A.22.3.74.(H)

PR 479C
formerly S 28D

POST OFFICE TELECOMMUNICATIONS HEADQUARTERS

SPECIFICATION FOR

CLOCK NO. 36 (MARK 6)

(CLOCK, ELECTRIC MASTER AND CONTROLLING)

P.O. THQ DRAWINGS P/T 36/2, P/T 39/1, P/T 29

AND DIAGRAM G.M.T. 39/2

NOTE:- Specification No. D 1000 shall be taken as forming part of this Specification.

1. CASE

1.1 The case shall be constructed strictly in accordance with the drawing and shall be of well seasoned oak, free from knots, shakes and other defects, stained and polished by an approved process.

1.2 The movement shall be truly and securely fixed inside the case.

1.3 The back shall be framed and flush panelled or of blockboard. If the former the three bolts for fixing the movement shall pass through the solid framing clear of the tenons and panel tongues. The back of the clock shall be surrounded by a fillet of oak, $\frac{1}{2}$" thick, 2" wide at top and bottom, and 1" wide down the length of the clock, the fillet to be fixed to the back by wood screws. The door shall be glazed with 24 oz clear sheet glass, properly hinged and secured by means of two recessed bolts and a lever lock. The lock shall be a "Lock No. 3" to Drawing P/T 30.

1.4 A concealed suspension of substantial type shall be provided. In addition, a fixing plate, fitted at the bottom of the case, shall be provided to facilitate adjustment and positioning of the clock on the wall. The suspension and plate shall be fitted flush in the oak fillet mentioned in 1.3.

1.5 An index shall be fitted in the case bottom to show by observation of the pendulum rod, that the clock is plumb and vertical.

1.6 A $\frac{1}{2}$" dia. hole shall be drilled on each side of the case for cabling purposes as shown in Drg. P/T 36/2. Dummy wooden plugs shall be inserted as a push fit in the holes.

1.7 Metal fixings (details on Drg. P/T 29)shall be provided for securing the pendulum in the case during transport. These shall be securely fixed to the clock case by means of bolts and nuts, with large washers, shake proof washers, and nuts at the back of the clock case. The wooden block at the bottom of the case, used for locating the rating screw of the pendulum during transport, shall be fixed in position after the metal fixings have been fitted.

2. CASTING

2.1 The various components of the clock shall be mounted on a suitable casting in the position indicated on Drawing P/T 39/1. The complete assembly shall be securely fixed inside the case by bolts and nuts as laid down in 1.7.

2.2 The casting shall be sound, clean, out of twist, free from blowholes and of uniform thickness. The surfaces shall be clean and machine finished, with other parts treated to ensure a smooth finish. The whole casting shall be finished according to Specification M 283 to colour No. 631, glossy, of BS 381.

3. PENDULUM

3.1 The pendulum shall be of "Invar" and fully compensated and maintained in oscillation electrically by the application of a Hipp toggle contact and electromagnet.

3.2 The rod shall be truly suspended so as to oscillate without any tendency to deviate from the vertical plane. The bob shall slide easily without side shake on the rod and provision shall be made to prevent the bob turning on the rod. The bob shall consist of a brass case, completely enclosing the lead weight of the bob. The rating screw shall be well cut and have 18 threads to an inch. The rating nut shall have a diameter not less than that of the bob, shall be marked with 60 numbered divisions on the periphery and shall revolve without backlash on the rating screw.

3.3 The rate of oscillation of the pendulum shall be 2 seconds per complete oscillation and the variation in the rate shall be adjustable to not greater than 8 seconds per week. With this adjustment the pendulum shall require not more than one driving impulse for every 15 complete oscillations when a battery of 4 volts is connected to the terminals of the driving coil.

3.4 All pendulums shall be interchangeable.

4. PULSE SPRING SETS

4.1 The clock shall be fitted with 4 sets of pulsing springs to provide the following facilities:-

(a) One second pulses:- springs shall be operated directly from the pendulum and shall be connected in parallel with No. 18 S.W.G. wire covered by an insulated sleeve.

(b) Six second pulses)
) operated by count wheels
(c) 30 second pulses)

(d) Driving pulses

(e) 1, 6 and 30 sec. pulse lengths 200 min to 500 max millisecond long.

4.2 All moving contact springs shall be of best spring hard Phosphor Bronze and shall be properly aligned. The spring sets shall be definitely positioned by two screws as shown in Drawing P/T 39/1.

4.3 All springs shall be efficiently insulated from the frame and from each other.

4.4 The spring sets (a-c) shall be adjusted so that the pulses transmitted shall have a duration of 0.2 second minimum and 0.5 second maximum.

4.5 All lever springs shall lie flat against the whole length of their buffer springs with a force of 5 to 8 grammes measured at the extreme tip of the spring. The contact springs shall lie flat against the whole length of their buffer springs with a force of 15 to 20 grammes measured at the extreme tip of the spring. The contact opening of all spring sets shall be 0.010 in minimum, and the lift of any contact spring from its buffer springs shall be 0.005 in $\pm$0.001 in.

5. CONTACTS

5.1 All contacts shall be of Platinum-iridium alloy (Pt90 Ir10) and shall be domed in accordance with Drawing SCO/129. The contacts shall be securely riveted to the springs, and shall make firmly and squarely without any tendency to bounce.

6. SPARK QUENCHING

6.1 All springs set shall be equipped with spark quenches consisting of a 200 ohms resistor and 1 μF capacitor as shown in Diagram GMT 39/2. These items shall be fitted in the position indicated on Drawing No. P/T 36/2.

7. AGATES

7.1 The Agate associated with the Hipp toggle shall be of good quality, free from defects or flaws and shall be secured firmly in its seating.

8. COUNT WHEELS, PAWLS AND DETENTS

8.1 The wheels shall be of hard rolled brass of 120 Brinell truly fixed and secured on their arbors and shall run freely in their bearings without undue laxity. The teeth shall be accurately cut and meshed and properly finished. The pivots shall be well polished and their bearings well formed and oil retaining.

8.2 The pawls shall be correctly shaped so that they engage the teeth cleanly and without any tendency to ride up.

8.3 At minimum amplitude of pendulum, the pawls and detents shall be clear of the appropriate teeth by at least 20% of the tooth pitch.

9. ADVANCE AND RETARD KEY

9.1 A Key No. 212 for advancing and retarding the 30 second pulse clocks shall be associated with the clock. The key shall be fitted in the position shown on Drawing No. P/T 36/2 and wired strictly in accordance with Diagram GMT 39/2.

10. FINISH OF COMPONENTS

10.1 The pendulum, steel push rods, pawls, detents, and other steel parts except pinions and pivots shall be blued and lacquered or finished nickel-copper-nickel. All brass parts shall be shot or sand blasted and lacquered, except on working surfaces.

11. APPARATUS

4 Capacitors M.C. No. 101 (Drawing 9208, Spec. D 742)
4 Resistors Spool, No. 6 - 200 ohm (Drawing 9480, Spec. D 1230)
1 Clip No. 31 (Drawing 62578)
1 Key No. 212 Grey (Drawing 60136, Spec. D 484)
1 Key Mounting Q (Drawing 62416, Spec. D 658)
1 Bracket Mounting Y (Drawing 9446)
2 Labels No. 22 White (Drawing 62540, Spec. D 259)
engraved "ADVANCE" and "RETARD" (size of characters to be 10 C.1. Drawing SD1, Sheets 1 and 2)
1 Label LD 152
1 Lock No. 3 P/T 30.

12. WIRING

The clock shall be wired, except where otherwise stated (see 4.1(a), with Wire, PVC No. 3A 1 wire/6½ lb. to Specification CW 109 exactly in accordance with Diagram GMT 39/2. Wiring to be "Red" for earth, "Black" for battery and "Green" for all other wiring (see GMT 39/2). The casting of the clock shall be wired to the earth terminal. All wires shall be neatly formed and fixed to the clock woodwork. Wires shall not touch the casting, nor be taken across the face of the casting. When two or more wires must be connected to a single terminal screw, each wire shall be soldered to a Part 1/STA/20 or Part 1/STA/21; wires shall not be twisted together under a single terminal. All wires shall be terminated with sufficient slack to allow for breakages, etc.

13. INSULATION RESISTANCE

The insulation resistance between any two points that are not required to be electrically connected and between electrical connexions and frame shall be not less than 1000 megohms when tested with 500 volts d.c.

14. GUARANTEE

14.1 The contractor shall guarantee each clock for a period of 12 months from date of acceptance and shall replace free of charge any parts which become faulty through normal use during that period.

14.2 A clock may at the discretion of the Department's inspecting officer be taken at random from a consignment, and subjected to a continuous test for a period up to six months. If any defects are found to develop due to inferior materials or workmanship, the whole or any proportion of the consignment may be rejected.

15. MARKINGS

15.1 Each clock shall be marked with the stock list number, the approved code letters identifying the manufacturer, the year of manufacture, the mark number and the diagram to which it is wired, in accordance with Specification D 1000, eg 36 FH 56/6, Dgm. GMT 39/2. (The letters FH are typical, and should be substituted by the letters allocated to the Contractor).

15.2 These markings shall be stamped or engraved on a suitable metal label fixed adjacent to the makers own name plate centrally inside the case.

15.3 A Label Diagram LD 152 shall be pasted inside the case on the back, and varnished over when dry.

Schedule of Drawings, Diagrams and Specifications referred to in this Specification

Drawing No.	Diagram No.	Specification No.
9208	GMT 39/2	D 742
P/T 36	LD 152	D 1230
9480		D 484
62578		D 1000
60136		D 658
62416		D 259
9446		CW 109
62540		BS 381
SD 1		M 283
P/T 39/1		
P/T 29 & 30		
SCO/129		

History: Open Issue. Transferred from S Branch. Drawings renumbered.

A Issue — Pars. 4.1, 4.5 and 10.1 amended. Par. 8.3 added.

B Issue — Par. 4.5 Contact spring lift was 0.050 ± 0.010 ins.

B Issue — Retyped (editorial reasons), file reference, controlling group and THQ title and address updated, technical content unchanged.

C Issue — Para 4.5 amended.

END OF SPECIFICATION

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