

RYCO 011C CUT-OVER TEST SET DESCRIPTION AND USE

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1. GENERAL

1.01 This section covers the description and use of the RYCO 011C Cut-Over Test Set.

1.02 The Cut-Over Set is designed to minimize interference with working circuits when the following work operations are performed:

- Cable Transfers.
- Cable Section Replacements.
- Loading and De-Loading.

Note: This set IS NOT designed for use on carrier circuits.

1.03 The set prevents interruption of service by providing a temporary transmission path or bridge while splicing operations are performed. Continuity and correct polarity of the bridge are verified before the original path is cut. A positive indication of continuity, proper polarity, and low resistance connection of the new path is received before the Cut-Over Set connections are removed.

1.04 Red and white lamps provide a positive indication of circuit continuity and show that the sequence of transfer operations are properly conducted.

1.05 The set comes equipped with cords for cable transfers. However, an AT-8329 B Transfer Cord is required at the second splice location when making section replacements. A 111 FS Foot Switch is available as a separate item to facilitate the work operation when large complements are transferred.



RYCO 011C Cut-Over Test Set
Fig. 1

2. DESCRIPTION

2.01 The 011C Cut-Over Set is a portable, battery-operated test set. It is housed in a sturdy steel case with overall dimensions 12-13/16 inches by 9-1/8 inches by 8-3/16 inches. The removable front cover protects the panel components from damage during transport and storage. The hinged rear cover has a tray for storing transfer cords and gives easy access to the batteries. Complete with batteries and cords, the set weighs 22 pounds.

2.02 The two cords are terminated in red and white banana plugs. Mating red and white jacks are provided on the panel. The other end of each cord is terminated in a cable clip intended to be attached to the cable pairs. These clips are designed to be attached to both tip and ring sides of a pair at the same time and with the same motion. One jaw of each clip is red and the other black to ensure that the clips will be placed on the pairs in proper polarity. (See Fig. 2.)

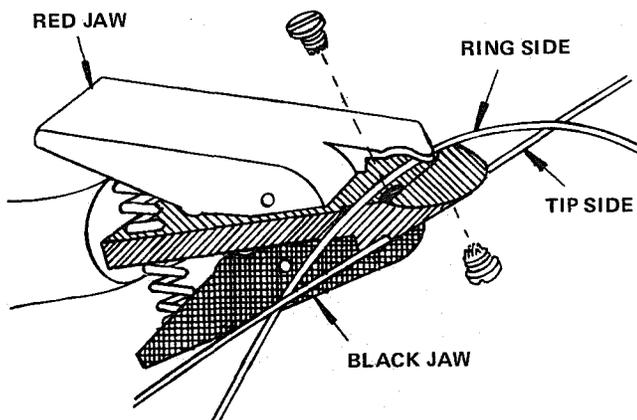


Fig. 2

2.03 Other features located on the front panel are:

- (a) Red and white lamps which give separate indications of ring and tip circuit continuity.
- (b) The VOLTS knob used to select the proper voltage for the circuit in which the transfer is being made. This knob should be in the OFF position when the set is not being used to conserve battery life.

- (c) The TEST button used to check the condition of the batteries and whether the set is operating properly.

- (d) A TEST-CUT toggle switch which introduces protective circuit elements while connections are being made and then by-passes them when the sole transmission path is through the set.

- (e) A toggle switch and two pairs of binding posts which implement the use of external batteries to extend the range of the set as required.

- (f) A receptacle for the plug attached to the foot switch.

2.04 The EXTERNAL BATTERIES switch should normally be down, in the OUT OF CIRCUIT position. If, on a long loop, the 24 volts of the internal batteries is inadequate to light the lamps, attach 24-volt batteries to the EXTERNAL BATTERY binding posts. Two separate batteries must be used, one for the ring circuit and one for the tip circuit. Observe the polarity indicated at the binding posts. With the rotary VOLTS switch in the OFF position, place the EXTERNAL BATTERIES key to the IN CIRCUIT position. Voltage in each circuit will be 24 volts higher than indicated on panel.

3. USES

(A) Cable Transfers

3.01 Make the following tests to see if set is operating properly:

1. Turn VOLTS knob to 24 and press TEST button. Both lamps should light. If not, check batteries and lamps. If ON lamp lights before button is pressed, or if after replacing batteries and lamps, the lamps do not light, return set for repairs. (See Part 4.)
2. Set VOLTS knob to the OFF position. Connect the transfer clips together (ring-to-ring, tip-to-tip). Adjust the VOLTS knob in a clock-wise direction until both lamps light. Remove the short from the clips.

Both lamps should go out. If not, set needs adjusting and should be returned for repairs.

3.02 Make the cable transfer as follows:

1. Connect transfer clips at ends of the cords to the selected OLD pair and the corresponding NEW pair. Since both clips must be attached in the same polarity, connect the red jaw of each clip to the ring side of a pair. (See Fig. 3.)
2. Adjust VOLTS knob until both lamps light. Lamps will not light if either of the pairs or the "B" transfer clips are reversed or defective. When they do light, continuity of the bridge through the NEW pair, heat coils, and jumpers is verified. If not:
 - a. The needle points may not have pierced the insulation properly to form a good connection. Squeezing the tip of the jaws may be required occasionally.
 - b. The color coding of the tip and ring sides may have been reversed at an intermediate point. Reverse one clip briefly. Remove the clip if the lamps do not light.
 - c. One of the pairs or conductors may be open or shorted. Tag both the old and new pairs and lay them aside to be checked by the test desk later.
 - d. Back-tap jumpers may have been improperly installed; tag both old and new pairs, laying them aside for further checks.
3. With the VOLTS knob set as in Step 2, remove and replace the B transfer clips a number of times. Check that the lamps go OFF when a clip is removed, and light each time it is replaced. With the lamps lit, throw the toggle switch from TEST to CUT a number of times. The lamps should stay lit in both positions. This test and adjustment establishes proper voltage for reliably checking continuity and polarity of transfers in this particular loop.
4. With the switch in the TEST position and the VOLTS knob in the position estab-

lished in Step 3, connect the Cut-Over Set to a selected OLD pair or bridge and to the corresponding NEW pair. Make the connection to the OLD pair toward the subscriber from where the cut will be made. (See Fig. 3.) Be careful to observe polarity.

Note: The toggle switch should always be in the TEST position when connecting or disconnecting the set or when adjusting the VOLTS knob. This introduces circuit elements which minimize impulse noise or 'hits'. If the switch is inadvertently left in the TEST position while transferring a normal pair forming a transmission loop, service will not be affected. If the pair is split or is being used in a special circuit, so that the two wires are not part of a loop carrying the same information, interference can occur unless the switch is in the CUT position.

5. Both lamps should be lit. If they are, proceed with the transfer. If the lamps are not lit, refer to Step 2.
6. With the lamps lit, throw the toggle switch to CUT. Cut the old pair or bridge, one conductor at a time. As each conductor is cut, the corresponding lamp will go OUT.
7. Splice one conductor of the OLD pair or bridge to the newly assigned pair. When splicing, follow color code of clips, that is, splice wires together that are connected to the same colored jaws. If neither lamp lights, remove the splice and ensure that an inadvertent attempt to splice tip-to-ring is not being made.
8. When the first side is properly spliced, one lamp will light. When the second conductor is spliced the second lamp will light, indicating that a proper, low resistance splice is made.
9. After both sides of the pair are spliced, throw the toggle switch to TEST and remove clips. Lamps will go out; set is ready for the next pair to be transferred. Both clips must be disconnected before either is attached to another pair.
10. Repeat Steps 4 through 9 for each working pair to be transferred.

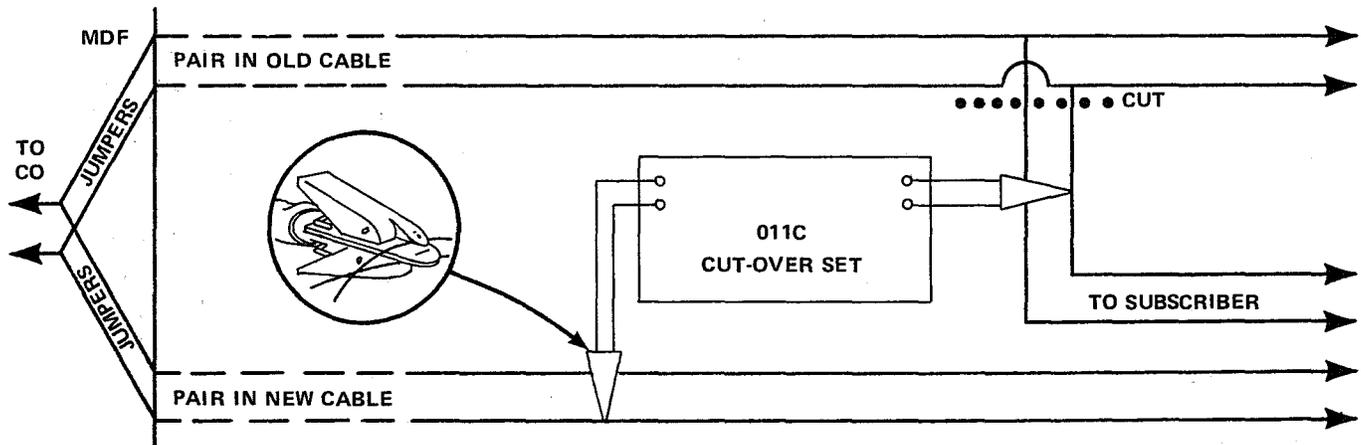


Fig. 3

11. Transfer the nonworking pairs using the conventional methods.

(B) Section Replacement

3.03 Test the set to check batteries and lamps as described in 3.01. Adjust set as follows for section cut-over.

1. Select a good pair in the NEW cable for use as the Half-Tap Pair. Connect the Cut-Over Set to the Half-Tap Pair at one splice location. Connect one end of an AT-8329 Transfer Cord to the Half-Tap Pair at the other splice location. Since both clips must be attached in the same polarity, connect the red jaw of each clip to the ring side of the pair. (See Fig. 4.)
2. Apply tone to one of the working pairs to be transferred at one splice location. Locate this pair at the other location.
3. With toggle switch in TEST position and VOLTS knob OFF, connect set to the working pair just identified. At the other location, connect the Transfer Cord to this pair. Make both connections to the working pair outside of the section to be cut out, away from the other splice location. (See Fig. 4.) Be careful to observe polarity.
4. Adjust VOLTS knob until both lamps light. Lamps will not light if either of the pairs or "B" transfer clips are reversed or defective. When lamps light, continuity of the bridge

through the Half-Tap Pair is verified. If not:

- a. The needle points may not have pierced the insulation properly to form a good connection. Squeezing tip of the jaws may be required occasionally.
 - b. Color coding of tip and ring sides may have been reversed at an intermediate point. Reverse one clip briefly. Remove clip if lamps do not light.
 - c. One of the pairs or conductors may be open, shorted, or improperly identified.
5. With the VOLTS knob set as described in Step 4, remove and replace "B" transfer clips a number of times. Check that lamps go out when a clip is removed, and light each time it is replaced. With lamps lit, throw toggle switch from TEST to CUT a number of times. Lamps should stay lit in both positions. This test and adjustment establishes proper voltage for reliably checking continuity and polarity of transfers in cable between these particular locations. This established voltage may need to be increased once during the transfer to compensate for various line conditions encountered. Spare pairs, working lines on-hook, and working lines in use present different conditions to the test set. Continue to use the increased voltage for the balance of the cut.

Note: Under some circumstances, it may be easier to adjust the VOLTS knob if connec-

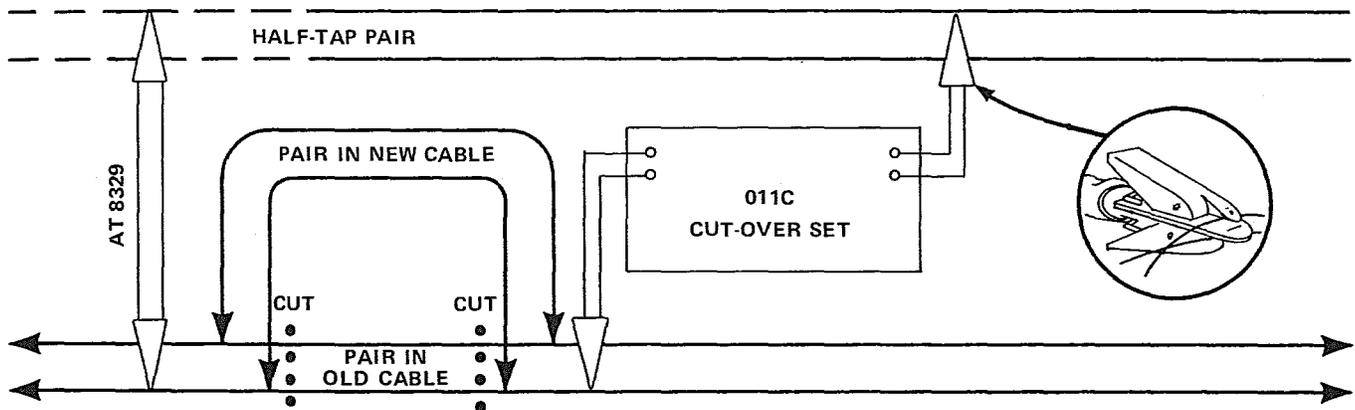


Fig. 4

tions to the Cut-Over Set are exchanged (right to left, left to right). Extremely long sections may require the attachment of external batteries to the set using the posts provided.

3.04 Begin cutting over section as follows:

1. Apply tone to one of the OLD pairs to be transferred at one splice location. Locate this pair at the other location.
2. With the Cut-Over Set toggle switch in the TEST position and the VOLTS knob OFF, connect the set to the pair just identified. At the other location, connect the Transfer Cord to this pair. Make both connections to the pair outside of the section to be cut out, away from the other splice location. (See Fig. 4.) Always connect the red jaw of the transfer clip to the ring conductor of a pair.
3. Both lamps should be lit. If they are, proceed with the transfer. If the lamps are not lit:
 - a. The needle points may not have pierced the insulation properly to form a good connection. Squeezing the tip of the jaws may be required occasionally.
 - b. Color coding of tip and ring sides may have been reversed at an intermediate point. Reverse on clip briefly. Remove the clip if the lamps do not light.
 - c. The OLD pair may be open, shorted, or improperly identified.
4. With lamps lit, throw toggle switch to CUT. Cut the working pair at each location, one conductor at a time. The lamps will go OUT.
5. At the opposite end of the cut from the Cut-Over Set, splice in a cable pair selected from the NEW complement, ring-to-ring and tip-to-tip.
6. At the location where the Cut-Over Set is being used, splice in one conductor of the selected NEW pair. If neither lamp lights, remove the splice and make sure that the pair is correctly identified and that an inadvertent attempt to splice tip-to-ring is not being made.
7. When the first side is properly spliced, one lamp will light. When the second conductor is spliced the second lamp will light, indicating that a proper, low resistance splice was made.
8. When both lamps are lit, throw the toggle switch to TEST and remove the transfer clips from the working pair. Lamps will go OUT. Both clips must be disconnected before either is attached to another pair.
9. Repeat Steps 1 through 8 for each pair transferred.

Note: The toggle switch should always be in the TEST position when connecting or disconnecting the set or when adjusting the VOLTS knob. This introduces circuit elements which minimize impulse noise or 'hits'. If the switch is inadvertently left in the TEST

position while transferring a normal pair forming a transmission loop, service will not be affected. If the pair is split or is being used in a special circuit, so that the two wires are not part of a loop carrying the same information, interference can occur unless the switch is in the CUT position.

(C) Loading and De-Loading

3.05 Test the set to check batteries and lamps as described in 3.01.

3.06 The procedure for splicing loads into a working circuit is as follows:

1. With the VOLTS knob at OFF and the toggle switch on TEST, connect the Cut-Over Set to the cable pair. One of the cords supplied with the set should be connected to the right of the load, and the other cord connected to the left of the load. (See Fig. 5.)
2. Adjust the VOLTS knob until both lamps light. If the transfer clips are not reversed and are making effective contact, the lamps should light at a low voltage.
3. With the lamps lit, throw the toggle switch to CUT. Cut the pair between the transfer

clips, one conductor at a time. As each conductor is cut, the corresponding lamp will go out.

4. Splice the load into the working pair. If connections are not reversed and the coil is not defective, both lamps will light. If one or both lamps are not lit, correct the trouble immediately.
5. With the lamps lit, return the toggle switch to the TEST position and remove transfer clips from the pair. Lamps will go out.
6. Leave VOLTS knob set at established voltage and connect transfer clips to another pair which is to be loaded.
7. Repeat Steps 1 through 6 for each working pair to be loaded.

3.07 With minor changes in procedure, this same method (3.06) may be used in deloading cable or in changing the location of load coils in working cable.

3.08 In very critical circuits, an additional precaution against interference may be taken by splicing in only the ring side of the load on one end. Then go to the other end of the load and splice in the ring side. One lamp should light. Then the splices can be completed with no chance of reversed connections.

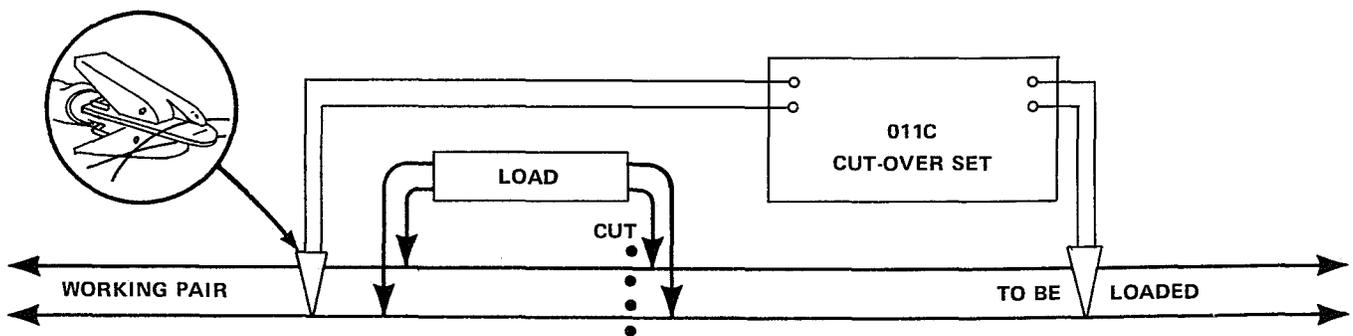


Fig. 5

4. CARE AND MAINTENANCE

4.01 Field maintenance of the set is limited to replacing batteries and lamps.

4.02 Batteries: Two KS-7120, 22-1/2 volt, and six KS-6522, 1-1/2 volt batteries are required.

Note: The front panel TEST button is used to make a qualitative test of battery voltage before starting to use the set. It also verifies that relays and lamps are working. Both lamps should light when rotary switch is in 24-volt position and button is pressed.

4.03 To replace the batteries, turn the fasteners on the back of the set 1/4 turn, counter-clockwise, to open the hinged covers.

4.04 Lamps: A type 43 or 1490 lamp is required. These are commercially available. The 43 type gives a brighter indication. The 1490, though dimmer, provides longer lamp and battery life.

4.05 Unscrew the plastic lamp covers to replace lamps.

4.06 If the set does not operate properly after replacing batteries and lamps, use the local Service and Return Program to return the set for repairs.

The first part of the report is devoted to a description of the work done during the year. It is divided into three sections: (a) the work done in the laboratory, (b) the work done in the field, and (c) the work done in the office.

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