Example of natural disaster detection and action support with QZS system (positioning supplementation and reinforcement)

- Detection of natural disasters
  A system that can use information such as movement of objects in the earth's surface, through high-precision positioning that applies the features of QZS, even in areas where positioning has conventionally been a difficult task (such as ground depressions and the earth's edge of mountains), and in areas that are dangerous to people.
  - Verification of observation equipment capable of performing stable, high-accuracy (centimeter-level) satellite positioning through the application of positioning supplementation/enforcement functions of high-precision-angle QZS
  - Verification of remote observation equipment that can be set up in dangerous areas (such as by dropping a small paratrooper)

- Action support at disaster
  A system that supports disaster prevention/evacuation planning based on the integration of information obtained not only through the conventional means of collecting disaster information (local governments) but also through the gathering of disaster information from the general public (including individuals and companies) who happen to be present at the site of the disaster, as well as through the sharing of disaster information with relevant ministries/agencies and local governments, particularly in the early stage of disasters.
  - Information-providing terminals (systems that can be used by handheld devices, PDAs, and types of equipment that can connect to personal computers) capable of performing stable, high-accuracy (meter-level) satellite positioning through the application of positioning supplementation/enforcement functions of high-precision-angle QZS
  - Verification of systems that gather positional information from seamless space, including indoors and underground
    - (such as GPS, IMES, RFID, and wireless LAN)
  - Verification of information-gathering systems that identify and manage information obtained from the general public
    - and send information-providing terminals, based on positional and time information
  - Verification of integrated information management systems that can share new information with the disaster prevention systems of relevant ministries/agencies and local governments, based on QZS
  - Verification of action support programs capable of implementing quick and accurate countermeasures as the result of immediate disaster response simulations

Example of mobile positioning system available throughout the whole country

Satellite positioning using GPS can immediately improve positioning accuracy through the QZS information. One of the weaknesses of GPS is that there are limitations to its usage time and location. Also, the distribution of correction information is limited to cell phones, for instance. At the present time, efforts are being made to materialize a QZS that can overcome these weaknesses.

With this application demonstration, GPS weaknesses can be overcome with the use of the information from the QZS, the practical application of an aboveground system that obtains nationally uniform, high-precision positional accuracy can be verified, and the usefulness of the QZS can be verified, leading to its practical application.

Thus, positioning accuracy and application methods can be demonstrated by making the system receiver (including various correction information) compatible with the QZS. In this way, improved work efficiency can be expected in fields that require high accuracy positioning, and economic effects and employment creation can be expected through the development of new application methods and the like.

Use of this system can provide high accuracy and greatly reduce time, particularly in fields that require a great amount of time, such as the preparation of digital road maps. Similarly, it can be applied to tasks such as surveying needed in the preparation of base maps, and the fields of application can be expanded.

Example of protection, security/safety, and barrier-free

In order to keep children and older persons safe in a world in which such persons are often involved in traffic accidents and incidents, it is important to enable guardians who may be some distance away to monitor the actions of such children and older persons, detect risky situations, and take quick responsive action. In this way a secure, safe society can be created.

- Use functions that can recognize children's actions as real-time geographic information.
- When a problem occurs, make it possible to coordinate police and local security authorities in a timely manner by making maximum use of such geographic information.

Use of QZS as means:
- Provides a function (related to Japanese version ESF1) that can constantly distribute information, including positional information (time information), to devices that people regularly carry with them (such as a cell phone).
- Ensures that a system that uses GPS reception, positional information of the base station is distributed. There are instances, however, in which expectations may not be met because the base station may be several kilometers away. Accordingly, it becomes necessary to utilize QZS supplementation plus an underground passage employing IMES or similar tool (distribution of positional information within a building).

Since a social network based on media such as cell phones will be created, we can look forward to seeing a revival of society's disappearing spirit of cooperation. This is an important aspect of a good quality of life for people.

Example of precision agriculture based on IT automatic driving

As the aging of society's population progresses, the aging of laborers and lack of successors have become major issues in the field of agriculture.

To resolve these issues, the national government is trying to make improvements by implementing area integration and large-section operations.

However, in an era that demands corresponding action for environmental preservation as well, the labor improvement effect gained by increasing the size of the section area is not large. Thus, techniques that are hoped to be effective in this regard include precision agriculture that supports farm field soil environment information and the full automation of machines work through IT automatic driving.

It is thought that IT automatic driving may produce an even larger effect in the future through its application to construction machinery as well as to industry and a variety of mobile units and automobiles for the general public.

Through the application of QZS (supplementation and reinforcement functions), it is hoped that stability will improve, scope of usage will broaden, and utilization will be effective.

A receiver that receives reinforcement signals from QZS will be combined with a receiver for dual-frequency and loaded machine work through IT automatic driving.

As the aging of society's population progresses, the aging of laborers and lack of successors have become major issues in the field of agriculture.
Satellite positioning using GPS can dramatically improve position accuracy through the utilization of QZS (complementation and reinforcement function).

One of the weaknesses of GPS is that there are limitations to its usage time and location. Also, in locations where GPS is not available with a cell phone, positional information of the base station is distributed; however, for the positional relationship with the base station and cell phone, satisfactory positional accuracy may not be obtained in cases. At the present time, vehicles are being made to use QZS that can overcome these weaknesses.

This aim of this examination is to verify the practical application of a new positional information application service for seamless positioning environment through use of information from a QZS or through the use of information from IMES indoors.

For example, the system can be expected to lead to regional and municipal revitalization and produce an economic effect as a result of the development of services and system technology that will not only enable anyone, such as, for example, tour guides and city conselgers, to utilize and employ the system at any time but enable local people to participate (such as by inputting information).

Example of local information distribution system for regional revitalization

Service and innovation field

Example of eliminating traffic congestion through positional information to all vehicles

Traffic ITS field

In urban areas, traffic congestion occurs at certain times and locations. This type of situation is accompanied by wasteful energy consumption, including idling. When vehicles are operated in this condition, not only does it cause drivers to become irritated but it causes increases in fuel costs as well as CO2 emissions and other environmental issues. As a solution, experiments are being conducted to combine means that will guide traffic by capturing vehicle movements, and that will utilize data from the GPS and QZS (which will also ease environmental pollution). Also, in experiments overseas, some cities are implementing “road pricing” for the purpose of adjusting the inflex of vehicles to areas in which congestion occurs.

Reducing the price of position-measuring devices will be a major factor in whether their usage will expand to all vehicles. Among the Personal Navigation Devices (PNDs) that have shown growing popularity recently, many models are not equipped with gurny and other auxiliary equipment; rather, the reception conditions of the satellite waves greatly influence the accuracy of the positional measurement. When a QZS is utilized, whose radio waves arrive from a higher elevation angle, it becomes possible to accurately identify a vehicle’s position, even between buildings in cities, with just satellite positioning and without depending on auxiliary equipment whose cost will increase.

A PND can be removed from a vehicle and connected to a telematics center from a home network environment. Drivers can then use it to diagnose the extent of energy conservation during driving. And before driving, they can download the latest local information and driving routes that take into consideration traffic conditions.

Example of transmission of pinpoint information via broadcast (Broadcasts with positional information tags)

With existing broadcasting satellites (BS) and terrestrial digital media broadcasting (T-DMB), focus is placed on the address at which a television is installed. Service consists of local-area-related weather forecasts and news, for instance, being shown on a television screen. However, such service did not distribute data while focusing on the positions of mobile, individual terminals. With satellite positioning accuracy, it is possible to identify positions in a narrower range than is possible with cell phone base station positioning; therefore, it becomes highly possible to distribute individualized information that is more likely to appeal to a chord with users than general information intended for a mass audience.

Utilizing part of a data broadcasting service for T-DMB broadcasting terminals, the following will be broadcast to portable terminals (such as car navigation systems and cell phones); over a relatively broad area after a regional ID has been detected:

- Positional data
- Probe data
- Traffic congestion data
- Fuel economy information
- Accidents
- Roadside assistance
- Emergency service
- Basic information for disaster prevention
- Special information
- Congestion information
- Traffic information
- Weather information
- Weather information
- Road condition information
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