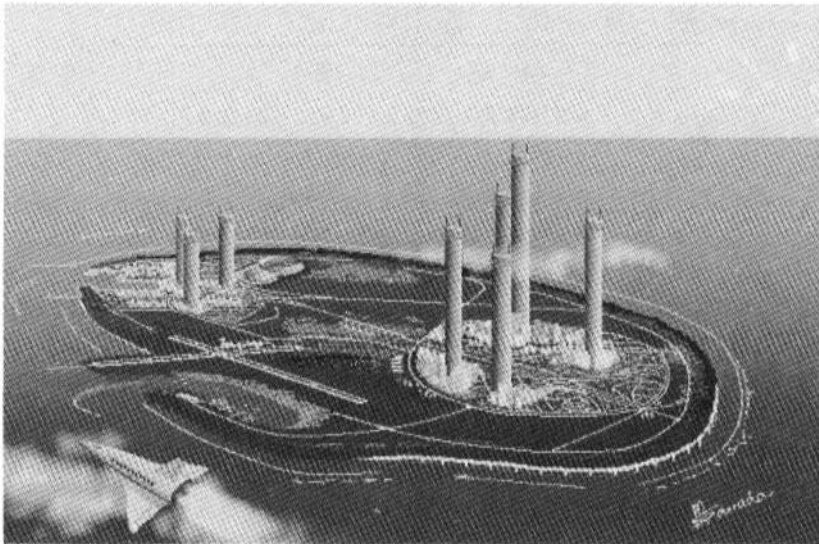


Ocean Republic (Plan for the Ocean City)

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1. Preface

Wacom is a computer peripheral equipment and CAD / CAM / CAE system manufacturer. We have the FRC (Fundamental Research Conference) every fall, inviting researchers both inside and outside of the company in various fields, having presentation of each research issue and having discussion.



OCEAN REPUBLIC

This presentation was held in FRC 1991.

2. Overview

'Republic' is one of the key words from the late '80s to '91. The dissolution of the Eastern European alliance in '99, the unification of Germany in '91, the breaking out

of the Gulf War and refugees due to regional conflict, the internal conflict of Yugoslavia, the dissolution of the Soviet Union, and after that dissolution, the independence of the new Republic. In other hand Towards European integration several measures are being shown one after another, the world is rapidly changing. Among them, it is time to ask the meaning of the NATION itself.

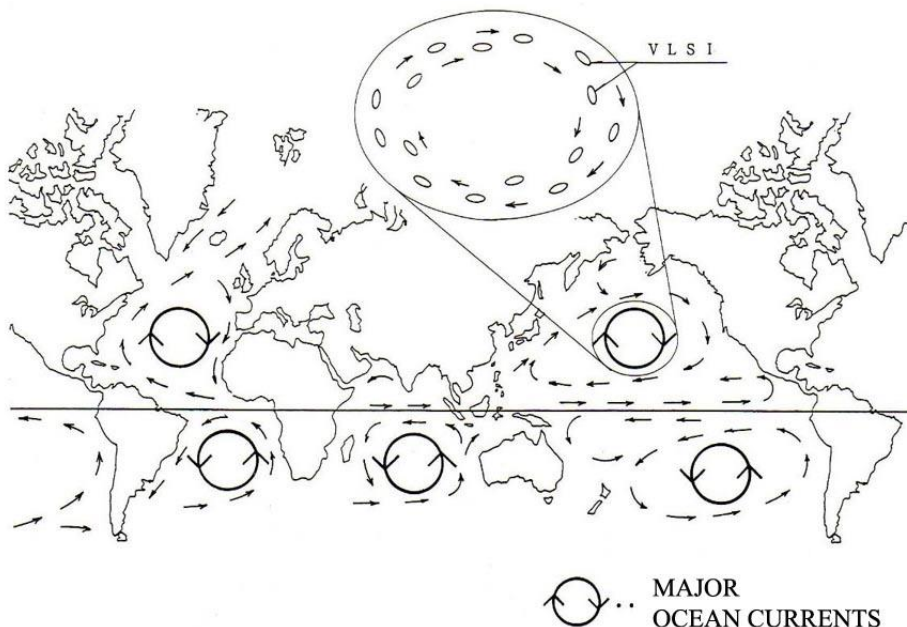
On the other hand, the world has many problems. Explosive growth of the population, food shortage, resource shortage, and increasing environmental destruction, and an increase in meteorological phenomena due to it. And these problems will never be solved as a problem of one single country. Even if political scientists, philosophers, and historians observe changes as

various view point, for the various world situations mentioned above, it is said that the world is steadily moving forward towards one large community, from a broader perspective point of view. And it seems that various problems such as mentioned above will be solved comprehensively only after such single community on the earth is come true.

What kind of era is the coming 21st century? For a while, I would like to think in "physical history". It can be said that the era in the past was a SOLID era. Human beings were utilizing land as intermediaries. Unlimited struggles between ethnic groups, indigenous and inflowing people the world map has been made up.

There are three states of matter, solids, liquids and gases. But if the passed era was solid era, it is considered that the future will be a liquid era, and then the space era will come as the gas era followed after liquid era. Therefore, the 21st century can be said to be the beginning of the liquid era where all ethnic people and races are mixed, that is, in another words, the marine era. Space colonies and other blueprints of space projects have been announced, but it seems that it will take considerably long time for many people to move and live in the space yet.

This project is a plan to utilize the space of the ocean by many ethnic



groups as in the liquid age and to comprehensively solve food problems, resource problems, environmental destruction problems, etc. In other words, it is a plan trying to build a "new nation" that has not existed in the past.

Fig.1 OCEAN CURRENTS AND VLSI

3. Plan for the Ocean Republic (Plan for the Ocean City)

The core of the plan is to construct huge floating structures which can navigate in the ocean, and we call them as VLSI (Very Large Sailing Island) for convenience.

VLSIs are floating hundreds of or thousands of gigantic floating structures which float in areas where the ocean currents refluxing, such as the North-South Pacific, the North-South Atlantic, the Indian Ocean, etc. Each structure has a dimension from hundreds of meters to a maximum of several tens of kilometers in length, and on the structure it has several airfoil-section buildings (having the same function as wings) with several hundred meters to several kilometers in height. Utilizing ocean current

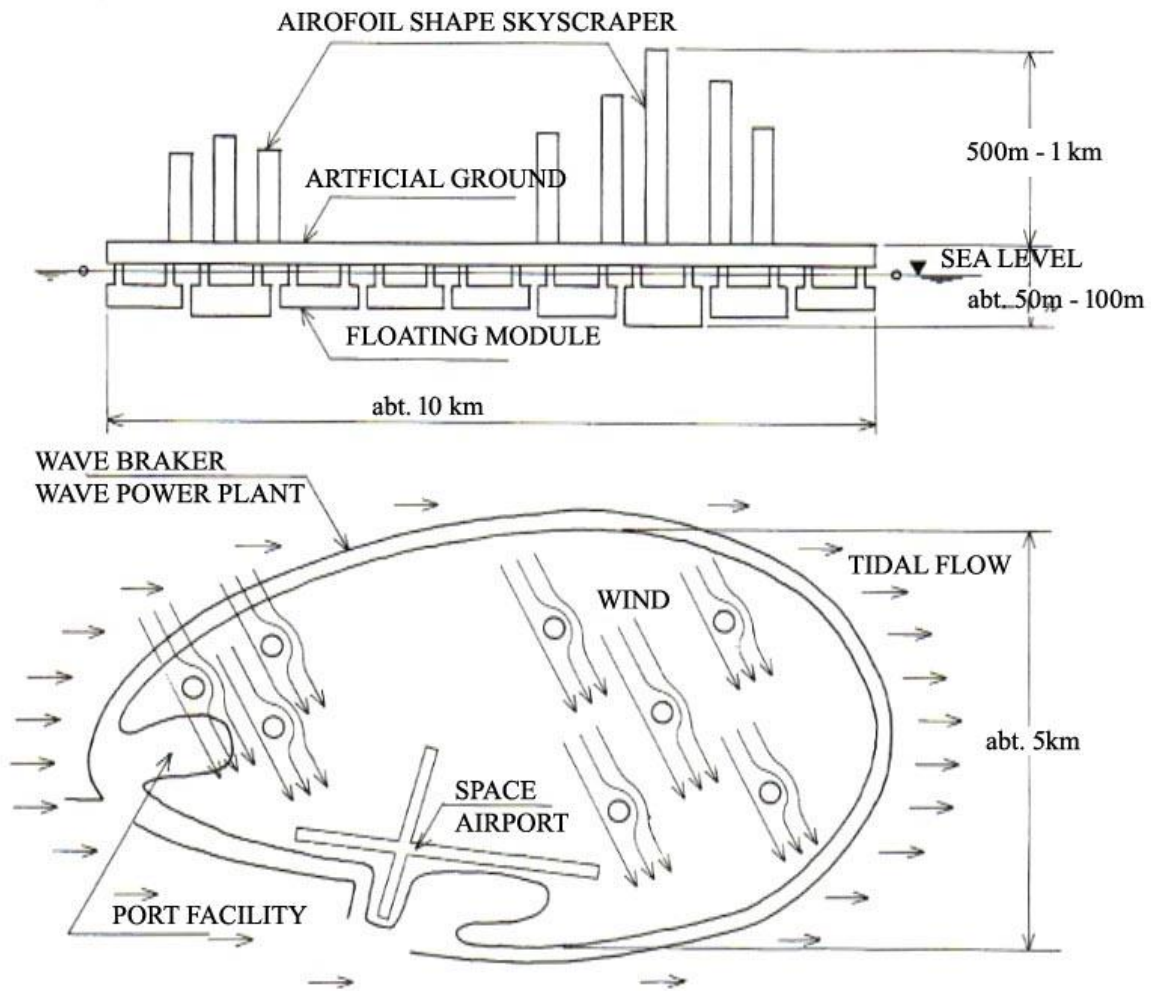
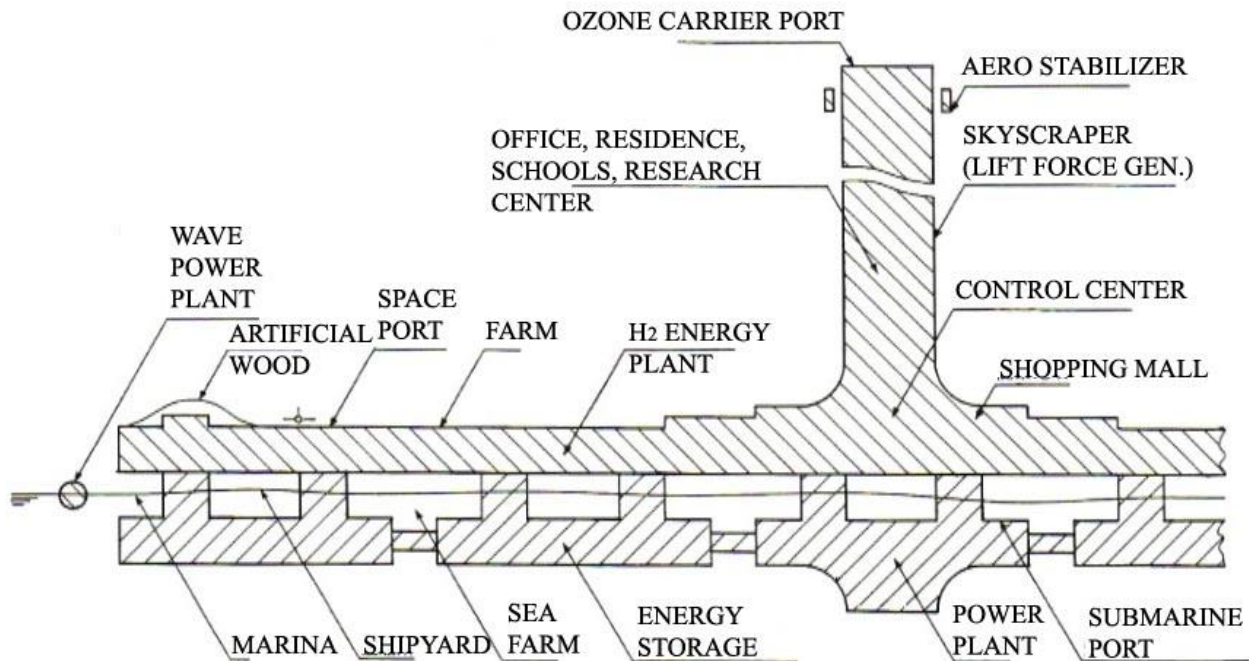


Fig.2 OUTLINE OF VLSI (abt. 10km length)

and wind power in the sea area, it continue to move in the same orbit on the ocean permanently. (Figs. 1 and 2)

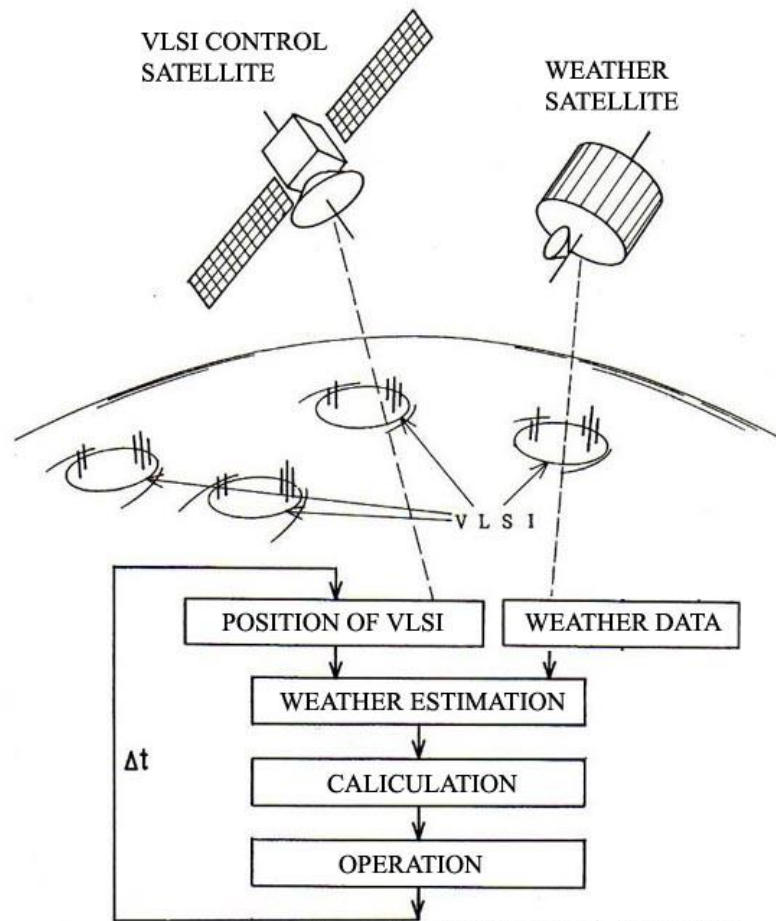
Also on it there are power plants, factories, farms, residence, office buildings, harbor facilities, airports, space airports, then the islands have function of cities and are used for various purposes. VLSI can be said to be a moving archipelago with national function, and they form a core of Ocean Republic. That is, the VLSI becomes a living space, factory for collecting marine resources, place of cultivation, place of fishery products plant, industrial base, furthermore it has a facility for regaining the destroyed global environment. In terms of political and social aspects, it should be a space under the jurisdiction of the supranational organization such as the United Nations, and it functions as a transient cushioning mechanism to build a community of many ethnic and racial communities and head towards one world. (Figure 3)



▲ Fig.3 VLSI SECTIONAL STRUCTURE

4. VLSI structure and operation method

In this chapter, I want to describe the case which VLSI is constructed by existing methods, that is, structural members such as steel and concrete. Other methods are described in the following section.



▲ Fig.4 VLSI OPERATION

VLSI is made up of a semi-permanent artificial ground which is the foundation of airfoil type buildings so to say skyscrapers and is based on rig-like marine structures (floating module). This floating module is partially replaceable and will be replaced after its life. The part of the floating module on which the skyscraper built up has large scale in depth to balance the upper heavy weight to keep balance. Those skyscrapers have circular section at its cut cross, and lift force (thrust force of VLSI) is obtained by the Magnus effect of the wind current around them. Therefore, VLSI sails offshore obtaining thrust force and turning moment by resultant force of ocean current force and wind lift force. In order to avoid collisions caused by shoal reefs or VLSI each other, it is necessary to control them comprehensively, and the control flowchart is shown in FIG. 4. Therefore, long-term prediction of weather is indispensable for VLSI control. Weather data of various places around the world at a certain point in time are collected by meteorological satellites and other means such as atmospheric pressure, temperature, humidity, weather, wind direction wind speed,

direction of tidal current, speed, water temperature, wave height, etc. It decide for each VLSI the best VLSI operation direction and speed at the next certain time point. Eventually VLSI will be controlled by the flow of air around skyscrapers, and will be orientated to the course where it should go and also speed.

5. For what purpose should VLSI be built?

VLSI is used for the following purposes in order to solve various problems on the earth as proposed in chapter 2.

1. Residential area (tens of thousands to ten million people per VLSI, total, tens of millions to about hundreds of millions)
2. Agricultural lands (including crop production plants)
3. Artificial fishing, fishery processing, and aquaculture facilities
4. Mineral processing plant from the Sea (uranium, manganese, rare metal, rare earth, etc.) Smelting facilities of resources
5. Hydrogen production plant
6. Various kind of production factories
7. Electrical power plant (power for self-use and converted to chemical energy to export)
8. Ozone production facility (utilizing static electricity generated by friction between atmosphere and skyscraper)
9. Compressed CO₂ storage facility, reuse treatment facility
10. Waste, industrial waste disposal and reuse treatment facility
- 11, Purification and cleaning facility (supplies oxygen to the sea water, activates the sea, recovery of sea being by spilled oil)
- 12 Port for vessels, airport, space airport (using the potential when located near the equator to depart and return for a spacecraft)
13. Collaborating research institutes of state, university, enterprises, and institutions of super-state agencies
14. Leisure facilities, recreational space
- 15, Cemetery (offshore ash scattering station)

The point is that there is a merit in that a new social life space arises on the ocean and is in a place away from the land. No. 15 cemetery is interesting.

But if the demand of cemetery increases, naturally it is needed to get space on the sea surface by efficiency reason.

6. VLSI construction method

If it is assumed that building with conventional shipbuilding technology, marine engineering, that is, steel and concrete, it will require a great deal of time and quantity. For example, when building a VLSI with a length of 1 kilometer, a width of 200 meters, and a depth of 40 meters, it is estimated to be about 20 times the amount of material required to build a 300,000 ton class tanker. For items of kilometers, widths of 5 kilometers, depths of 100 meters, approximately 7,500 times the quantity is required. Also, if you build dozens to hundreds of these VLSIs, they will be astronomical numbers. Of course, even now it is technically possible to build a VLSI of hundreds of thousands, but here I would like to consider a method using other structural members.

1. Calcium structure

Artificial coral reef, rapidly growing calcium skeleton (reinforcing material) in sea water filled with catalyst (microorganism) and calcium ion by applying bio technology.

2. Method by ice structure

Large ice blocks are covered with insulation material and freezer to construct the structure.

3. Use of volcano engineering

Volcano technologies using the volcano's energy, using lava from volcano like Hawaiian volcano Kilauea (Structures with pumice)

4. Development of new materials

A) Development of foamed steel

(Steel material containing bubbles)

B) Development of foamed concrete

(Develop bubbly concrete, currently used one)

C) Other structures, such as of industrial waste

7. Conclusion

In VLSI, it seems to be several types such as the semi-sub method

mentioned above, the shallow submersion type which appears on the sea surface only with the upper skyscraper, and each has advantages and disadvantages. I also want to find the opportunity and announce it. "The abbreviation of VLSI is the same as the VLSI of a large-scale integrated circuit. While the semiconductor VLSI is the maximum (technologically) product in the 20th century's minimum (size). I hoped that this VLSI would be the maximum in the 21st century and be the largest product.

For VLSIs small ones are hundreds of meters in length, and large ones extend over tens of kilometers. The fields that need to be developed and researched, how many sizes to build, how to build them, and other breakthrough of shipbuilding engineering, ocean engineering, construction engineering urban engineering, aerospace engineering, electrical and electronic engineering, information engineering, materials engineering, geophysics, biology, environmental engineering, economics, political science, law, religion, etc.

Recently, not only waterfront but also various big projects, such as geo front, have been launched, but these are not limited to technical problems but related to politics, economics, culture, art, religion, various things doing. It is no longer an era of technological idea alone, what is ethnic, national, what is the future society to come, is coming to an era when it must be considered comprehensively.

In view of these points, the Plan for the Ocean Republic is developing not only VLSI, but also in the broader sense throughout the future society based on the ocean, the hard aspects of underwater cities, artificial islands, etc., software such as social welfare I want to plan to promote research on both sides.

In addition, I used the stylus pen and digitizer to draw the conceptional picture, our products, and the software was drawn by Super Tableau of Sapiens corporation.