

<b>Trotter Controls, Inc. FORT WORTH, TEXAS</b>	<b><u>ENGINEERING REPORT</u></b>		NUMBER <b>ER-0093</b>	REVISION <b>F</b>
			MODEL FRDS GEN II	
TITLE Software Version History Log - GEN II FRDS	BY Len	CHK'D MP	SERIAL ALL	
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**Overview**

This Engineering Report provides a list of FRDS software revisions by version number, along with the operational changes made to each revision of the software.

**References**

Item	Document	Company
1	9001-0012, GEN II FRDS Operator's Manual	Trotter Controls, Inc.
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**PURPOSE:**

This report is to document changes in the GENII Fire Retardant Delivery System (FRDS) Software. These changes may not be fully described in the operations manual. Only changes that affect operation by the pilot or support personnel are included here.

**VERIFING CURRENT VERSION INSTALLED:**

**MAIN SOFTWARE**

To determine the version of main software running on the FRDS system, examine the startup boot screen (displayed immediately after power-up) as shown in Figure 1 and 2.

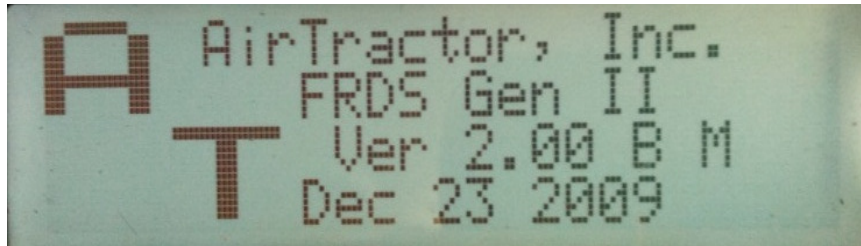
Figure 1 shows Version 1.09 created on Mar 17 2009, as displayed on a VFD (vacuum fluorescent) display.



**Figure 1**

Figure 2 shows Version 2.00 (beta) created on Dec 23 2009, as displayed on an LCD (liquid crystal) display.

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**Figure 2**

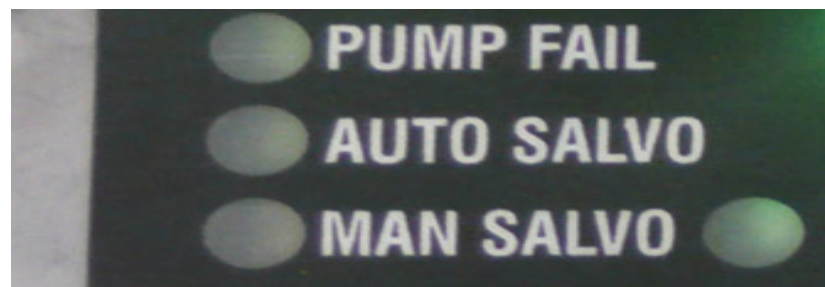
*Note: Logo and Version may differ from what is shown.*

**SUPERVISOR SOFTWARE**

To determine the version of the supervisor software running on the FRDS system, observe the "AUTO SALVO" LED when main power is first applied to the FRDS system. Count the flashes, any flash counts after five indicates version number.

**Version 1** is identified by the "AUTO SALVO" LED flashing 6 times just after startup.

**Version 2** is identified by the "AUTO SALVO" LED flashing 7 times just after startup.



**Figure 3**

**Version 2 Description.**

A software bug was found in version 1 that caused an erroneous Auto salvo dump after the mechanical salvo lever had been depressed. This dropped out the V- grounds inside the relay box and caused a True, True state on the supervisors inputs. When the lever was returned to the proper position and the V- ground was returned to normal, the supervisor would trigger a Auto Salvo.

The supervisor code was updated to include built in diagnostics to test the Dump and Not Dump inputs.

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If these inputs are equal, ether both High (true) or both Low (False) for a short period of time, the Supervisor goes into fault mode.

**Supervisor Fault mode.**

When the supervisor detects a fault condition, it will begin to flash the Auto Salvo LED at a slow rate constantly.

It will also suppress its heartbeat output to the Main Core processor which will in turn flag a 111 - Monitor error on the display screen. While in fault the Supervisors ability to detect and handle an Auto Salvo condition is disabled.

If the fault is corrected, the system auto corrects, stopping the fault flashing and resumes the heartbeat back to the Main Core processer.

After a brief amount of time, .5 seconds or so. The Supervisor is re-enabled to detect and handle an Auto Salvo condition.

If a fault condition happens while the button is pressed and is corrected while the button remains depressed. The Supervisor remains in a disabled condition until the dump button is released for .5 seconds or so. The Supervisor is then re-enabled to detect and handle an Auto Salvo condition.

**OBTAINING UPDATE VERSION TO INSTALL:**

Contact Trotter controls for latest software version available. These are available as code uploaded by service personnel with a properly configured PC with Microchip software or by using a stand-alone field programming unit.

*Note: Supervisor software is not field-upgradeable.*

**BRIEF VERSION HISTORY - MAIN SOFTWARE:**

The release version is in chronological order here.

Many versions of software were released during initial testing and product development. These were versions 1.00 thru 1.12 and were never released on production aircraft.

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1.13 was the initial release version when first GENII equipped aircraft delivery was delivered. This version is where this document begins tracking changes. All units in the field have been upgraded to V1.14 or higher.

**BRIEF VERSION HISTORY - SUPERVISOR SOFTWARE:**

No revisions have been made on this software since the initial product release. This is the only version released on production aircraft.

The "AUTO SALVO" LED flashes 6 times immediately after startup to identify version 1.0. In the unlikely event of a revision change of the software in the future, the LED flash count will increase to indicate that the supervisor software has been revised.

**VERSION WARNING:**

Units running Version 1.15 or previous should be updated to take advantage of new features and diagnostics. Contact Trotter Controls, Inc. for options.

**LATEST VERSION - MAIN SOFTWARE:**

The release version is listed in reverse chronological order.

**2.12.3 Not approved for release**

- Revised by Andy Holcomb
- 11/15/2014
- Added Bar a pressure bar graph to the auto and timer display that show in the ranges of 2600-3000+ psi
- Added the 4 place bit to TW91 userFlags2. when the 4 bit is set to 0 the graph will show, when set to 1 it will not display. The default is to display the graph
- The graph will not show if there are errors

**2.12.2 Current Release as of 12/19/14**

- Revised by Andy Holcomb
- 11/15/2014

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Made changes to not clear errors 123 thru 126. These are errors that can only be checked during startup and should not be cleared till fixed and rebooted.

- Fixed to allow errors 123 thru 126 to pass through when the I2C is not working.
- Made changes so the pump will not turn on if the above errors are present
- Note: the run pump switch will still run if pressed but the bleed valve is open
- Changed the Ground Line so it would show the max deliverable ground line when in pilot mode, not 0.

#### **2.12.1      OBS**

- Revised by Andy Holcomb
- 10/13/2014
- Changed "Fuel Ferry" to "Ferry Fuel" in the menu Screen
- Changed "FuelFerry" to "FerryFuel" in the Ferry Fuel Screen

#### **2.12      OBS**

- Revised by Andy Holcomb
- 8/19/2014
- Added metric display capability. Used Tweak 533 to control what unit type is displayed.
  - o Tweak set to 0 is English units.
  - o Tweak set to 1 is SI Units but English Coverage Level
  - o Tweak set to 2 is all SI.
- Made Fuel Ferry mode stay on even after reboot until a certain combination of key strokes is performed.
  - o Tweak 532 is used to log in the eeprom that the unit is in fuel ferry mode.
  - o In order to exit fuel ferry it is required to hold the "Close Gate" switch while turning the the "Hyd Power" switch off.
  - o Warning messages were added to tell the operator to turn off the Armed switch and turn on the Hyd Power switch.
- The Bypass valve was hard coded to stay off while in fuel ferry mode.

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- Removed stagnant errors that were coming up after self tests were performed.

**2.11 OBS as of 12/19/14**  
**Current Air Tractor Release**

**2.04**

- Auto Dump: Added timer to flash-armed-fast and hold close valve for 5 seconds after Auto Dump completes.
- Auto Dump: terminates at prox close instead of waiting 5 seconds.

**2.03**

- Sys Test: move gate angle test to before hydraulic flusher.
- Added tweak 808 to display status buffer HWM (high-water-mark) for additional step in QC testing.
- Shortened 3 buffers of length 350 to 200, saving 450 bytes.
- Removed four unused floats, saving 16 bytes data. This FIXES intermittent error (144\_multi) on Gate Angle Sys Test check.
- RCL: put equiv C.L. on left of bottom line, prefix with "CL:".
- Ground Line now 5 characters instead of 4 to allow >9999 feet for RCL.
- Calculate equivalent C.L. for RCL using (GPA, mph, swath).

**2.02**

- Tweak bit controls special use of ag RCL (reduced coverage level).
- RCL: main (auto) screen has GPA, MPH, and SWATH.
- No display service (DUMPING or GATE CLOSED) during auto dump.
- Flash ARMED LED at 5 Hz when dumping.
- Changed RCL status to persist across system resets.

**2.01**

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- This version is identical to v2.00 with date of 2/22/10 (no change to code from 2.00)

### 2.00

- Initial (beta) release required for LCD based GENII Systems.
- Auto detects the type of display being used with the system (either LCD or VFD). This applies to both the main display and remote display.
- Timer mode now defaults to "1 second" and "Pilot".
- Air Tractor logo changed.
- EEPROM no longer contains any persistent error codes
- Manuals have been updated to match this version of software
  - 9001-0011, Revision D ~ GENII FRDS Maintenance and Troubleshooting Manual
  - 9001-0012, Revision D ~ GEN II FRDS Operators Manual, Trotter Controls, Inc.

### 1.16

- Final Version 1 release. All subsequent releases will be version 2.00 or greater unless version 1 software was customized for a specific client.
- SysTest screen shows the calculated gate speeds for each of the six valves after a successful SysTest Valve Connection test.
- The SysTest Hydraulic Pump Pressure Limit test now shows the different limits for turning the pump on depending on whether the ARMED switch is on or off.

### 1.15

Units running this software version or previous should be updated.

- Main screen twist/push system for selecting coverage level and gallons-to-dump changed to ease operation and reduce pilot required input, this system is much faster (and easier) for the pilot to select and change the coverage level and gallons to dump.



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- At the end of a successful Pilot SysTest (either Pilot(ALL) or Pilot(no doors)), the message "ALL SYSTEMS PASSED" is displayed. The text "[YES] [NO]" is also displayed, indicating that the pilot can dismiss the message by pressing either YES or NO.

#### **1.14**

Units running this software version or previous should be updated

- Hydraulic pump is now turned on at two different hydraulic pressure (psi) values depending on whether the ARMED switch is on or off.

#### **1.13**

Units running this software version or previous should be updated

- Initial release version.
- Original manual and supporting documentation was written to coincide with this version.