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AUTOCONNECT ARRANGEMENTS
NO. 3 ELECTRONIC SWITCHING SYSTEM

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INTRODUCTION

1. GENERAL INFORMATION

1.01 This document describes the autoconnect feature of the No. 3 Electronic Switching System (ESS). The autoconnect feature allows users of the network administration (TRF), service order bureau (SO), switching control center (SCC), and repair service bureau (RSB) to connect their teletypewriter (TTY) to a No. 3 ESS through a dial-up connection, thus eliminating the need for dedicated TTY controllers (TTYC) and outside plant for the SO, TRF, and RSB for each ESS office. This feature also allows remote testing of customer lines in a No. 3 ESS by a centralized Local Test Desk (LTD) No. 14 or No. 16 arrangement.

1.02 When this document is reissued, the reasons for reissue will be included in this paragraph.

1.03 This feature is available with SO-2, Issue 3 and later system programs.

2. DEFINITION

2.01 The autoconnect feature provides a means to obtain a secure switched link to the ESS over nondedicated facilities by way of a manual or automatic dial-up procedure. The dial-up procedure can be initiated either by the user (by dialing a trigger telephone number) or, when a certain option is specified, by the ESS itself.

2.02 This is an optional No. 3 ESS feature.

2.03 The No. 3 ESS autoconnect feature allows users of those facilities (TRF, SO, RSB) which are normally dedicated to use nondedicated facilities either in place of or as a backup to those facilities. The direct distance dialing (DDD) network is used as needed to establish the connection between the ESS and the user.

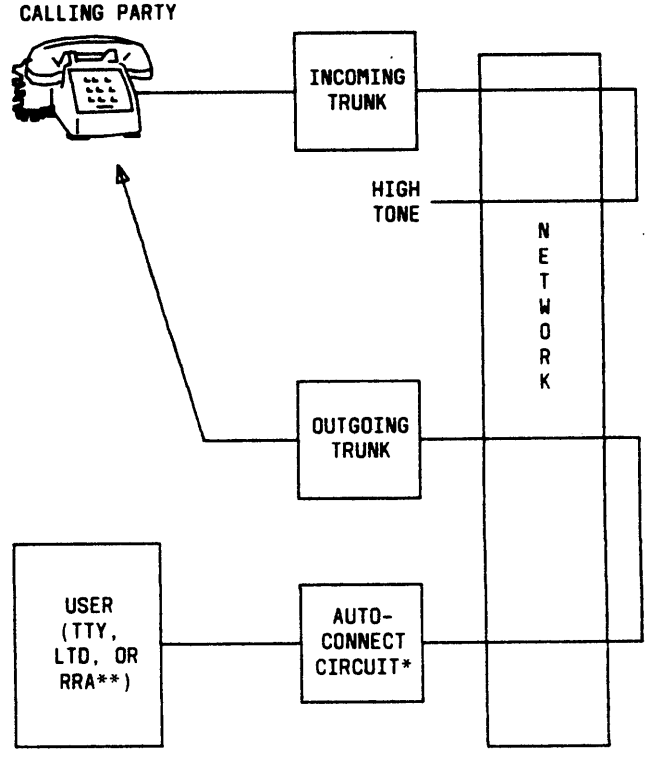
2.04 Teletypewriter messages are transmitted via a software controlled autoconnect circuit. When there is a message, the No. 3 ESS "dials" a number which terminates at the appropriate bureau. Upon receiving the call, a data set in the bureau turns on a teletypewriter which prints out the message. If there are no messages after a fixed time, the connection is dropped and the teletypewriter and autoconnect circuit are freed for other uses.

2.05 Personnel needing to communicate with the No. 3 ESS dial a special number. The ESS verifies the autoconnect request, then calls back with a prestored return telephone number associated with the dialed number. The called party answers, and a secure connection is made with the No. 3 ESS.

DESCRIPTION

3. USER OPERATION

3.01 The autoconnect feature allows users of these services that normally require dedicated facilities in a No. 3 ESS office to use the DDD network and shared equipment to provide a less costly replacement of or backup to those services. A typical autoconnect connection is shown in Figure 1.



* THIS CIRCUIT IS USED ONLY FOR A TTY USER
** RRA IS NOT AVAILABLE IN ISSUES 3 AND 4

Fig. 1—Typical Autoconnect Connection

3.02 Various TTY configurations are achieved using autoconnect. A minimum amount of hardware is used with autoconnect to provide the recommended TTY arrangement shown in Figure 2. This configuration provides separate TTYs for the traffic, service order, and repair service bureau. These TTYs share the miscellaneous channel, TTYC 1 port 1. This is possible as long as any one TTY does not occupy the channel for long periods of time. Another configuration of the TTYs includes a dedicated TTYC and a dedicated line as shown in Figure 3. Still another configuration uses a dedicated TTYC with autoconnect. This arrangement is shown in Figure 4. The above examples represent typical configurations of the TTYs and autoconnect. These examples all use TTYC 1 as a miscellaneous controller. If all autoconnects are removed from TTYC 1, then an autoconnect must be defined making TTYC 1 port 1 another remote maintenance autoconnect port.

3.03 The previously mentioned autoconnect is initiated by dialing a special "trigger" number. Each user is assigned a telephone number in the No. 3 ESS office to call whenever a connection from a remote teletypewriter to the miscellaneous channel is desired. These calls are intercepted when the ESS verifies the call as an autoconnect request. The autoconnect program determines if another user is currently connected to the miscellaneous channel. If so, the calling user receives normal busy tone. If not, the user receives high tone. This is a signal that the calling user should remain off-hook for at least 10 seconds (but less than 30) and then go on-hook. When the user goes on-hook, the ESS calls a prestored return telephone number associated with the dialed trigger number. This call sets up a connection from the miscellaneous channel to the correct remote teletypewriter. The connection is made over a normal outgoing trunk and appears to be a normal outgoing call. Upon receiving the call, a data set in the called bureau turns on a teletypewriter which prints out a message indicating that the user may begin to input messages. If there are no messages after a fixed time, the connection is dropped and the teletypewriter and autoconnect circuit are freed for other uses. The autoconnect function can also be arranged to automatically connect the miscellaneous channel to the appropriate remote teletypewriter when there is a message for that user.

3.04 Autoconnect also provides monitor capabilities via a port of a TTYC. The monitor port

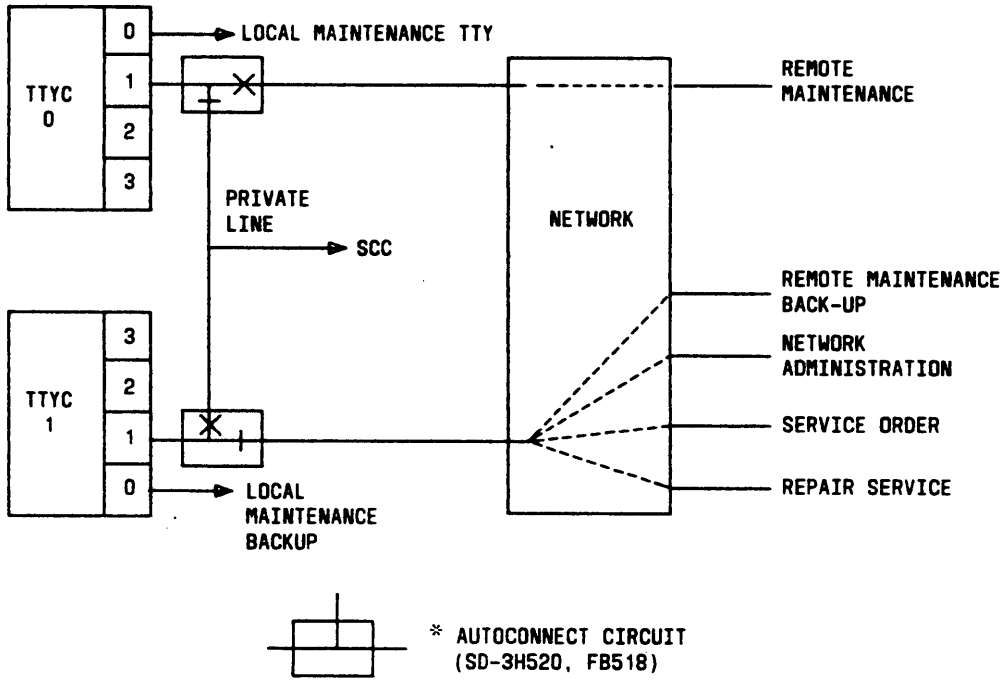
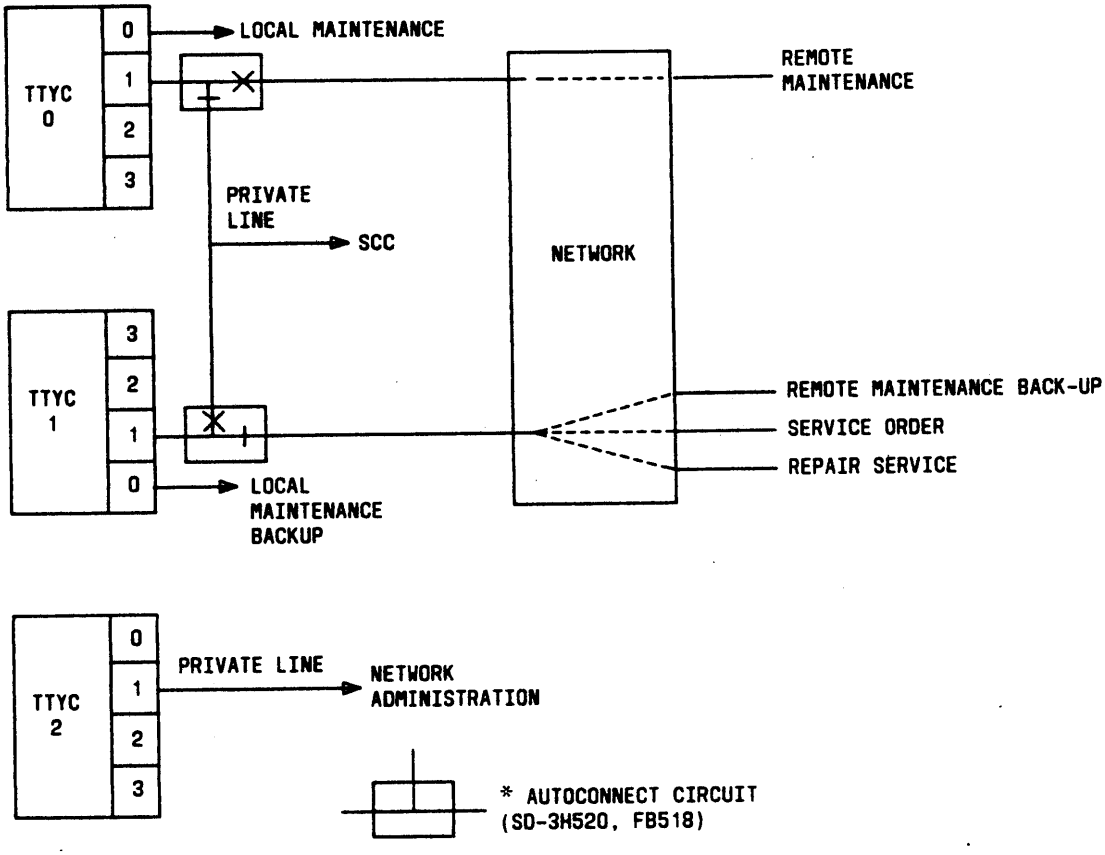


Fig. 2—Typical Autoconnect TTY Arrangement

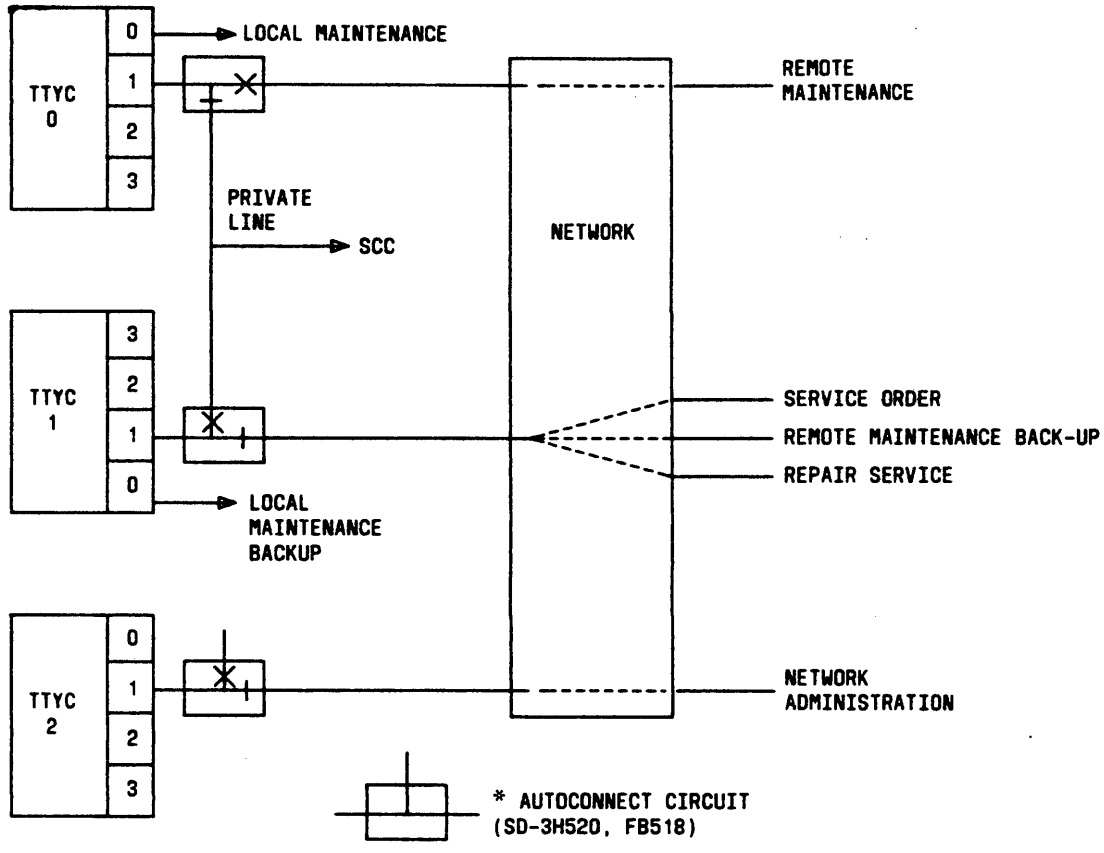


FUNCTION	TRIGGER	RETURN
REMOTE MAINTENANCE (SCC)	- 231-1203	- 1-815-798-1234
SERVICE ORDER	- 231-1201	- 777-9988
REPAIR SERVICE BUREAU	- 231-1202	- 1-963-5512
NETWORK ADMINISTRATION	- DEDICATED TTYC AND LINE	

Fig. 3—Dedicated TTYC With a Dedicated Line

status follows the status of ports 0 or 1 of the same controller. If a monitor port is defined for TTYC 1 port 2 on Figure 3 and a local TTY installed, then this (port 2) TTY will monitor all activity over TTYC 1 port 1. This provides a craftsperson that is visiting the office a record of all service order, traffic and repair service bureau activity.

3.05 A Local Test Desk (LTD) No. 14 or No. 16 can be connected via nondedicated facilities to a No. 3 ESS office by using the autoconnect feature. It is different from a TTY autoconnect in that it is not associated with a TTY controller or an autoconnect line circuit (SD-3H520, FB518). The tester must dial the appropriate trigger number and then remain off-hook for at least 10 seconds (but less than 30) after receiving high tone. When this number is recognized as an autoconnect request by the ESS, a connection is set up from the Remote Test Circuit (RTC)—Far End (SD-99311) to the LTD associated with the called trigger number. The LTD is then rung the same way as an incoming call. This call is answered by inserting a primary cord into the appropriate jack (LTD No. 14) or by operating the PRI on SEC key (LTD No. 16). If the LTD has not been called back within 2 minutes, the autoconnect has failed or the RTC



FUNCTION	TRIGGER	RETURN
REMOTE MAINTENANCE (SCC)	- 231-1203	- 1-815-798-1234
SERVICE ORDER	- 231-1201	- 777-9988
REPAIR SERVICE BUREAU	- 231-1202	- 1-963-5512
NETWORK ADMINISTRATION	- 231-1200	- 1-495-1222

Fig. 4—Dedicated TTYC With an Autoconnect Line

99311 is busy and the tester must redial the trigger number. Busy tone is returned if the tester remained off-hook and the autoconnect failed or the RTC 99311 was busy. Examples of nondedicated LTD arrangements that use the autoconnect feature are shown in Figures 5, 6, and 7.

4. SYSTEM OPERATION

4.01 The No. 3 ESS has the capability of providing several different configurations for TTY and LTD attachment via the autoconnect feature. Users of the network administration, service order, and repair service bureau can make use of the autoconnect partially dedicated (a dedicated TTYC and autoconnected line) and autoconnect nondedicated arrangements to connect their TTYs to the No. 3 ESS through a dial-up connection. The dial-up procedure is initiated either by the TTY user or by the No. 3 ESS. The switching control center (SCC) may also make a connection to the ESS office using the autoconnect arrangement in the event of a failure in the private line to the SCC TTY. The network administration, service order, and repair service bureau TTYs each may be dedicated or autoconnect independent of the arrangement used for the other TTYs. The users of LTDs can also have partially dedicated and

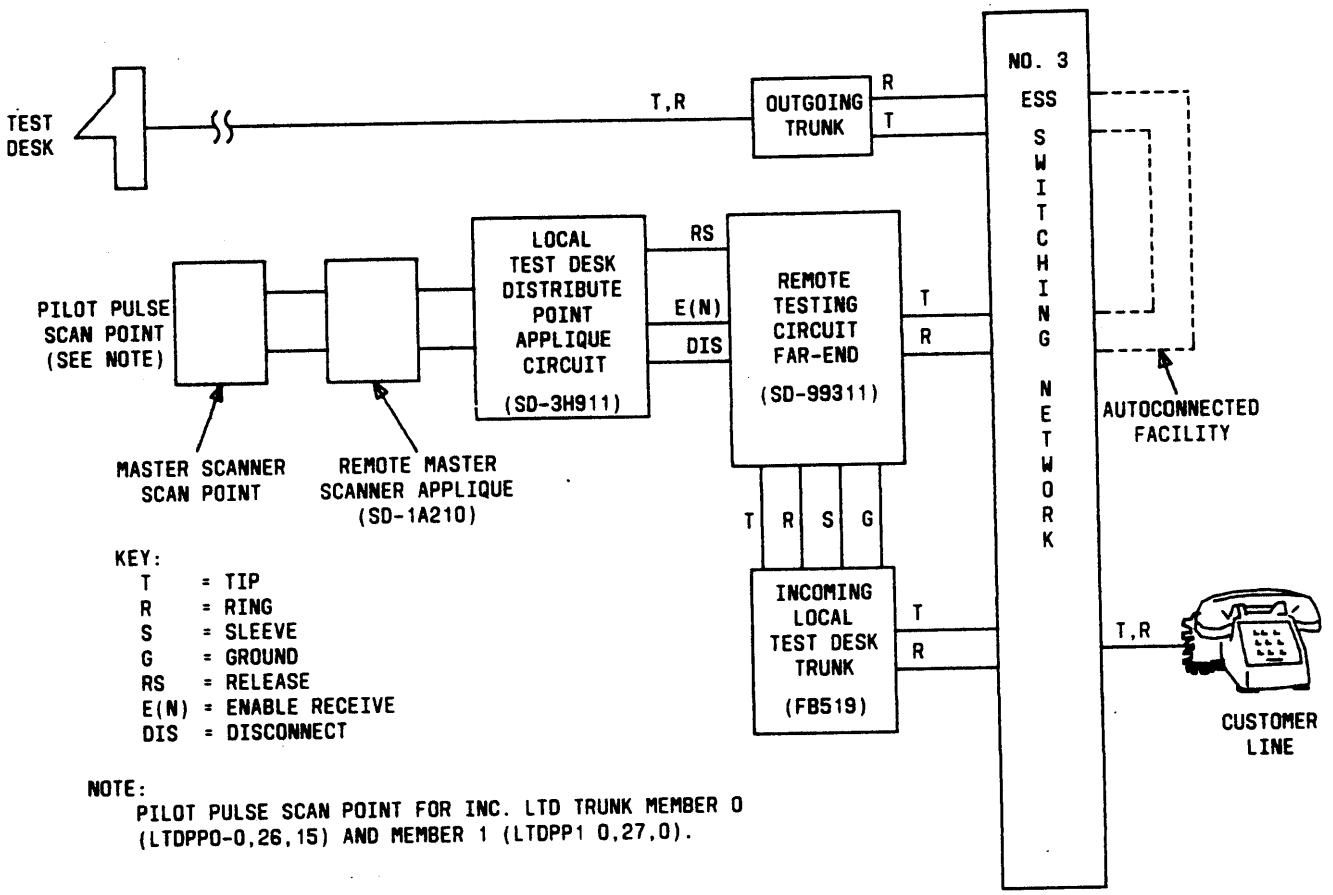


Fig. 5—Remote Nondedicated Local Test Desk Arrangement

nondedicated arrangements and access the ESS by a dial-up arrangement.

TTY AUTOCONNECT ARRANGEMENTS

4.02 A typical autoconnect arrangement which requires a minimum amount of hardware is shown in Figure 2. With the exception of the maintenance channels, all other users share a common source. A common port on a TTYC, the dialed switched path, and a TTY that is capable of being shared by several No. 3 ESS offices are the inherent features of a nondedicated arrangement.

4.03 The autoconnect partially dedicated arrangement requires the use of dedicated hardware at the No. 3 ESS to make a connection to the switching network. With the use of a TTYC and an autoconnect circuit (SD-3H520, FB518) as shown in Figure 4, not as many physical facilities are needed as with a dedicated arrangement. Figure 4 shows the local maintenance channel as being dedicated, the network administration channel with a partially dedicated arrangement, and the repair service bureau and service order bureau sharing a port with a nondedicated arrangement. A dedicated arrangement, with the network administration having a dedicated TTYC and a dedicated line, is shown in Figure 3.

4.04 In the No. 3 ESS, the TTYC is the interface device that acts as a buffer between the active No. 3 ESS central control and a TTY. Two TTYCs are contained in each of two TTYC units. For a basic No. 3 ESS office, two TTYC units are supplied with the maintenance frame and equipped with two TTYCs (0-1).

4.05 Any TTY arrangements beyond the typical arrangement as shown in Figure 2 requires

the use of an additional TTYC unit and/or the equipping of an additional TTYC to provide for a dedicated or autoconnect partially dedicated user. When Automatic Message Accounting Recording Center (AMARC) capabilities are required, TTYC 2-3 are dedicated to this use (see Figure 8).

4.06 In a typical autoconnect nondedicated arrangement, TTYCs and TTYC ports are assigned as follows:

TTYC UNIT	TTYC	PORT	TTY
0	0	0	Local Maintenance
0	0	1	Remote Maintenance
0	0	2	Monitor Port
0	0	3	Monitor Port
1	1	0	Local Maintenance Backup
1	1	1	Remote Maintenance Backup & Miscellaneous Autoconnect
1	1	2	Monitor Port
1	1	3	Monitor Port

4.07 Autoconnect circuits (SD-3H520, FB518) are located on the test frame. Each office is equipped with four circuits. Two of these circuits, designated autoconnect circuit 0 and autoconnect circuit 1, are each connected to a TTYC. The remaining two circuits may be assigned as conditions require. (An example of the assignment of a third autoconnect circuit is shown in Figure 4.) Autoconnect circuits are wired between the TTYCs and the network frames via cross connects on the combined distribution frame (CDF). An example of these cross connects is shown on Figure 9.

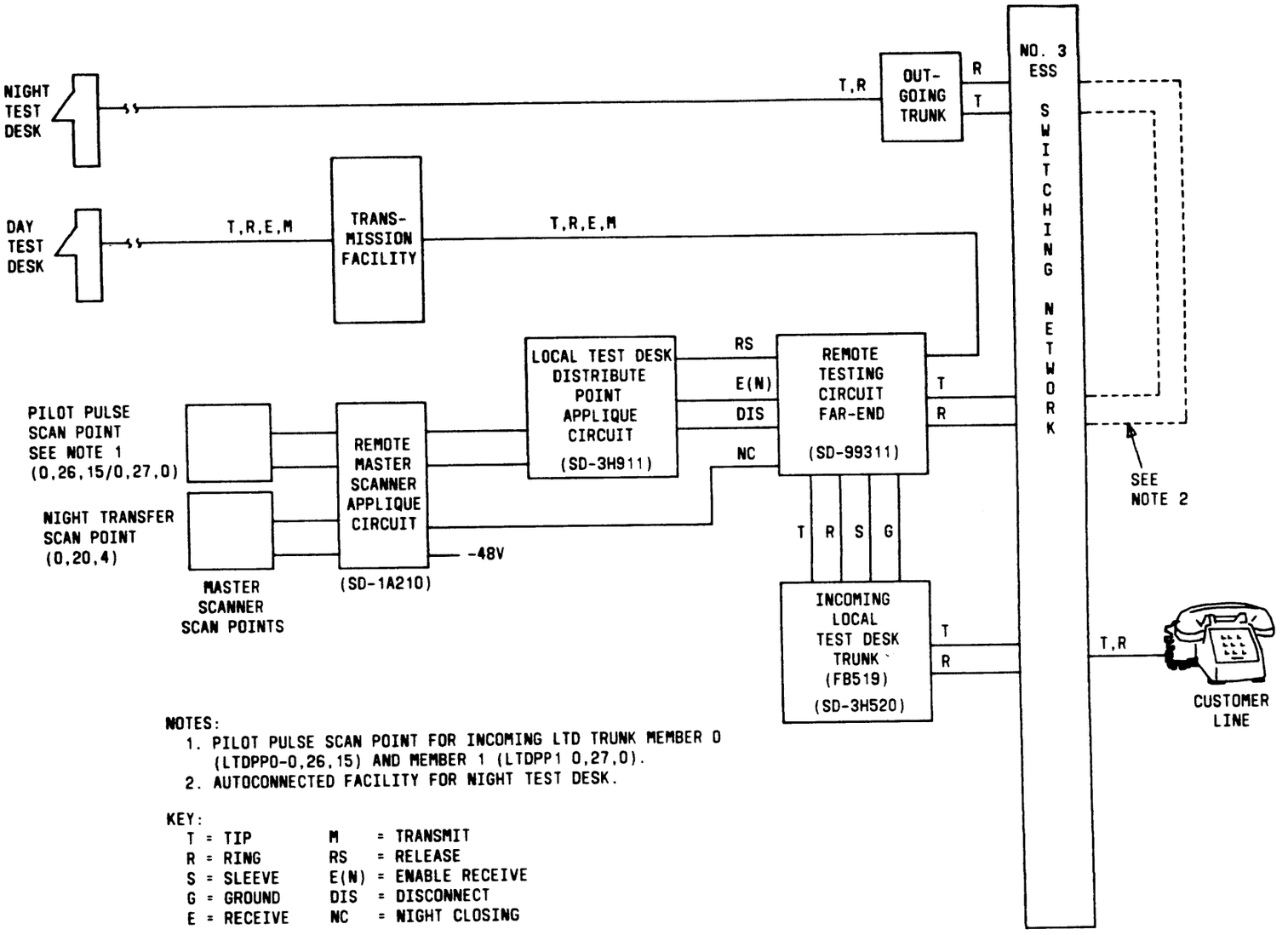
4.08 Autoconnect circuit 0 is assigned to TTYC 0 port 1. In the normal relay position (B-relay operated), TTYC 0 port 1 is connected by a dedicated line to the remote maintenance TTY (Figure 3). However if a failure should occur in the dedicated line, a trigger number may be dialed that will cause the ESS, by use of the autoconnect feature, to establish a direct distance dialing (DDD) connection to another TTY. The connection will be through autoconnect circuit 0 and TTYC 0 port 1.

4.09 Autoconnect circuit 1 is assigned to TTYC 1 port 1. In the normal relay position (A- and B-relay released), TTYC 1 port 1 is not connected to the private line or network. However, if a failure occurs in TTYC 0, the ESS will automatically switch the private line to the remote maintenance TTY through port 1 of TTYC 1. The local maintenance TTY must be switched manually from TTYC 0 port 0 to TTYC 1 port 0.

4.10 While the private line is switched to TTYC 1 port 1, no other TTY can make an autoconnect connection. When a trigger number is dialed, the calling party will receive a busy signal. When a report is to be printed on TTYC 1 port 1, it will be printed on the maintenance TTY.

4.11 All four ports of a TTYC can only be used for one type of TTY channel. TTYC 0 is always for maintenance. Port 0 is used for local maintenance and port 1 is used for remote maintenance (SCC). Ports 2 and 3 are optionally equipped. If they are equipped, TTYs connected to these ports should be defined as monitor. These monitor ports have complete input and output capability. However, the out-of-service status follows the status of ports 0 and 1 of the controller.

4.12 All four ports on TTYC 1 will be either the message class designated by a trigger number or, in the event of a failure in TTYC 0, will be backup maintenance. Ports 2 and 3 on TTYC 1 are optionally equipped. If they are equipped, they must be defined as monitor TTYs. Teletypewriters connected to these ports have complete input and output capability. The out-of-service status of these ports follows the status of ports 0 and 1 of the controller. If a monitor port is defined for TTYC 1 port 2 and a local TTY is installed, then this (port 2) TTY will monitor all activity over TTYC 1 port 1. This would provide a craftsperson that is visiting the office a record of all service order, network administration, and repair service bureau activity. As long as a TTY that is not defined as monitor is attached to port 2 or port 3 of TTYC 1, the ESS will fail to recognize a disconnect by a TTY connected to autoconnect port 1.

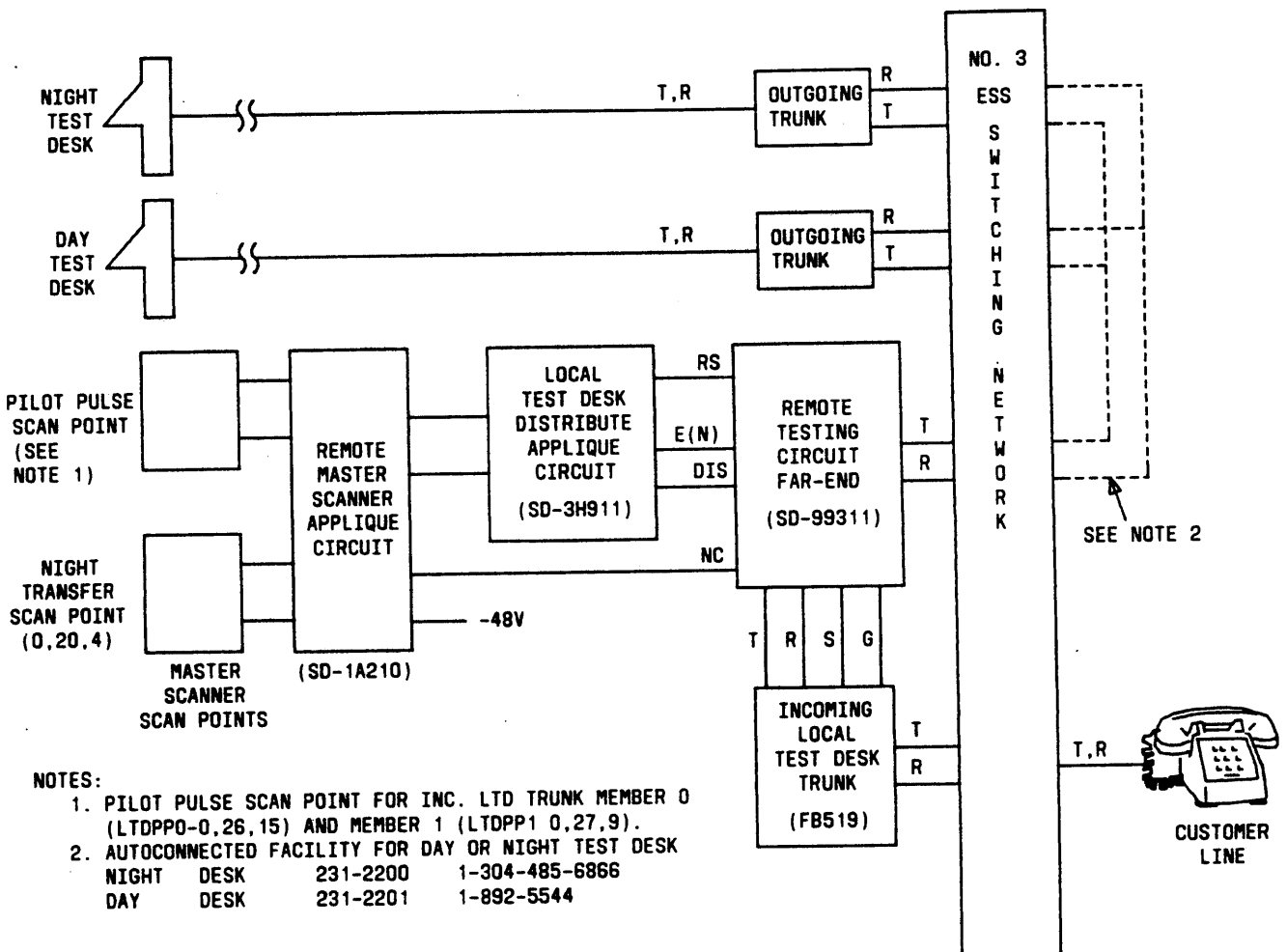


NOTES:
1. PILOT PULSE SCAN POINT FOR INCOMING LTD TRUNK MEMBER 0 (LTDPP0-0,26,15) AND MEMBER 1 (LTDPP1 0,27,0).
2. AUTOCONNECTED FACILITY FOR NIGHT TEST DESK.

KEY:

T	= TIP	M	= TRANSMIT
R	= RING	RS	= RELEASE
S	= SLEEVE	E(N)	= ENABLE RECEIVE
G	= GROUND	DIS	= DISCONNECT
E	= RECEIVE	NC	= NIGHT CLOSING

Fig. 6—Remote Dedicated Day/Nondedicated Night Local Test Desk Arrangement



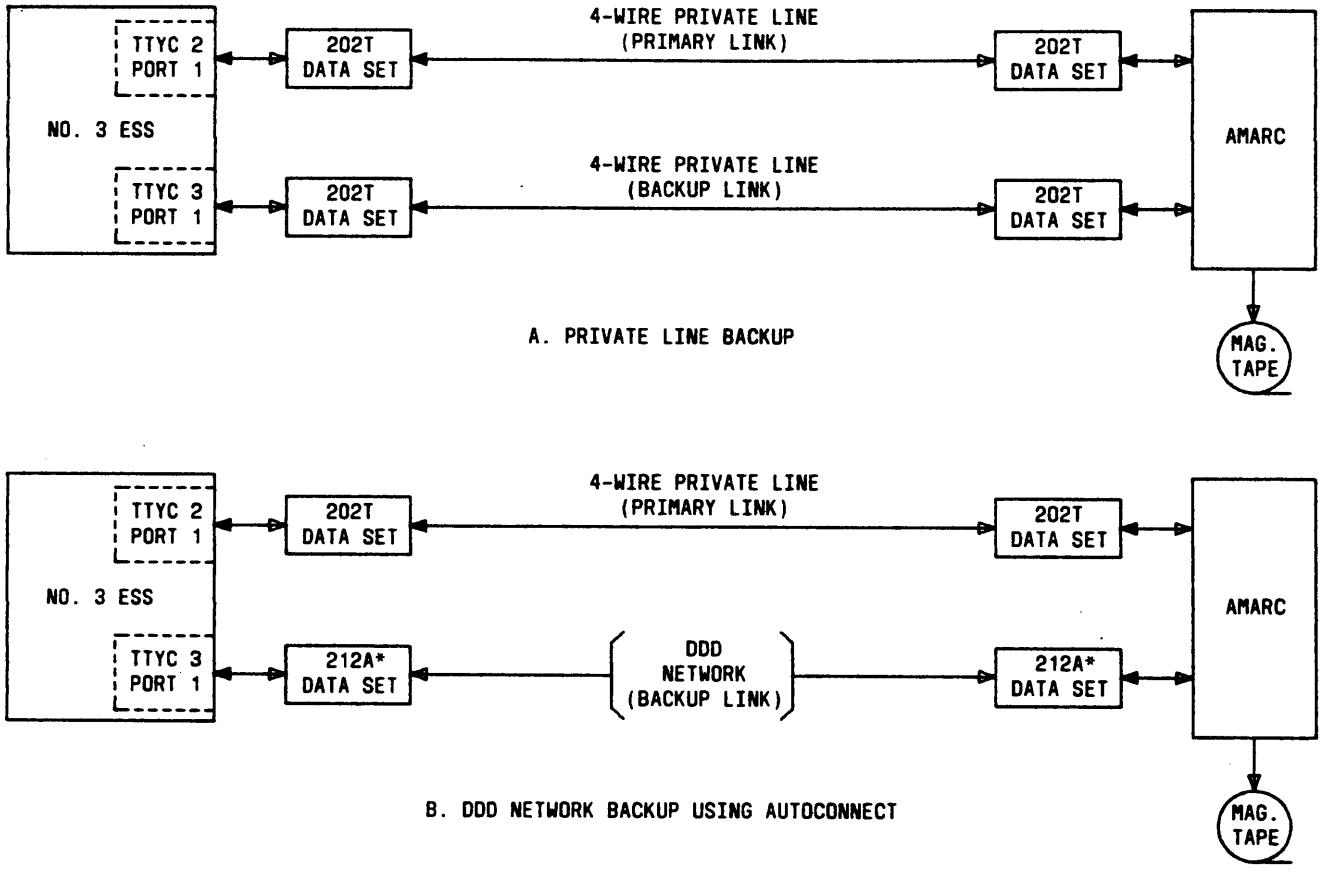
NOTES:
1. PILOT PULSE SCAN POINT FOR INC. LTD TRUNK MEMBER 0 (LTDPP0-0,26,15) AND MEMBER 1 (LTDPP1 0,27,9).
2. AUTOCONNECTED FACILITY FOR DAY OR NIGHT TEST DESK

NIGHT	DESK	231-2200	1-304-485-6866
DAY	DESK	231-2201	1-892-5544

KEY:

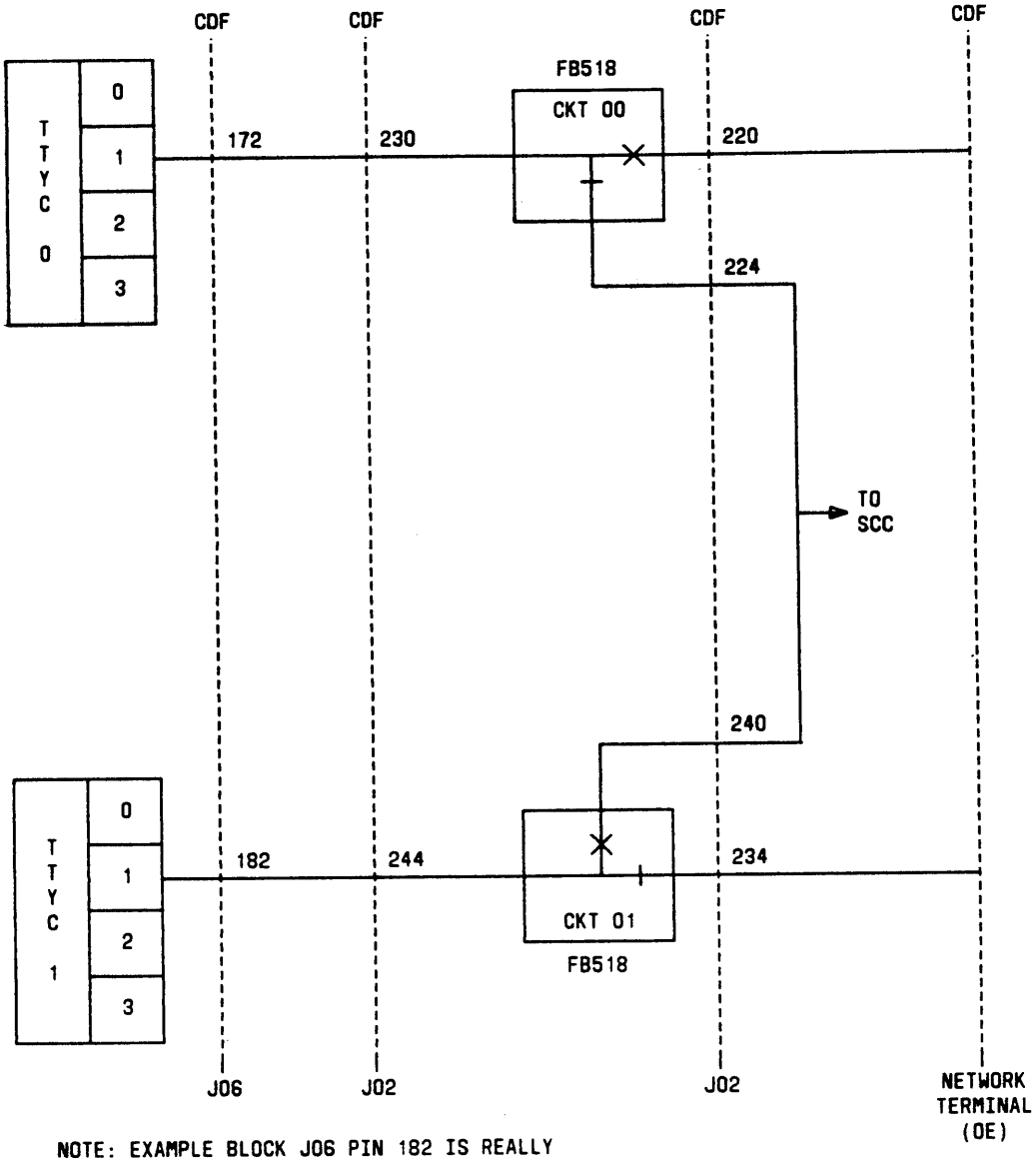
T	= TIP	RS	= RELEASE
R	= RING	E(N)	= ENABLE RECEIVE
S	= SLEEVE	DIS	= DISCONNECT
G	= GROUND	NC	= NIGHT CLOSING

Fig. 7—Remote Nondedicated Day/Nondedicated Night Local Test Desk Arrangement



* 212A DIALUP DATA SET CURRENTLY NOT AVAILABLE BY AMARC

Fig. 8—Block Diagram of Interconnections Between No. 3 ESS and AMARC



NOTE: EXAMPLE BLOCK J06 PIN 182 IS REALLY THE PAIR 182 AND 183.

Fig. 9—CDF-Wiring for Standard Autoconnect Arrangements

4.13 Teletypewriter messages are assigned a message class. The message classes are as follows:

MESSAGE CLASS	TTY
0	Maintenance (located on the maintenance frame in the No. 3 ESS office or the SCC from controller 1)
1	Backup Maintenance (located on the maintenance frame in the No. 3 ESS office or the SCC from controller 1)
2	Service Order Bureau
3	Network Administration
4	Repair Service Bureau
5	Office Records
6, 7	Automatic Message Accounting Recording Center (AMARC)

Note: The message class and the TTY controller and port are not necessarily the same.

4.14 Each message class used with both autoconnect arrangements, partially dedicated and nondedicated, has a different trigger number assigned to it. In addition to associating a return telephone number, the trigger number associates the message class and set of messages allowed to a specific user.

4.15 The entry type (ETYP) indicates the special work that must be performed for a specific function. Entry types 0-2 have message class assignments. The ETYP codes are as follows:

ETYP	USER
0	Teletypewriter (TTY)
1	Automatic Message Accounting (AMA) (Future)
2	Engineering and Administration Data Acquisition System (EADAS) (Future)
3	Spare
4	Local Test Desk (LTD)
5	Remote Recorded Announcement (RRA) (Future-3E3)
6	Spare
7	Spare.

4.16 Different sets of input and output messages are available to each message class with the exception of classes 0 and 1, which have an identical set of messages. All available input and output messages for No. 3 ESS are listed in the Input Message Manual, IM-3H300, and the Output Message Manual, OM-3H300.

4.17 Each message class (except 0 and 1) can be assigned automatic dial-up. When specified, automatic dial-up allows the ESS to call a TTY without a trigger number being dialed when an output message applying to the TTY's message class is to be printed. Automatic dial-up should be specified for message classes 3 and 4. It is recommended that any remote TTY that is accessed by automatic dial-up use the who-are-you (WRU)/answer back (ACK) test to verify that the remote TTY is on-line and will transmit back. Otherwise, if the remote TTY is not functional and WRU/ACK is not used, all data transmitted to that TTY will be lost. Automatic dial-up should be used with caution as conflicts could occur with other users. If another TTY is using the autoconnect port and a message is requested to print to another user of the autoconnect port, the message will not be printed immediately due to the busy condition. Automatic dial-up is required if traffic is autoconnected for printing data results as part of the "D"-schedule routine prints that may be scheduled during the late night hours.

4.18 When a message or report is to be printed on a particular TTY but the autoconnect port is in use by another TTY, the ESS will wait up to 10 minutes for the autoconnect port to become clear or wait until the output queue (temporary memory area where messages are stored in the No. 3 ESS before they are printed) is full. If at

the end of 10 minutes the port is still in use, the ESS will print the pending traffic message or report on the maintenance TTY. For other message classes, they will be routed to maintenance after a message is rejected due to the queue being full.

4.19 A time-out option for disconnect may also be assigned. The time-out option specifies a period of time, up to 300 seconds from the last message, after which the ESS will disconnect. In the case where no time-out is specified, the ESS will remain connected indefinitely. A different time-out may be specified for each trigger number. Caution should be exercised in the specifying of the time-out option. If a user has been assigned "no time-out" and that user does not go on-hook, a conflict for any subsequent user could occur.

4.20 The time-out option does not apply if the autoconnect was initiated via automatic dial-up. During an automatic dial-up connection, the ESS will wait 15 seconds after the last message before disconnecting.

4.21 The autoconnect feature can be initiated either by automatic dial-up or by use of a trigger number. The high tone option (default) should be specified if autoconnect is to be initiated by a person. If the high tone option is selected, then high tone is returned when the trigger number is dialed. The calling party must hang up between 10 and 30 seconds after the tone is returned for the autoconnect to succeed. If autoconnect is to be initiated remotely by an automatic calling unit (ACU), the 2225-Hz tone option (answer tone for 212 data set) must be used. (This is also the tone option used for AMARC backup.) Ten seconds after tone is returned, the ESS will disconnect and initiate the dial back.

4.22 There are also TTYC speed options for dedicated and autoconnected facilities. These are primarily sorted via Interrupt 12. The following table list recommended speed options available for each TTYC:

TTYC	SPEED	INTERRUPT	REMARKS
0	Low	10	
1	Low	11	
2	Hi	12	*This is independent of Device Speed*
3	Hi	12	
4	Low/Hi	10/12	110-300 Baud use interrupt 10
6	Low/Hi	10/12	600-1200 Baud use interrupt 12

4.23 For general information on TTY operation in the No. 3 ESS, refer to Section 233-110-115, Teletypewriter and Teletypewriter Controller—Description and Theory of Operation, and Section 233-152-120, Teletypewriter Software—Subsystem Description.

LTD AUTOCONNECT ARRANGEMENTS

4.24 The LTD autoconnect arrangement is different from a TTY autoconnect in that it is not associated with a TTYC or an autoconnect line circuit (SD-3H520, FB518). The tester at the LTD must dial the trigger number of the desired No. 3 ESS office. The system program at that office recognizes this called number as an autoconnect request and returns high tone if the RTC 99311 and LTD trunk are not busy. The tester must remain off-hook for at least 10 seconds (but less than 30) after receiving high tone and then go on-hook. The No. 3 ESS then sets up a connection through the RTC 99311 to the LTD associated with the called trigger number. The LTD is then rung the same as an incoming call. This callback is answered by inserting a primary cord into the appropriate jack (LTD No. 14) or by operating the PRI or SEC key (LTD No. 16). If callback has not occurred within 2 minutes, the autoconnect has failed or the RTC 99311 is busy, and the tester must redial the trigger number. Busy tone is returned if the tester remains off-hook and the autoconnect has failed or the RTC 99311 is busy.

4.25 To maintain this LTD autoconnect connection, it is necessary for the LTD to automatically generate a pilot pulse every 60 seconds or whenever a test key is operated. If the pilot pulse is not detected by the pilot pulse scan point (Figure 7)

for a period of 2 minutes, the local test desk handler (LTDH) program (PR-3H311) causes the autoconnect connection to be dropped in the same manner as if the disconnect key had been operated. Refer to Section 233-190-031, Local Test Desk Arrangements, for details of LTD arrangements.

REMOTELY INITIATED AUTOCONNECT

4.26 When the No. 3 ESS detects a terminating telephone number with the autoconnect class, control is passed to the Autoconnect Port Control Program (ACPORT), PR-3H250. The 4-digit translations (Figure 10) show the terminating class of service is autoconnect (MAJ=29); ACPORT then obtains the associated callback block from autoconnect translations and, from it, the user function.

4.27 If the user function is a TTY type of function, the required port is checked to see if it is available. If it is disconnected, the required message class is obtained and high tone is returned to the caller. Otherwise, busy tone is returned.

4.28 If the user function is for an LTD, for issue 3 the usable message class parameters (0, 1) take a different meaning for maintenance (day desk = 1 and the night desk = 0), and the TTYC keyword is used to identify the member number of the assigned incoming LTD trunk (SD-3H520, FB519). For issue 4 and later, the keyword TER identifies the member number of the assigned incoming LTD trunk and the keyword NIGHT identifies whether the autoconnect is for the night or day desk. A check is also made to see if this is a night transfer. If not, high tone is returned to the caller. If this is for a night transfer, the night transfer scan point is checked to see if it is set. High tone is returned if the scan point is set and busy tone if it is not.

4.29 The caller then waits at least 10 seconds (but less than 30) before going on-hook. If high tone was held long enough, the callback block data is used to initiate the callback. Otherwise, the call is failed.

4.30 The return number found in the callback block is then used by call processing programs to set up the callback. The ESS will wait 60 seconds for an answer by the TTY or LTD. If no answer is received at the end of this time, the ESS abandons the call. For the LTD, this ends the callback attempt. For TTYs, a 30-second time-out is then initiated and, at the end of this period, a retry is attempted. When this connection is not answered within 60 seconds, the ESS abandons the call and prints a failure message on the maintenance channel TTY.

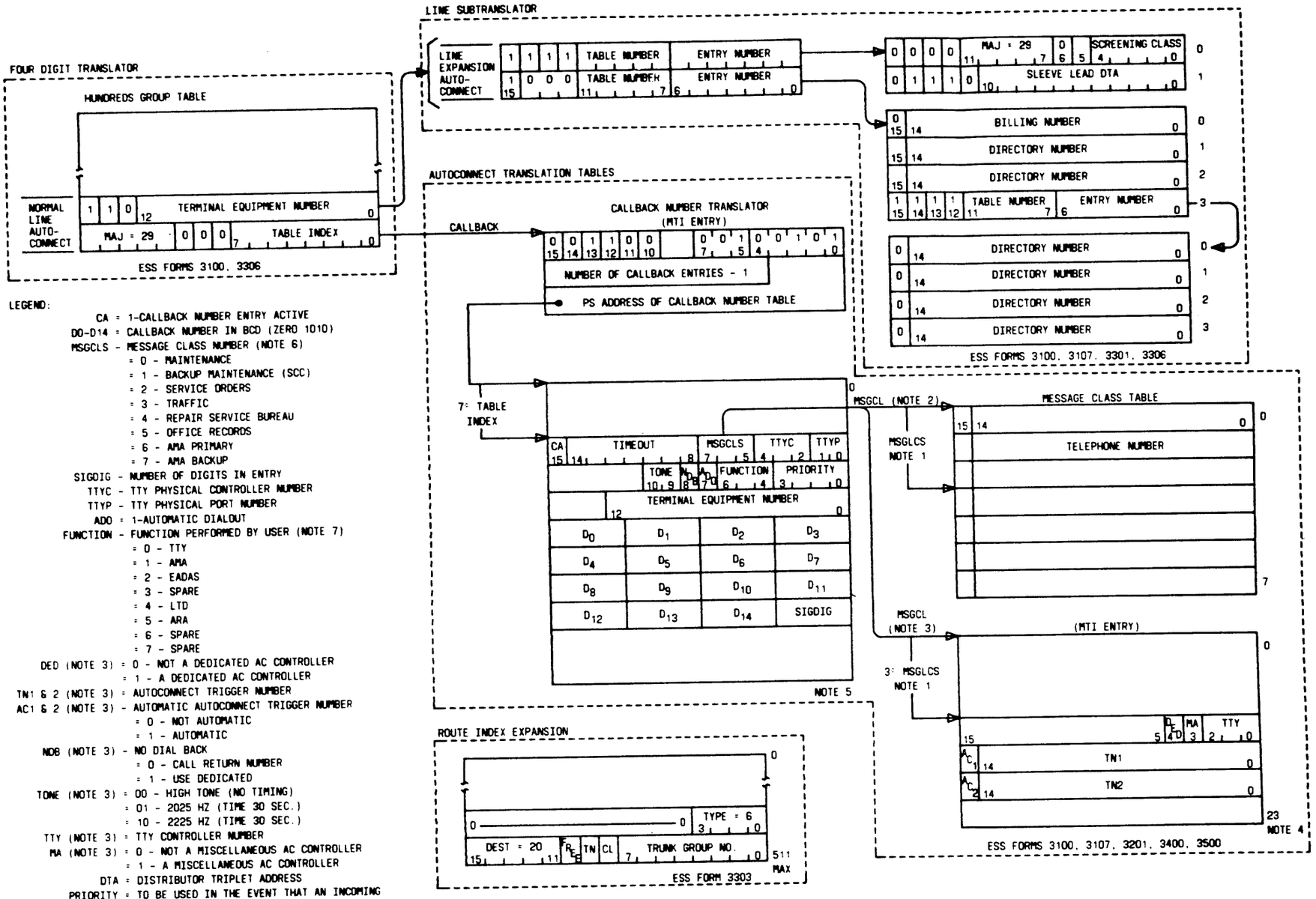
4.31 If this was a TTY type of function and either attempt was successful, the ESS will sign on by printing a message that includes the TTY ID assigned to that ESS office. If no further output is printed, the user may proceed to type input messages.

4.32 When an automatic calling unit (ACU) is used, a different tone other than high tone will be returned after the trigger number is dialed. A 2225-Hz tone is returned when a 212 data set is used. Ten seconds after the tone is returned, the ESS will disconnect. The callback block data is obtained and the callback is initiated. The callback then proceeds as described in 4.30. If either attempt was successful, the ESS will sign on by printing a message that includes the TTY ID assigned to that ESS office. When the autoconnected port has been idle for a variable interval (inputted by a recent change message) after the last input or output message, the ESS will disconnect.

4.33 If this was a LTD function, the tester at the LTD must answer the callback by inserting a primary cord into the appropriate jack (LTD No. 14) or by operating the PRI or SEC key (LTD No. 16). This action causes seizure of the RTC 99311 and completes the path from the ESS to the LTD. This connection remains up until the tester operates the disconnect key. If the ESS has not received an answer after 60 seconds, the call is abandoned.

INTERNALLY INITIATED AUTOCONNECT

4.34 The automatic dial-up option allows the ESS to call a TTY without a trigger number being dialed when an output message applying to the TTYs message class is to be printed. When a message is generated, the output message class is translated into a default trigger number which is then used to locate the appropriate callback block. The callback then proceeds as previously described in 4.30. If either attempt is successful, the ESS will sign on by printing a message that includes the TTY ID assigned to that ESS office. After the sign-on message is printed, the message that caused the preceding autoconnect sequence is



LEGEND:

CA = 1-CALLBACK NUMBER ENTRY ACTIVE
D0-D14 = CALLBACK NUMBER IN BCD (ZERO 1010)
MSGCLS - MESSAGE CLASS NUMBER (NOTE 6)
= 0 - MAINTENANCE
= 1 - BACKUP MAINTENANCE (SCC)
= 2 - SERVICE ORDERS
= 3 - TRAFFIC
= 4 - REPAIR SERVICE BUREAU
= 5 - OFFICE RECORDS
= 6 - AMA PRIMARY
= 7 - AMA BACKUP
SIGDIG - NUMBER OF DIGITS IN ENTRY
TTYC - TTY PHYSICAL CONTROLLER NUMBER
TTYP - TTY PHYSICAL PORT NUMBER
ADO = 1-AUTOMATIC DIALOUT
FUNCTION - FUNCTION PERFORMED BY USER (NOTE 7)
= 0 - TTY
= 1 - AMA
= 2 - EADAS
= 3 - SPARE
= 4 - LTD
= 5 - ARA
= 6 - SPARE
= 7 - SPARE
DED (NOTE 3) = 0 - NOT A DEDICATED AC CONTROLLER
= 1 - A DEDICATED AC CONTROLLER
TN1 & 2 (NOTE 3) = AUTOCONNECT TRIGGER NUMBER
AC1 & 2 (NOTE 3) - AUTOMATIC AUTOCONNECT TRIGGER NUMBER
= 0 - NOT AUTOMATIC
= 1 - AUTOMATIC
NDB (NOTE 3) - NO DIAL BACK
= 0 - CALL RETURN NUMBER
= 1 - USE DEDICATED
TONE (NOTE 3) = 00 - HIGH TONE (NO TIMING)
= 01 - 2025 HZ (TIME 30 SEC.)
= 10 - 2225 HZ (TIME 30 SEC.)
TTY (NOTE 3) = TTY CONTROLLER NUMBER
MA (NOTE 3) = 0 - NOT A MISCELLANEOUS AC CONTROLLER
= 1 - A MISCELLANEOUS AC CONTROLLER
DTA = DISTRIBUTOR TRIPLET ADDRESS
PRIORITY = TO BE USED IN THE EVENT THAT AN INCOMING TRIGGER NUMBER NEEDS ANY OF THE EXISTING AUTOCONNECT FACILITIES THAT ARE IN SERVICE
DEST = DESTINATION CODE
CL = 1-CLASS OF SERVICE TONE
TN = WHEN CL = 1, TN = 1 - USE HIGH TONE
= 0 - USE LOW TONE

NOTES:
1. MSGCLS IS A NUMBER INPUTTED VIA A TTY MESSAGE. IT IS THE SAME NUMBER AS FOUND IN THE CALLBACK TABLE.
2. THIS ENTRY IS USED ONLY FOR SO-2, ISSUE 3.3 OR EARLIER.
3. THIS ENTRY IS USED ONLY FOR SO-2, ISSUE 4 OR LATER.
4. THE DED BIT IN ENTRY 0 IS ALWAYS SET FOR THE MAINTENANCE TTY.
5. THE NUMBER OF ENTRIES IN THE CALLBACK TABLE ARE AUTOCONNECT USER LIMITED.
6. MESSAGE CLASS ENTRIES 5, 6, AND 7 ARE NOT APPLICABLE TO SO-2, ISSUE 3 OR EARLIER PROGRAMS.
7. FUNCTION CODES OTHER THAN 0 AND 4 ARE NOT APPLICABLE TO SO-2, ISSUE 3 OR EARLIER PROGRAMS.

Fig. 10—Autoconnect Translations Data

found and printed. If no further messages are pending for this channel, the TTYC is idled and a 15-second time-out is initiated. When the time-out is complete, the autoconnect is terminated. The next output message for the channel causes the same sequence to be repeated unless it occurs before the time-out is complete.

CHARACTERISTICS

5. FEATURE ASSIGNMENT

5.01 The autoconnect feature is provided on a per-system basis and applies only to those functions pertaining to TTY or LTD connections. Four autoconnect circuits (SD-3H520, FB518), two per FB518 circuit pack, are assigned per office. These must be used on autoconnects related to a TTYC.

5.02 This feature is intended for use by network administration, service order, and the repair service bureau in lieu of dedicated facilities. Remote maintenance at the SCC also uses autoconnect as a backup to the dedicated facilities. Personnel at a LTD also use the autoconnect feature in lieu of normally dedicated facilities or as a means of accessing a No. 3 ESS from a remote LTD (eg, a night nondedicated LTD arrangement).

6. LIMITATIONS

TTY

6.01 To provide the autoconnect feature, each office is equipped with four autoconnect circuits (SD-3H520, FB518), two per FB518 circuit pack, which are located on the test frame. Two of these circuits designated as autoconnect circuit 0 and autoconnect circuit 1, are normally connected to TTYC 0 port 1 and TTYC 1 port 1. One of the purposes of the autoconnect circuit is to switch the remote maintenance TTY private line from TTYC 0 port 1 to TTYC 1 port 1 in the event of a TTYC 0 failure. If a failure occurs in the private line, then the SCC may autoconnect into the maintenance TTYC. While the private line is switched to TTYC 1 port 1, no other TTY can make an autoconnect connection to TTYC 1. When a trigger number is dialed, the calling party will receive a busy signal. When a network administration report is to be printed, it will be printed on the maintenance TTY.

6.02 When either the nondedicated or partially dedicated autoconnect arrangements are defined, the network administrator should assign call forwarding to the network administration TTY line when possible. Call forwarding will allow the transfer of connections from the ESS to another TTY. Transfer may be desired either when the usual TTY is out of order or when another group (such as Network Design) would like access to the ESS.

6.03 The most significant effect of the TTY autoconnect arrangement is that all assigned users may share the same port (TTYC 1 port 1). Only one user can be connected at any one time. All other users who dial a trigger number will receive a busy signal. Automatic dial-up users will have their data printed on the maintenance TTY.

6.04 All remote TTY connections that may use autoconnect should use the who-are-you (WRU)/answer-back (ACK) test to prevent loss of data in the event that the remote TTY is out of service. If acknowledgement is not returned after the WRU, the data will be printed on the maintenance TTY. Otherwise, if the remote TTY is not functional and WRU/ACK is not used, all data transmitted to that TTY will be lost.

6.05 Autoconnect port sharing should not present user occupancy problems. Service order changes are not expected to be more than a few a day. Measurement schedules and office record updates are printed during late hours as scheduled by the Traffic Schedule Block. Repair Service Bureau would only use the channel when reported troubles need verification, testing a line, removing, or restoring a customer's line.

6.06 The assignment of TTYCs and their associated ports is dependent on the generic program and issue in an office and the type of autoconnect arrangement desired. With SO-2 Issue 3 and earlier generic programs, TTYC numbers range from 0-7. However, only TTYC numbers 0-3 are allowed. With SO-2 Issue 4 and later generic programs, the TTYC numbers also range from 0-7 and numbers 0-4 and 6 are allowed. The assignments of TTYC ports for autoconnect are as follows:

(a) Controller 0 port 0 is assigned to the maintenance teletype and may not have an autoconnect assignment.

(b) Controller 0 port 1 is assigned to the remote maintenance teletype and must have an autoconnect assignment.

(c) Controller 1 port 0 is reserved as a backup port for the maintenance teletype.

(d) Controller 1 port 1 may be assigned to any type of teletype and may have more than one message class assigned. This port is also used as a backup for the remote maintenance teletype, therefore an autoconnect assignment must be specified.

(e) Controllers 2, 3, 4, and 6 port 0 may only be assigned to a local teletype and may not have an autoconnect assignment.

(f) Controllers 2, 3, 4, and 6 port 1 may be assigned to any type teletype but must be dedicated to one message class. If the office has AMA, controllers 2 and 3 port 1 must be used for AMARC.

(g) Ports 2 and 3 on all controllers are monitor ports only and may not have an autoconnect assignment.

6.07 Caution should be exercised in the specifying of the time-out option. If a user has been assigned "no time-out" and that user does not go on-hook, a conflict for any subsequent user could occur. It is recommended that "no time-out" be assigned to only maintenance autoconnect.

6.08 Automatic dial-up can also have conflicts with other users. If another TTY is using the autoconnect port and a message is requested to print to another user of the autoconnect port, the message will not be printed at this time due to the busy condition but will be printed later or backed up to maintenance. Automatic dial-up may be specified only once for any message class and only on port 1.

6.09 One distinct trigger number must be assigned for each message class to be given autoconnect capabilities. The telephone number used should be one which would not ordinarily be assigned for customer service (eg, NXX-1203, -0010, -9898). For consistency, the same range of numbers should be used in each No. 3 ESS office.

6.10 The return number is the telephone number of the TTY to be called when either the automatic dial-up option is exercised or when a trigger number has been dialed. The return number may include an access digit and area code if the TTY is in a different number plan area and an access digit is required. The return number may be either a different one for each trigger number if separate TTYs are used for different functions or the same one for each trigger number if the same TTY is used for all functions.

6.11 The message class determines the set of input and output messages allowed when a particular trigger number is dialed. Message classes were specified in paragraph 4.13.

6.12 The time-out option was discussed in paragraph 4.19. It is recommended that "no time-out" be assigned to all maintenance autoconnects. The maximum allowable time-out is 300 seconds.

6.13 Any loop start office equipment number (OEN) may be used. The OEN will have a directory number assignment that will be the trigger number. All autoconnects from the same TTYC and port must have the same OEN.

6.14 The fixed distribute points for the FB518 circuit pack must be used.

6.15 The items in paragraph 6.01 through 6.14 are assigned in a new office on the ESS 3107-2 and 3500 forms (refer to the No. 3 ESS Translation Guide, TG-3). In a working office with Issue 3 or earlier, these items may be assigned by use of the ***RC:AC*** and ***RC:LINE*** message from the maintenance TTY. For Issue 4 and later, use RC:LINE (refer to the Input Manual IM-3H300).

6.16 The recommended line class class code for the autoconnect ports is ***ATC.*** The originating and terminating major classes are both ***29.*** The line class code and originating and terminating major classes must be assigned to an autoconnect port using the ESS 3100 form for a new office or by using the ***RC:LINE*** input message for a working office. These items may be initially assigned by using the ODA on the ESS 3306 form or by using the input message ***RC:LCC.*** Refer to the TG-3 and IM-3H300 for additional information.

LTD

6.17 Local test desk autoconnect is different from a TTY autoconnect in that it is not associated with a TTYC or an autoconnect line circuit (SD-3H520, FB518). A maximum of two incoming LTD trunk circuits (SD-3H520, FB519) can be provided per system. Each trunk circuit is independent of the other and can only be assigned to member 0 or 1 of the trunk group to which they are assigned. If the trunk is accessed by nondedicated facilities, a remote test circuit far end (SD-99311) is required.

6.18 The RTC 99311 is a one- or two-port device. The day dedicated and night nondedicated arrangement uses both ports. All other configurations require only one port. The RTC 99311 requires a ground start office equipment number (OEN) assignment only when using a nondedicated arrangement. Use of a nondedicated night center with the day center being either dedicated or nondedicated requires a distributor applique circuit (SD-3H911), a remote master scanner applique circuit (SD-1A210), and two scanner scan points. One scan point is required for the pilot pulse scan point which should be assigned to LTD PP0 0, 26, 15 (trunk group member 0) or to LTD PP1 0, 27, 0 (trunk group member 1). The other scan point is required for a night transfer scan point. The night transfer scan point can only be assigned to one RTC 99311 in an office and has the fixed designation and assignment of LTDNTP 0, 20, 4 (refer to Figure 7). ***This night transfer scan point assignment cannot be assigned to anything else.***

6.19 If two RTC 99311 are installed in a No. 3 ESS office and both have nondedicated arrangements, extra hardware is required. Another distributor applique circuit (SD-3H911) and a master scanner scan point (for the pilot pulse scan point) must also be installed.

6.20 When a day dedicated/night nondedicated arrangement is provided through the RTC 99311, the NC key at the day center and the night transfer scan point must be activated before the night center can be connected. When the night center is connected and active, the day center will be refused access to the RTC 99311. Otherwise, the day center can release the NC key and have access at any time.

6.21 The sleeve lead function (SL DTA, SL DTA+1, or SL DTA+2) of the OEN for the RTC 99311, when it is autoconnected, must be correlated with the distribute applique assignments. The sleeve lead distributor triplet address (DTA) must point to the first triplet of the peripheral decoder which drives the distribute point applique used for enabling and disconnecting appliques and pilot pulse detecting.

6.22 When nondedicated facilities are used and an autoconnect connection has been made, it is necessary for the LTD to automatically generate a pilot pulse (PP) every 60 seconds or whenever a key is operated. If the pilot pulse is not detected by the pilot pulse scan point (Figure 7) for a period of 2 minutes, the LTDH program causes the connection to be dropped in the same manner as if the disconnect key had been operated.

7. INTERACTIONS

7.01 The autoconnect feature is used in conjunction with the TTY and LTD arrangements in a No. 3 ESS office and interacts with the system programs associated with these arrangements. This feature can be used in lieu of dedicated TTYs or LTDs and their associated outside plant or as a backup to dedicated facilities in the case of maintenance TTYs. This feature is compatible with all other No. 3 ESS features.

8. RESTRICTION CAPABILITY

8.01 This feature can be restricted by the local operating companies by assigning the return number associated with a trigger number only to the TTY or LTD that requires the use of this feature.

INCORPORATION INTO SYSTEM

9. INSTALLATION/ADDITION/DELETION

9.01 The procedures for providing the autoconnect feature include making the trigger number, line, and callback data block assignments through the use of recent change (RC) messages or the office data administration (ODA) run. These ODA and RC message assignments are described in Parts 6, 11, and 12 of this section. Adequate hardware (described in Part 10) must also be provided. Procedures for determining the required quantities may be found in the Network Design Bell System

Practices (BSPs) Sections 233-060-XXX. Procedures for the installation of required hardware may be found in the Installation Engineering Handbook 269.

10. HARDWARE REQUIREMENTS

TTY

10.01 In a typical autoconnect TTY arrangement without the use of AMARC, only the left TTYC in each TTYC unit is equipped. The equipped TTYCs in TTYC units 0 and 1 are also labeled 0 and 1, respectively. The right-hand TTYCs in TTYC units 0 and 1 are labeled 2 and 3, respectively. Each TTYC has four ports. When AMARC capabilities are required, TTYC 2 and 3 are dedicated to this use. Any TTY requirements beyond a typical arrangement as shown in Figure 2 will require the use of an additional TTYC unit and the equipping of an additional TTYC to provide for a dedicated or autoconnect partially dedicated user. These additional TTYC units and TTYCs are assigned as follows:

TTYC UNIT	TTYC	PORT	TTY
0	2	0	Local TTY
0	2	1	AMARC or Dedicated to a Specific Message Class
0	2	2	Monitor Port
0	2	3	Monitor Port
1	3	0	Local TTY
1	3	1	AMARC Backup or Dedicated to a Specific Message Class
1	3	2	Monitor Port
1	3	3	Monitor Port
2	4	0	Local TTY
2	4	1	Dedicated to a Specific Message Class
2	4	2	Monitor Port
2	4	3	Monitor Port
2	6	0	Local TTY
2	6	1	Dedicated to a Specific Message Class
2	6	2	Monitor Port
2	6	3	Monitor Port

Note: TTYC unit 3 and TTYC 5 and 7 have not been engineered and are for future use.

10.02 The autoconnect circuits (SD-3H520, FB 518) are located on the test frame. Each office is equipped with four circuits, two per FB518. Two of these circuits, designated autoconnect circuit 0 and autoconnect circuit 1 are each connected to a TTYC port. Autoconnect circuit 0 is assigned to TTYC 0 port 1 and autoconnect circuit 1 is assigned to TTYC 1 port 1. The remaining two circuits may be assigned as needed. An example of a third autoconnect circuit is shown in Figure 4.

10.03 The interconnect wiring of the autoconnect circuits to the TTYCs and network frames via the CDF must be done as listed in SD-3H520, CPS FB518 and ED-3H108 to ensure proper operation of the autoconnect feature. An example of these interconnects is shown in Figure 9.

10.04 The TTYC speed options described in paragraph 4.22 are preassigned for TTYCs 0 through 3. The TTYC speed option for TTYC 4 and 6 can be assigned as needed per local operating company requirements.

10.05 Any available loop start office equipment number (OEN) may be used. The OEN will have a directory number assignment that will be the trigger number. All autoconnects from the same TTYC and port must have the same OEN.

10.06 The fixed distribute points for the FB518 must be used.

10.07 Refer to the appropriate Network Design BSPs in the Section 233-060-XXX series for details of determination of hardware quantities and associated formulas.

LTD

10.08 The following hardware is required to provide LTD arrangements via a nondedicated autoconnect connection.

- Remote Test Circuit Far End (SD-99311). This circuit is mounted in the miscellaneous frame and serves as the interface between the LTD and the No. 3 ESS for loops that are beyond 1500 ohms. For offices that are within 1500 ohms of a LTD, a Test Trunk

Ringing Circuit (SD-96474) is used instead of an RTC 99311.

- Incoming Local Test Desk Trunk Circuit (SD-3H520, FB519). This circuit is located in the Trunk and Line Test Panel and can only be assigned to member 0 or 1 of the trunk group that is used.

- Distributor Applique Circuit (SD-3H911). This circuit is located in the miscellaneous frame and all four triplets are normally used.

- Remote Master Scanner Applique Circuit (SD-1A210). This circuit is located in the miscellaneous frame and is used to drive the pilot pulse and night transfer master scan points.

- Master Scanner Scan Point. One scan point is required for a pilot pulse scan point and one for a night transfer scan point. The pilot pulse scan points are preassigned (but wiring must be connected at the frame) to LTDPP0 0, 26, 15 and LTDPP1 0, 27, 0 in the master scanner and should be assigned in direct relation to the member number assigned to the incoming LTD trunk. These scan points can be reassigned for other uses but this procedure is not recommended. The night transfer scan point is also preassigned to LTDNTP 0, 20, 4. However, this scan point cannot be assigned to anything else and is the only one that can serve as the night transfer scan point (see Figure 7). Only one RTC 99311 can be connected to a nondedicated night center.

10.09 If two RTC 99311 circuits are required, an additional incoming LTD trunk must be installed. If nondedicated facilities are used, an additional master scanner scan point is required for the pilot pulse detector.

11. SOFTWARE REQUIREMENTS

11.01 The translation data requirements for an autoconnect line consist of these items:

- A two-word expansion entry from the line subtranslator. This two-word entry in the line subtranslator contains table and entry numbers to expansion entries in both words. The first word contains an originating major class of 29 and a screening class of 31. The second word contains a sleeve lead DTA.

- Two four-word expansion entries from the line subtranslator are also used. Word zero of the first four-word expansion entry contains a billing number. Word three of the first four-word expansion entry contains the table and entry number of the second four-word expansion entry leaving the remaining six words for directory numbers.

- A number of seven-word entries in the autoconnect translation tables which are user limited. This seven-word entry makes up the callback data block which contains the callback number and options allowed for the autoconnect user. The first word of the callback data block contains a message class entry.

- A two-word entry in the hundreds group table of the four-digit translator. The first word contains an OEN which is used by the line subtranslator and the second word contains a terminating major class of ***29*** and a table index to the autoconnect translation tables.

- A two-word route index expansion entry for the callback contains an entry type of six in the first word and a destination code of twenty in the second word for high tone.

11.02 Refer to Figure 10 and the PA-3H3XX for other details about these translation layouts and how they are indexed.

11.03 The Autoconnect Port Control (ACPORT) program (PR-3H250) is required only for this feature. Otherwise, standard trunk and line translations are used. The ACPORT program is also used in conjunction with the Local Test Desk Handler (LTDH) program (PR-3H311) when autoconnect is used by a LTD. When the autoconnect feature is used with TTY facilities, the ACPORT program interacts with the TTY Message Administration (TTYMAP) program (PR-3H259), the Data Administration (DATADM) program (PR-3H262), and the Scanning Conversion Subroutine (SCSUBS) program (PR-3H260).

11.04 Processor real-time information will be included in this part when available.

12. DATA ASSIGNMENTS AND RECORDS

12.01 The software for the autoconnect feature may be installed through the use of recent change messages. For initial installations an ODA run must be used, but installed offices must use recent change messages.

12.02 If an ODA run is used to incorporate this feature, the following translation input forms must be completed and sent to the Western Electric Regional Data Center for processing. Refer to the Translation Guide TG-3 for details concerning the completion of these forms. Also refer to the PA-3H3XX and Figure 10 for translation data layouts affected by these forms.

- ESS 3100—Telephone Number Table
- ESS 3107-1,2—Supplementary Information Table
- ESS 3201—Trunk Assignment Table
- ESS 3202-1—Trunk Group Table
- ESS 3301—Rate and Route Table
- ESS 3303-1,2—Route Index Expansion Table
- ESS 3306—Line Class Code Table
- ESS 3400—Traffic Work Table Assignment
- ESS 3500-1,3—General Information Table

12.03 The following recent change messages may be used in incorporating this feature.

- RC:AC/—Used to define, change, or remove a TTY autoconnect channel. Before a TTY port can be referenced by this message, it must be defined by the RC:TTY/ message. The RC:AC message is used only in issue 3 and is combined with RC:LINE in issue 4. Refer to paragraph 12.04 for more information.
- RC:CKT/—Used to associate scan points, distribution triplets, and network terminals. Used only with a LTD.
- RC:DP pddd!—Used to define an equipped peripheral decoder.
- RC:GRP/—Used to define the trunk or service circuit feature for a group. Used only with a LTD.
- RC:LCC/—Used to associate an orginating major class, a terminating major class, and a screening class with a line class code.
- RC:LINE/—Used to add, change, or remove line information. It also includes autoconnect information in issue 4 and later generics. Refer to paragraph 12.04 for more information.
- RC:RTI/—Adds, changes, or deletes a route index expansion entry.
- RC:SCR/—Adds, changes, or deletes a screening class expansion entry.
- RC:SP/—Defines, changes, or deletes a miscellaneous scan point in the master scanner. Used only for a LTD.
- RC:TTY/—Used to change a TTY controller or port. A controller can be added or deleted, or its parity characteristics can be changed. A port can be added or deleted, or its answer-back and send-receive characteristics can be changed. Refer to paragraph 12.05 for more information.

12.04 In issue 3 offices, the RC:LINE message for a trigger number must use a different OEN (this generates dummy OENs). The RC:AC message must use the correct OEN of which there is only one per TTYC. To input changes using these messages use the following procedure. For TYP=NEW, input RC:LINE, then RC:AC. For TYP=OUT, input RC:AC, then RC:LINE. (If taken out in reverse, then the linkage is broken.) In issue 4 and later offices, the RC:AC message is combined with RC:LINE which will use the correct OEN.

12.05 In issue 3 offices, the RC:TTY message keyword "TTYC" is the message class of the dedicated controller. The keyword "SC" is the channel-subchannel which defines the physical TTYC. In issue 4 and later offices, the RC:TTY message keyword "TTYC" is the physical TTY controller. The keyword "CLS" is the message class.

12.06 Further details about these messages and their use can be found in IM-3H300 and the Recent Change Users Guide, Section 233-154-130.

13. TESTING

13.01 The lines associated with the autoconnect feature can be tested at the No. 3 ESS by using the maintenance TTY and the Trunk and Line Test Panel (TLTP). Refer to the No. 3 ESS TOP Maintenance Document, Section 233-142-100 for test procedures.

13.02 To functionally verify the trigger numbers and callback numbers, have these numbers dialed at the appropriate locations, check for the proper tone, and verify that callback occurred. If this fails, verify the translations as described in paragraph 13.05, and if translations are good, check office wiring.

13.03 To test automatic dial-up for TRF, disable any dedicated TRF facilities, set the clock to two minutes before the daily schedule is to start and see if it is printed out on the remote TTY. If this fails, verify the translation information as described in paragraph 13.05, and if translations are good, check office wiring.

13.04 To test the remote maintenance and RSB automatic dial-up, create a line problem with a known response and verify that the proper trouble report was printed at the appropriate remote TTY. When running the test in paragraph 13.03, check to see if a line test message was printed on the remote TTY. If this fails, verify the translation information as described in paragraph 13.05, and if translations are good, check office wiring.

13.05 Verify the translation information in the No. 3 ESS by entering the appropriate verify message via the TTY. Refer to IM-3H300 for information pertaining to the variable fields of these messages. The OM-3H300 provides the interpretation for the response of these messages. The verify messages are as follows:

- VER:GRP nnn!—Used to verify trunk and service circuit group data (used for LTD only.)
- VER:LCC/—Used to verify line class code information.
- VER:LINE!—Used to verify the OE for customer line originating and terminating translations.
- VER:OE/—Used to verify customer line originating and terminating translations.

14. OTHER PLANNING TOPICS

14.01 A combination of a dedicated TTY for the maintenance user and autoconnect for the other users, as shown in Figure 2, is a typical TTY arrangement. ***With this arrangement, the addition of AMARC (Figure 8) would complete the occupancy of the "basic" TTYC units in the maintenance frame.***

14.02 The addition of another TTY arrangement, such as a dedicated Network Administration TTY, would necessitate another TTYC unit equipped with an additional TTYC. Consideration should be given to accomodate the TTYC unit on a miscellaneous frame, and the possible use of an autoconnect circuit if the partially dedicated autoconnect option is supplied. Options for TTYs may be recent changed to fit the changing needs and demands of the users. The TTY controllers may be dedicated or nondedicated, except the AMARC TTYCs. When AMARC is defined in the office, TTYCs 2 and 3 are dedicated to its use. Refer to paragraph 10.01 for the recommended assignment of these additional TTYs and associated ports.

14.03 It is recommended that all autoconnect connections to remote TTYs use the who-are-you (WRU)/answer-back (ACK) test to verify that the remote TTY is on-line and will transmit back. Otherwise, if the remote TTY is not functional and WRU/ACK is not used, all data transmitted to that TTY will be lost. If WRU is sent and ACK is not returned, the data will be printed on the maintenance TTY.

14.04 When either the nondedicated or partially dedicated autoconnect arrangements are defined, the network administrator should assign call forwarding to the network administration TTY line when possible. Call forwarding will allow the transfer of connections from the ESS to another TTY. Transfer may be desired either when the usual TTY is out of order or when another group (such as Network Design) would like access to the ESS.

14.05 With the nondedicated autoconnect arrangement, the No. 3 ESS will call the network administration TTY at the completion of a D-schedule collection hour as defined in the Traffic Schedule Block. The No. 3 ESS will report D-schedule data, W-schedule data, and H-schedule data collected during the previous 24-hour period. The D-schedule should, therefore, be set to different intervals for different No. 3 ESS offices which report to the same network administration TTY in order that offices do not complete for a single TTY.

14.06 It is recommended that most offices install a day dedicated/night nondedicated LTD arrangement. This would allow more than two repair service bureaus to access the office and also permit testing if the dedicated facility was inoperative.

ADMINISTRATION

15. MEASUREMENTS

AUTOCONNECTED TRAFFIC TTY

15.01 A nondedicated facility for the traffic teletype may be provided to save the cost of a controller and link. With the nondedicated arrangement, the traffic measurements, local test desk, and service orders share the miscellaneous channel. This is possible as long as none of them occupy the channel for long periods of time. The nondedicated arrangements also allow one remote teletype to be used for several No. 3 ESS offices.

15.02 The Q, D, W, and H schedules may be associated with the nondedicated arrangment. The Q-schedule should not be requested to print automatically on the traffic teletype but can be manually requested at any time. The C-schedule is not allowed and the measurements normally on this schedule in an office with the dedicated option must be assigned to the D, W, or H schedule. All measurements except those on the weekly schedule are made continuously. Measurements which can be assigned to more than one schedule can be assigned to only one schedule at once. The schedules are the same for each day of the week, and are assigned to begin on the hour or half hour only.

15.03 With the nondedicated arrangement, busy hour traffic measurements are stored in the No. 3 ESS office on the cartridge tape. The Network Administrator cannot access the traffic data during the day. There is one printout each day (except for Q-schedules as stated in paragraph 15.02) on the remote traffic teletype of the data for the busy hours of that day. The printout time is controlled by the start time specified for the daily (D) schedule. It is suggested the Network Administrator schedule the printout between 10:00 P.M. and 3:00 or 3:30 A.M. In this way, the report times for different offices may be staggered so one remote traffic teletype may monitor several No. 3 ESS offices. Also, the most time-consuming traffic task can be performed at night and not interfere with other users of the miscellaneous channel. If the miscellaneous channel should be in use at the report time preventing the establishment of a connection to the traffic teletype, the printout program waits up to 10 minutes for the channel to be free. If it does not become free, the traffic reports are printed via the maintenance teletype so as not to lose the data.

TRAFFIC SCHEDULES

15.04 Quarter-Hour (Q) Schedule: The measurements assigned to the Q-schedule represent data for a 15-minute period. Q-schedule data is normally printed every 15 minutes on the maintenance teletype but may be inhibited. If the traffic teletype is dedicated, the Q-schedule may be printed on it or may be inhibited. When the traffic teletype is not dedicated, only the maintenance teletype should receive the Q-schedule printout automatically. In either case, the maintenance or traffic teletype can manually request a printout of the Q-schedule at any time. If a printout is requested, the raw data since the last 15-minute collection period and the totals for the past three 15-minute collection periods are reported.

15.05 Busy-Hour (H) Schedule: The measurements assigned to the H-schedule represent data for a one-hour period. At the beginning of a collection period, all registers assigned to the H-schedule are cleared. If the traffic teletype is dedicated, registers are read and printed at the end of the collection period. If the traffic teletype is not dedicated, register readings are transferred to the cartridge tape in the No. 3 ESS. The autoconnect feature allows the No. 3 ESS to call the traffic teletype at night and print all H-schedule data collected during the day and stored on the cartridge tape. The Network Administrator may schedule up to 23 one-hour collection periods for

H-schedule data. If the autoconnect method is employed for data collection, a limit of 8 to 10 busy hours is recommended. The more busy hours that are put in, the more time it takes away from the daily routine. Each collection period may be consecutive but should not overlap with another H-schedule collection period.

15.06 Continuous Nonbusy-Hour (C) Schedule: The measurements assigned to the C-schedule represent data which can be collected for one or more hours. At the beginning of the C-schedule collection period, all registers assigned to the C-schedule are cleared. At the end of the collection period, the registers are read and the data is printed on the traffic teletype. When the traffic teletype has the autoconnect feature, the C-schedule is not allowed, and the measurements normally on this schedule must be assigned to the D, W, or H schedule.

15.07 Daily (D) Schedule: The measurements assigned to the D-schedule represent data collected for a 24-hour period. At the end of the collection period, the registers are read and the data is printed on the traffic teletype. It is suggested that the Network Administrator schedule the printout between 10:00 P.M. and 3:00 or 3:30 A.M. The H and W schedules are also printed at this time when the traffic teletype has the autoconnect feature.

15.08 Weekly (W) Schedule: The measurements assigned to the W-schedule represent data collected for any number of half-hour periods per day. The collection periods will be the same for each day of the week. The registers are read, printed on the traffic teletype, and cleared once a week on Sunday night. Each night, the W-schedule registers are read and printed. This printout represents totals from the last Sunday night to the day of the printout. The W-schedule printout occurs after the D-schedule is printed.

15.09 Refer to Section 233-152-135, Traffic and Plant Measurements, for details of specific peg, usage, and overflow measurements that apply to the No. 3 ESS.

16. CHARGING

16.01 Charging for autoconnect calls is usually not applicable unless desired by the local operating company for record keeping purposes.

SUPPLEMENTARY INFORMATION

17. GLOSSARY

17.01 The following list identifies abbreviations and terms used in this document which may be unfamiliar to the reader.

- ACU—Automatic Calling Unit.
- AMA (Automatic Message Accounting)—The recording of call charge information on magnetic tape (or other storage mediums) for billing purposes.
- AMARC (Automatic Message Accounting Recording Center)—A centralized collection point for AMA data from several ESS offices.
- DDD—Direct Distance Dialing.
- DTA—Distributor Triplet Address.
- LTD (Local Test Desk)—Local test desk, either No. 14 or No. 16, is used by repair service bureau personnel in the testing and maintenance of customer line, cable, and trunk plant in local and distant central office areas.
- NC (Night Closing) Key—Operation of this local test desk key provides a means of one test center sharing the remote test equipment of a distant central office with a second test center.
- ODA (Office Data Administration) Run—Mechanism by which software may be changed in the No. 3 ESS. Information from the ODA input forms are inputted into the regional ODA computer, then sent back to the No. 3 ESS.
- OEN (Office Equipment Number)—Terminal location of a line, trunk, or service circuit on the distributing frame.
- Output Queue—A temporary memory area where messages are stored in the No. 3 ESS before they are to be printed.
- Partially Dedicated—An autoconnect TTY arrangement that uses a dedicated TTYC and a nondedicated autoconnected line.

- Pilot Pulse—A tone, sent by the operation of a test key at a local test desk to the remote office equipment, which guards against accidental release of a remote test connection. This signal must be received by the No. 3 ESS at least once every 2 minutes or an autoconnect connection will be torn down.

- PD—Peripheral Decoder

- PRI (Primary) Key—Operation of this local test desk key connects a test trunk to the primary test circuit in the local test desk.

- RRA—Remote Recorded Announcement

- RSB (Repair Service Bureau)—A centralized center used to remotely test central office equipment, outside plant, and customer lines via a TTY and/or LTD.

- RTC (Remote Test Circuit)—The circuit at end of the connecting facility between a local test desk and a distant office. A "near-end" RTC (SD-99309) transforms local test desk key operations into signals composed of three frequencies. These signals are transmitted to a "far-end" RTC (SD-99311) at the distant office where they are converted into dc signals. The dc signals then control relays in various test circuits. The test result dc signals are converted to a frequency between 1100 Hz through 1600 Hz and returned to the far end where it is reconverted to a dc signal to activate a voltmilliammeter.

- SCC—Switching Control Center.

- SEC (Secondary) Key—Operation of this local test desk key connects a test trunk to the secondary test circuit in the local test desk.

- Trigger Number—A telephone number or numbers in a No. 3 ESS office that, when called, causes on autoconnect sequence to occur and the party that dialed the trigger number to be called back over nondedicated or partially dedicated facilities. When answered, a secure connection is made between an LTD trunk circuit (SD-3H520, FB519) and a remote LTD or between a TTYC and a remote TTY.

- TTY—Teletypewriter.

- TTYC—Teletypewriter Controller.

18. REFERENCES

18.01 The following is a list of documents which may be consulted for further information related to this feature.

- Section 233-190-031—Local Test Desk Arrangements, No. 3 ESS

- Section 254-300-190—Teletypewriter and Teletypewriter Controller—Description and Theory of Operation

- Section 233-152-120—Teletypewriter Software—Subsystem Description

- Section 233-020-254—Teletypewriter Arrangement Common Control Administration-Network Administration

- Sections 233-060-XXX—Network Design Bell System Practices Series, No. 3 ESS

- Section 233-152-135—Traffic and Plant Measurements, No. 3 ESS

- Section 233-153-105—Programmed Maintenance Aids, No. 3 ESS

- Section 233-154-130—Recent Change Users Guide, No. 3 ESS

- Section 233-142-100—TOP Maintenance Document No. 3 ESS

- TG-3 Translation Guide

- IM-3H300—Input Message Manual, No. 3 ESS

- OM-3H300—Output Message Manual, No. 3 ESS

- PA-3H3XX—Office Data Tables Layout Specification, No. 3 ESS

- Installation Engineering Handbook 269

- ED-3H108—Switchboard Cabling Plan and Details For Low Profile Combined Distributing Frame
- CD and SD-99311—Common Systems Remote Testing Circuit—Far End
- SD-3H520, FB519—Incoming Local Test Desk Trunk Circuit
- SD-3H520, FB518—Autoconnect Line Circuit
- SD-1A210—Remote Master Scanner Applique Circuit
- SD-1C905—Common Systems-Teletypewriter Controller Unit Circuit
- SD-3H911—Distributor Applique Circuit
- PR-3H311—Local Test Desk Handler Program (LTDH)
- PR-3H250—Autoconnect Port Control Program (ACPORT)
- PR-3H259—TTY Message Administration Program (TTYMAP)
- PR-3H262—Data Administration Program (DATADM)
- PR-3H260—Scanning and Conversion Subroutines Program (SCSUBS)

AUTOCONNECT ARRANGEMENTS
NO. 3 ELECTRONIC SWITCHING SYSTEM

Comments concerning content, usability, and adequacy of this feature document will be welcomed. This sheet may be removed and mailed directly to Bell System Practices Organization.

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