

THE HOUSE EXCHANGE SYSTEM NO. 3 (KEYMASTER)

Facilities

1. **General.** This Instruction describes the facilities provided in a House Exchange System No. 3 (H.E.S. No. 3) which has been given the sales name of 'Keymaster'. This system provides intercommunication between a maximum of five stations with direct access from these stations to an exchange line.

[NOTE. The earlier 1 + 5 and 2 + 10 systems will be known as House Exchange Systems Nos. 1 and 2 (H.E.S. Nos. 1 and 2) respectively.]

2. Definitions.

(a) *Multiple station.* A multiple station is one equipped with a Telephone, Intercom., No. 3/1 (L or CB) which is a 700-type instrument. Multiple stations are linked by multiple cable and are normally confined to one building but the multiple may be extended to link stations in a nearby building if signalling limits are not exceeded.

(b) *Non-multiple extension.* This is an extension station which is equipped with a Telephone No. 710 (L or CB); it is connected to the multiple by a two-wire line and a relay-unit.

(c) *Main station.* This is the multiple station where incoming exchange calls always give an audible signal, and which assists the non-multiple extension with calls to other stations. The main station also controls some of the additional facilities which may be added to the system.

3. **Capacity of installation.** A H.E.S. No. 3 comprises one exchange line and up to five stations. One non-multiple extension may be connected in place of the last multiple station, and stations may also be replaced by private circuits to another house exchange system or a P.B.X. The system also includes one or two relay-units and a Power-unit No. 51A; all these units are wall-mounted.

4. **Exchange calls.** The H.E.S. No. 3 works on C.B. principles but may be connected to any type of public exchange. In L.B. areas an auxiliary unit must be fitted at the exchange to provide the required C.B. conditions.

The H.E.S. No. 3 is unsuitable for shared service.

Exchange service is available from any station including the non-multiple extension. Access to the exchange line is by a locking press-button with gravity-switch restoration. Exchange calls are secret. Calls may be held by any station and transferred to any other station.

Incoming exchange calls normally ring a standard magneto bell mounted inside the Telephone, Intercom., No. 3/1 at each multiple station but they do not ring a bell at the non-multiple extension except for night service. Each Telephone, Intercom., No. 3/1 is fitted with a bell cut-off key. This key is made inoperative at the main station to ensure that at least one bell of the installation can be rung by incoming exchange calls. If the exchange ringing supply is sub-standard, e.g. from a vibrator, it may not be possible to ring all bells simultaneously and one or two may have to be permanently short-circuited.

5. Intercom. calls. A multiple station can call any other station by means of a non-locking press-button. The non-multiple extension cannot call multiple stations directly and relies on the main station to signal the required station. Buzzer tone is returned to the non-multiple extension as an indication that the main station is being called. Intercom. calls are signalled at multiple stations by buzzer and at the non-multiple extension by magneto bell.

The intercom. speech circuit is common to all stations, thus intercom. calls are not secret. At multiple stations automatic connexion to the intercom. circuit is made when the handset is lifted but at the non-multiple extension the EXTN button must also be pressed.

6. Conference calls. All stations can be called in to a local conference by signalling each in turn. Conference facilities are not available on exchange calls.

7. Lamp signals. Telephones, Intercom., No. 3/1 are fitted with two M.E.S. bulbs. A red lamp signal indicates that the exchange line is engaged and warns other stations not to operate the exchange button as this interrupts the exchange line circuit. This lamp glows in rhythm with the ringing current on incoming exchange calls but is not intended to be a general calling signal. This lamp also flickers when an exchange call is held, e.g. while arranging for the transfer of the call to another station.

A white lamp signal is given when the intercom. circuit is in use to warn stations wishing to use this circuit not to interrupt a call in progress unnecessarily.

8. Extension engaged signal. A multiple station which attempts to call an engaged station operates its own buzzer.

9. Night service. The non-multiple extension may be given night service on incoming exchange calls by means of switching provided at the main station. Under this condition incoming exchange calls will ring the non-multiple extension bell as well as the bells at multiple stations but, to ensure that the number of bells does not exceed that which can be rung by the exchange, it is desirable to cut off bells which are not required.

Outgoing exchange service continues to be available at all stations and intercom. calls are not affected by night service conditions.

10. Association with a P.B.X. A H.E.S. No. 3 installation may be associated with a P.B.X. in several ways.

(a) An extension from a P.B.X. may be terminated on the exchange line connexion at the H.E.S. No. 3 installation. All the facilities available to P.B.X. extensions, including operator recall, are also available to H.E.S. No. 3 stations.

(b) Subject to satisfactory transmission, the H.E.S. No. 3 non-multiple extension may be terminated as an exchange line or private circuit on the distant switchboard. Exchange calls cannot be extended in either direction.

(c) A Relay-unit Q 415, fitted in place of a multiple station, will usually provide all normal interswitchboard facilities between a H.E.S. No. 3 and a P.B.X.

11. House exchange facilities between P.B.X. extensions. Individual P.B.X. extensions may be terminated on the H.E.S. No. 3 so that each station there has an exclusive line to the P.B.X. in place of direct exchange line access. Local intercom. calls can be made between stations, but access to exchange service or other P.B.X. extensions must be obtained via the P.B.X. Transfer to exchange calls must be made via the P.B.X.

12. Association of H.E.S. No. 3 with other house exchange installations.

(a) The non-multiple extension of the H.E.S. No. 3 may be connected to an exchange line position of H.E.S. Nos. 1 and 2. Exchange calls cannot be extended in either direction.

(b) The non-multiple extension of H.E.S. Nos. 1 or 2 may be connected as the exchange line of the H.E.S. No. 3. Subject to satisfactory transmission and signalling, exchange calls can be extended to the H.E.S. No. 3.

(c) A Relay-unit Q 415, fitted in place of a H.E.S. No. 3 multiple station, can be connected to either an exchange line or non-multiple position of an H.E.S. Nos. 1 or 2; use of the latter position allows exchange calls to be extended in either direction.

(d) Two H.E.S. No. 3 systems can be connected together by a private circuit connected as a non-multiple extension at one and via a Relay-unit Q 415 at the other. Exchange calls can be extended from the installation where the private circuit is connected as the non-multiple extension.

13. Extension plans. Plan arrangements similar to Extension Plans 1... and 107 can be provided at the non-multiple extension. Extension plans cannot be provided at multiple stations.

14. Extension bells and buzzers. Extension a.c. bells may be connected in addition to, or in place of, the existing magneto bell at all stations. Extension d.c. bells or buzzers may be connected to the intercom. signalling buzzer at multiple stations.

Loud-sounding bells may also be provided.

15. S.T.D. facilities. A Meter No. 19 can be fitted to the exchange line but if the H.E.S. No. 3 is a subsidiary to a P.B.X. equipped with operator recall, a Filter, Frequency, No. 144A must also be fitted in series with the signalling earth in the H.E.S. No. 3 (see P.B.X.s, B 3201).

Optional trunk barring by means of Lock No. 29A can be provided at any station. Permanent trunk barring can be fitted provided that access to the S.T.D. network is always available from one station.

16. Exchange service prohibited or restricted. Exchange service may be permanently barred to certain stations if required. Exchange service may also be restricted at certain stations so that either incoming or outgoing calls can only be connected at the discretion of the main station.

17. Exchange line monitoring. Although exchange calls are normally secret, one multiple station may be given the facility of monitoring exchange calls; this facility degrades transmission on the exchange line and its use is restricted to one station only.

18. Exchange service when power fails. The H.E.S. No. 3 derives its 50V operating supply from Power-unit 51A which is mains operated; secondary cells are not required. If mains power fails, or is switched off, bothway exchange service is available at all stations but intercom. service, lamp signals and the monitoring facility are not. Under these circumstances restricted service stations cannot be given access to the exchange line.

19. Other Instructions referring to H.E.S. No. 3. It is intended that further E.I.s will be issued giving a description of the apparatus, installation details, circuit operation, linking with other apparatus, and maintenance information.

Reference:- P.B.X.s, B 3201
(S1/3)

E N D