

# CF2 Resuscitation

The vast majority of CF2 applications operate in remote or unattended environments where there is nobody to intercede when a severe problem strikes. That's why, once you've loaded an application into flash and setup BOOT APP, or loaded an application file (.RUN or .PXE) on the CompactFlash card and created an AUTOEXEC.BAT file to launch it, the CF2 feels obliged to keep trying if at first it doesn't succeed. That's also why a program crash display concludes with a after-timeout reset and why PBM will always attempt to timeout to a reset if it's not the BOOT target or if it hasn't been invoked directly from PicoDOS with the PBM command. That may be somewhat frustrating on those rare occasions when an application load fails or an unfortunate typo in a critical SET command caused the system to go loopy, but it's that same mechanism that might keep a lengthy deployment from coming back with barely any data from an early spurious crash.

It's for those reasons that it's not difficult to get the CF2 to appear to be malfunctioning. However, unless there's a severe underlying problem with the onboard or attached hardware, it's relatively simple to revive an ailing CF2 and restore it to its factory defaults so that it will issue the familiar PicoDOS C:\> prompt. It's helpful to understand how and why the CF2 can get into such states, but the fact that you're reading this now probably means you're mostly interested in just getting it running.

## Step 1: Setting up.

You will need your CF2 to be connected to a PC running a terminal program (like MotoCross) at 9600 baud, 8 data bits, no parity, and 1 or 2 stop bits. You will also need to have access to pin-C39/IRQ5 and pin-C7/RESET, and you will need a power source of between 4V and 20V capable of supplying up to 200mA. You will also need to ensure that no external circuitry interferes with C12/SHDN, C38/WAKE, C42/MODCLK, or any of the data or address lines. Ideally, you'll be doing this resuscitation on an unmodified R212 or R216 RecipeCard which will guarantee those conditions and minimize the chance that the problem you're trying to recover from is caused by external hardware. You may also need access to the PicoDOS load file which you can usually find at C:\Program Files\Persistor\MotoCross Support\CFX\bin\CF2 on PCs setup for CF2 development, or on the installer CD at files\program files\Persistor\MotoCross Support\CFX\bin\CF2.

To summarize:

- MotoCross at 9600N81
- R212 or R216 RecipeCard
- 4V-20V, 200mA supply
- Access to C39/IRQ5 and C7/RESET
- CF2R4021.APP PicoDOS image file

## Step 2: Getting into PBM

When the CF2 powers up or get reset, it ALWAYS vectors into the Persistent Boot Monitor, but it almost always immediately re-vectors to PicoDOS or your flash application if there's one loaded and if someone has explicitly told it to BOOT APP from the PBM or PicoDOS command line prompts. However, if IRQ5 (also known as pin-C39) is grounded at power up or get reset, control will stay in PBM and the CF2 will revert to default 9600 baud setting to allow you to perform maintenance. This is why all Persistor RecipeCards include a PBM button which simply grounds IRQ5 when pushed. If you don't have a PBM button, you can achieve the same effect with a jumper wire connected between pins GND/C3 and IRQ5/C39 as shown in the photo below. Pin-3 is of course easy to count to and locate, but 39 is tricky unless you remember that it's just below pin-40 which has white silkscreen block and which is very helpful in locating C39.



**Ground IRQ5/C39/PBM and reset the CF2.**

You should see the following:

```
-----  
CF2 Permanent Boot Monitor  
www.persistor.com      V4.00  
-----I  
== FLASH WRITES ENABLED ==  
=== TIMEOUTS ACTIVATED ===  
  
PBM>
```

You may also see PBM begin to countdown to an automatic reset, and which will look like this:

```
PBM>60>50>40>30>20>10>9>8>7>6>5>4>3>2>1>  
Resetting...
```

You can continue to type commands while it's performing its countdown; just try to ignore the auto-typed numbers.

### Step 3: Try getting into PicoDOS

Very few startup problems are caused by a damaged PicoDOS flash image, so it's worth a quick attempt to get into PicoDOS and make changes from there.

**Keep IRQ5/C39/PBM grounded and type PICO<enter> from the PBM> prompt.**

It should look something like the following:

```
PBM>60>50>pico<enter>
```

```
-----  
Persistor CF2I5   SN 01874   PicoDOS V4.02r1   PBM V4.00  
(C) 1998-2005 Persistor Instruments Inc. - www.persistor.com  
-----
```

```
C:\>
```

Or (if you have no CompactFlash installed):

```
PBM>60>pico<enter>
```

```
-----  
Persistor CF2I5   SN 01874   PicoDOS V4.02r1   PBM V4.00  
(C) 1998-2005 Persistor Instruments Inc. - www.persistor.com  
-----
```

```
CompactFlash card missing, most features disabled
```

```
CF2>
```

Or (if PicoDOS is erased):

```
PBM>pico<enter>  
Can't!  
PBM>
```

## Step 4: Capture a snapshot of your system settings from PicoDOS

If you can get into PicoDOS, it's a good idea to capture some key settings that are likely to get clobbered in the next steps. This could be important for restoring your CF2 for use in your system, for diagnosing the reason why the startup problem occurred, and for requesting further help.

From the C:\> or CF2> prompt, type each line in turn:

```
VER /I<enter>
BOOT<enter>
SET<enter>
```

You should see something like:

```
C:\>ver /i<enter>
CF2I5   SN 01874
PicoDOS 4.02r1
BIOS    4.02r1
PBM     4.00
SPV     5.20-P
TPU     P.01
TLC     1.03

Dev:CF2   Code:PBM   Ver:400   CRC:487265A1...Verified
Dev:CF2   Code:BIOS  Ver:402   CRC:BA4B855C...Verified
Dev:CF2   Code:PICO   Ver:402   CRC:49FA1A72...Verified
Dev:CF2   Code:UPDS   Ver:520   CRC:545DB402...Verified
C:\>boot<enter>
Boots:
PicoDOS  (or APP or PBM)

C:\>set<enter>
(usually just blank)
```

## Step 5: Clear your VEE settings from PicoDOS

If you can get into PicoDOS, clearing the VEE persistent variables can eliminate some classes of startup problems.

**From the C:\> or CF2> prompt, type SET /E<enter>**

You should see something like:

```
C:\>set /e<enter>
This will clear the VEE and erase all of the environment variables!
Are you sure? <enter>
Clearing ... Ok
You should reset now to restore full VEE functionality! (not yet though)

C:\>
```

## Step 6: Force the CF2 to boot to PicoDOS

This command works the same from either PicoDOS or PBM, and it's easy to revert to whatever your system requires after getting the CF2 back up and running.

**From the C:\>, CF2>, or PBM prompt, type `BOOT PICO<enter>`**

You should see something like:

(if PicoDOS is already the boot target):

```
C:\>boot pico<enter>
Boots:
PicoDOS

C:\>
```

Or (if PicoDOS was not the boot target):

```
C:\> boot pico<enter>
Will boot PicoDOS
Resetting...
```

Or (if you do this from PBM>):

```
PBM> boot pico<enter>
Next: => 9 - PicoDOS at E10000

PBM>
```

## Step 7: Release (unground) IRQ5/C39/PBM and reset the CF2

Your CF2 should now boot up into PicoDOS using the default factory settings. If it does not, copy the captured session from MotoCross and paste it into an email to [help@persistor.com](mailto:help@persistor.com) along with a description of what led up to the problem and any clues you may have to offer.