

The CPU

The CPU is the main processing board for the 3.0 cockpit. On this board lies the main CPU of the computer as well as the RAM and the arcnet controller. Normally, the CPU only has a RGB output to the main screen. On Cameraship CPU's the addition of a scan converter is added in order to put out NTSC signals to be video taped and distributed throughout the centre.

The majority of problems with the game not operating properly are usually due to a malfunction to the CPU. Major problems such as the start up tests being failed, the cockpit locking up unexpectedly, or main screen abnormalities are usually fixed by replacing the CPU. Additionally, if the CPU is not seated tightly, the proper operation of the cockpit will most likely be impaired.

CPU Connections

The front of the CPU has several connections mounted on the front plate. These connections are illustrated in the following page:

The Node ID DIP switch bank is where the node assignment to the cockpit is set. Without the proper DIP switch setting proper communication to and from this cockpit is rendered impossible. The exact settings for node numbers is determined during initial installation. A record of the node number is recommended for each individual centre. The DIP switches are binary switches which has the switches 'up' or away from the board and the on position. Switch one is the least significant digit while switch eight is the most significant. As an example, node eleven is displayed with switches 1, 2, 8 & 9 in the up position.

The Scan Converter output is a BNC connector which connects to the coax cable labeled 'Comm Main Video.' The use of this output requires that a functioning scan converter be mounted on the CPU board. This port produces the video signal from the cockpit to the video distribution system. On CPU's equipped with scan converters, the scan converter is mounted on the CPU socket J4. The scan converter is then secured by using four sets of nuts, spacers and bolts on the corners of the scan converter.

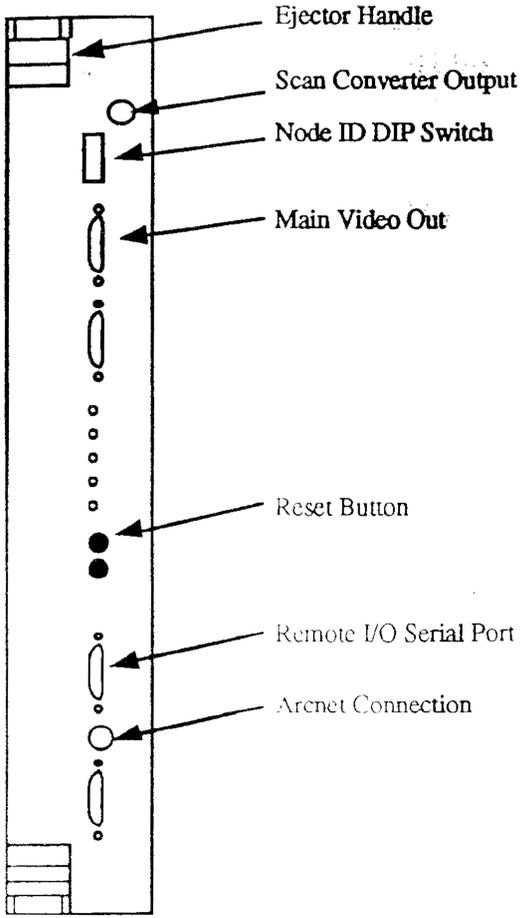
The Main Video Out is connected to the DB9 cable labeled 'Main Screen Signal' and is a standard VGA connection which drives the primary screen in the cockpit.

The Reset Button is the primary reset button on the cockpit. Depressing this button will initiate a reset of the entire cockpit.

The Interrupt Button beneath the reset button will force an interrupt on the CPU. This is used only under VWE supervision as a debugging tool.

The Remote I/O Serial Port is connected to the cable labeled 'Remote Serial Cable' and is the connection used for communication between the remote I/O board and the CPU.

The Arcnet Connection is a BNC connection which is attached to the coax cable labeled 'Comm. Bundle.' This is the LAN connection to the cockpit.



Ejector Handle

Scan Converter Output

Node ID DIP Switch

Main Video Out

Reset Button

Remote I/O Serial Port

Arcnet Connection

The Amiga Board

The Amiga board is actually an Amiga 500 motherboard mounted in a VWE carrier board. The function of the Amiga board is to display the graphics on the secondary screen of the cockpit. This board has only one connection other than the usual 300 pin connector on the side to mount into the backplane: The secondary screen video out. This is a standard Amiga VGA output which terminates in a DB9. This connects to the cable labeled for the secondary screen.

If problems with the cockpit involve the secondary screen, the Amiga board is a good place to check. Check that the Amiga board is properly seated in the card cage. Also check that the Amiga 500 motherboard is properly mounted into the carrier board. Most problems which manifest with the Amiga result in a blue secondary screen with white numbers on the left side of the screen. Reseating the Amiga board and long loading the cockpit will usually fix this problem.

The Sound Board

The sound board is the sound generation engine for the 3.0 cockpit. Contained inside the sound board are several Analog Devices ADSP's used for processing sounds stored. The sample memory of the sound board is stored in DRAM mounted on the board. During a long load, the files btaudio.dld or rpaudio.dld is loaded into the sound board. These files are the sample data for the cockpit to use during the game.

The sound board also acts as the amplifier for the cockpit. The speaker connections are on the sound board and the all the speakers take their driving energy from the board. The sound board also acts as the intercom system for the cockpits. The audio intercom information is passed from cockpit to cockpit and decoded by the sound board. The board also functions as a mixer of the various outputs for the user to the speakers.

Major problems with the sound boards usually manifest themselves with the cockpit losing sound during a game. Normally, if this happens sound is reestablished within 15 seconds as the software watchdog will reactivate the audio channels. If the problem with sound dropping out persists, the board may need to be reseated. It has also been noticed with the sound board that low voltage levels will cause the board to produce unreliable operation. Checking the voltage across a de-coupling capacitor on the board while the cockpit is in operation should produce a voltage of at least 4.9 volts. If the voltage on the sound board is lower, the voltage for the cockpit 5V power supply should be raised.

SOUND BOARD

The top minifit connector on the sound board is the amplifier output to the speakers. There are four speakers and four woofers located in the cockpit.

The top two LED displays are digital and analog power indicators. The third one is not used currently. The bottom LED display will indicate a sound board reset.

The sound board display is used for several functions. When the sound board is not loaded with software, the far left display flashes a star. As the cockpit sound is loaded, the star will switch to a rotating propeller. The displays are also used to display the current sound board intercom node number, and occasionally... under unfavorable circumstances, error codes.

The small dial rotary switch is used to select the node number for the intercom forwarding chain.

The top push button will cause a sound board reset.

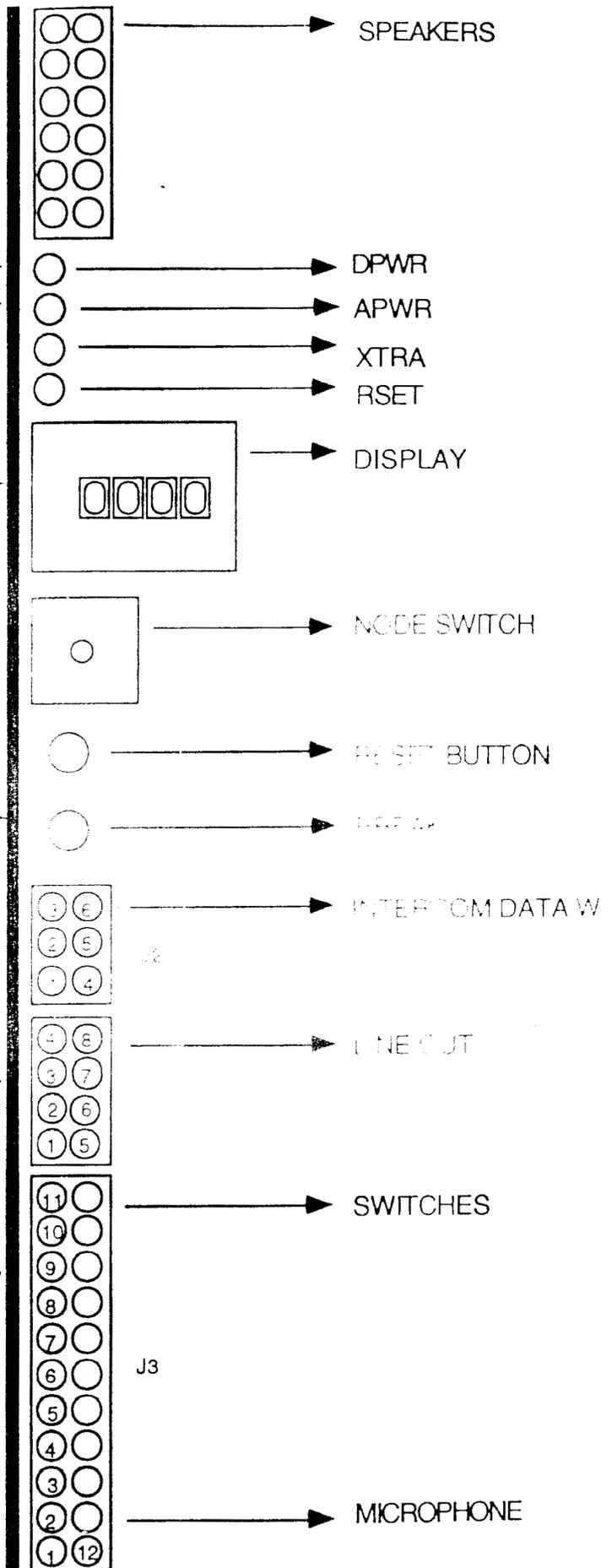
The second push button will generate a sound interrupt which should come out to each speaker. This can be used to test the speakers and sound board. The interrupt test should not corrupt the cockpit mission sounds.

The intercom data connector is where the network enters and exits the sound board. Pins 1 and 2 receive input from the previous cockpit and pins 4 and 5 forward the data to the next cockpit.

For monophonic output for the camera ship, pins 2 and 6 are used on the line out connector. This connector is presently only used for camera ships. Double check the resistor R44 on the sound board to insure that it is a 10K ohm.

The last connector is a 22 pin minifit type. It houses the wires for the intercom switches which are located in the cockpit directly below the throttle. It also houses the the microphone wires.

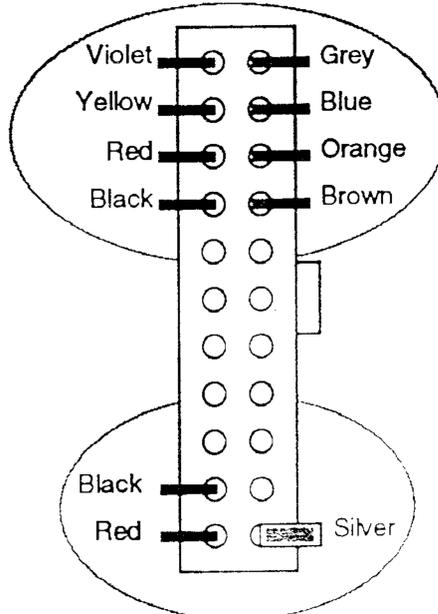
A further break down of the wire harnesses on the Intercom data wires, the intercom switch wires, and the microphone wires of connectors J2 and J3, please review the next page.



Connector breakdown for SB

J3

Lamp/switch wires



Microphone wires

J2

Intercom data wires

