DIGITAL SWITCHING SYSTEMS

DMS-100* FAMILY DATAPATH*

MSL/DMS-100* ASYNCHRONOUS ACCESS GENERAL DESCRIPTION

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1. INTRODUCTION

GENERAL

1.01 The Asynchronous Access Datapath feature supports a wide range of dial-up data communication applications similar to the Datapath RS-232 Data Unit (297-2121-226). The Asynchronous Access feature can be used in either DMS-100 offices or Meridian SL-100 PBXs. In either case, Asynchronous Access is supported only on inside plant facilities. It may not be extended to outside plant lines. Throughout this document, the telephone switch supporting Asynchronous Access is referred to as the MSL/DMS-100.

PRACTICE APPLICATION

1.02 The information in this Practice applies to offices with Batch Change Supplements 18-25 (BCS18-25) release software. Unless reissued, the Practice also applies to any office with subsequent BCS release software. The correspondence between BCS releases and Northern Telecom Practice (NTP) issues is given in "DMS-100 Master Index of Practices" (297-1001-001).

SOFTWARE IDENTIFICATION

1.03 Software applicable to a specific DMS-100 Family office is identified by a BCS release number and by Northern Telecom (NT) Product Engineering Codes (PEC). The significance of the BCS number and the PEC is described in 297-1001-450 (section 450/32) and in the Office Feature Record D-190.

1.04 A display of the BCS number and PEC for the NT feature packages available in a specific office can be obtained by entering the command string:

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PATCHER;INFORM LIST;LEAVE
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at a Maintenance and Administration Position (MAP).

REFERENCES

1.05 References listed as prerequisites are essential for an understanding of this Practice. Those listed as informative contain detailed information concerning other items mentioned in this Practice, but are not essential. References are inserted at the appropriate places in the text.

Note: The documents listed may exist in more than one version. See 297-1001-001 to determine the release code of the version compatible with a specific release of software.

Prerequisite References

DOCUMENT NUMBER	TITLE
297-1001-100	System Description

Informative References

DOCUMENT NUMBER	TITLE
297-1001-001	Master Index of Practices
297-2101-310	Service Order and Query System Reference Manual
297-2101-451	Customer Data Schema
297-2121-100	Datapath Guide to Documentation
297-2121-203	Asynchronous Access Installation
297-2121-226	Data Unit Installation and Maintenance
297-2121-303	Asynchronous Access Operation and Performance Testing
555-4141-100	AILU Description, Ordering, Installation and Operation
GS6X76	Asynchronous Interface Line Card General Specification

2. EQUIPMENT DESCRIPTION

2.01 DATAPATH uses an Asynchronous Interface Line Card (AILC) in a MSL/DMS-100 switch to provide Asynchronous Access.

2.02 The AILC occupies two standard line card slots and is mounted within a Line Concentrating Module (LCM) line drawer of the MSL/DMS-100 switch. The AILC uses both line card connectors: one for transmit, and the other for receive (RS 422 interface)

2.03 The basic function of the AILC is to interface with the Asynchronous Interface Module (AIM) or Asynchronous Interface Line Unit (AILU) that provide RS 422 or RS 232C interface conversion. However, Protocol Converter ports, X.25 Gateway ports, Personal Computer Interface Cards (PCIC), Apple MacIntosh computers, and DTE that are RS-422 compatible may also interface directly to the AILC. All Asynchronous Access features, such as keyboard dialing, NRS, and Autodial, are available in any of these configurations since the AILC contains the intelligence for the connection.

2.04 Although Datapath provides digital data communications, both digital and analog data sources and destinations are acceptable. Analog data sources are accessible via modem pooling (297-2121-224).

ASYNCHRONOUS INTERFACE LINE CARD

2.05 The MSL/DMS-100 Asynchronous Interface Line Card (AILC) available with BCS18 and higher software, contains the intelligence for the AIM. It is located in an LCM Line Card Drawer (requires two slots in the drawer) and is used with and encodes information streams received from the AIM. It routes this information through the MSL/DMS-100 switching network to the called data facility (computer or terminal).

2.06 Power constraints limit the total number of AILCs in a Line Card Drawer. A maximum of 21 AILCs may be installed in a normal G4 line drawer, provided that the remaining 11 2-slot positions are unoccupied.

Note: The AILC may also be used to connect terminals, protocol converter ports, X.25 gateway ports and other data transmission devices, that use an RS-422 interface, to the MSL/DMS-100 switching machine.

2.07 Each AILC supports one AIM unit. Each AILC has a microprocessor, a switching power supply and other electronic components. The transmission between the AIM and the AILC conforms to EIA RS-422 standards. The AILC supports transmission and reception of DTE data across its RS-422 interface. T-link EIA information stops at the AILC since there is no EIA signalling capability past the AILC.

ASYNCHRONOUS INTERFACE MODULE

2.08 The QMT9A Asynchronous Interface Module (AIM), available with BCS18 and higher software, is similar in appearance to the regular Data Unit (Fig. 1). It is packaged in a chameleon ash colored plastic housing that is 12.5 in (317.5 mm) long, 7.5 in (190 mm) wide. The module has a 4° slope with a front height of 1 3/4 in (44.5 mm) and a rear height of 2 3/4 in (70 mm). It weighs approximately 2 lb (1 kg).

2.09 The AIM is a stand-alone module that may be desktop or wall mounted and is used in conjunction with the DTE to originate or answer data calls within an MSL/DMS-100 environment. It supports keyboard dialing.

2.10 A standard 500/2500 telephone may be plugged into the rear of the AIM, using the 'phone' jack. When a voice pair is provided to the 'line' jack, the telephone then operates through the AIM line cord to a standard voice line card in the MSL/DMS-100 switch.

CONTROLS AND INDICATORS

2.11 The module is equipped with a power on/off switch and with a power on indicator.

CONFIGURATION

2.12 The AIM provides the interface between an RS-232-C compatible asynchronous DTE and the MSL/DMS-100 switch through an associated Asynchronous Interface Line Card (AILC).

2.13 The connection to the AILC is made via a miniature 6-position jack mounted on the rear of the housing. The AIM is equipped with a 7 ft (2.1 m) 6-conductor cord that is terminated with miniature 6-position plugs on each end.

2.14 The connection to the 110 V ac transformer is made with a 7 ft (2.1 m) 2-conductor cord that is attached to the rear of the unit.

2.15 The AIM can only be connected to the AILC. It cannot be connected to a Data Line Card (DLC).

2.16 The AIM connects to the DTE through a 25-pin connector that conforms to ISO-2110. The connector is mounted on the rear of the housing.

2.17 AIM can be connected in the back-to-back mode if the RS-422 send pair of one set is connected to the receive pair of the other set and vice versa.

PC INTERFACE CARD

2.18 The Personal Computer Interface Card (QPC512), available with BCS18 and higher software, permits connection of an IBM Personal Computer or IBM Personal Computer XT directly to the MSL/DMS-100 with standard twisted pair inside plant wiring. The card installs easily in the Personal Computer allowing the computer to be connected to the MSL/DMS-100 through a standard TELADAPT wall jack and the AILC. The PC may then access local and remote terminals, personal computers, other computer and databases using the MSL/DMS-100 networking capability.

2.19 The Personal Computer Interface Card User Guide (P0641829) provides installation information. However, the operating instructions only apply to the SL-1 Digital Communications Systems. Therefore, the operating instructions detailed in 297-2121-303 must be used with any Personal Computer equipped with the PCIC that is connected to the MSL/DMS-100 Switch and Datapath.

PROTOCOL CONVERTERS

2.20 Protocol Converters, with RS-422 compatible ports, facilitate circuit switched access to an IBM mainframe computer from ASCII terminals. Since no outside plant connections can be used, the IBM Mainframe must be colocated with the MSL/DMS-100 Switch. The Protocol Converter has a number of RS-422 ports which interface with an equal number of AILC at the MSL/DMS-100 via 4-wire twisted pair lines. The device emulates the functions of an IBM cluster controller and interfaces directly to the IBM front-end processor via a high-speed serial link.

2.21 The X.25 Gateway device, with RS-422 compatible ports, permits circuit-switched access to a public or private Packet Data Network (PDN). The configuration is similar to that of the Protocol Converter except that more than one (minimum two) high-speed serial link (trunks) is used to the PDN.

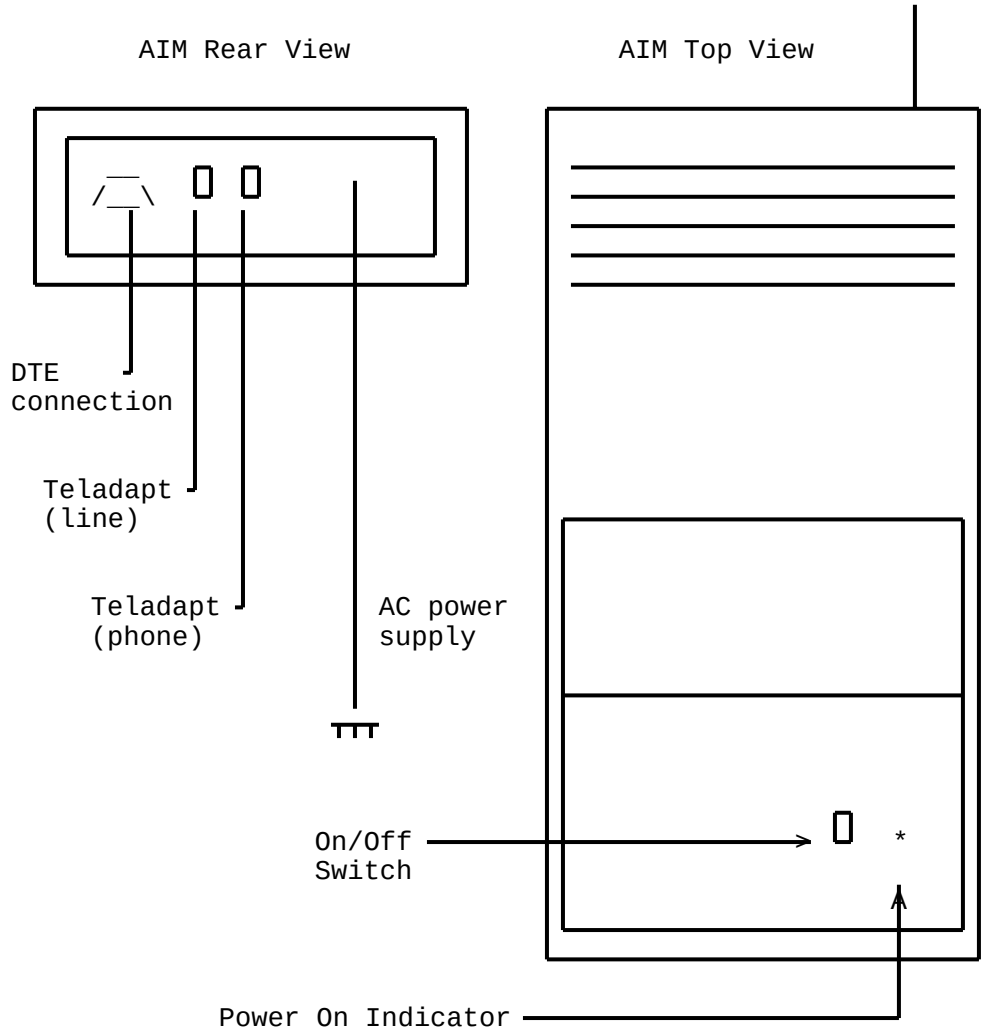

Fig. 1 - QMT9A Asynchronous Interface Module - Rear and Top View

3. DATA COMMUNICATION CHARACTERISTICS

QMT9A AIM

3.01 The AIM is a stand-alone module, equipped to transmit and receive data. It meets the DTE/DCE interface requirements of the EIA RS-232-C standard. The electrical characteristics of the interface to the associated Asynchronous Interface Line Card (AILC) meet the EIA RS-422 requirements. The AIM provides substantial electrical isolation between the RS-232 and RS-422 interfaces.

3.02 The AIM transmits data at 110, 150, 300, 600, 1200, 2400, 4800, 9600 and 19200 bps. Speeds may be determined by an autobauding procedure in the AILC.

3.03 The AIM RS-232 drivers and receivers convert logic signals to the RS-232 logical voltages. The optoisolator provides substantial ground isolation between the line interface and the DTE interface. The line is driven by the RS-422 drivers and receivers.

3.04 Table A indicates the EIA leads supported by AIM. These control leads are locally asserted. They do not support RTS/CTS flow control, and are not transmitted or received via T-link. DTE applications should not rely on these leads for dynamic control.

TABLE A
EIA SIGNALS SUPPORTED BY AIM

PIN NO.	DESCRIPTION	NAME	AIM CONNECTED TO DTE CKT FROM	TO
3	Receive Data (RXD)	BB	AIM	DTE
5	Clear to Send (CTS)	CB	AIM	DTE
6*	Data Set Ready (DSR)	CC	AIM	DTE
7	Signal Ground (SG)	AB	(common)	(common)
8*	Carrier Detect (CD)	CF	AIM	DTE
20#	Data Terminal Ready (DTR)	CD	DTE	AIM

* Held high by AIM and not under dynamic control.

\# DTE holds DTR lead to AILC in a steady space condition (OFF) as long as the DTE is not ready to transmit. When the DTE is ready to transmit, DTR is held in a steady mark condition (ON).

NT6X76AA AILC

3.05 The AILC uses EIA standard RS-422 signal levels and asynchronous baseband transmission to communicate with DTE that have the following characteristics:

Data Code	ASCII (ANSI standard X3.4)
Data Format	Asynchronous, Start-Stop (ANSI standard X3.15-1976)
Number of Bits	8-bits including parity
Parity	Mark, Space, Odd or Even
Data Rate	110, 150, 300, 600, 1200, 2400, 4800, 9600, 19200 bps
Stop Bits	2 bits for 110 bps; 1 bit for all other speeds
Clock	Internal, +/-1% Frequency Tolerance

PC INTERFACE CARD

3.06 The Personal Computer Interface Card transmits data to the AILC using the RS-422 data interface and functions with any MSL/DMS-100 Datapath system.

PROTOCOL CONVERTERS

3.07 The converter provides asynchronous ports for eight logical units; seven asynchronous ports and one dynamic printer port. A logical unit is assigned to each of the seven physical asynchronous connections. The eighth logical unit is a printer port that can be dynamically assigned to auxiliary ports associated with CRT connected to the seven asynchronous physical ports. The ports operate at speeds of 300, 600, 1200, 2400, 4800, or 9600 bps.

3.08 The converter provides one synchronous, full duplex/half duplex port that supports direct FEP connection (built-in optional modem eliminators) or remote connection via dedicated or dial-up modems. This port provides clocking, speeds of 1200, 2400, 4800 or 9600 bps and multi-drop configuration over private lines.

4. ABBREVIATIONS

AILC	Asynchronous Interface Line Card
AILU	Asynchronous Interface Line Unit
AIM	Asynchronous Interface Module
BCS	Batch Change Supplement
DTE	Data Terminal Equipment
LCM	Line Concentrating Module
PCIC	Personal Computer Interface Card
PDN	Packet Data Network