

# Communication Station

The Combat Information Center aboard  
the USS Hornet



From the USS Hornet Museum Education Department

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## About This Document

The Combat Information Center served as the nerve center of the Hornet, gathering data and information from the ship's sonar and radar and interpreting, recording, and relaying that information. This space required a small, highly trained crew to work in tight quarters while processing constant visual and auditory stimuli. Students will learn the crucial role CIC played in the Hornet's overall functionality, and the importance of effective communication when solving any problem. This program was designed for 3<sup>rd</sup> to 5<sup>th</sup> graders, but can be adapted to challenge high school students as well.

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## Goals

In this program, students will:

- Work collaboratively and communicate effectively to complete a challenge

## Objectives

In this program, students will:

- Understand the functions and importance of Combat Information Center aboard the Hornet
- Practice the design process as they come up with creative solutions to a challenge

## Big Questions...and Answers

What information was gathered in CIC?

Anything detected by the ship's sonar and radar- distances to and the location of surrounding ships, incoming aircraft, enemy vessels or submarines.

How do engineers solve a problem?

They come up with an idea, they create their idea, and test its viability. This process is repeated until they are satisfied with the outcome and their solution effectively solves the initial problem.

## Program Outline

In this program, students will have to work together to create a visual puzzle. This task requires direct, descriptive communication and teamwork.

### Approximate Program Timeline-

40 minutes total:

- Overview of CIC, Hornet history- 20-25 minutes
- Activity- 10-15 minutes

-Debrief- 5-10 minutes

### Suggested Materials-

-set of tangram shapes, bought or made

-small flat surface, like a flattened cereal box or plastic tray

-accompanying tangram puzzle outline sheets- animals or simple objects, but anything can work, even abstract shapes

Have students break up into pairs. Give one member of the pair the sheet with puzzles on it, the other the set of tangram shapes, and the flat surface if not working on the floor. Have each pair sit back to back on the floor or in chairs. The one with the puzzle sheet should pick one image to describe to the other. The student with the shapes must complete the tangram puzzle with only verbal instruction from their partner. The student giving instruction should not tell them what the end result is, but simply instruct them as to which pieces to fit where. Neither student should ever turn around to face the other. The team is successful once one student can correctly tell the other what they made.

Debrief, suggested questions-

- Which was more challenging- giving instructions or doing the puzzle?
- Discuss how this activity relates to the challenges facing the crew in CIC.

## Background Reference Material

### CIC

- The Combat information center is the nerve center of the Ship. Real time information is gathered here from the ship's radar, sonar, aircraft, and escorting vessels where it is assimilated and communicated to other essential areas of the ship.
- Other compartments related to CIC activities include the ASCAC and CATCC; both are adjacent to CIC and are part of the OI Division. All are classified spaces. ASCAC stands for Anti-Submarine Classification and Analysis Center. This area identifies a sunken wreck, underwater outcrop, a school of fish, and of course, a submarine. CATCC stands for Carrier Air Traffic Control Center.

This area is the aircraft carrier equivalent of an air traffic control center on land.

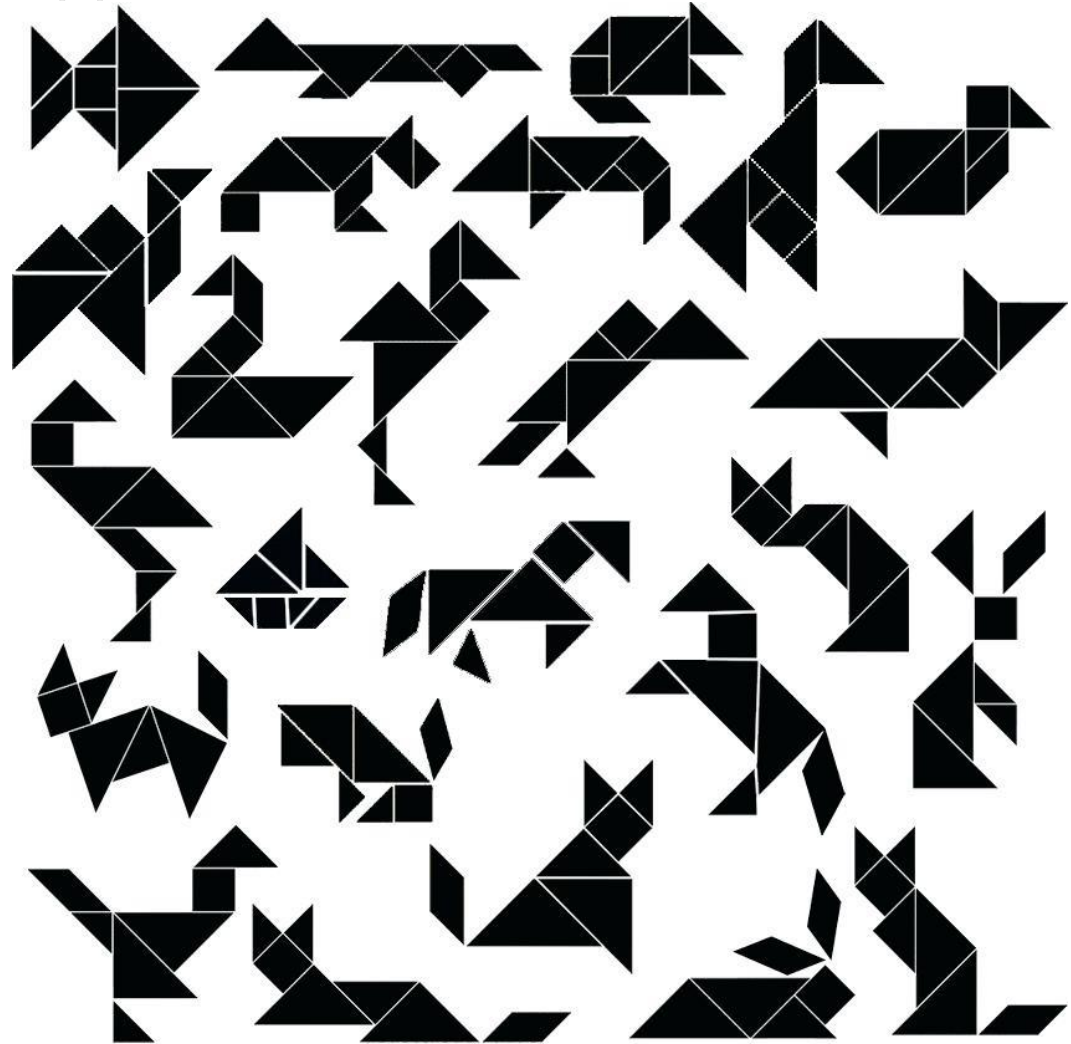
- Another important area within CIC is the Air Intercept Center. This located in the enclosed area in the left rear of the compartment. Personnel stationed here control the SPS-43 Long Range Air Search Radar and the SPS-30 Height Finding Radar. These radar are located on the mast and are the large bedspring-looking radar and the satellite-type radar dish, respectively. Long range radius is 500 miles and height range is 40,000 feet. Information pertaining to aircraft intercept was relayed to the CAP (Combat Air Patrol) protecting the ship and her task group. Air intercept information was also relayed to the Forward AA (Anti-Aircraft) control and to the MK56 radar gun director control rooms which controlled the individual operation of the Ships 5"38 gun batteries.
- CIC was a classified area and was only accessible by authorized personnel stationed here or those who gained permission to enter by the Commanding Officer. Personnel working within such area were highly qualified and worked 12 hour shifts "12-on-12-off". Approximately 40 people worked within five compartments and were all seated on swivel stools. All plotted course and information was marked on the status boards surrounding the CIC and associated compartments. Information was marked by writing backwards with grease pencil so as not to block the vision of this constantly updated information.
- Status board information was also most useful during a power loss. When power was restored the crew still had the last plotted course and information to reacquire the target!
- The CIC compartment ran in blue lights when the ship was underway or "operational".
- White lights were only on when the ship was in port cold or for cleaning maintenance or modifications in the yard.
- The master air display status board (spider web) tracked all aircraft operating in the vicinity of Hornet and her task group. The operational tracking radius of this display board is 500 miles, the equivalent range of the air search radar.
- The combined surface/air display status board tracked all ships and aircraft operating in the vicinity of the ship and her ASW (Anti-Submarine Warfare) task group.
- The NC-2 surface target computer plotted information for all surface attacks.

- Repeaters were located in CIC to monitor the ships course and direction. Examples of these functions are the gyro compass, knot speed, wind direction and Sonar repeater.
- During combat, the Hornet activated her ECM antenna to jam enemy aircraft radar and radio signals.
- CIC was equipped with a DRT (dead reckoning tracer) system. This was basically a primitive example of an early navigation computer. It mirrors the same DRT system located on the Navigation Bridge.
- All radar scopes read the same radar information but individually were used to track different information such as fixed wing control, rotary winged control, ASW control, and IFF (Friend or Foe).
- CIC fed constant updated information to the Flag and Navigation bridges, sonar control room, Pri fly, Secondary Con, and CAT.

## *Next Generation Science Standards*

| Grade Level | Standards   |
|-------------|---|
| 3-5         | <p><i>Engineering Design:</i></p> <p>ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</p> <p>ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</p> <p>ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</p> |

## Appendix: Class Materials



## Links and Credits

This program was created in conjunction with a grant from the Office of Naval Research, and expands upon ideas found in the following lesson:

<http://www.usnautilus.org/education/pdf/stemlessons/Operation-Navigation.pdf>