Trotter Controls, Inc.
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By: DC Checked: MAG

# FAA APPROVED
# FLIGHT MANUAL SUPPLEMENT

**FOR**

## TROTTER CONTROLS FIRE RETARDANT DISPERSAL SYSTEM (GEN III)

**AS INSTALLED IN**

## AIR TRACTOR AT-802/802A AIRCRAFT

_____
**REGISTRATION NUMBER**

_____
**SERIAL NUMBER**

**THIS SUPPLEMENT MUST BE ATTACHED TO THE FAA APPROVED AIRPLANE FLIGHT MANUAL WHEN THE TROTTER CONTROLS FIRE RETARDANT DISPERSAL SYSTEM (FRDS GEN III) IS INSTALLED IN ACCORDANCE WITH SUPPLEMENTAL TYPE CERTIFICATE SA02535AK.**

**THE INFORMATION CONTAINED HEREIN SUPPLEMENTS THE INFORMATION OF THE FAA APPROVED AIRPLANE FLIGHT MANUAL. FOR LIMITATIONS, PROCEDURES, PERFORMANCE INFORMATION NOT CONTAINED IN THIS SUPPLEMENT, CONSULT THE FAA APPROVED AIRPLANE FLIGHT MANUAL AND THE BASIC PILOT'S OPERATING MANUAL.**

**FAA APPROVED**

ALAN W WILSON Digitally signed by ALAN W WILSON
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# Revisions

| Rev | Page(s) | Description | By | Approved | Date |
|---|---|---|---|---|---|
| A | All | Initial Release | MAG | See Cover | 3/27/2020 |

# 1 General

The third generation fire retardant dispersal system, or FRDS GEN III, is installed in this aircraft. FRDS GEN III is an electrically driven system (no hydraulics) which reduces operational and support complexity as well as weight.

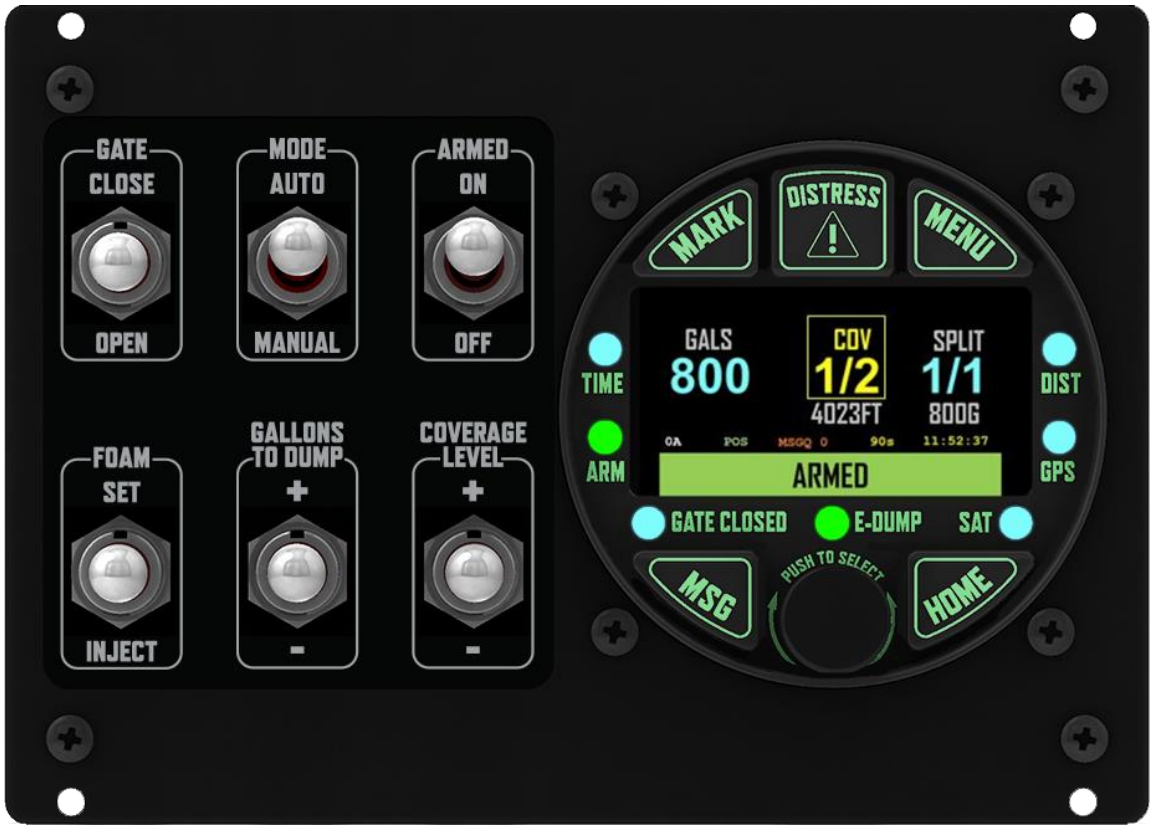


**Figure 1 - Pilot Interface Panel**

The controller is powered when the aircraft battery switch is ON. The primary control panel (Figure 1) allows the pilot to select the configuration for the drop. The pilot has the option of using a control knob to navigate the display and adjust settings, or switches to adjust the drop configuration. In addition to drop control, the unit provides advanced tracking and telemetry features that are transparent to the pilot.

The system is ARMED by the operation of a single switch. A small color display is used to indicate the drop configuration, main tank and foam tank quantity, and any alerts to the pilot.

**NOTICE**

THE FRDS GEN III MUST BE **ARMED** FOR THE **DROP** SWITCH TO OPERATE.

The system has two basic modes of operation.

**Auto Mode**
FRDS GEN III is primarily operated in AUTO mode which is used to manage the drop flow rate and quantity delivered after the pilot depresses the DROP switch located on the grip of the flight control stick. The preferred DROP switch location is shown in Figure 2 and an alternate location is shown in Figure 3.

**Figure 2 – Control Stick**

**Figure 3 - Alternate Control Stick**

The system can be programmed to perform ¼, ½, and complete drops of a tank based on a quantity of 800 U.S. gallons. This quantity can be adjusted using the GTD switch UP or DOWN.

Each drop can deliver a coverage level of 0.5, 1, 2, 3, 4, 5, or MAX (gallons per 100 $ft^2$).
In MAX coverage mode, the doors will open to the fully OPEN position. The coverage can be adjusted using the COVER switch UP or DOWN.

The selectable drop quantities are as follows:

- For coverage of 1 - 4, the selectable drop quantities are ¼, ½, and ALL.
- For coverage of 5 - MAX, the selectable drop quantities are ½ and ALL.

When in auto mode the doors will close when the selected drop quantity has been released or when the pilot released the DROP switch, whichever comes first.

The DROP switch must remain depressed for the duration of a drop, i.e. until the commanded quantity has been released. Releasing the DROP switch before the commanded quantity has been released will cause the doors to close immediately.

**Manual Mode**
FRDS GEN III also has a Manual Mode in which the extent to which the doors open is controlled by the pilot. Manual mode can be used to bypass the computer control system in the event that it is INOP or otherwise unresponsive.

The system must be ARMED by operating the appropriate switch, then when the DROP switch is pressed, the doors will open at a rate of approximately 20% per second – ie the gates will be fully open after 5 seconds.

When the DROP switch is released, the doors will close immediately.

**Emergency Drops**
In the unlikely event that the system does not drop, two alternate means of releasing the hopper contents are provided:

- **MAN SALVO** – this is activated by pressing the MAN SALVO button located on the left-hand side of the cockpit, as shown in Figure 4. This will cause the doors to open to a pre-determined fixed angle regardless of the ARM switch setting. This requires electrical power.
- **E-DUMP** – this is activated by pressing the e-dump button on the lever located on the left hand side of the cockpit and moving it forward as shown in Figure 4. No electrical power is required.

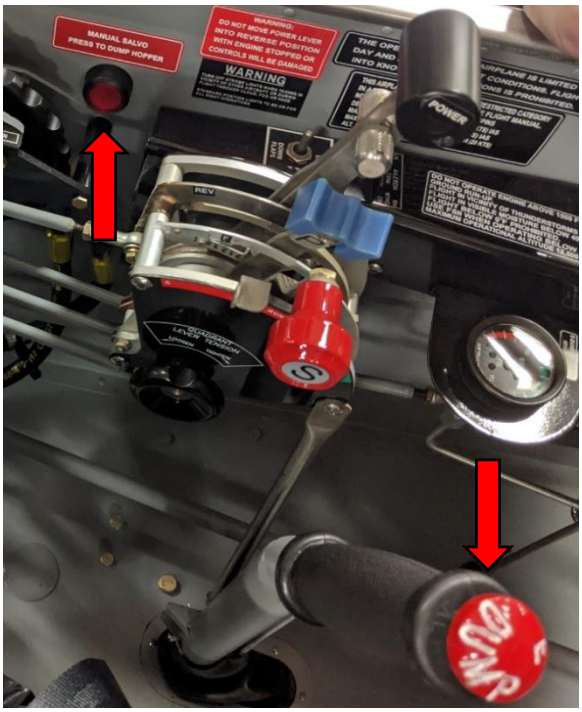


**Figure 4 - Manual Salvo Button & E-Dump Lever (View from Pilot's Seat)**

**Foam Injection**
FRDS GEN III supports the injection of a foaming additive which is used at the discretion of the pilot. The Pilot Interface shows the quantity of additive available. To inject the additive:

1. Operate the FOAM switch UP momentarily to show the foam inject screen.
2. Rotate the control knob to select the required foam concentration.
3. Begin the injection cycle by either:
   a. Pressing the control knob; or
   b. Operating the FOAM switch DOWN to INJ momentarily.

Note that once the concentration has been set, the injection can be triggered without the use of the Foam Control screen by operating the FOAM switch DOWN momentarily.

**Annunciators**
The LED annunciators on the Message Interface of the controller (Table 1) have the following meanings when illuminated.

Table 1 - Message Interface Annunciators

| Indicator | Meaning | Color/Status |
|---|---|---|
| **TIME** | The telemetry system is tracking by time | Blue / On |
| **DIST** | The telemetry system is tracking by distance | Blue / On |
| **ARM** | The system is ARMED | Green / Armed |
| **GATE CLOSED** | The doors are in the closed and latched position | Blue / Closed & Latched |
| **E-DUMP** | E-DUMP handle is in the latched position | Green / Latched |
| **SAT** | The Iridium modem is on-line | Blue / On-line |
| **GPS** | Good GPS data is being received | Blue / GPS Data Good |

**NOTICE**

ALWAYS VERIFY THAT THE **GATE CLOSED** ANNUNCIATOR IS ILLUMINATED BEFORE LOADING THE HOPPER WITH LIQUID. THIS ENSURES THAT THE DOORS ARE FULLY CLOSED AND MECHANICALLY LATCHED

Additionally, each button has a backlight which changes from GREEN to AMBER when the button is activated. The light behind the DISTRESS button will remain AMBER for as long as the distress condition remains active.

# 2 Limitations

There are no additional limitations associated with this installation.

# 3 Emergency Procedures

**EMERGENCY DUMP**

1. SALVO BUTTON ..... PUSH TO LATCH
   If gatebox doors do not open / hopper contents do not dump:
2. E-DUMP LEVER ..... PRESS BUTTON MOVE FWD

**⚠WARNING**

DO NOT FLY UPSLOPE TO DUMP ON A FIRE.
MAINTAIN SUFFICIENT ALTITUDE TO CLIMB AWAY IF DUMP IS ABORTED.

# 3-A Abnormal Procedures

**GATEBOX DOORS DO NOT OPEN IN AUTO/MANUAL MODE**

Follow **EMERGENCY DUMP** procedures.

**GATEBOX DOORS DO NOT CLOSE**

1. MODE SWITCH ..... AUTO
2. ARMED SWITCH ..... OFF
3. ARMED SWITCH ..... ARMED/UP
4. GATE CLOSED SWITCH .... TOGGLE UNTIL GATE CLOSED ILLUMINATED

*If procedure fails to close doors a second attempt can be made using MANUAL mode*

# 4 Normal Procedures

**BEFORE STARTING ENGINE**

1. SALVO BUTTON ..... EXTENDED/OFF
2. MODE SWITCH ..... AUTO
3. ARMED SWITCH ..... OFF
4. ARMED SWITCH ..... ARMED/UP
5. ARMED ANNUNCIATOR ..... ILLUMINATED
6. GATE CLOSED ANNUNCIATOR ..... ILLUMINATED
7. E-DUMP ANNUNCIATOR ..... ILLUMINATED
8. ALERTS ..... CHECK STATUS
9. HOPPER & FOAM TANK ..... LOAD WITH AGENT

**BEFORE TAKEOFF**

1. ARMED SWITCH ..... OFF

**⚠WARNING**

DO NOT FLY UPSLOPE TO DUMP ON A FIRE.
MAINTAIN SUFFICIENT ALTITUDE TO CLIMB AWAY IF DUMP IS ABORTED.

**APPROACHING DUMP SITE – NORMAL DUMP**

1. COVERAGE LEVEL ..... AS REQ'D
2. GALLONS TO DUMP ..... AS REQ'D
3. MODE SWITCH ..... AUTO
4. ARMED SWITCH ..... ARMED/UP
5. ARMED ANNUNCIATOR ..... ILLUMINATED
6. FLAPS ..... SET 10°
7. AIRSPEED ..... 125 - 130 MPH IAS
8. OVER DUMP SITE ..... PRESS DROP SWITCH
9. AIRCRAFT ATTITUDE ..... MAINTAIN LEVEL FLIGHT & ALTITUDE

   *If delivering split load:*

   a. ARMED SWITCH ..... OFF
   b. GALLON TO DUMP ..... SELECT FOR 2ND DUMP
   c. ARMED SWITCH ..... ARMED/UP
   d. OVER 2ND DUMP SITE ..... PRESS DROP SWITCH
   e. AIRCRAFT ATTITUDE ..... MAINTAIN LEVEL FLIGHT & ALTITUDE

10. ARMED SWITCH ..... OFF

# 5 Performance

There are no performance changes associated with this installation. Refer to Air Tractor AT-802/802A Basic Airplane Flight Manual for performance calculations.

# 6 Weight & Balance / Equipment List

There are no weight and balance envelope changes associated with this installation. Refer to current weight and balance for the aircraft.

# 7 Systems Description

The system is powered by a 5A circuit breaker labeled "CB FRDS CONTROL" in the instrument panel and a 105A circuit breaker labeled "CB FRDS MOTOR" on the upper firewall shelf.

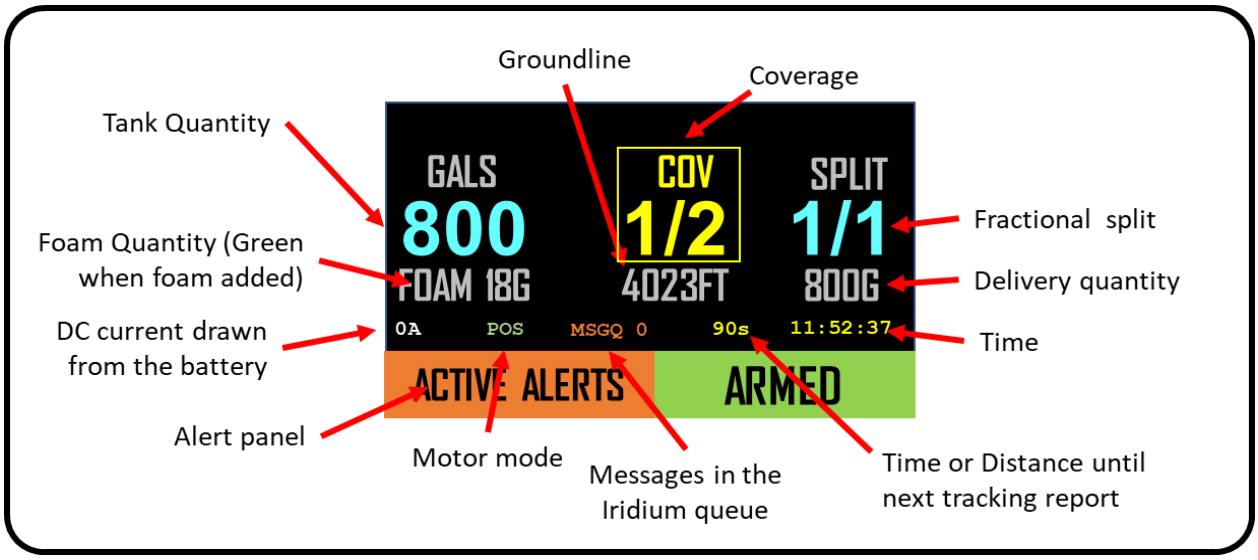


**Figure 5 - Pilot Interface Home Screen**

**ACTIVE ALERTS**

Indicates an active alert. Press MSG to see the alert window. Each alert gives guidance on corrective action.

**ARMED**

Indicates the system is ARMED and ready to drop when the DROP switch is pressed.

**SWITCH FUNCTIONS**

The functionality of the various switches located on the FRDS GEN III Pilot Interface is as follows:

**ARMED**

- ON – Applies power to the motor controller and arms the system for delivery.
  - Pressing the DROP switch initiates a delivery.
- OFF – Removes power from the motor controller.

**GATE (Active only when ARMED)**
- CLOSE – Moves the doors in the closed direction as long as the switch is held.
- OPEN – Moves the doors in the open direction as long as the switch is held.

**FOAM**
- SET – Opens the foam concentration adjustment menu.
- INJ – Operates the foam pump to inject foam into the hopper.

**GALLONS TO DUMP**
- (+) – Increases the gallons to deliver during an AUTO drop.
- (-) – Decreases the gallons to delivery during an AUTO drop.

**COVERAGE (Gallons per 100 $ft^2$ on the ground)**
- (+) – Increases the coverage on the ground. (higher flow rate)
- (-) – Decreases the coverage on the ground. (lower flow rate)

**MODE**
- AUTO – Doors are controlled by the computer system.
- MANUAL – Doors are controlled by the pilot.

# 8 Handling, Service & Maintenance

Ground handling procedures are unaffected by this installation. Service and maintenance items specific to this installation are found in Trotter Controls Document # 9001-0057.

# 9 Supplements

This Airplane Flight Manual Supplement must be inserted into the existing Airplane Flight Manual.