

Model S-F2
NIC FAX UNIT
(Machine Code: H231/H232)
SERVICE MANUAL

20 December, 2002
Subject to change

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1. INSTALLATION

1.1 NIC FAX UNIT TYPE 410

1.1.1 ACCESSORY CHECK

Check that you have the components and accessories indicated below.

No.	Description	Q'ty
1	NICF board	1
2	JPEG board	1*
3	OPIF Board	1
4	Decal User Function Key	1
5	NIC Fax Decal	1
6	CD ROM	1 set
7	Installation Procedure	1
8	Screw – M3 x 6	4
9	Software License Agreement	1
10	Core	1

*: NIC Fax Unit Type 410 (EU/Asia) does not contain JPEG unit

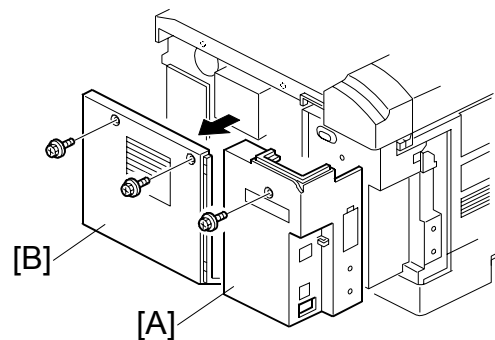
1.1.2 INSTALLATION PROCEDURE

⚠ CAUTION

Before installing an optional unit, do the following:

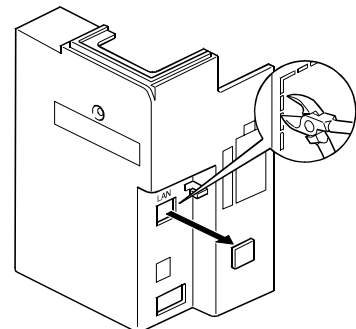
1. Print out all messages stored in the memory.
2. Print out the lists of user-programmed items and the system parameter list.
3. Turn off the main switch, and disconnect the power plug.

1. Remove the rear right cover [A] (⚙ x 1) first, then rear left cover [B] (⚙ x 2).



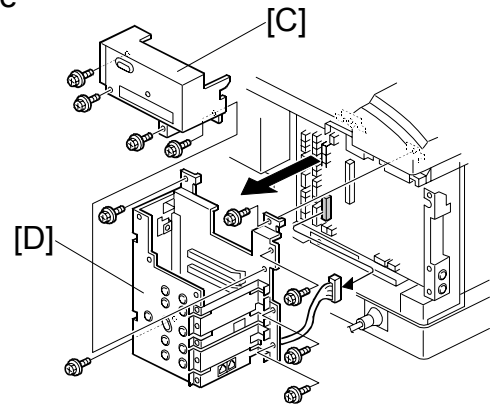
H5561902.WMF

2. Cut away the "LAN" window from the rear right cover as shown.



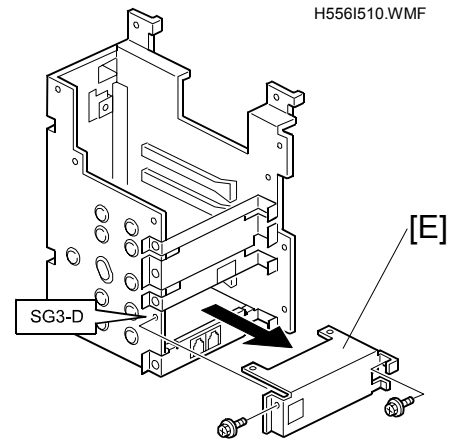
H5561517.WMF

3. Remove the upper bracket [C] (⚙️ x 4) and the lower bracket [D] (⚙️ x 6, 🛠️ x 1).



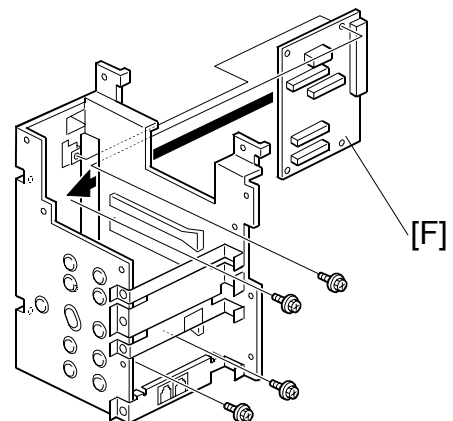
H5561510.WMF

4. Remove the bracket cover [E] (⚙️ x 2) from the lower bracket.



H5561511.WMF

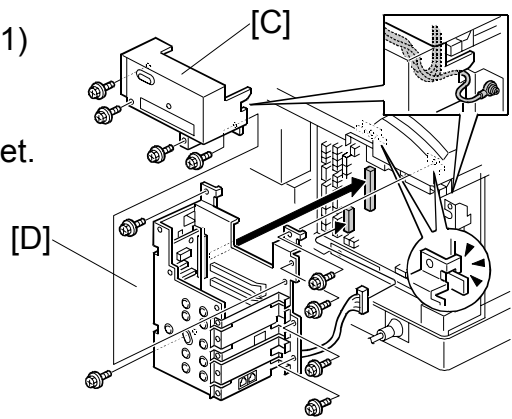
5. Insert the OPIF board [F] as shown, then secure it (⚙️ x 4).



H5561512.WMF

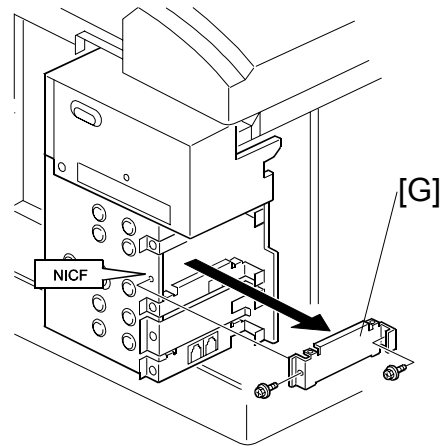
6. Replace the bracket cover removed in step 4.

7. Replace the lower bracket [D] (⚙️ x 6, 🛠️ x 1) and the upper bracket [C] (⚙️ x 4) and
NOTE: The harnesses and grounding wire should be inside of the upper bracket.



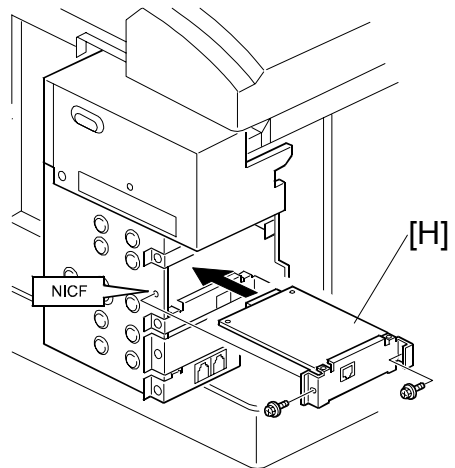
H5561513.WMF

8. Remove the bracket cover [G] (⚙️ x 2) from the lower bracket.



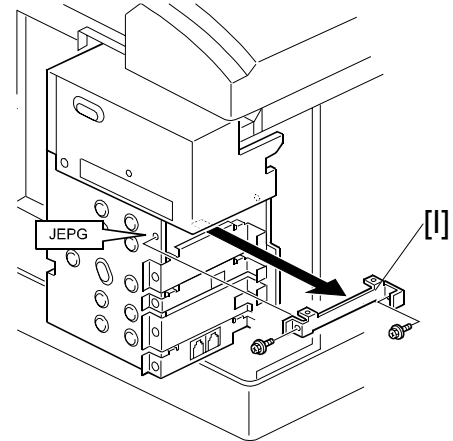
H5561520.WMF

9. Insert the NICF board [H] (⚙️ x 2) into the lower bracket.
NOTE: If you are installing the NIC Fax Unit Type 410 (for Europe and Asia), skip to step 12. For Color NIC Fax Unit Type 410 (for NA) or installing Color Unit Type 410 (for EU and Asia) at the same time, follow the next procedure.



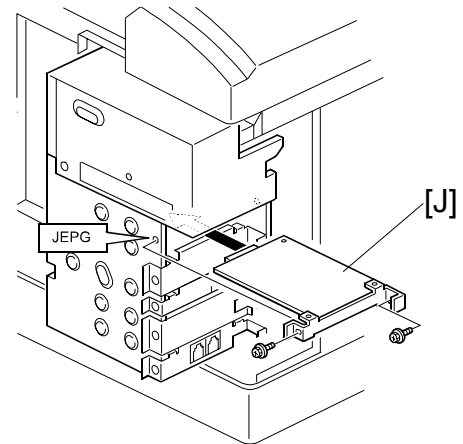
H5561514.WMF

10. Remove the bracket cover [I] (🔩 x 2) from the lower bracket.



H5561515.WMF

11. Insert the JPEG board [J] (🔩 x 2) into the lower bracket.



H5561516.WMF

12. Replace the rear covers.

13. Attach the “NIC FAX” decal [K] on the lower left side of the front cover.

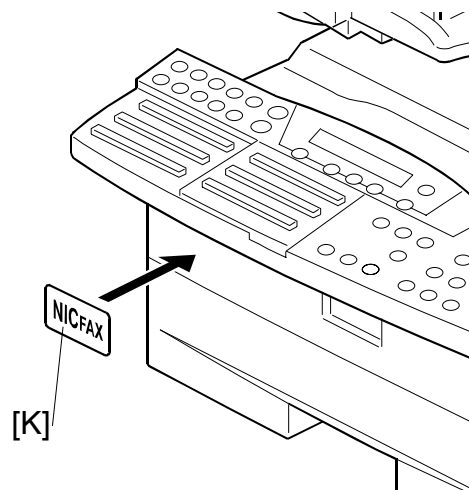
14. Plug in the machine and turn on the main power switch.

15. Print the System Parameter List from the Fax Service mode:

- **Color NIC Fax Unit Type 410 / NIC Fax Unit Type 410 and Color Unit Type 410** -
 Make sure that “NICF” and “COLOR” are listed as an option.

- **NIC Fax Unit Type 410** -
 Make sure that “NICF” is listed as an option.

Then exit Service mode.



H5561203.WMF

1.2 COLOR UNIT TYPE 410 (OPTION FOR EU/ASIA)

1.2.1 ACCESSORY CHECK

Check that you have the components and accessories indicated below.

No.	Description	Q'ty
1	JPEG board	1
2	Installation Procedure	1

1.2.2 INSTALLATION PROCEDURE

⚠ CAUTION

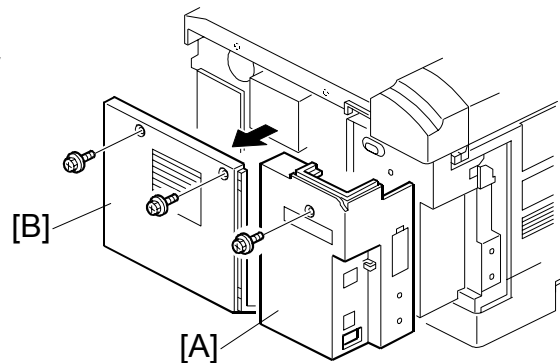
Before installing an optional unit, do the following:

1. Print out all messages stored in the memory.
2. Print out the lists of user-programmed items and the system parameter list.
3. Turn off the main switch, and disconnect the power plug.

NOTE: Before installing this option, NIC Fax Unit Type 410 should be installed in advance.

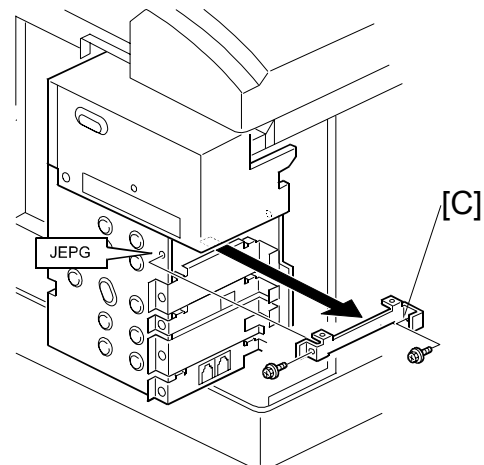
1. Remove the rear right cover [A] (⚙ x 1).

NOTE: You do not have to remove rear left cover [B].



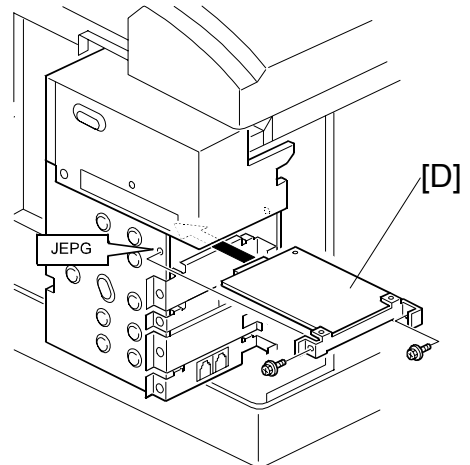
H5561903.WMF

2. Remove the bracket cover [C] (⚙ x 2) from the lower bracket.



H5561515.WMF

3. Insert the JPEG board [D] (2 x 2) into the lower bracket.



H5561516.WMF

4. Replace the rear cover.
5. Plug in the machine and turn on the main power switch.
6. Print the System Parameter List from the Fax Service mode, then make sure that "NICF" and "COLOR" is listed as an option.

1.3 INITIAL SETTINGS

Users can set the NIC Fax initial settings. Please refer to the Operating instructions for NIC Fax Unit Type 410.

- NOTE:** 1) Make sure that the following items are registered in the mail server before installation.
- IP address
 - Host name
 - Mail account and the password
- 2) When the machine is installed as a standalone fax because the mail server is not ready, program the only the following items.
- IP address: 127. 0. 0. 1
 - POP Server: NULL (nothing to input)

CAUTION: The initial settings include matters related to user security, such as the login password and IP addresses. So, please ask the user to input the initial settings of the NIC Fax. If the user asks you to input the initial settings, be sure to keep the settings confidential.

1.4 INITIAL CHECK

Do the following procedures to test the machine after installation.

1.4.1 CHECKING THE LEDS

Check that the orange (LED4) and the green (LED3) LEDs light when the LAN cable is connected after the machine is turned on.

If either (or both) LEDs do not light, the following conditions may be causing a problem.

The orange LED does not light:



- The LAN board may be defective or it may not be connected to the interface board.

The green LED does not light:

- The LAN cable may not be connected to a hub.
- The LAN cable may be defective.
- The LAN board may be defective or it may not be connected to the interface board.

1.4.2 LINK CHECK

This checks the link pulse communication between the machine (LAN board) and the hub. If the link pulse is correctly received from the hub, the machine displays "OK."

1. Enter the LAN service mode.
Press  ① ⑦, then hold down  for more than 3 seconds and press ②. Then press ① ⑧ and "OK".

```

D.LAN SW  1.DU SW
2.LINK    3.LOOP
    
```

H2311501.BMP

2. Press ②.

```

LINK CHECK      START
    
```

H2311502.BMP

3. Press .

```

LINK CHECK
OK!!
    
```

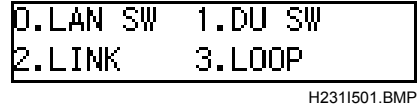
H2311503.BMP

If "NG" is displayed, check the cable connection or replace the cable.

1.4.3 LOOP BACK TEST

This mode checks the internal status of the LAN board.

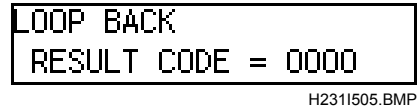
1. Enter the LAN service mode.
Press (1) (0) (7), then hold down for more than 3 seconds and press (2). Then press (1) (8) and "OK".



2. Press (3).



3. Press .



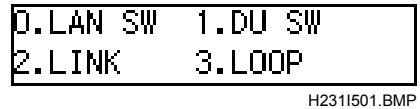
If the result shows any codes other than "0000", follow the troubleshooting procedures in section 2.

If the results of all the tests are successful, test communication with the server by sending mail from the machine back to the machine's own address.

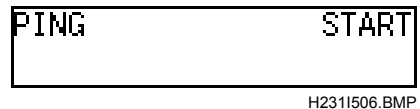
1.4.4 PING

The PING signals are sent out to the DNS server, SMTP server, and POP/IMAP server in that order. Then, the NIC fax checks the responses from the servers. If a server does not respond, a result code is displayed and the NIC fax does not send out the PING signal to the next server. When the address of a server is not registered, the NIC fax does not send out the PING signal to that server.

1. Enter the LAN service mode.
Press (1) (0) (7), then hold down for more than 3 seconds and press (2). Then press (1) (8) and "OK".



2. Press (5).



3. Press .

2. TROUBLESHOOTING

2.1 ERROR CODES FOR LAN COMMUNICATION

If an error code occurs, retry the communication. If the same problem occurs, try to solve the problem as suggested below.

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
10-00	The NIC is reset because of a timeout during handshaking.	No response is received during handshaking between NIC and FCU after a certain interval, so the NIC is reset.	FCU software procedure error or abnormal e-mail data.	FCU
10-01	The user pressed the Stop key.	Processing is interrupted because the user pressed Stop.		
10-02	Transmission test failed during the LAN testing procedures.	Transmission error occurred during the loop-back test.	The NIC board may be defective.	
10-03	Reception test failed during the LAN testing procedures.	Reception error occurred during the loop-back test.	The NIC board may be defective.	
10-04	The NIC is not ready.	The NIC is not ready after reset. The orange LED on the NIC board does not light.	The NIC board and/or ROM on the NIC board may not be connected completely. Re-install them. If that doesn't work, replace the NIC board.	
10-05	The NIC was reset because of a request from the NIC.	When an abnormal procedure occurs, the NIC sends a reset request to the FCU, then the FCU commands the NIC to reset.	NIC and/or FCU software may be working incorrectly.	
10-06	An abnormal command caused the NIC to reset.	The NIC was reset as a failsafe, because the handshaking between the NIC and the FCU was incorrect.	FCU software may be working incorrectly.	
10-07	Transmission was interrupted because the NIC was reset during tx data formatting.	The NIC was reset during the scanning of an original.	The NIC was reset by an error occurring in a job elsewhere.	
10-08	Incompatible NICF installed	The NICF installed in the machine is not compatible with the FCU.	Install NICF in the machine that is compatible with the FCU.	
10-10	A file with an unsupported format was received.	A decoding error during reception. The machine checks only the descriptions in the header of the e-mail, not the actual data in the e-mail.	The received file was not compressed using DCX or TIFF-F.	
10-11	DCX encoding error	An encoding error occurred while the scanned file was being converted using DCX during transmission.	FCU hardware may be defective and/or FCU software may be working incorrectly.	

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
10-12	DCX decoding error	The received e-mail had a correct header, but an error occurred while the DCX file was being decoded.	Incorrect DCX data and/or FCU may be defective and/or FCU software may be working incorrectly.	FCU
10-13	TIFF-F encoding error	An encoding error occurred while the scanned file was being converted using TIFF-F during transmission.	FCU hardware may be defective and/or FCU software may be working incorrectly.	
10-14	TIFF-F decoding error	The received e-mail had a correct header, but an error occurred while the TIFF-F file was being decoded.	Incorrect TIFF-F data and/or FCU may be defective and/or FCU software may be working incorrectly.	
10-15	E-mail reception was interrupted because the machine could not store the return address.	The machine cannot create a temporary file to store the "from address", because the maximum number of temporary files have been already created.	The e-mail will be received again after a regular interval when there are fewer temporary files. If some temporary files are deleted manually, it will be possible to create new ones.	
10-16	The machine interrupted data reception from a PC during LAN fax transmission, because the address of the destination could not be stored.	The machine cannot create a temporary file to store the "from address", because the maximum number of temporary files have been already created.	The PC will receive a busy signal and the PC fax application will send the data again. If some temporary files are deleted manually, it will be possible to create new ones.	
10-17	Document size and resolution of the received e-mail was over the limit.	Document size and resolution of the received e-mail was over the limit.	Document size and resolution of the received e-mail was over the limit.	
10-18	Mail RX was cancelled because the memory transfer information could not be saved.	The destination file was missing. The received mail was deleted and a communication error report was returned.	Release the destination file after time has elapsed.	
10-19	A transmission was cancelled when a mail return receipt was requested.	There was not enough area in memory to record the answering address and ID, the items required for receiving the mail return receipt. Too many mail receipts have accumulated for unsent transmissions.	No action. Just wait for the remote machine to re-send.	
10-20	The machine rejected an incoming e-mail for autorouting, because the ID code in the incoming e-mail did not match a personal code registered in the machine.	Incorrect ID code.	Ask the sender to correct the ID code, or change the setting of LAN bit switch 04 bit 0.	

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
10-21	The machine rejected an incoming e-mail for autorouting, because an incorrect address was registered with the personal code.	Incorrect address	Correct the address, or change the setting of LAN bit switch 04 bit 2.	FCU
10-22	The machine rejected an incoming e-mail for transfer request, because the ID code in the incoming e-mail did not match the ID code registered in the machine.	Incorrect ID code.	Ask the sender to correct the ID code, or change the setting of LAN bit switch 03 bit 3.	
10-23	The machine rejected an incoming e-mail for transfer request, because it specified a Quick/Speed Dial that contains an incorrect address.	Incorrectly formatted address stored in the Quick/Speed Dials.	Correct the addresses stored in the Quick Dials, or change the setting of LAN bit switch 03 bit 2.	
10-24	Transmission was cancelled because the detected size of the file was too larger.	The size of the file of the original sent exceeded the size of file size specified before sending.	Divide the original in sections and send as separate files, or use G3/G4 sending.	
10-25	A transmission result report could not be returned to a PC with LAN Fax.	The mail address of the PC is not set correctly for the personal box. The user code is not entered correctly on the PC.	Correct the mail address for the PC. On the PC, correct the user code.	
10-26	Reception with LAN Fax was cancelled because the send destination was incorrect.	The entry for the destination on the PC is not correct.	On the PC, correct the entry for the destination.	
10-27	Reception with LAN Fax was cancelled because the number of transmissions exceeded the limit.	The number of destinations specified for the transmission exceeded the limit for LAN Fax.	On the PC, reduce the number of destinations for the transmission.	
10-30	NIC EPROM error	Checksum error.	The EPROM on the NIC board may be defective. Replace the NIC board and/or EPROM if this error keeps appearing.	NICF
10-31	NIC memory error	The result of the checked memory value was incorrect	The DRAM on the NIC board may be defective. Replace the NIC board if the error keeps appearing.	
10-32	NIC serial module error	The hardware for the serial module in the CPU on the NIC board may be defective.	Replace the NIC board if the error keeps appearing.	
10-33	NIC timer module error	The hardware for the timer module in the CPU on the NIC board may be defective.	Replace the NIC board if the error keeps appearing.	

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
10-34	Error on the interrupt line connecting NIC to FCU	The hardware for the interrupt line between the NIC board and the FCU may be defective.	Replace the NIC board if the error keeps appearing.	NICF
10-35	Network controller error	Network controller hardware error on the NIC board	Replace the NIC board if the error keeps appearing.	
10-40	IP address not stored in the machine	The machine checks if the IP address is stored when the NIC board is reset.	Store the IP address of the machine.	
10-41	IP address conflict	The machine's IP address conflicts with another machine's. The machine check for IP address conflict using ARP procedures when the machine is turned on.	Change the IP address.	
10-42	Abnormal TCP/IP socket procedure	Error during the internal checking procedure of the NIC software runs when the machine is turned on	The NIC board and/or NIC ROM may be defective, or the NIC software is working incorrectly.	
10-43	Timeout during hand shaking	Error while the machine checks the handshaking between NIC board and FCU when the machine is turned on	The NIC board and/or NIC ROM may be defective, or the NIC software is working incorrectly.	
10-44	Sequence error during handshaking	Error while the machine checks the handshaking between NIC board and FCU when the machine is turned on	The NIC board and/or NIC ROM may be defective, or the NIC software is working incorrectly.	
10-45	IP address for DNS server not stored in the machine	DNS IP address is not registered	Check that the DNS IP address is correct.	
10-46	DNS server cannot be found	Cannot find the DNS server.	Check that the DNS IP address is correct.	
10-47	IP address cannot be obtained from DHCP server	DHCP server detected IP address overlap. Lease of IP address is deleted by the DHCP server administrator.	Check the DHCP server settings	
10-48	DHCP server cannot be found	Cannot find the DHCP server	Check the line condition. Check the DHCP server installation. Check the DHCP server settings.	
10-56	WINS server cannot be found	Cannot find the WINS server	Check the WINS server IP address. Check the line connection.	
10-57	NBT name registration failed	Overlap with the host name. WINS server IP address is not correct.	Determine whether host name is used for other devices. Check the WINS server IP address	
10-60	POP server IP address not registered	The IP address of the POP server is not registered in the machine.	Register the IP address.	

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
10-61	POP server cannot be found	The machine cannot find the POP server on the LAN.	Make sure that the IP address of the POP server is correct and check the traffic on the LAN.	NICF
10-62	Logging into POP server is disabled.	The machine finds POP server, but logging in is disabled.	Delete the user name and password of the POP server in the machine, then input it again. Otherwise, call administrator of the POP server.	
10-63	Disconnection from POP server.	The machine received a message from POP server that it will disconnect the communication.	Check the traffic on the LAN. Otherwise, call the administrator of the POP server to check if the server is turned off.	
10-64	MIME decoding error	Error during MIME decoding on the NIC board during reception.	Abnormal MIME data. Replace the NIC board if the error occurs during reception from several senders.	
10-65	E-mail with unsupported type of header was received	The machine decides whether the e-mail is a supported type or an unsupported type by the header of the e-mail.	The machine received an e-mail with a header type other than "text/plain" and "base 64".	
10-66	Received e-mail format error	This indicates that the received e-mail is not standard. There is no boundary between parts of the e-mail.	The sender must send e-mail in a standard format.	
10-67	The machine did not receive a response from the POP server at the expected time.	The POP procedures were interrupted by the server during reception.	The POP server is not working properly. Call the administrator of the server.	
10-70	No IP address stored for the SMTP server	The IP address of the SMTP server is not registered in the machine.	Enter the IP address in the machine.	
10-73	SMTP server cannot be found	The machine cannot find the SMTP server on the LAN.	Check the IP address of the SMTP server and check the traffic on the LAN.	
10-74	No e-mail address is stored.	The e-mail address of the machine is not stored in the machine.	Enter the e-mail address in the machine.	
10-75	The e-mail address is too long.	The length can be up to 127 bytes.	Delete the address and enter it again.	
10-76	No destination address was entered for transmission.	A temporary file is created to store the destination address for transmission. The machine checked the size of the file and the result was zero bytes.	Enter the address again.	

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
10-77	Incorrect destination address	The destination address does not exist in the server. The server determines whether the account of the destination is inside or outside the server by the domain name of the e-mail address. The server informs the machine during the POP procedures when there is no account in the server even though the domain name indicates the account should be on the server. When it is clear that the account is not on the server because of the domain name, the server has no way to know if the address is correct.	Enter the address again.	NICF
10-79	SMTP server hard disk full	The SMTP server informs the machine during the SMTP procedures that the server hard disk is full.	Call the administrator of the server.	
10-80	SMTP server shutdown	The SMTP server tells the machine during the SMTP procedures that it is shut down during communication.	Call the administrator of the server.	
10-81	SMTP server busy	The SMTP server informs the machine during the SMTP procedures that it cannot handle the data because of a problem, such as a locked mail spooler.	Call the administrator of the server.	
10-82	SMTP server turned off	When the server is turned off, the machine is informed by TCP/IP procedures that connection between the machine and the server is interrupted.	Check whether the LAN is congested or if a cable has been disconnected, or call the administrator of the server.	
10-83	Report format error	One line in the text data was too long when the machine created text e-mail for an error report.	Abnormal software procedure	
10-84	The machine did not receive a response from the SMTP server at the correct time	The machine sent commands to the SMTP server during transmission, but the server did not answer at the correct time	Abnormal SMTP server procedures. Check whether the LAN is congested or whether a cable has been disconnected, or call the administrator of the server.	
10-85	Unexpected response from the SMTP server.	The SMTP server sent a response to the machine which had an unexpected value.	Abnormal SMTP server procedures. Check whether the LAN is congested or whether a cable has been disconnected, or call the administrator of the server.	

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
10-86	Allocation for SMTP memory failed.	NICF memory is not sufficient.	Cycle the machine off and on. If this error occurs again, replace the NICF.	NICF
10-88	Cannot be accessed by the SMTP server when SMTP-AUTH is enabled	User name is not correct and/or password is not correct.	Check the user name. Check the password.	
10-90	No encoded line in the e-mail during transmission.	An error occurred while encoding scanned data.	The FCU software is not working properly.	FCU
10-91	Number of encoded lines does not match the number of scanned lines in the transmission.	An error occurred while encoding scanned data.	The FCU software is not working properly.	
10-92	Value of encoded offset does not match the scanned lines in the transmission.	An error occurred while encoding scanned data.	The FCU software is not working properly.	
10-93	Non-standard data in the e-mail.	The received e-mail contains non-standard image data.	Abnormal e-mail data. Inform this to the sender.	
10-94	Encode line could not be detected during server sending.	Internal error.	Re-install the Scan Router software.	
10-95	The number of lines did not match the pre-scan during server sending.	Internal error.	Re-install the Scan Router software.	
11-00	Error when writing program to the Flash ROM.	An error occurred while writing the NIC firmware to the Flash ROM.	The Flash ROM on the NIC is defective. Change the NIC board.	
11-01	Error in the transfer data header information	An error occurred while writing the NIC firmware to the Flash ROM.	The Flash card is defective.	
11-02	Transfer data check sum error	An error occurred while writing the NIC firmware to the Flash ROM.	The Flash card is defective.	
11-03	Abnormal transfer data length	An error occurred while writing the NIC firmware to the Flash ROM.	The Flash card is defective.	
11-04	Error during erasing the Flash ROM.	An error occurred while writing the NIC firmware to the Flash ROM.	The Flash ROM on the NIC is defective. Change the NIC board	
11-05	Error during writing to the Flash ROM.	An error occurred while writing the NIC firmware to the Flash ROM.	The Flash ROM on the NIC is defective. Change the NIC board	
11-06	Check sum error while writing data.	An error occurred while writing the NIC firmware to the Flash ROM.	The Flash ROM on the NIC is defective. Change the NIC board	
11-07	Reprogramming error	An error occurred while writing the NIC firmware to the Flash ROM.	The Flash ROM on the NIC or the Flash card is defective. Change the NIC board	

Trouble-shooting

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
12-10	SMTP Receiving – Line Break	SMTP server is down. Line defective or disconnected.	Check the line. Check the network environment. Contact your network system administrator	NICF
12-11	SMTP Receiving – MIME Decoding Error	MIME data corrupted. NIC-F defective	Remote fax defective. Replace the NIC-F.	
12-12	SMTP Receiving – Unsupported Mail Received	Mail other than Text, Plain, or Base64 was received.	Request the sender to correct the problem.	
12-13	SMTP Receiving – Mail Format Error	Mail data corrupted.	Request the sender to correct the problem.	
12-15	SMTP Receiving – Command Timeout	Line defective. Line disconnected. Setting on the targeted SMTP server is incorrect. NIC-F defective.	Check the line. Check the settings on the targeted SMTP server. Replace the NIC-F.	
12-16	SMTP Receiving - Disconnected	The targeted SMTP server disconnected during transmission.	Check the targeted SMTP server.	
12-17	SMTP Receiving – Illegal Off Ramp Address or Too Many Destinations	Received an illegal Off ramp (transmission to PSTN) address. The number of off ramp destinations is too large to control.	Request the sender to correct the problem.	
12-18	SMTP Receiving – Mail Address of Recipient Machine Not Registered	The mail address is not registered for the machine receiving the mail.	Register the mail address on your machine.	
12-19	SMTP Receiving – “RCPT TO” Error	“RCTP TO” command error occurred.	Request the sender to correct the problem.	
12-30	lpd - Line Disconnected	The line from the client is lost, due to job deletion. Line defective.	Check the line on the client side. Check the line.	
12-31	lpd - Command Sequence Error	Client lpd defective. NIC-F defective.	Check the settings at the client machine. Replace the NIC-F.	
12-32	lpd – Received Unsupported Command	Client lpd defective. NIC-F defective.	Check the settings at the client machine. Replace the NIC-F.	
12-33	lpd – Command Timeout	Client lpd defective. NIC-F defective.	Check the settings at the client machine. Replace the NIC-F.	
12-34	lpd – Data Format Error	Error in the data format. NIC-Fdefective.	PC fax driver defective. Replace NIC-F.	
12-37	Diprint – Line Defective	The line from the client is lost, due to job deletion. Line defective.	Check the line on the client side. Check the line.	
12-38	Diprint – Data Format Error	Data format error.	LAN fax driver defective. Replace the NIC-F.	
12-50	Server Address Not Registered	The address of the delivery server is not registered.	Set the address for the delivery server.	
12-51	Cannot Find Server	The setting of the server address is missing.	Check the server address.	

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
12-52	Cannot log into the server.	Delivery server address is missing. Line defective.	Set the delivery server address. Check the line.	NICF
12-53	Server Is Not Ready	Delivery server has not started (server may not be compatible).	Check the operation of the delivery server.	
12-55	Data Send to Server Error	Delivery server line defective. Data transmission error with server.	Check the operation of the delivery server. Check the line.	
12-60	Destination Specification Error in Send to Server	The specified folder ID does not exist on the server.	Check the address of the delivery server in the Address Book. Check the operation of the delivery server.	
12-61	Batch Broadcast Specified in Fax Receive Folder ID (#000)	An error was returned because a batch broadcasting specification exists in the ID (#000) of the fax receive folder. Normally, the batch broadcasting setting is not made from the FCU.	After the error is returned, batch sending executes each transmission in order, one by one, so there is no problem.	
13-00	IP-FAX Call Connection Error	The setting of the other party's terminal is not correct.	<ul style="list-style-type: none"> • Check if the IP Address, Host Name, and Alias Phone Number are correct. • Check if the call connection port number of the other party's terminal is correct. • Check for a firewall at the other party's terminal. • Switch the machine off and make sure that no LAN cables are disconnected. • For a Ricoh machine, make sure that the IP-FAX is enabled with the LAN SW setting. • Check that the other party's fax is not busy. 	
13-01	IP-FAX – Illegal Message Receive	The other party's fax is not T.38 compatible.	Contact the other party and check whether their machine is T.38 compatible and whether the machine is a real-time IFAX terminal.	
13-02	IP-FAX - Does Not Match Capacity	The other party's fax is not T.38 compatible.	Contact the other party and check whether the remote terminal is T.38 compatible and whether the machine is a real-time IFAX terminal.	
13-10	IP-FAX Gatekeeper – Duplicate Registration Error	A duplicate entry was entered during alias registration.	Change the alias name.	

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
13-11	IP-FAX Gatekeeper – Access Error	Gatekeeper setting not correct.	<ul style="list-style-type: none"> • Check the Host Name and IP Address of the gatekeeper. • Check the host port number of the gatekeeper. • Check the operation of the gatekeeper. 	NICF
13-12	IP-FAX – Local Terminal IP Address Error	The IP Address of your machine is not correct.	<ul style="list-style-type: none"> • Check the IP address of the machine and correct. 	
13-13	IP-FAX – Incorrect Alias	The alias is not correct.	Check the alias name and correct if necessary.	
13-14	IP-FAX – Receiving Terminal Not Registered	The gatekeeper of the receiving terminal is not registered.	Check whether the alias call destination of the terminal alias name has been registered with the gatekeeper. Check the destination.	
13-15	IP-FAX Call Model Incorrect	The call model is incorrect.	Check the call model registered at the gatekeeper and the IP FAX.	
13-16	IP-FAX – Other Gatekeeper Error	An error was returned in response to a request from the RAS task.	Check the IP-FAX settings. Check the gatekeeper settings. Reset the system.	
13-20	IP-FAX – Packet Loss with UDP	During non-ECM transmissions, too many packets are lost and cannot be recovered due to the lower number redundant packets.	Increase the number of redundant packets.	
13-21	IP-FAX – Cannot Receive With the Prescribed Time After Setup or Connect	The network bandwidth is too narrow.	Check the bandwidth of the other party's network to determine if it is too narrow.	
13-22	IP-FAX – Broken Link Detected at the Call Channel or the Data Channel	Network operating abnormally. Error occurred at the remote terminal.	Check the network to determine if there is a problem. Contact the other party to determine if the remote terminal broke the transmission.	
13-23	IP-FAX – Remote Terminal Disconnected Communication	The communication was cut off at the call channel or data channel of the remote terminal.	Contact the other party to determine if the remote terminal is disconnecting. Contact the other party and check whether the remote terminal is T.38 compatible and whether the machine is a real-time IFAX terminal.	

2.2 LAN TESTS

These tests are included in service function 18 (see section 3 of this manual).

2.2.1 LINK CHECK

A machine and a hub send and receive link pulses to each other to check the connections to the LAN at regular intervals. The machine lights the green LED on the NIC board when the pulses are received successfully.

When the link check is performed, the machine checks for a link pulse. The machine indicates "OK" on the display when the link pulse is received successfully.

Check the LEDs both on the NIC board and on the hub to see if the connection through the LAN cable is active.

- During this test, the machine watches the received link pulses from the hub. To check the link pulse from the machine to the hub, check the LED on the hub.

NOTE: While the machine is on, the orange LED on the NIC board is lit if it has been initialized successfully.

2.2.2 LOOP BACK

When the loop back test is done, the FCU sends test data to the NIC board. The data is sent back to the FCU using the loop-back function of the NIC. The FCU checks if the test data is the same as the data returned from the NIC. When they are the same, the FCU indicates "RESULT = 0000" on the display, which means that the NIC board test was successful.

NOTE: The machine does not send test data out of the machine on the LAN during the loop back test. The result is indicated even if the LAN cable is not connected to the NIC board.

When the NIC board is defective, one of the error codes in the following table will appear. In this case, re-install the NIC board and/or cable, or change them if the loop back test is still not successful.

- LOOP-BACK TEST RESULT CODES -

Code	Meaning	Code	Meaning
0000	The test finished without errors.	0008	Data delay error
0001	Defective IC network controller on the NIC board	0009	Carrier loss
0002	Test data did not meet regulations.	000A	Data is not processed at the correct time
0003	Data collision error	000B	No data received
0004	Buffer overflow while receiving data	000C	Data frame error
0005	Memory error	000D	Data overflow
0006	Memory error	000E	CRC error
0007	Received data does not reach the buffer at the correct time	000F	Receiving data buffer error

2.2.3 PING

The PING signals are sent out to the DNS, SMTP, and POP/IMAP servers in that order. The NIC fax checks the responses from the servers.

When the NIC fax has received all responses from the servers, it will display "RESULT CODE = 0000" (OK) on the operation panel. If a server does not respond, a result code is displayed on the operation panel and the NIC fax will not send out the PING signal to the next server. When the address of a server is not registered, the NIC fax does not send out the PING signal to that server.

The NIC fax checks the connection to the server address using the PING function. However, it only checks the connection to the specified address. If the wrong address is registered for a server and another server is connected to the network at that address, that server will respond to the PING signal, and the result of the PING test will be OK. Therefore, the PING test alone will not guarantee successful e-mail transmission and reception if the wrong addresses are input.

However, the PING test is a good tool for checking the network connection. If an e-mail problem occurs in the field, try the PING test first.

Result Code	Server
1046	DNS
1061	POP/IMAP
1073	SMTP

2.2.4 LOG DUMP

The protocol logs for communication between the POP/IMAP/SMTP server and the NIC fax unit are stored in a 24-Kbyte memory inside the machine. The logs can be printed out. The log dump list shows the POP/IMAP/SMTP commands and the responses from the server(s).

The NIC fax sends out POP/IMAP commands to the POP/IMAP server automatically, even if there is no received e-mail in the POP/IMAP server. Then the POP/IMAP commands and responses are stored in the memory. Therefore, if a long time passes after an error occurs, the data from the error will be lost.

2.2.5 TROUBLESHOOTING PROCEDURES

Use the following procedures to determine whether the machine or another part of the network is causing the problem.

Communication Route	Item	Action	Remarks
General LAN	1. Connection with the LAN	<ul style="list-style-type: none"> • Check that the LAN cable is connected to the machine. • Check that the LEDs on the hub are lit. 	
	2. LAN activity	<ul style="list-style-type: none"> • Check that other devices connected to the LAN can communicate through the LAN. 	
Between NIC Fax and PC	1. Network settings on the PC	<ul style="list-style-type: none"> • Check the network settings on the PC. 	<ul style="list-style-type: none"> • Is the IP address registered in the TCP/IP properties in the network setup correct? Check the IP address with the administrator of the network.
	2. Check that PC can connect with the machine	<ul style="list-style-type: none"> • Use the "ping" command on the PC to contact the machine. 	<ul style="list-style-type: none"> • At the MS-DOS prompt, type ping then the IP address of the machine, then press Enter.
	3. LAN settings in the machine	<ul style="list-style-type: none"> • Check the LAN parameters • Check if there is an IP address conflict with other PCs. 	<ul style="list-style-type: none"> • Use the "Network" function in the User Tools. • If there is an IP address conflict, inform the administrator.
Between machine and e-mail server	1. LAN settings in the machine	<ul style="list-style-type: none"> • Check the LAN parameters • Check if there is an IP address conflict with other PCs. 	<ul style="list-style-type: none"> • Use the "Network" function in the User Tools. • If there is an IP address conflict, inform the administrator.
	2. E-mail account on the server	<ul style="list-style-type: none"> • Make sure that the machine can log into the e-mail server. • Check that the account and password stored in the server are the same as in the machine. 	<ul style="list-style-type: none"> • Ask the administrator to check.

Communication Route	Item	Action	Remarks
Between machine and e-mail server	3. E-mail server	<ul style="list-style-type: none"> • Make sure that the client devices which have an account in the server can send/receive e-mail. 	<ul style="list-style-type: none"> • Ask the administrator to check. • Send a test e-mail with the machine's own number as the destination. The machine receives the returned e-mail if the communication is performed successfully.
Between e-mail server and internet	1. E-mail account on the Server	<ul style="list-style-type: none"> • Make sure that the PC can log into the e-mail server. • Check that the account and password stored in the server are the same as in the machine. 	<ul style="list-style-type: none"> • Ask the administrator to check.
	2. E-mail server	<ul style="list-style-type: none"> • Make sure that the client devices which have an account in the server can send/receive e-mail. 	<ul style="list-style-type: none"> • Ask the administrator to check. • Send a test e-mail with the machine's own number as the destination. The machine receives the returned e-mail if the communication is performed successfully.
	3. Destination e-mail address	Make sure that the e-mail address is actually used. Check that the e-mail address contains no incorrect characters such as spaces.	
	4. Router settings	Use the "ping" command to contact the router. Check that other devices connected to the router can sent data over the router.	<ul style="list-style-type: none"> • Ask the administrator of the server to check.
Between e-mail server and internet	1. Error message by e-mail from the network of the destination.	<ul style="list-style-type: none"> • Check whether e-mail can be sent to another address on the same network, using the application e-mail software. • Check the error e-mail message. 	<ul style="list-style-type: none"> • Inform the administrator of the LAN.

2.2.6 IP-FAX TROUBLESHOOTING GUIDE

IP-Fax Transmission

Cannot send by IP Address/Host Name

Check Point		Action
1	LAN cable connected?	Check LAN cable connection. Error Code: 10-46
2	Specified IP address/host name correct?	Check IP address/host name. Error Code: 13-00
3	Firewall/NAT is installed?	Cannot breach firewall. Send by using another method (Fax, Internet Fax)
4	Transmission sent manually?	Manual sending not supported.
5	IP address of local machine registered?	Register IP address. Error Code: 10-40/13-12
6	Port number required?	Send by specifying port number.
7	Specified port number correct?	Confirm port number of remote fax. Error Code: 13-00
8	DNS server registered when host name specified?	Contact network administrator.
9	SW used by Gatekeeper disabled?	Confirm setting. See User Parameter SW32 (20[H]) Bit 0
10	Remote fax a T.38 terminal?	Confirm whether remote fax is a T38 terminal. Error Code: 13-02
11	Remote fax switched off or busy?	Confirm that remote fax is switched on.
12	Network bandwidth too narrow?	Request network administrator to increase the bandwidth.
		Raise the delay level. LAN SW 11 Bit 0 to 3
		Lower the modem transmission baud rate. IPG3 SW 05
13	Remote fax cancelled transmission?	Confirm whether remote fax cancelled transmission. Error Code: 13-23

Trouble-shooting

Cannot send via VoIP Gateway

Check Point		Action
1	LAN cable connected?	Check LAN cable connection. Error Code: 10-46
2	VoIP Gateway T.38 standard?	Contact network administrator.
3	VoIP Gateway installed correctly?	Contact network administrator.
4	VoIP Gateway power switched on?	Contact network administrator.
5	Is the IP address/host name of the specified Gateway correct?	Confirm IP address/host name. Error Code: 13-00
6	Number of the specified fax correct?	Confirm remote fax number. Error Code; 13-00
7	Firewall/NAT is installed?	Cannot breach firewall. Send by using another method (Fax, Internet Fax)
8	Transmission sent manually?	Manual sending not supported.
9	IP address of local fax registered?	Register IP address. Error Code: 10-40/13-12
10	DNS registered when host name specified?	Contact network administrator.
11	Remote fax a G3 fax?	Confirm that remote fax is a G3 fax.
12	Remote G3 fax connected?	Confirm that G3 fax is connected.
13	Remote G3 fax switched on?	Confirm that G3 fax is switched on.
14	Network bandwidth too narrow?	Request network administrator to increase the bandwidth.
		Raise the network delay level. LAN SW 11 Bit 0 to 3
		Lower the modem transmission baud rate. IPG3 SW 05

Cannot send by Alias Fax number.

Check Point		Action
1	LAN cable connected?	Check LAN cable connection. Error Code: 10-46
2	Number of specified Alias fax correct?	Confirm the Alias of the remote fax. Error Code: 13-13
3	Firewall/NAT installed?	Cannot breach firewall. Send by using another method (Fax, Internet Fax)
4	Transmission sent manually?	Manual sending not supported.
5	Gatekeeper installed correctly?	Contact network administrator. Error Code: 13-11
6	Gatekeeper power switched on?	Contact network administrator. Error Code: 13-11
7	IP address/host name of Gatekeeper correct?	Confirm IP address/host name. Error Code: 13-11
8	DNS server registered when Gatekeeper host name specified?	Contact network administrator. Error Code: 13-11
9	SW used by Gatekeeper enabled?	Confirm setting. See User Parameter SW 32 (20 [H]) Bit 0
10	IP address of local fax registered?	Register IP address of local fax. Error Code: 10-40/13-12
11	Alias number of local fax registered?	Register Alias number of local fax. Error Code: 13-13
12	Remote fax registered in Gatekeeper?	Contact network administrator. Error Code: 13-14
13	Remote fax a T.38 terminal?	Confirm whether remote fax is T38 terminal. Error Code 13-02
14	Remote fax switched off or busy?	Contact network administrator.
15	Network bandwidth too narrow?	Request system administrator to increase the bandwidth.
		Raise the delay level. LAN SW 11 Bit 0 to 3
		Lower the modem transmission baud rate. IPG3 SW 05
16	Remote fax cancelled transmission?	Confirm whether remote fax cancelled transmission. Error Code: 13-23

IP-Fax Reception***Cannot receive by IP Address/Host name.***

Check Point		Action
1	LAN cable connected?	Check LAN cable connection. Error Code: 10-46
2	Firewall/NAT is installed?	Cannot breach firewall. Send by using another method (Fax, Internet Fax)
3	IP address of local fax registered?	Register IP address. Error Code: 10-40/13-12
4	Port number specified at remote sender fax (if required)?	Request sender to specify port number.
5	Specified port number correct (if required)?	Request sender to confirm port number.
6	DNS server registered when host name specified on sender side?	Contact network administrator. Error Code: 10-45/10-46 Note: Sender machine displays this error code if sender fax is a Ricoh model.
7	Network bandwidth too narrow?	Request system administrator to increase the bandwidth. Lower the start modem reception baud rate on the receiving side. IPG3 SW06
8	Remote fax cancelled transmission?	Confirm whether remote fax cancelled transmission. Error Code: 13-23

Cannot receive by VoIP Gateway.

Check Point		Action
1	LAN cable connected?	Check LAN cable connection. Error Code: 10-46
2	Firewall/NAT is installed?	Cannot breach firewall. Request remote fax to send by using another method (Fax, Internet Fax)
3	VoIP Gateway installed correctly?	Contact network administrator.
4	VoIP Gateway power switched on?	Contact network administrator.
5	IP address/host name of specified VoIP Gateway correct on sender's side?	Request remote fax to confirm IP address/host name.
6	DNS server registered when host name specified on sender side?	Contact network administrator.
7	Network bandwidth too narrow?	Request network administrator to increase the bandwidth.
8	G3 fax connected?	Confirm that G3 fax is connected.
9	G3 fax power switched on?	Confirm that G3 fax is switched on.



Cannot receive by Alias Fax number.

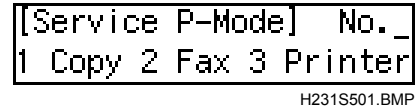
Check Point		Action
1	LAN cable connected?	Check LAN cable connection. Error Code: 10-46
2	Firewall/NAT is installed?	Cannot breach firewall. Request remote fax to send by using another method (Fax, Internet Fax)
3	Gatekeeper installed correctly?	Contact network administrator. Error Code: 13-11 Note: Sender machine displays this error code when sender fax is a Ricoh model.
4	Power to Gatekeeper switched on?	Contact network administrator. Error Code: 13-11 Note: Sender machine displays this error code when sender fax is a Ricoh model.
5	IP address/host name of Gatekeeper correct on the sender's side?	Request sender to confirm IP address/host name. Error Code: 13-11 Note: Sender machine displays this error code when sender fax is a Ricoh model.
6	DNS server registered when Gatekeeper host name specified on sender's side?	Contact network administrator. Error Code: 13-11 Note: Sender machine displays this error code when sender fax is a Ricoh model.
7	SW used by Gatekeeper on sender's side enabled?	Request sender to confirm settings. User Parameter SW 32 (20[H]) Bit 0 Note: Only if the remote sender fax is a Ricoh fax.
8	Local fax IP address registered?	Register IP address. Error Code: 10-40/13-12
9	Local fax Alias number registered?	Register Alias number. Error Code: 13-13
10	Network bandwidth too narrow?	Request system administrator to increase the bandwidth. Lower the start modem reception baud rate on the receiving side. IPG3 SW06
11	Remote fax cancelled transmission?	Confirm whether remote fax cancelled transmission. Error Code: 13-23
12	Local fax registered in Gatekeeper?	Contact network administrator. Error Code: 13-14 Note: Sender machine displays this error code when sender fax is a Ricoh model.

3. SERVICE TABLES AND PROCEDURES

3.1 SERVICE LEVEL FUNCTIONS

How to enter the Fax Service Mode

1. Ensure that the machine is in standby mode.
2. Press  ① ① ⑦, then hold down  for more than 3 seconds. The SP mode main menu opens.



[Service P-Mode] No. _
1 Copy 2 Fax 3 Printer

H231S501.BMP

3. Press ② to enter the fax service mode.



SERVICE FUNCTION
FUNCTION NO.

H231S502.BMP

Service
Tables

3.1.1 LAN BIT SWITCH PROGRAMMING

1. Enter the Fax Service Mode.

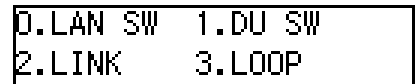
2. Press ① ⑧.



SERVICE FUNCTION
18.LAN

H231S503.BMP

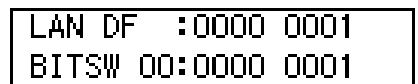
3. Press "OK".



0.LAN SW 1.DU SW
2.LINK 3.LOOP

H231S504.BMP

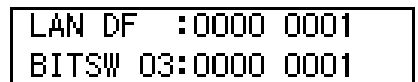
4. Press ①.



LAN DF :0000 0001
BITSW 00:0000 0001

H231S505.BMP

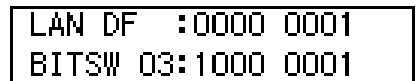
5. Scroll through the bit switches. Increment bit switch: ">"
Decrement bit switch: "<"
Example: Display bit switch 3: ">" x 3



LAN DF :0000 0001
BITSW 03:0000 0001

H231S506.BMP

6. Adjust the bit switch.
Example: To change the value of bit 7, press ⑦.



LAN DF :0000 0001
BITSW 03:1000 0001

H231S507.BMP

7. Either:
 - Adjust more bit switches - go to step 5.
 - Finish – Press "OK" then "Cancel".

3.1.2 LINK CHECK

This test checks the connection from the terminal to the hub.

1. Enter the Fax Service Mode.

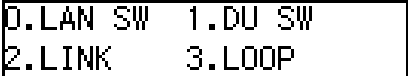
2. Press ① ⑧.



```
SERVICE FUNCTION
18.LAN
```

H231S503.BMP


3. Press "OK".



```
0.LAN SW  1.DU SW
2.LINK    3.LOOP
```

H231S504.BMP

4. Press ②.



```
LINK CHECK      START
```

H231S508.BMP


5. To start a test: ④

If test is successful, the display shows "OK!!".

If test is unsuccessful, the display shows "NG!!". :

Check the cable connection.

Replace the cable.



```
LINK CHECK
OK!!
```

H231S509.BMP

3.1.3 LOOP BACK TEST

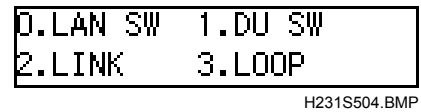
This test checks the connection between the FCU and the Network Interface Card (NIC).

1. Enter the Fax Service Mode.
2. Press **1** **8**.



H231S503.BMP

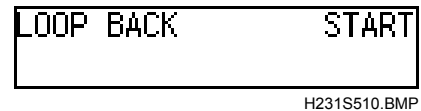
3. Press "OK".



H231S504.BMP

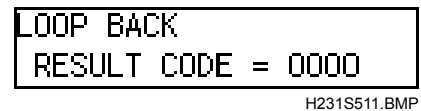


4. Press **3**.



H231S510.BMP

5. To start a test: **4**
 If the test is successful, the display shows "RESULT CODE= 0000".



H231S511.BMP

If the test is unsuccessful, the display shows "RESULT CODE= XXXX" (excluding "0000").

- Reinstall the NIC.
- Replace the NIC or FCU.

3.1.4 LOG DUMP

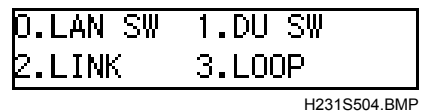
The communication between the NIC fax and the server log list is printed out.

1. Enter the Fax Service Mode.
2. Press **1** **8**.



H231S503.BMP

3. Press "OK".



H231S504.BMP

4. Press ">".

4.LOG DMP 5.PING

H231S512.BMP

5. Press ④.

LOG DUMP START

H231S513.BMP

6. Press ⑤.

3.1.5 PING

This test checks the connections to the servers.

1. Enter the Fax Service Mode.

2. Press ① ⑧.

SERVICE FUNCTION
18.LAN

H231S503.BMP

3. Press "OK".

0.LAN SW 1.DU SW
2.LINK 3.LOOP

H231S504.BMP

4. Press ">".

4.LOG DMP 5.PING

H231S512.BMP

5. Press ⑤.

PING START

H231S514.BMP

6. Press ⑤.

If the test is successful, the display shows "RESULT CODE= 0000".

If the test is unsuccessful, the display shows "RESULT CODE= XXXX"

(excluding "0000").

Check the server settings.

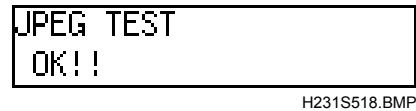
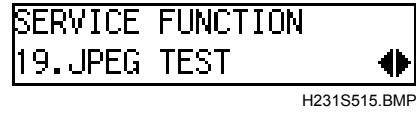
3.1.6 JPEG TEST

This test checks the JPEG unit.

1. Enter the Fax Service Mode.
2. Press **1** **9**.
3. Press "OK".
4. Press **4**.

If the test successful, the display shows "OK!!".
If the test unsuccessful, the display shows "NG!!".

Check the JPEG unit connection or replace it.



3.1.7 IP-FAX IP-G3 SWITCH SETTINGS

1. Enter the Fax Service Mode.

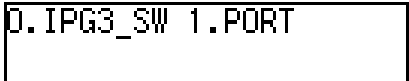
2. Press **2** **0**.



SERVICE FUNCTION
20. IP-FAX

H231S519.BMP

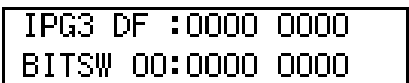
3. Press "OK".



0. IPG3_SW 1. PORT

H231S520.BMP

4. Press **0**.



IPG3 DF : 0000 0000
BITSW 00: 0000 0000

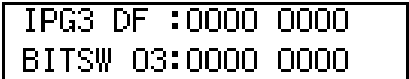
H231S521.BMP

5. Scroll through the bit switches.

Increment bit switch: ">"

Decrement bit switch: "<"

Example: Display bit switch 3: ">" x 3



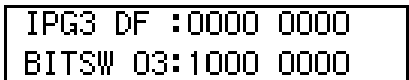
IPG3 DF : 0000 0000
BITSW 03: 0000 0000

H231S522.BMP

6. Adjust the bit switch

Example: To change the value of bit 7, Press

7.



IPG3 DF : 0000 0000
BITSW 03: 1000 0000

H231S523.BMP

7. Either

- Adjust more bit switches - go to step 5
- Finish – Press "OK" then "Cancel".

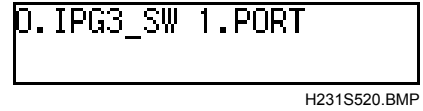
3.1.8 IP-FAX PORT SETTING

1. Enter the Fax Service Mode.

2. Press ② ①.



3. Press "OK".



4. Press ①.



5. Select the port, then change the settings.

It will not normally be necessary to adjust this in the field.



3.2 LAN SWITCHES

<p>⚠ WARNING</p> <p>Do not adjust a LAN switch that is described as "Not used," as this may cause the machine to malfunction or to operate in a manner that is not accepted by local regulations. Such bits are for use only in other areas, such as Japan.</p>

- NOTE:** 1) Default settings for bit switches are not listed in this manual. Refer to the System Parameter List print out.
- 2) The shaded blocks in the tables below indicate new switches (compared with the previous model).

LAN Switch 00 Protocol		
No.	FUNCTION	COMMENTS
0	LAN protocol dump list 0: Disabled 1: Enabled	The LAN commands between the NIC fax and servers or client PCs (POP, SMTP, and AT) are stored in the memory, and they can be printed out using service function 20-4 (LAN - log dump).
1	Not used.	Do not change this setting.
2-3	Select LAN Speed 00: Auto Nego 01: Fixed 10 Mbps (half duplex) 10: Fixed 100 Mbps (half duplex) 11: Not used.	With this switch set to Auto Nego (00), if the machine cannot communicate with a hub that is not 10 MB or 100 MB. If the machine cannot negotiate with the hub, change the setting. Note: "Nego" means "negotiation".
4-7	Not Used.	Do not change these settings.

LAN Switch 01 E-mail Transmission		
No.	FUNCTION	COMMENTS
0	Not used	Do not change this setting.
1	Compression modes for TIFF-F 0: TIFF-F(MH) standard mode 1: T.4-MH mode	RTC is added to the end of the image data when bit 1 is set to "1". A few non-standard models may require this bit to be at 1 for successful communication.
2	Inclusion on the Journal of the number of e-mail addresses in a broadcast 0: Disabled 1: Enabled	This bit is effective only when user parameter switch 06, bit 0 is set to "1".
3	Select "Reply To" Receipt with User Code 0: No reply 1: Reply output	When an e-mail is sent with a user code appended and the user wants to receive a receipt in the form of an error notification with the delivery mail address, set this switch set to 1.
4	Not used.	Do not change this setting.
5-7	Maximum number of broadcast destinations Bit 7 6 5 Setting 0 0 0 No limit 0 0 1 150 0 1 0 100 0 1 1 50 1 0 0 30 1 0 1 10 1 1 0 5 1 1 1 0 (Disabled)	The maximum number of broadcast destinations also depends on the SMTP server.

LAN Switch 02 E-mail Reception		
No.	FUNCTION	COMMENTS
0	Text e-mail header 0: Disabled 1: Printed	The header appears as follows: ***** E-mail INFORMATION ***** From: xxxxx Subject: xxxxxxxxxxxx *****
1	Action when printing a fax image file attached to an error report e-mail 0: Print the first page only 1: Print all pages	Note that the text part of the error report e-mail is always printed out completely, regardless of the setting of this bit.
2-3	Status String to Appear for Return Receipt 00: "Dispatched" 01: "Displayed" 10: Reserved 11: Reserved	When a return receipt is received in Microsoft Outlook 2000, there may be a problem in handling the receipt if it reports an error. In this case, set this switch to 01.
4	Selection of SMTP command for sending confirmation of mail reception 0: "MAIL FROM <>" 1: "MAIL FROM <own mail address>"	Some providers halt mail sending when this SMTP command does not contain the mail address to block SPAM mail. In this case, changing this bit to "1" enables sending confirmation of mail reception.
5-7	Not used	Do not change these settings.

LAN Switch 03 Transfer Request		
No.	FUNCTION	COMMENTS
0	Printout of the message when the machine is acting as a transfer station 0: Disabled 1: Enabled	1: After broadcasting, the machine prints out the file.
1	Transfer result report transmission 0: Always transmitted 1: Only transmitted if an error occurs	1: The machine will only send back a Transfer result report if there were errors during communication.
2	Action taken if there is a syntax error in one or more of the destination addresses 0: Transfers to correct destinations 1: All destinations aborted	1: When a programmed end receiver destination is not a valid e-mail address or otherwise incorrect, the machine does not transfer to any destinations.
3	Polling ID required for transfer 0: Polling ID required 1: Polling ID not required	0: If the polling ID does not match the other terminal's, the machine will not execute the transfer. 1: The machine does not check the polling ID.
4-7	Not used	Do not change these settings.

LAN Switch 04 Autorouting and Forwarding		
No.	FUNCTION	COMMENTS
0-2	Not used	Do not change these settings.
3	Select Subject for Autorouting and Forwarding. 0: Received in the e-mail from the sender 1: Stored in the receiving machine	This determines which RTI/CSI appears in the subject of the received e-mail at the destination PC.
4-7	Not used	Do not change these settings.

LAN Switch 05 PC Utility Software		
No.	FUNCTION	COMMENTS
0	Not used	Do not change this setting.
1	Permission for Quick/Speed/Group dial Overwrite from Web Status Monitor 0: Off (overwrite permission denied) 1: On (overwrite permission granted)	Normally, this switch is set to 0. ➔ 4.7 Web Status Monitor for more detailed.
2-7	Not used.	Do not change these settings.

LAN Switch 06 - Not used (do not change any of these settings)

LAN Switch 07		
No.	FUNCTION	COMMENTS
0-1	Not used	Do not change these settings.
2-3	Transmission attached file resolution Bit 1 0 Setting 0 0 400 x 400, 200 x 400, 200 x 200, 200 x 100 0 1 200 x 200, 200 x 100 1 0 200 x 200 1 1 Not used	If the user selects a higher resolution than enabled with this setting, the machine automatically converts the file to the highest resolution that is currently enabled.
4-6	Not used	Do not change these settings.
7	Select inches/mm Conversion for E-mail 0: Off 1: On	When an e-mail is sent (including the mail server delivery) an image with resolution converted from millimeters to inches can be attached to the e-mail for sending.

LAN Switch 08		
No.	FUNCTION	COMMENTS
0-7	Set Threshold for Amount of Memory Remaining Min.: 00H (0 K) Max.: FFH (510 K)	This switch sets the amount of available memory required in order to receive email. When the amount of available memory falls below the threshold, email cannot be received. The actual threshold value is determined by multiplying the value by 2: Threshold value = Setting x 2 K

LAN Switch 09 - Not used (do not change any of these settings)

LAN Switch 0A		
No.	FUNCTION	COMMENTS
0-3	Select Time Interval for SMTP Server Access for Server TX Min. : 00 (1 s) Max.: 0F (30 s)	This is the minimum interval between transmissions. A longer time interval may be required to broadcast sending to several destinations. The actual access time is determined by multiplying the setting by 2 s: Access interval = Setting x 2 s
4-7	E-mail transmission: Maximum number of sending attempts to the same destination	01 ~ 0F(Hex) times Interval between accessing server attempts while re-sending.

LAN Switch 0B		
No.	FUNCTION	COMMENTS
0	Accept 8-bit Email Text Without Error Report 0: Enabled 1: Disabled	0: Japanese text is 8-bit. If this is received by a non-Japanese system, it will appear as garbage, but no error will be generated. 1: When the machine receives 8-bit text data, it rejects the data and replies with an error e-mail notification.
1	Not used.	Do not change this setting.
2	Handling previously read mail 0: Distinguishes previously read mail. 1: Does not distinguish previously read mail.	This setting determines whether the system recognizes previously read mail when the server is accessed. When set to 0, only previously unread mail messages are received when the server is accessed. When set to 1, all mail, starting with the first, is received.
3	Decoding "Quoted Printable" Email 0: 1-byte codes 1: 2-byte codes	This bit is only effective if the encoding type is Quoted-Printable. When this bit is set to 0, the e-mail is deciphered as one-byte codes (suitable for some European non-ASCII characters). When this bit is set to 1, it is deciphered as Shift-JIS code (for Japanese text). If Japanese text is received with this bit at 0, it will be deciphered as one-byte code and will appear to be a string of non-ASCII European characters.
4	Receiving Mail with an Unsupported Header from the POP/IMAP Server 0: An error notice mail is sent back to the server. 1: Only the mail header is printed (no error).	When the NIC fax receives an unsupported document type, it sends an error notice mail back to the POP/IMAP server. If the mail does not have the correct From address, the server sends an error mail back to the NIC fax again. Then, if the error mail has an unsupported header type, the NIC fax will: 0: Send another error notice mail to the server 1: Print the mail header only
5	Mail Server Closes TCP/IP Connection Immediately After Sending Quit Command 0: Error 1: No error	When this bit is set to 0, if the server forces the TCP/IP connection to close after sending the QUIT command, the machine determines that there is a disconnection error. Set to 1 if error code 10-63 or 10-82 frequently occurs.
6-7	Not used	Do not change these settings.

LAN Switch 0C		
No.	FUNCTION	COMMENTS
0-2	Not used.	Do not change these settings.
3	Determines if an error is reported if the specified Addresses are not acquired from the Scan Router Server. 0: Reports (Error) 1: Does not report (No error)	Set to 1 for a customer who turns off the server frequently or periodically.
4-5	Interval for Checking Addresses in the Scan Router Server Bit 5 4 Setting 0 0 1 min. 0 1 3 min. 1 0 10 min. 1 1 No check	To check whether the user has stored new addresses on the server, the machine should connect periodically to the computer that is running Scan Router and get the newest user addresses. If the user wants to change the connection interval to Scan Router, or if the user does not need to check the addresses, change the setting.
6-7	Not used.	Do not change these settings.

LAN Switch 0D to 0E - Not used (do not change any of these settings)

LAN Switch 0F		
No.	FUNCTION	COMMENTS
0	DELE Command at Socket Timeout 0: Sent 1: Not Sent	<p>Normally, when the POP server sends EOF, the machine sends back DELE to delete the mail from the server. However, a POP server may start sending FF bytes part way through the communication if the mail size is over 1 Gbyte. It will not send EOF, so the machine will not send DELE to the server to delete the mail.</p> <p>To avoid this problem, set this bit to 0. Then when a socket timeout occurs during e-mail reception from the POP server, and if no EOF has been received, the machine sends the DELE command to the POP server in order to delete the e-mail message.</p>
1	Socket Timeout Time 0: 180 s 1: 60 s	This bit determines the socket timeout that is used when Bit 0 is set to 0. If the socket timeout setting at the POP server is less than 180 s, you must set this bit to 1, or it will have no effect because the POP server will disconnect before the machine can send a DELE command.
2	Part Delete Request Field, Send Character String 0: Content-X-CIAJWNETFAX:IGNORE 1: Content-X-ICFAX: Ignore-Message	Change this switch if a customer complains that Viewer download information is printing.
3-7	Not used.	Do not change these settings.

LAN Switch 10		
No.	FUNCTION	COMMENTS
0	IP FAX Selection 0: Off 1: On	Normally, the IP FAX feature is enabled. However, if the customer insists that they are using only the e-mail functions, set this bit to 0 to disable IP FAX.
1	IP FAX Transmit Port 0: TCP 1: UDP	Normally, TCP is selected. However, if the customer requests the use of UDP, set this bit to 1.
2	IP FAX Single Port Transmitting 0: Disable 1: Enable	Normally, these bits are disabled. Set both to 1 (enable) when the customer wants to reduce the number of TCP ports used for transmitting. When both single port and dual port transmitting are switched on, the single port takes priority during mutual IFAX transmitting.
3	IP FAX Dual Port Transmitting 0: Disable 1: Enable	
4	Select Transmitting via the IP FAX Gatekeeper 0: Disable 1: Enable	Normally, this bit is disabled in order to effect direct data sending to another T.38 terminal. However, set to 1 to enable the transmission if the customer's network environment supports gatekeeper transmission.
5	Reverse Order of Sending IP FAX T.30 Signal Bits 0: LSB First 1: MSB First	Change this setting to reverse the order of sending the T.30 signal bits. Set to 1 to have the most significant bit sent first.
6	Select IP FAX Bandwidth Control to Reflect DIS/DCS 0: Off. Does not reflect the MaxBit Rate value (bandwidth control) in DIS/DCS. 1: On. Reflects the MaxBit Rate value in DIS/DCS	Normally, set to 0 (Off). However, if the customer is concerned about managing the bandwidths, set to 1 (On)
7	Processing IP FAX Last Destination Fax Number in the SETUP Signal 0: The fax message is received without comparing the local fax number and the last destination fax number, even if the SETUP signal contains the last destination fax number. 1: Receives the fax message only when the local number matches the last destination in the SETUP signal.	Set this bit to 1 (On) if the customer requests that they want the last destination number in the SETUP signal and their terminal number to match in order to receive incoming faxes.

LAN Switch 11		
No.	FUNCTION	COMMENTS
0-3	Select IP FAX Delay Level Bit 3 2 1 0 Setting 0 0 0 0 Level 0 0 0 0 1 Level 1 0 0 1 0 Level 2 0 0 1 1 Level 3	Raise the level by selecting a higher setting if too many transmission errors are occurring on the network. If TCP/UDP is enabled on the network, raise this setting on the T.30 machine. Increasing the delay time allows the recovery of more lost packets. If only UDP is enabled, increase the number of redundant packets. Level 1~2: 3 Redundant packets Level 3: 4 Redundant packets
4-7	Not used.	Do not change these settings.

LAN Switch 12		
No	FUNCTION	COMMENTS
0	IP FAX Transmission Speed Control 0: Transmit at modem speed 1: No speed control	Set this switch to 1 (On) for customers who want to send faxes at maximum speed to another IP FAX terminal. However, even when the remote fax is a standard T.38 machine, if the transmission is sent faster than the modem speed, the remote fax may not be able to receive the transmission. When LAN switch 10 bit 6 = 1, or when using UDP protocol, modem speed applies even if this bit is 1.
1-3	Not used	Do not change these settings.
4-7	Insert the wait time Bit 7 6 5 4 Setting (ms) 0 0 0 1 100 0 0 1 0 200 k : 1 0 0 0 800 : 1 1 1 1 1500	Some VoIP Gateways require the wait time before each command. In such a case, change these bits for the specific time.

LAN Switch 13 to 1F - Not used (do not change any of these settings)

Service Tables

3.3 DU SWITCHES

DU Switch 00 to 0F - Not used (do not change any of these settings)
--

3.4 NIC FAX RELATED SWITCHES

Communication Switch 12										
No.	FUNCTION									COMMENTS
0-7	Redial Attempt Interval with Memory Sending to Same Destination									This bit switch setting allows you to set the time interval between redialing when using memory to send files to the same destination. If this Bit SW is set to 00H, the setting is the same as 01H (1 min.)
	Range: 01~FFH (1~255 Min.)									
	Units: 1 min.									
	Default: 05H (5 min.)									
	Max.: FFH (255 min.)									
	Min.: 01H (1 min.)									
	Bit	7	6	5	4	3	2	1	0	
		0	0	0	0	0	0	0	1	1 min.
		0	0	0	0	0	1	0	1	5 min.
		1	1	1	1	1	1	1	1	255 min.

Service Tables

Communication Switch 13										
No.	FUNCTION									COMMENTS
0-7	Redial Attempt Interval with Immediate Sending to Same Destination									This bit switch setting allows you to set the time interval between redialing when using immediate sending to the same destination. If this Bit SW is set to 00H, the setting is the same as 01H (1 min.)
	Range: 01~FFH (1~255 Min.)									
	Units: 1 min.									
	Default: 01H (1 min.)									
	Max.: FFH (255 min.)									
	Min.: 01H (1 min.)									
	Bit	7	6	5	4	3	2	1	0	
		0	0	0	0	0	0	0	1	1 min.
		0	0	0	0	0	0	1	1	3 min.
		1	1	1	1	1	1	1	1	255 min.

3.5 IPG3 SWITCHES

⚠ WARNING
Do not adjust an IPG3 switch that is described as "Not used," as this may cause the machine to malfunction or to operate in a manner that is not accepted by local regulations. Such bits are for use only in other areas, such as Japan.

NOTE: Default settings for bit switches are not listed in this manual. Refer to the System Parameter List print out.

IPG3 Switch 00 - Not used (do not change any of these settings)
--

IPG3 Switch 01		
No.	FUNCTION	COMMENTS
0-3	Not used	Do not change these settings.
4	DIS Frame Size 0: Off. Standard frame 1: On. 4 bytes	0: Recommended for receiving the 6-byte frames recommended for ITU-TG3. 1: Only the first 4 bytes in the DIS frame will transmit. Set to 1 if there are communication problems with PC-based faxes, which cannot receive extended DIS frames.
5-7	Not used	Do not change these settings.

IPG3 Switch 02		
No.	FUNCTION	COMMENTS
0	G3 Standard/Non-standard Protocol 0: Standard + non-standard 1: Standard only	This bit switch setting selects the G3 protocol. 0: DIS and NSF used. 1: Disables NSF/NSS signals (these are in non-standard mode communication).
1-4	Not used	Do not change these settings.
5	Use of Modem Rate History When Using Quick/Speed Dialing 0: Disabled 1: Enabled	0: Communications using Quick/Speed dials always start with the highest modem rate. 1: The machine uses the modem rate history for communications with the same machine when determining the most suitable rate for the current communication.
6-7	Not used	Do not change these settings.

IPG3 Switch 03		
No.	FUNCTION	COMMENTS
0	DIS Detection Number (Echo Countermeasure) 0: 1 1: 2	0: The machine hangs up if it receives the same DIS frame twice. 1: Before sending DCS, the machine waits for the second DIS, caused by echo on the line.
1-2	Not used	Do not change these settings.
3	ECM Frame Size 0: 256 bytes 1: 64 bytes	Set this bit to 1 when the other terminal only has a 64 byte frame size. The machine transmits with a frame size of 64 bytes.
4	CTC Transmission Conditions 0: Ricoh mode (PPR x 1) 1: ITU-T mode (PPR x 4)	When using ECM, the machine will choose a slower modem rate after receiving PPR once (Ricoch mode) or four times (ITU-T mode).
5	Modem Rate For Next Page After Receiving a Negative Code (RTN or PIN) 0: No change 1: Fallback	Set this bit switch to 1 to have the machine fall back before sending the next page if it receives a negative code. This setting is ignored for ECM transactions.
6-7	Not used	Do not change these settings.

IPG3 Switch 04		
No.	FUNCTION	COMMENTS
0-3	Training Error Detection Threshold 0: 0 bits 10: 10 bits 15: 15 bits	If the number of error bits in the received TCF is below this threshold, the machine informs the sender that the training was successful. Settings are in the range 00h~0F (00~15)
4-7	Not used	Do not change these settings.

IPG3 Switch 05		
No.	FUNCTION	COMMENTS
0-3	Initial Tx Modem Rate Bit 3 2 1 0 Setting (bps) 0 0 0 1 2.4 k 0 0 1 0 4.8 k 0 0 1 1 7.2 k 0 1 0 0 9.6 k 0 1 0 1 12.0 k 0 1 1 0 14.4 k Other settings - Not used	These bits set the initial starting modem speed for transmission. Use the dedicated transmission parameters if you need to change this for specific receivers.
4-5	Initial Modem Type for 9600/7200 bps Bit 5 Bit 4 Setting 0 0 V.29 0 1 V.17 1 0 Not used 1 1 Not used	These bits set the initial modem type for 9600 bps and 7200 bps, if the initial modem speed is set at these speeds. 00: V29 → V27 01: V17 → V29 → V27 For example, if 01 is set (V17) if the remote fax is not V17, then V29 is specified. Further, if V29 is lost, then V27 is select.
6-7	Not used	Do not change these settings.

IPG3 Switch 06		
No.	FUNCTION	COMMENTS
0-3	Initial RX modem rate Bit 3 2 1 0 Setting (bps) 0 0 0 1 2.4 k 0 0 1 0 4.8 k 0 0 1 1 7.2 k 0 1 0 0 9.6 k 0 1 0 1 12.0k 0 1 1 0 14.4k Other settings - Not used	The settings of these bits inform the transmitting terminal of the available modem rate for the receiving machine. Use a lower setting if high speeds during reception pose problems due to line errors, etc.
4-7	Modem types available for reception Bit 7 6 5 4 Setting 0 0 0 1 V.27ter 0 0 1 0 V.27ter, V.29 0 0 1 1 V.27ter, V.29, V.33 0 1 0 0 V.27ter, V.29, V.33, V17 Other settings - Not used	These bit settings inform the transmitting terminal of the available modem type for the receiving machine. V.33 is an exclusive Ricoh mode (NSF).

IPG3 Switch 07 to 0A - Not used (do not change any of these settings)
--

IPG3 Switch 0B (Europe only)		
No.	FUNCTION	COMMENTS
0*	Protocol requirements: Europe 0: Disabled 1: Enabled	Program these bit switches manually to match local requirements.
1*	Protocol requirements: Spain 0: Disabled 1: Enabled	
2*	Protocol requirements: Germany 0: Disabled 1: Enabled	
3*	Protocol requirements: France 0: Disabled 1: Enabled	
4*	PTT requirements: Germany 0: Disabled 1: Enabled	
5-7*	Not used	Do not change these settings.

IPG3 Switch 0C to 0F - Not used (do not change any of these settings)

3.6 FIRMWARE UPDATE PROCEDURE

This procedure is for upgrading the firmware for NICF and JPEG unit.

CAUTION

1. Make sure to turn the power off before inserting the IC card.
2. If the optional 40MB memory card is installed, make sure to re-install it before turning the power on.

3.6.1 START ADDRESS

If copying the firmware onto an IC card beforehand with MCE (Memory Card Explorer), please confirm that the start address and firmware files are as follows:

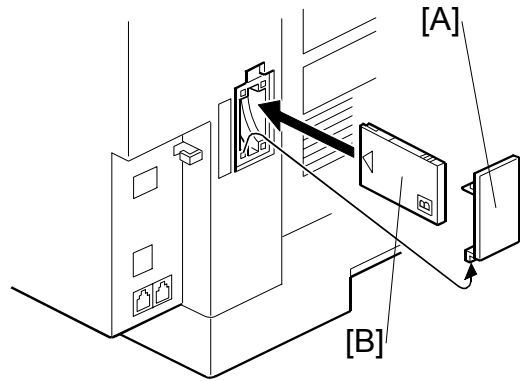


Firmware	Start address	Firmware file type
NICF	200000H	*. rdt / *. mdt
JPEG		

3.6.2 NICF/JPEG FIRMWARE UPDATE

1. Prepare an IC card that contains the required firmware.
2. Turn off the machine and remove the cover [A] and 40MB memory (if installed).
3. Insert the IC card [B] into the IC card slot.

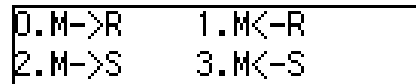
NOTE: The “B” side of the card must face towards the rear of the machine.



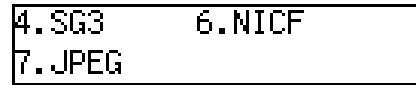
H231S901.WMF



4. Turn on the machine.
If the menu does not appear, enter the Fax service mode and use service function 12.
5. Press “>” key, then select either:

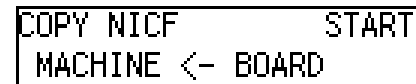


H231S525.BMP



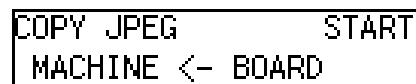
H231S526.BMP

NICF: press ⑥.



H231S527.BMP

JPEG: press ⑦.



H231S529.BMP

6. Press ④.
7. If “OK” is displayed, exit the function and turn off the machine.
If “NG!!” is displayed, repeat from step 1.
8. Remove the IC card, re-install the 40MB memory (if present) and reattach the cover.
9. After uploading firmware, turn the main power back ON and check the ROM version in Fax service mode (Function 21).

3.7 SERVICE RAM ADDRESSES

CAUTION

Do not change settings which are marked as “Not used” or “Read only.”

4000A0 to 4000BF (H) - LAN Switches

4002EE to 4002F1 (H) - E-mail Tx counter

Address	High	Low
4002EE	Tens digit	Unit digit
4002EF	Thousands digit	Hundreds digit
4002F0	Hundred thousands digit	Ten thousands digit

NOTE: The following counters have the same data format as above.

4002F2 to 4002F5 (H) - E-mail Rx counter

4002F6 to 4002F9 (H) - LAN fax counter

40062A to 400649 (H) - Password for administrator mode (max. 32 characters - ASCII)

NOTE: If the number of characters is less than the maximum, add a stop code (00 (H)) after the last character.

4006AE to 4006B1 (H) - IP address

e.g. 133.139.24.3

4006AE (H)	1st address: 133	85 (H)
4006AF (H)	2nd address: 139	8B (H)
4006B0 (H)	3rd address: 24	18 (H)
4006B1 (H)	4th address: 3	03 (H)

NOTE: The following IP addresses have the same data format as above.

4006B2 to 4006B5 (H) - Subnet mask information

4006BA to 4006BD (H) - Default gateway address

4006BE to 4006C1 (H) - Restriction on LAN fax communication (Access control)

4006C2 to 4006C5 (H) - Restriction on LAN fax communication (Access mask)

4006C6 to 4006C9 (H) - DNS 1 server address

4006CA to 4006CD (H) - DNS 2 server address

4006CE to 4006D1 (H) - WINS server address

4006D2 to 400751 (H) - SMTP server IP address (max. 128 characters – ASCII)

400752 to 4007D1 (H) - POP server IP address (max. 128 characters – ASCII)

4007D2 to 400811 (H) - Host name (max. 64 characters - ASCII)

- 400812 to 400851 (H)** - Own domain name (max. 64 characters - ASCII)
400852 to 400871 (H) - POP server login name (max. 32 characters - ASCII)
400872 to 400891 (H) - POP server password (max. 32 characters - ASCII)
400892 to 400911 (H) - Own e-mail address (max. 128 characters - ASCII)
400912 to 400991 (H) - Administrator's e-mail address
(max. 128 characters - ASCII)
400992 to 400A11 (H) - Back up e-mail address (max. 128 characters - ASCII)
400A12 to 400A15 (H) - Interval between automatic login to the POP/IMAP server
to receive incoming mail (min. 0A [H] = 10 s)

e.g. 60 min. = 3,600 sec. = 0E10 (H) seconds

400A12 (H)	00 (H)
400A13 (H)	00 (H)
400A14 (H)	0E (H)
400A15 (H)	10 (H)

400A1E to 400A21 (H) – Retry interval between login to the POP/IMAP server
when an error occurs (min. 0A [H] = 10 s)

400A26 to 400AA5 (H) – Auth. E-mail Rx address

400B56 to 400BD5 (H) – Scan Router server address

40121A to 40121B (H) - Difference from Greenwich Mean Time
40121A: Low - Hex
40121B: High - Hex

Examples

USA: -5 hours = -300 min. x -1 = 300 = 012C (H)

40121A: 2C

40121B: 01

Japan: +9 hours = 540 min. x -1 = -540 = FDE4 (H)

40121A: E4

40121B: FD

400E2E to 400E2F (H) – Calling signal port number

400E30 to 400E31 (H) – T.38 data port number

400E32 to 400EB1 (H) – Alias (max. 128 characters - ASCII)

400EB2 to 400EB5 (H) – Max Bitrate

400EB6 to 400EB7(H) – RAS port number

400EB8 to 400EB9 (H) – Port number of Gate Keeper

400EBA to 400F39 (H) – Host name of Gate Keeper (max. 128 characters - ASCII)

400F3A to 400F3B (H) – T.38 version

7A0000 to 7A5FFF (H) – Buffer in RAM for service mode log dump

4. DETAILED SECTION DESCRIPTIONS

4.1 INTERNET FAX

4.1.1 INTERNET FAX FEATURES

An Internet fax converts fax hard copy document data to e-mail format and transmits the data over the Internet. Another NIC fax or a PC can receive the e-mail sent by a NIC fax. Rather than inputting the telephone number of the destination, the user inputs the applicable e-mail address.

Documents are sent as e-mail messages with an attached TIFF-F image (the scanned original), so a MIME-compatible e-mail reader is required in order to view documents received on a PC. To view an attached image, software capable of displaying TIFF-F formatted images is required.

NOTE: The NIC fax must be connected to a LAN and set up correctly in order to use its Internet fax functions.

4.1.2 NIC FAX FEATURES

The Internet fax produced by Ricoh is known as NIC fax. Its main features are:

- TCP/IP communication protocols that support connection to a LAN with e-mail.
- Easy-to-master operations that are identical to those of a standard fax machine.
- Fax transmission and reception over a telephone line.
- Using Web Status Monitor to check the settings and status of a NIC fax from a PC.
- Transferring or mailing received faxes directly to a PC.
- Using the Internet to reduce communication costs.
- Reducing paper expenses by eliminating the use of paper for fax transmission and reception.
- The NIC fax communicates with a server over a LAN (it does not communicate directly with another party).
- If an error occurs, a mail error report is sent back to the sender.

Some minor restrictions of NIC fax are:

- If an Internet related error occurs, the sender might not receive an error report.
- The level of security for Internet communications is low. The use of standard subscriber lines is recommended for confidential communication.
- Voice communications are not supported over a LAN.
- Internet fax delivery might be delayed due to network congestion. Use standard fax communication whenever time is a crucial factor.

The following functions are supported with standard fax transmission, but not with Internet faxing.

These functions are not supported by e-mail transmission:

- Immediate Transmission
- Confidential Transmission
- SUB Code Transmission with Mode Key
- ID Transmission
- Polling Transmission
- Chain Dial
- Dialing with Dial Option Key
- On Hook Dial
- Manual Dial
- JBIG Transmission
- Batch Transmission
- ECM (Error Correction Mode)
- Forwarding Substitute Reception or Confidential Reception messages (forwarding to an e-mail address not supported).

These functions are not supported by e-mail reception:

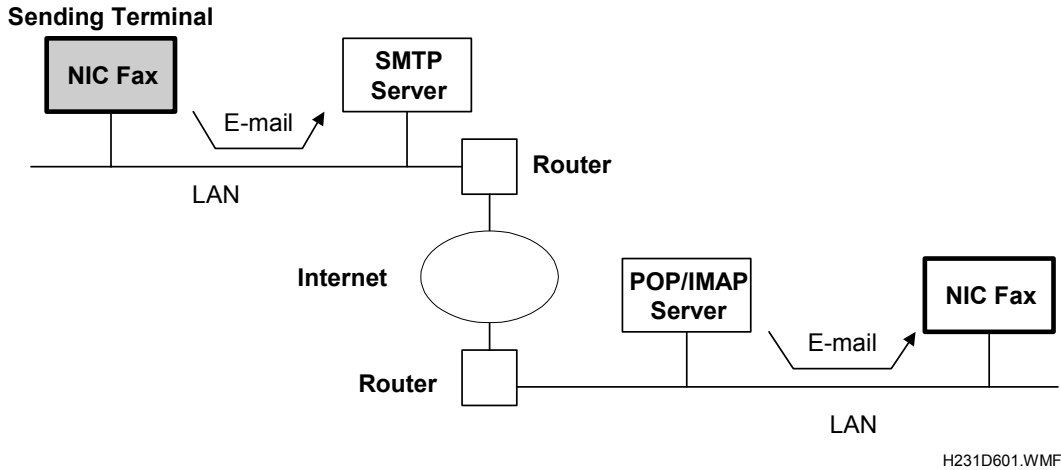
- ID Reception
- Confidential Reception
- Memory Lock Reception
- Polling Reception
- SEP Code Polling Reception
- Authorized Reception
- Multi-Copy Reception
- Specified Tray (optional paper tray required)

4.1.3 DNS SERVICE

The NIC Fax Unit Type 410 supports the DNS (Domain Name System). See Appendix B for more details. The NIC Fax can use the Domain Names for the SMTP and POP3/IMAP4 server instead of the actual IP addresses, provided that there is a DNS server on the same LAN as the SMTP server, POP3/IMAP4 server, and the NIC Fax. With models that do not support DNS, the user has to input the actual IP addresses of the SMTP server and the POP3/IMAP4 server.

4.2 INTERNET MAIL COMMUNICATION

4.2.1 MAIL TRANSMISSION



Procedure

Scanned documents are sent as electronic mail (e-mail).

All messages are sent using memory transmission. When blind carbon copy mail addresses (Bcc address) have been stored with the NIC Fax user settings, the machine also sends all messages to the Bcc address.

All e-mail transmissions are controlled using Simple Mail Transfer Protocol (SMTP) procedures. There must be an SMTP server on the same LAN as the sending machine, or the machine will not be able to send e-mail (it is not necessary to set up an SMTP account).

Data Formats

The scanned data is converted into a TIFF-F formatted file (only MH compression can be used).

The fields of the e-mail and their contents are as follows:

Field	Content
From	Mail address of the sender
Reply To	Destination requested for reply
To	Mail address of the destination
Bcc	Backup mail address
X-Mailer	ICFAX Version 1.0, a Ricoh mail utility. (IC means "Image Communication")
Subject	Fax message no. xxxx (file number) from the TSI (See notes below this table)
Content Type	Multipart/mixed Attached files: image/tiff, application/octet-stream
Content Transfer Encoding	Base 64, 7-bit, 8-bit, Quoted Printable
Message Body	MIME-converted TIFF-F (MIME standards specify how files are attached to e-mail messages)

Detailed Description

- NOTE:** 1) The message number will be in the subject field if no TSI or RTI is registered.
- 2) The label of the personal code and RTI will appear at the end of the subject field, if a personal code is entered.
- 3) The file number can be checked on the Journal.
- 4) The operator can enter the subject line.

Errors

An error report is generated if an error occurs during communication between the machine and the SMTP server. However, it is possible that the sender will not receive reports of errors that occurred between the SMTP server and the receiving terminal.

The interval between attempts to resend mail to the same destination when an SMTP error occurs is the same as for G3 fax transmission.

NOTE: The interval programmed with LAN switch 0A determines the minimum required interval between mail transmissions when there are no errors.

To view what happens when an error occurs when the machine is receiving, refer to the Mail Reception section.

Results

The transmission result is listed in the Journal. The file list for e-mail transmissions are created in the same way as for G3 memory transmissions. The TTI for the mail message includes the word "Mail" at the head of the information in the TTI column.

Selectable Options

These options are available for selection:

- With the default settings, the scan resolution can be either standard or detail. Inch-mm conversion before tx depends on the machine setting. Detail resolution will be used if Super Fine or Extra Super Fine resolution is selected, unless Fine resolution is enabled with LAN bit switch 07.
- The requirements for originals (document size, scan width, and memory capacity) are the same as for G3 fax memory tx.
- The default compression is TIFF-F format.
- The following options are available when sending a fax by e-mail: Send later, TTI, Economy transmission, Store double sided.

When optional features that are not available for e-mailing are selected, the machine will work as follows.

Using personal code with confidential ID in a broadcasting operation

If the personal code is selected first, e-mail addresses cannot be input, as the e-mail key is disabled.

If the e-mail addresses are input first, followed by the personal code, and the G3 addresses, the mail will be sent to all addresses. However, personal code with confidential ID will only be used for the G3 transmissions in the broadcast.

Cross reference:

LAN Bit Switch 01	Various e-mail transmission settings
LAN Bit Switch 07	Acceptable paper widths for sending
LAN Bit Switch 0A	Minimum interval between e-mail transmissions, maximum number of attempts to the same destination

User Parameter Switch 32 (20[H]) Bit 1, E-mail Fax Transmission Auto Detection:
0: Disabled 1: Enabled

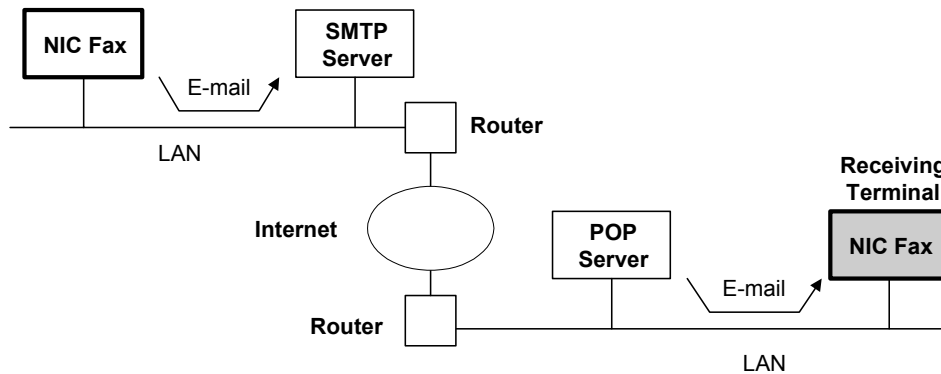
When enabled, the machine automatically detects whether the destination entered is an e-mail address. When disabled, the machine will first ask whether the destination is an e-mail or IP address, then prompt the user to input the address.

Secure Internet Transmission

To transmit e-mail via the Internet more securely, use SMTP authentication, and POP before SMTP for NIC FAX.

- **SMTP Authentication.** SMTP-AUTH requires user authentication before they can access the server. This prevents unauthorized access to the server. To use SMTP authentication, your server must support CRAM-MD5, PLAIN, or LOGIN. The account name and password specified in the "Mail Server" settings are used for SMTP authentication. Other account names and passwords cannot be specified. For User Parameter Switch 18 (12[H]) Bit 2, select "Yes" for "Execute SMTP Authentication".
- **POP Before SMTP.** Prevents unauthorized access to the SMTP server and requires users to access and log onto the POP3 server before sending e-mail. For User Parameter Switch 18 (12[H]) Bit 6 select "Yes" for "Access the POP3 server before accessing the SMTP server at the time of e-mail transmission".

4.2.2 MAIL RECEPTION



H231D912.WMF

This machine supports three types of e-mail reception:

- POP3 (Post Office Protocol Ver. 3.)
- IMAP4 (Internet Messaging Access Protocol)
- SMTP (Simple Mail Transfer Protocol)

POP3/IMAP4 Mail Reception Procedure

In order for the fax machine to receive e-mail, 1) there must be a POP3/IMAP4 server on the same LAN as the NIC fax, and 2) an account must be set up for the fax machine.

NOTE: Automatic mail reception can be enabled with either a user function key, or the Auto Mail RX feature setting (User Tools> Fax Features> Key Op. Tools> Network> Auto Mail RX).

When automatic mail reception is enabled with a user function key, the machine calls the POP3/IMAP4 server at regular intervals to check if any e-mail has arrived. The interval default is 3 minutes, adjustable in the range 1 to 60 min. in 1-minute steps. (User Tools> Fax Features> Key Op. Tools> Network> Mail Server> Mail Rx Interval). When the arrival of new e-mail is detected, the server receives the mail.

If the POP3/IMAP4 server is holding several e-mails for the NIC fax, the machine picks up the e-mails one at a time, in the order of arrival at the server.

POP3/IMAP4

Once POP3 has picked up the mail from a POP3 server, it deletes it from the server. IMAP4 also picks up the mail from a server, however, it does not delete the mail from the server.

When using POP3, User Parameter Switch 16 [10H] bits 0 and 1 can be set up so that the mail can be kept on the server. (This makes POP3 about the same as IMAP4.)

E-mail reception conforms to POP3 (Post Office Protocol version 3.0) procedures or IMAP4 (Internet Message Access Protocol).

Regardless of whether the automatic mail receive feature is enabled or disabled, the server can always be accessed to receive mail manually.

If an error occurs during mail reception, the reception is cancelled and the mail is deleted from the server.

Characteristics of POP3/IMAP4 Receiving

Here are some general characteristics of POP3/IMAP4 receiving:

- **No MX record registration.** There is no need to register the machine in the MX record of the DNS server.
- **Power can be switched off.** As long as the machine is not receiving mail, mail stored in the mail server is not lost when the power is switched off. With SMTP reception, if the machine is switched off, the SMTP server sends an error report back to the sender, and the machine will not receive the mail unless the sender sends it again when the machine is switched on.
- **Dial-up compliance.** POP3/IMAP4 can be accessed spontaneously, making it ideal for dial-up operation.

SMTP Reception

SMTP Mail Reception Procedure

By registering the NIC fax as an SMTP server in the MX record of the DNS server, you can enable direct receiving of mail from the SMTP server. When mail is sent to the mail address specified for the NIC Fax, it is received immediately without checking the server for the arrival of new mail (as is done in the POP/IMAP protocol) and the received mail can be routed to another fax for delivery.

Setting Method

The following settings are required for SMTP receiving:

- The NIC fax must be registered as an SMTP server in the MX record of the DNS server, and the address of the received mail must specify the NIC Fax.
- User Parameter Switch SW17 (11[H]) Bit 0 must be set to 1 to enable receiving mail with SMTP. Pressing the Stop button will not interrupt mail reception with SMTP.

Even if the MX record on the DNS server includes the NIC Fax, mail cannot be received with SMTP with User Parameter Switch SW17 Bit 0 set to 0. This switch must be set to 1. However, if SMTP reception is selected and the machine is not registered in the MX record of the DNS server, then either IMAP4 or POP3 is used, depending on the setting of User Parameter Switch 17 (11[H]),

SMTP Reception Characteristics

- **Expanded RX mail delivery.** The Off Ramp Gateway feature allows expansion for RX mail delivery to a G3 fax. The machine transfers incoming mail is sent to the G3 fax specified by the local part. For example, in a destination address specified as:

`fax=0454778907@c101.dom1.ricoh.co.jp`

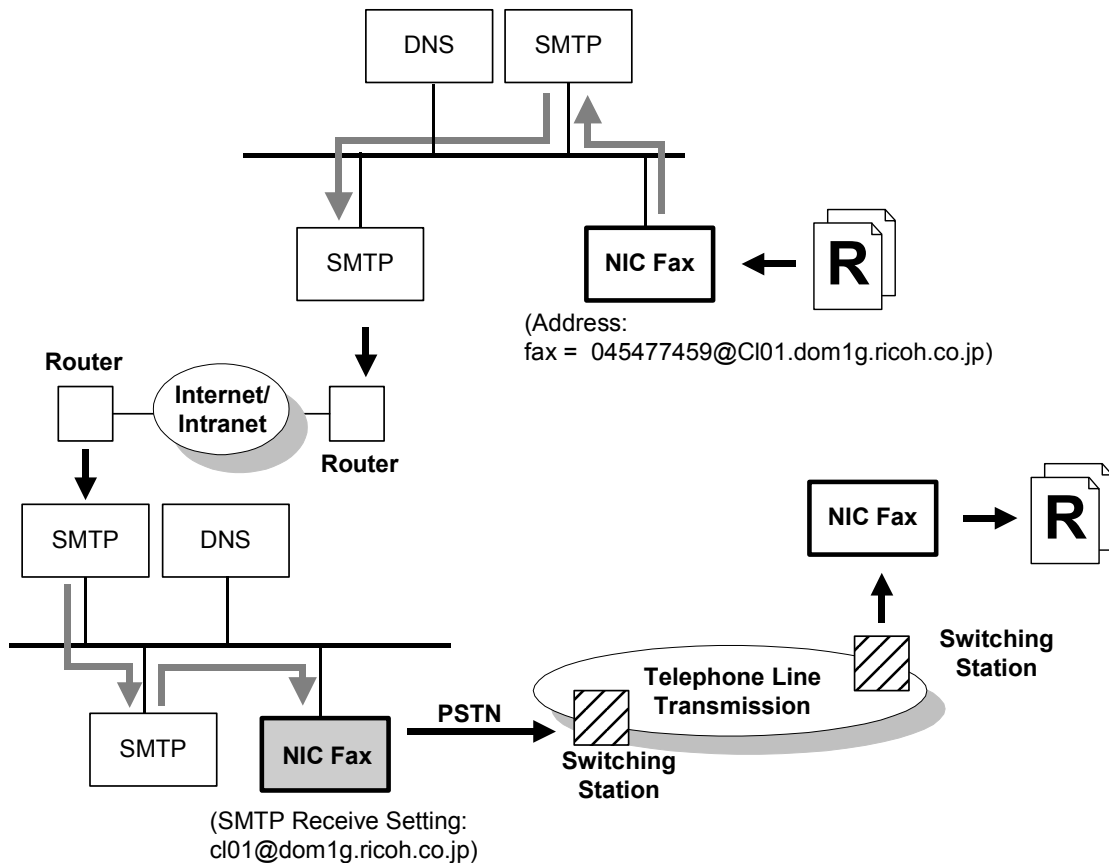
the 'local part' is **0454778907**.

- **A POP3/IMAP4 server is not required.** For example, in an environment where there is only a UNIX server and a POP3/IMAP4 server is not required or in an intranet environment where Notes is used for mail, mail received from outside is handled via the SMTP gateway.
- **Immediacy of response is slightly better.** There is no interval in the acquisition of mail as with POP3/IMAP4, thus slightly improving the response time.
- **Easier error handling.** When an error occurs with POP3/IMAP4, the receiving terminal sends an error mail back to the sender in order to inform them that an error has occurred. With SMTP mail reception, however, in almost all cases the SMTP server sends the error mail to the sender.

Delivering Mail Received With SMTP (Off Ramp Gateway)

If the address of the mail received with SMTP contains the following information, it can be delivered to another G3 fax:

Fax = " Delivery Number"@ "NIC FAX Host Name.Domain"



Detailed Description

H231D901.WMF

How to Set Up Mail Delivery

The sender must set the mail address in the following format in order to have NIC Fax deliver the mail sent to the server.

1) When dialing using a fax number

fax=<Delivery Destination Fax Number>@<NIC FAX Host Name>.<Domain Name>

Example:

fax=0454771459@cl01.dom1g.rioh.co.jp → Delivers to fax number 0454771459

2) When dialing using a Quick dial destination

fax=<# Quick Dial Number>@<NIC FAX Host Name>.<Domain Name>

Example:

fax=#01@cl01.dom1g.rioh.co.jp → Delivers to the number registered for Quick Dial key 01.

3) When dialing using a Speed dial destination

fax=<#*Speed Dial Number>@<NIC FAX Host Name>.<Domain Name>

Example:

fax=#*10@cl01.dom1g.rioh.co.jp → Delivers to the number registered for Speed Dial key 10.

4) When dialing using a Group destination

fax=<#Group Dial Number>@<NIC FAX Host Name>.<Domain Name>**

Example:

fax=#**05@cl01.dom1g.rioh.co.jp → Delivers to numbers registered for Group dial key 05.

Mail Delivery Conditions

The following conditions must be met for mail delivery by SMTP.

- 1) The machine must be set for SMTP mail delivery with User Parameter Setting SW17 (11[H]) Bit 1 set to 1.
- 2) If the user wishes to limit this feature so that the machine will only deliver mail from certain designated senders, the machine's "Auth. E-mail RX" feature must be selected (User Tools> Fax Features> Key Op. Tools> Network> Mail Server> Authorized E-mail Rx.). Only one address can be specified (see the next page).
- 3) If User Parameter SW17 (11[H]) Bit 1 is set to 0 to prohibit SMTP receiving, and if there is mail designated for delivery, then the machine responds with an error.
- 4) The number of transmissions of received mail is limited to 30 addresses. A Group counts as 1 destination.
- 5) The "fax=" setting does not distinguish between upper and lower case letters.
- 6) More than one destination cannot be specified in the mail address.
- 7) If the quick dial, speed dial, or group dial entry is incorrect, the mail transmission is lost, and the NIC fax issues an error to the SMTP server and outputs an error report.

Auth. E-mail RX

In order to limit access the mail delivery with NIC FAX, the addresses of senders must be registered. Only one entry can be registered.

1) Access Limit Entry

For example, to limit access to @NIC Fax.ricoh.co.jp:

gts@NIC FAX.ricoh.co.jp	Matches and is delivered.
gts@NIC FAX.abcde.co.jp	Does not match and is not delivered.
NIC FAX@ricoh.co.jp	Does not match and is not delivered.

2) Conditions

- The length of the mail address for registration is limited to 127 characters.
- If the registered address of the sender and the mail address of the incoming mail are compared and do not match, the incoming mail is discarded and not delivered, and the SMTP server responds with an error. However, in this case an error report is not output.
- If an address is not registered for the sender of the incoming mail as an authorized e-mail RX, and if the delivery destination receiving the mail is specified, then the mail is delivered unconditionally.

Handling Mail Reception Errors

Errors during POP3/IMAP4 procedures

When an error of this type occurs, the machine stops receiving and the message stays in the server. An error report is output. After a prescribed interval, the machine calls the server and starts to receive, starting with the interrupted message. If there is an incomplete received message in memory, it will be erased.

Abnormal files

When an error of this type occurs, the machine stops receiving and commands the server to erase the message. Then the machine prints an error report and sends information about the error by e-mail to the sender address (specified in the "From" or "Reply-to" field of the message). If there is an incomplete received message in the machine memory, it will be erased.

User Parameter SW16 (10[H]) Bit 3 can be used to disable the error notification feature.

The machine prints an error message when it fails to send the receive error notification after a certain number of attempts.

The following types of files are judged abnormal if one or more of the following are detected:

1. Unsupported MIME headers.

Supported types of MIME header

Header	Supported Types
Content-Type	Multipart/mixed, text/plain, message/rfc822 Image/tiff, application/octet-stream
Charset	US-ASCII, ISO-2022-JP, ISO 8859 X. Others are handled as US-ASCII.
Content-Transfer-Encoding	Base 64, 7-bit, 8-bit, Quoted Printable

8-bit: Depends on LAN switch 0B bit 0

Quoted printable: handling method depends on LAN switch 0B bit 3

2. MIME decoding errors
3. File format not recognized as either DCX or TIFF-F format
4. Resolution, document size, or compression type cannot be accepted

Remaining SAF capacity error

The machine calls the server but does not receive e-mail if the remaining SAF capacity is less than a certain value (the value depends on LAN Switch 08). The e-mail will be received when the SAF capacity increases (for example, after substitute reception files have been printed). The error handling method for this type error is the same as that for 'Abnormal files'.

If the capacity of the SAF memory drops to zero during reception, the machine operates in the same way as when receiving an abnormal file (refer to 'Abnormal files' above).

Printing Received Mail

To print received e-mail:

- The machine detects whether it has received a DCX or a TIFF-F format image, then prints it.
- Text in US ASCII, ISO 2022, or ISO 8859 X format can also be printed. When a line of text is longer than the paper width, the excess data will be truncated and lost.

Multi-part Messages

When a multi-part e-mail message contains several text parts and binary files, the message will be divided by boundaries, and each portion will be printed separately. If the machine cannot determine where the boundary is, it will print an error report, and then send error information e-mail back to the sender.

Cross reference:

LAN bit switch 02, 08, 0B

Various e-mail reception settings

User Parameter Switch 10 (0A[H])

Manual e-mail reception

The manual e-mail reception function can be stored in a User Function Key. When the key is pressed, the machine calls the POP3/IMAP4 server immediately. The timer for automatic POP3/IMAP4 server calling is reset every time the machine calls the POP3/IMAP4 server manually.

Here is an example of the sequence

- Automatic POP3/IMAP4 server call interval: 30 min.
- Machine called the POP3/IMAP4 server 15 min. ago.
- Machine calls the POP3/IMAP4 server manually.
- Machine re-sets POP3/IMAP4 server to call again automatically after 30 min.

User Function Keys

Both Automatic E-mail Reception and Manual E-mail Reception can be stored in User Function Keys.

- **Automatic E-mail Reception:** If the LED is lit, e-mail will be received from the server automatically (every 3 minutes). See below concerning the night timer.
- **Manual E-mail Reception:** The machine only receives e-mail when the user function key is pressed. The LED has no function.

Used with the Night Timer function

If the night timer feature is switched on, the machine may not be able to use automatic mail reception to pick up mail from the POP3/IMAP4 server, depending on the setting of the following user parameter switch. Manual e-mail reception can be used at any time regardless of this switch setting.

User Switch 16 (10H) Bit 4 determines whether to receive e-mail automatically when Night Timer is enabled:

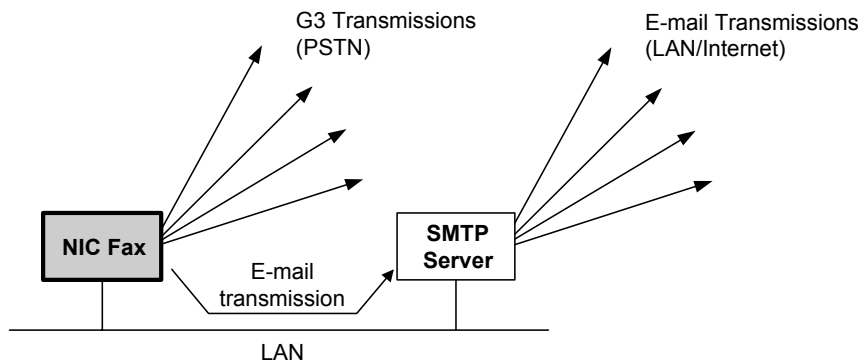
- 0: Yes. But receive only during the 'on' period for the fusing lamp. Overnight when the fusing lamp is off, automatic mail reception is disabled
- 1: No. Automatic mail reception cannot be used at any time, even during the day when the fusing lamp is on

Secure Internet Reception

APOP. Passwords are encrypted when e-mail is received, making it safer than POP3 authentication (clear text), which is not encrypted. APOP requires a POP server that supports APOP. To enable APOP, set User Parameter Switch 18 bit 1 (12[H]).

IMAP-AUTH (Mail Reception). If the IMAP Server supports the AUTHENTICATE command (CRAM-MD5, PLAIN, or LOGIN confirmation), then higher-level security confirmation can be implemented for users logging in.

4.2.3 MAIL BROADCASTING (E-MAIL AND G3 FAX ARE COMBINED)



H231D913.WMF

The machine can send the same message to several destinations in one operation. Some destinations can be G3 faxes and others can be e-mail. For the G3 fax transmissions, each address has to be dialed separately. However, all e-mail addresses can be sent with the message to the SMTP server in one transmission. The SMTP server then sends the message to each destination.

The following example for broadcasting to three e-mail destinations and two G3 fax destinations shows how G3 fax messages are each sent individually. However, the e-mail destinations are all sent to the server at the same time.

- Order of inputting the addresses at the operation panel
G3 fax (1) - mail (1) - G3 fax (2) - mail (2) - mail (3)
- Order of transmission
G3 fax (1) - mail (1), (2), (3) - G3 fax (2)

The SMTP server cannot broadcast the message if the message contents included individual information for each terminal in the transmitted data (such as a label insertion). If this type of feature is used, the machine sends the e-mails to the server one by one.

With the default settings, up to 250 destinations (including both e-mail and G3 fax) can be dialed for one broadcast. The maximum number of e-mail destinations in a broadcast depends on the limitations of the mail server.

Cross Reference:

LAN Bit SW 01, Bits 2, 5,6,7

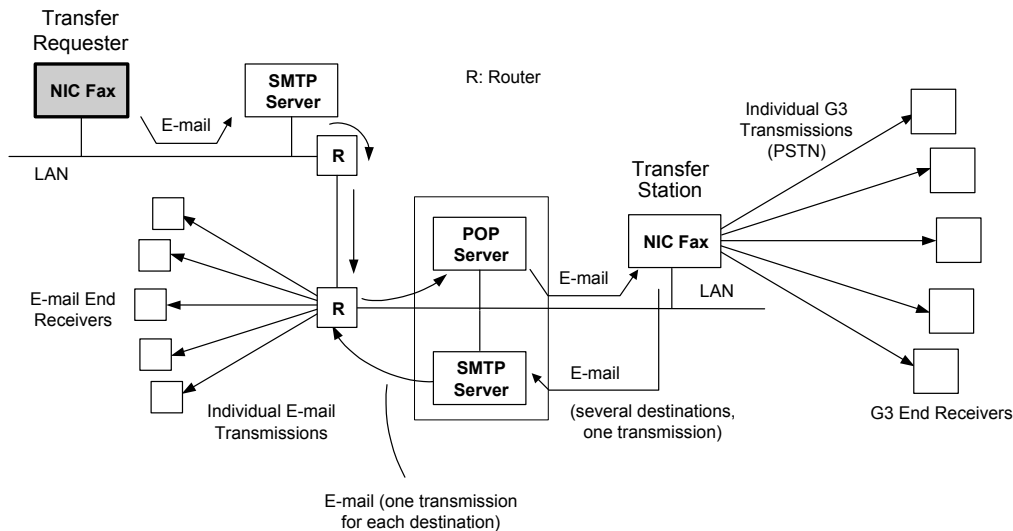
Various e-mail transmission settings

NOTE: Broadcasting will not work if batch transmission is disabled with User Parameter Switch 06 Bit 04.

4.2.4 TRANSFER REQUEST

Operation at the Transfer Requester

Request by Mail



H231D914.WMF

The requesting terminal dials the Transfer Station, and requests it to transfer the message to end receivers stored as quick dials, speed dials, and group dials in the Transfer Station.

- A quick dial number is indicated by a “#” and two or three digits.
- A speed dial is indicated by “#*”, and two or three digits.
- A group dial is indicated by “#**” and two digits.

The machine can request transfer to a maximum of 30 end receivers for each Transfer Station. The end receivers can be a mixture of e-mail and G3 fax addresses.

The transfer request goes to the SMTP server as an e-mail message. The dialing codes (Quick, Speed, Group) and the ID code are included in the mail body field of the e-mail as text. The message arrives at the POP3/IMAP4 server of the Transfer Station.

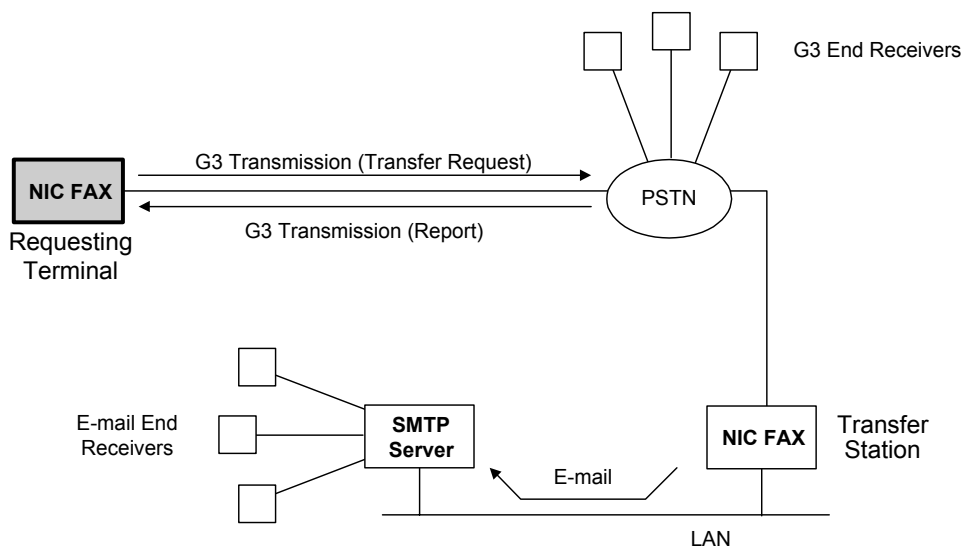
The Transfer Station sends the message to the end receivers (see “Operation at the Transfer Station”, pg. 4-18).

The Transfer Station sends back a transfer result report. The original may be attached to the transfer result report, depending on the G3 settings of the fax machine. For transmissions to e-mail end receivers, the transfer result report only indicates whether the message was successfully transmitted from the Transfer Station to its SMTP server.

The fields of the e-mail and their contents are as follows:

Field	Content
From	E-mail address of the requesting terminal
To	Destination address (Transfer Station address)
Bcc	Backup mail address
X-Mailer	ICFAX version 1.0
Subject	Fax Message No. xxxx (file number) from the TSI
Content-Type	Multipart/mixed Text/Plain (for a text part), image/tiff or application/octet-stream (for attached files)
Content-Transfer-Encoding	Base 64, 7-Bit, 8-bit, Quoted Printable
Mail body (text part)	RELAY-ID-: xxxx (xxxx: 4 digits for an ID code) RELAY: #01#*01#**01....
Message body	MIME-converted TIFF-F or DCX

Request by G3 Fax



H231D915.WMF

Detailed Description

The procedures are the same as for a normal G3 fax machine.

The requesting terminal dials the Transfer Station, and requests it to transfer the message to end receivers stored as quick dials, speed dials, and group dials in the Transfer Station.

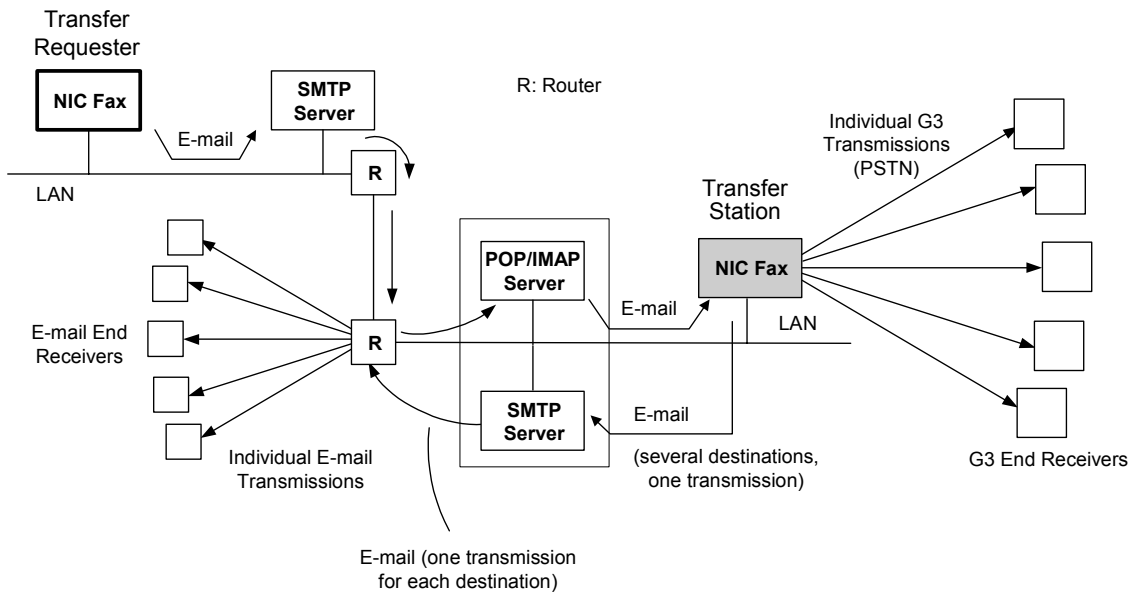
The machine uses NSF to send an ID code and the machine telephone number. Up to 30 end receivers can be requested.

End receiver destinations can also be selected using tone signals, in the same way as for other recent fax models. An e-mail address can also be selected in this way, as end receivers and as the destinations for receiving the transfer result report.

The receiving NIC fax machine receives the transfer request on the PSTN connection. It then handles the transfer request in the same way as explained in "Request by Mail". (pg.4-16)

Operation at the Transfer Station

Request by Mail



H231D605.WMF

The NIC fax polls the POP3/IMAP4 server at regular intervals. If a transfer request has come in, it receives the e-mail from the server, then sends the message to the end receivers by G3 fax or e-mail, depending on the type of end receiver address.

The NIC fax sends each G3 fax as an individual transmission. However, for the e-mail, the NIC fax sends the message to the SMTP server once, and the server broadcasts the message to the e-mail end receivers one at a time.

The Transfer Station sends back a transfer result report to the address in the "From" field of the received e-mail. If an administrator address is registered, the result report is also sent to that address. The original may also be attached to the transfer result report, depending on the G3 settings of the fax machine.

For transmission to e-mail end receivers, the transfer result report only indicates whether the message was successfully transmitted from the Transfer Station to its SMTP server. The Transfer Station does not know what happens to the messages on the way to the end receivers.

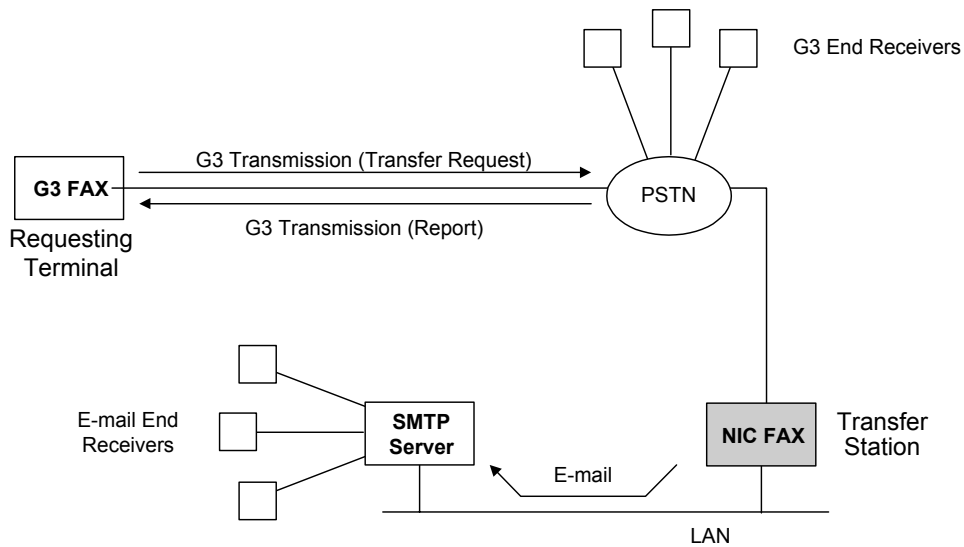
If a communication error occurs between the machine and the SMTP server during result report transmission, the machine prints the result report.

Cross reference:

LAN bit switch 03

Transfer station settings

Request by Fax



H231D916.WMF

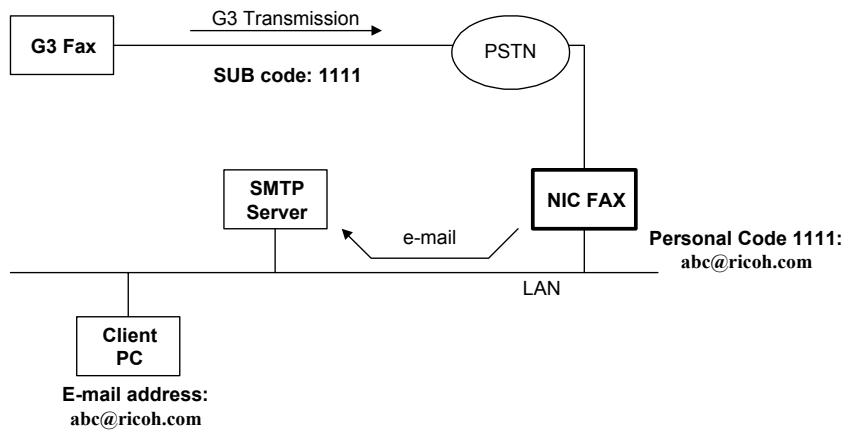
When the machine receives a transfer request by G3 fax, it sends the message to the e-mail and G3 end receivers in the same way as for a request by mail.

The machine sends back the transfer result report to the telephone number of the requesting terminal, which it specified in the NSF signal. The machine prints the result report if it cannot be sent.

The NIC Fax can accept end receiver destinations and transfer result report destinations that were sent from the requester as DTMF tones. This applies to e-mail or PSTN G3 addresses.

Detailed Description

4.2.5 AUTOROUTING



H231D918.WMF

When a G3 fax message is received with a SUB code (max. 20 digits), the machine compares this SUB code with the Personal Box SUB codes stored in the machine with e-mail addresses. If there is a match, the machine routes the message to that e-mail address by e-mail.

There can be only one destination. If there is no destination attached to the SUB code of the personal box, the incoming message is kept in the fax machine's SAF memory.

A communication failure report will be printed if a transmission error occurs between the machine and the SMTP server.

The RTI or CSI of the forwarding machine is indicated in the subject field of the forwarded e-mail. The format is "Fax Message N.xxxx from RTI (or CSI)".

Cross Reference:

LAN bit switch 04 Autoroute

4.2.6 TRANSFER BOX

When a G3 fax message is received with a SUB code, the machine compares this SUB code with the Transfer Box SUB codes stored in the machine with e-mail addresses. If there is a match, the machine transfers the message to that e-mail address by e-mail.

Up to 5 destinations, including both e-mail and G3 fax addresses, can be stored for one Transfer Box. There must be at least one destination.

4.3 MAIL OPTIONS

The following features are available as options for mail sending: entering a subject, designating the level of importance, confirming reception of the mail, and notifying URL viewing. However, with the exception of a return receipt (confirmation of reception from the other end), the receiver can enable these settings with a PC.

4.3.1 SUBJECT AND LEVEL OF IMPORTANCE

The subject entry for the mail being sent is limited to 150 characters. The subject can also be prefixed with an "Urgent" notation.

How the Subject Differs According to Mail Type

Mail Type	①	②	③		④
Subject Entry	Urgent or Off	---	Entry Condition		Fax Message No. + File No.
No Subject Entry	Urgent or Off	From	1. Delivery address entered in the user code.		
			2. User code name.		
			3. "CSI" ("RTI")		
			4. "RTI"	CSI not registered	
			5. "CSI"	RTI not registered	
		6. None	CSI, RTI not registered	"From" not affixed	
Confirmation of Reception	---	From	1. "CSI" ("RTI")		Normal: Return Receipt (dispatched). Can set LAN switch 02 bits 2 and 3 for 'displayed'.
			2. "RTI"	CSI not registered	
			3. "CSI"	RTI not registered	Error: Return Receipt (processed/error)
			4. None	CSI, RTI not registered	
Mail delivery, memory transfer, SMTP receiving and delivery	---	From	RTI or CSI of the station designated for delivery	Mail delivery	Fax Message No. + File Number
			RTI or CSI of sender	Mail sending from G3 memory	
			Mail address of sender	Memory sending	
			Mail address of sender	SMTP receiving and delivery (Off Ramp Gateway)	
Mail error notification	---	From	---		Error Message No. + File No.

Detailed Description

Items ① ② ③ ④ of the table above are in the Subject, but "---" means these items do not appear.

Subjects Displayed on the PC

Sender	Date	Size	Subject
Substation 2	04/25/2002	1,513	Parts List
Substation 2	04/26/2002	1,147	Specifications
Main Station	05/09/2002	33,551	[Urgent] Memo 2041
		21,624,288	

H231D919.WMF

4.3.2 E-MAIL MESSAGES

After entering the subject, you can enter a message by pressing the user function key assigned to the E-mail Message function. This key also allows you to register subjects and messages in the "Template: Subject" display.

The maximum length allowed for the Subject and Message is 148 characters (2 characters are reserved for delimiters). For more details, please refer to the operating instructions.

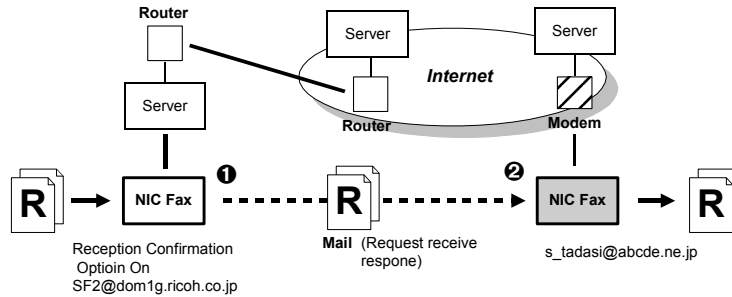
4.3.3 MESSAGE DISPOSITION NOTIFICATION (MDN)

The network system administrator can confirm whether a sent mail has been received correctly or not. This confirmation is done in four steps.

1. Send request for confirmation of mail reception.
NOTE: User Parameter switch 17 (11[H]) Bit 4 can be used to enable/disable this request
2. Mail reception (receive confirmation request)
3. Send confirmation of mail reception
4. Receive confirmation of mail reception

However, in order to send mail in response to the confirmation request, the other party's machine must be set to respond to the confirmation request.

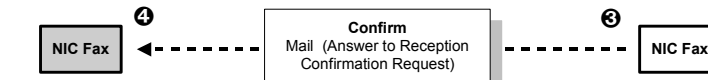
User Parameter Switch 17 (11[H]) Bit 2 Enables the response to a request for confirmation of mail received, when another party sends mail to your machine.



Detailed Description

① *** JOURNAL ***

Time	ADDRESS	Mode	Time	PAGE	RESULT
10:17AM	s_tadasi@abcde.ne.jp	MailSMQ	0'09"	2	--



TX Management Report

Confirmation (TX Management Report)

③ *** JOURNAL ***

Time	ADDRESS	Mode	Time	PAGE	RESULT
10:18AM	SF2@dom1g.ricoh	MailSMA	0'09"	2	--

④ *** JOURNAL ***

Time	ADDRESS	Mode	Time	PAGE	RESULT
10:17AM	s_tadasi@abcde.ne.jp	MailSMQ	0'09"	2	OK

Handling Mail**Handling Mail on the Send Side**

When mail is sent, a "Disposition Notification To" notation is included in the header as a request for confirmation that the mail was received.

```

X-Mozilla Status      : 0001
X-Mozilla Status2    : 00000000
Message-ID            : <3A23379A.81BE0ABD@domlg.ricoh.co.jp>
Disposition-Notification-To : T.Suzuki <s_tadashi@domlg.ricoh.co.jp>
Date                  : Tue, 28 Nov 2000 13:4203 +0900
From                  : T.Suzuki <s_tadashi@domlg.ricoh.co.jp>
X-Mailer              : Mozilla 4.73 [ja]C-CCK-MCD BDP jm-Sony 3
                       (Win95: U)
X-Accept-Language    : ja
MIME-Version          : 1.0
To                    : fuser_01@domlg.ricoh.co.jp
Subject               : Mail Request for Reception Confirmation
Content-Type          : text/plain: charset=iso-2022-jp
Content-Transfer-Encoding : 7bit

```

Handling Mail on the Receive Side

```

Return Path: <>
Received      : From fuser_01 ([133.139.157.20]) by domlg.ricoh.co.jp (post
                office MTA V1.9.3 ID# 0100110-37392) with SMTP id AAA163
                for<S_tadasi@domlg.ricoh.co.jp>
Date          : 28 Nov 2000 13:4236 +0900
X-Mailer      : ICFAX Version 1.0
MIME-Version  : 1.0
Content-Type  : multipart/report: report-type=disposition-notification:
                boundary="--ICFAX_000000EF48--"
To            : T.Suzuki <s_tadashi@domlg.ricoh.co.jp>
Message-ID    : <20001128133423664.ICFAX-XFC9BE-X26986@133.139.157.20>
From          : fuser_01@domlg.ricoh.co.jp
Subject       : From @81454771459" ("RICOH GTS) Return Receipt (dispatched)
X-Mozilla-status : 8001
X-Mozilla-Status2 : 00000000
X-UIDL       : 20001128044713447.AAA163@fuser_01

This is a Return Receipt for the mail that you sent to "fuser_01@domlg.ricoh.co.jp"
Final Receipt: rfc822:fuser_01#domlg.ricoh.co.jp
Original Message ID: <3A23379A.81BE0ABD@domlg.ricoh.co.jp>
Disposition: automatic action/MDN-send-automatically: dispatched      Respond Mail Text

```

A request to send a confirmation that a mail transmission has been received is answered if 1) this field is in the mail (in the 4th line above), and 2) User Parameter Setting SW 17 (11[H]) Bit 2 is enabled for sending the disposition notification. Specifically the content of the response is as follows:

Normal reception: "Return Receipt (dispatched)" in the Subject line
 LAN SW 02 (Bit 2, 3) Setting: "Return Receipt (displayed)"
 Error: "Return Receipt (processed/error)"

Handling Reports

1. Sending a Request for a Return Receipt by Mail

After a request for a return receipt by mail is sent, the journal is annotated with two hyphens (--) in the Result column and a "Q" in the Mode column.

2. Mail Receipt (Request for Receipt Confirmation) and Sending Mail Receipt Response

After the response to the request for the return receipt by mail is sent, the journal is annotated with two hyphens (--) in the Result column and an "A" in the Mode column.

3. Receiving the Return Receipt Mail

- After the return receipt is received, the information in the journal about the receipt request is replaced, i.e. the journal is annotated with "OK" in the Result column.
- When the return receipt reports an error, the journal is annotated with an "E" in the Result column.
- When the corresponding send information cannot be located, the return receipt transmission is discarded. Setting User Parameter Setting SW18 (12[H]) Bit 7 to 1 enables printing all responses to requests for return receipts. Setting Bit 7 to 0 enables printing a response only when an error occurs.
- The arrival of the return receipt is not recorded in the journal.

Detailed
Description

Report Sample

DATE	TIME	ADDRESS	MODE	TIME	PAGE	RESULT
MAY. 5	10:15	fuser_01@dom1g. ricoh. co.	Mail SM	0'09"	2	--
	10:16	fuser_01@dom1g. ricoh. co.	Mail SMQ	0'05"	1	--
	10:17	s_tadashi@dom1g. ricoh. co.	Mail SMQ	0'09"	2	OK
	10:19	m_masataka@dom1g. ricoh. co.	Mail SMA	0'05"	1	--

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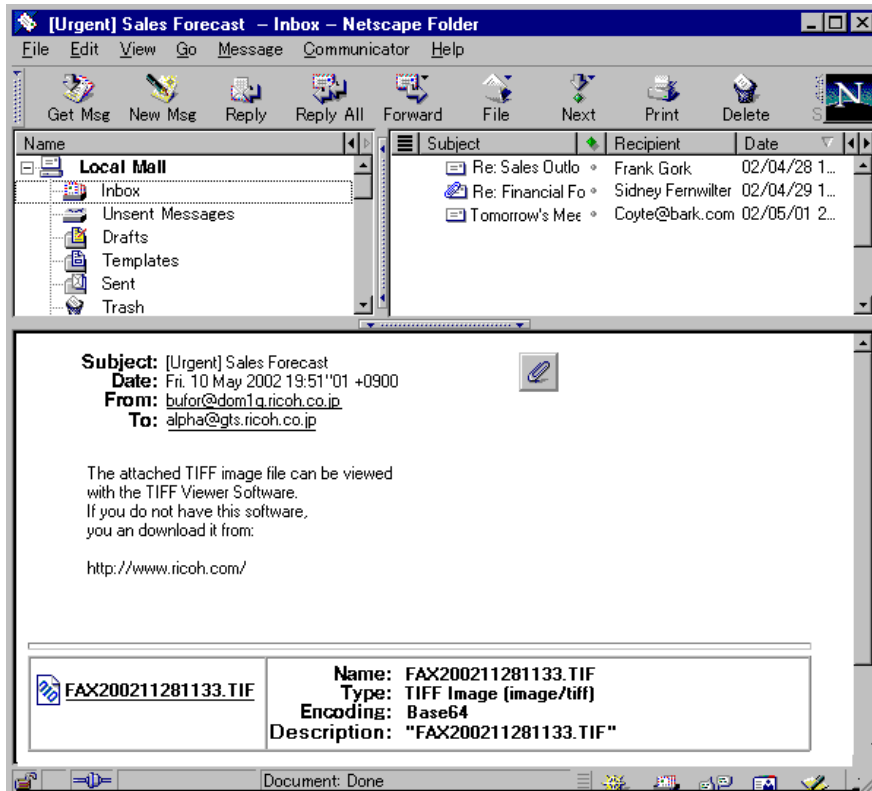
Return Receipt Conditions

- In order to use the return receipt feature, User Parameter Setting SW17 (11[H]) Bit 4 must set to 1 to switch this feature on. By default, Bit 4 is set to 0 to switch this feature off.
- The return receipt feature can be used only if the receiving side machine supports MDN (Message Disposition Notification).
- Even after the return receipt is received by mail, only the most recent 50 transactions appear in the Result column of the journal. However, the most recent 250 transactions are reported with the Web Status Monitor.
- If the specified mail address is in the mailing list, then return receipts may be received at the end of the transmission. In this case, the Result column of the journal is annotated for every return receipt received until only the result of the last transmission is accurately reported.

4.3.4 VIEW URL NOTIFICATION

You can include a URL in a mail for sending to a Web site where a view application can be used to download the mail in TIFF format. Once the mail is received, the user can view the image on the PC.

View Notification



H231D922.WMF

4.3.5 NETWORK BOOT

Network boot automatically acquires information related to network settings from the network DHCP server. Setting Network Boot to “DHCP” activates the Network Boot function. You do not need to set that information on the machine. The information in the table below can be acquired from the DHCP server.

Acquired Information	Description	Note
<ul style="list-style-type: none"> • IP Address • Subnet Mask • Gateway Address 	<p>If these items are specified on the machine, the information the DHCP server acquires is valid.</p>	<ul style="list-style-type: none"> • On the Network setting display, the values you specify on the machine always appear. • The User Parameters List shows both the values you specify on the machine and those the DHCP server acquires. • You use the Web browser to check currently valid settings among only values acquired by the DHCP server.
<ul style="list-style-type: none"> • Domain Name • DNS Address 1 • DNS Address 2 • WINS Addr. • SMTP Server • POP Server 	<p>If these items are specified on the machine, they are valid. If they are not specified, then the information acquired by the DHCP server is valid.</p>	

- NOTE:**
- 1) The following servers have been tested and confirmed to function adequately as DHCP servers: 1) Windows NT Server 4.0, and 2) Windows 2000 Server.
 - 2) DHCP (Dynamic Host Configuration Protocol) automatically assigns IP addresses to devices on the network and performs other required settings.
 - 3) To use a DHCP server, the DHCP server (or DHCP relay agent) must be installed on the same subnet.
 - 4) If the DHCP server cannot assign an IP address, then an IP address that is not used on the network and begins with “169.254” is selected automatically. Next, the fax machine periodically accesses the DHCP server to acquire an IP address, and when this succeeds, the IP address is replaced with a new one. This is called the “AutoNet” function. While the AutoNet function is running, the following functions cannot be used: 1) neither scanner function, 2) Internet fax function, 3) IP-Fax function, 4) LAN-Fax.
 - 5) While the fax machine is running with Network Boot set to “DHCP”, the IP address may be changed. To preserve the DHCP IP address assigned by the server, to one of the following:
 - Reserve the NIC Fax IP address (MAC address) that you want to use on the DHCP server, so the fixed address is allocated to NIC Fax.
 - Lease the IP address for an indefinite time.

Detailed Description

4.3.6 WINS SERVER

When the WINS server is running, the fax registers the host name and IP address on the WINS server and periodically renews them. Computers with the WINS client function allow you to communicate with the fax machine with the host name instead of the IP address. To use a WINS server, you need to specify the WINS server address.

- NOTE:**
- 1) The following servers have been tested and confirmed to work as WINS servers: 1) Window NT Server 4.0 Service Pack 4 (and higher), and 2) Windows 2000 Server.
 - 2) WINS (Windows Internet Name Service) associates the IP address allocated to a device on the network with the host name of the computer.
 - 3) This function searches for NIC FAX with the name from your computer. You cannot acquire the computer name from NIC FAX with the WINS server.
 - 4) Only the scope ID allocated by the DHCP server is available.

4.4 IP-FAX

What is IP-FAX?

The NIC fax conducts TX/RX transactions with a compatible fax machine (one that can use T.38 protocol) connected to a network that uses TCP/IP.

IP-FAX is a real-time Internet fax that provides the following general features:

- The destination for sending is not identified by a fax number. Instead, the IP Address or Host Name is used.
- On a network that employs a gatekeeper, an alias telephone number can be used to specify a send destination.
- IP-FAX can also send through a G3 Fax connected through a gateway to the PSTN (Public Switched Telephone Network) (Modem speed below V.17).
- IP-FAX can send faster than PSTN, and a server dedicated to handling mail is not required.
- Because direct connection with the other party's machine is possible, functions can be interchanged and transactions can be confirmed.

Features of IP-FAX

IP-FAX provides these important features:

- Compliance with ITU-T T.38 Standards.
- Employs TCP/IP communication protocols.
- Allows destinations to be identified by the IP Address, Host Name, or an Alias Telephone Number.

The main advantages of IP-FAX are:

- Costs are reduced as the main method of communication is over the Internet.
- All transactions can be confirmed as they are connected directly with the other party.
- Extremely high speed because IP-FAX can operate over a 10/100Base TX LAN.

The disadvantages of IP-FAX are:

- Communication through firewalls is not possible.
- Communication via gateway is the only method of transmission.
- High visibility (poor security).

NOTE: The transmission speed of IP-Fax is affected by the condition of the network (distance of wiring, packet loss, etc.). IP-Fax operates in real time, so IP-Fax must occupy one line until the other party's machine breaks communication.

Transaction Features Not Available with IP-Fax

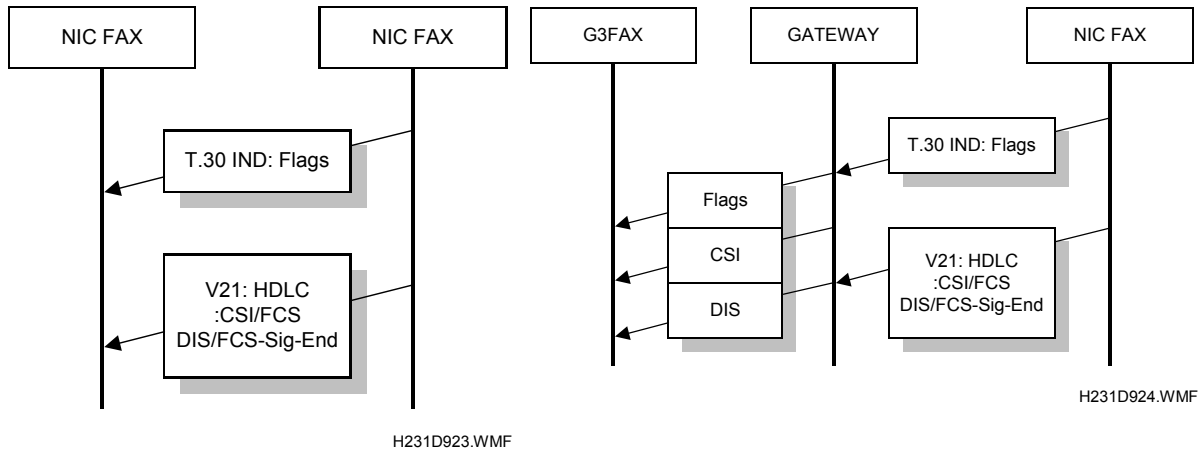
IP-Fax can use all features of a G3 fax with exception to the following:

- Sending: Memory file transfer, batch transmission.
- Receiving: Batch reception.

T.38 Transmission Protocol

The T.38 transmission protocol handles data in packets in order to allow IP-FAX to transmit with a T.30 G3 fax protocol network.

(1) Transactions in an Intranet (2) Transactions Between PSTN and Intranet

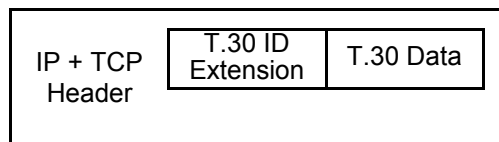


Packet Format

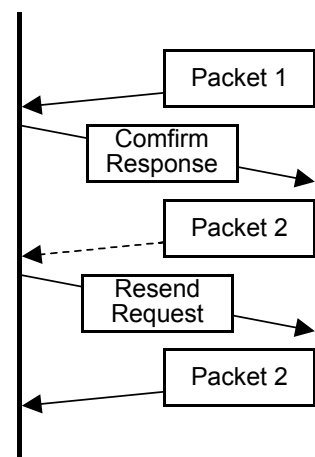
Fax TX/RX transmissions are conducted with T.38 IFP (Internet Fax Protocol) packet exchange via the Internet. TCP or UDP (protocols that employ two different packet formats) can be selected for transmission. TCP is selected by default for NIC FAX; you can change this to UDP with LAN switch 10 bit 1.

TCP Packet Format

TCP requires more time because it requires a confirmation response. However, TCP is more reliable because it always demands an affirmative response and requests a retry in response to an error.

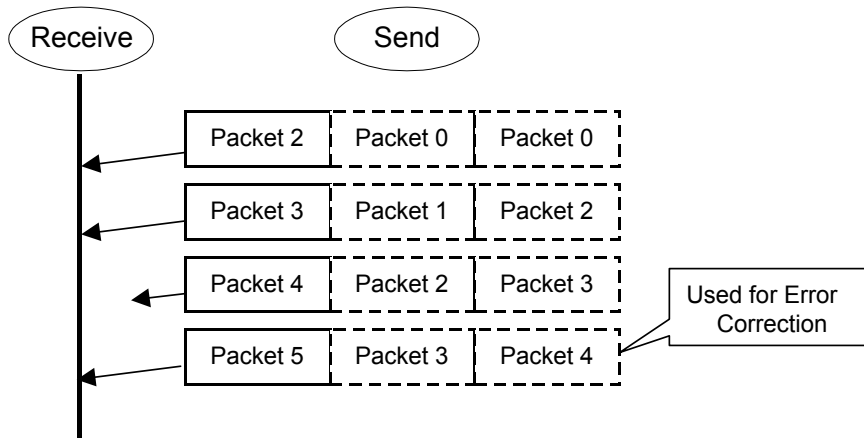


H231D926.WMF



H231D925.WMF

UDP Packet Format



H231D927.WMF

UDP is output without establishing the session. The UDP protocol does not correct errors or attempt re-sending. While it is much faster, generally its reliability is lower. However, on the receiving side with IP-FAX the speed is forced lower to prevent data overflow, making UDP slower than TCP.

NOTE: As a general rule, UDP is faster than TCP but slightly less reliable. On the other hand, TCP is more reliable than UDP but slightly slower.

Detailed Description

IP + UDP Header	Sequence Number	T.30 ID Extension	T.30 Data	Redundant Packet	Redundant Packet

H231D928.WMF

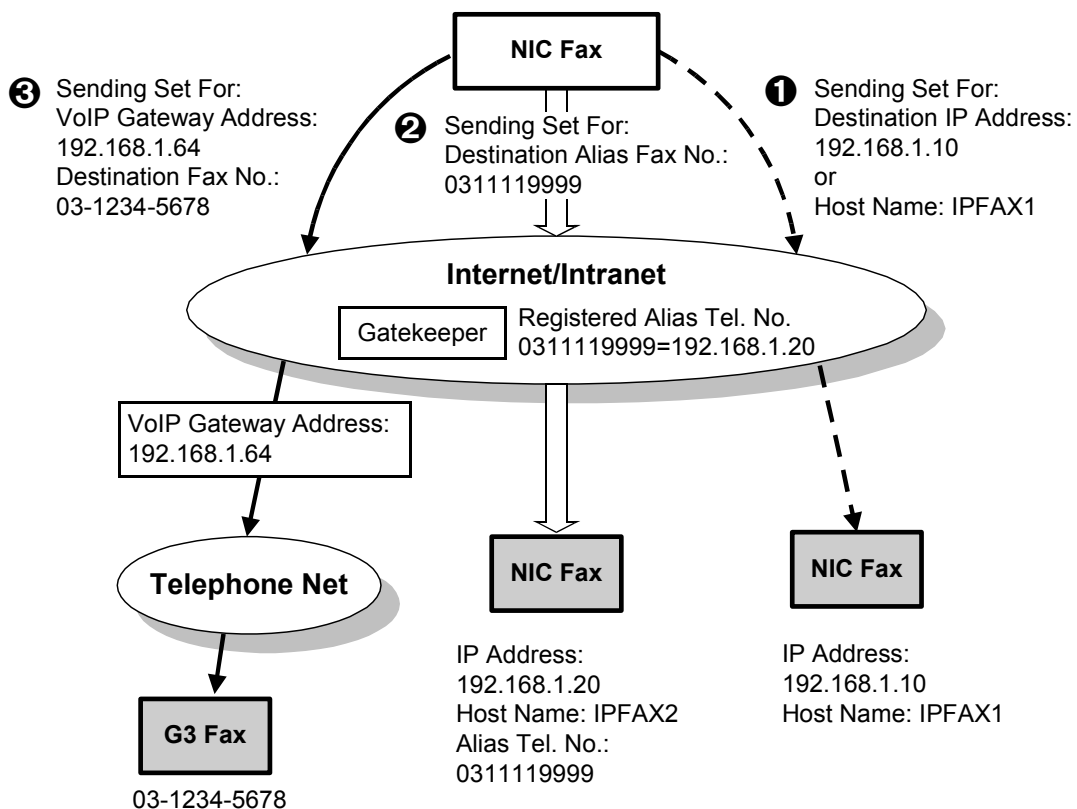
UDP appends a redundant packet to the data packet and sends both. At the NIC Fax, the redundant packet is affixed to only Phase C and the post message. The number of redundant packets can be changed as shown in the table below that lists the network delay parameters. However, increasing the number of redundant packets increases the size of the data and slows down the speed of the transmission.

UDP Related Switches

LAN Switch 11		
No.	FUNCTION	COMMENTS
0-3	Select IP FAX Delay Level Bit 3 2 1 0 Setting 0 0 0 0 Level 0 0 0 0 1 Level 1 0 0 1 0 Level 2 0 0 1 1 Level 3	Raise the level by selecting a higher setting if too many transmission errors are occurring on the network. If TCP/UDP is enabled on the network, raise this setting on the T.30 machine. Increasing the delay time allows the recovery of more lost packets. If only UDP is enabled, increase the number of redundant packets. Level 1~2: 3 Redundant packets Level 3: 4 Redundant packets
4-7	Not used.	Do not change these settings.

IP-Fax Sending

The chart below illustrates the three methods of data transmission with the NIC FAX operating in a TCP/IP network environment.



H231D929.WMF

Note how cases ❶, ❷, and ❸ operate in the illustration above:

- In (1) the NIC FAX, connected to the Internet/Intranet, sends a transmission to IP Address 192.168.1.10 or to Host Name IPFAX1 (192.168.1.10). The IP Address and Host Name must be previously registered on the DNS.
- In (2) the NIC FAX, connected to the Internet/Intranet using a VoIP gatekeeper, sends a transmission to the destination with the alias fax number 03 1111 9999 through VoIP gatekeeper 192.168.1.20.
- In (3) the NIC FAX, connected to the Internet/Intranet via a VoIP gateway connected to telephone network, sends a transmission to the Gateway Address and the destination fax number (192.168.1.64 and 03 1234 5678). (The Host Name can be substituted for the IP Address.)

Settings

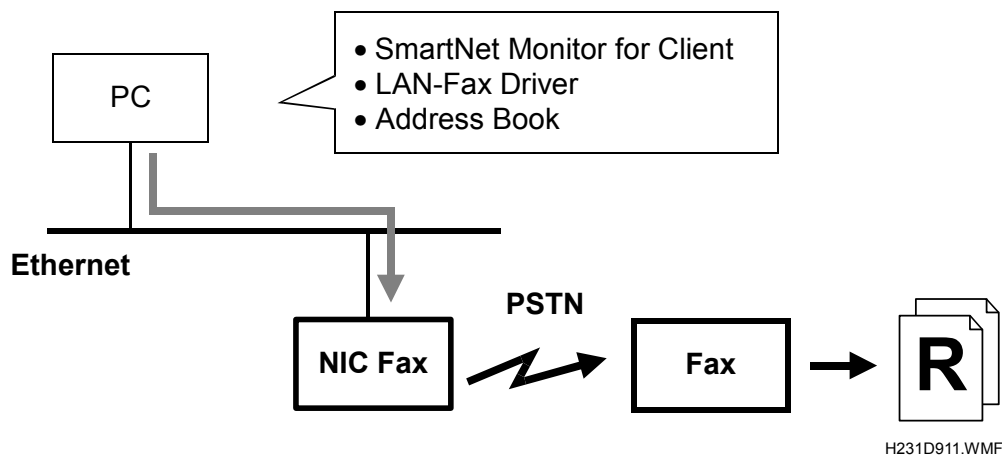
User parameter switch 32 (20[H]), bit 0

IP-Fax Gate Keeper usage

0: No, 1: Yes

LAN switches 10 to 12: Various IP-FAX settings (see the bit switch table)

4.5 LAN-FAX



A LAN-Fax driver can print out a document created with a PC application or send the document through NIC FAX to another fax. The following items and settings are required to use this feature:

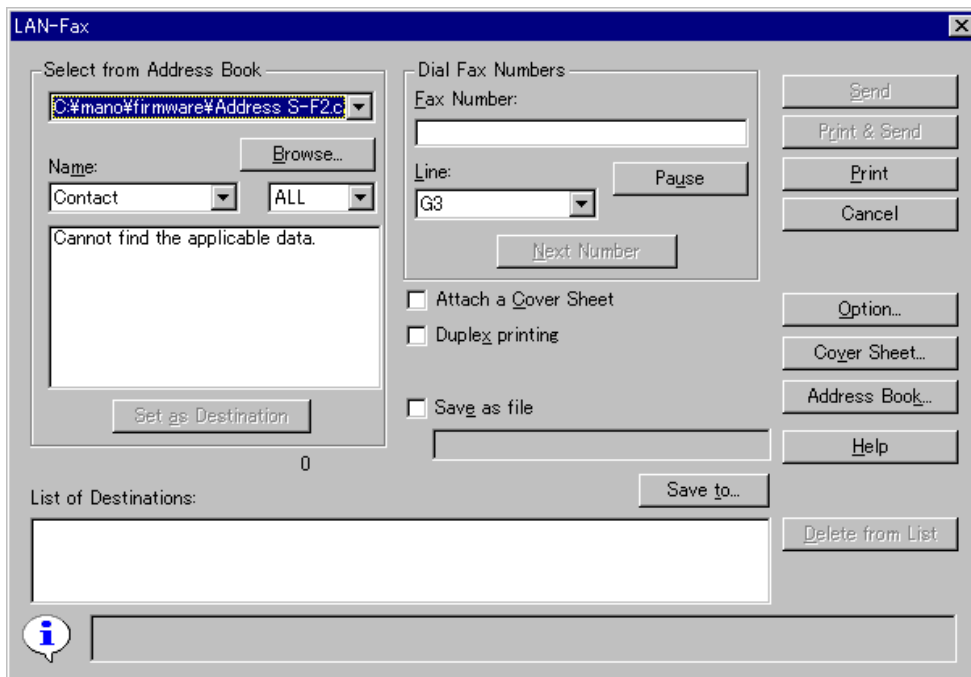
- NIC Fax and a PC connected to a LAN.
- The initial settings from NIC FAX (IP Address, Subnet Mask, Default Gateway settings).
- Software installed on the PC, namely, SmartNet Monitor for Client, the LAN-Fax driver, and an Address Book.

4.5.1 LAN-FAX PRINTING

Printing Operation

Follow this procedure to print.

1. From the File menu, select Print.
2. For the printer Name, select the name of the fax in the printer queue (“LAN-Fax F3” for example), then click the OK button. The LAN-Fax dialog box opens.
3. Select the settings for each mode, then click the Print button.

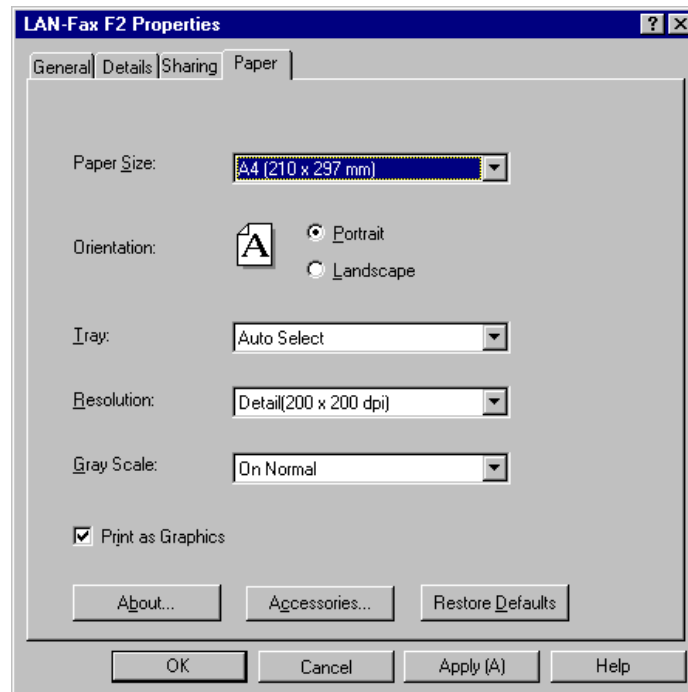


Detailed Description

H231D930.WMF

4. The following items are supported by this driver:

Item	Content
Paper Size	LT, LG, A4, A5
Orientation	Portrait (SEF), Landscape (LEF) Landscape originals, and A5 Portrait are rotated 90 degrees then printed.
Tray	Fixed at "Auto Select"
Resolution	200 x 100 dpi, 200 x 200 dpi, 400 x 400 dpi, 600 x 600 dpi (optional 40 MB of memory required for 600 x 600 dpi)
Grayscale	Off, Normal, Lighter
Accessories	G3-1, G3-2 dual line installation enabled



H231D931.WMF

Important Points About LAN-Fax Printing

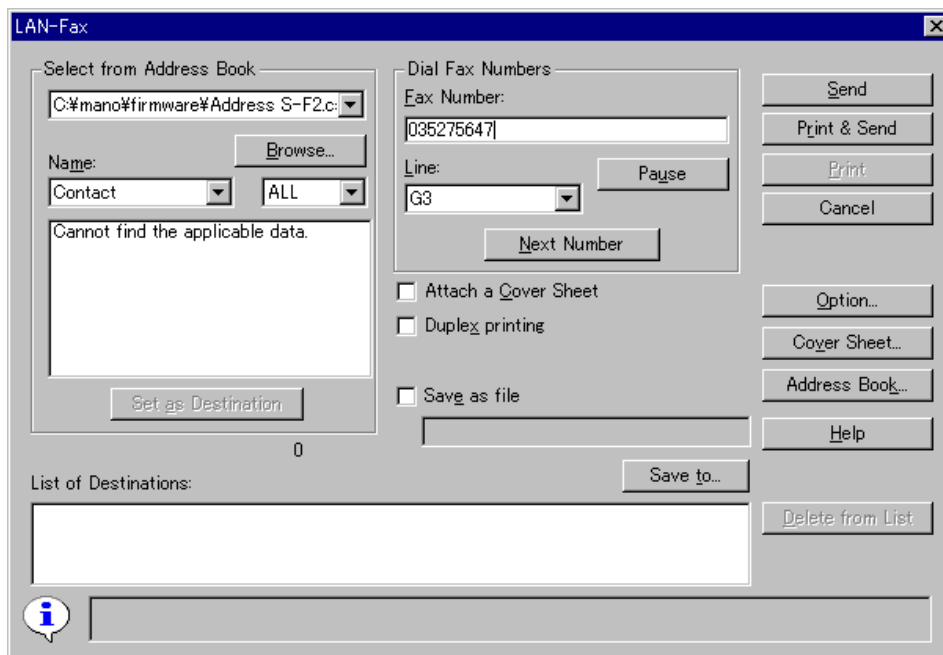
- A print job will not start if all paper trays are out of paper. Additionally printing will not occur if an error occurs while the fax is printing, if the printer driver is busy, or if the fax is communicating. In these cases, PC spooling halts and the PC enters the standby mode.
- The number of transactions between the fax and PC is limited to 3.
- The number of destinations during sending is limited to 100.
- A print job cannot be recovered if a paper jam occurs during printing or if the paper feed station runs out of paper.
- The fax does not notify the PC about the result of a print job.

4.5.2 LAN-FAX SENDING

Send Operation

Follow this procedure to send a fax.

1. In the software application, from the File menu select Print.
2. For the printer Name, select the name of the fax in the printer queue (“LAN-Fax F3” for example), then press OK. The LAN-Fax dialog box opens.
3. Enter the fax number using any one of the these dialing methods:
 - Quick Dial #<number>
 - Speed Dial #*<number>
 - Group Dial #**<number>
 - Direct Dial <number>
4. After making the settings for each mode, click either the Send button or the Send & Print button.



H231D932.WMF

Detailed Description

5. This driver supports the following items.

Item	Content
Print & Send	Allows setting Paper Size, Resolution
Address Book	Quick Dial, Speed Dial, Group Dial, 10-key pad Max. Length: 254 characters Max. Addresses: 100 destinations/files Line selectable for each destination.
Options	Sending at a specified time User Code Print fax header
Duplex printing	Allows Duplex printing
Save as File	Allows saving the file in TIFF format
Cover Sheet	Attach, Edit

6. The image information received from the PC is stored in the SAF and then sent. This conforms to the operation of Memory Transmission.


Important Points About LAN-Fax Sending

- A transmission will not start if every paper tray is out of paper, if the fax is printing, if an error occurs while the fax is printing, or if the fax is busy sending a document. In these cases, PC spooling halts and the PC enters the standby mode.
- The number of transactions between the PC and Fax is limited to 3.
- To enter the mail address for the destinations, you can enter previously registered Quick Dial, Speed Dial, and Group Dial keys.
- The fax does not notify the PC about the result of a transmission. However, if the PC user has registered the PC's mail address as a delivery address in a Personal Box in the machine, then specifying that user code in the LAN-Fax driver before PC fax transmission forces a return receipt for confirmation of the status of the transmission.

Here is a sample of a return receipt notification.

***** COMMUNICATION RESULT REPORT (2002.10.21 15:38 *****)	
TRANSFER STATION	qacicfax@shinyoko.ricoh.co.jp
TRANSFER	10.21 15:31

ADDRESS (GROUP)	PAGE RESULT
G3-1 :04771787	2/ 2 OK

REASON FOR ERROR	
E-1) HANG UP OR LINE FAIL	
E-2) BUSY	
E-3) NO ANSWER	
E-4) NO FACSIMILE CONNECTION	
E-5) MAIL SIZE ORDER	
 - FAX200210211138.TIF	

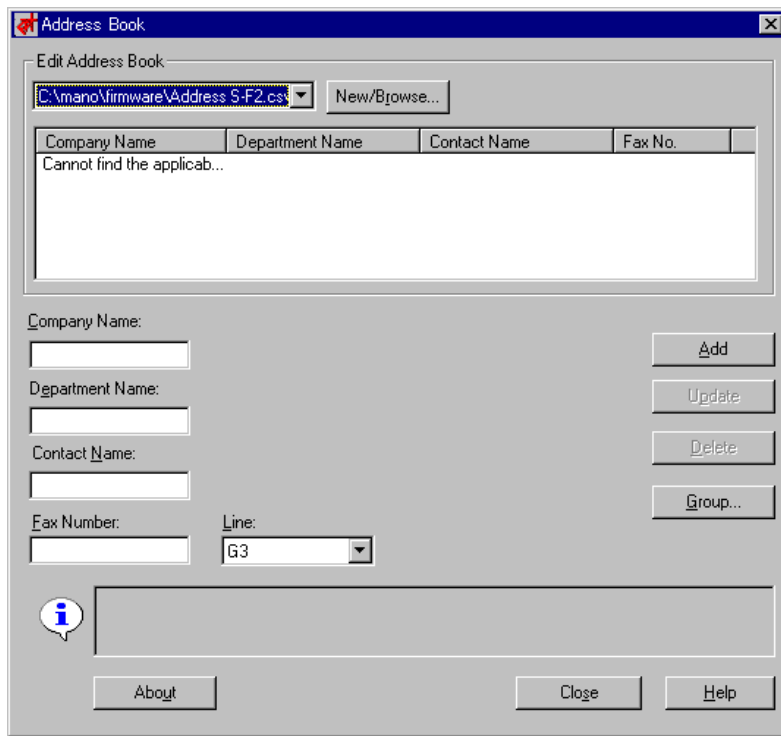
4.5.3 ADDRESS BOOK

The Address Book screen allows you to register and edit individual and group destination addresses.

Address Book Operation

Follow this procedure to use the address editor tool.

1. On the desktop, click the Start button, point to Programs, and then click the Address Book.
-or-
In the LAN-Fax dialog box, select Address Book.
2. Registered addresses are stored in CSV files, so these files can be edited with software applications, distributed, and opened and used on other computers.



H231D933.WMF

Detailed
Description

4.6 SCANNER FUNCTIONS

The scanner function of this machine provides two important functions:

- Scanning images to e-mail
- Delivering scanned images to a network

4.6.1 SCANNING SPECIFICATIONS

An original can be scanned in monochrome or color for sending. However, scanning mode is restricted by the file format.

- NOTE:** 1) For the European and Asian basic models, the optional color unit is required for color scanning.
 2) This machine sends a color document as an attachment; the machine does not function as a color fax.

Original	Default File Format	Option
Monochrome	TIFF	PDF
Color	JPEG	

User Parameter Setting SW17 (11[H]) Bit 5 determines the data format used in scanning.

SW17 (11[H]) Bit 5	0:	TIFF (monochrome)/JPEG Color
	1:	PDF

The line resolution for scanning is determined by the operation mode as shown in the table below.

LED Lit	Resolution	Original	
		Monochrome	Color
Standard	100 x 100 dpi	No	Yes
Standard ^{*1}	200 x 100 dpi	Yes	No
Detail	200 x 200 dpi	Yes	Yes
Detail + Super Fine	300 x 300 dpi	Yes	Yes
Super Fine	400 x 400 dpi	Yes	Yes
Ex. Super Fine ^{*2}	600 x 600 dpi	Yes	Yes

^{*1}: PDF is restricted to 200 x 200 dpi.

^{*2}: User Parameter SW20 (14[H]) Bit 2 determines whether Ex. Super Fine can be used for fax transmission. Bit 2 setting 0 (the default) disables Ex. Super Fine and setting 1 enables Ex. Super Fine.

JPEG

You can assign this function when you send color documents using the Scanner Function. You can select whether you send color documents in JPEG format or PDF format by pressing the user function key assigned to this function.

You can also select “JPEG” or “PDF” with the User Parameter Switch 17 (11[H]) Bit 5. If you need to change the format selection frequently, assign the JPEG function to a user function key.

Important Points About Scanning

- The operation panel is used for all scanning settings and scanning job execution.
- Mail volume restrictions apply to TIFF files only and do not apply to JPEG and PDF files.
- Images scanned to e-mail or delivered to a network are annotated with a “b” mark in the Journal.

Color Correction Functions

There are two methods for color correction:

- Scanner RGB

Scanner RGB Density Correction> User Tools> Fax Features> Setup> Scanner RGB

Select the color to adjust, then use the left and right arrow key to adjust the level (there are 5 possible levels).

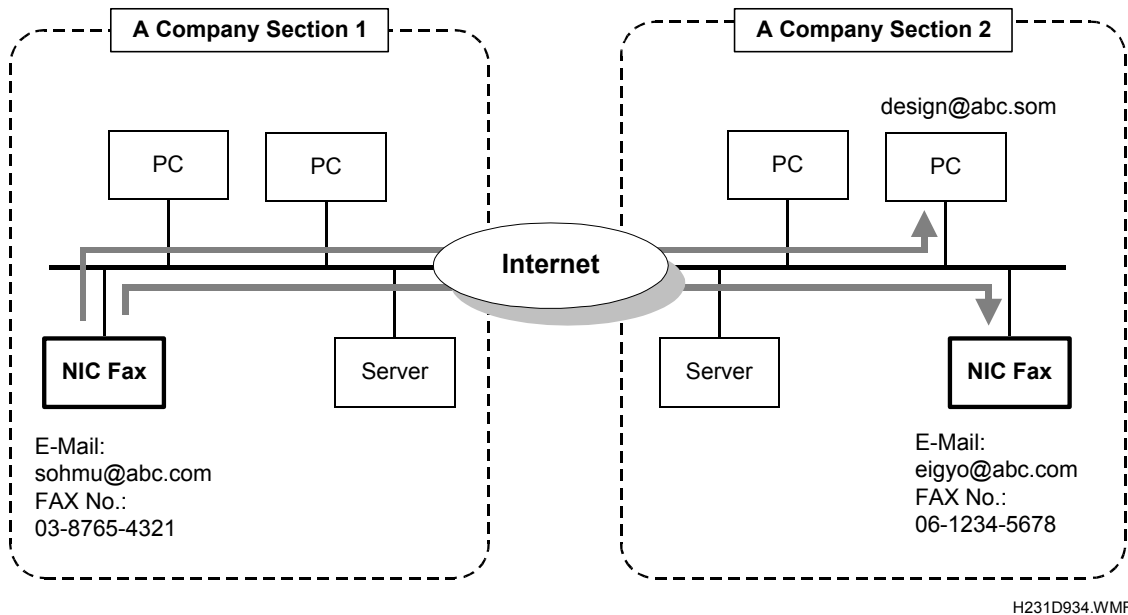
- Sample Rate Correction

Sampling Rate Correction> User Parameter Switch 33 (21[H]) Bit 0, 1

The sample rate switch adjusts the amount of time required to receive and transmit color images. The 0,0 setting requires the least amount of time, but the image may appear slightly lighter than normal. The 1,1 setting requires more time, but the image quality is closer to the original. The extra time is needed because the processed data does not compress so efficiently.

4.6.2 SCAN-TO-E-MAIL

The image of the scanned original is converted to a file. The file is attached to an e-mail for transmission.



Important Points to Remember About Scan-to-E-mail

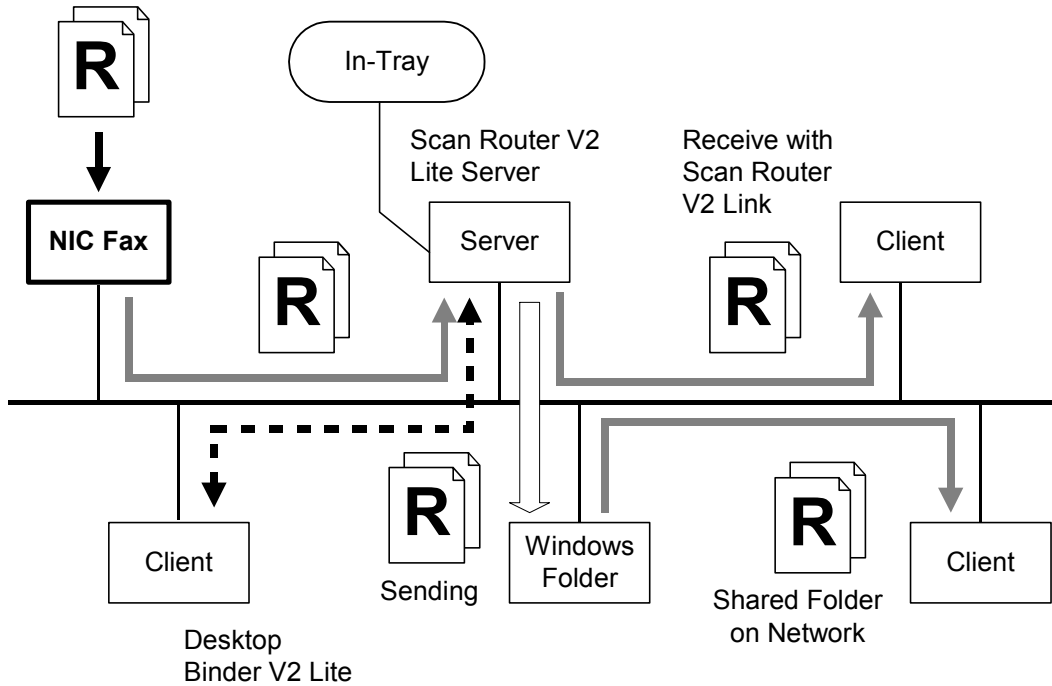
- In order to use scan-to-e-mail, "Scanner" must be registered in a user function key.
- The TTI (Transfer Terminal Identification) is not appended to a file scanned to e-mail.
- Images scanned in color are stored in the memory on the JPEG board, not in the SAF, so the mail must be sent with Immediate Transmission to one destination at a time.
- If Color Scanning is selected, then the original is scanned with text scanning set to Standard with line resolution set to 100 x 100 dpi (not 200 x 100 dpi).
- User Parameter Setting SW17 (11[H]) Bit 5 determines the data format used in scanning.

SW17 (11[H])Bit 5	0:	TIFF (monochrome)/JPEG Color
	1:	PDF

- The address determines the destination for scan-to-e-mail or delivery to a server.

4.6.3 SCAN TO NETWORK FOR DELIVERY

This machine can be used as a Scan Router V2 Lite scanner to deliver scanned image files to a network. The scanned document can be stored on the delivery server or stored in the folder of a computer on the same network. For more details about delivery servers, refer to the Scan Router manual.



Detailed Description

H231D935.WMF

Settings

- User Parameter Switch 16 (10[H]) Bit2: Set this bit to 1 when you wish to use the machine as a network scanner using Scan Router V2 Lite.
- System Switch 02 Bit 2: Set this bit to 1 when you want to use the machine as a network scanner with Scan Router V2 Professional.
- LAN switch 0C, Bits 4 and 5: Interval for checking if new addresses have been stored in the Scan Router Server.

4.7 WEB STATUS MONITOR (WEB BROWSER)

This machine can be accessed from a web browser to make initial settings or to check the status of the machine. By installing the Help file on the PC, you can also see descriptions of important terms and procedures.

4.7.1 WEB STATUS MONITOR OPERATION

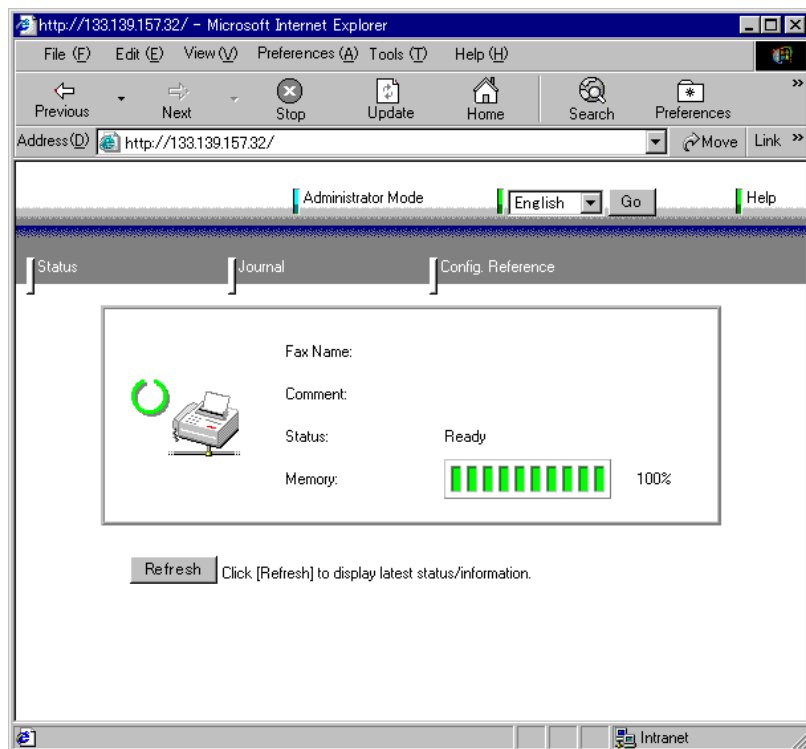
Follow the procedure below to access the Web Status Monitor.

1. Enter the NIC FAX IP Address directly into the browser screen. For example, enter:

http://133.139.157.32/

NOTE: If the customer is using a proxy server, make sure that the IP Address is entered for the "Exception" for the Web browser. (For Windows Explorer, for example, select Tools> Internet Options> Connection> LAN Settings> Details> (Proxy Server) Details> Exception.)

After connection, the screen below appears.



H231D936.WMF

2. Select Administrator Mode> Configuration> Setup to adjust the initial settings.

3. Click the appropriate button to confirm the settings listed below.

Button	Content
Status	Paper remaining, toner remaining, amount of memory in use
Journal	Shows the TX/RX history (Max.: 250 transactions), click the Details button to view details.
Config. Reference	Shows the initial settings and the information registered for the Quick Dial and Speed Dial keys and so on.
Administrator Mode	Shows the initial settings and the registration, update, and delete information in the backup list for destination information.

NOTE: In order to use the web browser Help, these files must be copied to the PC. Please refer to the operating instructions for more details.

Important Points About Backup and Restore

Dial settings can be acquired from a machine and saved with the Web Status Monitor on disk as a CSV file (or binary file). This CSV file serves as backup for all the Quick, Speed, and Group dial settings. The file can be restored to the machine if the settings are accidentally lost, or they can be written to any other machine newly installed on the network.

Detailed Description

Dial settings are always restored in this order:

- | | | |
|---------------|-------------|--|
| Step 1 | Quick dials | Note: When a Quick dial key is set up for group dialing, a link exists between the Quick dial key and the group number. |
| ↓ | ↓ | |
| Step 2 | Speed dials | |
| ↓ | ↓ | |
| Step 3 | Group dials | |

Here are some important points to remember about the settings of LAN SW05 Bit 1 and how they affect the restore operation.

LAN SW05 Bit 1 = 1 (Overwrite From PC Utility Allowed)

When the CSV file is restored *with no dialing information registered on the machine*, the settings are stored in the order Quick dials> Speed dials> Group dials. However, if a Quick dial key is set up for group dialing, at Step 1 only the group number is restored; the group name and link between the quick dial key and group number remain blank at Step 1 and Step 2 and are not restored until Step 3. All group dials are restored.

LAN SW05 Bit 1 = 0 (Overwrite From PC Utility Prohibited)**1) No Dialing Information Registered**

When the CSV file is restored *with no dialing information registered on the machine*, the settings are stored in the order Quick dials> Speed dials> Group dials.

However, if a Quick dial key is set up for group dialing, at Step 1 only the group number is restored; the group name and link between the quick dial key and group number remain blank at Step 1 and Step 2 and are not restored even at Step 3. No group dials are restored. (This is the default setting for Bit 1.)

2) Dialing Information Registered

When the CSV file is restored *with dialing information registered on the machine*, the settings are stored in the order Quick dials> Speed dials> Group dial:

- When Quick dials are restored at Step 1, if a Quick dial setting on the machine and in the CSV file have the same number, the Quick dial setting from the CSV file is not restored, an error occurs, and restore halts. If the Quick dial number on the machine does not match a number in the CSV file, the Quick dial is restored from the CSV file and the restore continues to Step 2 if no other matching numbers are detected.
- When Speed dials are restored at Step 2, if a Speed dial setting on the machine and in the CSV file have the same number, the Speed dial setting is not restored, an error occurs, and restore halts. If the Speed dial number on the machine does not match a number in the CSV file, the Speed dial is restored from the CSV file and the restore continues to Step 3 if no other matching numbers are detected.
- If a Quick dial key is set up for group dialing, at Step 1 only the group number is restored. The group name and link between the quick dial key and group number remain blank at Step 1 and Step 2 and are not restored at Step 3. No group dials are restored.

Backup Confirmation and Backup Content Confirmation Buttons

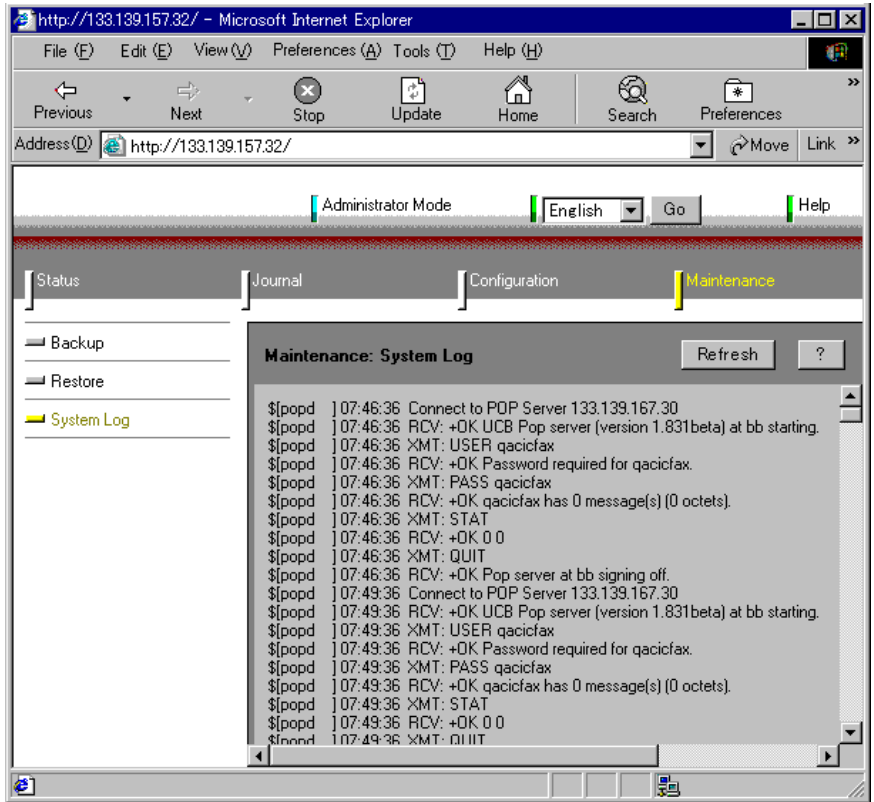
Perform Backup	Confirms that all data has been acquired at backup. (Enabled only at backup.)
Check Backup File	Always execute before restore in order to perform a logic check of the backup file data to confirm that the data conforms with the CSV file format and to ensure that registered entries on the machine match.

4.7.2 SERVICE MODE

The Service Mode is useful for investigating the cause of NIC Fax communication errors.

Follow this procedure when logging data between the NIC-Fax and server.

1. Select Administrator Mode> Password (Enter: **rifmaint**)> Service Mode.
2. Select Maintenance> System Log.



Detailed Description

H231D937.WMF

3. Now you can cut and paste the text to capture the most recent communication history that contains the error and send it as a text file to a service center.

SPECIFICATIONS

1. IFAX SPECIFICATIONS

Type

Color NIC Fax Kit Type 410 (NA)
NIC Fax Kit Type 410 (EU/Asia)

Connectivity

Local area network
Ethernet 100base-Tx/10base-T

Connection

100base-Tx/10base-T direct
connection

Resolution

Main scan: 200 dpi
Sub scan: 400 dpi, 200 dpi, 100 dpi

NOTE: To use 400 dpi, LAN switch 07
bits 2, 3 must be changed.

Transmission Time

1 s (through a LAN to the server)
Condition: ITU-T #1 test document
(Selerexe Letter)
MTF correction: OFF
TTI: None
Resolution: 200 x 100 dpi
Communication speed: 10 Mbps
Correspondent device: E-mail server
Line conditions: No terminal access

Document Size

Maximum message width is A4/LT.

E-mail File Format

Single/multi-part
MIME conversion
Image: TIFF-F (MH) format
DCX format (Rx only)

Protocol

(Supported by TCP/IP protocol)

Transmission:

IETF RFC821 SMTP procedure

Reception:

IETF RFC1725 POP3 procedure
IETF RFC2026 IMAP4 procedure

Data rate

100 Mbps(100base-Tx)
10 Mbps (10base-T)

Remark

The machine must be set up as an e-mail client before installation. Any client PCs connected to the machine through a LAN must also be e-mail clients, or some features will not work (e.g. Autorouting).

2. IP FAX SPECIFICATIONS

Connectivity

Intranet (firewall transmission not supported)

ITU-T

T.38 Standard

Transmission Protocol

TCP/IP (Switching between TCP and UDP possible with LAN SW10 Bit 1)

Transmission Resolution

Ex. Super Fine - 600 x 600 dpi

Super Fine - 400 x 400 dpi

Detail - 200 x 200 dpi

Standard - 200 x 100 dpi

(600 x 600 dpi can be switched off and on with User Parameter

SW20 (14[H]) Bit 2.)

Transmitting Methods

Immediate Transmission, Memory Transmission

Transmission Time: 1 to 2 seconds

Original - ITU-T#1 Chart

MTF Correction - OFF

TTI - None

Line Density - 200 x 100 dpi

Transmission Speed - 100/10 Mbps

Remote Device - This machine

Line - With no access from each terminal.

Communication Method

Three methods allowed for specifying the destinations between machines in the same network:

- 1) IP Address or Host Name (T.38 compliant machines, Port number appended to IP address for destinations.)
- 2) Communication via VoIP Gateway
VoIP gateway IP Address + Tel. Number
VoIP Gateway Host Name + Tel. Number
- 3) Gatekeeper with alias telephone number. (User Parameter Switch SW32 (20[H]) Bit 0 must be set to register gatekeeper and tel. number.)

Transmission Paper Size

A4 - 216 mm

LT - 210 mm

Compatible Machines

Other H556/H557 machines

5510L with NIC Fax option

T.38 standard machines

3. SCANNER FUNCTION SPECIFICATIONS

Functions

Sends (as attachment) a monochrome or color original scanned by the NIC fax unit.

NOTE: For EU/Asia basic models, Color Unit Type 410 is required for color scanning.

File Formats

TIFF (monochrome), JPEG (Color), PDF (monochrome or color). File format can be selected with User Parameter SW17 (11[H]) Bit 5.

Transmission Resolution

Monochrome, Color
600 x 600 dpi, 400 x 400 dpi
300 x 300 dpi, 200 x 200 dpi
(600 x 600 dpi can be switched off and on with User Parameter SW20 (14[H]) Bit 2.)

Monochrome - 200 x 100 dpi
Color - 100 dpi x 100 dpi

Destination

Mail address

Transmitting Methods

Monochrome Original
- Memory Sending
Color Original - Immediate Sending

Transmission Paper Size

A4 - 210 mm
LT - 210 mm

Receiving Unit

Monochrome - This machine, PC
Color - PC

Quality Adjustment

RGB (5 level)
Contrast/color

4. LAN FAX SPECIFICATIONS

Main Features

- Sends documents created with a software application over a LAN to another fax unit using a telephone line.
- Installer includes the LAN Fax driver and Address Book.
- Destinations specified with Quick, Speed, Group, Temporary dialing.

Resolution

200 x 100 dpi, 200 x 200 dpi, 400 x 400 dpi, 600 x 600 dpi
(600 x 600 dpi requires 40 MB memory option and User Parameter Setting SW20 (14[H]) Bit 2 enabled.)

Selectable Functions

Sending at specified time, user codes, print fax header, save as file, duplex printing.

Compatible Computers

IBM compatible PC/AT

Compatible Operating Systems

Windows 95, Windows 98, Windows Me, Windows XP, Windows NT 4.0, Windows 2000

Software Utilities Provided

LAN-Fax/Address Book
SmartNet Monitor for Client/Admin
DeskTop Binder V2 Lite
Scan Router V2 Lite

5. WEB STATUS MONITOR SPECIFICATIONS

Main Features

Allows use of a Web browser to monitor the activity and settings of this machine connected to the LAN

Compatible Computers

IBM compatible PC/AT

Compatible Operating Systems

Windows 95, Windows 98, Windows Me, Windows XP, Windows NT 4.0, Windows 2000

Compatible Web Browsers

Internet Explorer 6.0

Netscape Communicator 4.78

Netscape 6.2

(Browser requires the IP address entry of this machine.)

APPENDIX A

1. LAN BASICS

1.1 LAN CONFIGURATIONS

1.1.1 OVERVIEW

A LAN (Local Area Network) links computers within an installation such as a building or factory. It consists of communications hardware such as interface boards and cables, and software for the computers that are to be connected.

1.1.2 BASIC TYPES

The following three configurations are available for linking computers. The different wiring configurations are often referred to as 'topologies'

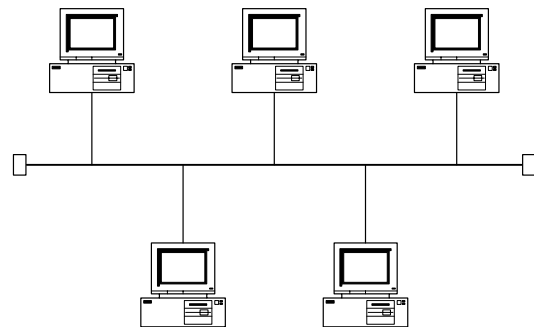
With all three topologies, signals sent from one computer go to all other computers. An address is included at the start of the data so that it is ignored by all computers except the destination.

Bus Configuration

One central cable is installed, with computers connected to it in branch fashion. All data is sent via the central cable.

Network Topology

a) Bus Connection

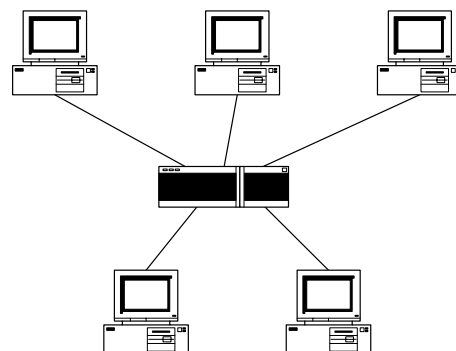


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Star Configuration

A central hub is used, with computers connected around it. All data is sent from the central hub.

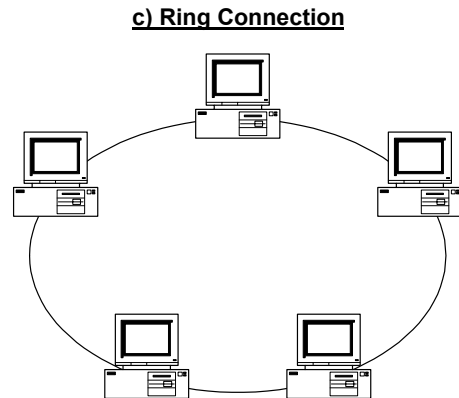
b) Star Connection



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Ring Configuration

Computers are connected in a ring.



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Because the data sent by one computer reaches all the others, only one computer may send data at any one time, or there will be a collision of data on the circuit. If one computer continues sending data, it will occupy the LAN to the exclusion of all others. To prevent this problem, data is limited to a length of a few kbytes. These small units of data are referred to as 'packets' or 'frames'.

1.1.3 AVOIDING DATA COLLISION

Collisions occur when data is sent from a number of computers simultaneously. Two methods are employed to prevent this.

- (a) The computers detect whether there is any data on the LAN, and only send when the LAN is free. There are several ways to do this. A typical method is CSMA/CD, which is used with Ethernet applications.

CSMA/CD (Carrier Sensing Multiple Access/Collision Detection)

A method by which multiple computers have access to the transmission route (referred to as 'multiple access'). The computers monitor the transmission route for data (carrier sensing), and send data if none is currently being sent. If a data collision is detected, the data is resent after a randomly determined wait time.

- (b) Token passing, in which collision of data is avoided before the event. Tokens ensure that the data only goes to the intended computer.

The various connection configurations and ways of avoiding data collision have resulted in a number of different types of LANs. The different types are incompatible when directly connected to each other, thus requiring the use of relay devices.

Main LAN Types and Their Characteristics

Type		Cable connection configuration	Transmission speed	Cables	Access control (collision avoidance)	Remarks
Ethernet	10Base-5	Bus	10 Mbits/s	Thick coaxial	CSMA/CD	The original Ethernet configuration
	10Base-2	Bus	10 Mbits/s	Thin coaxial	CSMA/CD	A simplified version of 10Base-5
	10Base-T	Star	10 Mbits/s	Twisted-pair	CSMA/CD	Currently the main type in use
Token ring		Star	4 Mbits/s or 16 Mbits/s	Twisted-pair	Token passing	IBM standard LAN
FDDI		Ring and star	100 Mbits/s	Optical fiber, twisted-pair	Token appending	Used primarily for trunk lines
Local Talk		Daisy chain	230 kbits/s	Twisted-pair	Proprietary	Fitted as standard to Macintosh PCs

* The NIC fax uses 10Base-T.

1.2 ETHERNET

1.2.1 OVERVIEW

Ethernet is currently the commonly-used LAN. It was originally developed by DEC, Intel, and Xerox. The original Ethernet standard incorporated what is now known as the 10Base-5 specialized Ethernet coaxial cable.

The IEEE802.2 standard was based on the Ethernet standard. Specifications for hardware components such as cables, were revised.

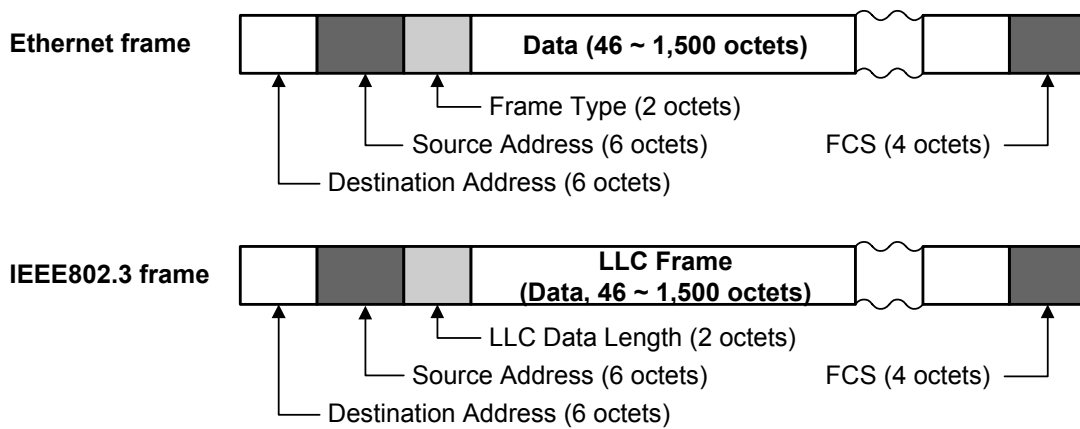
IEEE802.3 was then developed for use with media other than 10Base-5. 10Base-2, 10Base-F, and the most widely used 10Base-T, were subsequently developed.

In contrast to the Ethernet standard data transfer speed of 10 Mbps, IEEE802.3 allows data transfer at speeds between 1 and 20 Mbps.

1.2.2 ETHERNET FRAME STRUCTURE

Ethernet frames consist of the addresses of the source and destination computers, an identifier for the type of protocol used, the data, and finally the FCS (which is used to check whether or not the data has been correctly sent and received).

Compare the Ethernet frame type and the IEEE802.3 frame type in the following diagram.



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- **FCS (Frame Check Sequence):**
A CRC (Cyclic Redundancy Check) is employed to check whether or not the received data is correct. The receiving device (receiving node) reconstitutes the FCS from the received data. If it does not match the sent FCS, that frame is discarded as corrupted.
- **Identifier:**
Indicates the type of data that follows. The identifier is referenced by the receiving node to determine the type of protocol used to send the data.
- **Octet:**
A unit employed to indicate network data size. 1 octet is 8 bits (1 byte). The term is used to make a clear division into 8-bit units from a continuous stream of 1s and 0s with no inherent division into bytes.
- **LLC (Logical Link Control):**
The name of the data frame defined in IEEE802.3.
- **Node**
A computer or printer connected to the network.

1.2.3 MAC ADDRESSES

To allow each node in the network to communicate with others, it must have a unique identifier. In the Ethernet standard, a 48-bit address known as the MAC (Media Access Control) address is assigned to each computer. Each data frame contains the MAC addresses of the source and destination computers.

The MAC address is a fixed physical address that is set on the network card. It is six bytes in length for the Ethernet standard. The first three bytes are a header code which is controlled and allocated by the IEEE, and the last three bytes are a code independently controlled with each header (to prevent duplication). This ensures that the physical address of each Ethernet card is unique.

Under the Ethernet standard, frames are sent and received using these addresses (see 'Ethernet Frame Structure').

1.3 LAN HARDWARE

1.3.1 OVERVIEW

The basic LAN configuration consists of four hardware items.

- Interface boards - also known as LAN boards or Network Interface Cards (NICs):
Convert digital data into electrical signals, prevent data collision, and transmit data on cables
- Cables:
Primarily unshielded twisted-pair (UTP) and optical fiber cables
- Hubs:
Distribute signals
- Relay devices:
Connect LANs for the transmission of data to remote locations

LAN devices are regulated by IEEE (Institute of Electrical and Electronic Engineers) standards.

In addition to hardware, the following types of software are also needed.

- Transmission protocol software that can transmit data via a variety of relay devices
- Applications (database, e-mail), to provide the data in a format usable by the operator

1.3.2 RELAY DEVICES

Relay devices are required to expand LANs. These devices do the following.

Extending the Connection Distance

LANs allow high-speed transmission of data, achieved by sending high frequency signals over the cables. High frequency signals are considerably attenuated when transmitted over the cables, and signal waveforms are easily distorted, resulting in difficulties when transmitting over long distances (the maximum distance for transmission using twisted-pair cables to connect the hub and terminals with 10Base-T is 100m).

When expanding a LAN, relay devices are used to amplify the attenuated signals. Distorted signals are first converted back to digital format and regenerated to remove the distortion.

To cover even more remote locations, telecommunications companies provide dedicated lines, PSTN lines, and ISDN lines for connection to remote LANs.

Connection between Networks of Different Standards

As the types of cable used, and the signal and data format differ between different LAN systems, such systems cannot be connected directly. When a LAN system has to be connected to a different system, a relay device that can convert between the two systems is employed.

Conversion between different LAN systems involves first converting the signals back to digital format, and resending them in a format appropriate for the destination LAN.

Control of High-speed Transmission Routes

As the network grows, the number of connected computers increases, and so does the volume of data transmitted. There is a limit to the amount of data that can be transmitted on the network. When this is exceeded, the flow of data is impeded and communications are no longer possible.

There are a number of ways to increase the speed of data transmission on a LAN. A high-speed LAN may be used to prevent network congestion when the amount of data to be transmitted is large. When connecting LANs of different transmission speeds, relay devices are required that can convert between the two LAN types.

By-pass circuits may be installed when connecting LANs with relay devices. When there is a complex web-like interconnection of networks, there are a number of routes to the destination, so that busy parts of the network can be by-passed.

Filtering

There are also relay devices that can check the data on the network and remove all except that which is necessary. This is referred to as 'filtering'.

Controls which pass only specific protocols (used for the transmission of data and voice between terminals on networks such as TCP/IP, IPX/SPX, AppleTalk) are used to alleviate congestion in the relay circuits.

As the number of users increases, the network is used for greater variety of purposes, resulting in the entry of data through illegal access. Relay devices to limit access and to maintain security become necessary.

1.4 TYPES OF RELAY DEVICES AND GATEWAYS

Relay devices may be of various types - repeaters, bridges, switches, routers - depending upon their purpose and principles of operation.

Types of Relay Devices and their Functions

Function	Repeater	Bridge	Switch	Router
Cable extension	○	○	○	○
Connection with remote sites	✗	○	✗	○
Connection with different LAN types	✗	○	○	○
Avoiding congestion	✗	○	○	○
Restricting access	✗	✗	✗	○

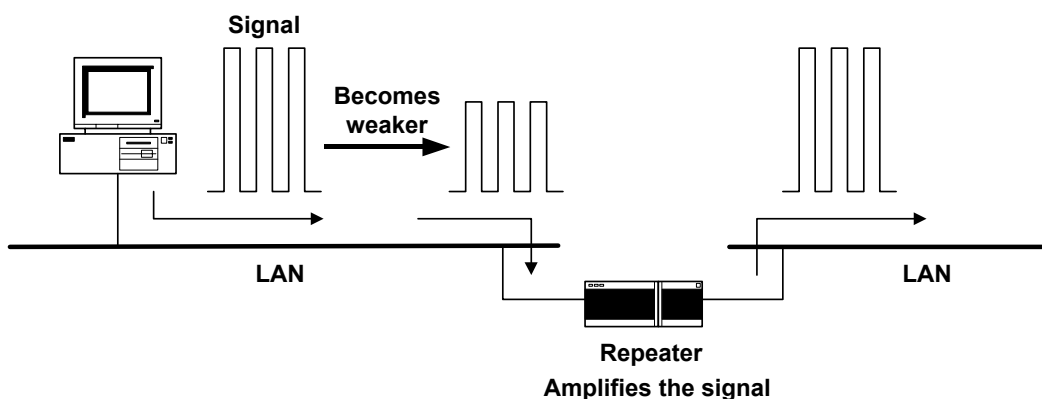
1.4.1 REPEATERS

A repeater amplifies signals. It is normally connected to a number of LANs, and amplifies signals from one LAN (one segment) and outputs it to another LAN (another segment).

It is considerably cheaper than a bridge or router, and does not require special setup. After power is switched on, the repeater connects to the two networks.

As distortion occurs when signals are amplified, the number of repeaters is limited to two with Ethernet.

Repeaters have no ability to store data, and are unable to prevent collisions when sending signals. Therefore, they have no effect on relieving congestion in a network.



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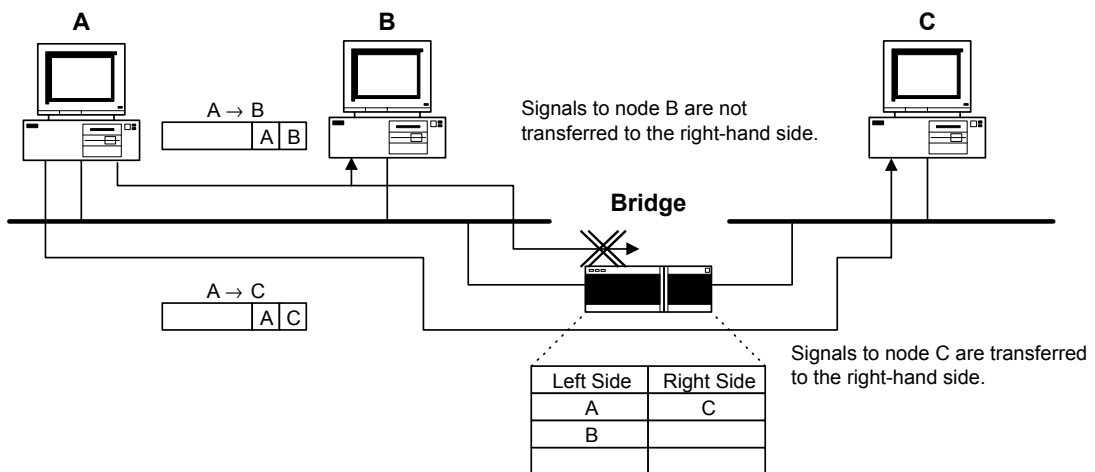
1.4.2 BRIDGES

In the same way as a repeater, a bridge converts received electrical signals back to digital format, and then regenerates the original electrical signals for transmission, thus preventing signal distortion.

Bridges can also filter out unnecessary data, and can act to alleviate congestion on the network. The bridge records the source MAC address in the header of the arriving data packets. In this way, the bridge builds up a picture of the location of each node (PC and printer).

In the example shown below, data sent from A to B also reaches the bridge. The bridge automatically records this data and remembers that A is located in the left-hand segment. When data is subsequently sent from B to A the bridge does not relay it to the right-hand segment. This process is referred to as filtering.

The bridge does not require special setup. After power is switched on, the bridge connects to the two networks.

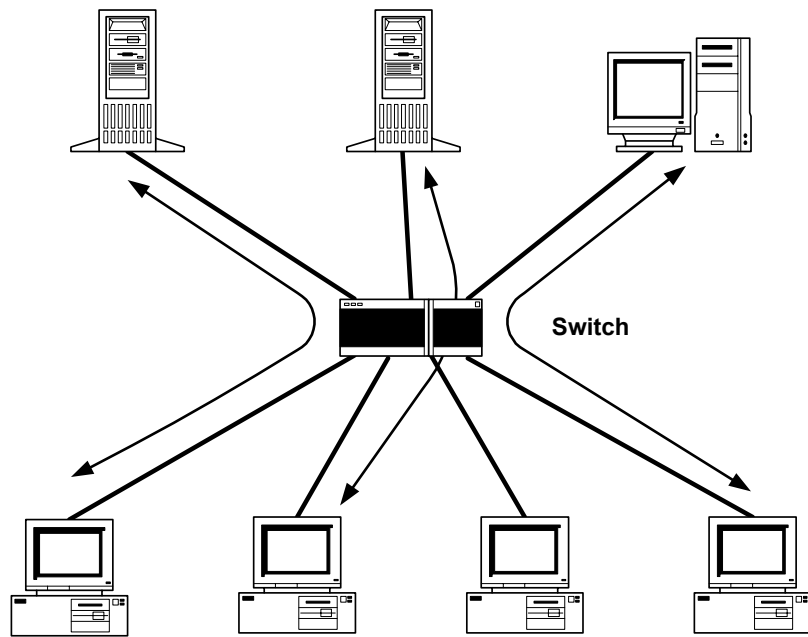


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1.4.3 SWITCHES

Switches have the same filtering function as bridges, however they also support simultaneous connection of multiple LANs, and allow parallel relaying.

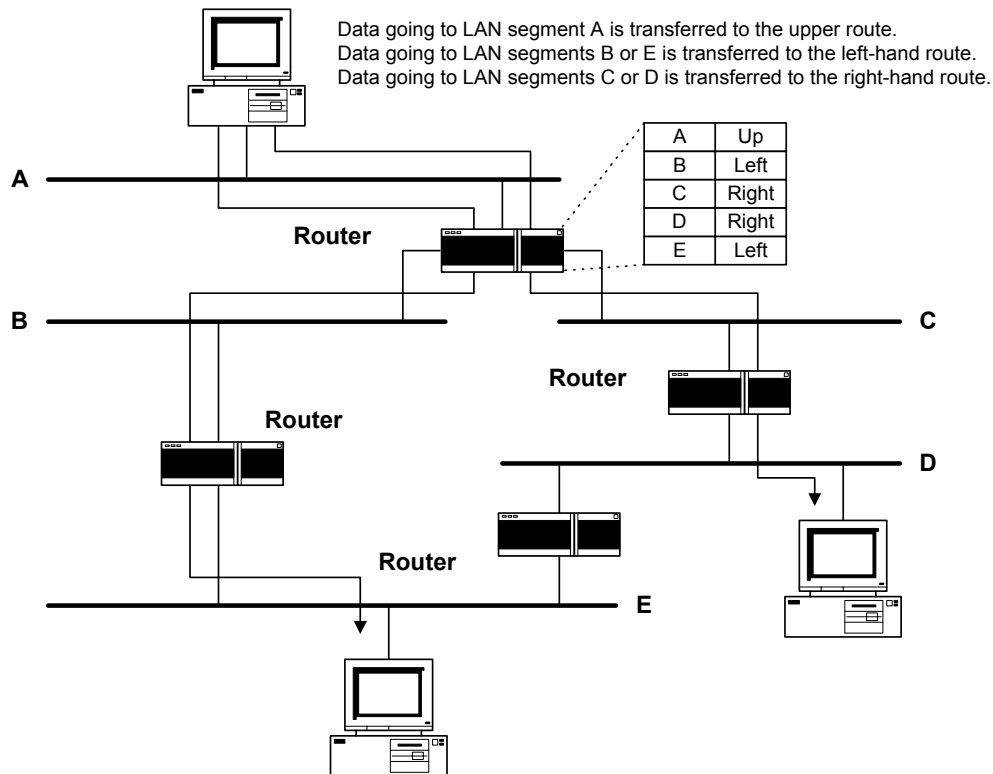
Relay processing time is reduced in comparison to bridges, and operation is therefore faster.



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1.4.4 ROUTERS

A router checks the destination information in the headers of the data packets on the network and determines which LAN it has to be sent to. The router contains a table which records the destinations.



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In contrast to repeaters and bridges, simply switching power on and connecting to the networks does not make ready the router for operation. Software appropriate for the communications protocol must first be installed, the network configuration checked, and the setup completed.

While filtering with bridges is implemented primarily by the checking of addresses, filtering with a router is implemented by the communications protocol.

Depending upon the application protocol, the router may be set to pass e-mail data, but not to transfer files.

Routers support considerably more sophisticated functions than bridges. For example, they may be set up to allow high priority data to be passed more quickly (priority control). Different LAN types have different formats for the destinations. The router makes sure that the destination is in the correct format for the next network.

When there are multiple routes to the destination, bridges and switches cannot be employed to reduce congestion since the data is sent via all routes. Routers, on the other hand, employ a number of routes set beforehand in accordance with the amount of data to distribute the load throughout the network (while bridges divide

up the network with MAC addresses, routers achieve this, in the case of a TCP/IP protocol, by analyzing IP addresses and sub-nets).

The router is a device central to the configuration of the network, and as such router functions are implemented in software in PC LAN servers and UNIX machines.

NOTE: In the NIC fax, the device setting the IP address as the default gateway is in practice a default router. When data is sent from the network belonging to the local machine to other networks, the device at the exit from the network is referred to as the default router.

1.4.5 GATEWAYS

While repeaters, bridges, and routers are available as dedicated hardware for network use, gateways are available as server and client software packages. They analyze all network communications protocols, and convert data, thus allowing connection of different networks. The Netware Gateway Service supplied with the WindowsNT Server is an example of this software.

1.5 NETWORK PROTOCOLS

1.5.1 OVERVIEW

Network protocols are standard procedures for transmitting data over a network. There are different protocols for different stages of the communication.

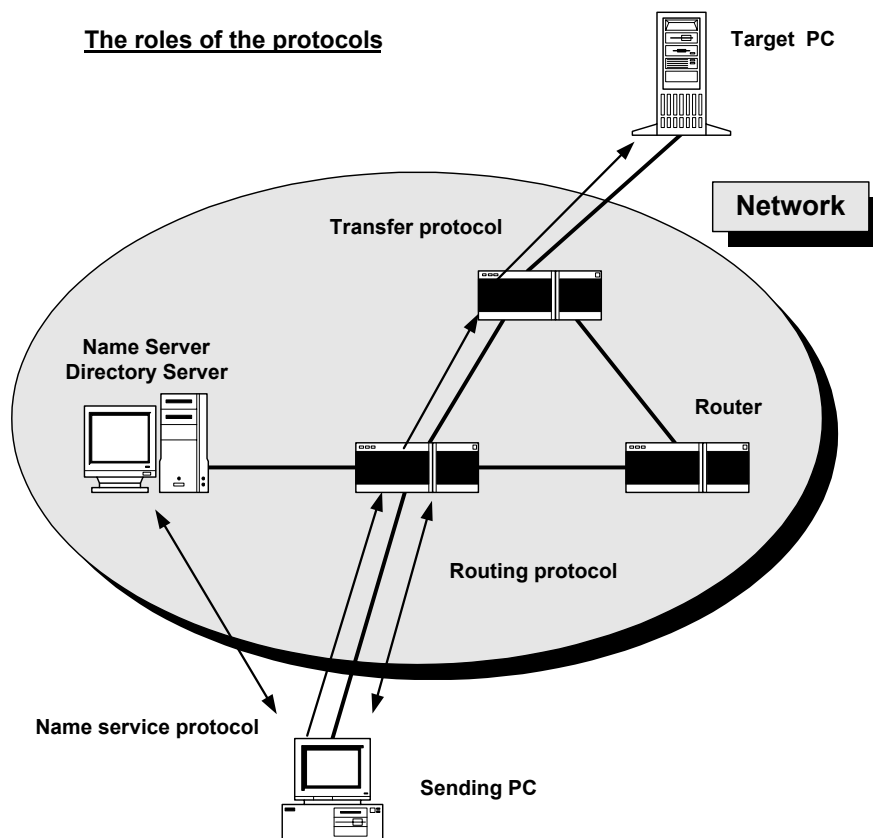
1.5.2 DATA TRANSMISSION

Data is sent using the following procedures.

- (1) Finding the destination
- (2) Determining the route to the destination
- (3) Sending the data

A number of protocols must be used in combination in order to execute each procedure. The TCP/IP protocol used with the Internet, the Network IPX/SPX protocol, and the Macintosh AppleTalk protocol, are combinations of protocols designed to achieve various specific procedures.

Protocols used for steps (1), (2), and (3) listed above are referred to as (1) the name service protocol, (2) the routing protocol, and (3) the transfer protocol respectively.



Appendix-A

1.5.3 NAME SERVICE PROTOCOL

A computer name is normally assigned to the computer. However, for the purposes of transmitting data, the name is converted to an address indicating its location on the network. The name service protocol provides lists of all names when the destination computer name is unknown.

The address is an identifier used in distinguishing between terminals and nodes on the network. The most common addresses are IP addresses and MAC addresses.

An IP address consists of a network address (to identify the network to which the terminal belongs) and a host address (to identify the terminal within the same network), both of which are set by the user.

A MAC address is registered in the memory of the network interface board by the manufacturer. Each MAC address is unique (no two are alike throughout the world).

1.5.4 ROUTING PROTOCOL

The routing protocol is used in determining the route used to transmit the data. A preset network route may be necessary, or it may be determined automatically by communication between routers.

If relay devices are to be added or moved, it is convenient to have a method of automatically determining new routes. The routing protocol provides this ability.

1.5.5 TRANSFER PROTOCOL

The transfer protocol is used in the transmission of data. It first checks for errors in the received data, and resends it if an error is detected. It also controls the rate at which data is transmitted, by communication between the source and destination.

In addition to these basic protocols, there are also various other protocols which provide for notification of network congestion, notification of errors, and so on.

Protocols Used with Different LAN Types

	Name Service Protocol	Routing Protocol	Transfer Protocol
Protocols used with the Internet (TCP/IP)	DNS	RIP OSPF	IP TCP UDP
Protocols used with Netware (IPX/SPX)	SAP NDS	RIP NLSP	IPX SPX
Protocols used with Macintosh (AppleTalk)	NBP ZIP	RTMP	DDP ASP

DNS: Domain Name Service**RIP: Routing Information Protocol****OSPF: Open Shortest Path First****IP: Internet Protocol****TCP: Transmission Control Protocol****UDP: User Datagram Protocol****SAP: Service Advertisement Protocol****NDS: NetWare Directory Service****NLSP: NetWare Link State Protocol****IPX: Internetwork Packet Exchange****SPX: Sequenced Packet Exchange****NBP: Name Binding Protocol****ZIP: Zone Information Protocol****RTMP: Routing Table Maintenance Protocol****DDP: Datagram Delivery Protocol****ASP: AppleTalk Session Protocol**

1.6 TCP/IP

1.6.1 OVERVIEW

TCP/IP is the standard Internet protocol, and is supported as a standard by Windows 95. It allocates 32-bit network addresses (IP addresses) to the nodes. As the addressing system does not depend upon physical media, TCP/IP provides for considerable flexibility in selection of routes.

The use of TCP/IP is not limited to Ethernet, but allows use of a variety of physical media.

TCP/IP is a combination of the TCP protocol and IP protocol.

1.6.2 COMMUNICATIONS WITH IP PROTOCOL

The IP protocol divides data into packets. When the destinations may be on several different LANs, the router selects the appropriate route for each packet before it is sent. This process is repeated until all data arrives at the destination network.

1.6.3 IP ADDRESS

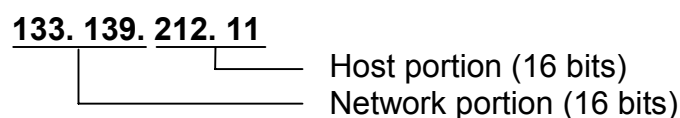
Communications with IP protocol requires that network devices such as PCs and routers using TCP/IP be assigned a 32-bit IP address as a means of identification.

When used in a single closed network, the IP addresses (referred to as private addresses in this case) may be used freely. However, when connected to the Internet, global addresses which are unique throughout the world must be used. Global addresses are managed by the Internet Assigned Numbers Authority (IANA), and are assigned upon receipt of an IP address.

1.6.4 IP ADDRESS FORMAT

IP addresses are 32 bits in length, and are normally converted to decimal notation in four 8-bit blocks as shown below.

Example of IP Address Notation



The IP address consists of host and network blocks as shown above. The network block represents a logical collection of hosts (a network), and the host block specifies a unique host within the network.

In the example above, a maximum of 65,534 (the maximum number of combinations of 16 bits) hosts may be allocated to that particular network block.

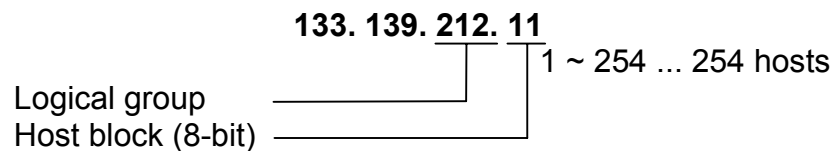
As TCP/IP involves the routing of packets using the address in this network block, the network block must be unique (no two can be alike throughout the world). On the other hand, the address within the host block is up to the user.

1.6.5 SUBNET AND SUBNET MASKS

Subnet masks divide the host block into sub-nets. In the example above, there are 65,534 possible host addresses, and it is difficult to manage all with one network.

The host address block is therefore subdivided into the upper and lower 8 bits, with the upper 8 bits handled as a logical group address. In this way, the IP addresses assigned to a company for its networks can be divided up into sub-nets of about 250 hosts for ease of management (each department of the company can be allocated a different logical group number, for example).

Example: Sub-net



NOTE: The final part of the IP address (the host block) cannot be 0 or 255.

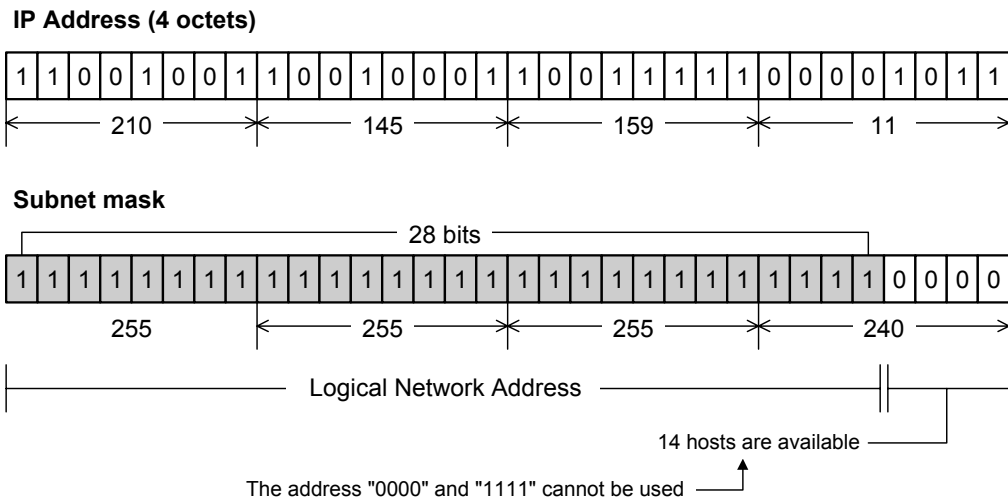
The dividing is done using a parameter known as the subnet mask. The subnet mask blocks off addresses, only permitting certain addresses to be used in a subnet.

A logical AND operation is done using the subnet mask to find the range of allowed sub-net addresses.

If your computer has the IP address 210.145.159.11, and the subnet mask is 255.255.255.0, the server can recognize that machines with an IP address of 210.145.159.* are on the same LAN, so messages are sent to it directly. Any IP address with a different value at the start has to be accessed through a router.

The following diagram shows how the AND operation can be used to limit the size of the subnet to a few IP addresses.

IP address and Subnet mask



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1.6.6 TCP AND UDP

While data is formatted into packets and sent to the desired node on the Internet using IP, communications applications (eg e-mail) do not control data transmission in packets.

The host requires a procedure for passing IP packets to the desired application. This requirement is satisfied with TCP (Transmission Control Protocol) and UDP (User Datagram Protocol).

APPENDIX B

1. E-MAIL BASICS

1.1 PRINCIPLES

1.1.1 OVERVIEW

Electronic mail (E-mail) is a system by which messages in the form of digital data are sent and received between computers. A variety of types of electronic mail are available - Internet e-mail, Microsoft Mail as used with the exchange client under Windows95, and Lotus Notes Mail.

E-mail works as follows.

- Messages are stored at some location.
- Users generally have equal privileges, and are able to both send and receive messages.

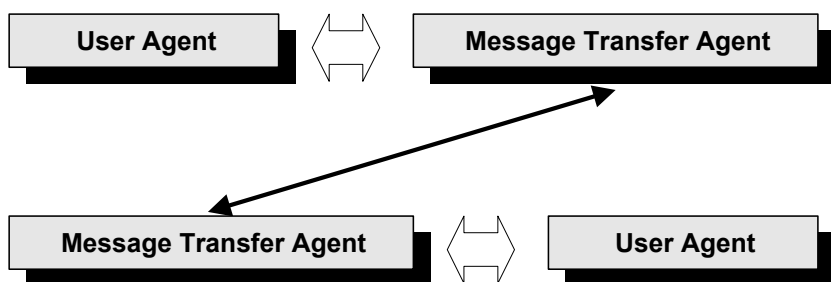
A telephone system requires that users are able talk to each other simultaneously. In the case of e-mail, the user first receives the message, and may then read it at any time, and send a reply if necessary.

1.1.2 SENDING AND RECEIVING

E-mail generally supports the following functions.

- A UA (User Agent) for creating e-mail and displaying received mail.
- An MTA (Message Transfer Agent) to handle transfer of messages.

The mail created by the sending UA is sent from the sending MTA to the receiving MTA, and displayed by the receiving UA.



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The simplest e-mail system is one in which messages are stored at a location accessible by all users. Each user has his/her own mailbox, and the sender puts messages in the recipient's mailbox. The recipient checks his/her mailbox to receive mail.

The mailboxes are normally at one location, often referred to as a "post office", and the process of sending e-mail approximates that of sending mail at the post office.

When the post office is accessible from all computers connected to the network, the system constitutes an e-mail system.

Microsoft Mail as used in Windows95, and Lotus Cc: Mail employ this system, as does the UNIX local mail system (i.e., not connected to the Internet, etc.).

1.1.3 E-MAIL NETWORKS

As the number of users increases, and geographically distant users are connected to the network, multiple post offices must be established, and users are no longer able to use the same post office for sending and receiving mail. A system which connects post offices for the purpose of exchanging mail (a transfer system) then becomes necessary.

In this case, the destination of mail is checked at the post office, separated into the various destination post offices, and passed it to the transfer system. The transfer system then communicates with the transfer systems of other post offices, and transfers the mail to the appropriate post offices. Mail sent from other post offices is sorted into the appropriate mailboxes at the receiving post office.

The above is a general description of an e-mail system. These functions are implemented with the exchange server software packages for Microsoft Mail and CC: Mail using optional gateway software.

The fundamental principles of Internet mail are the same, and are implemented in the UNIX SendMail program under UNIX.

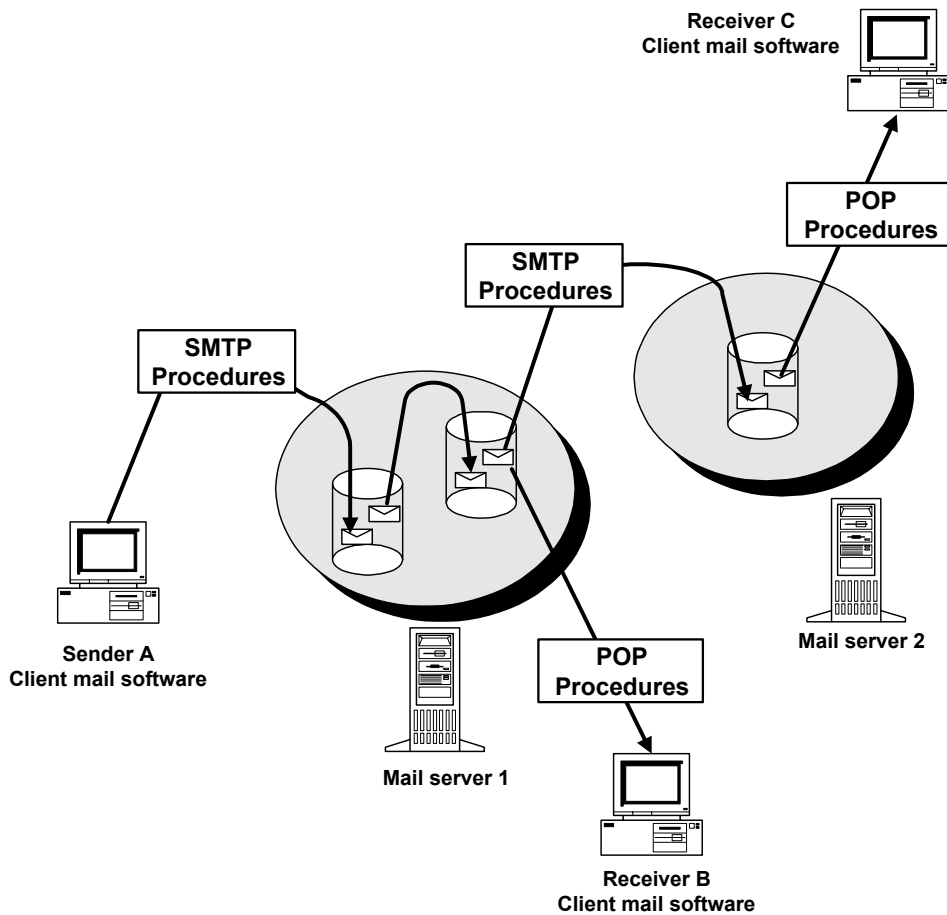
The following diagram shows what happens when somebody sends mail from a PC to a receiver with an account in the same post office and to a receiver with an account in another post office.

Machines A and B both have accounts in mail server 1. Machine C has an account in mail server 2.

When machine A sends the message, it goes to the local mail server using SMTP protocol. SMTP is based on TCP/IP. The post office transfers the message to receiver B's mail box. Receiver B picks the mail up from there, using POP procedures (POP is also based on TCP/IP).

To get to receiver C, the server sends the mail to mail server 2, using SMTP procedures. Mail server 2 puts the incoming mail into receiver C's mail box. Receiver C picks it up using POP procedures.

Some more detail on SMTP and POP follow later in this section.



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1.2 INTERNET MAIL

1.2.1 OVERVIEW

Internet e-mail (hereafter referred to as Internet mail) is a system for creating text messages in accordance with a set of standards, the messages then being sent to destinations using SMTP (Simple Mail Transfer Protocol).

NOTE: SMTP is a protocol for sending and receiving mail as defined in RFC821. It was originally developed for sending and receiving mail between servers. However it is currently used for sending mail from client environments using POP (Post Office Protocol – discussed in a separate section).

1.2.2 CHARACTER CODES

Messages consist of a header and the main text, both being subject to restrictions on usable character codes.

Specifications for data exchanged on the Internet are determined within the organization of the Internet, and do not necessarily conform to ISO (International Standards Organization) requirements. However, these organizations have codified these specifications to the extent that they are now the default standards organizations.

For example, the main text of a message created Japanese using JIS character codes must satisfy a particular set of requirements for transmission on the Internet. However, if it is to be sent on a network within a particular company, the unique requirements of that system may mean that the JIS codes are not always used.

1.2.3 MESSAGE ADDRESS NOTATION

The UA attaches the required header to the main text and sends it to the MTA. The MTA then adds to or changes the header as required to ensure that the message transfer route is recorded, and that the addresses of the destination and sender are correct.

Internet mail employs an 'address' to specify the message destination. The address format is generally as follows.

user name @ domain name

The mailbox name is generally employed as the 'user name'.

The MTA uses the 'domain name' to check the destination IP address with the DNS, and then sends the mail using SMTP.

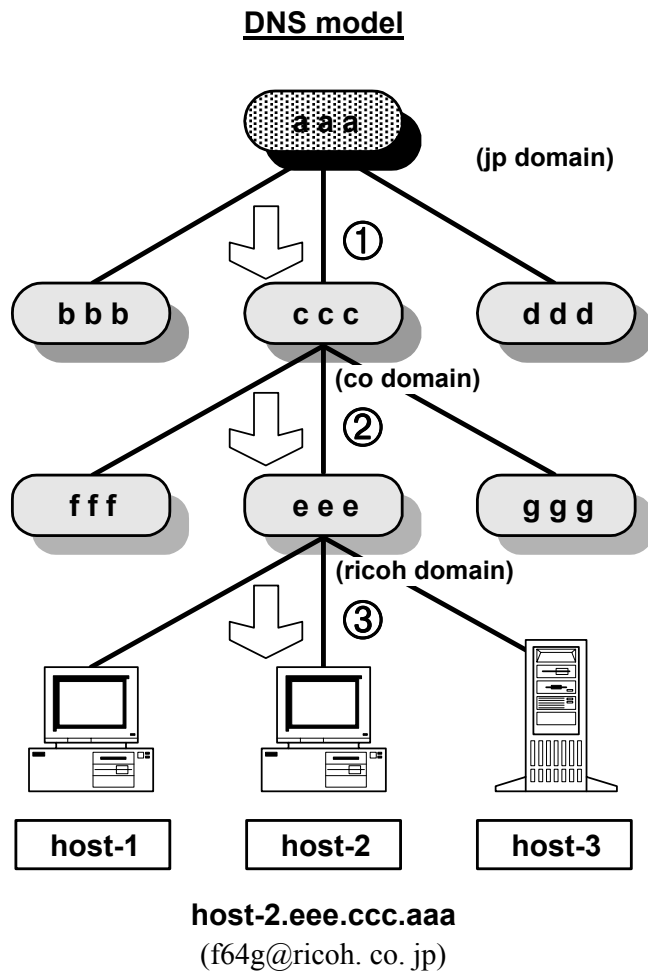
NOTE: DNS (Domain Name System) is a service which enables the IP address to be obtained from the host name under the TCP/IP network environment.

1.2.4 DNS AND DOMAINS

The IP address allows destinations within the Internet to be identified. This IP address is, however, a string of numbers not easily remembered by the user. To resolve this problem, a corresponding name is added so that the user need only specify the name in order to identify the destination.

DNS was developed for this purpose. Internet domain names are distributed among organizations in a hierarchical manner, with lower order domains being managed by the higher order domain. All organizations participating in the Internet have a domain name. The domain name first identifies countries, and is subsequently further divided in a tree structure to identify organizations.

The name server (DNS server) located in each domain holds the information about the domains and hosts under its management. When the client communicates using a host name or domain name, an inquiry is made to the DNS to obtain the destination IP address. Note that this domain name structure is independent of the physical structure of the network. The items in brackets below are examples of domain and mail addresses.



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1.2.5 TRANSFER OF INCOMING MAIL

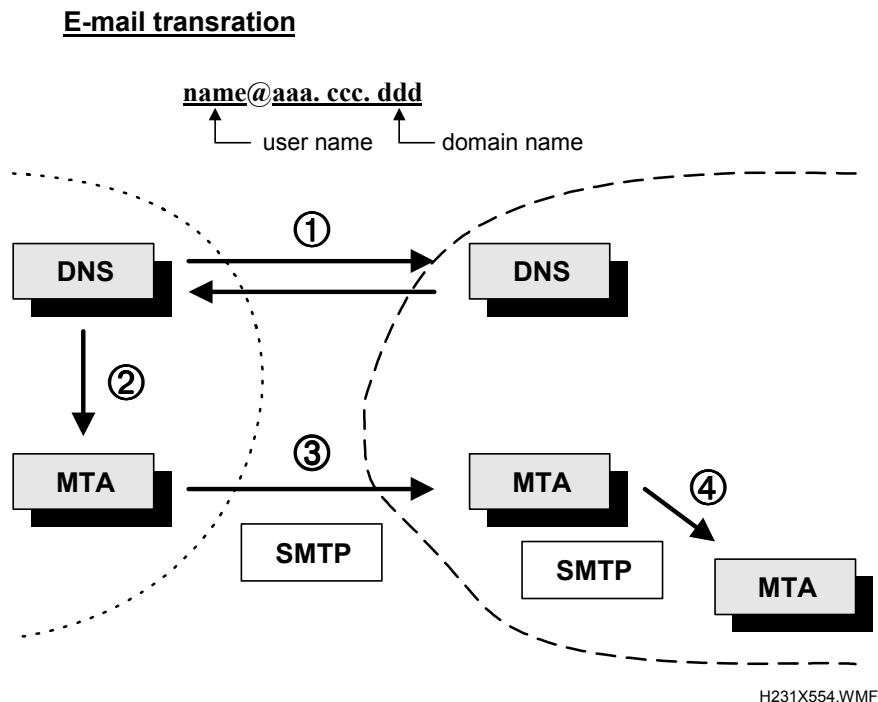
In some cases, incoming mail may be transferred to another server using SMTP and then stored on another mail server.

The UA used by the user receiving this mail detects its arrival by some method (e.g., by monitoring the contents of the directory designated to contain mail) and informs the user of this fact.

The UA then extracts the mail in accordance with instructions from the user and displays it.

The mail stored on the server is transferred to the user's PC using POP.

NOTE: POP (Post Office Protocol) is a protocol used in reading the content of the mail spooler using TCP/IP protocol. It is specified in RFC1725 (see a later section for more details).



The mail address consists of a host name (mailbox name) and domain name. Mail is distributed by first finding the IP address of the destination with the DNS, and then transferring the message using SMTP.

1. The mail destination within the relevant domain is checked using the domain portion of the mail address.
2. The MTA then connects to the destination mail server using the mail address thus obtained.
3. The mail is transferred to the destination MTA using SMTP.
4. Depending upon the size of the organization, the message may be further transferred to an internal MTA (not visible from outside the domain).

1.2.6 VERIFYING INCOMING MAIL

Arrival of mail at the intended destination on the Internet is not guaranteed. In the worst case, it may disappear at some unknown location. Furthermore, it is impossible to verify whether sent mail has been read or not.

Mail sent on the Internet passes through multiple servers and networks, and computers used within the Internet are of a variety of architectures. The network therefore contains a wide variety of hardware environments, in addition to the wide variety of software employed for mail transfer.

While there are no problems in most cases, it is obvious that arrival of mail cannot be completely guaranteed within this complex environment.

1.3 MESSAGE HEADERS

1.3.1 REQUESTS FOR COMMENTS

The basic protocols used for transmission of messages on the Internet are defined in RFC822. RFC822 primarily defines the header information for e-mail, with the details of the main text of the message being defined in MIME (RFC2045 - 2047).

- NOTE:** 1) An RFC (Request For Comments) is a document formally released by the Internet Engineering Task Force (IETF). The IETF has released a wide variety of RFCs on technical matters (e.g., network protocols) related to the Internet environment.
- 2) MIME (Multipurpose Internet Mail Extensions) is a protocol which removed such restrictions as the number of characters per line, and the maximum size of an e-mail transmission. It also made possible the transmission of non-character data (e.g., programs and bitmaps).

1.3.2 HEADER FORMAT

The header of an e-mail message consists of a header and the main text. A blank line is inserted between this header and the main text (the blank line is not included in the header).

The header is defined as a collection of fields, with the field format as follows.

field name ":" content

An example of the 'To' field, indicating the destination, is as follows.

To:XXX@ricoh.com

Header Example:

Received: from F64G.shinyoko.rioh.co.jp ([133.139.167.30]) by bb.shinyoko.rioh.co.jp (4.1/2.8Wb-91Jan07)

id AA15193; Sun, 15 Feb 98 14:53:50 JST

Return-Path: <f64g@shinyoko.rioh.co.jp>

Message-Id: <9802150553.AA15193@bb.shinyoko.rioh.co.jp>

Date: 15 Feb 1998 14:54:06 +0900

X-Mailer: ICFAX Version 1.0

Mime-Version: 1.0

Content-Type: multipart/mixed; boundary = "--ICFAX_60670AE6CB--"

To: hanako@shinyoko.rioh.co.jp

From: f64g@shinyoko.rioh.co.jp

**Subject: Fax Message NO.0003 from "+81454771786"
("RICOH SERVICE")**

1.3.3 HEADER TYPES

While a number of header fields are possible, the following three must be present.

- Date
- From
- To

Message Header Table (fields defined in RFC822)

Field	Field name	Meaning	Description
Date	Date	Date that the mail was created	Date and time in specified format Syntax: <address>
Person submitting mail	From	Person submitting mail	Mail address (including comments) Syntax: <address>
Address	Sender	Person sending mail	Mail address (including comments) Syntax: <address>
	Reply-To	Destination when a reply is sent	Mail address (including comments) Syntax: <address>
	To	Mail destination	Mail address (including comments) Syntax: <address>
	Cc	Destination of carbon copy	Mail address (including comments) Syntax: <address>
	Bcc	Destination addressees not covered by To and CC	Mail address (including comments) Syntax: <address>
Reference	Message-Id	Message ID	Message identification
	In-Reply-To	Source of reply	Message ID of original mail
	References	Referenced mail	Message ID of referenced mail
	Keywords	Keywords for search purposes	Any character string
Other	Subject	Mail title (summary)	Any character string
	Comments	Mail comment	Any character string
	Encrypted	Encryption algorithm specification	Defined word (defined in separate RFC)
Route	Return-Path	Route for return of mail	Mail address
	Received	Transfer record added by MTA	Describes transfer destination, transfer source, and protocol etc with From, By, With, etc
User defined		Fields defined by user	Field names beginning with X-. May be any character string, definition is up to the user.

* Other fields are available defined by separate RFCs (e.g., MIME).

1.3.4 FIELDS FOR SENDING E-MAIL

From Field

The From field indicates the person sending the mail. The difference between the From and Sender fields is that between 'the person creating the message' and 'the person actually sending the message'. These two fields are used when the two differ. When the From field is omitted, the Sender field is added automatically.

When a error occurs, a error notification is sent to the destination in the Sender field. When the Sender field has been omitted, the notification is sent to the destination in the From field.

Fields containing mail addresses may also include real names as a comment (the same applies to the Person Sending Mail and Addressee fields). In both cases below, 'IC FAX' is handled as a comment, and f64g@ricoh.com is recognized as the address.

Example 1 From: IC FAX <f64g@ricoh.com>

Example 2 From: f64g@ricoh.com (IC FAX)

Multiple mail addresses may be delineated by commas, and both address formats may be used together.

Reply-To Field

Reply-To clearly specifies the address to which the reply is to be sent. As this field may be omitted, it is possible that mail may be sent with this field blank. In such cases, the mail is returned to the address in the From field.

When both the From and Reply-To fields are used, the latter has priority.

The Return-Path field appears to have a similar function at first glance,. However it is not for return of mail, but is automatically added by the transfer system to specify the person submitting the mail, and is used to investigate the mail route when an error occurs.

1.3.5 ADDRESSEE FIELDS

To Field

The To field specifies the addressee for the mail. As with the From field, multiple mail addresses may be delineated with commas. The To field differs from the Cc field in that only the name of the person sending the message is specified.

Cc Field

Mail is sent to the addresses in the Cc (carbon copy) field in the same way as to the address in the To field. The difference only with the To field is whether the name is in the To field or the Cc field of the received mail.

Bcc Field

Bcc means Blind Carbon Copy. The Bcc field is deleted in mail sent to the addressees in the To and Cc fields. It is most commonly used when the address of the person sending the mail (the user in the From field) is to be entered in order to leave a copy of the sent mail.

As some mail software saves a copy of the sent mail, it may not be possible to specify the Bcc field in some cases.

Exceptions

The addressee fields do not always contain the addressee's name when mail is received. This is because since the actual addressee for the mail is specified by the MTA, when an alias is used to create a virtual addressee (in a local system, for example), the virtual address remains in the To field. This also occurs in cases such as mailing lists in which mail is sent to all on the mailing list.

- NOTE:** 1) An alias is a group address. Mail sent to the group address is sent to all members in the group.
- 2) A mailing list is a form of electronic conference using e-mail. E-mail sent to a mailing list is transferred to each member of the list. As such, it provides the same service as available with a PC-based centralized host-type bulletin board system in a distributed network environment.

1.3.6 DATE

The Date field indicates the date on which the mail was created (not the date it was sent). The date is in the following format.

Day, date month year hour: minute: second zone

Zone indicates the local time used in the system in which the mail was created, and is expressed as GMT+/-hhmm.

1.3.7 MISCELLANEOUS

Received Field

The Received field is used by the MTA sending the mail, to record the status of the mail. This field shows the route over which the mail was sent, and the computers which handled it prior to delivery.

In addition to information showing when and where the mail originated, and where it was sent to, some systems add further information (e.g., host IP address, software version) as a comment.

Message-Id Field

Internet mail adds an internationally unique message ID. This ID is created automatically, and is normally a combination of the time the message was sent and the name of the mail server.

1.4 SMTP

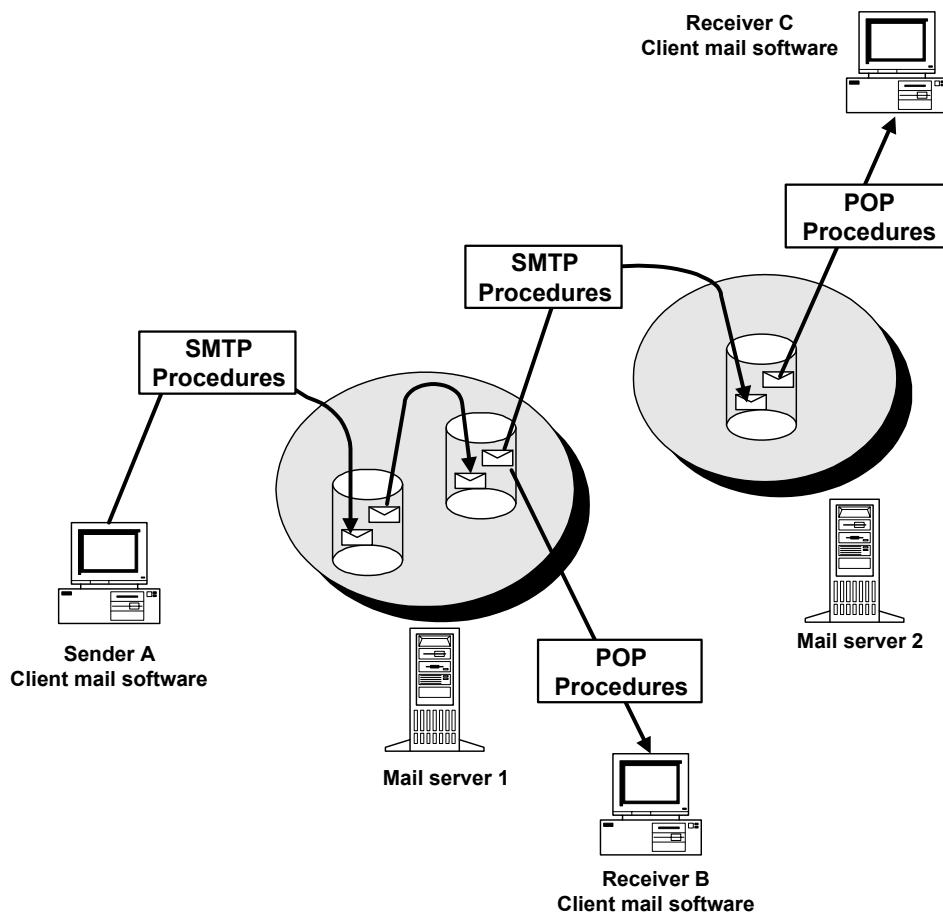
1.4.1 OVERVIEW

SMTP (Simple Mail Transfer Protocol) is used as the protocol for communication between Internet mail MTAs. It is defined in RFC821, which covers 8-bit data communications and message size negotiation, etc. SMTP is expanded upon in RFC1651 and RFC1653 as ESMTP.

SMTP uses text-based commands and responses between the client and server. In practice, it is a protocol used under TCP/IP, and data is therefore sent and received under TCP. Retry processing with communications errors is therefore handled at the TCP/IP level, and SMTP therefore needs only to handle sending and receiving of data, and command errors.

1.4.2 SMTP COMMANDS

SMTP commands are sent, and responses received, between the client and server when sending Internet mail. This communication involves sending of the domain name, sender's name, destination name, and main text etc to the server, and user verification.



H231X509.WMF

1.5 POP

1.5.1 OVERVIEW

E-mail on the Internet was originally transferred between hosts using SMTP, with the computer receiving the mail being operated all day long under the control of SMTP.

In practice, the use of dial-up IP connections to connect to the mail server via telephone lines, and the fact that the power supply may be switched off when the user returns home in the case of PC clients, means that mail cannot be transferred until the user connects to the server.

POP (Post Office Protocol) servers are used in such cases, i.e., when the connection is not permanently established.

1.5.2 POP SERVER CONFIGURATION

The POP server is a computer which receives user mail using SMTP. The mail for the user includes a setting to ensure that it is directed to the POP server.

Following connection to the Internet, the user receives e-mail directed to the server with POP procedures.

As with SMTP, POP is text-based, and as such sends command lines and receives responses, as well as sending instructions for user identification by clients, transmission of passwords, acquisition of mail, and deletion of mail on the server.

1.6 MIME

1.6.1 OVERVIEW

Audio messages and image files cannot be sent without further processing, if mail is restricted solely to characters.

MIME (Multipurpose Internet Mail Extensions) is a specification for the inclusion of various types of data in e-mail, and currently supported by almost all e-mail software for attachment of files.

MIME is defined in RFCs 2045 - 2049.

1.6.2 MIME FUNCTIONS

MIME supports the following functions.

- Inclusion of multiple objects in e-mail. other than text, each able to be handled at the receiving end.
- Binary encoding.
- Insertion of non-ASCII code characters (eg names in Japanese) in the header.

As MIME is a set of conventions which dictate how the main text of the message is to be handled, it employs a character string, referred to as the MIME header, to specify the content and method of encoding used, and to identify whether or not MIME is used in the mail.

1.6.3 MIME HEADER

Messages using MIME contain a header field as follows.

MIME-Version: 1.0

The use or not of this field determines whether or not the main text of the message follows the MIME conventions. Currently, only Version 1.0 of MIME exists.

MIME Header

Header	Meaning	Format
MIME-Version	Indicates that the message uses MIME	MIME-Version: 1.0
Content-Type	Message data type	Content-Type: Type/Subtype [;parameter]
Content-Transfer-Encoding	Encoding method used when sending data	Content-Transfer-Encoding: Encodingtype
Content-ID	A unique data ID. Uses the message ID.	Content-ID: Message ID
Content-Description	Data description	Content-Description: "This is MIME Data"
Content-	MIME header for future expansion	—

[Content-Type] is added to the header to indicate that a message is in MIME format. The [Content-Transfer-Encoding] header is also added as necessary to indicate how the data has been encoded. As some types of data do not require encoding, the [Content-Transfer-Encoding] header is not always required.

The [Content-Description] header is used when including comments. The content of this header is interpreted as comments referring to the content of the message, and has no effect on operation of the software.

1.6.4 DATA TYPES SUPPORTED WITH MIME

The following data types may be specified in the [Content-Type] header.

- Text: Information consisting of characters. The ISO-2022-JP character code set is used in Japan, while US-ASCII is used for ASCII codes.
- Image: Still images such as GIF and JPEG data.
- Audio: Audio information.
- Video: Digital animation such as animation and MPEG.
- Application: Various application files and standard data formats.
- Multipart: Main text which includes multiple objects. A MIME header is also added within the message to record other messages. Use of this data type allows sound, animation, and messages to be included in the same e-mail message.
- Message: Text message information.

1.6.5 MULTIPART

A data type which allows inclusion of multiple data items (objects). It allows for the inclusion of text and attached files in messages, and is the most commonly used type.

Multipart indicates the inclusion of multiple parts (data) in the main text, while the Content-Type header indicates how the individual parts are handled.

Multipart supports the following sub-types to indicate the relationship between the individual parts.

- Mixed: The message consists of multiple independent parts.
- Alternative: The message consists of multiple parts of the same content, but in different format.
- Parallel: The message consists of multiple parts which are reproduced and displayed simultaneously.
- Digest: A collection of RFC822-format messages in digest format.

Example: Received Multipart Mail Header

Received: from f64g.shinyoko.ricoh.co.jp ([133.139.167.30]) by bb.shinyoko.ricoh.co.jp (4.1/2.8Wb-91Jan07)

id AA15193; Sun, 15 Feb 98 14:53:50 JST

Return-Path: <f64g@shinyoko.ricoh.co.jp>

Message-Id: <9802150553.AA15193@bb.shinyoko.ricoh.co.jp>

Date: 15 Feb 1998 14:54:06 +0900

X-Mailer: ICFAX Version 1.0

Mime-Version: 1.0

Content-Type: multipart/mixed; boundary = "--ICFAX_60670AE6CB--"

To: taro@shinyoko.ricoh.co.

From: f64g@shinyoko.ricoh.co.jp

Mail header

Subject: Fax Message NO.0003 from "+81454771786"
("RICOH SERVICE")

text message here

---ICFAX_60670AE6CB--

Content-Type: image/tiff; name = "FAX.TIF"

Content-Transfer-Encoding: base64

Part header

Content-Discription: "FAX.TIF"

SUKqAAgAAAAARAP4ABAABAAAAAgAAAAABBAABAAAAwYAAAAEBBAABAAAAggQ
AAAIBAwABAAAAAQAAAAAMBAwABAAAAAwAAAAAYBAwABAAAAAooooBAwAB
AAAAAgAAABEBBAABAAAA6gAAABUBAwABAAAAAQAAABYBBAABAAAAggQAABc
BBAABAAAA7FwAABoBBQABAAAA2gAAABsBBQABAAAA4gAAACQBBAABAAAAABAA
AACgBAwABAAAAAgAAACkBAwACAAAAAABADEBAgAEAAAAICAgIAAAAAADIAAA
AAQAAAGQAAAAABAAAAAICWUG1JAYCWUG1JAYA6XQIVNAqxa5L5Sa8AgEktODg4I
WwuCCGOPMJQpVUFgSUU0risFhyDBBMRXPRSM0czZRVIJhLoRid2yafCjODgCNYmUC
HEpR8AgEmxOC7H5ThDwedZLzHXqpfk9bOjWQGAslkBgLJZAYCyWQGAslkBgLJZAYC
yWQGAslkBgLJZAYCyWQGAslkBgLJZAYCyWQGAslkBgLJZAYCyWQGAslkBgLJZAYC
yWQGAslkBgLJZAYCyWQGAslkBgLJZAYCyWQGAslkBgLJZAYCyWQGAslkBgLJZAYC
yWQGAslkBgLJZAYCyWQGAslkBAA==

---ICFAX_60670AE6CB---

A Multipart message contains multiple parts, with the strings which delineate these parts being specified with the boundary parameter.

Each part is delineated with

--boundary_string

and the final part is indicated with

--boundary_string--

1.6.6 BINARY DATA ENCODING

The binary data must be encoded as character strings in order to insert a binary file into a text message. In Internet mail, non-ASCII data such as single-byte Katakana in Japanese is not sent correctly.

This encoding method is indicated in the [Content-Transfer-Encoding] field in the MIME header. The following encoding methods may be specified in the [Content-Transfer-Encoding] field.

- 7-bit: 7-bit code (8th not used)
- 8-bit: Full 8 bits used
- Binary: Binary data
- Base64: Encoding of binary data in base64 notation
- Quoted Printable: Encoding of character subject binary data

Of the above, only 7-bit, Quoted Printable, and Base64 are normally used with e-mail. Other encoding methods cannot be used unless they are supported over the network.

1.6.7 BASE 64

Base 64 is commonly supported in e-mail application software for the transmission of binary data.

This method of encoding takes each six bits of the original binary data and converts it to numbers between 0 and 63, each of these numbers being assigned to one of 64 characters (26 upper case characters of the alphabet, 26 lower case characters of the alphabet, the numbers 0~9, and the + and / symbols).

APPENDIX C

1. MAIL POROTOCOL

1.1 SMTP COMMANDS

Command	Syntax	Responses
HELO (Hello)	HELO <domain>	S:250 <domain> E:500,501,421
	<p>This command is used to identify the sender-SMTP to the receiver-SMTP. The argument field contains the host name of the sender-SMTP. The receiver-SMTP identifies itself to the sender-SMTP in the connection greeting reply, and in the response to this command. This command and an OK reply to it confirm that both the sender-SMTP and the receiver-SMTP are in the initial state, that is, there is no transaction in progress and all state tables and buffers are cleared.</p>	
MAIL (Mail)	MAIL FROM:<reverse-path>	S:250 F:552, 451, 452
	<p>This command tells the SMTP-receiver that a new mail transaction is starting and to reset all its state tables and buffers, including any recipients or mail data. It gives the reverse-path which can be used to report errors. If accepted, the receiver-SMTP returns a 250 OK reply. The <reverse-path> can contain more than just a mailbox. The <reverse-path> is a reverse source routing list of hosts and source mailbox. The first host in the <reverse-path> should be the host sending this command.</p>	
RCPT (Recipient)	RCPT TO:<forward-path>	S:250, 251 F:550, 551, 552, 553, 450, 451, 452 E:500,501,503
	<p>This command gives a forward-path identifying one recipient. If accepted, the receiver-SMTP returns a 250 OK reply, and stores the forward-path. If the recipient is unknown the receiver-SMTP returns a 550 Failure reply. This second step of the procedure can be repeated any number of times. The <forward-path> can contain more than just a mailbox. The <forward-path> is a source routing list of hosts and the destination mailbox. The first host in the <forward-path> should be the host receiving this command.</p>	

Command	Syntax	Responses
DATA (Data)	DATA	I:354 F:451, 554 E:500, 501, 503, 421 after transmitting data; S:250 F:552, 554, 451, 452
	<p>If accepted, the receiver-SMTP returns a 354 Intermediate reply and considers all succeeding lines to be the message text. When the end of text is received and stored the SMTP-receiver sends a 250 OK reply. Since the mail data is sent on the transmission channel the end of the mail data must be indicated so that the command and reply dialog can be resumed. SMTP indicates the end of the mail data by sending a line containing only a period. A transparency procedure is used to prevent this from interfering with the user's text.</p> <p>NOTE: The mail data includes the memo header items such as Date, Subject, To, Cc, From [2].</p> <p>The end of mail data indicator also confirms the mail transaction and tells the receiver-SMTP to now process the stored recipients and mail data. If accepted, the receiver-SMTP returns a 250 OK reply. The DATA command should fail only if the mail transaction was incomplete (for example, no recipients), or if resources are not available.</p>	
SEND (Send)	SEND FROM:<reverse-path>	S:250 F:552, 451, 452 E:500, 501, 502, 421
	<p>The SEND command requires that the mail data be delivered to the user's terminal. If the user is not active (or not accepting terminal messages) on the host a 450 reply may returned to a RCPT command. The mail transaction is successful if the message is delivered the terminal.</p>	
SOML (Send or mail)	SOML FROM:<reverse-path>	S:250 F:552, 451, 452 E:500, 501, 502, 421
	<p>The Send Or Mail command requires that the mail data be delivered to the user's terminal if the user is active (and accepting terminal messages) on the host. If the user is not active (or not accepting terminal messages) then the mail data is entered into the user's mailbox. The mail transaction is successful if the message is delivered either to the terminal or the mailbox.</p>	
SAML (Send and mail)	SAML FROM:<reverse-path>	S:250 F:552, 451, 452 E:500, 501, 502, 421
	<p>The Send And Mail command requires that the mail data be delivered to the user's terminal if the user is active (and accepting terminal messages) on the host. In any case the mail data is entered into the user's mailbox. The mail transaction is successful if the message is delivered the mailbox.</p>	
RSET (Reset)	RSET	S:250 E:500, 501, 504, 421
	<p>This command specifies that the current mail transaction is to be aborted. Any stored sender, recipients, and mail data must be discarded, and all buffers and state tables cleared. The receiver must send an OK reply.</p>	

Command	Syntax	Responses
VRFY (Verify)	VRFY <user name>	S:250, 251 <full name of user> F:550, 551, 533 E: 500, 501, 502, 504, 421
	This command asks the receiver to confirm that the argument identifies a user. If it is a user name, the full name of the user (if known) and the fully specified mailbox are returned. This command has no effect on any of the reverse-path buffer, the forward-path buffer, or the mail data buffer.	
EXPN (Expand)	EXPN <mailing list>	S:250 F:550 E: 500, 501, 502, 504, 421
	This command asks the receiver to confirm that the argument identifies a mailing list, and if so, to return the membership of that list. The full name of the users (if known) and the fully specified mailboxes are returned in a multiline reply. This command has no effect on any of the reverse-path buffer, the forward-path buffer, or the mail data buffer.	
HELP (Help)	HELP [command]	S:211, 214 E: 500, 501, 502, 504, 421
	This command causes the receiver to send helpful information to the sender of the HELP command. The command may take an argument (e.g., any command name) and return more specific information as a response. This command has no effect on any of the reverse-path buffer, the forward-path buffer, or the mail data buffer.	
NOOP (No operation)	NOOP	S:250 E:500, 421
	This command does not affect any parameters or previously entered commands. It specifies no action other than that the receiver send an OK reply. This command has no effect on any of the reverse-path buffer, the forward-path buffer, or the mail data buffer.	
QUIT (Quit)	QUIT	S:221 E:500
	This command specifies that the receiver must send an OK reply, and then close the transmission channel. The receiver should not close the transmission channel until it receives and replies to a QUIT command (even if there was an error). The sender should not close the transmission channel until it send a QUIT command and receives the reply (even if there was an error response to a previous command). If the connection is closed prematurely the receiver should act as if a RSET command had been received (canceling any pending transaction, but not undoing any previously completed transaction), the sender should act as if the command or transaction in progress had received a temporary error (4xx).	

Command	Syntax	Responses
TURN (Turn)	TURN	S:250 F:502 E:500, 503
	<p>This command specifies that the receiver must either (1) send an OK reply and then take on the role of the sender-SMTP, or (2) send a refusal reply and retain the role of the receiver-SMTP.</p> <p>If program-A is currently the sender-SMTP and it sends the TURN command and receives an OK reply (250) then program-A becomes the receiver-SMTP. Program-A is then in the initial state as if the transmission channel just opened, and it then sends the 220 service ready greeting.</p> <p>If program-B is currently the receiver-SMTP and it receives the TURN command and sends an OK reply (250) then program-B becomes the sender-SMTP. Program-B is then in the initial state as if the transmission channel just opened, and it then expects to receive the 220 service ready greeting.</p> <p>To refuse to change roles the receiver sends the 502 reply.</p>	

Remarks

S: Successful

E: Error

F: Failure

I: Intermediate

1.2 SMTP RESPONSE COMMANDS

Reply codes	Meaning
211	System status, or system help reply
214	Help message [Information on how to use the receiver or the meaning of a particular non-standard command; this reply is useful only to the human user]
220	<domain> Service ready
221	<domain> Service closing transmission channel
250	Requested mail action okay, completed
251	User not local; will forward to <forward-path>
354	Start mail input; end with <CRLF>.<CRLF>
421	<domain> Service not available, closing transmission channel [This may be a reply to any command if the service knows it must shut down]
450	Requested mail action not taken: mailbox unavailable [E.g., mailbox busy]
451	Requested action aborted: local error in processing
452	Requested action not taken: insufficient system storage
500	Syntax error, command unrecognized [This may include errors such as command line too long]
501	Syntax error in parameters or arguments
502	Command not implemented
503	Bad sequence of commands
504	Command parameter not implemented
550	Requested action not taken: mailbox unavailable [E.g., mailbox not found, no access]
551	User not local; please try <forward-path>
552	Requested mail action aborted: exceeded storage allocation
553	Requested action not taken: mailbox name not allowed [E.g., mailbox syntax incorrect]
554	Transaction failed

1.3 POP COMMANDS

Command	Syntax	Responses
USER	USER <name>	+OK name is a valid mailbox -ERR never heard of mailbox name
	<p>To authenticate using the USER and PASS command combination, the client must first issue the USER command. If the POP3 server responds with a positive status indicator ("+OK"), then the client may issue either the PASS command to complete the authentication, or the QUIT command to terminate the POP3 session. If the POP3 server responds with a negative status indicator ("-ERR") to the USER command, then the client may either issue a new authentication command or may issue the QUIT command.</p> <p>The server may return a positive response even though no such mailbox exists. The server may return a negative response if mailbox exists, but does not permit plain text password authentication.</p>	
PASS	PASS <password>	+OK maildrop locked and ready -ERR invalid password -ERR unable to lock maildrop
	<p>When the client issues the PASS command, the POP3 server uses the argument pair from the USER and PASS commands to determine if the client should be given access to the appropriate maildrop.</p> <p>Since the PASS command has exactly one argument, a POP3 server may treat spaces in the argument as part of the password, instead of as argument separators.</p>	
QUIT	QUIT	+OK -ERR some deleted messages not removed
	<p>The POP3 server removes all messages marked as deleted from the maildrop and replies as to the status of this operation. If there is an error, such as a resource shortage, encountered while removing messages, the maildrop may result in having some or none of the messages marked as deleted be removed. In no case may the server remove any messages not marked as deleted.</p> <p>Whether the removal was successful or not, the server then releases any exclusive-access lock on the maildrop and closes the TCP connection.</p>	
STAT	STAT	+OK nn mm
	<p>The POP3 server issues a positive response with a line containing information for the maildrop. This line is called a "drop listing" for that maildrop.</p> <p>In order to simplify parsing, all POP3 servers are required to use a certain format for drop listings. The positive response consists of "+OK" followed by a single space, the number of messages in the maildrop, a single space, and the size of the maildrop in octets. This memo makes no requirement on what follows the maildrop size. Minimal implementations should just end that line of the response with a CRLF pair. More advanced implementations may include other information.</p> <p>Note that messages marked as deleted are not counted in either total.</p>	

Command	Syntax	Responses
LIST	LIST [message number]	+OK scan listing follows -ERR no such message
	<p>If an argument was given and the POP3 server issues a positive response with a line containing information for that message. This line is called a "scan listing" for that message.</p> <p>If no argument was given and the POP3 server issues a positive response, then the response given is multi-line. After the initial +OK, for each message in the maildrop, the POP3 server responds with a line containing information for that message. This line is also called a "scan listing" for that message. If there are no messages in the maildrop, then the POP3 server responds with no scan listings--it issues a positive response followed by a line containing a termination octet and a CRLF pair.</p> <p>Note that messages marked as deleted are not counted in either total.</p>	
RETR	RETR <message number>	+OK message follows -ERR no such message
	<p>If the POP3 server issues a positive response, then the response given is multi-line. After the initial +OK, the POP3 server sends the message corresponding to the given message-number, being careful to byte-stuff the termination character (as with all multi-line responses).</p>	
DELE	DELE <message number>	+OK message deleted -ERR no such message
	<p>The POP3 server marks the message as deleted. Any future reference to the message-number associated with the message in a POP3 command generates an error. The POP3 server does not actually delete the message until the POP3 session enters the UPDATE state.</p>	
NOOP	NOOP	+OK
	<p>The POP3 server does nothing, it merely replies with a positive response.</p>	
LAST	LAST	+OK nn
	<p>The POP3 server issues a positive response with a line containing the highest message number which accessed. Zero is returned in case no message in the maildrop has been accessed during previous transactions. A client may thereafter infer that messages, if any, numbered greater than the response to the LAST command are messages not yet accessed by the client.</p>	
RSET	RSET	+OK
	<p>If any messages have been marked as deleted by the POP3 server, they are unmarked. The POP3 server then replies</p>	
TOP	TOP <message number> <number of lines>	+OK top of message follows -ERR no such message
	<p>If the POP3 server issues a positive response, then the response given is multi-line. After the initial +OK, the POP3 server sends the headers of the message, the blank line separating the headers from the body, and then the number of lines of the indicated message's body, being careful to byte-stuff the termination character (as with all multi-line responses).</p> <p>Note that if the number of lines requested by the POP3 client is greater than the number of lines in the body, then the POP3 server sends the entire message.</p>	

Command	Syntax	Responses
APOP	APOP <name> <digest>	+OK maildrop locked and ready -ERR permission denied
	<p>Normally, each POP3 session starts with a USER/PASS exchange. This results in a server/user-id specific password being sent in the clear on the network. For intermittent use of POP3, this may not introduce a sizable risk. However, many POP3 client implementations connect to the POP3 server on a regular basis -- to check for new mail. Further the interval of session initiation may be on the order of five minutes. Hence, the risk of password capture is greatly enhanced.</p> <p>An alternate method of authentication is required which provides for both origin authentication and replay protection, but which does not involve sending a password in the clear over the network. The APOP command provides this functionality.</p>	

2. LOG DUMP

2.1 POWER ON

Just after the power of the machine is turned on, the NIC fax checks if there is any mail in the mailbox on the POP server.

```

[A]                                     [B]
#[system(intadm)] 99/10/22 19:34:44 RICOH NIC Ver. 1.2.8 (KAISER1) NOTICE:
#[system(intadm)] 99/10/22 19:34:44 H3067220 Ver. 18 NOTICE:
#[snmpd ] 99/10/22 19:34:46 Start snmpd Ver. 2.0 INFO: [C]

[D]
$[popd ] 19:34:49 Connect to POP Server 133.139.157.30 [1]
$[popd ] 19:34:49 RCV: +OK oslg.ricoh.co.jp POP3 server (post.office v.1.9.3)
ready Fri, 22 Oct 1999 19:35:51 +0900 [2]
$[popd ] 19:34:49 XMT: USER nicfax [3]
$[popd ] 19:34:49 RCV: +OK Password required for nicfax. [4]
$[popd ] 19:34:49 XMT: PASS nicfax [5]
$[popd ] 19:34:49 RCV: +OK nicfax's maildrop has 0 message (0 octets) [6]
$[popd ] 19:34:49 XMT: STAT [7]
$[popd ] 19:34:49 RCV: +OK 0 0 [8]
$[popd ] 19:34:49 XMT: QUIT [9]
$[popd ] 19:34:49 RCV: +OK oslg.ricoh.co.jp POP3 server closing connection

```

H231X600.WMF

A: 'intadm' indicates internal NIC fax messages

B: The NIC fax software version

C: The FCU software version

D: Displays the POP connections

E: XMT means transmission, RCV means reception

1. The NIC fax requests connection to the POP server.
2. The response to the connection request is received.
3. The login name is sent out.
4. The request for a password is received.
5. The login password is sent
6. The confirmation of the login password is received, and a response that there is no mail is received.
If the password is incorrect, the following command is received.
\$[popd] 19:34:49 RCV:-ERR Password failed for nicfax
7. The NIC fax requests the server to send the status of the mailbox on the server.
8. The server replies that there is no mail.
9. The NIC fax notifies that it is closing the connection.

2.2 MAIL TRANSMISSION

Documents are scanned and stored in the memory. Then, the NIC fax connects to the SMTP server and sends the documents as a mail.

[A]

```

$[smtpd ] 19:37:24 Connect to SMTP Server 133.139.157.30 -----[1]
$[smtpd ] 19:37:24 RCV: 220 oslg.ricoh.co.jp ESMTP server (post.office vl.9.3
ID# 0100110-37392) ready Fri, 22 Oct 19:38:26 +0900 -----[2]
$[smtpd ] 19:37:24 XMT: HELO kaiser1.ricoh.co.jp -----[3]
$[smtpd ] 19:37:24 RCV: 250 oslg.ricoh.co.jp -----[4]
$[smtpd ] 19:37:24 XMT: MAIL FROM:<nicfax@ricoh.co.jp> -----[5]
$[smtpd ] 19:37:24 RCV: 250 Sender <ncicfax@ricoh.co.jp> Ok -----[6]
$[smtpd ] 19:37:24 XMT: RCPT TO:<john@ricoh.co.jp> -----[7]
$[smtpd ] 19:37:24 RCV: 250 Recipient <john@ricoh.co.jp> Ok -----[8]
$[smtpd ] 19:37:24 XMT: RCPT TO:<nicfax@ricoh.co.jp> -----[9]
$[smtpd ] 19:37:24 RCV: 250 Recipient <nicfax@shinyoko.ricoh.co.jp> Ok -----[10]
$[smtpd ] 19:37:24 XMT: DATA -----[11]
$[smtpd ] 19:37:24 RCV: 354 Ok Send data ending with <CRLF>.<CRLF> -----[12]
$[smtpd ] 19:37:24 XMT:<DATA HEAD 32>
$[smtpd ] 19:37:24 XMT:<DATA HEAD 27>
$[smtpd ] 19:37:24 XMT:<DATA HEAD 17>
$[smtpd ] 19:37:24 XMT:<DATA HEAD 62>
$[smtpd ] 19:37:24 XMT:<DATA HEAD 33>
$[smtpd ] 19:37:24 XMT:<DATA HEAD 35>
$[smtpd ] 19:37:24 XMT:<DATA HEAD 71>
$[smtpd ] 19:37:24 XMT:<DATA CR/LF>
$[smtpd ] 19:37:25 XMT:<DATA BOUNDARY>
$[smtpd ] 19:37:25 XMT:<DATA PARTHEAD>
$[smtpd ] 19:37:25 XMT:<DATA MIME 2798>
$[smtpd ] 19:37:25 XMT:<DATA MIME 2804>
$[smtpd ] 19:37:26 XMT:<DATA MIME 2804>
:
:
$[smtpd ] 19:37:34 XMT:<DATA MIME 2800>
$[smtpd ] 19:37:36 XMT:<DATA MIME 1380>
$[smtpd ] 19:37:36 XMT:<DATA BOUNDARY-->
$[smtpd ] 19:37:36 XMT:<DATA EOM>
$[smtpd ] 19:37:36 RCV: 250 Message received: -----[15]
19991022023039136.AAA99@kaiser1.ricoh.co.jp -----[16]
$[smtpd ] 19:37:36 XMT: QUIT -----[16]
$[smtpd ] 19:37:36 RCV: 221 oslg.ricoh.co.jp ESMTP server closing connection --[17]
    
```

H231X601.WMF

A: Displays the SMTP connections.

1. The NIC fax requests connection to the SMTP server
2. The response to the connection request is received.
3. A transmission channel is opened and the domain name is sent.
4. The response containing the server domain name is received.
5. The NIC fax sends its own mail address, then notifies that it is opening the mail transmission.
6. The response is received.
7. The NIC fax sends the receiver address.
8. The response is received.
9. The NIC fax sends the next receiver address.
10. The response is received.
11. The NIC fax notifies that it is starting to transfer the mail data.
12. The request to transfer data is received.
13. The NIC fax sends the mail header.
14. The NIC fax sends the MIME data (FAX.TIF file).
15. The response and the ID number of mail are received.
16. The NIC fax notifies that it is closing the connection.
17. The response is received.

2.3 MAIL RECEPTION

The NIC fax connects to the POP server and checks the mailbox, then receives the stored two mails.

```

$[popd ] 19:44:49 Connect to POP Server 133.139.157.30
$[popd ] 19:44:50 RCV: +OK oslg.ricoh.co.jp POP3 server (post.office v.1.9.3)
ready Fri, 22 Oct 1999 19:44:52 +0900
$[popd ] 19:44:50 XMT: USER nicfax
$[popd ] 19:44:50 RCV: +OK Password required for nicfax.
$[popd ] 19:44:50 XMT: PASS nicfax
$[popd ] 19:44:50 RCV: +OK nicfax's maildrop has 2 messages (35431 octets).
$[popd ] 19:44:50 XMT: STAT
$[popd ] 19:44:50 RCV: +OK 2 35431
$[popd ] 19:44:50 XMT: TOP 2 0
$[popd ] 19:44:50 RCV: +OK Top 0 lines of message 2
$[popd ] 19:44:51 RCV:<TOP DATA EOM>
$[popd ] 19:44:51 XMT: TOP 1 0
$[popd ] 19:44:51 RCV: +OK Top 0 lines of message 1
$[popd ] 19:44:51 RCV:<TOP DATA EOM>
$[popd ] 19:44:51 XMT: RETR 1
$[popd ] 19:44:51 RCV: +OK 17689 octets
$[popd ] 19:44:51 RCV:<DATA 1442>
$[popd ] 19:44:51 RCV:<DATA 1460>
:
:
$[popd ] 19:44:53 RCV:<DATA 1163>
$[popd ] 19:44:53 RCV:<EOM>
$[popd ] 19:45:02 XMT: DELE 1
$[popd ] 19:45:02 RCV: +OK Message 1 has been deleted.
$[popd ] 19:45:02 XMT: RETR 2
$[popd ] 19:45:02 RCV: +OK 17742 octets
$[popd ] 19:45:02 RCV:<DATA 1442>
:
:
$[popd ] 19:45:04 RCV:<DATA 1203>
$[popd ] 19:45:04 RCV:<EOM>
$[popd ] 19:45:04 XMT: DELE 2
$[popd ] 19:45:04 RCV: +OK Message 2 has been deleted.
$[popd ] 19:45:04 XMT: QUIT
$[popd ] 19:45:04 RCV: +OK oslg.ricoh.co.jp POP3 server closing connection

```

[1] }
[2] }
[3] }
[4] }
[5] }
[6] }
[7] }
[8] }
[9] }
[10] }
[11] }
[12] }
[13] }
[14] }
[15] }
[16] }
[17] }

H231X602.WMF

1. The procedures of the logging into the POP server.
2. The POP server replies that there are two mails.
3. The NIC fax requests the server to confirm the status of the mailbox on the server.
NOTE: After the PASS command, the POP server does not always give information about mailbox status (see note 2 above), so the NIC fax asks again here.
4. The response is that there are two mails in the POP server.
5. The NIC fax requests the server to send the message header of message no.2.
6. The response is received.
7. The message header of message no.2 is received.

8. The NIC fax requests the server to send the message header of message no.1.
9. The response is received.
10. The message header of message no.1 is received.
11. The NIC fax requests the server to send the attached file.
12. The data is received.
13. The NIC fax requests the server to delete message no.1.
14. The response is received.
15. The procedures for receiving message no.2.
16. The procedures for deleting message no.2.
17. The NIC fax notifies that it is closing the connection.