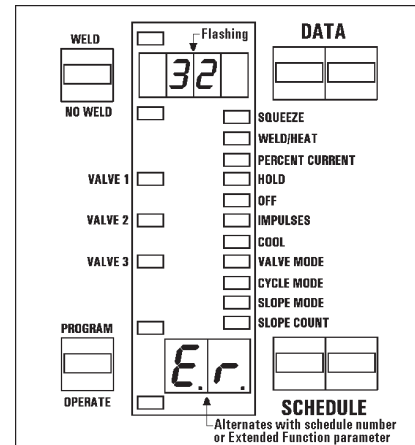


## APPLICATION NOTE 700127E NON-VOLATILE MEMORY ERROR

All ENTRON microprocessor based controls make extensive use of non-volatile memory devices for parameter data storage. Although safety features (control relays and opto-isolation) are in place to insure high voltage spikes do not appear on low voltage circuits, non-volatile memory devices can sometimes be affected by improper hook up, electrical disturbances generated in other equipment operating nearby, or in the welding machine itself.

When an ENTRON Series Control is powered up or returns from Emergency Stop condition, it executes a diagnostic test that reads all memory locations within schedule storage areas. If invalid data is stored in memory, control will display a flashing **14** or **32** in DATA display and **E.r.** in SCHEDULE display alternating with schedule number where invalid data (error) is found. If invalid data is found in EXTENDED FUNCTIONS' memory area, **E.r.** alternates with EXTENDED FUNCTION parameter designation.

The ERROR **14** or **32** indication does not mean there has been damage to welding control. It simply means something has caused invalid data to be stored in one or more memory locations. The control will not sequence until this error has been corrected.



The EN1000 Series Controls can be restored by using following procedure:

1. Press SELECT push button to stop the flashing.
2. Place control in PROGRAM mode.
3. Use SELECT push button to find function containing invalid data.
4. Use DATA push buttons to correct data.
5. Press ENTER.
6. Return control to OPERATE mode.

If more than one location has been affected, it may be necessary to use CLEAR ALL command in EXTENDED FUNCTIONS to erase all memory locations and restore default settings (factory settings).

The EN2000 Series Controls can be restored by using following procedure:

1. Remove power to control.
2. Press and hold PROGRAM SELECT push button.
3. Turn on power to control while PROGRAM SELECT push button is depressed to remove all data from memory. Reprogram control and operate as usual.

### Reoccurring ERROR **14** or **32** (ERROR CODE **14** Flashing in previous revisions)

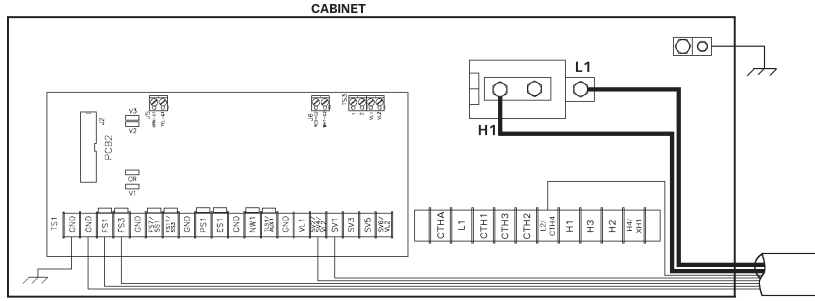
The effects of electrical disturbances can be minimized or prevented by observing the following precautions when installing welding control:

1. Make sure cabinet is properly grounded to power distribution system, nearby water pipe or other effective building ground with a wire adequate for its application.
2. All wires connected to the pilot input terminals on Terminal Strip TS1 (FS1, FS3, FS7, FS11, PS1, ES1, NW1, TLS1, and their adjacent GND terminals) should be separated as much as possible from other wires connecting to solenoid valves, welding transformers, and AC line. These pilot input wires should never be run through the same conduit with solenoid, welding transformer and AC line wires. Connection of any GND terminal to earth ground might cause Error **14** or **32**.

# WIRING AND ROUTING LOW AND HIGH VOLTAGE CONDUITS

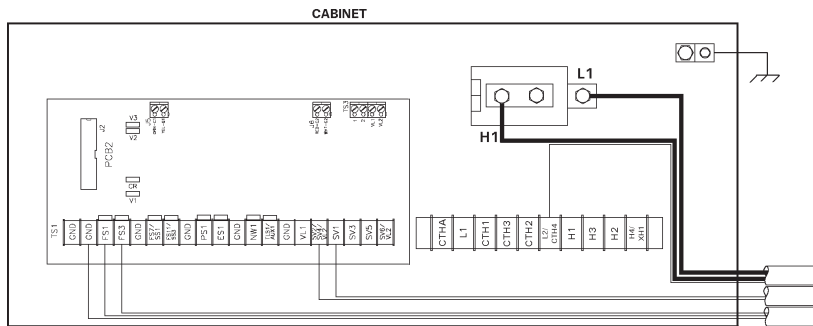
(Views shown are typical of an EN1000 or EN2000 Control)

## WRONG!



L1 and H1 will radiate electromagnetic spikes onto parallel wires bundled with it. Initiation wires are low voltage and are most vulnerable to electromagnetic spikes. Also, a short within this bundle could cause severe damage. **CAUTION: NEVER** connect Terminal Strip ground to earth ground.

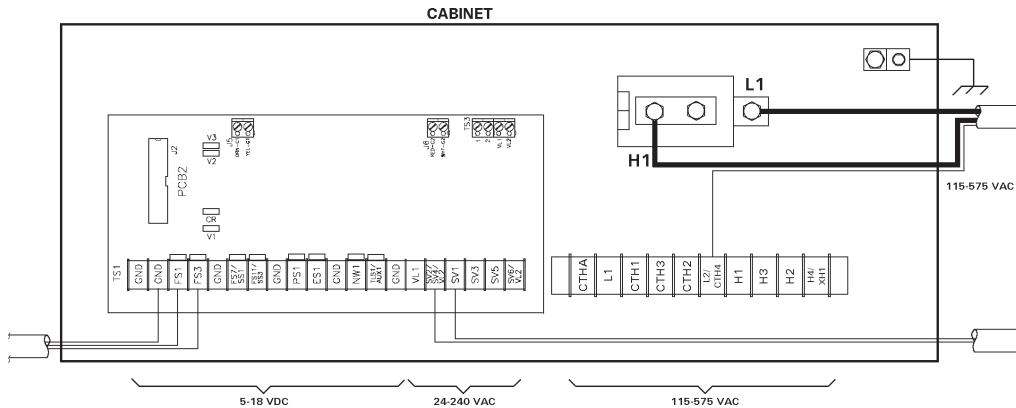
## BETTER



The wires are routed parallel to each other but in separate grounded conduits. The conduits isolate vulnerable wires and reduce noise, but often, when conduits are running parallel, wires will have some unprotected travel distance inside the cabinet. This could couple some electromagnetic spikes onto more vulnerable low voltage circuits.

## BEST

To minimize introduction of induced electrical transient spikes that cause corrupt data to be stored in control's microprocessor, the diagram below shows the best way to route cables and initiations. Note that all low voltage initiation wires have been physically isolated from any high voltage wiring. The routing method used in our example is not possible in all applications, but it should be considered the best possible. It would be ideal to route and exit low voltage terminals (5-18 VDC) at least 6" or more or at opposite end of cabinet from higher voltage terminals (24-240 VAC and 115-575 VAC).



## NOTICE

The GND designations on Terminal Strip TS1 are commons only (nominally at ground potential). These points should never be grounded externally. However, control cabinet must be properly grounded using ground lug on inside of cabinet.

## NOTICE

Avoid routing high and low voltage wires parallel to each other to eliminate coupling adjacent signals which may cause irregular operation.