



# SYNRAD Technical Bulletin

# 0027

Technical Issue: FH Flyer Marking Head Memory Corruption

Date: 03 March 2015

## Description:

On power up, the Flyer's Status LED should blink green about twice a second for approximately 30 seconds while booting up and then turn solid green once the boot-up is complete. Flyer heads can fail to finish the boot-up process if the Linux operating system (OS) in the Flyer's FLASH memory has been corrupted.

We have found two factors that lead to Flyer memory corruption:

- 1 Frequent cycling of power while the head is in the process of booting up.
- 2 Writing data to the head while it is actively marking in Standalone mode.

## Frequent Cycling of Power during Boot-up

Just as a desktop or laptop PC would suffer if the power cord were to be frequently plugged and unplugged to AC mains power while trying to boot-up, the Flyer head OS can be corrupted by the following:

- 1 Wiring power to the Flyer head through the machine's Estop switch. While this may seem like the safe thing to do, it is only the laser that really needs to be disabled through the Estop. If the machine operator frequently cycles the Estop to clear an error, the Flyer head will eventually suffer memory corruption. SYNRAD recommends that the power to the Flyer head be maintained while the Estop switch removes power from just the laser.
- 2 Dropouts / brownouts of the mains power. Some countries have periods of unstable power conditions, especially late at night. If your Flyer head is installed in a plant that suffers frequent power problems, be sure to turn the power off to the Flyer head when it is not being used.
- 3 Unstable voltage from the power supply proving 30VDC to the Flyer head. One customer found that the inrush current demand from the Flyer head (8A peak) was triggering the fold-back current limiting in the power supply, switching the output voltage between 30 and 0 volts as the capacitors within the Flyer head charged up. This was happening every time the head was powered up, leading to memory corruption. After selecting a different power supply, the memory corruption issues ceased.
- 4 Loose or broken power wiring. If you find that one Flyer installation is having frequent instances of memory corruption while other Flyer heads are fine, take a close look at the condition of the Flyer head power cable and connections.

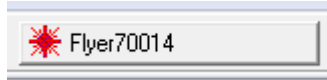
## Writing Data to the Head while Marking in Standalone Mode

Writing data to the Flyer head while it is actively marking in standalone mode has also been found to corrupt the Flyer OS.

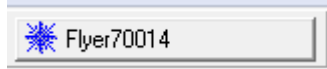
In case you're not familiar with the concept of standalone marking, here is a quick explanation.

The Flyer head supports marking in two modes:

- Tethered mode: the WinMark software controls all marking, streaming vector and power command data to the head while marking is in progress. WinMark also provides an ActiveX control so that you may control tethered marking using a custom front end interface. While the Flyer head is marking in tethered mode, a red icon is shown next to the head's name in the mark button:



- Standalone mode: complete MKH files are loaded into RAM memory in the head, either from the Flyer Filestore or from a network share folder. The Flyer head converts these files into vector and power command data. The Flyer head operating in standalone mode can also be controlled using the standalone functions in the ActiveX control, or by using the Modbus interface on the head. Note that you can monitor the head's marking process using the WinMark software, which will show a blue icon next to the head's name in the mark button to indicate that the head is in standalone mode:



When the Flyer is *actively marking in Standalone mode*, it is applying all of its computing resources to the marking process: breaking down the MKH file data into vector data, controlling the galvo motor servo loop, processing I/O commands, etc. To prevent data corruption when downloading data to the head, be sure to abort the marking process before the download. Once the download is complete, you can then load the desired file and begin marking again.

The WinMark software indicates that the Flyer head is actively marking in standalone mode by flashing the blue icon next to the head's name in the mark button. If the head is in standalone mode, but is currently idle, a solid blue icon is shown.

To update the Flyer head firmware or head properties, or to download a new MKH file to the head through WinMark, ensure that the Flyer head is idle:

1. Via the Flyer head's web page:
  - a. Connect an Ethernet cable to the Flyer head (make sure the USB cable is NOT connected).
  - b. Leave WinMark closed, but open a web browser.
  - c. In the address bar, type in the IP address of the Flyer head.
  - d. At this point, you should see the Flyer's web page.
  - e. On the left side of the page, click on System Parameters.
  - f. Scroll down the list to find the 'Mark on Startup:' hyperlink.
  - g. Click on this hyperlink to toggle the setting from Yes to No.
  - h. Reboot the head and it will still be in standalone mode, but will not go directly into a mark session.
2. Via the Test Mark at power up option:
  - a. Remove power from the head.
  - b. Hold the Test Mark (TM) button down while turning the head's power back on.
  - c. Continue to hold the TM button until the head finishes booting up (takes ~30 seconds).
  - d. The head will still be in standalone mode, but will not go directly into a mark session.



If you are controlling the Flyer with the WinMark ActiveX control, use the GetMarkMode method to verify that the head is not actively marking. If the GetMarkMode method returns a 'bStandaloneMarking' value of '1', use the ForceAbort method to stop marking, and then check the GetMarkMode values again.

If you do find that you've corrupted the operating system on the Flyer head, you can remotely reprogram ('reflash') your Flyer OS using the procedure and support files that are available for download from our FTP site at "<ftp://techuser:techuser01@apps.synrad.com/tech>". Go to the Flyer Files folder and download the PDF and ZIP files that are there. Note that the Flyer head must have internet access **without a firewall involved** for the reflash procedure to work.

For further information contact SYNRAD at 1.800.796.7231; outside the U.S., dial +1.425.349.3500 or fax us at +1.425.349.3667.