

TEST FOR NEUTRAL OVERCURRENT CONDITIONS ON
THREE PHASE ELECTRONIC DIMMING SYSTEMS

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Test Conditions:

A Three-Phase electronic dimmer board was connected to a three phase 120/208 volt service. Three dimmers were loaded to 2000 watts each, one dimmer on each of the three phases.

A current clamp transformer was connected to the neutral supplying the dimmer board. This clamp fed a Fluke 8040 4-1/2 digit DMM (true RMS responding) and a Tektronix 545A scope. Photos were taken using a Tektronix scope camera system with Polaroid Type 57 film. The scope was set to 2 ms/div.

PHOTO 3

Neutral current waveform of A phase dimmer at full.
16.43 Amps measured on neutral.

A similar waveshape and identical rms current reading occurs when any one dimmer is energized.

PHOTO 7

Neutral current waveform with all three phases at full.
3.00 amps RMS measured on neutral.
Note lack of complete cancellation even though all three loads are identical and at identical levels. Reference PHOTO 1-voltage waveform of a dimmer at full. Zero crossing deadtime (dimmer not completely on) causes lack of complete neutral cancellation.

PHOTO 5

Neutral current waveform with A phase dimmer at full, C phase dimmer at 55%.
Neutral current measures 20.72 Amps Rms.

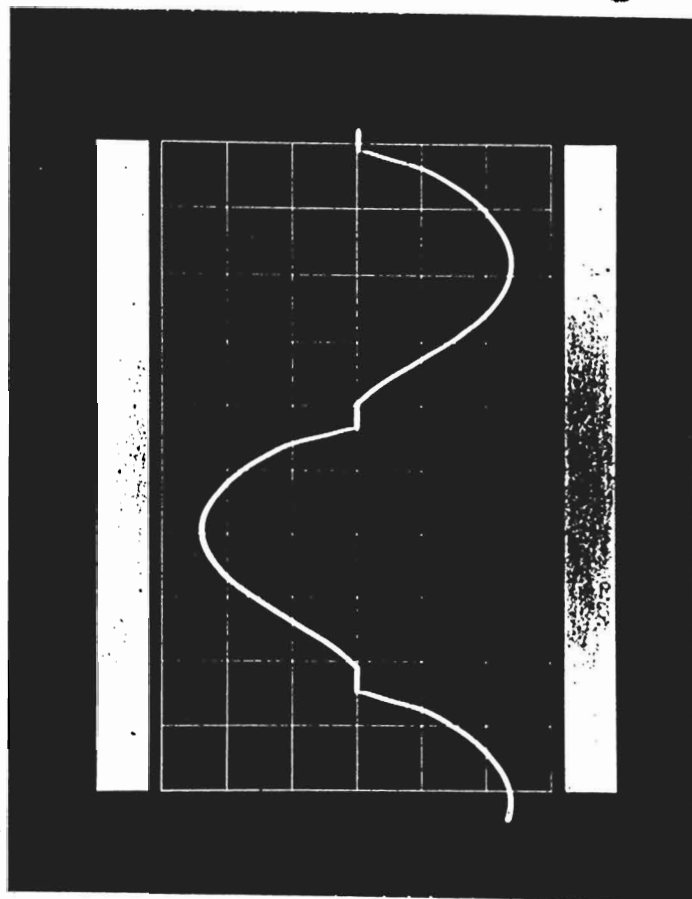
PHOTO 6

Neutral current waveform with A phase and C phase dimmers at full.
Neutral current measures 16.22 amps RMS.

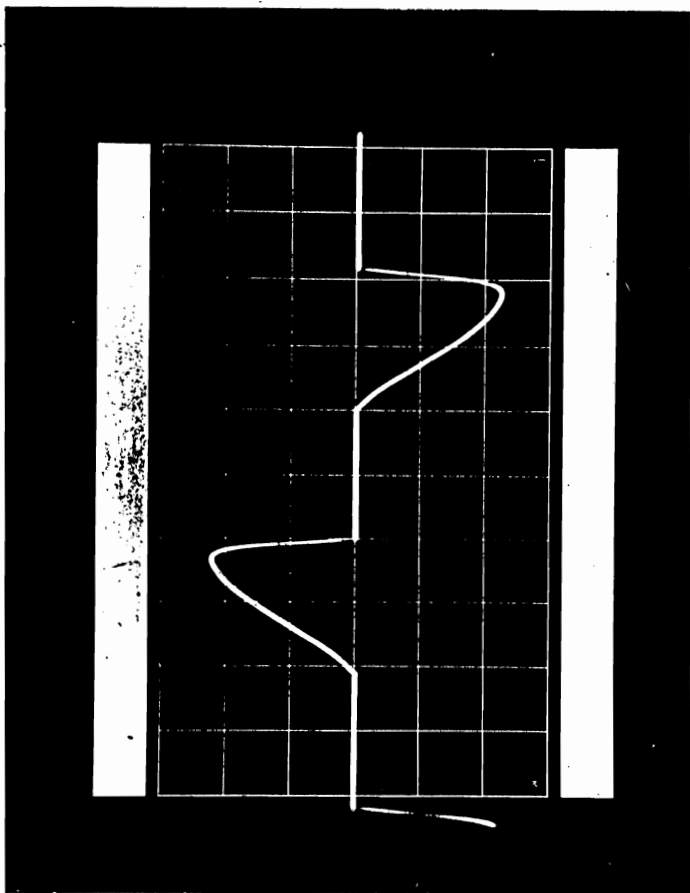
PHOTO 8

Neutral current waveform with A, B, and C phase dimmers at approx. 55%.
Neutral current measures 18.75 amps RMS

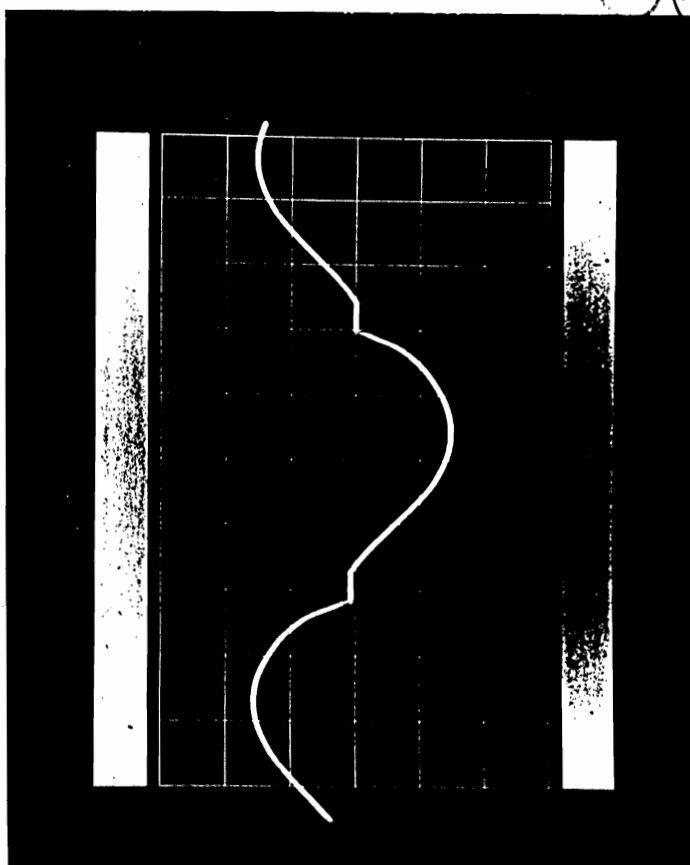
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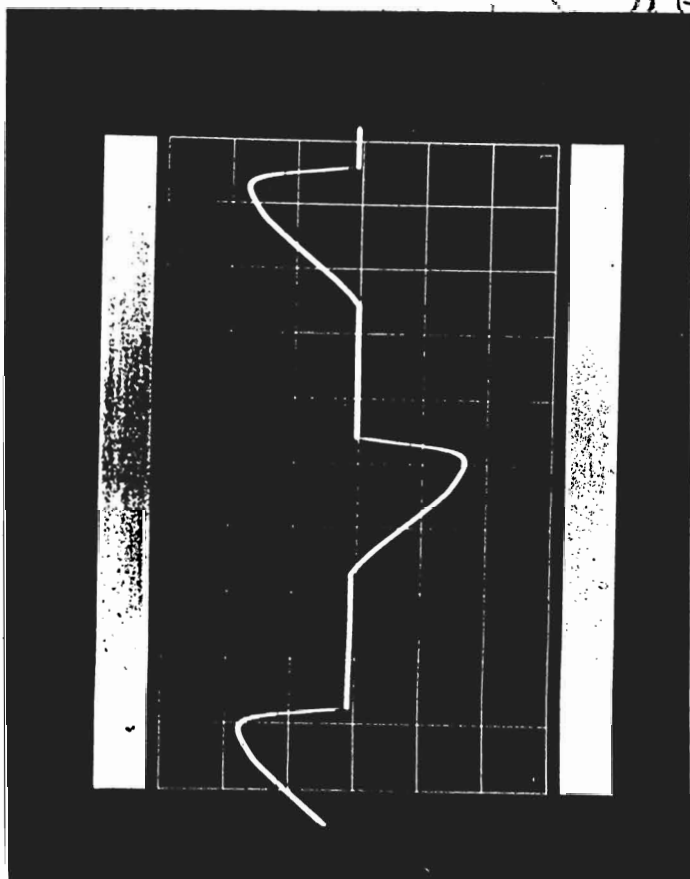
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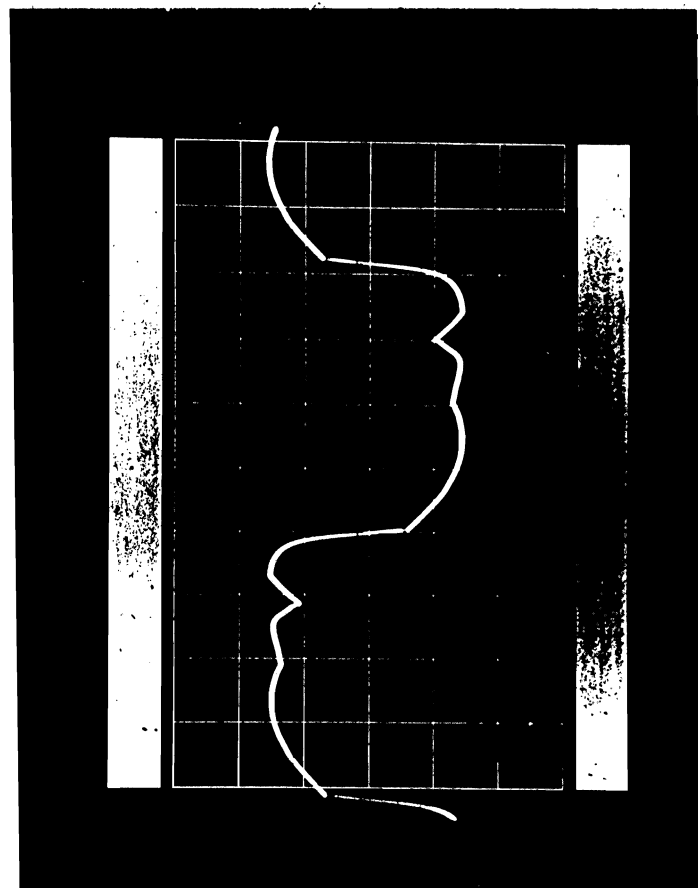
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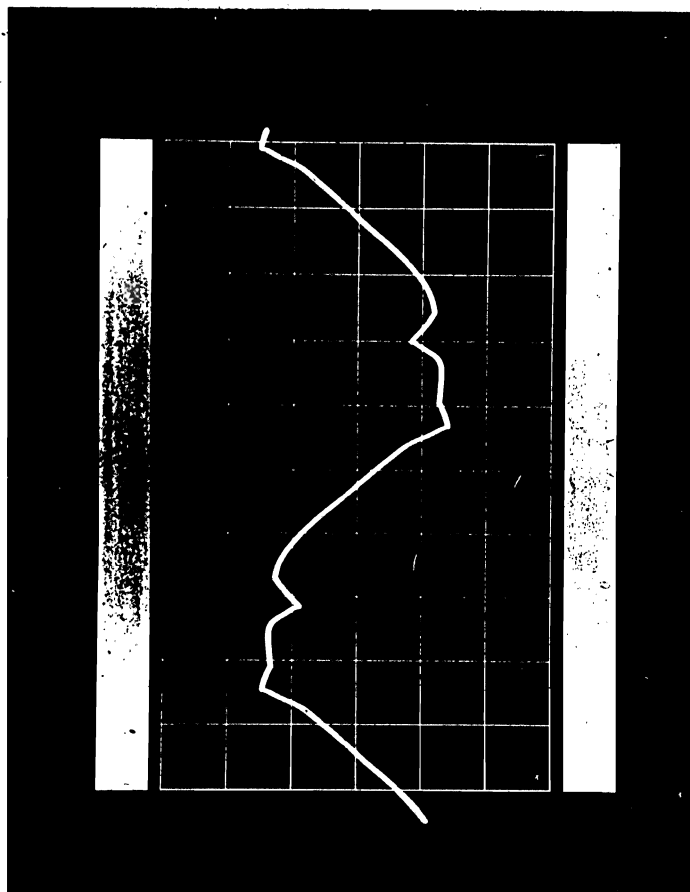


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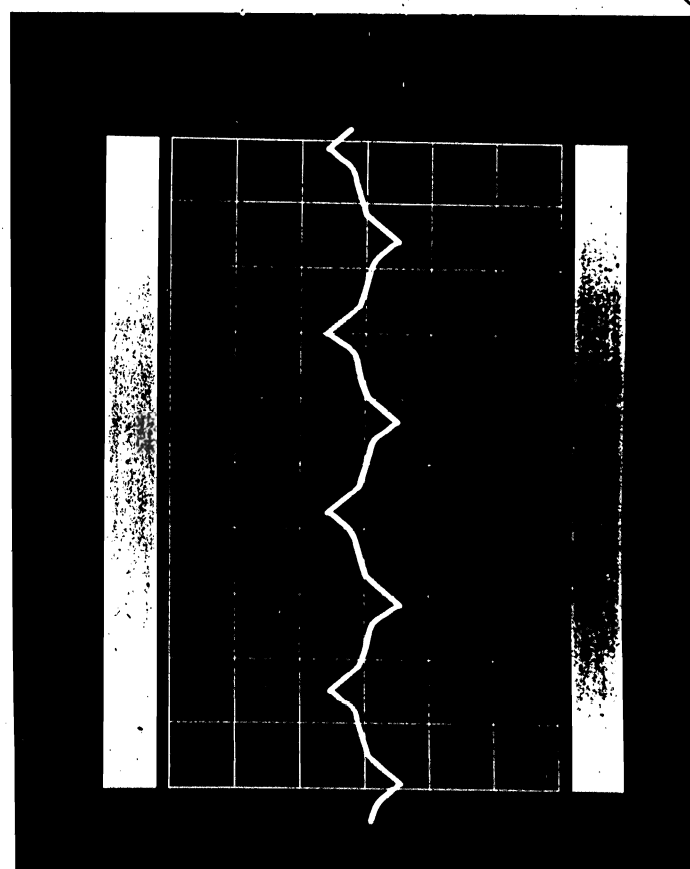


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