

Working to support a comfortable life for us all, Toshiba offers social infrastructure products such as automatic facilities represented by letter sorting machines, digital terrestrial television broadcasting systems, and communication systems including base stations for mobile phones. We also offer products that we feel touch the customer's heart when they use them. The world's fastest comfortable ride high-speed elevator installed in the world's tallest building serves as a prime example.

TT-1100 Letter Sorting Machine for Sweden Post

The TT-1100 letter sorting machine feeds mail automatically from the feeder module one by one, reads address information automatically using an OCR (Optical Character Reader) system, prints a barcode on each mail item and sorts mail to each destination stacker.

The TT-1100 responds to the various demands of each country. The TT1100 started operation from September 2004 for Sweden Post.

Special features are as follows:

- High work efficiency and space saving effect with a 2 layer stacker system
- High through-put (more than 36,000 pcs/h)
- Low noise level (67 dB)
- High operability man-machine interface (operation panel and display)



TT1100 letter sorting machine for Sweden Post

Three-Axis Turret for Target Tracking System

Target tracking cameras on motor-driven turrets have recently become prevalent in various settings such as security surveillance on important social infrastructure facilities, traffic situation monitoring in ITS (Intelligent Transport Systems), and so on.

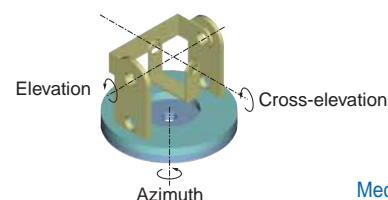
To smoothly track a moving target in any direction, two-axis gimbals would not suffice due to the so-called gimbal-lock phenomenon which occurs when the target comes close to the turret's zenith. While three-axis gimbals would remedy this performance limitation, in order to meet the required angular acceleration, however, the third axis, namely the cross-elevation axis, would almost certainly mean an increase in the mechanical complexity, size and weight of the turret.

With the intention of overcoming the above-mentioned difficulty, Toshiba has developed a compact three-axis gimbal-stabilized turret by devising a novel gimbal-control algorithm, which allows the following features:

- Swift and assured angular acquisition and tracking of a target in any direction within the turret's hemispherical field of view,
- Extremely stable observation-angle pointing accuracy for various vehicle-mountable applications whether on the ground or in the air,
- Agile angle-steering capability for sequential observation of multiple targets within a period sufficiently short to track those targets simultaneously.



Three-axis turret for target tracking system



Mechanism of three-axis gimbals

Development of High-Performance DSP Board

Today's applications of high-performance digital signal processor (DSP) technology are more demanding than ever, and multiprocessing computing has emerged as the only viable way of addressing the vast assortment of high-end DSP applications including real-time signal processing for high-resolution radar for example.

Toshiba has developed a single-board high-performance DSP featuring multiple advanced DSP-ICs and mass memory with random-accessibility.

The mainstream of recent technological trends is to configure DSP boards by implementing multiple processors with parallel-processing software, so that the number of processors at work varies in an efficient manner according to the speed and volume of processing required.

In addition, the DSP board developed has incorporated optimized high-speed and high-density "Jisso" technology for reliable data-transmission-line design, and has attained as high as ten times the processing capability without a hike in electricity consumption compared with equivalent predecessor boards.

Wide use of this DSP board should open the way for the realization of many sophisticated signal-processing applications that would have been unthinkable until now.



High-performance DSP board

Specifications

Item	Specification
DSP	32 bit floating point DSP ×5
Peak FLOPS/board	9 GFLOPS
Memory size	DSP 786 Kbyte ×5
	SRAM 16 Mbyte SDRAM 128 Mbyte
Memory bus speed	750 Mbyte/s
Off-board I/O	VME
	PCI (PMC sites ×2)
	DSP-IO ×4
Power	23 W

GFLOPS: Giga Floating point operations per sec.
VME: VERSA module European bus
PCI: Peripheral component interconnect
PMC: PCI mezzanine card

TTL/STL for Digital Terrestrial Television Broadcasting

TTL/STL (Transmitter to Transmitter Link/Studio to Transmitter Link) for digital terrestrial television broadcasting is a high stability and high quality microwave link for program transmission. Toshiba has developed two types of link, TS (Transport Stream)-TTL/STL and IF (Intermediate Frequency)-TTL.

The features of these systems are as follows:

For the TS-TTL/STL type

- High quality transmission with error correcting code
- Improvement of the ability to correct burst errors with time-interleaved architecture

For the IF-TTL type

- The first commercial product for the domestic market
- Almost no signal deterioration (Equivalence C/N: more than 45 dB)



TS-TTL/STL



IF-TTL

TTL/STL for digital terrestrial television broadcasting

Radio Over Fiber (ROF) Remote Base Station for Mobile Phone Systems

Mobile phone systems were first established to provide person to person voice communication. In the succeeding generation, data communications for Internet connections were then offered to mobile phone users.

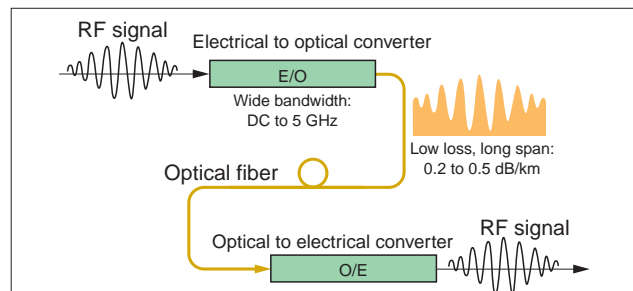
For enhanced mobile communication, a third generation system (3G) has now been standardized by the International Telecommunication Union, making multimedia services including streaming video available. Now new applications like electronic commerce with personal identification are emerging on the business scene.

This makes it ever more important to maintain high quality communication within tall buildings or in underground malls where many offices and shops are located. So Toshiba has developed an optical distribution system for the mobile phone system to provide the user with communication at any time in any place.

Optical distribution systems distribute RF (Radio Frequency) signals through optical fiber, and a laser diode that converts an electrical signal to an optical signal is a key component. The emergence of a laser diode with high power, high efficiency and lower cost makes the system very attractive, and its applications now extend to various fields.



External view of remote equipment



Overview of ROF technology

International Market Model of Digital Terrestrial Television Broadcasting Transmitter

A number of countries are in the process of deploying digital terrestrial television broadcasting (DTTB). DTTB enables high definition television programs and mobile reception services. Toshiba has developed a new DTTB transmitter for the international market.

There are several modulation systems for DTTB. We have developed a new modulator which is an all-in-one model that acts as both digital modulator and compensator for power amplifier distortion. The modulator board is exchangeable according to the modulation system of each country. The high efficiency compact design of the power amplifiers has enabled a reduction in the size of the power amplifier unit. And this also further improves ease of maintenance.

Our DTTB transmitters are ideally suited to meet the demands of the ever expanding international market.



1 kW digital transmitter (liquid-cooled type)

The World's Fastest High-Speed Elevator for TAIPEI101

Toshiba Elevator and Building Systems Corporation developed the world's fastest high-speed elevator (1,010 m/min.)*, and completed the installation of two cars within TAIPEI101 at the end of 2004. TAIPEI101 in Taiwan's capital Taipei is now the world's tallest building (508 m)*.



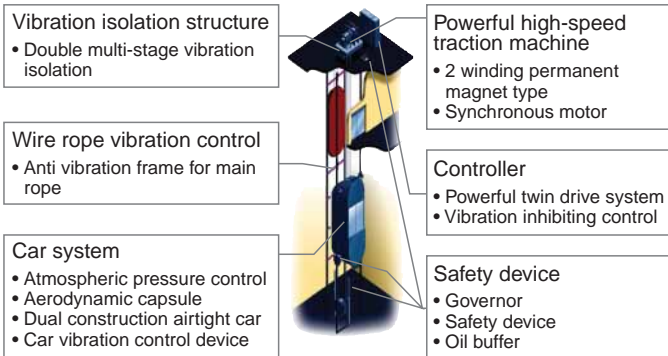
View of the world's tallest building TAIPEI101

Aiming at the improvement of riding comfort, we have concentrated on the development of the improved safety devices, more powerful machinery, and vibration and noise control systems demanded for comfortable high speed travel within a high rise hoist-way.

The attachment of an aerodynamic capsule designed to suppress noise within the car was particularly effective in enhancing riding comfort. The flow of air around the car was rectified. A roller guide that decreases forces exerted by the rail and a car vibration control device that actively prevents vibration of the car were also attached. This elevator is also the first in the world to adopt an atmospheric pressure control system to prevent passengers' ears from popping.

The running speed of the car first exceeded the existing record on December 16, and the world's fastest speed was certified by Guinness World Records.

*As of December 31, 2004.



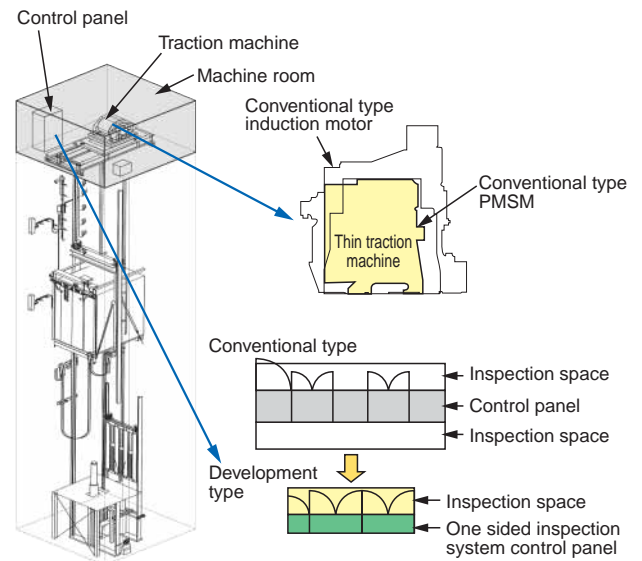
Elevator development items

New ELBRIGHT™ Space-Saving Machine-Room Elevator

Toshiba Elevator and Building Systems Corporation has developed and commercialized the high-speed gear-less elevator New ELBRIGHT™ achieving new levels of space and energy saving.

The New ELBRIGHT™ applies a 2-phase control system for the inverter, and has achieved a reduction in the dimensions of the traction machine and inverter device through the efficient d-q axis control of an IPM (Interior Permanent Magnet) motor. Furthermore, we have adopted a thin control panel with a one sided inspection system, and the machine-room space has been reduced by a maximum of 40%.

We make products that respond to the needs of a continuously diversifying market.



PMSM: Permanent Magnet Synchronous Motor

Comparison of new and conventional machine room layouts