NH-M-M4 "ARCO"

The All-Range Cockpit Option, “ARCO”, is an intuitive, adaptive cockpit system that changes shape and capabilities to match the user's current needs. It comes in sizes ranging from Fighter to Starship.

Designer:	Noval Defense, Space, and Security
Nomenclature:	NH-M-M4
Manufacturer:	Noval Heavy Industries
Fielded by:	Noval Heavy Industries, New Dusk Conclave
Availability:	Only as a component of Noval products.

History

The All-Range Cockpit Option, or “ARCO”, became a concept when the corporation's designers and engineers attempted to apply Noval's "A Focus on Adaptive Design" principle to their budding frame and fighter development program. One challenge was that designing a cockpit to work seamlessly with the NH-M-M2 "Orchestra" was a daunting task. It was simple enough to create a screen that could identify and display objects of various types, but that wasn't as convenient as a thumb button on a flight stick. They could add extra buttons to the flight stick, but what if those buttons weren't needed? What if the craft had an extra gun instead of a set of missiles?

Frustrated, the engineers decided to abandon the traditional cockpit design entirely.

They looked to the technologies available to them from Noval and other corporations and decided to take a more novel approach. All control sticks, control panels, and other physical components were removed. In their place, the engineers designed a cockpit that could adapt, moment to moment, to fit the user's exact needs. Rebinder was used to replicate only the necessary physical components, such as the grip and buttons of a joystick. An Orchestra moves the user and their components into place. Volumetric Display Modules are positioned to create screens, HUDs, and to cover the Rebinder material in visuals that match its intended function.

In effect, users enter a cockpit and become weightless. Necessary controls float and form into place around them, whether it be a chair to sit in or a console to enter commands. And, when things change, the cockpit changes to match.

Function and Design

Composition

The NH-M-M4 All-Range Cockpit Option, “ARCO”, is comprised of three major elements: Rebinder, Volumetric Display Modules, and an Orchesta device.

Rebinder

Tactile feedback and physical interfaces are provided by Rebinder. The material shapes itself to match a given task, whether it be a keyboard or a chair. The Rebinder can replicate the feel of most interfaces, including the keys of a keyboard, or the texture/feel of other materials. Various sensors within the Rebinder suspension handle reading these inputs and passing them on to the ARCO's computer to be translated into actionable inputs.

All surfaces and objects formed out of Rebinder appear as a glossy dark silver on their own.

Volumetric Display Modules

Multiple Galactic Horizon Volumetric Display Modules are situated throughout the cockpit's walls, carefully concealed to maintain the ARCO's aesthetic and to provide protection for the delicate hardware within. These modules can be moved within the walls' Rebinder to maintain optimal projection conditions.

Orchestra

An Orchestra device, integrated into the cockpit or the craft itself, is used to control the position of the user and other objects within the ARCO. This supplements the ARCO's Rebinder material, reducing the amount of material required to create the craft's interactive surfaces.

Combined with the other sensors within the ARCO, the Orchestra can read a user's large inputs (such as pushing a 'pedal' or swinging a control arm) and translate these movements into input for the craft.

Other Electronics and Components

A host of other components work in tandem with the three main technologies of the ARCO to provide highly precise information about the user's position, vitals, and so on.

Control

In addition to the replicated functions of a normal cockpit/bridge, the ARCO also responds to voice commands that alter its own behavior. These include commands such as “Increase/reduce inertial dampeners to 50%”, “Switch to Strike/Flight Mode”, and so on. If the craft possesses its own voice control system or AI, these options will be available for management by that system, instead.

Further details about the ARCO's controls can be found in the Variants section of this article.

Appearance

The unmodified walls and ceiling of the ARCO are smooth, featureless surfaces that are glossy and dark silver in color. The floor is completely flat and matches the walls.

The interior will adjust in shape and layout based on the user/s' needs. Chairs will form themselves from the floor, consoles will emerge from the walls, and control sticks will appear as needed. All elements use only the minimal amount of Rebinder and, by default, appear as a suspended element that uses the smallest amount of material to accomplish the task. This includes suspension of the object itself - support structures may or may not be created, instead relying upon the Orchestra system to maintain the object's position mid-air.

Object appearances, however, will appear to be finely made and immaculately detailed. In most cases, textures will be faithfully reproduced and the Volumetric Display Modules will lend color and texture to the various surfaces. A leather chair will, for all purposes, look and feel like a leather chair. Tangible controls will behave as though they are traditional controls of that type.

Volumetric Display Modules handle all display functions. All variants include a highly sophisticated HUD that rapidly adapts to whatever circumstance the user finds themselves within. From incoming fire indicators to a pleasant video call, the All-Range Cockpit Option can do it.

In all cases, the ARCO attempts to learn its users. A user's common mistakes will be detected and interpreted into the user's desired behavior. For example: If a button is too far for a user's fingers to reach, they will find it to be closer on the next attempt.

After a short period of using the ARCO's interfaces, users may find it uncomfortable to return to a non-ARCO cockpit.

Common systems such as inertial dampeners, life support, emergency systems, and so forth are included.

Variants

The ARCO comes in a range of options based on the size and needs of the craft it will be used in. Specific details for each are contained within this section.

All ARCO variants are able to act like the ARCO-I in the event of an emergency.

ARCO-C

The ARCO, Type-C, is designed for fighter and mecha operations involving users who can make a direct mental link to control their craft.

In most cases, it is simply a liquid suspension that a user slips into and can function without the need for a chair for the user to sit in. The 'cocoon' encases the user to restrict movements, protecting the pilot

while their mind is focused on the operations of the craft itself. 'Ventilation ducts' are created within the material, allowing the user to breathe naturally. During extended operation, the Rebinder material will move the user and massage their muscles to prevent fatigue and joint pain from a lack of inactivity.

Safety features, such as impact protection, are similar to the ARCO-I.

The ARCO-C has been designed not to impede life support, breathing, and other natural user motions. ARCO-C has been reported by some users as feeling uncomfortable or claustrophobic.

ARCO-F

The ARCO, Type-F, is designed for fighter cockpits. It typically features an actual, physical chair that is excellently crafted. Controls are created as necessary and respond as a veteran fighter pilot would expect. This includes controls that would be non-standard for a fighter craft, such as swiftly replacing a joystick with a console to select a weapon - and then switching back just as fast.

The Type-F is designed to support long-range operations. The cockpit's Rebinder material can be used to adjust the user's posture and massage limbs to support blood flow. When not in combat, the chair itself, arm supports, and so forth can adjust to improve the user's comfort and allow them to rest, if necessary.

All surfaces of the Type-F can have images projected onto them. These images can track the user's visual movements and adjust, making the user appear to be floating within the image itself. The default setting of the Type-F is that the user's controls and chair are visible, while the rest of the cockpit 'vanishes' to provide an excellent view of the space around the craft.

All appropriate safety features are included, typically concealed within the Rebinder material until necessary. The chair is capable of acting as an ejection seat, if the craft is designed for it, and contains resources such as air, water, filtration systems, and emergency equipment.

ARCO-I

The simplest of the ARCO variants, Type-I is designed for “Impact” purposes.

During an emergency, Rebinder encases the user and acts as a crash support structure. Intelligently designed crumple zones, liquid-metal cushioning, and other protective features swiftly form into place, securing the user's body against external harm and dampening as much impact force as possible. Once danger has passed, the Rebinder will expand to form a protective bubble around the user until conditions are adequately safe to allow the user to dismiss it. The cockpit's chair, which contains the ARCO-I's control unit and life support features, are likewise protected.

If the craft's cockpit remains intact during an emergency, the ARCO-I will attempt to provide structural reinforcement to any damaged components. Air leaks will likewise be covered by tendrils of Rebinder that emerge from the ARCO-I's dispensers.

A simple battery backup is included that can power the system for up to four hours in the event that the

ARCO-I is separated from a craft's power supply.

As a cost saving measure, the ARCO-I only includes the minimum amount of Volumetric Display Modules to produce a simple interface that displays the system's current statistics and basic controls. Unless otherwise noted, an ARCO-I does not include/require an Orchestra.

An ARCO-I can be retrofitted into an existing cockpit. Installation is a simple process. Rebinder dispensers and control mechanisms are placed throughout the cockpit. The command unit for the ARCO-I is typically installed into the cockpit's chair. Once the ARCO-I has been attached to a power source and the craft's computer, it is ready for use.

ARCO-M

The ARCO, Type-M, is designed for mecha of all types and sizes. Its default appearance looks like a Type-F cockpit sitting inside of a large, empty sphere. In many ways, the Type-M is simply a scaled up Type-F, with all the same features and considerations.

However, a user can enter 'Strike Mode' to completely change the cockpit's interior. The seat and controls all fade away, leaving the user suspended in mid-air. Surfaces are created to replicate the mecha's weapons and other systems within the space around the user. Depending on the craft, the user may be holding a sword hilt or a rifle grip. For users who don't have a way to digitally connect themselves to the craft, these grips will have controls for weaponry not held in the user's hands.

At this point, movement of the mecha itself is based entirely on the user's movements. Fine finger movements, subtle twitches of the wrist, and more will be relayed to the craft's computer. Micro movements by the user are detected by the cockpit's interior sensors, sensing the 'desire' to move forwards, backwards, and so forth.

The result is an extremely intuitive, highly precise control system that provides excellent control of mecha in a way that a standard control interface cannot.

Tactile feedback is provided by a thin coating of Rebinder around key parts of the user's body. The substance forms and deforms based on signals it receives from the craft/mecha, simulating resistance and damage in a way that is both natural and safe for the user.

For users with a means of directly interfacing with the craft, the ARCO will adjust its feedback and control systems to provide whatever their interface would be lacking.

Users can switch back into the standard, “Flight Mode” configuration, at any time. They will be gently set into their chair and the other controls will appear in the appropriate locations, literally formed around the user on request.

ARCO-S

The ARCO, Type-S, is scaled for a starship bridge. It shares features with the other ARCO types, but with a multi-station design.

Each station behaves in a similar way to the Type-M, configuring itself for the moment-to-moment needs of that station's operator. If a station is not in use, it can disappear back into the floors and walls.

In the event of an emergency, each 'station' will act as an independent ARCO-I. Control units and life support devices placed beneath the floor of each station's location can be separated away from the primary ARCO in the event of a catastrophic event, forming protective Rebinder 'bubbles' for each crew member.

Availability

The ARCO is currently available only as part of Noval products.

OOC Notes

Whisper created this article on 2020/04/07 12:55.

Approval Thread.

Products & Items Database	
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