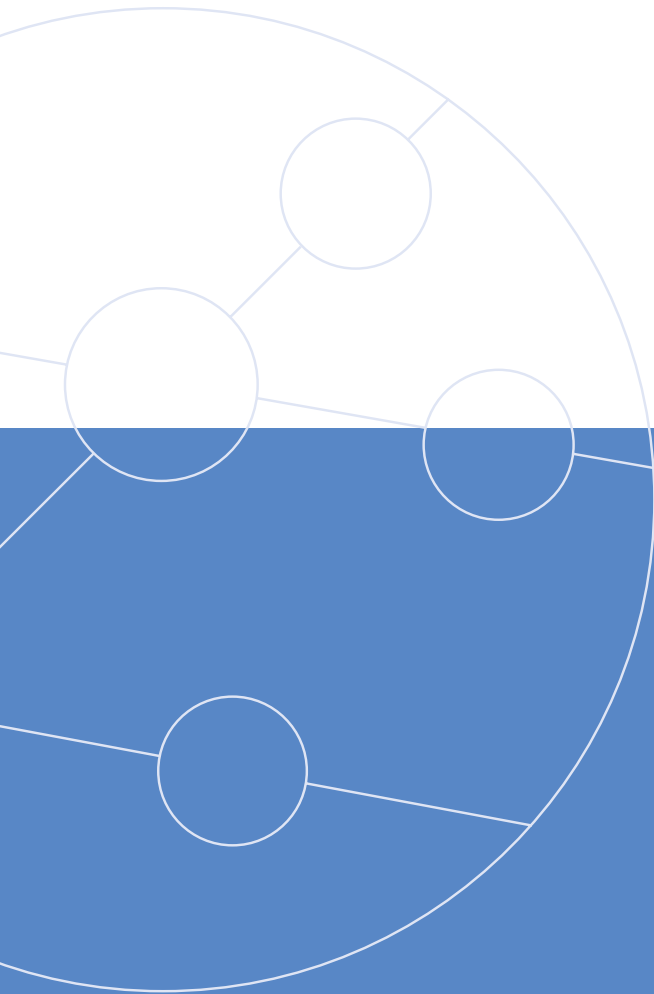


AuroraJazz



ATM Test Equipment



ATM

Broadband Testing for Next Generation Networks

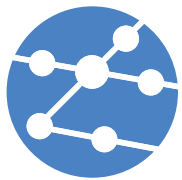


TrendCommunications

The Aurora Jazz provides comprehensive test capabilities for the installation, operation and maintenance of ATM (Asynchronous Transfer Mode) networks.

The complexity of ATM networks and equipment demands a high level of capability from test equipment. Aurora Jazz meets that challenge and exceeds expectations. Whether the test requirement is for commissioning, maintaining or troubleshooting locally or remotely with 'Remote

Viewer', the user of Aurora Jazz will be impressed with its ability to quickly and efficiently prove the correct operation of ATM circuits. Each of the test applications provide easy access to the available test routines, either for pre-programmed use or manually controlling all of the test parameters. This satisfies the needs of the field technician for a quick, easy-to-use tester, and of the network engineer for a fault finding analyzer.



AuroraJazz

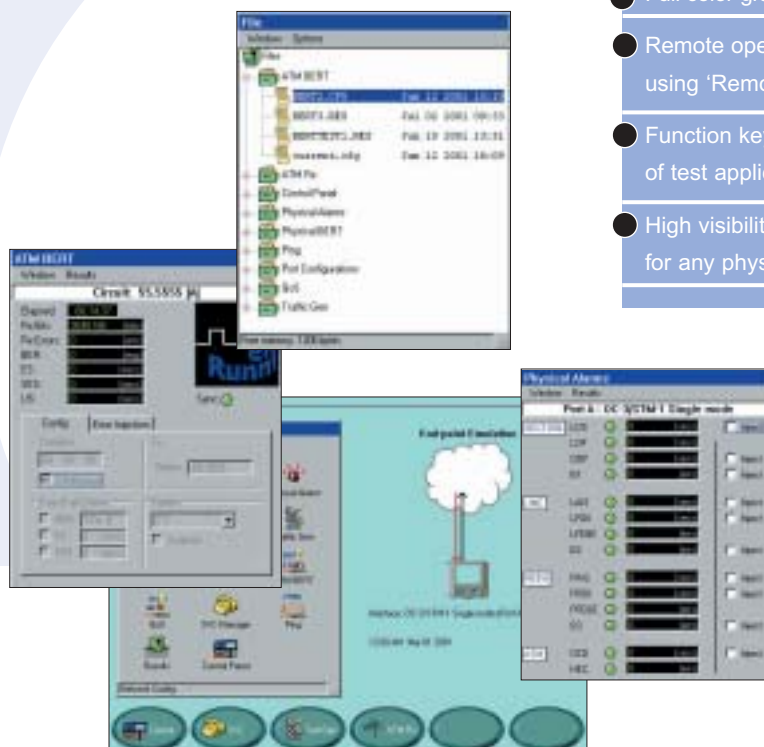
The User Interface

graphic simplicity

Aurora Jazz is equipped with a large color LCD, which is combined with an excellent user interface. A traditional text menu hierarchy has been avoided with the use of multi-tasking windows. This provides a comprehensive view of the instrument setup and operation in a clear and easy-to-learn format.

Remote Viewer is provided by operation of the graphical interface from a Windows™ based PC connected via Ethernet. This provides point-and-click mouse driven functionality.

The File Manager facility provides 384 kbytes memory for results and configuration stores for all applications, with the ability to copy data to or from a PC and clone configurations between units using the Ethernet interface.



- Robust design for field operation
- Lightweight, hand-held, battery powered
- Full color graphical user interface
- Remote operation through a PC using 'Remote Viewer'
- Function keys for quick operation of test applications
- High visibility LEDs, configurable for any physical interface alarm

Multi interface

Aurora Jazz is provided with two ports that can contain user-changeable interface modules. These allow any combination of line testing to be carried out, from 1.5 Mbit/s to 622 Mbit/s.

Networks can be tested by emulating the connection to the network or customer, or by monitoring a circuit in-line or passively, in single or bi-directional modes.

Mix and match of interface types:

- OC-12/STM-4 single mode (622 Mbit/s)
- OC-3/STM-1 single/multi mode (155 Mbit/s)
- DS3 (45 Mbit/s) and DS1 (1.5 Mbit/s)
- E3 (34 Mbit/s) and E1 (2 Mbit/s)
- ATM25 (25.6 Mbit/s)

Test applications

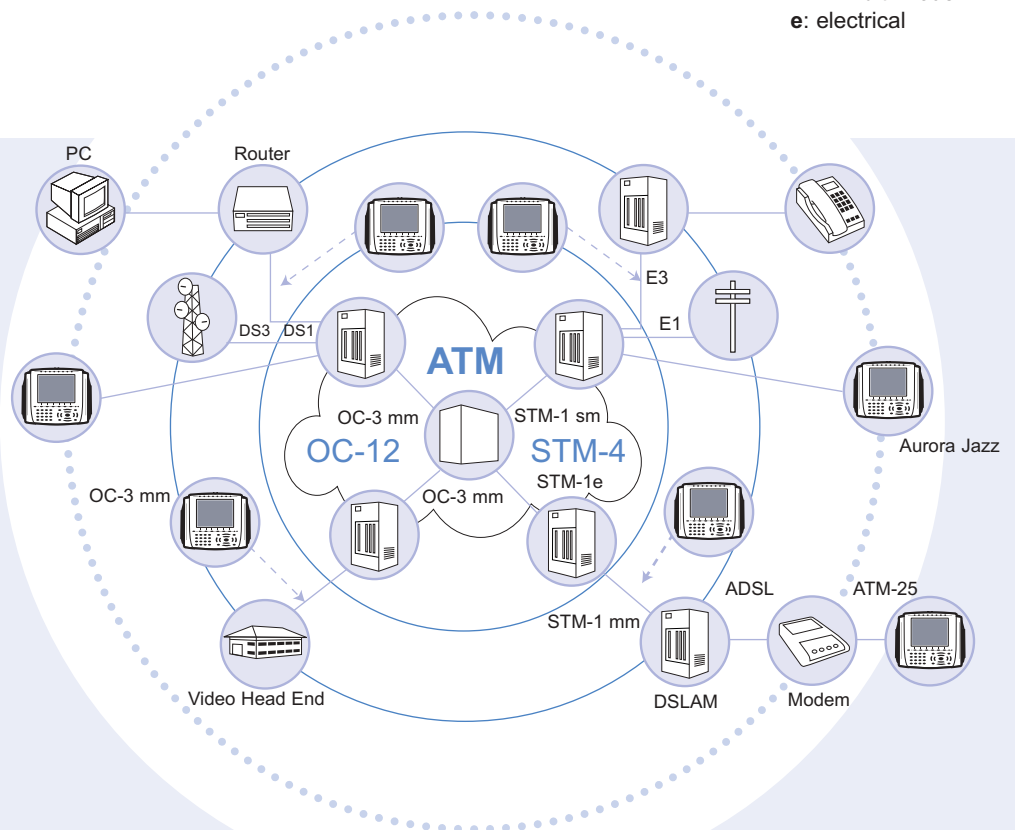
An ATM network is dependent on high reliability connections. Aurora Jazz addresses this by providing analysis of each type of interface with a report of error types and statistics. The user can also simulate error conditions with an inject facility. The quality of electrical links for PDH interfaces can be measured with the physical layer Bit Error Rate test capability making use of framed or unframed patterns.

At the ATM layer Aurora Jazz provides a comprehensive suite of tests. The traffic generator can transmit up to 256 different cellstreams using CBR, VBR or UBR profiles.

The ATM receiver will automatically synchronize with up to 1024 cellstreams indicating the VCC value and providing separate performance statistics for each circuit.

For the selected cellstream, OAM analysis can be used to test the ATM layer alarms, plus the operation of Continuity Check and Loopback cell types. An ATM cell BERT can be used to measure the cellstream performance.

sm: single mode
mm: multi mode
e: electrical



The O.191 Quality of Service test will provide a measure of errors involving data loss or misinsertion and of cell transfer timing. Applications involving the transfer of IP message packets over ATM can be tested using an IP Ping to ensure end to end connectivity, by either transmitting

or responding to IP Ping messages. Each of these tests can be run continuously, or under control of a timer, for up to 24 hours. Test results are compared to programmed thresholds and an overall pass/fail analysis provided.

Application environments

Aurora Jazz can be configured to emulate terminal equipment or the network, allowing it to function in any ATM environment.

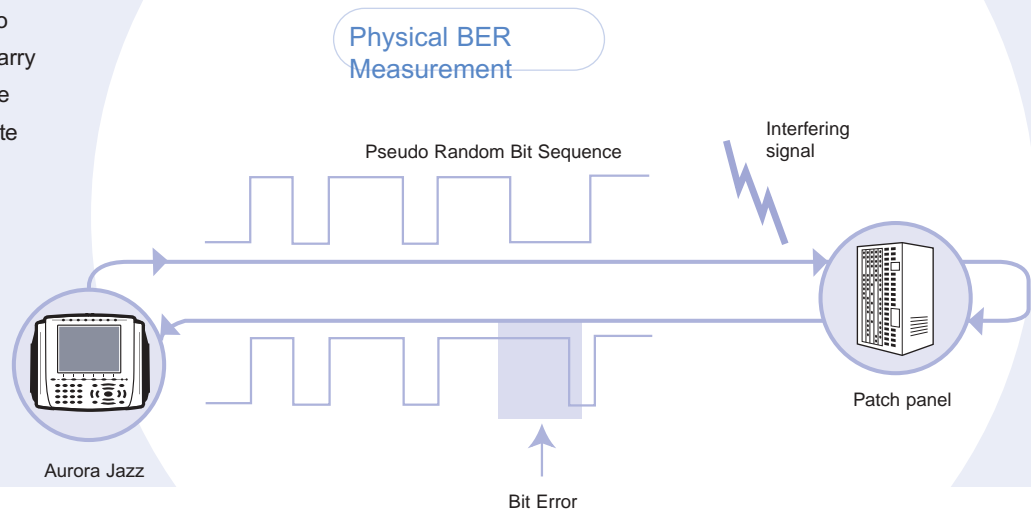


- Commissioning of physical circuits and ATM virtual circuits
- Generate network alarms at physical and ATM layer
- Multi-interface, DS1, DS3, OC-3/STM-1, OC-12/STM-4, E1, E3, ATM25
- Physical and ATM Bit Error Rate testing to check circuit quality
- Line rate cell processing of 1024 receive circuits and 256 transmit circuits
- Verification testing of cellstream performance
- Traffic Policing to verify or enforce Network Contract compliance
- QoS measurement for comprehensive performance testing
- OAM testing and decode of F4/F5 cells

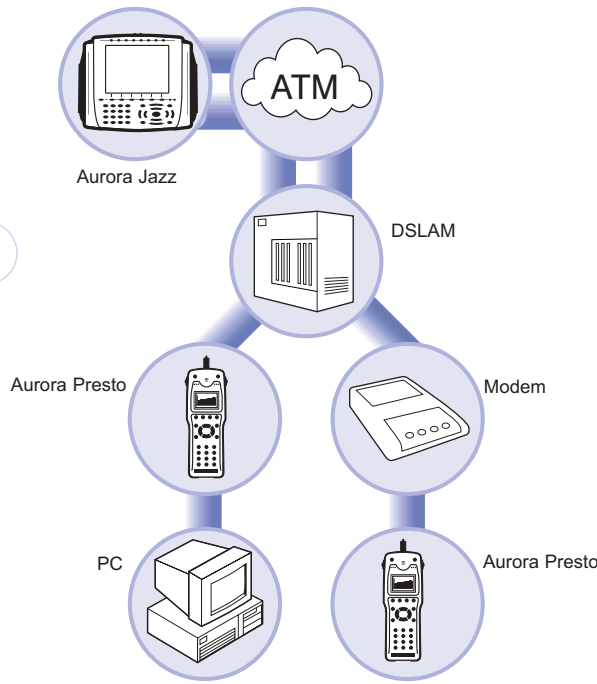
- Emulate end equipment or transmission network
- Fault finding on access network or transmission network
- Monitoring of network circuits

Network Commissioning

Each interface can be flexibly configured for the line type and network framing being used. Analysis is provided of physical alarms, including the ability to inject alarms. The ability to carry out physical BERT will ensure that the cable quality is adequate for the ATM service.



ADSL network testing



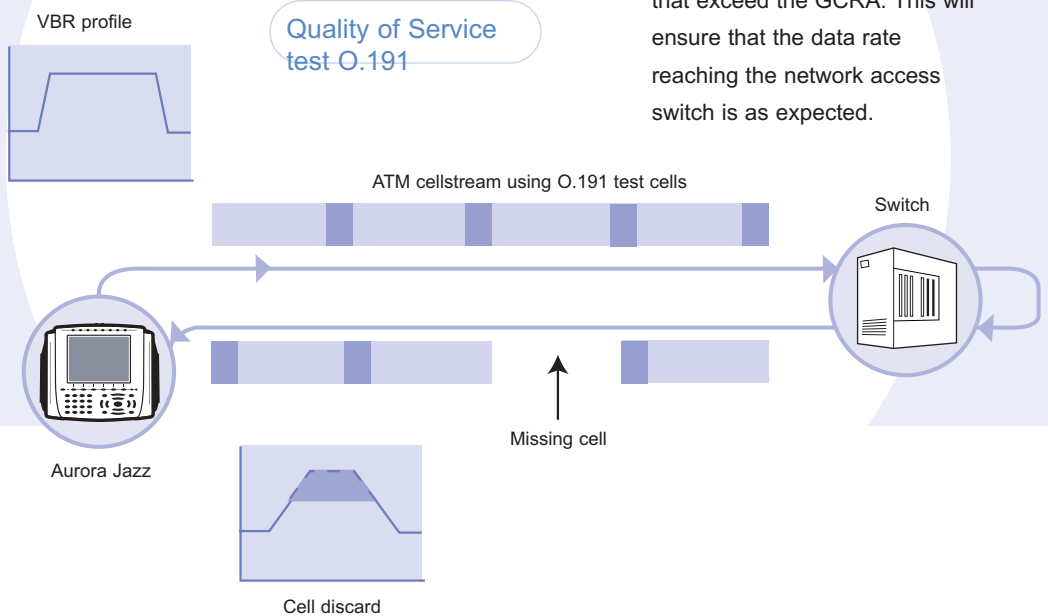
DSLAM Installation and Monitoring

xDSL network installation requires the rapid deployment of network infrastructure. Aurora Jazz can be used on the network side of the DSLAM to monitor traffic, or to provide test traffic through the xDSL connection.

Contract compliance

Quality of Service and Service Level Agreement Verification

The ITU-T O.191 test method is implemented to provide detailed assessment of circuit quality by measuring lost cells, misinserted cells, cell transfer delay, and 1 or 2 point cell delay variation. Counts are provided of Severely Errored Cell Blocks, Errored Seconds and Severely Errored Seconds. This test method is designed for proving that circuit performance meets the requirements of the service user and can be used by the network operator to demonstrate to the customer that the network performance is satisfactory.



Traffic Policing

The Traffic Policing application allows Aurora Jazz to compare the actual cell rate received from a user connection to the Network Traffic Contract. This is done on a cell-by-cell basis using the Generic Cell Rate Algorithm (GCRA). The network operator can use Aurora Jazz to enforce a contract by discarding cells that exceed the GCRA. This will ensure that the data rate reaching the network access switch is as expected.

Traffic Monitoring

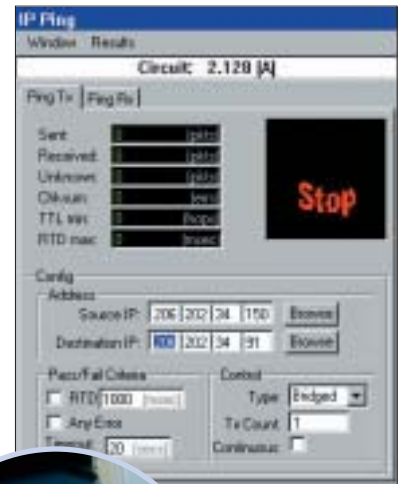
1024 ATM circuits can be monitored simultaneously with Aurora Jazz. Summary information is provided of Peak Cell Rate, Average Cell Rate, alarm status, cell discard tagging and ATM Adaptation Layer type. Traffic Policing may be used for contract verification. This provides statistics of contract violations and can discard non-compliant cells when the Aurora Jazz is configured in Through Mode. A cellstream window provides an instantaneous graphical view of cellstream data rate.

SVC

SVC (Switched Virtual Circuit) operation is provided by Aurora Jazz for testing networks using UNI3.0, UNI3.1 or UNI4.0 protocols. The tester can emulate the user or network side of the connection allowing ILMI address registration and SVC call establishment. The SVC application provides a comprehensive setup and test to prove that the SVC protocol is operating correctly, or to discover if faults are occurring. A trace window shows real time message flows between the tester and network equipment, and a history view is provided for filtering messages – these will help in finding the cause of faults. Once a circuit has been established the BERT, QoS or Traffic Policing measurements can be used to prove the cellstream performance.

IP PING

Aurora Jazz is able to send and receive Ping messages over a selected ATM cellstream. This enables the tester to prove IP connectivity to routers over the ATM network. Response messages will also be generated when Ping messages are received from other devices. Ping messages of variable payload size up to 4000 bytes are supported. Up to 16 addresses are supported and a measurement of response time is provided. In addition, the Ethernet port can also respond to Ping messages received from other devices.



Packet Output

Data carried with AAL5 encapsulation (the most common format for IP and other packet protocols) can be converted to Ethernet format for real-time analysis.

By using a PC-based protocol analyzer connected to the Ethernet port on the Aurora Jazz, full decode and analysis of the higher layer protocols can be carried out.

Bi-directional monitoring of a complete protocol link is possible with the installation of two like interface modules on the Aurora Jazz.



AuroraJazz

General

Size	11.2 x 9.8 x 2.8 in, 285 x 250 x 70 mm
Weight	5 lbs 15 ozs, 2.7 kg
Display	6.3" x 4.7", 640 x 480 pixel color LCD with backlight
LEDs	8 programmable for alarm & error indication, 1 for battery/power status
Ports	Serial Port, Ethernet Port for Packet Output & Remote Viewer functions
Power	AC multi-voltage adapter, 12V 4A output
Battery	6 cell NiMH 'D' cell or alkaline cells
Temperature	-13°F to +158°F storage, +32°F to +122°F operating
Results format	Plain text or CSV, export to PC via Ethernet port, print via Serial port

Interfaces

Any two interfaces may be installed

OC-12/STM-4 Optical Single Mode (1310 and 1550 nm), (SONET and SDH framing), FC connector

OC-3/STM-1 Optical Single Mode, 155 Mbit/s, (SONET and SDH framing), SC connector

OC-3/STM-1 Optical Multi Mode and Electrical CAT5 UTP, 155 Mbit/s, (SONET and SDH framing), SC and RJ45 connectors

OC-3/STM-1 Optical Multi Mode and Electrical G.703 coax, 155 Mbit/s, (SONET and SDH framing), SC and BNC connectors

DS3 45 Mbit/s (ADM/PLCP, C-bit/M23 frame) and DS1 1.5 Mbit/s (ADM/PLCP, SF/ESF), BNC and Bantam connectors

E3 34 Mbit/s (G.751 ADM/PLCP, G.832 ADM) and E1 2 Mbit/s (G.804 ADM, CAS and CRC), BNC and RJ45 connectors

Physical Layer tests

Physical alarms and errors monitored and counted for each interface type

Long term log file

Bit Error Rate Testing on DS3, DS1 and E3, E1 interfaces – PRBS 23, 20 (BellCore), 20 (ITU) and 15

Alarm and error injection

ATM layer tests

Traffic Generation – 256 virtual circuits, CBR, VBR & UBR

Traffic Scanning – 1024 circuits, Cell count, Cell rate, Peak cell rate, AAL type, histogram

Traffic policing verification and enforcement

ATM Bit Error Rate Testing – PRBS 23, 15 and 7

Quality of Service testing (O.191) – 1pt or 2pt CDV, CTD, CLR, CMR, CER, SECBR, ES, SES, US, LPAC

OAM (I.610) – AIS and RDI, Continuity Check, Loopback, real time capture and decode

IP Ping

ATM cellstream operation

Message send/receive, and response, 16 IP addresses supported, Loop time measured, RFC1483/2684 (MPOA), AAL5 LLC/SNAP, Variable Length payload <=4000 bytes

SVC

UNI3.0, UNI3.1, UNI4.0, ILMI

Packet Output

Real-time streaming of AAL5 data to Ethernet port

Remote Control Viewer

Graphic operation from a PC using Ethernet across a LAN or WAN



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Representative

To arrange a demonstration or to obtain the latest information on the Trend **Aurora**Jazz or any of Trend's other test equipment, contact your nearest Trend Representative.

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