

2.3. TROUBLESHOOTING DETAILS

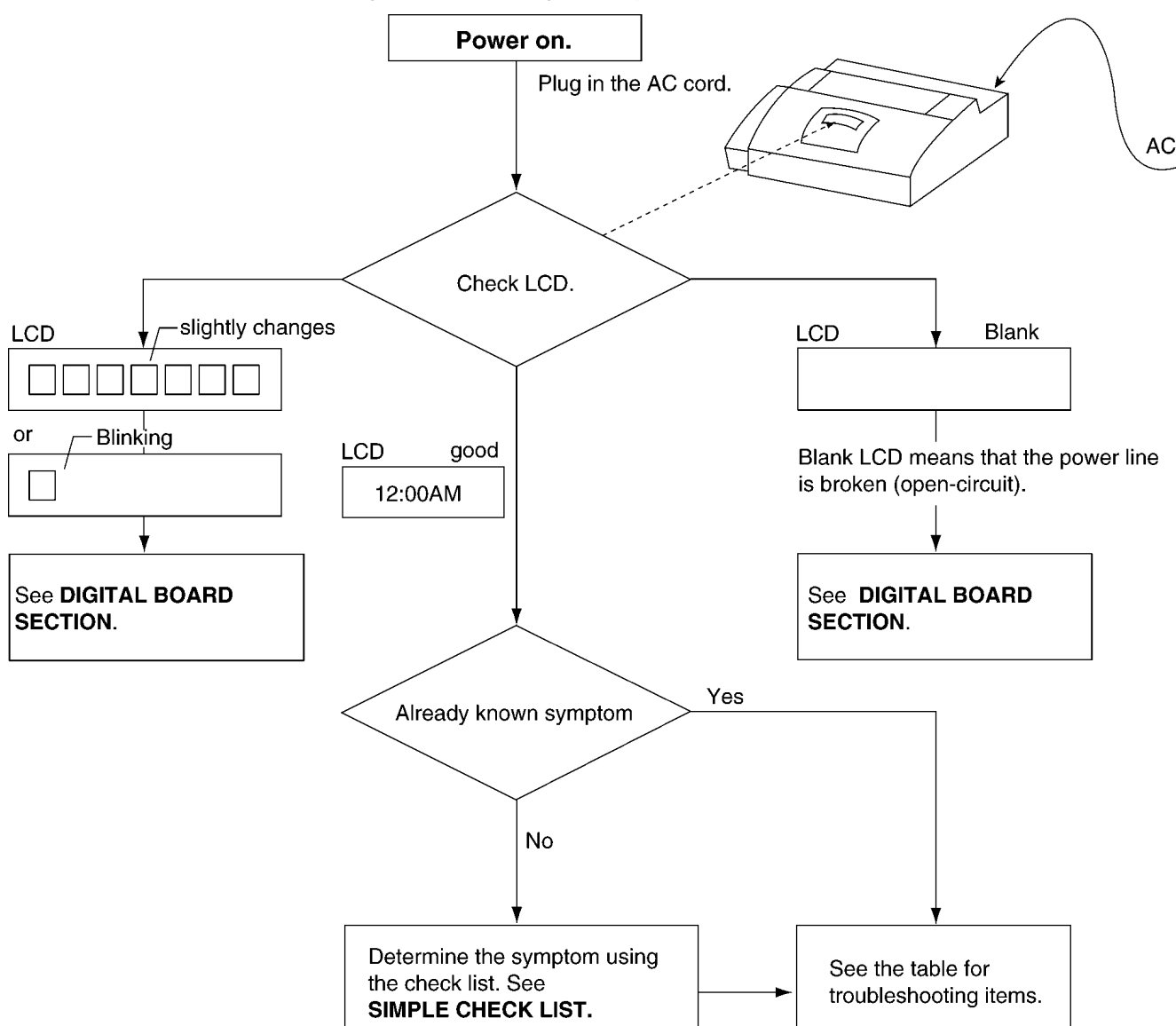
2.3.1. OUTLINE

Troubleshooting guide provides a logical path of deduction to assist in locating a fault and suggests methods of restoring the unit to full working condition. Use the reported symptoms of the fault to determine the best troubleshooting method. Even difficult faults can be tracked to a specific block or area, for example, the "Digital Board" or "Image Sensor".

A variety of fault descriptions from customers often point to the same area and, for this reason, careful analysis of the reported symptoms is required. After every repair, test all functions to ensure no problems are evident.

2.3.2. STARTING TROUBLESHOOTING

Select the appropriate troubleshooting method according to the symptoms.



CROSS REFERENCE:

SIMPLE CHECK LIST (P.32)

DIGITAL BOARD SECTION (P.60)

2.3.3. TROUBLESHOOTING ITEMS TABLE

FUNCTION	SYMPTOM	REFERENCE
Printing	Skewed receiving image	See SKEWED RECEIVING IMAGE (P.38)
	Expanded print	See EXPANDER PRINT (WHEN PRINTING) (P.39)
	Image is distorted	See IMAGE IS DISTORTED (WHEN PRINTING) (P.37)
	Black or White vertical lines appear.	See BLACK OR WHITE VERTICAL LINES APPEAR (P.38)
ADF (Auto Document Feeder)	No feed	See NO DOCUMENT FEED (P.33)
	Paper jam	See DOCUMENT JAM (P.34)
	Multiple feed	See MULTIPLE FEED (P.35)
	Skew	See SKEW (P.36)
Abnormal mechanical sound	Abnormal sound from the product	See WHEN COPYING OR PRINTING, AN ABNORMAL SOUND IS HEARD FROM THE UNIT (P.39)
Power supply	Voltage output is abnormal.	See POWER SUPPLY BOARD SECTION (P.75)
Operation panel	keys are not accepted.	See OPERATION BOARD SECTION (P.78)
Sensor	If the electric circuit is the cause, "REMOVE DOCUMENT" will be displayed.	See SENSOR SECTION (P.79)
Communication FAX, TEL (Analog/Digital board)	Cannot communicate by fax.	See DEFECTIVE ITS (INTEGRATED TELEPHONE SYSTEM) SECTION (P.72)
	Error code is displayed.	See HOW TO OUTPUT THE JOURNAL REPORT: (P.48)
	Cannot talk.	See ANALOG BOARD SECTION (P.70)
	DTMF tone doesn't work.	
	Handset/Monitor sound, volume	

2.3.3.1. SIMPLE CHECK LIST

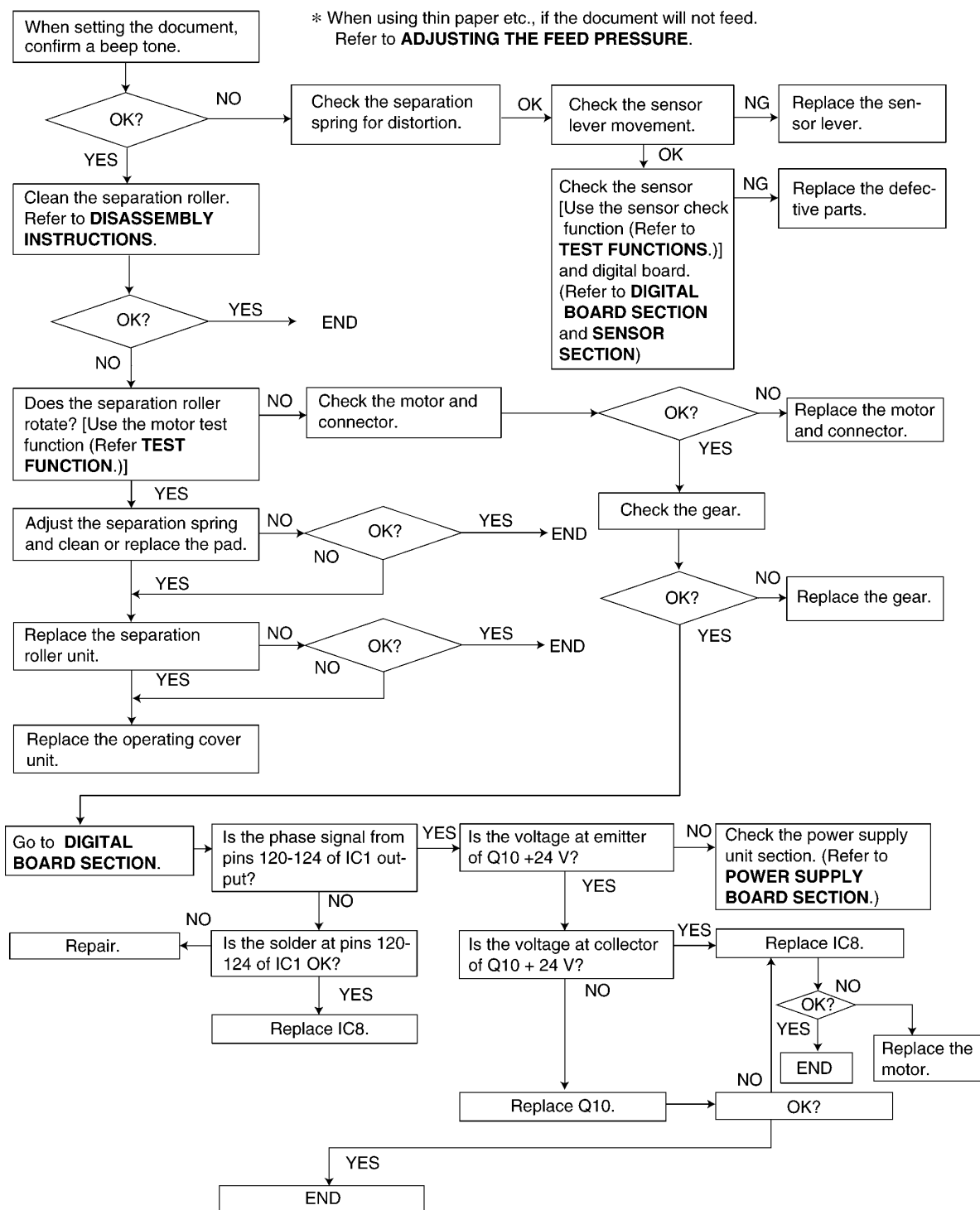
SERIAL NO.		DATE	
FUNCTION		JUDGEMENT	REFERENCE
FAX operation	Transmission	OK / NG	
	Receiving	OK / NG	
Copy operation	FINE mode	OK / NG	
	PHOTO mode	OK / NG	
Telephone operation	Handset transceiver / receiver	OK / NG	
	Monitor sound	OK / NG	
	Ringer sound	OK / NG	
	SP-Phone Tx/Rx	OK / NG	
	Dial operation	OK / NG	
	Volume operation	OK / NG	
Operation Panel	Key check	OK / NG	Service code #561 (Refer to TEST FUNCTIONS (P.93).)
	LCD check	OK / NG	Service code #558 (Refer to TEST FUNCTIONS (P.93).)
	LED check	OK / NG	Service code #557 (Refer to TEST FUNCTIONS (P.93).)
Sensor	Sensor check	OK / NG	Service code #815 (Refer to TEST FUNCTIONS (P.93).)
Clock		OK / NG	Is the time kept correctly? Check with another clock.
External Telephone	Handset transceiver/receiver	OK / NG	
	Remote control	OK / NG	Change to FAX receiving by pressing * 9. (Refer to code no. 041.on PROGRAM MODE TABLE (P.58).)

Note:

- Check according to the service code referring to the **TEST FUNCTIONS** (P.93).

2.3.4. ADF (AUTO DOCUMENT FEED) SECTION

2.3.4.1. NO DOCUMENT FEED



CROSS REFERENCE:

DIGITAL BOARD SECTION (P.60)

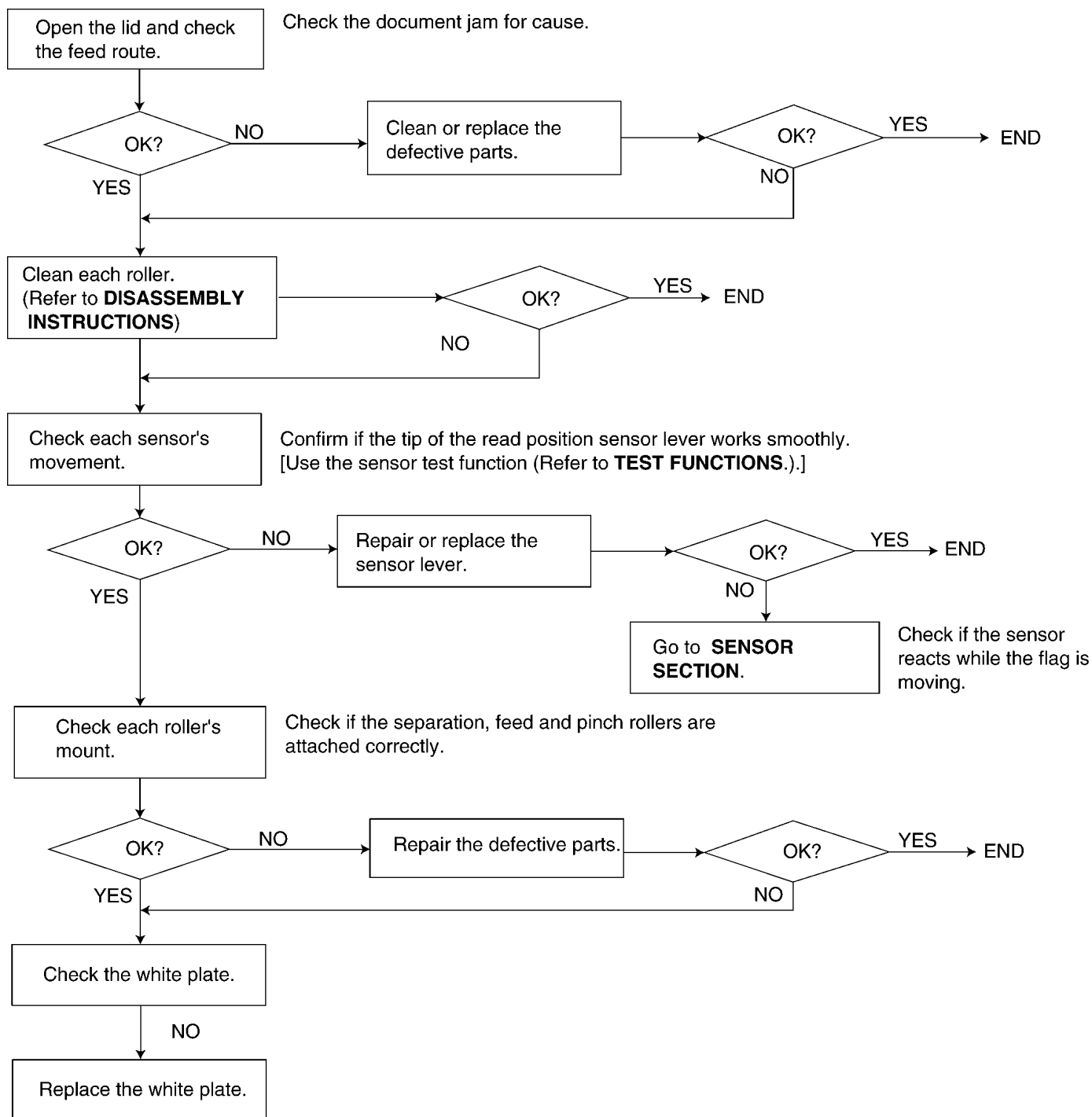
POWER SUPPLY BOARD SECTION (P.75)

SENSOR SECTION (P.79)

TEST FUNCTIONS (P.93)

DISASSEMBLY INSTRUCTIONS (P.95)

2.3.4.2. DOCUMENT JAM



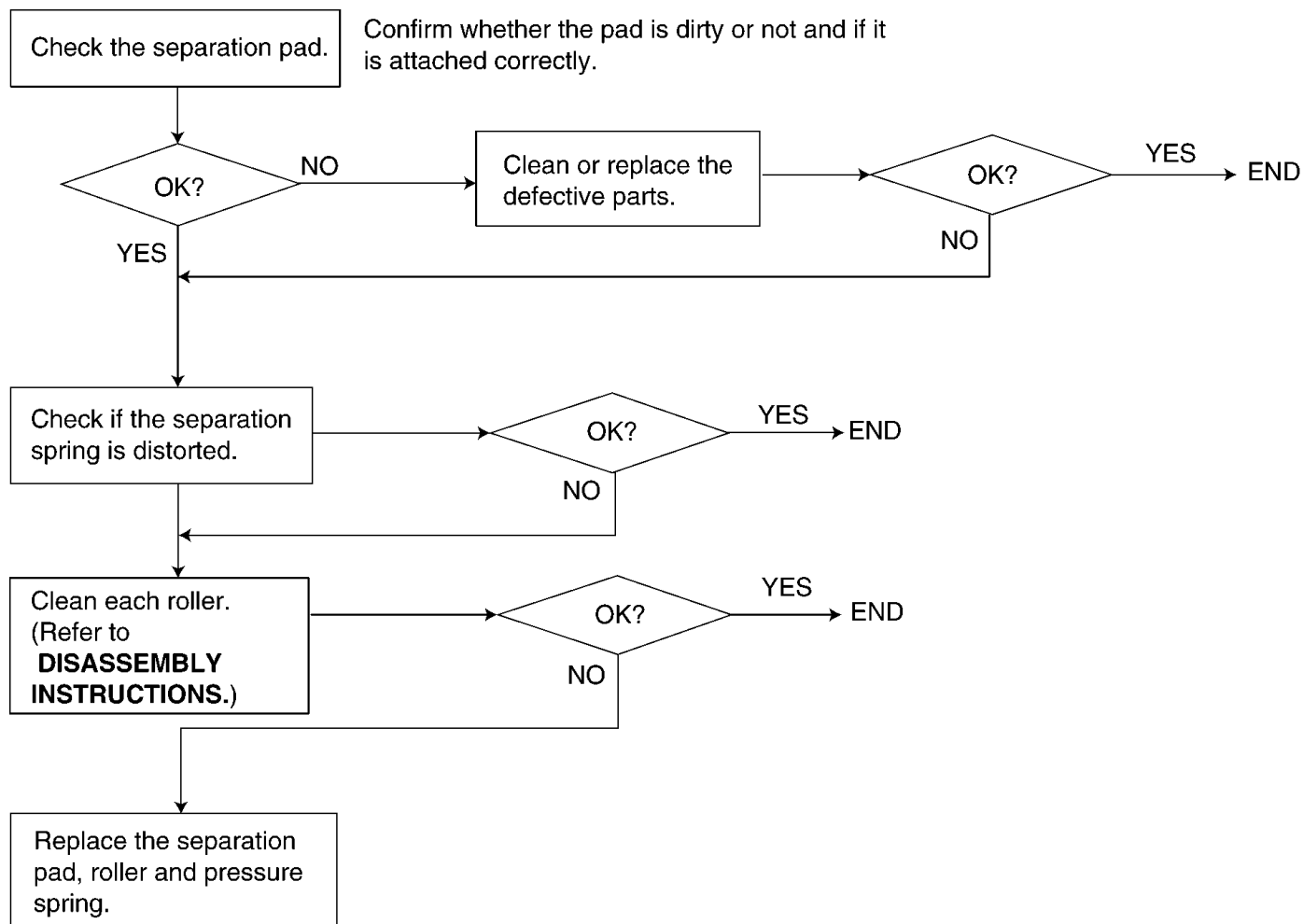
CROSS REFERENCE:

SENSOR SECTION (P.79)

DISASSEMBLY INSTRUCTIONS (P.95)

2.3.4.3. MULTIPLE FEED

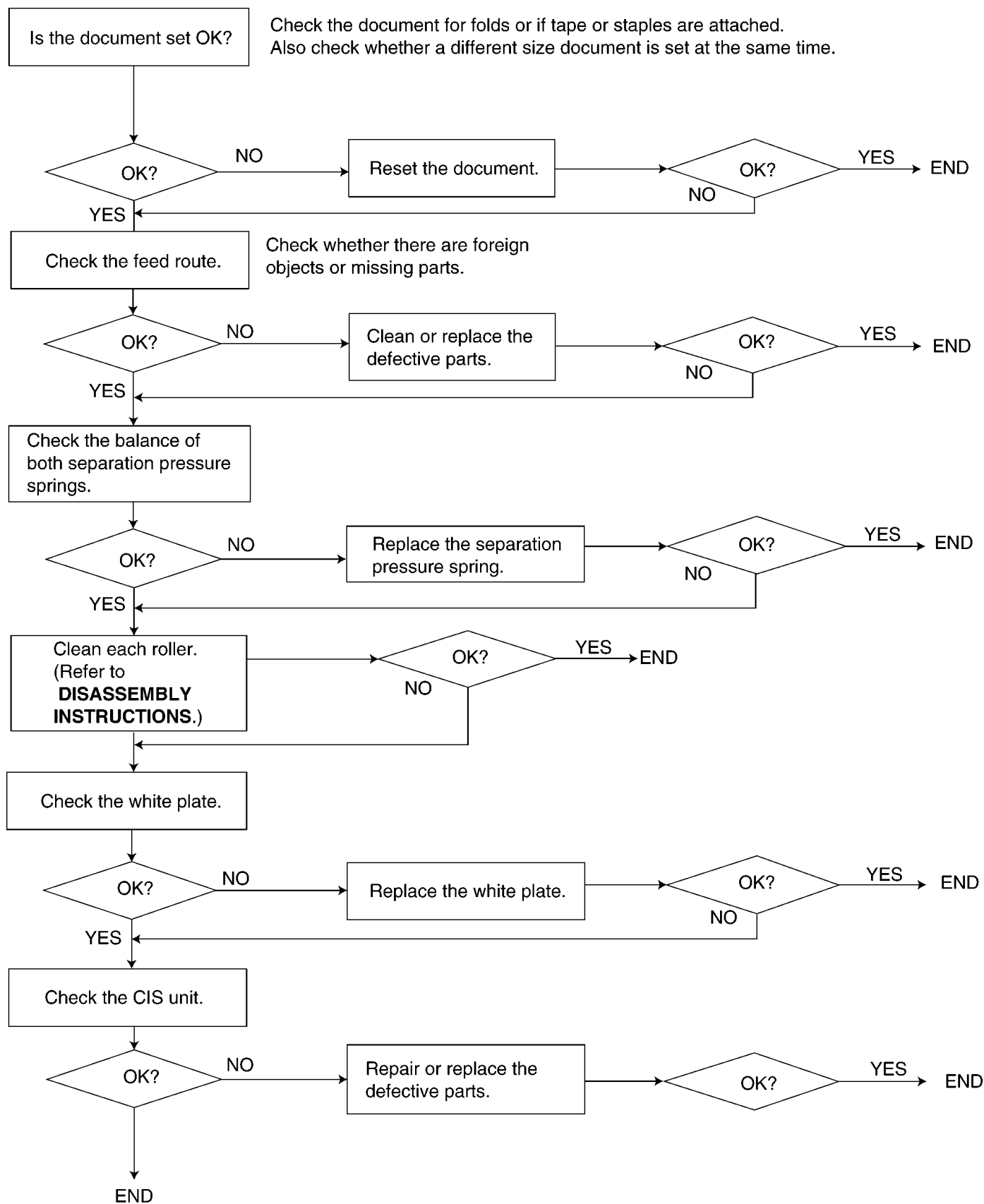
When using thick paper etc., If the document will not feed.



CROSS REFERENCE:

DISASSEMBLY INSTRUCTIONS (P.95)

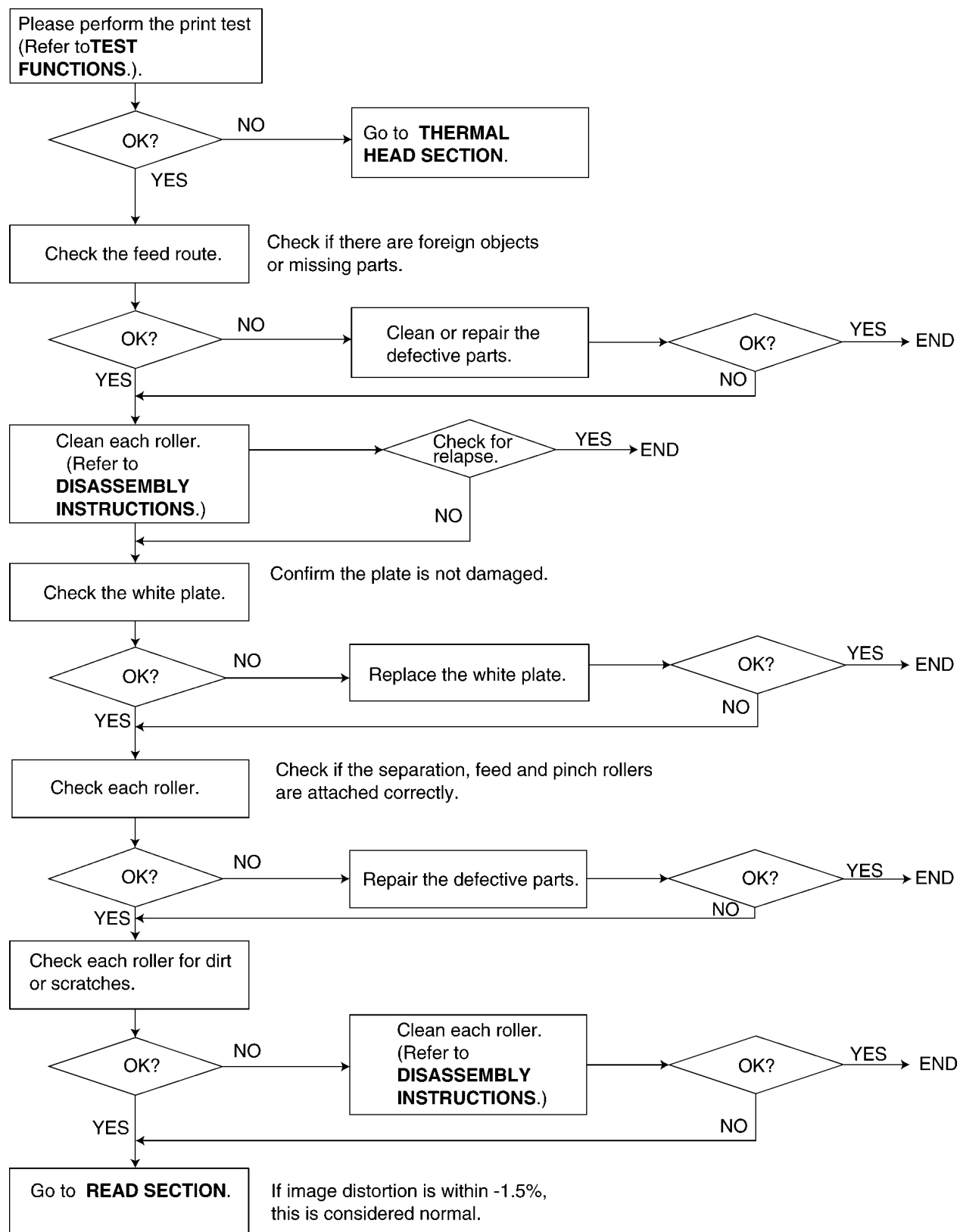
2.3.4.4. SKEW



CROSS REFERENCE:

DISASSEMBLY INSTRUCTIONS (P.95)

2.3.4.5. IMAGE IS DISTORTED (WHEN PRINTING)



CROSS REFERENCE:

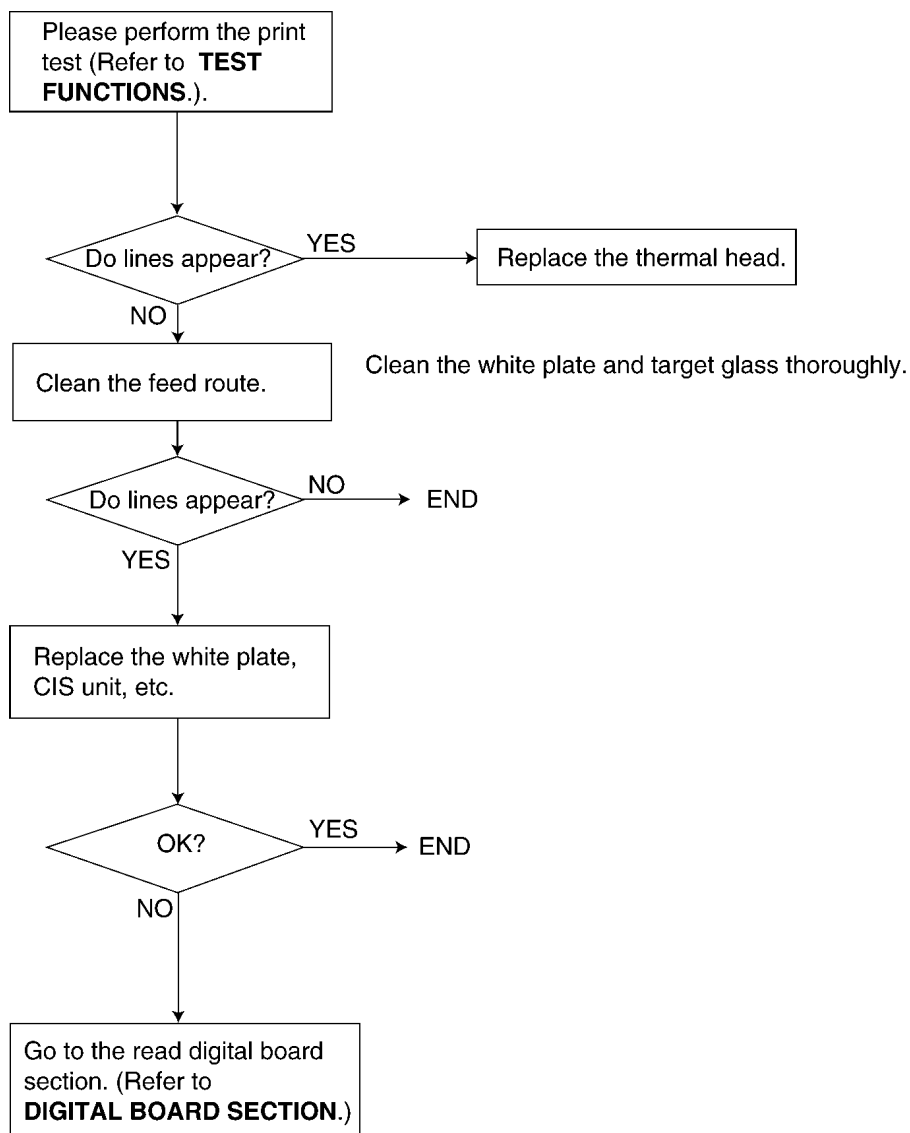
READ SECTION (P.79)

THERMAL HEAD SECTION (P.81)

TEST FUNCTIONS (P.93)

DISASSEMBLY INSTRUCTIONS (P.95)

2.3.4.6. BLACK OR WHITE VERTICAL LINES APPEAR

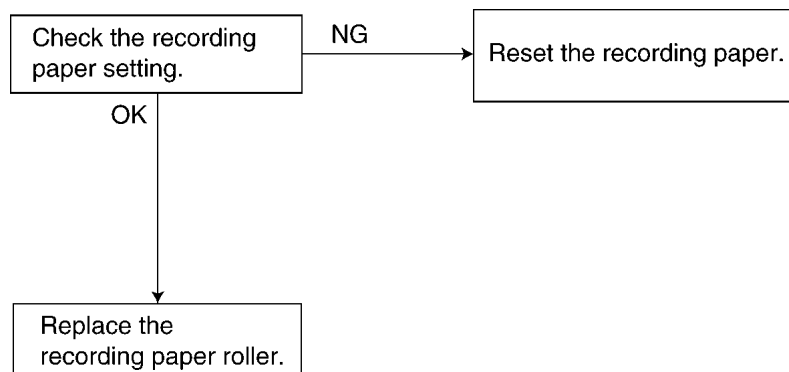


CROSS REFERENCE:

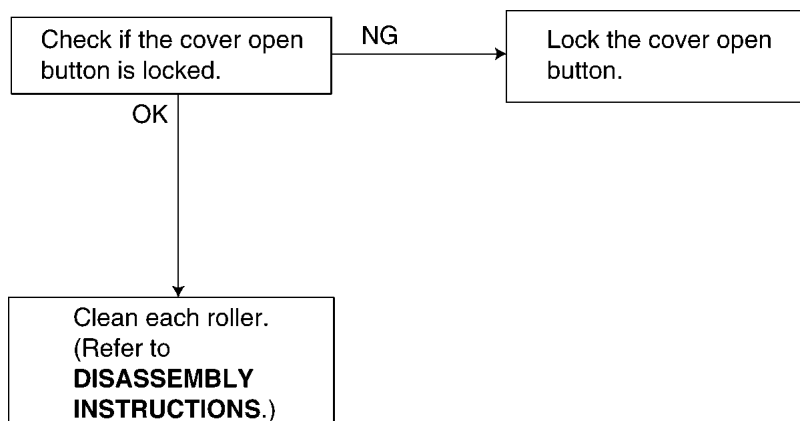
DIGITAL BOARD SECTION (P.60)

TEST FUNCTIONS (P.93)

2.3.4.7. SKEWED RECEIVING IMAGE



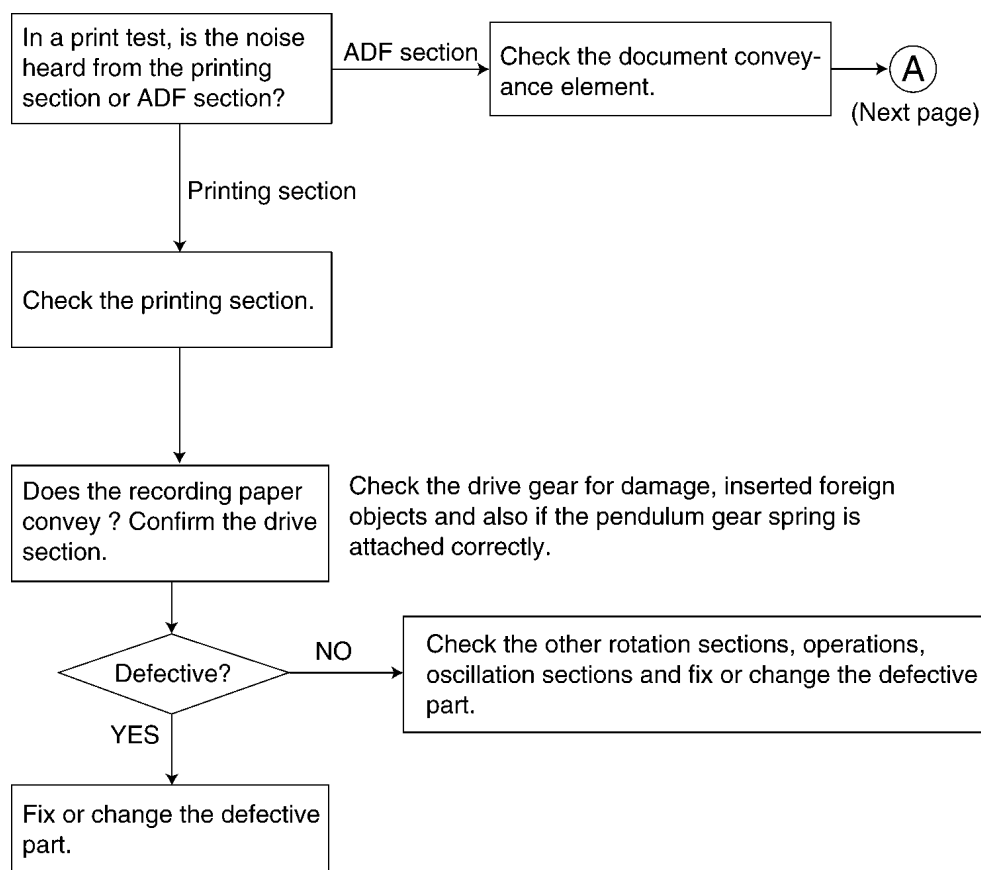
2.3.4.8. EXPANDER PRINT (WHEN PRINTING)



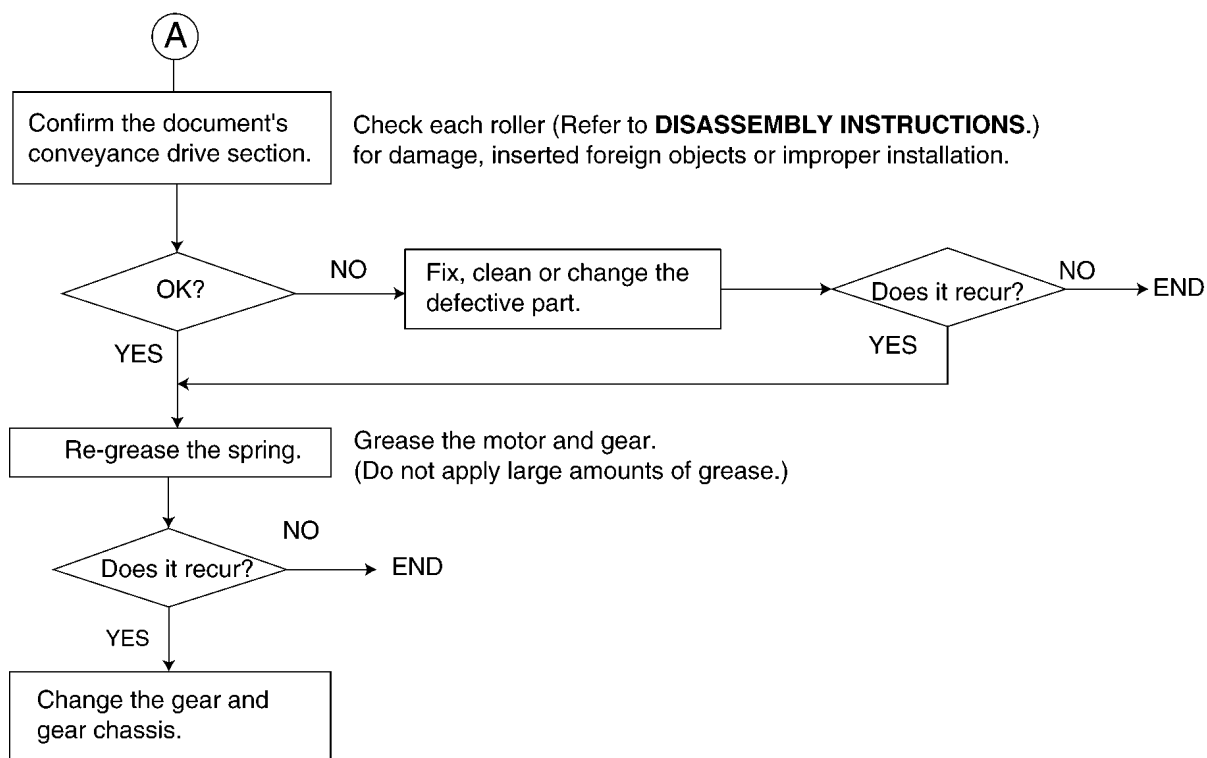
CROSS REFERENCE:

DISASSEMBLY INSTRUCTIONS (P.95)

2.3.4.9. WHEN COPYING OR PRINTING, AN ABNORMAL SOUND IS HEARD FROM THE UNIT



(From the previous page)

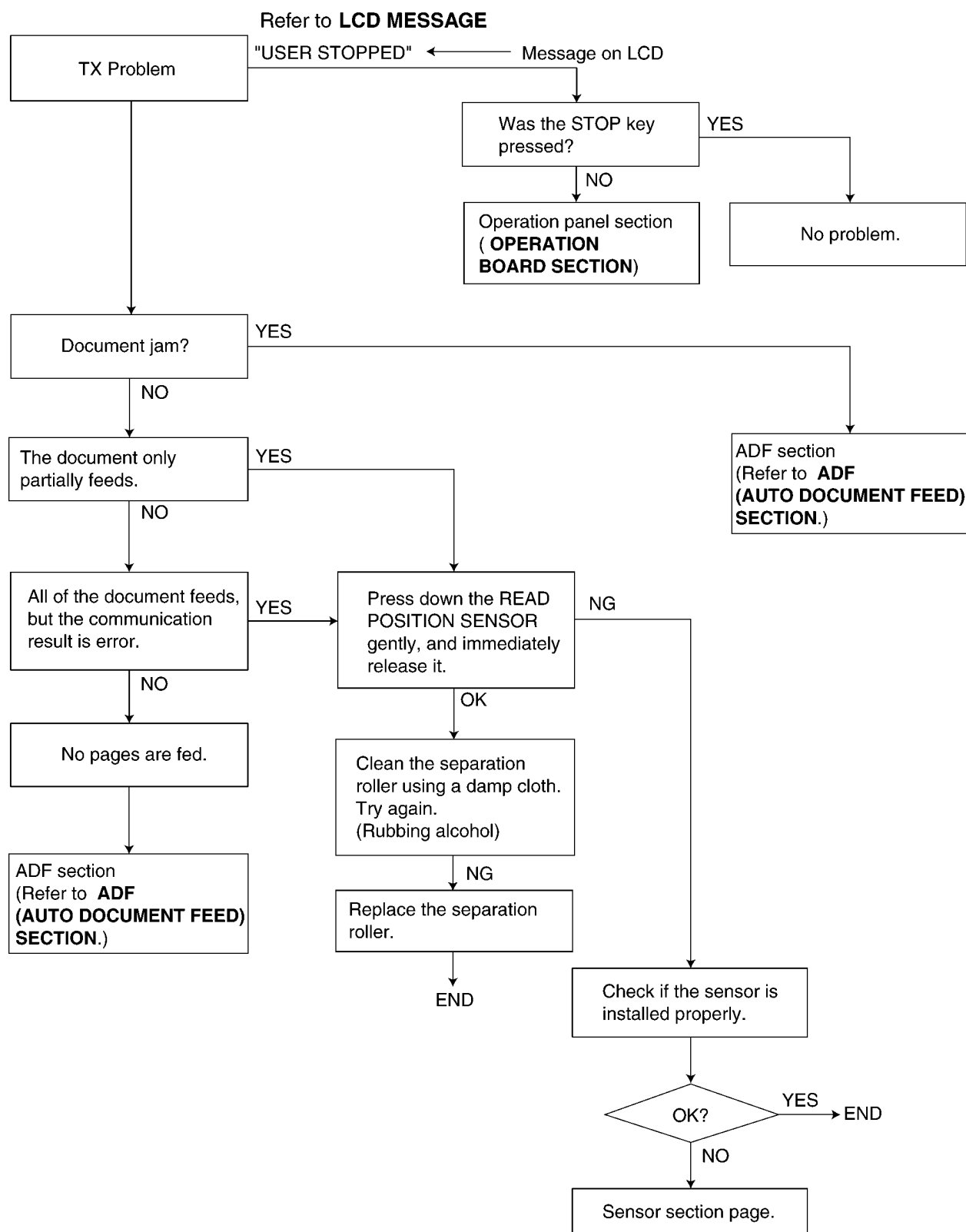
**CROSS REFERENCE:****DISASSEMBLY INSTRUCTIONS** (P.95)**2.3.5. COMMUNICATION SECTION**

Find the problem in the table shown below, and refer to the corresponding troubleshooting procedure in **DEFECTIVE FACSIMILE SECTION** (P.41).

No.	Symptom	Content	Possible cause
1	The paper is not fed properly when faxing. (Copying is also not possible.)	Troubleshooting	Problem with the feeding mechanism.
2	The fax usually transmits successfully but sometimes fails. (Copying is possible.)	Troubleshooting	Problem with the service line or with the receiver's fax.
3	The fax receives successfully one time and fails another. (Copying is possible.)	Troubleshooting	Problem with the service line or with the transmitter's fax.
4	The fax completely fails to transmit or receive. (The unit can copy documents.)	Troubleshooting	Problem with the electric circuit.
5	The fax fails either to transmit or receive when making a long distance or an international call. (The unit can copy documents.)	Detailed description of the possible causes (Similar to troubleshooting items No.2 and No.3.)	Problem with the service line.
6	No.1-No.5	The troubleshooting procedure for each error code will be printed on the communication result report.	

2.3.5.1. DEFECTIVE FACSIMILE SECTION

2.3.5.1.1. TRANSMIT PROBLEM



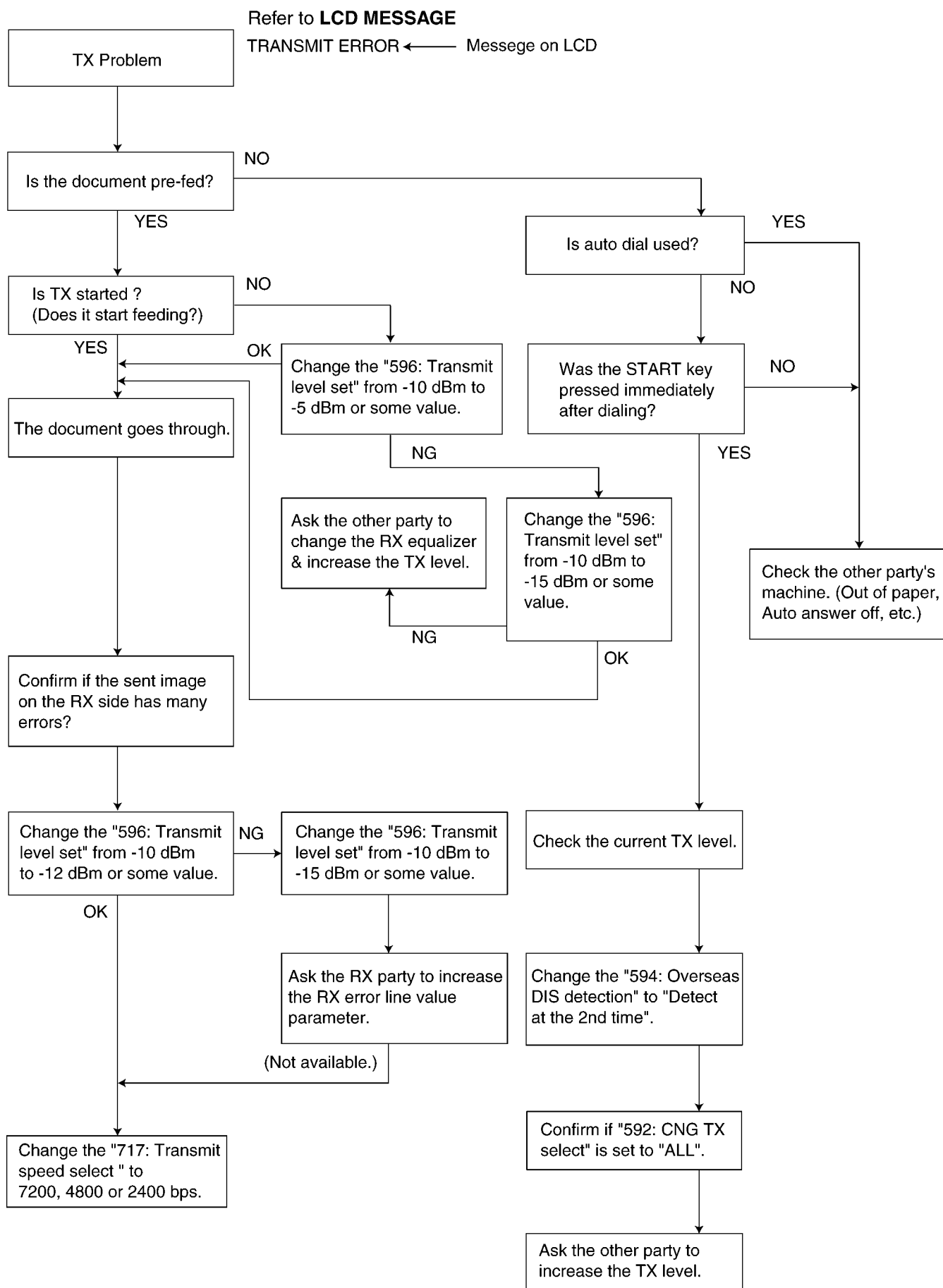
CROSS REFERENCE:

LCD MESSAGE (P.3)

ADF (AUTO DOCUMENT FEED) SECTION (P.33)

OPERATION BOARD SECTION (P.78)

2.3.5.1.2. SOMETIMES THERE IS A TRANSMIT PROBLEM



2.3.5.1.3. RECEPTION PROBLEM

Confirm the following before starting troubleshooting.

Is the recording paper installed properly?

There is the receiving problem when sometimes the below errors may be occurred.

Refer to **LCD MESSAGE** (P.3)

OUT OF PAPER

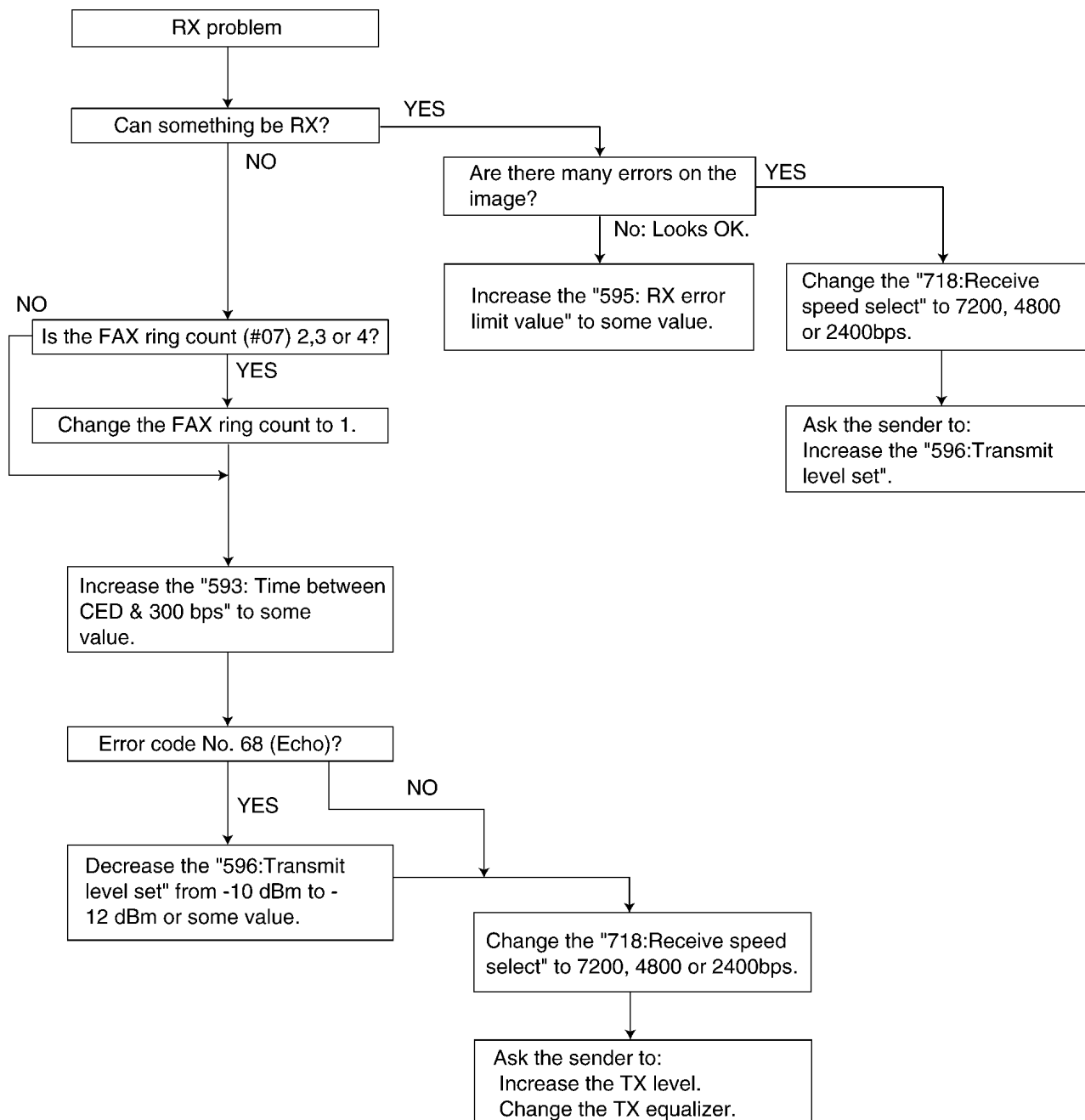
CHHECK COVER

UNIT OVERHEATED (If it doesn't return automatically, COVER OPEN, etc., reset the unit.)

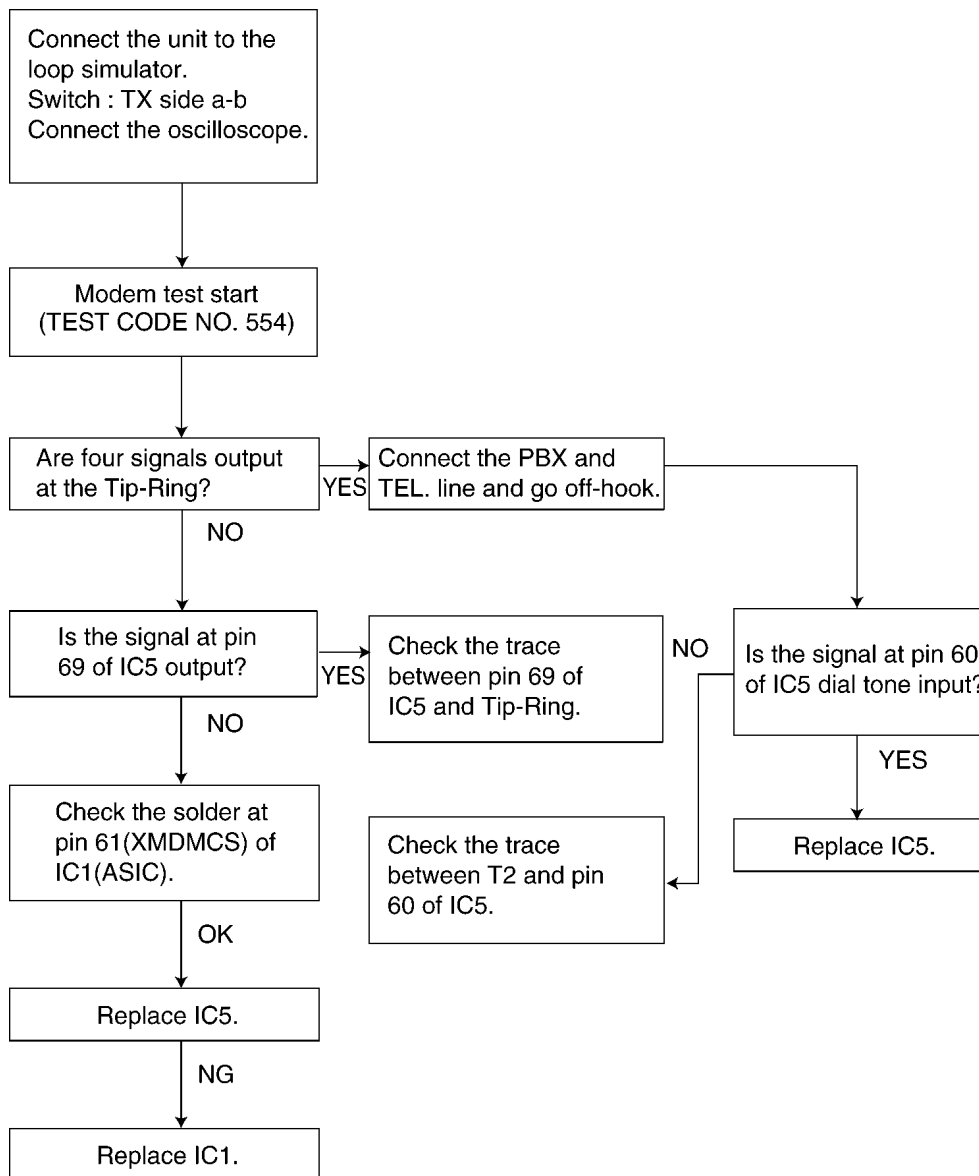
CHECK DOCUMENT

Please refer to **USER RECOVERABLE ERRORS** (P.28) for the above items.

Also, when a hardware deformity occurs, please check each sensor.



2.3.5.1.4. THE UNIT CAN COPY, BUT CANNOT TRANSMIT/RECEIVE



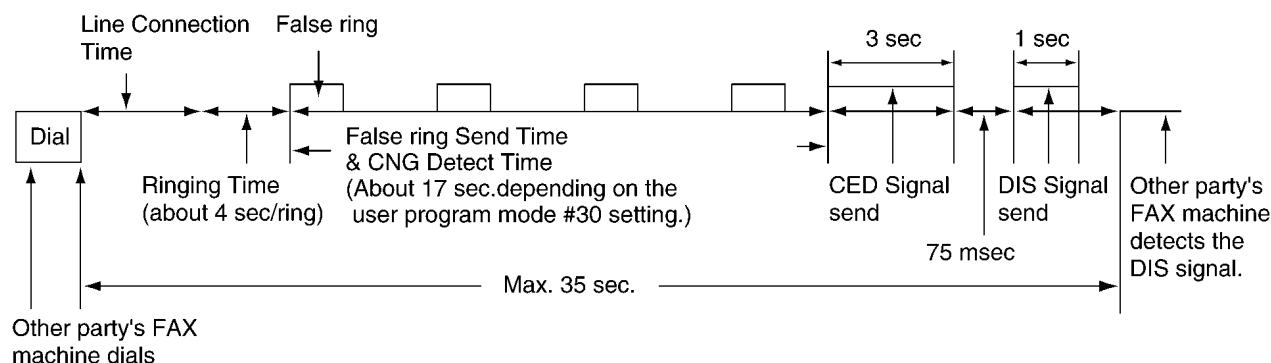
2.3.5.1.5. UNIT CAN COPY, BUT CANNOT TRANSMIT/RECEIVE LONG DISTANCE OR INTERNATIONAL COMMUNICATIONS

The following 2 causes can be considered for this.

Cause 1:

The other party is executing automatic dialling, the call has been received by this unit, and the CED or DIS signal response time is too long. (In most cases, this unit detects the CNG signal and can respond to the CED or DIS.) (According to the ITU-T standard, the communication procedure is stopped when there is no response from the other party within 35 sec, so that the other party releases the line.)

(Response time)



(Cause and Countermeasure)

As shown in the chart above, the total handshaking time must be reduced. Long distance connection and linking of several stations means the line connection time cannot be reduced. Accordingly, the following countermeasures should be attempted.

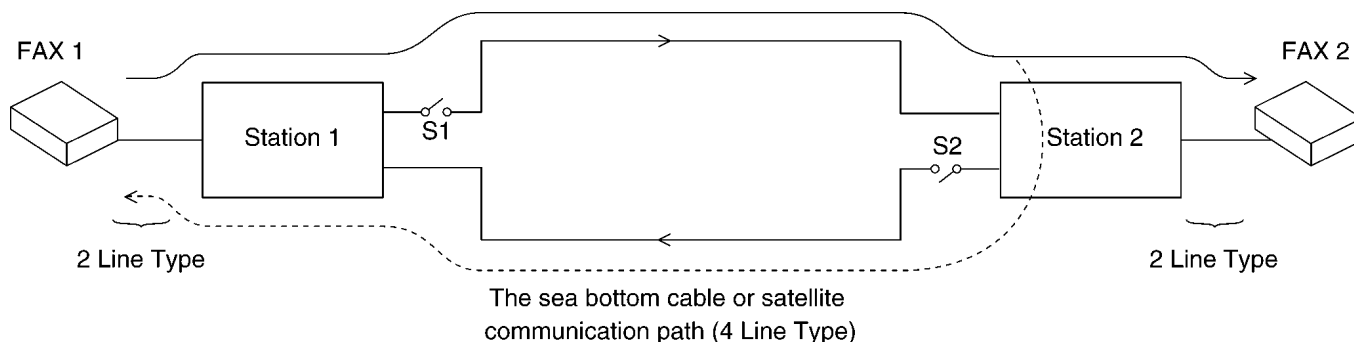
(A) The TEL/FAX DELAYED RING count should be 1. (User parameter: code No. 78)

(B) As the 35 sec. count starts directly after dialing or directly after the START button has been pressed for models with a START button, the other party should be called manually, if possible.

Another possibility is entering two pauses at the end of the auto dial number on the transmission side. Then the count start time will be delayed for 2 pauses (about 10 sec.).

Cause 2:

Erroneous detection due to an echo or echo canceler.



(Echo/Echo Canceler)

The signal from FAX1 reaches FAX2 via the stations 1 and 2, but the reflection signal at station 2 also returns via station 1 (echo). As the distance between station 1 and station 2 is far, the echo returns to FAX 1 a max. of 600 msec after transmission. There is a possibility that this signal is detected erroneously as the signal from FAX2. For a normal call, there is a possibility that the echo of their own voice will make the call difficult to understand. For this reason, each station (station 1, station 2) attaches echo cancellers (S1, S2) for international lines or long distance lines. For the echo canceler, the level of the transmission signal from FAX 1 is compared with the level of the reception signal from FAX2. When the S1 is closed and S2 is open, so that the echo does not return to FAX1.

(Causes and Countermeasures)

No.	Countermeasure Side	Echo Communication Problem Example	Countermeasure	Service Code
1	Sending side	Some time is needed to compare the level of the receiving and sending signals for the echo canceler. The header of the training signal lacks due to a switching delay to close S1.	Add a dummy signal to the beginning of the training signal.	Service code (521) (International mode select) This countermeasure becomes the default value.
2	Receiving side	The echo canceler function stops according to a CED signal frequency of 2100Hz (S1 and S2 are both ON), a DIS signal is returned as an echo, and a DCS signal from the sending side overlaps the DIS echo. Then the receiving side FAX cannot retrieve the DCS signal. (Refer to Fig. a)	Change to a 1100Hz CED signal frequency. (Refer to Fig. b)	Service code (520) (CED frequency select)
	Receiving side		Change the regular time of 75 msec between the CED signal and DIS signal to 500 msec. This will give at least 250 msec to recover the echo canceler operation. (Refer to Fig. c)	Service code (593) (Time between CED and 300 bps)
	Sending side		The sending side FAX sends a DCS signal not after receiving the 1st DIS signal but after receiving the 2nd DIS signal. (Refer to Fig. d)	Service code (594) (Overseas DIS detection select)
3	Sending side	Communication failure occurs in a long distance communication on the telephone line without an echo canceler.	Decrease the transmission level from -10 dBm to -15 dBm and the echo level will decrease.	Service code (596) (Transmit level set)
4	Sending side Receiving side	or	Decrease the receiving sensitivity from -13 dBm to about -32 dBm so an echo signal will not be received.	Service code (598) (Receiving sensitivity)
5	Sending side Receiving side	There are some cases (e.g. Mobil comms.) which cause the collision of TX / RX signals due to the delay / echo and noise of the network / terminal. (Refer to Fig. e)	Set additional Pause time (Service mode: code No. 774) in between the original and its repeated signals, to prevent the collision of the signals at both end.	Service code (774) (T4 timer)

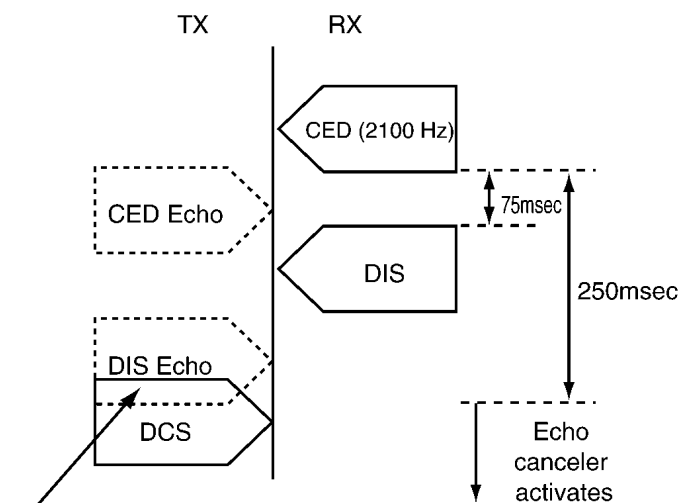


Fig. a (Overlapping the Echo of the DIS signal and DCS signal)

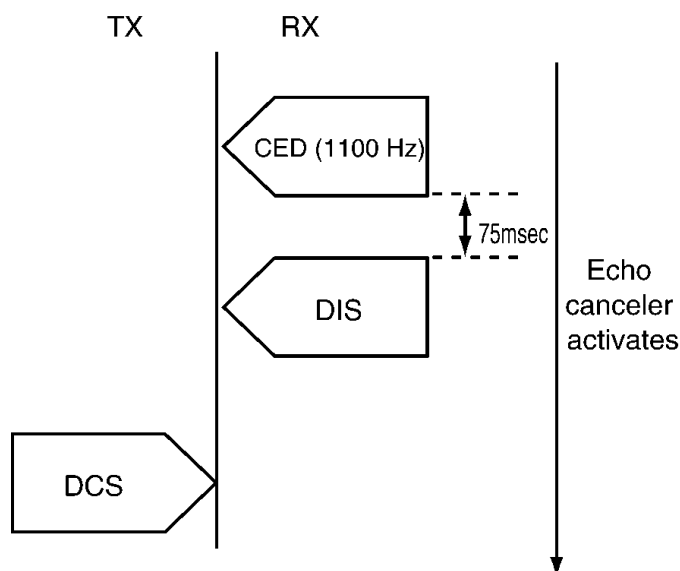


Fig. b (Countermeasure by Changing the CED Frequency)

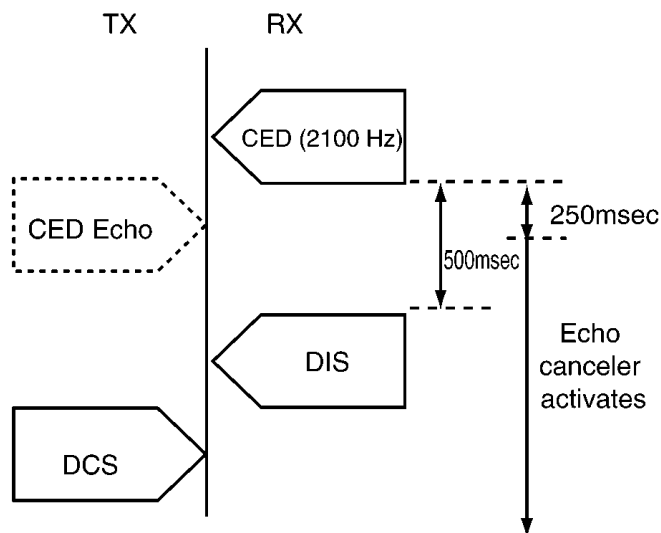


Fig. c (Countermeasure by Changing the Interval Between CED and DIS)

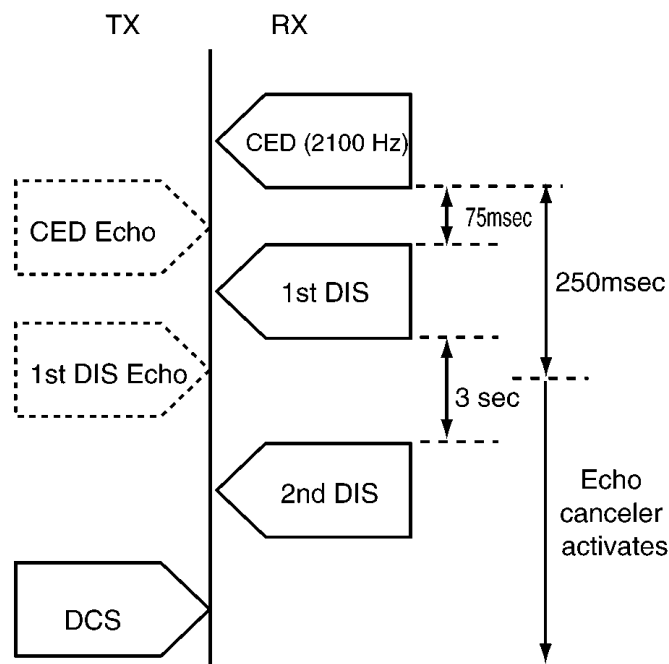
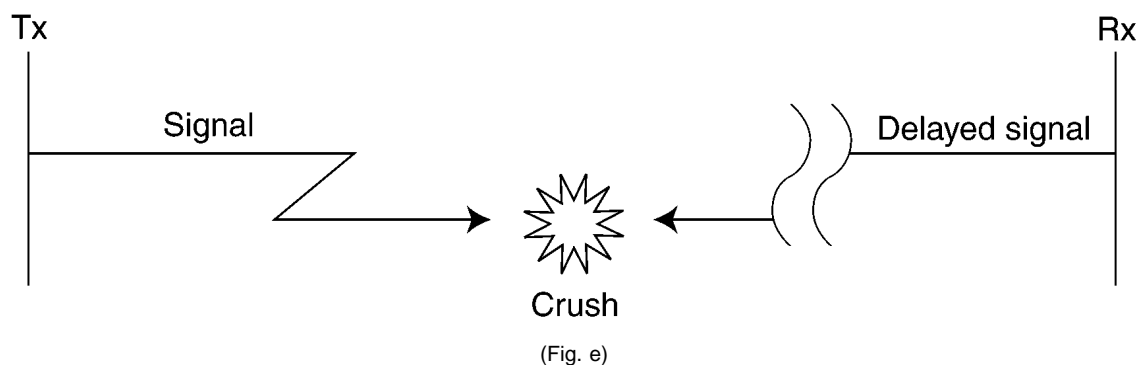


Fig. d (Countermeasure by Ignoring the 1st DIS)

<TX side signal>	<RX side signal>	<Countermeasure>
2nd / 3rd DCS / Training	& delayed CFR / FTT	at TX side
2nd / 3rd EOP / EOM / MPS	& delayed MCF / PIP / PIN / RTP / RTN	at TX side
delayed DCS	& 2nd / 3rd / --- DIS	at RX side



2.3.5.1.6. THE UNIT CAN COPY, BUT THE TRANSMISSION AND RECEPTION IMAGE ARE INCORRECT

(Long distance or international communication operation)

This symptom highly depends on the transmission and reception capability of the other FAX unit and the line conditions. The countermeasures for this unit are shown below.

Transmission Operation:

Set the transmitting speed to 4800BPS (service mode: code No. 717) or select the overseas mode.

Reception Operation:

If 80% or more of the reception is incorrect, set the receiving speed to 4800BPS. (Service mode: code No. 718)

- Refer to **SERVICE FUNCTION TABLE**(P.86).

2.3.5.1.7. HOW TO OUTPUT THE JOURNAL REPORT:

1. Press **[MENU]** repeatedly until the following is displayed.
2. Press **[SET]**.
3. Press **[◀]** or **[▶]** until the " JOURNAL REPORT " is displayed.
4. The report is printed out.

Ejemplo de un informe de comunicaciones de la jornada

[DIARIO]							Jan. 01 2002 04:19PM
NO.	OTHER FACSIMILE	START TIME	USAGE TIME	MODE	PAGES	RESULT	
01	<FAX # NOT AVAIL.>	Jan. 01 12:12AM	00'38	RCV	01	OK	
02	<FAX # NOT AVAIL.>	Jan. 01 12:13AM	00'43	SND	01	OK	
03	<FAX # NOT AVAIL.>	Jan. 01 03:47PM	00'41	RCV	00	OTHER FAX NOT RESPONDING	
04	1234	Jan. 01 04:05PM	00'40	SND	00	OTHER FAX NOT RESPONDING	
05	1234	Jan. 01 04:07PM	00'39	SND	00	OTHER FAX NOT RESPONDING	
06	1234	Jan. 01 04:09PM	00'39	SND	00	OTHER FAX NOT RESPONDING	
07	1234	Jan. 01 04:11PM	00'39	SND	00	OTHER FAX NOT RESPONDING	43

(3) TRANS: Sent directly (2) Communication (1) Error code
 RECEP: Received directly

Error code table:

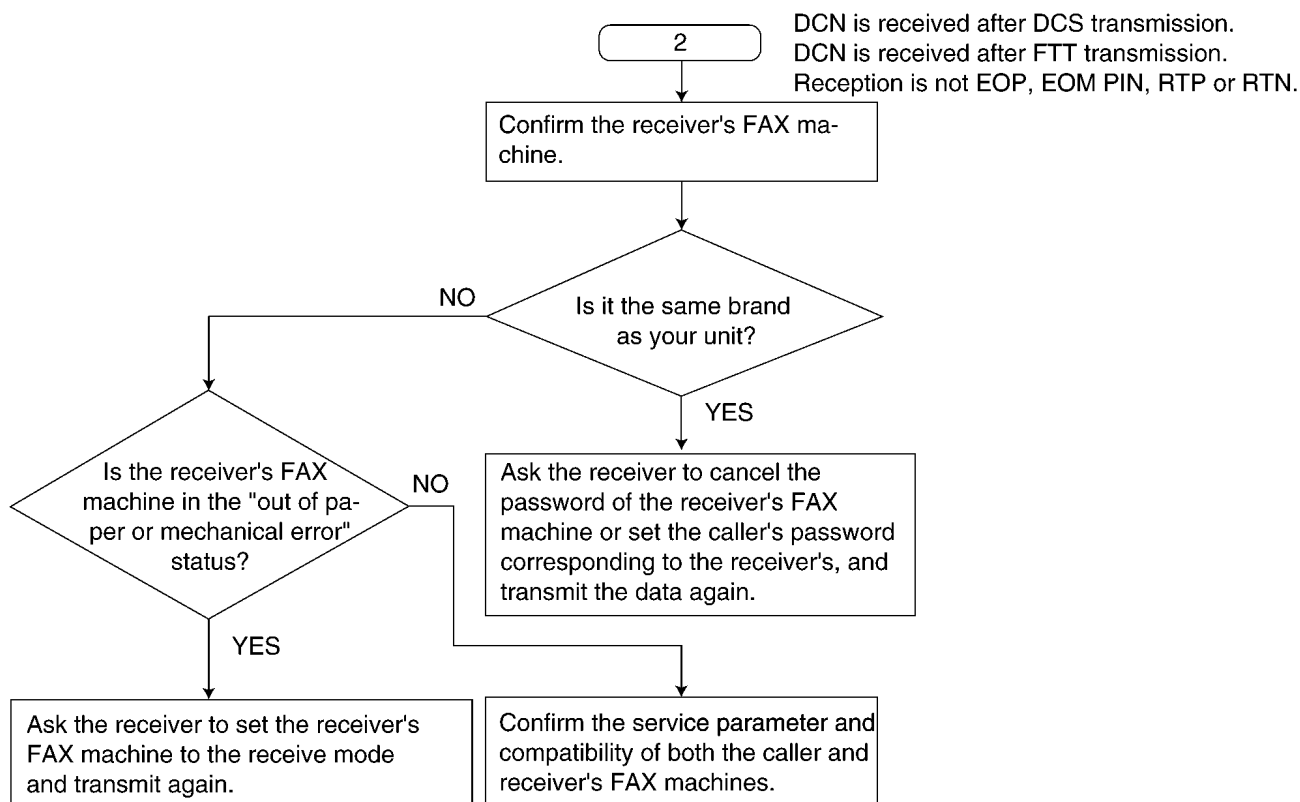
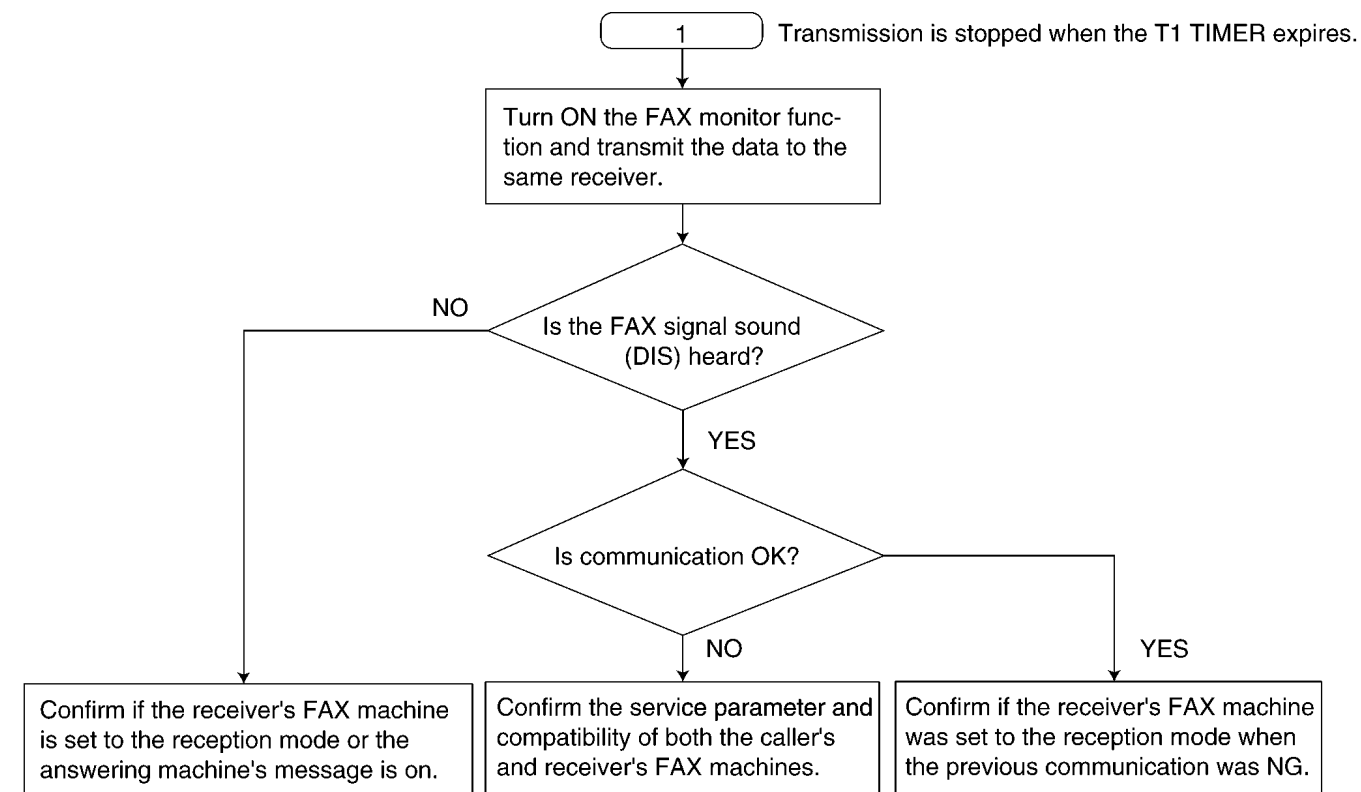
Refer to **ERROR CODE TABLE (P.6)**

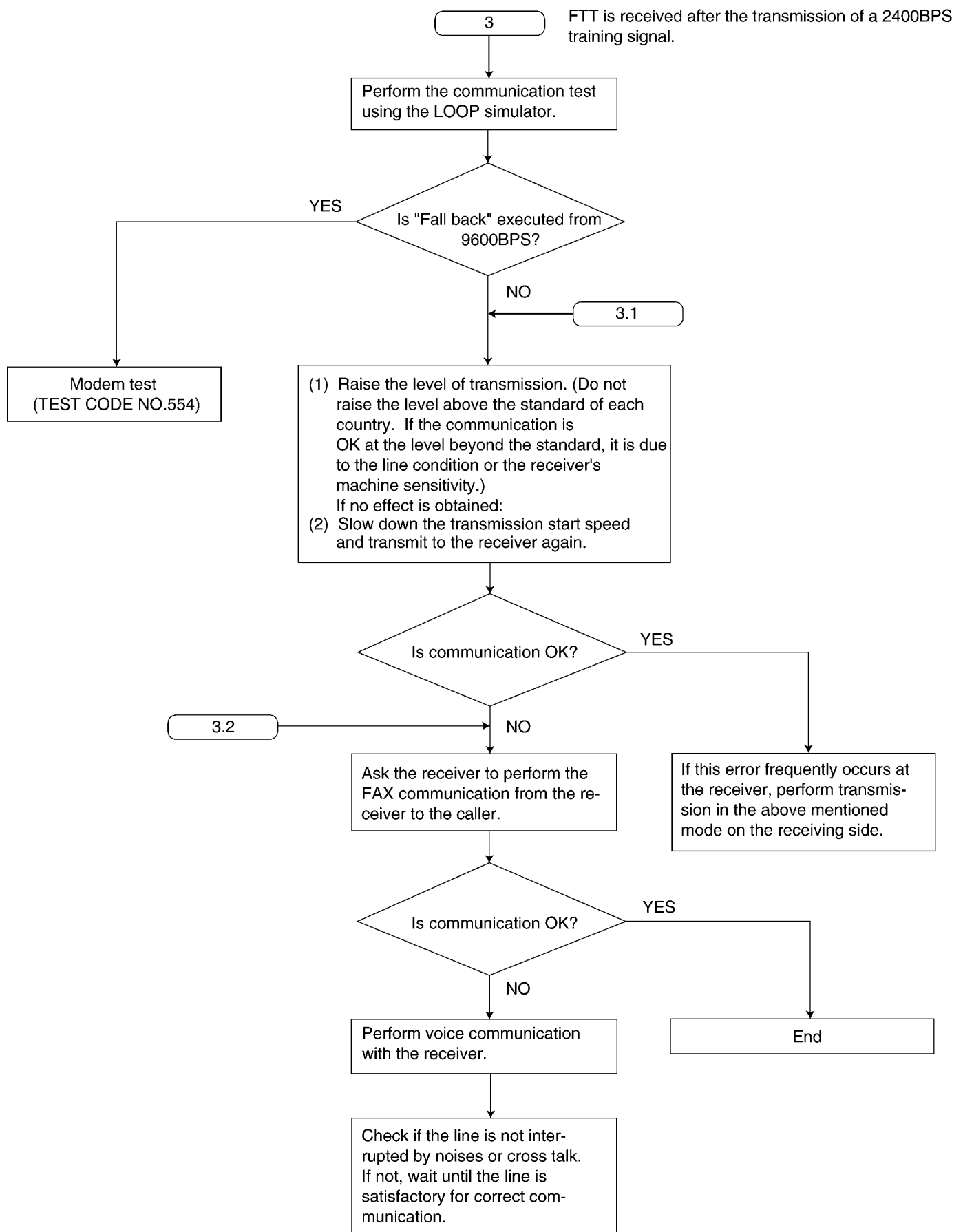
(1) CODE	(2) RESULT	(3) MODE	SYMPTOM	Counter-measure*
	PRESSED THE STOP KEY	SND & RCV	Communication was interrupted by the STOP button.	
	DOCUMENT JAMMED	SND	The document paper is jammed.	
	NO DOCUMENT	SND	No document paper.	
	PRINTER OVERHEATED	RCV	The thermal head is overheated.	
	PAPER OUT	RCV	Out of thermal paper or the cover is open.	
40	OTHER FAX NOT RESPOND	SND	Transmission is stopped when the T1 TIMER expires.	
41	COMMUNICATION ERROR	SND	DCN is received after DCS transmission.	1
42	COMMUNICATION ERROR	SND	FTT is received after transmission of a 2400BPS training signal.	2
43	COMMUNICATION ERROR	SND	No response after post message is transmitted three times.	3
44	COMMUNICATION ERROR	SND	RTN and PIN are received.	4
46	COMMUNICATION ERROR	SND	No response after FTT is transmitted.	5
48	COMMUNICATION ERROR	SND	No post message.	6
49	COMMUNICATION ERROR	SND	RTN is transmitted.	7
50	COMMUNICATION ERROR	SND	PIN is transmitted (to PRI-Q).	8
51	COMMUNICATION ERROR	SND	PIN is transmitted.	8
52	OTHER FAX NOT RESPOND	SND	Reception is finished when the T1 TIMER expires.	8
53	ERROR-NOT YOUR UNIT	RCV	DCN is received after transmission of NSC and DTC.	9
54	ERROR-NOT YOUR UNIT	RCV	DCN is received after transmission of NSC .	10
57	COMMUNICATION ERROR	SND	300bps error	11
58	COMMUNICATION ERROR	RCV	DCN is received after FTT transmission.	12
59	ERROR-NOT YOUR UNIT	SND	DCN responds to a post message.	13
64	COMMUNICATION ERROR	SND	Polling is not possible.	14
68	COMMUNICATION ERROR	RCV	No response at the other party after MCF or CFR is transmitted.	15
70	ERROR-NOT YOUR UNIT	RCV	DCN is received after CFR transmission.	13
72	COMMUNICATION ERROR	RCV	The carrier is cut when the image signal is received.	13
FF	COMMUNICATION ERROR	SND & RCV	Modem error.	12

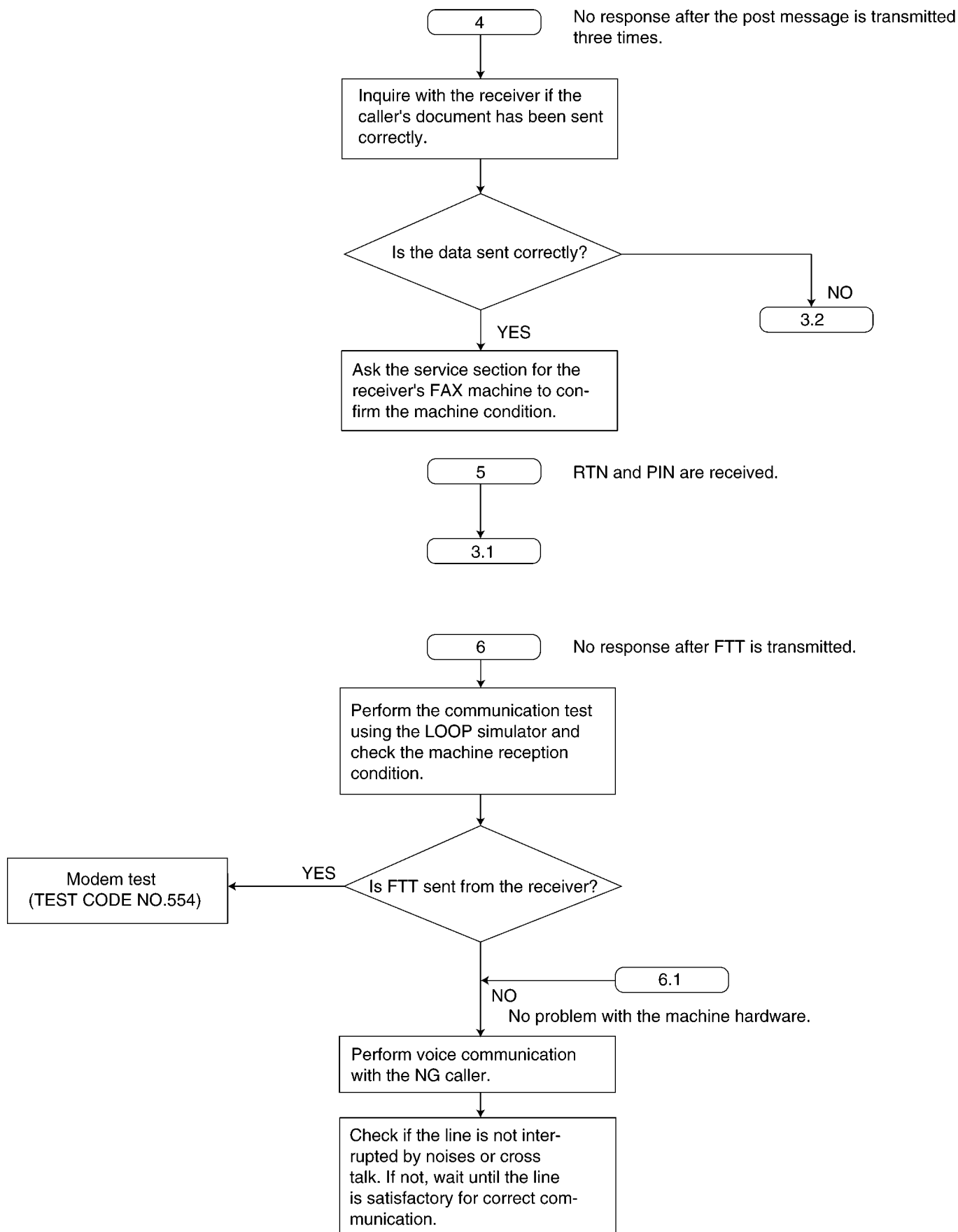
TRANS=TRANSMISSION RECEP=RECEPTION

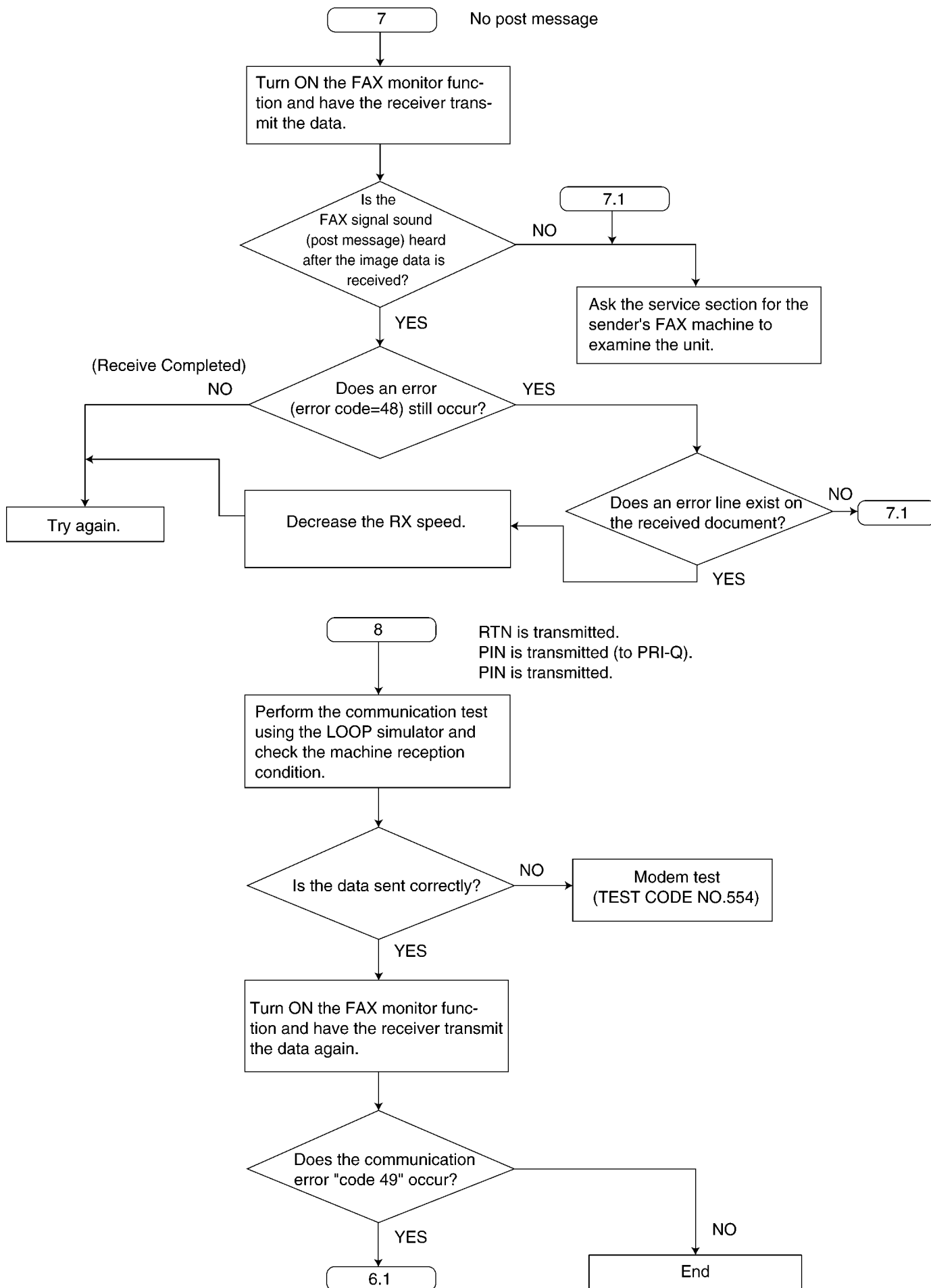
- a. Change the TX speed/RX speed. (Service code: 717/718, refer to **SERVICE FUNCTION TABLE (P.86).**)
 - b. Change the transmit level. (Service code: 596, refer to **SERVICE FUNCTION TABLE (P.86).**)
- If the problem remains, see the next page.

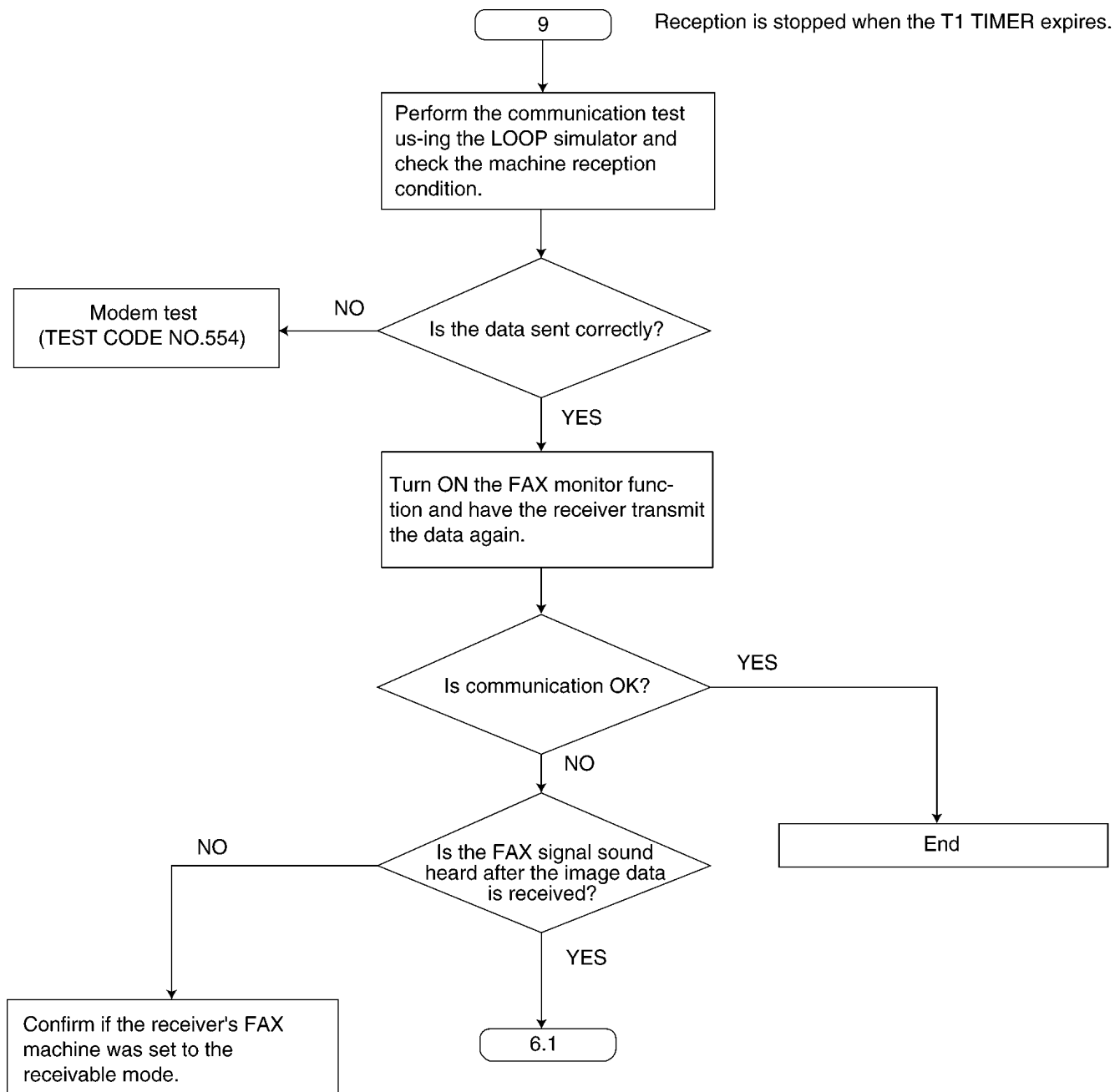
Countermeasure

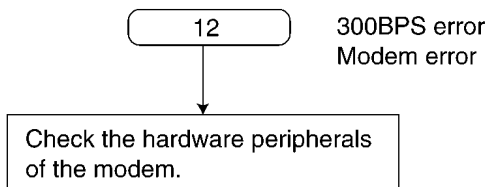
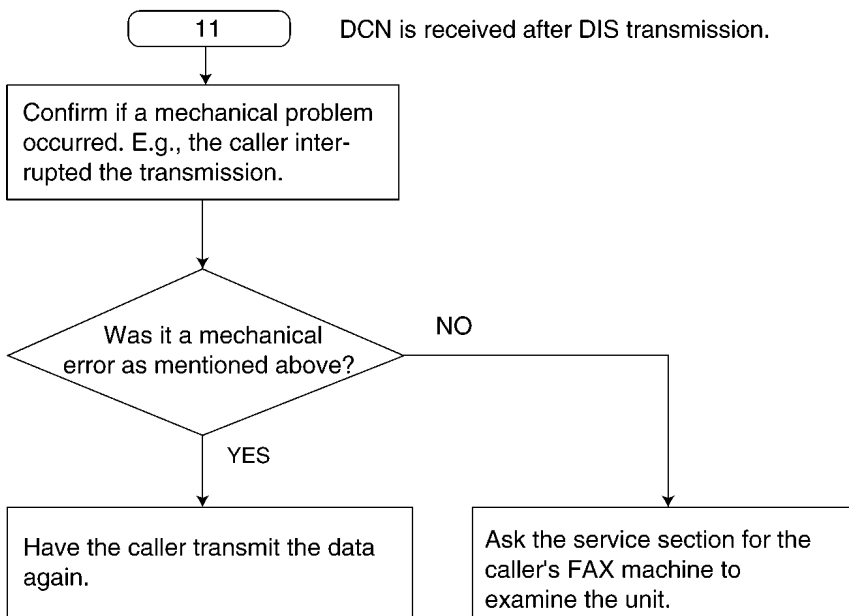
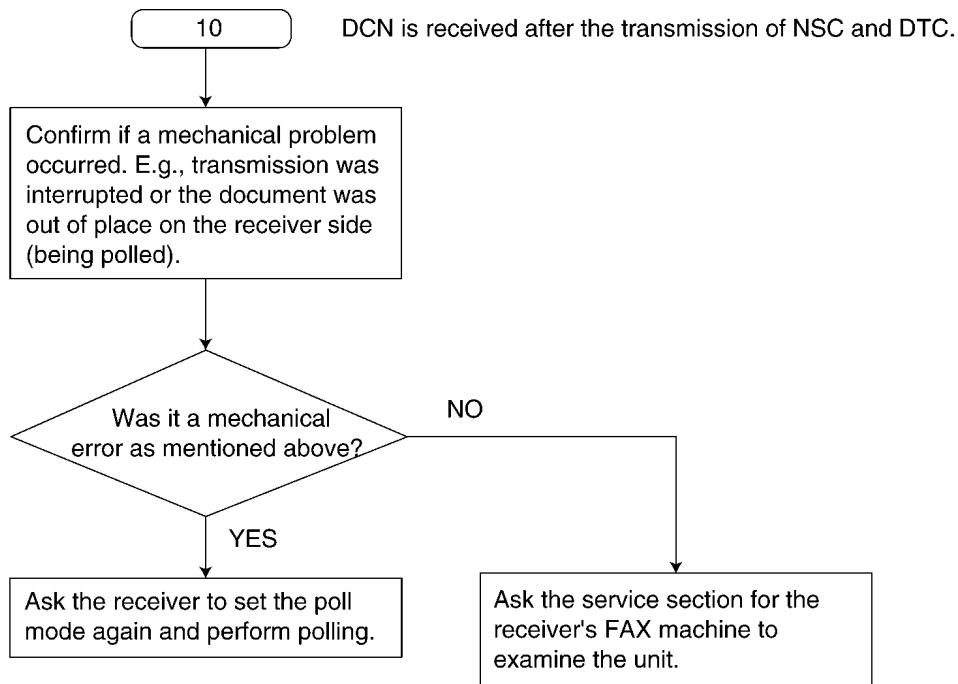


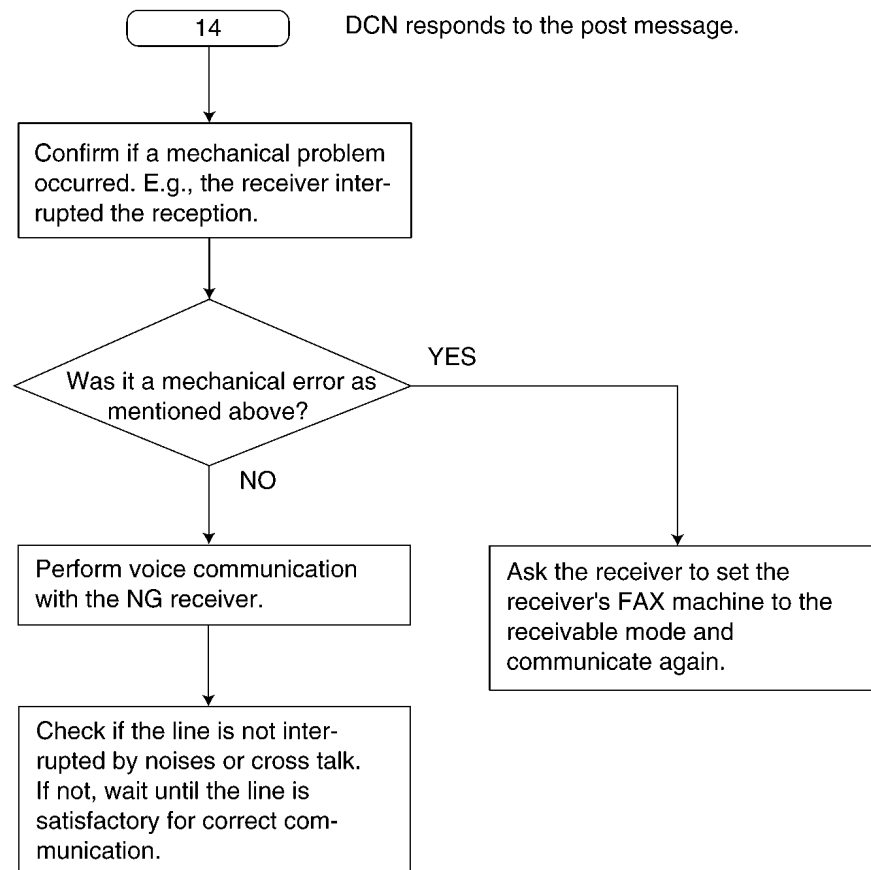
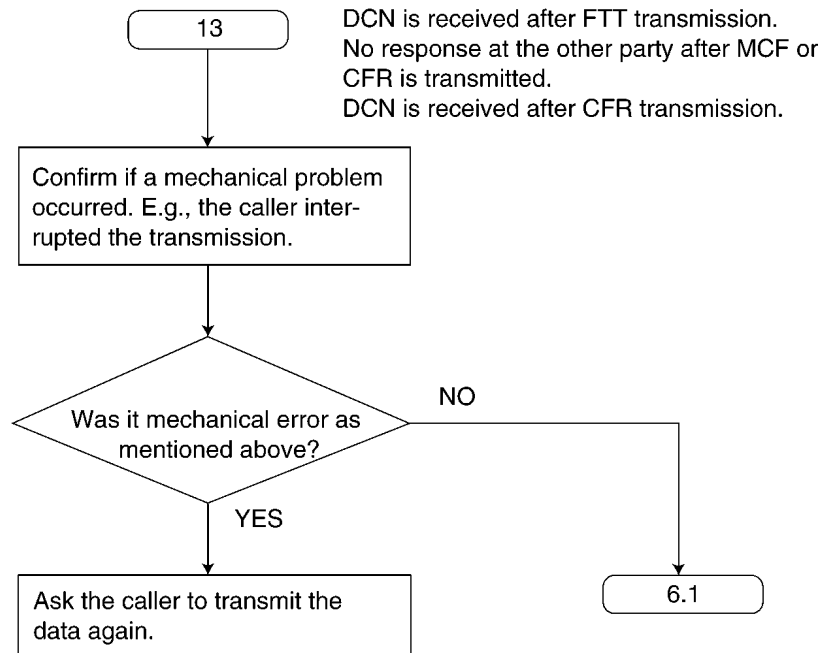


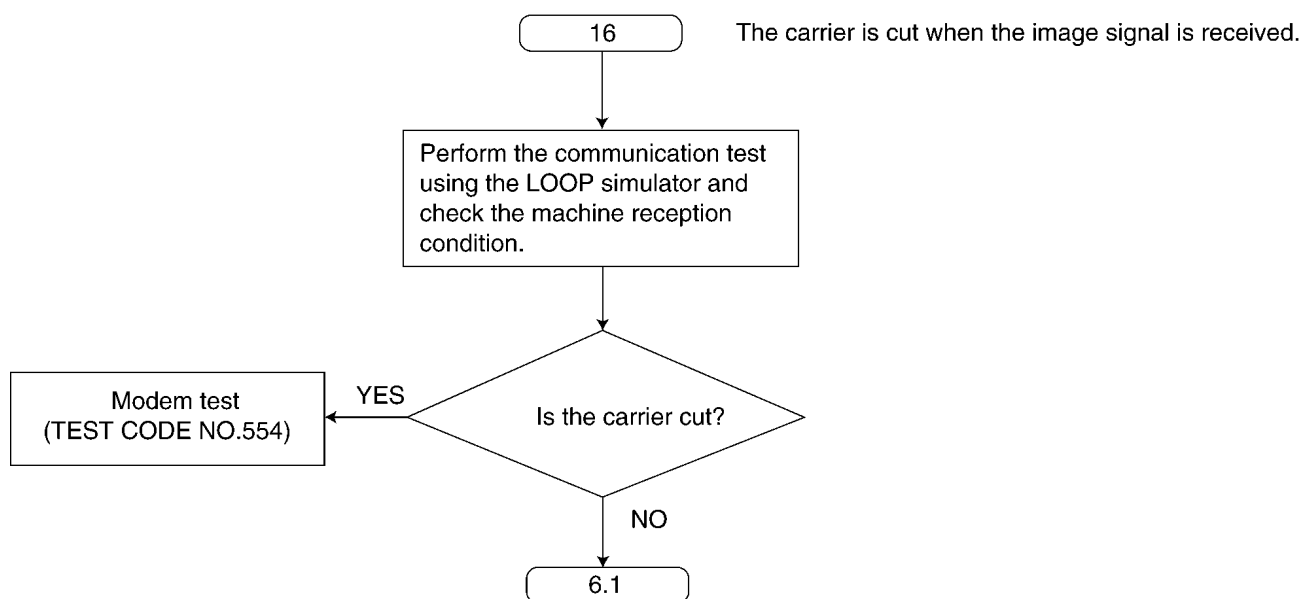
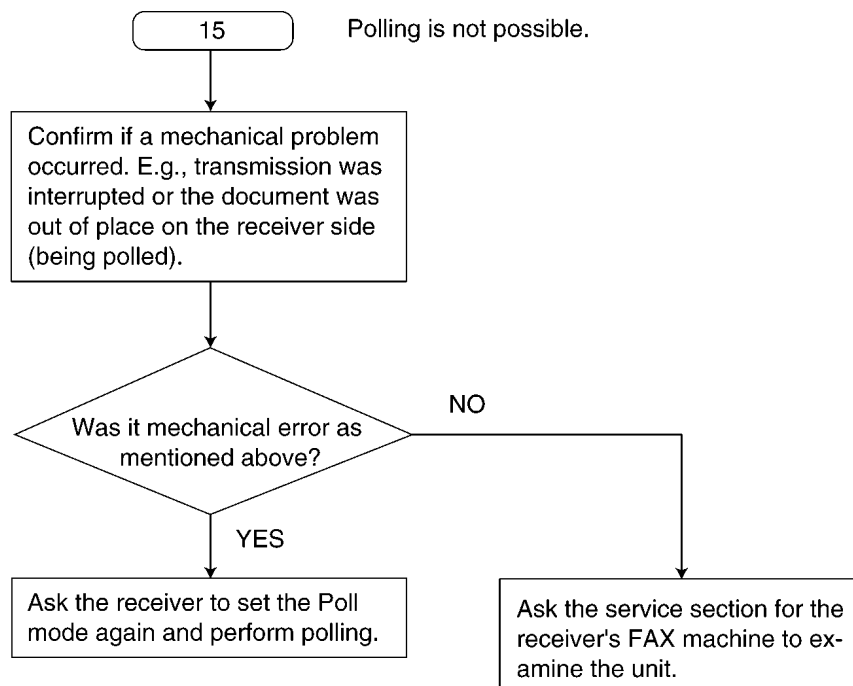












2.3.5.2. REMOTE PROGRAMMING

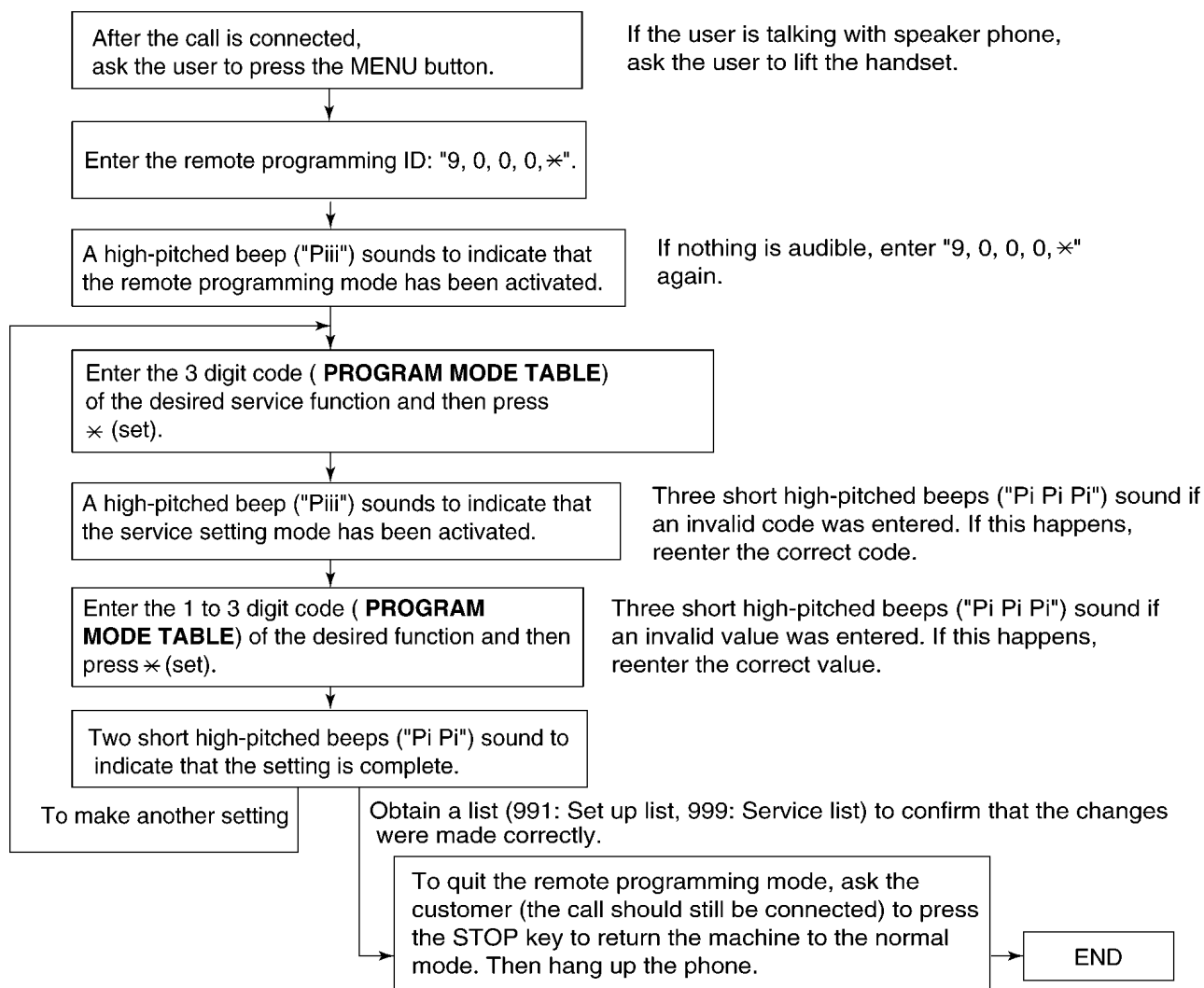
If, after the call is connected, the customer describes the situation and it is determined that the problem can be corrected by making parameter changes, this function makes it possible to change parameters such as the user code and service code from another fax (using DTMF tones). Therefore, travel to the customer's location is not required. However, it is not possible to change all the parameters remotely (Refer to **PROGRAM MODE TABLE** (P.58)). The function used to accomplish this is remote programming.

First, in order to check the current status of the service code parameter, out put the setup list (code: 991) and service list (code: 999) from the customer's fax machine. Based on this, the parameters for the desired codes can be changed. The procedure for changing and listing parameters is described on **ENTERING THE REMOTE PROGRAMMING MODE AND CHANGING SERVICE CODES** (P.57). Also, before exiting the remote programming mode, it is advisable to obtain a new list to confirm that only the desired parameters were changed.

Hint:

Since the connected telephone is in use during the remote programming mode, it may be helpful to ask the customer to switch to the speakerphone (except for a digital speakerphone). This frees the customer from the need to remain right next to the fax while you are making parameter settings. When finished, inform the customer. Also note that in very noisy locations where the DTMF tones are not audible, the remote programming function will not work.

2.3.5.2.1. ENTERING THE REMOTE PROGRAMMING MODE AND CHANGING SERVICE CODES



CROSS REFERENCE:

PROGRAM MODE TABLE (P.58)

2.3.5.2.2. PROGRAM MODE TABLE

Code	Function	Set Value	Default	Remote setting
001	Set the date and time	dd/mm/yy	-----	NG
002	Your logo (FT78CE_SLOVAK ONLY)	-----	-----	NG
003	Your FAX number (FT78CE_SLOVAK ONLY)	-----	-----	NG
004	Print transmission report	ERROR/ON/OFF	ERROR	OK
005	Auto receive mode	TAD/FAX/FAX ONLY/TEL/FAX	TAD/FAX	OK
006	TAD/FAX ring count (KX-FT78CE ONLY)	2~4:TOLL SAVER/RINGER OFF	TOLL SAVER	OK
006	TAD/FAX ring count (KX-FT78HG ONLY)	1~4:TOLL SAVER/RINGER OFF	2	OK
007	FAX ring count	1 to 4 rings	2 ring	OK
009	TEL/FAX delayed ring	1 to 4 rings	2 ring	OK
010	Recording time	VOX/1 MIN	VOX	OK
011	Remote TAD ID	-----	ID=111	NG
013	Dialing mode	TONE/PULSE	TONE	OK
022	Journal auto print	1:ON 2:OFF	ON	OK
023	Overseas mode	1:ON 2:OFF	OFF	OK
025	Delayed send	1:ON 2:OFF	OFF	NG
026	Auto CALLER ID list	1:ON 2:OFF	ON	OK
030	Silent FAX recognition ring	3 to 9 rings	3 rings	OK
039	LCD contrast	NORMAL/DARKER	NORMAL	NG
041	FAX activation code	1:ON 2:OFF	ON/ID=*9	NG
042	Message alert	1:ON 2:OFF	OFF	OK
043	REC. time alert	1:ON 2:OFF	OFF	OK
046	Friendly reception	1:ON 2:OFF	ON	OK
047	Voice guidance	1:ON 2:OFF	ON	OK
048	Language (KX-FT78CE ONLY)	1:Czech2:Slovak	Czech	OK
048	Language (KX-FT78HG ONLY)	1: Hungarian2:English	Hungarian	OK
049	Auto disconnect	1:ON 2:OFF	ON/ID=*0	NG
054	Common greeting MSG. REC. time	16s/60s	16s	OK
058	Original setting	NORMAL/LIGHT/DARKER	NORMAL	OK
060	Message transfer	1:ON 2:OFF	OFF	NG
061	Transfer greeting	CHECK/RECORD/ERASE	CHECK	NG
067	ICM monitor	1:ON 2:OFF	ON	OK
070	pager call	1:ON 2:OFF	OFF	NG
074	Location (KX-FT78CE_Czech ONLY)	1:Czech 2:Slovak	Czech	OK
074	Location (KX-FT78CE_Slovak ONLY)	1:Czech 2:Slovak	Slovak	NG
076	Connecting tone	1:ON 2:OFF	ON	OK
080	Set the default	YES/NO	NO	NG
501	Pause time set	001~600 X 100 msec	050	OK
502	Flash time set	01~99 X 10 msec	10	OK
503	Dial speed set	1:10pps 2:20 pps	10pps	OK
510	Vox time	1:6sec 2:4sec	6sec	OK
520	CED frequency select	1:2100Hz 2:1100Hz	2100	OK
521	International mode select	1:ON 2:OFF	ON	OK
522	Auto standby select	1:ON 2:OFF	ON	OK
523	Receive equalizer select	1:0km 2:1.8km 3:3.6km 4:7.2km	0km	OK
524	Transmission equalizer select	1:0km 2:1.8km 3:3.6km 4:7.2km	0km	OK
533	Setting the number of times that message transfer is redialled.	00~99	05	OK
534	Setting of the message transfer/pager call redial interval	001~999	065	OK
544	Document feed position adjustment value set	01~99 step	50	OK
550	Memory clear	Press "START".	-----	NG
551	ROM check	Press "START".	-----	NG
552	DTMFsignal tone test	1:ON 2:OFF	OFF	NG
553	Monitor on FAX communication select	1:OFF 2:P-B 3:ALL	OFF	OK
554	Modem test	Press "START".	-----	NG
555	Scanner test	Press "START".	-----	NG
556	Motor test	Press "START".	-----	NG
557	LED test	Press "START".	-----	NG
558	LCD test	Press "START".	-----	NG
559	Document jam detection select	1:ON 2:OFF	ON	OK
560	Cutter selection	1:ON 2:OFF	ON	OK
561	Key test	Press any key.	-----	NG
562	Cutter test	"START" push	-----	NG
570	Break % select (KX-FT78CE ONLY)	1:61% 2:67%	61%	OK
570	Break % select (KX-FT78HG ONLY)	1:61% 2:67%	67%	OK
571	ITS auto redial time set	00~99	05	OK

Code	Function	Set Value	Default	Remote setting
572	ITS auto redial line disconnection time set	001~999 set	065	OK
573	Remote turn-on ring number set	01~99	10	OK
580	TAM continuous tone detection	1:ON/2:OFF	ON	OK
590	FAX auto redial time set	00~99	05	OK
591	FAX auto redial line disconnection time set	001~999	065	OK
592	CNG transmit select	1:OFF/2:ALL/3:AUTO	ALL	OK
593	Time between CED and 300 bps	1:75/2:500/3:1s	75 ms	OK
594	Overseas DIS detection select	1:1st/2:2nd	1st	OK
595	Receive error limit value set	001~999	100	OK
596	Transmit level set	15~00dBm	-10	OK
598	Receiving Sensitivity	20~48	40	OK
717	Transmit speed select	1:9600/2:7200/3:4800/4:2400bps	9600bps	OK
718	Receive speed select	1:9600/2:7200/3:4800/4:2400bps	9600bps	OK
719	Ringer off in TEL/FAX mode	1:ON/2:OFF	ON	OK
721	Pause tone detect	1:ON/2:OFF	ON	OK
722	Redial tone detect	1:ON/2:OFF	ON	OK
731	CPC mode	1:A / 2:B / 3:OFF	A	OK
763	Friendly reception CNG detection select	1:10S/2:20S/3:30S	20S	OK
771	T1 timer	1:35 sec/2:60 sec	35 sec	OK
774	T4 timer	00~99 X 100ms	00	OK
775	Monitoring of message transfer	1:ON/2:OFF	OFF	OK
815	Sensor check	Press "START".	-----	NG
841	Digital SP-Phone RX & TX check	1: SP-Phone	-----	NG
882	Journal 3	1: START	-----	NG
991	Transmit basic list	1: START	-----	OK
992	Transmit advanced list	1: START	-----	OK
994	Transmit journal report	1: START	-----	OK
999	Transmit service list	1: START	-----	OK

OK : Can set the value by the remote programming feature or print a list.

NG : Cannot set the value.

Note:

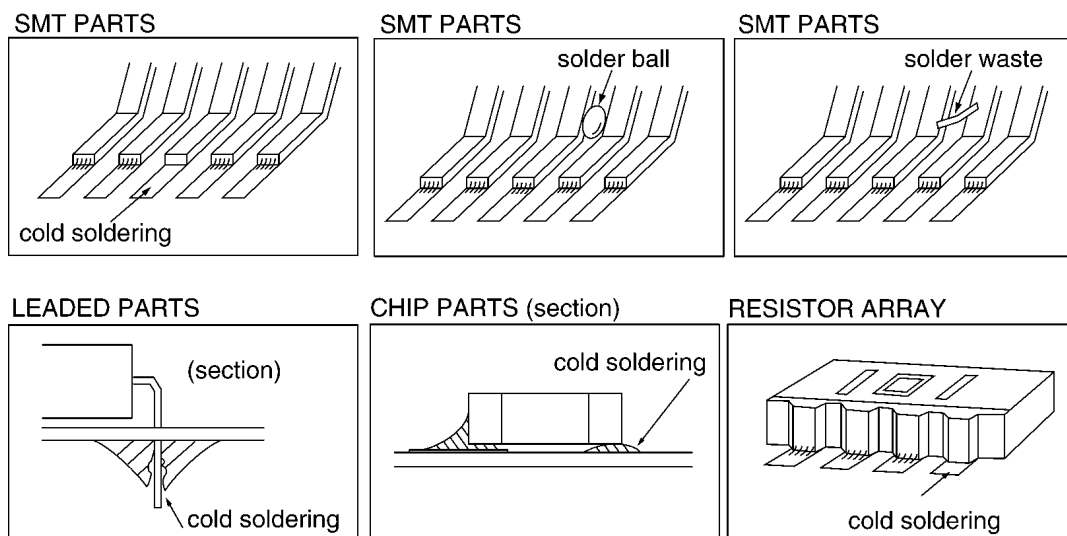
Note: Refer to **SERVICE FUNCTION TABLE** (P.86) for descriptions of the individual codes.

For example, the "004 Transmission report mode" set value "1:ERROR/2:ON/3:OFF" number corresponds to the number dialled.

2.3.6. DIGITAL BOARD SECTION

One of most difficult problems to deal with is when the system will not boot up.

The symptom: No response when the power is turned on. (No LCD display, keys are not accepted.)



Note:

1. Electrical continuity may have existed at the factory check, but a faulty contact occurred as a result of vibration, etc., during transport.
2. Solder waste remaining on the board may get caught under the IC during transport, causing a short circuit.

Before we begin mass production, several hundred trial units are produced at the plant, various tests are applied and any malfunctions are analyzed. (In past experiences, digital IC (especially SRAM and ROM) malfunctions are extremely rare after installation in the product.)

This may be repaired by replacing the IC, (ASIC etc.). However, the real cause may not have been an IC malfunction but a soldering fault instead.

Soldering faults which are difficult to detect with the naked eye are common, particularly for an ASIC and RA (Resistor Array). But if you have an oscilloscope, you can easily determine the problem site or IC malfunction by checking the main signal lines. Even if you don't have such a measuring instrument, by checking each main signal line and resoldering it, in many cases the problem will be resolved.

An explanation of the main signals (for booting up the unit) is below.

Don't exchange ICs or stop repairing until checking the signal lines.

An IC malfunction rarely occurs. (By understanding the necessary signals for booting up the unit, the "Not Boot up" display is not a serious problem.)

What are the main signals for booting up the unit?

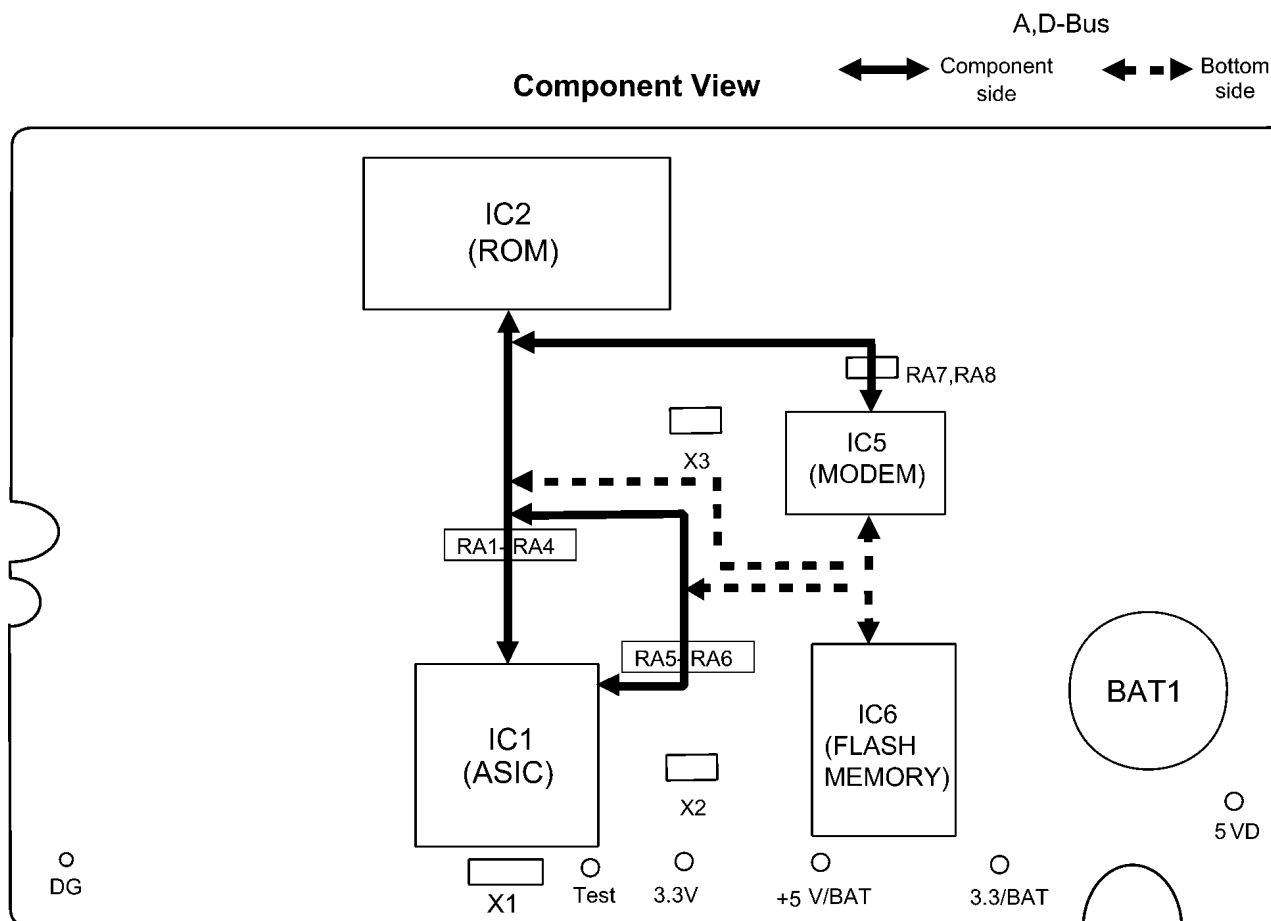
Please refer to the **DIGITAL BLOCK DIAGRAM** (P.61).

The ASIC (including the CPU) (IC1) controls all the other digital ICs. When the power is turned on, the ASIC (CPU) retrieves the operation code stored in the ROM (IC2), then follows the instructions for controlling each IC. All ICs have some inner registers that are assigned to a certain address.

It is the address bus by which the ASIC (CPU) designates the location inside each IC. And the data bus reads or writes the data in order to transmit the instructions from the ASIC (CPU) to the ICs.

These signal lines are all controlled by voltages of 5V/3.3V (H) or 0V (L).

2.3.6.1. DIGITAL BLOCK DIAGRAM



The signal lines that must be normal for the system to boot up are listed here [List 1].

For signal lines other than these, even if they malfunction they do not directly affect booting up the system.

[List 1]

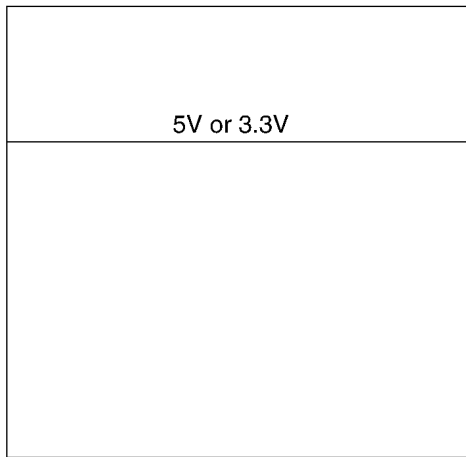
- | | | |
|-----|--------------------|-----------------------|
| (1) | D0~D7 | (Data Bus) |
| (2) | A0~A12, RBA0~RBA5 | (Address Bus) |
| (3) | \overline{RD} | (Read Signal) |
| (4) | \overline{ROMCS} | (ROM Select Signal) |
| (5) | \overline{WR} | (Write Signal) |
| (6) | \overline{RAMCS} | (SRAM Select Signal) |
| (7) | \overline{MDMCS} | (MODEM Select Signal) |

If these signals are normal, once the power is turned on, each IC repeatedly outputs 5V or 3.3V (H) and 0V (L). The following page shows NG and normal wave patterns.

NG Wave pattern (Refer to NG EXAMPLE)

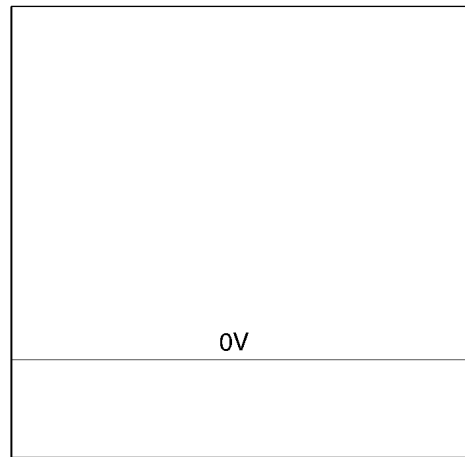
0V never appears.

NG

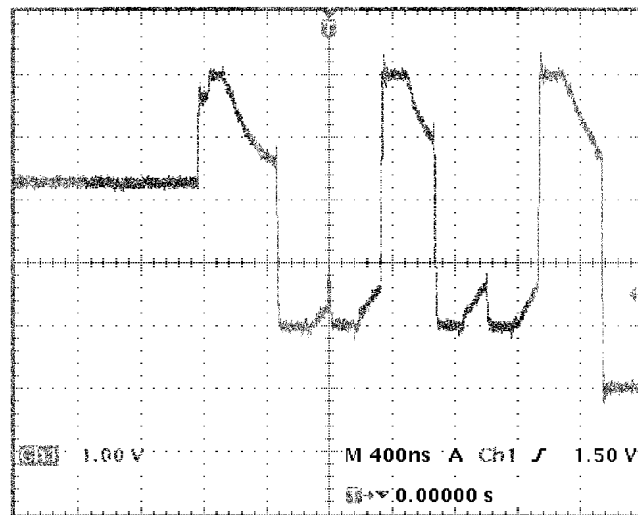


5V never appears.

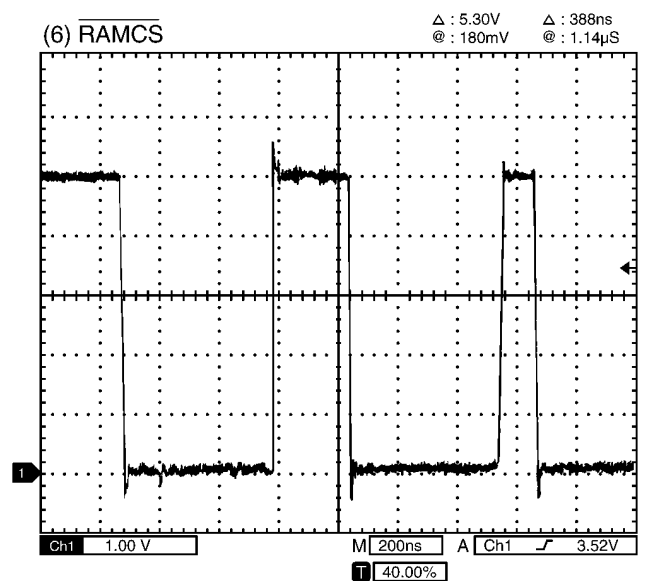
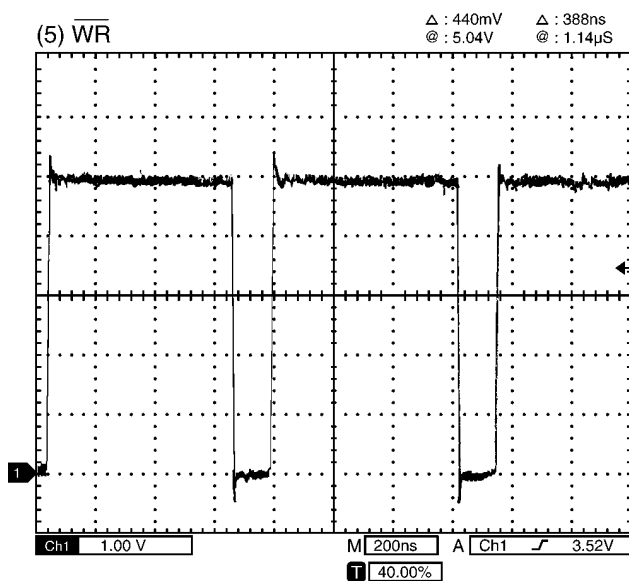
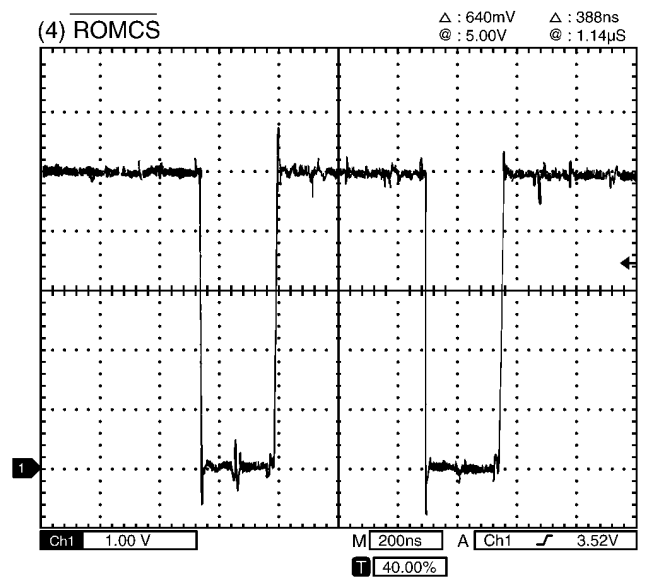
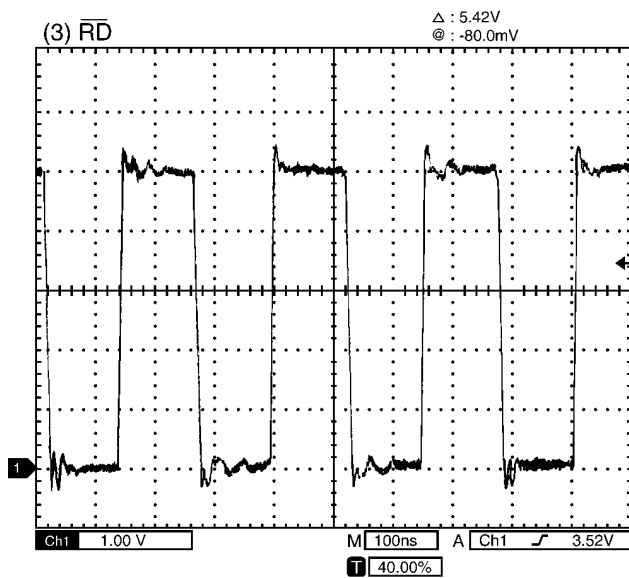
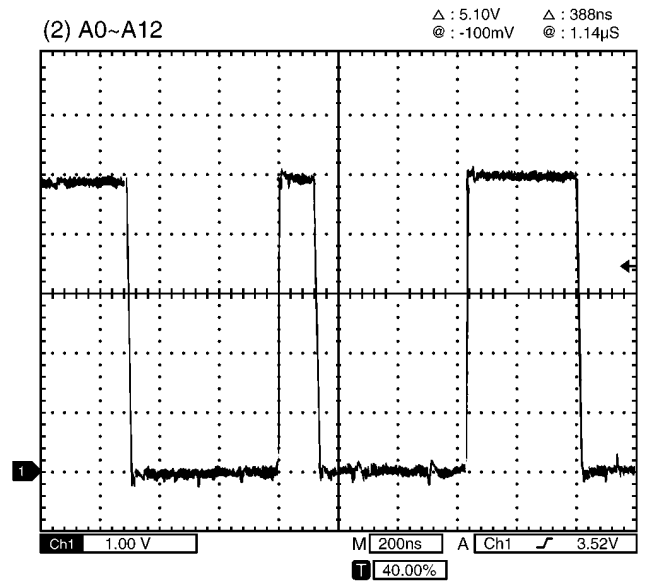
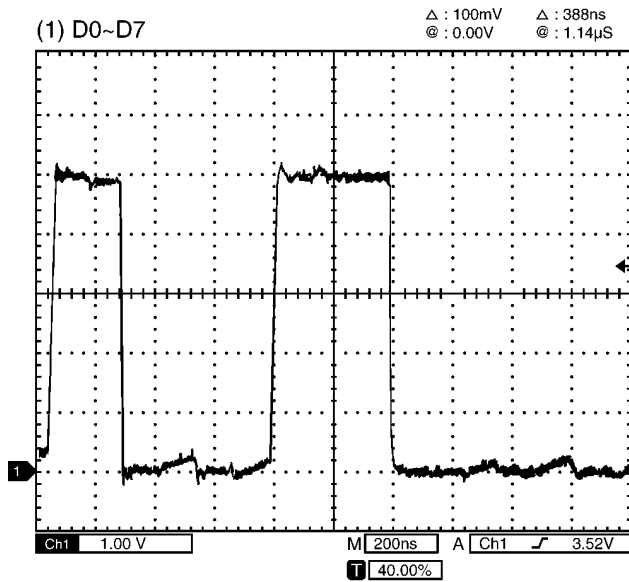
NG

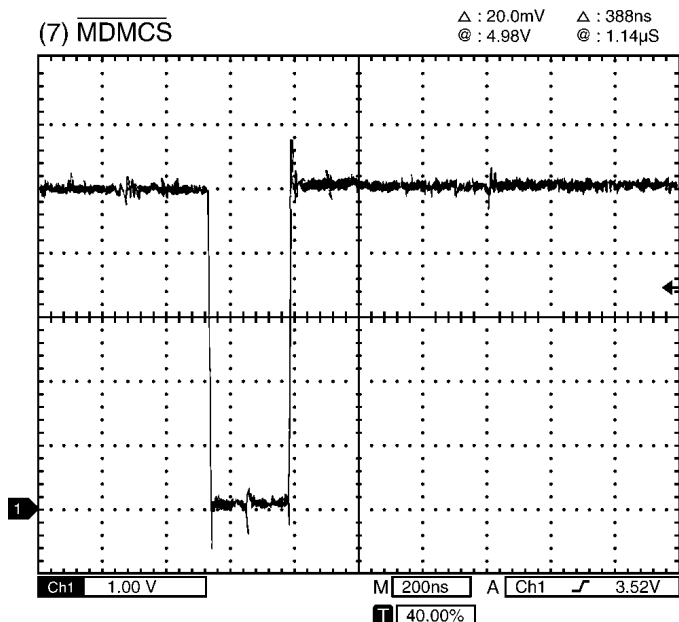


For a short between D0 and D1



Normal Wave Patterns





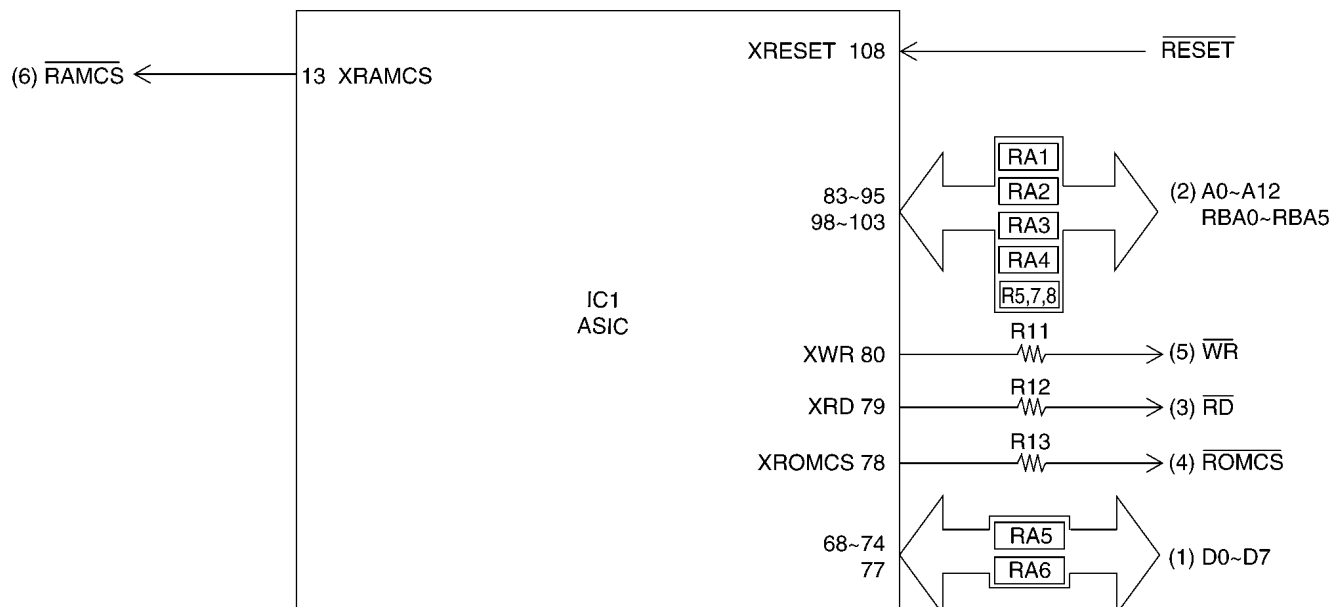
For these reasons and the software sequence to boot up the unit, if you use an oscilloscope to judge whether a signal is OK or NG, you must check in the same order as in [List 1]. (If the ASIC (CPU) failed to access the ROM, the ASIC cannot access the SRAM normally.)

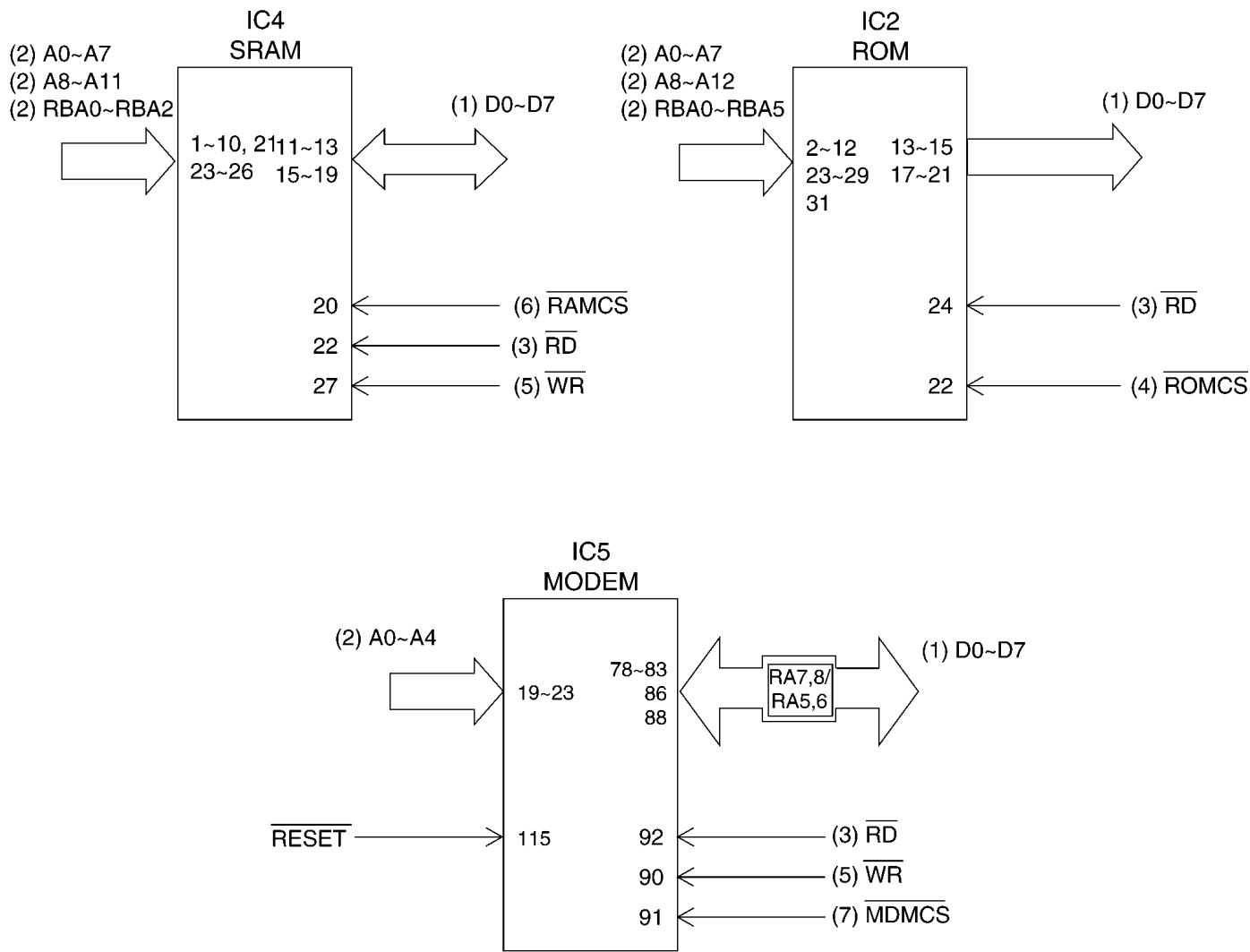
The digital circuit actually operates according to the timing combinations of these signals. So, if the timing of these signals is even slightly off, the circuit will not operate normally. Even if the IC did malfunction, the output voltage level may become abnormal but the timing is accurate according to the specifications. (If oscillation is provided accurately.)

Accordingly, the problem presented here is whether each IC outputs the correct signal. (See the I/O and Pin No. diagram.) In other words, is it constantly switching between 5V or 3.3V (H) and 0V (L) as described earlier.

All you have to do is check that the IC repeatedly outputs (H) 5V or 3.3V and (L) 0V.

I/O and Pin No. Diagram

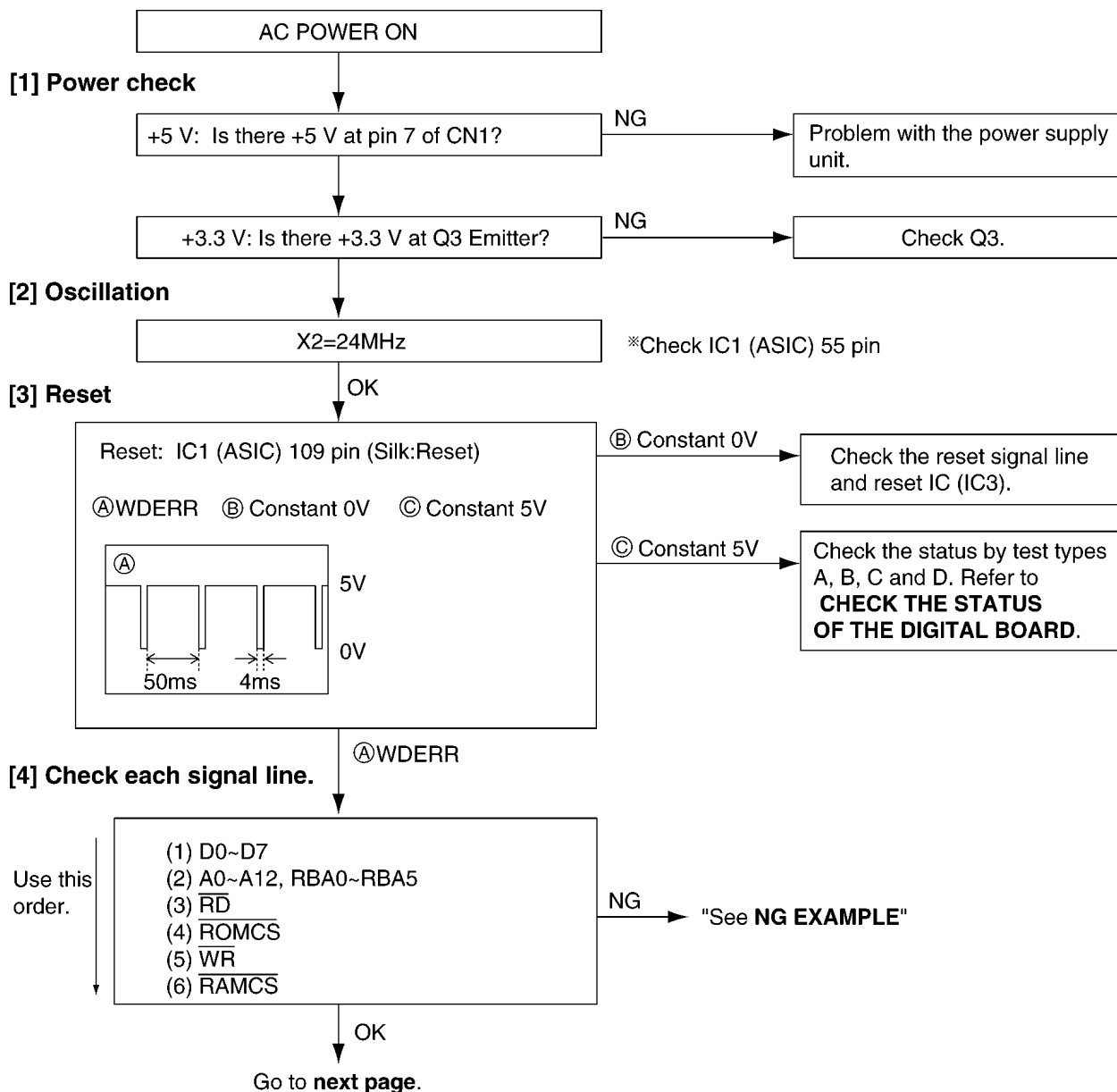




After the power is turned on, the ASIC (CPU) initializes and checks each IC.

The ROM, SRAM, and Modem are checked.

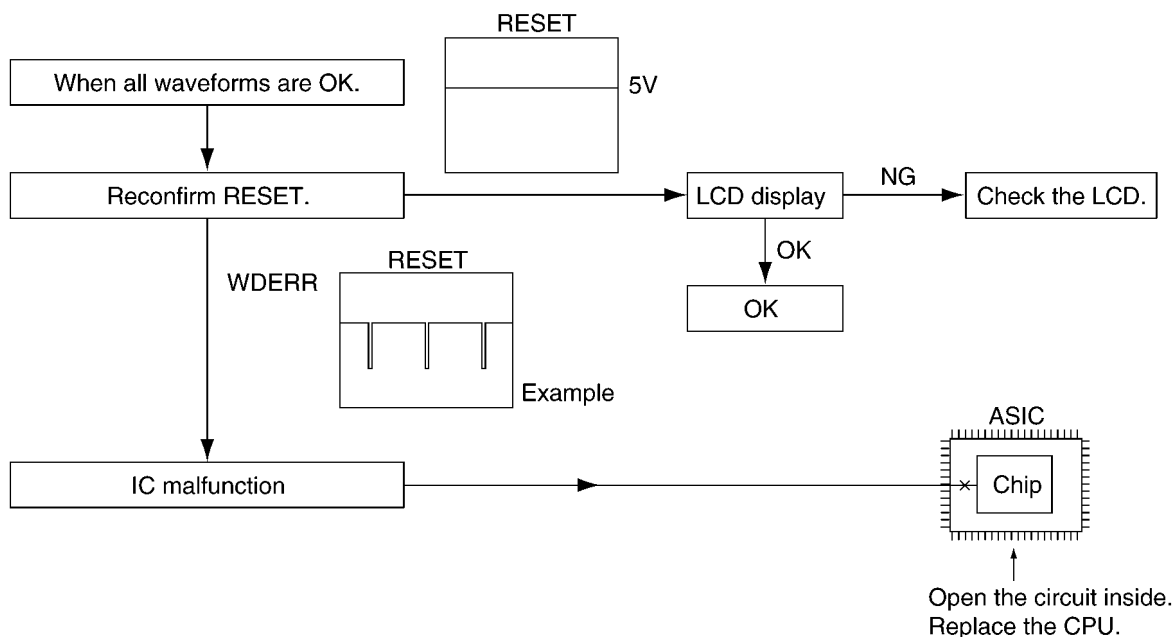
If initialization fails for the ICs, the system will not boot up.



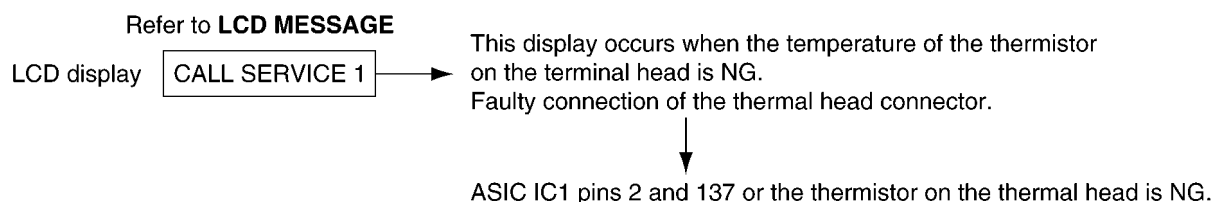
CROSS REFERENCE:

NG EXAMPLE (P.68)

CHECK THE STATUS OF THE DIGITAL BOARD (P.69)

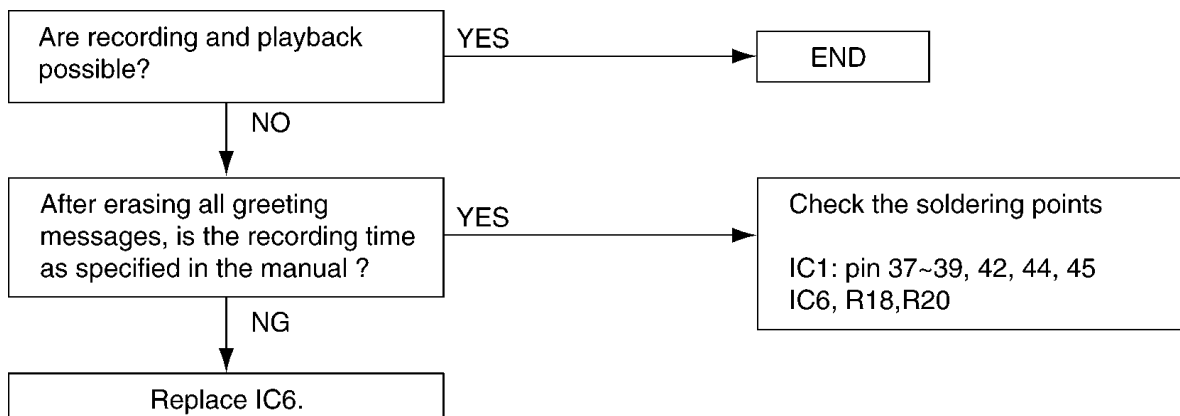


Other NG examples while the power is ON and the LCD displays the following.



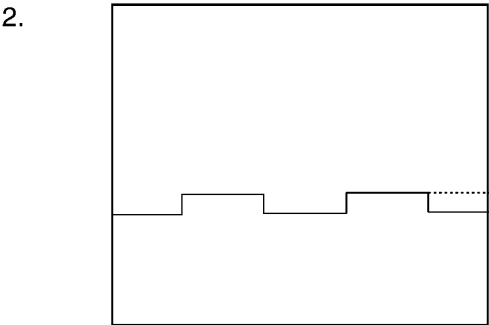
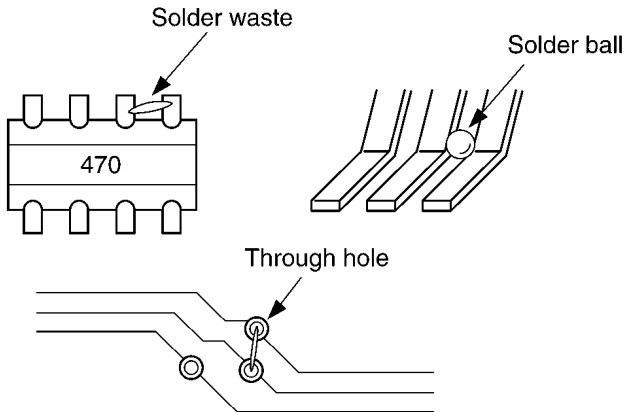
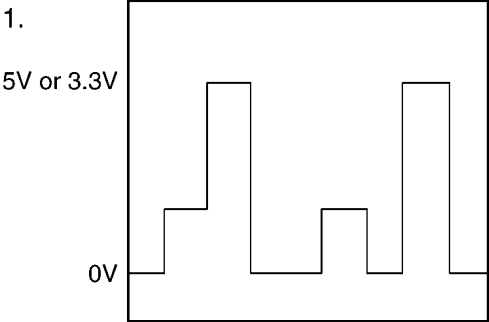
2.3.6.2. FLASH MEMORY (IC6)

If the unit is working correctly but the TAM function can not work, you should check the Flash Memory.

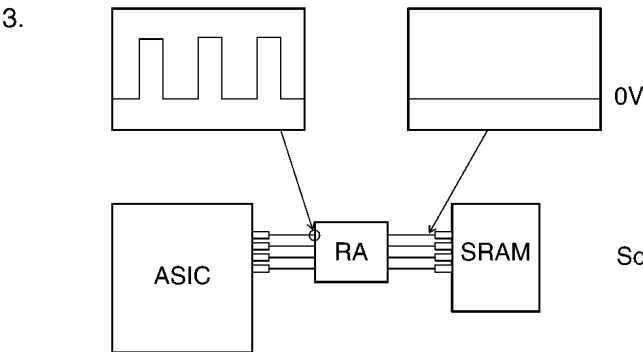
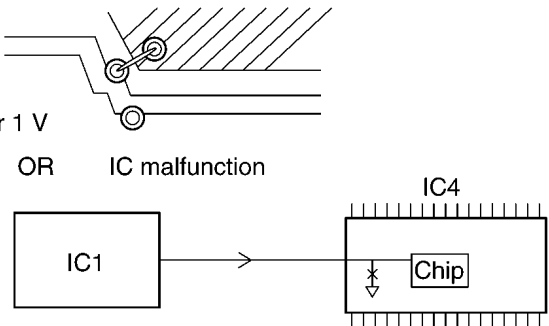


2.3.6.3. NG EXAMPLE

Short circuit from the adjacent signal wires.
Check for a short circuit in the RA and IC leads and the signal wire at the through hole.



Short between the signal line and GND.

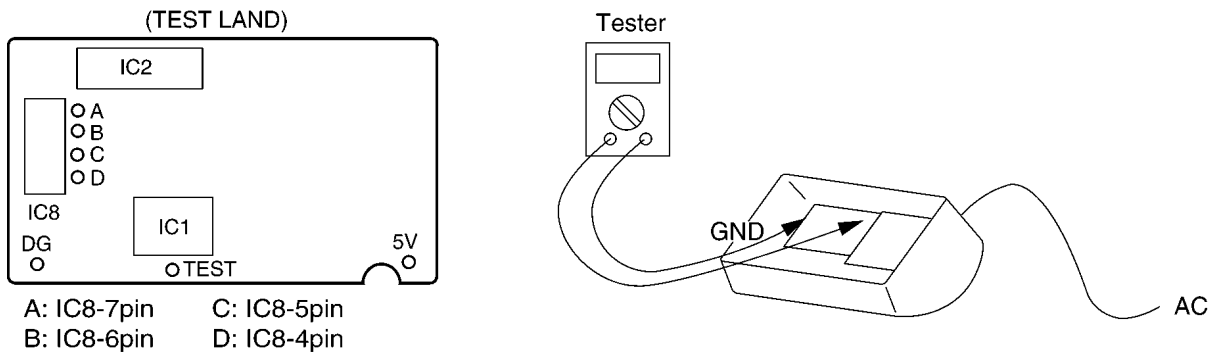


Solder fault on RA.

2.3.6.4. CHECK THE STATUS OF THE DIGITAL BOARD

Put the unit in the test mode and check the voltage at lands A, B, C and D.

Disconnect CN3 connector, during the test.



Turn off the power supply.

Short using a metallic object, such as tweezers, between the TEST and 5V land, and turn on the AC power.

Check the following after turning on the power, using an oscilloscope or tester.

To cancel the status check mode, turn off the AC power.

Item	Check point voltage				Check points
	A	B	C	D	
MODEM(IC5)	0V	5V	0V	0V	IC5
S-RAM(IC4)	0V	0V	5V	0V	IC4 (20 pin), IC1 (13 pin), IC4, R19
ASIC(IC1)	0V	0V	0V	0V	RA1~RA8, R5, R7~R8, R11~R13, IC1
ALL OK	5V	5V	0V	0V	

This indicates that the Add/Data Bus, RAM, ROM, MODEM, and ASIC are all completely connected to the CPU and that control from the CPU is possible.

Please check the soldering and conduction of these components.
If there is no problem, replace the ICs.

If you still have a problem with the digital board, refer to **NG wave pattern**.

To cancel the status check mode, turn off the AC power.