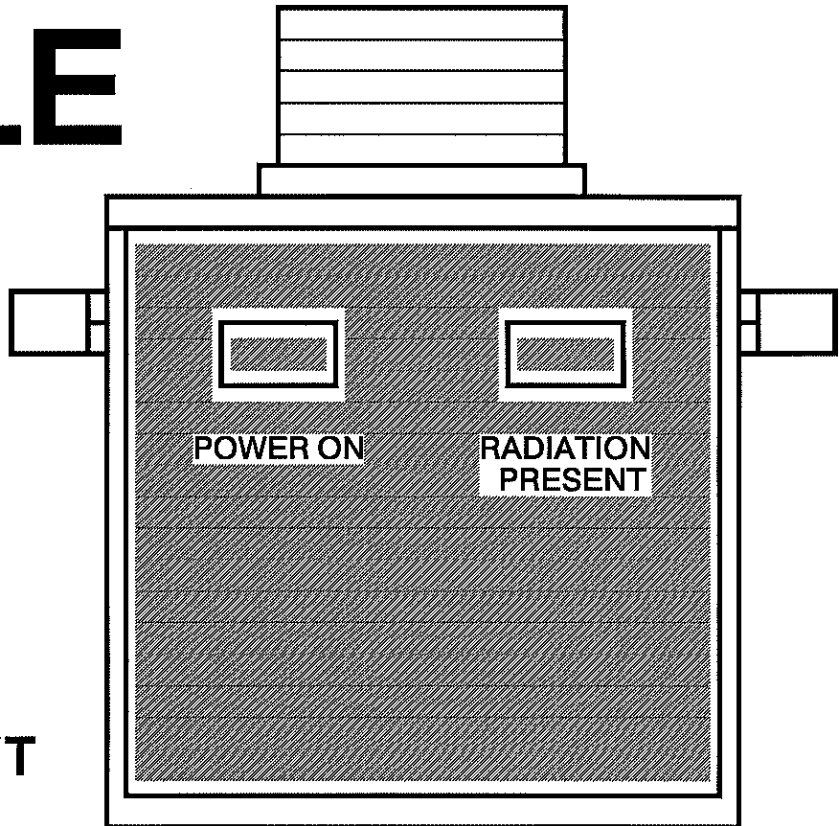


# NDS PRODUCTS

## MOBILE 12V

BEACON  
LIGHT, SIREN  
AND BATTERY  
WITH CHARGER  
120V OR 230V INPUT



# ND-4000 AREA MONITOR OPERATION MANUAL

Visit Our Web Site At:  
[www.ndsproducts.com](http://www.ndsproducts.com)

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**NOTE:** DUE TO NDS PRODUCTS' CONTINUING PROGRAM OF RESEARCH & DEVELOPMENT, ALL SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AND MAY BE VARIED AT OUR DISCRETION.

**1.0 USER CAUTION AND WARNINGS:**

THIS INSTRUMENT IS INTENDED SOLELY FOR THE DETECTION AND MEASUREMENT OF IONIZING RADIATION. IT SHOULD BE USED ONLY BY PERSONS WHO HAVE BEEN TRAINED IN THE PROPER INTERPRETATIONS OF ITS READINGS AND THE APPROPRIATE SAFETY PROCEDURES TO BE FOLLOWED IN THE PRESENCE OF RADIATION.

THE EQUIPMENT HEREIN IS DESIGNED AND MANUFACTURED IN COMPLIANCE WITH ALL APPLICABLE SAFETY STANDARDS; NEVERTHELESS, CERTAIN HAZARDS ARE INHERENT IN THE USE OF ALL ELECTRONIC EQUIPMENT. ADEQUATE WARNINGS ARE INCLUDED IN THIS MANUAL AND ON THE PRODUCT ITSELF TO COVER HAZARDS THAT MAY BE ENCOUNTERED IN NORMAL USE AND SERVICING OF THIS EQUIPMENT. NO OTHER PROCEDURES ARE WARRANTED BY NDS PRODUCTS. IT SHALL BE THE OWNER'S OR USER'S RESPONSIBILITY TO ASSURE THAT THE PROCEDURES HEREIN ARE METICULOUSLY FOLLOWED, AND ESPECIALLY THAT THE WARNING AND CAUTIONARY NOTES ARE HEEDDED. FAILURE ON THE PART OF THE USER IN ANY WAY TO FOLLOW PRESCRIBED PROCEDURES SHALL OBSOLVE NDS PRODUCTS AND ITS AGENTS FROM ANY RESULTING LIABILITY.

**READ YOUR OPERATION MANUAL**

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**2.0 WARRANTY:**

NDS PRODUCTS WARRANTS THAT THE PRODUCTS COVERED HEREBY SHALL BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR FROM DATE OF NDS PRODUCTS' SHIPMENT (GM TUBE IS WARRANTED BY THE OEM FOR 90 DAYS). THE FOREGOING WARRANTY DOES NOT APPLY TO ANY PRODUCTS WHICH HAVE BEEN SUBJECT TO MISUSE (INCLUDING STATIC DISCHARGE), NEGLIGENCE, ACCIDENT, OR MODIFICATION. NDS PRODUCTS' SOLE OBLIGATION TO BUYER HEREUNDER FOR PRODUCTS FAILING TO MEET THE AFORESAID WARRANTY SHALL BE, AT NDS PRODUCTS' DISCRETION, TO REPAIR AND RECALIBRATE THE NONCONFORMING PRODUCT OR TO REPLACE THE NONCONFORMING PRODUCT WITHIN THE WARRANTY PERIOD: 1) THE BUYER HAS RETURNED THE NONCONFORMING PRODUCT TO NDS PRODUCTS, FREIGHT PREPAID, & 2) NDS PRODUCTS HAS DETERMINED THE PRODUCT IS NONCONFORMING AND THAT SUCH NONCONFORMITY IS NOT A RESULT OF IMPROPER USE, REPAIR, MODIFICATION OR OTHER MISUSE BY BUYER.

THE FOREGOING WARRANTY AND REMEDIES ARE EXCLUSIVE AND ARE MADE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE. NDS PRODUCTS NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OR USE OF ITS PRODUCTS, AND NDS PRODUCTS MAKES NO WARRANTY WHATSOEVER FOR PRODUCTS NOT MANUFACTURED BY NDS PRODUCTS. NDS PRODUCTS SHALL NOT BE LIABLE FOR DAMAGES DUE TO DELAYS IN DELIVERIES OR USE AND SHALL IN NO EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND; WHETHER ARISING FROM CONTRACT, TORT, OR NEGLIGENCE, INCLUDING BUT NOT LIMITED TO, LOSS OF PROFITS, LOSS OF GOODWILL, OVERHEAD OR OTHER LIKE DAMAGES.

**3.0 SPECIFICATIONS:**

ENERGY RESPONSE.....GAMMA AND X-RAY FROM 80-2000KeV, +/-20%

MAXIMUM INTENSITY OR SATURATION:.....GREATER THAN 1000R/hr

TEMPERATURE RANGE:.....-30 TO 50 DEGREES C

SIGNALS:.....POWER ON/OFF SWITCH  
GREEN POWER ON LIGHT  
RED STROBE ALARM TRIP LIGHT  
AUDIO OFF/ON SWITCH  
AUDIO ALARM

POWER:.....12V DC BATTERY WITH CHARGER, 17 AMP HOURS

AUDIO:.....PIEZO ALERT

BATTERY LIFE:.....16 HOURS IN A CONSTANT RADIATION FIELD,  
LONGER WITH INTERMITTENT USE

BATTERY CHARGER:.....USE WITH PANASONIC PSC 12170F BATTERY ONLY

120VAC USE P/N ND-AC01 CHARGER  
230VAC USE P/N ND-EAC CHARGER

ENCLOSURE:.....NEMA 3R STEEL, MEETS UL 50 TYPE 3R, IEC 529, IP 32.  
12.5"HI (INCLUDING STROBE LIGHT) x 10. 8"W x 8" DEEP

WEIGHT:.....26 POUNDS

**4.0 DETECTOR:**

THE DETECTOR USED IN THIS INSTRUMENT IS A HALOGEN QUENCHED GEIGER TUBE. THE EFFECTIVE LENGTH IS 1.1 INCHES AND THE EFFECTIVE DIAMETER IS 0.482 INCH. THE WALL THICKNESS OF THE TUBE IS 30 mg/cm SQUARED.

**5.0 SURVEY METER LIMITATION (SATURATION) \* CAUTION \***

IT IS A WELL KNOWN PHENOMENON THAT ALL GEIGER-MUELLER SURVEY METERS SATURATE OR OVERLOAD AT SOME POINT (THIS MAY ALSO BE CALLED FLOODING OR JAMMING). THIS PARTICULAR MODEL WILL SATURATE WHEN IN A RADIATION FIELD IN EXCESS OF 1000 R/hr WHEN IT HAS BEEN PROPERLY MAINTAINED. IF THE RADIATION FIELD IS IN EXCESS OF 1000 R/hr, ONE OF TWO EVENTS WILL OCCUR: 1) THE NEEDLE WILL SWING TO THE EXTREME RIGHT AND WHEN IT REACHES SATURATION, THE NEEDLE WILL FALL BACK TO ZERO, OR 2) IF THE SURVEY METER IS TURNED ON IN A FIELD IN EXCESS OF 1000 R/hr, THE NEEDLE WILL NOT REACT AND STAY AT ZERO.

ALTHOUGH A 1000 R/hr FIELD IS EXTREMELY HIGH AND MAY NEVER BE ENCOUNTERED, PROPER RADIATION SAFETY PROCEDURES AND REGULATIONS SHOULD BE OBSERVED WHEN MAKING ANY TYPE OF RADIATION SURVEY.

**6.0 CHECKOUT/OPERATION:**

**6.1 POWER UNIT UP. GREEN "POWER ON" LIGHT SHOULD ACTIVATE. IF NOT, RECHARGE OR REPLACE 12V LIGHT BULB AT GREEN INDICATOR.**

**6.2 ACTIVATE MONITOR BY EXPOSING UNIT TO 2 mR/HR OR ABOVE. ALL WARNING DEVICES (LIGHTS, AUDIO) SHOULD ACTIVATE. IF NOT, RECHARGE AND/OR CHECK BULBS.**

**7.0 TROUBLESHOOTING:**

**NOTE! VOLTAGE DANGER. ONLY QUALIFIED PERSONNEL SHOULD ATTEMPT REPAIR.**

**7.1 WILL NOT ACTIVATE BUT HIGH VOLTAGE TO GM TUBE O.K.**

**POSSIBLE DEFECTIVE COMPONENT:**

**GM TUBE 713  
IC 14024  
IC 14069  
RELAY**

**7.2 12V BATTERY O.K. NO DC OUTPUT FROM CIRCUIT BOARD.**

**POSSIBLE DEFECTIVE COMPONENT:**

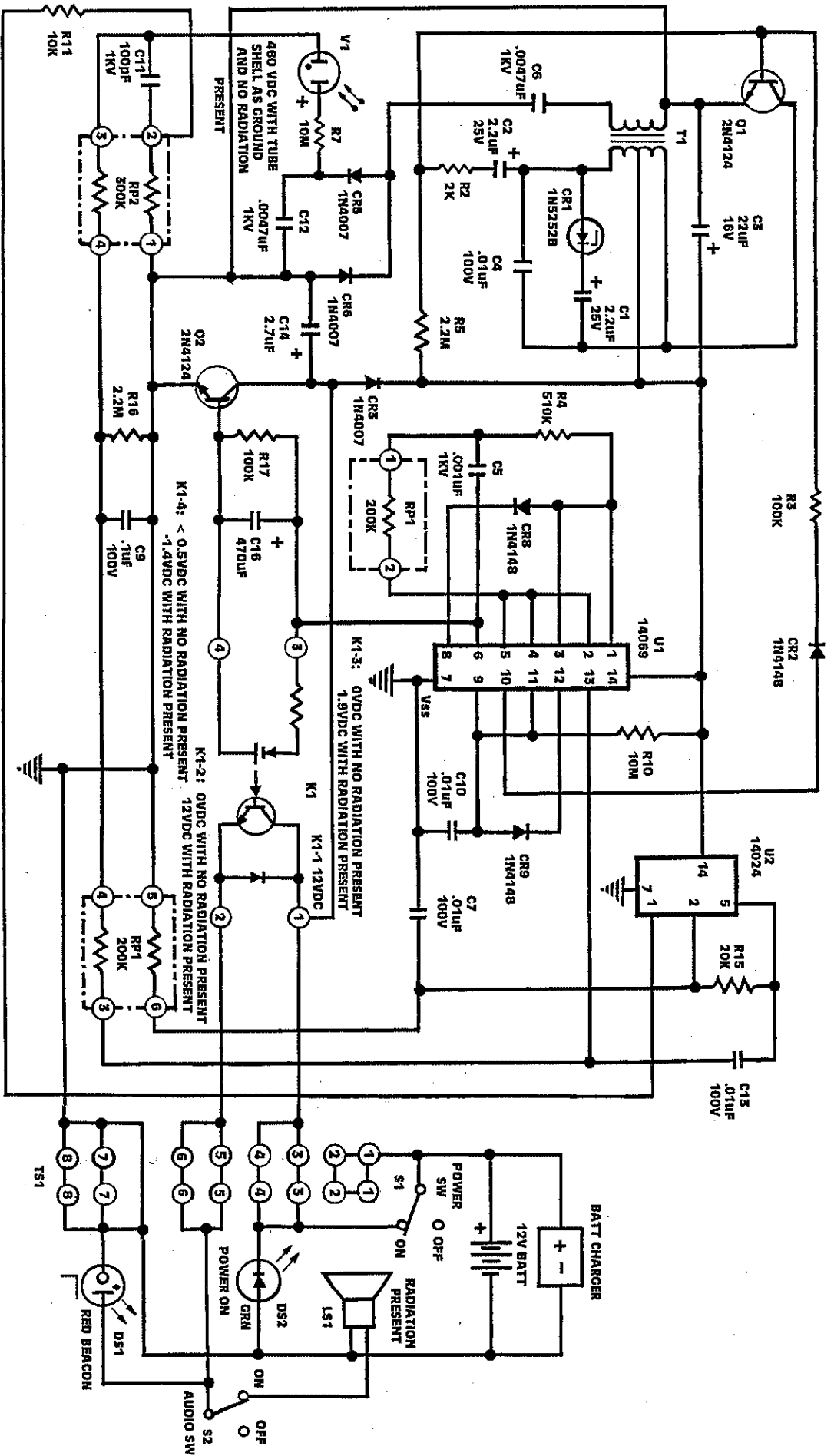
**T2  
CR11  
CR10**

**7.3 11V DC O.K. TO T1. NO VOLTAGE TO GM TUBE.**

**POSSIBLE DEFECTIVE COMPONENT:**

**T1  
CR5  
CR6  
Q1  
CR1**

31-Jan-00		BILL OF MATERIAL			
980-4000-012		ND-4000 12V PC ASSY		REV D	
ITM	PART NUMBER	DESCRIPTION	QTY	REF	DESIG
1	100-1000-102	CAP CER DISC .001 uF 1 KV 20% Y5U .25 LS	1	C5	
2	100-1000-472	CAP CER DISC .0047 uF 1 KV 20% Y5U .25 LS	2	C6, 12	
3	100-0100-103	CAP CER DISC .01 uF 100V 20% Y5U .25 LS	4	C4,7,10,13	
4	100-1000-101	CAP CER DISC 100.0 pF 1 KV 10% Y5U .25 LS	1	C11	
5	105-0025-477	CAP ELE ALUM 470.0 uF 25V 20% AXL 1.0 LS	1	C16	
6	110-0035-275	CAP ELE TANT 2.7 uF 25V 10% RDL .1 LS	1	C14	
7	110-0025-225	CAP ELE TANT 2.2 uF 25V 10% RDL .1 LS	2	C1,2	
8	110-0016-226	CAP ELE TANT 22.0 uF 16V 10% RDL .1 LS	1	C3	
9	115-0100-104	CAP PLY FILM 0.1 uF 100V 10%	1	C9	
10	150-0100-001	DIODE 1N4007 STANDARD RECOVERY	3	CR3,5,6	
11	150-0150-001	DIODE 1N4148 HIGH SPEED SWITCHING	3	CR2,8,9	
12	150-0300-001	DIODE 1N5252B ZENER	1	CR1	
13	200-0100-001	IC 14024 7 STAGE RIPPLE COUNTER	1	U2	
14	200-0300-001	IC 14069 HEX INVERTER	1	U1	
15	250-0100-202	RES CF 1/4W 5% 2.0 K OHM	1	R2	
17	250-0100-225	RES CF 1/4W 5% 2.2 M OHM	2	R5,16	
18	250-0100-103	RES CF 1/4W 5% 10.0 K OHM	1	R11	
19	250-0100-106	RES CF 1/4W 5% 10.0 M OHM	2	R7,10	
20	250-0100-203	RES CF 1/4W 5% 20.0 K OHM	1	R15	
21	250-0100-104	RES CF 1/4W 5% 100.0 K OHM	2	R3, 17	
22	250-0100-514	RES CF 1/4W 5% 510.0 K OHM	1	R4	
23	255-0004-304	RES NET 4 PIN 2 RES 300 K ISOL	1	RP1	
27	255-0006-204	RES NET 6 PIN 3 RES 200 K ISOL	1	RP2	
28	415-4000-012	RELAY SS 3-32VDC	1	K1	
29	225-0100-014	SOCKET IC 14 PIN	2	XU1,2	
30	450-6816-001	TRANSFORMER MINI 50VRMS 6816	1	T1	
32	475-0100-001	TRANSISTOR 2N4124 NPN	2	Q1, 2	
33	500-0713-001	TUBE GM 713	1	V1	
34	665-4000-002	TUBE CLIP 1.25 LG	1	XV1	
35	490-4000-008	TERM BD 8 CC	1	TB1	
36	551-4000-002	ND-4000 PC BOARD	1		
990-4000-012		ND-4000 12V UNIT ASSY		REV D	
ITM	PART NUMBER	DESCRIPTION	QTY	REF	DESIG
1	400-4000-012	AUDIO TRANSDUCER PIEZO ALERT 12V	1	LS1	
2	600-1215-001	BATTERY 12V 17A HOUR	1	BT1	
3	ND-AC01	BATTERY CHARGER 12V 120V	1	OPTION	
3	ND-EAC	BATTERY CHARGER 12V 230V	1	OPTION	
4	670-4000-001	CASE ND-4000 NEMA 8X8X4	2		
5	715-4000-001	CONNECTOR JACK BATT CHARGER	1	J1	
6	715-4000-002	CONNECTOR PLUG BATT CHARGER	1	P1	
11	690-4012-001	DECAL ND-4000	1		
17	675-4000-001	HANDLE MONITOR CASE	2		
18	576-4000-001	LAMP HOLDER 1.0 DIA	1	XDS2	
19	575-4000-012	LAMP S6 12V	1	DS2	
20	577-4000-002	LENS GREEN	1		
22	585-4000-001	LIGHT ASSY STROBE RED 12V DC .5A	1	DS1	
24	376-0500-002	SWITCH GUARD ROCKER	2		
25	375-0500-002	SWITCH ROCKER ON/OFF SPDT	2	S1,S2	



DRWING	M. BRITH	DATE	1/28
CHECKED	KES	DATE	1/28
ENGINEER	WDB	DATE	1/28
DO NOT COPY, REPRODUCE, OR USE DRAWING WITHOUT WRITTEN PERMISSION			
<b>NBS PRODUCTS</b> ND-4000 12V CIRCUIT DIAGRAM			DWG 870-4000-012 SHEET 1 of 1 REV C



