

GBPPR 'Zine



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"... grievous mental suffering inflicted upon Libellant by Libellee"

---- Listed reason on the March 10, 1964 divorce papers between Stanley Ann Obama (Libellant) and Barack Hussein Obama (Libellee).

I wonder if we can divorce the U.S. from *our* Barack Hussein Obama! LOL! Change!

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Verify each TNN moved to active TG as follows.

- (1) Verify each TNN by entering:

VF:TNSVY:S bbcdef,XPND!

bb = TLN (00 through 15)

c = Trunk switch frame or circuit (0 through 7)

d = Grid (0 through 3)

e = Switch (0 through 7)

f = Level (0 through 7).

- (2) Compare the TR14 output message with the data on Form ESS 1229. If the TR14 data is wrong, unassign TNN [refer to 6.2.9(8)] and repeat from Step (1).
- (3) Verify the TG data by entering:

VFY-TKGN-14 aaa.

aaa = TG number.

- (4) Compare the TR10 output message data (Fig. 12) with the data obtained from forms.
- (5) Does the TR10 output message contain an auxiliary block address?

If so, proceed as follows.

- (a) Enter:

DUMP:CSS,ADR cccccc,INC -1,L2;BIN!

ccccc = Auxiliary block address.

- (b) Using the DUMP:CSS output message, determine whether bits 22-18 of the first word of the auxiliary block are all zeros. If so, convert bits 9-0 of the word before auxiliary block to decimal; subtract 1 from the decimal number to determine the length of the auxiliary block. If bits 22-18 are not all zeros, convert bits 22-18 to decimal to determine the length of the auxiliary block; if this number is greater than 3, continue on to next step.

- (c) Enter:

DUMP:CSS,ADR cccccc,L bbbb;BIN!

ccccc = Auxiliary block address
bbbb = Length of auxiliary block.

- (d) Using the DUMP:CSS output message, convert the binary TNNs listed in the auxiliary block to decimal.

Note: List of TNNs begins at word 3 (fourth word of DUMP:CSS output).

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- (e) Verify that the TNNs listed in the auxiliary block agree with those moved to the active TG (Form ESS 1229A2).

6.2.12 Verify Trunk Members

At the MTCE terminal, verify member list as follows.

- (1) Enter:

TRK-GROUP-LT 0 0 nnnn.

nnnn = TG number.

- (2) Verify that the TNNs listed in the TN15 output message agree with those moved in TG.

6.2.13 Assign RI (Route Index)

At the terminal, assign the RI as follows.

- (1) Construct RC message per Table K and Fig. 19.
- (2) Enter RC message as constructed in Step (1) and observe the RC18 3 0 ACPT response.

6.2.14 Assign RI to Pseudo Route Index

At the terminal, assign RI to pseudo RI for service circuit TG. Proceed as follows.

- (1) Construct the RC message below:

**RC:RI:
PRI bbb
RI cccc!**

bbb = Pseudo RI (Form ESS 1303C, columns 52-54):

- = 169 for new ringing circuit (SD-1A621-01)
- = 176 for ATI circuit
- = 183 for ICLID test circuits

cccc = RI (Form ESS 1303C, columns 20-23).

- (2) Enter RC message as constructed in Step (1) and observe the RC18 3 0 ACPT response.
- (3) Using the MTCE terminal, idle all trunks by entering the following message for each TNN.

T-TNN-MI 00 ttttt.

ttttt = TNN.

Observe the TN06 ttttt dddd ACT response (where ttttt = TNN, and dddd = TG number).

- (4) Update office records.

Test all trunk members by performing trunk diagnostic tests (refer to Part 8).

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TABLE K		
RC:RI KEYWORDS		
RC MESSAGE	FORM ESS 1303C COLUMNS	REMARKS
RC:RI:	—	Message heading
RI cccc	20-23	cccc = Route index
TG bbb	25-27	bbb = Trunk group number
NRI aaaa	45-48	aaaa = Next route index. For SD-1A621-01, the NRI is a special ringing circuit (SD-1A188). = 2047 when columns = STOP
TCC ggg	—	Trunk class code. Used only if trunk group contains no members. Form ESS 1229A2, columns 41-43
FIXED	20-23	Fixed route index. Required when RI is 199 or less
CST ff	39	ff = LO (Low tone, steady)/HI (high tone, steady)/DL (double burst, low tone)/DH (double burst, high tone) class of service
CRC h	40	h = Coin return code
OPT ii	43-44	ii = Options
TATO u	55	u = 0 (column = 1)/1 (column = 3)/2 (column = 5)/3 (column = 7) for tone and announcement time-out period. Do not use when column = 0
SFMUT	56	Single frequency mutilation flag when column marked

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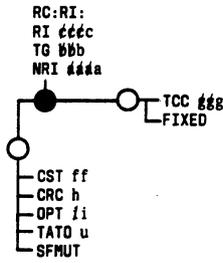


Fig. 19 — RC:RI Message Flowchart

6.3 Assign Traffic and Plant Measurements

Assign traffic and plant measurements and destination codes per AT&T TOP 231-371-001 and AT&T Practice 231-300-015.

7. ISPICM (ISPI CONTROLLER MAINTENANCE)/DIAGNOSTICS

Both automatic and manual diagnostics are available for testing ISPIC's hardware. The results of these tests can be used by maintenance personnel to maintain the performance standards of the circuits.

For active ISPICs, the "heartbeat" test runs continuously in the background if the firmware issue of the ISPIC(s) is as follows: for the ASC — MC6A002-A1, Issue 4 and later; and/or for the ISU — MC6A004-A1, Issue 5 and later. The "heartbeat" test provides a sanity check on the I/O channels. All functional operations of the data links are verified. If a channel is being communicated over, the data link LED (DL0/DL1) on the ISPIC is on (or otherwise blink). If such indication is not visible, then there is no communication over the I/O channel. As a result, fault recovery actions can occur in an effort to recover the channel and/or re-establish communication with an ISPIC. To restore an I/O channel, refer to AT&T Practice 231-302-305.

The firmware in the ISPICs can reject requests from ISPI clients (LASS, MSS, etc.) for various reasons. The reason(s) for the rejection are printed in the **ISPI ERROR** output message.

Automatic diagnostic requests can originate from the following stimulus:

- Controller power-up
- Controller fuse replacement
- Detection of IOP FDDL (full duplex data link) fault
- Detection of ISPIC hardware fault
- REX (routine exercise)
- ISPI trunk maintenance error analysis.

Caution: When an ISPIC is diagnosed or removed from service, the state of the ISPIC is changed to OOS (out of service), and its associated TIs are changed to H&W (high and wet). Calls that are in progress are not lost; however, no new calls are allowed.

If an automatic controller diagnostic passes, the controller is restored to active service. Whenever an ISPIC is restored to service, its associated TIs are returned to their previous state.

If an automatic controller diagnostic fails, the controller remains OOS and the TIs H&W. In addition, a status message (**ISPI CONT STATUS**) prints, and a major alarm sounds. All OOS ISPICs are identified in the hourly **MA03** output message.

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7.1 ISPICM Input Messages

Manual controller maintenance actions are requested at the I/O terminal. Refer to IM-6A001 for details of the "ISPI-C-" input message.

7.2 ISPICM Output Messages

Existing output messages, DR01, DR02, and DR04, report the diagnostic results for ISPICs. Other controller maintenance results are reported by "ISPI" output messages. These messages are explained in OM-6A001 and in PR-6A1377. For ISPIC diagnostic raw data analysis, refer to PK-6A1374.

7.3 Replace ISPIC Firmware Circuit Board

To replace an ISPIC firmware circuit board, proceed as follows:

- (1) Enter ISPI-C-STA ALL 0000.
- (2) Verify the ISPI TNN physical assignments; refer to 6.2.4 for procedure.
- (3) Toggle the ACI (TM435 board) ROS/RTS switch to ROS (request OOS).

Response: OOS LED flashes (on ACI board)

- (4) Wait for ACI OOS LED to stop flashing (i.e., OOS LED steady on).

Caution: If at any time it is desired to power down an OOS ASC unit after the installation of TM690 PSM/TM744 EPSM board(s), first lower the locking tab(s) which shuts off the internal circuitry of the TM690 PSM/TM744 EPSM board(s). This ensures the integrity of the data that is loaded into the board(s).

- (5) Depress the OFF button on the PMC board (TM507).
- (6) Remove the old firmware circuit board.
- (7) Plug in the new firmware circuit board.
- (8) Depress the ON button on the PMC board.
- (9) Toggle the ACI ROS/RTS switch to RTS (return to service).

Response: OOS LED flashes

- (10) Wait for ACI OOS LED to stop flashing (i.e., OOS LED steady off).
- (11) Perform trunk diagnostics (using T-TNN-DG or from TLTP) on one of the ISPI TNNs listed in the TR13 output message (from Step 2 above) if the ISPIC has assigned/equipped TNNs. Refer to 8.2.1 for trunk diagnostic procedures.

End of Procedure

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8. ISPI TRUNK MAINTENANCE/DIAGNOSTICS

Trunk maintenance/diagnostics consist of the following functions:

- (a) Removing and restoring ISPI TIs from/to service
- (b) Running diagnostic tests on suspected faulty trunk circuits
- (c) Routine testing of all trunk circuits via APT (automatic progression testing)
- (d) Verifying (manually) the trunk circuits from the trunk test positions.

Whenever a call processing call that involves an ISPIC fails, the associated TNN is placed on the TML. All such trunks are identified in the **ISPI ERROR** output message.

8.1 Removing and Restoring ISPI TIs

When an ISPIC is taken out of service, the associated ISPI TIs are placed H&W (high and wet). These trunks will remain H&W until the controller is returned to service. Afterwards, the trunks are restored to their previous states.

8.1.1 Determine Status of ISPI TIs

To determine the status of ISPI TIs, perform Step (a) or Step (b).

- (a) For a single trunk, enter the following message and observe the TN07 output response.

T-TNN-RS 0 0 tttttt.

ttttt = TNN.

- (b) For a trunk group, enter the following message and observe TN15 output response.

TRK-GROUP-LT 0 0 dddd.

dddd = Trunk group number.

8.1.2 Removing ISPI TIs from Service

ISPI TI circuits can be physically removed from service without powering down the associated ISPIC. This may be accomplished by performing Step (a) or Step (b).

- (a) From the trunk test panel, access the TNN, operate the **MAKE BUSY** key (or equivalent), and then release the **TRUNK** key (or equivalent). For details, refer to the appropriate AT&T practice listed in the next to the last paragraph in 8.2.1.
- (b) At the MTCE terminal, enter the following message and observe the TN06 or TN05 output response.

T-TNN-LO 0 0 aaaaaa.

aaaaaa = TNN.

If ISPI TI circuits are physically removed from the ISPIC, they must be logically unassigned in translations as well. If not unassigned in translations, the ISPIC diagnostic will be CATP until the logical and physical trunk assignments match. This may be accomplished by performing Step (c) or Step (d).

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- (c) Zero the unit-type-27 auxiliary block word associated with the TNN (slot). Remember the TNN for when it is later physically equipped.
- (d) Use the following RC message to unequip trunk(s).

**RC:TRK;OUT:
TNN aaaaaa!**

aaaaaa = TNN.

Note: As result of this message, the TNN is removed from the unit-type-27 auxiliary block.

8.1.3 Restoring Trunks to Service

Trunks may be restored to service by performing Step (a) or Step (b).

- (a) If testing at the trunk test panel, release all necessary test keys, and operate the **RMV BUSY/REMOVE BUSY** key (or equivalent) for each trunk. For details, refer to the appropriate AT&T practice listed in the next to the last paragraph in 8.2.1.
- (b) If testing at the MTCE terminal, enter the following message for each TNN, and observe the TN06 or TN05 output response.

T-TNN-MA 0 0 aaaaaa.

aaaaaa = TNN.

8.2 Diagnostic Tests

8.2.1 Existing Operational Trunk Tests

Several existing operational trunk test procedures can be used to test certain functions of the ISPI TI or ICLID test circuit from the trunk test panels (or via input messages). The functions that can be tested are given below.

Note 1: The trunk diagnostic fails if the ISPIC has not been pumped via the ISPIC diagnostic since the trunk assignment and physical equipage.

The 2-digit diagnostic test codes are as follows.

- (a) The following test codes may be used to test a single trunk or TG (see Note 2):
 - 00 — Normal diagnostic for specified trunk (without raw data)
 - 20 — Repeat normal diagnostic 32 times on specified trunk (without raw data)
 - 40 — Normal diagnostic with raw data
 - 60 — Repeat normal diagnostic 32 times with raw data.

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Note 2: If a TG diagnostic is requested, all failing trunks, up to the AML, are taken out of service.

- (b) The test codes listed below are used only for TGs (see Note 2):
- 06 — Normal diagnostic for specified trunk (without raw data). All failing trunks are removed from service
 - 26 — Repeat normal diagnostic 32 times on specified trunk (without raw data). All failing trunks are removed from service
 - 46 — Normal diagnostic with raw data. All failing trunks are removed from service
 - 66 — Repeat normal diagnostic 32 times with raw data. All failing trunks are removed from service.

The following test code is used ONLY for a single trunk: 0 — (**Abort repeat test** on trunk).

Existing 4-digit diagnostic test codes can be used to operate or release signal distributor points associated with the trunk under test. The same is true for central pulse distributor points.

The above tests may be requested by performing Step (1) or Step (2).

- (1) If testing at the trunk test panel, operate **test** key, dial 6-digit TNN or 3-digit TG number, then dial *cc and # where "cc" is the test code (above). For details, refer to the appropriate AT&T practice listed in the next to the last paragraph in 8.2.1.
- (2) If testing at the MTCE terminal, enter one of the following:

Note 3: In order to perform trunk diagnostics via input messages, the controller(s) must be in the active state.

- (a) T-TNN-aa 0 0 tttttt.
- (b) TRK-GROUP-aa 0 0 dddd.
- (c) TRK-LIST-fff.

aa = DG — Diagnose trunk (without a raw data printout)
= DR — Diagnose trunk and print diagnostic raw data if a failure occurs (Not used in TRK-GROUP message). Refer to PK-1A045.

ttttt = TNN
dddd = TG number
fff = SOS — Diagnose all service circuits on the out-of-service list.

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In response to the above input, the system response should be the TN05, TN15, TN10, TN01, or TL01 output message. Refer to OM-6A001 for interpretation of response.

For details on the above test panel procedures, refer to AT&T TOP 231-050-009 (TLTP), 231-050-008 (STTP), 231-050-007 (MTTP), or AT&T Practice 190-104-302 and AT&T Document OPA-1P036-01, Section 2 (CTTU/RTTU).

Diagnostics can also be run at scheduled time intervals (APT). If a trunk circuit fails the diagnostic, the circuit is immediately retested. A second failure results in the circuit being removed from service — provided that the AML for the TG is not exceeded. The AML for ISPI TGs can be as large as 25 percent of the trunks in a small TG or as small as 12 percent for a large TG.

8.2.2 Diagnostics for Announcement(s)

The following (five-digit) test codes request that a specific announcement phrase or sequence of announcement phrases be played over the ISPI TI associated with an ASC. These tests provide manual verification of the contents as well as the quality of the recorded announcement phrases. The procedure for requesting the announcement phrase(s) is as follows.

- (a) At the trunk test panel, dial 6-digit TNN, then dial *nmmmm and #.

where n = 2 — Request repetition of the announcement phrase specified by "mmmm"
= 3 — Request a sequence of announcement phrases starting at "mmmm"
mmmm = Announcement phrase number to be played (0 through 9999).

For details on the above test panel procedures, refer to AT&T TOP 231-050-009 (TLTP), 231-050-008 (STTP), 231-050-007 (MTTP), or AT&T Practice 190-104-302 and AT&T Document OPA-1P036-01, Section 2 (CTTU/RTTU).

- (b) Repeat procedure for other trunks to be tested.

8.3 Analyze Diagnostic Results for ISPI TIs

Refer to PK-1A045 for raw data analysis.

9. CUSTOM ANNOUNCEMENTS FOR THE ASC

All custom announcements were originally supplied on a unique-micro-coded TM432 SSM board, a customized circuit pack. This method is currently available only to those offices with assigned custom announcement micro-codes, and only for those custom announcements previously defined. Such customized announcements are provided at an additional expense. Contact your AT&T account representative for details.

All new, and any modified, custom announcements can only be supplied via the methods described below.

9.1 Adding New or Modifying Existing Custom Announcements

Customized announcements are provided by loading such data from either an audio cassette tape or from a PROM card into a PSM (programmable speech memory) board on the ASC. To accomplish this, the ASC must be equipped with the TM690 PSM and/or the TM744 EPSM (expanded PSM) board(s). These generic boards are used for storing custom announcement data. Customized data supplied on cassette tape are loaded into the TM690 PSM board; in contrast, data supplied on a PROM card are loaded into the TM744 EPSM board. After the PSM board is plugged into the ASC unit, it may be programmed (or loaded) from the tape(s) or the PROM card containing the desired digitally recorded speech segments as described in 9.2.1 or 9.2.2, respectively.

Your office must identify and supply information for each announcement segment to be changed. The custom announcements are recorded and placed on either cassette tape(s) or a PROM card by AT&T in a digital format with embedded protocol used by the PSM board(s) to control the data transfer. The digitized announcement data also contains segment identifiers which are accessible by the generic program.

The service listing and hardware specifications for this feature are defined in the ED6A038-11 drawing. For further ordering information, contact your AT&T account representative.

9.2 Loading Custom Announcement Data

PSM boards may be loaded by each individual office, or they may be loaded at a central location and distributed to the appropriate offices. It is the responsibility of the office to keep records of the announcements loaded in each PSM or EPSM board. It is also suggested that each board be labeled accordingly — with either the tape identifier or the PROM card identifier.

It is recommended that the spare PSM and EPSM board(s) be stored in either the ASC warm spare slots (EQL 040 or 048) or in any unused active slot. If warm spare slots are to be used, two pair of tracks must be installed in each slot. Tracks from the "terminal field" area can be moved to the warm spare slot(s); or otherwise, new tracks need to be installed. It is more advantageous to store spare PSM and EPSM boards in the active slots (EQL 016, 024, or 032) because these slots are diagnosed during the ISPI REX (routine exercise).

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Note: If the ASC is equipped with two PSM boards in active slots that have the same announcement segments, the board farthest to the right is used.

Proceed to 9.2.1 to load the TM690 PSM board(s), or 9.2.2 to load the TM744 EPSM board(s).

9.2.1 Load TM690 PSM Board(s)

The following apparatus is required for loading the TM690 board(s):

- Up to three (3) TM690 PSM boards per ASC unit (supplied with order)
- Any consumer-quality 1/8 inch format audio cassette tape player with earphone jack (not provided)
- Standard audio cassette tape(s). One tape is supplied (with the order) for each 100 spoken words of data. Any desired duplicate tapes should be indicated on the original order; or tapes may be duplicated by your office.
- One patch cable with male connectors on each end (not provided)
- (Optional) Two pair of tracks per warm spare slot (not provided)
- Circuit pack string tags (not provided).

Proceed as follows:

- (1) Toggle the ACI (TM435 board) ROS/RTS switch to ROS (request OOS).
Response: OOS LED flashes (on ACI board)
- (2) Wait for ACI OOS LED to stop flashing (i.e., OOS LED steady on).
- (3) Depress the OFF button on the PMC board (TM507).
- (4) Connect the battery of the PSM board to be loaded by moving the plug located at position X3 to the B-IN position.

Note 1: The TM690 PSM board is equipped with a back-up battery which retains data in memory for several months. The battery is shipped disconnected: the plug located at position X3 in the B-OUT position.

- (5) Plug the PSM circuit board into EQL 016, 024, or 032 on the ASC unit.
- (6) Depress the ON button on the PMC board.
- (7) Place the ASC in the loopback state to prevent automatic restoral; enter:

ISPI-C-LBS bbb 0000.

bbb = ISPIC member number (000 - 063).

- (8) Insert the tape into the tape player; move the volume control to its maximum position; and if provided, move the tone control to its most treble position.

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Note 2: The loading process *must* start from the beginning of side A of the tape. Rewind if necessary.

- (9) Connect one end of the patch cable to the earphone output jack of the tape player and the other end to the faceplate jack of the PSM board.
- (10) Open and then close the locking tab on the PSM board.

Response: The PSM board goes into its diagnostic mode to determine the integrity of the internal circuitry. Upon passing this test, the **XMIP** LED blinks twice (ready for data to be loaded).

- (11) Press the play button on the tape player.

Response: Once data is detected by the PSM board, the **XMIP** LED lights momentarily and then blinks once a second to indicate that data transmission is progressing successfully.

The amount of time required by the loading process is directly related to the number of words on the tape. It takes approximately 1 hour to load 100 words. If the **READY** LED lights within 15 seconds after the **XMIP** LED goes out, then the loading process is completed. If (a) the **READY** LED does not light, (b) the **ERROR** LED flashes once per minute, and (c) the entire side of the tape has played; then more data remains on the other side of the tape. At times during the loading process, the **ERROR** LED can flash once per minute. In this case, allow the tape to play to the end of the current side; turn the tape over; re-insert the tape into the tape player, and play side B. On multiple tape loads, upon completion of side B, insert and play side A of the next tape.

If an error is encountered during the loading process, the **ERROR** LED flashes an error code (refer to CPS TM690 for explanation). In this case, remove the cable from the faceplate jack on the PSM board, and then wait for the **ERROR** LED to stop flashing before attempting the load again. Continual loading errors are usually a result of an improper setup of the tape recorder or a defective tape. If necessary, contact AT&T for assistance.

- (12) Remove the cable connection from the PSM board faceplate jack.
- (13) Label (uniquely) the PSM board according to local practices.
- (14) Will this PSM board be used as a warm spare?
 - If **YES**, continue with Step 15.
 - If **NO**, then proceed to Step 17.
- (15) Install tracks for the warm spare slot(s) in EQL 040 and/or 048.
- (16) Remove the spare PSM board just loaded from EQL 016, 024, or 032. Re-insert the spare board into a warm spare slot, then continue with Step 18.
- (17) Will this PSM board be used as an active spare?
 - If **YES**, repeat Steps 3 through 13 for the active PSM board (board used by ISPI).
 - If **NO**, continue with Step 18.

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- (18) When loading of all PSM boards is completed, remove the ASC from the loopback state by entering:

ISPI-C-LBR bbb 0000.

bbb = ISPIC member number (000 - 063).

- (19) Toggle the ACI ROS/RTS switch to **RTS** (return to service).

Response: **OOS** LED flashes

- (20) Wait for ACI **OOS** LED to stop flashing (i.e., **OOS** LED steady off).

- (21) Verify the new announcements and a representative sample of other announcements; refer to 8.2.2 for details.

Caution: If at any time it is desired to power down an OOS ASC unit after installation of the PSM board(s), first lower the locking tab(s) which shuts off the internal circuitry of the PSM board(s). This ensures the integrity of the data that is loaded into the board(s).

End of Procedure

9.2.2 Load TM744 EPSM Board(s)

The following apparatus is required for loading the TM744 board(s):

- Up to three (3) TM744 EPSM boards per ASC unit (supplied with order)
- One PROM card. Any desired duplicate PROM card should be indicated on the original order.
- (Optional) Two pair of tracks per warm spare slot (not provided)
- Circuit pack string tags (not provided).

Proceed as follows:

- (1) Toggle the ACI (TM435 board) ROS/RTS switch to **ROS** (request OOS).

Response: **OOS** LED flashes (on ACI board)

- (2) Wait for ACI **OOS** LED to stop flashing (i.e., **OOS** LED steady on).

- (3) Depress the **OFF** button on the PMC board (TM507).

- (4) Connect the battery of the EPSM board to be loaded by moving the plug located at position **X20** to the **B-IN** position.

*Note: The TM744 EPSM board is equipped with a back-up battery which retains data in memory for several months. The battery is shipped disconnected: the plug located at position **X20** in the **B-OUT** position.*

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- (5) Plug the EPSM circuit board into EQL 016, 024, or 032 on the ASC unit.
- (6) Depress the **ON** button on the PMC board:
- (7) Place the ASC in the loopback state to prevent automatic restoral; enter:

ISPI-C-LBS bbb 0000.

bbb = ISPIC member number (000 - 063).

- (8) Insert the PROM card into the faceplate slot on the TM744 board. The card can **only** be inserted in **one way**; if inserted correctly, a **click** is heard.
- (9) Open and then close the locking tab on the EPSM board.

Response: If the PROM card is present and the locking tab is toggled, the TM744 EPSM board goes into a diagnostic mode, the PROM card data is loaded, and other tests are run (see Table L). The amount of time required to complete this loading process is constant, 15 minutes.

Response: If the PROM card is *not* present and the locking tab is toggled, only the "test CRC" and "test parity" self-test processes are run, lasting 4 minutes.

TABLE L		
TM744 EPSM BOARD		
LOAD & SELFTEST PROCESSES FLOWCHART		
STEP	STEP NAME	LED STATUS
A	Power on (initialization)	ERROR LED on (ERROR TYPE 2)
B	Close lock tab (initialization)	No LEDs on
C	PROM card present?	If NOT, go to "test CRC" (Step H); else, continue
D	Diagnostic	DIAG LED blinks
E	Copy PROM card data	SLFTST & DIAG LEDs toggle simultaneously after each bank
F	Generate CRC	DIAG LED blinks
G	Generate parity	DIAG LED blinks
H	Test CRC	SLFTST LED on
I	Test parity	SLFTST LED blinks
J	In service	READY LED on

- (10) Is either the **READY** or **ERROR** LED on?

If the green **READY** LED is on, the loading process is complete; continue with Step 11.

If the red **ERROR** LED is on or flashing, there is a loading error; repeat Steps 3 through 9. See error type explanations below:

ERROR TYPE 0: (**ERROR LED blinks twice/second**) CRC failure during selftest.
Probable cause: Battery or PROM card problem.

ERROR TYPE 1: (**ERROR LED blinks once/second**) Diagnostic failure.
Probable cause: EPSM board problem.

ERROR TYPE 2: (**ERROR LED constantly on**) Parity failure.
Probable cause: Battery or EPSM board problem.

Intelligent Simplex Peripheral Interface / #1A ESS

AT&T 231-365-005

Continual loading errors are usually a result of an improper PROM card insertion or a defective PROM card. If necessary, contact AT&T for assistance.

- (11) Remove the PROM card from the EPSM board faceplate slot.
- (12) Label (uniquely) the EPSM board according to local practices.
- (13) Will this EPSM board be used as a warm spare?
If YES, continue with Step 14.
If NO, then proceed to Step 16.
- (14) Install tracks for the warm spare slot(s) in EQL 040 and/or 048.
- (15) Remove the spare EPSM board just loaded from EQL 016, 024, or 032. Re-insert the spare board into a warm spare slot, then continue with Step 17.
- (16) Will this EPSM board be used as an active spare?
If YES, repeat Steps 3 through 12 for the active EPSM board (board used by ISPI).
If NO, continue with Step 17.
- (17) When loading of all EPSM boards is completed, remove the ASC from the loopback state by entering:

ISPI-C-LBR bbb 0000.

bbb = ISPIC member number (000 - 063).

- (18) Toggle the ACI ROS/RTS switch to RTS (return to service).
Response: OOS LED flashes
- (19) Wait for ACI OOS LED to stop flashing (i.e., OOS LED steady off).
- (20) Verify the new announcements and a representative sample of other announcements; refer to paragraph 8.2.2 for details.

Caution: If at any time it is desired to power down an OOS ASC unit after installation of the EPSM board(s), first lower the locking tab(s) which shuts off the internal circuitry of the EPSM board(s). This ensures the integrity of the data that is loaded into the board(s).

End of Procedure

10. ISSUING ORGANIZATION

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Page 60
60 Pages

GBPPR Homebrew Radar Experiment

High-Voltage Power Supply

Overview

One of the biggest experiments I've always wanted to work on is a homebrew radar system. No, not some pussy ultrasonic range finder using pre-made kits, but a true high-power pulse (and maybe Doppler) radar system. And I think it's now possible...

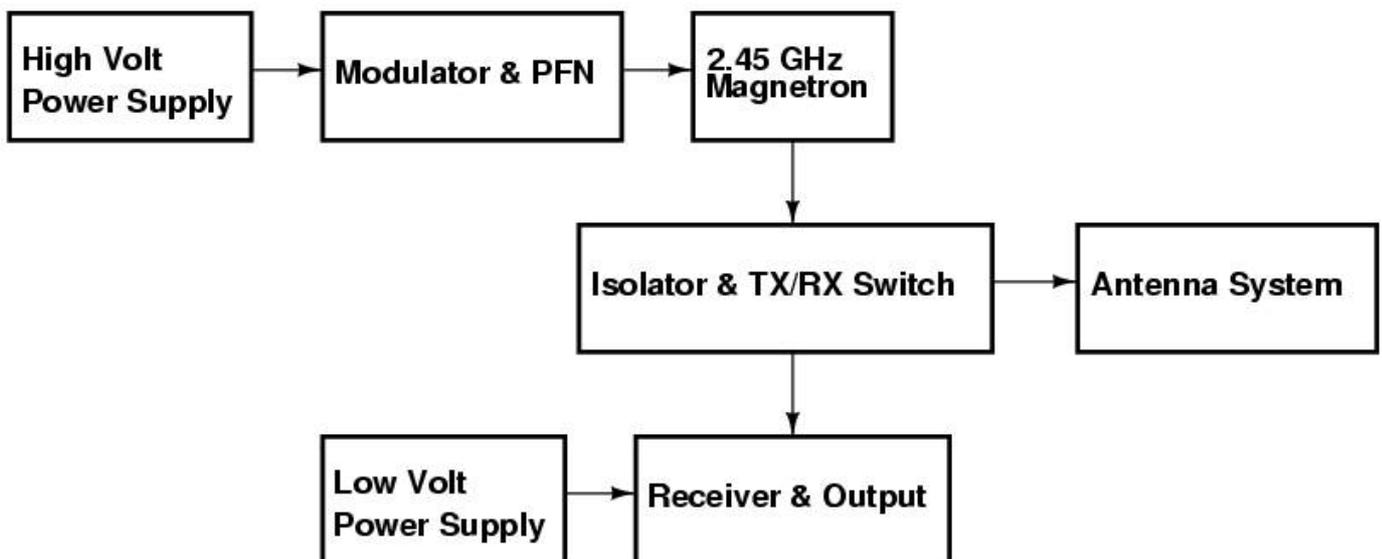
This project will be continuously "in development." I have *no idea* if the final outcome will even work, but I'll try to make all the experiments public and fairly-well documented. The overall work will be done in a series of sub-sections over the next few months (or even years). If it all works – great. If it doesn't... It'll look cool, and you'll have nice beacon to attract anti-radiation missiles.

The first series of this radar project will be building fairly well-regulated and stable high-voltage power supply. This project will be mostly a tweaking of the "Simple 4 kVDC Power Supply" project from *GBPPR 'Zine*, Issue #47. Be sure to refer to that article for all the nitty-gritty details on using microwave oven high-voltage transformers in high-voltage power supply applications.

This power supply's main rework will be the addition of a 0–120 VAC Variac on the microwave oven transformer's primary input. The Variac will allow you to "regulate" the transformer's final output voltage between 0–1,900 VAC. Since the output current and voltage requirements for a radar system are surprisingly not too demanding, we can eliminate a lot of the high-voltage filtering capacitors and easily beef-up the diode bridge rectifier circuit.

A conventional bridge rectifier circuit will be on the secondary output of the microwave oven transformer to give a maximum DC voltage output of around 2,500 volts ($1,900 * 1.414$). Regulating the transformer's primary input AC voltage to approximately 91 volts will give a final (unloaded) DC output of around 2,000 volts.

Radar Block Diagram



Pictures & Construction Notes



0.55 μ F / 2,300 VAC microwave oven voltage-doubling capacitor.

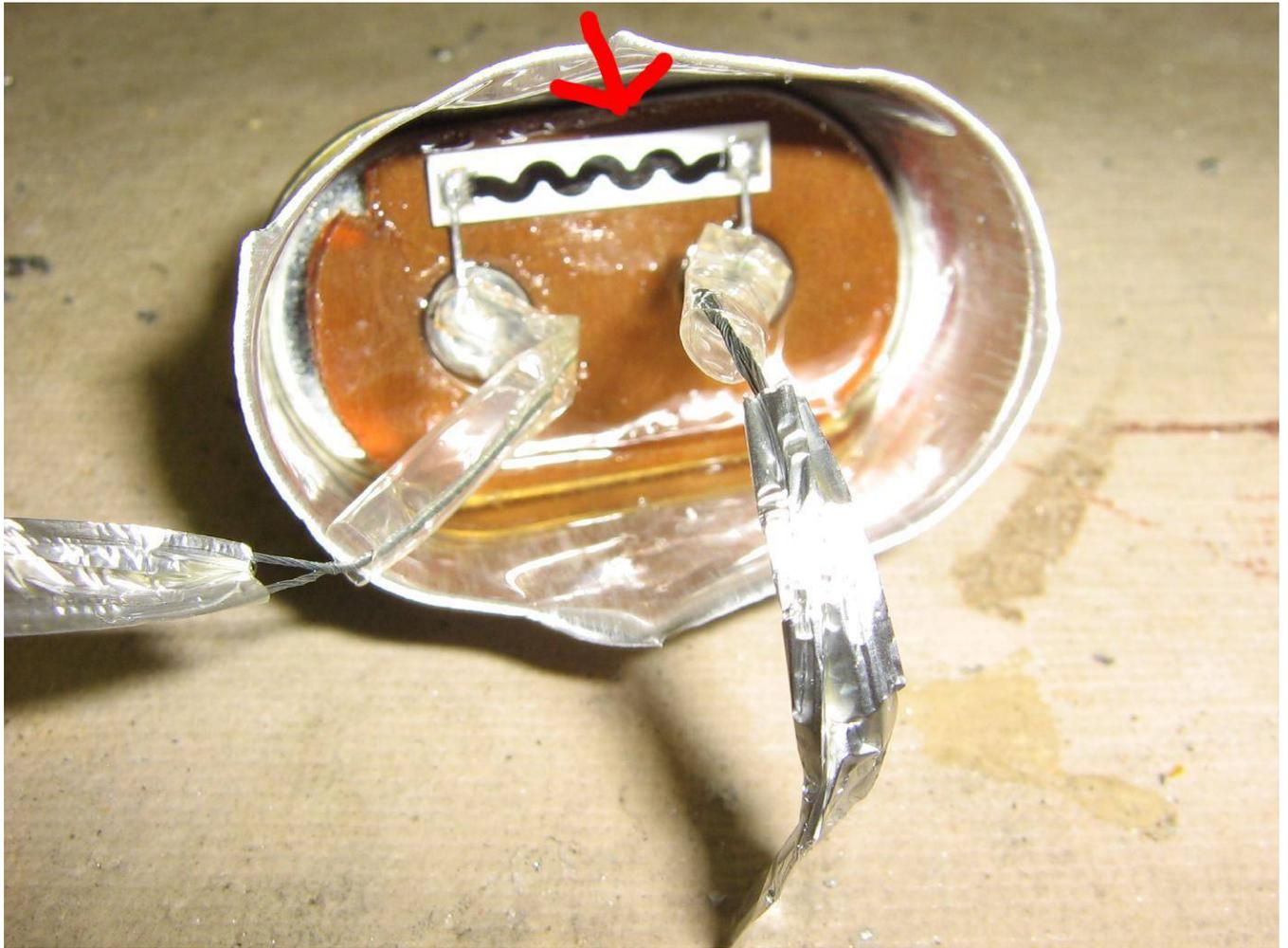
First, we'll show a little tip to salvage 10 Megaohm resistors capable of operating at high-voltages (2+ kilovolts).

Every high-voltage microwave oven capacitor should have an internal 10 Megaohm resistor across the leads to help drain the high-voltage charge when the AC power is off. We can salvage these resistors for use in high-voltage divider networks or for drain resistors in your own power supply circuits.



Start by cutting the bottom off the capacitor with a hacksaw.

The capacitor will leak its dielectric fluid, so be prepared. The fluid should be non-toxic, but be careful.

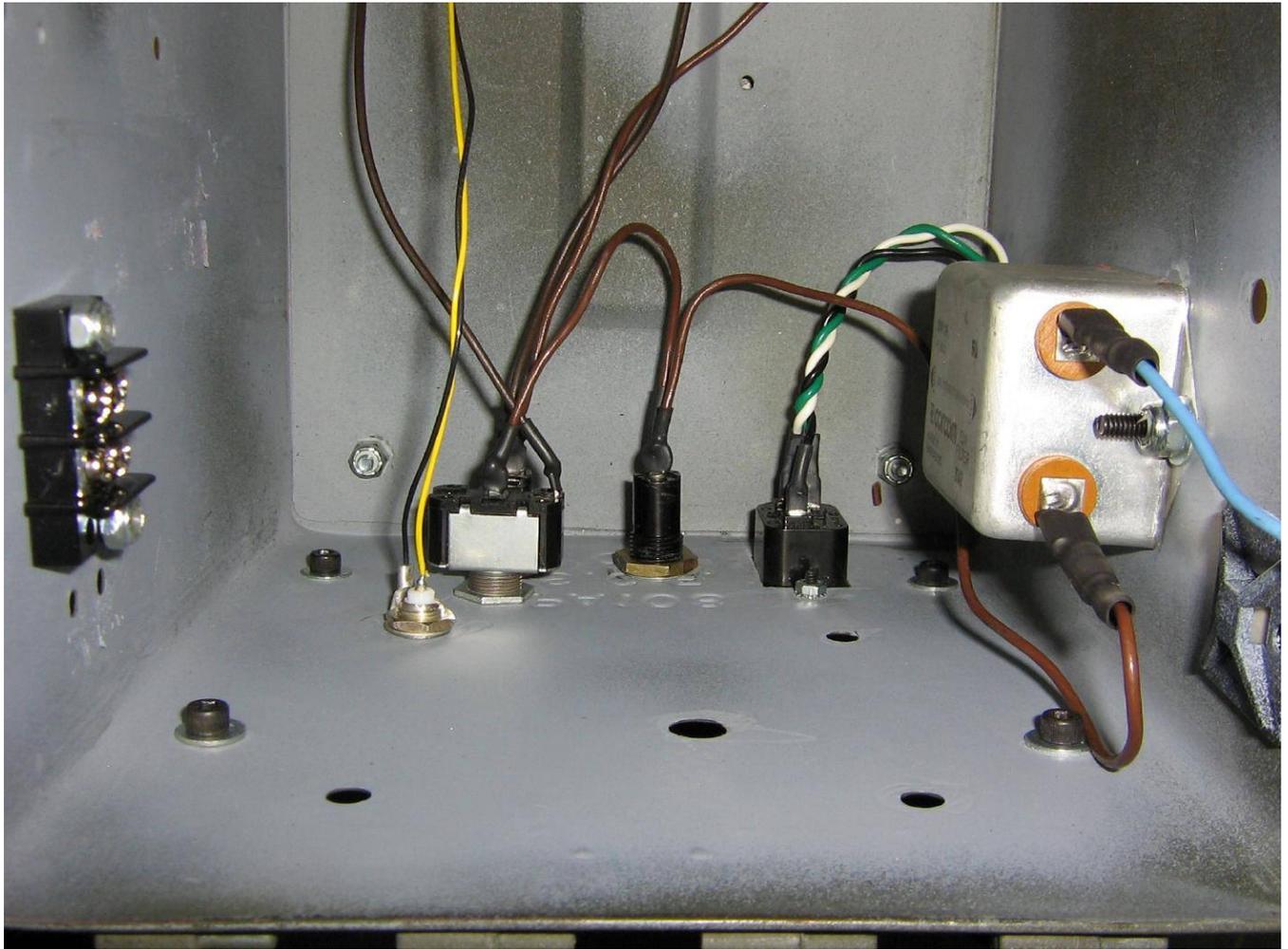


Use a needle-nose pliers to pull out the wrapped foil package which makes up the actual capacitor. It will be attached by its two leads, but should easily pull out with just a quick tug.

You'll want to then begin peeling back the outside case of the capacitor. This should expose the resistor across the capacitor's two terminals.

The resistor will be mounted on a ceramic substrate, so be careful removing it so it doesn't crack.

You can clip or unsolder the leads, as necessary.



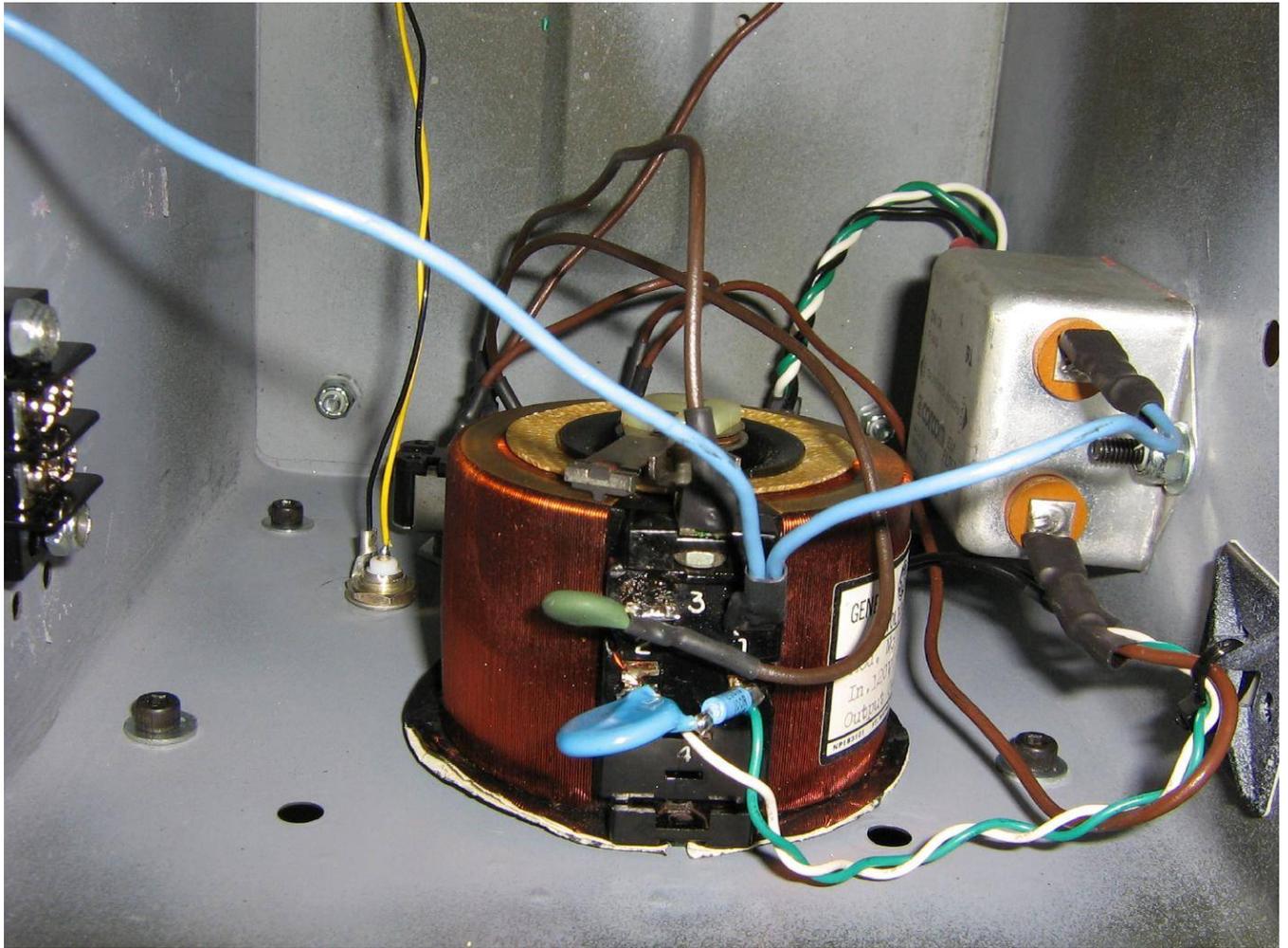
Salvaging the original 4 kV power supply circuit.

Remove the internal components, leaving the AC input socket, fuse, neon lamp, AC line filter, and power switch.

We'll be adding a separate fuse to protect the output of the Variac.

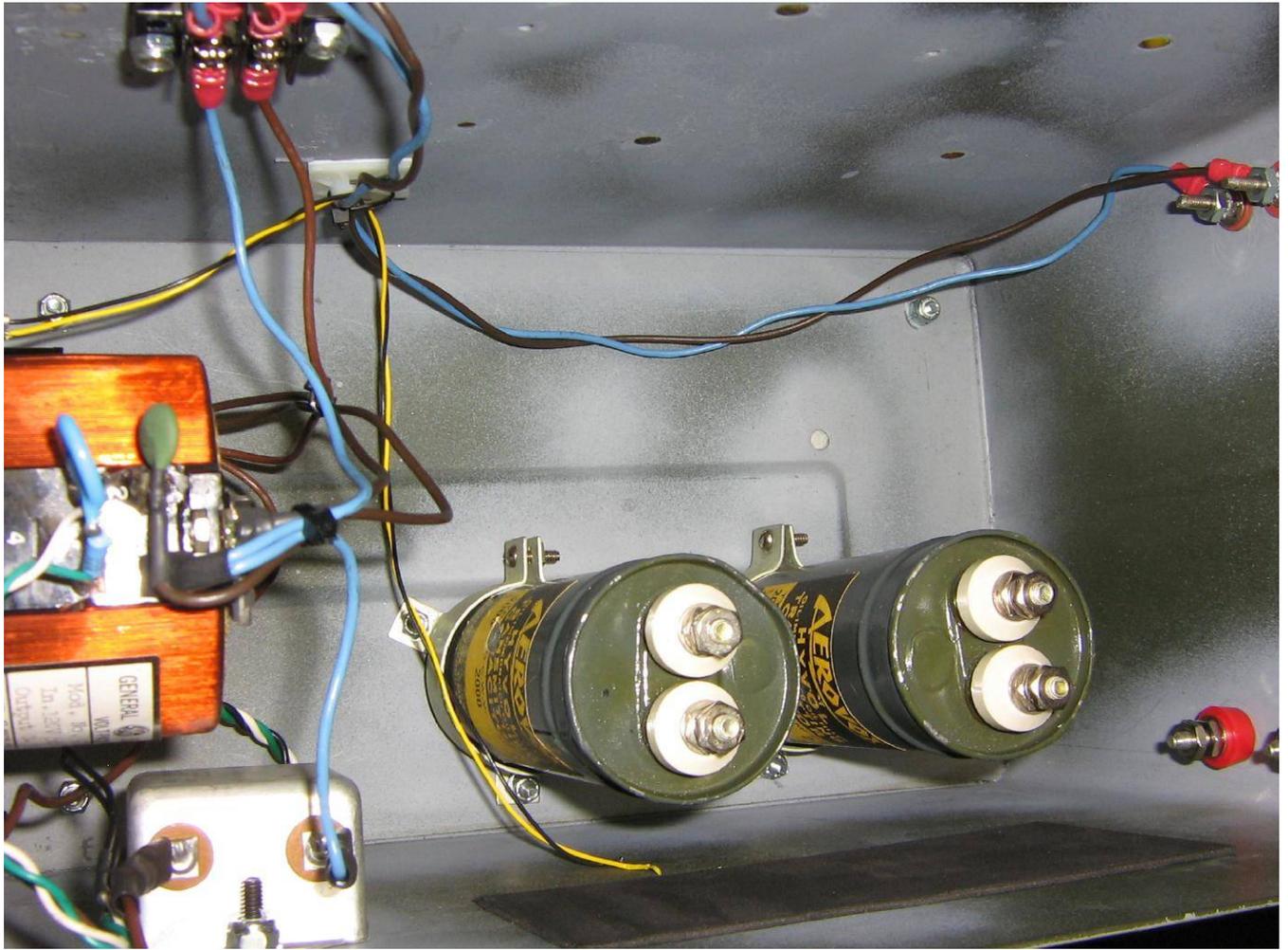
The BNC connector will be an optional "High-Voltage Test Point" for monitoring the power supply's DC output via a "divide-by-100" resistive network.

It think the BNC connector should have been an isolated version to help keep a single-point ground.



Mount the Variac to the front-panel of the case.

The little green blob on the Variac's AC input is a surge-suppression PTC resistor from an old computer/monitor switching power supply. This is used to limit the input current rush on power up. The blue series capacitor-resistor network form a snubber to clamp any voltage spikes from the Variac's primary winding on power up or down.

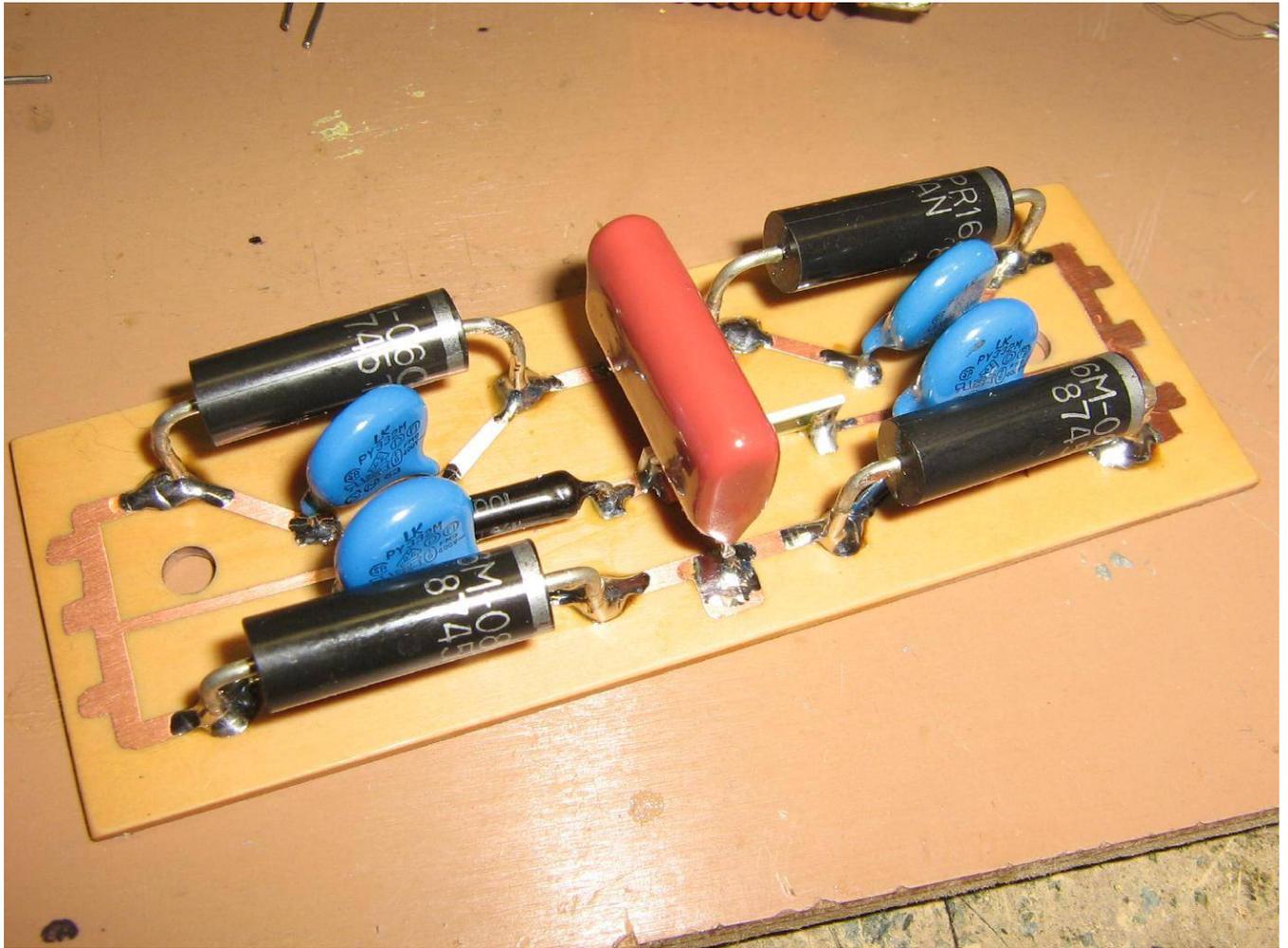


Install the high-voltage filtering capacitors.

Shown here are two Aerovox 2 μF , 2,000 WVDC capacitors I found at a hamfest. Several paralleled microwave oven capacitors will also work, but try to keep them all the same value.

Be sure to take proper high-voltage construction and mounting considerations into play when working around these capacitors.

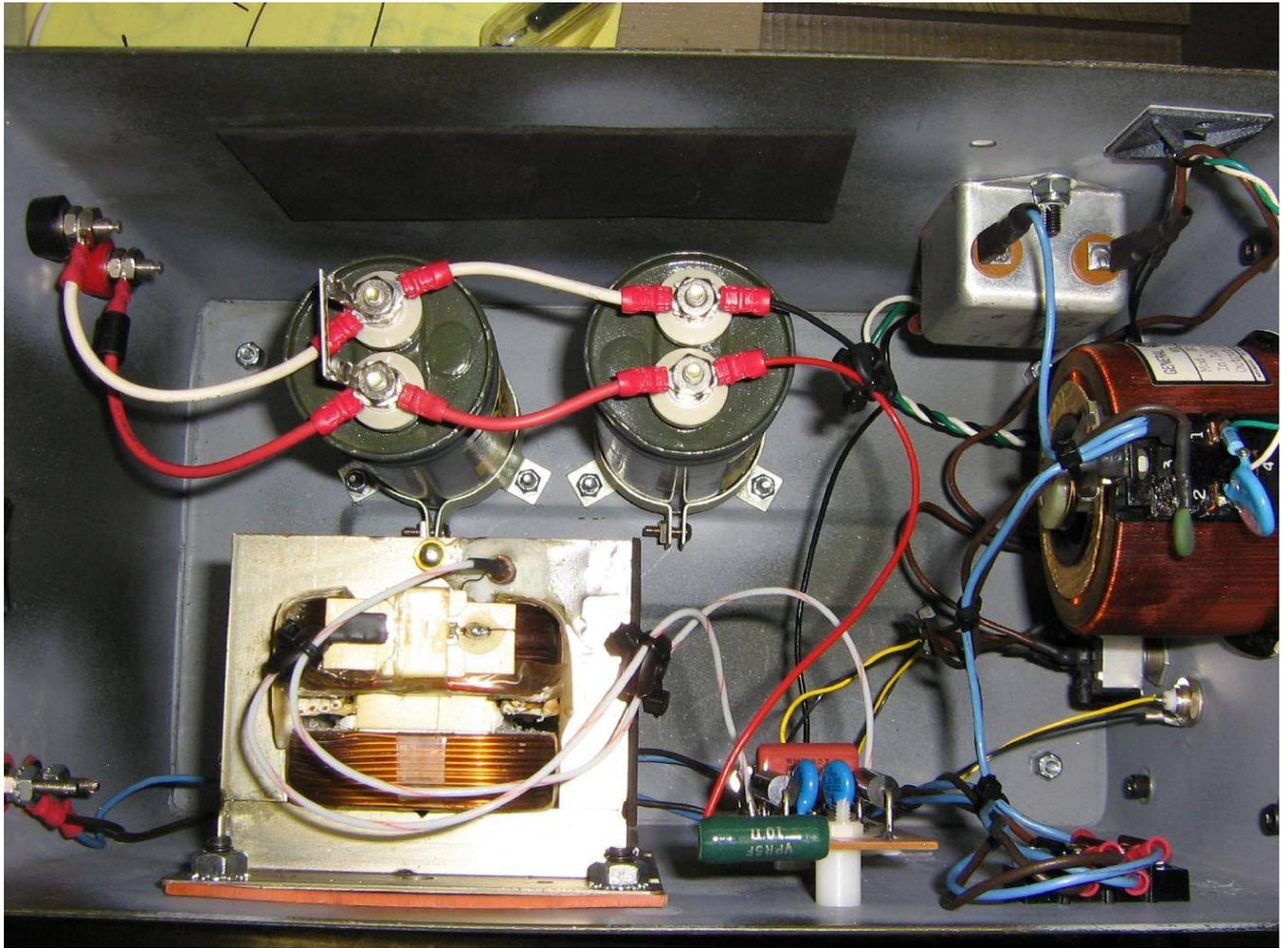
The AC output of the Variac connects to the terminal block shown on the top of the picture.



Solid-state, high-voltage bridge rectifier circuit.

The four diodes are HVPR16-06, but you can also use the high-voltage diodes from a microwave oven's voltage-doubler circuit, if they're the same. Each of the high-voltage diodes has a 3,300 pF / 3 kV capacitor across it. These are to help suppress any switching transients.

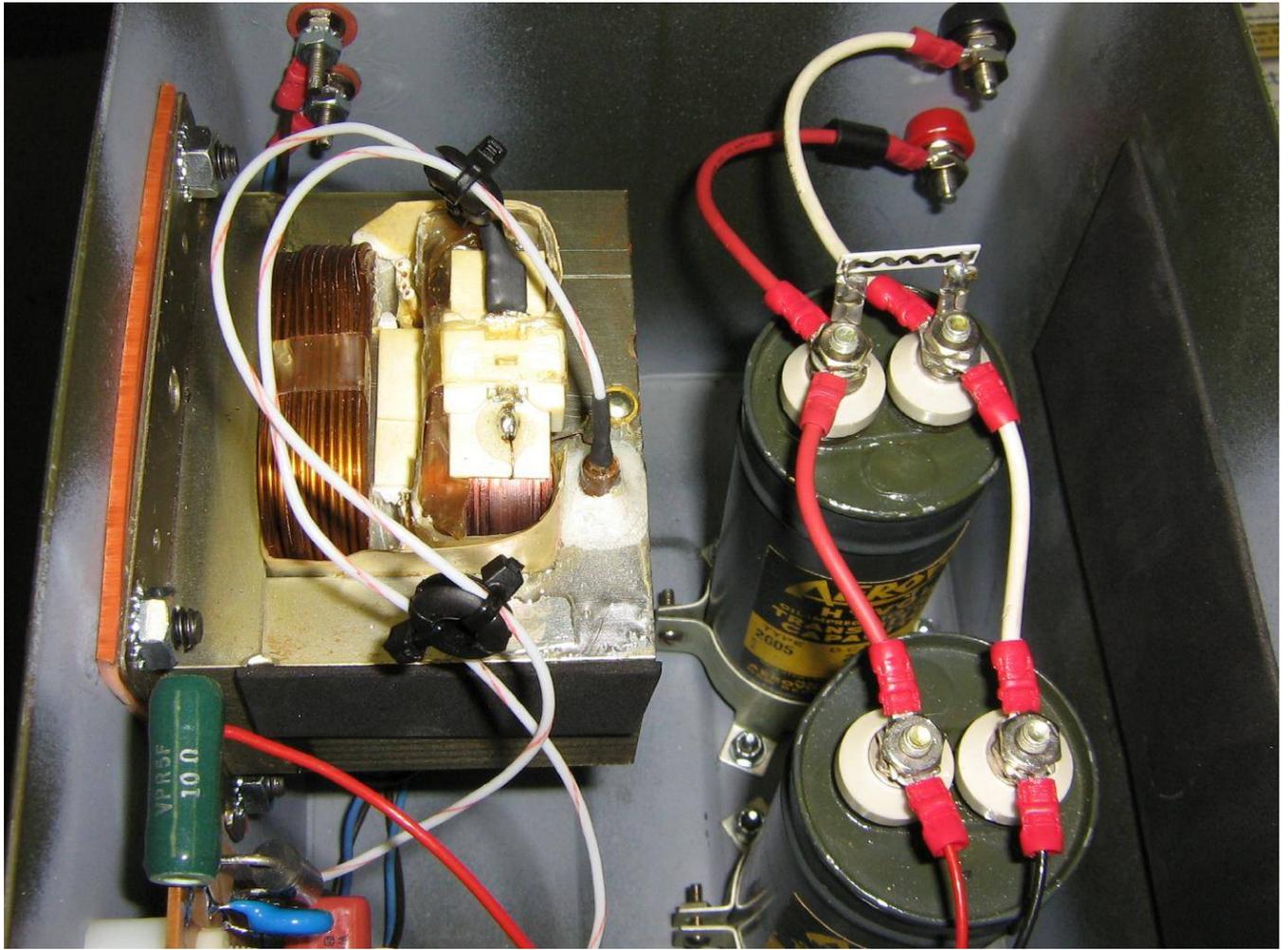
The red capacitor is a 8,200 pF / 3 kV, and is wired across the microwave oven transformer's secondary output. This is to also help suppress any high-voltage transients.



Completed high-voltage power supply internal overview.

A 10 ohm / 5 watt resistor was added in series from the bridge rectifier's positive DC output to help tame any current surges which could destroy the high-voltage diodes.

The microwave oven transformer is mounted against a sheet of rubber gasket to dampen any vibrations. The transformer doesn't need any extra high-voltage isolation in this application.



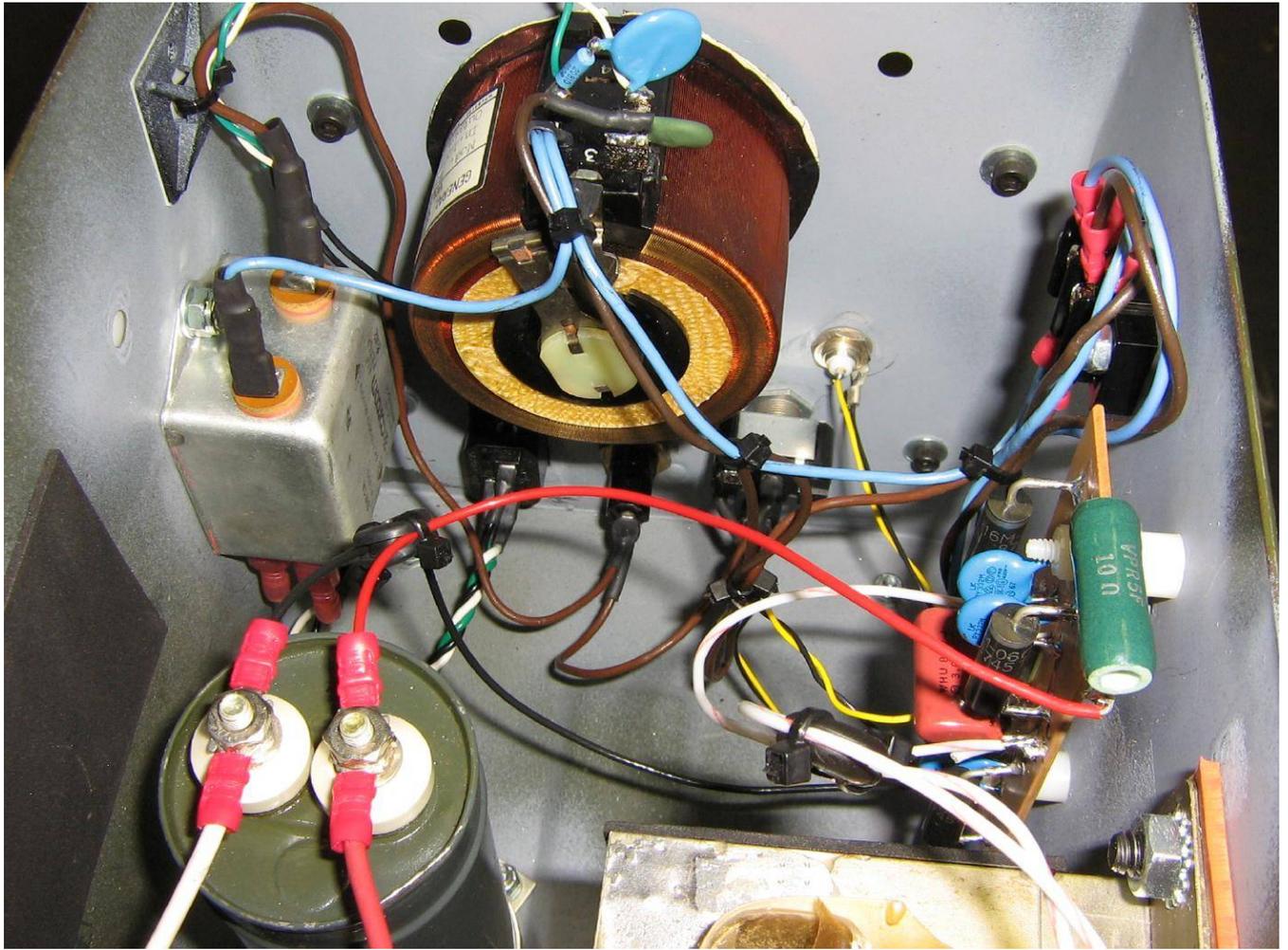
Completed high-voltage power supply internal overview. Alternate view.

Note the 10 Megaohm resistor across one of the high-voltage filtering capacitors on the right.

Also note the use of rubber grommets and zip ties to isolate and secure any wires carrying high-voltage.

The high-voltage output is via the two isolated banana jacks on the upper-right. A ferrite bead was slipped over the positive output wire.

The output of the Variac is tapped, ran through a fuse, and sent to the banana jacks on the upper-left.



Overview showing behind the front-panel and the Variac wiring.



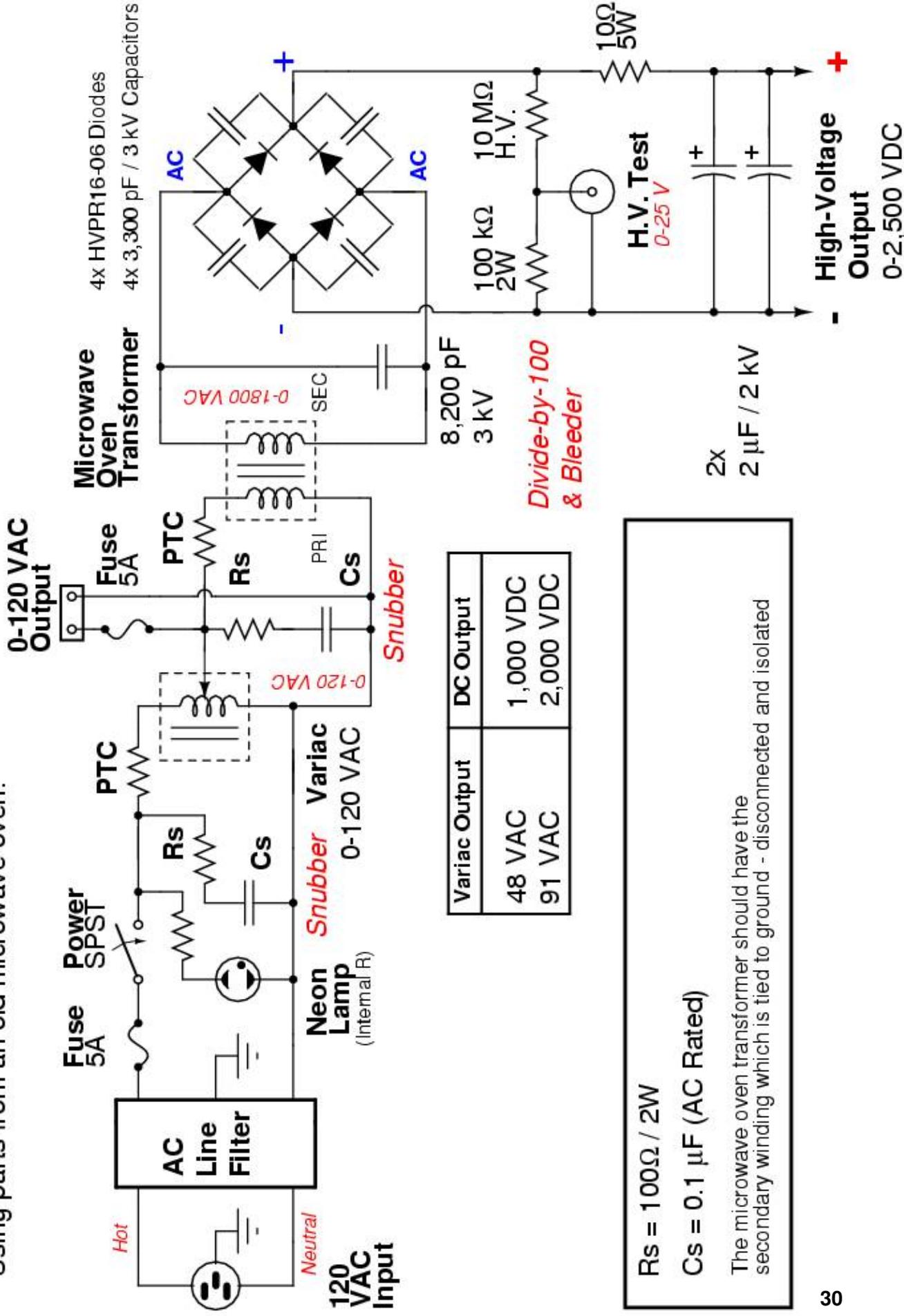
Completed high-voltage power supply overview.

The final DC output is adjustable from 0 to 2,500 VDC, but we'll only be using an output of 2,000 VDC for this radar project.

The BNC jack provides a "divide-by-100" voltage test point. It should read "20 Volts" when the power supply is set to an output of 2,000 VDC.

GBPPR Homebrew Radar Experiment: High-Voltage Power Supply

Using parts from an old microwave oven.



Variac Output	DC Output
48 VAC	1,000 VDC
91 VAC	2,000 VDC

Rs = 100Ω / 2W
 Cs = 0.1 μF (AC Rated)

The microwave oven transformer should have the secondary winding which is tied to ground - disconnected and isolated

GBPPR Homebrew Radar Experiment

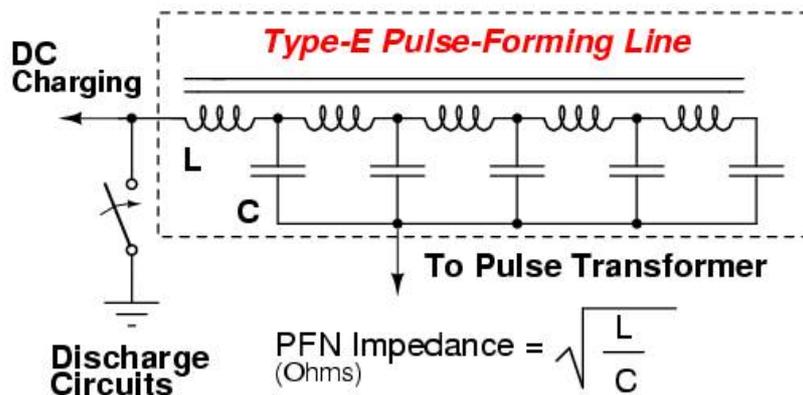
Pulse-Forming Network

Overview

The main component in a radar system that determines the RF pulse length is a passive circuit called the Pulse-Forming Network (PFN). This circuit is essentially a lumped-component inductor/capacitor version of a long piece of coaxial cable, in that it has a delay time and impedance. The number of inductor/capacitor sections in the pulse-forming network determines the overall pulse length, usually a microsecond or so. The ratio of inductor/capacitors also sets the impedance of the PFN. The impedance will stay the same, regardless of the number of L/C sections, provided the inductors/capacitors maintain the same value.

When operating, the PFN is charged to a high-voltage DC potential (we'll be using 2,000 volts) and is quickly discharged to ground using a thyatron or other type of high-speed trigger. Since the PFN is connected in series with the pulse transformer's primary, the discharge induces a large voltage spike equal to *one-half* the charging voltage in the pulse transformer's primary windings. This voltage pulse is equal in length to the PFN's delay time. The voltage pulse is further stepped-up via the pulse transformer's secondary winding and is finally applied to the magnetron's cathode. The PFN's impedance is also stepped-up via the pulse transformer to help match the magnetron's operating impedance, which is usually around 1,200 ohms. Impedance matching helps to keep the transmitted RF pulse from being "deformed." Pulse transformer operation will be covered in better detail in an upcoming article.

The PFN we'll be using is the most widely used version, the type-E pulse-forming transmission line. This consists of a single ferrite core with a number of winding taps for the capacitors.



$$\text{PFN Impedance (Ohms)} = \sqrt{\frac{L}{C}}$$

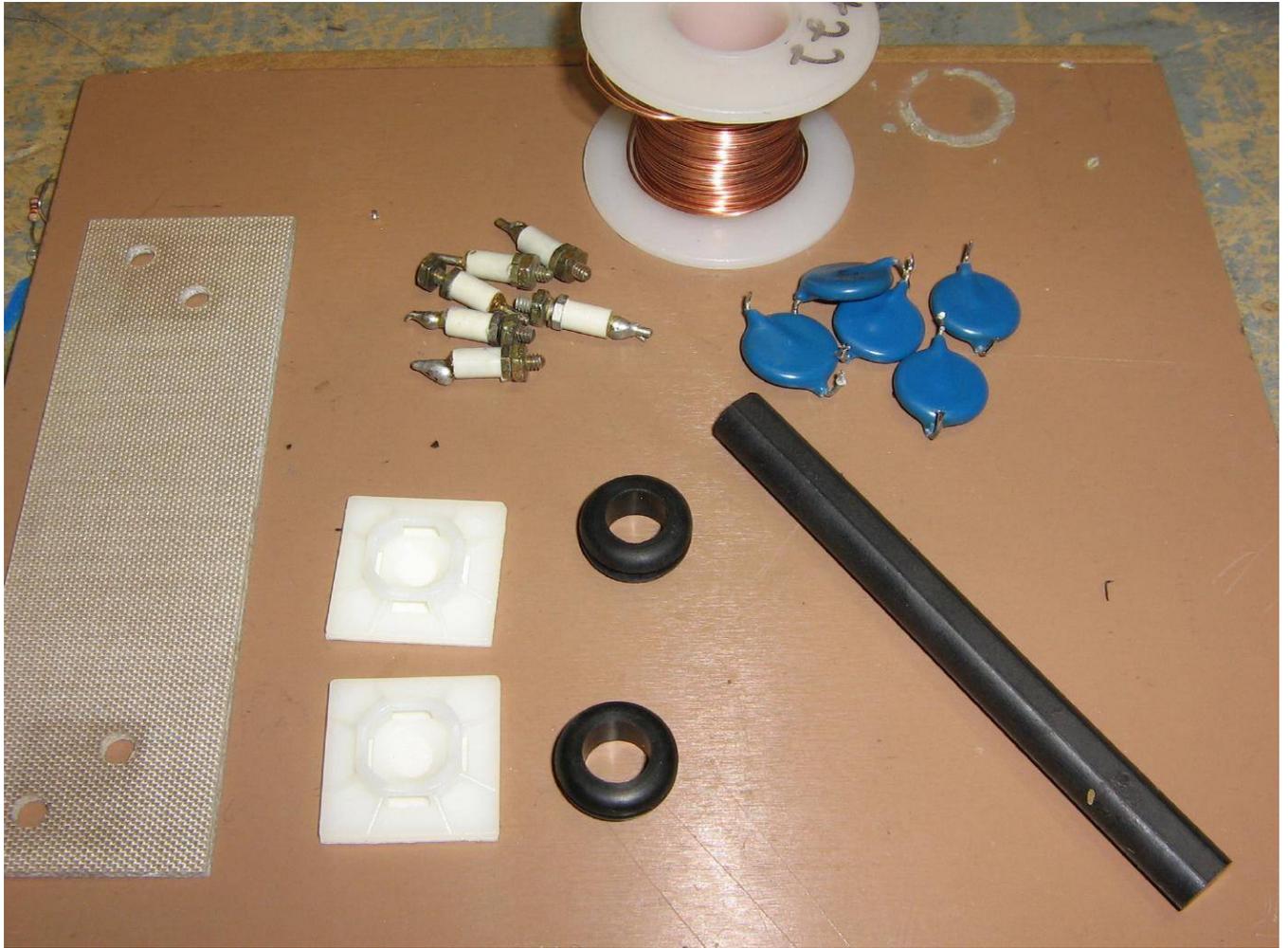
$$\text{Pulse Length (Seconds)} = 2 * n * \sqrt{L * C}$$

Where "n" is the number of L/C sections.
The example above has 5 sections.

Example:

Using five 10 μH inductors and five 1,000 pF capacitors; you would have a PFN with a pulse width of 1 μs and an impedance of 100 ohms.

Pictures & Construction Notes



Parts for our homebrew pulse-forming network.

The main L/C components are a 10 mm diameter ferrite rod antenna from an old "auto-setting" clock (C-MAX CMA-60-100 or similar), and five 1,000 pF / 4 kV capacitors.

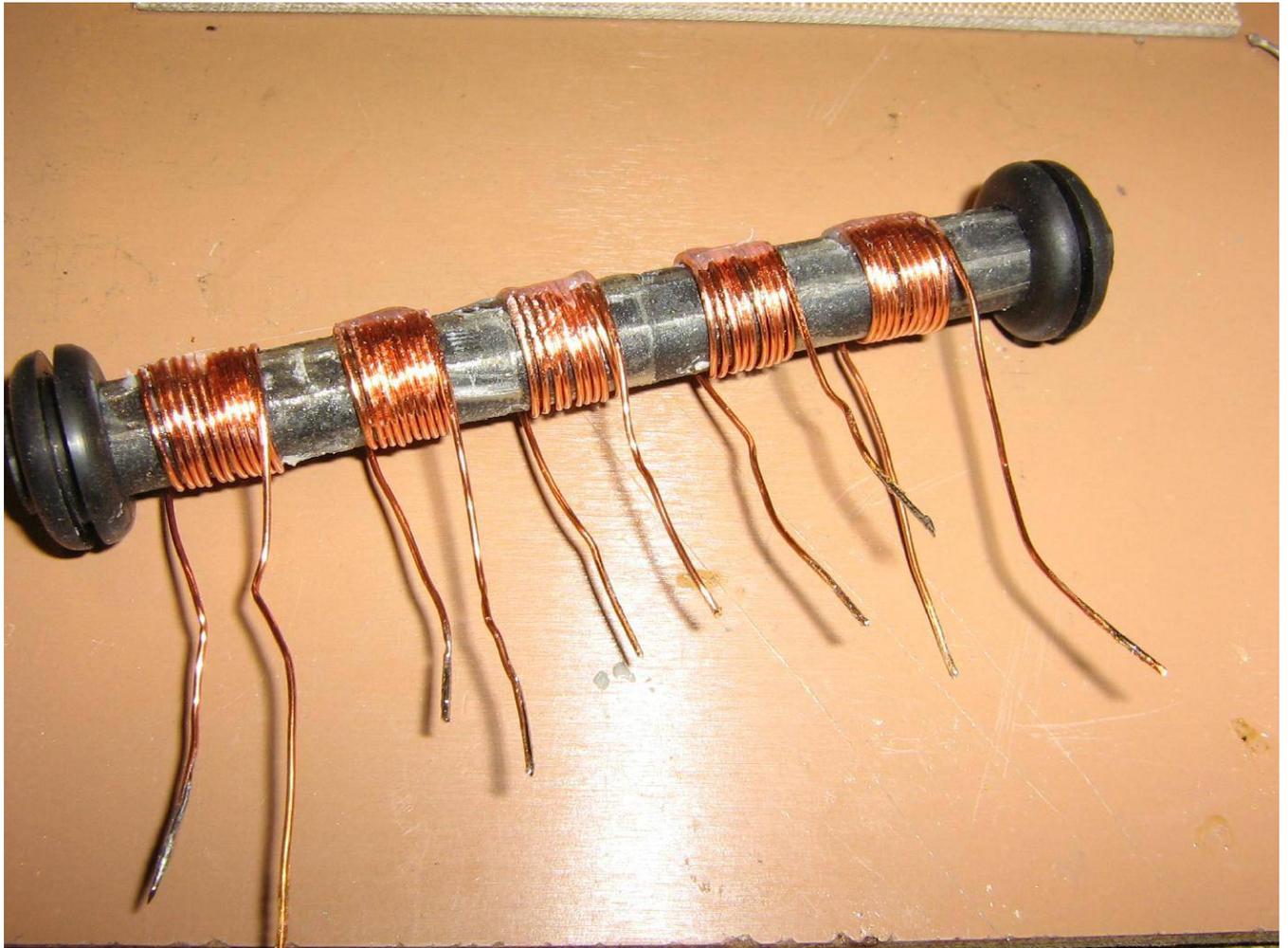
The inductors will be wound on the ferrite rod using #22 enameled wire.

The ferrite rod will be attached to an optional fiberglass base using two rubber grommets to isolate and secure it.

The white square things are adhesive-backed cable tie mounts.

Optional solder-terminals will be used for holding one end of the capacitors.

This is all a total hack, and I'm not even sure it's correct. I've never even seen a PFN in real-life. Seriously...



Forming the inductors.

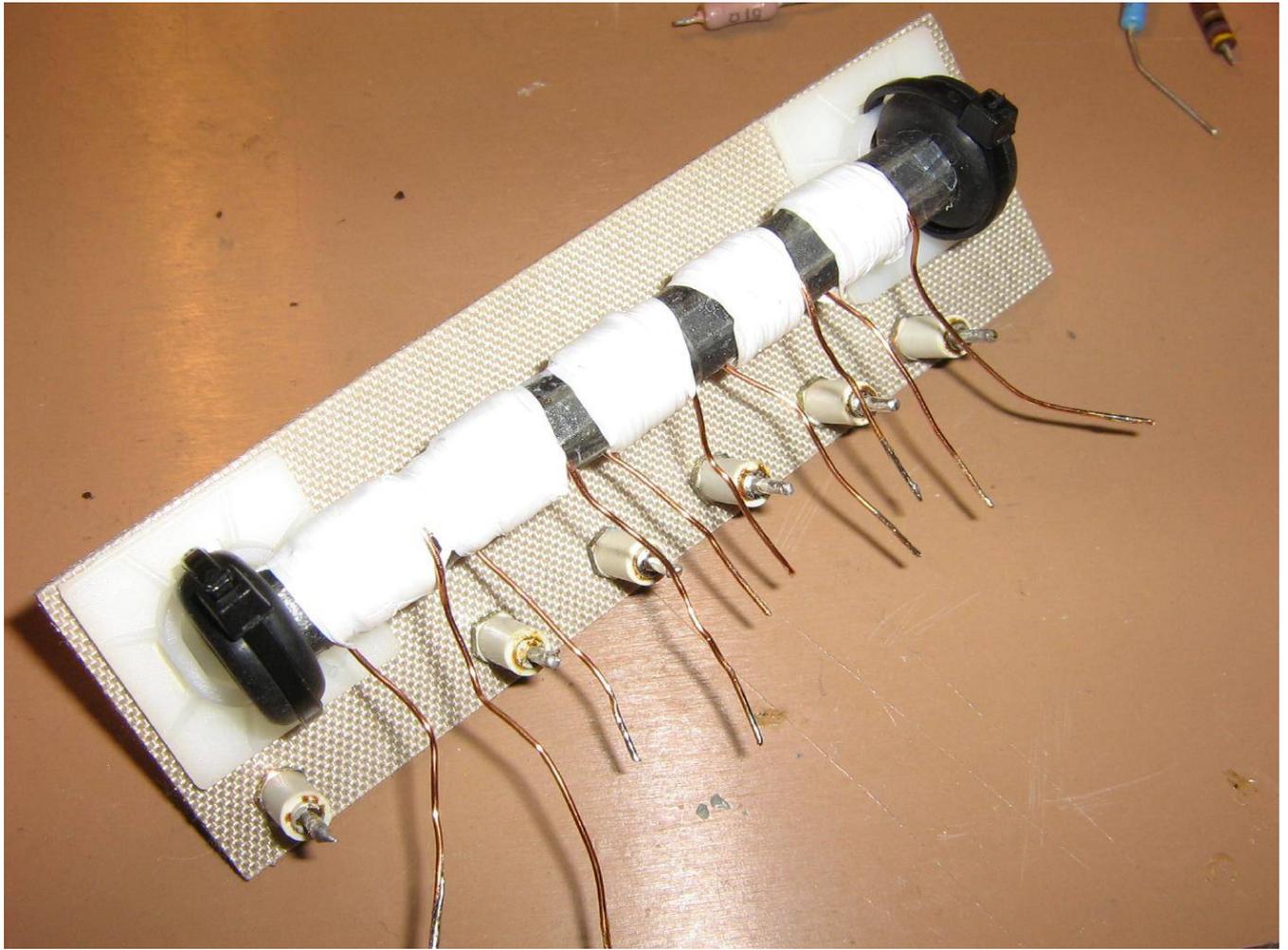
To help secure the windings, wrap the ferrite rod with some double-sided sticky tape.

Wind about 12 turns of #22 enameled wire to make a $10\ \mu\text{H}$ inductor. You may need to tweak the number of required turns, depending on the composition of the ferrite rod.

Make the five inductor sections, as shown above, then secure the windings with some Q-dope or other type of glue.

Be sure to leave a little space on the ferrite rod to attach the grommets.

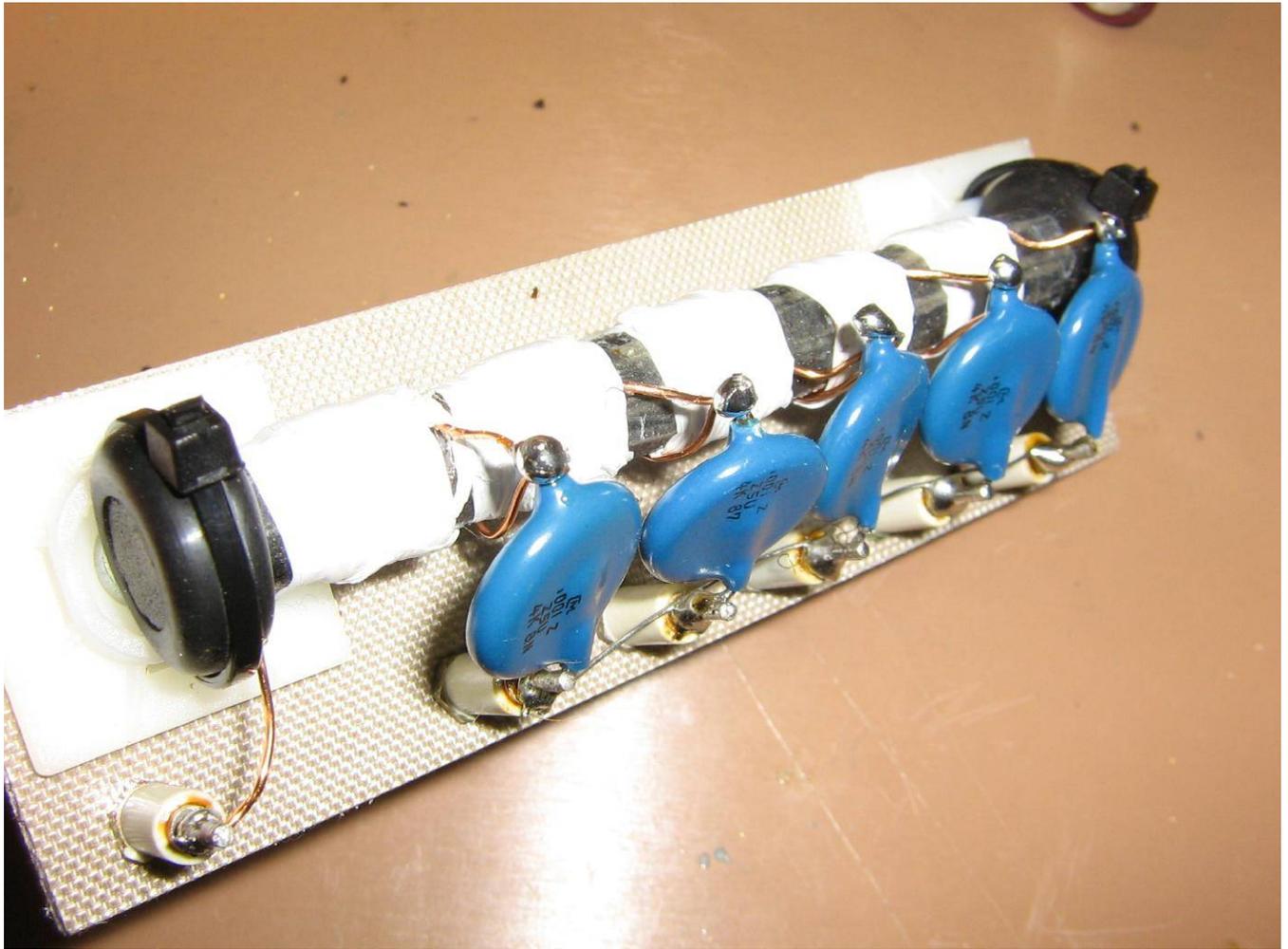
The PFN will generate high-currents, but only for a short time, so it pays to use heavier gauge wire.



When finished, secure and wrap the inductors with a few turns of Teflon plumbers tape.

Attach the ferrite rod to the base by wrapping zip ties around the grommets and attaching them to adhesive-backed mounting points on the base.

Mounting the PFN on a separate base is optional, but should help to make it easier to swap out if you need to change the radar's pulse length.



Completed pulse-forming network.

One lead of the high-voltage 1,000 pF capacitors is soldered to a terminal, the other is supported by the inductor windings.

The high-voltage DC charging positive input is via the terminal on the lower-left. The output is via any other terminal.

The entire PFN assembly will be mounted on stand-offs to allow for high-voltage isolation.

A very detailed description of how pulse-forming networks operation (and other radar operations) is available in the "U.S. Army Aviation Course – Subcourse MM5005: Radar Transmitter" manual.

This manual is available online at:

<http://www.tpub.com/content/armymunitions/mm50058/index.htm>

(Pulled from Google Books, so it is missing a few pages.)

TABLE 3—CHARACTERISTICS OF SOME TYPICAL HIGH VACUUM MODULATOR TUBES

Tube Type		Cathode	Cathode power watts	Maximum anode voltage	Peak anode current amperes
NT100	tetrode	oxide	48	12,000	10
829A	tetrode	oxide	14	5,000	10
715B	tetrode	oxide	58	15,000	15
304TH	triode	thoriated	130	18,000	7.5
6C21	triode	thoriated	150	33,000	15

3. Line Type Modulators²

The essentials of the line type modulator are the pulse forming network, the circuit for charging it, and the switch which discharges the network into the load. Rotary spark gaps, fixed triggered gaps both open and closed, and thyratrons have found application as switches, and the comparative ease with which satisfactory switches can be obtained has, among other reasons, resulted in the line type modulator almost completely superseding the high vacuum tube modulator.

Theory of Discharge of a Transmission Line

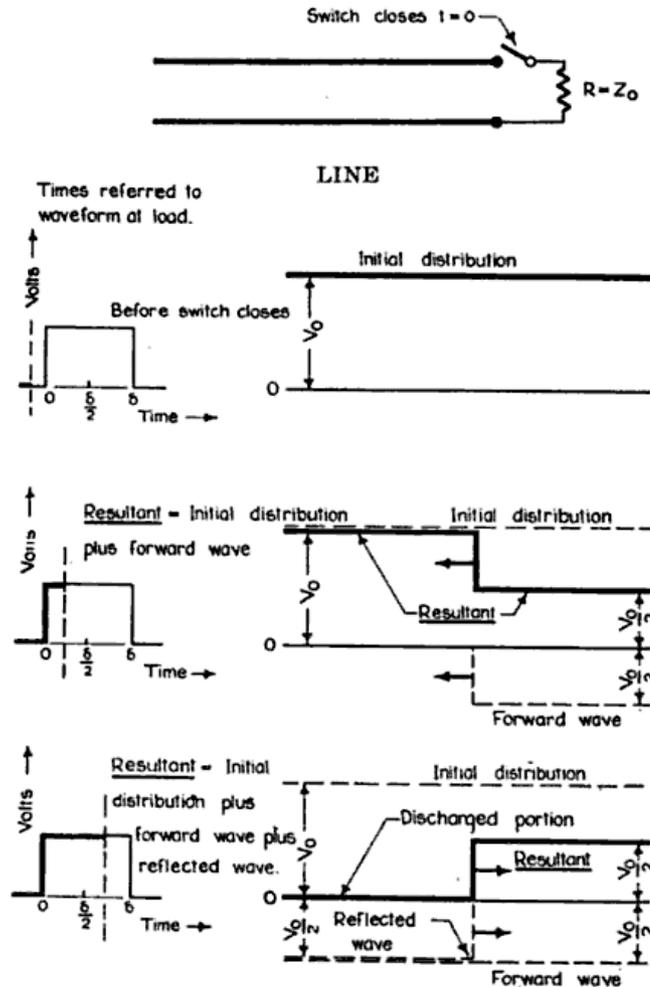
The development of the pulse forming network followed on the realisation that a uniform, low-loss, open-circuited transmission line gives a rectangular pulse when discharged into a resistance equal to its characteristic impedance.

Consider the case of Fig. 40 in which a line of characteristic impedance Z_0 is charged to a voltage V_0 and connected to a resistor R of magnitude Z_0 at time $t = 0$. For a short interval the line behaves as a generator of electromotive force V_0 and internal impedance Z_0 applying a voltage $V_0/2$ to the load. The initial voltage drop from V_0 to $V_0/2$ gives rise to a rectangular wave of voltage $V_0/2$ travelling away from the load. This travelling wave is completely reflected without change of sign at the open end and travels back to the load, where it

² K. J. R. Wilkinson, "Some developments in high-power modulators for radar," *J. Instn. Elect. Engrs.*, Vol. 93, Part IIIA, 1946, pp. 1090-112.

reduces the voltage to zero. The system is then completely discharged, the duration of a pulse being equal to twice the time of travel of a wave along the line.

If R is not equal to Z_0 , the discharge will reach completion



TRAVELLING WAVES

Figure 40.—Discharge of a matched transmission line showing travelling waves.

asymptotically. To find the conditions at any given time the steady voltage originally present and all travelling waves must be superposed.

Let V be the voltage across R . Immediately after closing the switch only one travelling wave of magnitude $V_o - V$ is present. The line current $(V_o - V)/Z_o$ equals the load current V/R so that

$$V = \frac{R}{R + Z_o} V_o.$$

This state persists until time $t = \delta$ when the wave reflected from the open end reaches the load. This wave of magnitude $V_o - V$ or $\frac{Z_o}{R + Z_o} V_o$ is partially reflected at the load, the reflection coefficient being $\frac{R - Z_o}{R + Z_o}$, so that in the interval

$$\delta < t < 2\delta$$

$$\begin{aligned} V &= \left(\frac{R}{R + Z_o} - \frac{Z_o}{R + Z_o} - \frac{Z_o}{R + Z_o} \cdot \frac{R - Z_o}{R + Z_o} \right) V_o \\ &= \frac{R(R - Z_o)}{(R + Z_o)^2} V_o. \end{aligned}$$

Continuing the calculation, a series of decreasing steps is

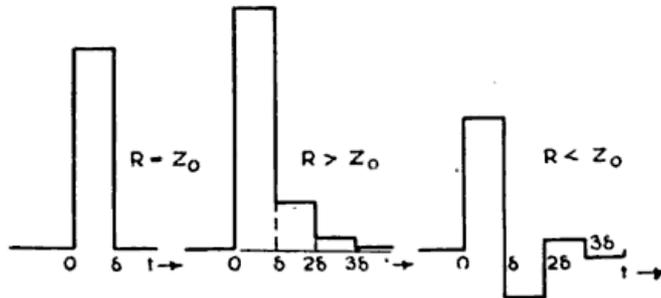


Figure 41.—Discharge of transmission line into resistance loads of different magnitudes.

found, which if $R > Z_o$ are of one sign, or if $R < Z_o$ are of alternate signs as in Fig. 41.

If the load is not a fixed resistance, but has a non-linear voltage-current characteristic independent of the rate at which

it is traced out, a stepped waveform will still result. This case, which may be treated graphically, is important in view of the marked non-linearity of magnetron characteristics.

Alternatively, the closing of the switch may be regarded as the application of a step-shaped voltage between its contacts. The alternating current impedance of the network which gives a current response of rectangular waveform when such a voltage is applied may be calculated by a well-known theorem.³ It transpires that a uniform open circuited transmission line in series with a load resistance equal to the characteristic impedance is required.

Networks Equivalent to the Uniform Line⁴

An actual transmission line to produce pulses of the length commonly used in radar (1 microsecond or more) would be of inconvenient dimensions. Hence networks consisting of lumped elements are used to approximate the performance of the open circuited line.

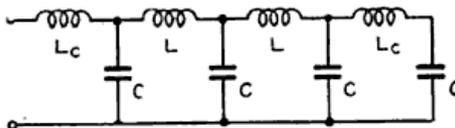


Figure 42.—Low pass filter pulse forming network.

Low Pass Filter Pulse Forming Network. The simplest and most commonly used equivalent network is the low pass filter shown in Fig. 42. Constructional advantages of this network

³ The current response $A(t)$ of a network to a unit step-shaped applied voltage is related to the corresponding alternating current impedance $Z(j\omega)$ by the equation

$$\frac{1}{aZ(a)} = \int_0^{\infty} e^{-a\lambda} A(\lambda) d\lambda$$

in which a is real and positive. Assuming a unit current pulse of duration δ for $A(t)$, we have $Z(j\omega) = \frac{1}{j} + \frac{1}{j} \coth j\omega\delta/2$.

⁴ E. L. C. White, "The use of delay networks in pulse formation," *J. Instn. Elect. Engrs.*, Vol. 93, Part IIIA, 1946, pp. 312-4.

only one capacitor has to withstand the full voltage and the pulse forming capacitors are all equal in value. It is therefore suitable for construction from standard components and is convenient for experimental purposes. However, these features are not important in a design intended for production, and the disadvantage that the pulse forming capacitors contribute nothing to the stored energy renders the Bartlett line inferior to the low-pass filter network.

Special Arrangements for Saving Insulation

The arrangements described above result in a pulse voltage equal to half the voltage to which the network is charged, so that the network must be insulated to withstand twice the voltage of the output pulse. The Blumlein circuit shown in Fig. 44 gives a pulse voltage equal to the voltage to which

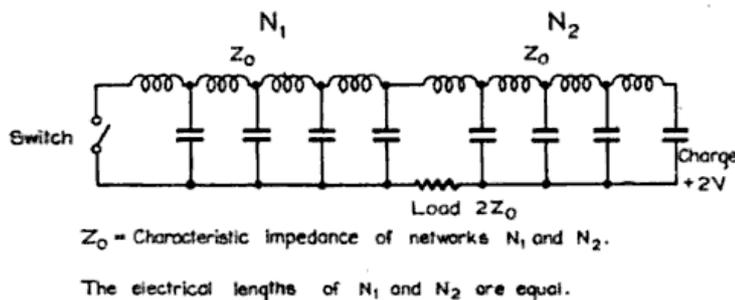


Figure 44.—Blumlein Circuit.

the lines are charged. The load impedance should equal twice the characteristic impedance of each of the pulse forming networks.

Another useful method of economising insulation is to charge two pulse forming networks in parallel and switch them to series connection for discharge through the load after the fashion of the Marx high voltage impulse circuit, as indicated in Fig. 45. Switch No. 1 operates first and the sudden rise

in voltage fires switch No. 2. The "hold-off" chokes must have sufficient inductance to prevent appreciable current building up in them during the pulse. Arrangements such as these have been superseded by the use of pulse transformers but they may still be found useful for experimental purposes when a transformer is not available.

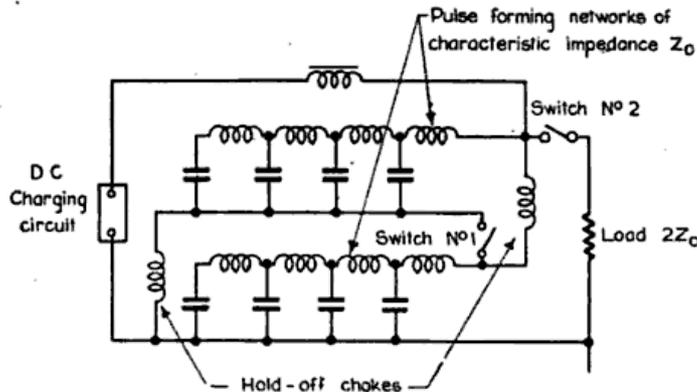


Figure 45.—Parallel charge, series discharge, circuit.

Switches Used in Line Type Modulators⁵

As mentioned earlier the requirements for the switch in a line type modulator are that it should close quickly and remain closed for the duration of the pulse. It should then open in time to permit the charging of the network for the next pulse.

Rotary Spark Gap. The rotary spark gap consists of a set of rotating electrodes which pass close by one or more fixed electrodes. Near the point of closest approach a spark passes which closes the switch. Current ceases on the discharge of the network and the electrodes separate, opening the switch before the voltage again builds up in preparation for the next spark. The repetition frequency is determined by the speed of rotation and the number of electrodes; for example, a speed of rotation of 3,000 revolutions per minute or 50 per second and ten moving electrodes passing one fixed electrode gives a repetition

⁵ F. S. Goucher, J. R. Haynes, W. A. Depp, E. J. Ryder, "Spark gap switches for radar," *Bell Syst. Tech. J.*, Vol. 25, 1946, pp. 563-602.

(Excerpt from Chapter 5 – Pulse Circuits)

(d) Pulse-Forming Lines. The heart of a line-type modulator is the pulse-forming line, which is an artificial transmission line open-circuited at one end. We will show in a qualitative way how an actual transmission line can be employed to form a pulse and will then trace briefly the development of the important types of artificial transmission lines in use at present for high level pulse generation. For the sake of simplicity we will assume the transmission line to be lossless, so that its characteristic impedance Z_0 and delay time τ , are given by (Chapter 2)

$$Z_0 = \sqrt{\frac{L}{C}} \quad (5.17)$$

$$\tau = l\sqrt{LC} \quad (5.18)$$

where L and C are the distributed inductance and capacitance per unit length, and l is the length of the line. Since the delay time is independent of frequency, it is evident that a complex pattern of frequencies, such as that contained in a rectangular pulse, will travel down the line with no disturbance of its phase relations and therefore with no distortion.

From the discussion of transmission lines given in Chapter 2, it can be seen that the incident and reflected signals observed at the open-circuited end of a transmission line have voltages which are in phase but currents which are reversed in phase. Thus a rectangular voltage pulse traveling in one direction on a line has associated with it a current which is equal and opposite to the current associated with an equal voltage pulse of the same sign traveling in the opposite direction. When two such pulses of voltage V and duration corresponding to a length l of the line meet, their voltages add but their currents cancel, so that at the instant of

perfect overlap there is in effect an *electrostatic* charge of voltage $2V$ on a section of line of length l . If a rectangular pulse, of voltage V and width $2l$, is impressed on an open-circuited line, Fig. 5-26 (a), at the instant of half reflection, Fig. 5-26 (c), the pulse

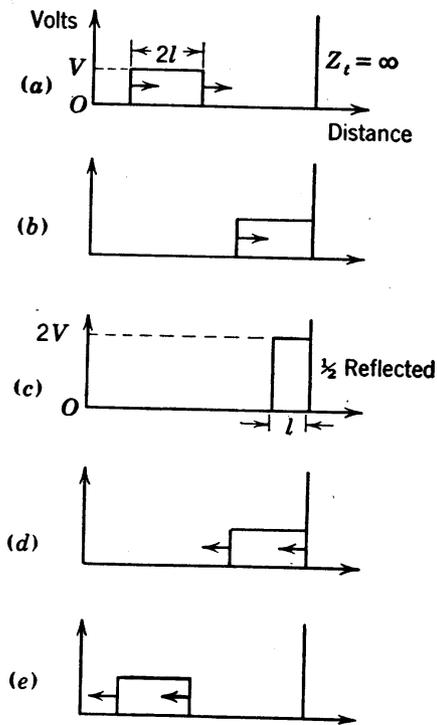


FIG. 5-26 Schematic representation of the reflection of a voltage pulse from the open end of a transmission line. At the instant of half reflection there is in effect an electrostatic charge on the end portion of the line.

width will be l , the pulse voltage $2V$, and the pulse current zero. If the line were suddenly cut at the left edge of the pulse, the electrostatic charge would remain on the line. If, at a later time, the removed section of line were replaced by a resistive load equal to the characteristic impedance of the line, a pulse of amplitude V , current V/Z_0 , and duration $2l/v_p$ seconds would appear across the load, v_p being the phase velocity of transmission along the line. At the end of this time the transmission line would be completely discharged, all the energy previously stored in the line as electrostatic charge having been transferred to the load and dissipated therein.

This phenomenon is applied in line pulsers. One of the types of switches mentioned above is employed to place across a charged open-circuited trans-

mission line a load having an impedance as nearly as possible equal to the characteristic impedance of the line.

(e) *Artificial Transmission Lines.* Since the pulse duration in seconds is given by $2l/v_p$, and since for ordinary parallel wire and coaxial lines v_p is very nearly equal to $(3 \times 10^8)/\sqrt{K}$ meters per second, K being the dielectric constant of the dielectric material used in the line, it is evident that to form a 1-microsecond pulse an air-dielectric line 150 meters long would have to be used. To

$$Z_0 = \sqrt{\frac{L}{C}}$$

$$\tau = 2n\sqrt{LC} \quad (5.19)$$

$$\frac{l}{d} = 1.33$$

$$\frac{L_C}{L} = 1.1 \text{ to } 1.2$$

where n is the number of sections, l is the length of coil per section, d is the diameter of the coil, and L and C are the inductance and capacitance per section. The last two equations are empirical. The value of n ranges from 1 to 3 for 0.1-microsecond pulses up to 4 to 7 for 5-microsecond pulses. A five-section line for $\tau = 1$ microsecond, working into a resistive load, gives a pulse which is very nearly flat on top and has a rise time of the order of 0.1 to 0.2 microsecond.

(f) *Charging the Pulse-Forming Line.* It is evident from equations 5.19 that

$$nC = \frac{\tau}{2Z_0} \quad (5.20)$$

for a type E line. The capacity nC must be charged to twice the desired pulse voltage in the period between pulses from a suitable power supply. Two types of charging are in general use, one of which employs a d-c supply while the other employs an a-c source.

D-C CHARGING. In various low power applications such as sweep circuits (cf. Chapter 6) condensers are commonly recharged through series resistances. This practice is not employed with high power modulators, since half the energy supplied from the source is necessarily lost in the resistor. The transfer of charge can be accomplished with very low losses if one employs a series inductance for isolating the line from the supply during the pulse. Qualitatively one may say that the inductance serves as a low impedance to the low frequencies contained in the gradual charging of the line during the interpulse period of hundreds or thousands

Motorola Bag Phone RF Info

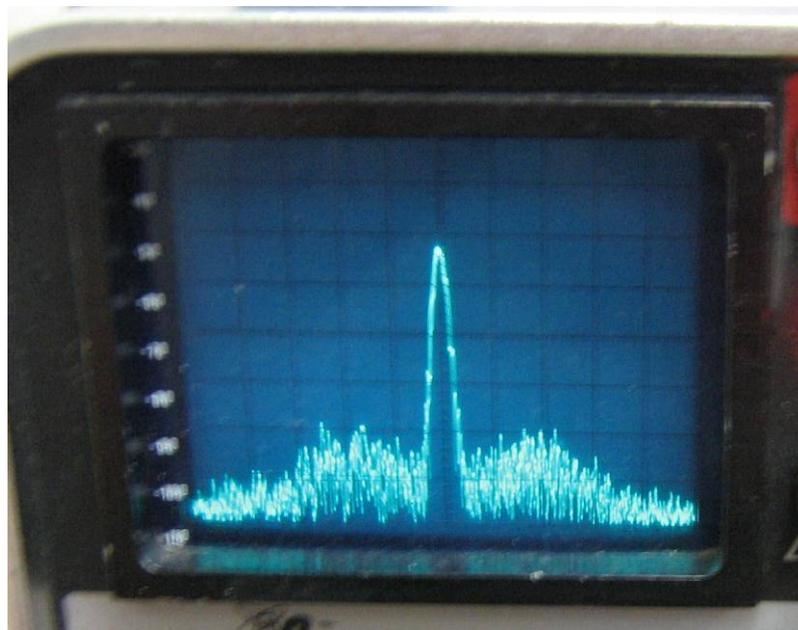
Overview

Finally got a chance to look at an old Motorola bag-style cellular phone on an IFR-1200S service monitor.

RF power output and a spectrum analyzer shot are shown before. The phone was in "test mode," with pin 21 on the DB-25 tied to ground.

The test frequency was 837.000 MHz. Enter 110400# on the keypad while in test mode to set the phone to that frequency. The phone's RF output power is set with the 12x# keypad entry. Where "x" is either 0, 1, 2, 3, or 4. Highest output power is with the "120#" option. The RF output seemed unstable while on the "124#" option, so stick with "123#" and pad down the RF power level with a resistive attenuator pad. Most commercial double-balanced mixers needs a +7, +10, +13, or +17 dBm input LO signal, if you use the phone for this application.

Motorola Test Mode Command	RF Output Power (Watts)	RF Output Power (dBm)
120#	2.57	+34.1
121#	0.85	+29.3
122#	0.30	+24.8
123#	0.10	+20.0
124#	0.02	+13
125#	No RF Output	No RF Output
126#	No RF Output	No RF Output
127#	No RF Output	No RF Output
128#	No RF Output	No RF Output
129#	No RF Output	No RF Output



Spectrum analyzer screen capture of a Motorola bag-style cellular phone, in testmode, transmitting at 837 MHz. The horizontal setting is 20 kHz per division. Vertical is 10 dB per division.

"I built this 16-bit computer and saved money. Learned a lot, too."

Save now by building the Heathkit H-100 yourself. Save later because your computer investment won't become obsolete for many years to come.

Save by building it yourself. You can save hundreds of dollars over assembled prices when you choose the new H-100 16-Bit/8-Bit Computer Kit - money you can use to buy the peripherals and software of your choice.

H-100 SERIES COMPUTER SPECIFICATIONS:

USER MEMORY:
192K-768K bytes*

MICROPROCESSORS:
16-bit: 8088
8-bit: 8085

DISK STORAGE:
5.25" disk drive,
8" disk drive
Winchester drive

KEYBOARD:
Typewriter style, 95 keys,
13 function keys,
18-key numeric pad

GRAPHICS:
Always in graphics mode.
640h 225v resolution; up to
eight colors are available**

COMMUNICATIONS:
Two RS-232C Serial
Interface Ports and
one parallel port

DIAGNOSTICS:
Memory self-test
on power-up

AVAILABLE SOFTWARE:
Z-DOS (MS-DOS)
CP/M
Z-BASIC Language
Microsoft BASIC
Multiplan
SuperCalc
WordStar

MailMerge
Data Base Manager
File Manager
General Ledger
Accounts Receivable
Accounts Payable
Inventory Control
Sales Invoicing
Lotus 1, 2, 3
PeachText 5000
Fortran-86
Cobol-86
Pascal
Basic Compiler
Most standard
8-bit CP/M
Software

The H-100 is easy to build - the step-by-step Heathkit manual shows you how. And every step of the way, you have our pledge - "We won't let you fail." Help is as close as your phone, or the nearest Heathkit Electronic Center.†

And what better way to learn state-of-the-art computing techniques than to build the world's only 16-bit/8-bit computer kit? To run today's higher-speed, higher-performance 16-bit software, you need an H-100. It makes a big difference by processing more data faster.

Dual microprocessors for power and compatibility. The H-100 handles both high-performance 16-bit software and most current Heath/Zenith 8-bit software.

Want room to grow? The H-100's standard 192K byte Random Access Memory complement can be expanded to 768K bytes - compared to a 64K standard for many desktop computers.

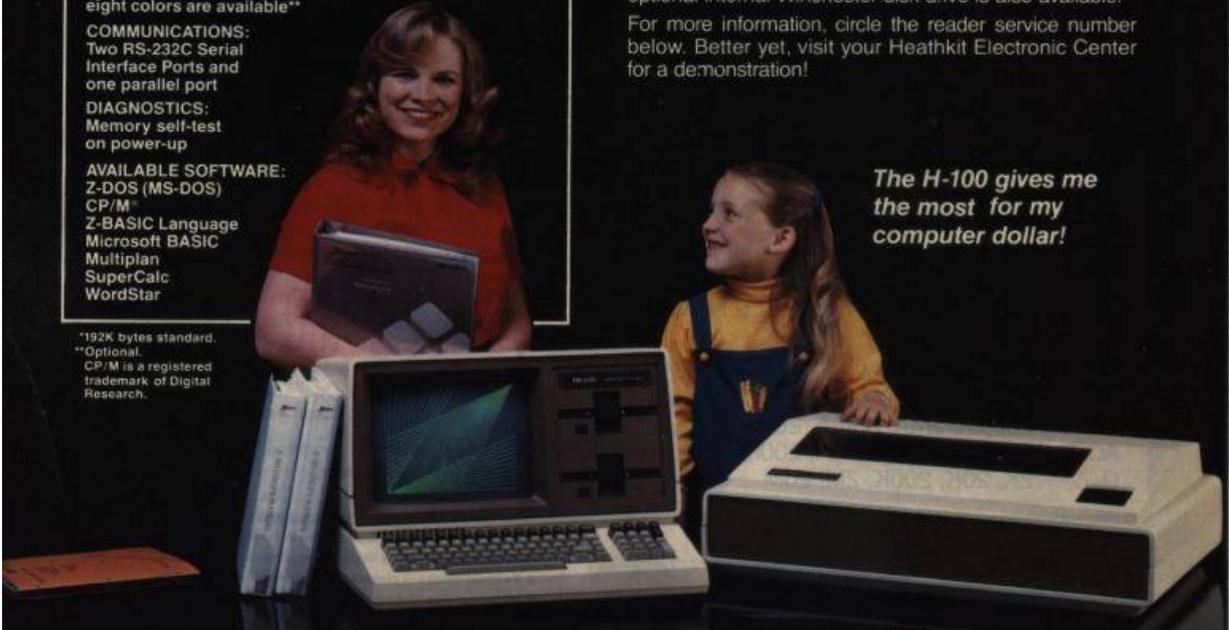
And the industry-standard S-100 card slots support memory expansion and additional peripheral devices, allowing your investment to grow.

High-capacity disk storage, too. The H-100's 5.25" floppy disk drive can store 320K bytes on a single disk. The computer also supports an optional second 5.25" and external 8" floppy disk drives. For maximum storage, an optional internal Winchester disk drive is also available.

For more information, circle the reader service number below. Better yet, visit your Heathkit Electronic Center for a demonstration!

*The H-100 gives me
the most for my
computer dollar!*

*192K bytes standard.
**Optional.
CP/M is a registered
trademark of Digital
Research.



Heathkit
Heath
Company

A subsidiary of Zenith Radio Corporation

Heathkit Electronic Centers are units of Veritechnology Electronics Corporation.

CIRCLE 37 ON FREE INFORMATION CARD

Most of today's "hackers" can barely find the power button on their computer.

End of Issue #65



Any Questions?

Editorial and Rants

Michael Moore sure hates capitalism!

From: gatewaypundit.blogspot.com/2009/09/to-michael-moore-capitalism-is-evil.html

Just some data for if you run a piece on Michael Moore's new movie.

Capitalism sure has been evil for Mike. For reference, Torch Lake is among the two or three most desirable places to live in Northern Michigan. Normally, Michael Moore says that Traverse City (96% White!) is his adopted hometown, or lies and says that he lives in Bellaire, like he has some kind of log cabin in the woods.

Nope, his home is an expensive house on 150 ft. of lake frontage.

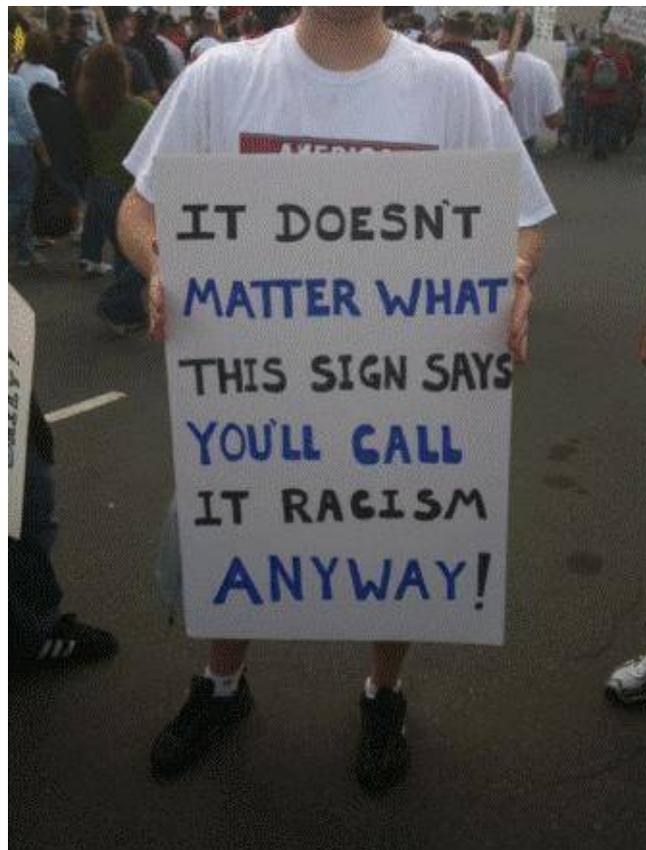
Property Information

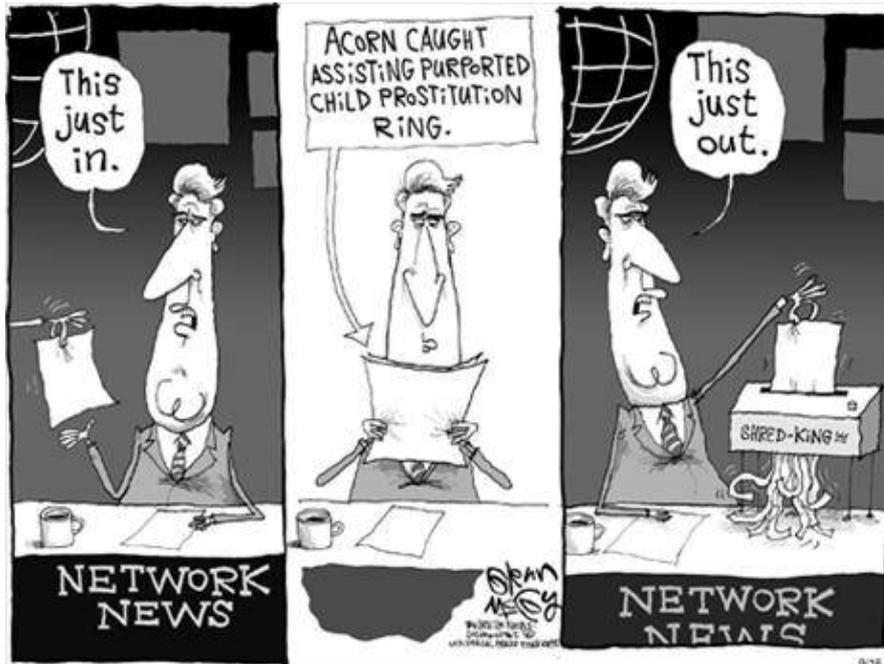
Owner Name(s): Michael Moore & Kathleen Glynn
Property Address: Central Lake, MI 49622
Current Taxable Value: \$390,976
School District: Bellaire
Current Assessment: \$647,200
Current Homestead: 100%
Current Property Class: 40 - Residential
Last Year's Assessment: \$647,200
Last Year's Homestead: 100%
Last Year's Property Class: 40 - Residential
Lake Frontage: Torch Lake
Waterfront Footage: 150.48 ft.

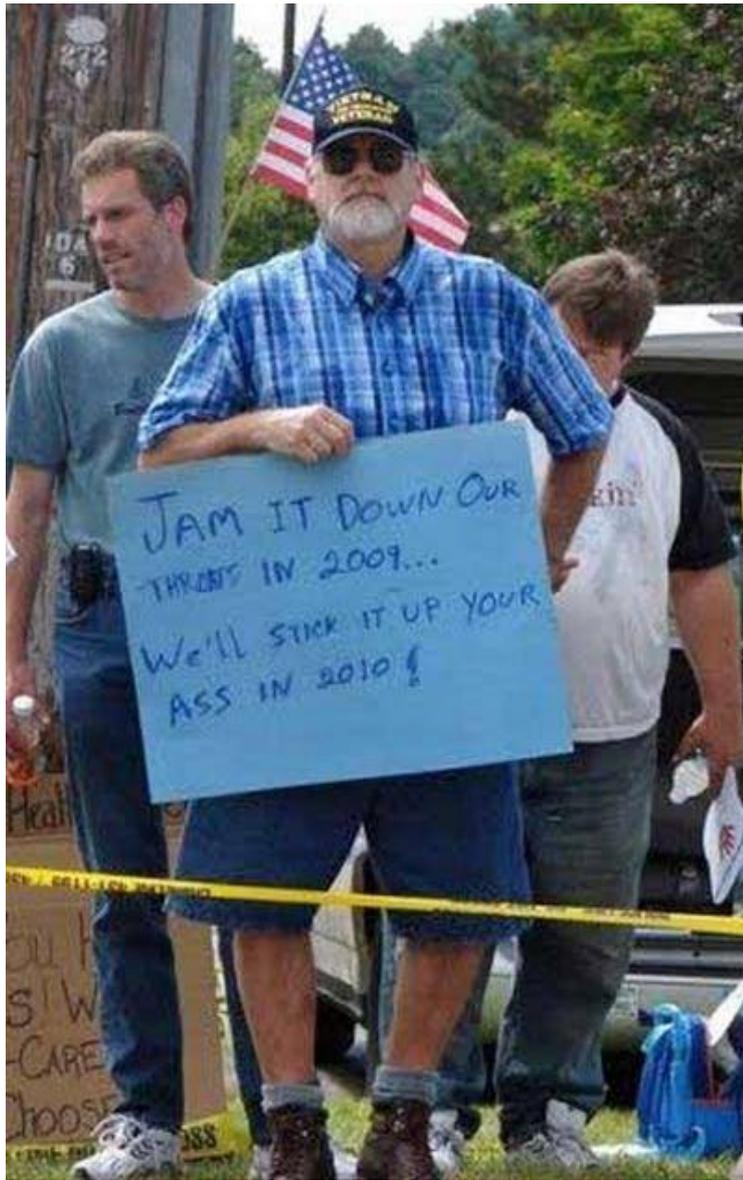
"Get me some fried chicken! Errr... Capitalism is bad!"



Some Pictures from the Tea Party







Compared to the professionally-made, Soros-funded, pro-Obama signs.



Back on June 8th, Barack Obama promised to speed up the stimulus projects over the summer and to "create or save" 600,000 jobs.

The AP reported: *"President Barack Obama is promising to speed federal money into hundreds of public works projects this summer, vowing that 600,000 jobs will be created or saved."*

The U.S. lost 443,000 jobs in June.

The U.S. lost 247,000 jobs in July.

The U.S. lost 216,000 jobs in August.

Instead of creating or saving 600,000 jobs this summer, the U.S. lost 935,000 instead. The unemployment rate is at 9.7%, the highest rate in 26 years.

Thanks Barack.



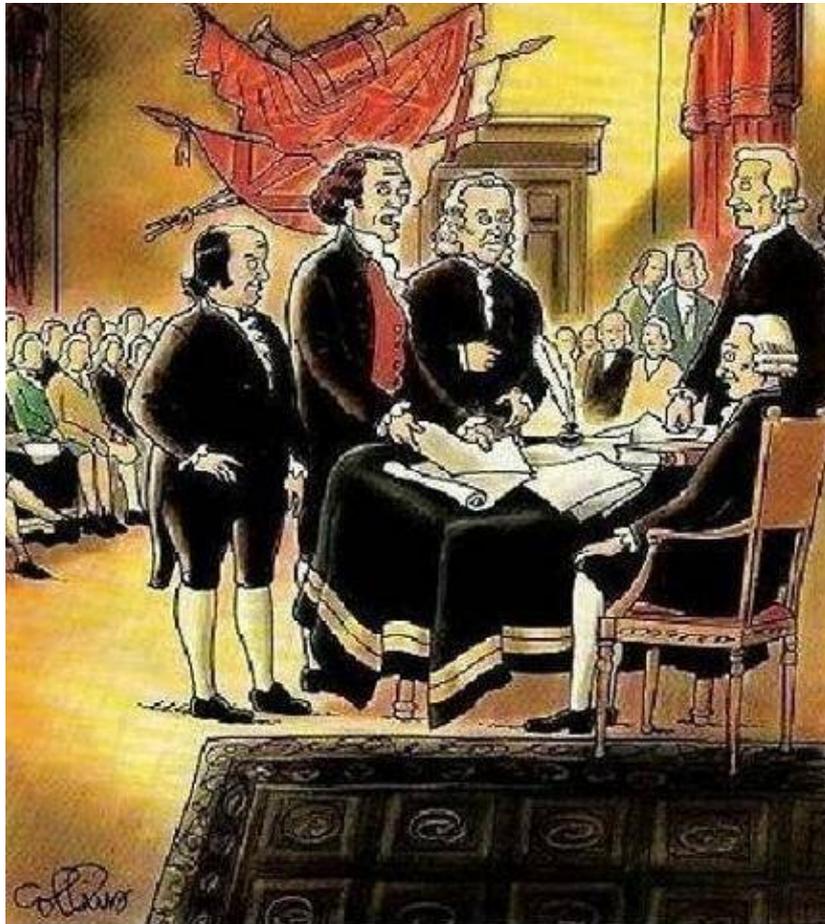
After Sept 12 DC Rally



After Inauguration of Barack Obama



This little piggie scares the markets, 
This little piggie steals homes, 
This little piggie has roast pork, 
This little piggie gets none (and has to pay for everything!) 
And this little piggie  Cries "Me, Me, Me!"
Then eats us out of house and home!



"I keep thinking we should include something in the Constitution in case the people elect a fucking moron."

Wait... You mean the mainstream media can't be trusted?

Public Trust in U.S. Media Eroding: Pew Study

September 14, 2009 – From: news.yahoo.com

WASHINGTON (AFP) – Public trust in the U.S. media is eroding and increasing numbers of Americans believe news coverage is inaccurate and biased, according to a study released on Monday.

Just 29 percent of the 1,506 adults surveyed by the Pew Research Center for the People and the Press between July 22–26 said news organizations generally get the facts straight.

Sixty–three percent said news stories are often inaccurate, up from 34 percent in a 1985 study, Pew said.

Sixty percent of those polled said the press is biased, up from 45 percent in 1985. Just 26 percent in the latest survey said that news organizations are careful their reporting is not politically biased.

Seventy–four percent said news organizations tend to favor one side in dealing with political and social issues. Eighteen percent said they deal fairly with all sides.

Pew said Republicans tend to be more critical of the news media than Democrats although negative attitudes toward the news media were also increasing among Democrats.

Fifty–nine percent of those who identified themselves as Democrats said news organizations are often inaccurate, up from 43 percent just two years ago.

Two–thirds of the Democrats polled said the press tends to favor one side rather than to treat all sides fairly, up from 54 percent in 2007.

Just 20 percent of those polled said news organizations are independent of powerful people and organizations and only 21 percent said they are willing to admit their mistakes.

The poll found television remained the dominant news source for the public, with 71 percent saying they get most of their national and international news from television.

Forty–two percent said they get most of their news from the Internet compared with 33 percent who cited newspapers.

Fifty–nine percent rated news organizations as "highly professional," down from 66 percent two years ago and 72 percent in 1985.

Sixty–two percent of those polled said news organizations are being fair to the Obama administration while 23 percent said media coverage has been unfair.

Forty percent said the major cable news outlets -- CNN, Fox News and MSNBC -- were their main source for national and international news with 22 percent saying they relied on CNN, 19 percent on Fox and six percent on MSNBC.

Seventy–two percent of Republicans view Fox News positively compared with just 43 percent of Democrats.

Those polled were starkly divided along party lines when it came to the *New York Times*.

Republicans viewed the *Times* negatively by a margin of 31 percent to 16 percent while Democrats viewed it positively by 39 percent to eight percent margin.

Sixty-eight percent of those polled said it would be a major loss if large national newspapers like the *Times*, *USA Today* and the *Wall Street Journal* were to stop publishing.

The survey had a margin of error of between plus or minus three percentage points.

Gee... I can't imagine why!



The screenshot shows the ABC News website interface. At the top, the ABC News logo is on the left, and "The Blotter from Brian Ross" is on the right. Below the logo is a navigation menu with "Home", "News", "Politics", "Blotter", "Health", "Entertainment", and "Money". Underneath the menu, there are links for "More Blotter: Consumer Alert", "Bernard Madoff", and "UAE Torture". A large banner reads "THE BLOTTER FROM BRIAN". Below the banner is a "Now Playing" section with a "WATCH: How to Check the Age of Your Tires" video thumbnail. The main content area features a large image of a man in a cap holding a sign that says "IT IS TIME TO WATER THE TREE OF LIBERTY!". To the left of the man, a person is holding a handgun. Below the image is the headline "Fear for Obama's Safety Grows as Hate Groups Thrive on Racial Backlash" and a sub-headline "Violent signs, gun, standoff latest in emerging anger towards the President." Below the sub-headline is a comment icon and the text "1467 Comments".

Free State Project – www.freestateproject.org

In the Circuit Court of the First Circuit

STATE OF HAWAII

AT CHAMBERS

Before the Honorable SAMUEL P. KING Judge Presiding

OPENLY IN THE PUBLIC COURT ROOM OF SAID JUDGE

STANLEY ANN D. OBAMA, Libellant

BARACK H. OBAMA, Libellee

1st CIRCUIT COURT
STATE OF HAWAII
GRIEVOUS MENTAL SUFFERING
1964 MAR 20 AM 10 56
Clerk

Decree of Divorce

On this 5th day of March A.D. 1964 at the Court House in the City of Honolulu, openly in the Public Court Room of said Judge, came on duty to be heard the petition of said above named Libellant, of the City and County of Honolulu, State of Hawaii, praying that the bonds of matrimony heretofore existing between them, the said LIBELLANT and LIBELLEE be dissolved by reason of the alleged grievous mental suffering inflicted upon Libellant by Libellee; And the said Libellant and her attorney, GEORGE L. T. KERR, being present in Court before said Judge, due proof was made to this Court that the said parties are legally intermarried, and that the allegations in said petition are true.

It is hereby Ordered, Adjudged and Decreed, That the bonds of matrimony existing between the said LIBELLANT and LIBELLEE be and the same are hereby dissolved. This decree to take effect from and after the date of signing and filing hereof.

IT IS FURTHER HEREBY ORDERED, ADJUDGED AND DECREED that the Libellant be and she is hereby granted the care, custody and control of BARACK HUSSEIN OBAMA, II, the minor child of the parties hereto, with the right of reasonable visitation in the Libellee, and further that the question of child support is specifically reserved until raised hereafter by Libellant.

DATED: Honolulu, Hawaii, this 20th day of March, 1964.

HENSHAW, CONROY & HAMILTON
(George L. T. Kerr)
1410 First National Bank Bldg.
Honolulu, Hawaii
Attorneys for Libellant.

Samuel P. King
Judge of the Circuit Court, First Circuit, State of Hawaii
Division of Domestic Relations

CLERK

I do hereby certify that this is a full, true, and correct copy of the original on file in this office pursuant to Section 92-30, Hawaii Revised Statutes.

Henshaw
Clerk, Circuit Court, First Circuit,
State of Hawaii

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