NO-SUCH-NUMBER TONE SUPPLY

ALARM ROUTINE, MANUAL TRANSFER

AND TROUBLE CLEARING PROCEDURES

COMMON SYSTEMS

1. GENERAL

1.01 This section covers the methods of handling alarms on no-such-number tone supply circuits, manually transferring the load from one tone generator to the other, and procedures to be followed in clearing trouble.

1.02 This section covers circuits arranged for both automatic and manual transfer (SD-96357-01) and those arranged only for manual transfer (SD-96295-01). It is arranged as follows:

1. GENERAL

2. CIRCUIT FEATURES

   (A) SD-96357-01
   (B) SD-96295-01

3. ALARM ROUTINE

   (A) SD-96357-01
   (B) SD-96295-01

4. LOCATING AND CLEARING TROUBLE

   (A) SD-96357-01
   (B) SD-96295-01

5. MANUAL TRANSFER

   (A) SD-96357-01
   (B) SD-96295-01

6. RECORDS

1.03 It may be found desirable periodically to alternate the load between the two tone generators in order to insure that the spare circuit will always be in serviceable condition.

1.04 Whenever trouble is cleared on these circuits, or the load is transferred either on a routine basis or because of trouble, a test should be made to verify that the associated circuits are receiving tone of the proper volume and pitch.

2. CIRCUIT FEATURES

(A) SD-96357-01

2.01 This circuit is provided with duplicate tone generators, consisting of vacuum tube oscillator-amplifier circuits. By means of the transfer (TR) key, either generator may be connected to the load. If the tone generator normally connected to the load should fail, the transfer circuit functions to energize the idle tone generator, and, after it has reached its operating condition, to transfer the load to it. The TR lamp is lighted as an indication that the load has been automatically transferred. This transfer will remain in effect until the REL key is operated, regardless of subsequent failures.

2.02 Each six seconds while the circuit is supplying tone, a check is made of the voltage between the filament and plate of the oscillator tube. If this voltage becomes too great, it is an indication that the oscillator tube is in poor condition and should be replaced. This causes an NT alarm to be given and the automatic transfer of the load to the idle tone generator.

2.03 A white lamp, designated 1 or 2, is associated with each tone generator. When lighted it indicates that the generator is energized, but is not in operating condition. As long as the generator which should normally be in service, as determined by the position of the TR key, is in trouble, audible and visual alarms are actuated. These may be retired while trouble is being cleared by the operation of the TST (test) key. This key also insures that both tone generators will remain energized and prevents automatic transfer if it has not already occurred.

2.04 The load may be transferred manually to the idle tone generator by means of the TR key. In this case, the TST key is used to energize the idle tone generator so that it may be put in operating condition before the load is transferred.

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(B) SD-96295-01

2.05 This circuit is provided with duplicate tone generators consisting of vacuum tube oscillator-amplifier circuits. By means of the transfer (TR) key either generator may be connected to the load. If the tone generator connected to the load should fail, audible and visual alarms will be actuated. No automatic transfer feature is provided, and the alarms will be received only during the period while an associated trunk circuit requires tone.

2.06 A periodic test of the condition of the oscillator tube is made as described in 2.02 with the exception that the load is not transferred automatically.

3. ALARM ROUTINE

(A) SD-96357-01

3.01 Upon receipt of an alarm, operate the TST key to retire the audible and visual alarms and to insure that both tone generators will remain energized while the cause of the alarm is being investigated. This key should be operated even if the alarms have already retired automatically, since this may occur if the tone generator normally connected to the load should fail momentarily and then become operative again. In this case, both generators would no longer be continuously energized, and unless the TST key were operated no alarms would be received until an associated circuit required tone.

3.02 Observe whether or not the TR (transfer) lamp is lighted, and which, if any of the white lamps are lighted. The TR lamp lighted is an indication that the load has automatically been transferred to the idle tone generator. If the TR lamp is lighted, proceed as in 3.03 to 3.06, otherwise proceed as in 3.07 and 3.08.

TR Lamp Lighted

3.03 If neither white lamp is lighted, it is an indication that the trouble which caused the alarm has cleared. Momentarily operate the REL key to transfer the load back to the preferred tone generator. Release the TST key.

3.04 If only the white lamp associated with the preferred tone generator is lighted, proceed to locate and clear the trouble in the preferred generator. When the trouble has been cleared, release the TST key and momentarily operate the REL key to transfer the load back to the preferred tone generator.

3.05 If only the white lamp associated with the spare tone generator is lighted, it is an indication that the trouble which caused the alarm has cleared and that the spare generator failed after the automatic transfer was effected. Momentarily operate the REL key to transfer the load back to the preferred tone generator and proceed to locate the trouble in the spare tone generator. When the trouble has been cleared release the TST key.

Note: Early installations were not arranged to maintain the filament circuit of the spare tone generator if the trouble in the preferred generator should clear after the load has been transferred to the spare generator. If this should occur, the spare generator will fail. The associated white lamp will be found lighted if there is a call waiting for tone, or will light when the TST key is first operated. Since the TST key reestablishes the filament circuit of the spare generator the white lamp will be extinguished after the filaments reach operating temperature.

3.06 If both white lamps are lighted, it is an indication that both tone generators are in trouble. In general, locate and clear the trouble in the preferred tone generator, as determined by the position of the transfer key. When the trouble has been cleared, operate the REL key to transfer the load back to the preferred generator. Locate and clear the trouble in the spare generator and then release the TST key.

TR Lamp Not Lighted

3.07 If only the white lamp associated with the preferred tone generator is lighted, it is an indication that the preferred tone generator has failed and the transfer circuit has not functioned. Clear the trouble in the transfer circuit. When the trouble has been cleared, release the TST key to permit the load to be automatically transferred to the spare tone generator. When the TR lamp lights reoperate the TST key and proceed to locate and clear the trouble in the preferred generator. When the trouble has been cleared, release the TST key and momentarily operate the REL key to transfer the load back to the preferred tone generator.

3.08 If both white lamps are lighted, it is an indication that the preferred tone generator has failed but that the idle tone generator is not in operating condition. Locate and clear the trouble in the idle tone generator. When the trouble has been cleared, release the TST key to permit the load to be automatically transferred to the idle tone generator. When the TR lamp lights, reoperate the TST key and proceed as in 3.04.

Note: From one to two minutes are required for the tube filaments of the idle tone generator to reach operating temperature and cause the associated white lamp to be extinguished.

(B) SD-96295-01

3.09 Note which of relays TN, F, and C are operated. Transfer the load to the idle tone generator by operating the TR (transfer) key to its other position, and then clear the trouble in the circuit which failed.

4. LOCATING AND CLEARING TROUBLE

(A) SD-96357-01

4.01 The white trouble lamp associated with a tone generator will be lighted under any of the following conditions: (1) no plate current in amplifier circuit (A relay fails to operate), (2) failure of A relay to operate C relay to open alarm circuit, (3) F relay operated during test for condition of OS tube, opening amplifier plate circuit.

4.02 Possible causes of the above conditions are as follows:

(1) No amplifier plate current

(a) defective AM tube
(b) open filament of OS tube
(c) open H or H1 resistance
(d) A relay out of adjustment
(e) open tertiary winding A relay
(f) short-circuited E condenser
(g) dirty contacts 2-3 F relay

(2) Failure to operate C relay

(a) open N resistance
(b) dirty contacts 1-2 A relay
(c) dirty contacts 1B-3B E relay
(d) open winding C relay
(e) crossed contacts 3T-4T C relay

(3) F relay operated during test of OS tube

(a) defective OS tube
(b) dirty contacts 4B-5B E relay
(c) dirty contacts 1B-2B C relay
(d) short-circuited S resistance
(e) F relay operating on non-operate

4.03 In general, if the F relay is found operated, it is an indication that the OS tube is defective, or that there is trouble in the associated circuit. Make a repeat test of the OS tube by momentarily insulating contacts 1B-2B of the G relay to release the F relay. Since the TST key is operated, the circuit will then go through a regular cycle of operating the A, C, D and E relays, and on the release of the C relay will retest the OS tube. If it fails on the repeat test, replace the tube, rechecking the pitch and volume of the tone as covered in the section of the A200. Division for the no-such-number tone supply. If this fails to correct the trouble, circuit trouble is indicated.

Note: When a new oscillator tube is installed it may fail to oscillate with the existing potentiometer setting. Accordingly, if difficulty is experienced in this respect, the potentiometer setting should be varied throughout its entire range before rejecting the tube as defective.

4.04 If the F relay is found unoperated, it is an indication that the trouble is due to failure of the C relay to be operated and open the alarm circuit. If the A relay is not operated, it is probable that the amplifier tube is defective. Replace the AM tube, and check the pitch and volume of the tone. If this does not clear the trouble, circuit trouble is indicated. If the A relay is found operated, but the C relay fails to operate, trouble in the C relay operating path is indicated.

4.05 When necessary, the pitch should be adjusted by changing the potentiometer setting, as specified on the circuit drawing. In general, no adjustment of the volume level should be required as a result of tube replacements, since the initial adjustment should be satisfactory. If adjustment is required, terminal strip strapping should be changed as specified on the circuit drawing.

(B) SD-96295-01

4.06 The NT (no tone) lamp will be lighted if there is a call waiting for tone and (1) there is no plate current in the amplifier circuit (TN relay fails to operate), or (2) operated TN relay fails to operate C relay to open alarm circuit, or (3) F relay operates during test for condition of OS tube, opening amplifier plate circuit.

Note: Items (2) and (3) do not apply to early circuits which were not provided with the "interrupter and alarm" feature.

4.07 Possible causes of the above conditions are:

(1) No amplifier plate current

(a) defective AM tube
(b) open A, B, C, F, G, H, or K resistance

(c) open A ballast lamp
(d) TN relay out of adjustment
(e) open secondary winding TN relay
(f) *dirty contacts 2-3 F relay
(g) crossed contacts A and 3, TN relay

(2) *Failure to operate C relay

(a) open U resistance
(b) dirty contacts 1-2 TN relay
(c) dirty contacts 1B-3B E relay
(d) open winding C relay
(e) crossed contacts 4T-5T C relay

(3) *F relay operated during test of OS tube

(a) defective OS tube
(b) dirty contacts 4B-5B E relay
(c) dirty contacts 1B-2B C relay
(d) short-circuited R resistance
(e) F relay operating on non-operate

* These items do not apply to early circuits which were not provided with the "interrupter and alarm" feature.

4.08 If the F relay is provided, and is found operated, it is probable that the oscillator tube is defective. Originate a test call to a vacant code. This may be done by means of a central office telephone or the outgoing trunk test circuit, when provided. In step-by-step tandem offices, where the central office telephone does not have access to the no-such-number tone supply circuit, a dial hand test set at the selector frame may be used. Temporarily transfer the load back to the tone generator and replace the defective OS tube. Check pitch and volume of the tone, as covered in the section of the A200. Division for the no-such-number tone supply. Readjust as in 4.05 if necessary. If this fails to clear the trouble, circuit trouble is indicated.

Note 1: The NT lamp may light for a short time each time the position of the TR key is changed.

Note 2: When a new oscillator tube is installed it may fail to oscillate with the existing potentiometer setting. Accordingly, if difficulty is experienced in this respect, the potentiometer setting should be varied throughout its entire range before rejecting the tube as defective.

4.09 If the F relay is not provided, or is found unoperated, and the TN relay is not operated, the amplifier tube may be defective. Replace the AM tube, and check the pitch and volume of the tone, readjusting if necessary. If this fails to clear the trouble, circuit trouble is indicated.

5. MANUAL TRANSFER

(A) SD-96357-01

5.01 Operate the TST key. When the idle tone generator is in operating condition, as indicated by the associated white lamp being extinguished, operate or release the TR key to the position corresponding to the generator to be placed in service. Release the TST key.

(B) SD-96295-01

5.02 Operate or release the TR key to the position corresponding to the generator to be placed in service.

Note: The NT lamp may light for a short time immediately following the change in the position of the TR key.

6. RECORDS

6.01 The required record of the periodic transfer or other action with respect to this equipment should be entered on the proper form.