How to Bypass Misprogrammed EEPROM that is Hanging Your System

AMD

Application Note

TITLE: How to bypass misprogrammed EEPROM that is hanging your system.

KEYWORDS: Am79C961, Am79C961A, Am79C965, Am79C970, Am79C970A, EEPROM.

PRODUCT: All PCnet controllers with serial configuration EEPROM.

VERSION: All silicon revisions.

CROSS REF: none

SYNOPSIS: If the EEPROM contents is accidentally misprogrammed, it's
possible to see strange system behavior including a system hang.
You then find yourself in a dilemma where you need to start the
system so you can reprogram the EEPROM but you can't because the
system hangs with the PCnet adapter card plugged in.

This Application Note takes you through the steps necessary to
bypass a misprogrammed EEPROM and allow your system to load
without hanging.

Introduction

Most of the PCnet family Ethernet controllers support a serial configuration EEPROM. The EEPROM may be a DIP or a surface mount device, but in either case, it's external to the PCnet controller. At power-on and hardware reset, the PCnet controller automatically senses the presence of the EEPROM and reads the contents into internal configuration and control registers.

When programmed correctly, the configuration EEPROM feature is great because your controller automatically initializes itself on power-on and system reset.

If the EEPROM contents is accidentally misprogrammed, it's possible to see strange system behavior including a system hang. This can occur because some of the internal control registers control activity on the bus interface. If you load these registers with illogical values, you might cause the controller to grab the bus and prevent other bus activity.

When this occurs, you find that you need to restart the system so you can reprogram the EEPROM but you can't because the system hangs with the offending PCnet adapter card plugged in.

Bypassing the EEPROM

There's a neat little trick you can perform to shut off the PCnet controller and regain control of the system so you can reprogram the serial EEPROM. During the power-on or hardware reset, you simply need to force the controller to think it's detected an EEPROM checksum error while reading the EEPROM. A checksum error will cause the controller to enter a special sleep mode where it's quiescent on the bus.

When you run one of the EEPROM programming utilities (e.g. EESETUP or Aminstal), they know how to wake up the controller and perform the EEPROM programming operation.

Magic Shorting Step

While the system is being powered on or a hardware reset is being applied, short pins 4 and 5 of the serial EEPROM. What you're doing is shorting the EEPROM data out pin (DO) to ground causing the data to look like a bunch of zeros. The bottom line is that the CRC check will fail and the controller will go off into it's quiescent state.

For AMD adapter card designs, the EEPROMs used are 93C57, 93C56, and 93C46. These EEPROMs are MICROWIRE compatible, physically compatible with the pin shorting directions given, and are compatible with the EEPROM programming software supplied by AMD.

```
              ___   ___
        CS  | 1 |_| 8 |  Vcc
        SK  | 2       7 |  No Connect
        DI  | 3       6 |  ORG (x16)
        DO  | 4       5 |  GND
             ---------
```

Table 1. Serial EEPROM Pin Configuration

REFERENCES:
 Ethernet/IEEE 802.3 Family
 1994 World Network Data Book/Handbook
 Publication ID. 14287C
 Advanced Micro Devices, Inc.
 AMD Literature: 1-800-222-9323

 Am79C961A PCnet-ISA II Jumperless, Full Duplex Single-Chip Ethernet
 Controller for ISA data sheet.
 Publication ID. 19364 Rev.A October 1994
 Advanced Micro Devices, Inc.

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