

**NIGHT SERVICE FOR CENTREX-CO**  
**(NIGHT SERVICE, TRUNK ANSWER ANY STATION)**  
**NO. 2 ELECTRONIC SWITCHING SYSTEM**

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**NOTICE**

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**FEATURE DEFINITION AND DESCRIPTION****1. DEFINITION**

**1.01** Night service is a feature of a centrex or PBX system which allows a designated telephone(s) within the centrex or PBX system to assume some of the attendant functions when the attendant positions are not manned. When the centrex or PBX system is in night service operation, the trunk answer any station feature can ring special signaling devices and make it possible for any station in the PBX or centrex system to dial a special code and answer calls to the night service telephone when it is not attended.

**1.02** With the night service feature in the No. 2 Electronic Switching System (ESS), not all attendant functions are capable of being transferred because of differences in hardware between the attendant console and the standard station telephone subset. When in the night service mode, the No. 2 ESS routes incoming listed directory number (LDN) calls from the exchange network or common control switching arrangement (CCSA) calls, and dial "0" calls to a night service line(s) within the centrex group. Each LDN and the attendant code (dial "0") may have separate night service numbers. This routing is provided on a fixed basis. Both call forwarding and station hunt features may be incorporated with the night service feature to provide for further night answering capability. When night service is in effect, the trunk answer any station feature may also be provided to activate an alerting device (bell, gong, etc.) when calls are made to these night stations. These calls can then be answered by any unrestricted station user in the centrex group by dialing a specific code.

**1.03** No. 2 ESS is arranged to provide the night service and trunk answer any station features with the EF-1 generic program. When the customer desires alerting using the trunk answer any station feature, external alerting devices may be installed. No other special hardware is required.

**2. DESCRIPTION**

**2.01** In order to initiate the night service feature, the NITE key is operated by the primary attendant in the centrex group. There is only one NITE key per customer group and the Attendant Monitor Program recognizes the initiation or cancellation of night service only from the primary

attendant console. When night service is in effect, certain calls which normally route to the attendant(s) are routed to the designated night service number(s). When the NITE key (see Figure 1A) is depressed by the primary attendant, the night service bit in the attendant idle list is set, and the night service lamp on the attendant console(s) is lighted. All calls will then be transferred to one or more preselected night service numbers. When the NITE key is again depressed, the night service bit in the attendant idle list is reset and the attendant console night service lamp is darkened, thus cancelling night service. See Figure 1B.

Night service numbers can be arranged in the following manner:

- (1) One number for each customer LDN
- (2) One number for centrex extensions calling the attendant (dial "0").

The night service number may be the same for both LDN calls and centrex extensions calling the attendant. Night stations may also have station hunting, thus providing for additional night answering capability. A maximum of 12 station hunting attempts is possible.

**Emergency Night Service**

**2.02** If all attendants have their headsets unplugged or consoles out of service, or there is a power failure at the console control cabinet or on the associated data link, emergency night service is automatically engaged by the system. Emergency night service operates the same as ordinary night service.

**Permanent Night Service**

**2.03** Permanent night service may be used to provide some of the basic attendant services without an attendant universal console for small centrex or PBX customer groups. Refer to Paragraph 4 or Section 232-190-012 for further information on this type of service.

**Flexible Night Service**

**2.04** The night service feature is flexible if the centrex customer also has the call forwarding feature. When the call forwarding feature has been activated at the station(s) designated as a

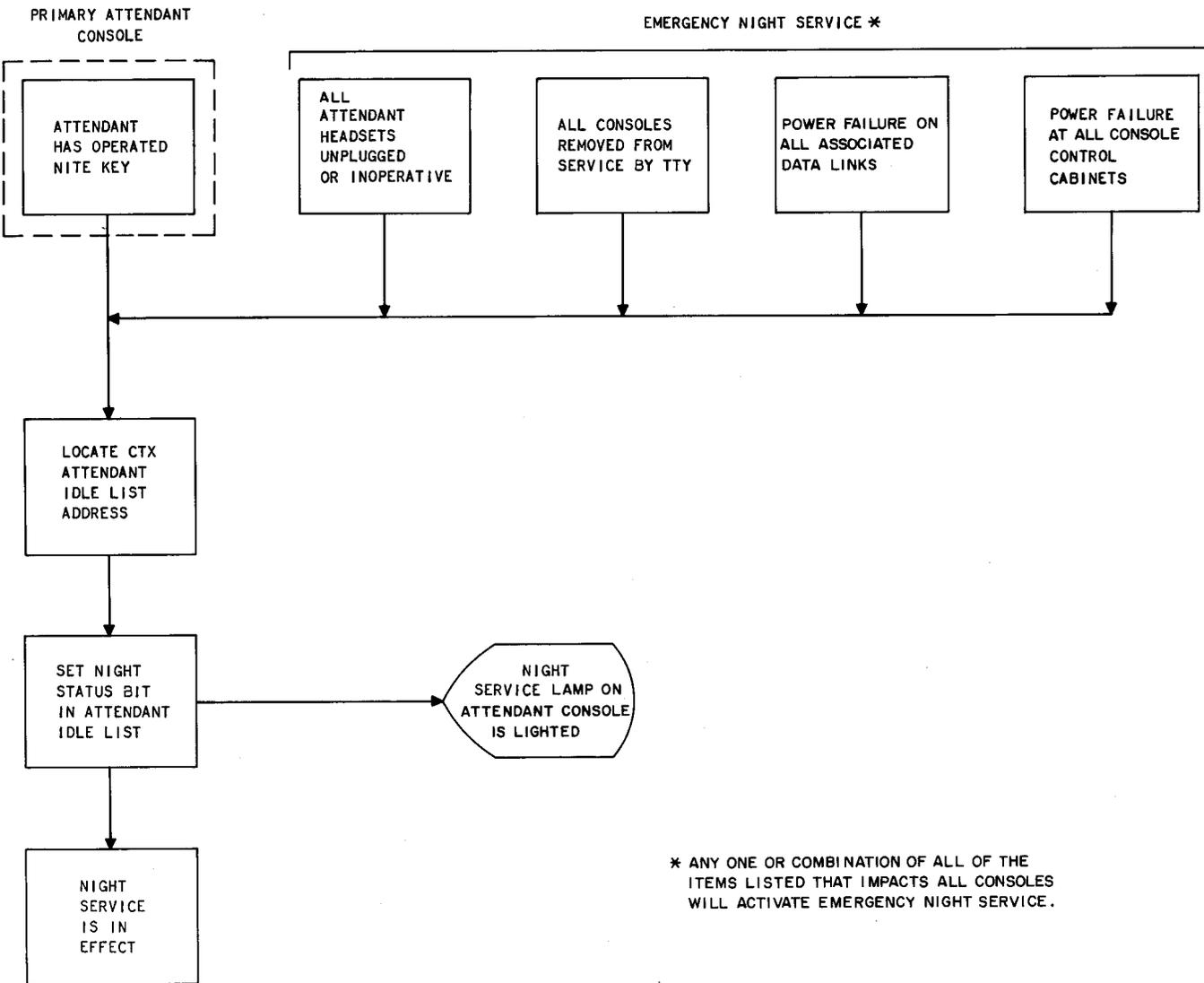


Fig. 1A—Night Service Feature Flow Diagram

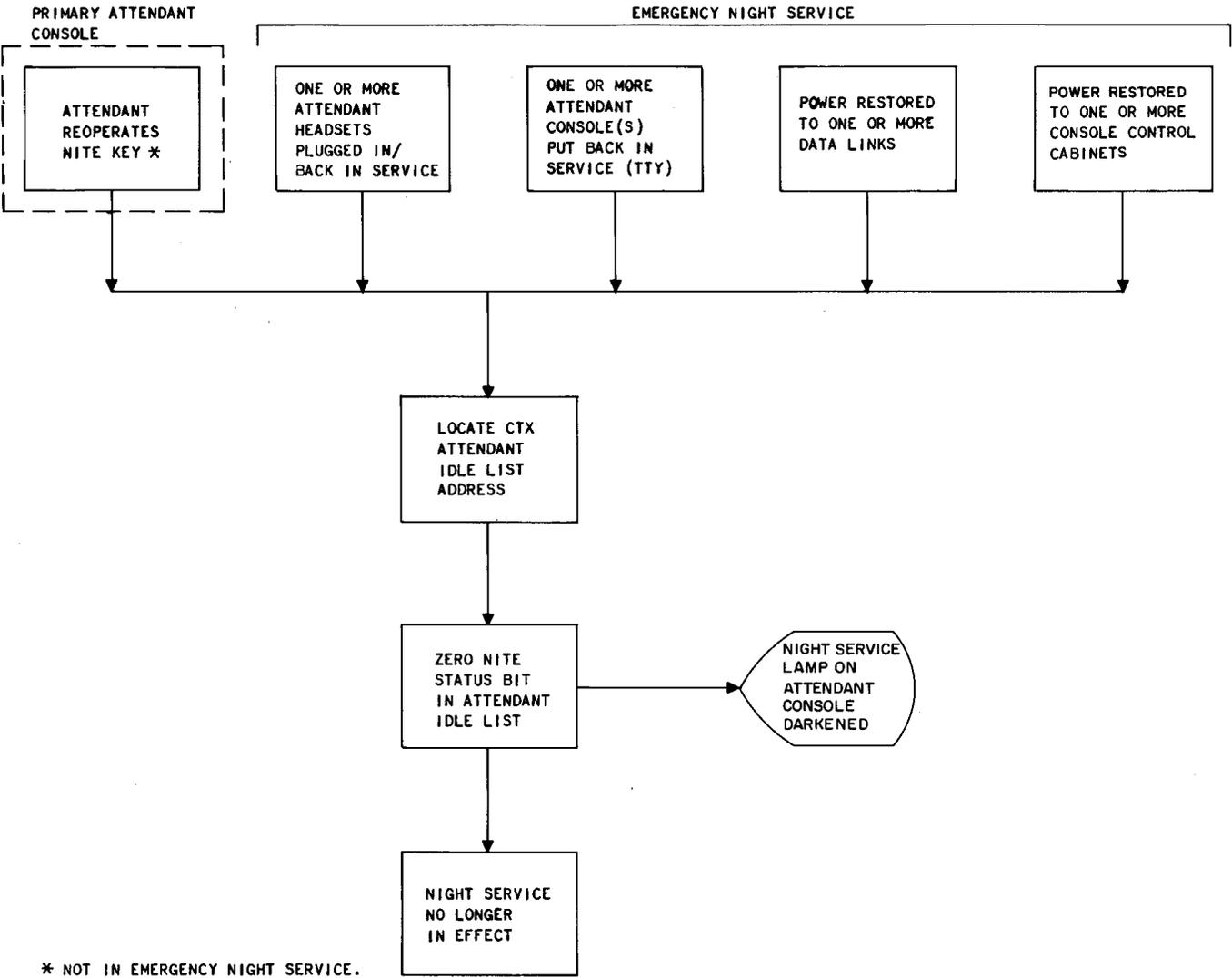


Fig. 1B—Cancellation of Night Service

night service number, calls that are routed to the night service number are automatically rerouted to the selected station within the same centrex group. A maximum of 12 call forward attempts and/or station hunting attempts is imposed by the No. 2 ESS system.

**Trunk Answer Any Station (TAS) Feature**

**2.05** The trunk answer any station (TAS) feature allows incoming exchange network calls, normally directed to the attendant, to activate a common alerting device (gong, bell, etc.) on the customer's premises when the attendant positions are in night service. These calls may then be answered by any station user in the centrex group who dials a special TAS code from any nonrestricted station. See Figure 1C.

**2.06** Once it has been determined that a call to the attendant (LDN or dial "0") is to be given night service treatment, the centrex number translator is checked to determine if the centrex has night service and the trunk answer any station features. If night service is in effect and the centrex has the trunk answer feature, a TA bit in the transient call register (TCR) is marked =1. The call then proceeds as usual until the centrex number and pickup group number are obtained. At this point, if the TA bit in the TCR is one, group number 255 is written into the TCR as a pickup number and a peripheral order is sent to connect the ringer to the "tip" lead (instead of the "ring" lead), thus causing the trunk answer any station audible devices to be operated. An alerting state progress mark is also written into the TCR.

**2.07** Only an extension in an idle state or with a previous call on hold may dial the trunk answer any station code. When the code is dialed, the centrex number translator determines that some special service access code was dialed. The originating line is screened to determine if special service access is permitted. If special service access is possible the code for trunk answer any

station (e.g., code = 0100) is read out of the translator and control is transferred to the centrex custom calling program. A hunt is then made through the TCRs to find one with the following characteristics: the same centrex number as the originator, pickup group number 255, and an alerting progress mark. If such a TCR is found, a path is established between the pickup call originator and the party calling the line that was being alerted, the line ringing is stopped, and the pickup call originator is connected to the party calling the line in the qualifying TCR. If no qualifying TCR is found, the originator is routed to reorder tone.

**Ringing Requirements**

**2.08** Signaling of station lines during daytime operation is performed by applying ringing "tip" to "ring." In night service operation where the customer group has the trunk answer any station, ringing is introduced from "tip" to ground. In this manner, the alerting devices (bells, gongs, etc.) are activated rather than the bell in the telephone. If calls to the night service number have been call forwarded, the call forwarded number is rung in the same manner ("tip" to ground). Calls routed to a night service number that is busy and in a station hunt group, the stations in that hunt group will also be rung from "tip" to ground.

**2.09** The customer-owned and maintained equipment (bells, gongs, etc.) that is installed can be arranged to sound according to customer needs. The alerting devices can be installed to sound at all times, only during night service operation, etc., depending upon individual customer preference.

**3. FEATURE FLOW DIAGRAM**

**3.01** Figures 1A and 1B illustrate the sequence of actions that occur when the NITE key is operated to initiate or cancel night service. Refer to Figure 1C for a flow diagram of the trunk answer any station feature.

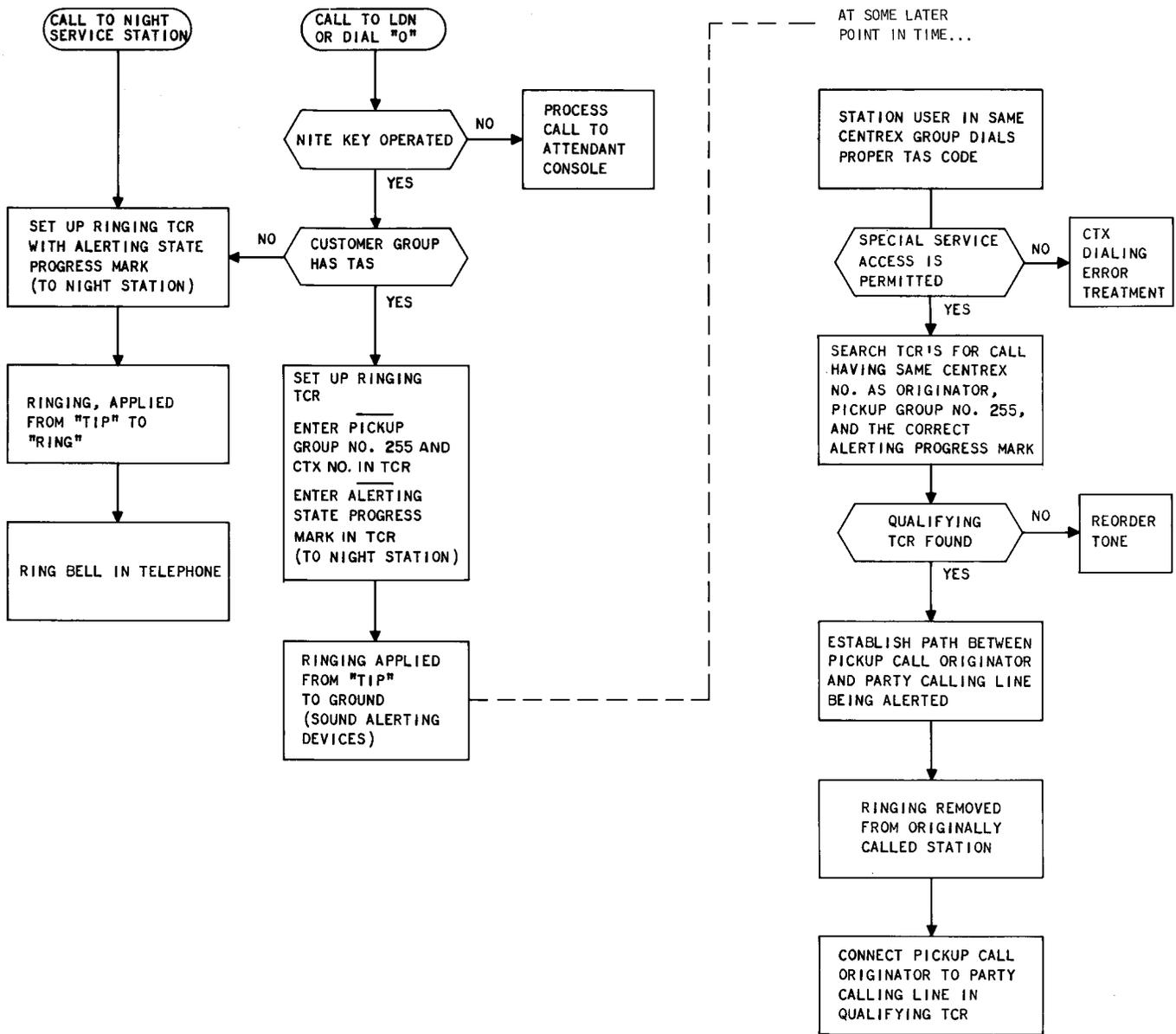


Fig. 1C—Trunk Answer Any Station Feature

**4. INTERACTIONS**

**4.01** Interactions that are associated with night service and trunk answer any station features are variable depending upon whether the customer has a universal type console or a nonconsole attendant, has night service with or without the trunk answer any station feature, has permanent

night service, etc. For detailed information concerning night service and trunk answer any station interactions with other features or system activities refer to Table A. The nonconsole attendant referred to in Table A represents a CALL DIRECTOR®, keyset, or a standard telephone. (It is not the 50A console because this console is not compatible with the EF-1 generic program.)

TABLE A

## DISPOSITION OF CALLS TO ATTENDANT ASSUMING VARIOUS FORMS OF NIGHT SERVICE

	UNIVERSAL CONSOLE ATTENDANT			NONCONSOLE ATTENDANT
	DAYTIME OPERATION		NIGHT SERVICE OR EMERGENCY NIGHT SERVICE (WITH OR WITHOUT TRUNK ANSWER ANY STATION) (B)	DAY OR NIGHT ("PERMANENT" NIGHT SERVICE")
	CONSOLES NORMAL	ALL CONSOLES POS BSY (A)		
LDN (Noncentrex) & CCSA)	CONSOLE	BUSY TONE	NS(C)	(F)
Dial "0" (Ext & Tie)	CONSOLE	BUSY TONE	NS(D)	(H)
Dial Attendant Conf	CONSOLE	BUSY TONE	NS(D)	(E)
Manual Calls to Attendant				
Extension	CONSOLE	BUSY TONE	NS(D)	(H)
Tie Trunk	CONSOLE	BUSY TONE	NS(D)	(F or H)
FX Trunk	CONSOLE	BUSY TONE	NS(D)	(F or H)
Call Forwarding to Attendant				
Busy Line	CONSOLE	BUSY TONE	BUSY TONE	(F)
Don't Answer	CONSOLE	CONTINUE RINGING	CONTINUE RINGING	(F)
Variable	CONSOLE	BUSY TONE	NS(D)	(H)
Call Transfer — Attendant	CONSOLE	FLASH IGNORED	NS(D)	(H)
Centrex Attendant Intercept	CONSOLE	BUSY TONE	REORDER	REORDER (E)
Attendant Control of Trunk Group Access (ACOF)	CONSOLE	BUSY TONE	(G)	(G)

*Note A:* Or Calls Waiting Queue full.

*Note B:* Emergency NS results from any one or more:

1. All headsets unplugged
2. Power off all console(s)
3. Centrex Data Link(s) inoperative
4. All consoles removed from service
5. Combinations of above

*Note C:* Each LDN has its own NS number

*Note D:* NS number from Centrex Group Expansion

*Note E:* Not available to attendants without UNIVERSAL CONSOLE:

1. Attendant Conference
2. Manual Lines
3. Centrex Attendant Intercept
4. ACOF to Attendant

*Note F:* These calls must be directed toward the nonconsole attendant as a centrex station, as opposed to an attendant console.

*Note G:* Call completes over trunk facility as normal.

*Note H:* These calls are directed toward the nonconsole attendant via the telephone number stored in the Centrex Group Expansion (see Figure 3).

NS — Night Station.

**ATTRIBUTES**

**5. STATION/SYSTEM**

**5.01** The night service and trunk answer any station features are provided on a per-customer group basis. Each centrex customer obtains these features as a part of the generic program without regard to the number of customer stations.

**6. LIMITATIONS**

**6.01** There are no limitations that must be considered for the night service feature if the customer is a centrex subscriber with at least one attendant console. The night service and trunk answer any station features are not available if the customer has a nonconsole attendant.

**6.02** With the trunk answer any station feature, only centrex stations in the customer group can pick up calls. Attendants and tie trunks cannot pick up night station calls.

**7. RESTRICTION CAPABILITY**

**7.01** The night service stations are defined in translations and may be provided with any of the features available to centrex stations, such as call forwarding, Threeway Calling, etc., as required.

**8. COST DATA**

**8.01** The costs of providing night service are as follows:

**Software**

Translations—

- One word per centrex group
- Four words for each LDN

**Equipment**

Key on console

Translation circuits in the console control cabinet

**INCORPORATION INTO SYSTEM**

**9. PLANNING**

**9.01** No extraordinary planning or coordination is associated with this feature.

**10. HARDWARE ENGINEERING**

**10.01** Special circuitry or hardware is not required to obtain this feature other than the universal (1B or 2B) console and associated data link equipment, and any customer-owned and maintained equipment (bells, gongs, etc.) that is required. The universal console is not required when the customer group has a nonconsole attendant.

**11. SOFTWARE ENGINEERING**

**11.01** None required.

**12. COMPATIBILITY**

**12.01** There are no hardware or interface requirements since hardware changes or additions are not required. However, all customer-owned and maintained equipment (bells, gongs, etc.) that is installed in conjunction with this feature must conform to Bell System standards to insure compatibility with the No. 2 ESS. Refer to 2.08 for ringing requirements.

**13. OFFICE DATA**

**13.01** To incorporate the night service or trunk answer any station features into the No. 2 ESS, an Office Data Administration (ODA) run or recent change message is required. The following ESS forms must be completed and submitted to the WECO Regional Center for processing when an ODA run is to be made:

- ESS 2109-1 Centrex Group Table Form Code 9A—If dial “0” night service is to be provided, enter the 7-digit directory number to which the calls are to be routed and also indicate if TAS is to be incorporated with the night service feature. This form is also used to indicate the telephone number where dial “0” calls are to be routed when a customer group has a nonconsole attendant.
- ESS 2101 Centrex Directory Number Table—If night service is to be provided for incoming

calls to LDNs, this form is used to correlate the 7-digit number to which incoming LDN calls will be routed when the No. 2 ESS is in night service.

Instructions for completing these forms are contained in TG-2H, Translation Guide.

#### Recent Change Messages

**13.02** Any changes, additions, or deletions to the LDN night service number or the night stations themselves can be made via recent change (RC) messages. The A RC:L recent change message is to be used when night service requires changes. The keyword NSN may be used in TYP NEW or CHG service orders to add or change the night service number(s) for an LDN.

**13.03** Recent change messages may also be used to add or delete the trunk answer any station feature. The A RC:CTX message along with keyword TAS is to be used when changes are required. The dial "0" night service number is also set up by the A RC:CTX message using keyword NSN.

Refer to IM-2H200 for details concerning the recent change messages.

**13.04** The A VY:L message is used to verify that the night service number has been defined properly in translations. The A VY:CTX message is used to verify that the trunk answer any station and/or dial "0" night service number recent changes have been correctly translated in the system. Refer to OM-2H200 for information on interpreting the verify printout.

#### Translations

**13.05** The night service feature requires a word of translation in the listed directory number expansion table (17 bits) and the centrex group expansion table (17 bits). Layouts of the night service words are shown in Figures 2 and 3. The call store attendant idle list also contains the NT bit, Figure 4, which must be set to allow night service to be in effect.

**13.06** The trunk answer any station feature translations involve a TAS bit in the centrex group expansion and the designation of the trunk answer any station special services access code in

the digit interpreter table expansion. See Figures 3 and 5. The TAS bit must be set and the special services access code must be properly defined in order to obtain the trunk answer any station feature.

#### 14. GROWTH/RETROFIT PROCEDURES

**14.01** Night service may be added, removed, or changed in an existing centrex group or a new centrex group by using recent change orders or with an ODA run.

**14.02** The trunk answer any station feature may be added or deleted in an existing or new centrex group through the use of recent change messages or an ODA run. If recent change orders are utilized for additions or deletions, the change will not become effective until a recent change update has been performed, entering the information into program store via magnetic cards. Refer to Section 232-004-301, Updating Program Store Translation Information.

**14.03** The EF-1 generic program is required for both the night service and trunk answer any station features.

#### 15. TESTING

**15.01** In order to verify that the night service feature has been activated and is operating properly, the primary attendant can dynamically check night service operation by:

- Operating the night service key and checking proper illumination of the night service lamp.
- Dialing "0" from an extension to verify that in-house calls to the attendant are routed to the night service number.
- Dialing "9" to secure an outside line and then dialing any LDN in the customer group to verify the routing of outside calls to customer LDNs to the night service number.

#### ADMINISTRATION

#### 16. MEASUREMENTS

**16.01** For detailed information concerning the traffic measurements associated with the

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night service and trunk answer any station features, refer to Section 232-120-301, Traffic and Plant Measurements.

### 17. RECORD KEEPING

**17.01** No special record keeping is required other than maintaining the applicable ESS-R forms (2109-9A-R, 2101-R) when translation changes are made via recent change messages.

### 18. CHARGING

**18.01** Centrex customer groups having the night service and/or trunk answer any station features are charged according to local tariff regulations.

## AVAILABILITY

### 19. NEW INSTALLATIONS

**19.01** These features are available for new installations in the EF-1 generic program.

### 20. GROWTH/RETROFIT

**20.01** The night service and trunk answer any station features are available with the EF-1 generic program.

## SUPPLEMENTARY INFORMATION

### 21. GLOSSARY

**21.01** The following is a list of abbreviations and acronyms used in this document.

- Common Control Switching Arrangement (CCSA)—A switched services network which provides private line facilities between customer locations via common control switching machines which may be shared with other users.

- Centrex—A type of service similar to PBX where the stations have Direct Inward Dialing (DID) and station identification on outgoing calls by either Automatic Identified Outward Dialing (AIOD) or operator.
- EF-1—Extended feature generic program.
- Listed Directory Number (LDN)—The number, which is listed in the telephone directory, for reaching the PBX of centrex attendant on a direct dial basis via the exchange network.
- Nonconsole Attendant—A nonconsole attendant refers to a CALL DIRECTOR, keyset, or a standard telephone set.
- Office Data Administration System (ODA)—This system provides the facility for generating the required office tables and related computer generated documentation of these data tables.
- Private Branch Exchange (PBX)—A switching system which provides internal telephone communications between stations located on a customers premises as well as between these stations and exterior networks.
- Trunk Answer Any Station (TAS)—When the attendant positions are in night service, calls normally directed to the attendant activate a common alerting signal on the customers premises. These calls may then be answered by any nonrestricted station in the centrex system which dials the special "Trunk Answer" code.
- Transient Call Register (TCR)—A call store register designated for storage of information concerning calls in progress.

### 22. REASONS FOR REISSUE

**22.01** This is the initial issue of this section.

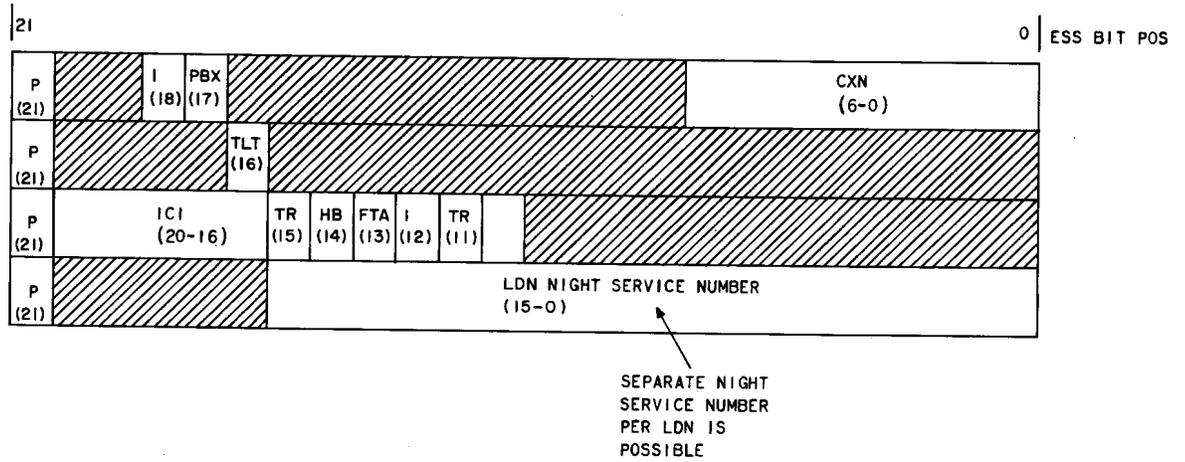
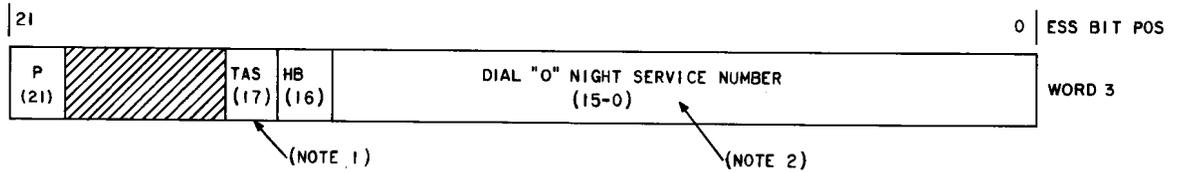


Fig. 2—Universal Console Listed Directory Number Expansion



NOTES:

1. TAS = 1 - CENTREX CUSTOMER GROUP HAS TRUNK ANSWER FROM ANY STATION FEATURE
2. DIAL "0" NIGHT SERVICE NUMBER OR TELEPHONE NUMBER TO ROUTE DIAL "0" CALLS FOR CUSTOMER GROUPS WITH NON-CONSOLE ATTENDANT

Fig. 3—Centrex Group Expansion

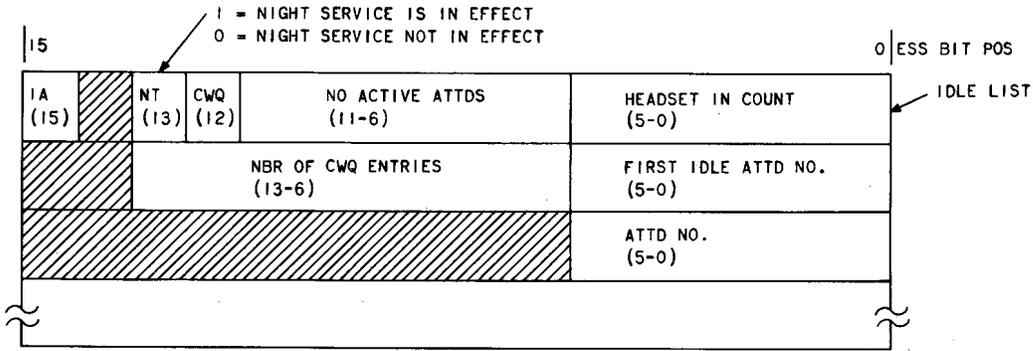
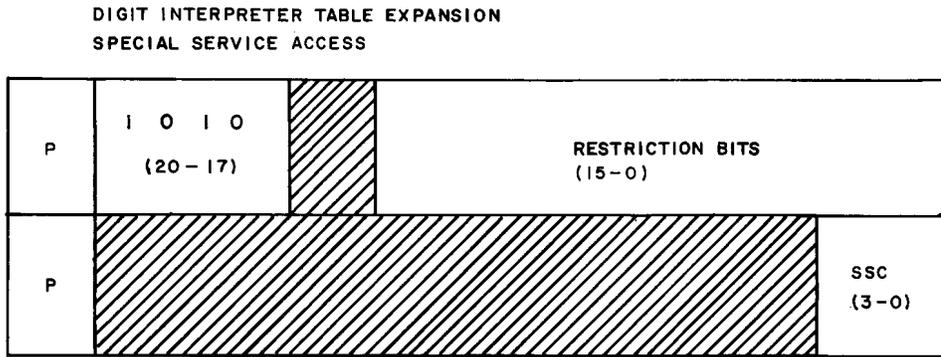


Fig. 4—Attendant Idle List/Calls Waiting Queue



SSC - SPECIAL SERVICE CODE  
WHEN SSC = 0100, THE ACCESS  
CODE USED TO REACH THIS  
ENTRY IS THE TRUNK ANSWER  
ANY STATION ACCESS CODE.

Fig. 5—Digit Interpreter Table Expansion—Special Service Access

23. REFERENCES

23.01 The following list contains source documents for the night service feature:

- Translation Guide, TG-2H
- PF-2H308 Attendant Monitor Program
- PD-2H308 Attendant Monitor Program
- PD-2H303 Centrex Custom Calling Program
- PD-2H312 Attendant Subroutines Program
- IM-2H200 Input Message Manual
- OM-2H200 Output Message Manual