

DDA SUBJECT FILE COPY

13 October 1988

MEMORANDUM FOR: Administrative Officer, DCI

VIA: Acting Deputy Director for Administration

FROM: John M. Ray
Director of Logistics

SUBJECT: Electronic Air Cleaner

REFERENCE: Memo for D/L from AO/DCI, dated 27 Sept 88,
Subject: Smoking Area

Jim:

1. The device described in the brochure attached to the referenced memorandum is most suitable in a small, closed environment where air is directed through the device and immediately recirculated into the area. The heating, ventilating and air conditioning (HVAC) systems in both the Original and New Headquarters Buildings operate on the principle of removal of the air from an area and return of the air to a central room for conditioning (heating or cooling). We are attempting to improve the environment in designated smoking areas by speeding up this process (removing the volume of air more times per hour).

2. We note that the installation instructions caution not to install the unit in a T-bar type ceiling unless special procedures are followed. Except for restrooms, some corridors, and special areas, the vast majority of the ceilings in the Original and New Headquarters Buildings are of the T-bar type.

3. A concerted effort is being made to provide better ventilation in the designated smoking restrooms. We are also responding to individual requests for improved ventilation in those specific areas which have been identified. Thank you for your suggestion.

[Redacted Signature]

John M. Ray

Attachment:
Reference

45-1

ADMIN-INTERNAL USE ONLY when separated
from CONFIDENTIAL attachment

OL 10321-88



C O N F I D E N T I A L

MED 4-1

SUBJECT: Electronic Air Cleaner

25X1 OL/FMG [redacted] (12 Oct 88)
25X1 Rewritten: O-DL [redacted] ngk (12 Oct 88)

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27 September 1989

MEMORANDUM TO: Director of Logistics

FROM: Administrative Officer/DCI

25X1

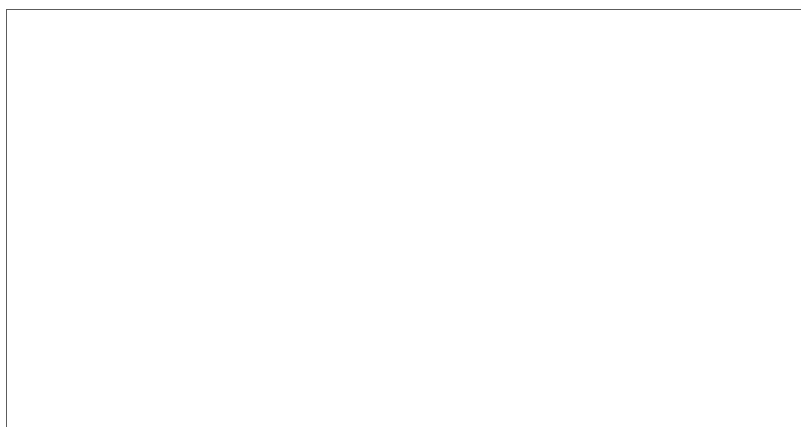
SUBJECT: Smoking Area

1. The attached brochure describes an electronic air cleaner that I believe might be feasible for use in designated smoking areas in Agency-controlled buildings.

2. All too often these smoking areas (usually restrooms), while convenient for smokers, become quite offensive to non-smokers as the room ventilation systems often leave much to be desired. A supplemental cleaning system would help immeasurably in ridding the air of these smoke particles and make the rooms "habitable".

3. Please take a look at the attached system and see if it could be of any use. I would certainly like to see something like this here at Headquarters.

25X1



CC

C/FMD/OL

Chairman, AOHSC

CONFIDENTIAL



**SPACE SAVER
MODEL 1000**

MANUAL FOR

- *INSTALLATION*
- *OPERATION*
- *SERVICE*

**SELF-CONTAINED
ELECTRONIC AIR CLEANER**

CAUTION: CAREFULLY READ RULES FOR SAFE OPERATION AND INSTRUCTIONS COMPLETELY. EXERCISE THE USUAL PRECAUTIONS WHEN WORKING WITH HIGH VOLTAGE.

**INSTALLER:
THIS MANUAL SHOULD REMAIN WITH THE INDIVIDUAL(S) WHO WILL BE CLEANING AND SERVICING THIS PIECE OF EQUIPMENT.**

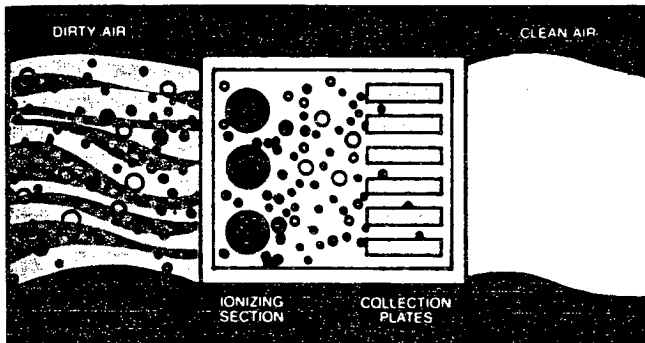
This manual provides information for location, installation, operation and service. Before installation and use of the air cleaner, carefully read these instructions to insure maximum benefits from the unit and to avoid needless service cost that can result from improper installation.

I. INTRODUCTION

This electronic air cleaner is technically known as a two-stage electrostatic precipitator. It is designed to remove airborne particles — dust, dirt, smoke — from indoor air.

Air movement through the unit is controlled by its own blower system. As dirty air enters the unit it passes through a prefilter. The prefilter removes large particles by direct impingement.

The prefiltered air then passes through a two-stage electrostatic precipitator. In the first stage of electrical operation, all airborne particles, even of submicroscopic size, are electrically charged (positive) as they pass through the ionizer. In the second stage of operation, the charged particles pass into an electrical field established between a series of parallel plates. Here the positively charged particles are attracted to the plates, forming the negative element of the field.



SPECIFICATIONS

Model	CAC - 1000
Rated Capacity	600 - 1000 ft. ³ /min. (1020 - 1700 m ³ /hr.)
Cell Weight	17 lbs. (7.7 kg)
Unit Weight	75 lbs. (34.0 kg)
Power Consumption	275 watts maximum
Electrical Input	120 Volts, 60 Hertz 1 Phase
Electrical Output	.9 ma @ 6200 VDC (Nominal)

II. OPERATION

CONTROL SWITCH (A)

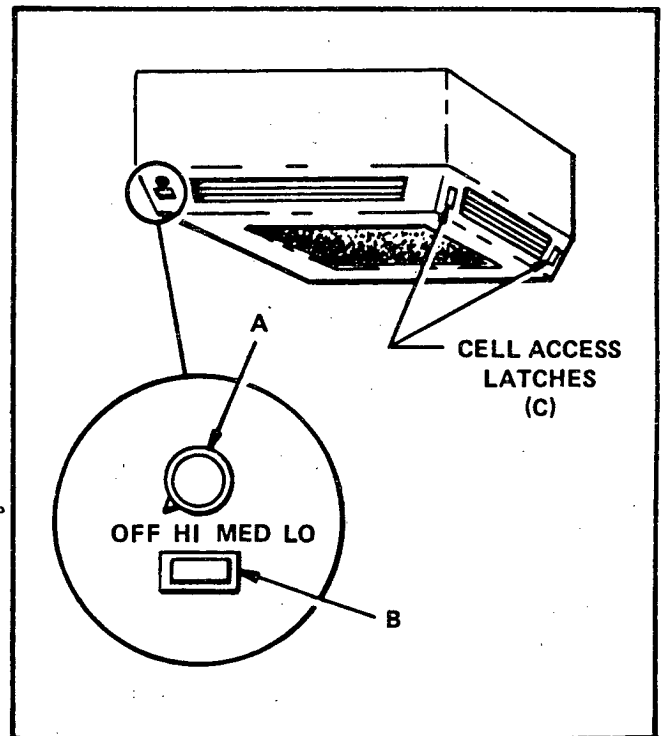
The 3 position control switch located on the side of the unit controls the operation of the power pack and the speed of the fan. (Lo - 600 CFM; Med. - 800 CFM; Hi - 1000 CFM Nominal).

ON/OFF LIGHT (B)

The on/off light monitors the electrical operation of your electronic air cleaner. When the control switch (A) is in the Hi, Med. or Lo position, power is being delivered to the power pack and the indicating light will glow. If the on/off light does not glow, the air cleaner is in need of attention. (Refer to service check list, Page 8.)

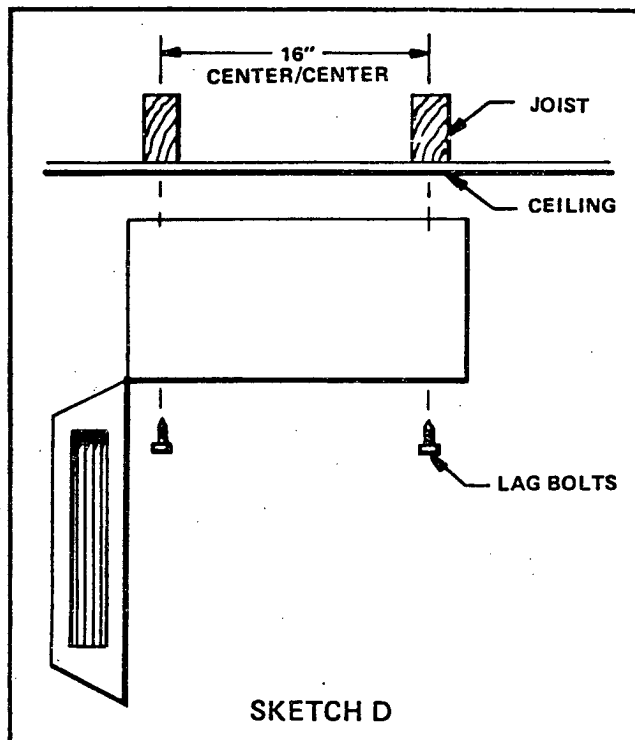
CELL ACCESS LATCHES (C)

The cell access latches located on the side of the unit hold the access door closed and are designed to automatically disconnect electrical power from the power supply when the access door is opened.



FLUSH MOUNT INSTALLATION

1. Carefully unpack the unit and check for damage incurred in shipment. Report any damage to the freight carrier immediately.
2. Open cell access door and remove the pre-filter and cell.
3. Select a location near the center of the area to be cleaned and locate the ceiling joists in that area.
4. Locate four mounting points (each being at a joist) and pre-drill holes into the joist and unit housing as shown in Sketch D.



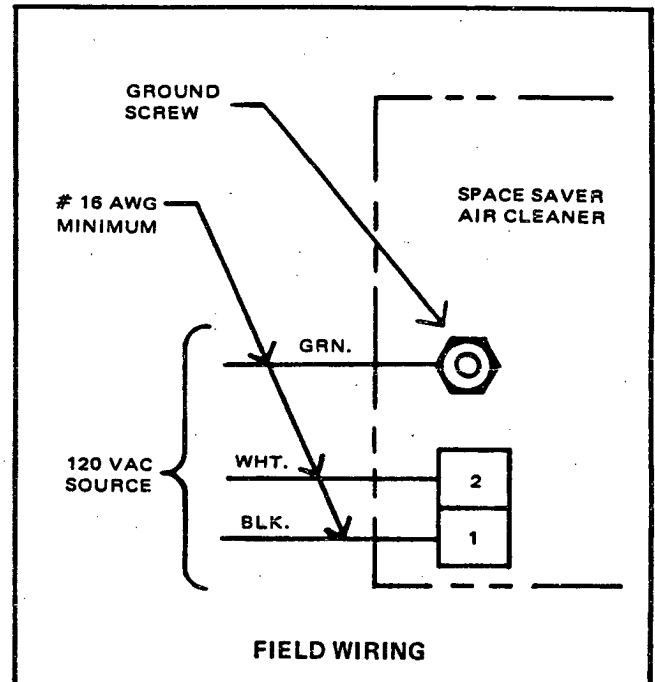
5. Lift unit to ceiling and secure using four $\frac{1}{4}$ " X $2\frac{1}{2}$ " lag bolts as shown in Sketch D.
6. Connect electrical power to unit. See Field Wiring Diagram.
7. If a carton filter is used, remove filter from plastic bag and install in guide rails on back of cell.
8. Re-install cell, pre-filter and carbon filter.
9. Close access door and unit is ready for operation.

IV. ELECTRICAL WIRING

Electrical access panel is located on the back of the

air cleaner cabinet assembly. Knockouts are provided in the top and side of the housing assembly. Wire the unit to a 120 volt, 60 HZ, 1 phase.

Field wiring requires connecting black and white leads to corresponding house current input. Connect incoming ground (green) wire to the ground screw located in air cleaner.



V. SYSTEM CHECKOUT

After assembling and installing the unit, switch the control switch on.

- A. The on/off light should now be on. The light shows unit has line voltage.
- B. Open cell access door. The on/off light should go out. The blower should also stop.

ARCING (SNAPPING OR CRACKING NOISE)

An occasional arcing noise may be emitted from the air cleaner. This is normal and is caused by an exceptionally large piece of dirt entering the collecting cell. An arcing noise may also be noted after cell washing. If this occurs and is constant, allow more time for the cell to dry. (Refer to service check list, Page 8.)

System Check

A simple system check can be made by drawing an arc as follows:

- Remove pre-filter and cell.
- Remove pre-filter from cell.
- Re-install cell without pre-filter.
- Use screw driver to energize safety switch.

If high volt meter not available, proceed as follows:

- Use an insulated screw driver to draw an arc between extended ground plate and ionizing wire. A sharp electrical arc of approximately 1/4" should be observed. This indicates proper cell operation. If weak arc or no arc is observed, follow cell and power supply checkout.
- If using high volt meter, voltage should read between 5.9 – 6.5 kilovolts. If voltage is below 6 kilovolts or no output at all, the problem lies in either the cells or power supply. See Service, Page 8.

2. Power Supply (without high volt meter)

If there is primary power to the power supply and the secondary output voltage is absent or very low, the power supply is defective. A simple check can be made by drawing an arc, with an insulated handle screwdriver between common ground and the high voltage output terminal (c). A good power supply will produce a pronounced arc where a defective one will produce no arc at all or a very weak one.

(Refer to Figure 1, Power Supply Test Points).

3. Power Supply Check (with DC high volt meter)

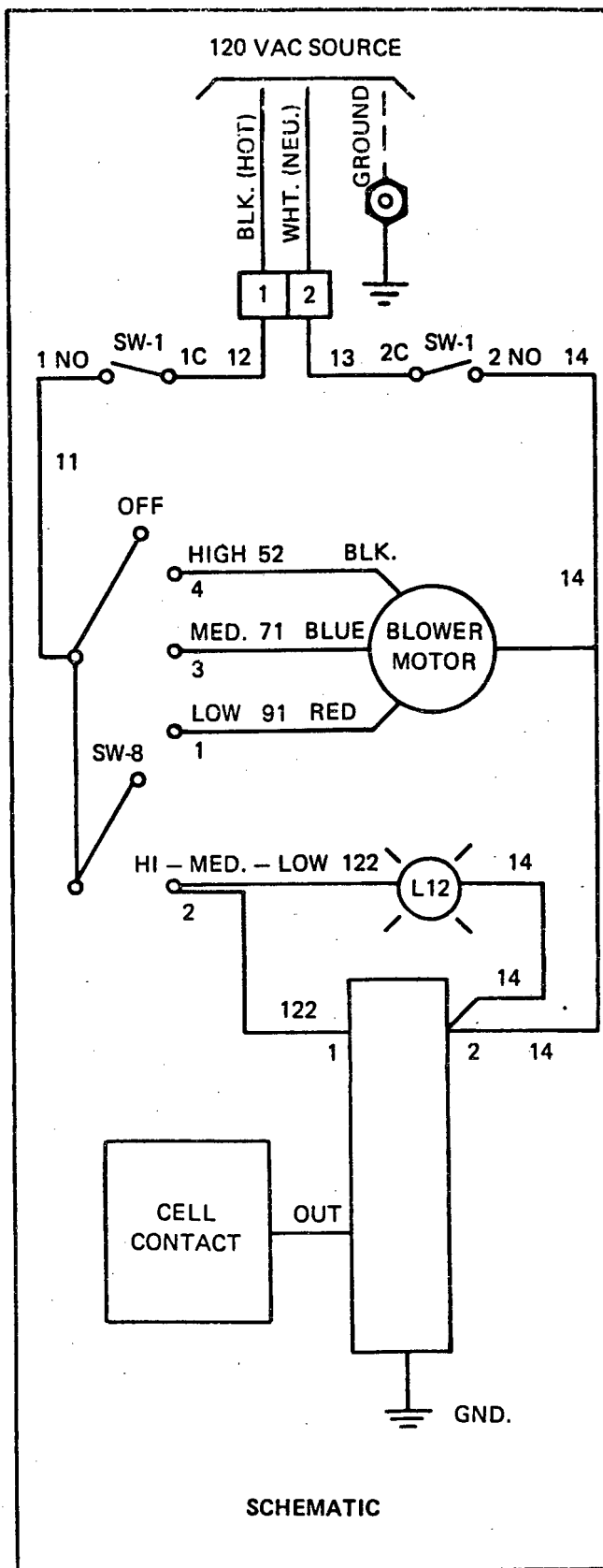
Take reading with the high voltage meter at cell contact point. Should range 7 KV or higher (without cell connected).

If voltage is above 7 KV, the problem is in the cell (see cell checkout procedure).

If voltage is below 7 KV (without cell connected), the problem is in the power supply.

Proceed as follows:

- Remove power pack from the unit.
- Check for loose wires; if loose wire found, reconnect.
- If defective power supply is indicated, replace.



B. Other Troubles -- Their Symptoms and Corrections**1. Arcing Noise**

When an arcing noise is noted, it is usually located in the DC high voltage circuit. The ionizing-collecting cell is part of this circuit and normally the trouble will be found to be in the cell. The noise is caused by high voltage arcing to ground.

An occasional arcing noise is normal and inherent in all precipitators. These occasional arcs are caused by large particles of dirt in the air such as a cigarette ash, insect, etc. Constant or repeated intermittent arcing should be checked.

Check For:

- a. Loose ionizing wire(s) -- repair or replace
- b. Excessively dirty cell components -- clean
- c. Damaged (bent) plates of ionizer -- straighten or replace
- d. Defective or loose high voltage lead or contact assembly -- repair, replace
- e. Cracked insulator -- replace
- f. Improper ground -- check ground and correct if necessary.

2. Hissing Noise

A hissing noise (or frying sound) usually stems from a loose high voltage connection or from an improper ground. The reduction in the designed spacing usually is caused by bends or deformities in the cell from mis-handling.

Check For:

- a. Damaged (bent) plates or ionizer -- straighten or replace.
- b. Loose ionizing wires -- repair or replace.
- c. Dirty cell or large piece of foreign material between plates -- clean.
- d. Defective high voltage contact assembly -- repair or replace.
- e. Poor connection between cell and contact assembly -- repair.
- f. Loose high voltage wiring -- repair.
- g. Improper ground -- check ground and correct if necessary.

3. Humming Noise

The ionizing wires have a normal tendency to vibrate

when charged. On some occasions when atmospheric conditions are just right and the humidity is exceptionally low, the vibration is aggravated to the point where an audible hum can be noted. It is usually noted more in the northern sections of the country during the winter months. This condition can be further aggravated if the ionizing-collecting cell is very dirty. The condition is self-correcting when the relative humidity is increased or can be alleviated by washing the cell.

4. Radio and/or Television Interference

This trouble is not common but when occurring is usually due to either a continuous high voltage "leak or discharge", or from the absence of a good common electrical ground. Refer to checks listed under 1. Arcing Noise and 2. Hissing Noise.

5. Ozone

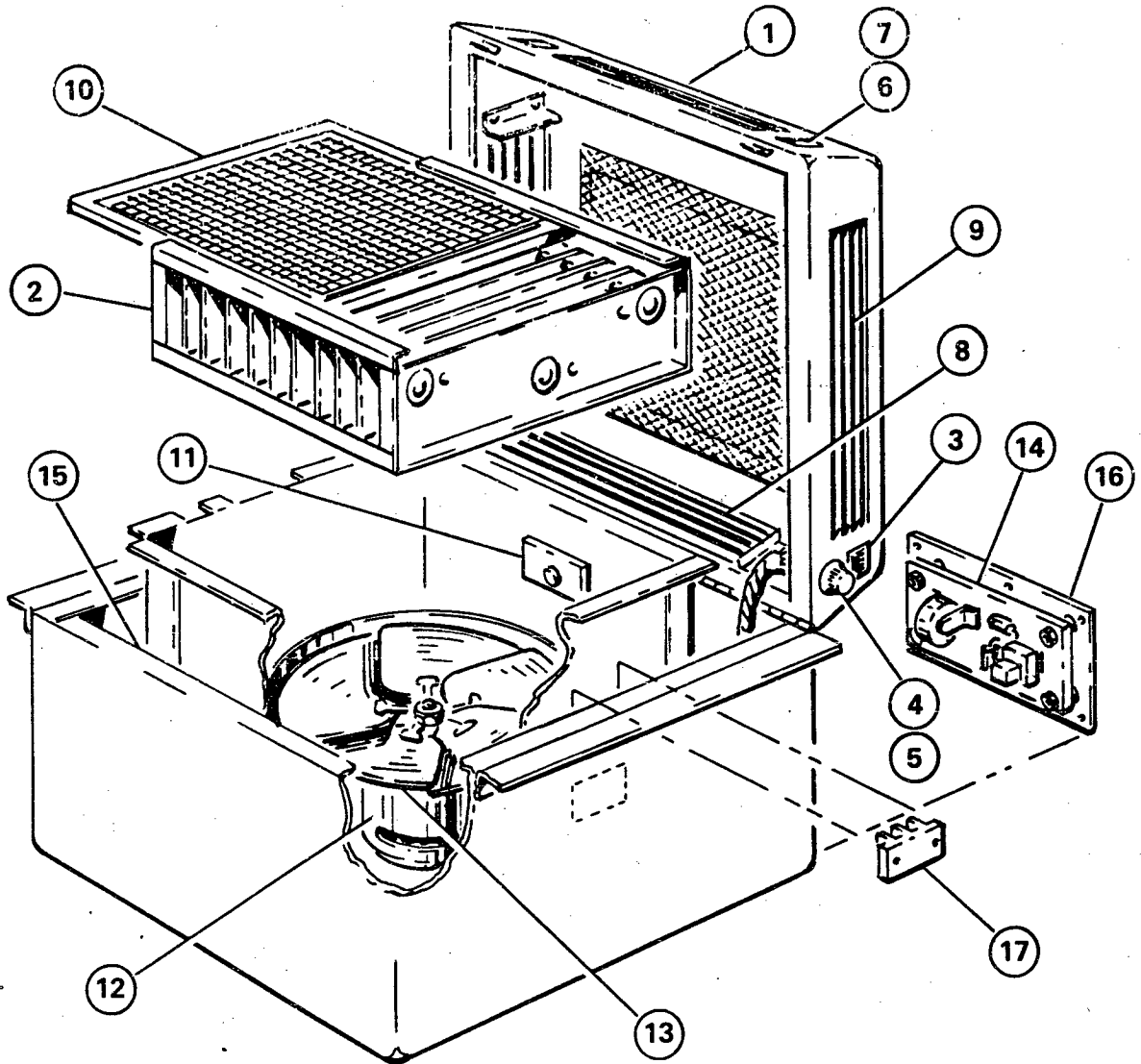
Under normal operating conditions all electrostatic air cleaners produce minute quantities of ozone as an incidental by-product, as do televisions and other electrical appliances. The design of the unit has been tested and is far below the published permissible limits. The level of detection (when it is noticed) varies from individual to individual, some being more susceptible than others.

Usually a new unit will produce more ozone than one that has been in operation for several weeks. This is due to the normal amount of sharp corners or manufacturing burrs on the ionizing-collecting cell. The voltage working on these areas however, tends to round them off, thereby they are self-correcting.

An ionizing-collecting cell that has been damaged, where the designed spacing between electrically charged and ground components has been decreased, may also produce an abnormal amount of ozone.

Check For:

- a. Damaged (bent) plates -- straighten or replace
- b. Loose ionizing wires -- repair or replace
- c. Dirty cell -- clean
- d. Loose high voltage connections -- repair or replace



X. PARTS LIST

Key No.	Part Number	Description	Qty.
1	434161-001	Cabinet Top	1
2	432153-001	Ionizer-Collector	1
3	121110-002	Light	1
4	228276-001	Rotary Switch	1
5	122861-001	Knob	1
6	134205-001	Latch	2
7	134206-001	Latch Actuator	2
8	332343-001	Grill	2
9	332343-002	Grill	2
10	232167-001	Pre-Filter	1

Key No.	Part Number	Description	Qty.
11	220978-006	Contact Board	1
12	231844-001	Motor	1
13	132864-001	Propeller	1
14	331845-102	Power Supply	1
15	132315-001	Gasket	6 ft.
16	134244-001	Cover Plate	1
17	220400-002	Terminal Block	1
	222961-001	Insulator	12
	220111-020	Ionizing Wire	17
	132309-001	Charcoal Filter	1