The Design

This sequence is designed so that three fairly tricky puzzle tracks can be tackled in any order (deliberately avoiding dependencies), but which must all be solved before the success condition may be met.

CONCEPT: The players link from D’ni to find themselves in a room containing a variety of mechanisms and artifacts. Via two discovered journals kept by DRC employees ("Dmitri" and "Nicole") and an audio recording left by Atrus, it is revealed that the room they are in is an observation pod above a unnamed world, nicknamed "Sunblind" by Atrus for its intense sunlight. (Well, he never was the most creative when it came to naming ages, was he?)

Nicole's journal reveals that while conducting repairs to the pod, a large avian shattered the pod's main window, and the linking book back to D’ni fell to the surface below. Nicole was able to link away to Relto; the players are not so fortunate.

SUCCESS CONDITION: Navigate the observation pod to the correct location and deploy the retriever arm to recover the lost linking book and secure your escape.

PUZZLE ONE: Power

There are three mechanical "stations" in the room: One that controls navigation, one that consists of a viewscreen, and one that activates the retriever arm. All three are non-operational by default. There is also a panel labeled with a symbol that should clearly suggest power--a lightning bolt or something--which comprises a 5x5 grid of inactive LED buttons, 3 inactive RGB LEDs in a row, and a Big Red Button with a symbol above it indicating “this turns things on”. Both journals and Atrus' recording make reference to the fact that multiple people are required in order to activate the stations.

In the course of exploring the room, players notice that the first of the three lights turns green when they are standing in front of the navigation station. If the other players wander the room while one player remains in front of the navigation station, they discover places to stand that cause the other two lights to activate green. When all three lights are active, the Big Red Button lights up. Pressing the button will activate the navigation console. The console will remain active until the Big Red Button is pressed again, at which point the process must be repeated to reactivate it.

The same process can be repeated to activate the viewscreen, the LEDs lighting up blue instead of green.

Unfortunately, Nicole's journal makes reference to the fact that the normal power conduits going to the retriever arm have been damaged, and must be bypassed using the manual power

routing controls (the 5x5 button grid). Standing in front of the retriever arm console causes the first LED to light up red, and the button grid to glow a dim white. Pushing the buttons toggles it to a full bright white. Nicole alludes to having left instructions for Dmitri as to which buttons to push, but comments that they too were lost when the avian broke the window.

If players are standing in front of sensors for two different stations that each control the same LED, that LED will just stay off. This requires players to not just stand in front of all of the sensors at once.

PUZZLE TWO: The Eyli Board

If they've solved the Power puzzle, players will be able to activate the navigation console, which consists of longitude and latitude inputs/displays (marked by Torans and Spans) in D'ni numerals, and a "move the pod here" button. Unfortunately, someone has affixed a combination lock to the button that actually causes the pod to move to selected coordinates, and taped a note nearby.

The journals depict the relationship between Dmitri, a retired anthropology professor, and Nicole, a young mechanical engineer, as one of very reluctant colleagues. Dmitri, who places a great deal of importance on understanding the cultures of the worlds he documents for the DRC, resents Nicole's somewhat blasé attitude about the people who built Sunblind's observation pod. Specifically, she resists his efforts to teach her a board game, "Eyli," found on many of these observation pods. Indeed, there is one in the room: a checker-style, 15x5 board of squares divided into three "fields" and topped with pieces in various shapes.

In his journal, one of Dmitri's entries is something like, "Maybe this will teach her to slow down and learn about the finer points of this world's culture." The note by the lock reads, "How about a game?" followed by a descriptive list of moves. From clues in the journals and Atrus's recording, the players can deduce the basic rules of Eyli well enough to follow Dmitri's instructions. If they do, scratches and decorations on the board in combination with the correct configuration of pieces reveal, when viewed from above, a D'ni number (1097, when converted to base-10), which is the combination to the lock.

PUZZLE THREE: The Coordinates

The navigation system is powered up, and the deployment mechanism has been unlocked. So where do you actually need to go?

On one wall of the room, a child's simple crayon drawings hang near a boarded-over (or otherwise sealed) window, each dated in messy handwriting with the day they were completed. These belong to Nicole's daughter, who visited Sunblind with her mother on occasion when babysitters weren't available (and after the Maintainers declared the pod child-safe). In Nicole's journal, she notes that her daughter was finishing a midday snack and drawing the view from

the window when the avian attacked. Comparing dates, the players can identify said drawing as one of a large moon between two tree-covered mountaintops.

The room contains a topographic map with labeled lines of latitude and longitude, capped with a diagram of the sun's longitudinal position at various times of day. Dmitri's journal notes that the pod's orientation never changes, and one of the journals notes that it faces west. players can use this information to determine that the pod was to the east of two North-South-oriented peaks when the book fell. While the topographical map identifies several possible pairs of peaks, only one is low enough to support trees, according to tree line measurements found among various statistics about Sunblind jotted down elsewhere in the pod. The players thus have a longitude. Atrus observes that a beautiful moon is sometimes visible, but only when the world's vivid sun is to one's back; in combination with the sun diagram and the knowledge that the drawing was made at midday, the player can determine the pod's distance from the peaks, giving the players a latitude.

PUZZLE FOUR: The Retriever Arm

If the players enter the coordinates in the powered-up navigation console and engage the unlocked lever/button, they'll have successfully navigated to the location of the linking book. Now there's just the small matter of retrieving it from the surface.

If the players disconnect the navigation station and power up the viewscreen, they can magnify the picture to see the linking book--but more importantly can read the piece of paper for which the book conveniently serves as a paperweight. The paper appears to contain an Eyli move, referencing one of the game board fields and a turn number. In actuality, this is Nicole's lost instructions for activating the retriever arm, left in tongue-in-cheek form for Dmitri. If the player recreates Dmitri's Eyli game up to the turn number indicated, the indicated 5x5 field will contain a number of pieces. These represent the locations on the power console’s 5x5 manual control grid that need to be activated. Doing so will activate the retriever arm console (a Big Red Button, and a locked box with green and red LEDs on top to indicate if it is unlocked). Engage the arm, and a box opens/unlocks, containing the linking book back to Todelmer.

ATMOSPHERE: I'd recommend having a sound effect play when a station is activated, when the pod moves, and when the retriever arms engages. It might also be fun to throw in some loud avian squawks when the players have navigated to the correct coordinates. The really-bright-sunlight concept exists largely so that we can just display a bunch of lens flare if the viewscreen is activated while the pod is in the wrong place, but it also might be fun to have bright lights shining through small cracks in the boarded-over window.

Atrus' Lines

(All of these will start and end with static, and will probably have some static/audio fading throughout. Nonessential lead-in/out text has been included in parentheses)

(It seems as though this) device was used by the researchers in this pod for recording the calls of local wildlife, but Catherine has encouraged me to use it as a sort of audio-journal. Secretly, I suspect she believes that I'll return home from one of my expeditions having forgotten how to talk, and wants me to keep in practice. I admit that sometimes after long periods of writing, (I find myself…)

(The name of this age is) thus far unknown, but until I discover its true name, I've taken to calling it "Sunblind." As fitting a name as any. I spend half my days with my back to the window, shading my eyes with an ever-tiring hand. Ah, but after the sun has passed over the pod, and its light is no longer so direct, the most breathtaking moon becomes visible over the horizon. I find I cannot stop staring at it, my eyes perhaps hungry to at last see this age's beauty without squinting. Perhaps (when I return home, I can…)

(I have made little) progress in using the pod's navigation controls. I've tried moving the sliders, but my efforts seem to be quite futile… Perhaps I need to adjust the phase?

(...came across a series of) D'ni geological surveys of this age. Of particular interest is a section detailing the process of obduction (taking place along the…)

(It has been a) long while since I last visited Sunblind, and I am pleased to discover these recordings still largely intact. I certainly have plenty to add to them. I was foolish not to come by myself after so long an absence, but Yeesha continues to prove adept at getting what she wants. I don't suppose she was half as startled as I to find people here upon our arrival; nor was I half so startled as they. They calmed quickly, but are, as I have learned, a cautious people; most of the machinery in this place will not even function without the presence of multiple operators, which explains why I had such difficulty all those years ago. They understand some D'ni phrases, suggesting that their ancestors had contact (with the original...)

(Most of our) time here has been spent waiting, in between bouts of activity on the surface. We've been passing the time playing a game the natives taught us; its real name is difficult to pronounce - Ee-ah-ee-lie, approximately - but Yeesha has taken to calling it "Eye-lee," for the pattern that appears on the board. She seems to have a knack for the game, winning more often than not. The round 'Kah' pieces give me particular trouble - they bounce back one square after hitting an obstruction, even if doing so pushes back or destroys the piece that sent the Kah

soaring to begin with. This behavior feels unintuitive to me, and I find myself forgetting to consider it during my moves. Ah, well. If nothing else it's good for her self-confidence. Since escaping her brother's captivity she has been (somewhat more reserved than...)

Intro for the players

- You do not need to take anything apart
- You do not need to look under the tablecloths/tables
- You do not need to unplug/plug-in anything
- You will know when you have won because it will tell you in no uncertain terms
    - also, because you will have found the linking book

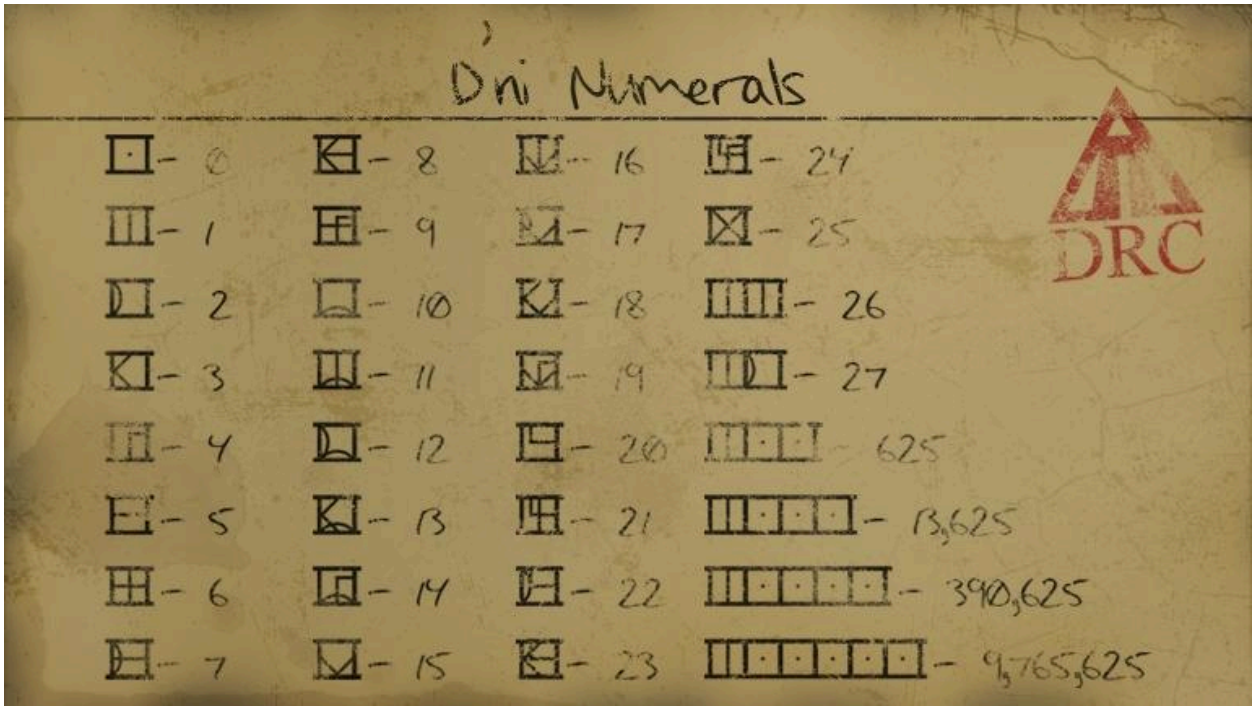
Electronics parts list

Power Console

- 25 LED buttons in a 5x5 grid
- 2x TLC5940 to control the LEDs in the buttons
- 3 RGB LEDs in panel mount holders
- Big Red Button (actually green) for ‘turning on’ power
- Arduino Mega to control everything
- Wireless chip

Navigation Console

- A page indicating how to convert from base 10 to d’ni and back



- Padlock (4 digits)
    - Cover for padlock http://smile.amazon.com/Master-Lock-Universal-Switch-Lockout/dp/B001925P6W
- Big “move the pod” button, with a cover that accepts the padlock
- 4 sliders (two each for longitude and latitude, to make it easier to select a number)
    - Originally was going to be two sliders for three digits, but was eventually consolidated to two sliders or two digits - one for each digit
- 2x 2-digit D’ni number displays
    - 4x 8x8 LED matrices
    - 4x 8x16 matrix backpacks
        - We had enough backpacks, was easier to just use one per 7x10 board
- Arduino
- IR sensor
- Wireless chip

Viewer Console

- Laptop
- LCD Monitor
- Controls for the audio playback
    - 4 LED buttons (next, last, play/stop, ‘record’)
        - the record button never lights up and is ‘broken’.
- A D’ni numeral display for which recording is queued up
    - Probably some that are just static or bird calls or something

    - 1x 8x8 LED matrix
    - 1x 8x16 matrix backpack
- Audio itself is controlled/played by the computer
- Arduino
- Wireless chip
- This Arduino is the master controller for the wireless network, feeding data to and from all the other ‘consoles’ and sensors
- IR sensor
- Rotary pot for zooming the display
- Two sliders to pan the display when zoomed

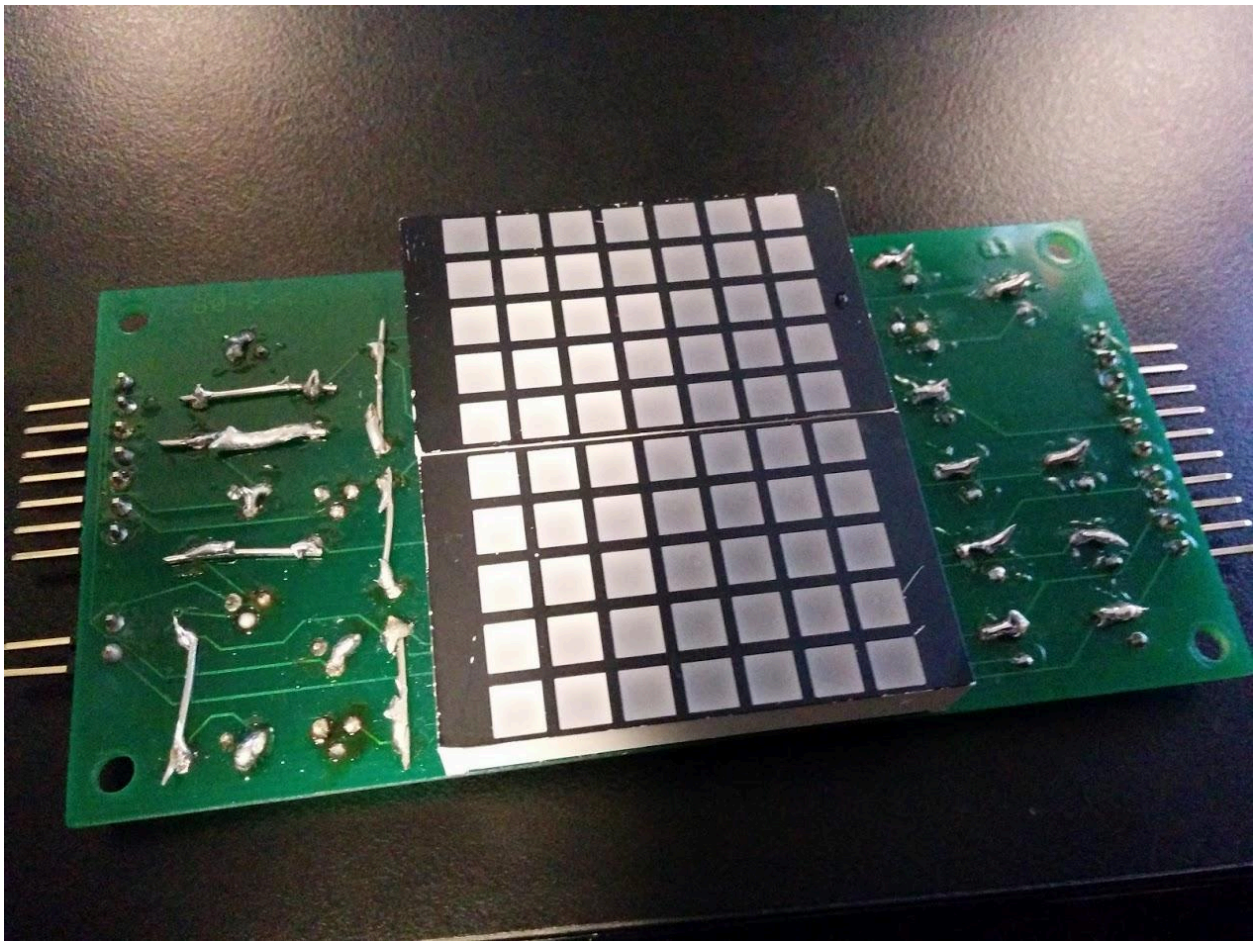
Retrieval Arm Console

- A box with hinged lid
- Servo
    - This ended up not working/locking up the system. The eventual assumption was that the servo was being told to move past the point where it latched and so it would lock up the system in its attempt to keep moving forward.
    - No one got far enough for it to really matter, though.
- A latch of some kind that can attach to the servo (like the hook and loop things for doors)
- Red and green LEDs
- Arduino
- IR sensor
- Wireless chip
- Blue button for activating the ‘arm’ (unlocking the servo)

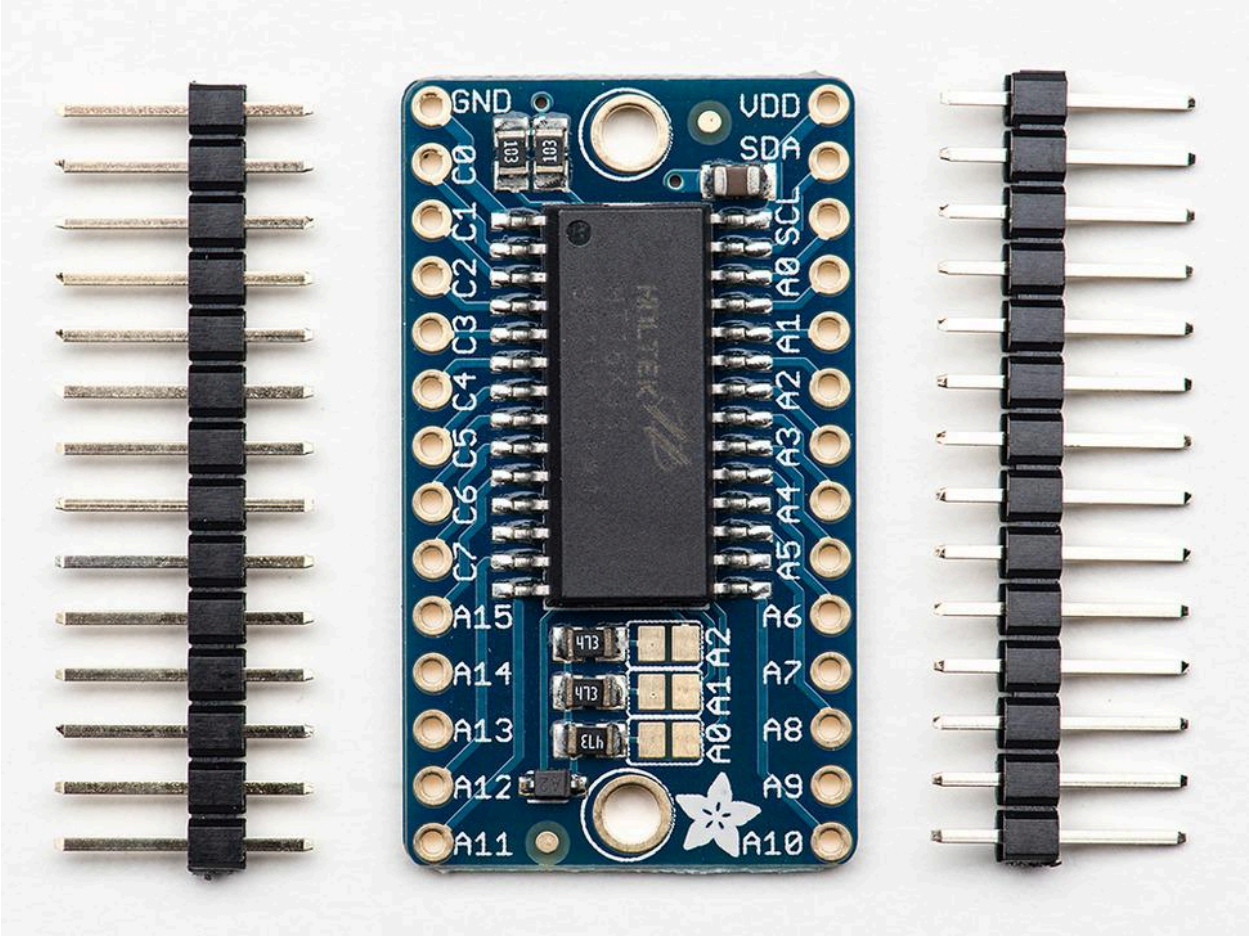
Proximity Sensors

- Arduino
- 2x IR sensors
- Wireless chip
- (for one pair of sensors) 4x AA batteries to get ~ 6.5V of power without a wall plug

Specific Components

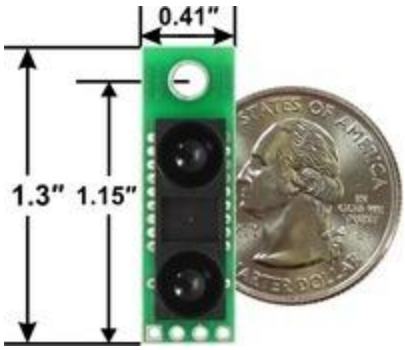


These were the basis of the D’ni number displays. They were originally designed back in my college days for an interactive public art sculpture project, and were repurposed here. Half of the transistors on the boards had mysteriously died, so the easiest solution was to cut them off and do really ugly solder jumpers to bridge the connections they used to make.



These ‘backpacks’ are designed to control an 8x16 pixel screen, and were perfect for our use. They came from Adafruit - http://www.adafruit.com/products/1427

These tiny little chips are how all of the systems communicated. They came from Addicore - https://www.addicore.com/nRF24L01-Wireless-AddiKit-p/129.htm. Each Arduino in the room was hooked up to one, and they were all connected to a mesh network using this library - http://tmrh20.github.io/RF24Mesh/index.html. This meant that they could dynamically reconnect to the network by finding the transmitter nearest them (physically) and routing all traffic through it. This way we didn't need wires running all over the room to one central point. They worked pretty well, especially for the (very cheap) price.



These even tinier boards were the key to making the power sensors in the room work. They are analog IR sensors from Pololu - https://www.pololu.com/product/2474. There are older models for sale elsewhere that are slightly larger, but they are inferior. These have a wider sensing range, are smaller, and cost a little less to boot!

Crayon Drawings Info

(copied from above, to start):
On one wall of the room, a child's simple crayon drawings hang near a boarded-over (or otherwise sealed) window, each dated in messy handwriting with the day they were completed. These belong to Nicole's daughter, who visited Sunblind with her mother on occasion when babysitters weren't available (and after the Maintainers declared the pod child-safe). In Nicole's journal, she notes that her daughter was finishing a midday snack and drawing the view from the window when the avian attacked. Comparing dates, the players can identify said drawing as ***one of a large moon between two tree-covered mountaintops***.

(more info)
As for crayon drawings, I think other than the one that's key to the puzzle, maybe there's one that is a drawing of a couple of Eyli pieces with them labeled? Just another way to communicate some of that info. Not essential though if that's hard or a stretch. ***For the rest, they're just red herrings, so any normal kid stuff is fine. Maybe have about six all together***? And then date them.

(more, though we need to coordinate the journal dates here, so hold off on dates)
And for the dates, they're going to be pretty arbitrary, so I don't think it really matters. I'm trying to think if there's a reason we might want to have this set during a particular year, either as a nod to something or for logistical reasons, but nothing is coming to me.

Map (in jpeg form)