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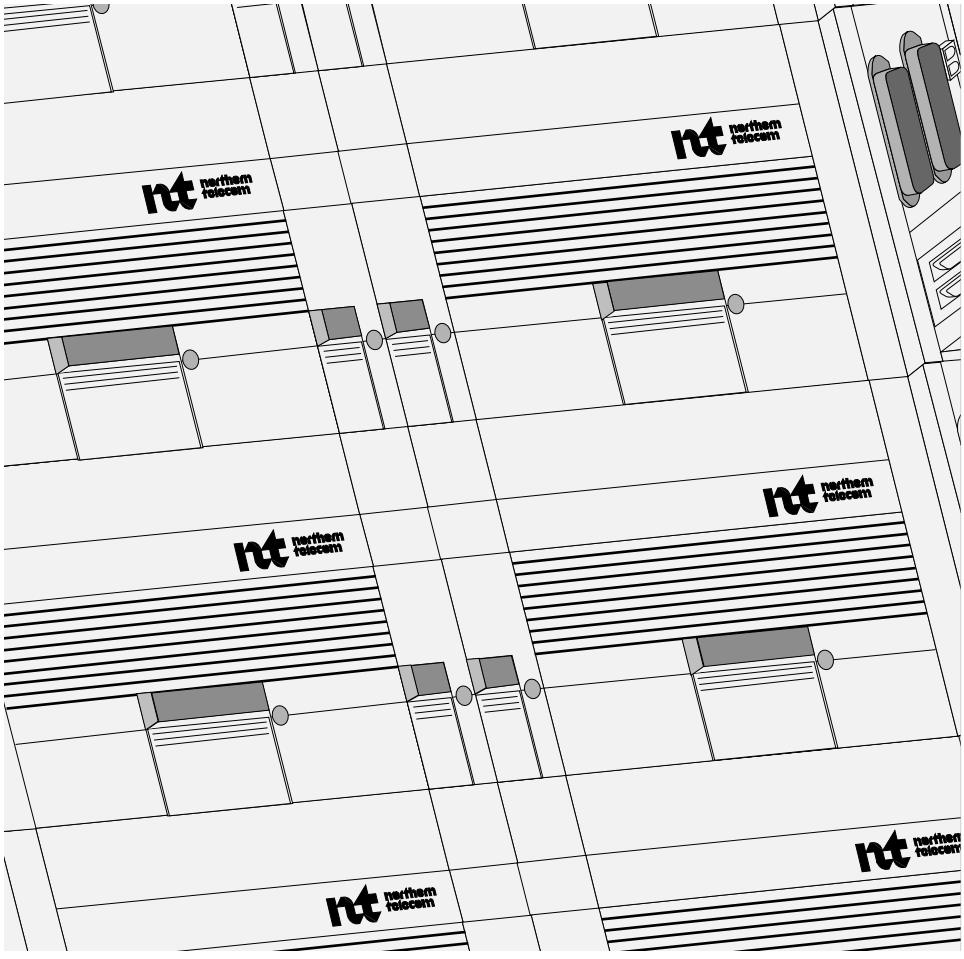
SONET Products

AccessNode

Traffic and Bandwidth Engineering Information

Issue 1.0 June 1999



NORTEL NETWORKS™

SONET Products

AccessNode

Traffic and Bandwidth Engineering Information

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AN17 Standard release of the document, Issue 1.0. Added information about GR-303 MVI host switch enhancements.

February 1999

AN16 Standard release of the document, Issue 1.0. For the AN16 Standard release, Issue 1.0, the following changes were made to this NTP:

- removed references to the Full Services Terminal (FST)
- indicated that traffic and bandwidth engineering tool is available on CD-ROM (no longer available on diskette)
- converted NTP to become a separately bound document (no longer in Volume 1)

June 1998

AN15 Standard 01.01 release of the document. Added information about the DMS Access feature.

September 1997

AN14 Standard 01.01 release of the document.

Contents

About this document

This document introduces traffic engineering for the AccessNode network. This document includes instructions for using the traffic engineering software tool (traffic tool), which is available on the AccessNode CD-ROM (AN15 or later). The traffic tool helps you calculate your AccessNode network requirements based on the quantity of lines you are servicing and the number of DS1 links required to support those lines at a GR-303 (DMS-100) host office.

References in this document

This document refers to the following documentation:

Engineering, Configuration, and Ordering Guide, Volume 1

- *Line Card Application and Special Services Engineering*, 323-3001-155

Basic traffic engineering concepts

This chapter contains a basic overview of the major concepts and principles used in traffic engineering, particularly as they relate to AccessNode systems and the traffic engineering software tool (see Chapter 4).

Traffic engineering theory

To engineer a telecommunications system to provide satisfactory service to subscribers, you must determine the relationship between the input (subscriber) load to the transport system and the transport system capacity. The formulas used in traffic engineering theory determine the transport (carrier) traffic at a particular loss probability (blocking/grade of service) relative to the subscriber input load, and, conversely, determine the number of circuits required to provide a particular level or grade of service.

Traffic intensity

The traffic intensity is average number of calls present on a group of circuits over a period of time, usually one hour.

Call blocking

Call blocking, also known as “incoming match loss” (IML), is when a call attempt is “blocked” because no circuits are available or because no idle connections exist to idle circuits. Call blocking as a network performance (grade of service) measurement is typically measured during the high-day busy-hour (HDBH), the busiest hour in the busy season.

Centum (hundred) call seconds

Centum call seconds (CCS) is the unit used to measure the average traffic intensity for a group of circuits. One CCS equals one call occupying one of the circuits for 100 seconds, or 100 calls occupying 100 circuits for an average of one second, during the time period being measured (typically one hour).

Busy Season

The term “busy season” signifies the three 30-day periods during a year, not necessarily consecutive months, that have the highest average traffic intensity (in CCS).

Average busy-season-busy-hour

The average busy season busy hour (ABSBH) is the continuous one-hour period that, on consecutive days in the 90-day busy season, contains on average the highest level of traffic intensity (measured in CCS).

> ***Note:*** Busy season data exclude Mother's Day, Christmas, and also non-regular events such as natural disasters and severe weather, which cannot be expected and anticipated to recur from year to year.

CCS ABSBH

CCS ABSBH is the unit used to measure the average traffic intensity for a group of circuits during the ABSBH. A CCS ABSBH value of one (1 CCS ABSBH) equals one of the circuits being busy for 100 seconds during the ABSBH, or 100 circuits in the group being busy for an average of one second during the ABSBH.

High day busy hour

The high day busy hour (HDBH) is the highest-traffic hour (sixty-minute period, not necessarily by clock) on the highest-traffic day of the year.

HDBH blocking

At this time, there is no explicit LSSGR recommendation for HDBH blocking. The traffic tool default value of 5% (0.05) HDBH blocking (see "Network requirements" on page 4-16) is the Nortel Networks recommendation for AccessNode systems.

HDBH to ABSBH traffic ratio

The HDBH (CCS)-to-ABSBH (CCS) ratio is a measure of traffic intensity. You must obtain operating company historical data for the HDBH and ABSBH traffic parameters (in CCS). Then calculate the HDBH-to-ABSBH CCS ratio, which must be greater than 1. AccessNode supports HDBH-to-ABSBH ratios from 1.1 to 1.7. The traffic tool defaults to 1.2 HDBH-to-ABSBH.

Grade of service objectives

Used in integrated applications for digital switches, "grade of service" is a measure of the probability that a call will be "blocked" during a specified period of peak traffic, usually the HDBH. Grade of service objectives are set as a maximum limit on HDBH blocking for a particular network. For example, a network with 0.07 HDBH blocking means that, for every 100 call attempts, an average of 7 are blocked and experience incoming match loss.

Traffic tool grade of service

You must allow for sufficient switch processing capacity to remain within the HDBH blocking maximum limit for your network. The traffic tool calculates the switch processing capacity your network requires based on the remote terminal requirements and the HDBH blocking level traffic tool default, and the HDBH-to-ABSBH traffic and call rate ratios.

Call attempts

Call attempts are a measure of traffic load measured during the ABSBH for system sizing purposes. The traffic tool does not use this measurement. A call attempt is a call by a subscriber line in which a complete destination address is provided and makes a bid for sevice. See also “Holding time” below.

CA ABSBH

The call attempts for the ABSBH value is calculated using the following formula:

$$\mathbf{CA} = \frac{\text{Average CCS ABSBH x 100}}{\text{Average holding time per call (in seconds)}}$$

Holding time

Holding time is the amount of time (usually given in CCS) that a call attempt (see “Grade of service objectives” above) is in the access/carrier system, regardless of the eventual disposition (connection, no answer, busy, or block) of the call.

AccessNode network elements and services

Traffic engineering in the AccessNode requires the following:

- specifying the types of services you will be providing
- calculating the number and type of AccessNode network elements required to service the line quantities you are servicing.
- calculating the number of DS1 links requiring an interface (and corresponding switch peripherals) at host switches or at a digital cross-connect.

This chapter discusses the first two requirements.

Remote site locations in the AccessNode

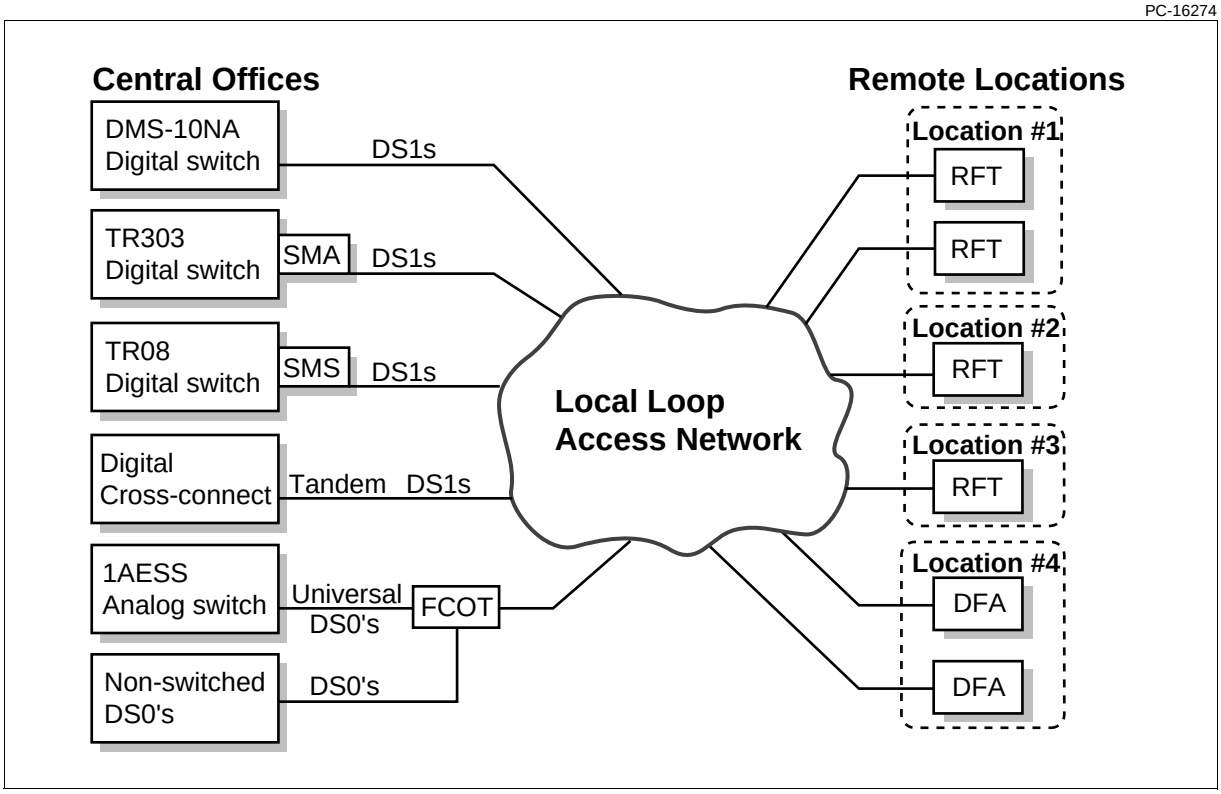
A remote site location in the AccessNode is any designated service area, which is served by an AccessNode remote network element (remote fiber terminal [RFT] or DS-1 fed access [DFA] terminal). You can specify any type of service supported by the AccessNode (see “AccessNode services” on page 2-3) and any quantity of lines. The traffic tool calculates the number of remote terminals required to service the quantity of lines you specify.

See Figure 2-1 on page 2-2 for some of the typical remote terminal and central office configurations.

Traffic tool remote locations

Nortel Networks has developed a software tool to automate the calculations required for traffic engineering AccessNode traffic to a Nortel Networks DMS-100 GR-303 (GR-303 DMS) digital switch. Chapter 4 contains instructions for this tool. You can use the traffic tool to try different combinations for your particular service area GR-303 DMS demands, based on number of subscriber lines, traffic load, and designated grade of service (based on LSSGR recommendations). This process can help you determine the optimal network configuration for your service area requirements, and can assist you in cost estimation by allowing you to save data entries for several configurations for later cost comparison.

Figure 2-1
Typical AccessNode remote terminal and switch peripheral configurations



Transport network feeder topologies

As indicated by the “cloud” in Figure 2-1, the terminals in an AccessNode network can be used in a variety of network feeder topologies. The traffic tool does not address the local loop access network requirements between the remote terminal(s) and the central office(s).

AccessNode network elements

The remote network elements of an AccessNode network can be provisioned to serve Integrated Digital Loop Carrier (IDLC), Universal Digital Loop Carrier (UDLC), mixed IDLC/UDLC, and tandem applications. The remote network element types used in an AccessNode network are as follows:

- remote fiber terminal (RFT)
- DS1-fed access (DFA) terminal

The AccessNode RFT and DFA remote network elements are described in the following sections.

Remote fiber terminal

The RFT supports DS0-based access to the local loop network and central office at the DS1 level. A single RFT supports DS0 service for up to 672 2-wire lines, or any combination of 2-, 4-, and 6/8-wire lines up to 672. Outgoing DS1s from an RFT are built into OC-3 or OC-12 optical signals for transport to a central office. The OC-3/12 signals from an RFT can be transported by any local loop access network that can support OC-3/12 SONET traffic to any of the central office host switch/transport architectures supported by the AccessNode. RFT traffic bound for a Universal office (requiring VF/DS0s) requires a fiber central office terminal (FCOT) to provide VF/DS0 presences at the central office.

DS1-fed access terminal

The DFA terminal supports DS0-based access to the local loop network and central office at the DS1 level. A single DFA supports DS0 service for up to 672 2-wire lines, or any combination of 2-, 4-, and 6/8-wire lines up to the maximum 672. The DS1 signals from a DFA can be transported by any local loop access network that can support DS1 traffic to any of the host switch/transport architectures supported by the AccessNode.

AccessNode services

The following sections describe the traffic services supported by AccessNode and a GR-303 DMS digital switch.

POTS lines

Standard service lines—referred to as plain old telephone service (POTS)—support dial tone to rotary and push-button telephones and access to nationwide and international carriers. In AccessNode, POTS lines are locally-switched services and are supported by 2-wire line cards in universal and integrated applications. POTS includes services, such as Emergency Number Service (911) and Operator Services. POTS can be upgraded to support Custom Calling features (such as Call Waiting, Call Forwarding, and Three-Way calling) without impacting switch capacity. These features are nodal, that is, they do not require additional switch processing over CCS7 trunking.

CLASS lines

Custom Local Area Signaling Services (CLASS) is a range of Bellcore standard features for residential and business lines that build on the foundation of Custom Calling POTS features. CLASS extends feature operation across multiple switches linked by Common Channel Signaling No. 7 (CCS7) trunks. CCS7 allows information about a call to be passed from one switch to another.

Coin lines

Coin services are locally-switched services supported by 2-wire line cards in both UDLC and IDLC applications. Coin services supported by AccessNode network elements (without special provisioning) include the following:

- dial-tone first
- coin first
- semi-postpay
- charge-a-call (coinless coin)
- private coin

Meridian digital centrex lines

Meridian Digital Centrex (MDC) lines allows businesses to have an on-premises system such as a PBX, including call distribution and handling features, call accounting, high-speed digital data services, and networking with other sites, without requiring on-premises switching equipment. MDC uses the resources of the public-network switch to deliver services over a telephone or data line from the central office. AccessNode provides access to all basic MDC features now available on the DMS SuperNode. Business subscribers can access these features using one of the following MDC applications on the local DMS SuperNode switch:

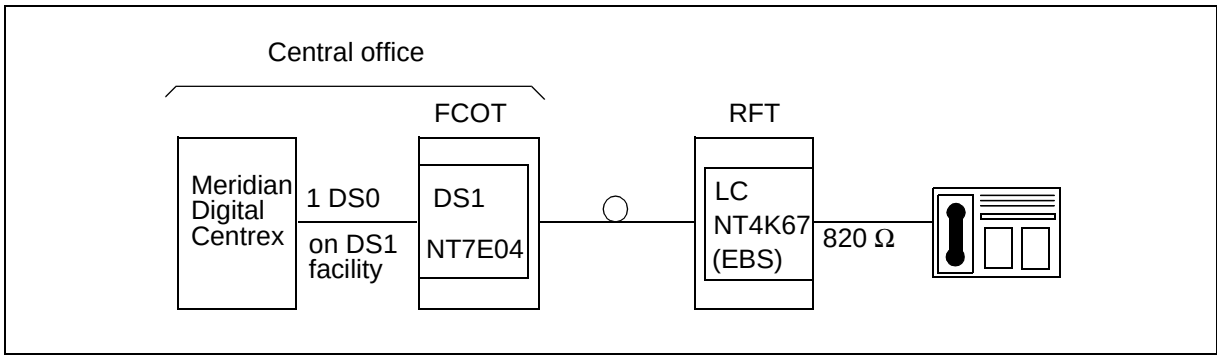
- single-party (basic 500/2500 set)
- attendant console
- electronic business set (EBS), integrated application only

For more information on AccessNode MDC services, see *Line Card Application and Special Services Engineering*, 323-3001-155, in *Engineering, Configuration, and Ordering Guide*, Volume 1.

Electronic business set

The AccessNode provides transparency between an DMS SuperNode switch and the customer's EBS. Figure 2-2 on page 2-5 shows a typical application of EBS service (integrated application) in a point-to-point fiber-fed system. Integrated applications in single-ended or DS1-fed systems, do not require FCOT equipment.

Figure 2-2
Typical integrated application of MDC electronic business set service



MDC supervision types supported by AccessNode include loop start, forward disconnect, and line side answer supervision. Address signaling types supported include dial pulse (DP) and DTMF. CLASS/CMS features are also supported.

EBS (P-Phone) lines

In this field, enter the number of electronic business set (EBS or Nortel Networks P-Phone, integrated application only) lines being serviced by the GR-303 DMS host at each remote location.

EBS (P-Phone) lines used as ACD agents

Automatic Call Distribution (ACD) can handle large volumes of incoming calls at business locations. ACD agents distribute the incoming traffic equally among a group of answering positions on standard telephone lines.

Universal Voice Grade lines

Universal Voice Grade (UVG) lines are remote terminal lines that support a range of services and operating features without requiring manual adjustments. UVG lines in the AccessNode support the following service codes and operating features:

- LSR (loop-start residential)
- LGB (loop ground business)
- loop start and ground start signalling
- on-hook transmission
- CLASS
- toll diversion

ISDN lines

Integrated service digital network (ISDN) line service supports a 2B+D clear-channel bandwidth between the local digital switch and the network termination (NT1) at the customer premises. That is, there are two 64-kb/s B channels for voice or data, and one 16-kb/s D channel. The D channel is used for carrying customer packet data, and for signaling between the local digital switch and the ISDN terminal equipment.

Bb's LAPB/X25 terminals to DMS-100

The number of 64-kb/s B-channels using link access protocol B (LAPB) on X.25 terminals requiring interface to the DMS-100.

LAPD/X25 terminals per ISDN line

The number of terminals per ISDN line that use link access protocol D (LAPD) according to X.25 protocols.

Average dpps all LAPD/X25 terminals per ISDN line

The estimated average data packets per second (dpps) for all LAPD/X.25 terminals per ISDN line.

For more information on AccessNode ISDN services, see *Line Card Application and Special Services Engineering*, 323-3001-155, in *Engineering, Configuration, and Ordering Guide,* Volume 1.

Special circuits (DS1 tandem lines)

AccessNode systems offer DS1 tandem line service for non-locally switched, non-switched, and special services. AccessNode network elements map the designated DS0s into VT 1.5s (DS1s) for transport by a channel bank or a DSX-1 cross-connect (DCS). AccessNode remote terminals and line cards support the following DS1 tandem services:

- 2 Wire tandem
- 4 Wire tandem
- 6/8 Wire tandem

A single AccessNode remote terminal can route tandem traffic to up to five separate digital cross-connects.

AccessNode network switch/transport requirements

This chapter discusses the network switch/transport requirements of the AccessNode.

Chapter contents

This chapter contains the following information.

AccessNode host switch/transport architectures

The types of traffic supported by the AccessNode include the following:

- DS1 traffic switched at a GR-303 (DMS-100) host office
- DS1 traffic switched at a GR-303 (generic) host office
- DS1 traffic switched at a TR08 host office
- DS1 non-switched traffic carried to a digital cross-connect (DCS)
- DS0 universal traffic switched via an analog host office
- DS0 non-switched traffic

To determine the traffic engineering requirements for an AccessNode system, you must calculate the number of DS1 links requiring an interface (and any corresponding switch peripherals) for each host type. You must also determine the number of remote terminals required to service the locations and line quantities in your system.

Note 1: The current version of the traffic tool calculates only the requirements for DS1 traffic switched at a GR-303 Nortel Networks DMS-100 (GR-303 DMS) host office (see "Traffic engineering software tool" on page 4-1).

Note 2: The traffic tool does not address DS1 link and peripheral requirements for GR-303 multi-vendor interfaces (GR-303 MVI). However, because of the similarities between GR-303 DMS and GR-303 MVI, you can use the traffic tool to generate approximate quantities for GR-303 MVI hosts.

Note 3: The traffic tool does not address DS1 link and peripheral requirements for TR08 and universal (analog) offices.

Non-GR-303 line provisioning limitation

Non-GR-303 DS0 circuits such as universal digital loop carrier (UDLC), TR08, and tandem lines are limited to 885 provisioned DS0s circuits in a single operations controller (OPC) span of control. AccessNode system controls in the OPC for the operations, administration, and maintenance of the OPC are not operational beyond this limit. If you engineer and provision more than 885 non-GR-303 lines, you need more than one OPC to manage the system.

GR-303 DMS host switch

The AccessNode remote network element (see "AccessNode network elements and services" on page 2-1) formats DS1 traffic bound for GR-303 host switches according to the GR-303 switch requirements. A GR-303 DMS host switch is a transport/access network switch (DMS-100) for DS1 traffic that operates according to Bellcore technical reference standard GR-303. AccessNode GR-303 DMS traffic must be carried to a DMS-100 SuperNode host switch, and requires a Subscriber carrier Module Access (SMA) switch peripheral.

GR-303 DMS host requirements

The GR-303 DMS specification describes integrated digital loop carrier (IDLC) traffic composed of narrowband DS0-based services that are switched locally by one or more digital switches. The AccessNode network element sending traffic to a GR-303 DMS switch requires an SMA-100 switch peripheral to interface with the host DMS-100 switch.

Subscriber carrier Module Access switch peripheral

The GR-303 DMS hosts serving a digital loop carrier system require an SMA peripheral module. The access network side (P-side) of an SMA module can accept up to 20 or 28 IDLC DS1s, depending upon the SMA version. The control side of the SMA connects to the network module in the DMS SuperNode switch through DS30 or DS512 links.

SMA ISDN requirements

SMA peripherals supporting ISDN require an enhanced D-channel handler (EDCH). An SMA/XPM module can support up to five AccessNode modules with ISDN or eight AccessNode modules without ISDN.

SMA concentration

The switch matrix timeslot of the SMA module supports up to a 1.25:1 concentration ratio for DS0 traffic.

DMS-100 interface

The DMS-100 interface on the control side of the SMA peripheral supports DS30 or DS512 links. The control side of a single SMA supports connections for 3-4 DS30 links or one DS512 link to the DMS-100 switch.

SMA XPM and CPM versions

The XPM version of the SMA module supports up to 20 DS1s. The CPM version of the SMA module supports up to 48 DS1s.

GR-303 DMS AccessNode CCS ABSBH traffic tool defaults

Table 3-1 lists the GR-303 DMS service types supported by AccessNode and their default CCS ABSBH values in the traffic tool.

Table 3-1
Traffic tool default CCS ABSBH

Service type	Traffic tool default CCS ABSBH
POTS	3 CCS ABSBH
CLASS	3 CCS ABSBH
Coin	5 CCS ABSBH
MDC (non P-Phone)	5 CCS ABSBH
MDC (P-Phone)	5 CCS ABSBH
MDC (P-Phone) used as ACD	5 CCS ABSBH
Universal Voice Grade	3 CCS ABSBH
ISDN (2B+D)	6 CCS ABSBH

Grade of service objectives

Used in integrated applications for digital switches, grade of service is a measure of the probability that a call will be “blocked” during a specified period of peak traffic. Call blocking, also known as “incoming match loss” (IML), is typically measured during the high-day busy-hour (HDBH), the busiest hour in the busy season. Grade of service objectives are set as a

maximum limit on HDBH blocking for a particular network. For example, a network with 0.07 HDBH blocking means that, for every 100 call attempts, an average of 7 are blocked and experience IML.

You must allow for sufficient switch processing capacity to achieve the HDBH blocking maximum limit for your network. The traffic tool calculates the switch processing capacity based on the remote terminal requirements and the HDBH blocking level, and the HDBH-to-ABSBH traffic and call rate ratios.

GR-303 MVI host switch

The AccessNode remote terminal (see "AccessNode network elements and services" on page 2-1) formats DS1 traffic bound for GR-303 MVI host switches according to the GR-303 MVI switch requirements. A GR-303 MVI host switch is a transport/access network switch for DS1 traffic that operates according to Bellcore generic requirement GR303. AccessNode GR-303 MVI traffic does not require a DMS-100 SuperNode host switch or an SMA switch peripheral. For instructions for setting traffic alarm thresholds, refer to *Line Card Provisioning Procedures*, 323-3001-315, in *Operations, Administration, and Provisioning*, Volume 4B.

TR08 IDLC host switch

The AccessNode remote terminal (see "AccessNode network elements and services" on page 2-1) formats DS1 traffic bound for TR08 host switches according to the TR08 switch requirements. A TR08 host is a local digital switch with a generic digital interface that accepts traffic from an SLC-96 digital loop carrier system, in accordance with Bellcore technical reference standard TR-TSY-000008. TR08 has three modes designated as I, II, and III. AccessNode supports only mode I, and does not support the DS1 span-protection feature of mode I. AccessNode traffic using a TR08 host switch requires an Subscriber carrier Module SLC (SMS) switch peripheral.

TR08 Host Requirements window

The Bellcore TR08 (TR-TSY-000008) specification describes integrated digital loop carrier (IDLC) traffic composed of narrowband DS0-based services that are switched locally by one or more digital switches.

A TR08 host is a local digital switch with a digital interface that accepts traffic from an SLC-96 digital loop carrier system. The SLC-96 system can carry four DS1s (96 DS0s) for each system. In AccessNode, TR08 hosts serving an SLC-96 digital loop carrier system require an SMS peripheral module.

SMS peripheral module

The SMS peripheral module contains two sides. One side interfaces with the access network; the other interfaces with the host digital switch. The access network interface (P-side) of an SMS module can accept up to 20 IDLC DS1s. The switch interface (control side or C-side) of the SMS connects to the network module in the DMS SuperNode switch through DS30 or DS512 links.

SMS with concentration

The SMS used in TR08 facilities supports several modes of concentration from remote concentrating terminals.

DMS-100 interface

The DMS-100 interface used on the control side of the SMS peripheral supports DS30 or DS512 links. The control side of a single SMS supports connections for 3-4 DS30 links or one DS512 link to the DMS-100 switch.

Universal office

A Universal office supports VF/DS0 traffic in the universal digital loop carrier (UDLC) format. Universal offices can be analog switches or VF special services (non-switched DS0s). Universal traffic from an AccessNode remote terminal (see “AccessNode network elements and services” on page 2-1) that is bound for a Universal office must pass through a fiber central office terminal (FCOT) for conversion from the DS1 level back to the VF/DS0 level.

Digital cross-connects

A significant portion of the inter-office circuits of most local exchange carriers is dedicated point-to-point transport—that is, transport between fixed locations. These non-switched services are handled by digital cross-connects such as DSX-1s and channel banks.

Non-switched service applications

Non-switched services are intended for the business portion of the market, and include a range of applications such as the following:

- low-speed data links for automated teller machine transactions and on-line lotteries
- private voice and data networks linking multiple business locations
- dedicated links for transferring high-resolution video images

Non-switched services provide businesses with alternate backup routes they can lease from telephony providers.

AccessNode DS1 tandem links

In AccessNode, non-switched special services require “tandem” links at the DS1 service level. DS1 tandem traffic contains narrowband DS0-based services that are not locally switched, but are handled by equipment such as a channel bank or a DSX-1 digital cross-connect (DCS). AccessNode supports 2-wire, 4-wire, and 6/8-wire DS1 tandem services.

Traffic engineering software tool

The traffic engineering software tool (traffic tool) is an automated tool that you can use to plan and provision the remote terminal and host switch peripheral requirements for an AccessNode (AccessNode) network. Unlike the former traffic engineering method of manual calculations based on engineering rules and tables, you can use the automated traffic tool to easily calculate the remote terminal and switch peripheral requirements for the remote locations you are servicing.

Note: This chapter contains several screen captures from the traffic tool graphical interface. The figures shown were prepared using a Macintosh. PC users may see a slightly different scheme.

Chapter contents

This chapter contains the following information.

Chapter task list

This chapter includes the following tasks.

Procedure	Task	See
4-1	Installing the traffic tool software	page 4-12
4-2	Setting up an AccessNode system configuration	page 4-13
4-3	Starting the traffic tool	page 4-14
4-4	Specifying the number of remote locations	page 4-15
4-5	Completing the traffic tool Input Questionnaire	page 4-16
4-6	Calculating system data	page 4-22
4-7	Saving ESMA worksheet data	page 4-27
4-8	Viewing and printing saved ESMA worksheets	page 4-29
4-9	Saving the traffic tool and all data	page 4-30
4-10	Printing all traffic tool data	page 4-31
4-11	Exiting the traffic tool	page 4-32

Purpose of the traffic tool

The traffic tool serves two purposes in helping you plan your network requirements. The first is to help you calculate the number of DS1 links requiring an interface (and corresponding switch peripherals) to a Nortel Networks DMS-100 GR-303 digital switch (GR-303 DMS).

Note 1: All places where the traffic tool interface displays “TR303” should be read as “GR-303 DMS”.

Note 2: The current version of the traffic tool does not address the DS1 link and switch peripheral requirements for digital host switches with either the GR-303 multi-vendor interface (GR-303 MVI) or the TR08 interface, or for universal (analog) host switches.

Second, the traffic tool lets you calculate the number and type of AccessNode remote terminals required to service the locations and line quantities you specify for the following types of traffic:

- DS1 traffic switched at a GR-303 DMS host office
- DS1 non-switched traffic carried to a digital cross-connect (DCS)

Note: The traffic tool does not address the local loop access network requirements between the remote terminal(s) and the central office(s), because these requirements vary by local loop.

Function of the traffic tool

The traffic tool entry fields allow you to enter the quantities and types of services you are providing. Based on these entries, the traffic tool performs the calculations to determine the number of DS1 links required and any host switch peripheral requirements at a GR-303 DMS host switch. The traffic tool also performs the calculations to determine your remote terminal requirements based on the total quantities and types of services you specify. The tool prompts you if the entry specified is outside acceptable AccessNode parameters.

Traffic tool system requirements

The traffic tool is shipped on the AccessNode CD-ROM.

Table 4-1 lists the system requirements to run the traffic engineering software tool.

Table 4-1
Traffic engineering tool system requirements

System component	Traffic engineering tool requirement
Operating platform	• Macintosh • IBM-compatible (Microsoft Windows 3.1 or later)
Operating software	Microsoft Excel, version 5.0 or later
RAM requirement	minimum of 4 MB
Hard disk space	2 MB
Screen size	minimum 640 x 480
Screen type	color or monochrome

Traffic tool information requirements

Before opening the traffic tool and configuring a system, collect the following operating company historical data for your remote location:

- average centum call seconds (CCS) average busy season busy hour (ABSBH)
- HDBH
- HDBH-to-ABSBH ratio

See “Basic traffic engineering concepts” on page 1-1 for descriptions of each of these parameters. If these parameters are not available, the traffic tool gives a default value for each of the service types (based on historical data from Nortel Networks). You must enter the CCS ABSBH for each remote location and each of the service types you are providing through a GR-303 DMS host.

Traffic tool worksheets

The traffic tool contains the following Excel worksheets for you to enter and view data:

- **AN:** The AN worksheet window contains the following subwindows:
  - — Input Questionnaire: allows you to enter the network data and requirements for up to 16 sites (see Figure 4-1 on page 4-5**)**
  - — Summary of Inputs and Results: displays the results of the traffic tool calculations based on the input data (see Figure 4-2 on page 4-6**)**
  - — Per ESMA Module Configuration: displays the configuration of each SMA2 required based on the network requirements you enter on the Input Questionnaire (see Figure 4-3 on page 4-7**)**
- **TMacros:** Not available to users
- **ESMA:** See Figure 4-4 on page 4-8**.** The ESMA worksheet contains the detail report for each ESMA required by the system, including the following information:
  - — number of DS1 links (Links)
  - — number of D-channel handlers (DCHs) used for ISDN lines
  - — number of ISDN lines (ISDN)
  - — traffic capacity usage in CCS (Traffic)
  - — numerical site identifier (Site)
  - — number of ESMA P-side and C-side ports used (PSide and CSide)
  - — number of Bb + Bd channels used (Bb+Bd)

  Note: The ESMA worksheet has a total capacity of 120 ESMA detail reports.

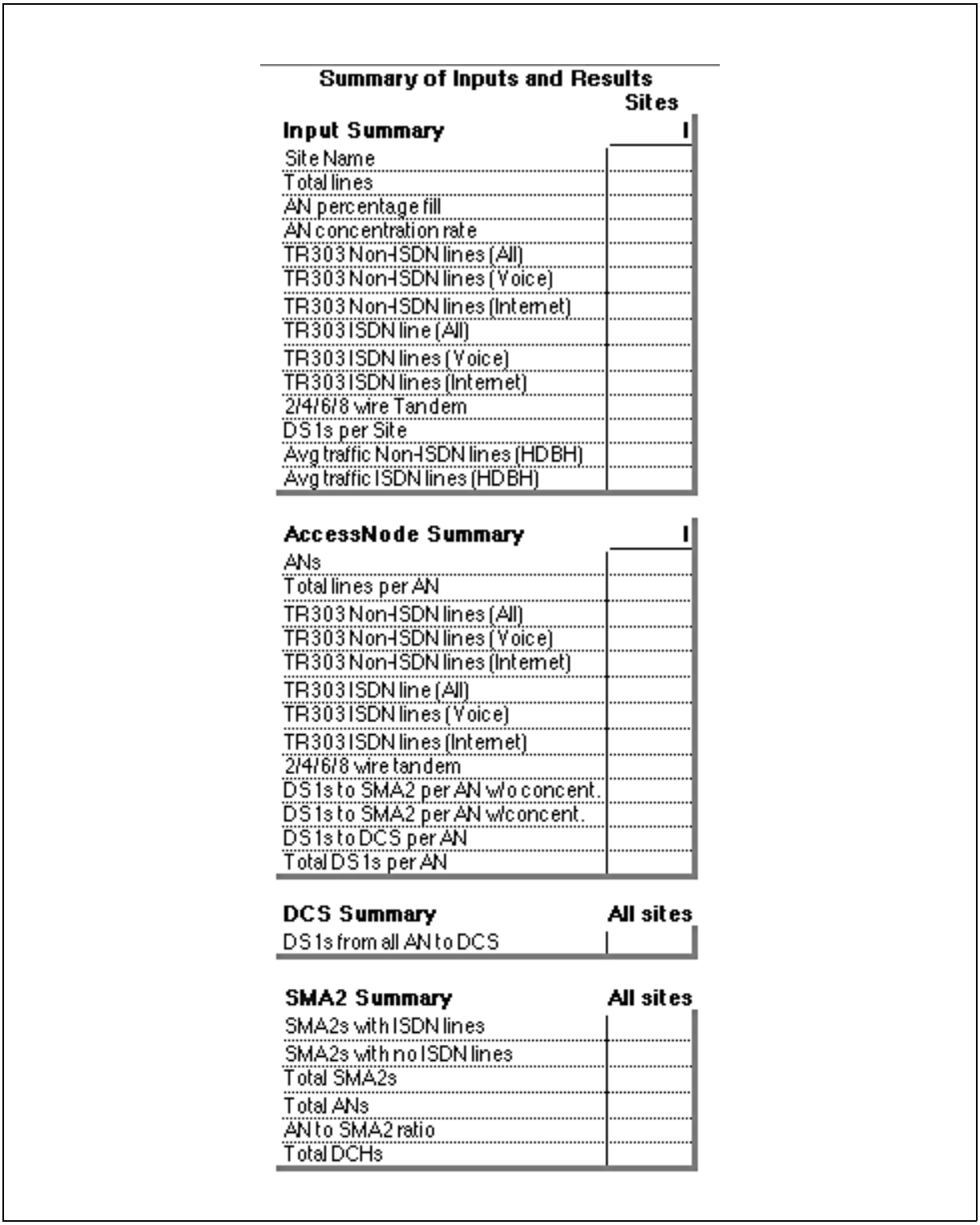
Figure 4-1
AN worksheet - Input Questionnaire

SC-10336

Input Questionnaire			Sites
Ques	**Network Requirements**	**Acceptable Ranges**	**1**
Q1	Site Name	input	
Q2	HDBH Blocking	0.05	0.05
Q3	HDBH To ABSBH Traffic Ratio	1.1 to 1.7 (default=1.2)	1.2
Q4	AN percentage fill?	up to 100% (default=100)	100
Q5	AN with concentration?	yes or no (default=yes)	Yes
Q6	SMA2 with concentration?	no	No
TR303 Line Quantities			
Q20	POTS lines	input	
Q21	RES lines	input	
Q22	COIN lines	input	
Q23	MDC lines	input	
Q24	EBS (P-Phone) lines	input	
Q25	EBS (P-Phone) lines ACD agents	input	
Q26	UVG lines	input	
Q27	ISDN lines 2B+D	input	
Special Circuits (Tandem) Quantities			
Q40	2 wire tandem	input	
Q41	4 wire tandem	input	
Q42	6/8 wire tandem	input	
Line Traffic Parameters (ccs) AB		*Note: Do not enter ccs if Internet = 100%*	
Q50	Avg traffic POTS	up to 36 (default=3)	
Q51	Avg traffic RES	up to 36 (default=3)	
Q52	Avg traffic COIN	up to 36 (default=5)	
Q53	Avg traffic MDC	up to 36 (default=5)	
Q54	Avg traffic EBS (P-Phone)	up to 36 (default=5)	
Q55	Avg traffic ACD agents	up to 36 (default=5)	
Q56	Avg traffic UVG	up to 36 (default=3)	
Q57	Avg traffic ISDN B-Channel	up to 36 (default=6)	
Internet Parameters			
Q60	Internet Penetration	up to 100%	
Q61	Internet Avg traffic	up to 36	
TR303 Packet Line Traffic Parameters			
Q90	Bb's LAPB/X25 terminals	input	
Q91	LAPD/X25 terminals per ISDN line	0 to 8	
Q92	Avg dpps all LAPD/X25 per ISDN	0.05 to 0.7	

Figure 4-2
AN worksheet - Summary of Inputs and Results

SC-10338



Summary of Inputs and Results

	Sites
Input Summary	**1**
Site Name	
Total lines	
AN percentage fill	
AN concentration rate	
TR303 Non-ISDN lines (All)	
TR303 Non-ISDN lines (Voice)	
TR303 Non-ISDN lines (Internet)	
TR303 ISDN line (All)	
TR303 ISDN lines (Voice)	
TR303 ISDN lines (Internet)	
2/4/6/8 wire Tandem	
DS1s per Site	
Avg traffic Non-ISDN lines (HDBH)	
Avg traffic ISDN lines (HDBH)	

AccessNode Summary	**1**
ANs	
Total lines per AN	
TR303 Non-ISDN lines (All)	
TR303 Non-ISDN lines (Voice)	
TR303 Non-ISDN lines (Internet)	
TR303 ISDN line (All)	
TR303 ISDN lines (Voice)	
TR303 ISDN lines (Internet)	
2/4/6/8 wire tandem	
DS1s to SMA2 per AN w/o concent.	
DS1s to SMA2 per AN w/concent.	
DS1s to DCS per AN	
Total DS1s per AN	

DCS Summary	**All sites**
DS1s from all AN to DCS	

SMA2 Summary	**All sites**
SMA2s with ISDN lines	
SMA2s with no ISDN lines	
Total SMA2s	
Total ANs	
AN to SMA2 ratio	
Total DCHs	

Figure 4-3
AN worksheet - Per SMA Module configuration

SC-10341

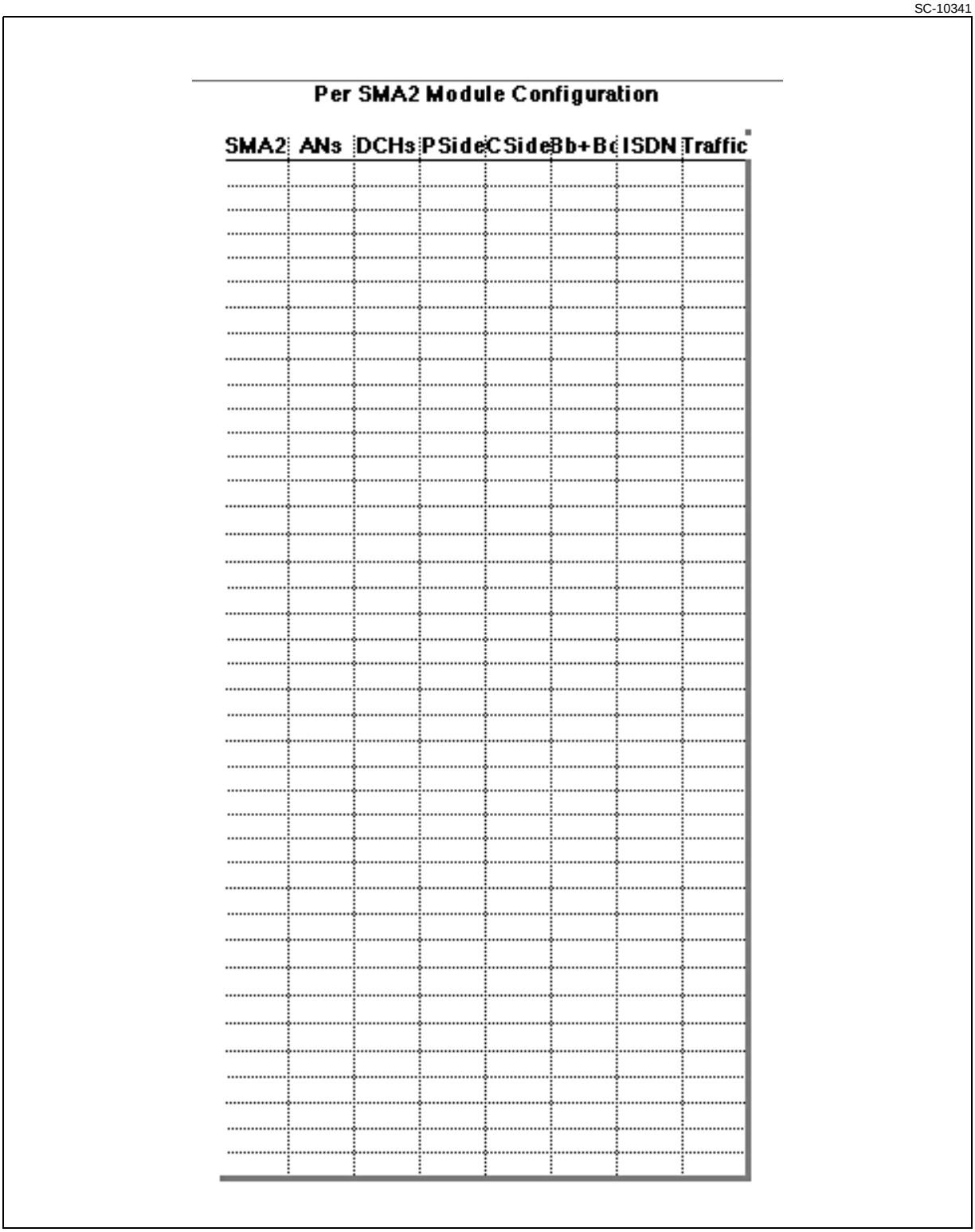
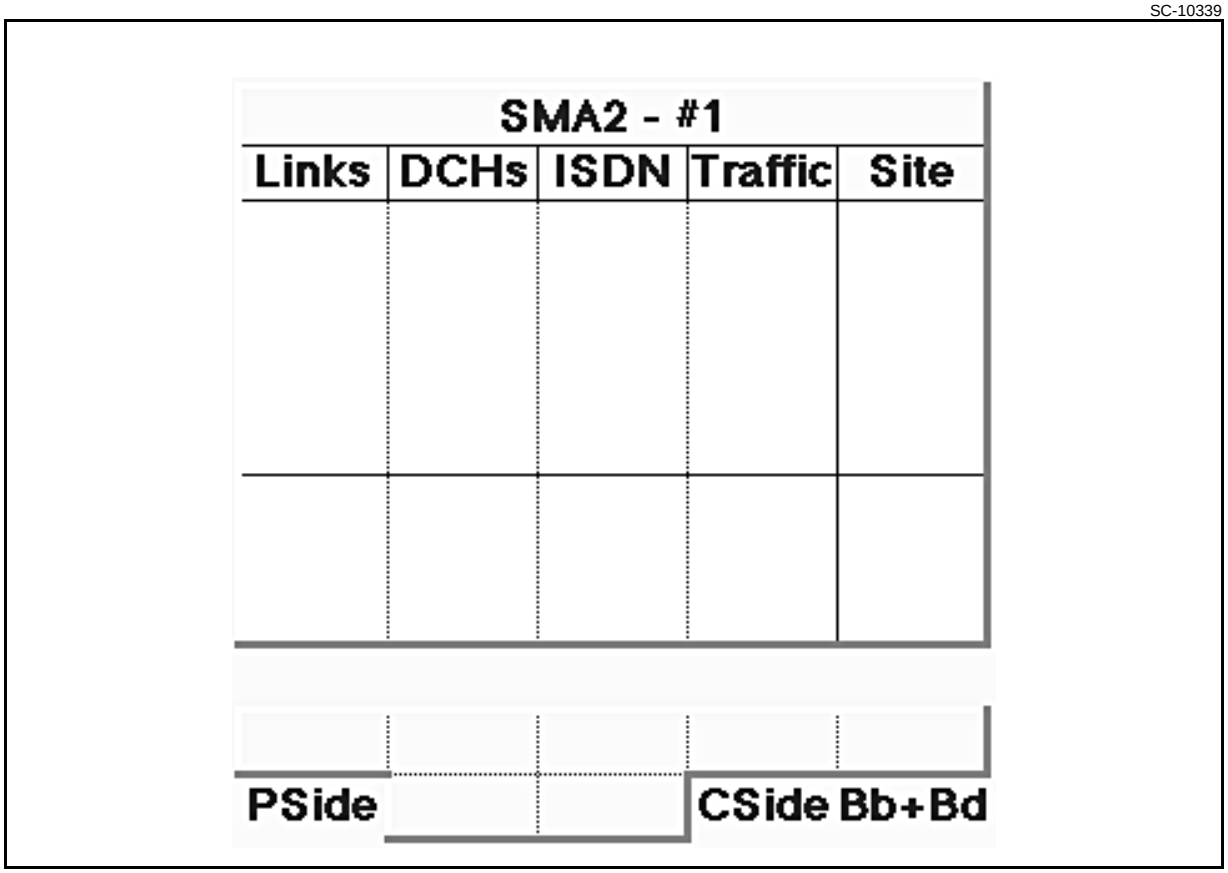


Figure 4-4
ESMA worksheet

SC-10339



ANTools command bar

The traffic tool “ANTools” command bar allows you to manipulate the AccessNode system data in the traffic tool. The ANTools command bar can float around the worksheet, or it can be placed with the Excel tool bars.

If the ANTools command bar is not visible

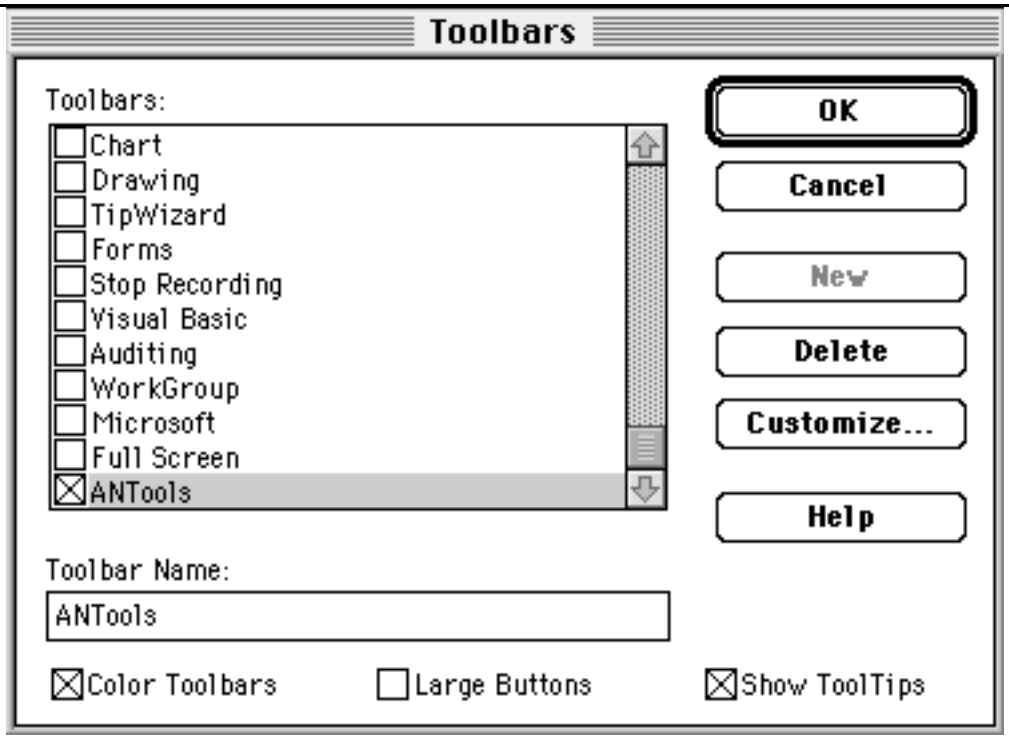
If you do not see the ANTools command bar, do the following:

1 Select “View/Toolbars...” from the Excel menu bar to access the Toolbars dialog.

2 Scroll to the end of the tool bar list and select the “ANTools” tool bar, as shown in Figure 4-5.

Figure 4-5
Excel Toolbars dialog

SC10383



ANTools command buttons

The following sections describe the command buttons on the ANTools command bar.

Calculating system data -  button

See Procedure 4-6 on page 4-22. Use this button to calculate the DS1 link, ESMA peripheral, and other system requirements based on your entries in the Input Questionnaire.

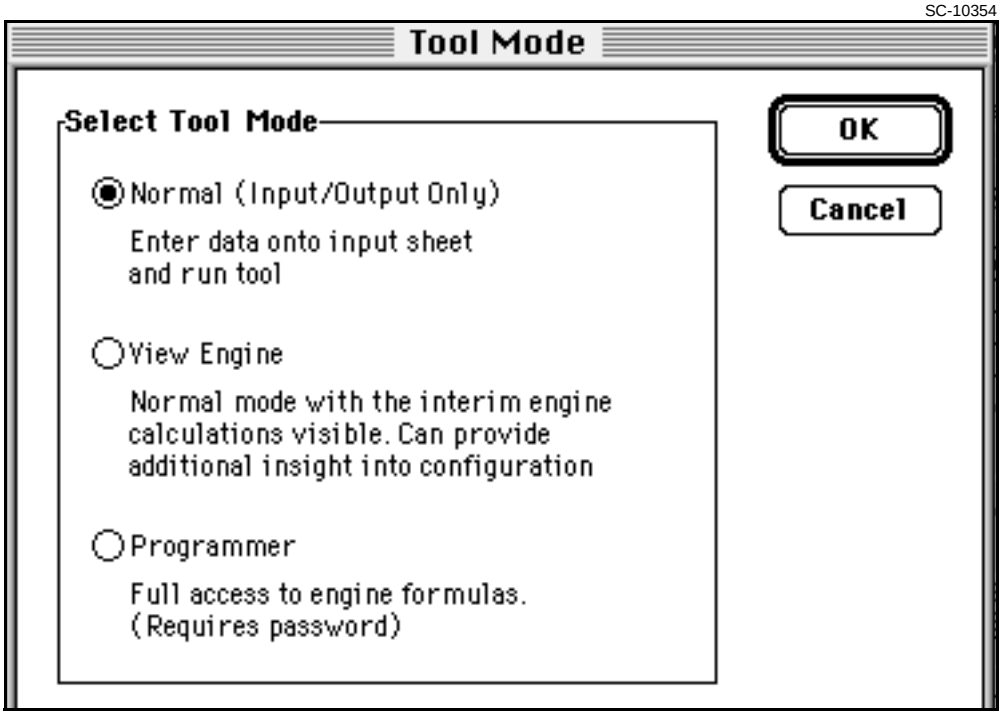
Traffic tool viewing modes -  button

This button offers you a choice of two modes for viewing and manipulating system data, as shown in Figure 4-6 on page 4-10.

> ***Note:*** The “Programmer” mode shown in Figure 4-6 is not available to users.

Figure 4-6
Traffic tool modes

SC-10354



Specifying the number of remote sites -  button

See Procedure 4-4 on page 4-15. Use this button to select the number of sites (1-16) in the system you are configuring.

Note: The traffic tool defaults to the maximum 16 sites.

Printing traffic tool data -  button

See Procedure 4-10 on page 4-31. Use this button to print all traffic tool data. Do not use the operating system print button or "File/Print" menu command. When you click on this button, the Print Options dialog displays options for printing Input data, Output data, and/or ESMA summary and detail reports.

Note: The Print Options dialog default has no options selected. Use the "Print Reports without shading" option, as the data is easier to read.

Clearing all system data - button

This button clears the traffic tool input and output data.

> **CAUTION**
> **Save data immediately after input**
> If you click this button, all data clears and is not retrievable.

Saving ESMA worksheets - button

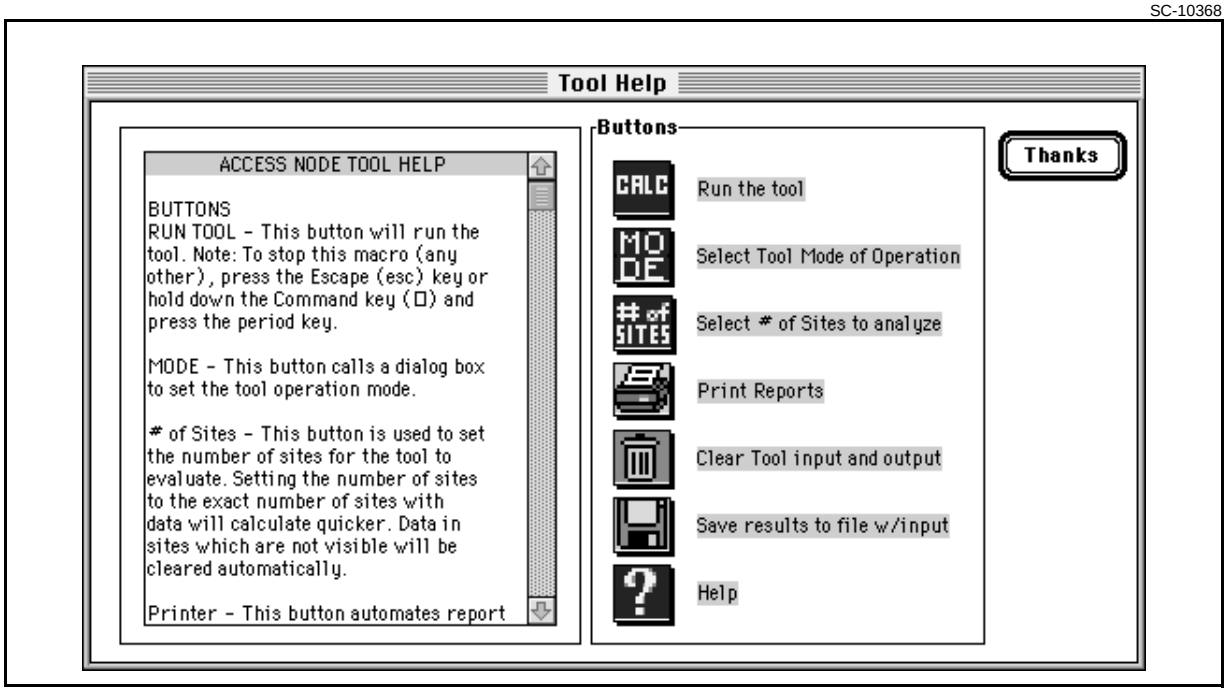
See Procedure 4-7 on page 4-27. Use this button to save the ESMA worksheet data. When you click on this button, the Save dialog displays the standard Excel options for saving the traffic tool ESMA worksheet data. The ESMA worksheet data includes the data in the Input Questionnaire, Summary of Inputs and Results, and Per ESMA Module Configuration.

Accessing traffic tool Help - button

This button launches the traffic tool help facility as shown in Figure 4-7. Help topics include much of the information in this chapter, such as the function/use of the ANTools command bar, tool operating modes, and data management.

Figure 4-7
Tool Help dialog

SC-10368



Procedure 4-1
Installing the traffic tool software

Use this procedure to install the traffic engineering tool.

Action

Step	Action
1	Insert the AccessNode CD-ROM.
2	Copy the PC or Macintosh file to your desktop.

—end—

Procedure 4-2
Setting up an AccessNode system configuration

This procedure gives the steps for setting up an AccessNode system configuration using the traffic tool. Each of the steps corresponds to a procedure in this chapter.

Action

Step	Action
1	Start the traffic tool (Procedure 4-3 on page 4-14).
2	Specify the number of sites you will be servicing (Procedure 4-4 on page 4-15).
3	Complete the Input Questionnaire for each site (Procedure 4-5 on page 4-16).
4	Calculate the AccessNode system requirements using the traffic tool (Procedure 4-6 on page 4-22).
5	Save the system ESMA worksheet input and output results (Procedure 4-7 on page 4-27).
6	View and interpret the ESMA worksheet input and output results (Procedure 4-8 on page 4-29).
7	Save the traffic tool including all data (Procedure 4-9 on page 4-30).
8	Print all system data (Procedure 4-10 on page 4-31).
9	Exit the traffic tool (Procedure 4-11 on page 4-32).

—end—

Procedure 4-3
Starting the traffic tool

Use this procedure to start the traffic engineering tool.

Action

Step	Action
1	Close any open Microsoft Excel files.
2	Double-click on the traffic tool icon, which looks like this:

The opening screen appears.

3	Click on Start to begin entering new system data.

—end—

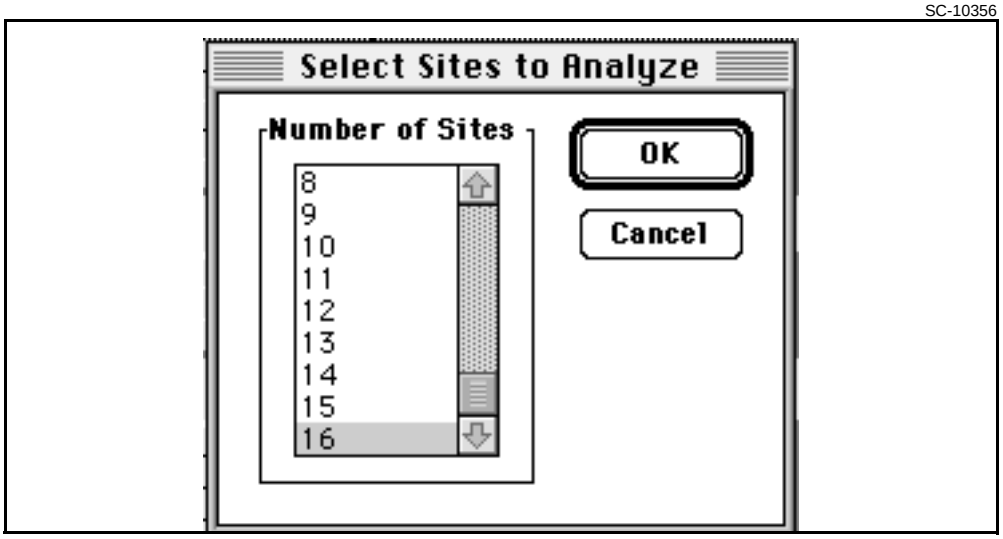
Procedure 4-4
Specifying the number of remote locations

Use this procedure to specify the number of remote sites. See “Remote site locations in the AccessNode” on page 2-1 for a definition of AccessNode remote site locations.

Action

Step	Action
1	Click on the “# of Sites” icon on the ANTools command bar (see “ANTools command bar” on page 4-8).
2	Select the number of sites (1-16) in the system (see the following screen). ***Note:*** The traffic tool defaults to the maximum 16 sites.

SC-10356



3	Click on the OK button.
4	Go to Procedure 4-5 to complete the Input Questionnaire.

—end—

Procedure 4-5
Completing the traffic tool Input Questionnaire

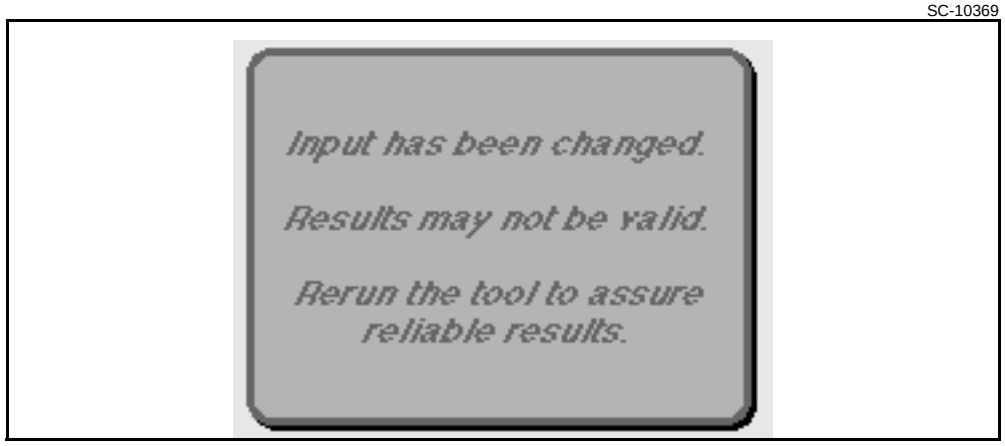
Use this procedure to complete the traffic tool Input Questionnaire. After you start the traffic tool, the "ToolESMA.xls" window appears, which contains the "Input Questionnaire" with the default values (see Figure 4-1 on page 4-5).

Entering new data

When you enter new data and change the default values, an input change reminder appears in the Summary of Results section of the ESMA worksheet as shown in Figure 4-8.

Figure 4-8
Input change reminder

SC-10369



The input change reminder indicates that the data shown in the Summary of Results and Per ESMA sections of the ESMA worksheet are not current. Recalculate the data to show results based on the new input.

Network requirements

This section describes the entries for the Network Requirements section of the Input Questionnaire.

—continued—

Procedure 4-5 (continued)
Completing the traffic tool Input Questionnaire

Site Name

Q1: Enter the designated name of each remote site location. All location names must be unique. See "Remote site locations in the AccessNode" on page 2-1 for the definition of a "site."

HDBH blocking

Q2: Do not enter data in this field. This field contains the default HDBH blocking grade of service objective for AccessNode systems. See "Basic traffic engineering concepts" on page 1-1 for a definition of HDBH blocking.

HDBH to ABSBH traffic ratio

Q3: Enter the grade of service objective for the HDBH (CCS)- to-ABSBH (CCS) traffic intensity ratio. Use operating company historical data for the HDBH traffic (in CCS) parameter. Calculate the HDBH-to-ABSBH CCS ratio, which must be greater than 1. AccessNode supports HDBH-to-ABSBH ratios from 1.1 to 1.7. The traffic tool defaults to 1.2 HDBH-to-ABSBH.

See "Basic traffic engineering concepts" on page 1-1 for a definition of HDBH-to-ABSBH traffic ratio.

AN percentage fill

Q4: Enter a number to designate the approved maximum fill percentage for the network element at each remote location. The traffic tool defaults to 100%.

AN with concentration

Q5: Enter Yes or No to indicate whether traffic concentration will be supported by the AccessNode network elements. The traffic tool defaults to Yes.

ESMA with concentration

Q6: The traffic tool does not calculate SMA2 concentration, so you cannot edit this field. It is set to "no" for all calculations. However, the switch matrix timeslot of the SMA2 module supports up to a 1.25:1 concentration ratio for DS0 traffic.

GR-303 DMS Line Quantities

Where the traffic tool interface displays TR303 read as GR-303 DMS.

This section describes the entries for the GR-303 DMS line quantities input section of the Input Questionnaire. See "AccessNode services" on page 2-3 for brief descriptions of each of these services.

—continued—

Procedure 4-5 (continued)
Completing the traffic tool Input Questionnaire

POTS lines

Q20: Enter the number of standard service lines—referred to as plain old telephone service (POTS)—served by the GR-303 DMS host at each remote location.

RES lines

Q21: Enter the number of residential and business lines supporting Custom Local Area Signaling Services (CLASS) for each remote location served by the GR-303 DMS host.

COIN lines

Q22: Enter the number of coin lines served by the GR-303 DMS host at each remote location.

MDC lines

Q23: Enter the number of Meridian Digital Centrex (MDC) lines served by the GR-303 DMS host at each remote location.

EBS (P-Phone) lines

Q24: Enter the number of electronic business set (EBS or Nortel P-Phone, integrated application only) lines served by the GR-303 DMS host at each remote location.

EBS (P-Phone) lines used as ACD agents

Q25: Enter the number of electronic business set (EBS or Nortel P-Phone) lines used as ACD agents at each remote location served by the GR-303 DMS host.

UVG lines

Q26: Enter the number of universal voice grade lines served by the GR-303 DMS host at each remote location.

ISDN lines

Q27: Enter the number of Integrated service digital network (ISDN) lines served by the AccessNode at each remote location.

Special Circuits (Tandem) Quantities

This section describes the entries for the special circuits (tandem) quantities section of the Input Questionnaire. See “AccessNode services” on page 2-3 for a description of DS1 tandem services.

—continued—

Procedure 4-5 (continued)
Completing the traffic tool Input Questionnaire

2 wire tandem

Q40: Enter the total number of 2-Wire (including POTS) tandem DS1 lines for each site in the AccessNode system.

4 wire tandem

Q41: Enter the total number of 4-Wire tandem DS1 lines for each site in the AccessNode system.

6/8 wire tandem

Q42: Enter the total number of 6/8-Wire tandem DS1 lines for each site in the AccessNode system.

—continued—

Procedure 4-5 (continued)
Completing the traffic tool Input Questionnaire

Line Traffic Parameters (ccs) ABSBH

This section describes the entries for the line traffic parameter (ccs) ABSBH section of the Input Questionnaire. See “Basic traffic engineering concepts” on page 1-1 for definitions of these parameters and related concepts. See “AccessNode services” on page 2-3 for descriptions of each service type.

Average line traffic parameters by service type

Q50-57: Enter the estimated average traffic parameters in hundred-call-seconds (CCS) per hour during the average busy-season- busy-hour (ABSBH). The acceptable range is 0 to 18, up to an HDBH level of 20.4 CCS. If you do not enter these parameters for each provided service type, the traffic tool uses the default values in its calculations. Table 4-2 lists the default values for each of the service types.

Table 4-2
Traffic tool CCS ABSBH defaults

Service type	Traffic tool default CCS ABSBH
POTS	3 CCS ABSBH
RES (CLASS)	3 CCS ABSBH
Coin	5 CCS ABSBH
MDC (non P-Phone)	5 CCS ABSBH
EBS (P-Phone)	5 CCS ABSBH
EBS (P-Phone) used as ACD	5 CCS ABSBH
Universal Voice Grade	3 CCS ABSBH
ISDN (2B+D)	6 CCS ABSBH

Internet Parameters

This section describes the entries for the internet parameter section of the Input Questionnaire. You must provide the Internet traffic parameters for all site locations supporting line occurrences from AccessNode remote terminals used for Internet applications.

Internet Penetration

Q60: Enter percentage of lines to be used for Internet dialup access (POTS, RES and UVG lines).

—continued—

Internet Average traffic

Q61: Enter for the Internet traffic the estimated average traffic parameter in hundred-call-seconds (CCS) per hour.

GR-303 DMS Packet Line Traffic Parameters

Where the traffic tool displays TR303 read as GR-303 DMS.

This section describes the entries for the GR-303 DMS packet line traffic parameter section of the Input Questionnaire. You must provide the packet traffic parameters for all site locations supporting ISDN line occurrences from AccessNode remote terminals. See the "ISDN lines" section of "AccessNode services" on page 2-3 for a description of GR-303 DMS line traffic parameters.

Bb's LAPB/X25 terminals to DMS-100

Q90: Enter the number of 64-kb/s B-channels using link access protocol B (LAPB) on X.25 terminals requiring interface to the DMS-100. The value must be less than 10% of the total number of ISDN lines.

LAPD/X25 terminals per ISDN line

Q91: Enter the number of terminals (0 to 8) for each ISDN line that uses link access protocol D (LAPD) according to X.25 protocols.

Average dpps all LAPD/X25 terminals per ISDN line

Q92: Enter the estimated average data packets per second (dpps) for all LAPD/X.25 terminals per ISDN line. The acceptable range is 0.05 to 0.7.

—end—

Procedure 4-6
Calculating system data

After you complete Procedure 4-5 on page 4-16, use this procedure to calculate your system requirements. based. See the following figures for examples of this procedure:

- Figure 4-9 on page 4-23 for a completed Input Questionnaire for two sites, “Atlanta” and “Norcross”
- Figure 4-10 on page 4-24 for the Populater worksheet results based on the data entered for the Atlanta and Norcross sites
- Figure 4-11 on page 4-25 for the Summary of Inputs and Results worksheet results for the Atlanta and Norcross sites
- Figure 4-12 on page 4-26 for the Per ESMA Module Configuration worksheet results for the Atlanta and Norcross sites

Action

Step	Action
1	Click on the  button on the ANTools bar to begin the calculation process. During the calculation process, the traffic tool automatically displays the “Populater” worksheet, which shows the details for each ESMA as it is being populated. ***Note:*** If the Excel “Status” bar is visible (select <View/Status Bar> from the Excel menu bar), you can see the progress of the calculations for each AccessNode remote terminal and ESMA switch peripheral. When the calculations are complete, the ESMA worksheet and the Summary of Inputs and Results and Per ESMA Summary fields show the results of your calculations. **—continued—**

Procedure 4-6 (continued)
Calculating system data

Figure 4-9
Example completed Input Questionnaire - Atlanta and Norcross sites

SC-10335

10/02/97 10:09 am

Input Questionnaire

Que:	Network Requirements	Acceptable Ranges	Sites I	Sites II
			Atlanta	Norcross
Q1	Site Name	input		
Q2	HDBH Blocking	0.05	0.05	0.05
Q3	HDBH To ABSBH Traffic Ratio	1.1 to 1.7 (default=1.2)	1.2	1.5
Q4	AN percentage fill?	up to 100% (default=100)	100	75
Q5	AN with concentration?	yes or no (default=yes)	No	Yes
Q6	SM-2 with concentration?	no	No	No
	TR303 Line Quantities			
Q20	POTS lines	input	480	960
Q21	RES lines	input	200	400
Q22	COIN lines	input	140	280
Q23	MDC lines	input	120	240
Q24	EBS (P-Phone) lines	input	140	280
Q25	EBS (P-Phone) lines ACD agents	input	12	24
Q26	UVG lines	input	350	700
Q27	ISDN lines 2B+D	input	250	500
	Special Circuits (Tandem) Quantities			
Q40	2 wire tandem	input	400	800
Q41	4 wire tandem	input	50	100
Q42	6/8 wire tandem	input	30	60
	Line Traffic Parameters (ccs) ABS *Note: Do not enter ccs if Internet = 100%*			
Q50	Avg traffic POTS	up to 36 (default=3)	3.00	4.00
Q51	Avg traffic RES	up to 36 (default=3)	3.00	4.00
Q52	Avg traffic COIN	up to 36 (default=5)	3.00	4.00
Q53	Avg traffic MDC	up to 36 (default=5)	3.00	4.00
Q54	Avg traffic EBS (P-Phone)	up to 36 (default=5)	5.00	8.00
Q55	Avg traffic ACD agents	up to 36 (default=5)	5.00	8.00
Q56	Avg traffic UVG	up to 36 (default=3)	3.00	4.00
Q57	Avg traffic ISDN B-Channel	up to 36 (default=6)	6.00	9.00
	Internet Parameters			
Q60	Internet Penetration	up to 100%	5	10
Q61	Internet Avg traffic	up to 36	12.00	18.00
	TR303 Packet Line Traffic Parameters			
Q90	Bb's LAPB/X25 terminals	input	5	10
Q91	LAPD/X25 terminals per ISDN line	0 to 8	2	6
Q92	Avg dpps all LAPD/X25 per ISDN	0.05 to 0.7	0.10	0.50

—continued—

Procedure 4-6 (continued)
Calculating system data

Figure 4-10
Populater worksheet - Atlanta and Norcross sites

TT-152.24

SMA2 - #1				
Links	DCHs	ISDN	Traffic	Site
5	1	63	2433	I
5	1	63	2433	I
5	1	63	2433	I
5	1	63	2433	I
6	1	46	3134	II
26	4	298	12866	22
PSide	30	14	CSideBb+Bd	

SMA2 - #2				
Links	DCHs	ISDN	Traffic	Site
6	1	46	3134	II
6	1	46	3134	II
6	1	46	3134	II
6	1	46	3134	II
6	1	46	3134	II
30	4	230	15670	20
PSide	34	16	CSideBb+Bd	

SMA2 - #3				
Links	DCHs	ISDN	Traffic	Site
6	1	46	3134	II
6	1	46	3134	II
6	1	46	3134	II
6	1	46	3134	II
6	1	46	3134	II
30	4	230	15670	20
PSide	34	16	CSideBb+Bd	

—continued—

Procedure 4-6 (continued)
Calculating system data

Figure 4-11
Summary of Inputs and Results - Atlanta and Norcross sites

SC-10337

Summary of Inputs and Results

Input Summary	Sites I	Sites II
Site Name	Atlanta	Norcross
Total lines	2,172	4,344
AN percentage fill	67%	64%
AN concentration rate	1.00	1.82
TR303 Non-ISDN lines (All)	1442	2884
TR303 Non-ISDN lines (Voice)	1369	2595
TR303 Non-ISDN lines (Internet)	73	289
TR303 ISDN line (All)	250	500
TR303 ISDN lines (Voice)	237	450
TR303 ISDN lines (Internet)	13	50
2/4/6/8 wire Tandem	480	960
DS1s per Site	1	11
Avg traffic Non-ISDN lines (HDBH)		8.84
Avg traffic ISDN lines (HDBH)		21.60

AccessNode Summary	I	II
ANs	5	10
Total lines per AN	435	435
TR303 Non-ISDN lines (All)	289	289
TR303 Non-ISDN lines (Voice)	274	260
TR303 Non-ISDN lines (Internet)	15	29
TR303 ISDN line (All)	50	50
TR303 ISDN lines (Voice)	47	45
TR303 ISDN lines (Internet)	3	5
2/4/6/8 wire tandem	96	96
DS1s to SMA2 per AN w/o concent.	17	
DS1s to SMA2 per AN w/concent.		7
DS1s to DCS per AN	4	4
Total DS1s per AN	21	11

DCS Summary	All sites
DS1s from all AN to DCS	60

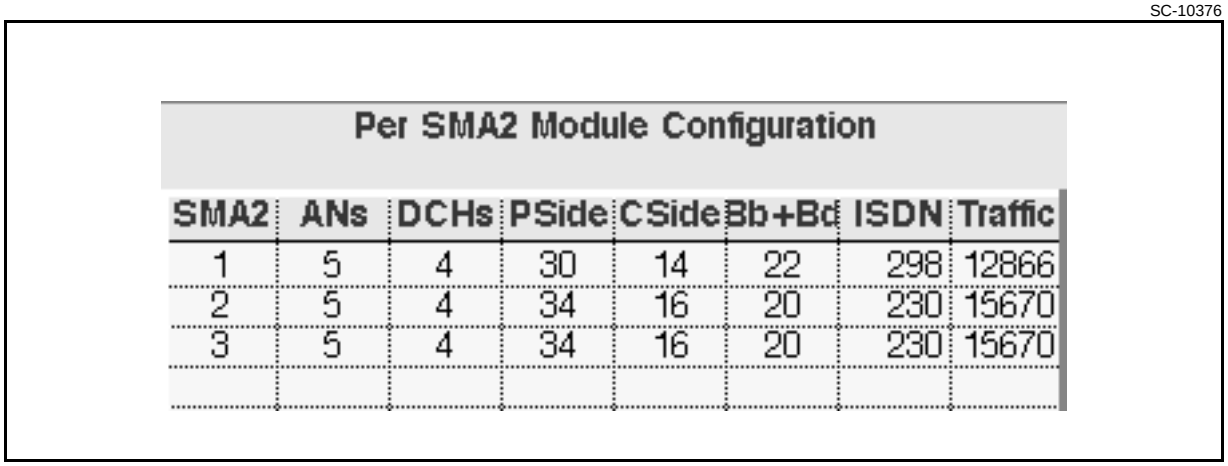
SMA2 Summary	All sites
SMA2s with ISDN lines	9
SMA2s with no ISDN lines	
Total SMA2s	9
Total ANs	15
AN to SMA2 ratio	1.67
Total DCHs	21

—continued—

Procedure 4-6 (continued)
Calculating system data

Figure 4-12
Per ESMA Module Configuration - Atlanta and Norcross sites

SC-10376



Per SMA2 Module Configuration

SMA2	ANs	DCHs	PSide	CSide	Bb+Bd	ISDN	Traffic
1	5	4	30	14	22	298	12866
2	5	4	34	16	20	230	15670
3	5	4	34	16	20	230	15670

—end—

Procedure 4-7
Saving ESMA worksheet data

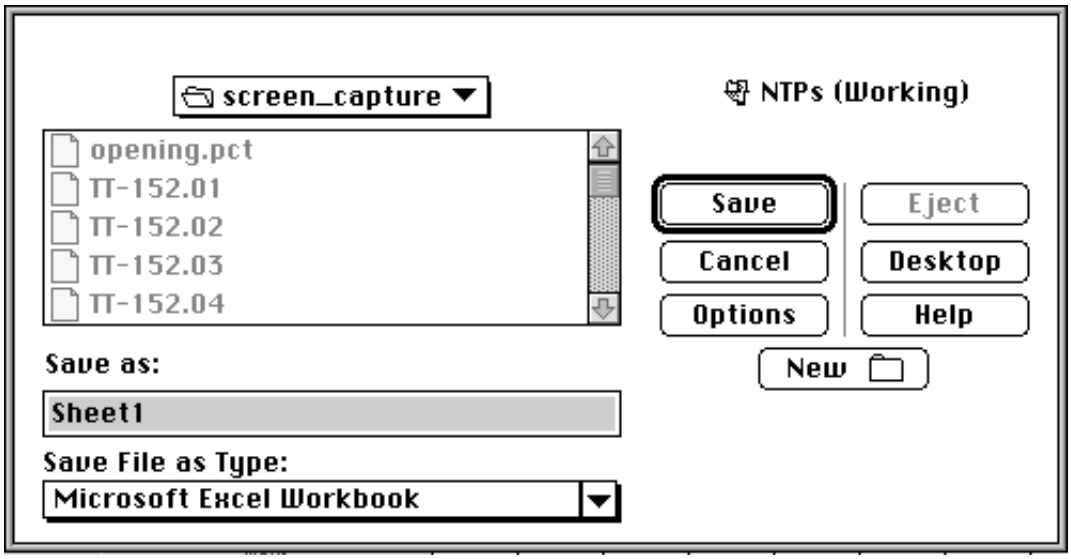
Use this procedure to save the ESMA worksheet data on a separate worksheet for printing copies for later analysis. The ESMA worksheet data includes the data in the Input Questionnaire, Summary of Inputs and Results, and Per ESMA Module Configuration. This procedure does not save the traffic tool.

Note: This procedure only saves the ESMA worksheet data.To save the data in the Populater worksheet, you must save the traffic tool as described in Procedure 4-9 on page 4-30, “Saving the traffic tool and all data”.

Action

Step	Action
1	Click on the  button on the ANTools bar. *The following dialog appears.*

SC-10366



2	Select the location and format you desire, and click on “Save”.

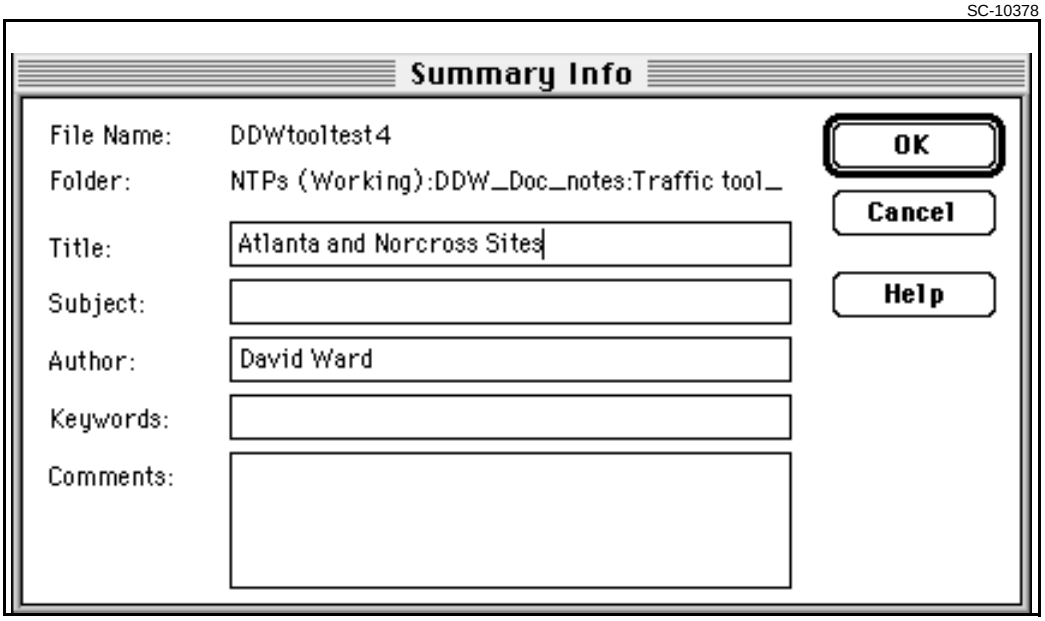
—continued—

Procedure 4-7 (continued)
Saving ESMA worksheet data

Step	Action

The Summary Info dialog appears.

SC-10378



3 Fill in the appropriate configuration information and comments, and click OK.

—end—

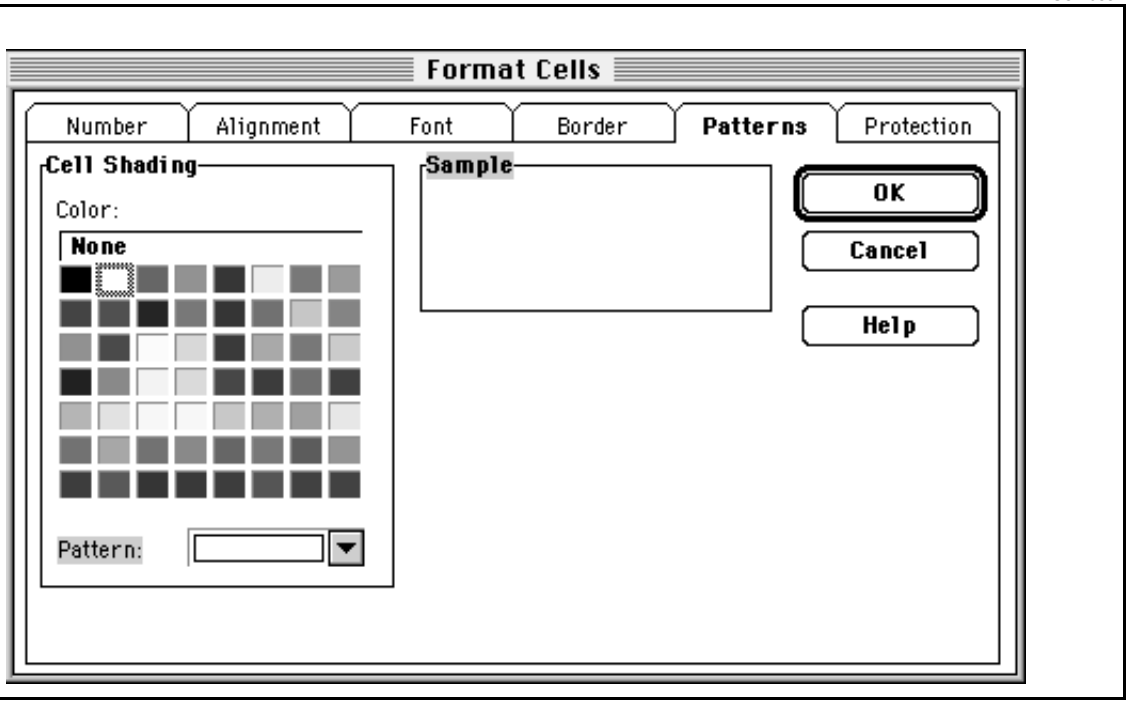
Procedure 4-8
Viewing and printing saved ESMA worksheets

Use this procedure to view and print the ESMA worksheet data you saved using Procedure 4-7 on page 4-27. The traffic tool saves the ESMA worksheet data in a dark cell format. Reformat the worksheet before viewing and printing.

Action

Step	Action
1	Open the Excel file containing the ESMA worksheet data.
2	Select all cells in the ESMA worksheet range.
3	Select “Format/Cells...” from the Excel menu bar.
4	In the Format Cells dialog, select the Patterns tab.

SC-10382



5	In the Patterns tab, select the white square in the Cell Shading color pallet or “None”, and click OK.
6	Print the ESMA worksheet data as you would any Excel worksheet. ***Note:*** Select landscape and fit-to-a-single-page print options.

—end—

Procedure 4-9
Saving the traffic tool and all data

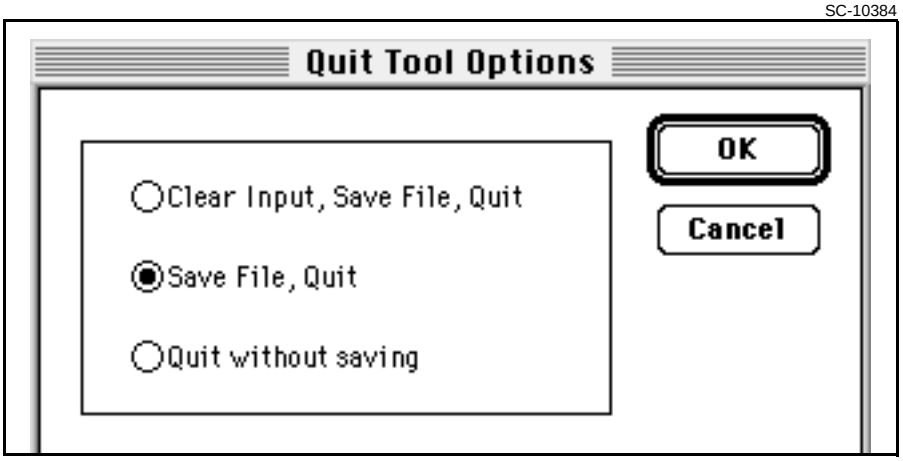
Use this procedure to save the traffic tool and all data, including the ESMA detail reports in the Populater worksheet.

CAUTION
Loss of traffic tool functionality
Do not rename the traffic tool program file. To copy all the data in the traffic tool, copy the program file with a new name. However, do all calculations and system configurations in the original traffic tool program file.

Action

Step	Action
1	Select “File/Save” from the Excel menu bar, or click the  icon on the Excel toolbar. ***Note:*** Do <u>not</u> click the  icon on the ANTools command bar. *The Quit Tool Options dialog appears.*

SC-10384



Note 1: You can also select the “Save File, Quit” option from the Quit Tool Options dialog.

Note 2: The Quit Tool Options dialog also appears when you select “File/Close” or “File/Quit” from the Excel menu bar.

—end—

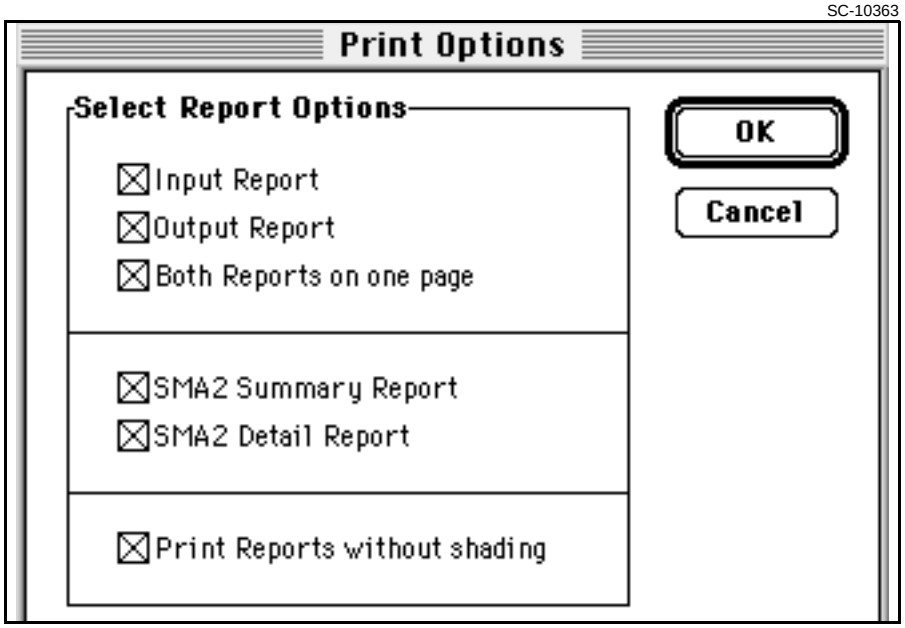
Procedure 4-10
Printing all traffic tool data

Use this procedure to print the traffic tool data.

Action

Step	Action
1	Click on the  button on the ANTools command bar. ***Note:*** Use this button for all printing. DO NOT use the Excel printing options. *The Print Options dialog appears.*

SC-10363



2	Select report options you want to print. ***Note:*** When the Print Options dialog appears, no report options are selected. You must select at least one of the top five options, or nothing prints. For clear output, always select the option, “Print Reports without shading.”

—end—

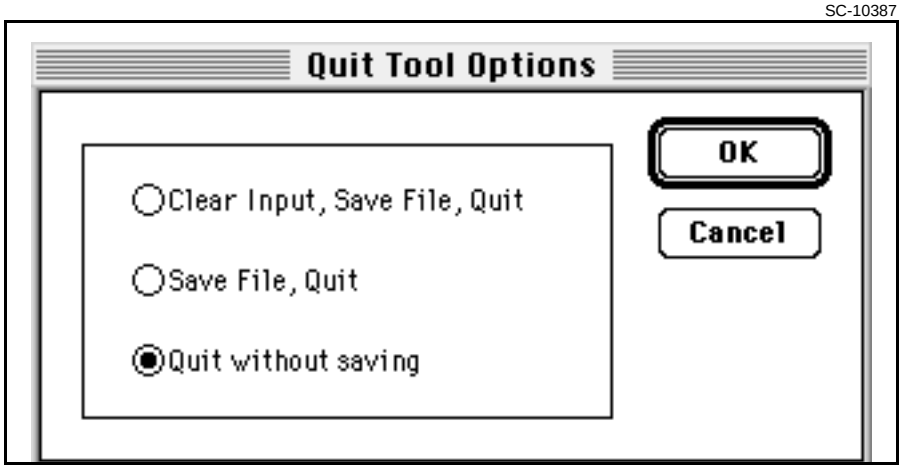
Procedure 4-11
Exiting the traffic tool

Use this procedure to exit the traffic tool.

Action

Step	Action
1	Select “File/Close” or “File/Quit” from the Excel menu bar. *The Quit Tool Options dialog appears.*

SC-10387



2	Select the quit option you want. ***Note:*** The traffic tool defaults to the “Quit without saving” option.

—end—

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Traffic and Bandwidth Engineering Information

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