# PATENT ASSIGNMENT

Electronic Version v1.1
Stylesheet Version v1.1

| SUBMISSION TYPE: | NEW ASSIGNMENT |
| --- | --- |
| NATURE OF CONVEYANCE: | ASSIGNMENT |

**CONVEYING PARTY DATA**

| Name | Execution Date |
| --- | --- |
| UCL BUSINESS PLC | 12/07/2011 |

**RECEIVING PARTY DATA**

| Name: | ASIO LIMITED |
| --- | --- |
| Street Address: | Argyle House |
| Internal Address: | 29-31 Euston Road |
| City: | London |
| State/Country: | UNITED KINGDOM |
| Postal Code: | NW1 2SD |

**PROPERTY NUMBERS Total: 1**

| Property Type | Number |
| --- | --- |
| Application Number: | 12926470 |

**CORRESPONDENCE DATA**

| | |
| --- | --- |
| Fax Number: | (703)816-4100 |
| Phone: | 7038164000 |
| Email: | jck@nixonvan.com |

*Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent via US Mail.*

| | |
| --- | --- |
| Correspondent Name: | Paul T. Bowen |
| Address Line 1: | Nixon & Vanderhye P.C. |
| Address Line 2: | 901 N. Glebe Road, 11th Floor |
| Address Line 4: | Arlington, VIRGINIA 22203 |

| ATTORNEY DOCKET NUMBER: | PTB-5663-2 |
| --- | --- |
| NAME OF SUBMITTER: | Paul T. Bowen |

Total Attachments: 8
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Deed of Assignment


Between


UCL Business PLC


And


ASIO Limited


Dated 7ᵗʰ December 2011


UCLB
Business

**THIS DEED OF ASSIGNMENT** dated                 2011 is made between:

1. **UCL Business Plc** ('UCLB'), incorporated in England and Wales (company registration number 02776963), whose registered office is The Network Building, 97 Tottenham Court Road, London W1T 4TP.

2. **ASIO Limited** ('ASIO'), incorporated in England and Wales (company registration number 07851934), whose registered office is Argyle House, 29-31 Euston Road, London NW1 2SD.

**RECITALS**

a) UCLB has made two Proof of Concept (PoC) awards for the development of the Chirp PoC Project (as defined below) .

b) Pursuant to the terms of these awards, all Intellectual Property generated during the Chirp PoC Project is owned by UCLB.

c) The Parties have agreed that the Intellectual Property is to be assigned to ASIO in consideration for the issue of shares in ASIO to UCLB.

**THIS DEED OF ASSIGNMENT WITNESSES** as follows:

    1    **Definitions**

In this Assignment, the following words shall have the following meanings:

| Chirp PoC Project | The project as described in Schedule 3 |
|---|---|
| Consideration | The shares to be issued to UCLB as set out in Schedule 1 |
| Costs | Those costs for Intellectual Property protection with respect to the Technology reasonably incurred by UCLB being the sum of £5,656. |
| Intellectual Property | The Patents and the Technology |
| Investment | The investment to be made by UCLB and Imperial Innovations Businesses LLP as described in the term sheet version 26 September 2011 |
| Parties | ASIO and UCLB |
| Patents | Those patent(s) and patent application(s) listed in Schedule 2 and any future patents and patent applications which are based upon or derive priority from those listed in Schedule 2 |
| PoC (1) | Proof of Concept award of £25000 dated 19th August 2010 |
| PoC (2) | Proof of Concept award of £12000 dated 4th January 2011 |

| Technology | Any and all inventions, technology, materials and know-how relating to the Chirp PoC Project described in Schedule 3 and all UCLB's rights in such inventions, technology, materials and know-how |
| --- | --- |

## 2 Assignment

2.1 In return for the Consideration UCLB hereby assigns and transfers (with full title guarantee) to ASIO absolutely:

    (a) all right, title and interest in the Intellectual Property;

    (b) all patents, software copyright and other intellectual property that may be granted pursuant to any applications listed in Schedule 2, as well as all patents, software copyright and other intellectual property that may derive priority from or have equivalent claims to or be based upon the Intellectual Property or Chirp PoC Project in any country of the world (and including supplementary protection certificates, divisions, continuations, continuations in part, reissues and extensions), and the Intellectual Property shall be deemed to include all such items of property; and

    (c) all rights of action, powers and benefits arising from ownership of the Intellectual Property, including without limitation the right to sue for damages and other legal and equitable remedies in respect of all causes of action arising prior to, on or after the date of this Assignment.

2.2 UCLB shall execute such documents and give such assistance as ASIO may require:

    (a) to secure the vesting in ASIO of all rights in the Intellectual Property;

    (b) to uphold ASIO's rights in the Intellectual Property; and

    (c) to defeat any challenge to the validity of, and resolve any questions concerning, the Intellectual Property,

and ASIO shall pay UCLB's reasonable costs reasonably incurred in connection with the obligations set out in this Clause 2.

## 3 Costs

ASIO shall pay an amount equal to the Costs to UCLB within twenty business days following the completion of the Investment, and such payment by ASIO shall be an absolute discharge of its obligation to pay the Costs.

## 4 Law and jurisdiction

The validity, construction and performance of this Assignment (including any non-contractual obligations arising out of or in connection with it) shall be governed by English law, and UCLB and ASIO submit to the exclusive jurisdiction of the English courts in respect of any dispute or claim arising in connection therewith (including non-contractual disputes or claims).

**EXECUTED** by the Parties through their authorised signatories on the date first above written:

**EXECUTED** as a **DEED** by:
**UCL BUSINESS PLC**                                  )
Acting by a Director:                                 )

In the presence of:

Witness signature:

Witness name:

Witness address:

Witness occupation:

> Mr Cengiz A Tarhan
> Managing Director
> UCL Business Plc

ALEX WEEDON
97 TOTTENHAM COURT ROAD,
LONDON, W1T 4TP

HEAD OF BUSINESS & LEGAL AFFAIRS.

**EXECUTED** as a **DEED** by:
**ASIO LIMITED**                                      )
Acting by a Director:                                 )
                                                      )

In the presence of:

Witness signature:

Witness name:

Witness address:

Witness occupation:

P. BERGER

MARINA EVANS

97 Tottenham Court Road
London W1T 4TP

Senior Business Manager.

**SCHEDULE 1**

**Considerations**

1. In return for PoC (1), 1500 ordinary shares of £0.01 each, in nominal value comprised in the capital of ASIO.

2. In return for PoC (2), 326 ordinary shares of £0.01 each, in nominal value comprised in the capital of ASIO.

**SCHEDULE 2**

### Patent Applications

UK IPO Application No: GB1016542.1

United States Application No: 12/926470

PCT/GB2011/051862

**SCHEDULE 3**

**Technology**
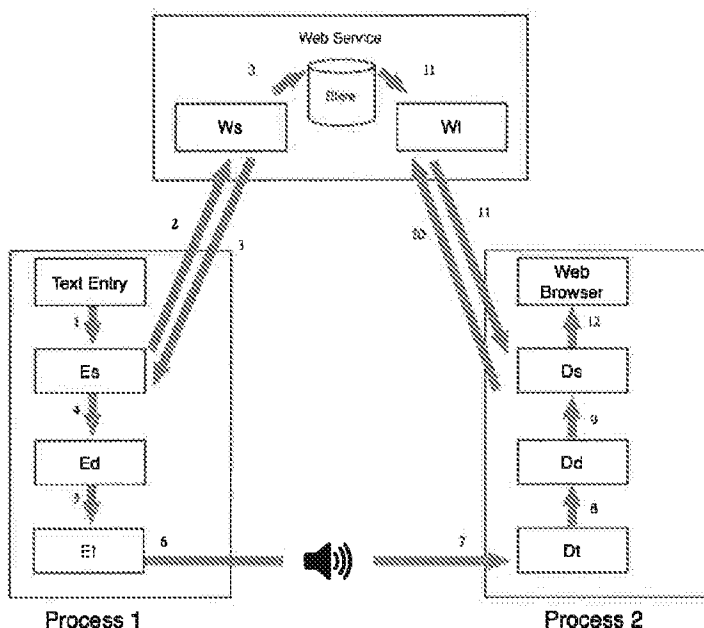
## THE CHIRP TECHNOLOGY

The Chirp System is a protocol and set of applications that support peer to peer and online sharing of small amounts of data using audio. By peer to peer, we refer to devices that are physically co-located, iPhones in the first instance. By online, we mean through social networks or standard web services. By small amounts of data we mean 32-128bits. By audio, we mean music that is audibly understandable as codes by listeners.

To place the discussion of reliability in context, we give one example scenario of use of URL sharing (i.e. small text snippet sharing) between two devices. There are many other scenarios, please see the Chirp Technology documents and patents.
The steps are as follows:

1. Alice pastes text in to an application ("Process 1" possibly ChirpApp), which is passed to the Es module (e.g. the URL "www.bbc.co.uk").
2. The Es process makes a request to a web service called Web Shorten (Ws)
3. Ws returns the Chirp Code for the URL (a "hash code" a la bit.ly) to Es. (e.g. "7642d3edfG") and also stores the relation between the Chirp Code and the URL in a database ("Store").
4. Es takes this Chirp Code and converts it to Music Code and passes it to Ed
5. Ed converts this in to an audio stream
6. The audio stream is played
7. Process 2 receives the audio stream
8. It is decoded to Music Code passed to the Dd.
9. Dd decode it to Chirp Code and passed it to Ds
10. Ds then sends the hash code to a web services called Web Lengthen (Wl).
11. Wl looks up the hash code in the Store and returns the corresponding long URL (e.g. www.bbc.ac.uk) to Ds.
12. Ds hands the URL to a web browser window to open.



Process 1                Process 2

The patent filings describe this technology and place it in the wider context of application scenarios and larger systems where Chirp plays a small role.

### Implementations and Know-How

<u>ChirpLib</u>
- A library that implements the functionality of:
    - encoding music codes in to audio representations in memory and optionally saving the audio to a .wav file;
    - decoding audio representation in memory in to music codes and optionally loading the audio from a .wav file.
- There are three versions of Decoding: Schmidt trigger, FFT tracking and peak tracking.
- There are two implementation of FFT using an external library and using an Apple-provided library.
- Written in C with some C++ and ObjC code.

<u>ChirpServer</u>
A webserver written in Django, Python and MongoDB that:
- encodes URLs to shortcodes;
- decodes shortcodes to URLs;
- manages user API keys;
- stores in a database;
- has been stress tested with large numbers of users and codes;
- is installed on a web service for current offline, online and ad-hoc testing.

<u>ChirpApp</u>
An application for an iPhone 3GS or better that:
- uses ChirpLib to encoded and decode audio representations;
- interfaces to the microphone and speaker of the iPhone to play and record sound;
- provides a visualization of the audio;
- manages links and shortcodes so that they can be played;
- encodes and decodes shortcodes from URLs via ChirpServer;
- provides interaction with other applications on the device to retrieve URLs and launch applications depending on the inferred mime-type of the URL

<u>ChirpTools</u>
A set of tools and configurations for assessing the reliability of Chirp comprising:
- the "sandwich" an acoustically dampened box that can contain several mobile devices and secondary audio sources;
- a set of tools and knowledge on how to configure the sandwich and the mobile; devices within it for remote online testing via a master computer;
- a set of command line tools and scripts for running benchmark tests on the sandwich;
- a repository of background audio clips and Chirp audio clips suitable for offline tests;
- a set of scripts for running offline tests, benchmarking and graphing the results.

<u>Miscellaneous</u>
- A set of scripts to drive the ChirpServer from the command line.
- A prototype extension for the Chrome web-browser that allows encoding and playing of Chirps directly from the web browser.
- A set of Pd scripts to simulate desired audio encoding regimes.