

## 222 Fire Warning System

The Railways Fire Officer asked if we could produce a warning tone should anyone on site dial a given number and this system was the result. It is not a substitute for an approved system involving press buttons etc around the site but it was quick and simple to put together as an interim measure whilst the site was properly assessed.

The system was not accessed using 999 as this could so easily be muddled up with the subsequent actions on finding a fire which would involve dialling 999 on a BT line. 222 was chosen as the number to set off the warning tone as level 2 was spare, cabled out already to the IDF and could be barred to off site phones using the coin box discrimination feature of the group selectors.

When 222 is dialled, the group selector steps to level 2 and seizes the 222 relay set. The next two digits are counted on a uniselector in the relay set. Should the digits be anything but 22 the relay set returns NU tone to the caller. If the digits are 22, then the relay set calls the PA via a line circuit of the Telecoms to PA Interconnection Equipment.

The relay set connects a warbling tone to the PA. The tone is alternately nu tone and continuous ring tone which produces a definite warbling sound. At the same time a bell is sounded in the shop and a lamp flashes.

The shop staff can stop the shop bell, make an announcement over the PA (temporarily over riding the warbling tone) and if required, stop the warning completely. The shop staff also have the facility, by pressing two start buttons simultaneously, to start the alarm without the need to dial 222.

If the alarm is not stopped it will switch off after about a minute. The caller can hang up once he has initiated the warning tone and this leaves his phone free for use to report the fire to a central point. If he does not hang up then his line will be released when the relay set has timed out and stopped warbling. Should the PA be in use for music or a telephone access call, then the fire warning tone will have preference.

### Circuit Description

So long as the relay set is free, it connects a battery condition to the P wire. A loop extended from the group selector will operate relay A.

A1 operates relay B.

B1 operates relay BA

B2 earths the incoming P wire to hold the connection.

BA2 starts the ringer.

BA5 prepares the impulsing path to the uniselector magnet.

When the caller dials, A1 operates relay C with the magnet current and steps the wipers at the end of each dial pulse. Relays B and C hold during the dial train as they are slow to release.

When the dial train ceases, relay C releases.

C1 connects an earth to relay NU if anything other than 2 has been dialled and NU holds subsequently and returns NU tone to the caller.

If the second 2 has been dialled then relay WS operates when C1 releases.

WS1 holds relay WS.

WS3 changes over the C1 earth path to a different set of wipers and bank contacts ready for the last digit.

When the caller dials the last digit, relay C again operates and holds to the magnet current and the uniselector wipers step on from outlet 2.

When the dial train ceases, relay C releases.

C1 connects an earth to relay NU if anything other than 2 has been dialled and NU holds subsequently and returns NU tone to the caller.

If the third 2 has been dialled then relay AL operates when C1 releases.

AL1 holds relay AL

AL4 operates relay ALR

AL5 "calls" the PA equipment via a direct access line circuit.

Relay ALR operating sets off the alarms via sets of contacts that extend conditions to external bells and lamps.

ALR2 starts the interaction of relays TN and TNA which pulse at just over once per second.

TN4 connects an intermittent NU tone to the A relay for transmission to the caller.

TNA1 starts to pulse the type 3 uniselector TM which steps continuously around its bank whilst the tone is connected.

TNA4 connects alternately NU tone or Continuous Ring Tone to the PA to start the warbling tone.

Once every revolution of the TM wipers, relay PU is operated briefly. Note that should there be any failure of the TM circuit a time pulse is connected to the second PU winding and this will ensure that the tone does eventually switch off.

PU1 and PU2 step the main uniselector every time PU is operated. This step occurs about every ten seconds.

Eventually the earth on wiper 5 causes a short circuit of the B and AL relays, which release.

B2 removes the P wire earth releasing the caller.

AL4 releases relay ALR.

This causes the warning tone to be disconnected and shop bells and lamps stop.

ALR5 releases relay BA.

BA1 releases relay WS

BA5 completes the homing circuit for the main uniselector which drives to its home position.

The relay set is now restored and ready for further use.

a) Note that if the caller had hung up while the relay set was operational, relays A and B would have released. This would have taken the earth off the P wire and released the caller. Relay BA would though have been held by contact ALR5 and maintained the relay set until it had completed its period of tone warbling. It would then have released and made the P wire free again by reconnecting the battery at WS6 or the homed uniselector wiper.

b) Note that the shop can start the relay set warbling by looping the "start alarm keys" wires. This would operate relays BP and in turn BPR, BA, AL and ALR to start the warbling sequence.

On releasing the keys, BP releases and BPR releases slowly.

During the slow release of BPR the uniselector magnet is energised and at the final release of BPR the wipers step off normal. This removes the P wire battery so that the relay set is busied until its warbling period is over.

c) Note that the shop "stop alarm key" will place a short circuiting earth on to cause the release of relays B and AL and therefore the stopping of the warbling sequence.

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