



Nistune Type 1 Diagnostics Technical Notes V1.2

(JECS ECCS 1984-1989 Legacy Engine Control Units)

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WARNING

If your ECU pulses the fuel pump, injectors, fuel regulator, flashes LEDs randomly (or they just stay on when they shouldn't) or your engine does not start then your ECU could be reading a corrupt ROM image.

Testing has shown that a corrupt ECU can keep the Mass Airflow Meter heater element on longer than 1 second and blow it like a fuse. This can even occur with other software driving an emulator or a bad BIN image file.

Ensure a corrupted image in your ECU is rectified immediately and is powered off if corruption is suspected to avoid this situation possibly occurring to you.

Corrupted ECU images are likely to be caused by

- Bad or incorrect image file loaded into the Type 1 board or emulator
- Poor connection between the Nistune board and ECU due to failure to secure the board correctly using hot glue or similar mechanism
- Poor header cable connection to the ECU from Nistune board
- Mismatched Nistune board configuration for the ECU image you are attempting to use

How to fix this:

- Always firstly try ECU with the factory ROM image using the original ROM chip you removed during installation. Attempt to start the vehicle with this chip before using with the vehicle with the Nistune board installed.
- Then attempt with the factory tune loaded in the Nistune board (where possible) to verify the board works correctly.
- Type 1 Rev1-2 boards only: Then attempt with the Nistune updated ROM image with the Nistune board to verify the ROM image works correctly
- Then attempt USB Consult connection to the Nistune board and this should connect and communicate with your laptop.

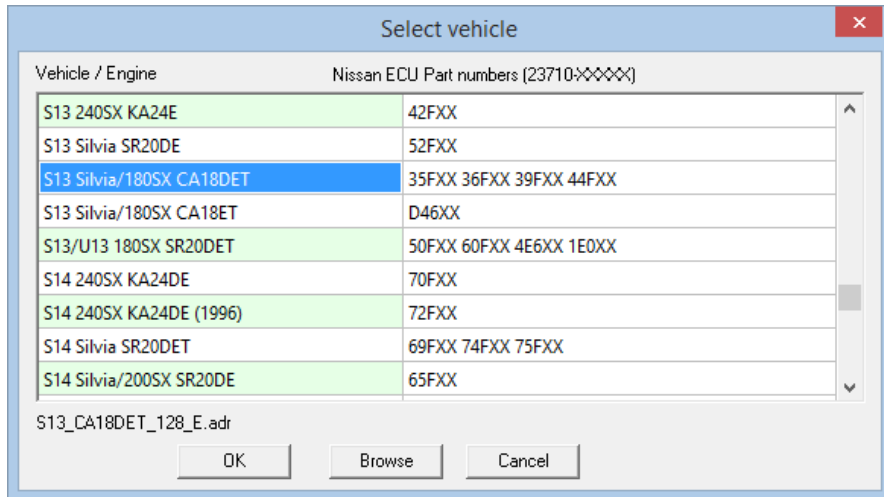
This document covers some of these issues in further detail

Solving USB Communications Device Problems

1. PC / Nistune fails to see the Type 1 board

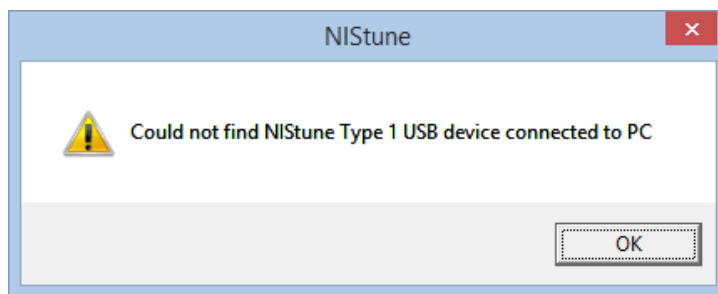
When you connect to Nistune using a Type 1 board, your PC should recognize the Type 1 board when you plug the cable between the ECU and your PC.

You should also have selected inside Nistune the correct vehicle you are trying to connect to



Selecting the correct vehicle to connect to in Nistune

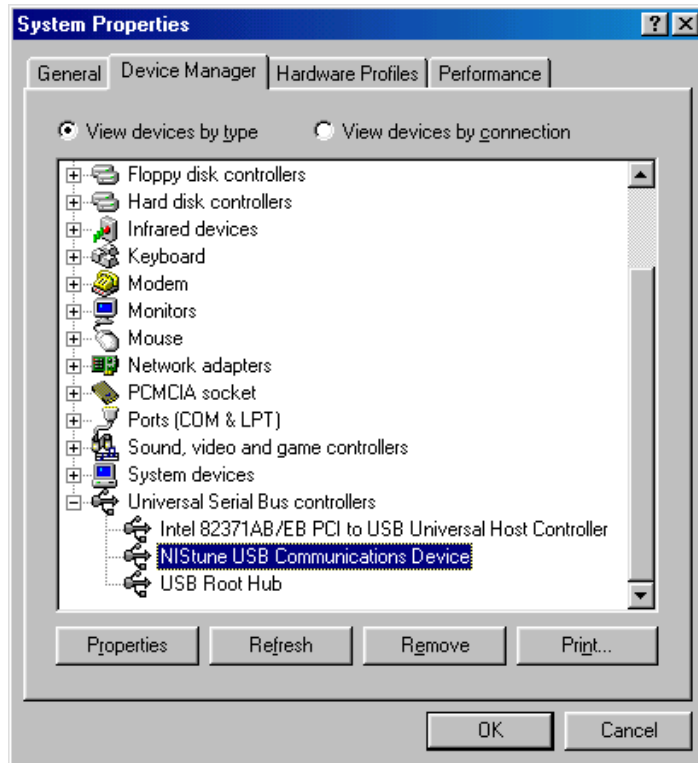
After this when you try and connect to the vehicle using the 'Consult' button Nistune should recognize the connection to the Type 1 board and attempt connection. If the drivers for the board are not installed, or if the board is not connected to the PC or there is a problem with the cable (or the FTDI USB chip on the Type 1 board was somehow damaged) then you will see the following error message:



Nistune cannot see the Type 1 board

Firstly check your Type 1 board can be 'seen' by Windows and that the drivers appear to be installed correctly. Inside Windows open up Control Panel > System > Device Manager > Universal Serial Bus Controllers

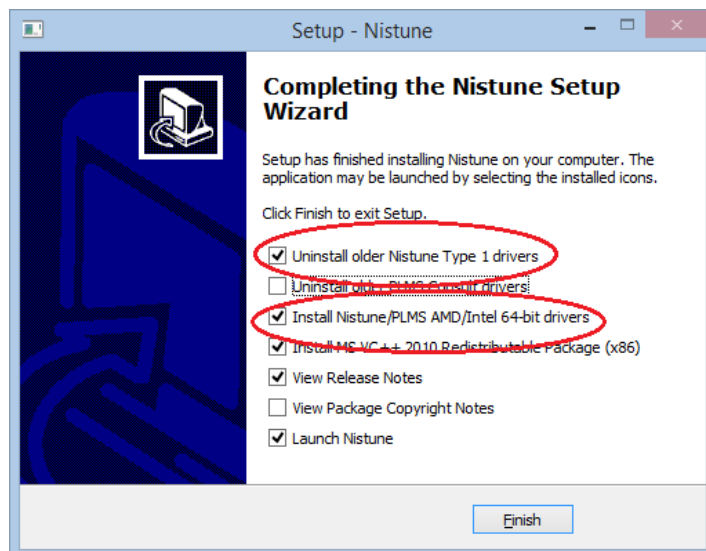
The Type 1 board should appear in the USB list when it the vehicle is powered on (Ignition switch is on)



The 'Nistune USB Communications' or 'Nistune Type 1 board' device should show up here as working. If not then reinstall Nistune and ensure the drivers have been selected for installation.

If driver has previously been installed and doesn't work (it might have an exclamation mark against it) then reinstall the drivers. Do this by clicking on Properties and then Reinstall Drivers. Point to the driver location where you installed Nistune to (usually Program Files (x86)\Nistune)

Another option is to uninstall and reinstall the driver by reinstalling Nistune.

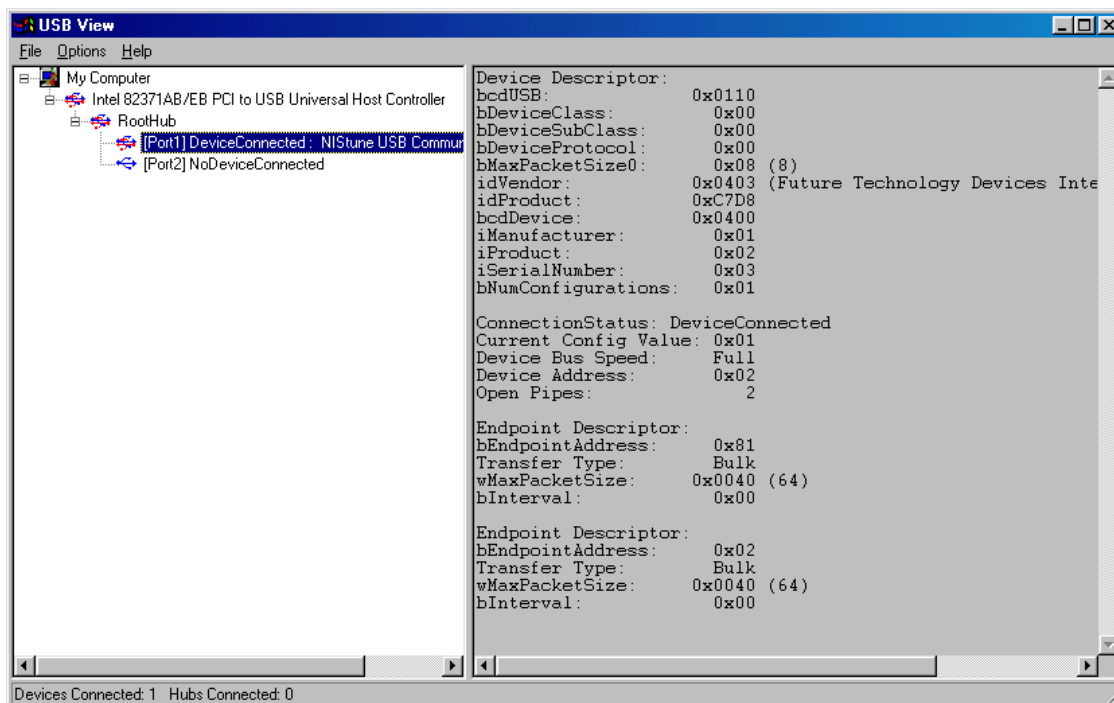


If the device does not show up at all in Device Manager then obtain the program USBview.exe and check the **Nistune USB Communications Device / Nistune Type 1 device** is detected when plugged in and ECU is turned on (Ignition switch on in vehicle).

Check before contacting us:

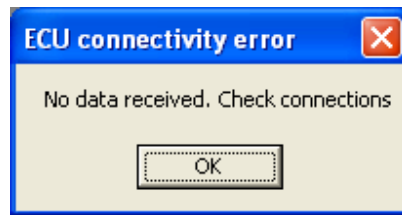
- USB cable connection
- Board correctly plugged in
- USB connector mini board to Type 1 board has continuity on all four lines (GND, VCC, DATA LO, DATA HIGH)
- ECU has power (diagnostic lights are flashing)
- Car is able to start with Nistune board installed
- Other USB devices work and are detected in USBView on your PC USB port

Check correct vendor and product Ids (0403 for vendor, C7D8 for product)



2. Connect to the USB device, it connects and then disconnects

You may receive an error 'USB Consult not connected' or 'No data received' error message



This can occur when the FTDI USB chip on the Nistune Type 1 board is detected by Windows and can be communicated with to but the Nistune firmware running in the ECU is not functioning properly or is not communicating to the USB device.

Things to check

1. Correct CPU header wire connections. Check is that the header connections from the Nistune board to the ECU are in the correct order and soldered to the correct pins. Double check the order of the wires against the hardware installation manual. Some ECUs have a 4 pin CPU header, whilst others you will solder directly to the HD6802 processor chip
2. Damage to any tracks on the ECU from where the socket was installed. Damage to any tracks between the socket and RAM chips in the ECU can cause problems communicating properly with the Type 1 board and the USB connection. Check these under a magnifying glass
3. Check the vehicle runs normally with the Nistune board installed. Check for signs of limp mode (ECU should be flashing LED codes in diagnostic mode). If the LEDs are still or flickering then it may not be running from the board properly. Try installing the factory ROM chip removed during installation into the socket and check the ECU operates correctly
4. Correct firmware loaded on the Nistune board matching your ECU. Nistune Type 1 boards must have the ECU base image matching the ECU installed in them. For example, an S13 CA18DET may have a Type 1 board with 39F00 (European base image) so should be similar to the ECU part number for it to work (for example 23710-39F01 on the ECU lid would be compatible).

Nissan ECU part numbers listed as 23710-XXXXYZ where XXX must match the board part number. Y is the transmission type generally and Z is the revision number of the Nissan image and can be interchanged normally.

5. Correct Xilinx programming for USB communications. By default all Nistune Type 1 boards are programmed with F700 for most ECU types. However if you are using one of the following ECUs then Xilinx programming must be changed by us prior to use:

FD00 (special program) – EK10 MA09ERT (March)

E000 (special program) – A31 RB20 (Cefiro), J30 VG30 (Maxima), D21 KA24, D21 VG30 (Truck)

F700 (default) – Used on all other vehicle types

Usually the board will have FD00 or E000 written on the board if it has been programmed specifically for those vehicles. Using the wrong Xilinx mapping will result in no USB connectivity. Contact us for more information.

6. Special case for Type 1 boards sold in 2008 (Revision 1, 2 limited to release of 24 boards)

Check your ECU Nistune patched software is running correctly.

Confirm your car will idle and operate as normal to check the ECU software properly. If it doesn't you may have a corrupt ECU image.

- You must upload the emulator again from the correct supplied Nistune patched image matching the address file selected from the Documents\Nistune\Address\Type1_Rev2_only folder
- If this fails then try a standard factory image in the Emulator
- If this fails, try the Emulator without the Nistune board with standard factory image
- If the emulator fails to function then try the same image on EPROM
- If the EPROM fails to function you either have a corrupt image or an ECU connection problem. Try another image or ECU.

The Pocket Romulator is susceptible to internal damage from voltage leaks from a laptop. Ensure the laptop has a grounding strap from some metal chassis on the laptop to the vehicle chassis

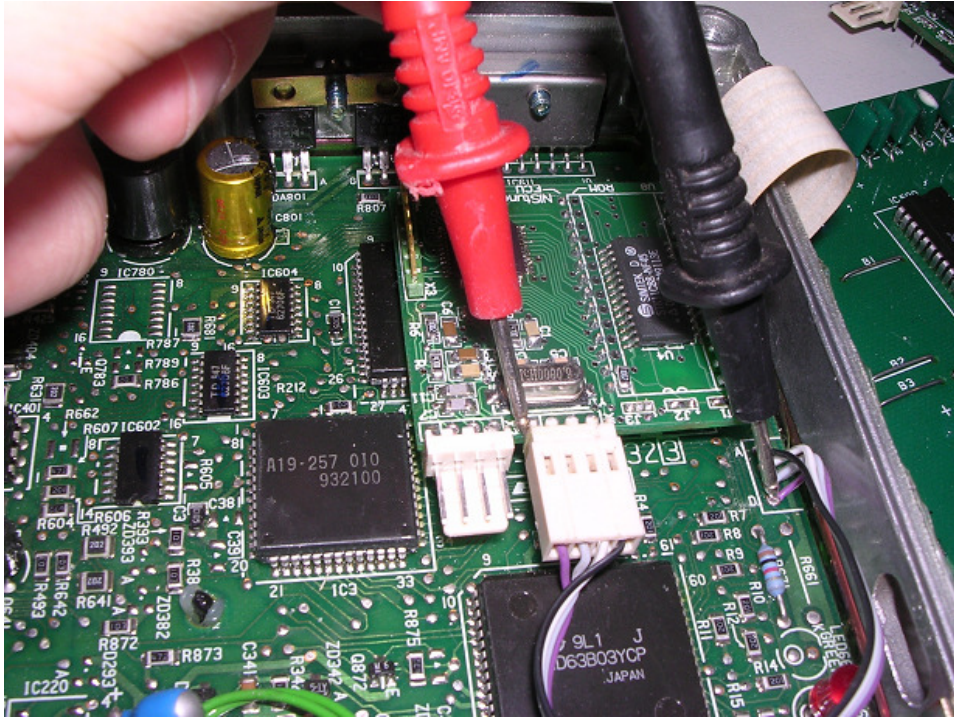
This is detailed in their FAQ

<http://xtronics.com/memory/pktROM.htm>

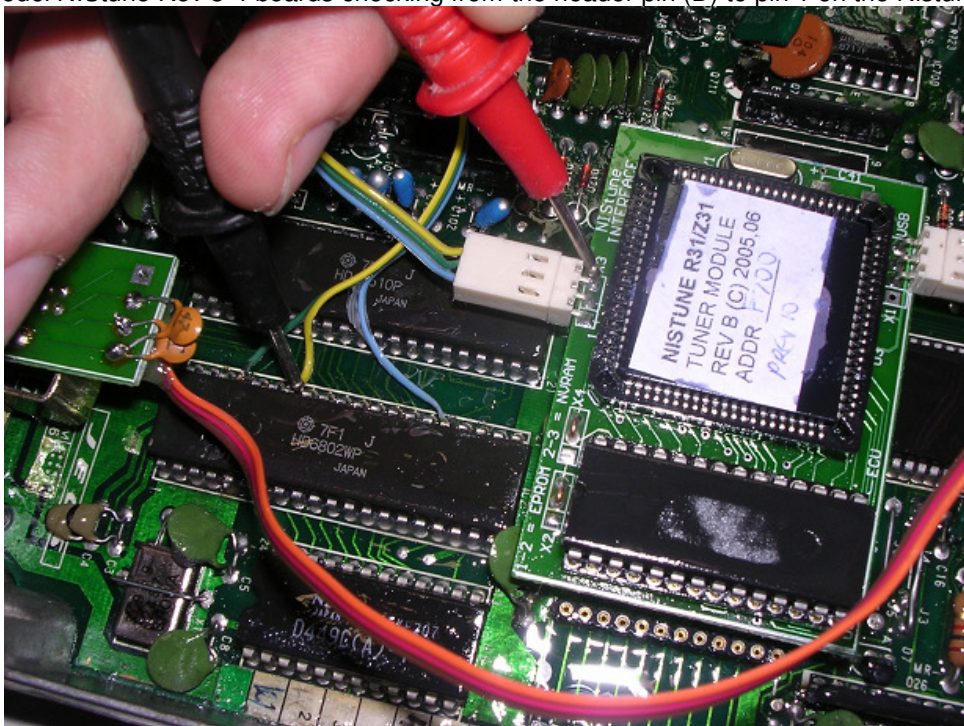
3. Checking CPU connector header

- (a) First check your cable connections are working. You need a multi meter and put it in to 'continuity mode' which makes a buzzing sound then the probes connect together.

Press the probes of the multi meter from the ECU connector side of the connection (either from the CPU leg or jumper cable connector) to the board connector where it enters the Nistune board. See pictures below



Later model NISTune Rev 3-4 boards checking from the header pin (D) to pin 1 on the Nistune board.



Earlier model Nistune Rev B board. Measuring CPU is connecting to the socket on the Nistune board

It might be necessary to clean up or push the probes through conformal coating which is a lacquer which protects the circuit boards from corrosion.

(b) Next check the jumper settings are correct for the chip you are using

- Rev 3B-4 boards only have the PGM jumper which must be open during use in the ECU
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- Rev C boards must have X1 (1-2) and X2 (1-2) for EPROM/Romulator mode or X2 (2-3) and X2 (2-3) for NVRAM mode. Also the J3 must be left unjumpered and J4 left unjumpered
- RevA/B boards must jumper X2 (1-2) and X4 (1-2) for EPROM/Romulator mode or X2 (2-3) and X4 (2-3) for NVRAM mode. The wrong mode make still run the ECU but Nistune wont work

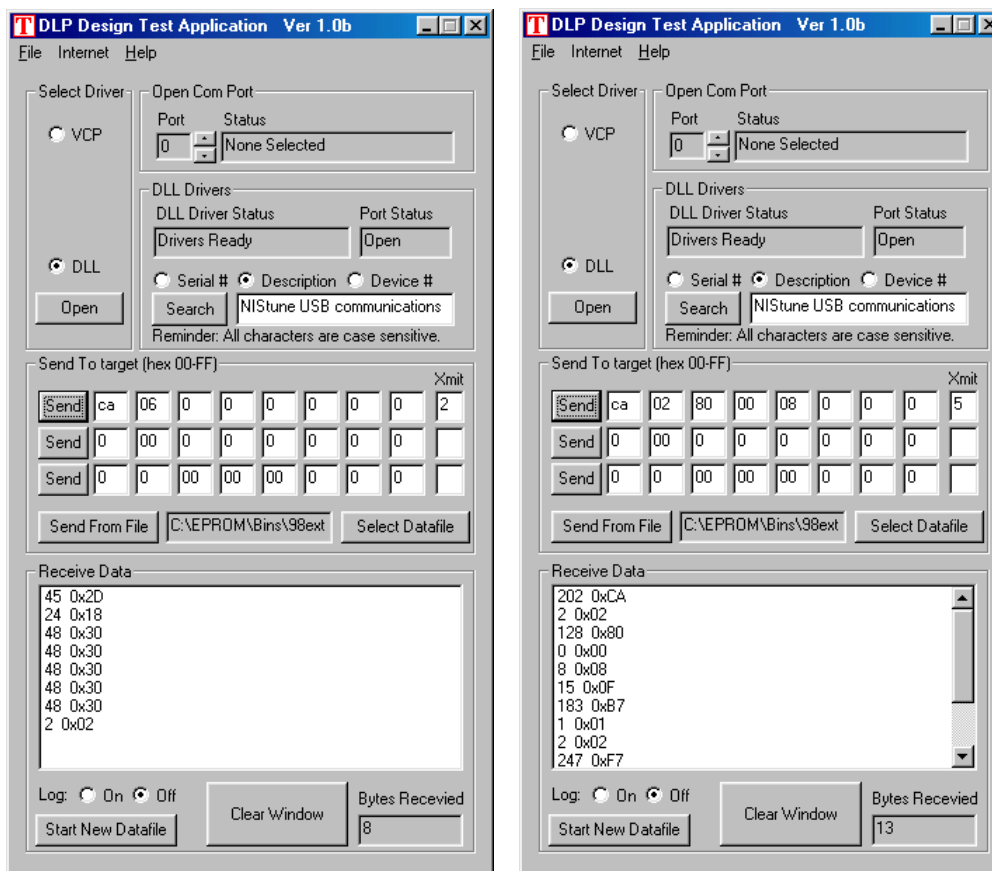
4. Advanced USB Diagnosis

If Nistune does not connect with the above steps then try checking the connection directly to the ECU without Nistune software. Note that this step is advanced and not normally required as Nistune debug logs are sufficient for diagnosis of communications issues.

File > Configuration > Debug logging will generate a log file which we can look at

Steps for advanced diagnosis are as follows:

1. Check you can talk to the board outside of Nistune. Download DLPtest.exe from <http://www.dlpdesign.com/usb/io8.shtml>
2. Copy DLPtest.exe to a spare folder and execute it
3. In the DLP Design Test Application program select
 - a. Select Driver = DLL
 - b. DLL Drivers = Description
4. Click 'Search' and you should see 'Nistune USB communications device'. So select this
5. Then this should show in the field next to 'Search' so now click 'Open' and Port Status should change to 'open'
6. If the above did not work then your driver is not installed correctly or FTD2XX.DLL cannot be found. If the DLL is not found then the 'Search' button will not function.
7. Send bytes CA 06 with 'Xmit' length field set to 2 and press SEND as per picture below
You should receive the ECU ID field data (older patch revisions only return 0x69)
8. Next check you can receive streamed data. Streamed data is done by CA 06 80 00 08 with 5 bytes in the transmit field. This should retrieve from address 8000, 8 bytes as displayed below



If the above does not work then recheck your CPU connections and correct Nistune firmware loaded on your board or emulator (for early boards only)

5. USB Communications works but drop out frequently or various error messages appear

Things to check

1. Does your laptop have a part of its earth connected to the chassis of your car? This is highly recommended if you are running the Pocket Romulator, to avoid damage to it and the Nistune board
2. Does the problem occur at a certain rev range, say when it hits 5000-6000 RPM that's when the drop out occurs. If so there is a frequency and noise issue. *Refer to our 'Diagnostics and communications' document for more solutions.*
3. Do you get noise through your stereo system which sounds like a buzz that increases as the RPMs increase? You may need to check your electrical system has sufficient noise suppressors on it.

Most dropouts occur because there is excessive USB noise going to the USB chip on the Nistune board. This problem can be made worse when you are running other USB devices, such as USB-Serial converters or other peripherals which can assist in creating more noise on the USB lines.

The problems could be associated with the type of USB A-B cable that you are using. Several users have indicated that they had frequent dropouts with particular USB cables. These have been significantly improved swapping for another higher quality USB cable. Higher quality cables tend to have better shielding characteristics which reduce noise. It has also been noticed that shorter cables will assist in doing this also. During development and testing I have used ~6 foot length USB A-B cables with minimal problems on my R31.

Poor shielding on any USB cable will cause problems, especially in an automotive environment where there is a greater amount of electrical noise (from coil, spark plugs, distributor etc) that at a normal PC workstation for instance would not experience this.

6. Nistune reports the error 'Cannot connect - Invalid CONSULT valid in address file' or 'Consult checksum error' or 'Invalid USB ECU address access on connection'



This error is due to an internal problem with the board firmware not matching what the Nistune software is trying to talk to.

Make sure correct vehicle is selected in Nistune. Otherwise contact Nistune for support with the particular error message you are getting

7. When I try to make a change to the maps, tables or constants and then disconnects

Type 1 Rev A/B boards only

This means that Nistune has attempted to write to your onboard NVRAM device or Romulator, but either during the write to the device or the read back verify by the ECU patch code, there was a failure.

Check that you have the correct offset and length specified in your address file

```
OFFSET=&H8000  
LENGTH=&H4000
```

If you are using a Pocket Romulator or similar emulator, ensure that the emulator is selected in the File - Configuration screen and the Emulator button is enabled (it changes RED when enabled). All updates when the emulator is selected will be performed to the emulator