

Lydney Signal Box 22 Line Exchange

S and Z Pulse Generator Notes

An S and Z generator producing pulses at 11 minute intervals has been installed. This circuit provides the time interval during which a call may be held. After a time, generally two periods of S & Z pulses totalling 22 minutes, the call is force released and the caller is held on the P relay in the line circuit. This should ensure that faults do not cause the junctions to be held for an unduly long length of time.

Operation

When an outgoing call is being made, an earth is applied to the S&Z start lead. This earth persists for the full length of any calls. Relay ST operates.

ST1 connects relay TP to the 30 sec pulse supply. TP1 therefore makes momentarily every 30 seconds.

Relays TA and TB act as a pulse halving circuit to produce a pulse every minute.

ST2 and TP1 operate relay TA at the first 30 second pulse received. TA1 completes a hold circuit for relay TA and places a short circuit across relay TB. At the end of the 30 second pulse, relay TP releases and at TP1 removes the short from relay TB. Relay TB operates in series with relay TA. Relay TA holds via relay TB.

When the second 30 second pulse arrives, relay TP operates momentarily again.

TP1 now short circuits relay TA, which releases. Relay TB holds during the pulse via TB1, TP1, TP3, ST2. When the pulse goes off, relay TP releases and at TP1 relay TB is also released. The pulse halving circuit is now ready for the next two pulses etc.

During this second pulse relay TA is released and relay TB is operated. For the duration of the pulse therefore, TA2 and TB2 operate the magnet of the rotary relay. which takes a step off normal.

Subsequently it will take a further step every minute that the relay set is held by the S & Z start lead. The RR4 contacts operate on step 10 and operate relay PA. This in turn operates relays PB, PC and PD. PD1 lights a lamp on the relay set.

On the 11th step, RR4 releases relay PA. PA1 extends an earth on the Z pulse wire.

PA2 also releases relay PB. PB2 removes the earth from the Z wire. It places the earth on the interpulse output, but this is not in use in this exchange.

PB1 then releases relay PC. PC2 removes the earth from the interpulse output and connects it to the S wire.

PC1 releases relay PD which at PD1 removes the earth from the S wire.

The relay set will then continue to step the ratchet relay and produce Z and S pulses every 11 minutes.

Note that the length of the Z and S pulses will be equal to the release lags of relays PB and PD.

Release

When the earth is removed from the S&Z start wire, which is when there are no outgoing calls being made, relay ST releases. ST2 releases any relays which may be operated and connects up a homing circuit for the ratchet relay via the RR2 contacts. RR2 opens on the home (or 11th step), to disconnect the homing path.

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