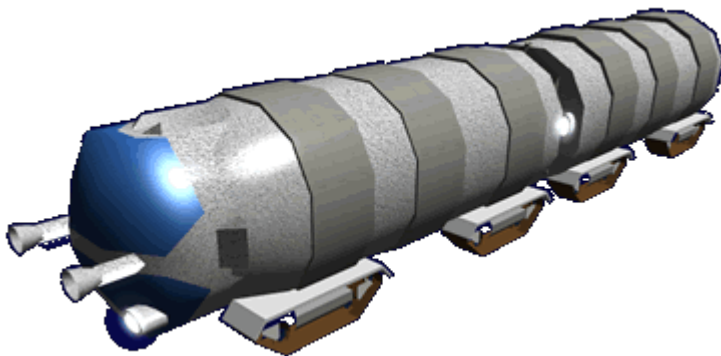


# M.O.L.E.S. - Mineral Ore Location and Extraction System

The MOLES is a system for locating and extracting ores that was designed and tested by the [Scientific Studies Service \(SSS\)](#) in YE 32.



## About the MOLES

The MOLES is a mining system developed by the [SSS](#), it can be operated by an on-board crew or remotely. It consists of a Naikei (bore), a collection of Unpan (Carriages), and a cluster of drones to mine and collect the ore.

## History

During [Project Kyasshu](#) the [SSS](#) explored ways to improve mining to supply their needs for production. The MOLES is the result of their efforts, and after testing the prototype they gave the designs to [Ketsurui Fleet Yards](#) for production.

## Appearance

The MOLES primary unit for boring is cylindrical with a tapered nose, and blunt tail end. It rides upon 4 sets of tracks. Two high powered [Ultrasonic/Sonic Drillers](#) protrude out the front.

# Operation

When boring the *Naikai* is accompanied by 3 or more *Unpan*. Detritus from the bore is brought in through a impeller and loaded into the *Unpans* When an *Unpan* is full it returns to the surface. When all of the *Unpan* are away from the *Naikai* it holds position. When one of the *Upa*n returns it resumes boring. At times while boring the *Naikai* will carve a wider area for use as a pullout so that *Unpans* leaving can go around ones returning.

## Statistical Data

### General

Class: Mining System Nomenclature: Ke-K5-1a Type: Automated Designers: [Scientific Studies Service \(SSS\)](#) Manufacturer: [Ketsurui Fleet Yards](#), [Scientific Studies Service \(SSS\)](#)

### Naikai - Dimensions

Length: 19 meters (62.32 feet) Height: 7 meters (22.96 feet) Width: 6 meters (19.68 feet)

### Speeds

- Driving: 60 kph (max)

### Bore rates

Speed	Substance
15 m/m <sup>1)</sup>	dirt
8 m/m <sup>2)</sup>	soft rock, sandstone
4 m/m <sup>3)</sup>	dense rock, granite

### Damage Capacity

See [Damage Rating \(Version 3\)](#) for an explanation of the damage system.

- Hull: 12 Armor
- Shields: None

### Unpan - Dimensions

Length: 16.5 meters (54.12 feet) Height: 7 meters (22.96 feet) Width: 6 meters (19.68 feet)

## Speeds

- Driving: 60 kph (max)

## Damage Capacity

See [Damage Rating \(Version 3\)](#) for an explanation of the damage system.

- Hull: 12 Armor
- Shields: None

## Naikei

The *Naikei* uses two high powered [Ultrasonic/Sonic Driller arrays](#) to tunnel through dirt and stone. The *Naikei* has a cockpit where two operators control the unit. The *Naikei* can be operated by the on-board [Isolated Computer Pads](#). Normally it is only operated by computer once the site has been initially worked. The *Naikei* also has a pair of sleeping bunks, a privy and a small kitchen for use by the occupants. The life support system can supply potable water and breathable air for thirty days without refurbishment.

The *Naikei* uses a [Ke-T8-E3103 Computer Array](#) created for the [Ke-T8 "Kuma" Multi-role Shuttle](#) as its guidance and control system.







The two [Ultrasonic/Sonic Driller arrays](#) are larger and more powerful version of those on the [MOGS](#); they can make a hole up to twice the width of the *Naikei*. The pulverized stone slurry is taken into the *Naikei* and some of it is kept to make braces. The rest of the slurry is passed into the *Unpan* and taken to the surface.

The aft portion of the *Naikei* has a compact [fabrication unit](#) like that found in the [Ke-P1-06a - Workshop](#). The slurry that is kept on the *Naikei* is processed and turned into a high tensile polymer that is by [Extrusion](#) shaped into braces and supports. The polymer is flexible and pliable until exposed to ultraviolet radiation. A bar-code is attached to each support and is read by the MOLES units when navigating the excavation.

## Sensors

The *Naikei* uses the same sensor package as the [MOGS](#).

-  [Ground penetrating radar](#) which can be used to image through rock, soil, ice, fresh water. It can detect objects, changes in material, and voids and cracks. Range is 1 kilometer.
-  [Seismometer](#) to measure and record motions of the ground.
-  [Seismic reflection](#) the *Naikei* has two seismic sources that generate controlled seismic energy. A series of receivers along its sides receive the reflected energy.
- Scalar ore scanner uses a scalar transducer to send a  [Scalar Field](#) out in a 180° arc. The scanner then analyzes the phase shift of the reflected energy to identify ores. Range: 500 meters.

## Lighting

The *Naikei* is equipped with retractable light bars containing Normal and Ultra-violet lights.

## Shaberu

The *Shaberu shovel* are small automated units that mine the desired ore. They are hexagonal, 1.5 meters wide, and 1 meter tall. They have an assortment of mining tools:

- carbide cutting tool
- sonic drill
- impact hammer
- mining laser.

Once the *Shaberu* has extracted a piece of ore it moves it behind it for a *Kyuu* to come and collect it. The *Shaberu* receives commands from the *Naikei*. The *Shaberu* move on six mechanical legs.

## Kyuu

The *Kyuu gatherer* actually perform the ore extraction. These drones gather the mined ore from the *Shaberu*. Once they are full they return the ore to the *Naikei*. They consist of a pair of claws, a scoop and a box to contain the ore. The *Kyuu* also assist with placement of braces and supports. They are two meters long, 1 meter wide and 1 meter high. They move on treads.

## Unpan

The *Unpan carriages* are used to transfer the ore to the surface. The *Unpan* collect ore from the *Nakei*. Once full the *Unpan* starts making its way along the tunnel. It transfers its cargo to another *Unpan*, which in turn will pass it to another. The *Unpan* are autonomous.

The *Unpan* has a cargo capacity of 4m x 5x x 14m or 280 cubic meters.

Each *Unpan* can carry the following units inside for deployment when the *Naikei* reaches the desired site. They bring the units down when empty:

- 2 Kyuu (Gatherers)
- 4 Shaberu (Shovels)

## MOLES Systems

### Power

All units in the MOLES use [Aether](#) generators for primary power.

### Armor Construction

Mining is dangerous work, and all MOLES units are built with a [Durandium Alloy](#) frame and covered in [Durandium Alloy](#) plating.

## Additional Use

The MOLES is also capable of being used to bore tunnels for other uses, such as transportation.

## OOO Notes

Artwork by [Nashoba](#).

<sup>1)</sup> , <sup>2)</sup> , <sup>3)</sup>

Meters per minute

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