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CIRCUIT AND 28TTY CHECKING ARRANGEMENT DESCRIPTION, OPERATION AND TEST PROCEDURE

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1. GENERAL

1.01 This section gives a description, the operating principles, and test procedure for the "Circuit and 28TTY Checking Arrangement" per EA12271SD.

2. DESCRIPTION

2.01 The Circuit was designed for use at an outlying station on a SCATS system.

2.02 The primary purpose of the Circuit is to provide circuit assurance on a SCATS system inasmuch as outlying station operation is fully automatic for both the sending and receiving portions of the circuit equipment.

2.03 This assurance is provided by visual and audible signals which will operate under numerous conditions of equipment failure at either the outlying station or the control station, and several conditions of line circuit or line equipment failure.

2.04 By combining the selective functions of a 28TTY and the sequential transmission of Transmitter Start Codes (TSC) with a timing circuit, the alarms will operate if no valid TSC is received within a pre-determined period.

2.05 The 28TTY is arranged so that any valid TSC, comprised of the constant "S" and a variable A, B, C, etc., will momentarily operate a contact which in turn recycles the timing circuit.

2.06 This recycling of the timing circuit will prevent the alarms from operating, indicating that there is circuit continuity, and that the selective functions of the 28TTY are operating satisfactorily.

2.07 Assuming the time-out period optionally arranged for four and one half minutes, the alarms would normally operate if a transmission were to extend beyond that period, delaying transmission of a TSC to recycle the timing circuit.

2.08 In the case of such long message transmission, the buzzer will be automatically deactivated, but the lamp will remain lit until a valid TSC is received.

2.09 Deactivation of the buzzer is effected by receipt of the first SPACE character in text operating a contact in the 28TTY.

2.10 In case of alarms produced by circuit or equipment trouble, the buzzer can be deactivated by a key.

The lamp, as above, remains operated until a valid TSC is received.

2.11 As stated in 2.04, alarm operation is dependent on selective functioning of the 28TTY and continuous, properly timed transmission of TSC's so that any malfunctioning of the 28TTY or nonreceipt of TSC's will operate the alarms.

2.12 Examples of such malfunctioning would be:

a. 28TTY selective mechanism trouble.

b. 28TTY ALS contact or stuntbox contact failure.

c. Power trouble such as 28TTY motor, power lead, power switch off or in trouble.

2.13 Possible causes for non-receipt of TSC's are:

a. Failure or wilful stopping of the polling equipment at the control station.

b. One way failure or close down of line facilities.

c. Repeater equipment.

d. Circuit cut condition.

2.14 The Circuit equipment consists essentially of 1-Y, 10-U, and 1-280A type relays for control circuit operation: 1-376B vacuum tube with associated capacitors and resistors for time-out circuit operation: 1 transformer, buzzer, key, and lamp for alarm operation: 3 function lever SOP and 1 contact assembly for 28TTY operation.

Note: Where 376B tubes are used observe precautions per BSPA502.053.

2.15 The Control circuit equipment is mounted in a ED-91472-011 cabinet.

The alarm lamp and key are mounted on one side of the 28TTY while the buzzer is mounted at the customer's direction. Power is obtained from the rectifier of the station control circuit per EA-10963SD.

3. THEORY OF OPERATION

3.01 Under normal operating conditions, with transmissions of 1-1/2 to 2 minutes or less, and using a time-out period of 4-1/2 minutes * operation is as follows:

*An optional time-out period of 3 minutes is available.

3.02 With a transmission in progress, the time-out circuit is charging for the first of three 90 second periods.

3.03 At the completion of the normal short transmission, and a few seconds thereafter, a TSC will be transmitted from the control station.

3.04 This TSC, momentarily operating the ALS contact in the 28TTY, will operate relay (AL) which furnishes a ground to discharge the capacitors in the timing circuit. The time-out circuit is now in condition to recycle.

3.05 Under the above operating condition, neither the visual nor audible alarms will operate.

3.06 In the case of any of those conditions listed in 2.12 and 2.13, both alarms should operate.

3.07 The alarm conditions are effected by means of a count circuit associated with the time-out circuit.

3.08 The time-out circuit after 90 seconds will be sufficiently charged to cause the vacuum tube to become conductive, furnishing current to start a relay chain action. This chain action will discharge and deactivate the time-out circuit, at the same time preparing relay action for the second 90 second period.

3.09 The time-out circuit again charges, and the chain action proceeds as before while preparing relay action for the third time-out period.

3.10 At the end of the third time-out period, approximately 4-1/2 minutes, relays have been activated which will operate the alarms.

3.11 As stated before, the buzzer can be deactivated by a key. The lamp will remain operated until a valid TSC is received.

4. TESTS

4.01 To test the Control circuit, co-ordination is required with the Serving Toll Test Center (STTC) due to the automatic features of the equipment.

4.02 The station tester should first obtain a release of the equipment if tests are to be made during service hours, then have the STTC terminate the station in a dummy or test circuit.

4.03 Assuming that the control station automatic polling equipment is not available for tests, it will be necessary for the STTC to transmit TSC's manually.

4.04 A valid TSC would be FIGS H LTRS FIGS * S LTRS.

*Here insert an individual valid station code.

4.05 At the station under test, place the 28 TTY in operating condition. With the circuit idle both visual and audible signals should operate after approximately 4-1/2 minutes.

4.06 Request the STTC to alternately transmit valid TSC's and short test sentences.

4.07 The visual and audible alarms should be deactivated and remain in that condition as long as the TSC's and short test sentences are being received.

4.08 Request the STTC to transmit numerous TSC's followed by a long message, (more than five minutes) followed by more TSC's.

4.09 The visual and audible alarms should operate after about 4-1/2 minutes of the test tape transmission. The audible alarm should deactivate automatically on receipt of the first SPACE character received during text while the visual signal remains operated until receipt of a valid TSC.

4.10 At the station under test, turn off the power of the 28TTY while the STTC is transmitting valid TSC's and short test sentences.

4.11 Both visual and audible signals should operate and remain operated until power is restored to the 28TTY.

4.12 The tests in 4.10 and 4.11 should be adequate to cover the three possible power conditions mentioned in 2.12.

4.13 Halting of the transmission of TSC's and short test tapes by the STTC as in 4.06 is the equivalent of those possible troubles listed in 2.13.

5. CONNECTING CIRCUITS

5.01 None

6. REFERENCES

EA10669CD Sequentially Controlled Automatic Transmitter Start System (SCATS).
EA10720CD MXD Timing and Control Circuit
P70.034 28 Teletypewriter
P70.031 28 Stuntbox