

Lydney Signal Box 22 Line Exchange

Final Selector Notes

Introduction

All incoming calls arrive from Norchard on two junctions. These junctions terminate on two 22 outlet uniselector final selectors. Two digits are received from Norchard.

The uniselector normally sits on outlet 0.

The first digit positions the wipers on the outlet prior to the outlets for the level dialled.

Dialling 1 positions the uniselector on outlet 1, then dialling 1-0 for the second digit positions the wipers on outlet 2-11 depending upon the digit dialled. Outlets 2-11 therefore have the multiple numbers 11-10.

Dialling 2 positions the wipers on outlet 2. The uniselector then drives to outlet 12. The second digit 1-0 then positions the wipers on outlets 13-22. Outlets 13-22 therefore have the multiple numbers 21-20.

Dialling 9 positions the wipers on outlet 9. The uniselector then drives to outlet 14. The second digit can only be 9 or 0. Dialling 9-0 positions the wipers on outlets 23-24. Outlets 23-24 therefore have the multiple numbers 99 and 90. 99 is connected to the test number circuit and 90 is connected to a line circuit and is used for the exchange telephone.

When the two digits have been received the relay set has the usual testing, ringing and transmission circuits to complete the call.

Operation

The final selector is seized by a loop on the junction, so long as the uniselector mechanism has homed correctly. Relay A operates to the loop.

A1 operates relay B to the battery from the uniselector magnet. B1 lights the relay set lamp and operates relay BA slowly. B2 holds relay B and maintains the short circuit across relay C. B3 starts the ringer.

If dialling occurs before relay BA has operated, A2 in releasing will operate relay NU, which in turn will hold to the B1 earth. NU3 disconnects the pulsing path for the magnet so that the uniselector will not step. NU4 connects NU tone to the transmission bridge to inform the caller that the call has been ineffective. This ensures that pulses cannot be clipped or ignored if the caller dials too rapidly.

When relay BA operates BA6 operates Relay CA and BA4 provides a pulsing path for the A1 contact to step the magnet. When A1 is released Relay B is held by the release lag caused by the short circuit on the large relay B winding. At the same time relay CD is operated to the battery provided by R5 and R6.

When relay A is operated, relay B receives current from the magnet battery but this current will not hold the magnet in the operated position and so the uniselector steps. Relay CD though is now short circuited and holds during pulsing due to this slugging effect.

When the digit has been received and pulsing ceases, relay B continues to be held but relay CD releases.

At the end of the first digit relay CD releases. CD3 then operates relay 1WS, 2WS, 9WS or NU according to the digit dialled. The WS or NU relay holds to the B1 earth. It is important to note that the relays must be adjusted so that the holding contact makes before the operate circuit is disconnected by 2WS4 or 9WS5. If the relay "buzzes" check this adjustment first. CD2 releases relay CA if there is sufficient time between pulse trains.

If a 2 or a 9 has been dialled it is necessary to drive the uniselector to the outlet marked by 2WS3 or 9WS4. 2WS2 or 9WS2 completes the self drive circuit for the uniselector.

The uniselector drives until the marked outlet is reached when relay T will operate. T1 cuts the drive and operates relay CC which then holds via its second winding and CC1. CC4 disconnects the self drive circuit. If the initial digit had been 1, then relays T and CC operate without any further delay.

The final digit is now dialled. Relay CD operates during the pulse train as before. The uniselector steps. Relay T releases. CD2 re-operates relay CA if it has released. CD1 operates relay CE. Relay CF is short circuit during the pulse train and does not operate. However at the end of the pulse train relay CD releases and at CD1 removes the short circuit from relay CF, which operates. Relays CE and CF now hold via CE1 to the B1 earth. Relay E operates to the CF2 earth.

The final now tests the called line to check if it is free or busy. A free line will have a battery condition on the P wire, a busy line will have an earth instead.

CD2 releases relay CA slowly. CA1 then releases relay E slowly. During the slow release of relay E, the P wire is tested by the H relay. This will operate if a battery exists on the P wire, but will not if the battery does not exist.

If the line is busy and relay H does not operate, then busy tone is returned to the caller via H6 and E1 contacts.

If the line is free, relay H will operate to the battery condition on the P wire. H1 holds the H relay and H5 earths the called line's P wire to operate the line circuit K relay and remove the battery and earth conditions on the line from the line circuit. H6 connects ring tone to the caller. H2 and H3 connect the called line to the F relay circuit and the intermittent ringing current. This flows through relay F but does not operate it as it is very slow to operate. The relay has an armature end slug and a second winding which is short circuited until the F relay operates. H7 prepares the circuit so that relay F can hold when it finally operates to the called line's loop.

When the called line answers, it places a loop across the neg and pos wires thus allowing DC to flow around the circuit. This operates relay F. F4 holds relay F. F1 and F5 disconnect the ringing current and connect the caller and called line together. F7 disconnects the ringing tone. F3 stops the ringer.

If a level other than 1, 2 or 9 had been dialled then CD3 when releasing after the initial digit will operate relay NU. NU holds, disconnects the pulsing path at NU3 and returns NU tone via NU4.

At the end of a call, relay A releases when the junction clears down. This short circuits relay B at A1 and relay B releases. B1 releases any held relays. BA1 is the last to release and this contact connects the homing circuit for the uniselector. When the selector arrives home it reconnects the earth leg out to the junction in readiness for the next call.

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