

**Programs After Market Services (PAMS)
Technical Documentation**

**NHE-6 TROUBLE-
SHOOTING
INSTRUCTIONS**

NHE-6 TROUBLESHOOTING INSTRUCTIONS

Contents

Introduction	Page 4
General	Page 4
Baseband Troubleshooting	Page 5
Phone is Totally Dead	Page 6
Flash Programming doesn't work	Page 7
Power Doesn't Stay On or the Phone is Jammed	Page 10
The Function of the 32 kHz Clock Oscillator in Test Circumstances	Page 10
Display Information: Contact Service	Page 12
The Phone Doesn't Register to The Network (no serv) or Phone Doesn't Make a Call	Page 13
The States of The DSP after Power On	Page 13
SIM Card is Out of Order (Insert SIM Card or Card Rejected)	Page 15
Audio Fault	Page 18
Charging Fault	Page 21
UIF Module troubleshooting	Page 22

Introduction

General

The purpose is to define the faulty module block, and then to locate the faulty component. The trouble shooting diagram has been planned so that the fault, whatever it is, can be found by as simple measurements as possible.

The flow charts give you the overview of the blocks. The purpose is that you proceed through the flow diagram so that, if your answer is YES for the asked question, go straight to the next level, but if your answer is NO, you have to go the subbranch.

Required servicing equipment:

- PC for Service Software with 486 CPU or newer
- Power supply (2.0 A)
- Digital multimeter
- Oscilloscope
- Spectrum analyzer
- Signal generator
- RF cables
- Modular cable
- RS232/MBUS adapter
- HP8922H or equivalent
- RF measuring chassis

The Troubleshooting for NHE-6 consist of a series of checks according to the following flow charts.

Baseband Troubleshooting

The following hints should facilitate finding the cause of the problem when the circuitry seems to be faulty. This trouble shooting guide is divided into the following sections.

1. Phone is totally dead
2. Flash programming doesn't work
3. Power doesn't stay on or the phone is jammed
4. Display information: Contact Service
5. Phone doesn't register to the network or phone doesn't make a call.
6. Plug in SIM card is out of order (insert SIM card or card rejected).
7. Audio fault.

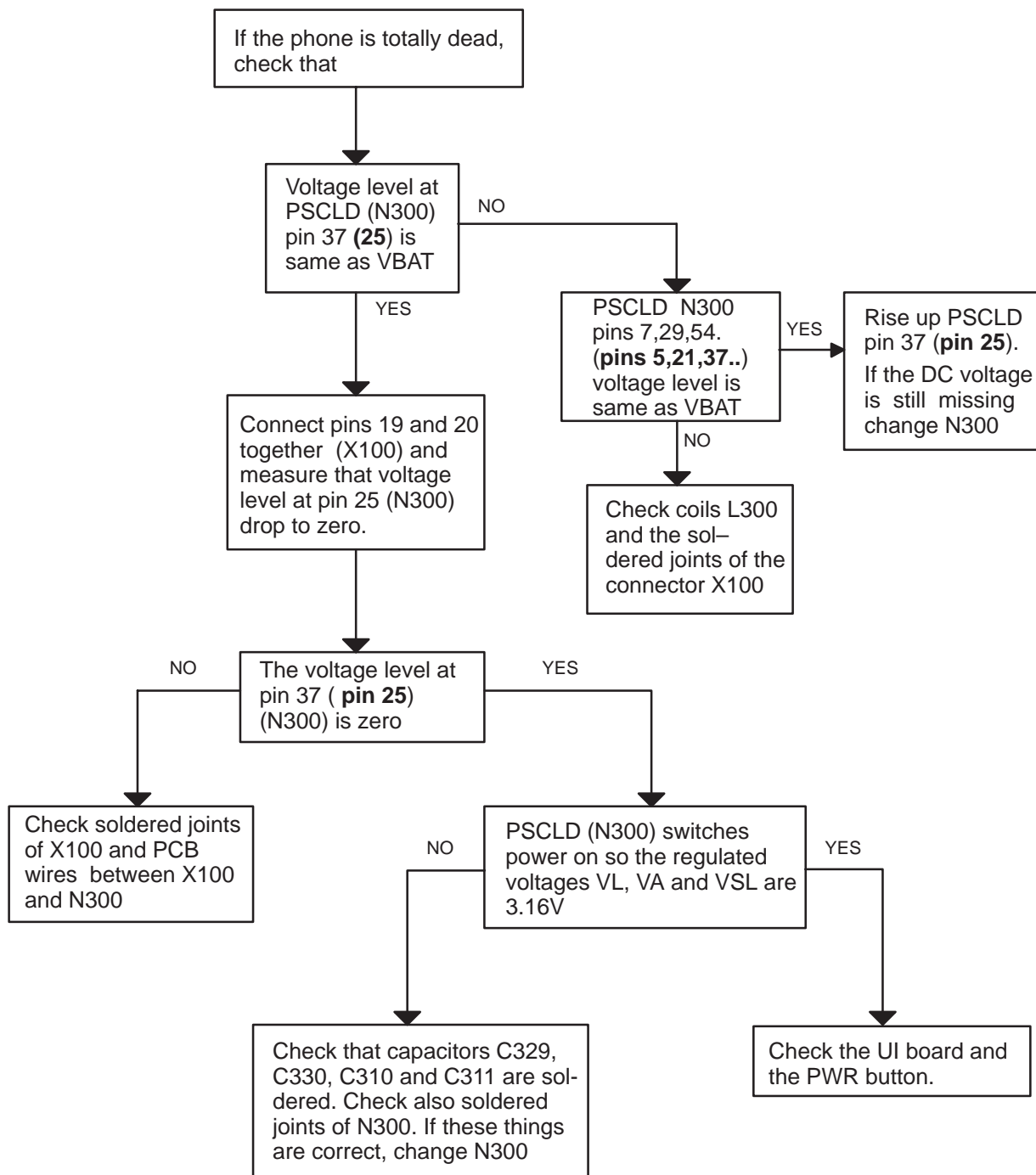
The first thing to do is carry out a thorough visual check of the module. Ensure in particular that:

- a) there is not any mechanical damage
- b) soldered joints are OK

Note: Pin numbers marked as bold characters (in brackets) are for PSCLD TQFP44 package !

Phone is Totally Dead

Trouble shooting diagram for this fault is represented below. Check at first that the battery back is OK and it is not empty. This kind of fault has been limited around the system connector (X100) and the PSCLD (N300).



Flash Programming doesn't work

The flash loading is handled via these components. Thus a fault in other components (DSP, RFI) can not prevent the flash loading.

In error cases, the flash prommer can give some information about the fault. The fault information messages could be:

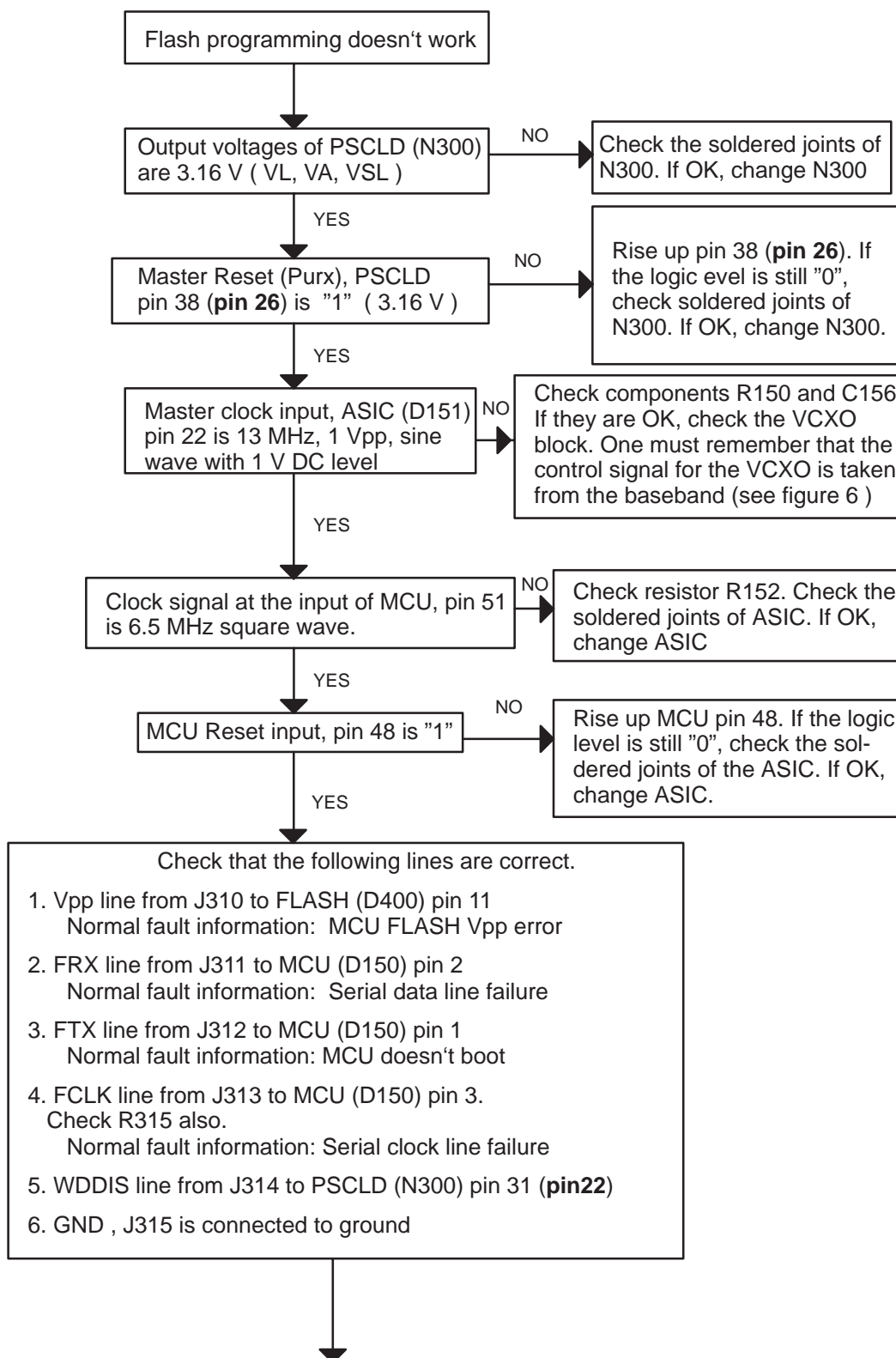
- MCU doesn't boot
- MCU flash Vpp error
- Serial data line failure
- Serial clock line failure
- External RAM fault
- Algorithm file or alias ID don't find

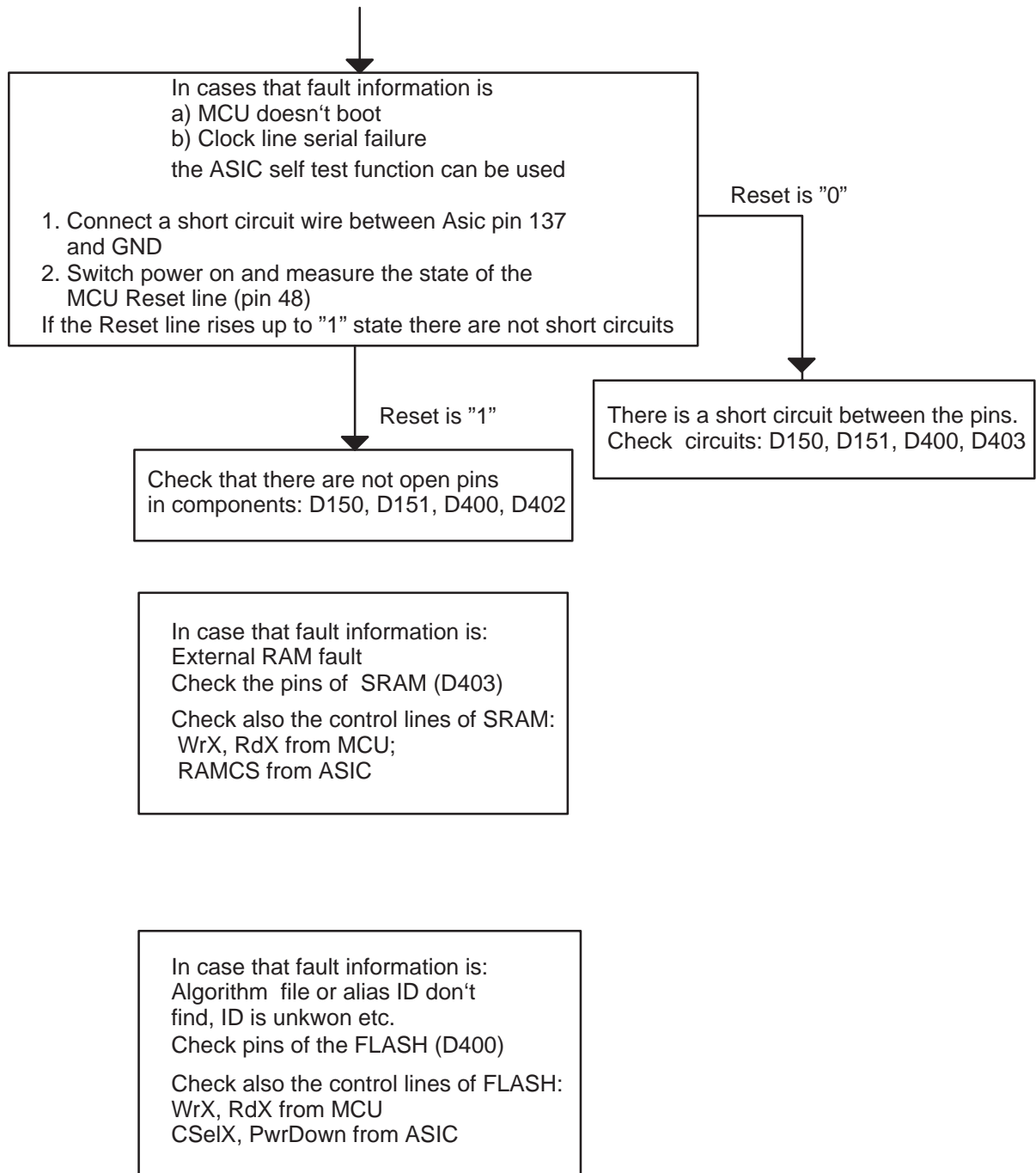
In cases where the flash programming doesn't succeed, it is possible to test the interface between the ASIC and the MCU. This test is useful to perform when the fault information is: MCU doesn't boot or Serial clock line failure.

The test procedure is following:

1. Connect a short circuit wire between Asic pins 137 and gnd.
2. Switch power on.
3. If the reset line of the MCU rises up, the interface is OK. Otherwise the reset line stays low.

Notice that this test can be used to find only short circuits, not open pins. This test also indicates that the 32 kHz clock is running, because the test logic is performed using 32 kHz clock oscillator.





Power Doesn't Stay On or the Phone is Jammed

If a fault has come after the flash programming, there are most probably open pins in IC's.

The soldered joints of IC's : D150 (MCU), D151 (ASIC), N300(PSCLD), D400 (FLASH), D403 (SRAM) are useful to check at first.

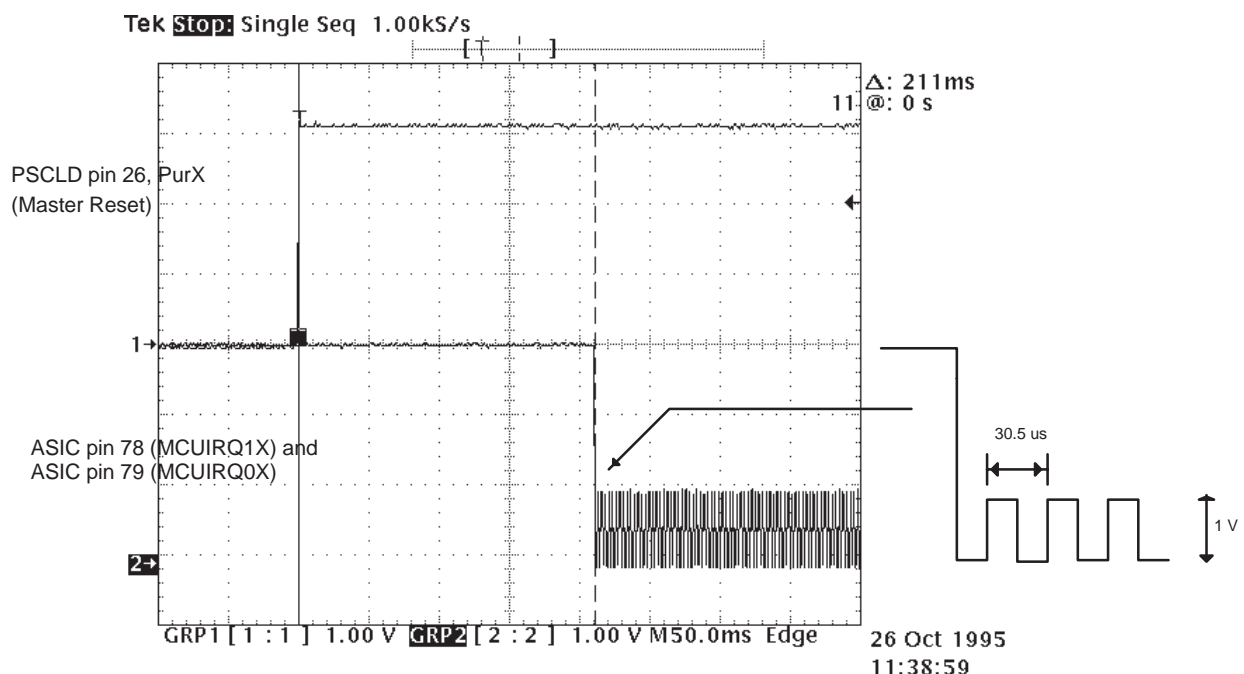
Normally, the power will switch off after 30 seconds, if the watchdog of the PSCLD can not be served by software. The power off function can be prevented by connecting a short circuit wire from the PSCLD pin31 (**pin 22**) (WDDIS) to the ground.

If the power switches off after 1..2 seconds, the pins of PSCLD and the PSCLD's auxiliary components must be checked.

If the phone is jammed, and no other reason has been found, the function of the 32 kHz clock oscillator must be checked. This can be done by setting the phone to the ASIC self test mode.

1. Connect a short circuit wire between Asic pin 137 and GND.
2. Make a short circuit between the ASIC pins 78 and 79.
3. Switch power on.
4. Measure the signal by oscilloscope at pins 78, 79 (ASIC).

The Function of the 32 kHz Clock Oscillator in Test Circumstances



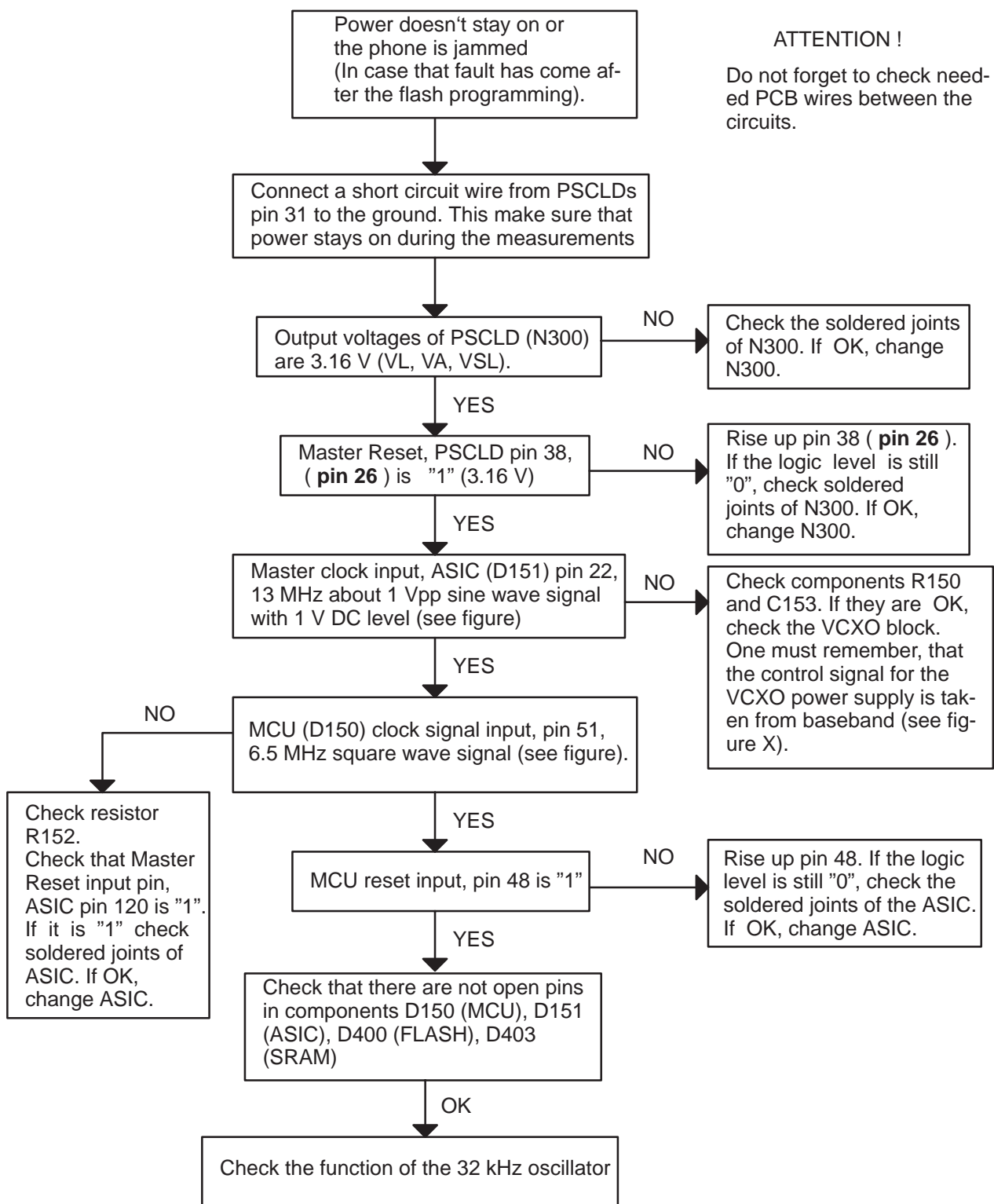
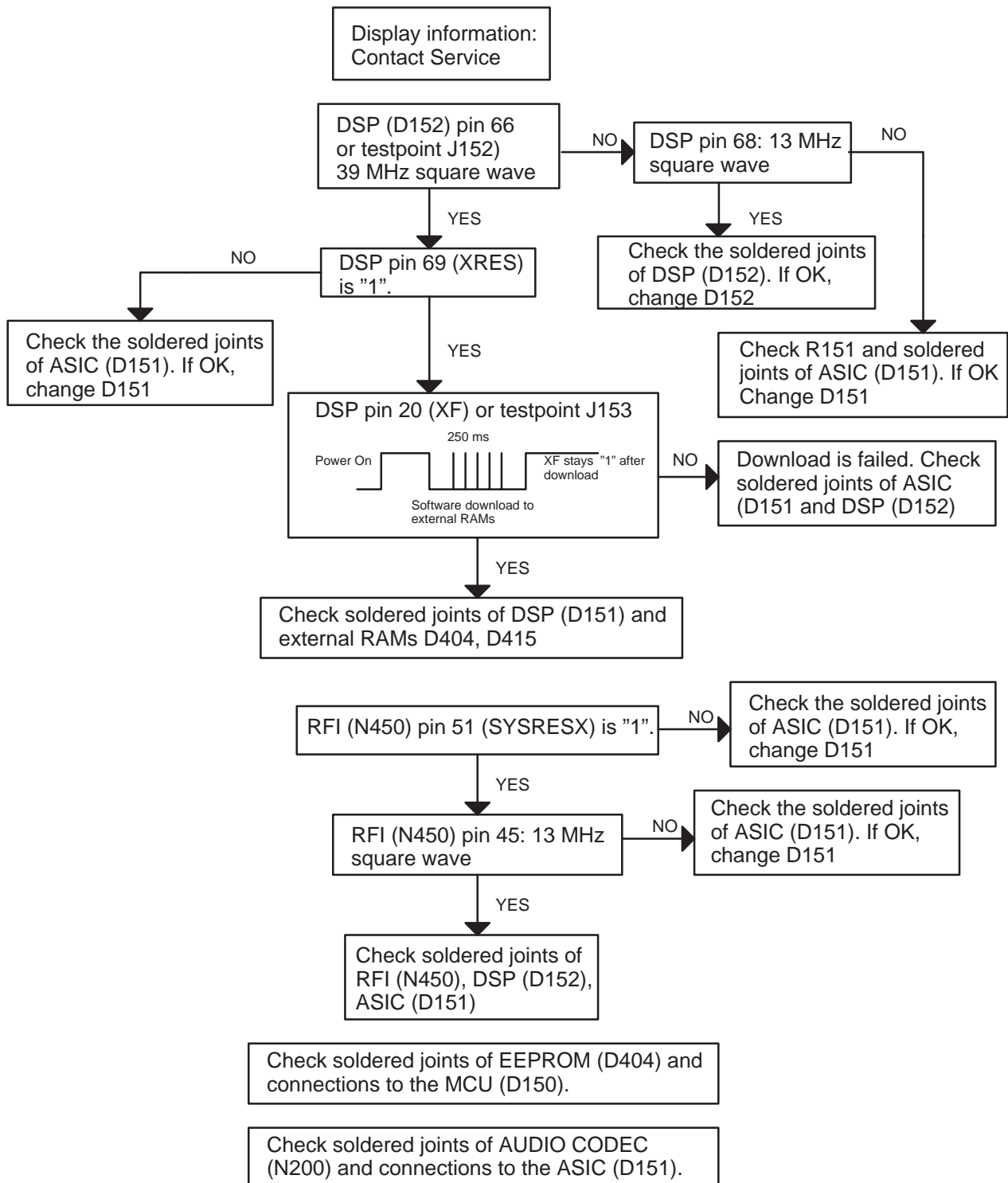


Figure 2. Trouble shooting HD843, Power doesn't stay on

Display Information: Contact Service

MCU is able to run and the watchdog of the PSCLD (N300) can be served.

In principle, the fault for contact service information can be found around ASIC (D151), DSP (D152), RFI (N450), EEPROM (D404) or AUDIO CODEC (N200).



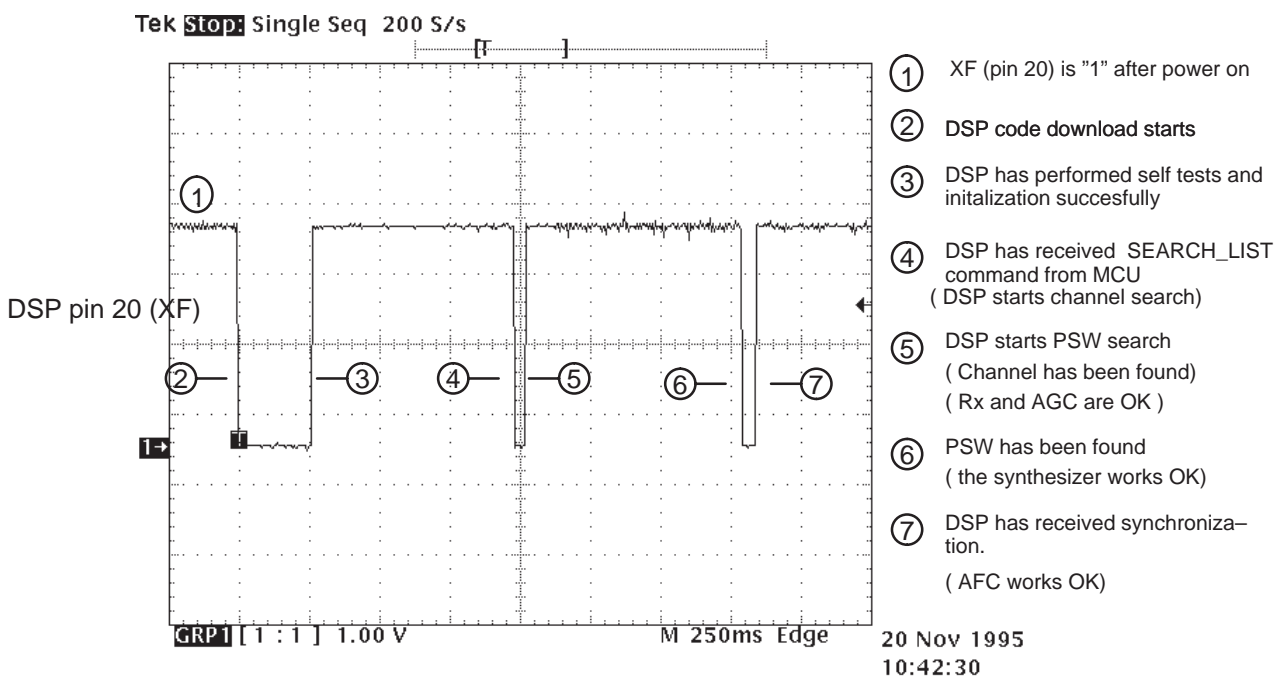
The Phone Doesn't Register to The Network (no serv) or Phone Doesn't Make a Call

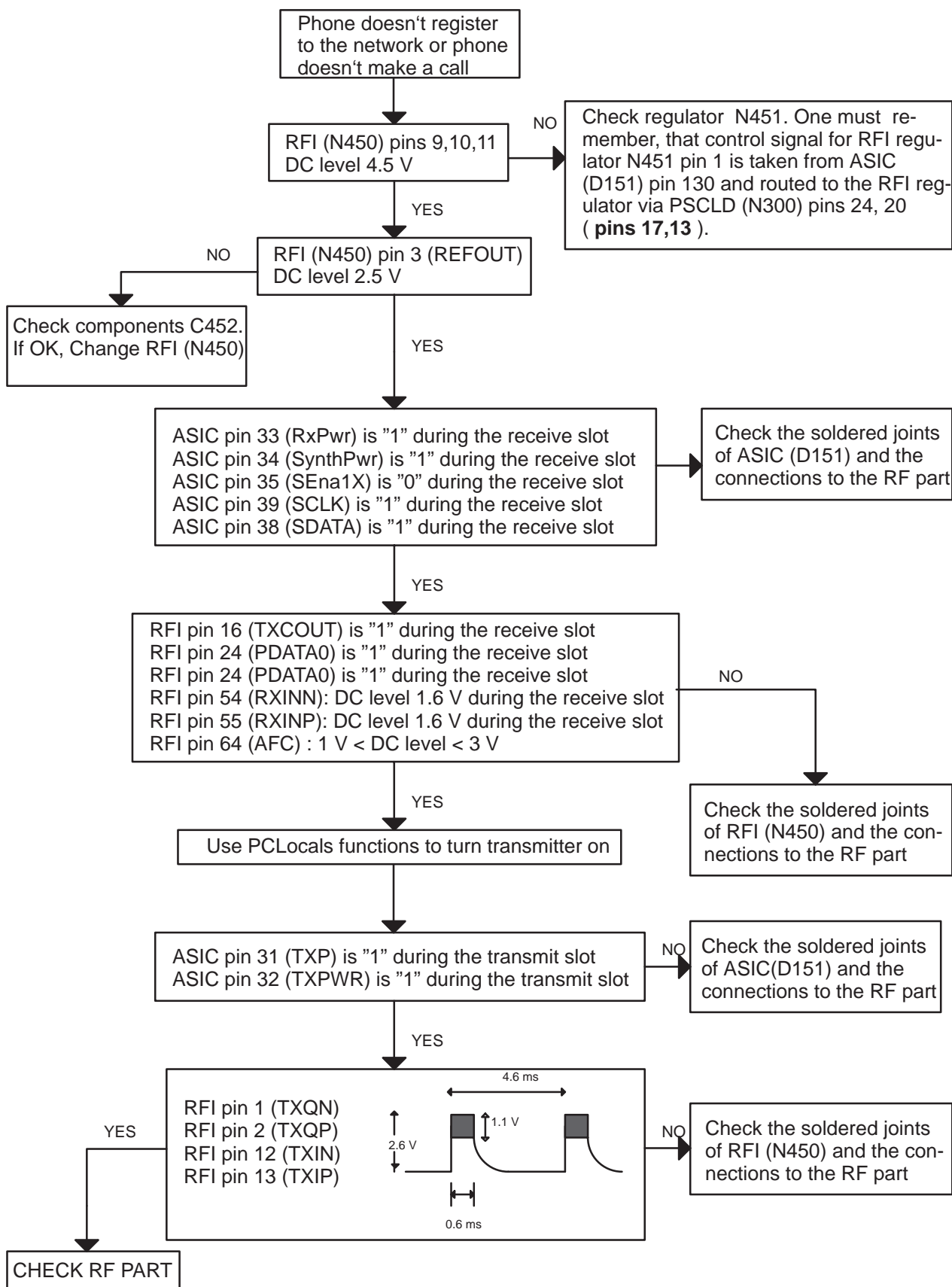
If the phone doesn't register to the network or the phone doesn't make a call, the reason for this could be either the baseband or the RF part. The phone can be set to wanted mode by WinTesla software and try to find reason for fault.

The control lines for RF are supplied both the ASIC (D151) and the RFI (N450). The ASIC handles digital control lines (between "0" = 0 V and "1" = 3.16 V) and the RFI handles analog control lines and proper input and output signals.

The DSP uses its external flag outputpin (XF pin 20) as an indicator of its operation state. During power up, DSP signals all completed functions by changing the state of the XF pin.

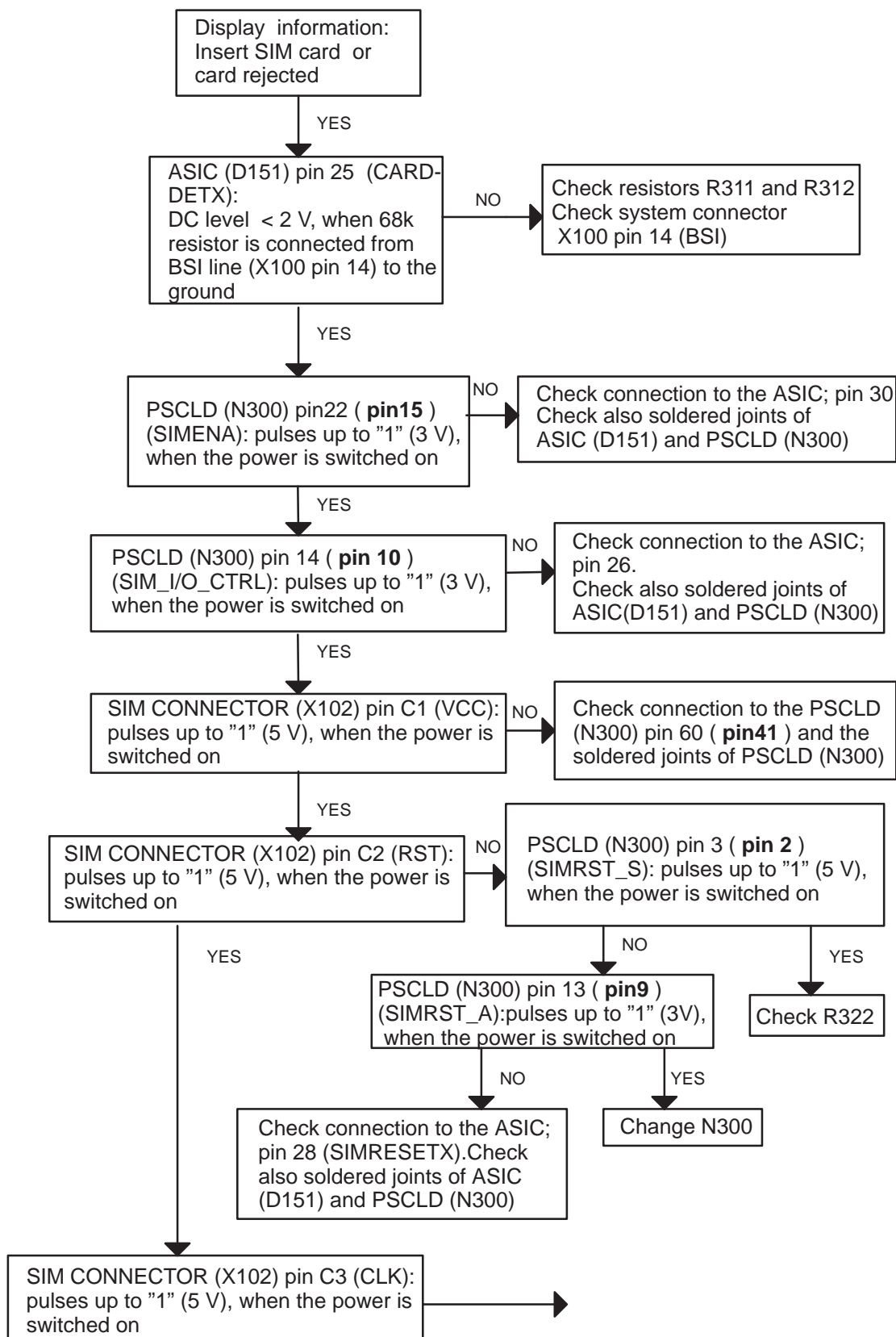
The States of The DSP after Power On

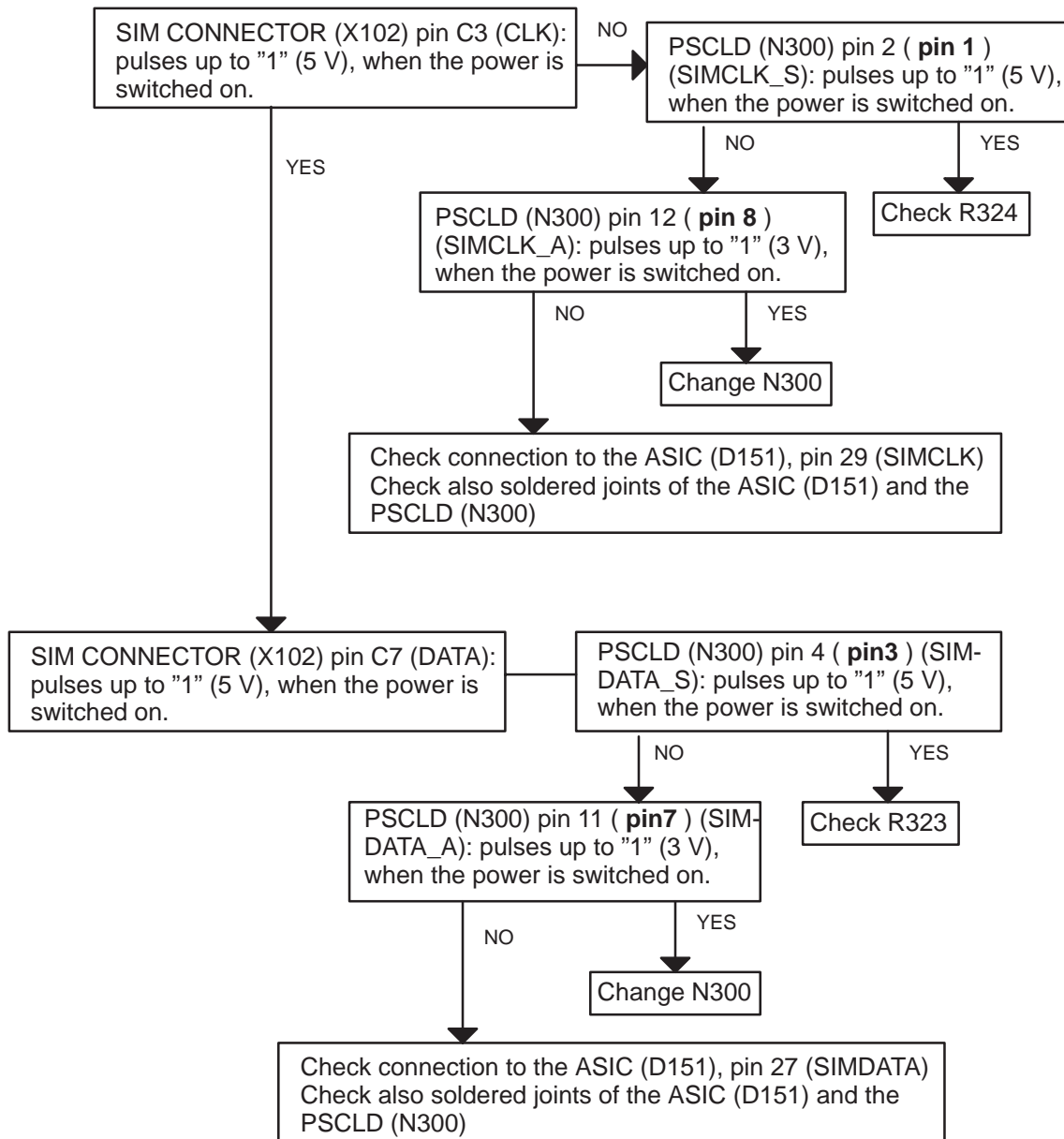




SIM Card is Out of Order (Insert SIM Card or Card Rejected)

The hardware of the SIM interface from the ASIC (D151) to the SIM connector (X102) can be tested without SIM card. When the power is switched on and if the BSI line is grounded by resistor, all the used lines (VSIM, RST, CLK, DATA) rises up to "1" (5 V) four times. Thus the fault can be found without SIM card most of the cases.



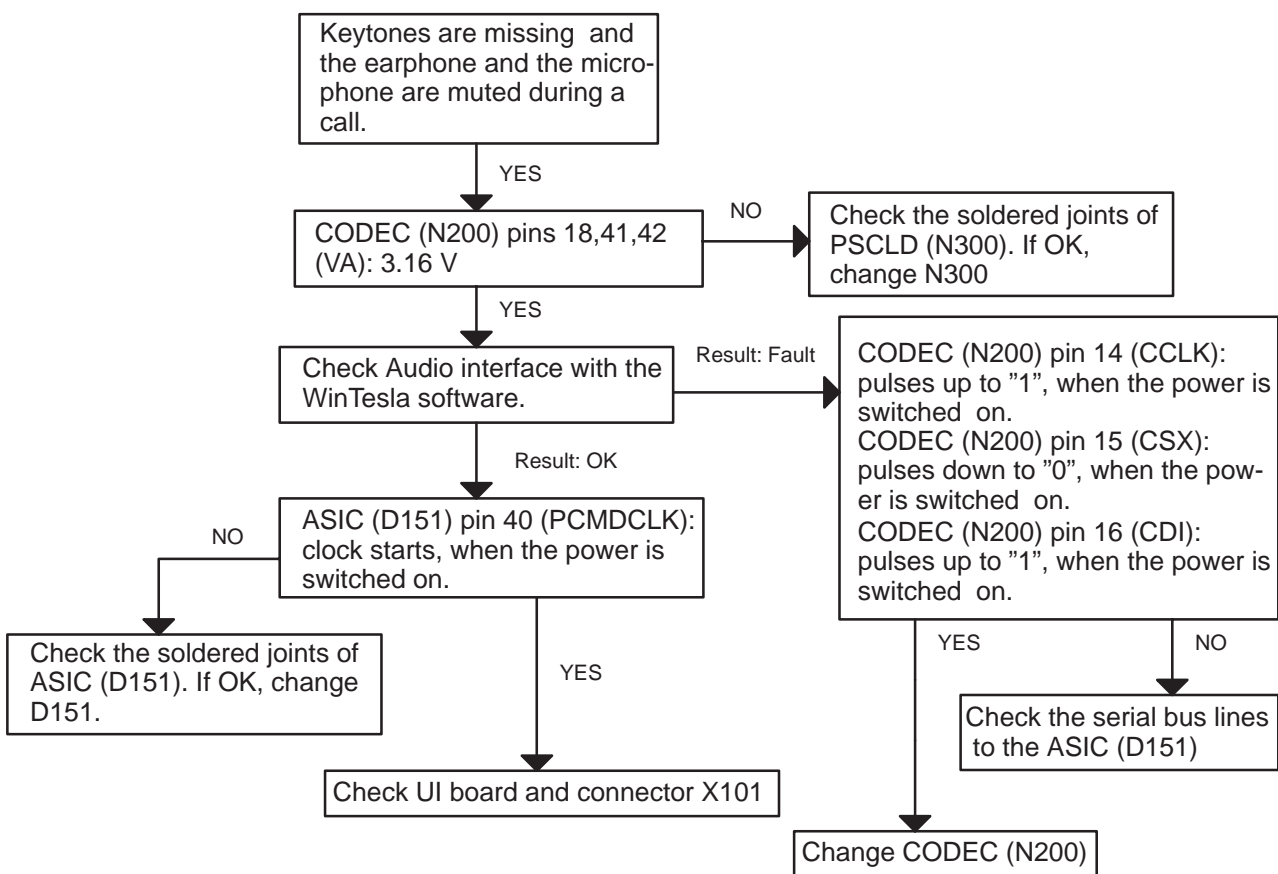


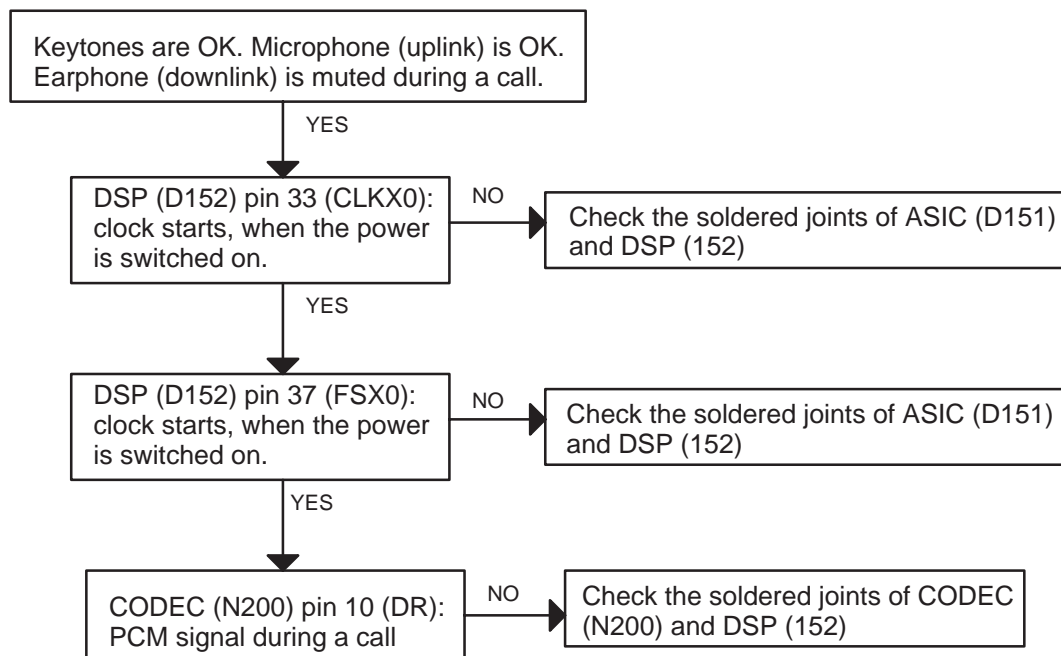
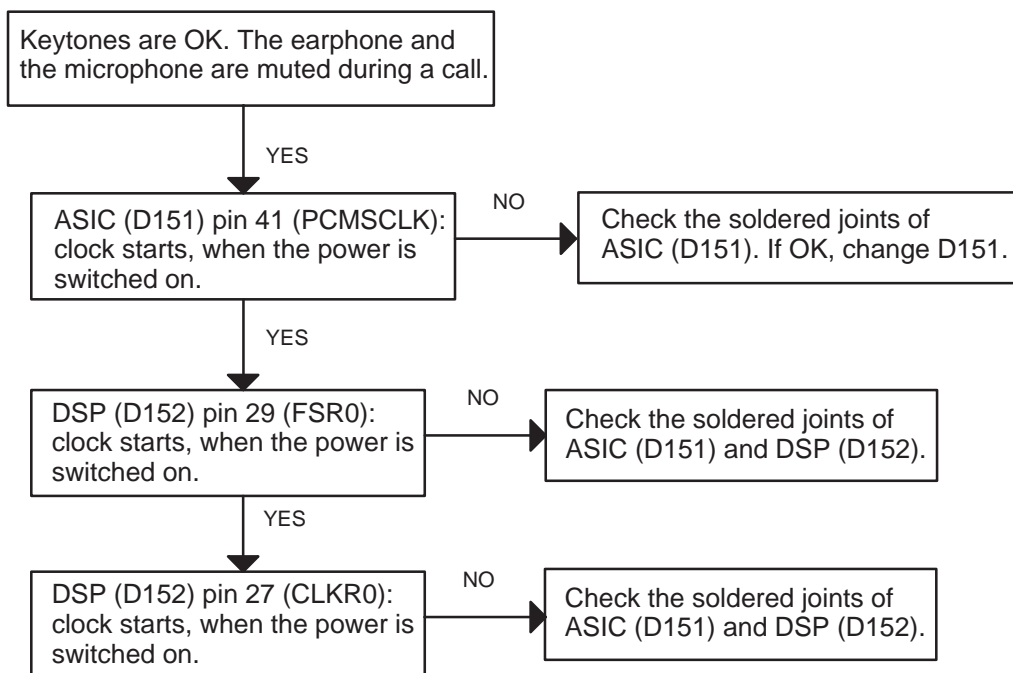
Audio Fault

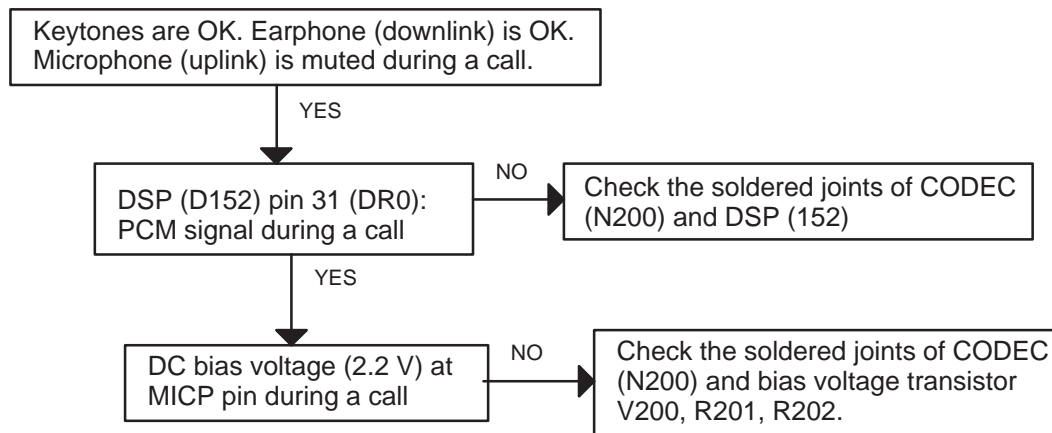
In cases that audio routings are totally muted, a fault could be in the serial bus. This serial bus is used for PSCLD (N300) and for Display driver also, so if the PSCLD and the display are OK, there are open pins in the AUDIO CODEC (N200) or the AUDIO CODEC is faulty.

Serial bus faults can be found with WinTesla software (self test).

Other possibilities are that PCM clock and sync lines are open. CODEC (N200), ASIC (D151) and DSP (D152) must be checked.







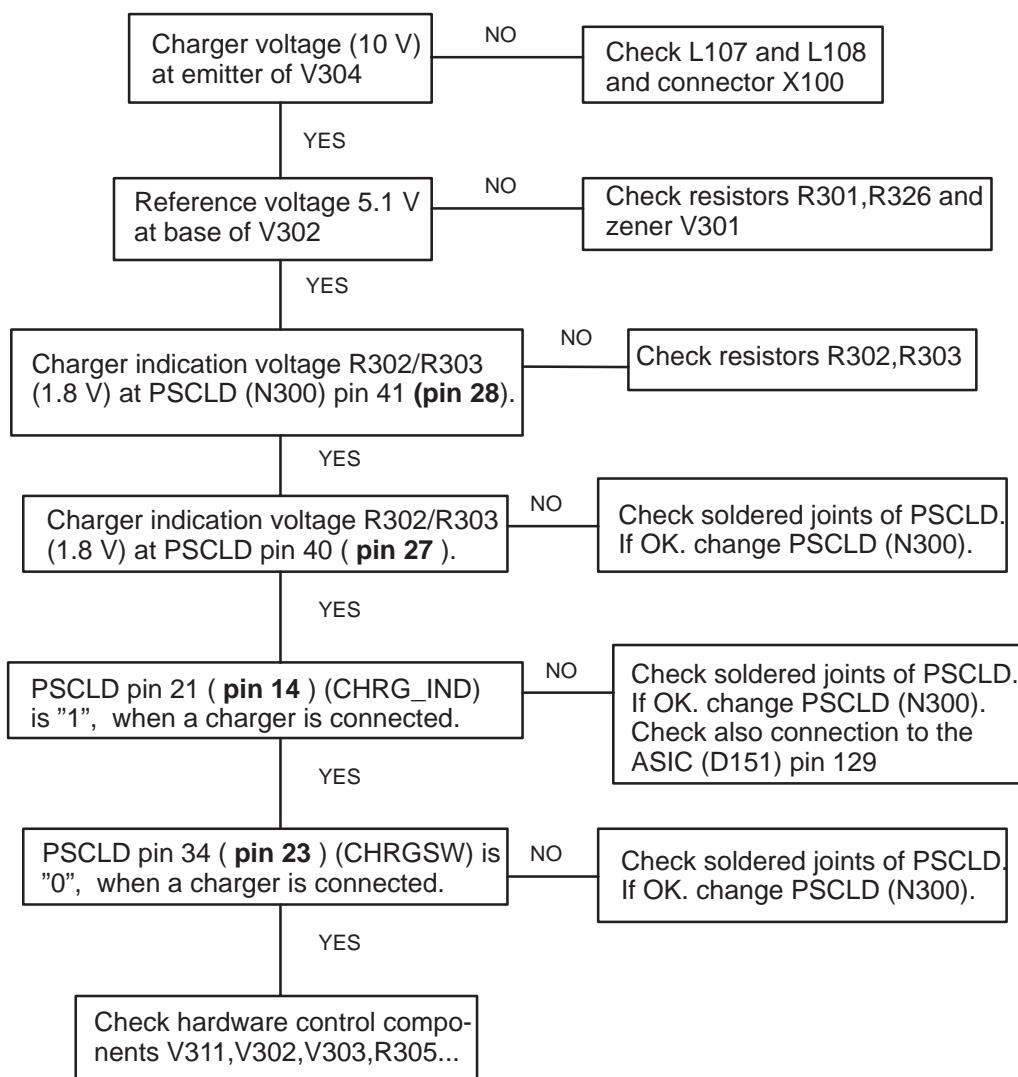
Charging Fault

Two different kind of faults can be distinguished from each other:

1. No information at all on the display when a charger is connected.
2. Display information: Not charging.

1. In case that information on the display is not given when a charger is connected, indicates that PSCLD (N300) pin 21 (**pin 14**) can not change the level of the CHRG_IND line (0 → 1), or the input pin of the ASIC (D151) pin 126 is unconnected.

2. If the display information is: Not charging, the charger indication has been done, but the hardware control unit can not control the charging switch transistor V304.



UIF Module troubleshooting

UIF- connector

- if flex seems not to work, first check the condition of the B-B- connector

LCD

1. LCD does not work
 - check the voltages VL and V5
2. Missing rows in LCD
 - check if there are breaks on LCD glass. If yes, change the module.

Microphone

1. Mic does not work
 - check connectors (board-to-board and slide conn.)
 - check L1, L2 and UIF connector pins 1 and 2.
 - change the front cover or SLIDE if needed

Earpiece

1. Earpiece does not work
 - Send tone to earpiece
 - if no sound emitted, check the spring contacts of earpiece
 - change Earpiece if needed

Buzzer

1. Buzzer does not work
 - check the voltage VB
 - send tone to buzzer, connect PWM signal to BUZZER line
 - if no sound emitted, check the solder pads of the buzzer
 - measure that transistor V403 operates
 - change buzzer or transistors if needed

Keyboard and display LEDs and Call LED

1. Keyboard LEDs do not work
 - check the voltage VB
 - connect KEYLIGHT line to logical HIGH and measure, that control transistors V404 and V405 operate
 - check the solder pads of LEDs
 - change LED or transistor if needed

2. Display LEDs do not work

- check the voltage VB
- connect LCDLIGHT line to logical HIGH and measure, that control transistor V402 operates
- check the solder pads of LEDs
- change LED or transistor if needed

3. Call LED does not work

- check the voltage VB
- connect CALL_LED line to logical HIGH and measure, that control transistor V400 operate
- check the solder pads of LED
- change LED or transistor if needed

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