Endless 02 frees new fighters

by Kieran Daly

Normalair-Garrett is to supply
onboard oxygen generating
equipment for the Lockheed
YF-23 Advanced Tactical
Fighter prototype. Trials of the
ATF unit have begun at Brooks
AFB, Texas.
Oxygen stored for aircraft
use is bulky, weighty, and
unpleasantly hazardous. Its
supply is a prime limiting factor
in dispersed and extended-
range fighter operations. The
US Navy, concerned about its
carriage on aircraft carriers in
particular, is determined to
minimise its use.

The next generation of com-
bat aircraft, however, should
be able to dispense with stored
gas as the primary crew
oxygen source. Instead, on-
board oxygen generation
systems (OBOGS), specifically
molecular sieve oxygen-
generating systems (MSOGS),
will "strain" oxygen from
engine bleed air and feed it to
the crew.

Already the B-1B carries a
system supplied by Normalair-
Garrett, and the company is to
provide further units for the
British Aerospace EAP fighter
demonstrator.

The system works by drawing
conditioned bleed, air through a
bed of Zeolite to filter out the
nitrogen, carbon dioxide, and
trace gases. Only oxygen and
inert argon pass through the
Zeolite molecular lattice. Zeo-
lite is a synthetic alumino-
silicate in a ceramic binder,
produced as small beads.
The oxygen/argon mixture
in atmospheric proportions of
21:1 is compressed to form a
breathable product containing
95 per cent oxygen. Back-
pressure from the product is
used to purge the waste gas left

Schematic of Normalair-Garrett three-bed MSOGS

Pressure-relief [-TrfiSiSmMmWmMMmMm
valve
| Oxygen-enriched product gas [I Conditioned engine bleed air

Above How MSOGS makes oxygen

Sizes range from this six-bed MSOGS, above, to a compact concentric device

in the Zeolite bed. In the three-
bed system illustrated, the bed
cycles are overlapped to provide
a steady flow. NGL says that the
95 per cent-rich mixture meets
maximum operational oxygen

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No-nav

routing
The McDonnell
Douglas Pilot's
Associate offers
automatic airborne
route planning,
calculating the safest
way to and from a
target by gathering
data from the threat
warning systems

requirements under normal
conditions.

The company has developed
two types of sensor to check that
the product gas is of the correct
composition. The fluidic sensor

NEWS IN BRIEF

• Asironaulics joins LRAACA
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n electronic flight
lay system for the US
Navy's Lockheed P-7 long-
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aircraft (LRAACA) The US
company will supply cockpit
sets for Lockheed's systems
integration laboratory and two
prototypes to be completed by
the end of 1992. I)
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compares the viscosity and rate
of flow of product and reference
gases through capillaries to
measure the partial pressure of
oxygen pressure. In the second,
a piece of Zirconia is heated to
750°C and the two gases are
passed either side, which
generates a measurable
electrical potential across the
material. This type of sensor
will be used in the EAP.

It is still not possible to
dispense entirely with stored
oxygen, because an emergency
bottle must be carried in
case of engine or electrical
power failure.
If cabin decompression
occurs above a pre-set altitude,
the system reverts automatic-
ally to emergency oxygen.
Operators can specify manual or
automatic reversion in the event
of other emergencies. If, for
example, the engine restarted
after a. failure, so would the
MSOGS. Operators can also
specify the ability to deselect
the emergency supply in such a
case.

As with conventional oxygen
systems, the ejection seat has its
own emergency bottle for use in
crew ejections.
NGL's standard MSOGS
uses three Zeolite beds,
arranged in line or in a triangle,
and weighs 551b. The latest
model has the beds arranged
concentrically, and weighs only
251b. NGL claims a unit life of
around ll,000hr and extremely
low maintenance requirements.
The company now has a
teaming arrangement with Pall
Safety Atmospheres of Tampa,
Florida, partly to gain access to
the US market and also to take
advantage of a Pall-developed
process to "fix" the Zeolite
granules to prevent the for-
mation of dust.

the system will allow a two-
crew fiightdeck. •:." • :

• SI on Tornado MLU
Smiths Industries is to provide
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y for ihe Royal
An [a Tornado
GR.l mid-life update. The
raster/cursive displ.i\ will be
lent full-colour
d moving
maps and monochrome
electro-optical sensor images.
The order is potentially worth
£\l million.

FLIGHT INTERNATIONAL, 6 May 1989 27