

Technical evaluation for promoting practical utilization of digital watermark
(project name: STEP2000)
Request for proposals

1. Objective

Digital watermark is an indispensable constituent technology for musical works and copyright management in the digital/network age. For various reasons, however, the movement toward their practical utilization has not gathered sufficient momentum. With a name abbreviated as "STEP2000", this project is aimed at furnishing enterprises involved in digital music distribution with major options for selection of digital watermark technology. It consists of the testing of the performance of various types of digital watermark technology and certification of those found to meet prescribed performance requirements. It is the objective of STEP2000 to certify the performance of digital watermark technology considered on the standardization project and the evaluative project to date, and thereby to promote its practical utilization. This proposal is the document to invite participant company("PARTICIPANT COMPANY") to this project.

2. Setup for implementation

STEP2000 is being promoted by JASRAC, CISAC and BIEM as the organizer("ORGANIZER"). JASRAC also functions as the project leader and the principal of evaluation and certification("PROJECT LEADER"). The Collective administrations of author's rights noted below will support the project, these organization are described as the member("MEMBER").

APRA (AUS) ,ASCAP (USA) ,BMI (USA) ,BUMA / STEMRA (NLD) ,
CASH (HKG) ,GEMA (DEU) ,MCPS / PRS (GBR) ,SACEM (FRA) ,
SGAE (ESP) ,SIAE (ITA) ,TEOSTO (FIN) ("MEMBER" as of 15 June 2000)

The ORGANIZER have asked Nomura Research Institute, Ltd. to serve as the project secretariat("PROJECT SECRETARIST"). The PROJECT SECRETARIST is to carry out the assessment testing in cooperation with the Japan Acoustic Laboratory.

3. Subject digital watermark technology (system requirements)

1) Information embedded in music material

Information is to be embedded in the sample tracks for two types of use. (As for the amount of bits to embed, we are considering more than one prerequisite.)

- * Copy control information - 2 bits in a time frame of no more than 15 seconds
- * Copyright management information - 72 bits in a time frame of no more than 30 seconds

2) Prerequisites for digital watermark technology

While there are various conceivable prerequisites for digital watermark technology, those applied in STEP2000 are as follows.

* Robustness

The digital watermark embedded in music material must be capable of detection even after various processing for use.

(Prospective processing)

- Processing in the mastering studio
- Processing in the broadcasting studio (and the prospective broadcasting environment)
- Processing related to distribution through networks
- Processing by consumer level equipment
- * Processing by DVD audio players (under consideration)

* Audibility

After the digital watermark has been embedded in it, the music materials must exhibit negligible deterioration of audibility (sound quality) even with golden or silver ears. In addition, quantitative analysis from the standpoint of acoustic science must not reveal any characteristics that would present problems in use.

* Time required for embedding and extraction of watermark information

The embedding and extraction of watermark information must be capable of accomplishment in a short time that would not hinder utilization.

* Multiple layer support (capability for handling multiple watermark layers)

The information embedded in music material must be capable of detection even after embedding additional information using the same watermark system. (The technology would permit the embedding of different watermark information on the same music material with the same watermark system by more than one company.)

4. Outline of the testing

In connection with the testing, the secretariat and participating firms will provide each other with certain items, as follows.

* Items provided by the secretariat to the participating firms

- Information to be embedded as the digital watermark
- CD-R (WAV file format) recorded with the sample tracks (five tracks) – 44.1 KHz/16 bit/ 2 channels: five tracks

* Items provided by the participating firms to the secretariat

- CD-R (WAV file format) recorded with the sample tracks embedded with the digital watermark
- Software/hardware (and system documents) for embedding the digital watermark information
- Software/hardware (and system documents) for extracting the digital watermark information

After receiving the items from the participating firms, the secretariat will conduct the testing for evaluation as to satisfaction of the aforementioned prerequisites. The specifications of this testing will be notified to each of the participating firms individually.

* In addition, the secretariat shall engage in exchange of other types of information necessary for utilization (adoption by businesses) with the participating firms.

* The secretariat shall also conduct testing related to processing with DVD audio (96 KHz/24 bits/6 channels) using the software and hardware provided by the participating firms (under consideration).

** Check of technology related to copy control

- The secretariat will test technology related to copy control in order to gauge the future application possibilities.
- In this testing, it will confirm whether or not the status of copy control information can be altered using the software (or hardware) provided by the participating firms.

5. Schedule

- 1) The firms intending to participate in the testing must convey these intentions to the secretariat no later than 14 July 2000 (Japan Standard Time; this stipulation also applies to other dates herein). Thereafter, they will conclude a contract for participation (i.e., project membership) inclusive of NDA with the secretariat. After contracting, the secretariat will promptly provide the participating firms with the prescribed items.
- 2) The participating firms will provide the secretariat with the prescribed items no later than 14 August 2000.
- 3) The test will be completed no later than 14 September 2000.
- 4) The participating firms will be notified of the certification of the technology recognized through the testing as meeting the prescribed performance requirements no earlier than 15 September 2000.

*In case the test items those are now under consideration or additional test is conducted, time schedule described below 2) might be changed.

6. Participation conditions

In light of the project's objective, the following conditions will be applied for participation.

* The technology in question must already be commercialized (or have an equivalent record of use).

* The company in question must have a business foundation solid enough to ensure ongoing, stable use of the technology by firms wanting to adopt it.

7. NDA

The participating firms will conclude a contract for participation with the secretariat inclusive of NDA. The NDA will contain stipulations on matters such as disclosure of information outside the secretariat and prohibition of reverse engineering. At the same time, it will define the scope of information disclosure to the executive principal and to the general public.

* Japan Acoustic Laboratory, which is implementing the testing, will be accorded the same position as the secretariat in the context of NDA conclusion.

8. Technical certification for technology

Technical certification for technology recommended for the use of enterprises involved in electronic music distribution, the executive principal will issue a certificate for its performance and announce the name of the company in question (there will be no announcement of the names of companies whose technology was not certified).

9. Inquiries

Inquiries and intentions to participate in the project should be relayed to the parties noted below by e-mail or conventional mail.

*Intentions to participate and general questions

Hideki Matsuo / Fumihiro Hirayama
Nomura Research Institute, Ltd (secretariat)
2-2-9 Hongo Bunkyo-ku Tokyo, Japan
step2000@nri.co.jp

*technical questions

Dr Hajime Suzuki / Dr Yasushi Yoshida
Japan Acoustic Laboratory
step2000@np.catv.ne.jp