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Looking ahead to the introduction of the active tag system using 433MHz band -- Partial report from the Information and Communications Council --

MIC received from the Information and Communications Council (chaired by Mr. SHOYAMA Etsuhiko, Chairman, Hitachi, Ltd.) a partial report concerning technical requirements for the active tag system using 433MHz band, part of the technical requirements for mobile ID systems (UHF-band RFID systems), of the inquiry No. 2009 concerning technical requirements necessary to improve performance of low-power radio systems submitted on September 30, 2002.

Background

In recent years, work has been ongoing to put in place and develop usage of active tag system using 433 MHz frequency band (referred to below as the active tag system using 433MHz band) on an international level, in order to bring about smooth and efficient international distribution.

It is expected that use of the active tag system using 433MHz band will lead to the speed up of management and operation of containers information particularly in the distribution field.

MIC received a partial report from the Information and Communications council, in anticipation of the introduction of the active tag system using 433MHz band, concerning technical requirements for the active tag system using 433MHz band.

This is expected to bring about the realization of smooth and efficient international distribution in the future.

Outline of partial report Outline of the active tag system using 433MHz band

- An active tag system is made up of active tags that can exchange information using the energy in built-in batteries, and interrogators that can switch the tags on and off, and read and write information.

- The active tag system using 433MHz band is used at all levels of shipment and delivery, transport, and export and import of goods in international distribution, and is useful in keeping track electronically of whether containers are opened or closed, and of their exact location.

CONTENTS

■ ■ ■

Looking ahead to the introduction of the active tag system using 433MHz band -- Partial report from the Information and Communications Council -- 1

Outline of report on economic trends in the ICT industry (first quarter of 2006) 3

MIC receives report from the Information and Communications Council concerning technical conditions for the improvement of narrow-band CS digital broadcasting system 7

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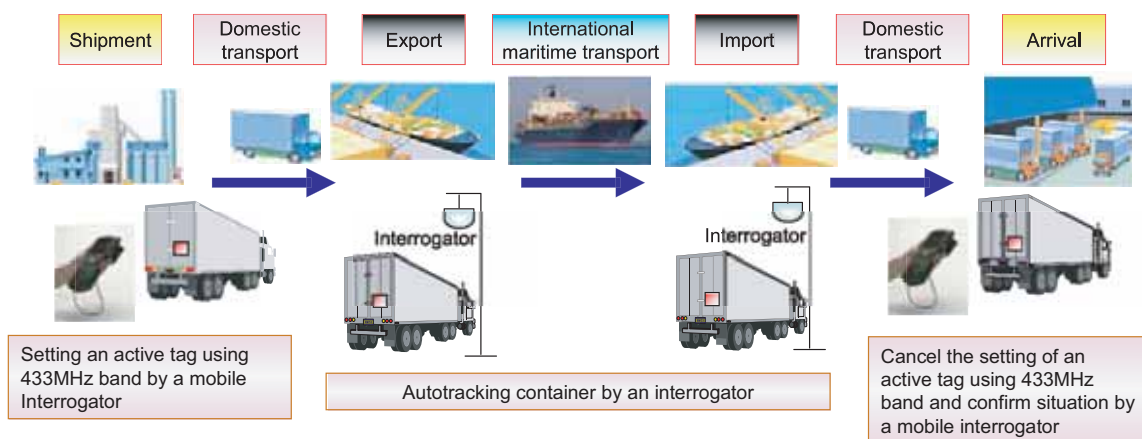
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Outline of investigation results



The main technical requirements for the active tag system using 433MHz band are as follows.

Topic	Main technical requirements	
	Interrogator	Active tag
Frequency used	433.92 MHz (433.67 MHz to 434.17 MHz)	
Permissible value of used frequency range	500kHz	200kHz
EIRP	1) When sending a signal for switching active tags on : 0.1 mW 2) Cases other than 1) : 0.4 mW	1mW
Communications method	Simplex method, simplex communications method and multicast communications method	
Transmission time limitations	Transmission time	1) When sending a signal for switching active tags on: stop within 2.7 seconds, within 1440 seconds per hour 2) Cases other than 1): stop within 1 second, within 360 seconds per hour
	Stoppage time	More than 1 millisecond

The active tag system using 433MHz band:

Devices that transmit information used for operations management of international transport goods (transport use equipment such as cargo, containers, palettes or other equipment used in international transport)

Interrogators using 433MHz band:

Wireless equipments that are mainly installed in ports, airports, factories or warehouses, and used to switch active tags on and off and transmit information data

Active tags using 433MHz band: Wireless devices that are attached to international transport goods, and transmit information concerning the status of the

international transport goods

Future plans

MIC will take this partial report into consideration, and plans to move ahead rapidly with formulating technical requirements concerning the active tag system using 433MHz band.

Outline of report on economic trends in the ICT industry (first quarter of 2006)

Points on trends in the information and communications technology (ICT) industry

The ICT industry is showing gradual expansion overall, driven by the increase in demand for information and communications. However, there are signs that inventories of electronic components and devices are beginning to build up.

	Trends	Comments
Overall	↗	By an increase of shipment following the completion of inventory adjustments, the conditions for the ICT manufacturing industry are recovering. While conditions for telecommunications also remain at high levels, there are concerns about profitability due to factors such as price reduction. The ICT industry as a whole is showing a gradual growth.
State of activity in the ICT industry	↗	Inventory adjustments completed. Production and shipments are rapidly recovering by electronic components and devices. However, there are signs that inventories are building up. The ICT service sector is showing a gradual growth.
Trends of capital investment in facilities in the ICT industry	↗	There is a major increase in investment in the ICT industry by new entry into the mobile phone business. Investment in the ICT manufacturing industry also stopped the sluggishness that had been caused by inventory adjustments
State of activity in the ICT industry	↗	Employment in the ICT industry is on upward trend, with a major increase in hiring for the industry in the first quarter of 2006.
Salary trends in the ICT industry	↗	Salaries in the electronic components and devices manufacturing industry are recovering after stagnating due to inventory adjustments.
Consumption trends in the ICT industry	↗	With the penetration of mobile phones and the Internet, the trend is towards an increase in the proportion of ICT related household expenditure, centering on telephone charges and Internet connection charges.
Information and communications related investment trends	↗	Orders are increasing for electronic and communications equipment, centering on equipment for ICT related productions facilities such as semiconductor manufacturing equipment and electric measuring equipment.
Information and communications related export and import trends	→	With the move to overseas locations of production of personal computer, there is a downward trend in the weight of both export and import of ICT related equipment. With the end of inventory adjustments overseas, ICT related trade value is currently increasing, both for export and import.
Information and communications related price trends	↘	Although there is a continuing decline overall in ICT related price, the range of the decline is becoming small.

NB: The upward arrows indicate an increase or an upward trend, and the downward arrows indicate a decline or a downward trend

Figure 1: Change in ICT related mining and manufacturing indices

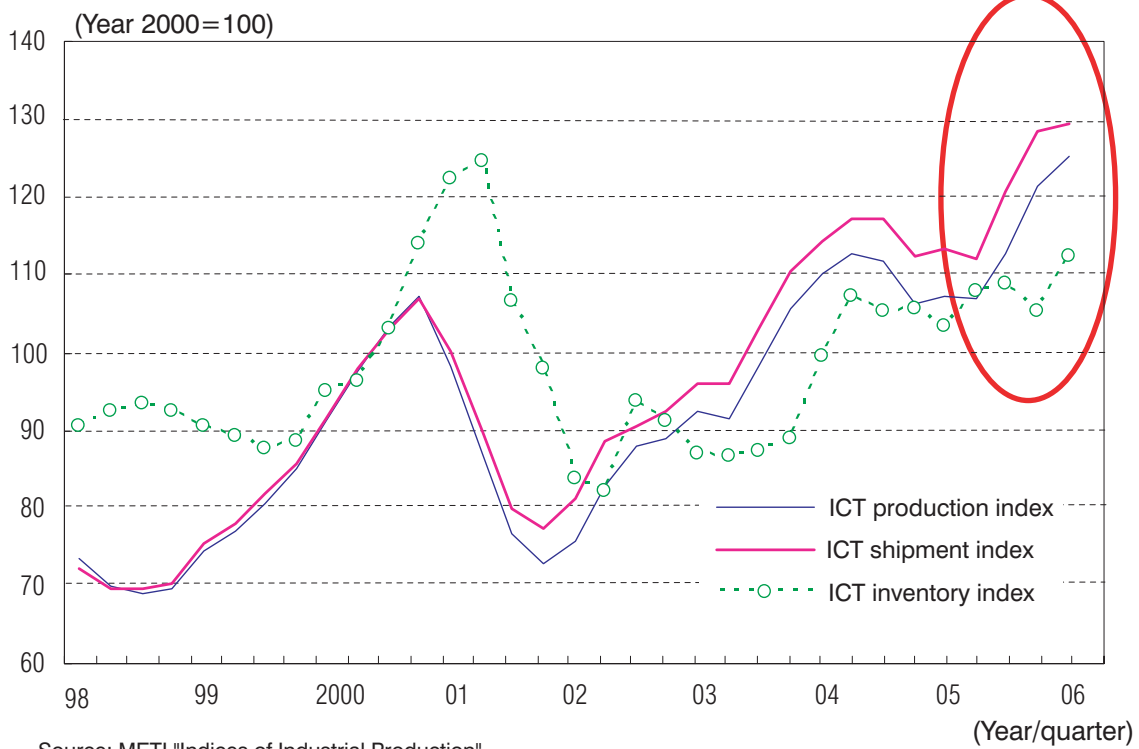
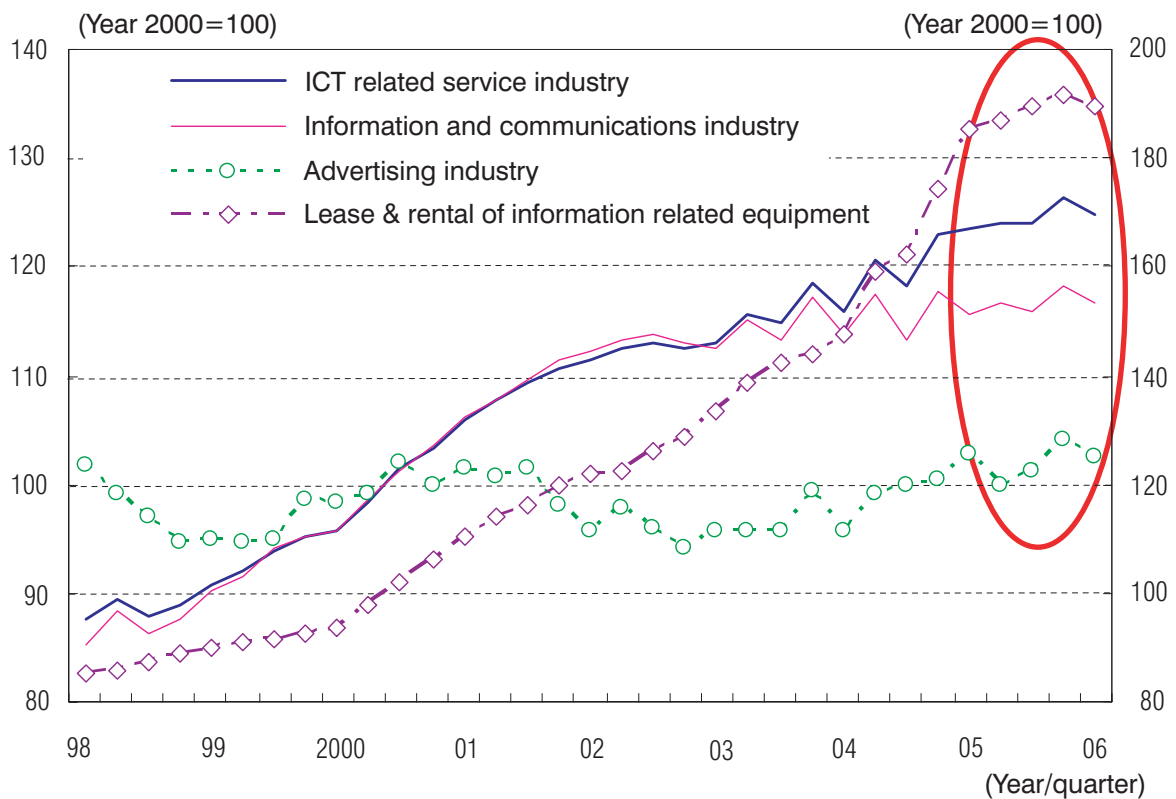
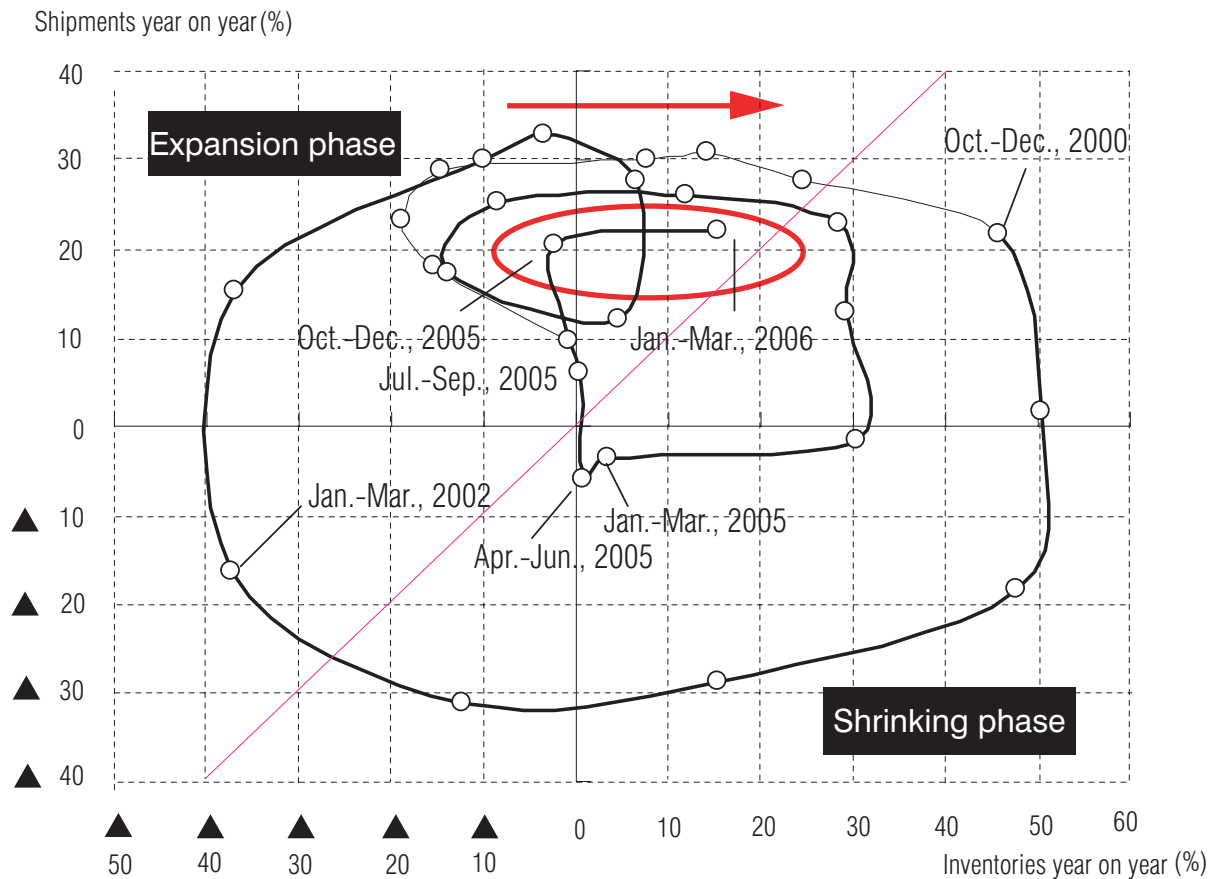


Figure 2: Change in ICT related service sector activity indices



NB: All values seasonally adjusted. ICT related service industry includes ICT industry, advertising industry, plus lease and rental of information related equipment
 Source: METI "Indices of Tertiary Industry Activity"

Figure 3: Graph of inventory cycle (electronic components and devices industry)



Source: MEI "Indices of Industrial

Comparative points of trends in the 13th and 14th cycles

IThe business cycle which started in January 2002 (the 14th cycle) shows a mutually balanced growth between the ICT industry and non-ICT industries

	13th cycle	14th cycle
Rate of growth in indices of all industries activity	3.6	6.9
ICT related industries activity index (Contribution level) (Contribution ratio)	22.5	25.9
	(2.3)	(3.0)
	<u>(63.0)</u>	<u>(43.4)</u>
Non-ICT related industries activity index (Contribution level) (Contribution ratio)	1.5	4.4
	(1.3)	(3.9)
	<u>(37.0)</u>	<u>(56.6)</u>

NB:
 13th cycle: January 1999 to January 2002
 14th cycle: From January 2002
 13th cycle showed growth from 1Q of 1999 to 4Q of 2000
 14h cycle showed growth from 1Q of 2002 to 4Q of 2005

Source: METI "Indices of All Industry Activity," "Indices of Industrial Production" and "Indices of Tertiary Industry Activity"

Information and communications-related production goods (e.g. electronic components and devices.) are one of the major fluctuation factors of the ICT industry

		13th cycle	14th cycle
Rate of growth of ICT related industrial production indices		43.7	58.9
ICT related production goods (Contribution level) (Contribution ratio)		46.9	77.6
		(27.7)	(48.1)
ICT related capital goods (Contribution level) (Contribution ratio)		(63.4)	(81.6)
		49.5	28.4
ICT related consumer goods (Contribution level) (Contribution ratio)		(12.9)	(7.0)
		(29.6)	(11.8)
ICT related consumer goods (Contribution level) (Contribution ratio)		21.0	28.4
		(3.1)	(3.8)
		(7.0)	(6.5)

NB:

13th cycle: January 1999 to January 2002

14th cycle: From January 2002

13th cycle showed growth from 1Q of 1999 to 4Q of 2000

14h cycle showed growth from 1Q of 2002 to 4Q of 2005

Source: METI "Indices of Industrial Production"

The fluctuation factors of end consumer goods have shifted from information related consumer goods (e.g. the Internet and mobile phones) to consumer electronics equipment (e.g. LCD TV)

	Weight	13th cycle		14th cycle	
		Increase ratio	Contribution level	Increase ratio	Contribution level
Total of ICT consumer goods	234.9	21.0	—	28.4	—
Information related consumer goods	126.6	41.0	19.9	3.4	1.8
Mobile phones	88.3	42.7	14.4	15.4	5.4
PHS	4.7	-24.5	-0.6	15.7	0.2
Personal computers	33.6	49.2	5.9	-13.9	-2.2
Consumerelectronics equipment	108.3	2.1	1.1	56.7	26.6
Color TV	10.6	-46.5	-4.0	—	—
LCD TV	2.2	23.3	0.2	364.3	6.6
Videotape recorder	5.4	-56.2	-2.3	—	—
DVD video player	6.8	11.6	0.3	-25.9	-0.6
Video camera	26.8	24.7	2.8	36.1	4.0
Digital camera	16.0	—	—	142.0	15.2
Car navigation	13.1	38.8	1.9	86.2	8.1
Headphonestereo	2.6	—	—	—	—
Car stereo	24.8	-32.3	-4.9	-45.7	-3.5

Source: METI "Indices of Industrial Production"

Conclusion

(1) The presence of the ICT industry has continued to increase even after the bursting of the IT bubble, and its effect on the Japanese economy as a whole is increasingly growing.

(2) The traction of the ICT industry in the current business recovery phase (the 14th cycle) is equal to that seen in the 13th cycle which was known as the IT bubble.

(3) Since the growth of non-ICT related industries in the 14th cycle is much higher than that in the 13th cycle, the presence of the ICT industry appears lower in the 14th cycle than that in the 13th cycle. Put in a different way, the current recovery is not being driven only by the ICT industry, but by a good balance between the ICT industry and non-ICT industries.

(4) The reasons for the growth of the ICT industry in the 13th cycle were increased information-related investment by corporations as well as the penetration of the Internet

and mobile phones in households. In the 14th cycle, the growth in demand for digital home appliance is the driving force. There are some changes in the information and communications-related demand between 13th cycle and 14th cycle.

(5) Regarding information and communications-related consumer goods, the increase was mainly driven by information related goods such as personal computers and mobile phones in the 13th cycle, and by consumer-use electronics equipment including digital home appliance such as digital cameras, car navigation and LCD TVs in the 14th cycle.

(6) There is a downward trend of the growth of information and communications related capital goods in the 14th cycle because the growth of information-related capital goods slowed down. This is largely because imported products including personal computers and related equipment was substituted for domestic products.

(7) The growth in ICT related production goods was high in both cycles as the driving force for the growth of ICT related production. In the 14th cycle, in addition to the continuing supply of components and devices for personal computers and mobile phones, the increase in demand for digital home appliance accelerated the growth.

(8) The breakdown of the ICT related service industry activity index shows a lower contribution by the communications industry because the penetration of mobile phones reached the ceiling, while a greater contribution by information related equipment leases and rentals as corporations shifted purchasing of information related equipment to leasing. In addition, there is a shift of information-related demand by business from telecommunications infrastructure and terminals to system maintenance and management.

MIC receives report from the Information and Communications Council concerning technical conditions for the improvement of narrow-band CS digital broadcasting system

MIC today received a report from the Information and Communications Council (chaired by Mr. SHOYAMA Etsuhiko, Chairman, Hitachi, Ltd.) concerning its inquiry No. 2019 of October 31, 2005, on technical conditions for the improvement of narrow-band CS digital broadcasting system (excluding wide-band transmission system).

Background

CS broadcasting that uses the 27 MHz bandwidth (narrow-band CS digital broadcasting) is experiencing a growing need for multi-channel services for HDTV broadcasting, as it is being affected by the move to HDTV in BS and digital terrestrial broadcasting and the rapid penetration of high-definition, large and flat screen TVs. At the same time, the introduction of the latest digital broadcasting technologies is desirable in order to promote the development of a better level

of CS digital broadcasting. Under these circumstances, the Telecommunications Technology Sub-Council of the Information and Communications Council has been investigating the technical conditions for the improvement of narrow-band CS digital broadcasting system and has submitted its report to MIC today.

Outline of report

The outline of the report is as shown below. This report takes into consideration the results of the invitation

to comment that was implemented by the council from June 5 to July 5, 2006.

Future plans

MIC will take this report into consideration and plans to promptly move ahead with the regulation of technical standard for the improvement of narrow-band CS digital broadcasting system.

Outline of report concerning technical conditions for the improvement of narrow-band CS digital broadcasting system

Technical conditions for DVB-S.2 transmission system

Confirmation of an increase of over 30% in transmission capacities (symbol rate: 23.3037Mps) with 27MHz satellite transponder.

Results of investigation

In order to determine appropriate parameters and to verify the properties of the DVB-S.2 system, various tests such as satellite transmission test were implemented.

In the environment for reception of current services (using a 45cm diameter parabolic antenna, required C/N=8dB), it was confirmed that it is possible to maintain the same quality as current services. As a result, transmission capacities increase was demonstrated as shown below.

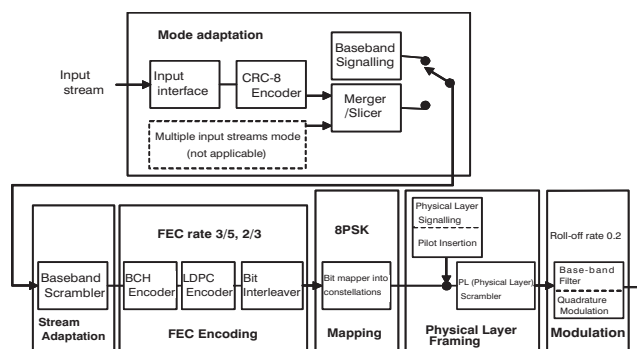
- Example of current system operation: Approx. 29.162Mbps, (21.0960Mps, under QPSK, FEC rate=3/4)
- Example of new system operation: Approx. 40.538Mbps (23.3037Mps, under 8PSK, FEC rate=3/5)

Setting parameters

Item	Specification
Modulation	8PSK
Symbol rate	23.3037Mps (permissible deviation: ± 20ppm)
FEC rate	2/3, 3/5
Transmission mode	CCM (constant coding and modulation)
FEC encoding	inner encoding: LDPC outer encoding: BCH
FEC frame length	64800 bits
Input stream format	Single Transport Stream
Roll-off rate	0.2

LDPC: Low Density Parity Check Codes
BCH: Bose-Chaudhuri-Hocquenghem

Structure of DVB-S.2 function



Technical conditions for video encoding (H.264)

The results of subjective assessment confirmed that HDTV: 13Mbps more or less conforms to the user requirements for broadcast image quality as determined by ITU-R

Results of investigation

Confirmation of a bit rate that conforms to the requirements (see note below) for broadcast image quality as determined by the ITU-R in conformity to the image assessment methods based on ITU-R recommendation, for HDTV.

Confirmation that, at the present time, image quality that is more or less in conformity can be obtained with 13Mbps.

With regard to bit rates lower than 13Mbps, the possibility of a future conformation to the ITU-R requirements is not denied

Conformity to ITU-R requirements

Bit rate	Degradation of less than 12% in DSCQS from the raw image with the 3/4 of evaluated images	Degradation of less than 30% in DSCQS from the raw image with all of the evaluated images
7Mbps	-	
9Mbps	-	
13Mbps		
17Mbps		

- Easily conforms with requirements
- More or less conforms to requirements
- Does not conform with requirements in present circumstances, but future image improvement is expected

Setting of parameters

Item	Specification
Profile	High profile (including Main profile)
Level	Image input format: Uses 3, 3.1, 3.2, 4 that can handle 480i, 480p, 720p, 1080i
Video signal (color matrix, etc.)	Corresponds to the regulations (based on ITU-R BT.709) for terrestrial digital broadcasting, BS digital broadcasting and wide-band CS digital broadcasting

NB: Of the 4 types at least of evaluated images that were chosen from the ITU-R recommendation BT.1210 and the like, the quality gap on the DSCQS scale is under 12% for 75% of the images evaluated. The quality gap for the remaining images evaluated is under 30%.

* DSCQS = Double-Stimulus Continuous Quality Scale: A subjective assessment method set out in the ITU-R recommendation BT.500-11

Frequency requirement

These will basically follow current technical standards

Frequency requirement

Confirmation through validation of transmission capacities that the technical conditions set out by current technical standards are satisfactory

Item	Technical requirement
Transmission frequency bandwidth	27MHz
Position of carrier frequencies	Center of transmission frequency
Permissible deviation of carrier frequencies	In conformity with Article 5 in Radio Equipment Regulations
Permissible interference value	That the ratio of the carrier wave power of the desired wave and noise equivalent power which is the aggregate of, the interference power that fall into the bandwidth and the thermal noise, satisfies the necessary C/N
Permissible value of strength of unnecessary emissions	In conformity with Article 7 in Radio Equipment Regulations

Transmission control signal and identifier additions

Additional regulations regarding descriptors below as stipulated in the announcement

(1) Satellite distribution system descriptor

The modulation method and the FEC rate (inner encoding) have newly been added to the satellite distribution system descriptor that shows the physical characteristics of the satellite transmission route

(2) System administration descriptor

As one of standard broadcasting systems, the type and assignment of this system have newly been added to the system administration descriptor that is used to differentiate broadcasts from non-broadcasts.

Results and usage image of the introduction of a new system

Making it possible to receive high-quality images and multi channels while still using current satellite transponders and receiving antennae

Current System

Number of multiplex channels possible using a single 27MHz satellite transponder: **1 channel**

Current System (DVB-S+MPEG-2)

- Information bit rate per transponder: approximately 29Mbps
- Bit rate per 1 HDTV channel: approximately 22Mbps

$$29\text{Mbps} \div 22\text{Mbps/ch} = 1\text{ch}$$

New System

Number of multiplex channels possible using a single 27MHz satellite transponder: **3 channels**

New System (DVB-S.2+H.264)

- Information bit rate per transponder: approximately max 45Mbps
- Bit rate per 1 HDTV channel: approximately 13Mbps

$$45\text{Mbps} \div 13\text{Mbps/ch} = 3\text{ch}$$



Communications satellite

Current: 1 HDTV channel/ transponder

New System: 3 HDTV channels/ transponder

Improvement in transmission capacity and video compression rate

(DVB-S.2 + H.264)

The technical standards will be revised in the course of 2006, and following the formulation of private-sector standards and the development of receivers and the like, the estimate is for the service to start in around 2008.



Transmitter



Receiver