

HANDLING CORDS

Cords are in constant use on most positions and from their nature contribute largely to the presence or absence of confusion on a position. A proper understanding and application of the best principles for handling them is therefore of great importance. Study of, attention to, and practice in, correct cord handling will ensure smooth operating with a minimum of effort and will be a material aid in maintaining good service.

1. Selecting the next cord to use. Three methods of selecting cords are recognized. One of the three will be indicated for use in your office.

a. Rotation Method. This method has been found to be most generally applicable. It is, briefly, to use the idle pairs in order from the left of the position to the right, not using disconnected cords again until their turn comes in this order. Thus you would use the first cord pair at the left first, then the second, third, and so on till you reached and used the last pair at the right. Then you would return to the first pair at the left or to the second if the first is still in use.

In offices where it is the practice to omit the two pairs at the left and at the right from selection in the rotation, start with the third pair from the left and stop with the third pair from the right. The four pairs reserved are used only for (1) long reaches, (2) passing to adjacent operators, or (3) when all other cords are in use. Where team keys are provided, the pairs so equipped at each side of the position are reserved for these purposes as well as for use by the adjacent operator if necessary.

b. Alternating Rotation Method. This method is the same as the one described in "a" except that alternate pairs are used. Where a high proportion of calls requires ticketing and timing, this procedure minimizes the occurrence of tickets on adjacent pairs. On one rotation you would use pairs with even numbers, 4, 6, 8 etc., that are idle; on the next rotation you would use the odd numbered pairs 3, 5, 7, 9 etc. The reservation of the two end pairs is made as described in "a."

c. Selective Method. Where answering lamps are associated with subscriber multiple jacks, the selective method may be preferable. It is also applicable to call circuit "B" boards.

In the selective method, you do not actually pick up a cord until a line signal appears, so that you may select a cord reasonably near the signal to be answered, thereby minimizing cord congestion. Do not take time to decide precisely which cord to use, but develop the habit of selecting one near the side of the position, for a long reach, one toward the right for a signal on or near the right side of your position, or one in the center for a signal near the middle of your position, etc. The reservation of the two end pairs described in "a" should be followed, of course, where it applies. When waiting for a line signal, you do not have a cord in your hand, but have both hands on the keyshelf, well toward the cords and well out toward the edges of your position, but not obscuring any cord signals. From this position the hand on the side nearest a signal can pick up a cord with almost no forward motion and move toward the signal as soon as it appears.

At call circuit "B" boards, as the stile strip numbers are received, locate the called hundred block in the multiple while receiving the rest of the number and then assign a calling office trunk that is near it. It is also a good plan to avoid assigning adjacent trunks until the volume of traffic makes this step necessary.

If team cords are provided, you may switch the end cords of the adjacent positions to your position circuit. Always operate the associated team key before plugging a team cord from an adjacent position into a jack. Use them only when no cords on your position are available or an exceptionally long reach in that direction is required.

May 1, 1940.

HANDLING CORDS—Continued

- 2. **Picking up a cord.** Reach under any cords that may be in the way, to obtain the cord you wish.
 - a. **To Use Yourself.** Grasp the plug close to the keyshelf to avoid the need for tossing it to secure a better hold. Use the thumb and index finger with the palm down. By a slight elevation of the wrist as you raise your arm, you bring the cord into a position so that your three remaining fingers can move it back toward the palm of your hand. It is then in a position either to hold easily or to use at once. If you are not to use the cord at once as when waiting for a signal, draw it out from under cords in use and straight across the position, trying to keep it parallel to the keys. Many operations can be performed with a cord in the hand, but if you find that the presence of the cord will interfere, as in writing, do not hesitate to drop it.
 - b. **To Pass to Another Operator.** Grasp the plug as in "a" but close to the top of the shell, using the hand on the side of the position to which the cord is to be passed. As you reach in that direction, straighten the wrist so that the hand makes a straight line with the forearm, palm downward. This permits the operator receiving the cord to grasp it in the usual position without hesitation or delay and without any need for you to follow the movement with your eyes.
- 3. **Use of both hands in manipulating cords.**
 - a. **"A" Position—Rotation Method.** If you do not train yourself thoroughly in two-handed operation, you are apt to rely heavily on your right hand. This fails to take advantage of an intangible rhythmic swing which helps to carry you along in your work. The rules of two-handed operation can not be stated precisely nor can they be followed uniformly at all times, but as general principles of operating they should be studied, practiced, and applied as circumstances indicate. Basically they are simply the alternate use of both hands on successive operations whenever feasible, thus:

	Right Hand	Left Hand
At a given instant,	Is at multiple	Doing something on keyshelf
Next step in cycle,	Returns to work on keyshelf	Goes up to multiple
Next step in cycle,	Goes up to multiple	Returns to keyshelf
Next step in cycle,	Returns to keyshelf	Goes up to multiple
etc.		

For example, you may start with a cord in your left hand and take it to an answering jack while the right hand moves to pick up the front cord. While the order is being received and acknowledged, the right hand is raising the cord, ready to test and plug in and the left is returning to the keyshelf. The left hand restores the listening key as soon as the test is completed and rings as soon as the plug is in the jack. The right hand comes down, picks up a back cord, and answers the next signal while the left hand is completing the ringing and operating the listening key on the cord pair the right hand has selected for the next call.

The basic rule on which this procedure rests is to pick up the next cord with the hand that is free and continue the sequence from that point. This basic rule is, of course, modified when necessary because, for example, it is clumsy to cross hands or to reach far across the position. Also, many occurrences interrupt the sequence, such as disconnects, long reaches, etc. but always pick up the sequence when these conditions are disposed of, and go on from there. Some conditions that occur are listed below.

- (1) When a call must be ticketed or dialed, the right hand of course is engaged in writing or dialing and the left hand generally picks up the front cord and connects to the trunk or multiple. By that time the right hand normally is free to restore the key on that connection and operate the key on the next pair to be used while the left hand is picking up the back cord of that pair.

HANDLING CORDS—Continued

3. Continued

- (2) When you must reach far to the right and the cord is in your left hand, you must transfer it, but while the right hand is reaching, the left hand can return to operate the keys.
- (3) When cords are to be disconnected, the hand that is free at the moment may start that work while the other hand is completing its work either on the keyshelf or in the multiple.
- (4) If there is any congestion requiring use of both hands for disconnecting, the same alternation may be continued, i.e. one hand on the keyshelf locating and tracing or pulling the cord to be disconnected, the other tracing it out and disconnecting, as outlined later in "6." Of course, where several near-by cords are to be disconnected at the same time, it is not good operating to alternate the hands so long as the cords can be reached almost with one motion.
- (5) When the alternate use of the hands involves crossing arms it obviously should not be practiced.
- (6) Where listening is automatic so that listening keys do not have to be operated, more time is available for the hand not engaged in connecting a cord to a jack to trace out and take down cords having disconnect signals.
- (7) Where the cord to be picked up is far to one side of a position, it may be smoother and more natural to use the hand on that side even though it breaks the sequence.

The result of this operation is to have a cord in hand available to answer a new signal when ready to take it at nearly all times. If the hand is required for other work the cord may be released or transferred to the other hand as circumstances require.

- b. "A" Position—Selective Method. Where the selective method is used, frequently the hand with which you answer a signal is more definitely determined for you but the sequence described above can be applied from that point on. Near the outer edges of the position it may be more natural and easier to use the same hand to pick up the front cord rather than the other hand, keeping the latter free to pick up a cord in the center or nearer side of the position. Also if you are just establishing a connection on a reach toward the right and the next signal is in the same direction, the right hand had better be returned from the multiple to pick up the next cord.
- c. "B" Position. The same idea of alternating hands should be applied in so far as appearance of trunk signals permits, thus on a key listening position:

	One Hand	Other Hand
(1) While the order is being received,	Picks up cord and takes to multiple. Connects after ringing key is set by other hand.	Operates next listening key and then ringing key on first cord.
(2) Second trunk selected, order being received while connecting first cord.	Operates listening key on third trunk and sets ringing key on second trunk.	Picks up second cord and takes to multiple.

Some of the restrictions in "a" also apply, such as crossing hands awkwardly, trying to reach too far across the position with the more distant hand, etc. Furthermore, the location of signals at times interferes materially but the basic rule applied with judgment and practiced conscientiously, should be helpful.

- 4. **Plugging into a jack.** There are two different ways of plugging into a jack. In some offices the first may be used for answering, in others the second may be preferred; but the second is always used when a test is made.

HANDLING CORDS—Continued

4. Continued

- a. **Direct Approach.** The direct approach is used only in answering signals in offices when practically no attention is required to class of service or number plate. As your hand moves toward the jack, raise the plug so it is pointing in the general direction of motion, and carry it to the jack as directly as possible. Bring the plug into a position nearly perpendicular to the face of the multiple, as you approach the signal to be answered. Carefully sight the tip of the plug and the jack, so that the tip will enter the jack on first contact and can be fully seated with a continuation of the same movement used up to that point. It should be unnecessary within normal reaches to use a supplemental movement of the hand or wrist to insert the plug all the way into the jack after the tip has come in contact with it.
- b. **Slant Approach.** The slant approach is an aid in focusing your attention on the class of service or the number plate of the signal to be answered. It also aids in rapid and accurate testing. The basic principle of this technique is to retain at all times an unobstructed view of the jack. One way to do this is to carry the plug slightly above and beyond the jack with the tip pointing down toward it and with your hand slightly turned to give you full view of the jack. Another method, particularly suitable for long reaches or for reaches across the position is to hold the hand below and to one side with the plug pointing up to the jack and with your wrist bent down to keep the view of the jack clear. When you have brought the tip of the plug into contact with the jack and are ready to plug in, insert the tip while sighting the jack. Then move the plug into line with the jack and push it in.

In either of the above methods, it is important that complete contact be made between the plug and the jack. To insure this, continue the pressure on the plug until you feel that it is all the way in the jack. This pressure should be applied through the thumb and fingers to the shell of the plug. Cultivate the habit of not pushing on the cord where it enters the heel of the plug.

5. Testing jacks. When you are connecting to a jack, as distinct from answering a signal, always test unless the jack is provided with visual busy indication or is a call circuit or key indicator trunk. Also, testing is not required when you are substituting one cord for another.

After you have reached the jack as in "4b" and while still cut in on the cord, bring the plug into contact with the jack so that the tip of the plug touches the rim of the jack but does not enter it. A click indicates that the particular line or trunk tested is busy. A tone indicates that the subgroup, of which the jack tested is the master jack, is busy. An out of order tone indicates that the line is not available for service. Absence of any audible signal indicates that you may plug in, doing so as in "4b."

If the jack to be tested is the master jack for a group and there is a plug in it, when you try to test it touch the tip of your plug to the sleeve of the plug in the jack to test for the master busy tone.

If the point in a group where you normally would start testing is congested with cords, at once start in another part of the group as though the first portion of the group had tested busy.

6. Disconnecting cords. When you are ready to disconnect a cord, remember three precautions,—(1) disconnect the correct cord to avoid a cut-off, (2) do not disturb adjacent cords, and (3) do not have your eyes off the supervisory lamps on the keyshelf any longer than necessary. As an aid in disconnecting the correct cord, associate the color of the cord with that of the disconnect signal.

Make disconnecting only a manual operation to a large extent, that is, practice tracing cords with a hand rather than your eyes. When you see a signal on a cord pair which indicates that disconnection is required, let your eyes guide your hand as it grasps the cord to be taken down just above the keyshelf,

HANDLING CORDS—Continued**6. Continued**

but then let your eyes return to watching for signals while you slide the hand along the cord until you feel the plug, grasp it with the thumb and first two fingers, pull it out, and restore it to its place. Meanwhile your other hand may be doing other work with the aid of your eyes, such as answering a signal or taking a trunk, or you may be receiving an order.

If the congestion is great enough, it may be necessary to alternately loosen and tighten the stretch of cord between your hand and the jack and to locate the cord beyond the congestion with the other hand, aided by your vision for a few moments. With the cord thus located, it may be followed to the plug and disconnected, with no further visual attention.

When possible such two-handed disconnecting should be done while you are waiting and both hands would otherwise be idle, as for example, while receiving the customer's request on another connection, while waiting for the called office to answer, etc. It may at times be necessary to delay answering new line or trunk signals to clear up a group of disconnects but this should be kept at a minimum, although when it becomes necessary it is preferable to delaying advancement of a call after acknowledgment.

The alternate slackening and tightening of a cord is a signal requesting assistance in disconnecting it. Thus when you are to disconnect a cord that goes so far beyond your position that you can not reach it or would interfere with an adjacent operator if you attempted to do so, grasp the cord and alternately raise it slightly from its well so that it sags noticeably, and then tighten it until you have attracted the attention of an adjacent operator and she disconnects it for you. When you see a cord in the multiple on your position being given this signal, grasp the plug of the cord as for disconnecting, pause to be sure you feel the distinctive pull, and then disconnect, pushing it gently toward the originating position as you release it.

In general where pairs of cords are involved, cultivate the habit of disconnecting the two cords of a connection in sequence rather than one cord on each of several connections. There will be occasions of simultaneous disconnect signals when it is more natural to disconnect two back cords that are near each other and then the corresponding front cords, but try to keep such occasions at a minimum. It is desirable, though not always practicable, to disconnect the front cord of a pair first, except on boards where it is necessary to disconnect the back cord first in every case.

An important part of disconnection is returning the cord to its socket. Do this as far as possible as you disconnect, by holding the plug well above the keyshelf and then moving the hand with the cord in a straight line to the cord socket and so permitting the cord to slide back to place. Do not release the plug until it has nearly completed its travel so that it will neither slam back in place nor fall on your keyshelf. If necessary, assist it to slide back with the other hand. If the congestion prevents it from sliding, help it gently from below.

When several disconnects occur simultaneously, it may be necessary to delay this restoral while the cords are taken down. In this case, pull the disconnected cords straight out toward the front of the position and when you are ready to replace them, raise them all at once with the back of the hand until they slide back in place.

7. Changing cords. When you have occasion to change the cord in a jack, develop the ability to make the transfer with one hand. Pick up the cord to be used and take it up to the jack where the change is to be made, then, with the fourth and fifth fingers firmly holding the shell of the plug to be removed, pull it straight out clear of the multiple. Give a slight twist of the wrist to bring the new cord into position and insert it in the usual way. Then lower the first cord without altering your grasp on it.