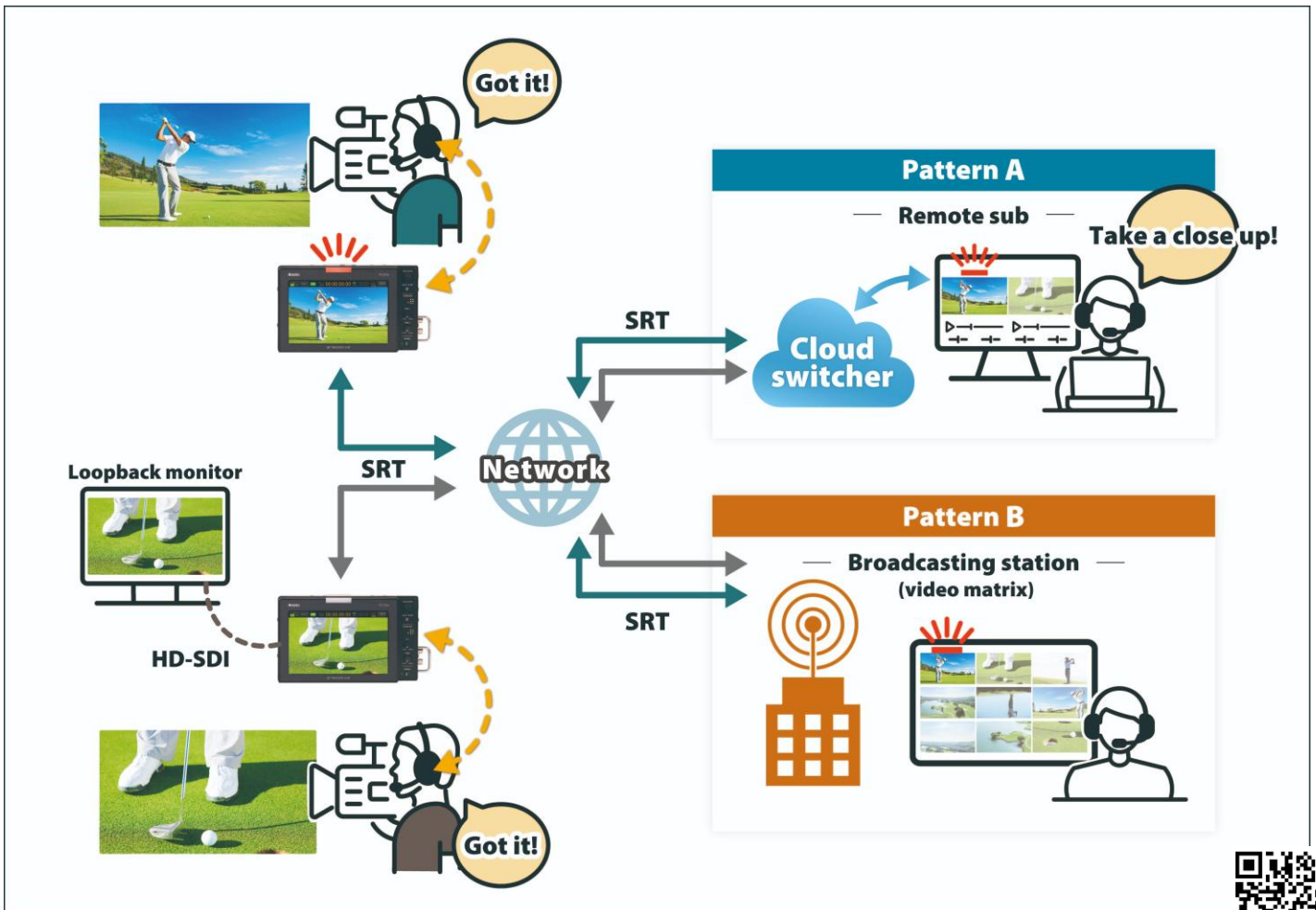![ASTRO - Designing Your Vision]

TR-5004

New SRT Protocol Compatible Transmission Device

- ✓ SRT Encoder/Decoder
- ✓ 3G-SDI → AVC/HEVC H/W CODEC
- ✓ Supports INTERCOM signals
- ✓ Supports TALLY signals
- ✓ SD card used for recording and playback
- ✓ Use two TR-5004s to send/receive SRT transmissions

Example of an SRT transmission device in use

1. Major Features

(1) IP gateway for existing cameras

- ✓ Easily convert HD-SDI to IP for IP live/Remote production.
- ✓ Supports CAMERA Feed, RETURN, INTERCOM, TALLY

SDI　　　IP Gateway　　　**IP (SRT)**

Camera V/A →

← RETURN V/A

TR-5004

Camera V/A
RETURN V/A
INTERCOM
TALLY

(2) Unique design with a 7-inch display

- ✓ Can be used as Second Viewfinder
- ✓ No need of additional monitor to show IP received video.

TR-5004 can be used by attaching to a camera or tripod.
It is unique style different from existing SRT encoders which
are normally installed in an OB truck or equipment room.

(3) Specifications

VIDEO FORMAT :
  - 1920×1080,
  - 60p/59.94p/50p/30p/29.97p/25p/24p/23.98p,
        YCBCR 4:2:2 10bit LevelA
  - 60i/59.94i/50i/24PsF/23.98PsF, YCBCR 4:2:2 10bit

CODEC :
  - H.265, HEVC 4:4:4/4:2:0 10bit
  - H.264, MPEG-4 AVC 4:2:2 10bit/4:2:0 8bit

2. SRT Transmission（SRT: Secure Reliable Transport ）

(1) Benefits

- ✓ High quality, low latency, high security, low-cost IP transmission protocol
- ✓ Perfect for live streaming and remote production over the public internet
- ✓ Cost/time saving, easy set-up and high-quality real-time operation

Camera Source — SDI → SRT Encoder — SRT 🔑 🔥 → Network (Public Internet) → SRT 🔑 🔥 → SRT Decoder — SDI → Switcher

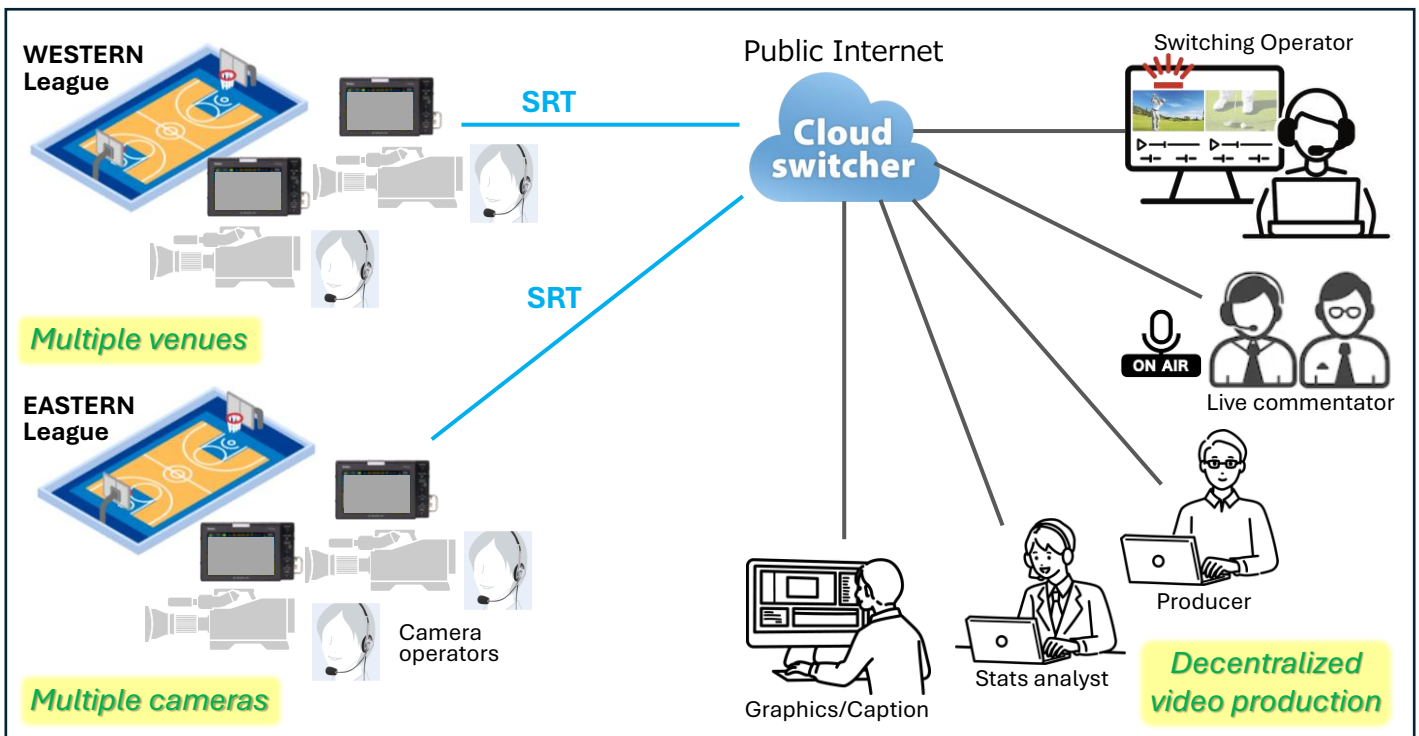## (2) Use Example : Low-Cost Remote Production

（a）International events
- Significant cost and time to prepare facilities for international transmission
- Difficult to send all related staff to the broadcast site

（b）Events and Sports
- Limited slots for these events on live TV
- To broadcast to viewers outside of their normal coverage area
  (Also allows people who have moved away from their hometown to see local events)

(3) IP Live Remote Production

- ✓ Consolidate video and audio from multiple cameras at multiple venues over the IP network.
- ✓ Decentralized remote video production. Allows for efficient production of a very polished finished product.
- ✓ While the camera crew is on site, other related persons can control the live production remotely.

WESTERN League — Multiple venues — EASTERN League — Multiple cameras — Camera operators — SRT → Public Internet — Cloud switcher → Switching Operator, Live commentator, Producer, Stats analyst, Graphics/Caption — Decentralized video production
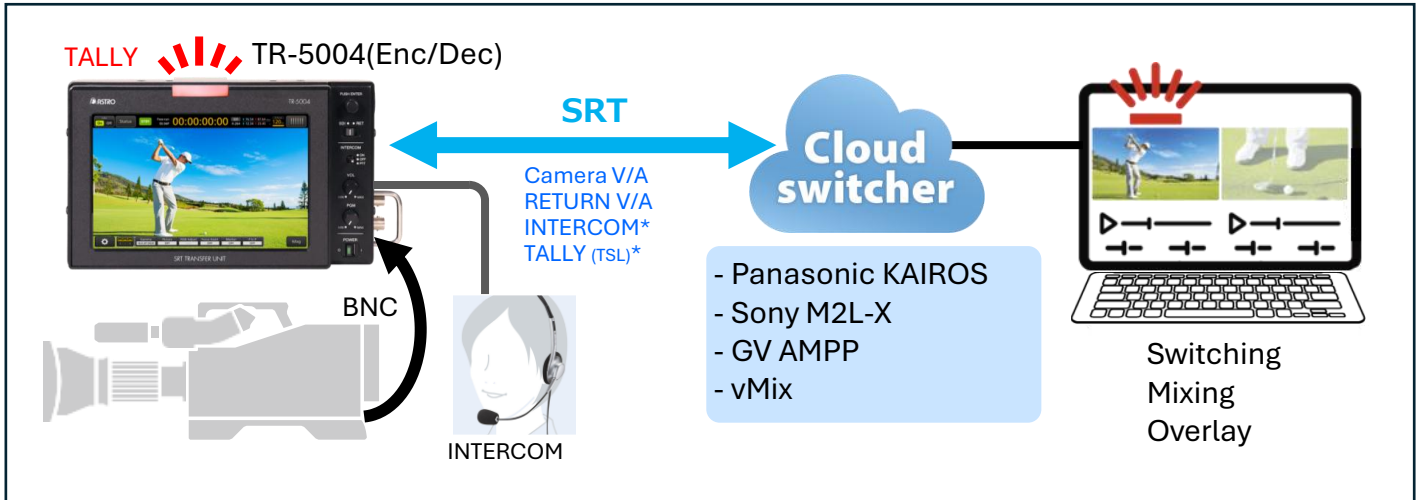
- ✓ The practical latency of SRT-based transmission is less than 500msec, allowing total operation and communication to work smoothly in real-time.
- ✓ While many major sports production companies use an ST2110 transmission system via a dedicated line, some also use an SRT-based network as secondary route to deliver video to related people in different locations.
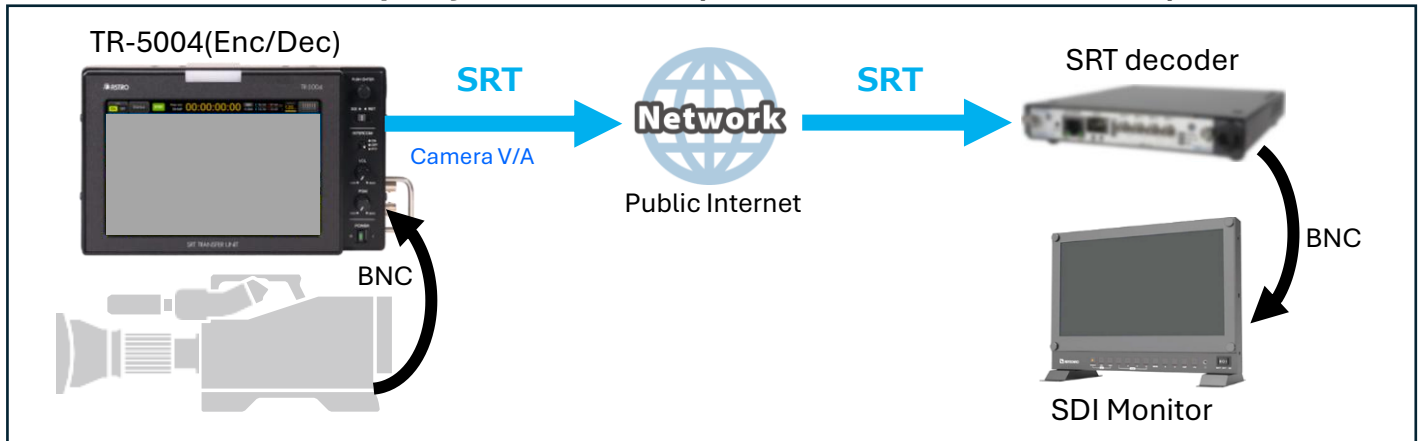
3. TR-5004 Use Examples

1. Cloud switcher, software switcher

TALLY TR-5004(Enc/Dec)

SRT

Camera V/A
RETURN V/A
INTERCOM*
TALLY (TSL)*

BNC

INTERCOM

Cloud switcher

- Panasonic KAIROS
- Sony M2L-X
- GV AMPP
- vMix

Switching
Mixing
Overlay

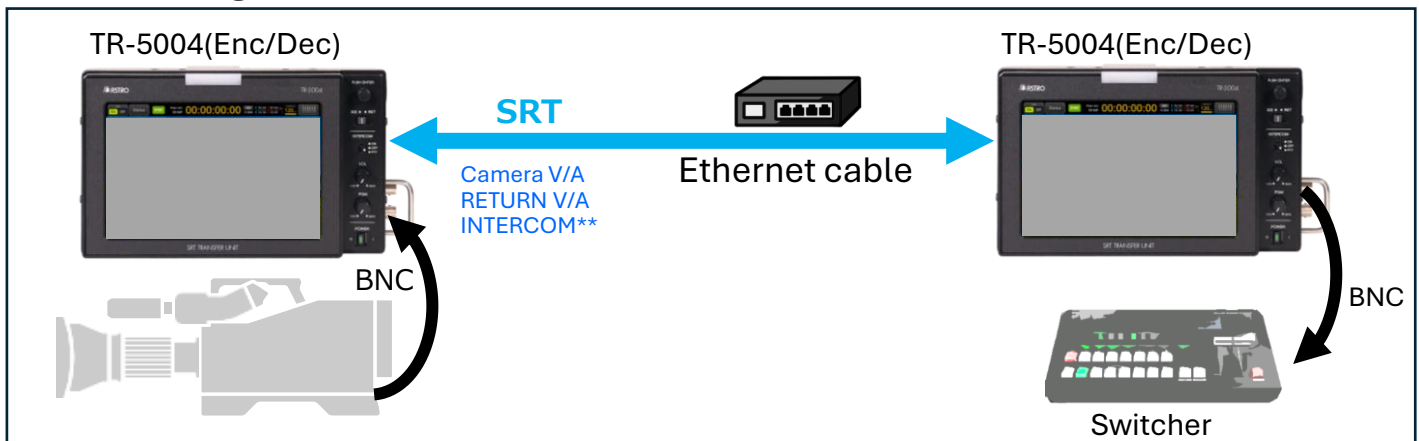RETURN, INTERCOM and TALLY signals are necessary for multi-camera operation.
(*INTERCOM and/or TALLY may not be supported depending on the switcher.)

2. Connection to a 3rd party SRT decoder (ie. Haivision MAKITO series)

TR-5004(Enc/Dec)

SRT

Camera V/A

BNC

Network

Public Internet

SRT

SRT decoder

BNC

SDI Monitor

Customers who already have an SRT device can also choose the TR-5004. Its portable design and large display allows a different style of workflow, one example of which is that it can be easily used on site as an additional monitor for a system camera.

3. Connecting two TR-5004s

TR-5004(Enc/Dec)

TR-5004(Enc/Dec)

SRT

Camera V/A
RETURN V/A
INTERCOM**

Ethernet cable

BNC

BNC

Switcher

Using an ethernet cable allows you to send signals further than with a BNC cable.
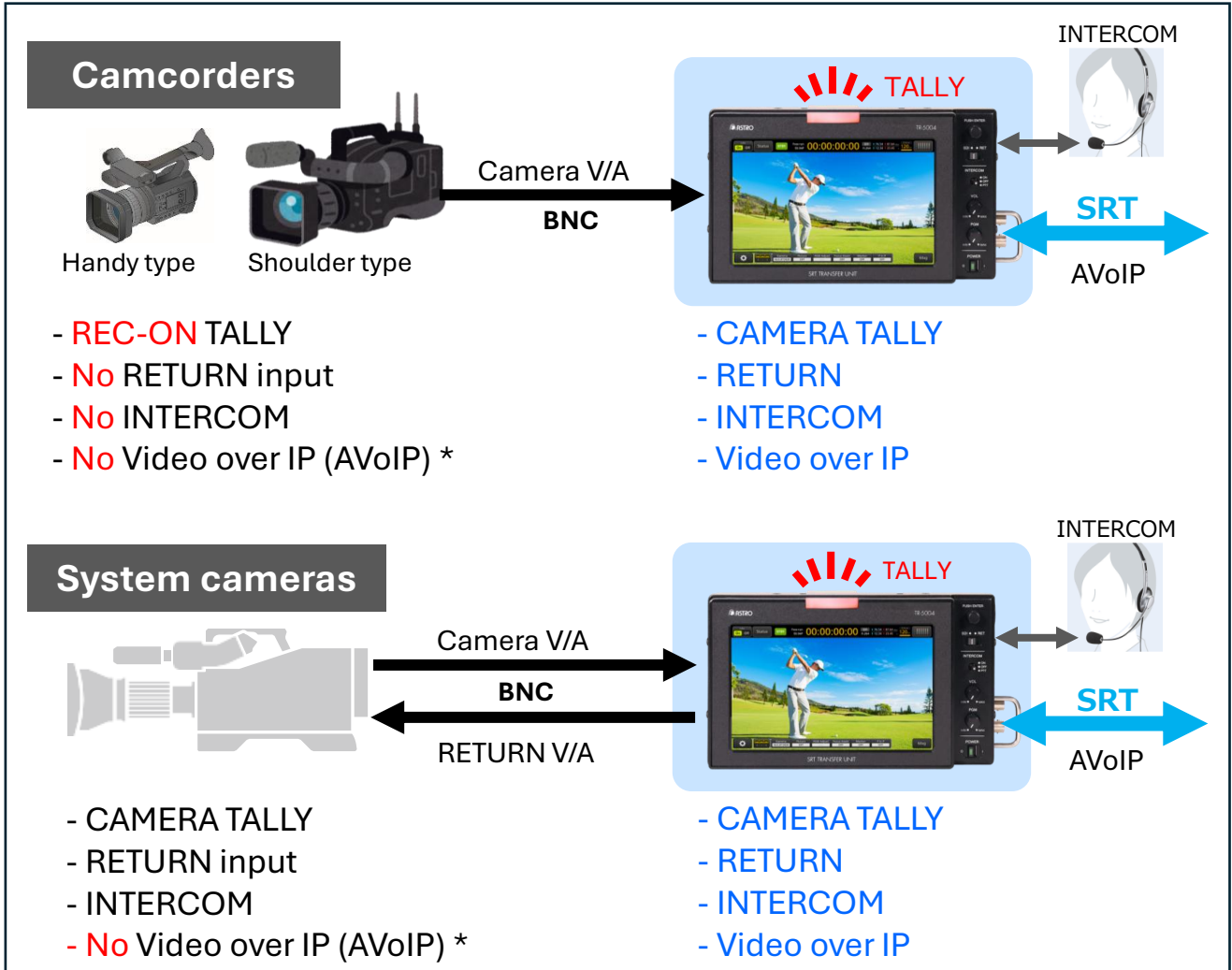By using two TR-5004s, customers can easily try out an SRT transmission workflow.
(**INTERCOM operation with two TR-5004s will be supported in V4.0.)

4. Camcorders for Remote Production

Camcorders don't have CAMERA TALLY or RETURN video input. However, by placing the TR-5004 close to a camcorder, it can be used in multi-camera remote operation, similar to a system camera.

Camcorders

INTERCOM

Handy type   Shoulder type

Camera V/A
BNC

TALLY

SRT

AVoIP

- REC-ON TALLY
- No RETURN input
- No INTERCOM
- No Video over IP (AVoIP) *

- CAMERA TALLY
- RETURN
- INTERCOM
- Video over IP

System cameras

INTERCOM

Camera V/A
BNC
RETURN V/A

TALLY

SRT

AVoIP

- CAMERA TALLY
- RETURN input
- INTERCOM
- No Video over IP (AVoIP) *

- CAMERA TALLY
- RETURN
- INTERCOM
- Video over IP

* High-end models may have an AVoIP feature, but many conventional cameras/camcorders do not.

5. Roadmap

V4.0 (Feb. 2025)
- SD Card Recording (Rec/simple playback only) (*Optional Add-on)
- PinP (Picture in Picture) for Camera Feed & Return Video
- TR-TR Interconnection (with INTERCAM operation)

Picture in Picture (V4.0)

V5.0 (Apr. 2025)
- SD Card Recording (*Optional Add-on)
- Throughput Display
- Setting Protection
- Embedded TC

For more information :   https://www.astrodesign.co.jp/english/product/tr-5004
For inquiries about TR-5004 : https://www.astrodesign.co.jp/english/form/mailform.cgi?type=default

CLICK!