

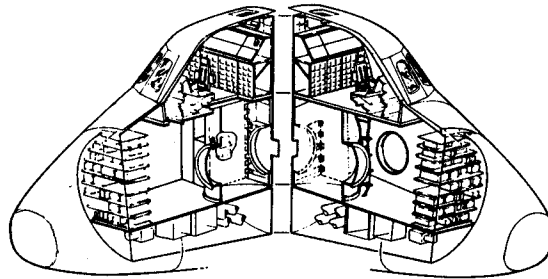
Location Coding Workbook

Loc Code 2102

Advanced Training Series

For Training Purposes Only
Training Division
Systems Training Branch

September 1986



NASA

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas

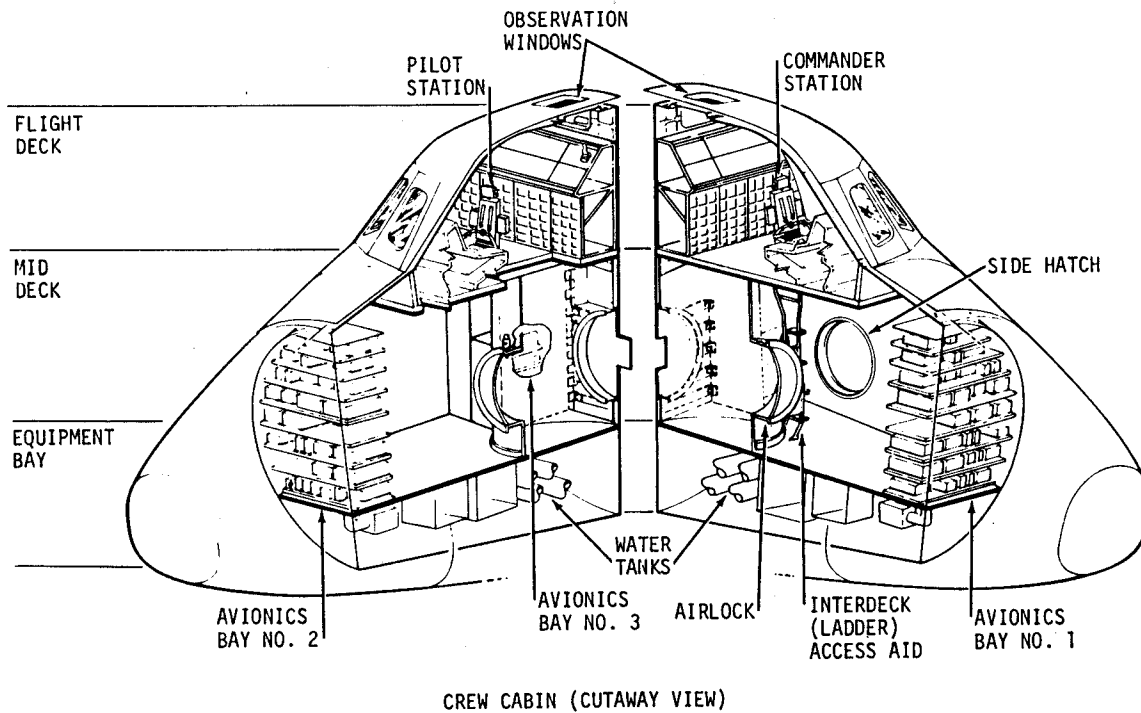
How To Use This Workbook

This book is organized into sections. You should proceed through the sections in the order they are presented. Within the section, however, you control your own progress. You should begin each section by reading the objective and the learning material. The learning material is set apart in a box. This is the central information to be learned. Supporting data following the learning material is provided as additional information to aid you in learning. If you are already quite familiar with the material presented in the learning material, skip right to the next sections. For other sections, with which you are somewhat familiar, you may want to read the objective, learning material, and some of the supporting data, then go on to the exercise. If the material is totally new to you, most of the supporting data should be very helpful.

This workbook is provided for your use. You may make notes or write comments anywhere you like. You may retain the text for later reference.

Lesson Introduction

The Orbiter location codes enable crewmembers to locate displays and controls, stowage compartments and lockers, access panels, and wall mounted equipment in the Orbiter crew compartments. The codes are referenced in various forms of the Shuttle documentation, including the procedural checklists, and are used extensively during Shuttle preflight activities to define the Orbiter equipment locations. The Orbiter crew compartments are the flight deck, middeck, and airlock. A fourth compartment, the Spacelab, will become part of the Shuttle configuration when the Spacelab module is flown. The Spacelab location coding is shown in the Spacelab Habitability Workbook (S Hab 2102). Because of compartment functions and geometry, each has a unique location coding format.



Section 1: Orbiter Crew Compartment Codes

Introduction

Each crew compartment (flight deck, middeck, and airlock) has a unique location coding format.

Location Code Formats

- Flight deck - A two- (or three-) character alphanumeric code. The first character is a letter and the second (and third) are numbers
- Middeck - A five-character alphanumeric code starting with M
- Airlock - A four- or five-character alphanumeric code starting with A

Examples of Orbiter Codes

Flight deck codes (two or three characters)

S1
L12
F6
A6
R11
02

Airlock codes (four or five characters)

AW82H
A04F
A02F

Middeck codes (five characters)

MF70G
MA13F
ML62G
MR37C
MD58V

Section 2: Flight Deck Location Codes

Introduction

A flight deck location code consists of two or three alphanumeric characters.

The forward flight deck contains the commander and pilot stations with the displays and controls (D&C) necessary to monitor, command, and control the Orbiter and Orbiter systems during normal and contingency operations. The forward flight deck also contains stowage provisions for the flight data file.

The aft flight deck contains D&C required to perform Orbiter systems management, on-orbit maneuvers, payload systems management, and payload handling operations. The aft flight deck also contains stowage provisions for crew equipment that must be accessed during early on-orbit operations.

Orbiter Flight Deck Location Coding

The characters in the flight deck codes specify the following:

First character - The first letter of a flight deck surface; the characters and surfaces are:

| | |
|-------------|--------------------|
| L - Left | C - Center console |
| R - Right | O - Overhead |
| F - Forward | S - Seats |
| A - Aft | W - Windows |

(The surfaces are addressed while sitting in the commander/pilot (CDR/PLT) seats)

Second/third characters - Numerics identifying the relative location of components on each flight deck surface

The following table contains the general numbering philosophy (second/third characters) for the flight deck surfaces:

| Surfaces | General numbering philosophy |
|---|---|
| L - Left R - Right C - Center console | • Numbered from top to bottom, forward to aft |
| O - Overhead | • Numbered from left to right, forward to aft |
| F - Forward A - Aft | • Numbered left to right, top to bottom (facing the surface) |
| W - Windows | • The forward windows are numbered left to right (W1 through W6) facing forward • The overhead windows are numbered left to right (W7 and W8) facing aft • The aft windows are numbered left to right (W9 and W10) facing aft |
| S - Seats | • The CDR's seat is <u>S1</u> and the PLT's seat is <u>S2</u> |

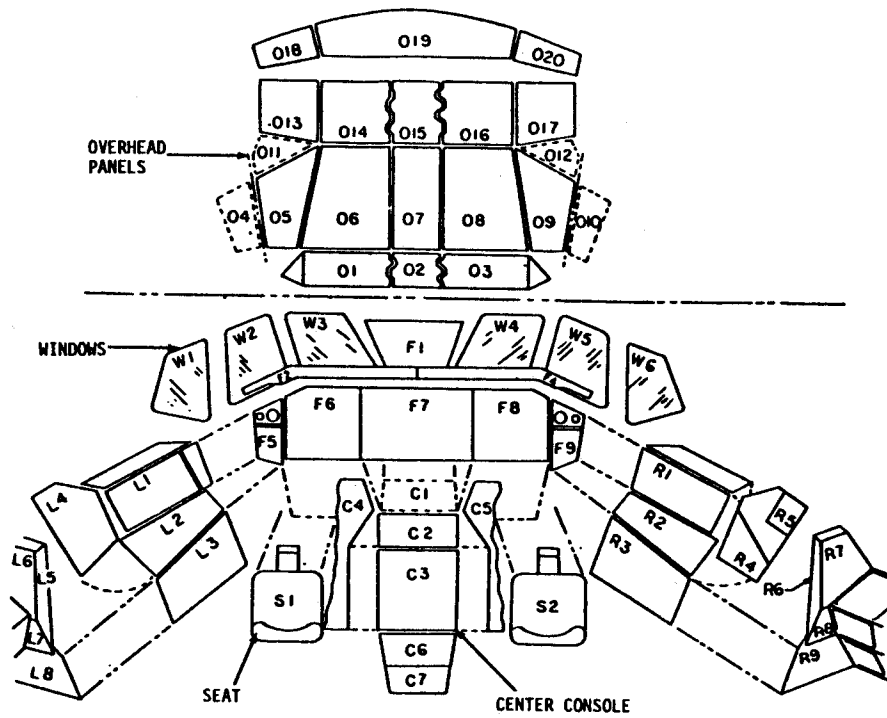


Figure 2-1.- Flight deck location codes (1 of 2).

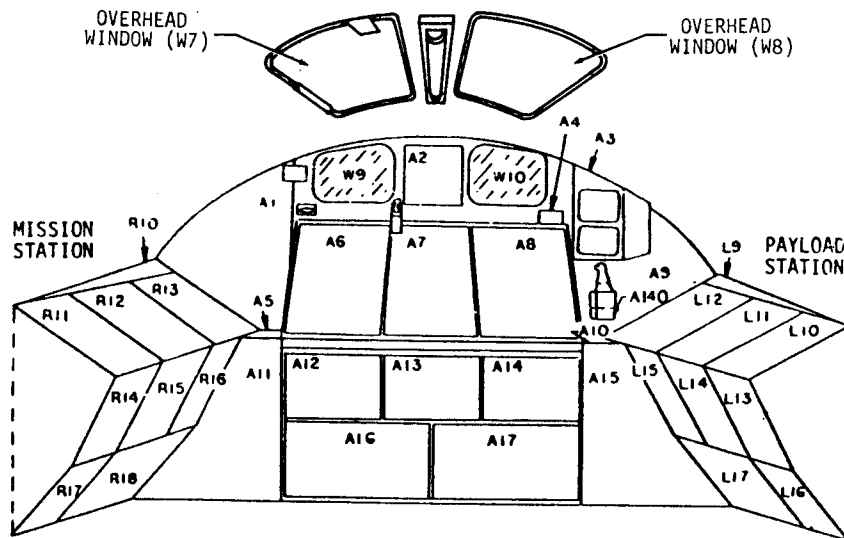


Figure 2-1.- Flight deck location codes (2 of 2).

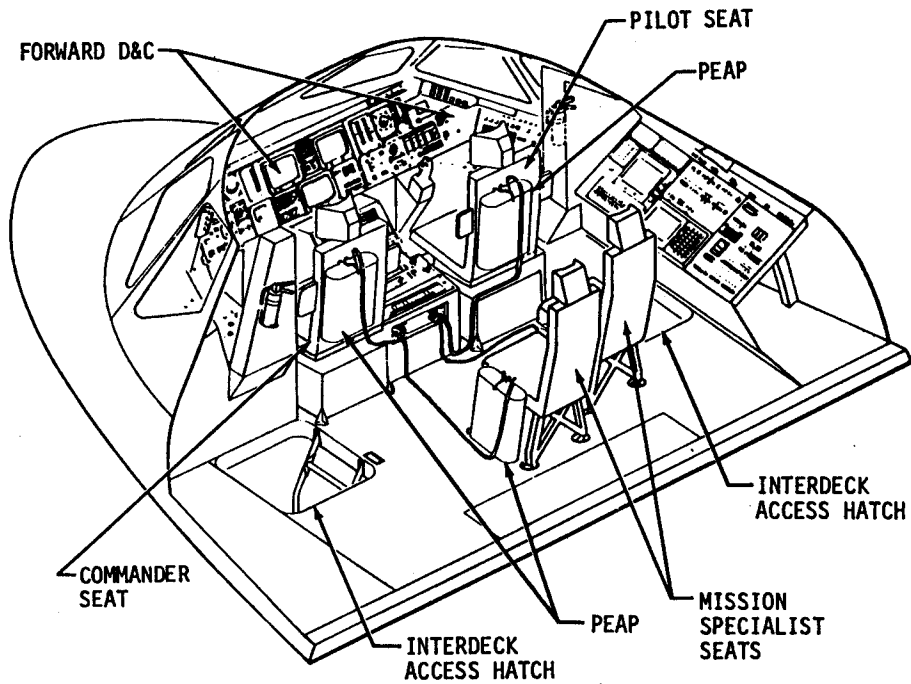


Figure 2-2.- Forward flight deck equipment.

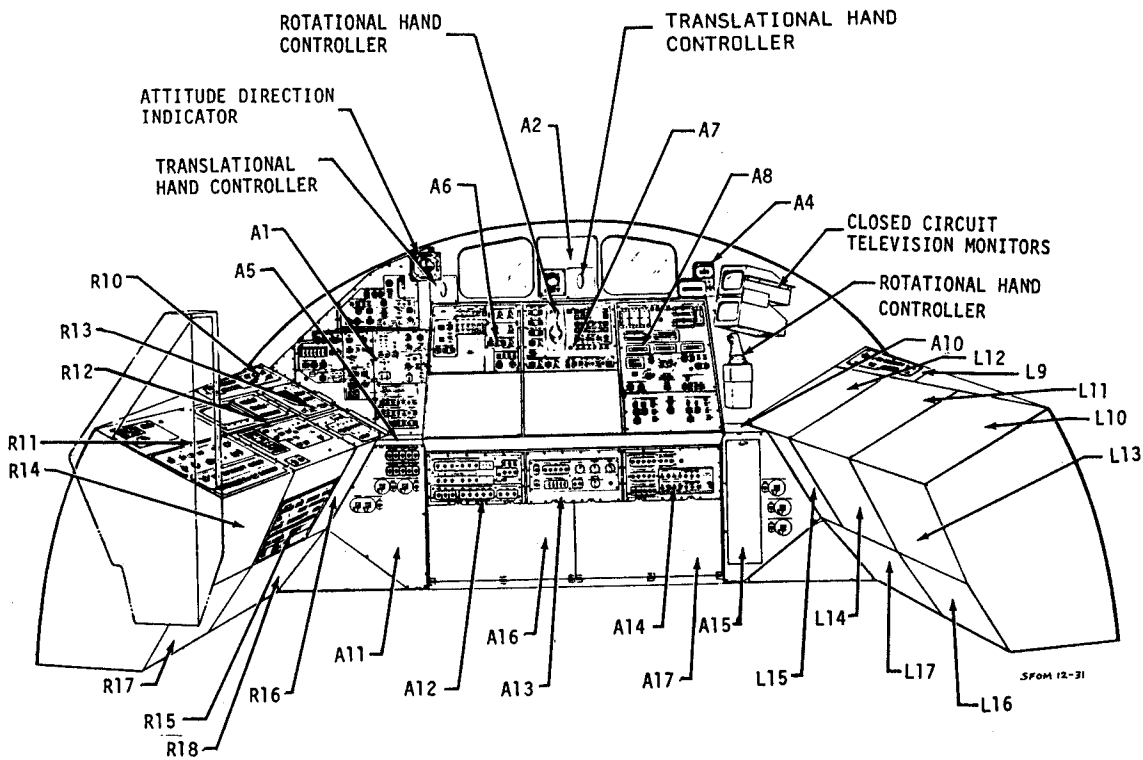


Figure 2-3.- Aft flight deck equipment and location codes.

Section 3: Middeck Location Codes

Introduction

The middeck location codes have five alphanumeric characters and start with M.

The Orbiter middeck contains D&C panels for Orbiter systems control, stowage provisions for most of the crew equipment on a flight, a waste management system (WMS) compartment, the airlock, and middeck floor stowage compartments. Beneath the middeck, the lower equipment bay contains environmental control and life support system (ECLSS) hardware. Access to equipment in the lower equipment bay is through middeck floor panels which are marked with middeck codes.

ML31C
ML86B
MA73C
M058F
M030F
M052J
M029J
M039M
M062M
M013Q

NOTE: The panel numbers listed below are not consistent with the location coding system defined by this document. However, in each case the location coding, as indicated, is in close proximity to the actual location. The panel numbers below were assigned prior to the middeck closeout panel design definition. The starting points for location coding were behind the closeout panels, whereas the starting points used in this document are in front of the closeout panels.

Orbiter Middeck Location Coding

The characters in the middeck codes specify the following:

First character - M for middeck.

Second character - The first letter of a middeck surface; the characters and surfaces are:

| | |
|-------------|--------------|
| L - Left | A - Aft |
| R - Right | D - Deck |
| F - Forward | O - Overhead |

The reference position for identifying the surface is standing on the middeck floor (deck) facing forward (+ X).

Third/fourth/fifth characters - These characters form a location grid on each middeck surface.

The third and fourth characters are numerics indicating the distance from the left* side of a surface expressed as a percentage of the total width of the surface (follows the contour of the wall).

The fifth character is an alpha character indicating the distance from the top* of a surface expressed alphabetically in increments of 6 inches.

*Each surface is addressed as follows to determine the "left" and "top" sides.

| Surfaces | Reference position |
|------------|--|
| L, R, F, A | Standing on deck facing the surface |
| D | Standing on deck facing forward (+ X) looking down |
| O | The overhead location grid matches the grid on the deck; i.e., a point on the overhead has the same third, fourth, fifth characters as a point directly below it on the deck |

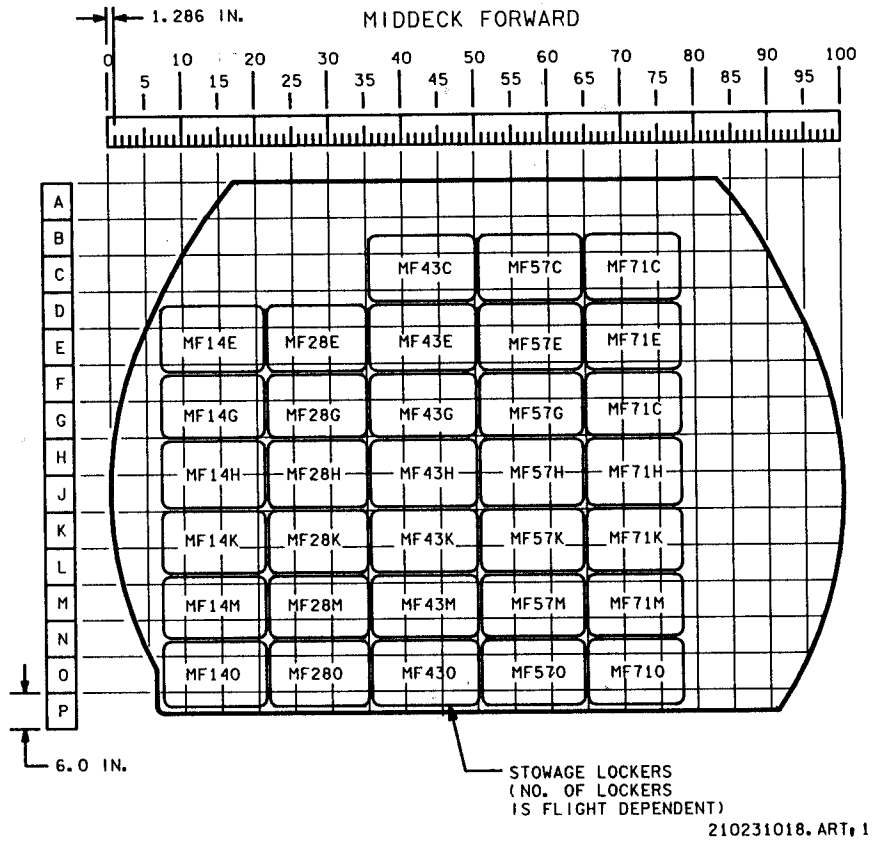


Figure 3-1.- Middeck location codes (1 of 8).

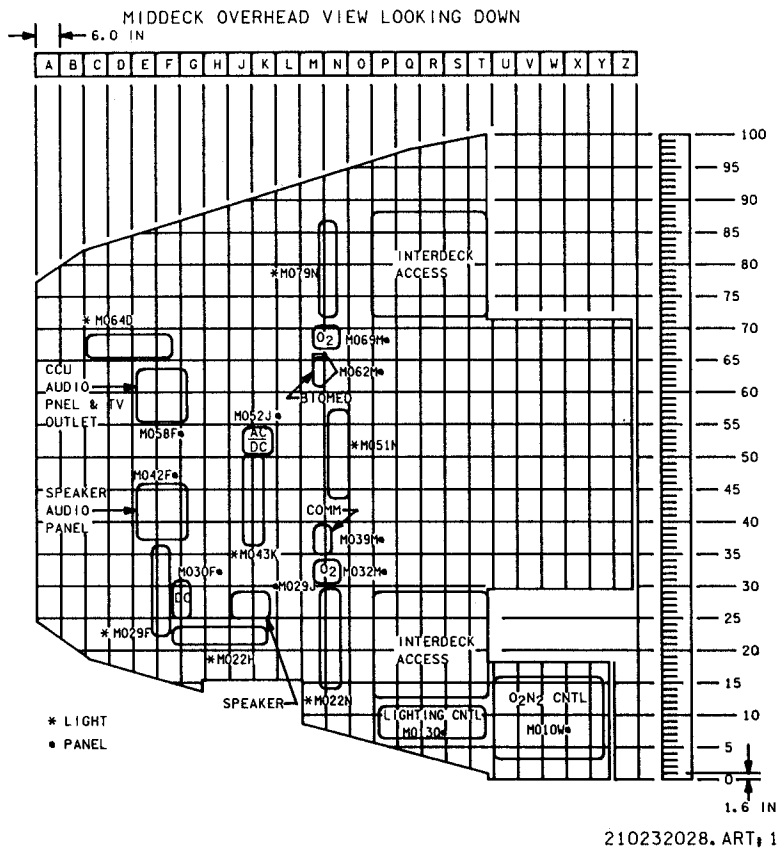
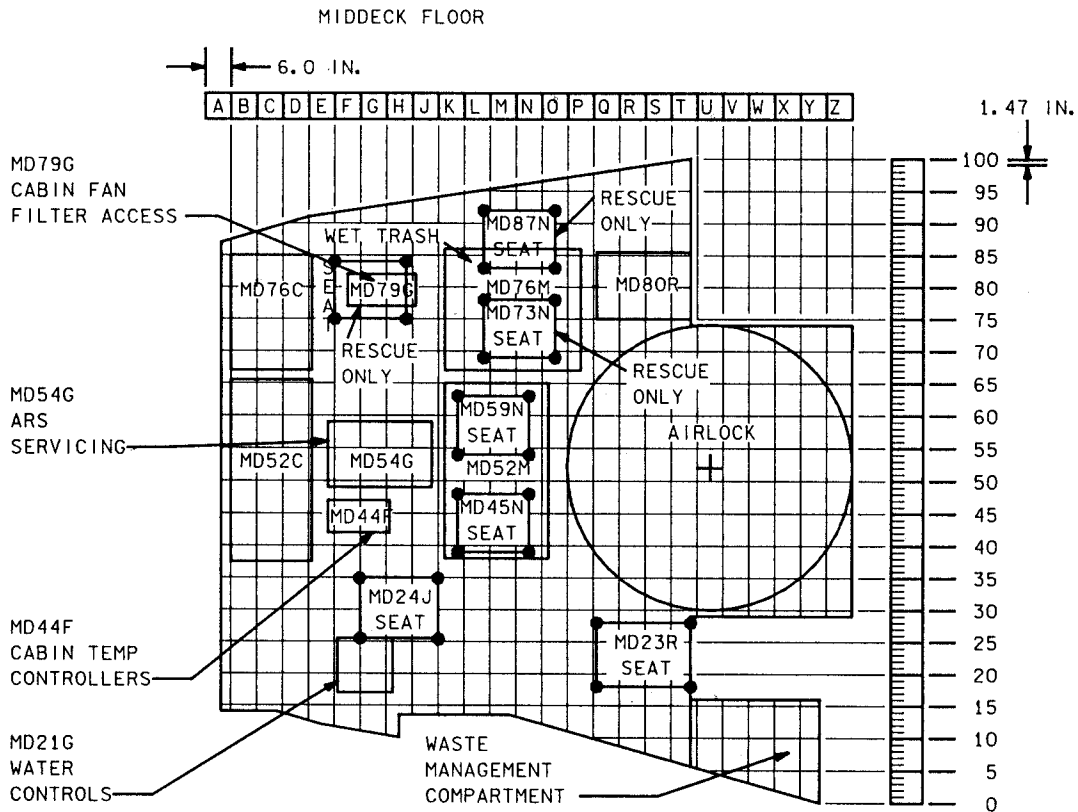
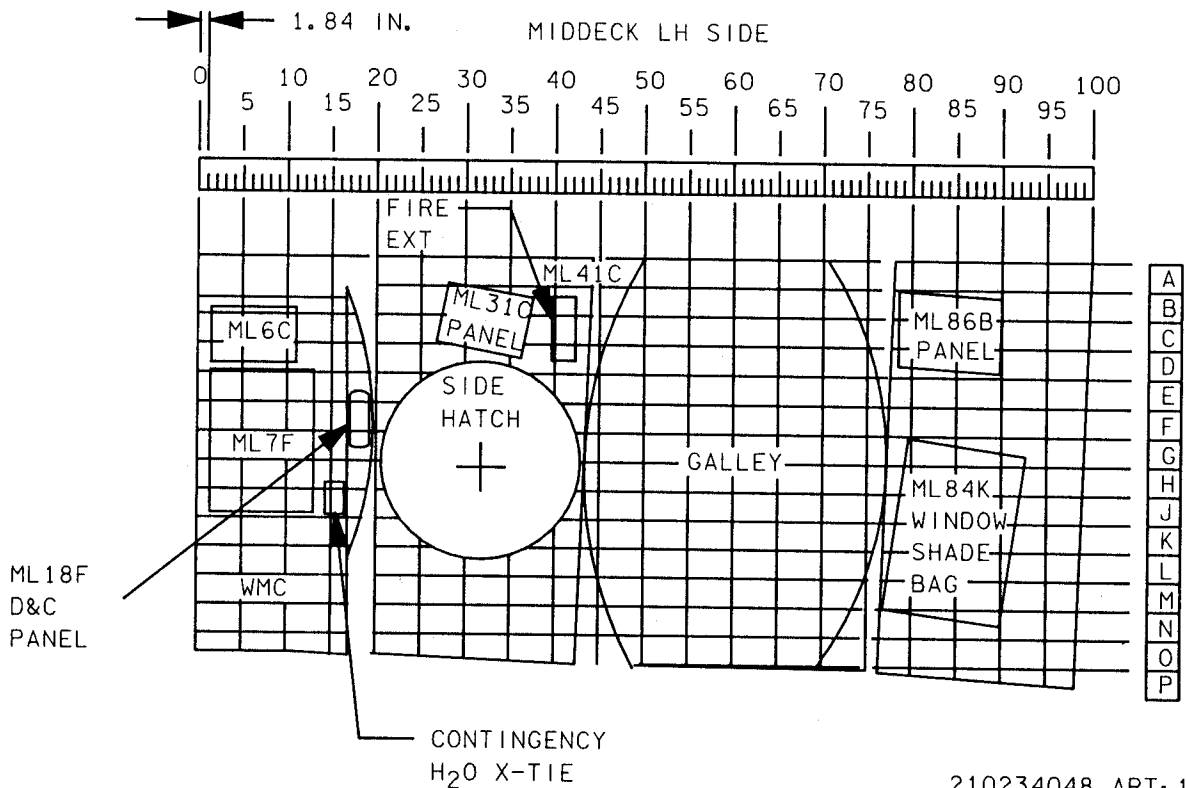


Figure 3-1.- Middeck location codes (2 of 8).



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Figure 3-1.- Middeck location codes (3 of 8).



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Figure 3-1.- Middeck location codes (4 of 8).

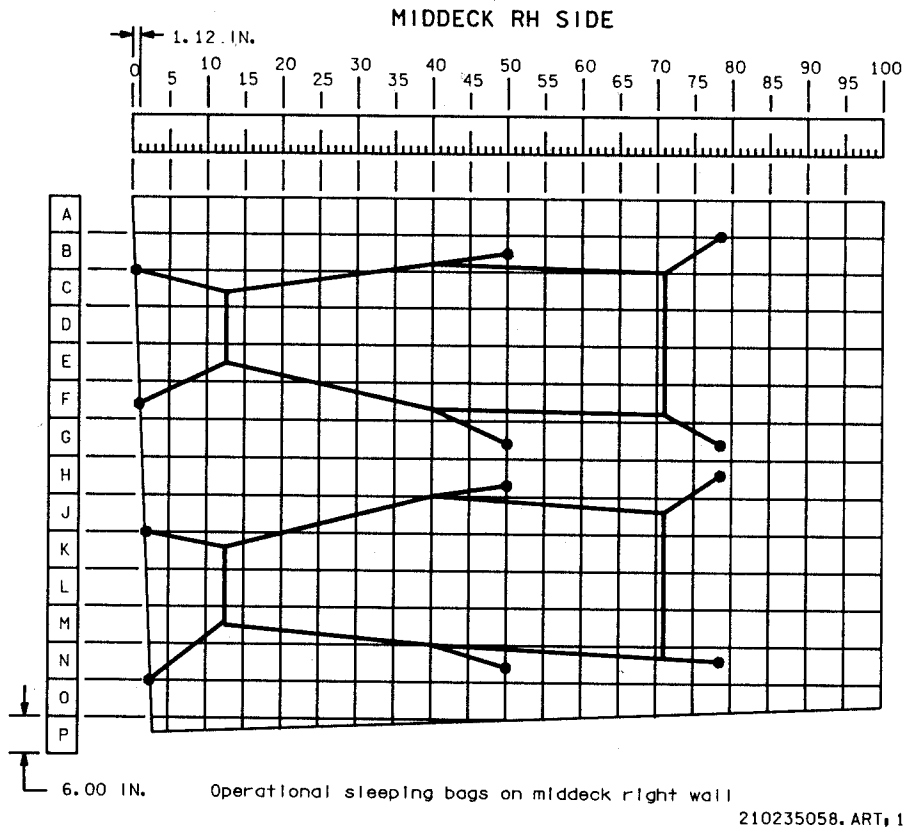


Figure 3-1.- Middeck location codes (5 of 8).

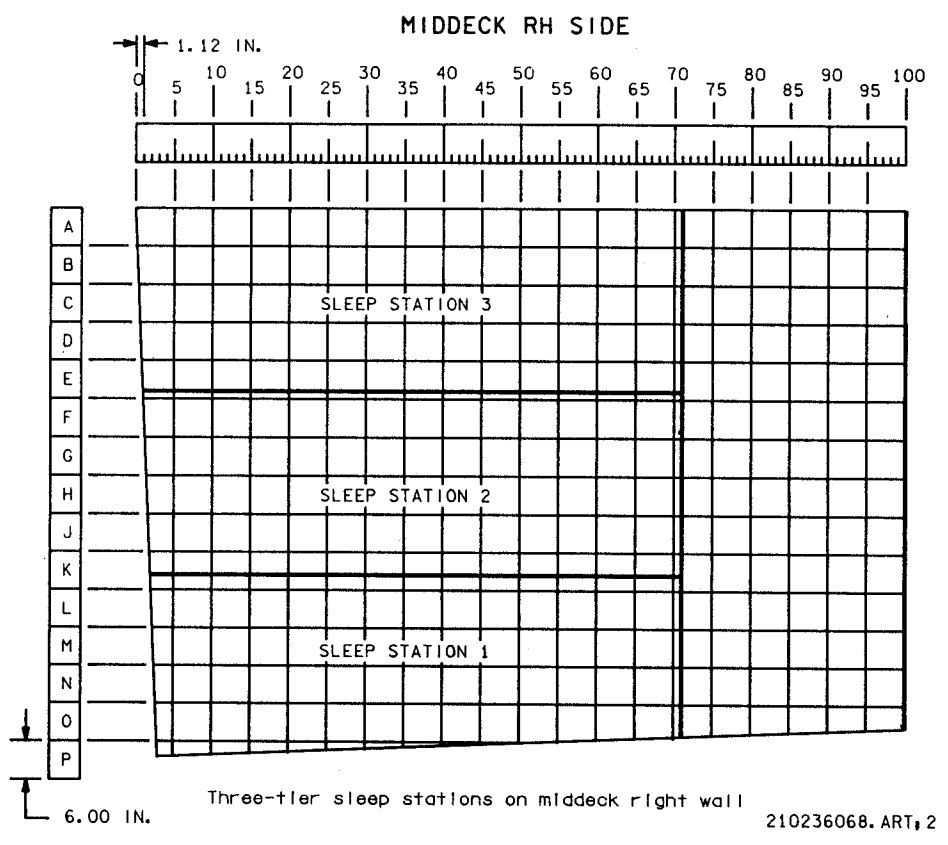


Figure 3-1.- Middeck location codes (6 of 8).

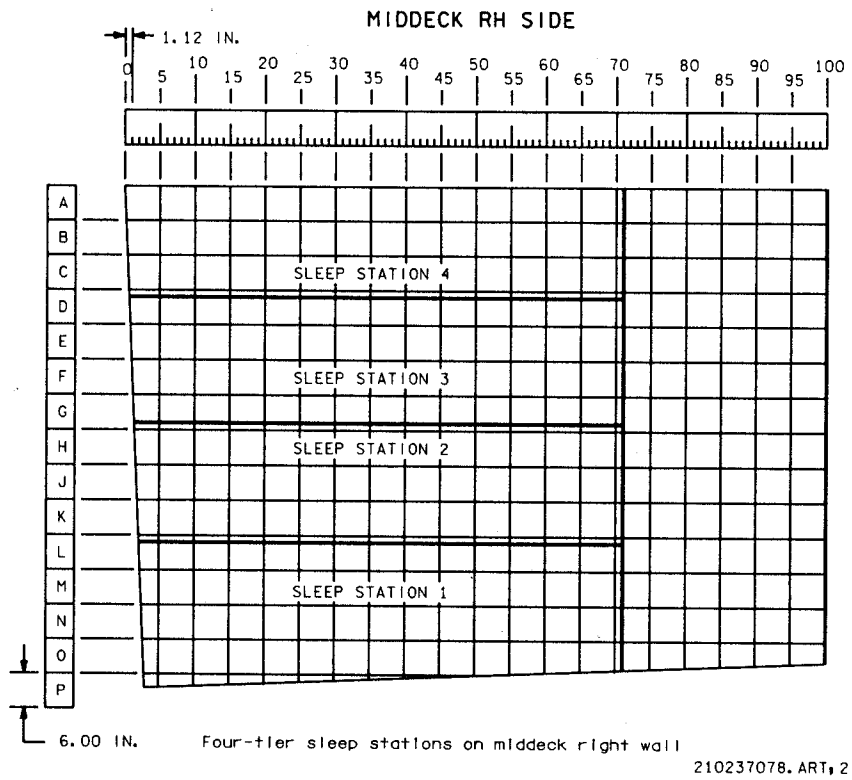


Figure 3-1.- Middeck location codes (7 of 8).

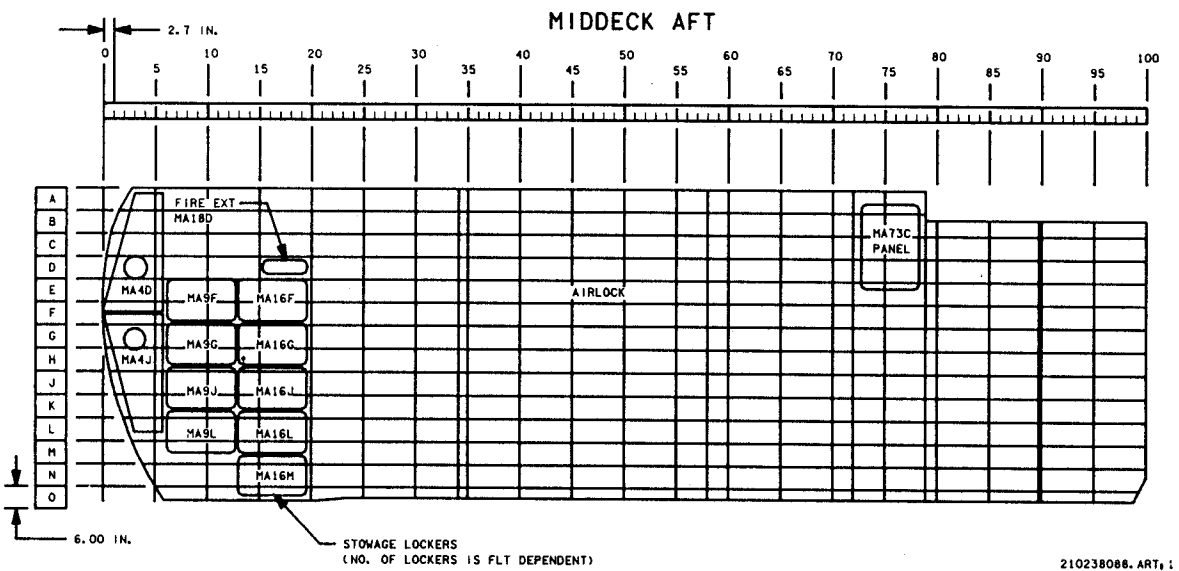


Figure 3-1.- Middeck location codes (8 of 8).

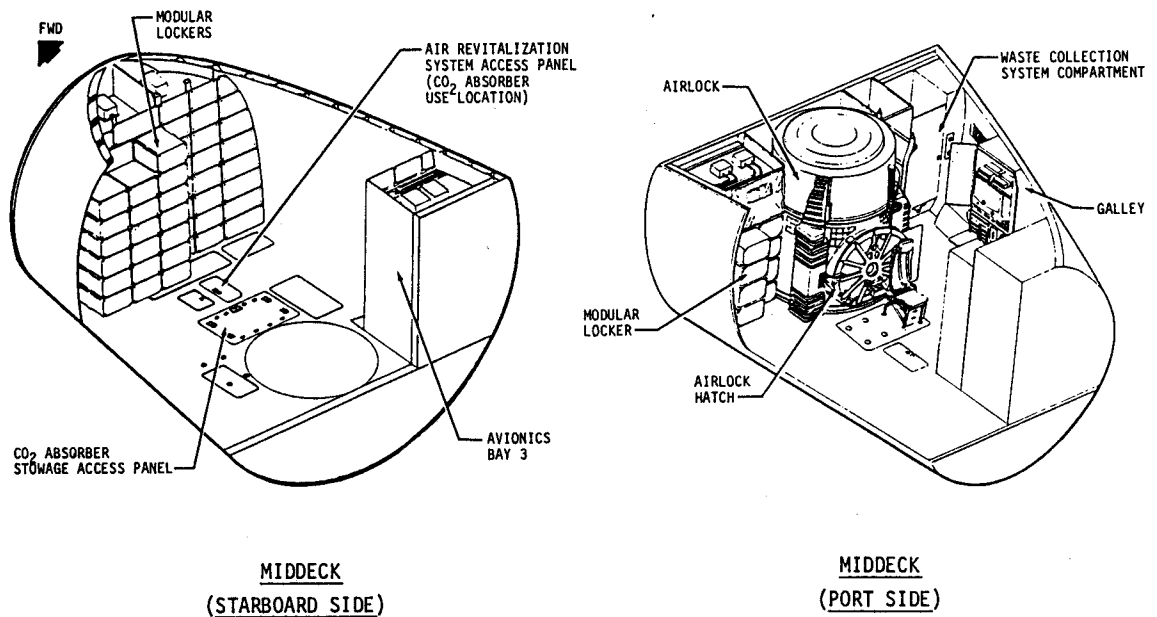


Figure 3-2.- Middeck cutaway.

Section 4: Airlock Location Codes

Introduction

An airlock code consists of four or five alphanumeric characters.

The airlock provides the capability to transfer from the middeck to the payload bay for extravehicular activity (EVA) without depressurizing the Orbiter cabin. The airlock has D&C panels for airlock systems control and stowage provisions for most of the crew equipment necessary to perform an EVA.

Orbiter Airlock Location Coding

The characters in the airlock codes specify the following:

First character - A for airlock

Second character - The first letter of an airlock surface; the characters and surfaces are:

- W - Wall
- O - Overhead
- D - Deck

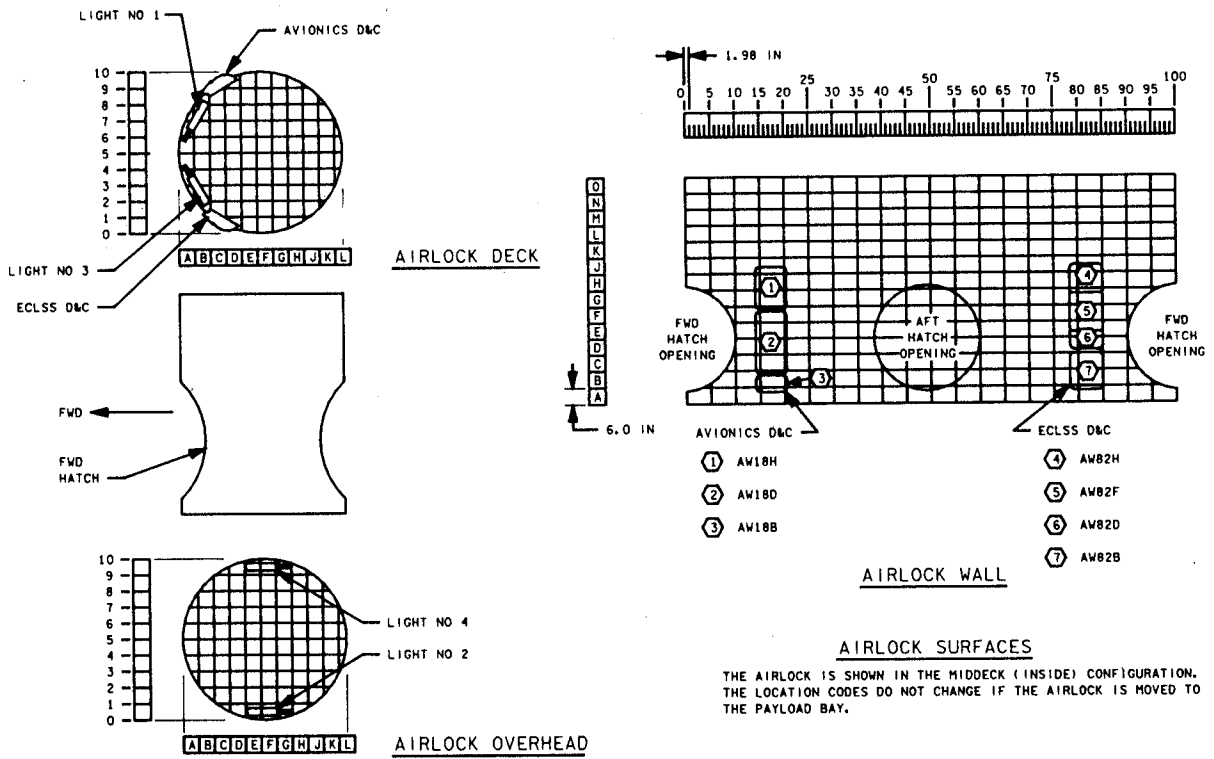
The "wall" is the inner wall of the cylindrical airlock. The "overhead" and "deck" are flat surfaces at each end of the cylinder. The airlock is oriented upside down with respect to the middeck, so that the airlock overhead corresponds to the middeck floor. The wall location codes have five characters and the overhead/deck codes have four characters.

Third/fourth/fifth characters (wall only) - These characters form a location grid on the airlock wall.

The third and fourth characters are numerics indicating the distance (clockwise) from the vertical centerline of the forward hatch (airlock in) expressed as a percentage of the total airlock circumference.

The fifth character is an alpha character indicating the distance from the overhead surface expressed alphabetically in increments of 6 inches.

Third/fourth characters (overhead/deck only) - These alpha (A through K) numeric (0 through 10) characters form location grids on the deck and overhead surfaces. Since these surfaces are small, items can be easily located without the aid of the location grids.



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Figure 4-1.- Airlock location codes (1 of 1).

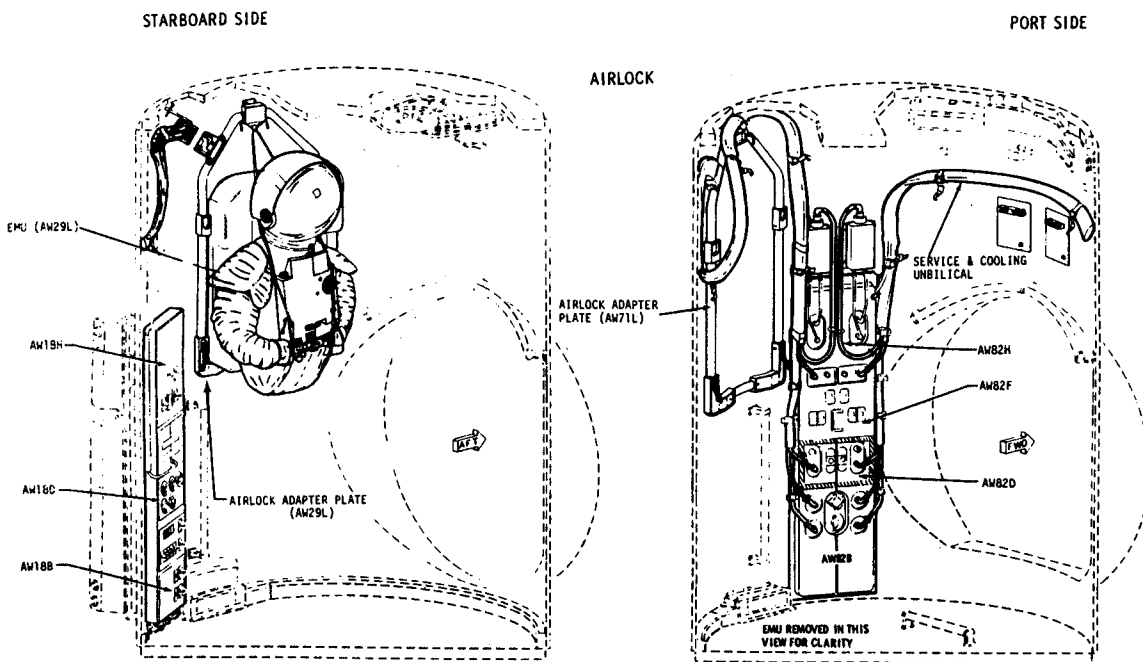


Figure 4-2.- Airlock equipment and associated location codes.