

PULSE* 120 – SG-1A

ELECTRONIC PRIVATE AUTOMATIC BRANCH EXCHANGE

CLASS-OF-SERVICE SELECTION

AND

FEATURE STRAPPING

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1. GENERAL

1.01 This section describes (a) the Class-of-Service (COS) and feature strapping options provided by the PULSE 120 Electronic Private Automatic Branch Exchange (EPABX), and (b) the method of selecting and installing the appropriate options to give the desired customer arrangement. Some of the following features cannot be used in systems configured for hotel/motel service.

1.02 Information on the selection and installation of station line, trunk, and attendant console services is given, including:

- (a) EPABX numbering plan
- (b) designation and brief description of options and features
- (c) EPABX COS and feature programming
- (d) preparation of installations record sheets (Section 553-5011-207)
- (e) sample installation record sheets.

1.03 Station line and trunk services in the PULSE 120 are provided on either an individual or individual and system basis. To assist the section user in making service additions, installing a complete feature or a system, the information given in the section is divided into individual and system service provision.

Example: If the user is providing a station line feature, e.g., DIGITONE Dialing, in the system, Part 3,G explains how the feature is installed in the EPABX and Part 2,J explains how the feature is applied to an individual station line. Once the feature is provided in the system, reference is necessary to Part 2,J only for information on future applications of the feature to individual station lines. A similar information arrangement is given for trunks in Parts 4 and 5, and attendant console services are covered in Part 6.

1.04 Service selection and installation procedures are discussed in Parts 7 through 11.

Note: Regardless of whether a minor service addition or a complete system is to be installed, the Installation Record Charts (Section 553-5011-207) must always be completed.

1.05 **Reason For Reissue:** to add information on the QPJ38E, QPJ81H, QPJ181B trunk circuits, the QPJ22C impulse analyzer circuit, and the QPJ95B translator control circuit.

NUMBERING PLAN

1.06 Up to 120 three-digit station line numbers are available for use in the PULSE 120 EPABX. An optional 2-digit numbering plan is available, when the EPABX is equipped with 80 stations or less (cannot be used with hotel/motel service or in systems equipped with call pickup, or call forward, or both. The PULSE 120 EPABX numbering plans are given in Tables A(a) and A(b).

A. 3-Digit Numbering Plan

1.07 The EPABX is configured for 3-digit numbering by inserting a QPJ54-type circuit pack in connector location 4 on the control shelf and by making strapping connections on TB12, mounted at the rear end of line shelf No. 1, according to Table B.

B. 2-Digit Numbering Plan

1.08 The EPABX is configured for 2-digit numbering by inserting a QPJ19-type circuit pack in connector location 4 on the control shelf and by making strapping connection on TB12 mounted at the rear end of line shelf No.1 according to Table B.

**TABLE A(a)
PULSE 120 EPABX NUMBERING PLAN (EXCEPT FOR HOTEL/MOTEL SERVICE)**

CONFIGURATION (Note 1)	ACCESS	ROTARY DIAL AND DIGITONE CALLING ADDRESS
1 – 120 Stations (3-digit)	Station number (Note 2)	First field of 80 stations – 210 to 289. Second field of 40 stations – 310 to 349.
1 – 80 Stations (2-digit)	Station number (Note 2)	80 Stations – 10 to 89.
2- or 3-digit (Note 3)	Codes	Attendant – 0 Local Control Office (CO) – 9. Trunks (other than local CO) and special services (Note 4) – 80-89.

Notes:

- The 2-digit numbering plan is optional on an EPABX equipped for 80 lines or less, but it is not available on systems equipped for call pickup, or call forward, or both.
- When Direct Inward Dialing (DID) or Common Control Switching Arrangement (CCSA) network in-dialing is provided, the station number is the last two or three digits of the 7-digit message network number. The number of digits used depends on the numbering plan. DID or CCSA facilities are required from the serving offices.

- The following special services have fixed access codes as shown, regardless of configuration

Call Pickup Group	=41,	Code 87 may be a special access code assign-
Call Pickup Directed	=42,	able to any trunk or special service.
Call Forward Request	=43,	
Call Forward Cancellation	=44	
Executive Ringback	=80,	
Executive Override	=88,	
Trunk Answer From Any Station	= 89.	

Because each of the special service codes, 8X, is used with the 2-digit numbering plan, the corresponding numbered line circuit becomes deactivated for incoming calls.

The 3-digit numbering plan allows codes 81, 85, 86, and 87 to be accessed by the corresponding unit digits 1, 5, 6, and 7. Also, if call pickup, or call forward, or both are not system features, code 84 can be accessed by unit digit 4. A full complement of 120 lines is available with the 3-digit numbering plan.

- Each trunk location has an access code which is dialed by the attendant for night service assignment, barge-in, and maintenance testing:

TRUNK NO.	ACCESS CODE	TRUNK NO.	ACCESS CODE	TRUNK NO.	ACCESS CODE
1	77	11	65	21	52
2	76	12	64	22	51
3	75	13	63	23	48
4	74	14	62	24	47
5	73	15	61	25	46
6	72	16	57	26	45
7	71	17	56	27	44
8	68	18	55	28	43
9	67	19	54	29	42
10	66	20	53	30	41

- When the system is in the power fail transfer mode, Trunks 1 through 10 are connected directly to Station Lines (2)10 through (2)19 respectively.

TABLE A(b)
PULSE 120 EPABX NUMBERING PLANS FOR HOTEL/MOTEL SERVICE

SERVICE ASSIGNMENT	FUNCTION	DIALED NO. *	SYSTEM NO. *	COMMENTS (SEE NOTE 1)
GUEST ROOM LINES	...	100 to 160 or 100 to 199	See Note 2	<i>Standard Plan A:</i> Consecutive room numbers; 61 rooms requires two line shelves; 100 rooms requires three line shelves.
	...	100 to 149 200 to 249	See Note 2	<i>Standard Plan B:</i> Two floors, 50 rooms per floor; requires three line shelves.
	...	100 to 132 200 to 232 300 to 332	See Note 2	<i>Standard Plan C:</i> Three floors, 33 rooms per floor; requires three line shelves.
	...	100 to 130 200 to 229	See Note 2	<i>Standard Plan C:</i> Two floors, 30 rooms per floor; requires two line shelves.
	...	—	See Note 2	Special order other than plans A, B, or C.
ACCESS CODES	Hotel/Motel Attendant	0	0	—
	Local Central Office	9	9	When allowed by class-of-service.
	Long Distance Operator	8	87	See Note 5.
	Special Services	1 to 6	220 to 225	See Note 5.
	Trunks (not CO)		81 to 86	See Note 6.
Hotel Administrative Lines with PFT		750 to 759	210 to 219	Required for all plans, standard and special order. See Note 7.
Hotel Administrative lines without PFT		761 to 764	226, 239, 246, 346	See Note 3.
<p>* Extension numbering in the standard PULSE 120 is based on a system address arrangement which is fixed and common to all units. Hotel/Motel service, however, requires a more flexible numbering plan, to meet individual requirements. The Hotel/Motel option for PULSE 120 contains circuitry that translates dialed numbers (chosen by the customer) into the system numbers (addresses) used in all PULSE 120 EPABX. Correlation between dialed numbers and system numbers is contained in a programmed memory, which is part of the translation circuitry.</p>				

TABLE A(b) (cont)

Notes:

1. When 7PLUS (7+) dialing is selected, the dialed numbers for guest rooms and administrative lines must be preceded by a 7.
2. The system numbers available for guest rooms are as follows:
 Line Shelf 1: 227 to 238
 240 to 245
 247 to 249

 Line Shelf 2: 250 to 289

 Line Shelf 3: 310 to 345
 347 to 349
3. 239, 246, and 346 are used for maintenance and testing and therefore should be assigned to administrative lines that can be subjected to interruption.
4. When Direct Inward Dialing (DID) or Common Control Switching Arrangement (CCSA) network in-dialing is provided, the dialed number is the last three digits of the 7-digit message network number. DID or CCSA facilities are required from the serving offices.
5. The following special services have fixed access codes as shown, regardless of configuration: Executive Ringback = 80; Executive Override = 88; Trunk Answer From Any Station (TAFAS) = 89.

A station line Class-of-Service (COS) may allow access to 87, the Long Distance Operator. The dialed number for this access code is 8. A delay of 8 s occurs after dialing the first digit 8. After 8 s, if the second digit of a special service access code is not dialed, the circuit connects to the Long Distance Operator. If a second digit is dialed within 8 s, the circuit operates normally. When a QPJ95B translator control circuit is provided, a delay of 1 s occurs unless switch S2 is in the 8 s delay position. When switch S2 is not in the 8 s delay position, a modification is provided to restore the 8 s delay when the attendant console is in the night service mode, enabling the dialing of code 89 for TAFAS. This modification is made by connecting a strap wire from J12 pin 25A on the central control shelf to J12 pin 39A on the option shelf.

6. Each trunk location has an access code which is dialed by the attendant for night service assignment, barge-in and for maintenance purposes:

TRUNK NO.	ACCESS CODE	TRUNK NO.	ACCESS CODE	TRUNK NO.	ACCESS CODE
1	77	11	65	21	52
2	76	12	64	22	51
3	75	13	63	23	48
4	74	14	62	24	47
5	73	15	61	25	46
6	72	16	57	26	45
7	71	17	56	27	44
8	68	18	55	28	43
9	67	19	54	29	42
10	66	20	53	30	41

7. When the system is in PFT mode, trunks 1 through 10 are connected directly to dialed numbers 750 through 759 (system numbers 210 through 219). Administration lines should be assigned so that during PFT, the trunks handling most incoming calls are connected to convenient, well-staffed locations (i.e., front desk).

**TABLE B
NUMBERING PLAN – STRAPPING
CONNECTIONS**

Follow Instructions Given in 7.01 through 7.07
When Installing Strapping Connections.

NUMBERING PLAN	STRAP PINS ON TB12 LINE SHELF NO. 1
2-Digit	1-2 4-6 7-8 10-11
3-Digit	2-3 5-6 8-9 11-12

2. INDIVIDUAL STATION LINE SERVICES

GENERAL

2.01 Class-of-service assignments, options, and features for station lines are provided individually by inserting diode pins in COS blocks. These COS blocks are mounted on QPJ28-type circuit packs installed on the control shelf in connector location 25 for station lines (2)10 through (2)49, connector location 24 for station lines (2)50 through (2)89; and connector location 4 on the option shelf for station lines 310 through 349. See Section 553-5011-207 for charts converting hotel/motel dialed numbers to PULSE 120 system numbers.

EXCHANGE NETWORK RESTRICTIONS

2.02 Station lines may be assigned one of the following designated services to the exchange network [CO, Foreign Exchange (FX), Wide Area Telephone Service (WATS), and CCSA access line]. The COS diode-pin assignments are given in Table J, Item 1, Page 47.

- Unrestricted Service
- Semirestricted Service
- Fully Restricted Service
- Toll Denied or Code Restricted Service

Special service restrictions may also be applied by allowing or denying station lines access to miscellaneous trunks.

A. Unrestricted Service

2.03 When assigned with 'Unrestricted Service', stations are:

- allowed dial access to the exchange network
- allowed to receive calls from the exchange network.

2.04 This COS assignment is automatically provided by the system and the insertion of diode pins in COS blocks is not required.

B. Semirestricted Service

2.05 When assigned 'Semirestricted Service', stations are:

- denied dial access to the exchange network
- allowed access via the attendant to the exchange network
- allowed to receive calls from the exchange network.

2.06 Insert a diode pin in position 1 on the QPJ28* for each station with this COS assignment.

C. Fully Restricted Service

2.07 When assigned 'Fully Restricted Service', stations are:

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- denied access to the exchange network
- allowed access to the attendant
- not allowed to receive calls from the exchange network, except as a result of a call pickup or call forward operation.

2.08 Insert a diode pin in positions 1 and 2 on the QPJ28* for each station with this COS assignment.

D. Toll-Denied or Code-Restricted Service

Toll Denied Service

2.09 When assigned 'Toll-Denied Service', stations are:

- allowed dial access to the local exchange network
- denied dial access to the toll exchange network
- allowed access via the attendant to the toll exchange network
- allowed to receive calls from the exchange network.

Code Restricted Service

2.10 When assigned 'Code Restricted Service', stations are:

- allowed limited dial access to the local and toll exchange networks
- allowed access through the attendant to local and toll exchange networks
- allowed to receive calls from the exchange network.

2.11 Insert a diode pin in position 2 on the QPJ28* for each station with either of these COS assignments.

Note: Either Toll Denied or Code Restricted Service must also be provided in the system (see 3.02 through 3.24).

E. Special Service Restrictions

2.12 Station lines may be allowed or denied access to miscellaneous trunks, i.e., FX, WATS, tie trunks, CCSA access lines, paging, and dictation. These trunks are assigned (see 5.05) to the access codes given in Table C. The COS diode-pin assignments are given in Table J, Item 2, Page 47.

Note: Fully restricted stations do not have access to FX, WATS trunks, or CCSA access lines. Semirestricted stations have access only through the attendant.

(1) *Access to Miscellaneous Trunk Codes*

Allowed dial access to miscellaneous trunks assigned to access codes given in Table C.

or

Denied dial access to these trunks.
Allowed access through the attendant.

Insert a diode pin in position 5 on the QPJ28* for each station denied access to these trunks.

(2) *Access to Code 7 or 87*

Allowed dial access to the trunk assigned to access code 7 or 87

or

Denied dial access to the trunk.
Allowed access through the attendant.

Insert diode pins in position 6 and 7 on the QPJ28* for each station-allowed dial access to the trunk assigned to access code 7 or 87. This COS is required in hotel/motel service for each station (system number) allowed access to the Long Distance Operator by dialing 8. When a QPJ54C is provided insert diode pins in position 7 only on the QPJ28 for stations requiring access to code 7 or 87.

**TABLE C
MISCELLANEOUS TRUNK ACCESS CODES**

CODES FOR 2-DIGIT NUMBERING PLAN	CODES FOR 3-DIGIT NUMBERING PLAN
81	1 or 81
82	82
83	83
84	4 or 84
85	5 or 85
86	6 or 86
87	7 or 87

Note: Single-digit access to trunks cannot be used in hotel/motel service. Code 87 is reserved for Long Distance Operator trunks in hotel/motel service. In systems equipped with call pickup and/or call forward trunks assigned to code 84 cannot be selected by dialing digit 4 only.

OPTIONS AND FEATURES

F. Warning Tone Application

2.13 The option is primarily for data application.

Warning tones are applied to off-hook stations at intervals for busy verification, barge-in, and executive override, and once for camp-on, and ringback and acceptance of a call forward request or cancellation. The application of warning tone signals to any station may be denied by inserting a diode pin in position 8 on the QPJ28* (Table J, Item 5, Page 43).

Note: When tone application is denied, the executive override, busy verification, and barge-in features are deactivated on the station line. However, the tone indicating acceptance of a call forward request or cancellation is still allowed.

G. Unassigned Station Intercept

2.14 Attendant interception of calls to unassigned stations equipped with circuit packs is provided by inserting a diode pin in position 6 in the QPJ28* (Table J, Item 3, Page 47). Attendant interception occurs automatically on calls to stations not equipped with circuit packs.

H. Hunting

2.15 The system has a maximum of twelve groups of 10 station numbers (e.g., 10 to 19). The ten station lines in a group of 10 may be placed in any one of three hunting groups, or they may be spread (nonconsecutively if required) over all three hunting groups. This provides a system with a total of 36 hunting groups. See Section 553-5011-207 for charts converting hotel/motel dialed numbers to PULSE 120 system numbers.

2.16 A station is assigned to a hunting group by inserting diode pins in the following positions on the QPJ28* (Table J, Item 4, Page 47).

HUNTING GROUP	DIODE POSITION
1	4
2	3
3	3 & 4

I. Executive Override

2.17 A station is allowed to enter a call in progress, as a third party, by dialing access code 88 followed by the busy station number.

2.18 Insert a diode pin in position 9 on the QPJ28* (Table J, Item 6, Page 47) for each station that is allowed this option.

Note: Executive Override must also be provided in the system (3.34).

J. DIGITONE Dialing

2.19 All stations can use a rotary dial set and a DIGITONE dial set.

2.20 Insert a diode pin in position 10 on the QPJ28* for each DIGITONE dial set (Table J, Item 7, Page 47).

Note: DIGITONE receiver, QPJ64-type circuit packs (up to four; three with hotel/motel service) must also be provided on the option shelf (Section 553-5011-202).

2.21 When all the stations use DIGITONE dials, this feature may be provided for the entire system (see 3.36). Diode pins are then not required under these circumstances.

3. SYSTEM STATION LINE SERVICES

GENERAL

3.01 Class of-service assignments, options, and features for station lines are provided on a system basis by inserting circuit packs, and by making strapping connections on TB4 and TB11. These blocks are mounted at the rear end of the control and fully-wired option shelves.

EXCHANGE NETWORK RESTRICTIONS

A. Toll Denied or Code Restricted Service

Toll Denied Service

3.02 This COS is provided on a system basis by either

- detection of reverse CO battery

or

- detection of a '0' or '1' in the first or first and second dialed digits after the trunk access code. The choice is dependent upon the switch setting on the QPJ56-type circuit pack.

3.03 REVERSE CO BATTERY DETECTION.

This option is automatically provided by the system. The individual station toll denial COS is provided by diode pin (see 2.11).

3.04 *DIGIT '0' OR '1' DETECTION.* This option is provided in the system as described in Chart 1. The individual toll denial COS is provided by diode pin (see 2.11).

3.05 The toll-denial circuit on the QPJ56-type circuit pack is activated whenever a connection is established between a station line, with a toll-denial COS, and a CO or FX trunk. This toll-denial circuit is not activated on connections with optional trunks.

3.06 The first or first and second digits dialed after the trunk access code are monitored for a '0' or '1'. Detection of either of these digits denies the connection. If neither of these digits is detected, the connection is allowed after the first or second digit is received, and the toll-denial circuit is locked out for the rest of the call.

3.07 If the following signals are detected during the activated period, the toll-denial circuit is reset, the DIGITONE receiver released, in the case of a DIGITONE call, and an overflow tone is sent to calling station.

- switchhook flash indication
- # or * from a DIGITONE STATION
- time-out signal, which occurs when digit interval is greater than 15 seconds.

3.08 For ground start trunks the toll-denial circuit ignores all digits until supervision is returned by the CO (dial-tone delay dialing), since the circuit is only activated when the dial tone is received from the CO.

3.09 For loop start trunks the toll-denial circuit can be overridden, since the circuit is activated immediately after the access code is dialed. The station may dial two digits, other than '0' or '1', first. When dial tone is received from the CO, the station then dials the toll access code, thus overriding the toll-denial circuit.

**CHART 1 – TOLL DENIED SERVICE (DIGIT ‘0’ OR ‘1’ DETECTION) –
PROVISION IN THE SYSTEM.**
Follow Instructions Given in 7.01 through 7.07 When Installing This Feature.

CIRCUIT PACK REQUIRED – QPJ56-type

STEP	PROCEDURE
1	Set the switch on the QPJ56-type circuit pack to either the “up” position for first digit detector or the “down” position for first and second digit detection; insert the circuit pack in: <ul style="list-style-type: none"> • connector location 1 on toll-denial suboption shelf <li style="text-align: center;">or • connector location 15 on the fully-wired option shelf.
2	Strap pin 37 to 42 on TB4 (Table E, Page 16) located at the rear end of the control shelf to disable the reverse CO battery detector.

Note: Refer to 2.09 for toll-denial assignment to individual stations.

Code Restricted Service

3.10 The code restriction feature provides a greater selection than the toll denied feature, in the denied access arrangement from a rotary or DIGITONE station to toll, area and exchange codes. All stations assigned with a Code Restricted COS are allowed to dial specific toll and area codes, and allowed or denied dial access to specific exchange codes. The code restriction feature is provided in the system (Chart 2).

3.11 The selection of absorbed toll access digits and allowed or denied area/exchange codes is made by inserting shorting pins in Code Restriction Field (CRF) blocks (Fig. 9, Page 42) and by making strapping connections.

3.12 The CRF blocks for trunks are mounted on QPJ55-type (full field) or QPJ58-type (half field) circuit packs installed on the fully-wired type option shelf in connector locations 17, 19, 21, and 23, if the QPJ85 is not installed in connector

location 24. Each circuit pack is arranged to serve CO trunks and one FX trunk group. The allowed or denied facility for area/exchange codes and FX trunk group selection are controlled by strapping connections on the strapping block TB11 located at the rear end of the option shelf. Each group of FX trunks assigned to an access code requires a separate CRF circuit pack.

3.13 The code restriction field is subdivided into two areas. The top section of the field (16 codes) is used for code selection on CO or FX trunk groups and the lower section (24 codes) is used for code selection on CO trunk groups only.

3.14 The top section (16 codes) of the CRF is divided into three subfields:

- toll access digit absorption
- allowed area and service codes
- allowed or denied exchange codes.

3.15 TOLL-ACCESS DIGIT ABSORPTION FIELD. This field allows up to four different toll single access digits to be repeatedly absorbed. If the first-dialed digit, following the access code, is programmed as an absorbed digit, then the following digit appears as the first digit. Absorption occurs repeatedly until an unprogrammed digit is dialed.

Note 1: The first four rows of shorting-pin holes on the first digit block only are used for digit absorption programming.

Note 2: If absorption of digit 2 is required, i.e., for 112 access code, then the first digit of an area code commencing with 2 is also absorbed. In these circumstances calls to areas with codes beginning with the digit 2 should be routed through the operator.

3.16 ALLOWED AREA AND SERVICE CODES FIELD. The next eight rows of shorting-pin holes following the digit absorption field are used for allowing calls to three-digit area and service codes. This field analyzes the second digit of the area or service code, and when digit 0 or 1 are

detected, the programmed codes in this field are scanned. The call is allowed, if the dialed code is programmed, or denied, if the code is not programmed.

3.17 ALLOWED OR DENIED EXCHANGE CODES. The remaining four rows of shorting-pin holes are used in conjunction with straps on TB11 on the option shelf for allowed or denied programming of local exchange codes. Any combinations of 1-, 2-, or 3-digit local codes are programmed as allowed codes when a ground strap is placed on TB11 (Table D). When the ground strap is omitted, the codes are programmed as denied codes.

3.18 The lower section of the CRF (24 codes) is used for programming allowed or denied exchange codes on CO trunk group only, as described in 3.17.

3.19 The programmable CRF on the half-field code restriction circuit pack (QPJ58) is identical to the full-field circuit pack (QPJ55), except that the allowed or denied exchange codes subfield is limited to only four codes.

**TABLE D
CODE RESTRICTION – STRAPPING CONNECTIONS ON TB11, OPTION SHELF
Follow Instructions Given in 8.01 through 8.08 When Making Strapping Connections**

CRF CIRCUIT PACK CONNECTOR LOCATION ON OPTION SHELF	TRUNK GROUP TYPE			
	CO	FX		
	EXCHANGE CODE ALLOW STRAP	ACCESS CODE STRAP	CRF ACTIVATE STRAP	EXCHANGE CODE ALLOW STRAP
17	16-17	—	—	—
19	—	4- †	1-2	21-22
21	—	9- †	6-7	26-27
23*	—	14- †	11-12	31-32

† Select one of the following pins 5, 10, 15, 20, 25, 30, or 35 which correspond to access codes (8)1, 82, 83, (8)4, (8)5, (8)6, and (8)7.

* Cannot be used if the QPJ85* is installed in location 24.

3.20 A CRF circuit pack inserted in connector location 17 on the option shelf can only be used for code restriction on CO trunks.

Expansion of Code Restriction Field

3.21 Expansion of the code restriction field to form separate fields for an FX trunk group or expansion to the CO trunk fields or both is achieved by inserting up to four CRF circuit packs and making strapping connections on TB11 on the rear end of option shelf as follows:

3.22 **CO TRUNK FIELD.** All fields on the CRF circuit pack in connector 17 are simply expanded by inserting additional circuit packs in connectors 19, 21, and 23*. These additions extend each corresponding field on the circuit pack in connector 17. No strapping is necessary on TB11.

3.23 **FX TRUNK FIELD.** Code restriction fields for a maximum of three different FX groups are established by installing circuit packs in connectors 19, 21, and 23* and by making the appropriate strapping connections on TB11 (Table D). Any one of these circuit packs can be assigned to any one of the seven FX group access codes in the system.

Example: If the QPJ55-type circuit pack, in connector 19 on the option shelf, is to be assigned to the FX group access code 83, pins 2 and 4 on TB11 are strapped to pins 1 and 15. The following CRF would then be available to FX group 83:

- 4 digit absorption
- 8 allowed area/service codes
- 4 allowed or denied exchange codes.

The remaining 24 codes are additional allowed or denied codes to those provided for the CO trunks by the circuit pack in connector 17.

Note: If a half-field circuit pack (QPJ58-type) is used, only four additional, allowed or denied codes are available for the CO trunks.

3.24 Code restriction fields for an FX group are expanded by strapping two or more CRF cards to the same access code on TB11.

OPTIONS AND FEATURES

A. Trunk Answer From Any Station (TAFAS)

3.25 All stations are allowed (unless fully restricted) to answer I/C attendant-directed calls, when the system is on night service, by dialing 89. Calls may be transferred between stations (unless fully restricted), if the call transfer-individual feature is provided (see 3.27 through 3.29).

3.26 This feature is provided in the system by Strapping pins 46 to 51 on TB4 (Table E) and installing the QPJ61-type circuit pack in connector location 9 on the control shelf.

Note 1: When a 2-digit numbering plan is used, station line 89 must also be assigned as the access code to TAFAS (see 5.02) by inserting a diode pin in position 7 on the QPJ28* for station line 89 (Table J, Item 3, Page 47).

Note 2: When a 3-digit numbering plan is used, the assignment of access code 89 is automatic when the TAFAS feature and the QPJ62* in connector 23 on the control shelf are installed. If the QPJ62* is not present, station line 289 must be assigned as the access code to TAFAS (see 5.04) by inserting a diode pin in position on the QPJ28* for station line 289 (Table J, Item 3, Page 43). A QPJ62 board must be used to access TAFAS when a QPJ54C is installed.

B. Call Transfer-Individual, Consultation-Hold and Add-On on Incoming and Outgoing Trunks

3.27 All stations (unless fully restricted) are automatically allowed to transfer I/C or O/G trunk calls to another station line (unless fully restricted).

* Cannot be used, if the QPJ85* is installed in location 24

CHART 2 – CODE RESTRICTED SERVICE – PROVISION IN THE SYSTEM.
Follow Instructions Given in 8.01 through 8.08 When Providing This Feature

EQUIPMENT REQUIRED:

Circuit Packs – QPJ56- and QPJ57-types. Up to four (three, if the QPJ85* is installed) full field QPJ55-type or half field QPJ58-type

Shelf – Fully-wired type option shelf equipped with a QPJ43-type circuit pack in connector location 29 for QSP6U shelf or connector 26 for QSP6M or QSP6R option shelf

STEP	PROCEDURE
1	Install QPJ56-type circuit pack in connector location 15 and QPJ57-type circuit pack in connector location 16 on the option shelf.
2	Strap pins 37 to 42 on TB4 (Table E, Page 16) located at the rear end of the control shelf to disable the reverse battery detector.
CO TRUNK GROUP	
3	Install a QPJ55- or QPJ58-type circuit pack in connector location 17 on the option shelf.
4	For each absorbed toll-access digit, insert a shorting-pin in one of the four assigned rows of holes in the first-digit CRF block (Fig. 9 Page 40).
5	For each allowed Area and Service code, insert up to three shorting-pins in one of the eight assigned rows of holes. One pin is required in each corresponding digit block.
6	For each denied Exchange code, insert three shorting-pins in one of the 28 (4 plus 24) assigned rows of holes. One pin is required in each corresponding digit block.
7	For allowed Exchange codes, repeat Step 6 and convert the restriction field to allow codes by strapping pin 16 to 17 on TB11 (Table D, Page 12) located at the rear end of the control shelf.
8	To expand the restriction fields, install additional circuit packs, as required, in connector locations 19, 21, and 23 (only if the QPJ85* is not installed in location 24), and repeat Steps 4 through 7.
FX TRUNK GROUP	
9	Install a QPJ55 or QPJ58-type circuit pack in connector location 19 on the option shelf.
10	Install the CRF activate and appropriate access code straps in TB11 (Table D, Page 12).

CHART 2 (Cont) – CODE RESTRICTED SERVICE – PROVISION IN THE SYSTEM.
Follow Instructions Given in 8.01 through 8.08 When Providing This Feature

STEP	PROCEDURE
11	Perform Step 4.
12	Perform Step 5.
13	For each denied Exchange code, insert three shorting pins in one of the four assigned rows of holes. One pin is required in each corresponding digit block.
14	<p>For allowed Exchange codes, repeat Step 13, and convert the restriction field to allowed codes by strapping pin 21 to 22 on TB11 (Table D, Page 12).</p> <p><i>Note:</i> The remaining 24 rows of holes cannot be used for FX trunk route programming but may be used as an expansion of the Exchange code restriction field on the QPJ55 circuit pack in location 17.</p>
15	To establish additional FX trunk group restriction fields, install a second or third circuit pack in connector locations 21 or 23 (only if the QPJ85* is not installed in location 24), and repeat Steps 10 through 14.

3.28 This feature is provided in the system by installing the call transfer QPJ60-type circuit pack in connector location 8 on the control shelf.

C. Call Transfer-Individual, Consultation-Hold and Add-On on Incoming Trunks Only

3.29 All stations (unless fully restricted) may be denied the call transfer-individual feature on O/G trunk calls by providing a strap between pins 47 and 52 on TB4 (Table E).

D. Call Transfer-Individual, Consultation-Hold and Add-On Excluded on Tie Trunks

3.30 All stations may be denied the call transfer-individual feature on tie trunk calls by providing a strap between pins 40 and 45 on TB4 (see Table E).

E. Executive Ringback

3.31 All stations may be allowed, by dialing 80 followed by a busy station number, to camp-on to the busy station, place the receiver on-hook and then be rung back when the desired station becomes available.

3.32 This feature is provided in the system by strapping pin 38 to 43 on TB4 (Table E) and installing QPJ77- and QPJ61-type circuit packs in their connector locations 6 and 9 on the control shelf.

Note 1: When a 2-digit numbering plan is used, station line 80 must also be assigned as the access code to Executive Ringback (see 5.02) by inserting a diode pin in position 7 on the QPJ28* for station line 80 (Table J, Item 3, Page 47).

Note 2: When a 3-digit numbering plan is used, the assignment of access code 80 is automatic when the Executive Ringback feature and the QPJ62* in connector 23 on the control shelf are installed. If the QPJ62* is not present, station line 280 must be assigned as the access code to Executive Ringback (see 5.04) by inserting a diode pin in position on the QPJ28* for station line 280 (Table J, Item 3, Page 47). A QPJ62 board must be used to access Executive Ringback when a QPJ54C is installed.

TABLE E
SYSTEM STATION LINE FEATURES – STRAPPING CONNECTIONS
 Follow Instructions Given in 7.01 through 7.07 When Installing Strapping Connections

FEATURE	STRAP PINS ON TB4 (Control Shelf)
TAFAS	46-51
Call Transfer-Individual, I/C Trunks Only	47-52
Call Transfer-Individual, Excluded on Tie Trunks	40-45
Reverse CO Battery Exclusion	37-42
Executive Ringback	38-43
Executive Override	48-53
DIGITONE Dialing	31-41

F. Executive Override

3.34 All stations which are programmed for override on an individual basis are allowed to enter a call in progress, as a third party, by dialing access code 88 followed by the busy station number.

3.35 This feature is provided in the system by strapping pin 48 to 53 on TB4 (Table E) and installing QPJ77- and QPJ61-type circuit packs in connector locations 6 and 9 on the control shelf.

Note 1: When a 2-digit numbering plan is used, station line 88 must also be assigned as the access code to Executive Override (see 5.02) by inserting a diode pin in position on the QPJ28* for station line 88 (Table J, Item 3, Page 43).

Note 2: When a 3-digit numbering plan is used, the assignment of access code 88 is automatic when the Executive Override feature and the QPJ62* in connector 23 on the control shelf are installed. If the QPJ62* is not present, station line 288 must be assigned as the access code to Executive

Override (see 5.04) by inserting a diode pin in position on the QPJ28* for station line 288 (Table J, Item 3, Page 47). A QPJ62 board must be used to access Executive Override when a QPJ54C is installed.

G. DIGITONE Dialing

3.36 When all stations use DIGITONE dials this feature may be provided for the entire system. Diode pins are not required for each station when this method of feature installation is used.

3.37 The feature is installed by strapping pin 31 to 41, on TB4 (Table E).

Note. Up to four (three with hotel/motel service) DIGITONE receiver QPJ64-type circuit packs must also be installed on the option shelf. Refer to Section 553-5011-202 for the number of circuit packs required.

H. Call Pickup

3.38 A station user (not the attendant) can answer a call directed to another station (not the attendant), when this feature is provided.

3.39 With directed call pickup a station user can answer a call directed to any other station by dialing access code 42 followed by the number of the ringing station.

3.40 The directed call pickup feature is provided in the system by installing QPJ86- and QPJ84-type circuit packs in connector locations 26 and 25 of the QSP6U option shelf.

3.41 With group (preassigned) call pickup, a station user can answer a call directed to a station in his same call pickup group by dialing access code 41. Call pickup group assignments are made on the QPJ85-type circuit pack,

3.42 The call pickup feature with group pickup is provided in the system by installing QPJ86-, QPJ84-, and QPJ85-type printed circuit packs in connector locations 26, 25 and 24 of the QSP6U option shelf. Also, a QPJ43-type circuit pack must be installed in connector location 29 of the QSP6U option shelf.

3.43 Instructions regarding the assignment of stations to call pickup groups are given in Step 5 of Chart 4. There are nine pickup groups, and a station may be assigned to any one of the nine or to no group at all. A maximum of 30 stations can be assigned to any one pickup group.

I. Call Forward

3.44 Calls directed to any station (not the attendant) can be automatically forwarded to another station (not the attendant) in the same EPABX when this feature is provided.

3.45 Requests for calls to be forwarded (using access code 43) or requests to cancel (using access code 44) previously entered call forwarding instructions will be accepted from either the station whose calls are to be or have been forwarded, or from the attendant console.

3.46 This feature is provided in the system by installing QPJ80-, QPJ82-, and QPJ86-type circuit packs in connector locations 27, 28, and 26 of the QSP6U option shelf. Also, a QPJ43-type circuit pack must be installed in connector location 29 of the QSP6U option shelf.

4. TRUNK SERVICES

GENERAL

4.01 Class-of-service assignments for trunks are made by inserting diode pins in COS blocks and by making strapping connections.

4.02 The COS blocks for the trunks are mounted on two circuit packs installed on the control shelf in connector locations 23 and 26. The three COS blocks on the QPJ29-type circuit pack (connector location 26) provide COS assignments for all 30 trunk positions, 10 of which may be used for miscellaneous trunks. The 10 miscellaneous trunk positions are also served for COS options by the single COS block on the QPJ62-type circuit pack (connector location 23).

4.03 At the rear of each trunk connector location, a trunk strapping block is mounted on the rear of the shelf. The strapping terminals on the block are wired to contacts on the trunk connector so that strapping connections may be made on the strapping block. The block is numbered from top to bottom.

4.04 The 15 connector locations assigned to trunk circuit packs on each trunk shelf can all be used for CO one-way I/C FX and WATS or DID trunks; or five on each shelf (trunk numbers 11 through 15 and 26 through 30) can be used for desired combinations of the following miscellaneous trunks:

FX

CCSA access lines

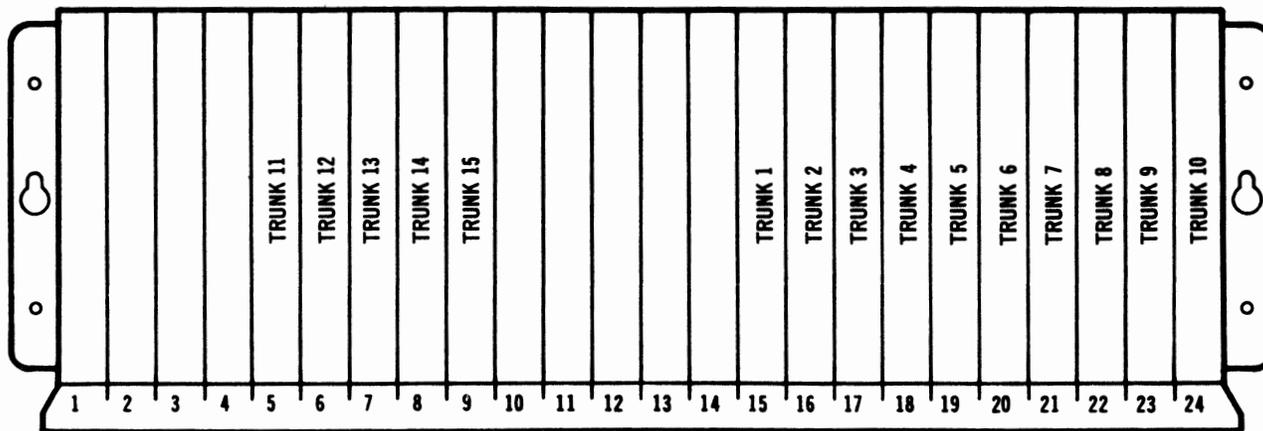
tie trunks

paging trunks (not more than five, all on trunk shelf no. 1)

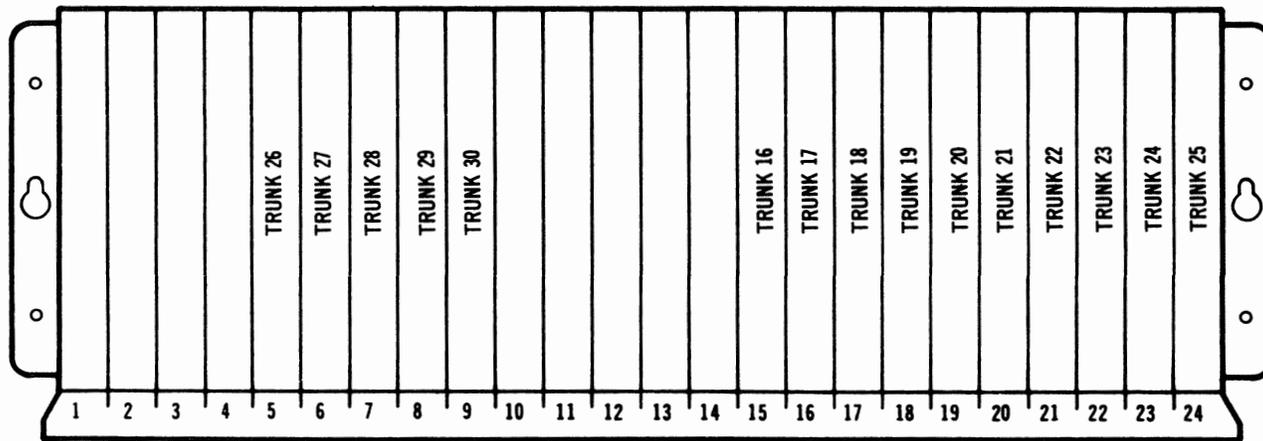
dictation trunk applique (not more than two, both on trunk shelf no. 1)

4.05 One-way I/C trunk arrangements are made by placing straps on the strapping block at the rear of the trunk connector. One-way O/G arrangements are made at the remote office.

4.06 The relationship between trunk numbers at the cross-connecting terminal and connector positions in the trunk shelves is shown in Fig. 1.



(a) Trunk Shelf No. 1



(b) Trunk Shelf No. 2

Note: Refer to Section 553-5011-202, Tables C and D for Trunk Location Assignments.

Fig. 1 – Trunk Position Numbering

AVAILABLE TRUNKS

A. Central Office Trunk

4.07 A CO trunk consists of a 2-wire trunk circuit at the PULSE 120 EPABX and an interconnecting transmission facility to a line appearance at the local exchange office. The trunk may be used as either a one-way I/C or a 2-way trunk with ground or loop-start signaling.

4.08 A CO trunk is installed by inserting either a QPJ38- or QPJ81-type circuit pack in the desired trunk connector and installing the appropriate options.

4.09 The options and features assignable to this type of trunk are:

- DIGITONE to Dial Pulse Conversion
- O/G Dialing Speed Selection
- Toll Denial or Code Restriction Inhibit
- Signaling Selection
- I/C Only Assignment
- Terminating Impedance Selection
- Transmission Mode Selection
- Signaling Range Adjustment

4.10 Each one of the listed options and features must be considered during the trunk installation and, if applicable, they must be provided. A description of the options and features and their installation is given in 5.07 through 5.25.

B. Central Office (Direct Inward Dialing) Trunk

4.11 A CO (DID) trunk differs from a CO trunk in that it is I/C only, and DID facilities are provided to all station lines on the PULSE 120 EPABX. This trunk has loop signaling.

4.12 A CO (DID) trunk is installed by inserting a QPJ76-type circuit pack in the desired trunk connector, inserting a diode pin in position 3 on the QPJ29* (Table K, Item 1, Page 48) and installing the appropriate options.

4.13 The options and features assignable to this type of trunk are:

- Signaling Selection
- I/C Only Assignment
- Terminating Impedance Selection
- Signaling Range Adjustment

The QPJ76F trunk unit has a switch S1 on the unit. This switch provides switchable 20 PPS, immediate start delay dial, and wink start according to Table EE.

4.14 Each one of the listed options and features must be considered during the trunk installation and, if applicable, they must be

provided. A description of the options and features and their installation is given in 5.17 through 5.20 and 5.25.

Note 1: When assigning DID trunks to trunk numbers 1 through 10, see 5.27 for power failure consideration.

Note 2: Refer to 6.04 for Attendant LDN Intercept assignment.

Note 3: The CO must be equipped to out-pulse two or three digits, depending on which station line numbering plan is used.

C. Foreign Exchange (FX) or Wide Area Telephone Service (WATS) Trunk

4.15 An FX or WATS trunk consists of a 2-wire trunk circuit at the PULSE 120 EPABX and an interconnecting transmission facility to a line appearance at a remote CO. The CO would not normally serve that customer's location. The trunk may be used as a one-way or a 2-way trunk with ground or loop-start signaling.

4.16 An FX or WATS trunk is provided by inserting a nongain QPJ38- or gain QPJ81-type or a QPJ181-type music-on-hold circuit pack in the desired trunk connector, inserting a diode pin in position 4 on the QPJ29* (Table K, Item 1, Page 48), and providing the appropriate options.

**TABLE EE
OPTION PROVIDED BY S1 SWITCH**

OPTION	(S1) SWITCH CONTACT							
	1	2	3	4	5	6	7	8
10 PPS	—	—						
20 PPS	X	X						
IMMEDIATE START			X	—		—	X	—
DELAY DIAL			—	X		X	—	
WINK START			X	—		—	—	X

X: ON
—: OFF

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4.17 The options and features assignable to this type of trunk are:

Assignment of Station Line Numbers as Trunk Access Codes
Trunk Access Code Assignment
DIGITONE-to-Dial Pulse Conversion
O/G Dialing Speed Selection
Toll Denial or Code Restriction Inhibit Signaling Selection
I/C Only Assignment
Terminating Impedance Selection
Transmission Mode Selection
Signaling Range Adjustment

4.18 Each one of the listed options and features must be considered during the trunk installation, and if applicable, they must be provided to ensure correct operation. A description of the options and features and their installation is given in 5.02 through 5.25.

D. Common Control Switching Arrangement Access Line

4.19 A CCSA access line consists of an access line circuit at the PULSE 120 EPABX and an interconnecting transmission facility to a line appearance at a CCSA office. The access line may be operated over a 2- or 4-wire facility and used as either a one-way or a 2-way trunk with E&M or DX signaling.

4.20 A CCSA access line is provided by inserting a QPJ69-type circuit pack in the desired miscellaneous-trunk connectors 5 through 9 on each trunk shelf, inserting diode pins in positions 3 and 4 on the QPJ29* (Table K, Item 1, Page 48) and position 2 on the QPJ62* (Table L, Item 1, Page 49) and installing the appropriate options.

4.21 The options and features assignable to an access line are identical to those given in 4.17 for an FX trunk. Each one of the options and features must be considered during the access line installation as discussed in 4.18.

4.22 Connections to an access line circuit via a 24V4-repeater are given in Section 553-5011-205.

Note: When the 2-digit numbering plan is used, the EPABX automatically absorbs the first two digits outpulsed from the CCSA office. For a 3-digit numbering plan only the first digit is absorbed.

E. Tie Trunk

4.23 A tie trunk consists of a trunk circuit at the PULSE 120 EPABX and an interconnecting transmission facility to a trunk circuit at another PBX. Two trunks are available:

- E&M/DX Signaling, 2-Way Dial Repeating
- Loop Signaling, 2-Way Dial Repeating
or
I/C Dial Repeating
O/G Automatic (OAID).

4.24 The operating mode of a E&M/DX Signaling trunk may be 2-way or I/C only over 2- or 4-wire facilities. The operating mode of a Loop Signaling trunk may be 2-way or I/C only over a 2-wire facility.

4.25 A tie trunk is provided by inserting either an E&M/DX signaling QPJ69- or loop signaling QPJ76-type circuit pack in the desired miscellaneous-trunk connectors 5 through 9 on each trunk shelf, inserting diode pins in positions 3 and 4 on the QPJ29* (Table K, Item 1, Page 48) and position 1 on the QPJ62* (Table L, Item 1, Page 49).

4.26 The exchange network and special service restrictions described in 2.02 through 2.12 apply to individual tie trunks. The COS diode pin assignments are given in Table K, Item 2, Page 48 and Table L, Item 2, Page 49.

- *Unrestricted Service:* This COS assignment is automatically provided by the system.

- **Semirestricted Service:** Insert a diode pin in position 1 on the QPJ29* circuit pack for each tie trunk with this COS assignment.
- **Full Restricted Service:** Insert a diode pin in position 1 and 2 on the QPJ29* circuit pack for each tie trunk with this COS assignment.
- **Toll Denied or Code Restricted Service:** Insert a diode pin in position 2 on the QPJ29* circuit pack for each tie trunk with this COS assignment.
- **Special Service Restrictions:**

(a) **Access to Miscellaneous Trunk Codes 1 or 81 through 6 or 86:** Insert a diode pin in position 6 on the QPJ62* circuit pack for each tie trunk denied access to these codes.

(b) **Access to Code 7 or 87:** Insert a diode pin in position 5 on the QPJ62* circuit pack for each tie trunk allowed access to the code.

4.27 The options and features assignable to a tie trunk are identical with those given in 4.17 for an FX trunk plus the I/C DIGITONE Dialing feature (5.06). Each of the options and features must be considered during the tie trunk installation as discussed in 4.18.

4.28 Connection to a tie trunk via a 24V4-repeater are given in Section 553-5011-205.

F. Senderized Tie Trunk

4.29 The difference between a senderized and a normal tie trunk is that a dial pulse sender is used at the far end of the trunk when dialing into the PULSE 120 EPABX. The sender must be arranged for immediate start.

4.30 The basic installation of this trunk is the same as that for a normal tie trunk, however the diode pins are inserted in positions 1 and 2 on the QPJ62* (Table L, Item 1, Page 49).

G. Paging Trunk

4.31 A paging trunk consists of a trunk circuit at the PULSE 120 EPABX and an interconnecting transmission facility to a paging amplifier. See Section 553-5011-205 for cable connections to the trunk circuit.

4.32 A paging trunk is provided by inserting a QPJ75-type circuit pack in the desired trunk connector (5 to 9 on trunk shelf no. 1; use connector 5 if attendant pre-emption is required) and inserting diode pins in positions 3 and 4 on the QPJ29* (Table K, Item 1, Page 48) and position 3 on the QPJ62* (Table L, Item 1, Page 49). Access code assignment and signaling options for this trunk are given in 5.05 and 5.17.

H. Recorded Telephone Dictation Trunk

4.33 A dictation trunk applique consists of a trunk applique circuit at the PULSE 120 EPABX which interfaces with a common systems dictation trunk circuit (SD65788-01). See Section 553-5011-205 for cable connections to the trunk circuit and recording machine.

4.34 A dictation trunk applique is provided by inserting a QPJ73-type circuit pack in the desired trunk connector (6 or 7 on trunk shelf no. 1). Insert a diode pin in positions 3 and 4 on the QPJ29* (Table K, Item 1, Page 48) and position 3 on the QPJ62* (Table L, Item 1, Page 49). Access code assignment and signaling options for this trunk applique are given in 5.05 and 5.17.

I. CO to CO or CO/FX to FX Trunk Connections

4.35 QPJ41B onward and QPJ62B circuit packs do not allow these types of trunk connection unless wiring straps on the packs themselves are changed. The restrictions may be removed as follows:

- To allow CO to CO trunk connections via the attendant; on QPJ41B add a wire strap between terminals A-A (location B-9, component side). For QPJ41C onward, A-A are at location E-3 component side.
- To allow CO or FX to FX trunk connections via the attendant; on QPJ62B remove

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the wire strap between terminals B-B and add a wire strap between terminals A-A (location A-1, component side).

J. Music-On-Hold

4.36 A music-on-hold trunk consists of a QPJ181-type trunk circuit at the PULSE 120 EPABX and on interconnecting transmission facility to an audio (music source) amplifier. See Section 553-5011-205 for cable connections between the EPABX and the amplifier.

4.37 When the trunk is used in a music-on-hold application, a customer-supplied audio source is applied to the party connected to the trunk tip and ring during non-talking conditions specified in Table N (Page 51).

4.38 A music-on-hold trunk is provided by installing a QPJ181-type circuit pack in the desired trunk connector. The music-on-hold trunk can be used as a CO, FX or WATS trunk (see 4.07 through 4.10 and 4.15 through 4.18). However, the music-on-hold trunk can be used only in NON-VNL applications because there is no 2 dB pad in the trunk.

4.39 Strapping to connect the external audio source to the music-on-hold trunk is described in 5.28 through 5.30.

5. INDIVIDUAL TRUNK OPTIONS AND FEATURES

GENERAL

5.01 These options and features are available or can be made available to a trunk by inserting pins in COS blocks mounted on QPJ28-, QPJ29-, and QPJ62-type circuit packs on the control shelf and by making strapping connections on the block mounted at the rear of the trunk connector and TB11 mounted on the rear end of the fully-wired type option shelf.

OPTIONS AND FEATURES

A. Assignment of Station Line Numbers as Trunk Access Codes

2-Digit Numbering Plan (cannot be used in hotel/motel service or in systems equipped with call pickup and/or call forward)

5.02 Station line numbers 80 through 89 may be assigned as access codes to trunks and special services:

Executive Ringback	80
Trunks	81-87
Executive Override	88
TAFAS	89

A number assigned as an access code is not available as a terminating station line but may be used as a station line with O/G call facilities only.

5.03 Insert a diode pin in position 7 on QPJ28* (Table J, Item 3, Page 47) in connector location 24 on the control shelf for each station line number assigned as a trunk access code.

Note 1: For assignment of special services to access codes 80, 88, and 89, see 3.31, 3.34, and 3.25 respectively.

Note 2: For assignment of trunks to access codes 81-87, see 5.05.

3-Digit Numbering Plan

5.04 Trunk and special service access code assignment is automatic when access codes are assigned to trunks (see 5.05) and when system strapping connections are made to provide TAFAS (see 3.25), Executive Ringback (see 3.31), and Executive Override (see 3.34). All 120 numbers remain available for station line assignment.

Note: Access code assignment to TAFAS, Executive Ringback and Executive Override is automatic only when the QPJ62* is installed in connector 23 on the control shelf. If the QPJ62* is not present, station line numbers 280, 288 and 289 must be assigned as access codes to these features by inserting a diode pin in position 7 on the QPJ28* (Table J, Item 3, Page 47) in connector location 24 on the control shelf for each number assigned.

Note: Single-digit access to trunks cannot be used in hotel/motel service. Code 87 is reserved for Long Distance Operator trunks in hotel/motel service. In systems equipped with call pickup and/or call forward, trunks assigned to code 84 cannot be selected by dialing digit 4 only.

**TABLE F
MISCELLANEOUS TRUNK ACCESS CODES**

TRUNK ACCESS CODES FOR 2-DIGIT NUMBERING PLAN	TRUNK ACCESS CODES FOR 3-DIGIT NUMBERING PLAN
81	1 or 81
82	82
83	83
84	4 or 84
85	5 or 85
86	6 or 86
87	7 or 87

B. Trunk Access Code Assignment

5.05 Any trunk located in connectors 5 through 9 on either trunk shelf may have access codes assigned as shown in Table F. Insert diode pin(s) in positions, indicated below, on the QPJ62* (Table L, Item 3, Page 45) for each trunk assigned to an access code:

ACCESS CODE	DIODE PIN POSITIONS
1 or 81	8
82	9
83	8,9
4 or 84	10
5 or 85	8,10
6 or 86	9,10
7 or 87	8,9,10

Note 1: Station line numbers 81-87 must also be assigned as trunk access codes (see 5.02) for a 2-digit numbering plan.

Note 2: Single-digit trunk access codes are only available with the 3-digit numbering plan, and cannot be used in systems configured for hotel/motel service. Code 87 is reserved for Long Distance Operator trunks in hotel/motel service. These LDO trunks should be FX trunks. If toll-denial or code restriction is a system feature, the LDO trunks must have a toll-denial inhibit COS (See 5.16).

Note 3: In systems equipped with call pickup and/or call forward, trunks assigned access code 84 cannot be selected by dialing digit 4 only.

C. Incoming DIGITONE Dialing

5.06 Incoming pulse dialing facilities are allowed on all relevant trunks. When I/C DIGITONE dialing facilities are required on a trunk, a diode pin is inserted in position 10 on the QPJ29* (Table K, Item 3, Page 48).

Note: DIGITONE receiver QPJ64-type and DIGITONE interface QPJ67-type circuit packs must be installed on the option shelf and trunk shelf no. 1 (Section 553-5011-202).

D. DIGITONE to Dial Pulse Conversion

5.07 This feature allows DIGITONE-equipped stations and attendant to dial O/G calls through CO, FX, and tie trunks when the distant exchange or PBX is not provided with DIGITONE receivers. This feature is not available with hotel/motel service.

Note: Stations 10 through 19 must be provided with supplementary rotary dial telephones when trunk numbers 1 through 10 are not equipped with DIGITONE receivers at the CO. This is necessary to ensure adequate emergency service when the system is in the power failure condition (see 5.27).

5.08 Insert a diode pin in position 9 on the QPJ29* (Table K, Item 5, Page 48) for each trunk requiring this feature.

5.09 The provision of this feature in the system is described in Chart 3.

5.10 The conversion equipment is released after dialing by the following methods:

- Pretranslation
- Time-out
- Depressing the octothorpe (#) key.

5.11 Release by the pretranslation method allows efficient use of the conversion equipment. The pretranslation circuit anticipates the total number of digits requiring conversion by analyzing the first three digits dialed following the trunk access code. Immediate release of the equipment is then possible after the last anticipated digit is dialed.

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5.12 There are three situations when the pretranslation circuit cannot successfully analyze the first three digits; the circuit then has to be partially or completely disabled by strapping connections on TB11, (Table G, Page 25). These situations are:

(1) When access is allowed from the PULSE 120 to any area codes that *do not* contain a '0' or '1' as a second digit. In this situation the pretranslator has to be partially disabled by strapping pins 36 to 37 on TB11. Release of the conversion equipment is then by time-out for direct area or exchange calls.

CHART 3 – DIGITONE-TO-DIAL PULSE CONVERSION – PROVISION IN THE SYSTEM
Follow the Instructions Given in 8.01 through 8.08 When Providing This Feature.

EQUIPMENT REQUIRED:

Circuit Packs – QPJ43*, QPJ53*, QPJ67*, Up to 4 - QPJ30*, and Up to 4 - QPJ64*

Shelf – Fully-Wired type Option Shelf

STEP	PROCEDURE																		
1	Install the fully-wired type option shelf.																		
2	<p>Install the circuit packs as follows:</p> <table border="1" data-bbox="341 1186 1201 1512"> <thead> <tr> <th>CIRCUIT PACK</th> <th>CONNECTOR LOCATION</th> <th>SHELF</th> </tr> </thead> <tbody> <tr> <td>QPJ53*</td> <td>10</td> <td>Option</td> </tr> <tr> <td>QPJ67*</td> <td>3</td> <td>Trunk No. 1</td> </tr> <tr> <td>QPJ43*</td> <td>26 QSP6M 29 QSP6U</td> <td>Option</td> </tr> <tr> <td>Up to 4 - QPJ30*</td> <td>11 through 14</td> <td>Option</td> </tr> <tr> <td>Up to 4 - QPJ64*</td> <td>6 through 9</td> <td>Option</td> </tr> </tbody> </table> <p><i>Note 1:</i> Refer to Section 553-5011-202 for the required number of QPJ30- and QPJ64-type circuit packs.</p> <p><i>Note 2:</i> The dial-pulse output speed of the QPJ30-type circuit packs must be selected, see 5.13.</p> <p><i>Note 3:</i> The QPJ43 is not required with QSP7L or QSP7M power shelves.</p>	CIRCUIT PACK	CONNECTOR LOCATION	SHELF	QPJ53*	10	Option	QPJ67*	3	Trunk No. 1	QPJ43*	26 QSP6M 29 QSP6U	Option	Up to 4 - QPJ30*	11 through 14	Option	Up to 4 - QPJ64*	6 through 9	Option
CIRCUIT PACK	CONNECTOR LOCATION	SHELF																	
QPJ53*	10	Option																	
QPJ67*	3	Trunk No. 1																	
QPJ43*	26 QSP6M 29 QSP6U	Option																	
Up to 4 - QPJ30*	11 through 14	Option																	
Up to 4 - QPJ64*	6 through 9	Option																	
3	Provide the pretranslator strapping connections listed in Table G, Page 25, if applicable to the system.																		

TABLE G
DIGITONE-TO-DIAL PULSE CONVERSION – PRETRANSLATOR
DISABLE STRAPPING CONNECTIONS

Follow Instructions Given in 8.01 through 8.08 When Making Strapping Connections

REASON FOR STRAP	STRAP PINS ON TB11 (Option Shelf)	DISABLING EFFECT OF STRAP
Second digit of accessible area code is <i>not</i> '0' or '1'	36-37	Partial
Incompatible CO numbering plan.	41-42	Complete
Local CO access code from a remote PBX is <i>other than</i> 9	46-47	Partial

(2) When access is allowed to a CO with a numbering plan which does not contain seven digits, the pretranslator has to be completely disabled (strap pin 41 to 42 on TB11). Release of the conversion equipment is then by time-out or depressing the octothorpe (#) key on all types of call.

(3) When the access code to a local CO is other than '9' at a remote PBX which is connected to the PULSE 120 via a tie trunk. In this situation the pretranslator has to be partially disabled by strapping pin 46 to 47 on TB11. Release of the conversion equipment is then by time-out or depressing the octothorpe (#) key on exchange network calls through the remote PBX.

E. Outgoing Dial Speed Selection

5.13 This option allows a choice of dial pulse output speeds, 10 or 20 pulses per second (pps), from a dial pulse sender (QPJ30-type) circuit pack located on the control or fully-wired option shelf.

5.14 Insert a diode pin in position 7 on the QPJ29* (Table K, Item 3, Page 48) for each trunk that requires an output of 20 pps from the dial pulse sender. The output from sender is 10 pps without the insertion of a diode pin.

F. Toll Denial or Code Restriction Inhibit

5.15 The toll denial or code restriction class-of-service assignment to an individual station line or tie trunk is inhibited when a trunk, with this feature, is accessed by the station line or tie trunk.

5.16 Insert a diode pin in position 6 on the QPJ29* (Table K, Item 8, Page 48) for each trunk that requires the inhibit feature. In hotel/motel service all Long Distance Operator trunks must have this COS.

G. Signaling Selection

5.17 The following types of signaling may be used on PULSE 120 EPABX trunks:

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- (1) Loop or ground start signaling on CO, FX, and WATS trunks.
- (2) Loop signaling on CO (DID), Paging, Dictation, 2-wire dial repeating, and OAID tie trunks.
- (3) E&M or DX (2- and 4-wire) signaling on CCSA access lines and dial-repeating tie trunks.
- (4) Off-normal ground switching of external equipment attached to a paging trunk.

5.18 The signaling options are provided by strapping pins on the block mounted at the rear of each trunk connector (Table M, Page 50). When signaling option (1) is provided, a diode pin must also be inserted in position 5 on the QPJ29* (Table K, Item 6, Page 48) for each trunk.

H. Incoming Only Assignment

5.19 This feature denies dial access to trunks assigned for I/C calls only. An I/C trunk feature is provided by strapping pins 32 to 33 on the block mounted at the rear of the trunk connector (see Table M, Page 50).

I. Terminating Impedance Selection

5.20 This option allows the selection of a 600- or a 900-ohm nominal trunk terminating impedance. The selection is made by strapping pins on the block mounted at the rear of the trunk connector (Table M, Page 50).

J. Transmission Facility Operating Mode Selection

5.21 The CO, FX, WATS, tie trunks, and CCSA access lines have been given a class designation, either VNL (Via Net Loss) or NON-VNL.

5.22 The NON-VNL class has been further designated either

- TRANSMISSION COMPENSATED for a 2-wire trunk facility with a loss greater than 2 dB, for which impedance compensation is provided; or a 4-wire trunk facility,

or

- NON-TRANSMISSION COMPENSATED for a 2-wire trunk facility with a loss less than 2 dB, or for which impedance compensation is not provided.

Note: Music-on-hold trunks (QPJ181-type circuit packs) can be used for NON-VNL service only.

5.23 These trunk class designations assure correct EPABX control over a 2-dB switchable pad (included in the trunk circuits) when a VNL trunk is connected to other trunks or lines. This control produces the correct transmission and echo performance for a VNL trunk connection. The control of the pad by the EPABX for all trunk connections is given in Table H.

5.24 Transmission facility operating mode selection is made for each trunk by diode pin assignments on the QPJ62* (see Table L, Item 4, Page 49) and with strapping connections on the block mounted at the rear of the trunk connectors (see Table M, Page 50). Apply the following general rules when installing trunks:

- (1) If the system contains only NON-VNL trunks, strap pin 30 to 31 at the rear of each NON-VNL trunk connector unless the trunk installed in that connector is a QPJ181-type circuit pack.
- (2) If the system contains both VNL and NON-VNL trunks, for each

**TABLE H
2-dB PAD CONTROL REQUIREMENTS**

THROUGH CONNECTION			TERMINAL BALANCE			THROUGH BALANCE	
<p style="text-align: center;">TO</p> <p style="text-align: center;">FROM</p> <p>LEGEND</p> <p>IN 2-dB Pad Switched IN</p> <p>OUT 2-dB Pad Switched OUT</p> <p>S 2-dB Pad Strapped OUT</p> <p>NA Not Applicable</p>			NON-VNL		VNL		
			TIE, CO, FX, WATS, CCSA		<p style="text-align: center;">TIE FX CCSA</p> <p style="text-align: center;">4-WIRE</p>		
			<p style="text-align: center;">STATION LINES, ATTENDANT LINE/CONFERENCE, DIGITONE RECEIVER PAGING, DICTATION</p>	<p style="text-align: center;">NON-TRANSMISSION COMPENSATED (2-wire facility, loss <2 dB or not impedance compensated.)</p>		<p style="text-align: center;">TRANSMISSION COMPENSATED (2-wire facility, loss >2 dB and impedance compensated or 4-wire facility.)</p>	
<p style="text-align: center;">STATION LINES ATTENDANT LINE/CONFERENCE, DIGITONE RECEIVER, PAGING, DICTATION</p>			<p style="text-align: center;">NA</p>	<p style="text-align: center;">S</p>	<p style="text-align: center;">S</p>	<p style="text-align: center;">IN</p>	
TERMINAL BALANCE	NON-VNL	TIE, CO, FX, WATS, CCSA	<p style="text-align: center;">NON-TRANSMISSION COMPENSATED (2-wire facility, loss <2 dB or not impedance compensated.)</p>	<p style="text-align: center;">NA</p>	<p style="text-align: center;">S</p>	<p style="text-align: center;">S</p>	<p style="text-align: center;">IN</p>
			<p style="text-align: center;">TRANSMISSION COMPENSATED (2-wire facility, loss >2 dB and impedance compensated or 4-wire facility.)</p>	<p style="text-align: center;">S</p>	<p style="text-align: center;">S</p>	<p style="text-align: center;">S</p>	<p style="text-align: center;">OUT</p>
THROUGH BALANCE	VNL	<p style="text-align: center;">4-WIRE } TIE FX CCSA</p>		<p style="text-align: center;">NA</p>	<p style="text-align: center;">S</p>	<p style="text-align: center;">S</p>	<p style="text-align: center;">OUT</p>
			<p style="text-align: center;">IN</p>	<p style="text-align: center;">IN</p>	<p style="text-align: center;">OUT</p>	<p style="text-align: center;">OUT</p>	

Note: Wherever the table states OUT, if the attendant enters the connection, the 2 dB pad is switched IN.

VNL trunk

- (a) Strap pin 29 to 30 at the rear of the trunk connector.
- (b) Insert a diode pin in position 7 on the QPJ62*.

NON-VNL trunk

- (a) Strap pin 30 to 31 at the rear of the trunk connector unless the trunk installed in that connector is a QPJ181-type circuit pack.
- (b) Insert a diode pin in position 4 on the QPJ62* when impedance compensation is provided or when the trunk facility has a loss greater than 2 dB.

Note: If class designations are not given prior to the installation of a trunk they should be obtained from the local Engineering Department.

K. Signaling Range Adjustment

5.25 These options allow the correct signaling conditions to be selected. The selection depends on the facility conductor loop resistance. The options are provided by making strapping connections on the block mounted at the rear of the trunk connector (Table M, Page 50).

L. Trunk Hunting

5.26 The system automatically provides trunk hunting from the high- to the low-numbered

trunks. The trunk circuit packs do not have to be provided in consecutive connectors.

M. Power Fail Transfer

5.27 During power failure, trunks 1 through 10 are automatically connected directly to stations (2)10 through (2)19 to provide emergency service. DID trunks should not be placed in connector locations 15 through 24 unless the CO converts DID trunks to normal CO trunks when the EPABX is in the power failure mode.

N. Music-On-Hold Trunk Connections

5.28 The customer-supplied audio source is connected to the music-on-hold trunk via pins 30 and 31 on the option strapping block.

5.29 The audio source appears as a balanced signal on the option strapping block via a pair of unused signaling leads of one of the universal trunk connectors (connectors 11 to 15 in trunk shelf no. 1 and connectors 26 to 30 in trunk shelf no. 2). The high side of the source appears on pin 17 (A1/M lead) and low side appears on pin 21 (B1/E lead).

5.30 Fig. 12 shows an example of music-on-hold trunk installation with QPJ181-type circuit packs installed in connector locations 8, 9, and 15 through 23 of trunk shelf no. 1. The external audio source appears on pins 17 (high) and B21 (low) of connector location 8. No other option strapping is shown in the example.

O. Expansion of Universal Trunks Using QPJ162*

5.31 Expansion of special service trunks from 5 to 10 is now possible on *trunk shelf #2 only*, using trunk positions 26 to 30. Trunk shelf #1 still retains its original 5 universal positions. The following are conditions that apply when universal trunk expansion is employed:

- (1) No shelf changes are required.
- (2) *Only* QPJ38, QPJ81, QPJ181, QPJ76 trunks may be used.
- (3) Trunk 26 must be identical to trunk 18
Trunk 27 must be identical to trunk 19
Trunk 28 must be identical to trunk 20
Trunk 29 must be identical to trunk 21
Trunk 30 must be identical to trunk 22.
- (4) Access codes and class of service would also have to be identical. I.e., if trunk 27 was an FX trunk, then trunk 19 would also have to be an FX trunk with the same access code and class of service as trunk 27.
- (5) QPJ162A and QPJ62 vintage printed circuit packs are *not* interchangeable, i.e., if a QPJ162A is used with expanded facilities inserting a QPJ62 vintage PCP will cause series system problems.

6. ATTENDANT CONSOLE SERVICES

GENERAL

6.01 Attendant console optional features and I/C call identification lamp assignments are made available by strapping connections on strapping block TB4 mounted on the rear end of the control shelf. Trunk Group Busy (TGB) lamp assignments are made available by strapping connections on the strapping blocks mounted at the rear of the trunk connectors.

6.02 The attendant console is prewired for all configurations and only requires plugging into the connector cables for satisfactory operation.

ATTENDANT CONSOLE OPTIONS AND FEATURES

A. Incoming Call Identification

6.03 The I/C call identification feature allows the identification of up to 10 types of attendant-directed call at the console. The I/C call identification signals from the EPABX control are assigned to the console lamps by making the appropriate strapping connections on TB4 (Fig. 11, Page 44).

B. Attendant-Listed Directory Number Intercept

6.04 A station line number may be used as the last two or three digits, depending upon the numbering plan, of a 7-digit exchange network number when DID or CCSA network in-dialing is provided. Insert a diode pin in position 6 on the QPJ28* (Table J, Item 3, Page 47) for each station line number used as a Listed Directory Number (LDN).

6.05 When used as attendant LDN, the number is not available as a terminating station line but may be used as a station line with O/G call facilities only.

C. Central Office Trunk Grouping

6.06 Incoming-only or 2-way trunks may be split into two groups for display of I/C calls on the attendant console to enable the appropriate response by the operator:

- (1) CO No. 1
- (2) CO No. 2 or DID .

All I/C trunk calls are automatically routed to the first group, if the second group-option is not provided.

6.07 To assign a trunk to the second group, insert a diode pin in position 8 on the QPJ29 (Table K, Item 7, Page 48). The group is then assigned to either a CO No. 2 or DID display by strapping the following pins on TB4 (Table I, Page 31).

- CO No. 2 – Pins 27 to 32
 DID – Pins 26 – 32.

D. Attendant Conference

6.08 The attendant conference feature allows the attendant to set up conference calls. Up to five station lines or trunks may be dialed by the attendant to take part in a conference call. This feature is provided by strapping pin 28 to 33 on TB4 (see Table I, Page 31), if the control shelf is a QSP6G or QSP6G2. QSP6G3 and later-vintage control shelves have no strapping for the conference feature. Conference is provided with installation of the QPJ65. Installation of the following circuit packs is required:

- (a) Conference control QPJ65-type in connector location 5 on the control shelf;
- (b) Conference amplifier QPJ72-type and conference trunk amplifier interface QPJ71-type in connector locations 10 and 11, respectively, on trunk shelf no. 1.

Note: When a trunk is assigned to the special service access code 7 or 87 the trunk **cannot** be included in a conference call.

E. Attendant Intercept

6.09 The attendant intercept feature allows **service denied** calls to be directed to the attendant. This feature is provided by strapping pin 36 to pin 41 on TB4 (Table I, Page 31).

F. Barge-In

6.10 The barge-in feature allows the attendant to verify the busy condition of a trunk circuit. This feature is provided by strapping pin 29 to pin 34 on TB4 (Table I, Page 31).

Note: The attendant option control QPJ63-type circuit pack must be installed in connector location 10 on the control shelf.

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G. Busy Verification

6.11 The busy verification feature allows the attendant to verify the busy condition of a station line. This feature is provided by strapping pin 30 to 35 on TB4 (Table I, Page 31).

Note: The attendant option control QPJ63-type circuit pack must be installed in connector location 10 on the control shelf.

H. Camp-On

6.12 The camp-on feature allows the attendant to provide camp-on to any I/C trunk call completed by the attendant to busy stations. This feature is provided by strapping pin 50 to pin 55 on TB4 (Table I, Page 31).

Note: The camp-on control QPJ61-type circuit pack must be installed in connector location 9 on the control shelf.

I. Lockout

6.13 The lockout feature denies the attendant the ability to re-enter incoming exchange network calls to stations or on hold which were completed through the console, unless recalled by the station. This feature is provided by strapping pin 39 to pin 44 on TB4 (Table I, Page 31).

Note: The attendant option control QPJ63-type circuit pack must be installed in connector location 10 on the control shelf.

J. Secrecy

6.14 The secrecy feature allows the attendant, upon processing any incoming exchange network call or re-entering any established I/C exchange network call, to consult privately with the called party by automatically splitting the connection and holding the calling party. This feature is provided by strapping pin 49 to pin 54 on TB4 (Table I, Page 31).

Note: The attendant option control QPJ63-type circuit pack must be installed in connector location 10 on the control shelf.

K. DIGITONE or Dial Pulse Sending

6.15 The DIGITONE or dial pulse sending feature allows the attendant to dial out on trunks equipped for DIGITONE or rotary dialing. This feature is provided by installing one of the following circuit packs in connector location 7 on the control shelf:

QPJ30-type for dial pulse sending
QPJ68-type for DIGITONE sending.

Note: If the DIGITONE to dial pulse conversion feature is provided (see 5.07), the attendant may share the use of the QPJ30-type circuit packs on the option shelf with station lines instead of using a dedicated QPJ30-type circuit on the control shelf for dial pulse sending on trunks. When sharing the senders, the attendant has no priority over stations.

L. Trunk Group Busy Identification

6.16 The TGB identification feature allows identification of up to six busy trunk groups on the console. The six lamps provided on the console for identification purposes are numbered from right to left. Lamp numbers 1 through 3 are associated with trunk shelf no. 1, and lamp numbers 4 through 6 are associated with trunk shelf no. 2, but any trunk group may include trunks located on both trunk shelves when both shelves are installed. TGB lamp connections appear on each strapping block mounted at the rear of the trunk connectors as follows:

TGB LAMP	PIN NO.
1	24R
2	25R
3	26R
4	24L
5	25L
6	26L

TABLE I
ATTENDANT CONSOLE OPTIONAL FEATURES – STRAPPING CONNECTIONS

Follow Instructions Given in 9.01 through 9.06 When Installing
Strapping Connections.

FEATURE	STRAP PINS ON STRAPPING BLOCK TB4 (on control shelf)
Attendant Conference	28-33 (QSP6G and QSP6G2 only)
Attendant Intercept	36-41
Barge-In	29-34
Busy Verification	30-35
Camp-On	50-55
Lockout	39-44
Secrecy	49-54
Second CO Trunk Group Display	
CO2	27-32
or	
DID	26-32
** Loop Key Release	11-15 and 33-44
** Busy Lamp Flashing	28-45
** Provided only with QSP6G3 and later vintage control shelves (QPJ26E, QPJ49B and QPJ52B or later vintage must be used)	

A trunk is connected to the required TGB lamp by strapping pin 27 to the appropriate TGB connection pin on the trunk strapping block (see Chart 9, Step 4, Page 59).

Note 1: If access to all six TGB lamps is required on trunk shelf no. 1, the trunk buffer no. 2, a QPJ42-type circuit pack, must be installed in connector location 13 on trunk shelf no. 2.

Note 2: All six TGB lamps light when the console is connected to the EPABX. The lamps are extinguished by either assignment (Chart 9, Step 4), or strapping to ground (Chart 9, Step 5).

M. Operating Range

6.17 The attendant console may be located within 300 cable-feet of the EPABX cabinet. When the console is:

- 100 feet or less from the cabinet – use option X on TB1 located on power shelf no. 1.
- more than 100 feet from the cabinet – use option W on TB1 located on power shelf no. 1 (Chart 9, Step 3, Page 59).

**N. Night Service – Assigned
Night Answer**

6.18 When the attendant position is to be unoccupied, connections may be established to allow certain calls, normally directed to the attendant, to be answered at PULSE 120 EPABX stations. The night service is flexible, i.e., the stations designated for night service may be changed by the attendant by using the attendant console. When a night station goes off-hook, a connection is established to the central office. In any given installation, night service may be provided alone or with the trunk answer from any station (TAFAS) feature. A station line, on night service, does not have access to any internal feature of the EPABX and service restrictions (toll denial or code restriction) do not apply. This feature is provided automatically by the system.

O. Released Loop Key Feature

6.19 QSP6G3 and later-vintage control shelves have provision for dropping the calls off the loop key provided QPJ26E, QPJ49B, and QPJ52B or later-vintage boards are installed in the shelf. This feature is provided by strapping pin 33 to pin 44 and pin 11 to pin 15 (Table I, Page 31). With this feature, incoming CO or FX calls, when extended to a station by the attendant, release from the loop key, when the attendant operates the release key on the following conditions:

- the call is ringing the station or is camped on the station
- the station has answered.

If the extended call is not answered within 35 seconds, the call recalls to the attendant, if the attendant is idle; or lights the call waiting lamp, if the attendant is busy. Also if a station makes a call transfer to another station and goes on-hook and the other station fails to answer in 35 seconds, the call recalls to the attendant.

6.20 An additional feature which can be used in conjunction with this mode of operation, provided the busy lamp field is installed, is the station lamp flashing feature. To provide this feature, strap pin 28 to pin 45 (Table I, Page 31) on the QSP6G3 or later-vintage control shelf. (11 to 15 and 33-44 must also be strapped. Table I, Page 31.) This feature extinguishes all station lamps on the busy lamp field on a 'no answer' recall condition except the station that is being recalled, it flashes at 60 IPM. When the attendant operates the loop key, all busy lamp stations return, and recalled station will be steady. Also dial 0 and intercepted calls flash the station lamp on the busy lamp field at the source rate.

If a call placed by the attendant to a station is placed on hold, the station lamp winks at the hold rate of the loop key. This lamp remains lit even when a 'no answer' recall condition occurs.

Note: If any vintage earlier than a QPJ52B, or QPJ26E, or QPJ49B is used, the straps 28 to 45, 33 to 44, and 11 to 15 must be removed.

➤ 6.21 AQPJ22C impulse analyzer assembly provides two recall timers to the attendant. A switch on the unit is set in either the "long recall" or "short recall" position. The "long recall" time is 35 s (6 rings) or as described in 6.19. The "short recall" time is 23 s (4 rings). The "short recall" time applies to ringing stations only. Camp-on-recall is always 35 s.

7. STATION LINE SERVICES – SELECTION AND INSTALLATION

INFORMATION

7.01 The following information is provided before the selection and installation of station line services:

- (a) the numbering plan for the PULSE 120 EPABX,
- (b) the assignment of station line code numbers, and
- (c) the required individual and system station line options and features (Parts 2 and 3).

PREPARATIONS

7.02 Locate the installation record sheets (Section 553-5011-207) supplied with the PULSE 120 EPABX, stored on the inside face of the front panel of the cabinet.

7.03 Mark the EPABX number plan strapping installation record (Fig. 2), following the instructions given in Chart 4, Step 1, Page 52.

7.04 Complete the station line COS installation record (Fig. 3 and 4) following the instructions given in Chart 4, Steps 2 and 3, Page 52. See Section 553-5011-207 for charts converting hotel/motel dialed numbers to PULSE 120 system numbers.

7.05 Mark the station line COS system strapping on the system strapping installation record sheet (Fig. 5, Page 36) following the instructions given in Chart 4, Step 4, Page 48.

7.06 Complete the station line call pickup group assignment record (Fig. 12) following the instructions given in Step 5, Chart 4.

PROCEDURE

7.07 To provide service to the station lines:

- (a) Ensure that the COS and strapping installation records have been completed; and that all the required circuit packs have been inserted (Section 553-5011-202).
- (b) Place the EPABX numbering plan strapping connections on the strapping block TB12 at the rear end of line shelf no. 1 as shown on the number plan installation record (Fig. 2, Page 33).
- (c) Select the appropriate COS circuit pack (QPJ28-type) in its connection location on a shelf as follows:
 - for station lines (2)10 to (2)49 connector location 25 on the control shelf
 - for station lines (2)50 to (2)89 connector location 24 on the control shelf
 - for station lines 310 through 349 connector location 4 on the option shelf.
- (d) Insert diode pins in the COS blocks in the diode position marked with an "X" on the COS diode-pin installation record (Fig. 3, Page 34, and Fig. 4, Page 35).
- (e) Place the station line COS system strapping connections on the strapping block TB4 at the rear end of the control shelf as shown on the system strapping installation record (Fig. 5 or Fig. 5A, Page 38 or Page 38.1).

(f) Position the switches on the QPJ85-type circuit pack to correspond to the location of each "X" on the call pickup group assignment installation record sheet (Fig. 11). Use a plastic tool with a blunted point such as AMP P/N 435744-1 to adjust the switches. **DO NOT USE** a pencil to adjust the switches because the point may break or graphite may be deposited on the surfaces of the switches leading possibly to improper operation.

(g) Stations not assigned to a call pickup group must have their corresponding switch in the "0" position on the QPJ85-type circuit pack.

7.08 Leave the installation records with the system on completion of the installation as a record of the services provided.

8. TRUNK SERVICES – SELECTION AND INSTALLATION

INFORMATION

8.01 The following information is provided before the selection and installation of trunk services:

- (a) The assignment of external trunks, as described in 4.01 through 4.34, to trunk connector locations 1 through 15, and 16 through 30.
- (b) The required individual trunk options and features (described in 5.01 through 5.30).

PREPARATIONS

8.02 Locate the installation record sheets (Section 553-5011-207) supplied with the PULSE 120 EPABX, stored on the inside face of the cabinet front panel.

8.03 Complete the trunk COS diode installation and record sheet (Fig. 6, Page 39) following the instructions given in Chart 5, Page 55.

8.04 Complete the trunk strapping installation record sheets (Fig. 7 and 8, Pages 40 and 41) following the instructions given in Chart 6, Page 55.

8.05 Complete the code restriction field shorting-pin installation and record sheet(s) (Fig. 9, Page 42) following the instructions given in Chart 7, Page 56.

8.06 Complete the DIGITONE-to-dial pulse conversion and code restriction strapping installation and record sheet (Fig. 10, Page 43) following the instructions given in Chart 8, Page 57.

PROCEDURE

8.07 To provide trunk service:

- (a) Ensure that the COS and strapping installation records have been completed, and that all the required circuit packs have been inserted (Section 553-5011-202).
- (b) Select the appropriate COS circuit pack in its connector location on the control shelf as follows:
 - for all trunks – connector location 26
 - for miscellaneous trunks – connector location 23
- (c) Insert diode pins in the COS blocks in the diode position marked with an "X" on the trunk COS diode-pin installation record (Fig. 6, Page 39).
- (d) Place the strapping connections on the strapping blocks at the rear of each trunk connector as shown on the trunk strapping installation records (Fig. 7, Page 40 and Fig. 8, Page 41).
- (e) Insert shorting pins in CRF blocks in pin position marked with an "X" on the code restriction field shorting-pin installation record (Fig. 9, Page 42).

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(f) Place strapping connections on the strapping block at the rear end of the option shelf as shown on DIGITONE-to-dial pulse conversion and code restriction installation record (Fig. 10, Page 43).

8.08 Leave the installation records with the system on completion of the installation as a record of the trunks and services provided.

9. ATTENDANT CONSOLE SERVICES – SELECTION AND INSTALLATION

INFORMATION

9.01 The following information is provided before the selection and installation of attendant console services:

- (a) the assignment for I/C call identification lamps,
- (b) the CO trunk groupings for trunk group busy indications and the console as described in 6.06,
- (c) the assignment for TGB lamps,
- (d) the optional attendant services to be connected,
- (e) the console operating range.

PREPARATIONS

9.02 Locate the installation record sheets (Section 553-5011-207) supplied with the PULSE 120 EPABX and stored on the inside of the cabinet front panel.

9.03 Mark the attendant console strapping on the system strapping record (Fig. 5 or 5A, Page 38 or 38.1) following the instructions given in Chart 9, Steps 1 through 3, Page 58.

9.04 Complete the trunk strapping installation records (Fig. 7 and 8, Pages 40 and 41) for TBG strapping, following the instructions given in Chart 9, Steps 4 and 5, Page 59.

PROCEDURE

9.05 To provide attendant console service:

- (a) Ensure that the system strapping and trunk strapping installation records have been completed, and that the required circuit packs have been inserted (Section 553-5011-202);
- (b) Ensure that the main power switch is OFF;
- (c) Strap the pins for the attendant console services on the strapping block TB4 on the rear end of the control shelf as shown on the system installation record (Fig. 5 or 5A, Page 38 or 38.1);
- (d) Strap the pins for TGB lamp connections on the strapping blocks mounted at the rear of the trunk connectors as shown on the trunk strapping installation records (Fig. 7 and 8, Pages 40 and 41);
- (e) Select the X or W option on power shelf no. 1 for the console lamp power supply, if not previously connected. (Refer to Section 553-5011-202.)

9.06 Leave the installation records with the system on completion of the installation as a record of the services provided.

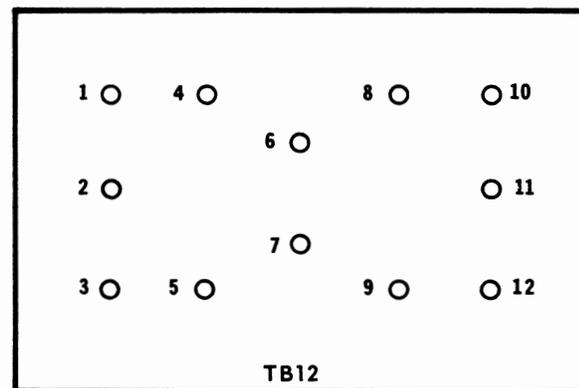


Fig. 2 – EPABX Number Plan, Strapping Installation Record

10. HOTEL/MOTEL SERVICE

10.01 The PULSE 120 EPABX can optionally be configured for hotel/motel service. When this service is present it is possible to have either seven plus (7+) or non-seven plus dialing of guest room and administrative telephones. In either case, single-digit special services are available. A five second time out is required after dialing the single-digit telephone number when 7+ dialing is not chosen.

10.02 Chart 10, Page 61 provides instructions for selecting 7+ or non-7+ dialing.

11. MESSAGE REGISTRATION FOR HOTEL/MOTEL SERVICE

11.01 Message registration is an option available with the PULSE 120 EPABX configured for hotel/motel service. This feature provides accumulation of completed local calls from guest room telephones by either:

- detection of reverse CO battery or

detection of -48V (nominal) on a third wire (message registration) lead associated with the CO trunk.

11.02 REVERSE BATTERY CO CONTROL.

This feature is part of the basic message registration feature and is automatically available when the system is equipped with the QPJ59* MESSAGE REGISTRATION CTL circuit pack.

11.03 **THIRD WIRE CONTROL.** This option requires one (for 1 to 15 CO trunks) or two (for 16 to 30 CO trunks) QPJ99* TRUNK 3RD WIRE INTFACE circuit packs in addition to the QPJ59* pack.

11.04 The choice of reverse CO battery or third wire control is determined by means of a switch on the QPJ59*. It is possible to have either one count per call or multiple counts per call. This choice is also made by means of a switch on the QPJ59*. See Chart 11, Page 57 for instructions on the settings of these two switches.

CONTROL SHELF CONNECTOR LOCATION 25 FOR LINE SHELF NO. 1 QPJ28A											CONTROL SHELF CONNECTOR LOCATION 24 FOR LINE SHELF NO. 2 QPJ28A															
	EXT	1	2	3	4	5	6	7	8	9	10		1	2	3	4	5	6	7	8	9	10	EXT			
BK 1	(2)10																						(2)50	BK 1		
	11																								51	
	12																								52	
	13																								53	
	14																								54	
	15																								55	
	16																								56	
	17																									57
	18																									58
	19																									59
BK 2	(2)20																						(2)60	BK 2		
	21																								61	
	22																								62	
	23																								63	
	24																								64	
	25																								65	
	26																								66	
	27																									67
	28																									68
	29																									69
BK 3	(2)30																						(2)70	BK 3		
	31																								71	
	32																								72	
	33																								73	
	34																								74	
	35																								75	
	36																								76	
	37																									77
	38																									78
	39																									79
BK 4	(2)40																						(2)80	BK 4		
	41																								81	
	42																								82	
	43																								83	
	44																								84	
	45																								85	
	46																								86	
	47																									87
	48																									88
	49																									89

Fig. 3 – Station Line COS Installation Record Sheet
for Lines (2)10 to (2)89

**OPTION SHELF CONNECTOR
LOCATION 4 FOR LINE SHELF NO. 3
QPJ28A**

	EXT	1	2	3	4	5	6	7	8	9	10
BK 1	310										
	11										
	12										
	13										
	14										
	15										
	16										
	17										
	18										
	19										
BK 2	320										
	21										
	22										
	23										
	24										
	25										
	26										
	27										
	28										
	29										
BK 3	330										
	31										
	32										
	33										
	34										
	35										
	36										
	37										
	38										
	39										
BK 4	340										
	41										
	42										
	43										
	44										
	45										
	46										
	47										
	48										
	49										

Fig. 4 – Station Line COS Installation Record Sheet
for Lines 310 to 349

ATT INTERCEPT L 1 <input type="radio"/>	RE CALL <input type="radio"/>	FR LINE DIAL O <input type="radio"/>	UR LINE DIAL O <input type="radio"/>	COL <input type="radio"/> 5
ICL1 6 <input type="radio"/>	ICL2 <input type="radio"/>	ICL3 <input type="radio"/>	ICL4 <input type="radio"/>	ICL5 <input type="radio"/> 10
11 <input type="radio"/>	ACCESS CODE 86 <input type="radio"/>	TKG <input type="radio"/>	ACCESS CODE 87 <input type="radio"/>	<input type="radio"/> 15
ICL6 16 <input type="radio"/>	ICL7 <input type="radio"/>	ICL8 <input type="radio"/>	ICL9 <input type="radio"/>	ICL10 <input type="radio"/> 20
ACCESS CODE 81 21 <input type="radio"/>	ACCESS CODE 82 <input type="radio"/>	ACCESS CODE 83 <input type="radio"/>	ACCESS CODE 84 <input type="radio"/>	ACCESS CODE 85 <input type="radio"/> 25
DID 26 <input type="radio"/>	CO2 <input type="radio"/>	CONF <input type="radio"/>	BARGE IN <input type="radio"/>	BSY VER <input type="radio"/> 30
DIGITONE 31 <input type="radio"/>	TKG <input type="radio"/>	CONF K <input type="radio"/>	BARGE IN K <input type="radio"/>	BSY VER K <input type="radio"/> 35
ATT INT ENABLE 36 <input type="radio"/>	DS BAT <input type="radio"/>	RGBK ENABLE <input type="radio"/>	LOCKOUT ENABLE <input type="radio"/>	RESTRICT CTR TIE <input type="radio"/> 40
GRD 41 <input type="radio"/>	GRD <input type="radio"/>	GRD <input type="radio"/>	GRD <input type="radio"/>	GRD <input type="radio"/> 45
GND 46 <input type="radio"/>	GRD <input type="radio"/>	GRD <input type="radio"/>	GRD <input type="radio"/>	GRD <input type="radio"/> 50
TAFAS ENABLE 51 <input type="radio"/>	IC CTR ONLY <input type="radio"/>	OVERRIDE ENABLE <input type="radio"/>	SECRECY ENABLE <input type="radio"/>	CAMP ON ENABLE <input type="radio"/> 55

TB4

CONSOLE OPERATING RANGE	PROVIDED (✓)	CONNECTION ON TERMINAL STRIP (POWER SHELF NO.1)
0 - 100 FT.		X
100 - 300 FT.		W

TB4 STRAPPING BLOCK FOR QSP6G AND QSP6G2 CONTROL SHELVES ONLY.

Fig. 5 - System Strapping Installation Record Sheet

ATT INTERCEPT L 1 <input type="radio"/>	RE CALL <input type="radio"/>	FR LINE DIAL 0 <input type="radio"/>	UR LINE DIAL 0 <input type="radio"/>	COL <input type="radio"/> 5
ICL1 6 <input type="radio"/>	ICL2 <input type="radio"/>	ICL3 <input type="radio"/>	ICL4 <input type="radio"/>	ICL5 <input type="radio"/> 10
LOOP RLS F 11 <input type="radio"/>	ACCESS CODE 86 <input type="radio"/>	TKG <input type="radio"/>	ACCESS CODE 87 <input type="radio"/>	LOOP RLS F <input type="radio"/> 15
ICL6 16 <input type="radio"/>	ICL7 <input type="radio"/>	ICL8 <input type="radio"/>	ICL9 <input type="radio"/>	ICL10 <input type="radio"/> 20
ACCESS CODE 81 21 <input type="radio"/>	ACCESS CODE 82 <input type="radio"/>	ACCESS CODE 83 <input type="radio"/>	ACCESS CODE 84 <input type="radio"/>	ACCESS CODE 85 <input type="radio"/> 25
DID 26 <input type="radio"/>	CO2 <input type="radio"/>	LAMP FLASHING <input type="radio"/>	BARGE IN <input type="radio"/>	BSY VER <input type="radio"/> 30
DIGITONE 31 <input type="radio"/>	TKG <input type="radio"/>	LOOP RELEASE <input type="radio"/>	BARGE IN K <input type="radio"/>	BSY VER K <input type="radio"/> 35
ATT INT ENABLE 36 <input type="radio"/>	DS BAT <input type="radio"/>	RGBK ENABLE <input type="radio"/>	LOCKOUT ENABLE <input type="radio"/>	RESTRICT CTR TIE <input type="radio"/> 40
GRD 41 <input type="radio"/>	GRD <input type="radio"/>	GRD <input type="radio"/>	GRD <input type="radio"/>	GRD <input type="radio"/> 45
GND 46 <input type="radio"/>	GRD <input type="radio"/>	GRD <input type="radio"/>	GRD <input type="radio"/>	GRD <input type="radio"/> 50
TAFAS ENABLE 51 <input type="radio"/>	IC CTR ONLY <input type="radio"/>	OVERRIDE ENABLE <input type="radio"/>	SECRECY ENABLE <input type="radio"/>	CAMP ON ENABLE <input type="radio"/> 55
TB4				

CONSOLE OPERATING RANGE	PROVIDED (✓)	CONNECTION ON TERMINAL STRIP (POWER SHELF NO.1)
0 – 100 FT.		X
100 – 300 FT.		W

TB4 STRAPPING BLOCK FOR QSP6G3 AND LATER VINTAGE CONTROL SHELVES.

Fig. 5A – System Strapping Installation Record Sheet

CIRCUIT NUMBER																		
CONNECTOR & TB NOS.	24	23	22	21	20	19	18	17	16	15		9	8	7	6	5		
TRUNK NO.	25	24	23	22	21	20	19	18	17	16		30	29	28	27	26		
STRAPPING PIN DESIGNATION	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R		
1		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	1
2		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	2
3		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	3
4		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	4
5		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	5
6		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	6
7		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	7
8		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	8
9		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	9
10		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	10
11		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	11
12		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	12
13		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	13
14		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	14
15		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	15
16		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	16
17		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	17
18		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	18
19		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	19
20		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	20
21		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	21
22		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	22
23		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	23
24		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	24
25		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	25
26		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	26
27		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	27
28		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	28
29		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	29
30		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	30
31		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	31
32		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	32
33		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	33
34		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	34

Fig. 8 – Trunk Shelf No. 2 Strapping Installation Record Sheet

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	1ST DIGIT										2ND DIGIT										3RD DIGIT									
	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
<u>TOLL ACCESS</u> <u>DIGIT ABSORPTION</u> FOR CO OR FX TRUNK GROUP	1										NOT USED WHEN PROGRAMMING FOR DIGIT ABSORPTION																			
	2																													
	3																													
	4																													
<u>ALLOWED AREA</u> <u>& SERVICE CODES</u> FOR CO OR FX TRUNK GROUP	1																													
	2																													
	3																													
	4																													
	5																													
	6																													
	7																													
	8																													
<u>ALLOWED OR DENIED</u> <u>EXCHANGE CODES</u> FOR CO OR FX TRUNK GROUP	1																													
	2																													
	3																													
	4																													
<u>ALLOWED OR DENIED</u> <u>EXCHANGE CODES</u> FOR CO TRUNK GROUP ONLY	1																													
	2																													
	3																													
	4																													
	5																													
	6																													
	7																													
	8																													
	9																													
	10																													
	11																													
	12																													
	13																													
	14																													
	15																													
	16																													
17																														
18																														
19																														
20																														
21																														
22																														
23																														
24																														

Fig. 9 – Code Restriction Field Shorting-Pin Installation and Record Sheet. (Four Sheets, one for Each Circuit Pack in Connector Locations 17, 19, 21, and 23 Only if the QPJ85* is Not Installed in Location 24)

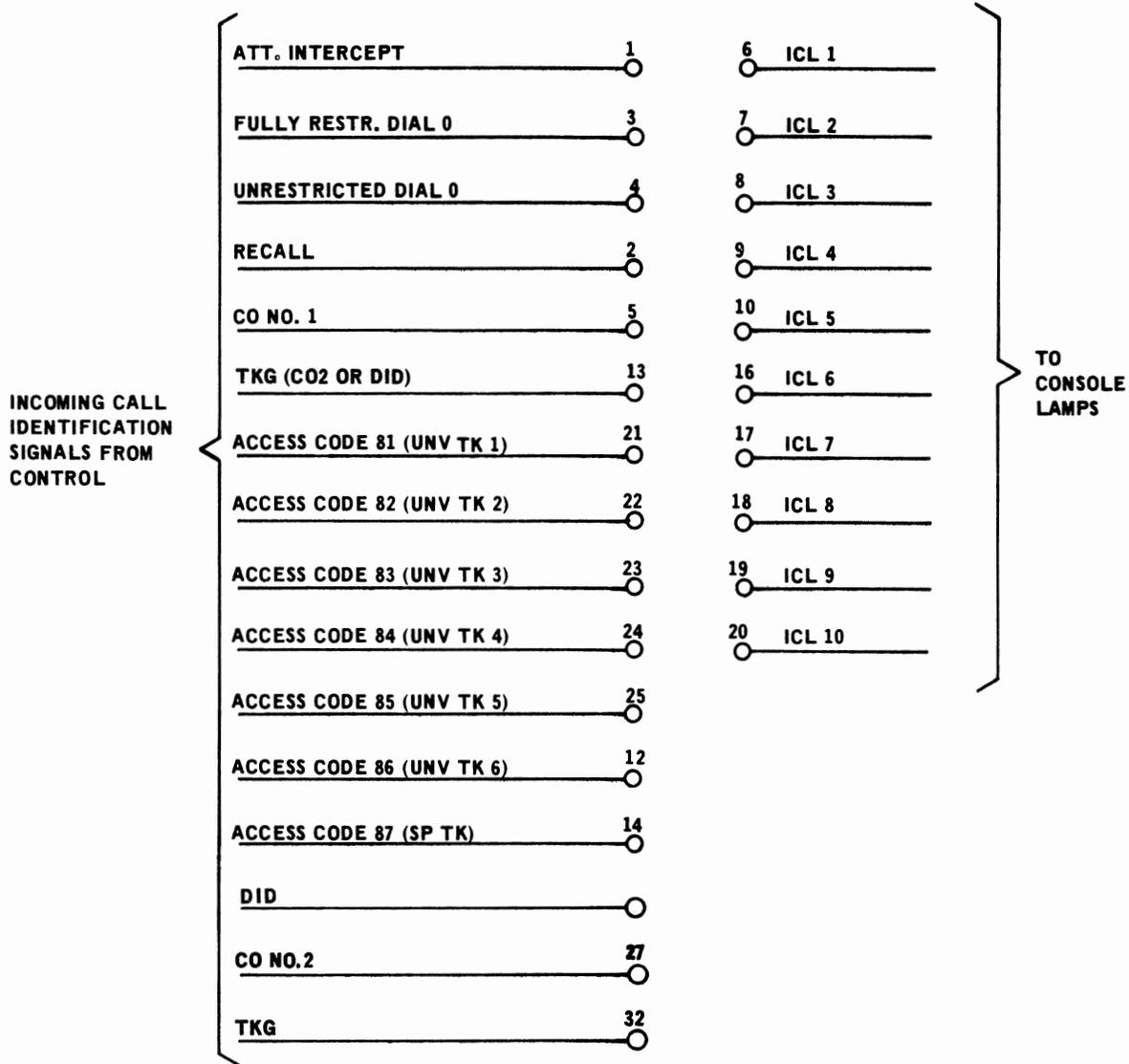
SECTION 553-5011-204

CIRCUIT NUMBER																						
CONNECTOR & TB NOS.	24	23	22	21	20	19	18	17	16	15							9	8	7	6	5	
TRUNK NO.	10	9	8	7	6	5	4	3	2	1							15	14	13	12	11	
STRAPPING PIN DESIGNATION	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R						
1		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					1
2		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					2
3		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					3
4		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					4
5		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					5
6		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					6
7		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					7
8		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					8
9		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					9
10		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					10
11		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					11
12		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					12
13		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					13
14		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					14
15		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					15
16		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					16
17		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					17
18		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					18
19		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					19
20		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					20
21		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					21
22		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					22
23		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					23
24		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					24
25		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					25
26		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					26
27		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					27
28		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					28
29		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					29
30		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					30
31		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					31
32		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					32
33		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					33
34		o	o	o	o	o	o	o	o	o		o	o	o	o	o	o					34

Fig. 7 – Trunk Shelf No. 1 Strapping Installation Record Sheet

	SEL		EN	FX
GND	CARD 2		CARD 2	81
1 ○	○	○	○	○ 5
	SEL		EN	FX
GND	CARD 3		CARD 3	82
6 ○	○	○	○	○ 10
	SEL		EN	FX
GND	CARD 4		CARD 4	83
11 ○	○	○	○	○ 15
	ALLOW			FX
GND	C.O.			84
16 ○	○	○	○	○ 20
	ALLOW			FX
GND	FX CARD 2			85
21 ○	○	○	○	○ 25
	ALLOW			FX
GND	FX CARD 3			86
26 ○	○	○	○	○ 30
	ALLOW			FX
GND	FX CARD 4			87
31 ○	○	○	○	○ 35
	DISABLE			
GND	PRETRAN(1)			
36 ○	○	○	○	○ 40
	DISABLE			
GND	PRETRAN(2)			
41 ○	○	○	○	○ 45
	DISABLE			
GND	PRETRAN(3)			
46 ○	○	○	○	○ 50
51 ○	○	○	○	○ 55
TB11				

Fig. 10 – DIGITONE-to-Dial Pulse Conversion and Code Restriction Strapping Installation and Record Sheet (TB11, Option Shelf)



Note: Pin 26 or 27 is strapped to Pin 32 when assigning TKG (Pin 13) to an ICL.

Fig. 11 — I/C Call Identification Signals and Lamps — Pin Designations on TB4 Strapping Block (Control Shelf)

CIRCUIT NUMBER																		
CONNECTOR & TB NOS.	24	23	22	21	20	19	18	17	16	15			9	8	7	6	5	
TRUNK NO.	10	9	8	7	6	5	4	3	2	1			15	14	13	12	11	
STRAPPING PIN DESIGNATION																		
	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R		
1	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	1
2	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	2
3	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	3
4	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	4
5	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	5
6	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	6
7	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	7
8	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	8
9	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	9
10	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	10
11	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	11
12	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	12
13	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	13
14	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	14
15	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	15
16	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	16
17	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	17
18	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	18
19	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	19
20	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	20
21	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	21
22	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	22
23	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	23
24	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	24
25	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	25
26	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	26
27	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	27
28	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	28
29	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	29
30	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	30
31	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	31
32	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	32
33	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	33
34	o	o	o	o	o	o	o	o	o	o		o	o	o	o	o	o	34

Fig. 12 – Music-On-Hold Trunk (QPJ181-type circuit pack) Installation

SECTION 553-5011-204

SW	EXT	GROUP								
		1	2	3	4	5	6	7	8	9
1	210									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									
	19									
2	220	X								
	21	X								
	22	X								
	23	X								
	24	X								
	25	X								
	26	X								
	27	X								
	28									
	29									
3	230									
	31									
	32									
	33									
	34									
	35									
	36									
	37									
	38									
	39									
4	240									
	41									
	42									
	43									
	44									
	45									
	46									
	47									
	48									
	49									
5	250									
	51									
	52									
	53									
	54									
	55									
	56									
	57									
	58									
	59									
6	260									
	61									
	62									
	63									
	64									
	65									
	66									
	67									
	68									
	69									
7	270									
	71									
	72									
	73									
	74									
	75									
	76									
	77									
	78									
	79									
8	280									
	81									
	82									
	83									
	84									
	85									
	86									
	87									
	88									
	89									
9	310									
	11									
	12									
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	18									
	19									
10	320									
	21									
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	25									
	26									
	27									
	28									
	29									
11	330									
	31									
	32									
	33									
	34									
	35									
	36									
	37									
	38									
	39									
12	340									
	41									
	42									
	43									
	44									
	45									
	46									
	47									
	48									
	49									

NOTE: + SW REFERS TO SWITCHES ON THE QPJ85* CIRCUIT PACK LOCATED IN CONNECTOR 24 OF THE QSP6U OPTION SHELF.

Fig. 13 – Station Line Call Pickup Group Assignment Installation on Record Sheet

TABLE J
COS DIODE PIN ASSIGNMENT FOR INDIVIDUAL STATION LINE SERVICES ON QPJ28*

Follow Instructions Given in 7.01 through 7.07 When Installing Diode Pins

OPTIONS AND FEATURES		DIODE POSITIONS									
ITEM	DESCRIPTION	1	2	3	4	5	6	7	8	9	10
1	EXCHANGE NETWORK RESTRICTIONS (CO/FX/WATS/CCSA CONNECTIONS) Unrestricted Semirestricted Fully Restricted Toll-Denial and Code Restriction	0 X X 0	0 0 X X								
2	SPECIAL SERVICE RESTRICTIONS Access to Miscellaneous Trunk Codes Allowed Denied Access to Code 7 or 87 Allowed Denied					0 X					
3	ASSIGNMENT OF ACCESS CODES Station Line Number 80 to 89 (or 280, 288, 289) Assigned As Access Code. Station Line Number Assigned as LDN and Attendant Intercept						0 X	X 0			
4	HUNTING No Group Hunting Group 1 Group 2 Group 3			0 0 X X	0 X 0 X						
5	WARNING TONE APPLICATION Allowed Denied								0 X		
6	EXECUTIVE OVERRIDE Denied Allowed									0 X	
7	DIALING Pulse DIGITONE (See 3.36)										0 X
<p>Legend: X—diode pin inserted, 0—no diode pin.</p> <p>* Not required when QPJ54C 120 line control assembly is provided.</p>											

TABLE K
COS DIODE PIN ASSIGNMENT FOR INDIVIDUAL TRUNKS ON QPJ29
 Follow Instructions Given in 8.01 to 8.08 When Installing Diode Pins

OPTIONS AND FEATURES		DIODE POSITIONS									
ITEM	DESCRIPTION	1	2	3	4	5	6	7	8	9	10
1	TRUNK TYPE CO CO (DID) FX or WATS Other (tie, CCSA, paging, dictation)			0 X 0 X	0 0 X X						
2	TIE TRUNK EXCHANGE NETWORK RESTRICTIONS (CO/FX/WATS/CCSA CONNECTION) Unrestricted Semirestricted Fully Restricted Toll-Denial or Code Restriction	0 X X 0	0 0 X X								
3	DIALING I/C Pulse Dialing I/C DIGITONE Dialing										0 X
4	DIALING SPEED 10 pps 20 pps							0 X			
5	DIGITONE-TO-DIAL PULSE CONVERSION Required Not Required									X 0	
6	CO, FX, OR WATS SIGNALING Loop Start Ground Start					X 0					
7	CO TRUNK GROUPS CO 1 CO 2 or DID Indication								0 X		
8	TOLL-DENIAL OR CODE RESTRICTION INHIBIT Required Not Required						X 0				
Legend: X—diode pin inserted, 0—no diode pin.											

TABLE L
COS DIODE PIN ASSIGNMENT FOR INDIVIDUAL TRUNKS ON QPJ62

Follow Instructions Given in 8.01 to 8.08 When Installing Diode Pins

OPTIONS AND FEATURES		DIODE POSITIONS									
ITEM	DESCRIPTION	1	2	3	4	5	6	7	8	9	10
1	TRUNK TYPE CCSA Tie Senderized Tie Paging or Dictation	0 X X 0	X 0 X 0	0 0 0 X							
2	TIE TRUNK SPECIAL SERVICE RESTRICTIONS Access to Miscellaneous Trunk Codes Allowed Denied Access to Code 7 or 87 Allowed Denied						0 X				
3	TRUNK ACCESS CODE ASSIGNMENT 1 or 81 82 83 4 or 84 5 or 85 6 or 86 7 or 87								X 0 X 0 X 0 X	0 X X 0 0 X X	0 0 0 X X X X
4	2 DB PAD CONTROL VNL NON-VNL NON-VNL TRANSMISSION COMPENSATED NON-VNL NON-TRANSMISSION COMPENSATED				X 0				X 0		
Legend: X—diode pin inserted, 0—no diode pin.											

TABLE M INDIVIDUAL TRUNK OPTIONS AND FEATURES – STRAPPING CONNECTIONS

Follow Instructions Given in 8.01 to 8.08 When Making Strapping Connections

TRUNK TYPE	TRUNK VINTAGE AND TYPE	STRAPPING CONNECTIONS															
		SIGNALING							I/C ONLY OR MAKE BUSY	TERMINATING IMPEDANCE		TRANSMISSION FACILITY OPERATING MODE		SIGNALING RANGE ADJUSTMENT FOR LOOP RESISTANCE			
		LOOP START	GROUND START	E&M	DX	0 OR + VDC RINGING	LOOP	SWITCHED GROUND		600Ω	900Ω	VNL 2 DB PAD SWITCHED	NON VNL 2 DB PAD STRAPPED OUT	>500Ω	>750Ω	>2500Ω	
CO (NON DID) 2 WIRE FX AND WATS	QPJ38A OR QPJ81A	13-20§	14-22			18-31§			32-33	2-3	1-2						
	[QPJ38B TO D QPJ81B TO G QPJ181A +] § [QPJ38E QPJ81H QPJ181B +] #	14-18# 15-16§, #	15-22§ 19-20§, #			14-18#			32-33	5-6	4-5	29-30+	30-31+			7-8 δ	
2 WIRE TIE OR CCSA ACCESS LINE 2 WAY DIAL REPEATING	QPJ69*			12-19 16-17 21-22	7-8 9-10 12-20 16-19								30-31				8-18') 10-22')
4 WIRE TIE OR CCSA ACCESS LINE 2 WAY DIAL REPEATING	QPJ69*			12-19 16-17 21-22	8-17 10-21 12-20 16-19							29-30	30-31				8-18') 10-22')
2 WIRE TIE 2 WAY DIAL	QPJ76*							15-22 19-20							7-9 8-10		
DID OR 2 WIRE TIE O/G AUTOMATIC I/C DIAL REPEATING	QPJ76*							13-20 14-22 14-22							7-9 8-10		
PAGING	QPJ75*							1-2 4-5	16-17 ‡								
DICTION	QPJ73*							1-2 4-5									

+ Applies on QPJ81* only, audio for QPJ181* music connects to pin 30 and 31
 ‡ Applies to QPJ75B only (for switching music and paging)
 § Minimum strapping required for QPJ38* B' to "D", QPJ81*B – "OG" and QPJ181A when ringing is super imposed on zero or positive D.C pins 14-18 A = N = Strapped and pins 18-31 are strapped applies on QPJ38D, QPJ81 "D" to "G" and QPJ181A only
 # Minimum strapping required for QPJ38E, QPJ81H, and QPJ181E When ringing is super imposed on zero or positive D.C for ground start trunks strap pins 14-18.
 δ Does not apply on QPJ38A and QPJ81A

If distant end is relay-type DX tie trunk and 8- 18 and 10-22 strapping is not made (loop resistance <2500Ω) add 2500Ω to the standard 1250Ω on relay trunk balancing resistance If far end is another pulse and loop resistance is <2500Ω 8-18 and 10-22 must be strapped in one of the machines if loop resistance is >2500 8-18 and 10-22 must be strapped in both machines

TABLE N
CONDITIONS UNDER WHICH AN EXTERNFL AUDIO SOURCE
CAN BE APPLIED TO THE TIP AND RING OF A MUSIC-ON-HOLD TRUNK
(QPJ181-TYPE CIRCUIT PACK)

CONDITIONS	AUDIO SOURCE CONNECTED TO TIP AND RING
Trunk placed on hold by attendant	Yes
EXCL SRC key operated or system wired for secrecy	Yes
While the attendant is extending* the call to a station which is busy but not talking	Yes
While the attendant is extending* the call to a station which is busy (talking) on a system <i>without</i> the camp-on feature	Yes
While the attendant is extending* the call to a station which is busy (talking) on a system with the camp-on feature and there is not a call already camped-on to that station	Not until attendant operates the release key
Trunk placed on consultation hold by station flashing and using call transfer individual feature	Yes
* Extending means after dialing the destination number but before operating the RLS key.	

**CHART 4 – STATION LINE AND SYSTEM INSTALLATION AND RECORD SHEETS
(FIG. 2 to 5, and 13) PREPARATION**

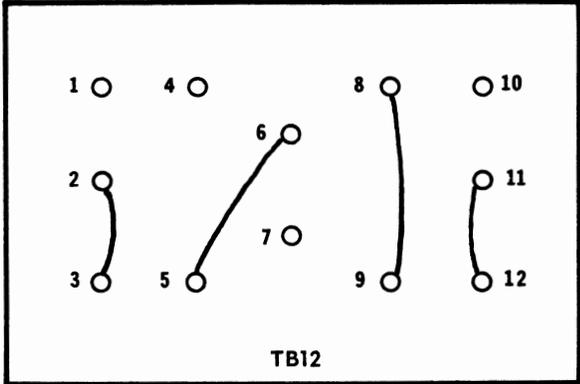
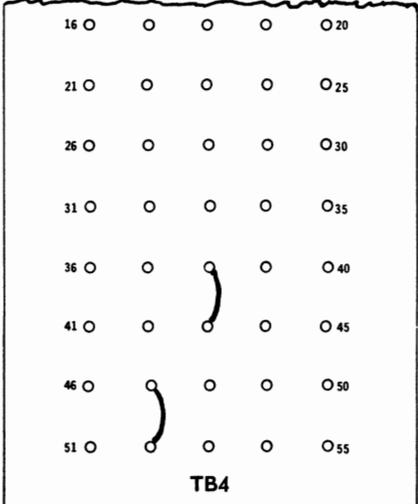
STEP	PROCEDURE	EXAMPLE																																																																																																			
1	<p>NUMBER PLAN STRAPPING</p> <p>For a 2- or 3-digit numbering plan:</p> <p>(a) Refer to Table B (page 7) and determine the strapping connections necessary for the required numbering plan.</p> <p>(b) Mark each strap on the number plan strapping record. (Example shows the strapping required for a 3-digit numbering plan).</p>	 <p style="text-align: center;">TB12</p>																																																																																																			
2	<p>COS DIODE PIN ASSIGNMENT</p> <p>For each station line:</p> <p>Refer to Table J (page 47) and determine the diode pins necessary to provide the required services.</p>	<p style="text-align: center;">TABLE J COS DIODE PIN ASSIGNMENT FOR INDIVIDUAL STATION</p> <p style="text-align: center;">Follow Instructions Given in 7.01 to 7.07 When In</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">OPTIONS AND FEATURES</th> <th colspan="3"></th> </tr> <tr> <th style="text-align: center;">ITEM</th> <th style="text-align: center;">DESCRIPTION</th> <th style="text-align: center;">1</th> <th style="text-align: center;">2</th> <th style="text-align: center;">3</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>EXCHANGE NETWORK RESTRICTIONS (CO/FX/WATS/CCSA CONNECTIONS)</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>Unrestricted</td> <td style="text-align: center;">O</td> <td style="text-align: center;">O</td> <td></td> </tr> <tr> <td></td> <td>Semirestricted</td> <td style="text-align: center;">X</td> <td style="text-align: center;">O</td> <td></td> </tr> <tr> <td></td> <td>Fully Restricted</td> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> <td></td> </tr> <tr> <td></td> <td>Toll-Denial and Code Restriction</td> <td style="text-align: center;">O</td> <td style="text-align: center;">X</td> <td></td> </tr> <tr> <td style="text-align: center;">2</td> <td>SPECIAL SERVICE RESTRICTIONS</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>Access to Miscellaneous Trunk Codes</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>Allowed</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>Denied</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>Access to Code 7 or 87</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>Allowed</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	OPTIONS AND FEATURES					ITEM	DESCRIPTION	1	2	3	1	EXCHANGE NETWORK RESTRICTIONS (CO/FX/WATS/CCSA CONNECTIONS)					Unrestricted	O	O			Semirestricted	X	O			Fully Restricted	X	X			Toll-Denial and Code Restriction	O	X		2	SPECIAL SERVICE RESTRICTIONS					Access to Miscellaneous Trunk Codes					Allowed					Denied					Access to Code 7 or 87					Allowed																																					
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3	<p>Mark each diode-pin requirement with an "X" in the appropriate column of the COS installation record. (Example shows station lines (EXT) 310, 311, and 312 have toll-denial service.)</p>	<p style="text-align: center;">OPTION SHELF CONNECTOR LOCATION 4 FOR LINE SHELF NO. 3 QPJ28A</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">EXT</th> <th style="text-align: center;">1</th> <th style="text-align: center;">2</th> <th style="text-align: center;">3</th> <th style="text-align: center;">4</th> <th style="text-align: center;">5</th> <th style="text-align: center;">6</th> <th style="text-align: center;">7</th> <th style="text-align: center;">8</th> <th style="text-align: center;">9</th> <th style="text-align: center;">10</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">310</td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">11</td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">12</td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">13</td> <td></td> </tr> <tr> <td style="text-align: center;">14</td> <td></td> </tr> <tr> <td style="text-align: center;">15</td> <td></td> </tr> <tr> <td style="text-align: center;">16</td> <td></td> </tr> <tr> <td style="text-align: center;">17</td> <td></td> </tr> </tbody> </table> <p style="text-align: left; margin-left: 20px;">BK 1</p>	EXT	1	2	3	4	5	6	7	8	9	10	310		X									11		X									12		X									13											14											15											16											17										
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CHART 4 (Cont) – STATION LINE AND SYSTEM INSTALLATION AND RECORD SHEETS (FIG. 2 TO 5) PREPARATION

STEP	PROCEDURE	EXAMPLE																																																																																																																																			
4	<p>FEATURE STRAPPING</p> <p>For each system feature:</p> <p>(a) Refer to Table E (page 16) and determine the strapping connections necessary to provide the required features.</p> <p>(b) Mark each strap on the system strapping installation record. (Example shows call transfer-individual on I/C trunks only, and executive ringback features.)</p>																																																																																																																																				
5	<p>CALL PICKUP GROUP ASSIGNMENT</p> <p>For each station line:</p> <p>(a) Determine to which call pickup group the station is to be assigned.</p> <p>(b) Mark an "X" in the appropriate column of the call pickup group assignment installation record.</p> <p>(The example shows station lines (EXT) 210, 212, and 213 in pickup group 3).</p> <p><i>Note:</i> No more than 30 stations can be assigned to any single call pickup group.</p> <p>Stations not assigned to a call pickup group must have their corresponding switch in the "0" position on the QPJ85-type circuit pack,</p>	<table border="1" data-bbox="1008 993 1446 1438"> <thead> <tr> <th rowspan="2">SW</th> <th rowspan="2">EXT</th> <th colspan="9">GROUP</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> </tr> </thead> <tbody> <tr> <td rowspan="10">1</td> <td>210</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>11</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>12</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>13</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>14</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>15</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>16</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>17</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>18</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>19</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>220</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	SW	EXT	GROUP									1	2	3	4	5	6	7	8	9	1	210			X							11										12			X							13			X							14										15										16										17										18										19											220								
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**CHART 5 – TRUNK COS DIODE PIN INSTALLATION AND RECORD SHEET
(FIG. 6) PREPARATION**

STEP	PROCEDURE	EXAMPLE																																																																																																																					
1	<p>Write the trunk circuit number against its assigned connector location on the COS record sheet, if not previously noted as instructed in Section 553-5011-202.</p>	<table border="1"> <thead> <tr> <th rowspan="3"></th> <th rowspan="3">TK NO</th> <th rowspan="3">CONN LOC</th> <th rowspan="3">TRUNK CIRCUIT NUMBER</th> <th rowspan="3">R 0 W</th> <th colspan="6">QPJ29 CONTROL SHELF LOCATION</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> </tr> </thead> <tbody> <tr> <td>30</td> <td>9</td> <td>AAA BBBB</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>29</td> <td>8</td> <td>XXX YYYY</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>28</td> <td>7</td> <td></td> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>27</td> <td>6</td> <td></td> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>26</td> <td>5</td> <td></td> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>25</td> <td>24</td> <td></td> <td>6</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		TK NO	CONN LOC	TRUNK CIRCUIT NUMBER	R 0 W	QPJ29 CONTROL SHELF LOCATION						1	2	3	4	5	6	30	9	AAA BBBB	1							29	8	XXX YYYY	2							28	7		3							27	6		4							26	5		5							25	24		6																																														
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2	<p>For each trunk:</p> <p>(a) refer to Table K. (Page 48) to determine the diode pins necessary for the required options.</p> <p>(b) mark each diode-pin requirement with an "X" in the appropriate column of the QPJ29 section of the record chart. (Example shows that trunk no. 29 is semirestricted).</p>	<table border="1"> <thead> <tr> <th rowspan="3"></th> <th rowspan="3">TK NO</th> <th rowspan="3">CONN LOC</th> <th rowspan="3">TRUNK CIRCUIT NUMBER</th> <th rowspan="3">R 0 W</th> <th colspan="6">QPJ29 CONTROL SHELF LOCATION</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> </tr> </thead> <tbody> <tr> <td>30</td> <td>9</td> <td>AAA BBBB</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>29</td> <td>8</td> <td>XXX YYYY</td> <td>2</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>28</td> <td>7</td> <td></td> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>27</td> <td>6</td> <td></td> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>26</td> <td>5</td> <td></td> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>25</td> <td>24</td> <td></td> <td>6</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>24</td> <td>23</td> <td></td> <td>7</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>23</td> <td>22</td> <td></td> <td>8</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>22</td> <td>21</td> <td></td> <td>9</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>21</td> <td>20</td> <td></td> <td>10</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		TK NO	CONN LOC	TRUNK CIRCUIT NUMBER	R 0 W	QPJ29 CONTROL SHELF LOCATION						1	2	3	4	5	6	30	9	AAA BBBB	1							29	8	XXX YYYY	2	X						28	7		3							27	6		4							26	5		5							25	24		6							24	23		7							23	22		8							22	21		9							21	20		10						
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3	<p>For each miscellaneous trunk (trunk numbers 11 through 15 and 26 through 30):</p> <p>(a) refer to Table L (Page 49) to determine the diode pins necessary for the required options.</p> <p>(b) mark each diode-pin requirement with an "X" in the appropriate column of the QPJ62 section of the record chart. (Example shows that semirestricted trunk no. 29 is a tie trunk).</p>	<table border="1"> <thead> <tr> <th rowspan="3">CONNECTOR</th> <th rowspan="3">R 0 W</th> <th colspan="10">QPJ62 CONTROL SHELF CONNECTOR LOCATION 23</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> </tr> </thead> <tbody> <tr> <td>8</td> <td>9</td> <td>10</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>1</td> <td></td> </tr> <tr> <td></td> <td>2</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>3</td> <td></td> </tr> <tr> <td></td> <td>4</td> <td></td> </tr> <tr> <td></td> <td>5</td> <td></td> </tr> </tbody> </table>	CONNECTOR	R 0 W	QPJ62 CONTROL SHELF CONNECTOR LOCATION 23										1	2	3	4	5	6	7	8	9	10	8	9	10											1												2	X											3												4												5																																	
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**CHART 6 – TRUNK AND SYSTEM STRAPPING INSTALLATION RECORD SHEETS
(FIG. 7 AND 8) PREPARATION**

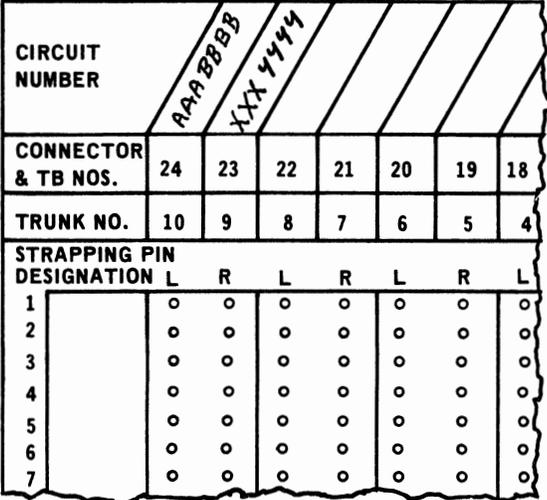
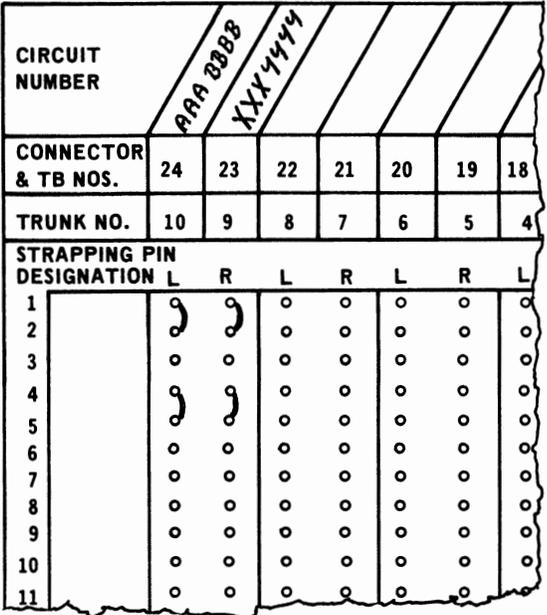
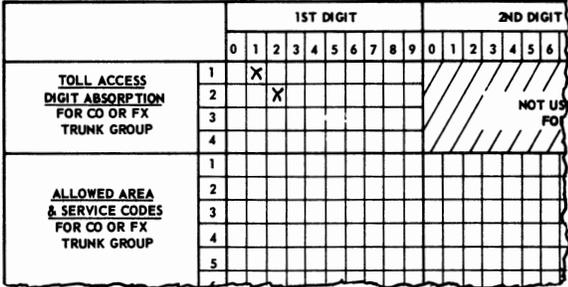
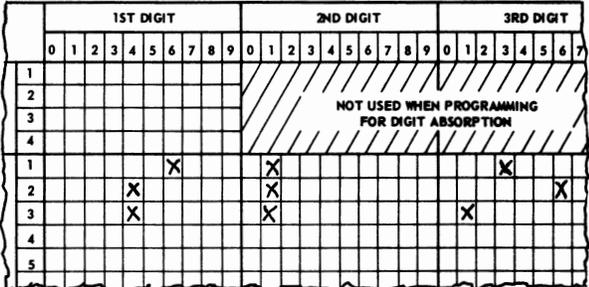
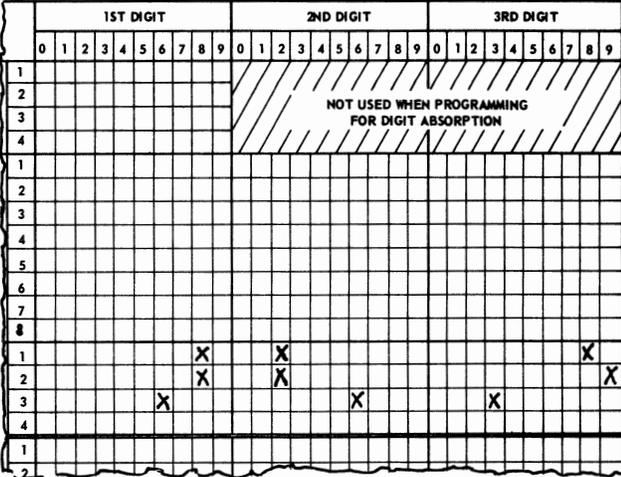
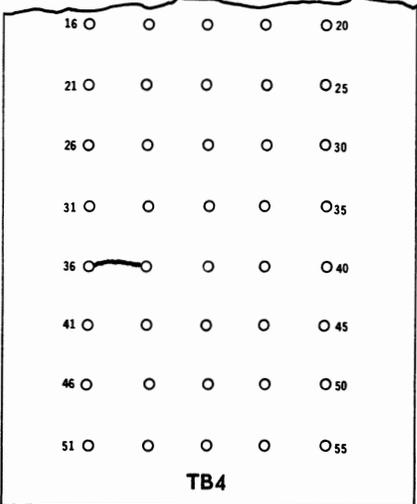
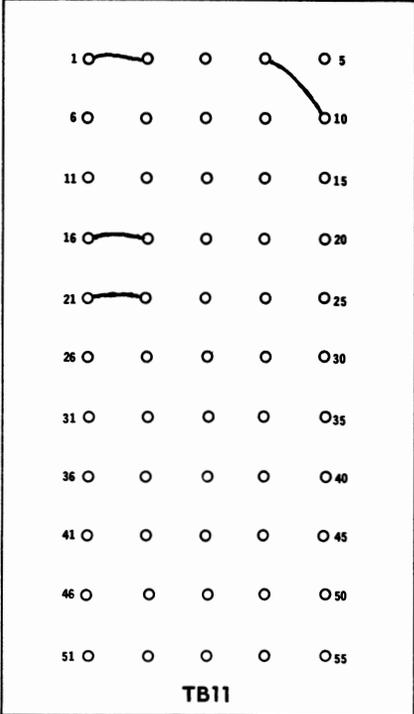
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2	<p>For each trunk:</p> <p>(a) refer to Table M (Page 50) to determine the strapping connections necessary for the required options and features.</p> <p>(b) mark the required strapping connections on the trunk strapping installation records (Fig. 7 and 8). The example shows partial strapping required for trunk no. 10 and 9 for CO trunks with 900-Ω termination).</p>	 <table border="1" data-bbox="964 1018 1511 1633"> <thead> <tr> <th colspan="2">CIRCUIT NUMBER</th> <th colspan="7"><i>AAA BBBB</i></th> </tr> <tr> <th colspan="2"></th> <th colspan="7"><i>XXX YYY Y</i></th> </tr> <tr> <th>CONNECTOR & TB NOS.</th> <td>24</td> <td>23</td> <td>22</td> <td>21</td> <td>20</td> <td>19</td> <td>18</td> </tr> <tr> <th>TRUNK NO.</th> <td>10</td> <td>9</td> <td>8</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> </tr> <tr> <th colspan="2">STRAPPING PIN DESIGNATION</th> <th>L</th> <th>R</th> <th>L</th> <th>R</th> <th>L</th> <th>R</th> <th>L</th> </tr> </thead> <tbody> <tr><td>1</td><td></td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td></tr> <tr><td>2</td><td></td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td></tr> <tr><td>3</td><td></td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td></tr> <tr><td>4</td><td></td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td></tr> <tr><td>5</td><td></td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td></tr> <tr><td>6</td><td></td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td></tr> <tr><td>7</td><td></td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td></tr> <tr><td>8</td><td></td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td></tr> <tr><td>9</td><td></td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td></tr> <tr><td>10</td><td></td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td></tr> <tr><td>11</td><td></td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td><td>o</td></tr> </tbody> </table>	CIRCUIT NUMBER		<i>AAA BBBB</i>									<i>XXX YYY Y</i>							CONNECTOR & TB NOS.	24	23	22	21	20	19	18	TRUNK NO.	10	9	8	7	6	5	4	STRAPPING PIN DESIGNATION		L	R	L	R	L	R	L	1		o	o	o	o	o	o	o	2		o	o	o	o	o	o	o	3		o	o	o	o	o	o	o	4		o	o	o	o	o	o	o	5		o	o	o	o	o	o	o	6		o	o	o	o	o	o	o	7		o	o	o	o	o	o	o	8		o	o	o	o	o	o	o	9		o	o	o	o	o	o	o	10		o	o	o	o	o	o	o	11		o	o	o	o	o	o	o
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CHART 7 – CODE RESTRICTION FIELD SHORTING-PIN INSTALLATION AND RECORD SHEET (FIG. 9) PREPARATION

STEP	PROCEDURE	EXAMPLE
<p>DIGIT ABSORPTION</p> <p>1</p>	<p>For each absorbed toll access digit mark each shorting-pin requirement with an “X” in the appropriate 1st digit column. (The example shows digit 1 and 2 absorbed.)</p>	 <p>The grid shows two sections: 'TOLL ACCESS DIGIT ABSORPTION FOR CO OR FX TRUNK GROUP' and 'ALLOWED AREA & SERVICE CODES FOR CO OR FX TRUNK GROUP'. Both sections have columns for 1st and 2nd digits (0-9) and rows 1-5. In the toll access section, 'X' marks are present in the 1st digit column for rows 1 and 2. The 2nd digit column for rows 1 and 2 is shaded and labeled 'NOT USED FOR...'. The allowed area section is currently empty.</p>
<p>ALLOWED AREA AND SERVICE CODES</p> <p>2</p>	<p>For each allowed code mark each shorting-pin requirement with an “X” in the appropriate 1st, 2nd and 3rd digit column. (The example shows allowed 613 and 416 area codes and 411 directory assistance service codes).</p>	 <p>The grid has columns for 1st, 2nd, and 3rd digits (0-9) and rows 1-5. A shaded area at the top is labeled 'NOT USED WHEN PROGRAMMING FOR DIGIT ABSORPTION'. 'X' marks are placed at (1st, 2nd, 3rd) = (6, 1, 3), (4, 1, 6), and (4, 1, 1).</p>
<p>ALLOWED OR DENIED EXCHANGE CODES</p> <p>3</p>	<p>For each allowed or denied codes (see also Chart 8, Step 2) mark each shorting-pin requirement in the appropriate 1st, 2nd, and 3rd digit column. (Example shows allowed 828, 829 and 663 exchange codes).</p>	 <p>The grid has columns for 1st, 2nd, and 3rd digits (0-9) and rows 1-8. A shaded area at the top is labeled 'NOT USED WHEN PROGRAMMING FOR DIGIT ABSORPTION'. 'X' marks are placed at (1st, 2nd, 3rd) = (8, 2, 8), (8, 2, 9), and (6, 6, 3).</p>

**CHART 8 – DIGITONE-TO-DIAL PULSE CONVERSION AND CODE
RESTRICTION STRAPPING INSTALLATION AND RECORD
RECORD SHEET (FIG. 10) PREPARATION**

STEP	PROCEDURE	EXAMPLE
1	<p>DIGITONE TO DIAL PULSE CONVERSION</p> <p>For each trunk provided with the DIGITONE-to-dial pulse conversion feature:</p> <p>(a) refer to Table G (Page 25) to determine if strapping connections are necessary to disable the pretranslator.</p> <p>(b) Mark the required strapping connections on the record sheet (Fig. 10, Page 43) (The example shows strapping required when area codes do not contain '0' or '1' as a second digit.)</p>	 <p align="center">TB4</p>
2	<p>CODE RESTRICTION</p> <p>For each code restriction field circuit pack installed in connector locations 17, 19, 21, and 23 on the option shelf:</p> <p>(a) refer to Table D (Page 12) to determine the strapping connections necessary for assignment of:</p> <ul style="list-style-type: none"> connectors to FX trunk group access codes and activate CRF. exchange code field to allow. (see also Chart 7, Step 3). <p>(b) mark the required strapping connections on the record sheet (Fig. 10, Page 43). (The example shows exchange code field on the CO code restriction circuit pack installed in connector location 17 strapped for allow, and the circuit pack in connector location 19 strapped to serve an FX trunk group with access code 83 and the exchange code field for allow.)</p>	 <p align="center">TB11</p>

**CHART 9 – SYSTEM AND TRUNK INSTALLATION RECORD SHEETS
(FIG. 5, 7, AND 8) (ATTENDANT CONSOLE PART) PREPARATION**

STEP	PROCEDURE	EXAMPLE
1	<p>(a) Refer to Fig. 11, Page 44 for pin connections to the 13 available I/C call identification signals and the 10 I/C identification lamps (ICL1-10).</p> <p>(b) Mark the required strapping connections on the system strapping installation record (Fig. 5 or 5A, Page 38 or 38.1). (Example shows unrestricted Dial "0" to ICL3 and CO 1 to ICL5.)</p>	<p style="text-align: center;">INCOMING CALL IDENTIFICATION SIGNALS FROM CONTROL</p>
2	<p>For each optional attendant feature:</p> <p>(a) Refer to Table I (Page 31) and determine the strapping connections necessary to provide the required features.</p> <p>(b) Mark each strap on the system strapping installation record (Fig. 5 or 5A, Page 38 or 38.1). (Example shows straps for attendant intercept and camp-on features.)</p>	<p style="text-align: center;">TB4</p>

**CHART 9 (Cont) – SYSTEM AND TRUNK INSTALLATION RECORD SHEETS
(FIG. 5, 7, AND 8)(ATTENDANT CONSOLE PART) PREPARATION**

STEP	PROCEDURE	EXAMPLE														
3	Enter the appropriate console operating range by a check mark in the "Provided" column of the record (Fig. 5 or 5A, Page 38 or 38.1).	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">CONSOLE OPERATING RANGE</th> <th style="width: 33%;">PROVIDED (✓)</th> <th style="width: 33%;">CONNECTION ON TERMINAL STRIP (POWER SHELF NO. 1)</th> </tr> </thead> <tbody> <tr> <td>0 – 100 FT.</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">X</td> </tr> <tr> <td>100 – 300 FT.</td> <td></td> <td style="text-align: center;">W</td> </tr> </tbody> </table>	CONSOLE OPERATING RANGE	PROVIDED (✓)	CONNECTION ON TERMINAL STRIP (POWER SHELF NO. 1)	0 – 100 FT.	✓	X	100 – 300 FT.		W					
CONSOLE OPERATING RANGE	PROVIDED (✓)	CONNECTION ON TERMINAL STRIP (POWER SHELF NO. 1)														
0 – 100 FT.	✓	X														
100 – 300 FT.		W														
4	<p>For each trunk in a TGB group, mark a strap on the trunk strapping installation records (Fig. 7 and 8 (Pages 40 and 41) from pin 27 to the appropriate pin for the required TGB lamp as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th style="width: 50%;">TGB LAMP</th> <th style="width: 50%;">STRAP PIN 27 TO</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">1</td><td style="text-align: center;">24 R</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">25 R</td></tr> <tr><td style="text-align: center;">3</td><td style="text-align: center;">26 R</td></tr> <tr><td style="text-align: center;">4</td><td style="text-align: center;">24 L</td></tr> <tr><td style="text-align: center;">5</td><td style="text-align: center;">25 L</td></tr> <tr><td style="text-align: center;">6</td><td style="text-align: center;">26 L</td></tr> </tbody> </table> <p>(Example shows trunks no. 10 and 5 on TGB lamp 6, and trunks no. 9, 8, and 7 on TGB lamp 5.)</p>	TGB LAMP	STRAP PIN 27 TO	1	24 R	2	25 R	3	26 R	4	24 L	5	25 L	6	26 L	
TGB LAMP	STRAP PIN 27 TO															
1	24 R															
2	25 R															
3	26 R															
4	24 L															
5	25 L															
6	26 L															

CHART 10 – HOTEL/MOTEL SERVICE – 7+ OR NON 7+ DIALING	
<p>Circuit packs required – QPJ95-Type QPJ10-, 11-, 12- or 13-Type (two required) (see note)</p>	
STEP	PROCEDURE
1	<p>Set switch S1 on the QPJ95-type circuit pack to either the 7 plus position or the non-7 plus position as required.</p> <p>Set switch S2 on the QPJ95B circuit pack (if provided) to either 8 sec delay or not 8 sec delay as required (See Table A (b) note 5).</p>
2	<p>Install the QPJ95-type circuit pack in connector location 12 on the Hotel/Motel Option Shelf QSP6R.</p>
3	<p>Install one QPJ10-, 11-, 12-, or 13-type circuit pack in each of connectors 13 and 14 on the Hotel/Motel Option Shelf QSP6R.</p>
<i>Note:</i>	<p>QPJ10-type circuit packs are used when a special numbering plan has been selected. QPJ11-type packs give standard numbering plan A. QPJ12-type packs give standard plan B, while QPJ13-type packs give standard plan C. See Table A(b), Page 5, for a description of the numbering plans.</p> <p>If QPJ10-type circuit packs are used, the dialed number to system number correlation charts in Section 553-5011-207 must be filled out by the installer. The QPJ-number and any designation numbers or letters on the QPJ10-type circuit pack should be noted in Section 553-5011-207.</p>

**CHART 11 – MESSAGE REGISTRATION VIA REVERSE CO BATTERY OR
THIRD WIRE**

**Circuit packs required: QPJ59-Type
QPJ99-Type (one or two required with third wire trunk control)
QPJ83B or later vintage (one, two, or three required)**

STEP	PROCEDURE
1	Set switch S1 on the QPJ59-type circuit pack to either the REVERSE BATTERY or the 3RD WIRE position as determined by the type of message registration control provided at the central office (CO).
2	Set switch S2 on the QPJ59-type circuit pack to either the SINGLE PULSE or the REPETITIVE position as determined by the type of message registration control provided at the central office (CO).
3	Install the QPJ59-type circuit pack in connector location 9 on the Hotel/Motel Option Shelf QSP6R.
4	When trunk 3rd wire control is used for message registration, install a QPJ99-type circuit pack in Connector 10 of the QSP6R option shelf for trunks 1 to 15. Install a second QPJ99-type circuit pack in connector 11 of the QSP6R option shelf for trunks 16 to 30.