

Programmes After Market Services NSB-5 Series Transceivers

Troubleshooting Instructions

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Troubleshooting

The following hints should facilitate finding the cause of the problem when the circuitry seems to be faulty. This troubleshooting instruction 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
- 8 Charging fault

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

- there are not any mechanical damages, and
- solder joints are okay.

Phone is Totally Dead

This means that the phone doesn't take current at all when the power switch is pressed (X400 pin 7) or when the watchdog disable pin is grounded. Used battery voltage must be higher than 3.1V. Otherwise, the hardware of CCONT (N100) totally prevents power from switching on.

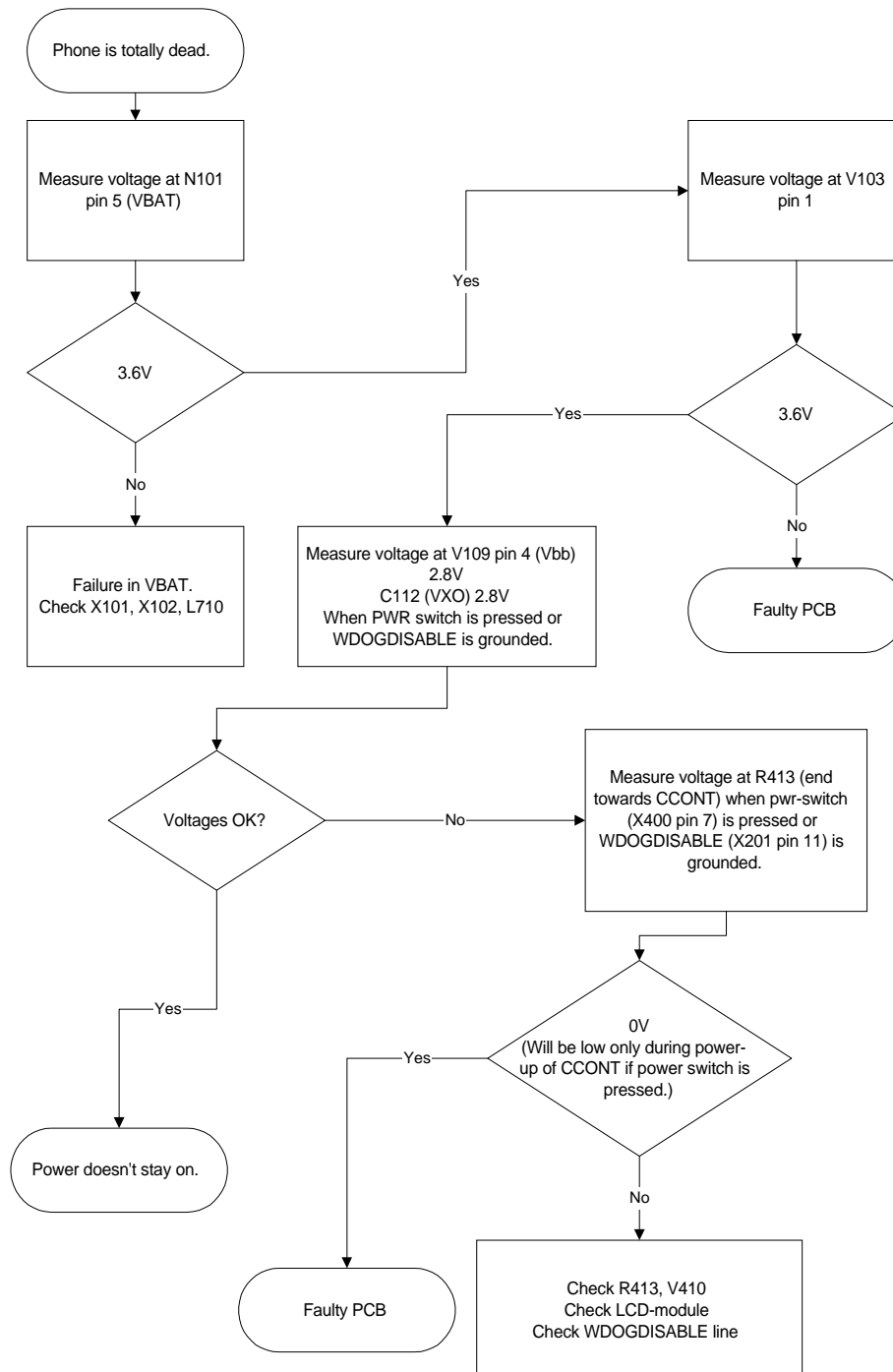


Figure 1: Fault Finding for Totally Dead Phone

Flash Programming Doesn't Work

The flash programming can be done via panel connector X201 or via system connector X200.

In production, the first programming is done via panel connector X201. After this, the panel connector is cut away, thus other flash programming must be done via system connector X200.

The main differences between these are:

- FLASH programming voltage (V_{pp}) is produced a different way, and
- Signal routings are different.

The fault-finding diagrams for flash programming are shown in Figure 2, Figure 3, and Figure 4.

In cases of flash programming errors, the flash prommer can provide some information about a fault. The fault information messages could be:

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

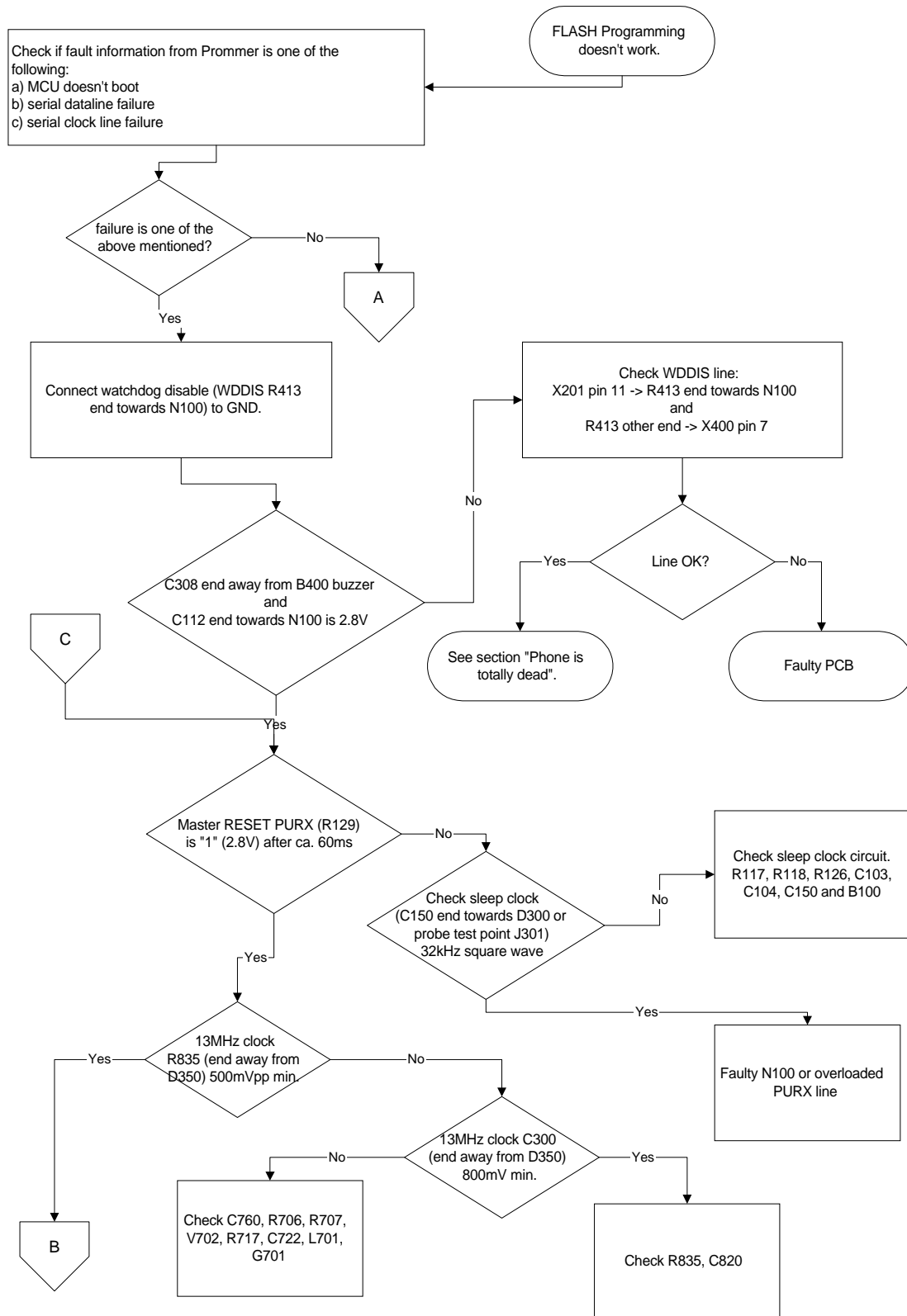


Figure 2: Fault Finding for Flash Programming Errors

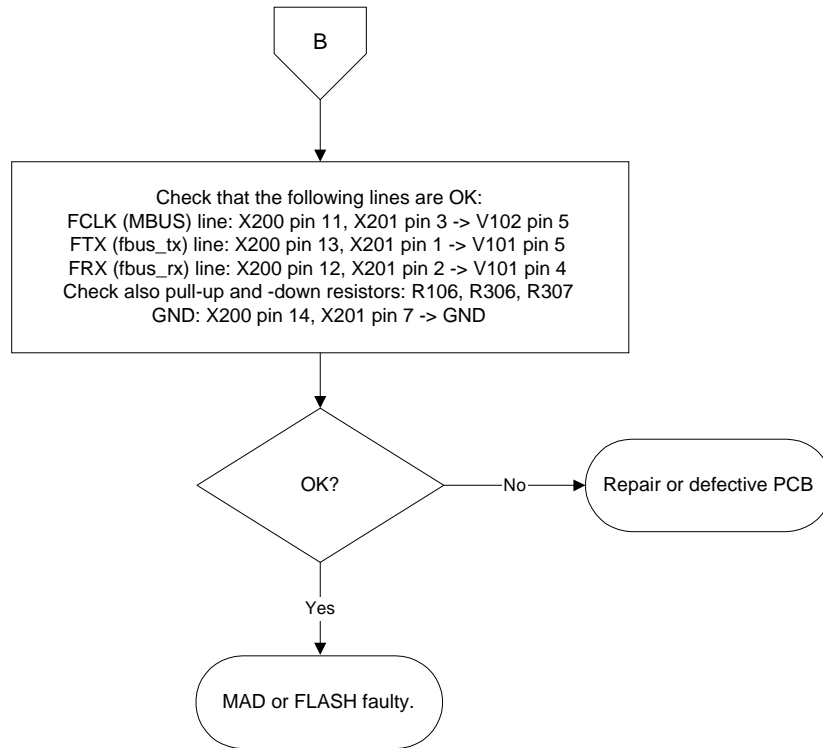


Figure 3: Fault Finding for Flash Programming Errors (Cont'd)

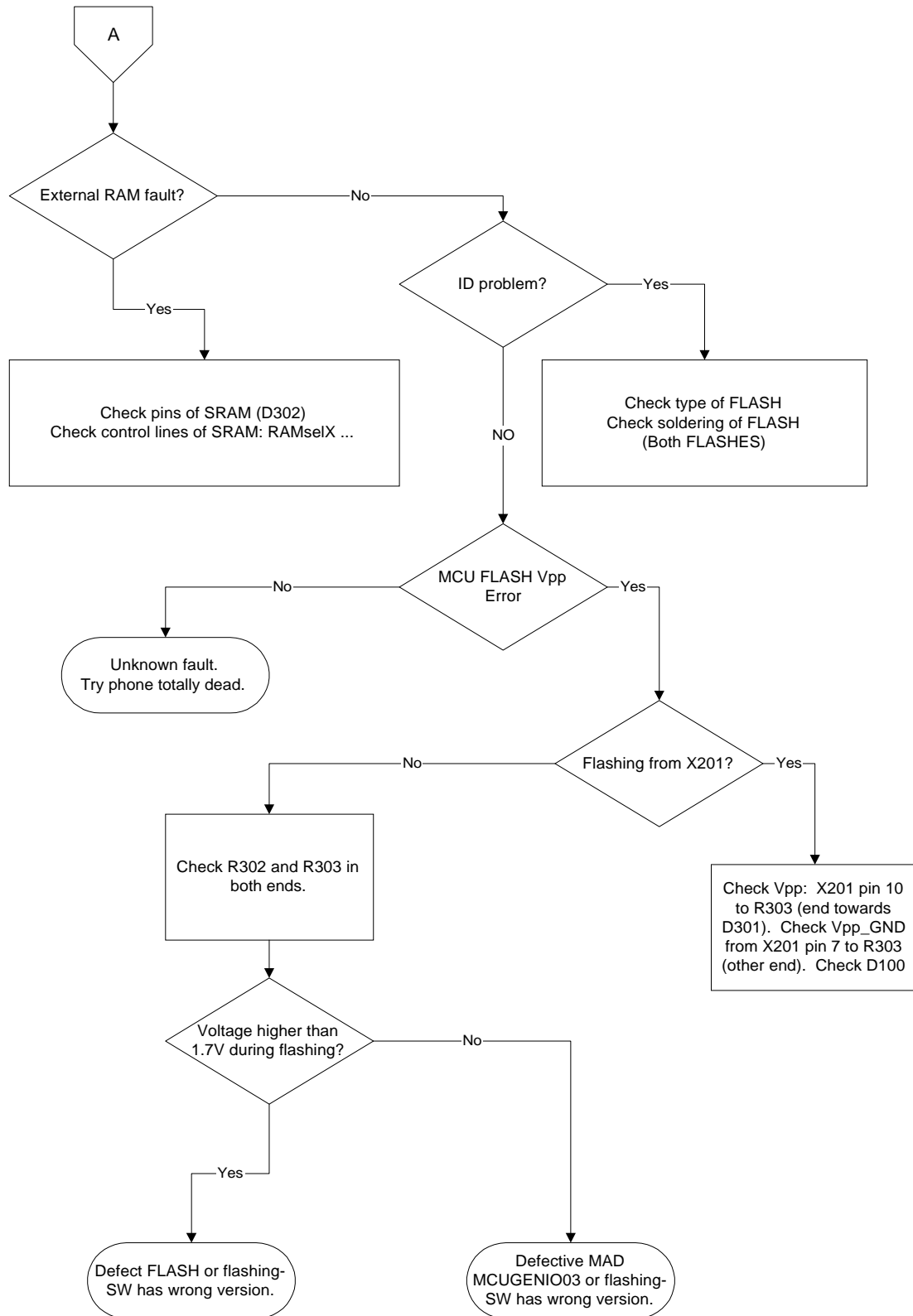


Figure 4: Fault Finding for Flash Programming Errors (Cont'd)

Power Doesn't Stay on or Phone is Jammed

If this kind of fault occurs after flash programming, there may be open pins on ICs or other discrete components. Solder joints on discrete capacitors and resistors and open joints on components with pins, such as D302 (SRAM), should be checked first. The soldered joints of ICs D300 (MAD2WD1), D301 and D303 (FLASH), N200 (COBBA_GJP), and N100 (CCONT) are difficult to visually inspect since these components are CSP or uBGA style packages.

A quick and easy way to test the solder joints on CSPs is to apply a small amount of pressure to the top of the package while powering-up the phone. If the phone powers-up while applying pressure to a specific component (e.g., MAD), then it can be assumed that that component has faulty solder joints.

Normally, the power will be switched off by CCONT (N100) after 30 seconds if the watchdog of the CCONT cannot be served by software. In order to verify if watchdog is updated, verify that X400 pin-2 is high and at the same time X400 pin-13 toggles. In normal cases, there is a short burst of pulses every 8 seconds.

The power-off function of CCONT can be prevented by connecting a short circuit wire from R413 (end towards N100) to ground.

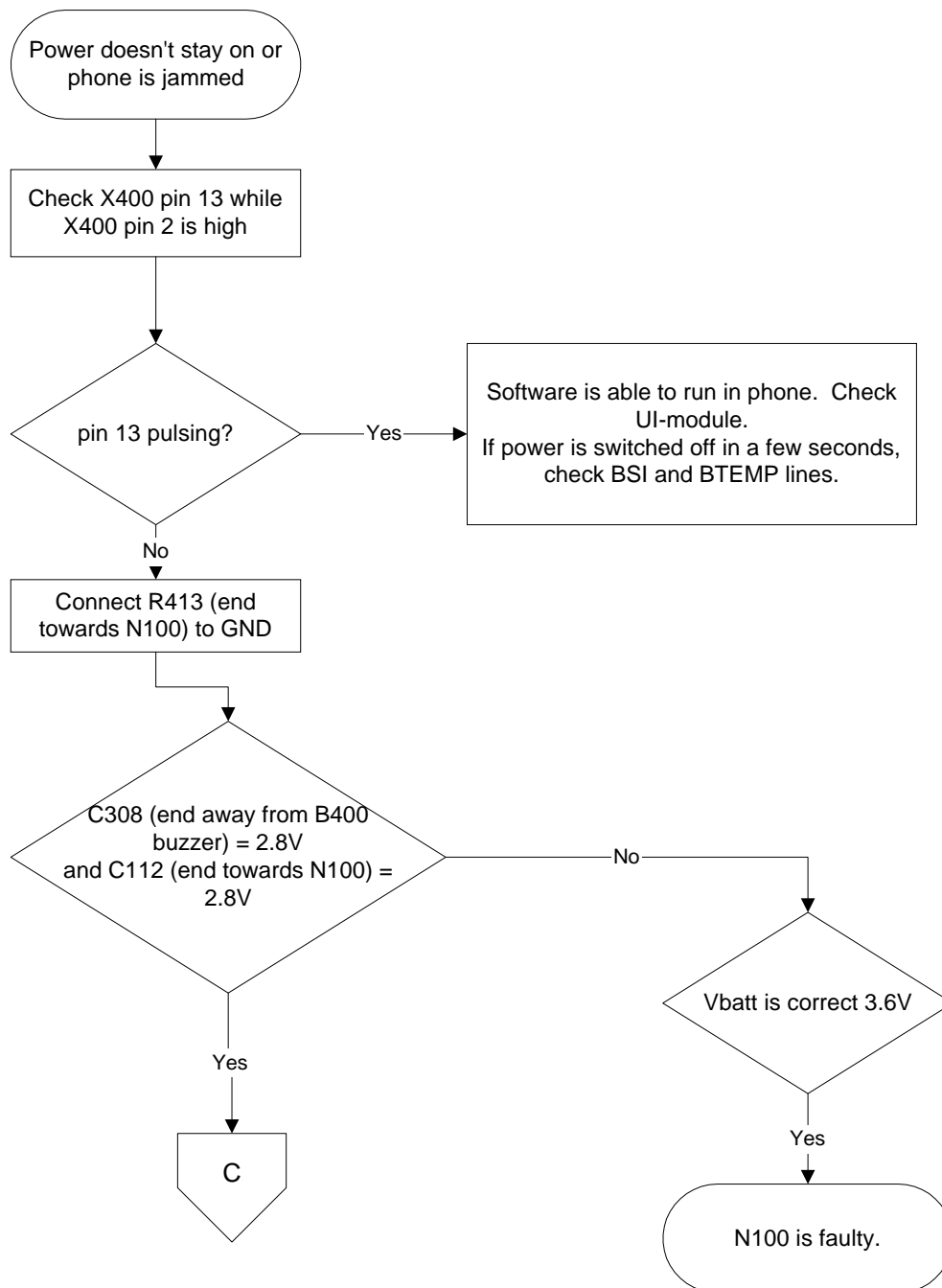


Figure 5: Power Won't Stay on or Jammed Phone

The label "C" refers to Figure 2.

Display Information: Contact Service

This fault means that software is able to run and thus, the watchdog of CCONT (N100) can be served.

Self-test functions are run when power is switched on and software has started to execute from flash. If any of the self-tests fail, contact service information will be shown on

the display. This may indicate open solder joints on components, faulty PCB, or other damage to the phone has occurred.

“Contact Service” may also indicate that the flash software has become corrupted. The phone may then require either a simple re-flash or, in some cases, a total erase and re-flash.

Phone Doesn't Register to the Network 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 could be either a baseband or RF part.

Wintelsa service software can be used to set the required mode and determine if the fault is in the RF or baseband sections (RF interface measurements).

The control lines for the RF section supply both the System ASIC (MAD2;D300) and the RFI (Cobba_GJP; N200). MAD2WD1 handles digital control lines (synthena, TxP, etc.) and Cobba handles analog control lines (AFC, TxC, etc.)

The DSP software is constructed so that operation states of DSP (MAD2WD1) can be seen in external flag (DSPXF) output pin J314.

After power-up, DSP signals all completed functions by changing the state of the XF pin (see Figure 6, Figure 7, Figure 8, and Figure 9).

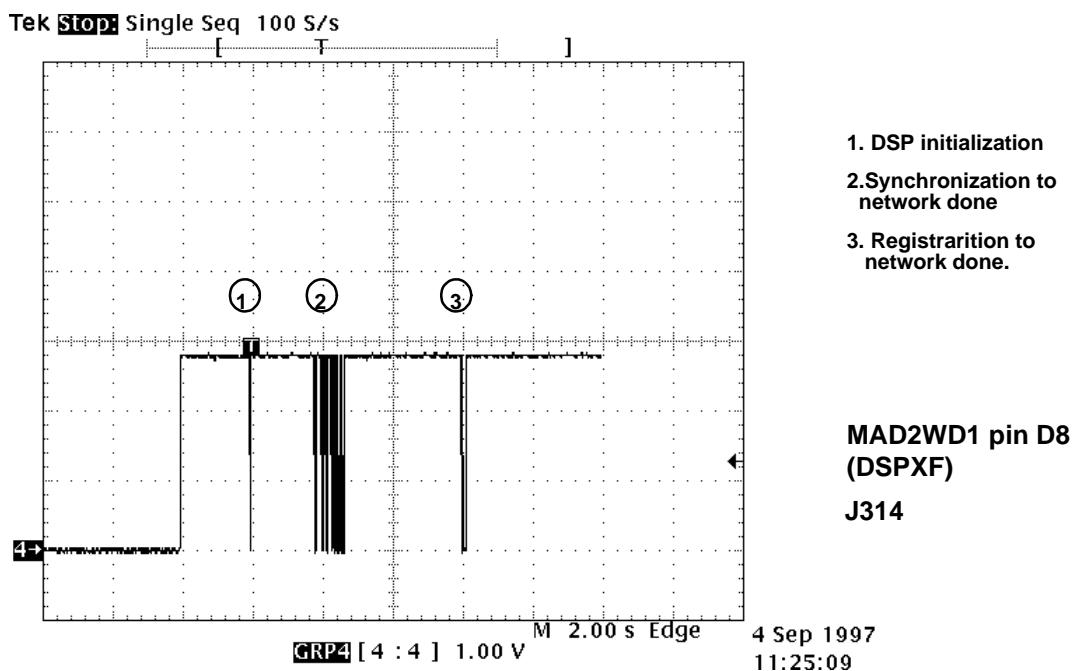


Figure 6: The states of DSP (MAD2) after power on

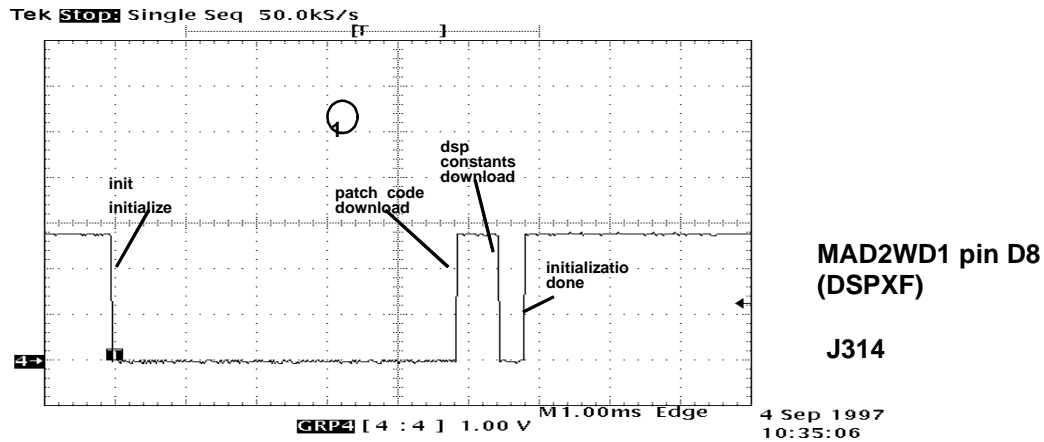


Figure 7: The states of DSP after power on

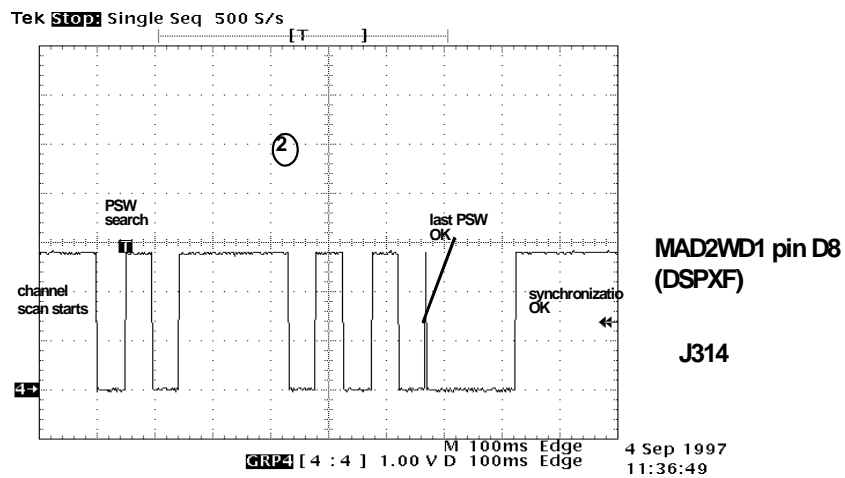


Figure 8: The states of DSP after power on

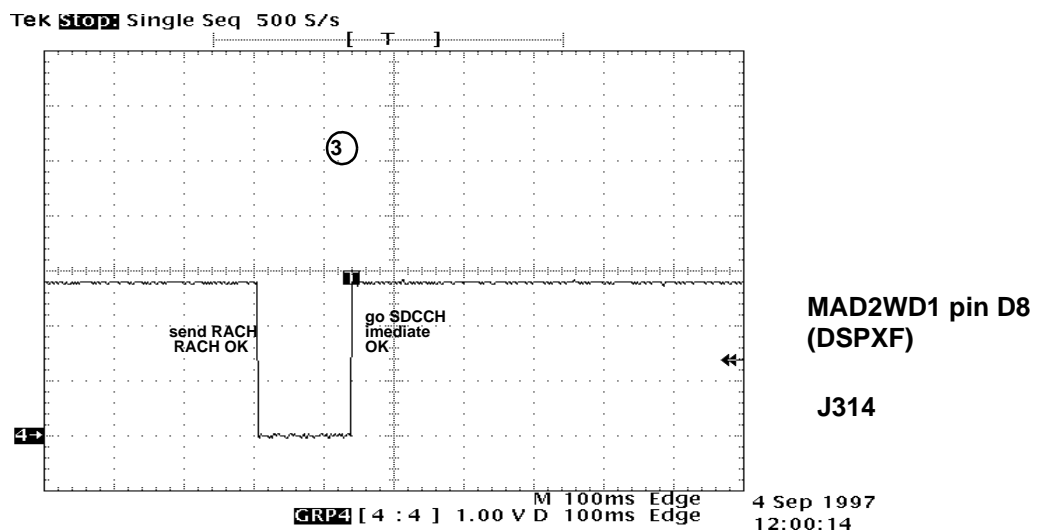


Figure 9: The states of DSP after power on

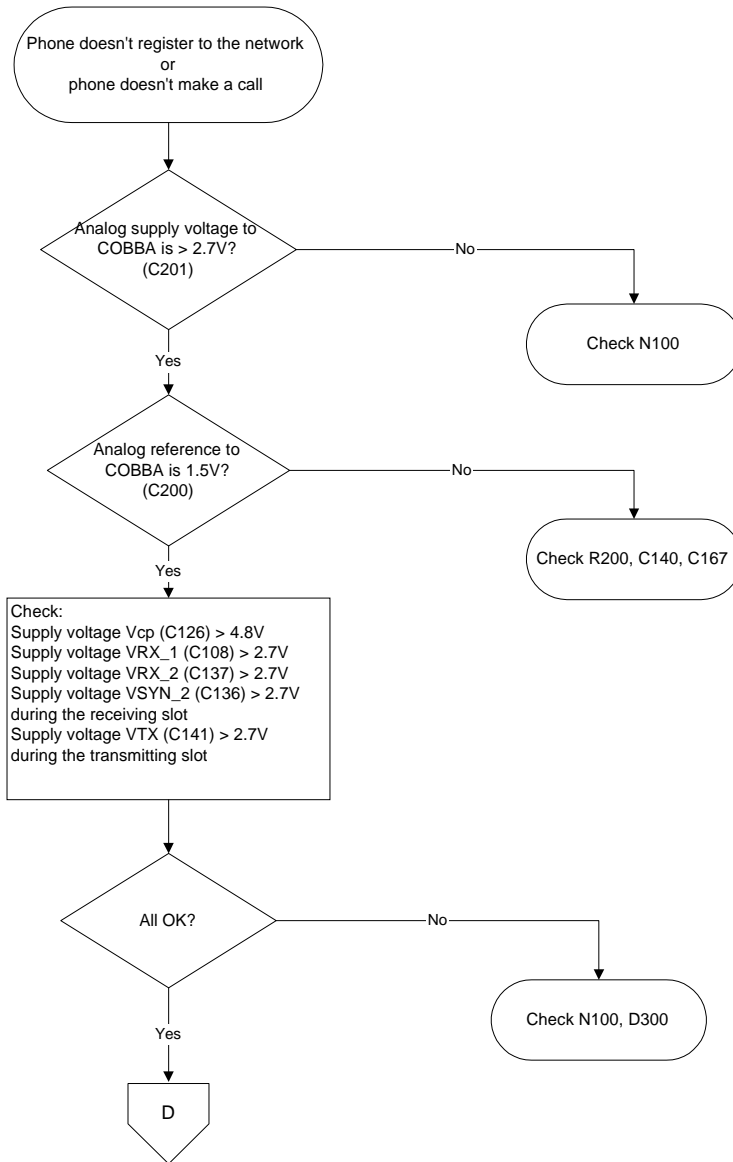


Figure 10: Fault Finding for Network Registration or Call Problems

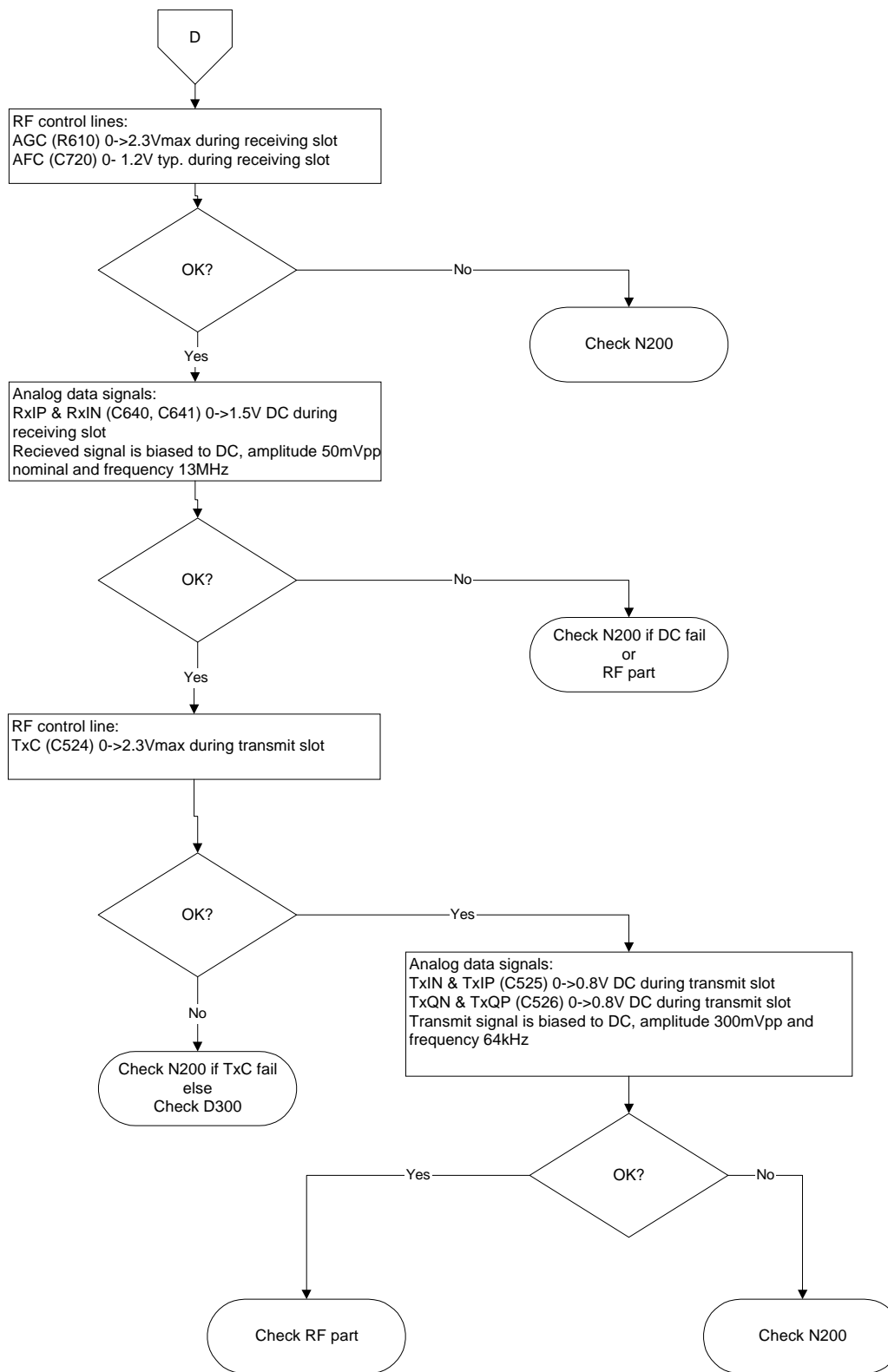


Figure 11: Fault Finding for Network Registration or Call Problems (Cont'd)

SIM Card is Out of Order

The hardware for the SIM interface from MAD2WD1 (D300) to the SIM connector (X100) can be tested without a SIM card.

When the power is switched on and if the BSI line (X102;1) is grounded by a resistor, all of the used lines (VSIM, RST, CLK, DATA) rise up to 5V four times. Thus, "Insert SIM card" faults can be found without a SIM card.

The fault information "Card rejected" means that the ATR message (the first message is always sent from card to phone) is sent from the card to the phone, but the message is somehow corrupted, data signal levels are wrong, etc., or factory set values stored to the EEPROM are not correct.

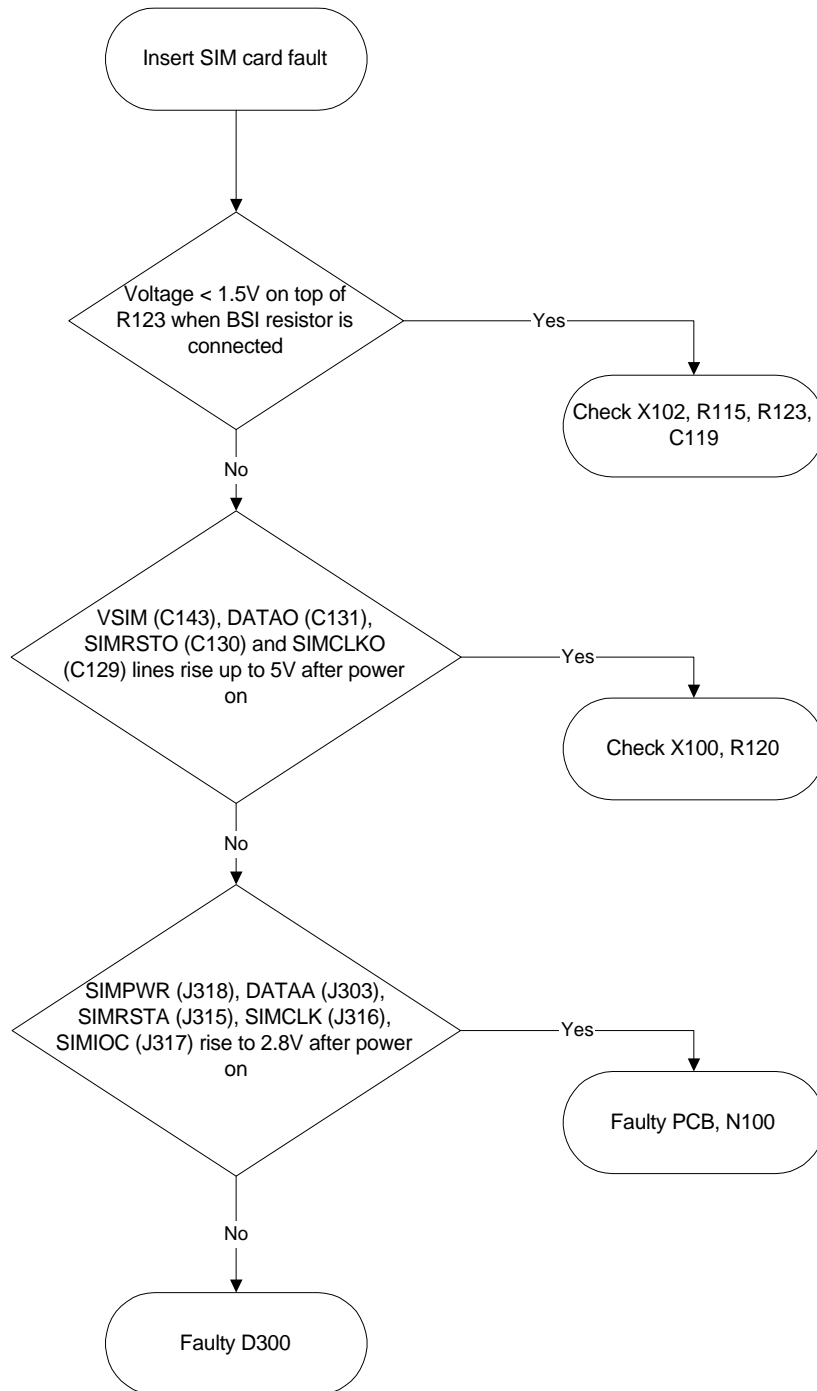


Figure 12: Fault Finding for “Insert SIM Card” Error

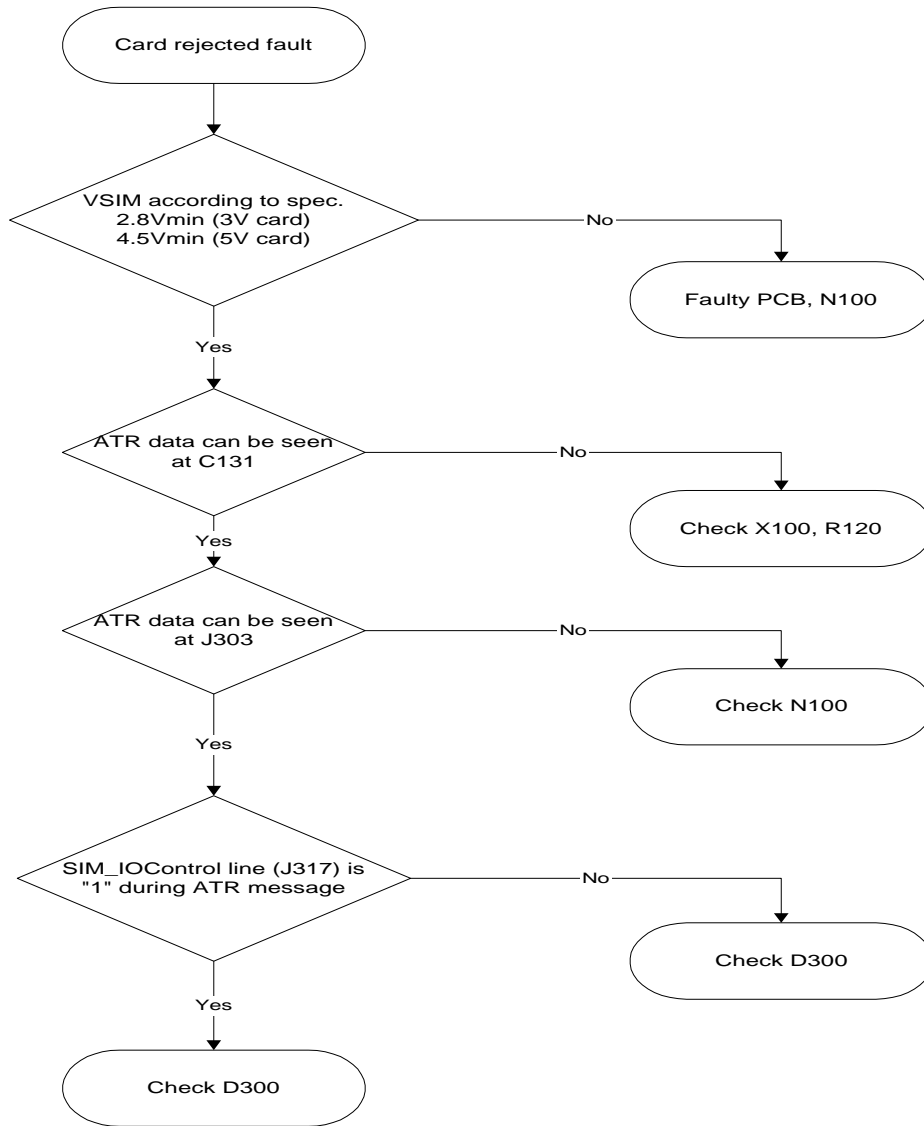
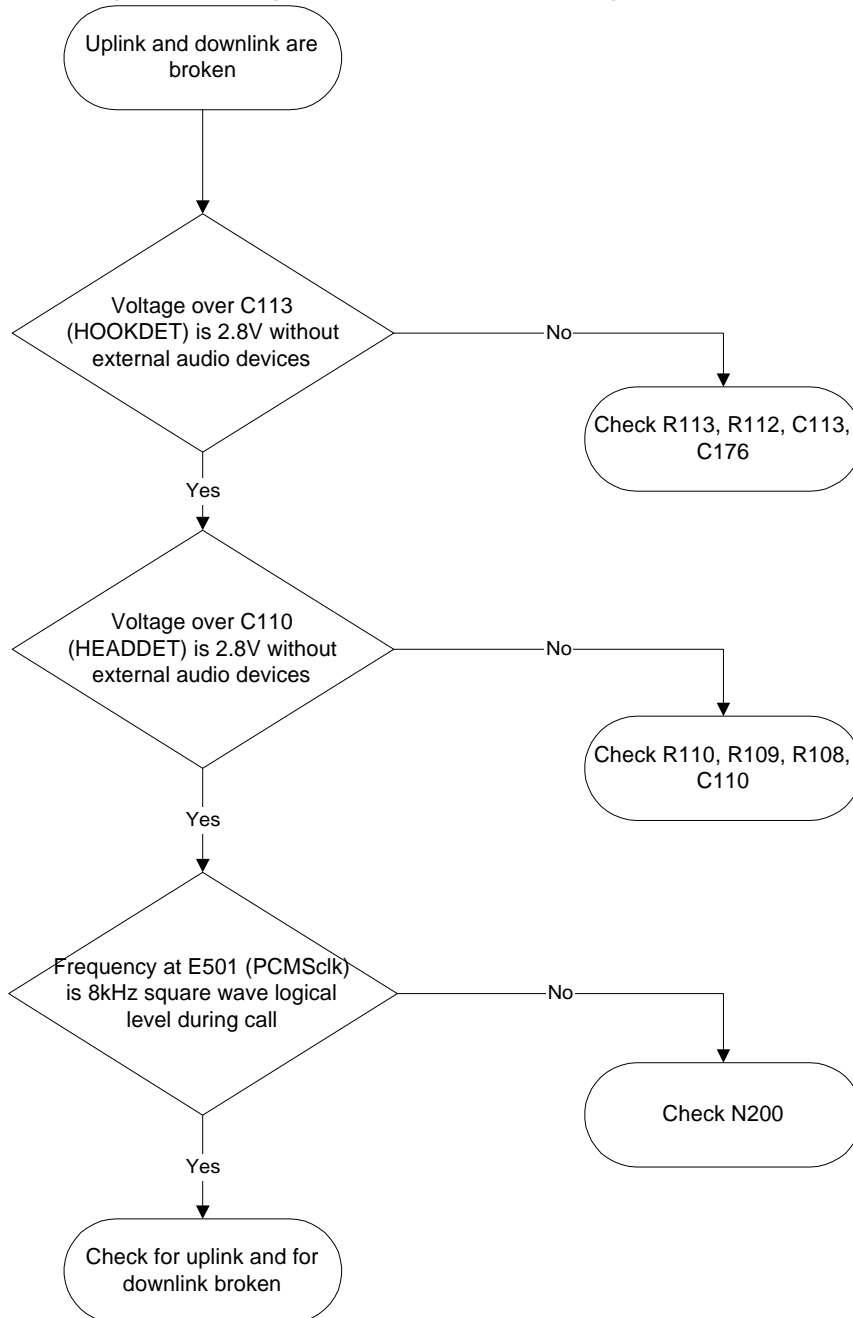


Figure 13: Fault Finding for Rejected SIM Card

Audio failure: Uplink (microphone) and downlink (earphone) are broken**Figure 14: Fault Finding for Broken Uplink and Downlink Audio**

Audio failure: Uplink (microphone) is broken

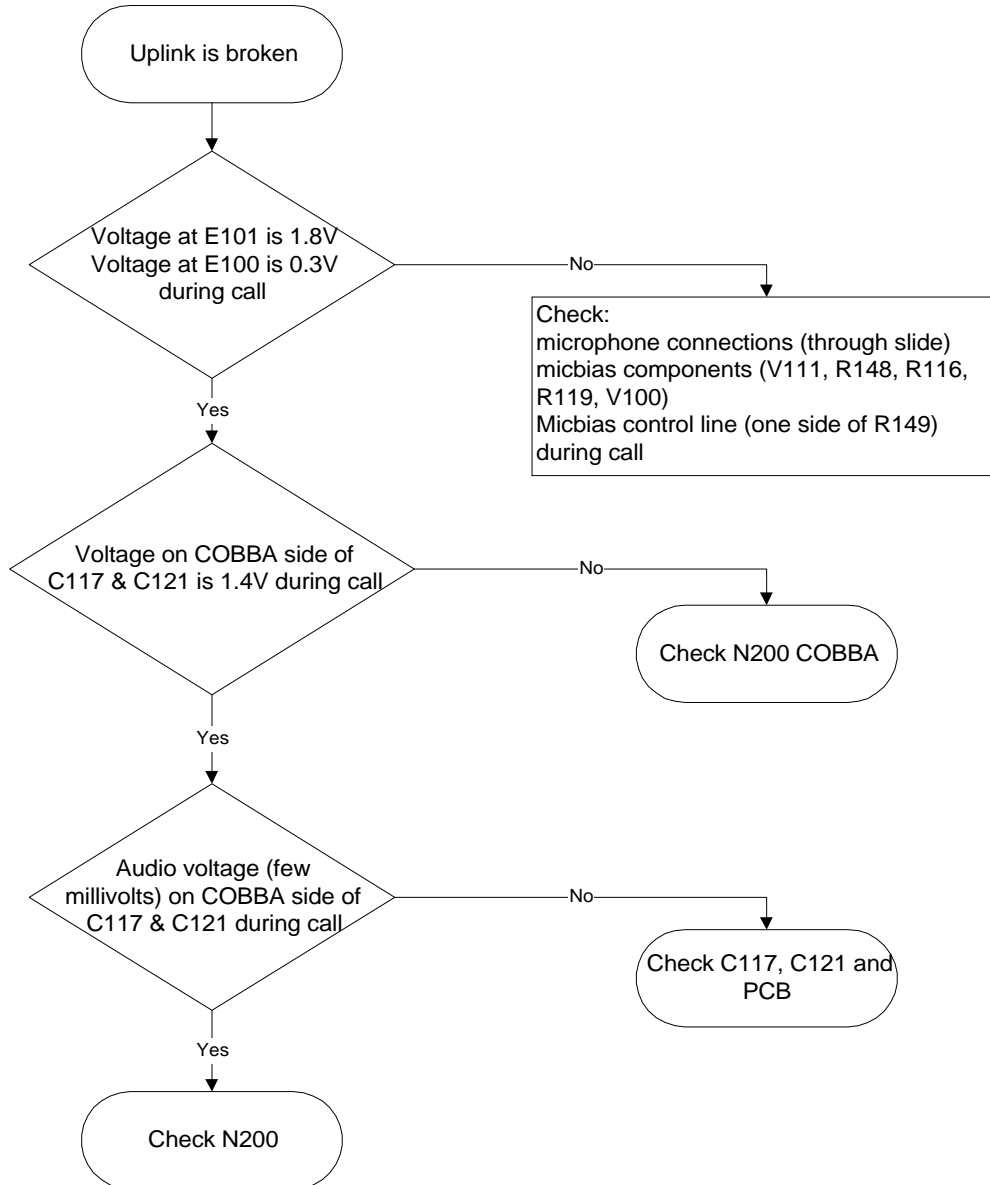
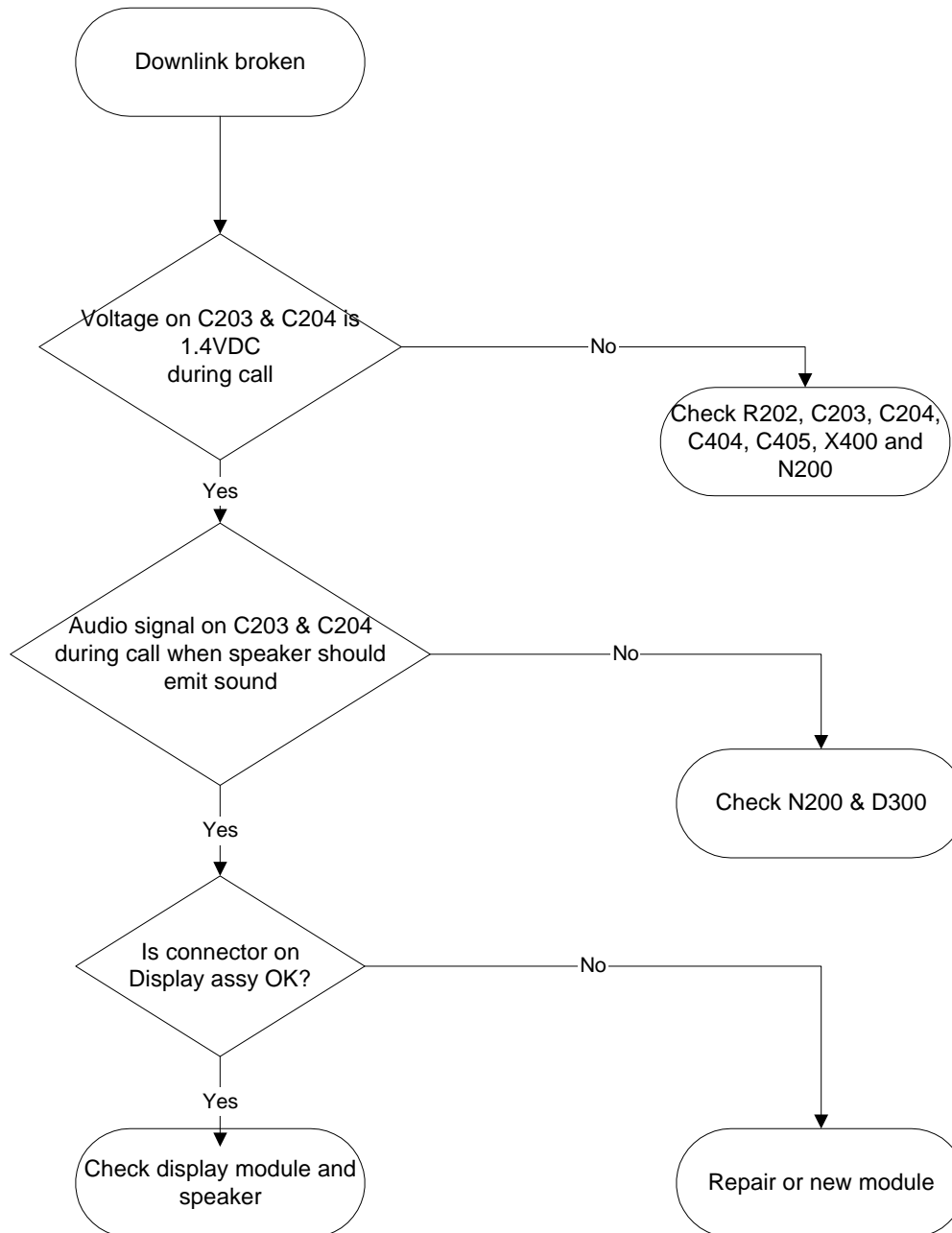
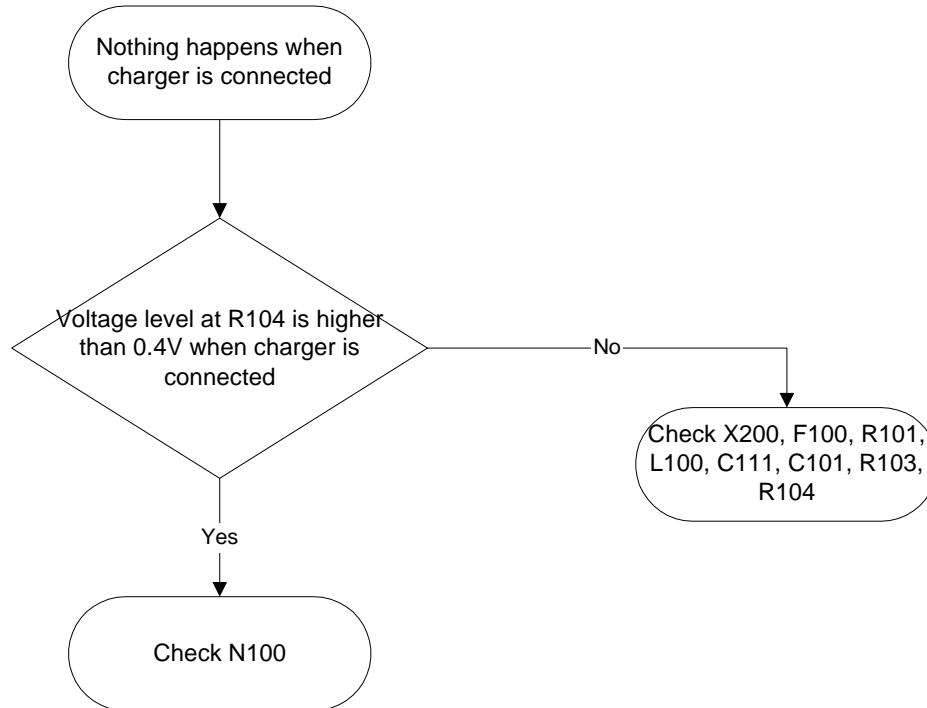


Figure 15: Fault Finding for Broken Uplink Audio with Working Downlink

Audio failure: Downlink (earphone) is broken**Figure 16: Fault Finding for Broken Downlink with Working Uplink**

Charger Failure

**Figure 17: Fault Finding for Charger Failure**

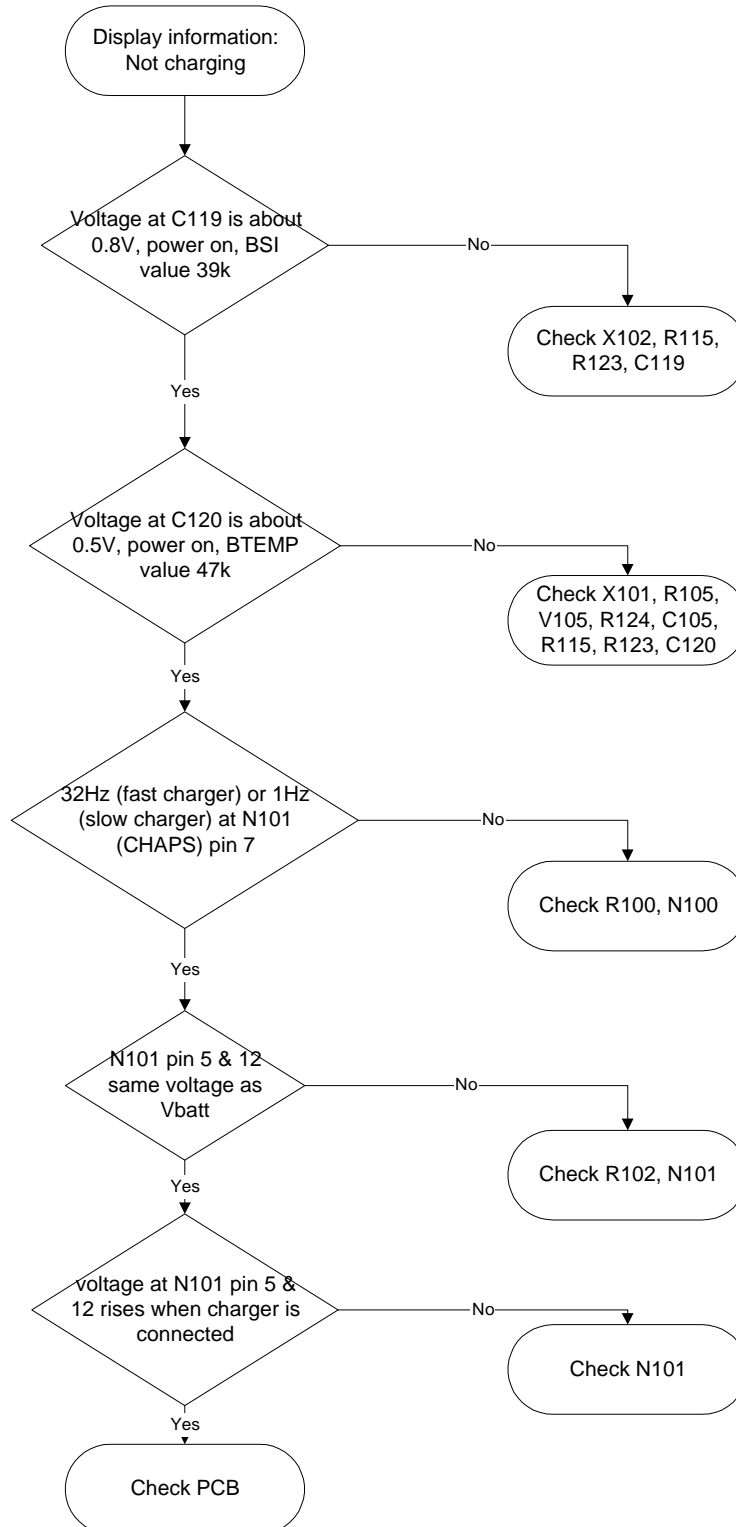


Figure 18: Fault Finding for Charger Failure (Cont'd)