OPERATIONS: SPACEFLIGH T

NASA budget cuts restrict Freedom
BY TIM FURNISS

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ASA may be told by the US
Government to delay the
launch of the first components
for the Freedom international
space station to the year 2000 as
a result of independent project
reviews and budget negotiations
in Congress.
The space station could also
be redesigned and major com-
ponents launched on expenda-
ble unmanned launch vehicles,
rather than the Space Shuttle.
The reaction of international
partners involved in the project,
the European Space Agency,
Japan and Canada, will await
final confirmation of Freedom's
status in November after full
Congressional clearance of
NASA's budget. Launches of
partners' components could be
delayed by two to three years.
Partners have already been
informed that there will be a
90-day redefinition study by
NASA ordered by Congress as a
condition of granting NASA's
Fiscal Year 1991 budget request.
Ian Pryke, ESA's director in
Washington, has confirmed that
top level discussions have al-
ready taken place between the
agencies about the possible ram-

Tanking test cl<
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tanking test at the Kennedy
Space Centre on 24 October
revealed no propellant leaks on
the Space Shuttle Atlantis,
which is likely to be cleared for
a night launch about 10 Novem-
ber on its mission for the US
Department of Defense (DoD).
A tanking test in June re-
vealed hydrogen leaks which
delayed the DoD mission from
July. A similar test on Columbia
was scheduled for October 29 in
the hope that its hydrogen leak
problem can be isolated and the
Shuttle cleared for launch on its
much-delayed STS 35 Astro 1
mission before the end of 1990.
The STS 38 DoD mission
scheduled for November will be

ifications of the redefinition.
The US space agency re-
quested $15.1 billion for FY
1991 and after a series of wran-
gles in the House and Senate
during the summer — not
helped by NASA's Hubble and
Shuttle problems — a final
budget of around $13 billion
seems likely to be approved.
This is a 13% increase over
1990 but the agency has been
told that in future it cannot
expect an increase over 8%,
which would have a crucial
effect on Freedom and other
programmes.
The space station request for
1991 could be slashed from the

requested $2.5 billion to around
$1.9 billion and the agency's
redefinition will be directed at
lowering the development and
operating costs and reducing its
reliance on the Space Shuttle.
Over 20 Space Shuttle mis-
sions from 1996-1998 were to
have been required to assemble
the full station. The NASA re-
view committee, led by Norman
Augustine, chairman of Martin
Marietta, will urge NASA to
await the development of an
Advanced Launch System-class
unmanned booster to launch
the main components. •

the penultimate classified Shut-
tle flight. STS 44 Atlantis is
scheduled to carry a DSP early
warning satellite into orbit next
year. An unclassified DoD mis-
sion, STS 39 by orbiter Discov-
ery, is scheduled for February
next year but an SDIO Spacelab
research mission, STS 49, Star-
lab, may be cancelled due to
budget cuts.
No further Shuttle DoD mis-
sions are scheduled after this.
The original Magnum elec-
tronic-intelligence satellite pay-
load for STS 38 may have been
replaced by a quick-reaction
reconnaisance satellite to oper-
ate in low Earth orbit in support
of operation Desert Shield. •

ARIANE SCORES
HUGHES DOUBLE
Ariane V39, the fifth launch of
the most powerful Ariane version,
the 44L, took place from Kourou,
French Guiana on 12 October,
carrying two Hughes communica-
tions satellites, SBS 6 and Galaxy
6. The SBS 6 providest Ku-band
high-speed digital data services
for Comsat, while the Galaxy 6
model is Hughes Communications'
first Ku-band spacecraft with 16
transponders for VS domestic
services. The next Ariane launch,
V40 with an Ariane 1 44P
booster, is set for November, car-
rying Satcom CI and GStar IV.

COBE captures I
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ASA's Cosmic Background
Explorer (COBE) has taken
its first image of the Milky Way
galaxy in a wavelength that
reveals the dust from which
planets and galaxies are formed.
The image was taken by the
spacecraft's Diffuse Infra-red
Background Experiment and
shows radiation from cold inter-
stellar dust.
Combined with an earlier
image taken with the same in-
strument but at a different

Debris danger
faces Shuttle

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ncreasing space debris in
Earth orbit may soon make it
too dangerous to fly manned
spacecraft, such as the Shuttle
and space station Freedom, ac-
cording to the US Congress'
Office of Technology Assess-
ment (OTA).
"Unless nations reduce the
amount of orbital debris they
produce each year, future space
activities could suffer loss of
capability, loss of income and
even loss of life, as a result of
collisions between spacecraft
and debris," the OTA says. Of
the 6,645 artificial objects larger
than a football, and together
weighing a total of 2.04 million
kg, that can be tracked in Earth
orbit, only 6% are functional
satellites. The other debris com-
prise mainly dead spacecraft
and spent rocket stages. There
are also an estimated 70,000
bits of smaller debris that can-
not be tracked, such as nuts and
bolts, and billions of small par-
ticles such as flakes of paint and
spacecraft insulation.

Even a flake of paint at a
relatively high velocity could
puncture an astronaut's spaces-
uit. "Continued steady growth
of debris could render some
well-used low Earth orbits too
risky to use by the year 2000 or
2010," says the OTA.
The report says that nations
"must act", to reduce the prolif-
eration of debris, for example,
rocket stages could be com-
manded to re-enter Earth's at-
mosphere or strengthened so
they do not break up into nu-
merous bits. •

ilky Way dust
wavelength — which revealed
the millions of stars in the
Milky Way — the image will
enable scientists to determine
the content, energetics and
large-scale structure of the gal-
axy as well as the distribution of
dust within the Solar System.
The data will also be studied
for evidence of a faint, uniform
infra-red background, the resid-
ual radiation from the first stars
and galaxies formed following
the creation of the Universe. •

ars Atlantis

FLIGHT INTERNATIONAL 31 October - 6 November, 1990