

CIRCULATION	GENERAL		
SUFFIX			
AMENDT			
PAPER	W		

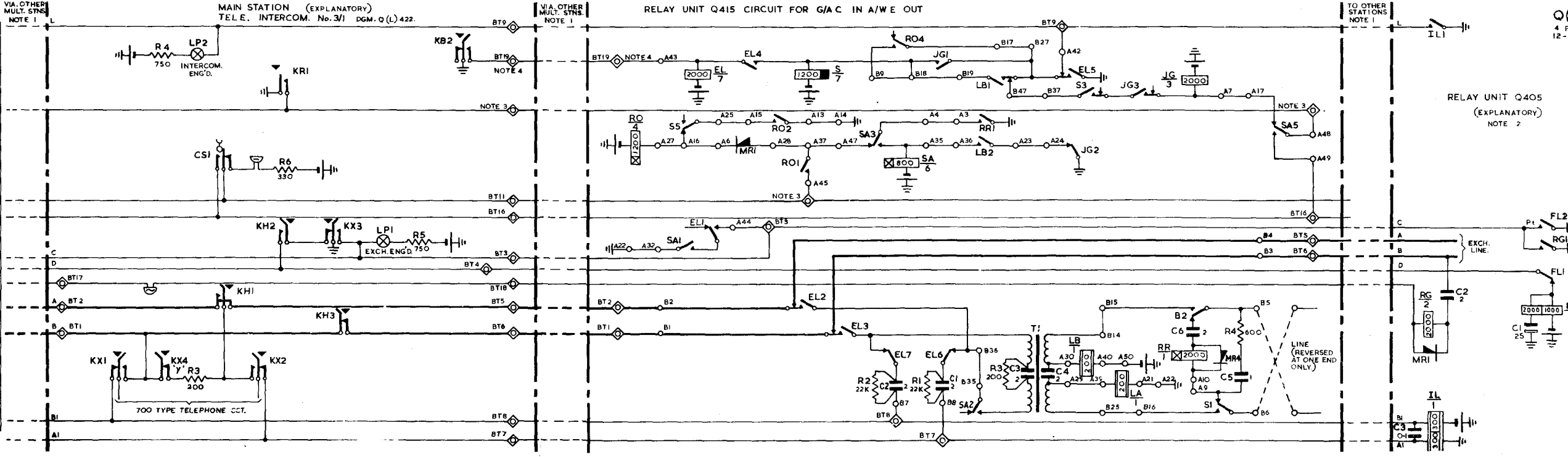
**H.E.S. No.3 (KEYMASTER)**  
**TERMINATION OF PRIVATE AND INTERSWITCHBOARD**  
**CIRCUITS USING RELAY UNIT Q415**  
 SIGNALLING GROUP G/AC IN A/WE OUT

**Q(L)443**  
 4 PANELS-1  
 12-2-64.

**NOTES :-**

1. RELAY UNIT Q415 REPLACES THE LAST MULTIPLE STATION, BUT MUST BE CONNECTED BEFORE THE NON-MULTIPLE EXTENSION IF FITTED. MORE THAN ONE RELAY UNIT Q415 MAY BE FITTED.
2. RELAY UNIT Q405, OR Q410 WHEN FITTED, MUST BE CONNECTED AFTER THE LAST STATION. SEE DGMS. Q(L)403 & 404. IN THIS DGM. TYPICAL CONNEXIONS FOR RELAY UNIT Q405 ARE SHOWN.
3. THESE CONNEXIONS WILL DEPEND ON THE NUMBER OF THE STATION REPLACED BY THE RELAY UNIT Q415, AND ALSO THE NUMBER OF THE MAIN STATION, SEE DGM.Q(L)441 NOTES 3 & 4.
4. THIS CONNEXION IS PROVIDED AT THE MAIN STATION ONLY IF THE EXTENSION OF EXCHANGE CALLS OVER THE PRIVATE CIRCUIT IS AUTHORISED ON THE ADVICE NOTE.
5. FOR ARRANGEMENT OF STRAPS IN RELAY UNIT Q415 SEE DGM. Q(L)441.

CIRCUITRY GENERAL  
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Q(L)443  
 4 PANELS - 2  
 12-2-64

**RELAY UNIT Q415 CONNECTED FOR G/AC IN A/WE OUT  
CIRCUIT OPERATIONS**

**Q(L)443**

4 Panels-3  
**12-2-64.**

**1. OUTGOING CALL**

Lifting the handset at a multiple station operates relay IL. IL1 puts earth on intercom engaged lamp wire and pressing calling button (KR) extends earth to operate relay JG via SA5. JG1 operates relay S to intercom engaged earth and relay JG holds via JG3 and S3. S1 and S2 contacts connect relays LA and LB to line.

**2. ANSWERING CONDITIONS**

When distant end answers relays LA and LB operate. LB1 releases relay JG and holds relay S. LB2 operates relay SA on release of JG2. SA5 completes station engaged condition.

**3. INCOMING CALL**

Incoming AC ringing operates relay RR via S1 and S2. RR1 extends earth to operate relay R0. R02 holds relay R0. R01 extends RR1 earth to operate main station

buzzer. When main station answers relay IL is operated and IL1 extends earth to intercom engaged wire and relay S is operated via R04. S1 and S2 disconnect relay RR and connect relays LA and LB to line. S5 releases relay R0. LB1 holds relay S to earth on intercom engaged wire. LB2 operates relay SA. SA2 completes speech path.

**4. CLEARING**

When multiple station clears first IL1 earth is removed from intercom engaged wire and relay S is released. S1 and S2 release relays LA and LB. LB2 releases relay SA. When distant end clears first relays LA and LB release. LB1 releases relay S. LB2 releases relay SA.

**5. EXCHANGE CALLS (See note 4)**

Exchange calls received on multiple stations may be extended to the tie line. The tie line is signalled and answer obtained as described in Paras. 1 and 2. Pressing the

Q(L)443

4 Panels-4

## CIRCUIT OPERATIONS (CONT'D.)

control button (KB) at the selected station extends an earth to operate relay EL. Relay S and relay ES, hold to earth via LB1 and EL4 and EL5. EL2, 3, 6 and 7 switch the tie line to the exchange line. LB2 operates relay SA. SA2 completes speech path and hold loop to exchange. SA5 provides station engaged condition. Exchange line is released when tie line distant end clears. Relays LA and LB then release, LB2 releases relay SA. SA2 removes hold loop from exchange line. SA5 removes station engaged condition. LB1 releases relays S and EL.