

DIAGRAM NOTES (ISSUE 1)

for

DIAGRAM GBW 13780 MOD A

titled

UAX NZ 13 INCOMING JUNCTION FROM PARENT OR NON-DEPENDENT EXCHANGE

An explanation of the above circuitry is covered under the following headings:

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1. GENERAL.

The diagram shows the circuit of an incoming junction to a UAX NZ 13 from a parent or non-dependent exchange. This modified version of GBW 13780 can be used in lieu of GBW 13981.

2. FACILITY SCHEDULE.

Provision is made for:

- (a) Seizure of circuit by extension of a loop via I/C negative and positive lines.
- (b) Return of guarding Eth to I/C P wire on seizure.
- (c) Switching to first free linefinder control relay set.
- (d) By-pass circuit to allow dialling to commence while linefinder is searching for calling line.
- (e) Return of overflow busy tone to calling line under premature dialling conditions.
- (f) Guarding of I/C P wire during C.S.H. condition.

3. CIRCUIT OUTLINE.

The extension of the loop via the I/C Neg. and Pos. lines operates relay LS which operates relay BA, and guarding Eth is applied to I/C P wire. Relay BA prepares the operation of relays HA or HB, depending upon which linefinder control relay set the circuit seizes. Assuming that relay HA operates as relay set No. 1 is seized, the lines are switched to the group selector associated with the linefinder via the relay set. A marking condition is applied to level 9 of the linefinder and a start condition to the linefinder is made.

Relay LS releases and relay P operates, which releases relay BA. If the calling party should dial before the linefinder has commenced to search for the calling line, the impulses are diverted via the "bypass" circuit to the group selector associated with the linefinder. When the calling line is found, relay K operates which releases relay HA.

Should premature dialling occur, relay LS responds to dialling and operates relay JA. At the end of dialling, relay JA and BA are held and busy tone is returned to the calling line.

When the called party clears, relay K releases and reconnects relay LS. If the calling party has cleared, relay P releases. If the calling party remains connected, relay LS operates and holds relay P. Clearing of the calling line releases relay LS, which releases relay P. The guarding Eth is removed from the I/C P wire when relay P releases.

4. CIRCUIT DETAIL.

4.1 Seizure of Circuit.

The circuit "free" condition is indicated by absence of earth on the I/C P wire.

The extension of the loop via the I/C Neg. and Pos. lines results in the operation of relay LS.

Relay LS operating.

LS1 operates relay BA via P5.

Relay BA operating.

BA1 prepares operating circuit for relay JA should premature dialling occur (see 4.4).

BA2 applies guarding Eth. to I/C P wire.

BA3 prepares operating circuit for relay HA.

BA4 prepares operating circuit for relay HB.

4.2 Selection of L.F. Control Relay Sets.

Referring to Note 2 of the diagram:

- (a) If L.F. Control relay set No. 1 is the first choice and is free, relay HA will operate.
- (b) If L.F. Control relay set No. 2 is the first choice and is free, relay HB will operate.
- (c) If L.F. Control relay set No. 1 is first choice and is engaged and No. 2 is free, relay HB will operate.
- (d) If L.F. Control relay set No. 2 is first choice and is engaged and No. 1 is free, relay HA will operate.

Assuming that relay HA operates:

Relay HA operating.

HA1 operates relay P via JA5.

HA2) switch the lines to the group selector associated with the

HA6) linefinder, via the control relay set and also releases relay LS.

HA3 marks the calling line on level 9 of the linefinder.

HA4 disconnects operating circuit of relay JA.

HA5 holds relay HA via its 25 ohm winding, K5, HB8 to Batt. in the control relay set.

HA7 applies start condition to linefinder.

HA8 prevents operation of relay HB to 2nd choice control relay set.

Relay P operating.

P1 applies alternative guarding Eth to the I/C P wire.

P2 prevents Eth via relay HA being applied to TA lead during search for calling line.

P3 prevents Eth via relay HB being applied to TB lead during search for calling line.

P4 spare.
P5 disconnects relay BA which releases slowly.

Relay BA releasing slowly.

BA2 ineffective since P1 is operated.

Should the calling party dial before the linefinder has searched for and switched to the calling line, the impulses are diverted by the "bypass" circuit (K4 and HA2, and K3 and HA6) to the group selector.

4.3 Calling Line Found by Linefinder.

When the calling line is found, relay K operates.

Relay K operating.

K1 provides an alternative holding circuit for relay P.
K2 applies relay K to level 9 of linefinder banks.
K3) disconnect the "bypass" dialling circuit.
K4)
K5 releases relay HA.
K6 ineffective at this stage.
K7 ineffective at this stage.
K8 "Y" applies a 3000 ohm Pos. Bat. to "M" wire to effect route unbarring when the junction is extended to the outgoing junction equipment.

Relay HA releasing.

HA1 ineffective since K1 is operated.

Dialled impulses are now routed via the linefinder banks to the group selector and subsequent equipment.

Reverting to 4.2, should relay HB have operated, the sequence of operations are similar except that control relay set No. 2 would function.

4.4 Premature Dialling.

Reverting to the end of 4.1, should the calling party dial before relay HA or HB has operated, relay LS responds to the impulses. On the first disconnect pulse, relay LS releases.

Relay LS releasing.

LS1 operates relay JA via HA4, HB4, BA1 and releases relay BA.

Relay JA operating.

JA1 applies overflow busy tone Eth to the tone winding of relay LS and consequently into the calling line.
JA2 prevents operation of relay HA at this stage.
JA3 prevents operation of relay HB at this stage.
JA4 applies Eth to ringer start lead.
JA5 holds relay JA.

Upon the receipt of a loop pulse, relay LS reoperates and at LS1 re-energises relay BA. During dialling, relay BA remains held due to its slow release feature.

At the end of dialling, relay BA holds to Eth at LS1, and relay JA holds to Eth at JA5. Neither of the control relay sets are seized and overflow busy tone is returned to the subscriber.

4.5 Called Subscriber Releases.

When the called party clears, Eth is removed from P wire from linefinder and releases relay K.

Relay K releasing.

K1 disconnects relay P which is slow to release.
K3)
K4) re-connect calling line to relay LS.

4.6 Release of Circuit.

If the calling party remains connected when the called party clears, relay LS operates to the loop when K3 and K4 release as above.

Relay LS operating.

LS1 holds relay P via P5.

The guarding Eth is maintained by P1 on the I/C P wire. When the calling party clears, relay LS releases.

Relay LS releasing.

LS1 releases relay P.

Relay P releasing.

P1 removes guarding Eth from I/C P wire.

If, however, at the end of 4.5, the calling party has cleared, relay P releases when K1 releases.

Relay P releasing.

P1 removes guarding Eth from the I/C P wire.

5. DESIGN DETAILS.

5.1 Relay BA is slow to release to hold during premature dialling (see 4.4).

5.2 Relay P is slow to release to cover the transit time of K1 releasing and LS1 operating (see 4.6).

5.3 Contacts K2 and K3 are "make before break" contacts to prevent relay K buzzing when operated via the M lead (see 4.3).

5.4 Contact K8 has been made a "Y" action in order to prevent K relay buzzing on release due to K2 and/or K6 bunching before K8 disconnects the positive battery.

5.5 Diode D1 to allow fast guard earth on seizure of the R/S from LS1 and prevent locking of BA and P relays.

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