SWITCHING SYSTEMS MANAGEMENT
TRANSACTION NETWORK
ASSIGNMENT ADMINISTRATION
GENERAL ASSIGNMENT RECOMMENDATIONS

CONTENTS PAGE

1. GENERAL

1.01 This section explains the network configuration of the Transaction Network (TN) and recommends procedures for the network administrator to use in making assignments in the TN for dial-in, asynchronous, and synchronous ports.

1.02 When this section is reissued, this paragraph will contain the reason for reissue.

1.03 For a detailed description of the TN, see Dial Facilities Management Practices, Division H, Section 17a, System Description.

1.04 Refer to the following sections in Division H of the Dial Facilities Management Practices for other assignment administration procedures:

- Section 17e(2), New Offices
- Section 17e(3), Working Offices
- Section 17e(4), Office Additions
- Section 17e(5), Office Records.

1.05 The title of each figure in this section includes a number(s) in parentheses which identifies the paragraph(s) in which the figure is referenced.

2. NETWORK CONFIGURATION

2.01 The TN serves three separate networks: the dial-in access network (DAN) which serves TOUCH-TONE® telephones including the Transaction I and Transaction II sets; the polled access network (PAN) which serves Transaction III sets; and the customer service center (CSC) network which serves CSCs. Descriptions of each of these networks are given in 2.02 through 2.19.

2.02 Figure 1 is a block diagram of the DAN. Each port from a dial line adapter (DLA)

and a 407A data set is connected to a line equipment in a telephone switching office. The numbers appearing beside each port are port numbers and are explained in parts 3 and 4.

2.03 Each port may be assigned as a member of a hunt group, a foreign exchange line, or a tie line.

2.04 DAN ports are divided into two groups: automatic voice answerback (AVA) and frequency shift keying (FSK). In the AVA group, each DLA is cross-connected to a port on the audio-response unit (ARU). Stations which connect to AVA ports receive voice messages under control of the TN processor. In the FSK group, DLAs are not cross-connected to ports on the ARU. Stations which connect to FSK ports receive responses using FSK signaling.

2.05 Transaction II sets contain FSK receivers and can convert FSK responses to characters on its light emitting diode (LED) display. Transaction II sets can also receive AVA responses and can be used in transactions on either AVA or FSK ports. Transaction I sets contain no FSK receivers or LED displays and can be used in transactions on AVA ports only.

2.06 The AVA and FSK ports must be assigned discrete telephone numbers for access by dial-in stations in order that a station may connect to only its designated service.

2.07 The dialing card used by the Transaction set should contain the telephone number of the proper dial-in ports. When a connection is made by a Transaction station to a dial-in port, a character from the dialing card is transmitted by the station to the TN which identifies the type of response which the station should receive. If the type of port to which the station is connected does not transmit the type of response specified by the character or if a character is not received, the TN disconnects.

2.08 The number of AVA and FSK ports is determined by the network design order. If changes in AVA and FSK port quantities become necessary, the network administrator should contact the network design engineer.

2.09 The second network in the TN is the PAN; it is illustrated in the block diagram in Figure 2. Polled stations such as the Transaction III are used in the PAN. Each station is connected to a data station selector (DSS) access line. Each DSS may be connected directly to the TN (primary DSS) or to two ports of another DSS (secondary DSS).

2.10 Each DSS requires two asynchronous lines from the TN message switch or a primary DSS as trunks to the TN message switch. The two asynchronous lines are referred to as a ***buddy pair.*** Each trunk in the buddy pair serves a different set of access lines in the DSS. If a failure should occur in one buddy-pair trunk, the other trunk can serve all of the DSS access lines. The network administrator determines the DSS access lines which will be controlled by each trunk in the buddy pair. The procedure for establishing the arrangement is covered in 4.05 through 4.16.

2.11 Each primary DSS buddy-pair trunk is connected to an asynchronous line adaptor (ALA) in the TN. The buddy pair is served by two ALAs designated by the same number and located in two asynchronous line adaptor hardware (ALAH) units on the same ALA frame. For example, a buddy pair could be assigned to ALAH 00, ALA 01 and ALAH 01, ALA 01 or it could be assigned to ALAH 02, ALA 15 and ALAH 03, ALA 15.

2.12 The basic serving units of the DSS are circuit boards called ***port cards.*** Each DSS contains space for a maximum of eight port cards and each port card can serve a maximum of eight stations. A fully equipped DSS therefore contains 64 access line ports. However, three ports cannot be assigned (ports 0, 7, and 63) and this leaves a maximum of 61 stations which can be served by a DSS.

2.13 When a port card fails, all access lines served by the port card are out of service. If both members of a buddy pair to a secondary DSS are served by access lines on the same primary DSS port card and that port card fails, the buddy pair to the secondary DSS and all ***stations*** served by the secondary DSS are out of service. ***It is therefore imperative that both members of a buddy pair to a secondary DSS not be assigned to the same port card on a primary DSS.***

2.14 The network administrator should also spread stations belonging to one customer over different port cards in order that the customer will not lose service on all stations due to a port card failure.

2.15 The network design engineer determines the quantity and locations of primary and secondary DSSs but the network administrator makes all assignments of buddy pairs from ALAs to primary DSSs, assignments from primary DSSs to secondary DSSs, and assignments of stations to DSS ports.

2.16 The third network in the TN is the CSC network which is illustrated in Figure 3. Four-wire lines to CSCs are served by CSC network ports. Each CSC is served by one or more line groups consisting of one or more 4-wire lines.

2.17 Each 4-wire line may be connected to any synchronous line adaptor hardware (SLAH) unit which provides the proper speed and method of transmission. Three different speeds of transmission expressed in bits per second (bps) (2400 bps, 4800 bps, and 9600 bps) and two different methods of transmission (analog and digital) are available. Each combination requires a different data set or a data service unit arranged for a different speed as shown in Figure 4. A line group may contain individual lines with different speeds and methods of transmission.

2.18 For each ***type*** of data set used in the CSC network, one SLAH unit equipped with a data set of the same type must be designated as a spare. For each type of data service unit arranged for a particular speed, one SLAH unit equipped with a data service unit set for that speed must be designated as a spare. There is no restriction on which SLAH units the network administrator designates as spare as long as the SLAH unit contains the proper data set or data service unit.

2.19 Data sets and data service units are generally not installed in the CSC network until there is a need for service.

3. PORT AND STATION NUMBERS

3.01 Each dial-in port, CSC port, and polled station in the TN is identified in memory by a 7-digit number. The first three digits of the port and station numbers in a particular TN office are the same and identify the TN office. TN office codes may duplicate office codes used in the switched telephone network. The remaining four digits are assigned as shown in Figure 5.

3.02 Numbers within the range of 0000 through 0998 are used for CSC assignments. Numbers within the range of 0000 through 0009 are used in implied and abbreviated addressing and should not be assigned. (Implied and abbreviated addressing are explained in paragraphs 5.06 and 5.07.) Numbers within the range of 0010 through 0499 identify CSC line groups and numbers within the range of 0500 through 0998 identify individual lines. Line group numbers are the numbers which are used for routing messages from stations. Individual line numbers are used for maintenance and testing.

3.03 If a TN office used the code 201, a CSC line group consisting of five lines could have the group number 201-0400 and the individual lines could be numbered 201-0500, 201-0501, 201-0502, 201-0503, and 201-0504. In this example the five CSC lines are numbered in sequential order; however, there is no physical requirement for sequential numbering. The TN hunts for idle lines in a CSC group but it does not use the port number to hunt; consequently, there is no advantage in any particular order of numbers. The network administrator may use any numbering scheme desired.

3.04 The number 0999 is used by CSC and polled terminals to address service messages and must not be assigned.

3.05 Numbers within the range of 1000 through 7999 are used for polled station assignments. The network administrator assigns each polled station a unique number from this range. When a station is reassigned to a different access line, it may retain its station number as long as the new access line is served by the same TN office. In order to conserve main store memory space, the network administrator should not leave large blocks of unassigned numbers between numbers selected for assignment to polled stations.

3.06 Numbers within the range of 8000 through 8999 are used for dial-in port assignments. These numbers represent the identities of the ports only to the TN itself. The ports may be assigned any numbers in the telephone switching machine to which the ports are assigned.

3.07 Dial-in port numbers differ from other port and station numbers in the TN in that each number is preassigned. A particular dial line adapter hardware (DLAH) unit, DLA, and 407A data set will be assigned the same 8000-series number in any TN office in which it appears. For example, DLAH 02, DLA 04 will always be assigned port number 8036. The first three digits of the complete port number are the office code of the TN and differ in each TN office.

3.08 A complete listing of dial-in port number assignments appears in Figure 6.

3.09 Numbers within the range of 9000 through 9999 are reserved for future applications.

3.10 The network administrator makes all number assignments to CSC ports and polled stations. The network administrator does not assign numbers to dial-in ports since these numbers are preassigned.

3.11 For billing purposes, a numbering plan area (NPA) code is used to identify ports and stations in addition to a 7-digit number. The NPA codes used and the geographical areas which the codes represent are the same as the codes and areas used in the switched telephone network.

3.12 More than one NPA can be served by a TN, but all polled stations served by a particular polled access circuit must have the same NPA code.

4. PORT EQUIPMENT NUMBERS

4.01 Each dial-in port, CSC port, and DSS port in the TN is identified in memory by an equipment number. It is important to note that CSC and dial-in ports are identified by both a port number and an equipment number; only the polled ***station*** is identified by a station number; and the DSS ***port*** is identified by an equipment number.

4.02 Teletypewriter messages in the TN use a ***keyword/data*** format to identify equipment numbers. ***Keyword*** is the abbreviation of a hardware component and ***data*** are the number of the component.

4.03 For example, CSC ports are identified as follows:

SLAH yy, where yy = 00 through 91

SLAH is the keyword which identifies the port as being associated with an SLAH unit and yy is the data which identifies the number of the SLAH unit.

4.04 Primary DSS ports are identified as follows:

ACCL nn ALAH mm POLL pp,

Where:

nn = 00 through 15

mm = 00 through 15

pp = 00 through 63

ACCL identifies the access link from the ALA to the DSS, ALAH identifies the ALAH unit, and POLL identifies the DSS port.

4.05 As stated in 2.11, both DSS lines in the buddy pair are served by identically numbered ALAs; therefore, one ACCL number identifies both members of a buddy pair. Together, ALAH and ACCL distinguish the individual members of the buddy pair.

4.06 The port on the DSS itself is identified by POLL. The ALA line which polls the port is identified by ALAH. For example, if the network administrator assigns a polled station to a primary DSS port designated as

ACCL 01 ALAH 14 POLL 04

the station is assigned to port 04 of a primary DSS and is polled by ALA 01 on ALAH 14.

4.07 This DSS is also served by ALA 01 on ALAH 15. If the network administrator were to change the assignment of the station to

ACCL 01 ALAH 15 POLL 04

then only the ALA which polls the station changes. The station retains the same physical DSS port assignment.

4.08 Secondary DSS ports are identified as follows:

ACCL nn ALAH mm POLL ppqq,

Where:

nn, mm, and pp are in the range previously listed;

qq = 00 through 63

4.09 In the assignment information for a secondary DSS, qq represents a port number on the secondary. The remainder of the assignment information identifies the primary DSS port which polls the secondary DSS port qq.

4.10 If the network administrator were to change a polled station assignment on a secondary DSS from:

ACCL 01 ALAH 14 POLL 04 27

to:

ACCL 01 ALAH 15 POLL 04 27

then the ALA which polls secondary DSS port 27 changes. No physical port assignments change.

4.11 However, not only does the polling ALA for port 27 in the secondary DSS change in the example in 4.10 but the polling ALA for ***all*** secondary DSS ports polled by port 04 on the primary DSS changes. If the network administrator wished to change the polling ALA for only port 27 on the secondary DSS, the assignment of the primary DSS port serving the DSS would have to be changed.

4.12 For example, let the secondary DSS in the example in 4.10 be served by primary DSS ports designated by the following:

ACCL 01 ALAH 14 POLL 04

ACCL 01 ALAH 15 POLL 33

Then a station served by secondary DSS port 27 could be reassigned as follows:

From: ACCL 01 ALAH 14 POLL 04 27

To: ACCL 01 ALAH 15 POLL 33 27

In this assignment change, the polling ALA of secondary DSS port 27 is changed without changing the polling ALA of any other DSS port and without any physical rearrangement.

4.13 The network administrator should assign polled stations in such a manner that load is evenly distributed between ALAs. If load data are not available, assignments should be made in such a manner that each ALA to a particular DSS polls an equal number of stations.

4.14 Ports on a primary DSS which are selected to serve a secondary DSS must be located on different port cards in the primary and must also be assigned to different ALAH units.

4.15 In both primary and secondary DSSs, ports 00, 07, and 63 must not be assigned. Ports 00 and 63 are unavailable and port 07 is used for testing.

4.16 The network design engineer specifies the quantity and location of DSSs and the network administrator makes all assignments. These assignments include the assignment of polled stations to DSS ports, secondary DSSs to primary DSS ports, and primary DSSs to ALAs and ALAH units. Business services and marketing will be involved in this process.

4.17 Dial-in ports can be identified uniquely by either of the following:

DLAnn DLAHmm

or

DS407nn DLAHmm

Where:

nn = 00 through 16

mm = 00 through 16

DLAH designates the DLAH unit in both messages. DLA represents the dial line adapter and DS407 represents the 407A data set. DLAs and 407A data sets have a one-to-one relationship and both of the above assignments would describe the same port when the values of mm and nn are the same.

4.18 As stated in 3.07, each dial-in port is assigned a particular preassigned port number in the 8000 series. (Fig. 6 is a listing of these numbers.) Therefore, each dial-in port can also be uniquely identified by its 7-digit port number.

4.19 It is recommended that the network administrator use the 7-digit port number for identification when providing dial-in ports for assignment in the switched telephone network. The use of the 7-digit port number has the following advantages.

- The first three digits of the number identify the TN office to which the ports belong.
- The number has a familar 7-digit format similar to a telephone number.
- The number avoids the use of terms such as DLA, DS407, and DLAH which may be unfamiliar to the network administrator responsible for assignment of the ports to telephone switching machines.

4.20 It is important to note that all assignments in the CSC network and the PAN in a particular TN office should be the responsibility of one network administrator. However, ***assignments in the DAN require assignments in telephone switching machines which may not be the responsibility of the same network administrator who has responsibility for the TN office.*** Close cooperation is necessary between the TN network administrator and all other network administrators responsible for port asignments.

5. CLASS OF SERVICE

5.01 The class of service is used for the following purposes:

- To identify the type of station (restricted polled, unrestricted polled, or dial-in)
- To identify stations which a CSC has chosen to serve
- To ensure that a message is delivered to the same dial-in station which made a corresponding inquiry.

5.02 The network administrator assigns the class of service to polled stations and CSCs but the network administrator does not assign the class of service to dial-in stations. The TN itself assigns class of service to dial-in stations as they connect to dial-in ports.

DIAL-IN STATIONS

5.03 The class of service of dial-in stations is assigned by the TN. As each station is connected to a dial-in port it is assigned a class-of-service character. The class-of-service character is a binary number; the first part of this number designates the station as a dial-in station. The second part is a number which is incremented by one each time a station connects. By checking for a match between the class-of-service character of the station to which a response is delivered against the class-of-service character of the station which made the inquiry, the TN can ensure that a response is delivered to the station which made the inquiry.

POLLED STATIONS

5.04 Two classes of service are defined for polled stations: ***restricted*** and ***unrestricted.*** Restricted stations may send messages to and receive messages from only CSC line groups whose numbers are specified on a ***restricted service list*** in main store memory and who have chosen to serve restricted polled stations. Different restricted service lists may exist in memory. The TN message switch identifies the restricted service list to which a station has access by a restricted service list number assigned to the station which corresponds to the number of the associated list.

5.05 Each restricted service list may contain up to ten CSC line group numbers. When a restricted polled station originates a message, it may specify the CSC line group on the restricted service list to which the message is to be delivered by the use of ***implied*** or ***abbreviated*** addressing.

5.06 Implied addressing is a service in which the restricted polled station may omit the identification of the called CSC line group from the heading information in the message. The TN message switch will supply the address "0" as the implied address. Address "0" corresponds to the first CSC line group number on the station's restricted service list and the message switch will deliver the message to the corresponding CSC line group.

5.07 Abbreviated addressing is a service in which the restricted polled station may transmit one of the digits in the range of 1 through 9 in the heading information in the message rather than

a complete CSC line group number. The digits 1 through 9 correspond to the second through tenth entries on the station's restricted service list. The TN message switch will deliver the message to the corresponding CSC line group.

5.08 Unrestricted stations may send messages to and receive messages from any CSC line group which has chosen to serve unrestricted polled stations. The unrestricted polled station must use the complete CSC line group number in the heading information in transmitted messages.

CSC LINE GROUPS

5.09 A CSC line group may be arranged to accept messages from and deliver messages to either restricted polled stations, unrestricted polled stations, dial-in stations, or any combination of the three types of stations.

6. CSC AFFILIATIONS

6.01 The TN will forward messages from one CSC to another CSC belonging to the same ***affiliation.*** An affiliation is a group of CSCs which have a mutual agreement to accept messages from each other. Each CSC may belong to a maximum of ten different affiliations.

6.02 The network administrator must assign one of the following affiliation options to each CSC line group.

- Affiliated
- Unaffiliated
- None.

6.03 ***Affiliated*** designates the CSC line group will accept messages from any other member of its affiliation. ***Unaffiliated*** designates the CSC line group will accept messages from any other CSC. ***None*** designates the CSC line group will not accept any messages from another CSC.

6.04 Affiliations are identified by names composed of hexadecimal characters (hexadecimal characters are the digits 0 through 9 and the letters A through F). The hexadecimal name of each affiliation is determined by AT&T. When a CSC is a member of one or more affiliations, the network administrator is responsible for assigning the proper identity of each affiliation.

7. TRANSLATIONS

7.01 The area of TN memory which contains routing, charging, and assignment information is called the ***translations*** area of memory.

7.02 Translations data reside both in the auxiliary 3A processor's main store memory and on magnetic tape cartridge. The main store copy of translations is used by the 3A central control during normal operations and the magnetic tape cartridge copy is used as a backup. If translations data are erased from main store memory, the central control regenerates translations data using the magnetic tape cartridge copy.

7.03 All translations data are inputted to the system by teletypewriter messages. Teletypewriter messages which affect translations data are called ***recent change*** (RC) messages.

7.04 ***Recent change messages are the only means by which translations data can be entered into TN memory.*** Since recent change messages cannot be used until a TN is installed, assignment information for a new TN office is not required until the office is installed.

7.05 Recent change messages are first entered into the memory of the on-line processor only. Ordinarily, audit programs in the TN check for mismatches in duplicated machine memory. Before the recent change process begins, these programs are stopped by entering the message ALW:RC! on the teletypewriter. The programs are again allowed at the end of the recent change process by typing STOP:RC!

7.06 For a complete listing of recent change messages, see the TN input message manual.

7.07 Recent change messages are checked by the TN at the end of the session. If all messages are valid, the off-line memory is updated as well as the data on the magnetic tape cartridge.

7.08 Translations data contained on the magnetic tape cartridge represent the most current data. It is from these data that the TN prints a

complete listing of office records. It is recommended that these mechanized office records be used as the network administrator's assignment records in a working office.

7.09 Additional information pertaining to office records can be found in Dial Facilities Management Practices, Division H, Section 17e(5), Office Records.

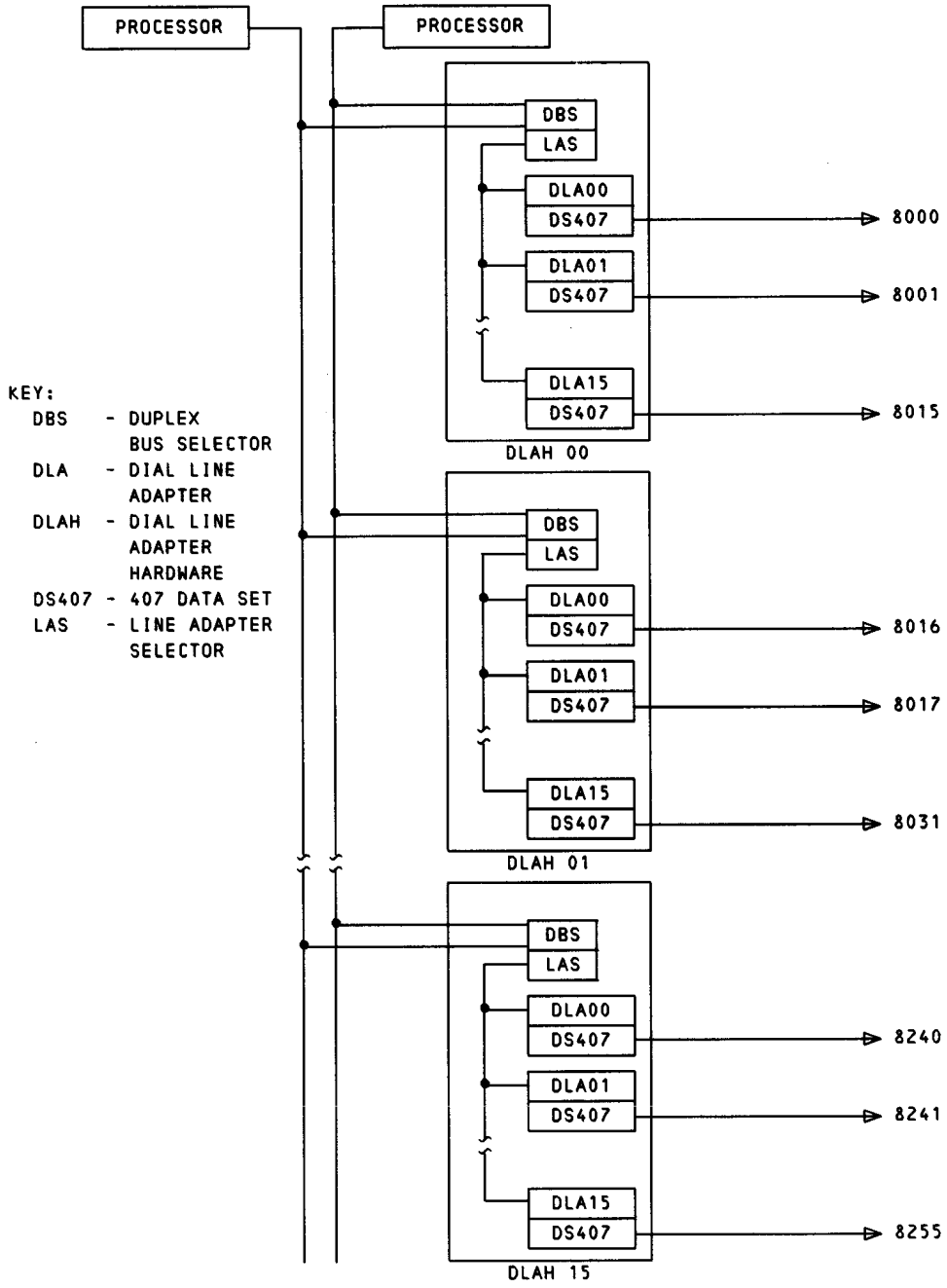


Fig. 1—Dial-In Access Network (2.02)

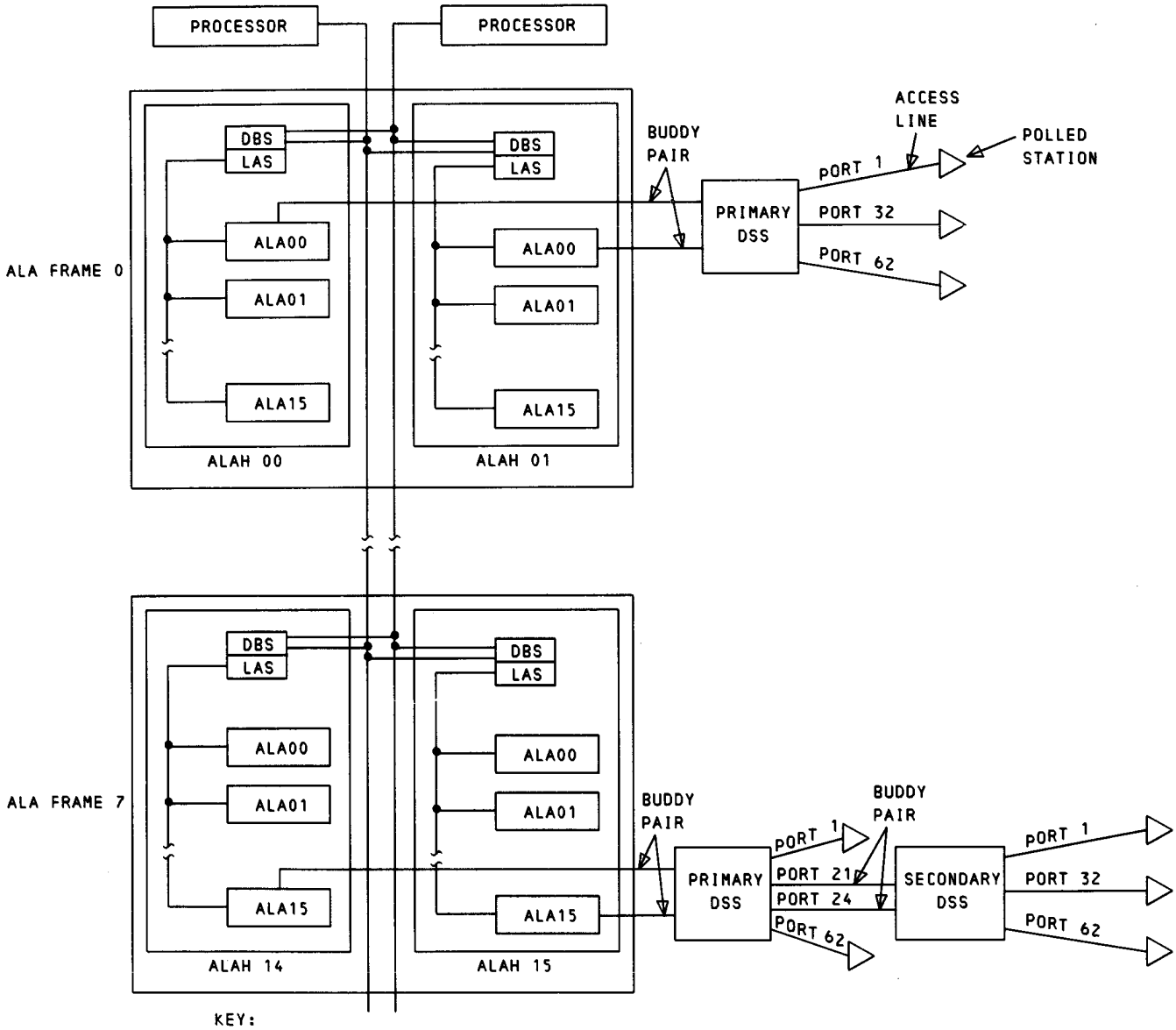
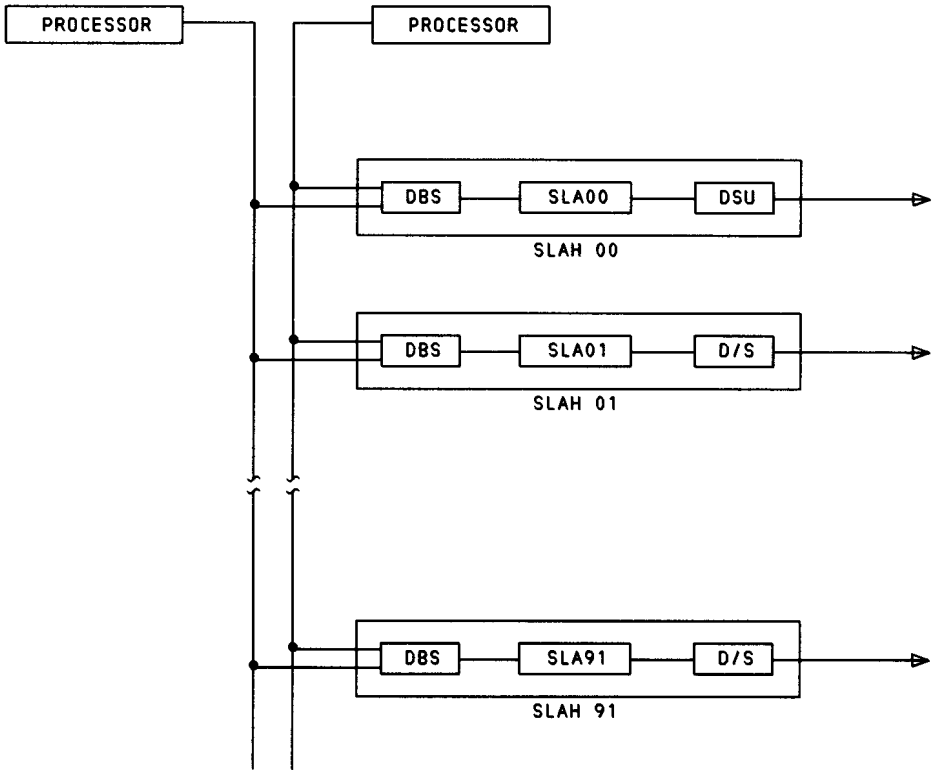


Fig. 2—Polled Access Network (2.09)



KEY:
- DBS - DUPLEX BUS SELECTOR
- D/S - DATA SET
- DSU - DATA SERVICE UNIT
- SLA - SYNCHRONOUS LINE ADAPTER
- SLAH - SYNCHRONOUS LINE ADAPTER HARDWARE

Fig. 3—CSC Network (2.16)

METHOD OF TRANSMISSION	SPEED OF TRANSMISSION	EQUIPMENT REQUIRED
Analog	2400 bps	201C Data Set
Analog	4800 bps	208A Data Set
Analog	9600 bps	209A Data Set
Digital	2400 bps	500A Data Service Unit Set at 2400 bps
Digital	4800 bps	500A Data Service Unit Set at 4800 bps
Digital	9600 bps	500A Data Service Unit Set at 9600 bps

Fig. 4—Equipment Required for Synchronous Lines (2.17)

Number: aaa-bbbb

aaa is the code assigned to the TN office.

bbbb is:

0000 through 0009	Implied and Abbreviated Addressing	
0010 through 0499	Line Groups	Customer Service Centers
0500 through 0998	Lines	
0999	Service Messages	
1000 through 7999	Polled Stations	
8000 through 8999	Dial-in Ports	
9000 through 9999	Reserved	

Fig. 5—Port and Station Numbers (3.01)

DLAH	DLA	PORT NUMBER	DLAH	DLA	PORT NUMBER	DLAH	DLA	PORT NUMBER	DLAH	DLA	PORT NUMBER
00	00	8000	04	00	8064	08	00	8128	12	00	8192
	01	8001		01	8065		01	8129		01	8193
	02	8002		02	8066		02	8130		02	8194
	03	8003		03	8067		03	8131		03	8195
	04	8004		04	8068		04	8132		04	8196
	05	8005		05	8069		05	8133		05	8197
	06	8006		06	8070		06	8134		06	8198
	07	8007		07	8071		07	8135		07	8199
	08	8008		08	8072		08	8136		08	8200
	09	8009		09	8073		09	8137		09	8201
	10	8010		10	8074		10	8138		10	8202
	11	8011		11	8075		11	8139		11	8203
	12	8012		12	8076		12	8140		12	8204
	13	8013		13	8077		13	8141		13	8205
	14	8014		14	8078		14	8142		14	8206
	15	8015		15	8079		15	8143		15	8207
01	00	8016	05	00	8080	09	00	8144	13	00	8208
	01	8017		01	8081		01	8145		01	8209
	02	8018		02	8082		02	8146		02	8210
	03	8019		03	8083		03	8147		03	8211
	04	8020		04	8084		04	8148		04	8212
	05	8021		05	8085		05	8149		05	8213
	06	8022		06	8086		06	8150		06	8214
	07	8023		07	8087		07	8151		07	8215
	08	8024		08	8088		08	8152		08	8216
	09	8025		09	8089		09	8153		09	8217
	10	8026		10	8090		10	8154		10	8218
	11	8027		11	8091		11	8155		11	8219
	12	8028		12	8092		12	8156		12	8220
	13	8029		13	8093		13	8157		13	8221
	14	8030		14	8094		14	8158		14	8222
	15	8031		15	8095		15	8159		15	8223
02	00	8032	06	00	8096	10	00	8160	14	00	8224
	01	8033		01	8097		01	8161		01	8225
	02	8034		02	8098		02	8162		02	8226
	03	8035		03	8099		03	8163		03	8227
	04	8036		04	8100		04	8164		04	8228
	05	8037		05	8101		05	8165		05	8229
	06	8038		06	8102		06	8166		06	8230
	07	8039		07	8103		07	8167		07	8231
	08	8040		08	8104		08	8168		08	8232
	09	8041		09	8105		09	8169		09	8233
	10	8042		10	8106		10	8170		10	8234
	11	8043		11	8107		11	8171		11	8235
	12	8044		12	8108		12	8172		12	8236
	13	8045		13	8109		13	8173		13	8237
	14	8046		14	8110		14	8174		14	8238
	15	8047		15	8111		15	8175		15	8239
03	00	8048	07	00	8112	11	00	8176	15	00	8240
	01	8049		01	8113		01	8177		01	8241
	02	8050		02	8114		02	8178		02	8242
	03	8051		03	8115		03	8179		03	8243
	04	8052		04	8116		04	8180		04	8244
	05	8053		05	8117		05	8181		05	8245
	06	8054		06	8118		06	8182		06	8246
	07	8055		07	8119		07	8183		07	8247
	08	8056		08	8120		08	8184		08	8248
	09	8057		09	8121		09	8185		09	8249
	10	8058		10	8122		10	8186		10	8250
	11	8059		11	8123		11	8187		11	8251
	12	8060		12	8124		12	8188		12	8252
	13	8061		13	8125		13	8189		13	8253
	14	8062		14	8126		14	8190		14	8254
	15	8063		15	8127		15	8191		15	8255

Fig. 6—Dial-In Port Numbers