CANARY II MODEL 4080

Repair Manual

Health Physics Instruments
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I. TURNING THE CANARY II ON AND OFF AND BATTERY CHECK

The on/off switch is located on the right side of the instrument behind the oblong opening. To turn the instrument on slide the on-off switch towards the top of the instrument. You will not be able to do it with your finger, but a pen or pencil inserted into the slot will work. When first turned on the Canary II will beep. This indicates a good or poor battery. If it goes BEEEEEEEEEP then it is a good battery. If it goes beep, rather like a chirp, then it is a poor battery and should be replaced.

II. BACKGROUND RADIATION

The Canary as delivered will beep every 0.01 mR. Each time it beeps the length of beep will indicate the battery condition. If it has a short beep, rather like a chirp, then it needs a new battery.

III. DIGITAL DISPLAY

The display shows the cumulative radiation level since the instrument was turned on. The display has a maximum of 6 digits. The first digit on the digital display is 0.01 mR. The numbers under the display correspond to the digit above them. If the display reads 326, the 3 is over the 1 mR and indicates 3 mR. The 2 is over the .1 mR and indicates .2 mR. The 6 is over the .01 mR and indicates .06 mR. This would be a reading of 3.26. Another way to think of the level is to think of the decimal point two places to the left.

IV. RESET

To reset the instrument to zero, turn it off, wait 5 seconds, then turn it back on. The display should read 0.

V. BATTERIES

The batteries will last about 1000 hours at background levels. To change them, remove the thumbscrew on the top and slide the back up from the front. It should slide easily. Remove the batteries by sliding them toward the top of the instrument. Do ***NOT*** use a metal screwdriver to remove them as this may short the batteries. We supply a wood battery removing tool Replace them with the polarity as shown on the battery holder. BATTERY TYPE: 2 ea. BR2325.

VI. BEEPER

The beeper will beep every time the instrument receives 0.01 mR. The beeper can be turned off. Open the case as described under BATTERIES above. Remove the small jumper in the center of the board. Replace the case. The beeper will still beep at turn on to indicate the battery condition.

VII. CALIBRATION

To calibrate the instrument, expose it from the front. The center of the detector is midway between the front and the rear of the case, and 1/2 in up from the bottom. The calibration adjust potentiometer is on the bottom of the circuit board near the detector. Turn it clockwise to increase the sensitivity.

VIII. SHOCK

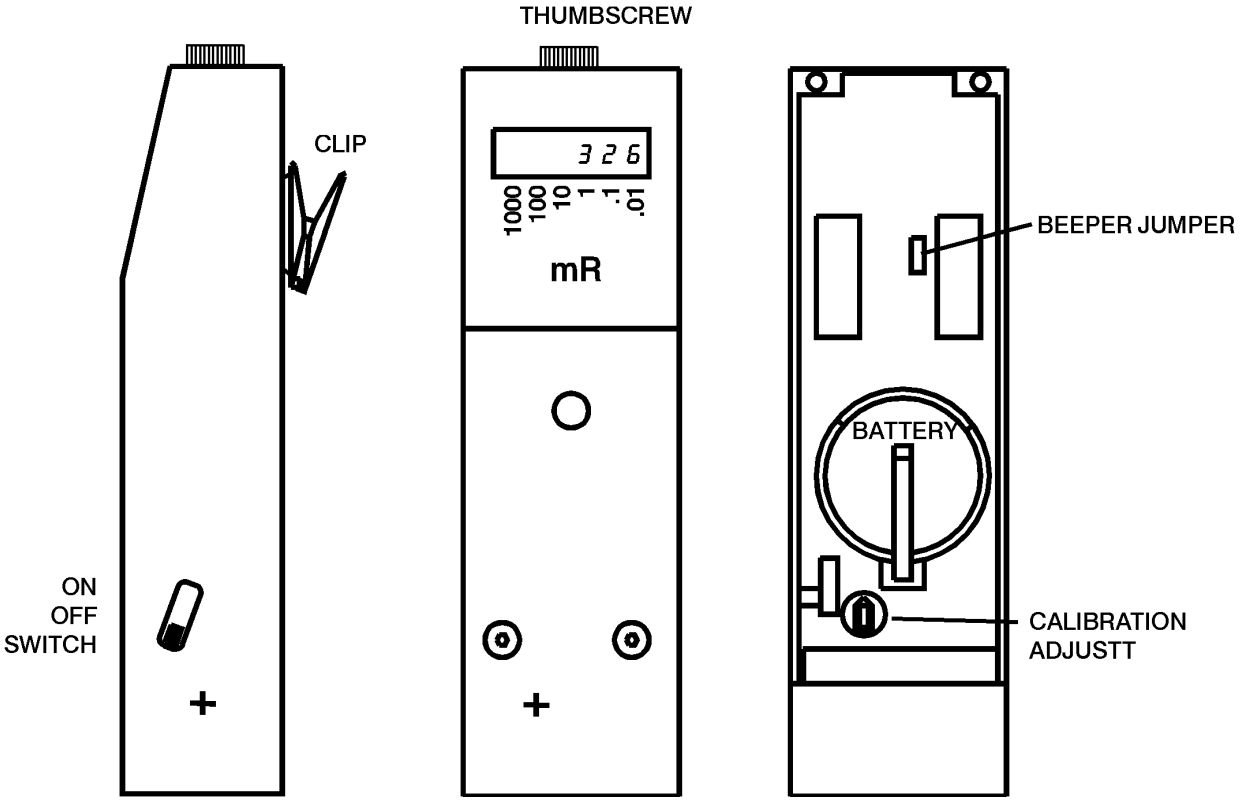
If the case is severely banged by a hard instrument or dropped on a hard floor, the display may add a count. This is to be expected, however remember that it is only 0.01 mR

IX. BEEPER REPLACEMENT

The beeper is glued to an O ring with silicone adhesive. Mark the center of the beeper with a felt tip pen. The O ring and beeper are then glued into the instrument case. The wires should be oriented toward the top of the instrument. To center the beeper over the hole, center the mark on the beeper on the beeper hole.

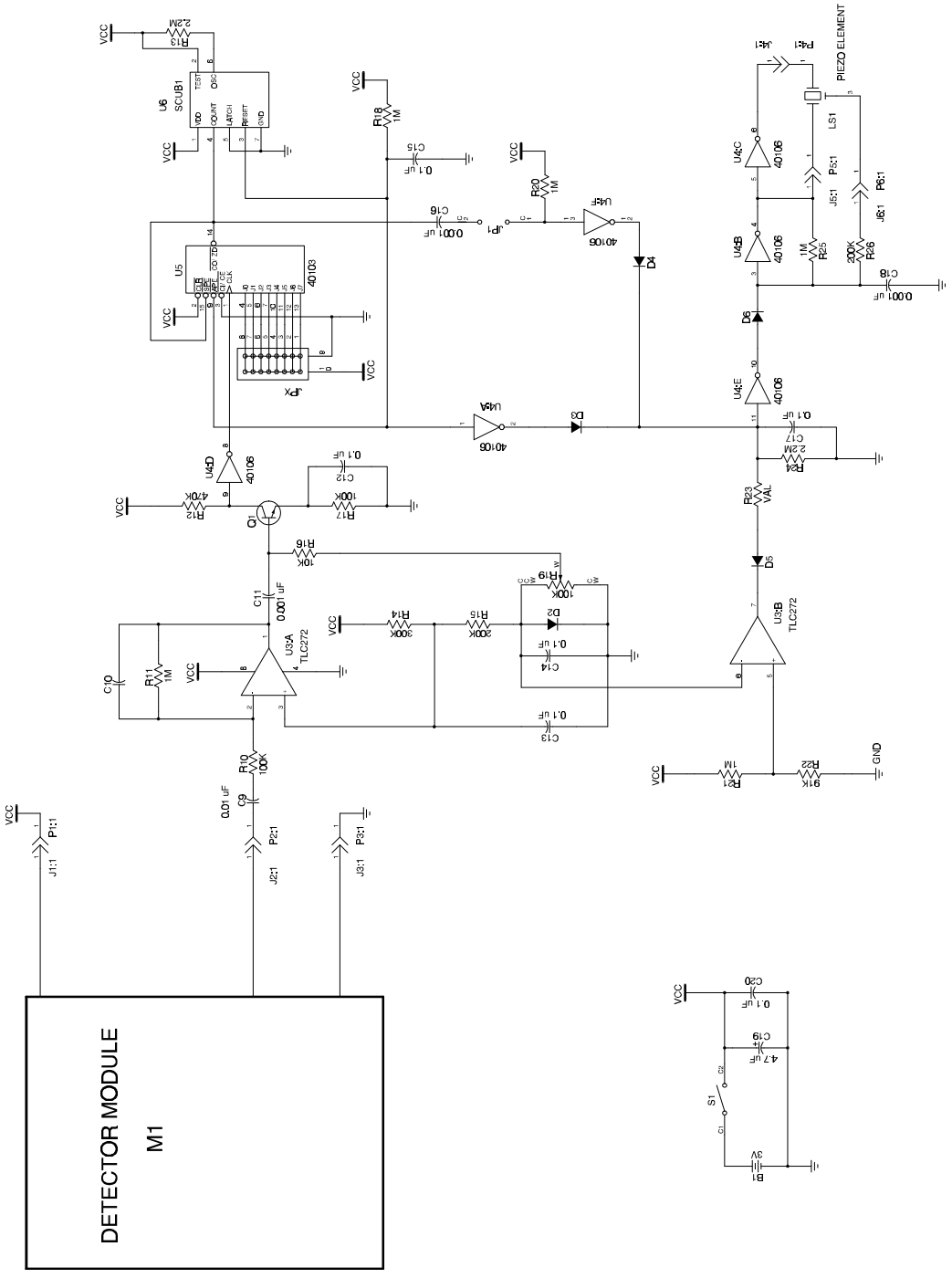
X. MODULE REATTACHMENT

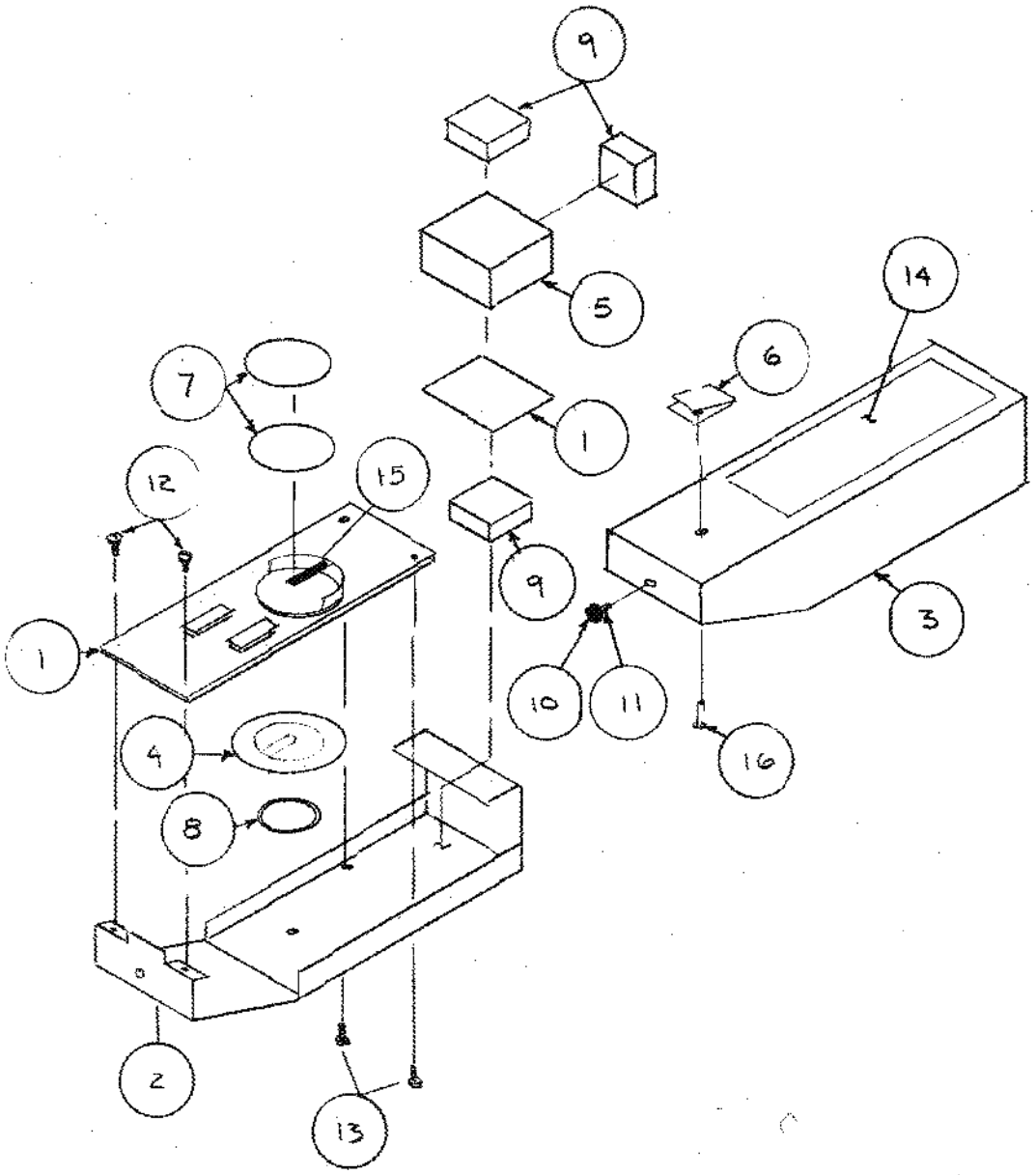
If the module is no longer attached to the case, remove all of the adhesive on both the module and the case. Lighter fluid works well as a solvent for the tape. The module is held in place with 1/8" thick double stick foam tape. If you do not have 1/8" thick tape, laminate two pieces of 1/16" thick tape. Center the module on the case and press it down.



XI. PART LIST

0	DESIGN	QUAN	PART NO	TYPE	DESCRIPTION	MFG	SUPPLIER	DRAWING #
	01	1	4080-007		P.C. Board	HPI	Custom Cir	4080-010
	02	1	4080-005		Case, Base	HPI	Neal Feay	4080-010
	03	1	4080-006		Case, Cover	HPI	Neal Feay	4080-010
	04				See LS1			4080-010
	05	1	7601020527		Potting Shell	Robison	Robison	4080-010
	05A	1	4080-010-05A		Detector Module	HPI	HPI	4080-010
	06	1	LA33-68		Belt Clip	Harco	Harco	4080-010
	07				See B1,2			4080-010
	08	1	217		O ring			4080-010
	09	1			Foam, Tape			4080-010
	10	1			Thumb Screw Cap			4080-010
	11	1		4-40 x 1/8	SCREW, SHCS		SP TOOL	4080-010
	12	1		2-56 x 3/16	SCREW, Pan X		SP TOOL	
4080-010								
	13	1		2-56 x 3/16	SCREW, RHCS		SP TOOL	4080-010
	14	1			LABLE, HPI/FWT			4080-010
	15	1	BH-906S		BAttery Holder	Mem Prot	Tauber	4080-010
	16	1	BH-906S		BAttery Holder	Mem Prot	Tauber	4080-010
	16	1	LA33-73		Eyelet	Harco	Harco	4080-010
	B1,2	2	BR2325	Lithium	Battery, Coin type			4080-008
	C11	1		C.001uF 50 VDC	Capacitor, Mono			4080-008
	C12	1		.1 uF 50VDC	Capacitor, Mono			4080-008
	C13	1		.1 uF 50VDC	Capacitor, Mono			4080-008
	C14	1		.1 uF 50VDC	Capacitor, Mono			4080-008
	C15	1		.1 uF 50VDC	Capacitor, Mono			4080-008
	C16	1		C.001uF 50 VDC	Capacitor, Mono			4080-008
	C17	1		.1 uF 50VDC	Capacitor, Mono			4080-008
	C18	1		220pF 50 VDC	Capacitor, Mono			4080-008
	C19	1		4.7 uF 6VDC	Capacitor, Tantalum			4080-008
	D2	1	1N4148		DIODE, Signal			4080-008
	D3	1	1N4148		DIODE, Signal			4080-008
	D4	1	1N4148		DIODE, Signal			4080-008
	D5	1	1N4148		DIODE, Signal			4080-008
	D6	1	1N4148		DIODE, Signal			4080-008
	LS1	1	7BB-27-4CA0		PIEZO ELEMENT			4080-008
	R10	1		100K	Resistor, 1/8W 5% CF			4080-008
	R11	1		1M	Resistor, 1/8W 5% CF			4080-008
	R12	1		470K	Resistor, 1/8W 5% CF			4080-008
	R13	1		2.2M	Resistor, 1/8W 5% CF			4080-008
	R14	1		300K	Resistor, 1/8W 5% CF			4080-008
	R15	1		200K	Resistor, 1/8W 5% CF			4080-008
	R16	1		1M	Resistor, 1/8W 5% CF			4080-008
	R17	1		100K	Resistor, 1/8W 5% CF			4080-008
	R18	1		1M	Resistor, 1/8W 5% CF			4080-008
	R19	1		100K	Resistor, 1/8W 5% CF			4080-008
	R20	1		1M	Resistor, 1/8W 5% CF			4080-008
	R21	1		1M	Resistor, 1/8W 5% CF			4080-008
	R22	1		91K	Resistor, 1/8W 5% CF			4080-008
	R23	1		100K	Resistor, 1/8W 5% CF			4080-008
	R24	1		2.2M	Resistor, 1/8W 5% CF			4080-008
	R25	1		1M	Resistor, 1/8W 5% CF			4080-008
	R26	1		200K	Resistor, 1/8W 5% CF			4080-008
	S1	1	SSB-12R		Switch, Slide	ALCO		4080-008
	U3	1	TLC27L2CP	IC	DUAL OP AMP	TEX INST		4080-008
	U4	1	MC14584BCP	IC	HEX SCHMIDT TRIGGER			4080-008
	U5	1	CD40103BN	IC	8 BIT DN COUNTER			4080-008
	U6	1	SUBCUB II		COUNTER/DISPLAY			4080-008


DETECTOR MODULE
M1
PIEZO ELEMENT
VCC
GND
TLC272
40106
40103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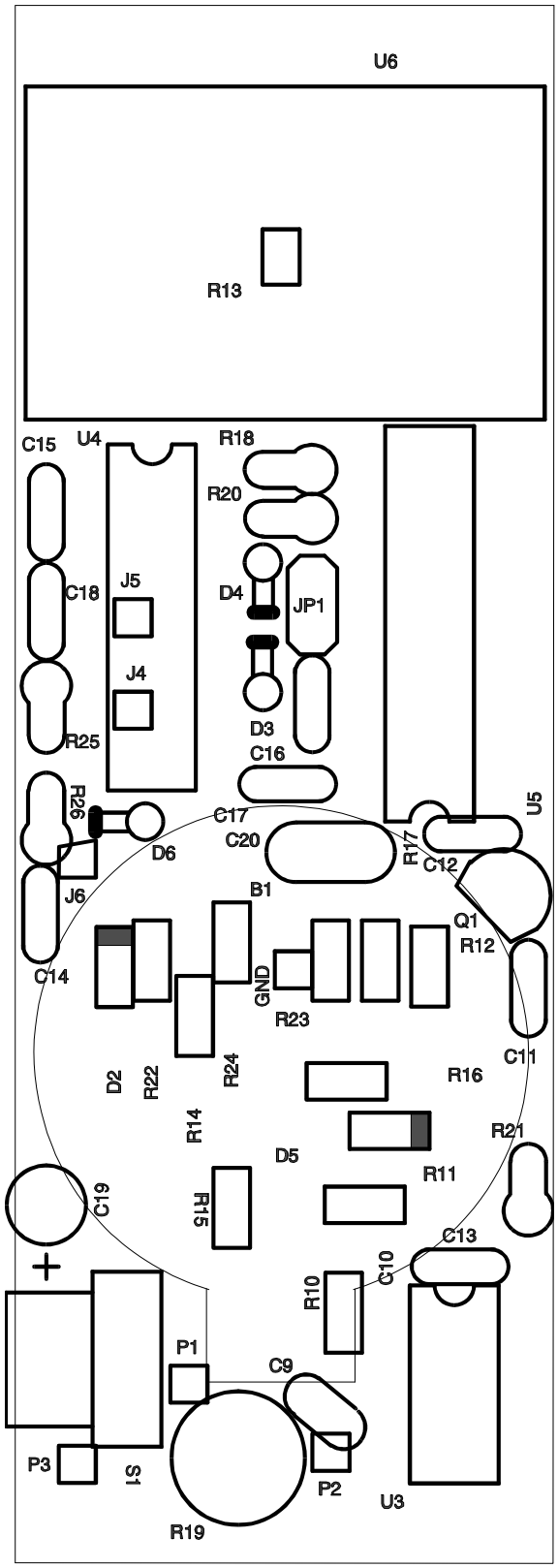
U6
R13
C15
U4
R18
R20
C18
J5
D4
JP1
J4
D3
R25
C16
R26
C17
U5
D6
C20
R17
C12
J6
B1
Q1
R12
C14
GND
R23
C11
D2
R22
R24
R16
R14
R21
D5
R11
C19
R15
C13
C10
R10
P1
C9
P3
S1
P2
U3
R19