DIGITAL CARRIER TRUNK FRAME IMPLEMENTATION GUIDELINES 1/1A "ESS*" SWITCHES

CONTENTS PAGE

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1. GENERAL

1.01 This section helps clarify the planning of Digital Carrier Trunk (DCT) frame installations. It covers several areas of concern when implementing the DCT frame. The areas covered are: planning, toll facilities, trunk administration, central offices, work units, maintenance responsibility, and training availability.

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

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

1.04 The DCT feature, with proper planning, realizes significant reductions in equipment, floor space, wiring, engineering, and installation. The DCT replaces the need for universal trunk features and D-banks (Fig. 1).

1.05 The DCT frame provides an interconnection between the 1/1A ESS machine network and the digital transmission lines. This interconnection is accomplished by a microprocessor controlled interface for signaling and receiving status reports. Digits are received, converted to digital data, and a channel unit is selected for outplusing. There may be up to 20 digroups in one DCT frame. Each digroup may have 24 channels for a total of 480 channels per DCT (refer to Section 231-037-021).

2. NETWORK PLANNING/INTEROFFICE FACILITIES ENGINEERING RESPONSIBILITIES

2.01 The DCT frame may be used with a new ESS switch installation, with ESS switch growth, with a new terminating office using the direct interface frame (4ESS switch). The DCT frame may also be used when additional carrier facilities are required and when main distributing frame and cable relief dictate the need.

2.02 When a DCT frame is planned for installation, consideration of the need for new carrier spans or the reuse of existing spans **must** be made at the time of planning.

2.03 The installation of new carrier spans must be completed prior to DCT acceptance testing.

2.04 Growth trunks must be placed on new DCT systems to a level that will not exceed the amount of spare trunk equipment at the far end terminal.

2.05 When using existing carrier spans for DCT, and bank modernization is planned, the spare T-lines must be used to build new T-systems to terminate on the DCT to the extent possible with compatible far end D-banks and trunk circuits.

2.06 When the reuse of existing T-carrier facilities is planned, carrier facility grooming must be done **prior** to the DCT installation start date to minimize work operations at the time of cutover. Requests for grooming must be made to the Circuit Provisioning Center no less than 56 weeks prior to the planned cutover date for DCT. This will give sufficient time for grooming trunk orders to be completed prior to DCT assignment orders.

2.07 Grooming T-carrier facilities involves the moving of existing trunks from a system (24 channels) to leave only message trunks to be used for the involved DCT. Special services or other office traffic must be removed (Fig. 2).

2.08 Existing systems in a route, undergoing DCT conversion, must be groomed. Compatible D-banks (D1D, D2, D3, or D4) at far end terminals are required. The number of additional DCT systems needed to handle the quantity of existing trunks and growth in each route must be determined.

2.09 In the course of DCT job planning, the Network Planning/Interoffice Facility District must forward facility routing plans to the central office district manager. The facility routing plans will give the central office supervisor the data to begin the scheduling of work requirements.

3. CIRCUIT PROVISIONING CENTER RESPONSIBILITIES

3.01 When T-carrier facility grooming is needed, the Interoffice Facilities Current Planner will notify the Circuit Provisioning Center to issue orders for this work. Grooming orders must be issued no less than 40 weeks in advance of the planned DCT cut date.

3.02 The Circuit Provisioning Center will also issue orders to insure that compatible D-banks (D1D, D2, D3, or D4) are assigned to the far end terminal of the planned DCT facility. These orders must be issued no less than 40 weeks in advance of the planned DCT cut date. When grooming is required, D-bank changes must be complete before grooming starts.

3.03 The Interoffice Facility Current Planner will identify to the Circuit Provisioning Center, the carrier systems that will be assigned to DCT.

3.04 The Circuit Provisioning Center must provide copies of the T-carrier facility record for each system assigned per the terminal bay record. This information must be forwarded to the Trunk Administrator for the involved office no less than 20 weeks prior to the planned DCT cut date.

3.05 Approximately 40 weeks prior to the service date of the Telephone Company Equipment Order (TEO), the Facility Current Planner will prepare the T-CXR DCT Terminal Bay Record and send it to the Circuit Provisioning Center.

3.06 The DCT Terminal Bay Record will show the T-system number and terminating office location for each DCT digroup.

3.07 The Circuit Provisioning Center upon receipt of the DCT Terminal Bay Record will contact the equipment engineer for the DCT trunk frame number that will be assigned by Western Electric.

3.08 Trunk order preparation will normally begin approximately 20 weeks prior to the planned DCT cut date when the TCXR DCT Terminal Bay Record and copies of the T-carrier facility records are

received from the Circuit Provisioning Center. At this time T-carrier D-bank change and grooming orders, which were issued at the 40-week interval, should have been completed under the control of the Circuit Provisioning Center.

3.09 The DCT trunk group administration requires the establishment of the Trunk Group Supplementary Record 1216.

3.10 A given trunk group (if necessary) may have some members assigned to UT/MUT frames and the balance assigned to the DCT frame. Trunk group assignment to the DCT frame must be distributed so that all members are not on the same digroup. Multiple DCT frame installations digroups of different frames should be utilized.

3.11 With this information, the Circuit Provisioning Center will prepare the appropriate forms as follows:

Form 1212	Mechanized TNN Input
Form 1214	TRUST Record
Form 1202	Trunk Group Record
Form 1212B	Trunk Group Equipment Assignment Record
Form 1200	Universal Trunk Frame Record
Form 1224	Digital Trunk Frame Record

3.12 Form updates should be done as follows:

(a) New Office: Thirty weeks prior to service, when the translation group is preparing finals, is the last chance for trunk equipment correction.

(b) Existing Office: The TRUST Records can be changed with the next normal office record update.

3.13 A manual conversion to the Digital Trunk Frame Assignment Record (ESS Form 1224) must be made for all offices to facilitate the conversion of DCT.

4. LOCAL NETWORK ADMINISTRATION RESPONSIBILITIES

4.01 Cutovers to DCT will involve turning down unusual numbers of trunks in order to perform precutover testing and the actual cutover to the new system.

4.02 The local network administrator must determine the maximum number of trunks that can be turned down on each involved route for periods of scheduled precut testing and during the times of cutover. This information shall be provided to the cutover coordinator prior to the preparation of pretest and cutover procedures (paragraph 5.10).

4.03 The local network administrator must monitor office and trunk group loads to insure that call blockage is not being caused by excessive trunk turn down during precutover testing and during the actual cutover.

5. CENTRAL OFFICE MAINTENANCE FORCE RESPONSIBILITIES

5.01 The ESS switch central office must have the 1E6 or 1AE6 or later generic program with the peripheral unit parity feature to provide DCT (Section 231-090-152).

5.02 Several items must be addressed to provide a smooth transition to DCT. These items are: type of ESS switch cut (new or growth), type of facilities (new or reuse), quantity of trunks (spare, new trunk link network reuse), and routing. The interoffice facilities current plan has considered each of these when planning DCT and can be contacted for information.

5.03 With newly installed ESS switch central offices there is a need to consider the facilities to be used. With new facilities, the availability of incoming circuits at the far end offices must be considered in determining precut testing and cutover procedures (Fig. 3, Step 1 existing).

5.04 With reused facilities from the old office, carrier grooming must be done **prior** to working any cutover trunk orders. ***Carrier grooming must be scheduled to complete prior to the DCT installation start date to minimize work activity in preparing cutover orders.***

5.05 When an existing ESS switch central office has growth activity to prepare for an office replacement, the same facility considerations apply as with a new replacement.

5.06 In a growth situation (Fig. 4), redistribution of junctors and trunks must be completed

prior to performing trunk connections to the DCT (Fig. 4, Step 2).

5.07 Large growth jobs involving multiple network additions will require that junctor redistribution be done in stages covering more than one weekend. The need to perform junctor redistribution over more than one weekend must be identified early in the planning stage of the growth work. The responsible equipment engineer can make appropriate arrangements with Western Electric to accommodate these needs (refer to Section 231-019-101).

5.08 After all required redistribution is complete, connections then may be made to the DCT frame (Fig. 4, Step 3). If the trunks are to be cutover from the universal trunk frame, transfer a minimum number to prevent network blockages on working trunk groups. Figure 4, Step 4 represents an office utilizing DCT and universal trunk, which will normally be the case when growth is concerned.

5.09 Detailed planning to develop a method for cutting each trunk group must be completed before cross connections to DCT equipment is started. These plans must include:

(a) The method of cutting the digital systems cross connect from the D-bank(s) to DCT, ie, patch cord rearrangement or cutover device. Refer to the following:

- Figure 3, Step 2 (precutover) involves, (1) by pass existing cross connect on DSX using patch cord, (2) remove old cross connections, and (3) run new cross connections from existing facilities to DCT on DSX panel.

- Figure 3, Step 3 (cutover) involves, (1) remove patch cord at the time of cutover, (2) remove old cross connects after cutover.

(b) The method(s) for moving trunk network number connections from universal trunk to DCT equipment, ie, swing jumpers or use cutover device on trunk distributing frame (see Fig. 4, Step 3).

(c) The number of trunks that can be removed from service and converted at any one point in time must be determined. These figures must be supplied by the local network administrator working in conjunction with the trunk administrator(s) of the involved offices.

5.10 The cutover coordinator must develop and publish detailed schedules for both precutover testing and the actual cutover procedures. These procedures must include the work steps to be taken at the originating end, intermediate points, and the termination end. Also a detailed work schedule for each function to assure coordinated work efforts should be prepared.

6. SPECIAL CONSIDERATIONS FOR LARGE CUTOVERS INVOLVING MAJOR GROWTH AND DIGITAL CARRIER TRUNK ADDITIONS

6.01 When an office has a major growth job to accommodate a large central office replacement cutover and will turn up DCT with that cutover, work operations must be planned to include the following events in the indicated sequence.

(a) The T-carrier grooming must be completed before growing the new networks into the ESS switch (Fig. 2).

(b) Grow the new networks into the system and redistribute universal trunks across all networks (Fig. 5, Step 2). This may require several stages spread over more than one weekend.

(c) Grow the DCT into the system.

(d) Install trunk link network to DCT cross connections per trunk orders and perform precutover testing (Fig. 5, Step 3). At this time, trunks will be cross connected from the existing office and reused trunks from the old office.

(e) Insure that the detailed trunk cutover procedures (paragraph 5.10) are prepared. The actions necessary to cut over existing ESS office trunks and the reused old office trunks in a manner that will not create blockage for customers in either office should also be included.

7. MAINTENANCE RESPONSIBILITIES

7.01 Maintenance of the DCT and its associated equipment, up to the DSX bay, is the responsibility of the ESS switch Switching Control Center when maintenance of the toll equipment is assigned to another force.

7.02 When maintenance of the toll equipment is also assigned to the ESS switch force, mainte-

nance of the DCT frame and facility is the responsibility of the ESS switch Switching Control Center.

7.03 The operational plan for local and/or remote T-carrier system alarm monitoring which interfaces with the Facilities Maintenance Administration Center (FMAC) will be used at DCT locations.

8. PERSONNEL REQUIREMENTS

8.01 The following figures are used in developing personnel requirements (for budget purposes) for the necessary DCT cross-connections and facility grooming for DCT conversion:

- One half-hour per trunk for the universal trunks/DCT change.
- Fourteen hours per carrier system to be groomed.

Note: These figures have been derived from historical information for similar work functions.

8.02 Trunk quantities for DCT conversion may be obtained from the interoffice facilities/toll switching project engineer.

9. TEST EQUIPMENT

9.01 All DCT central offices will receive a complete set of DCT maintenance equipment with the initial installation. No central office activity is necessary to obtain the test equipment as the local equipment engineer is responsible for its provision.

10. TRAINING

10.01 Self-paced courses are available at the Bell Operating Company Training Centers.

- Peripheral Unit Controller (PUC) - Course TTC 518
- Digital Carrier Trunk (DCT) - Course TTC 518A.

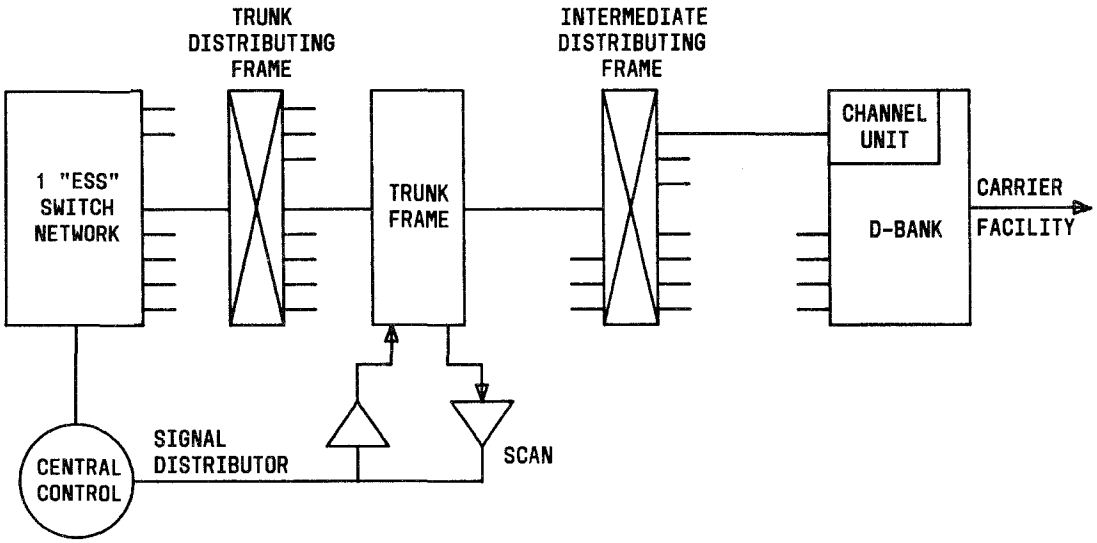
11. REFERENCES

11.01 Refer to the letter SL:IL 82-07-151, Interoffice Facilities/Equipment Planning — Provisioning of Digital Carrier Trunks (DCT)

11.02 Complete detail information on DCT operation and testing may be found in the following documents:

SECTION	TITLE
231-037-021	Digital Carrier Trunk Frame Description
231-050-015	TOP-DCT Testing
231-090-152	Digital Carrier Trunk (DCT) Feature.
231-037-020	PUC - Description and Maintenance Considerations
231-045-410	DCT - Software Subsystem Description
231-049-101	DCT - Maintenance Considerations
231-115-501	Office Alarms
231-130-320	Manual Trunk Test Position
231-180-321	TLTP, STTP, ATF-MO
801-505-156	DCT Equipment Design

CENTRAL OFFICE USING THE UNIVERSAL TRUNK FRAME



CENTRAL OFFICE USING THE DIGITAL CARRIER TRUNK FRAME

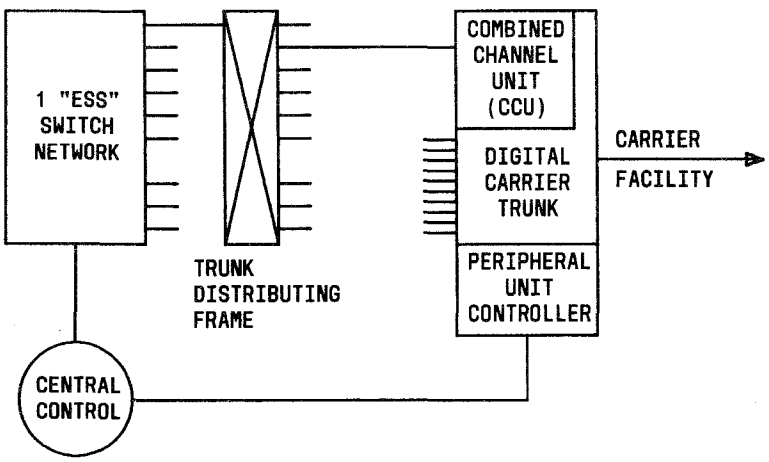
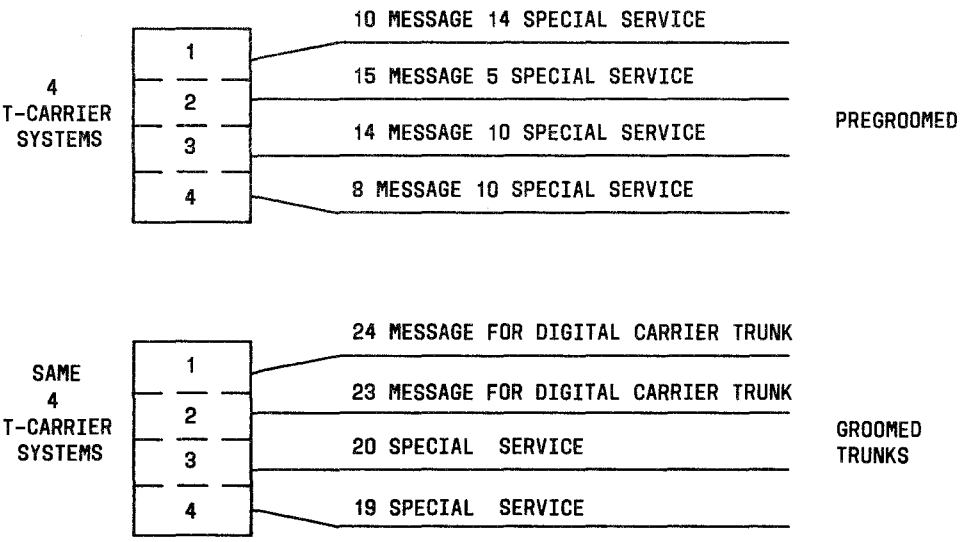


Fig. 1—Comparison of Universal Trunk Versus Digital Carrier Trunk Installation



NOTE:
FACILITY GROOMING IS THE MOVING OF SPECIAL SERVICE TRUNKS FROM A T-CARRIER SYSTEM THAT IS TO BE USED FOR DIGITAL CARRIER MESSAGE TRUNKS.

Fig. 2—Facility Grooming (2.07, 6.01)

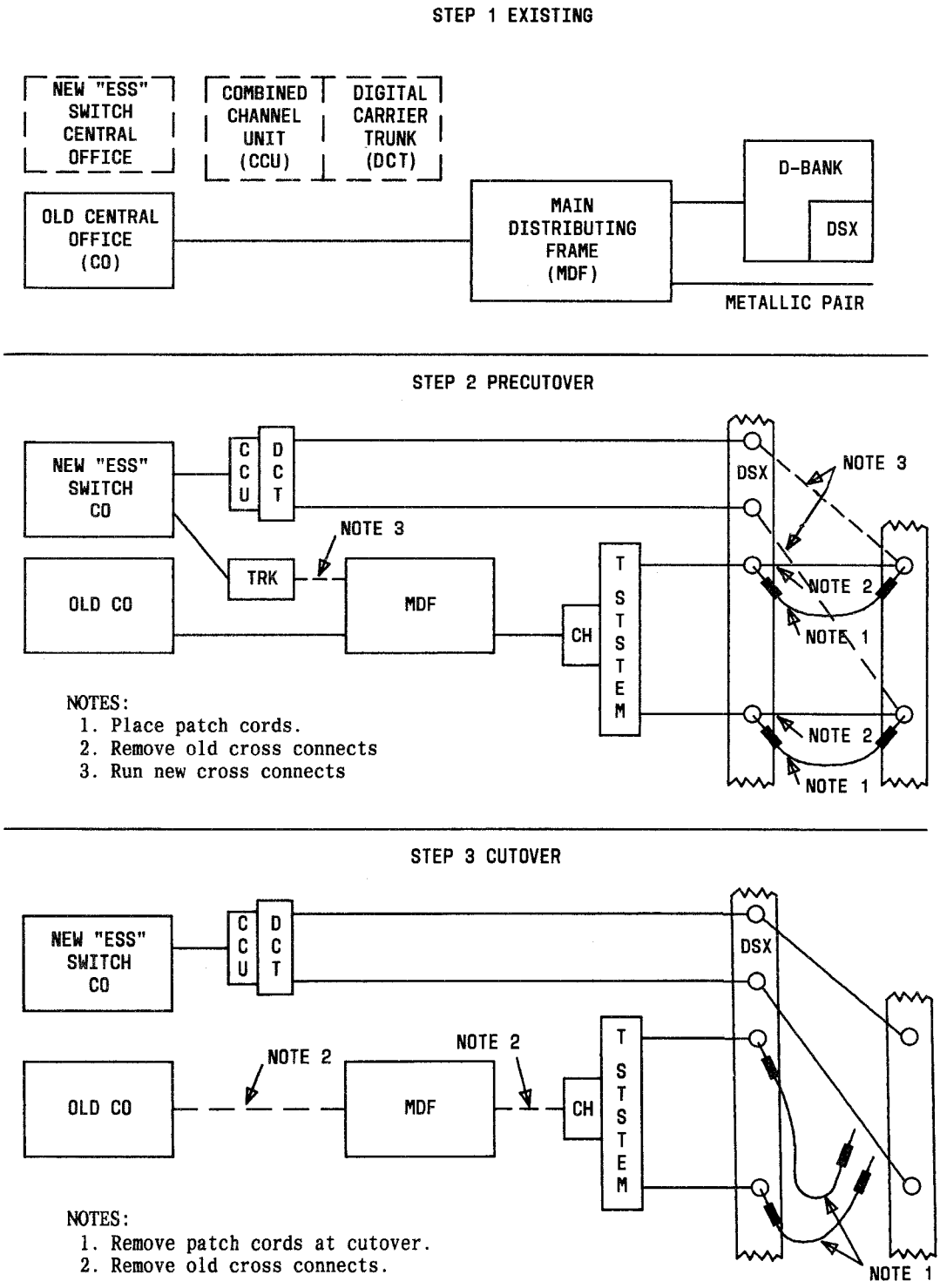


Fig. 3—New ESS Switch Central Office With DCT Replacing Existing Central Office (5.03, 5.09)

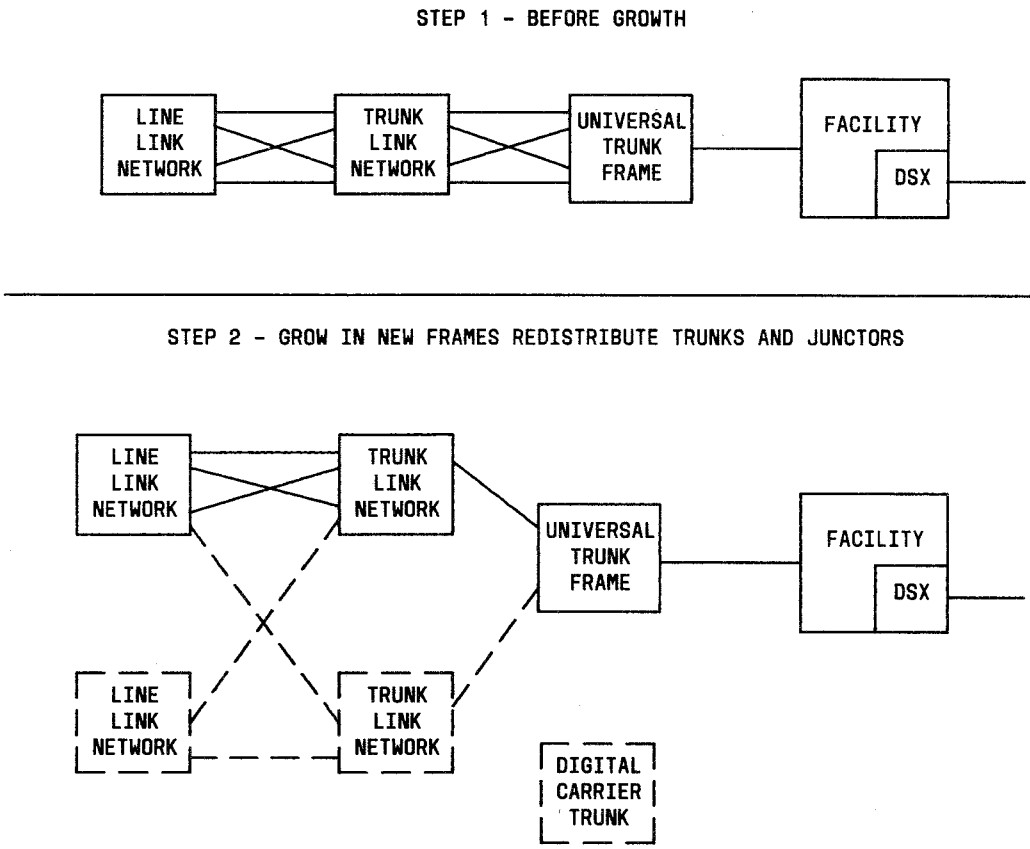
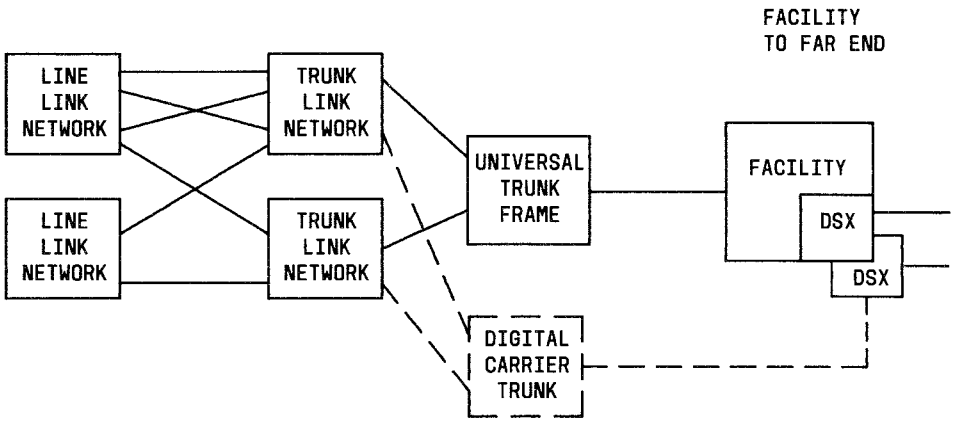


Fig. 4—Central Office Growth With DCT Addition (Sheet 1 of 2) (5.06, 5.08)

STEP 3 - PREPARING CROSS CONNECTIONS PRE-TEST ALL TRUNKS



STEP 4 - COMPLETED JOB UTILIZING BOTH DIGITAL CARRIER TRUNK AND STANDARD TRUNKING

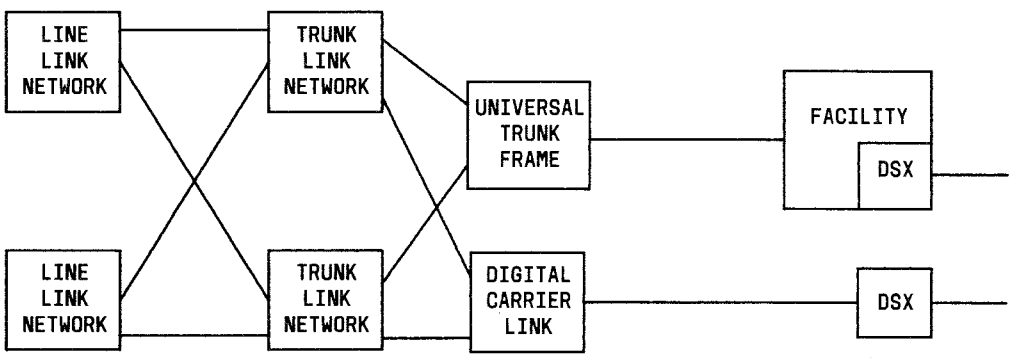


Fig. 4—Central Office Growth With DCT Addition (Sheet 2 of 2) (5.06, 5.08)

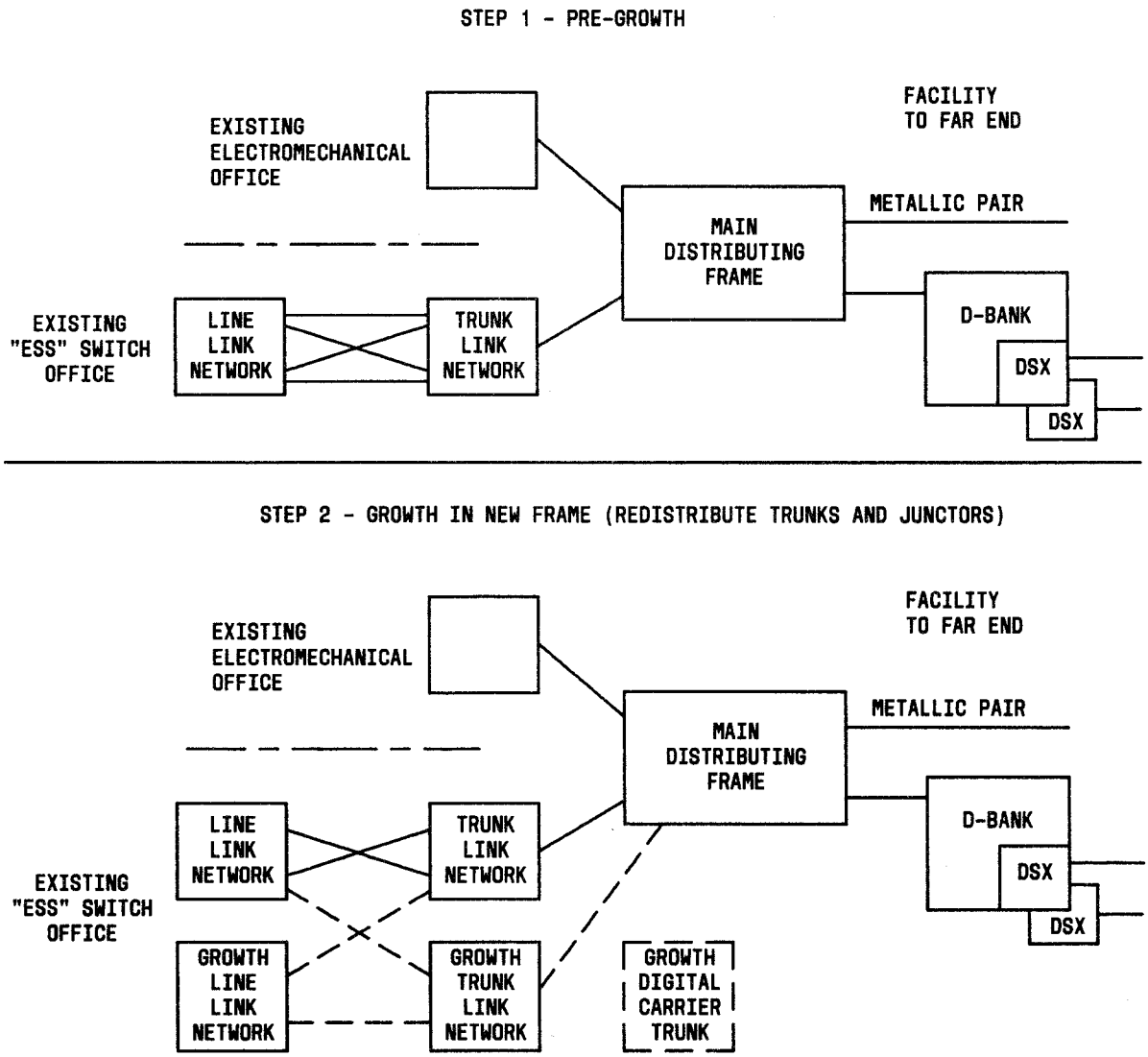


Fig. 5—Central Office Cutover With Major Growth and DCT Addition (Sheet 1 of 2) (6.01)

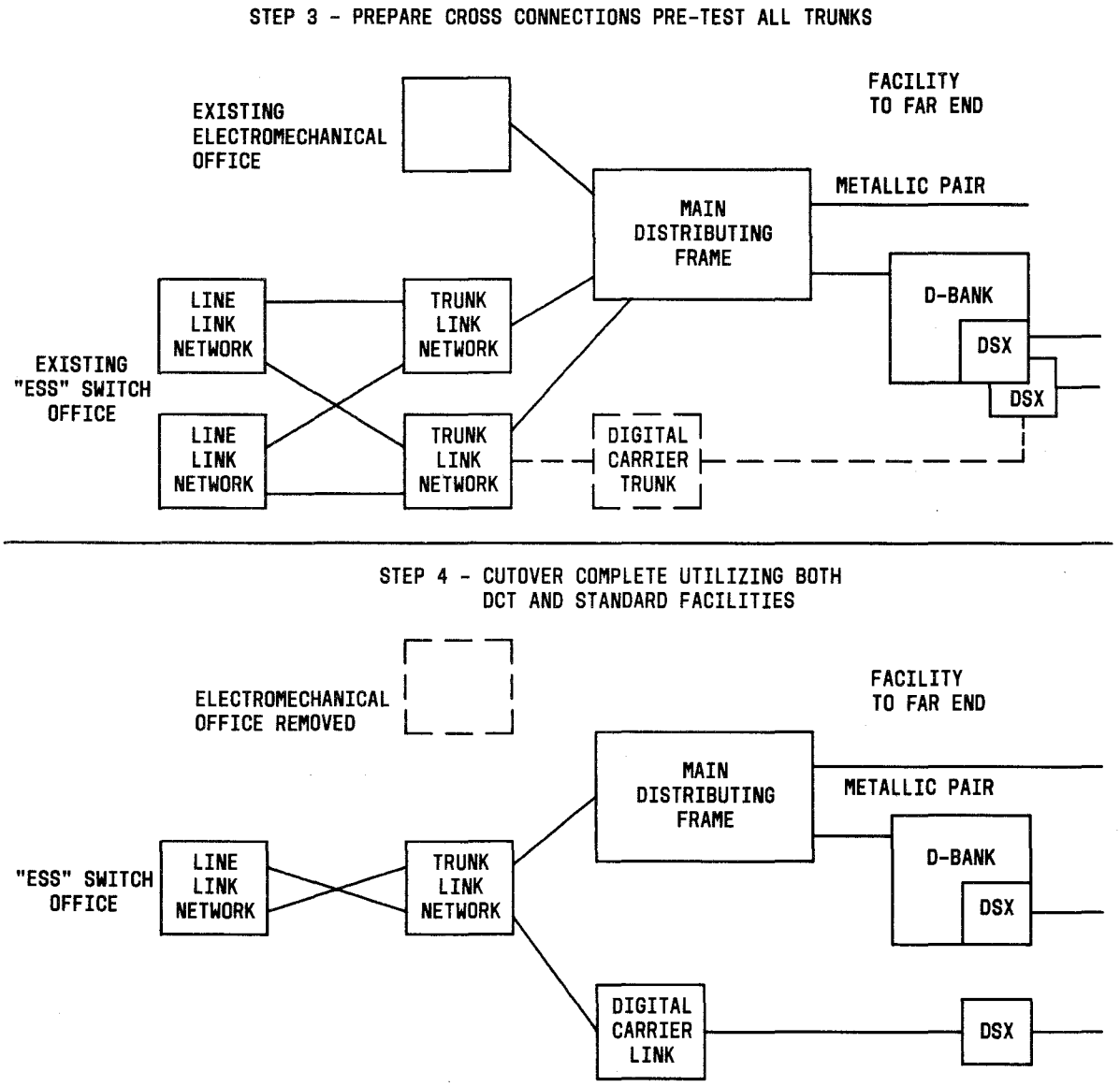


Fig. 5—Central Office Cutover With Major Growth and DCT Addition (Sheet 2 of 2) (6.01)