Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [HBC PHY and MAC]

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Abstract: [Current Status of HBC merged proposal and application examples]

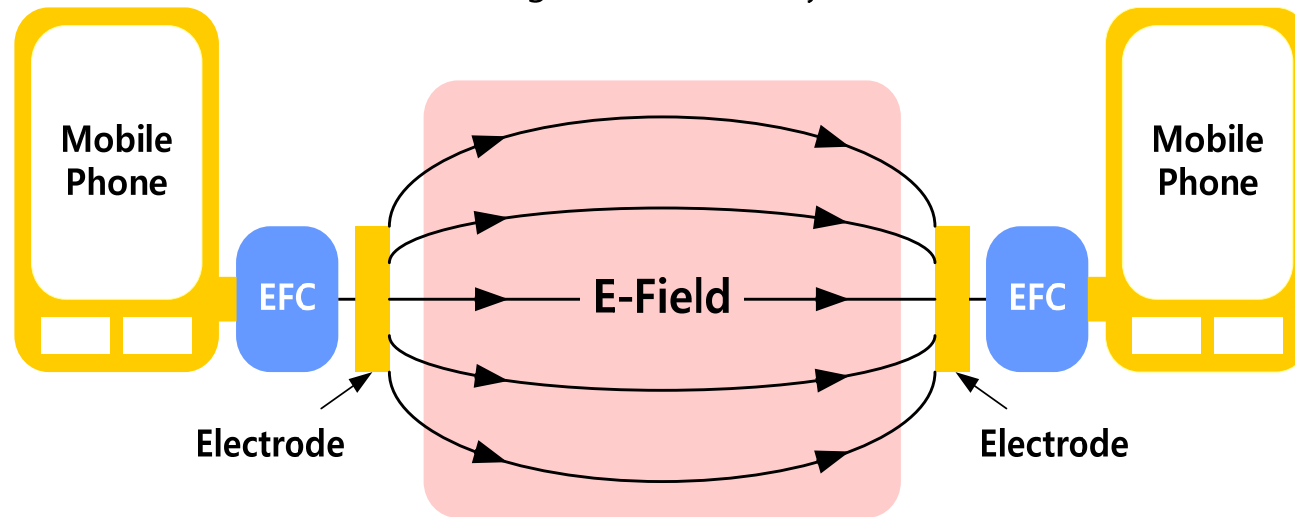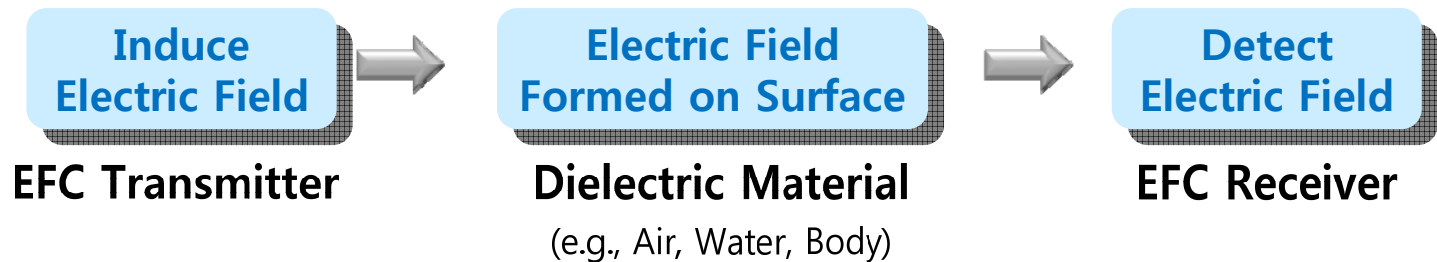**Purpose:** [Response to "TG6 Call for Proposals" – IEEE P802.15-08-0811-02-0006]

HBC PHY and MAC

(Human Body Communication)

SAMSUNG / ETRI/CNU

How Does It Work?

Data transmitted by inducing electric field on dielectric body

| **Induce Electric Field** | → | **Electric Field Formed on Surface** | → | **Detect Electric Field** |

EFC Transmitter   **Dielectric Material**   **EFC Receiver**
(e.g., Air, Water, Body)

Mobile Phone

EFC

Electrode

E-Field

Electrode

EFC

Mobile Phone

No Antenna, Low Power, Security

EFC : Technology enabling HBC

Features of Technology

- ***Direct Digital Baseband Signaling***
  - Easy to Implement
  - Low Power Consumption
  - No Antenna, less complex
- ***Electric-Field Communication***
  - Intuitive Service by touching
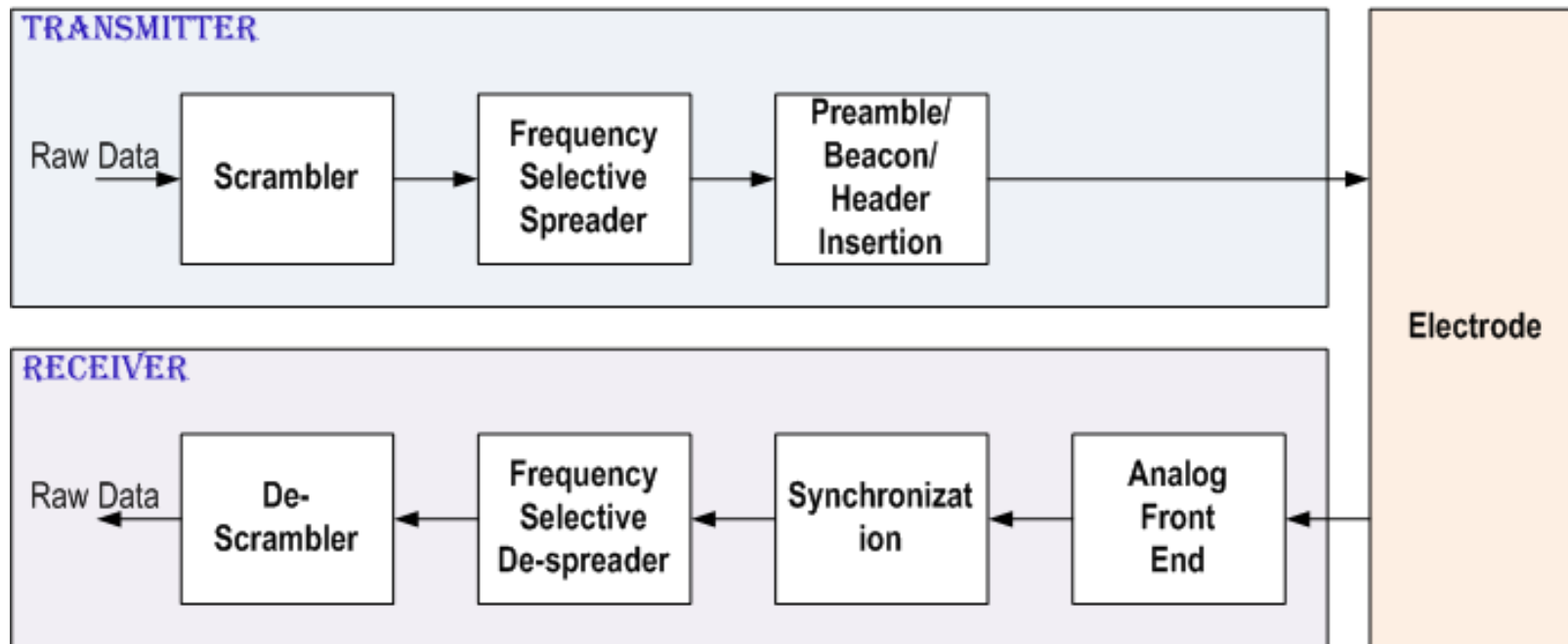 - Afford to communicate up to a few centimeter off the body

Specifications

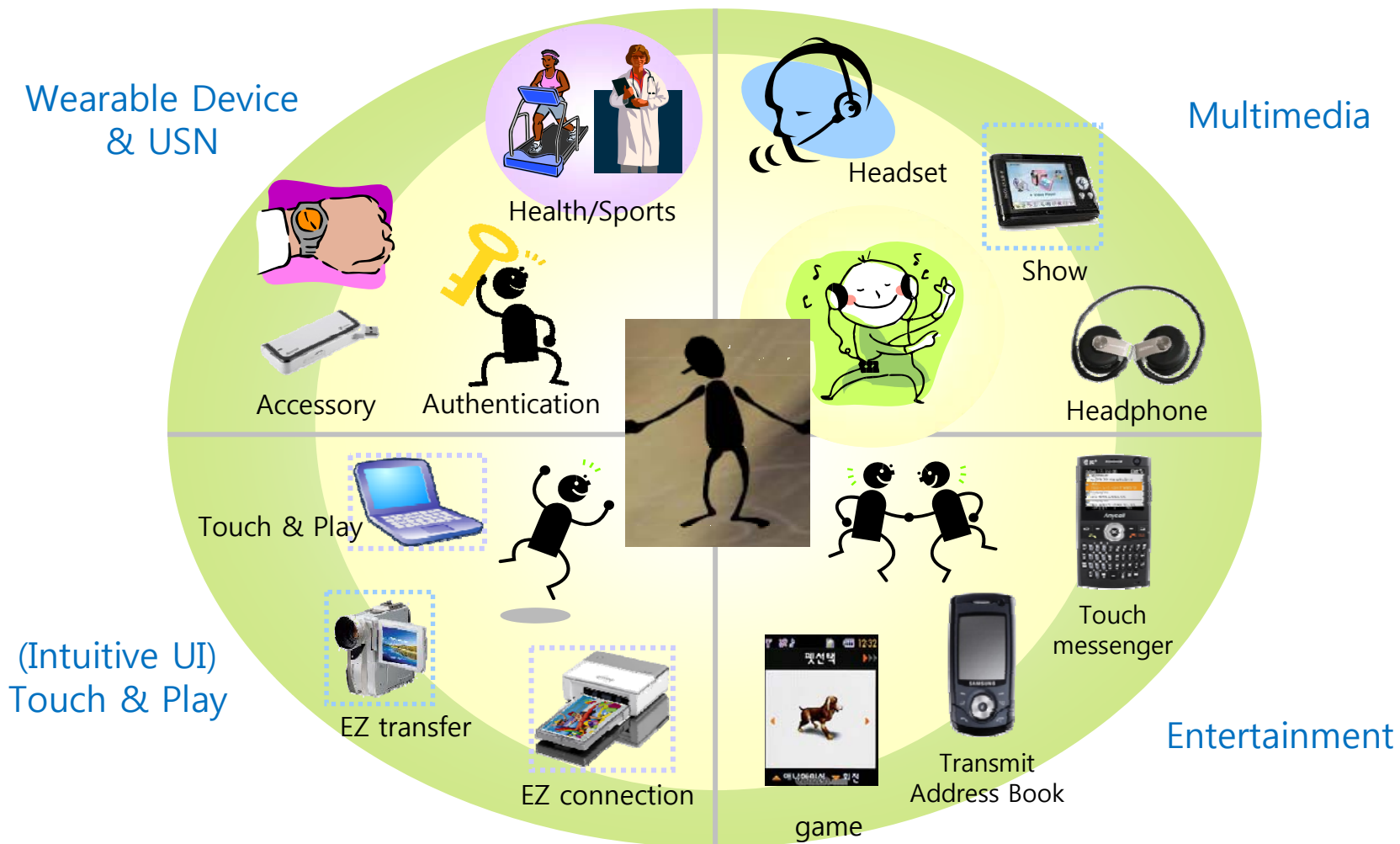| Parameter	Spec.
Frequency Band	10 ~ 50 MHz
Comm. Environment	On-body to On-body
Transmission Method	Direct Digital Transmission
Data Rate	Up to 10 Mbps
Baseband Signaling	Frequency Selective Orthogonal Code

Merged Proposal Status

- ETRI & Samsung Electronics are working on a merged proposal

- Completed merged proposal will be presented to TG during September meeting

System Block Diagram

Possible Applications of EFC

Wearable Device & USN

Multimedia

Headset

Health/Sports

Show

Accessory   Authentication

Headphone

Touch & Play

Touch messenger

(Intuitive UI)
Touch & Play

EZ transfer

Entertainment

EZ connection

Transmit Address Book

game

Mobile Multimedia/Entertainment

Audio/Voice
- High quality audio streaming (MP3)
- External HBC Dongle or built-in HBC module
- Bi-directional voice support for handsfree service
  - A watch phone and a handsfree earpiece

- Digital Audio
- Voice
- Voice
- Mobile Phone
- PDA
- UMPC

- Mobile Phone
- PDA
- UMPC
- Video

Video
- High quality video streaming (video or DMB)
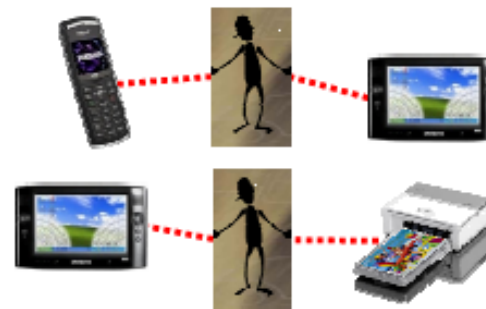- From one mobile to another or a wearable display unit

Fun/Emotional experiences
- A couple listening/watching together holding hands
  - One mobile device & two headphones, for example
- Personal/Secret/Love message transfers (TMS)
  - Business card, address book, love message, etc.

Intuitive Services

"EZ Connect"
- Quick, simple connection between devices
  - "touch and play" instead of "plug and play"
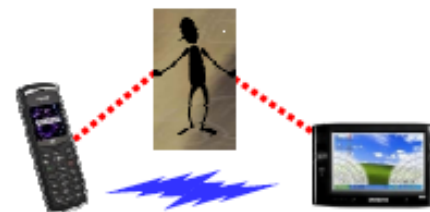 - No cables needed
- HBC dongles (USB), HBC memory cards

"EZ Authorize"
- Quick authorization of valid users
  - Access to cars, PCs, servers, file cabinets, etc.
- Wearable USIM card (watch, ring, necklace, etc.)
  - Use any phone in your hand as if it's yours

"EZ Pairing"
- Quick, simple pairing of wireless devices
  - Device selection not needed
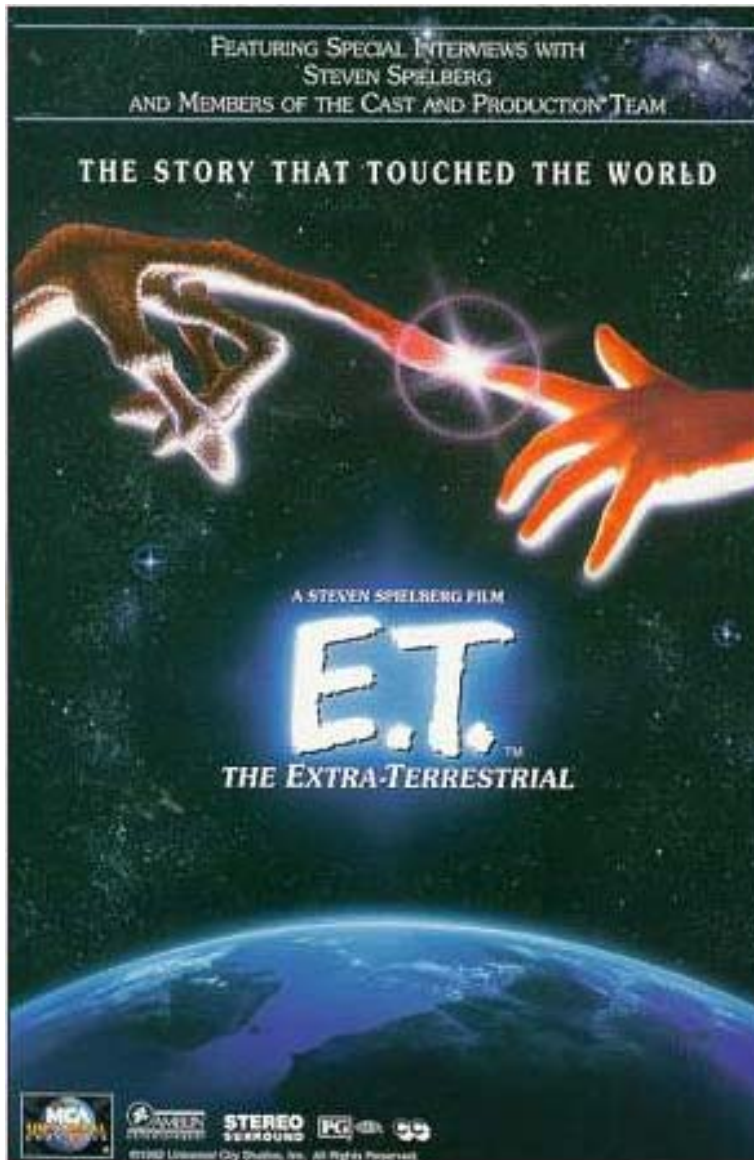 - Once paired data transfer via wireless method

Other Application Ideas

"EZ Info" System
- Provides product information (prices)
  - When product tag is touched while holding the cart, information and/or coupon is shown on the display mounted on the cart
- Music album sampler
  - Touch an album's display while wearing store provided headphones
- Display information in museums, art galleries, etc.
  - Touch a displays info tag while wearing provided headphones

e-Health / e-Fitness / e-Sports
- Wearable health monitoring sensors
  - For the elderly
  - Self monitoring while exercising
  - Training aid for athletes
- Touch-based assistance for the disabled
  - Touch a Braille sign & hear information via an earpiece

Q & A