

JUL 03 1985

License Nos. 20-07875-01  
20-07875-02E  
Docket Nos. 030-04672  
030-09009

MEMORANDUM FOR: Vandy L. Miller, Chief, Material Licensing Branch  
NMSS

FROM: James H. Joyner, Chief, Nuclear Materials Safety and  
Safeguards Branch, Region I

SUBJECT: DAMAGE OF SOURCE INTEGRITY IN DUST MASS MONITORING DEVICES  
CONTAINING EXEMPT QUANTITIES OF CARBON-14 SEALED SOURCES

GCA Corporation is licensed to assemble and distribute dust mass monitoring devices, containing exempt quantities of carbon-14 as sealed sources. From 1979 to 1982, GCA Corporation distributed 364 of these monitors to customers exempt from licensing pursuant to Section 30.20, 10 CFR 30. Since 1982 (the year of the previous inspection), GCA has discontinued manufacturing of these devices, but continued to service the existing devices held by their customers. Such servicing includes source replacements. To date, GCA has documented 8 cases of replacing damaged carbon-14 sources in these monitors sent in for repairs. Each of these cases reported either a ruptured source or the membrane on the source being missing. This is a 2.2% defect rate.

We are bringing this matter to your attention so that you may consider whether either the device or the distribution license needs to be modified. Please feel free to have your staff contact John Glenn of my staff for additional information.

Original Signed By:  
James H. Joyner

James H. Joyner, Chief  
Nuclear Materials Safety  
and Safeguards Branch

Enclosures:  
1. Licensee's Repair Records

RI:DRSS  
Varela/fi  
06/17/85  
*MA*

*jo* RI:DRSS  
Glenn  
06/17/85

*jo* RI:DRSS  
Joyner  
06/27/85

OFFICIAL RECORD COPY

MEMO GCA CORP - 0001.0.0  
06/18/85

8507120098 850703  
REG1 LIC30  
20-07875-01 PDR

RETURN ORIGINAL TO  
REGION I  
*ML 11*

# ROM REPAIR CHECK-OUT SHEET

Model No. 101-1 Serial No. 2037



UPK Umwelt- und  
Prozeßkontroll  
GmbH

I. Symptoms (attach correspondence)

6-916-001

Auftrags-Nr.

R-244/268

Reg. Nr.

Rechnungs-Nr.

P-12/82

Postfach 1223

6350 Bad Nauheim

Bundesrepublik  
Deutschland

II. Accessories Included

Less manual, 1 coated disc & 1  
Cal disc

III. Recommended Action

Calibrate

Data

1. Radiation Background 5/12 (<0.05 mr/hr)

2. Verify Fault 5/12 & deepening don't clear  
(lengthen clearing pulse)

3. Batteries Condition Dead, corroded

4. Battery Charger (and Circuit) ✓ 100 volts

5. Leakage Current ✓ (<300 µa)

6. B Rate (Clean Disc) low 1500 (± 150 pps)

7. Card 2 Leakage L.M.308 Compensation cap.

8. Card 2 Test Points ✓

9. High Voltage ✓

1. Symptoms (attach correspondence)

6-916-001

II. Accessories Included

Less manual, included are  
11 control disc & 1 cal disc  
also 1 extra air tube

III. Recommended Action

Clean / align & calibrate

IV. Data

1. Radiation Background R/A (<0.05 mr/hr)

2. Verify Fault Source punctured

3. Batteries Condition Corroded

4. Battery Charger (and Circuit) ✓ ma volts

5. Leakage Current ✓ (<300  $\mu$ a)

6. S Rate (Clean disc) ✓ 1500 ( $\pm$  150 pps)

7. Card 2 Leakage ✓ (v)

8. Card 2 Test Points ✓ (v)

9. High Voltage ✓



Bio/Dynamics inc  
6-915-001

RDM REPAIR CHECK-OUT SHEET

Model No. 201-1 Serial No. 21048

I. Symptoms (attach correspondence)

II. Accessories Included

Less) flow meter, manual &  
filter paper included in 1 good  
GM tube & 1 punctured tube

III. Recommended Action

Calibrate

1. Radiation Background R/O (<0.05 mr/hr)

2. Verify Fault punctured source & GM  
tube

3. Batteries Condition ✓

✓ 4. Battery Charger (and Circuit) Repair or Replace volts .

5. Leakage Current ✓ (<300  $\mu$ a)

6. B Rate (Clean Disc) --- 1500 ( $\pm$  150 pps)

7. Card 2 Leakage ✓ (✓)

✓ 8. Card 2 Test Points all comp. (✓)

9. High Voltage 742 ✓



12. Cal Disc Checks (3) ( )  
13. Flow Rate (Clean Disc)  
14. Pulse Width ☒ (Normally 50  $\mu$ sec)  
15. Motor Voltage ☒

V. Remarks

☒ Batt charger hardware  
broken loose (Replace charger)  
☒ Replace CM tubes with his spare tube  
RDM base casting not R/A

By

GEO

Date

8/1/79

Pure

~~intake assembly~~ R/A

intake nozzle R/A

C<sup>14</sup> source

Tube holder R/A

1 cal disc

new style inlet cover

Batt charger 140-300 ☒

Polovoid window

(101) <sub>2</sub>

## RDM REPAIR CHECK-OUT SHEET

D. Giles, S.A.

Model No. 101-4 Serial No. 2697

## I. Symptoms (attach correspondence)

## II. Accessories Included

Complete

## III. Recommended Action

Ch. alignment / calibrate

## IV. Data

1. Radiation Background 12/12 (<0.05 mr/hr)

2. Verify Fault

Source membrane missing3. Batteries Condition Dead, recharge & test4. Battery Charger (and Circuit) ✓ ma volts5. Leakage Current ✓ (<300  $\mu$ a)6. S Rate (Clean Disc) very low 1500 ( $\pm$  150 pps)7. Card 2 Leakage ✓ (✓)8. Card 2 Test Points ✓ (✓)9. High Voltage ✓

10. Card 1 Test Points ✓ (✓)
11. Zero Checks (3) \_\_\_\_\_
12. Cal Disc Checks (3) ( ) \_\_\_\_\_
13. Flow Rate (Clean Disc) ✓
14. Pulse Width ✓ (Normally 50  $\mu$ sec)
15. Motor Voltage ✓

V. Remarks

Replace pump filter  
Clean intake & tube  
 \_\_\_\_\_  
 \_\_\_\_\_

by JECL Date 3/12/24

Parts

14 gaskets  
 11 nicad batteries  
 1 cal disc  
 1 cover latch  
 1 pump filter

R/A Parts  
 maggel, intake  
 cover

(.110) 2



## RDM REPAIR CHECK-OUT SHEET

*Daria Gordon*  
*Newton ma,*Model No. 101-4 Serial No. 2424

## I. Symptoms (attach correspondence)

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## II. Accessories Included

Less manual  

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## III. Recommended Action

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## IV. Data

1. Radiation Background R/A (<0.05 mr/hr)2. Verify Fault Source punctured  

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3. Batteries Condition 2 cells shorted4. Battery Charger (and Circuit) ✓ ma          volts5. Leakage Current 1 (<300  $\mu$ a)6. B Rate (Clean Disc)          1500 ( $\pm$  150 pps)7. Card 2 Leakage          (✓)8. Card 2 Test Points          (✓)9. High Voltage

10. Card 1 Test Points \_\_\_\_\_ (1)
11. Zero Checks (3) \_\_\_\_\_
12. Cal Disc Checks (3) ( \_\_\_\_\_ ) \_\_\_\_\_
13. Flow Rate (Clean Disc) \_\_\_\_\_
14. Pulse Width \_\_\_\_\_ (Normally 50  $\mu$ sec)
15. Motor Voltage \_\_\_\_\_

V. Remarks

NO ST/By Voltage Replace Q1 on  
Card 4, test boards, OK

ged.

Date

1/17/84

R/H Parts subject to cleaning

parts  
1 pump  
Case insert (foam)  
2 Head cells  
1 Cal disc  
2 coated disc  
1 Polaroid window  
N. 5172  
ED lamp

Base  
Cover  
nagel  
gear (substrate)  
gear (advance)  
tube holder  
tube  
pump  
case insert (foam)  
gear stop button  
Card # 4 & wires  
knob  
hardware (capstan)  
2 coated disc  
1 Cal disc  
tygon hose

(1000)

*Sage Service*  
8-916-001

RDM REPAIR CHECK-OUT SHEET

Model No. 101-1 Serial No. 2621

I. Symptoms (attach correspondence)

R/A

II. Accessories included

Less manual, pump & control disc  
included and cal disc

III. Recommended Action

Clean, align, calibrate

IV. Data

1. Radiation Background R/A (<0.05 mr/hr)

2. Verify Fault

3. Batteries Condition 2 cells shorted

4. Battery Charger (and Circuit) ✓ ma volts

5. Leakage Current ✓ (<300  $\mu$ a)

6. B Rate (Clean Disc) — 1500 ( $\pm$  150 pps)

7. Card 2 Leakage ✓ (✓)

8. Card 2 Test Points ✓ (✓)

9. High Voltage ✓



10. Card 1 Test Points clock 39ms slow (✓)

11. Zero Checks (3)                     

12. Cal Disc Checks (3) (        )                     

13. Flow Rate (Clean Disc) ✓

14. Pulse Width ✓ (Normally 50  $\mu$ sec)

15. Motor Voltage ✓

Remarks

Source membrane slightly lifted  
        
        
      

By GED Date 8/27/82

Parts

✓ C<sup>14</sup> source (short) ✓

✓ 2 Nicad cells

✓ 1 nozzle

✓ 1 cal disc

R/A parts

Cover → clean  
nozzle α

tube → clean  
tube holder → clean

(110) 2

## RDM REPAIR CHECK-OUT SHEET

215119

6-916-001

Model No. 101-1 Serial No. 2532

## I. Symptoms (attach correspondence)

## II. Accessories Included

Less manual, Bats charger & cable  
included are 6 disc (3 R/A)  
secured with container for the case

## III. Recommended Action

## IV. Data

1. Radiation Background R/A (<0.05 mr/hr)2. Verify Fault R/A source punctured3. Batteries Condition 4 cells dead (shorted)4. Battery Charger (and Circuit) NONE ma volts5. Leakage Current ✓ (<300  $\mu$ a)6. B Rate (Clean Disc) ✓ 1500 ( $\pm$  150 pps)7. Card 2 Leakage ✓ (v)8. Card 2 Test Points ✓ (v)9. High Voltage ✓

10. Card 1 Test Points ✓ Clock slow

11. Zero Checks (3) ✓

12. Cal Disc Checks (3) (X)

13. Flow Rate (Clean Disc) ✓

14. Pulse Width ✓ (Normally 50  $\mu$ sec)

15. Motor Voltage ✓

V. Remarks

Items 3-15 performed after  
cleaning

gco

Date

8/11/83

Parts

Cryolane (request)

3 coated disc

14 ounce ✓

Wicad Ball ✓

(1000)<sub>2</sub>

R/B Parts

Cover OK

gear OK

shaft OK

maggy OK

tube holder OK

Base OK

3 coated disc X



## RDM REPAIR CHECK-OUT SHEET

Canada  
HOSKINSModel No. 101-1 Serial No. 2220

## I. Symptoms (attach correspondence)

## II. Accessories Included

RDM only, no case & no  
batteries, included 1 damaged  
= cal. disc

## III. Recommended Action

Clean, align & calibrate

## IV. Data

1. Radiation Background R/O (<0.05 mr/hr)
2. Verify Fault Source membrane  
missing
3. Batteries Condition NONE
4. Battery Charger (and Circuit) NONE ma \_\_\_\_\_ volts
5. Leakage Current ✓ (<300  $\mu$ a)
6. B Rate (Clean Disc) R/O 1500 ( $\pm$  150 pps)
7. Card 2 Leakage ✓ ( $\checkmark$ )
8. Card 2 Test Points ✓ ( $\checkmark$ )
9. High Voltage ✓

Card #1 display not bright  
poor solder connection at supply resistor

10. Card 1 Test Points \_\_\_\_\_ (✓)
11. Zero Checks (3) \_\_\_\_\_
12. Cal Disc Checks (3) ( \_\_\_\_\_ ) \_\_\_\_\_
13. Flow Rate (Clean Disc) low
14. Pulse Width \_\_\_\_\_ (Normally 50 usec)
15. Motor Voltage \_\_\_\_\_

## V. Remarks

Mood of C<sup>14</sup> must have spelled away from instrument, Base has less background than normal.

By gfa Date 1/24/83

Parte

- 5'4 ounce (Lang)
- " Nicad Battery
- 1 Cal disc
- 1 Polaroid window
- 1 pump filter
- 1 pump elbow

R/A Parts

Nozzle  
intake  
cover  
Base

(110) ~

1. Symptoms (attach correspondence)

Serial No. 8016

6-916-001

II. Accessories Included

Complete - included are 4 discs  
& 2 cal discs

III. Recommended Action

Clean R/A parts, align/calibrate

IV. Data

1. Radiation Background R/A ( $\pm 0.05$  mr/hr)

2. Verify Fault Wanderer & C'9 removed

3. Batteries Condition 1.2 A/b Et cells

4. Battery Charger (and circuit) C 01 volts

5. Leakage Current C ( $\pm 300$   $\mu$ A)

6. Print Rate (Clean Disc) C 100 1500 ( $\pm 150$  pps)

7. Card 2 Leakage ✓ (✓)

8. Card 2 Test Points ✓ (✓)

9. High Voltage ✓



10. Card 1 Test Points ✓ (✓)  
11. Zero Checks (3) \_\_\_\_\_  
12. Cal Disc Checks (3) ( \_\_\_\_\_ )  
13. Flow Rate (Clean Disc) ✓  
14. Pulse Width ✓ (Normally 50  $\mu$ sec)  
15. Motor Voltage ✓

V. Remarks

Clean  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

By

GEI

Date

11/24/82

Parts

C-4 source  
11 Vicad Batteries

R/A parts

1033C OK  
Cover OK  
intake OK (110) 2