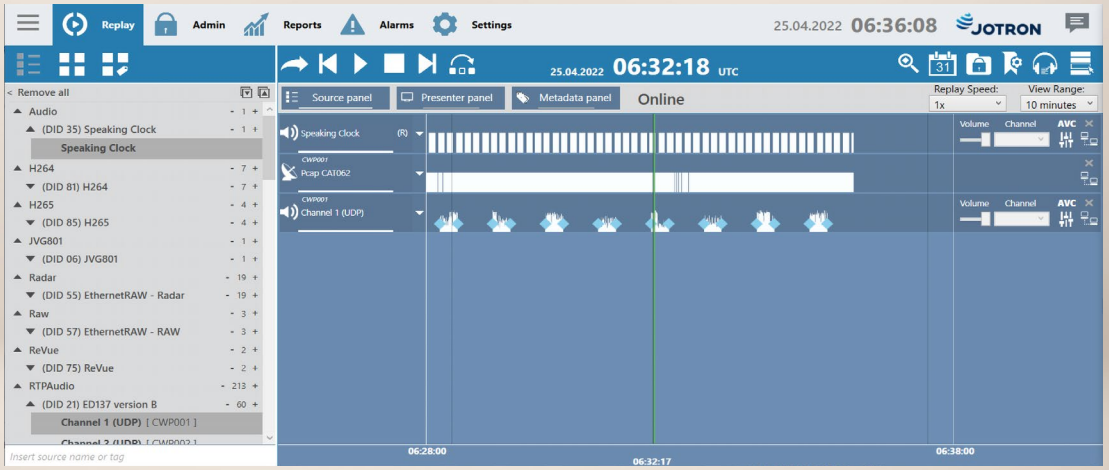
Jotron Ricochet

Record and replay system



- Designed for performance
- Designed for ATC and ATM
- Records all types of data in unlimited quantities
- Playback data synchronized with millisecond precision
- Statistics and investigation

JOTRON
Performance for Life

Jotron Ricochet record and replay system

Jotron is a leading supplier of VHF and UHF radio equipment for air traffic management (ATM) operations. Ricochet is Jotron's world leading synchronised record and replay system within the ATM and marine markets.

Ricochet record and replay

The product has been designed to meet the specific demands of world-wide ATM environments and is fully compliant with national and international standards.

The unique set of Ricochet software modules can be assembled in a multitude of combinations. Ricochet software, coupled with COTS hardware, enables Jotron to deliver a state of the art recording system.

Key features

Recording

Ricochet supports a wide range of data interfaces and protocols. Essentially, all data streamed on a serial line or an IP network can be recorded.

All data is time stamped and indexed enabling accurate and prompt response times during replay. Numerous time sources are supported, including NTP, NMEA, IRIG_B and Warton.

Replay

The replay user interface is very intuitive and is easy to learn. The main window displays a visualisation of recorded data on a timeline. Ricochet replay provides superior input response times, without prior preparation.

Replay commences immediately, selecting and deselecting channels or changing replay time is done at the click of a finger.

Ricochet includes a generous amount of replay tools such as; individual volume controls, left or right speaker control, an audio analyser for slow speed replay with pitch control, looping, fast forwarding, bookmarking, video zooming, panning, snapshoting and data forwarding options for more advanced applications. Realtime monitoring functionality is also available.

You can choose from the following data handling functions:

- Quarantine: A copy of selected data saved to a secure area, ensuring it is available after a scheduled deletion
- Impound: A copy of a single secure file based on a select time period and channel(s) which can be replayed in the Catch Offline Player
- Archive: A copy of a set of recorded files and configuration saved for offline storage for replay in the Offline Player
- Export: A copy of selected data in an audio/video file that can be played in a mainstream media player

Catch Offline player

Catch Offline is a light version of the replay client, which runs stand-alone and replays impound files and archived data.

Management features

The required administration and management features for maintaining the system are included in accordance with ATM applications:

- Alarm management with interfaces for external alarm circuit connections and support for SNMP
- User and user group administration with a set of access rules
- Graphical analogue audio input tuning tool
- Audit trail

Wide range of solutions

The Ricochet solution is applicable for a single 8 channel audio recorder or a nationwide turn-key solution, ensuring effective and comprehensive investigation and analysis of recorded data.

The modular architecture and the IP based intercommunication offers virtually no limits to how a system can be built. Ricochet is used to record the following:

- Radio communications: Analogue, digital, E1, ISDN, RTP, ED-137B
- Telephones: Analogue, digital and IP
- Ambient microphones
- Screen images: VGA, DVI, Display Port using H.264 or lossless coding with resolution up to 4k2k (UHD)
- Radar: Serial og Ethernet interface. Support several Asterix categories
- CCTV: IP cameras

Any of the above modules can be combined.

Ricochet is used as a recording solution for the following locations:

- Nationwide solutions (distributed data collection and recording modules, integrated management replay and data handling)
- Area Control Centres (a turn-key solution for hundreds of audio channels and screens)
- Airports of all sizes (from a single audio recorder to a comprehensive multi-channel system integrated with other ATM systems)

- Remote tower solutions (audio and video)
- Defence installations
- Navy vessel and offshore platform heliports (audio, radar and CCTV)
- Vessel traffic services (radio, telephones, marine radar video and tracks, AIS and CCTV)

Interconnect multiple systems

Multiple systems can easily be interconnected giving an investigator access to data recorded at any site, individually or integrated. Investigators can select freely recorded data from any site, in any combination and replay synchronously, or archive, impound or export for long term storage or distribution.

In the same manner multiple systems can be administrated from a central location, effectively becoming one system.

The future is now

All systems involved in ATM are moving gradually towards an all digital world. Recording systems by nature must evolve since the requirement for recording is still a necessity. Cloud solutions are becoming part of the infrastructure design for ATM, tying all equipment and functions together via IP networks. The future is that a component can be reached and controlled anywhere.

Jotron has implemented the ED-137 standard for interchange of digital audio over IP networks in the Ricochet recording system as well as in the VHF and UHF radio equipment. This is however, just the start. Only when standards are designed and adopted for all data flows, and the standards also include replay and data handling functions, the completely integrated ATM recording and replay «cloud» can reach its full potential.

Ricochet record and replay system

«Ricochet inside»

The underlying architecture of the Ricochet software makes it ideal for distributing modules, collecting necessary data and tying it together as a system.

The Ricochet Replay API, which is the name of the control message protocol used between the software application and the recording system, is public and open for anyone to use. Some VCS and VTS vendors have utilised this and written replay functions into VCS panels and VTS traffic displays.

In the field of air traffic incident investigation, accuracy, speed, and thorough documentation are critical. **Ricochet Investigator**, the latest addtion to the Ricochet system, is designed specifically to meet these demands. It gives investigators and training personnel advanced transcription capabilities that transform recorded audio into precise, searchable text. Whether analyzing cockpit voice recordings, radio communications, or control tower exchanges, this tool provides a streamlined solution to transcribe and review conversations that may be pivotal to understanding incident dynamics.

Long term relationships

Jotron offers a selection of support levels. The company encourages customers to contact Jotron regarding usage and maintenance of Jotron's products, especially for recording systems that are based on software running on COTS hardware. Systems can often be updated or modernized gradually, thereby extending the lifetime.

Cyber Security

Jotron is ISO 27001 certified and all our products are designed and developed with a strong focus on cyber security. Some of the measures Jotron has implemented in our Ricochet software are:

- Modular design to enhance security and isolation (layered structure)
- Support for encrypted data storage
- Role-based access control and authentication
- Support for encrypted communication (TLS) between front-end and back-end
- Antivirus compatible front-end and back-end
- Assisted firewall configuration
- Cryptographically signed libraries, executables, and installers
- Secure monitoring through SNMP v3
- Configuration integrity validation and monitoring

TYPE AND FUNCTIONALITY OF RECORDERS	Jotron Ricochet
Controller Working Position (CWP) recorder • Unlimited number of screens per CWP • Unlimited number of audio channels at the CWP • Keyboard and mouse recording at the CWP	☑
Legal audio recorder • Unlimited number of audio channels before, after and/or from the VCCS	☑
Navigation-, radar- and other data (also proprietary and encrypted data) • Unlimited LAN channels • Unlimited serial channels	☑
Complete ATM/CNS recorder (ATG and TTW)	☑
Free selection of what to replay (screens, audio, radars, LAN channels, etc. or specific CWP with associated audio, screens and data) at any time of replay, and free selection of replay time at any time, all with immediate response both from local, remote and centralized replay station	☑
Integrity through independence • Independent of the radars • Independent of the radios • Independent of the VCCS • Independent of the ATC/ATM system • Independent of the screens/display system • Independent of the type of data	☑