operating
and maintenance
INSTRUCTIONS

Dosimeter Charger
Jordan Model 750

FCDA Item No. CD V-750

Jordan Electronics, Inc.

3025 West Mission Road

Alhambra, California

GENERAL DESCRIPTION

The *Jordan 750 Dosimeter Charger* is used to charge or "Zero" pocket type quartz fibre dosimeters. A standard 1.5 volt flashlight cell is used in conjunction with a pulsing switch, step-up transformer and storage capacitor to obtain the approximately 150 volts required to charge a dosimeter.

THEORY OF OPERATION

The circuit of the dosimeter charger is shown in figure 2, page 10. When the charging switch S_1 is closed, current flows from the 'D' cell B through the primary of the transformer L. When the switch is opened, the energy stored in the inductance of the transformer is released. Since the primary now sees an open circuit, this energy must be released in the secondary circuit as a voltage pulse. This pulse is considerably higher than the 240 volts required to fire the four neon bulbs. When the neon bulbs fire and become conductors, the stored energy is transferred to the storage capacitor C_1.

Each pulse applied with the charging switch increases the voltage on the capacitor until this voltage is approximately 240 volts. At this voltage, the neon tubes will fire at the capacitor voltage and discharge the capacitor through the transformer secondary winding. The voltage across the capacitor is thus limited to approximately 240 volts.

The resistor R_1 is used in conjunction with the back contacts of the charging switch to drain the charge on the storage capacitor and reduce the voltage to the exact amount required to make the dosimeter read zero.

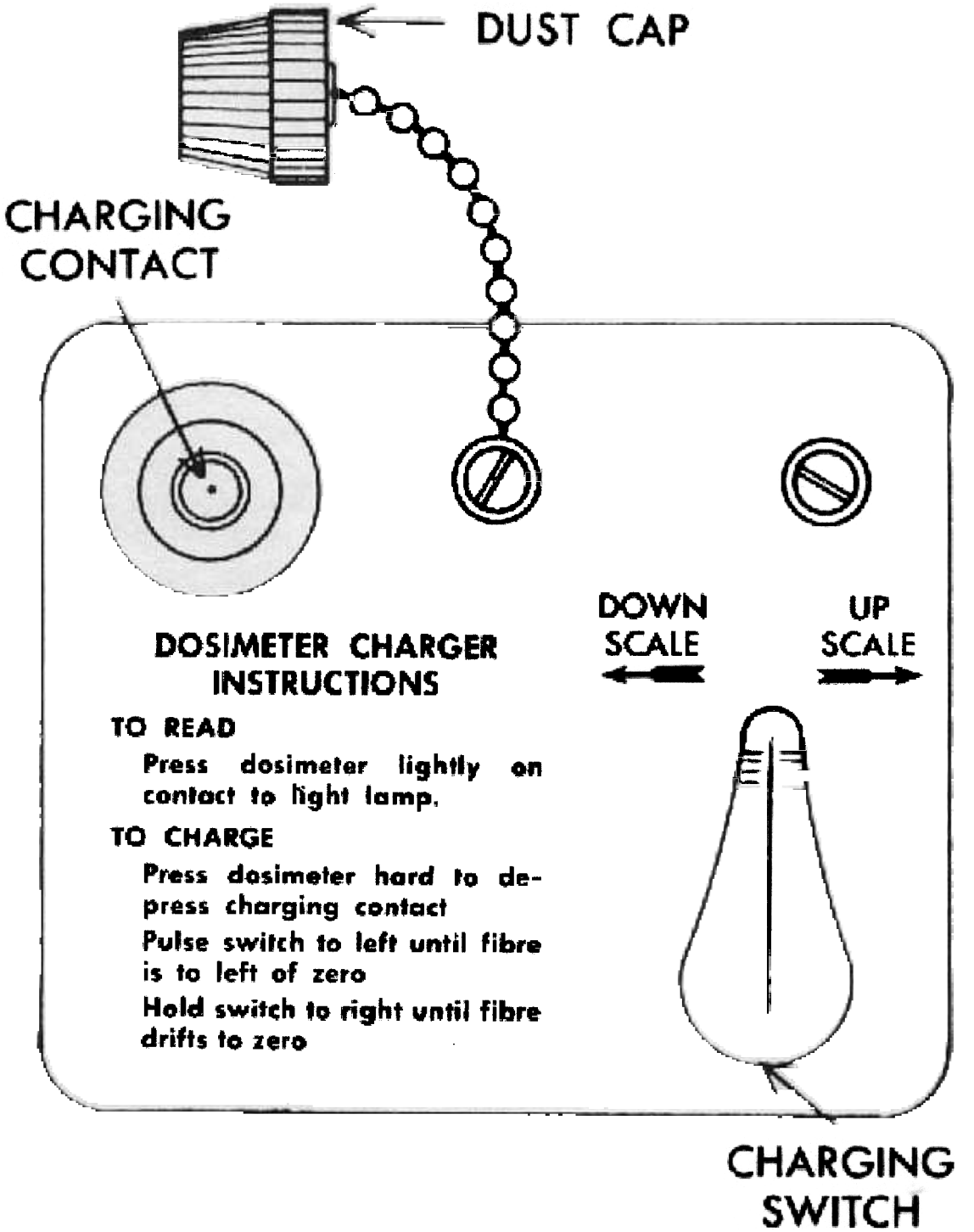

Figure 1—Dosimeter Charger
Model Jordan 750

The resistor R_1 limits the primary current to the amount required to charge a dosimeter in five pulses of the charging switch, and, the capacitor C_2 reduces sparking and extends the life of the switch contacts. The switch X_2 operates the lamp I when the charging contact is depressed.

INSTALLATION

3.1 Inspection

Inspect the instrument carefully for any signs of damage in shipment. If any damage is apparent, the battery should not be installed until an electrical check is made to prevent a short causing further damage.

3.2 Battery

Remove the cover from the instrument by loosening the screw on the bottom.
Insert the 'D' cell with the negative terminal toward the outside of the instrument. Pulse the charging switch and see that the neon tubes flash. Depress the charging contact and see that the lamp is lit. If not, see section 5 or 7 for maintenance procedure.

4.0 OPERATION

4.1 To read dosimeters.

a. Remove the dust cap from the charging contact.
b. Place dosimeter on charging contact and press lightly to light lamp.
c. Read dosimeter.
d. Replace dust cap.

4.2 To charge dosimeters.

a. Remove dust cap from the charging contact.

b. Place dosimeter on charging contact and press firmly until the dosimeter touches the bottom of the charging well.
c. Press the charging switch in the direction marked "DOWN SCALE" several times. The fibre in the dosimeter should be observed to move farther down scale with each pulse. Continue pressing the switch until the fibre is at or below the zero mark.
d. If the fibre goes below the zero mark with the last pulse, press and hold the switch to the right "UP SCALE" and allow the fibre to drift up to the zero mark. Release the switch.
e. Remove the dosimeter and read it in the normal manner. Some dosimeters will read slightly higher when removed from the charger and held in the horizontal plane. If this is the case, re-charge the dosimeter to a point sufficiently below the zero mark to compensate for this. If the dosimeter is to be read only on the charger, this is unnecessary.
f. If trouble is experienced in locating the fibre, short the charging contact to the contact well with the dosimeter shell or other metal object. This establishes a fully discharged condition and when the dosimeter is placed on the charging contact, the fibre will go off scale to the right and a known starting point will be established.
g. Replace dust cap.

5.0 OPERATOR'S MAINTENANCE

5.1 Battery replacement.

The 'D' cell should be replaced when the lamp dims noticeably while the charging switch is actuated. Remove the cover and replace the cell as outlined in section 3.

5.2 Lamp replacement.

A spare lamp is installed inside the instrument. If the lamp refuses to light, replace it with the spare. Check the lamp with an ohm-meter before discarding.

5.3 Contact cleaning.

If the charging switch or lamp switch is inoperative or unreliable, the contacts should be cleaned. This is done preferably with a contact file, but can be done in an emergency with a nail file, very fine emery paper or even course wrapping paper.
Place the cleaning tool between the contacts, close the contacts and draw the tool in and out several times. Test the contacts and continue cleaning only if required.

6.0 PREVENTIVE MAINTENANCE

Preventive maintenance is advisable once every six months of storage or prior to any period of use after storage.
Check the operation of the instrument and follow the procedures in section 5 if any difficulty is noted. Check the 'D' cell for any signs of leakage or swelling. Replace the 'D cell if this condition is found or if it is weak.
Whenever the instrument is stored for more than a few weeks, the 'D' cell should be removed to prevent possible damage.

7.0 CORRECTIVE MAINTENANCE

If the instrument will not charge any of the several dosimeters, and the steps in section 5 do not correct the problem, the following steps are suggested:

a. Inspect the instrument for any shorts, broken wires or loose connections.

b. Pulse the charging switch to see that the neon bulbs flash. If they do,and the instrument still does not work, the storage capacitor C_1 may be shorted. Check this with an ohm-meter. If the bulbs do not flash, the transformer may be shorted or open. The resistance of the primary winding should be 0.5 ohms and the secondary winding 2850 ohms. Neither winding should show any continuity to the case when the leads are disconnected from the circuit.

c. The resistance from the charging electrode to the case should be above the range of ordinary ohm-meters (5,000 megohms or higher). If a lower reading is observed, check for dirt on the circuit board, capacitor or charging contact insulator.

d. The neon bulbs should light with a voltage of approximately 60v. Check each one separately for proper operation.

e. Check the capacitor C_2 across the charging switch. This should show infinite resistance on an ohm-meter.

f. Check the current limiting resistor R_2. The resistance should be 1.0 ohms $\pm$ 10%.

g. Measure the resistance across the charging switch contacts when closed. This should be less than 0.1 ohms.

8.0 REPLACEABLE PARTS

8.1 Mechanical Components.

No. Req'd	*Description and Function*	*Jordan Part No.*
1	Spring, Charging Switch	MS-0151
1	Spring, long, lamp switch	MS-0149
1	Spring, short, lamp switch	MS-0161
2	Spring, coil, charging contact return	MW-0007
1	Charging contact	HX-0054
1	Knob, charging switch	HK-004
1	Cap, dust (with chain)	AE-0022
1	Case	MS-0142

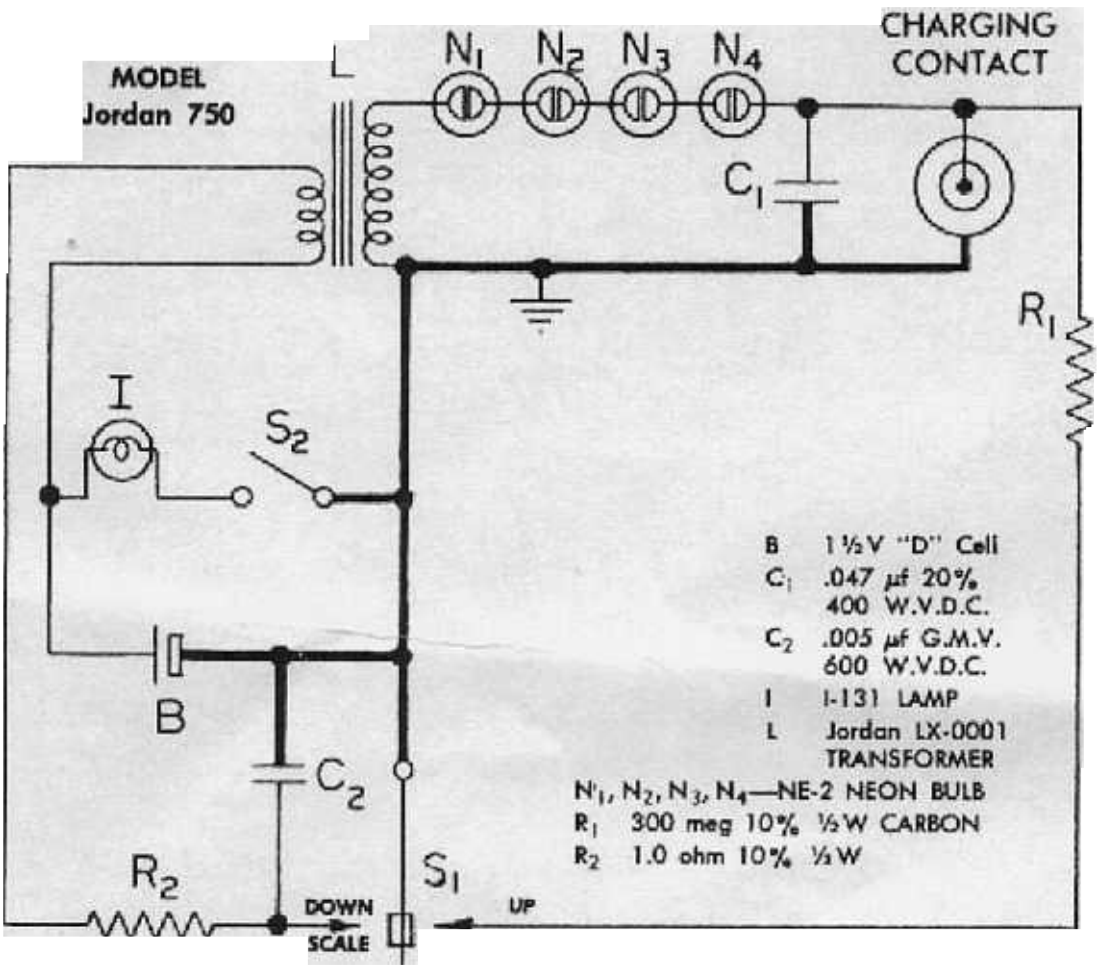

Figure 2—Circuit Diagram

8.2 Electrical components

Circuit Symbol	*Description and Function*	*Manufacturer*	*Mfr's Part No.*	*Jordan Part No.*
B	1.5V 'D' Cell	National Carbon	950	BA-0005
C_1	Capacitor, storage .047 uf ±20% 400V Hermetically sealed	Pyramid	PGH	CP-4473-A
C_2	Capacitor, spark suppressor .005 μμf GMV 600V	RMC	Type B	CC-6502
I	Lamp, dosimeter scale illumination	GE	I-131	EL-0003
L	Transformer, charging voltage	Malmac		LX-0001
N_1, N_2, N_3, N_4	Neon bulb, voltage limiting	GE	NE-2	EL-0004
R_1	Resistor, discharging 300 megohm ±10% ½W	IRC	BTS	RC-0307
R_2	Resistor, current limiting 1.0 ohms ±10% ½W	IRC	BW-½	RX-0005