

See AP. 113D-0303-1 held c1
Sep 1965

Chapter 10

VIBRATOR, VALRADIO, TYPE 230/30/28AT

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LEADING PARTICULARS

Vibrator unit, Type 230/30/28AT	...	Ref. No. 5UB/7643
Input volts	28V d.c.
Output volts ... ..	...	110 or 230V a.c. 50 c/s
Output, power ... ..	...	30W
Overall dimensions		
Length ... ..	...	7.375 in.
Width ... ..	...	5.75 in.
Height ... ..	...	3.875 in.
Weight ... ..	...	6.75 lb.

Introduction

1. The vibrator, Type 230/30/28AT, is a power unit designed to convert 28V d.c. to 110 or 230V a.c. at 50 c/s, with an output of 30 watts, by using a double stepping commutating vibrator.

DESCRIPTION

2. The inverter is enclosed in a sheet steel box, the cover of which consists of the four sides and the top, secured to the base by four 4 B.A. bolts and stiff-nuts. Electrical connection to the unit is made by a 6-pole Plessey socket, Type CZ.48995, which protrudes through a clearance hole in the top of the cover. The 3-amp. fuse carrier protrudes through a second clearance hole adjacent to the socket (fig. 1).

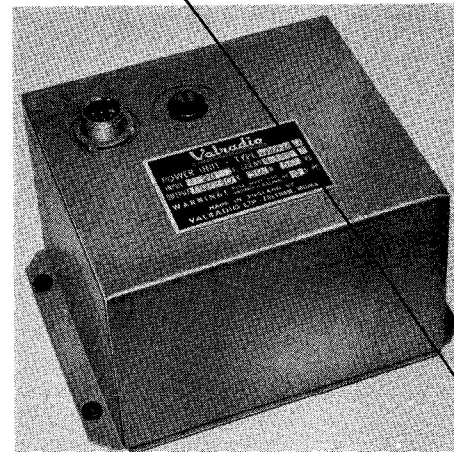


Fig. 1. General view of unit

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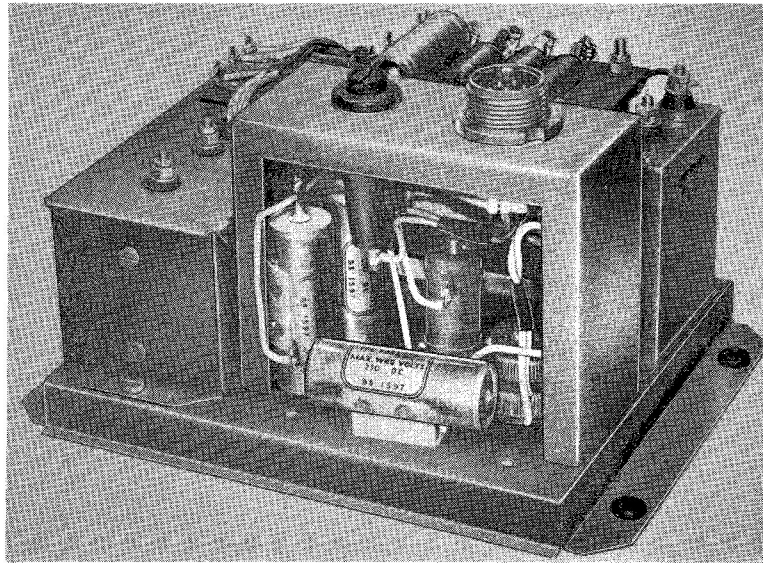


Fig. 2. Interior view, cover removed

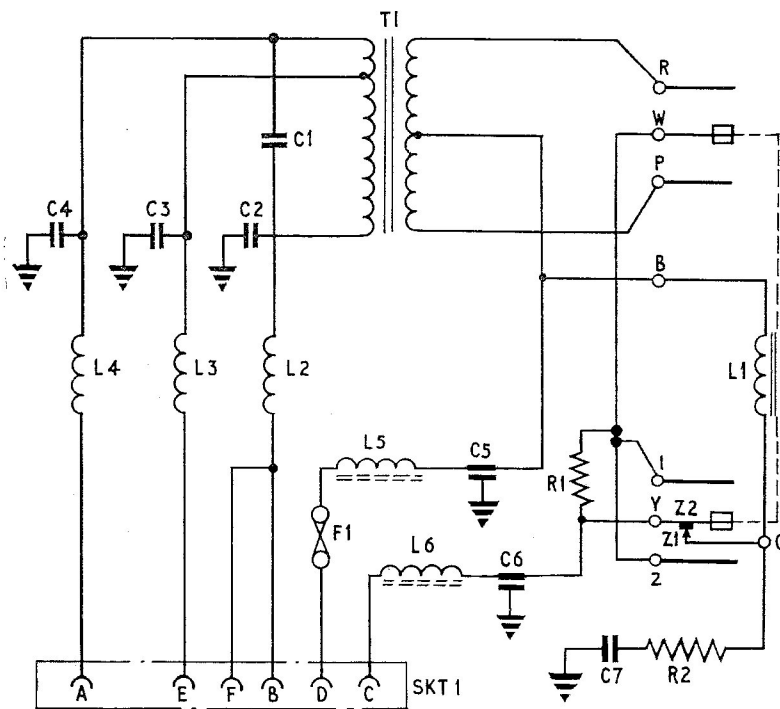


Fig. 3. Circuit diagram

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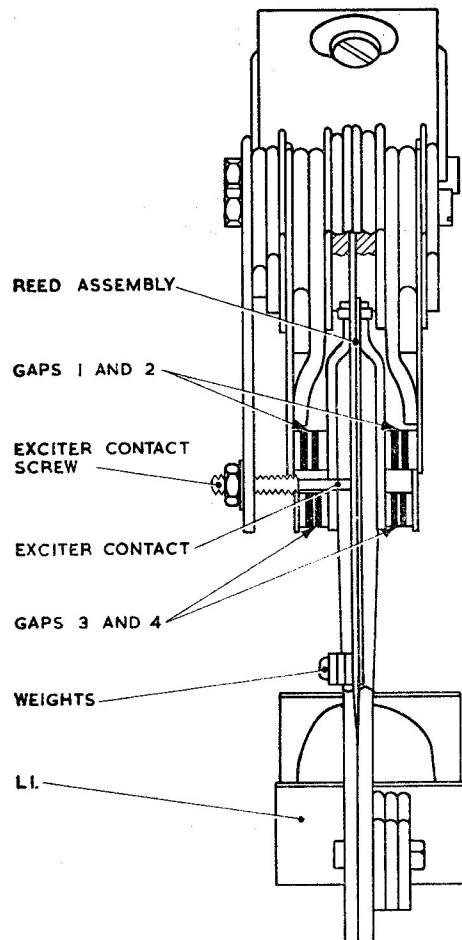


Fig. 4. Vibrator component

3. All components are mounted on a chassis formed by the base of the unit, the vibrating component being enclosed in its own dust-proof metal box secured to the base by two 4 B.A. bolts and stiff-nuts (fig. 2).

OPERATION

4. When a 28V d.c. supply is applied to pins C and D, the vibrator exciter coil L1 is magnetized, attracting the reeds carrying contacts W and B. Owing to the gap (approx. 0.006 in.) on R, W and P being smaller than the gap on contacts 1, B and 2 (approx. 0.012 in.), W will make contact with say P initially, causing current to pass through half the primary of TR1 with R1 in series to limit the current. Then, as the reeds continue to swing in the original direction, B makes

contact with 2 and shorts out R1, allowing the full voltage to be applied to the transformer.

5. On the return swing of the reeds, R1 is put back in series with the primary winding of TR1 before the circuit is broken. By making and breaking the circuit through TR1 in this manner, arcing at contacts W and B is greatly reduced.

6. L1, which supplies the mechanical energy to operate the reeds, is actuated by a separate small pair of contacts Z1 and Z2, Z1 being mounted on an adjustable screw for servicing purposes. These contacts, which are normally closed, are opened as the reeds swing away from the stationary contact screw, and it is this interruption of current which sets the reed assembly vibrating. The frequency of vibration is determined by weights attached to the free end of the reeds (fig. 4).

7. A radio frequency suppression network is included consisting of C2, C3, C4, C5, C6, L2, L3, L4, L5 and L6. Spark quenching is provided by capacitors C1 and C7 (fig. 3).

INSTALLATION

8. Two mounting feet, each drilled with two 0.25 in. holes and fitted with rubber grommets, are provided for installation purposes. The holes form a rectangle 6.875 in. by 3.5 in.

SERVICING

9. Inspect all solder and screw type terminals for security of connections. Inspect all capacitors, coils and resistance components for signs of overheating; renew any suspect parts.

10. Inspect vibrator contacts for pitting and burning. Slight burn marks should be treated as described in A.P.4343, Vol. 1, Sect. 11, Chap. 2.

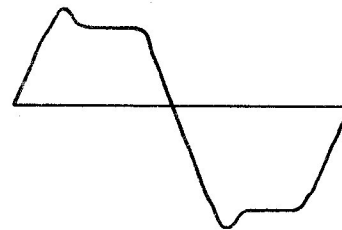


Fig. 5. Waveform diagram

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if the contacts are heavily burnt or pitted a new vibrator component should be fitted, taking care that the existing colour coding is adhered to.

Output voltage test

11. 230V a.c. check.

- (1) Using an a.c. voltmeter of known accuracy, and with a load of 2,000 ohms connected across pins A and B of the 6-pole socket and 27V d.c. connected to

pins C and D; check that the output voltage at A-B is 230V.

- (2) Connect an oscilloscope across the load; waveform should conform to that shown in fig. 5.

12. 110V a.c. check.

- (1) With a standard load of 1,000 ohms connected across pins E and F, and 27V d.c. connected to pins C and D; check that output voltage at E-F is 110V.

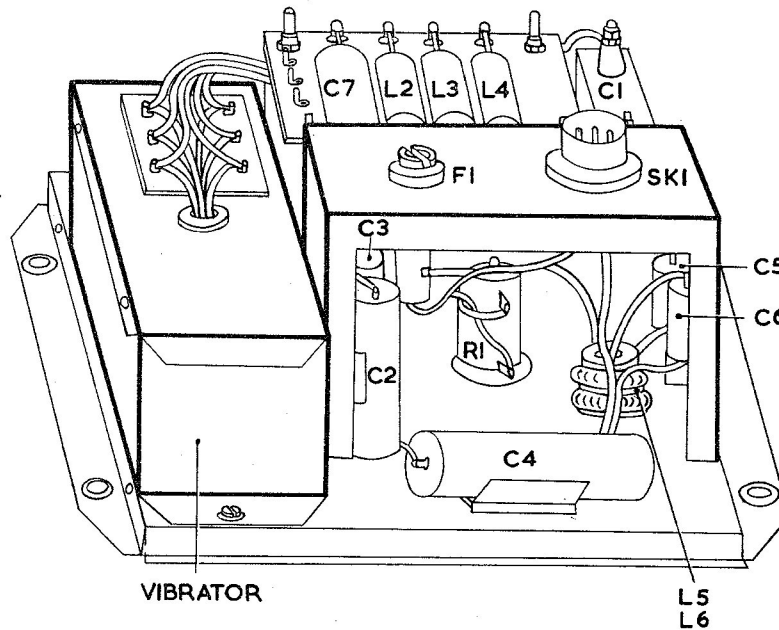


Fig. 6. Component diagram

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Defect	Cause	Remedy
Vibrator does not start	L1 open circuit. Contacts badly worn.	Renew L1. Treatment as described in A.P.4343, Vol. 1, Sect. 11, Chap. 2.
Vibrator starts only when tapped	Choke L4 or L5 open circuit Exciter screw out of adjust- ment	Renew defective choke(s). Loosen exciter screw locknut, turn exciter screw approx. $\frac{1}{8}$ turn clockwise, tighten locknut.
Low output volts Continual fuse blowing	Excessive contact wear Excessive exciter contact pressure	Renew complete vibrator. Loosen exciter screw locknut, turn exciter contact screw slightly anti-clockwise.
Vibrator starts, but no out- put volts	Component breakdown Transformer T1 defective	Renew defective component. Renew T1.
Incorrect waveform	Vibrator contact settings un- balanced	Fit new vibrator.

Table 1
Circuit component details

Fig. 6 Index No.	Part No.	Description
C 1	92	0.5 μ F capacitor
C 2	335/99B/1	S.T.C. capacitor
C 3	335/99B/1	S.T.C. capacitor
C 4	335/99B/1	S.T.C. capacitor
C 5	335/85A/1	S.T.C. capacitor
C 6	335/85A/1	S.T.C. capacitor
C 7	B 406 K	0.1 μ F capacitor
F 1	L 356	Fuse-holder 3 amp.
L 2	RFS 300 AT	Choke
L 3	RFS 300 AT	Choke
L 4	RFS 300 AT	Choke
L 5	RFS 500 AT	Choke
L 6	RFS 500 AT	Choke
R 1	20/10	Resistor
SK 1	CZ.48995	Plessey 6-pole socket
	T230/30/28 AT	Transformer
	24 AT	Vibrator exciter coil
	PP 24/50 AT	Vibrator

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