

203

CLASS A CLOCK SYSTEMS

Installation in Telephone Exchanges

***1 General.** This Instruction described the method of installing and wiring pulse-type electrical clocks in buildings which contain a telephone exchange. Installation in other buildings is dealt with in B 3300. The conditions governing duplication of the master clock and/or clock units are detailed below.

All pulse clock installations in telephone exchanges should be wired in accordance with Dgm GMT 34/1 Issue E or later issues. The wiring to the slave clocks should be in accordance with Dgm GMT 38.

The distribution of the pulses from the master clock (Clock No. 36) should be via Clock-units GMT 34 or 35, as shown in Table 1 and Figs. 1 to 8.

TABLE 1

Type of exchange at site	Classification of exchange	Number of slave clocks	Fig. No.
None	-	1-100 Over 100	See B 3300
Non-director	Without chargeable time indicators	1-100 Over 100	2 7
	With chargeable time indicators	1-100 Over 100	4 7
	Multi-exchange site or exchange with mixed pre-2000/2000-type equipment during "turn-round"	1-100	3
		Over 100	8
Director with less than 6000 lines multiple capacity and all director exchanges with electronic S and Z pulse generators only. Group switching centre equipped with electromechanical controlling register-translators with facilities for transit routing	Pre-2000 or 2000-type	1-100 Over 100	4 7
	Multi-exchange site or exchange with mixed pre-2000/2000-type equipment during "turn-round"	1-100 Over 100	5 8
Director with 6000 lines or more multiple capacity but without electronic S and Z pulse generators	Pre-2000 or 2000-type	Any number Any number	7
	Multi-exchange site or exchange with mixed pre-200/200-type equipment during "turn-round"		8
Group switching centre equipped with electromechanical controlling register-translators without facilities for transit routing	Pre-2000 or 2000-type	Any number Any number	7
	Multi-exchange site or exchange with mixed pre-2000/2000-type equipment during "turn-round"		8

2 Control of system. One master clock station only should be provided in any pulse clock system. The system should serve all the buildings on the same site. The term "site" describes one continuous area of ground or areas which are connected by bridge, tunnel or duct not exceeding 100 yds. total length in one or more sections connecting a part of the system to the master clock station. The master clock station should, if possible [subject to the requirements of par. 6 (b)] be located in a position which will produce the minimum cabling costs.

At all sites, other than Group Switching Centres (G.S.C.s) having electro-mechanical controlling register-translators without facilities for transit routing, one master clock will control all slave clocks and exchange equipment.

At G.S.C.s equipped with electromechanical controlling register-translators without facilities for transit routing two master clocks should be provided and used simultaneously to give separate supplies of 1-second pulses to odd and even registers but the slave clocks and other exchange equipment should still be controlled by one master clock.

3 Basis of provision of Clock-units GMT 34. Normally one Clock-unit GMT 34 only should be provided in any installation. Exceptions are given below and in paragraph 4.

(a) *Multi-exchange site.* A separate Clock-unit GMT 34 should be provided for each exchange.

(b) *Pre-2000-type exchanges with 2000-type "turn round" extension.* A separate Clock-unit GMT 34 should be provided for each type of equipment in pre-2000-type exchanges where an extension with 2000-type equipment is intended to form the nucleus of a new 2000-type exchange.

4 Basis of provision of duplicate master clocks and clock-units. The extent of duplication is determined by the size and/or type of exchange or the number of slave clocks and is described in Table 1 and Figs. 1 to 8.

NOTE:- Retrospective action should be taken at any exchanges which are G.S.C.s and are equipped with electromechanical controlling register-translators without facilities for transit routing.

5 Power supply. Where slave clocks are installed in telephone exchanges, repeater stations, telegraph offices etc. they should be connected to the main battery provided the nominal voltage does not exceed 60V.

Where this facility is not available and a single-phase 250V maximum 50 c/s a.c. mains supply exists a 24V battery and float charging rectifier should be provided on the basis shown in Table 2. The daily consumption in Ah should be determined from the data quoted in Table 3.

A Lamp, Alarm-indicating, No. 4, a Case No. 24 and a Bell No. 56C should be cabled to a position where attention will be obtained in the event of mains failure.

TABLE 2

Daily consumption (Ah)	Battery type	Rectifier type	Accommodation	POWER, General
0 to 2	Cells, Secondary, No. 10	No. 93A	Battery-unit No. 1A	S 1212
2 to 7.5	Cells, Secondary, Enclosed, No. 2	No. 38A	Cabinet, Secondary Cell, D 63201	S 1320 S 3320 S 5320

TABLE 3

Current consuming item	Daily consumption (Ah)
Clock No. 36 pendulum drive (0.5 amp)	0.2
30-second slave clock group (0.25 amp)	0.1
1-second slave clock group (0.25 amp)	3.0
30-second pulse relay	0.01
1-second pulse relay	0.06
1-second pulse lead (0.1 amp)	1.2
6-second pulse lead (0.1 amp)	0.2

6 Position, identification and mounting of clocks. Clocks should be positioned to enable easy access for adjustment and maintenance and also to minimize unauthorized interference. Markings for circuit identification, if required, must not be conspicuous and should be by adhesive label or signwriting on an area not larger than $\frac{1}{2}$ in. x 1 in. on the bottom of the case and near the rear edge.

(a) *Slave clocks.* A slave clock should be suspended not less than 8 ft. above floor level using a $1\frac{1}{2}$ in. No. 8 woodscrew. If mirror plate suspension is used, $\frac{3}{16}$ in. minimum of the screw shank should protrude. An additional woodscrew should be provided just above the 6 o'clock position for temporary support of the clock while attending to wiring. The clocks should be checked for correct operation before mounting.

(b) *Master clock.* Clocks No. 36 should be mounted on a wall which is free from shock, vibration and wide variation of temperature. Where conditions permit, the clock should be mounted at a height such that the count wheels are about 5 ft. above floor level. If the wall is uneven battens should be provided so that the clock is mounted truly vertically. An index in the base of the clock should be used in conjunction with the pendulum. A special fixing plate is provided for securing the lower half of the clock to wall or batten. Avoid damage to spring-sets, toggles etc. when fitting the pendulum.

(c) *Clock-units.* Clock-units GMT 34 and 35 and Key No. 289B are designed for wall mounting.

(d) *Clock-connector, No. 96A (Drg. P/T 85).* This item should be fitted out of sight behind each slave clock. It provides a termination for the circuit wiring and permits withdrawal of the clock from the circuit by short-circuiting it using the special screw provided, without affecting the operation of other clocks (see Dgm. GMT 38).

7 Design and balancing of clock group circuits. The slave clocks should be arranged in groups with added resistance (R1 and R4 - R11 in Dgms. GMT 34/1 and 35/1) such that the current flowing at nominal battery voltage is 220-270 mA for 30-second clocks and 200-250 mA for 1-second clocks. Resistors, Coil, No. 9 should be used.

When determining the approximate resistor value required, each slave clock should be assumed to have a resistance of 8.5 ohms. A final correction should be

made to obtain the exact value required. If a change is made in the number of slave clocks in a circuit the value of the series resistor should be modified accordingly. Clock-units GMT 34 and 35 are equipped to supply two groups of slave clocks. When more than two circuits are required additional relays, resistors, spark quenches and fuses should be requisitioned, fitted locally and connected as shown in Dgms. GMT 34/1 and 35/1.

8 STD exchanges, 30-second pulse supply. Where a 30-second supply is required for tariff control equipment, one pulse relay contact and spark quench circuit should be allocated exclusively for each tariff equipment slave clock as shown in Dgm. GMT 34/1.

9 Check of new installation. Special observations should be made for one week and the accuracy of the master clock checked daily. The following checks should be made before putting the installation into service:-

- (a) System for accuracy TESTS & INSPECTIONS, Routine, Z 5501.
- (b) Change-over arrangement (where provided) TESTS & INSPECTIONS, Routine Z 5502
- (c) Master clock TEST & INSPECTIONS, Routine, Z 5503
- (d) Slave clock circuits TESTS & INSPECTIONS, Routine, Z 5506

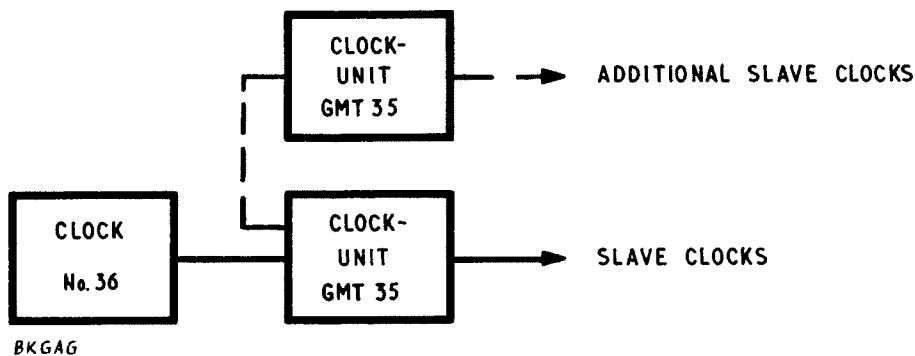


FIG. 1

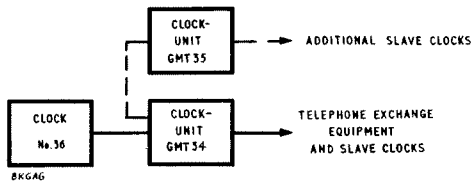


FIG. 2

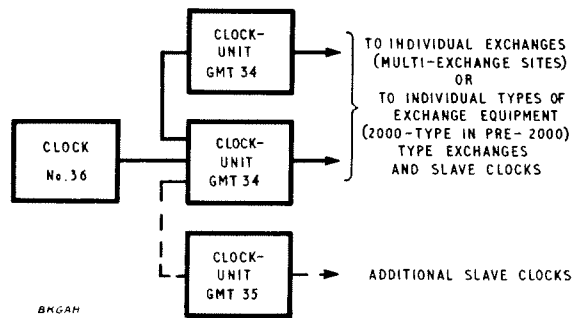


FIG. 3

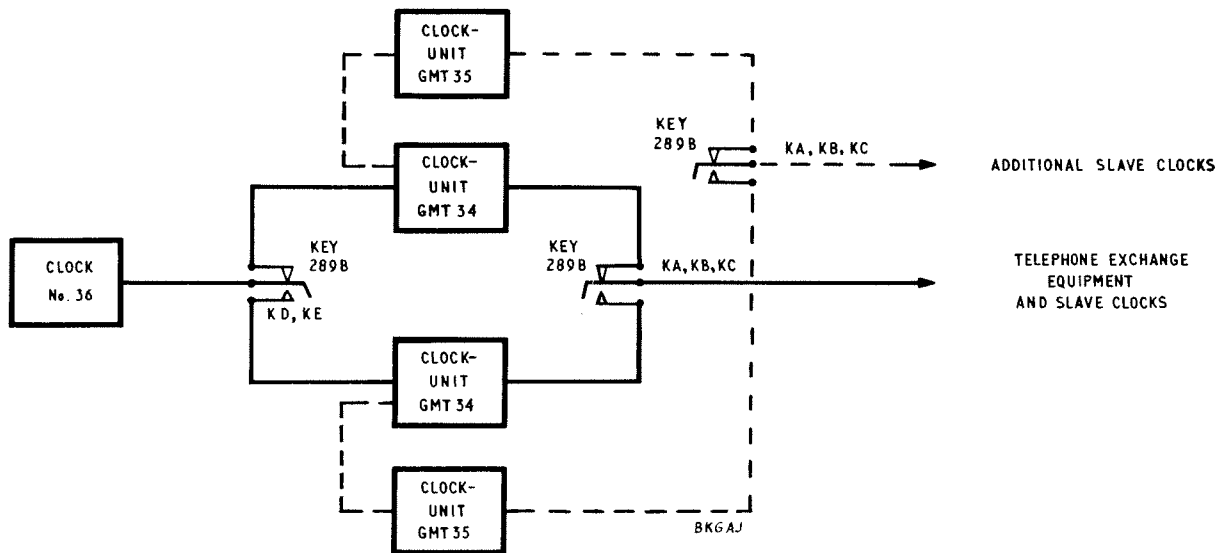


FIG. 4

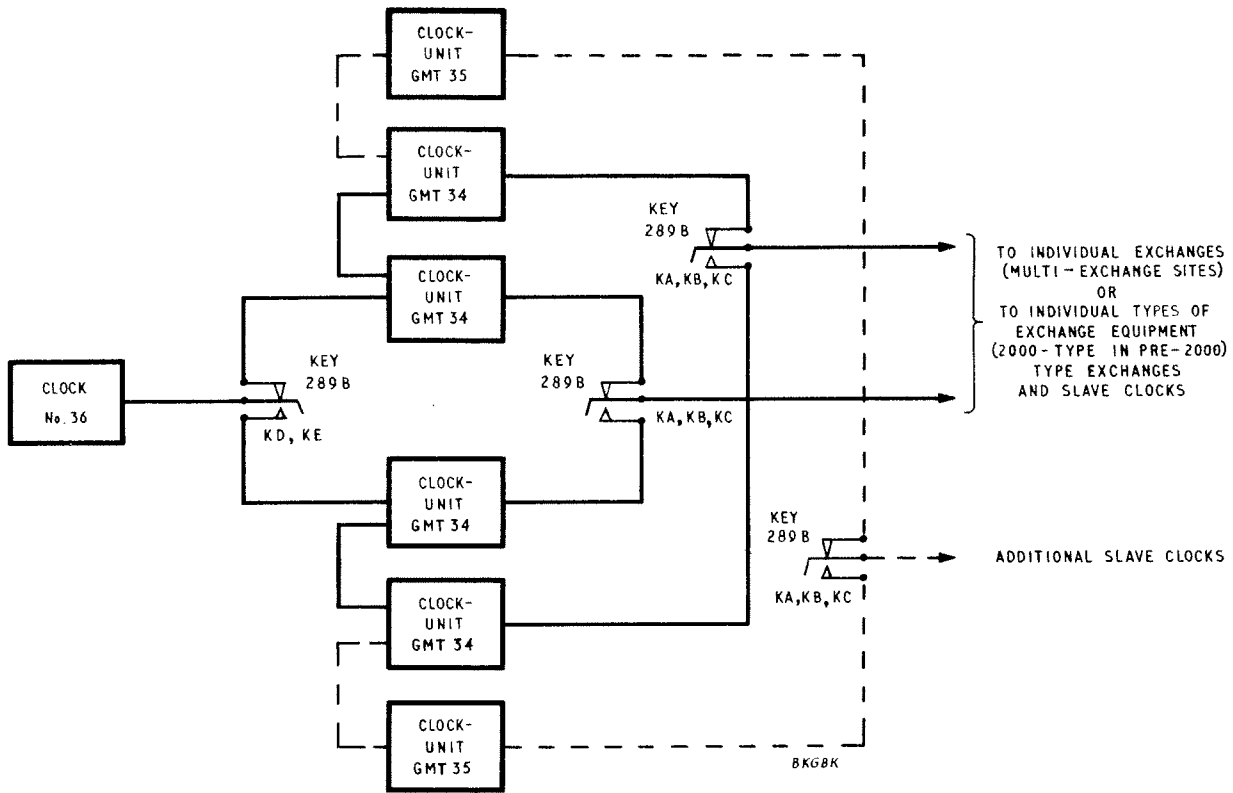


FIG. 5

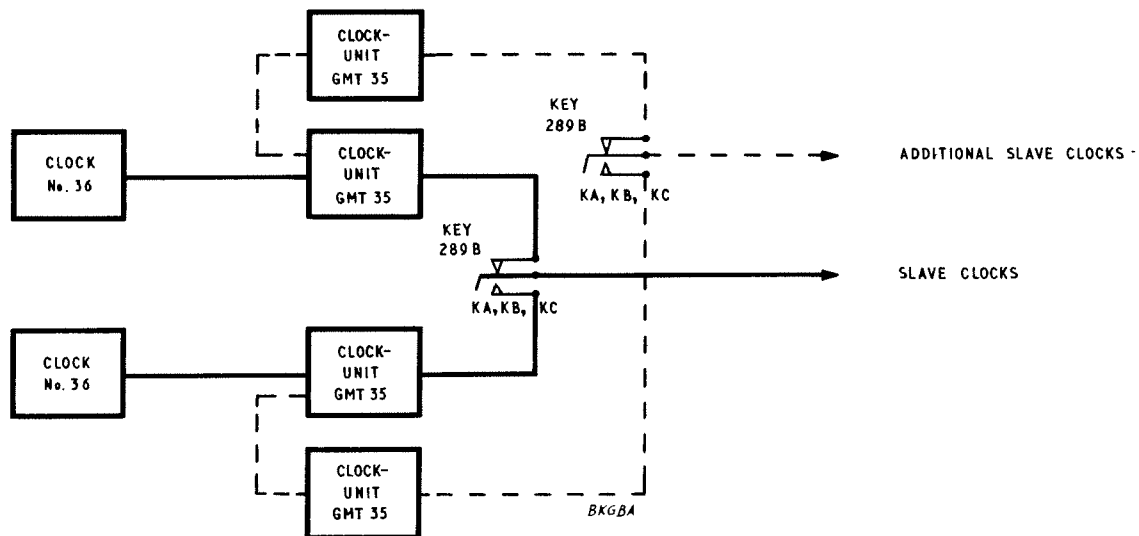


FIG. 6

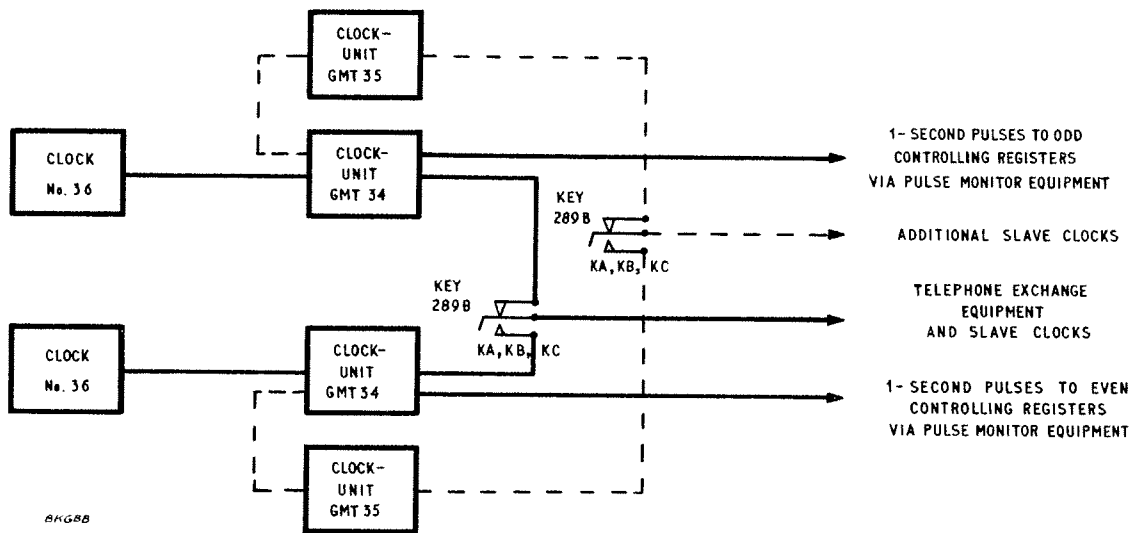


FIG. 7

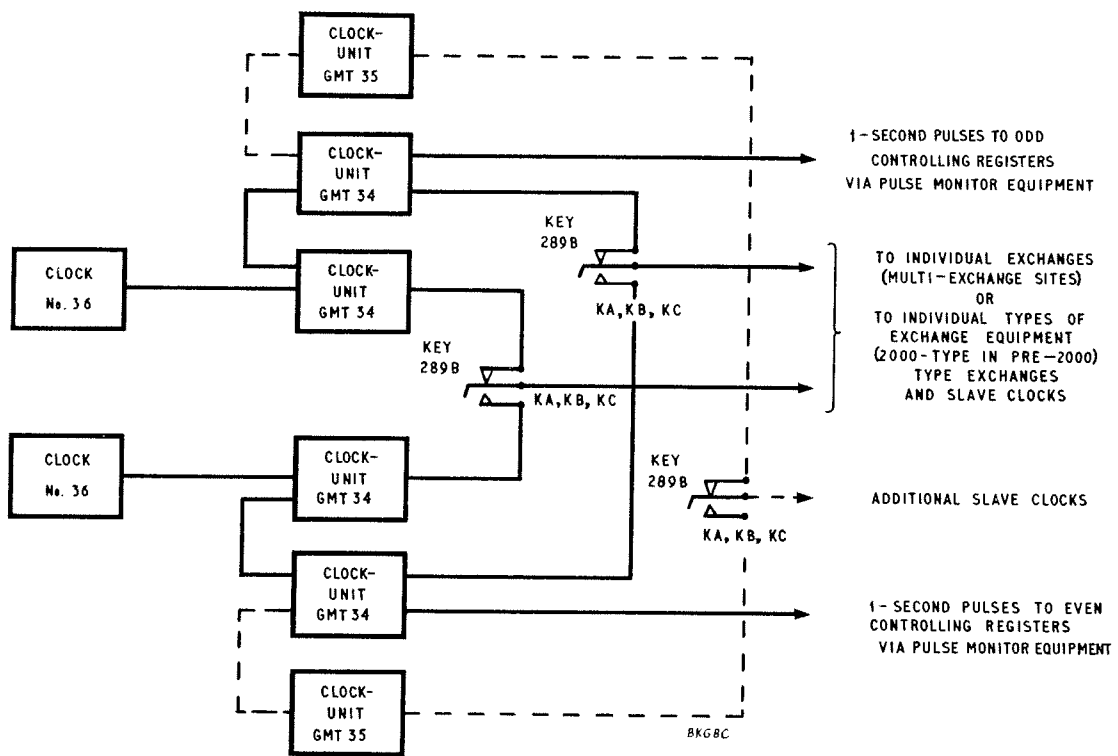


FIG. 8

References:- B 3300
POWER, General, S 1212, S 1320, S 3320, S 5320
TESTS & INSPECTIONS, Routine, Z 5501, Z 5502, Z 5503, Z 5506
(PMD/EB/ESS)

E N D