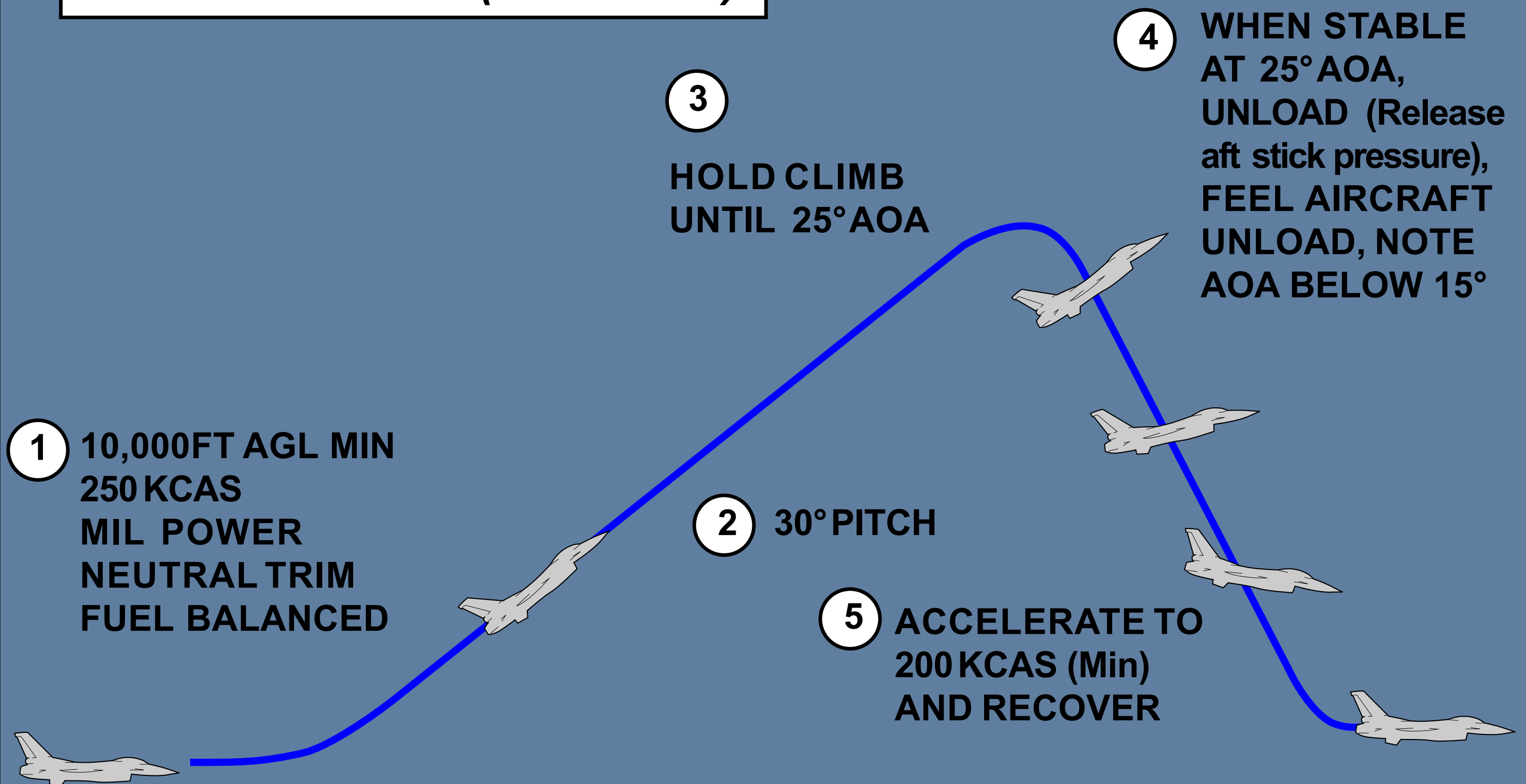


# F-16C

## HARTS Maneuver # 1

Based upon the Korean AF BEM, Volume 5, 1 October 2005 (Unclassified)

### ***Unload Maneuver (HARTS #1)***



### OBJECTIVES for the Horn Awareness and Recovery Training Series (HARTS #1-5)

**HARTS #1 Unload Maneuver:** To learn the proper technique required to unload the aircraft and recognize an unloaded condition.

**HARTS #2 Nose-High Recovery Maneuver:** To systematically practice the unload maneuver and rolling to the nearest horizon while unloaded.

**HARTS #3 Horn Demonstration Maneuver:** To demonstrate and check the operation of the low-airspeed/nose-high position warning horn and to practice proper recovery procedures at the horn.

**HARTS #4 Horn Recovery Maneuver, 50 to 70 Degrees:** Practice recovery at the horn from nose high, high AOA, and low-airspeed conditions.

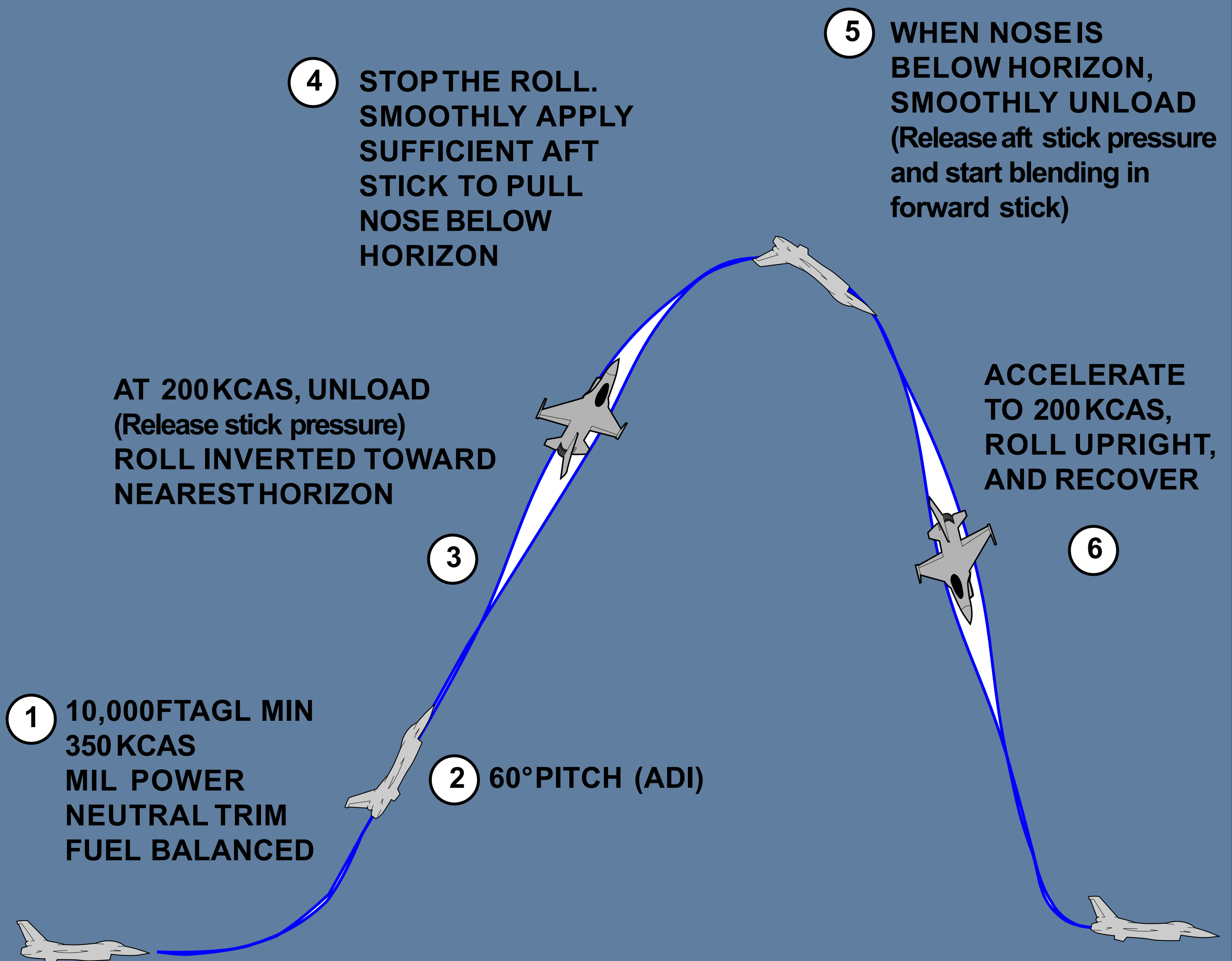
**HARTS #5: Horn Recovery Maneuver, 70 to 110 Degrees:** Practice recovery at the horn from very nose high, high AOA, and low airspeed conditions.

**NOTE:** HARTS maneuvers are to be flown by CAT I loaded aircraft only.

# F-16C

## HARTS Maneuver # 2

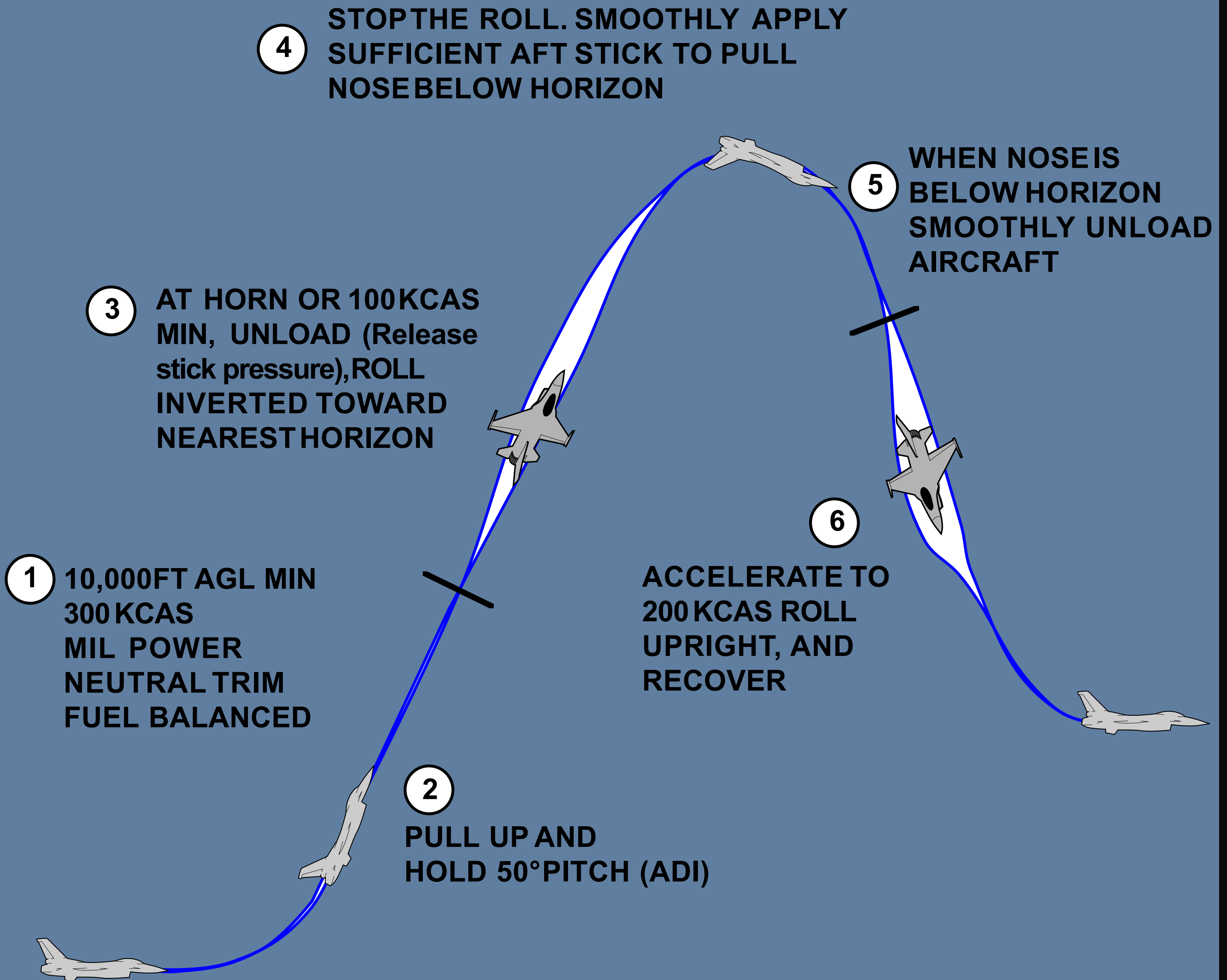
### *Nose High Recovery Maneuver (HARTS #2)*



# F-16C

## HARTS Maneuver # 3

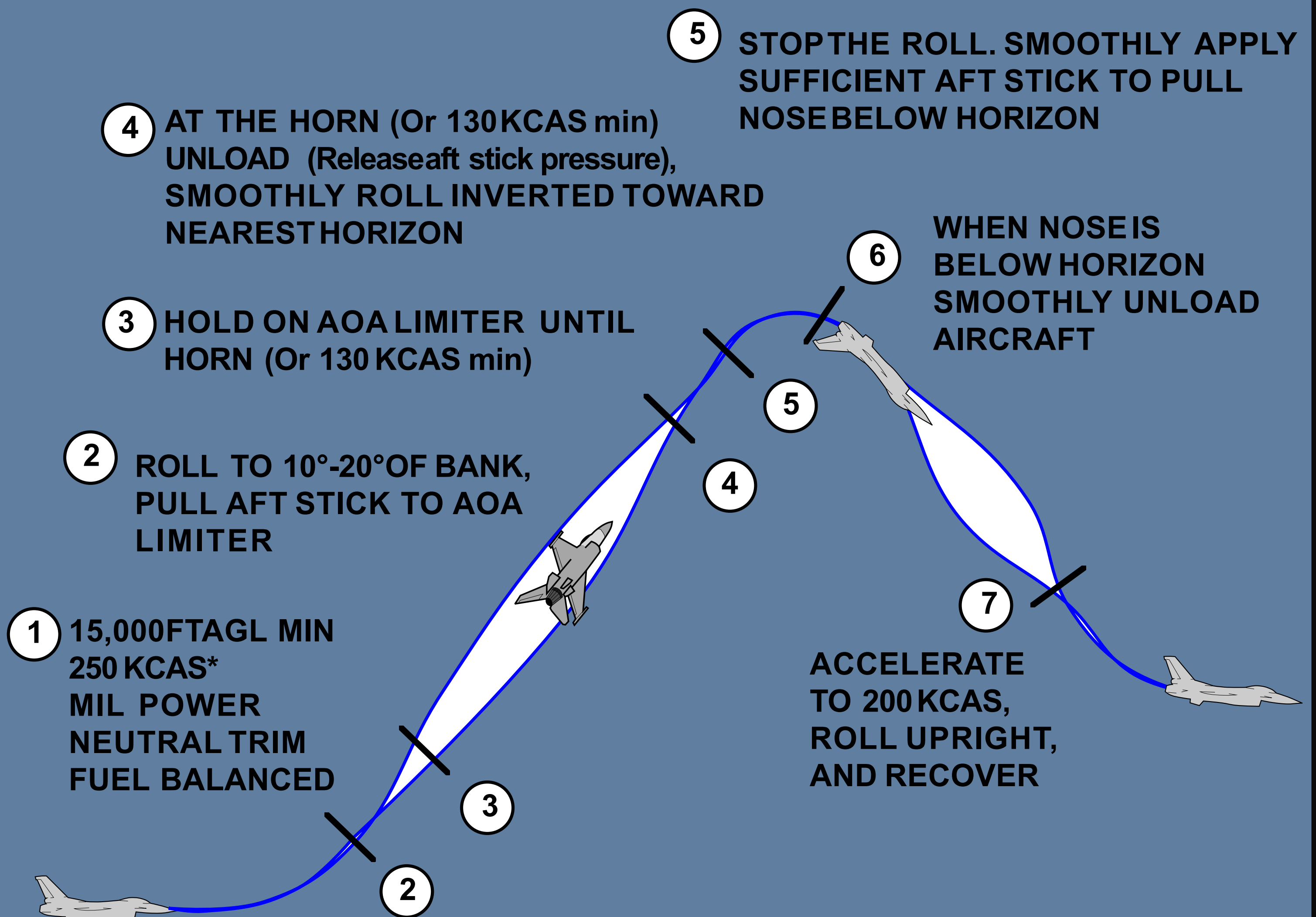
### *Horn Demonstration Maneuver (HARTS #3)*



# F-16C

## HARTS Maneuver # 4

### *Horn Recovery Maneuver 50° - 70° (HARTS #4)*

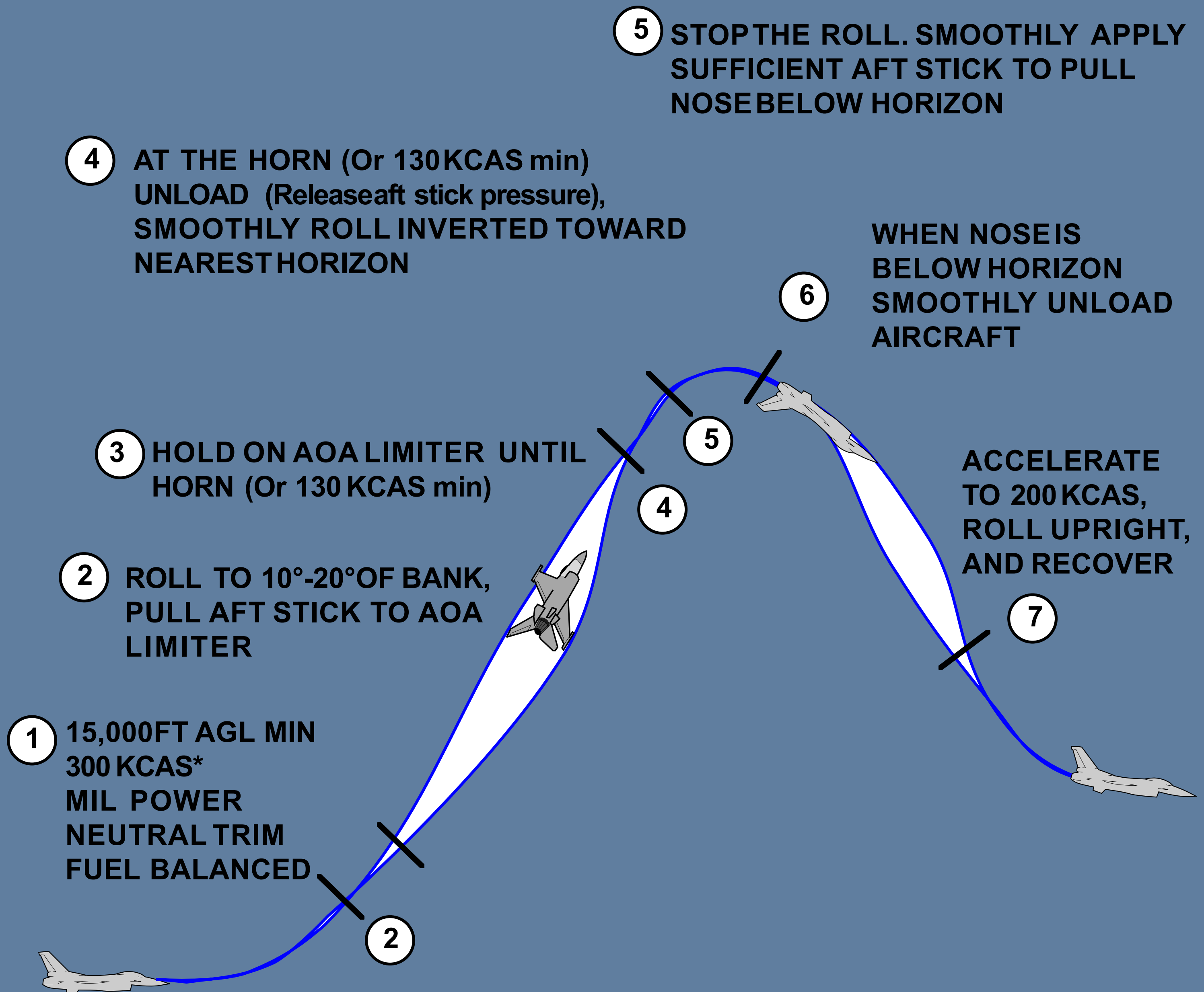


NOTE: Entry airspeed for F-16C/D  
with wing tanks is 250 to 275 KCAS

# F-16C

## HARTS Maneuver # 5

### *Horn Recovery Maneuver 70° - 110° (HARTS #5)*



**\*NOTE:** Entry airspeed for F-16C  
with wing tanks is 250 to 275 KCAS

# F-16C

## Aerobatics

### *Loop/Immelmann*

FOR IMMELMANN,  
UNLOAD AS NOSE  
APPROACHES  
HORIZON  
AND ROLL ERECT

180 - 220 KCAS

13° - 15° AOA

FOR LOOP, PLAY  
BACK PRESSURE  
TO ACHIEVE ENTRY  
ALTITUDE AND  
AIRSPEED

4 - 5 G PULL

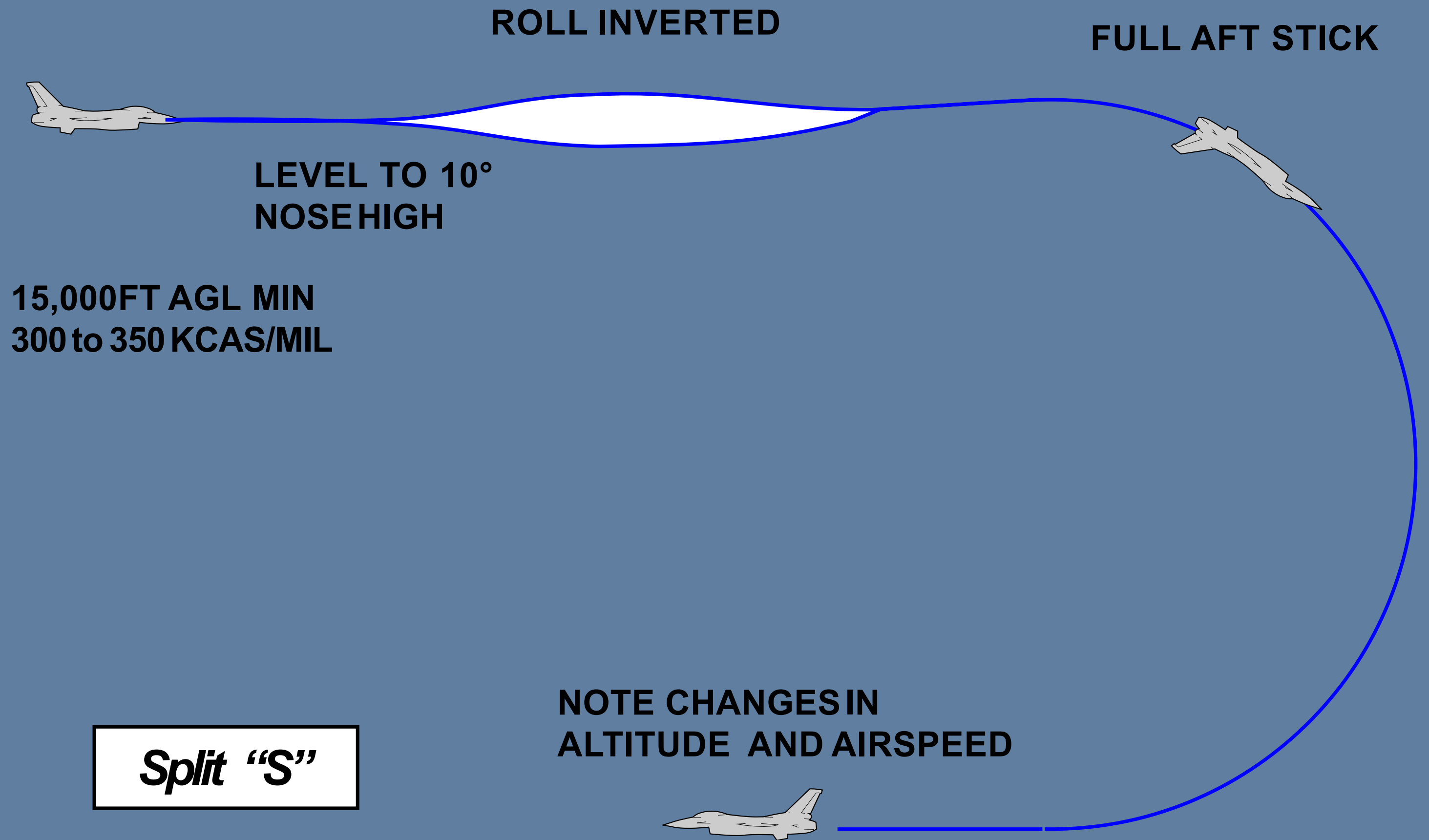
5000FT AGL MIN  
450KCAS MIN IN MIL  
350KCAS MIN IN FULL AB

**NOTE:** If 200 KCAS occurs at any attitude above 60 degrees pitch and other than true vertical, Immediately execute the Nose-High Recovery Maneuver (HARTS #2).



# F-16C

## Aerobatics



# F-16C

## Aerobatics

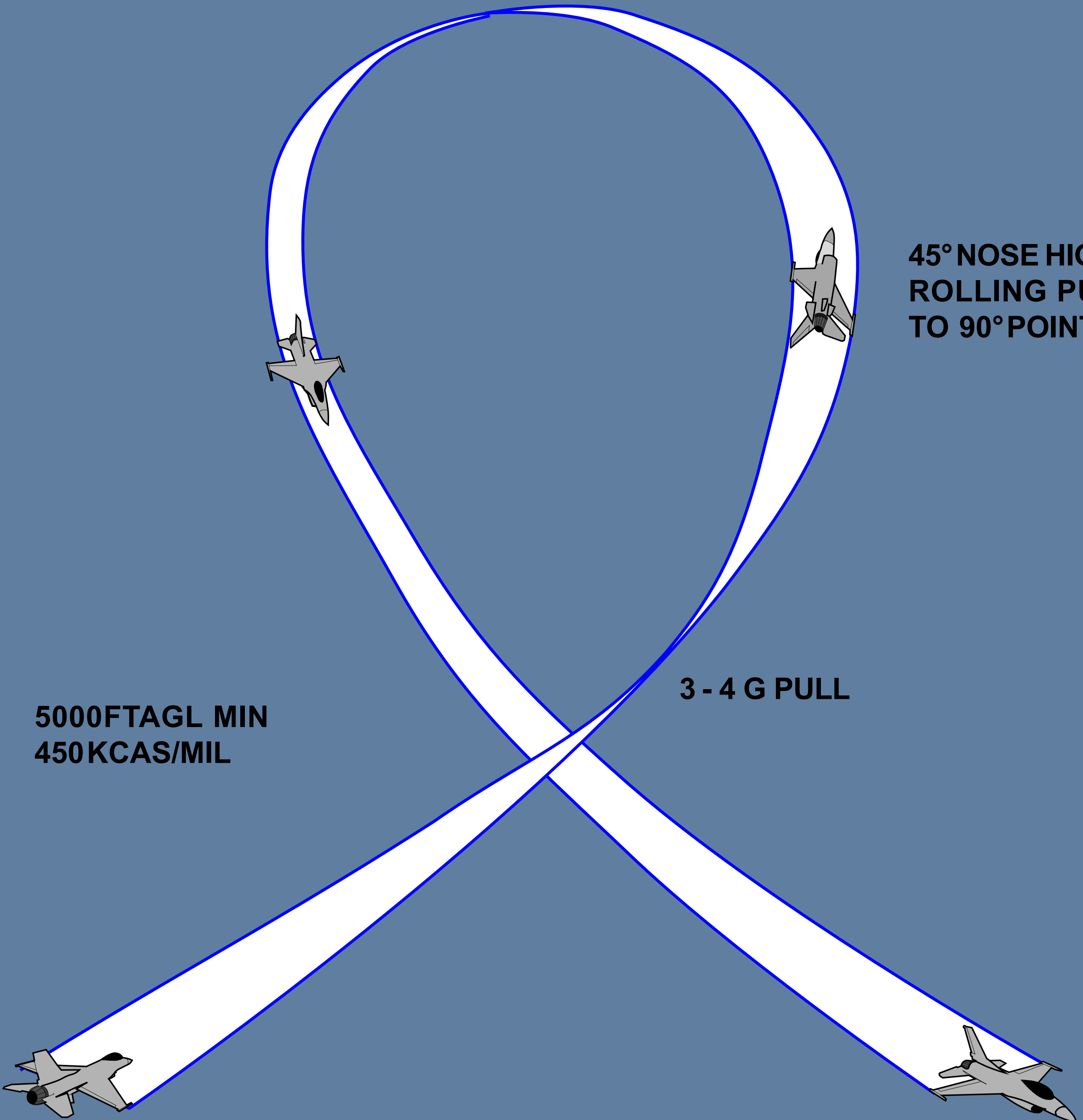
### *Cloverleaf*

200 to 220 KCAS

45° NOSE HIGH  
ROLLING PULL  
TO 90° POINT

5000FTAGL MIN  
450KCAS/MIL

3 - 4 G PULL





# F-16C

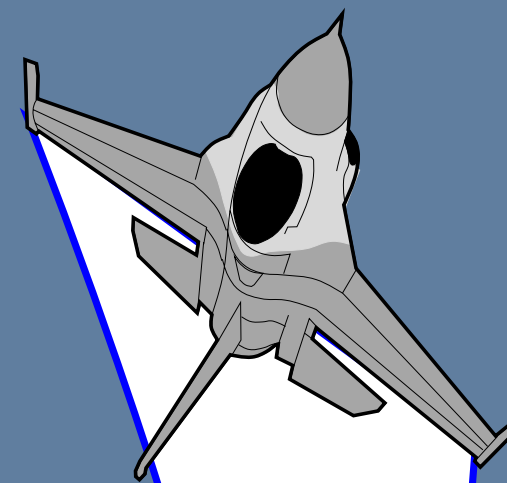
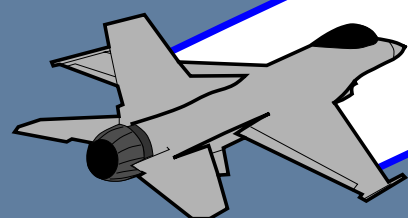
## Aerobatics

### *Pitchback*

180° OF TURN,  
135° INVERTED BANK,  
300 KCAS MIN  
NOTE ALTITUDE AND  
AIRSPEED AT TOP

SELECT FULL AB,  
ROLL TO 40° to 50° OF BANK,  
AND BEGIN 5 to 7 G TURN

5000 FT AGL MIN  
400+ KCAS MIN



# F-16C

## Aerobatics

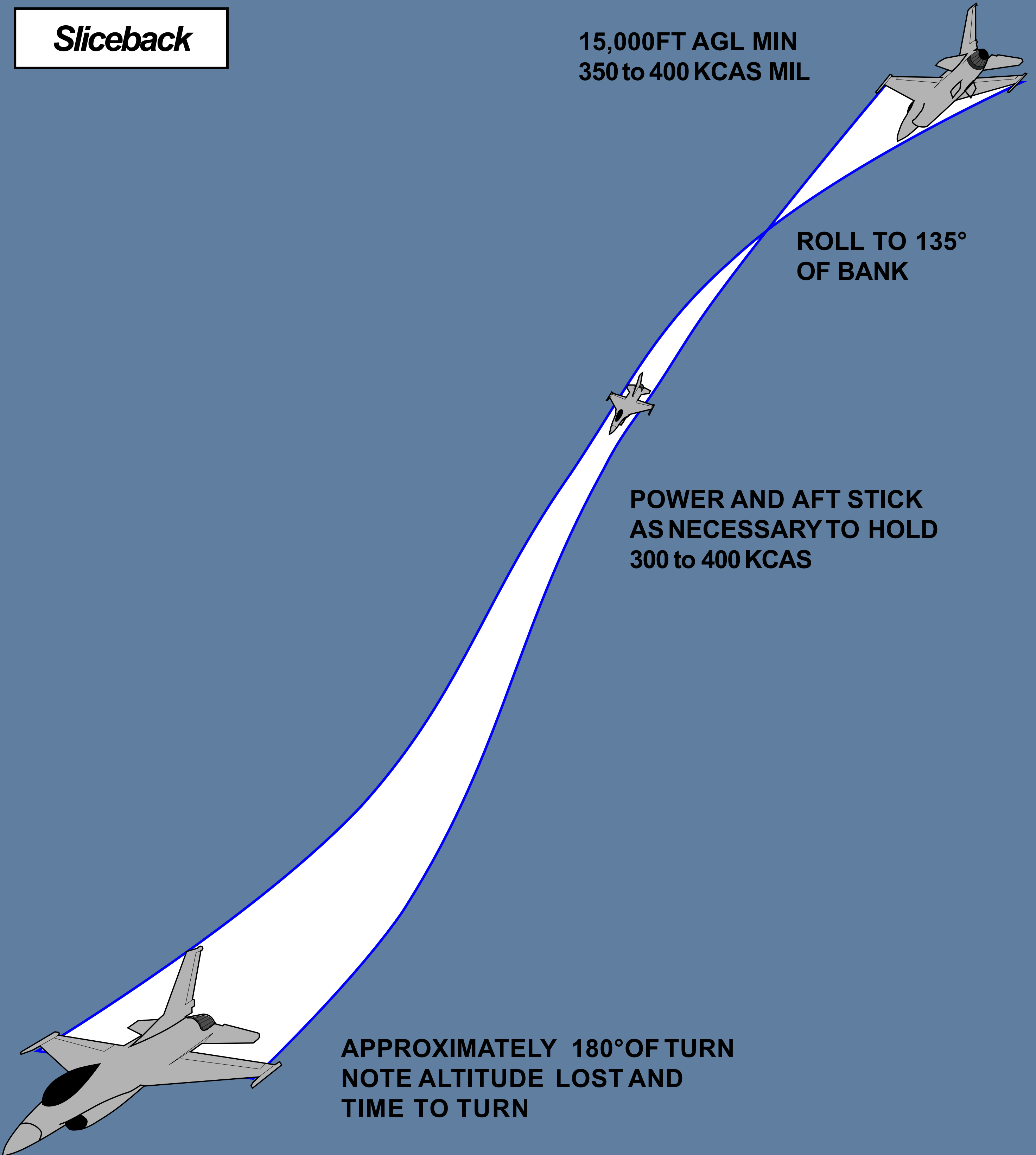
### *Sliceback*

15,000FT AGL MIN  
350 to 400 KCAS MIL

ROLL TO 135°  
OF BANK

POWER AND AFT STICK  
AS NECESSARY TO HOLD  
300 to 400 KCAS

APPROXIMATELY 180° OF TURN  
NOTE ALTITUDE LOST AND  
TIME TO TURN



# F-16C Aerobatics

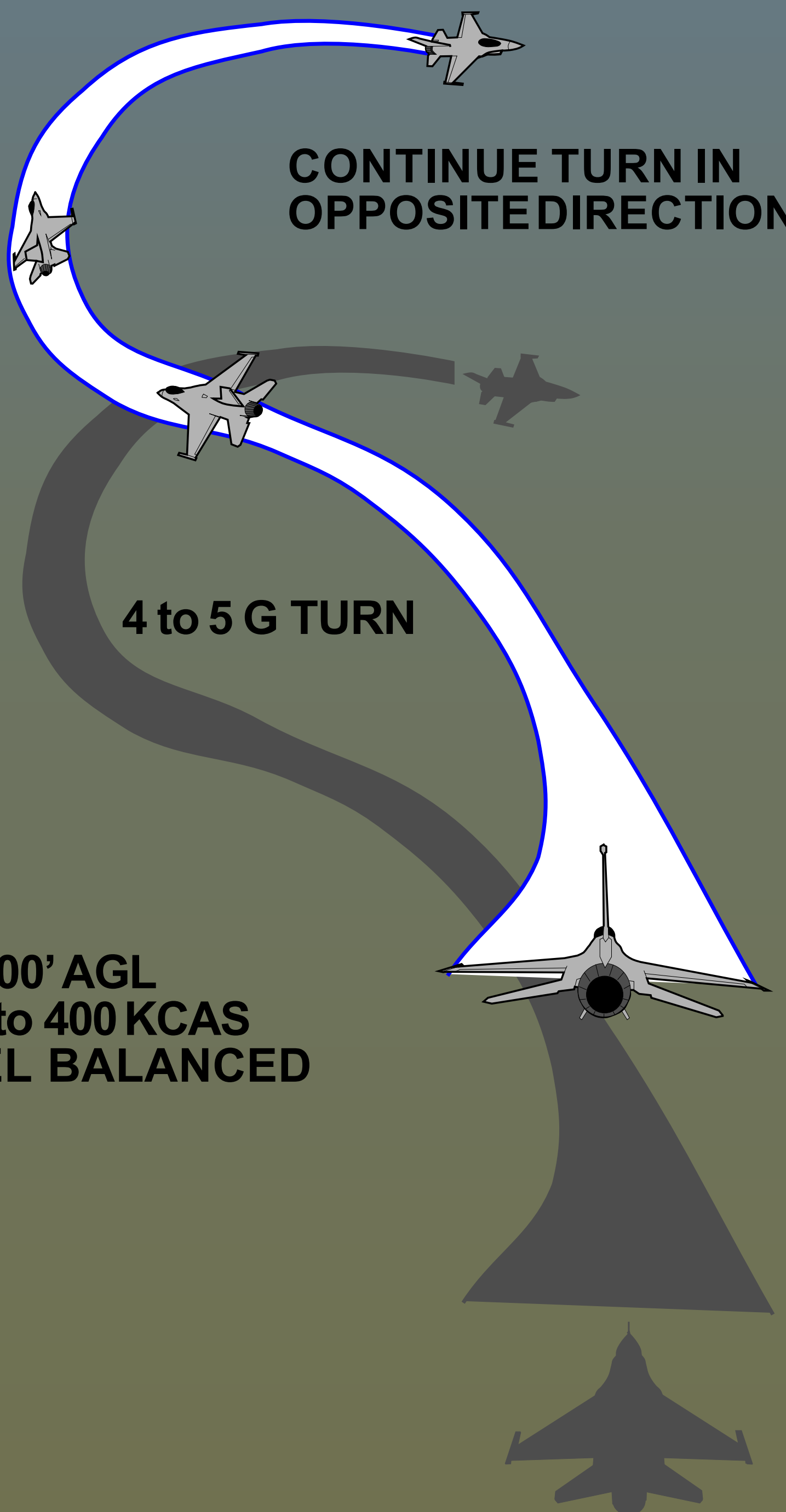
## *Reversals/Rolling Maneuvers*

ON COMMAND, EXECUTE  
MAX RATE ROLL AT 4 to 5 Gs

CONTINUE TURN IN  
OPPOSITE DIRECTION

4 to 5 G TURN

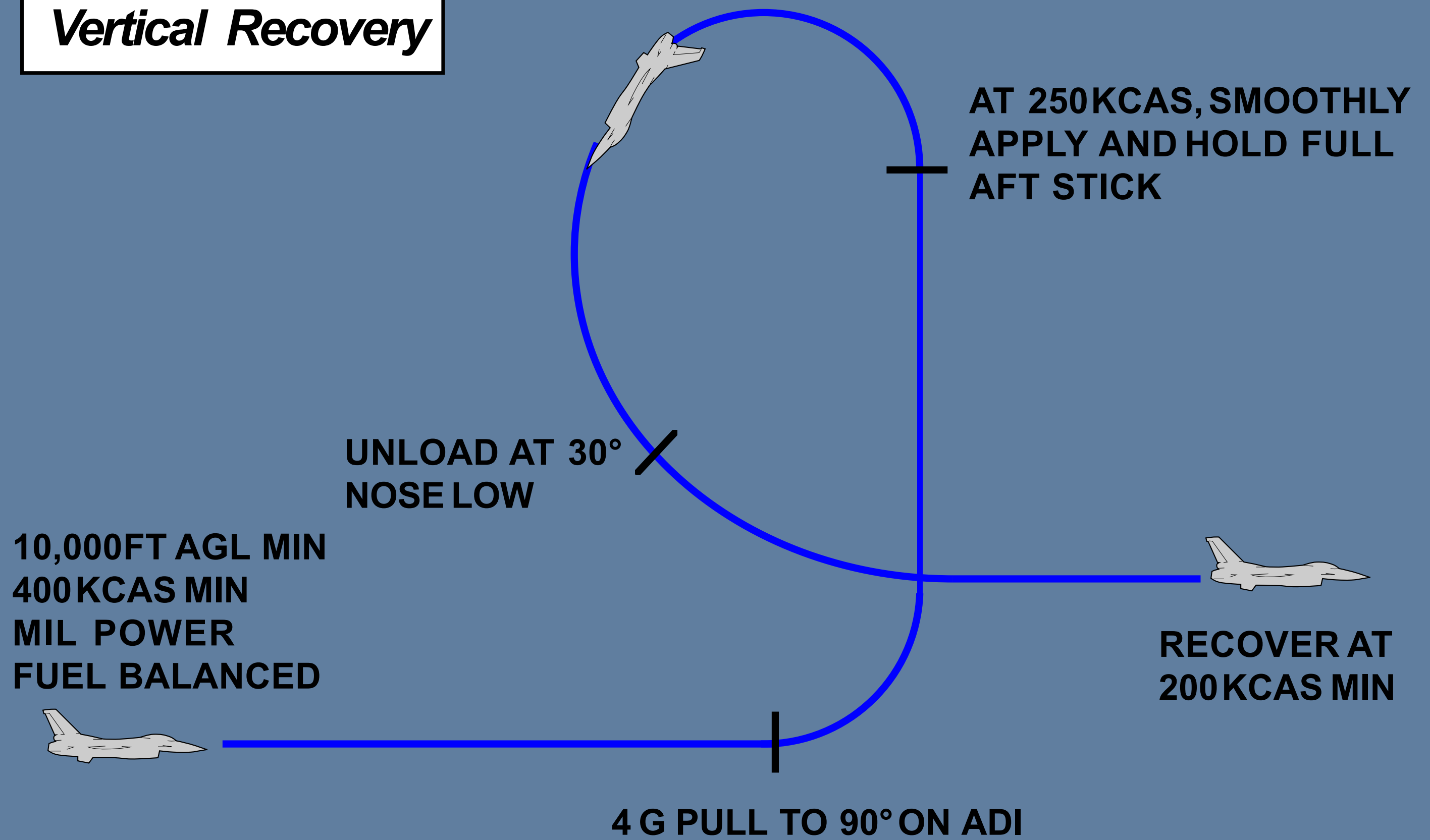
10,000' AGL  
300 to 400 KCAS  
FUEL BALANCED



# F-16C

## Aerobatics

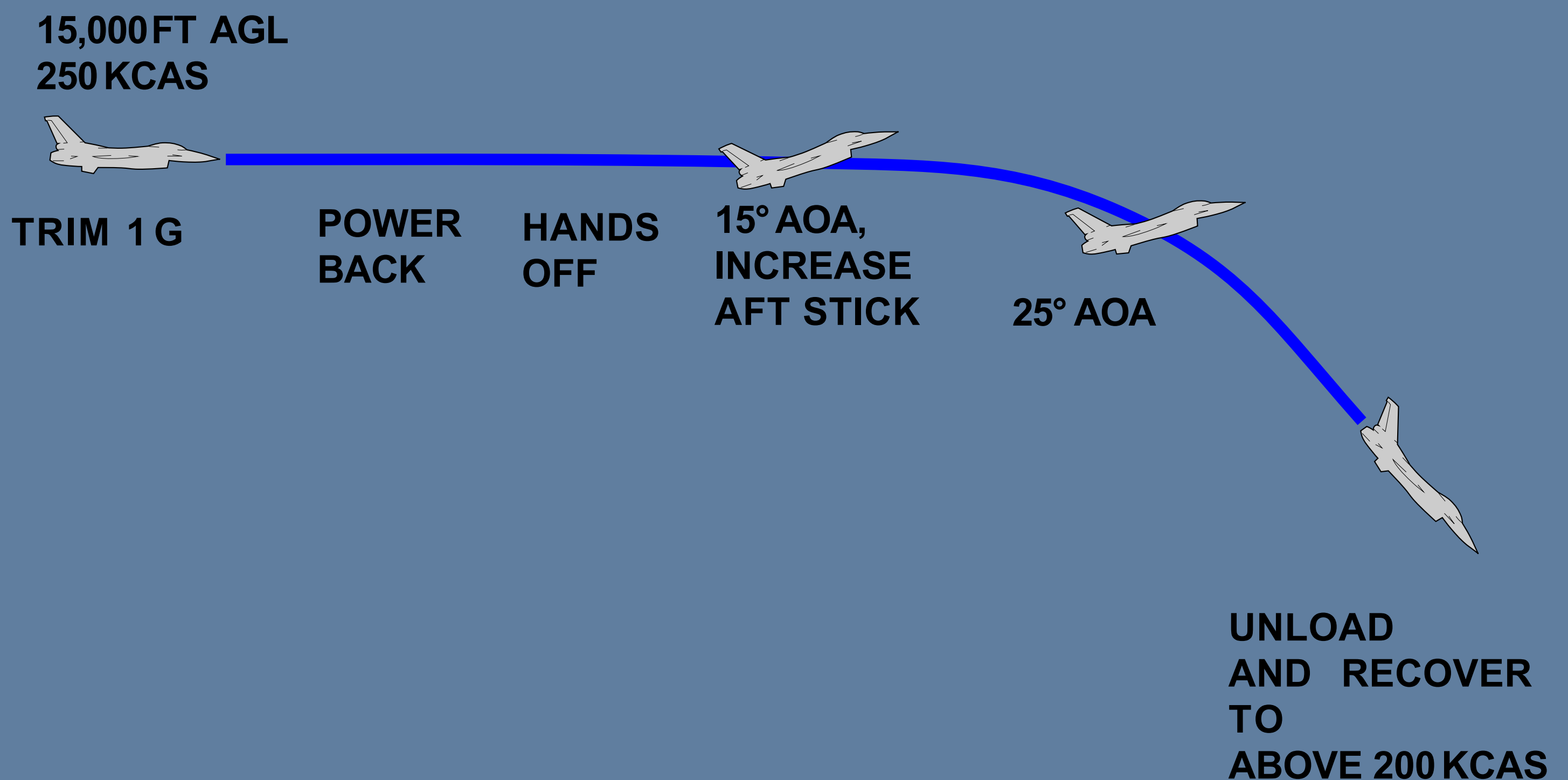
### *Vertical Recovery*



# F-16C

## Aerobatics

### *AOA Limiter Demonstration*

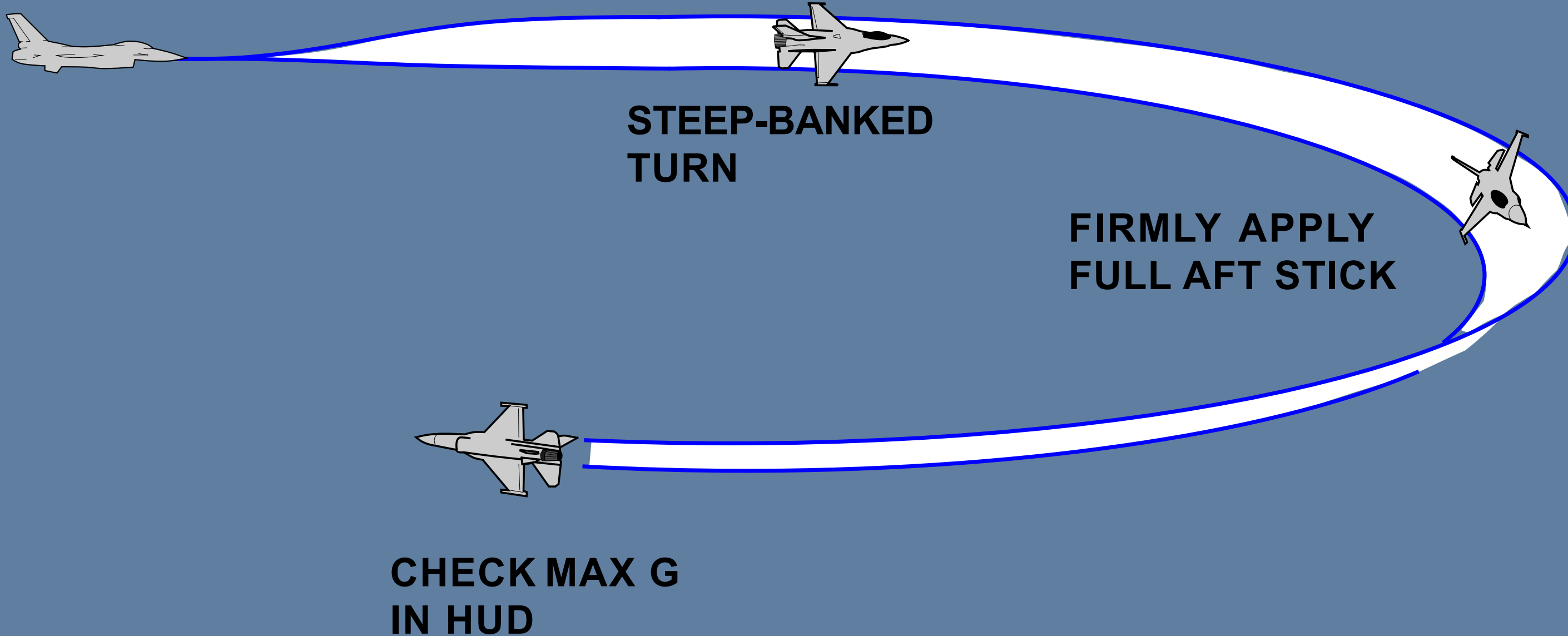


# F-16C

## Aerobatics

### *G-Limiter Demonstration*

15,000FT AGL  
0.9 MACH  
MIL POWER

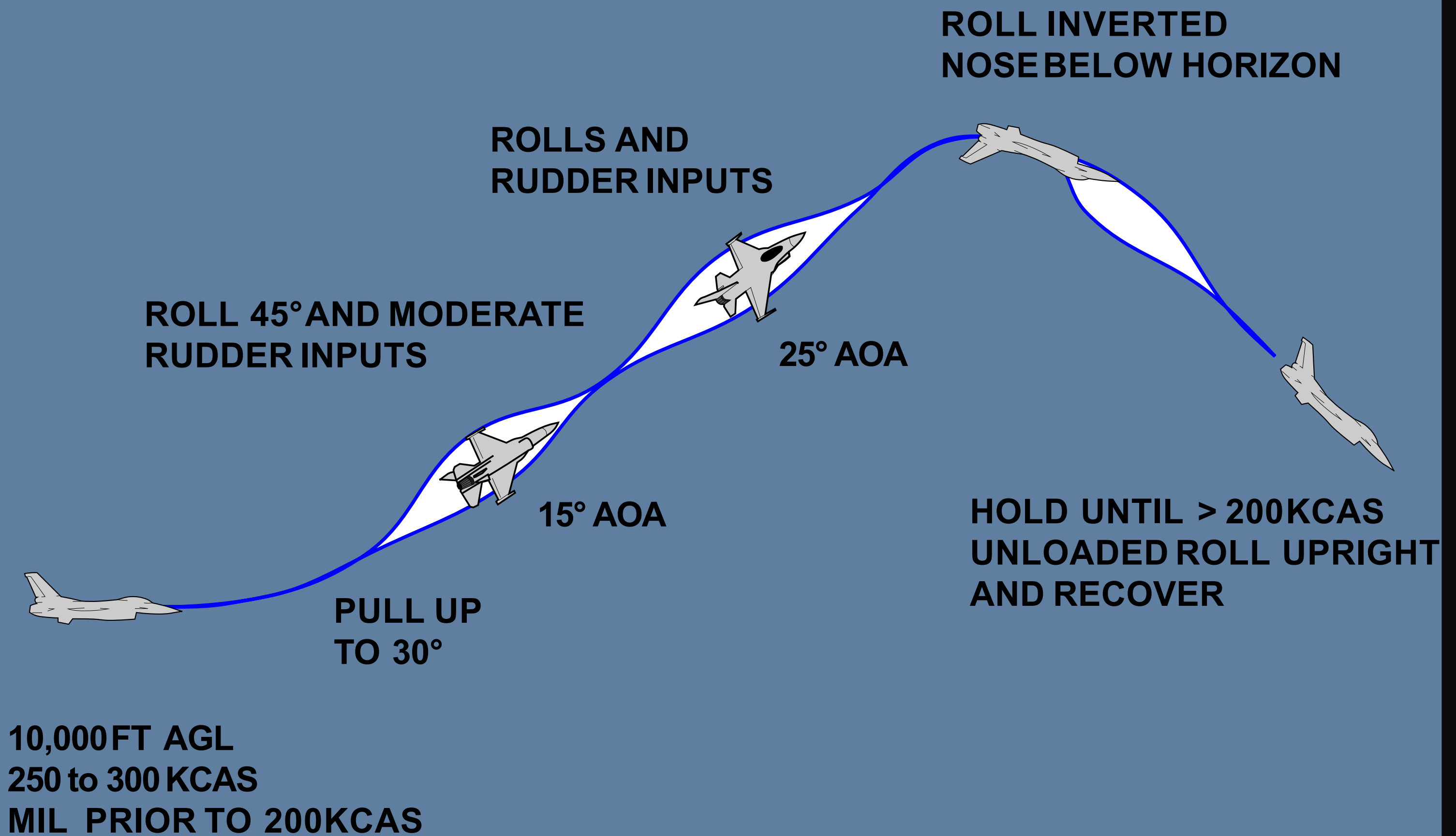




# F-16C

## Aerobatics

### ***30-Degree Climb Limiter Demonstration***



# F-16C

## Aerobatics

### ***G-Command Demonstration***

RELEASE STICK AND  
OBSERVE AIRCRAFT  
RECOVER

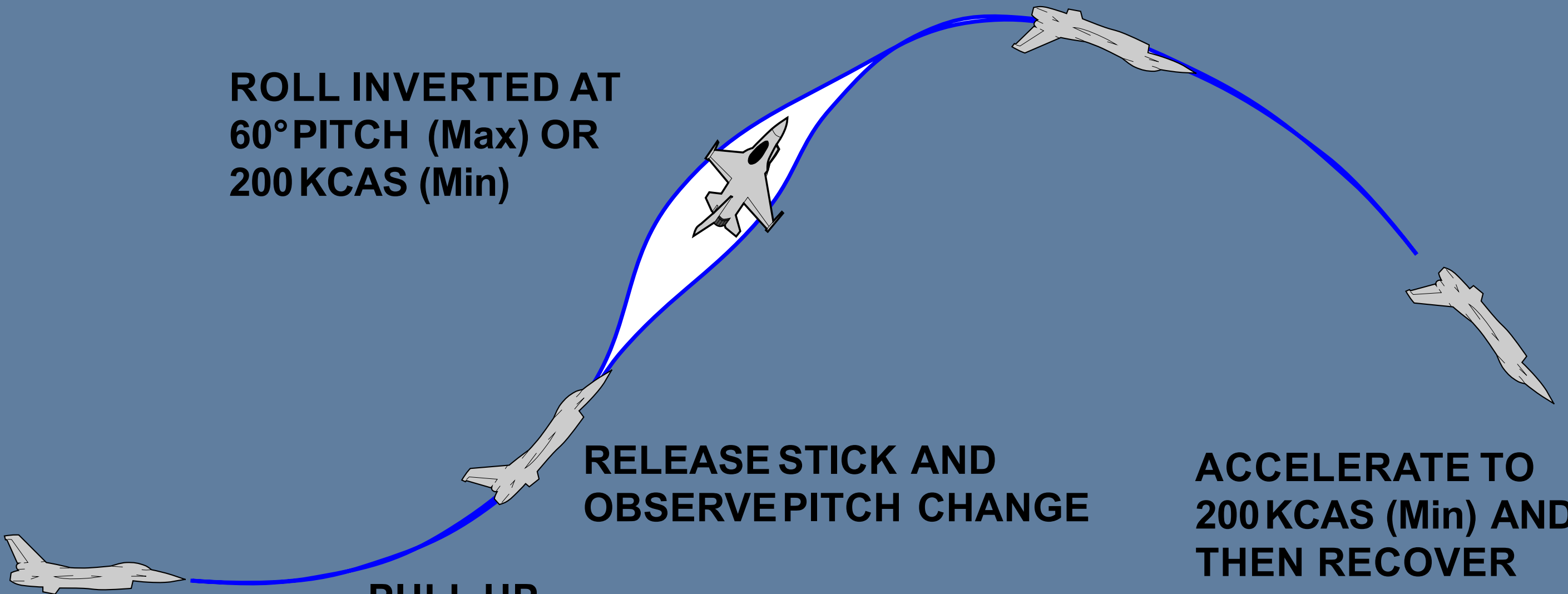
ROLL INVERTED AT  
60° PITCH (Max) OR  
200 KCAS (Min)

RELEASE STICK AND  
OBSERVE PITCH CHANGE

ACCELERATE TO  
200 KCAS (Min) AND  
THEN RECOVER

PULL UP  
TO 50°

10,000 FT AGL  
400 KCAS  
TRIMMED,  
BALANCED,  
AND MIL PWR



# F-16C

## Aerobatics

### *Afterburner Demonstration (High and Low Speed)*

15,000FT AGL  
250 to 350 KCAS

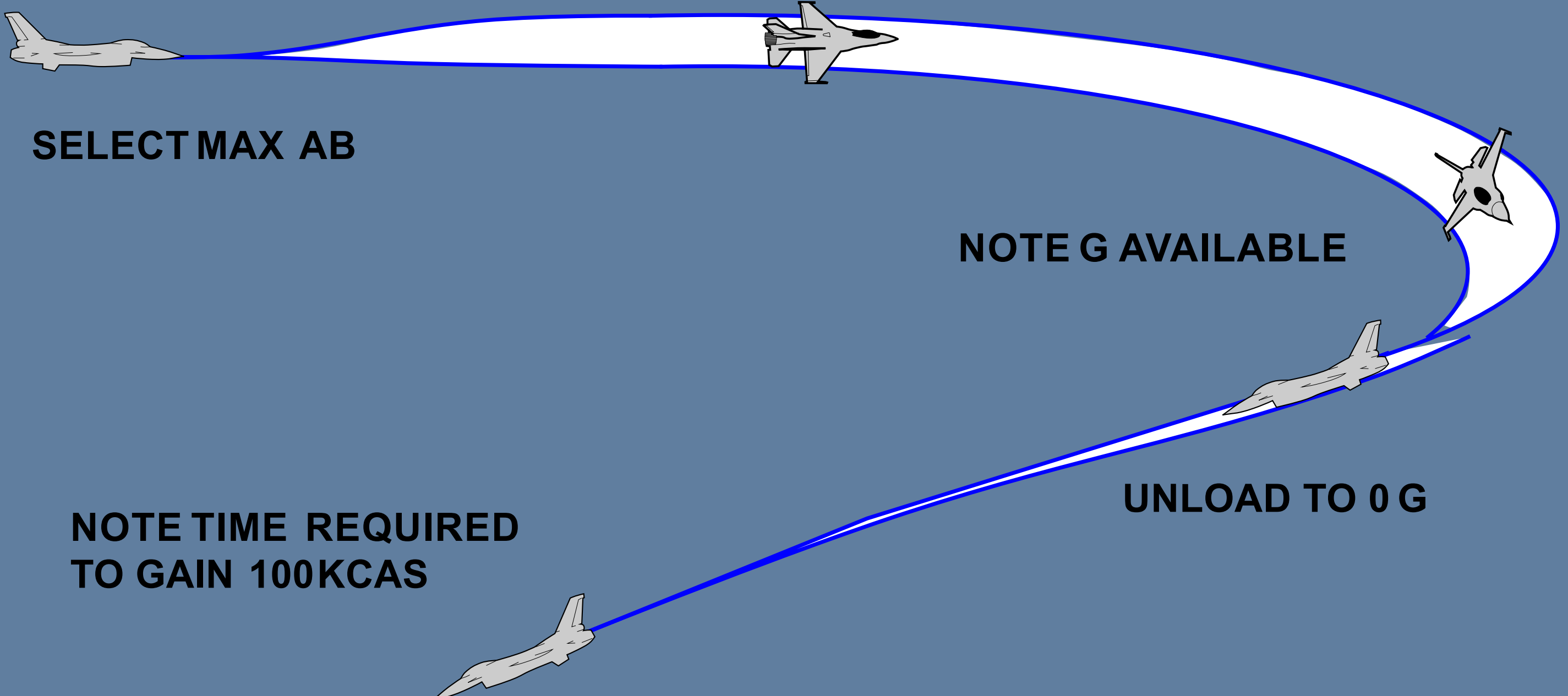
TURN TO MAINTAIN  
AIRSPEED

SELECT MAX AB

NOTE G AVAILABLE

NOTE TIME REQUIRED  
TO GAIN 100KCAS

UNLOAD TO 0 G



# F-16C

## Aerobatics

### ***Slow Flight Demonstration***

10,000FT AGL  
250 KCAS

CHECK HORN AT  
15° AOA, LANDING  
GEAR DOWN

DESCEND AT  
700 to 800 FPM,  
11° AOA, AND SPEED  
BRAKES OPEN

11° to 13° AOA

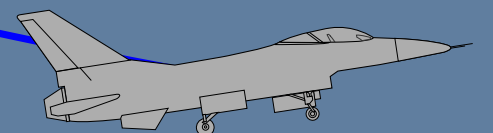
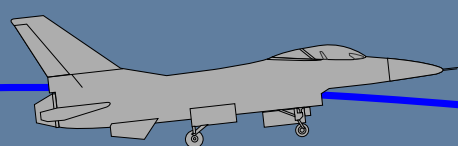
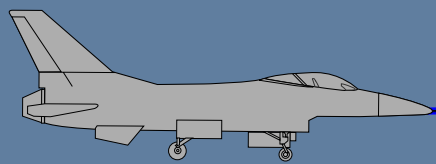
CHECK FPM

LOWER AND  
RAISE LANDING  
GEAR AS AIRSPEED  
SLOWS

CYCLE  
SPEEDBRAKES

ROLL 15° to 30°  
AND NOTE VVI  
AND AOA

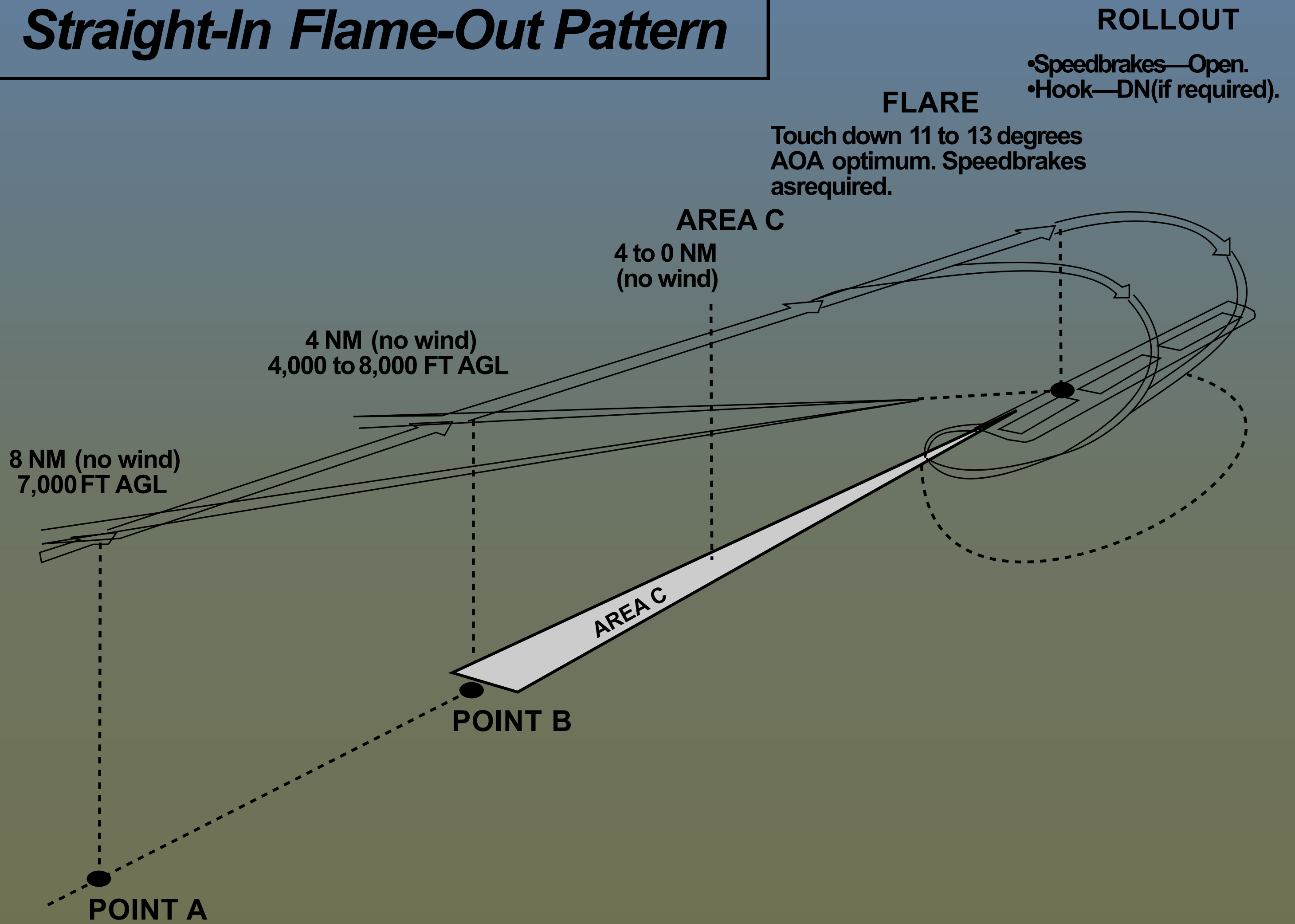
EXECUTE GO  
AROUND



# F-16C

## Flame-Out Approach Techniques and Procedures

### *Straight-In Flame-Out Pattern*



# F-16C

## Flame-Out Approach Techniques and Procedures

### Overhead Flame-Out Pattern

