

Honeywell

PRODUCT DESCRIPTION

FOR

MULTI-INPUT INTERACTIVE DISPLAY UNIT (MIDU)

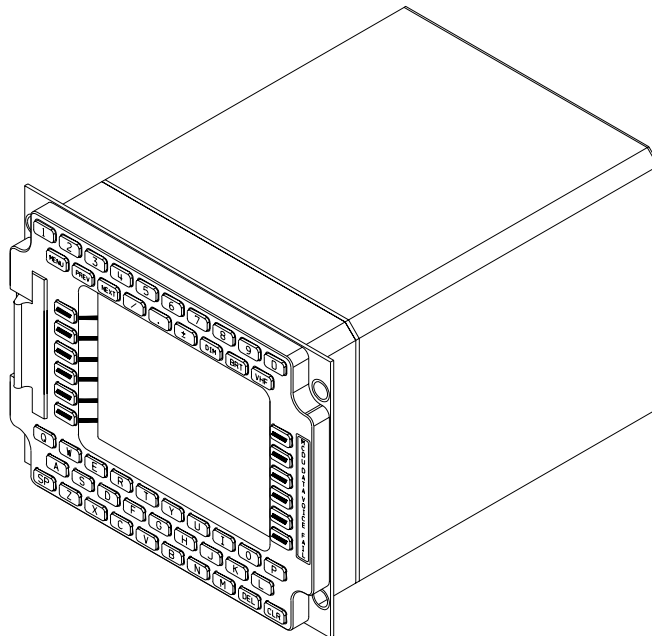
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Overview of ARINC-739 MULTI-INPUT INTERACTIVE DISPLAY UNIT (MIDU)

1.0 PRODUCT DESCRIPTION

The Multi-input Interactive Display Unit (MIDU) is the compact equivalent of the Boeing Multi-purpose Control Display Unit (MCDU), without the built-in navigation functionality, allowing a natural integration into aircraft that require a third MCDU or a dedicated MCDU for systems such as the ACARS / CMU and SATCOM. The MIDU contains ARINC-739 terminal functionality allowing flight-crew control and interaction with ACARS, ACMS, SATCOM, CMC, and other subsystems through standardized MCDU interfaces.



Multi-input Interactive Display Unit -- MIDU

The MIDU features a color LCD display and a tactile keyboard providing a small, low-cost substitute for the traditional *third MCDU*. Two factors that make the MIDU an ideal device for this role:

MCDU Terminal Emulation: the MIDU fully supports the MCDU's screen formats and keyboard operations as defined by ARINC-739.

Extended Subsystem Support: The MIDU currently supports four (4) ARINC-739 subsystems but has the growth potential to expand to eleven (11) ports.

The MIDU features reloadable software and internal growth capability to support expanded functionality. An example is the Radio Management Panel (RMP) application currently used on such aircraft as the Boeing 767-300 aircraft. Designed to DO-178B Essential Standards for software, the RMP function provides Voice Mode Protection of the VHF-Center radio. An additional tuning option may also be enabled in the RMP function, allowing

tuning of any ARINC-716 compatible VHF radio. This installation would allow the removal of one of the conventional Radio Control Panels (RCP) to increase cockpit pedestal space.

NOTE: The MIDU supports simultaneous ARINC 739 terminal emulation and ARINC 716 Radio Control Panel operations.

The MIDU features the following aircraft interfaces. The primary interfaces are immediately available. The secondary interfaces may be available through the MIDU's expansion capability, with the unit designed to support such upgrades in the future based on customer demand.

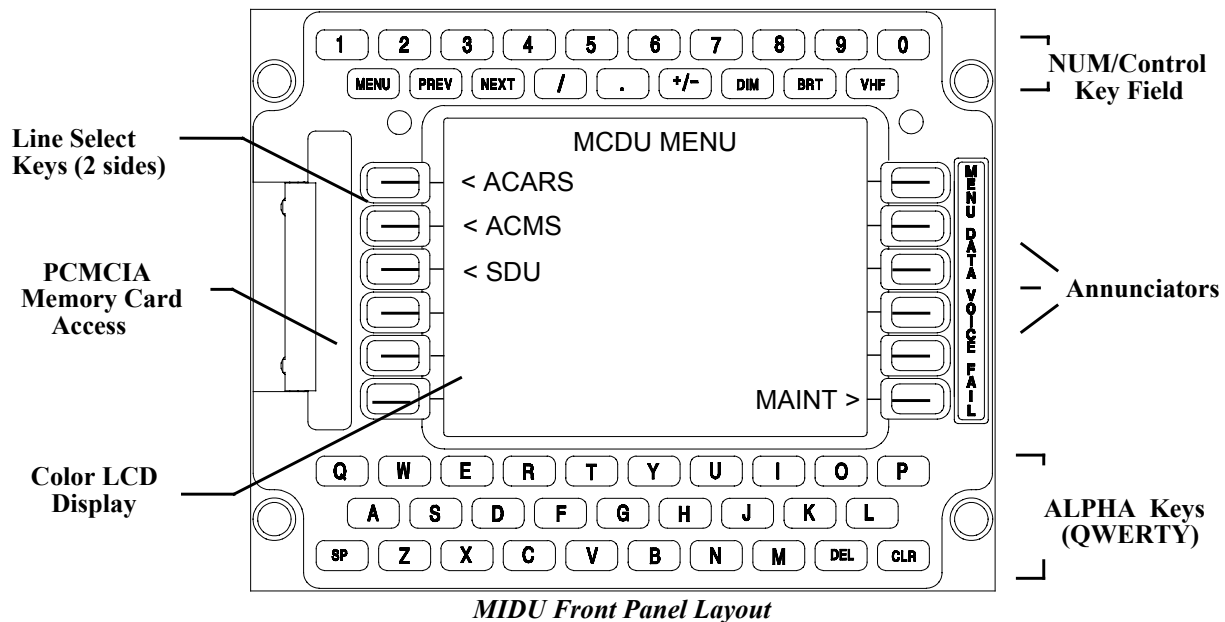
Primary Interfaces

- Four (4) ARINC-429 Interface Channels
- Sixteen (16) Programmable Aircraft Discretes
- 115 VAC, 400 Hz or +28 VDC Operation
- 5 VAC/DC Panel Light Control

Secondary (Expansion) Interfaces

- Eight (8) ARINC-429 Interface Channels
- Two (2) EIA-422A Interface Channels
- One ARINC 573 Interface Channel
- NTSC Video Input

The MIDU front panel consists of a full alpha-numeric keyboard for data entry (QWERTY or LINEAR), a color Active Matrix Liquid Crystal Display (AMLCD) for data presentation, four Annunciators providing MIDU and subsystem status, and a PCMCIA memory cartridge slot for software loading and expanded multi-functional operations.



MIDU Front Panel Layout

• Display Features

- ARINC-739 (14 Lines x 24) Character Text
- Monochrome or Color Operation with Dual Fonts, Underscore, Flashing, and Reverse Video Attributes
- Automatic and Manual Brightness Control
- Wide Viewing Area, 2.40" High x 2.90" Wide Display

• Keypad Features

- ARINC-739 Keyboard Operation with full Boeing MCDU key-set
- Tactile Feedback for Positive Switch-Action
- Separate Key Fields for Intuitive Operator Recognition
- Remote Panel/Key Backlighting Control
- Dedicated VHF Control Key

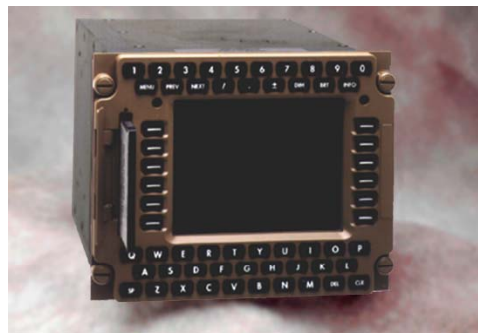
ANNUNCIATORS

MCDU MENU - indicates an alternate ARINC-739 subsystem is requesting service from the operator.

VHF VOICE - indicates that the MIDU has enabled Voice communication via a VHF subsystem. This annunciator supports the VHF Radio Management Application only.

VHF DATA - indicates that the MIDU has enabled ACARS transfers of data via a VHF subsystem. This annunciator supports the VHF Radio Management Application only.

MIDU FAIL - indicates an internal fault in the MIDU.



The MIDU Provides Full ARINC 739 Capability and Supports Up To 4 Subsystems (Such as CMU, FDAMS and SATCOM)

2.0 MIDU PART NUMBERS

The following table indicates the hardware part number for the MIDU:

Hardware Part Number	Bezel Color	Keypad Layout (QWERTY/LINEAR)
964-0443-001	Blue ¹	QWERTY
964-0443-002	Gray ²	QWERTY
964-0443-003	Brown ³	QWERTY
964-0443-004	Gray ⁴	LINEAR

- ¹ Airbus Blue consists of a keypad with White nomenclature on Black keys and a Blue (Honeywell #530-1411-001) faceplate.
- ² Boeing Gray consists of a keypad with White nomenclature on Black keys and a Light Gray (Boeing Airplane Co. #703) faceplate.
- ³ Boeing Brown consists of a keypad with White nomenclature on Black keys and a Beige (Boeing Airplane Co. #8925) faceplate.
- ⁴ Fokker Gray consists of a keypad with White nomenclature on Black keys and a Light Gray (FED-STD-595 #36118) faceplate.

The following table indicates the ARINC 739 software Part Numbers for the MIDU. This software comes standard with the MIDU hardware. The specific part number desired should be identified when ordering the MIDU.

Standard Software for the MIDU:

Software Part Number	Description
998-1994-511	ARINC-739 MCDU Application, supporting Full Color display
998-1994-521	ARINC-739 MCDU Application, supporting Monochrome White Display
998-1994-530	ARINC-739 MCDU Application, supporting Monochrome Green display

An optional software package, which is purchased separately from the MIDU, is the Radio Control Panel (RCP) software, which allows the MIDU to perform control panel tuning for one ARINC 700 series radio. This RCP software packages will enable the flight crew to switch the radio between voice and data mode. In addition, software packages will support voice frequency tuning (Tuning On). Note: There is a separate cost for the RCP software, and does not come standard with the MIDU.

RCP Software Part Number	Description
998-1994-540	Color, Voice / Data switching, RCP Tuning off
998-1994-545	Color, Voice / Data Switching, RCP Tuning on
998-1994-546	Color, Voice / Data Switching, RCP Tuning on, 8.33 compliant
998-1994-550	Monochrome White, Voice / Data Switching, RCP Tuning Off
998-1994-555	Monochrome White, Voice / Data Switching, RCP Tuning On
998-1994-556	Monochrome White, Voice / Data Switching, RCP Tuning On, 8.33 compliant
998-1994-561	Monochrome Green , Voice / Data Switching, RCP Tuning Off
998-1994-565	Monochrome Green, Voice / Data Switching, RCP Tuning On
998-1994-566	Monochrome Green, Voice / Data Switching, RCP Tuning On, 8.33 compliant

The MIDU can be configured using re-loadable software to support either Full Color display, Mono Green, or Mono White, and RMP Tuning can be enabled or disabled, or any combination thereof.

3.0 INTERFACES AND CHARACTERISTICS

PCMCIA Cartridges

The MIDU includes a *Personal Computer Memory Card International Association* (PCMCIA) memory cartridge interface slot, enabling the MIDU to perform unique operations. This design concept yields a versatile cost-effective terminal able to host a suite of independently developed and certified (as required) programming packages in addition to normal ARINC-739 terminal activity. With software additions, the MIDU can support dual modes, depending on the presence of a program/memory cartridge.

Airborne Mode. In this mode (currently supported), *Certified* applications are "installed" and reside in MIDU permanent memory. These applications run concurrently to perform the existing MCDU and RMP functions.

Ground Support Mode. In this mode, *Non-certified* applications may also be operated on the MIDU while on the ground. Non-certified applications cannot be "installed" into the MIDU's non-volatile memory but may be temporarily downloaded into MIDU memory for execution. This type of application will only remain installed as long as the "application" cartridge remains in place. This mode may be supported with additional development efforts. At present, there are no ground applications that have been developed for the MIDU.

Aircraft and Subsystem Interface

The MIDU has been successfully integrated with many avionics subsystems built by Honeywell and other avionics vendors including Teledyne, Rockwell Collins, and Honeywell and is currently installed on such aircraft as the B767-300ER, MD-83, B747-200/300, B757, A300-600, F70 and Avro RJ85. The system has been installed in aircraft with both Honeywell and Collins SATCOM systems.

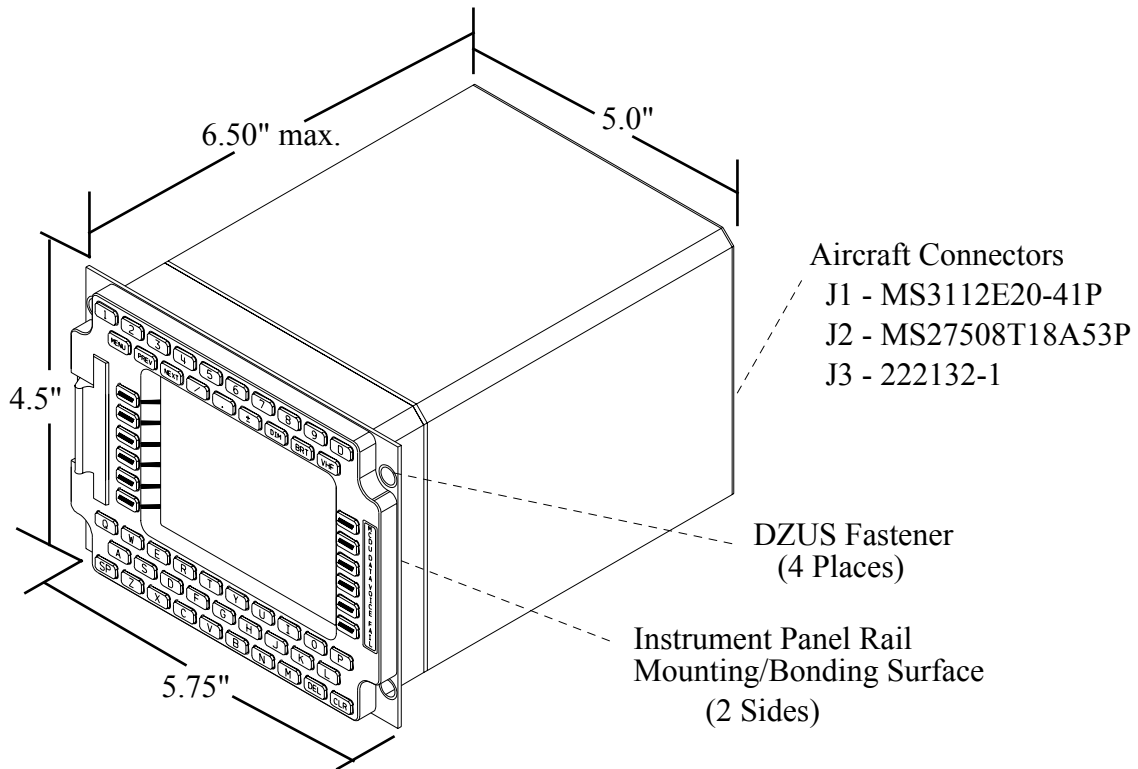
The MIDU supports up to 4 (four) device to be connected, such as ACARS/CMU, SATCOM, FDFAMS, etc. Each of these interfaces is over ARINC 429, using the ARINC 739 protocol.

4.0 Summary

The MIDU is a robust small cockpit display unit that provides a cost-effective solution for providing a full ARINC 739 compatible display with keypad in the cockpit. The MIDU has been certified by airline manufacturers (such as Boeing and Airbus), and is used by many leading airlines around the world, including such airlines as Lufthansa, TWA, Air France, Air New Zealand, KLM, Swissair, America West, Cathay Pacific, and many others. The MIDU is commonly installed on such aircraft as 737, 757, 767, A300/310 aircraft, and is especially suited for many other classic and regional aircraft. The MIDU Supports interfaces with up to four different systems, allowing airlines to use the MIDU to control such systems as CMUs, SATCOM systems and FDAMS. In addition, the MIDU has an optional software package that may be ordered, which allows the unit to also operate as a VHF Radio Control panel for one ARINC 700 series radio. The compact size of the MIDU is especially suitable for those cockpits in which aircraft real estate is scarce.

MIDU Design Parameters

- Mounting: MS25212 panel mount - 3/8" Dzus Console Rails
- Dimensions: 4.5"H x 5.75"W Panel width x 6.5" Maximum Depth
- Connectors: J1: MS3112E2041P (MS3116F2041S Mate)
- J2: MS27508T18A53P (MS27473T18A53S Mate)
- J3: 222132-1 BNC Jack (221185-2 BNC Mate)
- Power Input 115 VAC, 400 Hz **or**
28 VDC
- Power Dissipation: 40 Watts Maximum (conduction/convection/radiation cooled)
- Weight: Less than 6.5 Pounds



MIDU External Interfaces