# MODULAR CABLE TRANSFERS

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## 1. GENERAL

**1.01** This section gives the procedures to be followed by the Outside Plant Construction forces to complete Modular Cable Transfers. This 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 620-050-020PT.

**1.02** (Reserved for future use.)

**1.03** Splicing Forces Responsibilities:

(a) Upon receipt of the CO 4991 (Request for Verification/Pretest Post Test form) from the Loop Assignment Center (LAC), splicing forces are responsible to complete the pretest and verification and return the CO 4991 to the LAC.

*Note:* With frame forces concurrence, the local Cable Transfer Administration Plan (CTAP) Committee may delegate this responsibility to the Frame forces.

(b) Splicing forces will tag all "pots" and "A" and "B" special circuits in the cable and convert the splice with 710 modules prior to the construction scheduled start date of the transfer.

(c) When the preliminary work completion information is received from the Central Office (CO) forces, splicing forces are responsible for the validation of the back-taps (tip and ring) in the CO. All ***no-buzzes*** will be reconciled by frame forces within 48 hours. [See 1.03 (a) *Note.*]

(d) The Splicing Supervisor will contact the Automated Repair Service Bureau (ARSB) Supervisor prior to (1 or 2 days) the scheduled transfer date to verify that all supportive work is complete.

(e) Throughout the entire cable splicing operation (prelim work and transfer) Construction will arrange for placement of air tanks or tap air pipes to maintain air pressure as required.

(f) Splicing forces obtain opening and closing numbers from the ARSB prior to any operation being performed in any working cable. Upon obtaining an open number the splicer will give the job number he/she is working on, the location of the splice, all counts under every sheath being opened, and the nature of the type of work being performed.

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

- Verify circuits using an approved transfer switch.
- Make the transfer one module at a time.
- Obtain the necessary release on all "C" categorized special circuits through the ARSB.

*Note:* On the scheduled date of transfer, the splicers single point of contact for transferring ***all*** special service pairs which require a release will be the ARSB. If any or all special circuits to be transferred are not under the control of the local ARSB, the splicer will contact the ARSB for referral to the proper Special Services Serving Bureau (SVB) which controls the circuit.

(h) Special Services Protection Lists (P 2201) will be properly processed.

(i) Upon receipt of CO 4991 from the LAC, splicing forces will be responsible for the completion of the post test and will return the form to the LAC.

**1.04** Time Reporting Procedures — Splicing Forces: Time reporting procedures must be consistent with accounting handbook instructions.

| | | *CODE* |
|---|---|---|
| • Tagging | OUTSIDE PLANT | "M" |
| • 710 Module Conversion | OUTSIDE PLANT | "M" |
| • Splice Rebuilding (maintenance reasons) | 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" |

## 2. PRETESTING

**2.01** The pretest will be made according to the Cable Transfer Administration Plan (CTAP) Schedule (Form CO 4991, Request for Verification/ Pretest/Post Test) by the responsible splicing forces. The splicing forces will use an approved test set, eg, the APC 300A Console, APC Cable Analyzation and Acceptance Test Set (CAATS), Perkins Research PR 50A Rapid Pair Tester, the Industrial Technology, Inc. Throwmaster 106 Transfer Switch, or equivalent. The pretest will be a DC metallic test, ie, shorts, grounds, crosses, opens, splits, and punchbacks. The technician will then record the results on the CO 4991 and return the form to the LAC which will record any changes due to defective or working pair(s).

## 3. TAGGING AND PRELIMINARY SPLICING

**3.01** The splicing technician shall tag all "pots" and "A" and "B" special circuits and convert the splice to modules several days before the scheduled start date of the transfer. This will be far enough in advance to ensure the completion of all preliminary work prior to the day of transfer. All "C" special circuits which cannot be tagged during the prelim because of release requirements, will be left untagged until the day of transfer. On the day of transfer, the splicing technician can identify all "C" special circuits by toning the pairs after a release on the circuit is obtained.

**3.02** A nonmodular splice needs to be completely converted to a Guideline Modular Splice in conjunction with a cable transfer when any of the following conditions are met:

(a) Entering for transfer or energizing any splice which has partially been converted and is designated SX, JX or FX.

(b) Maintenance reasons found only after the splice has been opened.

(c) Transfer or energizing one half or more of the CO identified pairs in any one sheath.

(d) When required by engineering.

**3.03** ***Do not*** tag and convert to modules when:

(a) Manhole size will not allow for sheath removal when new wire is needed.

(b) Transfer or energizing is less than one half of the CO identified pairs in any one sheath.

(c) Small aerial cable transfers (in a 300 pair or less cable size) because:

(1) Extensive travel time required.

(2) Extensive set up time required.

(3) Pretest was good.

(d) Transfer is in an existing facility splice, 200 pairs or less involved because:

(1) Extensive travel time required.

(2) Extensive set up time required.

(3) Pretest was good.

**3.04** On the day of preliminary splicing, the splicing technician will:

(a) Have a copy of the Special Services and Defective Pairs List (Form P 1557) and the results of the Pretest (Form CO 4991).

(b) Call the ARSB for an opening number.

(c) Open the splice(s).

(d) Set up a splicing technicians telephone.

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

(f) Call the ARSB for a temporary closing number.

(g) Close the splice.

***Note: Do not eliminate the steps in 3.04 in any other situation. It is not lost effort. This does not eliminate the requirement to pretest, post test and validate back-taps.***

## 4. SPLICE CONVERSION PROCEDURES (PRELIM)

**4.01** The following example converts an existing conventional Straight ⟨SX⟩ splice (Figs. 1 and 2) to a Modular Guideline Straight ⟨S⟩ splice. To do this, a new stub will be introduced to the ⟨SX⟩ splice after it has been converted to modules. The branch (distribution) cable will then be transferred from the straight ⟨SX⟩ splice to the CO end of the stub, making a new Facility ⟨F⟩ splice. The end result will be both a Modular Guideline Straight ⟨S⟩ and Facility ⟨F⟩ splice (Fig. 3).

(a) Conversion to a Straight ⟨S⟩ Splice.

(1) Begin the conversion of the existing ⟨SX⟩ splice by starting in the back groups and working forward until all groups have 710 tagging connector modules in place.

(2) Place the index strip of a connector module in the cutterpresser. Place at random 25 of the 100 pairs (100 pair group cable) of the CO cable to be converted in the index strip.

(3) If the group to be joined is not spliced through, press and cut the pairs. Place the body of the module on the index strip and press it. Insert at random 25 pairs of the field cable into the body of the module; press, cut and place a cap permanently. Continue to place, press, cut and cap throughout the 100 pairs. The 100 pair group is now an ⟨S⟩ splice.

(4) If the group to be joined is ***spliced through,*** do ***not*** cut the pairs. Place the connector module on the index strip and press it, half tapping the pairs (Fig. 4A). Trace 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. Press, cut and place a permanent cap on the connector module (Figs. 5 and 6). Remove the module from the cutterpresser (Fig. 4B) and cut off the CO half-tap from the module (Fig. 4C), and protect the exposed ends protruding from the module. Place, press, cut, cap, and trim throughout the entire group. This group has now been converted to an ⟨S⟩ splice.

(5) 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 service (Fig. 7A). This group is now partially converted to an ⟨S⟩ splice. Continue this procedure to convert the entire cable. (See Fig. 7B.)

(b) Half tapping pairs on Branch (Distribution) Cable.

(1) Place the index strip of a connector module in the cutterpresser and insert the pairs in color sequence.

***Note: Do not cut the conductors — this is half-tapping.***

(2) Place the body of the connector module on the index strip and press (Fig. 8). Place the pairs of a 710 tagging connector (piece-out module used to provide additional wire to the pairs) into the connector module starting with white/blue on the left and continuing in polyethylene-insulated conductor (PIC) color code sequence. This will bring the connector module into numerical order and provide the 27 inches of wire from the butt of the distribution cable to the beginning of the bridge module which is required on the field side of a Facility ⟨F⟩ Splice (Figs. 9A, 9B, 10A and 10B). Check the P 1557 (Special Services and Defective Pair List) for "C" category special circuits which will require a release on the day of transfer. These pairs should be left out of the connector module until the day of transfer. Cap the connector module temporarily.

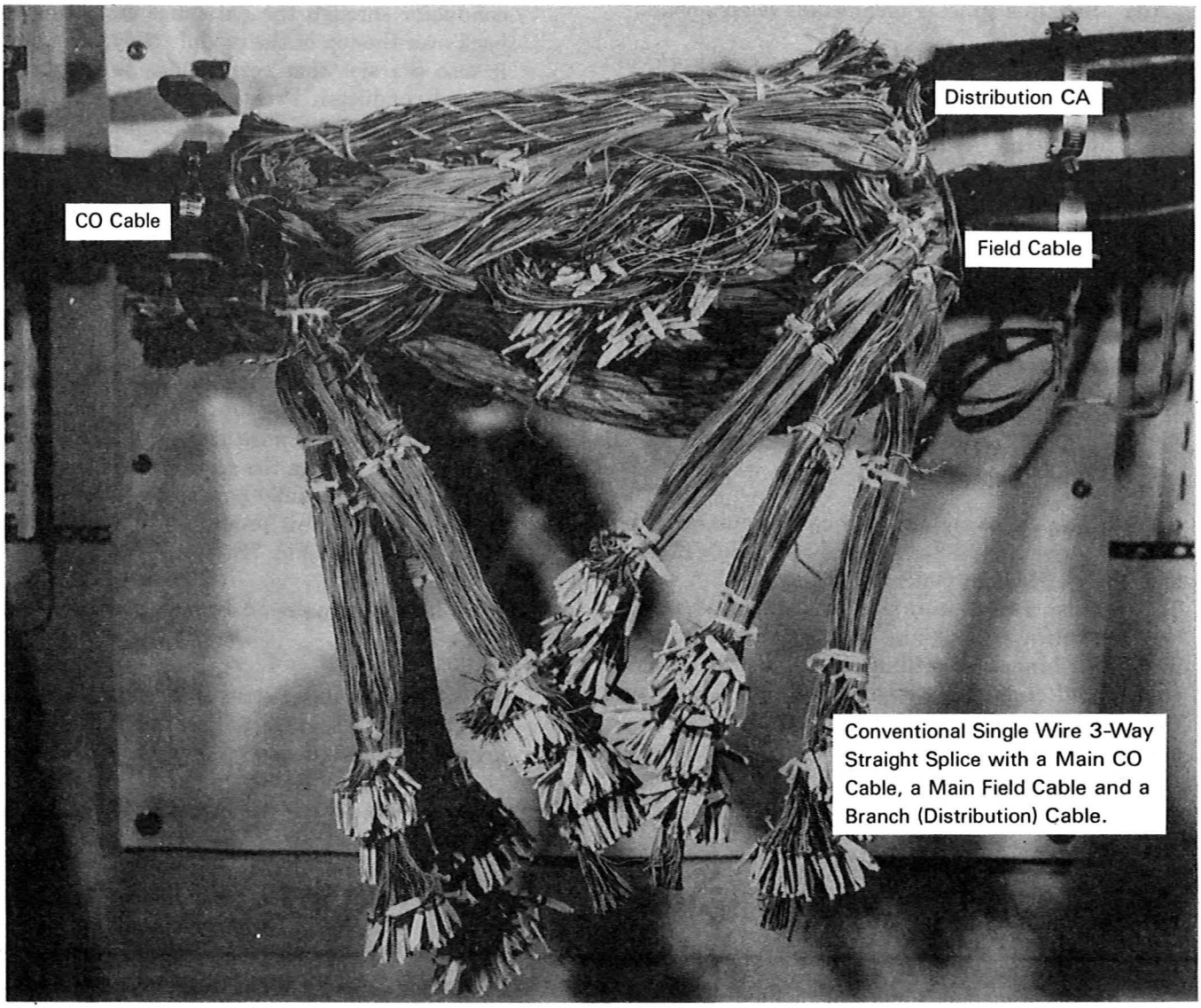
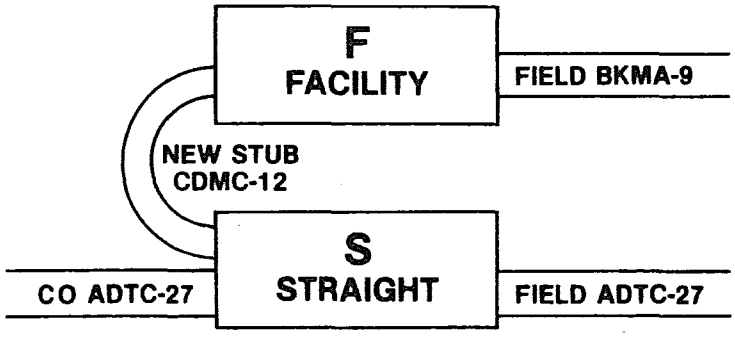

Distribution CA
CO Cable
Field Cable
Conventional Single Wire 3-Way Straight Splice with a Main CO Cable, a Main Field Cable and a Branch (Distribution) Cable.

**Fig. 1**


Splice Before Conversion
Fig. 2




Splice Converted to a Guideline Modular Splice Configuration
Fig. 3

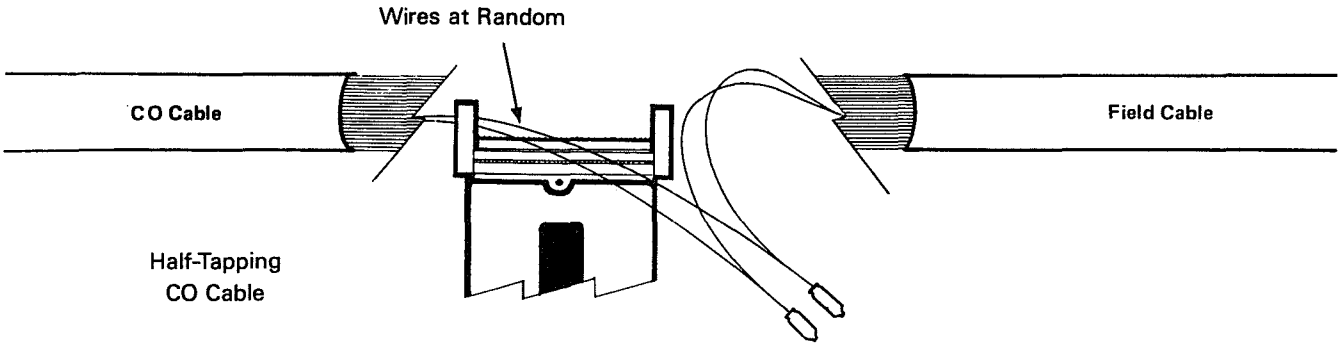



**Fig. 4A**

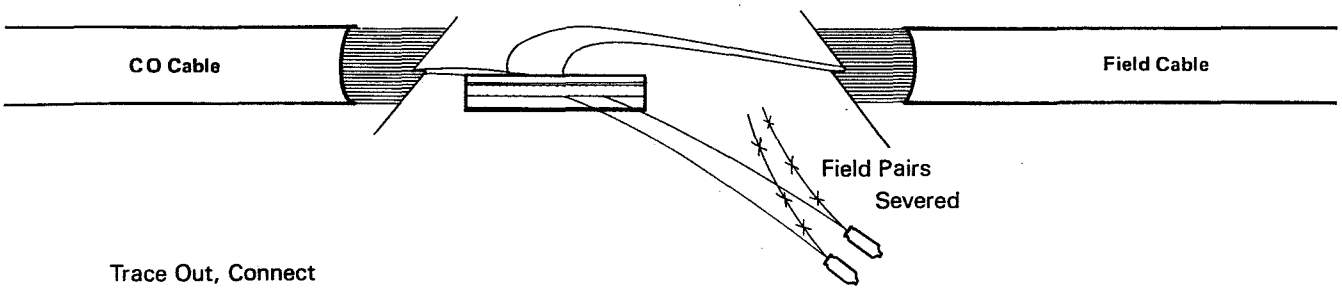



**Fig. 4B**

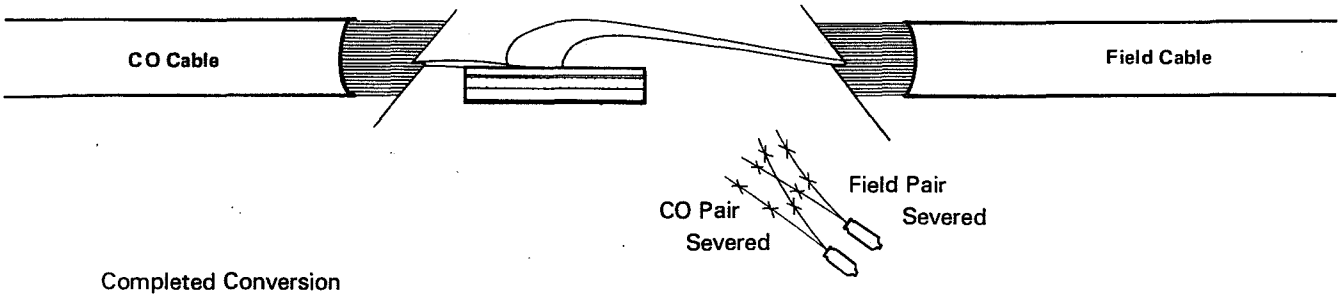



**Fig. 4C**

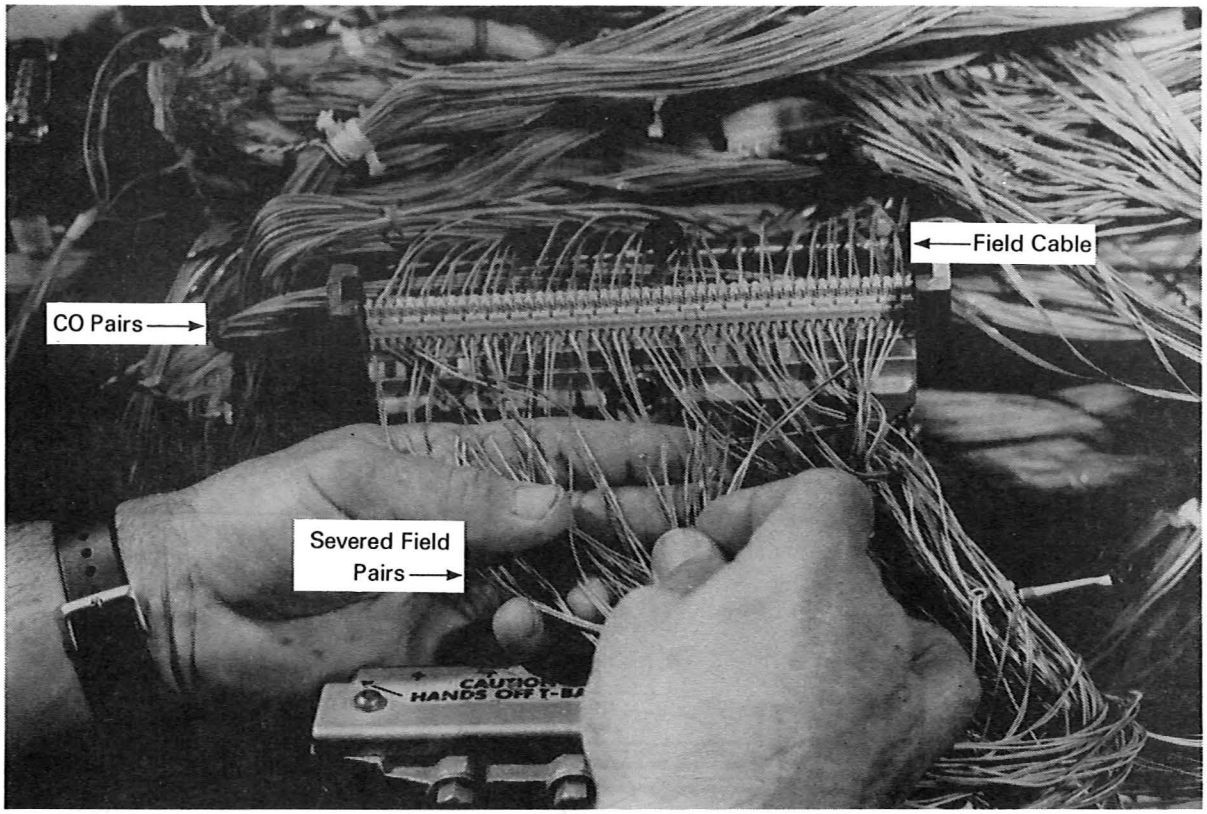

Field Cable
CO Pairs
Severed Field Pairs
CAUTIO
HANDS OFF T-BA

Fig. 5

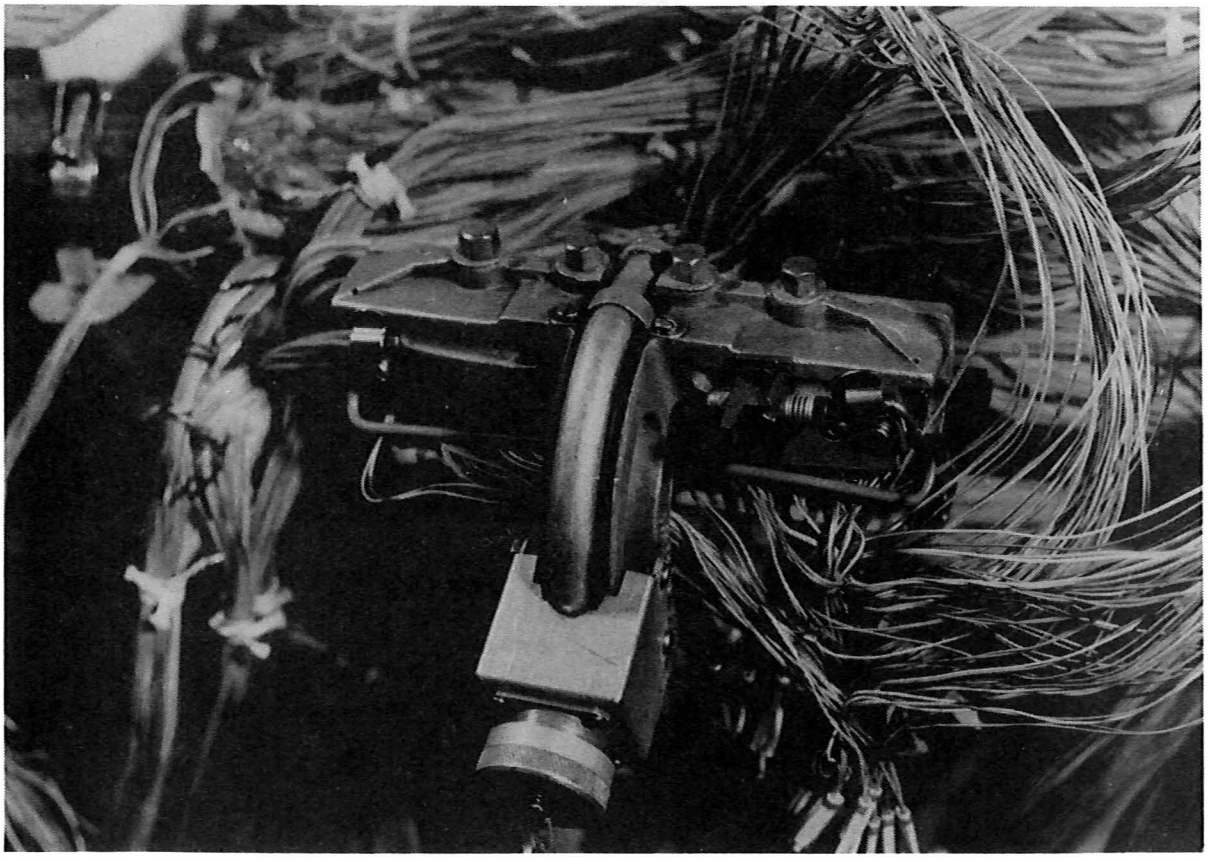
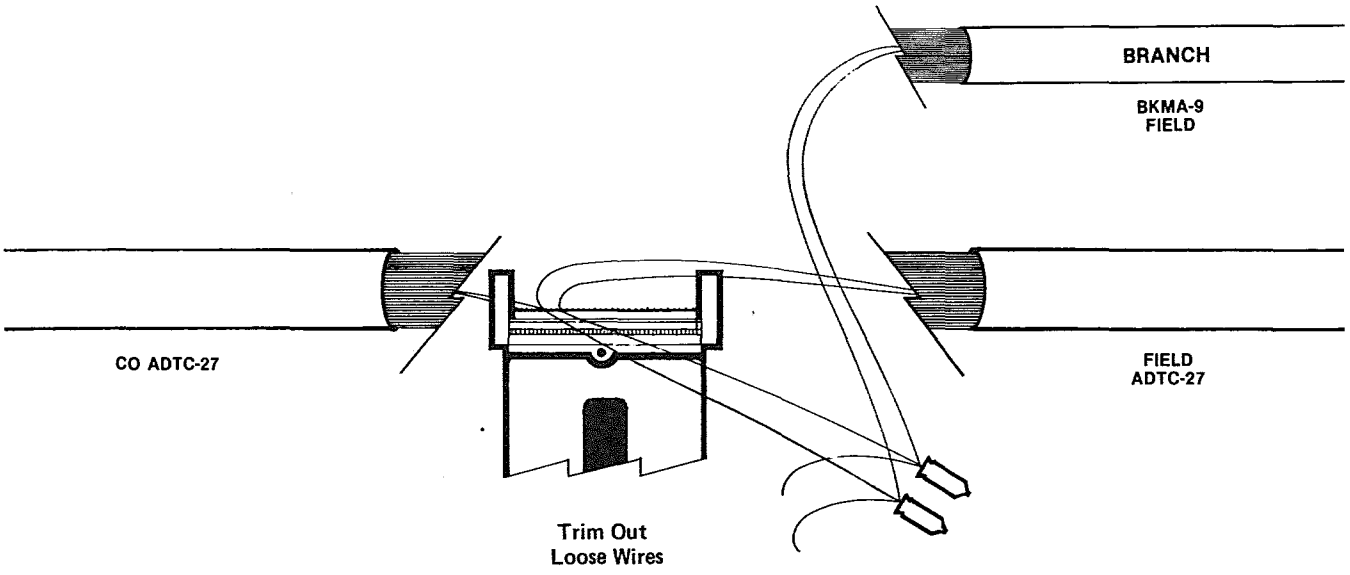


Fig. 6

Working *From* Way

CO Pairs Placed at Random
Field Pairs Traced Out to Corresponding CO Pair




**Field Cable**
**Fig. 7A**

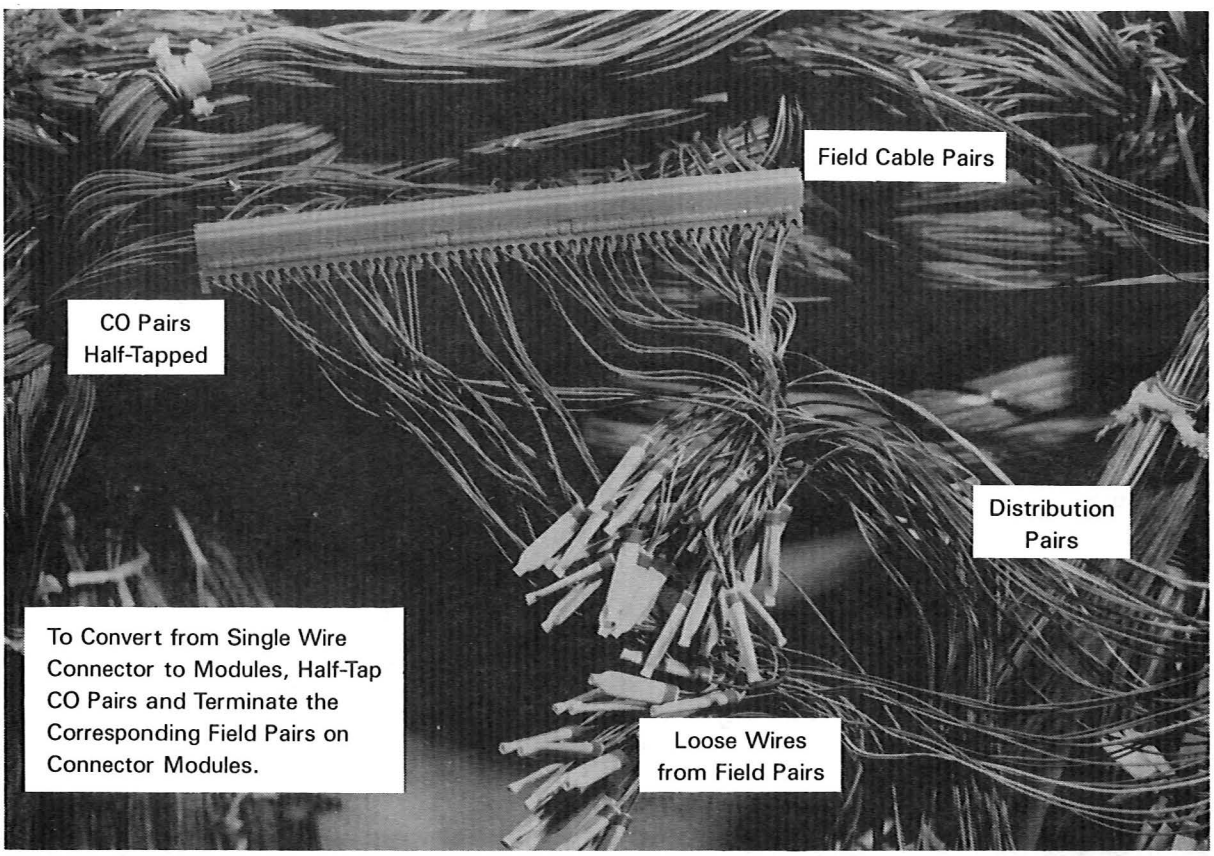
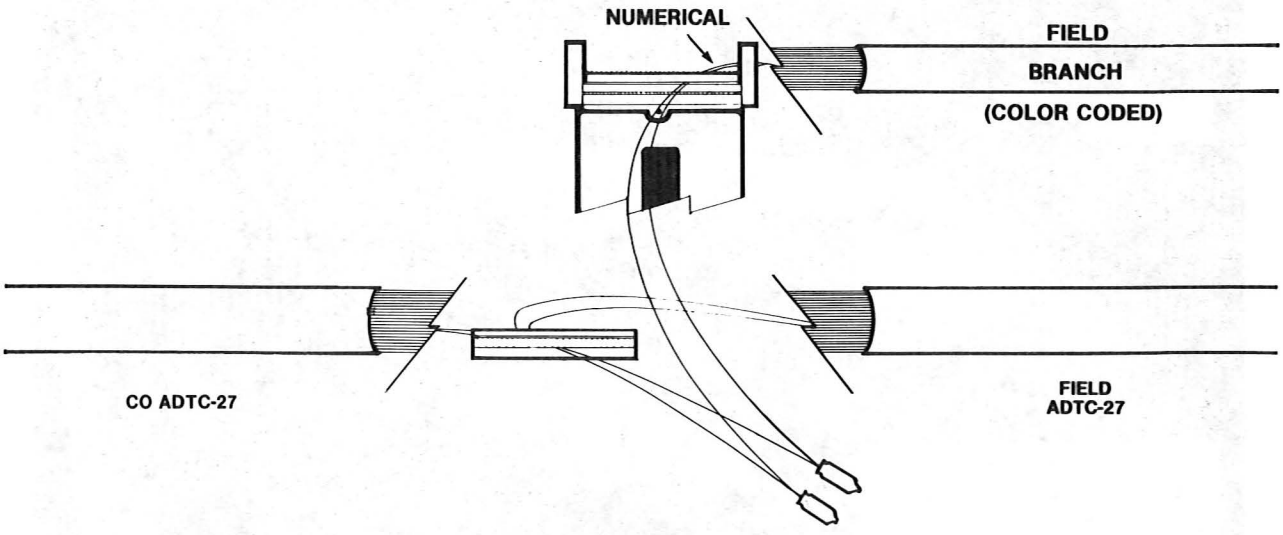
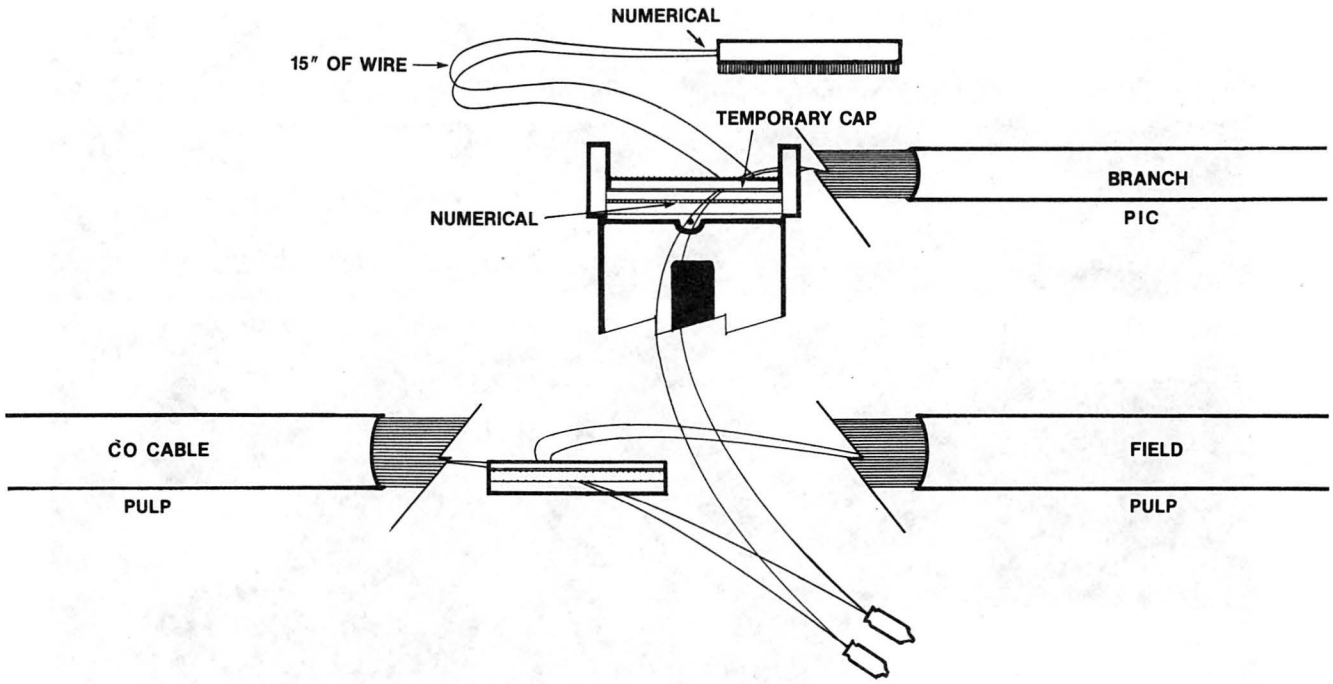



**Fig. 7B**




**Field Cable (Half Tapping)**
**Fig. 8**




**Placing 710 Tagging Connector**
**Fig. 9A**

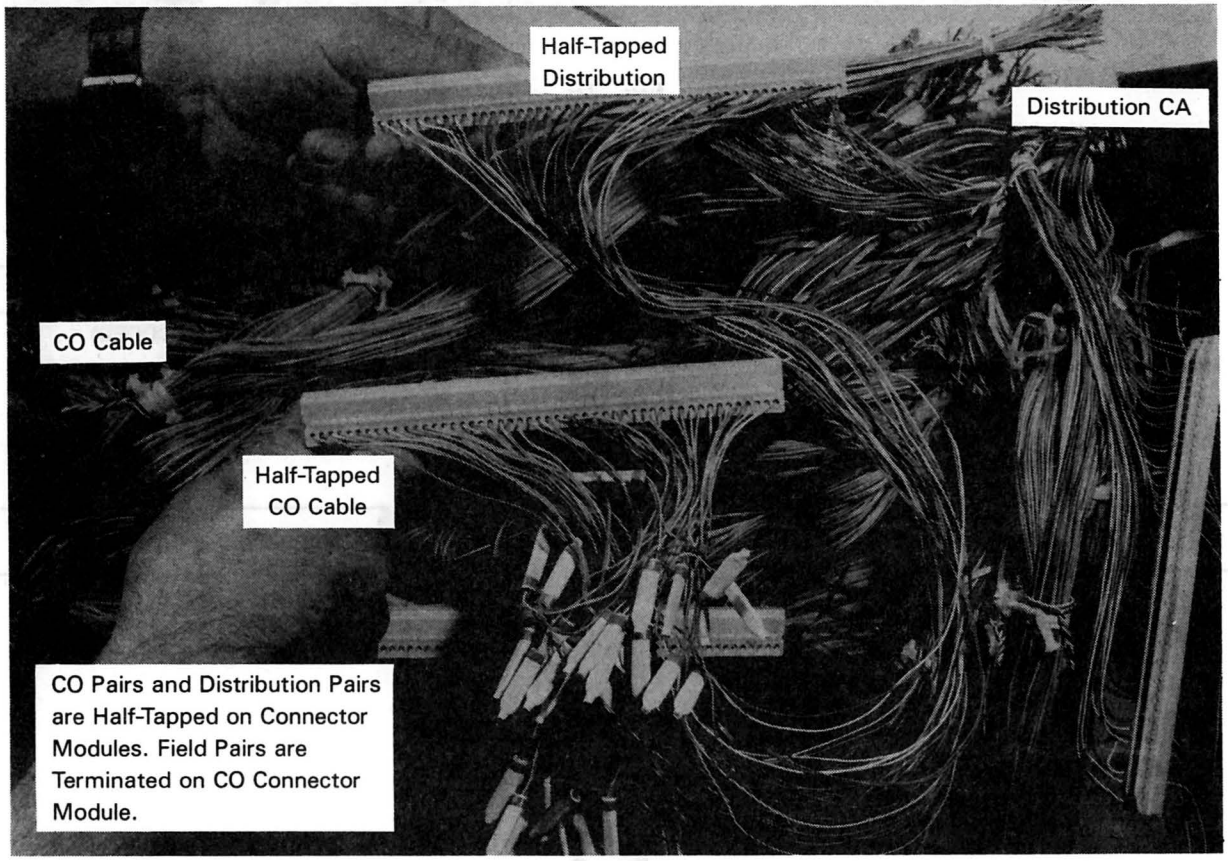



**Fig. 9B**

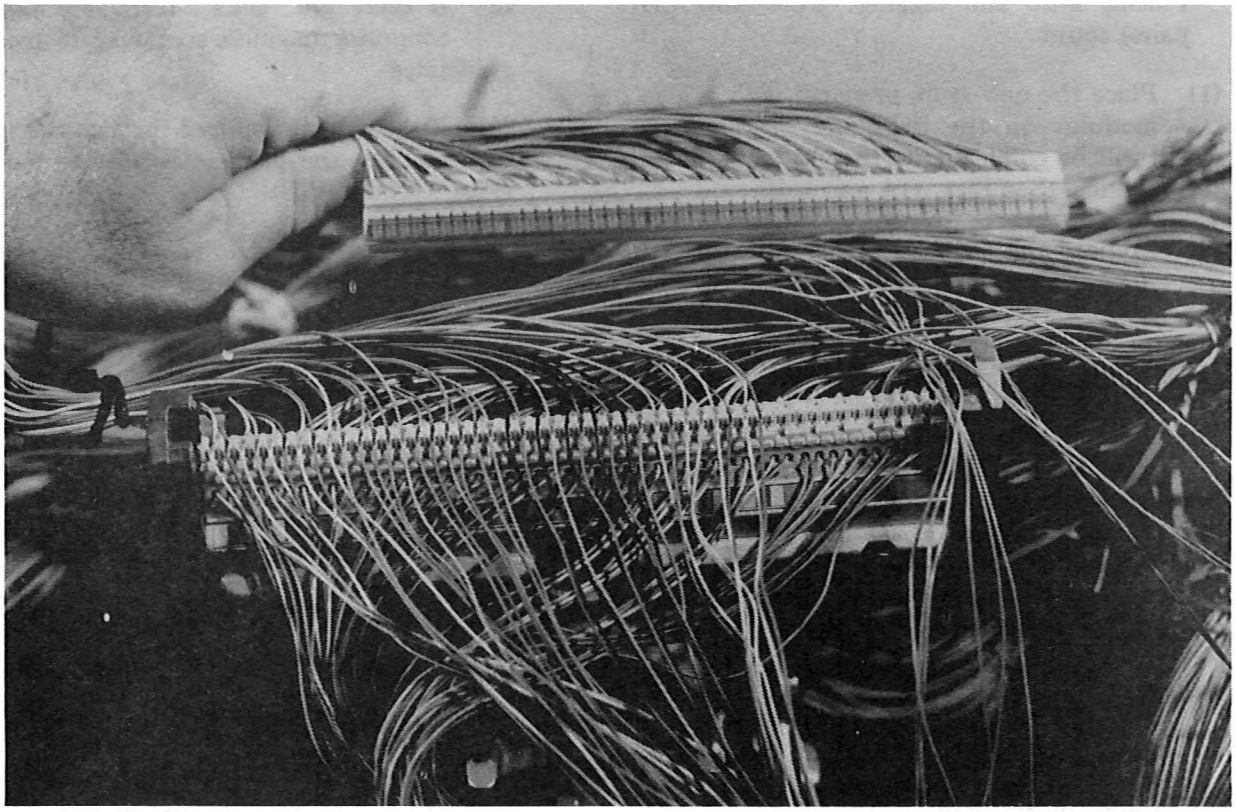


Fig. 10A

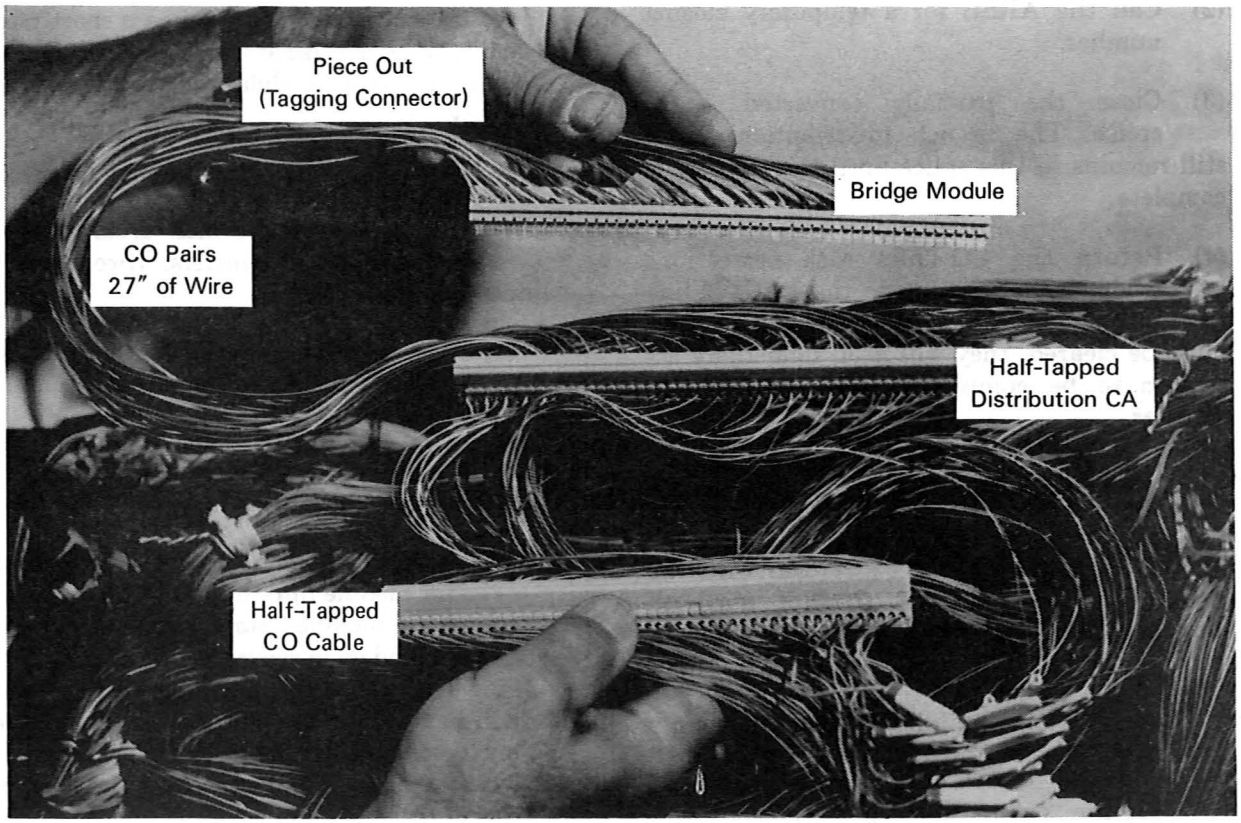



Fig. 10B

(c) Placing stub and tagging "TO" (new CO pairs) count.

(1) Place the new stub, prepared with bridge modules on the field end of the stub which will be connected to the CO pairs in the ⟨S⟩ splice. (See Figs. 11A and 11B).

(2) Prepare the CO end of the stub for the ⟨F⟩ splice closure and temporarily clear the ends. Plug the field end bridge modules of the stub into the new "TO" count of the ⟨S⟩ splice (Figs. 12A and 12B).

(3) Place the index strip of the connector module (or bridge module if building a Backwards Facility ⟨FB⟩ splice, see 4.03) into the cutterpresser. If the module has been used for the tag (Fig. 13), press and cut the pairs, then press the connector module and cap on permanently (Fig. 14).

(d) Preliminary work complete (Fig. 15).

(e) Closing the splices.

(1) Close the splice on the CO end of the stub ( ⟨F⟩ splice).

(2) Call the ARSB for a temporary closing number.

(3) Close the partially converted ⟨S⟩ splice. The branch (distribution) cable still remains in this splice until the transfer is complete.

(4) Return the CO 4991s with corrections made during tagging to the LAC. If line rearrangements are required or defective pairs must be cleared, they will need immediate attention to be completed before the day of transfer.

**4.02** Use these procedures to convert an existing splice to a Junction ⟨J⟩ splice.

(a) Conversion: Begin the conversion with the back groups and work forward until all groups being converted have 710 modules in place.

(b) Conversion or rebuilding of CO "to" counts involved in the cable transfer.

(1) Tag the "to" pairs in the CO cable.

(2) If there are "ends", terminate pairs in connector modules according to modular guidelines.

(3) If the pairs are spliced through the splice, half-tap the pairs in connector modules (Figs. 16A and 16B).

(c) Conversion or rebuilding of CO counts not involved in the transfer.

(1) Randomly place all pairs of the CO cable into index strips of connector modules (Figs. 17A and 17B).

(2) The size limitation in a conversion or rebuilding is:

| *Feeder Cable Size* | *Opening Size* |
|---|---|
| 1200 Pairs | 20 inches |
| 1800 Pairs | 28 inches |
| 2400 Pairs | 36 inches |

No more than 96 modules per bank. All cables larger than 2400 pairs ***cannot*** be converted in the same closure. The piece-out modules placed on the 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.

*Note:* This is half-tapping, not severing.

(d) Conversion of field cables "from" counts involved in cable transfers. (See above size limitation conversion)

(1) Tag the "from" pairs on the field cable. Remove sheath as guidelines require.

(2) Half-tap all pairs numerically in order of tag. ***DO NOT SEVER PAIRS***, this is the piece-out module.

(3) Place the pairs of the 710 tagging connector module into the top of the body of the connector module. Start with white/blue on the left, and go in sequence. Make sure the tagging module in its final plugged in condition will have white/blue on the left. Cap the connector module temporarily. This is the location where reverses found during verification on the day of transfer will be corrected.

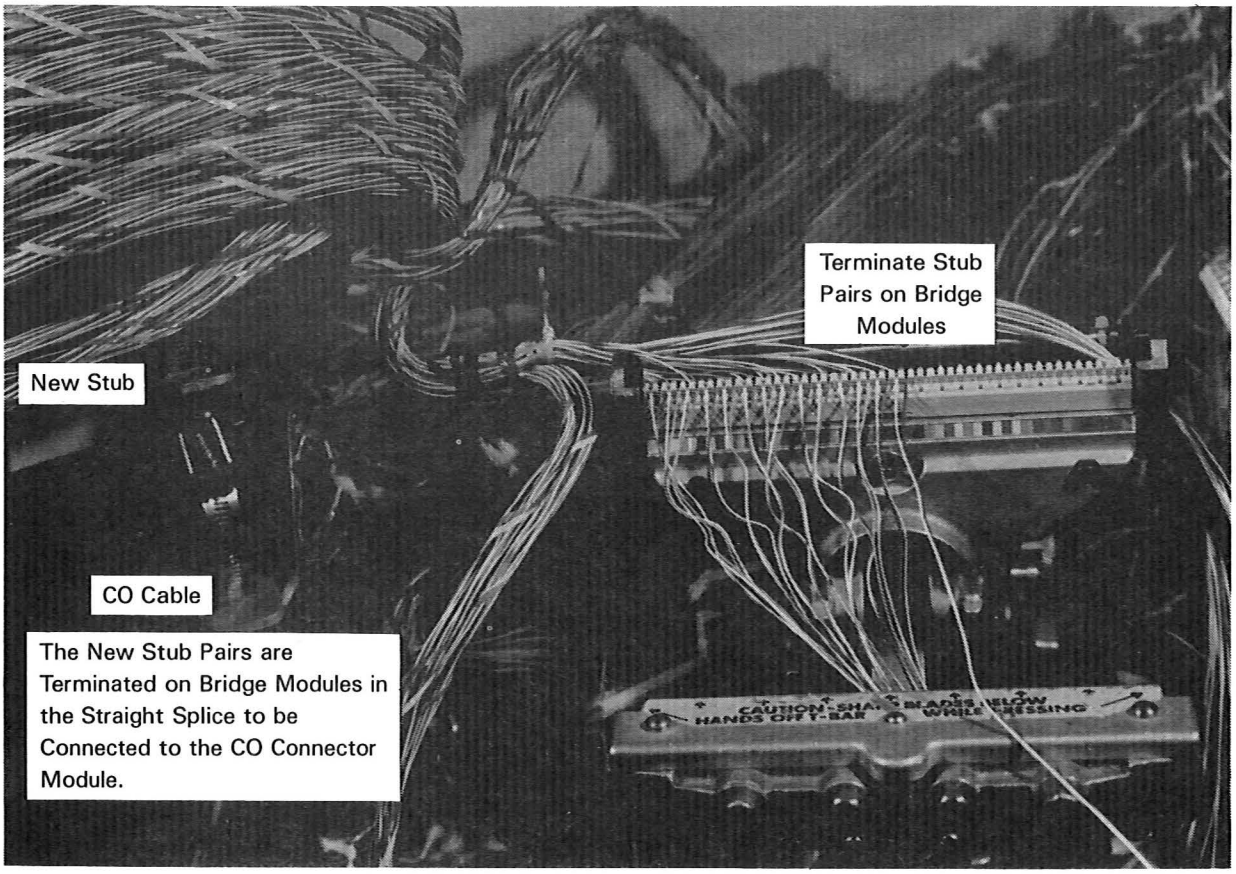
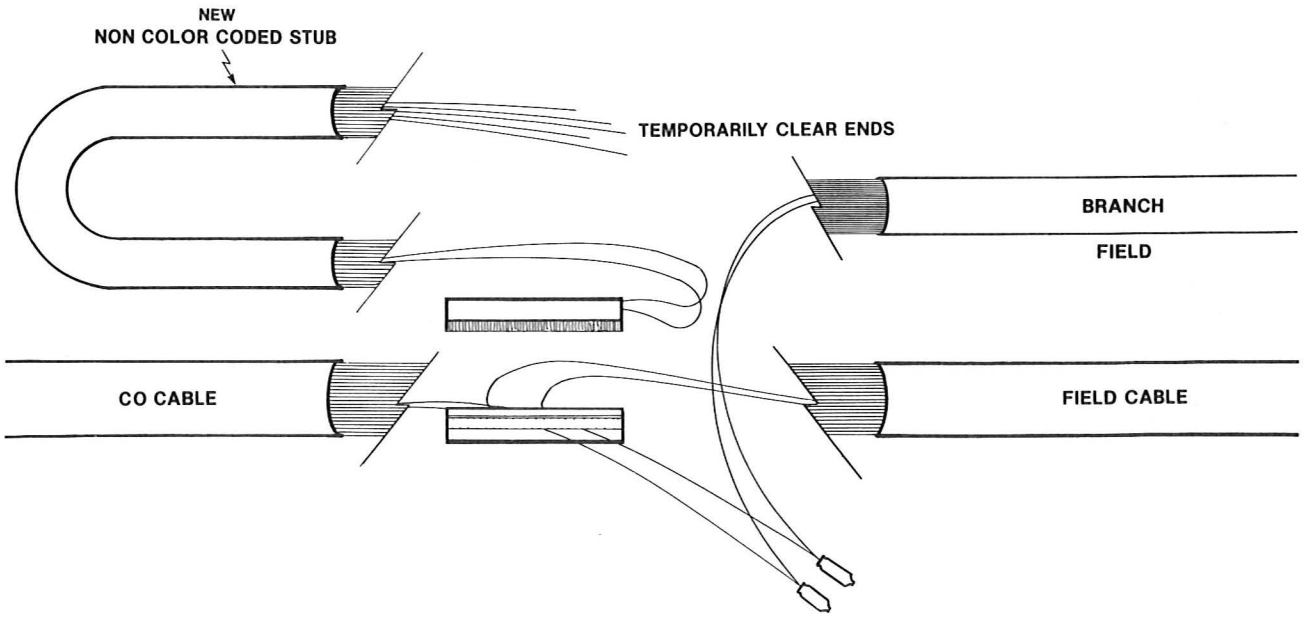



Fig. 11A




Tagging Preparation *In* Way
Fig. 11B

Fig. 12A

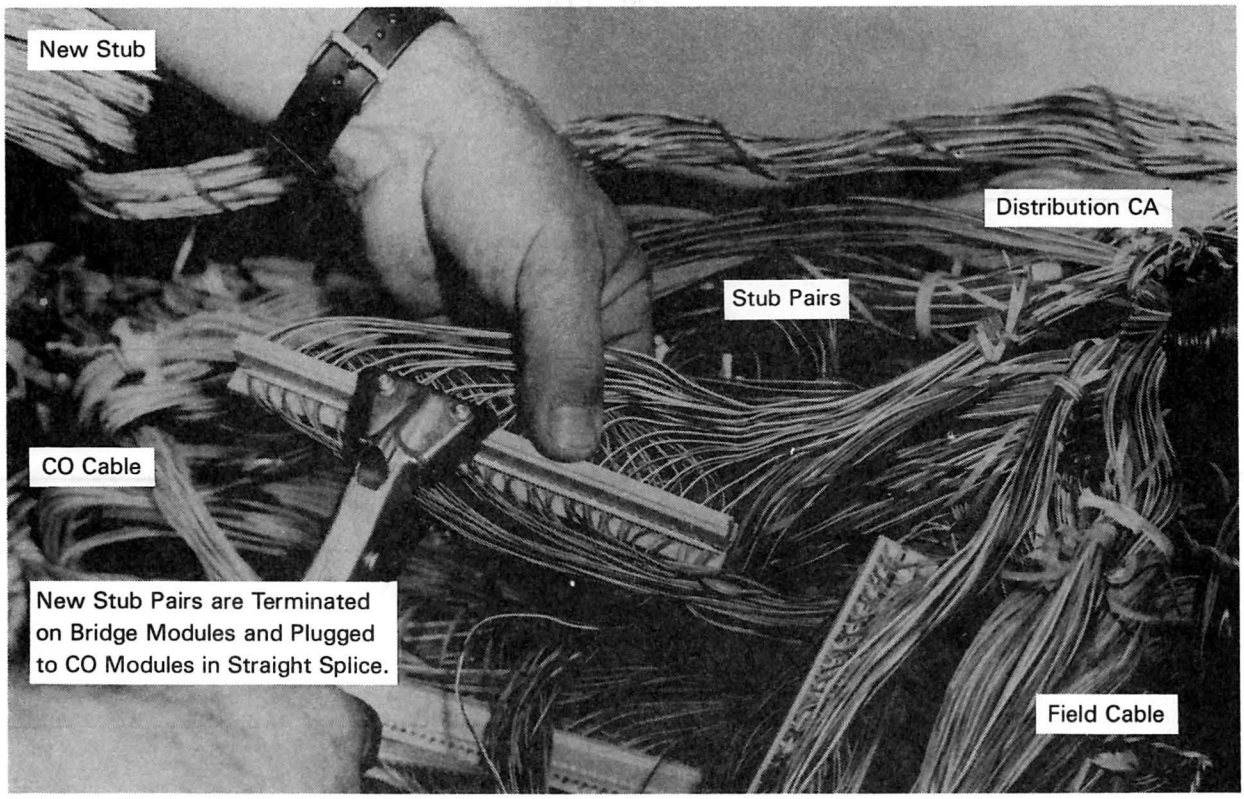
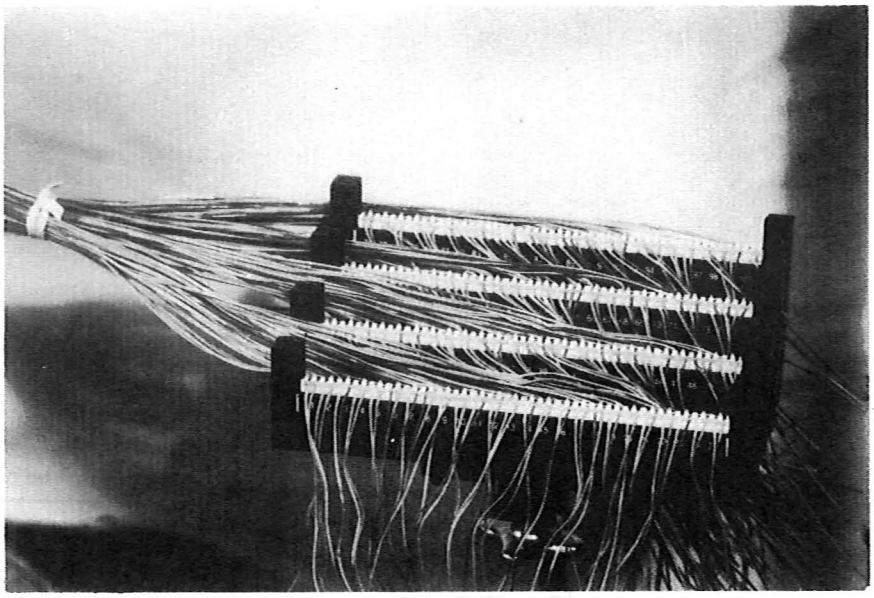



Fig. 12B



**Tagging Complete**
**Fig. 13**

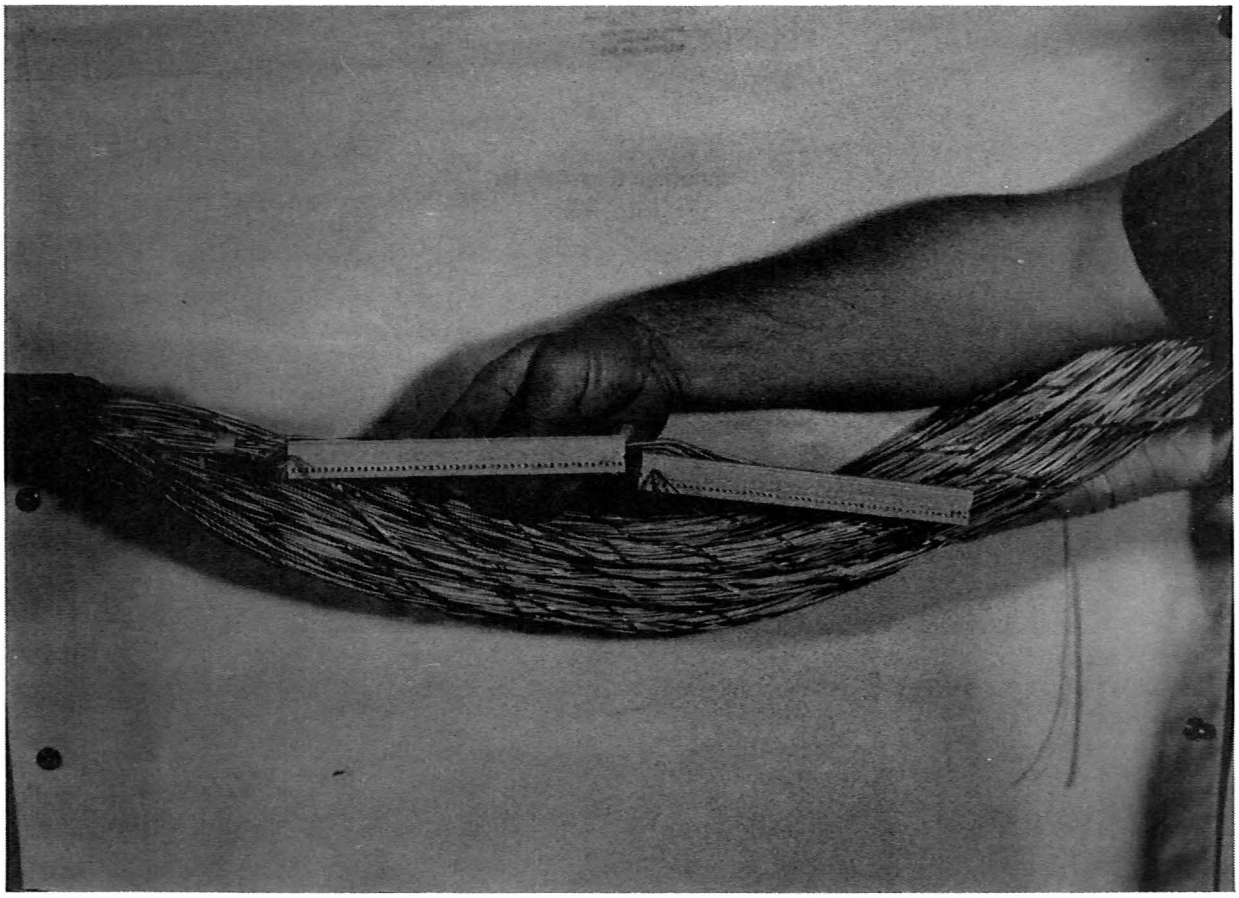
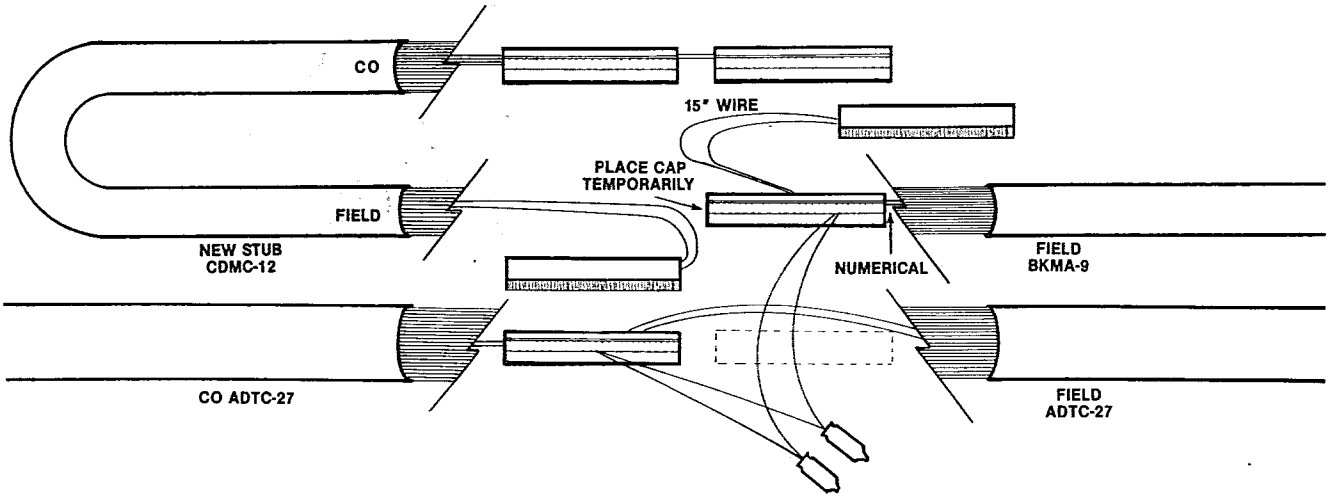
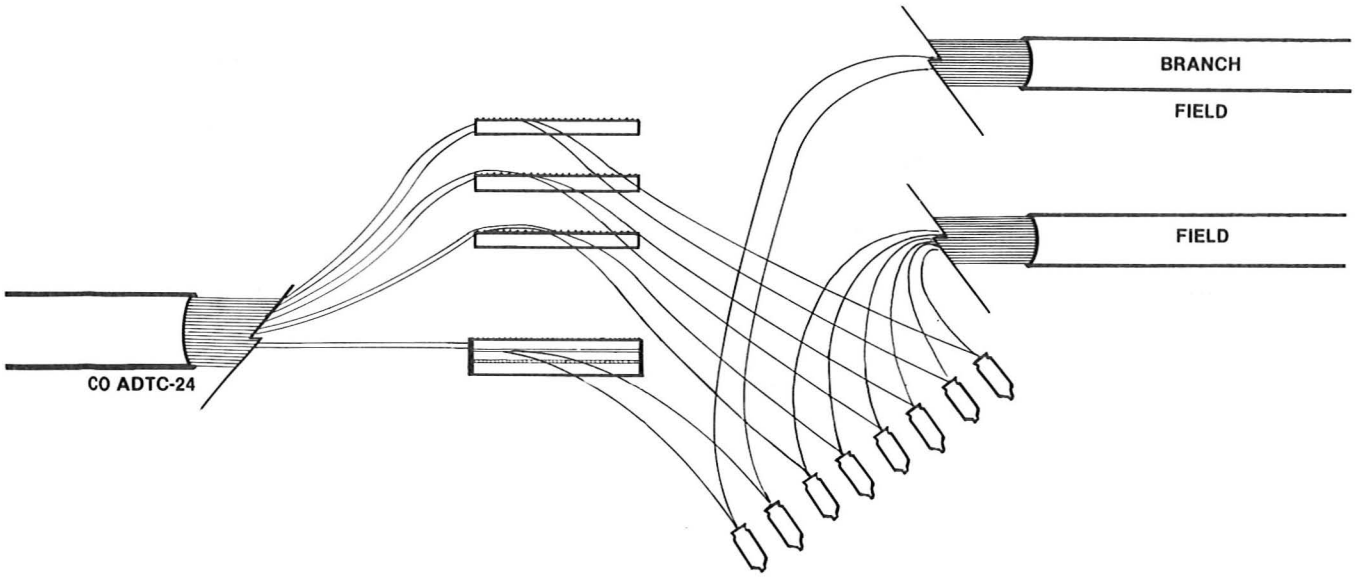


**Fig. 14**




**Prelim Complete**
**Fig. 15**




**Tagging and Rebuilding *To* Count**
**Fig. 16A**

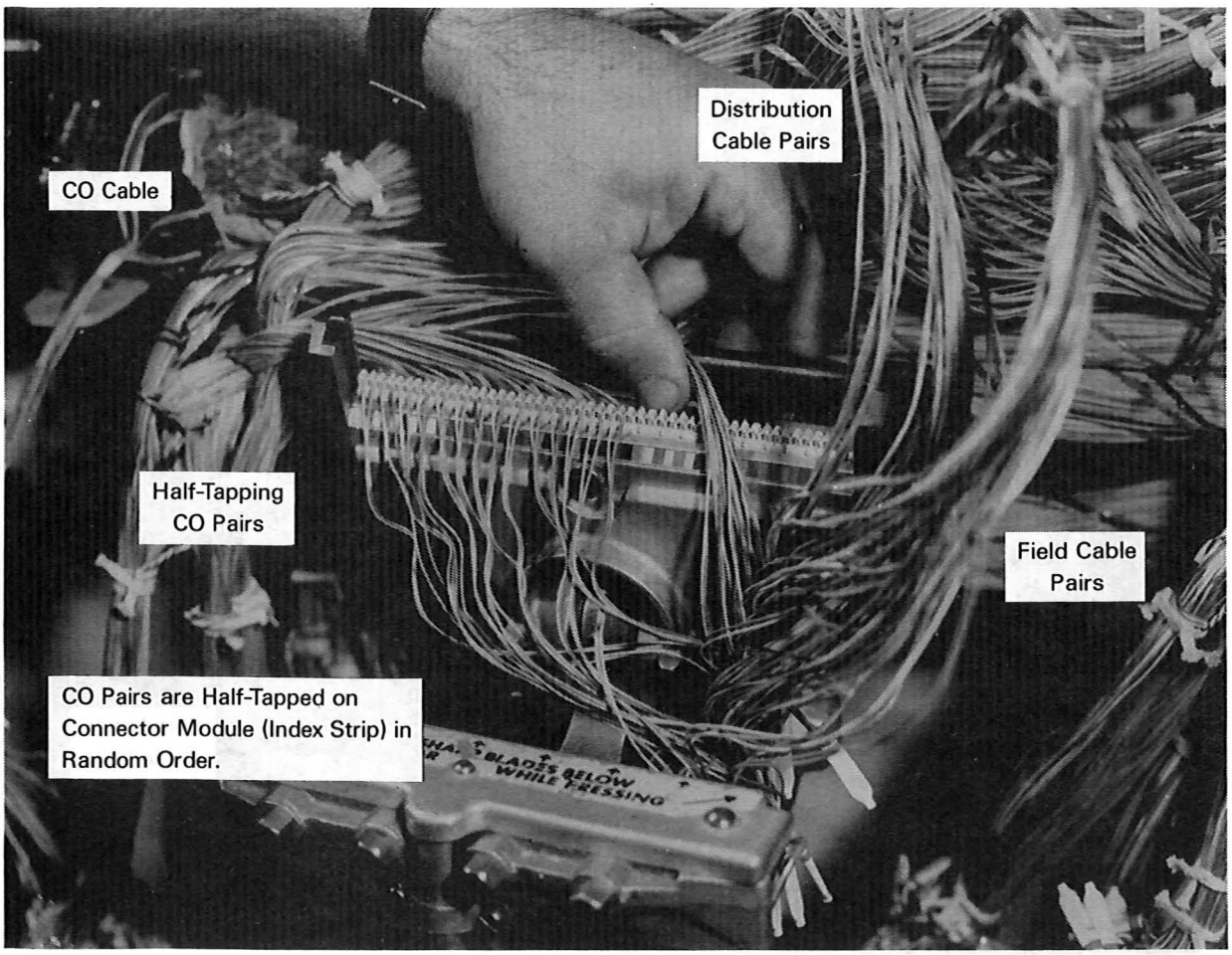
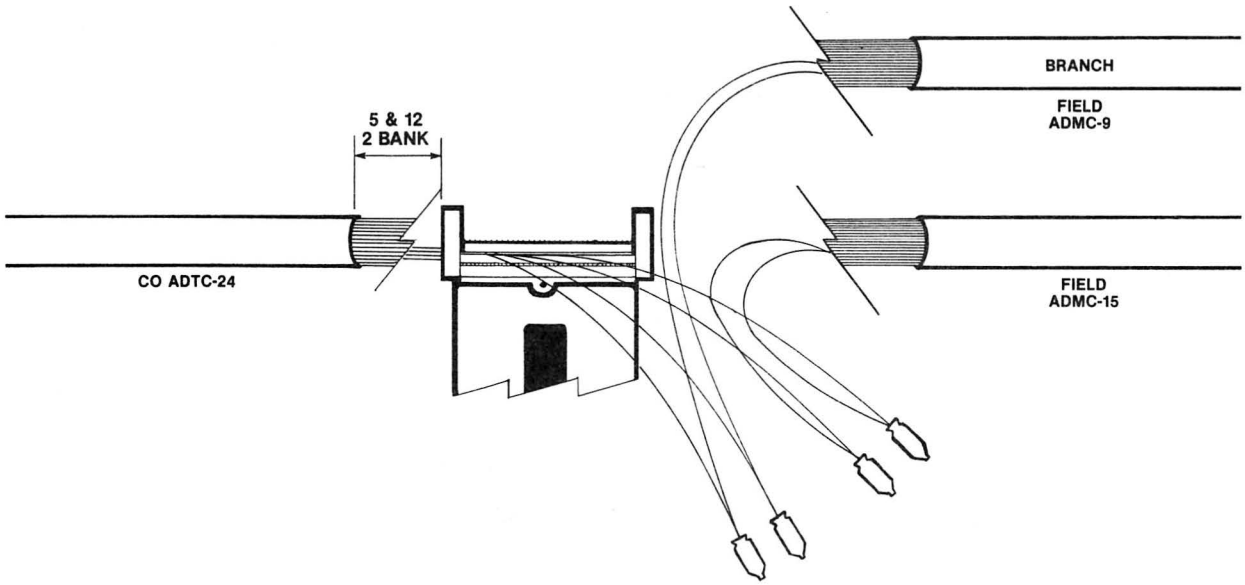



**Fig. 16B**




**Junction Splice**
**(All But *To* Count)**
**Fig. 17A**

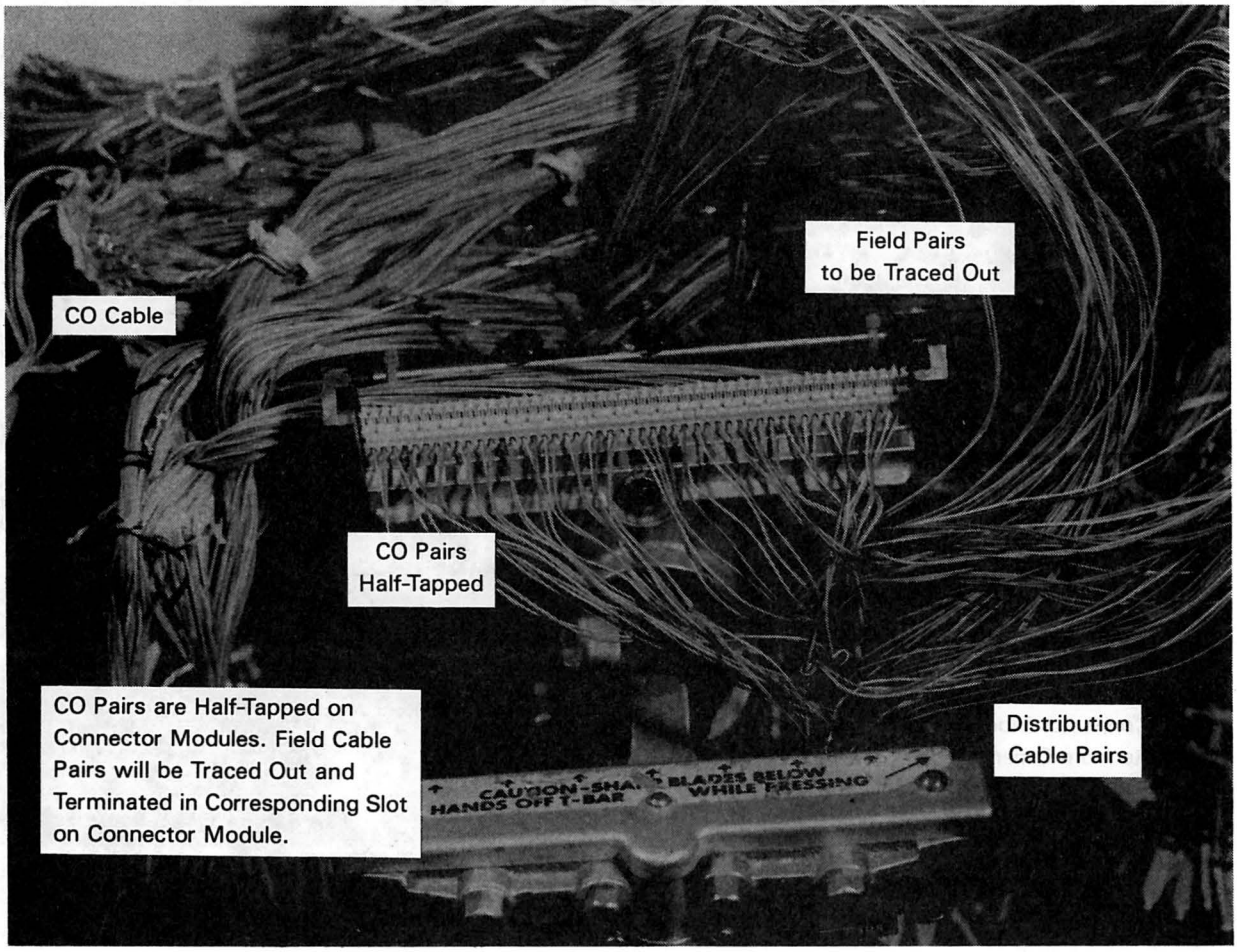



**Fig. 17B**

(4) Place all remaining pairs to be converted or rebuilt, but not transferred, of the field cables into the index strip of a connector module, tracing each conductor from the half-tapped CO cable and placing the corresponding conductor from the field cable into the same position in the index strip of the connector module.

*Note:* This is half-tapping, ***DO NOT SEVER.***

(5) Place the body of the module in the index strip and press. Place the trailing ends of the 710 tagging connector in the body of the connector module. Press, cut, and place cap temporarily.

(6) A transfer switch must be used during the conversion or rebuilding to check for reverses.

(7) Conversion or rebuilding for the non-transferring groups is completed. (See Fig. 18 for conversion to modular Junction splice.)

**4.03** Backwards Splice — Junction Backwards ( ⟨JB⟩ ), Facility Backwards ( ⟨FB⟩ ):

(a) The Junction Backwards ( ⟨JB⟩ ) and Facility Backwards ( ⟨FB⟩ ) splice is constructed with the wire dimensions and 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. 19).

(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 cables to obtain the proper wire lengths.

*Note:* All loopbacked wire will be terminated with bridge modules. All existing wire will be built with connector modules. (See Figs. 20, 21A and 21B for an example of a ⟨FB⟩ splice.)

(d) Directions for conversion.

(1) Tag the new CO pairs (stub) and terminate in bridge modules with either 27 or 40 inches of wire.

(2) Tag the existing field cable and half-tap with connector modules.

*Note:* Field pairs should enter module from the rear so the CO side can be trimmed off the front at a later time.

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

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

(5) Trim off the old CO pair and protect.

## 5. VALIDATING BACK-TAPS

**5.01** When the frame forces have placed Back-Taps on all items to be transferred, construction forces are responsible for validating the Back-Taps according to the Cable Transfer Schedule.

**5.02** The approved method for validating Back-Taps is by using an approved automatic pair identifier system and an approved transfer switch (for 50 pair or more access), the APC 300A Console, the APC CAATS unit, a combination of switches or equivalent. See Fig. 22 for a typical set up. Pairs are accessed to equipment with front tap shoes to frame connectors.

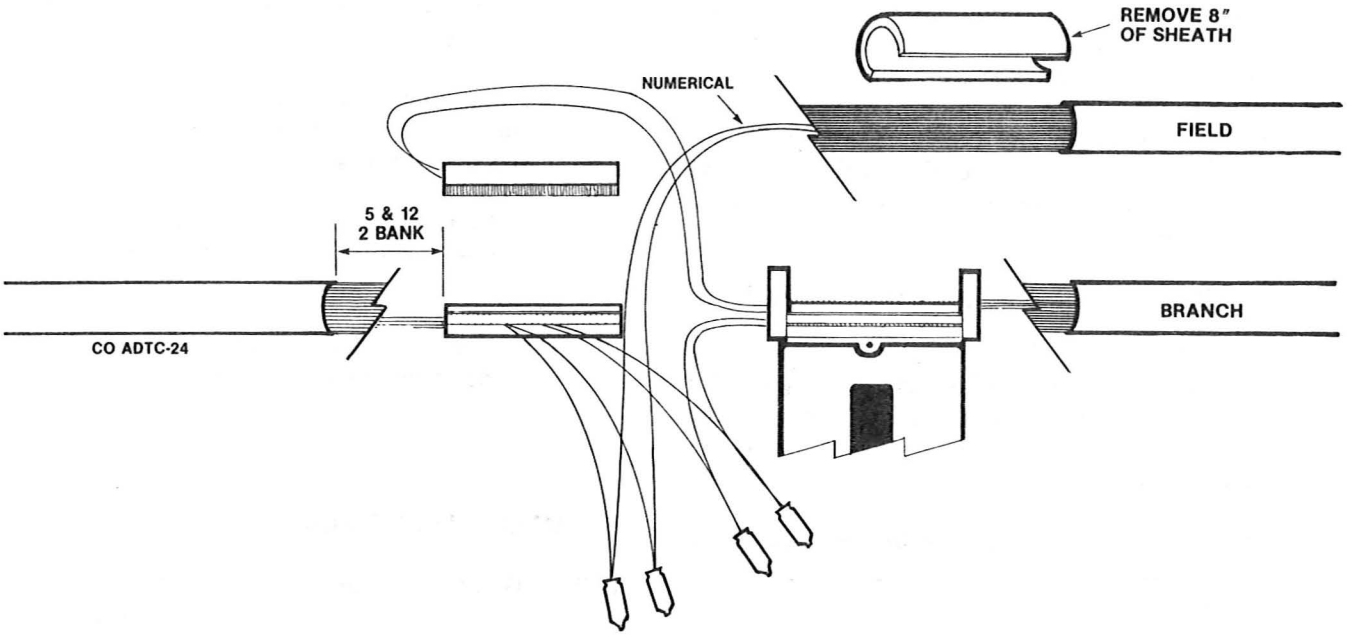
**5.03** After Back-Taps have been validated, all ***no-buzzes*** are reported to the appropriate CO forces.

- If ***no-buzzes*** were found, splicing forces will be responsible for the revalidation of all Back-Taps.

  *Note:* With Frame concurrence, the local CTAP Committee may delegate this responsibility to the Frame Forces. ***The transfer will not be started until the Back-Taps are 100% correct.***

## 6. CABLE TRANSFER — STRAIGHT AND JUNCTION SPLICES

**6.01** On the day before the transfer the splicing supervisor must confirm with the ARSB that all coordination for releases and work orders is complete. If requirements cannot be met the transfer must be rescheduled.




**Junction Splice**
**Fig. 18**

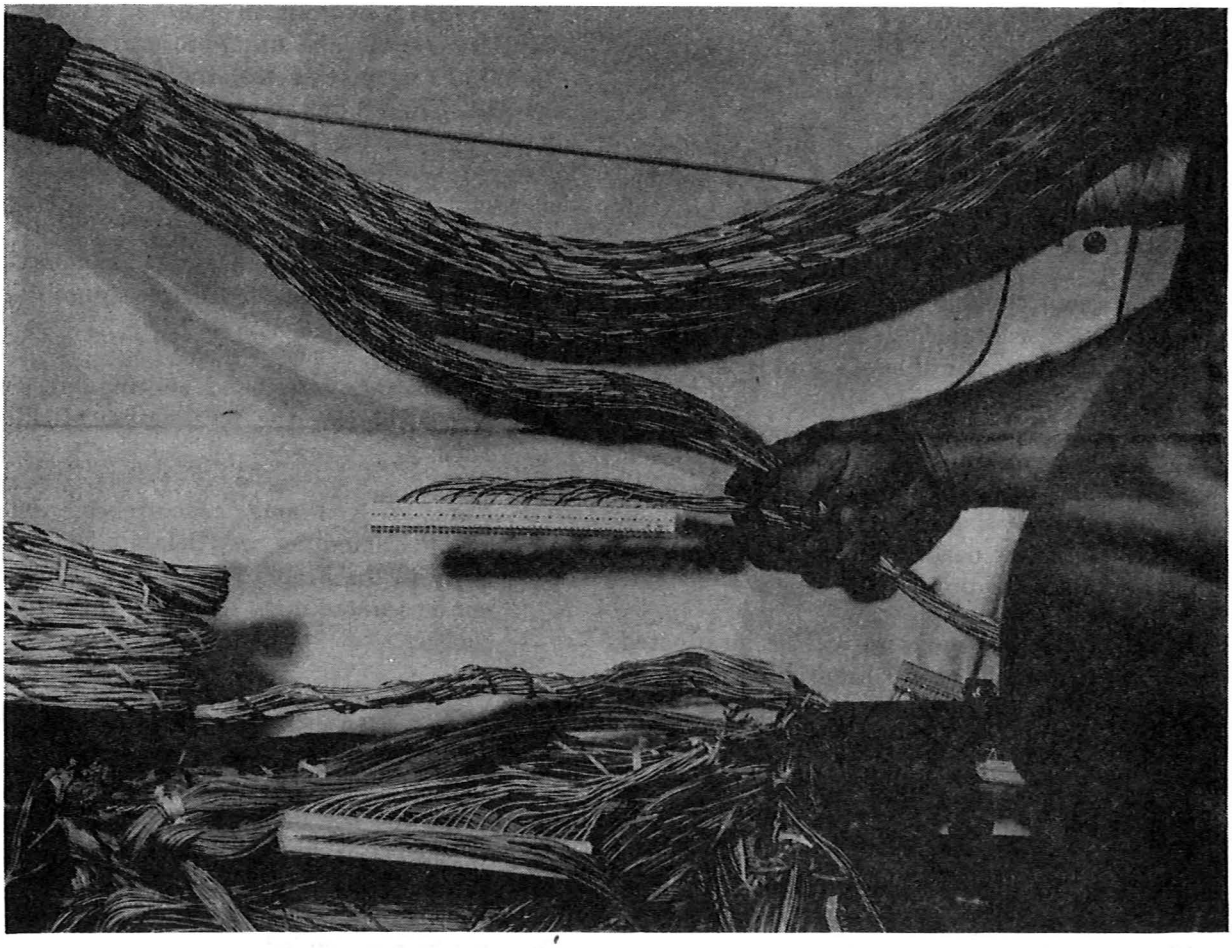
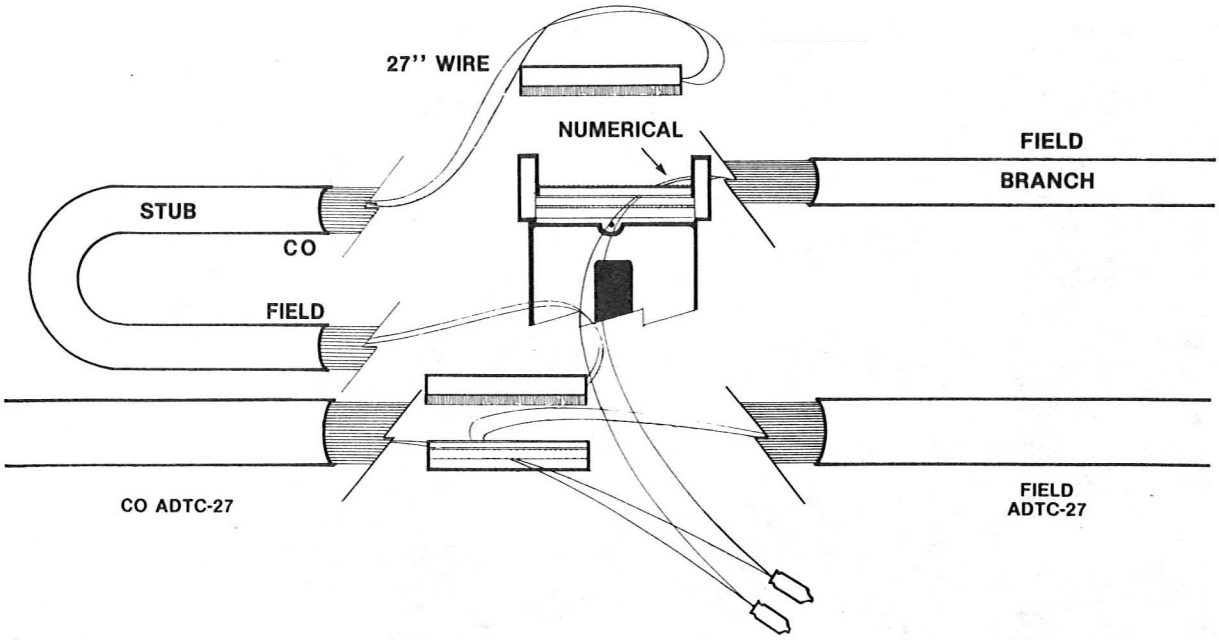


**Fig. 19**




**Backwards Facility**
**Fig. 20**

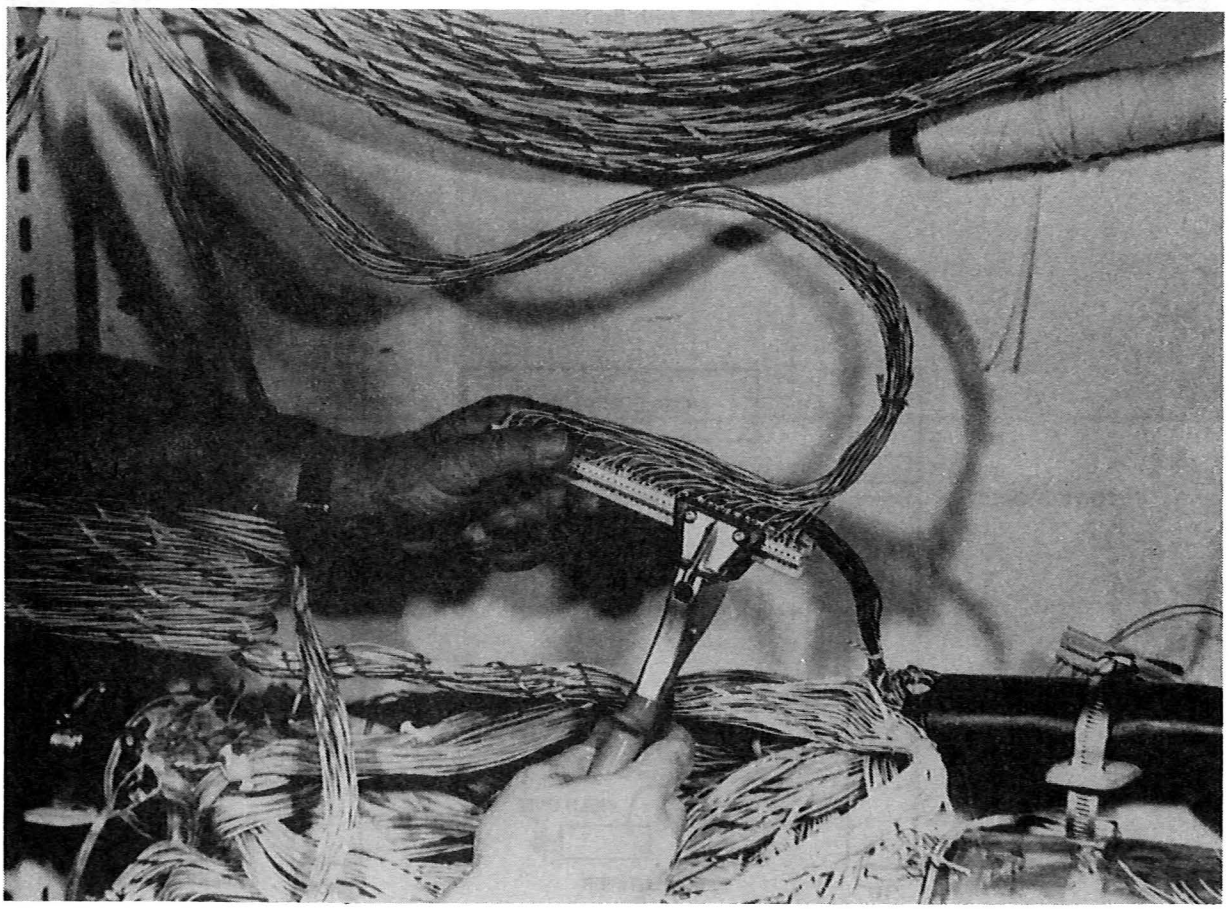


**Fig. 21A**

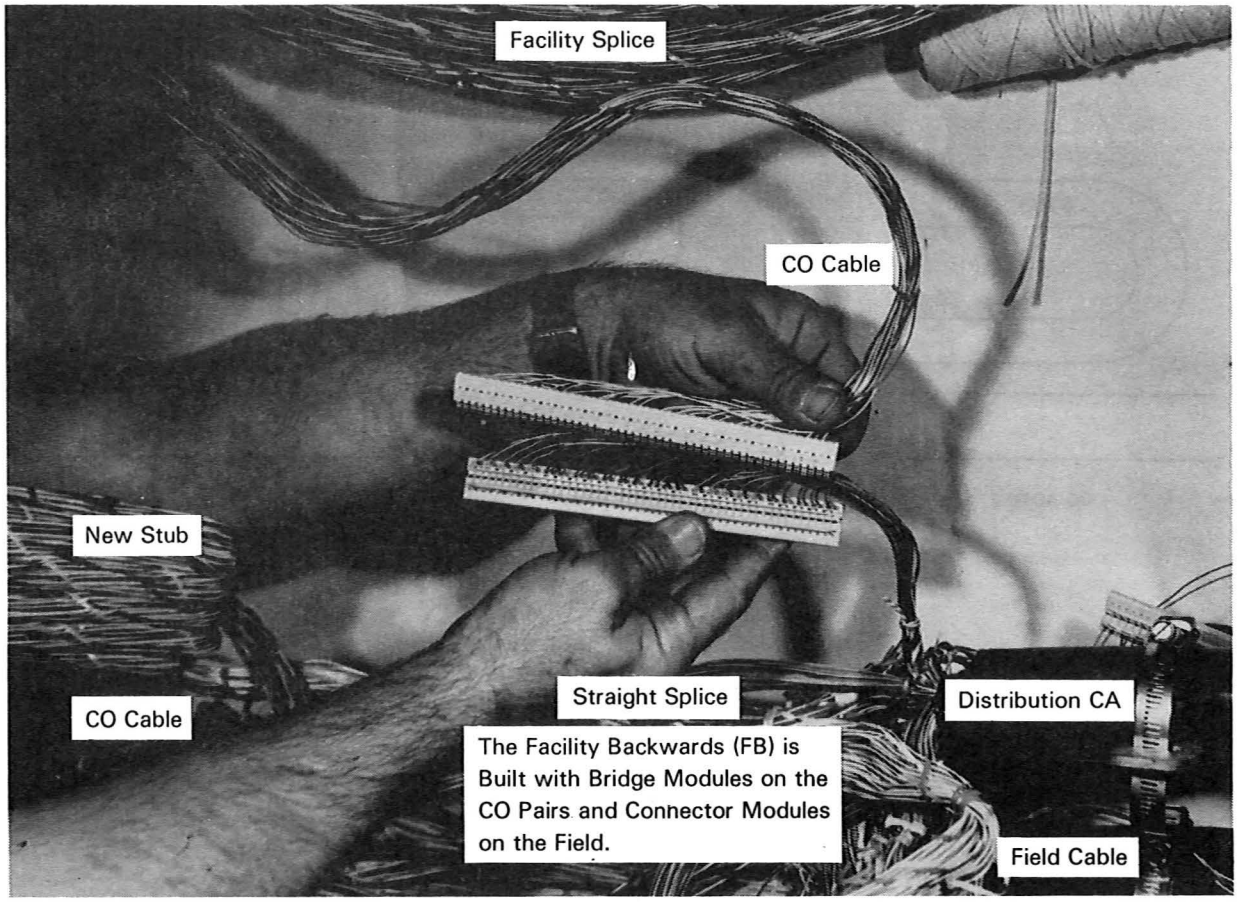
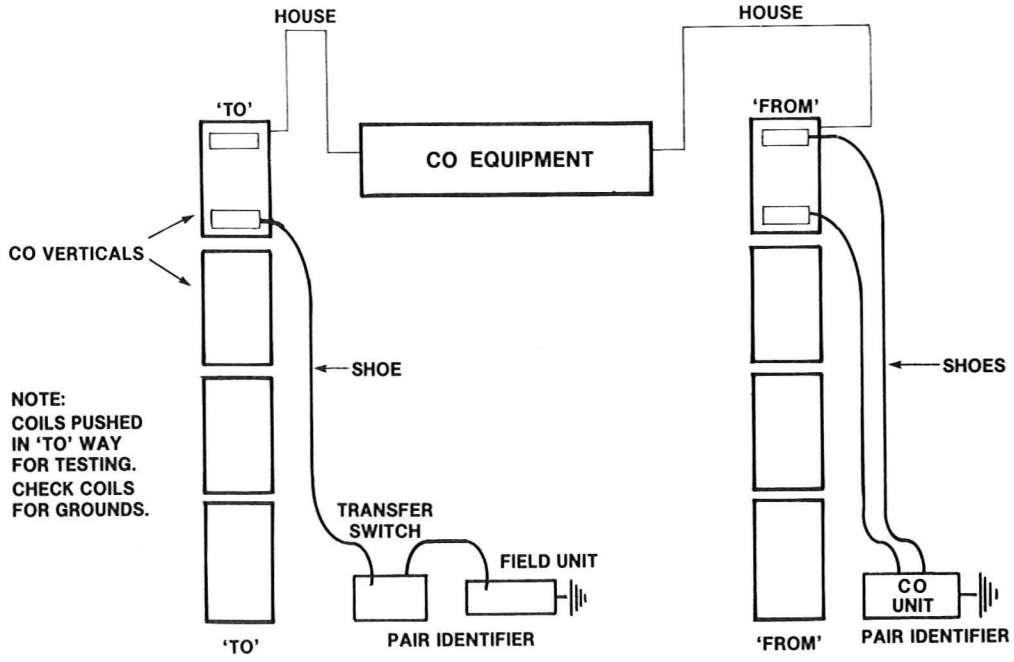



**Fig. 21B**




**Validating Back-Taps**
**Fig. 22**

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

(a) Have all required forms: P 1557 (Special Services and Defective Pair List), P 2010 (Cable Transfer Sheets), and P 2201 (Special Protection List).

(b) Call the ARSB for an opening number and any changes to the transfer.

(c) Open the splice(s).

(d) Set up a splicers talk pair.

(e) Call the CO for coils "in" on the first 25 pairs to be transferred.

**6.03** Set up approved transfer equipment according to specifications.

- All transfers must be done using an approved transfer switch, eg, the Western Progress 9120, the Perkins Research PR54D, and the Industrial Technology Inc. Throwmaster 106, or equivalent.

**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 840A tool or equivalent. Protect any pairs protruding from the module.

**6.05** Call the CO to have coils removed the "From" way and have coils placed for the next 3 hours work (Approximately 300 pairs). Call the ARSB with the status of the coils up to that point and inform them that the first 25 pairs have been transferred. The ARSB may test the first 25 pairs transferred to ensure there are no problems however, the splicer need not wait for the test and can continue on with the transfer. (See Fig. 23 for first 25 pairs transferred.)

**6.06** Continue transferring pairs until work is completed.

**6.07** For "C" special circuits which require special handling, the ARSB coordinates the release of the circuit and acts as the central point of contact for the splicer for the transfer of the pair.

(1) The splicing technician will contact the ARSB at the agreed upon time for the transfer of all "C" type circuits, at which point the splicer will be directed to the proper Serving Bureau (SVB) for each circuit requiring a release. Unless the ARSB is the SVB on any of the circuits being transferred, they need not remain on the line and may let the splicer work directly with the SVB.

(2) If field ***meets*** are required during the transfer to make adjustments to the circuit, the splicer need not remain on the line while the adjustments are being made. If trouble exists and cannot be corrected at that time, the SVB can contact the splicer on the splicer's talk pair and instruct the technician to restore the pair back to the original or old count.

(3) Every effort will be made to transfer every "C" circuit at the time agreed upon by the SVB and customer. At the agreed upon times for transfer, the splicing technician will halt all other work and contact the SVB for the release.

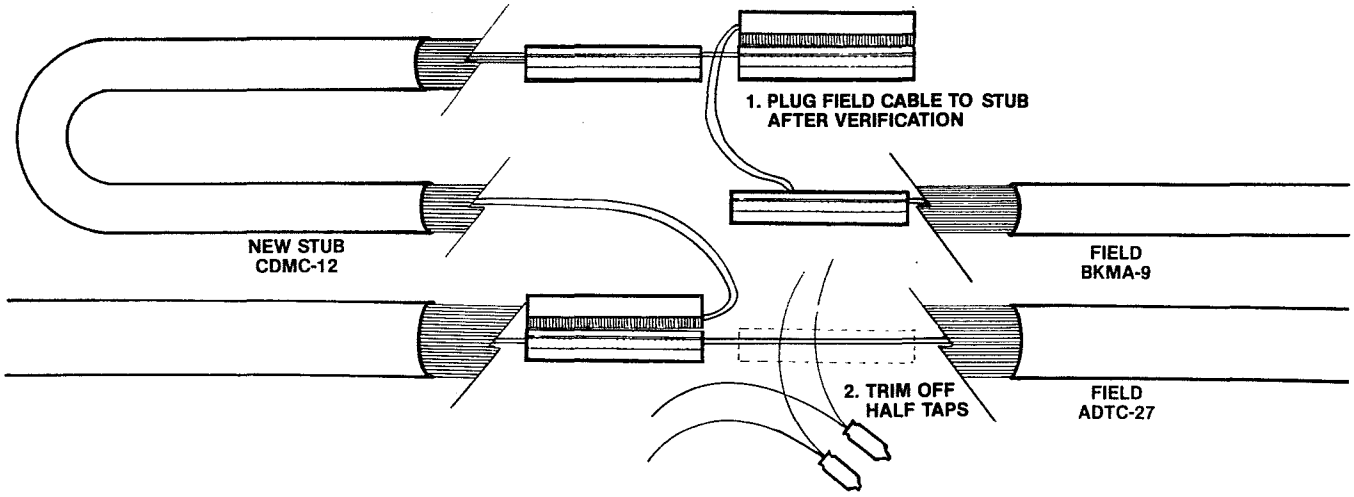
*Note:* After the initial contact with the ARSB/ Maintenance Center (MC) for direction to the proper control office, the ARSB can request that the splicer work directly with the SVB on all subsequent releases. However, the ARSB will be informed of the progress of all special circuits which are on the transfer regardless of the SVB.

(4) Prior to obtaining a temporary or permanent close at the end of the work day, the splicing technician will check with the SVB to ensure that all customers with "C" circuits being transferred are back in service ***prior*** to the splice being closed for the day.

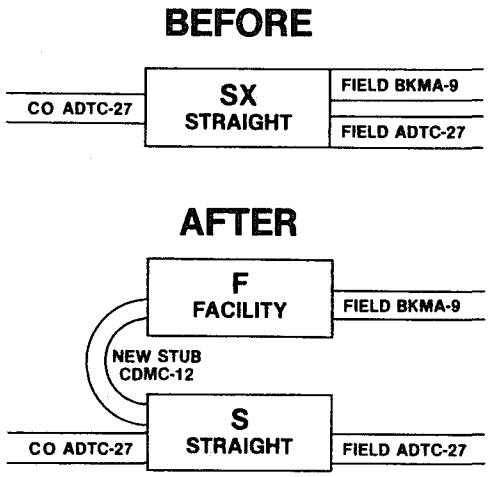
**6.08** To make the transfer of a special circuit requiring special handling in the splice, verify the new "to" pair with the old "from" pair for proper ring and tip continuity using the transfer switch. If the pairs verify, remove the temporary cap from the connector module and insert the special circuit pair in the body. Press and cut the pairs and place a permanent cap. Trim off the half-tapped wires.

**6.09** When the transfer is complete (Fig. 24) call the ARSB for a final closing and OK number.

*Note:* It is the responsibility of the splicer to call the frame forces for the placement and removal of all coils on the transfer. The splicer will not however call for the placement or removal of coils on any special circuit requiring a release from the customer. Those coils will be coordinated by the SVB having control of that circuit.




Transfer of First 25 Pairs Complete
Fig. 23




**Future transfers will be simply plug and unplug of modules**

**NO WIRE WORK**

Fig. 24

## 7. POST TEST

**7.01** Splicing forces are responsible for the post test following the completion of the transfer.

*Note:* With frame forces concurrence this responsibility may be delegated by the CTAP Committee to the frame forces.

**7.02** The procedures and equipment used for the post test are the same as those for the pre-test.

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