



DEFENSE LOGISTICS AGENCY

GEM & AME PROGRAMS

C-17 Globemaster III

Generalized Emulation of Microcircuits



System

C-17 Globemaster III (WSDC DTF)

Role: Strategic and Tactical Airlifter

Produced: 1991 – 2015

System Manufacturer: Boeing

Deployed: June 1993

Number Built: 279

Number in Service:

- Air Force: 157
- Air National Guard: 47
- Air Force Reserve: 18
- Foreign Military: 56

Emulation Support

The expected system service lifetime of the C-17 reaches out until 2040.

There are 27 GEM emulations assigned to NSNs used in the C-17 weapon system.

The DLA Emulation Programs have saved C-17 at least \$30M in cost avoidance.

(*Source: Air Force Scientific Advisory Board)

(**Last updated November 2019)

GEM Part Number: GEM33320BXC

Application	C-17 Landing Gear
Obsolete Device	EP1800 Erasable Programmable Logic Device (EPLD).
Emulation Solution	In this application the device is only programmed once. As a result, the GEM program was able to provide a Form-Fit-Function-Interface (F3I) hard-coded ASIC replacement for the obsolete programmable microcircuit. For over 20 years, the GEM Program has fulfilled 89 delivery orders consisting of over 400 individual parts. The GEM33320BXC part is still actively available.
Customer	Boeing has successfully used the GEM Program's Emulation of a programmable device.
Benefit to Program	Eliminated costly system redesign due to part obsolescence and provide long-term production support.
Manufacturing Support	Utilized on-demand GEM manufacturing capability to deliver over 400 parts on time.

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 War (DOW) Trusted Foundry supplier, and our manufacturing processes are qualified to MIL-PRF-38535.

