

Chapter 6.

TFE-2 Model C TROUBLE- SHOOTING INSTRUCTIONS

TFE–2 Model C TROUBLESHOOTING INSTRUCTIONS

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Introduction

General

The purpose is to define fault block of the module and then find out the broken 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 diagrams 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
- Power supply (2.0 A)
- Digital multimeter
- Oscilloscope
- Spectrum analyzer
- Signal generator
- RF cables
- Modular cable
- RS232/MBUS adapter
- RF measuring chassis
- Termination

The Troubleshooting for TFE–2 Model C consists of a series of checks according to the following flow diagrams.

Baseband Troubleshooting

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

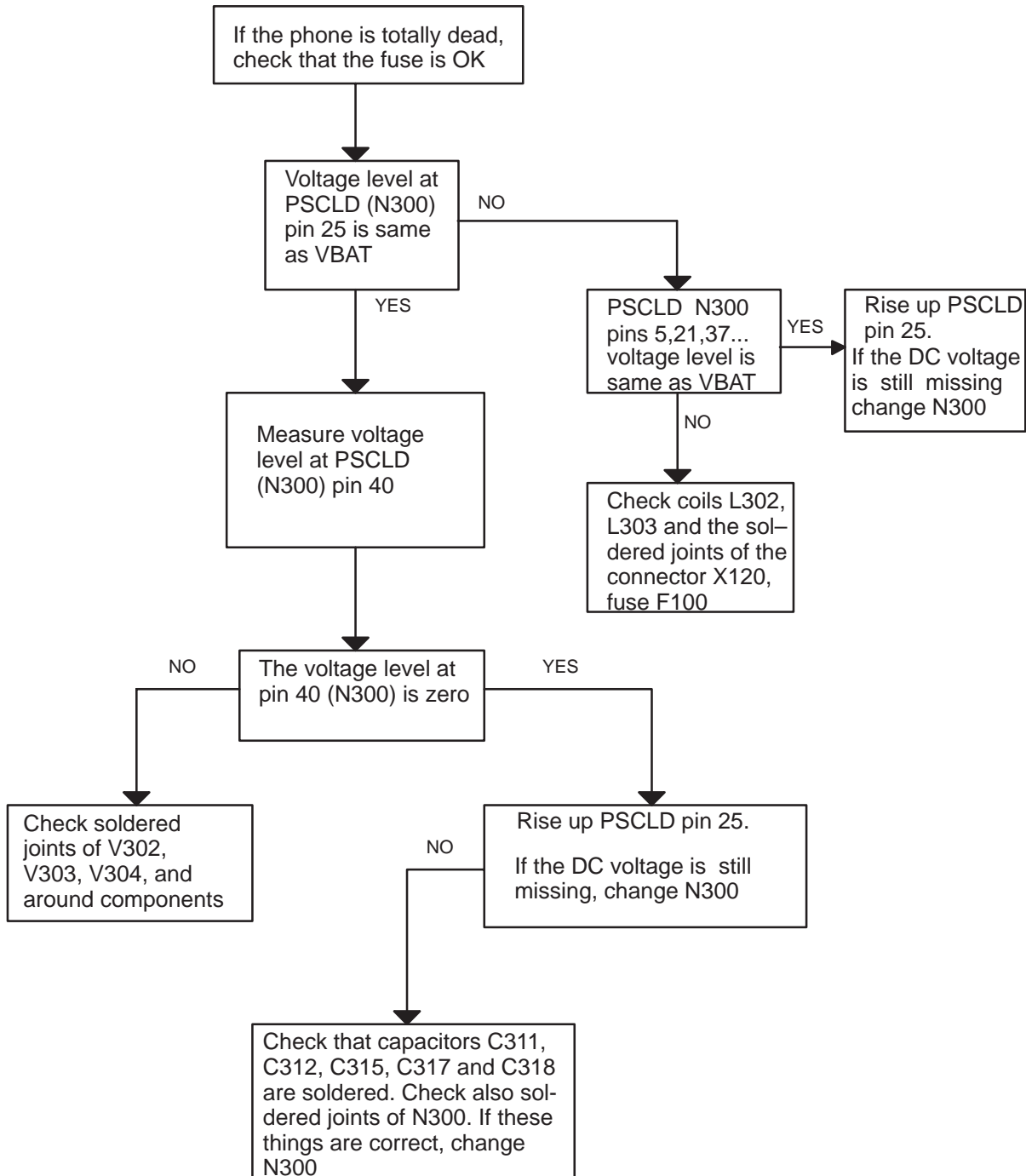
1. Terminal is totally dead
2. Flash programming doesn't work
3. Power doesn't stay on or the terminal is jammed
4. Display information: Contact Service
5. Terminal doesn't register to the network or terminal doesn't make a call.
6. Plug in SIM card is out of order (insert SIM card or card rejected).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

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

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

Terminal is Totally Dead

Troubleshooting diagram for this fault is represented in following figure. 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 (X103) and the PSCLD (N301).



Flash Programming Doesn't Work

The block diagram for the flash programming is shown in figure 12. 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 a 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

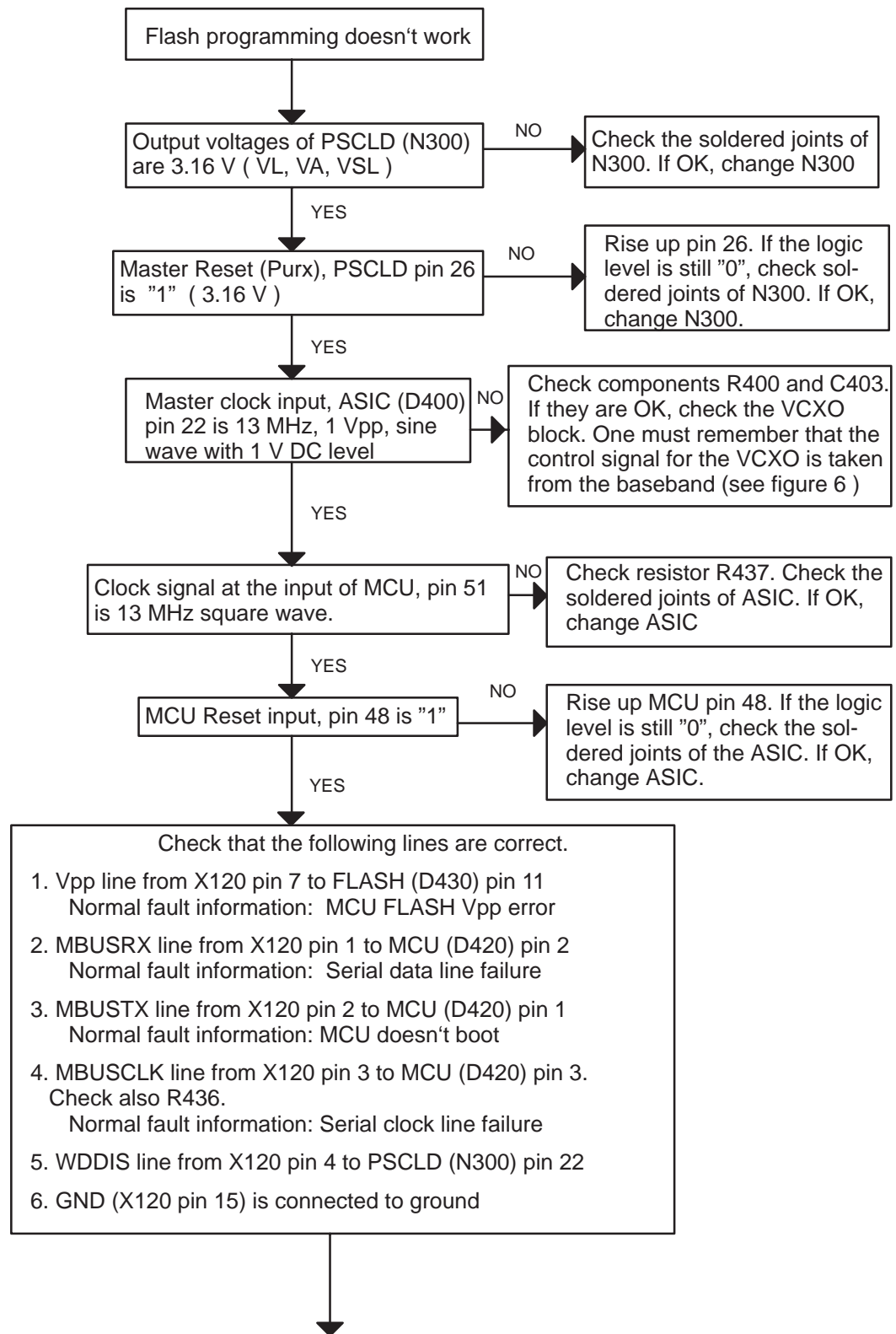
In cases that the the flash programming doesn't succeed, there is a possibility to test the interface between the ASIC and the MCU.

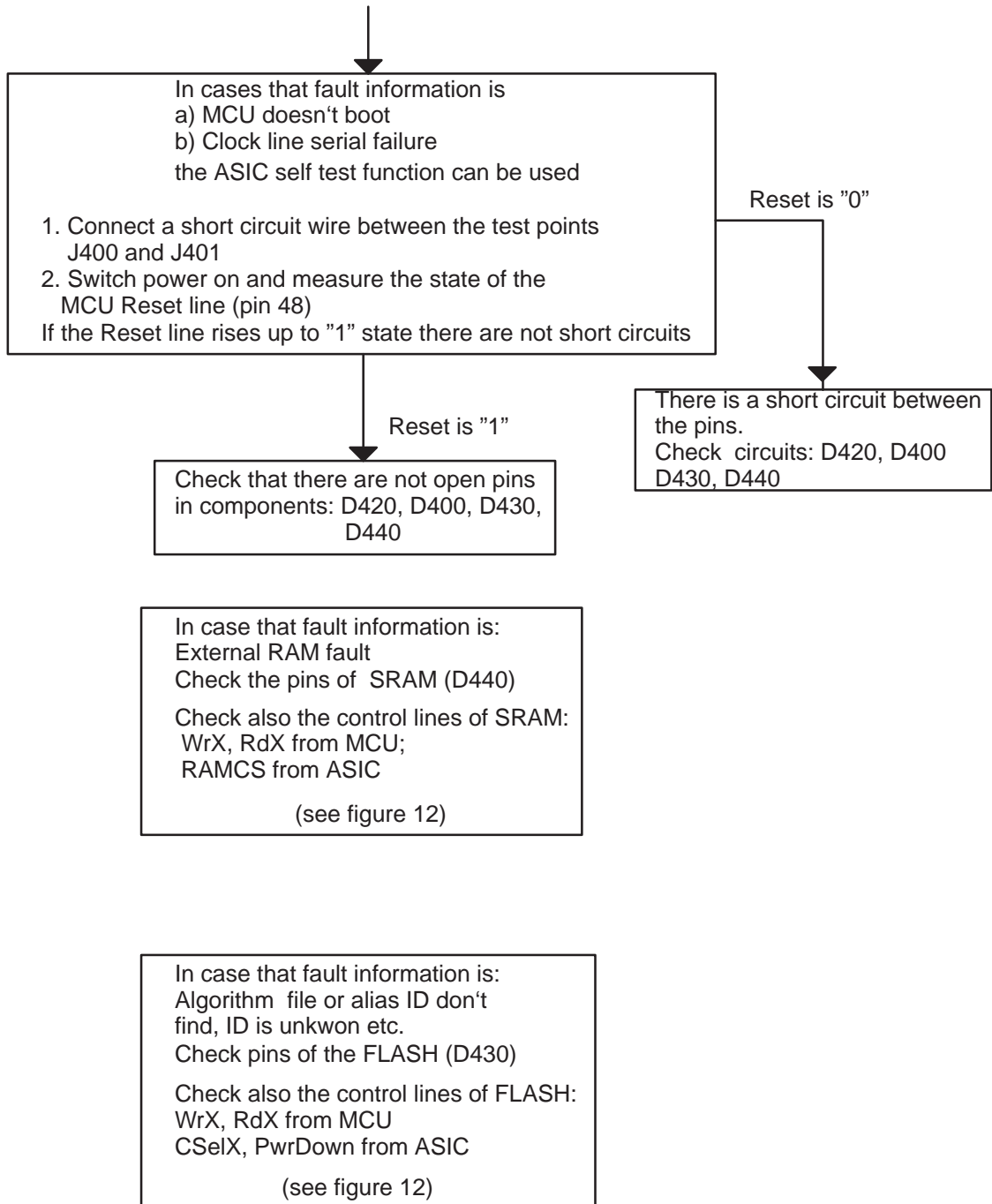
This test is useful to do, when the fault information is: MCU doesn't boot or Serial clock line failure.

The test procedure is following:

1. Connect a short circuit wire between the test points J400 and J401.
2. Switch power on.
3. If the reset line of the MCU rises up, the interface is OK. Otherwise the reset line stays low.

One must be noticed that this test can be found only short circuits, not open pins. This test indicate also that 32 kHz clock is running because of the test logic is made by 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: D420 (MCU), D400 (ASIC), N300(PSCLD), D430 (FLASH), D440 (SRAM) is useful to check at first.

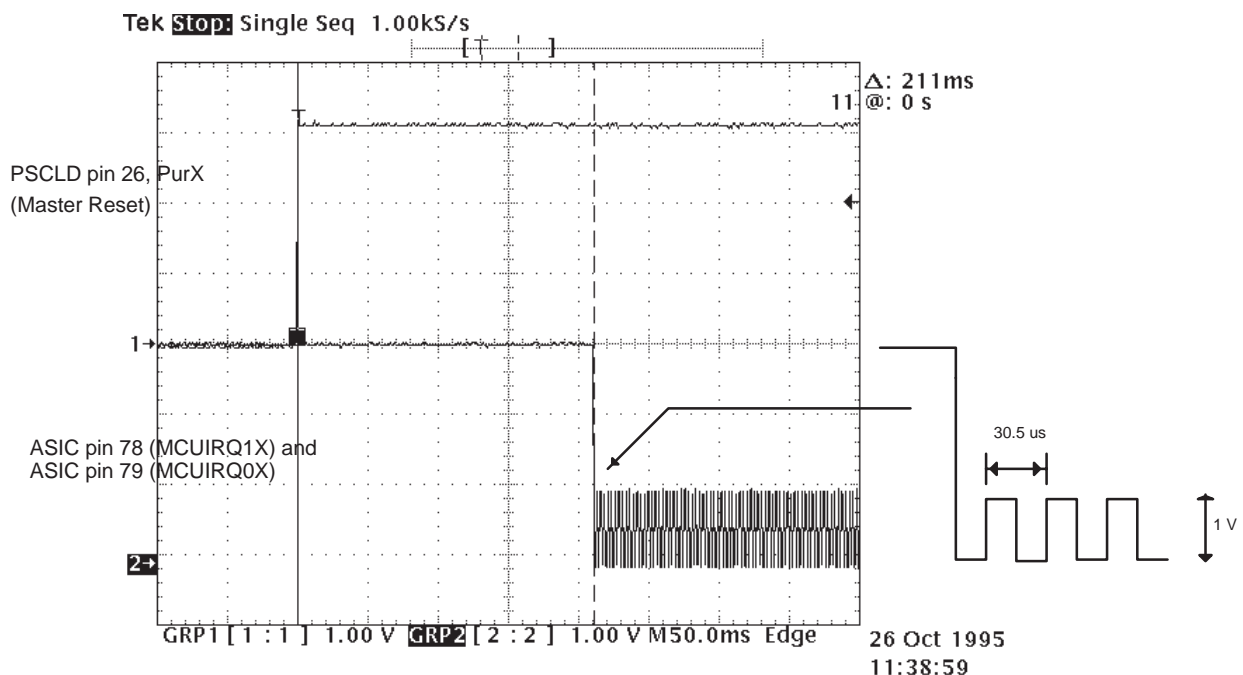
Normally, the power switch off after 30 seconds, if the watchdog of the PSCLD can not be served by software. The power off function can be prevented by connecting a short circuit wire from the PSCLD pin 22 (WDDIS) to the ground.

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 32 kHz clock oscillator must be checked. This can be done by setting the phone to the ASIC self test mode.

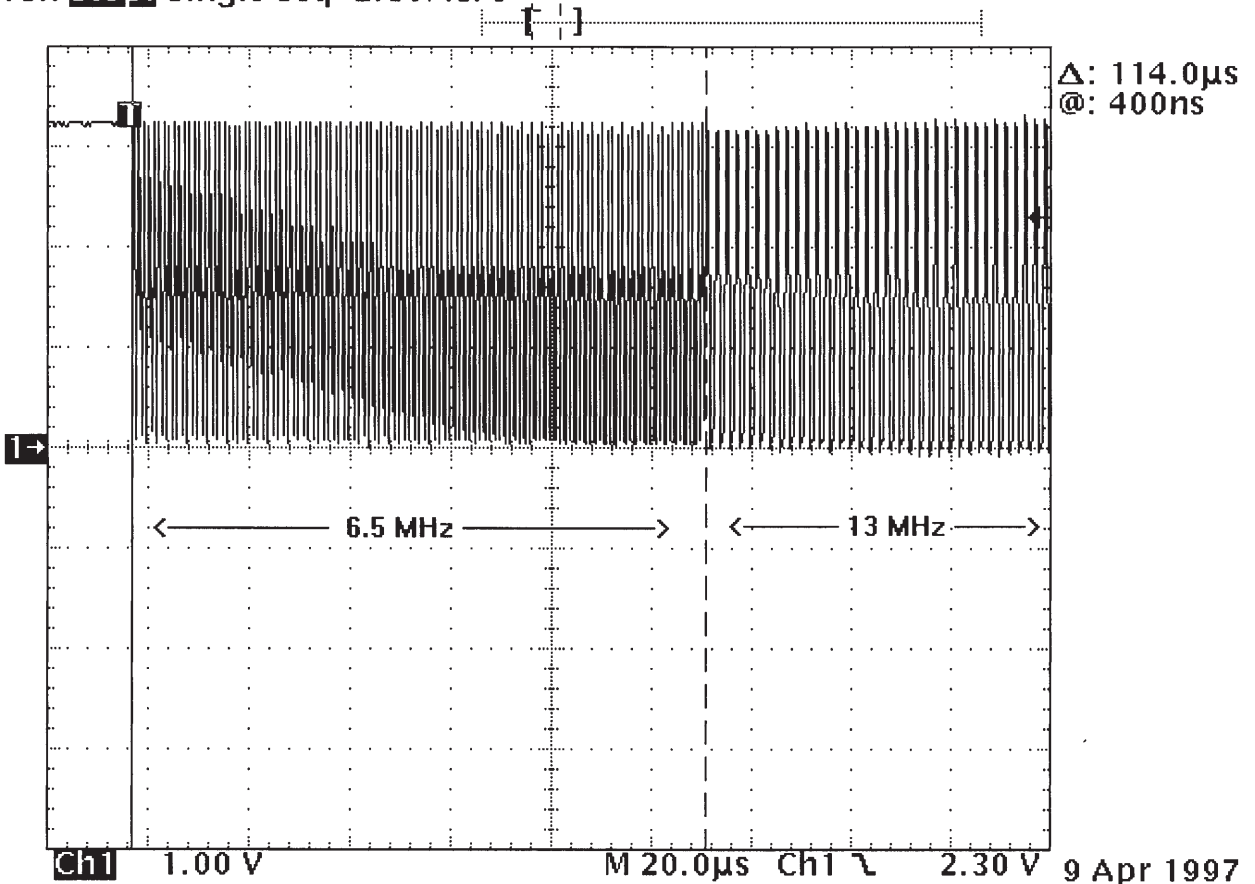
1. Connect a short circuit wire between the test points J400 and J401.
2. Make a short circuit between the ASIC pins 78 and 79.
3. Switch power on.
4. Measure the signal by oscilloscope at pins 78, 79 (ASIC).

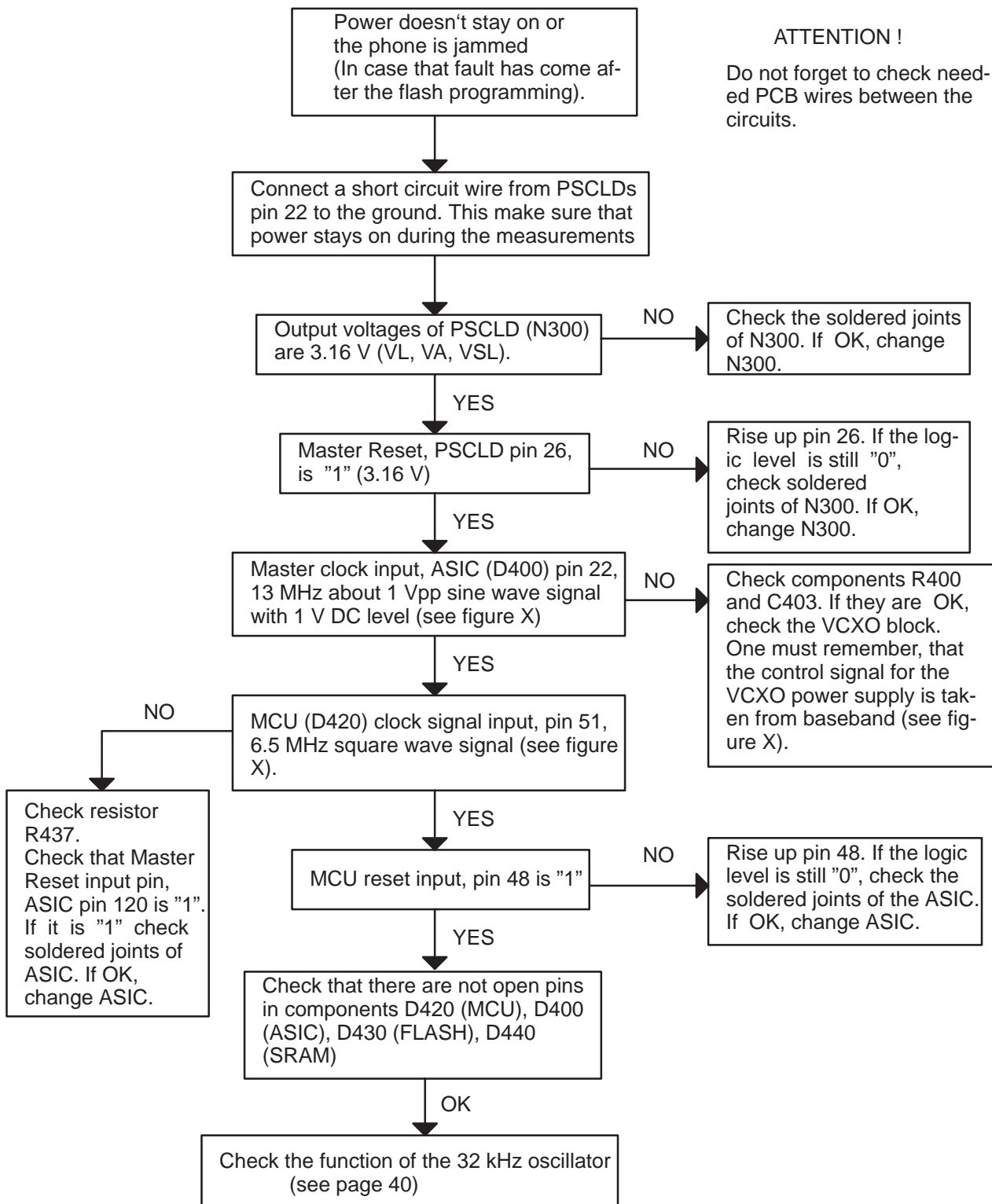
The Function of the 32 kHz Clock Oscillator in Test Circumstances



The MCU Clock Signal During Start-up Phase

Tek **Stop:** Single Seq 2.50MS/s



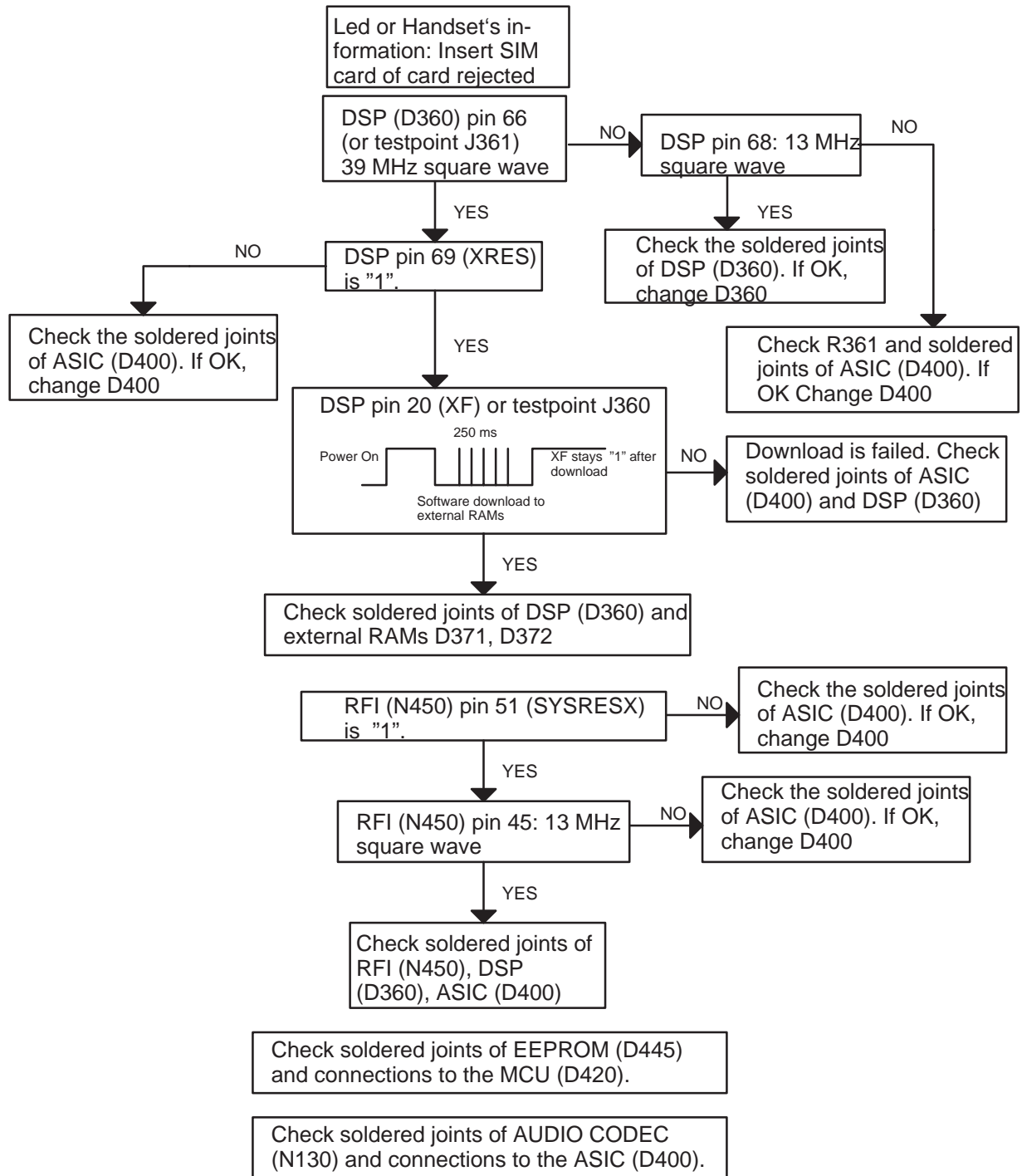


LED Indication or Handset's display Information: Contact Service

This fault means that MCU is able to run and the watchdog of the PSCLD (N300) can be served. Thus PCLocals functions can be used and some information about the fault is possible to get.

If LED combination suggests "Contact Service" in TFE-2 Model C, it may also be because immobilizer has gone off. Check the state of immobilizer with handset. If it shows "Install terminal" or "Terminal moved", contact your local operator for assistance.

The diagram is on the next page.



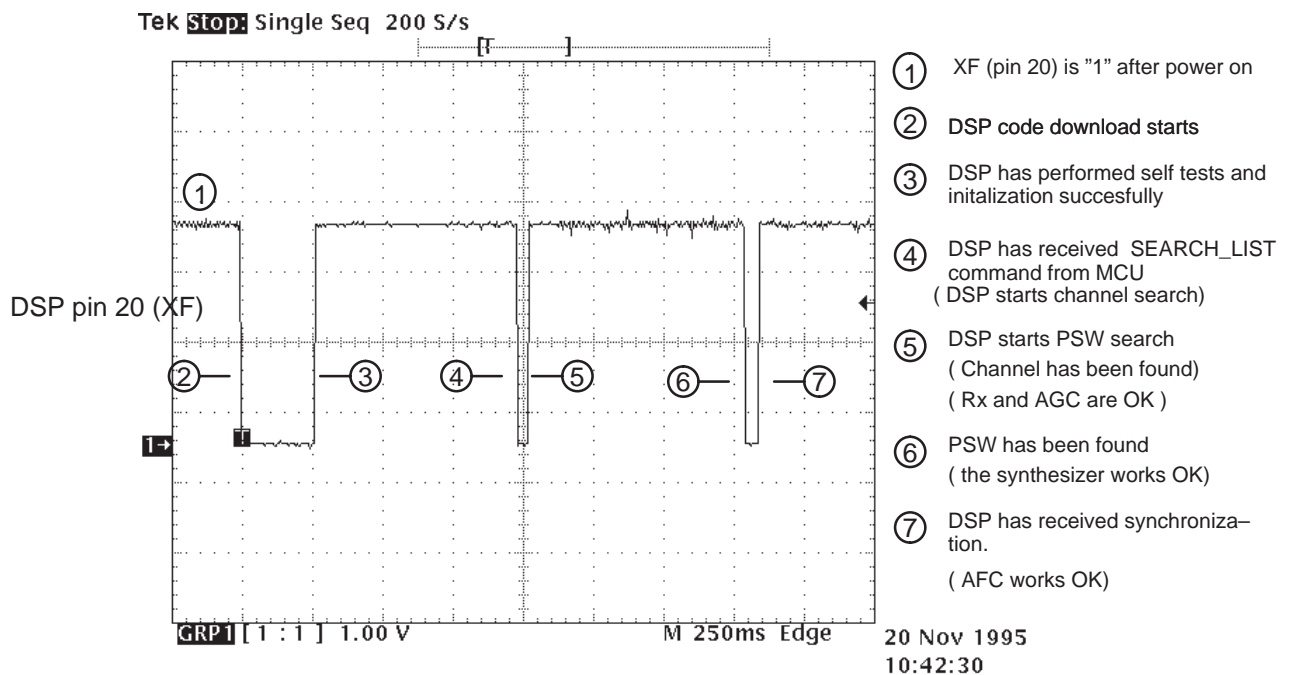
The Terminal Doesn't Register to The Network (no serv) or Doesn't Make a Call

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

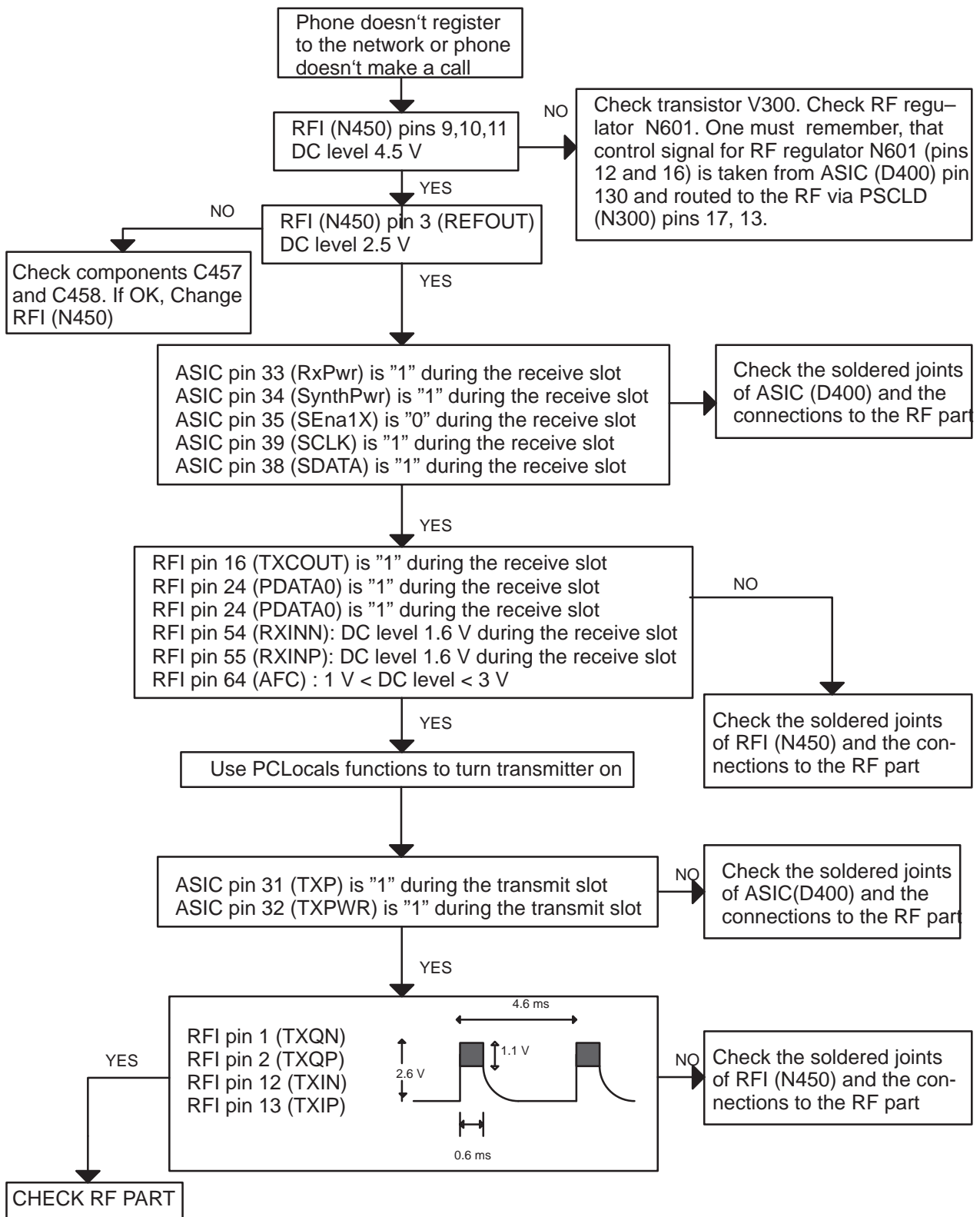
The control lines for RF are supplied both the ASIC (D400) and the RFI (N450). The ASIC handles digital control lines (between "0" = 0 V and "1" = 3.16 V) and the RFI handles analog control lines and proper input and output signals.

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 (see figure 38).

The States of The DSP after Power On

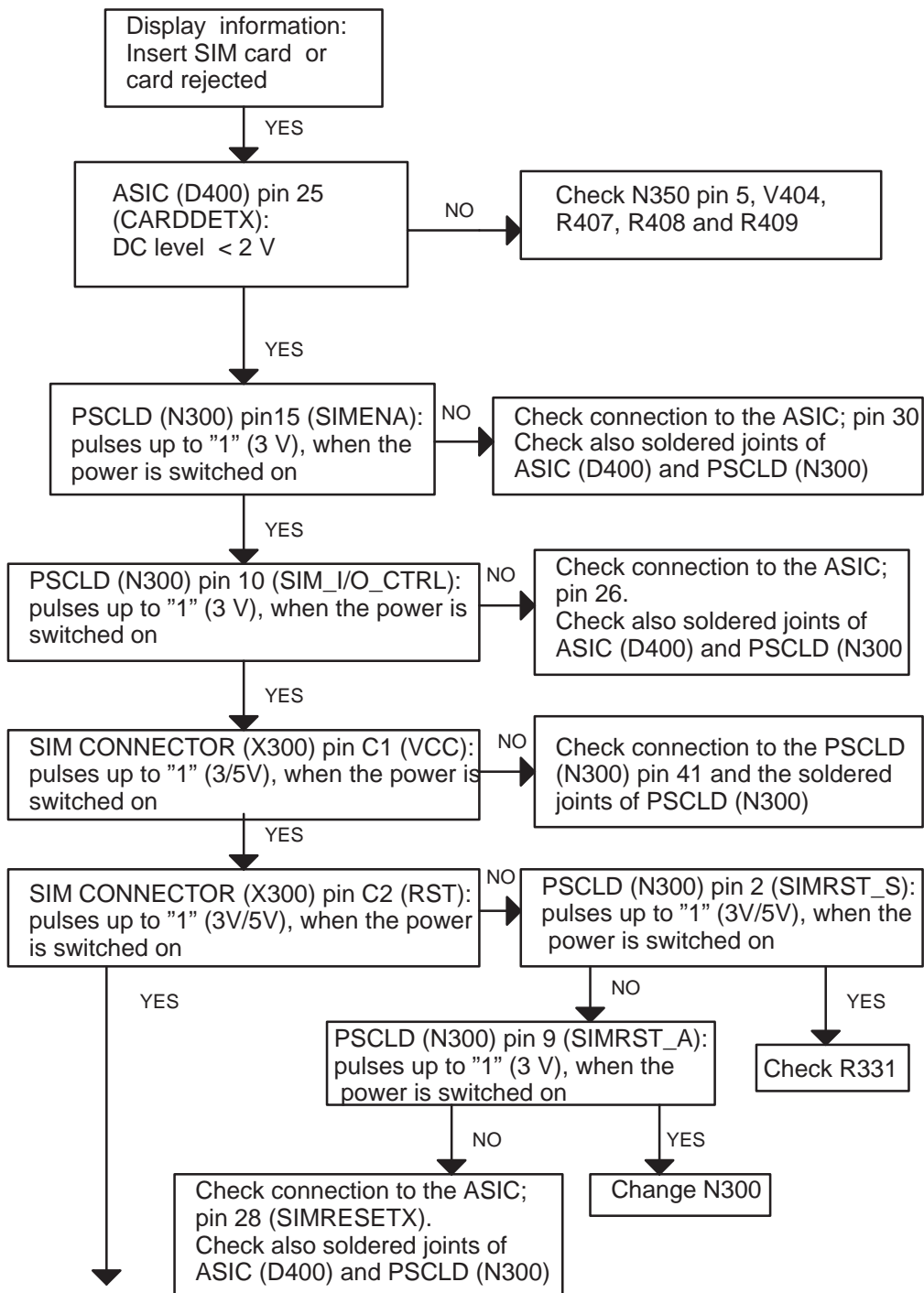


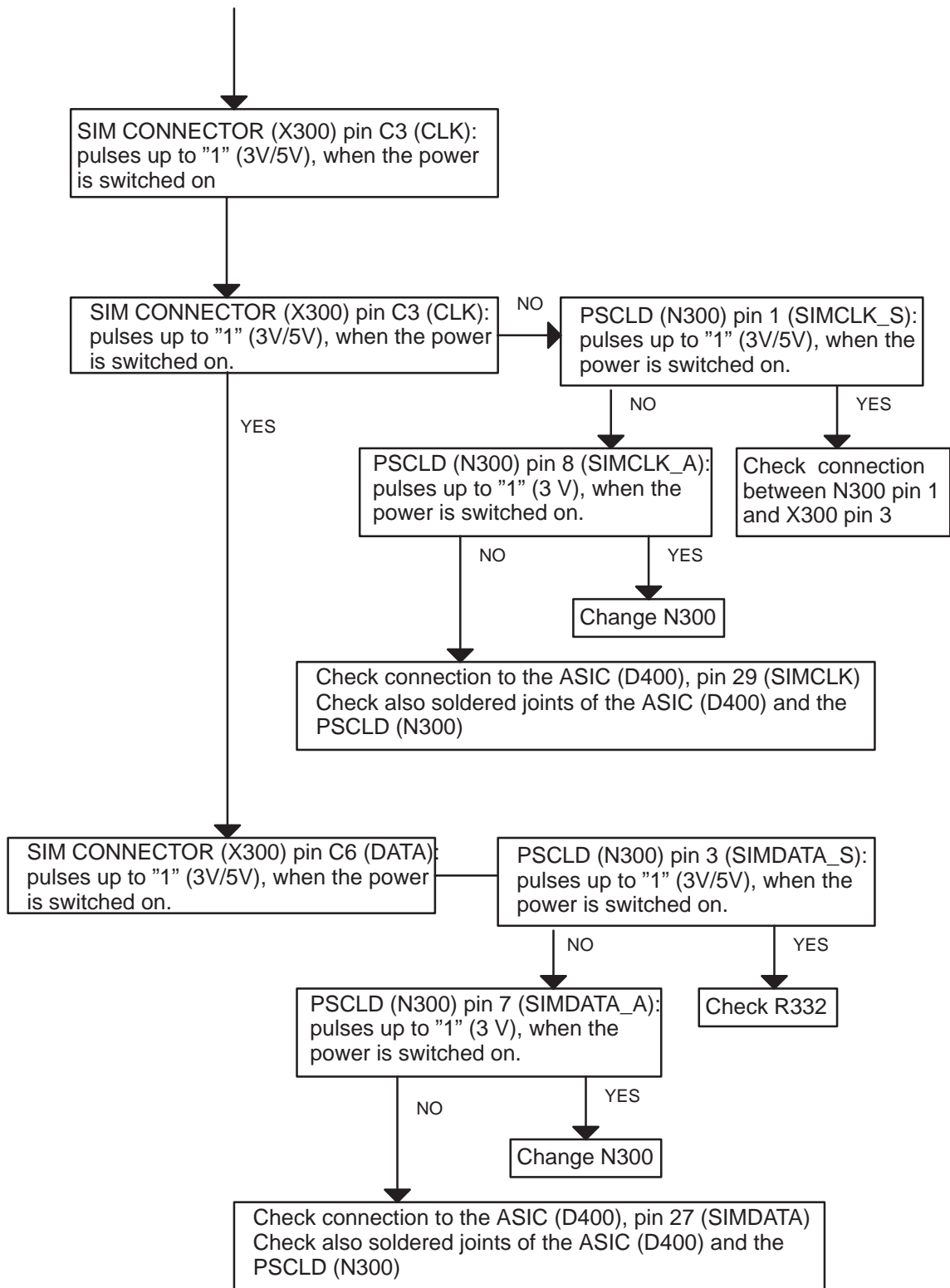
The Terminal doesn't register to the network (No Serv) or doesn't make a call



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

The hardware of the SIM interface from the ASIC (D400) to the SIM connector (X300) can be tested without SIM card. When the power is switched on, all the used lines (VSIM, RST, CLK, DATA) rises up to "1" (first 3V and then 5 V) four times. Thus the fault can be found without the SIM card in most cases.



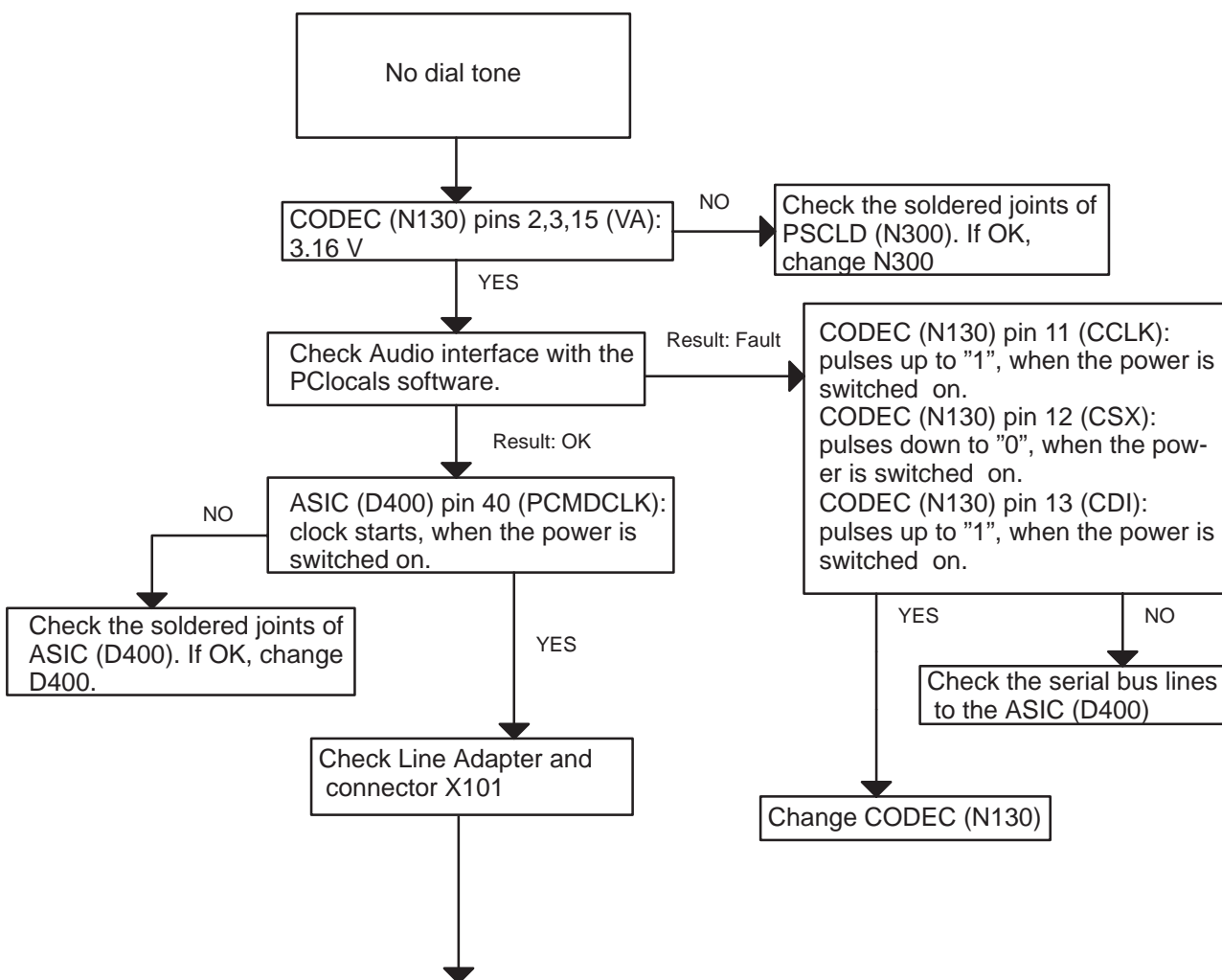


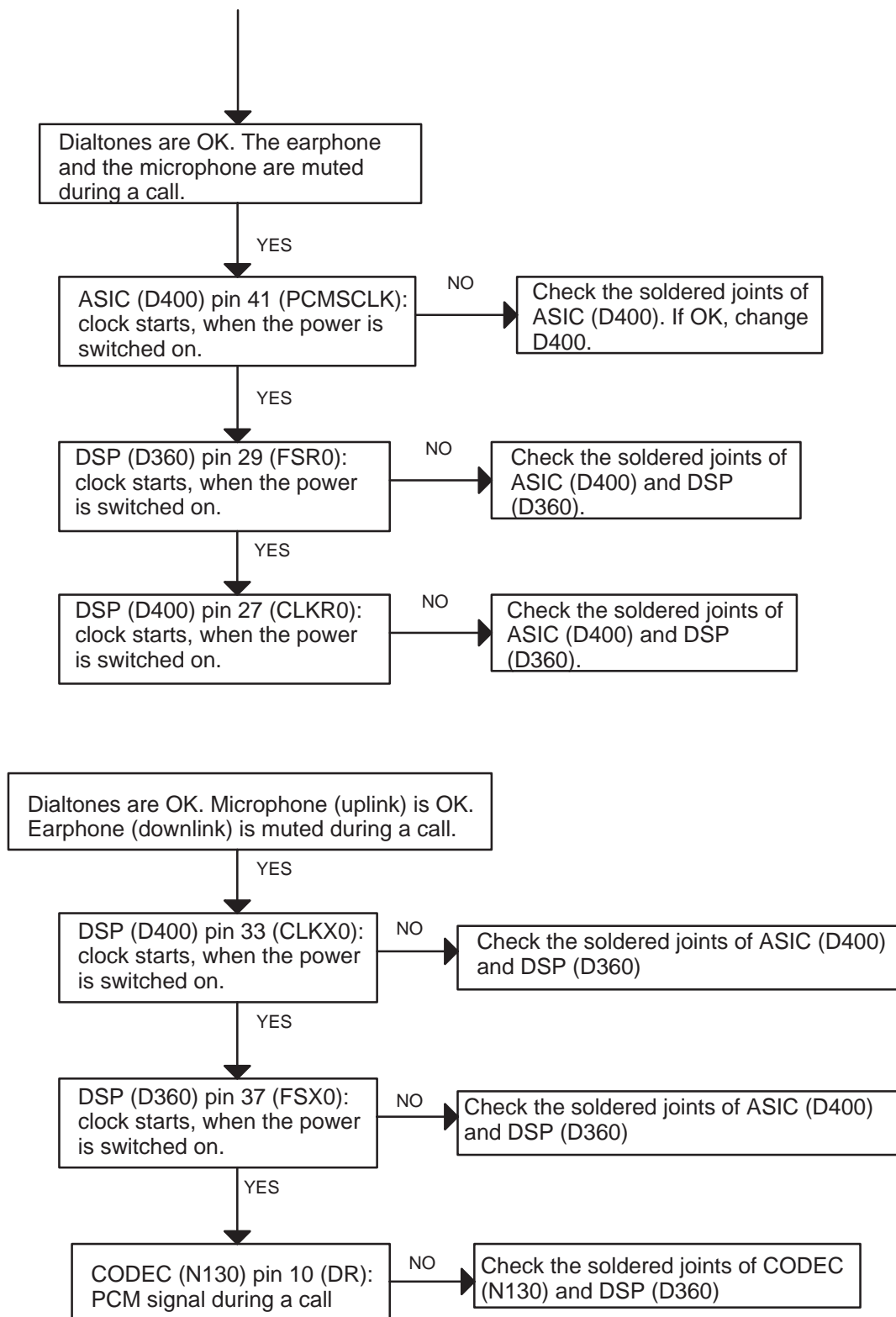
Audio Fault

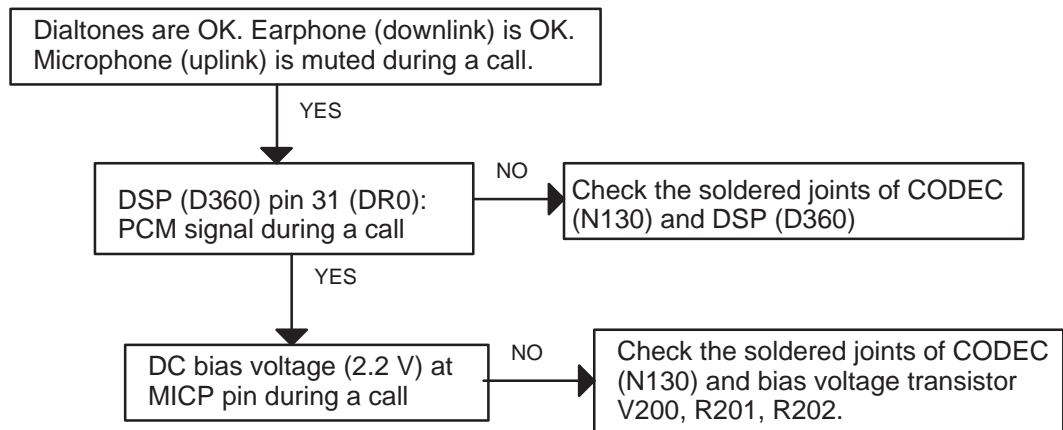
In cases that audio routings are totally muted, a fault could be in serial bus. This serial bus is used for PSCLD (N300), so if the PSCLD is OK, there are open pins in the AUDIO CODEC (N130) or the AUDIO CODEC is faulty.

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

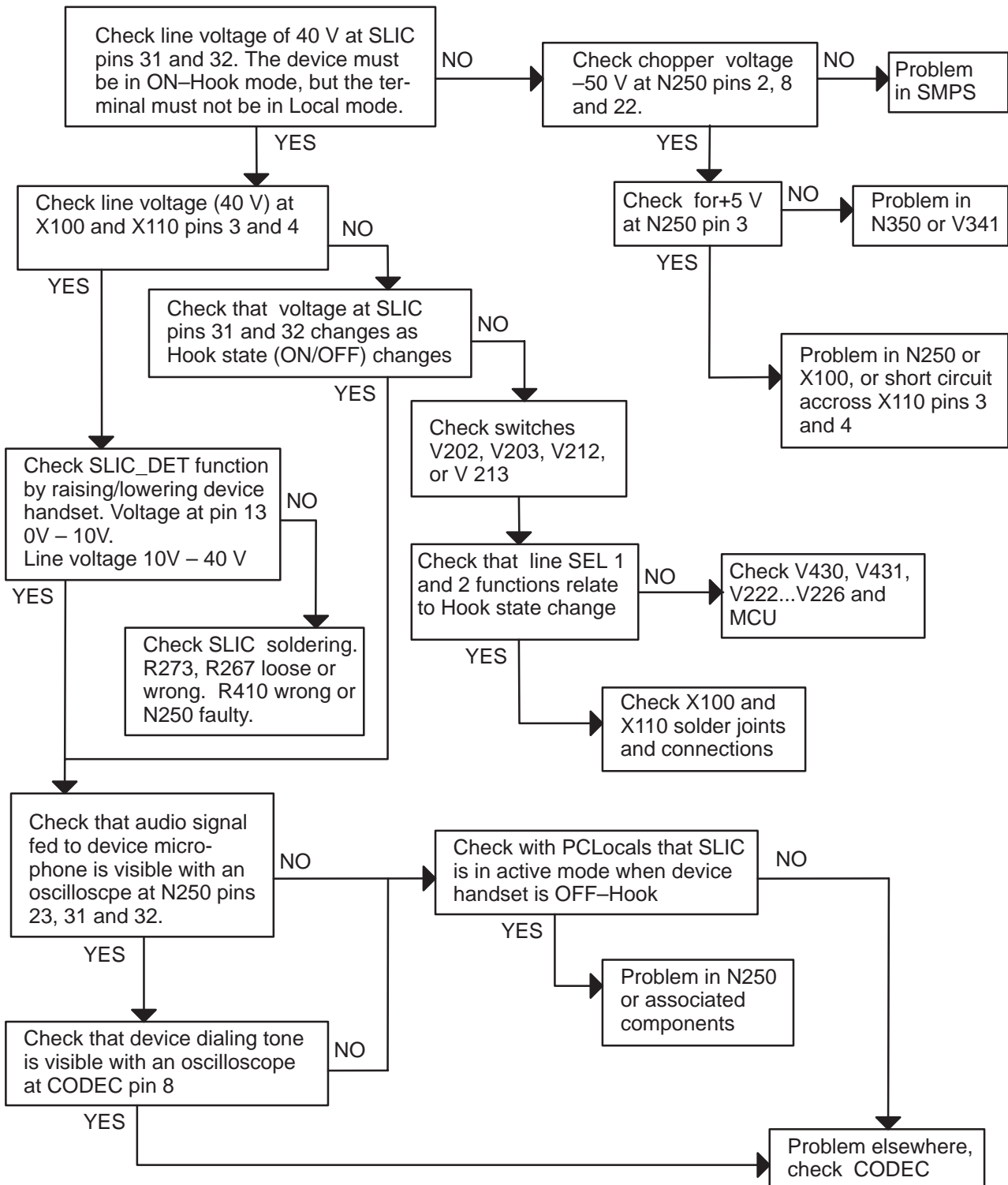
Other possibilities are that PCM clock and sync lines are open. CODEC (N130), ASIC (D400) and DSP (D360) must be checked (see figure 27).





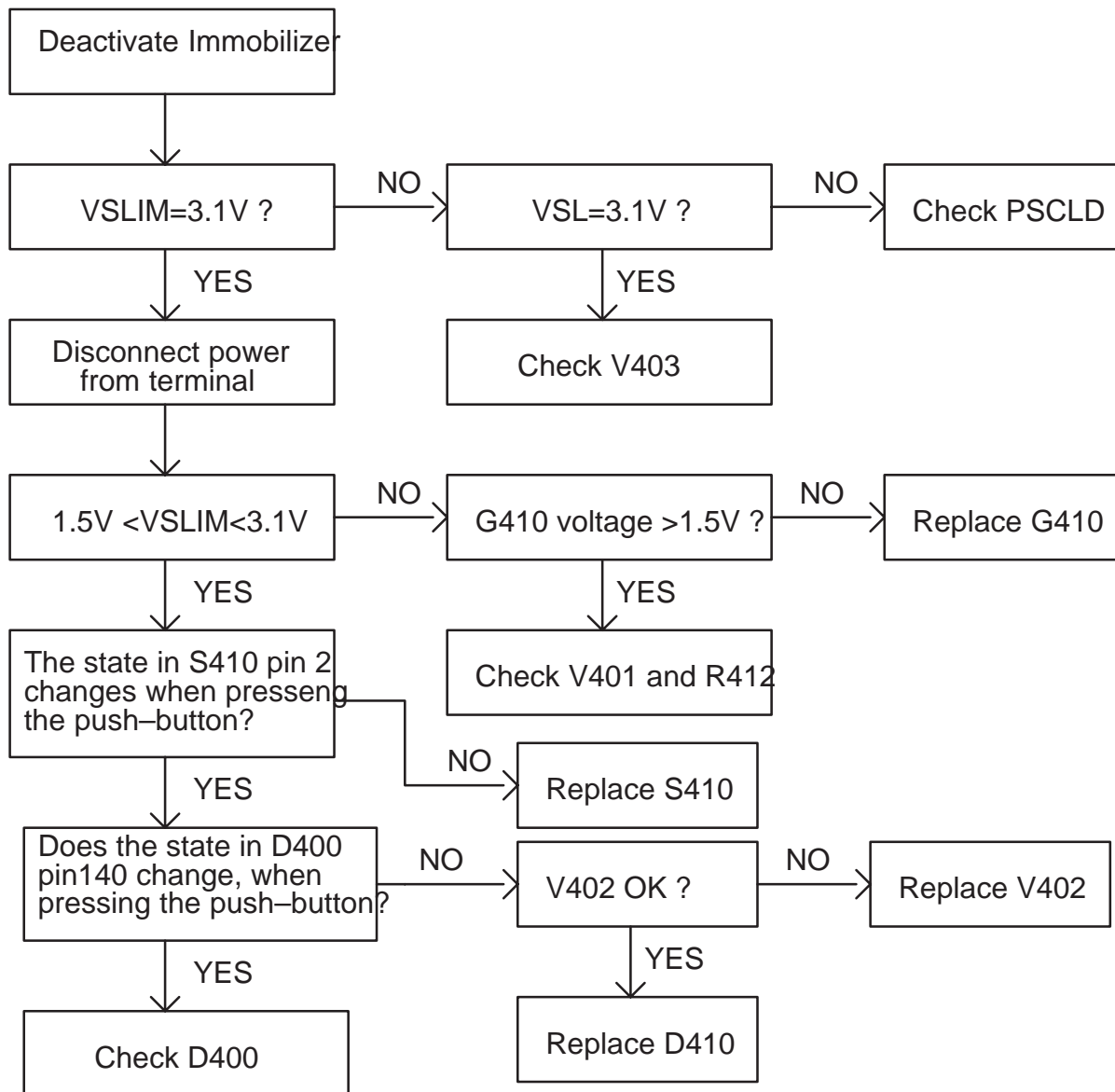


Line Adapter troubleshooting: Terminal works with handset, but not with device



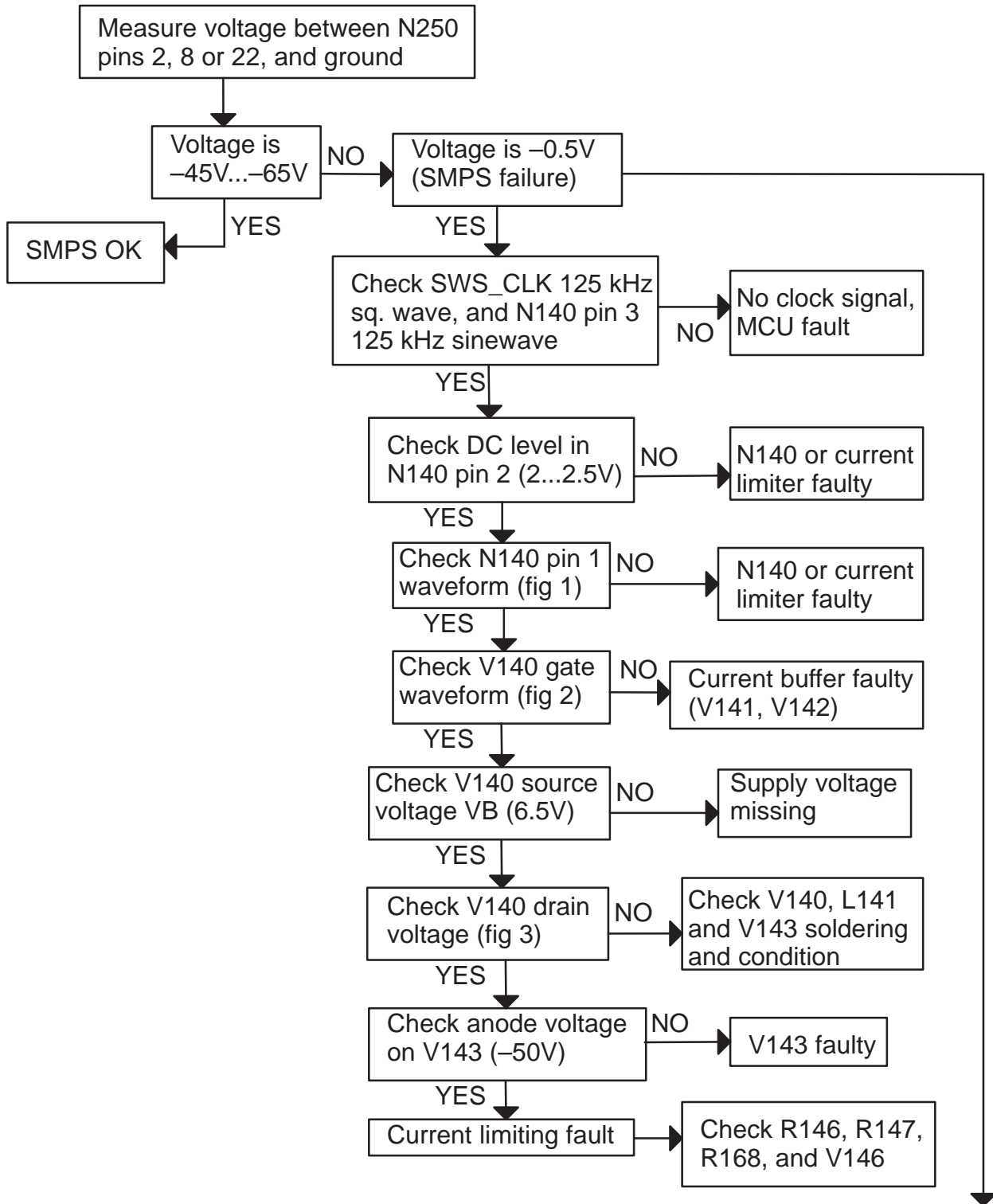
Immobilizer troubleshooting (in TFE-2 model C)

Note ! The Immobilizer has to be switched on after the service. The operator has to check the immobilizer state when the terminal is returned from the service.



Switch mode power supply problems

The switch mode power supply (SMPS) measured at N250 pins 2, 8, and 22 is normally $-45\text{v} \dots -65\text{ V}$ with reference to ground.



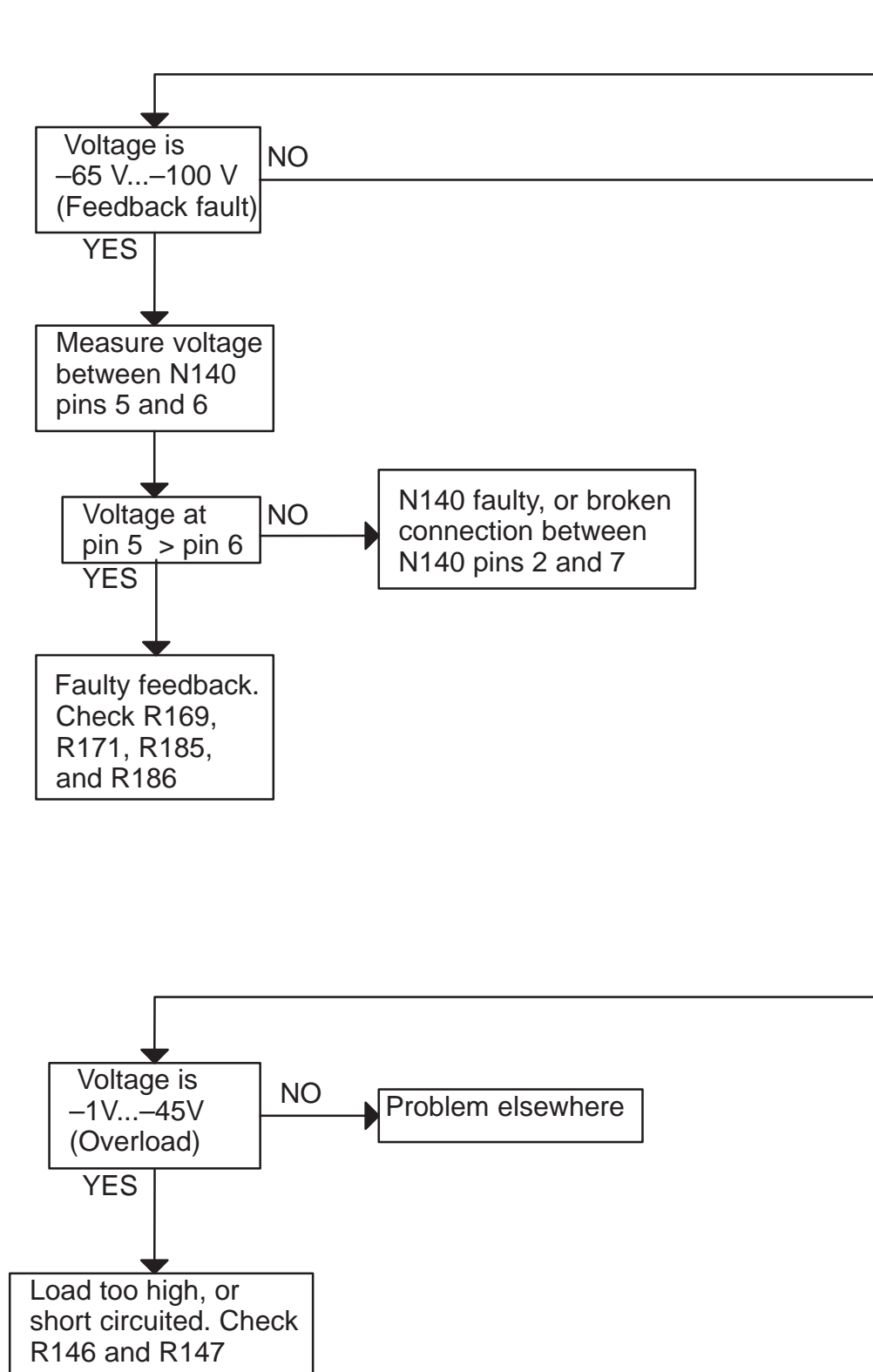


Figure 1
N140 pin 1 waveform

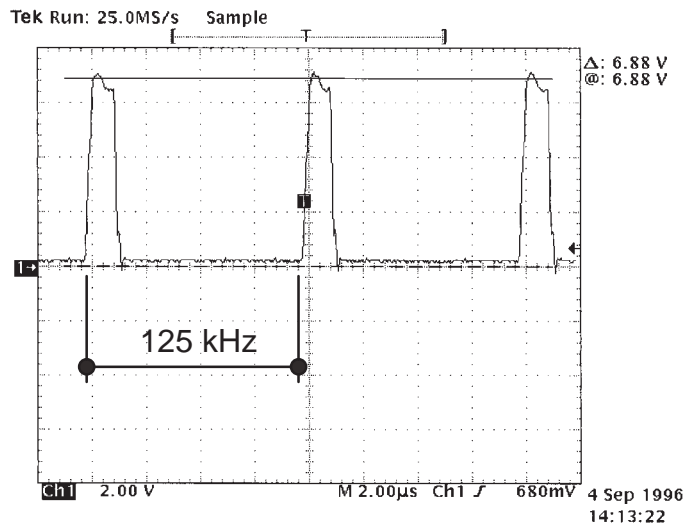


Figure 2
V140 gate waveform

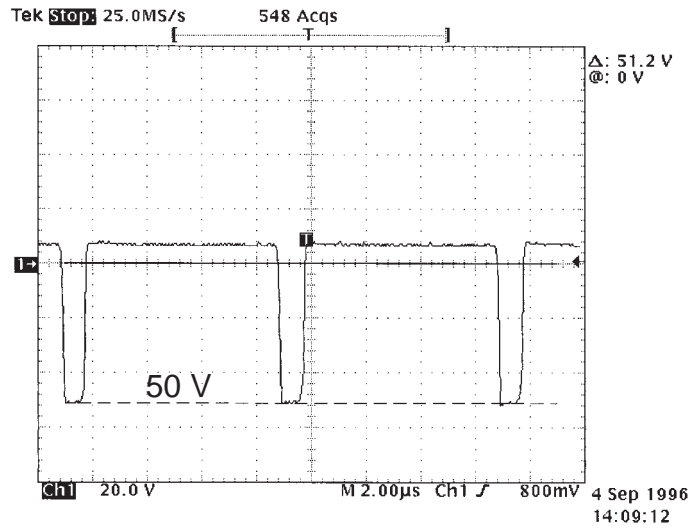


Figure 3
V140 drain voltage

