DEFENCE

Rafale to fly in June

ST CLOUD

Dassault's Rafale is an
"experimental combat air-
craft prototype" intended to
demonstrate the feasibility of
using advanced technologies
for application to the French
Air Force and Navy's 1990s
requirements, Avion de
Combat Tactique (ACT) and
Avion de Combat Marine
(ACM) respectively.
First flight of the Rafale
from the Istres test centre is
scheduled for June. The air-
craft integrates several new
technologies: extensive use of
major composite structures;
advanced aluminium-lithium
alloys; new manufacturing
techniques, in particular
titanium superplastic forming
and diffusion bonding; digital
flight controls; and digitised
integrated systems.
Both the ACT and ACM
will be dual-role aircraft with
air-to-air and air-to-ground
missions. In the air-to-air role
the requirement is for at least
six air-to-air missiles; two
short-range and four medium-
range is a likely mix. The
medium-range missiles will be
active self-homing enabling
the aircraft to launch them in
rapid succession. The aircraft
will have an internal gun and
internal electronic counter-
measures.

In the air-to-ground role

Top Rafale's debut at St Cloud on December 14. Above The cockpit layout. Note the side-stick, right, and stick-like throttle, left

the basic requirement is to
deliver a minimum of 3-5
tonnes of armaments, includ-
ing advanced stand-off weap-
ons on a target 300-350 n.m.
from base. The aircraft will
have six wing and six fuselage
hardpoints and missiles will
be semi-recessed.

The ACT/ACM radar,
under development by
Thomson-CSF, will have an
acquisition range in the 50
n.m.-class, presumably
against fighter-sized targets.
Signal processing will be
advanced with full look-
down/shoot-down capability,
target track-while-scan on up

to eight hostiles, automatic
threat assessment, and threat
priority allocation is required.
The aircraft will have a
thrust-to-weight ratio in
excess of unity to provide high
manoeuvrability. Rafale, at
9-5 tonnes, will be powered
initially by two General Elec-
tric F404s and, later, two
Snecma M88s. The ACT/
ACM will weigh 8-5 tonnes
and be slightly smaller than
Rafale, which is 15-5m long
with 10-6m wingspan and
47m2

wing area.
Rafale must also demon-
strate short-field capability
and be able to take off in 500m

or less with full internal fuel
load of 4,250kg, two medium-
range AAMs and full gun
ammunition. Dassault esti-
mates the take-off weight in
this configuration as 14,000kg
and the ground roll to be
about 400m, rising to "less
than 700m" at 20,000kg take-
off weight. On landing, the
approach speed will be 120kt
or less to a no-flare touch-
down. The main gear is
stressed for a sink rate of
4m/sec (13-3ft/sec). The
ACM nose gear will be
strengthened for catapult
and/or ski jump launches and
a retractable tail-hook will be
fitted.

Cockpit layout

Higher aircraft manoeuvra-
bility means higher physical
stress for the pilot and better
weapon system performance
means more data for the pilot
to sort. To help reduce pilot
stress and improve his overall
g capacity, Rafale's modified
Martin-Baker Mk 10 zero-
zero seat is reclined between
30° and 40°; the exact figure
for ACT/ACM is to be derived
from Rafale experience.

Flight controls are rudder
pedals and a right-hand side-
stick with a similar left-hand
"stick" for the throttle. Cock-
pit displays consist of a wide-
angle holographic headup

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