



Space Shuttle External Markings

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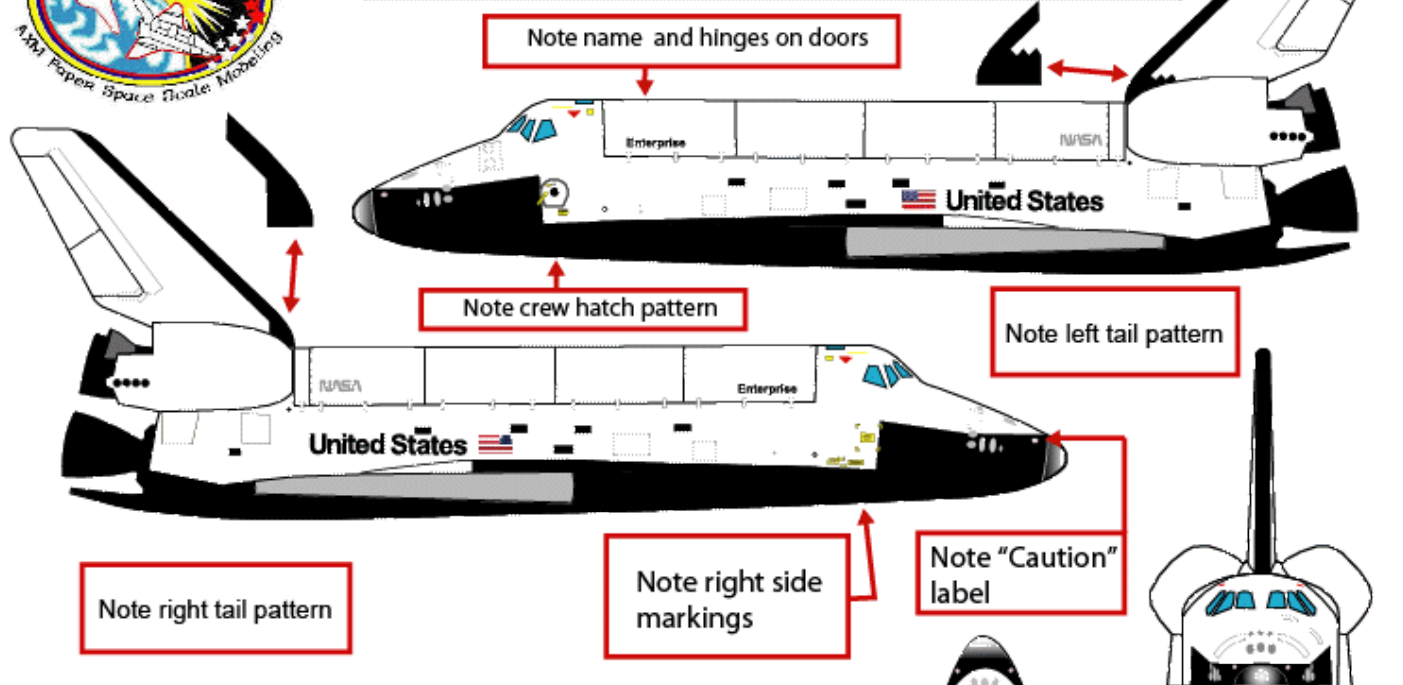
Reference Manual for Space Shuttle Modelers



Enterprise

OV-101

-Original Markings-



Unmanned Captive Flights

Flight 1	2/18/77
Flight 2	2/22/77
Flight 3	2/25/77
Flight 4	2/28/77
Flight 5	3/2/77

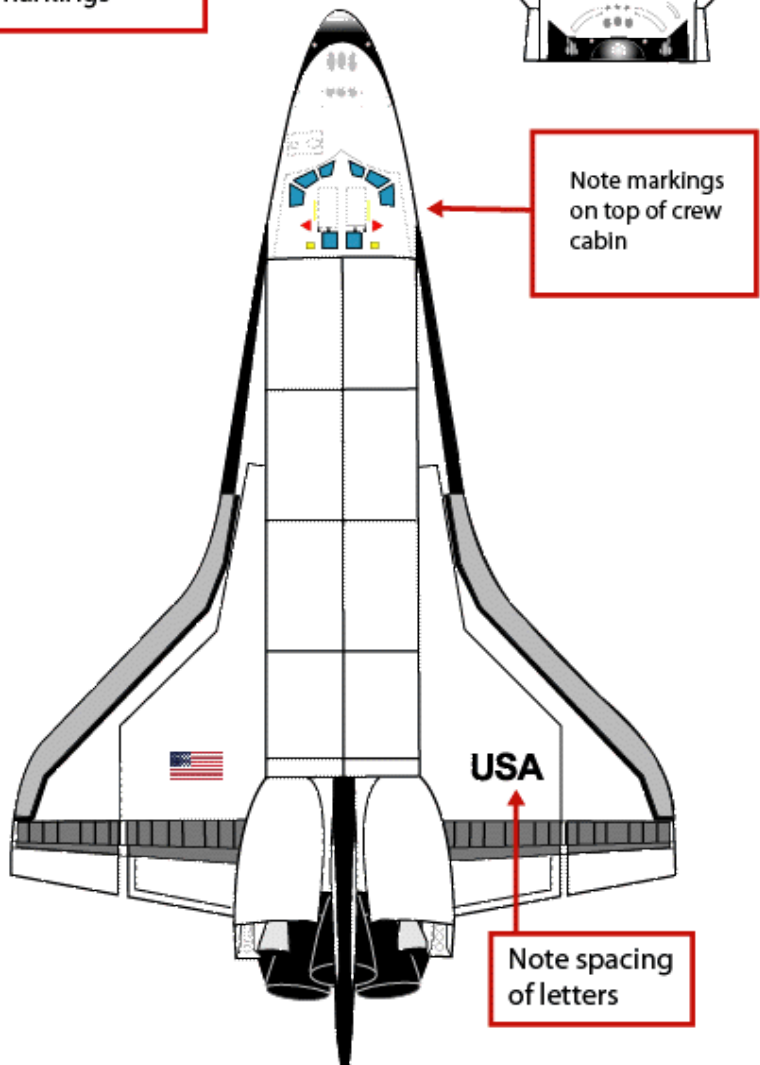
Manned Captive Flights

Flight 1	6/18/77	H-F
Flight 2	6/28/77	E-T
Flight 3	7/26/77	H-F

Manned Free Flights Approach and Landing Tests

ALT 1	7/12/77	Tail cone on	H-F
ALT 2	9/13/77	Tail cone on	E-T
ALT 3	9/23/77	Tail cone on	H-F
ALT 4	10/12/77	Tail cone off	E-T
ALT 5	10/26/77	Tail cone off	H-F

H-F: Haise - Fullerton
E-T: Engle - Truly



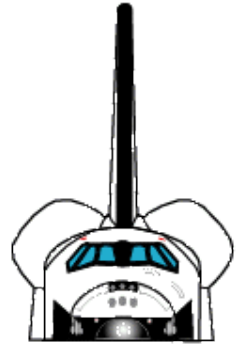
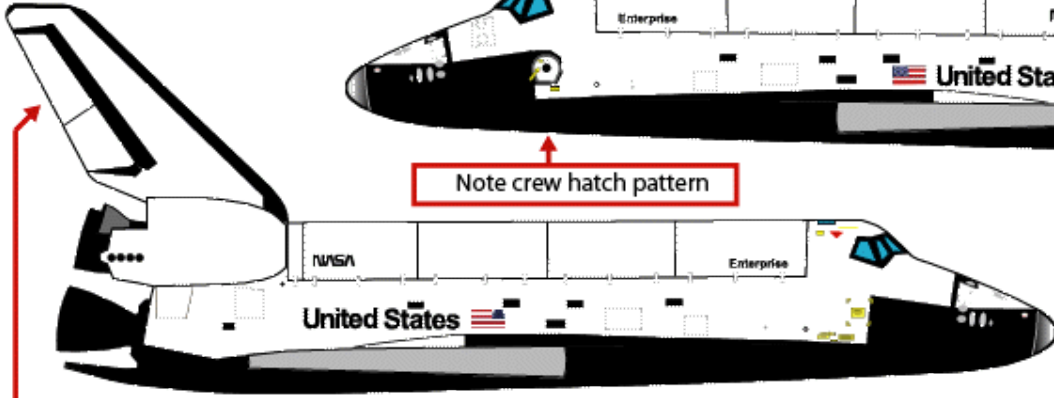
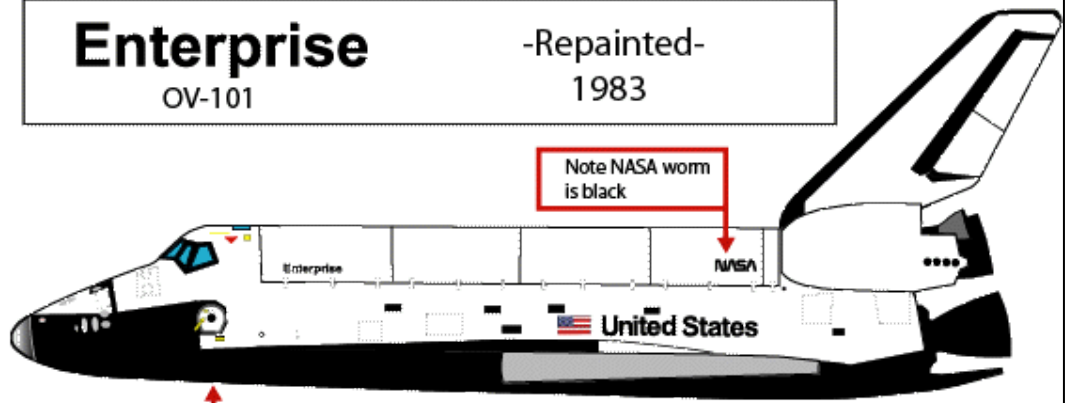


Enterprise

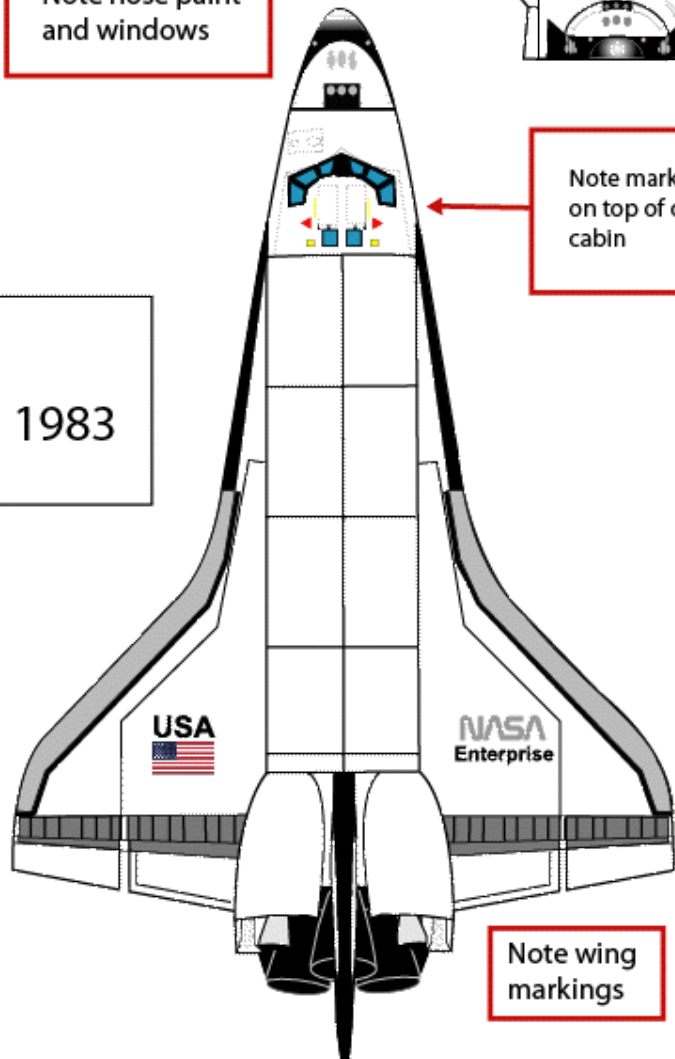
OV-101

-Repainted-

1983



External Markings used at the Paris Air Show tour in 1983



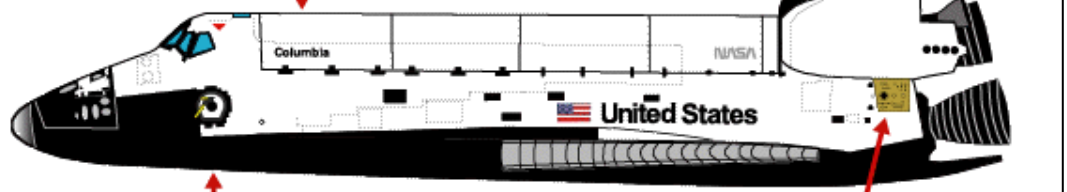


Columbia

OV-102

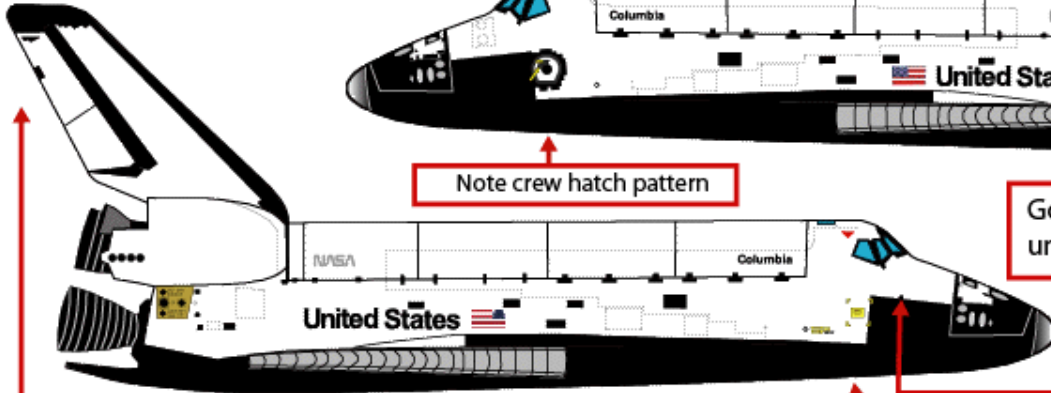
-Original Markings-
April 12, 1981

Note name and hinges on doors



Note crew hatch pattern

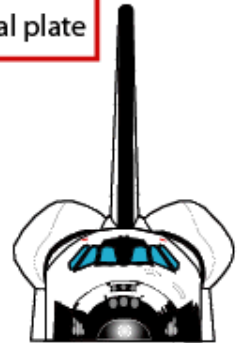
Golden umbilical plate



Note tile pattern on tail

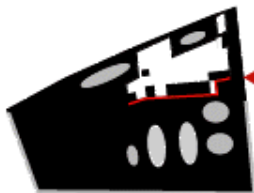
Note right side markings

Note unique tiles



Note asymmetry of front tiles

Note markings on top of crew cabin



Red line indicates base layout on rest of fleet

Left side only



Details



Details

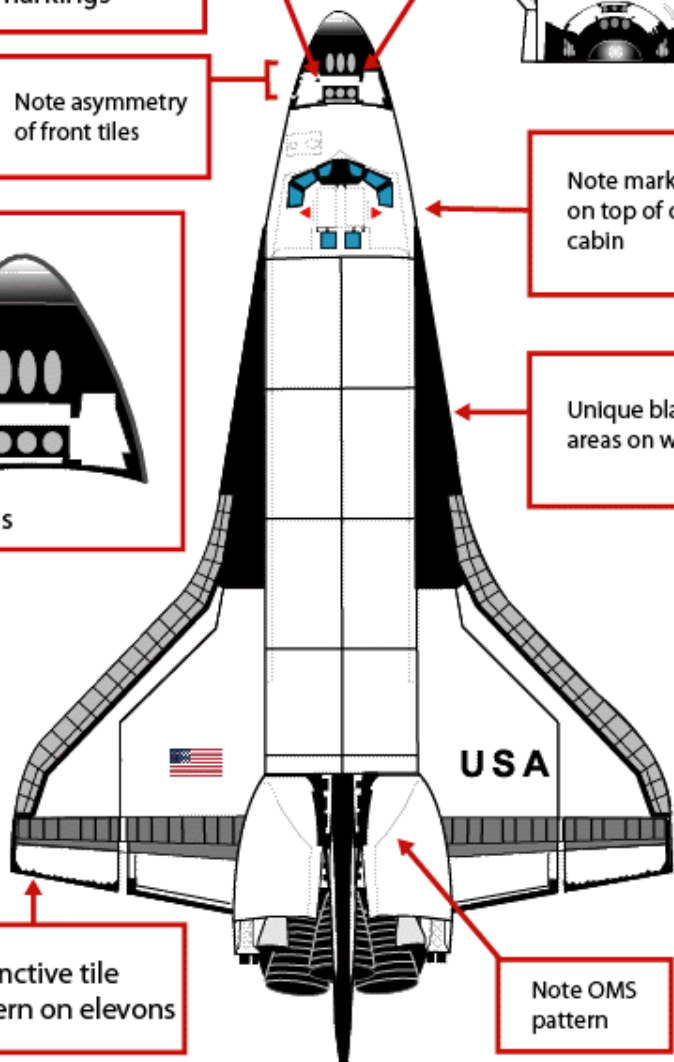
Unique black areas on wings

Missions flown:

STS-1 (4/12/81)

Distinctive tile pattern on elevons

Note OMS pattern



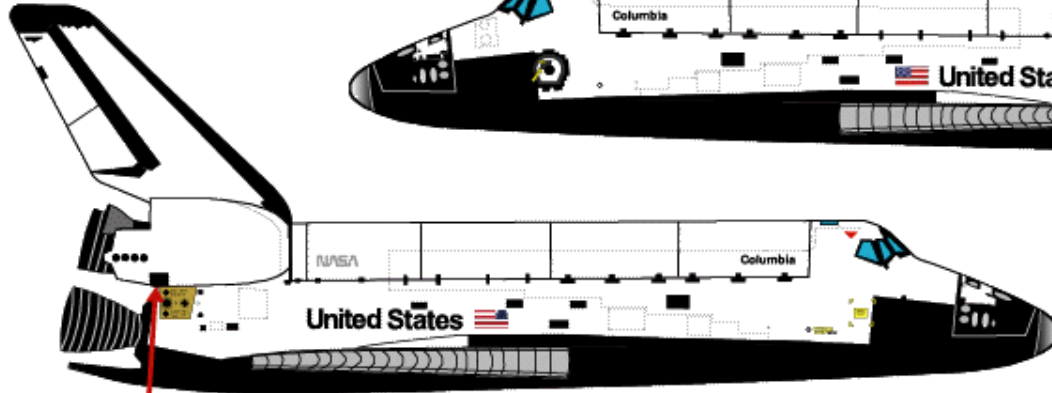
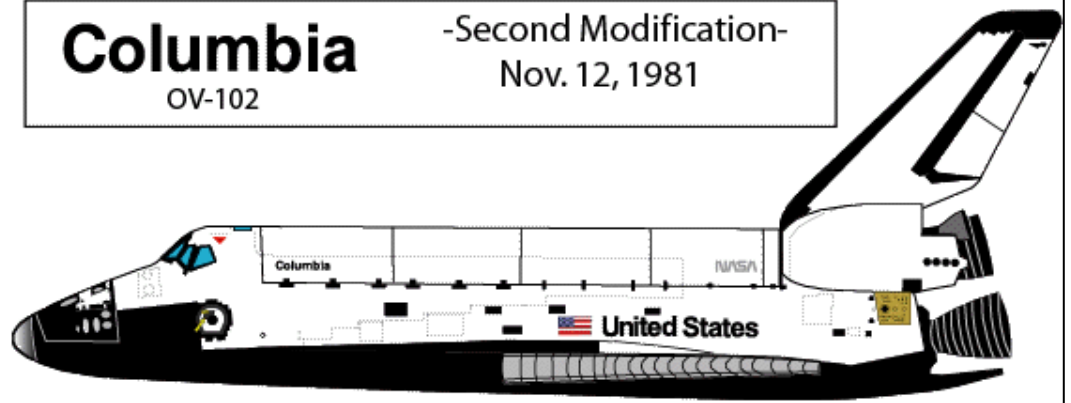


Columbia

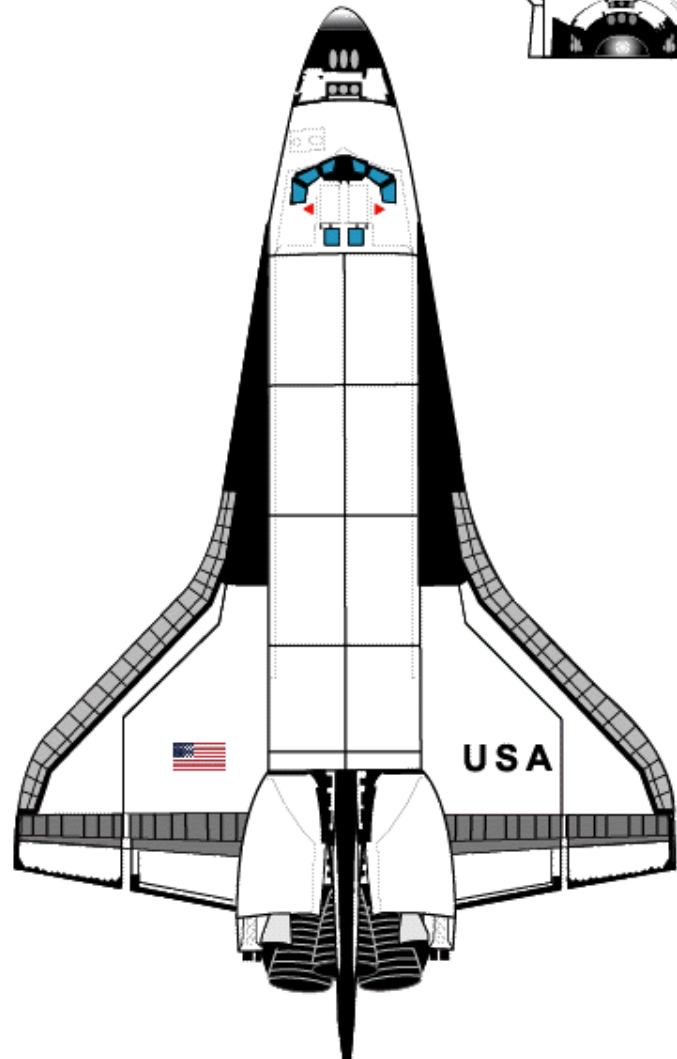
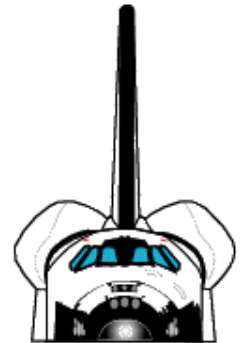
OV-102

-Second Modification-

Nov. 12, 1981



Only modification is the black tile added to the lower corner of the OMS pods



Missions flown:

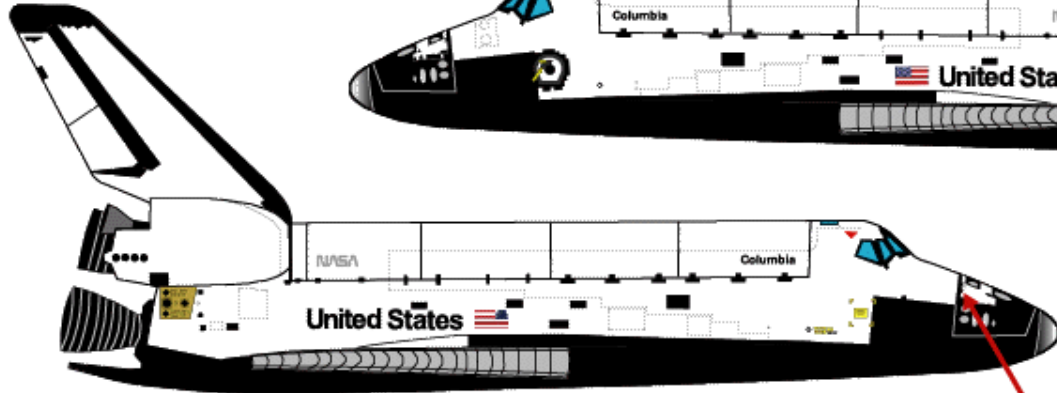
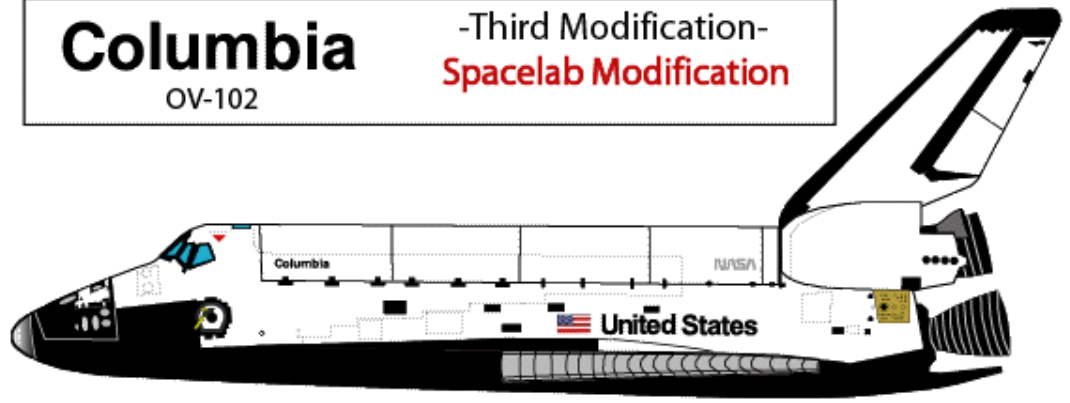
- | | |
|-------|----------|
| STS-2 | 11/12/81 |
| STS-3 | 3/22/82 |
| STS-4 | 6/27/82 |
| STS-5 | 11/11/82 |



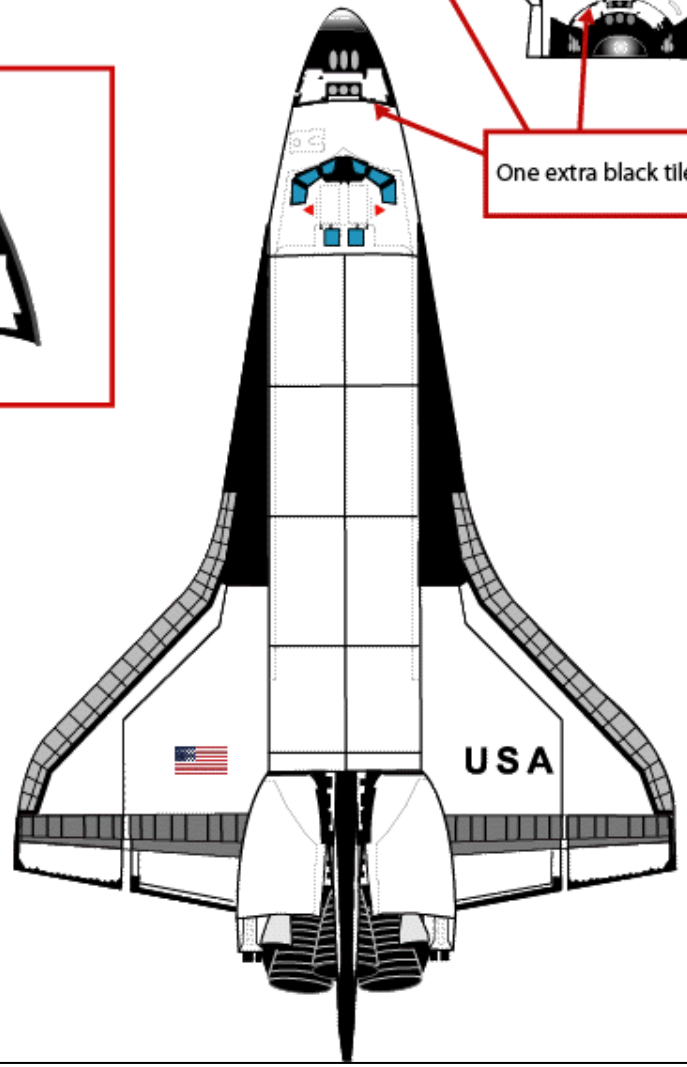
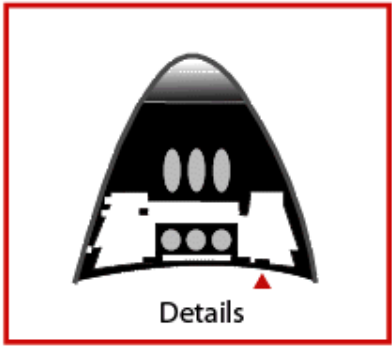
Columbia

OV-102

-Third Modification-
Spacelab Modification



One extra black tile added



Missions flown:
STS-9 11/28/83

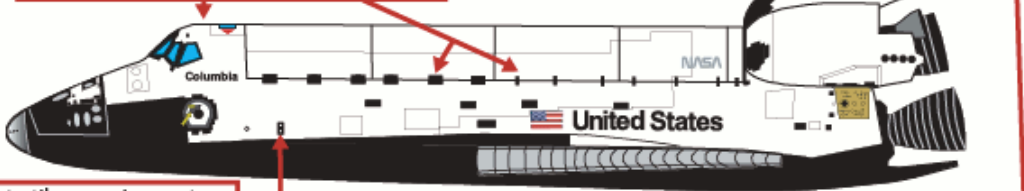


Columbia

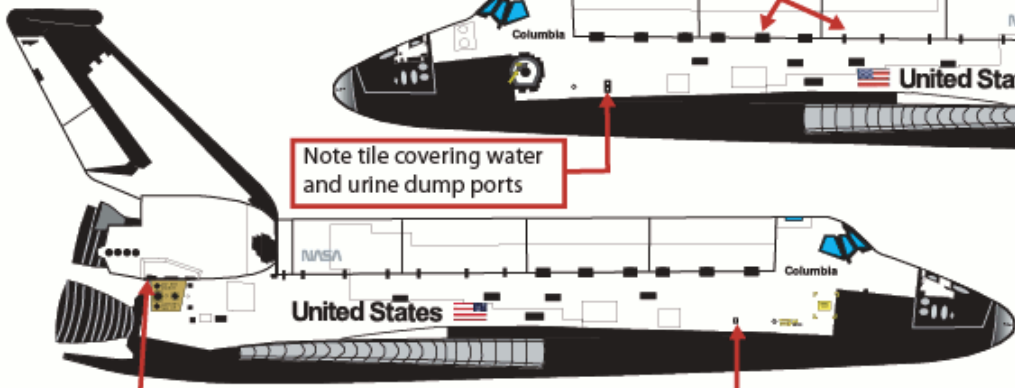
OV-102

-Fourth Modification- OEX Package Modification

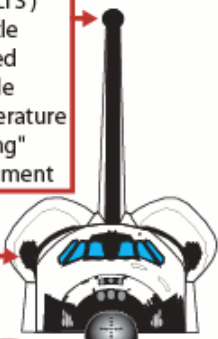
Name moved to the front of cabin
Note hinges on doors



Note tile covering water and urine dump ports



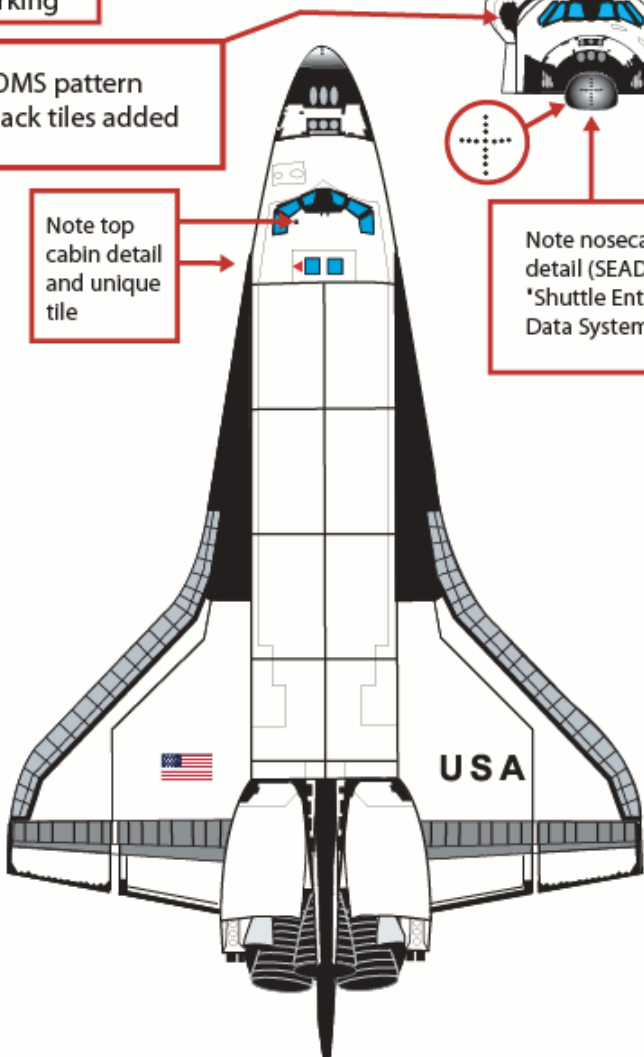
Note tailpod (SILTS)
"Shuttle Infrared Leeside Temperature Sensing" experiment



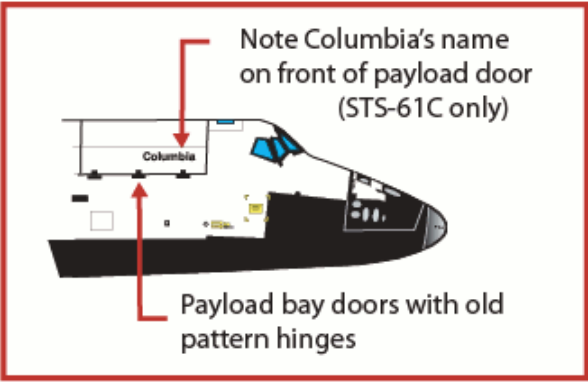
Note different large white tile on lower corner of the OMS pods

Note tile covering water vent marking

Note OMS pattern and black tiles added



Note nosecap detail (SEADS) 'Shuttle Entry Air Data System'



Note Columbia's name on front of payload door (STS-61C only)

Note top cabin detail and unique tile

Payload bay doors with old pattern hinges

Missions flown:

61C	1/12/86
STS-28	8/ 8/89
STS-32	1/ 9/90
STS-35	12/ 2/90

* OEX: Orbiter Experiment Program

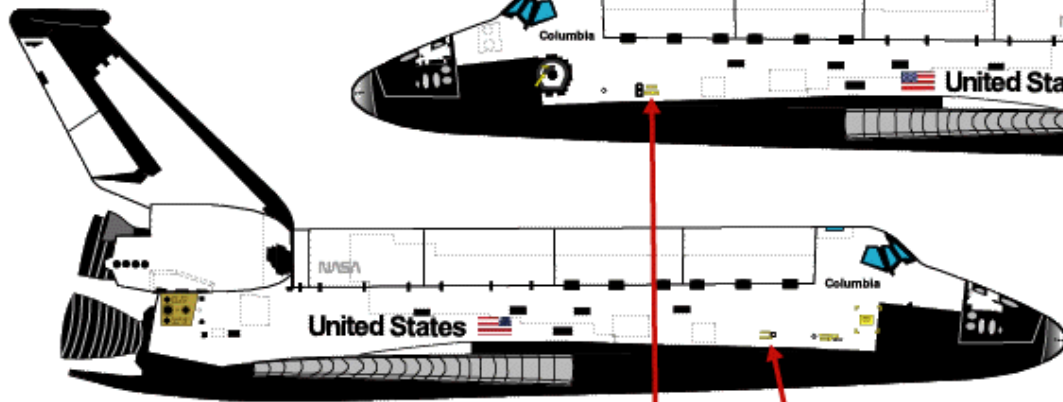


Columbia

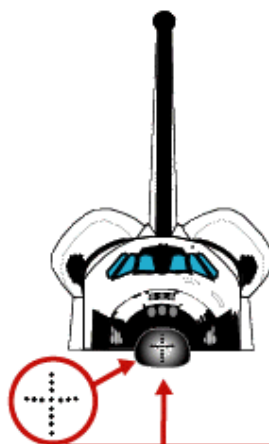
OV-102

-Fifth Modification-

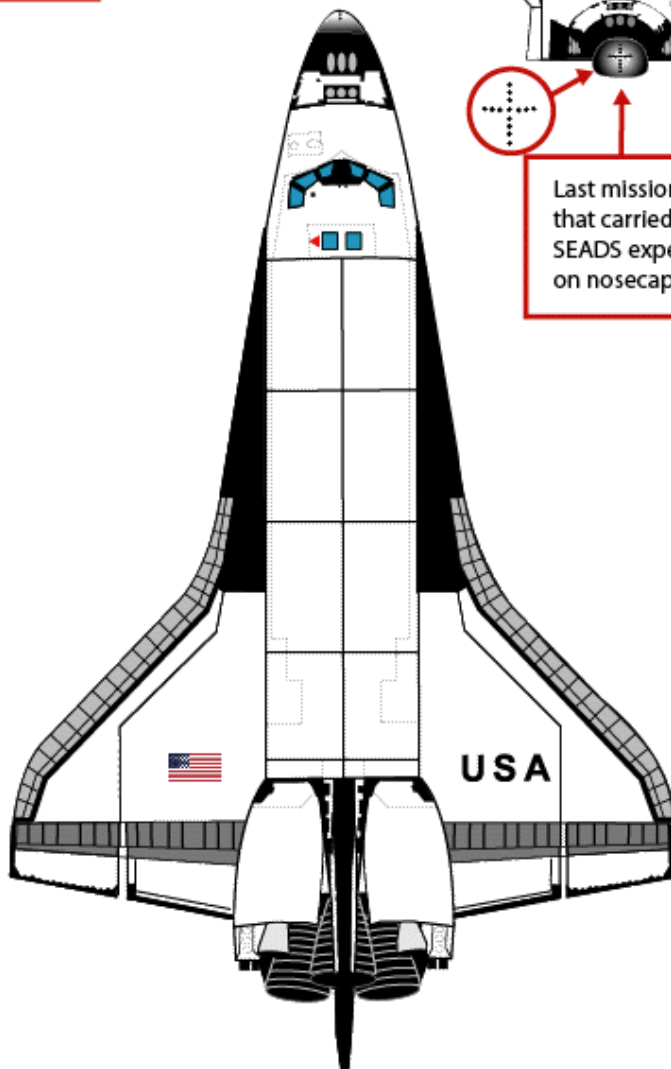
Jun. 5, 1991



Note labels added



Last mission that carried the SEADS experiment on nose cap



Missions flown:
STS-40 6/5/91

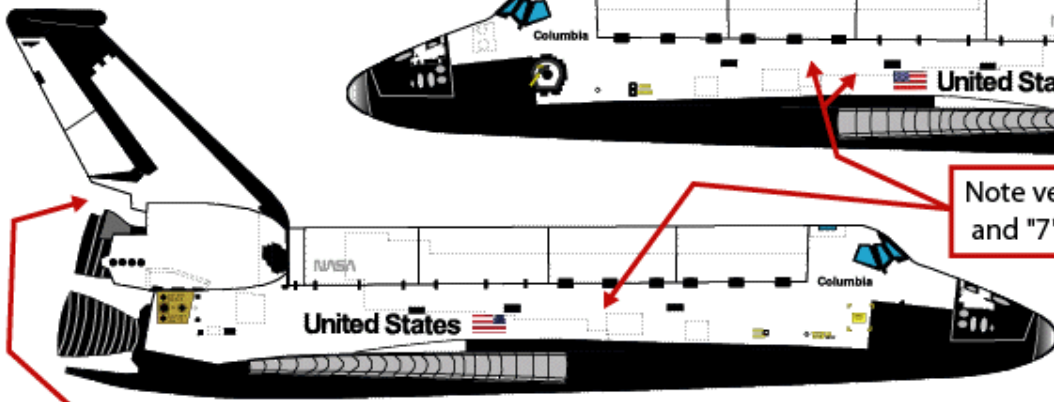
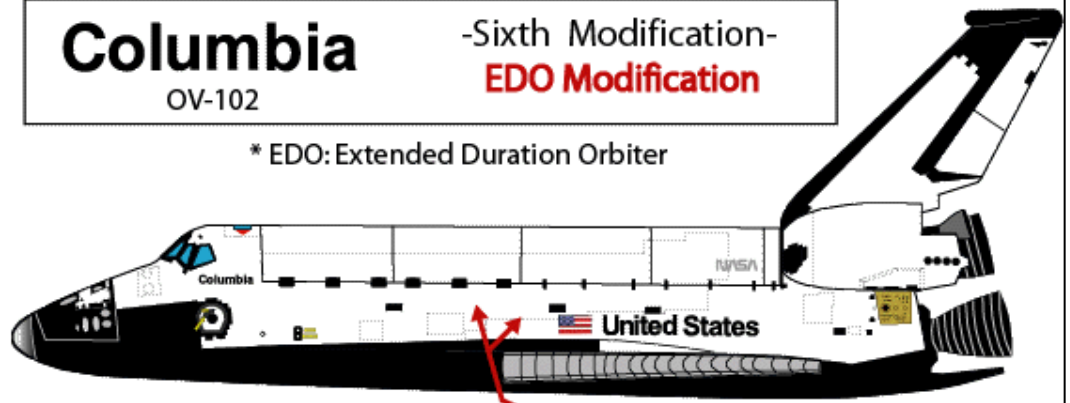


Columbia

OV-102

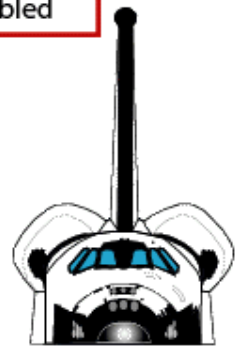
-Sixth Modification-
EDO Modification

* EDO: Extended Duration Orbiter

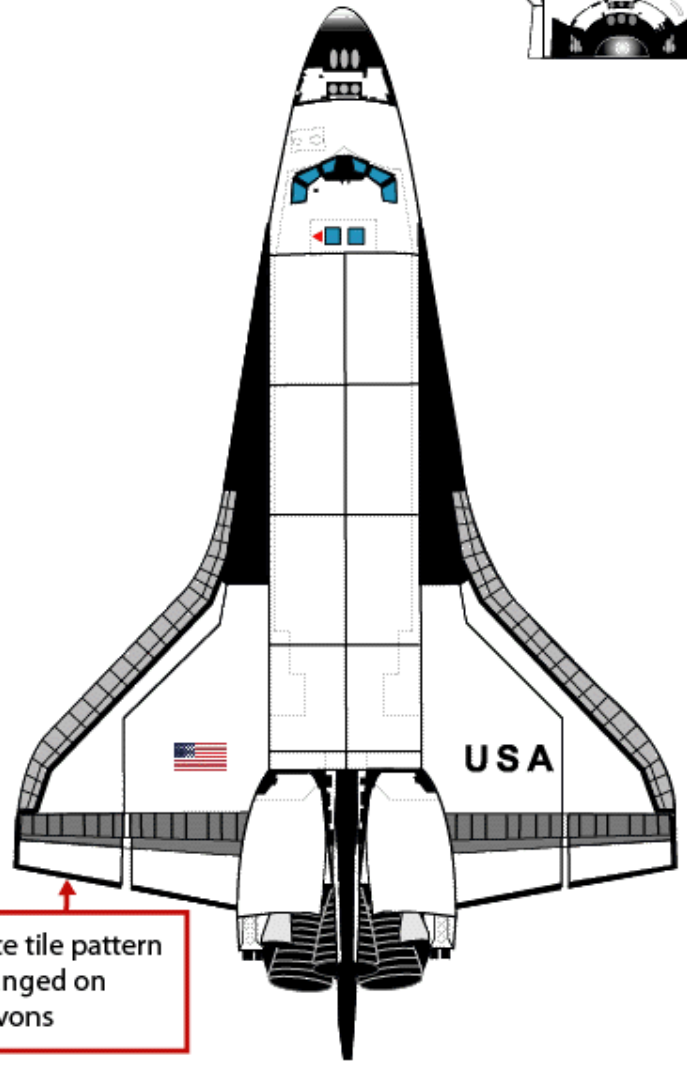


Note vent doors "4"
and "7" disabled

Note the drag chute
added to the tail



Missions flown:	
STS-50	6/25/92
STS-52	10/22/92
STS-55	4/26/93
STS-58	10/18/93
STS-62	3/ 4/94
STS-65	7/ 8/94



Note tile pattern
changed on
elevons



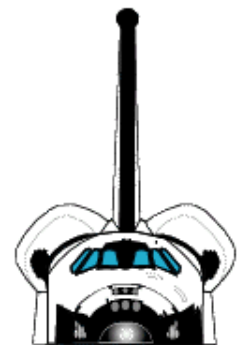
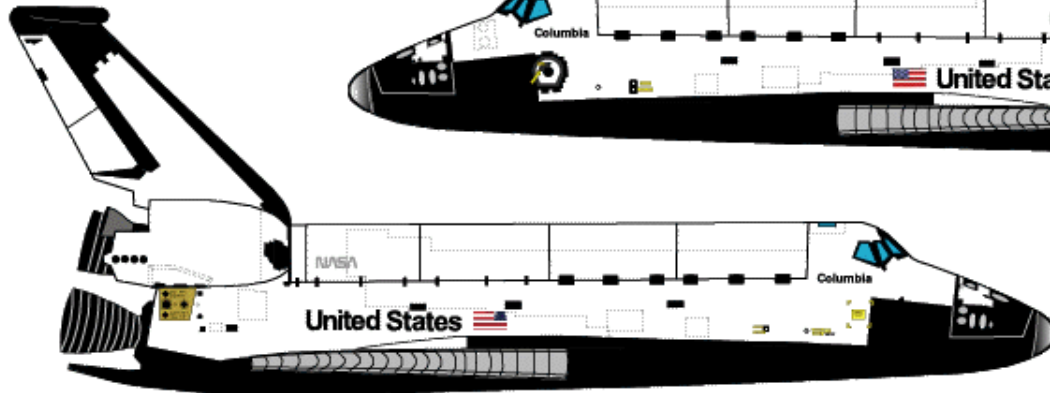
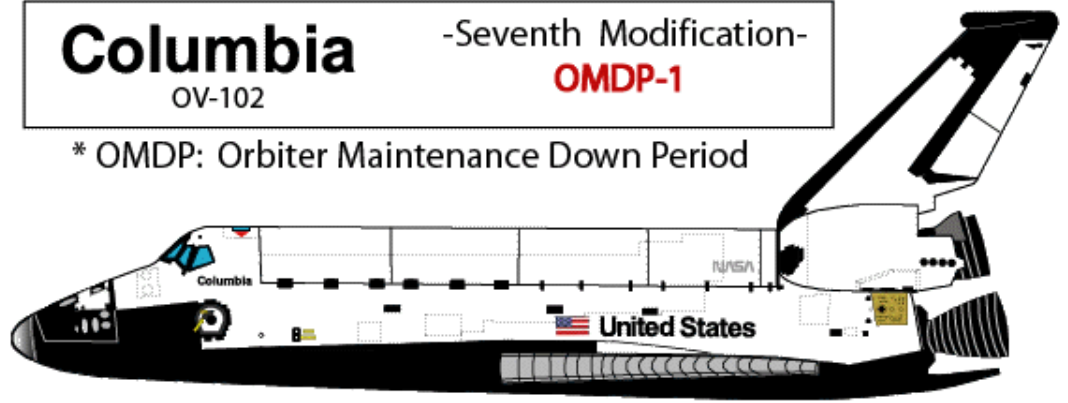
Columbia

OV-102

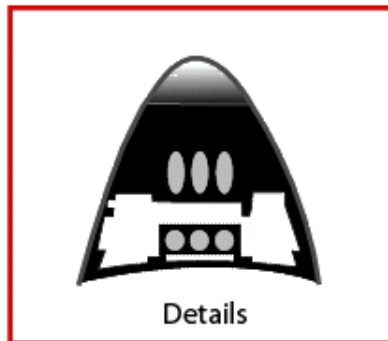
-Seventh Modification-

OMDP-1

* OMDP: Orbiter Maintenance Down Period

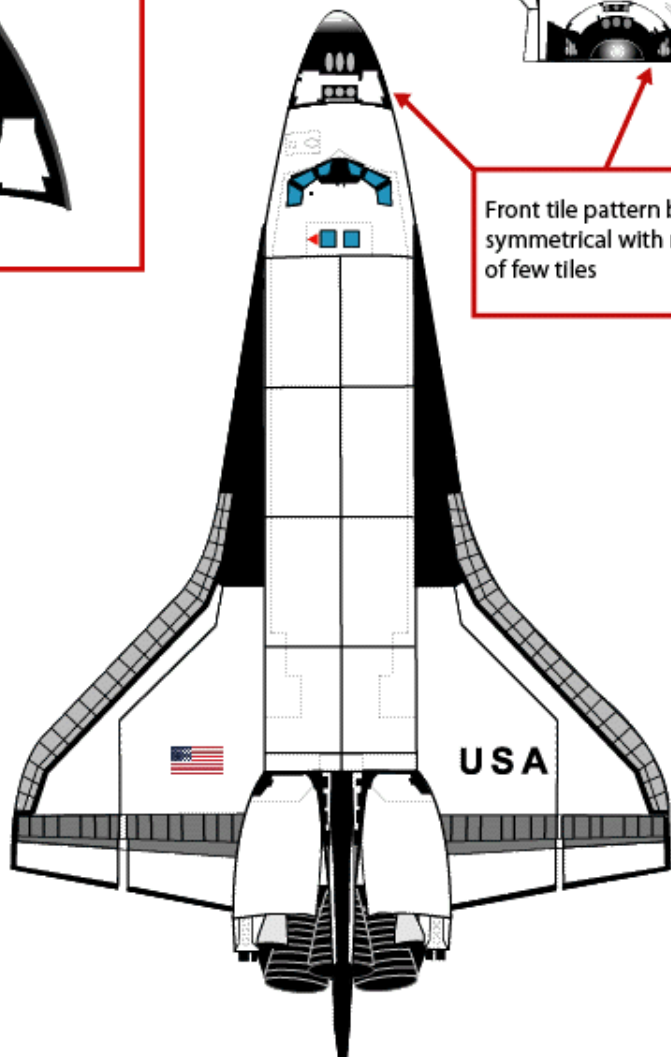


Details



Details

Front tile pattern becoming symmetrical with removal of few tiles



Missions flown:

STS-73	10/25/95
STS-75	2/22/96
STS-78	6/20/96
STS-80	11/19/96
STS-83	4/ 4/97
STS-94	7/ 1/97
STS-87	11/18/97
STS-90	4/17/98
STS-93	7/22/99

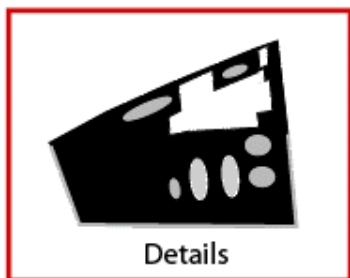
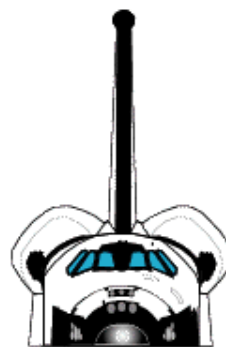
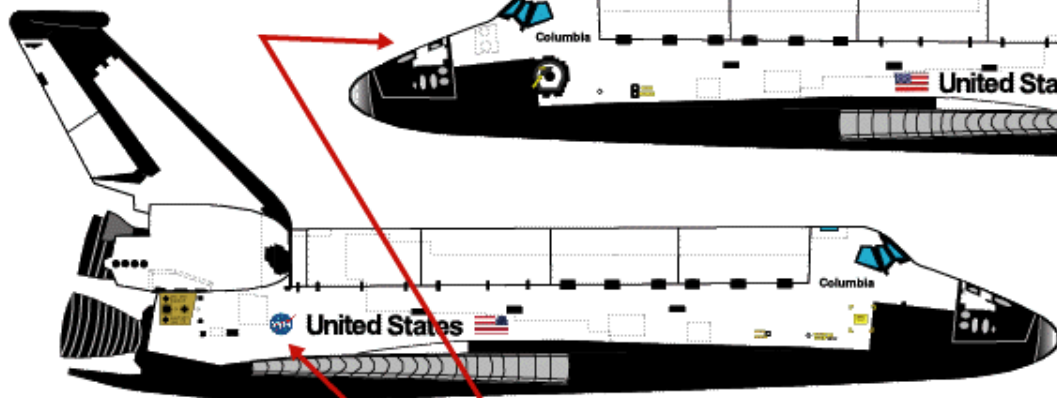


Columbia

OV-102

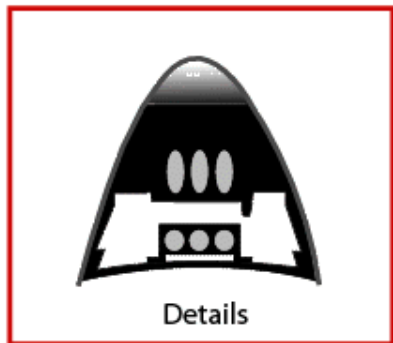
-Last Modification-

OMDP-2



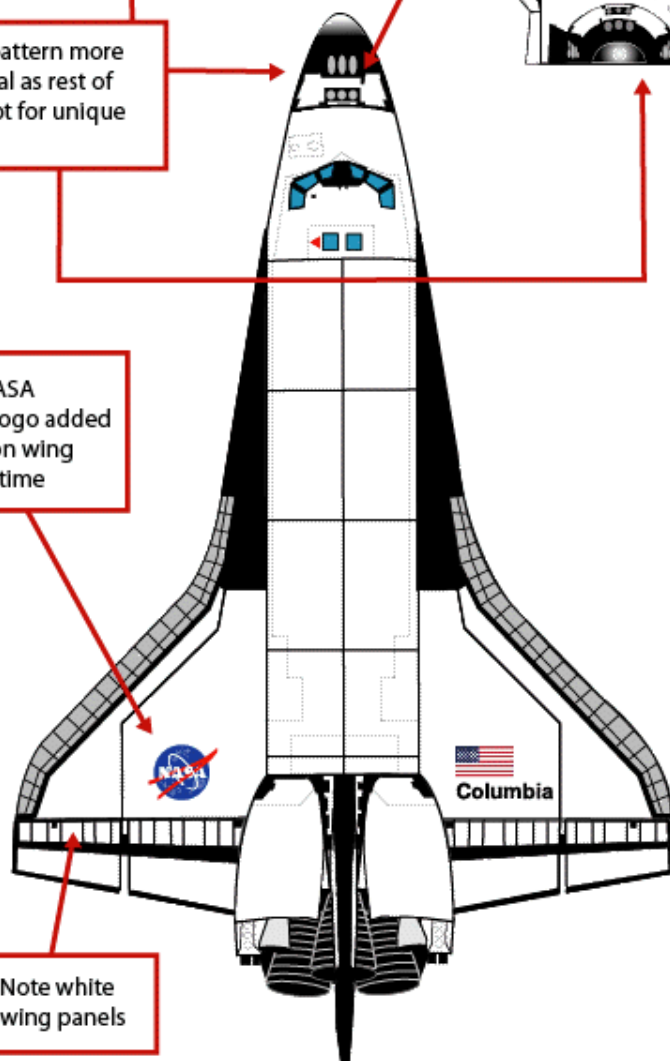
Details

Front tile pattern more symmetrical as rest of fleet, except for unique tile



Details

Note the NASA 'Meatball' logo added and name on wing for the first time



Note white wing panels

Missions flown:

STS-109 3/ 1/02

STS-107 1/16/03

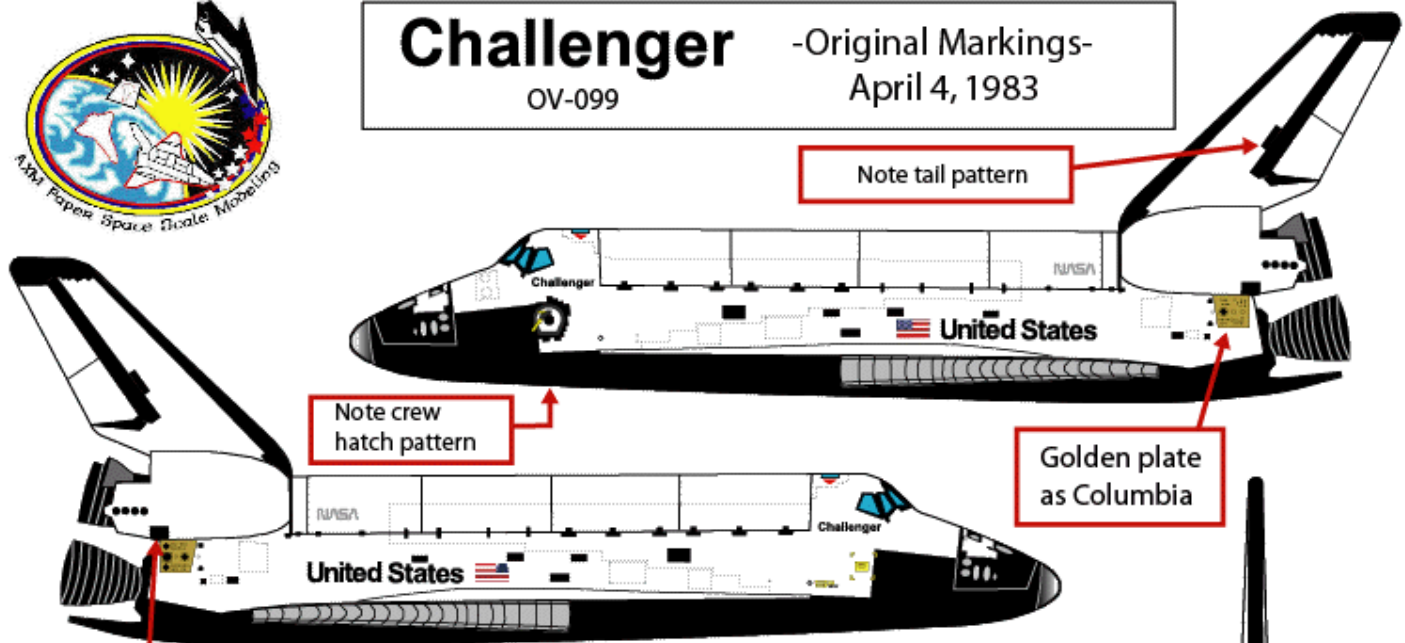
(Orbiter lost - Feb. 1, 2003)



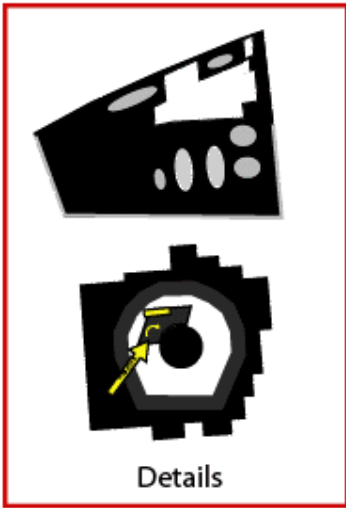
Challenger

OV-099

-Original Markings-
April 4, 1983



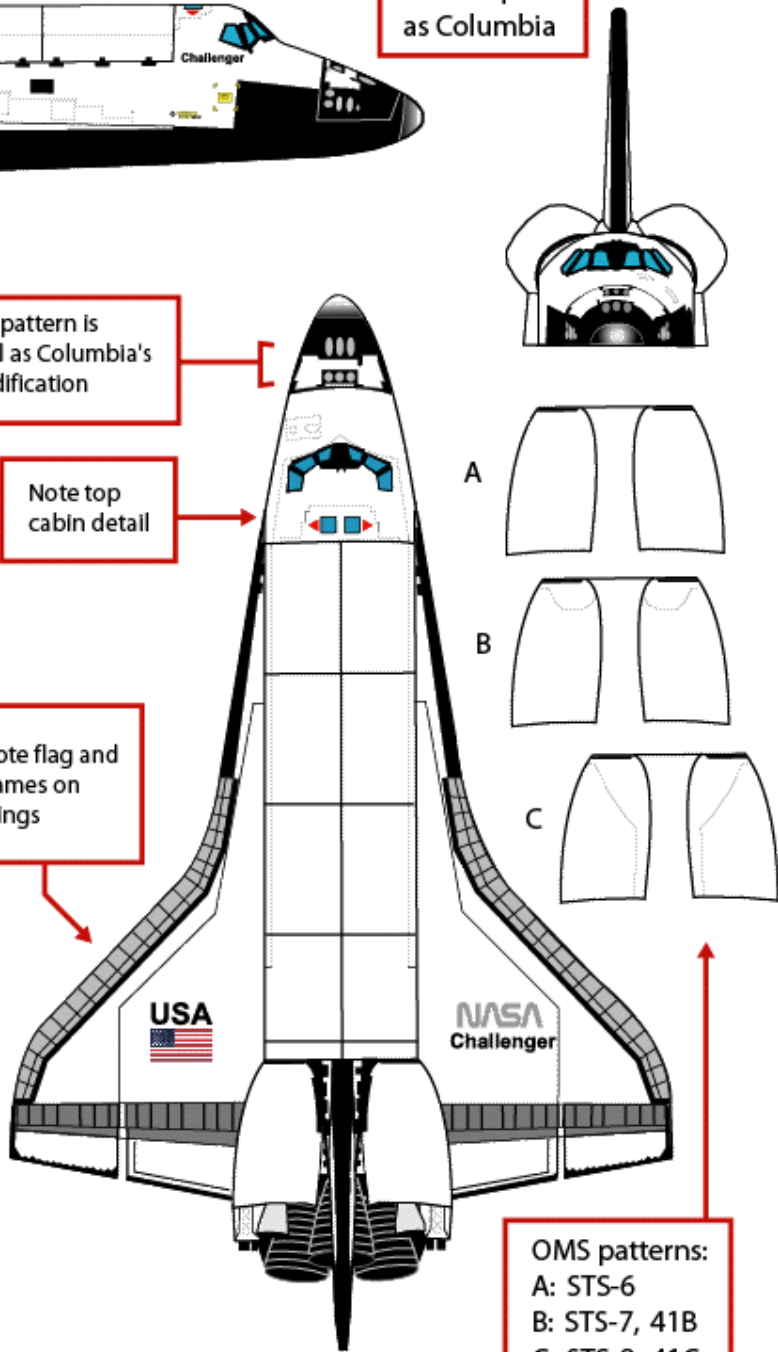
Note black tile on lower corner of OMS pods



This tile pattern is identical as Columbia's last modification

Note top cabin detail

Note flag and names on wings



OMS patterns:
A: STS-6
B: STS-7, 41B
C: STS-8, 41C

Missions flown:	
STS-6	4/ 4/83
STS-7	6/18/83
STS-8	8/30/83
41-B	2/ 3/84
41-C	4/ 6/84

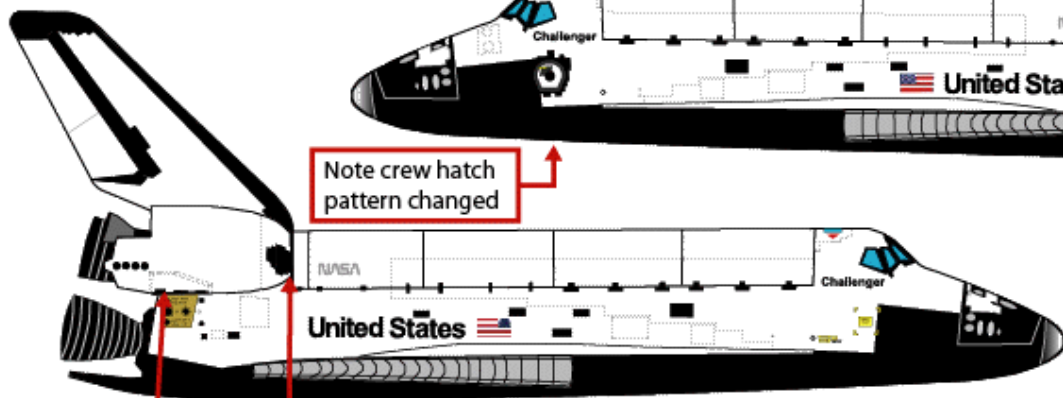
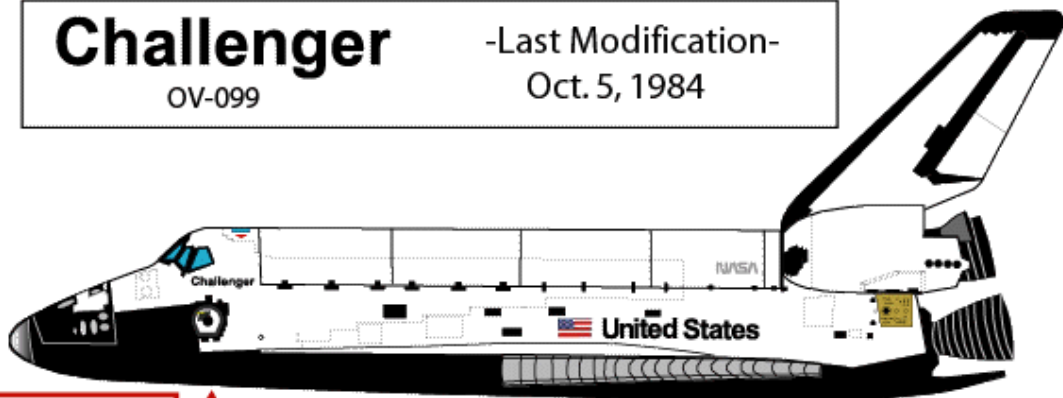


Challenger

OV-099

-Last Modification-

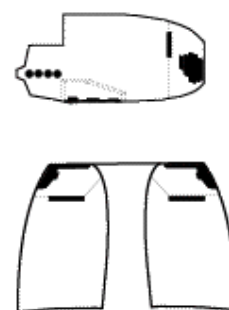
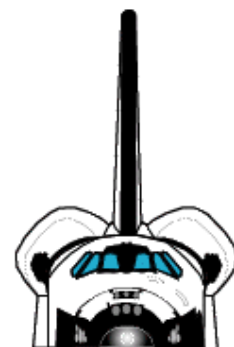
Oct. 5, 1984



Lower corner tile of the OMS pods changed and black tiles added to the front of pods



Details



41-G

Missions flown:

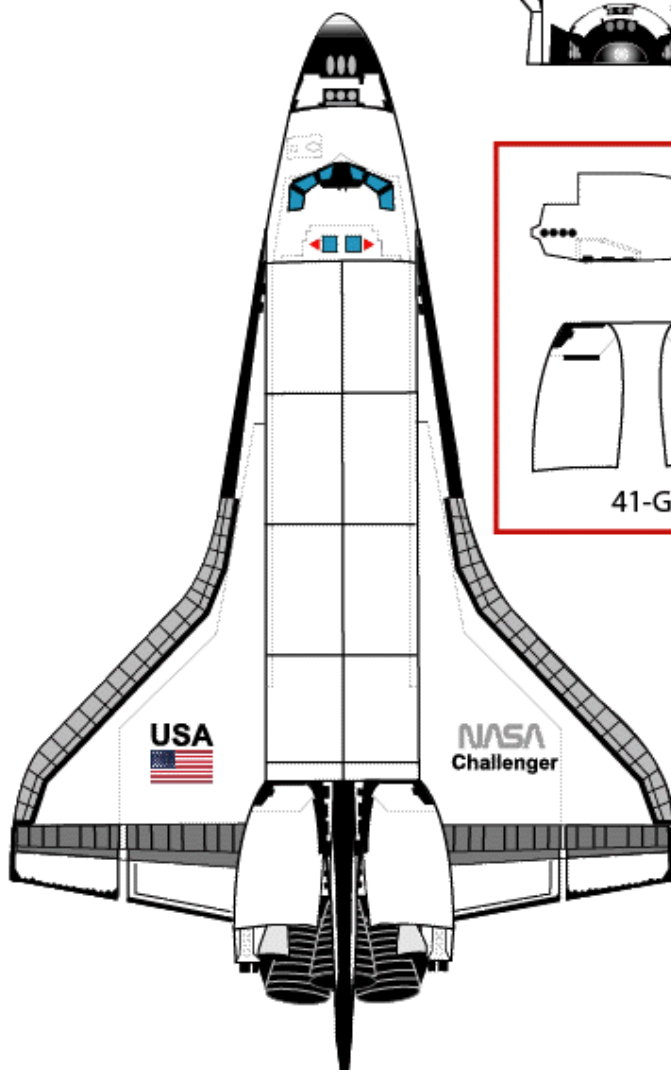
41-G 10/5/84

51-B 4/29/85

51-F 7/29/85

61-A 10/30/85

51-L (Jan. 28, 1986)
(Orbiter lost)





Discovery

OV-103

-Original Markings-
Aug. 30, 1984

Note door hinge pattern

Note tail pattern

Note crew hatch pattern

White umbilical plate, same for OV-104, OV-105

Note black tile on lower corner of OMS pods

Note unique tile on right side of windows

Symmetry of front tiles

Note top cabin detail

Details

Note line of surface insulation

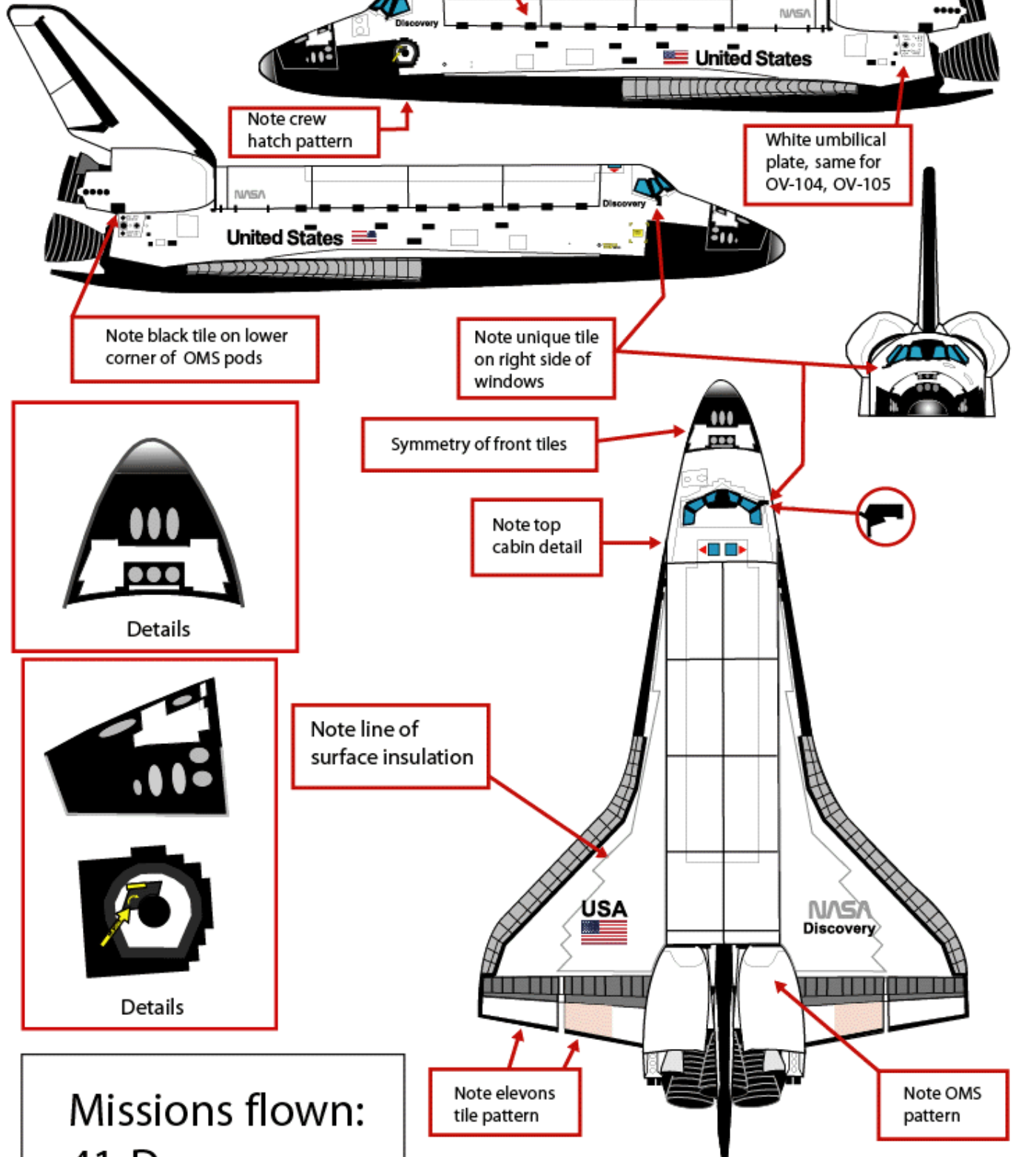
Details

Missions flown:

41-D 8/30/84

Note elevons tile pattern

Note OMS pattern

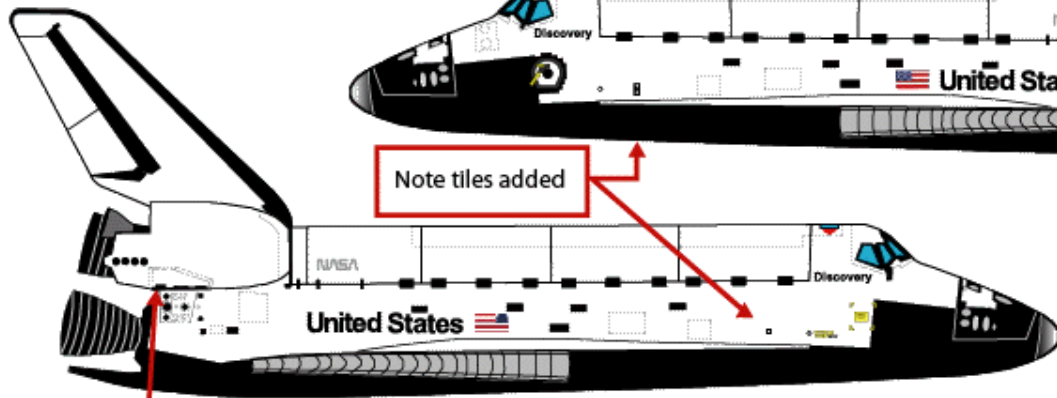
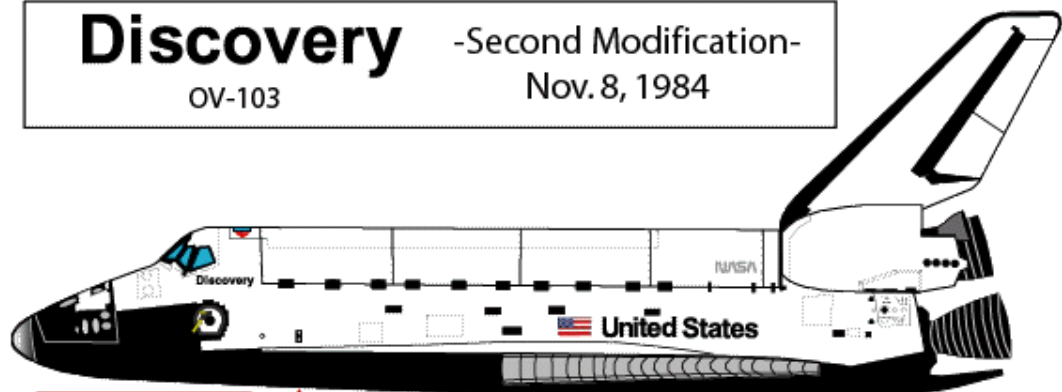




Discovery

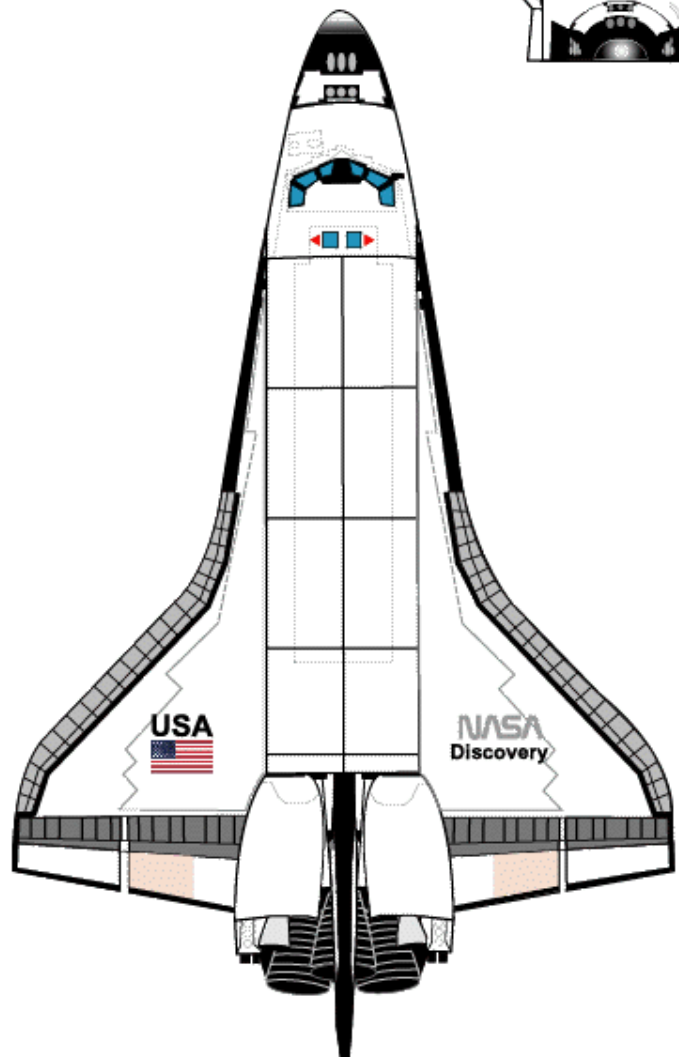
-Second Modification-
Nov. 8, 1984

OV-103



Note tiles added

Note tile on lower corner of OMS pods

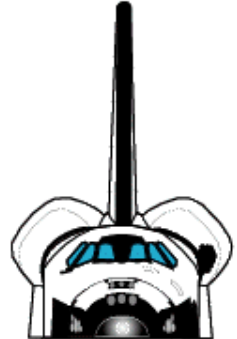
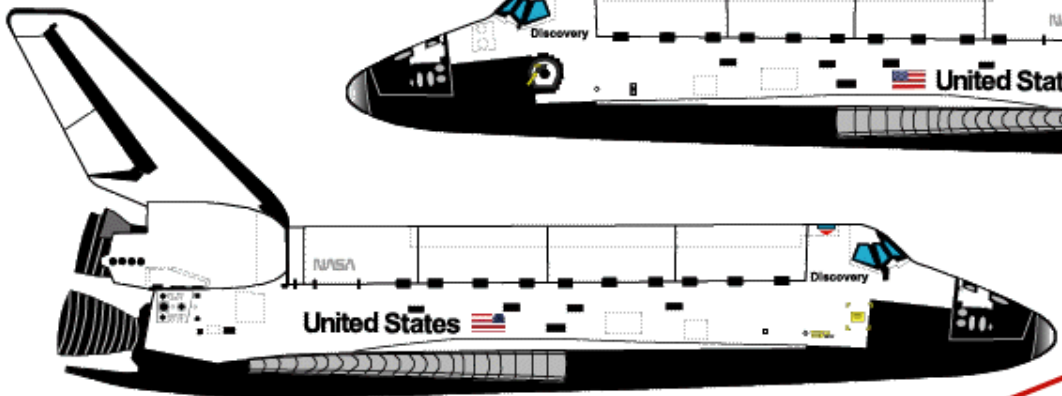


Missions flown:	
51-A	11/ 8/84
51-C	1/24/85
51-D	4/12/85

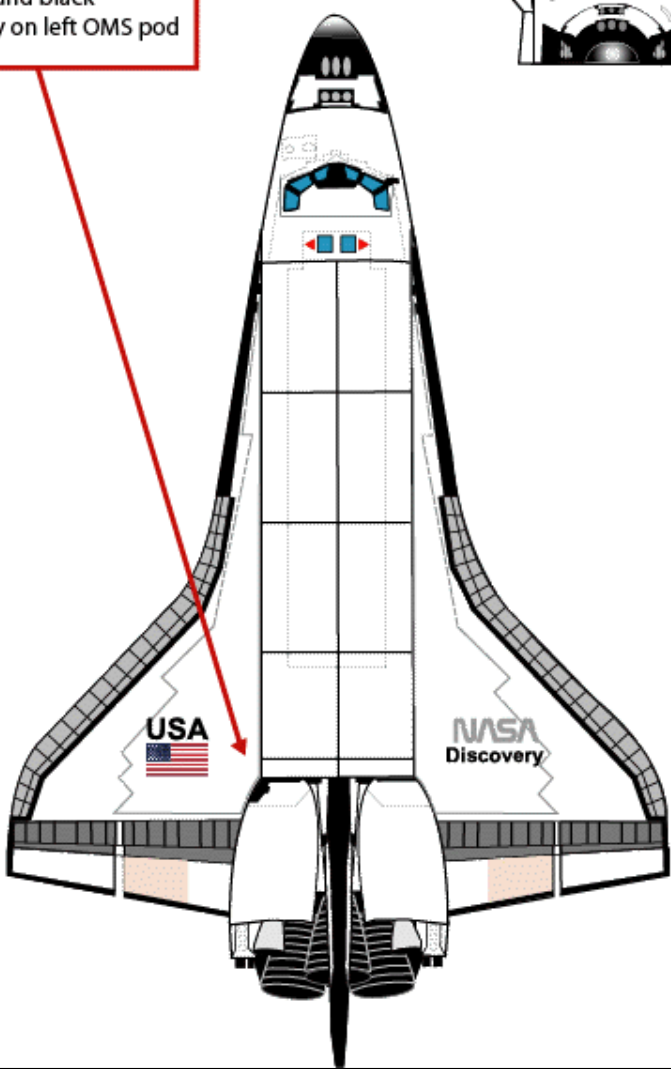


Discovery -Third Modification- OV-103

June 17, 1985



Note OMS pattern and black tile area added only on left OMS pod



Missions flown:	
51-G	6/17/85
51-I	8/27/85

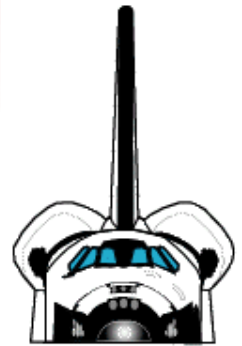
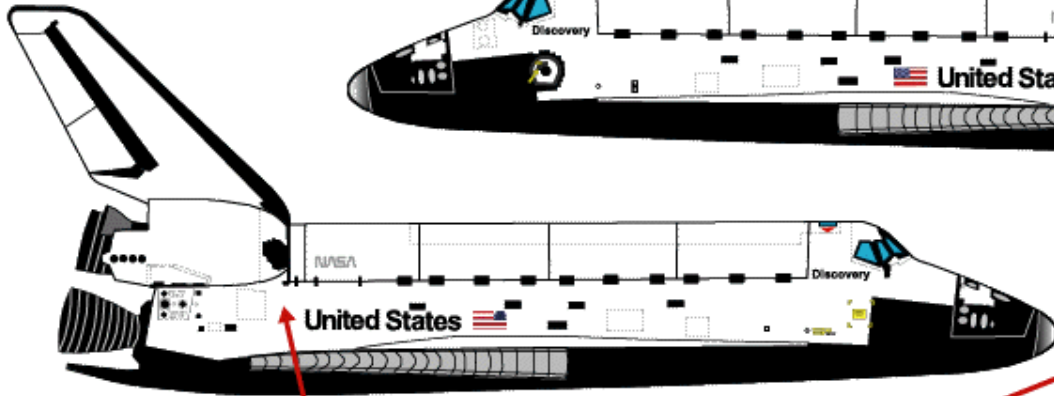


Discovery

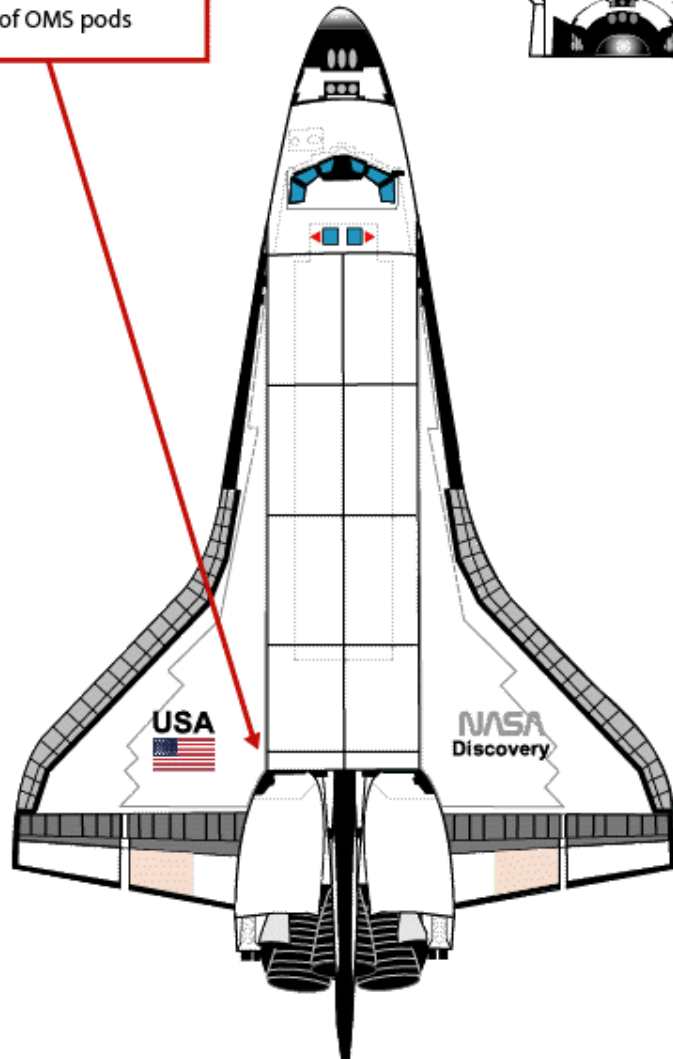
-Fourth Modification-

OV-103

Sep. 26, 1988



Note black tile areas on both sides of OMS pods



Missions flown:

STS-26 (RTF) 9/26/88

STS-29 3/13/89

STS-33 11/23/89

STS-31 4/24/90

STS-41 10/6/90

* RTF: Return to Flight

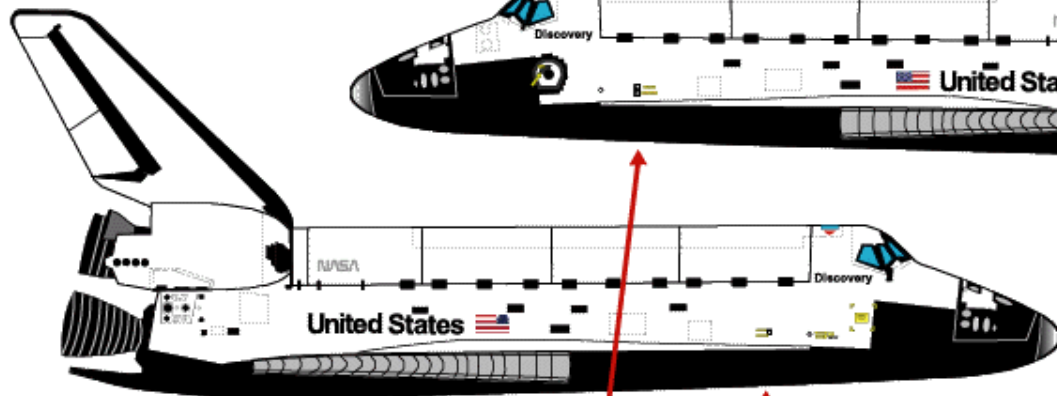


Discovery

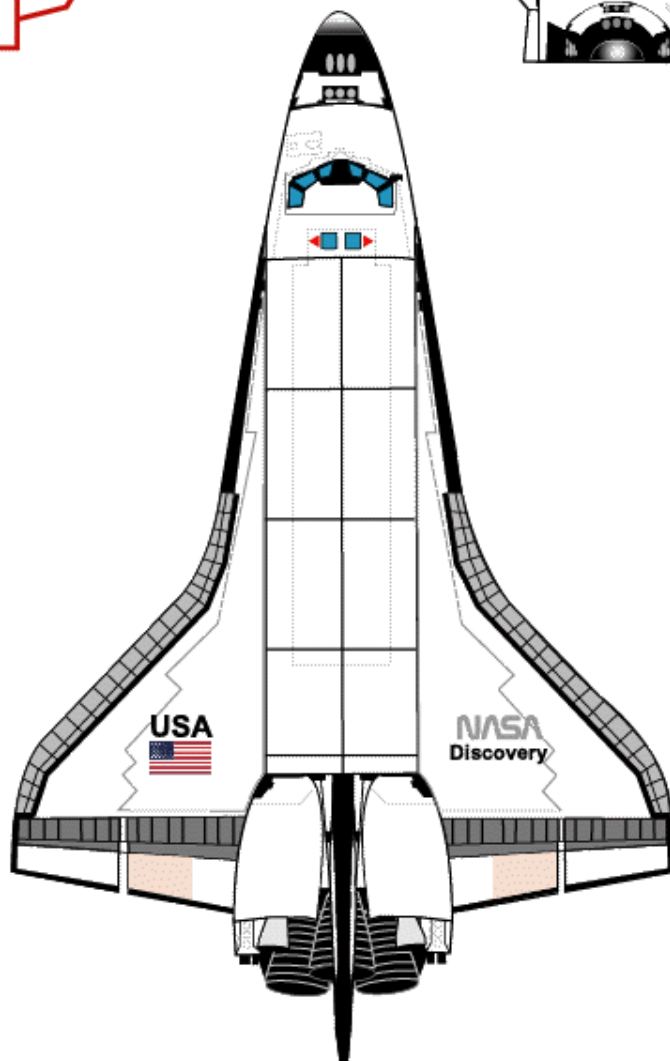
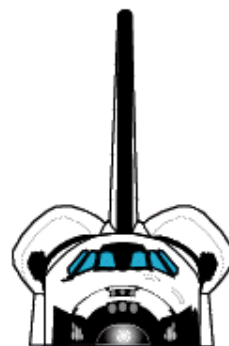
OV-103

-Fifth Modification-

Apr. 28, 1991



Note labels added on sides



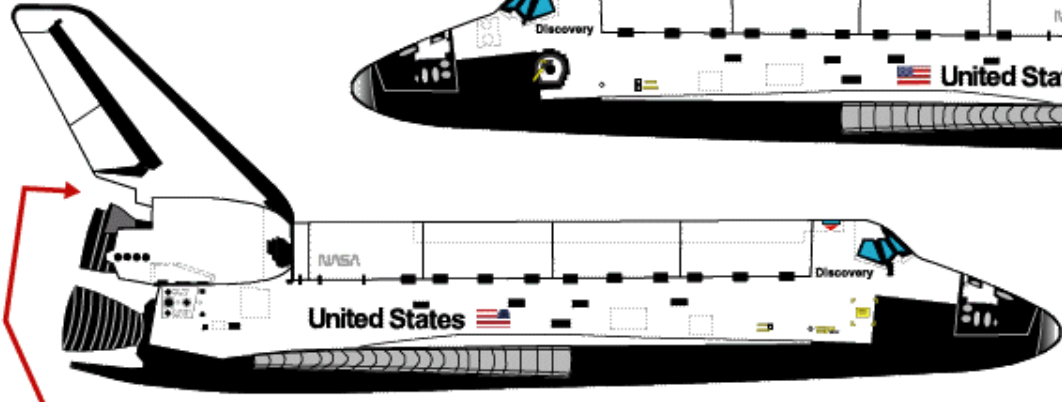
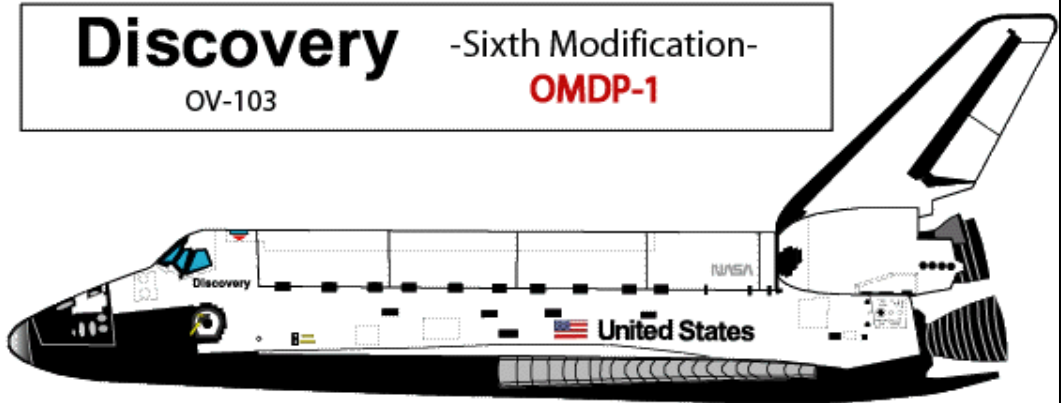
Missions flown:

STS-39	4/28/91
STS-48	9/12/91
STS-42	1/22/92

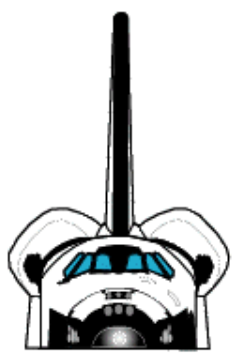


Discovery -Sixth Modification- OMDP-1

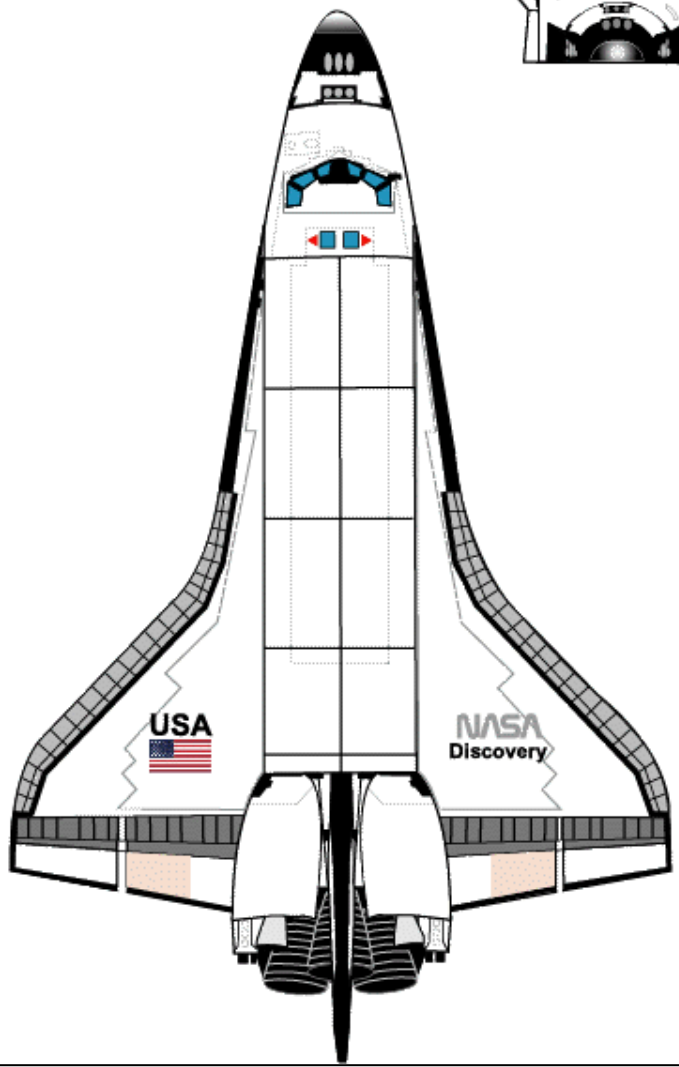
OV-103



Note drag chute added to tail



Missions flown:	
STS-53	12/ 2/92
STS-56	4/ 8/93
STS-51	9/12/93



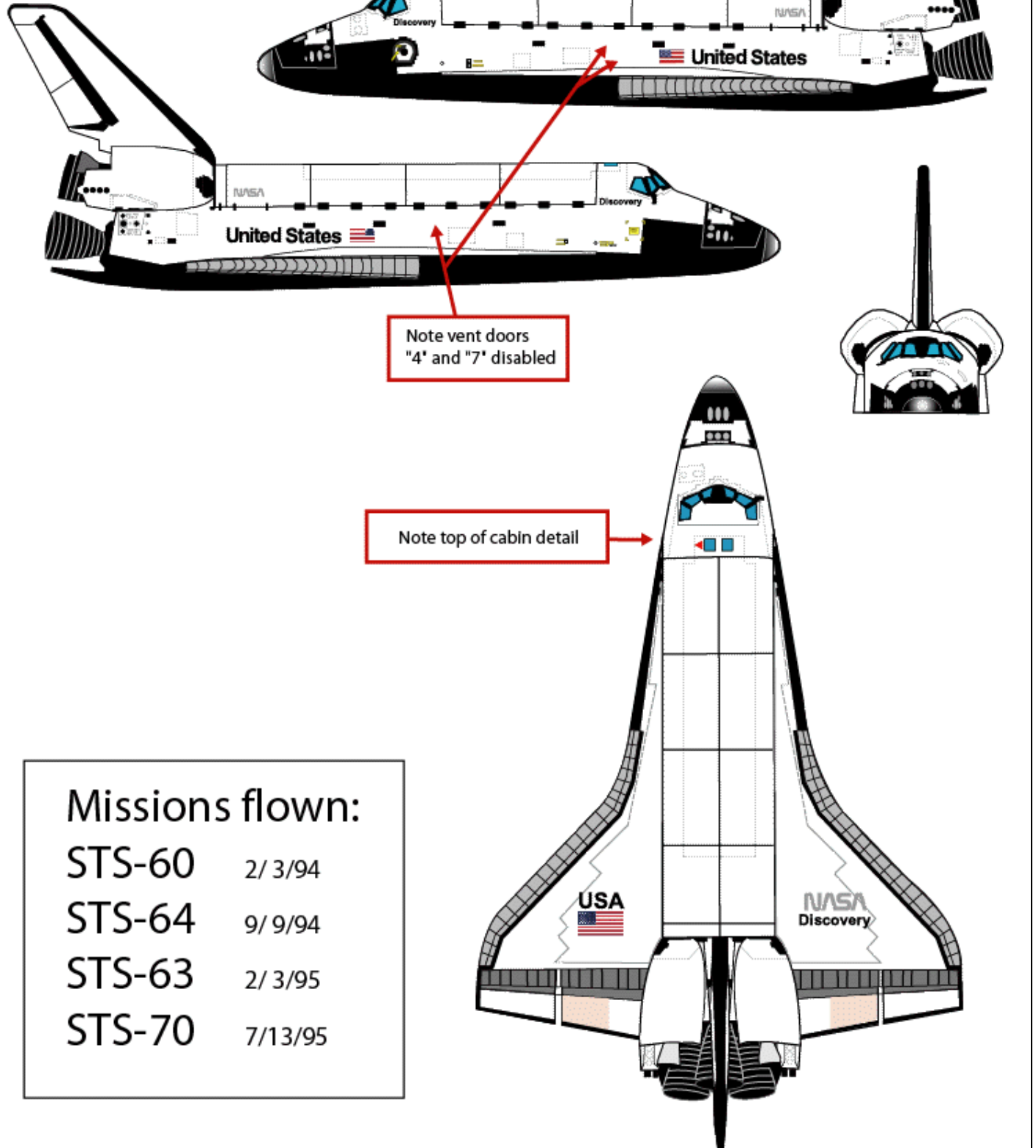


Discovery

OV-103

-Seventh Modification-

Feb. 3, 1994



Note vent doors
"4" and "7" disabled

Note top of cabin detail

Missions flown:

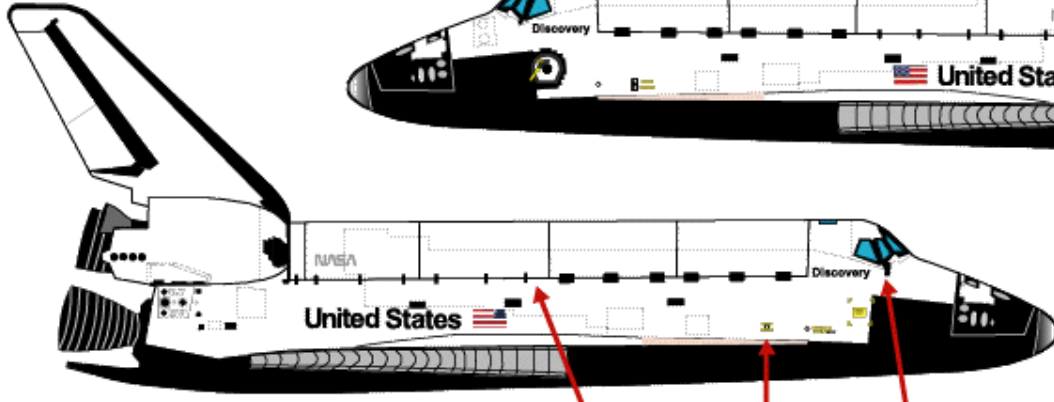
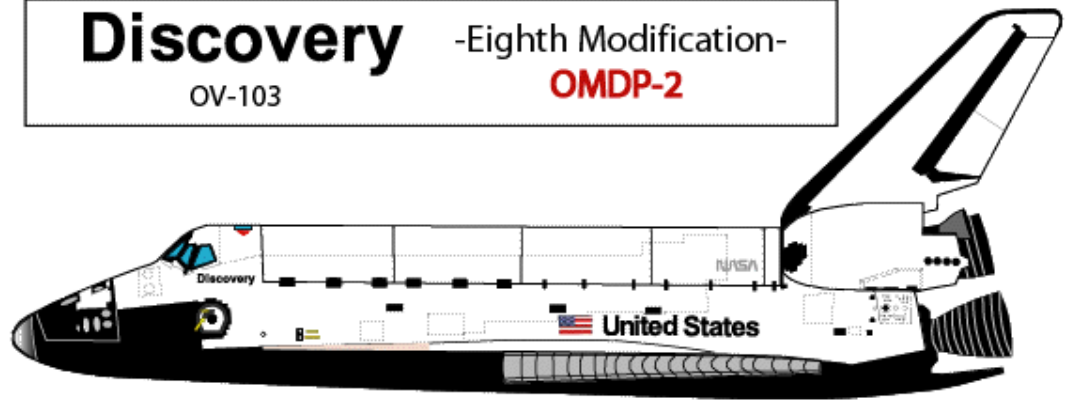
STS-60	2/ 3/94
STS-64	9/ 9/94
STS-63	2/ 3/95
STS-70	7/13/95



Discovery -Eighth Modification-

OV-103

OMDP-2



Note door hinges pattern

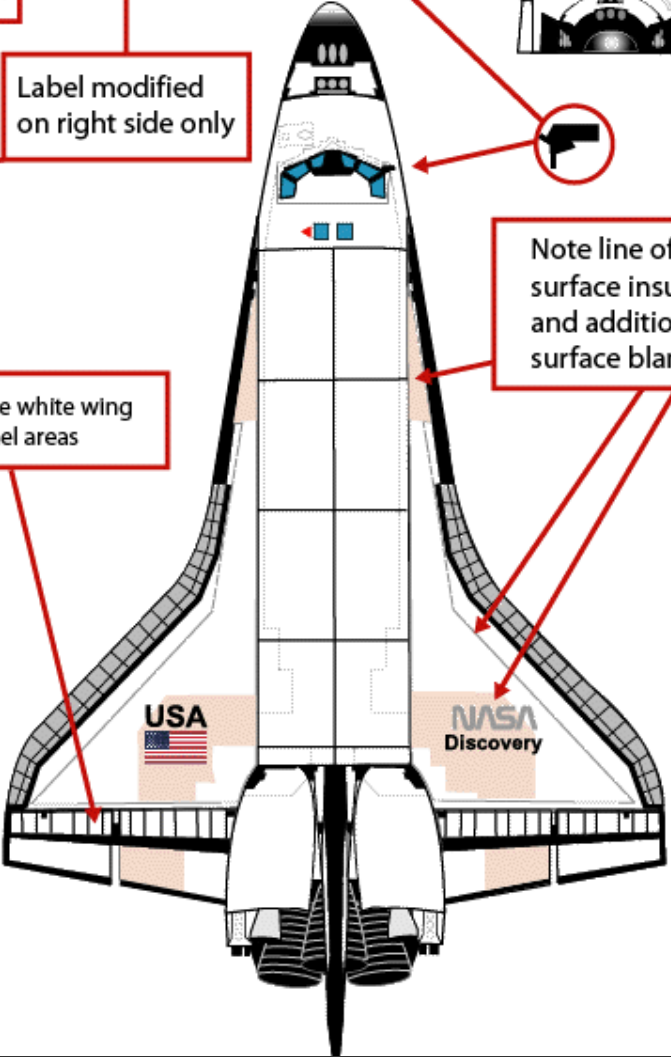
Window tile modified



Label modified on right side only

Note line of surface insulation and addition of surface blankets

Note white wing panel areas

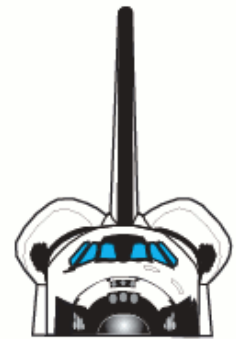
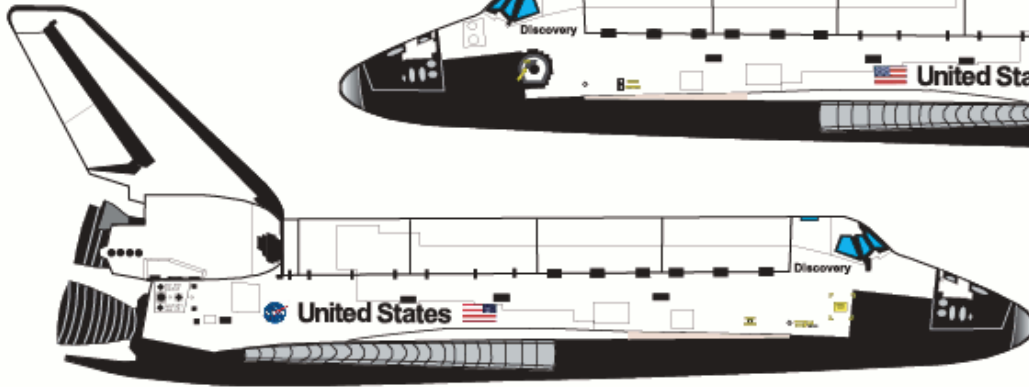
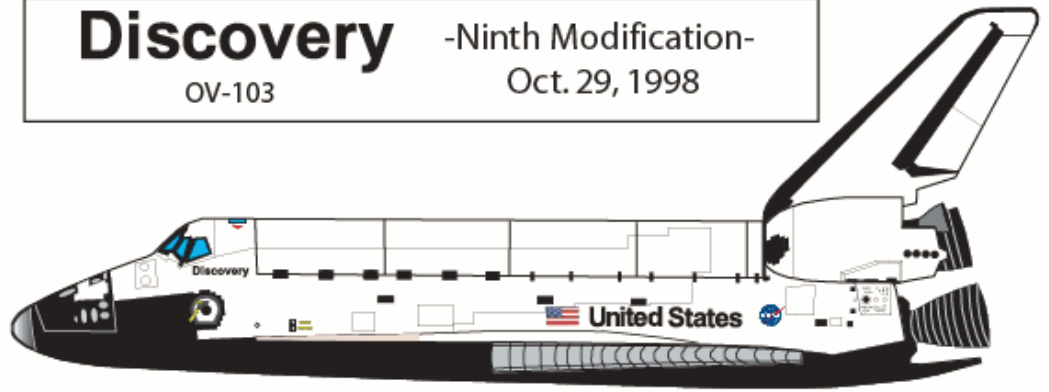


Missions flown:	
STS-82	2/11/97
STS-85	8/7/97
STS-91	6/2/98



Discovery

-Ninth Modification-
OV-103
Oct. 29, 1998



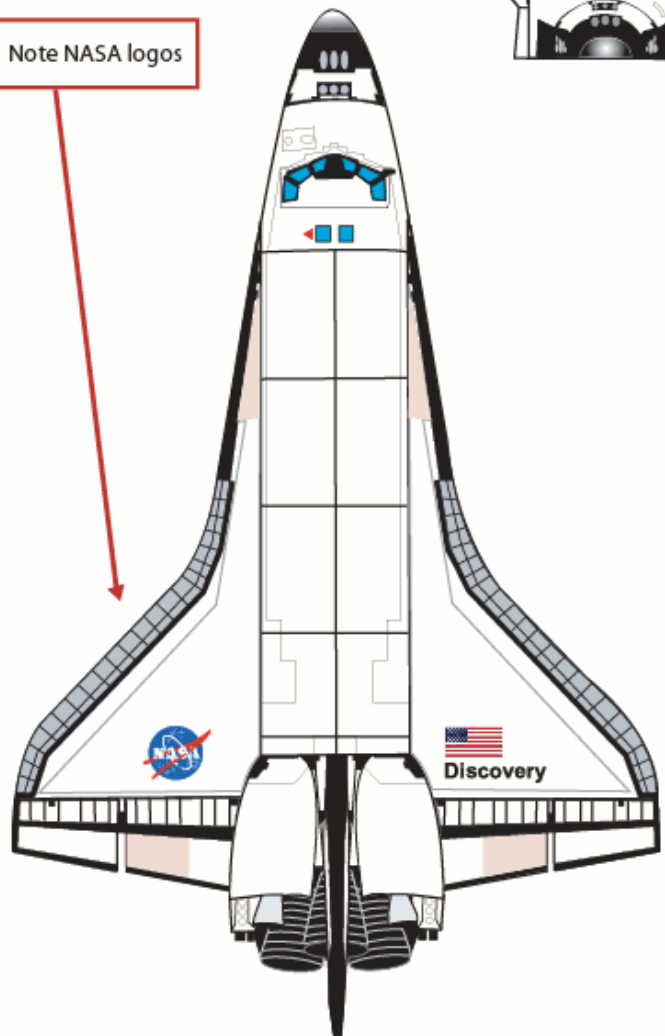
Missions flown:

STS-95	10/29/98
STS-96	5/27/99
STS-103	12/19/99
STS-92	10/11/00
STS-102	3/8/01
STS-105	8/10/01

OMDP-3

STS-114 (RTF)	7/26/05
STS-121 (RTF)	7/4/06
STS-116	12/9/06
STS-120	10/23/07
STS-124	5/31/08
STS-119	3/15/09
STS-128	8/28/09
STS-131	4/5/10
STS-133	2/24/11 (Last Flight)

Note NASA logos



* RTF: Return to Flight

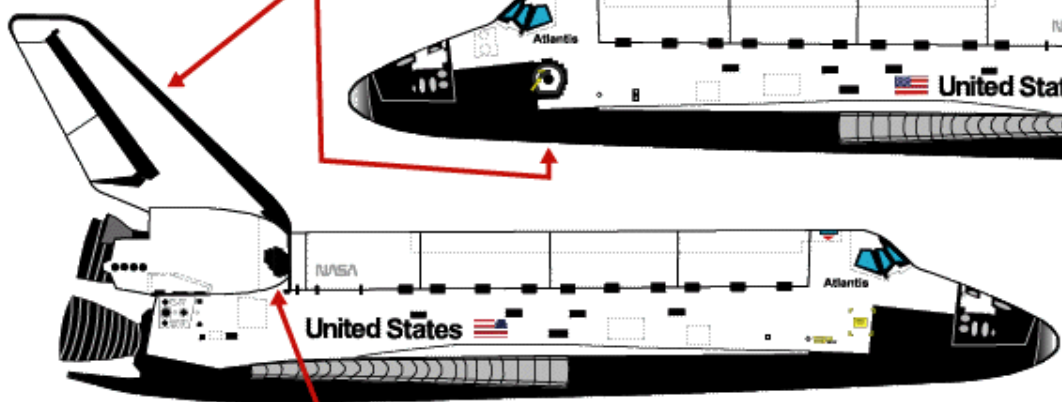
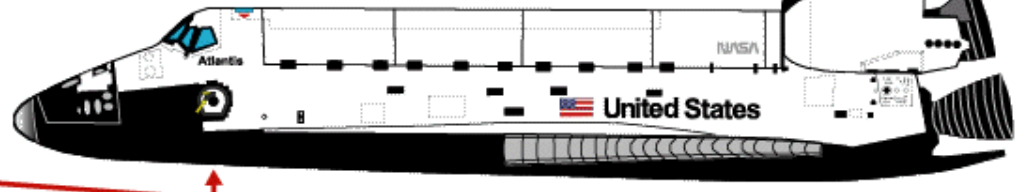


Atlantis

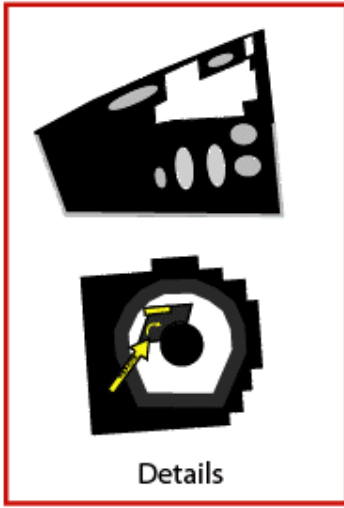
OV-104

-Original Markings-
Oct. 3, 1985

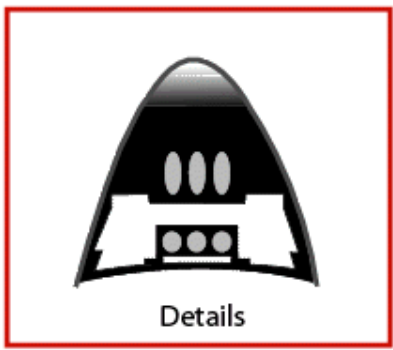
Crew hatch and tail pattern
same as OV-103 and OV-105



Note tile on right OMS pod only



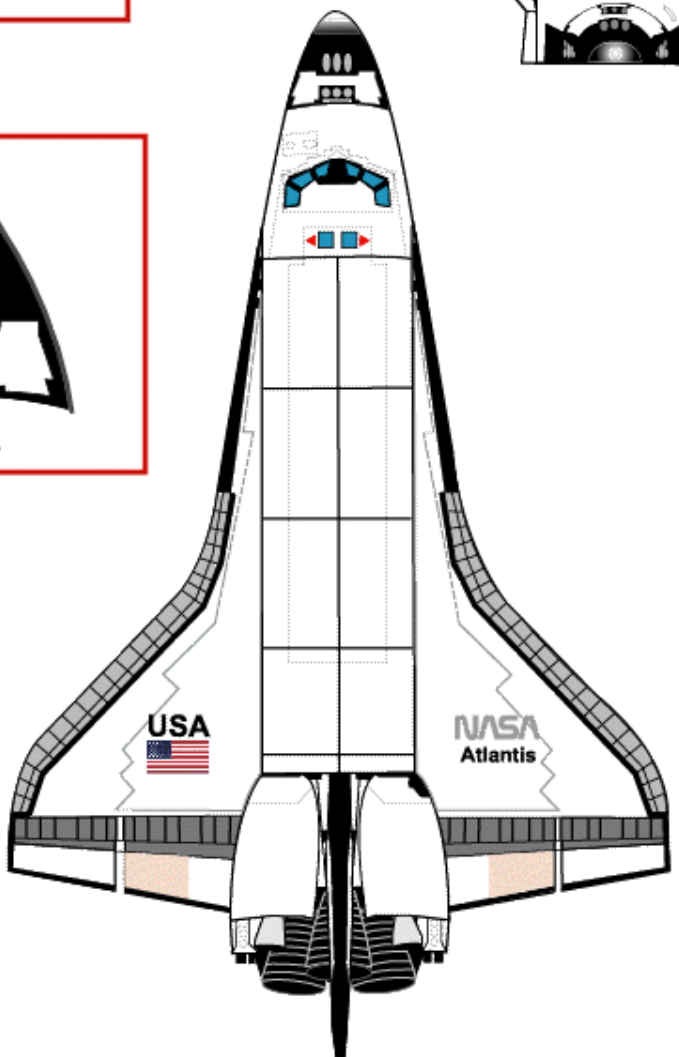
Details



Details

Missions flown:

51-J	10/ 3/85
61-B	11/27/85



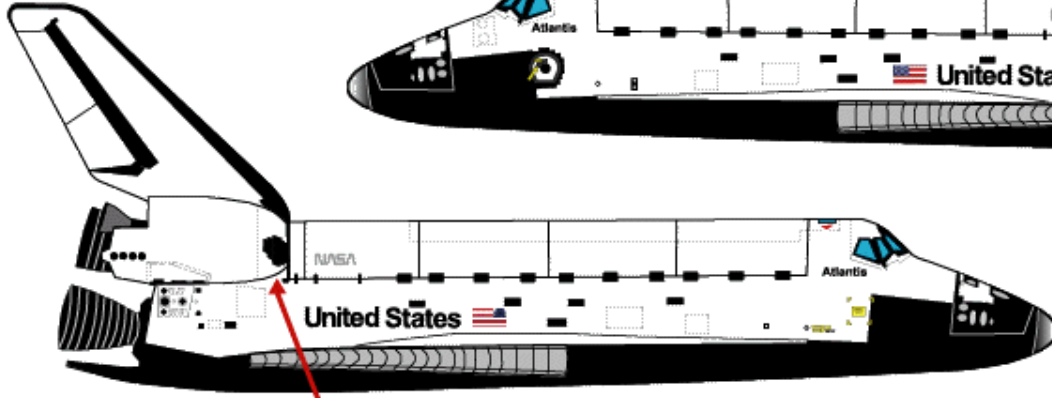
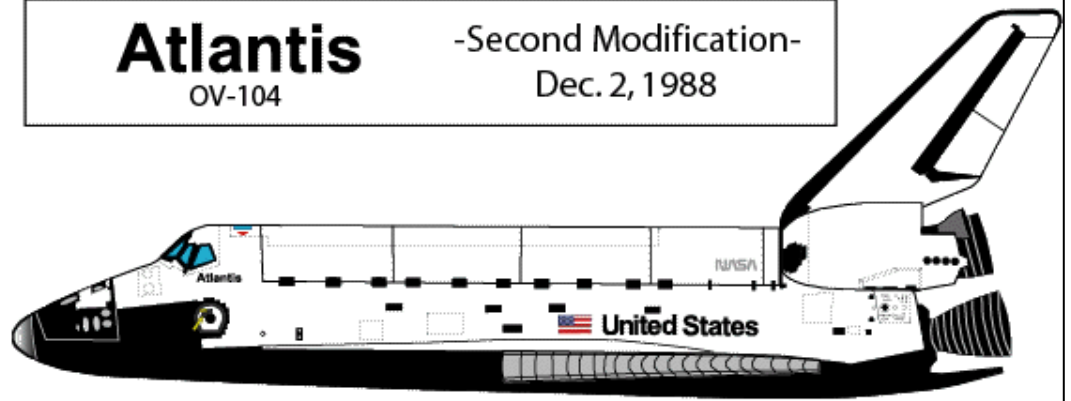


Atlantis

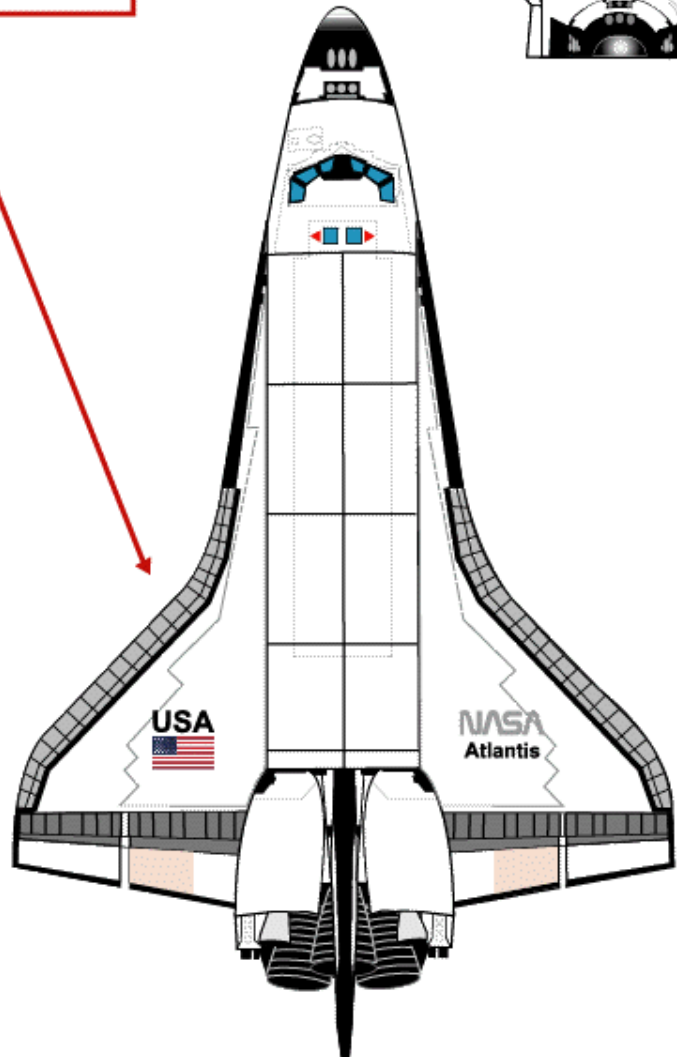
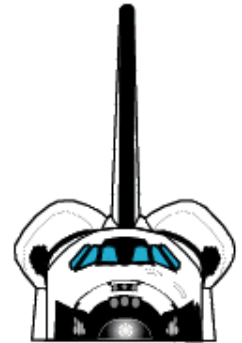
OV-104

-Second Modification-

Dec. 2, 1988



Note black tiles on both OMS pods



Missions flown:

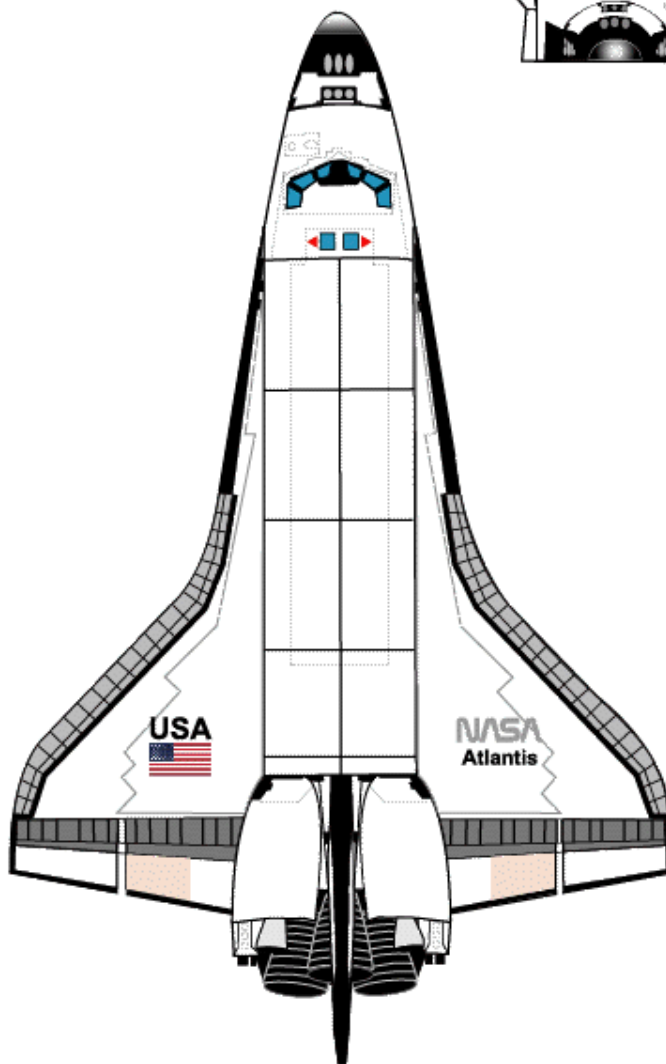
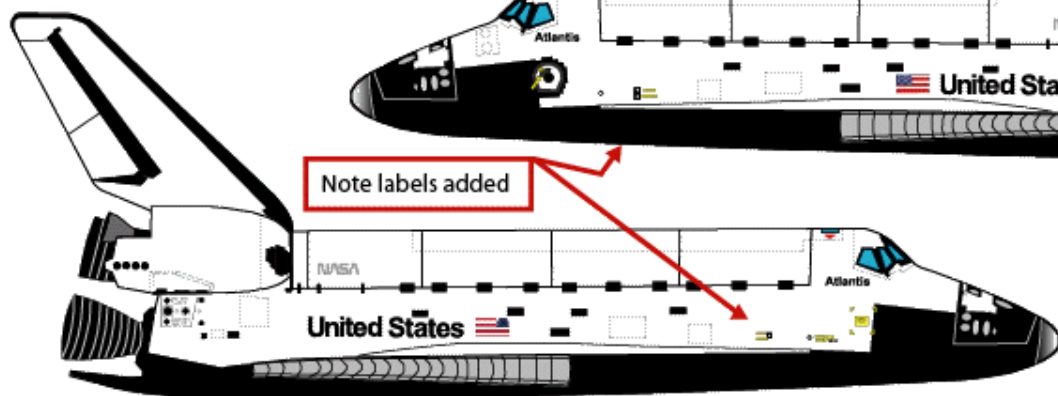
STS-27	12/ 2/88
STS-30	5/ 4/89
STS-34	10/18/89
STS-36	2/28/90
STS-38	11/16/90
STS-37	4/ 5/91



Atlantis

OV-104

-Third Modification-
Aug. 2, 1991

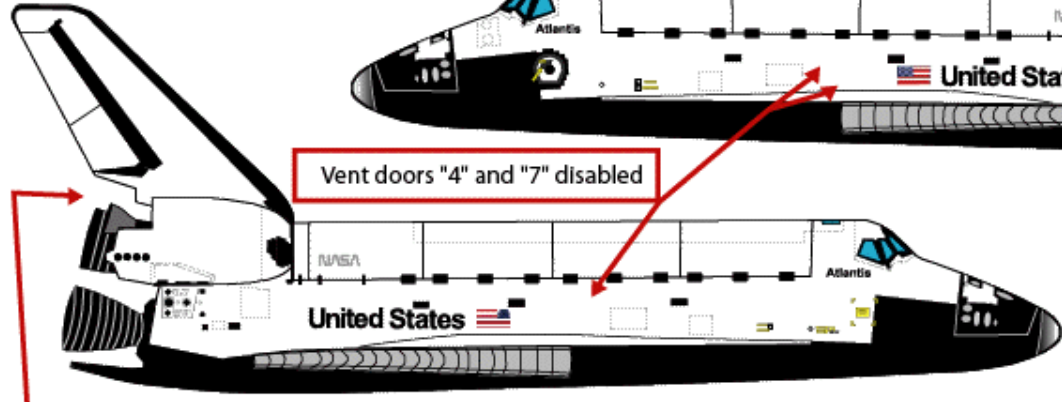
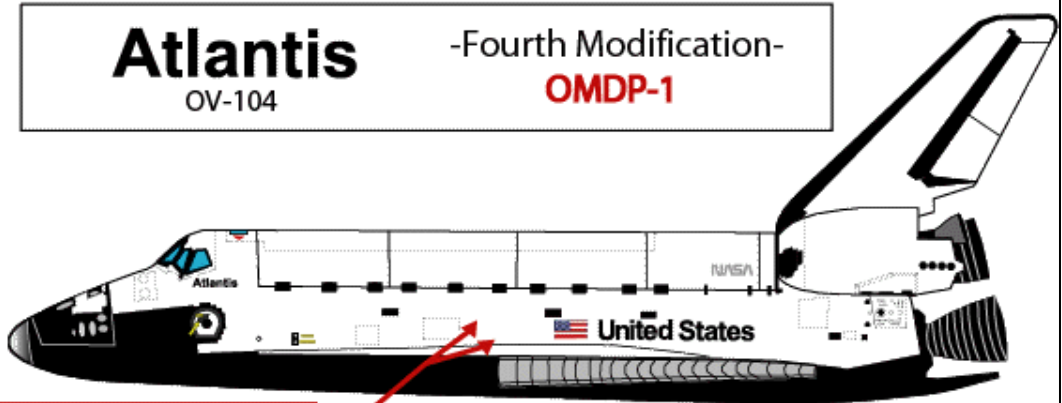


Missions flown:

STS-43	8/ 2/91
STS-44	11/21/91
STS-45	3/24/92
STS-46	7/31/92

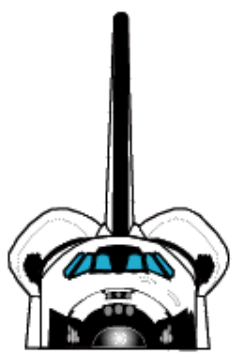


Atlantis -Fourth Modification-
OV-104 **OMDP-1**

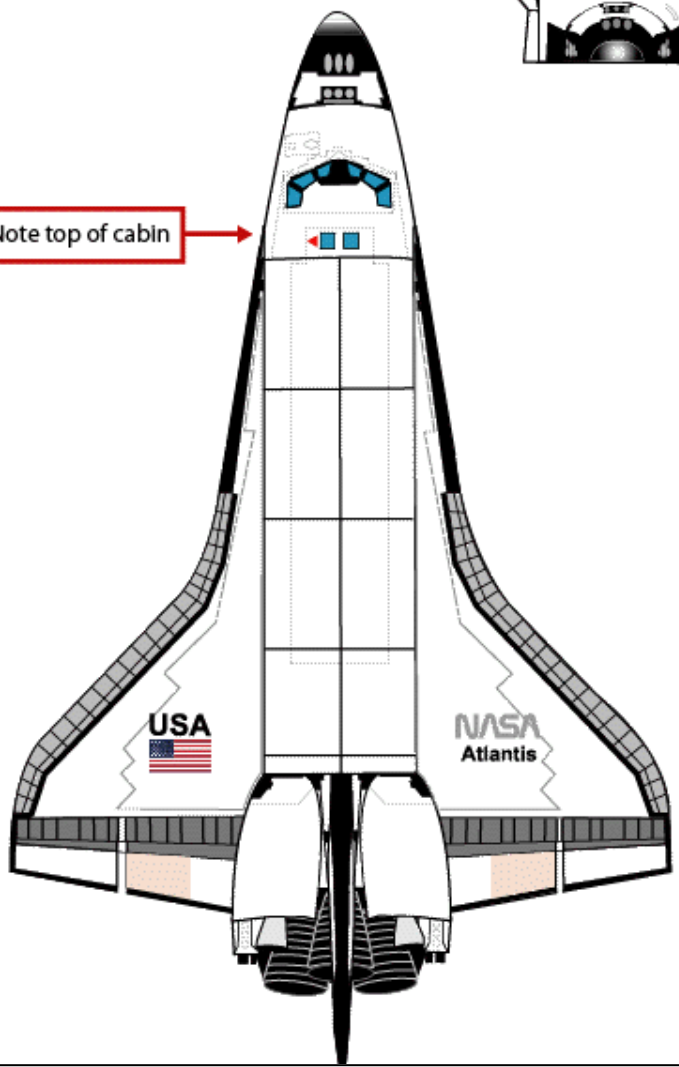


Vent doors "4" and "7" disabled

Note drag chute added



Note top of cabin



Missions flown:

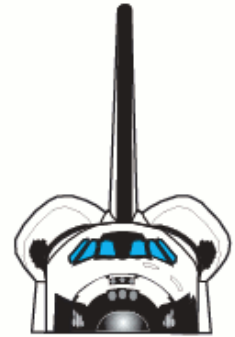
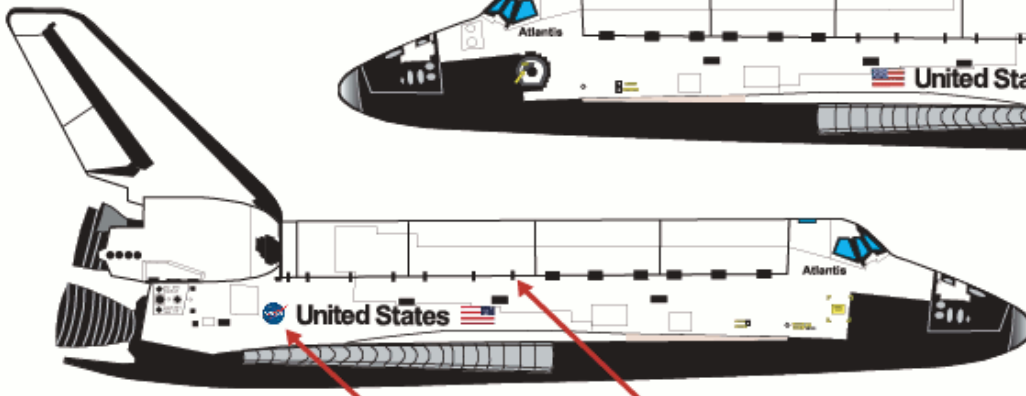
STS-66	11/ 3/94
STS-71	6/27/95
STS-74	11/12/95
STS-76	3/22/96
STS-79	9/16/96
STS-81	1/12/97
STS-84	5/15/97
STS-86	9/26/97



Atlantis

OV-104

-Fifth Modification-
OMDP-2



Missions flown:

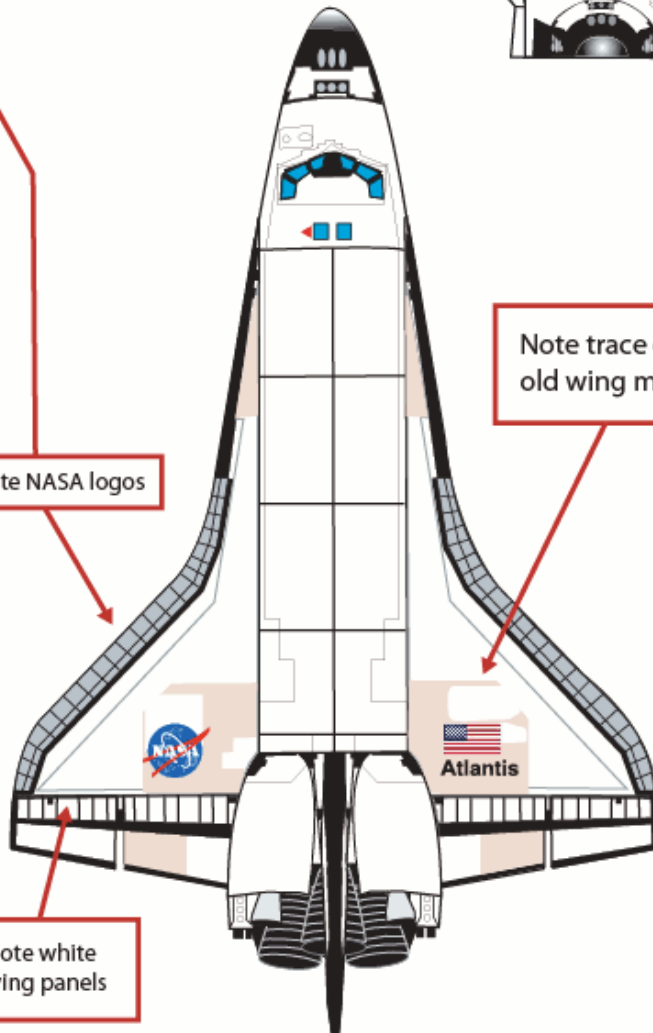
STS-101	5/19/00
STS-106	9/ 8/00
STS-98	2/ 7/01
STS-104	7/12/01
STS-110	4/ 8/02
STS-112	10/ 7/02
OMDP-3	
STS-115	9/9/06
STS-117	6/8/07
STS-122	2/7/08
STS-125	5/11/09
STS-129	11/16/09
STS-132	5/14/10
STS-135	7/8/11 LAST MISSION

Note door hinge pattern

Note NASA logos

Note trace of
old wing markings

Note white
wing panels



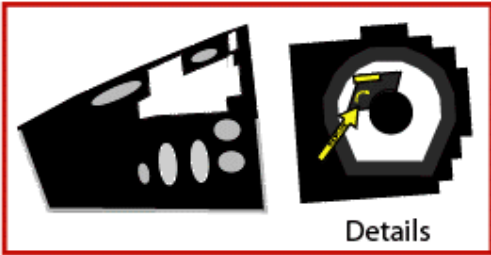


Endeavour -Original Markings- OV-105 May 8, 1992

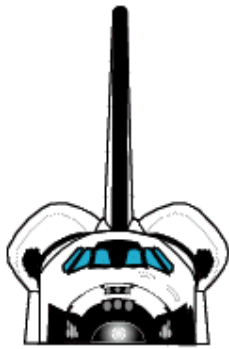
Note crew hatch and tail pattern as OV-103 and OV-104

Vent doors "4" and "7" disabled

Note drag chute



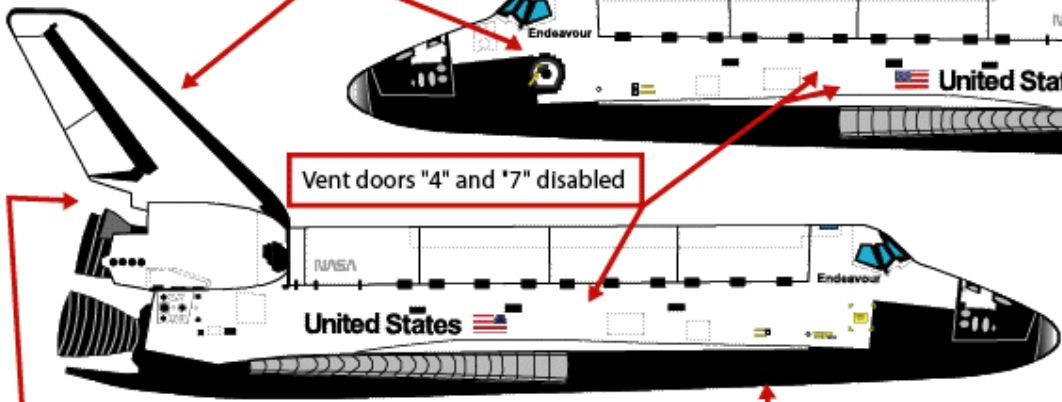
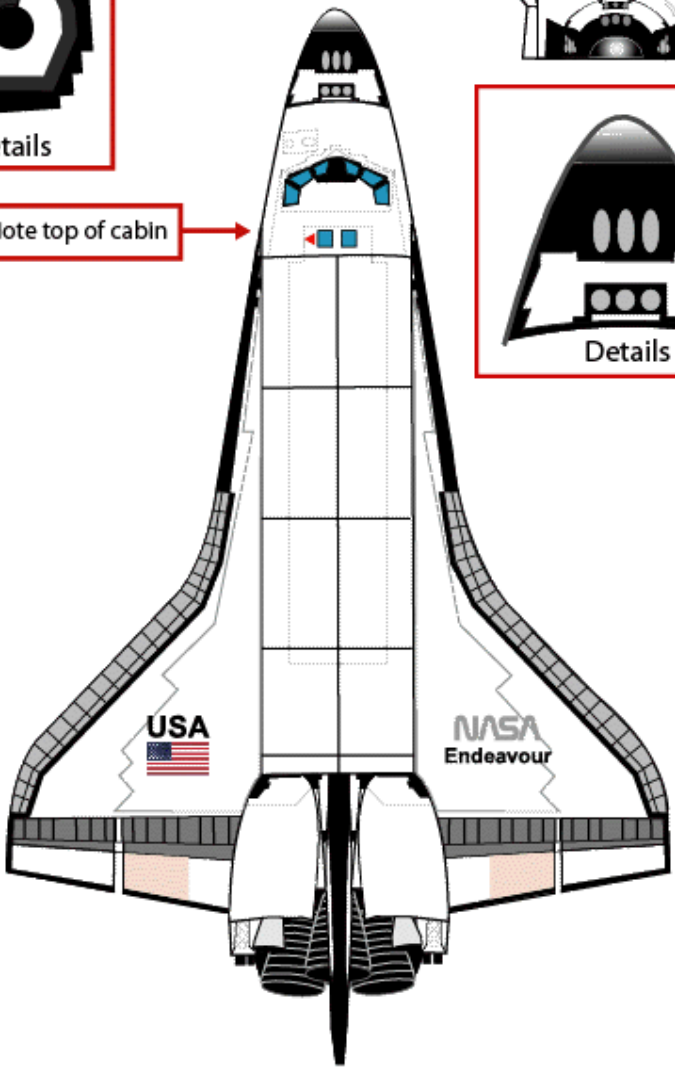
Note labels



Note top of cabin

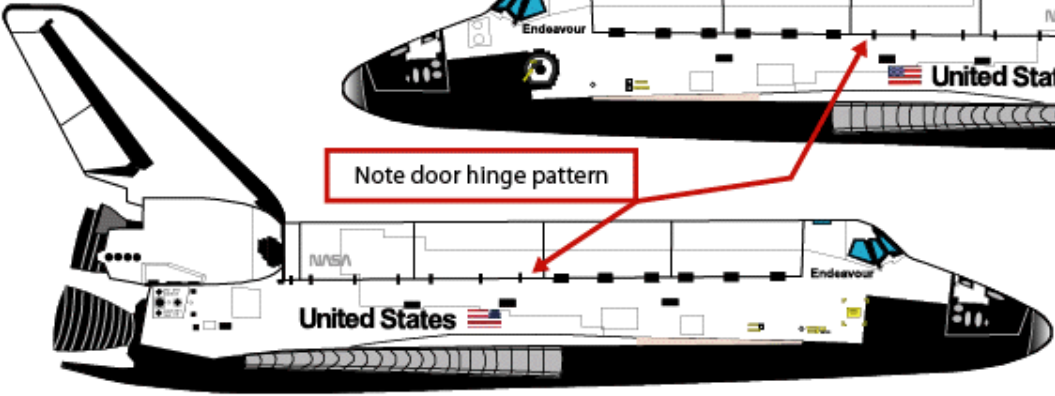
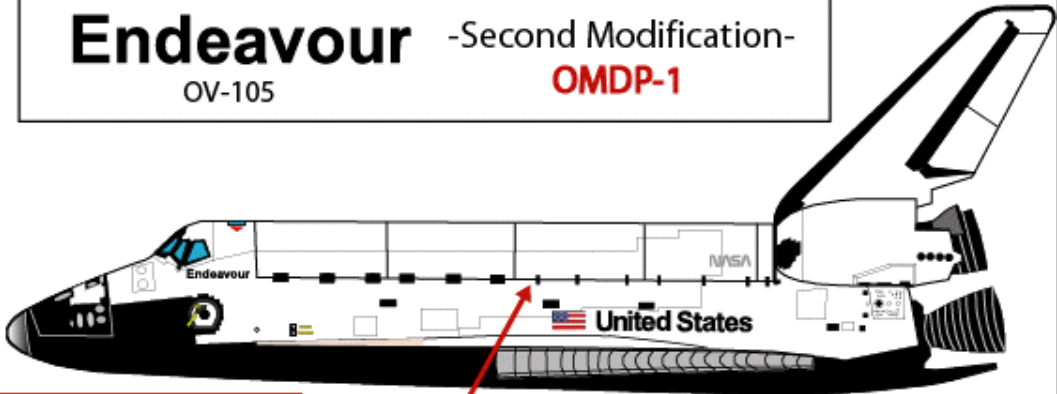
Missions flown:

STS-49	5/ 8/92
STS-47	9/12/92
STS-54	1/13/93
STS-57	6/21/93
STS-61	12/2/93
STS-59	4/ 8/94
STS-68	9/30/94
STS-67	3/ 2/95
STS-69	9/ 7/95
STS-72	1/13/96
STS-77	5/19/96

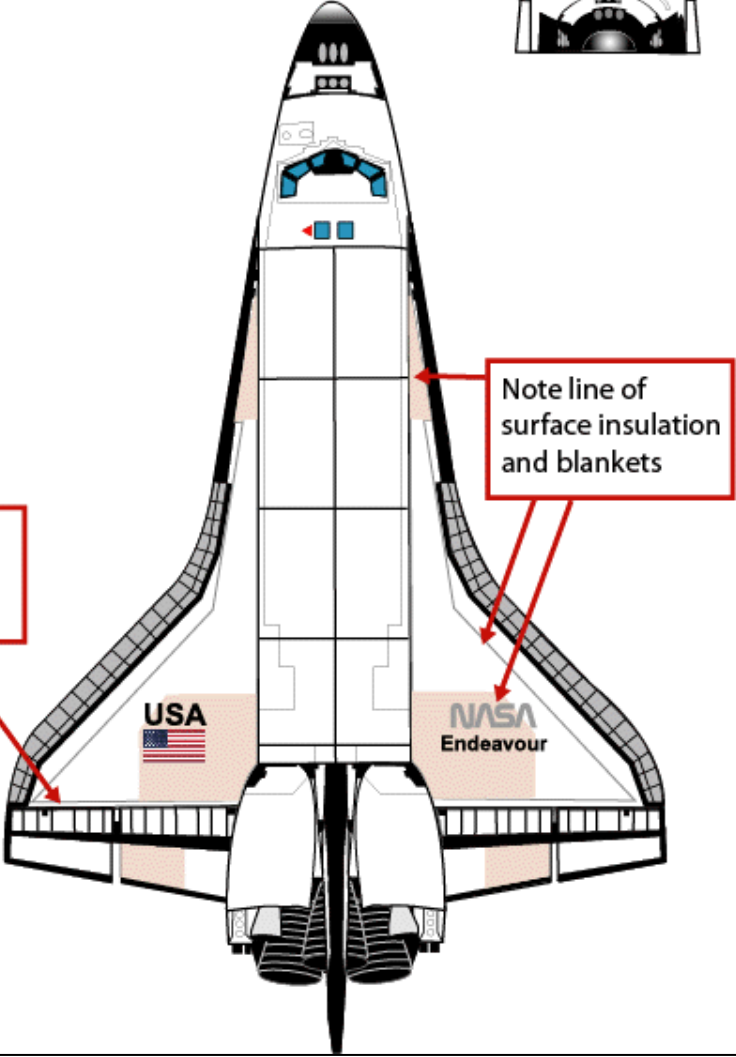
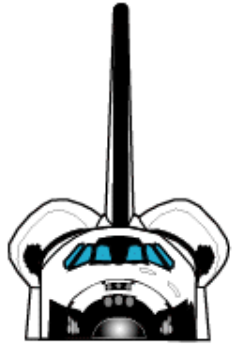




Endeavour -Second Modification- OV-105 **OMDP-1**



Note door hinge pattern



Note line of surface insulation and blankets

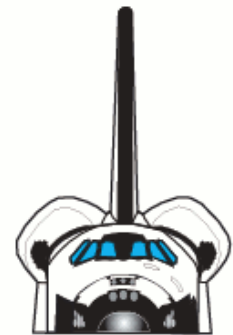
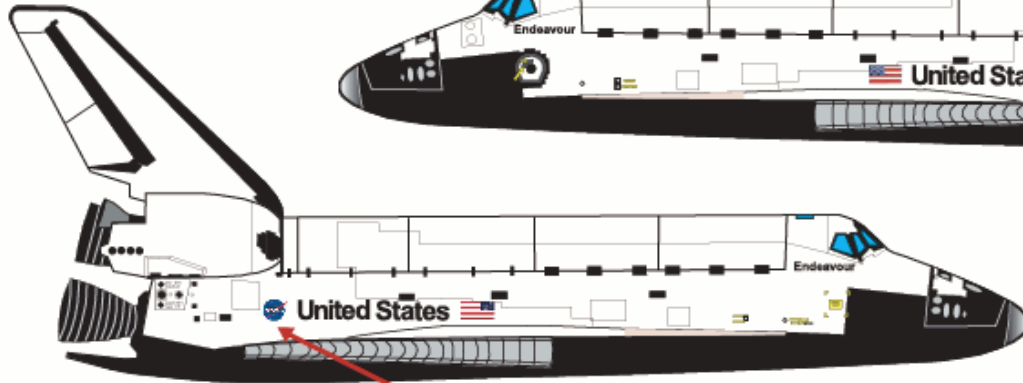
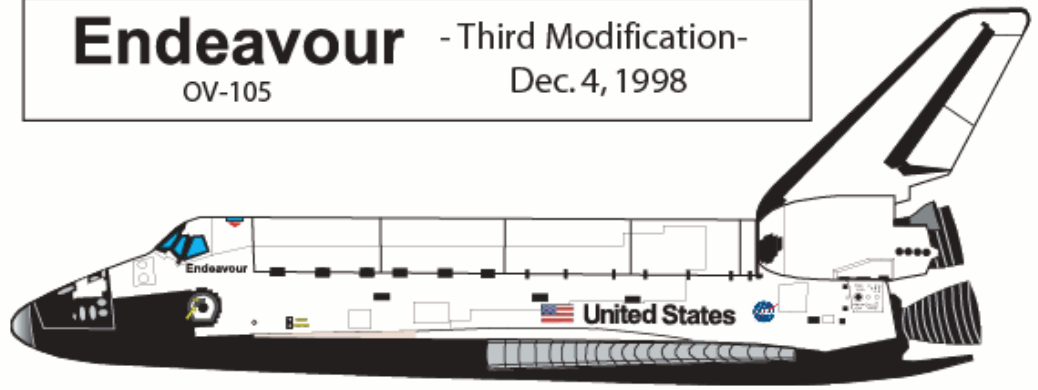
Note white wing panels

Missions flown:
STS-89 1/23/98



Endeavour - Third Modification- OV-105

Dec. 4, 1998



Missions flown:

STS-88	12/ 4/98
STS-99	2/11/00
STS-97	12/ 1/00
STS-100	4/19/01
STS-108	12/5/01
STS-111	6/ 5/02
STS-113	11/23/02

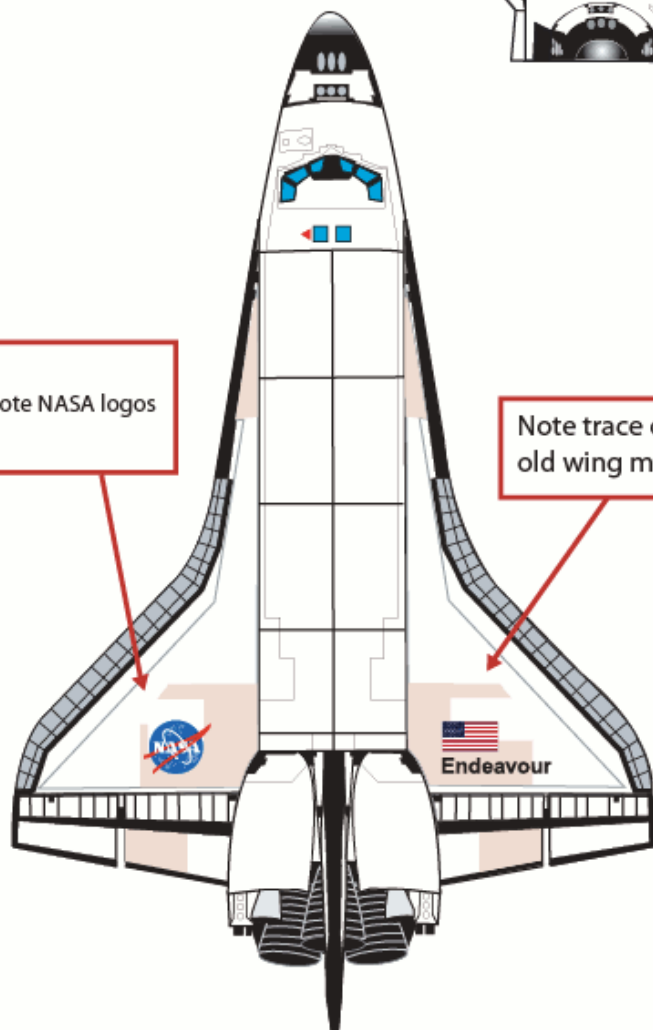
OMDP-2

STS-118	8/8/07
STS-123	3/11/08
STS-126	11/14/08
STS-127	7/15/09
STS-130	2/8/10

STS-134 5/16/11
(Last Flight)

Note NASA logos

Note trace of old wing markings



References

Space in Miniature #3 - "Space Shuttle" by Michael J. Mackowski

Space Shuttle - The History of the National Space Transportation System, The First 100 Missions
by Dennis R. Jenkins

Squadron/Signal Publications #20 - "Walk around Space Shuttle"

The Space Shuttle Operator's Manual - Revised Edition

NASA / KSC Media gallery photos