

## MDR3 New Features

10/23/13

### I. Motor Status Display

- A. Activate the Motor Status Display by pressing any of the red buttons.
- B. Change the Torque and Direction setting of a motor by pressing the button adjacent to the corresponding connector. The bottom row of buttons control the torque and the upper row control the direction.
  - 1. At each press of the torque button, the LED color changes to indicate the maximum torque level: blue minimum, green mid-level, red maximum.
  - 2. Pressing the direction button changes the motor direction to correspond with the hand unit. The white LED indicates the status.
- C. After approximately 4s from the last button press, the display will turn off.



### II. Wireless Channels

- A. Dual displays. The channels can be viewed from either the top or side of the MDR3.
- B. Activate the Channel Display by pressing either the UP or DOWN button for 2s. While the display blinks, the channel can be raised or lowered with the switches.
- C. The channel switches will remain active for 4S after the last activation.
- D. New wireless channels 30-59 are available. These channels avoid interference when MDR units are positioned very close together (less than 1m). A blue dot is placed on hand units with this capability. The units are backwards compatible with all units having the G4 designation.



### III. USB

A. Loading new software. See appendix A for a detailed description.

1. Set-up for MAC. The MDR3 uses native USB drivers for the MAC and the drivers will load and run automatically when the MDR3 is connected to the MAC.

a. Run the Preston Software Update application. The application is available on the Preston Cinema downloads page: <http://198.170.86.103/downloads.html>

b. To load the update, press and hold the Reset button while powering up the MDR3 and follow the on-screen instructions.

2. Set-up for the PC. Although the USB to serial drivers are native for the PC, a driver installation procedure must be followed the first time the MDR3 is connected to the PC.

This procedure is detailed in Appendix B of this document.

a. Download the USB driver from our website “Downloads” page:

<http://prestoncinema.com/Upgrades/MDR3USBdriver.zip>

b. After the driver is installed on the PC, run the Preston Software Update application. This application is available on the Preston Cinema downloads page:

<http://198.170.86.103/downloads.html>

B. Storing lens metadata in a USB memory stick. A new file is created each time the camera run command is initiated. See Appendix B for a description of the file structure.

1. Required cable: 4760 Mini 5-pin male USB to female USB2. This is a **host** extension type cable for “on-the-go” OTG application.

2. In order to initialize the USB thumb drive properly, you must power down the MDR3 before connecting the drive.

### IV. Serial Ports

A. The devices and corresponding cables in the list below are automatically recognized by the MDR3.

1. Cinetape cable 4742

2. Fujinon Cabrio cable 4748

3. Canon Digital lenses cable 4749

### V. Power

A. Internal “OR” circuitry directs current from highest voltage source present at either the Power or Camera receptacle.

B. Quiescent Current: .24A @ 12VDC, .13A @24VDC.

C. Maximum current requirements. The amount of current required depends on the number of motors being driven and the amount of torque required. The maximum current is limited by the torque settings chosen by the user. When the torque is set to the maximum (Red) level, the peak current for that motor is approximately 1.6A at 24V and 3.2A at 12V. Many cameras have limited current capacity available at their accessory port and we therefore recommend taking power directly from a battery. P-tap power cables are available as PN 4641.

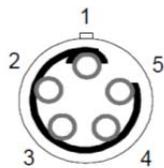
VI. Time Code

A. Jamming TC with a Clockit device. After connecting the Clockit to the MDR3 with cable 4731, the HU3 will indicate that its TC is synced (see picture below). This feature requires that the HU3 is running firmware version 2.14 or later.



B. MDR3 time code accuracy and stability. The MDR3 real-time clock is tuned at the factory to better than 1 ppm accuracy at ambient temperature of 20C. To maintain 1 frame accuracy at 24fps or 30 fps, the MDR3 should be jammed at 8 hour intervals or less, at ambient 20C.

D. Genlock Input. The TC connector has an input for genlock. When a genlock signal is detected the lens metadata will be stored synchronously. The connector pinout is shown from the termination side of the plug:



Pin #	Function
1	Gnd
2	TC in
3	
4	Genlock in
5	

VII. Analog Input functions. When an analog signal is detected at the Analog receptacle, the corresponding motor channel(s) will be controlled.

A. Microforce zoom cables:

1. For Digital Microforce, cable 4765.
2. For analog Microforce V+F3, cable 4766.

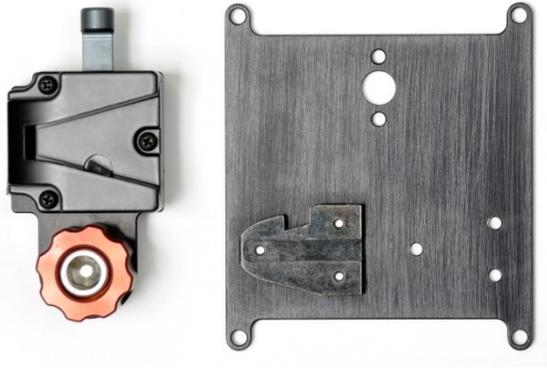
B. Canon Broadcast Controls: Focus/Zoom splitter 4771.

C. Fujinon Broadcast controls: Focus/Iris/Zoom splitter 4770.

## VIII. MDR3 Mounting

A. The bracket set shown below mounts the MDR3 to cameras having 3/8-16 mounting positions. The V-lock quick-release adds to the convenience. The mount is shown in the picture below with a Sony F55.

MDR3 Mounting V-lock Bracket p/n 4790



B. The MDR3 side bracket mates with the follow focus mount on the PRO.

MDR3 SIDE PRO BRACKET p/n 4795



## B. Third Party Options.

MDR3 mounting brackets are currently available from:

1. Cinematic Precision: <http://www.cinematicprecision.com/camera-assistants#/id/i2544317>

2. Film-stuff.com: <http://film-stuff.com/remote-focus-accessories/screw-on-preston-mdr-mount.htm>

## Appendix A. Uploading firmware through the USB Port.

MDR3 Firmware Updates for Mac .....	6
Drivers.....	6
Procedure .....	6
MDR3 Firmware Updates for PC .....	6
Drivers.....	6
Procedure .....	10

### A. MDR3 Firmware Updates for Mac

#### 1. Drivers

The MDR3 uses native USB to serial drivers on a mac, which come included with the operating system. The drivers should load and run automatically when the MDR3 is connected.

If you're extra curious, you can check that the drivers are properly loaded by entering the following command into the terminal (located in the utilities folder of applications) before and after plugging the MDR3 in and see if a new serial device pops up.

```
> ls /dev/tty.*
```

#### 2. Procedure

Launch the MDR3 Software Update application provided by Preston. The software should run on OS X 10.6 and higher. It can be found on the downloads page of [www.prestoncinema.com](http://www.prestoncinema.com) or by clicking the link [MDR3.zip](#). Unzip the folder by double clicking on it. Go into the newly created folder by the same name and double click the update application to launch the software. Follow the on screen instructions from there.

You will have to power the MDR3 while holding the Reset button to get it into boot mode, which is required to update the MDR3 firmware.

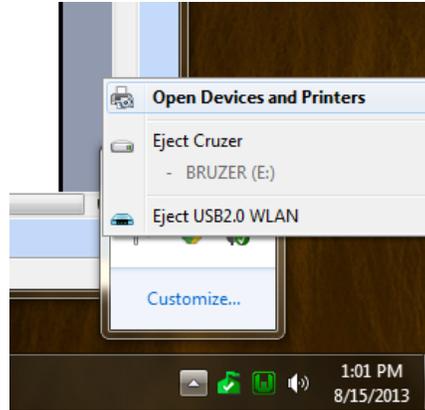
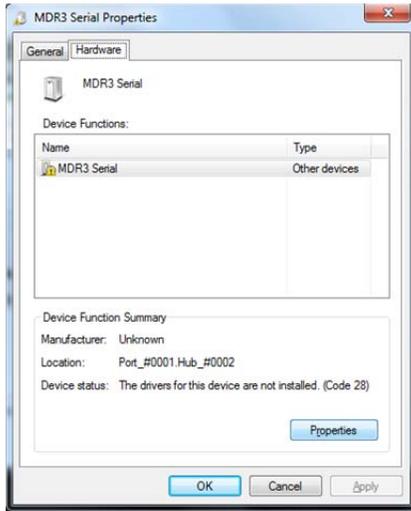
### B. MDR3 Firmware Updates for PC

#### 1. Drivers

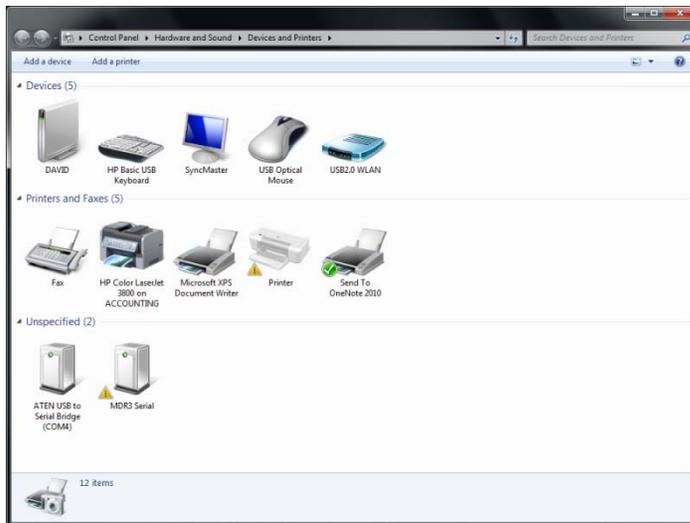
Like for the Mac, the MDR3 uses native USB to serial drivers for the PC. Unfortunately, PCs have to be told to associate our device so it feels like you have to install drivers anyway. Fret not, for this process only is required the first time an MDR3 is plugged in.

The process below outlines installing the drivers for the MDR3.

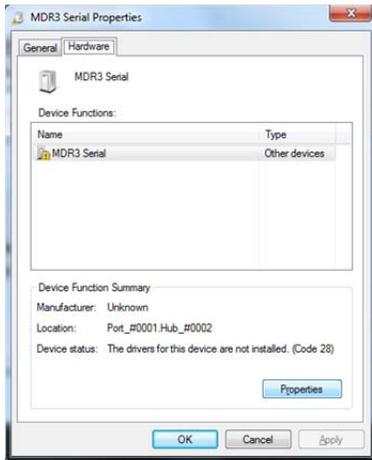
1. Power up the MDR3 and connect the USB cable from the PC to the MDR3. The PC will probably try to automatically install a driver. It will be unsuccessful.
2. Open the Devices and Printers.



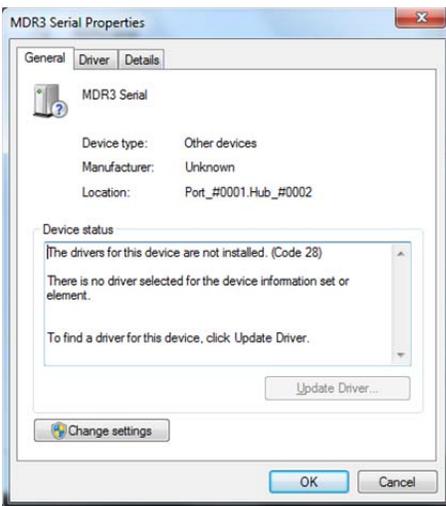
3. Right click the MDR3 Serial device, which will have an exclamation point error next to it. Select Properties.



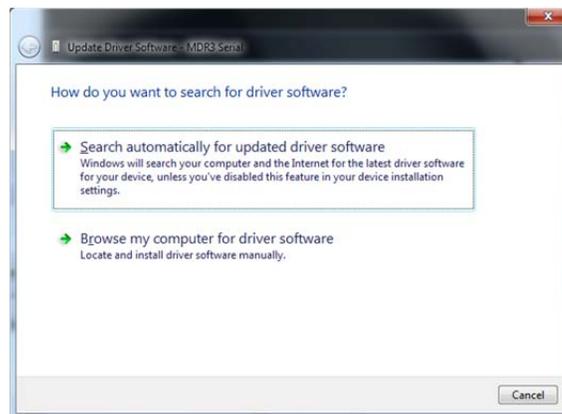
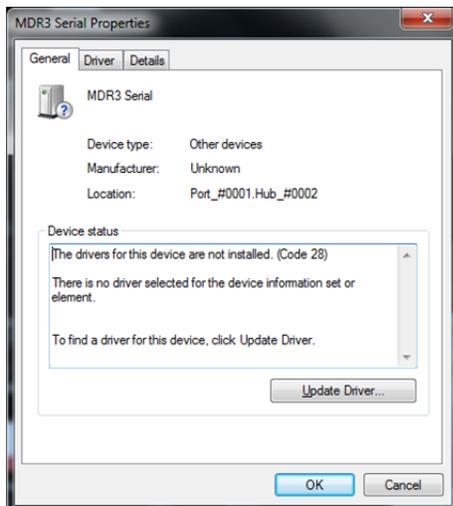
4. Select the Hardware tab above and select Properties.



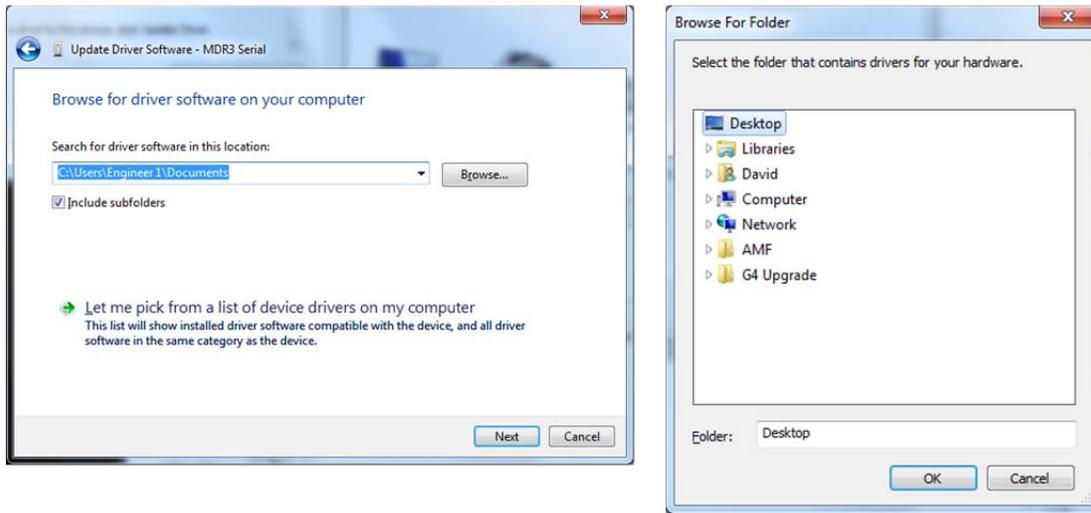
5. Press the Change settings button on the General tab.



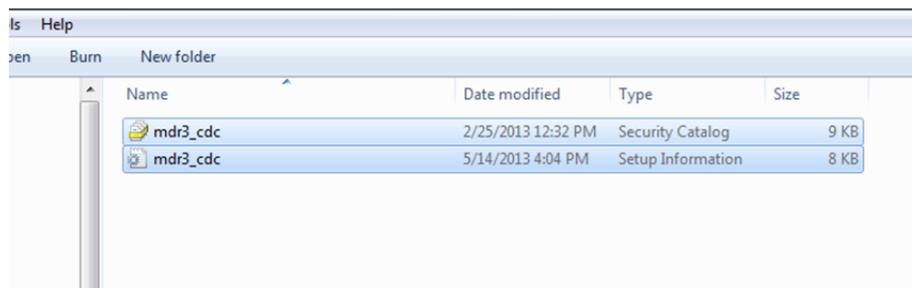
5. Select Update Driver...



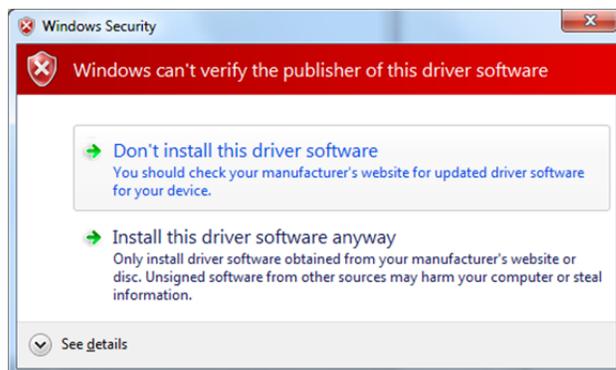
6. Select Browse my computer for driver software.



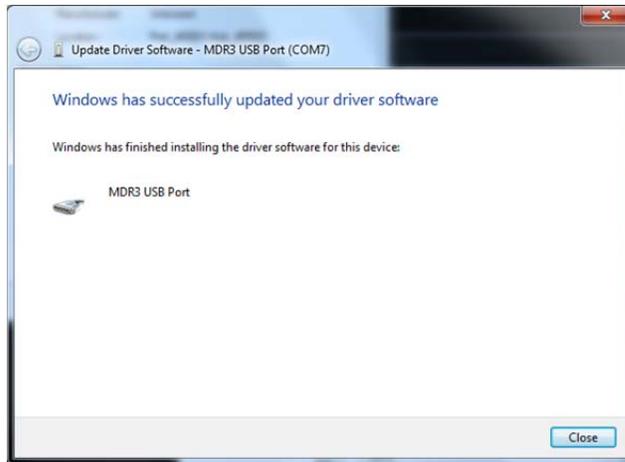
7. Click the Browse... button to locate the folder containing the driver files downloaded from Preston's website (<http://prestoncinema.com/Upgrades/MDR3USBdriver.zip>). They're named MDR3\_cdc (if you have file extensions turned on, they're .inf and .cat files).



8. When you click OK. Windows should begin the installation process. It can't verify who we are because we're not registered, but you trust us so click Install this driver software anyway.



9. When it installs, you should have the following window. Feel free to close the window. If you'd like to double check. Our MDR3 comes up as MDR3 USB Port and it says which COM port it's associated with.



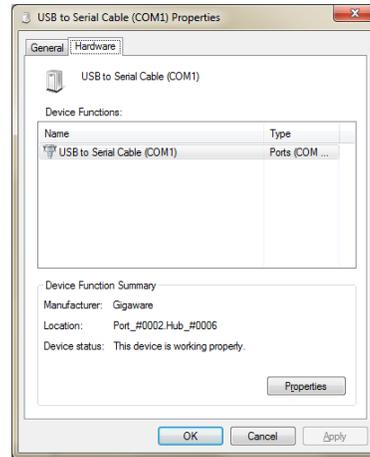
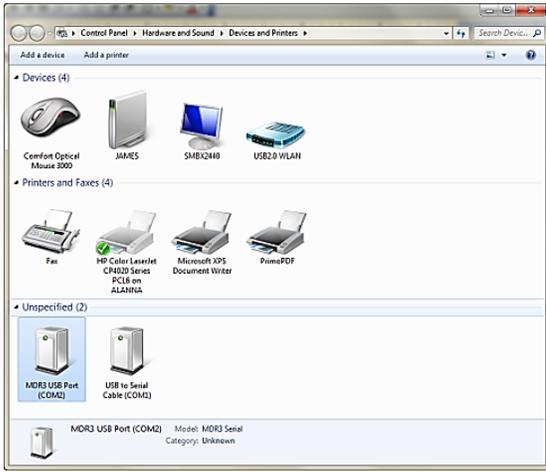
## 2. Firmware Update Procedure

To update MDR3 firmware, make sure the steps to set up the drivers has been done on the PC before trying to run the software. Also, check that the MDR3 has ended up on COM1 - COM4. If not, check the Changing COM Ports section below to see how to change which COM port the MDR3 is set to.

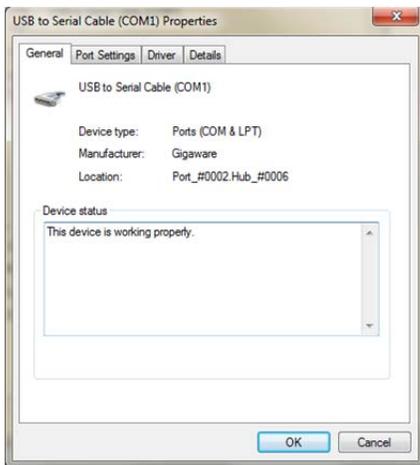
Launch the MDR3 Software Update application provided by Preston. The software should run XP and above. It can be found on the downloads page of [www.prestoncinema.com](http://www.prestoncinema.com) or by clicking the link [MDR3 Upgrade](#). Double click the downloaded executable to launch the software. Hold the Reset button to the MDR3 while powering it on. This will start it in boot mode so the Upgrade software on the PC can recognize that the MDR3 is connected. Follow the on screen instructions from there.

### 3. Changing COM Ports

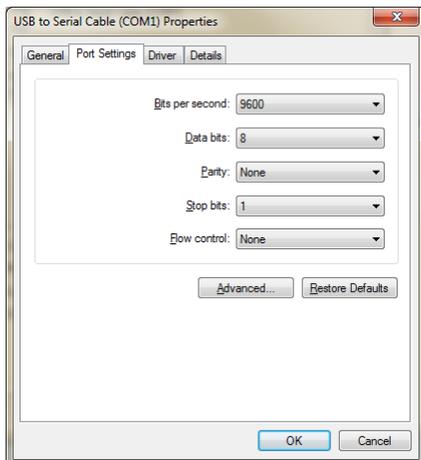
1. Right click the device you want to change the COM port for. Select the hardware tab from the window that pops up. Then click the Properties button.



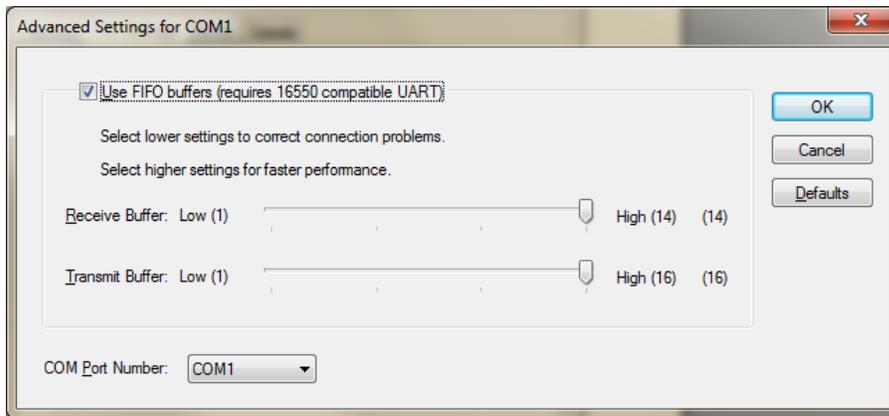
2. Select the Port Settings.



3. Select the Advanced... button.



4. Select the COM port desired from the drop down menu at the bottom. Note that you may have change your hardware set up to make room for the device if COM1 - COM4 are already occupied.



5. Click OK in all the windows to close them out.

## Appendix B. Preston Metadata Description

The metadata file created by the Preston MDR3 is in an XML format. Basic information about the XML format can be attained from wikipedia at <http://en.wikipedia.org/wiki/XML>. The MDR3 creates a file for every time the camera is run. The file name is created based on the date and time information kept in the MDR3. Time information can be synchronized with timecode devices. A list of files might look like the following:

2013-08-15\_15-30-30.xml

The file name is presented in order of time resolution from years down to seconds. The above shows the metadata began to record on August 15, 2013 at 30 seconds into 3:30pm. In otherwords. the filename goes year-month-day\_hour-minute-second.xml.

The data in the file is encapsulated with XML tags, as required by the xml standard. These look like the following:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
```

```
<root>
```

```
...
```

```
...
```

```
</root>
```

The data for the four motor positions is presented as four hex values representing a 16-bit number (0-65535). This number is the absolute position within the span of the lens, which is defined by the two mechanical end stops found during our motor calibration procedure. Each set of motor positions is preceded by the time, including the fraction of a second the information is related to. The fraction of a second has a 10ms resolution. HH is hour of the day (defined in the filename). MM is minute of the hour. SS is the second of the minute. FF is the fraction of a second. The motor position data is recorded in 12ms intervals.

```
<data>
  <time>HH:MM:SS:FF</time>
  <lens>
    <iris>IIII</iris>
    <focus>FFFF</focus>
    <zoom>ZZZZ</zoom>
    <aux>AAAA</aux>
  </lens>
</data>
```

A real dataset related to the file name above might look as follows:

```
<data>
  <time>15:30:30:24</time>
  <lens>
    <iris>0FD4</iris>
    <focus>E06D</focus>
    <zoom>3356</zoom>
    <aux>ABCD</aux>
  </lens>
</data>
```

In the example above the time is 3:30pm with 30 seconds and 240 ms, or 30.24 seconds. The Iris position is 0x0FD4 (4052 decimal). The focus is 0xE06D (57453 decimal). The zoom is 0x3356 (13142 decimal). The auxiliary is 0xABCD (43981 decimal).