Jeffy and Unity guide you through all the astonishing aspects of Furukawa Electric!

**Jeffy**
(Elder brother with the uniform number 2)

**Unity**
(Younger brother with the uniform number 9)

Jeffy and Unity are the team characters of Jef United Ichihara Chiba.


Furukawa Electric supports Jef United Ichihara Chiba.

# Furukawa Here and There

Telling the truth

**Furukawa Electric Group products are used in many aspects of our daily lives.**

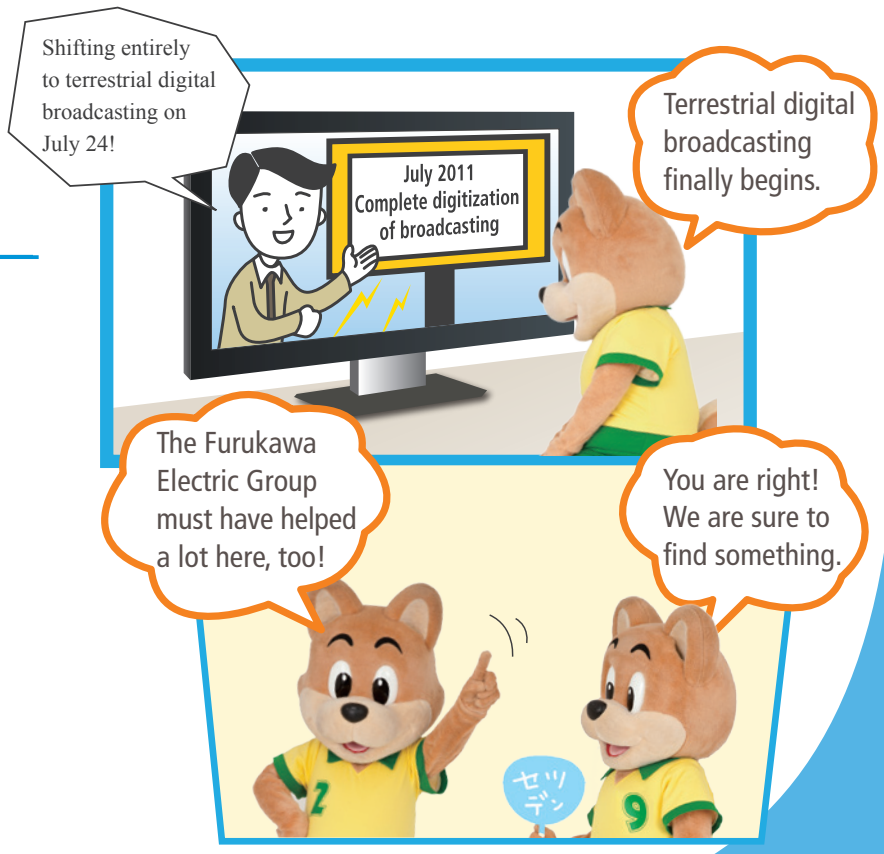
**Even** though you may not actually see the products of the Furukawa Electric Group that often, they are used in many familiar places.

Furukawa Here and There is a series featuring astonishing stories about these products, told with a focus on different scenes and topics in daily living.

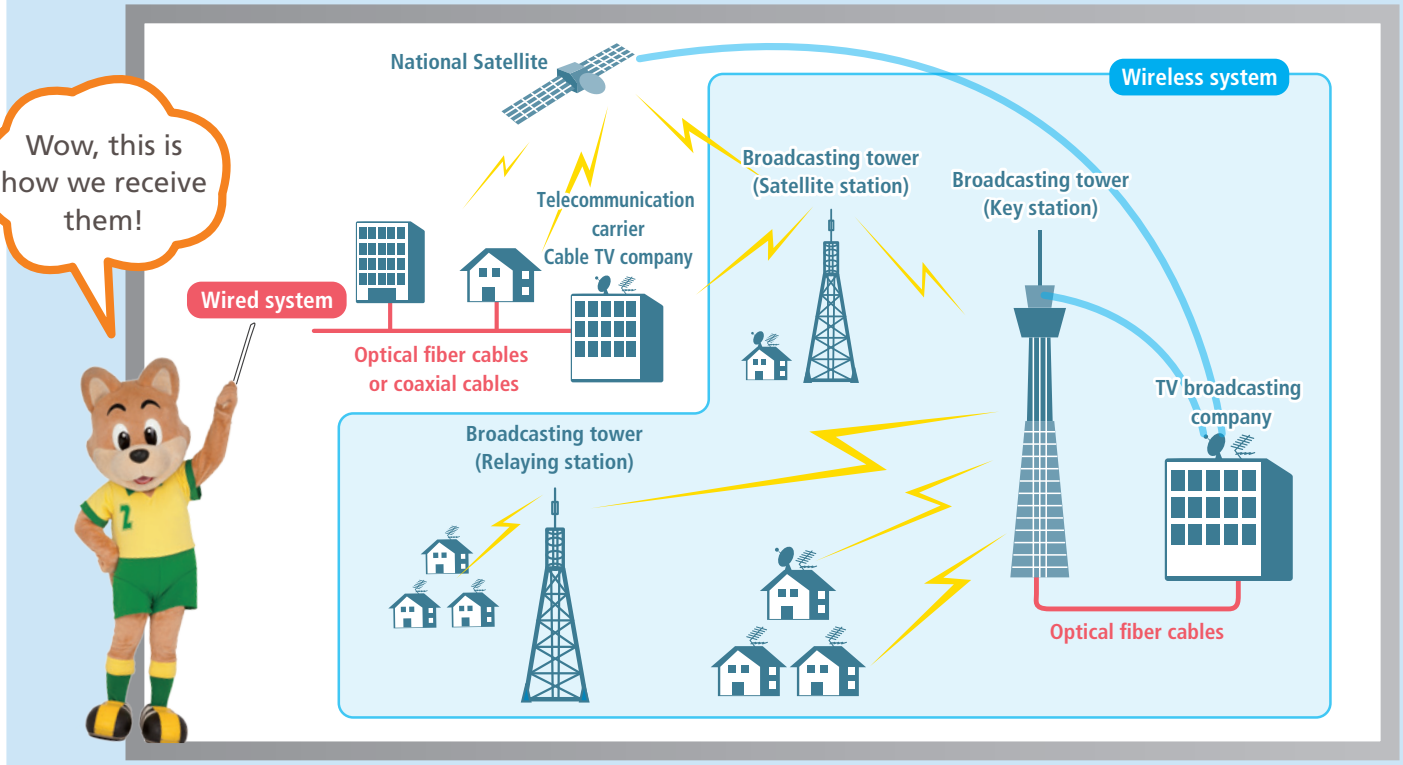
This issue features "broadcasting." Don't miss the Furukawa products.

## Featured in this issue: Broadcasting

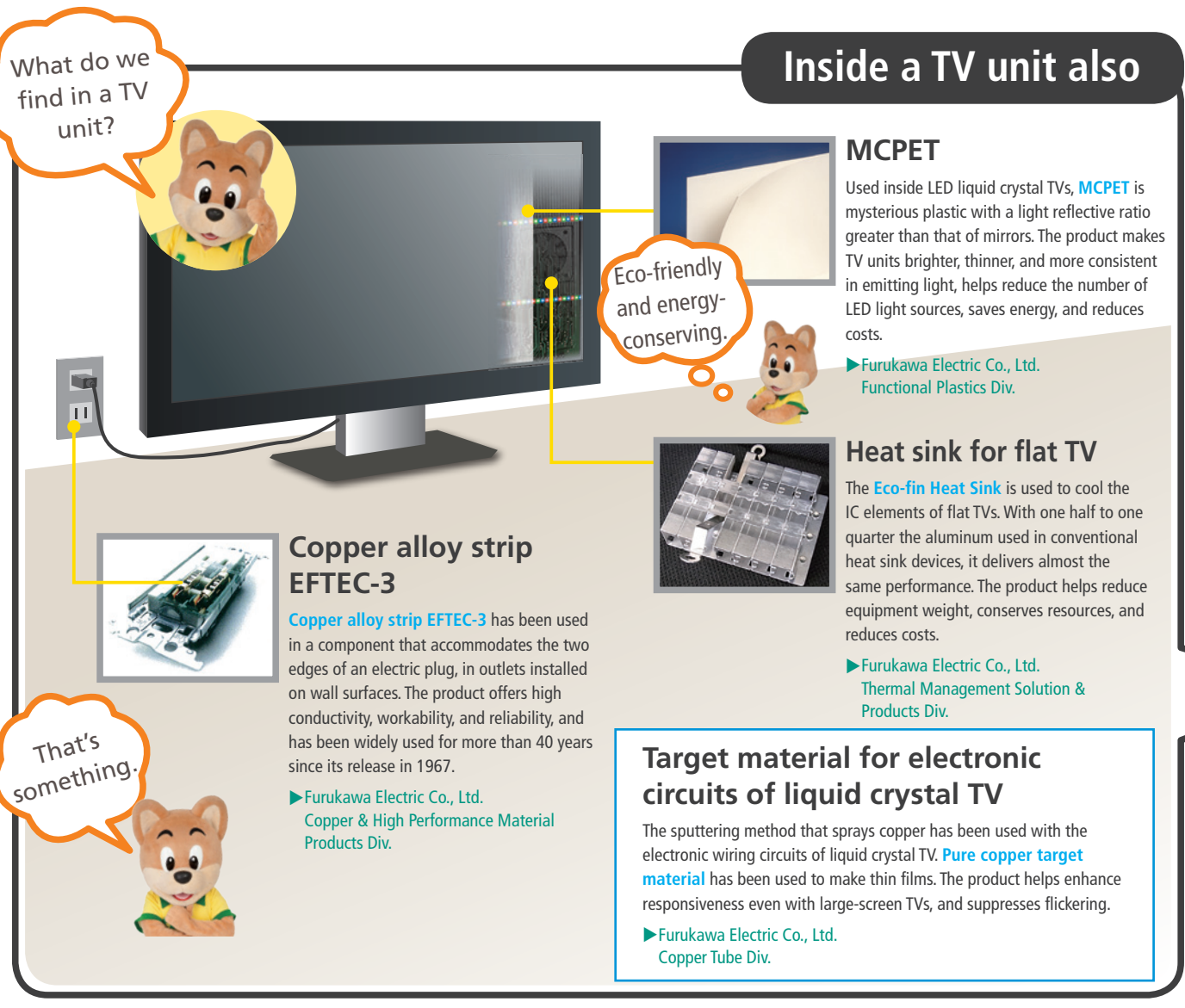
"TV broadcasting will be completely digitized by June 24, 2011." "Tokyo Sky Tree has reached a height of 634 m, making it the highest free-standing broadcasting tower in the world." We have heard the statements a number of times, and they both relate to broadcasting. Today, broadcasting is indispensable for daily life. Broadly, there are two kinds of broadcasting systems: the wireless system that sends broadcasting waves from antennas, and the wired system that connects antennas with cables. This issue features the Furukawa Electric Group, which has strongly supported both systems over long years.



# How are TV images and voices sent?




# Inside a TV unit also




## MCPET

Used inside LED liquid crystal TVs, **MCPET** is mysterious plastic with a light reflective ratio greater than that of mirrors. The product makes TV units brighter, thinner, and more consistent in emitting light, helps reduce the number of LED light sources, saves energy, and reduces costs.

▶Furukawa Electric Co., Ltd.
Functional Plastics Div.

## Heat sink for flat TV

The **Eco-fin Heat Sink** is used to cool the IC elements of flat TVs. With one half to one quarter the aluminum used in conventional heat sink devices, it delivers almost the same performance. The product helps reduce equipment weight, conserves resources, and reduces costs.

▶Furukawa Electric Co., Ltd.
Thermal Management Solution & Products Div.

## Copper alloy strip EFTEC-3

**Copper alloy strip EFTEC-3** has been used in a component that accommodates the two edges of an electric plug, in outlets installed on wall surfaces. The product offers high conductivity, workability, and reliability, and has been widely used for more than 40 years since its release in 1967.

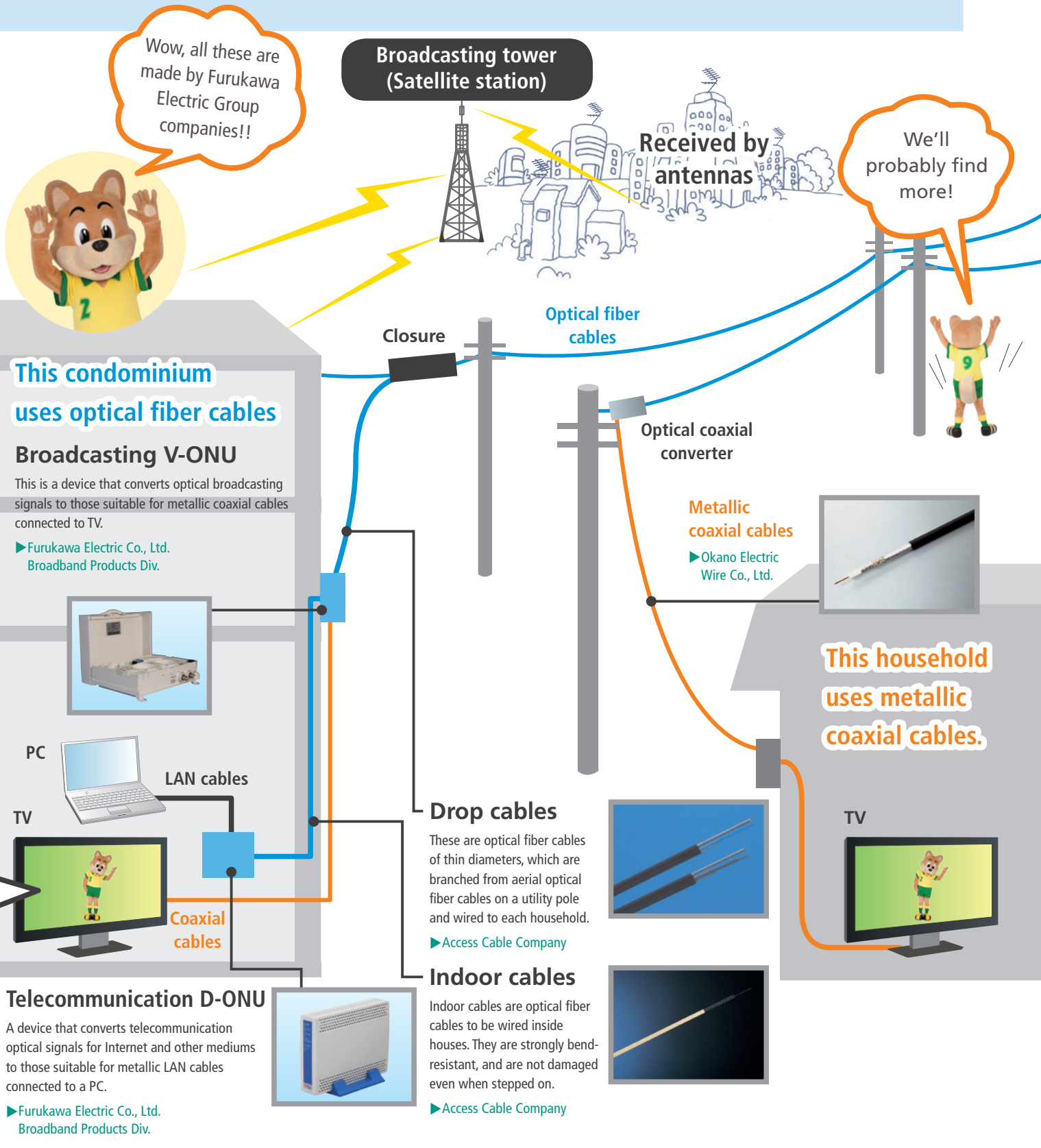
▶Furukawa Electric Co., Ltd.
Copper & High Performance Material Products Div.

## Target material for electronic circuits of liquid crystal TV

The sputtering method that sprays copper has been used with the electronic wiring circuits of liquid crystal TV. **Pure copper target material** has been used to make thin films. The product helps enhance responsiveness even with large-screen TVs, and suppresses flickering.

▶Furukawa Electric Co., Ltd.
Copper Tube Div.

With TVs, images and voice are sent from a TV station to a transmission station called a key station (base station) located on a broadcasting tower, where they are converted to broadcasting waves and sent on-air (Radio waves are sent out). These waves are partially received directly at households, but in remote areas the waves are dampened and stable reception of broadcasting waves becomes difficult. In such cases, a satellite station is installed that receives weak radio waves from the key station, and then sends them out again after amplification. This enables households remote from the key station to receive broadcasting waves well. There is also a system where a cable TV company receives the broadcasting waves and distributes them directly to households via cables (wires). Broadcasting waves are distributed to all households in Japan without exception, by either of the relaying systems.



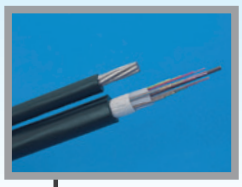
Let's go out on the town.

I see, optical fiber cables are growing in importance even more.

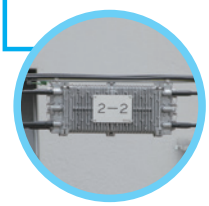
## Optical fiber cables

Data transmission of even greater speed and volume is in demand, due to digitized and high-resolution broadcasting and the fusion of broadcasting and telecommunication. **Optical fiber cables** that can transmit large volumes of data, even when used individually, are essential today.

▶Furukawa Electric Co., Ltd.
Optical Fiber and Cable Products Div.



I didn't know that.



## Optical coaxial converter

A device that converts optical signals to electrical signals.

▶Miharu Communications Inc.

## Closure with built-in optical coupler

This is an optical coupler that branches optical fiber cables on a utility pole for wiring to each household. **Optical closure** is a box for protecting the **optical coupler**. These products feature low losses, and light-weight and compact designs.

▶Furukawa Electric Co., Ltd.
FITEL Products Div.

## EFLEX

Optical fiber cables are sometimes buried underground, in addition to being installed on utility poles. When buried, resin protective pipe **EFLEX** protects the cables.

▶Furukawa Electric Co., Ltd.
Functional Plastics Div.

## Full support for design, construction, and maintenance!

The Furukawa Electric Group handles **Fiber To The Home (FTTH)** systems that integrate wireless transmission systems or broadcasting relay systems of TV stations with optical fiber networks, for distributing broadcasting (images) and telecommunication services to each household. We have a broad lineup of devices that constitute the system, from devices at centers to terminals used at home. We have also provided full support for cable TV companies and telecommunications carriers by going beyond merely delivering devices to configure the entire system from system design to construction and maintenance.

▶Furukawa Electric Co., Ltd.
Broadband Products Div.


## Parabolic antenna for microwave links

Lightweight and rust-resistant **aluminum alloys** have been used with parabolic antennas.

▶UACJ Corporation
▶Furukawa C&B Co., Ltd.

**Broadcasting tower (Satellite station)**

**Broadcasting and telecommunication companies**

## Cable TV facilities

Cable TV facilities convert broadcasting signals received as radio waves into those suitable for transmission via wires (cables).

▶Miharu Communications Inc.

## FTTH transmission devices

FTTH transmission devices convert electrical signals into optical signals, and send broadcasting signals, Internet and other telecommunications signals, as well as IP telephone signals via optical fiber cables.

▶Furukawa Electric Co., Ltd.
Broadband Products Div.

## Furukawa also supports construction works!


Work is needed to draw out one optical fiber from the trunk lines on a utility pole and connect it to a line wired to household. The work requires sophisticated technologies for connecting two optical fibers without even the slightest dislocation. High-speed, high-quality, **optical fiber fusion splicer** lets two optical fibers face each other without dislocation, and connects them by fusing them with arc discharges, simply by placing the cables and pressing the button. The very stable and hands-free specifications of the equipment enable work to be completed quickly, even on a utility pole.

▶Seiwa Giken Inc.

National satellite

Broadcasting tower (Satellite station)

Broadcasting tower (Key station)

We can see the program on mobile phones as well.

One Seg broadcasting

## How a broadcasting tower works

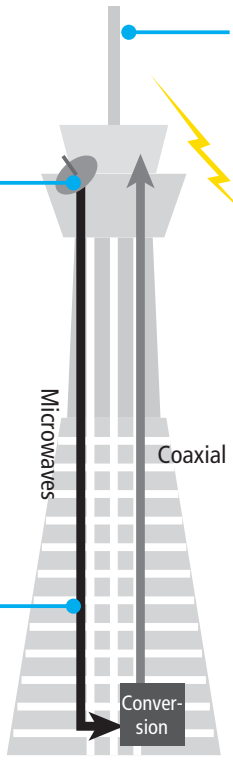
Radio waves (microwaves) received by a **parabolic antenna** are brought into the station building via **waveguide (rectguide®)**, converted to broadcasting radio waves (UHF waves) with a converter, sent back to the **transmission antenna** via coaxial feeder lines, and then transmitted.

### Parabolic antenna

▶Furukawa C&B Co., Ltd.
▶UACJ Corporation

### Rectguide

▶Furukawa C&B Co., Ltd.




### Transmission antenna

▶Furukawa C&B Co., Ltd.

Face-sharing omni-directional multi-panel antenna array on Tokyo Tower

Antennas on the Tokyo Sky Tree

### Furukawa C&B worked with all its might to continue broadcasting after the Great East Japan Earthquake

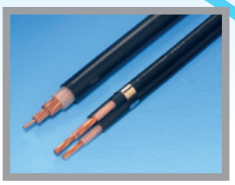
On March 11, some of the antennas on Tokyo Tower was damaged by the Great East Japan Earthquake. However, a construction squad from Furukawa C&B hurried to the Tower, and by the evening on the same day was conducting repair work even as the aftershocks continued.

That's how the Furukawa Electric Group helps people.

## Power supply cables

Various types of **power cables** are used for supplying electricity to broadcasting towers. These cables play important roles in delivering electricity to all devices that need electricity.

▶Furukawa Electric Industrial Cable Co., Ltd.



## Combiners

**Shared facilities** are for sending several broadcasting waves, for NHK and private and local broadcasting companies. Thanks to these facilities, radio waves may be sent from one antenna.

▶Furukawa C&B Co., Ltd.

## DC power source equipment (storage)

Broadcasting towers are equipped with **backup storage batteries** and **power source equipment**, in order to continue supplying power even at times of power failure and interruptions. Our DC power source equipment has been widely adopted at main stations and relaying stations nationwide, for its excellent maintainability, space-saving compactness, strong earthquake resistance, and high reliability, enabling shorter construction times.

▶The Furukawa Battery Co., Ltd.

That's very important!

## Furukawa C&B continues protecting the safety of sky and broadcasting

On the top of Tokyo Tower are aircraft warning lights to prevent aircraft collisions at night. You may not have been aware of this, but Furukawa C&B replaces these light bulbs. They are replaced once each year when antennas are inspected, to avoid the risk of an accident that might occur if they are allowed to run down. Since strong radio waves are harmful to the human body, the work is done late at night, after broadcasting has finished. Even though Tokyo Sky Tree will be completed soon, Tokyo Tower will remain as is, as a backup. So the work to replace light bulbs will continue in the future.

Images courtesy of:
Tobu Railway Co., Ltd.
Tobu Tower Sky Tree Co., Ltd.

**TV station**

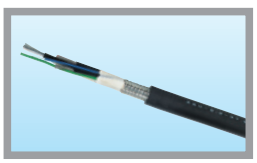
**Optical fiber cables**

## Let's take a look inside a studio!

## Optical fiber composite cables for TV camera

Optical fiber cables that enable transmission of large-volume data at high speed are essential in the age of digital high-resolution broadcasting. TV cameras use **optical fiber composite cables** in addition to cables for power supply, controlling calls by camera operators, transmitting image signals and other applications. The composite cables support digitization and high-resolution broadcasting in the TV industry.

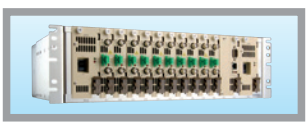
▶Furukawa Electric Industrial Cable Co., Ltd.



## Optical transmission devices

**Optical transmission devices** convert broadcasting signals from electrical to optical signals, for transmission via optical fiber cables. These are among the key items for broadcasting.

▶Furukawa C&B Co., Ltd.
▶Furukawa Electric Co., Ltd. Broadband Products Div.



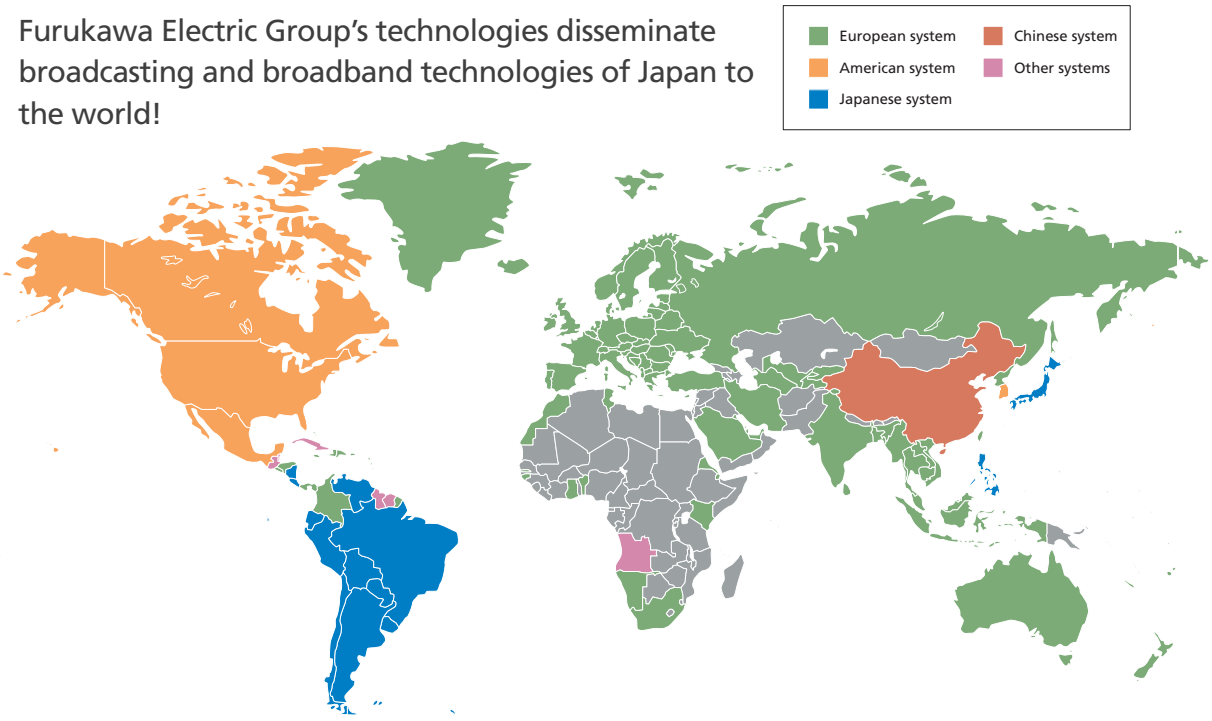
## Uninterruptible power source (UPS) devices

To continue broadcasting even at times of power failure without interruption, broadcasting stations are equipped with **UPS** and **backup storage batteries**. These devices help supply electricity stably for broadcasting, which is among the public infrastructures indispensable to our daily lives.

▶The Furukawa Battery Co., Ltd.

# Japan's system (ISDB-T International) are adopted in Latin America!

Furukawa Electric Group's technologies disseminate broadcasting and broadband technologies of Japan to the world!




It has been decided that the Japanese system (ISDB-T International) of terrestrial digital broadcasting will be adopted in 11 countries in Latin America and other regions. The Japanese system is most likely to be adopted in Africa as well, as it is highly compatible with mobile phones (One Seg broadcasting).

The Japanese system (ISDB-T International) is to be adopted in most Latin American countries

| Country name | |
|---|---|
| Brazil | Broadcasting started in December 2007 |
| Peru | Broadcasting started in March 2010 |
| Argentine | Broadcasting started in April 2010 |
| Chile | September 2009 (adoption finalized) |
| Venezuela | October 2009 (adoption finalized) |
| Ecuador | March 2010 (adoption finalized) |
| Costa Rica | May 2010 (adoption finalized) |
| Paraguay | June 2010 (adoption finalized) |
| Philippines | June 2010 (adoption finalized) |
| Bolivia | July 2010 (adoption finalized) |
| Uruguay | December 2010 (adoption finalized) |

**Ever since the start of TV broadcasting in Japan in 1953, the Furukawa Electric Group has been developing numerous broadcasting antennas and related equipment at numerous locations in Japan, including analog and digital TV broadcasting antennas for Tokyo Tower (completed in 1958). Consistently leading the industry, we have also built a presence in Latin America, where we build the highly reliable social infrastructure required for broadcasting. In our business, we call on the robust technologies and services, extensive experience, brand strength, and sales capabilities of Brazil FISA. Furukawa Electric's technologies are contributing to broadcasting, even on the other side of the world.**


FURUKAWA ELECTRIC CO., LTD. http://www.furukawa.co.jp/english/

**Head office** Marunouchi Nakadori Building, 2-3, Marunouchi 2-chome, Chiyoda-ku, Tokyo 100-8322
TEL.+81-3-3286-3001 FAX.+81-3-3286-3919


**Export Control Regulations**
The products and/or technical information presented in this booklet may be subject to the application of the Foreign Exchange and Foreign Trade Act and other related laws and regulations in Japan.
In addition, the Export Administration Regulations (EAR) of the United States may be applicable.
In cases where exporting or re-exporting the products and/or technical information presented in this booklet, customers are requested to follow the necessary procedures at their own responsibility and cost.
Please contact the Ministry of Economy, Trade and Industry of Japan or the Department of Commerce of the United States for details about procedures.



I-179 2C7 TR 100