

Subscriber's Uniselector

Introduction

The subscriber's uniselector is provided on a one per line basis in most larger exchanges. It consists of a uniselector and two relays, with a connection to the customer's meter.

The circuit allows a calling customer to have access to a number of first selectors. Early equipment used a home position and twenty four outlets to first selectors. This had the disadvantage that should an early outlet be faulty then a caller was effectively cut off during periods of light traffic. A two home circuit was evolved with home positions on outlets 0 and 12. This reduced the number of actual outlets to first selectors to twenty three but did allow alternate call attempts to be made via different outlets.

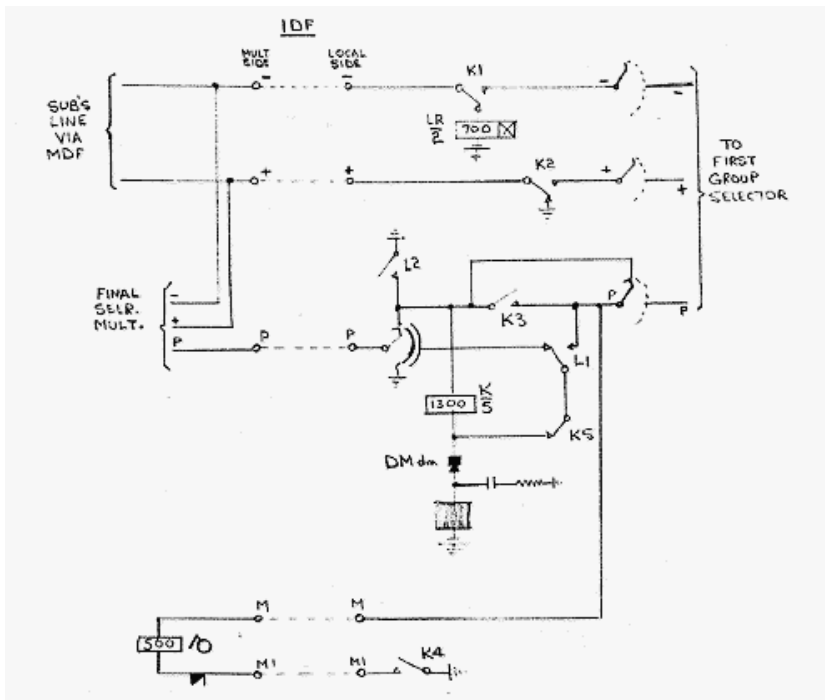
When an outgoing call is made, Relay LR operates which busies the final selector and also starts the uniselector hunting round its bank. The circuit passes over any busy outlet which will be denoted by the presence of an earth or 50 volt positive condition on the P wire.

A free outlet will be denoted by the absence of a condition (a "dis") on the P wire. This stops the uniselector which then switches the caller's loop on to the first selector. The uniselector then holds to a busying earth returned on the P wire from the first selector.

When the called customer answers a meter pulse or pulses can be passed back via the P wire in the form of a 50 volt positive battery condition. This will operate the caller's meter the appropriate number of times.

When the caller clears down, the busying (and holding) earth on the P wire is removed by a later piece of equipment. This allows the uniselector to restore to the next home position.

Outgoing Call



When a calling loop is received, relay LR operates (slowly, see note below).

L1 prepares the drive circuit

LR2 has two functions. It busies the final selector multiple and completes the drive circuit to the magnet via the home position of the P wire arc.

The uniselector magnet operates and at the end of the stroke opens the interrupter contacts. This disconnects the magnet and the armature restores and steps the wipers to outlet one.

If this outlet is busy, the earth on the P wire reoperates the magnet ready for a step on to outlet two. The uniselector therefore hunts over busy outlets via the P wire earths. During this period the K relay is short circuited by the P wire earths.

When a free outlet is reached, the magnet cannot reoperate as there is no earth available on the P wire. Current can also flow via the K relay to the L2 earth, although the current is so low that it cannot reoperate the uniselectore magnet. Relay K operates.

K1 and K2 extend the calling loop to the first selector.

K3 extends the L2 earth to the P wire to busy the outlet against any other hunting uniselector.

K4 connects the meter to the P wire ready to receive a meter pulse.

K5 disconnects the magnet from the L2, K3 earth condition so that the uniselector cannot step on.

The first selector returns a holding earth on the P wire to take over from the L2, K3 earth.

Relay LR releases after approximately 100ms and at L2 removes the temporary earth to the P wire.

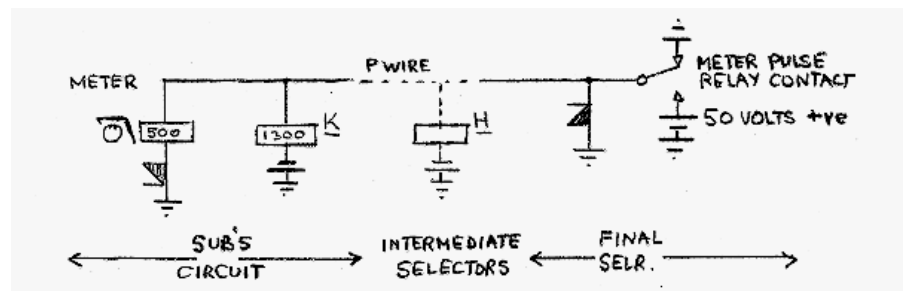
Relay K now holds to the P wire earth from the first selector.

The P wire to the final selector multiple has been earthed by the wiper on the homing arc.

Note : Relay LR is slow to operate to ensure that the full release lag is always available however long or short the operation of the relay. This is important if the uniselector switches to an early outlet. Should LR release before the earth returns on the P wire from the first selector, then relay K would release, reconnecting LR to the caller's loop. This may cause relay chatter and false stepping of the uniselector magnet and wipers.

Once switched, the caller receives dial tone from the first selector and can make his call. When the called customer answers, the earth on the P wire is momentarily replaced with a 50 volt positive battery.

During this pulse the caller's meter will operate (50 volts across the meter winding) and the K relay will hold (100 volts across the winding).



Notes : a) The P wire remains busied during the meter pulse as another hunting uniselector will still operate its drive magnet to the 50 volts positive condition.

b) The rectifier in the meter circuit prevents the meter from falsely operating to any negative potential on the P wire.

c) The K4 contact prevents the meter from falsely operating during hunting, to a busy P wire with metering potential on it.

d) The rectifier connected to the P wire in the final selector provides a hold path for the K and H relays during the short period as the metering contact changes over.

Clear Down

When the caller clears down, the P wire earth is removed by one of the subsequent selectors or relay sets. Relay K releases.

K1 and K2 reconnect the LR relay and earth.

K5 connects the magnet circuit to the homing arc.

The uniselector drives until it reaches a home position when the earth to the drive circuit is disconnected at the homing arc.

When the uniselector is back on a home position, the K relay battery condition is reconnected to the P wire to the final selector multiple making the customer available for incoming calls.

Incoming Call

On an incoming call, the final selector finds the K relay battery condition on the P wire of the final selector multiple. The final selector then earths the P wire to busy the called customer and to operate the K relay. K1 and K2 remove the LR relay battery and earth (the bridging conditions). This clears the line for ringing etc conditions from the final selector.