NIC FAX UNIT TYPE 510

(Machine Code: H210)

SERVICE MANUAL

14 June, 2002
Subject to change

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1. INSTALLATION

1.1 NIC FAX UNIT TYPE 510

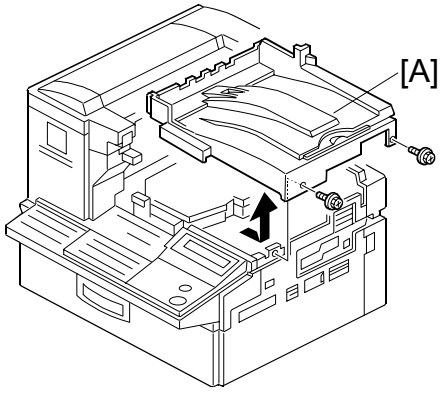
This option can be installed in the following model: H310
This installation must only be done by qualified service personnel.

⚠CAUTION

Do the following before installing an optional unit:

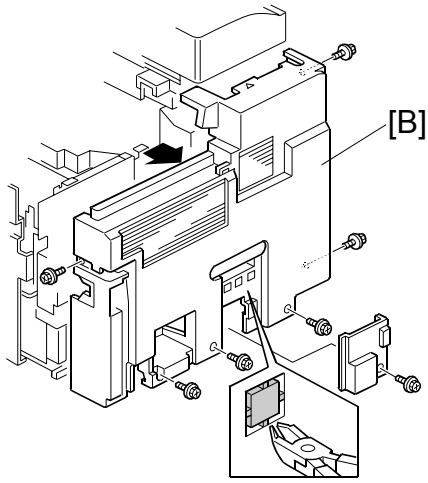
1. **Print out all messages stored in the memory.**
2. **Print out the lists of user-programmed items and the system parameter list.**
3. **Turn off the main switch, and disconnect the power plug.**

1. Remove the upper cover [A] (🔩 x 2).



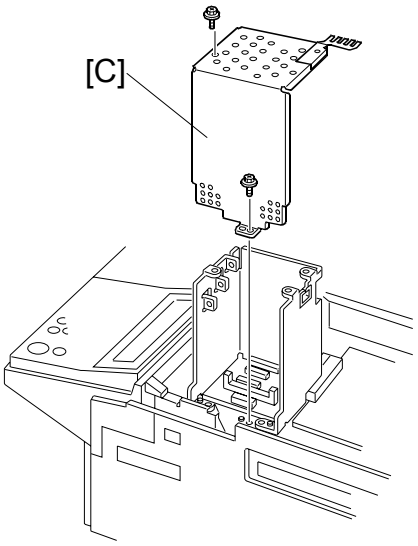
H210I006.WMF

2. Remove the rear cover (🔩 x 7) [B] and cut away the LAN small cover as shown.



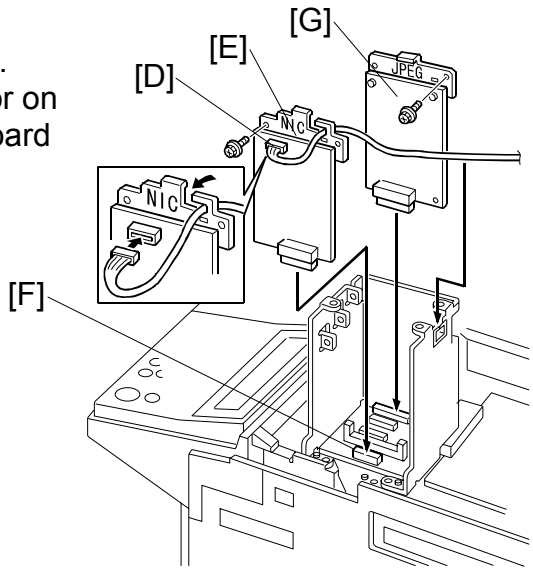
H210I013.WMF

3. Remove the bracket cover [C] (x 4) as shown.



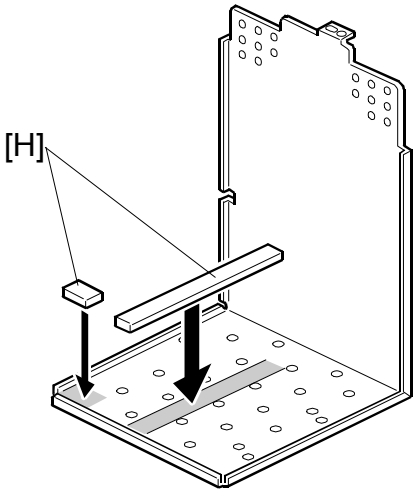
H210I523.WMF

4. Connect the harness [D] to the NIC board [E]. Then insert the board into the NICF connector on the OPIF board [F]. Then, insert the JPEG board [G] into the JPU connector.



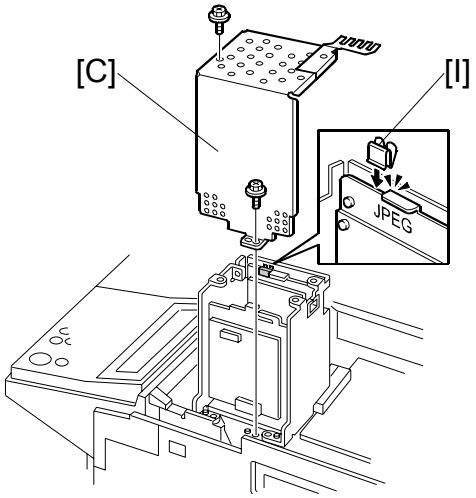
H210I023.WMF

5. Attach the adhesive strips [H] to the bracket [C] as shown.



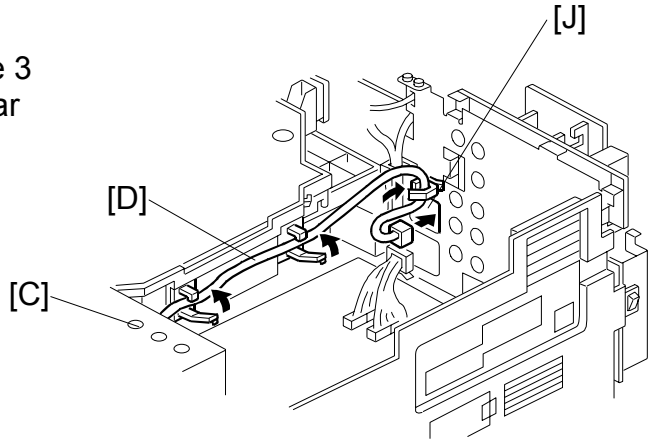
H210I048.WMF

6. Attach the earth clip [I] to the JPEG board, then replace the bracket cover [C].



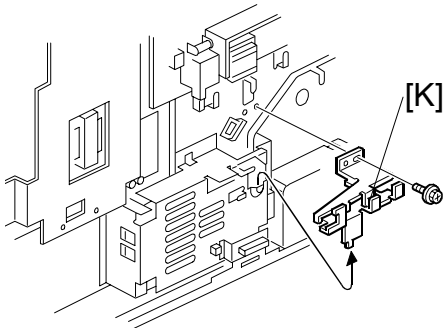
H210I524.WMF

7. Lead the harness [D] through the 3 clamps and the hole [J] in the rear bracket as shown.



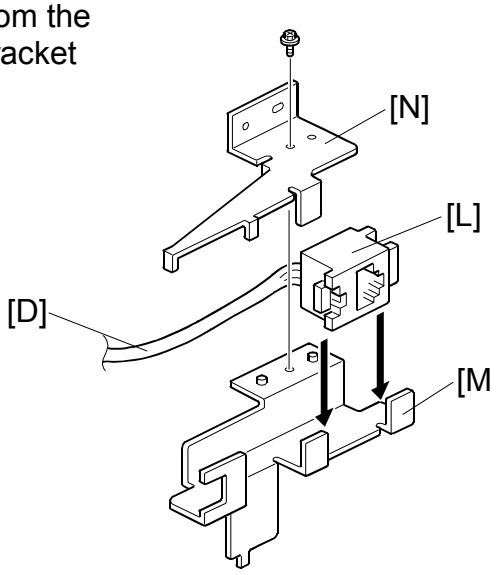
H210I020.WMF

8. Remove the bracket assembly [K] from the rear side of the machine as shown.



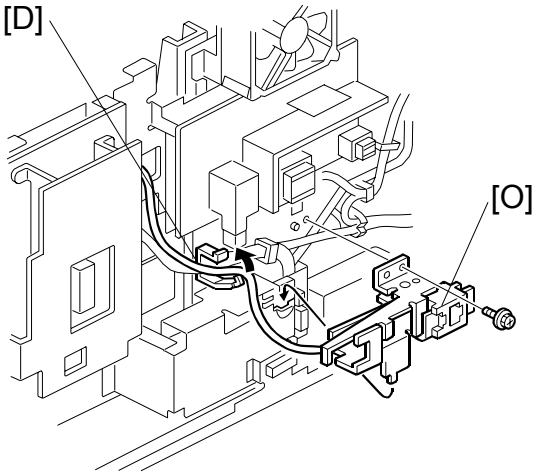
H210I040.WMF

9. Attach the connector [L] of the harness [D] from the unit kit to the bracket [M]. Then, attach the bracket [N] (🔩 x 1).



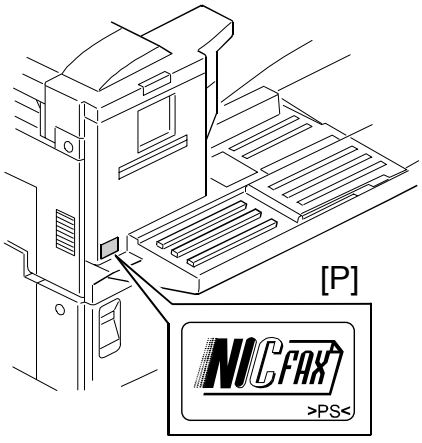
H210I024.WMF

10. Lead the harness [D] from Step 7 through the clamp as shown. Then attach the bracket assembly [O] to the rear side of the machine (🔩 x 1).



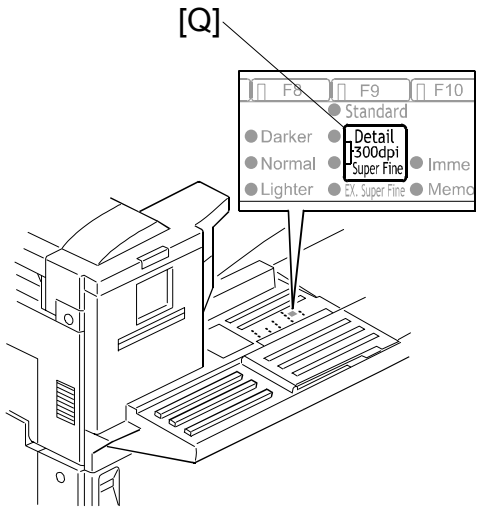
H210I025.WMF

11. Reattach the rear and upper covers.
12. Affix the “NIC FAX” decal [P] on the front side of the top cover as shown.



H210I042.WMF

13. Affix the decal [Q] to the operation panel as shown.



H210I043.WMF

14. Plug in the machine and turn on the main power switch.
15. Set system switch 02 bit 2 to 1.
16. Print the System Parameter List from inside Service mode, then make sure that “NICF” is listed as an option. Then exit Service mode.

1.2 INITIAL SETTINGS

Users can set the NIC Fax initial settings. Please refer to the Operator's Manual for NIC Fax Unit Type 510.

1.2.1 PROGRAMMING ITEMS

NOTE: Make sure that the following items are registered in the mail server before installation.

- IP address
- Host name
- Mail account and the password

Items to Program	Programming Methods	Remarks
IP address	User Function/Web Status Monitor	
Subnet mask	User Function/Web Status Monitor	
Default gateway	User Function/Web Status Monitor	
DNS server address 1	User Function/Web Status Monitor	Voluntary
DNS server address 2	User Function/Web Status Monitor	Voluntary
Access control	User Function/Web Status Monitor	Voluntary
Access mask	User Function/Web Status Monitor	Voluntary
SMTP server	User Function/Web Status Monitor	
POP server	User Function/Web Status Monitor	
Host name	User Function/Web Status Monitor	Voluntary
Mail address	User Function/Web Status Monitor	
Domain name	User Function/Web Status Monitor	Voluntary
Login name	User Function/Web Status Monitor	
Login password	User Function/Web Status Monitor	
E-mail acquisition interval	User Function/Web Status Monitor	Voluntary
Time difference	User Function/Web Status Monitor	Voluntary
Administrator mail address	User Function/Web Status Monitor	Voluntary
Backup mail address	User Function/Web Status Monitor	Voluntary
Gate keeper Address	User Function/Web Status Monitor	Voluntary
Own Fax Number	User Function/Web Status Monitor	Voluntary

NOTE: 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.

1.3 INITIAL CHECK

Do the following procedures to test the machine after installation.

1.3.1 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.

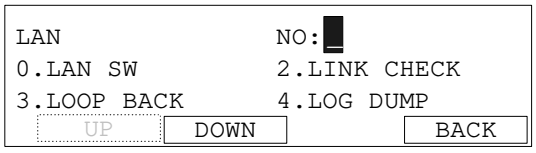
The green LED does not light:

- 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.

1.3.2 LINK CHECK

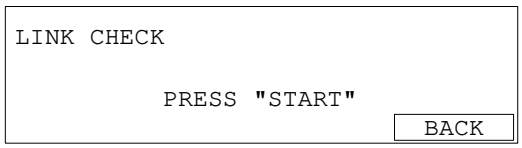
This checks the link pulse communication between the machine (LAN board) and the hub. If the link pulse is correctly received from the hub, the machine displays "OK."

1. Enter the LAN service mode.
   User Tools + # + 1 0 7 ◇
   Then press 2 0.



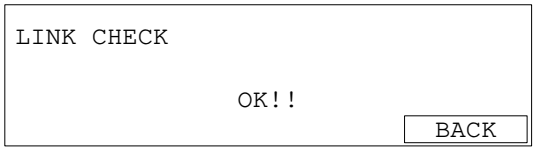
H210I620.WMF

2. Press 2.



H210I621.WMF

3. Press ◇.



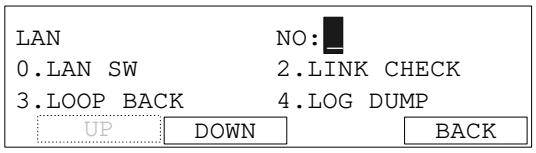
H210I622.WMF

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

1.3.3 LOOP BACK TEST

This mode checks the internal status of the LAN board.

1. Enter the LAN service mode.
   User Tools + # + 1 0 7 ◇
   Then press 2 0.

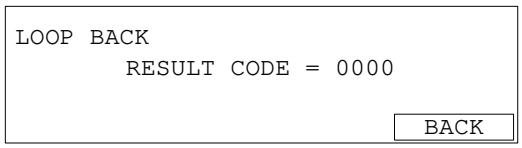


H210I620.WMF

2. Press 3.

H210I624.WMF

3. Press ◇.



H210I625.WMF

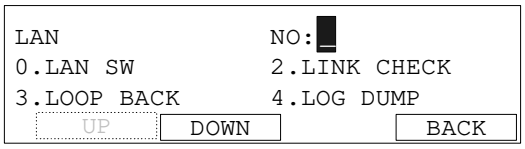
If the result shows any codes other than “0000”, follow the troubleshooting procedures in section 2.

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.

1.3.4 PING

The PING signals are sent out to the DNS server, SMTP server, and POP 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.
   User Tools + # + 1 0 7
   Then press 2 0.

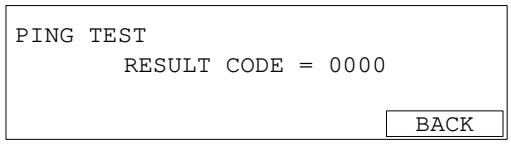


H210I620.WMF

2. Press 5.

H210I629.WMF

3. Press ◇.



H210I630.WMF

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 hand-shaking 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.	
10-60	POP server IP address not registered	The IP address of the POP server is not registered in the machine.	Register the IP address.	
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.	
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.	

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
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”.	NICF
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.	
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.	
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.	

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
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.	NICF
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.	
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.	FCU
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.	
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 off-set 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.	

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
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.	NICF
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	
11-90	SNMP community error	Community error		
11-91	SNMP packet error	Contents of packet is error		
11-92	SNMP packet size error	Packet size is over 1024 byte		
11-93	SNMP ODI size error	ODI size over 24byte		
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	
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.	

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
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.	NICF
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.	
12-52	Cannot log into the server.	Delivery server address is missing. Line defective.	Set the delivery server address. Check the line.	
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.	

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
13-00	IP-FAX Call Connection Error	The setting of the other party's terminal is not correct.	• 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.	NICF
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.	
13-11	IP-FAX Gatekeeper – Access Error	Gatekeeper setting not correct.	• Check the Host Name and IP Address of the gatekeeper. • Check the host port number of the gatekeeper. • Check the operation of the gatekeeper.	
13-12	IP-FAX – Local Terminal IP Address Error	The IP Address of your machine is not correct.	• 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.	

Code	Meaning	Explanation	Suggested Cause/Action	Error is Informed from
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.	NICF
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 20 (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 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
1073	SMTP

2.2.4 LOG DUMP

The protocol logs for communication between the POP/SMTP server and the NIC fax unit are stored in a 16-Kbyte memory inside the machine. The logs can be printed out. The log dump list shows the POP/SMTP commands and the responses from the server(s).

The NIC fax sends out POP commands to the POP server automatically, even if there is no received e-mail in the POP server. Then the POP 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	• Check that the LAN cable is connected to the machine. • Check that the LEDs on the hub are lit.	
	2. LAN activity	• Check that other devices connected to the LAN can communicate through the LAN.	
Between NIC Fax and PC	1. Network settings on the PC	• Check the network settings on the PC.	• 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	• Use the “ping” command on the PC to contact the machine.	• At the MS-DOS prompt, type ping then the IP address of the machine, then press Enter.
	3. LAN settings in the machine	• Check the LAN parameters • Check if there is an IP address conflict with other PCs.	• 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	• Check the LAN parameters • Check if there is an IP address conflict with other PCs.	• 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	• 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.	• Ask the administrator to check.

Communication Route	Item	Action	Remarks
Between machine and e-mail server	3. E-mail server	• Make sure that the client devices which have an account in the server can send/receive e-mail.	• 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	• 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.	• Ask the administrator to check.
	2. E-mail server	• Make sure that the client devices which have an account in the server can send/receive e-mail.	• 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.	• 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.	• 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.	• Inform the administrator of the LAN.

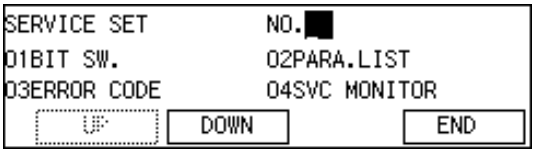
3. SERVICE TABLES AND PROCEDURES

3.1 SERVICE LEVEL FUNCTIONS

In this section, frequently used keys are referred to with the following symbols.
[◇] - Start key
[+] - + Key
[-] - - Key
[◀] - Left arrow key
[▶] - Right arrow key

How to enter the Service Mode

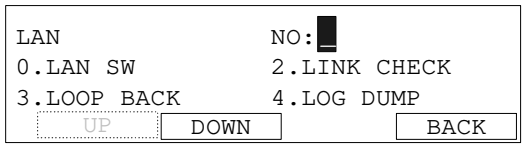
1. [User Tools] + [#] + [1] [0] [7] [◇]



H210S500.BMP

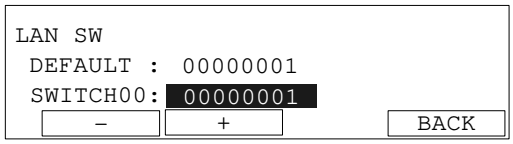
3.1.1 LAN BIT SWITCH PROGRAMMING

1. Enter the Service Mode.
2. [2] [0]



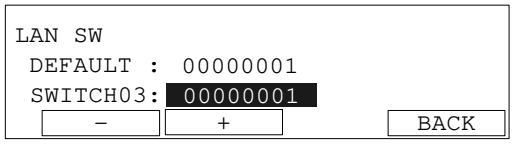
H210S602.WMF

3. [0]



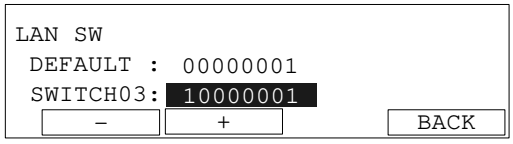
H210S603.WMF

4. Scroll through the bit switches.
   Increment bit switch: [+]
   Decrement bit switch: [-]
   Example: Display bit switch 3: [+] x 3



H210S604.WMF

5. Adjust the bit switch.
   Example: To change the value of bit 7, press [7]



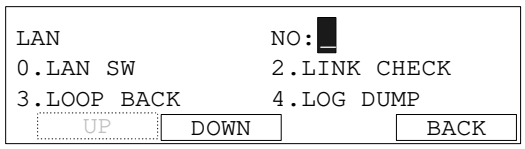
H210S605.WMF

6. Either:
   - Adjust more bit switches - go to step 4.
   - Finish - [User Tools]

3.1.2 LINK CHECK

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

1. Enter the Service Mode.
2. [2] [0]

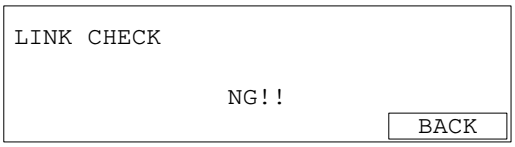


H210S602.WMF

3. [2]

H210S606.WMF

4. To start a test: [◇]
   If test is successful, the display shows "**OK!!**".
   If test is unsuccessful, the display shows "**NG!!**". :
   Check the cable connection.
   Replace the cable.

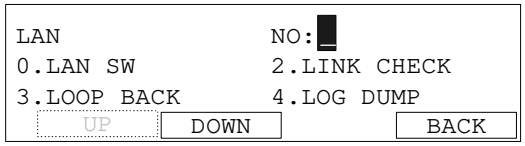


H210S607.WMF

3.1.3 LOOP BACK TEST

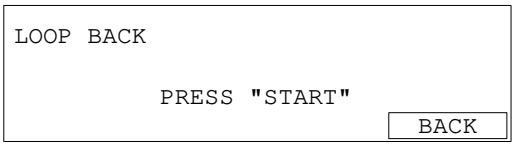
This test checks the connection between the FCU and the Network Interface Card (NIC).

1. Enter the Service Mode.
2. [2] [0]



H210S602.WMF

3. [3]



H210S608.WMF

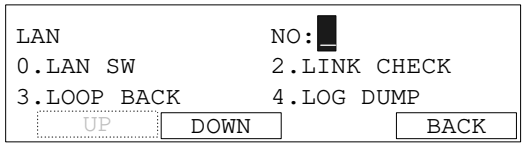
4. To start a test: [Start]
   If the test is successful, the display shows “RESULT CODE= 0000”.
   If the test is unsuccessful, the display shows “RESULT CODE= XXXX” (excluding “0000”).
   Reinstall the NIC.
   Replace the NIC or FCU.

H210S609.WMF

3.1.4 LOG DUMP

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

1. Enter the Service Mode.
2. [2] [0]



H210S602.WMF

3. Press [4].

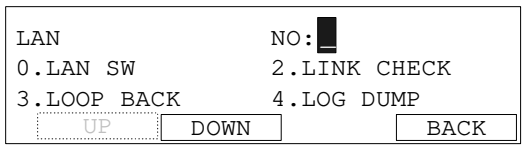
4. Press [Start].

H210S626.WMF

3.1.5 PING

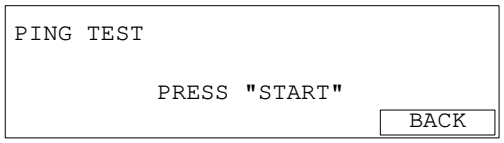
This test checks the connections to the servers.

1. Enter the Service Mode.
2. 2 0



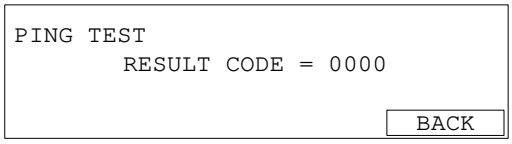
H210S602.WMF

3. Press 5.



H210S629.WMF

4. Press ◇.
   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.



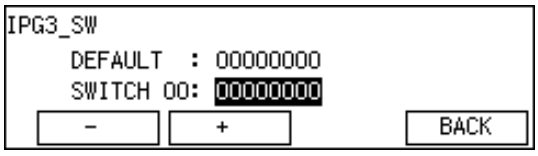
H210S630.WMF

3.1.6 IP-FAX IP-G3 SWITCH SETTINGS

1. Enter the Service Mode.
2. 2 2

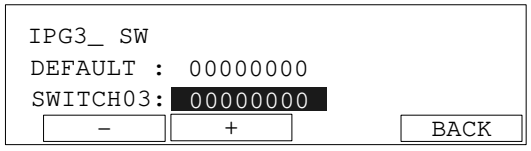
H210S551.BMP

3. 0



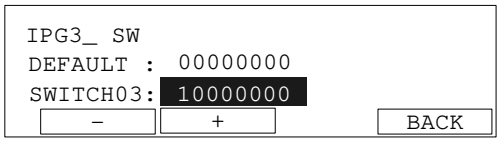
H210S552.BMP

4. Scroll through the bit switches.
   Increment bit switch: +
   Decrement bit switch: -
   Example: Display bit switch 3: + x 3



H210S610.WMF

5. Adjust the bit switch
   Example: To change the value of bit 7, Press 7.



H210S611.WMF

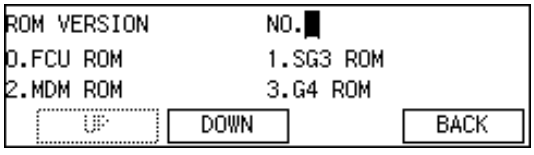
6. Either
   - Adjust more bit switches - go to step 4
   - Finish - User Tools

3.1.7 IP-FAX PORT SETTING

1. Enter the Service Mode.
2. 2 2

H210S551.BMP

3. 1



H210S554.BMP

4. Select the port, then change the settings.

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

3.2 LAN SWITCHES

⚠WARNING

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.

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.	
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”.
4-5	Not Used.	
6	FTP Protocol 0: Enabled 1: Disabled	FTP (File Transfer Protocol) is used for communication with the computer that is running Scan Router. Set this bit switch to 0 to use this machine with Scan Router.
7	SNMP protocol **0:** Enabled **1:** Disabled	SNMP (Simple Network Management Protocol) is used by network status monitoring utilities.

LAN Switch 01 E-mail Transmission		
No.	**FUNCTION**	**COMMENTS**
0	Not used	Do not change these settings.
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.	
5-7	Maximum number of broadcast destinations Bit 7 6 5 Setting 0 0 0 250 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: xxxxxxxxxx **********
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.
4-7	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	Select Operation for Mismatch Between Delivery IDs 0: Executes normal receiving, local machine prints. 1: No receiving.	This setting determines how a transmission is processed when the received delivery ID (F-Code) is not registered. The 0 setting forces reception when the delivery ID codes do not match.
1	Select File Output for a Delivery TX Error 0: Deletes the file after the local machine prints the file 1: Deletes the file without sending	This setting determines whether the file is printed when an SMTP error occurs after sending to the delivery server. A communication result/failure report is always output after the error occurs.
2	Select Operation When Delivery Destination Error Occurs When Receiving a File 0: Receives normally, local machine prints the file 1: No receiving, file is not printed	This setting determines what happens when a transmission is received for an F-code box in which the delivery destination registered in the F-code box is not a mail address, or the delivery destination is not registered in the F-code box.
3	Select Subject for Autorouting and Fowarding. 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	Select Subject for Backup TX 0: Outputs TX destination for the TO information (phone number or destination name). 1: Outputs only FROM information.	This setting determines whether the Subject entry of a backup transmission contains the information of the “To” entry (telephone number, destination name) along with the “From” information, or if only the “From” information is provided. The Subject entry also changes the Backup Message.
5-7	Not used	Do not change these settings.

LAN Switch 05 PC Utility Software		
No.	**FUNCTION**	**COMMENTS**
0	Programmed Data Editing and Deleting using from Web Status Monitor 0: Disabled 1: Enabled	If this bit is changed, the machine must be turned off and on to make the new setting effective. **0:** Web Status Monitor cannot be used to change the programmed data **1:** Programmed data can be changed, but only in administrator mode.
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. ☛ 4.9 Web Status Monitor for more detailed.
2-7	Not used.	

LAN Switch 06		
No.	**FUNCTION**	**COMMENTS**
0-7	Not used.	Do not change these settings.

LAN Switch 07		
No.	**FUNCTION**	**COMMENTS**
0-1	Attached file width (Tx) **Bit 1 0 Setting** 0 0 A3, B4, A4, LT, DLT 0 1 B4, A4, LT 1 0 A4, LT 1 1 Not used	If the document is larger than this setting, the machine automatically reduces it.
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		
No.	**FUNCTION**	**COMMENTS**
0-7	Not used.	Do not change these settings.

LAN Switch 0A		
No.	**FUNCTION**	**COMMENTS**
0-3	Select Time Interval for SMTP Server Access for Server TX 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 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 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**
0-1	Encode Mode for FTP Transfer Bit 1 0 Setting 0 0: MH 0 1 MR 1 0 MMR 1 1 Not used	The Bit 0 and Bit 1 settings determine how data is encoded for FTP transmission.
2-3	Not used.	
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.	

LAN Switch 0D		
No.	**FUNCTION**	**COMMENTS**
0-7	Not used.	Do not change these settings.

LAN Switch 0E		
0-3	Not used.	Do not change this setting.
4	PCSM Selection 0: Returns “No Such Name” 1: Returns total for sheets printed, total for fax prints.	PCSM (Printer Cost and Security Manager) is the Aficio counter manager module. This setting determines what happens when a request is received from the SNMP manager for a counter information MIB request. The information requested is returned only when setting 1 is enabled.
5-7	Not used.	Do not change this setting.

LAN Switch 0F		
No.	**FUNCTION**	**COMMENTS**
0	DELE Command at Socket Timeout 0: Sent 1: Not Sent	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. 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.
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.	

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 **1** **2** **3**	Select IP FAX Delay Level 0000: Level 0 0001: Level 1 0010: Level 2 0011: 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: 5 Redundant packets
4-7	Not used.	

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) if the customer wants to send faxes at maximum speed to another IP FAX terminal. However, even if 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.
1-7	Not used.	

3.3 NIC FAX RELATED SWITCHES

System Switch 0C		
No.	**FUNCTION**	**COMMENTS**
0	A3/DLT original priority **0:** A3 1**:** DLT	Determines whether the machine will regard the original as A3 or DLT when the paper size has not been selected for fax sending, scan-to-mail, or color scanning.
1-2	Not used	Do not change these settings.
3	A4/LT original priority 0**:** A4 **1:** LT	Determines whether the machine will regard the original as A4 or LT when the paper size has not been selected for fax sending, scan-to-email, or color scanning.
4-7	Not used	Do not change these settings.

Communication Switch 12		
No.	**FUNCTION**	**COMMENTS**
0-7	Redial Attempt Interval with Memory Sending to Same Destination Range: 01~FFH (1~255 Min.) Units: 1 min. Default: 05H (5 min.) Max.: FFH (255 min.) Min.: 01H (1 min.)	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.)

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.

Communication Switch 13		
No.	**FUNCTION**	**COMMENTS**
0-7	Redial Attempt Interval with Immediate Sending to Same Destination Range: 01~FFH (1~255 Min.) Units: 1 min. Default: 01H (1 min.) Max.: FFH (255 min.) Min.: 01H (1 min.)	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.)

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.

3.4 SERVICE RAM ADDRESSES

⚠CAUTION
Do not change settings which are marked as "Not used" or "Read only."

4000B0 to 4000CF (H) - LAN Switches

4002FE to 400301 (H) - E-mail Tx counter

Address	High	Low
4002FE	Tens digit	Unit digit
4002FF	Thousands digit	Hundreds digit
400300	Hundred thousands digit	Ten thousands digit

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

400302 to 400305 (H) - E-mail Rx counter

400306 to 400309 (H) - LAN fax counter

40086A to 400889 (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.

4006AA to 4006AD (H) - IP address

e.g. 133.139.24.3

4006AA (H)	1st address: 133	85 (H)
4006AB (H)	2nd address: 139	8B (H)
4006AC (H)	3rd address: 24	18 (H)
4006AD (H)	4th address: 3	03 (H)

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

4006AE to 4006B1 (H) - Subnet mask information

4006B6 to 4006B9 (H) - Default gateway address

4006BA to 4006BD (H) - Restriction on LAN fax communication (Access control)

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

4006C2 to 4006C5 (H) – DNS 1 server address
4006C6 to 4006C9 (H) – DNS 2 server address

4006CA to 400749 (H) - SMTP server IP address (max. 128 characters – ASCII)

40074A to 4007C9 (H) - POP server IP address (max. 128 characters – ASCII)

4007CA to 400809 (H) - Host name (max. 64 characters - ASCII)

40080A to 400849 (H) - Own domain name (max. 64 characters - ASCII)

40084A to 400869 (H) - POP server login name (max. 32 characters - ASCII)

40086A to 400889 (H) - POP server password (max. 32 characters - ASCII)

40088A to 400909 (H) - Own e-mail address (max. 128 characters - ASCII)

40090A to 400989 (H) - Administrator's e-mail address (max. 128 characters - ASCII)

40098A to 400A09 (H) - Back up e-mail address (max. 128 characters - ASCII)

400A0A to 400A0D (H) - Interval between automatic login to the POP server to receive incoming mail (min. 0A [H] = 10 s)

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

400A0A (H)	00 (H)
400A0B (H)	00 (H)
400A0C (H)	0E (H)
400A0D (H)	10 (H)

400A16 to 400A19 (H) – Retry interval between login to the POP server when an error occurs (min. 0A [H] = 10 s)

400A1E to 400A9D (H) – Auth. E-mail Rx address

400B4E to 400BCD (H) – Scan Router server address

4015F6 to 4015F7 (H) - Difference from Greenwich Mean Time

4015F6: Low - Hex
4015F7: High - Hex

Examples

USA: -5 hours = -300 min. x -1 = 300 = 012C (H)
4015F6: 2C
4015F7: 01

Japan: +9 hours = 540 min. x -1 = -540 = FDE4 (H)
4015F6: E4
4015F7: FD

400F26 to 400F27 (H) – Calling signal port number

400F28 to 400F29 (H) – T.38 data port number

400F2A to 400FA9 (H) – Alias (max. 128 characters - ASCII)

400FAA to 400FAD (H) – Max Bitrate

400FAE to 400FAF(H) – RAS port number

400FB0 to 400FB1 (H) – Port number of Gate Keeper

400FB2 to 401031 (H) – Host name of Gate Keeper (max. 128 characters - ASCII)

401032 to 401033 (H) – T.38 version

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

3.5 G3I SWITCHES

G3I Switch 00 - Not used (do not change any of these settings)

G3I 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 this setting.

G3I 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.

G3I 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	Not used	Do not change this setting.
2	Not used	Do not change this setting
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 (Ricoh 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 this setting.

G3I 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.

G3I 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 V.34 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.

G3I 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).

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. The e-mail sent by the NIC fax can be received by another NIC fax or a PC. Instead of inputting the telephone number of the destination you want to send to, you input the applicable e-mail address.

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

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.
- Also supports fax transmission and reception over a telephone line.
- Web Status Monitor can be used to check the settings and status of a NIC fax from a PC.
- Received faxes can be directly transferred or mailed to a PC.
- Use of the Internet greatly reduces communication costs.
- Elimination of the use of paper for fax transmission and reception reduces paper expenses.
- The NIC fax communicates with a server over a LAN. It cannot communicate directly with another party.
- If an error occurs, mail informing of this error (known as ‘error mail’) will be sent back to the sender. However, if there are some problems on the Internet, error mails may not be received.
- The level of security for Internet communications is low. The use of standard subscriber lines is recommended for confidential communications.
- Voice communications are not supported over a LAN.
- Internet fax delivery might be delayed due to network congestion. Use standard fax communication whenever communication is time sensitive.

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

Functions Not Supported by Mail Transmission

- Immediate Transmission
- ID Transmission
- Confidential Transmission
- Polling Transmission
- Batch Transmission
- Forwarding of Substitute Reception or Confidential Reception messages (Forwarding to a mail address is not supported.)
- ECM
- Dialling with the Dial Option Key

Functions Not Supported by Mail Reception

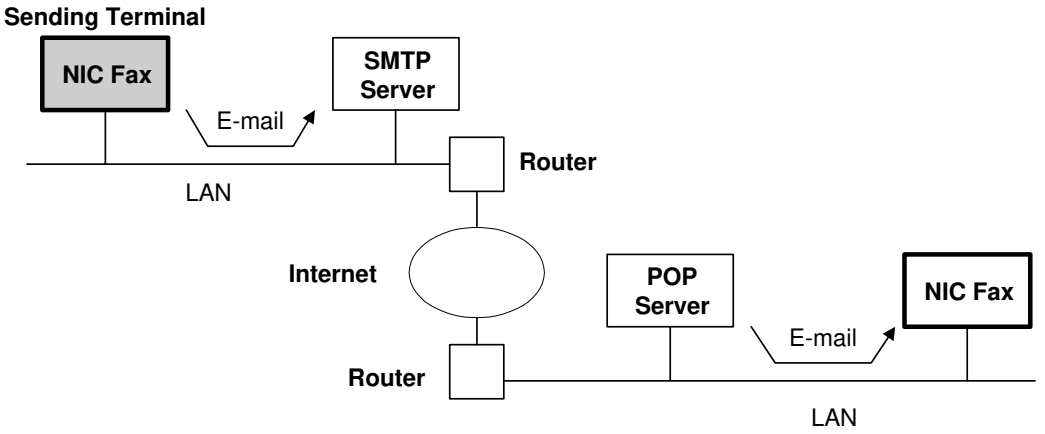
- Manual Reception
- ID Reception
- Forwarding Station (Forwarding of Mail is not supported.)
- Confidential Reception
- Polling Reception
- Multi-sort Reception
- Authorized Reception
- Memory Lock Reception
- Specified Paper Cassette Selection

4.1.3 DNS SERVICE

The NIC Fax Unit Type 510 supports the DNS service (Domain Name System: see Appendix B for more details). The NIC Fax can use the Domain Names for the SMTP and POP server instead of the actual IP addresses, if there is a DNS server on the same LAN as the SMTP server, POP 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 POP 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 a backup mail address (Bcc address) has been stored with the NIC Fax user settings, the machine also sends all the 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).

If user parameter switch 18 (12[H]) bit 6 is set to 1, the machine will check with the POP server if you have any new mail. This is done before your mail is sent.

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	Mail address to be replied
To	Mail address of the destination
Bcc	Backup mail address
X-Mailer	ICFAX Version 1.0 (ICFAX is a Ricoh mail utility - IC means Image Communication)
Subject	Fax message no. xxxx (file number) from the TSI (see the notes below this table)
Content-Type	Multipart/mixed Attached files: image/tiff, application/octet-stream
Content-Transfer-Encoding	Base 64

Field	Content
Message Body	MIME-converted TIFF-F (MIME standards specify how files are attached to e-mail messages)

NOTE: 1) The message no. 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 the personal code is entered.
3) The file number can be checked on the Journal.

Errors

An error report will be generated if an error occurs during the communication between the machine and the SMTP server. However, it is possible that the sender will not receive notice 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.

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

Results

The transmission result is listed on the Journal. The file list for e-mail transmissions is 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

1. 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.
2. The requirements for originals (document size, scan width, and memory capacity) are the same as for G3 fax memory tx.
3. The default compression is TIFF-F format.
4. The following options are available when sending a fax by e-mail:
   - SUB code
   - Send later
   - TTI
   - Economy transmission
   - Destination check
   - Store double sided

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

Example: Using personal code with confidential ID in a broadcasting operation

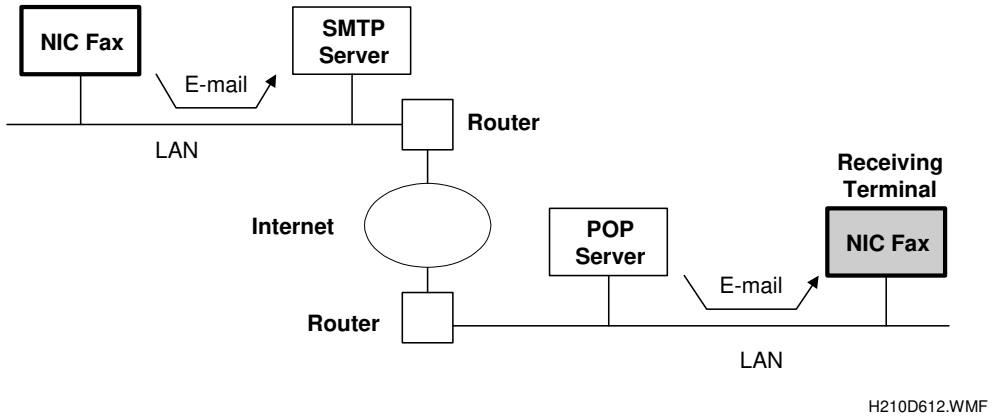
If the personal code is selected first, e-mail addresses cannot be input, because the e-mail key is disabled.

However, if the e-mail addresses are input first, then the personal code, then 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
Email Fax Transmission Auto Detection: 0: Disabled 1: Enabled
When enabled, the machine automatically detect whether or not the destination entered is an email address. When disabled, the machine will first ask whether the destination is an email or IP address, then prompt the user to input the address.

4.2.2 MAIL RECEPTION USING POP3



Procedure

There must be a POP (Post Office Protocol) server on the same LAN as the NIC fax, or it cannot receive e-mail, and an account must be set up for the fax machine.

If automatic mail reception is enabled (this can only be done with a user function key setting; there is no user tool), the machine calls the POP server at a regular interval to check if any e-mail has come in. Three minutes is the default interval; the interval can be adjusted from 1 minute to 60 minutes in one-minute steps (User Tools – Key Operator Tools – System Settings – Network – Mail Server – Mail Rx Interval). When the arrival of new mail is detected, the server receives the mail.

If the POP server is holding several e-mails for the NIC fax, the machine picks up the e-mails one at a time, in the order that they arrived at the server. The machine can leave the e-mails on the POP server after receiving them (User parameter switch 16 [10H] bit 0, 1).

E-mail reception is done in accordance with Post Office Protocol version 3.0 (POP3) procedures.

If the night timer function is enabled, automatic mail receive is disabled, whether the fusing lamp is on or off. Manual mail receive must be used.

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.

Handling Mail Reception Errors

Errors during POP3 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 certain interval, the machine calls the server and starts to receive, starting with the interrupted message. If there is an incompletely received message in the machine's 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 out and sends information about the error by e-mail to the sender's address (in the "From" or "Reply-to" field of the message). If there is an incompletely received message in the machine's memory, it will be erased.

User Parameter SW16 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.

Abnormal files are as follows:

1. The e-mail has an unsupported MIME header.

   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 error
3. The machine cannot recognize the file format as DCX or TIFF-F.
4. The resolution, document size, or compressed 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'.

Also, if the capacity of the SAF memory goes down to zero during reception, the machine acts in the same way as when receiving an abnormal file (refer to 'Abnormal files').

Paper Size

1. The maximum paper width for a received message depends on the paper size in the machine (max. A3).
2. When the machine receives a A3 document but there is only A4 and B4 paper in the machine, the machine reduces the data automatically and prints it on A4 paper.

Printing Received Mail

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

Multi-part Messages

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

Cross reference:
LAN bit switch 02, 08, 0B - Various e-mail reception settings
User switch 10

Manual e-mail reception

The manual e-mail reception function can be stored in a User Function Key. When this key is pressed, the machine calls the POP server immediately. The timer for automatic POP server calling will be reset when the machine calls the POP server manually.

Example:

The automatic POP server calling interval is 30 minutes.
The machine called the POP server 15 minutes ago.
Now, the machine calls the POP server manually.
The machine will call the POP server automatically after 30 minutes (not after 15 minutes).

User Function Keys

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

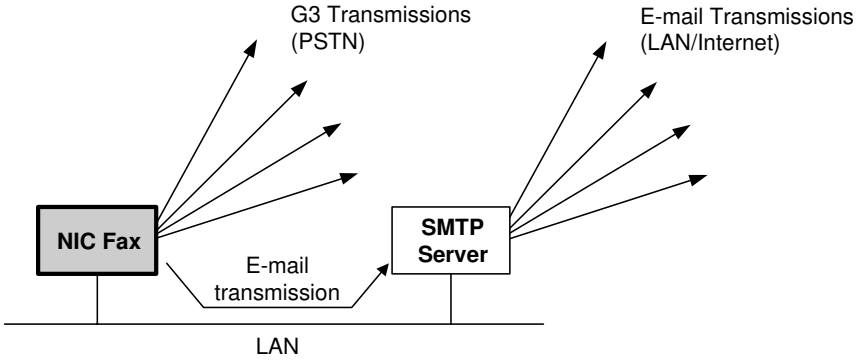
- Automatic E-mail Reception: If the LED is lit, e-mail will be received from the server automatically (every 3 minutes). However, see below concerning the night timer.
- Manual E-mail Reception: The machine only receives e-mail when the user function key is pressed. The LED has no function.

Conjunction 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 POP 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
Whether to receive e-mail automatically when Night Timer is enabled
0: Yes, but 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

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



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The machine can send the same message to several destinations in one operation. Some destinations can be G3 fax and some can be e-mail. For the G3 fax transmissions, each address has to be dialled separately. However, all the 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, but 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 a feature included individual information for each terminal in the transmitted data (such as label insertion). If this type of feature was 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 dialled for one broadcast. The maximum number of e-mail destinations in a broadcast depends on the mail server's limits.

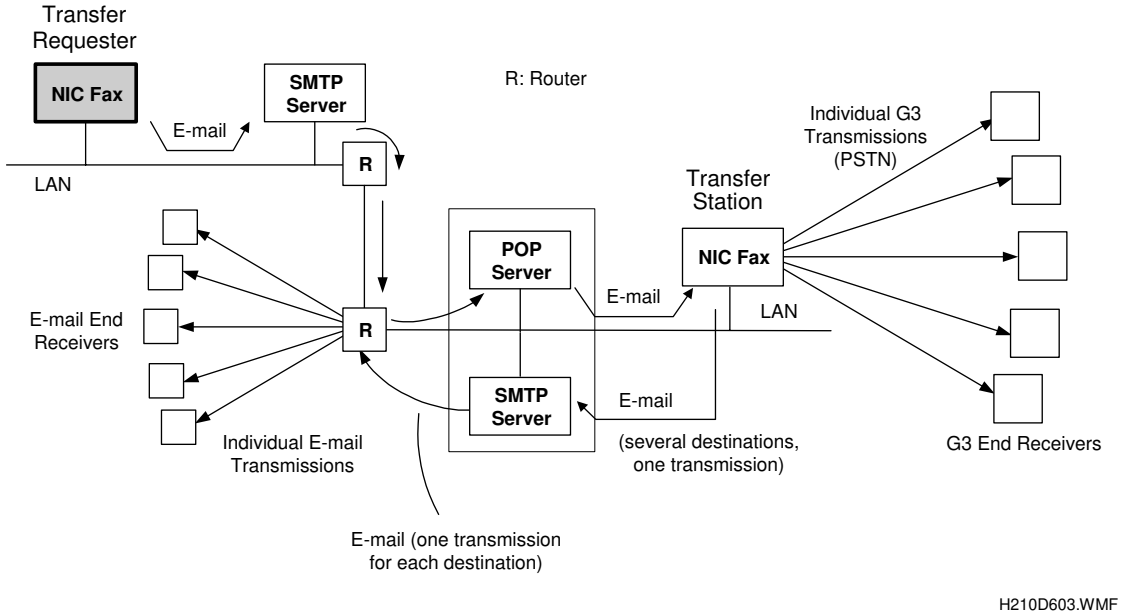
Cross Reference:
Bit 2 and Bits 5 to 7 of LAN bit switch 01 - Various e-mail transmission settings

Broadcasting will not work if batch transmission is disabled with user switch 06.

4.2.4 TRANSFER REQUEST

Operation at the Transfer Requester

Request by Mail



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, and a group dial is indicated by “#” and “**” and two digits.

The machine can request transfer to a maximum of 30 destinations for each transfer station. The destinations 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 quick/speed/group dials (and the ID code) are included in the mail body field of the e-mail as text. The message arrives at the POP server of the transfer station.

The transfer station sends the message to the end receivers (see Operation at the Transfer Station for details).

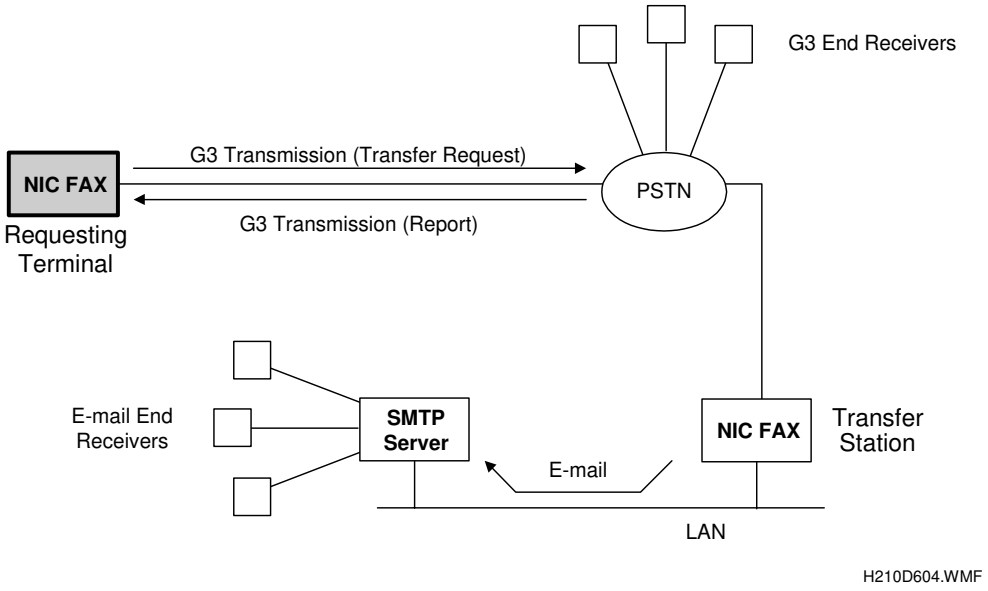
The transfer station sends back a transfer result report. The original may be attached to the transfer result report, depending on the G3 settings of the fax machine. For transmissions to e-mail end receivers, the transfer result report only indicates whether the message was successfully transmitted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

When making a transfer request, the machine can send the same message to more than one transfer station (each transfer station may transfer the message to a maximum of 30 destinations). All addresses dialled by the requesting terminal must be set up as transfer stations.

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's address)
Bcc	Backup mail address
X-Mailer	ICFAX version 1.0
Subject	Fax Message No. xxxx (file number) from theTSI
Content-Type	Multipart/mixed Text/Plain (for a text part), image/tiff or application/octet-stream (for attached files)
Content-Transfer-Encoding	Base 64
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



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.

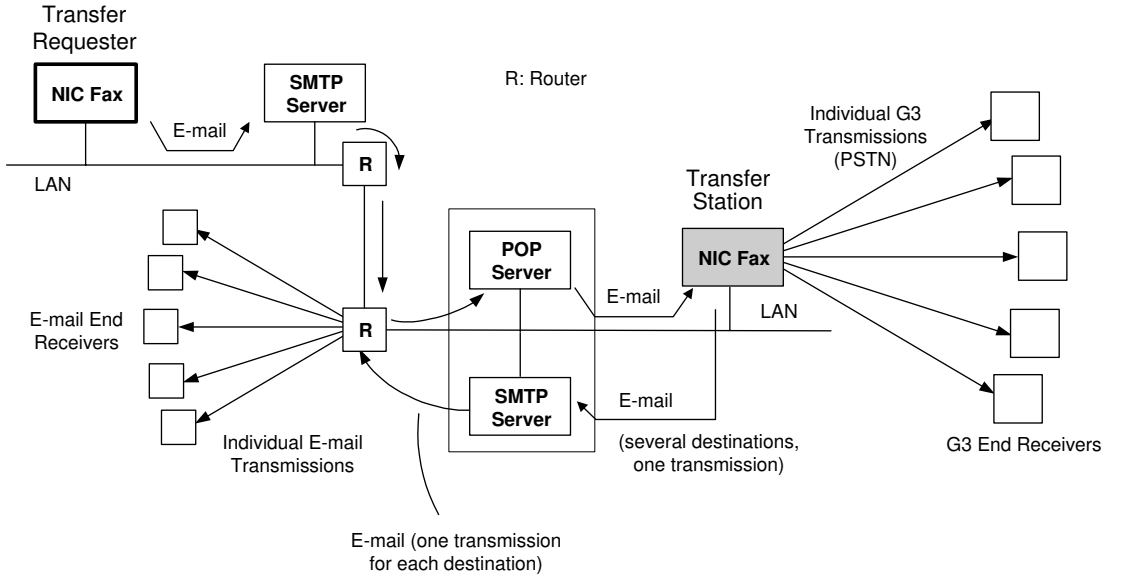
Using NSF, the machine sends an ID code and the machine's own telephone number. Up to 30 end receivers can be requested.

End receiver destinations can also be selected using tonal signals, in the same way as for other recent fax models. E-mail address can also be selected in this way, as end receivers and as the destination 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'.

Operation at the Transfer Station

Request by Mail



The NIC fax polls the POP server at regular intervals, as mentioned in a previous section. 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.

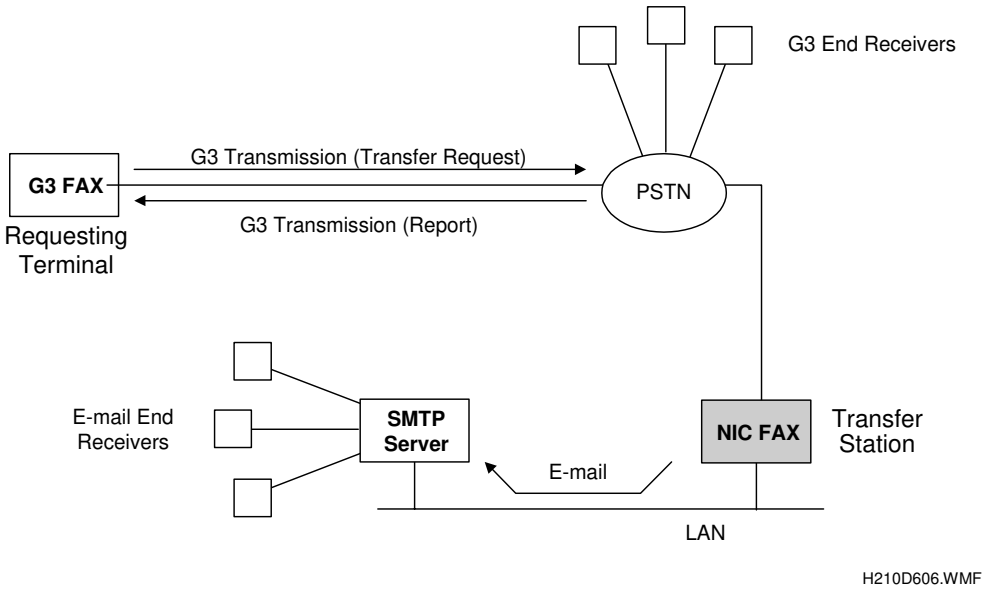
The transfer station sends back a transfer result report to the address in the From field of the received e-mail. If an administrator's address is registered, the result report is also sent to that address. The original may be attached to the transfer result report, depending on the G3 settings of the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



When the machine receives a transfer request by G3 fax, it sends the message to the various 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 requesting terminal's telephone number, which it specified in the NSF signal. The machine prints the result report if it cannot be sent.

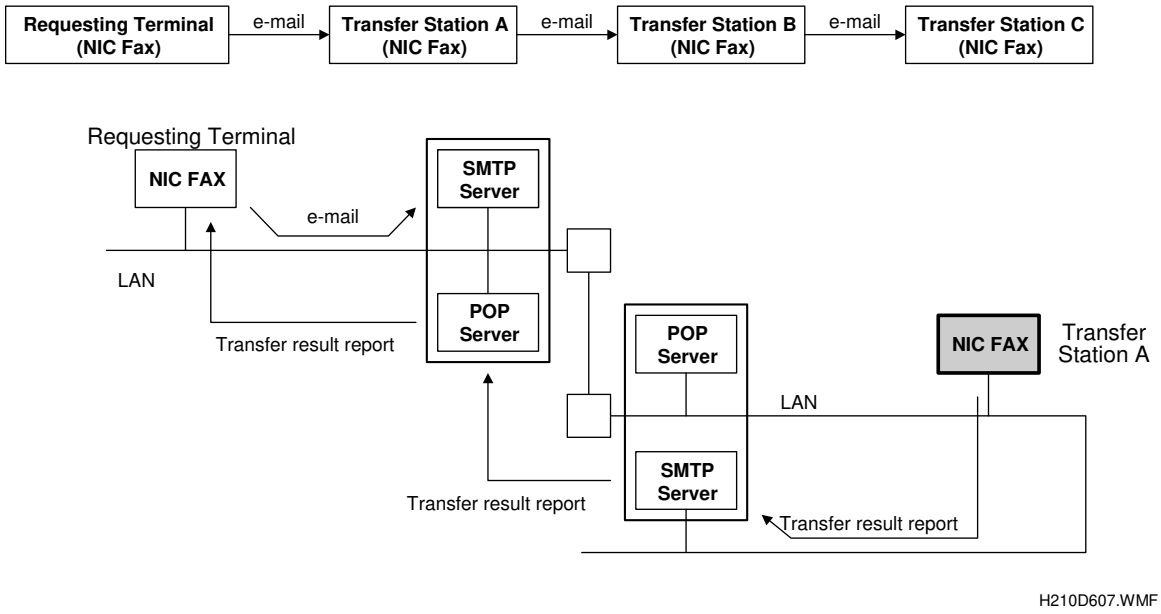
The NIC Fax can accept end receiver destinations and transfer result report destinations that were sent from the requester as DTMF tones. This applies for e-mail or PSTN G3 addresses.

Transfer Result Reports for Multi-step Transfer

If All Links are by Mail

After it has passed on the transfer request to the next transfer station, each transfer station sends a transfer result report back to the previous transfer station in the chain by e-mail.

The bottom part of the drawing shows details of the route from Transfer Station A back to the requesting machine.



The procedure is as follows.

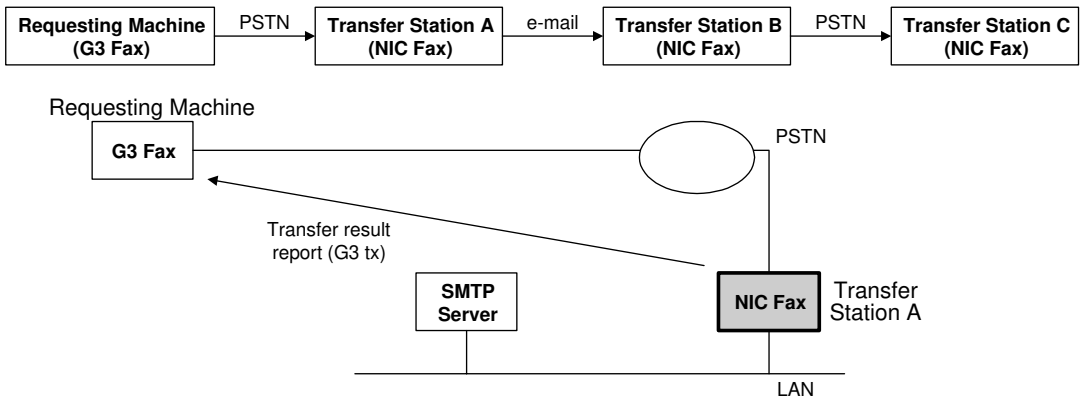
1. The requesting terminal requests transfer station A to transfer a message.
2. Transfer station A passes the request on to transfer station B.
3. Transfer station A sends a transfer result report back to the requesting machine.
4. Transfer station B passes the request on to transfer station C.
5. Transfer station B sends a transfer result report back to transfer station A.
6. The broadcasting station (transfer station C) sends the message to its SMTP server (e-mails) and to the G3 destinations.
7. Transfer station C sends a transfer result report to transfer station B (for e-mail end receivers, it only indicates whether the message was successfully passed on to transfer station C's SMTP server).

NOTE: The requesting machine's own telephone number is not included in a transfer request message by e-mail, so the transfer station at the end of the chain cannot send a report back directly to the requesting machine. The requesting terminal only receives a report of how the communication went between transfer stations A and B.

If Some Links are G3 Fax

The procedure is exactly the same as for a request by e-mail, as described on the previous page.

(The bottom part of the drawing shows details of the route from Transfer Station A back to the requesting machine.)



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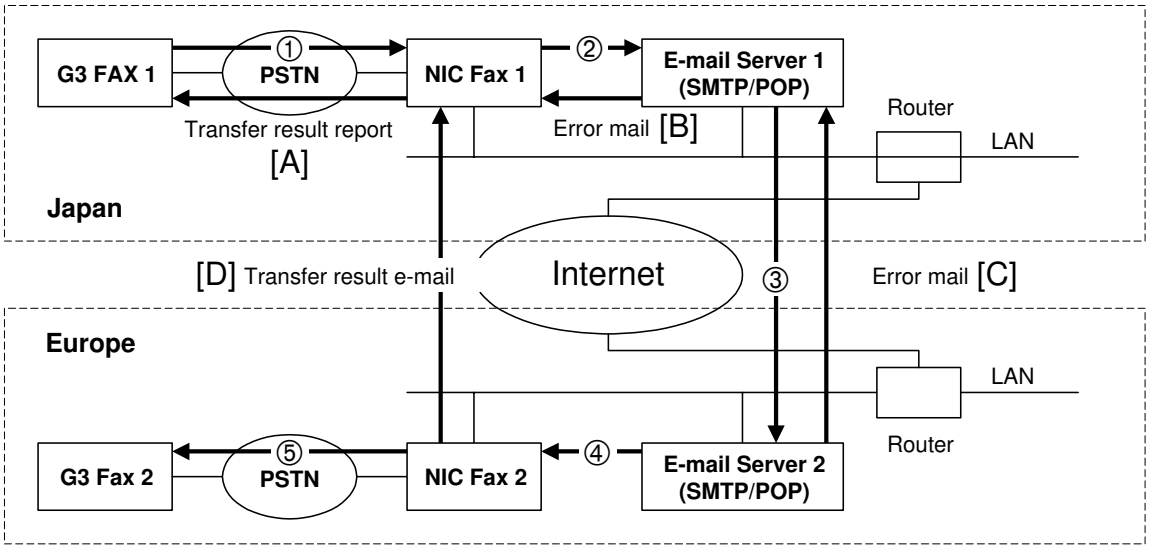
Even if there is only one e-mail link in the chain, the transfer result report from the final transfer station cannot get back to the requesting terminal.

However, if there are two or more consecutive PSTN links in the chain, the transfer station at the end of the PSTN chain will be able to send a transfer result report back to the machine at the start of the PSTN chain.

For example, if only the link between transfer stations B and C is e-mail, transfer station B will be able to send a report all the way back to the requesting terminal.

Example of a Transfer Request and Result Report



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The steps of the transfer request are as follows:

1. G3 Fax 1 sends a transfer request to NIC Fax 1 by G3 fax (① in the diagram).
2. NIC Fax 1 sends e-mail to E-mail Server 1 (② in the diagram).
3. E-mail Server 1 sends e-mail to E-mail server 2 (③ in the diagram).
4. E-mail server 2 sends e-mail to NIC Fax 2 (④ in the diagram).

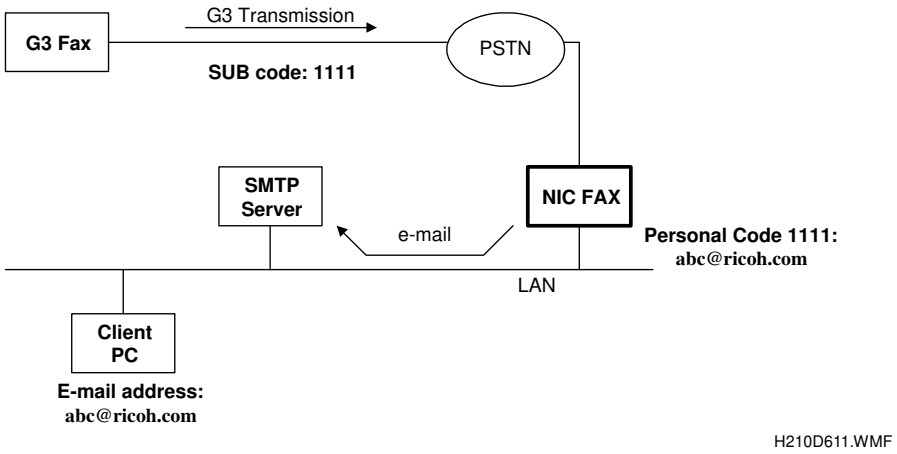
NOTE: Steps 2 to 4 assume that NIC Fax 1 sends the transfer request to NIC Fax 2 by e-mail, and not G3 fax.

5. NIC Fax 2 sends a G3 fax message to G3 Fax 2 (⑤ in the diagram).

The steps for sending the transfer result report and any mail reporting errors is as follows:

1. NIC Fax 1 sends a transfer result report [A] to G3 Fax 1 after ① in the diagram.
2. When an error occurs at ③, e-mail server 1 sends e-mail reporting an error [B] to NIC Fax 1. Error mail is also sent to the administrator if the address has been registered in NIC Fax 1.
3. When an error occurs at ④, e-mail server 2 sends e-mail reporting an error [C] to NIC Fax 1. Error mail [C] is also sent to the administrator if the address has been registered in NIC Fax 1.
4. NIC Fax 2 send a transfer result report [D] to NIC Fax 1 through e-mail server 1 and e-mail server 2 after transferring the message to the end receivers (after ⑤ in the diagram).

4.2.5 AUTOROUTING



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

Please refer to the main fax service manual for details.

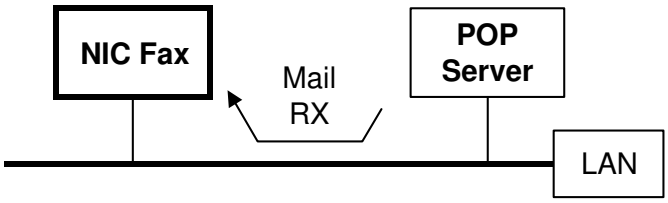
4.2.6 TRANSFER BOX

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 FAX 5510L NIC FAX MAIL RX: NEW FEATURES

4.3.1 TYPES OF E-MAIL RECEPTION SUPPORTED



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This machine supports three types of e-mail reception: POP3 (Post Office Protocol Ver. 3.), IMAP4 (Internet Messaging Access Protocol), and SMTP.

POP3 picks up the mail from a POP3 server and deletes it from the server

IMAP4 also picks up the mail from a server, but 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.

With SMTP, a mail server is not needed. However, the network administrator must register the NIC fax machine as an SMTP server in the MX record of the DNS server. Then the NIC fax will receive the mail directly without having to pick it up from a server.

Selecting the mail reception method

User parameter switch 17 (11[H])

Bit 0: SMTP reception	0: Off, 1: On
Bit 6: Mail reception protocol selection	0: POP, 1: IMAP4

If bit 0 enables SMTP reception, this method will be used. 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 will be used (depending on bit 6)

4.3.2 HOW POP AND IMAP4 RX DIFFER FROM SMTP RX

Characteristics of POP/IMAP4 Receiving

1. There is no need to register the machine in the MX record of the DNS server.
2. 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 get the mail unless the sender sends it again when the machine is switched on.
3. Dial-up compliance. POP can be accessed spontaneously, making it ideal for dial-up operation.

SMTP Reception Characteristics

1. 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.
   Local part: If you specify a destination address as 'fax=0454778907@dom1.ricoh.co.jp', for example, the 'local part' is '0454778907'.
2. A POP server is not required. For example, in an environment where there is only a UNIX server and a POP 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.
3. Immediacy of response is slightly better. There is no interval in the acquisition of mail as with POP, thus slightly improving the response time.
4. Easier error handling. When an error occurs with POP, the receiving terminal sends an error mail back to the senders 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.

4.3.3 RECEIVING USING IMAP4

This is basically the same as receiving with POP3.

Server Access

Please refer to section 4.2.2 (Mail Reception using POP3).

The following sections are the same as described in section 4.2.2 (Mail Reception using POP3).

- Handling Mail Reception Errors
- Paper Size
- Printing Received Mail
- Multi-part Messages

4.3.4 SMTP RECEPTION

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 protocol) and the received mail can be routed to another fax for delivery.

Setting Method

The following settings are required for SMTP receiving.

1. 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.
2. User Parameter Switch SW17 Bit 0 must be set to 1 to enable receiving mail with SMTP.

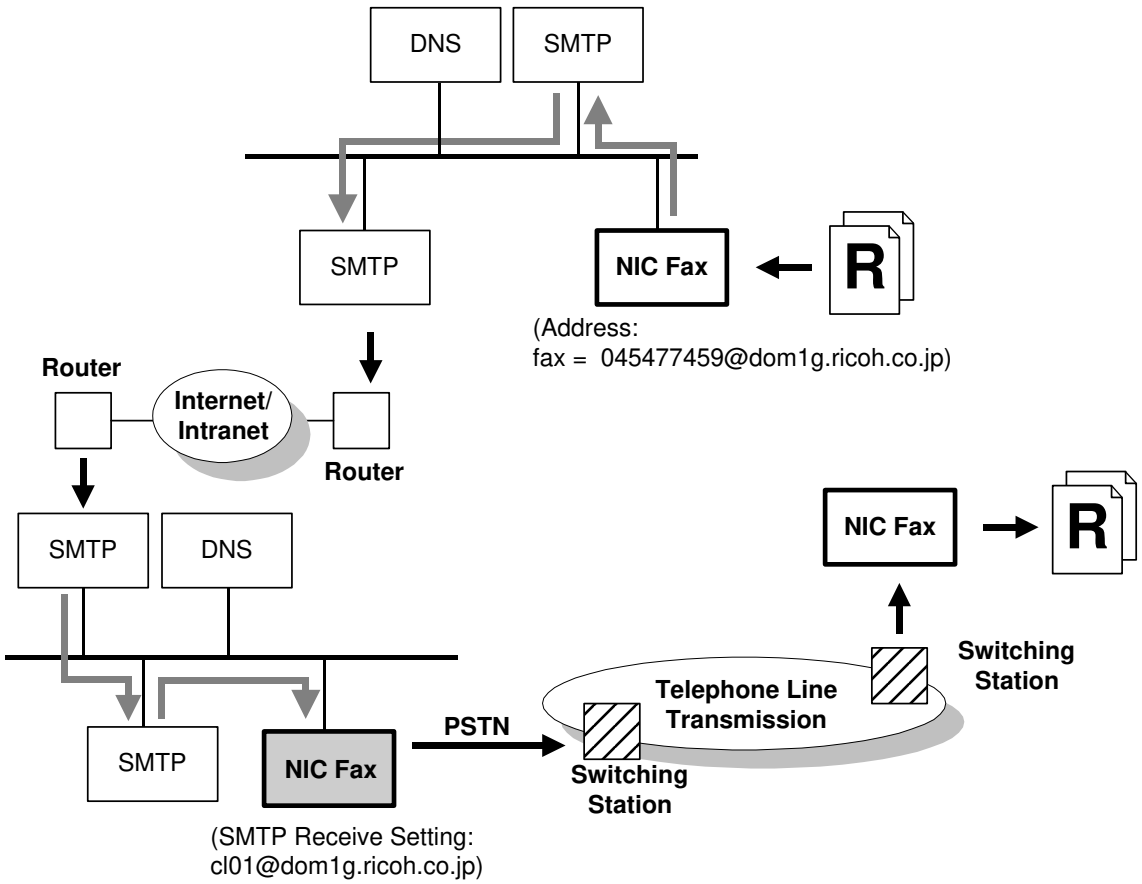
NOTE: Pressing the Stop button will not interrupt mail reception with SMTP.

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.

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"



H210D901.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@dom1g.ricoh.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@dom1g.ricoh.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@dom1g.ricoh.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@dom1g.ricoh.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 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 – Key Operator Tools – System Features – Network – Mail Server – Auth E-mail Rx.). Only one address can be specified (see the next page).
3) If User Parameter SW17 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 and Example
   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.
   - After the registered address of the sender and the mail address of the incoming mail are compared and if they 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.

4.4 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.

4.4.1 SUBJECT AND LEVEL OF IMPORTANCE

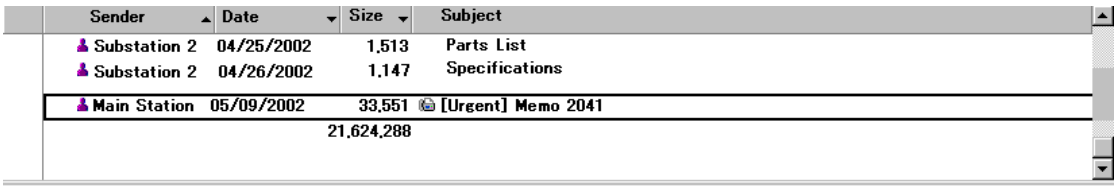
The subject entry for the mail be sent is limited to 20 characters. The subject can also be prefixed with an “Urgent” notation.

How the Subject Differs According to Mail Type

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

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



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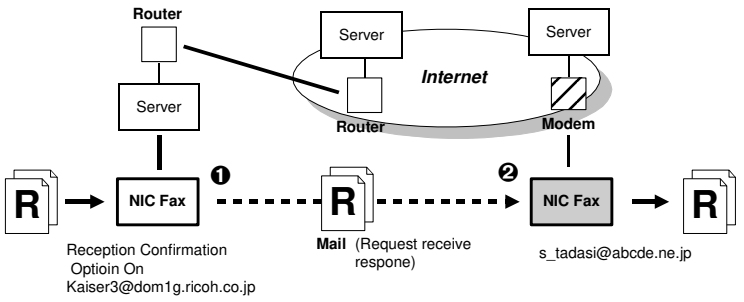
4.4.2 MESSAGE DISPOSITION NOTIFICATION (MDN)

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.
   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

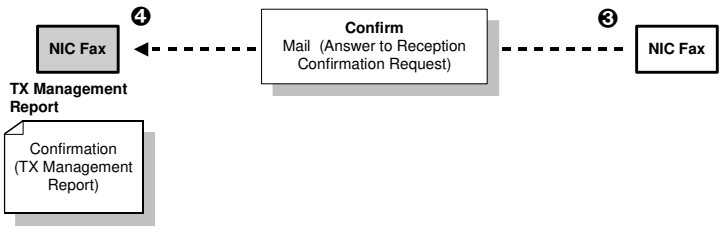
However, in order to send mail in response to the confirmation request, the other party's machine must be set to respond to the confirmation request.

- 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.



❶ * * * JOURNAL * * *

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



❸ * * * JOURNAL * * *

Time	ADDRESS	Mode	Time	PAGE	RESULT
10:18AM	Kaiser3@dom1g.ricoh	MailSMQ	0'09"	2	- -

❹ * * * JOURNAL * * *

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

OK

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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@dom1g.ricoh.co.jp>
Disposition Notification To   : T.Suzuki <s_tadashi@dom1g.ricoh.co.jp
Date                          : Tue, 28 Nov 2000 13:4203 +0900
From                          : T.Suzuki <s_tadashi@dom1g.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@dom1g.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 dom1g.ricoh.co.jp (post
                          office MTA V1.9.3 ID# 0100110-37392) with SMTP id AAA163
                          for<S_tadasi@dom1g.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                    :   fuser_01@dom1g.ricoh.co.jp
Message ID            :   <20001128133423664.ICFAX-XFC9BE-X26986@133.139.157.20]>
From                  :   T.Suzuki <s_tadashi@dom1g.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@dom1g.ricoh.co.jp”
Final Receipt: rfc822:fuser_01#dom1g.ricoh.co.jp
Original Message ID: <3A23379A.81BE0ABD@dom1g.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 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 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 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.

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	s_tadashi@dom1g. ricoh. co.	Mail SMA	0'05"	1	--

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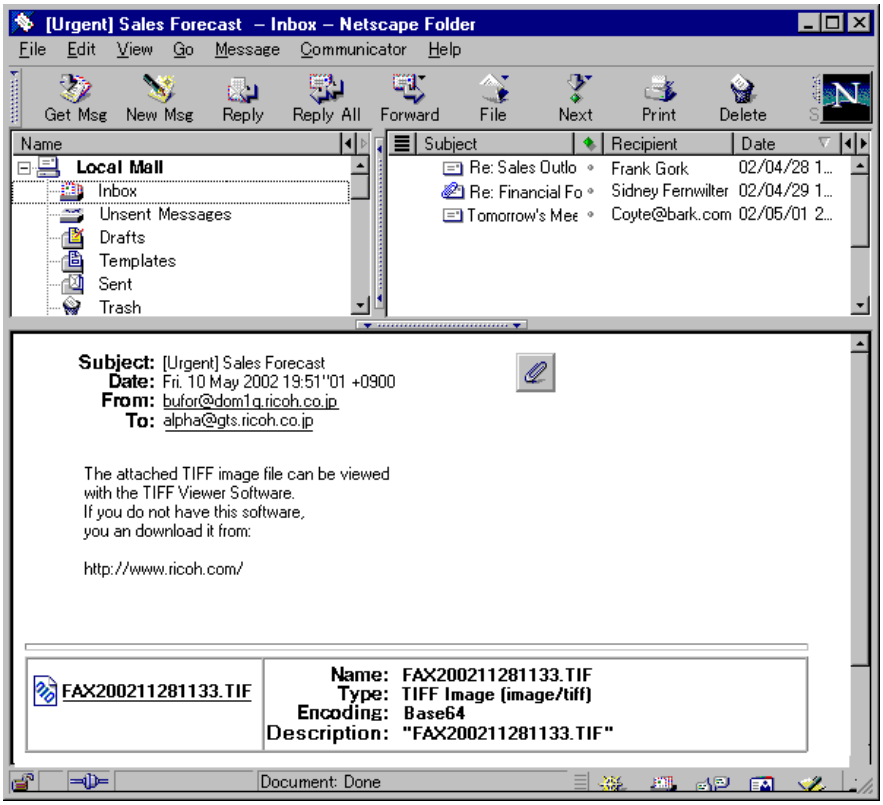
Return Receipt Conditions

- In order to use the return receipt feature, User Parameter Setting SW17 Bit 4 must set to 1 to switch this feature on. By default, Bit 4 is set to 0 which switches 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.

4.4.3 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. After the mail is received by the PC, the user can view the image on the PC.

View Notification



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4.5 SMTP AND POP SERVER ACCESS

After an original is scanned for sending by mail, it is sent immediately to the SMTP server.

When mail is received by POP, periodically (at the mail receive interval) the POP service is queried about the arrival of new mail. When new mail is detected, it is received automatically. However, mail can be received manually at any time. User switch 16 [10H] bit 4 determines whether the machine picks up mail from the POP server when the night timer is in action.

Unlike POP, where queries for new mail must be done at prescribed intervals, SMTP mail reception is also immediate, so no setting for automatic receiving is required.

Mail Sending from the SMTP Server

The scanned original is stored in memory and is sent only after appending the TTI and label insertion, confirming the number of lines to send, and compressing the file. This requires more time between when the original was scanned and its time of actual transmission.

SMTP Server Access

Server Status	TX Time
Busy	COM SW12, 5 min. until re-access (5: Default)
Error	
Multiple Destination*1	LAN SW0A Bit 0~3, 2 s until re-access (2: Default)
Max. Number of Calls	LAN SW0A Bit 4~7, 5 retries

1*: Refers to the setting that inserts labels (“To” information) in the header of each fax when faxes are sent one by one. When this feature is selected, sending documents all at once to the SMTP server is not done.

Switches Related to SMTP Server

COM Switch 12			
Bit	**Default**	**FUNCTION**	**NOTES**
0	1	Interval between redials when redialing the same destination for memory sending. Setting: 01~FFH (1~255 min.) Set at 1 min. intervals. Default: 05H (5 min.) Max: FFH (255 min.) Min: 01H (1 min.) Bit 7 6 5 4 3 2 1 0 1 min. 0 0 0 0 0 0 0 1 0 0 0 0 0 1 0 1 5 min. 1 1 1 1 1 1 1 1 255 min.	These bits set the time interval between dialing the same destinations for memory sending. Setting to 00H sets redialing for 1 minute intervals.
1	0		
2	1		
3	0		
4	0		
5	0		
6	0		
7	0		

LAN Switch 0A		
No.	**FUNCTION**	**COMMENTS**
0-3	Select Time Interval for SMTP Server Access for Server TX 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.

Detailed Description

Receiving Mail from the POP Server

Automatic mail reception: The machine automatically accesses the POP server and checks for the arrival of new mail at a defined interval. If new mail is present when the POP server is accessed, the mail is received automatically.

Automatic receive can be switched on and off. Also, user switch 16 [10H] bit 4 determines whether the machine picks up mail from POP server when the night timer is in action. When the machine has been powered down with the night timer, automatic mail receiving is prohibited even if auto receive is switched on for normal operation. However, new mail can be received manually at any time, regardless of the on/off setting of the automatic mail receiving function.

Accessing the POP Server

Server Status	When Receiving	
Error	Manual	The server is not accessed.
	Auto	The server is accessed at the defined interval to receive new mail.

Standard Time Interval for Accessing the POP Server

When the NIC Fax is powered on and the automatic receiving function is switched on, this enables automatic receiving from the POP server. Thereafter, the POP server is queried at regular intervals based on the time setting for the time interval in effect when the device was powered on.

Related Switches

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: xxxxxxxxxx **********
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.
4-7	Not used	Do not change these settings.

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 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	LAST command sending to the POP server **0:** Enabled **1:** Disabled	The LAST command is sent to the POP server by the machine during POP procedures. The reply from the server informs the machine which e-mail to start receiving from. If POP server responds abnormally, set the bit to Set this bit to 0 to receive the most recent e-mail first. If set to 1 the machine will always receive from the first e-mail on the list in the server. This is required if the POP server still contains old e-mail that cannot be deleted.
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 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 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.

4.6 IP-FAX

What is IP-FAX?

The NIC fax conducts send and receive 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 is 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 because the main method of communication is over the internet.
- All transactions can be confirmed because it can connect 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

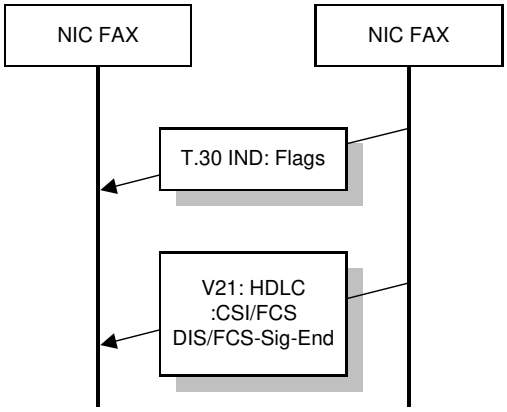
IP-Fax can use all features of a G3 fax with exception to the following:

- 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



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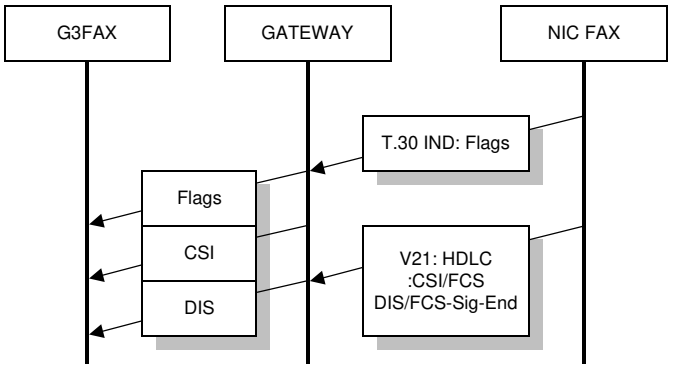

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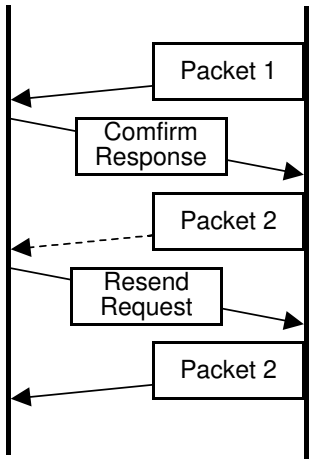
Packet Format

Fax send and receive 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.



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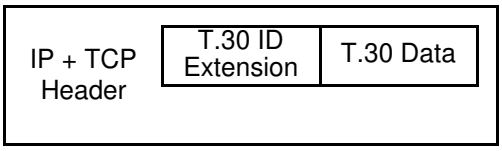

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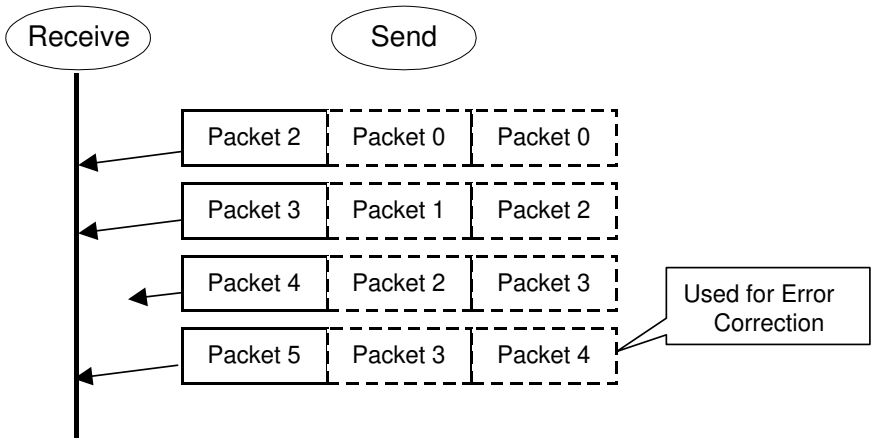
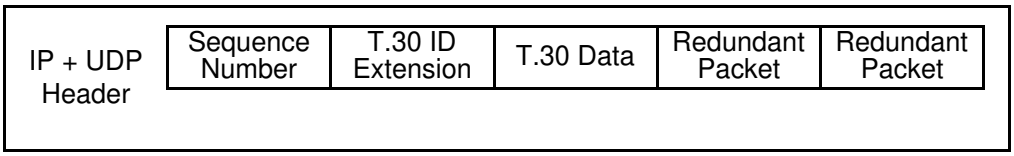
UDP Packet Format



H210D908.WMF

UDP is output without establishing the session. The UDP protocol does not correct errors or attempt re-sending, so it is very fast but 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.



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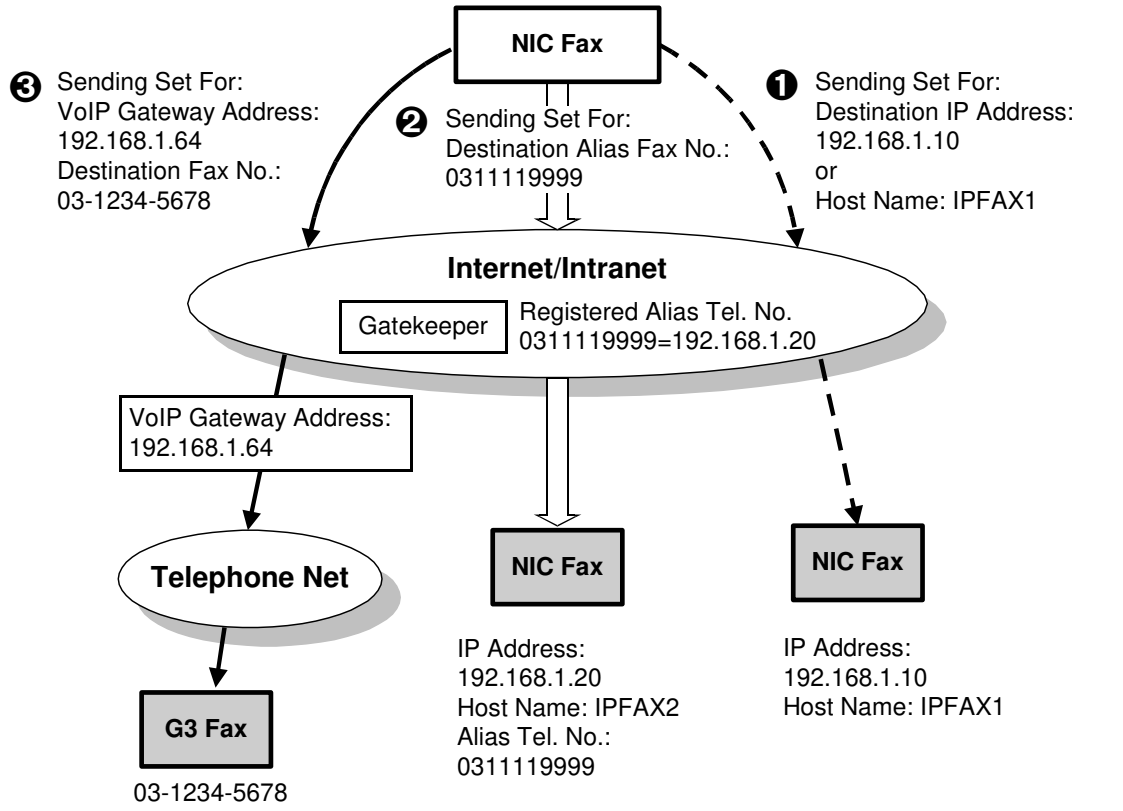
UDP appends a redundant packet to the data packet and sends both. At the NIC Fax, the redundant packet is affixed to only Phase C and the post message. The number of redundant packets can be changed as shown in the table below that lists the network delay parameters. However, increasing the number of 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 1 2 3	Select IP-FAX Delay Level **0000**: Level 0 0001: Level 1 0010: Level 2 0011: Level 3	Raise the level by selecting 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: 5 Redundant packets
4~7	Not used.	

IP-Fax Sending

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



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

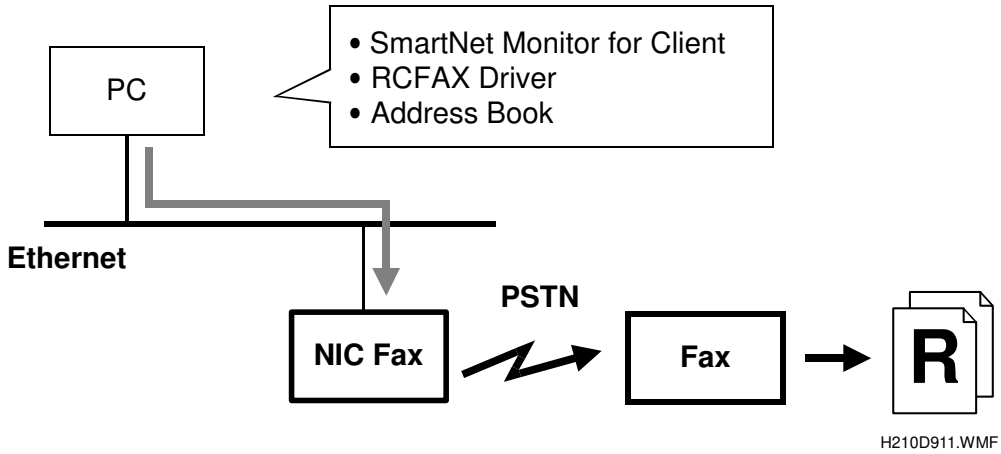
- In (1) the NIC FAX, connected to the Internet/Intranet, sends a transmission to IP Address 192.168.1.10 or to Host Name IPFAX1 (192.168.1.10). The IP Address and Host Name must be previously registered on the DNS.
- In (2) the NIC FAX, connected to the Internet/Intranet using a gatekeeper, sends a transmission to the destination with the alias fax number 03 1111 9999 through 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)

4.7 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:

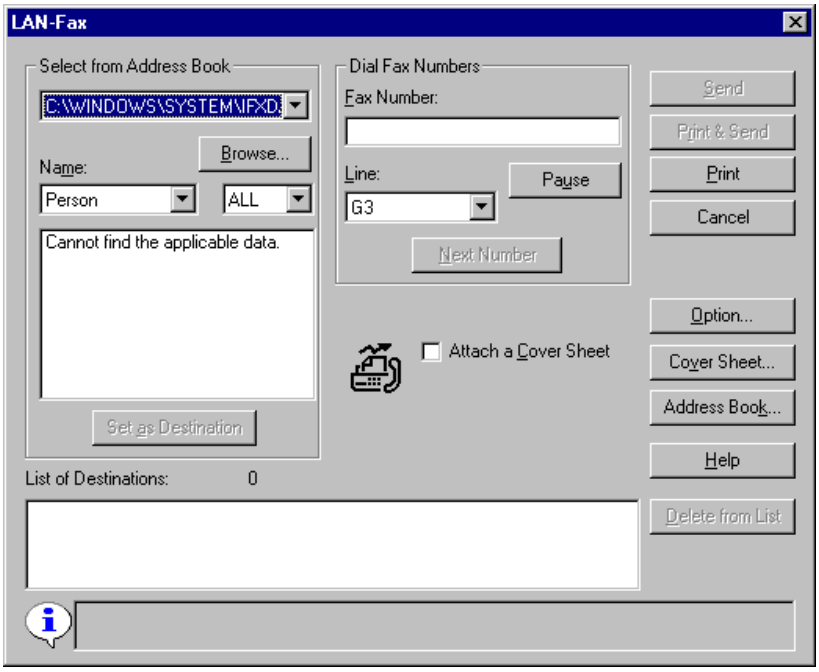
- NIC Fax and a PC connected to a LAN.
- The initial settings from NIC FAX (IP Address, Subnet Mask, Default Gateway settings).
- Software installed on the PC, namely, SmartNet Monitor for Client, the LAN Fax driver, and an address book.

4.7.1 LAN FAX PRINTING

Printing Operation

Follow this procedure to print.

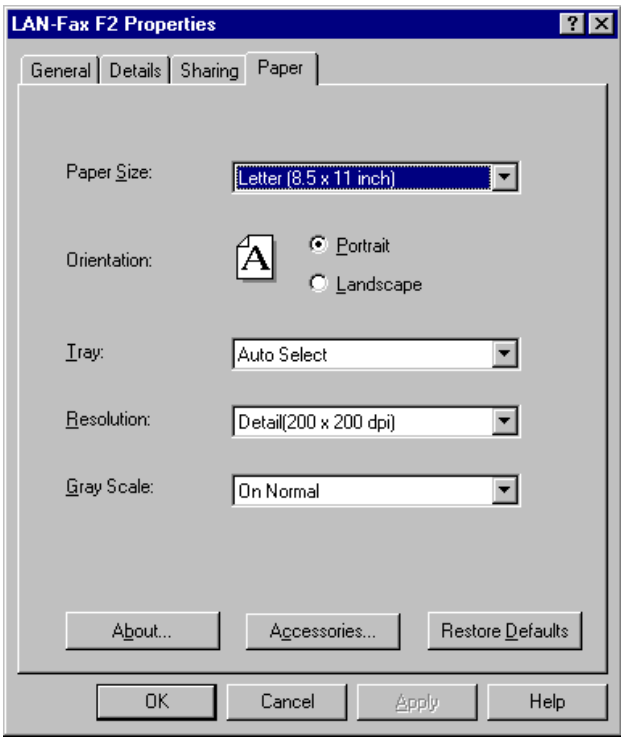
1. From the File menu, select Print.
2. For the printer Name, select the name of the fax in the printer queue (“LAN Fax F2” for example), then click the OK button. The LAN Fax dialog box opens.
3. Select the settings for each mode, then click the Print button.



H210D916.WMF

4. The following items are supported by this driver.

Item	Content
Paper Size	DLT, LT, LG, A3, A4, A5, B4, B5
Orientation	Portrait (SEF), Landscape (LEF) Landscape originals, and B5, 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, G4 dual line installation enabled



H210D917.WMF

Important Points About PC Fax Printing

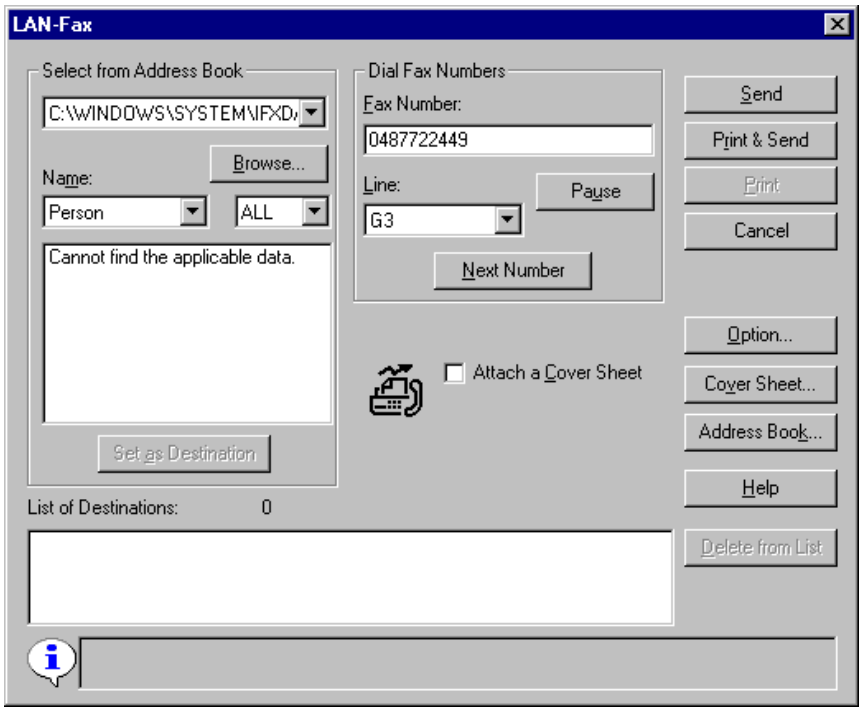
- A print job will not start if every paper tray is out of paper, if an error occurs while the fax is printing, if the printer driver is busy, or if the fax is communicating. In these cases, PC spooling halts and the PC enters the standby mode.
- The number of transactions between the fax and PC is limited to 5.
- 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.

4.7.2 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 F2” for example), then press OK. The LAN Fax dialog box opens.
3. Enter the fax number.
4. After making the settings for each mode, click either the Send button or the Send & Print button.



H210D918.WMF

5. The following items are supported by this driver.

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
Cover Sheet	Attach, Edit

6. The image information received from the PC is stored in the SAF and then sent. This conforms with 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 5.
- 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 an F-code 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.

```
**** Mail Information ************************************ 6.10.2002 12:20 ******

From: Aoyama@abc.def.co.jp
Subject: From "0311119999" [Fax Message No. 0010]

*******************************************************************************


           ********** TRANSFER RESULT REPORT (6.10.2002 12:46 **********
TRANSFER STATION          Aoyama@abc.def.co.jp
TRANSFER REQUESTED TIME:  6.10 1202


ADDRESS (GROUP)                                          PAGE   RESULT
G3     :9522                                               1       OK
G3     :9518                                               1       OK
```

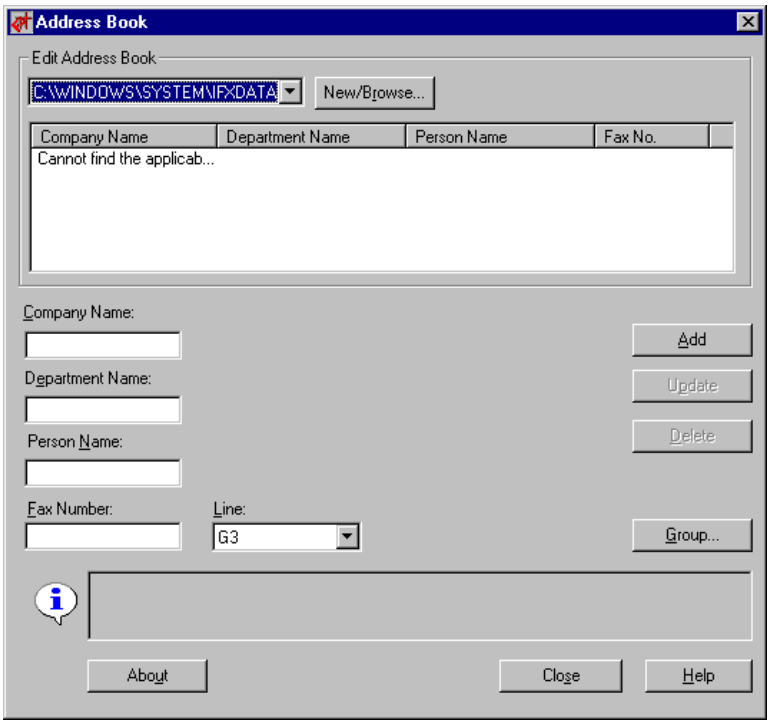
4.7.3 ADDRESS BOOK

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, 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.



H210D919.WMF

4.8 SCANNER FUNCTIONS

The scanner function of this machine provides two important functions:

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

4.8.1 SCANNING SPECIFICATIONS

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

Original	Default File Format	Option
Monochrome	TIFF	PDF
Color	JPEG	

User Parameter Setting SW17 Bit 5 determines the data format used in scanning.

SW17 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.

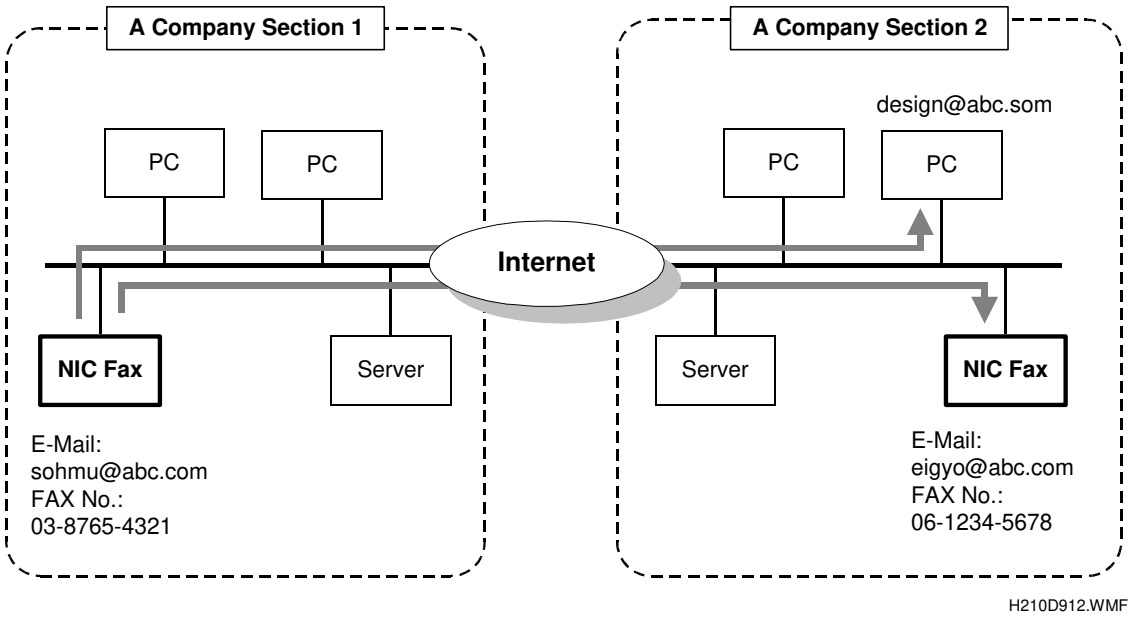
***2:** User Parameter SW20 Bit 2 determines whether Ex. Super Fine can be used for fax transmission. Bit 2 setting 0 (the default) disables Ex. Super Fine and setting 1 enables Ex. Super Fine.

Important Points About Scanning

- The operation panel is used for all scanning settings and scanning job execution.
- The quality of the scanned image can be adjusted at the operation panel. There are two adjustments. Note that some settings can increase the file size, which increases the transmission time. Refer to ‘Sending Color Documents in section 6 of the H310 service manual.
- 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.

4.8.2 SCAN-TO-E-MAIL

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



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

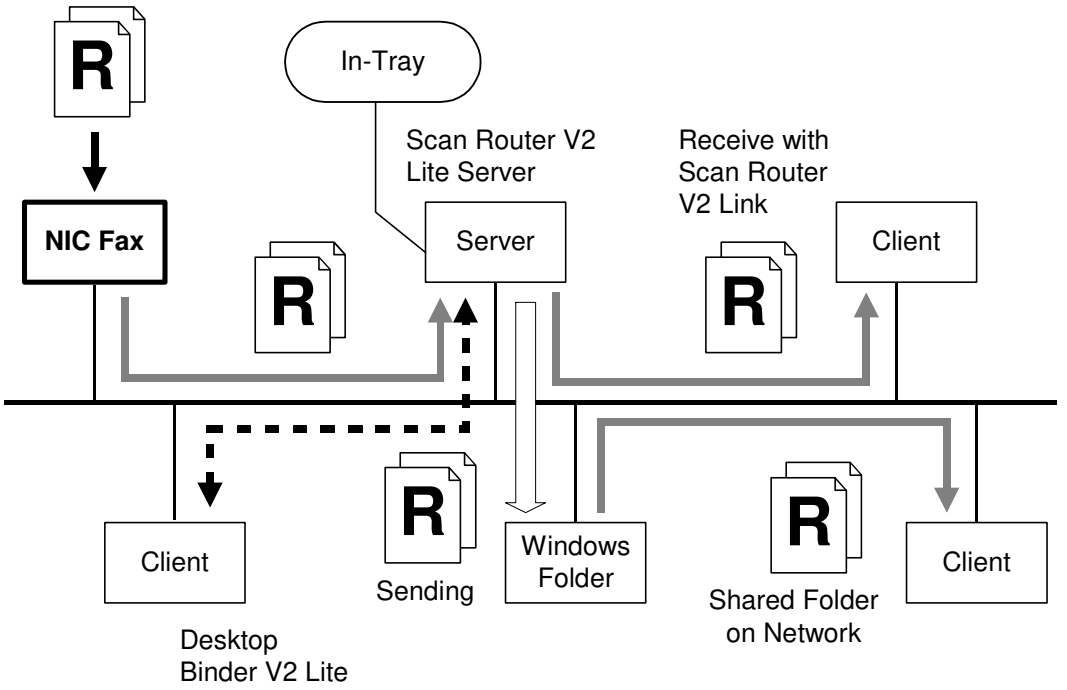
- In order to use scan-to-e-mail, “Scanner” must be registered in a user function key.
- The TTI (Transfer Terminal Identification) is not appended to a file scanned to e-mail.
- Images scanned in color are stored in the memory on the JPEG board, not in the SAF, so the mail must be sent with Immediate 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 Bit 5 determines the data format used in scanning.

SW17 Bit 5	**0:**	TIFF (monochrome)/JPEG Color
	1:	PDF

- The address determines the destination for scan-to-e-mail or delivery to a server.
- The quality of the scanned image can be adjusted at the operation panel. There are two adjustments. Refer to ‘Sending Color Documents in section 6 of the H310 service manual.

4.8.3 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.



H210D913.WMF

Settings

System switch 02 bit 2: Set this bit to 1 when you wish to use the machine as a network scanner using Scan Router.

LAN switch 0C, bits 4 and 5: Interval for checking if new addresses have been stored in the Scan Router Server

4.9 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.

4.9.1 WEB STATUS MONITOR OPERATION

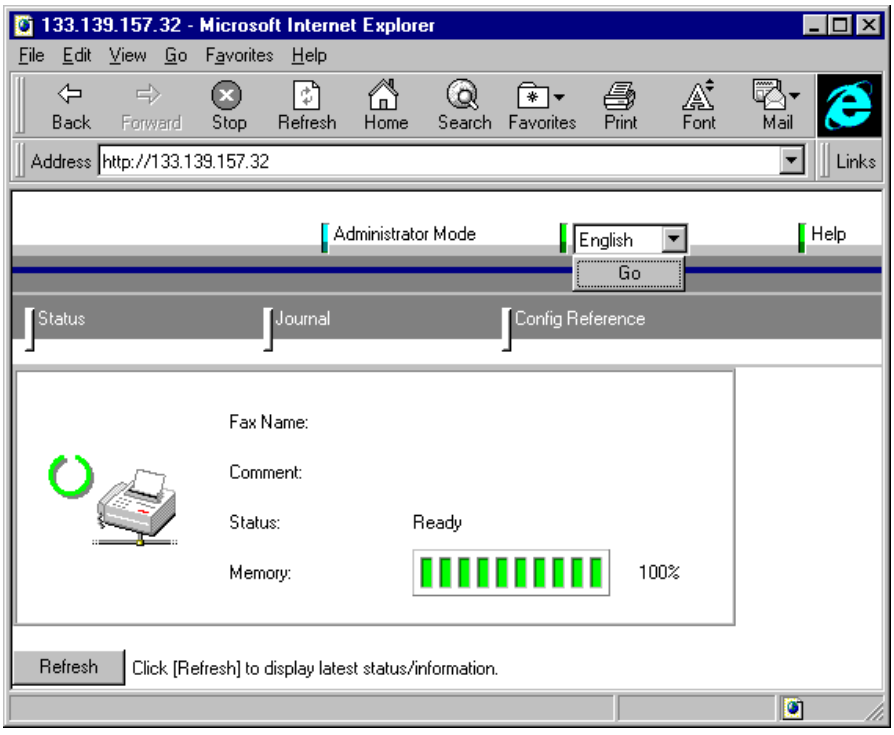
Follow the procedure below to access the Web Status Monitor.

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

   `http://192.168.1.10/`

   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.



H210D920.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, move, copy, 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.

Dial settings are always restored in this order:

Step 1 Quick dials
↓ ↓
Step 2 Speed dials
↓ ↓
Step 3 Group 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.

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)

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.)

LAN SW05 Bit 1 = 0 (Overwrite From PC Utility Prohibited)

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.

SPECIFICATIONS

1. IFAX SPECIFICATIONS

Type
NIC Fax Kit Type 510
(LAN board option for Model K3)

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

Connection
100base-Tx/10base-T direct connection

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

NOTE: To use 400 dpi, a LAN bit switch setting must be changed.

Transmission Time
9 s (through a LAN)
Condition: ITU-T #1 test document (Slerexe 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
The maximum message width is A4/Letter width by default. To use B4, A3, or Double Letter width, a LAN bit switch setting must be changed.

E-mail File Format
Single/multipart
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 which are 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

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 Bit 0 must be set to register gatekeeper and tel. number.)

Transmission Paper Size
A4 - 216 mm
B4 - 256 mm
A3 - 304 mm

Compatible Machines
Other H310/H311 machines
T.38 standard machines

3. SCANNER FUNCTION SPECIFICATIONS

Functions

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

File Formats

TIFF (monochrome), JPEG (Color), PDF (monochrome or color). File format can be selected with User Parameter SW17 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 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

B4 -256 mm

A3 - 297 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 from 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 Bit 3 enabled.)

Selectable Functions

Send at specified time, user codes, print fax header.

Compatible Computers

IBM compatible PC/AT

Compatible Operating Systems

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

– Web Status Monitor –

Main Features

Allows you to use 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 5.5
Netscape Communicator 4.78
Netscape 6.1
(Browser requires the IP address entry of this machine.)

Software Utilities Provided

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

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

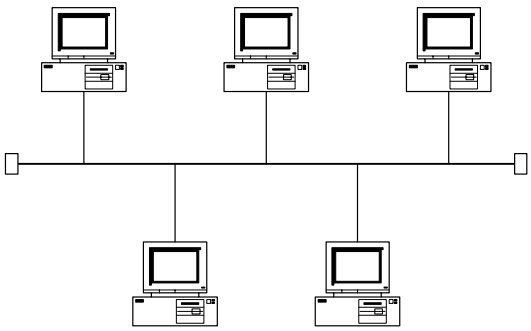
With all three topologies, signals sent from one computer go to all other computers. An address is included at the start of the data so that it is ignored by all computers except the destination.

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

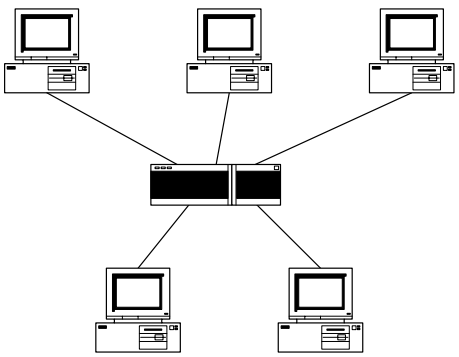


H210X501.WMF

Star Configuration

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

b) Star Connection

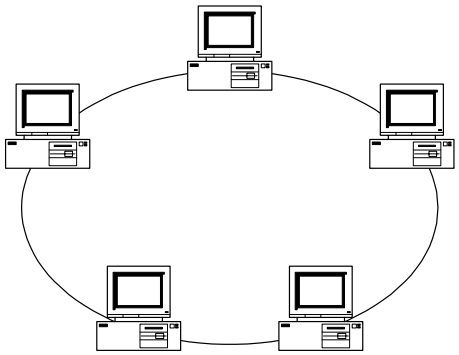


H210X502.WMF

Ring Configuration

Computers are connected in a ring.

c) Ring Connection



H210X503.WMF

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.

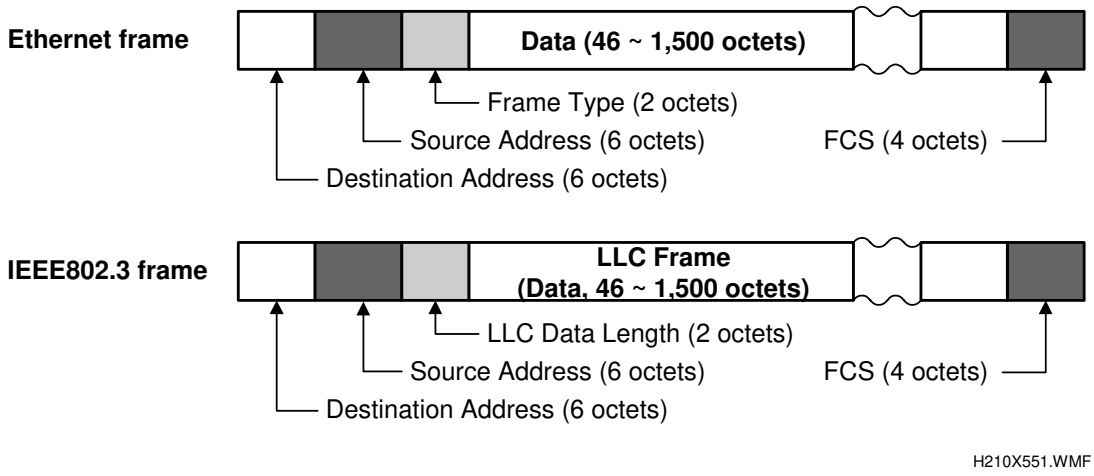
IEEE802.3 was then developed for use with media other than 10Base-5. 10Base-2, 10Base-F, and the most widely used 10Base-T, were subsequently developed.

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.



H210X551.WMF

- 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	✗	✗	✗	❍

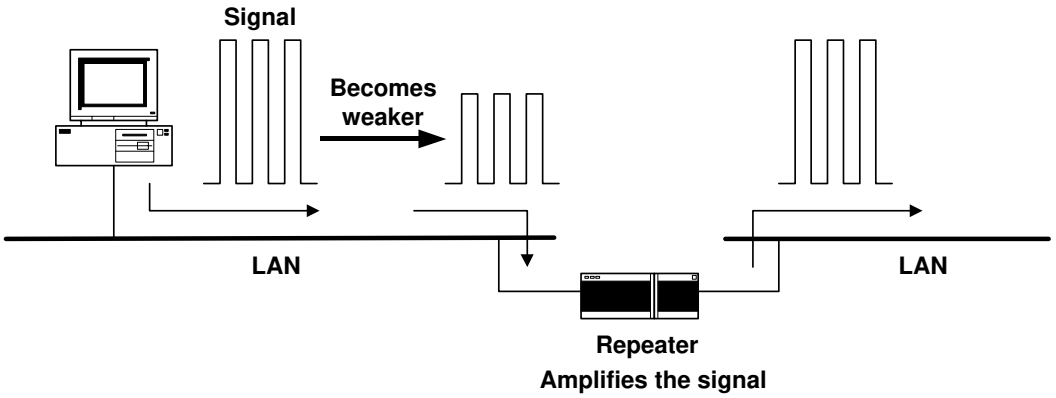
1.4.1 REPEATERS

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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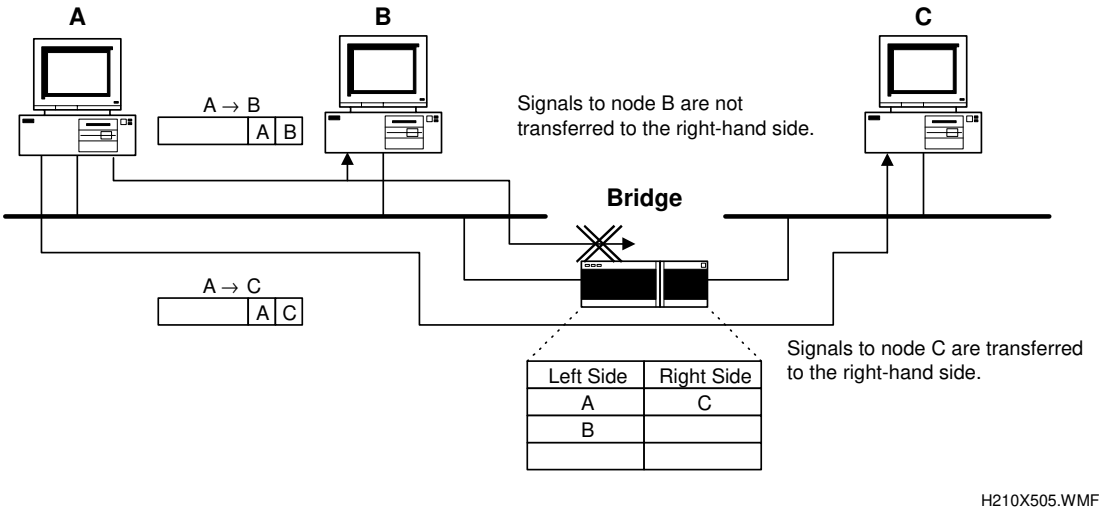
1.4.2 BRIDGES

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.

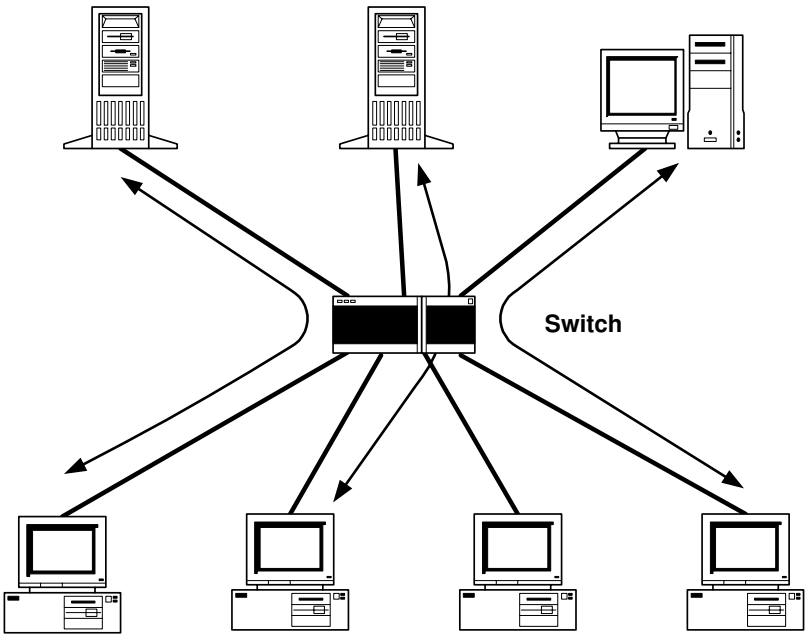


Appendix-A

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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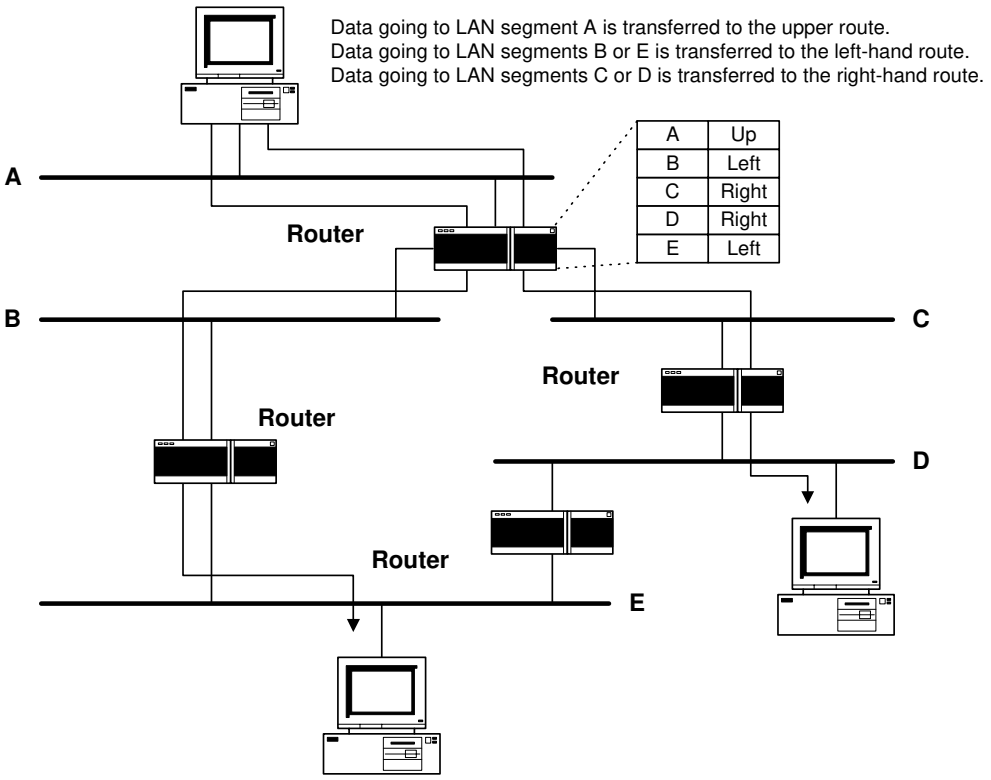
1.4.4 ROUTERS

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.

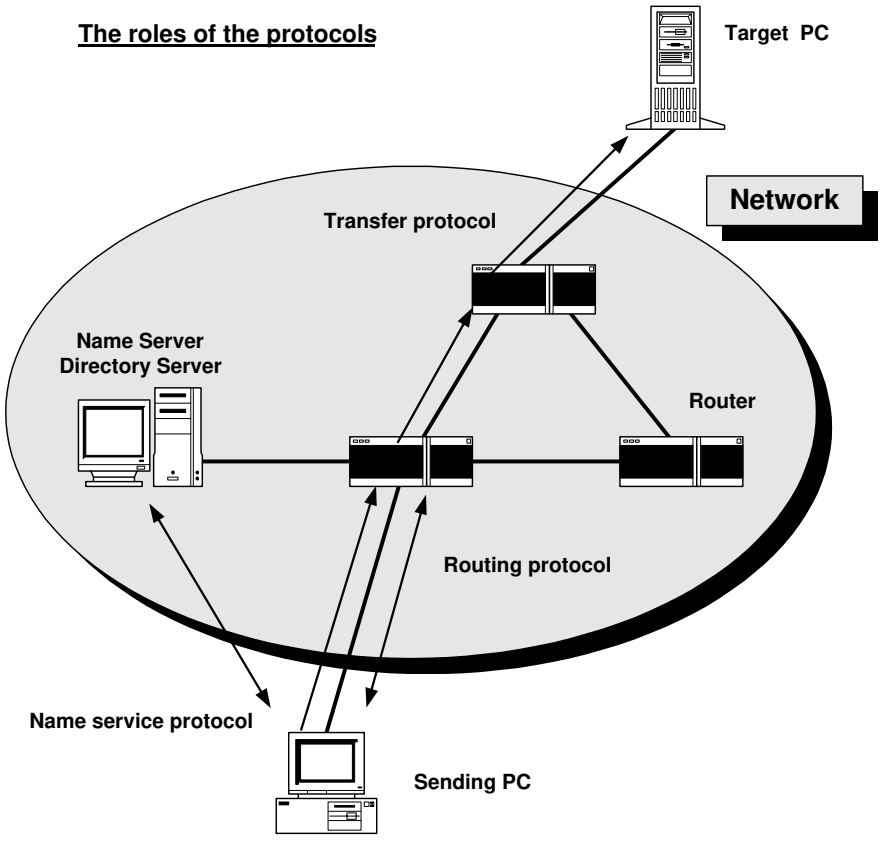
1.5.2 DATA TRANSMISSION

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 Netware 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.



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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

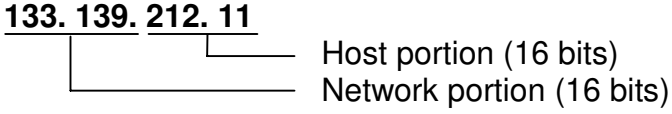
Communications with IP protocol requires that network devices such as PCs and routers using TCP/IP be assigned a 32-bit IP address as a means of identification.

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.

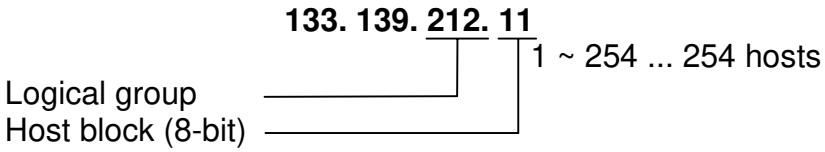
As TCP/IP involves the routing of packets using the address in this network block, the network block must be unique (no two can be alike throughout the world). On the other hand, the address within the host block is up to the user.

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



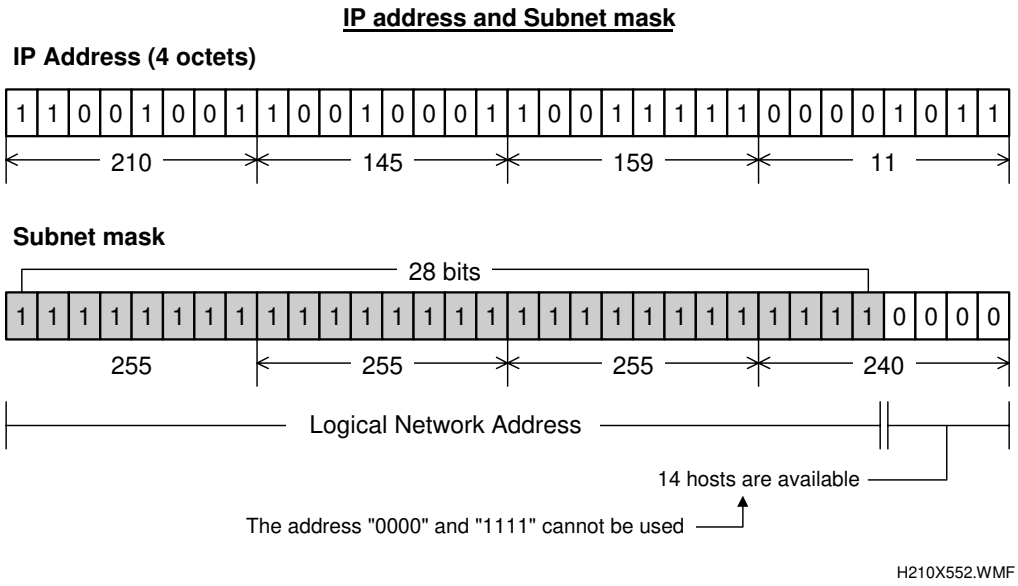
NOTE: The final part of the IP address (the host block) cannot be 0 or 255.

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.



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.

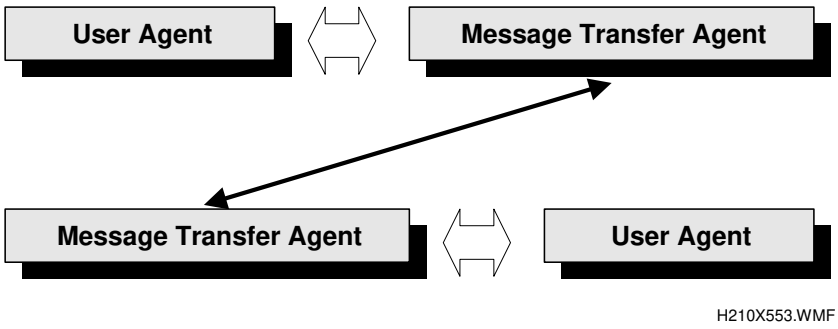
A telephone system requires that users are able talk to each other simultaneously. In the case of e-mail, the user first receives the message, and may then read it at any time, and send a reply if necessary.

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.



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.

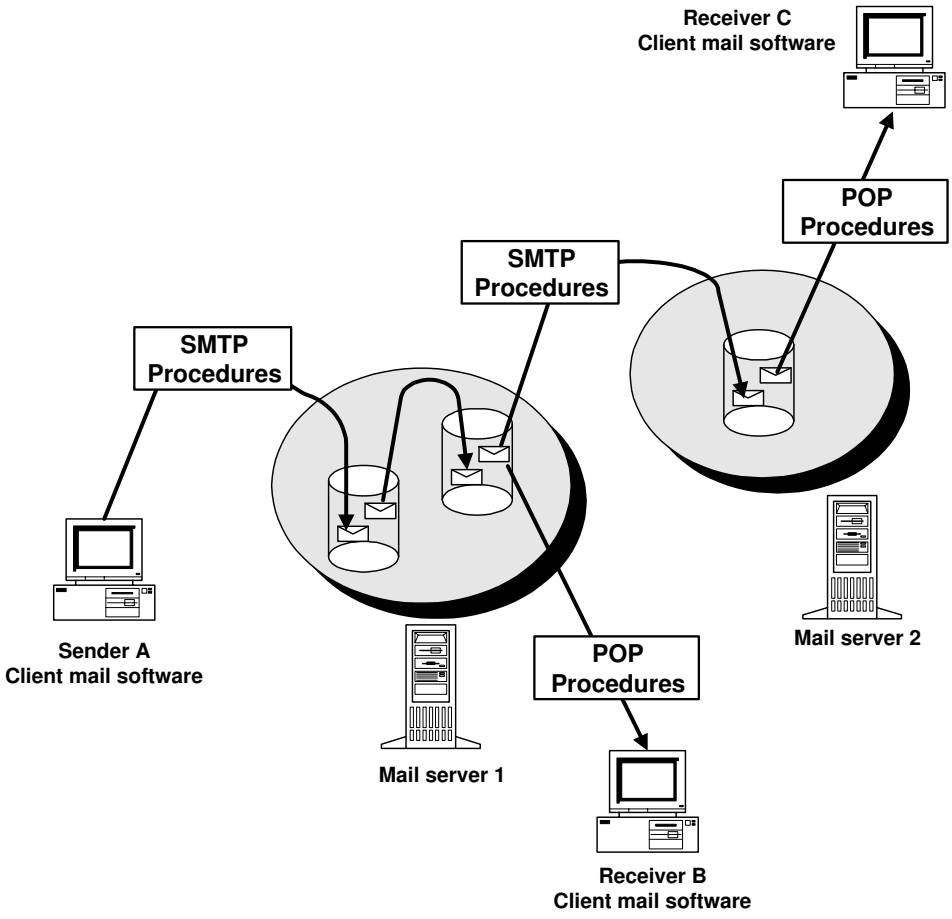
The following diagram shows what happens when somebody sends mail from a PC to a receiver with an account in the same post office and to a receiver with an account in another post office.

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. Mali 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.

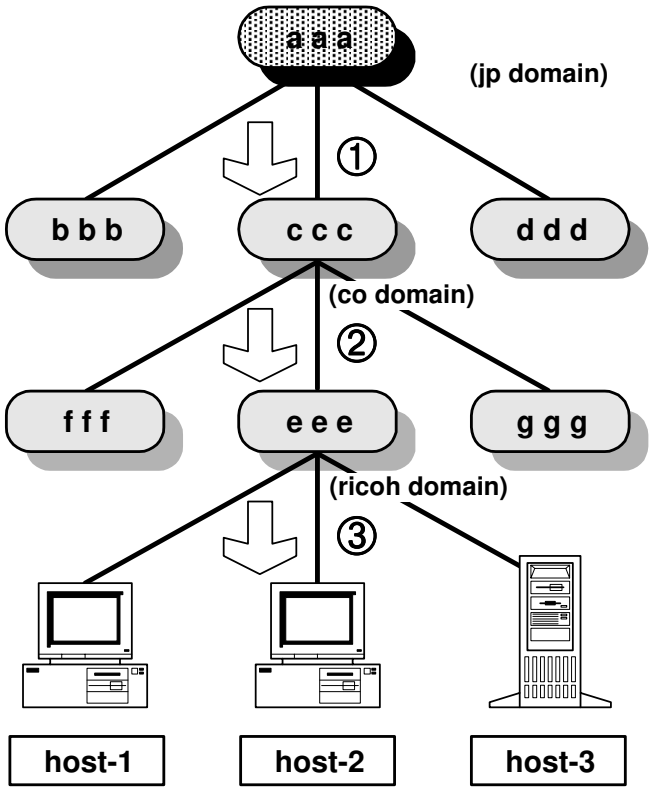
1.2.4 DNS AND DOMAINS

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.

DNS model



host-2.eee.ccc.aaa
(f64g@ricoh. co. jp)

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Appendix-B

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.

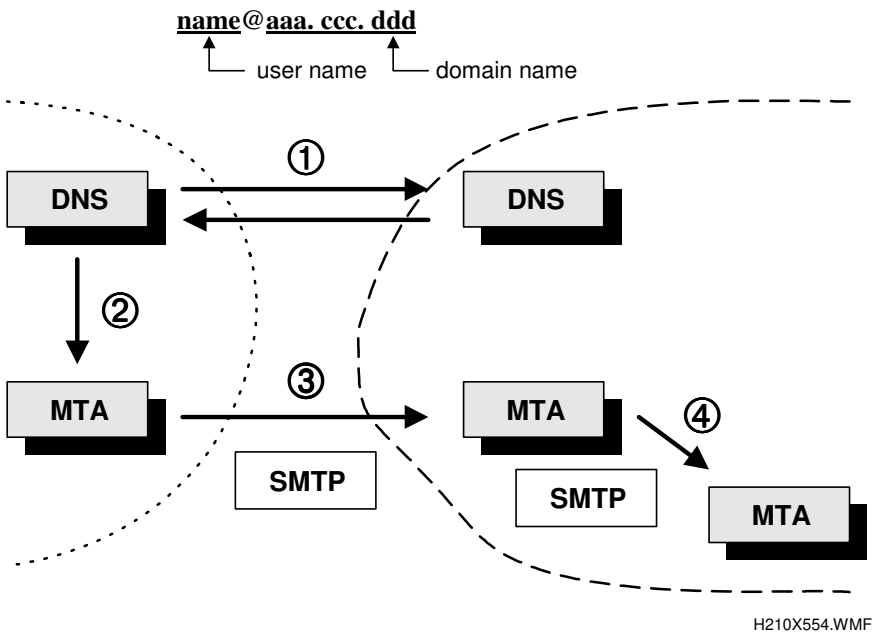
The UA used by the user receiving this mail detects its arrival by some method (e.g., by monitoring the contents of the directory designated to contain mail) and informs the user of this fact.

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).

E-mail transration



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.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: hanako@shinyoko.ricoh.co.jp
From: f64g@shinyoko.ricoh.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

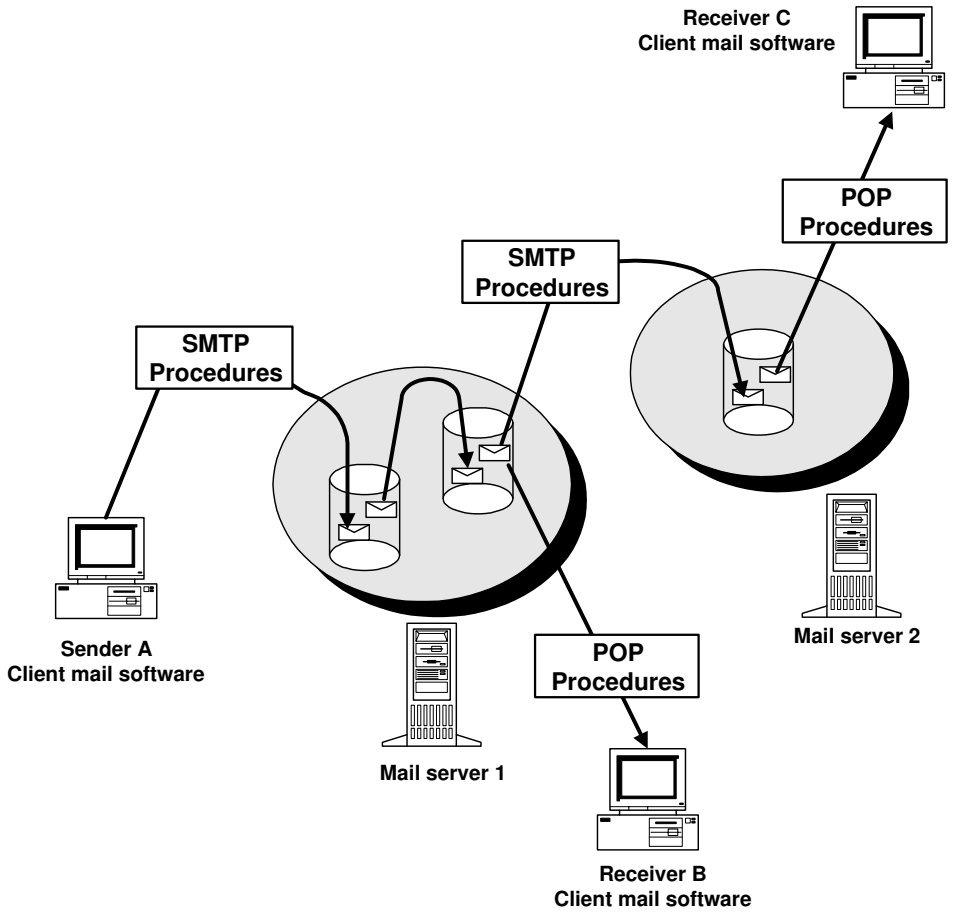
1.4.1 OVERVIEW

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.



H210X509.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 Contents-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"

SUkqAAgAAAARAP4ABAABAAAAAgAAAAABBAABAAAAwAYAAAEBBAABAAAAggQ
AAAIBAwABAAAAAQAAAAMBAwABAAAAAwAAAAYBAwABAAAAAAAAAAoBAwAB
AAAAAgAAABEBBAABAAAA6gAAABUBAwABAAAAAQAAABYBBAABAAAAggQAABc
BBAABAAAA7FwAABoBBQABAAAA2gAAABsBBQABAAAA4gAAACQBBAABAAAABAA
AACgBAwABAAAAAgAAACkBAwACAAAAAAABADEBAgAEAAAAICAgIAAAAADIAAA
AAQAAAGQAAAABAAAAAICWUG1JAYCWUG1JAYA6XQlVNAqxa5L5Sa8AgEktODg4I
WwuCCGOPMJQpVUFgSUU0risFhyDBBMRXPRSM0czZRVlJhLoRid2yafCjODgCNYmUC
HEpR8AgEmxOC7H5ThDwcdZLzHXqpfk9bOjWQGAslkBgLJZAYCyWQGAslkBgLJZAYC
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 m1ust 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
	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.	
MAIL (Mail)	MAIL FROM:<reverse-path>	S:250 F:552, 451, 452
	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.	
RCPT (Recipient)	RCPT TO:<forward-path>	S:250, 251 F:550, 551, 552, 553, 450, 451, 452 E:500,501,503
	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.	

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
	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. **NOTE:** The mail data includes the memo header items such as Date, Subject, To, Cc, From [2]. 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.	
SEND (Send)	SEND FROM:<reverse-path>	S:250 F:552, 451, 452 E:500, 501, 502, 421
	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.	
SOML (Send or mail)	SOML FROM:<reverse-path>	S:250 F:552, 451, 452 E:500, 501, 502, 421
	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.	
SAML (Send and mail)	SAML FROM:<reverse-path>	S:250 F:552, 451, 452 E:500, 501, 502, 421
	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.	
RSET (Reset)	RSET	S:250 E:500, 501, 504, 421
	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.	

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
	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. 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. 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. To refuse to change roles the receiver sends the 502 reply.	

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

Reply codes	Meaning
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
	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. 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.	
PASS	PASS <password>	+OK maildrop locked and ready -ERR invalid password -ERR unable to lock maildrop
	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. 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.	
QUIT	QUIT	+OK -ERR some deleted messages not removed
	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. Whether the removal was successful or not, the server then releases any exclusive-access lock on the maildrop and closes the TCP connection.	

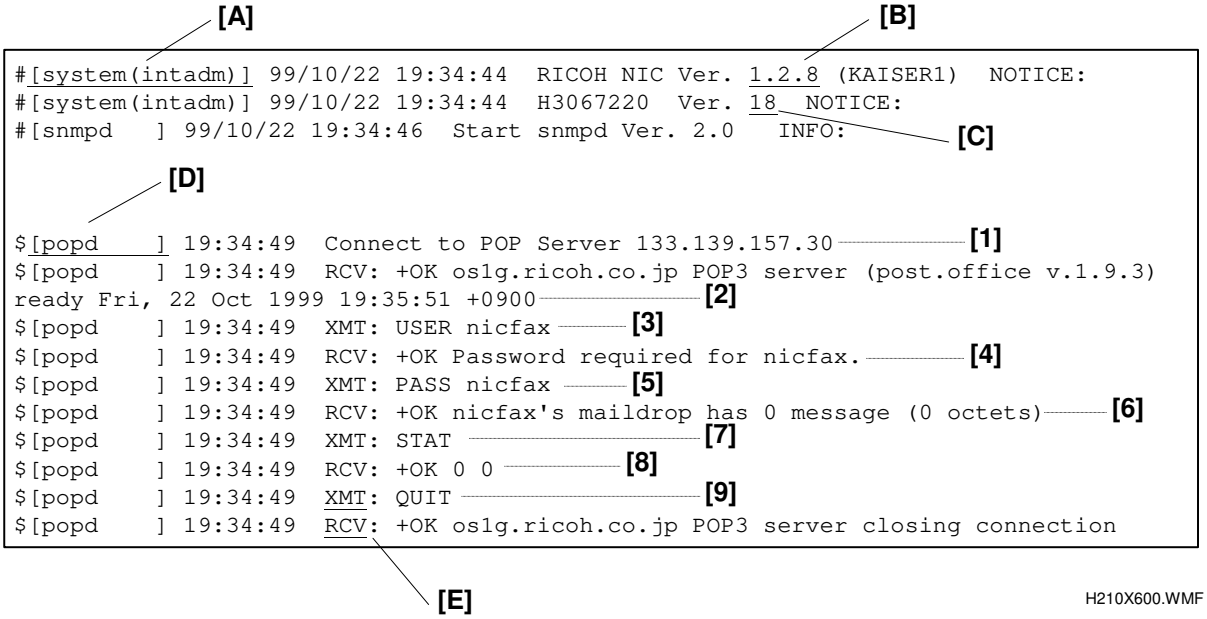
Command	Syntax	Responses
STAT	STAT	+OK nn mm
	The POP3 server issues a positive response with a line containing information for the maildrop. This line is called a "drop listing" for that maildrop. In order to simplify parsing, all POP3 servers are required to use a certain format for drop listings. 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. Note that messages marked as deleted are not counted in either total.	
LIST	LIST [message number]	+OK scan listing follows -ERR no such message
	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. 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. Note that messages marked as deleted are not counted in either total.	
RETR	RETR <message number>	+OK message follows -ERR no such message
	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).	
DELE	DELE <message number>	+OK message deleted -ERR no such message
	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.	
NOOP	NOOP	+OK
	The POP3 server does nothing, it merely replies with a positive response.	
LAST	LAST	+OK nn
	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.	
RSET	RSET	+OK
	If any messages have been marked as deleted by the POP3 server, they are unmarked. The POP3 server then replies	

Command	Syntax	Responses
TOP	TOP <message number> <number of lines>	+OK top of message follows -ERR no such message
	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). 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.	
APOP	APOP <name> <digest>	+OK maildrop locked and ready -ERR permission denied
	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. 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.	

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.



H210X600.WMF

A: 'intadm' indicates internal NIC fax messages

B: The NIC fax software version

C: The FCU software version

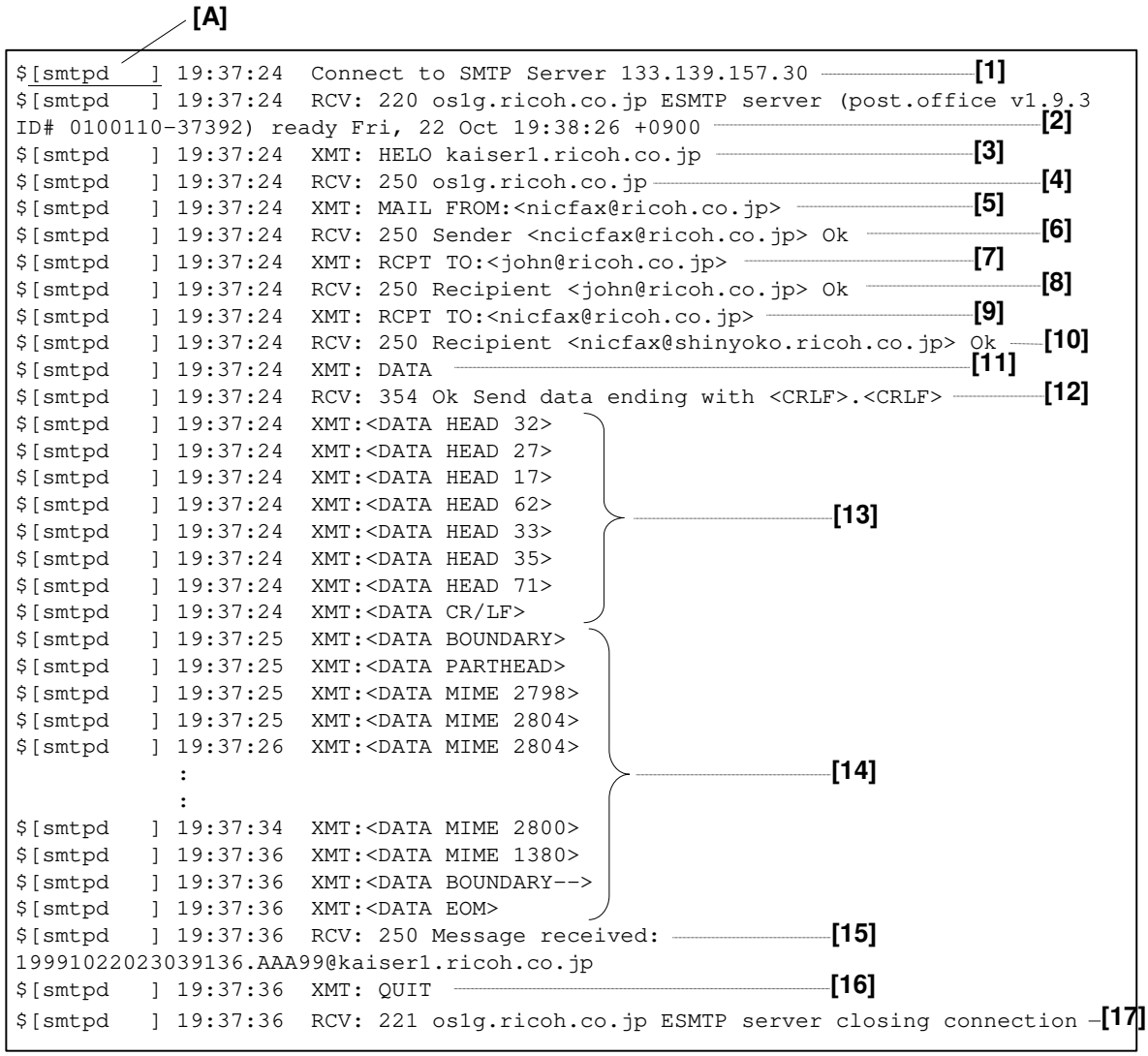
D: Displays the POP connections

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 TRANSMISION

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



H210X601.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 os1g.ricoh.co.jp POP3 server (post.office v.1.9.3)
ready Fri, 22 Oct 1999 19:44:52 +0900                                          [1]
$[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).  [2]
$[popd    ] 19:44:50  XMT: STAT                                                [3]
$[popd    ] 19:44:50  RCV: +OK 2 35431                                         [4]
$[popd    ] 19:44:50  XMT: TOP 2 0                                             [5]
$[popd    ] 19:44:50  RCV: +OK Top 0 lines of message 2                        [6]
$[popd    ] 19:44:51  RCV:<TOP DATA EOM>                                       [7]
$[popd    ] 19:44:51  XMT: TOP 1 0                                             [8]
$[popd    ] 19:44:51  RCV: +OK Top 0 lines of message 1                        [9]
$[popd    ] 19:44:51  RCV:<TOP DATA EOM>                                       [10]
$[popd    ] 19:44:51  XMT: RETR 1                                              [11]
$[popd    ] 19:44:51  RCV: +OK 17689 octets
$[popd    ] 19:44:51  RCV:<DATA 1442>
$[popd    ] 19:44:51  RCV:<DATA 1460>                                          [12]
              :
              :
$[popd    ] 19:44:53  RCV:<DATA 1163>
$[popd    ] 19:44:53  RCV:<EOM>
$[popd    ] 19:45:02  XMT: DELE 1                                              [13]
$[popd    ] 19:45:02  RCV: +OK Message 1 has been deleted.                     [14]
$[popd    ] 19:45:02  XMT: RETR 2
$[popd    ] 19:45:02  RCV: +OK 17742 octets
$[popd    ] 19:45:02  RCV:<DATA 1442>                                          [15]
              :
              :
$[popd    ] 19:45:04  RCV:<DATA 1203>
$[popd    ] 19:45:04  RCV:<EOM>
$[popd    ] 19:45:04  XMT: DELE 2                                              [16]
$[popd    ] 19:45:04  RCV: +OK Message 2 has been deleted.
$[popd    ] 19:45:04  XMT: QUIT                                                [17]
$[popd    ] 19:45:04  RCV: +OK os1g.ricoh.co.jp POP3 server closing connection
```

H210X602.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.