	OFF	Reserved
Bit No. 7	0	**0**	1	1
Bit No. 6	0	**1**	0	1

RX result report:

Description	ON	ON (Error)	OFF	Reserved
Bit No. 5	0	**0**	1	1
Bit No. 4	0	**1**	0	1

14.3.51 SOFT SWITCH: #49

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Reserved	Reserved	0	
7			0	
6			0	0
5	Re-dial method if Comm. Fail	**0: Re-dial again**	0	
		1: Base on re-dial time interval		
4	No. of rings	(see table below)	0	
3			0	1
2			0	
1			1	

No. of rings:

No. of rings	1	2	3	4	5	6	7	8
Bit No. 4	0	**0**	0	0	0	0	0	0
Bit No. 3	0	**0**	0	0	1	1	1	1
Bit No. 2	0	**0**	1	1	0	0	1	1
Bit No. 1	0	**1**	0	1	0	1	0	1

No. of rings	9	10	11	12	13	14	15	16
Bit No. 4	1	1	1	1	1	1	1	1
Bit No. 3	0	0	0	0	1	1	1	1
Bit No. 2	0	0	1	1	0	0	1	1
Bit No. 1	0	1	0	1	0	1	0	1

14.3.52 SOFT SWITCH: #50

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Transmit or cancel after time out in "Memory TX"	**0: Cancel and print out report**	0	
		1: Transmission		
7	Reserved	Reserved	0	0
6			0	
5			0	
4			0	
3			0	0
2			0	
1			0	

• Bit 8: Can select cancel this job and print out report or start to send in case of time when memory full condition occurs.

14.3.53 SOFT SWITCH: #51

Bit No.	Designation	Function						Initial Setting	
								Bit	HEX
8	Reserved	Reserved						0	0
7								0	
6								0	
5								0	
4	T30 monitor report selection	Description	Not to print	Print report for each transaction	Print report while reporting error	Not used		0	
3		Bit No. 4	0	0	1	1		0	0
		Bit No. 3	0	1	0	1			
2	Send unsent page mode for memory transmission	0: From error page						0	
		1: From start page							
1	Reserved	Reserved						0	

14.3.54 SOFT SWITCH: #52

Bit No.	Designation	Function	Initial Setting	
			Bit	HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5			0	
4			0	
3			0	0
2			0	
1			0	

14.3.55 SOFT SWITCH: #53

Bit No.	Designation	Function	Initial Setting	
			Bit	HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5			0	
4			0	
3			0	0
2			0	
1			0	

14.3.56 SOFT SWITCH: #54

Bit No.	Designation	Function					Initial Setting	
							Bit	HEX
8	Report Date/Time type	0: Digits format					1	
		1: Alpha numeric format						
7	Report Date/Time format	When bit No.8 is "1".					0	A
		Date/Time	2008. MAR. 25	MAR. 25. 2008	25. MAR. 2008			
		Bit No. 7	0	0	1			
6		Bit No. 6	0	1	0		1	
		When bit No.8 is "0".						
		Date/Time	2008. 11. 25	25. 11. 2008	11. 25. 2008			
		Bit No. 7	0	0	1			
		Bit No. 6	0	1	0			
5	Memory near full capacity for Fax and I-Fax scanning	Description (KB)	256	512	1024	1536	0	
		Bit No. 5	0	0	1	1		
4		Bit No. 4	0	1	0	1	1	
3	Memory near full capacity for N-scan scanning	Description (KB)	512	1024	2512	5024	0	8
		Bit No. 3	0	0	1	1		
2		Bit No. 2	0	1	0	1	0	
1	Reserved	Reserved					0	

14.3.57   SOFT SWITCH: #55

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5			0	
4			0	0
3			0	
2			0	
1			0	

14.3.58   SOFT SWITCH: #56

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5			0	
4			0	0
3			0	
2			0	
1			0	

14.3.59   SOFT SWITCH: #57

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5			0	
4			0	0
3			0	
2			0	
1			0	

14.3.60   SOFT SWITCH: #58

Bit No.	Designation	Function	Initial Setting Bit	HEX
8	Time out from PSK to FSK delay time	0: 6 sec. / 1: 30 sec.	0	0
7	Reserved	Reserved	0	
6			0	
5			0	
4			0	0
3			0	
2			0	
1			0	

- Bit 8: This is the delay time for PSK signal after sending MCF or PPR command. The timer depends on each country regulation.

14.3.61 SOFT SWITCH: #59 (Part 1)

Bit No.	Designation	Function		Initial Setting Bit	HEX
8	Reserved	Reserved		0	
7				0	2

Bit No. 6

Time between mean time	+00:00	+00:30	+01:00	+01:30
Bit No. 6	0	0	0	0
Bit No. 5	0	0	0	0
Bit No. 4	0	0	0	0
Bit No. 3	0	0	0	0
Bit No. 2	0	0	1	1
Bit No. 1	0	1	0	1

Bit No. 5 — Initial Setting Bit: 0

Time between mean time	+02:00	+02:30	+03:00	+03:30
Bit No. 6	0	0	0	0
Bit No. 5	0	0	0	0
Bit No. 4	0	0	0	0
Bit No. 3	1	1	1	1
Bit No. 2	0	0	1	1
Bit No. 1	0	1	0	1

Bit No. 4 — Initial Setting Bit: 1

Time between mean time	+04:00	+04:30	+05:00	+05:30
Bit No. 6	0	0	0	0
Bit No. 5	0	0	0	0
Bit No. 4	1	1	1	1
Bit No. 3	0	0	0	0
Bit No. 2	0	0	1	1
Bit No. 1	0	1	0	1

Bit No. 3 — Designation: Time Between GMT (Greenwich Mean Time) — Initial Setting Bit: 0

Time between mean time	+06:00	+06:30	+07:00	+07:30
Bit No. 6	0	0	0	0
Bit No. 5	0	0	0	0
Bit No. 4	1	1	1	1
Bit No. 3	1	1	1	1
Bit No. 2	0	0	1	1
Bit No. 1	0	1	0	1

Bit No. 2 — Initial Setting Bit: 1 — HEX: A

Time between mean time	+08:00	+08:30	+09:00	+09:30
Bit No. 6	0	0	0	0
Bit No. 5	1	1	1	1
Bit No. 4	0	0	0	0
Bit No. 3	0	0	0	0
Bit No. 2	0	0	1	1
Bit No. 1	0	1	0	1

Bit No. 1 — Initial Setting Bit: 0

14.3.62 SOFT SWITCH: #59 (Part 2)

Bit No.	Designation	Function		Initial Setting Bit	HEX

Bit No. 6 — Initial Setting Bit: 1

Time between mean time	+10:00	+10:30	+11:00	+11:30
Bit No. 6	0	0	0	0
Bit No. 5	1	1	1	1
Bit No. 4	0	0	0	0
Bit No. 3	1	1	1	1
Bit No. 2	0	0	1	1
Bit No. 1	0	1	0	1

Bit No. 5 — Initial Setting Bit: 0

Time between mean time	+12:00	-00:30	-01:00	-01:30
Bit No. 6	0	1	1	1
Bit No. 5	1	0	0	0
Bit No. 4	1	0	0	0
Bit No. 3	0	0	0	0
Bit No. 2	0	0	1	1
Bit No. 1	0	1	0	1

Bit No. 4 — Initial Setting Bit: 1

Time between mean time	-02:00	-02:30	-03:00	-03:30
Bit No. 6	1	1	1	1
Bit No. 5	0	0	0	0
Bit No. 4	0	0	0	0
Bit No. 3	1	1	1	1
Bit No. 2	0	0	1	1
Bit No. 1	0	1	0	1

Bit No. 3 — Designation: Time Between GMT (Greenwich Mean Time) — Initial Setting Bit: 0

Time between mean time	-04:00	-04:30	-05:00	-05:30
Bit No. 6	1	1	**1**	1
Bit No. 5	0	0	**0**	0
Bit No. 4	1	1	**1**	1
Bit No. 3	0	0	**0**	0
Bit No. 2	0	0	**1**	1
Bit No. 1	0	1	**0**	1

Bit No. 2 — Initial Setting Bit: 1 — HEX: A

Time between mean time	-06:00	-06:30	-07:00	-07:30
Bit No. 6	1	1	1	1
Bit No. 5	0	0	0	0
Bit No. 4	1	1	1	1
Bit No. 3	1	1	1	1
Bit No. 2	0	0	1	1
Bit No. 1	0	1	0	1

Bit No. 1 — Initial Setting Bit: 0

14.3.63　SOFT SWITCH: #59 (Part 3)

Bit No.	Designation	Function					Initial Setting Bit	Initial Setting HEX
6	Time Between GMT (Greenwich Mean Time)	Time between mean time	Greenwich mean time + T				1	A
			-08:00	-08:30	-09:00	-09:30		
		Bit No. 6	1	1	1	1		
		Bit No. 5	1	1	1	1		
5		Bit No. 4	0	0	0	0	0	
		Bit No. 3	0	0	0	0		
		Bit No. 2	0	0	1	1		
		Bit No. 1	0	1	0	1		
4		Time between mean time	Greenwich mean time + T				1	
			-10:00	-10:30	-11:00	-11:30		
		Bit No. 6	1	1	1	1		
		Bit No. 5	1	1	1	1		
		Bit No. 4	0	0	0	0		
3		Bit No. 3	1	1	1	1	0	
		Bit No. 2	0	0	1	1		
		Bit No. 1	0	1	0	1		
2		Time between mean time	Greenwich mean time + T				1	
			-12:00		Reserved			
		Bit No. 6	1	1 1 1 1 1 1 1				
		Bit No. 5	1	1 1 1 1 1 1 1				
		Bit No. 4	1	1 1 1 1 1 1 1				
		Bit No. 3	0	0 0 0 1 1 1 1				
1		Bit No. 2	0	0 1 1 0 0 1 1			0	
		Bit No. 1	0	1 0 1 0 1 0 1				

- Bit1-6: This value must be entered correctly, or E-mail headers will be wrong. A good reference web site may be found at http://greenwichmeantime.com
  Available ranges are:12 to -12, in half hour increments. The default setting was depend on each PTT.

14.3.64　SOFT SWITCH: #60

Bit No.	Designation	Function	Initial Setting Bit	Initial Setting HEX
8	Reserved	Reserved	0	0
7			0	
6	Quick memory TX	0: Ineffective	0	
		1: Effective		
5	Reserved	Reserved	0	0
4			0	
3			0	
2	Off hook alarm after communication	0: Alarm	0	
		1: Not alarm after communication		
1	Display destination selection within TX phase C	0: Local Name or telephone number	0	
		1: Remote telephone number		

14.3.65　SOFT SWITCH: #61

Bit No.	Designation	Function									Initial Setting Bit	Initial Setting HEX
8	Reserved	Reserved									0	0
7											0	
6											0	
5											0	
4	Max. No. of ring	No. of rings	1	2	3	4	5	6	7	8	1	F
		Bit No. 4	0	0	0	0	0	0	0	0		
3		Bit No. 3	0	0	0	0	1	1	1	1	1	
		Bit No. 2	0	0	1	1	0	0	1	1		
		Bit No. 1	0	1	0	1	0	1	0	1		
2		No. of rings	9	10	11	12	13	14	15	16	1	
		Bit No. 4	1	1	1	1	1	1	1	1		
		Bit No. 3	0	0	0	0	1	1	1	1		
1		Bit No. 2	0	0	1	1	0	0	1	1	1	
		Bit No. 1	0	1	0	1	0	1	0	1		

14.3.66 SOFT SWITCH: #62

Bit No.	Designation	Function	Initial Setting Bit	Initial Setting HEX
8	Reserved	Reserved	0	0
7			0	
6			0	
5			0	
4			0	0
3			0	
2			0	
1			0	

14.3.67 SOFT SWITCH: #33

Bit No.	Designation	Function	Initial Setting Bit	Initial Setting HEX
8	"#" key definition in PBX mode	1: "#" is external key, machine (PBX) default is internal 0: "#" is internal key, machine (PSTN) default is external	1	8
7	Reserved	Reserved	0	
6			0	
5			0	
4			0	
3			0	
2	Fax TX image adjust	0: Normal 1: Special handle	0	0
1	TX result report with image	0: Yes 1: No	0	

- Bit 8: If this bit set to 1, the # key is use to access PSTN line after dial the pre-fix number
       If this bit set to 0, the # key is use to access PBX line instead of PSTN line.
- Bit 1: This bit set to "1", the first page image will not append at the bottom of error report or OK report.
- Bit2: When this bit sets to "1", "Thin line" image with TEXT mode becomes more clear.

14.3.68 SOFT SWITCH: #64

Bit No.	Designation	Function	Initial Setting Bit	Initial Setting HEX
8	Reserved	Reserved	0	0
7			0	
6	Print RX error report in RX side if no any FAX signal detected	0: No 1: Yes	0	0
5	10 PPS & 20 PPS selectable by user	0: No 1: Yes	0	
4	Reserved	Reserved	0	0
3			0	
2			0	
1			0	

- Bit 6: If this bit set to 1, Machine do not print put RX error report if no detect any Fax signal from the other party.
- Bit 5: Can not open by user to change PPS if this bit set to "0".

15. Fax Protocols

15.1 G3 ECM (G3 Error Correction Mode)

- G3 ECM is the error correction system newly recommended by consultative committee of International telephone & telegraph of 1988.
- By G3 ECM, documents are divided into blocks (called partial page) for transmission. If any error takes place in any frame (one partial page consists of 256 frames) on a partial page, the receiving party generates the retransmit request with erroneous frame numbers.

Here is an example where frame 1 and frame 3 are subjected to error:

4139F3C555DA
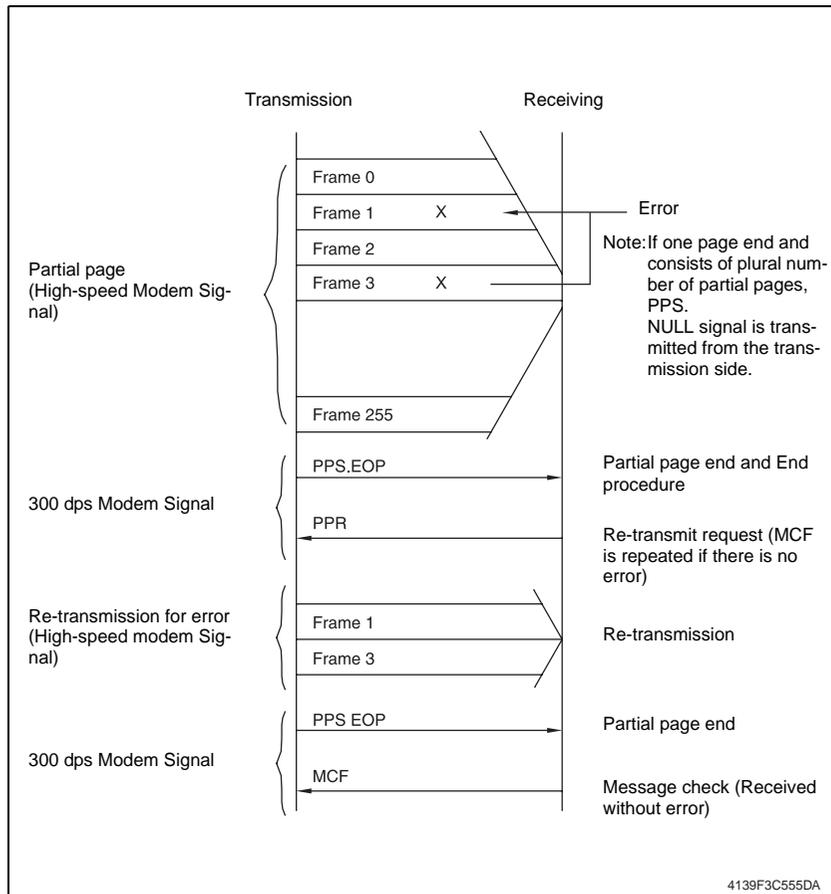
15.2 Line control

15.2.1 Procedure of G3 mode communication

- Basic communications diagram of G3 mode.

Drawing: Line Control

4139F3C556DA

15.3 Table of reference code

Code	Function
CFR	Confirmation to Receive. 1850 Hz or 1650 Hz 3 sec.
CIG	Calling Station Identification.
CRP	Command Repeat.
CSI	Called Subscriber Identification.
DCN	Disconnect.
DCS	Digital Identification Signal.
DIS	Digital Transmit Command.
DTC	Digital Transmit Command.
EOM	End of Message. 1,100 Hz.
EOP	End of Procedure.
FTT	Failure to Train.
MCF	Message Confirmation. 1,650 Hz or 1,850 Hz.
MPS	Multi-Page Signal.
NCS	Non-Standard Facilities Command.
NCF	Non-Standard Facilities.
NSS	Non-Standard Facilities Set-up.
PIN	Procedural Interrupt Negative.
PIP	Procedural Interrupt Positive.
PRI-EOM	Procedure Interrupt-End of Message (COM).
PRI-MPS	Procedure Interrupt-Multi page Signal (MPS).
PRI-EOP	Procedure Interrupt-End of Procedure (EOP).
RTN	Retrain Negative.
RTP	Retrain Positive.
TSI	Transmitting Station Identification.

15.4 How to analyze the T30 protocol monitor

- DCS or DIS
- HEX Data as printed on page.
- Example: V.17 Communication

- FIF (Facsimile Information Field)

HEX	1				2			
	0	0	4	6	8	8	0	0
Data Bit	0 0 0 0	0 0 0 0	0 1 0 0	0 1 1 0	1 0 0 0	1 0 0 0	0 0 0 0	0 0 0 0
Bit No.	8 7 6 5	4 3 2 1	16 15 14 13	12 11 10 9	24 23 22 21	20 19 18 17	32 31 30 29	28 27 26 25
Note	Bit No.11= 1, Bit No.12=0 7200 bps Bit No.15= 1 R8 x 7.7 Lines/mm (Fine Mode) Bit No.19= 0, Bit No.20=1 Unlimited Paper Length							

- Hex-Binary Conversion List

Hex	Binary	Hex	Binary	Hex	Binary	Hex	Binary
0	0 0 0 0	4	0 1 0 0	8	1 0 0 0	C	1 1 0 0
1	0 0 0 1	5	0 1 0 1	9	1 0 0 1	D	1 1 0 1
2	0 0 1 0	6	0 1 1 0	A	1 0 1 0	E	1 1 1 0
3	0 0 1 1	7	0 1 1 1	B	1 0 1 1	F	1 1 1 1

DIS (DTC) / DCS Bit Allocation Table of FIF (Facsimile Information Field)

Bit No.	Designation	DIS/DTC	DCS
1		"0"= Invalid "1"= Store-and-forward switching Internet fax simple mode	
2	Set to "0"		
3		"0"= Invalid "1"= Real-time Internet fax	
4	Set to "0"		
5	Set to "0"		
6		"0"= Invalid "1"= V.8 capabilities	Invalid
7	Flame size	"0" = 256 octets preferred "1"= 64 octets preferred	Invalid
8	Set to "0"		
9		"0"= Invalid "1"= Ready to transmit a facsimile document (polling)	Set to "0"
10		"0"= Invalid "1"= Receiver fax operation	
11	Data signalling rate	(see sub-table below)	(see sub-table below)
12			
13			
14			
15		"0"= Invalid "1"= R8 × 7.7 lines/mm and/or 200 × 200 pels/25.4 mm	
16		"0"= Invalid "1"= Two-dimensional coding capability	"0"= Invalid "1"= Two-dimensional coding

Bit No. 11–14 Data signalling rate:

DIS/DTC:

Bit No. 14	13	12	11	Data signalling rate
0	0	0	0	V.27 ter fall-back mode
0	0	0	1	Rec. V.29
0	0	1	0	Rec. V.27 ter
0	0	1	1	Rec. V.27 ter and V.29
0	1	0	0	Not used
0	1	0	1	Not used
0	1	1	0	Reserved
0	1	1	1	Reserved
1	0	0	0	Not used
1	0	0	1	Not used
1	0	1	0	Reserved
1	0	1	1	Rec. V.27 ter, V.29, V33 and V.17
1	1	0	0	Not used
1	1	0	1	Not used
1	1	1	0	Reserved
1	1	1	1	Reserved

DCS:

Bit No. 14	13	12	11	Data signalling rate
0	0	0	0	2400 bit/s, rec. V.27ter
0	0	0	1	9600 bit/s, rec. V.29
0	0	1	0	4800 bit/s, rec. V.27ter
0	0	1	1	7200 bit/s, rec. V.29
0	1	0	0	Invalid
0	1	0	1	Reserved
0	1	1	0	Invalid
0	1	1	1	Reserved
1	0	0	0	14,400 bit/s, rec. V.17
1	0	0	1	9,600 bit/s, rec. V.17
1	0	1	0	12,000 bit/s, rec. V.17
1	0	1	1	7,200 bit/s, rec. V.17
1	1	0	0	Reserved
1	1	0	1	Reserved
1	1	1	0	Reserved
1	1	1	1	Reserved

Bit No.	Designation	DIS/DTC	DCS
17	Recording width capabilities	(see sub-table below)	(see sub-table below)
18			
19	Recording length capability	(see sub-table below)	(see sub-table below)
20			
21	(Minimum scan line time)	(see sub-table below)	(see sub-table below)
22			
23			
24	Extension field	"0"= Without "1"= With	
25	Reserved		
26		"0"= Invalid "1"= Un-compressed mode	
27		"0"= Invalid "1"= ECM	
28	Set to "0"		Frame size 0: 256 octets Frame size 1: 64 octets
29	Set to "0"		
30	Set to "0"		

Bit No. 17–18 Recording width capabilities:

DIS/DTC:

Bit No. 18	17	Data signalling rate
0	0	Scan line length 215 mm ± 1%
0	1	Scan line length 215 mm ± 1% and scan line length 255 mm ± 1%
1	0	Scan line length 215 mm ± 1% and scan line length 255 mm ± 1% and scan line length 303 mm ± 1%
1	1	Invalid

DCS:

Bit No. 18	17	Data signalling rate
0	0	Scan line length 215 mm ± 1%
0	1	Scan line length 255 mm ± 1%
1	0	Scan line length 303 mm ± 1%
1	1	Invalid

Bit No. 19–20 Recording length capability:

DIS/DTC:

Bit No. 20	19	Recording length capability
0	0	A4 (297 mm)
0	1	A4 (297 mm) and B4 (364 mm)
1	0	Unlimited
1	1	Invalid

DCS:

Bit No. 20	19	Recording length capability
0	0	A4 (297 mm)
0	1	B4 (364 mm)
1	0	Unlimited
1	1	Invalid

Bit No. 21–23 Minimum scan line time:

DIS/DTC:

Bit No. 23	22	21	Minimum scan line time capability at the receive
0	0	0	20 ms at 3.85 1/mm: T 7.7 = T 3.85 20 ms
0	0	1	5 ms at 3.85 1/mm: T 7.7 = T 3.85
0	1	0	10 ms at 3.85 1/mm: T 7.7 = T 3.85 10 ms
0	1	1	20 ms at 3.85 1/mm: T 7.7 = 1/2 T 3.85
1	0	0	40 ms at 3.85 1/mm: T 7.7 = T 3.85 40 ms
1	0	1	40 ms at 3.85 1/mm: T 7.7 = 1/2 T 3.85
1	1	0	10 ms at 3.85 1/mm: T 7.7 = 1/2 T 3.85
1	1	1	0 ms at 3.85 1/mm: T 7.7 = T 3.85

DCS:

Bit No. 23	22	21	Minimum scan line time
0	0	0	20 ms
0	0	1	5 ms
0	1	0	10 ms
1	0	0	40 ms
1	1	1	0 ms

Bit No.	Designation	DIS/DTC	DCS
31	"0"= Invalid "1"= T.6 coding capability		"0"= Invalid "1"= T.6 coding enabled
32	Extend field	"0"= Without "1"= With	
33	"0"= Invalid "1"= Field not valid capability		
34	"0"= Invalid "1"= Multiple selective polling capability		Set to "0"
35	"0"= Invalid "1"= Polling sub address transmission (DTC) by Polled Sub Address (DIS)/PSA		Set to "0"
36	"0"= Invalid "1"= T.43 coding		
37	"0"= Invalid "1"= Plane interleave		
38	Set to "0"		
39	Set to "0"		
40	Extend field	"0"= Without "1"= With	
41	"0"= Invalid "1"= R8 x 15.4 lines/mm		
42	"0"= Invalid "1"= 300 x 300 pels/25.4 mm		
43	"0"= Invalid "1"= R16 x 15.4 lines/mm and/or 400 x 400 pels/25.4 mm		
44	"0"= Invalid "1"= Inch based resolution preferred		Resolution type selection "0"= metric based resolution "1"= inch based resolution
45	"0"= Invalid "1"= Metric based resolution preferred		Do not care
46	Minimum scan line time capability for higher resolutions.	"0": T 15.4 = T 7.7 "1": T 15.4 = 1/2 T 7.7	Do not care
47	"0"= Invalid "1"= Selective polling (DIS)/ Selective polling transmission (DTC)		Set to "0"
48	Extend field	0: Without 1: With	
49	"0"= Invalid "1"= Sub Addressing capability		"0"= Invalid "1"= Sub Addressing transmission
50	"0"= Invalid "1"= Password/ Sender Identification capability (DIS)/ Password transmission (DTC)		"0"= Invalid "1"= Sender Identification transmission
51	"0"= Invalid "1"= Ready to transmit a data file (polling)		Set to "0"
52	Set to "0"		
53	"0"= Invalid "1"= Binary File Transfer (BFT)		

Bit No.	Designation	DIS/DTC	DCS
54	"0"= Invalid "1"= Document Transfer Mode (DTM)		
55	"0"= Invalid "1"= EDIFACT Transfer (EDI)		
56	Extend field	0: Without 1: With	
57	"0"= Invalid "1"= Basic Transfer Mode (BTM)		
58	Set to "0"		
59	"0"= Invalid "1"= Ready to transmit a character or mixed mode document (polling)		Set to "0"
60	"0"= Invalid "1"= Character mode		
61	Set to "0"		
62	"0"= Invalid "1"= Mixed mode		
63	Set to "0"		
64	Extend field	"0"= Without "1"= With	
65	"0"= Invalid "1"= Processable mode 26		
66	"0"= Invalid "1"= Digital network capability		
67	Duplex and half duplex capabilities	"0"= Half duplex operation only "1"= Duplex and half duplex operation	"0"= Half duplex operation only "1"= Duplex operation
68	"0"= Invalid "1"= JPEG coding		
69	"0"= Invalid "1"= Full color mode		
70	Set to "0"		"0"= Invalid "1"= Preferred Huffmann tables
71	"0"= Invalid "1"= 12 bit/pixel/element		
72	Extend field	"0"= Without "1"= With	
73	"0"= Invalid "1"= No sampling (1:1:1)		
74	"0"= Invalid "1"= Nonstandard radiation light		
75	"0"= Invalid "1"= Nonstandard is mute range		
76	"0"= Invalid "1"= North American Letter (215.9 mm × 279.4 mm) capacity		"0"= Invalid "1"= North American Letter (215.9 mm × 279.4 mm)

| Bit No.	Designation	DIS/DTC	DCS
77		"0"= Invalid "1"= North American Legal (215.9 mm × 355.6 mm) capacity	"0"= Invalid "1"= North American Legal (215.9 mm × 355.6 mm)
78		"0"= Invalid "1"= Single layer sequential encoding, basic capacity	"0"= Invalid "1"= Single layer sequential encoding, basic
79		"0"= Invalid "1"= Single layer sequential encoding, optional L0 capacity	
80	Extend field	"0"= Without "1"= With	
81		"0"= Invalid "1"= HKM key management capacity	"0"= Invalid "1"= HKM key management selection
82		"0"= Invalid "1"= RSA key management capacity	"0"= Invalid "1"= RSA key management selection
83		"0"= Invalid "1"= Override mode capacity	"0"= Invalid "1"= Override mode function
84		"0"= Invalid "1"= HFX40 code capacity	"0"= Invalid "1"= HFX40 code selection
85		"0"= Invalid "1"= Alternative code number 2 capacity	"0"= Invalid "1"= Alternative code number 2 selection
86		"0"= Invalid "1"= Alternative code number 3 capacity	"0"= Invalid "1"= Alternative code number 3 selection
87		"0"= Invalid "1"= HFX40-1 hashing capacity	"0"= Invalid "1"= HFX40-1 hashing selection
88	Extend field	"0"= Without "1"= With	
89		"0"= Invalid "1"= Alternative hashing system number 2 capacity	"0"= Invalid "1"= Alternative hashing system number 2 selection
90		"0"= Invalid "1"= Alternative hashing system number 3 capacity	"0"= Invalid "1"= Alternative hashing system number 3 selection
91	Reserved		
92		"0"= Invalid "1"= T.44 (Mixed raster content) mode	
93		"0"= Invalid "1"= T.44 (Mixed raster content) mode	
94		"0"= Invalid "1"= T.44 (Mixed raster content) mode	
95		"0"= Invalid "1"= Page length maximum strip size for T.44 (Mixed raster content)	
96	Extend field	"0"= Without "1"= With	

Bit No.	Designation	DIS/DTC	DCS
97		"0"= Invalid "1"= Color/mono-color multi-value 300 pixels x 300 pixels or 400 pixels x 400 pixels / 25.4 mm	
98		"0"= Invalid "1"= R4 x 3.85 lines/mm and/or 100 pixels x 100 pixels / 25.4 mm for color/mono-color multi-value	
99		"0"= Invalid "1"= Single phase C BFT negotiation capacity	
100	Set to "0"		
101	Set to "0"		
102	Set to "0"		
103	Set to "0"		
104	Extend field	"0"= Without "1"= With	

TROUBLESHOOTING

16. Jam display

16.1 Misfeed display

- When a paper misfeed occurs, the printer shows the corresponding paper misfeed status by means of the Error indicator on the control panel or LCD display.

```
_____CAUTION_____
    FUSER JAM
  OPEN TOP COVER
```

A0HFF4E502DA
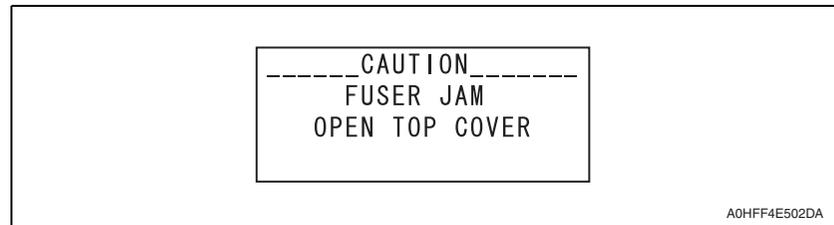
Display	Misfeed Location	Misfeed processing location	Action
TRAY2 JAM OPEN TOP COVER	Tray2 media feed section	Tray2	Lower Feeder Unit Service Manual P.15
CHECK TRAY1 PAPER LOAD PAPER (XXX) (PRESS START KEY)	Tray1 media feed section	Top cover	P.179
DUPLEX JAM OPEN TOP/DUPLEX	Switch back section	Duplex door	Duplex Option Service Manual P.15
TRANSFER JAM OPEN TOP COVER	Transfer section	Top cover	P.179
DUPLEX JAM OPEN DUPLEX COVER	Duplex option transport section	Duplex door	Duplex Option Service Manual P.16
FUSER JAM OPEN TOP COVER	Fusing section	Top cover	P.180
OUTPUT JAM OPEN TOP COVER	Exit section	Top cover	P.180
ORIGINAL DOC. JAM OPEN DOC. FEED COVER (PRESS START KEY)	Document feeding section	ADF top cover	P.181
	Document transport section		P.181
	Document exit section		P.182

16.1.1 Misfeed display resetting procedure

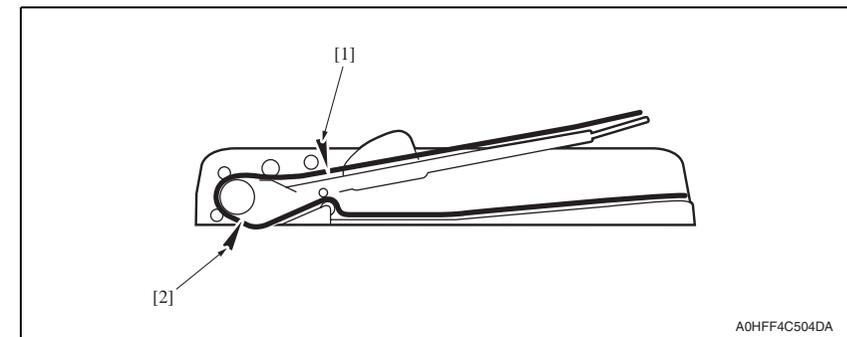- Open the relevant cover, clear the sheet of misfeed paper, and close the cover.

16.2 Sensor layout

- System equipped with a lower feeder unit and duplex option.

A0HFF4C503DA
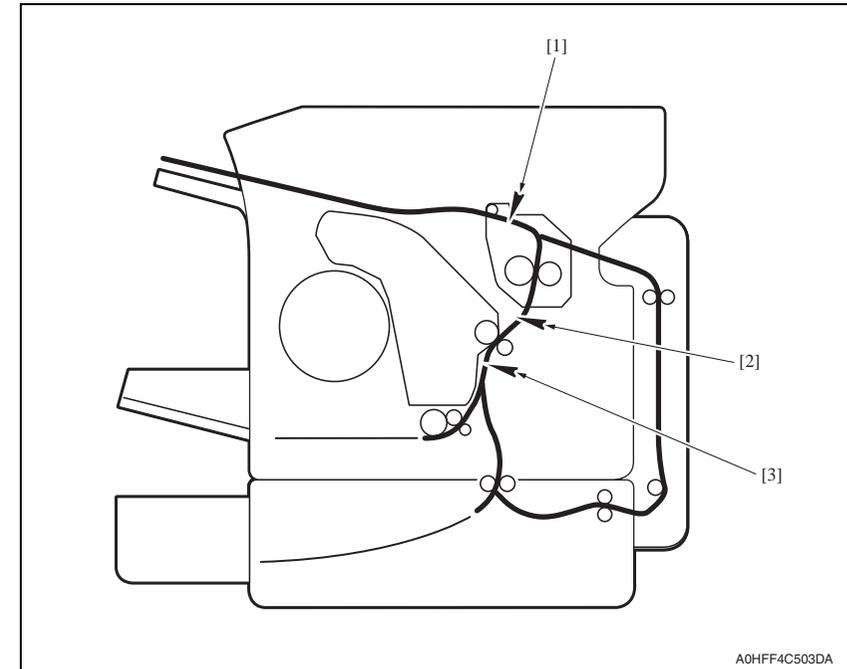
[1] Exit sensor (PS4)
[2] 2nd image transfer retraction position sensor (PS3)
[3] Registration sensor (PS2)

- Auto document feeder unit

A0HFF4C504DA

[1] Media feed sensor (on REYB/1)
[2] Registration sensor (on REYB/1)

16.3 Solution

16.3.1 Initial check items

• When a media misfeed occurs, first make checks of the following initial check items.

Check item	Action
Does media meet product specifications?	• Change media.
Is media curled, wavy, or damp.	• Change media. • Instruct user in correct media storage.
Is a foreign matter present along the media path, or is the media path deformed or worn?	• Clean or change the media path.
Are rolls/rollers dirty, deformed, or worn?	• Clean or change the defective roll/roller.
Are the edge guide and trailing edge stop at correct position to accommodate the media?	• Set as necessary.
Are actuators found operational as checked for correct operation?	• Correct or change the defective actuator.

16.3.2 Misfeed at tray1 media feed section

A. Detection timing

Type	Description
Detection of misfeed at media feed section	The leading edge of the media does not block the registration sensor (PS2) even after the lapse of a predetermined period of time after the tray1 media feed solenoid (SD1) has been energized.

B. Action

Relevant electrical parts	
Registration sensor (PS2) Tray1 media feed solenoid (SD1)	Printer control board (PRCB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Initial check items	—	—
2	Check the PRCB connector for proper connection and correct as necessary.	—	—
3	PS2 sensor check.	PRCB PJ12-6 (ON)	C-3
4	SD1 operation check.	PRCB PJ10-2 (REM)	C-10
5	Change PRCB.	—	—

16.3.3 Misfeed at 2nd transfer section

A. Detection timing

Type	Description
Detection of misfeed at 2nd transfer section	The media does not unblock the registration sensor (PS2) even after the lapse of a predetermined period of time after the registration roller solenoid (SD2) has been deenergized.
	The 2nd image transfer retraction position sensor (PS3) is not blocked by the media that has moved past the position, at which the sensor is blocked.
Detection of media left in 2nd transfer section	The registration sensor (PS2) is blocked when the power switch is turned ON, a cover is opened and closed, or a misfeed or malfunction is reset.
	The 2nd image transfer retraction position sensor (PS3) is blocked when the power switch is turned ON, a cover is opened and closed, or a misfeed or malfunction is reset.

B. Action

Relevant electrical parts	
Registration sensor (PS2) 2nd image transfer retraction position sensor (PS3) Registration roller solenoid (SD2)	Printer control board (PRCB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Initial check items	—	—
2	Check the PRCB connector for proper connection and correct as necessary.	—	—
3	PS2 sensor check.	PRCB PJ12-6 (ON)	C-3
4	PS3 sensor check.	PRCB PJ12-3 (ON)	C-2
5	SD2 operation check.	PRCB PJ10-4 (REM)	C-9
6	Change PRCB.	—	—

16.3.4 Misfeed at fusing section

A. Detection timing

Type	Description
Detection of misfeed at fusing section	The media does not block the exit sensor (PS4) even after the lapse of a predetermined period of time after the registration roller solenoid (SD2) has been energized.
	The exit sensor (PS4) is unblocked within a predetermined period of time after it has been blocked by the media.
	The transport motor, polygon motor, and rack motor are energized even after the lapse of a predetermined period of time after media information has been created.
Detection of media left in fusing section	The exit sensor (PS4) is blocked when the power switch is turned ON, a door or cover is opened and closed, or a misfeed or malfunction is reset.

B. Action

Relevant electrical parts	
Exit sensor (PS4) Registration roller solenoid (SD2)	Print control board (PRCB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Initial check items	—	—
2	Check the PRCB connector for proper connection and correct as necessary.	—	—
3	Make the sensor check of exit sensor (PS4) and, if any abnormal condition is found, replace the fuser unit with a new one.	—	—
4	SD2 operation check	PRCB PJ10-4 (REM)	C-9
5	Change PRCB.	—	—

16.3.5 Misfeed at exit section

A. Detection timing

Type	Description
Detection of misfeed at exit section	• The exit sensor (PS4) is not unblocked even after the lapse of a predetermined period of time after it has been blocked by the media.
Detection of paper left in exit section	• The exit sensor (PS4) is blocked when the power switch is turned ON, a cover is opened and closed, or a misfeed or malfunction is reset.

B. Action

Relevant electrical parts	
Exit sensor (PS4)	Print control board (PRCB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Initial check items	—	—
2	Check the PRCB connector for proper connection and correct as necessary.	—	—
3	PS4 sensor check	—	B-5 to 6
4	Change Fuser unit.	—	—
5	Change PRCB.	—	—

16.3.6 Misfeed at the document feeding section

A. Detection timing

Type	Description
Detection of misfeed at the document feeding section	• The media feed sensor (on REYB) is not unblocked even after the lapse of a predetermined period of time after the document feed motor (M100) has been energized.
Detection of media left at the document feeding section	• The media feed sensor (on REYB) is unblocked when the power switch is turned ON, the cover is opened and closed, or a misfeed or malfunction is reset.

B. Action

Relevant electrical parts	
Document feed motor (M100) Media feed sensor (on REYB)	MFP board (MFPB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Initial check items	—	—
2	Check the MFPB connector for proper connection and correct as necessary.	—	—
3	M100 operation check	MFPB P1-1 to 4	J-6
4	Media feed sensor (on REYB) sensor check	MFPB P4-4 (ON)	K to L-5
5	Change MFPB.	—	—

16.3.7 Document transport section

A. Detection timing

Type	Description
Detection of misfeed at the document transport section	• The registration sensor (on REYB) is not blocked even after the lapse of a predetermined period of time after the media feed sensor (on REYB) has been unblocked.
Detection of media left at the document transport section	• The media feed sensor (on REYB) is unblocked and the registration sensor (on REYB) is blocked when the power switch is turned ON, the cover is opened and closed, or a misfeed or malfunction is reset.

B. Action

Relevant electrical parts	
Document feed motor (M100) Media feed sensor (on REYB) Registration sensor (on REYB)	MFP board (MFPB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Initial check items	—	—
2	Check the MFPB connector for proper connection and correct as necessary.	—	—
3	M100 operation check	MFPB P1-1 to 4	J-6
4	Media feed sensor (on REYB) sensor check	MFPB P4-4 (ON)	K to L-5
5	Registration sensor (on REYB) sensor check	MFPB P4-1 (ON)	K to L-5
6	Change MFPB.	—	—

16.3.8 Misfeed at the document exit section

A. Detection timing

Type	Description
Detection of misfeed at the document exit section	• The registration sensor (on REYB) is not unblocked even after the lapse of a predetermined period of time after the media feed sensor (on REYB) has been unblocked.
Detection of media left at the document exit section	• The registration sensor (on REYB) is blocked when the power switch is turned ON, the cover is opened and closed, or a misfeed or malfunction is reset.

B. Action

Relevant electrical parts	
Document feed motor (M100) Media feed sensor (on REYB) Registration sensor (on REYB)	MFP board (MFPB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Initial check items	—	—
2	Check the MFPB connector for proper connection and correct as necessary.	—	—
3	M100 operation check	MFPB P1-1 to 4	J-6
4	Media feed sensor (on REYB) sensor check	MFPB P4-4 (ON)	K to L-5
5	Registration sensor (on REYB) sensor check	MFPB P4-1 (ON)	K to L-5
6	Change MFPB.	—	—

17. Malfunction code

17.1 Trouble codes (service call)

- The printer's CPU performs a self-diagnostics function that, on detecting a malfunction, gives the corresponding malfunction code and maintenance call mark on the control panel.

```
_____CAUTION_____
  MACHINE TROUBLE
SERVICE CALL (####)
```

A0HFF4E500DA

17.1.1 Trouble code list

- For the details of the malfunction codes of the options, see the service manual for the corresponding option.

Display message	Misfeed location	Detection timing
0001	Transport motor malfunction	• The motor lock signal remains HIGH for a predetermined consecutive period of time while the transport motor remains energized.
001B	Developing motor malfunction	• The developing motor does not rotate evenly even after the lapse of a given period of time while it is being started.
		• The motor lock signal remains HIGH for a given period of consecutive time while the developing motor is being rotated.
004A	Duplex cooling fan motor malfunction	Duplex Option Service Manual P.18
004C	Ozone ventilation fan motor malfunction	• The ozone ventilation fan motor does not rotate evenly even after the lapse of a given period of time while it is being started.
		• The motor lock signal remains HIGH for a given period of consecutive time while the ozone ventilation fan motor is being rotated.
004E	DC power supply fan motor malfunction	• The DC power supply fan motor does not rotate evenly even after the lapse of a given period of time while it is being started.
		• The motor lock signal remains HIGH for a given period of consecutive time while the DC power supply fan motor is being rotated.
0092	Transfer belt rotation failure	• The belt positioning sensor does not detect the transfer belt position detection hole a second time even after the lapse of a predetermined period of time after it has detected one while the transfer belt is rotated.

Display message	Misfeed location	Detection timing
0094	2nd image transfer pressure / retraction failure	• The 2nd image transfer retraction position sensor is not activated (retracted position) within a given period of time after the retraction sequence of the 2nd transfer roller has been started.
		• The 2nd image transfer retraction position sensor is not deactivated (pressed position) within a given period of time after the pressure sequence of the 2nd transfer roller has been started.
0300	Polygon motor malfunction	• The polygon motor does not rotate evenly even after the lapse of a given period of time after it has been started.
		• The motor lock signal remains HIGH for a given period of consecutive time while the polygon motor is being rotated.
0310	Laser malfunction	• The SOS signal is not detected within a given period of time after the output of the laser has been started.
0500	Fuser warm-up failure	• The thermistor /1 does not detect the specified temperature and the warm-up cycle is not completed even after the lapse of a given period of time after the cycle has been started.
0502	Thermistor open-circuit failure	• The temperature detected by the thermistor does not reach a predetermined level even after the lapse of a given period time after the warm-up cycle has been started.
0503	Thermistor resistance failure	• The difference between the temperature detected by thermistor/1 and that detected by thermistor/2 exceeds a predetermined value.
0510	Abnormally low fuser temperature	• The temperature detected by the thermistor /1 remains lower than the specified value for a given period of time or longer.
0520	Abnormally high fuser temperature	• The temperature detected by the thermistor /1 remains higher than the specified value for a given period of time or longer.
		• The heater lamp remains ON for a given period of time or longer.
0F51	Waste toner full sensor malfunction	• It is determined that the LED and photo receiver are faulty through a check made when a new imaging cartridge is detected.
13C0	Print control board malfunction	• A communication error occurs in print control board (PRCB).
13DD	Backup data error	• The printer determines that EEPROM is yet to be mounted when the main power switch is turned ON.
13F0	Engine control failure	• An undefined malfunction occurs in the engine section (PRCB, etc.).
3C00	Trouble related to EEPROM error	• Turn the power switch OFF then ON. If error remains replace the EEPROM.
3C10		
3C40		
13E2	Engine flash ROM write error	• Flash ROM writing is found faulty during a check.

Display message	Misfeed location	Detection timing
CF01	BB error	• Contact the responsible people of KONICA MINOLTA before taking some countermeasures.
0045	Exit tray cooling fan motor malfunction	• The exit tray cooling fan motor does not rotate evenly even after the lapse of a given period of time while it is being started.
		• The fan motor lock signal remains HIGH for a given period of consecutive time while the exit tray cooling fan motor is being rotated.
0650	Scanner home sensor abnormalities	• A low motor lock signal is not detected even after the lapse of a predetermined period of time after the polygon motor has been started.
		• The motor lock signal remains HIGH for a predetermined consecutive period of time while the polygon motor remains energized.
14A3	IR lamp malfunction	• The intensity of the light emitted from the exposure lamp of the scanner falls short of the specified value.
1038	Engine connect error	• Printer control board (PRCB) to MFP board (MFPB) connection failure.
		• The copier determines that there is an error if the print control board (PRCB) fails to send an acknowledgement signal to the MFP board (MFPB) for a given period of time or more.
		• An error command signal is transmitted from the MFP board (MFPB) to printer control board (PRCB).
		• An error status signal is transmitted from the printer control board (PRCB) to MFP board (MFPB).
3FFF	Flash ROM write error	• The copier determines that there is an error if writing to the flash ROM fails during upgrading of the firmware.
		• When the power switch is turned ON, the error indicator lights up steadily and a corresponding message appears on the display.
		• If this error message appears, no operations can then be performed. It is not possible to upgrade the firmware from a PC connected through USB connection, either.

17.2 Resetting a malfunction

• To reset a malfunction, turn the power switch OFF and then ON again.

17.3 Solution

17.3.1 0001: Transport motor malfunction

Relevant electrical parts	
Transport motor (M1)	Print control board (PRCB) DC power supply (DCPU)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the M1 connector for proper connection and correct as necessary.	—	—
2	Check M1 for proper drive coupling and correct as necessary.	—	—
3	Check the PRCB connector for proper connection and correct as necessary.	—	—
4	M1 operation check	PRCB PJ8-1 to 6	C-2
5	Change M1.	—	—
6	Change PRCB.	—	—
7	Change DCPU.	—	—

17.3.2 001B: Developing motor malfunction

Relevant electrical parts	
Developing motor (M3) Driving unit	Print control board (PRCB) DC power supply (DCPU)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the developing motor connector for proper connection and correct as necessary.	—	—
2	Check the PRCB connector for proper connection and correct as necessary.	—	—
3	M3 operation check	PRCB PJ5-1 to 4	C-12
4	Change M3.	—	—
5	Change PRCB.	—	—
6	Change DCPU.	—	—

17.3.3 004C: Ozone ventilation fan motor malfunction

Relevant electrical parts	
Ozone ventilation fan motor (FM2)	Print control board (PRCB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the FM2 connector for proper connection and correct as necessary.	—	—
2	Check the fan for possible overload and correct as necessary.	—	—
3	FM2 operation check	PRCB PJ16-1 (REM) PRCB PJ16-3 (LOCK)	C-4
4	Change FM2.	—	—
5	Change PRCB.	—	—

17.3.4 004E: DC power supply fan motor malfunction

Relevant electrical parts	
DC power supply fan motor (FM1)	Print control board (PRCB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the FM1 connector for proper connection and correct as necessary.	—	—
2	Check the fan for possible overload and correct as necessary.	—	—
3	FM1 operation check	HV CN2-1 (REM) HV CN2-3 (LOCK)	B-4 to 5
4	Change FM1.	—	—
5	Change PRCB.	—	—

17.3.5 0092: Transfer belt rotation failure

Relevant electrical parts	
Belt positioning sensor (PS6) Imaging cartridge	Print control board (PRCB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the PRCB connector for proper connection and correct as necessary.	—	—
2	PS6 sensor check	—	—
3	Change imaging cartridge.	—	—
4	Change PRCB.	—	—

17.3.6 0094: 2nd image transfer pressure/retraction failure

Relevant electrical parts	
2nd image transfer retraction position sensor (PS3) 2nd image transfer pressure/retraction solenoid (SD4) Transport motor (M1)	Print control board (PRCB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the M1 connector for proper connection and correct as necessary.	—	—
2	Check the SD4 connector for proper connection and correct as necessary.	—	—
3	Check M1 for proper drive coupling and correct as necessary.	—	—
4	Check SD4 for proper drive coupling and correct as necessary.	—	—
5	Check the PRCB connector for proper connection and correct as necessary.	—	—
6	PS3 sensor check	PRCB PJ12-3 (ON)	C-2
7	SD4 operation check	PRCB PJ10-6 (REM)	C-9
8	M1 operation check	PRCB PJ8-1 to 6	C-2
9	Change M1.	—	—
10	Change SD4.	—	—
11	Change PRCB.	—	—

17.3.7 0300: Polygon motor malfunction

Relevant electrical parts	
PH unit	Print control board (PRCB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the cable and connector for proper connection and correct as necessary.	—	—
2	Change PH unit.	—	—
3	Change PRCB.	—	—

17.3.8 0310: Laser malfunction

Relevant electrical parts	
PH unit	Print control board (PRCB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the cable and connector for proper connection and correct as necessary.	—	—
2	Change PH unit.	—	—
3	Change PRCB.	—	—

17.3.9 0500: Fuser warm-up failure
0503: Thermistor resistance failure

Relevant electrical parts	
Fuser unit	Printer control board (PRCB) DC power supply (DCPU)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (Electrical component)
1	Change fuser unit.	—	—
2	*1.* Main switch is turned ON. *2.* Open the top cover. *3.* Press the following ten keys in this order. 2 → 6 → 2 → 3 → 7. *4.* Main switch is turned OFF/ON.	—	—
3	Change PRCB.	—	—
4	Change DCPU.	—	—

17.3.10   0502: Thermistor open-circuit failure
0510: Abnormally low fuser temperature
0520: Abnormally high fuser temperature

Relevant electrical parts	
Fuser unit	Printer control board (PRCB) DC power supply (DCPU)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (Electrical component)
1	Check the fuser unit for correct installation (whether it is secured in position).	—	—
2	Check the fuser unit, DCPU, and PRCB for proper connection and correct as necessary.	—	—
3	Change fuser unit.	—	—
4	Change PRCB.	—	—
5	Change DCPU.	—	—

17.3.11   0F51: Waste toner full sensor malfunction

Relevant electrical parts	
Waste toner full sensor (PS7) Imaging cartridge	Print control board (PRCB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the PRCB connector for proper connection and correct as necessary.	—	—
2	PS7 sensor check	—	—
3	Change imaging cartridge.	—	—
4	Change PRCB.	—	—

17.3.12   13C0: Print control board malfunction

Relevant electrical parts
Print control board (PRCB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Reboot the main body.	—	—
2	Change PRCB.	—	—

17.3.13   13DD: Backup data error

Relevant electrical parts	
Print control board (PRCB)	MFP board (MFPB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the cable and connector for proper connection and correct as necessary.	—	—
2	Change PRCB.	—	—
3	Change MFPB.	—	—

17.3.14   13F0: Engine control failure

Relevant electrical parts	
Print control board (PRCB)	MFP board (MFPB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the cable and connector for proper connection and correct as necessary.	—	—
2	Change PRCB.	—	—
3	Change MFPB.	—	—

17.3.15   13E2: Engine flash ROM write error

Relevant electrical parts	
Print control board (PRCB)	MFP board (MFPB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the cable and connector for proper connection and correct as necessary.	—	—
2	Change PRCB.	—	—
3	Change MFPB.	—	—

17.3.16   0045: Exit tray cooling fan motor malfunction

Relevant electrical parts	
Exit tray cooling fan motor (FM4)	MFP board (MFPB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the FM4 connector for proper connection and correct as necessary.	—	—
2	Check the fan for possible overload and correct as necessary.	—	—
3	FM4 operation check	PRCB PJ24-4 (REM) PRCB PJ24-6 (LOCK)	C-13
4	Change FM4.	—	—
5	Change MFPB.	—	—

17.3.17   0650: Scanner home sensor abnormalities

Relevant electrical parts	
Scanner motor (M101)	Print control board (PRCB) DC power supply (DCPU)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check to see if the lock lever of the Scanner unit is unlocked and unlock the lock lever if it is locked.	—	—
2	Check the M101 connector for proper connection and correct as necessary.	—	—
3	Check M101 for proper drive coupling and correct as necessary.	—	—
4	Check the PRCB connector for proper connection and correct as necessary.	—	—
5	M101 operation check.	MFPB P2-1 to 4	1680MF: J-12 1690MF: J-6
6	Change PRCB.	—	—
7	Change DCPU.	—	—

17.3.18   14A3: IR lamp malfunction

Relevant electrical parts	
Scanner unit	MFP board (MFPB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the exposure lamp for lighting condition when the power switch is turned ON and, if any faulty symptom is evident, correct the Scanner Unit.	—	—
2	Check the MFPB connector for proper connection and correct as necessary.	—	—
3	Change scanner unit.	—	—
4	Change MFPB.	—	—

17.3.19   1038: Engine connect error

Relevant electrical parts	
Print control board (PRCB)	MFP board (MFPB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Turn OFF and ON the power switch.	—	—
2	Check the PRCB connector for proper connection and correct as necessary.	—	—
3	Check the MFPB connector for proper connection and correct as necessary.	—	—
4	Check for proper connection between PRCB and MFPB and correct as necessary.	—	—
5	Change MFPB.	—	—
6	Change PRCB.	—	—

17.3.20   3FFF: Flash ROM write error

Relevant electrical parts	
Print control board (PRCB)	MFP board (MFPB)

Step	Action	WIRING DIAGRAM	
		Control signal	Location (electrical component)
1	Check the cable and connector for proper connection and correct as necessary.	—	—
2	Identify the specific firmware that is responsible for the error.	—	—
3	Rewrite the firmware.	—	—
4	Unplug parameter chip from PRCB and then plug it back in.	—	—
5	Change PRCB.	—	—
6	Change MFPB.	—	—

18. Power supply errors

18.1   Machine is not energized at all (DCPU operation check)

Relevant electrical parts	
Power switch Printer control board (PRCB)	DC power supply (DCPU)

Step	Check Item	Location (Electrical component)	Result	Action
1	Is the power source voltage being applied to CN6 on DCPU?	1680MF: J to K-8 1690MF: J to K-1	NO	Check wiring from power outlet to SW1 to CN1-N.
2	Are fuses (F1 and F2) on DCPU conducting?	—	NO	Change DCPU.
3	Are DC24 V and DC5 V being applied to PJ17 on the printer control board?	E-4 to 5	NO	Change DCPU.
			YES	Change PRCB.

18.2   Control panel indicators do not light

Relevant electrical parts	
MFP board (MFPB) Control panel	DC power supply (DCPU)

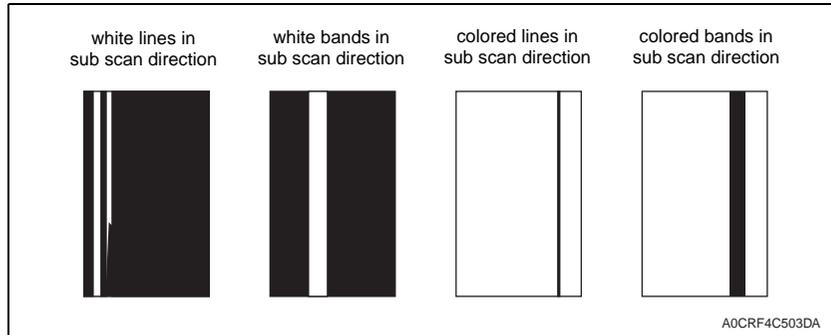| Step	Check Item	Location (Electrical component)	Result	Action
1	Is the power source voltage being applied to CN6 on DCPU?	J-6	NO	Check wiring from power outlet to SW1 to CN1-N.
2	Are fuses (F1 and F2) on DCPU conducting?	—	NO	Change DCPU.
3	Is PJ1 on PRCB properly connected?	1680MF: F to G-10 1690MF: F to G-3 to 4	NO	Reconnect.
	Is P10 on MFPB properly connected?	1680MF: H-10 1690MF: H-3 to 4		
	Is P7 on MFPB properly connected?	1680MF: I-10 to 11 1690MF: I-3 to 4		
4	Is CN701 on control panel properly connected?	1680MF: J to K-10 to 11 1690MF: J to K-3 to 4	NO	Reconnect.
			YES	Change control panel. Change MFPB.

19. Image quality problems

19.1 Print system

NOTE
- **Typical faulty image samples shown in the following are all printed with A4S setting.**

19.1.1 White lines/bands, colored lines/bands in sub scan direction
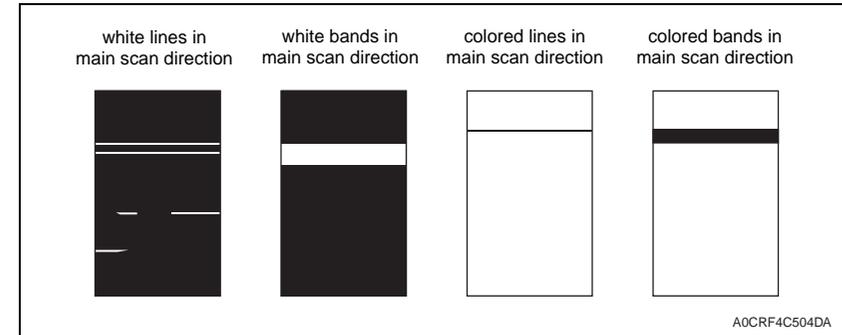
A. Typical faulty images

white lines in sub scan direction   white bands in sub scan direction   colored lines in sub scan direction   colored bands in sub scan direction

A0CRF4C503DA

B. Troubleshooting procedure

Step	Section	Check item	Result	Action
1	Imaging cartridge	Are there scratches or lines evident on the photo conductor surface?	YES	Replace the imaging cartridge.
2		Is the outside dirty?	YES	Clean.
3		Is the connector or contact terminal of the imaging cartridge connected properly?	NO	Clean the contact terminal.
4		Is the transfer belt dirty with fingerprints or oil?	YES	Clean.
5		Is the transfer belt dirty or scratched?	YES	Wipe the surface clean of dirt with a soft cloth. Replace the scratched transfer belt with a new imaging cartridge.
6	PH unit	Is the connector or contact terminal of the PH unit connected properly?	NO	Clean the contact terminal or reconnect the connector.
7		Is the window surface dirty?	YES	Clean.
8	2nd transfer roller	Is the 2nd transfer roller dirty or scratched?	YES	Replace the 2nd transfer roller.
9	Media path	Is there a foreign object in the media path?	YES	Remove the foreign object.
10	Fuser unit	Is the fusing entrance guide plate dirty or scratched?	YES	Clean. Replace the fuser unit.
11		Have steps 1 to10 eliminated the problem?	NO	Replace the toner cartridge. → Replace the PH unit.

19.1.2 White lines/bands, colored lines/bands in main scan direction
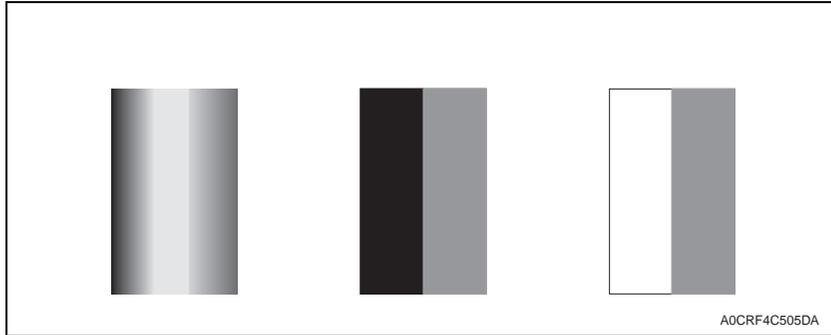
A. Typical faulty images

white lines in main scan direction   white bands in main scan direction   colored lines in main scan direction   colored bands in main scan direction

A0CRF4C504DA

B. Troubleshooting procedure

Step	Section	Check item	Result	Action
1	Imaging cartridge	Are there scratches or lines evident on the photo conductor surface?	YES	Replace the imaging cartridge.
2		Is the outside dirty?	YES	Clean.
3		Is the connector or contact terminal of the imaging cartridge connected properly?	NO	Clean the contact terminal.
4		Is the transfer belt dirty or scratched?	YES	Wipe the surface clean of dirt with a soft cloth. Replace the scratched transfer belt with a new imaging cartridge.
5	Toner cartridge	Is the developing bias contact terminal in good contact?	NO	Clean the contact terminal or check the terminal position.
6	PH unit	Is the connector or contact terminal of the PH unit connected properly?	NO	Clean the contact terminal or reconnect the connector.
7	2nd transfer roller	Is the 2nd transfer roller dirty or scratched?	YES	Replace the 2nd transfer roller.
8	Media path	Is there a foreign object in the media path?	YES	Remove the foreign object.
9	Fuser unit	Is the fusing entrance guide plate dirty or scratched?	YES	Clean.
10		Have steps 1 to 9 eliminated the problem?	NO	Replace the DC power supply.

19.1.3   Uneven density in sub scan direction
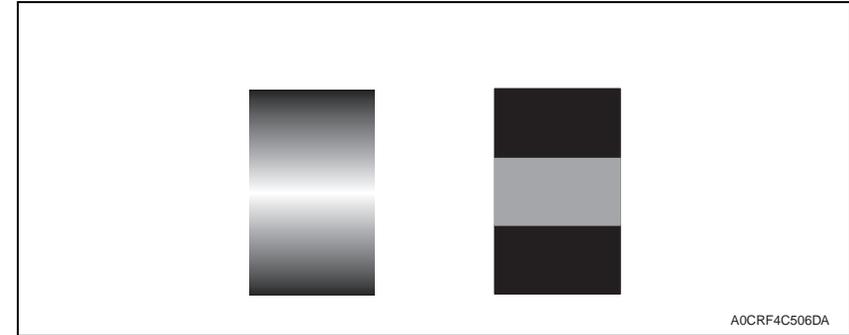
A. Typical faulty images

A0CRF4C505DA

B. Troubleshooting procedure

Step	Section	Check item	Result	Action
1	Imaging cartridge	Are there scratches or lines evident on the photo conductor surface?	YES	Replace the imaging cartridge.
2		Is the outside dirty?	YES	Clean.
3		Is the transfer belt dirty or scratched?	YES	Wipe the surface clean of dirt with a soft cloth. Replace the scratched transfer belt with a new imaging cartridge.
4		Is the terminal dirty?	YES	Clean.
5	PH unit	Is the window surface dirty?	YES	Clean.
6	2nd transfer roller	Is the 2nd transfer roller dirty or scratched?	YES	Replace the 2nd transfer roller.
7		Have steps 1 to 6 eliminated the problem?	NO	Replace the toner cartridge. → Replace the PH Unit. → Replace high voltage unit.

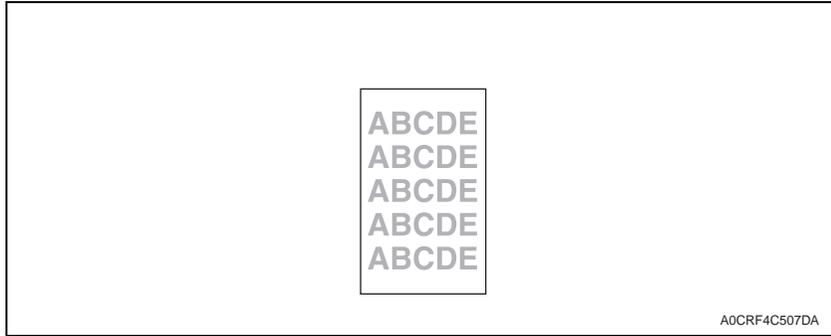**19.1.4   Uneven density in main scan direction**

A. Typical faulty images

A0CRF4C506DA

B. Troubleshooting procedure

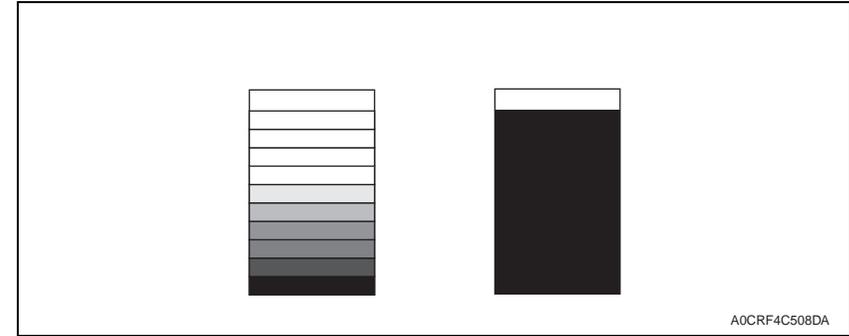| Step	Section	Check item	Result	Action
1	Imaging cartridge	Are there scratches or lines evident on the photo conductor surface?	YES	Replace the imaging cartridge.
2		Is the outside dirty?	YES	Clean.
3		Is the transfer belt dirty with fingerprints or oil?	YES	Clean.
4		Is the transfer belt dirty or scratched?	YES	Wipe the surface clean of dirt with a soft cloth. Replace the scratched transfer belt with a new imaging cartridge.
5		Is the terminal dirty?	YES	Clean.
6	2nd transfer roller	Is the 2nd transfer roller dirty or scratched?	YES	Replace the 2nd transfer roller.
7		Have steps 1 to 6 eliminated the problem?	NO	Replace the toner cartridge. → Replace high voltage unit.

19.1.5 Low image density

A. Typical faulty images

ABCDE
ABCDE
ABCDE
ABCDE
ABCDE

A0CRF4C507DA

B. Troubleshooting procedure

Step	Section	Check item	Result	Action
1	Imaging cartridge	Is the outside dirty?	YES	Clean.
2		Is the contact dirty?	YES	Clean.
3	PH unit	Is the window surface dirty?	YES	Clean.
4	2nd transfer roller	Is the contact dirty?	YES	Clean.
5	Media	Is the media damp?	YES	Replace the media with new media that has just been unwrapped.
6	IDC sensor board	Is the sensor dirty?	YES	Clean.
7		Have steps 1 to 6 eliminated the problem?	NO	Replace the toner cartridge. → Replace the Imaging cartridge. → Replace the 2nd transfer roller. → Replace the PH unit. → Replace the IDC sensor board. → Replace the printer control board. → Replace the high voltage unit.

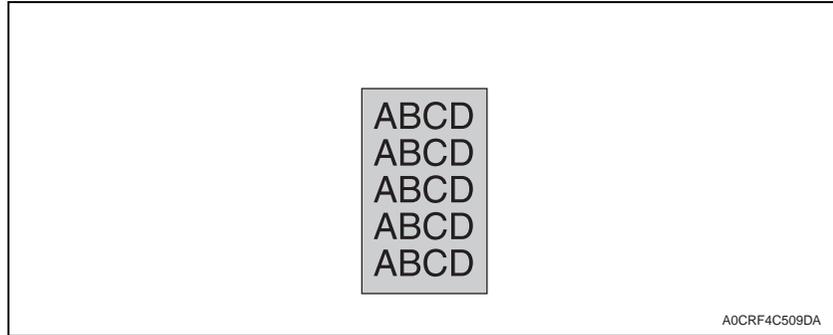### 19.1.6 Gradation reproduction failure

A. Typical faulty images

A0CRF4C508DA

B. Troubleshooting procedure

Step	Section	Check item	Result	Action
1	Imaging cartridge	Is the outside dirty?	YES	Clean.
2	PH unit	Is the window surface dirty?	YES	Clean.
3	IDC sensor board	Is the sensor dirty?	YES	Clean.
4		Have steps 1 to 3 eliminated the problem?	NO	Replace the toner cartridge. → Replace the PH unit. → Replace the IDC sensor board. → Replace the high voltage unit.

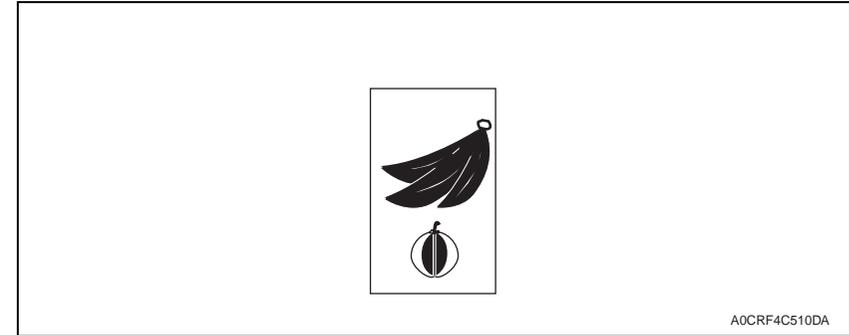### 19.1.7 Foggy background

A. Typical faulty images

ABCD
ABCD
ABCD
ABCD
ABCD

A0CRF4C509DA

B. Troubleshooting procedure

Step	Section	Check item	Result	Action
1	Imaging cartridge	Are there scratches or lines evident on the photo conductor surface?	YES	Replace the imaging cartridge.
2		Is the outside dirty?	YES	Clean.
3		Is the contact terminal of the imaging cartridge connected properly?	NO	Clean the contact terminal.
4	Toner cartridge	Is the developing bias contact terminal in good contact?	NO	Clean the contact terminal or check the terminal position.
5	PH unit	Is the connector or contact terminal of the PH unit connected properly?	NO	Clean the contact terminal or reconnect the connector.
6		Is the window surface dirty?	YES	Clean.
7	IDC sensor bozrd	Is the sensor dirty?	YES	Clean.
8		Have steps 1 to 7 eliminated the problem?	NO	Replace the toner cartridge. → Replace the PH unit. → Replace the IDC sensor board.

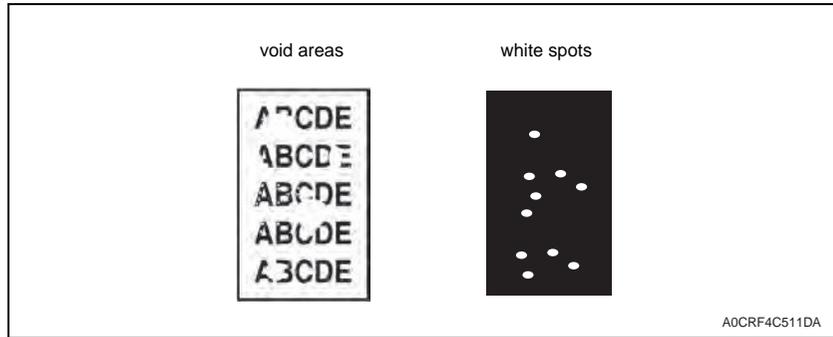### 19.1.8 Poor color reproduction

A. Typical faulty images

A0CRF4C510DA

B. Troubleshooting procedure

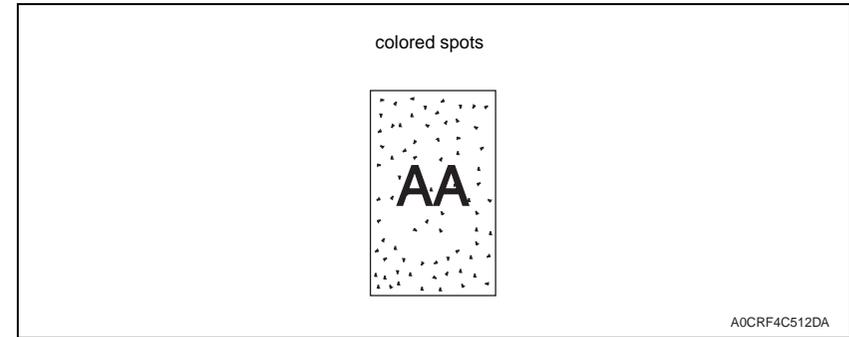| Step	Section	Check item	Result	Action
1	Media	Is the media damp?	YES	Replace the media with new media that has just been unwrapped.
2	imaging cartridge	Is the terminal dirty?	YES	Clean.
3	IDC sensor board	Is the sensor dirty?	YES	Clean.
4		Have steps 1 to 3 eliminated the problem?	NO	Replace the imaging cartridge. → Replace the IDC sensor board. → Replace the printer control board. → Replace the high voltage unit.

19.1.9 Void areas, white spots

A. Typical faulty images

void areas   white spots

A0CRF4C511DA

B. Troubleshooting procedure

Step	Section	Check item	Result	Action
1	Imaging cartridge	Are there scratches or lines evident on the photo conductor surface?	YES	Replace the imaging cartridge.
2		Is the outside dirty?	YES	Clean.
3		Is the transfer belt dirty with fingerprints or oil?	YES	Clean.
4		Is the transfer belt dirty or scratched?	YES	Wipe the surface clean of dirt with a soft cloth. Replace the scratched transfer belt with a new imaging cartridge.
5		Is the ground terminal connected properly?	NO	Correct.
6	2nd transfer roller	Is the 2nd transfer roller dirty or scratched?	YES	Replace the 2nd transfer roller.
7	Media path	Is there a foreign object in the media path?	YES	Remove the foreign object.
8		Is the fusing entrance guide plate dirty or scratched?	YES	Clean or replace.
9		Have steps 1 to 8 eliminated the problem?	NO	Replace the toner cartridge.

### 19.1.10 Colored spots

A. Typical faulty images

colored spots

A0CRF4C512DA

B. Troubleshooting procedure

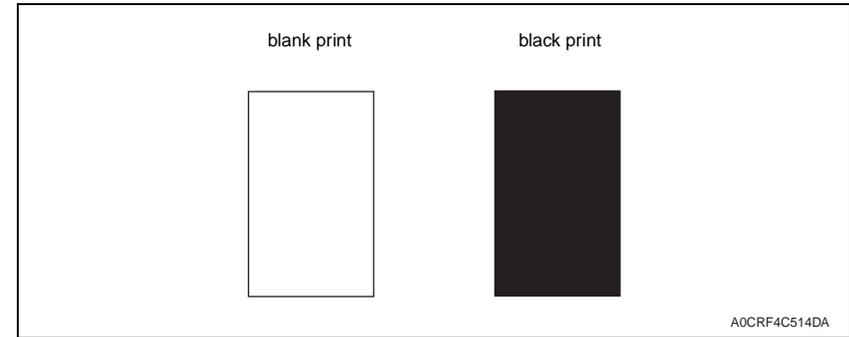| Step	Section	Check item	Result	Action
1	Imaging cartridge	Are the spots in a single color?	NO	Replace the imaging cartridge.
2		Are there scratches or lines evident on the photo conductor surface?	YES	Replace the imaging cartridge.
3		Is the Transfer Belt dirty with fingerprints or oil?	YES	Clean.
4		Is the transfer belt dirty or scratched?	YES	Wipe the surface clean of dirt with a soft cloth. Replace the scratched transfer belt with a new imaging cartridge.
5	2nd transfer roller	Is the 2nd transfer roller dirty or scratched?	YES	Replace the 2nd transfer roller.
6	Media path	Is there a foreign object in the media path?	YES	Remove the foreign object.
7	Fuser unit	Is the fusing roller dirty or scratched?	YES	Replace the fuser unit.
8		Have steps 1 to 7 eliminated the problem?	NO	Replace the toner cartridge.

19.1.11 Blurred image

A. Typical faulty images

blurred image

ABCDE
ABCDE
ABCDE
ABCDE

A0CRF4C513DA
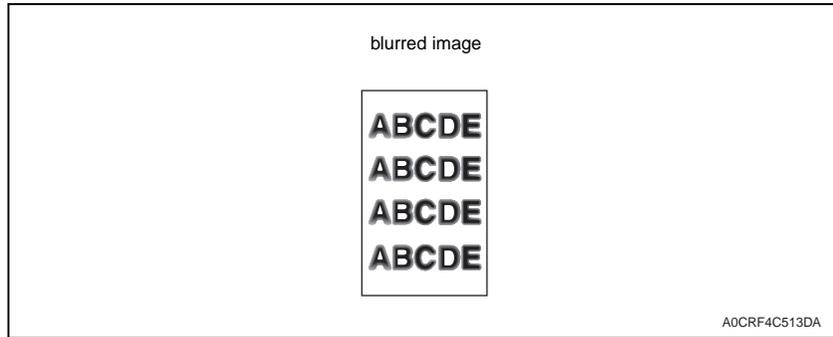
B. Troubleshooting procedure

Step	Section	Check item	Result	Action
1	PH unit	Is the window surface dirty?	YES	Clean.
2	Imaging cartridge	Is the outside dirty?	YES	Clean.
3		Have steps 1 to 2 eliminated the problem?	NO	Replace the imaging cartrdge. → Replace the PH unit.

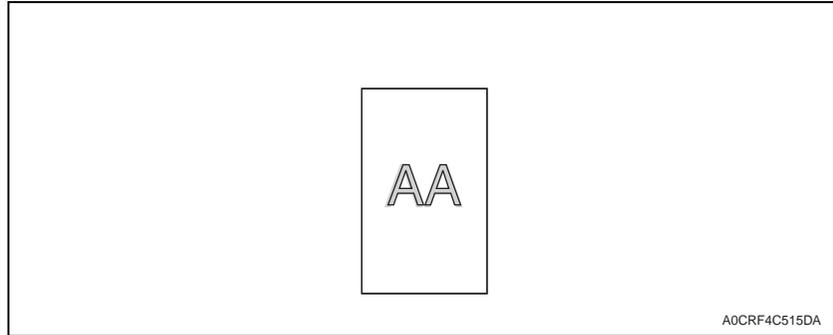### 19.1.12 Blank copy, black copy

A. Typical faulty images

blank print   black print

A0CRF4C514DA

B. Troubleshooting procedure

Step	Section	Check item	Result	Action
1	Image check	Does a blank print occur?	YES	Check the PH unit connector for proper connection.
2	Imaging cartridge	Is the gear of the imaging cartridge drive mechanism installed properly?	NO	Check or correct the drive transmitting section or replace the imaging cartridge.
3		Is the charge corona voltage contact or photo conductor ground contact of the imaging cartridge connected properly?	NO	Check, clean, or correct the contact.
4	High voltage unit	Is the connector connected properly?	NO	Reconnect.
5		Have steps 1 to 4 eliminated the problem?	NO	Replace the high voltage unit. → Replace the printer control board. → Replace the PH unit.

### 19.1.13 Incorrect color image registration

A. Typical faulty images

A0CRF4C515DA

B. Troubleshooting procedure

Step	Section	Check item	Result	Action
1	Imaging cartridge	Is the transfer belt dirty with fingerprints or foreign matter?	YES	Clean.
2		Is the transfer belt dirty or scratched?	YES	Wipe the surface clean of dirt with a soft cloth. Replace the scratched transfer belt with a new imaging cartridge.
3		Is the photo conductor scratched?	YES	Replace the imaging cartridge.
4		Is the drive coupling to the machine dirty?	YES	Clean.
5	2nd transfer roller	Is the 2nd transfer roller dirty or scratched?	YES	Replace the 2nd transfer roller.
6		Have steps 1 to 5 eliminated the problem?	NO	Replace the PH unit. → Replace the printer control board.

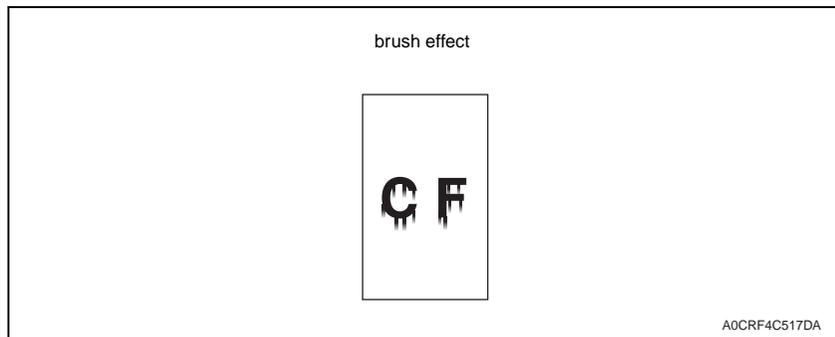### 19.1.14 Poor fusing performance, offset

A. Typical faulty images

poor fusing performance   offset

A0CRF4C516DA
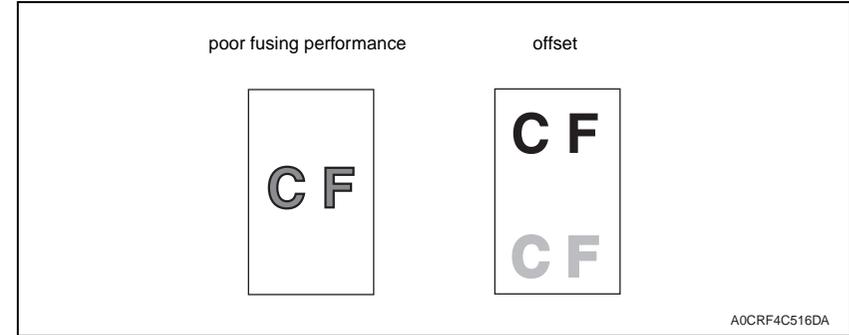
B. Troubleshooting procedure

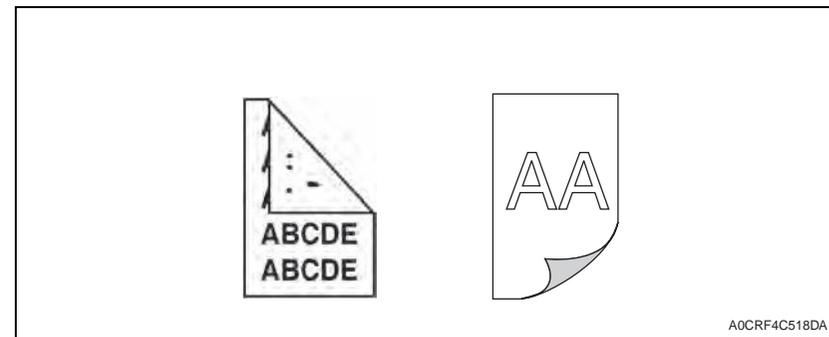| Step	Section	Check item	Result	Action
1	Media	Does the media being used conform to specifications?	NO	Replace the media.
2	Fuser unit	Are the fuser separator levers in the correct position?	NO	Correct.
3		Have steps 1 to 2 eliminated the problem?	NO	Replace the fuser unit. → Replace the printer control board.

19.1.15 Brush effect

A. Typical faulty images

brush effect

C F

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B. Troubleshooting procedure

Step	Section	Check item	Result	Action
1	Media	Is the media damp?	YES	Replace the media with new media that has just been unwrapped.
2		Does the media being used conform to specifications?	NO	Replace the media.
3	Imaging cartridge	Are there scratches or lines evident on the photo conductor surface?	YES	Replace the imaging cartridge.
4		Is the transfer belt dirty with fingerprints or oil?	YES	Clean.
5		Is the transfer belt dirty or scratched?	YES	Wipe the surface clean of dirt with a soft cloth. Replace the scratched transfer belt with a new imaging cartridge.
6	Fuser unit	Is the fusing entrance guide plate dirty?	YES	Clean.
			NO	Replace the fuser unit.

19.1.16 Back marking

A. Typical faulty images

ABCDE
ABCDE

AA

A0CRF4C518DA

B. Troubleshooting procedure

Step	Section	Check item	Result	Action
1	Media path	Is there a foreign object in the media path?	YES	Remove the foreign object.
2	Fuser unit	Is the fusing entrance guide plate dirty or scratched?	YES	Clean or replace.
3		Is the fusing roller scratched or dirty?	YES	Replace the fuser unit.
4	imaging cartridge	Is the transfer belt dirty with fingerprints or foreign matter?	YES	Clean.
5	2nd transfer roller	Is the 2nd transfer roller dirty or scratched?	YES	Replace the 2nd transfer roller.
6		Have steps 1 to 5 eliminated the problem?	NO	Replace the imaging cartridge. → Replace the fuser unit. → Replace the high voltage unit.

### 19.1.17 Pitch lines, pitch uneven density

A. Typical faulty images

24mm

25mm

4138fs4507c0

A034F4C507DA

A034F4C508DA

B. Troubleshooting procedure

Step	Section	Check item	Result	Action
1	Image check	Do faint lines extending in parallel with the main scanning direction occur at a pitch of 24 mm?	YES	• Execute [UTILITY] - [MACHINE SETTING] - [IMAGE REFRESH]. See P.105 **NOTE** • **If one image refresh sequence does not make the faint lines less noticeable, run it a second time.**
		Does uneven density at a pitch of 25 mm occur?	YES	• Leave the main unit to stand idle under environment free of high humidity.
2	Toner cartridge	Is the toner cartridge for each color of toner installed in position?	NO	Reinstall.
3	PH unit	Is the PH unit secured in position with the fixing screw?	NO	Secure it in position.
4	Toner cartridge	Is the drive mechanism of the toner Cartridge dirty or damaged?	YES	Clean or replace the toner cartridge.
5	Imaging cartridge	Is the photo conductor dirty, scratched, or worn?	YES	Replace the imaging cartridge.
6	2nd transfer roller	Are the 2nd transfer roller and drive mechanism dirty, deformed, or worn?	YES	Replace the 2nd transfer roller.
7	Fuser unit	Are the rollers and drive mechanism of the fuser unit dirty, scratched, deformed, or worn?	YES	Replace the fuser unit.
8		Have steps 1 to 7 eliminated the problem?	NO	Replace the imaging cartridge.

20. FAX error

20.1 Communication error


```
_____CAUTION_____
COMMUNICATION
      ERROR(####)
( PRESS ANY KEY )
```

A00FF4E001DA
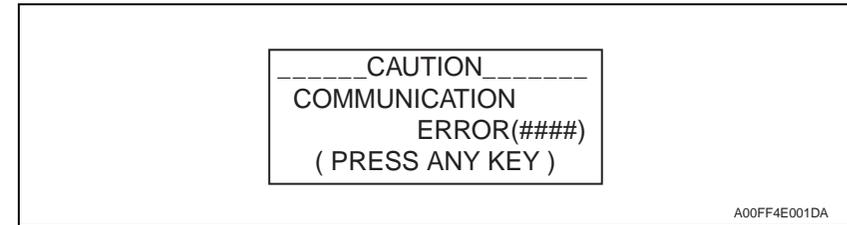
20.2 Outline

- Error caused by a problem of communication functioning. Five possible causes of errors are:
1. Communication is discontinued by a machine error.
2. Communication is discontinued by a machine trouble.
3. Communication is discontinued by an error occurring at the destination station.
4. Communication is discontinued by a protocol error.
5. ADF Error on trouble.
- When communication is discontinued due to item 3 or 4, transmission is retried. In other case, transmission is canceled without retry.

20.3 Error occurring during transmission

- The transmission error before "Phase-B" performs redial according to the redial interval of each country and the number of times.
  The transmission error after "Phase-C" performs redial only one time. Transmission is canceled when an error occurs again. (can change in Soft SW)

4139F4E513DA
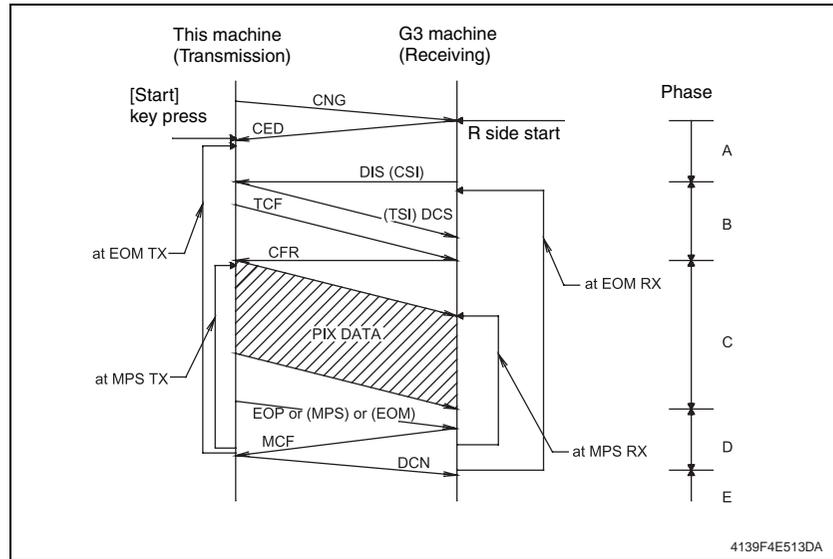
20.3.1 Error occurring during reception

- Reception is canceled.

20.4 Error code

20.4.1 Reception

Code	Possible Causes of Error.
0001	Manual receive mode, nothing G3 signal received within 35 sec.
0003	Received DIS after sending DIS signal.
0004	Received DCN after sending DTC signal.
0006	Detect busy tone within receiving phase B.
0009	Can not receive any signal within 35 sec. in manual polling mode.
0010	Received DCN signal after sending DTC signal in polling RX.
0011	Can not receive any correct response after sending three DTC signal.
0012	Remote side password not match in polling RX/our side no any file to be polling.
0013	Can not receive carrier within 6 sec. after sending CFR in data phase C.
0014	Can not receive T.30 signal after sending FTT signal.
0015	Line polarity change within receiving phase B to D.
0016	Receive DCN signal after sending PTT signal.
0017	Can not receive any response from remote side after sending type of xxx_EOM signal.
0018	Can not detect energy within 6 sec. after sending FTT command.
0019	Received DCN signal sending CFR signal.
001A	No energy on line over 6 sec. within phase C before any corrected ECM frame.
001D	Detect flag but nothing after CFR.
0020	Can not correct frame within 6 sec. or in no-ECM mode, one decoding line over 6 sec.
0021	File full.
0022	Owing to noise interference on the line, receiving side can not receive correct data within specified time (no ECM).
0023	Received PWD error in RSD or upgrade F/W.
0024	TX and RX machine both are different machine ID in upgrade F/W.
0025	TX and RX machine both are different company ID in upgrade F/W.
0026	Remote monitor level error remote side can not access in upgrade F/W.
0027	Detect machine prohibit Remote monitor connected.
002A	Line problem.
0030	Can not receive any signal within 6 sec. at phase D.
0031	Received incorrect signal at phase D (not EOP, MPS, EOM, DCS PPS_Q, PPS_Q, etc.).
0032	Can not receive carrier within 6 sec. after sending MCF or RTP, RTN signal.
0033	Received DCN signal at phase D within pages (not last page).
0039	In non-ECM mode, when machine already received the data but next line data does not receive within 13.1 seconds.
003F	Remote side TSI not define in machine one touch or speed dial directory.
0040	Can not receive carrier within 6 sec. after sending CTR.
0041	Can not receive carrier within 6 sec. after sending PPR.
0042	Can not receive correct signal after sending RNR signal.
0043	Receive incorrect signal at phase D in ECM mode.
0044	Can not receive carrier /FSK signal within 6 sec. after sending MCF in ECM mode.
0045	Can not receive any correct signal after sending RNR response with ERR signal.

Code	Possible Causes of Error.
0046	Receive incorrect signal when sending RNR which response with ERR signal.
0047	Can not receive correct signal after sending ERR signal.
0048	Can not receive correct signal after receive PPS_PRI_Q or PRI_Q, EOR_PRI_Q.
0049	Can not receive correct signal after sending PIP/PIN signal within 13 sec.
004A	Line energy over threshold last 60 sec. after MCF, and can not detect FSK or carrier signal in ECM mode.
004B	Can not detect correct FSK signal even through detected FSK tone within 6 sec.
004C	Handshake fail during re-train or between page in V.34 RX.
004E	Receive DCN signal after sending DIS in V.34.
004F	Remote side disconnected after sending ANSam in V.8 phase.
0050	Can not receive any correct signal after sending CJ signal in V.8 phase.
0051	Can not receive phase 3 signal after phase 2 within 20 seconds in V.34.
0052	Can not receive phase 4 signal after phase 3 within 20 seconds in V.34.
0053	Modem disconnect after phase 4 in V.34.
0054	Remote side disconnected after phase 4 in V.8.
0055	Receive incorrect signal after sending DIS signal in V.34.
0056	Modem disconnect after sending CFR in V.34.
0057	Can not detect image signal within 6 seconds after sending CFR.
0058	Can not detect image signal within 6 seconds after modem enter to primary phase in V.34.
005A	Modem can not detect any correct ECM frame with 3 minutes in phase C.
005B	Can not detect phase 5 signal after primary channel within 6 seconds.
005C	Detect busy tone within control channel after phase C.
005D	Modem can not detect any correct ECM frame with 12 sec. in phase C.
005E	Can not detect control channel signal after received RCP frame within 6 seconds.
005F	Can not detect silence after sending JM signal for polling TX function.
0060	There are no any bulletin files to be polled in V.34.
0061	Machine can not detect V.21 or V.8 signal with 35 seconds.
0062	Modem disconnect in phase D after our side sending out flags sequence in control channel.
0063	Can not receive any flag sequence in control channel within 6 seconds in phase D.
0064	Can not detect any control channel signal in phase D within 60 seconds even through energy still on the line.
0065	Can not detect any control channel signal within 60 seconds after detect silence in phase D.
0066	Can not receive T.30 signal or carrier after sending CFR in V.34.
0070	User press stop key within receiving.
0071	Memory full within receiving.
0072	Received EOR_Q Signal.

20.4.2   Transmission

Code	Possible Causes of Error.
0080	Can not detect any G3 signal within 35 sec. specified by ITU-T in phase B.
0081	Received DTC signal in transmission phase.
0082	Transmitting unit receives a signal other than DIS or DTC and DCN in phase B.
0083	Detected FSK signal, but can not receive any signal within 35 seconds.
0084	Detect DCN signal in phase B.
0085	Transmitting unit sending DCS 3 times consecutively, but each time responds with DIS/DTC.
0086	Detected responds signal other than DTC, DIS, FTT, DCN or CFR after sending DCS.
0087	Training attempt has failed because speed unit can not adjust to low lower speed.
0088	Received DCN signal after sending out DCS signal.
008B	Receiver's protocol of DIS is received, but it is not compatible with our machine.
008D	Receiver's protocol of DIS is received, but remote side can not receive document temporary, may be cause by run out of paper or other reason.
008E	Remote side CSI number not defined in machine one touch or speed dial directory.
008F	Modem not ready to received V.34 data within 6 seconds after received CFR signal.
0090	Called side document not ready for our polling.
0091	Sending out DCS+TCF signal 3 times consecutively but no signal in response from receiver.
0092	Remote side disconnected within transmitting phase.
0093	Received DCN signal after sending out DCS signal for V.34.
0094	Time out during transmit ECM frame or RCP command.
0095	Wrong ID number when Polling RX.
0099	Remote side disconnect after primary channel.
009A	Can not detect any signal after sending CI signal.
009C	Received DCN after sending DTC in V.34 polling RX.
009D	Remote side hang up before V.34 modem enter phase 2 state in V.34 polling RX.
009F	Can not received any response from other side after sending PPS_EOM signal.
00A0	User stop or cancel transmission job.
00A1	Document JAM within transmission.
00AE	Can not finished V.8 procedure or detect V.21 signal after CM signal within 30 seconds.
00AF	Modem can not enter into control channel after TX side sending out RCP signal for V.34.
00B0	Can not received any command after our side retry there DCS signal in V.34 TX.
00B1	Can not finish V.8 procedure or detect V.21 signal after ANSam signal within 35 seconds.
00B2	Can not detect phase 2 signal after our side sending CJ signal within 30 seconds.
00B3	Can not detect correct V.21 or JM signal after sending CM signal.
00B4	Can not detect correct phase 2 signal within 25 second after CM/JM signal exchange.
00B5	Can not detect phase 3 signal after phase 2 within 25 seconds.
00B6	Can not detect phase 4 signal within 25 seconds after CM/JM exchange.
00B7	Can not detect phase 5 signal after phase 4 within 30 seconds.
00B8	Remote side disconnect after our side sending DCS signal in V.34.
00B9	Receive T.30 signal other than DIS, DCS, CFR after sending DCS signal in V.34.
00BA	Can not received correct signal after our side sending DTC signal in V.34.
00BB	Every time our side received DIS signal after sending DTC in V.34.

Code	Possible Causes of Error.
00BC	Modem can not ready within 10 seconds after entering primary channel in V.34.
00BD	Can not detect correct V.21 or JM signal after detected FSK frequency.
00BE	Remote side no document to be polled after V8 handshaking.
00BF	Capability no match.
00C0	Remote side disconnect before entering primary channel in V.34.
00C1	At phase-D, transmitting units out EOP 3 times consecutively, but receive no answer from receiving unit.
00C2	Remote side disconnect after sending out V.8 CM signal.
00C4	After sending MPS signal, the received is not one of MCF, RTN, PIP, PIN, RTP, DCN.
00C5	Received DCN signal after sending MPS signal.
00C9	At phase-D, sending MPS 3 times consecutively, but no answer from receiving unit.
00CA	After sending EOP signal, the received is not one of MCF, RTN, PIP, PIN, PRI-EOP, DCN.
00CB	After sending EOP signal, the received is DCN signal.
00CC	After sending EOM signal, the received is not one of MCF, RTN, PIP, PIN, RTP, DCN.
00CD	At phase-D, transmitting units out EOM 3 times consecutively, but receive no answer.
00CE	At phase-D, transmitting units out EOM, but receive DCN.
00CF	Received incorrect signal after sending DTC signal for V.34 polling.
00D0	Received ERR signal after sending EOR_NULL.
00D1	Received incorrect response after sending PPS_EOP signal in V.34.
00D2	Received DCN after sending PPS_EOP signal.
00D3	Received DCN after sending PPS_NULL signal.
00D4	Received DCN after sending PPS_EOM signal.
00D8	Can not detect correct phase 3 signal for polling within 25 seconds.
00D9	Can not detect correct phase 3 signal after detect silence after phase 2.
00DA	Can not detect phase 4 signal within 30 seconds or remote side hang up over 6 seconds.
00DB	Can not received any T.30 signal within 15 seconds within phase 4.
00DC	Received T.30 signal in phase 4 other than DCS, DIS or DTC.
00DE	Remote side no SUB capability in V.34.
00E0	At phase-D, transmitting units out PPS_NULL 3 times consecutively but receive not answer.
00E1	Received incorrect response after sending PPS_NULL.
00E2	Can not receive any response in RR response procedure after sending PPS_NULL.
00E4	At phase-D, transmitting units out PPS_MPS 3 times consecutively but receive no answer.
00E5	Received incorrect response after sending PPS_MPS.
00E6	Can not receive any response in RR response procedure after sending PPS_MPS.
00E7	Received DCN after sending PPS_MPS.
00E8	At phase-D, transmitting units out PPS_EOP 3 times consecutively but receive no answer.
00E9	Receive PIN signal after sent last page three times.
00EA	Can not receive any response in RR response procedure after sending PPS_EOP.
00EB	At phase-D, transmitting units out PPS_EOM 3 times consecutively but receive no answer.
00EC	Received incorrect response after sending PPS_EOM.
00ED	Can not receive any response in RR response procedure after sent out PPS_EOM.
00EE	At phase-D, transmitting units out EOR_NULL 3 times consecutively but receive no answer.

| Code	Possible Causes of Error.
00EF	Received incorrect response after sending EOR_NULL.
00F0	Can not receive any response procedure after sending EOR_NULL.
00F1	At phase-D, transmitting units out EOR_MPS 3 times consecutively but receive no answer.
00F2	Received incorrect response after sending EOR_MPS.
00F3	Received ERR signal after sending EOR_MPS.
00F4	Can not receive any response in RR response procedure after sending EOR_MPS.
00F5	At phase-D, transmitting units out EOR_EOP 3 times consecutively but receive no answer.
00F6	Received incorrect response after sending EOR_EOP.
00F7	After Received ERR, our side can not received response after sending EOR_EOP command.
00F8	At phase-D, transmitting units out EOR_EOM 3 times consecutively but receive no answer.
00F9	Received incorrect response after sending EOR_EOM.
00FA	Received ERR signal after sending EOR_EOM.
00FB	Can not receive any response in RR response procedure after sending EOR_EOM.
00FC	Can not receive any response after sending CTC.
00FD	Can not speed down to lower speed in ECM mode.
00FE	Memory full for transmission.
00FF	Redail all fail.

21. Scan error

| Code	Display	Content
0100	CANNOT CONNECT SMTP Server	• While the scanned document was being sent in Scan mode, a connection with the specified server could not be established.
0101	CANNOT CONNECT POP3 Server	
0102	CANNOT CONNECT DNS Server	
0103	CANNOT CONNECT FTP Proxy Server	
0104	CANNOT CONNECT SMB Server	
0106	FTP SERVER ERROR	• The file cannot be saved on the indicated server.
0107	SMB SERVER ERROR	
0108	WRONG PASSWORD FTP Server	• The password is incorrect, so the indicated server could not be accessed.
0109	WRONG PASSWORD SMB Server	
010A	WRONG PASSWORD SMTP Server	
010B	WRONG PASSWORD POP3 Server	
010D	SERVER MEMORY FULL SMTP Server	• The memory of the SMTP server has become full.
010F	CANNOT GET IP SMTP Server	• The IP address of the SMTP server could not be obtained from the DNS server.
0110	CANNOT GET IP POP3 Server	
0111	CANNOT GET IP FTP Server	
0113	COMMUNICATION ERROR SMTP Server	• While data was being sent in Scan mode, the connection to the server was interrupted.
0114	COMMUNICATION ERROR FTP Server	
0115	COMMUNICATION ERROR SMB Server	
0118	DISCONNECT SMTP Server	• The connection to the server was interrupted.
0119	DISCONNECT POP3 Server	
011B	DISCONNECT FTP Proxy Server	
011C	DISCONNECT SMB Server	

APPENDIX

22. Parts layout drawing

22.1 Main body


A034F5C501DA
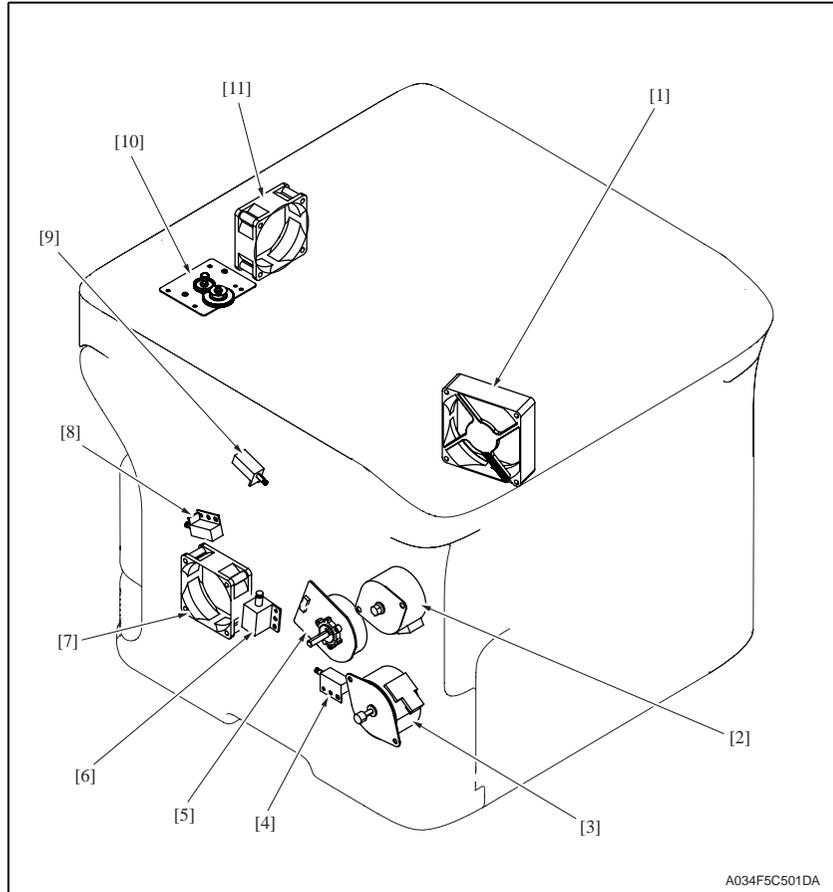
[1]	DC power supply fan motor (FM1)	[7]	Ozone ventilation fan motor (FM2)
[2]	Rack motor (M2)	[8]	2nd image transfer pressure/retraction solenoid (SD4)
[3]	Developing motor (M3)	[9]	Cleaning blade pressure/retraction solenoid (SD5)
[4]	Tray1 media feed solenoid (SD1)	[10]	Scanner motor (M101)
[5]	Transport motor (M1)	[11]	Exit tray cooling fan motor (FM4)
[6]	Registration roller solenoid (SD2)		

A034F5C502DA
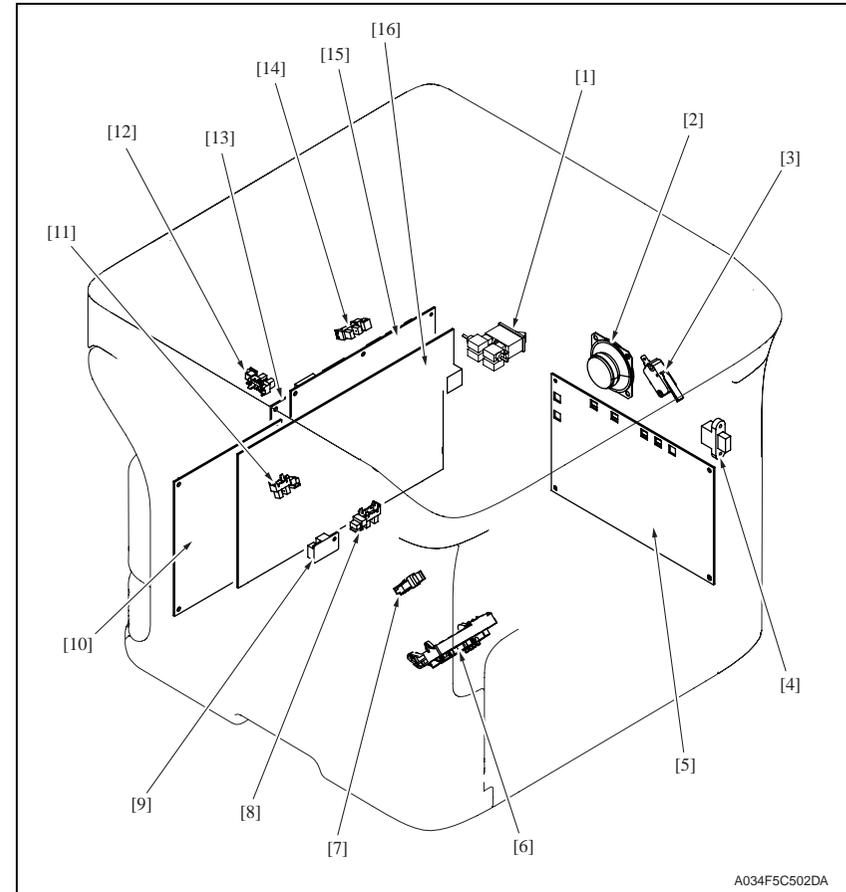
[1]	Main power switch (SW1)	[9]	Temperature/ humidity sensor (TEM/HUMS)
[2]	Speaker (SP)	[10]	Print control board (PRCB)
[3]	Interlock switch (MS2)	[11]	2nd image transfer retraction position sensor (PS3)
[4]	USB port (USB)	[12]	Media full sensor (PS16)
[5]	High voltage unit (HV)	[13]	FAX control board (FAXB)
[6]	Contact switch (SW5)	[14]	Exit sensor (PS4)
[7]	Rack positioning sensor (PS5)	[15]	MFP board (MFPB)
[8]	Registration sensor (PS2)	[16]	DC power supply (DCPU)

22.2 Auto document feeder

A034F5C500DA
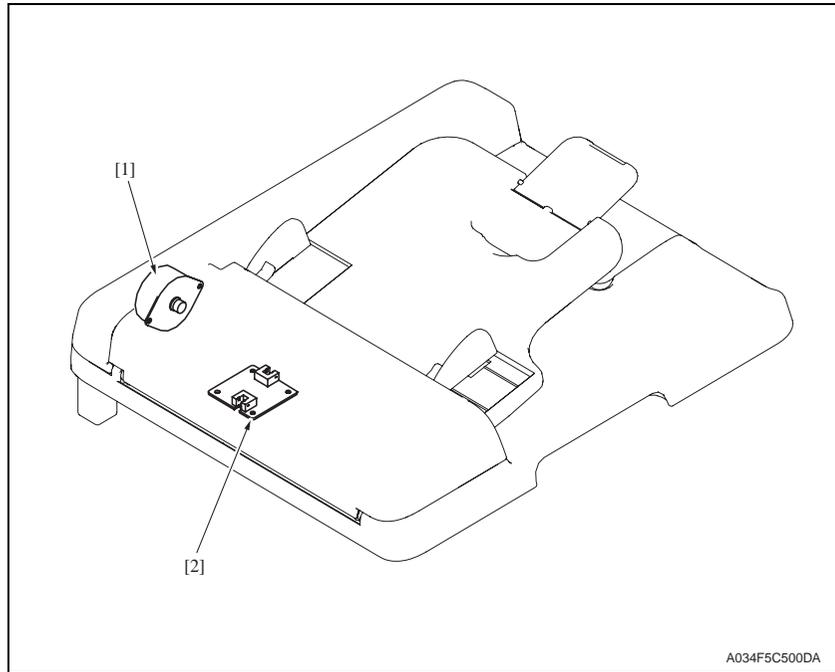
[1] DF transport motor (M100)   [2] Relay board/1 (REYB/1)

22.3 Lower feeder unit (option)

A0VPF5C500DA
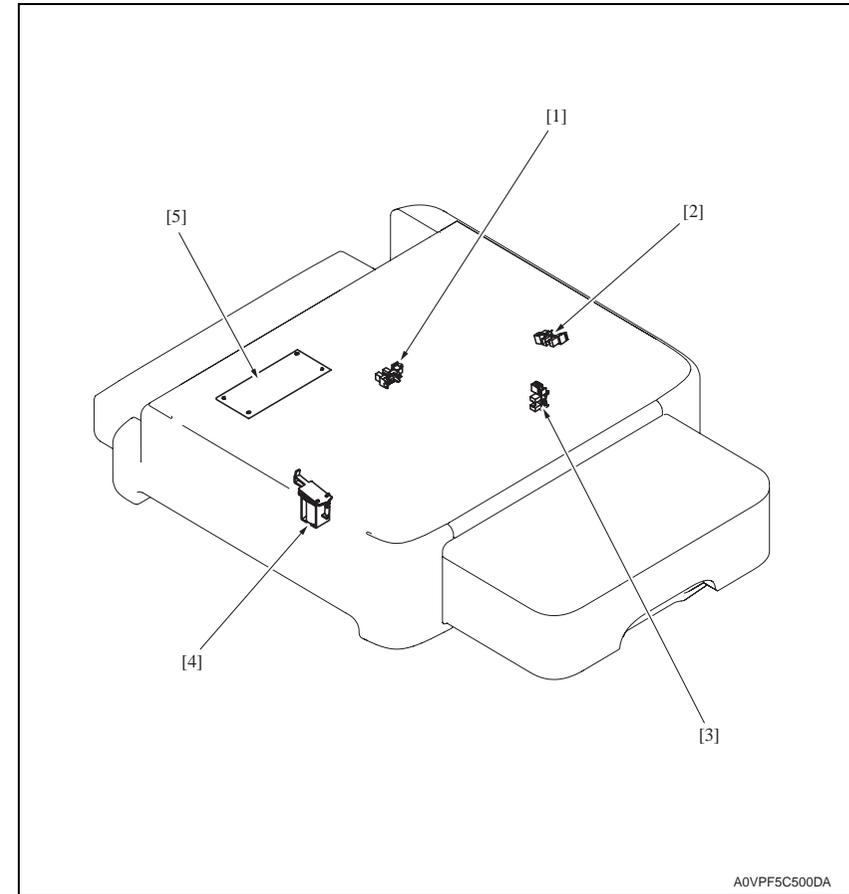
[1] Transport sensor (PS12)   [4] Media feed solenoid (SD6)
[2] Media empty sensor (PS10)   [5] PC control board (PCCB)
[3] Tray set sensor (PS11)

22.4 Duplex option (option)

A0VTF5C500DA
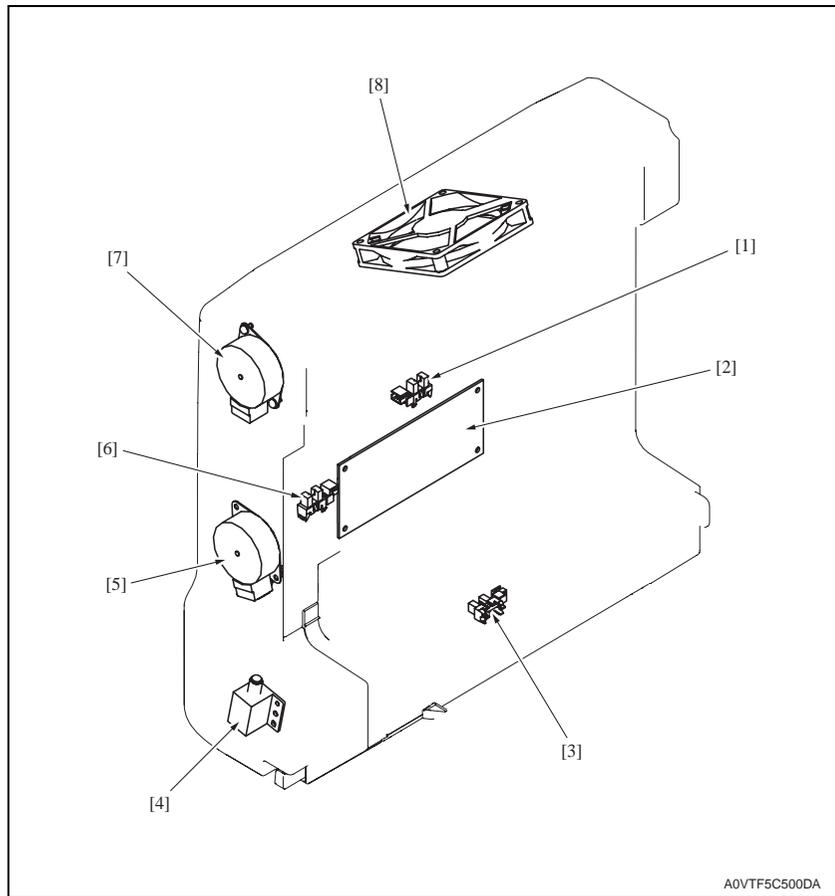
[1]	Transport sensor/1 (PS15)	[5]	Transport motor (M6)
[2]	AD drive board (ADDB)	[6]	Door sensor (PS14)
[3]	Loop sensor (PS13)	[7]	Switchback motor (M5)
[4]	Registration solenoid (SD7)	[8]	Cooling fan motor (FM3)

22.5 Duplex option attachment (option)

A0VTF5C501DA
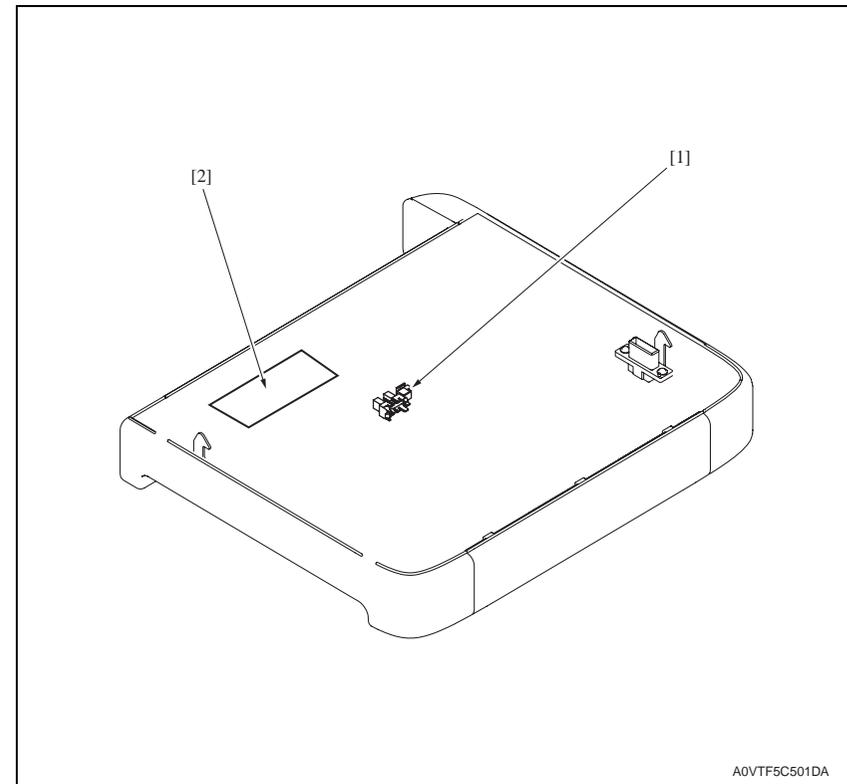
[1]	Transport sensor/2 (PS17)	[2]	Relay board/2 (REYB/2)

23. Connector layout drawing

Description

Number of Pin ⟶ ① Possible to confirm by removing external cover.

1 Not possible to confirm by removing external cover.

A034F5C506DA
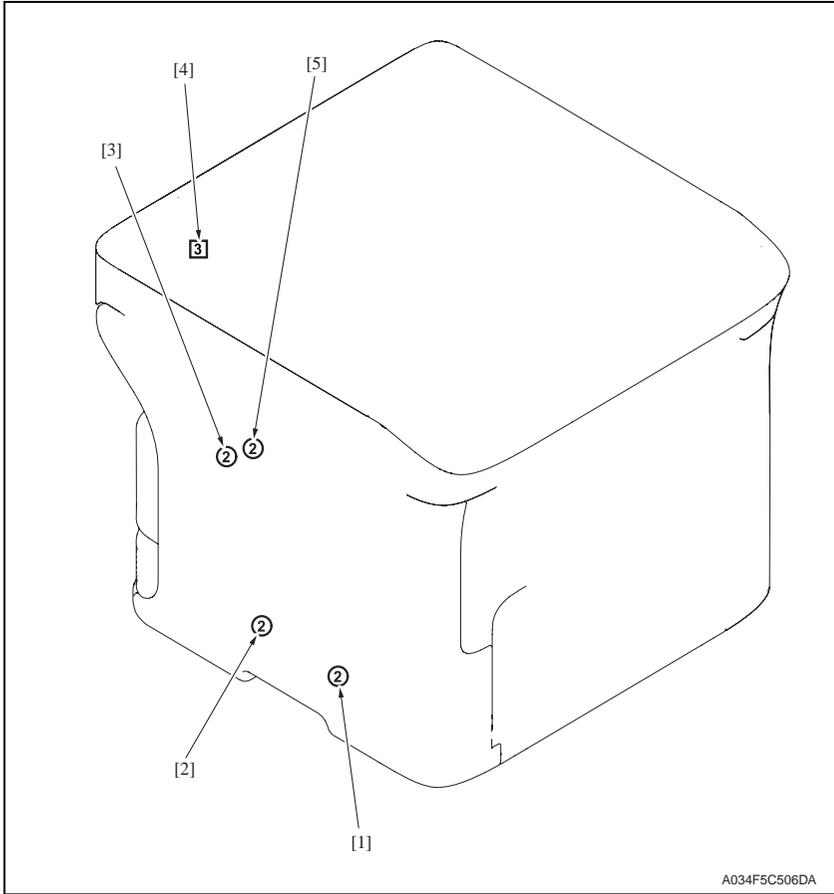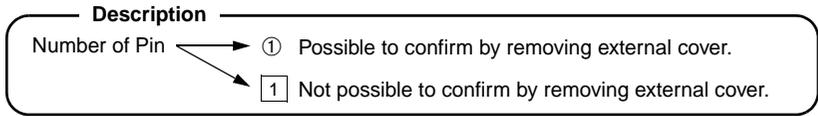
No.	CN No.	Location	No.	CN No.	Location
[1]	CN2	D-10	[4]	CN14	D-13
[2]	CN3	D-9	[5]	CN6	D-11
[3]	CN5	D-9			

24. Timing chart
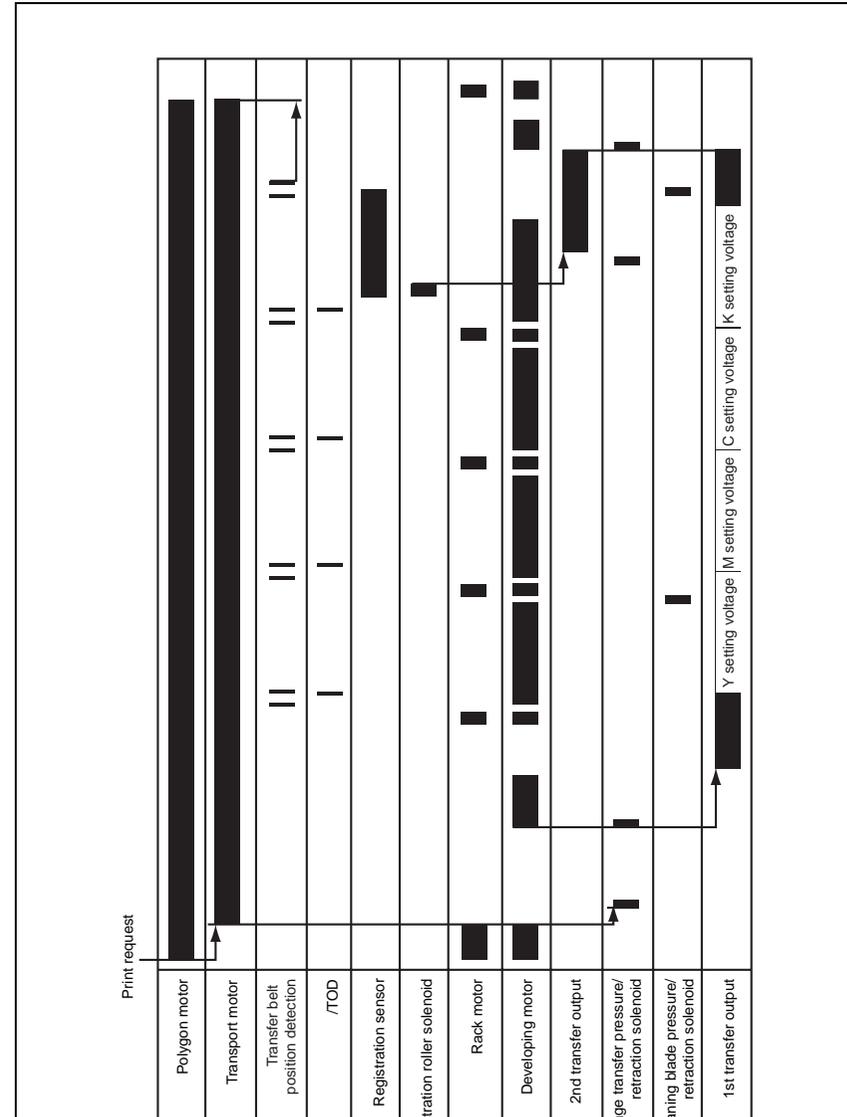
MC160n Overall wiring diagram

Transport motor — M1
2nd image transfer retraction position sensor — PS3
Registration sensor — PS2
Temperature/humidity sensor — TEM/HUMS
Contact switch — SW5
Ozone ventilation fan motor — FM2
DC power supply fan motor — FM1
HV High voltage unit — CN1
Fusing unit — CN4
PH unit
2nd image transfer pressure/retraction solenoid — SD4
Registration roller solenoid — SD2
Tray1 media feed solenoid — SD1
Imaging unit — CN1
Cleaning blade pressure/retraction solenoid — SD5
Rack positioning sensor — PS5
Rack motor — M2
Developing motor — M3
Media full sensor — PS16
Defogger fan motor — FM4

To P8 (1690MF)
To P8 (1680MF)
To 1690MF
To 1680MF

Ferrite core

PJ8 PJ12 PJ14 PJ15 PJ16 PJ17 PJ6 PJ3 PJ2 PJ19 PJ18 PJ10 PJ9 PJ5 PJ24

PRCB
Print control board

1690MF 1680MF

Battery

PJ1 PJ1 PJ21 PJ23 NC

P10 P10

BT1,BT2

MFPB
MFP board

MFPB
MFP board

Lower feeder unit (option)
Duplex attachment (option)

CN2 CN3 P3 P5 J1 CN3 J1
NC NC NC NC NC NC NC

P9 P8 P7 P6 P4 P2 P1 CN4 CN1
P9 P8 P7 P6 P2 BT1,BT2

DESCRIPTION

DESTINATION LOCATION

To PH unit To PH unit

Scanner unit Scanner unit

Ferrite core Ferrite core

Tube Tube

M101 M100
FAXB
FAX control board

M101

Battery

DCPU
DC power supply

DCPU
DC power supply

CN6 CN4 CN3 CN7 CN5
CN6 CN4 CN3 CN7 CN5

OB
Operation board

OB
Operation board

REYB/1
Relay board/1

CN701 CN701

PT1 PT2

Scanner motor
DF transport motor
Scanner motor

P101

Ferrite core Ferrite core

SW1 MS2 SW1 MS2

Main power switch
Interlock switch

Main power switch
Interlock switch

Registration sensor
Media feed sensor

SP
Speaker

7-C 7-C

CLOSED END CONNECTORS EXTRA LARGE
CLOSED END CONNECTORS LARGE
CLOSED END CONNECTORS MEDIUM
CLOSED END CONNECTORS SMALL
POSITIVE LOCK RECEPTACLE #250 WITH HOUSING
POSITIVE LOCK RECEPTACLE #187 WITH HOUSING
POSITIVE LOCK RECEPTACLE #110 WITH HOUSING
OUTPUT OF ACTIVE LOW
OUTPUT OF ACTIVE HIGH
INPUT OF ACTIVE LOW
INPUT OF ACTIVE HIGH
OUTPUT OF ACTIVE HIGH OR LOW
INPUT OF ACTIVE HIGH OR LOW
DC24V
DC5V

1 RXD : Reception data
2 TXD : Transmission data
3 I.T. : Image transfer
4 P.C. : Photo conductor