Sociable Objects Workshop

Instructor: Rob Faludi

Plan for Today

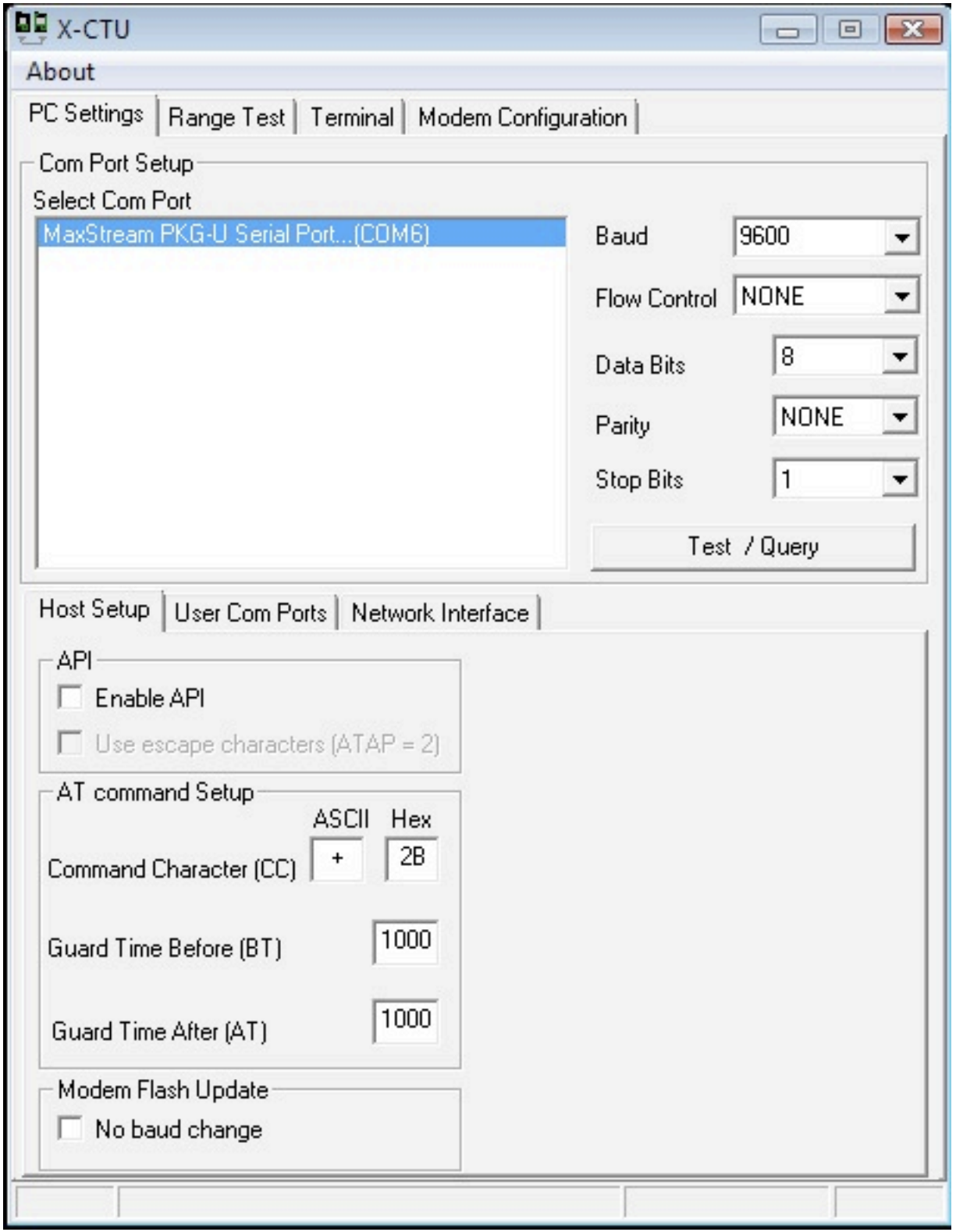
- Presentations of Imagined Sociable Objects
- PAN ID signup, mailing list signups, documentation
- firmware updates
- basic configuration
- pair exercise
- doorbell exercises description
- Readings & Assignments

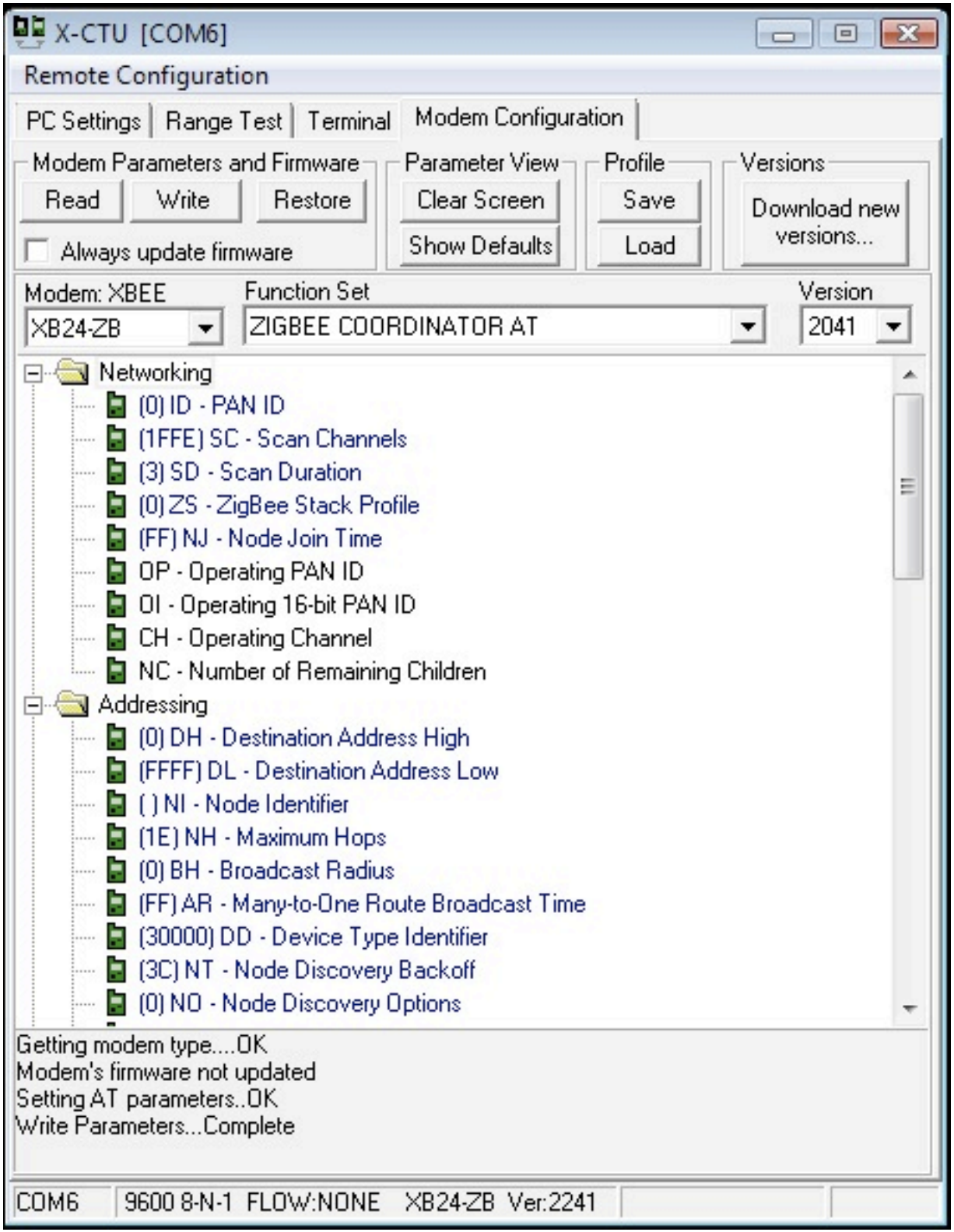
Administrative

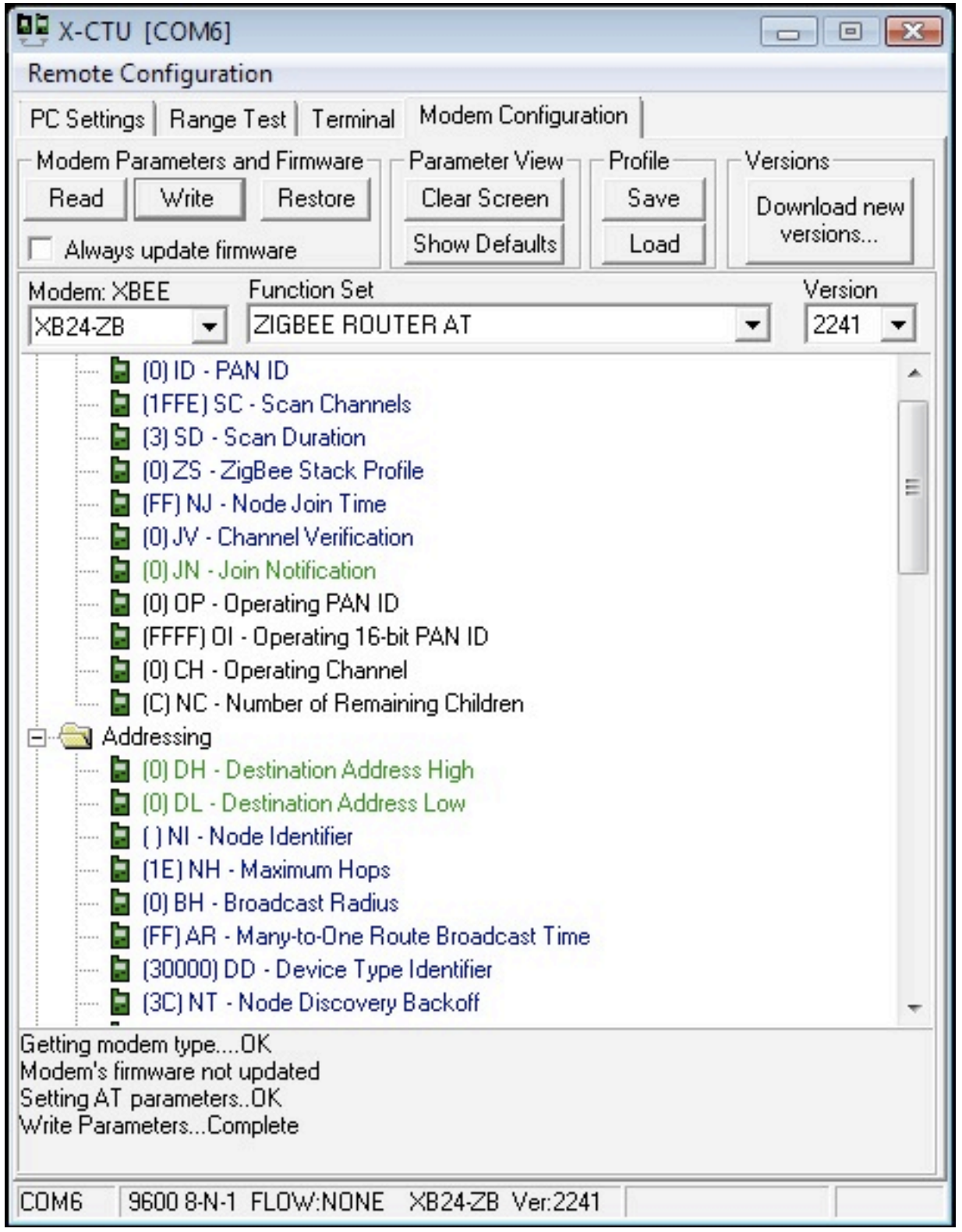
- PAN ID signup
- mailing list signups
- documentation
    - every project
    - for now, send me links and I'll post them

Imagined Sociable Objects Presentations

Firmware Updates


X-CTU
About
PC Settings
Range Test
Terminal
Modem Configuration
Com Port Setup
Select Com Port
MaxStream PKG-U Serial Port...(COM6)
Baud
9600
Flow Control
NONE
Data Bits
8
Parity
NONE
Stop Bits
1
Test / Query
Host Setup
User Com Ports
Network Interface
API
Enable API
Use escape characters (ATAP = 2)
AT command Setup
ASCII
Hex
Command Character (CC)
+
2B
Guard Time Before (BT)
1000
Guard Time After (AT)
1000
Modem Flash Update
No baud change


X-CTU [COM6]
Remote Configuration
PC Settings
Range Test
Terminal
Modem Configuration
Modem Parameters and Firmware
Read
Write
Restore
Always update firmware
Parameter View
Clear Screen
Show Defaults
Profile
Save
Load
Versions
Download new versions...
Modem: XBEE
XB24-ZB
Function Set
ZIGBEE COORDINATOR AT
Version
2041
Networking
(0) ID - PAN ID
(1FFE) SC - Scan Channels
(3) SD - Scan Duration
(0) ZS - ZigBee Stack Profile
(FF) NJ - Node Join Time
OP - Operating PAN ID
OI - Operating 16-bit PAN ID
CH - Operating Channel
NC - Number of Remaining Children
Addressing
(0) DH - Destination Address High
(FFFF) DL - Destination Address Low
( ) NI - Node Identifier
(1E) NH - Maximum Hops
(0) BH - Broadcast Radius
(FF) AR - Many-to-One Route Broadcast Time
(30000) DD - Device Type Identifier
(3C) NT - Node Discovery Backoff
(0) NO - Node Discovery Options
Getting modem type....OK
Modem's firmware not updated
Setting AT parameters..OK
Write Parameters...Complete
COM6
9600 8-N-1 FLOW:NONE XB24-ZB Ver:2241


X-CTU [COM6]
Remote Configuration
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Versions
Download new versions...
Modem: XBEE
XB24-ZB
Function Set
ZIGBEE ROUTER AT
Version
2241
(0) ID - PAN ID
(1FFE) SC - Scan Channels
(3) SD - Scan Duration
(0) ZS - ZigBee Stack Profile
(FF) NJ - Node Join Time
(0) JV - Channel Verification
(0) JN - Join Notification
(0) OP - Operating PAN ID
(FFFF) OI - Operating 16-bit PAN ID
(0) CH - Operating Channel
(C) NC - Number of Remaining Children
Addressing
(0) DH - Destination Address High
(0) DL - Destination Address Low
( ) NI - Node Identifier
(1E) NH - Maximum Hops
(0) BH - Broadcast Radius
(FF) AR - Many-to-One Route Broadcast Time
(30000) DD - Device Type Identifier
(3C) NT - Node Discovery Backoff
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COM6
9600 8-N-1 FLOW:NONE XB24-ZB Ver:2241

X-CTU

- Coordinator
- Router
- Both AT command mode
- resets
- about API configurations

Basic Configuration

AT Commands

Baud, Bits and Parity

- Baud rate: 9600
- Data bits: 8
- Stop bits: 1
- Parity: None
- Flow control: none for now...

Data Mode vs. Command Mode

- Idle Mode, transmit and receive data
- Command Mode, talk to the XBee itself
  - +++ "*Yo, XBee*"
  - AT "*Attention!*" (Hayes command set)
    - always press enter after AT commands
    - *never* press enter after +++

Some AT Commands

- AT -> OK
- ATDH, ATDL -> destination address hi/lo
- ATID -> personal area network ID
- ATCN -> end command mode
- ATWR -> write current configuration to firmware
- ATMY -> ~~my address~~ NOT SETTABLE FOR ZIGBEE

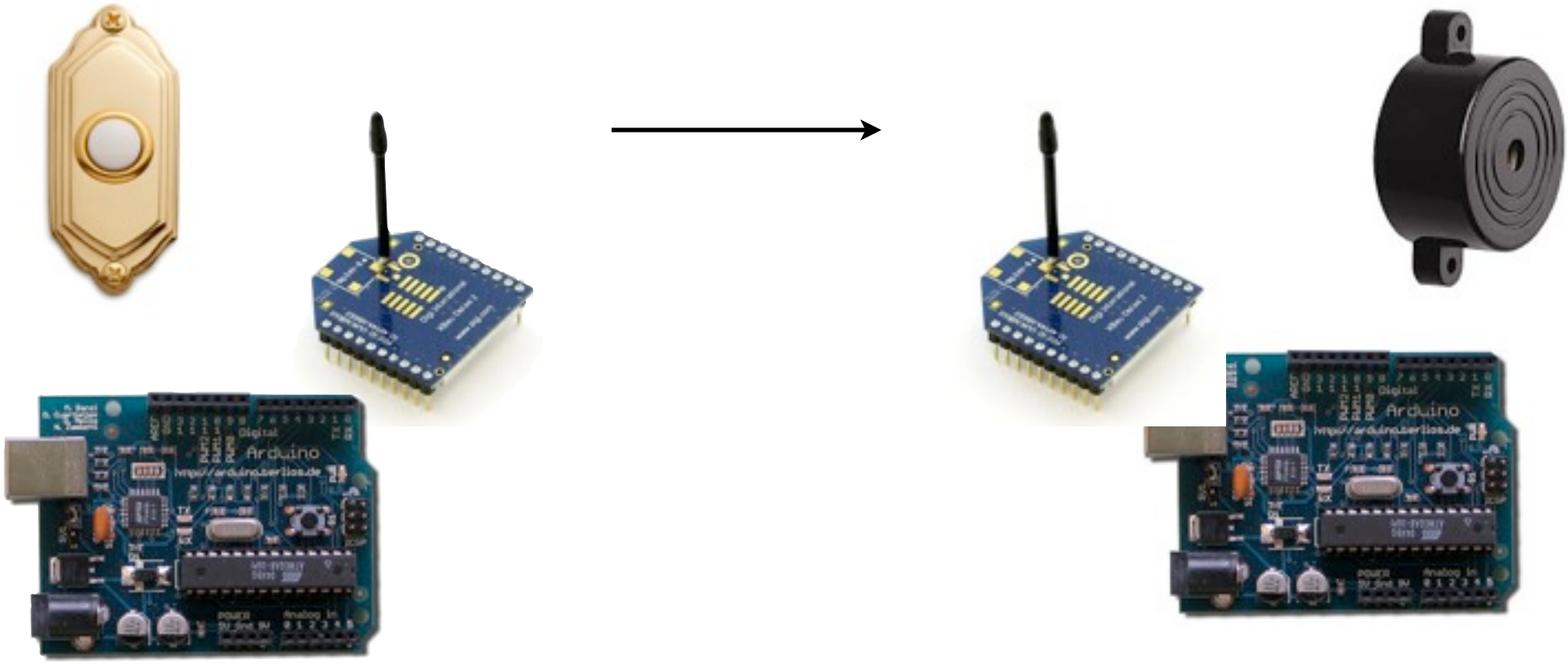
Pair Exercise

Create a Basic ZigBee Pair

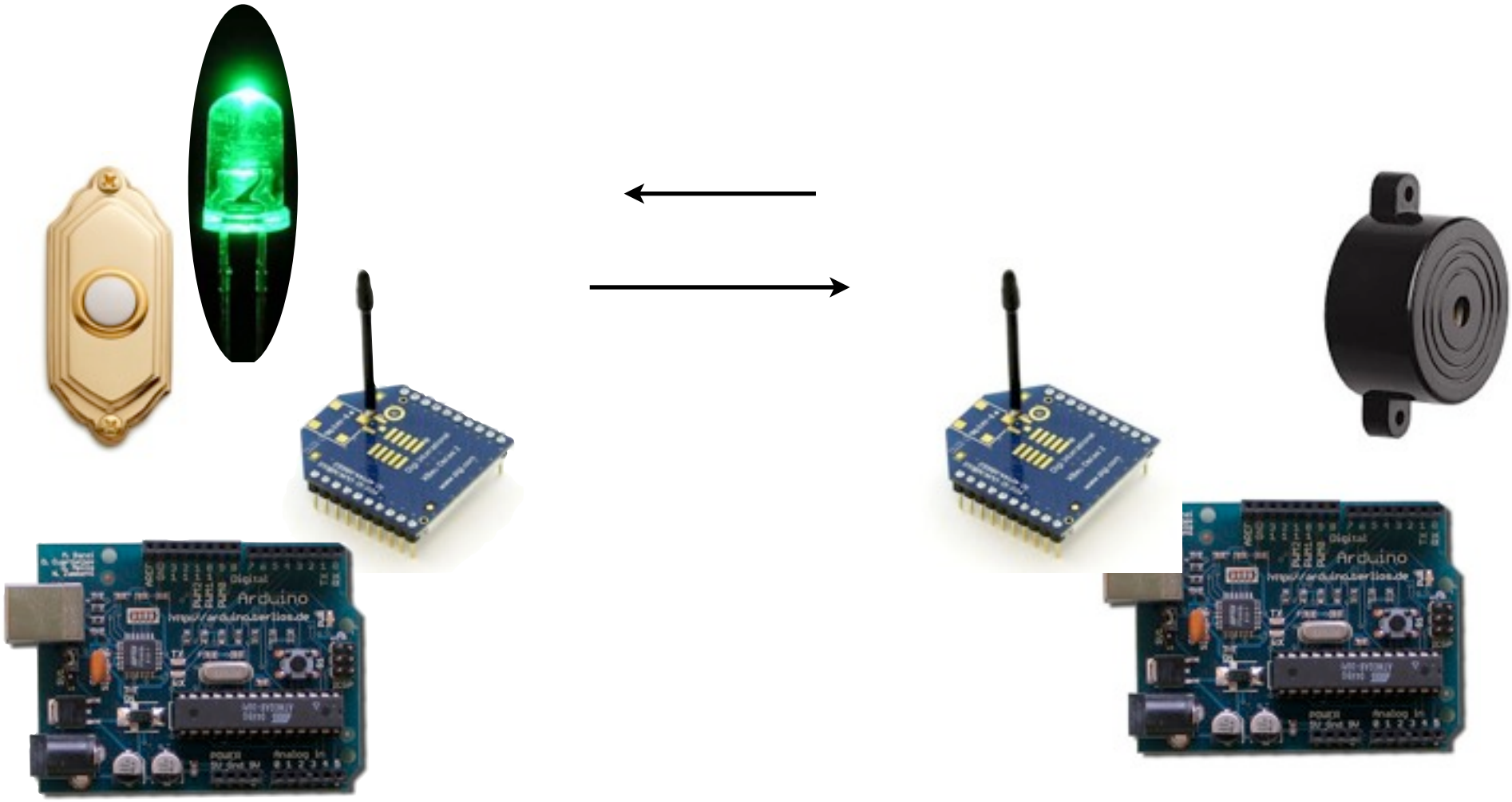
- One coordinator and one router
- Use the 64-bit addresses for destinations
- ATNR will reset your network layer, useful if you join the wrong ID
- Remember, the radios work reliably, troubleshooting is mostly about figuring out what they’re doing.

Doorbell Exercises

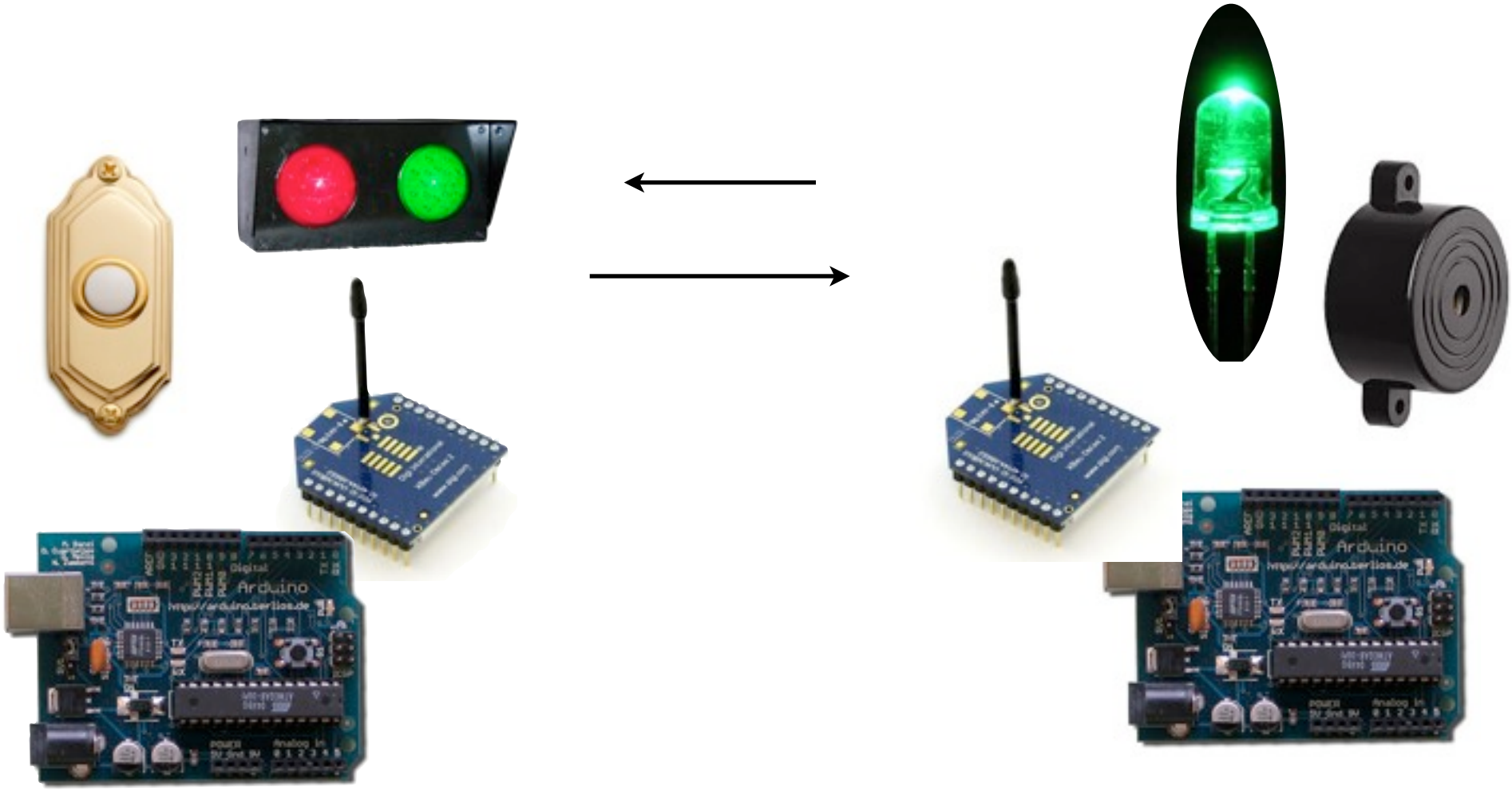
Basic Doorbell



Feedback Doorbell



Nap Doorbell



Readings and Assignments

- Readings
    - XBee ZB Manual, first sections
- Assignments
        - basic pairs exercise
        - work on starting doorbell assignments if possible