SCANNER KIT

(Code: A844)

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1.   OVERALL MACHINE INFORMATION

1.1   SPECIFICATIONS

1.1.1 SCANNER CONTROL BOARD

Standard Scanner Resolution:	Main scan/Sub scan 600 dpi
Available Scanning Resolution Range:	Main scan/Sub scan

Book Mode
   Binary processing: 100 ~ 2400 dpi
   Grayscale Processing: 100 ~ 600 dpi
ADF Mode
   Binary processing: 100 ~ 1200 dpi
   Grayscale Processing: 100 ~ 300 dpi

Grayscales:	8 bits/pixel
Scanning Speed:	0.8 s/200 dpi (A4 lengthwise, Binary, Book mode, MMR Compression)
Scanning Throughput:	22.8 spm for TWAIN (local peer-to-peer scanning) 35.1 spm for Delivery mode (network scanning to a server) (A4 lengthwise, Binary, ADF mode, MMR Compression)
Interface:	Network interface x 1 Ethernet (100 base-TX/10 base-T for TCP/IP)
Compression Method:	MH, MR, MMR (Binary Picture Processing) JPEG (Grayscale Processing)
Video Memory Capacity:	9 MB (Standard – 4 MB for image storage, 5MB for a work area) 1 DRAM SIMM slot (16 MB or 32 MB) Up to 36 MB (4MB + 32 MB)
Power:	DC 5V, 3A (from the main machine)

1.1.2 DRAM SIMM

Number of Pins	72 pins
Access Speed	60 ns or faster
Capacity	16 or 32 MB
Parity	Any setting is OK
Type	EDO required

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1.2 SOFTWARE

1.2.1 SCANNER DRIVERS

The following scanner drivers are included on the CD-ROM.

- Network TWAIN Driver for Windows 95/98/NT4.0/NT3.51

1.2.2 SCANNER UTILITIES

- Scan Router for Windows 95/98/NT4.0
- Aficio Manager for Admin/Client (Windows 95/98/NT4.0)
    NOTE: The Aficio Manager utilities are included on the CD-ROM for the
             optional printer controller.

2.   DETAILED SECTION DESCRIPTIONS

2.1 HARDWARE OVERVIEW
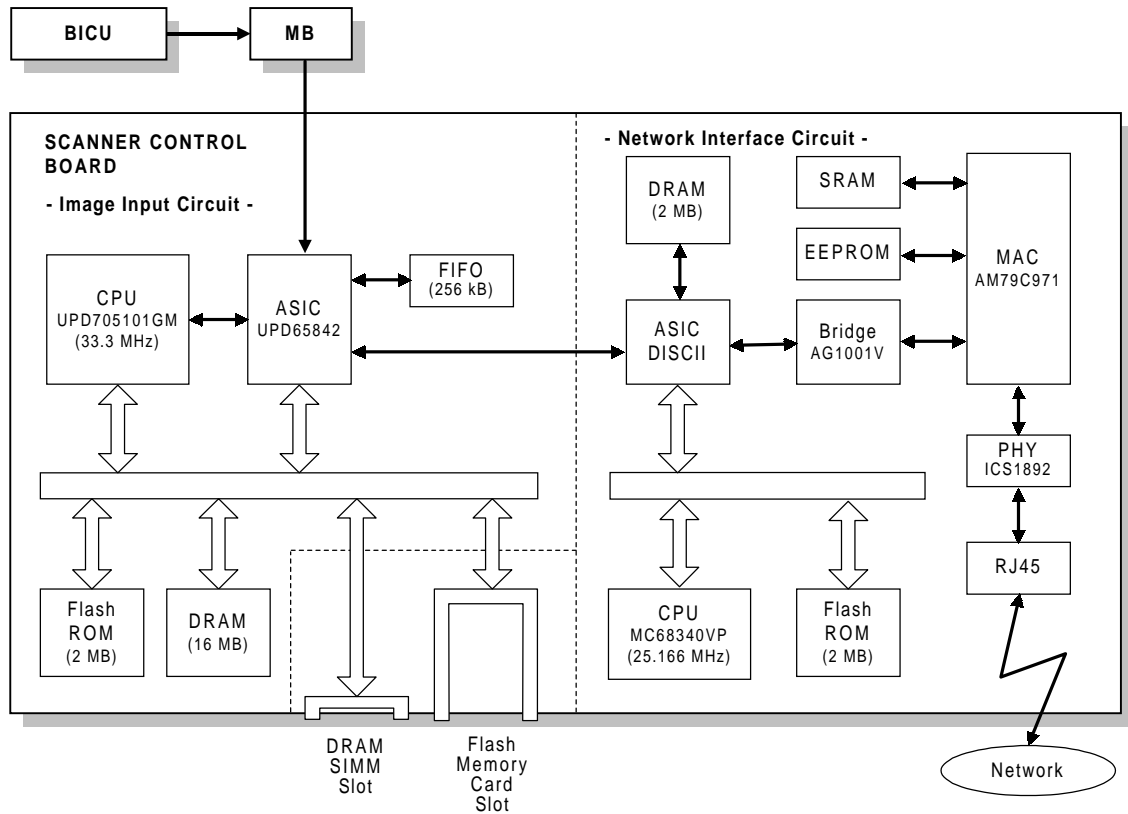
A844D500.WMF

The scanner controller contains image input and network interface circuits. The image data from the BICU is compressed in the image input circuit, then the data goes to the network through the network interface circuit.

Each circuit has a CPU and flash memory IC. The functions of each major component are as follows.

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1. Image input circuit
    CPU: UPD705101GM

    - Sequence control for the image input circuit
    - Clock/time control
    - DMA control

    ASIC: UPD65842

    - Stores the image data from the BICU board in the main machine into the buffer memory (DRAM)
    - Address control when recalling the data from the memory
    - DMA control for the network interface circuit

    DRAM:

    Compresses and stores the image data from the main machine (Total 16 MB. 9MB for work area, 4MB for buffer area, 3 MB for the working program)

    Flash ROM:

    Contains the scanner controller program and stores the UP/SP settings for the scanner (2 MB)

2. Network interface circuit
    CPU: MC58340VP

    - Sequence control for the network interface circuit
    - Clock/time control
    - DMA control

    ASIC (DISCII):

    - Bus interface between the image input circuit and network interface circuit

    Bridge: AG1001V

    This is an ISA-PCI bridge; it corrects the timing and decodes the commands between the ISA bus and the PCI bus.

    MAC: AM79C971

    This is a LAN controller; it covers the same functions as the Data Link Layer of the OSI model.

    PHY: This device covers the same functions as the Physical Layer of the OSI model.

    Flash ROM: Contains the program for the network interface (2 MB)

    EEPROM: Contains UP/SP settings for the network interface

2.2 SCANNER FUNCTIONS

2.2.1 SELF DIAGNOSTICS

Every time the main power switch has just been turned on, the scanner board performs the self diagnostics and the following items will be done automatically.

- SRAM read/write test
- Flash ROM read test
- Battery test
- Initializes the network interface circuit
- Application software for scanner controller test
- Connection test between the scanner board and the main body

If an error is detected, an appropriate error message or condition will be generated (refer to the Troubleshooting section).

2.2.2 IMAGE PROCESSING IN THE SCANNER CONTROLLER

The image processing for scanner mode is done in the IPU chip on the BICU board. However, the following processes are done in the scanner controller.

- Image compression
- Sub-scan magnification

Also, the scanner controller has a gamma table and dither matrix for scanner mode. When the user selects the image mode using the scanner driver, the appropriate gamma table and dither matrix are downloaded to the BICU board. Then the IPU chip does the image processing using these tables or matrixes.

Image compression

The image compression method for binary picture processing uses MH, MR, or MMR, depending on scanner SP mode 002. Grayscale processing uses JPEG. This is done by the software.

Sub-scan magnification

Usually, the sub-scan magnification is done by changing the scanner motor speed. However, when the amount of data being transferred is high (e.g, low resolution in grayscale processing mode), the scanner controller deletes every other line.

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3. INSTALLATION PROCEDURE

[A]

A844I600.WMF

[B]

A844I601.WMF

[C]

[D]

A844I602.WMF
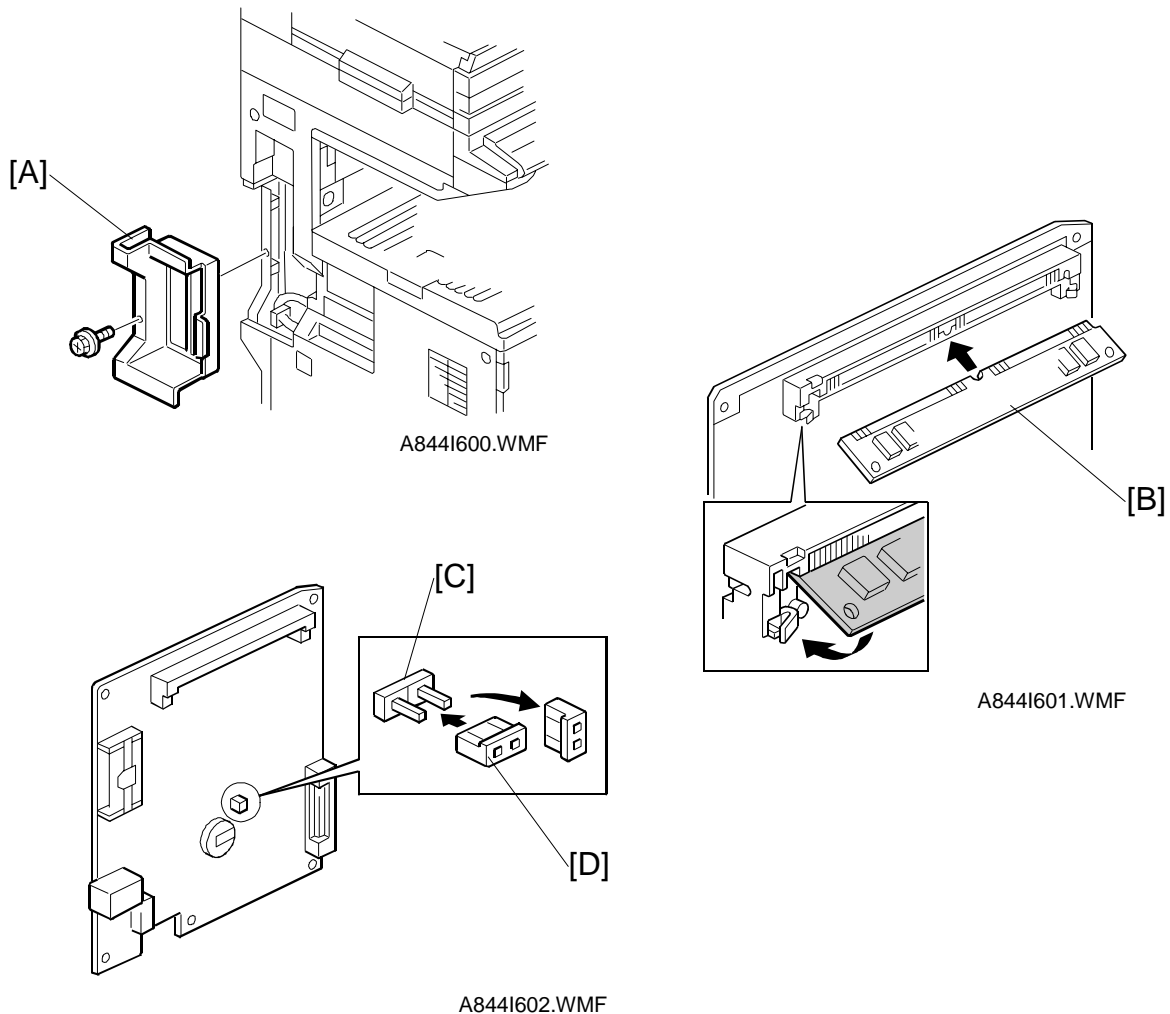
⚠**CAUTION**

Unplug the main machine's power cord before starting the following procedure.

NOTE: Before doing the following steps, the printer controller (B306) must be installed.

When installing the scanner controller and the printer controller (B306) at the same time, skip step 1.

1. Remove the application cover [A] (1 screw)

2. Install the optional SIMM memory [B] on the scanner board if it is required.

3. Short TB4 [C] on the scanner board with jumper [D].

A844I504.WMF

A844I503.WMF
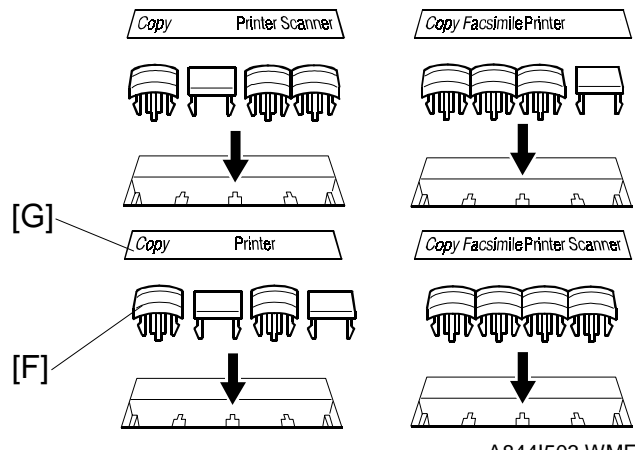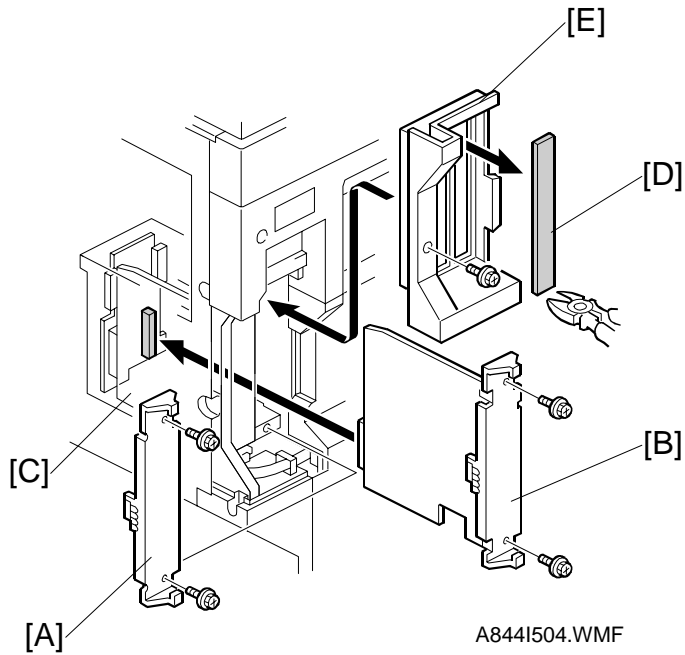
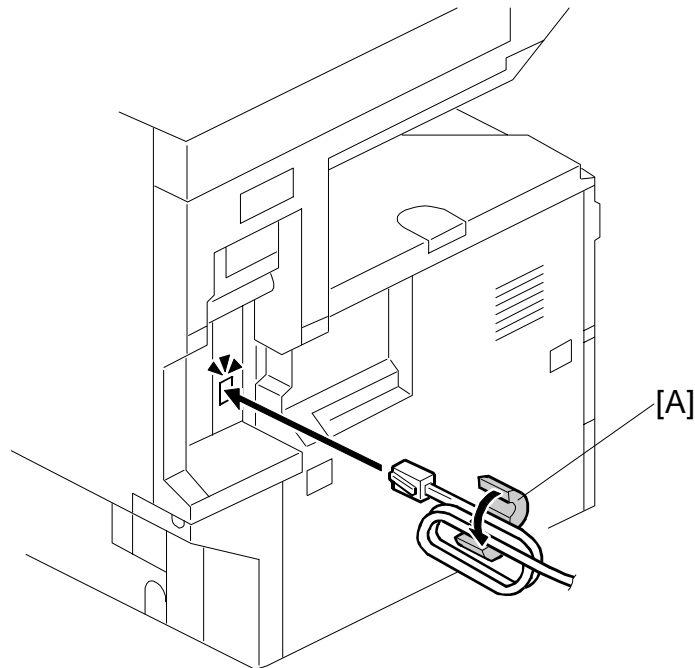4. Remove the plate [A] from the expansion box (2 screws).

5. Install the scanner controller board [B] in the right-most slot of the expansion box [C] (2 screws).

6. Cut away the cover [D] from the application cover [E].

7. Reinstall the application cover (1 screw).

8. Remove the mode key cap. Then install the key tops [F] and decal [G] depending on the machine configuration, as shown.

A844R502.WMF

9. Turn the machine on, SC4003 may occur. Do the following procedure to clear the SC condition.
    NOTE: The meaning of SC4003 is that the battery worn out. Even if the TB4 is shorted by the jumper chip, the battery level is low at the time of installation of the scanner controller board. This SC condition will not occur for about 30 minutes after the TB4 has been shorted.
    1) Enter SP mode (⌨ → ① → ⓪ → ⑦ → Ⓒ press Ⓒ for more than 3 seconds).
    2) Select 4 (Scanner SP mode).
    3) Press the Next bottom 4 times to access SP005 (Error Log Indication).
    4) Leave the SP mode.
    5) Turn the machine off and on. If SC4003 still occur, check the jumper position.

10. Make sure that the parallel cable is not connected to the printer controller and check the setting of the following copier SP mode (enter the SP mode and select 1):

    *   SP5-907: Plug & Play Brand Name and Production Name Setting – select the correct one.

11. Attach the core [A] to the STP (Shielded Twist Pair) cable, then connect the cable to the scanner controller.

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4.   SERVICE TABLE

4.1   SERVICE PROGRAM MODE

4.1.1   SERVICE PROGRAM ACCESS PROCEDURE

The service program access procedure, such as "Entering Service Program (SP) Mode" and "Exiting SP Mode" is the same as for copier and fax, as follows.

Entering SP mode

⊛/⊘ → 1 → 0 → 7 → C/⊘ (hold it for more than 3 seconds.)

Exiting SP mode

Press the "Back" and "Exit" keys until the standby mode display appears.

4.1.2   SERVICE PROGRAM MODE TABLES

NOTE: 1) In the Function column, comments are in italics.
2) In the Settings column, the default value is in bold letters.

No.		Function	Setting
001	FTP Port Number	Changes the FTP port number.	0000 ~ 9999
		After changing this value, do the following:	1 / step
		1. Run the Registry Editor.	**3670**
		2. Access /HKEY_LOCAL_MACHINE/SOFTWARE/Ricoh/NetworkScanner	
		3. Change the value of PortNo to this SP mode's value.	
002	Compression Type	Selects the compression type for binary picture processing.	0: MH 1: MR **2: MMR**
003	Software Version	Displays the software version.	
004	Program Number	Displays the program's part number.	
005	Error Log Display	Displays the error logging data	
		Check this data when SC4005 occurs. Then inform it to the service center.	
006	Scan Data Reset	Resets all scanner data (UP and SP modes) except for the network interface data (UP-Network-1 ~ 8)	
		Press "1" three times to reset.	
007	All Data Reset	Resets all UP and SP settings	
		Press "1" three times to reset.	

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| No.		Function	Setting
008	NIC Data Reset	Resets all network interface data (UP-Network-1 ~ 8) *Press "1" three times to reset.*	
009	Density Adjustment 1	Adjusts the image density for each image density level which can be selected with UP mode (UP-Scan-Density)	0 ~ 255 1 / step **40**
010	Density Adjustment 2		0 ~ 255 1 / step **70**
011	Density Adjustment 3		0 ~ 255 1 / step **100**
012	Density Adjustment 4		0 ~ 255 1 / step **130**
013	Density Adjustment 5		0 ~ 255 1 / step **170**
014	Density Adjustment 6		0 ~ 255 1 / step **200**
015	Density Adjustment 7		0 ~ 255 1 / step **230**
016	ROM Disk Format	Initializes the flash ROM. Press "1" three times to initialize.	

4.2 DOWNLOADING NEW SOFTWARE

4.2.1 SOFTWARE DOWNLOAD PROCEDURE

The software for the scanner controller contains the system software, application software, and network interface software. The new software can be downloaded from a flash memory card.

1. Prepare a flash memory card that has been programmed with the latest software.
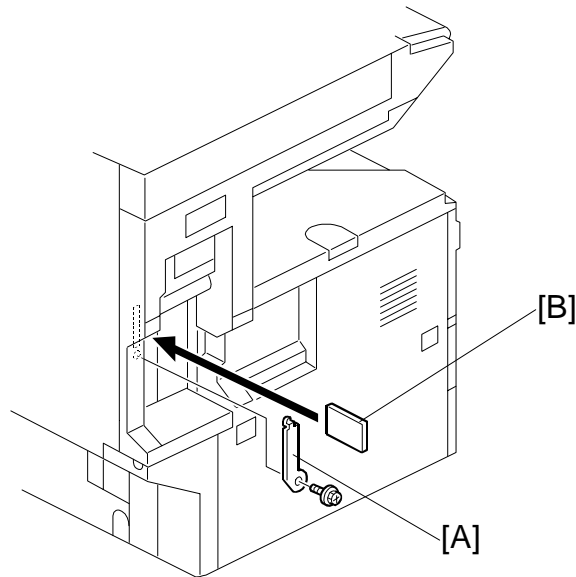
A844M500.WMF

2. Turn off the machine and disconnect the Ethernet (STP) cable from the scanner controller.

3. Remove the cover [A], and insert the flash memory card [B] into the slot so that the "A" side of the card faces the front of the machine.

4. Turn the machine on and press the Scanner Mode key.

5. Press the INSTALL key in reply to the message. Software download will take several minutes.

6. Make sure that the machine displays the scanner SP mode, then after new software has been downloaded successfully, turn off the machine, remove the card, connect the Ethernet cable, and turn the machine back on.

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4.2.2 ERROR MESSAGES DURING THE SOFTWARE DOWNLOAD

If downloading failed, one of the following error messages appears. At this time, press the "CONFIRM" bottom in the display to re-try the download.

Message	Action
SYS Erasing Failed ADDR:XXXXXXXX	Re-try the download. If the download fails again, replace the scanner controller.
SYS Writing Failed ADDR:XXXXXXXX	
SYS Verify Failed ADDR:XXXXXXXX	
APL Erasing Failed ADDR:XXXXXXXX	
APL Writing Failed ADDR:XXXXXXXX	
APL Verify Failed ADDR:XXXXXXXX	
NIC board is not equipped	
NIC Initialization failed. CODE:XXXX	
NIC Download mode is disable	
NIC Writing Failed ADDR:XXXXXXXX	
NIC Host Service Error CODE:XXXX	Re-try the download. If the download fails again, replace the scanner controller. Check whether the STP cable is disconnected. If it is connected, disconnect the cable and re-try the downloading.

5.   REPLACEMENT AND ADJUSTMENT

5.1   NOTE FOR REPLACING THE SCANNER CONTROLLER BOARD

The scanner controller does not have a configuration report and cannot upload/download settings to an IC card. So, before replacing the scanner controller board, check all UP mode and SP mode settings. After replacing the board, re-input these settings.

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6.   TROUBLESHOOTING

6.1   SERVICE CALL CONDITION

The scanner controller board automatically performs the self diagnostics whenever the main power switch is turned on. If an error is detected, it displays an error message on the LCD. Turn the main switch off and on to reset the SC condition.

6.1.1 SC CODE DESCRIPTIONS

SC code	Error Items	Conditions	Action
SC4001	DRAM Error	• SIMM defective • A SIMM type other than 16MB or 32MB SIMM is installed	Replace or re-install the SIMM
		• Standard SRAM defective	Replace the scanner controller board
SC4002	Flash ROM Error	The machine cannot scan	Defective firmware; try to download the software. If the download fails, replace the scanner controller.
SC4003	Battery Error	• The battery has run out	Replace the scanner controller board
		• The jumper TB4 is at the off position	Change the jumper position
SC4004	NIC Error	NIC circuit defective	Replace the scanner controller board
SC4005	Application Error	Logical error	Turn the main switch off and on, check the error log data (SP005), then inform it to the service center.

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6.2 LEDS
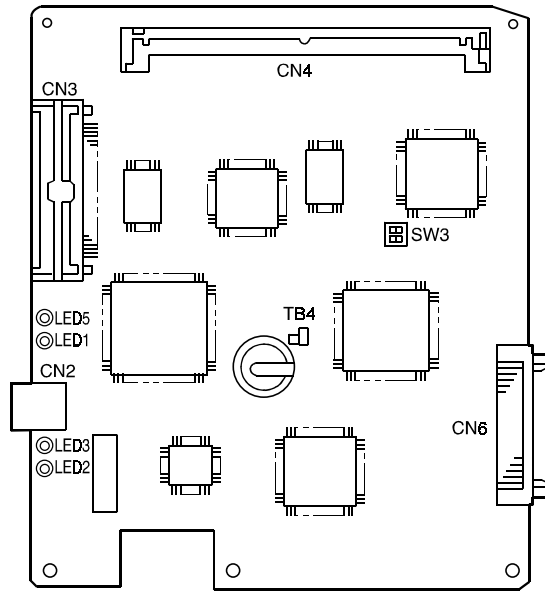
A844T500.WMF

LED No.	Color	Status	Condition
LED1	Yellow	Lit	The network interface circuit is working properly.
		Off	The network interface circuit does not work.
LED2	Green	Lit	The scanner controller board is connected to the network properly.
		Off	The scanner controller board is not connected to the network.
LED3	Green	Lit	100 Base-TX
		Off	10 Base-T
LED5	Red	Lit	+ 5V is supplied
		Off	+ 5V is not supplied
		Blinking	Communication error between the scanner controller board and BICU.