

**Call up #7 against Standing Offer W7711-037898
CR 2008-086**

Speech Communication in Noise

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Contract #W7711-037898/001/TOR

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Abstract

This report describes work performed by Trellis Consulting on Callup #7 against Standing Offer #W771-037898 during the months of January to March of 2008 DRDC Toronto. A set of DVDs created of existing DAT noise loops were calibrated to give the same resultant noise spectra in the Noise Simulation Facility. As well, normalized CDs were created for an external source to use. Familiarity with the QuietPro™ system was also acquired.

Résumé

Le présent rapport décrit les travaux effectués par Trellis Consulting dans le cadre de la commande subséquente n° 7 à l'offre à commandes n° W771-037898 durant les mois de janvier à mars 2008 à RDDC Toronto. Un jeu de DVD créés à partir de boucles de bruit sur bande audionumérique ont été étalonnés de manière à produire le même spectre de bruit résultant dans l'installation de simulation du bruit. De même, des CD normalisés ont été créés pour utilisation par une source externe. On s'est également familiarisé avec le système QuietPro^{MC}.

Executive Summary

During this seventh call up against Standing Offer W7711-037898, the DVD loops created previously were calibrated in the Noise Simulation Facility of DRDC Toronto to give identical frequency spectra as the original DAT loops. This was imperative to achieve so that the noise loops accurately represented the original recordings. Normalized CDs were also created to give the best possible fidelity to external consultants for their testing purposes. Additionally, the capability of Nacre QUIETPRO™ communications earplugs was investigated in preparation for laboratory trials.

Sommaire

Dans le cadre de cette septième commande subséquente à l'offre à commandes n° W7711-037898, les boucles sur DVD créées antérieurement ont été étalonnées dans l'installation de simulation du bruit de RDDC Toronto de manière à donner le même spectre de fréquences que les boucles originales sur bande audionumérique. Il fallait absolument effectuer cet étalonnage pour que les boucles de bruit représentent fidèlement les enregistrements originaux. Des CD normalisés ont aussi été créés afin de fournir la meilleure fidélité possible pour les essais exécutés par les consultants externes. De plus, on a analysé la capacité des bouchons d'oreilles pour communications Nacre QUIETPRO^{MC} en vue des essais en laboratoire.

1 Introduction

This document describes the work carried out by Trellis Consulting while working on Call up #7 against Contract # W7711-017898/001/TOR. Originally, this call up covered the 2-month period from 1 January 2008 to 29 February 2007. The call up was extended until March 31, 2007.

The main objective of this Call up was to convert the library of audio tapes in DRDC Toronto's Noise Simulation Facility's (NSF) to DVD format and provide general technical help pertaining to the facility's audio system.

The Statement of Work also called for:

- a. Expansion and validation of currently available software to run an experiment on speech communication in the Noise Simulation Facility.
- b. Noise recording and calibration of levels as required.
- c. Consultation on the purchase of equipment for the measurement of noise and computer hardware/software in support of psychoacoustic experimentation and signal processing.
- d. Cross checking of acoustics devices against DAs
- e. Assistance with the analysis and interpretation of noise dosimetry data previously collected during field trials

2 Tasks Performed

The following sections describe the work performed under this Call up.

2.1 Calibration of DVDs

A newly purchased DVD player for use in the NSF outputs audio signals at levels that are different from those output by all the other existing noise sources in the facility. This meant that numerous level measurements had to be made in order to get a properly calibrated signal coming from the DVD player. Special purpose noise CD's were created to assist in analyzing the level from the DVD player. Ultimately, the proper levels were found and 4 hour DVD's of each noise source were recorded and added to the noise library. These included recordings of:

- Aurora
- Leopard Tank
- Griffon
- Sea King
- Hercules (Load Master position)
- Hercules (Flight Engineer position)

2.2 Normalized CD Creation

There was also a requirement to create a separate set CDs for use in an external research facility. Since the capability of the audio system in that facility had not been specified, it was necessary to provide the highest possible signal to noise ratio on the CDs. To this end, normalized versions of the CD's were created. The noise spectra of each source was also provided with the CDs to allow for proper calibration.

2.3 Nacre QUIETPRO™ Communications Earplugs

During this Call up two sets of Nacre Quietpro communications earplugs were purchased for laboratory trial. In order to understand the capability of this device which is being considered for purchase by the CF there was a requirement to attend a demonstration by the distributor. Instruction was provided on the capability and various features of this device and methods of fitting.

3 Recommendations for Future Technical Work

In order to continue with the lines of experimentation detailed above and based on an assessment of the work completed to date, the following requirements are foreseen:

1. Expansion and validation of currently available software in the Noise Simulation Facility to model auditory overload in a CF vehicular command post.
2. Noise recording and calibration of levels as required.
3. Consultation on the purchase of equipment for the measurement of noise and computer hardware/software in support of psychoacoustic experimentation and signal processing.
4. Cross checking of acoustics devices against DAs

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