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### INSIGHT: The Evolution of Network Management

The growth in the capabilities of the monitoring and control (M&C) solutions available for satellite network operators has been staggering over the last 10 years. M&C products originally designed to provide the operator with the ability to remotely control the stations uplink and downlink equipment for a single antenna from a PC rather than equipment front panels. For each antenna that was installed, a new M&C computer was put into the operations room to allow operators to control the equipment. This resulted in operators having to learn multiple M&C systems just to manage the equipment in their facility.

Today's M&C Solutions have evolved into true *Network Management Solutions (NMS)*, which allows operators to manage all the equipment associated with all the antennas from a single operator terminal in the control room. For larger network operators, they can manage all their antennas across all their facilities from a single terminal located in their *Network Operations Center (NOC)*. From this single terminal, they can control the equipment located half way around the globe as if standing right in front of it.

These new *NMS*

Xicom has the BUC that fits your needs.

**BUC Power Levels (Watts)**

C-Band	45
X-Band	10
X-Band	12
X-Band	40
Ku-Band	8
Ku-Band	16
Ku-Band	25
Ku-Band	40

- ❖ Compact Sizes
- ❖ No Shelter Required
- ❖ Internal RF Filtering
- ❖ Lightweight
- ❖ Direct Antenna Mount
- ❖ L-Band Input
- ❖ Full M&C via RS-485 or Ethernet
- ❖ 24/7 Technical Support
- ❖ Service Centers Worldwide

Solutions also provide

expanded scope into “what” could be managed. Traditional M&C Solutions focused on the antennas RF equipment. Today’s NMS solutions are being asked to manage all the equipment associated with the distribution of the network services. While this certainly includes the antenna RF equipment, it also includes the encoding/decoding equipment, matrix switches and routers, as well as the IP Network located at the facility (hubs, servers, gateways, firewall, etc.).

The NMS is also required to interface with the ancillary equipment associated with the facility such as the facility alarms (fire, temperature etc.), HVAC systems, Security Systems, and Power Systems (UPS, Generators, fuel tank levels, etc.).

All of these new capabilities certainly have made operators much more efficient in their day to day task of managing the equipment associated with their station or network which has in turn reduced the time to recover from any equipment failures when they do occur. Improved automation tools in the NMS products have also allowed them to automate much of the manual control that was required in the old M&C environment. Tasks such as switching from on-line to back-up equipment, or even an entire uplink or down-link; or performing uplink power control to account for rain-fade conditions can now all be automated.

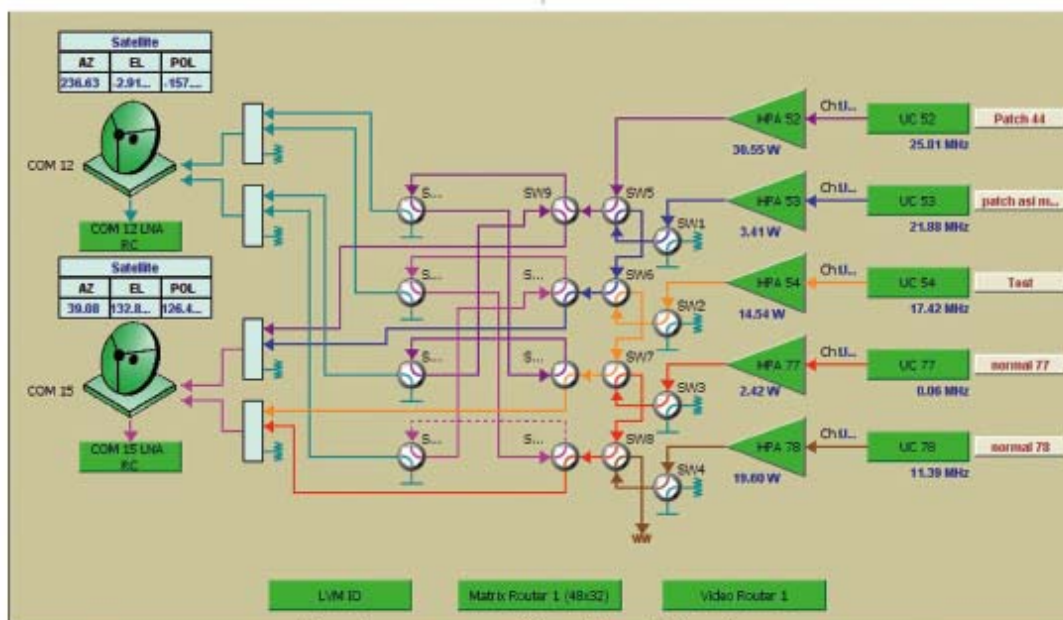


Figure 1 — antenna uplink and downlink equipment

What hasn't changed, until now, is the way the operators manage the network or facility. Since the very beginning and initial installs of the M&C Systems, operators have always been provided with a Graphical User Interface

(GUI) that consisted of a block and level (B&L) screen display (See Figure 1) of the antenna uplink and downlink equipment. When an equipment failure occurred, operators would receive a pop-up notifying them of the failure, the icon on the screen would change color, and they would get an audible alarm to warn them a failure had occurred. Operators could then use the M&C GUI to identify the cause of the problem and work to resolve it. The same basic concepts 20 years ago are still being employed today save some minor changes based upon the new graphical capabilities of the software development environment today.

But the demands on the operators of these networks are changing and so are their requirements. With the ever increasing demand for satellite capacity and with the unique advantage satellite offers when serving rural as well as under developed and developing countries with communications services


(voice/data/video), more and more network service providers are entering the marketplace, and existing network service providers are expanding out their networks at a rapid pace. Probably most importantly, the customers that are using these networks for their communications requirements are demanding that the network service providers meet higher and higher availability requirements for their mission critical applications.

These requirements are funneled down to the network service provider through *Service Level Agreements (SLAs)* which demand 99.99 percent availability on the network, which is about an hour of system downtime per year. In order to meet these requirements, they need the tools which can quickly allow them to determine how equipment failures on the network effect their SLA obligations to their customers. They need to stop managing the equipment on the network, and start to manage the services or traffic on the network.

Until recently, there has been no solution on the market that tied the services or traffic on the network to the physical communications equipment which serves as the backbone of the network. NMS

Solutions have been focused on managing the equipment and have not provided the capability to manage the actual services that are being carried on the network.

**Newpoint Technologies, Inc.**, a wholly owned subsidiary of Maryland based **Integral Systems**, is one of the leading suppliers of NMS Solutions to the satellite marketplace and is looking to change the way




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network service providers are managing their network and in June will release a new **TrueNorth Service Manager Application** which will run on top of their **Compass NMS** solution.

The new TrueNorth Service Manager will allow operators to manage the equipment on the network through the use of traditional block and level displays as well as also provide Service Management Views of the system. Operators will be able to see all the services that are currently running on the network and by selecting any service, they will be able to see the equipment used to transport the service from its source (entry point on the network) to its ultimate destination (exit point on the network). This can be limited to within a single facility, or can be across a network of satellite earth stations (See Figure 2).

As new services are added or removed from the network, the GUI is updated to reflect the current traffic for the operators. While managing the services, if the operator moves a back up unit (HPA for example) into place for another one on the network as a result of a failure or to perform maintenance, the service views for the traffic using that device with in the system are automatically updated to reflect the change in the new equipment path.

As the TrueNorth Service Manager is fully integrated with the **SAT Corps Monics** and **DSA Carrier Monitoring Solutions (CMS)**, the satellite carrier that is used by the service can also be included as part of the service. So failures on the transponder, rain fade conditions, and carrier interference can also be used to determine the status of the service, and when an alarm occurs on the CMS solution, operators can see the services affected by the loss of the carrier.

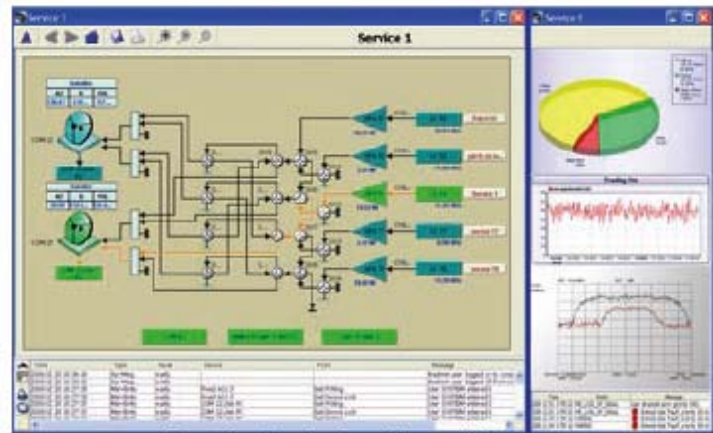
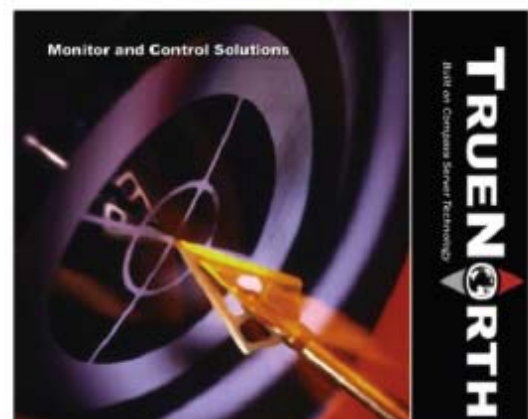


Figure 2— Service Level View w/CMS Data

When a failure does occur on the network or CMS, the operator is not only alerted as to the details of the equipment or carrier failure in the traditional sense but is also notified of the service or services which are affected by this failure. Based upon the established SLA agreements, each service can be assigned a priority level, so that when failures do occur, operators can focus their attention into recovering the higher priority services on the network. This allows network service providers to maximize the revenue on their network by allowing the operator to respond to the failures which will cost the most based upon the established SLA agreements.

In addition to providing the real-time management of the services and the equipment which are generating the revenue for the service provider, important information regarding the operation of the network is logged for later analysis. Users can print reports based upon the performance of the network such as the availability of each of the services in the network, MTTR of each service, and MTBF for each service which is carried on the network. This information can be used to feed billing and provisioning systems and to demonstrate the



reliability of the network to their customers.

NMS Solution providers continue to evolve their products at an alarming pace to keep up with the ever dynamic satellite network management requirements. Newpoint continues to lead the way with the new TrueNorth Service Management System which allow operators to manage their network the way they manage their business. For the NMS to stop managing the equipment on the network, and start focus on the services and traffic on the network, and aid in maximizing the SLA agreements and revenue that can be generate from the network.