MODULAR CABLE TRANSFERS

CONSTRUCTION

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1. GENERAL

1.01 This section describes the procedures to be followed by the outside plant construction work group (CWG) to complete modular cable transfers. The method is designed to simplify and reduce the time and labor involved in making cable transfers. It is to be used with the Cable Transfer Administration Plan (Section 620-050-020) and Modular Splicing—Engineering Administration (Section 935-111-402). Ideally, cable transfers will eventually be plug and unplug with no wire work.

1.02 When this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 The modular splicing system consists of six basic splice types. The six basic splice types and their respective symbols are:

(1) Straight = S

(2) Facility (RICS) = F

(3) Junction = J

(4) Load = L

(5) Nonstandard = X

(6) Distribution = D.

1.04 On work prints where modular splices are shown, the engineer will show the size (number of banks) and type. For example, 4F by the splice symbol indicates a 4-bank facility splice. The size indicated is based upon the ultimate use of the splice and may show four banks where two would suffice on the job being done, but the later addition of another feeder would require four banks. Building the 4-bank format at the outset will save work later.

1.05 The single-bank, 2-bank, and 4-bank configurations are shown in outline form in Fig. 1.

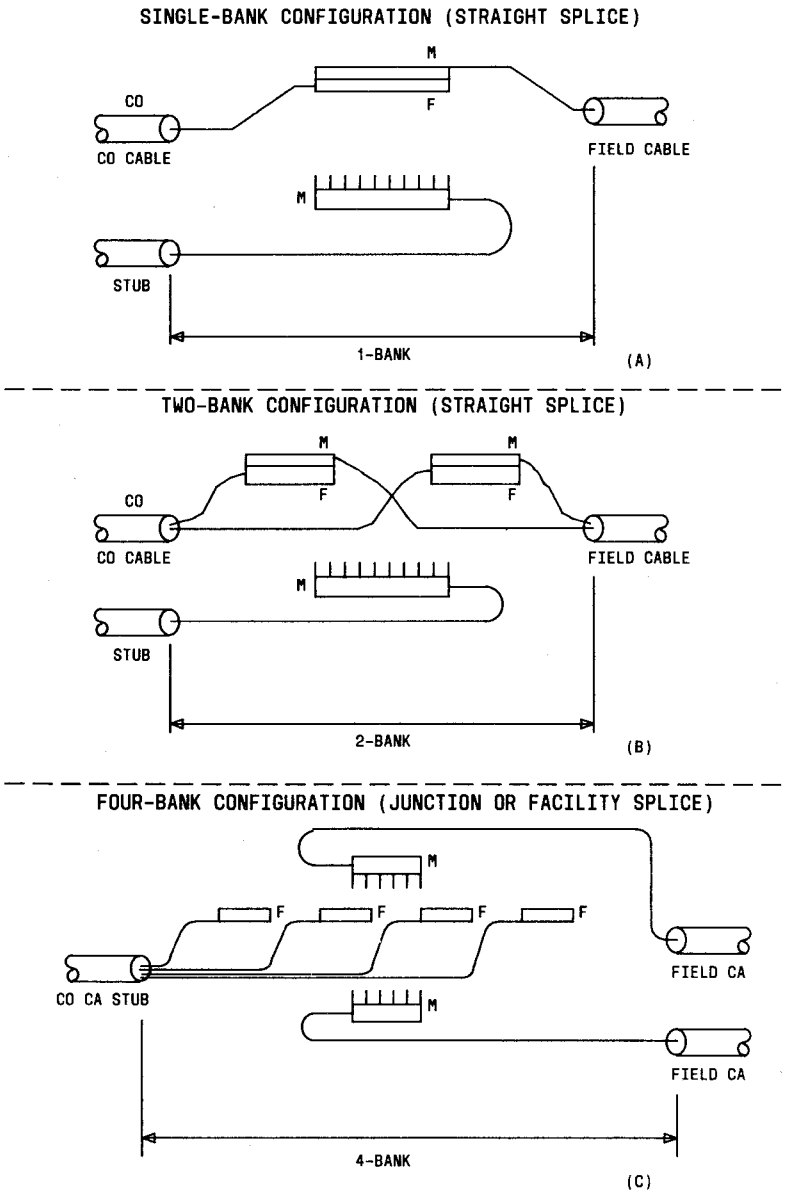


Fig. 1—Single-Bank, 2-Bank, and 4-Bank Splice Configurations

1.06 The term ***backwards splice*** is used in this document to refer to a modular splice that is constructed with the wire dimensions and the type of modules reversed and is used to save wire work, as detailed in paragraph 4.02.

1.07 Special services are categorized as follows:

(a) Category "A" special services must be identified as special but may be transferred the same as plain old telephone service (POTS). Some may require customer notification by the Maintenance Center (MC).

(b) Category "B" special services require a customer release obtained by the MC or Special Service Center (SSC) prior to transfer.

1.08 The MC or SSC shall coordinate the release and transfer of all special and designed services designated as "B" services per Section 620-050-020. The classification of service codes is in Appendix 1 of Section 620-050-020.

1.09 Cable transfers include the following splicing force responsibilities:

(a) When delegated by the Cable Transfer Committee, per Section 620-050-020, upon receipt of the Exchange Customer Cable Record (ECCR) and/or local forms for verification/pretest/post test from the Loop Assignment Center (LAC), the splicing force will be responsible for completion of the pretest and verification and return of the ECCR and/or local forms to the LAC.

(b) Splicing forces will identify the cable pair counts in the transfer and convert the counts involved to modules if other than modular connectors are in place prior to the scheduled day of transfer (Section 935-111-402). Splices considered for rebuilding to modular will have been jointly inspected by engineering and construction and a ***joint decision*** made, which should be shown on the work print.

(c) When the preliminary completion work information is received from the central office (CO) force, the splicing force, when delegated, will be responsible for the validation of CO back-taps.

Note: All nonvalidated pairs (noncircle test) will be reconciled by the CO work group (COWG).

(d) The splicing supervisor will contact the Construction Management Center (CMC) supervisor at least 1 day in advance of the scheduled day of transfer to verify that all supportive work is complete and to verify any release requirements of category "B" special services.

(e) Throughout the entire splicing operation (preliminary splicing and transfer), construction will buffer the cable by placing auxiliary air sources or tapping air pipes to maintain air pressure as required in Section 637-305-303.

(f) Splicing forces will obtain opening and closing numbers from the MC per Section 620-020-005.

(g) On the scheduled day of transfer, splicing forces will complete the following:

- Request the COWG to place heat coils in the new counts
- Verify circuits using an approved transfer switch
- Make transfers one module at a time
- Proceed with the previously arranged transfer of category "B" special services with the MC or the SSC.

(h) Properly process a Special Services Protection List, Form E-4106 per Section 680-300-012.

(i) Upon receipt of a request for verification/pretest/post test from the LAC, splicing forces will be responsible for completion of the post test and will return the form to the LAC.

1.10 Time reporting by the splicing forces must be consistent with the Accounting Handbook and specifically for modular cable transfers.

- Cable Pair Identification (Tagging) .... Outside Plant M
- Module Conversion .... Outside Plant M
- Splice Rebuilding (Maintenance Only) .... Outside Plant R
- CO Verification .... Central Office M
- CO Pretest .... Outside Plant R

- CO Back-Tap Validation .... Central Office M
- CO Post Test .... Outside Plant R
- Conformance Test .... Outside Plant M

2. PRETESTING

2.01 The pretest, when delegated, will be made according to the Cable Transfer Administration Plan (CTAP) schedule Form E-6358, as detailed in Section 620-050-020. The LAC will send the request for verification/pretest/post test to the CMC. The technicians will be responsible for the pretest, using an approved test set, the Go/No-Go test set, or equivalent. The technician will then record the results on the form used for the request and return the form to the CMC. Upon receipt from the CMC, the LAC will record any changes involving defective or working pairs.

3. CABLE PAIR IDENTIFICATION (TAGGING) AND PRELIMINARY SPLICING

3.01 The splicing technician shall identify the cable pair counts and convert the splice to modules, where applicable (see paragraph 3.02), before the scheduled start date of transfer. This will be done in advance to ensure the completion of all preliminary work. All "B" special circuits which cannot be tagged during the preliminary splicing because of release requirements will be left untagged until the day of transfer. On the day of transfer, the splicing technician can identify all "B" special circuits by toning the pairs after a release on the circuit is obtained.

3.02 According to Section 935-111-402, Modular Splicing—Engineering Administration, a nonmodular splice should be ***completely converted*** to a modular splice in conjunction with a cable transfer if any of the following conditions are met.

(a) More than 50 percent of the pairs are being respliced.

(b) More than one type of wire-joining device was previously used in the splice, requiring complete rebuilding of the splice before new or additional work can be done.

(c) The splice has a poor maintenance record.

(d) The splice was poorly built or has had much past activity.

(e) The splice may have been partially converted or rebuilt in the past and is designated SX, FX, or JX on the work print, as detailed in Section 935-111-402.

(f) When required by engineering as shown on the work print. Where doubt exists, engineering and construction must visit the splice together and make a joint decision on partial or complete conversion to modular before the work prints are issued to construction.

3.03 On the day for preliminary splice conversion, the splicing technician shall:

(1) Have a copy of the Special Service and Protection List and Updated Defective Pairs List, Forms E-4106 and E-4108

(2) Call the MC for an opening number per Section 620-020-005

(3) Buffer the cable per Section 637-305-303 and open the splice

(4) Set up a splicing technician's telephone on a pair designated by the LAC

(5) Proceed with the necessary wire work to complete the splice conversion

(6) Call the MC for a closing number per Section 620-020-005

(7) Close the splice.

4. SPLICE CONVERSION PROCEDURES

4.01 The following procedures should be used in making transfers which involve converting the entire existing straight splice (SX), Fig. 2, that has not been converted to modular to a modular straight (S) splice, connecting to it a new stub, and transferring the branch (distribution) field cable to the stub by making a new modular facility splice (F). (See Fig. 3 and 4.)

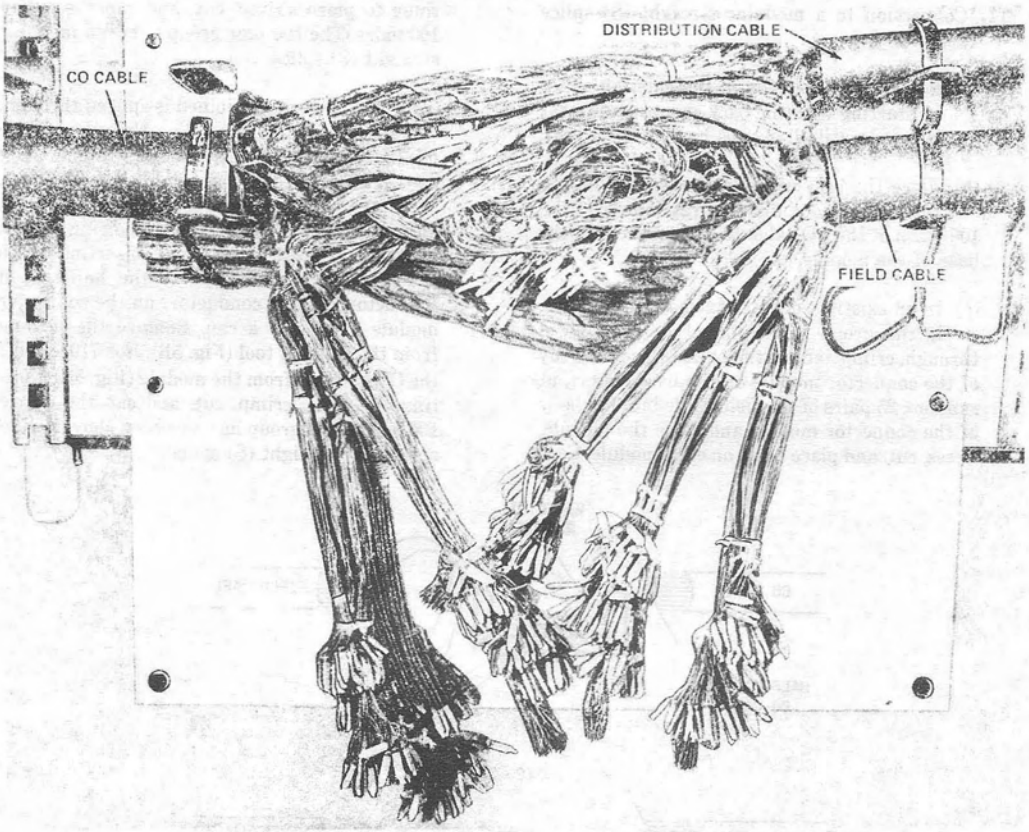


Fig. 2—Existing Single-Wire, 3-Way, Straight Splice

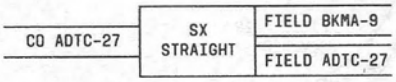


Fig. 3—Existing Conventional Splice

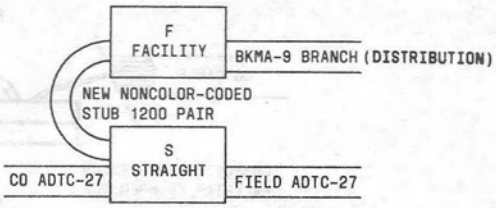


Fig. 4—Converted to a Modular Splice Configuration

(1) Conversion to a modular straight (S) splice includes:

(a) Begin the conversion of the existing splice by starting with the back groups and working forward until all groups have been spliced.

(b) Place the base of the connector module in the splicing tool. Place, at random, 25 of the 100 pairs of the CO cable to be converted in the base of the module.

(c) In an existing, nonstandard straight splice, if the group to be joined is not spliced through, crimp and cut the pairs. Place the body of the connector module on the base. Insert, at random, 25 pairs of the field cable into the body of the connector module and close the module. Press, cut, and place a cap on each module. Continue to place, crimp, cut, and cap the entire 100 pairs. The 100-pair group is now a modular straight (S) splice.

(d) If the group to be joined is spliced through, do not cut the pairs. Use the appropriate joining module for the splicing system being used. Place the connector modules on the base. Half-tap the pairs (Fig. 5A) by tracing each conductor through the old splice and bring it back over the top of the module body, inserting it into the slot that corresponds to the half-tapped conductor. Cut the conductors on the connector module and place a cap. Remove the module from the splicing tool (Fig. 5B). For 710, cut off the CO half-tap from the module (Fig. 5C). Continue to place, crimp, cut, and cap the entire 100 pairs. This group has now been converted to a modular straight (S) splice.

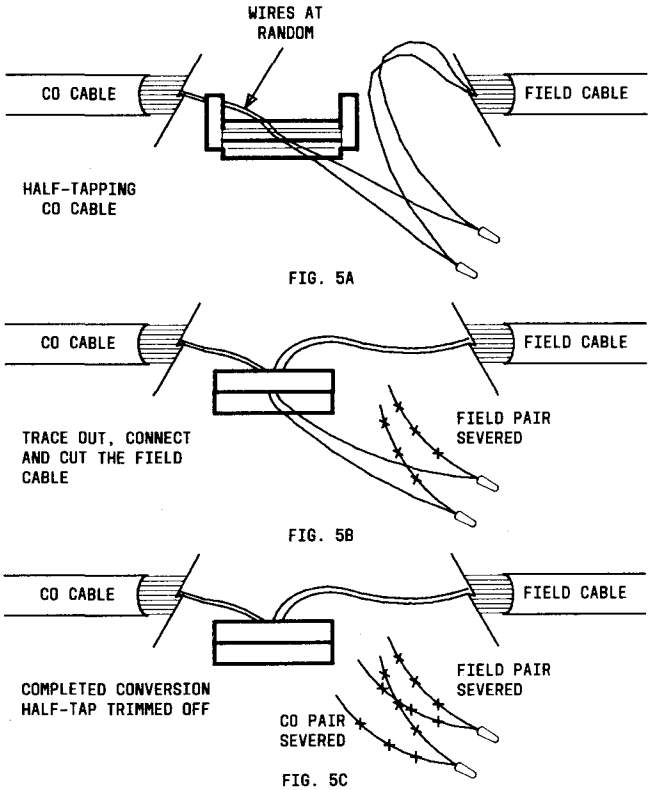


Fig. 5—Conversion of Field Count

(e) If there is a branch (distribution) cable spliced to the group, leave the half-tap and trim the loose wire from the single-wire connector to protect the circuit (Fig. 6). This group is now partially converted to a modular straight (S) splice. Continue this procedure to convert the entire cable.

(2) Half-tapping pairs on branch (distribution) cables includes:

(a) Place the base of the connector module in the splicing tool and insert the pairs in color or numeric sequence. Do not cut the wires. (See Fig. 7.)

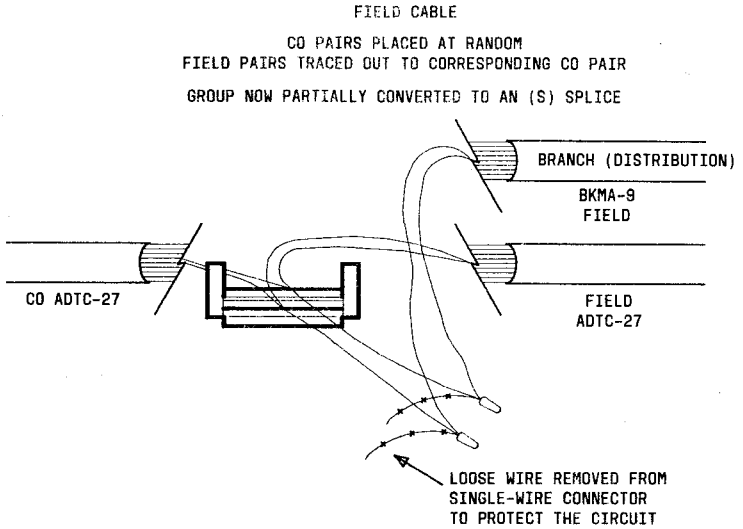


Fig. 6—Partial Conversion of Pair Group

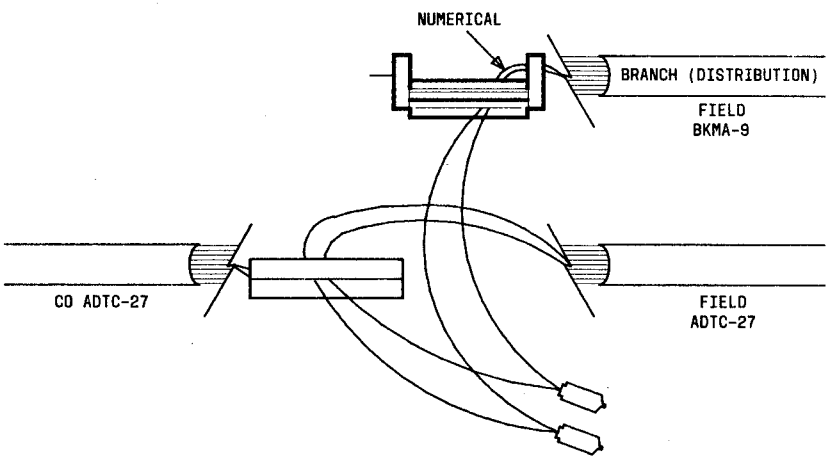


Fig. 7—Half-Tapping Field Cable

(b) Place the half-tap module on the base. Place the pairs from the piece-out module (bridging module or tagging connector) into the half-tap module, starting with the white/blue pair on the left and continuing in plastic-insulated conductor (PIC) color-code sequence (Fig. 8). This will bring the bridging module into numerical order.

Note: A piece-out module (bridging module) is a module with bridging capabilities and a 25-pair piece of PIC cable terminated in color-code sequence. It is used to provide the necessary wire to complete the transfer.

(c) Check Forms E-4106 and E-4108, Special Service and Protection List and Defective Pair List for MC/SSC controlled circuits (any pair requiring customer notification). Leave the pairs of the piece-out module that correspond to "B" category special circuits out of the connector module. These circuits will be controlled by the MC on the day of the transfer. Cap the connector module temporarily.

(3) Placing a stub and identifying "To" (new CO pairs) count includes:

(a) Place the new stub with bridge modules, or equivalent, on the end entering the straight (S) splice.

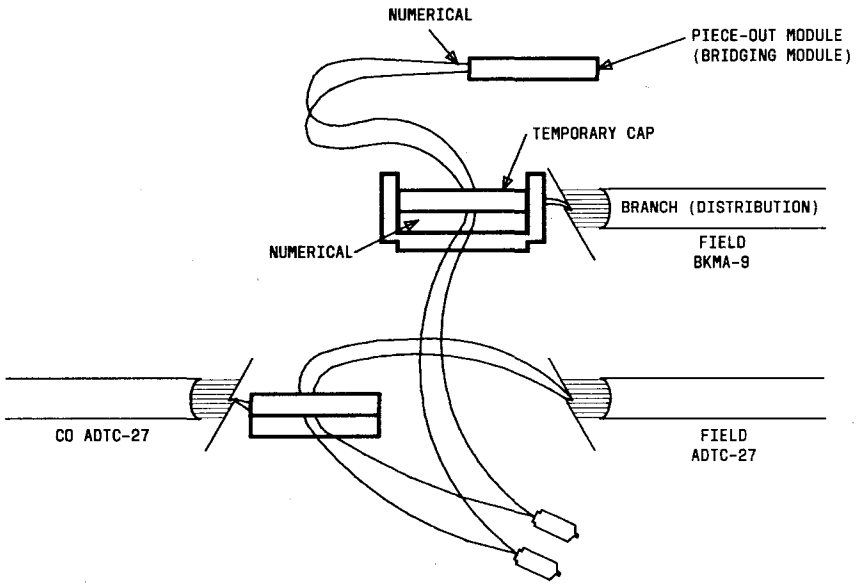


Fig. 8—Placing Piece-Out Module (Bridging Module)

(b) Prepare the CO end of the stub for the facility (F) splice and temporarily clear the ends. Plug the connectorized end of the stub into the "To" count of the straight (S) splice. (See Fig. 9.)

(c) Place the appropriate connector module in the splicing, tool. After the cable pairs in the CO end of the stub have been ***numerically*** identified, place them in the connector module and cut, crimp, and cap (for 3M, place in body top 4000 D). The preliminary work is now complete (Fig. 10).

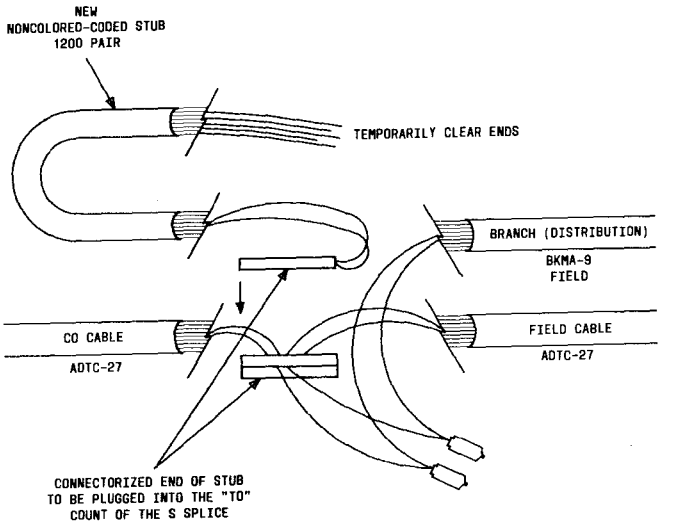


Fig. 9—Preparing New Stub

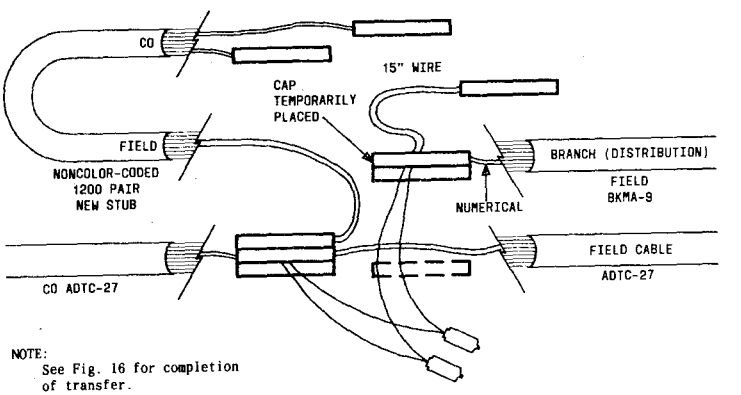


Fig. 10—Preliminary Work Complete

(4) Closing a splice includes:

(a) Close the splice on the field end of the stub, which is a facility (F) splice.

(b) Close the partially converted (S) splice. The field cable is still in this splice with the extra bridge module to be used on the day of the transfer.

(c) Call the MC for a closing number.

(d) Return the defective pair list with corrections made during cable pair identifying to the LAC. If line rearrangements are required or if defective pairs must be cleared, they must be accomplished before the day of transfer. The transfer procedure is described in Part 6.

4.02 A junction splice is described as being used at the end of an allocation area and will be used as a cable pair administration point. Therefore, the splice must be constructed with reentry limited to plugging or unplugging of binder groups with the associated modules for this feature. The following procedures should be used when converting an existing splice to a modular junction (J) splice:

(1) Begin conversion with the back groups and work forward until all groups being converted have connectors in place.

(2) The conversion or rebuilding of CO "To" counts involved in the transfer includes:

(a) Identify the "To" counts in the CO cable.

(b) If there are "ends," terminate pairs in connector modules as required.

(c) If the pairs are spliced through the splice, half-tap the pairs in modules. (See Fig. 11.)

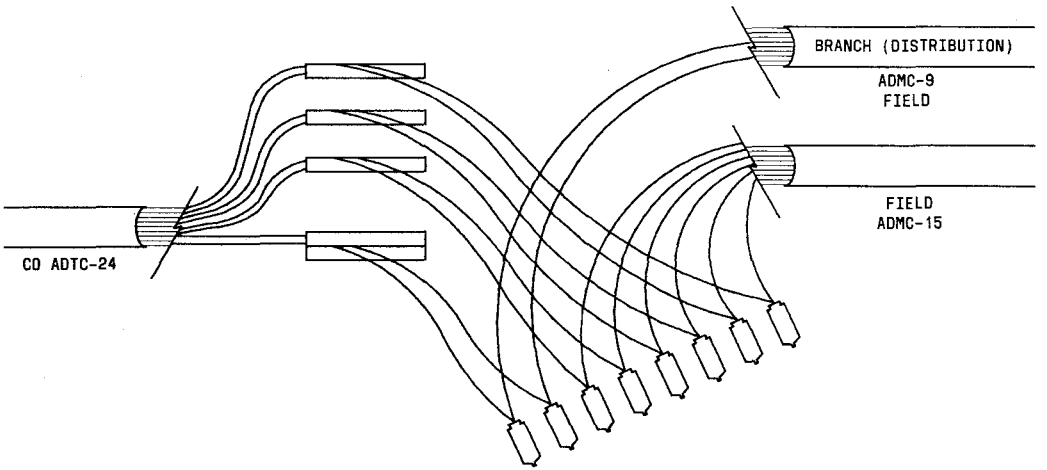


Fig. 11—Tagging and Rebuilding "To" Count

(3) The conversion or rebuilding of CO counts not involved in the transfer includes:

(a) Randomly place all the pairs of the CO cable into bases of half-tap modules (Fig. 12). Follow the flow of the wire to avoid kinks. Modules should be maintained in 25-pair integrity whenever possible.

(b) The size limitation in a conversion or rebuild is:

FEEDER CABLE SIZE	OPENING SIZE
1200 pairs	19 inches
1800 pairs	27-1/2 inches
2400 pairs	36 inches

There is a physical limitation of 96 modules per bank. All cables larger than 2400 pairs cannot be converted in the same closure. The piece placed on the branch (field) cables must be placed in a separate closure. This requires a short piece of cable the same size as the one being pieced out. The standard modular guidelines will then apply. This is a half-tapping operation—do not cut cable pairs.

(4) Conversion of field cable "From" counts involved in the cable transfer involves:

(a) Identify the "From" pairs on the field cable. Remove the sheath as required.

(b) Half-tap all pairs numerically in order of the pair identity. ***Do not cut cable pairs. This is the connecting point for pairs in the piece-out module (bridging module).***

(c) Place the cable pairs from the piece-out module into the top of the body of the half-tap module. Start with a white/blue pair on the left, and go in sequence. Make sure the piece-out module in its final plugged-in condition will have a white/blue pair on the left. Cap the connector module temporarily. This is the location where reverses found during back-tap validation will be corrected on the day of transfer.

(d) Place all remaining pairs to be converted or rebuilt, but not transferred, from the field cables into the base of a connector module. Trace each conductor from the half-tapped CO cable and place the corresponding conductor from the field cable into the same position in the base of the connector module. ***This is a half-tapping operation—do not cut cable pairs.***

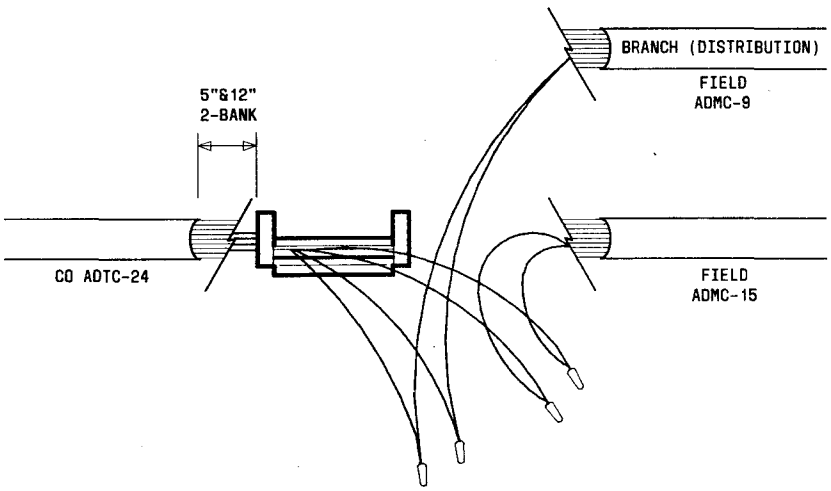


Fig. 12—Junction Splice Rebuilding CO Counts Not in the Transfer

(e) Place the body of the module on the base and crimp. Place the trailing ends of the piece-out connector in the body of the connector module. Crimp and place cap temporarily.

(f) A transfer switch must be used during conversion or rebuilding to check for reverses and other cable faults.

(g) The conversion or rebuilding for the nontransferring groups is completed in this operation. See Fig. 13 for conversion to modular junction splice.

4.03 The ***backwards splice*** is discussed as follows:

(a) The junction backwards (JB) and facility backwards (FB) splices are constructed with the wire dimensions and the type of modules reversed.

(b) The new CO cable stub is built with either 27 inches or 40 inches of loopback wire, depending on the number of banks, and is terminated with bridge modules.

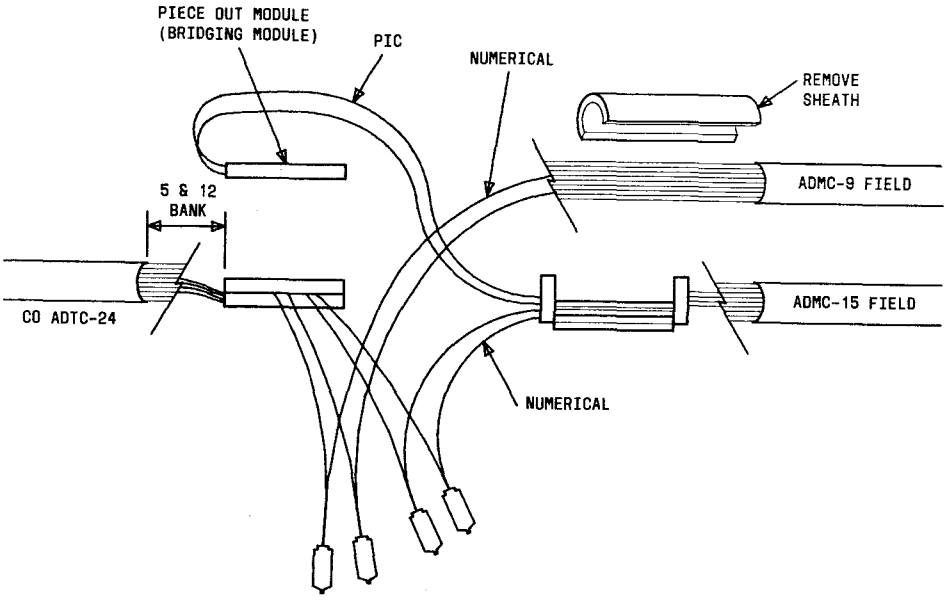


Fig. 13—Conversion to Modular Junction (J) Splice

(c) The backwards splice is normally used when adding a new CO cable or stub to an existing, conventional, single-wire connector splice. This eliminates the need to piece out the existing CO or field cables. Compare this method to the one in paragraph 4.01. All loopback wire will be terminated with bridge modules. All existing wire will be built with connector modules. See Fig. 14 for an example of a backwards facility splice.

(d) Directions for conversion are as follows:

(1) Place the new stub with the CO end cleared.

(2) Add half-tap connector to CO, field, and branch cables as described in paragraph 4.01 (Fig. 7).

(3) Place bridge modules on the field end of the stub and connect to the CO main cable.

(4) Identify the new CO pairs and terminate in ***bridge*** modules with either 27 inches or 40 inches of wire.

(5) Identify the existing branch (distribution) cable and half-tap with appropriate connector modules.

(6) Verify, with an approved transfer switch, the half-tapped pairs with the new CO pairs.

(7) Connect the new CO module with the corresponding connector module.

(8) Trim off the old CO pairs and protect.

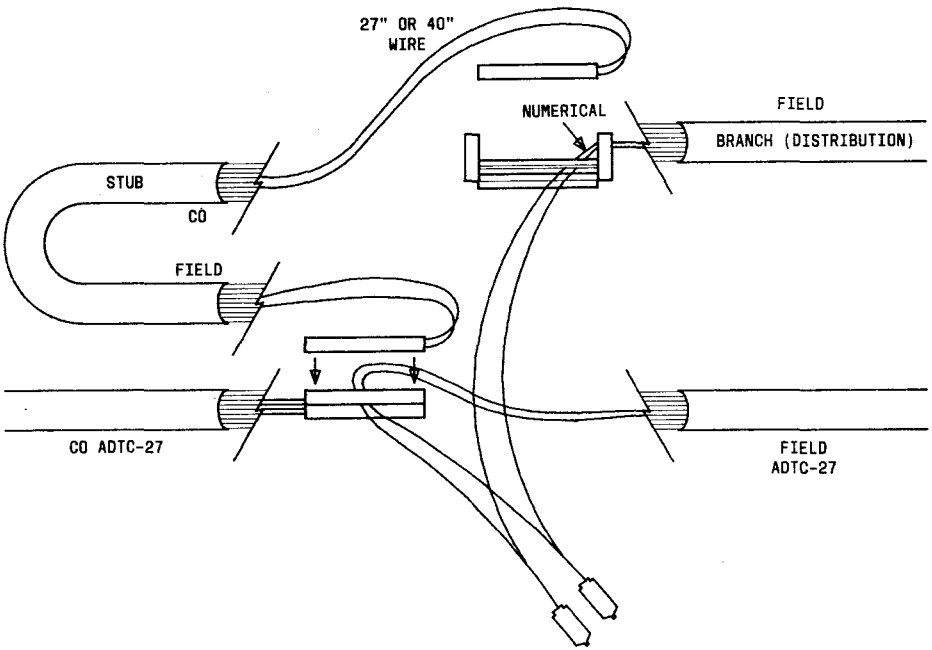


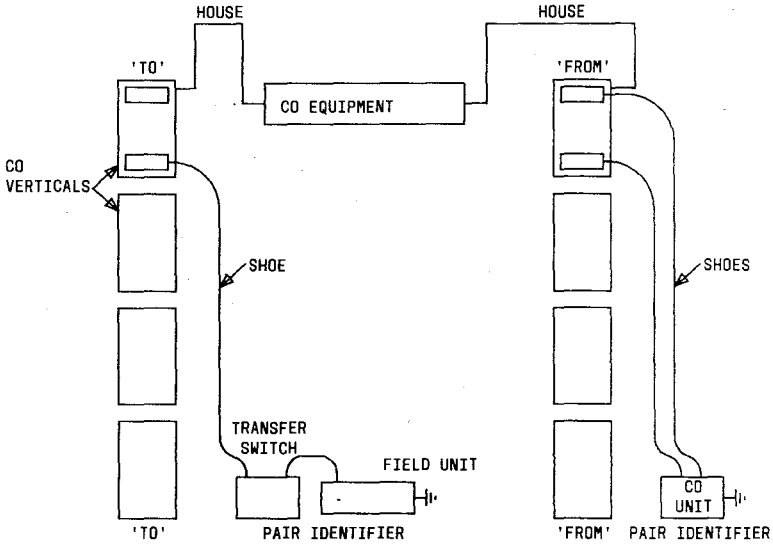
Fig. 14—Backwards Facility Splice (Modular)

5. VALIDATING CO BACK-TAPS

5.01 When the COWG has placed back-taps on all pairs to be transferred, the construction forces, if delegated, are responsible for validating the CO back-taps per the cable transfer schedule.

5.02 The approved method for validating back-taps utilizes an automatic pair identifier system and an approved transfer switch (for 50-pair access), cable analysis test sets, a combination of two approved transfer switches, or an equivalent unit. (See Fig. 15 for a typical setup.) Pairs are accessed to the equipment with front-tap shoes to frame connectors.

5.03 After back-taps have been validated, all nonvalidated pairs are reported to the COWG for their attention. If nonvalidated pairs were found, splicing forces will be responsible for the revalidation of all back-taps. ***No transfer is to be started until the back-taps are 100-percent correct.***



NOTE:
COILS PUSHED IN 'TO' WAY FOR TESTING. CHECK COILS FOR GROUNDS.

Fig. 15—Validating Back-Taps

6. CABLE TRANSFERS—STRAIGHT (S) AND JUNCTION (J) SPLICES

6.01 In advance of the scheduled day of transfer, the CMC supervisor must confirm with the MC/SSC that all coordination for release and work orders are complete. If the requirements cannot be met, the transfer must be rescheduled.

6.02 On the day of the transfer, the splicing technician shall:

(1) Have all required Forms E-4108 (Defective Pair List), E-2573 (Cable Transfer Sheets), and E-4106 (Special Service and Protection List)

(2) Call the MC for an opening number and reconcile any changes to the transfer

(3) Buffer in accordance with Section 637-305-303 and open the splice

(4) Set up a splicing technician's phone on a pair designated by the LAC

(5) Call the CO for heat coils placed in the first 25 pairs to be transferred.

6.03 Set up approved transfer test sets according to specifications. All transfers must be done using an approved transfer switch.

6.04 Verify working service in the first 25 pairs to be transferred. If all items are correct, connect the new CO module to the field module and trim out the old CO pairs with an appropriate wire removal tool (Fig. 16).

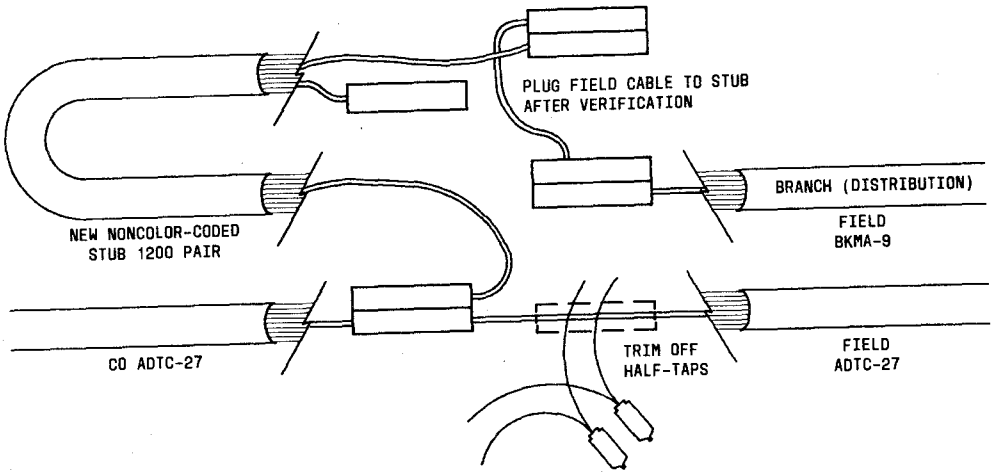


Fig. 16—Transfer of First 25 Pairs Complete

6.05 Call the CO to have heat coils removed from the "From" pairs.

6.06 Continue transferring pairs as above until the work is completed.

6.07 For "B" special circuits that require special handling, the MC/SSC will coordinate the release with the transfer of the remaining pairs in the module. Remove the temporary cap from the connector module and insert the special circuit in the body. Crimp and cut the pairs and place a permanent cap. Trim off the half-tapped wires.

6.08 When the transfer is complete (Fig. 17), call the MC for a final closing number.

7. POST TEST

7.01 Splicing forces, if designated, will be responsible for the post test following the completion of the transfer.

7.02 The procedures and equipment used for the post test are the same as those for the pretest (Part 2).

7.03 The post test should be done as soon after the completion of the transfer as possible.

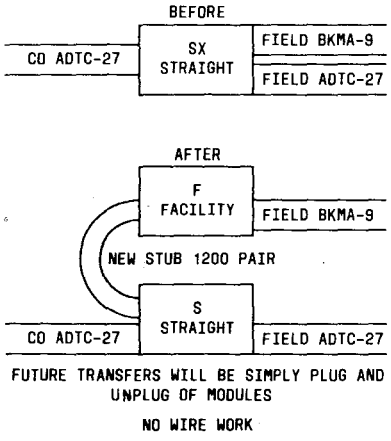


Fig. 17—Rebuild and Transfer Complete