PAMS Technical Documentation

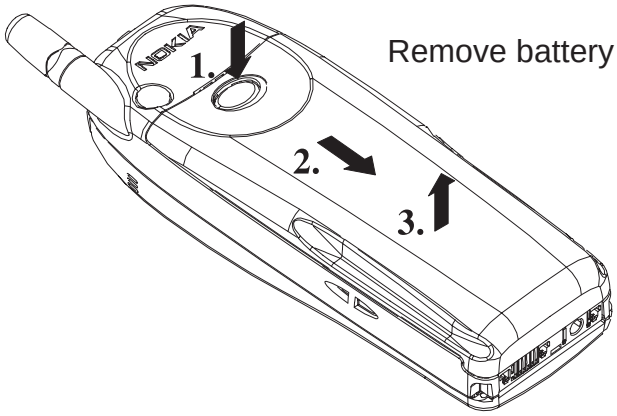
NSE–1 Series Transceivers

Disassembly & Troubleshooting Instructions

Original 03/98

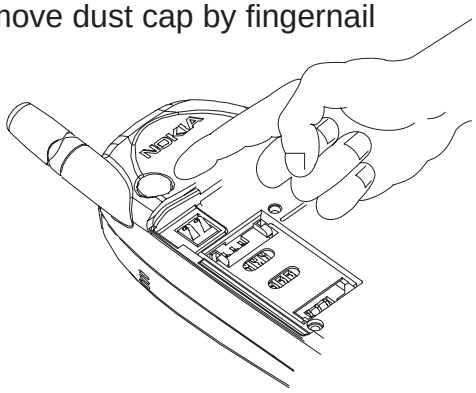
CONTENTS

Disassembly

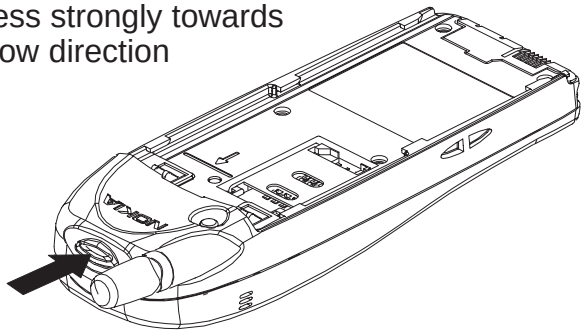


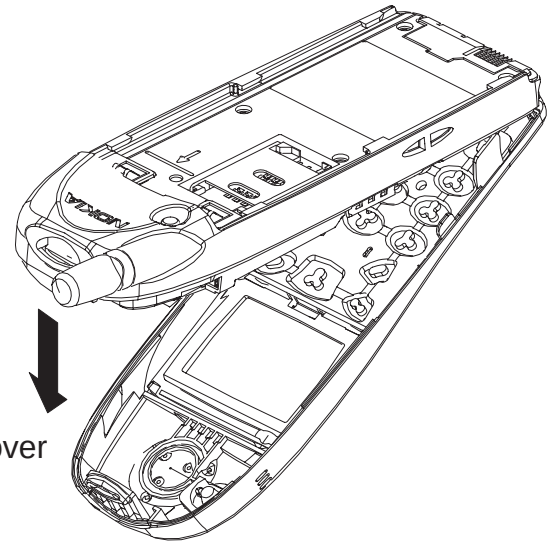
Remove battery

Remove dust cap by fingernail

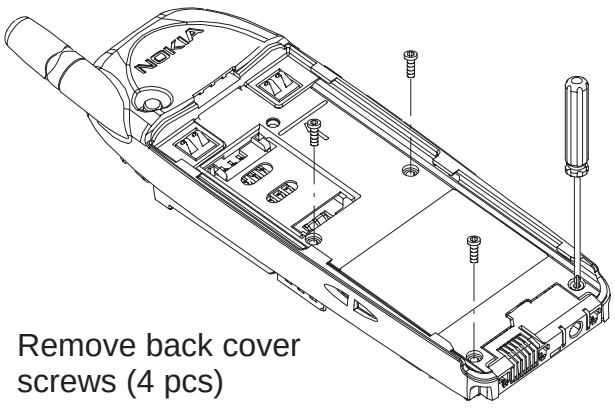


Press strongly towards
arrow direction

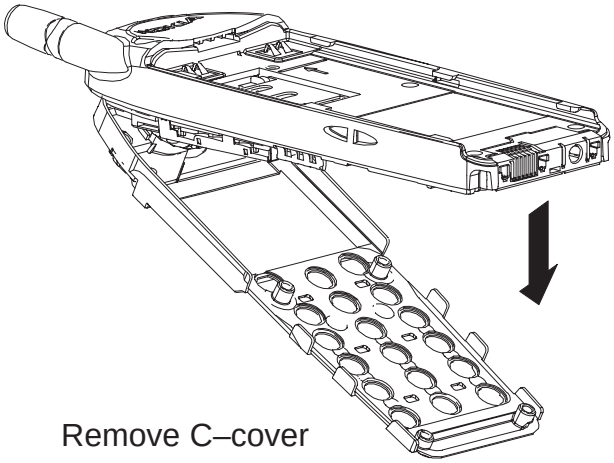




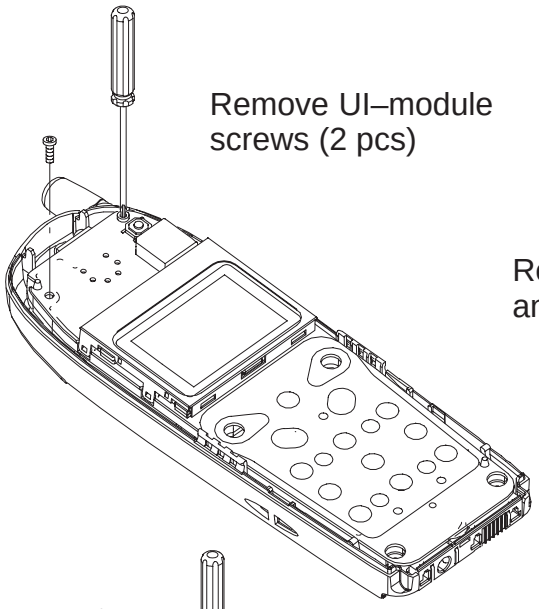
Carefully remove A–cover
Note snap fixings !



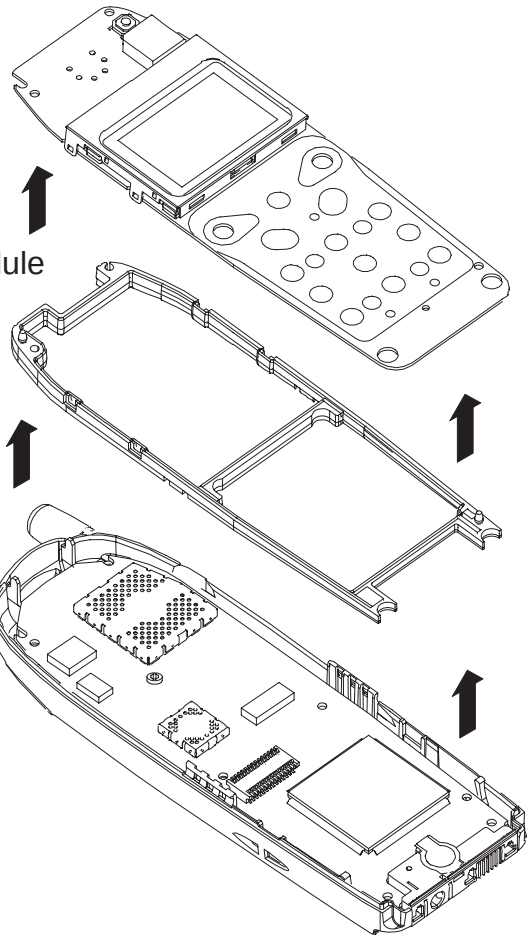
Remove back cover
screws (4 pcs)



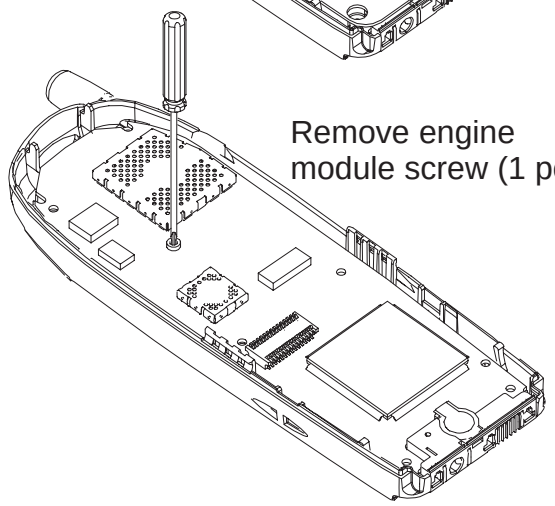
Remove C–cover



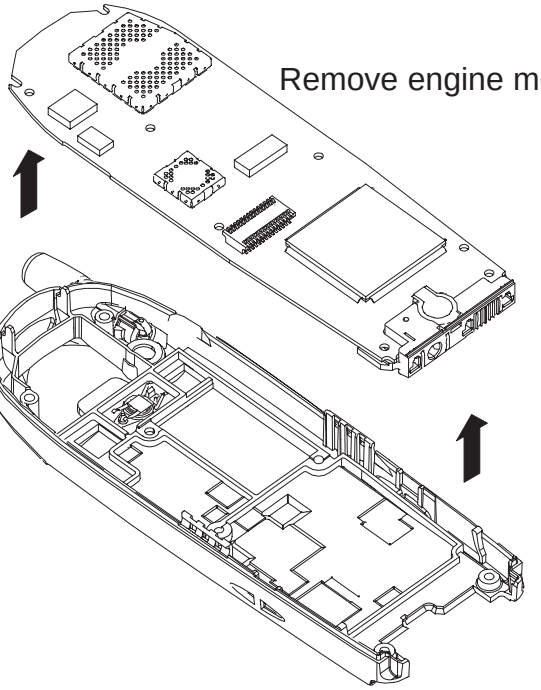
Remove UI–module screws (2 pcs)



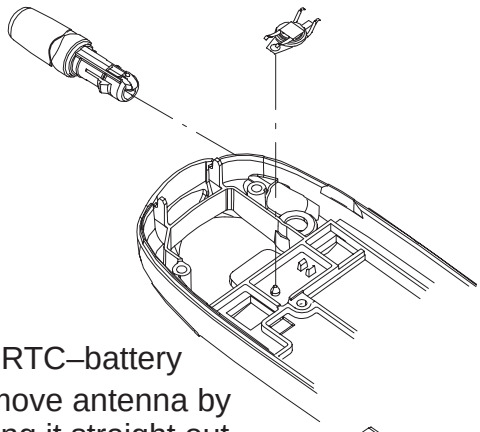
Remove UI–module and frame



Remove engine module screw (1 pc)

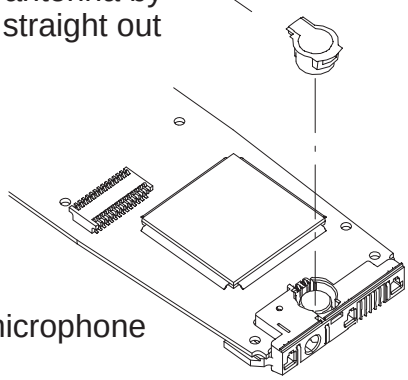


Remove engine module



Remove RTC–battery

Remove antenna by pulling it straight out



Remove microphone

Trouble Shooting

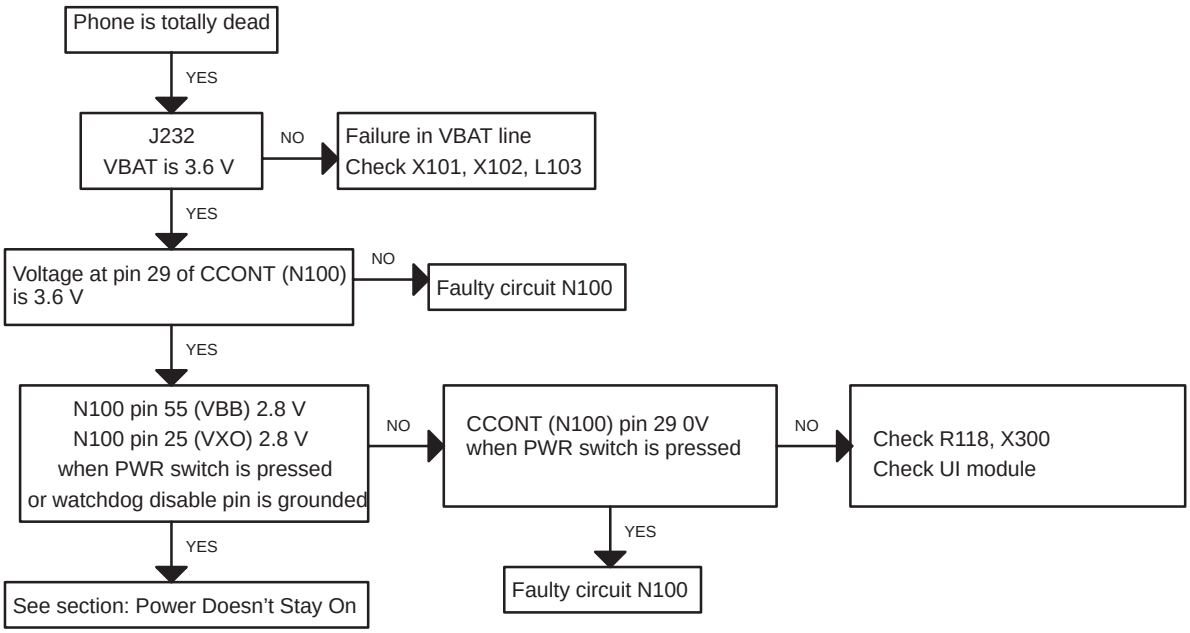
The following hints should facility finding the cause of the problem when the circuitry seems to be faulty. This trouble shooting instruction is divided following section.

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 thing to do is carry out a through visual check of the module. Ensure in particular that:
a) there are not any mechanical damages
b) soldered joints are OK

Phone is totally dead

This means that phone doesn't take current at all when the power switch is pressed or when the watchdog disable pin (N100 pin 29) is grounded. Used battery voltage must be higher than 3.0 V. Otherwise the hardware of CCONT (N100) prevents totally to switch power on.



Flash programming doesn't work

In service places flash programming can be done via system connector X100.

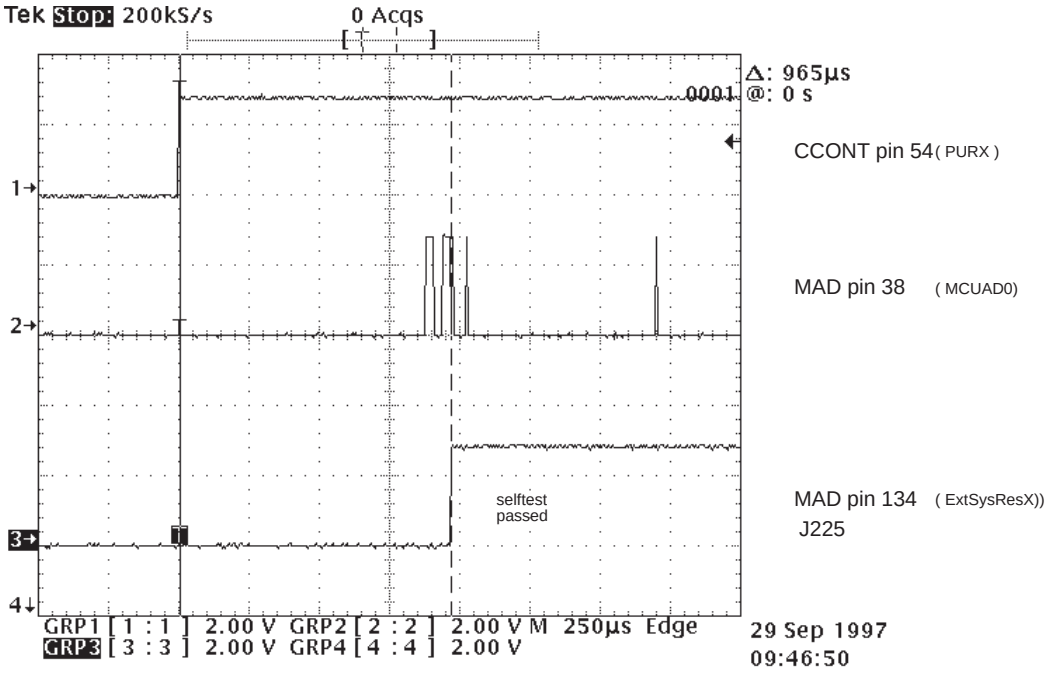
In flash programming error cases the flash prommer can give some information about a fault.
The fault information messages could be:
– MCU doesn't boot
– Serial clock line failure
– Serial data line failure
– External RAM fault
– Algorithm file or alias ID don't find
– MCU flash Vpp error

In cases that the flash programming doesn't succeed there is a possibility to check short circuits between the memories and the MCU (MAD2). This test is useful to do, when the fault information is: MCU doesn't boot, Serial clock line failure or Serial data line failure.

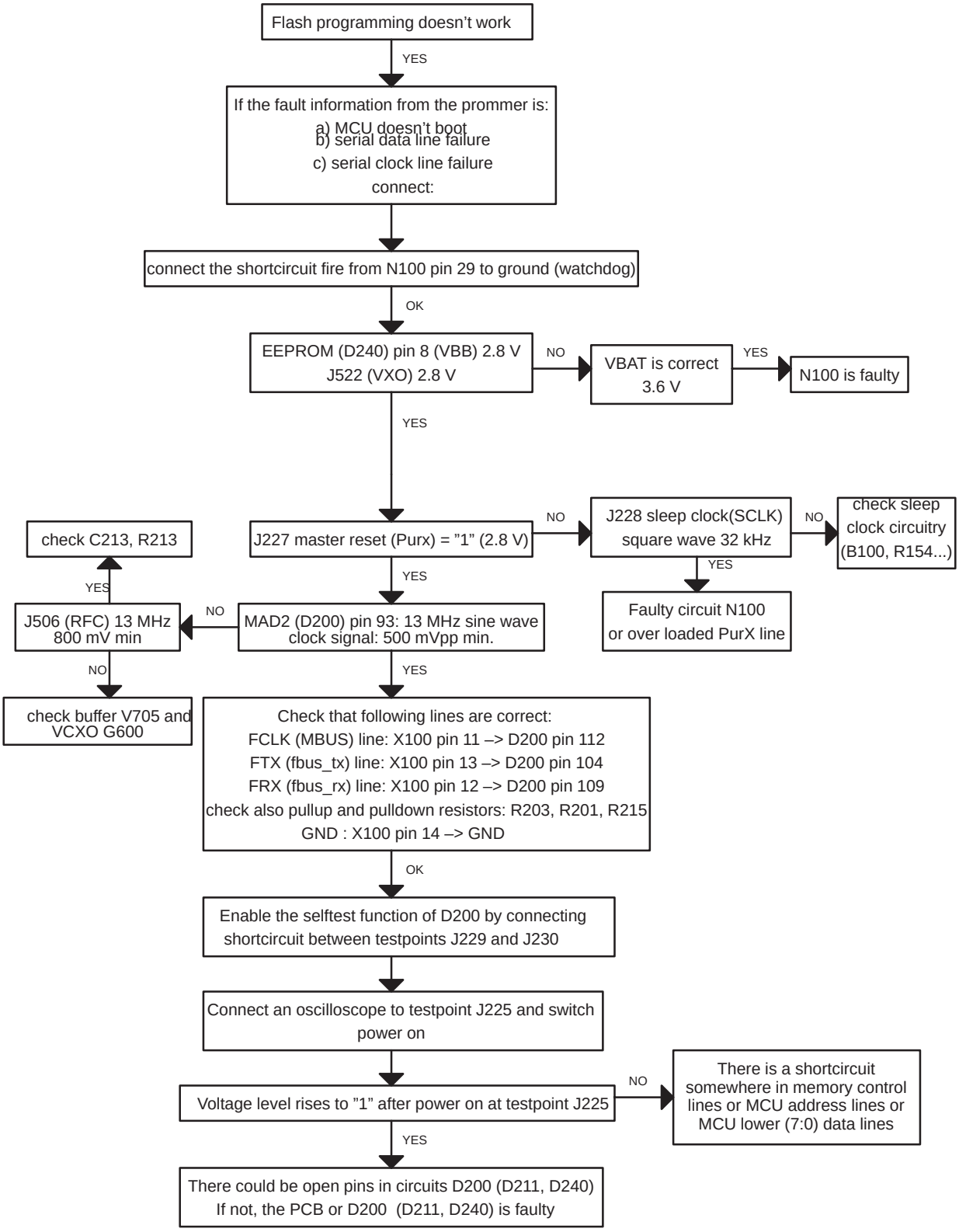
The test procedure is following:

1. Connect the short circuit wire between the test points J229 and J230.
2. Switch power on
3. If the voltage level in testpoint J225 is 2.8 V (”1”), the interface is OK. If there is a short circuit, the voltage level in testpoint J225 stays low and 32kHz square wave signal can be seen in the lines which are already tested.

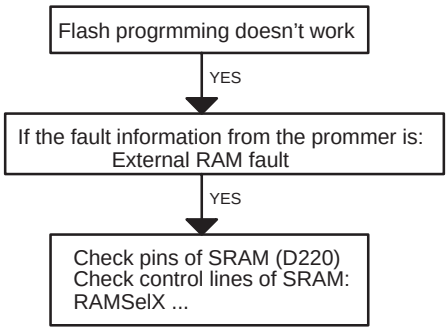
One must be noticed that this test can be found only short circuits, not open pins.
Also upper data lines (15:8) of flash circuit D210 are not included to this test.

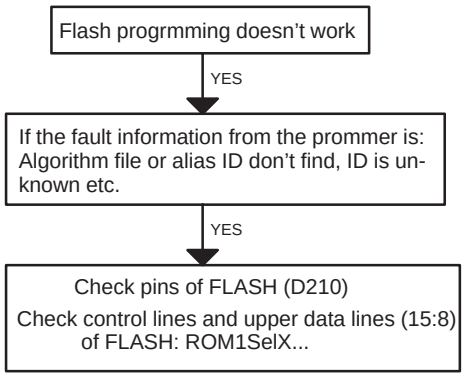


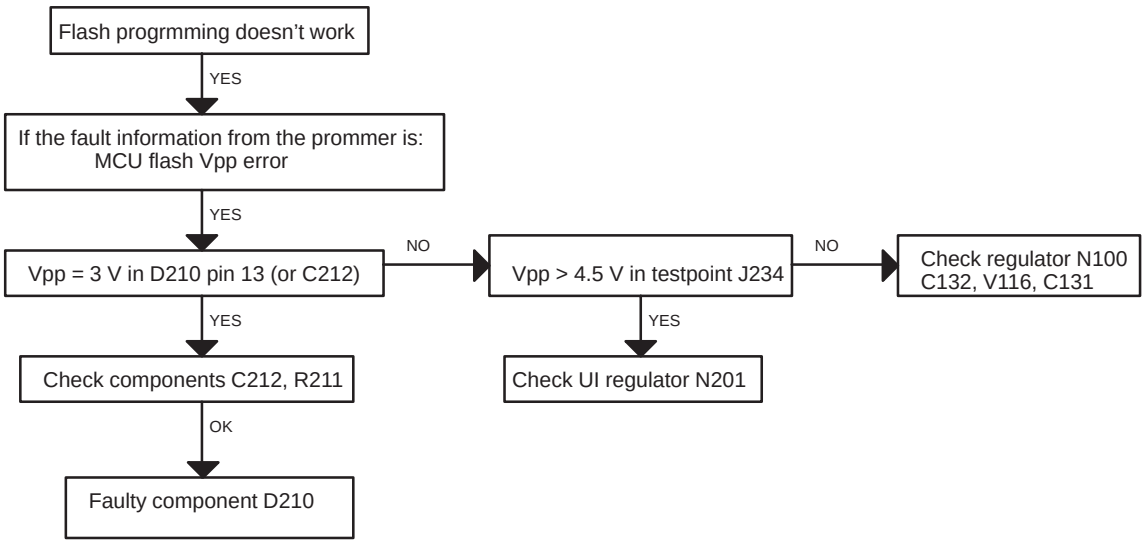
Flash Programming failure (1)



Flash Programming failure (2)





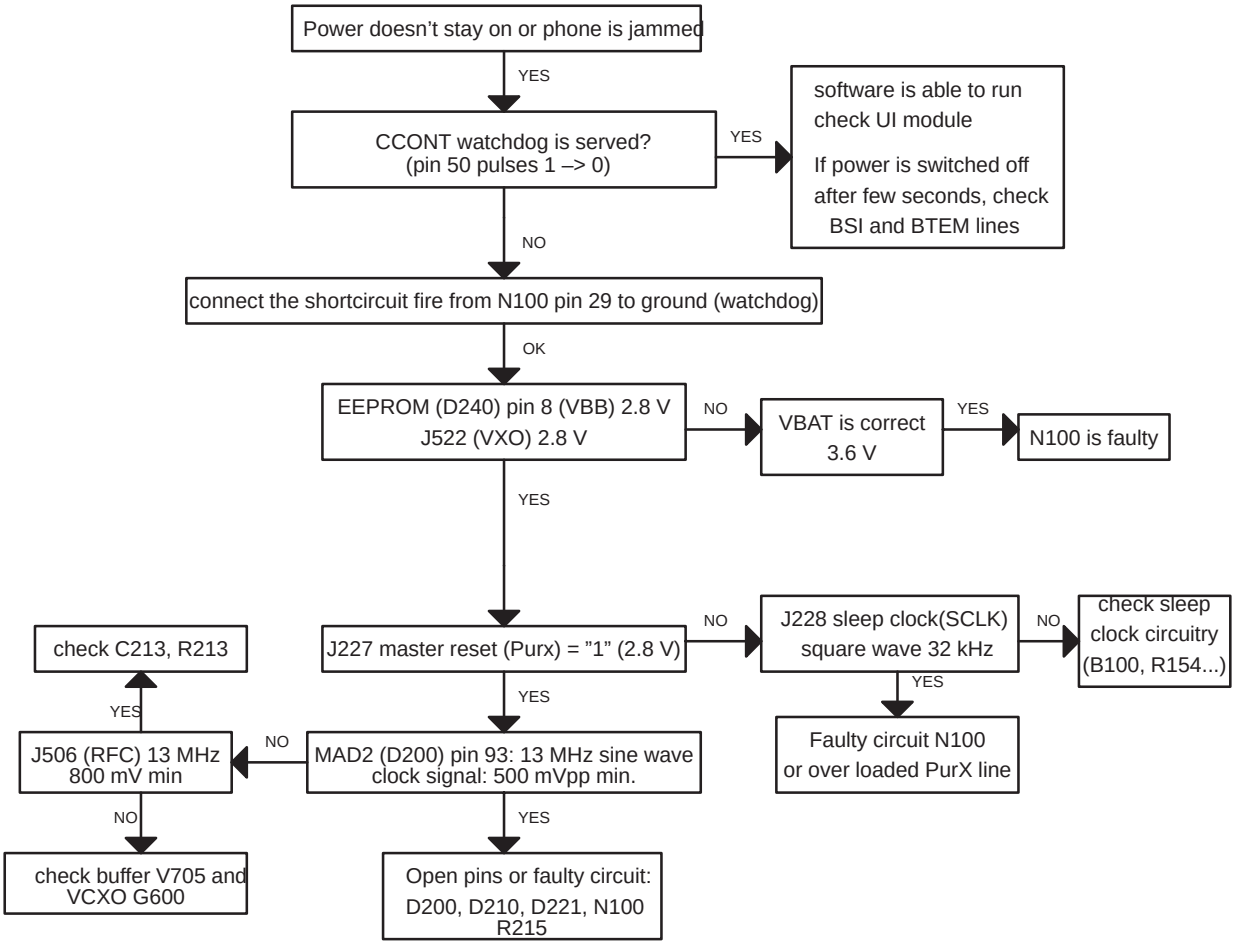


Power doesn’t stay on, or phone is jammed

If this kind of fault has come after flash programming, there are most probably open pins in ICs.
The soldered joints of ICs: D200 (MAD2), D210 (FLASH), N100 (CCONT), D221 (SRAM) are useful to check at first.

Normally the power will be switched of by CCONT (N100) after 30 seconds, if the watchdog of the CCONT can not be served by software.
The watchdog updating can be seen by oscilloscope at pin 50 (DataselX) of CCONT.
In normal case there is a short pulse from ”1” –> 0 every 8 seconds.

The power off function of CCONT can be prevented by connecting a short circuit wire from CCONT pin 29 to ground.



Display Information: Contact Service

This fault means that software is able to run and thus the watchog of CCONT (N100) can be served.
Selftest functions are run when power is switched on and software is started to excute from flash.
If any of selftests is failed, contact service information will be shown on display.

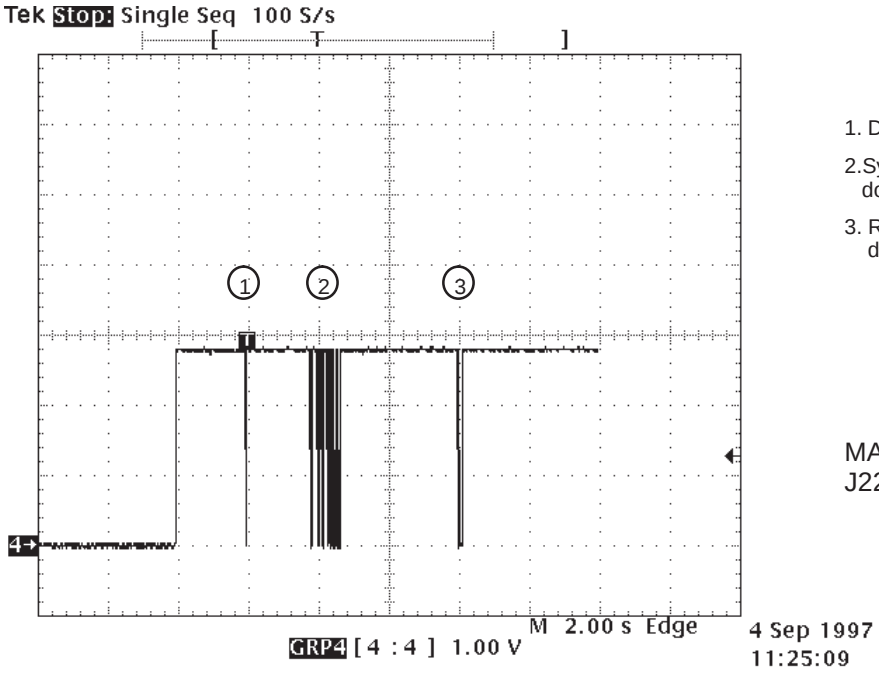
The phone doesn’t register to the network or phone doesn’t make a call

If the phone doesn’t register to the network or the phone doesn’t make a call, the reason could be either the baseband or the RF part.
The phone can be set to wanted mode by WinTesla service software and determinate if the fault is in RF or in baseband part (RF interface measurements).

The control lines for RF part are supplied both the System Asic (MAD2;D200) and the RFI (Cobba; N250). MAD2 handles digital control lines (like synthe, TxP etc.) and Cobba handles analog control lines (like AFC, TxC etc.).

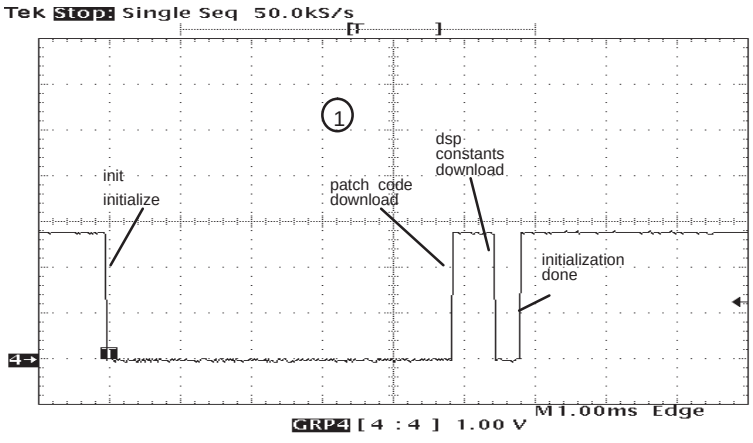
The DSP software is constructed so that operation states of DSP (MAD2) can be seen in external flag (DSPXF) output pin (D200 pin 91).

After power up, DSP signals all completed functions by changing the state of the XF pin (see figures 39 and 40).

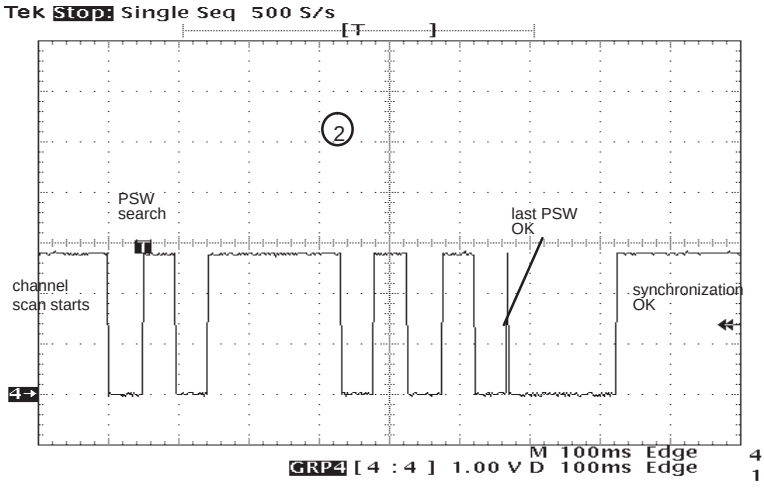


1. DSP initialization done
2. Synchronization to network done
3. Registrarition to network done.

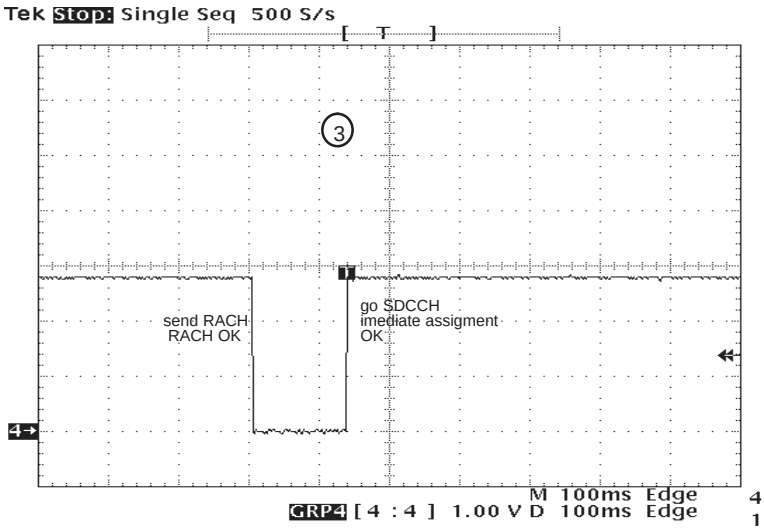
MAD2 pin 91 (DSPXF)
J222



MAD2 pin 91 (DSPXF)
J222

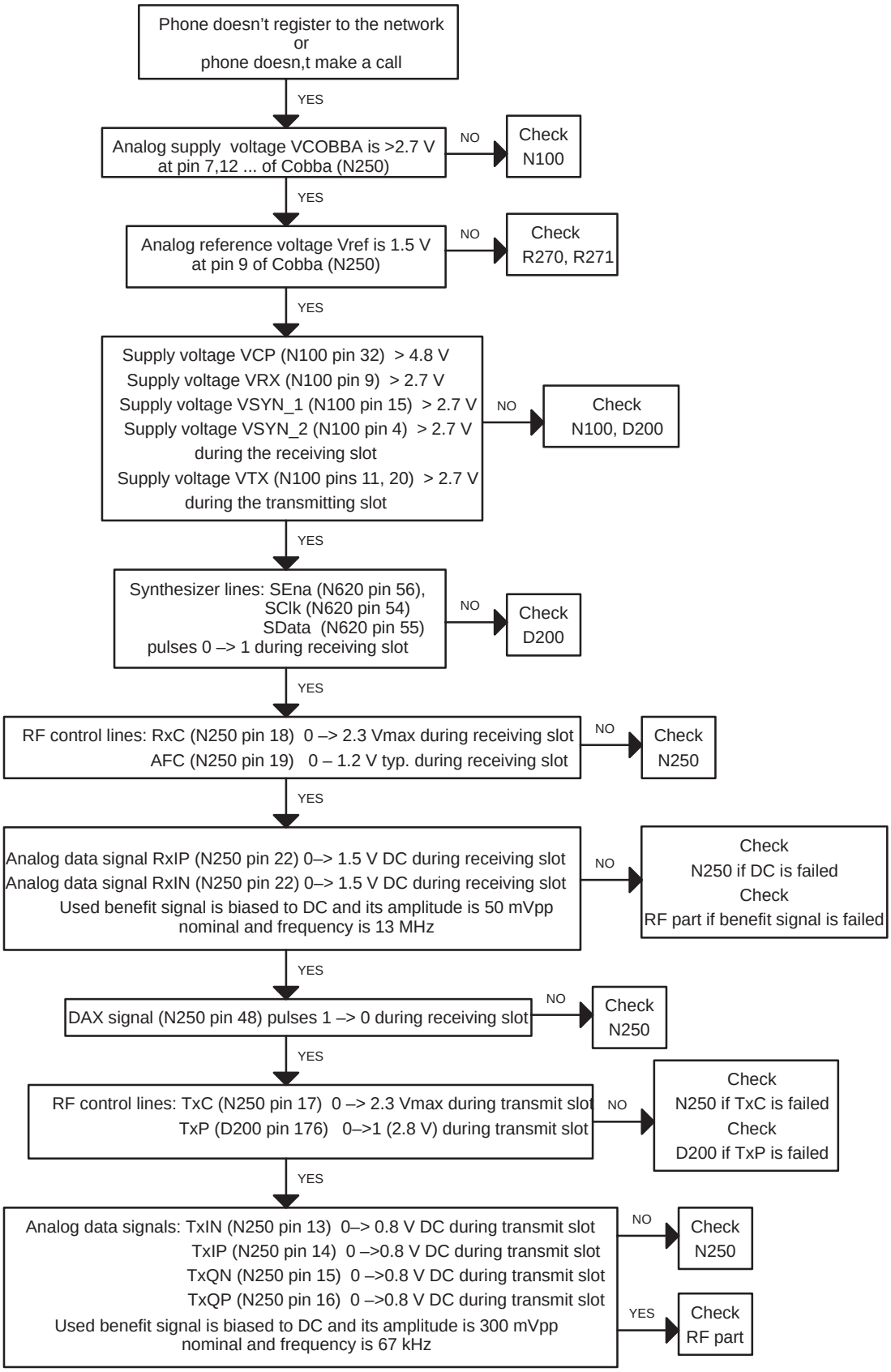


MAD2 pin 91 (DSPXF)
J222



MAD2 pin 91 (DSPXF)
J222

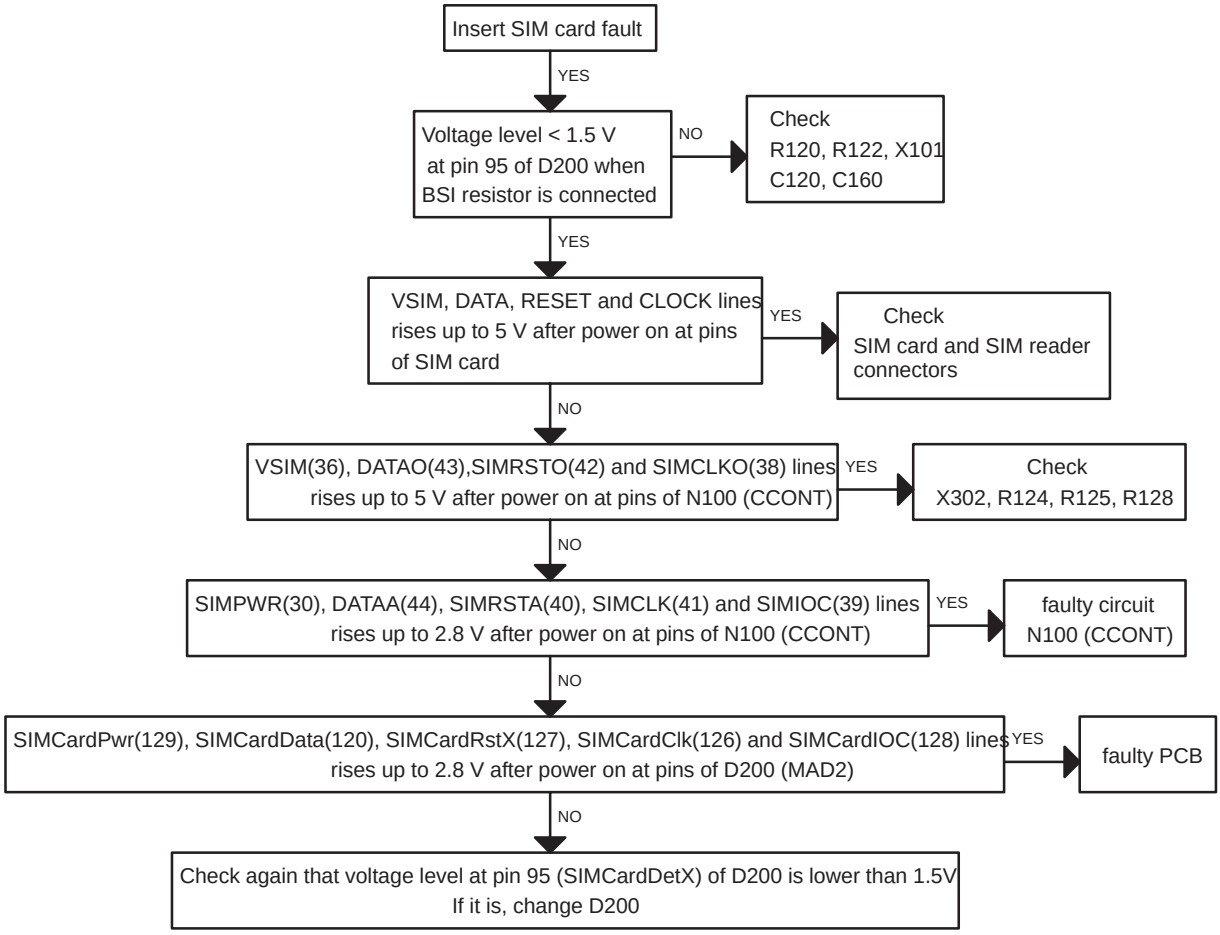
Phone register failure

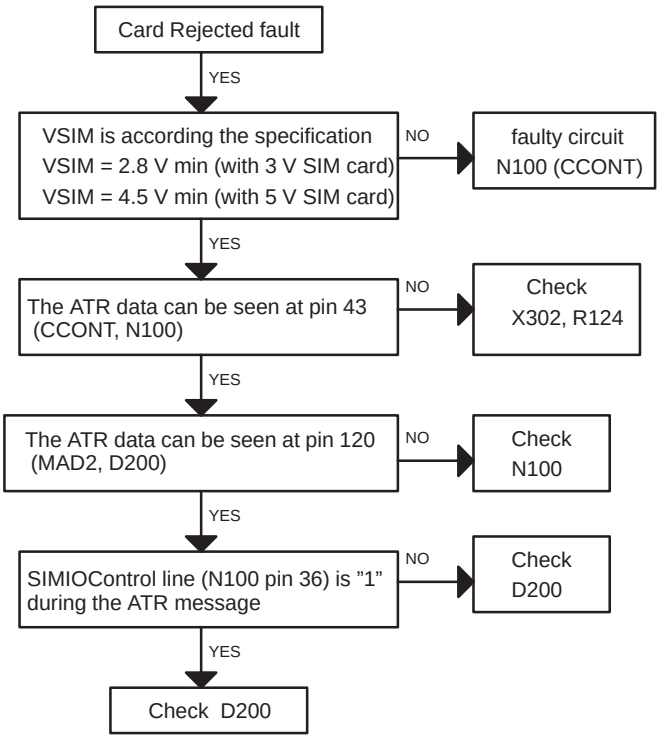


SIM card is out of order

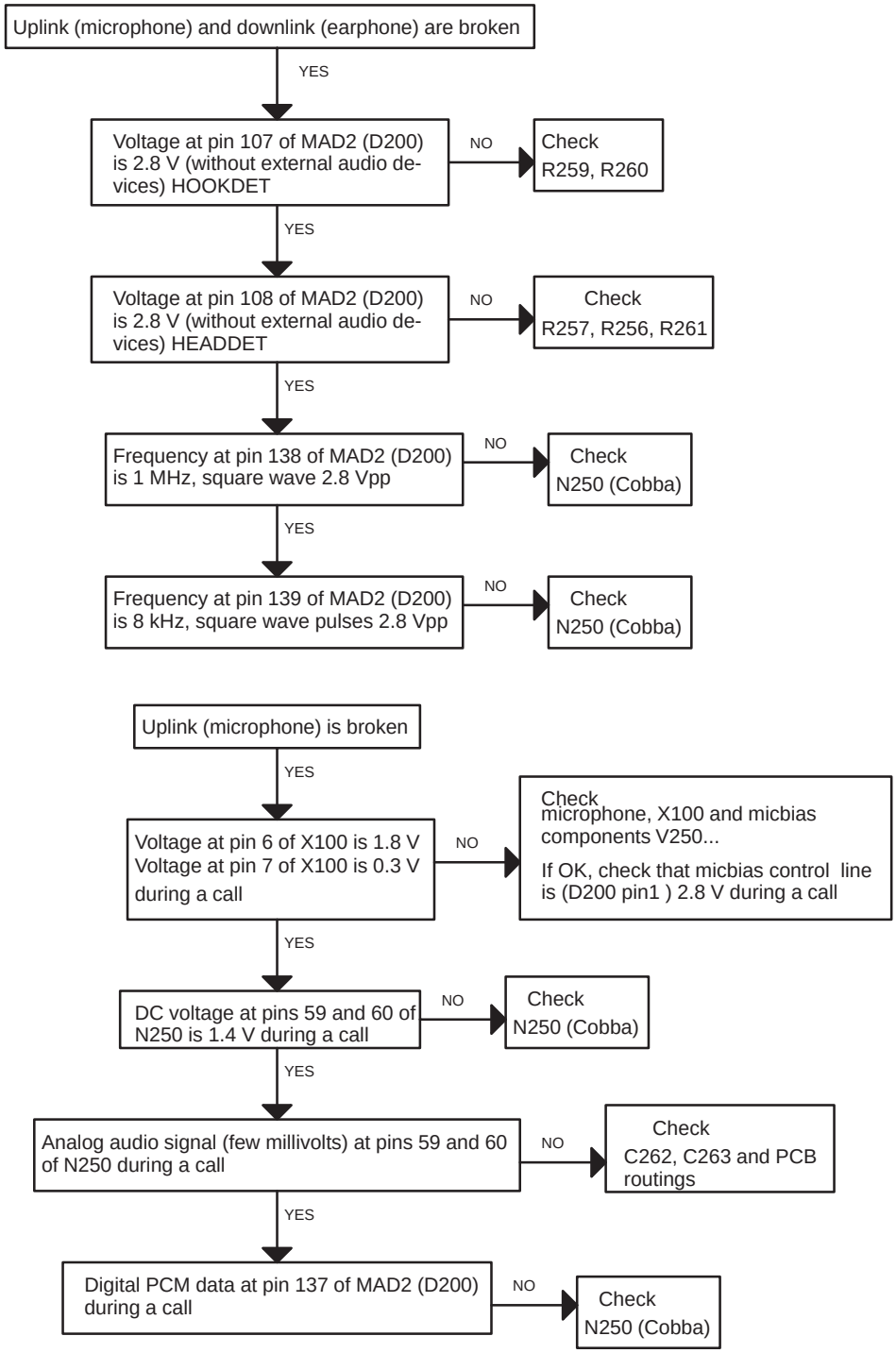
The hardware of the SIM interface from MAD2 (D200) to the SIM connector (X302) can be tested without SIM card.
When the power is switched on and if the BSI line (X101;1) is grounded by resistor, all the used lines (VSIM, RST, CLK, DATA) rises up to 5 V four times. Thus ”Insert SIM card” faults can be found without SIM card.
The fault information ”Card rejected” means that ATR message (the first message is always sent from card to phone) is sent from card to phone but the message is somehow corrupted, data signal levels are wrong etc. or factory set values (stored to the EEPROM) are not correct.

SIM Card failure

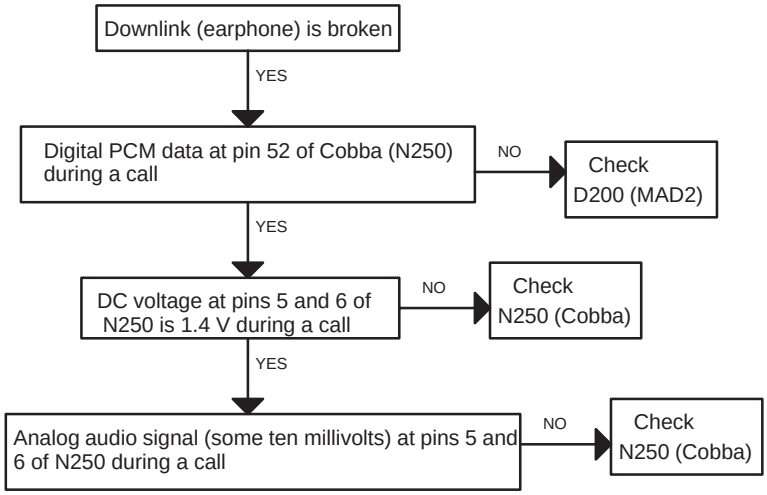




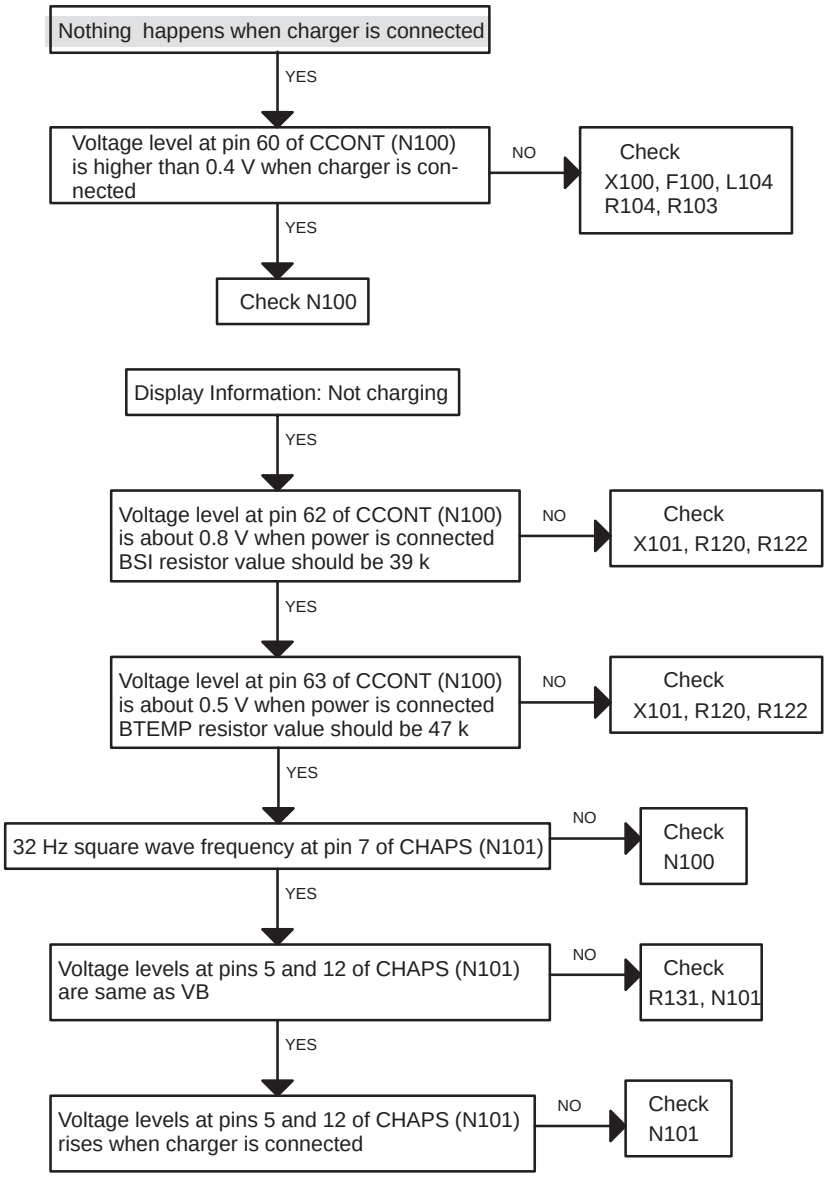
Audio failure (1)



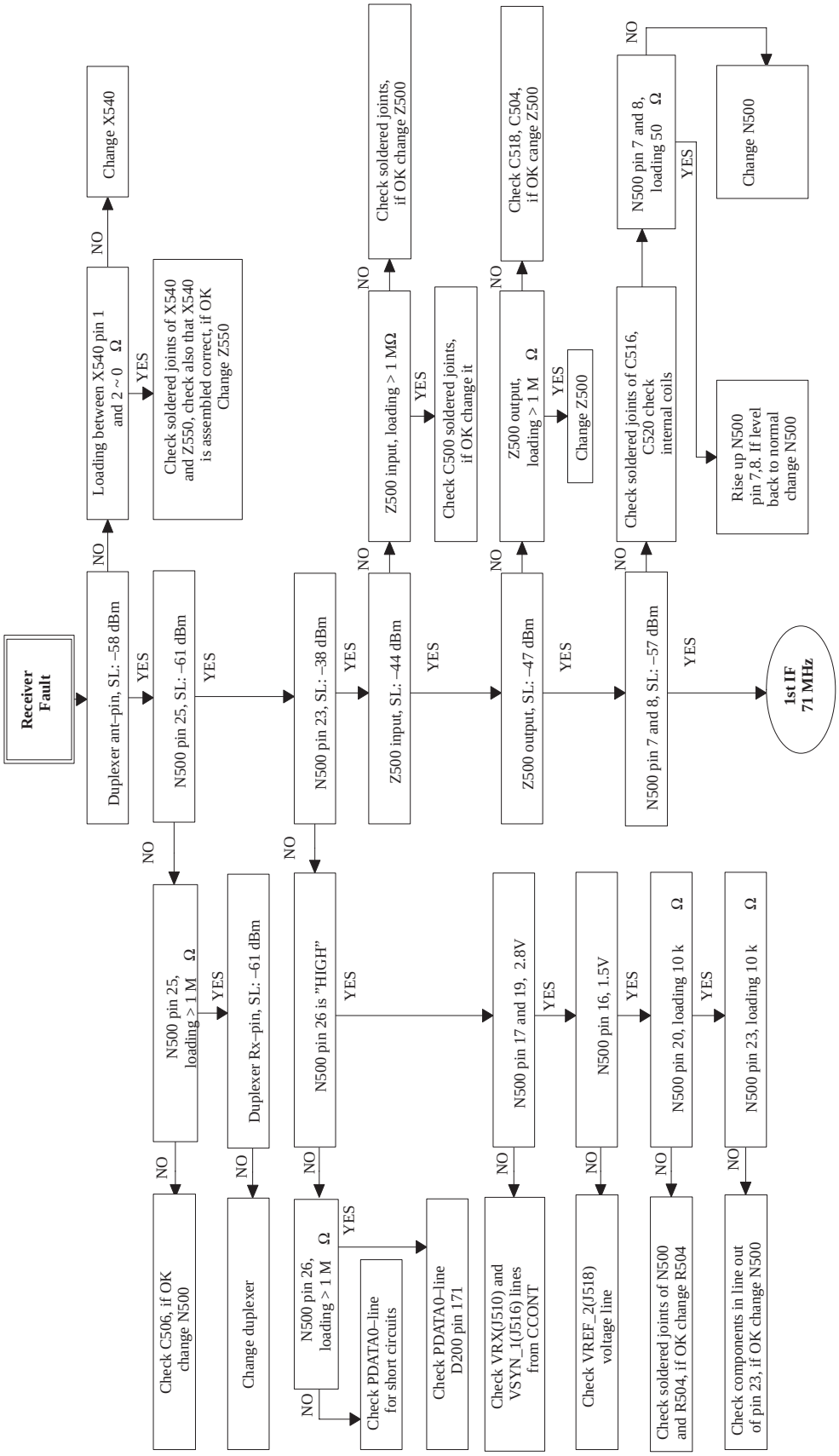
Audio failure (2)



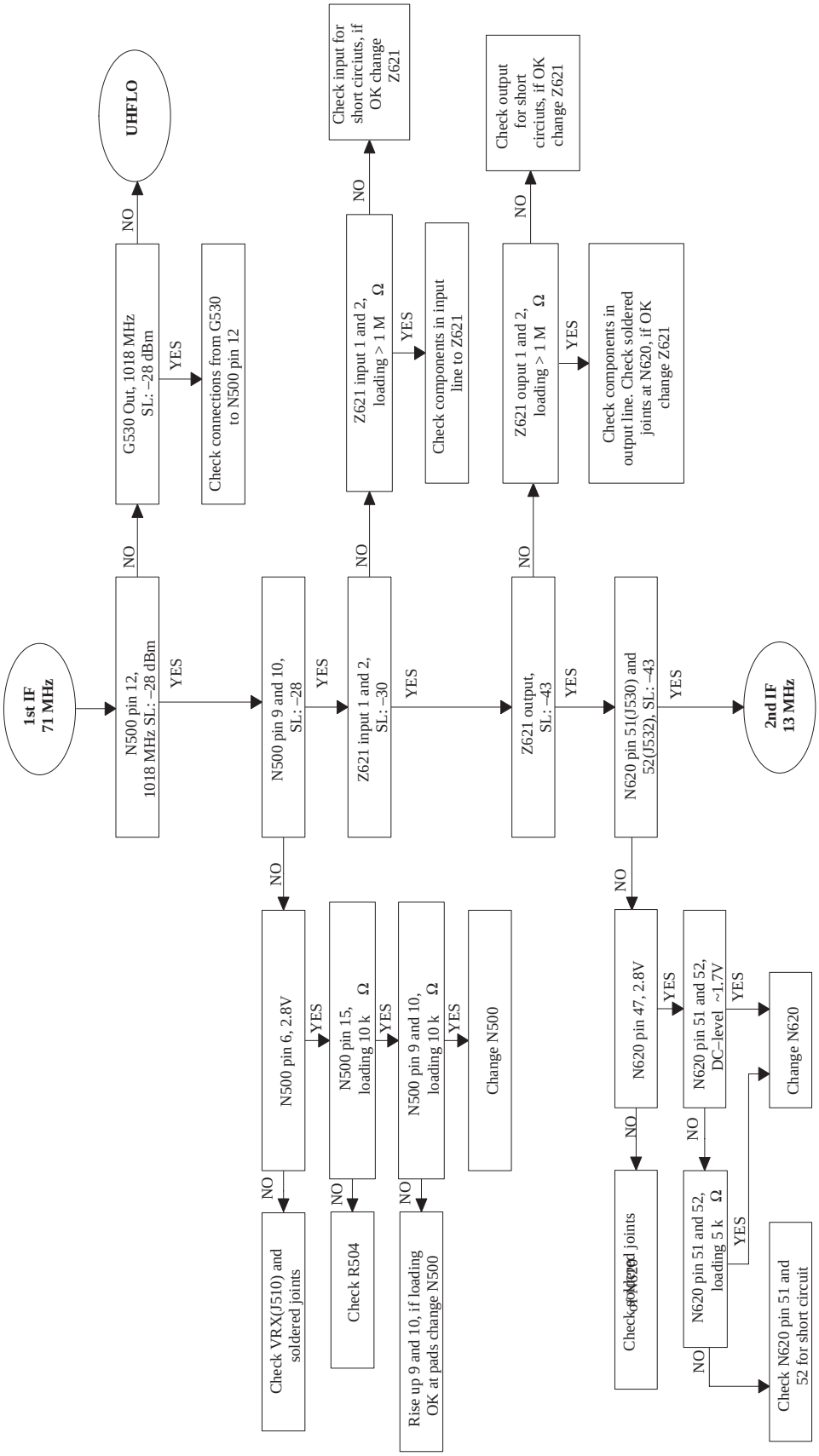
Charger failure



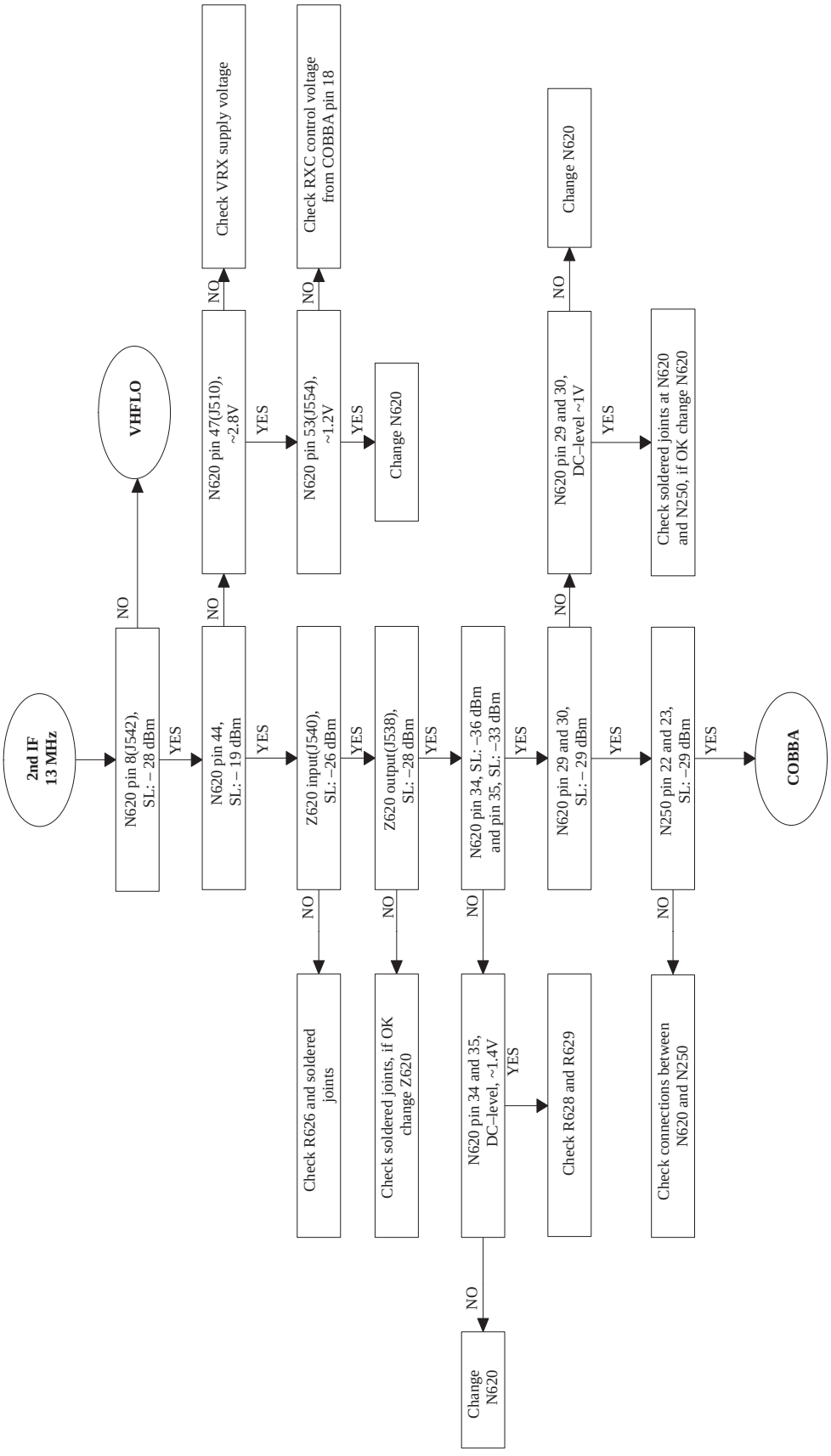
Receiver Fault (1)



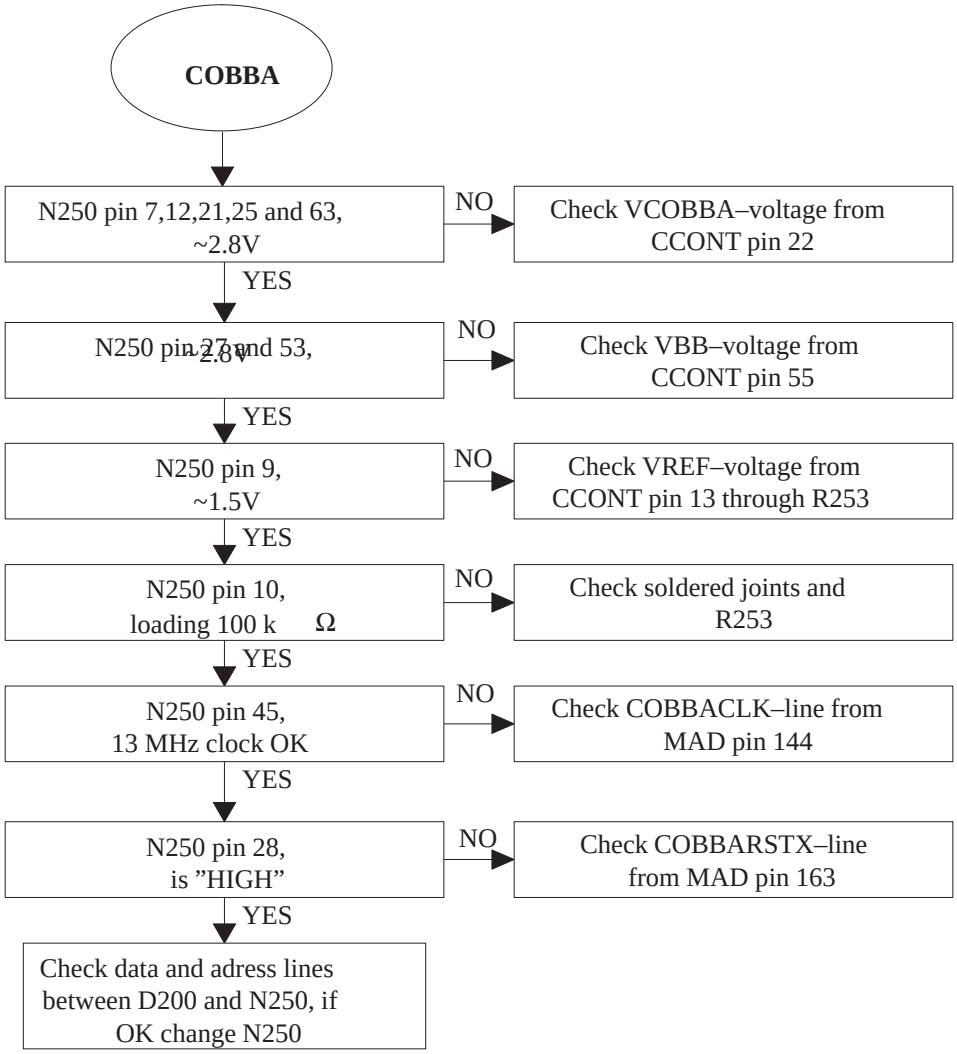
Receiver Fault (2)



Receiver Fault (3)

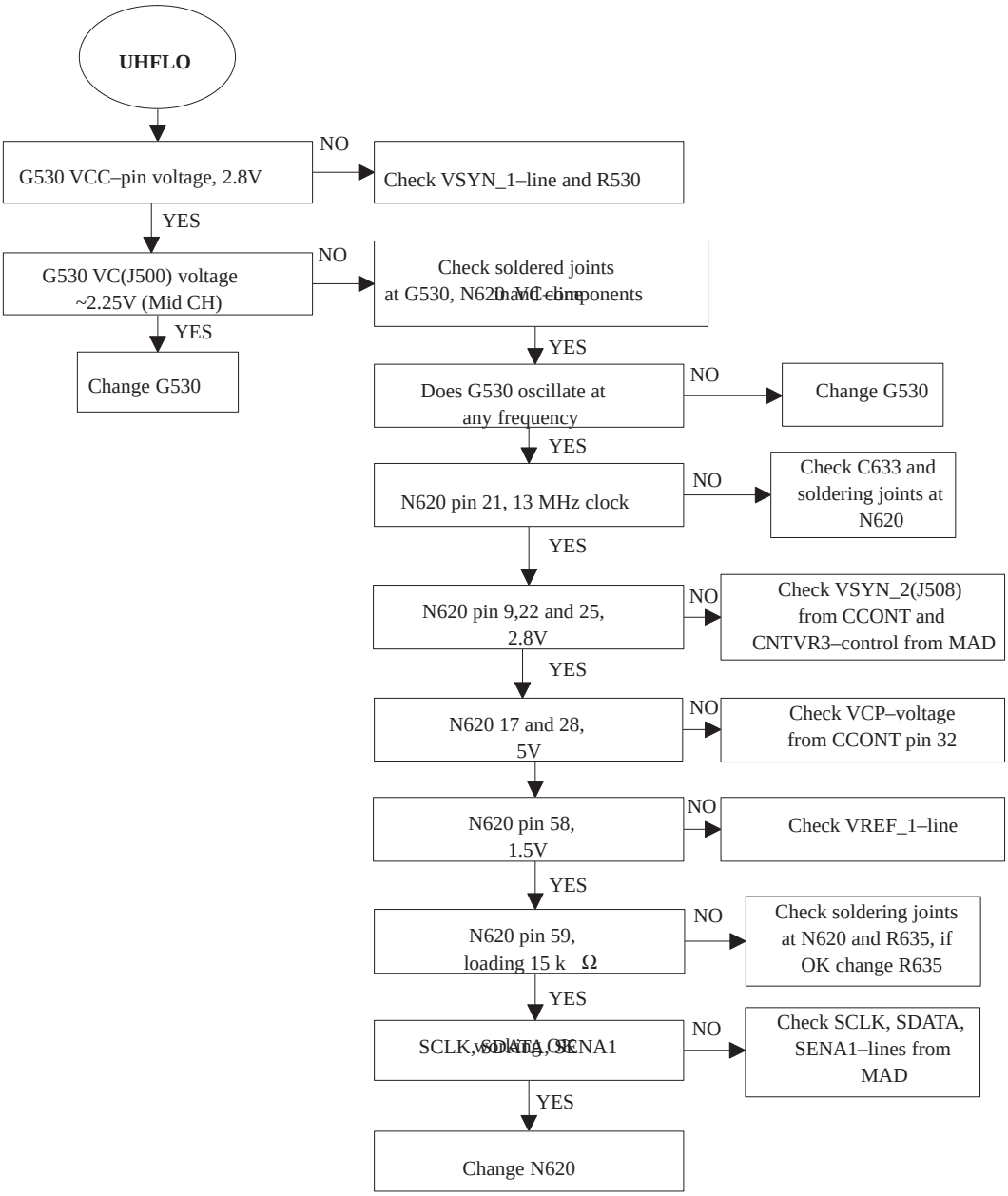


Receiver Fault (4)



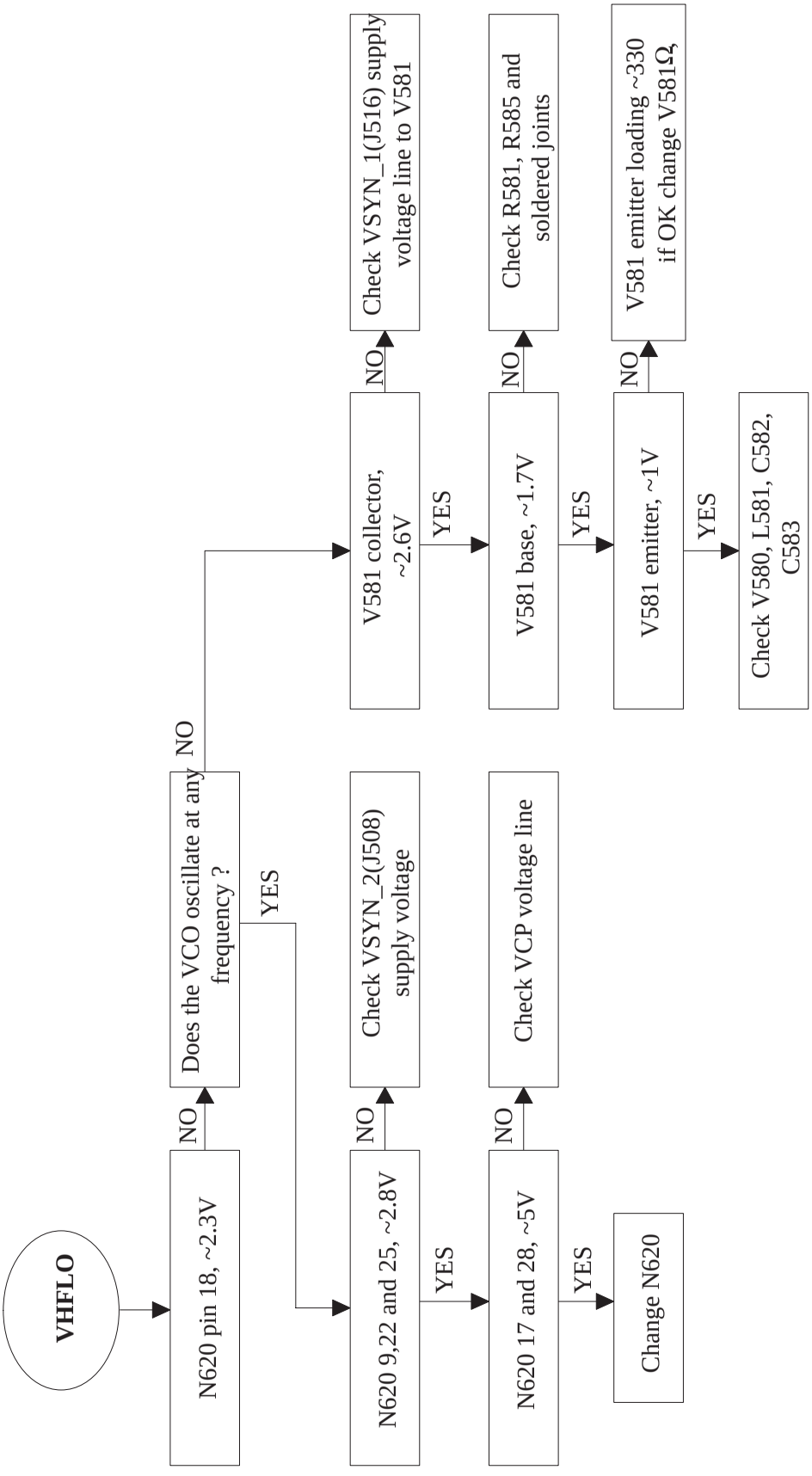
COBBACLK – signal:
Oscilloscope picture in Appendix A

Receiver Fault (5)

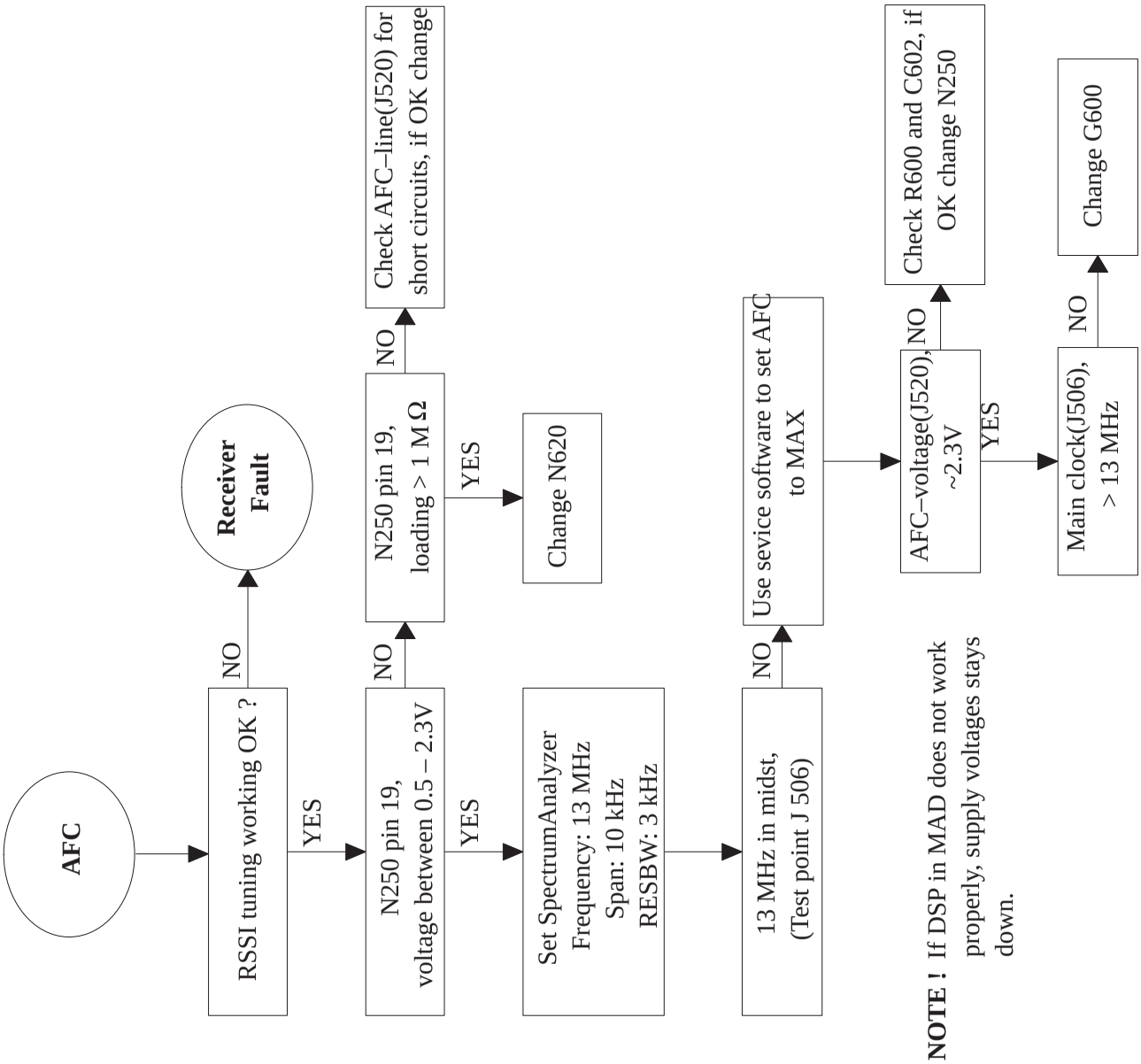


13 MHz clock oscilloscope picture in Appendix A
SCLK, SDATA, SENA1 oscilloscope pictures in Appendix B

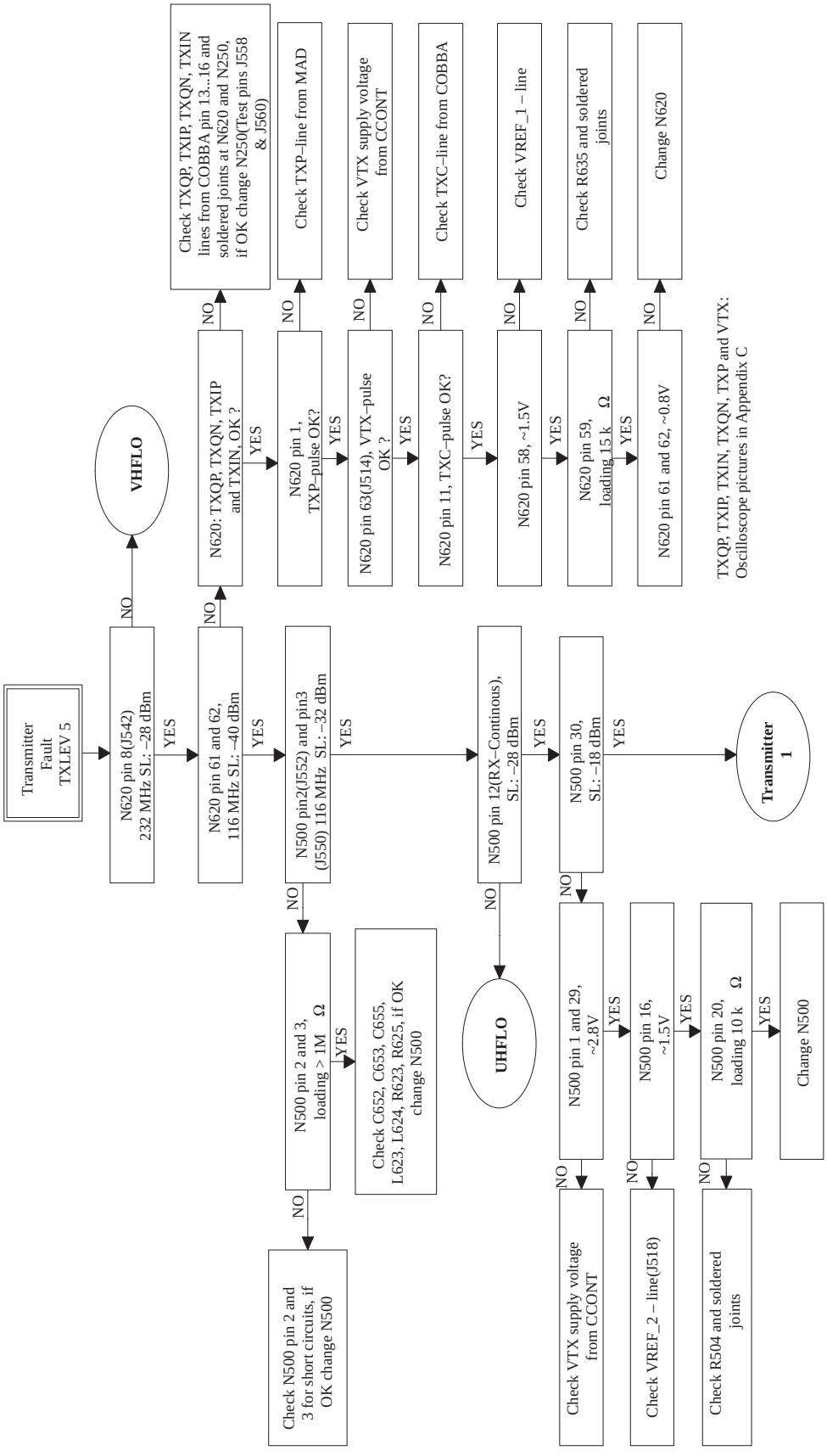
Receiver Fault (6)



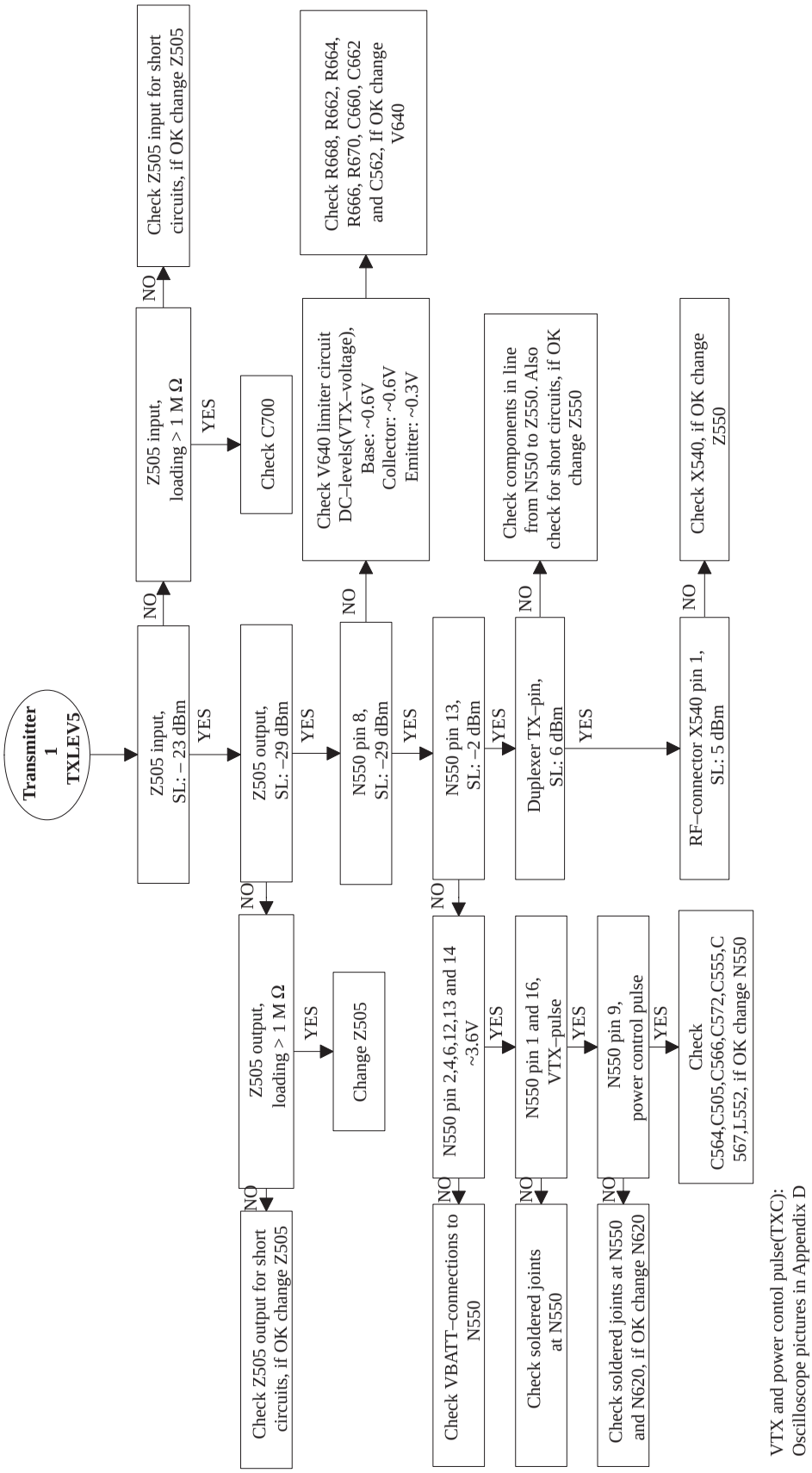
Receiver Fault (7)



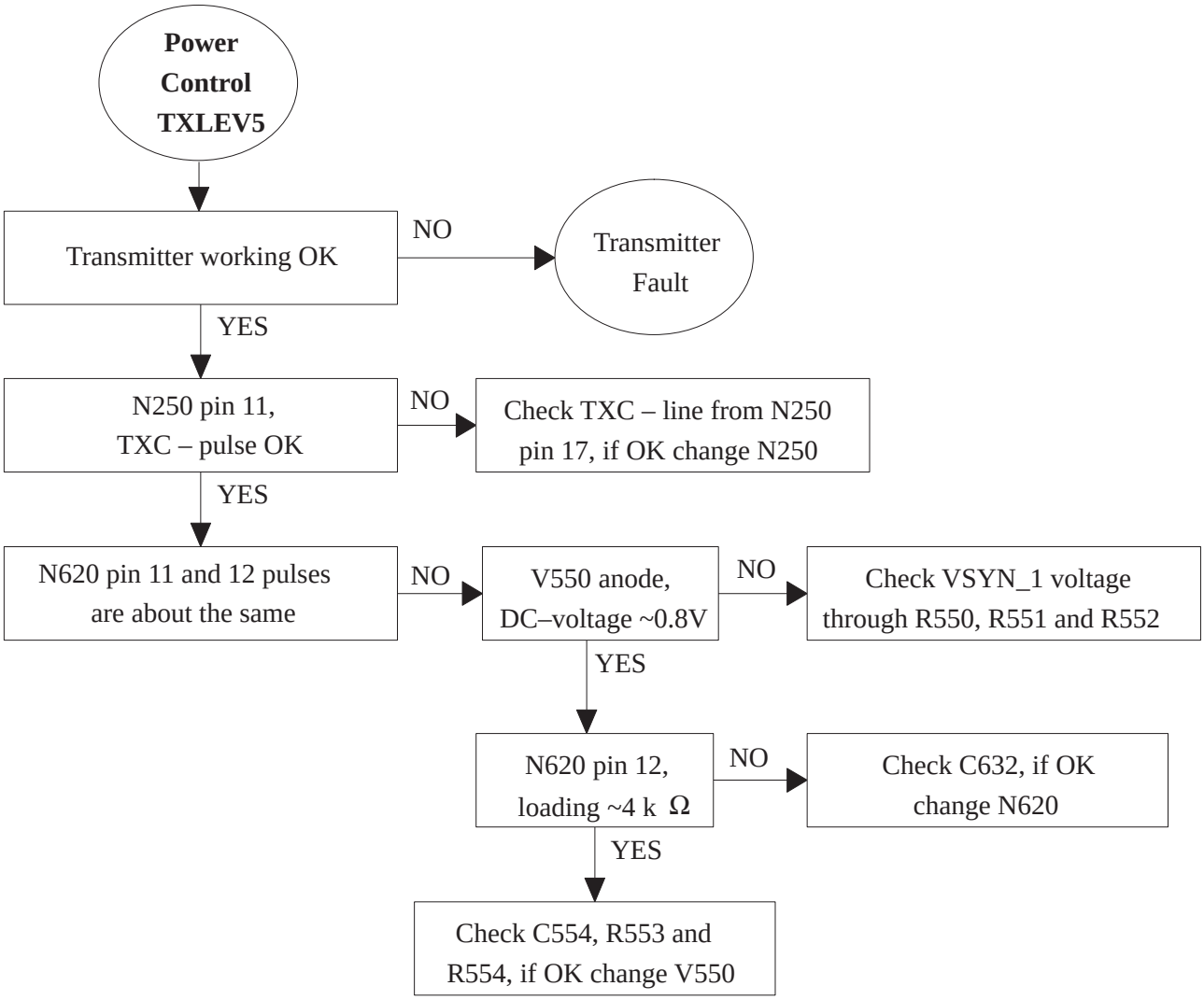
Transmitter Fault (1)



Transmitter Fault (2)

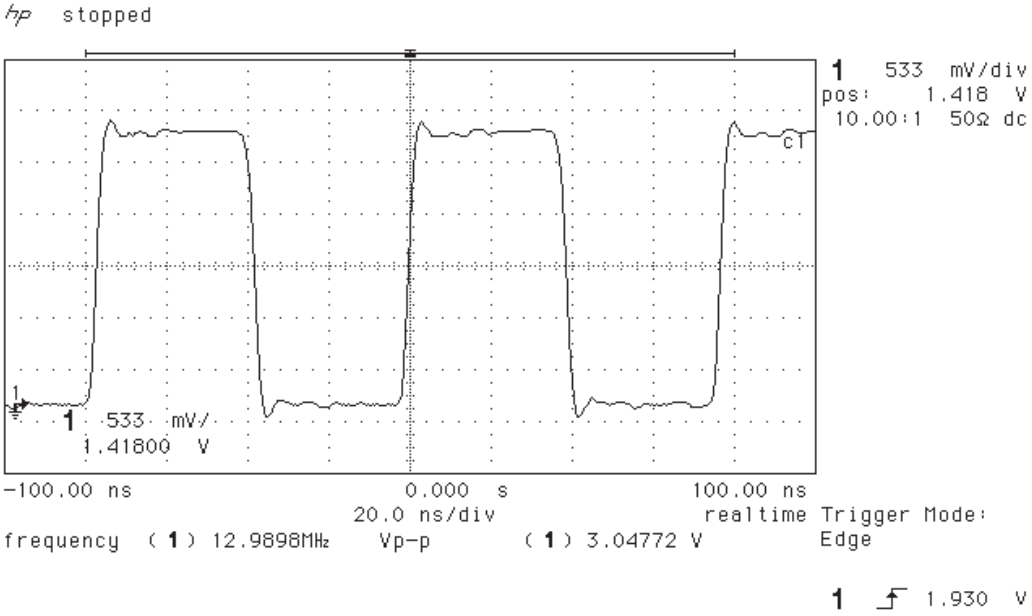


Transmitter Fault (3)

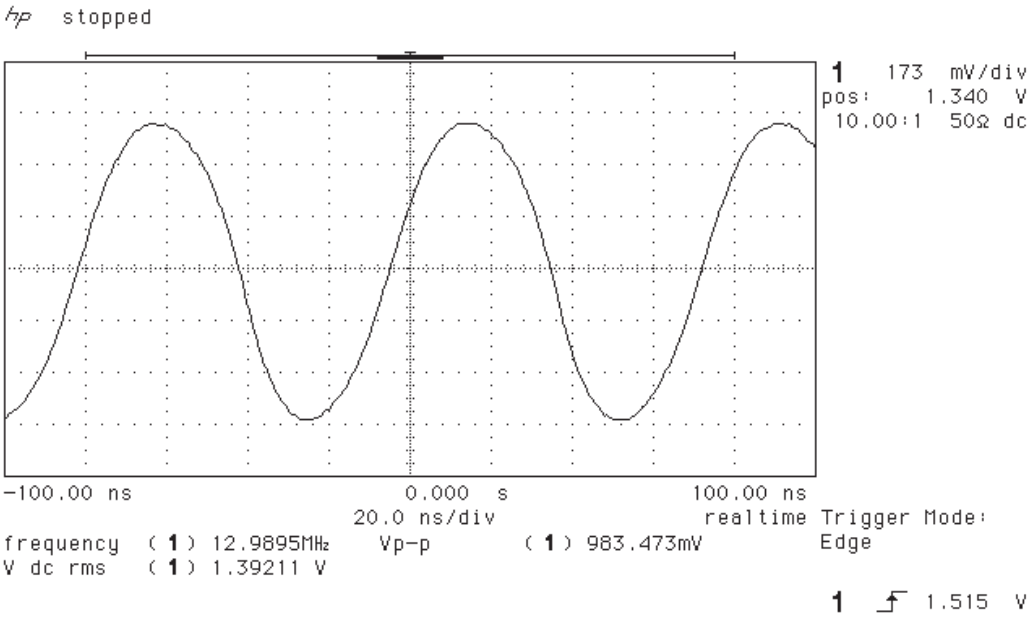


TXC – pulse:
Oscilloscope picture in Appendix D

Appendix A

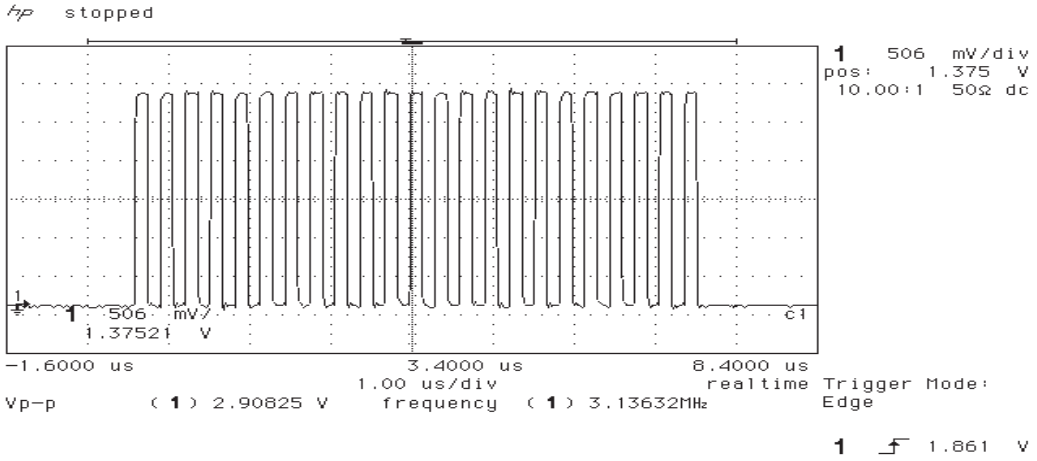


Picture 1. COBBACLK – signal

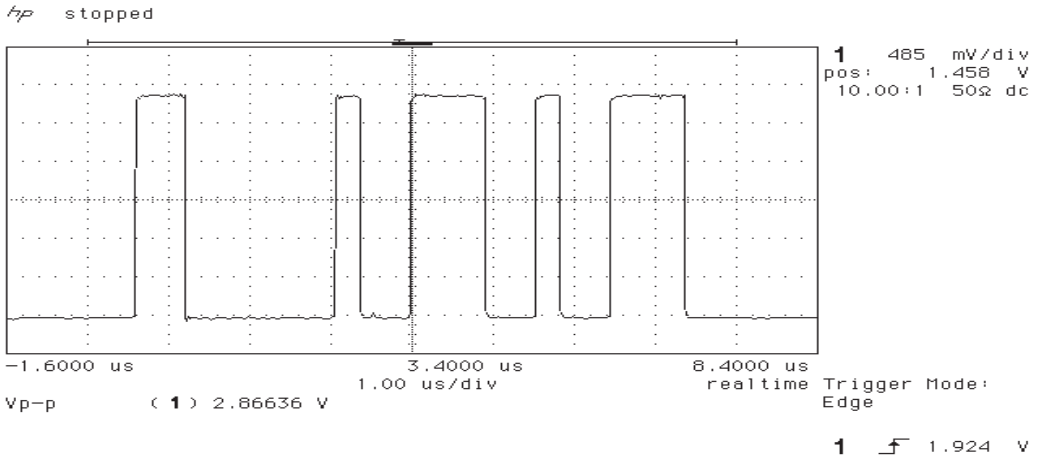


Picture 2. 13 MHz Main clock – signal

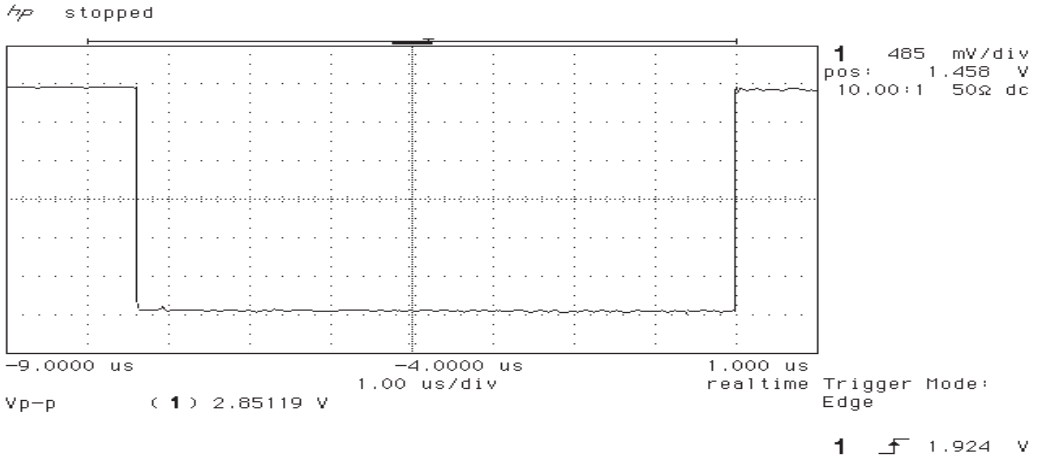
Appendix B



Picture 3. SCLK – signal

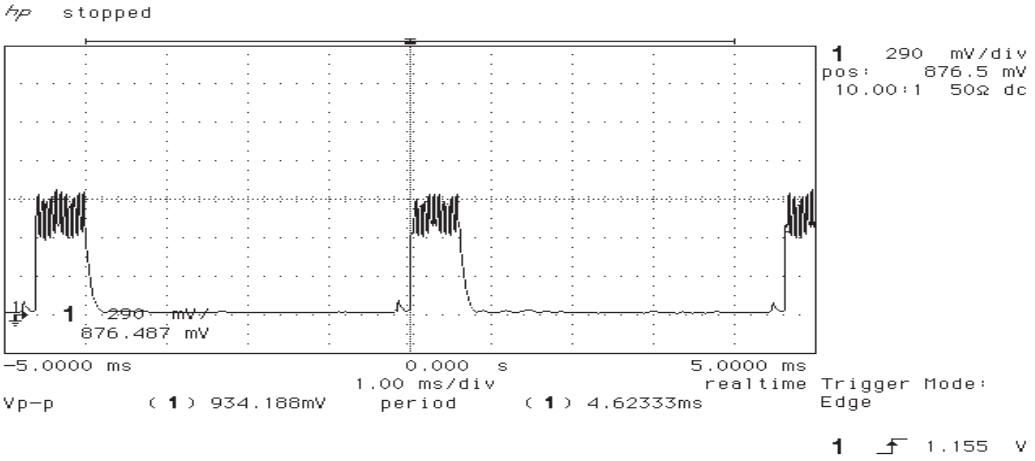


Picture 4. SDATA – signal

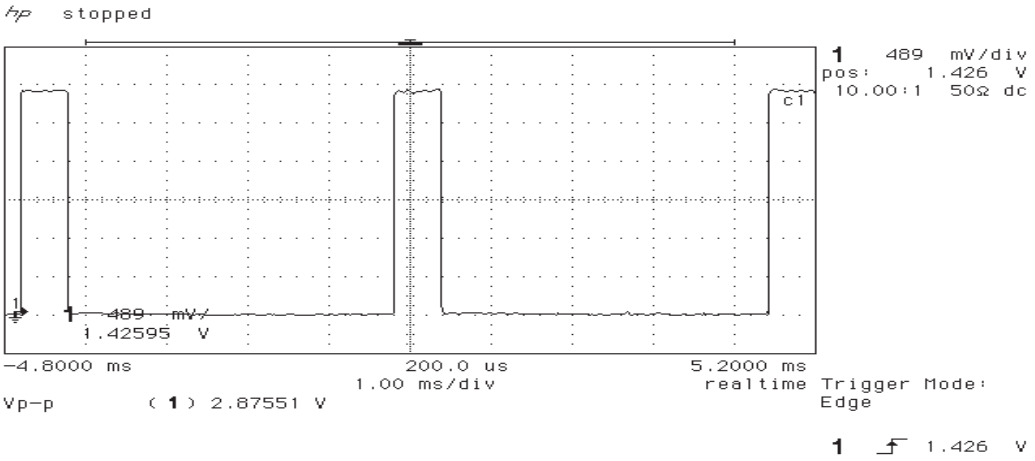


Picture 5. SENA1 – signal

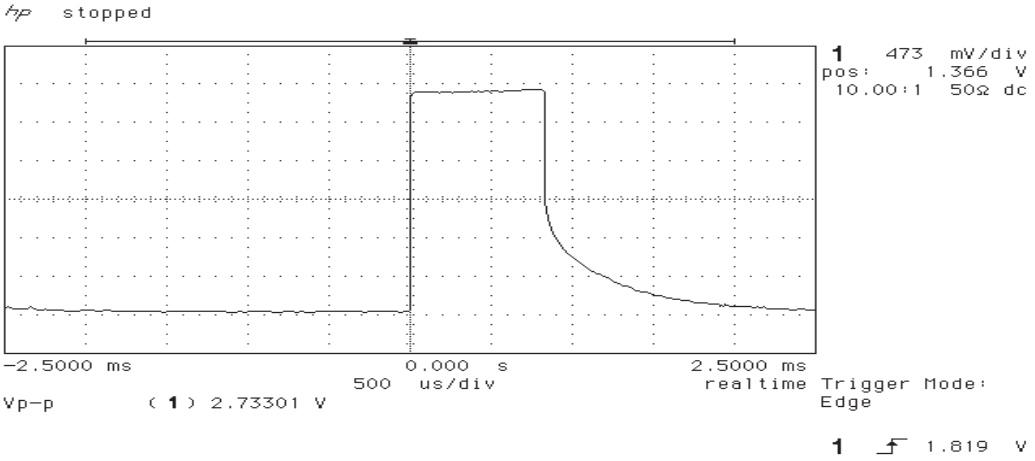
Appendix C



Picture 6. TXQP, TXQN, TXIP and TXIN – signal

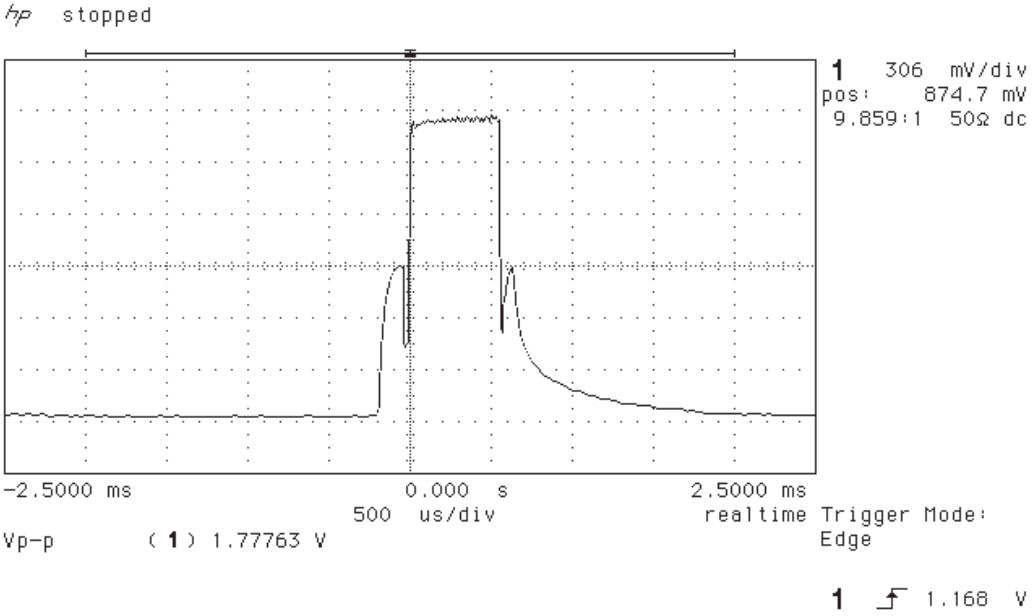


Picture 7. TXP – signal

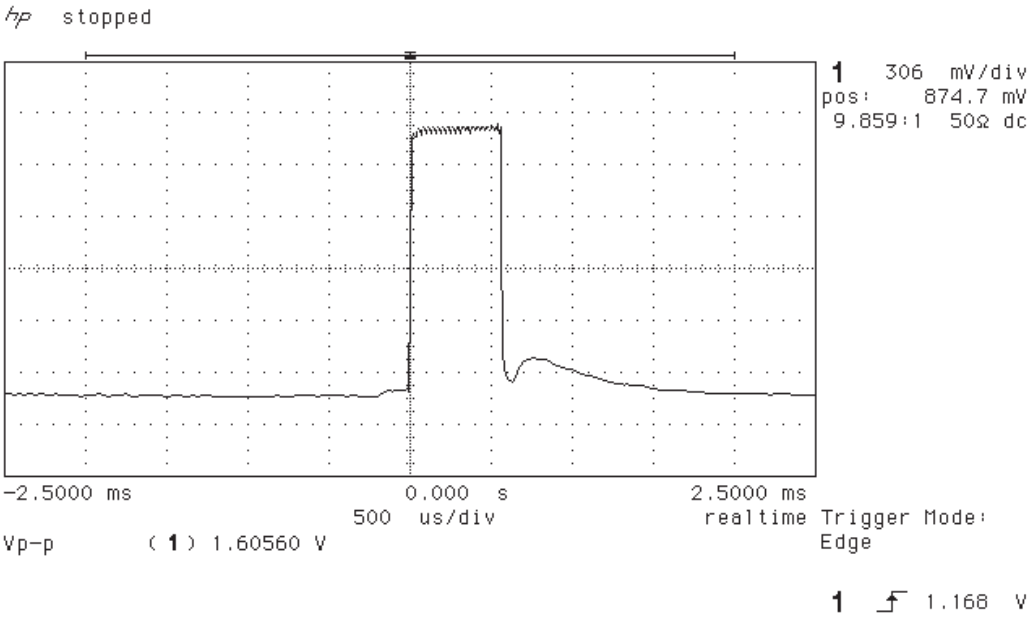


Picture 8. VTX – signal

Appendix D



Picture 9. TXC – signal (TXLEV5)



Picture 10. DET – signal(N620 pin 12) TXLEV5