Phalanx: Generalized Emulation of Microcircuits

System
Phalanx Close-In Weapon System (CIWS)

Role:
Anti-ship Missile Defense

Produced:
1978 - Present

In Service:
Since 1980

Used by:
U.S. Military & 24 Allied Nations

Emulation Support
DLA's Emulation Programs reverse engineered and manufactured a Form-Fit-Function-Interface (F3I) replacement of the part with matching critical programmable timer precision.

This solution prevented costly, time-consuming hardware and software redesign.

The DLA GEM Program provides a permanent on-demand manufacturing source.
<table>
<thead>
<tr>
<th>Application</th>
<th>Phalanx Close-In Weapon System</th>
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<tbody>
<tr>
<td><strong>Obsolete Device</strong></td>
<td>XR-2240, NSN 5962-01-507-5909, SMD P/N 5962-0050701QEA Programmable Timer / Counter</td>
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<td><strong>Emulation Solution</strong></td>
<td>A sample device was electronically reverse engineered and reference information was used to create a Form-Fit-Function-Interface (F3I) Emulation of the original part with matching critical programmable timing precision.</td>
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<td><strong>Customer</strong></td>
<td>DLA, Raytheon, Curtiss Wright Inc., and all subcontractors.</td>
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<td><strong>Benefit to Program</strong></td>
<td>Eliminated hardware and software redesign due to part obsolescence, and provides long-term production support.</td>
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<td><strong>Manufacturing Support</strong></td>
<td>Parts were system validated with a populated Circuit Card Assembly (CCA) in the field prior to live action firing tests. Production status: On-demand manufacturing capability in-place with 1,476 parts delivered from 37 shipments since 2004.</td>
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**Our Story**

In the late 1980s, DLA recognized that microcircuit obsolescence threatened the readiness of many American defense systems. Numerous systems in the armed forces were designed and developed in the 1960s and 1970s. For example, the U.S. Air Force began flying the F-15 Eagle tactical fighter in 1972, and the U.S. Navy first tested the Aegis phased-array radar at sea in 1973. Because of continued advancements in semiconductor technology, the original suppliers stopped manufacturing the microelectronic components used in these and other systems. In 1987, DLA contracted with SRI to begin research and development on how to best replace obsolete microcircuits with standardized, modern integrated circuits (IC). DLA and SRI collaborated to develop the GEM Program. Using its on-site Trusted semiconductor foundry and deep knowledge of IC design/development, SRI produces on-demand, Class Q microcircuits matching the Form-Fit-Function-Interface (F3I) criteria of the required microcircuit. DLA is developing the next generation of F3I microcircuit Emulation capability through the AME Program to further alleviate growing IC obsolescence issues caused by the continued rapid advancements in technology. The new capabilities developed by AME are utilized by the GEM Program to ensure the Emulation Programs continue to meet weapons systems wide-ranging requirements. SRI’s semiconductor foundry is accredited as a Department of Defense (DoD) Trusted Foundry supplier, and our manufacturing processes are qualified to MIL-PRF-38535.

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