MODEL 4022

SIGNAL SURVEY METER

MANUAL

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C A U T I O N

THE THIN WINDOW GM DETECTOR BEHIND THE SCREEN ON THE BOTTOM OF THE INSTRUMENT IS EASILY BROKEN. THIS DETECTOR IS EXPENSIVE. CARELESS HANDLING WILL RESULT IN AN UNNECESSARY EXPENSE OF BUYING A NEW DETECTOR.

SPECIFICATIONS

MECHANICAL

Dimensions: 3” x 6 ¼” x 1 5/8” (75mm x 159mm x 40mm)

Weight:14 oz. (500 grams)

Case: Black Anodized Aluminum

Detector: Peanut GM Tube

OPERATIONAL

Readout: 2 ½ Taut Band Meter

External Controls: ON-OFF-ON WITH SPKR toggle switch,Range toggle switch X1, X10, X100 (10, 100, 1000 mR/h), Lamp push switch.

Internal Controls: Calibrate adjustments X1, X10, X100

Radiation Detected: gamma, Xrays

Range: 0-10, 0-100, and 0-1000 mR/h

Geiger Tube Voltage: 950V

Battery: 9v

Battery Life: 500 hours

“QR” Quick Response Time Constant:

X1 Slow 7 sec. Fast 1 sec.

X10 Slow 3.2 sec. Fast 1 sec.

X100 1. sec.

Beeper: Piezo Electric. Beeps every count with power switch in ON WITH SPKR position, beeps only at turn-on in ON position. Beeps at turn-on if battery is good.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

INTRODUCTION

The Signal is a meter that has an integral GM detector. It is a high quality simple to operate instrument suitable for both lab and field use.

OPERATION

Your model 4022 Survey Meter is shipped fully assembled with batteries. To get started:

Turn Power switch to “ON with spkr”

The instrument should beep and the meter will read upscale. After about 3 seconds the meter should read the proper amount of radiation.

Put the Range switch on x1 and the meter should move to zero which is normal background radiation.

FEATURES

The Signal incorporates a “QR” quick response meter circuit that eliminates the need for a reset or time constant switch. The meter will move quickly to near the correct value then slow down as it approaches the value. This reduces the meter fluctuations at low counting rates while still responding quickly to significant changes in the counting rate.

Another feature of the meter is the antisaturation circuit that will not let the meter fail in high radiation levels.

The long battery life of 500 hours is enough time to operate the meter for about a year at 2 hours a day and the automatic battery check warns of a low battery when it does happen.

The compact size allows the Signal to be carried and operated with one hand, a strong consideration when doing extended surveys when the other hand may be busy.

FUNCTIONS

In this section we will discuss the three controls and how they operate the instrument.

POWER SWITCH

The power switch is a three position switch. In the center position the instrument is turned off. In the upper position the instrument is turned on without the speaker. In the bottom position the instrument is turned on with the speaker.

When the instrument is first turned on the speaker will beep. This indicates that the battery is good. If the speaker does not beep then the battery needs replacing. Also at turn on the meter will automatically display the battery condition for about 3 seconds. How high into the BATT OK section of the meter the pointer moves is an indication of the condition of the battery.

RANGE SWITCH

The Range switch is a three position switch that switches the range for the meter. In the up position (x 1) the instrument is reading the scale on the meter. In the middle position (x 10) the meter is reading 10 times the value printed on the scale. Full scale is 100 mR/h. In the bottom position (x 100) the meter is reading 100 times the value printed on the scale. Full scale is 1000 mR/h.

LIGHT SWITCH

The Light Switch turns on the light above the meter. Push it to turn on the light. Release to turn the light off.

SPEAKER

The speaker is located behind the hole above the meter. It beeps at turn on to indicate a good battery and if the Power switch is in the lower position of ON with spkr, the speaker will beep with each pulse from the GM Detector.

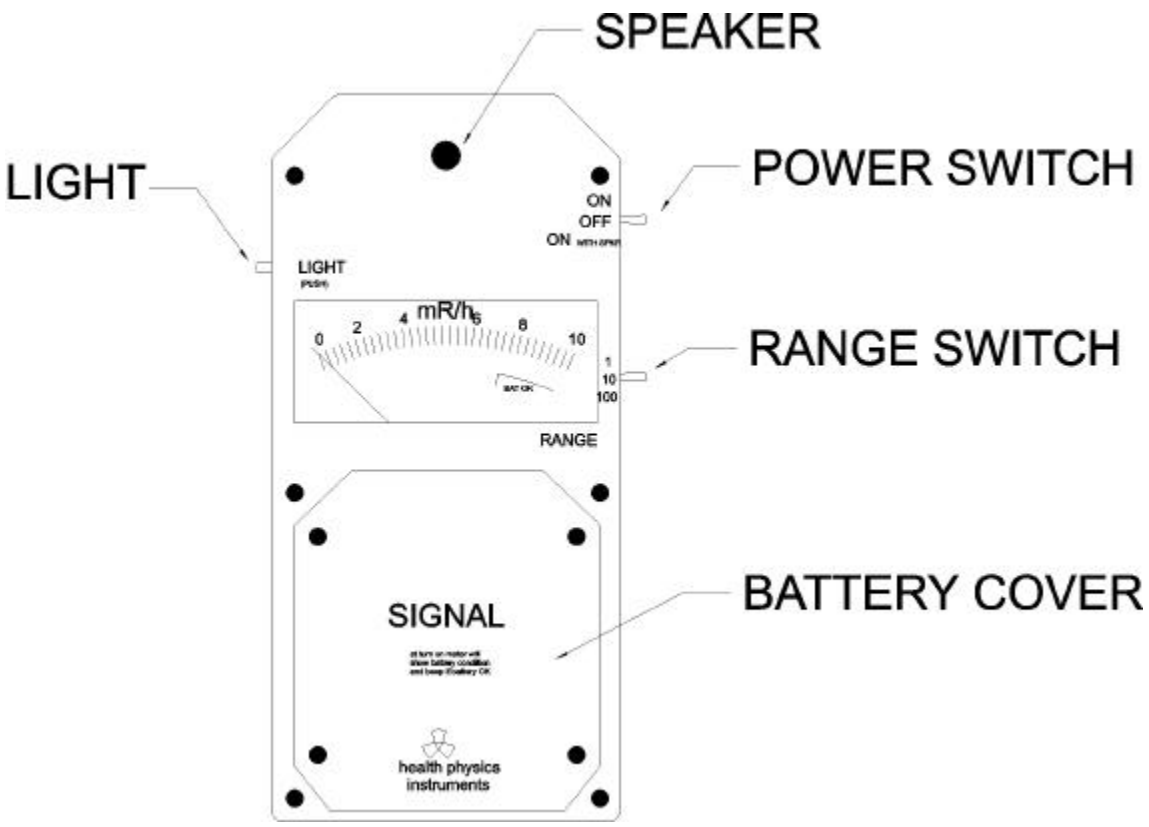


Fig 1 Front Panel Controls

MAINTENANCE AND ADJUSTMENT

BATTERY CHANGE

The Model 4022 requires a single 9 volt battery. You can use any type of 9 volt battery that will fit. To replace the battery turn the instrument off and unscrew the four screws

on the battery cover that is on the front panel. Remove the cover. Remove the battery and replace with a fresh one observing the polarity marked on the holder. Replace the cover.

CALIBRATION

The only user calibration is the sensitivity of the three ranges for the meter. The instrument is designed to measure gammas and therefore should be calibrated with a radiation source. The calibration is done as follows:

1. Turn the instrument on.
2. Set the Range switch to X1.
3. Expose the instrument from the side to 80% of full scale and adjust the X1 calibration (to the left of the battery holder) so the meter reads correctly.
4. Change the range switch to X10 and repeat step 3.
5. Change the range switch to X100 and repeat step 3.
6. You may also wish to report the readings of 20% full scale on all ranges to verify linearity.

This completes the Calibration. A complete calibration would also check the reading of the meter to off scale conditions.

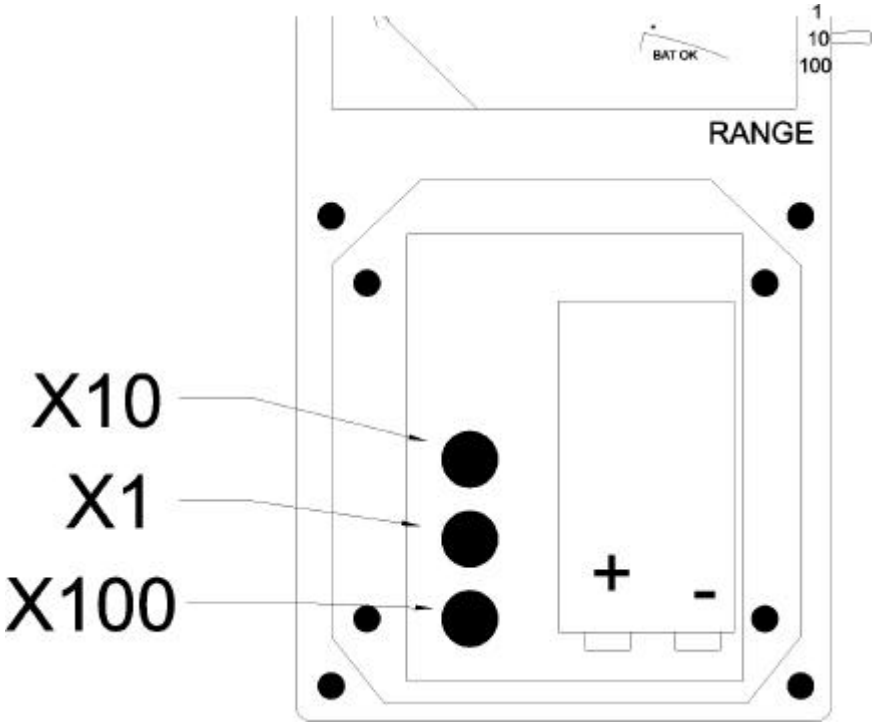


Fig 2 Battery box and Calibration

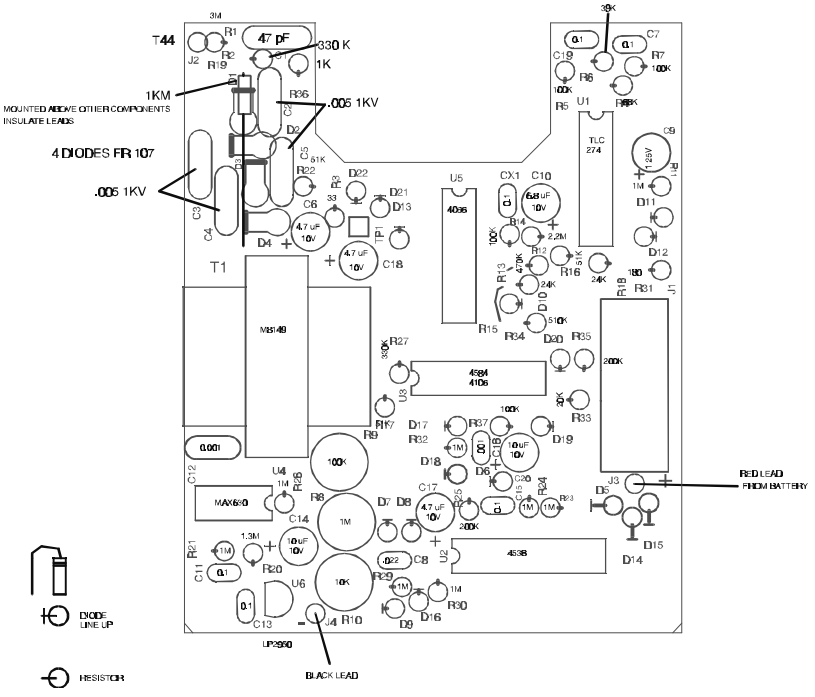
WARRANTY

HPI equipment is warranted, to the original purchaser only, to be free from defects in materials and workmanship for a period of one year from date of shipment, unless

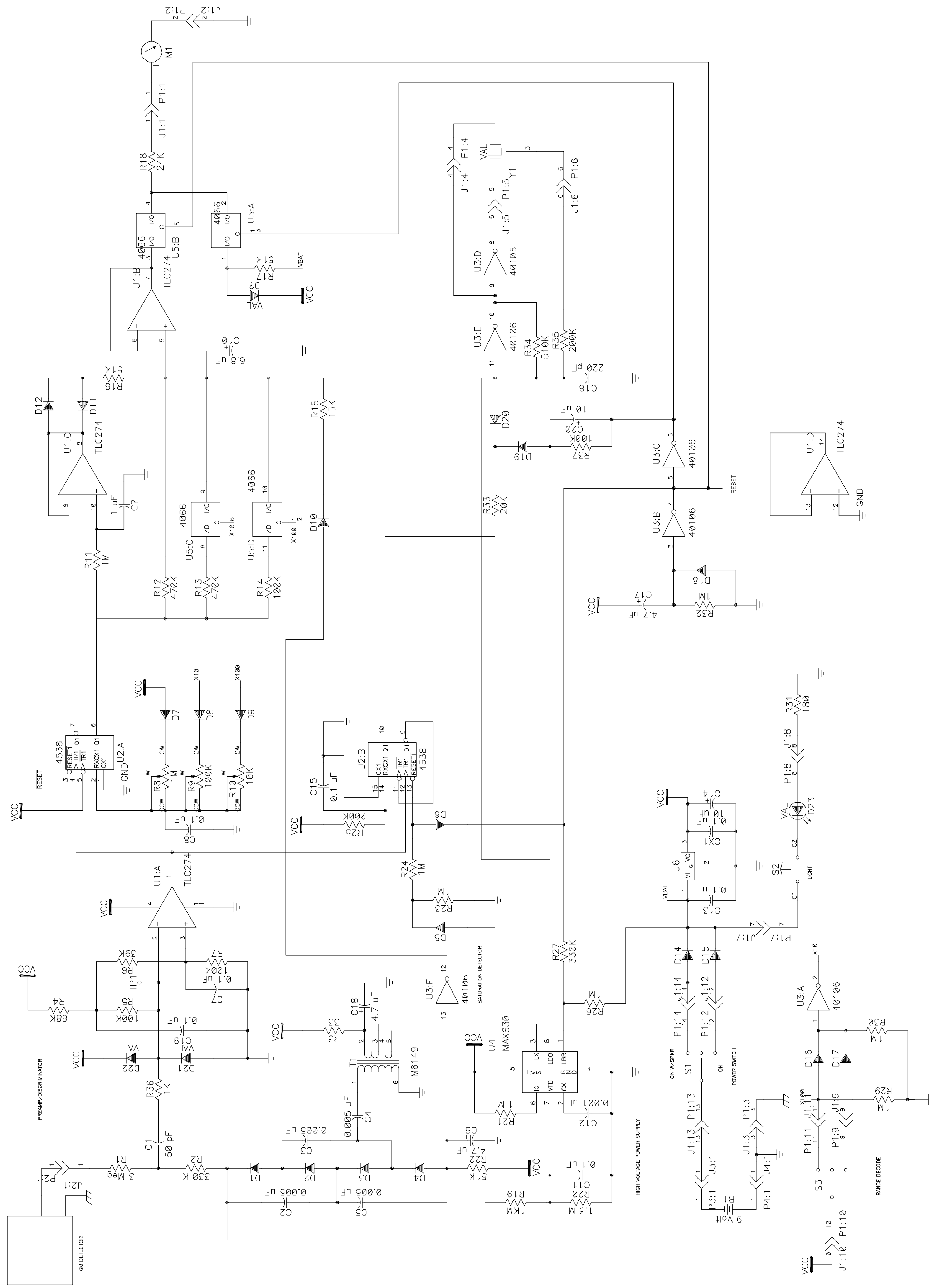
otherwise defined in the applicable product data sheet. Under this warranty, equipment which has been properly installed and operated and not subject to misuse, misapplication, or abuse, but becomes defective will be repaired by us at our factory or replaced, at the option of HPI, and Buyer will pay only the cost of freight (plus custom and broker fees where applicable) and in-transit insurance to and from HPI. Of course, expendable supplies such as batteries and easily damaged items such as thin window Geiger tubes if broken, are not within the warranty.

Except for the warranties specifically set forth herein, there shall be no other warranties, whether express, implied, or statutory, including implied warranties of merchantability or fitness. In addition, it is expressly agreed by Buyer, in purchasing the goods, that the liability of HPI, if any, shall be limited solely to the replacement and repair of the goods in accordance with the warranties specifically and expressly set forth herein, and HPI shall not be liable for loss of use of the equipment or for other incidental or consequential costs, expenses, or damages incurred by Buyer.

NOTE: Instrument should be examined and tested as soon as received by Buyer. Claims for damage, if any, should be filed at once with the carrier.



PARTS PLACEMENT


GM DETECTOR
PREAMP/DISCRIMINATOR
HIGH VOLTAGE POWER SUPPLY
SATURATION DETECTOR
ON W/SPKR
POWER SWITCH
RANGE DECODE
LIGHT
RESET
9 Volt
MAX630
M8149