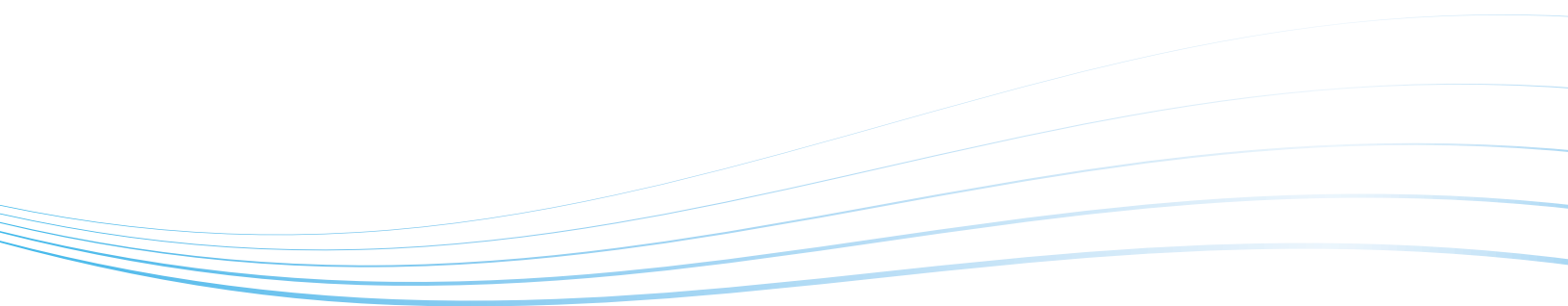




PLANTRONICS
SOUND INNOVATION™

All headsets are
not created equal.

.....
>>> > WHITEPAPER



→ ◎ • • → **All Headsets Are Not Created Equal.**

INTRODUCTION

Telephone headsets and amplifiers are a significant core expense for call centers. With economic pressures forcing companies to chisel as much cost as possible from their operations, some call centers may feel tempted to make initial purchase price the primary factor in their headset buying decisions.

Most call centers, however, recognize that a more important buying criteria than initial price is headset performance over time—that is, the total cost of owning a headset. Obviously, when price points are reasonably comparable, headsets that need fewer repairs and general service, and that last longer, will in the long run, cost less than headsets that are less durable.

But it has been difficult for call centers to find an objective measure of headset durability. Until now, they have had to rely on their experience with different headset models—a valuable guide for the future, but one that doesn't prevent costly buying errors today.

This is why Plantronics recently completed, and is now publishing, the results of an exhaustive test of headset durability. Plantronics has conducted these durability tests on its own headsets for many years as part of its rigorous quality assurance program. The particular tests discussed in this white paper include Plantronics headsets and headsets from another vendor—GN Netcom—to give call centers an overall headset durability benchmark.

The test results show clear evidence that Plantronics headsets perform significantly more reliably than those from GN Netcom, and that buying Plantronics headsets can significantly reduce the amount call centers must spend on headsets overall. The bottom line is that all headsets are not created equal and Plantronics headsets are the most cost-effective headsets for call centers to own over time.

TEST METHODOLOGY

The headset durability tests discussed in this white paper were conducted by Plantronics' Product Assurance Labs at its test laboratory in Santa Cruz, California. Wherever possible, the test design incorporates recognized industry standards. In instances where standards have not been set, the test design uses metrics that represent reasonable headset performance expectations as identified by call center managers.

Each headset underwent seven tests. All headsets were tested using the same methodology and equipment. The tests, described below, are constructed to simulate headset usage in a real call center environment over a period of four years. The only exception is the electrostatic discharge test, which simulates headset usage over a period of two years.

1. Drop test: Headsets are dropped from a height of 60 inches (average wearing height while standing for headsets) and 30 inches (average desk height for amplifiers) until a failure occurs or until each piece is dropped 72 times, simulating 18 drops per year over four years. This standard is set by FCC part 68 and Bellcore GR-314-CORE.

2. Cable flex test: Headset cables (the cord connecting the telephone to the headset) are flexed at the boot until a failure or 400,000 flexes, simulating 100,000 flexes per year over four years.

3. Boom rotation test: The headset boom is rotated until a failure or 40,000 rotations, simulating 10,000 rotations per year over four years.

4. Headset/handset switch cycling test: The headset/handset switch is activated until a failure or 200,000 times, simulating 50,000 activations per year over four years.

5. Volume control cycling test: The headset volume control is rotated end to end until failure or 20,000 rotations, simulating 5,000 rotations per year over four years.

6. Electrostatic discharge (ESD) test: Voltages of plus and minus 8 kV are discharged into the product until failure or 20 discharges, simulating 10 ESD hits in each polarity per year over two years. This standard is specified in the European Union standard EN55024 (1998).

7. Storage/thermal shock test: This test simulates temperature and humidity extremes that a headset may experience during shipment. Each headset is tested for performance after experiencing several temperature cycles from -20°F to 150°F and being stored at 90°F /90% humidity. This standard is set by Bellcore GR-314-CORE.

Four headset/amplifier combinations were tested: two from Plantronics and two from GN-Netcom. These headsets and amplifiers were chosen to be tested for two key reasons: they are models that directly compare and compete against each other and they each represent a combination of headset/amplifier that are commonly used in the call center environment.

Table 1: Four amplifier/headset combinations were tested.

Style	Plantronics Headset	GN Netcom Headset
Convertible style with noise-canceling microphone.	DuoPro® H181N-M12 Suggested price:\$264	405 Flex Profile SF-GN8000 Suggested price: \$228
Dual earpiece headband style with a noise-canceling microphone.	Encore® H101N-M12 Suggested price: \$268	ADDvantage Plus ADP II-GN8000 Suggested price: \$228

TEST RESULTS

The Plantronics and GN Netcom headset models performed comparably on three tests:

- Cable flex*
- Headset/handset switch cycling
- Volume control cycling

Full results of these tests are included in Appendix A.

* Note that two of the four GN Netcom ADPII-GN8000 models tested did not pass the cable flex test at the 400,000 mark, the threshold passed by the other models tested. Full results are shown in Appendix A.

However, significant differences between the Plantronics and GN Netcom models were shown in four of the seven tests:

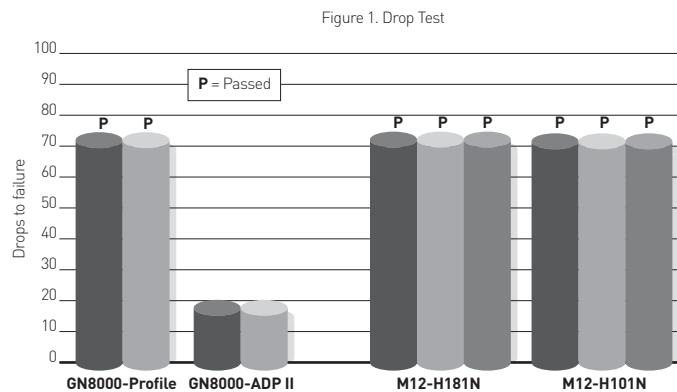
- Drop test
- Boom rotation
- ESD
- Storage/thermal shock

The results of these studies are discussed here.

Drop test

In the drop test, a "failure" is defined as the headset ceasing to function or the headset being so mechanically changed that the call center would not be able to reassemble the product. As shown, both Plantronics headset models and the GN8000-Profile passed the 18-drops-per-failure standard (FCC part 68 and Bellcore GR-314-CORE) simulated by Plantronics to 72-drops-per-failure to represent for four years of use; the GN8000-ADP II, however, had a drops-to-failure score of 18.

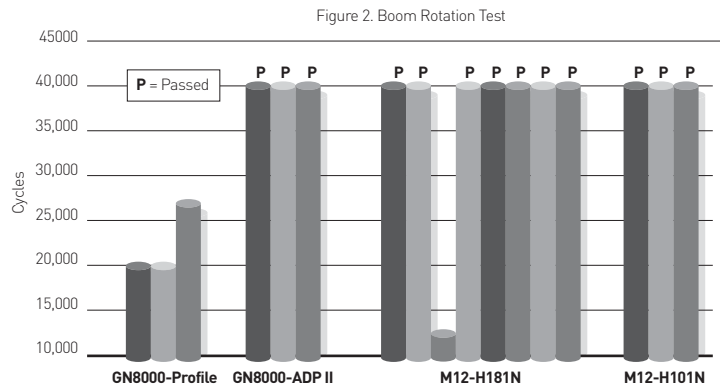
Figure 1:
Results of the
drop test



Boom rotation test

As figure 2 illustrates, the Plantronics DuoPro H181N-M12 and seven of eight Plantronics Encore H101N-M12 models tested met the 40,000 cycles-to-failure standard outlined in the boom rotation test. The GN8000-ADP II model—the model that failed the drop test—also met the 40,000 rotation measure. However, the GN Netcom model that passed the droptest—the GN8000-Profile—had two failures at the 20,000 mark and a third at just under 27,000. In this test, a failure is defined as a notable difference in the operation of the boom, as demonstrated by noise, static or intermittent function.

Figure 2: Boom rotation test. A failure is defined as a notable difference in the operation of the boom, as demonstrated by noise, static, or intermittent function.

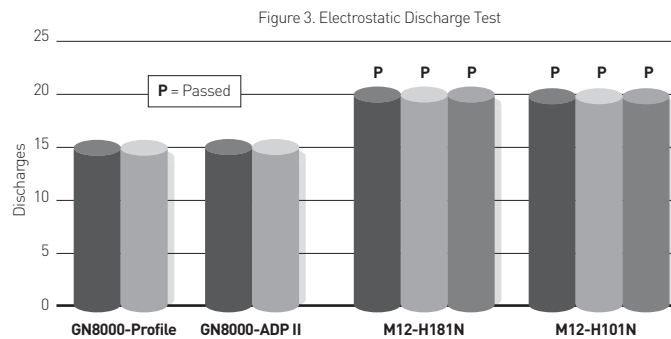


Electrostatic discharge test

The ESD test measures the headset’s response to receiving an electrostatic shock. The European Union standard, EN55024, requires headsets to be able to withstand at least ten shocks, which is typically what a headset will receive in one year.

Figure 3 illustrates the results of the ESD testing. The GN Netcom headset models failed at 15 electrostatic shocks, while Plantronics headset continued to operate normally at 20 shocks, a number simulating the number of shocks expected in a two-year period.

Figure 3: Illustrates the results of the ESD testing.

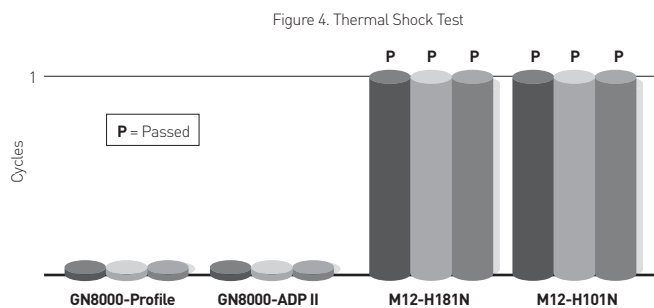


Storage/Thermal shock test

As noted previously, this test is designed to measure a headset's ability to withstand the extremes of temperature and humidity it may experience during shipment. (Therefore, as product shipment generally occurs a limited number of times—and possibly only once—a four-year-equivalency test design is not applicable here.)

The storage/thermal shock test measures a single shipment "cycle." A cycle consists of four stages: First each headset is stored for six hours at -20°F and six hours at 150°F; then the headset is stored—twice—for two hours at -20°F and two hours at 150°F. Finally the headset is stored for six hours at 90°F/90% humidity. In this test, failure is defined as the unit no longer functioning for a simple user test.

Figure 4: Neither of the GN Netcom headsets passed a storage/thermal shock cycle.



SUMMARY: YOUR HEADSET CHOICE MAKES A DIFFERENCE TO YOUR BOTTOM LINE

The results of the above headset reliability tests conducted by Plantronics demonstrate clearly that the cost of a headset is much more than its initial purchase price. When you calculate the total cost of ownership over the life of a headset, the durability of Plantronics products clearly illustrate that all headsets are not created equal—Plantronics headsets do not break as often as the competition. Fewer failures allow agents to stay on task, increasing productivity. Fewer failures also mean you need less inventory on hand to run your call center and less time managing broken inventory, which lowers your total cost of ownership.

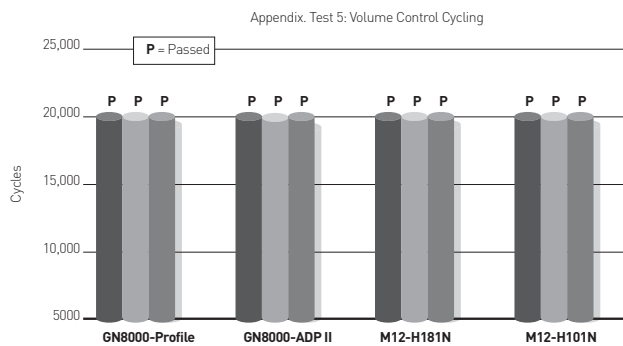
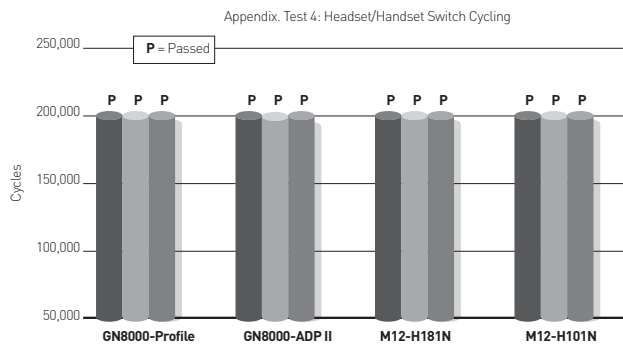
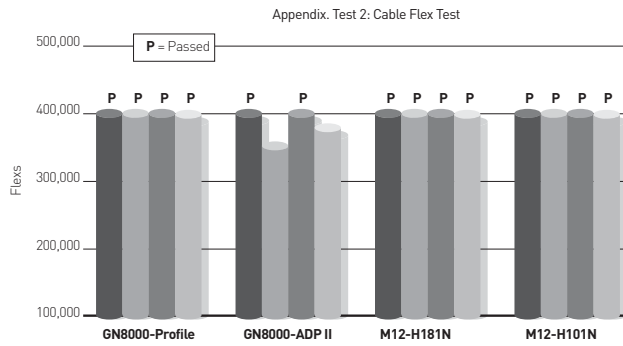
The following is a short list of categories where Plantronics headset durability can improve cost of ownership measurements:

- Security stock—Fewer spare headsets on hand to run your center.
- Spare parts—Fewer accessories required to keep agents operational.
- Storage—Less space required to store additional headsets and accessories.
- Accumulated agent uptime—Fewer failures increases agent availability and performance metrics.
- Handling—Time and effort spent obtaining a replacement headset: from collection, to storage, to purchase order routing through the organization, etc.
- Shipping expenses—Cost to return the headset to the vendor for service.
- Repair Charges—The cost to have the headset repaired.

Regardless of the size of a call center, these cost savings can make a substantial contribution to trimming bottom line expenses.

Appendix A

Results of the tests in which Plantronics/GN Netcom performed comparably.



Sound innovation for missions to the moon. And for everyday life on this planet, too.

In 1969, a Plantronics headset carried the historic first words from the moon: "That's one small step for man, one giant leap for mankind." Today, we're the headset of choice in mission-critical applications such as air traffic control and 911 dispatch. This history of proven sound innovation is the basis for every product we build—whether it's for work, for home or on the go.

