Asian Telematics & Navigation Markets

Sample Page

SRD JAPAN, INC.

Introduction

The navigation market, forms a large scale in market in Japan, and has just begun to emerge in the U.S. following its emergence in Europe. And Asia is next.
Although Europe and the U.S. have led the way within the telematics market, Japan is close to catching and overtaking these areas.

As a matter of course, it can be said that as technologies developed in the Japanese market have spread to the world, big opportunities now exist in the navigation and telematics markets. As these technologies are used in automobiles, a field in which Japan has global brand power, a significant synergy exists.

The beginnings of an Asian navigation market are starting to develop in South Korea, Taiwan, and China. Significantly, auto sales doubled in the Chinese market in 2003. China is a big automobile seller and is becoming a big automobile producer. As a people, the Chinese have a disposition towards desiring navigation technology.

The development of the Asian telematics market is accelerated in South Korea, which has thus far led in the field of high-speed mobile communications. South Korea, which has already gained a global competitive edge in mobile communications by using CDMA as a standard, is starting to develop international competitiveness in telematics, an extension of mobiles. Taiwan is also making advances in development, targeting the Chinese market. IT companies in Europe and the U.S. are among the first to develop businesses for building networks.

At present, automakers and electronics manufacturers in Japan consider the Asian market to be the most important navigation and telematics market. They are currently focused on how they should be strategically involved in the market to achieve desirable results. Particularly, developments in the Chinese market have become an issue.

Based on these current conditions, we have attempted to research the Asian market, focusing on approaches to the Chinese market. We have centered our focus on areas including strategies by Taiwanese IT companies, strategies by Hyundai, Samsung, and LG in South Korea, and the rise of Chinese companies.
We have also widened the research scope to encompass the current state of 3G across Asia, as the emergence of 3G accelerates the growth of telematics.

We hope this report will be useful for those involved in the relative markets and look forward to your opinions.

SRD Japan, Inc.
May, 2004

1-2 Comparison of Asian Telematics Markets (Japan, South Korea, Taiwan)

1-2-1 Comparison of Telematics Systems

Comparison of Telematics Systems Among Major Suppliers in Three Countries

		Japan					South Korea		Taiwan
OEM	/Supplier	Toyota	Nissan	Honda	Pioneer	Clarion	SK Telecom	Hyundai/Kia	Yulon/ Nissan
Service name		G-BOOK	Carwings	Internavi Premium Club	AirNavi	AutoPC	NATEDrive	Mozen	TOBE
Service started		2002 (Monet started in 2000)	2002 (Compass Link started in 1999)	2002 (InterNavi started in 2000)	2002	2002	2002	Nov-03	2002
System		Factory-installed car navigation or dedicated terminal	Factory-installed car navigation or dedicated terminal	Factory-installed navigation or dealer's option navigation	Commercial dedicated terminal	Dedicated PC	PDA or dedicated attachment for mobile phone	Factory-installed dedicated terminal	Factory-installed dedicated terminal
Device supplier		Denso/ Aisin AW/ Panasonic	HCX (Xanavi/ Clarion/Hitachi)	Alpine /Toshiba /Mitsubishi Electric /Pioneer	Pioneer	Clarion	Samsung	LG	Xanavi
Hardware price (yen)		Approx. 300,000	Approx. 300,000	Approx. 300,000	139,000	300,000 or less	300,000 or less	200,000 or less	60,000-120,000
OS		Windows Automotive	Windriver VxWorks	iTron	iTron	Windows Automotive	Microsoft Pocket PC Phone Edition	QNX/Motorola	Windriver VxWorks
Built-in communication module		Denso	Hitachi		Alps			LG	
Transmission method									
	Communication unit	Mobile phone	Mobile phone	Mobile phone		Mobile phone	Mobile phone		
	Dedicated communication unit	29,000 yen			Buit-in			Buit-in	Buit-in
Transmission fee									
	Charge by the hour	Yes, or (see below)	Yes	Yes		Yes	Yes, or (see below)	Yes	Yes
	Fixed charge per month	1,380 yen	+ 800 yen		1980 yen	+ 1480 yen	20,000 won	28,000 won	
Transmission speed (Max)		144 Kbps	9.6 Kbps	9.6 Kbps	144 Kbps	9.6 Kbps	2.4 Mbps	144 Kbps	9.6 Kbps
Navigation method		Storage	Storage	Storage/Server	Server	Server	Server	Server	Operator
Navigation Guidance		Map	Map	Map	Map	Map	Map or Turn	Arrow	
Route Guidance		Map Voice Guide	Map Voice Guide	Map Voice Guide	Map Voice Guide	Map Voice Guide	Voice Guide Turn by turn	Voice Guide Turn by turn	Operator
Traffic information system		VICS	VICS	VICS & Probe Car	VICS	VICS	ROTIS Probe Car	ROTIS Probe Car	

In Asia, Japan and South Korea leads the way in developing telematics systems, with Taiwan and China following behind. Europe, the U.S., Japan, South Korea, and Taiwan are all trying to break into and expand in the huge Chinese market.

The table above shows comparisons of major telematics systems in Japan, South Korea, and Taiwan.

Each Company's Latest Navigation Models Offered as an Option by Dealers (As of November, 2003)

Supplier	OEM	Storage	Price (Yen)	Hardware				
				Features	CPU, etc.	Monitor	Display Features	Updates for Maps and Contents
Pioneer	Honda	HDD 20GB	345,000	***Makes optimal plan when user inputs "when" "with who," and "where"** ***Intelligent route function for determining whether a user purposely took another route or mistook the road** *Recognizes traffic lanes of urban highways and navigates cars to cruising lanes *Personalization function and route analyzer *Rewriting landmarks *Customized wallpaper	*Less than 1 second (64bit RISC CPU) and a dedicated drawing chip (GDC) *Dedicated chip for increasing accuracy of positional information (cruising on a 10 m scale) ***3D hybrid sensor for collecting errors owing to vertical intervals** ***High-speed matching of maps (5 times per second)**	7 inch wide monitor with 32,000 colors	*Sky View *TwinView *Driver's View *Lane Information *Illustration of junctions	*Users remove the HDD and send it to a factory. The HDD is returned after the upgrade is completed.
Panasonic	Toyota, Mazda	HDD 16GB	198,000	*9.5 GB map data *Auto memory of past routes *Just **2DIN size together with a 1DIN DVD video/audio** *Auto memory of driving routes *Update function for landmarks	*All-in-one performance with "Ultra 1" chip *64 bit CPU *Drawing chip *I/O ASIC *3D gyro *Speed pulse sensor	***1DIN sized in-dash unit** *6.5 inch wide TFT monitor with 280,000 pixels	*3D lane guide *Illustration of cubic interchanges, highway entrances, and fork roads *Satellite map *Virtual city map	Users connect a PC to the navigation system with a SD card or USB and access Panasonic and Shobunsha Publications (Super Mapple Digital World) web sites to download the latest data.
Alpine	Honda	HDD 16GB In-dash	218,000	***Touch Panel** ***In-dash HDD** ***Users can choose from various AV head units**	*64 bit RISC CPU *Graphic IC *Hybrid crystal gyro *Acceleration sensor	6.5 inch wide monitor with 32,000 colors	*Zoom function for realistic 3D intersections *Best lane guide *3D guide map *City location map *Dual display	
Kenwood	Subaru's Legacy	**HDD 20GB**	250,000	*1DIN sized in-dash unit *Telecommunication modem supporting i-mode *Supports CocoSecom *Sky Cruise View ***Sattelite Cruise View** *City Cruise View *Detailed map of urban areas on a 10 m-scale *User customization *ATOK *Users can choose from various AV head units	*Ultrahigh-speed CPU "NAVIEM" (200MHz 64bit CPU) *Drawing chip *Supports GPS and VICS with 1 chip *64 MB ram *High-speed drawing chip *Ceramic gyro, ***High-speed matching of maps (per 0.2 secnd and 2 m)**	7 inch wide monitor with 336,960 pixels (touch panel screen)	*3D display of intersections *3D junction guide/visual cruising map	
Fujitsu Ten	Toyota	HDD 20 GB 2 discs (one for navigation and another for audio)	355,000	***In-dash unit with a dual face** *Displaying routes with realistic image data from the IKONOS satellite *Edit function of 3,000 songs stored in the audio HDD (in ATRAC3 format) *Supporting back eye cameras *Customization of wallpapers (100 papers) *User customization	*64 bit BUS RISC CPU that can parallel process 2 commands *Dedicated graphic IC *ASIC for VGA only	**7 inch** VGA wide monitor with 1,150,000 pixels	*Route guidance with satellite photos *Hyper lane assistance *Virtual town map *Realistic wide map *Lane assistance at junctions	*Users remove the HDD and send it to the factory. The HDD is returned after the upgrade is completed.
Clarion	Nissan	**20GB HDD**	293,000	*2DIN size unit with 6.5 inch wide TV, DVD-ROM, audio functions *Touch panel *Auto display for parking locations on arrival	*64 bit BUS RISC CPU (SH-4R) *Dedicated graphic IC	In-dash type 6.5 inch wide monitor with 32,000 colors and 336,960 pixels	*Transparent display *3D realistic landscape *World map *Starlight Cruise	
Mitsubishi Electric	Honda, Mitsubishi Mortors	**20GB HDD**	230,000	*Java game contents downloads *Uses Windows CE *7 inch TV and DVD player functions	64 bit RICS CPU	7 inch wide monitor with 336,960 pixels	*Zoom function for 3D intersections *3D polygon realistic landmarks *Illustrated map of highway entrances	
Xanavi	Nissan	**16GB HDD**	170,000		64 bit RICS CPU			*Users remove the HDD and send it to the factory. The HDD is returned after the upgrade is completed.

1-5 Telematics and Navigation Markets in Asia

Asia Telematics Market Predictions

(Unit: 1000)

	2001	2002	2003	2004	2005	2006
Japan	30	42	105	250	360	490
South Korea		15	18	50	85	175
Taiwan		10	21	32	55	80
China			100	200	400	600
Hong Kong		5	7	10	20	40
Malaysia			1	30	80	150
Total	30	72	252	572	1,000	1,535

Predictions by SRD Japan, Inc.

Asia Navigation Market Predictions

(Unit: 1000)

	2001	2002	2003	2004	2005	2006
Japan	2,100.0	2,300.0	2,500.0	2,575.0	2,652.0	2,732.0
South Korea		28.0	35.0	40.0	51.0	71.0
Taiwan		9.0	9.0	10.0	12.0	14.0
China	0.5	0.7	2.0	14.0	45.6	166.0
Total	2,100.5	2,337.7	2,546.0	2,639.0	2,760.6	2,983.0

Predictions by SRD Japan, Inc.

The tables above show forecasts for telematics and navigation markets in Asia.
The numbers in the tables indicate sales units.

It is expected that China will be the largest telematics market in 2006. The country has a great need for products that offer safety, a feature of telematics-related products.
In Japan, South Korea, and Taiwan, the telematics market may not expand, as needs for products that offer safety are not as high.

For the navigation market, Japan will form a large market in 2006. Though other Asian countries have adopted Japan's navigation technology and provide the same functions, the spread of the navigation market growth has slowed as content such as maps and "Points of Interest" has not been developed enough in these countries.
The navigation market is expected to establish itself in China in 2006, as Japanese makers intend to install navigation systems as standard equipment into cars for the purpose of differentiating their products.

2-6-2 Options Offered by Dealers

Chinese car dealers are structured as follows:

1) OEM stores
2) Local dealers
   Local dealerships have been established by successful businesspeople in Hong Kong, Shanghai, and Beijing. These dealerships handle cars from a variety of automakers. Some dealers sell cars from several makers, while others sell cars from a specific maker.
   Dealers that sell luxury cars such as Benz, BMW, Audi, or Lexus operate stores that specialize in one selected maker only.

We think that in China, rather than automakers making recommendations to dealers to offer options, dealers themselves will tend to decide to sell options.
Dealers act at their own discretion, meaning that makers do not hold any significant influence over them. As makers cannot control dealers, they will take responsibility for only their cars, while the dealers will take charge of selling optional products such as car audio and car navigation systems.

This picture proves that Toyota dealer sell mobile DVD player.

Mobile DVD has wide appeal in China.

These factors indicate that options offered by dealers are equivalent to products sold by accessory shops. The difference is that dealers sell commercial products as an option, while accessory shops sell the same products in the aftermarket.

At present, some car audio makers such as Panasonic provide their products in China via Chinese distributors. Generally, these agents sell the products wholesale to car dealers.

2-6-3 Aftermarket

In China, there are no shops specializing in car accessories like Autobacs and Yellow Hat in Japan.

Yellow Hat, No2 car accessory store in Japan, has a large flag shop, affiliated to Panasonic, in Dong Guan. And in 2004, they will open a direct sales store at Shanghai International Autocity, to the west of Shanghai. Its store will start construction in April 2004 in the autocity and will be completed in October that year.

After that Yellow Hat plans to build third shop at Beijing. Until 2008, they plan 20 shops in China.

Autobacs, No1 car accessory store in Japan, has also just opened a shop in 27th April 2004. This photo is a situation of opening day. In fact, there were a few customers all day.

This shop is located on the southwest of Shanghai. This is first store in China and second store in Shanghai will be planned in 2005.

Paian Auto Service Co.,Ltd , Chinese partner, holds 20% of this joint venture.

2-8-3 Mapping Software

Map Makers in Chinese Telematics and Navigation Markets
[Mapping Software]

SuperMap GIS Technologies	www.supermap.com.cn	Develop and sell GIS software. They have entered the Taiwanese and Japanese markets. Founded a joint venture with Microsoft in November 2003.	
China NavInfo Co.,Ltd.		This was subsidiary of the State Bureau of Surveying and Mapping. Toyota transferred mapping technology for navigation systems to them when entering the Chinese market. Denso help them produce navigation maps throughout China. Their maps have been used in Toyota VIOS since 2003.	Toyota/ Denso
Beijing CASW Data Technology	www.casw.com.cn	A joint venture for developing GIS technology in collaboration with Leica, ESRI, and Garmin. They also develop navigation systems with GPS. A high tech company under the umbrella of the Chinese Academy of Sciences. They have exchanged technology with Kiwi-W consortium in Japan. They acquired 20% of the shares of a joint venture between Zenrin and Nanjing University and are now developing navigation maps with Zenrin. Zenrin, Neusoft, and Beijing CASW Data Technology have taken charge of 49%, 31%, and 20% of creation of the maps respectively. The maps are used in Sanyo Electric's portable navigation systems.	Zenrin
China Datong Industries		Founded a navigation map company with Aisin AW, Fujitsu, Fujitsu Ten, Yamada Corp., Golden Software, and BeiJing Photron Optoelectronics. They will release commercial navigation products in the end of 2004.	Fujitsu Ten/ Aisin AW
Beigin Lingtu Software	www.lingtu.com.cn	Engaged in GPS traffic control systems, software, and GIS business. They have established joint ventures or have technical associations with IBM, Oracle, HP, Nokia, Ericsson, and NTT DoCoMo.	
National geomatic Center of China (NGCC)	http://ngcc.sbsm.gov.cn/ http://nfgis.nsdi.gov.cn/	Brilliant Technology Development (Hongkong software company) and NGCC are working together for China navigation map.BTD has already supplied Hongkong map to Teleatlas.	

Digital maps are the base for telematics and navigation systems. It was not until 2000 that China started to seriously create digital maps. Since 2000, private companies have established joint ventures in anticipation of growth in the markets. Though government institutions have been researching the systems in a small way, many have simply studied the situation in foreign markets.

The table above shows major digital map companies in China. It also shows their relations with Japanese companies, as they have close relations with Japanese makers.

Zenrin, a major map maker in Japan, developed the first navigation maps of China. In 1986, Zenrin was asked by a professor of Nanjing University to develop navigation maps, and they founded a joint venture. Although maps of cities including Beijing were completed, until

1) Beijing UniStrong Science & Technology

Foundation: 1994
Beijing UniStrong Science & Technology are the exclusive agent for Garmin in the U.S.
They founded a joint venture and limited partnership with China Space Industry Group and China Aviation Industry Corp II.

In regard to navigation maps for Garmin's StreetPilot, they have completed maps for nationwide roads (highways, national routes, and provincial, prefectural, and village roads) and detailed maps of 87 major cities and 338 other cities.

6 cities: Beijing, Shanghai, Guangzhou, Shenzhen, Changchun, Wuhan
5 provinces: Jiangsu, Zhejiang, Guangdong, Fujian, Hebei
Others: 332 cities
Nationwide traffic networks

The maps include points of interest such as hospitals, schools, hotels, restaurants, post offices, banks, amusement facilities, and movie theaters.

The picture on the left shows a Garmin navigation product, StreetPilot III. in Taiwan manufactures Garmin's products.

Free accessory memory card: maps of 338 cities, 64 MB
Pay memory card: detailed maps of 338 cities, 128 MB

At the Shanghai Motor Show 2003, the release of a DVD navigation product developed with Jiangsu Shinco Electronic Group, a major DVD player maker, was announced.
The product is equipped with AV features (CD/VCD/MP3/CD-R/CD-RW) including a voice navigation function and a DVD player function.

Recently, they have announced the founding of a joint venture with an American company, NavCom Technology (www.navcomtech.com). NavCom is developing solutions for increased accuracy of GPS positioning and satellite communication systems.

2) VIOS Navigation System Performance

Features

Location accuracy	GPS, Gyro sensor, Speed sensor
Input method	Facility name, Address, Zip code,Telephone number
Operation	Touch panel input
Guidance	Audio guidance, 6.5 inch map display
AV	CD/VCD playback possible
Phone	Handsfree
Security	Burglar alarm in conjunction w ith keyless entry
Navigation map supplier	**China NavInfo Co.,Ltd**

We think the features of the VIOS navigation system are at about the same level as the Japanese 2000 model.
The system uses the KIWI format and has map display features such as 3D graphic display, voice guidance, and touch panels.

Users can set a destination with pinpoint search, facility search, phone number search, place of interest search, or zip code search functions. They can also use registered points and past records when searching a destination.

3-2 ROTIS (Road Traffic Information System)

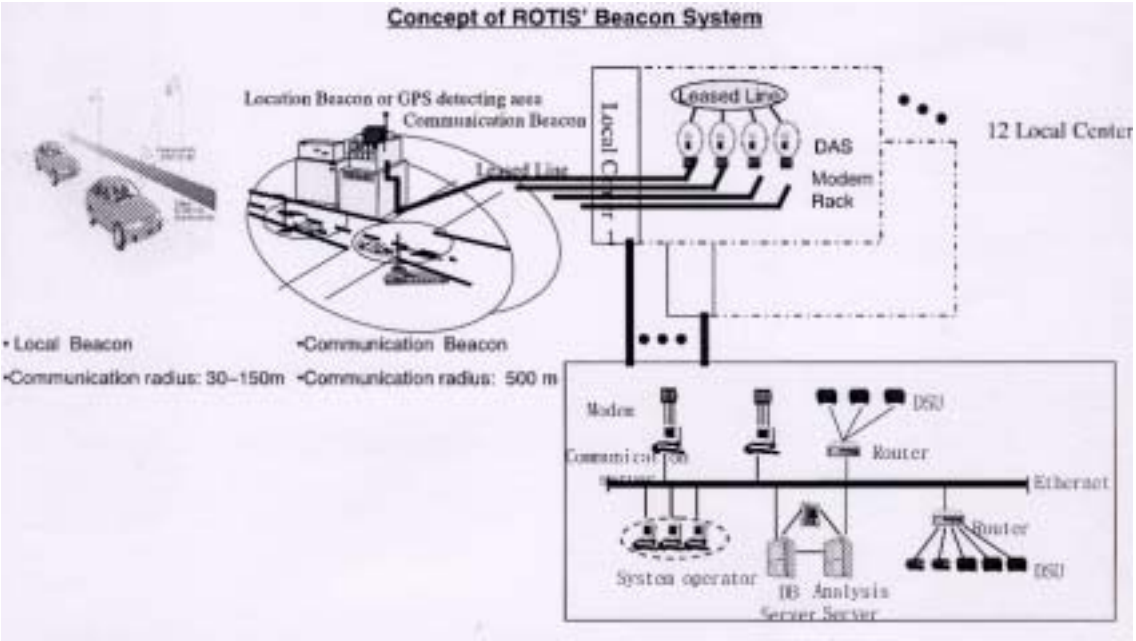
www.rotis.com
Date of Establishment: December 1999
Employees: 70 (including 35 employees for development)
Capital: 960 million dollars

ROTIS provides a traffic information service, using probe cars, in Seoul and seven cities around Seoul. The service also started in Pusan at the end of 2002.

ROTIS began to provide full services for Mozen and NATE Drive in Seoul and surrounding cities at the end of 2003.
This system is equivalent to VICS in Japan. VICS was developed by the Japanese government, and Vehicle Information and Communication System Center (VICS Center) provides the service to users for free.

ROTIS, a private company, was set up as an intrepeneurial venture within LG Group in December 1996, and became independent as LGTIS in 1997, and changed title to ROTIS in 1999. With the change to ROTIS, the company separated completely from LG Group.

The figure below shows how traffic information is gathered.



Beacons are set up at distances between 30-150 meters, information is gathered from over 20,000 probe cars (including taxis, rental cars, trucks and courier vehicles), and then the information is sent to the Mozen and NATE Drive Centers.

3-4-2 NATE Drive/Entrac

This is a telematics service provided by SK Telecom. It can be bought at SK Telecom stores.
Samsung has brought out a specialized terminal for the system, and KTF will start a service at the end of 2003.

NATE Drive Charges

		Regular	Premium
Communication charge		Basic monthly charge + call charge	Free
Basic monthly charge		9,000 won	20,000 won
Service and Fees			
Route guide	Operator service	Free 8 Times, After 1,000won/time	Free
	Character input	Free	
Points of interest (neighborhood)		Free	
Traffic information		200 won/time	
Lifestyle information		Free	
Emergency service		Free	

There are two types of rate plan, regular and premium. With the premium service, customers pay 20,000 won (equivalent to 2,000 yen), and can use the service as much as they like. The expense involved with using the service is currently the main weakness of it.

The mobile phone is placed on a specialized cradle. The price of the cradle is 236,500 won.
Pushing the E Button gives access to emergency services.
The service is compatible with mobile phone models, SCH-X150/X430/X650 and X700.

4-4-3 TOBE System Service

1. GPS Stolen Car Tracking
   Yulon guarantees that the car will be returned within 30 days after it is stolen.
   The number of stolen cars reached 51,765 in Taiwan in 2002. The figure has been increasing every year.
   Demand for GPS security systems has grown.
2. Speed Limit Display
   The system indicates the speed limit for all roads nationwide to car drivers. When the car is breaking the speed limit, a warning is indicated on the rear view mirror.
   The number of people charged for speeding reached 600,000 in 2002. The total amount in fines was 1.1 billion yuan.
3. Towing Report Service for Parking Violations
   To avoid traffic violations such as parking violations, enquiries can be made to the operation center asking for nearby parking areas. Owners are informed when their cars are about to be towed due to parking infringements, so that towing fees and parking fines can be avoided. Yulon pays fees for owners if contact is not made to the owners in this case.
   In Taiwan the number of parking offences is 4.7 million, with fines totaling 9 billion yuan.
4. Mayday Alert
   A warning is sent automatically to the center when the airbag is activated, and emergency services such as ambulances are arranged.
   The total number of deaths from traffic accidents was 4,843 in 2002.
5. Roadside Assistance Service
   Assistance can be requested by contacting the center when the car breaks down, tires puncture or the car runs out of fuel.
   Yulon pays the fees required for assistance if the assistance does not arrive within an hour or the specified time.
6. Concierge Service
   Drivers can receive necessary information from the call center.
7. Handsfree Function
   Drivers can make handsfree calls, using GSM mobile phones owned by the driver.

The GPS module used is made by SiRF.