NETWORK MANAGEMENT (slide show id# s1 - scott) duration = 3:09:19

CONFIGURATION MANAGEMENT

Configuration management is an essential component of network management. It addresses both tactical and strategic issues that network managers face in today's complex networking environment.

Used in conjunction with other network management products, Accugraph's physical network management application completes the suite of tools required for enterprise network management.

Let's look at some facts that help justify why you are making the investment in documenting your network.

Well-documented industry figures include:
- 35% of your physical infrastructure changes annually
- 40% of these changes go undocumented
- The average network is down 4 hours per week at an average cost of $5,000 per hour.

Accugraph is recognized by the platform providers as a leader in the area of configuration management.

With our suite of applications, Accugraph is uniquely positioned to provide our customers with a complete set of tools for addressing all areas of configuration management.

MT 923 DEFINED

MT923 is a physical network management application which provides you with a suite of tools for documenting and managing your physical infrastructure.

MT923 acts as an interface between the logical network node manager and the trouble ticket application to provide physical locators for network components.

A powerful relational database link makes it possible to access information on network components instantly.

MT923 consists of seven basic modes:
- Graphic Input
- Designer
- Asset Manager
- Network Manager
- Network Analyst
- WAN Designer
- and Cable Manager

MT923 is written entirely in "C" and has a full complement of API's available for developers.

PLATFORMS SUPPORTED

MT923 supports three hardware platforms:
- Hewlett Packard's series 9000 700
- IBM's RISC 6000
- and Sun's Sparc Station

Network management platforms that MT923 supports include:
- HP's OpenView
- IBM's NetView 6000
- Sun's Sun NetManager
- Cabletron's Spectrum
- and NetLab's Diamonds 3G

Accugraph currently supports the following relational databases:
- Oracle
- Ingres
- Sybase
- and Informix

MT923 supports two trouble ticket applications:
- Remedy Corporation's Action Request system
- and Legent Networx Paradigm system

MT 923 BASICS (slide show id# s2 - karen) duration = 6:55:00

RECOMMENDED CONFIGURATION

Configurations differ between platforms based on vendor requirements. Recommended system requirements include:
- A minimum hard disc size of 1GB
- A minimum of 32MB of RAM memory for a stand alone system, 64MB if you're running a management platform, and an additional 32MB, if you are running the trouble ticket application all on the same system.

DEFAULT DIRECTORY LAYOUT (00:35:00)

A pre-defined data structure is provided with MT923. This structure may be customized by the user. The default is /users/mtp.This directory contains three key sub-directories:
- The data directory contains several sub-directories where standard symbols provided with MT923 are stored.
- The init directory contains all default files including the core MountainTop defaults, as well as MT923 configuration files.
- The prog directory contains all executables for the core product.

When you start MT923 you will be prompted to select a default file if you have not specified one

in your script through environmental variable. Most system defaults are preset based on the database you are running. These defaults may be edited at any time through the set default menu.

WINDOWS AND MENUS (01:45:00)

MT923 provides a completely flexible windowing environment.

Main Menu

The main menu provides access to over 90 percent of the commands found in MountainTop. This menu can be shown or hidden at any time with a click of the mouse.

Function Bars

There are two function bars at the top of the screen that hold frequently used commands. Function bars are user definable. However, MT923 provides a structured menu environment to ensure a shorter learning curve.

Information Window

The information window provides system information including: a) user id, b) the version in operation, c) and time and date.

Supplemental Menu

The supplemental menu provides work space information about: current units, step and zoom factor, current pen and point selection.

Layer Manager

The layer manager menu provides access to any of the 256 layers. For example, cables may be located on a different layer than devices.

Drafting Window

The main drafting window is the work area where graphics are created and modified.

Other Menus

Other menus are accessible from the main drafting menu by simply selecting the appropriate icon, for example, the alpha window which holds the technical documentor.

MODIFYING WINDOWS (SAVING WINDOWS) (03:18:00)

Windows can be sized and moved around simply by dragging and dropping them in the desired location.

In this way multiple window defaults may be stored. These environments are saved with your UNIX user and group ID.

MODIFYING AND SAVING DEFAULTS (SAVING DEFAULTS) (03:38:00)

There are two kinds of defaults in MT923, system defaults and MT923 specific defaults.

System Defaults

System defaults include:

- Which buttons are assigned on the function bar
- The environment for unit settings; feet, inches or millimeters
- Default data directories
- Text sizing defaults

From the Main Menu select System Setup, Drawing Defaults and Modify.

A complete listing of all system defaults which can be modified is presented. Changes can either replace an existing default file or saved as a new file.

Specific default settings can be linked to a file or user that will automatically load at log-in or when a file is opened.

MT923 Defaults

The MT923 environment contains a complete set of it's own defaults loaded at the time of installation. These defaults can be modified at any time.

Typical defaults that you may want to edit in this file include:

- Inheritance definitions for transaction logs when performing a move, add, or change
- Layer definitions
- Table naming definitions

Select Edit Default from the Set Default Menu.

A default file from the list and a standard vi window appears containing the current defaults. These defaults can now be edited.

Once completed, simply save the file, and upon reloading it, these will now be your new defaults.

There is an environmental variable that will automatically load a preset configuration file.

SCHEDULING EVENTS (05:34:00)

MT923 provides the ability to schedule events. This is especially useful when integrating to the

management platform allowing the updating of scheduling status at periodic intervals.

The scheduling shelf is contained in an ASCII file. It can be global or maintained separately by each user.

To modify the scheduling shelf, access the Edit Default Menu. Select a directory where you will be accessing that file from and the file appears in a vi window.

Enter the desired executable file (This file must be either a MT923 executable or a custom written MountainTop core macro) Then place the function, specify an interval of repetition and any delay before executing the specified action.

Register commonly used functions into this file and schedule them to run simply by removing comment lines.

There is a full compliment of API calls which give you direct access to scheduling functions should you choose to write and schedule your own functions.

DRAWING WITH MT 923 (slide show id# s3 - scott) duration = 03:51:00

IMPORTING GRAPHICS

Graphics may be imported into MT923 from various sources. For instance, the facility group in an organization may maintain facility drawings in DXF or IGES format, both of which are supported by MT923.

Select load all from the file menu to load a file. MT923 determines the file type at the time of selection. A native MT923 file will simply be loaded. When DXF or IGES files are loaded a prompt window provides conversion update information.

SCANNING GRAPHICS (00:41:00)

Paper drawings can be scanned and loaded as raster images.

The scanned image provides a template for creating a vector drawing.

MT923 supports CCITT group 3 or 4 formats with drawings up to "E"size. Accugraph's scan module and an external scanner are both required.

Products exist that allow the direct conversion from rastor to vector but we recommend using the process outlined above.

BASIC DRAWING COMMANDS (01:20:00)

Background graphics and floor plans can be created very quickly in the workspace using the full

complement of shapes provided with MT923. Elements can be dynamically scaled and rotated at the time of placement.

A floorplan can be easily drawn using the continous walls function. Arcs can be drawn by providing three points, the line bends dynamically. Circles can be drawn in the same manner.

At any time I can zoom into a particular area. This zoom function can be accessed while in the middle of other commands. The full limit function allows you to return to a complete picture of everything drawn in your workspace.

To create complex graphics, I can select from a template or a shape. I can then group that shape and finally create its higher level intelligence and give it a name and a reference point. That is now available to me to attach to the database as an intelligent object.

LAYERING CONVENTIONS (02:29:00)

Layers allow you to differentiate elements based on type and view them as needed. MT923 provides a full layering environment to the user with 256 possible layers.

Recommended layering conventions including pre-defined layer names are also provided based on AIA standards.

To determine which layer my furniture is located on access the layer manager. From the list of layers I choose furniture. These elements have been assigned to layer 230.

Layers can be turned on and off. Let's turn off the layer holding the furniture.

Files can be saved with particular layers toggled on and off.

Mapping Layers

MT923 supports a complement of filtersets that allow you to map certain types of elements to specified layers. Layers can be mapped through the Defaults Menu.

For example, layering conventions used by an outside architectural firm can be automatically translated to your company's layering conventions so when the file is loaded it appears the way you expect it to.

NETWORK DESIGN (slide show id# s4 - karen) duration = 03:53:00)

ADDING A DEVICE

MT923 provides a complete set of tools for designing both local and wide area devices and con-

nections.

Over 300 pre-defined symbols are provided with MT923. These symbols can be accessed via a bit map template or a simple device listing. These elements can also be scaled and rotated.

External symbol libraries or customized symbols may also be used.

Let's add an object into an existing floor plan. We'll select a workstation from the device list and place it down. This device is now automatically attached to the database.

The database attributes for this new object can now be viewed.

Face plates, location tags and cables can be added in a similar manner. You also have the option of pre-attaching symbols to database columns you have preset.

ADDING CABLES (01:09:00)

Let's run a cable from this face plate, through this tray to this wiring closet. The cable appears on our drawing.

The length of the cable is input at either end and the cable is added to your database. The length discrepency created by rise and drop is accounted for in a configuration setting.

Database attributes for this cable can now be viewed.

INHERITING ATTRIBUTE DATA (01:40:00)

Let's move this object into room 1054. With the inherit function I can specify for this object to inherit the attributes of this room.

The attribute data for this object now reflects the inherited site, location, floor and room number , as well as the permanent and temporary owner.

This powerful containment tool can be used for any type of data inheritance.

WIDE AREA NETWORKS (02:14:00)

MT 923 provides a powerful toolset for designing topology maps of your wide area circuit diagrams. This map of North America is used to layout your circuit topology. Node sites are referenced by a cloud symbol and circuits are drawn as lines.

Several types of circuits can be added with the WAN designer including data and transmission circuits. For example, lets's add a T-1 line.

Select two node sites and the line appears. Name and reference point are then provided. Circuit ID, vendor, and long haul carrier can also be attached to this line.

Once the object has been added a record is placed in the database. Since we added a T-1 circuit, 24

channels were assigned. Fractional T-1's can be added in a similar manner.

NAVIGATING THE NETWORK (03:20:00)

Once graphics have been loaded into your system, links can be set up to navigate throughout your drawings.

The first step in this process is either to create or import button graphics.

Links can then be set up between these buttons.

In this way user friendly navigation schemes can be set up to traverse your network.

NETWORK COMPONENTS (slide show id# s5 - karen) duration = 10:42:00

COMMON NETWORK TOPOLOGIES

Network topologies are important because they define how networks communicate. Let's discuss four major network architectures.

Bus Topology

The bus topology is a traditional ethernet type of architecture, which provides carrier sense multiple access with collision detection.

Imagine your network as a very busy highway. Messengers use this highway to carry information between components on your network. When collisions occur additional messengers are sent out.

Bus topologies are simplistic in their approach to controlling network traffic. They are very pervasive and easy to install and setup.

Token Ring Topology

The token ring topology implements the concept of a round robin world. Picture a bus that rides around the network. As it passes, messengers can board if there is space. If there is no space, messengers must wait. This approach eliminates collisions and does a better job of network traffic control.

Star Topology

In a star topology, nodes are served by a central concentrator or hub, that all connections on the network pass through. Standard collision detection is provided.

Many premises are already equipped with twisted pair wiring and have a central wiring closet making a star topology very easy to implement.

Star topologies are relatively easy to manage because everything comes into a central concentrator.

Tree Type Topology

The tree-type topology is typically seen in legacy networks where you have a host, a mainframe

for instance, a controller and a series of devices connected off the controller. These topologies are typically very easy to manage.

Network management has become critical in the last five years because tree-type topologies that store and access information in a central location have been replaced by distributed environments where information is spread throughout the network.

COMMON NETWORK DEVICES (02:22:00)

Network devices can be broken down into four basic classifications:

Simple PC's and peripherals

Simple PC's and peripherals can operate as stand alone devices or hooked onto a network, but are complete and independent of providing any operation to the network.

Network Computing Devices

Network computing devices include: servers, gateways, routers and hubs. These devices serve as facilitators to the network for concentrating, forwarding, or storing information. They are also used to pass information on to telco devices.

Telco Devices

Telco devices typically serve as the point of demarcation to the wide area world. This includes:

- Modems for dial up or leased lines
- CSU/DSU's for T-1 lines
- Muxes

Transmission Equipment

Transmission equipment, the telco switching equipment that is used primarily at the central office of a local or wide area exchange carrier, and occasionally at the customer premise, can accomplish the switching of the different types of information transmitted over your network.

COMMON CABLE TYPES (03:42:00)

There are several common cable types which are used in both local area and wide area networks.

Unshielded Twisted Pair

Unshielded twisted pair is the most common method of bringing telephone and data to the desk-top. This cable medium is comprised of one or more pairs of twisted insulated copper wire bound in a single plastic sheath. Speeds vary from 4 to 100 MB per second with this media. Unshielded twisted pair is subject to noise and consequently has an unrepeated distance limitation of 400 feet.

Shielded Twisted Pair

Shielded twisted pair provides a transmission medium with reduced noise, thereby increasing the integrity of the network. It provides up to 500 feet of unrepeated signal.

Thin Lan

Thin Lan cable is popular in local area networks. It is made up of a single 50 ohm copper coax wire. It provides up to 500 feet of uninterupted unrepeated signal.

Thick Lan

Thick Lan is typically used as a backbone riser in larger buildings that tie into thin lan networks on each floor. It is made up of a single 50 ohm copper coax wire and provides up to 1400 feet of un-interupted unrepeated signal.

Fiber Optic

Fiber optic cable can carry 30,000 times more information than copper. It is made up of a single optic fiber surrounded by insulation which is terminated at either end.

COMMON NETWORK PROTOCOLS (05:27:00)

There are a number of common network protocols.

SNA and X.25

SNA and X.25 are two older protocols commonly found. They are still widely used in the financial community and many large corporations that rely heavily on mainframe environments and have not yet made the transition to newer technology.

SNA, System Network Architecture, was developed by IBM and is widely used in both IBM and non-IBM environments.

X.25 assembles data into packets and broadcasts them over public or private switching networks. When packets reach their destination they are disassembled for use.

TCP/IP and OSI

TCP/IP and OSI began to emerge in the late 70's.

TCP/IP, Transmission Control Protocol/ Internet Protocol, is the most pervasive local area protocol used today in ethernet.

OSI, Open Systems Interconnect, is a variation of TCP/IP implemented in a local area environment. It is not as widely accepted as TCP/IP.

FDDI and ATM

FDDI and ATM have emerged as promising new technology that will gain market share over time.

FDDI, Fiber Distributed Data Interface, is a protocol specifically designed for high speed traffic on fiber optic lines. FDDI is a strong choice for a new network.

ATM, Asynchronous Transfer Mode, increases throughput by transmitting data in cells.

X.400 and X.500

X.400 and X.500 are emerging as standard definitions for both network messaging and directory services.

NETWORK MANAGEMENT PROTOCOLS (07:39:00)

Management protocols are used to help manage the networks or the protocols that are running on them. We are going to deal specifically with local area management protocols.

SNMP

SNMP, Simple Network Management Protocol, is a variation of the original simple gateway management protocol. It was originally developed to provide a tool with minimum overhead for managing gateways in a local area environment.

It has been enhanced to manage all TCP/IP traffic and in some cases, non-IP devices.

SNMP is based on a master/slave relationship. The management platform is responsible for polling the agents to get updated status information. In large network environments this can cause a large amount of overhead.

SMNP functions on a very simple 5-command premise, does not provide security and is not a very good mechanism for grabbing a large amount of data.

SNMP is the most widely accepted and rapidly growing segment and is probably the safest management protocol choice.

SNMP V2

SNMP V2 is a standard that incorporates some comprehensive and security features not available in SNMP.

It also provides for bulk copying of information and the ability to set up a remote monitoring environment.

CMIP

CMIP, Common Management Information Protocol, is the protocol for managing the OSI model. It is similar to SNMP but there are some fundamental differences.

CMIP is based on an intelligent agent model. If a change occurs at the agent level this information is forwarded back to the management platform.

In large network environments this can minimize overhead of polling traffic by limiting communication from the agent only when changes occur. Periodic polling intervals, like those found with SNMP, are eliminated.

CMIP is slowly making inroads.

SMP

SMP, Simple Management Protocol, is a variation of SNMP. SMP incorporates some of the functions of CMIP in an attempt to address the limitations of SNMP. It has not been widely distributed at this point.

DECnet

The DECnet protocol provides the ability to manage DECnet. There are several products on the market which integrate the DNM environment into your traditional SNMP or CMIP worlds.

ADDING A "MANAGED OBJECT" (ss id# s6-scott) duration=02:57:00)

SYNCHRONIZING WITH THE DATABASE (DYNAMIC DISCOVERY)

Integration between MT923 and your management platform begins with the comparision of devices in your management platform with those in your physical database. This activity is referred to as dynamic discovery.

This comparison, or synchronization, of the database is accomplished with the update database command. When the comparision is completed node status for existing nodes will be updated.

Once this is completed an exception list will be generated that will list all the nodes discovered by the management platform that don't yet exist in the physical database.

From this exception list you are able to load an object into the workspace, have a database record automatically populated, and update it's status.

Status can be updated independently of the synchronization in one of three ways:

- A single node
- All nodes in the current drawing
- The entire database

LOADING A NODE (01:13:00)

A node that has not been attached to your physical database can be loaded by selecting it from the exception list. A symbol is then chosen to represent the device, either a default or one that has been user defined.

Now place the object down in the floor plan. The status is now retrieved and the record is populated.

Let's zoom into the node that we just added. The host name has been populated and the current status is normal depicted by the green color.

VIEWING NODE INFORMATION (01:50:00)

The node interface button will display information populated from node manager including IP and

link address, status and subnet. In the case of a router, where multiple interfaces exist, many records are displayed. This is a key feature because it enables the user to quickly populate the database without manual entry.

I can view all the nodes in this current drawing by selecting the drawing nodes function. It gives me a list of all the devices that are currently on this floor.

DUPLICATE IP TRAPS (02:28:00)

Duplicate IP traps are a frequent problem coming from the management platform.

MT923 gives you the ability to enter in the link address, which comes through on the trap, and then search the physical database for the location of the object. In this way objects illegally added to your network can be located.

TROUBLE TICKETS (ss id# s7-scott) duration = 01:35:00

QUERYING A DEVICE FOR OPEN TT'S

Let's begin with a device in our network which should be running normally, but is showing as an unmanaged object.

We can see if there are any open trouble tickets for this device by selecting the ticket query function. The prompt window displays the search criteria, in this case the host name. This criteria is stored in a default file which is user definable.

The trouble ticket application appears on the screen and a list of tickets associated with that particular device is displayed. There do happen to be several open right now. I can select one of these tickets to get more detailed information on the situation.

I have full capability of working with any open ticket assuming I have the appropriate privileges because this is a fully functional trouble ticket application not just a view mode.

CREATING A TROUBLE TICKET (00:59:00)

A trouble ticket can be created directly through the MT923 environment. The function executed depends on the trouble ticket being used.

For example, selecting the ARS submit button, the user will be prompted to identify the object a ticket is being opened for.

Information about the object selected is passed to the new trouble ticket. This information is defined in a default mapping table. To view a ticket once it's been created, use the ticket query function.

MOVES, ADDS AND CHANGES (PERFORMING A MOVE, ADD OR

CHANGE) (ss id# s8-scott) duration = 03:31:00

PREPARING FOR A MOVE

The process of performing a move, add or change with MT 923 is very similar. Let's look at the process of performing a move.

Before a move can be performed two things have to be set up:
- Creation of the transaction tables
- Formatting of the move sheets

There are three transaction tables in MT 923: one each for move, add and change. These tables track status and history information on all moves, adds and changes that are executed.

To create a move transaction table select the create log table function. Depending on the database engine you are running, this table will be automatically created with no user intervention at the database level.

Move sheets display information about a particular move.

When an object is selected for a move, the database information is put through these template sheets to generate the move.

The create add form function is used to modify the style of your move sheet. Move sheets are based on header, body and footer format files.

REQUESTING A MOVE (01:21:00)

The move process begins by requesting a move. A move may be requested by anyone, even if the user doesn't have the neccessary permissions to perform a move.

Select the object you want to move, its current location, and it's destination.

A request form appears providing information about the selected object including: System description, current location, destination, current owner and room number. Move requests can include the date requested and the date completed for better workflow management.

VIEWING PENDING MOVES (02:07:00)

Pending moves can be viewed with the pending moves function. There are currently two moves pending, including the one that we just created. Associated information is also provided.

EXECUTING A MOVE (02:22:00)

The move is executed by first selecting the object, it's current location and it's destination. Now select the object and move it into it's new location.

An optional move sheet can be created in the alpha window. Information provided includes: host

name, room number, location, previous location and new location for the current object.

This information can be output to a printer, pasted into a drawing, or saved to a file for future reference.

MARKING A MOVE AS COMPLETE (03:01:00)

The final step in the move process is to mark the move as complete. By viewing the completed moves log I see the move we just completed. This log provides an historical reference of all moves that have occurred.

FLUSHING TRANSACTION TABLES (03:09:00)

Transaction Tables may be flushed at any time. Assuming you have the appropriate permissions this is accomplished with the Flush Tables function from the main menu.

ADHOC QUERIES (ss id# 9-Karen) duration = 02:15:00

GRAPHIC SQL QUERIES

Adhoc queries of your database may be performed with Accugraph's powerful graphic interface.

Through the SQL menu the user can query, add, enter and manage database elements.

The end user is completely shielded from SQL.

SETTING SEARCH PARAMETERS (00:28:00)

First, determine the tables which have objects connected to the current drawing with the Search Element function.

Select a table which displays a current list of the columns identified and then select a column to display as a result of this query.

Select the columns to search on.

Determine how you would like the results of the query to be ordered.

Next, identify the search criteria. In this case everything that is "like". A wild card is also included.

The query is then performed.

VIEWING A QUERY REPORT (01:13:00)

Results of the query appear in the alpha window.

The alpha window is a limited text editor that allows you to add a title, page numbers and a date to your query reports.

This report can then be saved to a file, printed or attached to a drawing for reference.

GRAPHIC QUERY RESULTS (01:38:00)

The results of a given query can be displayed on your drawing.

The devices found in this query are highlighted in magenta.

SAVING QUERIES (01:51:00)

Frequently performed queries can be recorded and assigned to the function bar.

This is done by toggling the save command to 'yes' and assigning a number to the query.

This query can also be assigned to a button on your drawing.

CONNECTIVITY ANALYSIS (ss id# s10-scott) duration = 02:19:00

The system provides a flexible environment for maintaining connectivity information. The user has complete control over what will be included for analysis and how information is displayed. A powerful expert engine calculates paths and provides the user with multiple results.

CONFIGURATION FILE

The configuration file defines all of the parameters that the system will use to manage and display connectivity information. This file can be created and edited by the user through a motif interface.

CONNECTIONS TABLE (00:39:00)

MT923 maintains connectivity through the use of a connections table. The key to maintaining connections is the use of a unique identifier for each object in your network. Entries are made in the connections table in the format: id1, table1; id2, table2.

CONNECTING ITEMS (01:06:00)

Connections are established graphically by "connecting the dots." This can be done for two objects or multiple objects. Connections can also be entered directly into the connections table.

For example, to connect a device to a face plate choose add connections from the network analyst menu. Next, select connect items. The user is prompted to select the first item followed by the second item.

DISPLAYING THE PATH (01:36:00)

To display the path select the display path function from the search menu. The system will process the connections table and hilite the path.

The user can display a schematic diagram of the path by selecting draw polygon from the schematic menu. The user will digitize the zone for display and the schematic will appear.

Because the user has control over what information is displayed in the path, this tool can be used to assist in diagnosing network problems. For instance, the device status field can be included in the display so the user can see the current status of all devices in the path.

WORKING WITH GROUPS (ss id# s11-karen) duration = 01:59:00

ADDING GROUPS OF OBJECTS

Groups of objects can easily be added to your database. The first step is to group the desired objects.

From the database menu choose group attach. A prompt asks if you would like to use information in the text editor to populate field information.

Default values can be defined that assign the same information like floor number and location to all of the objects being attached to the database.

Next, identify the table to place the devices in, in this case we'll use the device table. These elements have now been attached to the database. Attribute data for any of these devices can now be displayed.

EDITING GROUPS OF OBJECTS (00:58:00)

Groups of elements can be edited. First, identify the group of objects to be edited.

Then identify the columns you wish to modify. Let's modify the floor number, department and location fields. We enter thirteen for the floor, R&D for the department and Chicago for the location.

The attributes of any of the objects we modified can be displayed. Notice that the changes we made for this object are reflected. This technique of updating your database provides a powerful tool for keeping your database information current.

Notice that these fairly complex SQL commands are all performed graphically. Typing is required only when adding or updating values.

IMPLEMENTING MT 923 (ss id# s12-scott) duration = 02:24:00

LICENSING ISSUES

Accugraph uses a license server to license its products. It's based on concurrent and nonconcurrent usage which is very much like a library system of check-in and check-out.

The concurrent license floats on the network and is available to all users when it is checked out.

The nonconcurrent license is locked to a particular node. Consult your Accugraph sales represen-

tative for configuration and pricing information.

NETWORK SECURITY (00:37:00)

Network security is an important consideration for any network manager. Accugraph products take full advantage of existing security available at the network level, the Unix level, and the database level.

The system administrator controls access to data by user account log-in.

Depending on the permissions set-up in your MT923 home directory, specific users can be given or denied the ability to view or modify particular files.

TECHNICAL SUPPORT (01:13:00)

Accugraph has an 800 support line for technical support. The hours of support are Monday through Friday from 7am to 6pm mountain time. There is a guaranteed 2-hour response time.

Technical support also includes your software upgrades.

TRAINING (01:37:00)

Accugraph currently offers three classes on the MT 923 product:

- 2-Day End User Class
- 3-Day Administrator Class
- 1 week Developers Class

The two-day end user class provides a basic introduction to the various modes of operation in MT 923.

The three day administrators class offers a more in-depth look at the MT 923 product.

The one-week developers class is for programmers who will be developing there own custom programs and applications using the API.

For detailed curriculum of topics covered contact your Accugraph sales representative.