



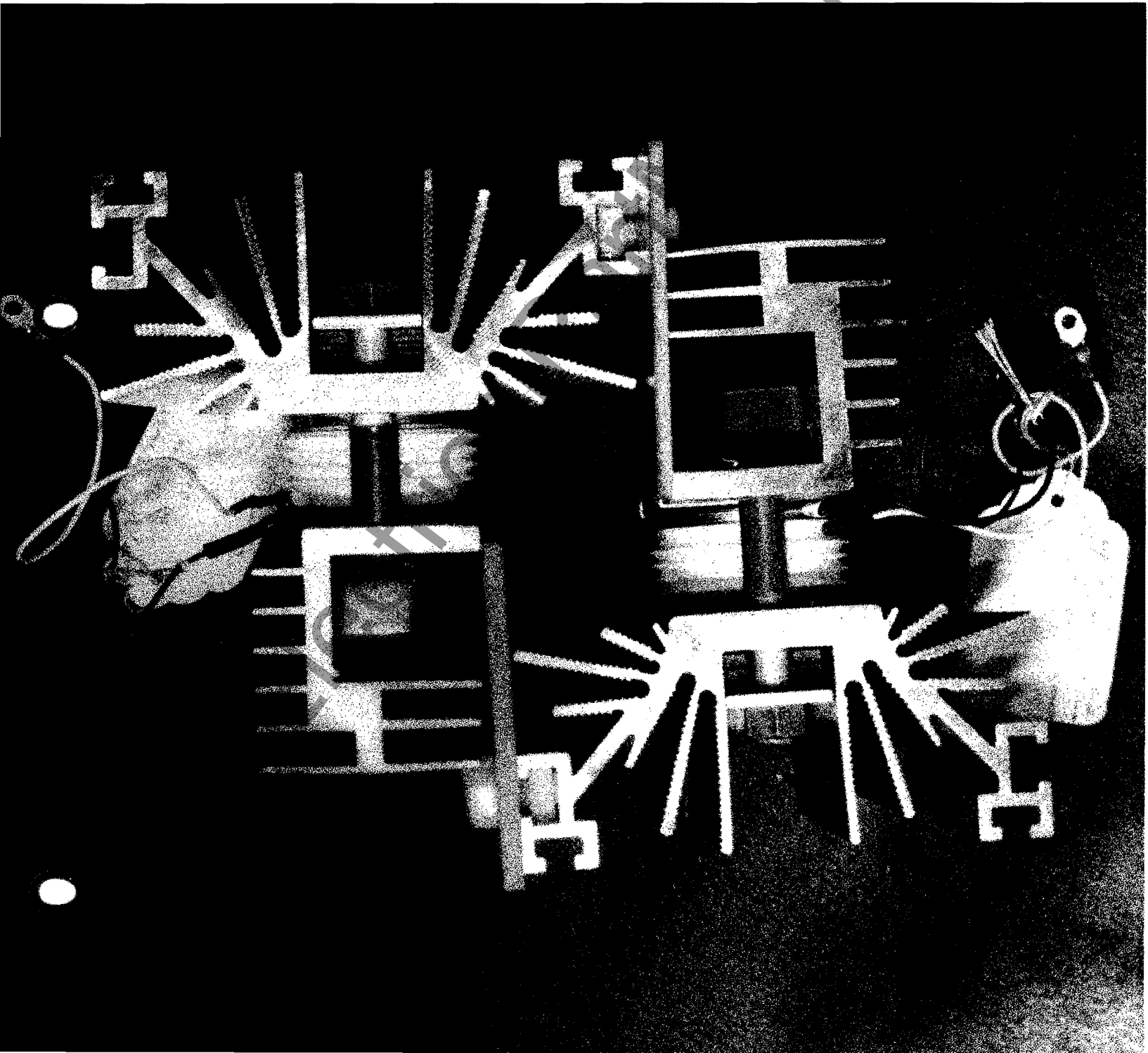
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## M4 Thyristor Case Rebuild





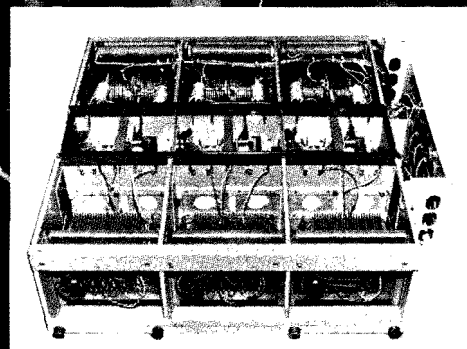
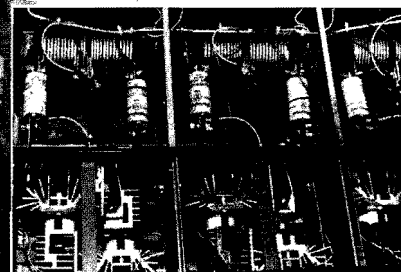
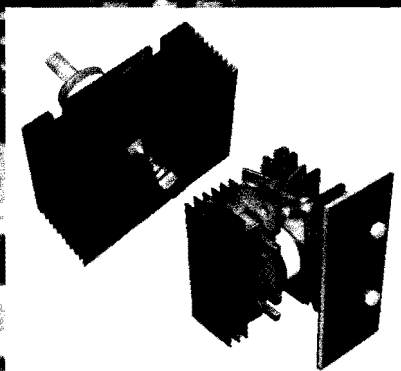
## M4 Thyristor Case Rebuild

Main: Westinghouse engineers provide expert, off-site M4 case rebuild services. A "loaner" case can be provided to minimize facility downtime.

1. Two in series thyristors with integral heat sinks (left) are replaced with a single current production thyristor with separate heat sink (right). The one-in-series design reduces thyristor failure and can represent an 80% reduction in your thyristor inventory.

2. If required, reactor units can be replaced by Westinghouse to minimize fault related failures.

3. New thyristor assemblies and internal AC power distribution system, with rebuilt gating and snubber circuits are an effective mechanical replacement procedure for original Westinghouse M4 thyristor case design.





### **Innovative Modernization Techniques from Westinghouse Engineering & Instrumentation Services**

The Westinghouse Engineering & Instrumentation Services Division (E&ISD) is one of the largest and most experienced industrial service organizations in the nation. With more than 80 fully-staffed Engineering Service Offices throughout the continental U.S., E&ISD has complete local capabilities to provide a wide range of electrical and mechanical equipment services in three broad categories: installation, physical maintenance and engineering advisory services.

At E&ISD, we have established an ongoing program to identify emerging customer needs, and evolve effective service technologies and procedures to meet them. The M4 Thyristor Case Rebuild is just one of many new capabilities we have developed in order to enhance both the quality and scope of service options available to our customers.

As a world leader in the design and manufacture of solid state DC drive control equipment, Westinghouse is the natural choice for M4 Thyristor Case Rebuilds. More importantly, since all M4 Thyristor Cases are Westinghouse built, installed and maintained, we're already familiar with your system's operating history and coordination requirements.

In most instances, retrofitting of your M4 Thyristor Case can be performed at half the cost of a new case. Moreover, replacement of conventional two-in-series thyristor configurations with single thyristor units can significantly enhance reliability and provide extended working life.

### **Modular Case Rebuilds for Added Reliability, Reduced Maintenance and Longer Thyristor Life**

The Westinghouse M4 Thyristor case is the original Westinghouse thyristor power supply, and was manufactured between 1960 and 1970. The M4 case featured matched two-in-series thyristors with integral heat sinks, a configuration which has since become obsolete due to the increased voltage rating of modern thyristors. The M4 Thyristor Case Rebuild is a simple and effective retrofit/refurbishment procedure which replaces these components with more reliable current-production "Hockey Puck" style thyristors with separate heat sinks.

Retrofitting is applicable to all 250, 480 and 750V M4 thyristor configurations. All cases can be rebuilt to 750V class to provide maximum available system voltage capability and universal sparing. In addition, modular construction of individual cases permits quick interchange for loaned replacements or system upgrade programs.

A complete M4 Thyristor Case Rebuild consists of:

- Replacement of matched two-in-series thyristors and integral heat sinks with current-production thyristor units.

- Complete replacement of internal power distribution system, including new leads.

- Examination of reactor mountings to determine integrity of mountings under bolted fault conditions.

- Rebuild of gating distribution system.

- Inspection of wiring harness.

- Rebuild voltage snubber circuits.

### **Features:**

**Thyristor replacement**—Eliminates problems associated with coordinated firing of two thyristors in series, and increases integrity of thyristor case. In addition, retrofitting with current-production components means improved availability of renewal parts, and a 80% reduction in thyristor stocking requirements.

**Rebuilt M4 case fits into existing case mounting and maintains existing cable connection**—This affords minimized repair down-time and a 50% cost-savings versus replacement of M4 Thyristor cases with new manufactured equipment.

**Rebuild can be performed on a loaner basis**—By providing "loaner" M4 cases and performing rebuilds at an off-site Engineering Service Office, E&ISD can reduce by two weeks the amount of facility down-time required for change-out.

**Inspection and replacement of M4 reactor mounts**—Improves fault-withstand capabilities of reactors and associated assemblies, minimizing fault-related failures and reducing by 40% the downtime associated with this type of failure.



## Westinghouse Engineering Service Locations\*

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Birmingham 35209  
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Mobile 36607  
1125 N. Corporate Drive  
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### Arizona

Phoenix 85034  
1825 E. Jefferson Street 602-271-9237

### California

Bakersfield 93301  
1328 34th Street  
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Los Angeles 90221  
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San Diego 92123  
5450 Complex Street  
Unit 310 619-571-2907  
San Francisco 94608  
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### Colorado

Englewood 80110 (Denver)  
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### Georgia

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Savannah 31402  
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P.O. Box 2783 912-236-3066

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Honolulu 96804  
1030 Mapunapuna Street 808-839-9260

### Illinois

Lansing 60438 (Chicago)  
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### Kansas

Overland Park 66210 (Kansas City)  
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Building 6, Suite 200 913-383-6538

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Metairie 70011 (New Orleans)  
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Monroe 71202  
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Syracuse 13206-1683  
4030 New Court Road 315-437-2279

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2001 W. Morehead Street  
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### Ohio

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7710 Reading Road 513-948-7277

Cleveland 44135  
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5722 Clinton Drive 713-675-9667

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1001 East Fourth Street 804-232-8949

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1029 7th Avenue 304-529-3264

### Wisconsin

Elm Grove 53122 (Milwaukee)  
205 Bishops Way  
P.O. Box 1000 414-786-0260

\*The offices which appear above represent a partial listing of Westinghouse Engineering Service offices located in the United States. For a complete list contact your closest office or call the Westinghouse Engineering Information Center at 800-441-3134. Outside of the continental U.S. call 412-928-2559.

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