EDL Displays, Inc.

Technical Support

Convergence Adjustment of 3-Gun Monochrome Displays

The accompanying document is intended as a reference document for technicians already familiar with making convergence adjustments on color CRTs.

Improper adjustment of convergence rings can cause severe misconvergence. This condition can be difficult to correct, and may necessitate return of the monitor to the factory for repair.

If you are unfamiliar with making mechanical convergence adjustments, proceed as follows:

1. Before attempting to correct convergence via the convergence rings, try to achieve satisfactory convergence using the electrical controls only.

2. If mechanical adjustment is necessary, please contact Technical support at EDL for advice before making adjustments.

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3-Gun Monochrome Monitor
Convergence Adjustment

The 3-gun monochrome monitor achieves high brightness by using a 3-gun color electron gun assembly to illuminate a monochrome phosphor in a specially constructed CRT.

Because three guns are used, convergence must be optimized as in a color CRT, in order to achieve maximum resolution. This tube does not employ a shadow mask, so purity adjustments are not required. Convergence is a matter of causing the three beams to strike the same scanning spot as accurately as possible over the entire screen.

Two means of convergence are provided.

Static convergence multi-pole magnet rings are placed on the tube neck. These magnet rings come in pairs, and can be rotated to adjust field angle and strength (through cancellation). The rings closest to the front of the monitor effect vertical displacement of horizontal lines, while the pair of rings closest to the rear of the Monitor effect horizontal displacement of vertical lines. There is some interaction, so convergence adjustment via the rings requires patience and care.

Fixed convergence coils mounted in the CRT neck permit fine adjustment of static convergence through adjustment of field strength by varying current through the coils. The action of these coils is precise and highly independent, but they cannot overcome poor adjustment of the convergence rings.

Calibration procedure:

1. With power off, unplug and partially withdraw the rear panel Convergence Module. Remove Monitor top cover.
2. Apply power to the monitor.
3. Using a test pattern generator, apply a V-H grid pattern w/ border. Adjust size and position so that the pattern fills the screen without over-scan.
4. Adjust static convergence via the convergence rings. It is not possible to get perfect convergence at every part of the screen. Optimize convergence for minimal, but most uniform misconvergence overall. Tighten the convergence ring clamp and re-check convergence.
5. Turn Monitor off.
6. Re-install the Convergence Module. Replace Monitor cover.
7. Apply power to the Monitor.

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8. Test rotate the top-most control potentiometer fully CW, then fully CCW. Leave this control at the extreme, which produces the greatest horizontal spread of misconverged vertical lines.
9. Test rotate the third-from-top control potentiometer fully CW, then fully CCW. Leave this control at the extreme, which produces the greatest vertical spread of misconverged horizontal lines.
10. Rotate the second-from-top control potentiometer to achieve best possible centering of the middle line of each vertical trio. Optimize for best overall balance across the screen.
11. Rotate the Bottom-most from top control potentiometer to achieve best possible centering of the middle line of each horizontal trio. Optimize for best overall balance across the screen.
12. Adjust the top-most control for the finest line width of vertical lines. Optimize for the best overall balance across the screen.
13. Adjust the third-from-top control for the finest line width of horizontal lines. Optimize for the best overall balance across the screen.

Convergence is completed. Note that while perfect convergence is not possible at every area of the screen, it is possible to trade-off a small degree of convergence in the center of the screen in order to improve convergence in the corners. If slight misconvergence can be tolerated in the extreme corners, it is possible to obtain nearly perfect convergence across the remainder of the screen.