

Communications Systems Business Briefing



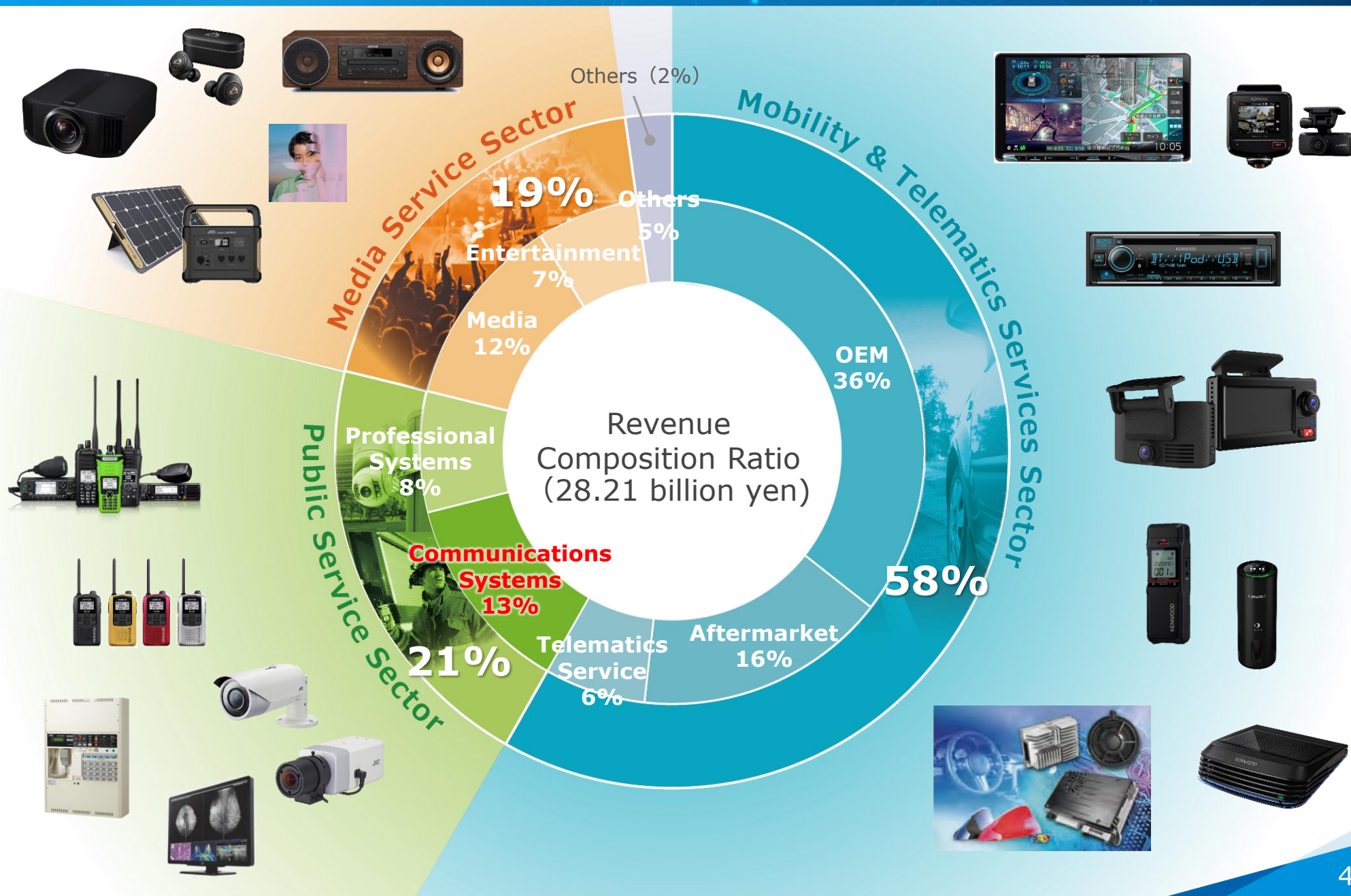
JVCKENWOOD Corporation

December 14, 2022

1. Business Overview & Professional Radio
2. Market Environment & Business Strategy

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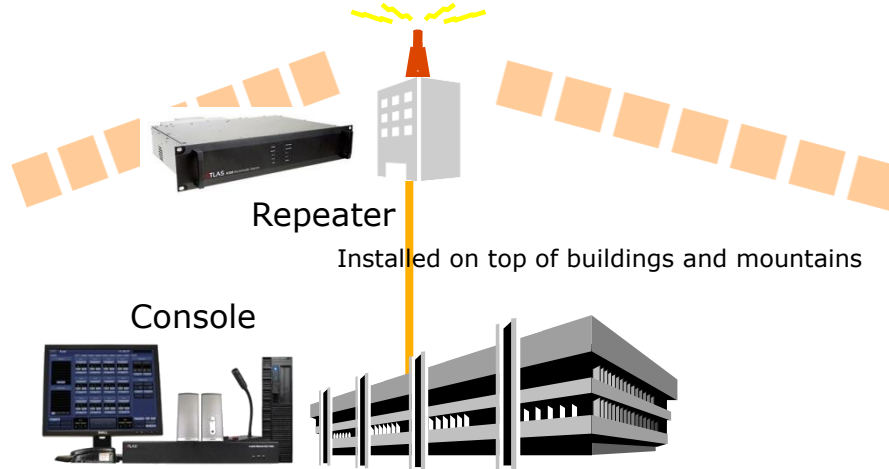
Revenue composition ratio by sector for FYE 3/'22



Main categories

Professional radio communications systems

Portable radios



Mobile radios



License-free radio

No license, qualification or application required.



Amateur radio

For personal use. Requires an amateur radio license.



History of Communications Systems Business



1946
Established Kasuga
Radio Co., Ltd.



Professional Digital Radio Systems
(New product VP8000 (center))



1983
Entered U.S. professional
communications systems business



2018

Capital and business alliance
with Tait International Ltd.



2018

Radio Activity S.r.l. becomes
a consolidated subsidiary

2014

EF Johnson Technologies, Inc.
a JVCKENWOOD Company

EF Johnson Technologies, Inc.
becomes a consolidated subsidiary

2007

Introduced NEXEDGE, an NXDN-compliant
digital wireless system

2001

Introduced TK-5400, a P25-compliant digital radio

Professional radio

1958 Launched the 9R-42J amateur radio receiver



2013

Launched the HF flagship TS-990



Founding period

Amateur radio

1940

1960

1980

2000

2020

Main business locations for Communications Systems Business



Strengths of JVCKENWOOD's Communications System Business

■ Four major strengths:

**Entered overseas markets
in the 1980s**

**Over 40 years of
experience and trust**

**Network of approx. 900
distributors
in North America**

**Results in the North American
private market**

**Customization for high quality,
high functionality, and
customer optimization**

**Long-term customer
acceptance**

**Achievements in the field of
motorsports with
high sound quality**

**Proven clear sound quality and
noise canceling function**

Our track record of introducing to the public safety market

■ For police, fire, and emergency services in multiple counties in the U.S.

- County of Santa Barbara, California USD 31M
- Frederick County, Virginia USD 23M
- Delaware County, Pennsylvania USD 34M

■ U.S. Government Agencies

- Department of State
- U.S. Embassies worldwide

■ Taipei City Police Department, Taiwan



Department of State California Highway Patrol

Our track record of introducing to private market

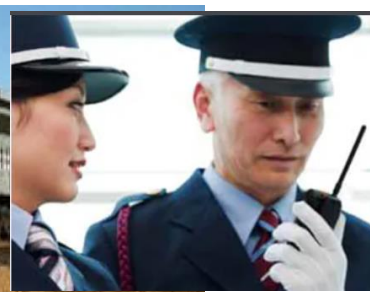
- Railroad companies in North America (over 90% market share)
- Electric, water and gas utilities
- Private security companies
- Hotels and casino resorts
- Ballparks
- Racetracks
- Airports
 - Istanbul Airport
- Logistics warehouses
- Golf courses
- Food, beverage and retail stores
- Consumer electronics stores
- Car accessory stores/car dealers



Istanbul Airport



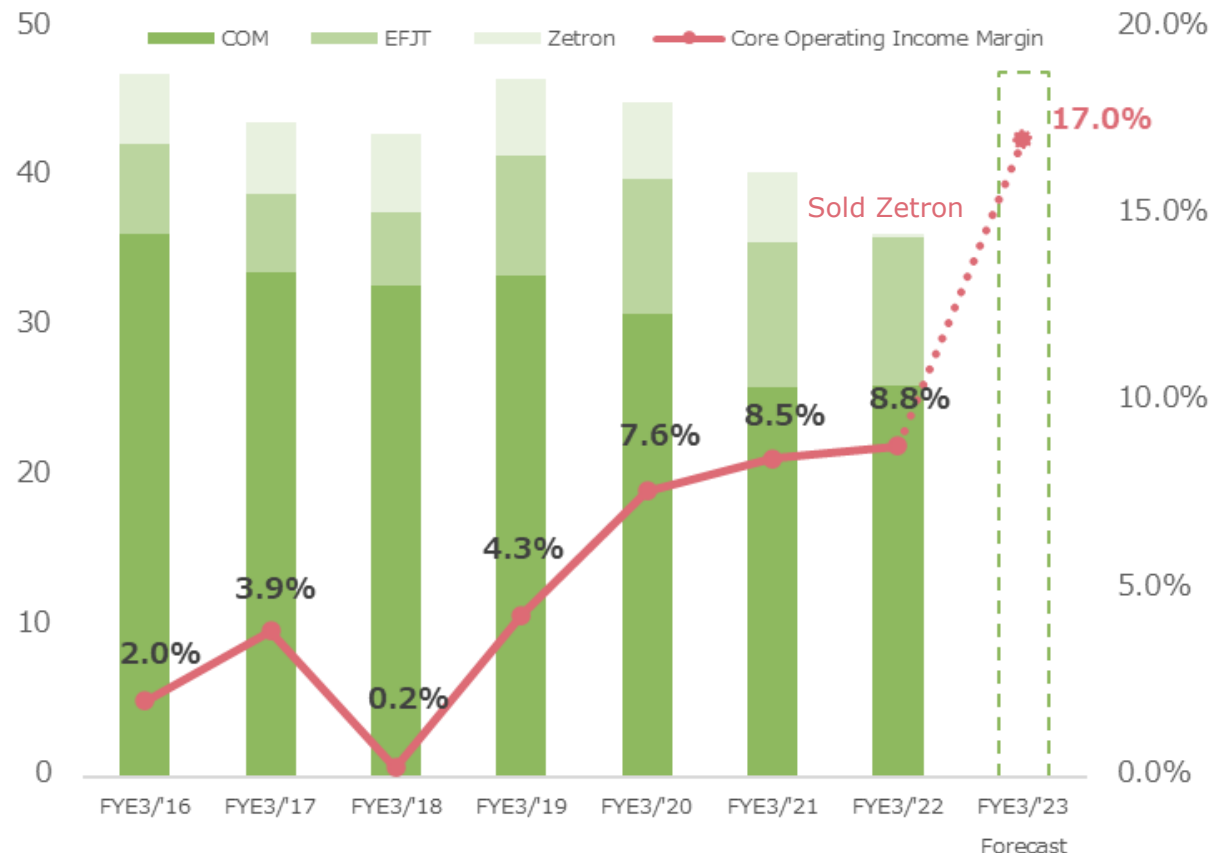
Railroad companies in North America



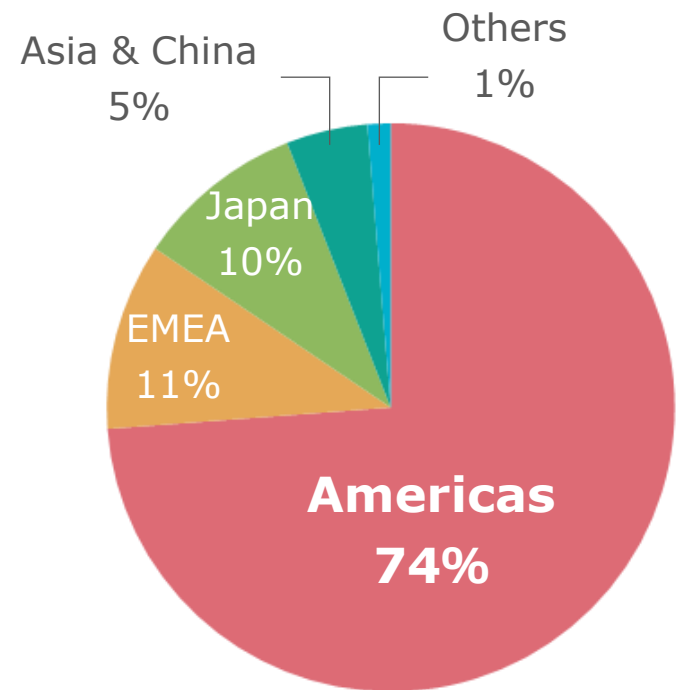
Performance trends of Communications Systems Business

- Core operating profit margin increased from FYE 3/'18.
- Americas accounts for approx. 74% of sales revenue by region.

(billion yen)



Revenue composition ratio
by region (FYE3/'22)



- COM: DMR, NXDN, analog, amateur, low power
- EFJT: For public safety (P25)
- Zetron: Communication command and control system equipment (sold in April 2021)

Features of professional radio systems

■ Advantages over cell phones and smartphones

One-to-many immediate calls

- Command and guide **many people at once**.
- Easy operation with a single push of the push-to-talk (PTT) button.

Resilient to emergencies and disasters

- Wide communication coverage area secured by repeaters.
- Enables terminal-to-terminal communications **even if a repeater is down due disasters, etc.**

Self supportable

- **Reliable communication** with own infrastructure.
- No monthly communication fees with only initial investment.

High quality and robustness

- Ensures quality through **high level testing**.
- Suitable for police and firefighters to carry into **hazardous environments**.

Low delay

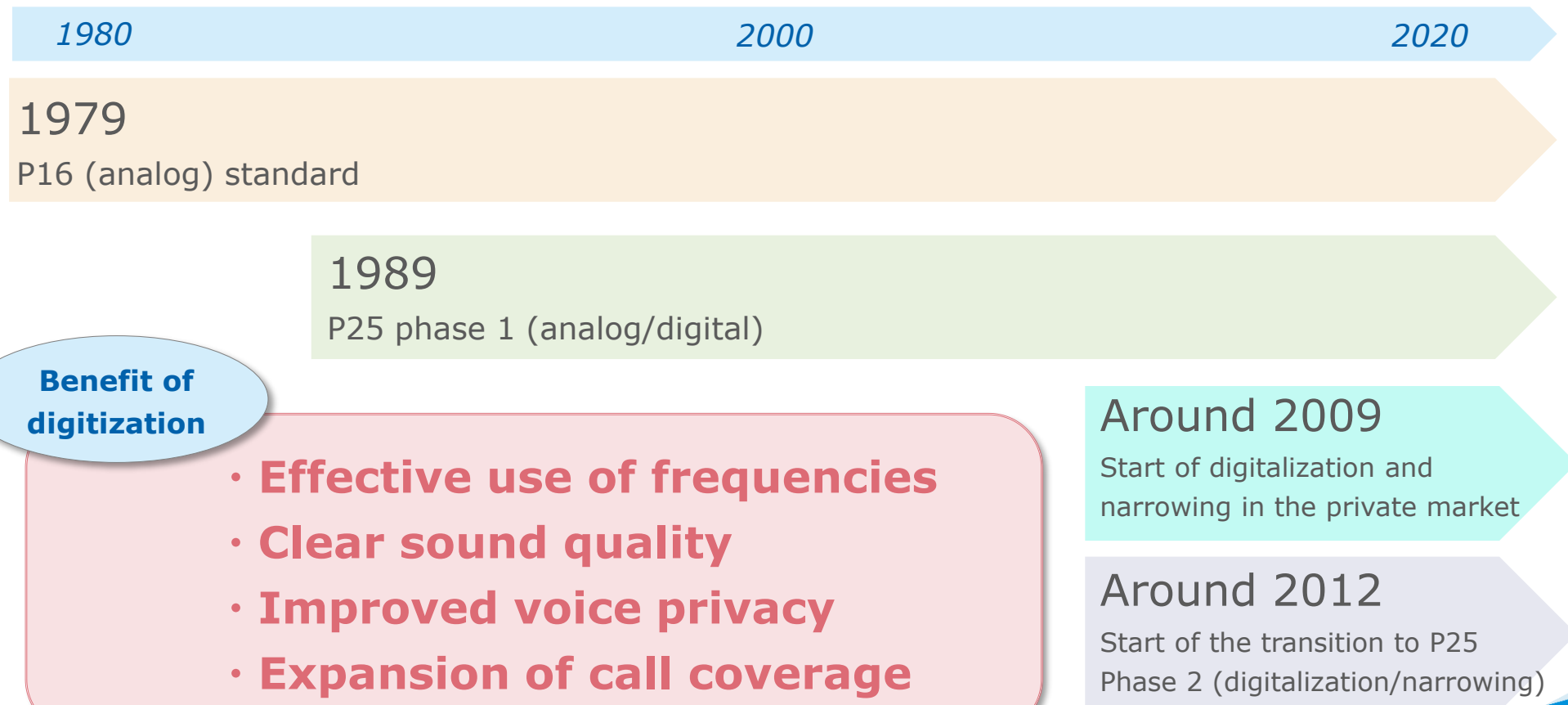
- Meets strict demands of police and fire departments, where a one-tenth of a second delay in judgment can directly affect human lives.

Videos

- ① Product development with customers
- ② Noise canceling function
- ③ Quality testing conducted at the business center

Digitalization of professional communications systems in North America and its benefits

- The P25 standard, a digital standard for North American public safety, was created in 1989.
- Frequency exhaustion due to the spread of cellular phones since 2000.
- In response to the frequency exhaustion issue, narrowing of 6.25 kHz in the private market started around 2009, followed by narrowing of P25 as phase 2 around 2012.



Rapid growth of the Communications Systems Business -> To be a stable source of revenue

<Background>

1. Rapidly growing demand for shifting to digital radios in the United States

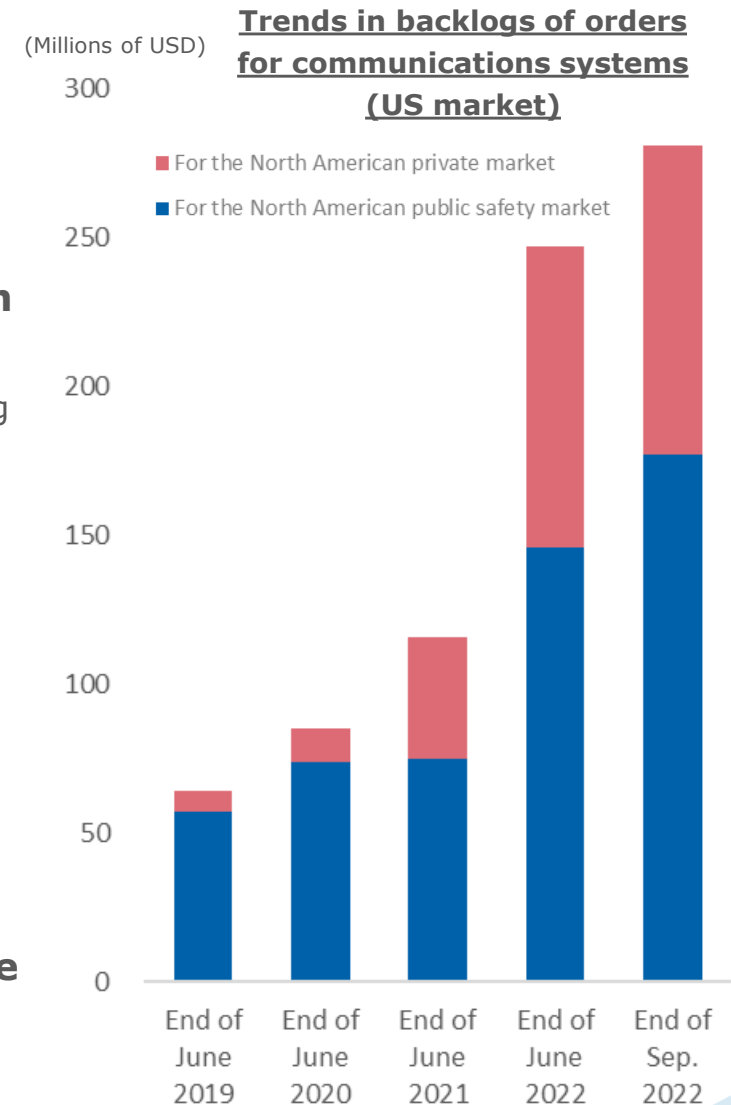
- Demand spans as long as about 10 years and will continue to be strong for the next few years
- Large government budgets for private security and public safety markets drive strong demand

2. Demand for communications systems is expanding around the world as a crisis management measure

- Increasing momentum toward disaster prevention and BCP
- Strong sales of professional radio equipment as a means of emergency communication

3. Stable supply of products through early response in the supply chain

- Increasing profits by limiting suppliers and adjusting prices
- Selected as a manufacturer of secure radio equipment



1. Business Overview & Professional Radio

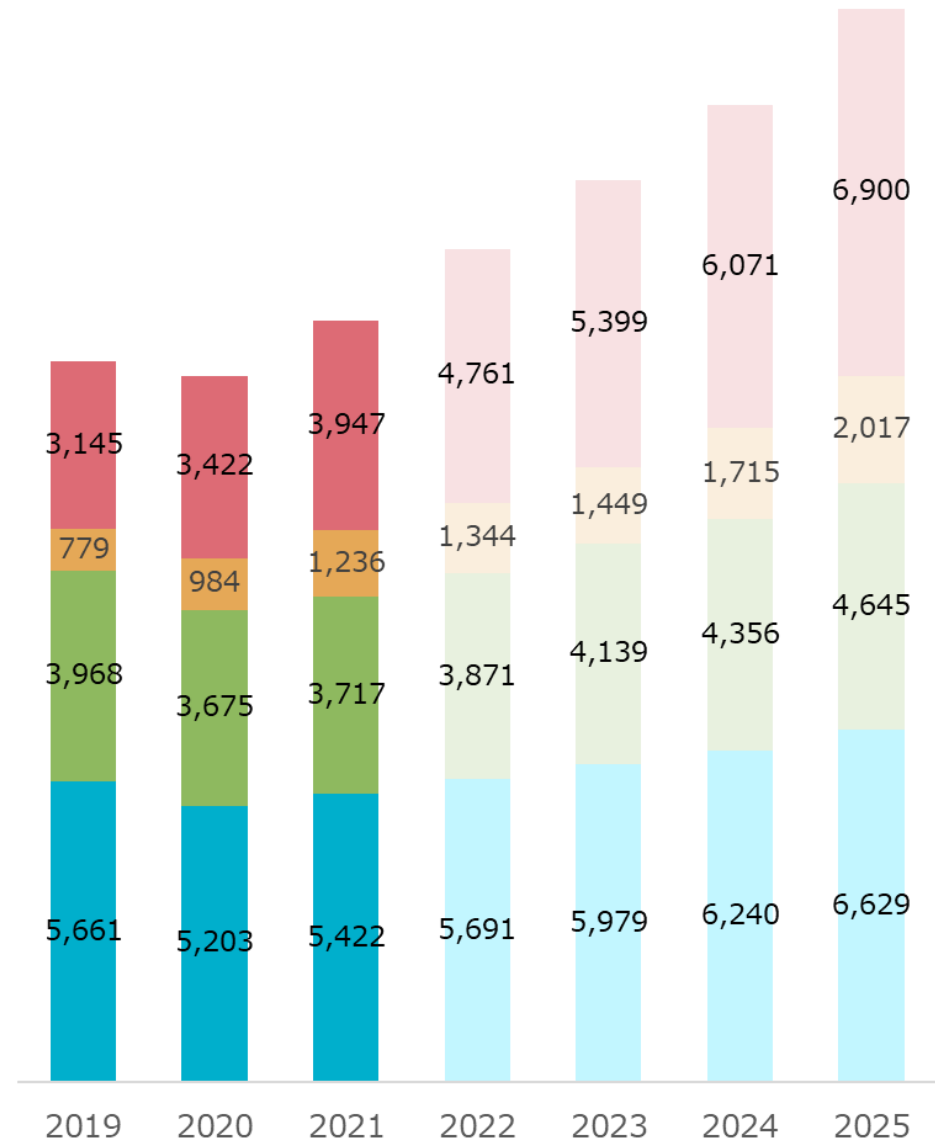
2. Market Environment & Business Strategy

Market size of professional radio (all regions)

- This material adopts four categories.
- Slight contraction from 2019 to 2020 due to COVID-19 impact but recovered from 2021.
- Both categories are projected to expand through 2025.

■ Public Safety Market: P25, TETRA, TETRAPOLE, PDT
■ Private Market: DMR, NXDN, dPMR, Analog, Others
■ Hybrid solutions: Hybrid solutions: Hybrid areas of professional radio and broadband (devices (LTE/5G in-vehicle routers, IP wireless terminals), infrastructure (LMR integration systems), IP wireless services)
■ Broadband solutions: LTE/5G products and services (LTE/5G terminals, LTE/5G base stations, EPCs (central equipment), applications, billing systems, line systems)

Professional radio market size (USD million)



Market segment and major communication protocols in this document

- While referring to the OMDIA report as market data, the following market segments are used for convenience in this document.
 - **Public safety market: P25, TETRA, TETRAPOL, PDT**
 - **Private market: DMR, NXDN, Others (including dPMR), Analog**

Market Segment	Communication Protocols		Market Region	Outline
Public Safety Market	Digital	P25	North America	<ul style="list-style-type: none"> Standards developed by North American public safety experts. Oligopolistic market dominated by U.S. companies.
		TETRA TETRAPOL PDT, etc.	Europe, Africa, China, Asia, etc.	<ul style="list-style-type: none"> Europe: TETRA and TETRAPOL China: PDT
Private Market	Digital	DMR	All regions	<ul style="list-style-type: none"> Substantial international standard. Many manufacturers participates in the market.
		NXDN	All regions	<ul style="list-style-type: none"> A digital standard jointly developed by JVCKENWOOD and Icom Inc. Derived and expanded to many other standards.
		Others	All regions	<ul style="list-style-type: none"> dPMR, etc.
	Analog		All regions	<ul style="list-style-type: none"> In major markets such as the U.S. and China, new sales cannot continue due to legal restrictions for the purpose of effective use of spectrum.

Our target markets and their sizes (all regions in 2021)

- Target markets: public safety market and private market.

Public Safety Market



Public safety market:
P25 · TETRA · TETRAPOL · PDT

- Police ● Fire department
- Emergency services
- Government agencies, etc.

USD 5,422M

Approx.
600 billion yen

Private Market



Private market:
DMR · NXDN · dPMR · Analog · Others

- Schools ● Airports ● Railways ● Construction
- Retail Factories ● Mines ● Hotels
- Public utilities (electricity, water, gas)
- Amusement parks
- Shopping malls
- Stadiums, etc.

USD 3,717M

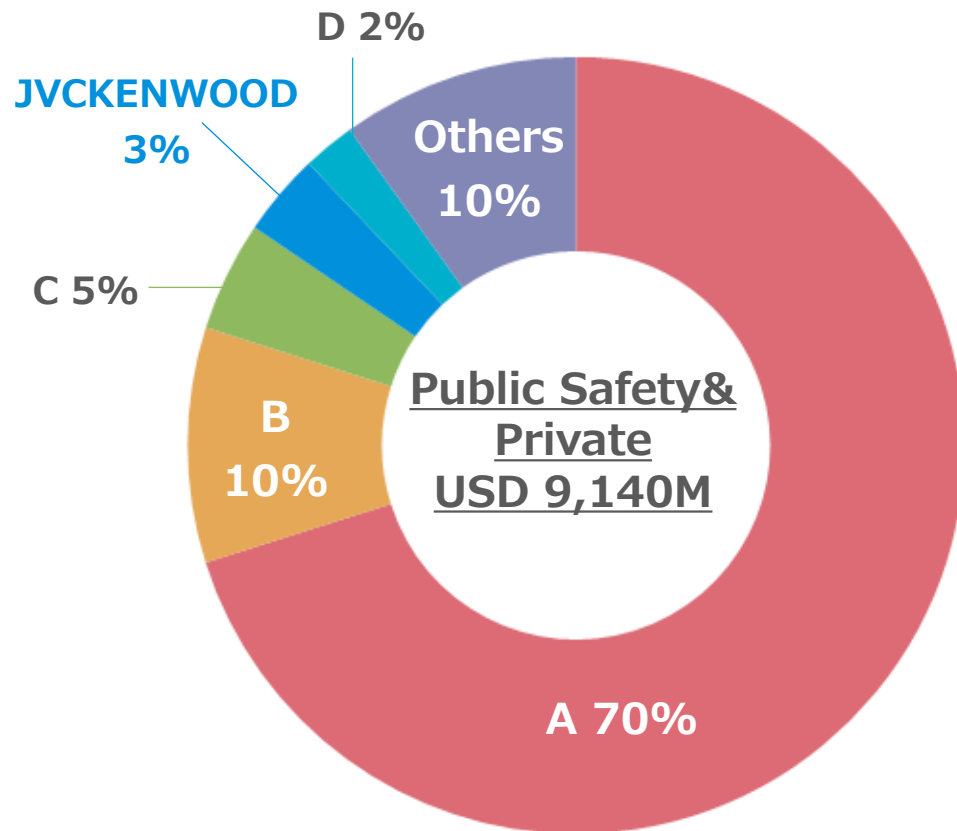
Approx.
412 billion yen

Exchange rate: TTS 2021 average 110.8 yen

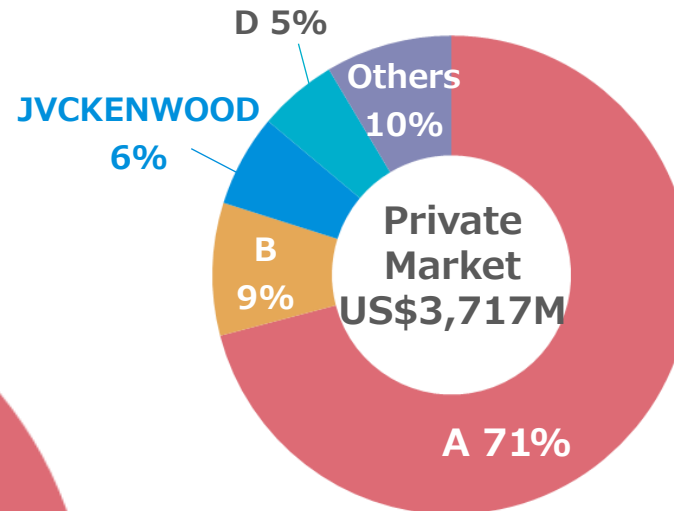
Our market share (all regions in 2021)

- Company A has by far the largest market share in the public safety market and the private market.

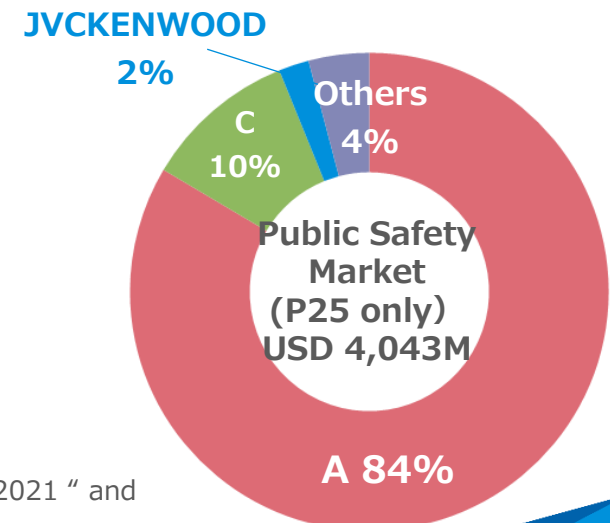
Professional radio market in 2021



Private market share in 2021

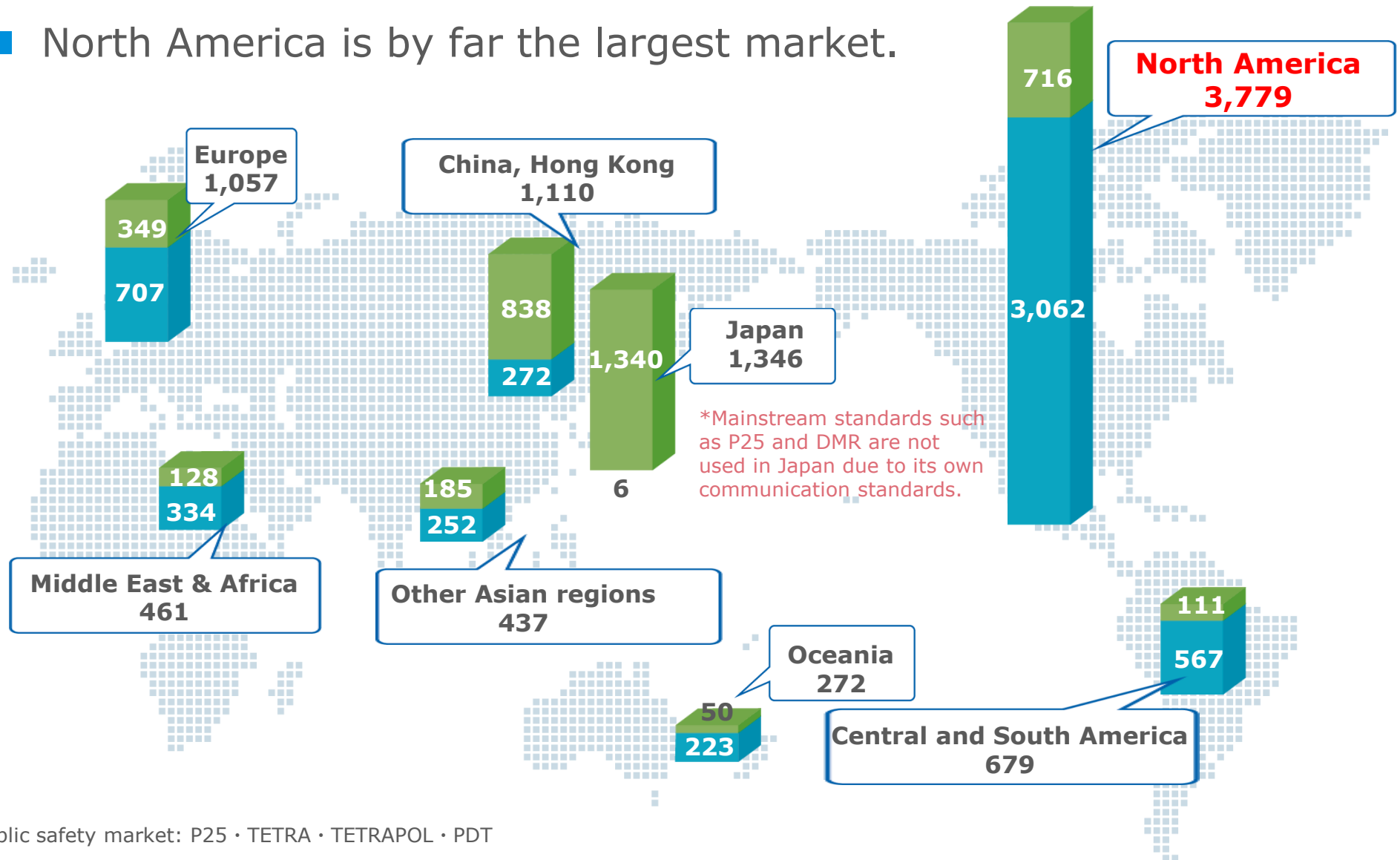


Public Safety market (P25 only) share in 2021



Market size by region (2021, USD million)

- North America is by far the largest market.

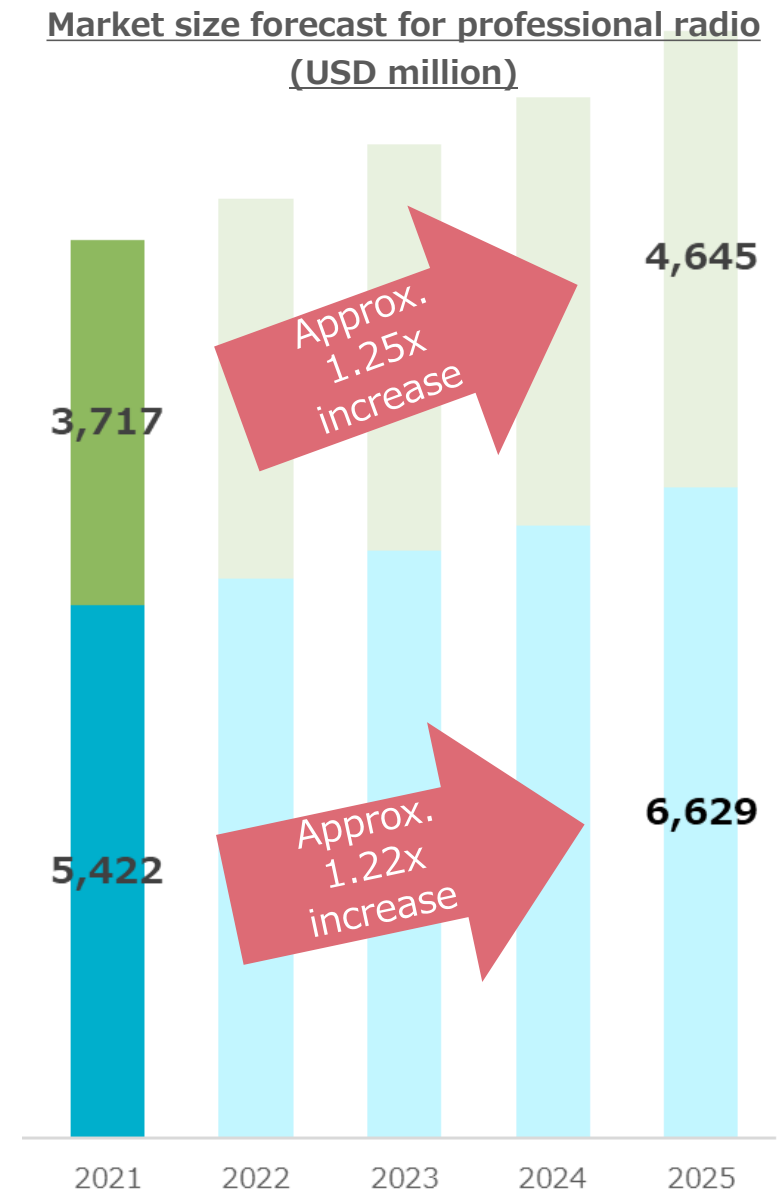


External growth factor: market forecast for our target markets

Both public safety and private markets, which is our target markets, are expanding toward 2025.

- Switching from analog to digital increased product unit price/system price.
- Large government budgets for the public safety markets and private security in the U.S.
- U.S. Federal Communications Commission (FCC) banned on sales of telecommunications equipment and surveillance cameras by five Chinese companies

■ Public safety market: P25 • TETRA • TETRAPOL • PDT
■ Private market: MR • NXDN • dPMR • Analog • Others



Internal factor of growth 1: Launch of new high-performance products

- **Launch of the new VP8000 tri-band-compatible radio equipment, which covers 3 frequency bands*¹ and 2 digital protocols*² in one unit, leading to an expanded presence in the United States (January, 2023)**
 - A single radio unit enables intercommunication between police and fire departments, etc. and school security in the same municipality in the event of an emergency

Example in the US market



=> This enables the acquisition of new sales channels and new projects to accelerate growth in the North American public safety markets

*1: Support for VHF/UHF and 700/800 MHz frequency bands

*2: Compatible with different digital radio standards, P25 and DMR

*3: A digital radio standard developed for the US public safety market

*4: Short for Digital Mobile Radio, an international digital radio standard

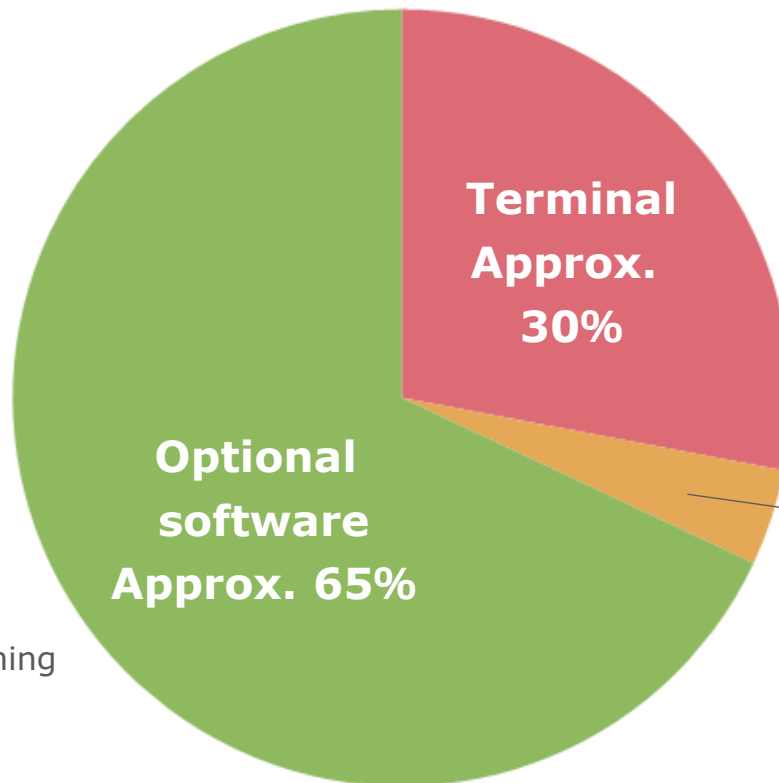
Example of a business model for the P25 market*Not applicable to all of our products.

- In addition to the terminal itself, basic accessories and a variety of software options are required to use the wireless terminal in a way that meets the user's needs.
- Software options include essential functions, which can be added for high gross margin sales.

Example of breakdown of sales amount
per P25 portable radio terminal



- Frequency
- Channel
- Protocol
- Encryption level
- Various additional features
 - ✓ GPS
 - ✓ Man Down
 - ✓ Over-the-Air programming
 - ✓ Keypad programming



Basic accessories
(antenna, battery, charger)
approx. 5%



Internal factor of growth 2: strengthening of business structure

Company-wide efforts to permanently strengthen the business structure

2018- T Project

2020- Management Base Reform

2020- CEM* Project

Initiatives of Communications
Systems Department

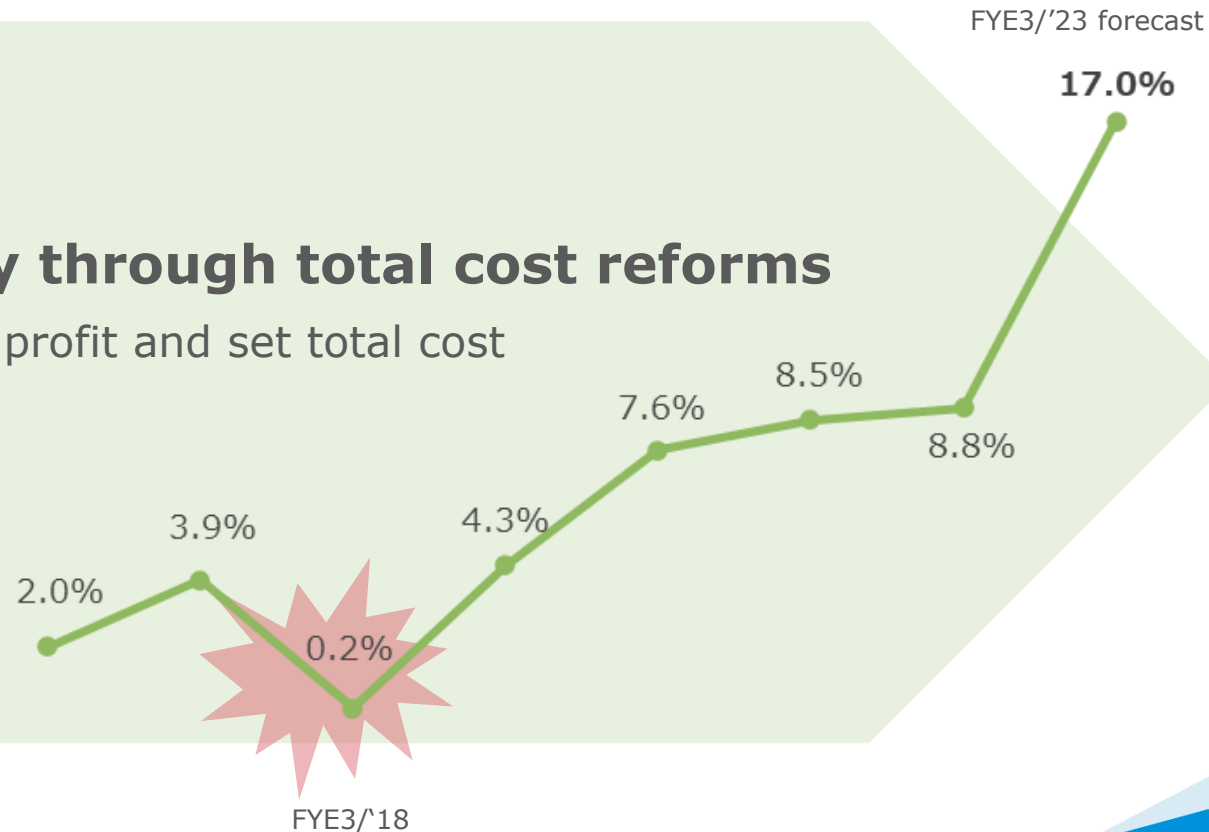
THESEUS

Improve profitability through total cost reforms

- Fix target core operating profit and set total cost



Status update meeting



Future growth strategy

- Aim for steady sales growth in expanding markets with clearly prioritized goals and investments.

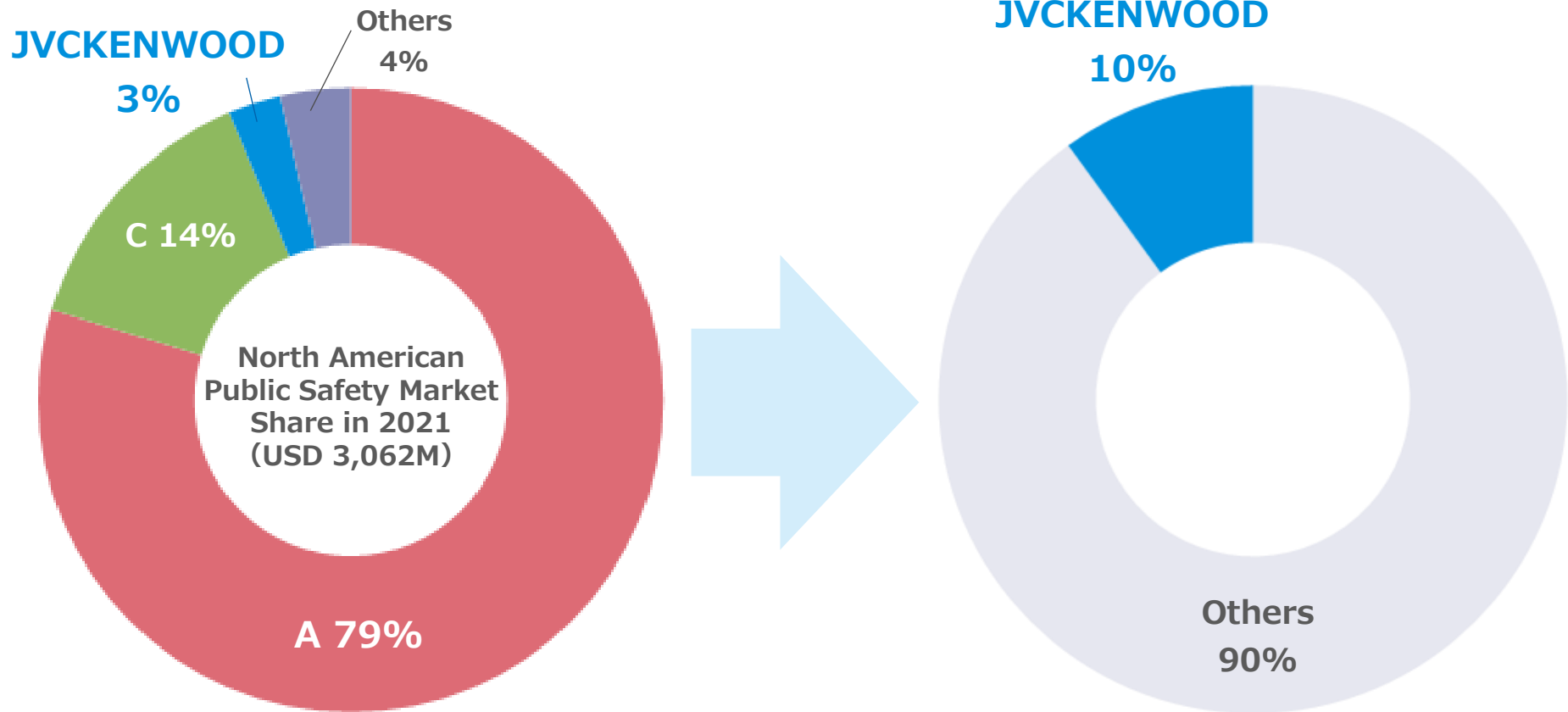
Strengthening production lines, sales channels, and ensuring human resources for solution development

- ① **USD 400M sales in the North American public safety market (approx. 4 times current sales).**
- ② **Strengthening of domestic business.**
- ③ **Expanding added value through the use of broadband technology.**

Delivering safety and security to customers around the world through our Communications Systems Business

Expand sales in the North American public safety market

- Aiming to achieve USD 400M in sales in the expanding North American public safety market (approx. 4 times current sales).
- Accelerate the acquisition of bids from approx. 3,000 counties in the U.S. that will be digitized sequentially, aiming for a market share of approx. 10% in the future, up from approx. 3% in 2021.



Strengthening of domestic business

- Introduction of digital convenience radio equipment with antibacterial and antiviral processing*¹
- Sales of disaster prevention radio equipment to local governments remains steady.
- Expanding market demand toward FY2024 due to changes in the radio administrative system*² (130,000 license stations).
- Growing demand for professional radio equipment with an intrinsically safe explosion-proof structure*³ that can be used where there is a risk of explosion or fire.



Digital convenience radio
TPZ-D563BT



Portable disaster prevention
radio equipment
TCP-D609DP



Intrinsically safe
explosion-proof radio device
NX-330EX

*1: The SIAA mark is displayed on products that have been evaluated according to the ISO 22196 method and whose quality is controlled and information disclosed in accordance with the guidelines of the Society of International sustaining growth for Antimicrobial Articles.

*2: Revision of the Radio Law that analog system frequencies in the 350 MHz and 400 MHz bands will no longer be available after December 1, 2024.

*3: Structure certified by a public agency as not being an ignition source (sparks, hot areas) in hazardous areas where there is a risk of explosion due to gas and dust.

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