1 SPACEFLIGHT

'Pebbles' prototypes awarded to Orbital

Shuttle pumps hit

by budgeting cuts
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he NASA programme to de-
velop new Space Shuttle
main engine liquid-oxygen and
liquid-hydrogen turbopumps
with a lifetime of 55 flights,
aiming for a first mission in
1994, has been affected by
budget cuts.
While a new oxidiser tur-
bopump may still fly in 1994, a
new hydrogen turbopump certi-
fication programme will be de-
ferred until after the oxidiser
pump has been flight certified,
severely delaying a mission on
which both new turbopumps
could fly together on an engine.
NASA selected Pratt & Whit-
ney (P&W) to develop the new
pumps in 1986, because the
existing Rocketdyne pumps were
showing signs of premature wear
after as few as six flights, requir-
ing major maintenance. The
P&W pumps were designed to
be interchangeable, with im-
proved pumps also being devel-
oped by Rocketdyne. The
programme, originally estimated
to cost S240 million, is $250
million over budget. A projected
total cost of $850 million and
NASA budget cuts have slowed
the programme.
While P&W conducted a 1.5s
ignition test on a Shuttle main
engine, with both oxygen and
hydrogen turbopumps, on 17
December, marking a "major
milestone" for the company. A
Rocketdyne hydrogen fuel tur-
bopump has been certified to fly
on the March Shuttle mission. •

Intercosmos launched

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he Soviet satellite, Intercos-
mos 25, was launched on 18
December with the piggy-back
Czechoslovakian spacecraft
Magion 3 from the Plesetsk Cos-
modrome aboard a Tsyklon
booster. The satellite was placed
into a 3,083 x 440km orbit with
an inclination of 82.5°, which
Magion 3 also entered after ejec-
ting from the main spacecraft.
With the smaller Magion 3
manoeuvring in orbit using a
Soviet Pulsar engine, the two
satellites will study electrons
and plasma in the Earth's iono-
sphere and magnetosphere as
part of the Apex programme. •

BY TIM FURNISS

Orbital Sciences (OSC) has

been awarded a $10.8 mil-
lion contract by the Strategic
Defence Initiative (SDI) Organ-
isation to launch two prototype
"Brilliant Pebbles" spacecraft
with one Pegasus air-launched
booster in 1994.

This is the 16th outstanding
launch contract for Pegasus, in
addition to its 42 launch op-
tions. The programme's third
launch, for the Defence Ad-
vanced Research Project Agency
(DARPA), of the Array of Low
Energy X-Ray Imaging Sensors
spacecraft (ALEXIS), has been
delayed considerably by con-
cerns about the booster' s
performance during its two
earlier flights.
The TRW-built Brilliant Peb-
bles programm e prototyp e
spacecraft are called "lifejackets"
because they will assess the sen-
sor housing, which provides
solar power and thermal control.
Brilliant Pebbles is the highly
distributed, space-based ballistic
missile tracking, identification
and destruction system that
is a key element of the SDI
defence shield.

Despite the technical concerns
over Pegasus, the booster has
proved remarkably successful in
gaining military, civilian and in-
ternational orders. This is partly
because of its low cost, lack of
competitors and the fact that it
is an operational project.
OSC launche d the first
Pegasus in April 1990, carrying
a NASA-DARPA payload called
Pegsat. In July 1991 it launched
seven DARPA Microsats, but
into a lower orbit than planned
as a result of a first-second-stage
separation anomaly.
Between the ALEXIS flight
this year and 1993, there will be
two further DARPA-US Air
Force missions and one DARPA
mission. Pegasus has also been
booked to launch NASA's Sea-
Star spacecraft, also built by
OSC, and seven NASA Small
Explorer satellites, including one
for Argentina in 1994, with op-
tions for three more.

Pegasus will also launch a
Brazilian satellite in September
1992. The US Air Force has
booked one firm and 39 optional
launches, while Orbital Sciences
will use Pegasus to launch its
proposed Orbcomm data-relay
satellites. D

DRA confident of

project despite

Soviet upheaval
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he planned commercial mis-
sion to the Mir space station
by a German astronaut in March
1992 is still on schedule, despite
the political upheaval in the
former Soviet Union.

The German space agency,
DRA, says that lift-off for the
planned eight-day mission by
Klaus Dietrich Flade on Soyuz
TM14 is to start on 17 March. A
12-day French commercial mis-
sion by Michel Tognini on
Soyuz TM15, scheduled for July,
is also safe, according to
officials.

The second flight of the Buran
space shuttle is almost certain to
be delayed for at least two years,
to 1994. Buran is to be launched
unmanned and, en route to the
Mir space station, is scheduled
to retrieve a solar panel from the
station and return it to Earth. It
will be man-tended by a two-
man crew launched in a Soyuz
TM, which will also dock with
Mir later.

The two Soyuz TM-Buran
crews being trained for this mis-
sion are test pilots Ivan Bakurin
and Alexei Boroday, who have
been teamed with experienced
Soyuz flight engineers Alexander
Balandin and Alexander
Ivanchenkov. •

ATLAS AND
ARIANE LAUNCH

A veteran Ariane 44L booster (left)
carries the Inmarsat 2F3 and Tele-
com 2A communications satellites
into geostationary transfer orbit
(GTO) from Kourou on mission V48
on 16 December, while the General
Dynamics Atlas 2 (right) made its
maiden flight from Cape Canaveral's
Pad 36B on 7 December, carrying the
Eutelsat 2F3. Ariane placed its pay-
loads into GTO with one burn of its
third stage Eutelsat was first placed
into a low-Earth parking orbit and
then its Centaur stage was restarted
for the GTO burn. Each satellite was
placed into geostationary orbit using
on-board apogee motors. Inmarsat
2F3 will be stationed at 179°E,
Telecom 2A at 3°E and Eutelsat
2F3 at 16°E.

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