16
j?
AIR-SUPERIORITY FIGHTERS AND INTERCEPTERS COMPARED

FLIGHT International, 6 January 1979

Aircraft

Ajee t
Shenyan g F-6
F-5E Tiger II

MiG-21MF

Mirage 50
Kfir

F-104S

Mirage F.1C

Mirage 2000

F-16

F-5G

F-18 Hornet

F-18L

Se a Harrier

Super Etendard
Yakovle v Forger

F-4E Phanto m

MiG-23S Flogger

MiG-23 Flogger E

F-15 Eagle

Mirage 4000

JA37 Vigge n

Tornad o F.2

F-14 Tomca t

Su-15 Flagon

MiG-25 Foxbat

Comba t weigh t
(lb, at 50 per cent
internal fuel)
6,800
14,900
12,800

16,400

18,800
21,000 (C1)
20,300 (C2)
19,400

21,000

19,700

18,900

14,500?

27,900

23,300

16,000

18,200
14,500

37,900

31,600

30,600

35,700

35,000?

32,500

34,700

; 48,200

36,400

62,300

Comba t thrust/
weigh t ratio
Dr y Afterburni
0-69 —
0-77' 0-96
0-55 0-78

0-52 0-88

0-58 0-84
0-59 0-88

0-61 0-92

0-52 0-76

0-63 1-01

0-76 1-26

0-62 103?

0-64 1-07

0-77 1-29

1-34 —

0-60 —
1 14 —

0-63 0-94

0-55 0-80

0-51 0-74

0-81 1-33

0-6+ 10 +

0-50? 0-86

0-46 0-89

0-51 0-87

0-5? 0-87

0-54 0-87

Comba t wing
loading
ng (lb/in2

)
50
55
69

66

50

53 (C1)
46 (C2)
99

78

46

63

78?

70

58

76

59
85

72

79

76

59

?

58

107

85

97

103

Fuel
fraction

0-32
0-23
0-32

0-26

0-28
0-30

0-45

0-32

0-33

0-33

?

0-35

0-31

0-29

0-34
0-31

0-30

0-28

0-30

0-29

?

0-28?

0-33

0-31

0-34

0-43

Cannon

2 x 30mm
3 x 30mm
2 x 20mm

Missiles N o
of
hard points
none 4
none 2
Sidewinder 5

1 twin- Atol l 5
barrel 23mm
2 x 30mm
2 x 30mm

1 x 20mm

2 x 30mm

2 x 30mm

1 x 20mm

1 x 20mm

1 x 20mm

1 x 20mm

2 x 30mm

2 x 30mm
none

1 x 20mm

1 x twin-
barrel
23mm

Magic 5
Shafrir 7
Sidewinder
Sidewinder 6
Sparrow
Aspide
Magic R.530 7
Super 530
Magic 9
Super 530

Sidewinder 9

Sidewinder 5
Sparrow
Sidewinder 9
Sparrow
Sidewinder 11
Sparrow
Sidewinder 5

Magic 5
Atol l 4
Aphid?
Sidewinder 9
Sparrow
Atol l 4
Apex

1 x twin- Atol l 4
barrel 23mm
1 x 20mm

2 x 30mm

1 x 30mm

1 x 27mm

1 x 20mm

Sidewinder 5
Sparrow

Magic ?
Super 530
Sidewinder 7
Sky Flash
Sidewinder 6
Sky Flash
Sidewinder 6
Sparrow
Phoenix
1 twin- Ana b 4
barrel 23mm Acrid?
optional
gunpack

Acrid 4

Fire-control
radar

none

Scan Can
APO-159

Jay Bird

Aidal l
EL/M-2001B

R21G/H

Cyrano IV

Track -
while-scan

—

no
no

no

no
no

no

no

developed by no?
Thomson-CSF
and EMD

developed by no
Westinghouse
as on F-16

APG-65

APG-65

Blue Fox

Agave
gun-ranging
radar only
APQ-120

High Lark

Jay Bird

APG-63

?

PS-46/A

"Fox Hunter'

AWG- 9

RP11 Skip
Spin
Fox Fire

no

8 targets

8 targets

no

no
no

no

no

no

on F-15C &
D

?

yes

6 targets?

20 targets

no?

no

* optional equipment.

first Phoenix missile salvo arrives. This feature will there-fore also discuss some of the specialised intercepters which, although not primarily intended for close-range dogfighting, could be used to win and hold air superiority.
A good air-superiority fighter must excel in three areas: detection of targets, manoeuvrability and weaponry. Ever since the days of the F-86 Sabre, fighters have been equipped with some form of radar. This must have enough range to match the enemy threat and be resistant to hostile jamming. Modern radars are expected to have some de-gree of look-up and look-down ability and must incorpor-ate an illuminator if semi-active radar-guided missiles are to be carried.

Recent fighter designs have stressed the importance of 360° vision from the cockpit, while the use of head-up displays and control stick/throttle-mounted controls allows the pilot to keep his quarry continuously in view through-out the engagement. If positive identification of likely tar-gets at long range is necessary, some kind of electro-optical viewing system must be fitted. A radar or infra-red warning receiver is another valuable accessory, giving the pilot clear indication if his own aircraft is likely to come under attack.

Most fighters carry an internally mounted cannon for close-in combat. This must have a high rate of fire and enough ammunition to allow about five seconds of firing time. Recoil forces can be significant, so the gun is best placed close to the aircraft centreline.
Air-to-air missiles fall into two categories. Short-range "dogfight" weapons generally use infra-red homing, while the heavier medium-range weapons tend to have semi-active radar guidance. Missiles often mean high-drag in-stallations which penalise the parent aircraft, especially if missiles are retained during close-in combat. On the other hand, wingtip launchers for Sidewinder-class missiles can act like Whitcomb winglets, reducing drag during cruise.

What makes a

successful fighter?

I

RRESPECTIVE of starting conditions, most aerial combats quickly come down to around or below Mach 1 • 2 and 35,000ft and often fall to subsonic speeds. Manoeuvr-ability must therefore be optimised for these conditions. The pilot who enters combat with most aircraft energy, either in the form of height or speed, will have the advant-