BSS Audio
Soundweb London BLU-80, BLU-32, BLU-16 MTBF
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5/16/2008

MTBF Defined

Failure rates of systems are normally characterized by the so-called "bathtub curve". System life is divided into three phases: infancy, useful life, and end of life. MTBF is simply the inverse of the failure rate during the useful life period (mean time to failure, or MTTF) plus the mean time to repair (MTTR).[i]
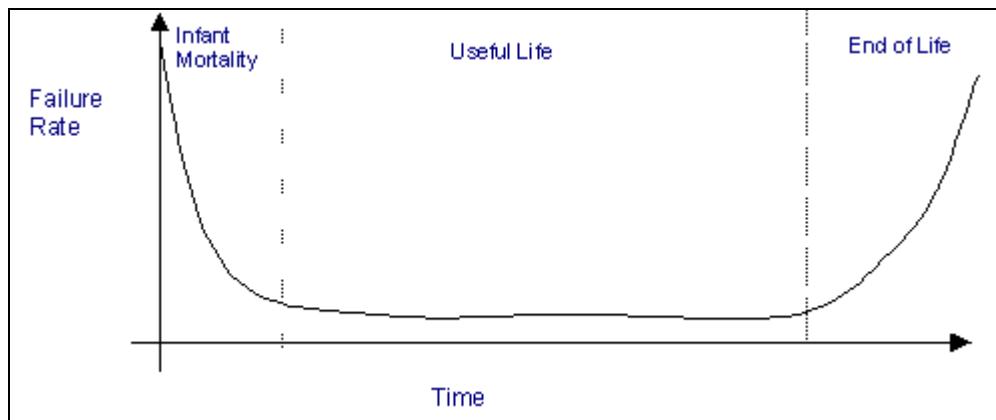

Figure 1 – The "Bathtub" Curve[ii]

The MTBF for the BSS Audio Soundweb™ London products BLU-80, BLU-32, and BLU-16 was calculated by measuring the return rate in a sample population, as described below.

Calculation Methodology

A population of 486 Soundweb™ London BLU-80, BLU-32 and BLU-16 devices was evaluated. The failure rate during "useful life" was measured by counting all returns for repair from the sample population three months after shipment for installation. This measurement was carried out over a five month (22 week) observation period. Four units failed during this period.

The service time during the observation period was calculated as follows:

80% operate full time (24 hours per day, 7 days per week) over the 22 week period:
22 weeks full time = (22 weeks) x (168 hours/week)   = 3696 hours

20% operate part time (5 hours per week) over the 22 week period:
22 weeks part time = (22 weeks) x (5 hours/week)   = 110 hours

The average operation time is 80% x 3696 + 20% x 110   = 2979 hours

The demonstrated MTTF and MTTR can therefore be calculated as follows:

MTTF = (Population x Average Operation Time) / (Repair Population)
MTTR = (Total Repair Time) / (Repair Population)

MTBF is the sum of MTTF and MTTR (the Mean Time to Repair). Since the MTTF of the Soundweb™ London products is on the order of decades, the MTTR does not materially affect the demonstrated MTBF. MTBF is therefore essentially the same as MTTF in this case.

This information is summarized in Table 1 below:

Production Population	486	units		
Operation Analysis				
Operating period	22	weeks		
Full Time Percentage	80.00%			
Full Time Rate	168	hours/week		
Part Time Percentage	20.00%			
Part Time Rate	5	hours/week		
Average Operation	2979	hours		
Return Population	4	units		
Demonstrated MTTF	361924	hours	41.316	years

Table 1 – MTTF Summary

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[i] Daly, Kevin, "MTBF", as quoted at http://en.wikipedia.org/wiki/Mean_time_between_failures

[ii] Adapted from Speaks, Scott, "Reliability and MTBF Overview", Vicor, as quoted at http://www.vicr.com/documents/quality/Rel_MTBF.pdf