

GBPPR 'Zine



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"One must take into account that, in the countries of the West, pro-Soviet propaganda has been conducted for quite a long time and is very goal-oriented and clever, and that pro-Soviet elements have penetrated many key positions, particularly in the mass media."

--- Quote from Andrei Sakharov, the "father of the Soviet hydrogen bomb," in the summer 1983 issue of *Foreign Affairs* magazine.

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Bell System Station Protection and Grounds – Part 2

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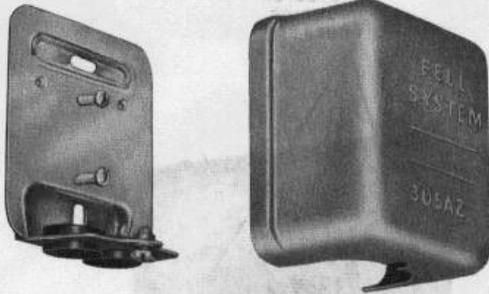


Fig. 21—305A2 (MD) Protector Mounting

various types of screws, anchors, etc. required. Stainless steel screws should be used for outdoor installations.

4.02 Where more than one protector is installed at the same indoor location, provide a 1-inch separation when protectors are horizontally mounted and a 2-inch separation when protectors are vertically mounted (Fig. 31). When more than one 123- or 128-type protector is installed at the same outdoor location, the protectors may be installed in a C or D customer service closure.

4.03 Where the 150B cover is to be used with 123- or 128-type protectors, mount the protectors in an upright position to permit proper installation of the cover.

4.04 Terminate line input (ie, aerial or buried drop) and station wires on the protector with the ring conductors (single tracer or red wires) connected to the right-hand terminals of the protector. Unused station wire conductors should be looped back and coiled around the station wire jacket or stored in such a manner as to prevent them from coming into contact with protector terminals or bare wires.

4.05 Current production 123- and 128-type protectors are manufactured with two nuts on each line terminal. Terminate line wires under the bottom washer and nut. After tightening the bottom nuts, place station wiring under the top nuts. Use washers between wires when more than one wire is placed under a nut. Use caution when terminating

small gauge station wires on the protector terminals as the wire may catch in the threads of the terminal and be cut or broken when nuts are tightened. Older 123- and 128-type protectors have one nut on each line terminal.

4.06 Make sure all nuts are tight.

4.07 Where an acceptable metallic cold water pipe is used as the ground electrode, it is preferable to install the 123- and 128-type protectors directly on the water pipe. Protectors installed in this manner are grounded with a minimum resistance to ground.

4.08 Install protectors on acceptable metallic cold water pipes using one of the following brackets:

- 72A (MD) bracket (Fig. 32)—use with 123A1A and 123E1A protectors for indoor location
- 90A (MD) bracket (Fig. 33)—use with 123B1A, 128A1A-2, or 128E1A-2 protectors for indoor location
- 114A bracket (Fig. 34)—use with 123- and 128-type protectors for indoor or outdoor locations.

4.09 The 114A bracket can also be used to install the 123- or 128-type protectors directly on power service entrance conduit.

4.10 Use the 150B cover to protect the 123- and 128-type protectors that are installed on a 114A bracket at outdoor locations.

4.11 To install the 72A (MD) or 90A (MD) bracket:

- (1) Place a B station ground clamp through slots in the bracket (Fig. 35).
- (2) Attach the B station ground wire clamp to an acceptable metallic cold water pipe in the usual manner.
- (3) Remove the screw or bolts from the bracket and slide the protector in place, making sure the notched portion of the bracket is under the pronged washer of the ground terminal of the protector.

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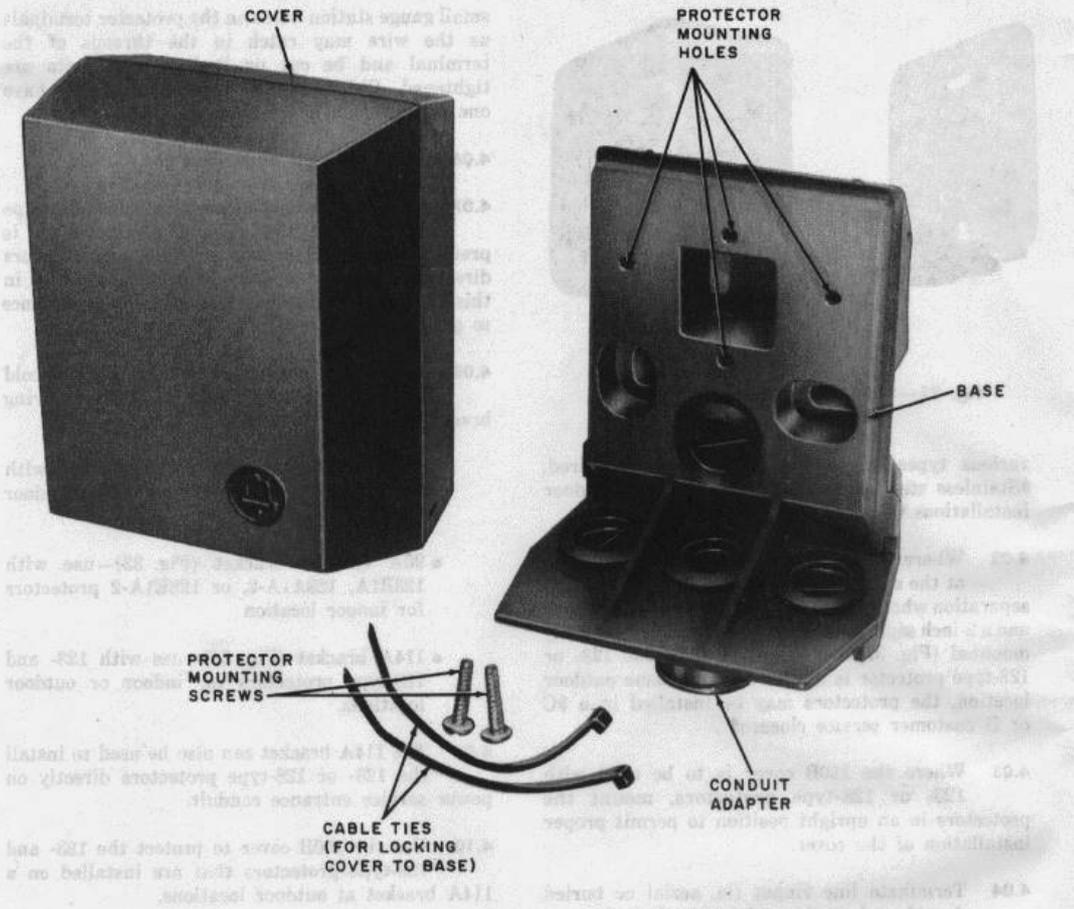


Fig. 22—B Customer Service Closure

(4) Place the mounting screw furnished with the 72A Φ (MD) Φ bracket through the bottom mounting hole of the 123- or 128-type protector and into the threaded hole in the bracket

or

Place the mounting bolts furnished with the 90A bracket through the side mounting holes of the 123- or 128-type protector and through the holes in the bracket. Thread nuts on the mounting bolts.

(5) Tighten mounting screw or bolts (Fig. 36).

(6) Install Form E-3013B. This form may be placed on the B station ground clamp (Step 2).

4.12 To install the 114A bracket:

(1) Place a B station ground clamp through slots in the bracket. Select horizontal or vertical slots in the bracket, whichever will

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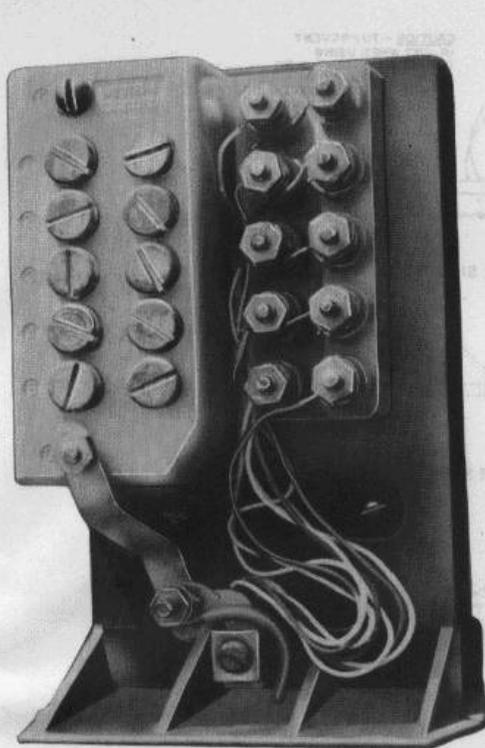


Fig. 23—142A1A Protector in C Customer Service Closure

permit mounting the bracket in an upright position.

(2) Attach the B station ground clamp to an acceptable metallic cold water pipe or to the power service entrance conduit in the usual manner (Fig. 37).

(3) Mount the 123- or 128-type protector on the 114A bracket using the two No. 8-32 self-tapping screws furnished with the bracket.

(4) Connect the 2-inch length of copper wire (attached to the bracket) under the pronged washer of the protector ground terminal (Fig. 38).

(5) Connect service wire and station wires in the usual manner.

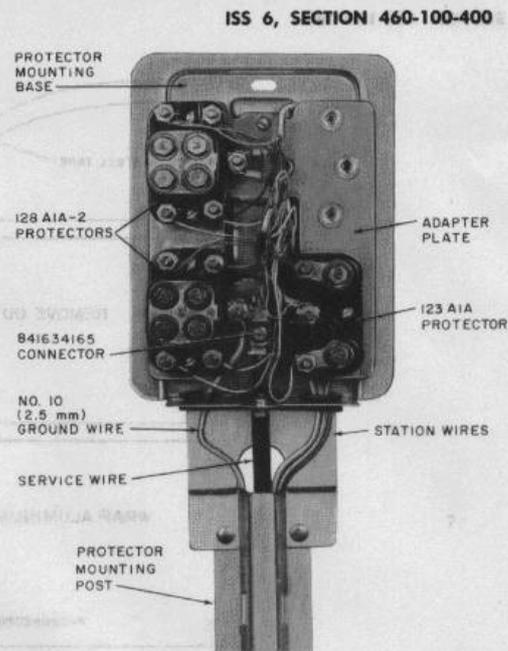


Fig. 24—93D1 (MD) Protector Mounting Installed on Protector Mounting Post

(6) Install Form E-3013B. This form may be placed on the B station ground clamp (Step 2).

(7) Install 150B cover at outdoor locations, where mechanical protection is required, or where appearance is a factor.

4.13 The 6A3A terminal blocks are installed in a PC6 (Fig. 11) or PC12 cable closure as follows:

(1) Remove upper front cover from the cable closure.

(2) Loosen captive screw at top of backboard and tilt backboard forward.

(3) Insert mounting studs of the 6A3A terminal block through the holes in the backboard (starting at the top left).

(4) Thread nuts on mounting studs and tighten.

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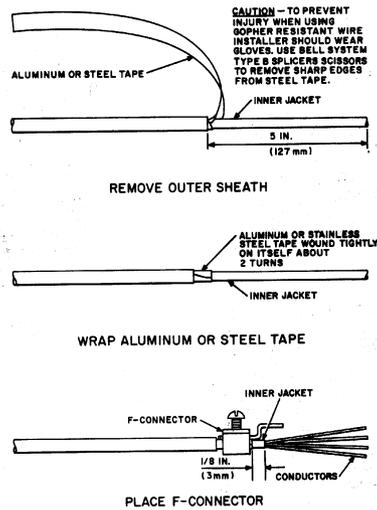


Fig. 25—Preparing B or C Service Wire for Bonding of Metal Shield

- (5) Secure the backboard in the upright position.
- (6) Run a No. 6 ground wire from the ground connector mounted on the grounding and bonding bar to an approved grounding electrode.
- (7) Join the terminal block leads to the cable pairs with approved wire connectors.
- (8) When a signal ground is required and there are no facilities for a signal ground at the telephone location, a 2A ground strip can be mounted on the backboard of the cable closure and used for a signal ground terminal. The 2A ground strip must be provided separately.
- (9) Using plastic cable ties, dress cable closure per Fig. 11.
- (10) Replace upper front cover on the cable closure.

Note: If the station wires are being brought in through the back of the closure, it will be necessary to remove the knockout from the back of the closure. **Seal this opening with duct seal.** If closure is mounted on a combustible wall, place metallic conduit from the knockout through the wall.

- 4.14 The 116C protector is wall mounted via two screws. The protector may be mounted horizontally or vertically. When mounted horizontally, the protector should be positioned so the cover drops down.
- 4.15 The 117B protector is wall mounted via two screws and may be mounted in the horizontal or vertical position.
- 4.16 Multipair protectors are generally placed at the time cable facilities are installed or are installed as specified by detailed plans. When

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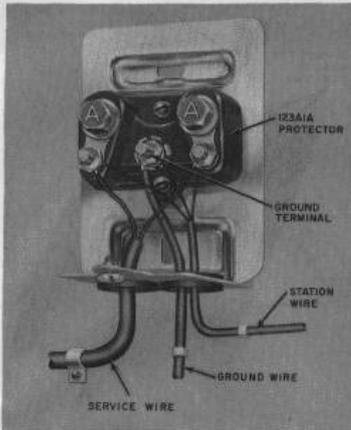


Fig. 26—123A1A Protector Installed in 305A2 (MD) Protector Mounting

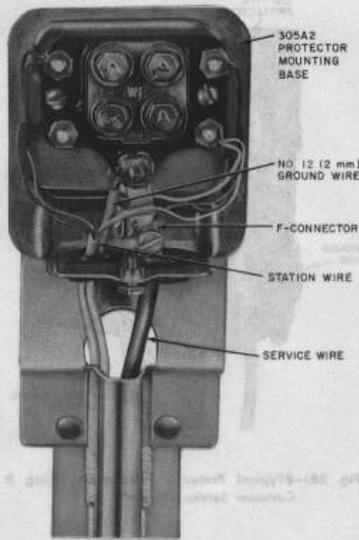


Fig. 27—305A2 (MD) Protector Mounting Installed on a Protector Mounting Post

multipair protectors are to be otherwise installed, reference should be made to the section pertaining to the particular protector being installed (Table C).

5. FUSED PROTECTORS

5.01 The 1293C Φ (MD) Φ protector (Fig. 39) is used for outdoor installations and the 106C protector (Fig. 40) is used for indoor installations. These protectors are the same except the 1293C Φ (MD) Φ protector is comprised of a 106C protector enclosed in a 93C Φ (MD) Φ protector mounting (Fig. 41).

5.02 The 106C protector consists of a base of nonconductive material containing five binding posts, two 11C fuses (Fig. 42), and two 2A1A protector units.

5.03 Where it is necessary to protect more than one pair of wires with fused-type protectors, additional 1293C Φ (MD) Φ or 106C protectors must be used.

5.04 Where the 106C protector is installed indoors, it must be mounted where the drop or service wire enters the building, keeping the length of drop or service wire within the building to a minimum.

5.05 Insulated building attachments must be used for attaching drop or service wires to combustible surfaces where fused protectors are used. Also, insulated tubing must be used where drop or service wires are fed through combustible walls.

5.06 Φ When the 106C protector is installed outdoors, use a C (Fig. 43) or D customer service closure. Where this combination is used to terminate buried service wire, mount the protector upside

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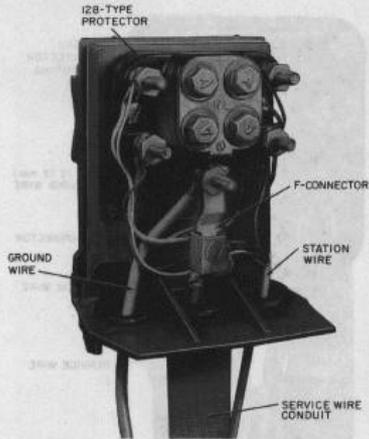


Fig. 28—Typical Protector Installation Using B Customer Service Closure

down in the closure so the ground terminal is at the bottom. This will facilitate the F connector.

The conductors of the buried service wire must be connected to the line terminals (marked L) at the top of the protector, while the station wiring must be connected to the bottom terminals (marked I).

5.07 At older installations, the 98A (MD) protector may still be in use. The 98A (MD) protector (Fig. 44) consists of a base of nonconductive material containing five binding posts, two 11C fuses, and a carbon block protector well arranged for the use of No. 26 and No. 27 protector blocks. For outside installations, the 98A (MD) protector is mounted in a 93C (MD) protector mounting.

6. GROUNDING AND BONDING



All protector grounds and bonds should be as short and as straight as practical and should be located where future visual inspections can be made. Avoid

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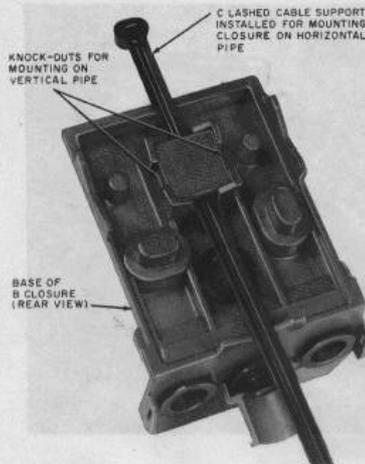


Fig. 29—Installation of C Lashed Cable Support on B Customer Service Closure

making sharp bends in grounding and bonding conductors.

6.01 Before selecting a protector ground, determine how the power service is grounded (Table D). The National Electrical Code (NEC) requires that, where available, an acceptable metal underground water pipe system shall always be used as the grounding electrode for the power system and the telephone protector. (An acceptable water pipe electrode is one that has at least 10 feet of metallic pipe buried in the earth and may be either part of a municipal water system or a private well.) The code also requires that, if an acceptable water pipe is not available, the interior metal cold water pipe of the premises must always be bonded to the power ground. Where an acceptable water pipe system is not available, the power service may be grounded to any of the following:

- The metal frame or steel of a building where effectively grounded

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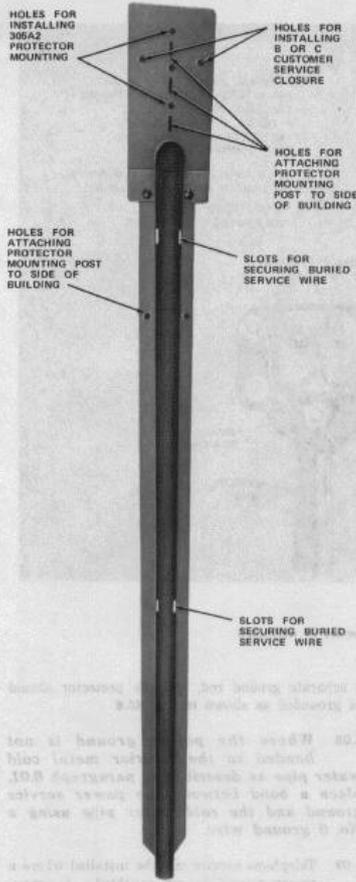


Fig. 30—Protector Mounting Post (PMP)

- Bare No. 4 or larger copper wire or steel reinforcing rod not less than 20 feet in length and encased in the concrete footing of the building.
 - A ground rod, galvanized pipe or plate buried in the earth.
- 6.02 Do not connect station protector ground wires to:
- Gas pipes
 - Electrical service branch circuit conduit
 - Armor of BX cable
 - Interior of any electrical box
 - Aluminum conductors or conduit.
- 6.03 Connections may be made to aluminum power service ground conductors only when it is necessary to bond to an interior metallic water pipe. See Table F for proper connector for aluminum attachments.
- 6.04 Station protectors installed at locations with the power grounded to an acceptable water pipe, as described in paragraph 6.01, should be grounded as shown in Fig. 45 or installed directly on the water pipe.
- 6.05 Station protectors installed at locations where the power is grounded to a concrete encased electrode or to grounded building steel should be grounded as shown in Fig. 46 and 47.
- 6.06 Where the power is grounded to a ground rod and an acceptable water pipe or building ground does not exist, it is necessary to know if the power service is MGN (multigrounded neutral). This information should be obtained according to local instructions. Station protectors installed where an MGN power system is grounded to a ground rod should be grounded as shown in Fig. 48. Where a non-MGN power system is grounded to a ground rod, protectors should be grounded as shown in Fig. 49.
- 6.07 The current NEC stipulates the electric service must use a ground rod in addition to a water pipe ground. Where the power is grounded in this manner, it is unnecessary to install

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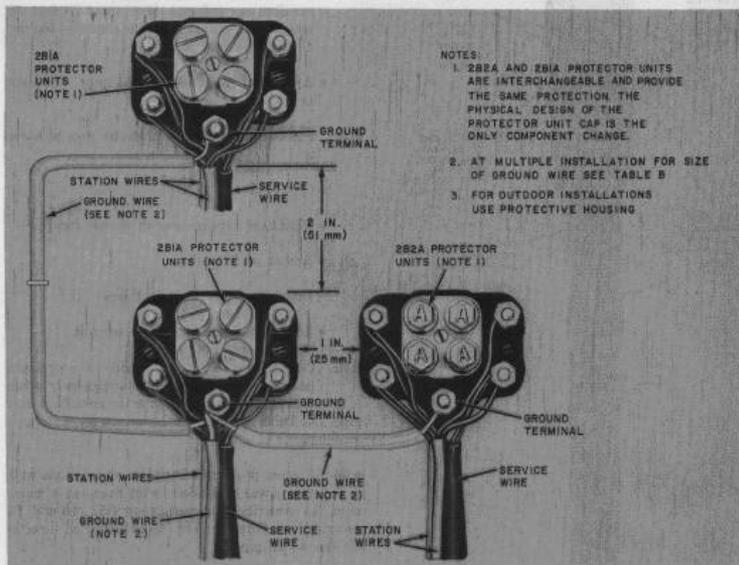


Fig. 31—Installation Protectors in Multiple



Fig. 32—72A Bracket

a separate ground rod, and the protector should be grounded as shown in Fig. 45.

6.08 Where the power ground is not bonded to the interior metal cold water pipe as described in paragraph 6.01, place a bond between the power service ground and the cold water pipe using a No. 6 ground wire.

6.09 Telephone service may be installed where a power ground is not provided. However, the customer should be informed immediately of the need for a power ground and be requested to notify the telephone company when the ground has been provided. The procedure for notifying the

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Fig. 33—#90A Bracket

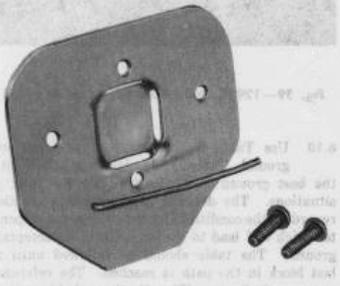


Fig. 34—114A Bracket



Fig. 35—B Station Ground Clamp Through Slots in 72A Bracket

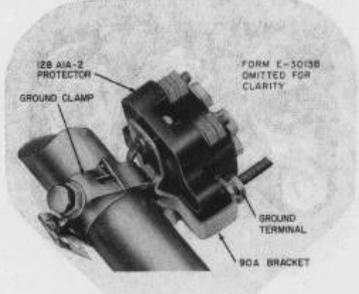


Fig. 36—Protector Installed on Metallic Water Pipe

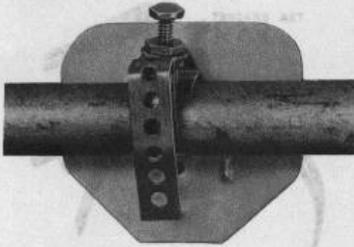
customer shall be covered by local instructions. Station protectors installed where there is no power, or the power ground is inaccessible, should be grounded as shown in Fig. 50 or 51.

Caution should be exercised on visits (installation or repair) to locations where structures are under

construction or are being remodeled. At these locations, temporary power and water pipe arrangements are often encountered. Therefore, it is very important to select a ground electrode of a permanent nature. Also, ground wire runs

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FORM E-3013B OMITTED FOR CLARITY

Fig. 37—114A Bracket Installed on Water Pipe or Power Entrance Conduit

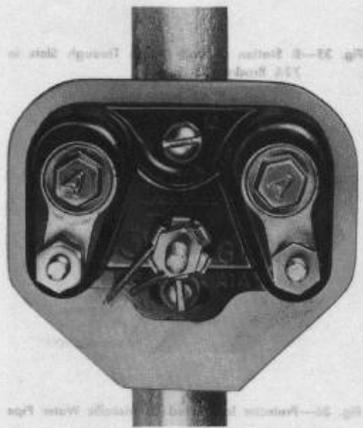


Fig. 38—Ground Wire of 114A Bracket Connected to Protector Ground Terminal

should be made in such a manner they will not be removed, changed, broken, or present a hazard.

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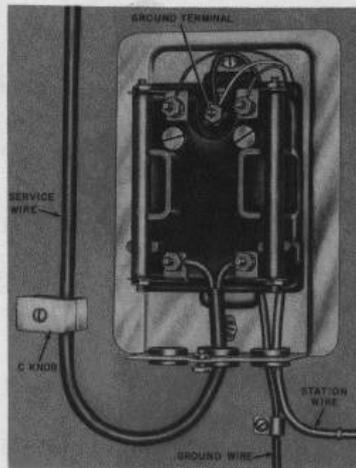


Fig. 39—1293C (MD) Protector, Cover Removed

6.10 Use Table D to select the best protector ground. Table D is designed to help identify the best ground electrode available for most job situations. The decision blocks contain questions regarding the conditions for grounding, the responses to which will lead to the selection of an acceptable ground. The table should be followed until the last block in the path is reached. The referenced notes and figures (Fig. 45 through 51) provide additional information and installation procedures.

6.11 See Table E for ground clamp selection. See Table F and Fig. 25, 52, 53, 54, and 55 for wire connectors. Connections to building steel may be made by using a C or D insulator support (Fig. 56).

6.12 **Do not connect protector grounds to aluminum power ground conductors.**

6.13 If the power ground wire is enclosed in metallic armor or conduit, the metallic armor

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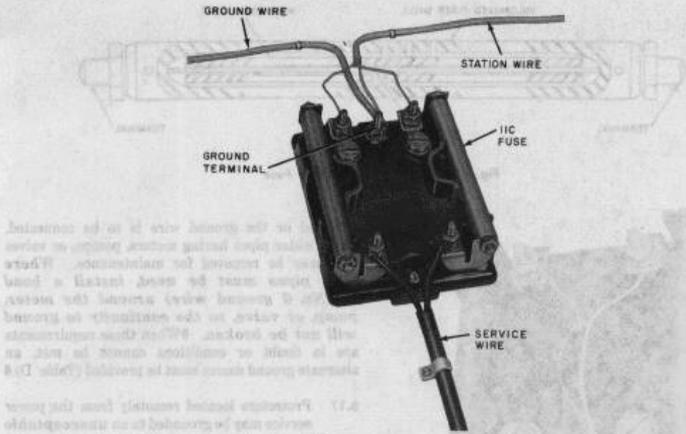


Fig. 40—106C Protector

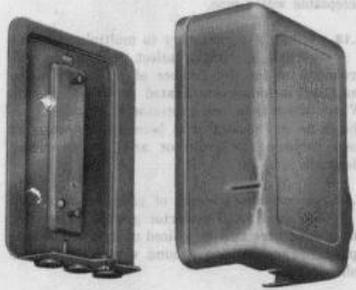


Fig. 41—93C (MD) Protector Mounting

or conduit may be considered as the grounding conductor when making connections.

6.14 Metallic power service entrance conduit may be used for the protector ground instead of the power ground wire, and the protector can be mounted on the entrance conduit by using a 114A bracket. (Refer to paragraph 4.12 for installation of the 114A bracket.) The power service entrance conduit is the conduit through which the power service conductors feeding the premises enter the box containing the main power breaker or fuse.

6.15 Where protectors are located so that running wire to an acceptable water pipe results in a shorter length of wire than if run to the power ground, the water pipe may be used, **provided the water pipe is bonded to the power ground**. An acceptable metallic water pipe is the preferred ground where the power ground is inaccessible or there is no power.

6.16 When installing a protector directly on a metallic water pipe or when connecting the protector ground wire to a water pipe, **make**

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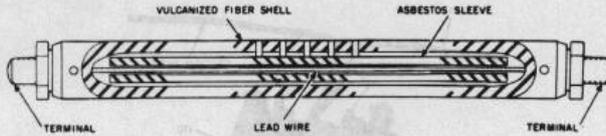


Fig. 42—11-Type Station Line Fuse

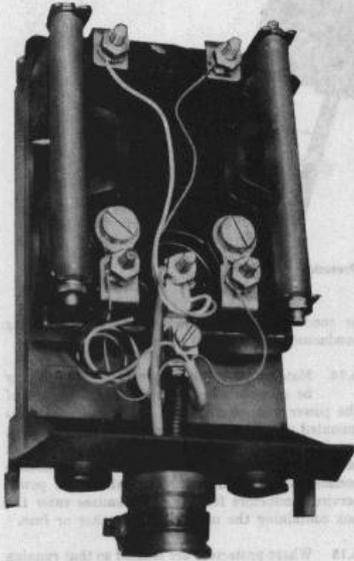


Fig. 43—#106C Protector in C Customer Service Closure

sure the pipe is metallic for at least 10 feet in the earth where it leaves the premises. Determine that there are no insulating joints, plastic sections, or plastic water meters in the water pipe on which a protector is to be

mounted or the ground wire is to be connected. Avoid water pipes having meters, pumps, or valves that may be removed for maintenance. **Where such pipes must be used, install a bond (of No. 6 ground wire) around the meter, pump, or valve, so the continuity to ground will not be broken.** When these requirements are in doubt or conditions cannot be met, an alternate ground source must be provided (Table D).

6.17 Protectors located remotely from the power service may be grounded to an **unacceptable** metallic water pipe or to building steel **provided that the water pipe or building steel is bonded to the power service ground.** This is preferable to making very long ground wire runs to the power service ground or to a remote acceptable water pipe.

6.18 Where it is necessary to multiple protector ground terminals, select the proper size ground wire for the number of protectors to be installed, including anticipated growth (Table B). Where more than one protector is installed, use the same size ground wire between protectors as used between the protector and the grounding electrode.

6.19 A continuous length of ground wire should be used for a protector ground. However, the ground wire may be spliced using a sleeve-type splice. When splicing ground wire, consider the following:

- Do not splice new ground wire runs
- Do not splice existing ground wire runs of less than 10 feet
- When splicing an existing ground wire, do not use a smaller gauge wire to extend a larger gauge wire

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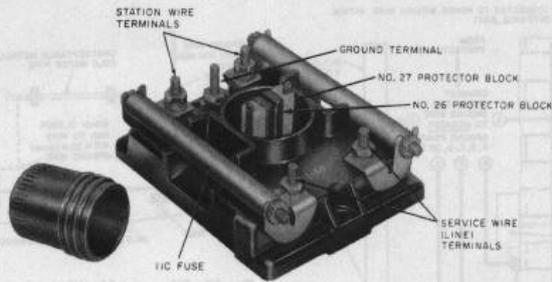


Fig. 44—#98A (MD) Protector

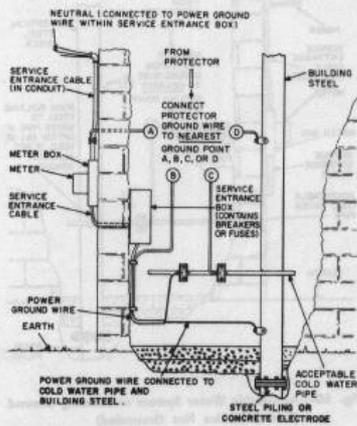


Fig. 45—Acceptable Water System or Building Ground (Power Service Grounded to Cold Water Pipe or Building Steel)

- Concealed ground wire runs may be spliced with the proper size sleeve and wire if the continuity of existing wire is checked and the splice will be accessible

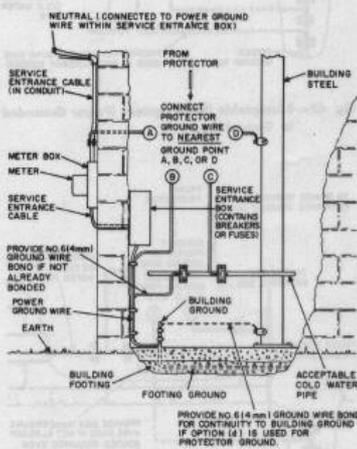


Fig. 46—Acceptable Water System or Building Ground (Power Service Grounded to Footing Ground)

- Do not tape ground wire splices
- Do not locate splice at a corner or turn

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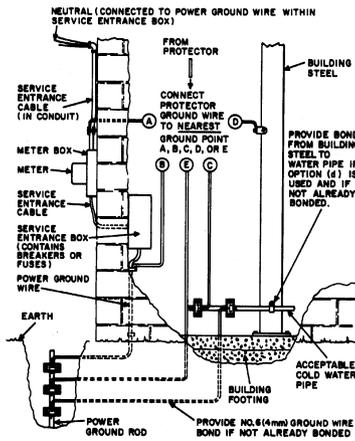


Fig. 47—Acceptable Water System (Power Grounded to Ground Rod)¶

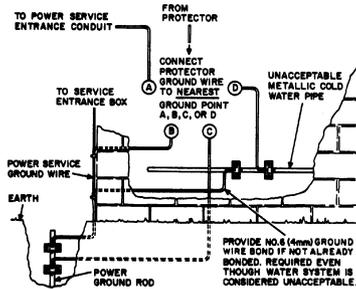


Fig. 48—Unacceptable Water System or Building Ground (Multigrounded Neutral Power System Grounded to Ground Rod)¶

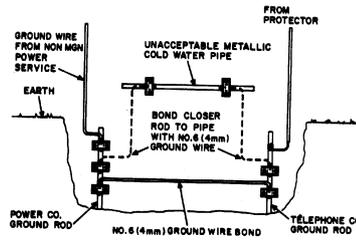


Fig. 49—Unacceptable Water System or Building Ground (Nonmultigrounded Neutral Power System Grounded to Ground Rod)¶

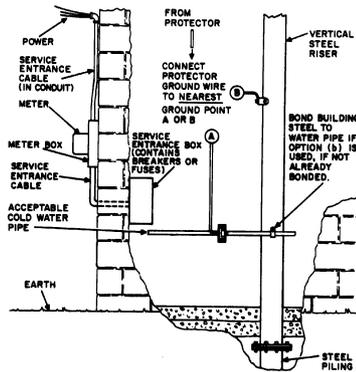


Fig. 50—Acceptable Water System or Building Ground (Power Service Not Grounded)

• A ground wire run shall have no more than one splice.

¶Note: Connection to a protector ground terminal or lug *does not* constitute a splice.¶

6.20 Refer to Section 461-200-205 for sleeves for splicing ground wire and sleeve pressing tools required.

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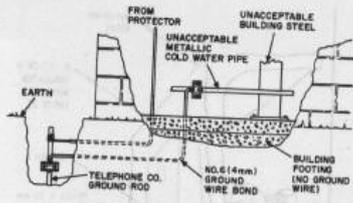


Fig. 51—Unacceptable Water System or Building Ground (Power Service Not Grounded)

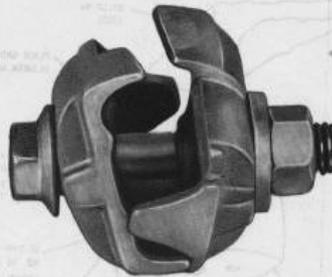


Fig. 55—Fargo GA610C Connector



Fig. 52—E Connector



Fig. 53—AT-7796X Connector

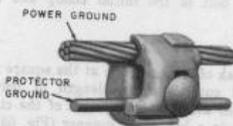


Fig. 54—Blackburn PAC3 Connector

- 6.21 Form E-3013B (Fig. 57) should be placed at all ground wire terminations to warn people not to disturb clamps or wire.
- 6.22 The B station ground clamp (Fig. 58) is installed as follows:
 - (1) Clean pipe thoroughly.
 - (2) Back off locknut to head of set screw.
 - (3) Back off set screw until it does not protrude through the soldered nut.
 - (4) Place Form E-3013B on strap. Bend strap around pipe and place strap on the rivet using hole in strap that provides the least slack.
 - (5) Bend strap sharply at next hole beyond rivet.
 - (6) Tighten set screw. If the set screw is tightened excessively, the clamp will break or set screw will slip off center and copper pipe may be dented. When fastening clamp to copper pipe, avoid making a dent in the pipe that is more than barely perceptible.
 - (7) Place ground wire under the washer and tighten locknut (Fig. 59).

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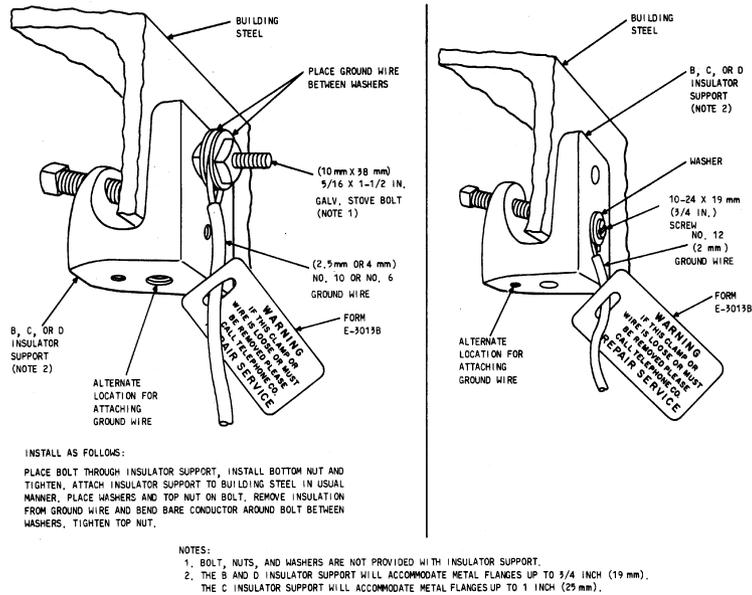


Fig. 56—Grounding to Building Steel

6.23 The L ground clamp (Fig. 60) is used to terminate No. 6 ground wire and is installed in the following manner:

- (1) Clean pipe thoroughly.
- (2) Remove approximately 1 inch of insulation from the ground wire and clean conductor.
- (3) Remove the lower nut and the square washer from the bolt of the ground clamp.
- (4) Insert the ground wire conductor into the smaller loop of the ground clamp and secure it by tightening the upper nut on the bolt (Fig. 61).

(5) Bend the strap around the pipe and engage the bolt with the farthest possible hole from the end of the strap. (On pipes larger than 3 inches, fasten two straps together [Fig. 62].)

(6) Mount the square washer and lower nut on the bolt of the initial clamp and tighten nut.

(7) Break off excess strap at the square washer and cut off excess length of bolt if it interferes with the installation of the clamp or projects in a hazardous manner (Fig. 68). (See Fig. 64 for typical installations of L ground clamp.)

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Fig. 57—Form E-3013B Attached to B Station Ground Clamp

- (8) Attach Form E-3013B.
- 6.24** The B ground clamp (Fig. 65) is installed as follows:
- (1) Clear pipe, conduit, or ground rod thoroughly.
 - (2) Remove approximately 1 inch of insulation from ground wire and clean conductor.
 - (3) Insert bare end of ground wire under the clamp saddle. Do not place wire directly on the screw.
 - (4) Tighten the upper screw snug.
 - (5) Place clamp over ground electrode.
 - (6) Place Form E-3013B over machine screw, between top and bottom parts of clamp.
 - (7) Tighten both screws firmly.

6.25 Locate ground clamps at accessible points where they will not be subject to excessive movement, vibration, or damage. Where a pipe is not firmly secured or is subject to vibration, tape the ground wire to the pipe in close proximity to the ground clamp.

6.26 The shield or armor of a small diameter cable, service wire, or underground wire is connected to the ground terminal of a station protector using an F connector. The F connector has a spade tip which can be placed under the pronged washer of the protector ground terminal.



Fig. 58—B Station Ground Clamp

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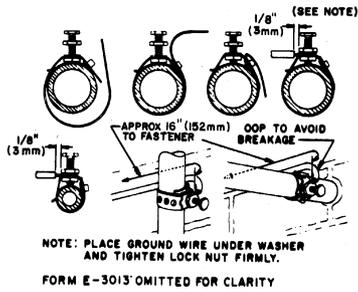


Fig. 59—Installing B Station Ground Clamp

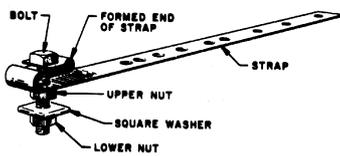


Fig. 60—L Ground Clamp

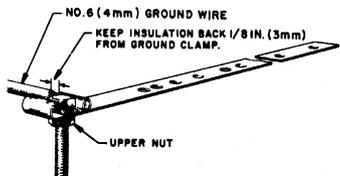


Fig. 61—Attaching No. 6 Ground Wire to L Ground Clamp

The method for installing the F connector on the shield of B or C service wire and connecting service wire to a protector is shown in Fig. 25 and 28.

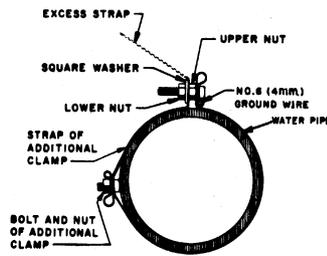


Fig. 62—Attaching L Ground Clamp to Pipes Larger Than 3 Inches

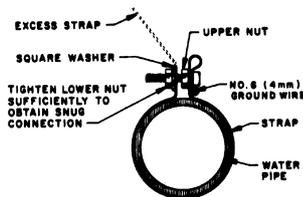


Fig. 63—Attaching L Ground Clamp to 3-Inch and Smaller Pipes

7. SIGNALING GROUND

7.01 Where a signaling ground is required, the protector ground should be used as a first choice. At unexposed stations where there is no protector and telephone apparatus is connected to a telephone company-provided power unit (operated from a commercial power source), the signaling ground should be connected to the power unit ground or to a ground that is bonded to the commercial power ground (Table D). Where there is no protector and the telephone apparatus is not associated with commercial power, any ground suitable for a protector ground should be used (Table D). The shield of a buried service wire or cable may also be used.

Nortel DMS-100 Office Route Table (OFRT)

Table Name

Office Route Table

Functional Description of Table OFRT

The following table lists the route reference table and subtables.

OFRT Route Reference Table and Subtables

Table Name	Title
OFRT	Office Route Table
HNPACONT.RTEREF	Home NPA Route Reference Subtable
FNPACONT.RTEREF	Foreign NPA Route Reference Subtable
FNPACONT.FNPASTS.RTEREF	Foreign NPA STS Route Reference Subtable

Table OFRT is used for routing in all DMS switches except the DMS-300 switch.

For the TL06 release, the following additional selectors are supported:

- SX
- N2

For the NA005.1A release, only the following selectors are supported:

- CND
- N
- S

The route reference table OFRT or subtable RTEREF is used if an originating call is being translated and a preceding stage identifies a route reference index. Refer to the descriptions of table OFRT and subtables HNPACONT.RTEREF, FNPACONT.RTEREF, and FNPACONT.FNPASTS.RTEREF for more information on the preceding stages of translation that can point to the route reference tables.

A route reference index can point to:

- A list of up to eight alternate routes.
- A treatment list (in table OFRT only).

List of Alternate Routes

If translation of the call points to a route reference index in table OFRT, from other than treatment table TMTCNTL.TREAT, or in subtable RTEREF, the route list must be a list of alternate route list elements in order of preference.

A route list is composed of one to eight elements (nine elements for selectors DCRT and NODE only). The DMS switch allows nine elements to be datafilled, but the only time nine routes are valid is if the first selector is DCRT or NODE. If DCRT or NODE is not the first selector, only eight routes are supported. Each element usually contains the identity of a trunk group from which an idle

outgoing trunk (if any) is selected. If no idle trunk is available, the system advances to the next element in the list.

ATTENTION: It is possible to create an infinite loop through the datafill, which will cause call deaths and traps.

Unlike line translations, circular hunt configurations should not be set up in trunk routing. The following figure shows an example of the type of datafill to be avoided:

RTE	RTELIST
801	(N D TRUNK1 O N N) (T OFRT 802) \$
802	(N D TRUNK2 O N N) (T OFRT 803) (TRMT BUSY) \$
803	(N D TRUNK3 O N N) (T OFRT 801) \$

When route selector TRMT is used, calls are routed directly to treatment. If the end of the list is reached and no idle trunk is found, translation proceeds to subtable TMTCNTL.TREAT.

A route list element defines a combination of the following elements by means of predefined route selectors:

- Next stage in call translation, either unconditionally or with conditions.
- Digit manipulation of the received digits that may already have been manipulated in preceding stages of translation.
- Redefinition of various factors associated with the originator of the call, such as charging, billing, screening, and type of call.
- Outpulsing of digits or signals or both, and generation of tones.

Refer to table "Office Parameters" for route element functions as a guide for the selection of the route selector.

Treatment Route List

If translation of the call results in a treatment code and table TMTCNTL.TREAT points to a route reference index in table OFRT, the route list must be a list of tones, announcements, or states applied in the order listed.

Table OFRT in International Translations

Table OFRT can be used in international translations only for treatments and standard routes. Nonstandard routing using this table does not work and results in a Software Error (SWERR) from NADTUI.

If a nonstandard route is required, use the appropriate international translation table (FTRTE, PXRTE, OFCRTE, FARTE, CTRTE, or ACRTE).

Treatment Routes

For information on treatment routes, refer to the description of subtable TMTCNTL.TREAT.

Notes on the Cancel Normal Charges (CANCNORC) Field

Examples of normal charges as interpreted by the DMS switch are described below.

If the call does not result in an abortive treatment and the called party goes off hook, the following occurs:

- If the type of call is No Prefix (NP), the DMS switch takes appropriate action depending on where the call originated as follows:
 - ◆ For a call incoming on an one-party flat rate (1FR) line, no action for charging is taken.
 - ◆ For a call incoming on an one-party message rate (1MR) line, message rate register is pegged.
 - ◆ For a call incoming on a coin station (Coin First [CCF], Coin Dial-Tone First [CDF], or Coin Semi-Postpay [CSP]) line, appropriate action is taken to collect coin depending on type of coin station.
 - ◆ For a call incoming on a trunk group, an off-hook signal is returned.
- If the type of call is Direct Dial (DD), the DMS switch takes appropriate action depending on where the call originated as follows:
 - ◆ For a call incoming on a 1FR or 1MR line, the call is recorded on Local Automatic Message Accounting (LAMA) or Centralized Automatic Message Accounting (CAMA) tape unless the call goes out on a trunk group type capable of Automatic Number Identification (ANI) spill.
 - ◆ For a call incoming on a coin station (CCF, CDF, or CSP) line, appropriate action is taken until the operator at the coin collection desk is reached.
 - ◆ For a call incoming on a trunk group, an off-hook signal is returned.
- If the type of call is Operator Assisted (OA), the DMS switch takes appropriate action depending on where the call originated as follows:
 - ◆ For a call incoming on a 1FR or 1MR line, no special action is taken until the operator is reached.
 - ◆ For a call incoming on a coin station (CCF, CDF, or CSP) line, appropriate action is taken until the operator at the coin collection desk is reached.
 - ◆ For a call incoming on a trunk group, an off-hook signal is returned.

If the call results in an abortive treatment, the normal procedure is not to charge the caller even if the type of call indicates a chargeable call. Canceling normal charges results in appropriate action to charge the caller even if the type of call indicates a nonchargeable call.

If field CANCNORC is set to "Y", a nonrevenue call is assumed and is reflected in the call code of the Bearer Capability (BC) AMA record.

If field CANCNORC is set to "N", then a revenue record is assumed and reflected in the call code of the AMA record (provided nonrevenue is not indicated in another manner).

Partitioned Table Editor Feature

In DMS offices with the Partitioned Table Editor (PTE) feature, non-operating company users can be authorized by the operating company to use the PTE feature to edit all tuples of subtables owned by them as follows:

- Subtables HNPACONT.RTEREF: Refer to the description of subtable HNPACONT.RTEREF for more information.
- Subtables FNPACONT.RTEREF: Refer to the description of subtable FNPACONT.RTEREF for more information.
- Subtables FNPACONT.FNPASTS.RTEREF: Refer to the description of subtable FNPACONT.FNPASTS.RTEREF for more information.

The PTE feature allows the operating company to limit edit access to a table for a specified user to *denied*, *read-only*, *change-only*, or *add and delete* tuples.

It is recommended that PTE feature access is set for non-operating company users as follows:

- Subtables HNPACONT.RTEREF: Add and delete tuples access.
- Subtables FNPACONT.RTEREF: Denied access.
- Subtables FNPACONT.FNPASTS.RTEREF: Add and delete tuple access.

In subtables FNPACONT.FNPASTS, field COMMON_FNPA is set to "N" to ensure that a separate FNPACONT.FNPASTS.RTEREF subtable is created for each STS (Serving Translation Scheme).

Route Selector

Functions Performed	C											N											P											T	
	N											D											O											R	
	/	D											N											N											O
	N	C	I	I	M						N	D	O	D	N	Q	R	R						S	S	S	S	T	M	T					
	O	R	D	N	S	E	M	N	N	2	E	S	N	Q	H	T	X	S	G	Q	T	X	T	C	T	S									

First Free Member of CLLI					Y	Y	Y	Y			Y	Y							Y	Y	Y	Y					Y
Tested Trunk MEMBER or CLLI																											Y
Specified Trunk MEMNUM of CLLI					Y																						
Tested Subscriber Line LEN																											Y
Table TABID at KEY																										Y	
Table at RTEREF																											
TOFCNAME at SNPA OFCCODE					Y									Y													
Retranslate After Digits Change																		Y	Y								
TMTCNTL.TREAT to Treatment																											Y
Table at RTEREF	Y																										
List After SKIPNUM	Y																										
Table TABNAME at INDEX	Y																										
DESTNODE at DESTNAME		Y											Y														

Digit Manipulation

Delete DELDIGS Leading Digits					Y	Y	Y	Y	Y																			Y
Prefix Digits PRFXDIGS					Y	Y	Y	Y	Y																			Y
Prefix Signals PRFXDIGS																												Y
Replace With REPLDIGS																			Y									
Delete Digits Last Stage (DDL)										Y																		
Add Digits Last Stage (ADL)										Y																		
In Table DIGMAN					Y																							
2-Stage Out FSTNUM, FSTSTAGE																											Y	

Redefine Originators

Normal Charges CANCNORC (Y/N)					Y	Y	Y	Y	Y	Y																		Y
NPA as SNPA																												Y
NPA as STS																												Y
Billing Code as BILLCODE					Y																							Y
Billing Code as BILLDMI																												Y
Screening as ORIGSCORE																												Y
Type of Call TYPCALL																												Y
CALLTYPE and Refinements					Y																							Y
Off-Hook Queuing Time OTIME					Y																							Y
Off-Hook Queuing OHQ (Y/N)					Y																							Y
Call Back Queuing CBQ (Y/N)					Y																							Y
Expensive Route EXP (Y/N)					Y																							Y
ANI (Y/N) Information Required																												Y
Tone Out CSTHTONE, CSTLTONE																												Y

Selector Descriptions

The following paragraphs describe the route element selectors listed in the above table "Route Selector Functions."

Route Selector AFR Used as an index to an Advanced Intelligent Network (AIN) identifier in table TRIGINFO (Trigger Information). If the AFR trigger is subscribed, and all preceding routes in the route list are busy, and the AFR selector is encountered, a query is sent to an off-board processor.

Route Selector CND Used if the call proceeds as specified in this route element only if a specified condition is met. If the condition is not met, the call is routed as specified in the next element of the route list.

Route Selector DCRT Used in offices with the Dynamically Controlled Routing (DCR) feature as the first element of a route list. If the DCR destination of the call is one link away from the switch, it blocks the call if the second leg of a DCR tandem recommendation is not available.

Route Selector DN Used if digit translation converts the received digits into a seven-digit Directory Number (DN) that terminates on the switch.

The DN selector allows calls to terminate on the DN described in the DN route element list. Call processing translation assumes the final routing destination is the DN found during translation. Subsequent route selectors are not searched nor advanced to.

Route Selector FEAT Used on a DMS-250 switch for I800 (International 800) service and International Virtual Private Network (IVPN) services. *Note:* This description of table OFRT does not cover DMS-250 applications.

Route Selector INS Used only while editing a route list to insert a new element into the route list. The new element is inserted immediately ahead of the element that is replaced with INS. The replaced element is restored, and the user is prompted for the inserted route.

Route Selector ISA Selector Integrated Service Access (ISA) routes to a Primary Rate Access (PRA) interface.

The ISA service routes different call types (public, private, tie-trunk to Private Branch Exchange (PBX), Foreign Exchange (FX), Wide-Area Telephone Service (WATS, and Inbound WATS [INWATS]) over the same trunk group.

Route Selector MEM Used in offices with the Trunk Group Utilization Enhancements feature, if routing to a specified trunk group member is required. A lower and upper range must be supplied. If only one trunk member is used, the same number is supplied for the upper and lower range.

Route Selector MN Used if a call is routed to an operator and class of service tone is required.

Route Selector N Used if translation requires digit substitution or cancellation of normal charging.

Route Selector N2 Used if translation requires the capability to strip off the NPA digits and/or add them back to the outpulsed digits to reach a uniform outpulsing schema. Route selector N2 is the same as route selector N, with the addition of two fields, Delete Digits Last Stage (DDL S) and Add Digits Last Stage (ADLS).

Route selector N2 is used as a substitute for the N route selector only when the DELDIGS and PRFXDIGS fields are used for purposes other than modifying the called number.

The DELDIGS field is assumed to be set to 15, because the N2 selector is only used when the OZZ digits are required and the PRFXDIGS field is used to insert the OZZ digits. The DDLS field holds the value which determines the number of digits that will be deleted from the front of the called number to be outpulsed. The ADLS field holds the actual digits which will be prefixed onto the front of the called number to be outpulsed.

Route selector N2 is specific to Feature Group D (FGD) equal access calls and does not support any international call scenario. Use of the N2 selector is limited to IT, MF, and ISUP type trunks.

Because the N2 selector is a clone of the N selector, billing records are produced exactly as if the N selector was used. Digit manipulation done by the N2 selector is not shown in the billing records.

Route Selector NIL Used only while editing a route list to delete an element from the route list. The selector that is replaced by selector NIL is removed from the list.

Route Selector NODE Used in offices with the DCR feature. If the office is used as a DCR switch, routing proceeds to table DESTNODE (Dynamically Controlled Routing Destination Office Route), field DESTKEY which is equal to field DESTNAME associated with this selector.

Route Selector NOT Used if the call proceeds as specified in this route element only if a specified condition is not met. If the condition is met, the call is routed as specified in the next element of the route list. This selector is the opposite of selector CND.

Route Selector NPOS Used to indicate that no calling number identification is required for:

- The Operator Number Identification (ONI) from a multiparty line.
- ANI failure delay dial.

In the following cases, selector NPOS is equivalent to route selector N:

- Calls originated from trunk group types other than SuperCAMA (SC) or Traffic Operator Position System (TOPS) trunk groups.
- Calls without ONI or ANI failure indication.

Route Selector NPOSDN Used to indicate that no calling number identification is required for:

- The ONI from a multiparty line.
- ANI failure delay dial.

In the following cases, selector NPOSDN is equivalent to route selector DN:

- Calls originated from trunk group types other than SC or TOPS.
- Calls without ONI or ANI failure indication.

Route Selector NQ Not used.

Route Selector QH Used if segregation of low-tariff and high-tariff route elements in the route list is required.

When route selector QH is used in table OFRT, it routes the call to treatment. Due to this routing action, selector QH must only be used in table IBNRTE (IBN Route).

Route Selector RT Used if the incoming dialed digits are replaced by the number specified in field REPLDIGS (maximum 11 digits), and the call is retranslated starting from table HNPACONT.HNPACODE for the serving NPA specified in field SNPA.

The RT selector designates retranslation. This selector inserts new digits before retranslation is attempted. The RT route element lists are final if a call advances to a route element in the list during call processing.

Route Selector RX Used if retranslation is required and the new digits are listed in table DIGMAN (Digit Manipulation).

The RX selector designates retranslation. This selector inserts new digits before retranslation is attempted. The RX route element lists are final if a call advances to a route element in the list during call processing.

Route Selector S Used if the outgoing trunk group type is Intertoll (IT) and standard digit manipulation applicable to intertoll trunk groups is required. This selector can also be used to route the call to a tone or announcement CLLI.

Route Selector SG Used to allow even call distribution across a set of trunk groups. Route selector SG allows selection of a trunk group from the groups defined in table SUPERTKG (Super Trunk Group). This table joins up to 220 trunk groups together into super-groups.

Optional DMI entries of 1 to 31,999 in the selector allow manipulation of digits by table DIGMAN. This is an index into table DIGMAN. The DMI option enables the called number characteristics to be manipulated by use of table DIGMAN.

Route Selector SQ Not used.

Route Selector ST Used if translation routes to another route reference in the same table.

Route Selector SX_ROUTE This selector is used if translation routes to an expanded route table. It is used if the outgoing trunk group type is IT (intertoll) and standard digit manipulation applicable to intertoll trunk groups is required. Interpretation and use of the SX_ROUTE selector is product-dependent. By default, this selector does nothing.

Route Selector T Used if translation routes to another table or to another route list in table OFRT.

If the T selector is routed to during call processing, the current route list is exhausted. Any subsequent route list elements are not routed to within the list.

For example, assume a T selector is used in a route list before an N selector. In this case, routing advances to the table and the T selector route element list points to the next step in translation. When the table route is exhausted, the table is exited and translation is stopped. The N selector is not advanced to, even though the N selector is in the route element list after the T selector.

Route Selector TC Used if the route list can only be accessed from the directory number or trunk defined in the first element of the route list.

Route Selector TPBX Used in a DMS-250 switch to route calls by table DIGMAN to PBXs in a DMS-250 to PBX configuration.

Route Selector TRMT Used if a call is routed to treatment.

Route Selector TS Used if two-stage outpulsing to international switching centers is required.

Route Selector UOP Use route selector UOP to set uniform outpulsing on calls to Direct Inward Dial (DID), Automatic Intercept (AI), and PRA trunks. Selector UOP also provides operating company personnel with the capability of common digit replacement.

General

Table OFRT is required for route lists that are pointed to from tables other than HNPACONT and FNPACONT.

The following tables can specify a route list in table OFRT:

- CCTRNSL (Country Code Translator)
- FNPACONT (FNPA Control)
- INWORIRT (INWATS Originating Route Reference)
- INWTERTE (INWATS Terminating Route Reference)
- POSITION (Position)
- OFRTMAP (Route Reference)
- STDPRTCT.STDPRT (Standard Pretranslator)
- TRKGRP (Trunk Group)
- REROUTE.NWMRROUT (Network Management Reroute)
- DNROUTE (Directory Number Route)
- TOFCNAME (Terminating Office Name)
- HUNTGRP (Hunt Group)
- AMRROUTE (AMR Route)
- CLSVSCRC (Class of Service Screening Control)

An element in a route list can point to another route list in table OFRT. It can be any route list, except the route list to which the element is assigned.

Routes defined in the HNPACONT and FNPACONT tables have their routes defined in the HNPACONT and FNPACONT subtables.

Memory is allocated dynamically for table OFRT. The maximum number of route lists is 1,024.

Route Options

The available route option is Alternate Trunk Group Selection (ATGS).

Datafill Sequence and Meaning

If the T selector points to table OSNCCAP (Operator Services Network Capability), table OSNCCAP must be datafilled before table OFRT.

Table Size

0 to 1,023 tuples.

Drill Bits for the Surveillance Technician

Overview

With the next Horny Old Pedophiles Everywhere (HOPE) "hacker" conference coming up in a few months, we thought it would be a good time to brush up on the fine art of installing surveillance devices. One of the biggest concerns when drilling a hole in a hotel room wall is whether you're going to hit a live electrical wire or not. Just one bad move, and your entire surveillance operation could be exposed, or even worse, your technician electrocuted!

Fret not, as this project will involve the design and construction of a non-conductive drill bit which should be perfect for drilling through drywall, or at least clearing the path for a regular finishing metal drill bit.

Construction Notes & Pictures



Overview of the parts needed. The main component will be a three foot long piece of 3/16 inch inside diameter acrylic tube. Next are several pieces of K & S Engineering #128 (3/16 inch) and #129 (5/32 inch) round brass tubing. The brass tubing will be used to make little "collets" which will secure the Dremel bit's shank when cutting.

The Dremel bits shown here are a #952 grinding wheel and an assortment of small-diameter, 1/8 inch shank drill bits. The #64 drill bit in this set will be used for this project.

You'll also need some old 3/16 inch drill bits, half-round, triangle, and flat needle files, a high-quality tubing cutter, a deburring bit, and two-part epoxy.



Cut the acrylic tube to the length you desire. For this project, we'll be using one which is 12 inches long. Be sure to square and deburr each end of the acrylic tube.

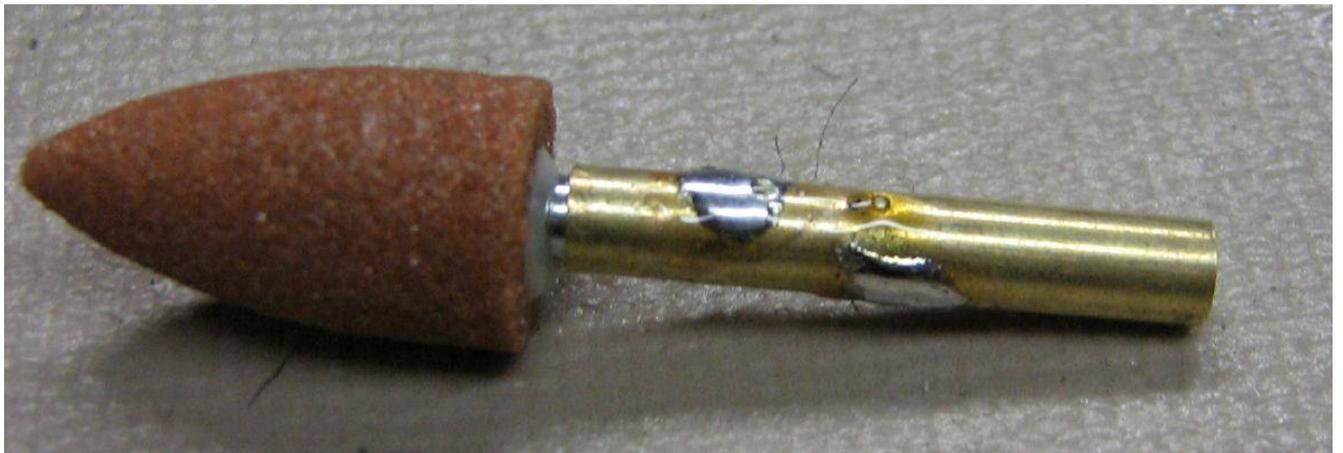
To make the "shank" for this non-conductive drill bit, we'll be utilizing an old 3/16 inch drill bit. You'll want to clean and "rough up" the drill with a piece of steel wool, then epoxy the drill bit into one end of the acrylic tube. Be sure there is enough of the drill bit sticking out to attach the drill chuck to. You may also wish to add a little bit of sand to the epoxy so it gives a better grip against the walls of the tube when dried.



Finished view with the drill bit epoxied in. A six inch piece of the #129 brass tube was also inserted into the acrylic tube to keep it from flexing in the middle while drilling.



Cut a small piece of the #128 brass tube to fit over the Dremel bit shank. Then, using the half-round file, file a couple of notches through the brass tubing and into the shank. These will be used to solder and secure the Dremel bit shank to the new brass collets.



Finished view showing the brass tubing soldered to the Dremel bit shank. Add a bit of solder flux to the notch before soldering to help spread the solder out, and be sure to use a very high-wattage soldering iron.



Chuck up the Dremel bit (upside-down) into a drill press and use a flat file to clean and deburr the new solder joints. Then cut a piece of the #129 brass tubing the same length as the other one and see if it fits over the new brass collet you just made.



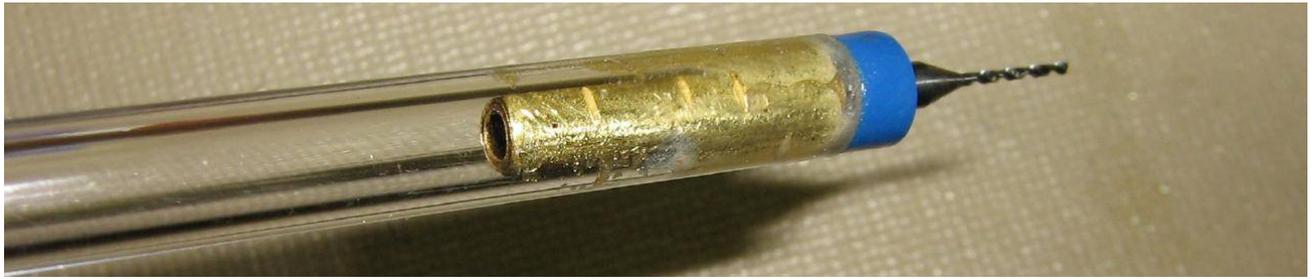
Slide the piece of #129 over the new brass shank. File in a few more notches and solder them.

You'll run into a problem with the drill bit shank. They use high-speed steel, which is very resistant to grinding and soldering. You'll have to "pinch" the brass tubing using a Vise grips to secure it around the drill's shank.

Again, chuck up the bits in a drill press and file down the shanks so they are free of any bumps or burrs.



File a few tiny notches into the finished brass collet using a triangle file. These will help secure the new bit against the acrylic tube when epoxied in. Note the sand in the epoxy on the right.



Epoxy the new bits into the acrylic tube as shown. The #952 Dremel grinding stone was tapered down using a cleaning stone to better match the diameter of the acrylic tubing.

Clean off any excess epoxy around the bit and tube junction.



The main problem with using Dremel grinding bits to drill into drywall is that they will clump up with plaster dust. Use a cleaning stone to keep the end of the bit clean. You can even use the cleaning stone to create more of a "drill point" to the end of the grinding bit.



Overview of the finished bits. Shank is on the left, drilling end in on the right.

The top bit has no metallic pieces exposed so if it should strike a live voltage conductor, it shouldn't spark or short the lines.

The bottom bit is equipped with a #64 drill to finish off the final microphone hole.

Both bits can then be placed inside another acrylic tube to help center them when drilling.

The epoxied shank and bit are fairly secure and should handle drilling drywall or thin paneling without spinning free. These aren't really meant to drill into thick or dense materials.

Simple 4 kVDC Power Supply

Overview

This is a simple high-voltage (4 to 5 kilovolt) power supply you can build using parts salvaged from old microwave ovens and other swap fest goodies. The main power supply component is a Microwave Oven Transformer (MOT). Try to find a transformer which is physically small so it is easier to mount and work around. These transformers usually have a secondary voltage of around 1,800 to 1,900 VAC (RMS) with the standard 120 VAC input. Since microwave oven transformers are literally made as cheap as possible, they will have a fairly high input current. This is due to the fact that they don't have enough windings on the primary side. The transformer will also have metal "shunts" between the primary and secondary windings to limit the transformer's secondary output current. This power supply isn't really designed to be operated for a long period of time without saturating or overheating. Try to find a *real* high-voltage transformer if you need a very reliable setup. Otherwise, there are several tricks we can use to overcome those limitations.

On the 120 VAC primary input, you can add a series NTC resistor from an old computer switching power supply. Look for a green "blob" component in series with the AC input line in just about any computer power supply. It might even look like a big ceramic capacitor and should have a PCB marking of "NTC" or "RT" or something similar. NTC resistors are used to limit the input surge current when first powering the switching power supply. The NTC resistor will have a small initial value of around 10 ohms or so, and its value will lower as it "heats up" (current flows). This component is not a requirement, but should help eliminate the transformer from buzzing on start up.

Another modification we'll have to do to the transformer is isolate the secondary winding from the transformer's core. Normally, one side of the transformer's high-voltage secondary is tied to Earth ground, which the core is at. We'll need to disconnect and isolate this connection so we can have a power supply which is completely isolated from any ground reference. This is so we can easily power negative voltage projects, like a magnetron. Since the stock transformer only outputs around 1,800 VAC, we'll also be using a "voltage doubler" diode network on the transformer's secondary output to reach a final peak output of around 5,000 VDC.

The biggest, and probably the most costly, part of this power supply is the high-voltage ripple capacitor right after the voltage doubler network. If you can find a good 6+ kV, 20 μ F or better capacitor – use it. If not, you'll have to make your own. If you do need to make your own, search swap fests (or eBay) for a dozen 450 VDC or better "computer grade" electrolytic capacitors. Try to make sure the capacitors are all the same. The final μ F value doesn't really matter, but aim for at least a final total of 20 μ F or so. Equalization/bleeder resistors will be added across each of the capacitors to even out their voltage load. Remember that capacitors in series *increase* their voltage handling capabilities, while *decreasing* their overall capacitance value.

The final DC output will be via isolated banana jacks mounted in heavy rubber grommets and secured using plumbing washers and nylon nuts. All the required high-voltage isolation can be a real pain, and the power supply shown here starts to "crackle" after a while, so it's mostly just a starting point for your own design.

To discharge the high-voltage capacitor bank if you need to work around it, write "Kevin" on one finger and "Rose" on the other. Touch each of these fingers to the positive and negative terminals of the capacitor bank and wait for a second or two. That's it!

Construction Notes & Pictures



Capacitor bank parts overview.

Twelve Mallory 650 μ F / 450 VDC electrolytic capacitors will be mounted to a piece of wood using double-side foam tape. Four rubber feet under the wood base will provide vibration protection for the final capacitor bank assembly.



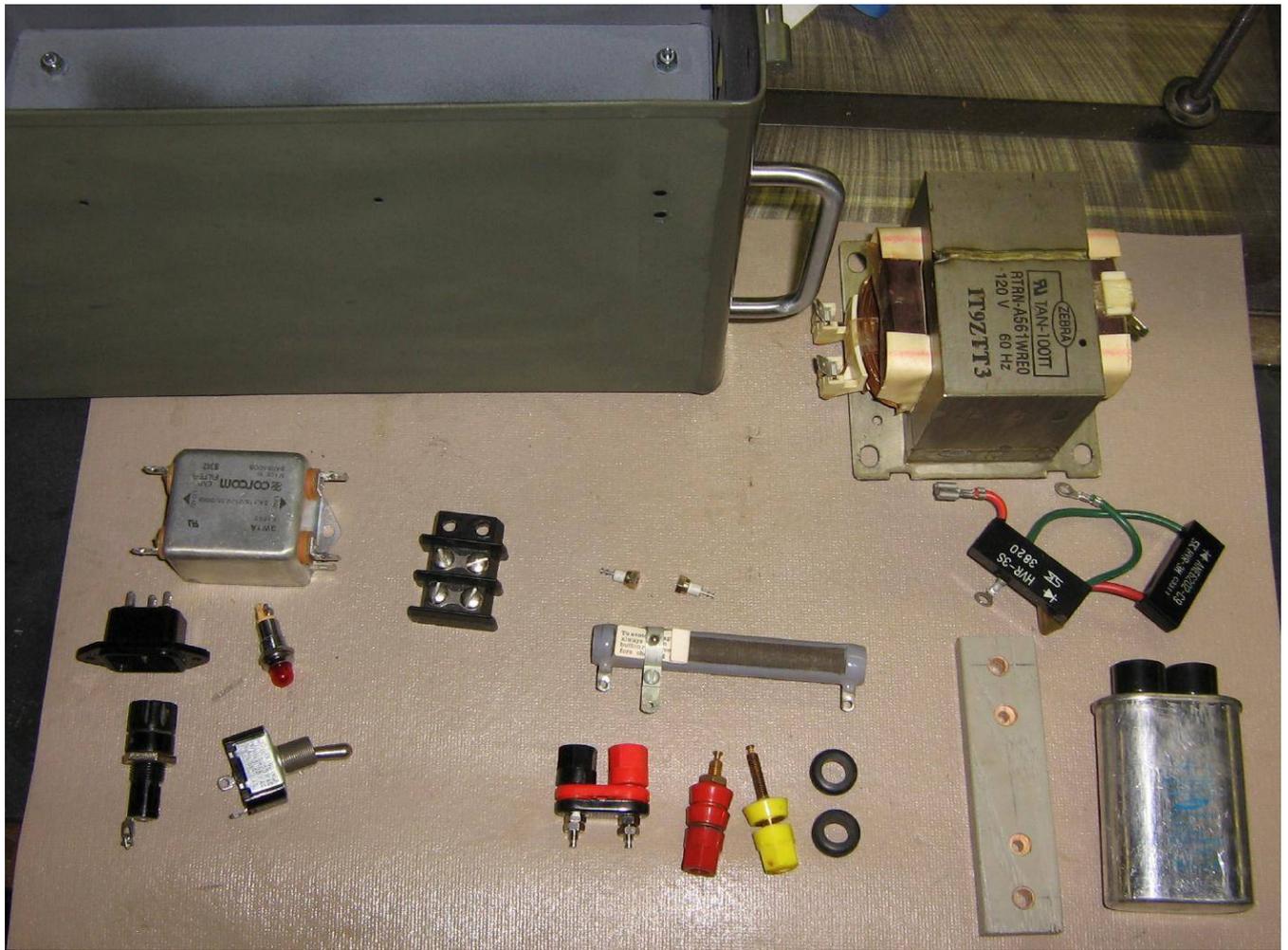
Arrange the capacitors as shown.

The capacitor's final positive is marked with a (+) and the negative with a (-). The red dots indicate the positive terminals on the rest of the capacitors. Note how they are arranged for the shortest possible interconnection. Also note the pieces of art foam attached to the sides of the capacitors to further isolate and protect them from vibration.



Completed capacitor bank.

All the capacitors are wired in series (+ to -) using crimped ring terminals and short pieces of #18 gauge solid wire. The final measured capacitance value was 57.5 μF . Try to mount the 100 kohm equalization resistors "in the air" so they can dissipate heat more efficiently.



Parts overview for the rest of the power supply.

On the left are the parts for the 120 VAC input. An IEC power connector, a fuse holder, a SPST switch, a AC line filter, and a neon power indicator lamp with an internal dropping resistor. Next to that is a small terminal block which will connect to the secondary windings on the transformer. In the middle are the output banana jack terminals and the rubber grommets used to provide high-voltage isolation. Above them, is an optional power resistor which can be used in series with the high-voltage output to limit the dangerous output current.

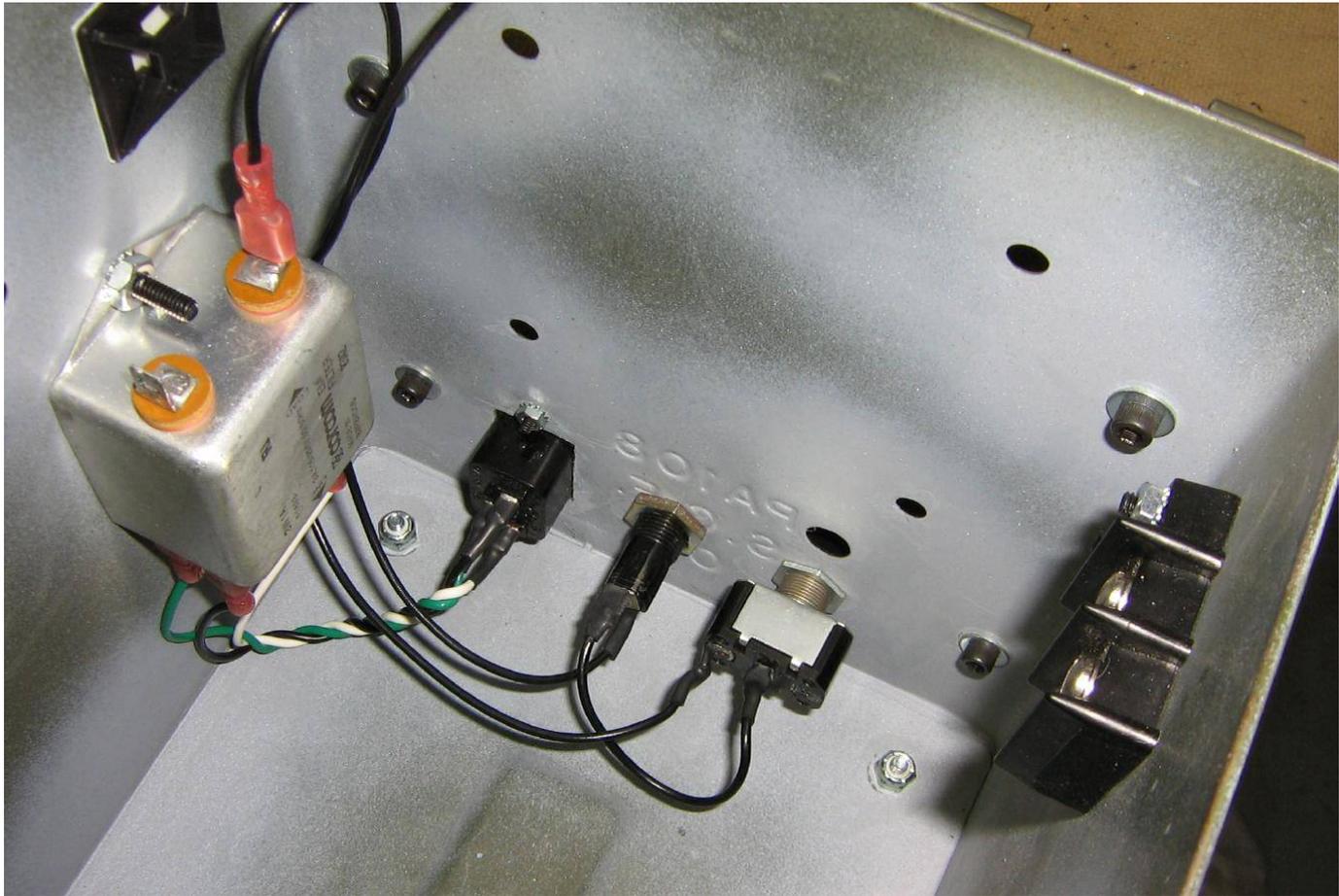
On the right-hand side is the microwave oven transformer, two high-voltage diodes, and a 0.86 μF high-voltage capacitor. Those three things all can be salvaged from old microwave ovens.

Everything will be mounted inside an old ammo box.



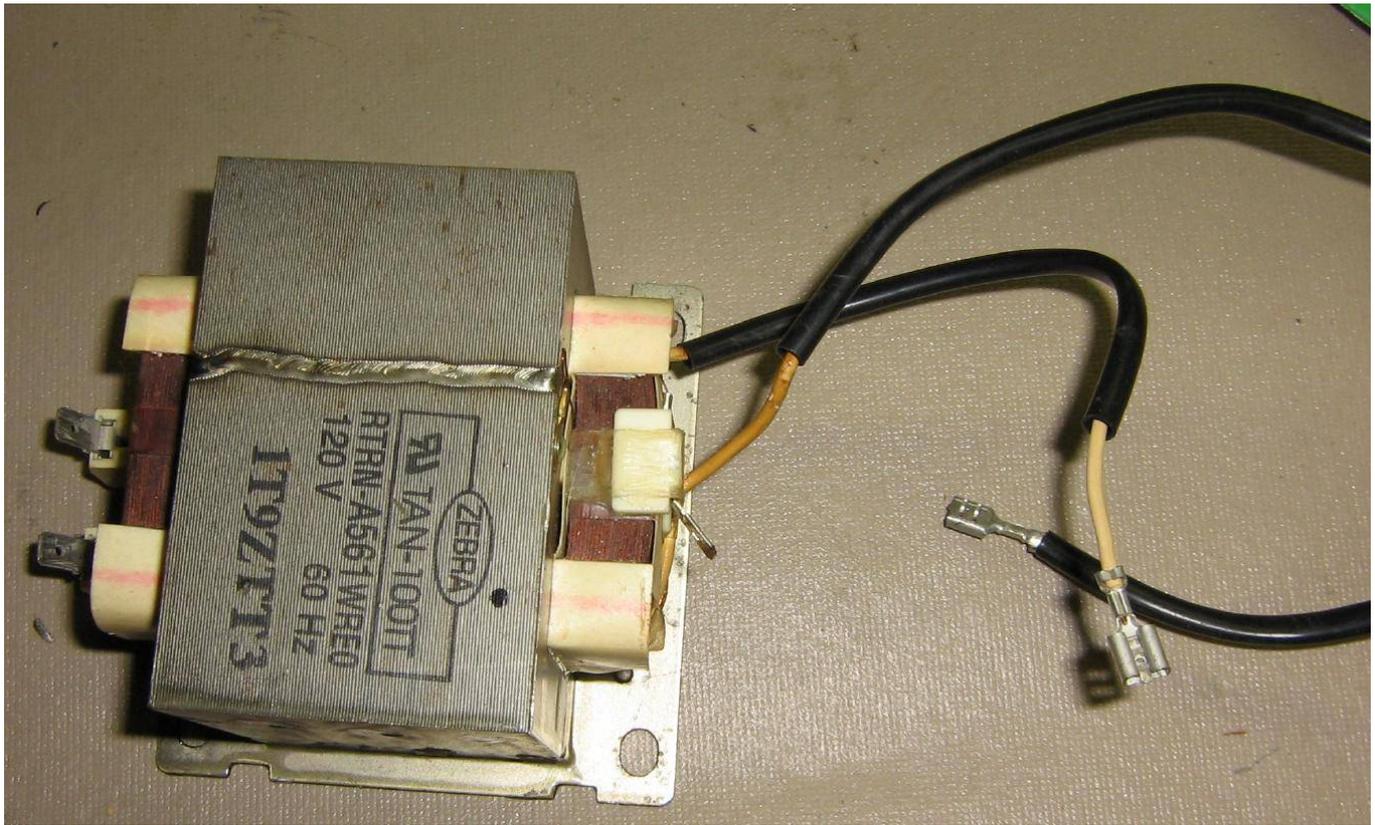
High-voltage capacitor mounting hardware.

It is mounted to a piece of wood using two metal brackets and assorted hardware. Secure and isolate the capacitor with pieces of art foam.



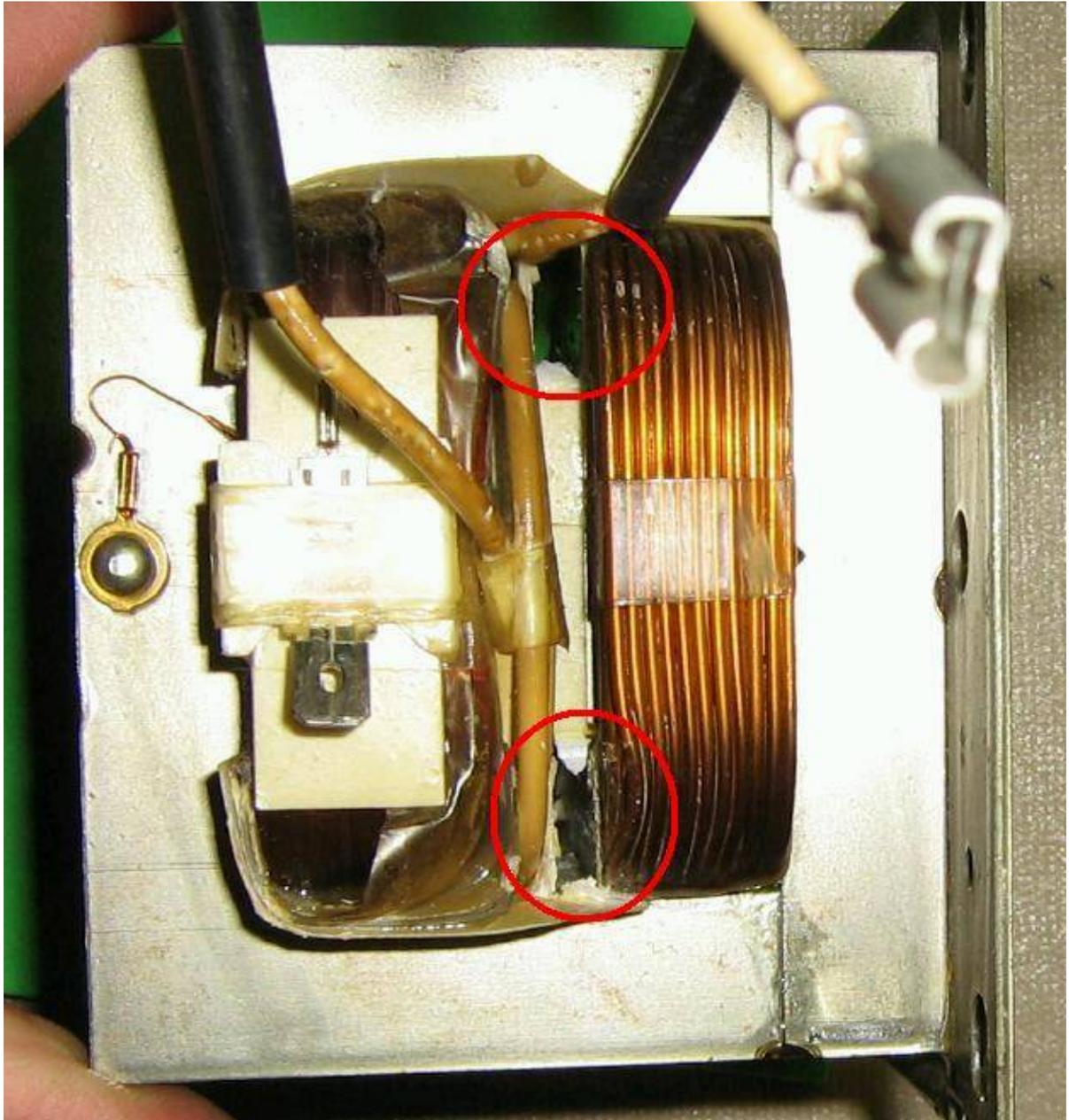
Internal view of the 120 VAC input connections.

The terminal block to the right will be for easy connection to the transformer's 1,800 VAC secondary output.

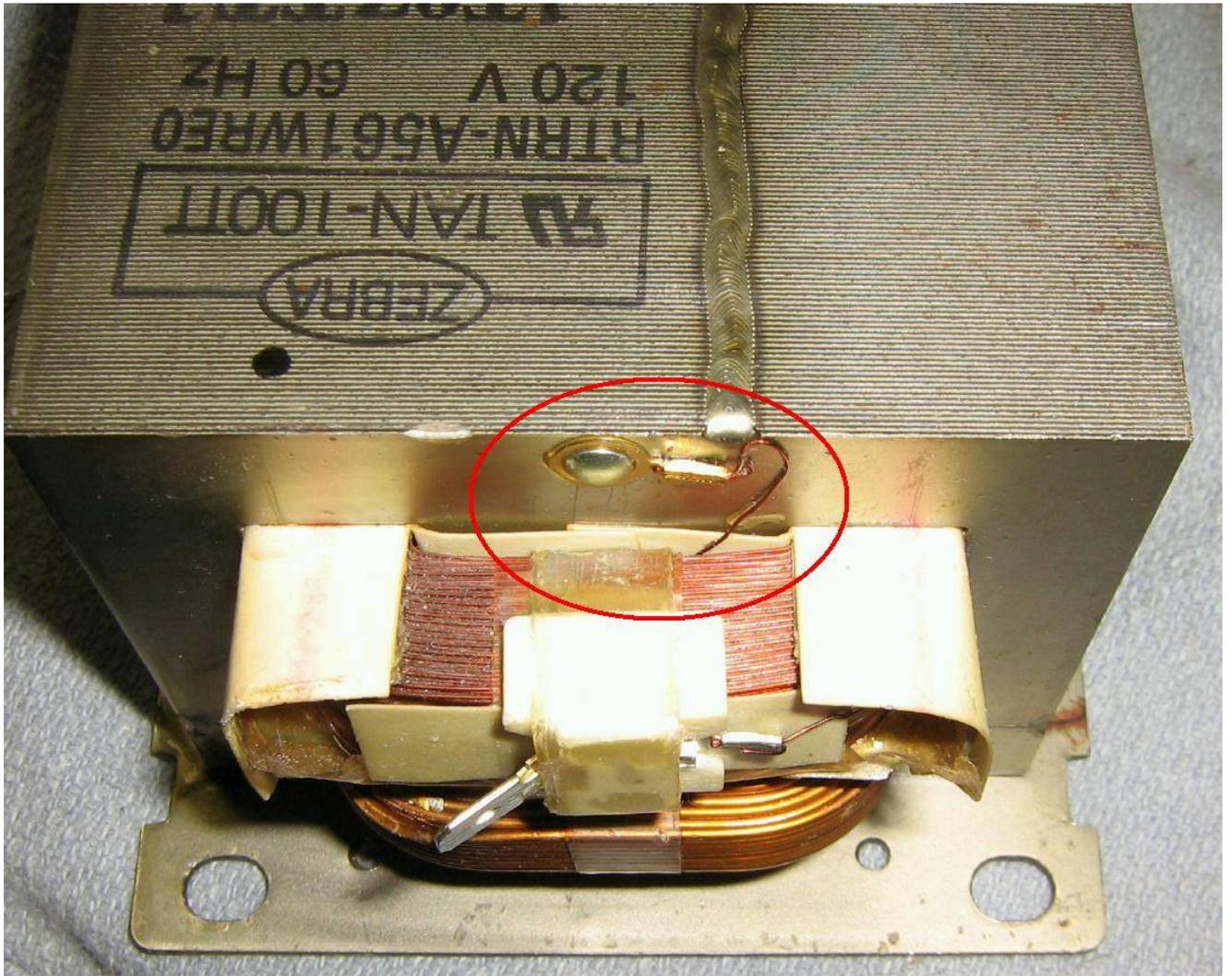


Close up of the microwave oven transformer.

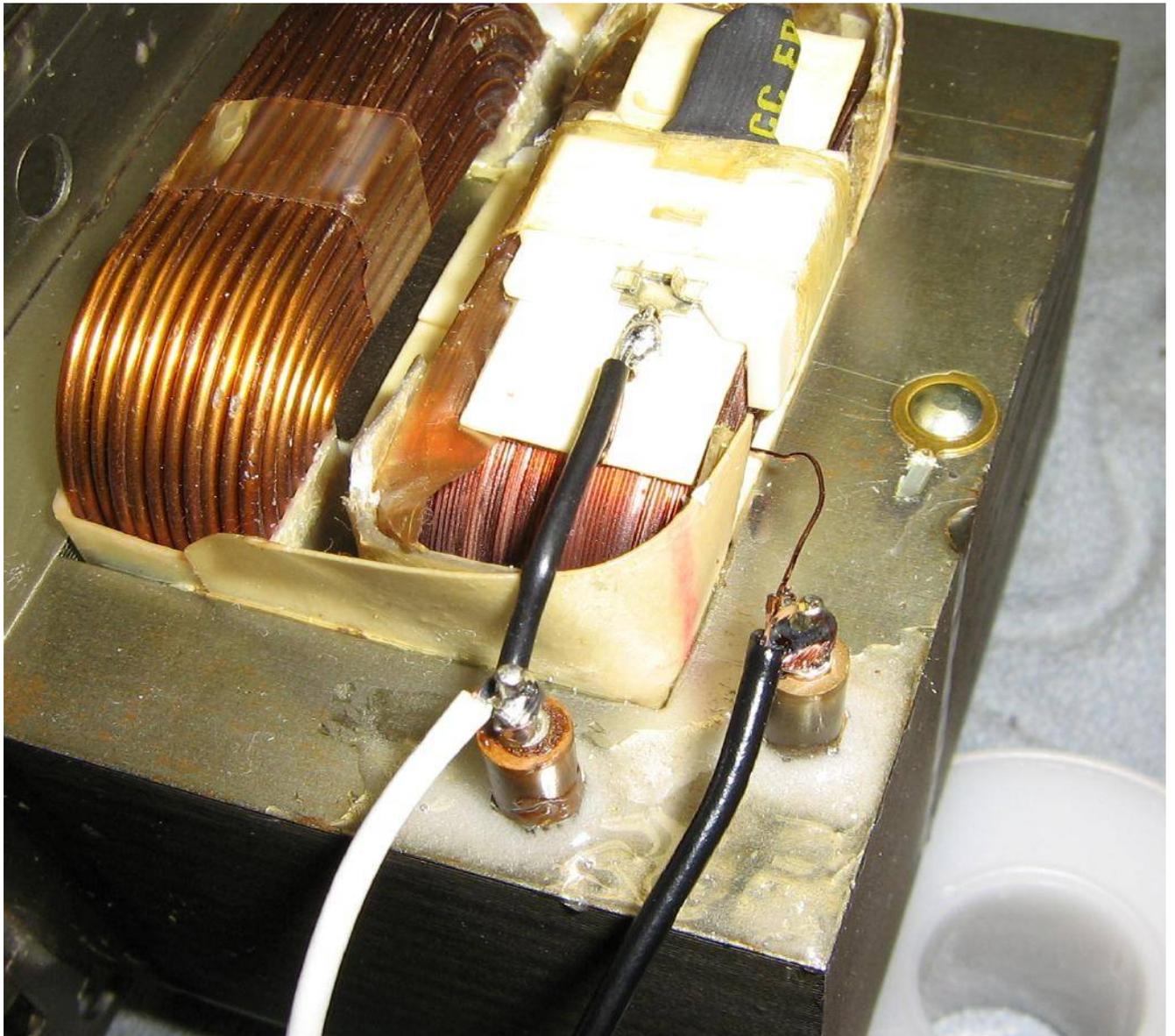
The 120 VAC primary input is on the left, the 3.3 VAC and 1,800 VAC secondaries are on the right. The 3.3 VAC filament winding wires can be removed.



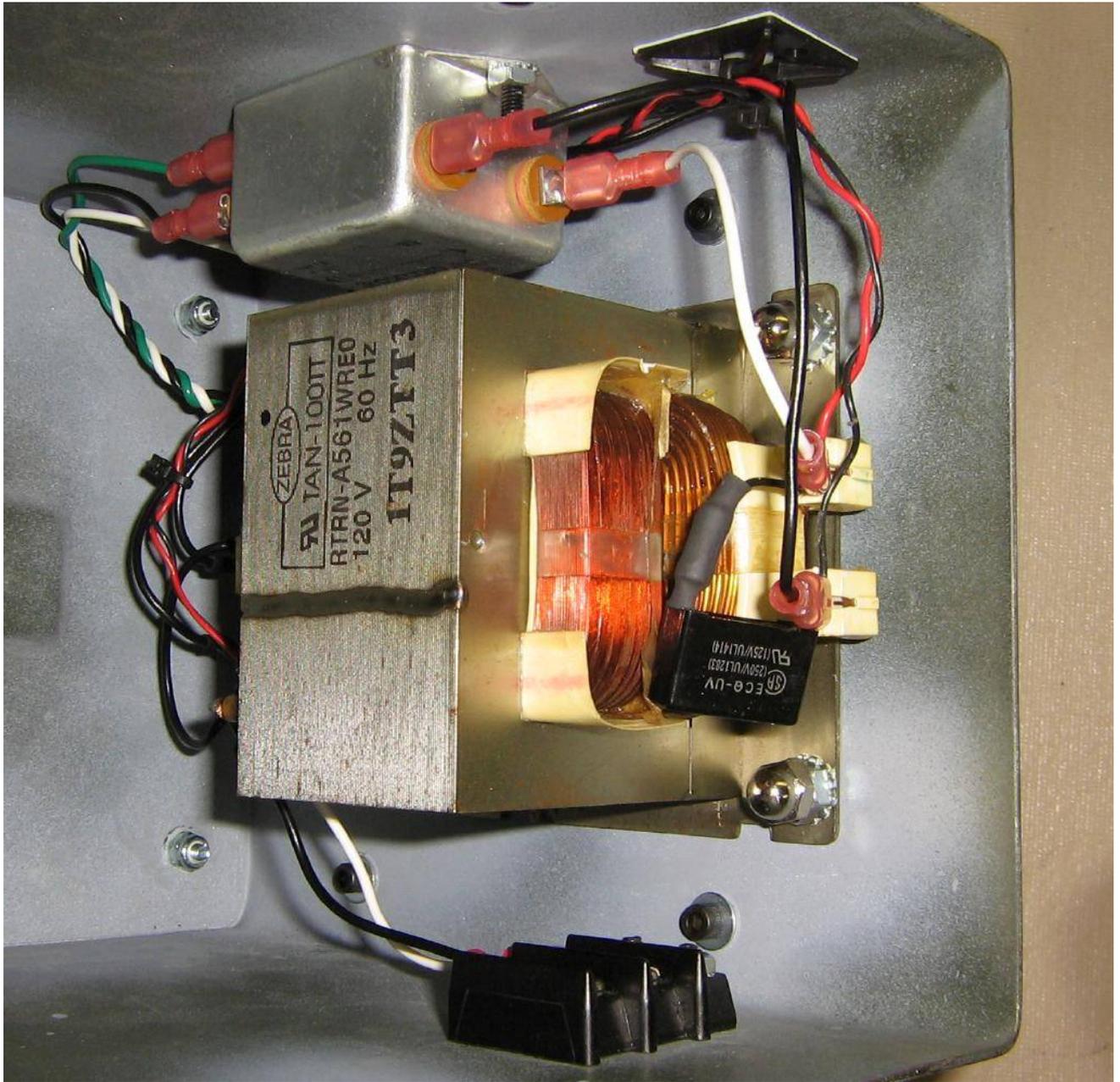
You may wish to knock out the magnetic shunts between the transformer's windings. You can see where they used to be in the above picture. Use a pin punch and a rubber mallet to gently loosen them. Try not to damage any of the transformer's windings.



You'll also need to isolate the transformer's secondary winding from the transformer's core. You can see this connection circled in the above picture.

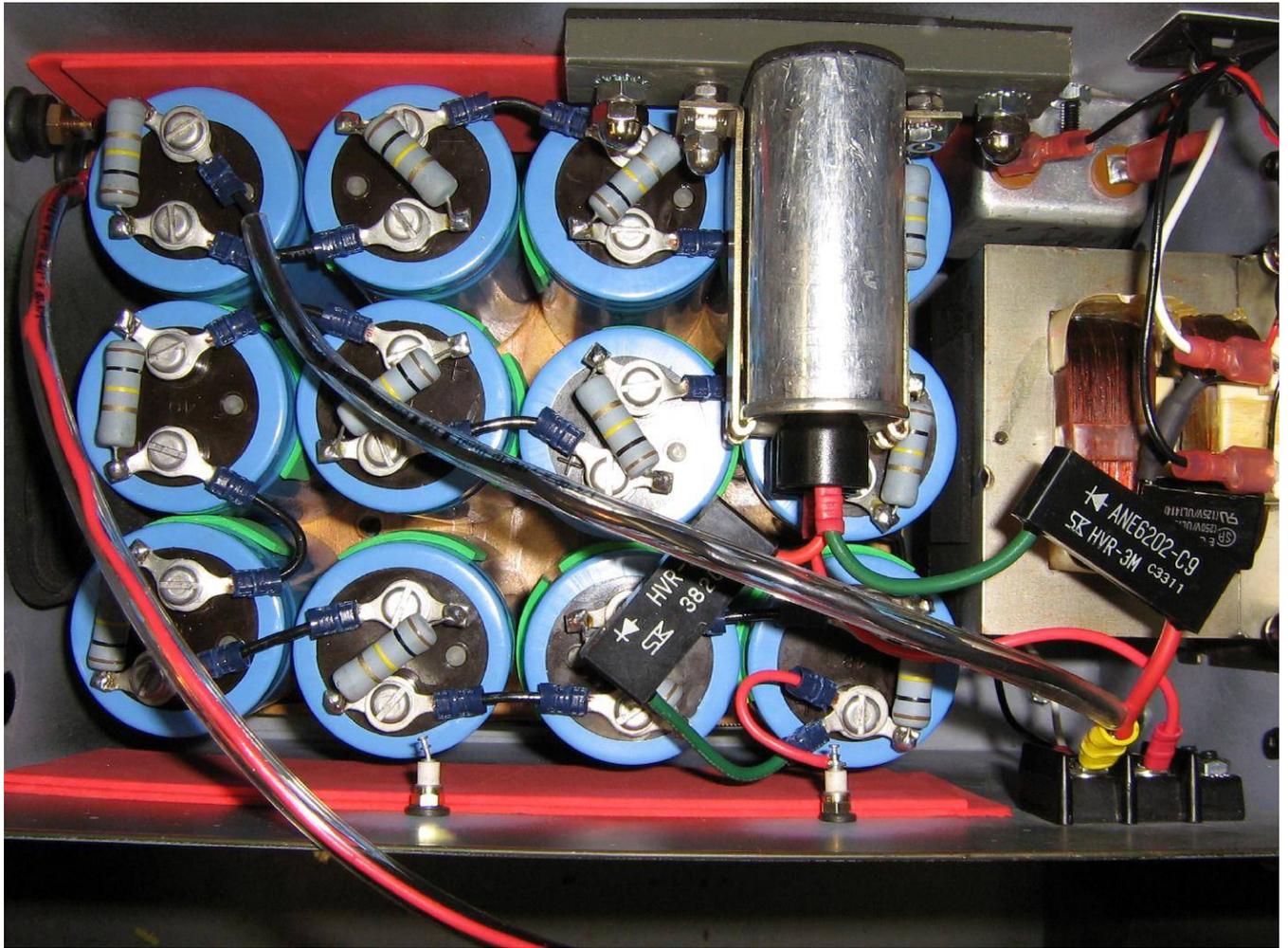


Here you can see how the transformer's windings were isolated and soldered to two stand-off insulators epoxied to the transformer. This gives the transformer a final 1,800 VAC (RMS) output which is isolated from Earth ground.



Mount the transformer as so. There is a transient snubber circuit across the transformer's primary input. The high-voltage secondary output goes to the black terminal block.

From here on, you'll need to exercise standard high-voltage construction practices and cautions.



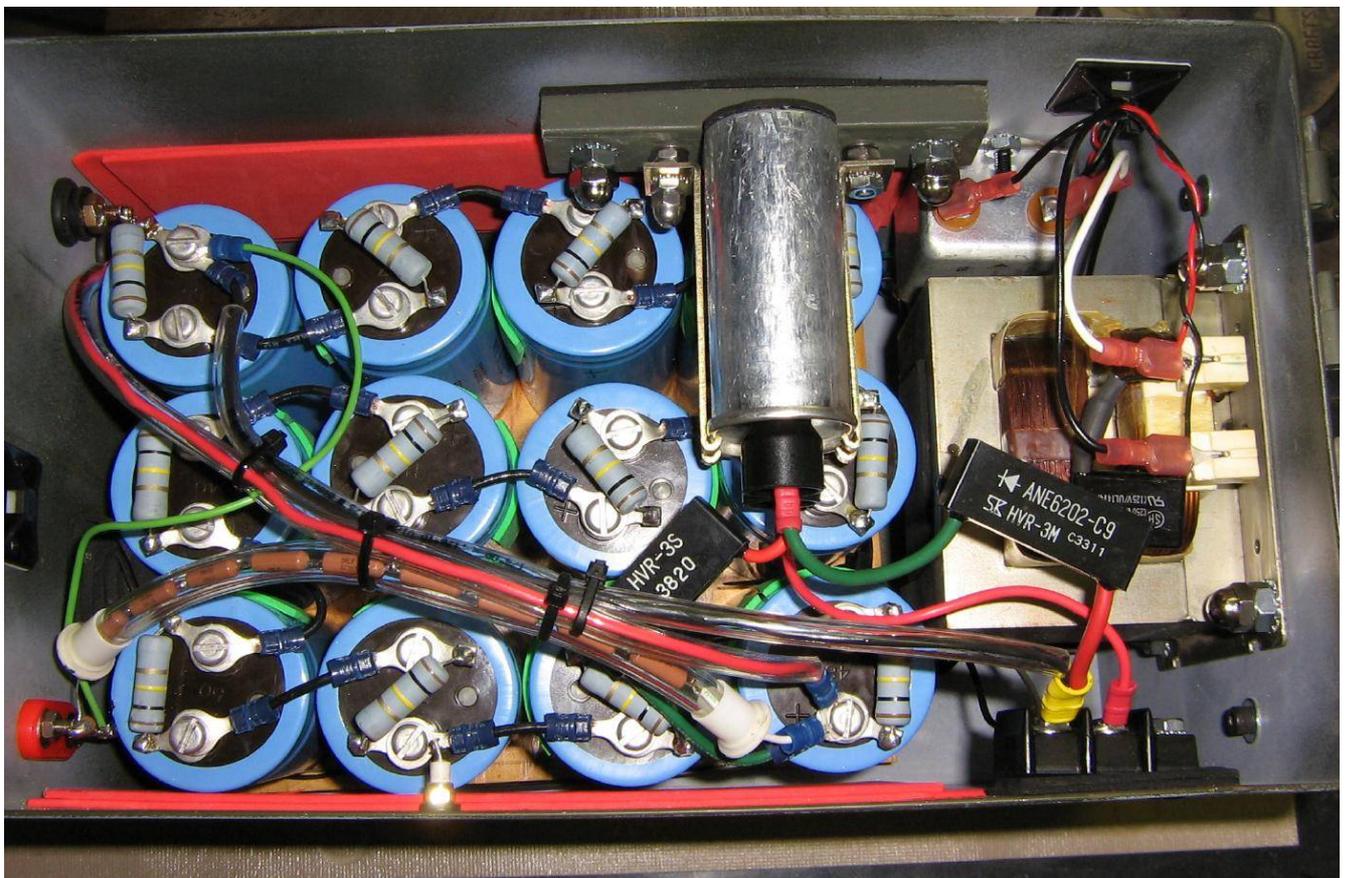
Install the ripple capacitor bank into the ammo box and mount the output and divider banana jack terminals making sure they are not shorted. Use additional rubber grommets or washers if needed.

The ammo box shown here in this project was slightly too small, so maybe try using something else. You'll also want to mount the high-voltage series capacitor at this time, again making sure its body is not shorted against anything. Double and triple check the polarity connections on *everything*, then connect up the voltage doubler diodes to the high-voltage series capacitor and ripple capacitor bank.



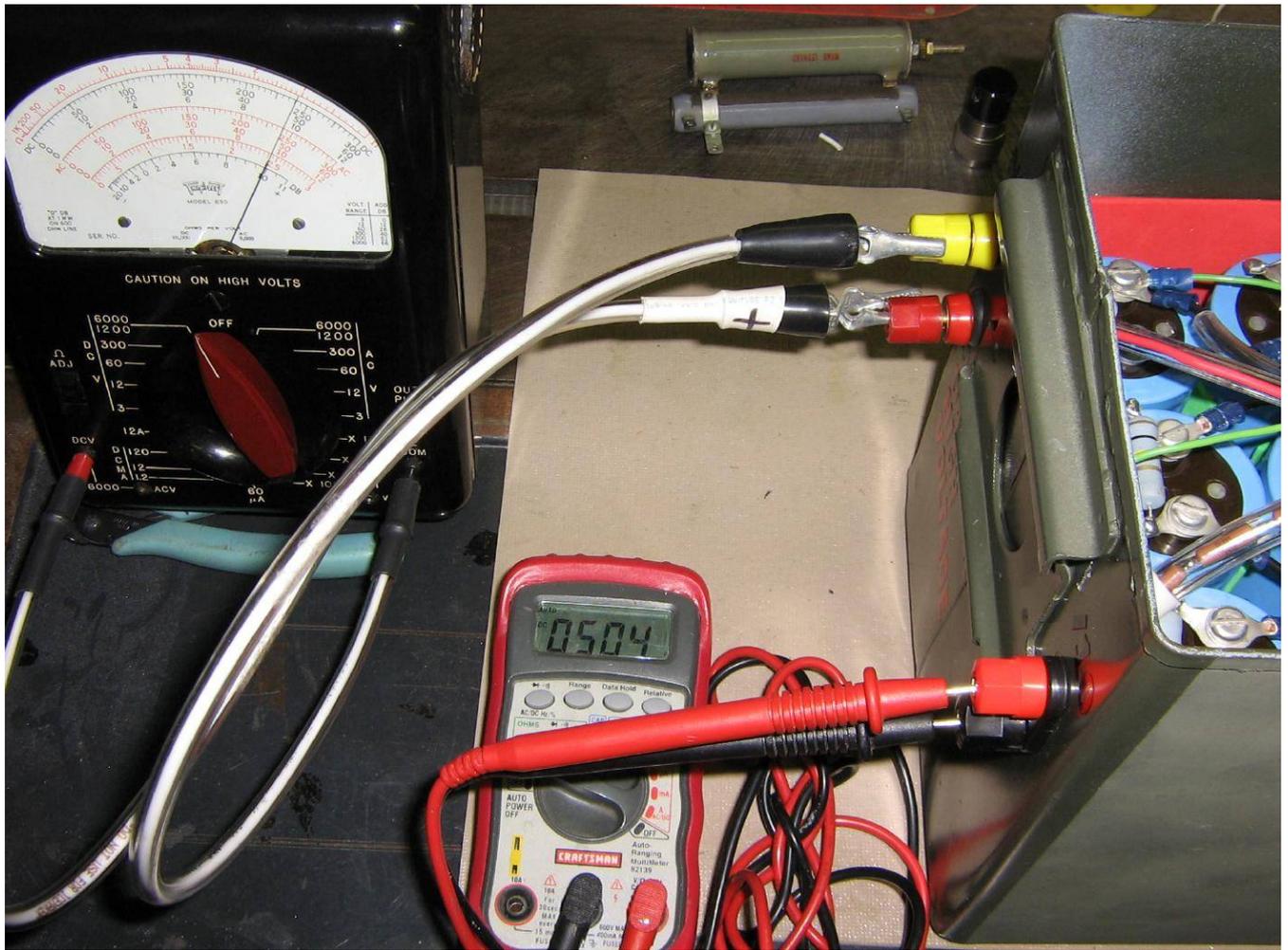
High-voltage divider resistor.

Nine 499 kohm resistors are wired in series and placed inside a piece of 3/8 inch I.D. vinyl tubing. Secure the ends of the tubing with plastic caps. This series-resistor network along with one more 499 kohm resistor make a "divide-by-10" voltage divider. This is so you can measure the power supply's final output without the need for a special volt meter.



Completed power supply internal view.

Long high-voltage connections are placed in vinyl tubing.



"I love it when a plan comes together..."

The theoretical final voltage output should be the transformer's 1,800 VAC output multiplied by 2.8 (5,040 VDC). The measured value from the divide-by-10 network is 504 VDC. This corresponds to an output voltage of 5,040 VDC. The analog meter is reading just under 5,000 VDC.



Completed front panel overview.

120 VAC input is on the lower right-hand side. The power switch has a protective rubber boot. The protection bars are four inch brass drawer handles.

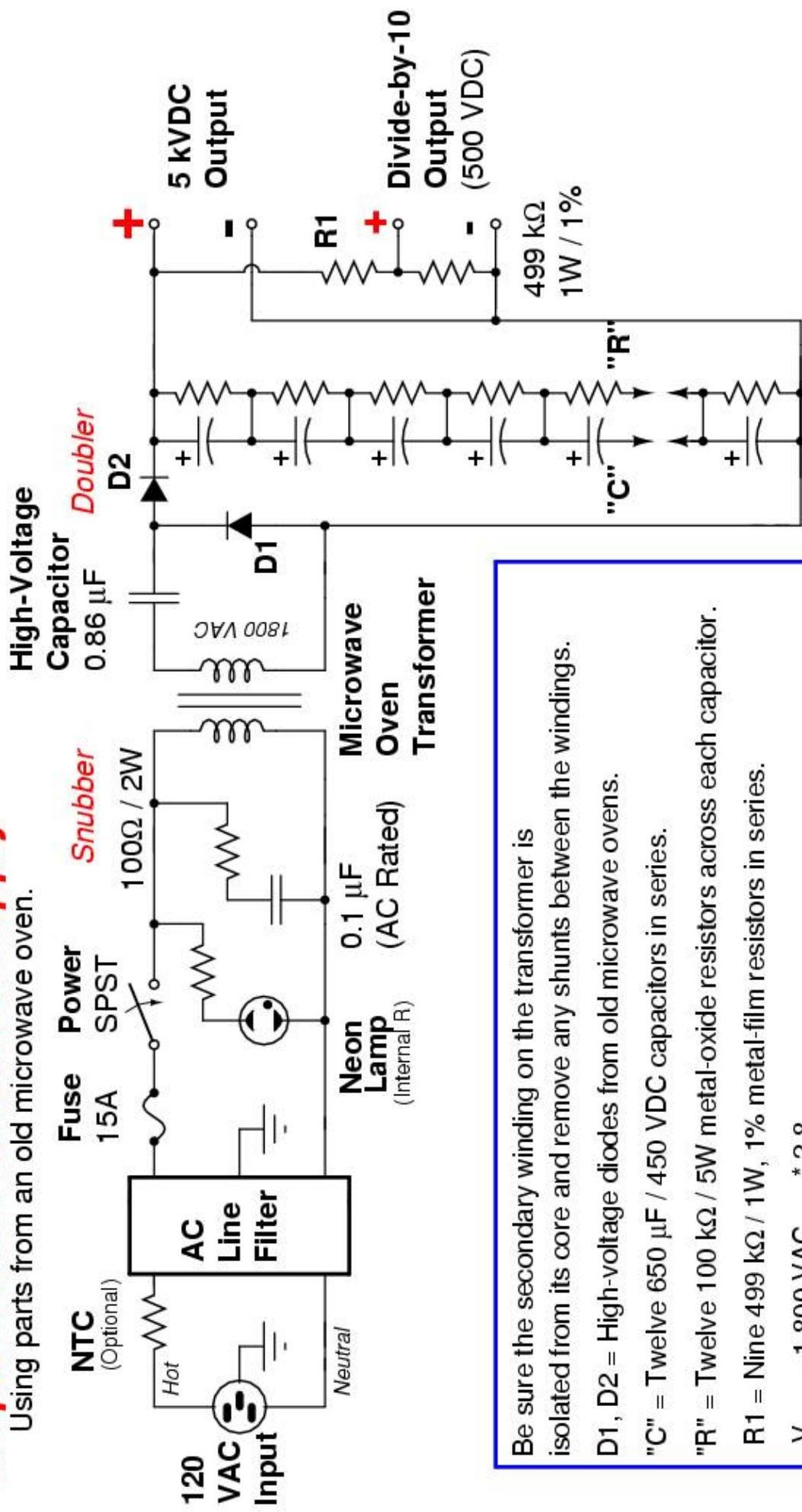


Completed rear panel overview.

The high-voltage output is on the left-hand side, and the divide-by-10 reference output is on the right-hand side.

Simple 4 Kilovolt Power Supply

Using parts from an old microwave oven.



Be sure the secondary winding on the transformer is isolated from its core and remove any shunts between the windings.

D1, D2 = High-voltage diodes from old microwave ovens.

"C" = Twelve 650 μF / 450 VDC capacitors in series.

"R" = Twelve 100 k Ω / 5W metal-oxide resistors across each capacitor.

R1 = Nine 499 k Ω / 1W, 1% metal-film resistors in series.

$V_{\text{OUT}} = 1,800 \text{ VAC}_{\text{RMS}} * 2.8$

Final Output Voltage = 5,040 VDC

MIMI

Photographed by Peter Gowland



RING-A-DING-DING, MIMI. How are we supposed to rap if you're on the phone all the time? "Hush, Sid. I'm waiting for my best buddy to get on the line so I can test out the new Hello-Phone telephone amplifier." But I'm right here, Luscious Lady, so why are you feeding that thing more coins? And by the way, what are you talking about? "Well, Dumbbell, once this call goes through, I just put the receiver on the table and you or anyone within a radius of 20 ft. can hear the person on the other end." I like your side of town best, Meem. "And I'd like you outta town pronto, Snooty Sid. Now the Hello-Phone—this wood-grain-look contraption that runs off a 9V battery and is the same size as a pencil cup—just needs to point to the receiver or the phone dial (depending on what make of phone you have). The gadget's keen for conference calls so everyone can listen in and it frees both hands so you can sit back, relax and take notes while listening. And if you're the busy type—which you obviously aren't—you can take care of business while waiting for your caller to get back on the line. Why, you can even talk to the other party while you're standing several feet from the receiver." You needn't worry, Princess, because I'll be here at your beck and call. "No, thanks, Transylvania Lineman, 'cause I'm not interested. Say hello to your own Hello-Phone by sending \$20 to Toki Intl. Inc., Box 15241, Santa Ana, Calif. 92705." Well, even though that's the way you seem to want things, I'll make sure my first call is to you so the world can hear me say "I love you!" "Don't be so sure, Hotbreath, 'cause you'll either get a busy signal or there'll be plenty of static on the line." ●

82

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End of Issue #47



Any Questions?

Editorial and Rants

Jonah Goldberg is the author of the New York Times bestseller [Liberal Fascism](#).

The Facts Your Liberal Friends Need to Hear

By Jonah Goldberg

Liberals, perhaps more than anyone, believe that we should be vigilant against the threat of fascism. Now, they also believe that fascism can only come from the Right—I think they're wrong. But, what liberals – and everyone else – very much need to understand is that whatever direction fascism comes from, it's popular. Fascism succeeds in democratic countries because it convinces people that it's the wave of the future, it's progressive, it's young, it's vital, it's exciting. Fascist promise to fix what's broken in our democracy, to heal our wounds, to deliver us to promised lands. So if you think fascism comes from the Right, fine. But at least keep in mind that it won't sell itself as dull, or uptight, or old-fashioned.

Let me take a moment to give you a concrete sense of what I mean.

Fascism appealed to youth activists. Indeed, the Nazis and Fascists were in major respects youth movements. In 1931, 60 percent of all German undergraduates supported the Nazi Student Organization. "Their goal," the historian John Toland wrote of the young idealists who fed the Nazi rise to power, "was to establish a youth culture for fighting the bourgeois trinity of school, home and church."

Meanwhile, middle and lower class Germans were attracted to the economic and cultural populism of Nazism. The Nazi party began as the German Worker's Party. The Nazis economic rhetoric was eerily similar to John Edwards "Two Americas" talk. The Nazis promised to clamp down on Big Business – particularly department stores, the Wal-Marts of their day – and end the class struggle. Theodore Abel, an impressively clever American sociologist, gives us insight into why working class Germans were attracted to Nazism. In 1934 Abel took out an ad in the Nazi Party journal asking "old fighters" to submit essays explaining why they had joined. He restricted his request to "old fighters" because so many opportunists had joined the party after Hitler's rise. The essays were combined in the fascinating book *Why Hitler Came Into Power*. One essayist, a coal miner, explained "Though I was interested in the betterment of the workingman's plight, I rejected

[Marxism] unconditionally. I often asked myself why socialism had to be tied up with internationalism—why it could not work as well or better in conjunction with nationalism." A railroad worker concurred, "I shuddered at the thought of Germany in the grip of Bolshevism. The slogan 'Workers of the World Unite!' made no sense to me. At the same time, however, National Socialism, with its promise of a community ... barring all class struggle, attracted me profoundly." A third worker wrote that he embraced the Nazis because of their "uncompromising will to stamp out the class struggle, snobberies of caste and party hatreds. The movement bore the true message of socialism to the German workingman."

Nazism's appeal to the professional classes was just as strong. Raymond Dominick, a historian specializing in the history of German environmentalism, found that by 1939, 59 percent of conservationist leaders had joined the Nazi party, while only 10 percent of adult males had. Forty five percent of medical doctors had joined and roughly one quarter of teachers and lawyers had. The two groups of professionals with the highest rates of participation in the Nazi Party? Veterinarians were first and foresters were a close second. Dominick found a "unique nexus between National Socialism and nature conservation."

The Nazis and Italian Fascists won—over big business, cultural elites, the youth and the lower—classes because they portrayed themselves as heroically on the side of progress, protecting the environment and the poor. Fascists preached unity, togetherness and an end to division.

Liberals need to ask themselves where do they hear this rhetoric the most?

I'm not saying that merely being for the environment, the poor or national unity makes you a fascist. But what I am saying is that if you're concerned about spotting fascism on the horizon you can't just look at people you don't like. That's like only looking for your lost car keys where the light is good. Huey Long reportedly said that if Fascism comes to America it will be called "anti—Fascism." Liberals can still make their arguments that fascism comes from the right. But until they understand that wherever fascism may come from, it never arrives save in a form that the best and the brightest are willing to accept with open arms.

And if liberals don't know their history, they won't be equipped to spot it when it comes knocking.

What Hillary and Barack Have in Store

By Jonah Goldberg

The most common left wing definition of fascism is "when business runs the government." Historically, this is basically nonsense. But that hasn't stopped liberals like Robert F. Kennedy Jr. from saying it over and over again.

But if we are going to go by that definition, conservatives in the U.S. are hardly the fascists. The principled conservative position is that the free market should rule the day. Businesses are never "too big to fail" and corporate welfare is folly. In all honesty, we must admit that many Republicans fail to live up to these conservative principles. But what are liberal principles? They are simply this: corporations should be "progressive." Government should regulate corporations heavily as a means of using big business as another branch of the state. Hillary Clinton wants "public—private partnerships." She believes that businesses must collude with government in providing universal healthcare to the point where it's impossible to tell where the government begins and business ends. She has contempt for entrepreneurs and small business. When it was pointed out to her that "Hillarycare" would hit small businesses while enriching big corporations, she replied that she couldn't worry about every under—capitalized business in America. Barack Obama, meanwhile,

talks incessantly about how government must police the "patriotism" of corporations. His definition of "patriotism" in this regard seems extremely elastic.

We've seen something like this before. Woodrow Wilson implemented a form of "war socialism" during WWI. Big Business and government worked seamlessly together under the auspices of the War Industry Board. Industry rigged the system for its own benefit, with the approval of government. When the war ended, the American people rejected Wilson's war socialism, but Progressive intellectuals didn't. They proclaimed "we planned in war" and, hence, felt they should be allowed to plan the economy during peacetime as well. They looked enviously at Fascist Italy and, even more so, the Soviet Union. These were the sort of grand "experiments" they wanted to conduct here at home. "Why," Stuart Chase asked in his 1932 book, *A New Deal* (which many credit with originating the phrase) "should the Russians have all the fun of remaking a world?"

They finally had their chance under the New Deal, where FDR – a veteran of the Wilson Administration – tried to recreate what the Progressives had wrought during the war. When Hugh Johnson – the head of the National Recovery Administration, the centerpiece of FDR's New Deal – took office in 1932, one of the first things he did was hang a portrait of Mussolini on his wall and started handing out pro-fascist literature to FDR's cabinet.

The left has told us that the New Deal rescued the little guy, the "forgotten man." But in reality it prolonged the Great Depression and served as a boon to Big Business.

For example, Clarence Darrow was charged with studying the effects of the NRA. In "virtually all the codes we have examined," he reported, "one condition has been persistent ... In Industry after Industry, the larger units, sometimes through the agency of ... [a trade association], sometimes by other means, have for their own advantage written the codes, and then, in effect and for their own advantage, assumed the administration of the code they have framed." We may believe that FDR fashioned the New Deal out of concern for the "forgotten man." But as one historian put it, "The principle seemed to be: to him that hath it shall be given."

The fundamental mistake Hillary Clinton, Barack Obama, John Edwards and company make is that they assume "clamping down" on corporations will lessen the role of big business in politics. The reality is exactly the opposite. Microsoft had nearly no lobbyists in Washington DC until Washington DC decided to go after Microsoft. Now, Microsoft has an enormous lobbying operation. Walmart is the same story. Once big business discovers that it's profit margins are determined in Washington, big business focuses on Washington.

Perhaps more importantly, really big corporations like regulations. Coca-Cola can pass its costs onto the consumer. But smaller business are not only hurt by regulations, they are also prevented from competing with the big boys because those regulations serve as a "barrier to entry."

The great "fascist bargain" with big business goes something like this: The government promises corporations market share, a lack of competition and reliable profits in exchange for compliance with its political and ideological agenda. Today big corporations hold up their end of the deal. They buy into global warming (often at a profit) they agree to all the tenets of diversity-mongering and affirmative action. They cast themselves as "Progressive" corporate citizens and in exchange we get economic policies that punish entrepreneurs and inhibit free markets.

This is as it should be according to the Progressives, the New Dealers and today's Democratic Party. And whether you want to call it fascism is up to you, but it fits what liberals have been saying about fascism to a T.

Government Knows Best

By Jonah Goldberg

Type "New York City Council" and "ban" and "2007" into Google. Here's some of what you find:

A *New York Times* story: New York City Council Approves Ban on Metal Bats

A BBC News story: "Racial slur banned in New York."

A CNN story on how New York is considering banning "ultrathin" models.

A *New York Sun* article on how New York City is contemplating banning feeding pigeons.

A link to the Humane Society's effort to ban horse drawn carriages.

And that's on the first page alone.

These sorts of stories trickle-in almost hourly. Sometimes we hear them and are briefly distracted by them, other times we tune them out as background noise. And, most often, we simply forget them, these little human interest stories that amused us for a moment on talk radio or in back pages of a newspaper.

Sometimes we giggle about what's happening in other countries, without long pondering that places like Canada and Britain often blaze the trail we are on. For example:

In Britain, in a perfectly typical event quickly forgotten, police tracked down and nearly arrested an 11-year-old boy for calling a 10-year-old boy "gay" in an e-mail. This was considered a "very serious homophobic crime" requiring the full attention of police. In 2006, the coppers fingerprinted and threw a 14-year-old girl into jail for the crime of racism. Her underlying offense stemmed from the fact that she refused to join a class discussion with some fellow students because they were Asian and didn't speak English.

In England, traffic cameras are now trained on drivers to arrest them for eating in their cars. And in both Britain and Canada, the old Hitler Youth slogan, "Nutrition is not a private matter!" has taken on a new life. One expert this week argued that obesity must now be treated like Global Warming (http://www.metro.co.uk/news/article.html?in_article_id=99600&in_page_id=34), requiring stern government intervention.

Health experts in Britain and Canada insist that the government has every right to meddle in the private life of its citizens since the state is picking up the tab for their healthcare (never mind that it's not the "state" but the taxpayers themselves). As Tony Harrison, a British health-care expert, explained to the *Toronto Sun*, "Rationing is a reality when funding is limited." So fat people and others can't get surgeries if bureaucrats or doctors don't think they're worthy of surgery. Now, of course, there's a certain logic here since the taxpayers are picking up the tab and someone has to make the hard choices about priorities. But it never occurs to these people that maybe the fact that the government is slowly being put in charge of many of the most important and personal issues in peoples' lives is in fact an argument against socialized medicine. It doesn't occur to them that refusing to unload seriously ill patients (http://www.dailymail.co.uk/pages/live/articles/news/news.html?in_article_id=515332&in_page_id=1770) from ambulances, sometimes for hours at a time, just so emergency rooms can meet government quotas, is a sign that something is seriously wrong with the way statist handle medicine.

Woodrow Wilson proclaimed that the goal of Progressivism was to have the individual "marry his interests to the State." "Government" he wrote in book, "The State," "does now whatever experience permits or the times demand." "No doubt," he wrote elsewhere, taking dead aim at the Declaration of Independence, "a lot of nonsense has been talked about the inalienable rights of the individual, and a great deal that was mere vague sentiment and pleasing speculation has been put forward as fundamental principle."

He was hardly alone. "[W]e must demand that the individual shall be willing to lose the sense of personal achievement, and shall be content to realize his activity only in connection to the activity of the many," declared the pioneering progressive social activist Jane Addams.

The old story of the frog who doesn't jump out of the pot because the heat is turned up so slowly comes to mind.

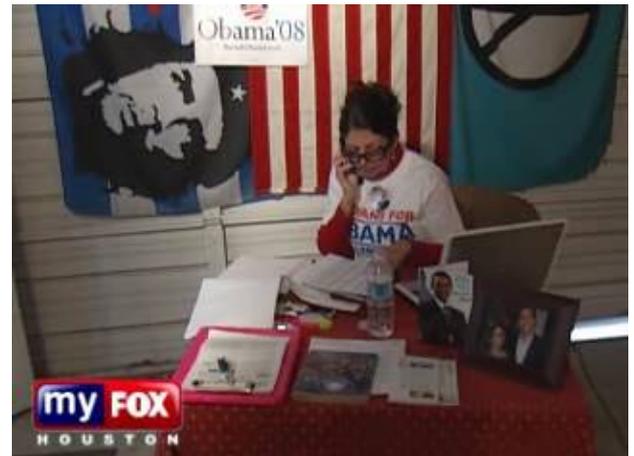
On countless fronts, the natural pastures of daily liberty are being paved over by bureaucrats, politicians and other do-gooders. They aren't merely fixing problems as they come up. They are laying-down a path to a world where people like them are in charge of our lives, in large ways and small. And when you realize it, the funny stories we so often hear, aren't so funny anymore.

Agenda for the 2008 Democratic National Convention

7:00 PM	Opening flag burning
7:15 PM	Pledge of Allegiance to the U.N. in Spanish
7:20 PM	Ted Kennedy proposes a toast
7:25 PM	Nonreligious prayer and worship with Jessie Jackson and Al Sharpton
7:45 PM	Ceremonial tree hugging
7:55 PM	Ted Kennedy proposes a toast
8:00 PM	How I Invented the Internet - Al Gore
8:15 PM	Gay Wedding - Barney Frank presiding
8:35 PM	Ted Kennedy proposes a toast
8:40 PM	Our Troops are War Criminals - John Kerry
9.00 PM	Saddam Memorial Rally - Cindy Sheehan and Susan Sarandon
11.00 PM	Ted Kennedy proposes a toast
11:05 PM	Collection for the Osama Bin Laden kidney transplant fund - Barbara Streisand
11:15 PM	Free the Freedom Fighters from Guantanamo Bay - Sean Penn
11:30 PM	Oval Office Affairs - William Jefferson Clinton
11:45 PM	Ted Kennedy proposes a toast
11:50 PM	How George Bush Brought Down the World Trade Towers - Howard Dean & Rosie O'Donnell
12:15 AM	"Truth in Broadcasting Award" - Presented to Dan Rather by Michael Moore
12:25 AM	Ted Kennedy proposes a toast
12:30 AM	Satellite address by Mahmoud Ahmadinejad
12:45 AM	Nomination of Hillary Rodham Clinton by Nancy Pelosi
12:50 AM	Speech and toast by Hugo Chavez to the departure of "the great satan", 'W' Bush
12:55 AM	Hillary proposes a toast to our 89 million new Democratic Mexican voters
1:00 AM	Ted Kennedy proposes a toast to the extinction of the Republican party.
1:05 AM	Coronation of Hillary Rodham Clinton
1:30 AM	Ted Kennedy proposes a toast
1:35 AM	Bill Clinton asks Ted Kennedy to drive Hillary home

"Mr. Obama recalled the opening lines of the Arabic call to prayer, reciting them with a first-rate accent. In a remark that seemed delightfully uncalculated (it'll give Alabama voters heart attacks), Mr. Obama described the call to prayer as one of the prettiest sounds on Earth at sunset."

— March 3, 2007 quote from Barak Obama in the *New York Times*.
(<http://select.nytimes.com/2007/03/06/opinion/06kristof.html>)



Barak Obama's little fascist following also worship a known Communist terrorist and child murderer.

Now there's a real shocker!

Barack Obama The anti-American

I find it a little disturbing how many people blindly jump on the Obama bandwagon just based on rhetoric. It's like a cult of fascist liberals with groupie fever.

Marked as: Mature

Apparently this country has gone downhill so far that a liberal presidential candidate doesn't even have to have good citizenship skills or be a patriot.

To view this video you need at least version 6 of your flash player. Please upgrade your flash player [HERE](#) After your player has been upgraded, restart your browser and revisit the current page.

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US doubles Bin Laden reward to \$50 million

Senate doubles Bin Laden reward Friday, 13 July 2007, 17:45 GMT 18:45 UK The US Senate has voted 87-1 to double the reward for the death or capture of al-Qaeda chief Osama bin Laden to \$50m. ..



Obama gives AL QAEDA a free pass in Iraq

I don't think he knows that Al Qaeda is VERY ACTIVE in Iraq, or he doesn't care maybe



Bin Laden Son Wants to Be Peace Activist

CAIRO, Egypt (AP) - Omar Osama bin Laden bears a striking resemblance to his notorious father—except for the dreadlocks that dangle halfway down his back. Then there's the black leather biker

Barak Obama's little fascist following are also going around marking YouTube and Liveleak videos they don't agree with as "mature." This is so people will have a harder time viewing them, especially if you're at work or school.

Straight from NOAA's website. You won't hear this on CNN!

Increased Hurricane Losses Due to More People, Wealth Along Coastlines, Not Stronger Storms, New Study Says

February 22, 2008 – From: www.noaanews.noaa.gov

A team of scientists have found that the economic damages from hurricanes have increased in the U.S. over time due to greater population, infrastructure, and wealth on the U.S. coastlines, and not to any spike in the number or intensity of hurricanes.

"We found that although some decades were quieter and less damaging in the U.S. and others had more land-falling hurricanes and more damage, the economic costs of land-falling hurricanes have steadily increased over time," said Chris Landsea, one of the researchers as well as the science and operations officer at NOAA's National Hurricane Center in Miami. "There is nothing in the U.S. hurricane damage record that indicates global warming has caused a significant increase in destruction along our coasts."

In a newly published paper in *Natural Hazards Review*, the researchers also found that economic hurricane damage in the U.S. has been doubling every 10 to 15 years. If more people continue to move to the hurricane-prone coastline, future economic hurricane losses may be far greater than previously thought.

"Unless action is taken to address the growing concentration of people and property in coastal hurricane areas, the damage will increase by a great deal as more people and infrastructure inhabit these coastal locations," said Landsea.

The *Natural Hazards Review* paper, "Normalized Hurricane Damage in the United States: 1900–2005," was written by Roger A. Pielke Jr. (University of Colorado), Joel Gratz (ICAT Managers, Inc.), Chris Landsea, Douglas Collins (Tillinghast–Towers Perrin), Mark A. Saunders (University College London), and Rade Musulin (Aon Re Australia).

The team used two different approaches, which gave similar results, to estimate the economic damages of historical hurricanes if they were to strike today, building upon the work published originally by Landsea and Pielke in 1998, and by Collins and Lowe in 2001. Both methods used changes in inflation and wealth at the national level. The first method utilized population increases at the county coastal level, while the second used changes in housing units at the county coastal level.

The results illustrate the effects of the tremendous pace of growth in vulnerable hurricane areas. If the 1926 Great Miami Hurricane were to hit today, the study estimated it would cause the largest losses at \$140 billion to \$157 billion, with Hurricane Katrina second on the list at \$81 billion.

The team concludes that potential damage from storms – currently about \$10 billion yearly – is growing at a rate that may place severe burdens on exposed communities, and that avoiding huge losses will require a change in the rate of population growth in coastal areas, major improvements in construction standards, or other mitigation actions.

The National Oceanic and Atmospheric Administration, an agency of the U.S. Commerce Department, is dedicated to enhancing economic security and national safety through the prediction and research of weather and climate-related events and information service delivery for transportation, and by providing environmental stewardship of our nation's coastal and marine

resources. Through the emerging Global Earth Observation System of Systems (GEOSS), NOAA is working with its federal partners, more than 70 countries and the European Commission to develop a global monitoring network that is as integrated as the planet it observes, predicts and protects.



AP Associated Press

Wed Mar 12, 1:45 AM ET

Thai-Muslim protesters chant slogans next to a photo of a Danish cartoonist during a protest outside the Danish embassy in Bangkok, Thailand Wednesday, March 12, 2008. Some 800 Thai Muslims took part in the protest against the reprinting of a cartoon in Danish newspapers perceived as insulting to Islam. (AP Photo/Apichart Weerawong)

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From:

<http://news.yahoo.com/nphotos/slideshow/photo//080312/481/640c0bf2e4c74c418691b61d419bfc96>

Note the "photo" actually shows this Danish cartoonist's decapitation and a dog peeing on him.

The Associated (with terrorists) Press never mentions this.