

DIAGRAM NOTES (ISSUE 1)

for

GBW 13960 MOD. A

titled

UAX NZ13 OUTGOING JUNCTION TO NON-DEPENDENT
AUTO EXCHANGE WITH INCOMING JUNCTION BARRING FACILITY

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

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1. GENERAL.

- 1.1 The diagram GBW13960MOD A shows the circuit of an outgoing junction relay set provided at a UAX NZ13 to which access is gained via selector levels.
- 1.2 This modified version of GBW 13960 can be used in lieu of GBW 16831.
- 1.3 Relays rendered ineffective when R/S used in this modified form are DA, DB, MB, OC, OH and TO.

2. FACILITIES.

Provision is made for:

- (a) Transmission bridge.
- (b) N.U. Tone.
- (c) Seizing and guarding the circuit from intrusion.
- (d) Batt testing.
- (e) Barretter feed to calling loop.
- (f) Time Pulse start lead.
- (g) Time Pulse release.
- (h) Detection of called subscriber answering
- (i) Discriminating lead "M".
- (k) Guarding the circuit during release of junction.
- (l) Relaying forward to the junction the dialled pulses from calling subscriber.
- (m) Manual hold.

3. CIRCUIT OUTLINE.

- 3.1 Access to this circuit is made via selector levels.
- 3.2 Selector level seizure of this circuit causes access to be made to an outgoing junction to a non-dependent auto exchange. Dialling takes place with pulse repetition to the distant exchange. If a successful call is made ring tone is returned from the distant selector via the transmission bridge.
- 3.3 The "called subscriber answer" causes a reversal of junction potential which is detected by the D relay. Potential reversal is then provided from the calling side of the circuit for supervisory purposes. Conversation called to calling subscriber may now take place.
- 3.4 Manual hold condition is provided by a signal over the +ve junction wire, whereby the circuit is guarded and held from the distant exchange when the calling subscriber clears.

3.5 A route barring facility is provided by signalling on the "M" lead. A pos. batt signal on the "M" lead operates relay NU and transmits NU Tone back to the calling party and releases the junction.

3.6 An incoming junction relay set or group selector can be associated with this circuit, to which access from a non-dependent auto exchange can be made. Gaining access in this manner prevents access to this circuit via selector levels.

3.7 Time pulse release is provided once the called subscriber has cleared or NU tone has been returned to calling party.

4. CIRCUIT DETAIL.

4.1 Seizure. The circuit is seized via selector level if the 150 ohm batt is present on the "P" wire. The group selector tests into the "P" wire and switches causing the -ve and +ve leads to be looped by the calling subscriber's telephone.

Relay A operates,

A1 prepares to extend loop to junction.

A2 completes operate path for relay B.

Relay B operating,

B1 prepares the polarity reversal circuit.

B2 prepares to extend loop to junction.

B3 completes operate path for relay BA.

Relay BA operating,

BA1 prepares operate path for BB & DD relays.

BA2 disconnects 150 ohm test batt and extends guard eth to "P" lead to prevent intrusion by other circuits.

BA3 prepares operate path for relay CD.

BA4 completes operate path for relay HA which operates.

Relay HA operating,

HA1 not connected.

HA2) extend the loop forward to junction to

HA3) seize the distant incoming selector.

HA4 prepares alternative hold path for HA relay.

HA5 extends busy eth to P lead (IDF LOCAL).

Seizure of the circuit is complete and is followed by dialled pulse trains over the -ve and +ve leads from the selector level.

4.2 Receipt of Dialed Pulse Trains. Relay A pulses and on the first release of A2, relay CD operates (Eth, A2, BA3, 500CD, Batt.)

Relay CD operating,

CD1 s/c the secondary windings of transformer TR1 to provide a clean loop to the junction.

CD2 completes operate path for CC relay and applies guard eth to P1.

CD3 completes operate path for relay BB.

CD4 provides additional guard eth to "P" lead.

Relay CC operates but is ineffective at this stage.

Relay BB operating,

BB1 completes hold path for relay CD.

BB3 disconnects the time pulse circuit earth
completes the hold circuit for relay BB.

BB4)
BB5) not effective in this circuit.

Relays B and CD hold during the pulse train and at the end of the train relay CD releases removing the S/C on the TR1 secondary at CD1 and releasing relay CC at CD2 (relay CC is ineffective at this stage).

4.3 Called Subscriber Answers. This condition is signalled by a potential reversal of the junction.

Relay D operates due to the configuration of MR1 and MR3.

D1 s/c the A1 contact unit to cover the flick of relay A when relay DD operates.

D2 completes the operate path for relay DD.

Relay DD operating,

DD1 completes operate path for relay DC which operates

DD2 opens the S/C path of TR1 and D relay.

DD4 further disconnects time pulse start.

DD3) reverses call side of transmission bridge potentials
DD5) for supervisory purposes.

Relay DC operating,

DC1 completes hold path for DC relay.

DC2 prepares time pulse start circuit.

Conversation may now proceed between called and calling subscribers.

5. RELEASE.

5.1 Called Subscriber Releases. Junction potentials are restored to normal by the release of the called subscriber.

Relay D releases,

D2 disconnects circuit to relay DD which releases.

Relay DD releasing,

DD4 completes circuit to "time pulse start" (Eth, DD4 DC2, 1000TM, TM1, Time Pulse Start).

5.2 Time Pulse Release. If the calling subscriber fails to release after called subscriber, when the time pulse release signal arrives and operates relay PR - PR1 contact unit disconnects the busy eth back to the incoming "P" lead and the circuit clears down. Relay TM locks to the time pulse hold lead via TM1.

5.3 Calling Subscriber Clears. Assuming the called subscriber has cleared followed by the release of the calling subscriber. The loop to the A relay is removed and A relay releases.

Relay A releasing,

A1 disconnects loop to junction to release the distant equipment.

A2 completes the operate path for CD relay via BA3/BB1 and releases the B relay. During the release time of relay BB the CD relay is held.

Relay CD operated,

CD2 completes operate path for CC relay.

CD3 completes further hold path for relay BB.

CD4 maintains eth on P lead.

Relay CC operating,

CC1 not effective.

CC2 provides alternative hold path for HA relay.

CC3 holds off the test batt from the "P" lead.

After its slow release period, relay B releases.

Relay B releasing,

B2 extends MH relay via R8 to the pos. leg of the junction.

B3 releases BA and DC relays.

Relay BA releasing,

BA1 disconnects eth to BB relay which starts to release.

BA2 prepares test batt circuit to "P" lead.

BA3 disconnects operate path of relay CD.

BA4 disconnects operate earth from relay HA.

Relay DC releasing,

DC2 releases relay TM (if operated).

Relay BB releasing,

BB1 disconnects hold path for CD relay which releases.

Relay CD releasing,

CD2 removes hold path for CC relay which releases.

CD4 removes busy eth off incoming "P" lead.

Relay CC releasing,

CC1 not effective.

CC2 disconnects hold path to HA relay which releases.

CC3 restores 150 ohm test batt to incoming "P" lead.

Relay HA releasing,

HA3) restore -ve and +ve leads

HA2) to normal.

HA5 connects P & P1 leads through and removes busy eth off P lead (IDF LOC.)

5.4 The circuit has now restored to normal the incoming "P" lead having been busied during the release time of B-BA-BB-CD and CC relays to ensure that the equipment at the distant end of the junction has restored before a follow on call can take place.

6. BOTHWAY WORKING.

6.1 The foregoing has traced a call outgoing from selector levels, but the junction to the non-dependent auto exchange can be used in a bothway mode.

6.2 Calls from the non-dependent auto exchange terminate in the UAX via the junction on incoming junction relay sets or on a UAX 13 group selector (GBW 15960).

6.3 A call to the incoming junction relay set or selector causes an eth to be extended back over the P1 lead operating relay CC.