



**AM-TR-MKT-000108**

**AMERITECH DIRECTORY SEARCH (ADS)  
TECHNICAL DESCRIPTION**

All Ameritech Operational Information Document Originators N/A

N/A Issue #2, February 1994 N/A

N/A N/A N/A N/A N/A N/A

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## 1. Introduction

### 1.1. *Interface Overview*

The proposed interface offers direct access to Ameritech's database information without utilizing ADS operators.

The interface uses one method of transport, X.25 standard packet transmission service.

## 2. Access Description

Access to Ameritech's host computers will depend upon selection of transport facility and terminal equipment compatible with that selection according to the specifications contained in this publication.

### 2.1. *Data Architecture*

The character set in the interface is encoded in ASCII ANSI 3.64 Standard for asynchronous communication protocol. The asynchronous communication is configured with a 10-bit data word utilizing one start bit, seven data bits, one parity bit (even parity) and one stop bit. X-ON and X-OFF flow control will not be utilized. The send transmission signal for data streams is the carriage-return character. CPE data may be sent in either upper or lower case (or a combination thereof). ADS Host characters will be sent in upper case characters.

### 2.2. *X.25 Packet Network Interface Requirements*

Data will be transmitted over packet facilities conforming to CCITT X.25 user interface standards as described in Ameritech Technical Reference AM TR-NPL-000002, and X.75 interfaces to other packet switched public data networks described in Ameritech Technical Reference AM TR-NPL-000016.

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**2.2.1. X.25 Parameters and Options**

The following parameters and options should be utilized as specified in Ameritech Technical Interface Document AM TR-NPL-000002 issued May 1988 when accessing DA Hosts via the X.25 packet interface:

- A. Switched Virtual Calls only
- B. Default maximum packet size "64 octets"

**2.2.2. X.25 Customer Premises Equipment**

Equipment at the customer premises should be designed in accordance with standard X.25 packet transmission interface requirements described in Ameritech Technical Interface Document AM TR-NPL-000002 issued May 1988.

**2.3. System Availability and Data Base Access**

The ADS system will be available for user log-in seven days a week, 24 hours a day. System response time may not average more than two seconds per search at busy hour. System response exits the front-end processor and ends when the screen response exits the front-end back to the end user.

The ADS system will be connected to a copy of the existing Ameritech data bases from Illinois, Indiana, Michigan, Ohio and Wisconsin, which are IBM, and the Ameritech Packet Switch Network.

**2.4. End User ID/password**

A block of identification codes, which will consist of 10 digits, will be reserved for each ADS customer. For example, customer A would be assigned 7000000000 series, customer B assigned 8000000000 series. The user-id password will consist of an additional four alpha-numeric characters.

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## **2.5. Database Security**

ADS users must log-in with an assigned user-id and password. No user-id will be allowed to log-in if it is already in a log-in session. Users will be permitted three attempts at entering their assigned password.

An entry will be made in a security log file whenever a log-in fails.

The user will also be disconnected from the system with any of these conditions:

- A. A user-id fails to log-in after three tries
- B. An assigned user-id attempts to log-in while already logged-in
- C. A logged-in user session is inactive for a period exceeding the timeout threshold.

## **2.6. Critical Transmission Requirements**

The following requirements are critical to the efficient transport of data in this interface:

- A. ADS Host computers will not ECHO CPE data stream characters.
- B. Data forwarding is not permitted to occur until the data forwarding (send) carriage-return character is detected in a data stream. Transport Facility control functions must not override this requirement. Functions such as "Idle Timer Delay" in Packet Assembler/Disassembler devices must be inhibited or disabled. The CPE computers must not release data characters to any transport facility until all the characters for a logical data stream have been collected in a buffer.

## **3. Protocol Specification**

This section defines the protocol used for communication between end user customer equipment located on the customer premises (CPE) and ADS host.

### **3.1. Overview**

Communication between the CPE and the host is achieved by the exchange of Data Stream transactions. Data Streams are composed entirely of ASCII characters and end with the ASCII

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character carriage-return. The contents of the Data Streams vary with the Data Stream being sent and are composed of smaller components called records. Records start with an ASCII character backslash (\) followed by an upper case alpha character. Multiple records may be present in a data stream from ADS to the CPE but not from the CPE to ADS.

(See Table 3-1 Data Stream Records)

### **3.2. Record Identifiers and Contents**

Records begin with a backslash (\) character. Records are further divided into fields. The method by which these fields are distinguished depends on the type of field. The three types of fields are keyword, ordered and positional. These types of fields are defined as follows:

A. A keyword field begins with one (1) letter keyword, is followed by an equal sign (=) character, and ends with either a field separation pipe (|) character, a new record indicator backslash (\) character or the end of data stream indicator (carriage-return) character. Keyword fields may appear in any sequence in a record.

B. An ordered field begins after a field separator (|), or in a fixed position if it is the first ordered field, has a variable length up to a maximum (see Table 3.1 Data Stream Records), and ends with a field separator. The absence of data in an ordered field is represented by the field separator only. The identity of an ordered field is determined by the number of fields that have preceded the field (i.e., nth field of a record). The absence of data in a field is represented by a field separator followed by another field separator, a new record indicator, or an end of data stream indicator.

C. A positional field begins in a fixed character position, has a defined length, and ends in a fixed position.

#### **TABLE 3-1 Data Stream Records**

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TABLE 3-1 Data Stream: Records

ORIGI-NATOR		RECORD TYPE	RECORD DESCRIPTION	FIELD DESCRIPTION	TYPE	POSITION KEY/ ORDERED	CONTENT TYPE	MAND- ATORY	MAX CHAR	CODE	CONTENTS
CPE	U	User Login	User Id	POS	3	A/N	YES	10			(User Identification)
			Password	POS	4	A/N	YES	4			(User Password)
	Q	User Query	Area Code (NPA)	KEY	A=	N/M	YES	5			*A= (NPA)
			Locality Name	KEY	L=	A/N	YES	32			*L= (City, Town, Neighborhood, etc.)
			Search Indicator	KEY	I=	Alpha	YES	3			*I= 'R' or 'B' or (M, C, S, F or G)
			Search Name	KEY	N=	A/N	YES	32			*N= (Res., Bus. or Gov. Name)
			Place Name	KEY	P=	A/N	NO	24			*P= (Street Name)
			Subordinate Search	KEY	S=	A/N	NO	24			*S= (Specific Identification Within a Caption: Set Bus. & Gov Only)
	M	More Listings Request	User Request Continuation of Listings From Same Query	POS	3	Alpha	YES	4			"MORE"
	L	User Logout	User Request For Logout From System	POS	3	Alpha	YES	6			"LOGOFF"
E D A	U	Host Login Request	Login Request	POS	3	A/N	YES	2		E1	
	I	Host Notice of Invalid Login	Login Invalid	POS	3	A/N	YES	2		E2	
	T	Trunk Time Exceeded System Disconnected	User Time Exceeded	POS	3	A/N	YES	2		E3	
	D	Disconnect	User Disconnected	POS	3	A/N	YES	2		E4	
	L	User Logout Response From Host	Session Ended	POS	3	A/N	YES	2		E5	
	R	Host Resource Failure	Resource Failure	POS	3	A/N	YES	2		E6	
	V	Host Notice of Valid Login	Login Valid	POS	3	A/N	YES	2		E7	
	G	Network Transport Failure	Garbled CPE Data Stream	POS	3	A/N	YES	125		E8	(Up to 125 Char. of Record)
	H	Directory Inaccessible	Data Base Lock Out	POS	3	A/N	YES	2		E9	

\* Total aggregate number of characters in combined name, address and street, and locality is limited to ninety (90)

\* Total aggregate number of characters in combined name, address and street, and locality is limited to ninety (90)

**TABLE 3-1 Data Stream Records**

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ORIGI- NATOR	RECORD TYPE	RECORD DESCRIPTION	FIELD		TYPE	POSITION KEYS UNDELETED	CONTENT TYPE	MAND- ATORY	MAX CHAR	CORE	CONTENTS
			DESCRIPTION	KEYS							
	S	Screen Header	Search Area Code	POS	3	NUM	YES	3			(NPA)
			Total Number of Q Records Returned	ORD	2	NUM	YES	2			(Number and Range 00-99)
			Copyright Year	ORD	3	NUM	YES	4			(Last Four Digits of Year, i.e., 1987)
			Search Initiation	ORD	4	ALPHA	YES	1			(A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z)
			Search Locality Name	ORD	6	ANY	YES	40			(City, Town, Neighborhood, etc.)
			Search Prefix Suffix	ORD	7	ANY	YES	22			(Street)
			Stipulative Search Information	ORD	8	ANY	YES	22			(Successive Name)
	C	Capital Teacher/Subscriber Information	Level of Index	POS	3	NUM	YES	1			(Numeric Range 0-9)
			Capital Text	ORD	2	ANY	YES	20			(First Capital for Word of Char. 3-9; 1-9; 10-19; 20-29)
	Q	Listing Record	Listing Index Level	POS	3	NUM	YES	1			(Numeric Range 0-9)
			Listing Name	ORD	2	ANY	YES	50*			(Residence, Business or Government Name or NY)
			Listing Telephone Number	ORD	3	ANY	YES	18			(Professional Listing Telephone Number or NY)
			Listing Address and Street	ORD	4	ANY	YES	90*			(City Address)
			Listing Locality	ORD	5	ANY	YES	40*			(City, Town, Neighborhood, etc.)
	N	Total Number of No Listings Found	No Listings Found	POS	3	ANY	YES	7		F1	
	E	How Many of Too Many Listings Found	Too Many Listings	POS	3	ANY	YES	2		F2	
	M	Error Message	Locality Invalid For This Basecode	POS	3	ANY	YES	36		F3	(L = Up To 30 Char of Entry)
			Invalid Entry	POS	3	ANY	YES	36		F4	(M = Up To 30 Char of Entry)
			Search Criteria Missing	POS	1	ANY	YES	18		F5	(ADDDN) (Separated by Blank)
			Maximum Characters Exceeded	POS	3	ANY	YES	12		F6	(R = For Required Information)
			Invalid Keyword	POS	3	ANY	YES	4		F7	(First 2 Char. in Keyword)
			Invalid Area Code	POS	3	ANY	YES	4		F8	(A = Area Code Entry)
			Invalid Record Type	POS	3	ANY	YES	17		F9	(Up to 123 Char. of Record)
			Invalid Type Code	POS	3	ANY	YES	17		G1	(Up to 123 Char. of Record)
			Sequence	POS	3	ANY	YES	36		G2	(K = Up To 30 Char. of Entry)
			Search Elements	POS	3	ANY	YES	36		G3	(L = Up To 30 Char. of Entry)
			Interquable	POS	3	ANY	YES	36		G3	(L = Up To 30 Char. of Entry)

\* Total aggregate number of characters in combined name, address and street, and locality is limited to ninety (90)

#### 4. Data Flow Procedure Description

The data flow procedure describes the logical sequence of events of data stream transactions and is in direct reference to Attachment 1 ADS Data Flow Diagram. The steps contained in this procedure do not include error and recovery steps (see Section 4.2 Error and Recovery Procedures).

ADS users must log-in with an assigned user-id and password. No user-id will be allowed to log-in if it is already in a log-in if they fail to input the correct password after three tries. User search and system response details are described in Attachment 1.

Maximum number of lines of information per screen will be ten.

End users will be able to make business, residence, and government searches as is the case with directory assistance. Government searches will be single level only.

Searches will be presented to the ADS system one at a time and expect either screen or system messages as a response. System Messages are described in Section 4.2 (Table 4-1). The first screen of a multiple screen response will be sent by the ADS Host automatically. If the user desires subsequent screens for that response, they will send the appropriate page forward search.

4.1. *Data Flow Procedure*

<u>STEP</u>	<u>PROCEDURE</u>
START A	<ul style="list-style-type: none"> <li>▪ CPE initiates Packet wake-up signal to ADS Host Computer.</li> <li>▪ ADS HOST responds with \U Login request record.</li> <li>▪ ADS HOST sets (or resets) one (1) minute timer to measure CPE idle time.</li> <li>▪ ADS HOST monitors timer to determine if one (1) minute has elapsed before a CPE response.</li> <li>▪ If timer <math>\geq</math> (1) minute ADS HOST sends \T record and then executes procedure step G. else CPE sends \U Login security data.</li> <li>▪ if CPE login is valid ADS HOST sends \V Login valid record to CPE. ADS HOST sets (or resets) inactivity threshold timer. Else if this is CPE's third (3<sup>rd</sup>) unsuccessful attempt to Login, ADS HOST sends \D disconnect message to CPE. ADS HOST then executes procedure step G. Else ADS HOST sends \ Invalid Login record to CPE and Then returns to procedure step A.</li> </ul>
B	<ul style="list-style-type: none"> <li>▪ If timer <math>\geq</math> inactivity threshold ADS HOST executes step E. else CPE sends \Q Query record to ADS HOST.</li> </ul>
C	<ul style="list-style-type: none"> <li>▪ ADS HOST answers CPE Query with \S Search Criteria record plus the appropriate answer to CPE Query of either \M, \E, \N, or \Q or \C and multiple \Q records; or just multiple \Q records (see Table 3-1 for ADS HOST data streams records).</li> <li>▪ ADS HOST resets inactivity threshold timer.</li> <li>▪ If the number of \Q listings received by CPE is &lt; total number of Q listings found by ADS HOST, If CPE desires to see more of the found listings, If timer &lt; inactivity threshold CPE sends \M request for more listings to ADS HOST. ADS HOST executes step C. Else ADS HOST executes procedure step E. Else CPE executes procedure step D.</li> </ul>
D	<ul style="list-style-type: none"> <li>▪ If CPE wants another new Query CPE executes step B. Else if timer &gt; inactivity threshold ADS HOST executes step E. Else CPE sends \L Logoff request record to ADS HOST. ADS HOST then executes step F.</li> </ul>
E	<ul style="list-style-type: none"> <li>▪ ADS HOST sends \T Timeout record to CPE.</li> </ul>
F	<ul style="list-style-type: none"> <li>▪ ADS HOST responds with \L Logged Off record to CPE.</li> </ul>
G	<ul style="list-style-type: none"> <li>▪ ADS Host releases port and transport facility.</li> </ul>

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#### **4.2. *Error and Recovery Procedures***

If a reset occurs on a packet transport facility and a data stream was lost or garbled as a result the CPE will resend the data stream transaction involved at the time the reset happened. The ADS Host will send a "\G" record if it receives a garbled transaction within one (1) second after receipt of a network reset.

If the connecting public switched network link is lost during a dial up session the CPE will reinstate the dial up procedure. After successful Login the User will resume transacting with the ADS Host by resending the last Q query record attempted before the link was lost.

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Table 4-1 Host Codes Contained in Record's Data Content Field.  
- Maximum length of a message is 125 characters of content.

These messages may appear in combination:

Type	Code	Message	Message Explanation
U	E1	\UE1	<b>HOST LOGIN REQUEST</b> - Sent after customer has successfully initiated a connection to the ADS Host computer.  No charge message
I	E2	\IE2	<b>HOST NOTICE OF INVALID LOGIN</b> - Sent if the login and/or password provided on the customer's \U record is invalid. Possible reasons:  1. Record received by the host does not begin with the two characters \U. 2. Login is blank or does not exist. 3. Password is invalid. 4. Login is invalid.  No charge message
D	E4	\DE4	<b>DISCONNECT</b> - Sent on any abnormal termination, except for timeout. Sent after three (3) invalid login attempts.  No charge message
R	E6	\RE6	<b>HOST RESOURCE FAILURE</b> - Sent whenever a serious error code is detected.  No charge message
V	E7	\VE7	<b>HOST NOTICE OF VALID LOGIN</b> - Sent upon successful validation of the ID and password provided by the customer on the \U record. Indicates that the ADS session is ready to begin accepting inquiries.  No charge message
G	E8	\GF8<data>	<b>NETWORK TRANSPORT FAILURE (GARBLED CPE DATA STREAM)</b> - Sent as either a stand-alone message or concatenated in a data stream with a \S record when a record not beginning with the backlash character (\) is received. Is followed by up to 123 characters of the record received which caused the error.  No charge message
H	E9	\HE9	<b>DIRECTORY INACCESSIBLE (DATA BASE LOCK OUT)</b> - Sent when the ADS data base is not on-line.  No charge message
N	F1	\NF1	<b>NO LISTINGS FOUND</b> - Sent when the number of valid listings retrieved by an inquiry is zero (0).  No charge message
E	F2	\EF2	<b>TOO MANY LISTINGS</b> - Sent when the number of listings retrieved by an inquiry is:  1. Greater than 60 for a RES 2. Greater than 99 for a BUS/GOV  No charge message

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Table 4-1 Host Codes Contained in Record's Data Content Field.  
- Maximum length of a message is 125 characters of content.

These messages may appear in combination:

Type	Code	Message	Message Explanation
T	E3	\TE3	<b>IDLE TIME EXCEEDED SYSTEM DISCONNECTED</b> - Sent if the session has been idle longer than the allotted limit.  No charge message
L	E5	\LE5	<b>USER LOGOFF RESPONSE FROM HOST</b> - Sent on normal session termination, i.e., issuance of a log off request by the customer.  No charge message
M	F7	\MF7<keyword>=	<b>INVALID KEYWORD</b> - Sent when <keyword> is not in the list of valid keywords.  No charge message
M	F4	\MF4<keyword>=<data>	<b>INVALID ENTRY</b> - Sent when <keyword> is a valid keyword but <data> is not within the range of acceptable values for the particular keyword, e.g., any keyword followed by a null value.  No charge message
M	F8	\MF8A=<area code>	<b>INVALID AREA CODE</b> - Sent when the area code provided is not valid in Amentech territory.  No charge message
M	F3	\MF3L=<locality>	<b>LOCALITY INVALID FOR THIS DIRECTORY</b> - Sent when the locality provided on an inquiry is not valid.  No charge message
M	F9	\MF9<data>	<b>INVALID RECORD TYPE</b> - Sent when the first character of the record is a backslash, but the second character is not a valid record type. NOTE: During the login procedure any record not beginning with the two characters \U will cause a \IE2 message to be issued.  No charge message
M	F6	\MF6<data>	<b>MAXIMUM CHARACTERSEXCEEDED</b> - Sent when either  1. Total Record length of the customer inquiry exceeds 128 2. An individual keyword field exceeds the maximum length for that field: N>30 L>30 P>22 S>22 A>3 I>1  No charge message
M	F5	\MF5<keyword list>	<b>SEARCH CRITERIA MISSING</b> - Sent when the inquiry does not contain a keyword and data value which have been designated as mandatory, i.e., Indicator (I=), Locality (L=), Area Code (A=) and Name (N=) not all present.  No charge message

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Table 4-1 Host Codes Contained in Record's Data Content Field.  
- Maximum length of a message is 125 characters of content.

Type	Code	Message	Message Explanation
M	G1	VMG1<record>	<b>RECORD TYPE OUT OF SEQUENCE</b> - Sent when the ADS system expects to receive a \Q record and some other record type is received instead. The most common case is when the an \M record is sent when no additional records are available for display.  No charge message
M	G2	VMG2<data>	<b>DUPLICATE KEYWORD</b> - Sent in response to a customer \Q record (inquiry) which contained a duplicate occurrence of a single keyword.  No charge message
M	G3	VMG3<keyword list>	<b>SEARCH ELEMENTS INCOMPATIBLE</b> - Sent when the data values associated with two (2) keywords are incompatible.  No charge message

## 5. Data Streams

The number of characters in a data stream depends upon whether the data stream contains one or more records. A CPE data stream will always consist of only one (1) record. An ADS Host data stream may consist of one or more records (two or more, when the stream is in response to a CPE query).

### 5.1. Maximum Number of Characters in a Record

(See Table 3-1 Data Stream Records)

A record shall not exceed 128 characters [including the start of record indicator "\", the record identifier (alpha character), field separators (pipe "|") and the potential end of data stream indicator (carriage-return character)]. Only the last record in a data stream contains the end of data stream indicator.

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**5.2. Maximum number of records in an ADS Host data stream will not exceed a total of eleven (11) records**

*5.2.1. Combinations of Records in an ADS Host Data Stream*

ADS Host records are combined (Concatenated) in a data stream as follows:

5.2.1.1. ADS HOST record types U, V, D, and I

ADS Host record types U, V, D, and I are stand alone records and are never combined with other ADS Host record in a data steam.

5.2.1.2. ADS Host Record Type D

ADS Host record type D is a stand alone record when CPE fails to produce a valid USER ID and PASSWORD in three (3) attempts.

5.2.1.3. ADS Host Record Type T

Record type T is a stand alone record when CPE fails to produce a valid LOGIN when the ADS Host detects that the time allotted for LOGIN has been exceeded. Record types T and L are concatenated with type L following type T when the ADS Host detects that the time allotted for receipt of CPE data stream has been exceeded any time after CPE has successfully completed a valid LOGIN.

5.2.1.4. ADS Host Record Type L

ADS Host record type L is a stand alone record in an ADS Host data stream when it is the response to CPE record type L. Record type L from an ADS Host may be combined with record type T as described in paragraph 5.2.1.3.

5.2.1.5. ADS Host Record Type S

ADS Host record type S is always the first record in an ADS Host data stream consisting of possible combinations of S and Q, N, E, R, H, M, G and C type records.

A. When one or more M records follow an S record there are no other type records allowed in that data stream.

B. When either an N or E or G or H or R type record immediately follows an S record there are no other records allowed in that data stream.

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C. When a C record follows an S record either a C, Q, or multiple C and Q records will follow the C record. G, H, N, R, E and Q records are never combined with each other in a data stream.

D. When a Q record follows an S or C type record there may be more Q and C records concatenated after the first Q record in that data stream (up to the maximum of 11 concatenated S, C, and Q records). Only M, C and Q type records may appear in multiples in an ADS Host data stream. M and Q type records will not appear together in the same data stream.

#### 5.2.1.6. ADS Host Record Types R, N, G, H and E

ADS Host record types R or N or G or H or E are concatenated in a data stream as described in main paragraph 5.2.1.5 and subparagraphs 5.2.1.5 b and c.

#### 5.2.1.7. ADS Host Record Type C

ADS Host record type C is concatenated in a data stream as described in main paragraph 5.2.1.5 and subparagraphs 5.2.1.5 c and d.

#### 5.2.1.8. ADS Host Record Type M

ADS Host Record Type M is concatenated in a data stream as described in main paragraph 5.2.1.5 and subparagraphs 5.2.1.5 c and d.

#### 5.2.1.9. ADS Host Record Type Q

ADS Host record type Q is concatenated in a data stream as described in main paragraph 5.2.1.5 and subparagraphs 5.2.1.5 c and d.

## **6. Examples of ADS Host Data Streams**

### **A. Host Login Request**

\UE1 (carriage-return character)

### **B. Host Notice of Invalid Login**

\IE2 (carriage-return character)

### **C. Idle Time Exceeded - System Disconnected**

\TE3 (carriage-return character)

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**D. Disconnect**

\DE4 (carriage-return character)

**E. User Logoff Response from Host**

\LE5 (carriage-return character)

**F. Host Resource Failure**

\S513I01I1988IRIKING,MIDAYTON:INDEPENDENCEII

\RE6 (carriage-return character)

**G. Host Notice of Valid Login**

\VE7 (carriage-return character)

**H. Host Data Response for Residence Listing**

\S513I01I1987IRIKING,MIDAYTONIINDEPENDENCE II

\QOIKINGbMARTINbLUTHERbJRI555-

2222I302bINDEPENDENCEbBLVDI

DAYTON (carriage-return character)

**I. Host Data Response for Business Listing**

\S201I02I1987IBISEARSbROEBUCKbCOMPANYIBRIDGewaterICATALOG

\C1ISEARSbROEBUCKbANDbCOMPANY

\C2IDEPARTMENTbSTORES

\C3IBRIDGewater

\C4ISOMERSETbSHOPPINGbCTR

\Q4ICATALOG-TObPLACEbANbORDERI555-7400IIBRIDGewater

\Q4ICATALOG-TObCHECKbANbORDERI555-3200IIBRIDGewater

(carriage-return character)

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**J. Host Data for Government Municipality Listings**

\S201I03I1987IMIFIREbDEPARTMENTSOMERVILLE II

\C1ISOMERVILLEbBOROUGHbOFb-

\C2IBORObOFFICES

\C3IFIREbDEPARTMENTb170bEbMAINbSMVLb-

\Q3ITObREPORTbAbFIREI555-0331IISOMERVILLE I

\C4IFORbOTHERbPURPOSESb-

\q4IENGINEbCObNOb170bEbMAINbSMVLI555-7301IISOMERVILLE I

\Q4ICENTRALbHOOKbANDbLADDERbCOb24bDIVISIONbSMVLI555-

\7302ISOMERVILLE (carriage-return character)

**K. Host Notice of No Listings Found**

\S201I00I1987IRIKINGbMITRENTON:INDEPENDENCE II

\NF1 (carriage-return character)

**L. Host Notice of Too Many Listings Found**

\S32I00I1987IRISMITHICHICAGO II

\EF2 (carriage-return character)

**M. Locality Invalid for this Directory**

\S201I00I1987IRISMITHICHICAGOITRIPP II

\MFL3=CHICAGO (carriage-return character)

**7. Description of Record Field Contents**

This section defines the data elements of fields in CPE and ADS Host type records.

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All listings will be accessible by primary name and address search as is the case with director assistance. Input and output record formats, also known as data stream records, for both the host and the user are described in Table 3-1.

Non-published listings (NP) will be included in the data base. When a NP is a candidate for display, no name, address, locality or telephone number details will be sent to the CPE. Literal "NP" will be returned in the telephone number field, all other fields are zero (Ø) in length.

### 7.1. CPE Record's Field Contents

CPE record type alpha identifier is always in upper case.

Following is a description of field's data elements by CPE record type:

#### 7.1.1. CPE Record Type "U" Fields

USERID	A ten (10) character numeric identification used for Security Login
PASSWORD	A four (4) character A/N mixed-case identification used in conjunction with USERID for security LOGIN.

#### 7.1.2. CPE Record Type "Q" Fields

AREA CODE	Literal "A=" immediately followed by three (3) numeric character NPA.
LOCALITY NAME	LITERAL "L=" immediately followed by fully spelled A/N Locality Name (maximum thirty (30) characters). The word of the name that ends in the thirtieth character position is wildcarded in the Host's database search.
SEARCH INDICATOR	Literal "I=" immediately followed by one (1) ALPHA character representing "R" Residence, Business "B," Government Municipality "M," Government County "C," Government State "S," Government Federal "F," or all Government levels "G."
LISTING NAME	Literal "N=" immediately followed by fully spelled A/N Residence surname and given (first) name or initial preceded by a comma (,) or Business name fully spelled or Government section name fully spelled. The spelled name may not exceed thirty (30) A/N characters. The word of the name that ends in the thirtieth character position is wildcarded in the Host's database search.

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LISTING PLACE	Literal "P=" immediately followed by fully spelled A/N Street (place) name or initial. The spelled street may not exceed twenty-two (22) A/N characters. The term of the name that ends in the twenty-second character position is wildcarded in the Host's database search. If the street name is one character it is wildcarded. This field is optional.
LISTING SUBORDINATE SEARCH	Literal "S=" Immediately followed by fully spelled subordinate search name for Business and Government only. Maximum twenty-two A/N characters. The term of the name that ends in the twenty-second character position is wildcarded. This field is optional.

7.1.3. CPE Record Type "M" Field

MORE LISTINGS REQUEST	Literal "MORE" four (4) character ALPHA comment.
-----------------------	--

7.1.4. CPE Record Type "L" Field

USER LOGOFF	Literal "LOGOFF" six (6) character ALPHA comment.
-------------	---

7.2. ADS Host Record's Field Contents

**ADS Host record type alpha characters are always in upper case.**

Following is a description of field data elements by ADS Host Record type.

7.2.1. ADS Host Record Type "U" Field

HOST LOGIN REQUEST	Literal "E1" two (2) character A/N comment (Code).
--------------------	--

7.2.2. ADS Host Record Type "V" Field

LOGIN VALID	Literal "E7" two (2) character A/N comment (Code).
-------------	--

7.2.3. ADS Host Record Type "I" Field

LOGIN INVALID	Literal "E2" two (2) character A/N comment (Code).
---------------	--

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## 7.2.4. ADS Host Record Type "S" Fields

SEARCH AREA CODE	three (3) character mirror image of numeric NPA supplied by customer.
NUMBER LISTINGS FOUND	two (2) character numeric in the range of 00-99 representing total number of listings recovered by a search.
COPYRIGHT YEAR	four (4) character numeric year supplied by ADS Host.
SEARCH INDICATOR	one (1) character mirror image of ALPHA search indicator supplied by the customer representing Residence, Business or Government (same as in CPE Record Type Q).
SEARCH LISTING NAME	mirror image of name supplied by the customer (30 characters max.) used by ADS Host to search the database for matching name(s).
SEARCH LOCALITY NAME	mirror image of locality name supplied by the customer (30 characters max.) used by ADS Host to refine the selection of listing records that matched on SEARCH LISTING NAME.
SEARCH PLACE NAME	mirror image of place name supplied by the customer (22 characters max.) used by ADS Host to refine the selection of listing records that matched on SEARCH LISTING NAME.
SEARCH SUBORDINATE NAME	Characters (22 max.) used by ADS Host to refine the selection of subsets of caption and listing records that matched on SEARCH LISTING NAME.

## 7.2.5. ADS Host Caption Record Type "C" Fields

CAPTION NUMBER	Caption tier number preceding associated listing records. Tier numbers are one (1) character numeric in the range of 1-9 representing the level of indent of caption in a set.
CAPTION TEXT	Entire Caption tier text (max. 70 characters A/N).

## 7.2.6. ADS Host Caption Record Type "Q" Fields

To acknowledge that a non-published entity exists matching the customer's request, only the report NP will be returned. The literal 'NP' will be returned. The literal 'NP' will be returned in the telephone number field with all other fields zero (Ø) in length.

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TIER NUMBER	one (1) character numeric number in a range 0-9 representing level of indent. A tier number of zero (Ø) represents a stand-alone listing; not part of a caption set.
LISTING NAME	max. fifty-nine (59) character A/N name in recovered listing.
LISTING TELEPHONE NUMBER	Range of 3 to 18 character (including hyphens between segments) A/N telephone number or "NP" two (2) character ALPHA representing non-published telephone number.
LISTING ADDR & STREET	max. fifty-nine (59) character A/N address and street in recovered listing.
LISTING LOCALITY	max. fifty-nine (59) character A/N Locality in recovered listing. A Listing Locality may differ from a Search Locality. The Ameritech System utilizes a search criteria that accepts non-official localities and translates them to database localities. In addition, a difference may occur since ADS utilizes a search technique that employs a radius determined by vertical and horizontal coordinates.

The maximum aggregate number of characters in the combined total of characters of the Name, Address and Street, and Locality may not exceed ninety (90) characters.

#### 8. Rule for Caption Records in ADS Host Data Stream

In all of the associated Listing Records for a Caption or tiers of Captions are not completed in the same data stream then the Caption record(s) are repeated in the next (MMORE) data stream preceding the continued associated Listing Records.

#### 9. Rule for Associated Records in Residence Listings

When a Residence listing record does not match on the surname search key, i.e., "teenagers telephone," but was recovered in the search because of its relationship to another matching listing record then the combination of related listing records will be contained in the same data stream.

#### 10. County, State, Federal ADS Search Criteria for Government Listings

The Ameritech ADS government search will span all levels of government.

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**11. Rule for Data Field Truncation in ADS Host Data Streams**

The total aggregate number of characters in combined name, address and street, and locality is limited to ninety (90). Therefore, the address and street field will be truncated to accommodate this rule when necessary. If more characters are required to be truncated, then the locality field will be truncated. The name field will not be truncated below the maximum allowed fifty-nine (59) characters.

**12. Definition of ADS Host Caption Information**

- A caption is a hierarchical title or heading which relates to other subordinate captions and/or listing(s) that logically follow and are logically grouped together.

Example: (Business)

<u>Type</u>	<u>Contents</u>	
*Listing		
Tier 1	Sears Roebuck and Co	
Tier 2	Department Stores	
Tier 3	Watchung-	
Tier 4	US Hwy 22 & Terrill Rd. Wchng	555-2772
Tier 4	Catalog Telephone Shopping	555-8900
Tier 4	Installed Home Improvement sales	555-0999
Tier 3	Bridgewater -	
Tier 4	Somerset Shopping CTR-	
Tier 5	Catalog - to place an order	555-7400
Tier 5	Catalog - to check an order	555-3200

- \* The appearance of this caption equals one listing. Subsequent screens showing additional indents of the same caption set are included in this single listing.

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**13. Definition of ADS Host Listing Information**

- A listing is defined as a straight-line, slu set or caption set.

Example: (Government - Municipality)

<u>Type</u>	<u>Contents</u>	
*Listing		
Tier 1	Somerville Borough of-	
Tier 2	Boro Offices-	
Tier 3	Code enforcement office	
	75 West End AV SMVL	555-0222
Tier 3	Boro Office 25 West End AV SMVL	555-2300
Tier 3	Civil Defense Headquarters 5 <sup>th</sup> SMVL	555-1230
Tier 3	Fire Department 170E Main SMVL	
Tier 4	To report a fire	555-0331
Tier 5	For other purposes-	
Tier 6	Engine Co No 1	
	170 E Main SMVL	555-7301

\* The appearance of this caption equals one listing. Subsequent screens showing additional indents of the same caption set are included in this single listing.

**14. Data Content Requirements for Entry in Key Fields by CPE for "Q" Type Records****14.1. Key identifiers**

Key identifiers must be formatted exactly as follows: "A=", "L=", "N=", "I=", "P=" and "S=". If key identifier data contained in the CPE Q record is in error the host will return an error message and abort any search attempt. KEY IDENTIFIER ALPHA CHARACTERS ARE ALWAYS IN UPPER CASE.

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**14.2. Data elements**

Data elements accompanying key identifiers must be left justified following the equal sign (=) of the key identifier. The last character of the last data element contained with key identifiers must be immediately followed by a field separator pipe character (|) or an end of record carriage-return character [blank (space) characters are not permitted between data and/or field separator or end of record indicator].

**14.3. Name (N=) field for Residence**

Name (N=) field data for Residence type search may (optionally) contain given name information in the form of first name or initial immediately preceded by a comma (,) after the surname.

**14.4. Name (N=) field data for Business or Government**

Name (N=) field data for Business or Government type search must consist of fully spelled word(s). The search words must match one for one with the host database name.

**14.5. Locality (L=) field**

Locality (L=) field data may be the name of a City, Town, Hamlet, Neighborhood (i.e., Germantown, Frenchtown, Little Italy), Borough (i.e., Brooklyn Queens, Richmond, Staten Island, Manhattan, New York City), etc.

**14.6. Government Municipality (I=M)**

Government Municipality (I=M) relates to Cities, Towns, Townships, Hamlets, Neighborhoods, Boroughs, etc.

**14.7. Government County (I=C)**

Government County (I=C) relates to Counties, Parishes, Territories, Regions, etc.

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**14.8. Government State (I=S)**

Government State (I=S) relates to States, District of Columbia, Protectorates, etc.

**14.9. Search Types**

The Ameritech databases are not partitioned into different levels of government. All levels of government will be searched with search types M, C, S, F.

**15. Search Strategy for CPE and ADS Host**

All terms in fields are separated by blanks, and multiple blanks are treated as a single blank.

**15.1. Area Code/NPA (A=)**

Literal **A=** immediately followed by three numeric digits. The ADS Host system will verify that all characters are numeric input and validate the presence of the Area Code in the data base.

**15.2. Locality Name (L=)**

Literal **L=** immediately followed by the fully spelled alpha-numeric locality name. The locality may be a single or multiple term field. If the last term ends in the 30th position, the ADS Host system will wild-card the locality name. A locality name may be the name of a City, Town, Hamlet, Borough (e.g., Brooklyn, Queens, Staten Island, Manhattan, Bronx), etc.

Valid character(s) are A to Z and/or zero (0) to nine (9). Special characters with the exception of the apostrophe, will be removed and replaced with a blank. When an apostrophe is encountered that is preceded and followed by a valid character, the apostrophe will be removed and concatenated. Any blanks prior to the first valid character will be removed and concatenated. Any blanks following the last valid character will be removed and concatenated. Multiple blanks that are between valid characters will be removed and replaced with a single blank.

A listing Locality may differ from a Search Locality because the ADS system utilizes a search criteria that accepts non-official localities and translates them to database localities. In addition, a difference may occur since ADS employs a search technique that uses a radius, determined

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by vertical and horizontal coordinates, and presents the listings ordered by the proximity of the locality in the listing to the target locality in the search argument.

RES searches are performed against the entire directory book in which the target locality is contained.

BUS/GOV searches are performed against data base listings whose localities are within a predefined geographic scope from the target locality. If the distance between the data base listing locality and the search argument locality is outside the predefined scope, the listing is deemed to be an unsuitable candidate for display and discarded.

### 15.3. Listing Name (N=)

#### Residence

Residence listing name is a literal N= followed by a fully spelled surname, and optional first name or initial preceded by a comma plus second name or initial following first name and preceded by a comma. Valid characters in the listing name portion are A to Z and/or zero (0) to nine (9).

**Surname editing:** Character(s) prior to the first comma are considered the surname. If a comma is not included in the name field, the entire field is considered the surname. Special characters in the surname portion of the name field, including hyphens, ampersands and blanks, will be removed and concatenated.

**Given name editing:** Character(s) following the first comma are considered the given name portion of the name field. Special characters, with the exception of the apostrophe, will be replaced with a blank. When an apostrophe is encountered that is preceded and followed by a valid character, the apostrophe will be removed and concatenated. Any blanks prior to the first valid character in the given name portion of the name field will be removed and concatenated. Any blanks following the last valid character will be removed and concatenated. Multiple blanks that are between valid characters will be removed and replaced with a single blank.

#### ADS Host Search Strategy

1. The ADS host will perform an exact match on the surname supplied on an inquiry.
2. The ADS host will perform an exact match on fully spelled first and middle names supplied on an inquiry, where "fully spelled" is defined as a name consisting of two or more characters.
3. The ADS host will perform an exact match on single-character first/middle names in the data base matched by the first character of a fully spelled first/middle name supplied on an inquiry.

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4. If the first/middle name supplied on an inquiry consists of a single character, the ADS host will perform an exact match on single first/middle initials in the data base equal to that character and a wild-card match on fully spelled first/middle names beginning with that character.
5. Listings will be presented to the customer sorted in "best match" order.

(See Table 15-1 Given Name/Street Name Fields Word Matching Categories.)

Table 15-1 Given Name/Street Name Fields Word Matching Categories

CATEGORY	DESCRIPTION	ARGUMENT	=	LISTING EXAMPLE
0	Perfect Match	AL J  ELM	= =  =	ALBERT JOHN  ELM
1	The argument word is a shortened form of the listing word.	AL J  ELM	= =  =	ALBERT JOHN  ELMWOOD
2	All listing characters matched in sequence but the listing word was shorter than the argument word.	EDW MARK  GREENW	= =  =	E MJ  GREEN
3	All argument characters matched in sequence and the last argument character matched the last listing character but some interior listing character(s) were unmatched.	JAS MA  BY	= =  =	JAMES MICHAEL  BROADWAY
4	All argument characters matched in sequence but listing character(s) were unmatched and the last listing character was unmatched.	TOM MA  DR	= =  =	THOMAS MICHAEL  DEARBORN

## Dual Name Listings

The ADS system accepts requests for dual list names, i.e., an inquiry which consists of two (2) first names separated by an ampersand, where the ampersand is optionally preceded and/or followed by a space. The ADS host performs an exact match on such a "dual name" listing if it exists in the data base.

## Business/Government

Literal N= followed by a fully spelled business or government name. All terms of a multiple term field are used in matching and considered as fully spelled. The words in the inquiry name do not have to be in the same order as the ADS Host data base name.

Valid character(s) in the Name field are A to Z and/or zero (Ø) to nine (9). Special characters, with the exception of the apostrophe, will be removed and replaced with a blank. When an apostrophe is encountered that is preceded or followed by a valid character, the apostrophe will be removed and concatenated. Any blanks prior to the first valid character will be removed and concatenated. Any blanks following the last valid character will be removed and concatenated. Multiple blanks that are between valid characters will be removed and replaced with a single blank.

### 15.4. Street/Place Name (P=)

This is an optional field

Literal P= immediately followed by a fully spelled alpha-numeric street/place name or a single character. If a single character is used, the ADS Host system will assume a wild-card search on all street names beginning with that character. House numbers, street directional, thoroughfare type and street suffix should not be presented.

Valid characters in the Street/Place name field are A to Z and/or zero (Ø) to nine (9). Special characters, with the exception of the apostrophe, will be replaced with a blank. When an apostrophe is encountered that is preceded or followed by a valid character, the apostrophe will be removed and the space concatenated. Any blanks prior to the first valid character will be removed and concatenated. Multiple blanks that are between valid characters will be removed and replaced with a single blank.

For listings in the ADS Host system with multiple term street names, the ADS system will match against all words in the Street name field of the listing not just against the first word. If an inquire is submitted with multiple words in the Street/Place name field have to be in the same order as the ADS Host data base street name.

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If a query is presented with an entry in the "P=" field, the ADS system will treat a blank street name on a RES listing in the ADS Host data base as an exact match. When entering a Street/Place name on a BUS/GOV search, only listings that contain perfectly matching streets are displayed. Listings will be displayed according the category/level of match.

(See Table 15-1 Given Name/Street Name Fields Word Matching Categories.)

### **15.5. Listing Subordinate Search (S=)**

This is an optional field.

Literal **S=** immediately followed by fully spelled subordinate search name for BUS/GOV only. The words in the subordinate search name do not have to be in the same order as the ADS Host database name words for this field. This field may contain a section, department, title, heading, or other identifier.

Valid character(s) in the Subordinate Search field are A to Z and/or zero (Ø) to nine (9). Special characters, with the exception of the apostrophe, will be removed and replaced with a blank. When an apostrophe is encountered that is preceded or followed by a valid character, the apostrophe will be removed and concatenated. Any blanks prior to the first valid character will be removed and concatenated. Any blanks following the last valid character will be removed and concatenated. Multiple blanks that are between valid characters will be removed and replaced with a single blank.

### **15.6. Tier Level Indicator Description**

#### **Q Record**

Stand alone listing (non-caption header) is a tier level of 0.

Captioned listings have level 1-9.

#### **C Record**

Tier level of 1-9.

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**16. Exchange Message Interface**

Ameritech will provide End-User Usage data to ADS customers in EMI format 105036 described in the attachment.

Transmission of EMI files from Ameritech to subscribing ADS customers may vary according to tariff options. Procedures will be established at service start up.

**17. Cities File**

Ameritech will provide each current and prospective customer with a copy of its Cities file. This file contains all cities that are accessible in the Ameritech region on ADS. Updates will be provided to customers when changes are made to the system tables. Cities are marked as containing only Ameritech listings, only independent listings, or containing both Ameritech and Independent listings, otherwise known as "split" localities. Ameritech recommends that split localities be available for end users to search because Ameritech listings are available for display even though non-licensed Independent listings are blocked from screen appearance by NPA-NNX.

The copy of the entire cities file will be in DOS format on a 3 1/2 high density diskette.

Updates will be provided on a quarterly basis, with most frequent updates issued at the discretion of Ameritech.

<b>Cities File Format</b>				
<b>Standard Interface Specification</b>				
<b>FIELD</b>	<b>FROM</b>	<b>TO</b>	<b>LENGTH</b>	<b>VALUE/EXPLANATION</b>
Action Code	1	1	1	Literal <b>D</b> or <b>A</b> .
City Name	2	31	30	USPS/Canada Post standard spelling.
State/ Providence	32	33	2	USPS state/Canada Post providence abbreviation.
Area Code	34	36	3	
NTN	37	46	10	Packet network of ADS.
Country	47	49	3	Literal <b>USA</b> or <b>CAN</b>

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Coverage Indicator	50	50	1	<p><b>I</b> = Independent Company not covered in database.</p> <p><b>S</b> = Shared – Area partially covered in database.</p> <p><b>A</b> = Active – Area totally covered in database.</p>
Coverage Percentage	51	52	2	Two digits in the range '00' through '99'. Will be '00' if <b>Coverage Indicator</b> is either <b>A</b> or <b>I</b> . Will be '01' through '99' if <b>Coverage Indicator</b> is <b>S</b> to indicate percentage of independent territory which <b>is</b> covered in provider's database.

## 18. Glossary

A/N	Alphabetic, Numeric
ACD	AREA CODE (NPA)
ALPHA	Alphabetic (Character(s))
ANSI	American National Standards Institute
ASCII	American National Standard Code for Information Interchange
bps	Bits Per Second
CCITT	International Telegraph and Telephone Consultive Committee
CPE	The work station used by the end user to access the host
Customer	The interexchange carrier
DA	Directory Assistance
ADS HOST	Ameritech Directory Search computer system
End User	The customer of the interexchange carrier that subscribes to ADS service through that carrier
IND	SEARCH TYPE INDICATOR (CATEGORY)

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Listing	A listing is defined as a straight-line listing, a SLU-set, or a caption set. Each set is considered a listing, not the sum of total of its indents, nor the sum of its indents with telephone numbers
LOC	LOCALITY (CITY)
NAM	NAME (PERSON OR OTHER)
NPA	Number Plan Area or Area Code
PLC	PLACE (STREET)
SUB	SUBORDINATE SEARCH INFORMATION (SUBORDIANTE NAME)

## 19. References

1. "Interface Between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Terminals Operating in the Packet Mode on Public Data Networks." CCITT Recommendation X.25, 1980 (Amended in 1984 and given a new title: "Interface Between Data Terminal Equipment (DTE) and Data Circuit Terminating Equipment (DCE) for Terminals Operating in the Packet Mode and Connected to Public Data Networks by Dedicated Circuit.")
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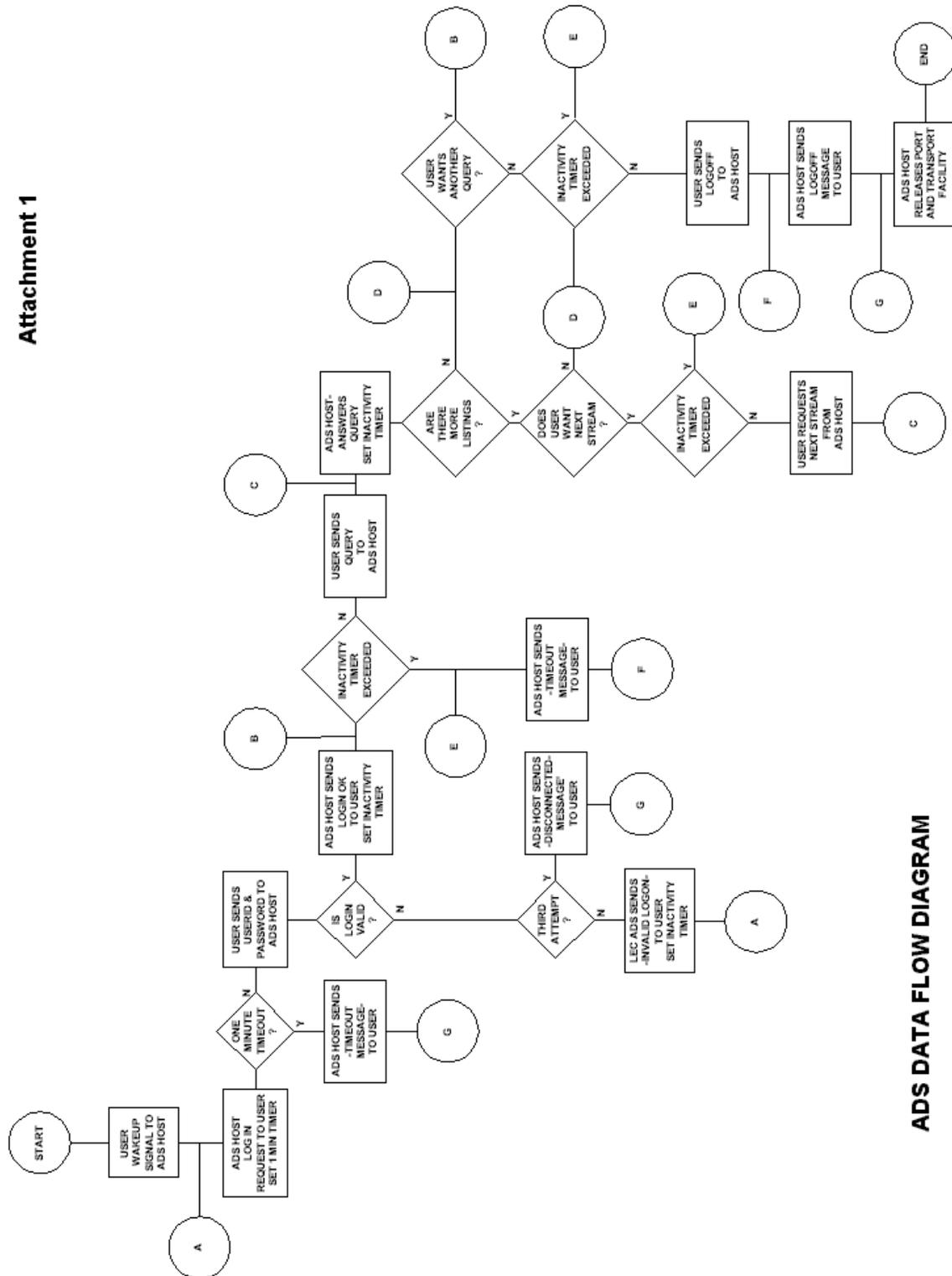
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**ATTACHMENT 1 - ADS Data Flow Diagram**

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Attachment 1



ADS DATA FLOW DIAGRAM

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**ATTACHMENT 2 - Exchange Message Interface Electronic Directory Assistance Line  
Summary Unrated Message**

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EXCHANGE MESSAGE INTERFACE  
ELECTRONIC DIRECTORY ASSISTANCE LINE SUMMARY  
UNRATED MESSAGE

10 Category			
Pos	Field Description		Char
1			
2	Category		
3	Group	Message Identification	9
4	Group		
5	Group Type		
6			
7	Year		
8	Month	Date of Receipt	4
9	Day		
10		Reserved	9
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EMI 105036 Record (SR STS-00032, Issue 7, August 1990)

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