

**Table 2-3. Nonrecurring Cost Factors for DMSMS Resolutions**

Resolution	Definition	Nonrecurring Cost Factors			Required Activities and Explanation of Cost	Notes
		Low	Average	High		
Existing Stock	Obsolete, surplus item owned by a firm or activity that is not an aftermarket manufacturer or aftermarket supplier.	—	—	—	Not applicable.	NRE costs associated with excess stock are included in procurement labor. Additional NRE cost for existing stock is assumed to be negligible. A 30% burden is added to the cost of the part if obtained from DSCC.
Reclamation	The use of an item found in equipment beyond economical repair at depots or surplus items from the Defense Reutilization and Marketing Service (DRMS).	\$ 629	\$ 1,884	\$ 3,249	Shipping, refurbishment, and testing. Go/no-go testing only for low hours. Up to 40 hours of screening and testing are included in high value.	Although DRMS normally does not charge DoD users for transportation, the shipping charges included here are for receiving, unpacking, and incoming inspection.
Alternate	A part that is equal to or better than the part specified on a parts list. Such parts may be (1) listed in a specification or standard as superseding parts; (2) upgraded or better than original parts (such as JANTX in place of JAN, Standard Microcircuit Drawing parts in place of vendor unscreened parts, military temperature range parts in place of commercial temperature range parts); or (3) equivalent or interchangeable parts that are functionally the same, mechanically the same, and of the same quality as the specified parts, such as parts from a different vendor.	2,750	6,384	16,500	Engineering investigations, F3I testing, and data. Low to high range reflects the amount of testing needed to ensure that replacement is suitable for the application.	Typically an F3I drop in replacement. Manufacturer part number may change but generic part number may not.
Substitute	A part whose performance may be less capable than the part specified on a parts list for one or more reasons (e.g., quality or reliability level, tolerance, parametrics, temperature range).	5,000	18,111	50,276	Engineering investigations, F3I testing, screening, system testing, qualification conformance inspection testing (QCI) and data. Low to high range reflects the amount of testing needed to ensure that replacement is suitable for the application. Low also applies to linear or memory devices; high applies to processors or controllers.	Typically an F3I drop in replacement but may be a plastic part, commercial part, emulated part (from catalog), or aftermarket part (from catalog). Manufacturer part number and generic part number may change.
Aftermarket	An original equipment manufacturer (OEM)-authorized assembly of an obsolete part. Packaging houses such as Rochester Electronics, Lansdale Semiconductor, and Burlington Microelectronics are authorized by the OEM to provide custom assembly of obsolete integrated circuits using existing wafer and die. In some cases, a manufacturer has acquired the photo mask sets or the entire assembly process from the OEM. A photo mask holds the pattern for each layer of an integrated circuit's design. The manufacturer is then authorized to produce wafer, cut die, and package the cut die.	15,390	47,360	114,882	Engineering investigations, F3I testing, screening, qualification conformance inspection testing (QCI) and data. Includes minimum buy, ranging from 50 to 283 units. Aftermarket manufacturers factor these costs into the recurring cost of the components. Low value is for cutting and packaging die; high value is for manufacturing wafer, cutting die, and then packaging.	Some sources provide product only until wafer/die inventory is depleted. The majority of sources did not provide data on system testing. If required, system testing could add an average of \$5,375.
Emulation	A manufacturing process that produces a substitute form, fit, function, and interface (F3I) item for the unobtainable item. Through microcircuit emulation, inventory reduction can be achieved because obsolete items can be replaced with state-of-the-art devices that emulate the original and can be manufactured and supplied on demand.	17,000	68,012	150,000	Engineering investigations, F3I testing, screening, system testing, qualification conformance inspection testing (QCI) and data. Reverse engineering original device and developing a personalized wafer. Low to average range indicates complementary metal oxide semiconductor (CMOS) or bipolar technology with fewer than 1,000 gates. High is greater than 1,000 gates or when more development time is needed due to increased complexity.	Does not include mixed-signal or high-voltage parts. Does not include advanced technology requiring VHDL. Range for mixed-signal, high-voltage parts is \$50k to \$300k.
Redesign	Designing a DMSMS item out of the system. Usually used as a last resort, with the goal typically of enhancing system performance and improving reliability and maintainability. Because substantial NRE and recurring logistics cost may accrue, redesign is most appropriate when a sufficient quantity (determined by cost trade-off analysis unique to each circuit board) of DMSMS problems are involved for the same circuit board.	22,400	111,034	250,000	Minor redesign (board re-layout) of a circuit card assembly (shop replaceable unit): engineering, program management, test, and data. High value includes qualification.	The average between minor and major redesign is approximately \$250k (\$260,593). However, one outlying data point of \$2,000k was removed from the data because it was more than 3 sigma (standard deviations) from the mean—most likely due to unique program requirements. If that point is included, the average for major redesign is \$516,142 and the combined average for minor and major redesign is \$313,588.
		200,000	410,152	770,000	Major redesign (board replacement) of a circuit card assembly (shop replaceable unit): engineering, program management, test, and data. High value includes qualification.	
LOT Buy	The purchase of a sufficient quantity of an obsolete item to meet the projected demands of the supported equipment for its expected operational lifetime. Preferable to LOT buy is bridge buy, a purchase of limited-quantity components to support near-term requirements until a longer-term solution can be achieved.	—	—	—	Quantity needed to sustain operations over a specified period of time. Based on program-specific demand calculations (product of component cost, failure rate, operating hours, quantity per end item, and quantity of end items).	Bridge buys are also program-specific.