



INTERCOM SYSTEM

TOA EXES-5000 INTERCOM SYSTEM

TROUBLE SHOOTING GUIDE



TOA ELECTRIC CO., LTD.

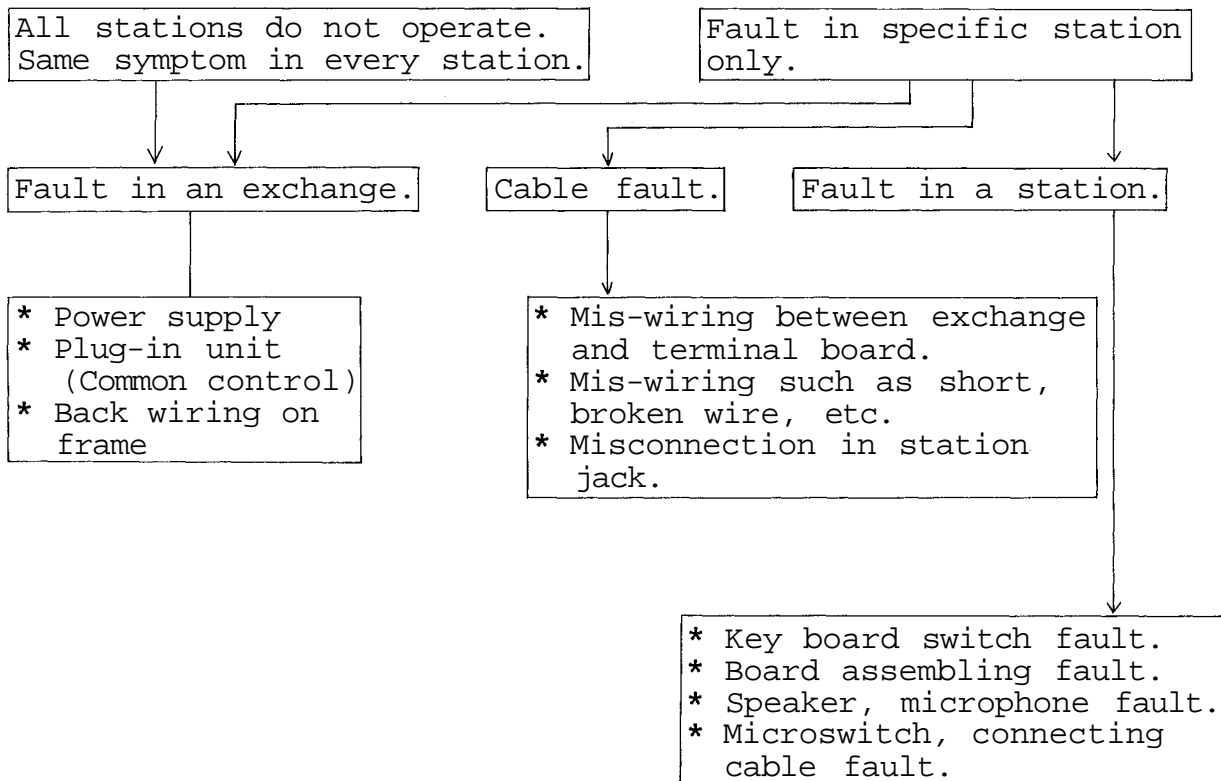
KOBE, JAPAN

8. TROUBLE SHOOTING GUIDE

Repairing of the EXES-5000 system is basically done by replacing defective units with good ones. The system's faults in an installation can be divided into the following categories.

1. Faults in an exchange
2. Faults in a station
3. Cable faults

To make system repairing easier, find which category is involved, then refer to the chart below for assistance in fault finding.



EXES-5000 SYSTEM CHECK FLOW CHART

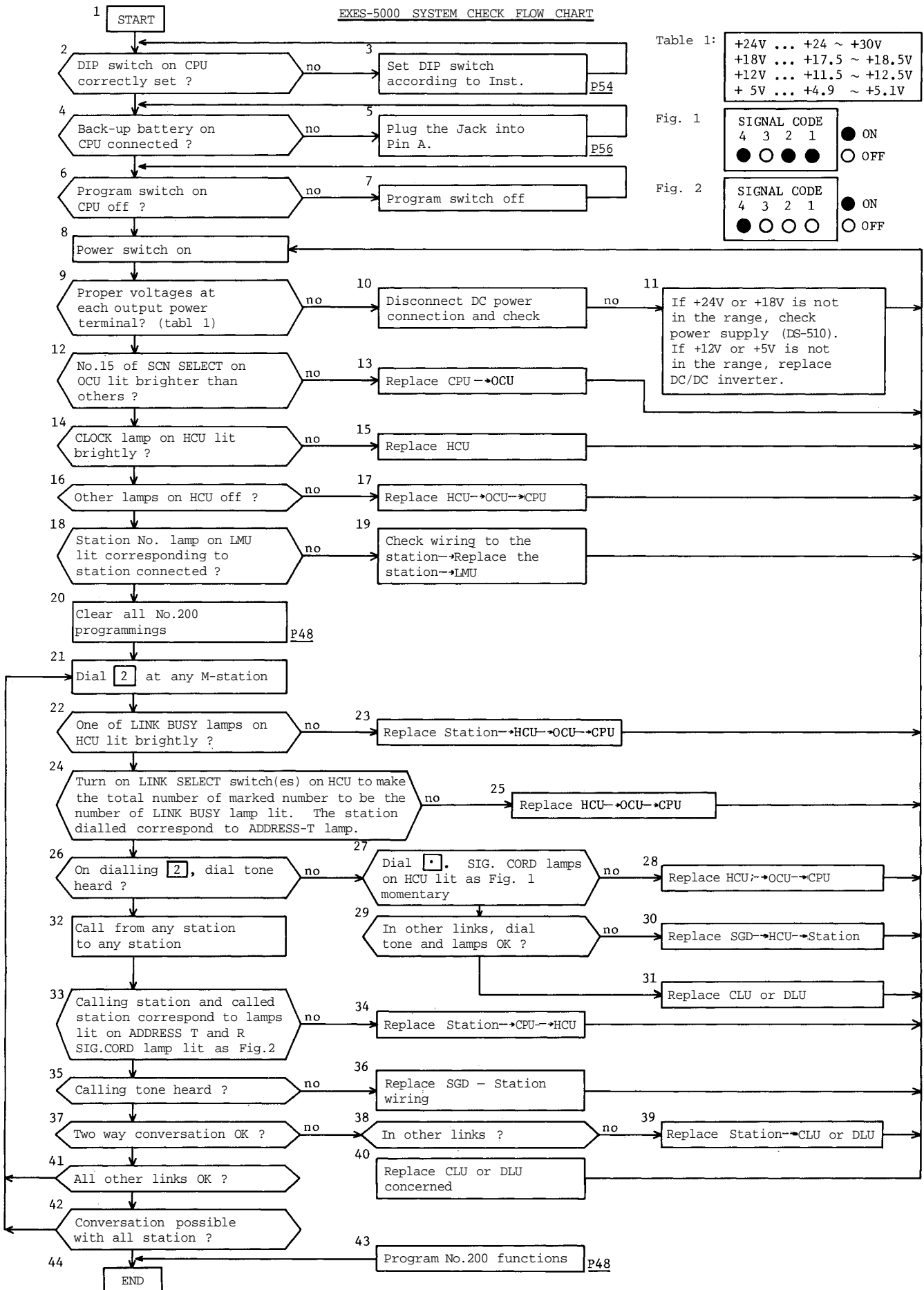
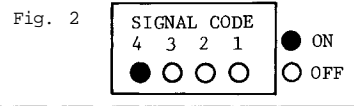
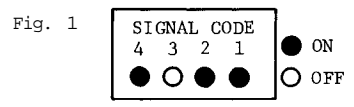


Table 1:

+24V ...	+24 ~ +30V
+18V ...	+17.5 ~ +18.5V
+12V ...	+11.5 ~ +12.5V
+5V ...	+4.9 ~ +5.1V



8-1. FAULT IN EXCHANGE

Before power supply check, confirm the following three points to eliminate elementary faults:

1. Is voltage selector set correctly?
2. Is AC power supplied?
3. Is power switch ON?

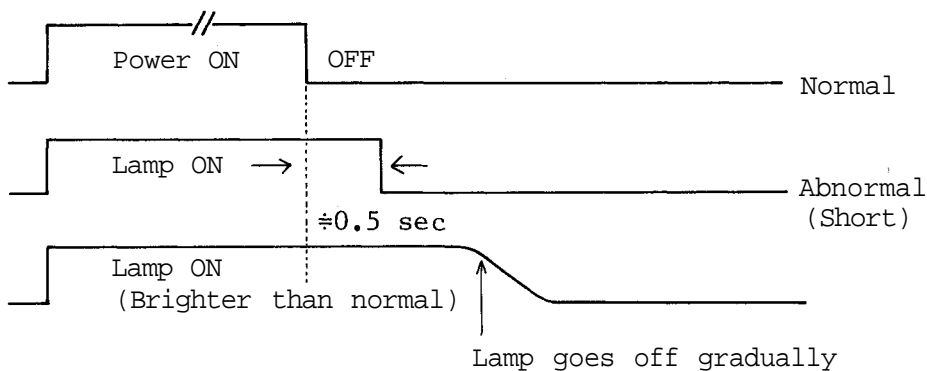
Start checking after disconnecting all wiring connected to DC output of the power supply unit.

SYMPTON	CHECK-ITEM							
Exchange does not operate.	All DC output voltages are correct.	* Over-current flows into one of plug-in units.						
	All or one of DC output voltages are not correct.	* Fault in the power supply unit DS-510.						
Abnormal voltage of +24V terminal.	Right range: +24 ~ +30V	* Replace AC and DC fuses. * Incorrect setting of the voltage selector. * Faulty power transformer.						
Abnormal voltage of +18V.	Right range: +17.5 ~ +18.5V	* Faulty 2SA-753. * Faulty μ A7818KG.						
Abnormal voltage of +5V or +12V.	Right range: +4.9 ~ +5.1V +11.5 ~ +12.5V	* DC/DC inverter (MIV-02) is defective.						
Battery is not charged.	Check the current flowing into the battery. Right range: 80 ~ 120mA	* Replace PCB of charging circuitry.						
AC & DC operation lamps are OFF. Buzzer does not operate. Note: Only when DC power supply (Battery) is employed.	Check all DC voltage.	* Replace PCB of charging circuitry.						
Blown AC and/or DC fuse.	All DC output voltages are correct. Check all stations involved in All-Call paging.	* Over-current flows into one of plug-in units. (Especially on +18V) * MIV-02 is defective. * Replace fuse according to the following.						
		<table border="1"> <thead> <tr> <th>Number of stations</th> <th>Fuse</th> </tr> </thead> <tbody> <tr> <td>0 ~ 30</td> <td>DC 5A</td> </tr> <tr> <td>31 ~ 64</td> <td>DC 7A</td> </tr> <tr> <td>65 ~</td> <td>DC 10A</td> </tr> </tbody> </table>	Number of stations	Fuse	0 ~ 30	DC 5A	31 ~ 64	DC 7A
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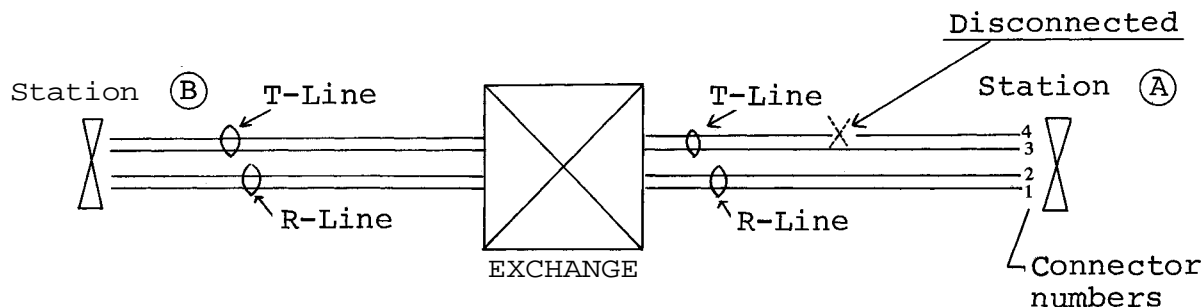
8-2. HOW TO FIND SHORT BETWEEN T-LINE AND R-LINE

If the shorted condition between T-line and R-line is not corrected for a long time, it may burn out the guard resistor (330Ω , $1/2W$) on the LMU board. Therefore, find the shorted line according to the following procedure:

1. Turn off the privacy switch on all stations in the system.
2. Turn on the power switch of the system for several seconds, then, turn it off.
3. Watch the lamps on the LMU panels. The lamps on normal lines will go off after approximately 0.5 second. The lamps on the shorted lines will stay on more than 0.5 second.



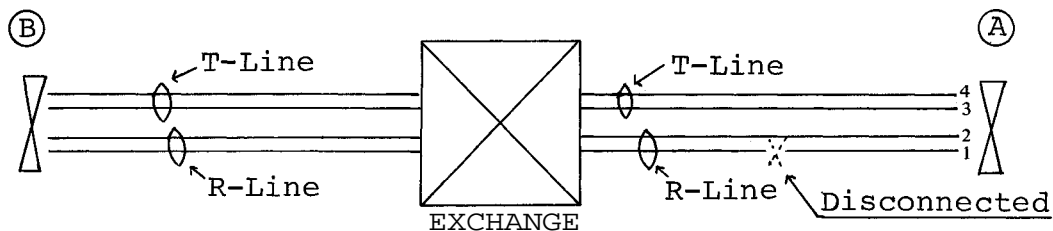
1. One of transmitting lines (T-Line) is disconnected.



- Symptom
- 1-1 A can make dialing.
 - 1-2 A can hear B .
 - 1-3 B can not hear A .
 - 1-4 Noise is heard at B .
 - 1-5 Noise increases at B when Press-To-Talk bar is pressed at A .

LMU Lamps ----- Normal

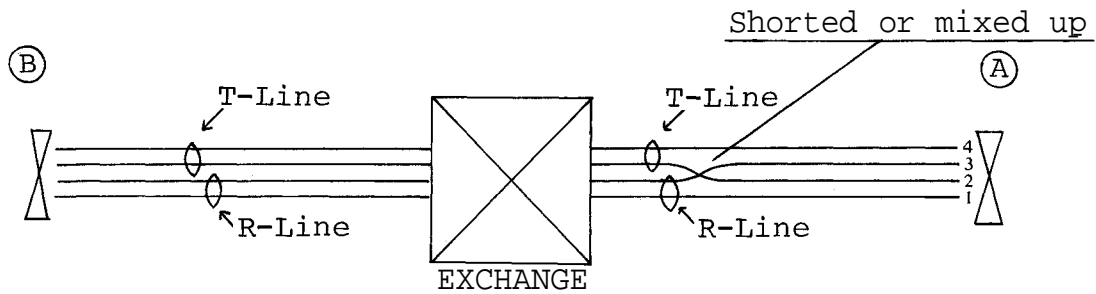
2. One of receiving lines (R-Line) is disconnected.



- Sympton:
- 2-1 A can make dialing without dialing tone.
 - 2-2 When B dials A , busy tone or dial tone will be heard at B immediately after the calling tone.

LMU Lamps ----- Normal

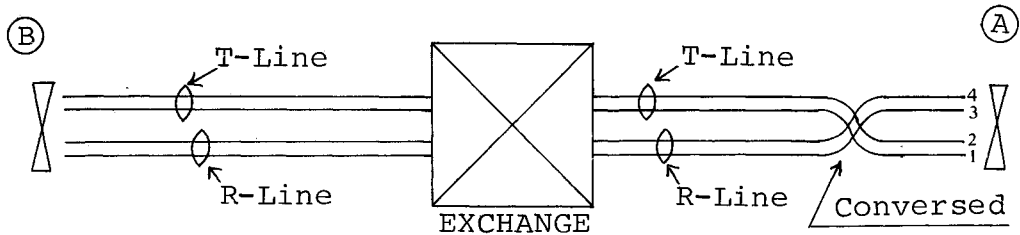
3. T-Line and R-Line are shorted or mixed up.



- Symptom 3-1 A can not dial.
 3-2 Conversation is impossible between stations.
 3-3 When B dials A , noise will be heard at B immediately after the calling tone.

LMU Lamps ----- Brighter than normal.

4. T-Line and R-Line are connected conversely.



- Sympton: 4-1 A can not make dialing.
 4-2 Conversation is impossible between stations.
 4-3 When B dials A , noise will be heard at B .

LMU Lamps ----- Brighter than normal.

8-3. FAULT IN SPECIFIC STATION ONLY

Find the cause according to the following table if the fault lies with a specific station only, not with all stations.

	CHECK-ITEM	CAUSE
Dialing can not be made at privacy off mode.	LMU Lamp is off.	* Disconnection of both T & R-Lines. * Guard resistor 330Ω on LMU is burned out due to T & R-Lines short.
	Specific Lamp on LMU is brighter than normal.	* T & R-Lines are shorted.
	LMU Lamp is on in normal.	* Fault in the station. (Replace PCB board.)
Specific key does not operate.	Replace the station and make sure that the station is not faulty.	* Fault in key board switch or matrix circuitry. * Fault in the dial generator. (Replace PCB board.)
Calling tone can not be heard. Dialing tone can not be heard on dialing. Sound from the other party can not be heard.	Same symptom remains even if the station is replaced.	* Short or open in R-Line. * Fault in the demodulation circuitry on LMU. (Check LM-380, MT-547.)
	Becomes normal if the station is replaced.	* Disconnection of R-Line or improper connection of the station connector. * Fault in MT-547 on LMU. * Station fault.
Sound is not transmitted to the other party.	Same symptom remains even the station is replaced.	* Short or open in T-Line. * Fault in the modulation circuitry on LMU.
	Becomes normal if the station is replaced.	* Fault in MIC circuitry of the station. (Replace MIC or PCB)
On dialing, noise is heard by the called party.	Same symptom remains even the station is replaced.	* One of T-Lines is disconnected.
	Becomes normal if the station is replaced.	* Fault in MIC element. * Fault in T-Line of the station. * Low frequency oscillation of MIC AMP. (Faulty bypass capacitor)

<p>Sound of the other party is broken during call.</p>	<p>Same symptom remains even the station is replaced.</p>	<ul style="list-style-type: none"> * Adjust the volume control of station speaker if the room produces reverberation. (Lower the volume.) * Increase the gain of MIC AMP. * Replace PCB after checking if MIC unit is not touching its case.
<p>Immediately after the calling tone, the line switches to cancel, busy, dial tone, etc.</p>	<p>Same symptom remains even the station is replaced.</p>	<ul style="list-style-type: none"> * One of R-Lines is disconnected. * Fault in photo coupler PC-504 on LMU. * Fault in MT-547 on LMU or in the station.
	<p>Becomes normal if the station is replaced.</p>	<ul style="list-style-type: none"> * One of the R-Lines is disconnected or the station connector is not connected properly.

8-4. SPEECH AND FUNCTION TEST

1. Speech Test

After completing the wiring check and the power supply and exchange test according to the system flow chart, the speech test for each station can then take place.

IMPORTANT NOTE

Before testing, all programming (Secretary transfer, Master/Substation, Executive Priority Function) must be cleared from station No.200 by turning on the PROGRAM switch of the CPU, or the speech test can not proceed correctly.

- * Call every station one by one from any master station and examine the speech quality and sound volume.
- * The sound volume can be adjusted by the volume on the rear of the station. (Fully clockwise for maximum)
- * A call to a station in the room produces reverberation and may present broken sound. Turn down the volume of the station speaker until the sound becomes normal.
- * Each station must be located properly where no feedback will occur between station and external speakers. The gain adjustment of the paging amplifier is also important in order to avoid troublesome feedback.
- * The Press-To-Talk bar on the station keyboard must be used for the speech test when stations are installed in high noise areas (more than 60dB noise).
- * Speech quality (broken sound, natural conversation, tone quality, etc.) must be tested with each line in the CLU or DLU employed in the system.

2. Function Test

- * Check all employed functions with a few stations near the exchange.
- * Check "User Programmable Functions" at stations involved after the programming from station 200.
 - + Secretary Transfer: Is transfer made correctly with the privacy switch on at the executive station.
 - + Master/Substation : Touch dial at substation can call its master station.
 - + Executive Priority: Is this function operated at stations involved.
- * Use all number keys including and , Press-To-Talk bar, Vol. L/H and privacy switch to test all functions.

EXAMPLE: + Both calling and conversation tests with station number 200 through 209.

- + Change the position of Vol. L/H and make sure that the switch works.
- + Turn the privacy switch ON. Is privacy tone heard from the station when someone calls?

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