

**CCS Technical Documentation
RH-12/RH-28 Series Transceivers**

**6(a) – Baseband Troubleshooting
Instructions**

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Introduction

This document describes in overview the different hardware error possibilities for the RH-12/RH-28 phone.

Not every possible hardware error is described in this document, but only those possible to correct.

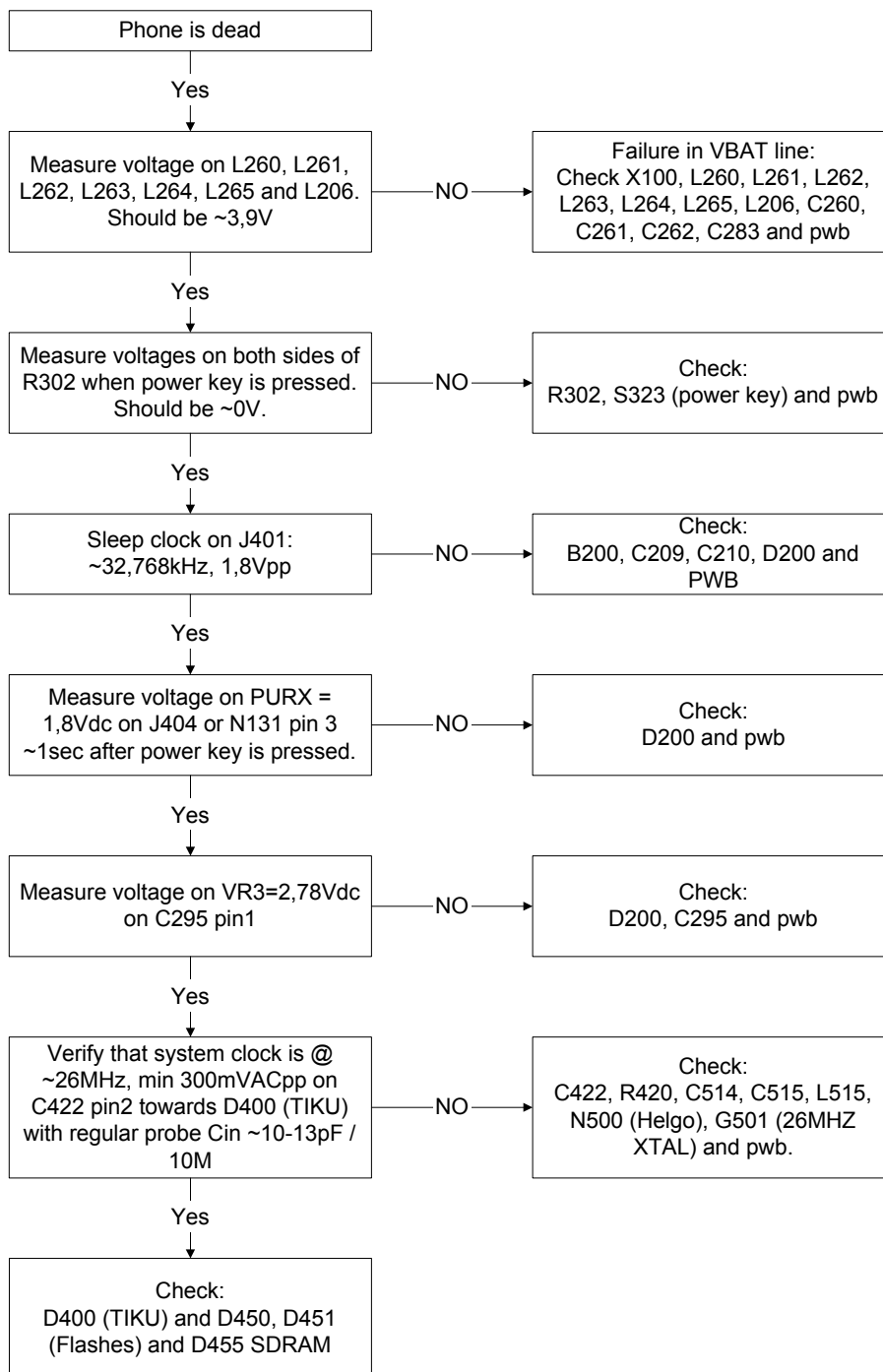
General Failures

Phone is dead

This means that the phone doesn't use any current at all when supply is connected and/or power key is pressed.

It is assumed that the voltage supplied is 3,9Vdc. UEME will prevent any functionality at battery/supply levels below 2,9Vdc and the software will shut the phone down at 3,1Vdc.

Figure 1: Phone is dead



Flash programming doesn't work

The flash programming on RH-12/RH-28 boards is only possible via the pads on the PWB.

In case of Flash failure in production (FLALI station), problem is most likely related to SMD problems. Possible failures could be Short-circuiting of balls under μ BGAs (e.g. UEME, TIKUEDGE, SDRAM, FLASH), missing or misaligned components.

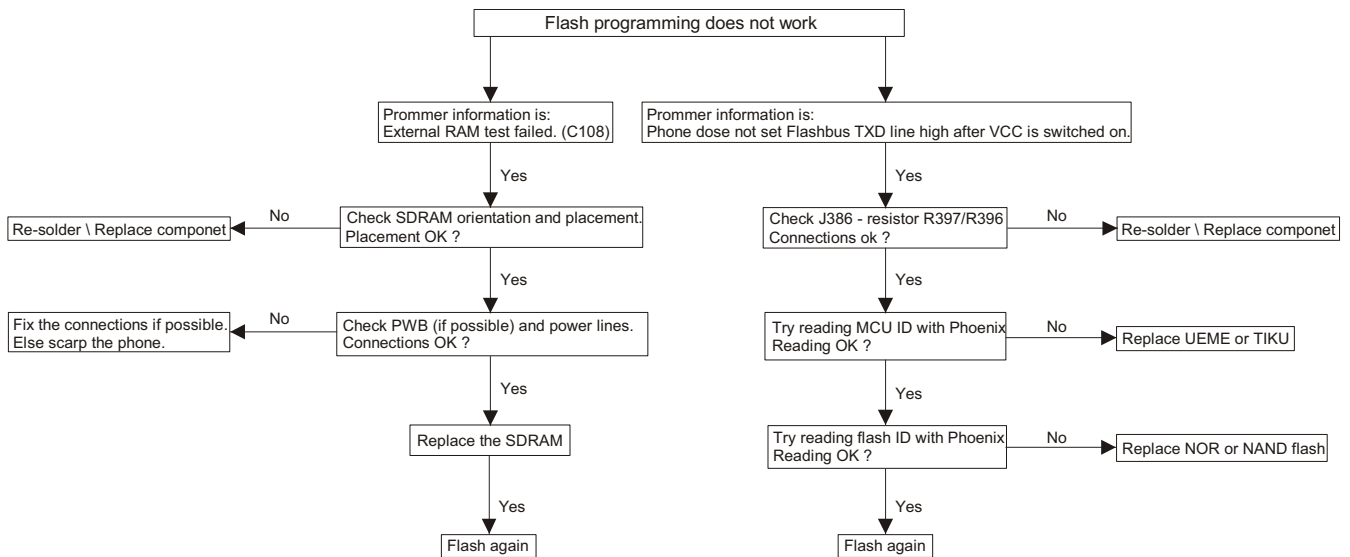
In flash programming error cases the flash prommer (via Phoenix or Darium) can give some information about the fault. The fault information messages could be:

- Phone doesn't set Flashbus TXD line high after VCC is switch on.
- External RAM test failed.

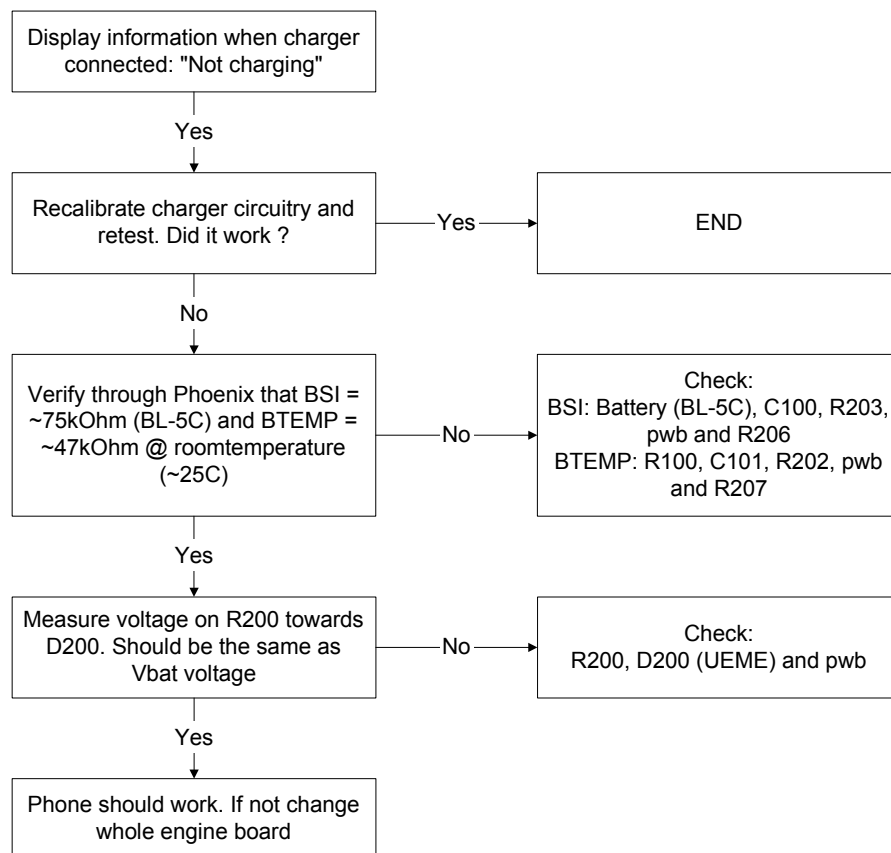
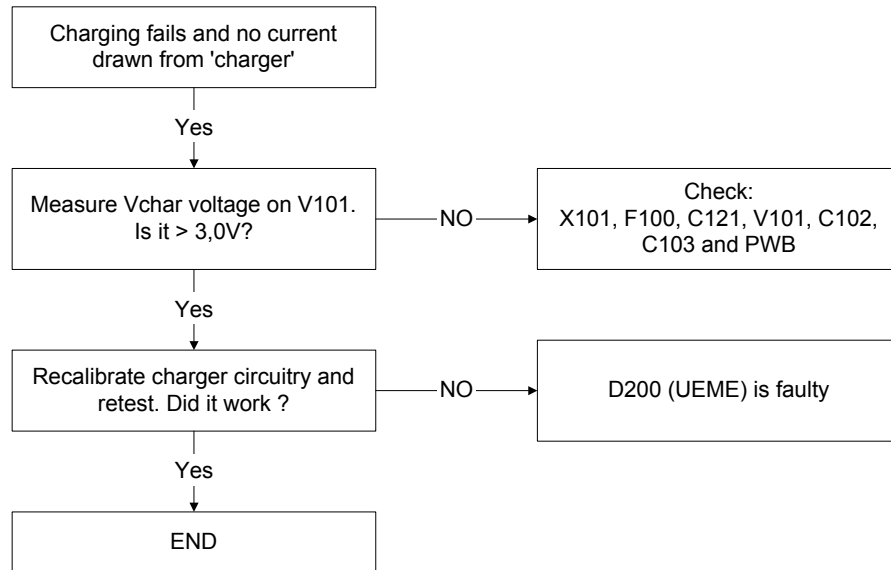
These errors are some of the most common errors and based on this, a fault finding diagram for flash programming is shown below. Various errors can appear from the prommer when flashing the phone - not all of them can be directly linked to the HW or phone.

Because of the use of μ BGA components, it is not possible to verify on the diagram, if there is a short circuit in control and address/data lines on TIKUEDGE, NOR flash, NAND flash or SDRAM.

Figure 2: Flash programming does not work



Charging Failure

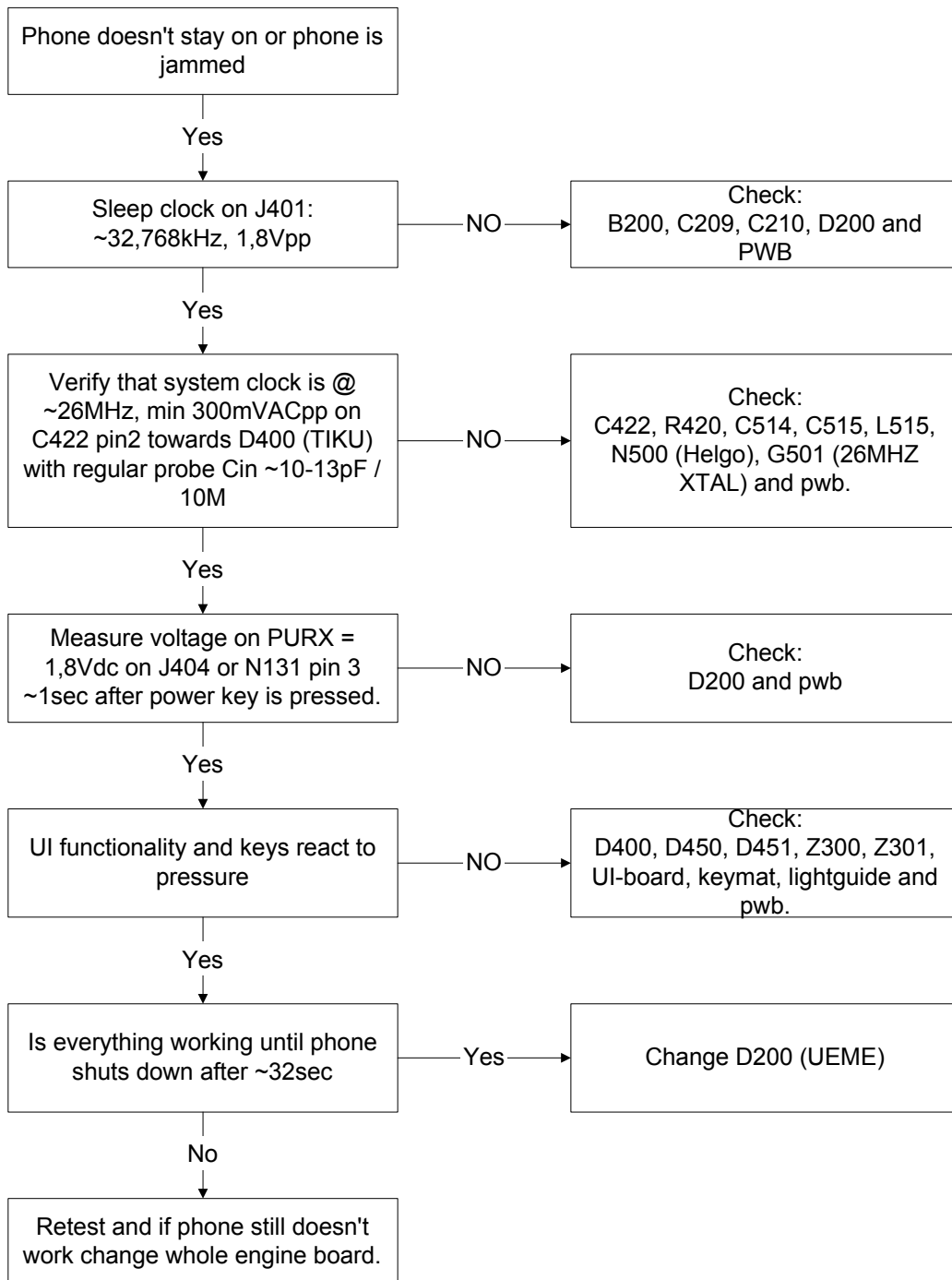


Phone doesn't stay on, or phone is jammed

If this kind of a failure is presenting itself immediately after FLALI, it is most likely caused by ASICs missing contact with PWB.

If the MCU doesn't service the watchdog register within the UEME, the operations watchdog will run out after approximately 32 seconds. It is not possible to measure this service routine.

Figure 3: Phone doesn't stay on, or is jammed



Display Information: "Contact Service"

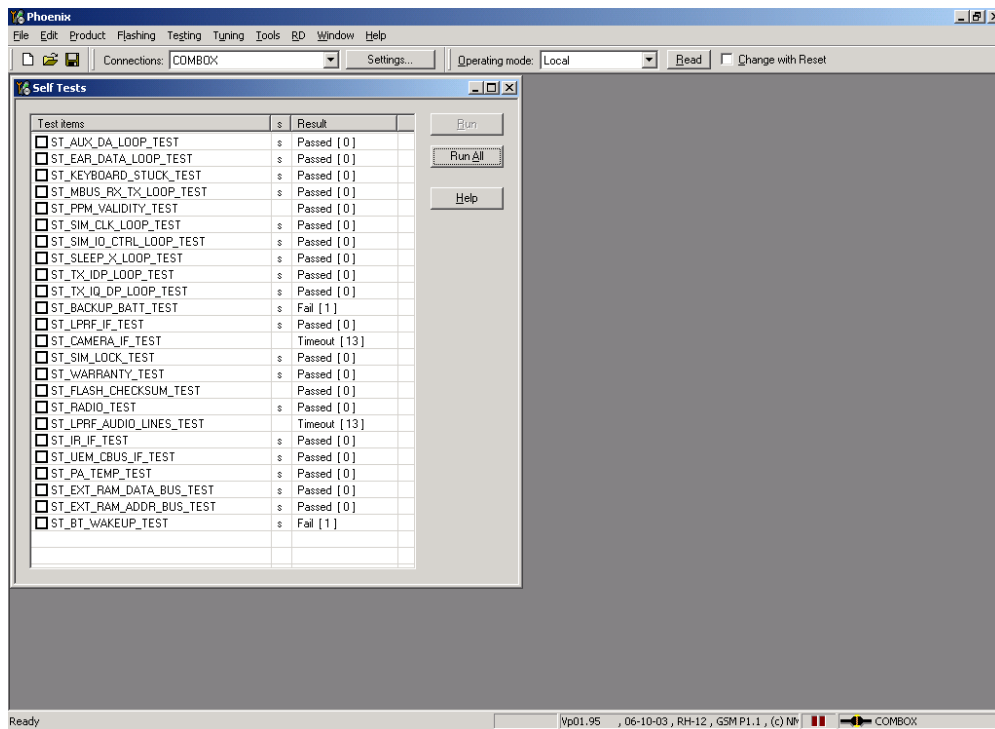
When this error appears in the display it means that one or more of the internal baseband tests has failed. The baseband tests (self tests) are performed each time the phone is powered on. The self tests are divided into those performed while powering up (Start up tests) and the ones that can be executed with a PC using Phoenix (Runtime tests). The following Start-up tests are performed during power up:

UEM CBUS IF TEST
SLEEP X LOOP TEST
AUX DA LOOP TEST
EAR DATA LOOP TEST
TX IDP LOOP TEST
TX IQ DP LOOP TEST
SIM CLK LOOP TEST
SIM IO CTRL LOOP TEST
MBUS RX TX LOOP TEST
BACKUP BATT TEST
RADIO TEST
WARRANTY TEST
PA TEMP TEST
SIM LOCK TEST
PPM VALIDITY TEST
KEYBOARD STUCK TEST
LPRF IF TEST
FLASH CHECKSUM TEST
CAMERA IF TEST
EXT RAM DATA BUS TEST
EXT RAM ADDR BUS TEST
NAND FLASH ID TEST
BT WAKEUP TEST
IR IF_TEST

If all these self tests are passed, the phone will start up.

From Phoenix it's possible to run all the self tests and the additional "Runtime test". The test cases can be seen below.

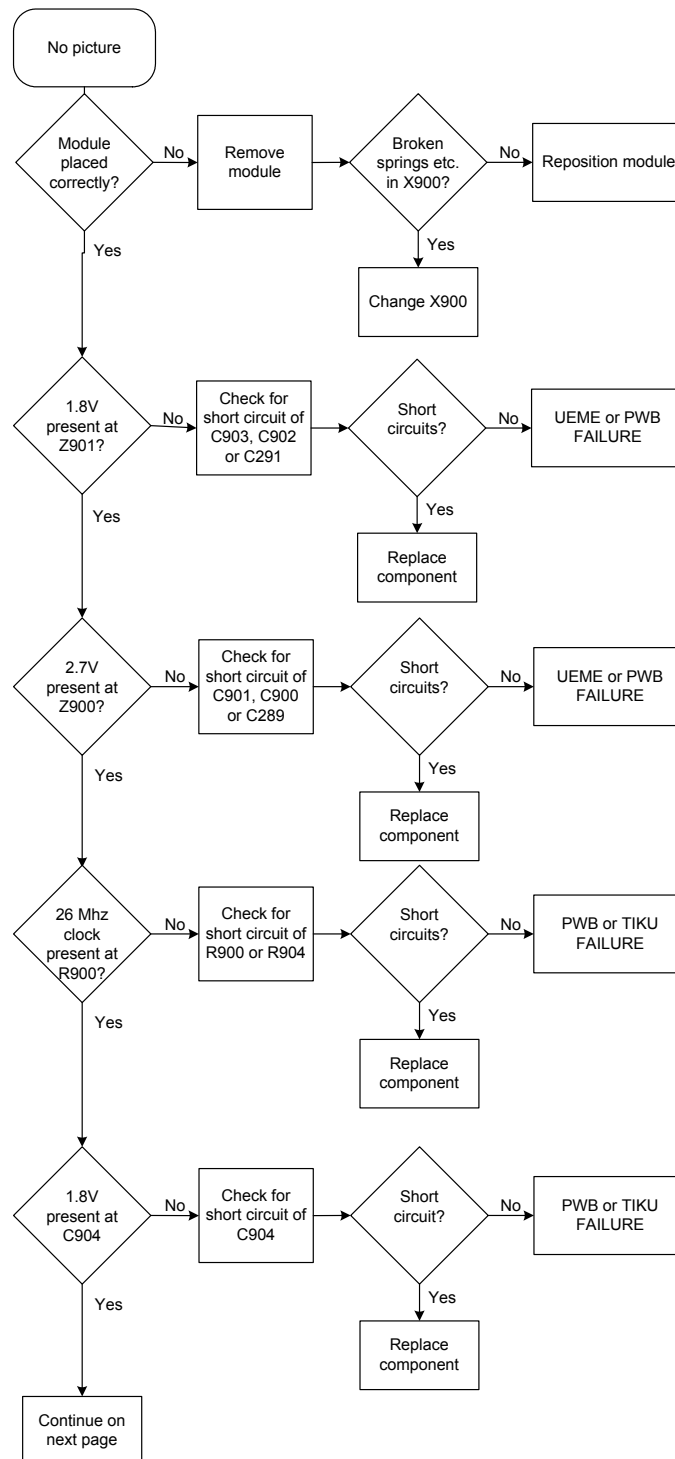
Figure 4: Display Information: "Contact Service"

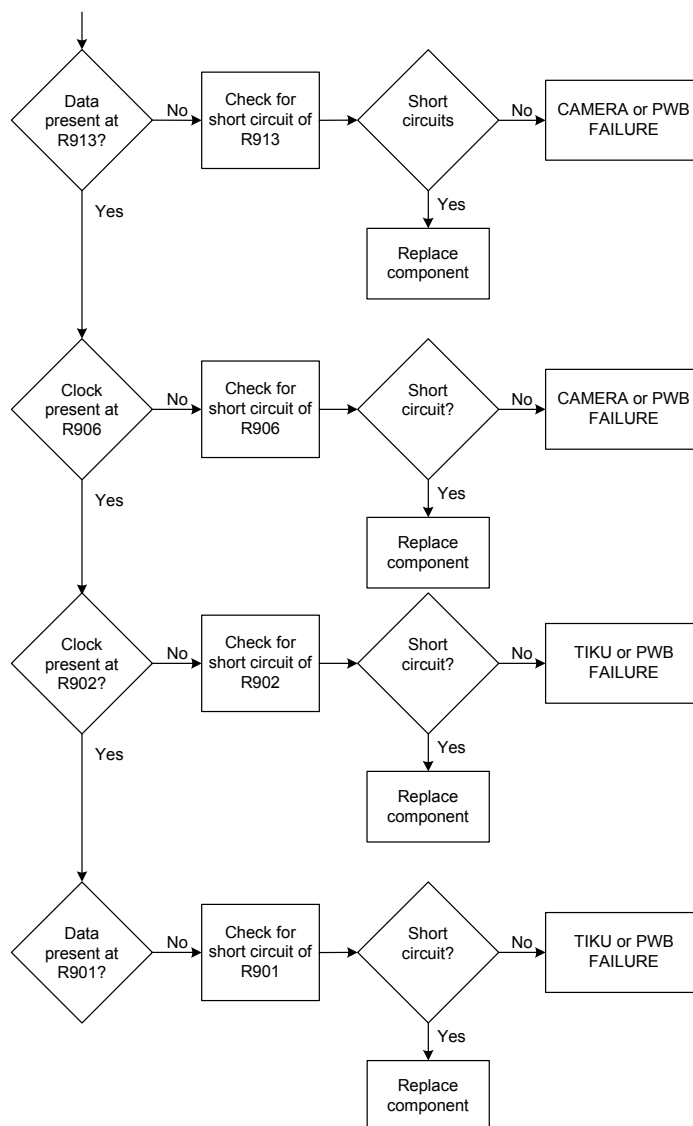


Function Failures

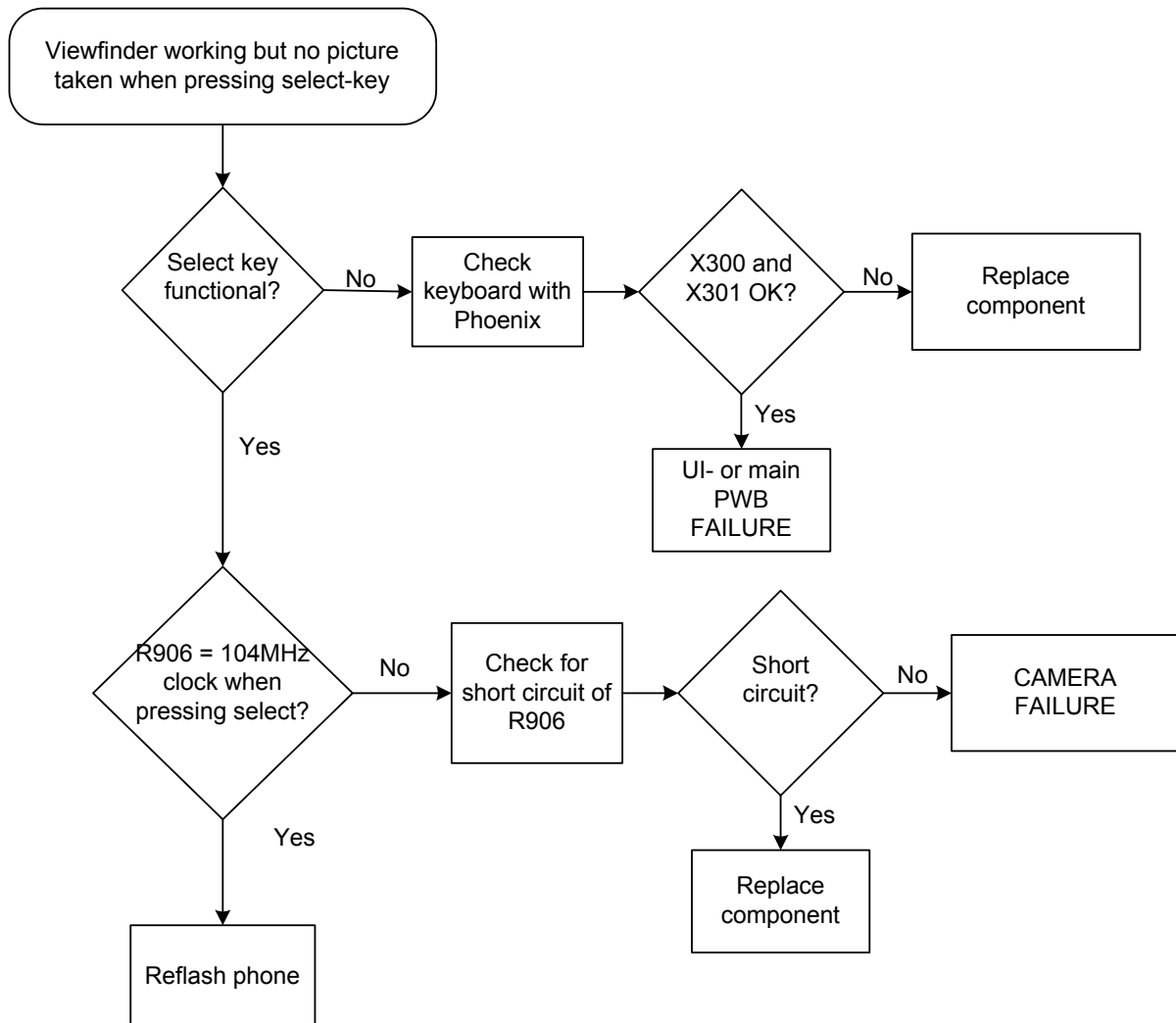
Camera Failure

No picture





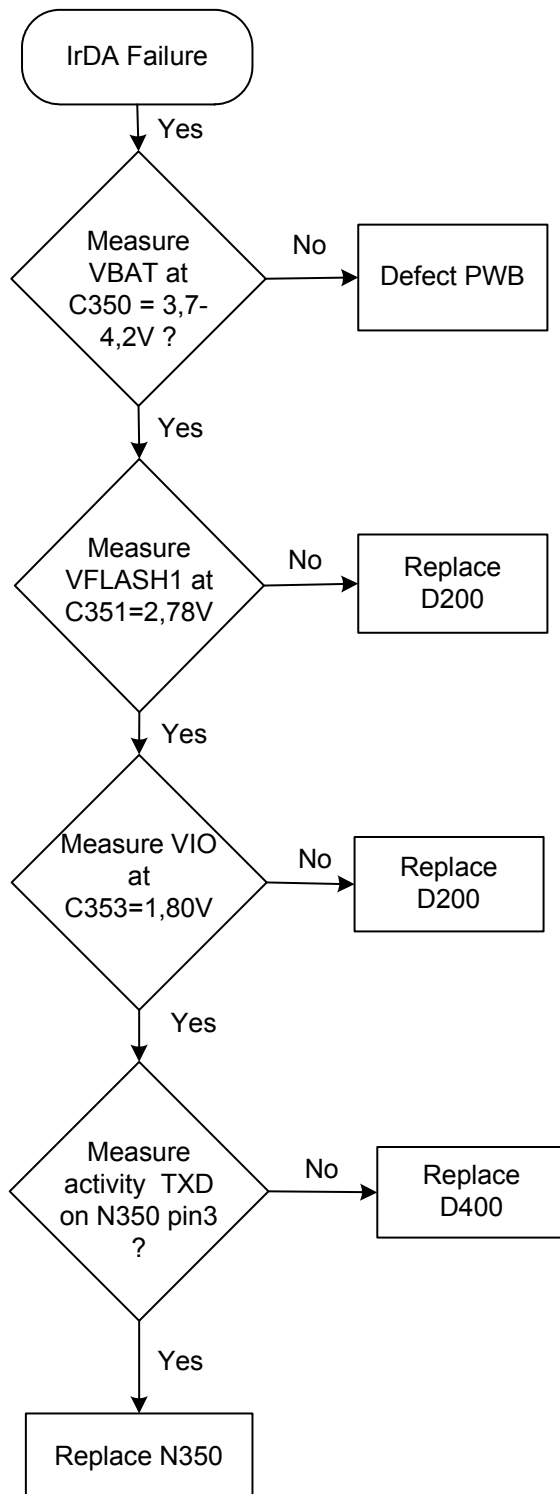
Viewfinder working but no picture taken when pressing select-key



FM-radio Failure

The FM-radio troubleshooting guide is placed in the RF section.

Infrared Communication Failure

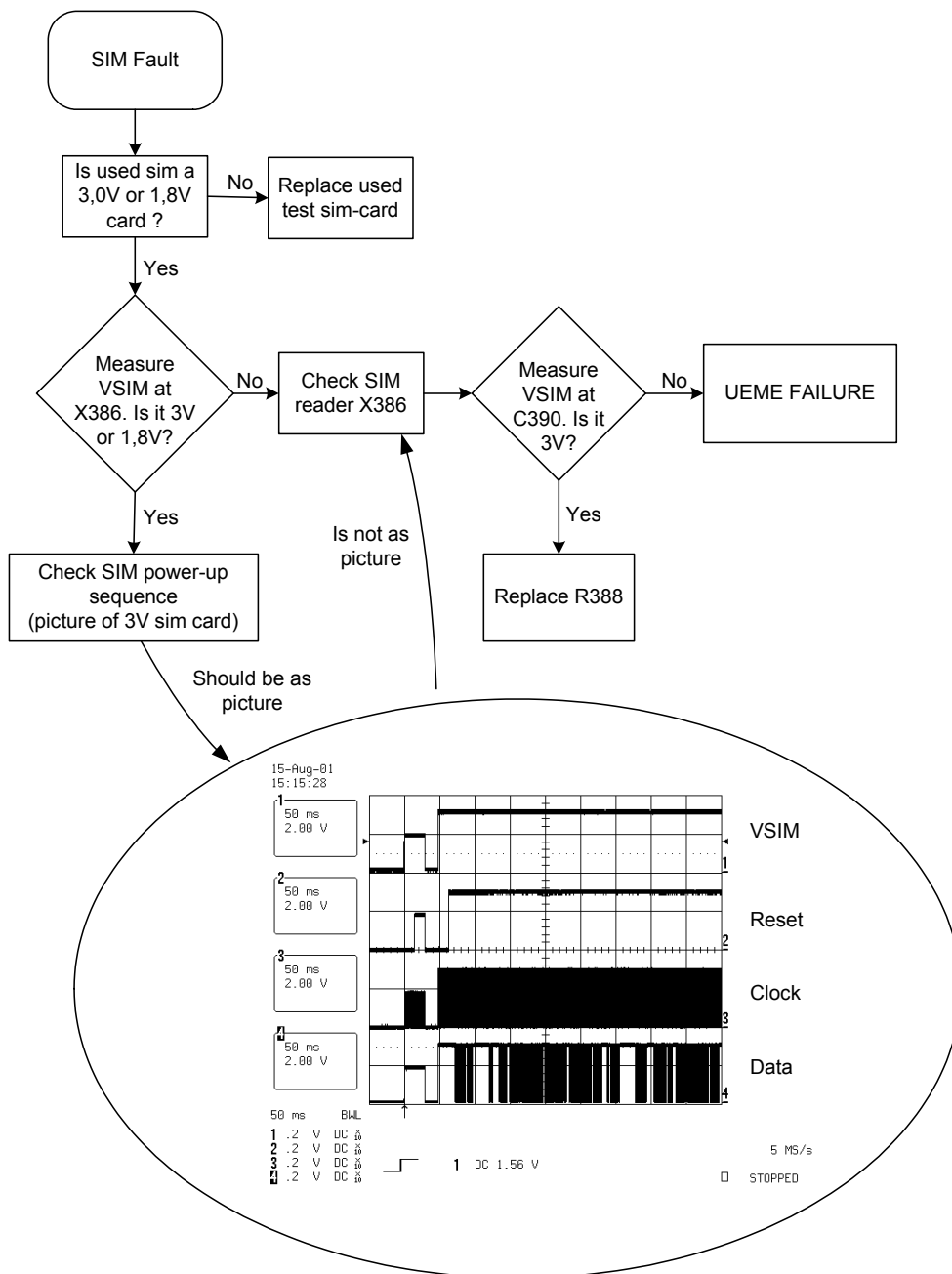


SIM Failure

The hardware of the SIM interface from the UEME (D200) to the SIM connector (X386) can be tested without a SIM card. When the power is switched on, the phone first checks for a 1,8V SIM card and then a 3V SIM card. The phone will try this four times, whereafter it will display "Insert SIM card".

The error "SIM card rejected" means that the ATR message received from the SIM card is corrupted, e.g. data signal levels are wrong. The first data is always ATR and it is sent from card to phone.

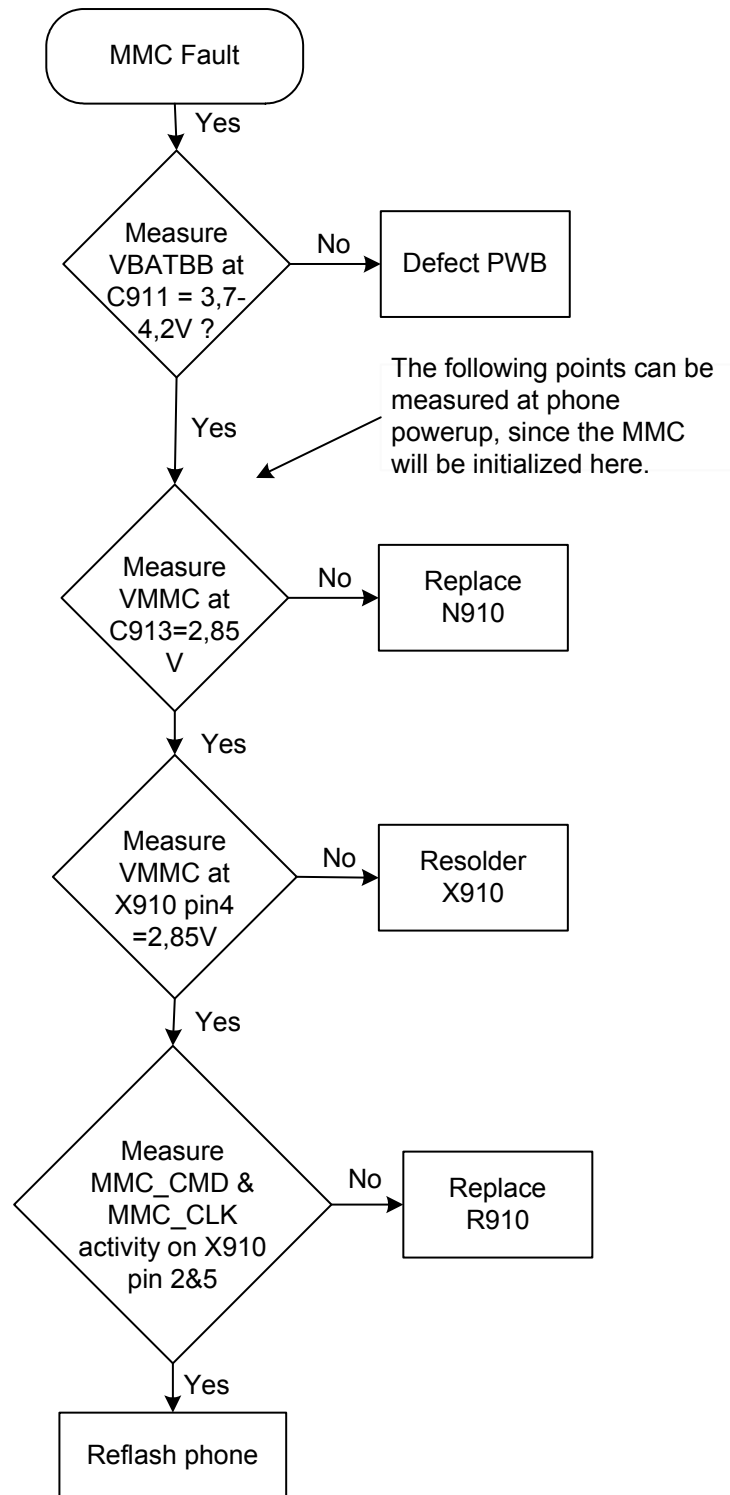
Figure 5: SIM Failure



MMC Failure

The hardware of the MMC interface from the UEME (D200) to the MMC connector (X910) can't be tested without a MMC card. To be able to measure the following, solder wires on respective points.

Figure 6: MMC Failure

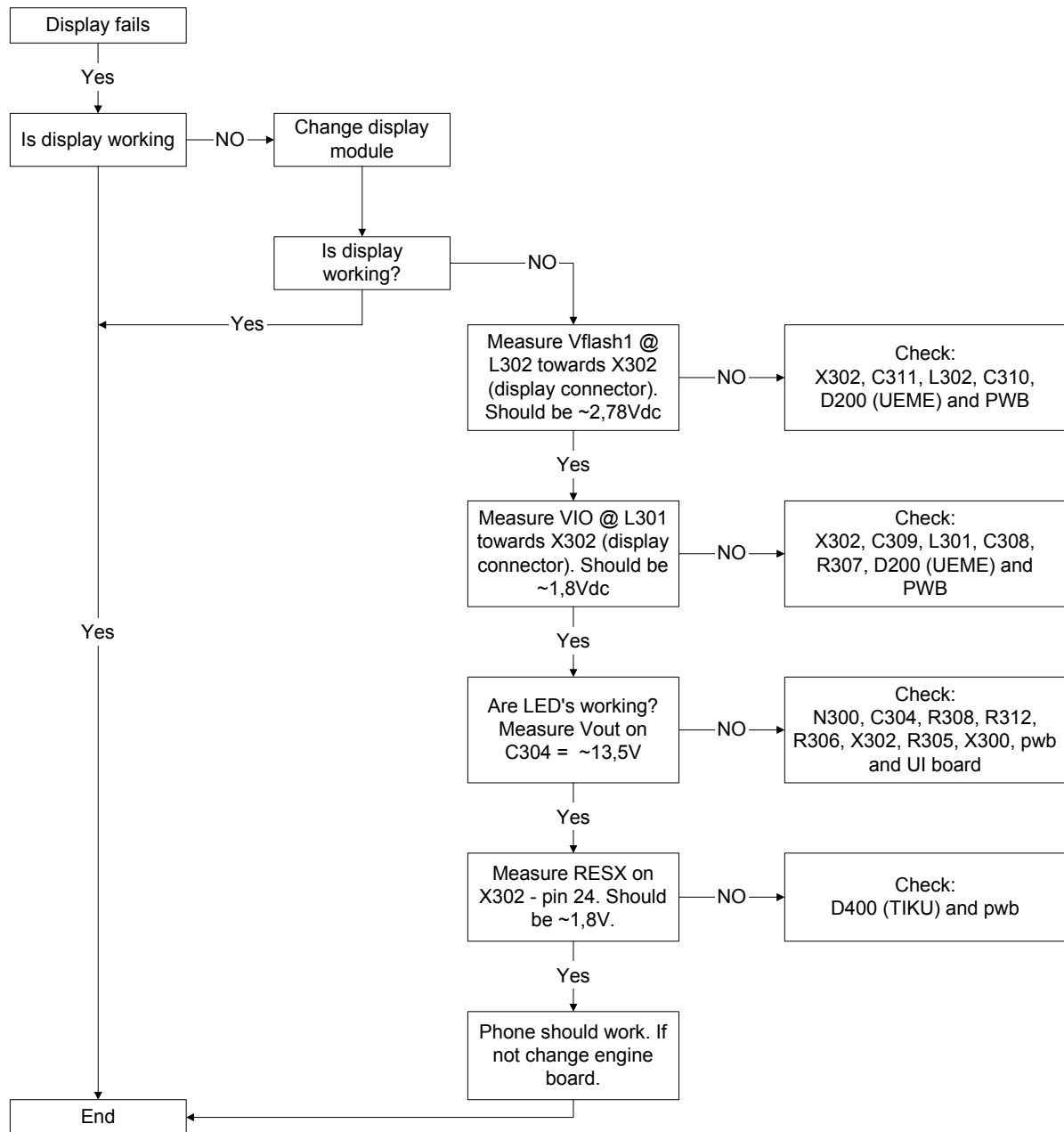


Bluetooth Failure

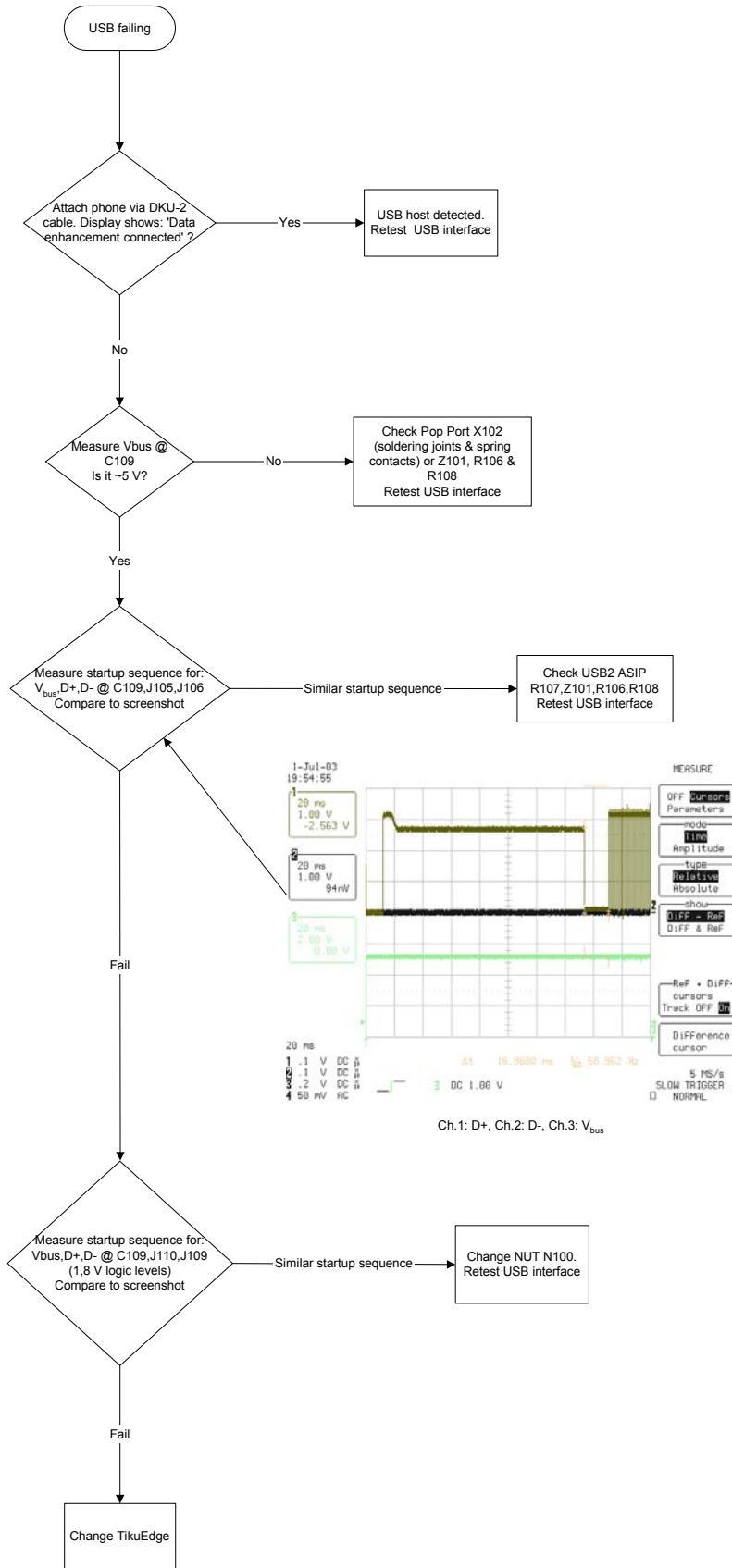
The Bluetooth troubleshooting guide is placed in the RF section.

When the flash D450 or UEME has been replaced the IMEI has to be reprogrammed. This will automatically include reprogramming of the BT address.

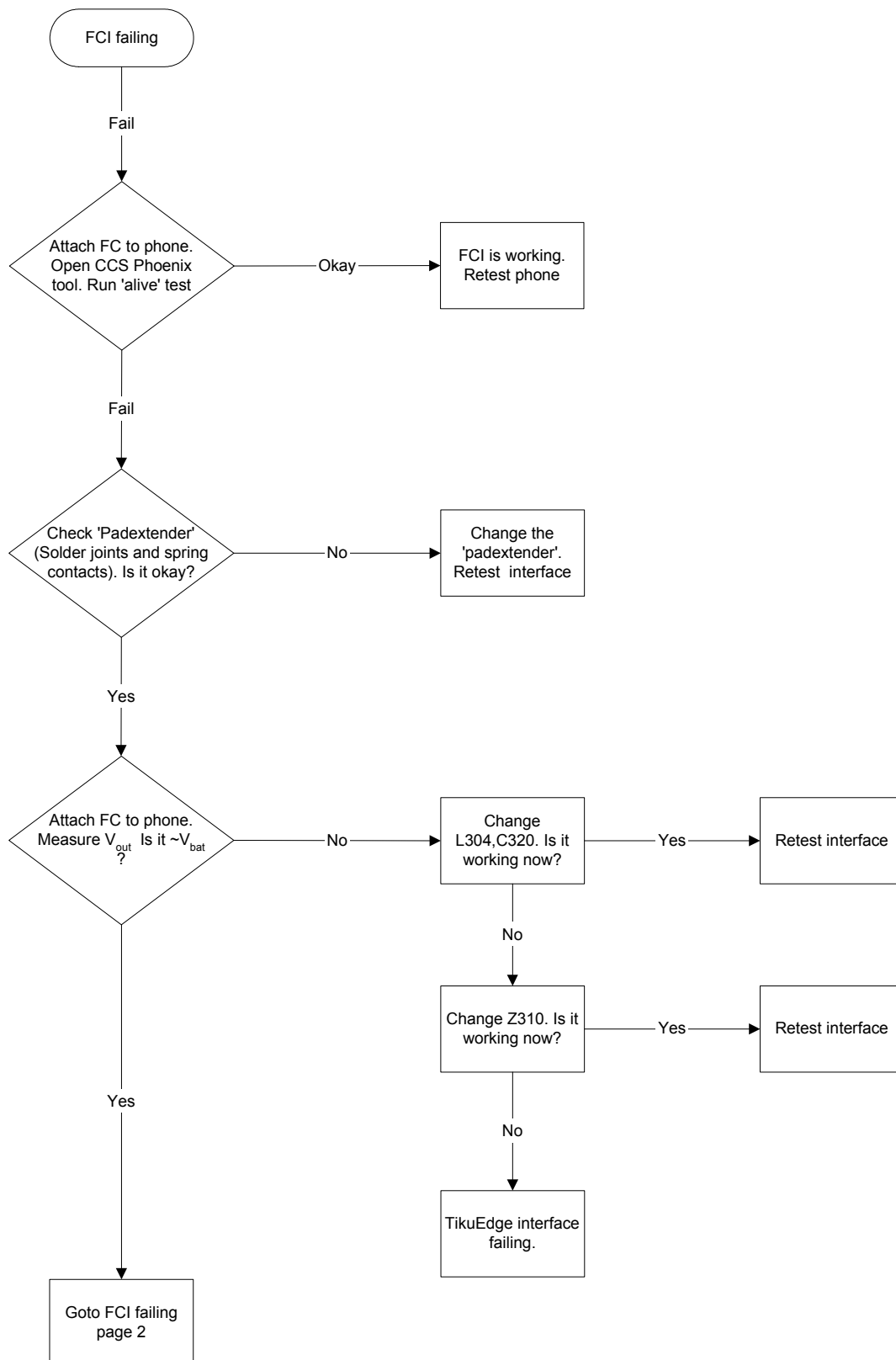
Display Failure

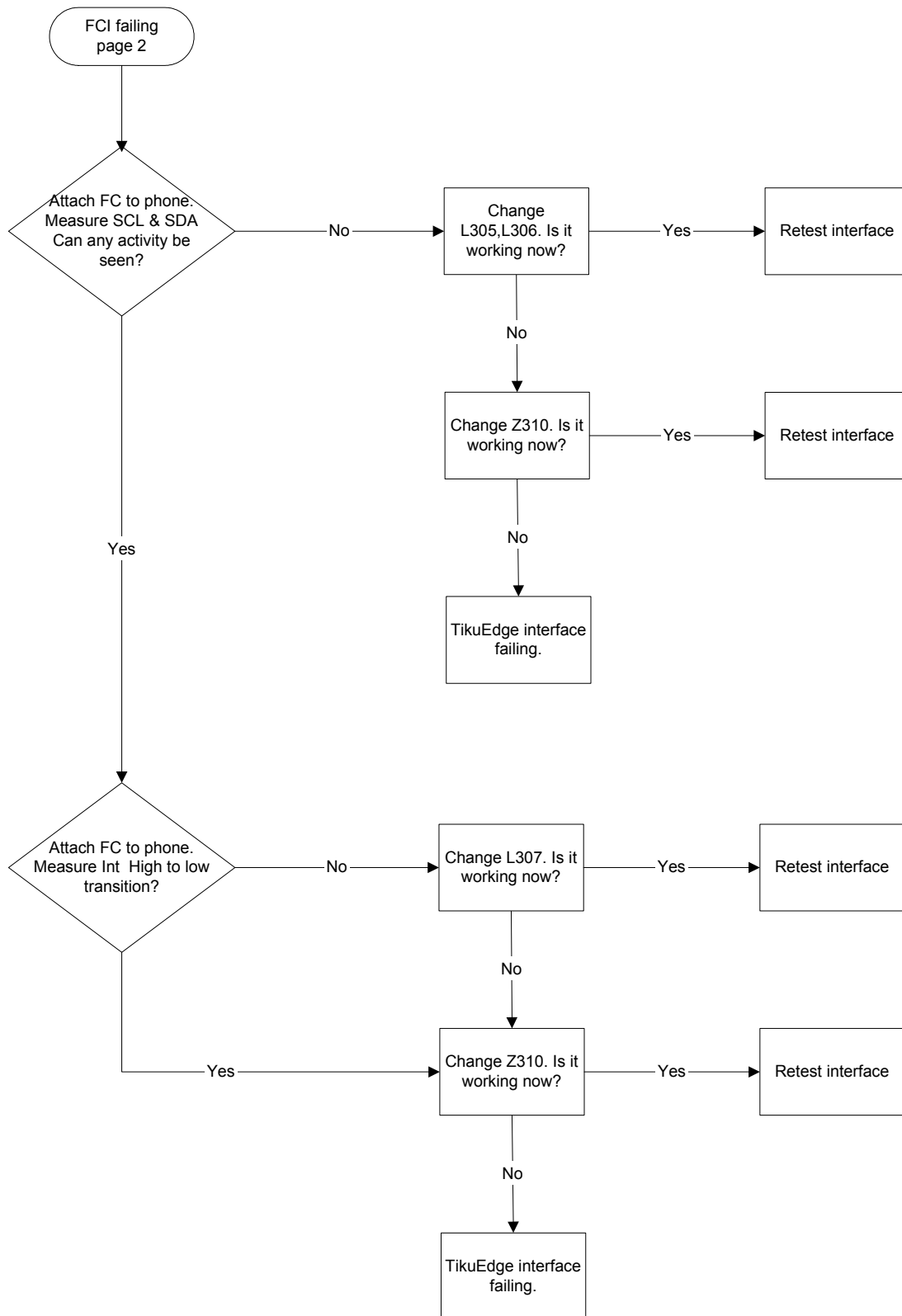


USB Data Transmission Failure



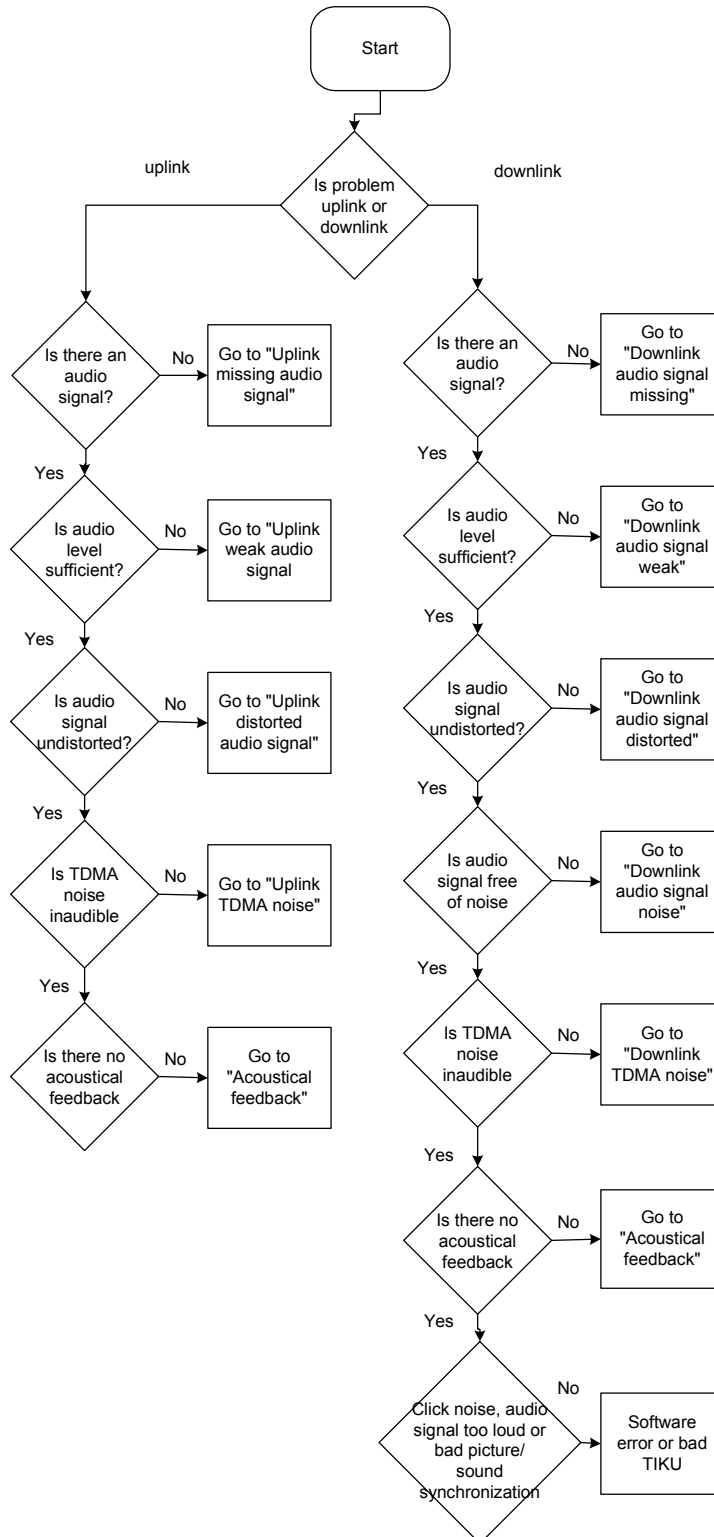
Functional Cover Failure



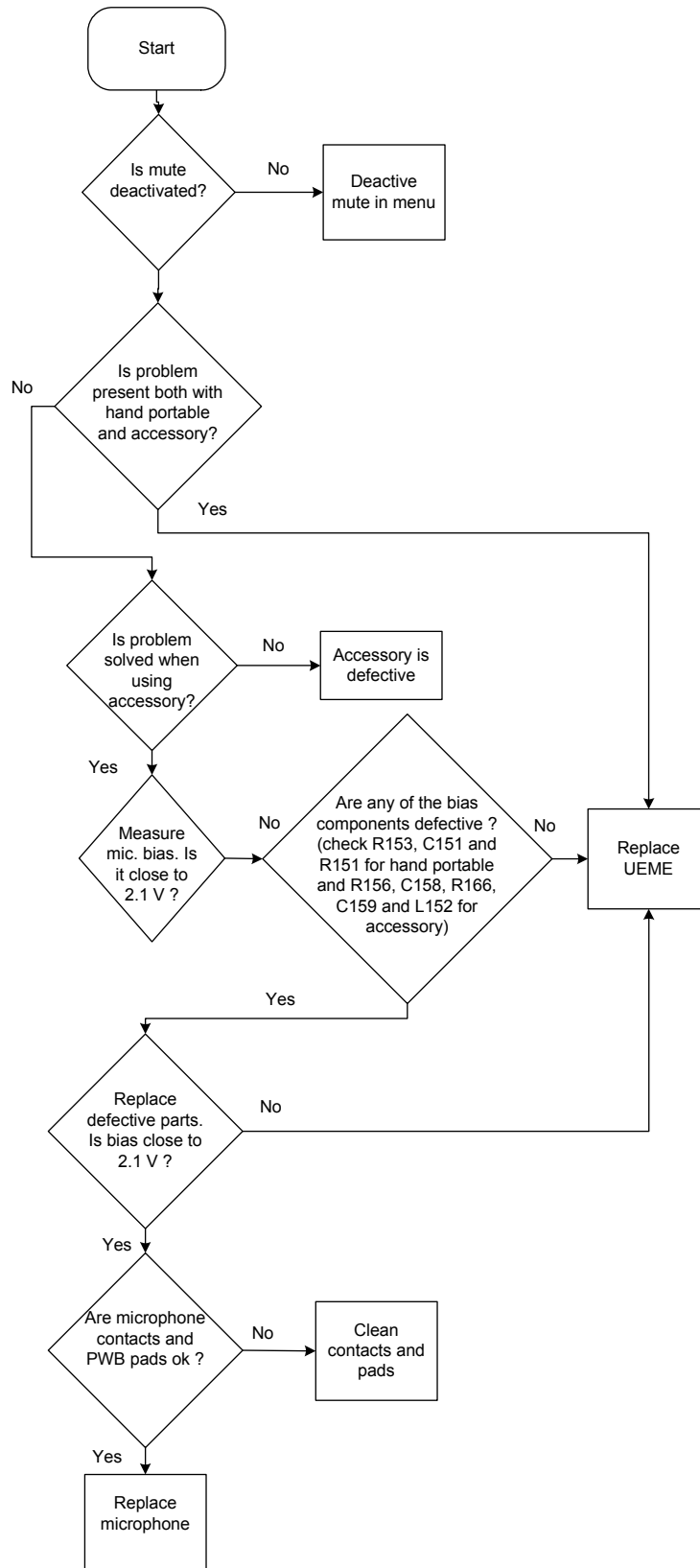


Audio Failure

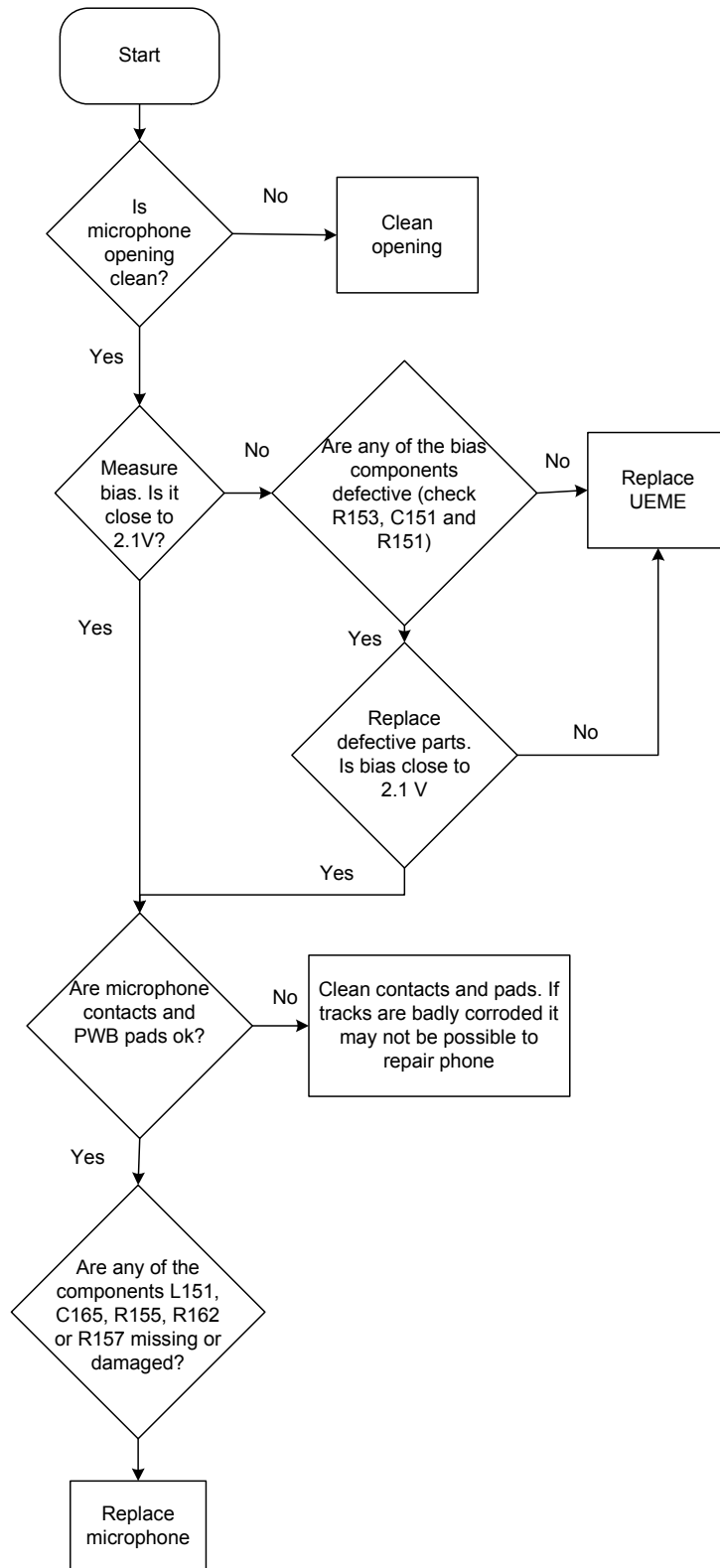
Uplink or downlink failure



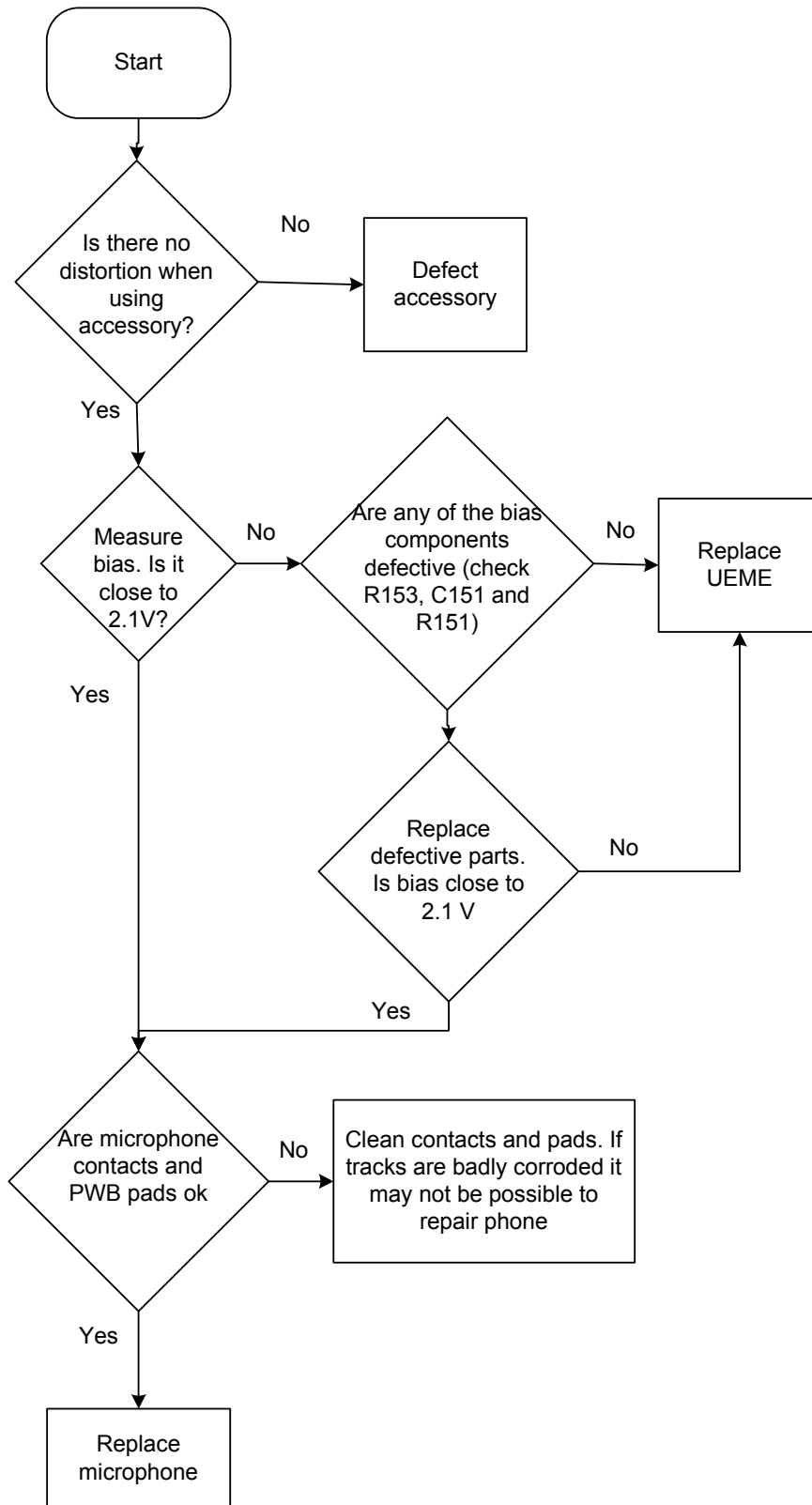
Uplink missing audio signal



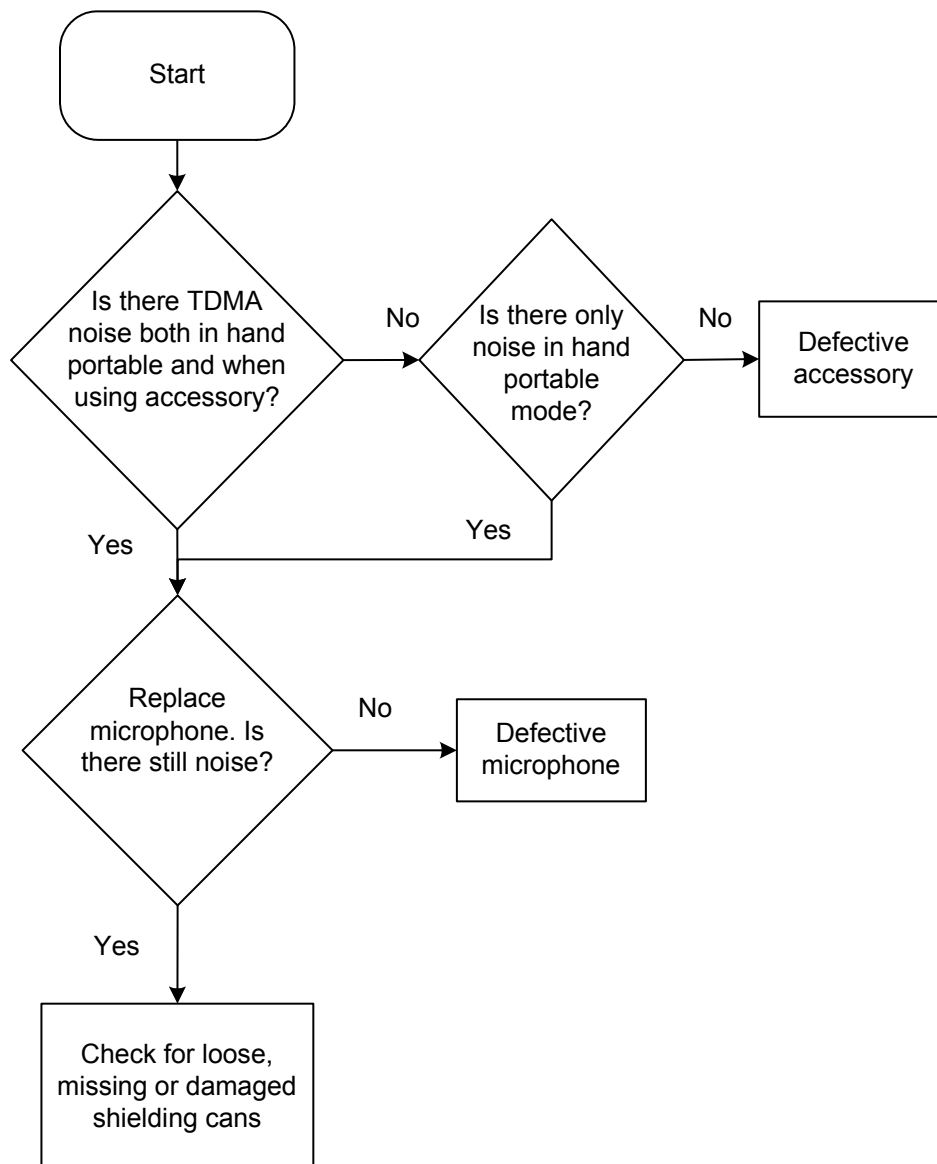
Uplink weak audio signal



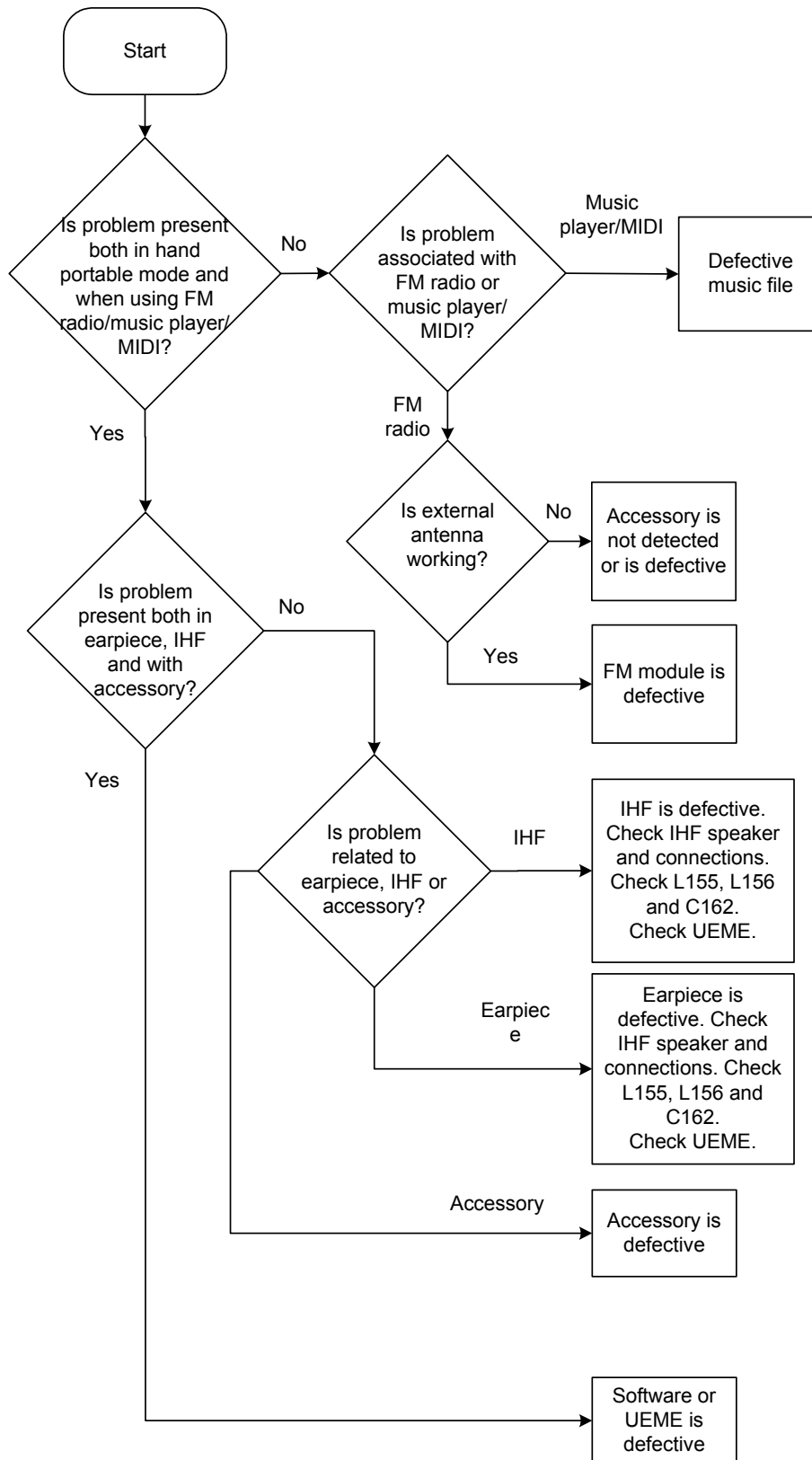
Uplink distorted audio signal



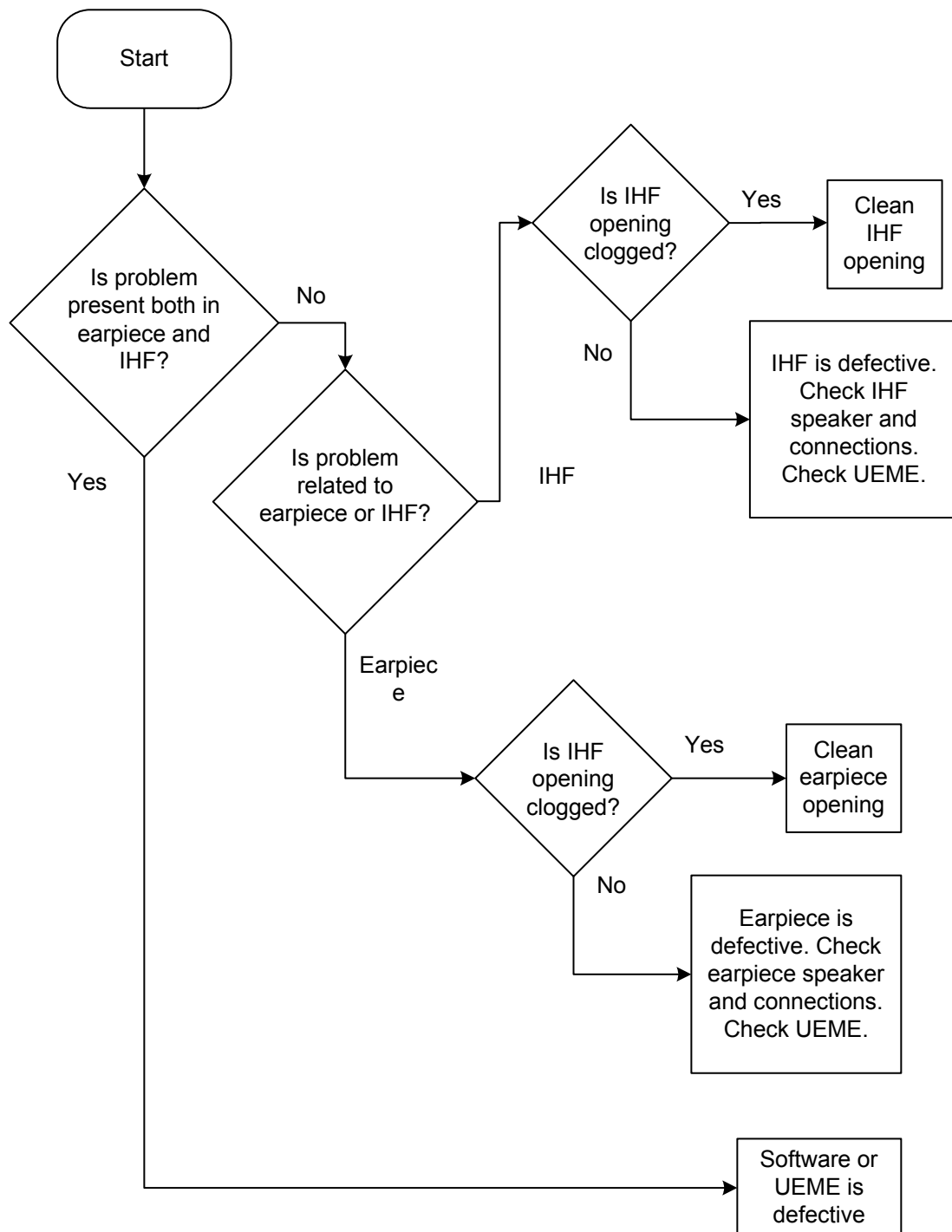
Uplink TDMA noise



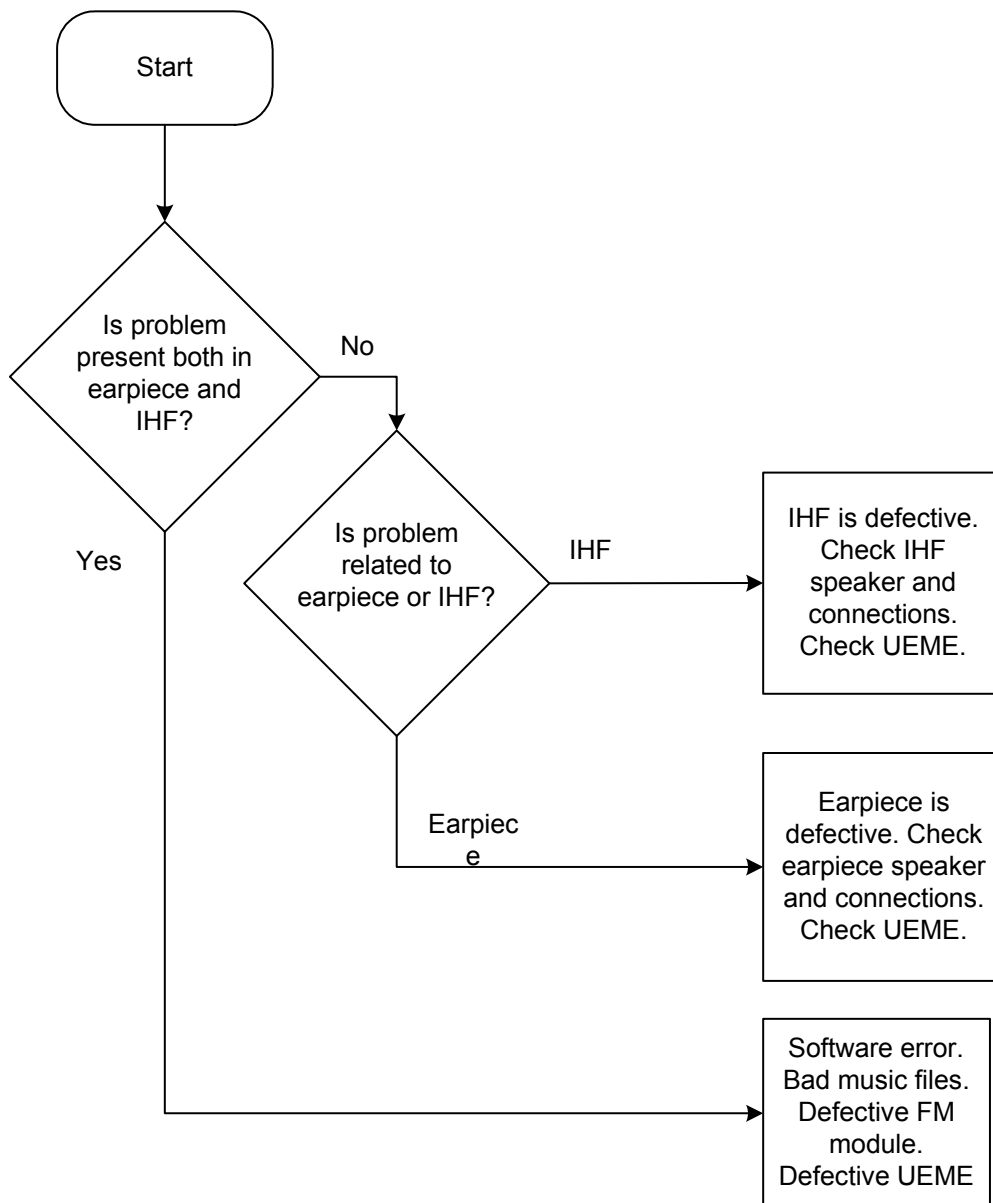
Downlink missing audio signal



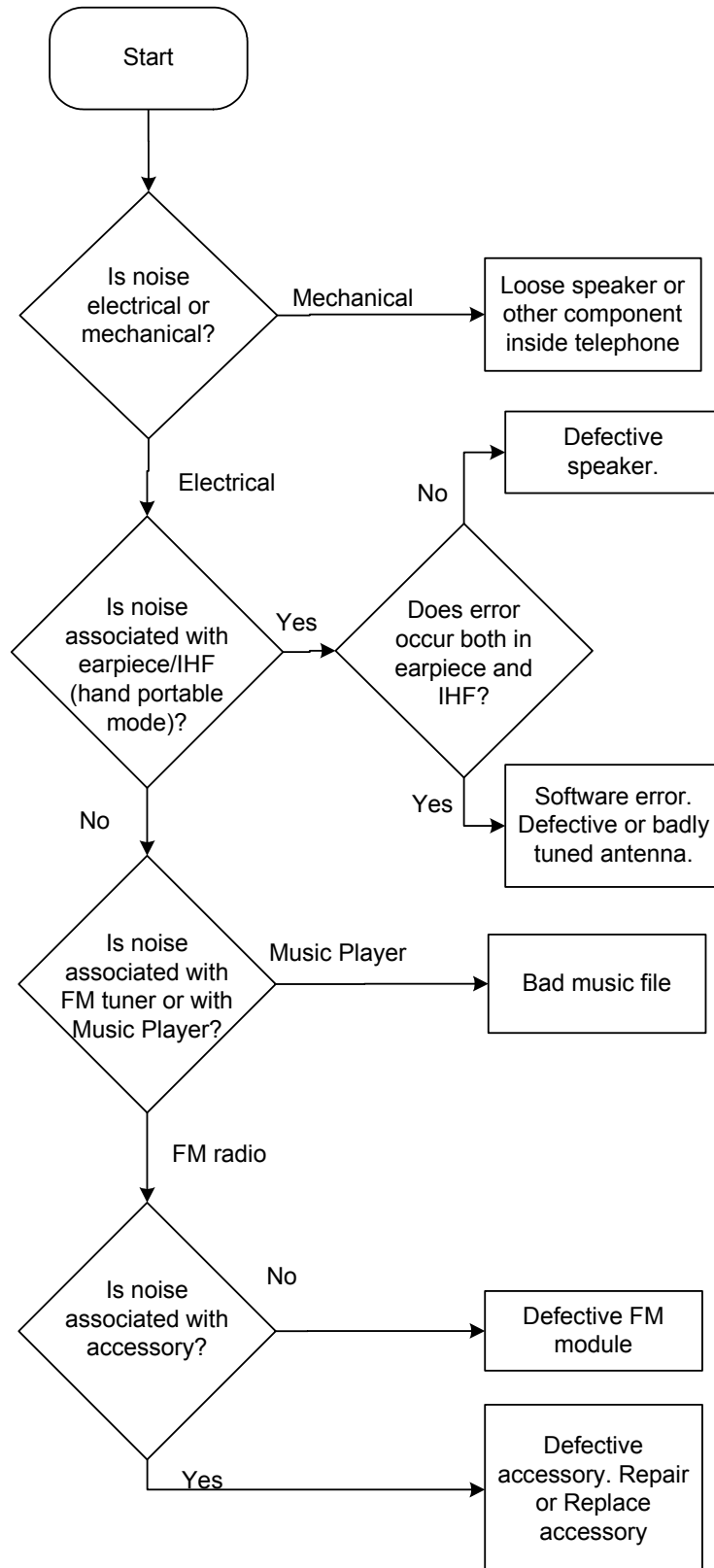
Downlink weak audio signal



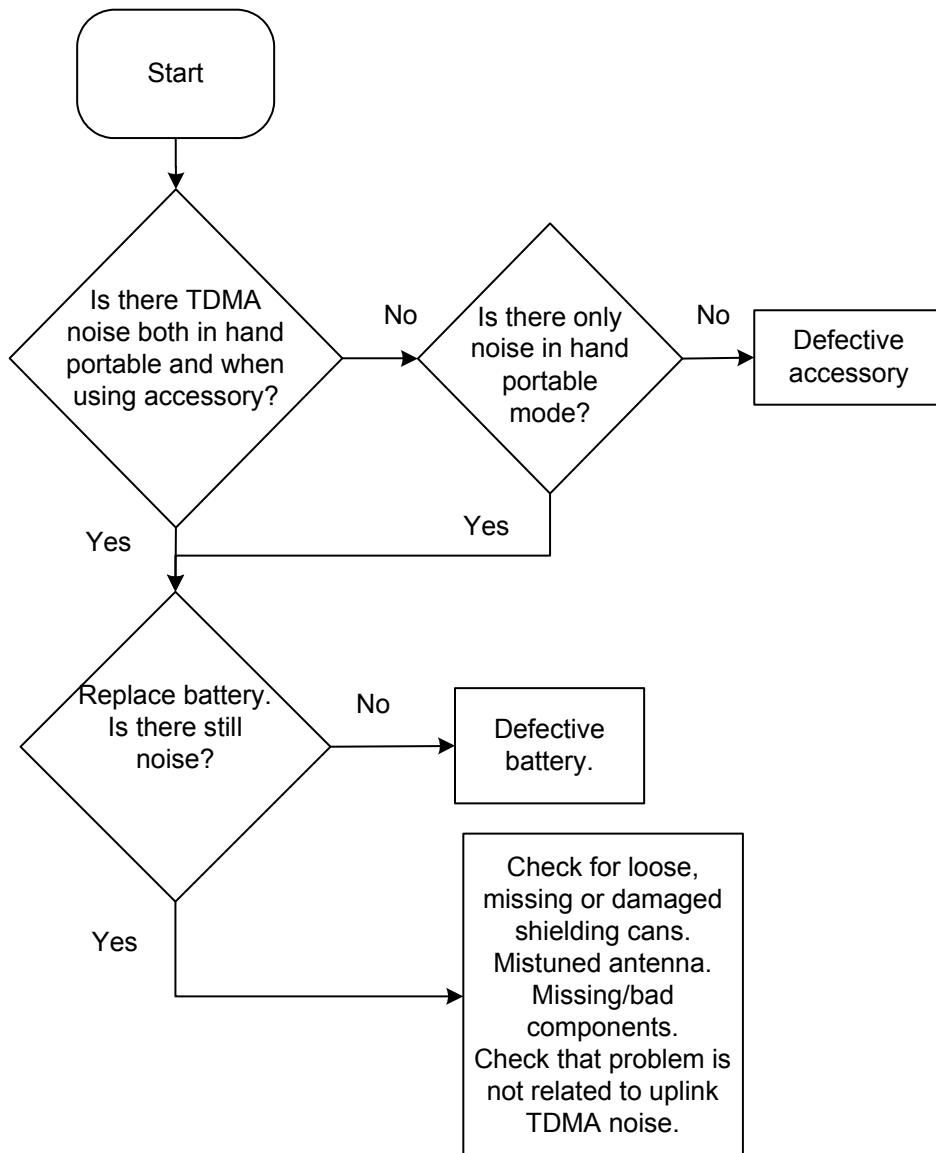
Downlink distorted audio signal



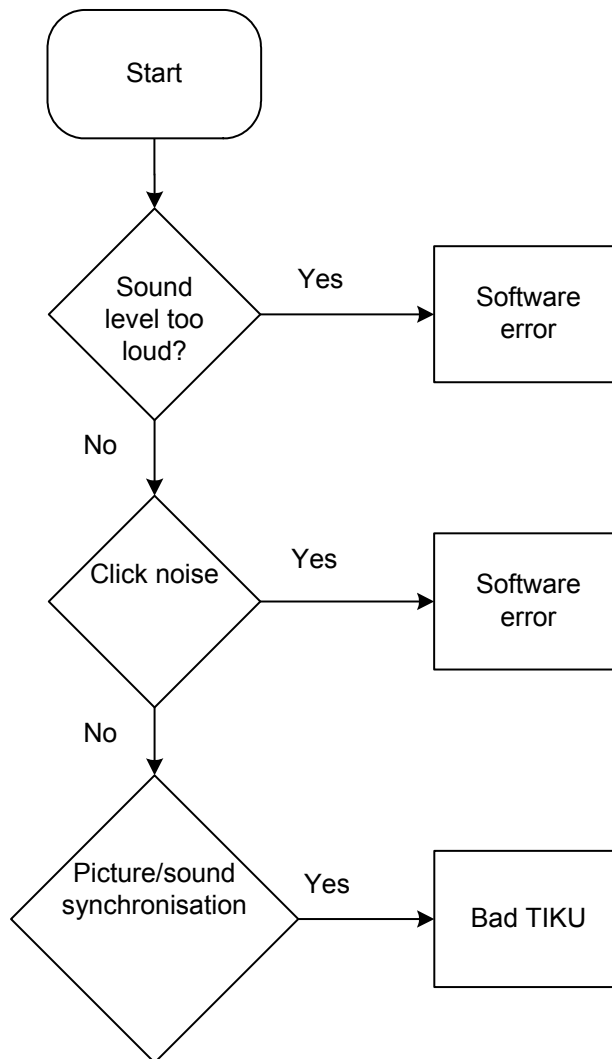
Downlink noise in audio signal



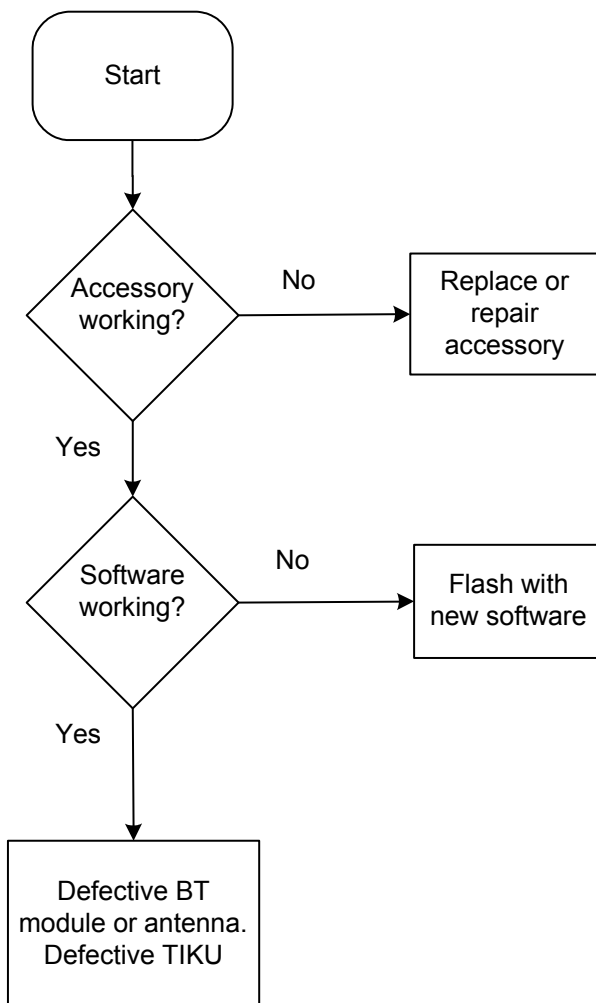
Downlink TDMA noise



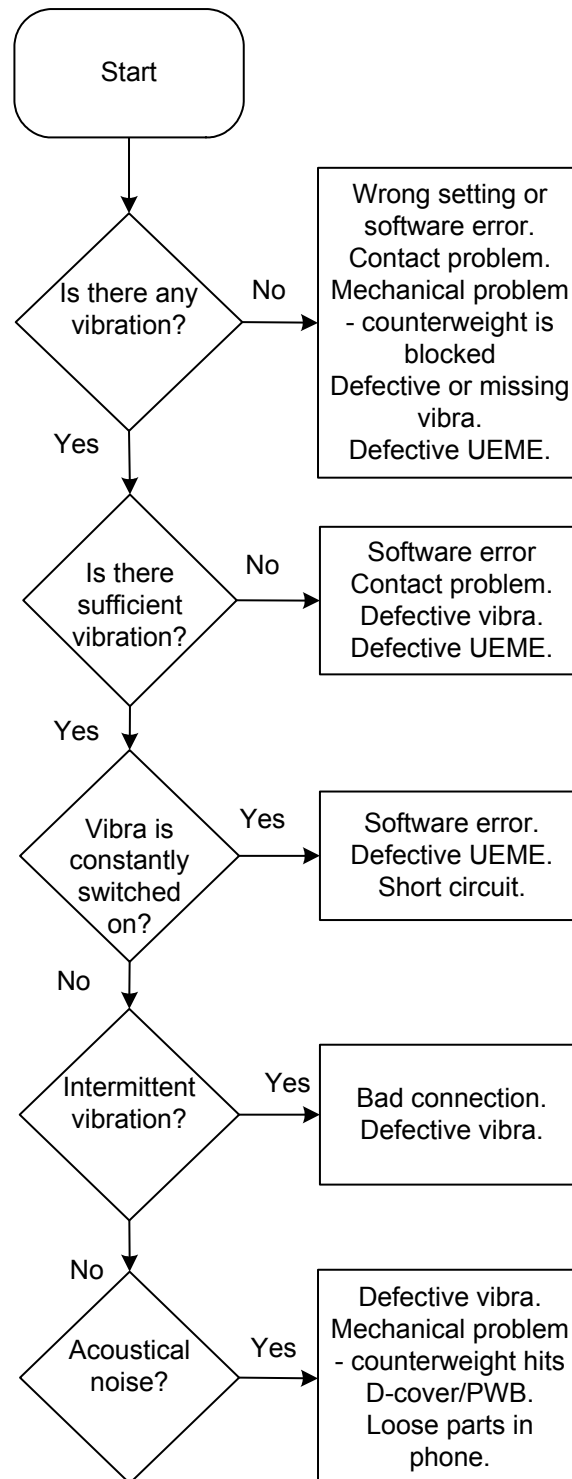
Various noise problems



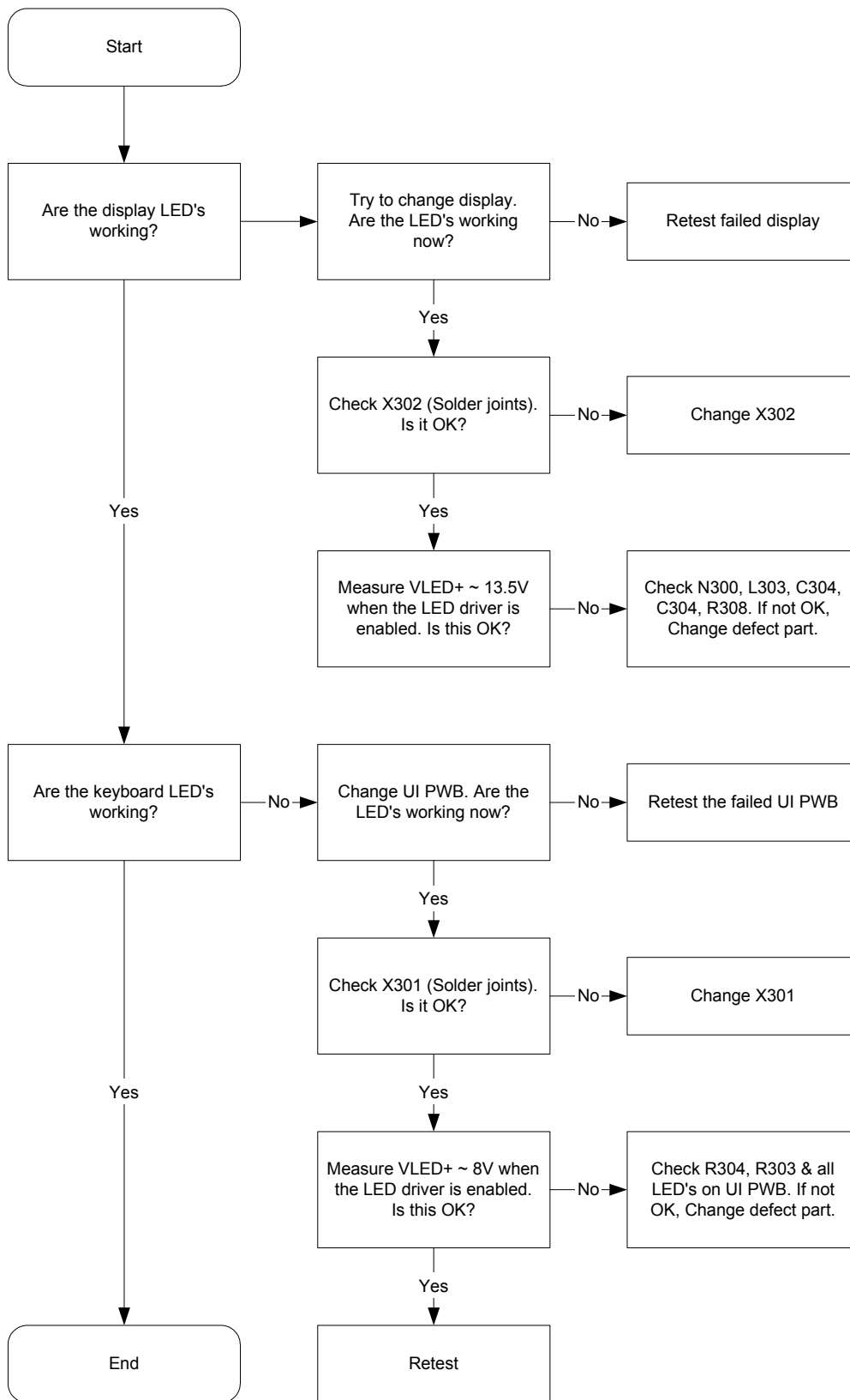
BT audio errors



Vibra errors

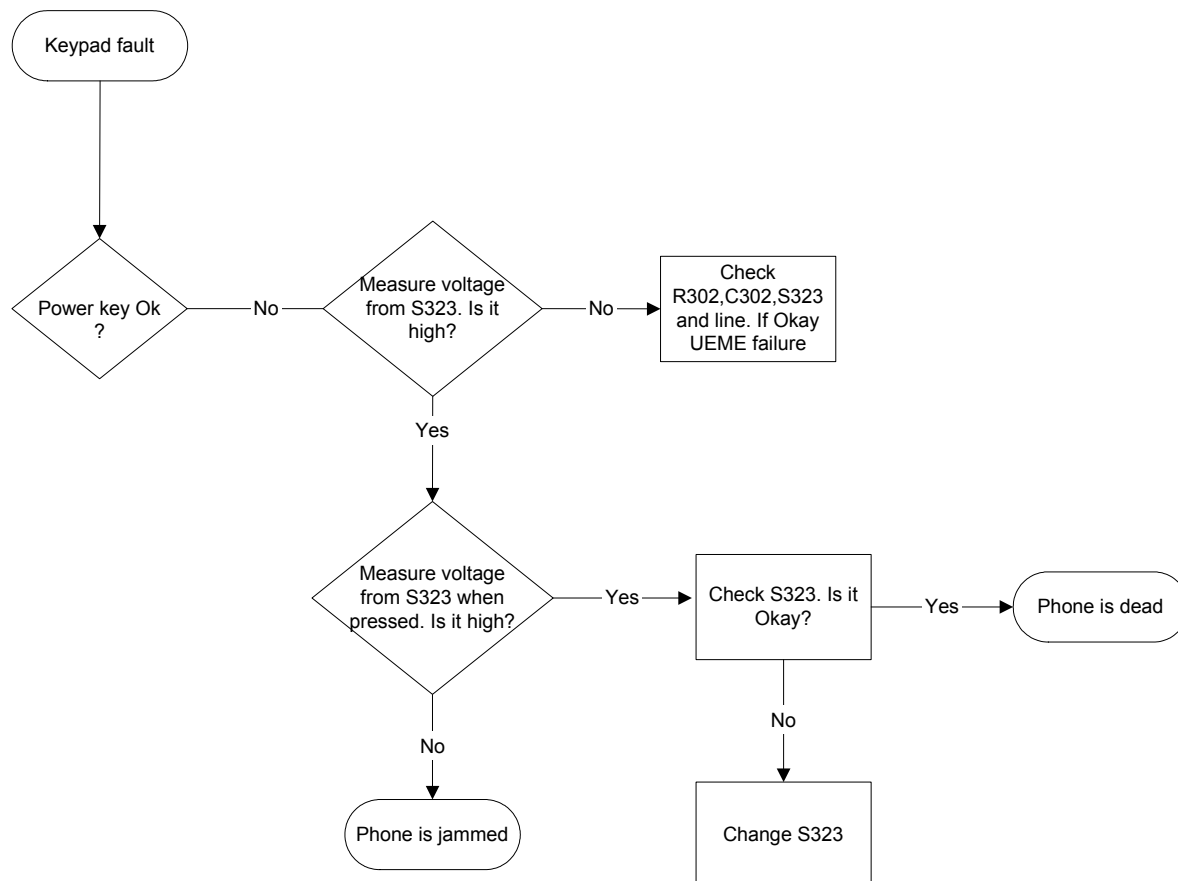


BackLight Failure

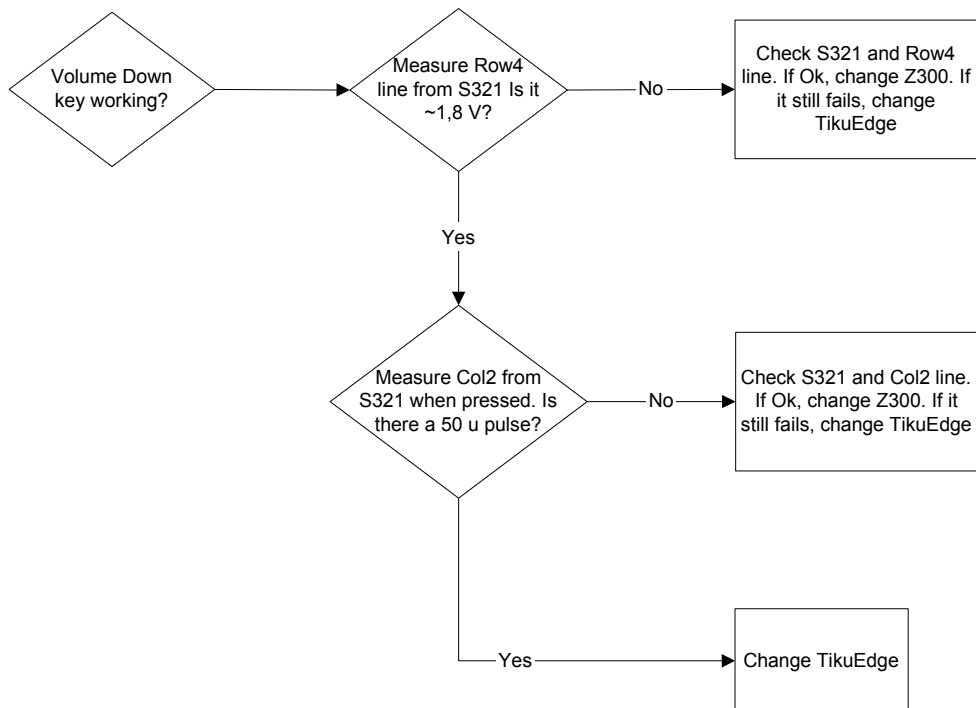
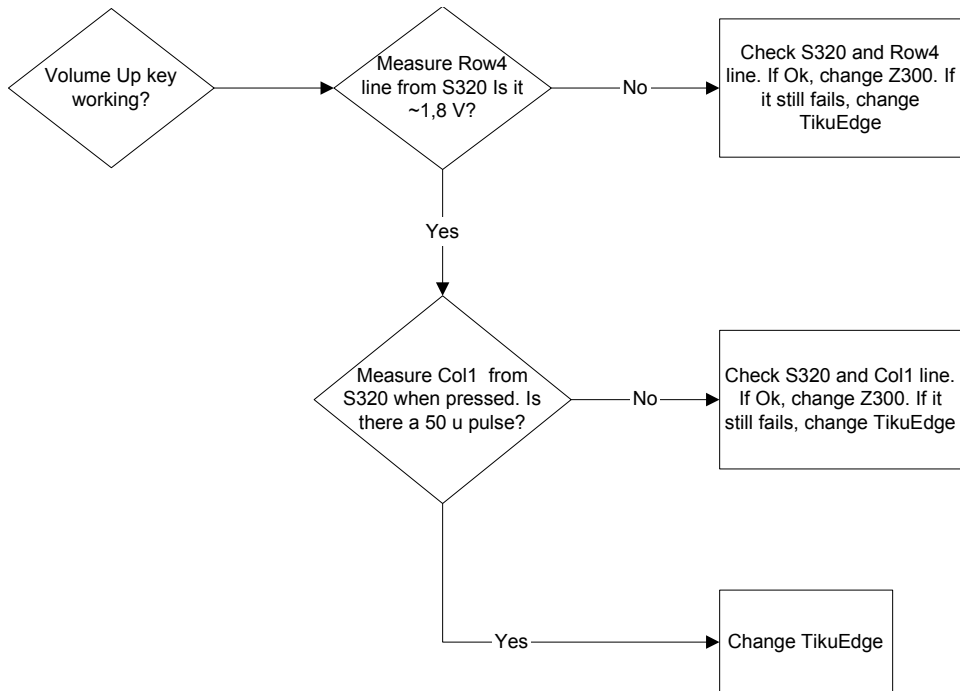


Key Failure

Power Key Failure



Volume Key Failure



UI module keys working

