

Macoun

Ablauf

- Einführung / Motivation
- Audio
- BTLE
- USB





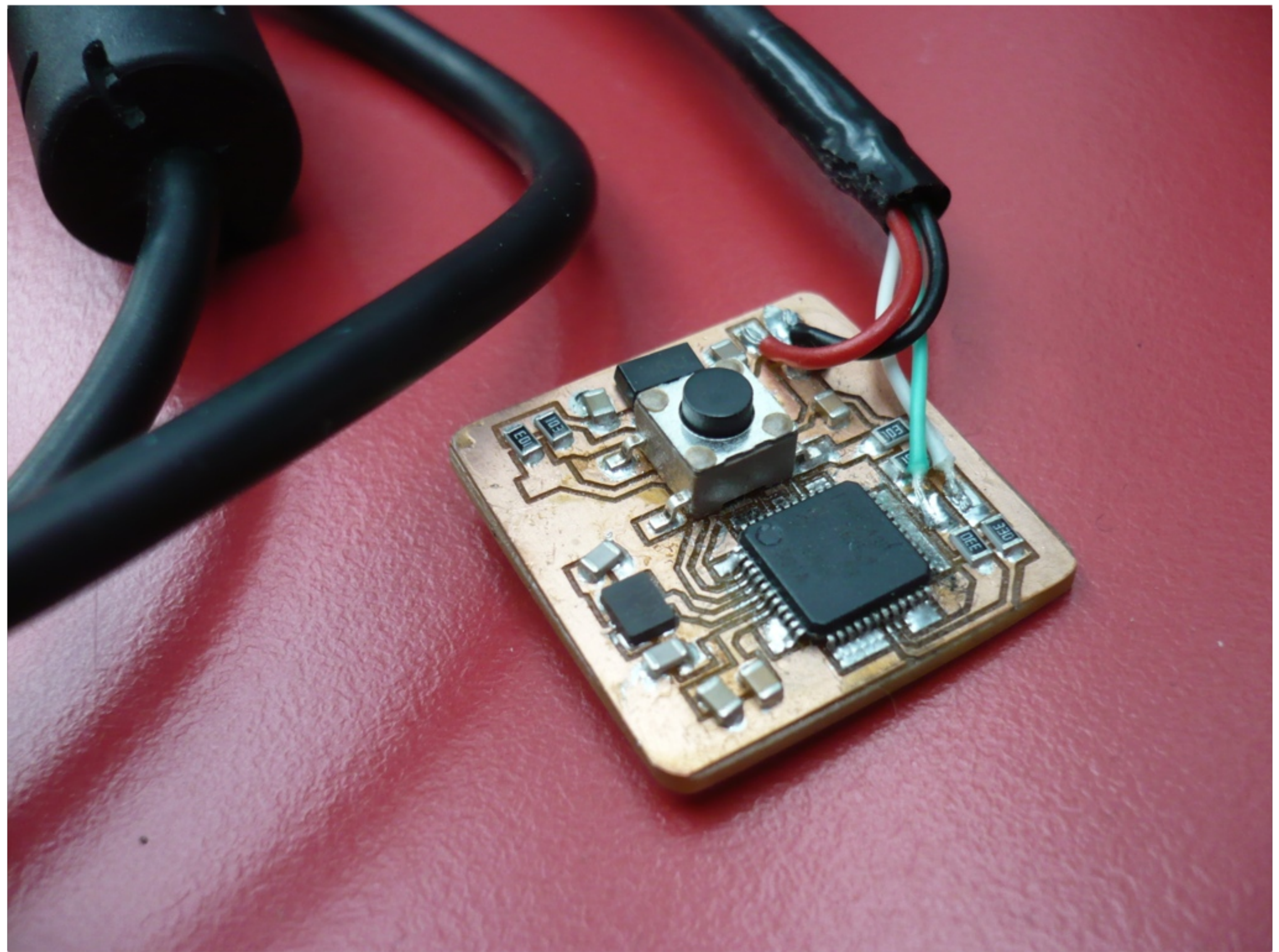
zoe

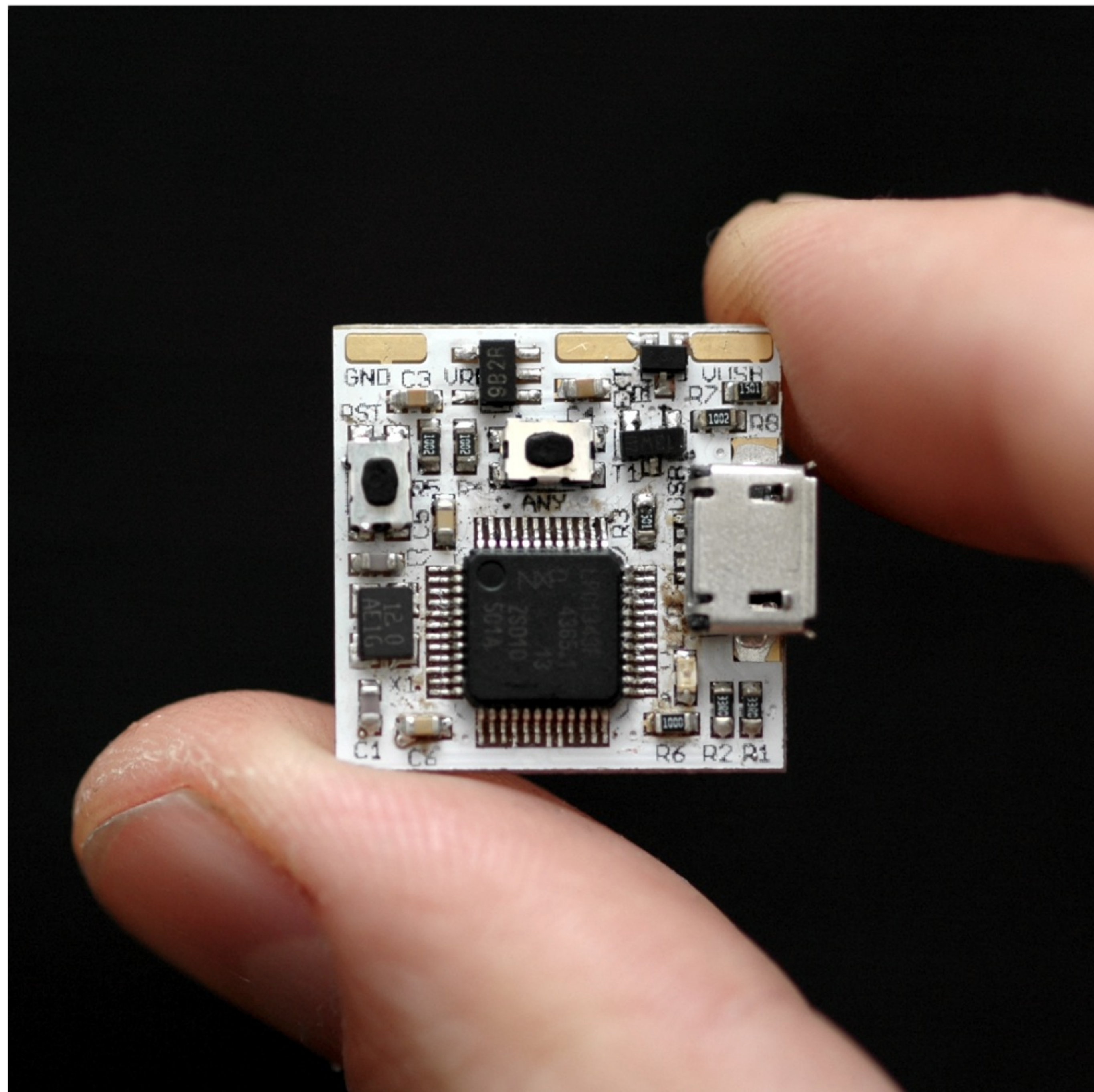


Loë









Audio

BLE

Firewire

USB

WIFI

Dock Conn.

Accelerometer

Camera

SD Card

Gyroskop

Vibrator

Lightning

Magnetometer

Bluetooth

Sleep LED

Video Out

Magsafe

Thunderbolt

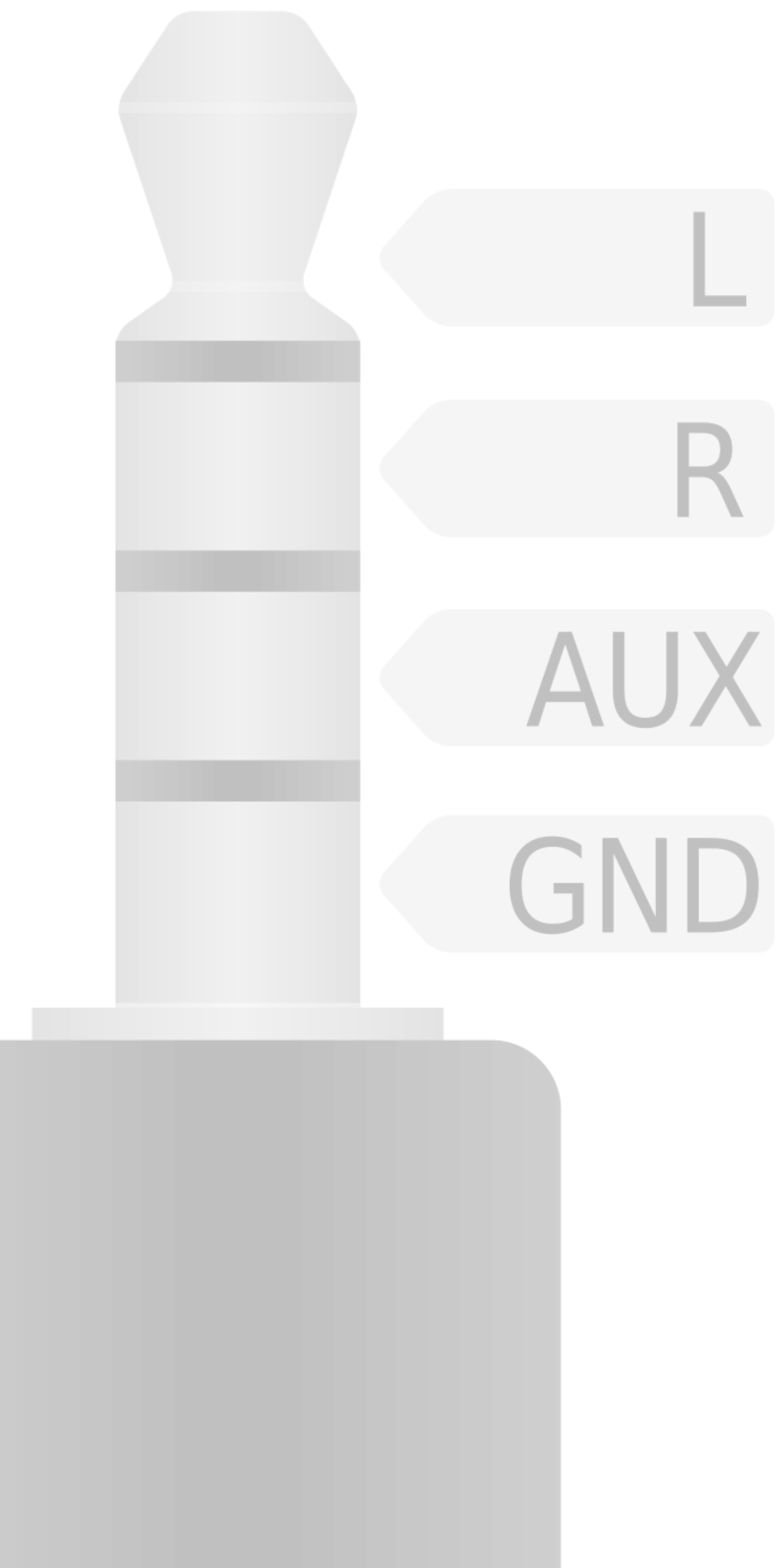
Ethernet

IR

Display

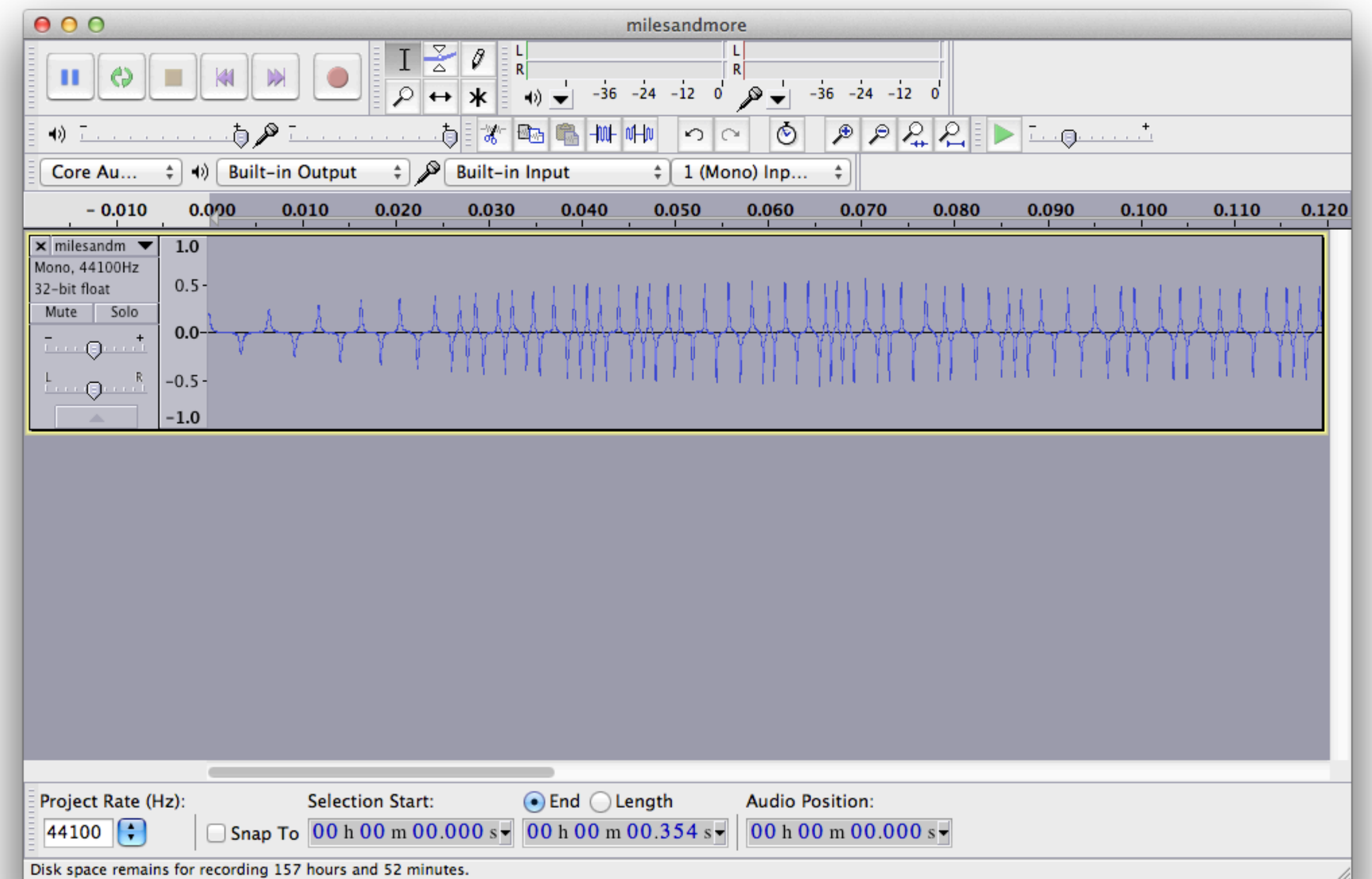
Prox Sens

Fingerprint

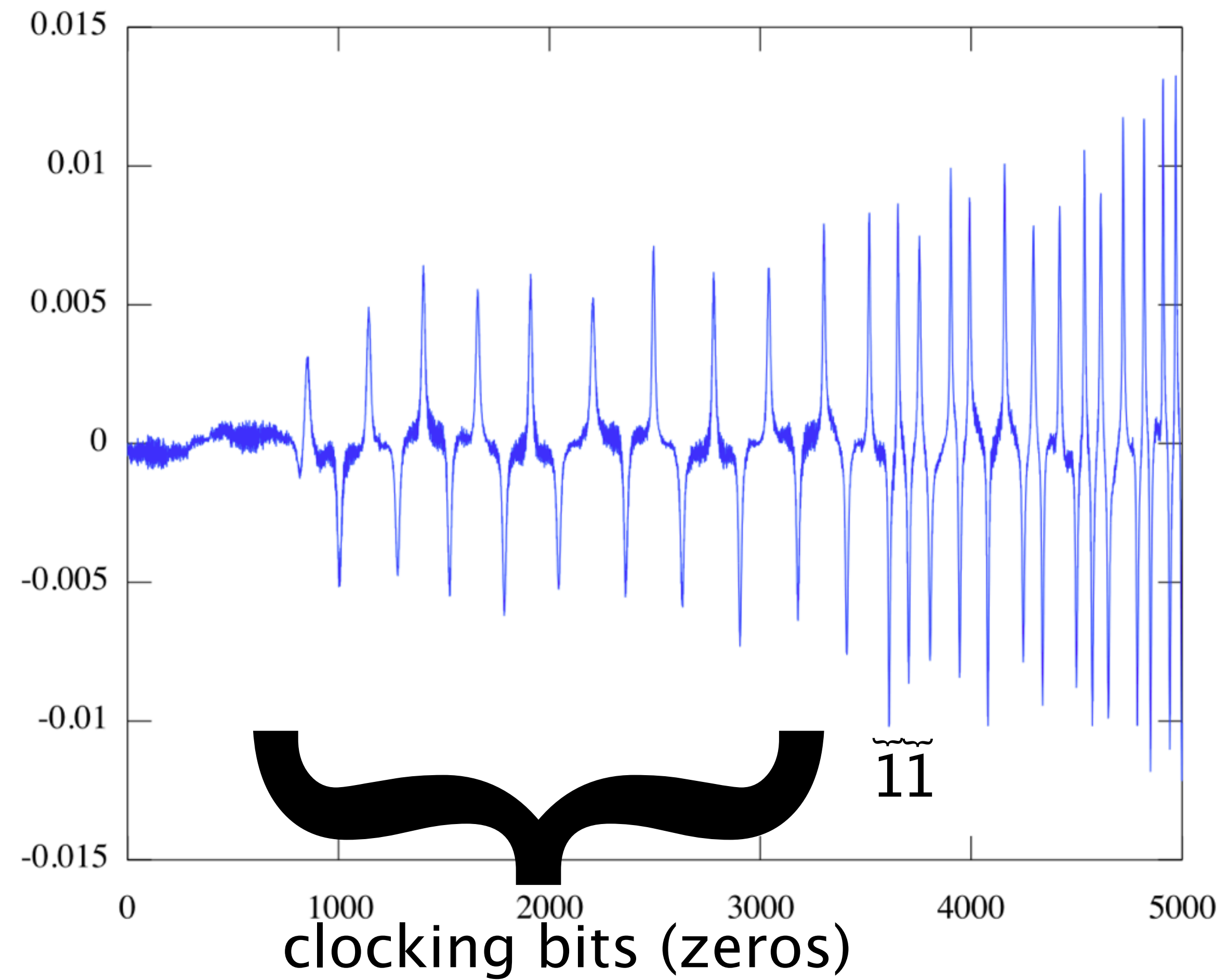


Audio - Der Exot

Kartenbömmel

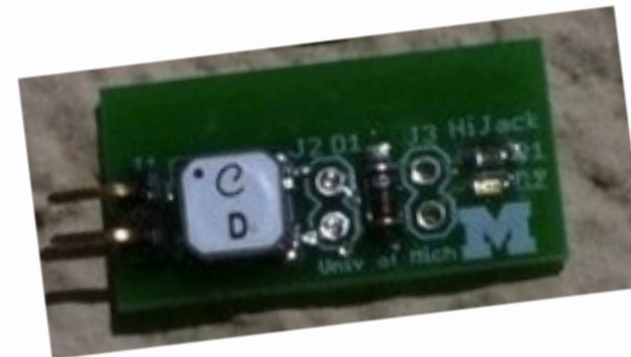


Kartenbömmel

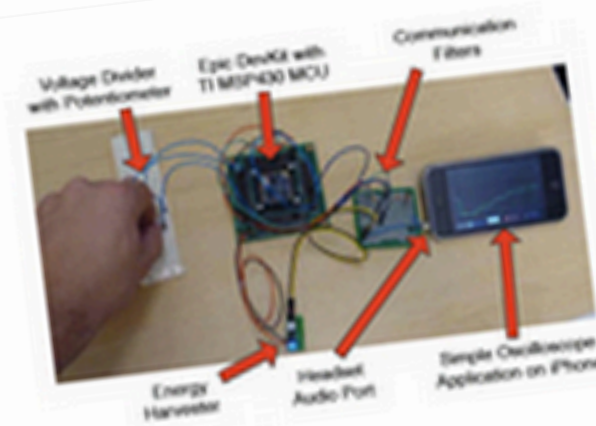


HiJack

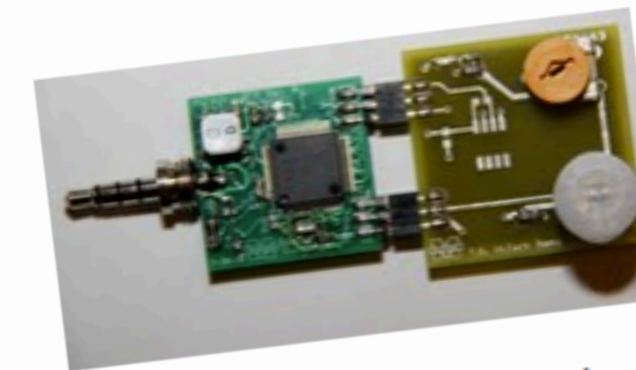
Gallery



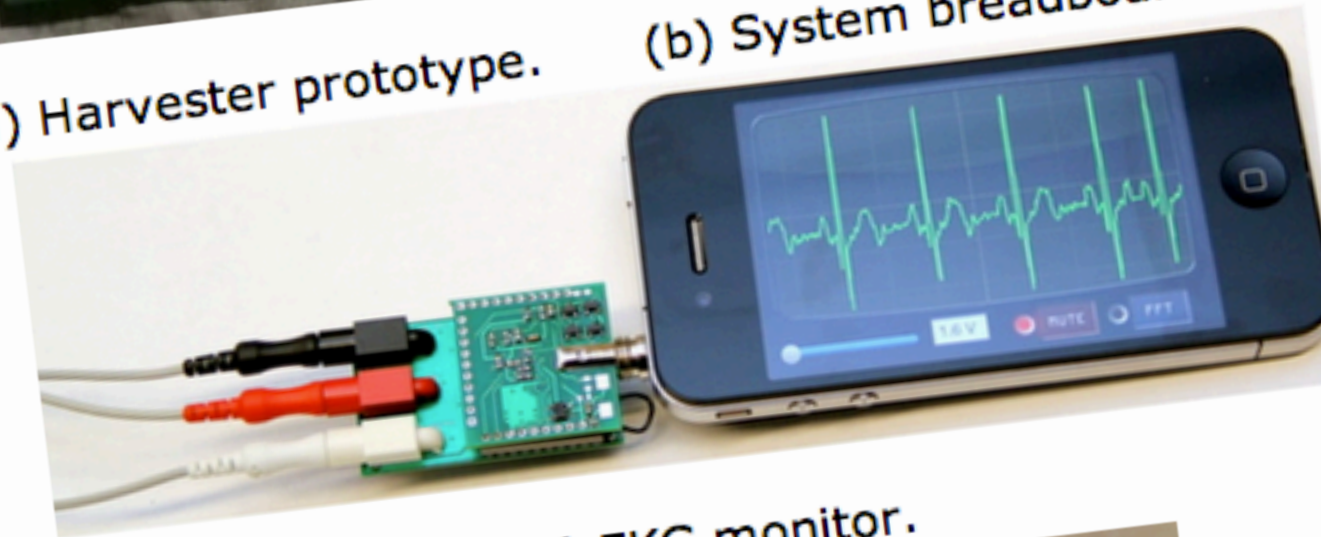
(a) Harvester prototype.



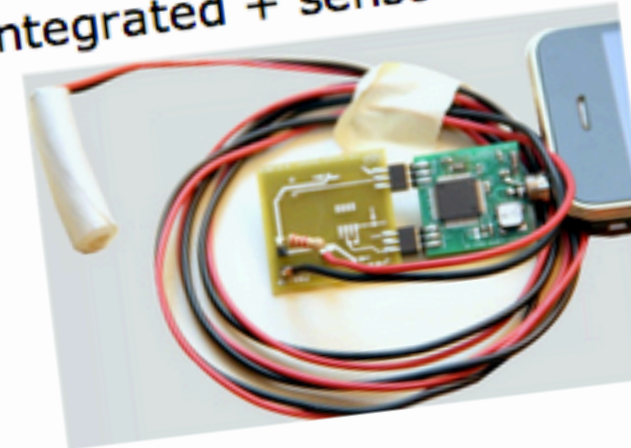
(b) System breadboard.



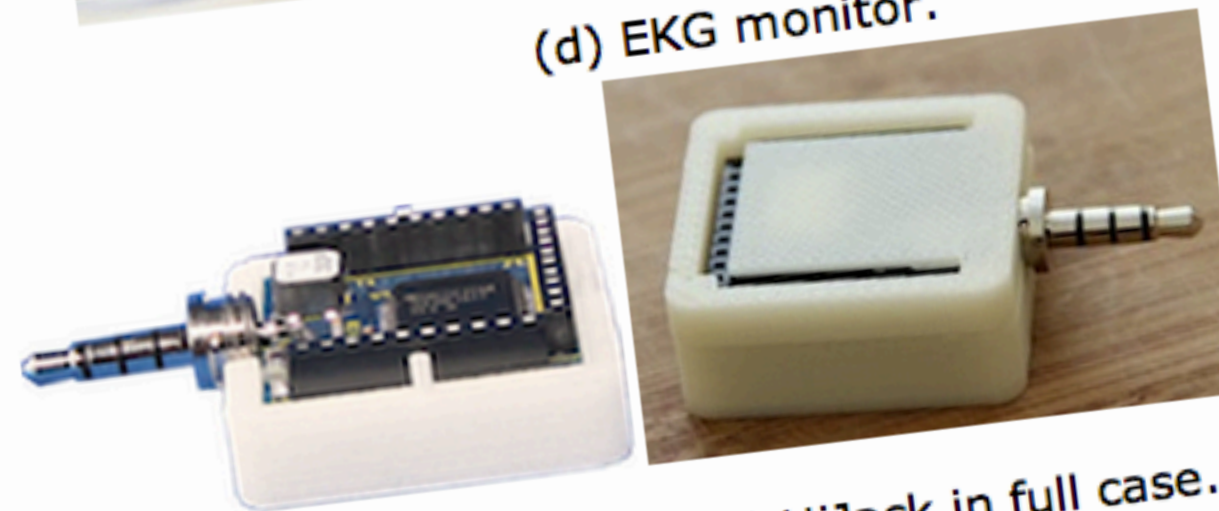
(c) Integrated + sensorboard.



(d) EKG monitor.

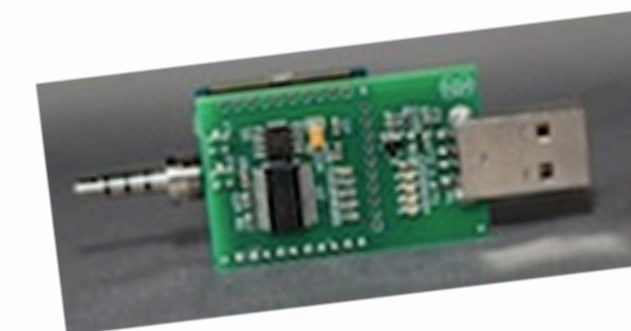


(e) Soil moisture sensor.



(f) HiJack in case.

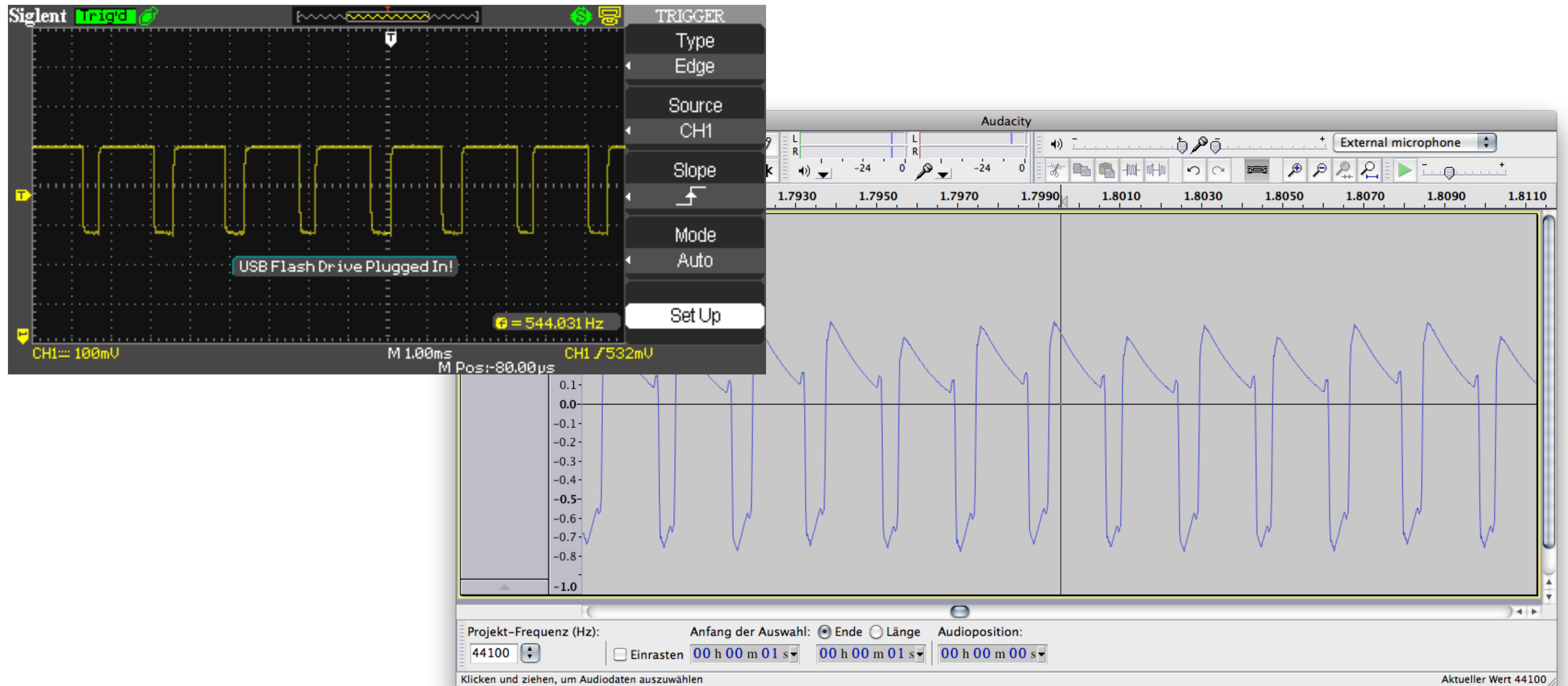
(g) HiJack in full case.



(h) HiJack + USB Programmer
(**bottom**).

Demo

The Analog/Digital Divide

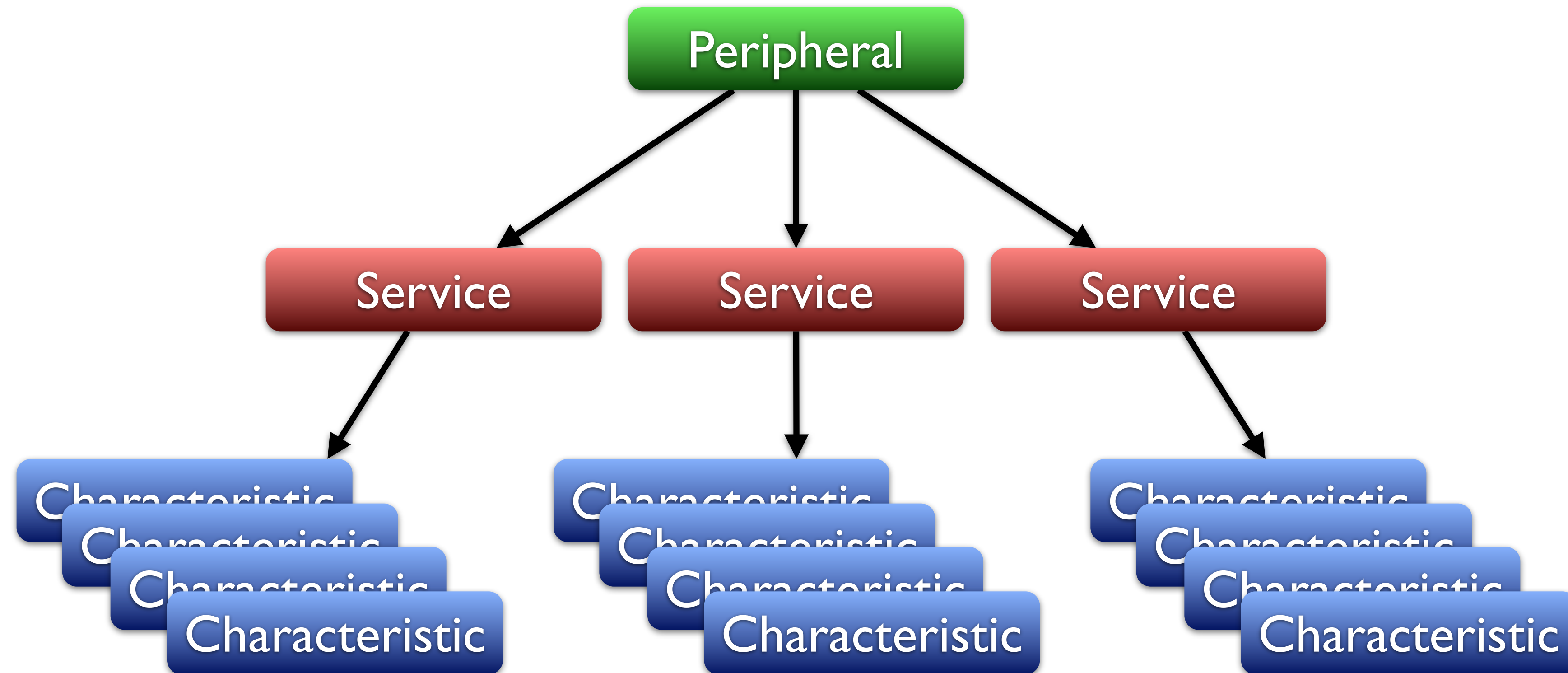




Bluetooth LE - Der Neue

Bluetooth
Bluetooth LE
Bluetooth Smart
Bluetooth Smart Ready

GATT



IOBluetooth vs. CoreBluetooth


```
- (void)applicationDidFinishLaunching:(NSNotification *)aNotification {  
    self.mgr = [[CBCentralManager alloc] initWithDelegate:self queue:nil];  
    ...  
}  
  
- (void)centralManagerDidUpdateState:(CBCentralManager *)central {  
    if (state == CBCentralManagerStatePoweredOn)  
        [self.mgr scanForPeripheralsWithServices:nil options:nil];  
}
```



```
- (void)centralManager:(CBCentralManager *)central didDiscoverPeripheral:
(CBPeripheral *)peripheral advertisementData:(NSDictionary *)advertisementData
RSSI:(NSNumber *)RSSI {
    ...
    [self.mgr stopScan];
    peripheral.delegate = self;
    self.peripheral = peripheral;
    [self.mgr connectPeripheral:peripheral options:nil];
}

- (void)centralManager:(CBCentralManager *)central didConnectPeripheral:
(CBPeripheral *)peripheral {
    [peripheral discoverServices:nil];
}
```



```
-(void) peripheral:(CBPeripheral *)peripheral didDiscoverServices:(NSError
*)error {
    for (CBService* service in peripheral.services) {
        if ([service.UUID isEqual:[CBUUID UUIDWithString:IRTEMP_UUID]]) {
            self.tempService = service;
            [self.peripheral discoverCharacteristics:nil
                                     forService:self.tempService];
        }
    }
}
```



```
- (void)peripheral:(CBPeripheral *)peripheral
didDiscoverCharacteristicsForService:(CBService *)service error:(NSError
*)error {

    self.tempDataChr = [self findCharacteristicWithUUIDString:IRTEMP_DATA_UUID
                                                    inService:service];

    self.tempConfChr = [self findCharacteristicWithUUIDString:IRTEMP_CONF_UUID
                                                    inService:service];

    uint8_t on = 1;
    NSData* onOffData = [NSData dataWithBytes:&on length:1];

    [self.peripheral writeValue:onOffData
                     forCharacteristic:self.tempConfChr
                     type:CBCharacteristicWriteWithResponse];

    [self.peripheral setNotifyValue:YES
                     forCharacteristic:self.tempDataChr];
};
```



```
- (void)peripheral:(CBPeripheral *)peripheral  
didUpdateValueForCharacteristic:(CBCharacteristic *)characteristic error:  
(NSError *)error {  
    const uint8_t* data = [self.tempDataChr.value bytes];  
    ...  
}
```


Demo

USB - Der Klassiker

Serial CDC

HID



MIDI

Willkommen in den 80ern!



Command Byte

Command I=Note on

MIDI channel I

Data Byte

Note 72 = C4

Data Byte

Velocity 100

1 0 0 1 0 0 0 1

0 1 0 0 1 0 0 0

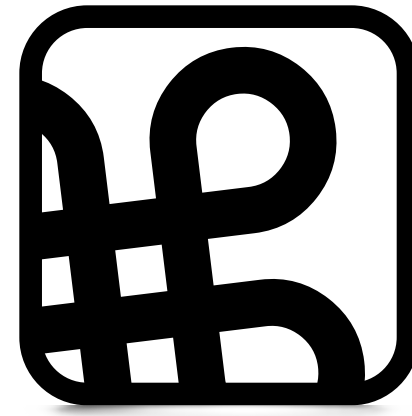
0 1 1 0 0 1 0 0

8N1, 31250 Baud

Demo

Fragen?

Vielen Dank



Macoun