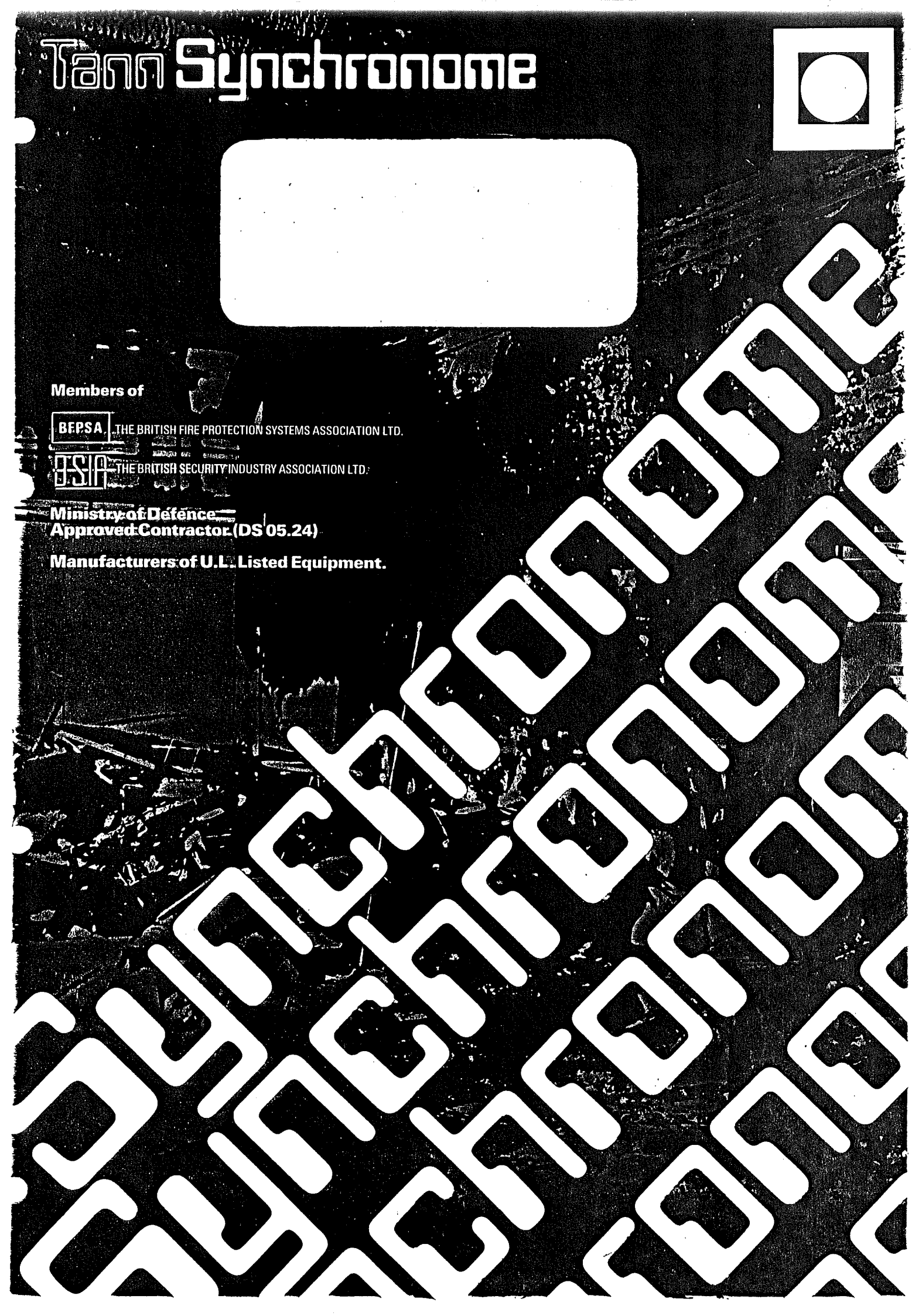
Tann Synchronome



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M C / 1

MASTER CLOCK SYSTEM

INSTALLATION & MAINTENANCE MANUAL

CONTENTS

Tann Synchronome

S E C T I O N A

MASTER CLOCK

GENERAL DESCRIPTION
&
INSTALLATION

THE SYNCHRONOME MASTER CLOCK

FOR OPERATING HALF-MINUTE IMPULSE DIALS ONLY

The Master Clock is fitted in a polished hardwood case, 50" Long, 10½ " wide and 6" deep; it is fitted with a 7" diameter half-minute impulse dial having minute and hour hands.

The pendulum movement consists of a substantial baseplate on which the pendulum impulsing and electrical switching mechanism is fitted and the pendulum suspended.

The pendulum is of one second's length, that is to say, its length is such that it will take one swing from left to right or vice versa, in one second of time.

The pendulum rod is of Invar, a nickel steel alloy, having a negligible temperature coefficient, the pendulum bob is of steel and weighs 16 lbs. The construction of the pendulum is such that it is well compensated against temperature changes, and it is given impulse every 30 seconds from a detached gravity system which impulses the pendulum around the zero position. This combination enables the clock to keep time to within 2 seconds per week, and often much better.

The impulsing to the pendulum and the electrical switching every 30 seconds is illustrated and described on the enclosed Print No. 20007.

ERECTION

Unpack the clock, the pendulum and the bob.

It is necessary to fit the clock on a substantial wall which is free from vibration if the best result in timekeeping is to be obtained. The clock should be erected so that the case is about 6 feet above the floor level; this will bring the clock movement to a convenient height for fitting up and for attention in the future.

The Clock should first be hung on its hanging plate. Drill and plug the wall, and fit a 1½" x No.12 wood screw into the plug so that the screw head projects about ¼" from the face of the wall. Hang the clock on to the screw by its hanging plate. Open the door of the clock and hang a plumb line from the top left side of the case and bring the clock to an upright position as indicated by the plumb line. Mark off the wall, through the three holes, two at the top, and one near the bottom in the backboard of the case. Remove the clock from the wall and drill and plug the wall in the three positions. Replace the clock on the wall, and screw back through the three holes firmly to the wall; for this purpose use three 2½" x No.12 roundhead screws.

Ascertain with the plumb line that the clock is not leaning out or in at the top, i.e. check that the wall is upright. If the clock is not hanging right in this respect, the fixing screws should be slackened off and hardwood packing of the right thickness placed behind the top or bottom batten to bring the clock upright. Finally, tighten the screws.

Having got the clock firmly fixed to the wall, remove the ties from the gravity lever, backstop etc, and proceed with the assembly of the pendulum.

It will be seen that the pendulum rod is already fitted with the brass suspension spring chop at the top end, the impulse pallet and the bottom bob collar and pendulum bob supports or rating nut at the bottom end. Remove the rating nut and bottom bob collar from the thread at the bottom end of the pendulum rod. Get the pendulum bob and slide it over the thread and on to the rod until the rating thread projects well from the bottom of the bob, be sure that the brass domed collar fitted into the bob is at the top, place the bottom bob collar onto the rating thread and slide it on to the bottom of the bob so that the smaller diameter of it fits into the bottom of the bob. Screw the rating nut back on to its thread; allow the bob to rest on it and screw it up until the domed collar in top of the bob is level with the mark on the pendulum rod. This will be about the right position of the bob to enable the pendulum to keep good time, although further adjustments will be necessary after a time, mainly owing to the difference in gravity between Westbury, Wiltshire, and the place where the clock is being erected.

The trunion, top chops and suspension spring will be found as one unit, clamped tight under the wing nutted straps at the top of the Master movement frame, also the jewelled click and the case key in separate envelopes. Release the wing nuts and remove the trunnion fitting and proceed to fit it to the top end of the pendulum. To do this, first remove the screw passing through the bottom chop already fitted to the top end of the pendulum. Take hold of the top chop with the spring already fitted, and insert the spring carefully into the slot of the bottom chop until the hole in the spring exactly lines up with the screw hole in the bottom chop, at the same time, making sure that the spring clamping screw head in the top chop is on the same side as the spring clamping screw will be on the bottom chop. Tighten the screw in the bottom chop until the spring is clamped firmly but not gripped dead tight.

Now remove the jewelled click from its envelope and fit into the special slotted screw at the back of the impulse pallet so that the arm of the click comes to rest at the bottom of the circular sheet.

Hang the pendulum in position by placing the cross bard or trunnion on top of the pendulum bracket at the top of the movement frame or baseplate. Be careful to get the pivots of the trunnion resting on the bracket and see that the trunnion is square, i.e. is parallel to the back of the case, also that the pendulum is positioned so that the rod is centred at the same distance from the back of the baseplate as the 15-toothed wheel; in this position the gathering click will correctly engage the wheel at the centre of the 'D' shape on the jewel.

Having hung the pendulum satisfactorily, the impulse pallet should be in the correct position relative to the impulse roller on the gravity lever. The top corner of the impulse curve of the pallet should swing under the roller with a clearance of 1/100 of an inch when the gravity lever is supported on its catch. If necessary, the pallet should be re-adjusted on the pendulum for height to obtain the clearance of 1/100 of an inch if for any reason it is not so.

The position of the pendulum from right to left has been set correctly, but should be checked as follows: when the pendulum is hanging still at zero the gravity lever should be unlocked from its catch and the gravity lever roller allowed to rest on the curved part of the pallet. In this position, the pivot of the gravity lever roller should be level, horizontally, with the top corner of the impulse curve of the pallet. If adjustment is required, slacken the suspension top chop and move it along the trunnion, tighten screw. Take great care if any adjustment is made to the pallet that it is finally tight on the rod and in line with the plane of the swing of the pendulum. The jewelled click should be in the correct position for gathering one tooth only of the 15-toothed wheel for each complete swing of the pendulum, however large the arc. The click should be bent up or down slightly if the gathering action is too shallow or too deep.

The working current in the half-minute switch circuit is 0.33 amp and the resistance in the Master Clock which is in the half-minute circuit, can be adjusted to ensure this. The half-minute circuit has a pair of output terminals which are bridged over to complete the series circuit.

Exterior half-minute impulse dials, relays or other instruments may be added in series with the half-minute impulse circuit by removing the bridge across the output terminals and connecting the external locks etc. which should be connected in series to each other, to them. The resistance in the half-minute circuit would require re-adjusting then external dials or instruments are added to maintain the required working current of 0.33 amps.

THE MASTER CLOCK DIAL MOVEMENT

The dial movement is fitted on to the dial on the door of the case.

The propelling of the dial wheel work is by means of reciprocating brass lever having the armature plate at its bottom end, which is attracted on each impulse passed through the coil. At the top end of the reciprocating lever is fitted a driving clock which engages and drives the main centre wheel. The wheel is held steady and prevented from moving by the back-stop lever, the steel square end of which will be seen resting on a tooth of the wheel immediately below the driving click.

To set the hands to time, press with the finger on the left-hand end of the backstop lever which will be seen projecting from the top left-hand corner of the movement. This will disengage the wheel work from the click and backstep square and leaves the large wheel free to revolve by hand. Set to time and release backstop.

THE BEAT SCALE OF WOODEN BLOCK

The beat scale block should be stood on the bottom of the case so that the '0' in the centre of the scale is exactly in line with the bottom point of the pendulum when the pendulum is hanging still at zero. The scale should be about $\frac{1}{8}$" behind the joint of the pendulum; when in the correct position the block should be pressed on to the bottom of the case. It has two sharp projections on its underside which will hold it in position.

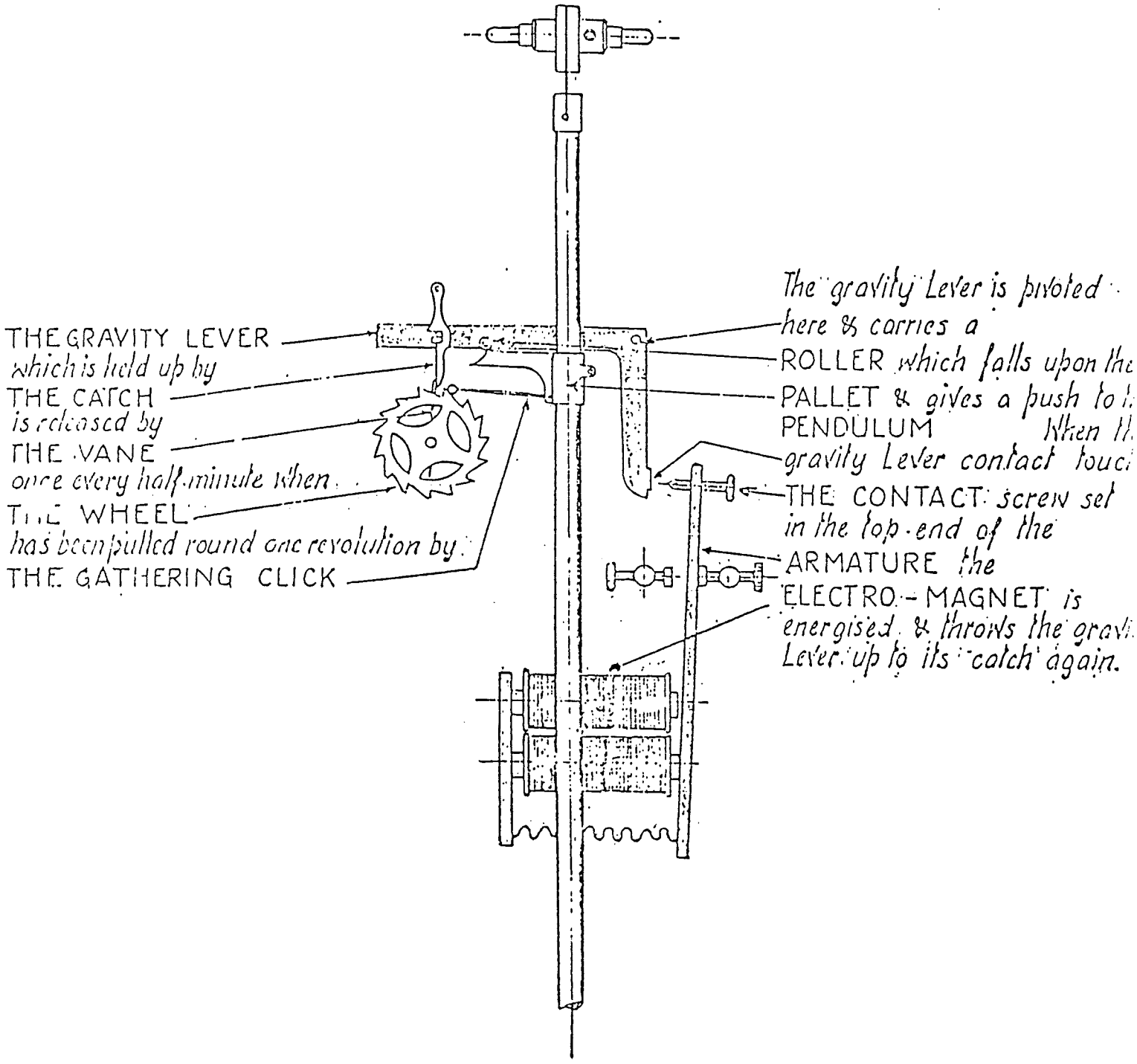
BATTERY

The Master Clock on its own requires 4volts for its operation but if further dials or instruments are added to the outset terminals (all in series with each other) the battery voltage must be increased at the rate of 1 volt for every 3 ohms of circuit resistance.

Where an adjustable resistance is fitted in the Master Clock for the purpose of regulating the current in the half-minute impulse circuit, more voltage may be in use than is required by the circuit. In this case, the resistance should be adjusted to keep the current 0.33 amps.

When everything is ready to start the Master Clock, swing the pendulum until the pointer at the bottom end shows just over 20 + 20 millimetres on the scale, at which arc the gathering click will gather the 15-toothed wheel, a one tooth for each complete cycle of the pendulum and the gravity lever will impulse the pendulum at each 30 seconds. Leave the pendulum to increase its arc, so that after about one hour, the arc should be 36 + 36 millimetres to 40 + 40 millimetres.

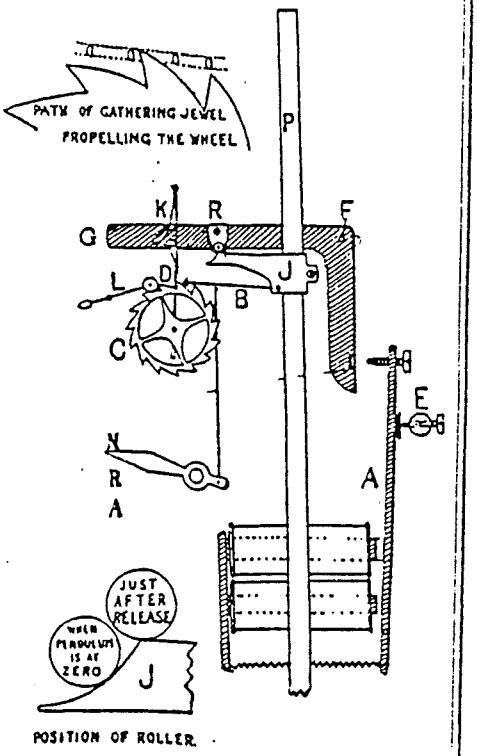
After one hour, the arc should remain perfectly steady. A constant arc between the figures given above indicates the clock is in good working order, and very good timekeeping may be expected.



The Synchronome Switch.

" Print NO. 20007 "

A Armature.
B Gathering click.
C Wheel.
D Vane.
E Stop screw.
F Pivot.
G Gravity arm.
J Impulse bracket.
K Catch.
L Backstop.
P Pendulum.



S E C T I O N B

MASTER CLOCK -

MAINTENANCE

MAINTENANCE INSTRUCTION

The information so far has dealt with the setting up of the clock and the performance which may be expected from it. There will come a time, however, when the clock needs attention, due to infiltration of dirt into the pivot holes and other parts, drying up of the lubricating oil, or wear or breakage of some part or parts.

The clock should work for about one to two years without need of oiling or adjustment, during which time the arc of the pendulum should have remained, within a little, quite steady. Whilst the arc does remain steady and the clock is giving a satisfactory performance it should be left alone.

If the arc appreciably decreases or keeps varying it is generally a sign of increasing or fluctuating friction and the clock may soon stop.

Oiling all the pivots and the working surface of the catch may get over the trouble, but if it does not, the clock will have to be stripped down.

It is not usual to get trouble with the switch contacts which are made of platinum unless they are being overloaded without adequate spark suppression.

In a normal Synchronome Master Clock System operating a number of dials, all the coils in the system are individually bridged with a non-inductive shunt resistance which reduces sparking at the Master Clock contacts to a point which is negligible, and no other precaution is necessary. When the Master Clock is operating several hundred dials in a number of paralleled series circuits, a special spark suppressor is used in addition to the normal shunting. This ensures complete protection of the contacts.

If the Master Clock should stop, the stoppage will either be caused by friction in the mechanism or a break in the electrical circuit, either of which may be ascertained as follows:-

If the gravity lever is resting on its catch then friction in the mechanism is the cause of the stoppage. If the gravity lever is not resting on its catch, but its roller is on the pallet on the pendulum, then a break in the electrical circuit is indicated. The break may be within the Master Clock but usually it is in the wiring of the external dials. Assuming the clock has stopped through friction in the mechanism and oiling the pivots and catch, as previously mentioned, does not get over the trouble, it will be necessary to dismantle the mechanism for cleaning and oiling.

To do this it is not necessary to remove the pendulum from its set position. The electrical circuit should be opened by removing the wire from the gravity lever terminal, or break the circuit at any other convenient point.

Release the gravity lever from its catch and let its roller rest on the curve of the impulse pallet. Now remove the two screws holding the bridge and take out the 15-toothed wheel, the backstop and the catch, being careful when removing the bridge that these parts do not fall out. Clean the parts if possible by washing them in benzine, petrol or tetro, drying and wiping perfectly clean with clean dust-free rag.

If it is not possible to wash the parts, clean them off well with clean dust-free rag. Clean the bridge plate and the back plate and clean the pivot holes out with a tapered pegwood twisted in the holes, and scraped clean several times for each pivot hole, until the pegwood comes out clean.

Having cleaned the 15-toothed wheel, see that the pivots are perfectly clean and polish the long surfaces of the teeth of the wheel, they have already been burnished but may now be tarnished. It is best to clean the teeth with a metal polish such as Blue-bell, do not touch the short upright parts of the teeth beyond wiping them clean.

When the backstop and catch have been wiped clean, this assembly is ready to be re-assembled. Before placing the back pivots in the pivot holes in the back plate, oil them with good quality clock oil. Be careful not to bend any of the pivots and that the light catch spring is resting in the little nick on the right hand side of the catch. Replace the bridge carefully, guiding the pivots into the holes, and screw the plate down firmly. The catch must be on the right of the catch piece (U catch) on the gravity lever. Next the gravity lever should be taken out for cleaning, first remove the flex from the terminal, take out the screws securing the top pivot plate, take the plate off and remove the gravity lever. Unscrew the top plate holding the steel roller and take out the roller. Wipe the gravity lever clean, Clean all the old oil off the U catch, clean out the roller pivot hole with pegwood, wipe the gravity lever pivots thoroughly clean and if the platinum contact plate is pitted, clean it with very fine glass paper until the pitting is removed. Clean the steel roller and its top plate and replace them on the gravity lever, seeing that the roller is the right way round, i.e. the body of the roller is nearest the top plate, oil the roller pivots.

Before replacing the gravity lever attention should be given to the impulse pallet and the gathering click on the pendulum. Remove the gathering click from its bearing screw by lifting the jewelled end of the click and sliding its pivot end out of the hole, backwards. Wipe off the jewel and the pivot end of the click and clean the bearing screw with pegwood.

Wipe the pallet clean, particularly the top surface and the impulse curve, if these surfaces still appear to be dirty or stained, rub them carefully with a little metal polish on a rag and clean off, when clean replace the click but do not oil its pivot.

Now the gravity lever can be replaced, first clean the back bearing plate and the top bearing plate, pegging out the pivot holes, replace the gravity lever, first oiling the back pivot. See that the U catch is on the left of the catch, which must be pushed well to the right against its return spring, to do this, reconnect the gravity lever flexible lead to its terminal.

The armature should next be taken out, first unhook the tailspring and unscrew the continuity flexible lead from the baseplate, unscrew the top plate, remove it and the armature. Wipe the armature clean and clean the platinum tip of the screw with a very fine glass paper keeping it flat on the surface. Clean the top plate and back plate and the pivot holes.

Wipe the two magnet poles clean and replace the armature, first oiling the back pivot. Reconnect the continuity flex to the baseplate and hook up the spring.

Oil all front pivots, i.e. the front pivots of the 15-toothed wheel, the backstop, the catch, the gravity lever and the armature. Do not oil the teeth of the wheel or the click jewel or its pivot bearing. Oil the catch step, i.e. the part of it which supports the gravity lever U catch. Reconnect the electrical circuit, when the clock is now ready to be set going again, but before doing this check over the various settings as given in the ERECTION section and check and re-set the gaps at the contacts if necessary.

To re-set the gaps, first, with the gravity lever on its catch push the armature against its left hand buffer when the air gap between the armature and the top magnet pole end should be 0.01 inches. Adjust the left hand buffer until this is so. Next, with the armature still held against the left hand buffer and the gravity lever on its catch, measure the air gap between the contacts. It should be set at 0.070 inches (1.8 millimetres). To set this gap adjust the contact screws at the top of the armature. Finally, allow the armature to fall back on its right hand buffer and with the gravity lever still on its catch the air gap between the contacts should be set at 0.212 inches (5.4 millimetres). When these adjustments are completed see that all screws are held tight with their lock nuts.

Give a final check over to see that the wheel spins freely and all pivots are quite free in the bearing holes, the catch return spring has amoderate pressure and the electrical circuit is reconnected.

The Master Clock dial will probably need no attention but if it should the procedure to be carried out is dealt with in the instructions on Maintenance of Dial Movements.

The Master Clock is now ready to be set working. Swing the pendulum just sufficiently to see the 15-toothed wheel is being gathered and the gravity lever is being released and operating every 30 seconds. This Master Clock Switch has been designed to operate itself and a circuit of series connected dials at a working current of 0.33 amp. Excessive current will make the switch operate with some violence but the switch and the clocks in circuit will continue to operate correctly providing the current does not exceed about 0.4 amp. Indeed, it will operate correctly with a reduction of current down to 0.26 amp, at which point the contact duration which is normally 0.06 to 0.08 second, suddenly increases to approximately 0.3 second. This increase is most noticeable visually at the Master Clock and audibly at the Master Clock and at every dial in the circuit. This is usually a warning that the battery needs attention. However, if the battery is found to be in good order, it could be that there is excessive resistance in the circuit. The weight of the gravity lever, the distance the contacts are apart, the strength of the armature tailspring and the coil winding are all arranged to bring about the above conditions.

SECTION C

POWER SUPPLY UNIT -

TECHNICAL DESCRIPTION

CONTENTS

1. INTRODUCTION

1.1. GENERAL

A range of Power Supply Units have been designed to meet the requirements of BS5839 Part 1, and they are suitable for use with the entire range of Tann Synchronome Fire Alarm Control Panels.

Each Power Supply Unit contains a mains powered Primary supply, and a Secondary charger/battery supply. The Secondary supply is monitored for charger fault and battery disconnect.

There are 3 types of charger (24/10, 24/25, 24/50) with maximum outputs of 1A, 2.5A and 5A respectively. Each of these is available as type PS (Power Supply) which is supplied complete with standby batteries; and type BC (Battery Charger) suitable for use with customer supplied batteries, or for use with a separate Tann Synchronome battery cabinet containing suitable cells.

1.2. STANDARD CONFIGURATIONS

1.2.1. TYPE 24/10 - 1A

BC 24/10	This is a Battery Charger (1A max. output) for use with external batteries. The charger output voltage is set during manufacture to 27.3V, to provide constant voltage float charging of 24V lead acid batteries. Automatic current limiting protects the circuit against excessive current output.
PS 24/10/6	This is a 1A Power Supply Unit containing a type 24/10 (1A) charger as above, with 6Ah cells.

1.2.2. TYPE BC24/25

BC 24/25	This is a Battery Charger (2.5A max output) for use with external batteries. The charger output voltage is set during manufacture to 27.3V, to provide constant voltage float charging of 24V lead-acid batteries. Automatic current limit protects the circuit against excessive current output.
PS 24/25/15	This is a 2.5A Power Supply Unit, containing a type 24/25 (2.5A) charger, as above, with 15Ah cells.
PS 24/25/24	This unit is similar to the PS24/25/15 but contains 24Ah cells.
PS 24/25/30	This unit is similar to the PS 24/25/15 but contains 30Ah cells.

1.2.3. TYPE 24/50-5A

BC 24/50	This is a Battery Charger (5A max, output) for use with external batteries. The charger output voltage is set during manufacture to 27.3V, to provide constant voltage float charging of 24V lead-acid batteries. Automatic current limit protects the circuit against excessive current output.
PS 24/50/15	This is a 5A Power Supply Unit containing a type 24/50 (5A) charger, with 15 Ah cells.
PS 24/50/24	This unit is similar to the PS 24/50/15 but contains 24Ah cells.
PS 24/50/30	This unit is similar to the PS 24/50/15 but contains 30Ah cells.

2. CIRCUIT OPERATION

2.1. INTRODUCTION

Type 24/10 and 24/25 charger circuits are identical in operation and differ only in certain component values.

The 24/50 charger circuit is similar in operation to the above but incorporates additional components to enable the higher output current to be obtained.

Except where otherwise stated, Type 24/10 circuit operation is described below:

A full-wave, unsmoothed D.C. supply is provided for the charger circuit via FS1, the mains transformer, and Diode Bridge D1-D4 (Bridge rectifier B1 in 24/50). The remainder of the circuitry can be divided into 3 sections.

a) Voltage Comparator and Thyristor Drive (R11, T2, T3, Z1 and TH1).

b) Current Limiting (R3, T1, D5).

c) Fault Detection (D8, C4, T4; Z2, T5).

2.2. VOLTAGE COMPARATOR & THYRISTOR DRIVE CIRCUIT

The Thyristor TH1 acts as an electronic switch. When fired it connects the battery across the bridge rectifier output, allowing charging current to flow, via R3. Firing of the thyristor is controlled by T2 and T3 which form a voltage comparator.

A reference voltage is developed across Z1. This appears as a clipped, full wave rectified sine wave. As the voltage across Z1 increases to the reference level, C3 begins to charge through R7 producing a negative going ramp voltage at the base of T2. The emitter voltage of T2 is set by the current passed by T3. This is in turn controlled by the setting of RV1, which is effectively across the output of the charger. When the base-emitter voltage of T2 reaches approximately 0.6V T2 conducts and fires the thyristor, which allows current to flow for the remainder of the voltage cycle. (The 24/50 circuit uses a larger type of thyristor, the extra gate current required being provided by emitter followed T6).

When the bridge output voltage drops below the reference level, Z1 appears as a low resistance and discharges C3. The charging current is therefore a series of pulses.

As the battery voltage rises, the voltage at RV1 slider/T3 base, and therefore T3 emitter will also rise. As a result of this, the ramp voltage at T2 base has to reach a progressively more negative value before T2 conducts, charging current therefore flowing for a decreasing portion of the voltage cycle. Eventually, when the battery is fully charged (i.e. battery off-load voltage - 27.3V) charging current will have reduced to a low 'trickle charge' level.

2.3. **CURRENT LIMITING CIRCUIT.** The charging current drawn by the batteries is monitored by applying the potential across R3 to the base of T1, after smoothing by C1 and R4. As more current is drawn, T1 is biased further into conduction and its collector voltage rises. This effectively reduces the reference voltage across Z1, via D5, retarding the operating point of T2. More current is also drawn through the CHARGE CURRENT L.E.D., increasing its brightness. Eventually charging current is drastically reduced, preventing damage to the circuit.

2.4. **FAULT DETECTION CIRCUIT.**

2.4.1. **Battery Disconnect/Charge Fuse Rupture.**

The presence of the battery limits the charger output voltage to a maximum of approximately 27.3V. Should the battery be disconnected, the peak voltage from the charger exceeds the breakdown voltage of Z2 which passes current to charge C5. As a result T5 switches ON, illuminating the FAULT L.E.D. and producing a LOW Charger FAULT output via R18.

2.4.2. **Zero Charge Current**

As charging current pulse flow via D8, C4 cannot become charged. If for any reason no current flows, C4 charges up via R10 and switches T4 ON. This in turn switches T5 which gives a charger FAULT output as described above.

2.4.3. **D.C. ON L.E.D.**

This is also monitored for failure by D9. If the L.E.D. should fail open-circuit, then a LOW FAULT output will be provided via R18. D9 and R19 to -Ve.

2.5. **OUTPUT FUSES.**

The Primary and Secondary and Charger fuses protect the charger circuit against excessive current being drawn by the Primary and Secondary loads, and the battery.

D10 affords protection against reverse polarity connection to the battery. Should this occur, D10 will be forward biased, rupturing the CHARGE fuse and giving a fault indication (as described in 2.4.1.)

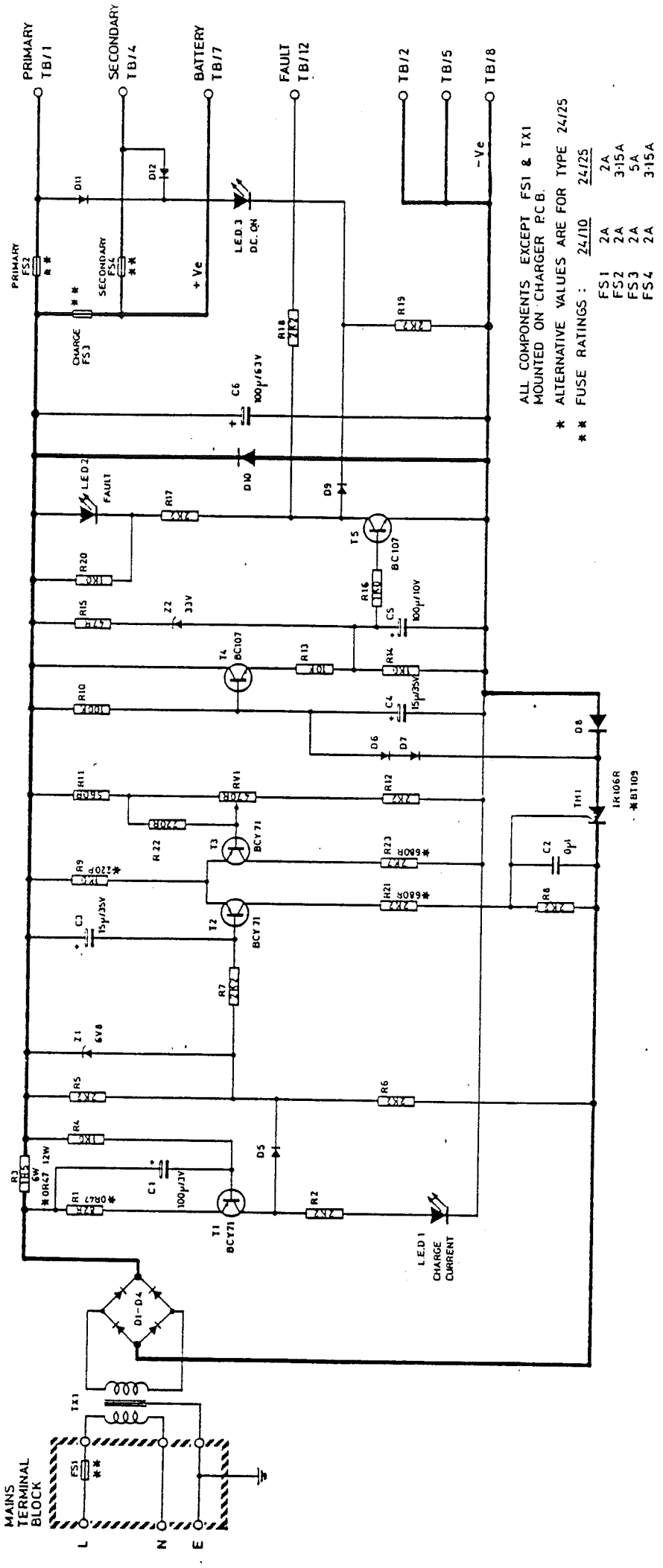


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Fig. 2.1. Type 24/10 & 24/25 Charger - Circuit

3 . PARTS LISTS & LAYOUT DIAGRAMS

3.1. TYPE 24/10

	SCHEDULE NO.
TYPE BC24/10 BATTERY CHARGER ASSEMBLY	FS4705-1
TYPE PS24/10/6 POWER SUPPLY ASSEMBLY	FS4702-1
TYPE 24/10 CHARGER CHASSIS ASSEMBLY	FS4631-1
TYPE 24/10 CHARGER P.C.B. ASSEMBLY	PS4621-1

PARTS LIST

PRODUCT	SCHEDULE NO.
TYPE 24/10 CHARGER CHASSIS ASSEMBLY	FS 4631-1

PART NO.	DESCRIPTION	QTY	COMPONENT NO.
PD4630-1	Chassis Sub-Assembly	1	
PS4621-1	24/10 Charger P.C.B. Assembly	1	
IBB25914-1	Mounting Pillar	3	
BO25918-1	Transformer	1	
110/1/41	Terminal Block 12 Way	1	
BA 4633-1	Terminal Block Label	1	
110/1/89	Terminal Block Mains	1	
150/1/44	Fuselink 2A	1	
356/1/5	Screw Self Tapping No. 6 x 3/8"	4	
140/1/26	Nut 'U'	4	
350/1/5	Screw Ch. Hd. M3 x 5	7	
470/14/2	Washer Plain M3	7	
IFC26075-1	Screw Ch. Hd. M3 x 14	2	
350/1/24	Screw Ch. Hd. M3 x 10	2	
160/1/2	Grommet Rubber ¼" I.D. x 3/8" O.D.	1	
160/1/1	Grommet Rubber 3/16" I.D. x ¼" O.D.	1	
FA4334-1	Mains Warning Label	1	
BA4634-1	Chassis Label	1	

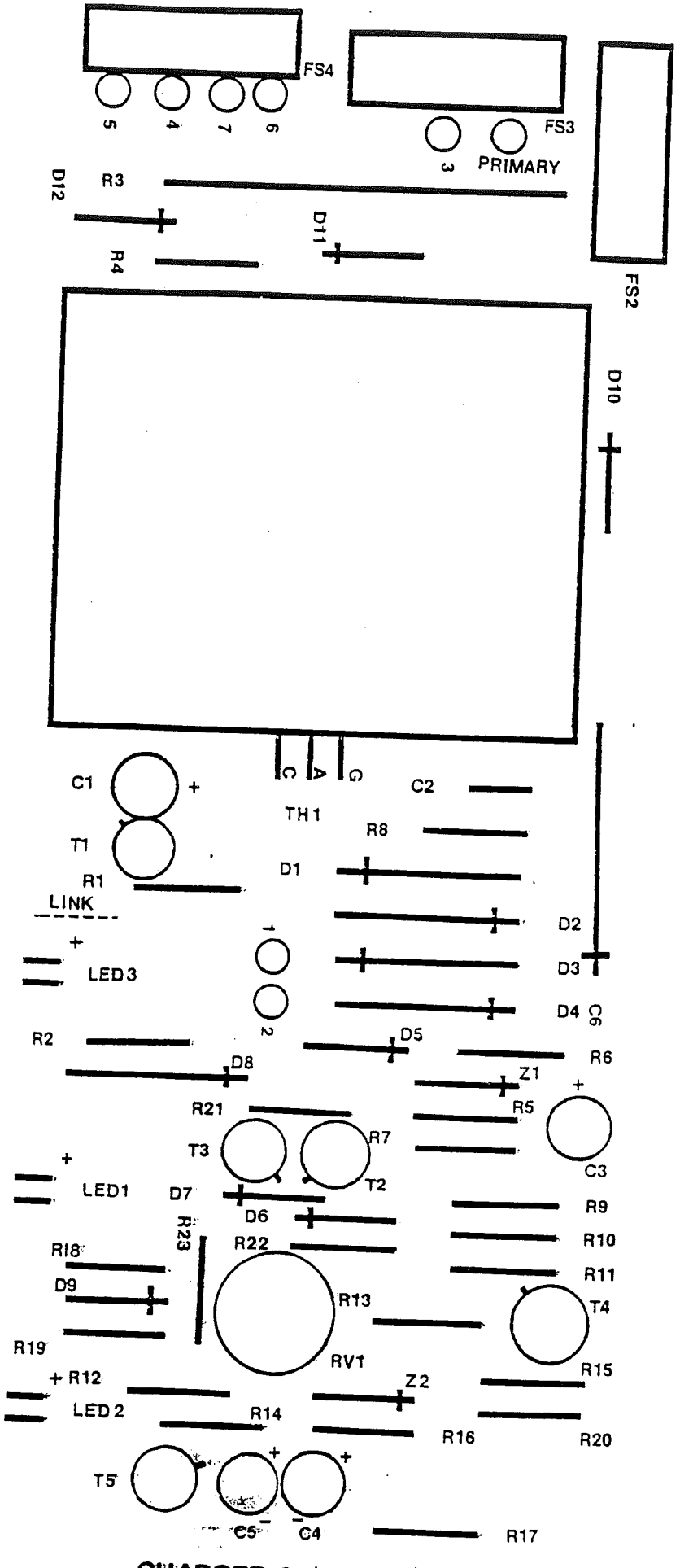


Fig. 4.3.1. Type 24/10 Charger - P.C.B. Layout.

PARTS LIST

PRODUCT	SCHEDULE NO.
TYPE 24/10 CHARGER P.C.B. ASSEMBLY/PAGE 2	

PART NO.	DESCRIPTION	QTY	COMPONENT NO.
380/2/40	L.E.D. (Green)	2	LED1, LED3.
380/2/42	L.E.D. (Yellow)	1	LED2
IBB25913-1	Heatsink	1	
150/1/27	Fuselink 2A (20mm)	3	FS2, FS3, FS4.
150/1/36	Fuseholder	3	FS2, FS3, FS4.
350/1/6	Screw Ch. Hd. M3 x 8	2	
256/1/1	Nut Hex. M3	2	
221/1/29	Wire Link Tinned Copper 22SWG x 25 Long	1	

PARTS LIST

PRODUCT	SCHEDULE NO.
TYPE 24/10 CHARGER P.C.B. ASSEMBLY	PS 4621-1

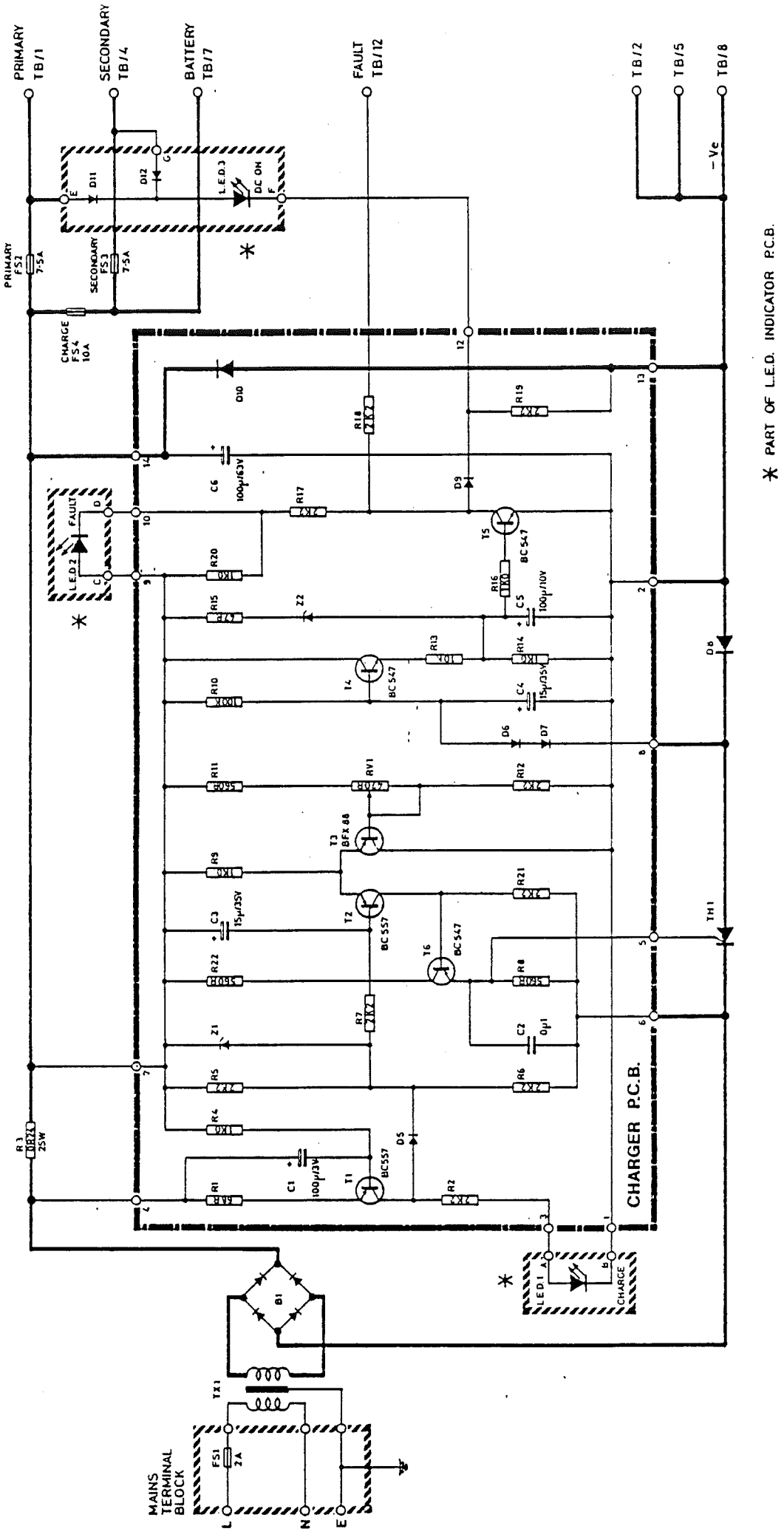
PART NO.	DESCRIPTION	QTY	COMPONENT NO.
BC4620-1	Charger P.C.B.	1	
314/1/14	Resistor ¼W 47R	1	R15
314/1/26	Resistor ¼W 82R	1	R1
314/1/45	Resistor ¼W 220R	1	R22
314/1/25	Resistor ¼W 680R	1	R11
314/1/1	Resistor ¼W 1K	5	R4, R9, R14, R16, R20.
314/1/22	Resistor ¼W 2K2	10	R2, R5-R8, R12, R17-R19, R21.
314/1/27	Resistor ¼W 2K7	1	R23
314/1/2	Resistor ¼W 10K	1	R13
314/1/5	Resistor ¼W 100K	1	R10
310/3/13	Resistor 6W 1R5	1	R3
312/2/2	Resistor Variable 470R	1	RV1
050/2/3	Capacitor 0µ1/250V	1	C2
050/1/40	Capacitor 15µ/35V TANT	2	C3, C4.
050/1/47	Capacitor 100µ/3V TANT	1	C1
050/1/44	Capacitor 100µ/10V	1	C5
050/1/30	Capacitor 100µ/63V ELECTROLYTIC	1	C6
380/1/30	Transistor BCY71	3	T1, T2, T3.
380/1/27	Transistor BC107	2	T4, T5.
380/2/43	Thyristor IR106C	1	TH1
380/2/2	Diode IN4003	11	D1-D9, D11, D12
380/2/20	Diode SIM3	1	D10
380/2/39	Zener Diode BZY88 6V8	1	Z1
380/2/45	Zener Diode BZY88 33V	1	Z2

PARTS LIST

PRODUCT	SCHEDULE NO.
TYPE BC24/10 BATTERY CHARGER ASSEMBLY TYPE PS24/10/6 POWER SUPPLY ASSEMBLY **	FS 4705-1 FS 4702-1

PART NO.	DESCRIPTION	QTY	COMPONENT NO.
PD4671-1	Case Sub-Assembly *	1	
PD4672-1	Front Cover Sub-Assembly * (Silk screened to PC4674-1)	1	
PS 4631-1	24/10 Charger Chassis Assembly	1	
350/1/14	Screw Ch. Hd. M4 x 6	3	
470/14/7	Washer Plain M4	3	
140/1/36	Dzus Fastener *	1	
140/1/37	'O' Ring *	1	
221/1/28	Allen Key *	1	
BO26850-1	Serial No./Mod. Label Assembly	1	
BA4679-1	Battery Lead Assembly +Ve (Red 0.75mm²) **	1	
BA4679-2	Battery Lead Assembly -Ve (Black 0.75mm²) **	1	
BA4679-3	Battery Lead Assembly Inter-connecting (Grey 0.75mm²) **	1	
	* For optional front cover fastening using security key-lock; replace items marked * with the following:		
PD4671-2	Case Sub-Assembly	1	
PD4672-2	Front Cover Sub-Assembly (Silk screened to FC4671-1)	1	
190/1/5	Key Lock (500-E-3-A56)	1	

** Items marked ** required for PS 24/10/6 only.

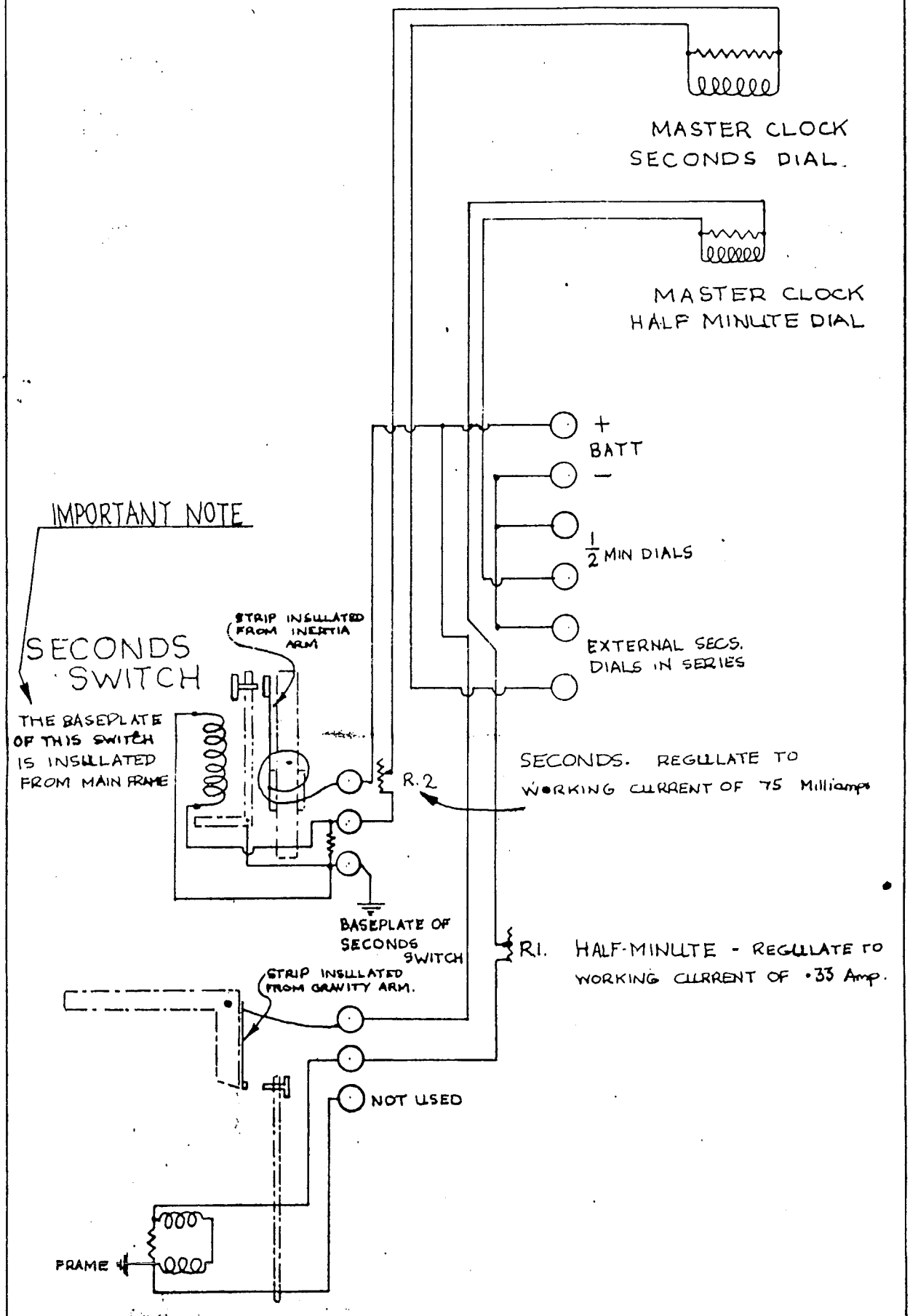


00A

Fig. 2.2. Type 24/50 Charger - Circuit.

Our policy is one of continuous improvement and we reserve the right to change specifications without notice.

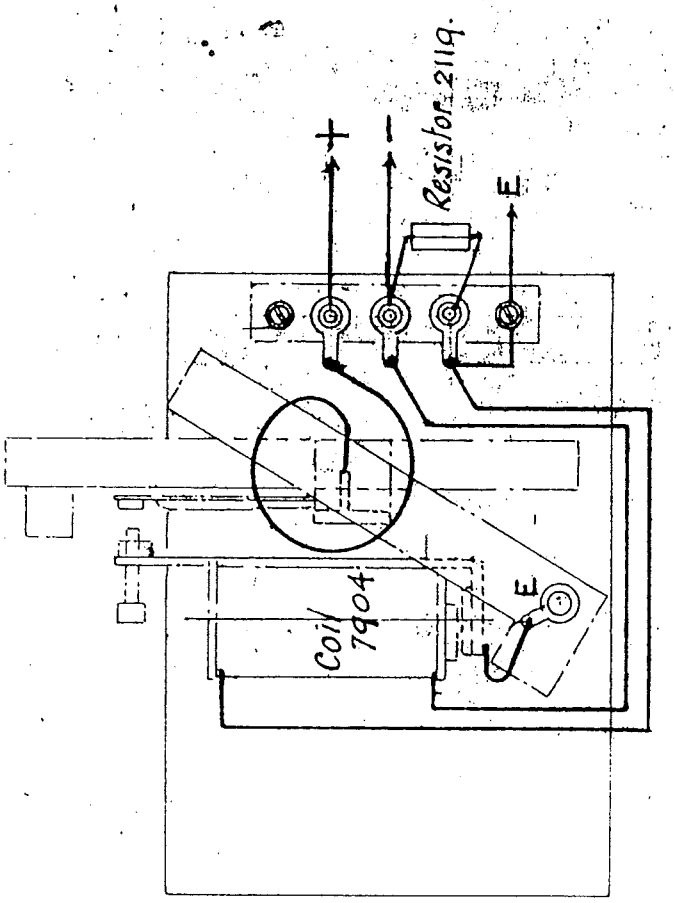
 10-28017-00



SYNCHRONOME MASTER CLOCK

TRANSMITTING IMPULSES EVERY HALF MINUTE & EVERY SECOND

DRG.No. MC/0108/7



See also Drg No. 14675

CONFIDENTIAL

REV. No.	REVISIONS	C/N	SIG DATE
1			
2			
3			
4			

TOLERANCES
FRACTIONAL .....
DECIMAL .....
Unless otherwise stated.

USED ON:—
Assembly 1564.

MATL.

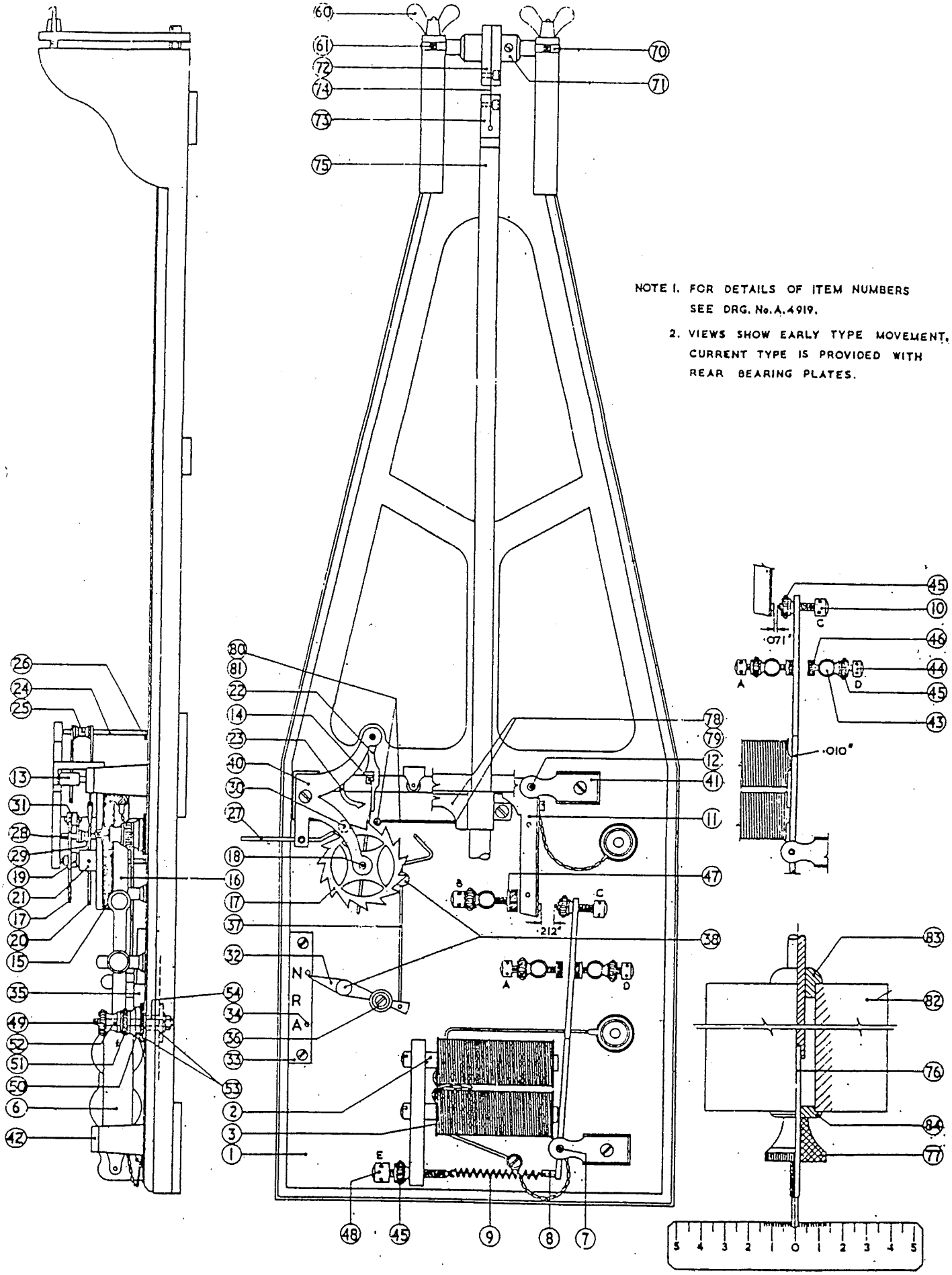
FINISH.

DRN. [signature]
DATE 20.6.60
CHKD
SCALE F.S.

SYNCHRONOME Co. Ltd.

TITLE Wiring Diagram No 1. Seconds Switch.

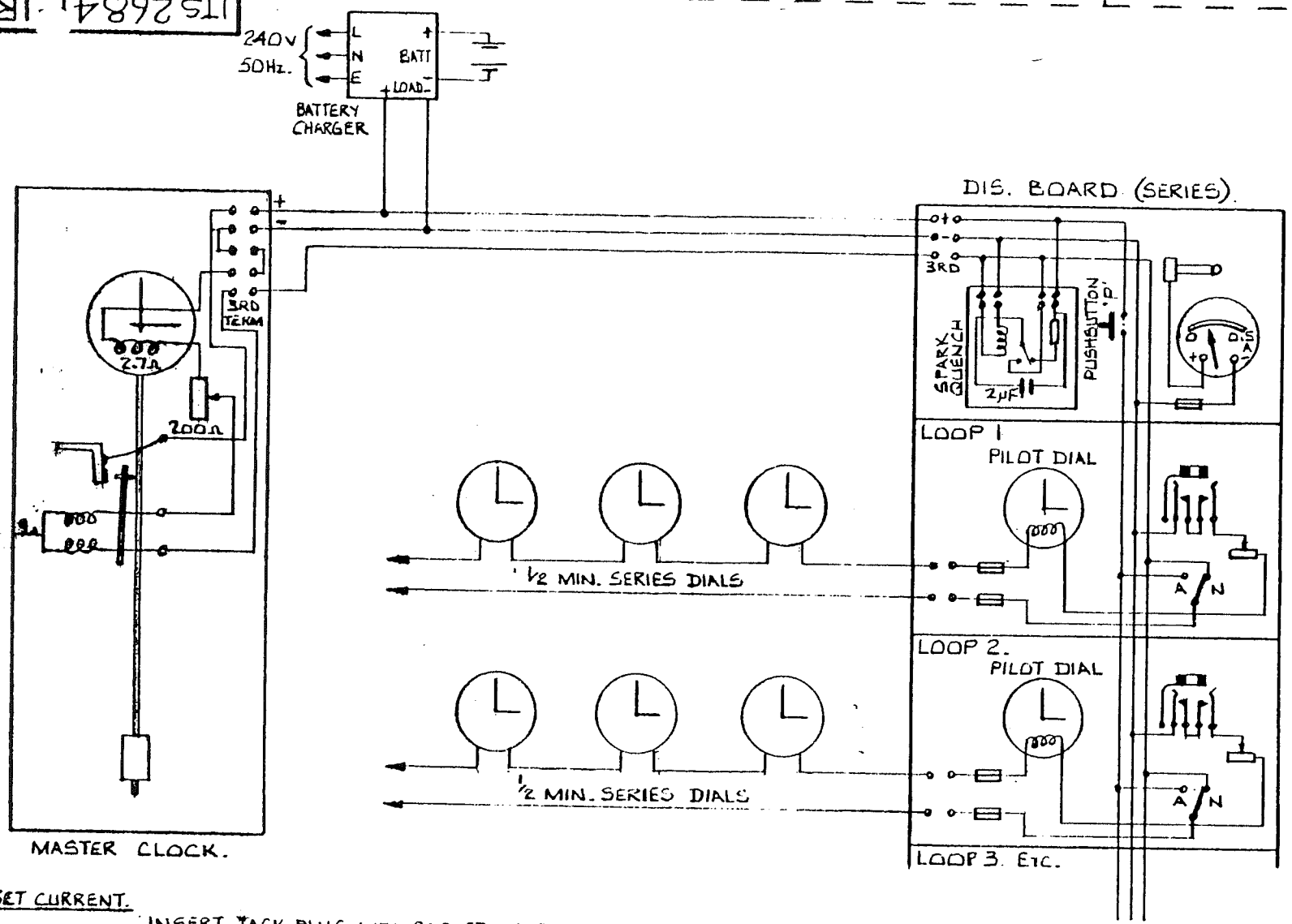
DRG. No. MC/0108/7


NOTE 1. FOR DETAILS OF ITEM NUMBERS SEE DRG. No. A. 4919.
2. VIEWS SHOW EARLY TYPE MOVEMENT. CURRENT TYPE IS PROVIDED WITH REAR BEARING PLATES.
·071"
·010"
·212"
N
R
A
E
A
C
D

PARTS REFERENCE LIST (Drawing No. 4919)

1. Baseplate
2. Pole
3. Pole Cheek
6. Armature
7. Armature Arbor
8. Tailspring Stud
9. Tailspring
10. Contact Screw
11. Gravity Lever
12. Gravity Lever Arbor
13. Impulse Roller
14. Catch Gravity Lever
15. Contact Block
16. Contact Fixed
17. 15 Toothed Wheel
18. 15 Toothed Wheel Arbor
19. 15 Toothed Wheel Collet
20. Vane
21. Vane Collet
22. Latch, Locking
23. Accelerator Catch
24. Arbor
25. Collet
26. Spring
27. Backstop Lever
28. Backstop Arbor
29. Backstop Collet
30. Roller
31. Roller Stud
32. N.R.A. Lever
33. N.R.A. Plate Engraved
34. Pin
35. Bush
36. Spring Washer
37. Wire
38. Guide Stud
40. Bridge Plate
41. Gravity Lever Top Plate
42. Armature Top Plate
43. Capstan Pillar
44. Capstan Screw
45. Capstan Screw Nut
46. Buffer (2 leather)
47. Buffer (1 felt)
48. Tailspring Screw
49. Terminal Thread
50. Terminal Collar
51. Knurled Nut
52. Terminal Head
53. Insulating Washer
54. Insulating Tube
60. Trunnion Clamp
61. Trunnion Clamp Thread
70. Trunnion
71. Top Chop
72. Top Chop Plate
73. Bottom Chop
74. Suspension Spring
75. Pendulum Rod
76. Rating Thread
77. Rating Nut
78. Pallet
79. Pallet Clickscrew
80. Click Arm
81. D. Jewel
82. Bob 14-16 lbs.
83. Top Collar for Bob
84. Bottom Collar for Bob

ITS.26841-IR



TO SET CURRENT.

INSERT JACK PLUG INTO SOCKET OF PANEL UNDER TEST, SET ITS SWITCH TO 'ADVANCE' PUSH, PUSHBUTTON 'P' AND ADJUST CURRENT TO ·33A BY VARIABLE RESISTOR.

TO ADVANCE 1 OR MORE LOOPS.

PUT SW./SWS. TO ADVANCE AND PULSE BUTTON 'P' TO ADVANCE DIALS.

TO RETARD 1 OR MORE LOOPS.

PUT SW./SWS. TO ADVANCE : THIS WILL STOP CLOCKS OF LOOP OR LOOPS CONCERNED.

ISSUE 1

DRAWN W.A. DENNIS	DATE 29-9-77
CHECKED	SCALE —

— ANGLE PROJECTION

UNSPECIFIED DIMENSIONAL TOLERANCES ——

FINISH ——

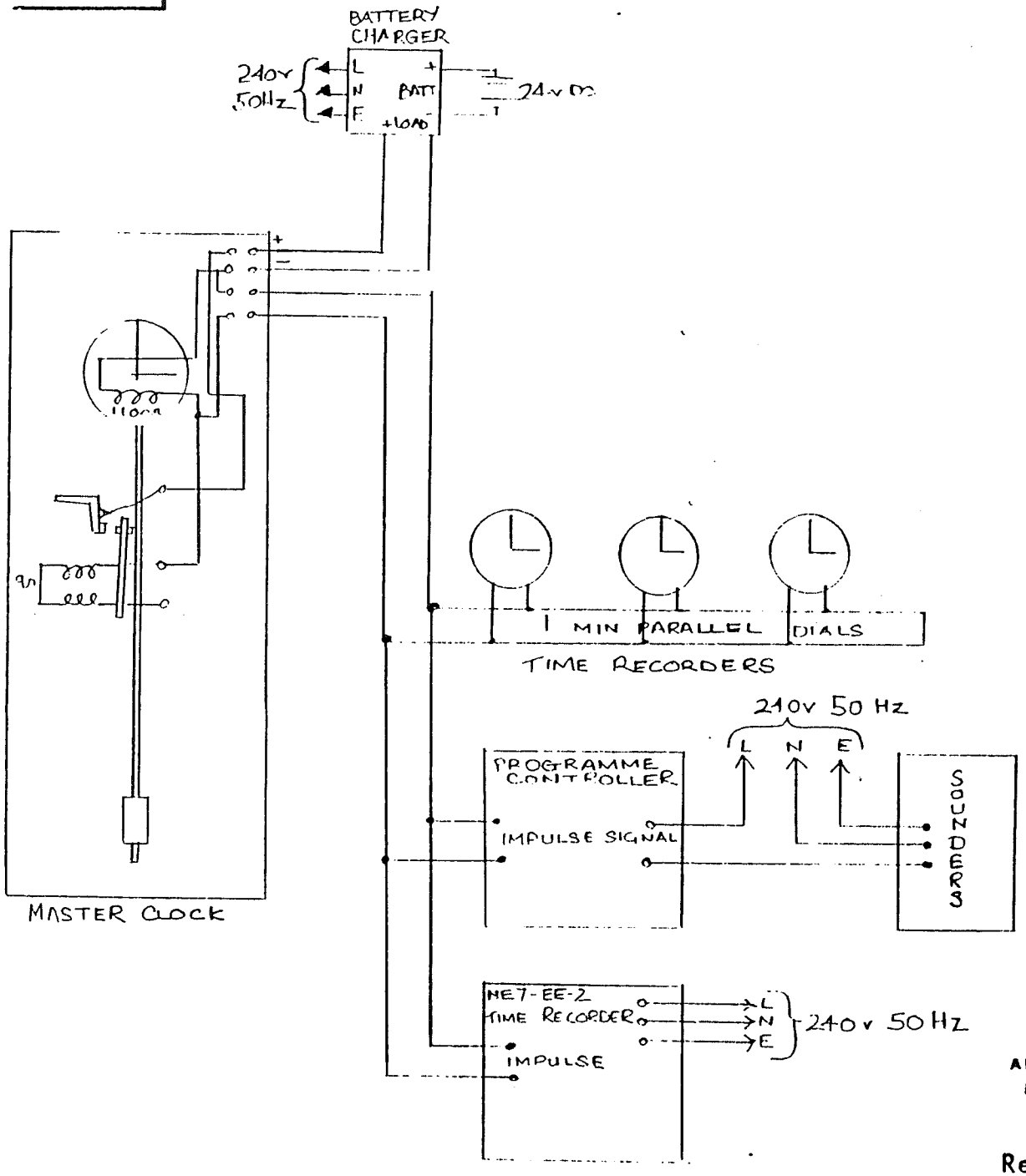
MATERIAL ——

TITLE
WIRING DIAGRAM OF TYPICAL SERIES CLOCK CIRCUIT.

DRAWING No.
ITS.26841-1R.

0543E

DO NOT SCALE



ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.

Remove sharp edges and burrs.

ISSUE 1

DRAWN	DATE
CHECKED	SCALE

ANGLE PROJECTION

UNSPECIFIED DIMENSIONAL TOLERANCES

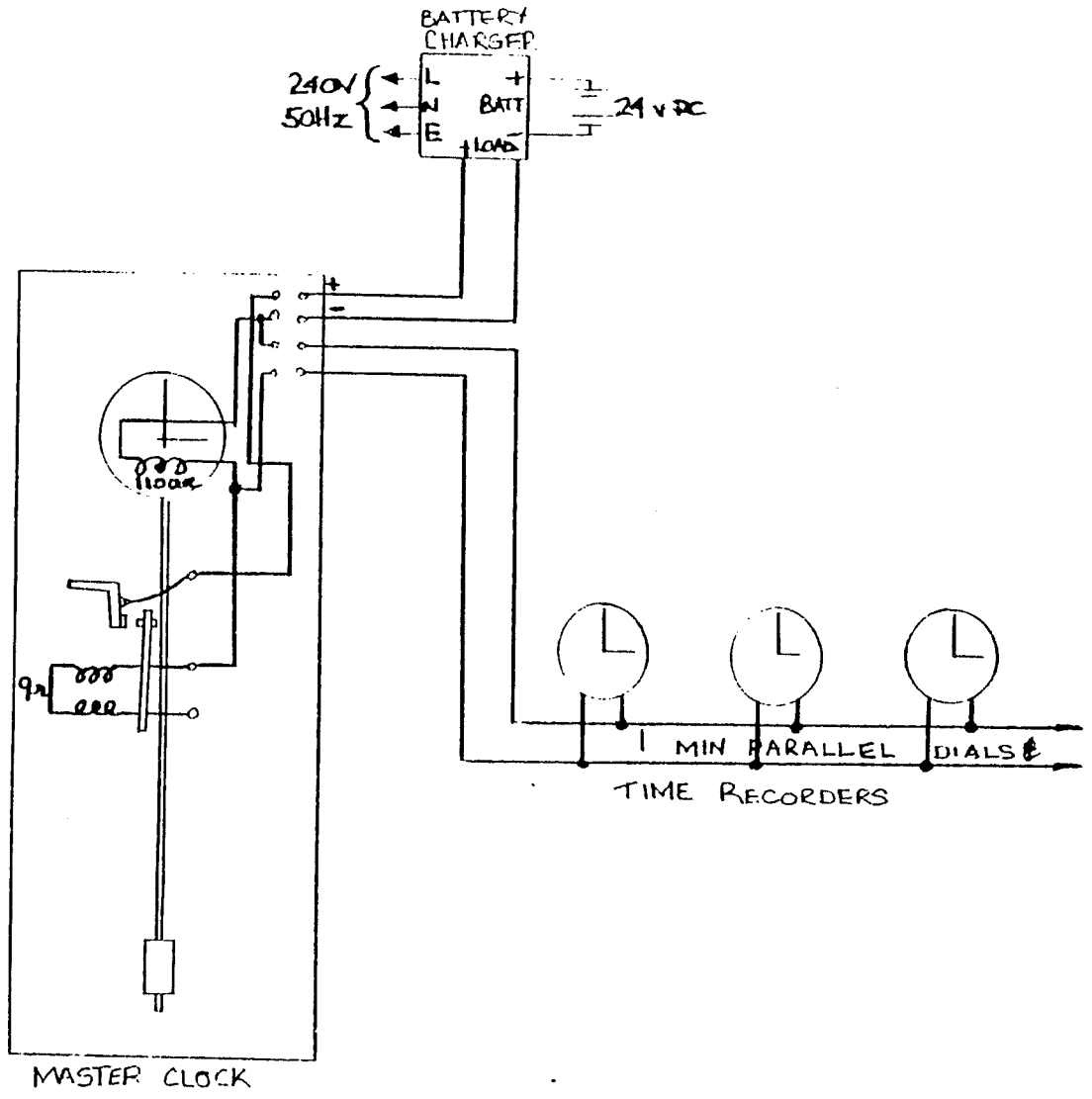
FINISH

MATERIAL

TITLE

DRAWING No.

DO NOT SCALE



ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.

Remove sharp edges and burrs.

ISSUE 1	
DRAWN	DATE
CHECKED	SCALE
ANGLE PROJECTION	
UNSPECIFIED DIMENSIONAL TOLERANCES	
FINISH	
MATERIAL	
TITLE WRING DIAGRAM OF TYPICAL PARALLEL MASTER CLOCK CIRCUIT.	
DRAWING No. E 1101	