

Ski Association of Japan Instant Data Sharing for Ski Jump Video Analysis

TOUGHBOOK

Taking full advantage of the Video Feedback System in improving ski jumping performances. Supporting the Japan team.



Background to introduction

Innovative performance enhancing measure of the Japan team, Video Feedback System

Ski jumping is now huge! The sport has been attracting large audiences thanks to dynamic jumping, as though flying in the sky without any hesitation, from steep ramps with a maximum vertical drop of 140 meters and such beautiful jump styles. In recent years, new rising stars bearing expectations from all across Japan have made their debuts one after the other, further exciting the fans. Further attention has been gained, thanks to Sara Takanashi, who won a bronze medal at the 2018 Pyeongchang Winter Olympic Games, and Ryoyu Kobayashi, who won at the Four Hills Tournament, a traditional European series of matches, with four consecutive wins, a first for a male Japanese jumper. Did you know that the ski jump team of the Ski Association of Japan, riding on a tremendous wave of popularity, is actually being supported by TOUGHBOOK?

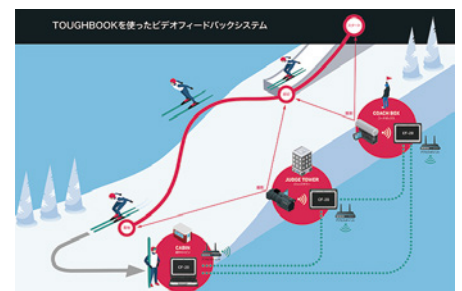
Ski jumping is a sport of dynamically jumping from a steep ramp to jump further. The key to long jump is the amount of speed one can generate during an approach, in addition to the timing and strength at the time of taking off. To satisfy all of these points, it is crucial to create the ideal posture for each jumper, according to Washizawa, Chief Coach of Japan's women's jump team. To make world-leading jumps, it is necessary to precisely control one's jumping form, as if one were a precision machine. To achieve this goal and to enable the jumpers to check their form, the team adopted a method where coaches give instructions after training, while watching videos taken by coaches with jumpers.

Looking toward even higher levels, the Japan team reached the conclusion that if they could share video information with the jumpers immediately after a jump, while it is still fresh in their mind, it would become easier to make minute adjustments to form. It was then decided by the Japan Institute of Sports Sciences (JISS) to start developing a Video Feedback System to share video images and create a necessary organization.

Why TOUGHBOOK CF-20 was chosen

Tough PC that can be used in harsh snow conditions as a key to completing the system

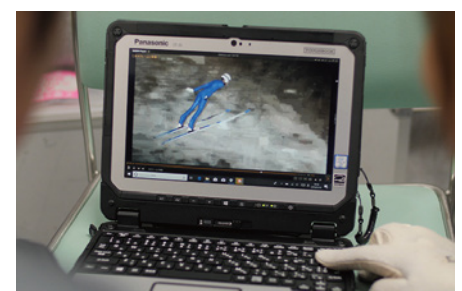
The distance from a coach box beside the "kante" (take-off ramp) to a jumpers' room, where the jumpers look at videos, is about 140 meters at a maximum, though it depends on the actual ski jumping hills.



System diagram of Video Feedback System, as developed by JISS



Checking videos of jumps in the outdoor coach box



Checking footage of jumps in the jumpers' room right after the jumps and receiving instructions from coach

After a jumper lands, data must be transmitted over this long distance, within about 40 seconds. Tomokazu Miura, a system engineer at JISS, developed a system to encode video data into smaller-sized data and transmit it via Wi-Fi.

It appeared that the system could be built without a hitch, but a new problem emerged. As the coach box built to properly observe the conditions of jumpers is established outdoors, it is directly affected by harsh weather environments. The performance of TOUGHBOOK CF-20 thus attracted a good deal of attention.

1. Withstands harsh conditions, such as snowstorms

TOUGHBOOK CF-20 with a dustproof and water-resistant design compliant with IP65 protects ports subject to water and dust with port covers, etc. and can be used at jumping hills exposed to harsh winds and snow.

2. Operates at temperatures below 0°C (32°F) in winter and more than 30°C (86°F) in summer

The results of environmental tests at the Panasonic technological lab show that TOUGHBOOK CF-20 can operate at a temperature of between -10°C (-14°F) and 50°C (122°F). The PC can be used for ski jumping, etc. in difficult conditions with temperatures below 0°C (32°F) in the winter and more than 30°C (86°F) in the summer.

3. Continuous operation for about 10.5 hours made possible using a second battery

Training may take place both in the morning and afternoon in a series or on consecutive days, which frequently causes dead batteries. At the same time, the mission of a coach is to watch the jumpers. They felt it was too much of a bother to have to worry about batteries, really just wanting to concentrate on the jumpers. In this regard, as TOUGHBOOK CF-20 can be installed with a second battery for continuous operation of about 10.5 hours, coaches can use it without additional hassle.

Voice of customer

Video Feedback System, almost like an assistant coach

The Video Feedback System incorporating TOUGHBOOK CF-20 supporting use in tough environments was completed and started operations with the Japan women's ski jump team and the Nordic combined team in 2012. It is currently spreading to junior teams.

The range of applications has also been expanded. The system now not only allows reviews to be made immediately after a jump, but also allows jumpers to look back on their jumps at a later time simply by uploading data to a cloud server. This is very useful for jumpers to relive an image of a successful jump by simply watching a video or receiving appropriate instructions during overseas tours by having their coaches watch videos on site. The Video Feedback System has penetrated to athletes and is now widely considered to be indispensable.

Future outlook of using TOUGHBOOK

Utilizing the rugged TOUGHBOOK to realize a video analysis system for further evolution

The Video Feedback System is groundbreaking, and further evolution is currently being considered. Kaoru Yamanobe, a researcher at JISS, developed an action analysis system. Instead of just recording scenes of jumping in the form of videos, the system uses high-speed video cameras at fixed points to analyze the movements of jumpers and collect analysis information such as shifts in weight and angles of jumps. By comparing a jump with those from a previous season or with top jumpers in the world, countermeasures can be planned in significant detail.

As the system also needs to operate outdoors, TOUGHBOOK CF-20, which is durable in harsh environments, plays an active role.



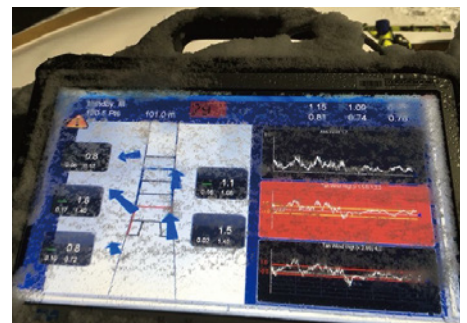
Toru Washizawa, Chief Coach, Women's Ski Jumping



Tomokazu Miura, System Engineer, Japan Institute of Sport Sciences



Kaoru Yamanobe, Researcher, Japan Institute of Sports Sciences



Older model of TOUGHBOOK installed in the coach box



Motion analysis system for easy analysis of shifting weight shows overlapping images, such as frame-by-frame playback