



# NMERI Halon Alternatives Technical Working Conference

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## U.S. NAVAL AIRCRAFT INERT GAS GENERATOR TEST PROGRAM

Prepared by: Marco Teppeschi and Bill Leach

Naval Air Warfare Center Aircraft Division

Sponsored by: Mr. James Homan, AIR-4.3.5

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# INERT GAS GENERATOR APPLICATIONS

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- F/A-18 E/F
  - ENGINE BAY
  - DRY BAY
- V-22
  - DRY BAY
  - MID-WING



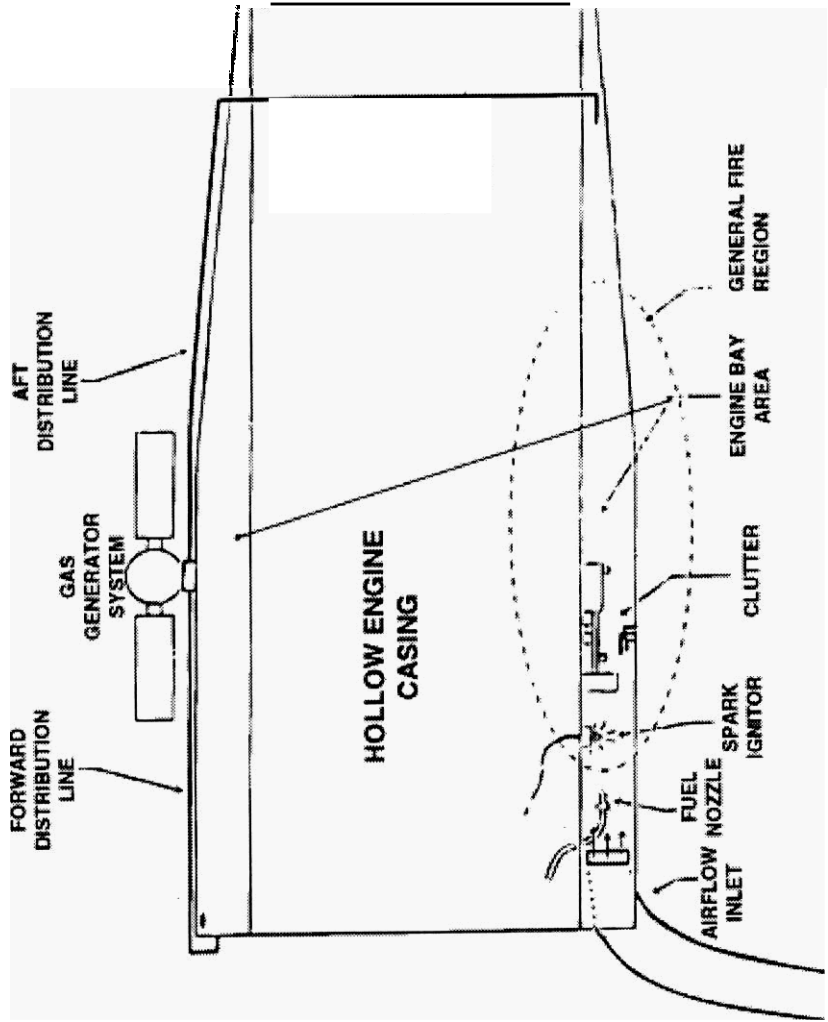
# INERT AS WEAPONS

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- WORKHORSE GAS GENERATORS
  - 200MS, 1 LB GAS GENERATORS (F-18)
  - 1 LB MONOLITHIC GAS GENERATORS (F-18)
- PELLETTIZED PROPELLANT GENERATORS (F-18, V-22)
- SOLID GRAIN GAS GENERATOR (F-18)



# F-18 E/F ENGINE BAY SIMULATOR





# F/A-18 E/F ENGINE NACELLE TESTING

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- ENGINE NACELLE TEST ARTICLE
- VARIABLE DISTRIBUTION SYSTEMS,  
PROPELLANT TYPES
- ESTABLISHED SOLID GRAIN  
PROPELLANT EQUIVALENT TO  
HALON TESTS CONDUCTED IN 11/94
- RESULTS:
  - 5.5 POUND SOLID GRAIN GAS GENERATOR



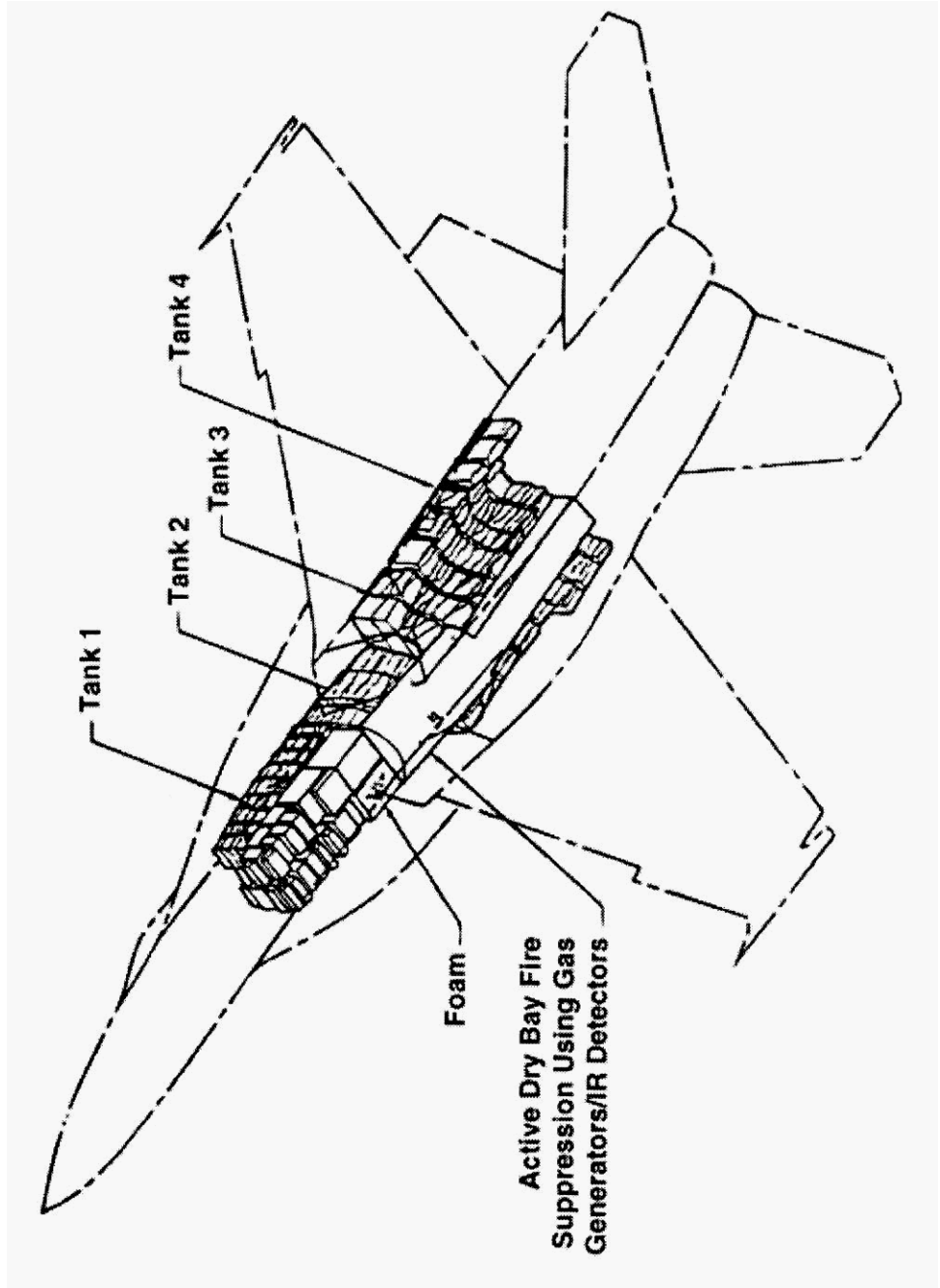
# F/A-18 E/F ENGINE NACELLE TESTING (CONT'D)

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- PRESSURE / CONCENTRATION TESTS MEASUREMENTS TAKEN
  - CONCENTRATION TESTS TAKEN WITH AND WITHOUT FIRE PRESENT
  - RESULTS DEMONSTRATED SAME LEVEL OF OXYGEN DEPLETION DURING AGENT DISCHARGE FOR BOTH TEST EVENTS
  - VARIED DISTRIBUTION SYSTEM DIRECTLY AFFECTS INERTION LEVELS



# F-18 E/F DRY BAY AREA





# F/A-18 E/F DRY BAY TESTING

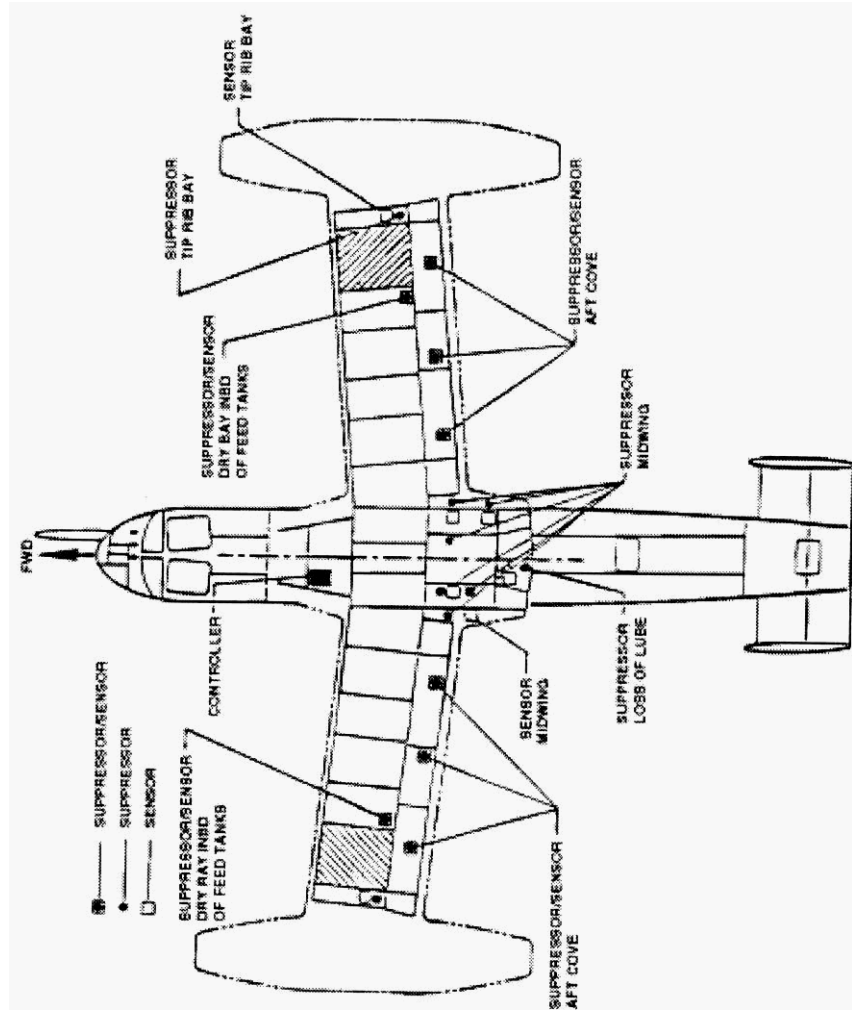
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- LIVE FIRE TEST (LFT) CONDUCTED - 10/95 - 11/95
- FULL SCALE DRY BAY SIMULATOR & SURROGATE LFT TESTING - 8/96 - 10/96
- TEST CONDITIONS & PROCEDURES
  - VARIABLE THREAT, NUMBER & LOCATION OF GAS GENERATORS





# V-22 DRY BAY INERT GAS GENERATOR SYSTEM





## V-22 MIDWING LIVE FIRE TEST

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- V-22 EMD #6 AIRCRAFT TESTBED
- SUCCESSFULLY TESTED HD-WING FIRE PROTECTION SYSTEM - 1/96-2/96
- SYSTEM SIZED FOR SEVEN 420g PELLETTIZED GAS GENERATORS
- PRESSURE / CONCENTRATION MEASUREMENT TESTS TAKEN



# HIGHLIGHTS

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- F-18:
  - AGENT CONCENTRATION TESTS WITH FIRE
  - MONOLITHIC GAS GENERATOR
- V-22:
  - 1ST AGENT CO ENTRATION TEST FOR GAS GENERATOR BASED SYSTEM
  - ACTUAL AIRCRAFT USED
  - PHYSICALLY ACTING AGENT (BOTH V-22, F-18)

