



ESV Workstation

Site Preparation Guide

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Introduction

Thank you for selecting an ESV Workstation product. This site preparation guide and checklist is provided to assist you in the planning and preparation of your site for a trouble-free installation. Prior to installation, an installation coordinator will contact you. This coordinator is assigned to track your system from its sales order approval to its shipment, delivery, and installation. After verifying that your site checklist is complete and that all components of your system have been delivered, the coordinator will schedule the installation, and an Evans & Sutherland Field Service Engineer will be dispatched. By following this procedure, Evans & Sutherland hopes to predict the particular needs of each installation.

The information presented here is generic and should be tailored to meet individual situations. These site planning guidelines promote the following:

- Timely system installation
- Optimum equipment reliability
- Efficient operation of the system
- Ease of equipment maintenance

Please contact your Evans & Sutherland Service Center if you have any questions.

Site Planning

Before the ESV Workstation can be installed, you must prepare your site. This includes providing adequate space and location, making provisions for power, temperature and air quality, and ensuring sufficient facilities for the ESV Workstation and interactive devices. This guide provides you with the information necessary to properly prepare your site.

Adequate site planning and preparation eases the installation process and produces efficient system operation. Site planning requirements vary greatly from site to site. The location and environmental aspects of your system are as significant as the equipment itself. The system could prove to be unusable if it is placed in an awkward or inadequately supported location. Space and location are the primary considerations for site selection. Table 1 shows the components and size specifications, and Table 2 shows the cable lengths.

Table 1. Component Dimensions

<u>Component</u>	<u>Length - in (cm)</u>	<u>Width - in (cm)</u>	<u>Height - in (cm)</u>	<u>Weight - lb (kg)</u>
Control Unit	30.0 (76.2)	17.0 (43.2)	25.5 (64.8)	150 (67.5)
Display	20.8 (53.4)	19.4 (49.8)	17.5 (44.9)	68.5 (31)
RDC	15.0 (38.1)	15.0 (38.1)	3.0 (7.6)	12 (5.4)
Keyboard	18.0 (45.7)	7.8 (19.7)	1.6 (4.0)	5 (2.3)
Mouse	3.75 (9.5)	2.8 (7.0)	1.0 (2.5)	0.5 (.2)
Control Dials	8.0 (20.3)	9.0 (22.9)	5.5 (14.0)	9.5 (4.3)
15x15 Tablet	20.8 (52.8)	20.7 (52.6)	3.0 (7.7)	3.2 (1.4)
18x25 Tablet	30.7 (77.9)	24.1 (61.3)	3.1 (7.9)	23.2 (10.5)

Table 2. Cable Lengths

<u>Cable</u>	<u>Length - feet (meters)</u>
Display to Control Unit	10, 20, 45 (3.1, 6.1, 13.7)
RDC to Control Unit	10, 20, 45 (3.1, 6.1, 13.7)
Control Unit to AC Power	8 (2.4)
RDC to AC Power	8 (2.4)
Display to AC Power (RDC)	3 (1.0)

Space

The ESV Workstation should be positioned out of direct sunlight and away from all sources of heat, including central heating vents, with a minimum of 2 inches (5 cm.) of clearance around the control unit to allow for air flow and cabling. At least two sides of the control unit must be left exposed to allow for adequate air flow. The back of the display must have at least 6-1/2 inches (16 cm.) of clearance for cabling.

The actual floor space required will depend on the system itself, the length-to-width ratio of the area, and the locations of walls, partitions, windows, and doors. To determine the exact area your system requires, prepare a scaled layout that includes all features of the site location. The area allotted should provide for the following:

- Future expansion of the system
- Storage of related materials
- Convenient system operation
- Easy access for service and maintenance

Location

Locate your ESV Workstation site near work-related areas for efficient operation. The location of the site also depends on existing or planned facilities at the site. The location must do the following:

- Provide adequate AC power
- Conform to environmental requirements
- Conform to safety and fire regulations
- Provide easy access for equipment delivery and installation
- Provide for the flow of work in the most efficient manner possible with respect to such considerations as related areas, human factors, storage, and noise isolation

Environmental Support

When selecting your site, you must plan for adequate power and for environmental support factors, such as temperature requirements and adequate air quality.

Power Requirements

You need to provide additional power for any other equipment that will be operated in the area, such as test equipment and calculators. The USA wall receptacles should be a wall plugs, NEMA 5-20R **20A or equivalent**. The power specifications for the components are shown in Table 3.

Table 3. Power Specifications

<u>Component</u>	<u>Line Voltage</u>	<u>Max. Current</u>		<u>Line Freq.</u>	<u>Power Cons.</u>
	<u>110/220V</u>	<u>120V</u>	<u>220V</u>	<u>(Hz)</u>	<u>(Watts)</u>
Control Unit (lg)	110/220	16A	8A	60/50	1920
Display	110/220	1.25A	.7A	60/50	150
RDC	110/220	6A	3A	60/50	720 ← MUST BE WRONG.

The line voltages shown in Table 3 are within a tolerance of +6% to -10%. The ESV Workstation requires one dedicated 20 amp service line. The system may be damaged if adequate service is not provided.

The available supply of AC power must be adequate to handle the power loads represented by the installation of the ESV Workstation as well as any anticipated future loads. The electrical system must conform to applicable national and local codes and ordinances. Check the electrical service prior to system installation to ensure that power levels are within the specified limits.

The control unit and the display run on two-wire-plus-ground circuits. The display must share a common electrical ground with its supporting control unit.

To ensure proper operation of the ESV Workstation, the following limitations are placed on AC power disturbances:

- A maximum of 10% of nominal power for 0.1 seconds occurring no more than once every 10 seconds.
- Maximum harmonic content of 5% rms, no more than 3% rms for any single harmonic.
- Maximum impulse of 300V with rise time of 0.1 microseconds or slower, lasting no longer than 10 microseconds for total duration.

Note: Many unconditioned AC service mains exceed these specifications, especially during periods of heavy use and/or electrical disturbances. Ensure that the input power supplied to ESV Workstation equipment has been adequately conditioned.

220 Volt Option

For the 220 Volt option, the ESV Workstation is supplied with an EE 7/7 ("schuko") 10A cordset.

Temperature Requirements

The best way to provide the proper air temperature is to provide a separate thermostatic control to compensate for the heat dissipated by the ESV Workstation and any other equipment and personnel in the area. The air conditioning system must provide sufficient heating and cooling to maintain the environment within the limits shown in Table 4.

Table 4. Temperature and Humidity Limits

	<u>Operating</u>	<u>Non-Operating</u>
Temperature	50 ⁰ F to 104 ⁰ F (10 ⁰ C to 40 ⁰ C)	-40 ⁰ F to 122 ⁰ F (-40 ⁰ C to 50 ⁰ C)
Humidity	20% to 80% (non-condensing)	1% to 90% (non-condensing)

Heat dissipation factors can be calculated by using the values given in Table 5. These values should be added to any other heat generated by equipment and personnel located in the same room.

Table 5. Heat Dissipation Factors

<u>Component</u>	<u>Heat Dissipated</u>
Control Unit	6566.4 BTU/hr (1920 Watts)
Color Display	512 BTU/hr (149.7 Watts)
RDC	2462.4 BTU/hr (720 Watts)
One Person	400 BTU/hr (117 Watts) ← WHERE DO WE GET THIS

3000

Air Quality

The ESV Workstation equipment is designed for use in a clean environment, where air filtration is not always possible. However, the control unit should be placed away from high traffic areas because the build-up of potential contaminants is more concentrated in these areas. Airborne dust, dirt particles, and smoke can clog intake air filters and cause damage to the hard disk and tape drive.

Dust is usually controlled by normal heating, ventilating, and cooling equipment if adequate filters are used. Keep the system area clean and orderly to lessen the concentration of airborne particles and help maintain system reliability. Where excess dust or airborne particles are present, install an electrostatic filter to prevent damage to the system.

Caution: Never place the ESV Workstation in an area containing even small concentrations of corrosive chemicals.

Facilities Preparation and Considerations

The following sections provide information on fire and safety precautions, the work table, floor coverings, cabling, and use of partitions. Information on operating considerations such as acoustics, lighting, vibration, static electricity and electrostatic discharge (ESD), electromagnetic interference (EMI), corrosive elements, and altitude is also provided.

Fire and Safety Precautions

- Existing building fire and safety codes should be adequate for the ESV Workstation installation. However, local experts should be consulted about fire prevention and extinguishing devices.
- Do not install the ESV Workstation near the use, storage, or manufacturing of flammable or explosive material.
- For safety as well as operational reasons, each interconnected piece of equipment must be provided with a properly grounded outlet.
- All power circuits must be adequately protected with fuses or circuit breakers of a suitable size.
- No metal should be exposed on the walking surface of floors.

Work Table

The ESV Workstation display and interactive devices should be installed on a table or large desk of heavy construction with a durable, non-glare surface. The minimum recommended surface area is 13 square feet (1.2 square meters), and the recommended height is 29.5 inches (75 cm).

In areas where ergonomic compliance is required, the table's height should be adjustable from approximately 27 inches (68 cm) to 30.5 inches (76 cm). It is also recommended that the chair's height be adjustable.

Floor Coverings

The most desirable flooring is a raised floor that includes tile-covered panels supported by a grid system of pedestals. These floors simplify installation and provide flexibility for subsequent layout changes or expansion. They also provide an area through which cables connecting various components of the system can be routed and kept out of the way.

If you are unable to use a raised floor, most floor surfaces are adequate for installation, with the following considerations:

- For any high-grade industrial carpeting with short, closed-loop piles, you should use minimal or no padding. The carpet should have good antistatic properties and/or a low surface resistivity. Shag rug, deep pile and other such carpets are not recommended and can cause serious operational difficulties. These rugs have loose fibers and collect dust particles which can clog cooling inlet filters and generate unacceptable levels of static electricity.
- Most tiles provide a suitable surface, however, specific attention should be given to underlay. There is a tendency for some tiles to build up static charge. This can be minimized by proper application of low-resistivity sealer and polish. This application will need to be repeated at appropriate intervals.
- Wax is not recommended as a protective coating for floors in a computer area as it tends to build up surface resistivity and increase static charge.
- Other surfaces should be evaluated for surface resistivity, ease of cleaning and resistance to decomposition, durability, cost, and appearance.

Cabling

Conduits, cable ramps, and any necessary alterations must be implemented prior to the system delivery. All customer-supplied cables must be shielded.

Networking

If you plan to make your ESV Workstation part of an Ethernet network, you must have an Ethernet thickwire connection to your Ethernet backbone ready when the system is installed.

Partitions

Floor-to-ceiling partitions are an effective way of controlling noise and dust. Partitions must be positioned to avoid blocking air flow to the equipment and to allow for equipment access and cabling restraints.

Acoustics

The ESV Workstation is designed to operate with a minimum amount of noise. Cooling fans within the cabinets are a possible source of audible sound, but in most environments ambient sound will be louder than the ESV Workstation.

If several ESV Workstations are to be operated in close proximity, acoustical damping of the ceiling, floors, and walls might be considered.

Lighting

The ESV Workstation is designed to operate in a normal lighting environment. The optimum lighting for a graphics CRT display should be subdued, indirect incandescent lighting. To reduce operator fatigue, avoid lighting that produces glare on the face of the CRT.

Vibration

Vibration can cause slow degradation of mechanical parts and contacts. It should be avoided whenever possible. In cases where structure-borne vibration is negligible, no problems should arise. If there is any unusual or prolonged vibration anticipated, consult an Evans & Sutherland Technical Support representative.

EMI

The ESV Workstation has been tested and found to meet the FCC radiation limits for a Class A computing device, pursuant to *FCC Computer Rules, Part 15, Subpart J*.

EMI sources close to computer systems can affect their operation. It is difficult to predict whether or not problems will arise at a particular site. Some common sources of EMI that have been known to cause failures are:

appliances	industrial machines	relay contactors
arc welders	magnetic devices	static electricity
broadcast stations	mobile communications	thunderstorms
dielectric heaters	office machines	ultrasonic cleaners
fluorescent lights	power tools	vehicle ignitions
high voltage power lines	radar	

Consult an Evans & Sutherland Technical Support representative if potential problems exist at a particular site.

Static Electricity and ESD

Static electricity is the result of physical action. Vibration, friction, and separation of materials are common static generators. People and furniture are the most common static storage collectors. Static may be generated by walking, rising from chairs, moving objects, or pushing vehicles with nonconductive wheels. Voltages of 16KV have been measured on plastic-covered metal desk chairs as a result of a person standing up. This often occurs at low relative humidities (0 to 20%).

Do not locate the ESV Workstation in an area where potentially large charges of static electricity may gather. For information on floor conductivity, see *IEEE Standard 142-1972*. Although the ESV Workstation has been engineered to resist the harmful effects of ESD, every effort should be made to reduce the possibility of ESD directly to the equipment.

Corrosive Environments

Operation of the ESV Workstation in a corrosive environment results in damage to electronic components and circuitry. Some common corrosive substances are:

ammonia	nitrates	sodium chloride (table salt)
hydrocarbons	nitrogen oxides	sulfur dioxide
hydrogen sulfide	ozone	

Consult an Evans & Sutherland Technical Support representative if any of these contaminants are present in the intended environment.

Altitude

System operation at high altitudes may be affected by low air density. Heat dissipation problems may occur at altitudes greater than 7,000 feet (2,000 meters). If high altitude operation is anticipated, additional air flow around the control unit should be provided.

Pre-delivery Planning

Pre-delivery planning is essential for smooth installation and acceptance of your ESV Workstation. It is important that you prepare a detailed schedule of installation activity as soon as possible after the equipment has been ordered and the site selected and prepared.

Once the installation has taken place, you are responsible for the disposal of the packaging material. Preparations should be made in advance to remove the empty packaging material from the installation site when installation is complete.

Delivery Constraints

The largest box fits through a 36-inch (92-cm.) wide doorway. Ensure the route the equipment is to travel from the receiving area to the installation site allows the equipment to move freely. The packaged equipment must be able to fit through any halls, doorways, around any bends, or in elevators.

Equipment Packaging and Handling

It is your responsibility to transport the system from its unloading site to the actual installation site. This should be done prior to the system installation date. Do not subject the equipment boxes to any hard bumps or shocks. Keep the boxes in a vertical position as indicated on the box surface. Do not open them.

For shipment, the ESV Workstation and peripherals are packed in a reinforced cardboard box which is attached to a pallet. The display box is banded to the top of the ESV Workstation box. The dimensions of the shipping box are as follows:

- English units: 35.0 in (length) x 23.5 in (width) x 34.0 in (height)
- Metric units: 89 cm (length) x 60 cm (width) x 86 cm (height)

Evans & Sutherland has adopted the *shockwatch* label and the *tip-and-tell* label as a way to safeguard the ESV Workstation during shipment. These labels are simple and effective warning devices that tell you if a shipment has been roughly handled.

The *shockwatch* and *tip-and-tell* labels help identify responsibility for products damaged during shipping. Since mishandling the product activates the devices, the presence of these labels encourages careful handling for the ESV Workstation. If the product has been mishandled, the labels indicate the following: the *shockwatch* label indicator in the center of the label turns bright red and cannot be reset; and the *tip-and-tell* label indicator turns blue and cannot be reset.

Receiving Procedure

You must follow this procedure when the ESV Workstation is delivered to your site:

- 1) Upon receipt of your shipment, note the color of the *shockwatch* and *tip-and-tell* indicators. If you receive more than one carton, check all of the labels. **Do not refuse shipment.**
- 2) If any of the labels have been triggered, note the cartons that have been mishandled on the delivery ticket and request that the carrier's driver sign a receipt acknowledging that the labels have been activated.
- 3) If the product is visibly damaged, note this on the delivery ticket receipt and contact Evans & Sutherland immediately by calling:

In the USA, **800-582-4375**

In Europe, your local sales office.

All boxes, with the exception of boxes containing documentation, must be opened and unpacked only by an authorized Evans & Sutherland Field Service Engineer. Unpacking by unauthorized persons may void the warranty on this equipment.

If you must open the boxes to move the system to the installation site, please contact the Evans & Sutherland Service Center and request authorization to open the boxes.

Should you unpack or inspect any of the equipment without an authorized Evans & Sutherland Field Service Engineer present, or without authorization from Evans & Sutherland, you assume all responsibility for any damage or shortage claims with the carrier.

Installation Procedure

- 1) After the ESV Workstation is shipped, a representative from the Evans & Sutherland Field Service Department will contact the customer to verify delivery.
- 2) The customer will call the Field Service Department to initiate the installation.
- 3) A representative from the Field Service Department will contact the customer to verify that the site preparations have been completed and 20 amp service is available. An installation appointment will be scheduled with the customer.
- 4) The Evans & Sutherland Field Service Engineer will arrive at the customer site, and install the workstation.

Customer Checklist

- Have you selected an appropriate site for your ESV Workstation?
- Does the selected site have adequate power and environmental support?
- Have the work facilities for the selected site been prepared?
- Have all of the pre-delivery conditions been met?

If the answer to all of the above questions is yes, then you are ready to schedule the installation of your ESV Workstation. To schedule an installation, call:

in the USA, **800-582-4375**

in Europe, your local sales office.

