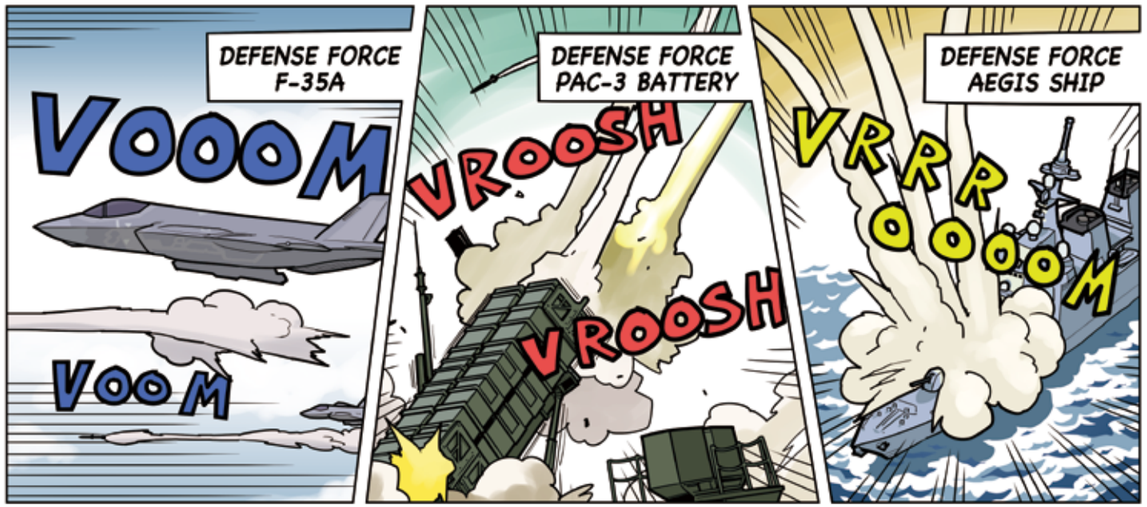


Episode 5:

Defense Against a Saturation Attack

The enemy fleet has launched a full-fledged offensive with cyber and electronic attacks that aim to paralyze the islands' defense system. Thankfully, the IBCS architecture succeeded in minimizing the damage from this attack. But the Ikaros Defense Force has no time to take a breather. Countless cruise missiles are heading to the islands from every direction.

DARN! THIS IS A CONCENTRATED ATTACK ON SAKIIKA ISLAND!

YIKES!

THIS MIGHT BE TOO MUCH.

HUH? MISSILES CONCENTRATING ON THE SOUTHWEST AREA...?

SECOND WAVE ATTACK HAS JUST BEGUN WITH CRUISE MISSILES!

HQ ON THE MAIN ISLAND

FIRE ALL! OUR DESTROYERS WILL ALSO INTERCEPT MISSILES!

WE HAVE ONLY SIX INTERCEPTOR MISSILES LEFT!

66 MISSILES COMING OUR WAY!

HOW MANY MISSILES?

SECOND WAVE ATTACK INCOMING!

SAKIIKA ISLAND

BOOM

BOOOM

To Be Continued...

BLAM BLAM BLAM BLAM

BANG BANG BANG BANG

FIRE!

AND EVACUATE!

FLASH!

SEEMS WE'RE STILL BEING JAMMED... USING SIGNAL LIGHTS.

RRRRRRRRRR

CIVILIAN AIRPORT ON A REMOTE ISLAND

SCREEE!

LET'S GO, BUDDY.

VROOOM

TARGET CHANGE: SOUTHWEST ISLANDS.

WHEEE!

ROGER.

SWITCH TO PLAN OMEGA: ATTACK AND OCCUPY SAKIIKA ISLAND.

ALL OUR MISSILES WERE INTERCEPTED!? THEIR CAPABILITIES WERE UNEXPECTED.

YES, SIR!

WE'LL FOCUS OUR SECOND WAVE ATTACK ON THE SOUTHWEST ISLANDS.

ENEMY FLAG SHIP CIC

Unified command and control of land, sea, air, space, and cyber domains

The ultimate situational awareness : IBCS

The enemy's all-out attack began in the previous Episode 4. Although the first cyber and electronic attacks did not make significant gains in the face of IBCS, in this Episode 5 they launched a saturation attack with a multitude of cruise missiles. IBCS successfully defended against the 1st and 2nd waves of attack (despite sustaining some damage in the 2nd wave). In this article let's look at shared situational awareness of friendly units through IBCS.

Shared Situational Awareness of Friendly Units through Networking

In this series, I have explained the advantages of network-centric warfare, focusing on the following points:

- wide area situational awareness capability
- capability to accurately discern enemy activity even under cyber and electronic disruption
- capability to engage quickly and accurately.

To realize this, you need to construct a system that networks the (1) means of detection, or sensors such as radars, (2) means of engagement, or shooters such as air defense missiles, and (3) computers that provide situational awareness and command and control (C2) functions.

However, the benefits of networking are not limited to gaining situational awareness of enemy forces; it can also be used to monitor the situation of friendly forces.

Keeping track of and updating in real time information such as the whereabouts, force strength and equipment status of friendly units under your command, their battle damage or readiness status, are all indispensable elements for accurate battle command. Why?

Take an extreme example: it is of little use to send fighter jets armed with anti-aircraft missiles to attack an enemy ship. A friendly fighter squadron is located closest to an incoming enemy will not be useful as a fighting force if it is heavily depleted or its ammunition stocks are about to run out. If such units are directed against enemy forces, they will not only fail to achieve results, but will also unnecessarily increase losses.

Clearly, knowing the whereabouts of units under your command is important in preventing friendly fire. Compared to sea and air forces, which are better equipped to identify friend or foe, friendly fire is particularly problematic in land combat. The same is true when providing close air support to ground forces from the air. Because of the close proximity of friendly and enemy units, the slightest mistake can lead to friendly fire.

To Accurately Direct Units under Your Command

To accurately recognize the situation of friendly forces, you need to constantly update the location and status of units under your command. In the past, one had to rely on verbal communication from the front, but now that we have positioning systems, computers, and networks, we can automatically transmit the latest information. At least, it is technically feasible.

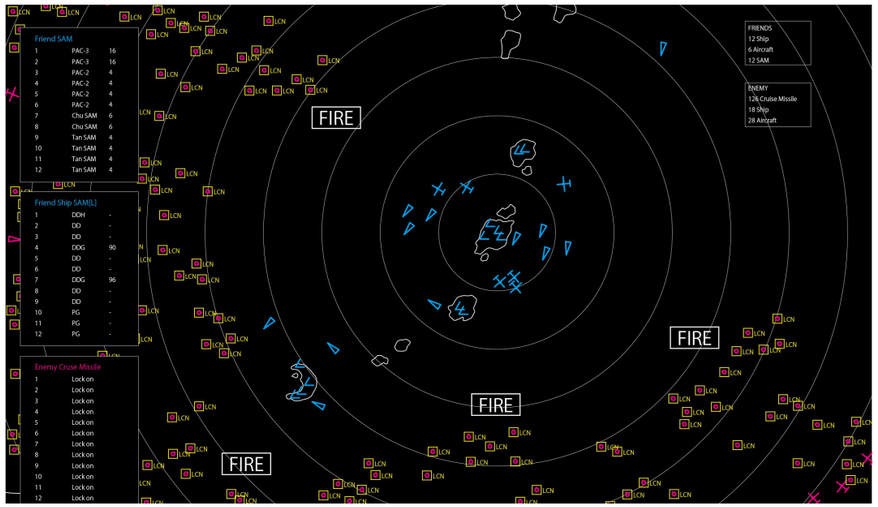
What happens by combining accurate and real-time situational awareness of incoming enemy forces and accurate and real-time situational awareness of friendly forces to intercept them? It becomes possible to establish a reliable C2, which is to send the nearest and most capable unit to intercept the incoming enemy. Even if the best unit is not close at hand and only the next best unit can be sent, it is far better than no responding force at all.

Even if your own forces are deployed near a point of enemy attack, they may be understrength or not ready to respond. In this episode, there is a scene in which there are friendly units stationed on the island under enemy attack, but unfortunately they don't have enough ammunition left.

In such cases, supplies and reinforcements must be dispatched as quickly as possible and you must know where, what type, and how many for the units under your command. Units that do not exist or cannot be utilized will not make effective reinforcements. Similarly, sending supplies that units deployed on the ground do not need will be a waste of transportation capacity and time. Accurately grasping your own situation and sending reinforcements as soon as possible is critical in preventing a situation in which friendly units become saturated under an enemy attack.

Situation of Friendly Units Shown on the IBCS Screen

The battle situation screen image shown on the first page of this episode is based off an actual IBCS screen. As noted in this article, this screen shows the situation of friendly units as well as enemy information, as detected by various sensors. For instance, the number of friendly ships, aircraft, and SAM launchers are shown on the upper right of the screen, and the number of air defense missiles left on each platform is shown on the left.
On a real IBCS screen, all information transmitted over the network is automatically shared including the whereabouts and number of sensors (radars) and their current system mode. You can also select only necessary information to be displayed on the screen.



Command and Control across All Battle Spaces: JADC2

Furthermore, what would happen if such a networked situational awareness and C2 were integrated and fused as a single picture, rather than shared only within each specific warfighting domain (land, sea, air, space, cyberspace, electronic warfare)?

An optimal solution is not always to intercept enemy aircraft by fighter jet. Sometimes, using assets from different domains, such as "blinding" enemy aircraft by electronic and/or cyber attacks, or intercepting them with surface/ship-to-air missiles instead of anti-aircraft missiles from fighter jets, might be more effective.

In such a case, you cannot have separate situational awareness and C2 for each warfighting domain, because then you cannot accurately grasp the situation of friendly forces in adjacent domains. Instead, you need to realize a single situational awareness and C2 that covers all domains.

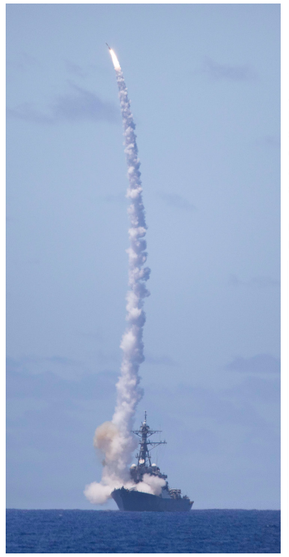
This is the fundamental idea behind the JADC2 (Joint All Domain Command and Control) concept promoted by the U.S. Department of Defense. By constructing a network and C2 web that covers all domains, C2 can be exercised to ensure the most appropriate units are directed to engage enemy forces.

The U.S. military likens JADC2 to the ride-sharing service Uber. In the case of Uber, both users (those seeking a ride) and drivers (those seeking a customer) have a smartphone, and the smartphone's built-in positioning system allows them to locate their real-time whereabouts. The essence of Uber is that the system locates the whereabouts of users and drivers, and directs the driver closest to the user who made a ride request to be dispatched to the user.

Applied to the JADC2 concept, the enemy is the Uber user and the friendly unit under your command that will engage the enemy is the driver. To realize this concept, you must accurately know the whereabouts and identifications of both enemy and friendly units.

The U.S. military has long sought to build an information sharing system across all services. Going one step further, JADC2 seeks to realize an integrated C2 system spanning the entire military.

Equipment Used in This Episode



The photo on the left shows a SM-2 missile being fired from the VLS of Arleigh Burke-class missile destroyer USS Benfold. The VLS (Vertical Launching System) is the section that looks like a grid on the ship deck seen below. Each grid is called a "cell," inside which is a canister containing a missile stored vertically. The VLS of Japan's most advanced Maya-class Aegis ship carries a total of 96 cells on the front and rear decks. If the ship carries only surface-to-air missiles (SAMs), this means 96 SAMs could be fired to intercept - but usually other missiles such as anti-submarine missiles are installed in a certain number of cells. (Photo Credit: U.S. Navy)

A Patriot missile launcher fires a PAC-2 missile. One launcher carries four canisters. One canister can carry one PAC-2 missile or four PAC-3 missiles. Therefore, one launcher can carry four PAC-2 missiles or 16 PAC-3 missiles at a maximum. (Photo Credit: U.S. Army)

A F-35A firing an AIM-120 AMRAAM (medium-range anti-aircraft missile). The F-35A can carry up to four AIM-120s in its weapon bay. By also using pylons under the wings, the F-35 can carry up to 12 AIM-120s, as shown in a take-off scene in this episode. (Photo Credit: U.S. Air Force)