CLOCK CIRCUITS

TESTS

1. GENERAL

1.01 This section describes the tests to be made on clock circuits for common systems. The tests are as follows:

(A) Position Clocks.

(B) Master Clocks.

(C) Secondary Clocks.

1.02 This section is reissued to arrange for its application to time of day service clock circuits.

1.03 The chief operator should be notified before any operating room clocks are reset, so that action can be taken to correct the timing of calls.

2. METHOD

(A) Position Clocks

2.01 Inspect the clocks to see that they are running properly and that they show uniform time indication. Individual clocks which are slow should be advanced by movement of the armature manually. Individual clocks which are fast should be retarded by operating the armature and holding it in an operated position until in step with other clocks.

Note: In connection with time of day service, position clock should be advanced or stopped by operating the clock control key to its STEP or STOP position as covered by the note under 2.02.

2.02 Check time of position clocks with the time of master clock or secondary wall clock provided for that purpose. In case of differences between position clocks and master clocks the position clocks should be reset by means of the reset key in the master clock set. To accomplish this, all position clocks may be advanced at the same time by operating the reset key the desired number of times. All position clocks may be retarded at the same time by holding down the reset key the desired length of time.

Note: In connection with time of day service, when the time indicated on the position clock does not read correctly, it should be reset by operating the clock control key to its STEP or STOP position as required, in order to synchronize it with its associated master clock. By operating the key to its STEP position (non-locking) the clock will be given an additional pulse to advance its position 7-1/2 seconds. By operating the key to its STOP position (locking) the advancement of the clock is stopped. The key should be released only when the second hand of the associated master clock reaches the white segments or the first half of any quarter minute. The position clock should read 7-1/2 seconds faster than the associated master clock when the second hand of the associated master clock reaches the green segments or the second half of any quarter minute.

2.03 Operate contact transfer key and observe operation of position clocks for one minute. When, in making these tests, impulses are obtained over an emergency circuit for exchanging impulses between two offices, the chief operator at the distant office should be notified, before operating the transfer keys so that the transfer keys in the distant office will not be operated during the test. In cases where return impulses are not furnished from the office under test, this precaution will not be necessary.

2.04 Test each of the master, sub-master and group relays and keys by operating each relay key separately and observing the operation of position clocks controlled by that key.

2.05 Test emergency group relay equipment by substituting for regular group relay equipment.

(B) Master Clocks

2.06 Check non-synchronized grand master clocks, when used, by comparing with accurate time to be obtained locally.

2.07 Check synchronized master clocks, when used, for proper response to synchronizing magnets. The minute hand should be on twelve for clocks synchronized on the even hour and on the three for clocks synchronized fifteen minutes after the hour. Where the minute hand is not on the proper figure when the synchronizing impulses are received, the synchronizing magnet should move the minute hand to the proper figure.

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2.08 Check non-synchronized district and building master clocks, when used, by comparing with accurate time to be obtained locally.

2.09 Check synchronized district or building master clocks, when used, for proper operation of synchronizing magnets. The minute hand should be on twelve for clocks synchronized on the even hour and on the three for clocks synchronized fifteen minutes after the hour. Where the minute hand is not on the proper figure when the synchronizing impulses are received, the synchronizing magnet should move the minute hand to the proper figure.

2.10 When synchronized master clocks of any of the above types require resetting, proceed as follows:

2.11 Master Clocks Synchronized on the Even Hour: Move the hour hand to the desired point either forward or backward. The minute hand may be moved forward or backward for setting to twelve. The locking device will not permit backward movement beyond this point.

2.12 Master Clocks Synchronized Fifteen Minutes After the Hour: Set in the same manner as described in 2.11 except that minute hand may be moved forward or backward for setting to three. The locking device will not permit backward movement beyond this point.

2.13 To correct a synchronized master clock that is fast to a greater extent than can be corrected by turning the minute hand backward, as described in 2.11 and 2.12, it will be necessary to turn both the hour and minute hands the proper amount.

2.14 To check the proper position of the minute hand with respect to the proper relation to the synchronizing device, move the minute hand backward as far as the locking device will permit. In this position the minute hand should be at the synchronizing point which is either twelve or three. The sending point for closure of contacts for the synchronizing of other master clocks should also be checked. If the minute hand does not come in the proper position, remove it and replace as required.

2.15 Emergency master clocks should be placed in service after the regular clocks have been checked and allowed to remain in service 24 hours when they should be replaced by the regular clocks. The emergency clocks should be checked immediately after placing in service as outlined in 2.06 to 2.09.

(C) Secondary Clocks

2.16 Check time of secondary wall clocks by comparing them with the master clock which operates them. The secondary clocks are attached to the wall so that they may be moved out from the wall enough to allow access to the hand setting thumb nut located on the back of the movement. This hand setting thumb nut is so arranged that the clock may be set forward or backward any amount by turning the nut.

2.17 If all secondary clocks are slow, they may be set ahead by operating the relay which operates them a sufficient number of times.

2.18 If all secondary clocks are fast, they may be retarded by holding the armature of the relay which operates them in an non-operated position or by opening the SEC switch in the clock.

2.19 Check the operation of transfer keys, relays and emergency trunk when used. Operate the contact transfer key and observe the operation of the secondary clocks for one minute. When, in making these tests, impulses are obtained over an emergency circuit for exchanging impulses between two offices, the chief operator at the distant office should be notified, before operating the transfer keys so that the transfer keys in the distant office will not be operated during the test. In cases where return impulses are not furnished from the office under test, this precaution will not be necessary.

2.20 Test each of the master, sub-master and group relays and keys by operating each relay key separately and observing the operation of the secondary clocks controlled by that key.

2.21 Test the emergency group relay equipment by substituting for regular group relay equipment.

3. REPORTS

3.01 The required record of the tests should be entered on the proper form.