IMPULSE CLOCKS

Type	Total Res.	Armature Return Spring Tension	Type
T.M.C. Worm Drive	18	Non-Operated 5-9 grms. Operated 14-18 grms.	K4962B
T.M.C. Worm Drive	50	Non-Operated 37-43 grms. Operated 54-60 grms.	K4961E

Type	Total Res.	Min. Arm. Tension	Armature Residual	Armature Travel	Non-Op. m/A.	Operate m/A.
T.M.C. Pallet	2.5	5 grms.	2-4 mils	Fixed	150	160
*T.M.C. Pallet	5	8 grms.	2-4 mils	Fixed	110	120
*T.M.C. Pallet	10	10 grms.	2-4 mils	Fixed	100	110
T.M.C. Quiet	2.5	7 grms.	2-4 mils	Fixed	170	180
T.M.C. Quiet	5	7 grms.	2-4 mils	Fixed	150	160

Type	Armature Tension	Armature Resid.	Armature Travel	Non Op	Op	Drive Pawl At Rest
Gents Latest types	Adjust to meet current figures	2 mls Clear	Drive pawl to gather 1.5 teeth	170 mA	180 mA	2 or 4 teeth between back stop & pawl
Gents Early Types	Adjust to meet current figures	2 mls Clear	Drive pawl to gather 1.5 teeth	170 mA	180 mA	2 or 4 teeth between back stop & pawl
Synchronome Early Types	12-14 grms.	Paper Shims	Drive Pawl to gather 1.0 to 1.25 teeth and no more	170 mA	180 mA	4 teeth between back stop and pawl
Synchronome Slim 3.7 Ω Early Type	9-10 grms.			200 mA	210 mA	
Synchronome Slim 2.7 Ω Current Type	9-10 grms.			190 mA	200 mA	
Synchronome Slim 4.7 Ω	13-14 grms.			200 mA	210 mA	

X5

* The small leaf spring fitted on these movements bears against the upper stop click with a tension of 2 grms on the 10 Ω movement, and just sufficient on the 5 Ω movement to hold the click in engagement with the pallet wheel when the clock is turned upside down.

Contd/...

IMPULSE TRANSMITTERS

T.M.C. High Movement

Contact Gap, Armature non-op.	92 mils
Armature Tension	Just hold against back-stop
Armature Residual	2-4 mils
Contact Gap, Armature operated	16 mils
Latch Depth	Gravity type full less 10 mils. Spring type $\frac{1}{3}$rd. locking pallet face.
Latch Tension	Use Weights K90698. With gravity lever held unlocked, adjust tension :- Latch tail to leave stop-pin with long weight suspended, not to leave stop-pin with short weight suspended.
Clearance between Unlocking Pin and Latch	Just clearance
Impulse pallet & roller clearance	10-15 mils
Gathering jewel position at rest	Gathering jewel should be $\frac{2}{3}$rd. distant from tooth to be gathered and $\frac{1}{3}$rd. distant from last tooth gathered.
Backstop roller position	4th tooth from that last gathered.
Amplitude	2.0° to 2.4° plus, or 38 mm to 45 mm plus.
Lubrication	Lubricate all pivots of spindles and bearings of rollers. Lightly lubricate the locking surface of the catch. Do not lubricate the gathering pallet wire bearing, or pivot of backstop roller wire. (See opposite.)

Synchronome Movement

Armature Residual	10 mils
Latch Depth	Just perceptible play between felt buffer pad and gravity lever.
Contact Gap, Armature operated	71 mils (ensure gravity lever does not move when inserting gauge).
Contact Gap, Armature non-op.	212 mils (ensure gravity lever does not move when inserting gauge).
Armature Tension	5-7 grms against stop.
Clearance between Unlocking Pin & Latch	10 mils min.
Sustaining Position	With pendulum at rest and gravity lever unlocked, tip of pallet should be horizontally in line with roller pivot.
Amplitude	3.0° to 3.5° plus, or 30 mm to 35 mm.
Lubrication	Lubricate all pivots of spindles and bearings of rollers. Lightly lubricate the locking surface of the catch. Do not lubricate the gathering pallet wire bearing, or the backstop roller where this is made of fibre. (See opposite)

Contd/...

LUBRICATION OF MOVEMENTS

It is important that oil sinks are not overfilled. Before commencing lubrication the sinks should be wiped dry after which the oil should be applied to the centre of the bearing. If the sinks are only half filled the surface tension of the oil will retain it in the bearing. Should, however, the sinks be overfilled or their sides "wetted", the oil will drain away leaving the bearing dry.

To apply the oil use a piece of 20 gauge iron or steel wire flattened at the end and shaped into an arrow head. A paper clip is ideal for this purpose. Do not use copper wire since copper may contaminate the oil.

If an Impulse Transmitter is keeping good time and its amplitude is constant it is not necessary to strip and clean the movement before oiling. However, those parts which can easily be removed without affecting the relationship of other components (i.e. the 15 tooth wheel on the HM and the Synchronome transmitters) should be removed and cleaned, the accessible bearings being oiled before re-assembly.

RATING OF IMPULSE TRANSMITTERS

Rating Nut - Per Division			
Imp. Trans. Type	H.M.	Syn.	Mag.
Secs. per week (approx)	10	70	14

A6

Effective Values of Rating Weights - H.M., Syn. and Mag. Impulse Transmitters.							
Weight No.	80 (Standard)	40	20	10	5	2½	5/16
Approx Size (mm)	25 x 20	20 x 13	20 x 6	10 x 6	6 x 5	5 x 3	5 mm dia.
Secs/week (approx)	40	20	10	5	2½	1¼	5/32

To calculate for gain when removal of all weights will not compensate :-

$$\frac{\text{Effective value of standard rating weight} + \text{No. of secs. gain per week} - \text{Effective value of total weights on bob}}{\text{No. of secs. per week per division}} = \text{No. of divs. down}$$

To calculate for loss when max. weights will not compensate :-

$$\frac{\text{Effective value of total weights on bob} + \text{No. of secs. loss per week} - \text{Effective value of standard rating weight}}{\text{No. of secs. per week per division}} = \text{No. of divs. up}$$

Note : Rate only on the mean of two consecutive gains or losses.

Contd/...

LOOP CURRENTS

When checking the current in the prime loop and ½ minute impulse clock circuit(s), the voltage should be measured and the current adjusted in accordance with the figures given in the table below.

The Impulse Transmitter may double impulse, stop or vary its timekeeping if a current is used in excess of or less than the figures given.

VOLTS FOUND	Adjust Current (mA) to :-	
	H.M. Wood Case and Synchronome Impulse Transm.	H.M. Metal Case Impulse Transm. and ½ min. Imp. Clock Cct.
36	300	270
37	308	277
38	316	285
39	324	292
40	332	300
41	340	307

1. Ensure that log book, relevant "Envelopes" and rating weights are supplied.

2. ACCUMULATORS.

Check: Containers not cracked, acid level correct, specific gravity, intercell connections, terminals greased, filling vents facing front, tops clean and dry.

3. PANEL.

Check: Wiring and connections, fuses, transformer taps to correct volts and live leg of mains to terminal 'L', Charge Rate and Rectifier Back Feed - See EIM/4002, Relays - See EIM/1030, Current in Time Loop, Impulse Indicator.

Note. Enter all observations in log book.

Check sound signal relays to ensure contacts break live leg of mains and relay frame is not insulated from panel.

4. IMPULSE TRANSMITTER.

Carry out adjustment checks according to EIM/4005.

Note. Enter all observations in log book.

5. UNISELECTOR CHRONOGRAMS.

Uniselectors. Check all for: Tightness of fixing screws, wiper assembly secure on spindle, wiper position - entering bank, wiper position - centre of bank, wiper position - leaving bank, wiper assembly - backlash. Hand stepping - reliably around entire bank. Satisfactory lubrication.

All switches must be tested to run reliably on 31/32 V.

Check: Wiring and connections. Relays. Programmes, by manually setting switches near to signal times and adding impulses via relay A. Signal duration.

Re-set and synchronise.

6. MANUAL SIGNAL PANEL.

Check: Wiring and connections. Satisfactory operation of keys. Correct labels.

7. TIME RECORDERS.

Check: Correct day plate fitted. Correct day change time. Punching. Printing, by stamping a card and checking that it is clear and central. Time correct according to hands and programme unit (P.M. underlined). Ribbons winding correctly. Colour change by operating trailer lever. Correct day. Programme recorded on machine. Spark quenches and earthing of cases on automatic Recorders. Lubrication.

8. CARD RACKS.

Ensure installed in satisfactory positions.

Contd/...

9. IMPULSE DIALS.

Manually impulse movement and visually check satisfactory. Reset to time.

10. SOUND SIGNALS.

Check each unit earthed, and also for adequate coverage.

11. Complete log book in every detail.