

# GBPPR 'Zine



Issue #68 / The Monthly Journal of the American Hacker / December 2009

***"That's not how science works,' she said. 'It doesn't matter if 99,000 people all agree about something and one person is right. Politics works like that – a certain number of people vote for something and then it becomes true. But with science, it's the one person who tells the truth.'"***

---- November 21, 2009 quote from Ann McElhinney about her upcoming "global warming" debunking video.

***"If anything, I would like to see the climate change happen, so the science could be proved right, regardless of the consequences. This isn't being political, it is being selfish."***

---- July 5, 2005 quote from noted "global warming" expert Prof. Phil Jones in the leaked CRU emails.

## Table of Contents

- ◆ **Page 2 / Message Service System / #1A ESS (Part 2)**
  - ◆ Implementation procedures for the personalized message services under a #1A ESS.
- ◆ **Page 38 / High-Performance 28 VDC Power Supply**
  - ◆ Several upcoming projects will require a fairly high-quality 28 volt / 10 amp power supply.
- ◆ **Page 57 / World Scanner Report – Vol. 4, No. 10**
  - ◆ Found an old 1994 issue of Bill Check's excellent radio technology newsletter, and thought I'd share it.
- ◆ **Page 67 / Bonus**
  - ◆ You're Going to Jail!
- ◆ **Page 68 / The End**
  - ◆ Editorial and rants.

# Message Service System / #1A ESS (Part 2)

ISS 2, AT&T 231-318-364

2. Enter the octal length of the seized memory block (hh) into the -1 word of the MDCSBIATG subtranslator by typing:

```
RC:PSWD:  
ADD ggggggg  
OLDDAT 0  
DAT hh!
```

ggggggg = Starting address of the memory block seized in Step 1.  
hh = Octal length of seized memory block.

The system response should be an **RC18 1 0 ACPT** message indicating the RC:PSWD message has been accepted.

3. Type the following message to determine if the MDCSBIATG subtranslator length has been entered correctly.

```
DUMP:CSS,ADR ggggggg,L 1!
```

The system response should be a **DUMP:CSS** output message indicating the octal contents of the address (ggggggg). This value should agree with the octal length (hh) entered in Step 2.

4. Add octal 1 to the starting address (ggggggg) of the memory block seized in the previous step to obtain the address of word 0 (iiiiiii) for the new MDCSBIATG subtranslator.
5. Link the seized block to the bit table common block by typing:

```
RC:PSWD:  
ADD mmmmmmm  
OLDDAT 0  
DAT iiiiiii!
```

mmmmmmm = Address recorded in 6.2 (aaaaaaa) + octal 2.  
iiiiiii = Octal address of word 0 found in Step 4.

The system should respond with an **RC18 1 0 ACPT** message indicating that the message was accepted.

6. Type the following message to determine if the MDCSBIATG subtranslator has been linked properly to the bit table common block.

```
DUMP:CSS,ADR mmmmmmm,L 1!
```

The system response should be a **DUMP:CSS** output message indicating the octal contents of address mmmmmmm. This value should agree with iiiiiii, the octal address of word 0 of the new MDCSBIATG subtranslator linked to the bit table common block.

Page 27

# Message Service System / #1A ESS (Part 2)

AT&T 231-318-364

## 6.3.3 Build MDCSBIATLH (Message Service Call Store Bit Index Assignment Table for Line History)

The MDCSBIATLH subtranslator is an 87-word block (words -1 through 85) of fixed length. The following steps will seize, initialize, and link a subtranslator to the bit table common block (Fig. 8).

1. Seize and initialize to zero an 87-word block of memory by typing:

```
RC:SUBTRAN:  
DATA 0  
LNG H87  
OTHER!
```

The system should respond with an **RC18 17 0 INFO** message with the octal starting address (jjjjjj) and length (kk) of the seized block. Also, an **RC18 17 0 ACPT** message should print indicating that the RC:SUBTRAN: message was accepted.

*Note:* The address and length of the seized block should be recorded for future reference. The starting address (jjjjjj) of the seized block represents the -1 word of the new MDCSBIATLH subtranslator.

2. Enter the octal length (kk) of the seized memory block into the -1 word of the MDCSBIATLH subtranslator by typing:

```
RC:PSWD:  
ADD jjjjjj  
OLDDAT 0  
DAT kk!
```

jjjjjj = Starting address of the memory block seized in Step 1.  
kk = Octal length of seized memory block.

The system response should be an **RC18 1 0 ACPT** message indicating that the RC:PSWD message has been accepted.

3. Type the following message to determine if the MDCSBIATLH subtranslator length has been entered correctly.

```
DUMP:CSS,ADR jjjjjj,L 1!
```

The system response should be a **DUMP:CSS** output message indicating the octal contents of the address (jjjjjj). This value should agree with the octal length (kk) entered in Step 2.

# Message Service System / #1A ESS (Part 2)

ISS 2, AT&T 231-318-364

4. Add octal 1 to the starting address (jjjjjj) of the memory block seized in the previous step to obtain the address of word 0 (llllll) for the new MDCSBIATLH subtranslator.
5. Link the seized block to the bit table common block by typing:

```
RC:PSWD:  
ADD nnnnnnn  
OLDDAT 0  
DAT llllll!
```

nnnnnnn = Address recorded in 6.2 (aaaaaaa) + octal 4.

llllll = Octal address of word 0 found in Step 4.

The system should respond with an **RC18 1 0 ACPT** message indicating that the message was accepted.

6. Type the following message to determine if the MDCSBIATLH subtranslator has been linked properly to the bit table common block.

```
DUMP:CSS,ADR nnnnnnn,L 1!
```

The system response should be a **DUMP:CSS** output message indicating the octal contents of address nnnnnnn. This value should agree with llllll, the octal address of word 0 of the new MDCSBIATLH subtranslator linked to the bit table common block.

# Message Service System / #1A ESS (Part 2)

AT&T 231-318-364

## 6.4 Enter MSS Option(s) in Centrex Common Block

There are no changes to the purpose of the message, the message types, the initial conditions, or the results of message. Refer to AT&T Practice 231-318-355 for other keyword options and the latest RC:CTXCB information.

### 6.4.1 New Keywords

MWI	YES/NO	Message Service MWI (message waiting indicator). Indicates whether or not a Centrex group has the message waiting option.
MSAMA (Note 1)	b/NO	Message Service Automatic Message Accounting Indicator. Used to indicate method of billing for a Centrex group. The value of "b" is either F or C:  MSAMA F — Flat rate billing. MSAMA C — Billing on Centrex group basis.
IOCHAN	cc/NO	I/O Channel Number. Used to designate I/O channel available for use by message service center lines and hunt groups within the Centrex group. Valid values range from 24 through 95.
MSGDSK (Note 2)	dd/NO	Message Service ID. Used to identify a Centrex group receiving MSS information over an I/O channel. Valid values range from 1 through 63.

**Note 1:** MSAMA will be input when billing on a flat rate or group basis for Centrex message service center lines.

**Note 2:** MSGDSK and IOCHAN both must be input to enable message service centers to use an I/O channel for MSS information.

# Message Service System / #1A ESS (Part 2)

ISS 2, AT&T 231-318-364

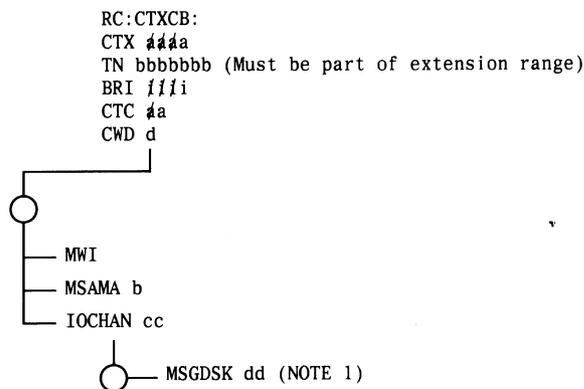
## 6.4.2 Adding, Changing, or Deleting MSS Options in a Centrex Common Block

### 6.4.2.1 Adding MSS Options to a Centrex Common Block

**Initial Conditions:** The Centrex head table exists and the specified Centrex group number is unassigned. If a supplementary auxiliary block is to be built, the supplementary Centrex head table must exist. The supplementary Centrex head table must be built to the same size as the Centrex head table.

**Results of Message:** A Centrex common block is seized, linked to the Centrex head table, and built as specified. If a supplementary auxiliary block is required, it is seized, linked to the supplementary Centrex head table, and built as specified.

Add MSS options for Centrex common block as shown in Fig. 9. Refer to AT&T Practice 231-318-355 for the latest RC:CTXCB information.



Where:

CTX #### = Centrex Group Number (1-9999 - Parameter Limit)  
TN bbbbbb = Listed Directory Number  
BRI iiii = Base Route Index (200 - Parameter Limit)  
CTC #a = Call Transfer Code (0, 2, 8, 12, or 13)  
CWD d = Call Waiting Codes (0-7)

Note:

1. MSGDSK must be input with IOCHAN if I/O channel is to be used by message service centers.

Fig. 9 — Add MSS Option(s) to a Centrex Common Block

# Message Service System / #1A ESS (Part 2)

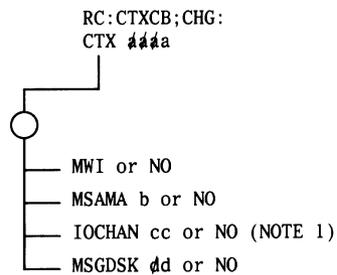
AT&T 231-318-364

## 6.4.2.2 Changing or Deleting MSS Options in a Centrex Common Block (Except for the Digit Interpreter Portion)

**Initial Conditions:** The specified Centrex common block exists. If a supplementary auxiliary block is required and does not exist, the supplementary Centrex head table must exist. The supplementary Centrex head table must be built to the same size as the Centrex head table.

**Results of Message:** Data in the common block is changed as specified. Data in the supplementary auxiliary block is changed, deleted, or an auxiliary block is seized, linked to the head table, and built, if required.

Change or delete MSS option(s) in a Centrex common block as shown in Fig. 10. Refer to AT&T Practice 231-318-355 for the latest RC:CTXCB information.



Where:

CTX #### = Centrex group number

Note:

1. If IOCHAN and MSGDSK previously inputted, and if IOCHAN changed, MSGDSK must also be changed.

Fig. 10 — Change or Delete MSS Option(s) in a Centrex Common Block

# Message Service System / #1A ESS (Part 2)

ISS 2, AT&T 231-318-364

## 6.5 Enter MSS Option(s) in Centrex Digit Interpreter Table

There are no changes to the purpose of the message, the message types, the initial conditions, or the results of message. Refer to AT&T Practice 231-318-355 for other keyword options and the latest RC:CTXDI information.

### 6.5.1 Changed Keyword(s)

STYP aa Subtype Number. Used to determine what kind of data type 5 entry this Centrex digit interpreter entry is. STYP 28 is used for message service message waiting access codes. A sub-subtype of 1 or 0 is used with subtype 28 to indicate whether the access code is for MWI activation or MWI deactivation, respectively, for a Centrex line.

### 6.5.2 Add MSS Option(s) to Centrex Digit Interpreter Table

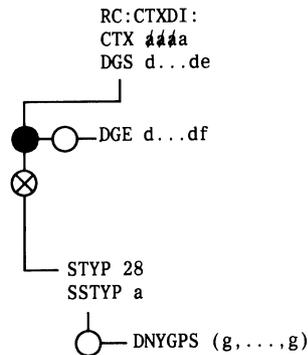
**Initial Conditions:** The Centrex common block exists with sufficient levels of digit interpreter tables for the final data entry.

**Results of Message:** The specified final data entry (or range of entries) is entered in (or completely replaces existing entries in) the digit interpreter table.

Add MSS option(s) to Centrex digit interpreter table as shown in Fig. 11.

# Message Service System / #1A ESS (Part 2)

AT&T 231-318-364



Where:

- CTX #...a = Centrex group number (1-9999 - parameter limit)
- DGS d...de = Digits to be interpreted (Max of 7 digits)
- DGE d...df = End of range digits to be interpreted (0>9, only last digit)
- SSTYP a = Sub-subtype number
- DNYGPS (g,...,g) = Deny access to a specified centrex access treatment restriction group. Each g may have value of 0 to 7 and 1 to 8 gs may be specified.

Fig. 11 — Add MSS Option(s) For Centrex Digit Interpreter Table

## 6.6 Assign MSS Options to a New Multiline Hunt Group (Centrex, ESSX-1, and Non-Centrex Except ACD)

There are no changes to the purpose of the message, the message types, the initial conditions, or the results of message.

### 6.6.1 New Keywords

MDC      YES/NO      Message Service Center. Used to indicate message service center assignment for hunt group.

# Message Service System / #1A ESS (Part 2)

ISS 2, AT&T 231-318-364

MWI	YES/NO	Message Service Message Waiting Indicator. Used to indicate if all lines in multiline group have message waiting option.
MSAMA	b/NO	Message Service Automatic Message Accounting Indicator. Used to indicate method of billing for a message service center line. The value of "b" is F, C, or M: MSAMA F — Billing on a flat rate basis. MSAMA C — Billing on a Centrex group basis. MSAMA M — Billing on a multiline hunt group basis.
IOCHAN	aa	Input/Output Channel Number. Used to interface to 1A ESS switch unit.
MSGDSK	q/d	Message Service Number. Used to identify individual message service centers in multiline group.

**Note 1:** The MSAMA keyword must be input if the hunt group is a message service center. If MSAMA C is input, then the Centrex group must already be assigned MSAMA. The MSAMA keyword may be input when billing on a hunt group basis for message service center lines is desired.

**Note 2:** If a message service center needs MSS information sent over an I/O channel, keywords IOCHAN and MSGDSK both must be input.

**Note 3:** If billing on a Centrex group basis is desired, and if the MLHG has an I/O channel and a message service ID assigned, then the Centrex group must also be assigned an I/O channel and a message service ID.

## 6.6.2 Add MSS Option(s) to a New Multiline Hunting Group (Centrex, ESSX-1, Non-Centrex Except ACD)

**Initial Conditions:** A group of stations or consoles must be connected so that hunting for an idle line is provided to complete a call. The TN associated with the hunt group must be assigned to route index 85 (unassigned TN), or if Centrex, to Centrex intercept (Centrex base route index). The appropriate line class code must be entered in the USOC (universal service order code) table. If the hunt group is part of a Centrex group, appropriate Centrex translations should be entered.

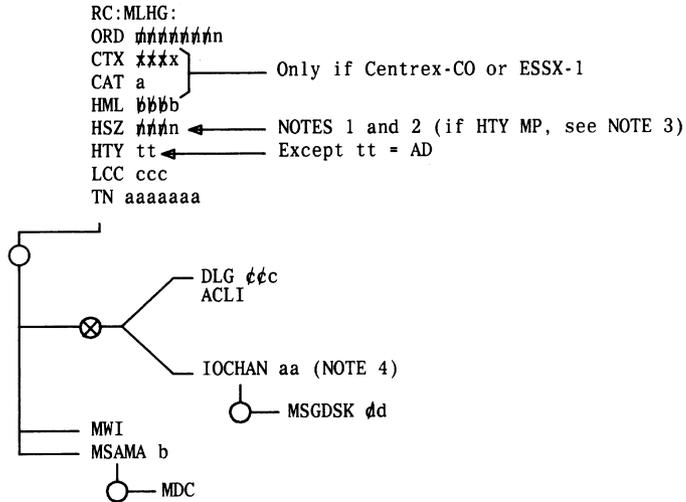
**Results of Message:** A multiline hunt group common block is entered in translations. A multiline hunt group head table, containing the address of a hunt list, is entered in translations.

Add MSS option(s) to a new multiline hunting group as shown in Fig. 12.

Page 35

# Message Service System / #1A ESS (Part 2)

AT&T 231-318-364



Where:

- ORD *nnnnnnnn* = Order Number
- CTX *xxxx* = Centrex Group Number
- CAT *a* = Centrex Access Treatment Code
- HML *bbbb* = Multiline Hunting Group Number
- HSZ *nnnn* = Number of Hunt-List Terminals
- HTY *tt* = Hunt Type
- LCC *ccc* = Line Class Code
- TN *aaaaaa* = Telephone Number of MSC
- DLG *cc* = Data Link Group Number
- ACLI = Automatic Customer Message Output System Calling Line Identification
- IOCHAN *aa* = Input/Output Channel Number ( $24 \leq aa \leq 95$ )
- MSGDSK *dd* = Message Service Number ( $1 \leq dd \leq 63$ )

Notes:

1. Do not enter HSZ 16. If 16 hunt terminals are required, enter HSZ 17.
2. A multiline hunting group must have at least 1 hunt list, even though it need not have any terminals in the hunt list. Thus, HSZ must be at least 1.
3. For multiposition hunt (HTY MP) the HSZ must be such that an even number of lists are provided (i.e., 16 to 31, or 48 to 63).
4. If I/O channel is used to receive MSS information, MSGDSK must be input.

Fig. 12 — Add MSS Option(s) to a New Multiline Hunting Group

# Message Service System / #1A ESS (Part 2)

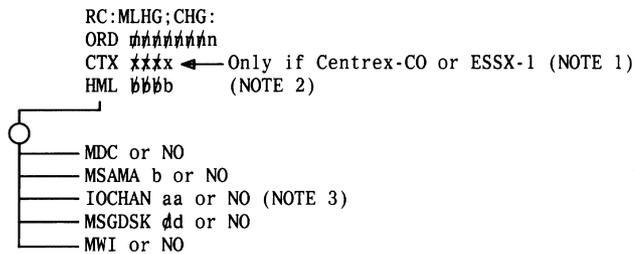
ISS 2, AT&T 231-318-364

## 6.6.3 Change or Delete MSS Option(s) to a Multiline Hunting Group (Centrex, ESSX-1, Non-Centrex Except ACD)

**Initial Conditions:** Multiline hunt group common block translations exist for the multiline group to be changed.

**Results of Message:** Translations associated with the multiline hunt group common block are changed.

Change or delete MSS option(s) to a multiline hunting group (Centrex, ESSX-1, non-Centrex except ACD) as shown in Fig. 13.



Where:

- ORD #####n = Order Number
- CTX #### = Centrex Group Number
- HML ##### = Multiline Hunting Group Number
- IOCHAN aa = Input/Output Channel Number (24 ≤ aa ≤ 95)
- MSGDSK dd = Message Service Identification Number (1 ≤ dd ≤ 63)

Notes:

1. With Centrex-CO or ESSX-1, the keyword CTX is required, but the Centrex number #### may be a change from the existing one. However, the number #### must be in the same MCX complex group or ESSX-1 complex group.
2. If the hunt group number is to be changed, all lines and the hunt group must be removed with OUT messages and reentered with the new hunt group (HML) number.
3. If the IOCHAN da is changed and MSGDSK has been previously assigned, the MSGDSK must also be changed.

Fig. 13 — Change or Delete MSS Option(s) to a Multiline Hunting Group (Centrex, ESSX-1, Non-Centrex Except ACD)

# Message Service System / #1A ESS (Part 2)

AT&T 231-318-364

## 6.7 Assign MSS Options to POTS, Multiline, and Centrex Lines

There are no changes to the purpose of the message, the message types, the initial conditions, or the results of message. Refer to AT&T Practice 231-318-325 for other RC:LINE keyword options.

### 6.7.1 New Keywords

MDC	YES/NO	Message Service Center. Used to identify line with message service center assignment.
MWI	YES/NO	Message Service Message Waiting Indicator. Used to indicate if a line has the message waiting option. MWI gives message center lines the capability to activate/deactivate the message waiting indicator on a line. MWI gives message service clients the capability to receive message waiting tones.
VMWI	YES/NO	Message Service Visual Message Waiting Indicator. Used to indicate if a line has the visual message waiting option.
MSAMA	b	Message Service Automatic Message Accounting Indicator. Used to indicate method of billing for a message service center line. Possible values for "b" are I, F, C, and M: MSAMA I — Billing on an individual line basis. MSAMA F — Billing on a flat rate basis. MSAMA C — Billing on a Centrex group basis. (See Note) MSAMA M — Billing on a multiline hunt group basis. v (See Note)

*Note:* If MSAMA C or MSAMA M is input to the line, then the Centrex or multiline group must already be assigned MSAMA. The group must have a MSAMA C and a MSAMA M.

# Message Service System / #1A ESS (Part 2)

ISS 2, AT&T 231-318-364

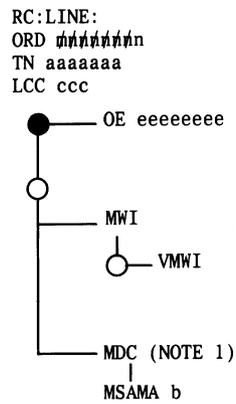
## 6.7.2 Add, Change, or Delete MSS Options on New Individual Line (Non-Centrex-CO, Non-ESSX-1, Non-MLG)

**Initial Conditions:** The DN and LEN translations exist for the line to be changed.

**Results of Message:** The DN and/or LEN translations are changed to reflect the line information. The change(s) is immediately effective in translations.

Add MSS options as shown in Fig. 14.

Change or delete MSS options to an existing individual line as shown in Fig. 15.



Where:

ORD #####n = Order Number  
TN aaaaaaa = Telephone Number of MSC  
LCC ccc = Line Class Code  
OE eeeeeeee = Originating Equipment Number

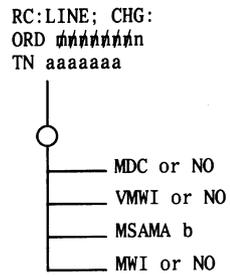
Note:

1. RSS lines are not allowed to be Message Service Centers

Fig. 14 — Add MSS Options to a New Individual Line (Non-Centrex, Non-ESSX-1, Non-MLG)

# Message Service System / #1A ESS (Part 2)

AT&T 231-318-364



Where:

ORD 0000000n = Order Number

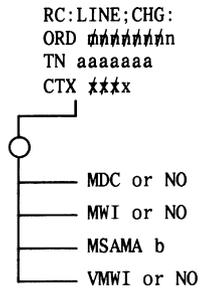
TN aaaaaaa = Telephone Number of MSC

Fig. 15 — Change or Delete MSS Options to an Individual Line (Non-Centrex, Non-ESSX-1, Non-MLG)



# Message Service System / #1A ESS (Part 2)

AT&T 231-318-364



Where:

ORD 00000000n = Order Number  
TN aaaaaaa = Telephone Number of MSC  
CTX xxxx = Centrex Number

Fig. 17 — Change or Delete MSS Options to a Centrex-CO or ESSX-1 (Non-MLG) Line

## 6.7.4 Add, Change, or Delete MSS Options on Multiline Hunt (Non-Centrex) (not Multiple Position Hunt, ACD or Nonhunt)

**Initial Conditions:** The multiline hunting group message (RC:MLHG) must be entered first. The TN, if required, must be assigned to route index 85 (unassigned TN), or to route index 84 (changed TN). The OE number must be unassigned.

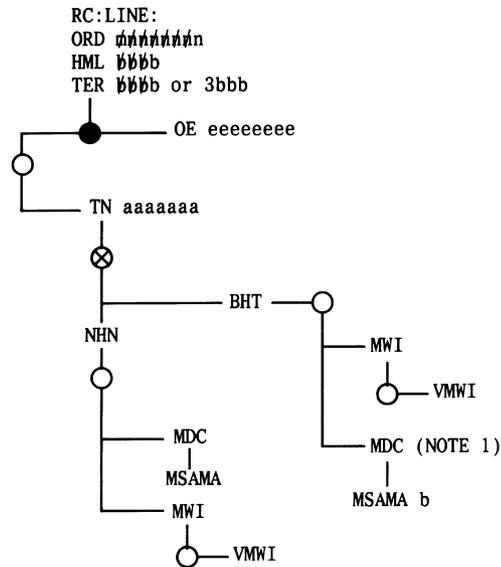
**Results of Message:** The DN and LEN translations are entered for the terminal. The terminal is placed in service in translations as follows.

Add MSS options to a multiline (non-Centrex) line as shown in Fig. 18.

Change or delete MSS options to a multiline (non-Centrex) line as shown in Fig. 19.

# Message Service System / #1A ESS (Part 2)

ISS 2, AT&T 231-318-364



Note:

1. Multiline Hunt Group must have MDC first before the line with MDC option is added to the hunt group

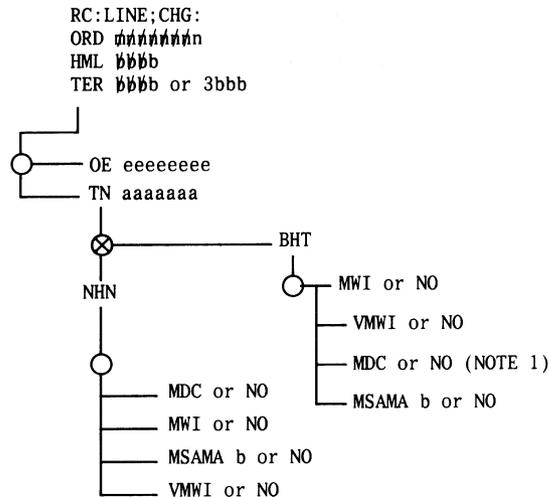
Where:

ORD ##### = Order Number  
 HML ##### = Multiline Hunting Group Number  
 TER ##### or 3bbb = Multiline Group Terminal Number  
 OE eeeeeeee = Originating Equipment Number  
 TN aaaaaaa = Telephone Number of MSC  
 BHT = Begin-Hunt Terminal  
 NHN = Nonhunt Number

Fig. 18 — Add MSS Options to a Multiline (Non-Centrex) Line

# Message Service System / #1A ESS (Part 2)

AT&T 231-318-364



Note:

1. Multiline Hunt Group must have MDC first before the line with MDC option is added to the hunt group

Where:

ORD 00000000n = Order Number  
 HML 0000 = Multiline Hunting Group Number  
 TER 0000 or 3bbb = Multiline Group Terminal Number  
 TN aaaaaaa = Telephone Number of MSC  
 BHT = Begin-Hunt Terminal  
 NHN = Nonhunt  
 OE eeeeeeee = Originating Equipment

Fig. 19 — Change or Delete MSS Options to a Multiline (Non-Centrex) Line

## 6.7.5 Add, Change, or Delete MSS Options on Multiline Hunt (Centrex or ESSX-1, not Multiple Position Hunt or ACD) Line

**Initial Conditions:** The multiline hunting group message (RC:MLHG) must be entered first. The TN, if required, must be assigned to Centrex intercept (Centrex base route index). The OE number must be unassigned. For changing a multiline hunt line, the DN and LEN translations must exist for the terminal to be changed.

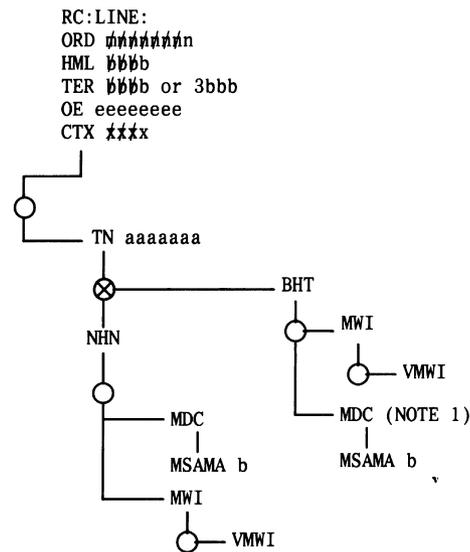
# Message Service System / #1A ESS (Part 2)

ISS 2, AT&T 231-318-364

**Results of Message:** The DN and LEN translations are entered for the terminal. The terminal is placed in service in translations. For changing a line, the DN and/or LEN translations are changed to reflect the changed information. The change(s) is immediately effective in translations.

Add MSS option(s) to a multiline hunt line (Centrex or ESSX-1, not multiple position hunt) as shown in Fig. 20.

Change or delete MSS option(s) to a multiline hunt line (Centrex or ESSX-1, not multiple position hunt) as shown in Fig. 21.



Note:

1. Multiline Hunt Group must have MDC first before the line with MDC option is added to the hunt group

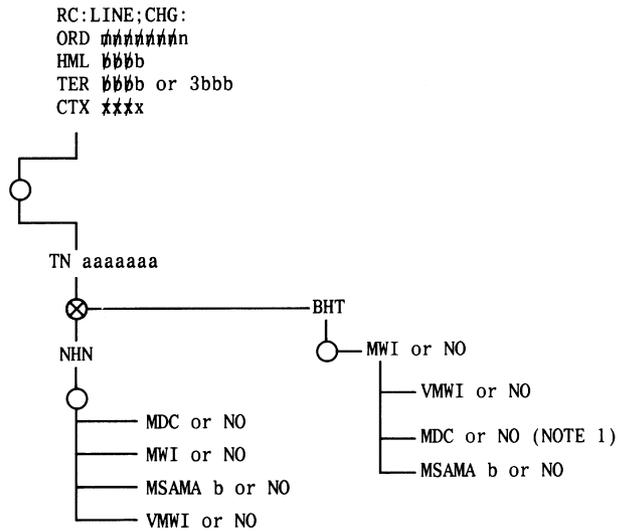
Where:

ORD #####n = Order Number  
 HML ##### = Multiline Hunting Group Number  
 TER ##### or 3bbb = Multiline Group Terminal Number  
 OE eeeeeee = Originating Equipment  
 CTX #### = Centrex Number  
 BHT = Begin-Hunt Terminal  
 TN aaaaaaa = Telephone Number of MSC  
 NHN = Nonhunt Number

Fig. 20 — Add Multiline Hunt (Centrex or ESSX-1, not Multiple Position Hunt or ACD) Line

# Message Service System / #1A ESS (Part 2)

AT&T 231-318-364



Note:

1. Multiline Hunt Group must have MDC first before the line with MDC option is added to the hunt group

Where:

ORD #####n = Order Number  
 HML ##### = Multiline Hunting Group Number  
 TER ##### or 3bbb = Multiline Group Terminal Number  
 CTX #### = Center Group Number  
 TN aaaaaaa = Telephone Number of MSC  
 NHN = Nonhunt  
 BHT = Begin Hunt Terminal

Fig. 21 — Change or Delete Multiline Hunt (Centrex or ESSX-1, not Multiple Position Hunt or ACD )  
 Line

# Message Service System / #1A ESS (Part 2)

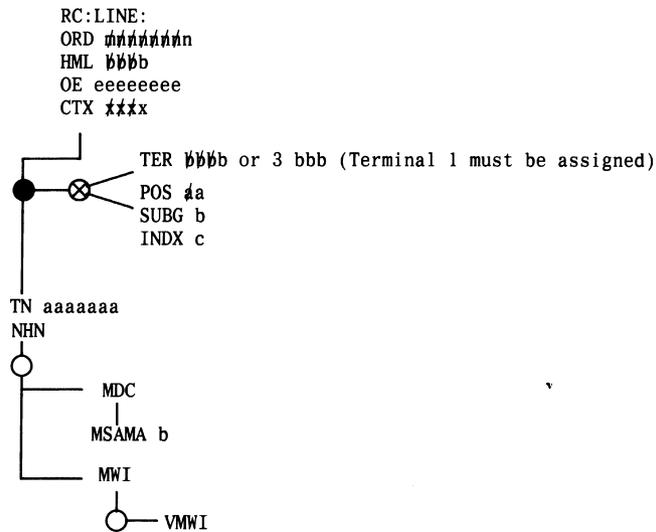
ISS 2, AT&T 231-318-364

## 6.7.6 Add MSS Option(s) to a Multiple Position Hunt Group (Centrex-CO or ESSX-1)

**Initial Conditions:** The multiline hunting group message (RC:MLHG) must be entered first. The TN, if required, must be assigned to Centrex intercept (Centrex base route index). The OE number must be unassigned.

**Results of Message:** The DN and LEN translations are entered for the terminal. The terminal is placed in service in translations.

Add MSS option(s) to a multiple position hunt group (Centrex-CO or ESSX-1) line as shown in Fig. 22.



Where:

- ORD #####n = Order Number
- HML ##### = Multiline Hunting Group Number
- OE eeeeeee = Originating Equipment Number
- CTX ####x = Centrex Group Number
- TER ### or 3 bbb = Multiline Group Terminal Number
- POS #a = Position Number in Multiposition Hunt Arrangement
- SUBG b = Subgroup in Multiposition Hunt Group
- INDX c = Index
- TN aaaaaaa = Telephone Number of MSC
- NHN = Nonhunt

Fig. 22 — Add MSS Option(s) to Multi Position Hunt Group (Centrex-CO, ESSX-1) Line



# Message Service System / #1A ESS (Part 2)

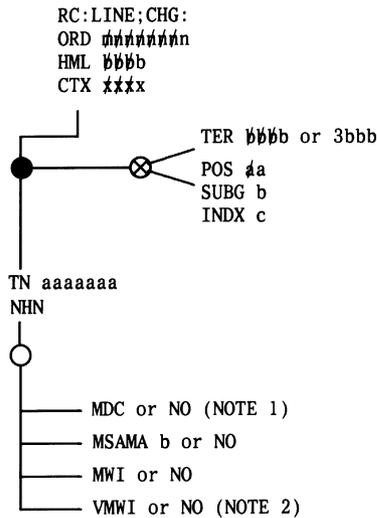
ISS 2, AT&T 231-318-364

## 6.7.8 Change Line for MSS Option(s) in a Multiple Position Hunt Group

**Initial Conditions:** The DN and LEN translations exist for the terminal to be changed.

**Results of Message:** The DN and/or LEN translations are changed to reflect the changed terminal information. The change(s) is immediately effective in translations.

Make MSS option change(s) to a line as shown in Fig. 24.



**Notes:**

1. Multiline hunt group must have MDC first before the line with MDC is added to the hunt group.
2. When changing from VMWI to AMWI, the customer may lose the message waiting indication.

**Where:**

- ORD 00000000 = Order Number
- HML 0000 = Multiline Hunting Group Number
- CTX 0000 = Centrex Group Number
- TER 0000 or 3000 = Multiline Group Terminal Number
- POS 4a = Position Number in Multiposition Hunt Arrangement
- SUBG b = Subgroup in Multiposition Hunt Group
- INDX c = Index
- TN aaaaaaa = Telephone Number of MSC
- NHN = Nonhunt

Fig. 24 — Change Line for MSS Option(s) in a Multiple Position Hunt Group

# Message Service System / #1A ESS (Part 2)

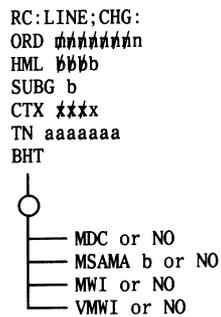
AT&T 231-318-364

## 6.7.9 Change MSS Option(s) on a Begin-Hunt TN in a Multiposition Hunt Group

*Initial Conditions:* The DN translations exist for the subgroup to be changed.

*Results of Message:* The DN translations are changed to reflect the begin-hunt subgroup information. The change(s) is immediately effective in translations.

Make MSS option change(s) on begin-hunt TN as shown in Fig. 25.



Where:

ORD #####n = Order Number  
HML ##### = Multiline Hunting Group Number  
SUBG b = Subgroup in Multiposition Hunt Group  
CTX ###x = Centrex Group Number  
TN aaaaaa = Telephone Number of MSC  
BHT = Begin-Hunt Terminal

Fig. 25 — Change MSS Option(s) on a Begin-Hunt TN in a Multiposition Hunt Group

# Message Service System / #1A ESS (Part 2)

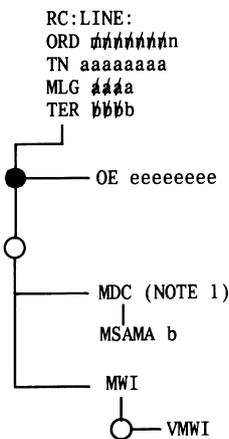
ISS 2, AT&T 231-318-364

## 6.7.10 Add MSS Option(s) to a Multiline Nonhunting Line (Non-Centrex)

**Initial Conditions:** The multiline nonhunting group message (RC:MLHG;) must be entered first. The TN must be assigned to route index 85 (unassigned TN) or route index 84 (changed TN). The OE number must be unassigned.

**Results of Message:** The DN and LEN translations are entered for the terminal. The terminal is placed in service in translations.

Add MSS option(s) to a multiline nonhunting line (non-Centrex) as shown in Fig. 26.



**Note:**

1. RSS lines not allowed to be Message Service Centers.

**Where:**

ORD #####n = Order Number  
TN aaaaaaa = Telephone Number of MSC  
MLG ####a = Multiline Group Number  
TER ##### = Multiline Group Terminal Number  
OE eeeeeeee = Originating Equipment Number

**Fig. 26 — Add MSS Option(s) to Multiline Nonhunting Line (Non-Centrex)**



# Message Service System / #1A ESS (Part 2)

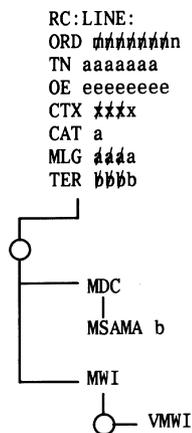
ISS 2, AT&T 231-318-364

## 6.7.12 Add MSS Option(s) to a Line in a Multiline Nonhunting Group (Centrex or ESSX-1)

**Initial Conditions:** The multiline nonhunting group message (RC:MLHG) must be entered first. The TN must be assigned to Centrex intercept (Centrex base route index). The OE number must be unassigned.

**Results of Message:** The DN and LEN translations are entered for the terminal. The terminal is placed in service in translations.

Add MSS option(s) to a line in a multiline nonhunting group (Centrex or ESSX-1) as shown in Fig. 28.



Where:

ORD 00000000n = Order Number  
TN aaaaaaa = Telephone Number of MSC  
OE eeeeeeee = Originating Equipment Number  
CTX xxxxx = Centrex Group Number  
CAT a = Centrex Access Treatment Code  
MLG 0000 = Multiline Group Number  
TER 0000 = Multiline Group Terminal Number

Fig. 28 — Add MSS Option(s) to a Line in a Multiline Nonhunting Group (Centrex or ESSX-1)

# Message Service System / #1A ESS (Part 2)

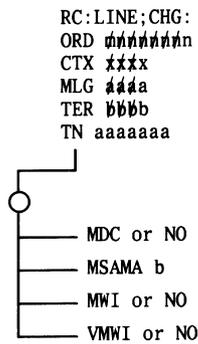
AT&T 231-318-364

## 6.7.13 Change MSS Option(s) to a Line in a Multiline Nonhunting Group (Centrex or ESSX-1)

*Initial Conditions:* The DN and LEN translations exist for the terminal to be changed.

*Results of Message:* The DN and/or LEN translations are changed to reflect the changed terminal information. The change(s) is immediately effective in translations.

Change MSS option(s) to a line in a multiline nonhunting group (Centrex or ESSX-1) as shown in Fig. 29.



Where:

ORD #####n = Order Number  
CTX xxxx = Centrex Number  
MLG ddd = Multiline Group Number  
TER bbbb = Multiline Group Terminal Number  
TN aaaaaa = Telephone Number of MSC

Fig. 29 — Change MSS Option(s) to a Line in a Multiline Nonhunting Group (Centrex or ESSX-1)



# Message Service System / #1A ESS (Part 2)

AT&T 231-318-364

Where:

ORD *nnnnnnn* = Order Number  
CTX *xxxx* = Centrex Group Number  
HML *bbbb* = Multiline Hunting Group Number  
TER *bbbb* = Multiline Group Terminal Number  
OE *eeeeeee* = Originating Equipment Number  
BTN *bbbbbbb* = Special Billing Telephone Number  
TN *aaaaaaa* = Telephone Number of MSC  
NHN = Nonhunt Line  
C60A = 60A Customer Premises System Console  
GST = Ground Start Line  
SP *eeeeee* = Scan Point Number  
PTDT = Prohibit Terminating Disconnect Timing  
ZIP = Zip Tone (Incoming Call Identifier)  
DP (a,bccccc) = Distributor Point Number  
DPP (1,bccccc) = Distributor Point for Protection Number  
DLG *ccc* = Data Link Group Number  
RDI = Remote Data Interface

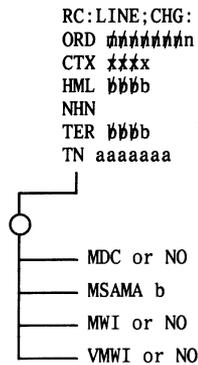
Notes:

1. The first terminal number assigned must be two times the maximum expected quantity of 90A CPS consoles
2. The BTN must be the same as the TN.
3. The SP assignment is made by the RCMAC which must notify the SCC to make the RC:MSN assignment required (attendant interface circuit).
4. The distributor point assigned by the RCMAC for DPP must be the adjacent higher point to the assignment for the last DP (attendant interface circuit)

Fig. 30 — Add MSS Option(s) to a Line in an ACD Group (Sheet 2 of 2)

# Message Service System / #1A ESS (Part 2)

ISS 2, AT&T 231-318-364



Where:

ORD 00000000n = Order Number  
CTX xxxx = Centrex Group Number  
HML 0000 = Multiline Hunting Group Number  
NHN = Nonhunt  
TER 0000 = Multiline Group Terminal Number  
TN aaaaaa = Telephone Number of MSC

Fig. 31 — Change or Delete MSS Option(s) to a Line in an ACD Group

## 6.8 Assign MSS Option(s) to Multiline Nonhunting Group (Centrex, ESSX-1, or Non-Centrex)

### 6.8.1 Add MSS Option(s) to a New Multiline Nonhunting Group (Centrex, ESSX-1, or Non-Centrex)

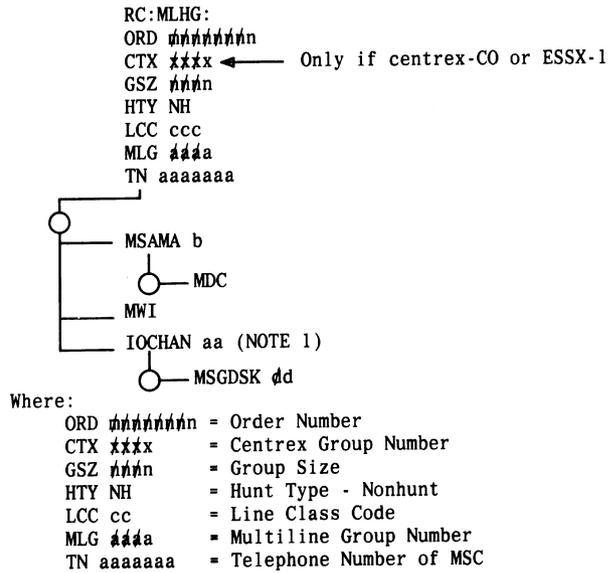
**Initial Conditions:** A group of stations or consoles must be connected so that common translations are provided for a group of lines. The TN associated with the nonhunt group must be assigned to route index 85 (unassigned TN), or if Centrex, to Centrex intercept (Centrex base route index). The appropriate LCC (line class code) must be entered in the USOC table. If the nonhunt group is part of a Centrex group, appropriate Centrex translations should be entered.

**Results of Message:** A multiline nonhunt group common block is entered in translations. A multiline nonhunt group head table containing the address of a primary list is entered in translations.

Add MSS option(s) to a new multiline nonhunting group (Centrex, ESSX-1, or non-Centrex) as shown in Fig. 32.

# Message Service System / #1A ESS (Part 2)

AT&T 231-318-364



Note:

1. MSGDSK required if I/O channel is to be used to receive MSS information.

Fig. 32 — Add MSS Option(s) to a New Multiline Nonhunting Group (Centrex, ESSX-1, or Non-Centrex)

## 6.8.2 Change or Delete MSS Option(s) in a Multiline Nonhunting Group (Centrex, ESSX-1, or Non-Centrex)

**Initial Conditions:** Multiline nonhunt group common block translations exist for the multiline nonhunt group to be changed.

**Results of Message:** Translations associated with the multiline nonhunt group common block are changed as specified.

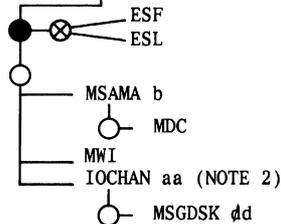
Change or delete MSS option(s) in a multiline nonhunting group (Centrex, ESSX-1, or non-Centrex) as shown in Fig. 33.



# Message Service System / #1A ESS (Part 2)

AT&T 231-318-364

RC:MLHG:  
 ORD  $\text{nnnnnnnn}$   
 CTX  $\text{xxxx}$   
 CAT a  
 HML  $\text{bbbb}$   
 HSZ  $\text{nnnn}$   
 HTY AD  
 HTC  
 DAG  $\text{ddd}$   
 NOFG  $\text{ee}$   
 TN aaaaaaa (NOTE 1)  
 LCC ccc  
 DPP  
 PRB  
 TTC  
 CST ← Only for Phase 2



Where:

ORD  $\text{nnnnnnnn}$  = Order Number  
 CTX  $\text{xxxx}$  = Centrex Group Number  
 CAT a = Centrex Access Treatment Code  
 HML  $\text{bbbb}$  = Multiline Hunting Group Number  
 HSZ  $\text{nnnn}$  = Number of Hunt-List Terminals  
 HTY AD = Hunt Type - Automatic Call Distributor  
 HTC = Circular Hunt  
 DAG  $\text{ddd}$  = Data Accumulation Group  
 NOFG  $\text{ee}$  = Number of Functional Groups  
 TN aaaaaaa = Telephone Number of Functional Group  
 LCC ccc = Line Class Code  
 DPP = Distributor Point for Protection  
 PRB = Sets PBX Bit in Ring Code  
 TTC = Touch Tone Calling  
 CST = Console Status  
 ESF = 2-Digit Speed Calling  
 ESL = 1-Digit Speed Calling

Notes:

1. The TN should be the same as the listed TN for the primary functional Group
2. MSGDSK required if I/O channel is to be used to receive MSS information.

Fig. 34 — Add MSS Option(s) to a New ACD Multiline Hunting Group

# Message Service System / #1A ESS (Part 2)

ISS 2, AT&T 231-318-364

## 6.9.2 Change or Delete MSS Option(s) to an ACD Multiline Hunting Group

**Initial Conditions:** Multiline hunt group common block translations exist for the multiline hunt group to be changed.

**Results of Message:** Translations associated with the multiline hunt group common block are changed as specified.

Change or delete MSS Option(s) to an ACD multiline hunting group as shown in Fig. 35.

```
RC:MLHG;CHG:
ORD #####n
CTX #### (NOTE 1)
HML #### (NOTE 2)

○
├── MDC or NO
├── MWI or NO
├── MSAMA b or NO
├── IOCHAN aa or NO (NOTE 3)
└── MSGDSK dd
```

Where:

ORD #####n = Order Number  
CTX #### = Centrex Group Number  
HML #### = Multiline Hunting Group Number

Notes:

1. The keyword CTX is required, but the centrex number #### specified may be a change from the existing one. However, the number #### must be in the same MCX complex group or ESSX-1 complex group.
2. If the hunt group number is to be changed, all lines and the hunt group must be removed with OUT messages and reentered with NEW messages, using the new hunt group number.
3. If IOCHAN changed and MSGDSK previously assigned, then MSGDSK must also be changed.

Fig. 35 — Change or Delete MSS Option(s) to an ACD Multiline Hunting Group

# Message Service System / #1A ESS (Part 2)

AT&T 231-318-364

## 6.10 Assign Traffic Measurement Code and Traffic Index(es) for MSS Option(s)

**Initial Conditions:** The specified traffic subtranslators [H, C, or Q (selected quarter hour)] exist with an unassigned code (TMC 10) in the word at each specified index.

**Results of Message:** For each segment, the specified entry is made in the specified H, C, or Q schedule, or customer traffic group.

Refer to AT&T Practice 231-318-338 for additional traffic related information.

Assign TMC and traffic index(es) for MSS option(s) as shown in Fig. 36.

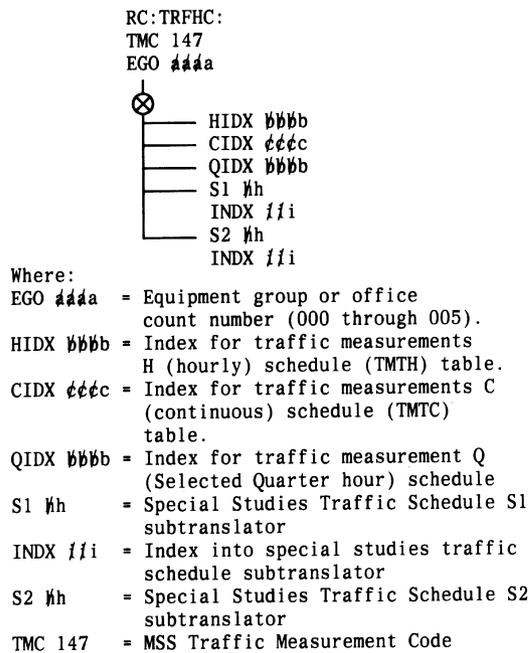


Fig. 36 — Assign Traffic Measurement Code and Traffic Index(es) for MSS Option(s)

# High-Performance 28 VDC Power Supply

## Overview

Several upcoming projects in *GBPPR 'Zine* will be requiring a fairly high-quality / high-amperage 28 volt DC power supply. The design here will be based around the high-current 28 VDC power supply project which has been in the *ARRL Handbook for Radio Amateurs* for last ten years or so. The handbook article should be studied thoroughly before beginning this project. Most of the power supply's components can be tracked down at hamfests or salvaged from old or dead computer power supplies.

The main components to this power supply are the step-down mains transformer and ripple capacitor(s). The transformer's secondary should be capable of continuously sourcing *at least* 30 VAC at 10 amps without saturating or overheating. Unfortunately, a proper transformer with these specifications can be physically quite large. Anyone who has ever lugged a 50 amp Astron power supply around will agree... The transformer shown in this project doesn't quite meet these requirements, but that's all I could find, and it was free. On the output of the transformer, after the bridge rectifier, is the main ripple capacitor. For a 10 amp power supply with low output voltage ripple, the capacitor(s) should have a total value of around 100,000  $\mu\text{F}$ . These capacitors can also be a problem to find. The power supply shown here uses two surplus 24,000  $\mu\text{F}$  / 50 volt capacitors in parallel. Note that the capacitors should have a DC working voltage of at least 50 volts. This is to handle the 30 volt output of the transformer multiplied by 1.414 via the bridge rectifier. If you do use multiple capacitors, try to maintain the same value and manufacture, if possible. Note that the input voltage to the LM723 voltage regulator should be about two volts *above* (30 volts) the required final output voltage to maintain proper voltage regulation. If the transformer/capacitor combination can't keep up under a high-current load, you may lose output voltage regulation. Note that some people power the LM723 off a separate higher-voltage secondary winding from the transformer for just this reason.

Improvements to the original schematic from the *ARRL Handbook* article are the addition of several protection diodes and RF bypass capacitors to the main LM723 voltage regulator circuit. The protection diodes help to prevent reverse base-emitter breakdowns in any transistors if a residual voltage were to leak "backwards" into the regulator circuit. The RF bypass capacitors will help to maintain voltage regulation even in the presence of high-intensity electromagnetic fields. An optional SCR over-voltage protection circuit will also help to protect any equipment connected to this power supply.

The output from the LM723 will control several 2N3055 "pass" transistors which are used to increase the current capability of the power supply. The 2N3055 is a fairly old device, and there are *much* better drop-in replacements, but you can usually find them very cheap (or free) at hamfests. One drawback of the 2N3055 is the requirement for a fairly large heatsink. The datasheet for the 2N3055 mentions each transistor can dissipate around 150 watts or so, but this is only for a few seconds. Multiple 2N3055 transistors are required for a supply that can source a continuous 10 amp output. Three 2N3055 are used here, with each transistor handling around three amps and dissipating around 60 watts of "waste" power. In this continuous operation, the 2N3055s *will* need to be mounted to a large heatsink and probably also fan cooled.

## Pictures & Construction Notes



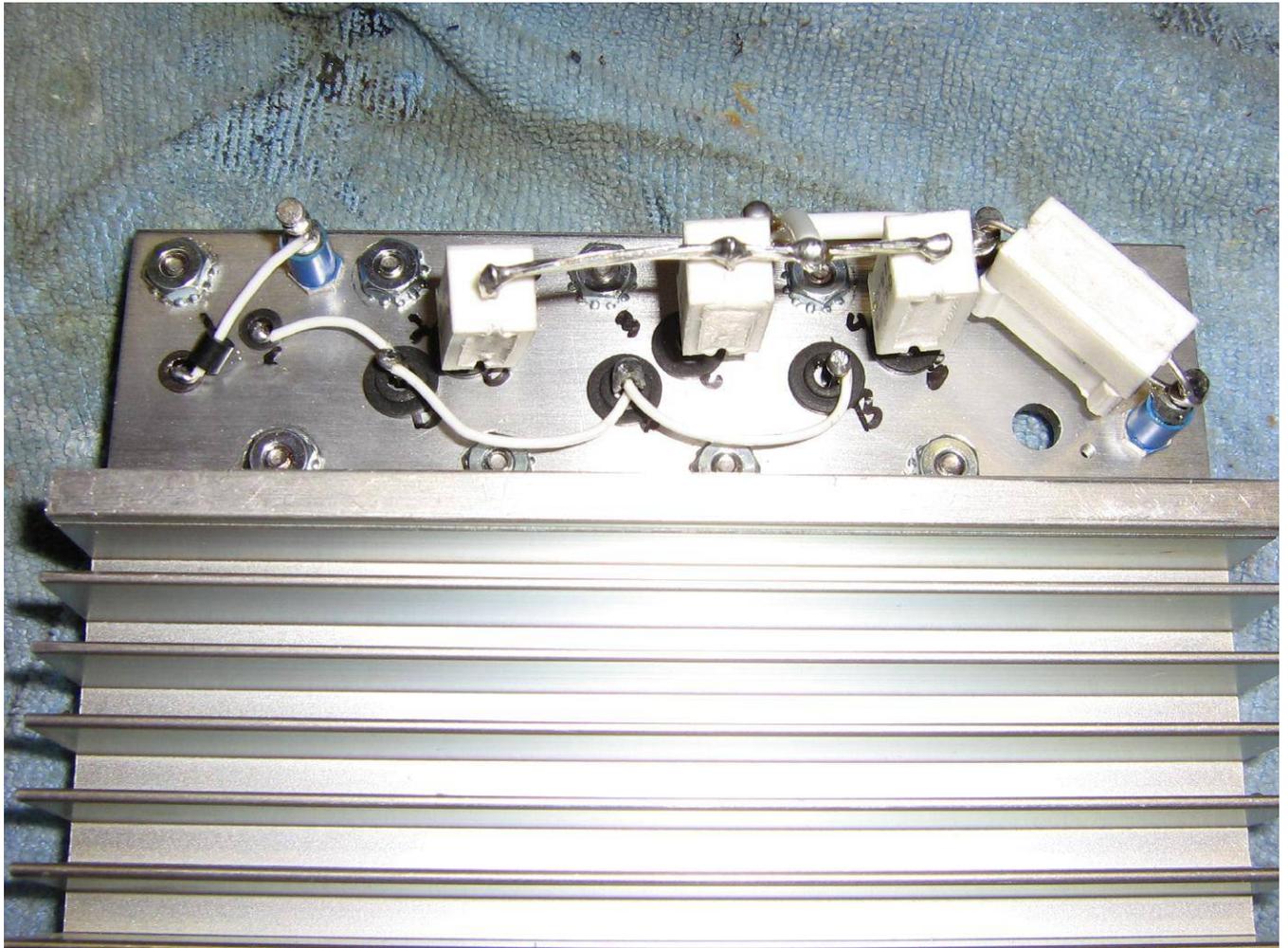
Mounting the 2N3055 pass transistors to the heatsink.

The heatsink was salvaged from an old power supply, and is probably undersized for this application.

Use mica washers or thermal grease on the bottom of the transistors to help with heat dissipation.

Try to use transistors from the same manufacturing lot, if possible.

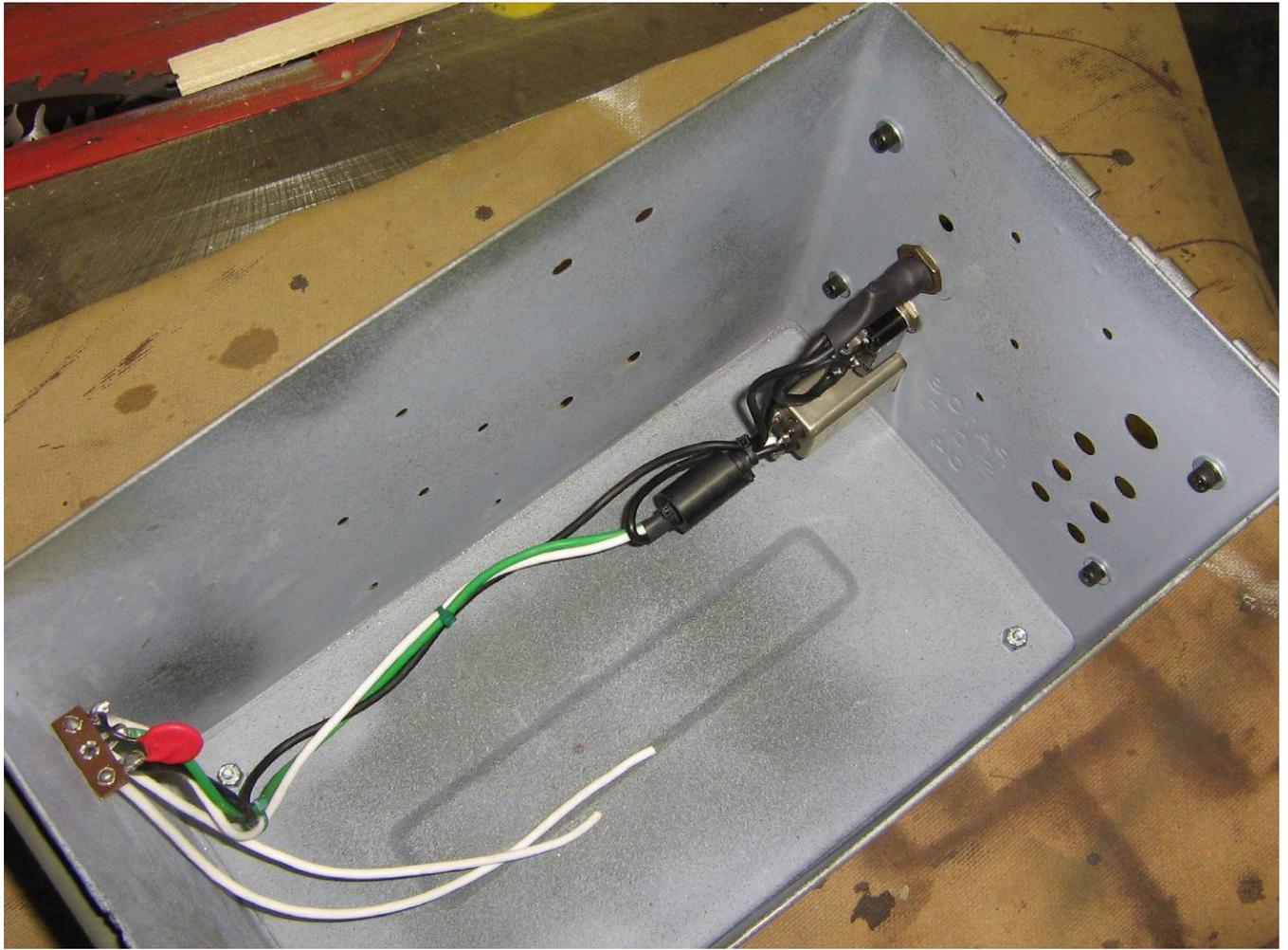
The solder tabs are for the common-collector wire connections.



Base and emitter wiring connections to the 2N3055 transistors.

0.1 ohm / 5 watt resistors are used for current equalization between the transistors and two 0.1 ohm resistors are used in parallel to set the current limit control of the LM723 regulator IC.

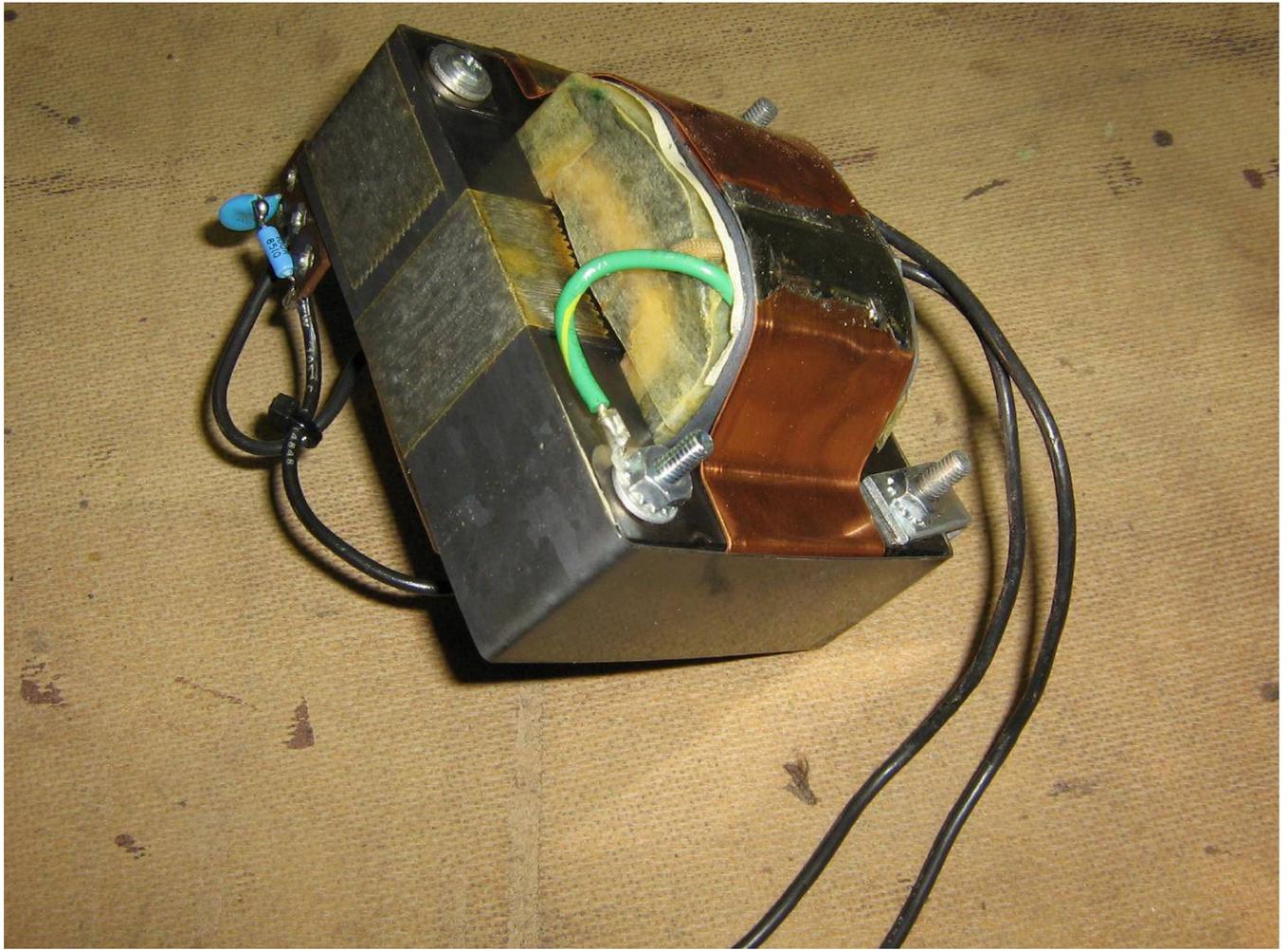
Because I didn't use sockets for the 2N3055 transistors, you'll have to isolate the heatsink from the project case as it will be at the collector's voltage potential.



120 VAC input power connections to the project case.

The 120 VAC mains connector is a filtered IEC-type. A large ferrite bead was slipped over the incoming mains lines to suppress any RF interference.

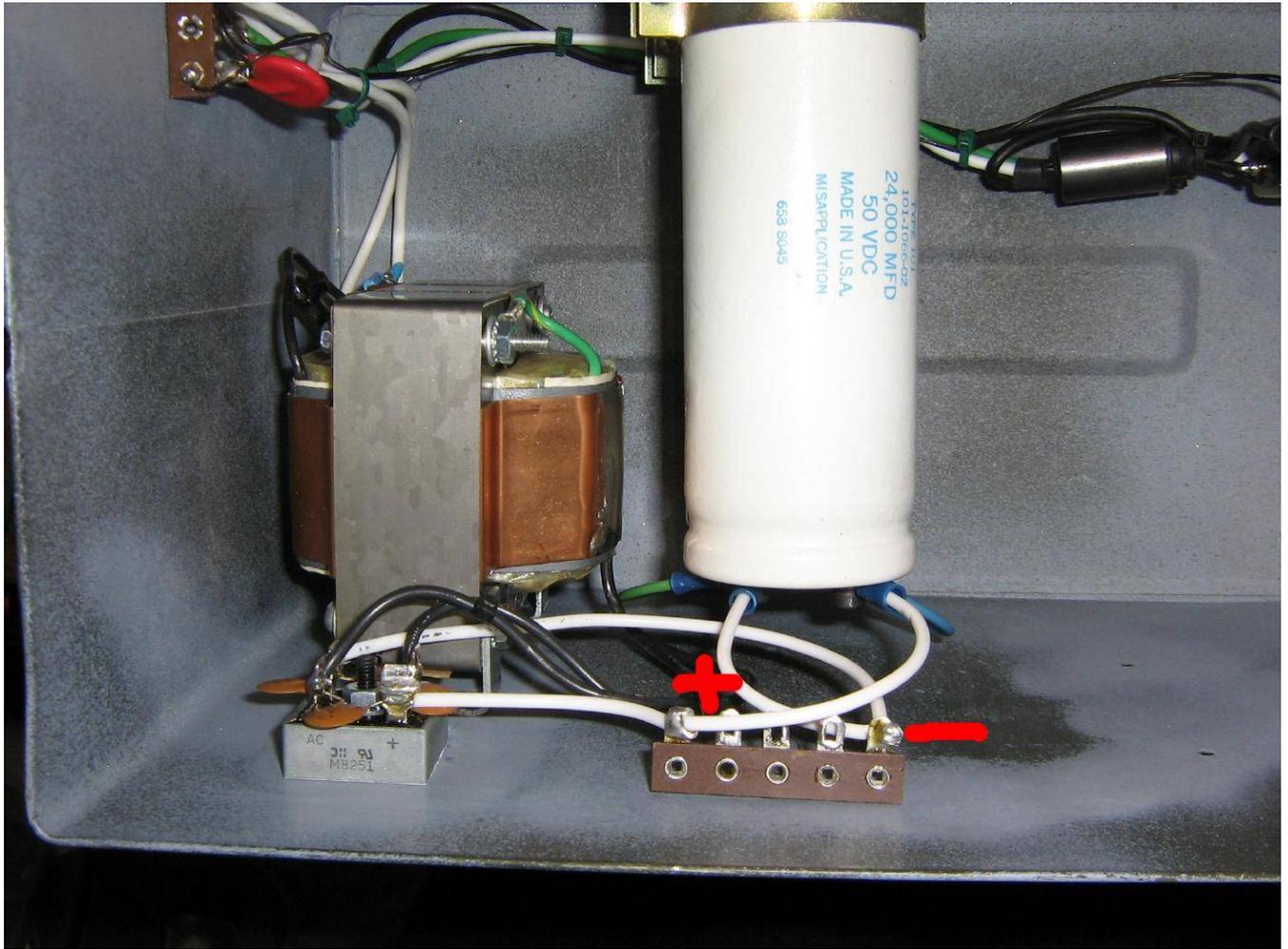
The large red thing on the left is a 150 volt Metal-Oxide Varistor (MOV) to suppress any voltage spikes on the incoming power line. It is placed across the hot and neutral lines. MOVs are available at Radio Shack.



Hamfest transformer with a 30 VAC secondary.

The transformer is a little too small for this application, but that's all I could find.

A terminal strip is used for the primary connections and to mount a resistor/capacitor snubber circuit.

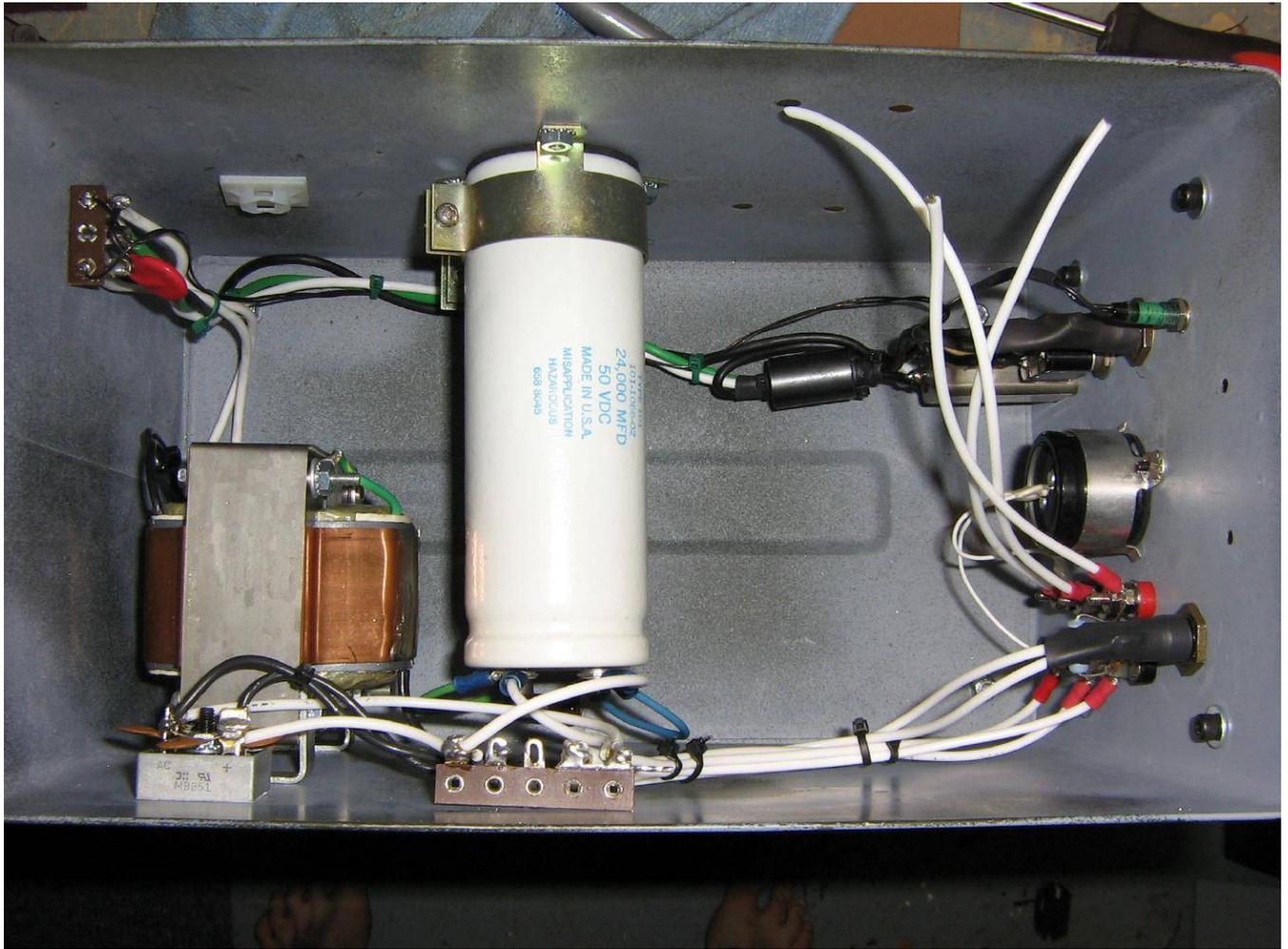


Mounting the transformer, bridge rectifier block, and the transformer's ripple capacitors.

0.01  $\mu\text{F}$  capacitors are added across each terminal of the rectifier block to suppress EMI. The bridge rectifier block is mounted to the case with some thermal grease to act as a heatsink.

Note the use of a single-point isolated ground system. The project case will be at "Earth" ground, while the negative terminal of the power supply will be isolated and tied to a common point on the output of the bridge rectifier.

The terminal strip serves as a central location for tapping the output from the ripple capacitors.

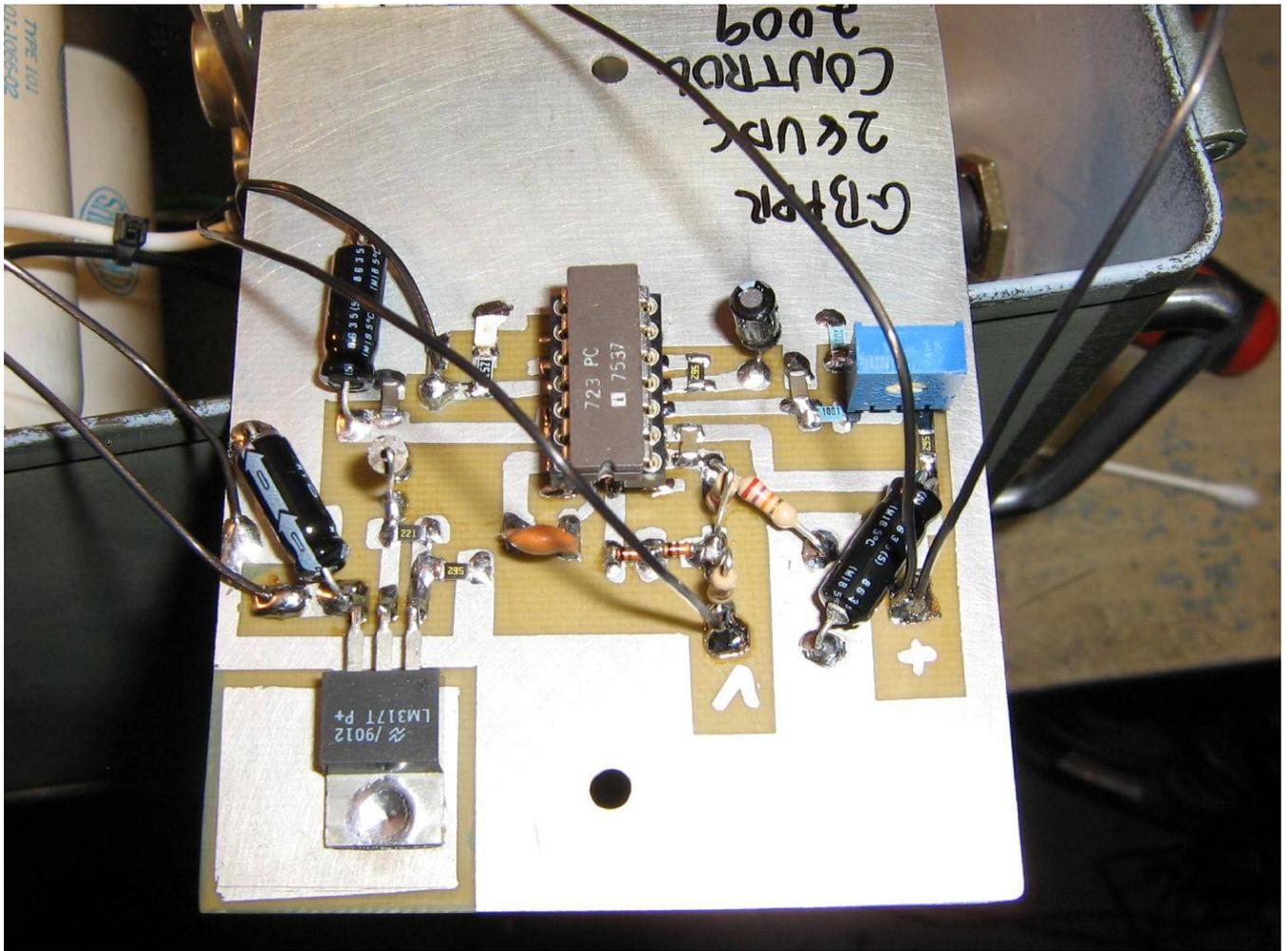


Additional front-panel wiring.

The **NEGATIVE** output voltage banana jacks are tied to a single-point ground.

The large capacitor on the right-side is the final 680  $\mu$ F output filter capacitor.

The fuse holder on the lower-right is blown if the over-voltage protection SCR fires.



LM723-based voltage regulator board.

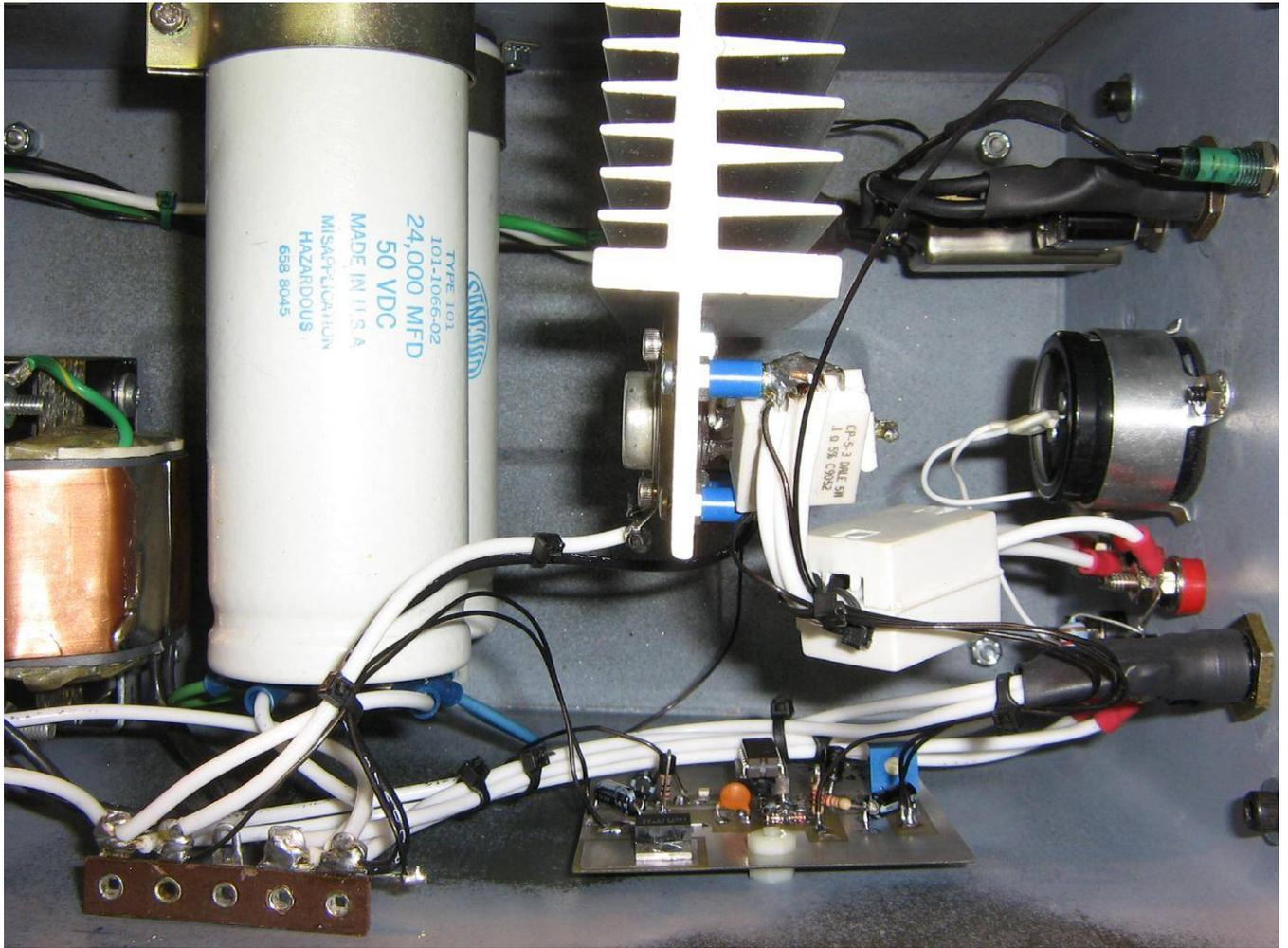
1% tolerance metal-film resistors should be used in the voltage divider sections.

1/4 watt resistors should be used in the current limiting section.

The tab of the LM317 voltage regulator should be isolated from the circuit's ground.

The 1 kohm voltage adjust potentiometer can be panel-mounted, if desired.

Use a socket for the LM723 so you can easily replace it.

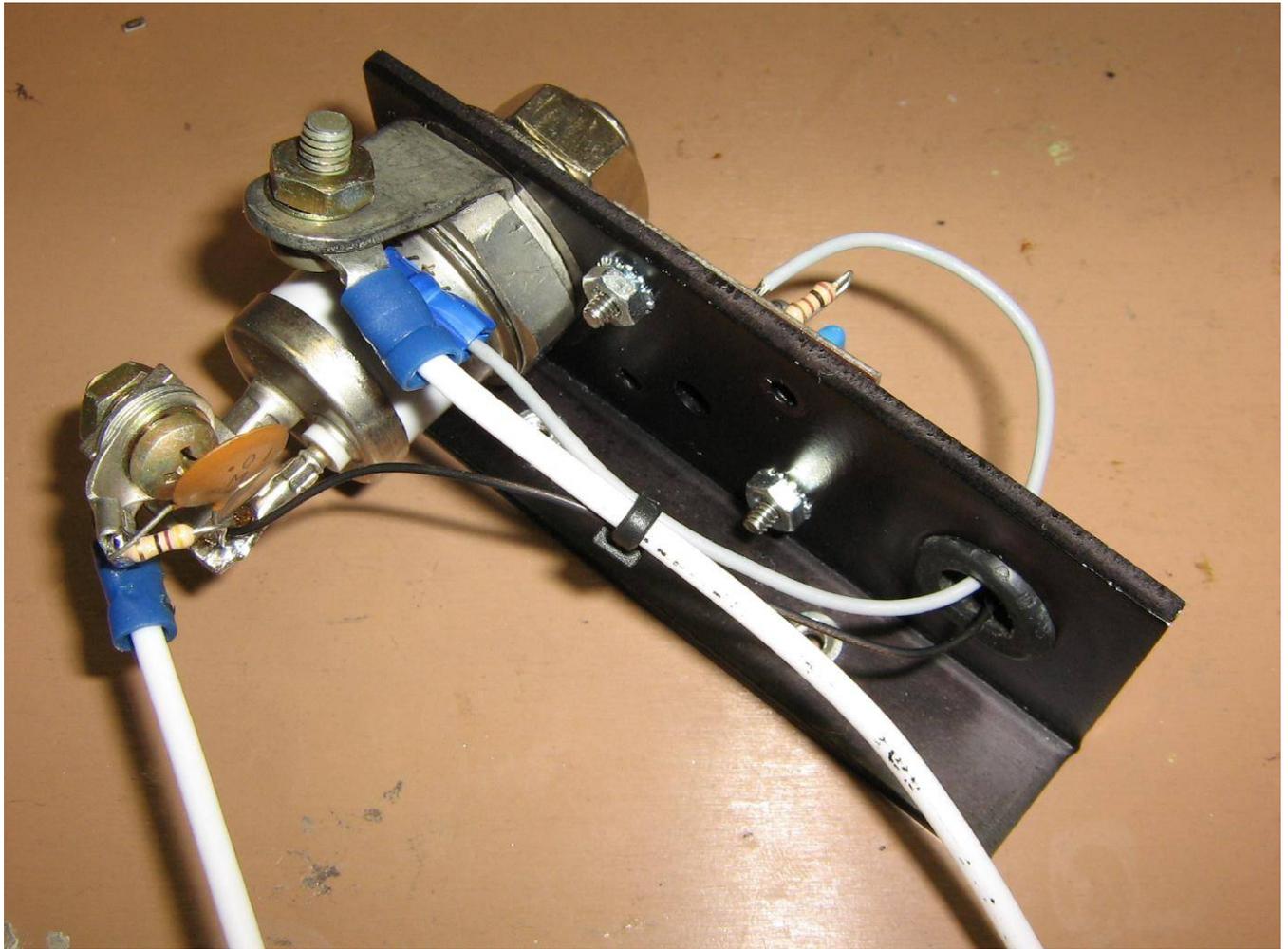


Mounting the 2N3055 heatsink assembly and the voltage regulator board.

The voltage regulator's circuit board is isolated from the case using nylon hardware.

The heatsink is isolated from the case using head gasket material to maintain a good thermal contact.

The large white rectangle is a ferrite bead which is attached to the **POSITIVE** output leads.



Over-voltage Silicon-Controlled Rectifier (SCR) circuit.

This SCR fires, blowing a fuse, should the power supply's output voltage exceeds 33 volts.

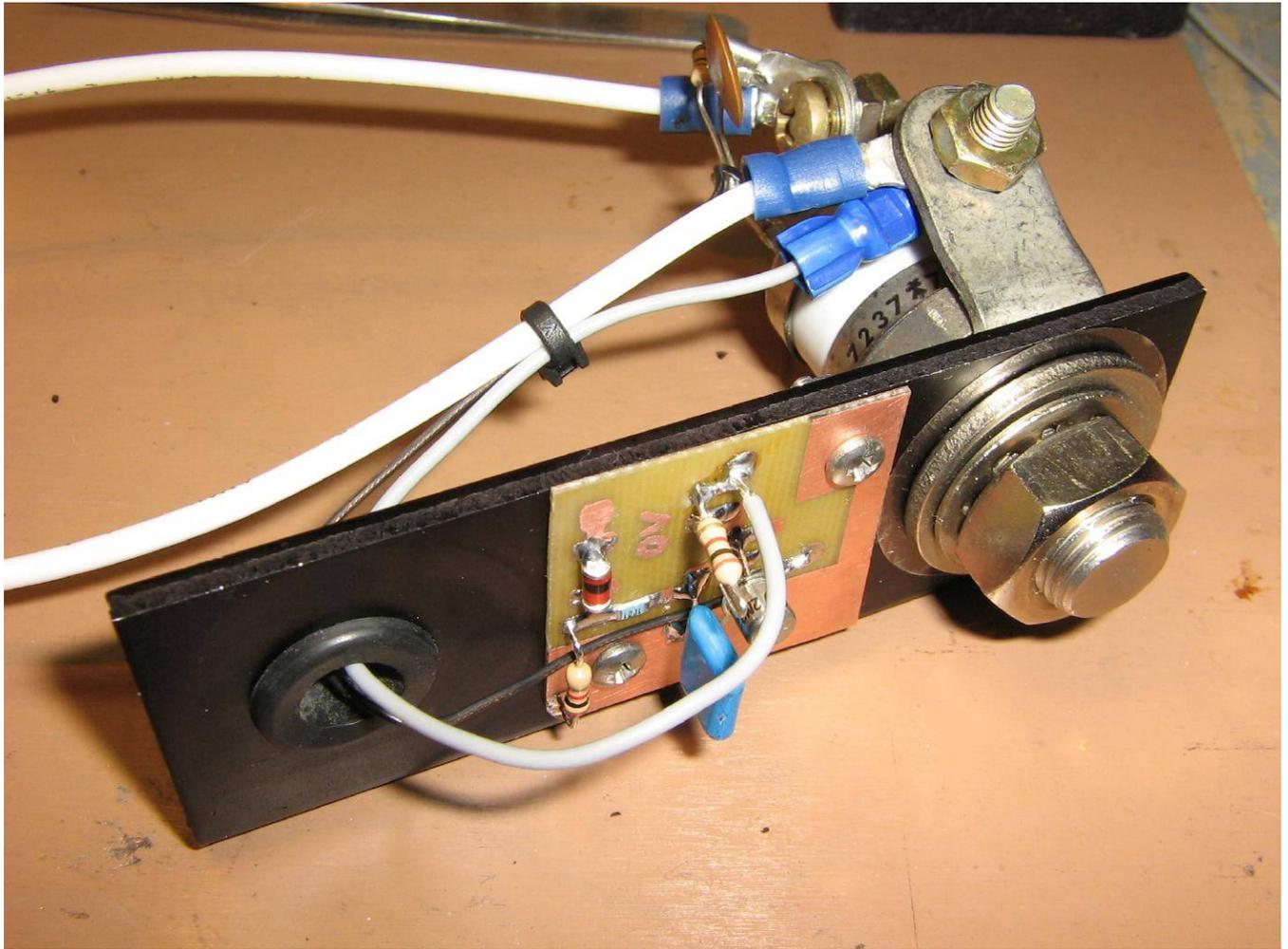
The large SCR was salvaged from a hamfest. Any high-current / 100 volt SCR should work.

Be sure to mount the SCR on some type of heatsink, as it can get hot when triggered.

Also be sure the connecting wires can handle the high-current drawn until the fuse blows.

The anode of the SCR is isolated from the L-bracket using mica washers.

The 47 ohm drain resistor and 0.01  $\mu\text{F}$  capacitor are mounted directly across the SCR's gate terminal to it's grounded cathode.

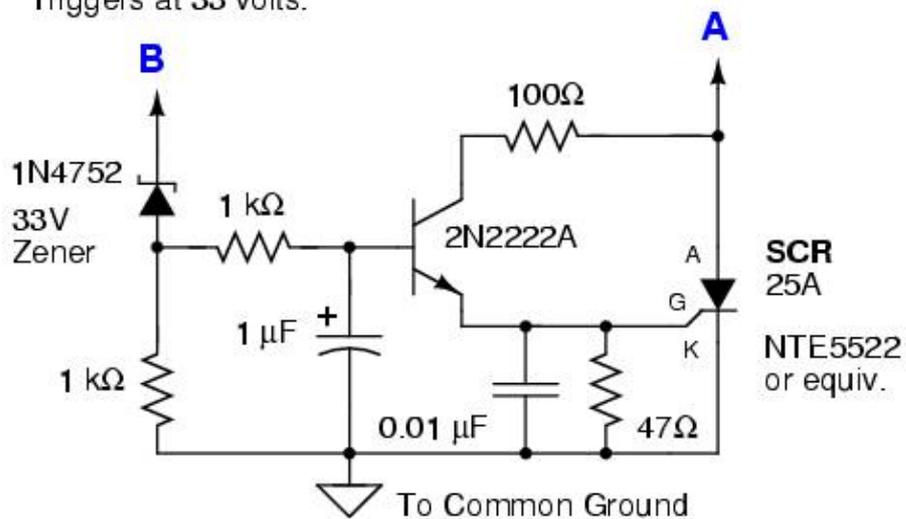


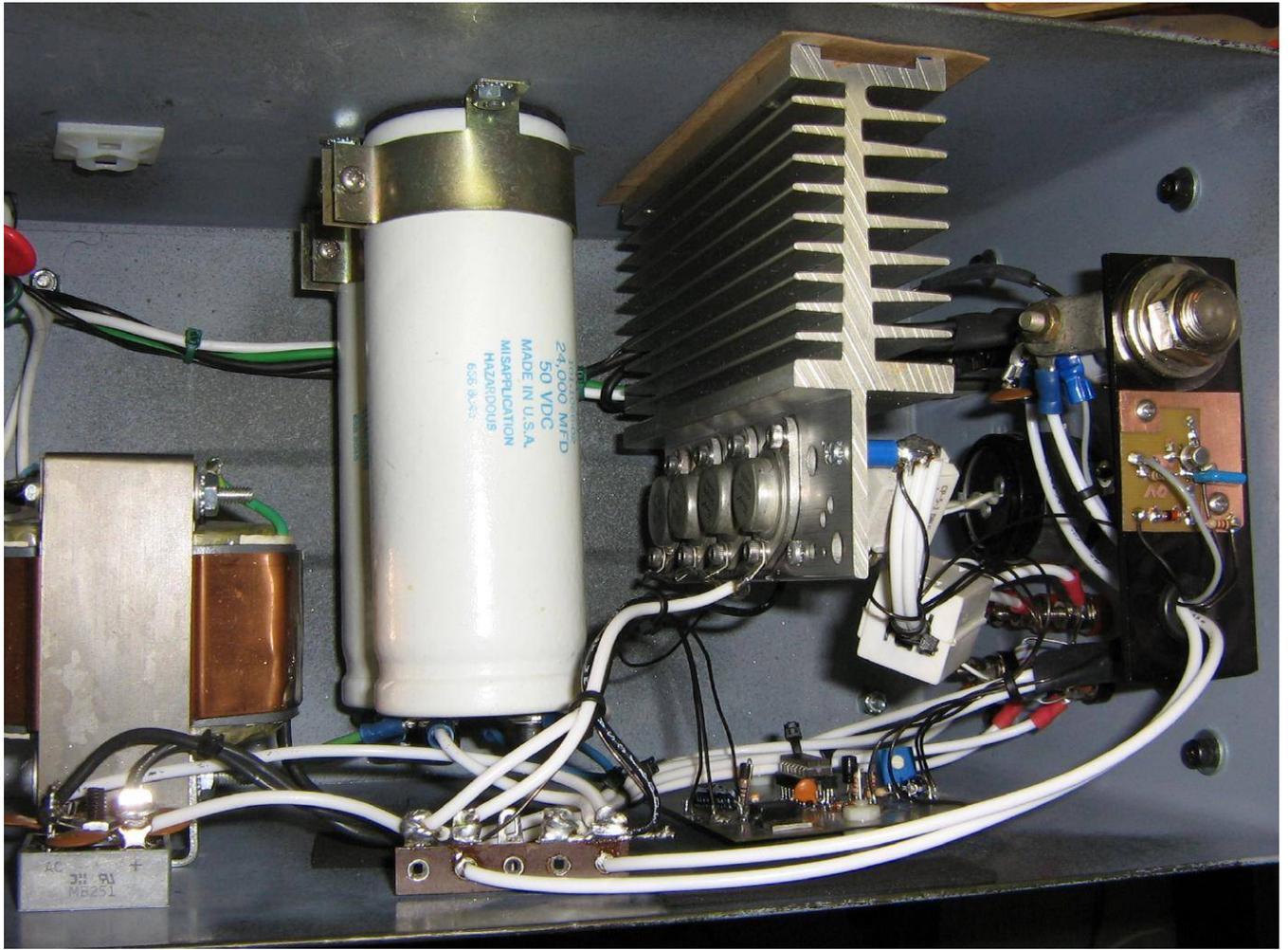
Over-voltage circuit board.

The little orange thing is a 1N4752 33 volt Zener diode.

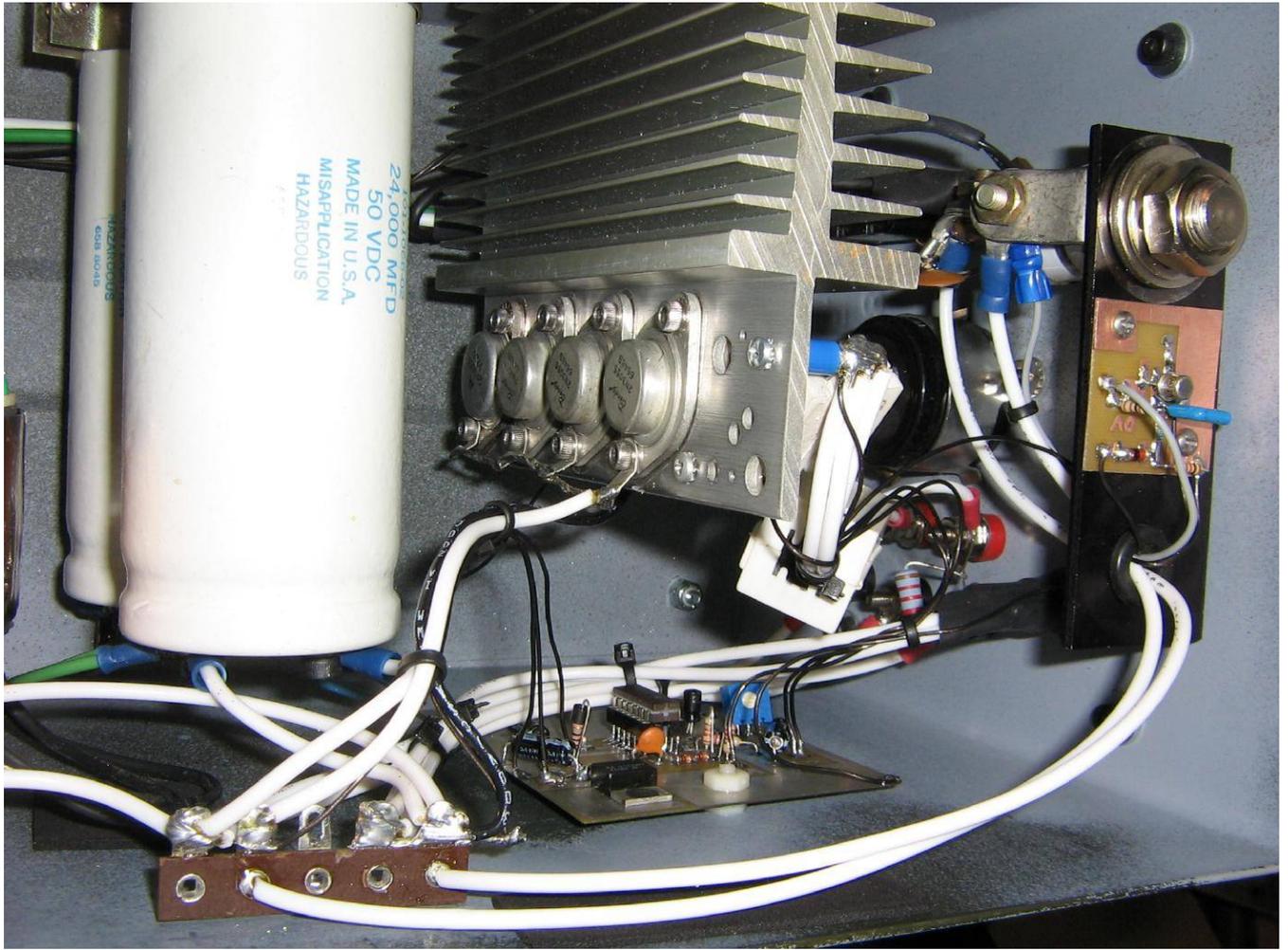
## Over-Voltage Protection Circuit

Triggers at 33 volts.





Completed 28 volt power supply internal overview.



Completed power supply alternate view.



Outside case front-panel overview.

The voltage outputs are via a series of banana jacks.

The fuse on the upper-left is for the over-voltage circuit.

The fuse, switch, and socket on the right-side are for the incoming 120 VAC power.



## 28-V, High-Current Power Supply

From the 2007 edition of the *ARRL Handbook for Radio Amateurs*.

### 28-V, HIGH-CURRENT POWER SUPPLY

Many modern high-power transistors used in RF power amplifiers require 28-V dc collector supplies, rather than the traditional 12-V supply. By going to 28 V (or even 50 V), designers significantly reduce the current required for an amplifier in the 100-W or higher output class. The power supply shown in **Fig 17.44** through **Fig 17.48** is conservatively rated for 28 V at 10 A (enough for a 150-W output amplifier) — continuous duty! It was designed with simplicity and readily-available components in mind. Mark Wilson, K1RO, built this project in the ARRL lab.

#### CIRCUIT DETAILS

The schematic diagram of the 28-V supply is shown in **Fig 17.45**. T1 was designed by Avatar Magnetics specifically for this project. The primary requires 120-V ac, but a dual-primary (120/240 V) version is available. The secondary is rated for 32 V at 15 A, continuous duty. The primary is bypassed by two 0.01- $\mu$ F capacitors and protected from line transients by an MOV.

U1 is a 25-A bridge module available from a number of suppliers. It requires a heat sink in this application. Filter capacitor C1 is a computer-grade 22,000- $\mu$ F electrolytic. Bleeder resistor R1 is included for safety because of the high value of C1; bleeder current is about 12 mA.

There is a tradeoff between the transformer secondary voltage and the filter-

capacitor value. To maintain regulation, the minimum supply voltage to the regulator circuitry must remain above approximately 31 V. Ripple voltage must be taken into account. If the voltage on the bus drops below 31 V in ripple valleys, regulation may be lost.

In this supply, the transformer secondary voltage was chosen to allow use of a commonly available filter value. The builder found that 50-V electrolytic capacitors of up to about 25,000  $\mu$ F were common and the prices reasonable; few dealers stocked capacitors above that value, and the prices increased dramatically. If you have a larger filter capacitor, you can use a transformer with a lower secondary voltage; similarly, if you have a transformer in the 28- to 35-V range, you can calculate the size of the filter capacitor required. Equation 3, earlier in this chapter in the Filtration section, shows how to calculate ripple for different filter-capacitor and load-current values.

The regulator circuitry takes advantage



**Fig 17.44** — The front panel of the 28-V power supply sports only a power switch, pilot lamp and binding posts for the voltage output. There is room for a voltmeter, should another builder desire one.



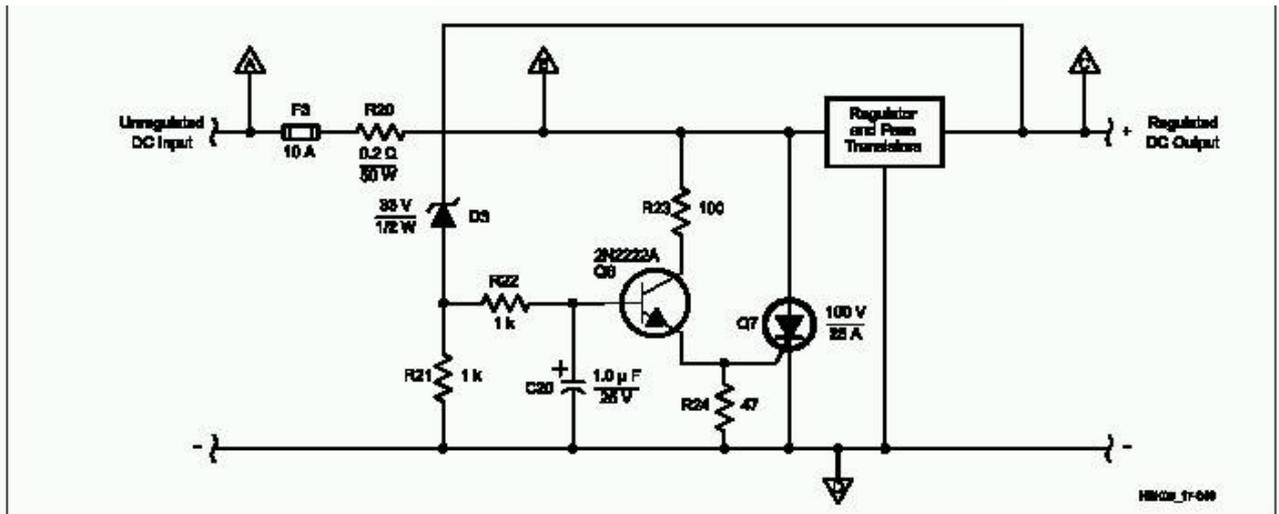


Fig 17.46 — Schematic diagram of the overvoltage protection circuit. Resistors are ¼-W, 5% carbon types unless noted.

D3 — 33 V, ½-W Zener (NTE 5036A or equiv.)

Q6 — NPN Transistor (2N2222A or equiv.)

Q7 — 100 V, 25A SCR (NTE 5522 or equiv.)

may be added or deleted with no effect on the rest of the supply. If you choose to use the “crowbar,” make the interconnections as shown. Note that R20 and F3 of Fig 17.46 are added between points A and B of Fig 17.45. If the crowbar is not used, connect F2 between points A and B of Fig 17.45.

The crowbar circuit functions as follows: The Zener-hold off diode (D3) blocks the positive regulated voltage from appearing at the base of Q6 until its avalanche voltage is exceeded. In the case of the device selected, this voltage level is 33 V, which provides for small overshoots that might occur with sudden removal of the output load (switching off a load, for instance).

In the event the output voltage exceeds 33 V, D3 will conduct, and forward bias Q6 through R22 and C20, which eliminates short duration transients and noise. When Q6 is biased on, trigger current flows through R23 and Q6 into the gate of SCR Q7, turning it on and shorting the raw dc source, forcing F3 to blow. Since some SCRs have a tendency to turn themselves on at high temperature, resistor R24 shunts any internal leakage current to ground.

### CONSTRUCTION

Fig 17.47 shows the interior of the 28-V supply. It is built in a Hammond 1401K enclosure. All parts mount inside the box. The regulator components are mounted on a small PC board attached to the rear of the front panel. See Fig 17.48. Most of the parts were purchased at local electronics stores or from major national suppliers. Many parts, such as the heat sink, pass transistors, 0.1-Ω power resis-



Fig 17.47 — Interior of the 28-V, high-current power supply. The cooling fan is necessary only if the pass transistors and heat sink are mounted inside the cabinet. See text.

tors and filter capacitor can be obtained from scrap computer power supplies found at flea markets.

Q2-Q5 are mounted on a Wakefield model 441K heat sink. The transistors are mounted to the heat sink with insulating washers and thermal heat-sink compound to aid heat transfer. TO-3 sockets make electrical connections easier. The heat-sink surface under the transistors must be absolutely smooth. Carefully deburr all holes after drilling and lightly sand the edges with fine emery cloth.

A five-inch fan circulates air past the heat sink inside the cabinet. Forced-air cooling is necessary only because the heat sink is mounted inside the cabinet. If the heat sink was mounted on the rear panel with the fins vertical, natural convection would provide adequate cooling and no fan would be required.

U1 is mounted to the inside of the rear panel with heat-sink compound. Its heat sink is bolted to the outside of the rear panel to take advantage of convection cooling.

U2 may prove difficult to find. The 317L is a 100-mA version of the popular 317-series 1.5-A adjustable regulator. The 317L is packaged in a TO-92 case, while the normal 317 is usually packaged in a larger TO-220 case. Many electronics suppliers sell them, and direct replacements are available from many local electronics shops. If you can't find a 317L, you can use a regular 317.

R7 is made from two 0.1- $\Omega$ , 5-W resistors connected in parallel. These resistors get warm under sustained operation, so they are mounted approximately  $\frac{1}{16}$  inch above the circuit board to allow air to circulate and to prevent the PC board from becoming discolored. Similarly, R6 gets warm to the touch, so it is mounted away from the board to allow air to circulate. Q1 becomes slightly warm during sustained operation, so it is mounted to a small TO-3 PC board heat sink.

Not obvious from the photograph is the use of a single-point ground to avoid

ground-loop problems. The PC-board ground connection and the minus lead of the supply are tied directly to the minus terminal of C1, rather than to a chassis ground.

The crowbar circuit is mounted on a small heat sink near the output terminals. Q7 is a stud-mount SCR and is insulated from the heat sink. The other components are mounted on a small circuit board attached to the heat sink with angle brackets.

Although the output current is not extremely high, #14 or #12 wire should be used for all high-current runs, including the wiring between C1 and the collectors of Q2-Q5; between R2-R5 and R7; between F2 and the positive output terminal; and between C1 and the negative output terminal. Similar wire should be used between the output terminals and the load.

## TESTING

First, connect T1, U1 and C1 and verify that the no-load voltage is approximately 44 V dc. Then, connect unregulated voltage to the PC board and pass transistors. Leave the gate lead of Q6 disconnected from pin 8 of U4 at this time. You should be able to adjust the output voltage between approximately 20 and 30 V. Set the output to 28 V.

Next, short the output terminals to verify that the current foldback is working. Voltage should return to 28 when the shorting wire is disconnected. This completes testing and setup.

The supply shown in the photographs dropped approximately 0.1 V between no load and a 12-A resistive load. During testing in the ARRL Lab, this supply was run for four hours continuously with a 12-A resistive load on several occasions, without any difficulty.

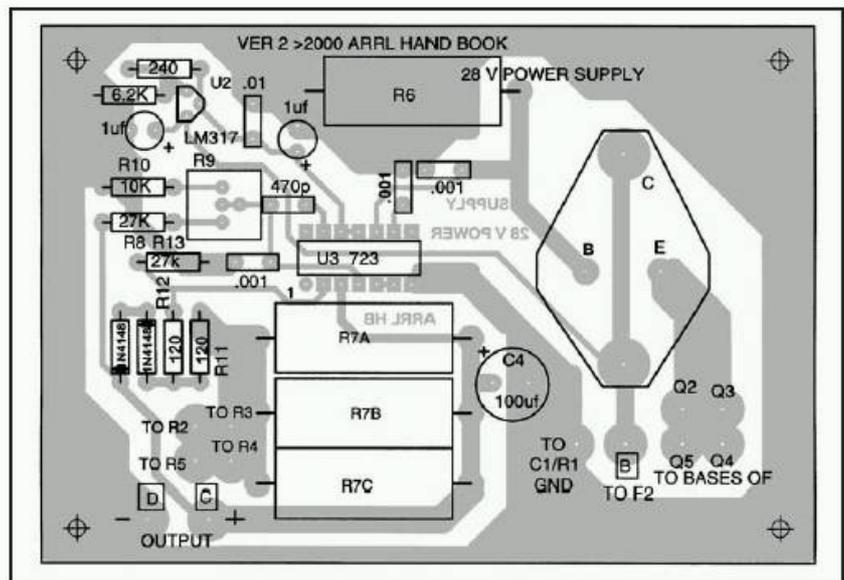


Fig 17.48 — Parts placement diagram for the 28-V power supply. A full-size etching pattern is in the **Templates** section of the *Handbook* CD-ROM.

# World Scanner Report – Vol. 4, No. 10

## REFERENCE DATA

WSR Voice/Business, 1:30pm-5:30pm, PDT  
 Non-holiday weekdays ONLY! (619) 578-9247  
 Hertzian Intercept BBS, 5:30pm-1:30pm, PDT  
 Weekdays & 24-hrs weekends (619) 578-9247  
**BBS Setup: 1200-28,800-bps, 8N1, ANSI or TTY.**  
 Index & Table of Contents to WSR always available  
 for free download from BBS or \$5 for MS-DOS  
 floppy disk or \$5 printed hard copy.

## WORLD SCANNER REPORT

A Journal of VHF-UHF Radio Technology & Engineering

Published by COMMtronics Engineering at PO Box 262476, San Diego, CA 92196

Publisher/Editor: W. D. Check, Sr. aka "Dr. Rigermartin"

Copyright © 1991-94 - All Rights Reserved - ISSN 1061-9240

Volume 4, Number 10

\$4.00

## LAST ISSUE OF 1994

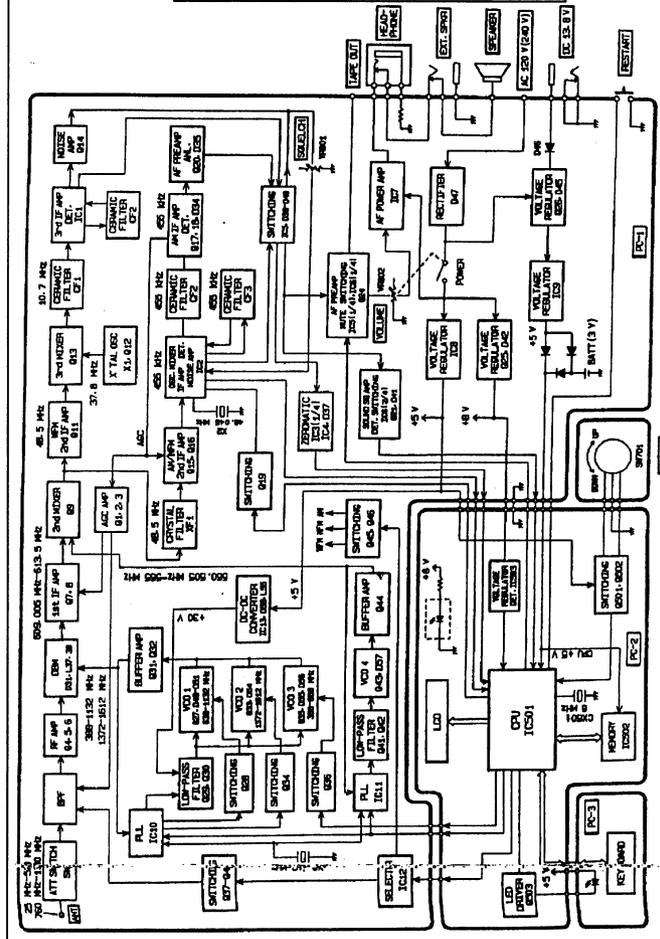
Some subscriptions are now expired with this **final issue for 1994**. Renew right away to assure uninterrupted delivery of the first issue of 1995! Check your mail label; if it says **Expires: 11/30/94**, then this issue will be your last until you renew. It is anticipated that V5N1 will be released in the first week of January, so if budgets are in a pinch, you have until then to get things nailed down. As continues to be our custom, if you want to renew but have to delay on account of a slim budget, simply tell us and we'll send the next issue automatically and you can have through January, 1995, to cough up. Those who do not plan to renew can also receive the next issue by asking for it and telling us why the decision not to renew.

## PRO-2035 IS HOT!

And I told you a little last month about the one in my long, bony fingers! Now I have more to tell you, thanks to the slick new Service Manual now in my paws. It's a tough decision which one I'd rather have in my hands, the scanner or the Service Manual, so I gave up and took 'em both! By the way, I and a few other lucky ones got our Service Manuals for the usurious price of \$1.<sup>00</sup> apiece! No kidding, but apparently others got in too late and reported something to the effect of \$13 ea.

Gosh, I don't know where to start first! My cup of information runneth over profusely. Well, let's start with the Block Diagram shown to the right. You PRO-2004/5/6 aficionados will want to compare your block diagrams with that of the PRO-2035 to assure yourselves that the electronic design remains much the same. This is very important in the big picture of scanner **hacking** because almost all my mods for the PRO-2004/5/6 will apply to the PRO-2035!

## PRO-2035 BLOCK DIAGRAM



## PRO-2035 FACTS & FIGURES

Lets talk some hard core facts & figures about the PRO-2035 for starters. Remember that **baby-poop green backlight** I told you about last month? Well, the color hasn't changed, but my opinion has! That backlight is not an

electroluminescent panel like in the PRO-2004/5/6! Turns out, there are nine bright green LED's behind the LCD Display to provide the backlighting! This is good news when you consider the cost and time to replace an EL panel after the sucker has worn out. LED's don't wear out, you see. So why did they

pick GREEN LED's? Well, probably because red backlight doesn't contrast very well; yellow can be too bright for good vision at night; and blue LED's remain too expensive and probably too low intensity. One of these days, I will rip into the back of that LCD display and see about possibilities of exchanging those green weenies with blue LED's. At about \$2.50 ea, the \$15 cost to get rid of that sick green might be worth it.

**MEMORY** in the PRO-2035 is a 28-pin, surface-mount SRAM chip (IC-502) organized as 8k x 8 for 64-k total. Guess what! This almost certainly makes our extended memory mods a reality! You could use a 32k x 8 (256-k) SRAM to yield 4,000 channels in 4-Blocks of 1,000 each. Better still, a 128k x 8 (1-M) chip will yield 16,000 channels in 16 Blocks of 1,000 each. Since I haven't done the memory mod yet, I can only speculate, but if the 400-ch PRO-2004/5/6 used a 2k x 8 (16-k) SRAM for its memory, then 4-times that memory capacity in the PRO-2035 for but 2½ times the number of channels should produce some interesting results. Memory enthusiasts will recall how the PRO-2004/5/6 store Scan Bank and Priority Channel settings on board the CPU's ROM. The PRO-34 and 37 stored the Delay and Lockout settings in CPU ROM as well. Therefore, one might speculate that the PRO-2035's CPU doesn't store *any* of the custom settings, thanks to the excess of outboard memory. I'll know and report more on this in early '95 when I've had a chance to rip into my PRO-2035 with great vigor.

A **SPEEDUP** seems possible in the PRO-2035 by replacing CX-501 (8-MHz) with a 10-MHz quartz microprocessor crystal. This will yield a 25% speed boost at the cost of a commensurate reduction of the DELAY time. Such a speedup might also eliminate the PRO-2035 from contention in other high performance mods. Crystal speedups are always a compromise, unlike diode speedups in the PRO-2004/5/6 which involved no compromise that we could ever determine.

No more simple **DIODE/RESISTOR SOUP-UPS** like in the days of old! The keyboard addressing scheme no longer uses diodes in the matrix to set program variables. In fact, there appear to be no firmware program variables whatsoever

in this design. Adding insult to injury, the keyboard matrix does not appear very interesting at all; not in the conventional sense, anyway. Forget any quick and dirty *add-a-diode* or *clip-a-resistor* mods for the PRO-2035. Ain't gonna happen.

The **LOGIC/CPU Board is readily accessible**, however! It's almost as easy as the old PRO-2004; not quite. You'll need some instructions if you're not comfortable with ripping scanners apart. So here's what ya do:

1. Disassemble the PRO-2035 as follows: Remove external AC or DC power before launching the invasion. Remove the four screws that hold the front panel to the chassis; disconnect all cables that go from the front panel to various places around the receiver. Disconnect the black ground wire from the main chassis.

**NOTE:** Memory will be lost if and when CN-502 is disconnected from the main receiver board for more than a few seconds. If this is not acceptable, you can leave CN-502 plugged in with the understanding that the Memory Battery will be providing "keep alive" power to the Logic/CPU board and therefore carries the risk of serious damage if you aren't sure of what you're doing. One little ZAP and the party's over! Disconnect CN-502 if there is any doubt.

2. Remove the four screws that hold the metal shield over the Logic/CPU Board and carefully lift up and remove the shield. Remove the two remaining screws that hold the Logic/CPU Board to the front panel. Now comes the only tricky part: the board is held tight to the front panel by virtue of that white 15-pin connector, CN-503, much in the same fashion that secures the PRO-2005/6 Logic Boards in their front panels. You will have to "jiggle" and work the board up and off the 15 male pins of the Keyboard PCB underneath. You can slip a flat-blade screwdriver under the Logic Board to assist matters with some gentle prying. Just be careful and patient as you work the board up and off the pins below.

## CONNECTIONS TO THE LOGIC/CPU BOARD

This process is harder to ruminant about than to perform. When the Logic/CPU Board is free, note how adjacent to CN-503 are fifteen unused, plated-thru holes that scream for a purpose! I suggest you insert and solder a 15-pin strip of "pin-line" sockets to facilitate EASY connection of the Interface wiring. The metal shield has to be "nibbled" or notched out about ¼" to leave room for this strip before it can be reinstalled, and DO reinstall it when you're done. It's there for a good reason. Any number of other things may later connect to CN-503, including Search & Store modules; Remote Controllers; and even computer interfaces! There is no sense in soldering anything directly to CN-503, nor mechanically inserting pins into it when there is the convenience of those holes adjacent to the connector. A strip of pin-line sockets will make future work in this area a piece of cake. When the 15-pin pin-line strip socket has been soldered in place next to CN-503, insert a second strip of 15 Pin Line sockets into the first, males to females. This one becomes your removable "plug" for whatever future purposes you may have in mind or come to mind later.

**CE-232/HB-232 Interface works** with the PRO-2035 to a limited extent. It is unfortunate that the almighty dollar has to do all the driving these days, but one hardware difference between the PRO-2035 and its honorable predecessors is the LCD Driver was moved on board the CPU where the data between CPU - LCD driver can not be accessed. Thus the **CE-232/HB-232**

**Interface** will not function with the

PRO-2035 as a 2-way controller like for the PRO-2004/5/6. While this is a decided disadvantage, the CE-232 and HB-232 can still (*easily*) be made to **AutoProgram** and **Keyboard Control** the PRO-2035! If you stop to consider how long it will take to hand-program those 1,000 channels from that miserable front panel of the PRO-2035, you'll see where the CE-232 Interface is still a strong

## BETA TESTERS WANTED

Procedures and necessary extra software have been developed by which the PRO-2035 can be interfaced to the CE-232 or HB-232 Interface. If you own BOTH the scanner and an interface and would like to participate in the *beta test* at no cost, contact me via the *Hertzian Intercept BBS* where the files and instructions can be made available to you. The beta test is not conducted by mail; strictly by BBS and timely reports are expected.

# World Scanner Report – Vol. 4, No. 10

plus. Limited tests so far show that the CE-232 can **AutoProgram** the scanner at a rate of about 70-ch/min or about 15-mins for a full 1,000-ch program. Believe me, it would take you days to do it by hand.

**The Analog Section** (main receiver) of the PRO-2035 has so few changes that I recognize it like the back of my hand. Virtually all the mods we've developed for the PRO-2004/5/6 for this section will apply directly to the PRO-2035. These analog or general application mods include the following:

**MOD-4 Squelch:** The PRO-2035 reverted back to the PRO-2004/5 design and eliminated the bilateral switch upgrade that was evident in the PRO-2006. The Squelch feedback resistor is not 100-k (R-157) which may eliminate any need to monkey around in this area. My Squelch seems OK and I've not been tempted to mess with it yet. I suppose you could emulate the bilateral switch enhancement of the PRO-2006, but best advice is to leave this area alone for now.

**MOD-5 Better Tape Audio** might be worth a look later, but the existing TAPE REC circuit looks fine.

**MOD-6/33 AutoTapeRecorder Switch** is a definite "to do". The circuit of MOD-6 in Vol-1 of my book has been superseded by MOD-33 in Vol-2, the design of which remains valid. The connection point for the AutoTapeRec switch in the PRO-2035 will be at IC-2, Pin 13. NOTE: Start with a high value of resistor to the base of the AutoTapeRec switch and decrease it a value at a time until the switch performs flawlessly. A good starting point will be 100-k with a final value of around 33-k to 47-k probably being optimum. Refer to the below circuit as a guide.

The idea behind my AutoTapeRec Switch is to offer an affirmative trigger for a tape recorder to start when there is a signal and to stop when there is not. The Squelch gate is what offers this pure logic, after all, when SQ is set, there is nothing to record, and when SQ is open, there's a signal! The concept of VOX (voice activated recorders) is nice in principle, but oftentimes there is noise present in a TAPE REC jack even though the SQ is set. This noise can trigger a VOX recorder.....uncouth! The below AutoTapeRec Switch will work with most any scanner ever made provided you connect it to the proper Squelch Gate location. This has been extensively discussed in back issues of the WSR and will not be repeated here.

**MOD-8 Headphone Audio** continues to be a good hack. In the PRO-2035, jumper R-228 (270-Ω) with a low value resistor of about 5-33Ω, or so.

**MOD-9 Disable the Beep** can be vital to the preservation of your nerves (or your spouse's). For a permanent disable, clip the brown wire that goes to Pin 1 of CN-3. To selectively disable the Beep, insert a SPST switch between the wire cuts. For remote control of the Beep from a **CE-232/HB-232 Interface**, connect one of the User Switches (AA-DD) to the wire at CN-3, Pin-1. Then CTRL+F(n) where n=1-4, enables or disables the Beep at will.

**MODs 10-11** apply without comment. MODs 12-13 are long superseded by **MODs 25-26 S-Meter** which will work just wonderfully in the PRO-2035! There isn't a lot of space inside the front panel in which to install LED's, but the new microLEDs might offer opportunity for a slick looking S-Meter! The basis of an S-Meter for your PRO-2035 remains unchanged from the PRO-2004/5/6 series, thanks to the "extra" IF strip for AM mode

and for developing the receiver's AGC function. The tap for input to the S-Meter detector is at the cathode of D-34 at T-8. The below diode detector circuit is the main requirement for either an analog or LED S-meter. Build it and connect it as shown. Attach the S-Meter of your choice to the output. The S-Meter circuits are well covered in Vol-2 of my book and cannot be repeated here.

NOTE: This S-Meter detector circuit below is good ONLY for the PRO-43, PRO-2004/5/6, and PRO-2035. An S-Meter for all other scanners has been adequately covered in a back issue of the **\*WSR\***.

**MOD-14 Shortwave Interface** for SSB detection is still a good bet and very easy to accomplish in the PRO-2035. You can tap the 455 KHz IF output at the cathode of D-34 at T-8, or maybe better still at the junction of CF-4, C-153, and R-135 where the signal is a lot weaker and perhaps better for the shortwave receiver.

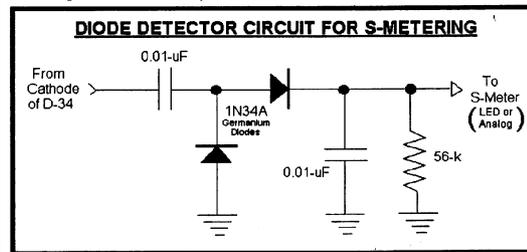
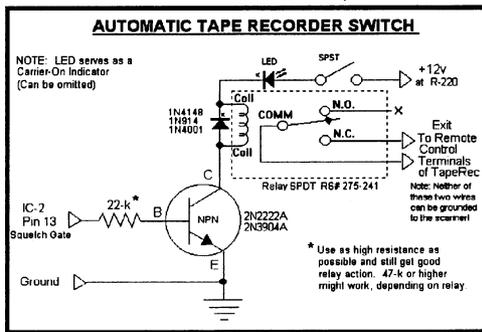
**MOD-16 Extended Memory** was discussed earlier in this article and is a definite probability. More later.

**MOD-23 Search & Store** modules from Key Research Co. May or may not work well with the PRO-2035. There may be less of a need for them anyway since the PRO-2035 has a Search & Store of its own. Best to check with Key Research Co. on this one.

**MODs 25-26 S-Meter** discussed above **MOD-27 Center Tune Meter** remains unchanged. The signal tap is at TP-2 or Pin 9 of IC-2.

**MOD-28 KMBC** - future discussion **MOD-29 Extended Delay** will require some revision (minor) and will be presented in a future article.

**MOD-30 Event Counter** Radio Shack discontinued the *event counter module* and so this hack is rather moot. Maybe a good idea to beg them to bring it back?



**MOD-31 CTCSS Decoder** (TS-32P) from Communications Specialists Co at (800) 854-0547 remains a viable and useful hack for the PRO-2035. There may be some ways to really exploit the power of CTCSS by using the TS-32P in conjunction with one of Professor Peabody's unpublished enhancements for it. You'll have to beg him to finish it up, I guess. He thinks you guys don't like him anymore.....

**MOD-32 Carrier On Indicator** is an old standby. No comment necessary.

**MOD-33 ATRS** - already discussed

**MOD-34 Shielding** gets a change of design, thanks to Miller-Stephenson's lack of desire to sell to the public and to the defects that plague their sprayers. Spray shielding no longer recommended. Instead, use heavy duty aluminum foil glued to the inside surfaces of the plastic cases of the scanner. See back issues.

**MOD-43 SCA Detector** should work just fine in the PRO-2035 but the procedure will require a new diagram & approach. Watch for a future article.

**MOD-44 Data/Tone Squelch** is just as hot as ever and will work fine. Hookup will differ a little and so will be discussed in a future article.

**Unnumbered MODs** for the PRO-2004/5/6 that appeared here in the WSR will be discussed in future articles as they apply and as I have a chance to review and test them. For example, Professor Peabody's AutoTagger and AutoCrystalSwitch might be sure-fire winners. We'll see.....

## ADD A HOLD FUNCTION TO RADIO SHACK'S FREQUENCY COUNTER

**EDITOR'S INTRO:** *This information comes from Pat Richard of Michigan who sent me a file that got misplaced. I pieced the info together from various sources and offer it here:*

Ground TP-17, simple as that. In the schematic, TP-17 is at U3, Pin-1, connected to +5V thru a 47k resistor. On the circuit board, TP-17 is on the display side, just right of the lower-right corner of the IC. Ground spots are the three non-tinned points in the large area of metal about 1/4 inch below and to the right. TP-17 is the tinned pad next to a chip resistor marked '473' for 47k. A momentary, n.o., SPST push button

switch can be used to ground TP-17 thru a 1k resistor! Drill a small hole to mount the switch just above the plastic depression so you can push the button with your right thumb. A small toggle switch will fit if you want an indefinite HOLD function.

Speaking of frequency counters, I found the following user's perspective on one of the computer networks:

From: Andrew Porrett Thu 25 Aug 94  
To: All

Subj: Frequency Counters  
Hi folks, I saw this recent exchange, and thought I'd add my own observations. If it sounds like a sales pitch, I'm sorry, but it ain't. Just my experiences with my unit. I hope some of you find it informative. There are several brands with various features, so do your homework.

**From SJ>** I know that RS's Freq counter is relatively new but is it a good buy for the modest person only looking for something to help find the freqs for radio at hotels, etc? I just want to use it with my scanner, so far...because if I want to do something else, I can use my friends one, but only for something major..he really gets NERVED.

**Bill Cheek replies>** *Unfortunately, even VERY GOOD lab counters are not suited for grabbing hot new freqs out of the air. The hundred dollar models won't be any better, that's for sure.*

*If you are close enough, and if the nearby transmitter stays keyed long enough and doesn't overmodulate the carrier, then it is possible to get a freq reading on the counter. But I can assure you that you will make 100-attempts for every one successful intercept.....if that. Is it worth it? You tell me. - Bill*

### Andrew Porrett responds:

The first frequency counter I owned was a Startek SK 1350. It's was fairly basic 1-1000 MHz unit, whose only extra feature was a hold switch.

With this unit, I had to watch the counter display random counts until the target started transmitting. At that point, I could either try to memorize seven digits, or hit the hold switch real fast.

While it did work, it was a pain. When the target transmitted, the display varied somewhat (*hey, that's what happens when the signal isn't real strong and you can't stand right beside that security guard while holding up a counter*). Unfortunately, a bouncing display looks like a random display with no signal present. By the time I decided that the counter was counting the target's transmission, and reach for the hold switch, the target stopped transmitting.

Also, the accuracy of the count was directly related to the strength of the signal reaching the counter. As I moved further away from the transmitter, the count would drop lower and lower. Alas, the counter gave no indication of signal strength, so it was often impossible to know if I'd snagged the real thing or junk.

I'm not familiar with the Radio Shack counter, but I imagine that it would perform in a manner similar to what I've described above.

I took the original counter back to the retailer and traded up to a Startek ATH-15 counter, rated at 1-1500 MHz. This unit has greater sensitivity, a signal strength bar graph and an auto trigger and hold feature (ATH).

With ATH enabled, the display freezes in the absence of a local signal. As long as a signal is present, the counter counts. When the signal stops, the unit auto-presses the hold button for you.

The trigger level for the ATH function is adjustable, and when set properly, virtually guarantees that the device will only produce accurate counts. Weak signals, which could produce incorrect results, won't start the unit counting.

This means you can put the counter in your pocket, wait for a transmission, and then check the display later.

I took a vibrator out of an old pager and installed it in the counter, and now the whole thing vibrates when it counts (*another warranty shot to hell*). For stealth counting, I'll usually wear the counter on my belt (oh yeah, added a belt clip too), with a long T-shirt covering it. With this setup, I can stand right next to my victim and wait until I get a buzz.

The bar graph is nice too. It gives a highly visible indication that a nearby transmitter has keyed up. The longer the bar, the better the count. The graph also lets you estimate the transmitter output power, as well as showing background RF levels.

Frequency counters often have more than one counting speed. This is the length of time it takes the counter to calculate and display the frequency. The Startek has several gate times, ranging from 0.08 to 6.6 seconds. Longer gate times give less frequent updates, but more accurate displays. They can be used to calibrate a transmitter to within ten hertz (display shows xxx.xxxxx MHz).

A gate time of 0.31 seconds will update the display about three times per second, and is accurate to within 1 KHz (display shows xxx.xxx MHz). This is the setting I use most, as it allows the ATH to latch any voice transmission, but rejects brief noise bursts.

# World Scanner Report – Vol. 4, No. 10

The fastest gate time of 0.08 seconds is used in conjunction with the ATH feature to catch very fast transmissions (usually computer generated). I have used this mode to snag short data bursts coming from our local law enforcement vehicles. The display is only accurate to 10 KHz (display shows xxx.xx MHz), but you can just round up to the next standard frequency.

I've also used this super-fast count-and-hold mode to watch our Tropez cordless phone handiest keep in touch with the base STARTEK INTERNATIONAL unit. Every 13 seconds, the two units have a "very" brief chat to make sure that they're still in range. If you separate them too much, they start peeping until you reunite them.

The main question asked by those who are interested in acquiring a frequency counter is "how far away will it pick up a signal?". This ability is affected by the quality of the unit, the antenna you use, the radiated power of the target, the frequency being used, and the amount of background RF noise.

I normally use the rubber ducky antenna that came with my Pro-43. It seems to do an OK job. The bar graph likes it better than my other portable antennas.

In metropolitan areas, the counter is being bombarded by dozens of high powered AM/FM/TV/paging transmitters. This severely degrades the counter's range. I find that trying to snag signals in downtown Toronto is a waste of time, just too much RFI. Outdoors, anyway. I haven't tried snagging security in a downtown hotel. Maybe there'd be (a lot) less RFI inside the building, and the counter could work it's magic.

**IF YOU PLAN TO HUNT FREQUENCIES IN AN RF INFESTED METROPOLITAN AREA, YOU MAY BE WASTING YOUR MONEY ON A FREQUENCY COUNTER**

Pretty opinionated, eh? Well, it's just an opinion. Feel free to disagree. Luckily, I live by the city limits, in an area with medium RF levels. In this area, I had the following results:

Transmitter	Freq	Distance
cordless phone	49 MHz	2 in
Tropez cordless	926 MHz	9 in
cellular phone	830 MHz	7 ft
4 watt handheld	418 MHz	> 20 ft
fire truck	155 MHz	> 100 ft
police cruiser	408 MHz	> 100 ft
locomotive	161 MHz	> 300 ft
FM broadcast	101 MHz	>2000 ft



The manual that came with the counter claims much better distances for the lower powered devices. They must have tested them in the middle of nowhere. Or maybe my antenna sucks. Also, I think that most counters have poor sensitivity at the low and high ends. From 100 to 500 MHz, they're probably great. At 30 or 800 MHz, you'll notice a sensitivity drop.

Keep in mind that those figures above are my distances for bang-on, accurate readings. As

distances increase, you can make a counter display less accurate, but still useful numbers. For instance, if your counter is getting a somewhat degraded signal and displays "451.1039", the true frequency is probably a bit higher, so get your scanner searching 451 - 453 MHz. That's about a three second loop on a '43. You'll nail it the next time they talk.

Sometimes you can use "social engineering". One time, I walked up to a mall security guard and said "I just bought this, but I don't know if it works. Would you help me?" He was really nice and keyed the mike. He wanted to see how the strange little black box worked.

If you manage to pull this off, keep your counter a couple of feet away from the transmitter to avoid any possibility of damaging the counter's front end. The same applies to your expensive scanner.

To wrap up, the first unit I tried was fine when "I" could control the transmitter. When someone else did the talking, I watched a lot of meaningless random numbers. If I was lucky, I'd get some steady numbers. If I was truly blessed, I'd hit the hold switch before those random numbers started up again.

The second unit is what a counter should be. I turn it on and it does the work. It tells me when that that idling CN locomotive down the block hammers the neighborhood on 161.415 MHz. Probably talking to the dispatcher. Sure enough, he's starting to roll.

I guess you get what you pay for. I used to have a double conversion scanner, but now I know better. Same with counters.

**ED wrap-up:** I liked Andy's "social engineering" approach, didn't you? © Anyway, rumor has it that the StarTek company was launched by the dude who used to run Optoelectronics. Clearly they know how to make frequency counters but they don't get as good press as

Optoelectronics who seems to advertise everywhere. For more information:

**StarTek International**  
 398 NE 38th St, Ft. Lauderdale, FL 33334  
 (305) 561-2211 Orders & Information  
 (800) 638-8050 Orders Only  
 (305) 561-9133 FAX

Please...when you contact suppliers recommended by the WSR, mention where you read about them. As you know, we don't accept advertising, but it helps our credibility to have vendors know us. Oftentimes, vendors are willing to give or lend products to us for review here in these pages. Understandably, we cannot afford to buy a sample of everything out there.....so remember that vendor cooperation with us is vendor cooperation with YOU...which counts! Please tell vendors when we mention them.

**PERCON CORP.**  
**NEW PRODUCT**  
**SPEC SHEET**

**Product Name:** SPECTRUM

**Description:** SPECTRUM is a frequency database with over 3 Million records. Data is extracted from the FCC Master Frequency Database. The Database includes records for Police, Fire, Hospitals, Businesses, State and Local Governments, Airlines, utilities, Hotels, Theme Parks, Taxis, Freight Companies, Phone Companies, and much more. Frequencies range from DC to Daylight.

**Field Description:** Fields Include: Frequency, Call sign, Radio Service Code, Class of Station, DBA Name, Transmitter City/County/State, Transmitter Latitude and Longitude, and Number of Mobiles for Vehicle, Marine, Air, Portable and Pagers.

**Program Description:** SPECTRUM comes as a complete system, which requires no installation and setup. The program is executed from the CD-ROM. The program allows the user to extract data for display to screen in a Browse Screen, or to 132 column printed reports. Data can be extracted by a Frequency in a State, Call sign in a State, DBA Name in a State, Radio Service Code in a City, all Frequencies in a County, or all Frequencies in a City. The user is prompted for all required search parameters. The program is extremely easy to use and is suitable for entry-level scanner enthusiasts and power users.

# World Scanner Report – Vol. 4, No. 10

**System Requirements:** The system requires a 386 Processor or above, CGA, EGA, or VGA video display, a minimum of 2 Meg of Hard Disk, CD-ROM drive, and a printer (capable of 132 columns for reports).

**Database File Format:** The database is in a dBase III, IV, or FoxPro Compatible file format.

**Price:** The price for a single unit is \$29.95. Shipping for UPS Blue (Second day) is \$7.50.

PerCon Corporation  
4906 Maple Springs / Ellery Rd  
Bemus Point, NY 14712  
(716) 386-6015 Fax (716) 386-6013

## FROM THE READERS

**From: Stan Palen, King George, VA:**

Enclosed is my order for the 2006 computer interface kit. You met my price threshold.

In my shop I repair watches and have two other places I sit. One is my desk and the other is this computer. In order to control my scanner I brought out three lines from my 2006 keyboard to bring out the scan button and the up arrow to jump past things I don't want to hear. I have this on a pigtail that reaches all workstations.

A remote for this would be neat, but a lot harder. Just something some other people might be interested in.

The pins coming off the keypad are 7 and 10 for up arrow and 5 and 10 for scan. A momentary switch for Radio Shack does the job nice. Also since the switches are 1-1/2 inches apart it is easy to get the right one. Keep up the good work!

**ED Reply:** Depending on how you did that remote, you could have set yourself up for big time trouble. Do you know that the pins on the scanner's keypad go directly to the CPU? Yup! The slightest twinge of static or noise could smoke that expensive and hard-to-replace CPU. A real "remote" unit isn't that much harder to do than you've already done. Just involves a 4066 CMOS Bilateral switch to do the internal switching when triggered by an external switch arrangement, much as you now do. I'll write it up into an article soon. Several people have asked for scanner 'remote controllers'.

## SMART COMPUTER BUYING

**From: H. Dragonetti; Townville, SC:** Hi, wow I never knew computers were such fun and hard to learn.

**ED:** Hell, I could have told you that! Remember the old saying, "No pain, no gain." Hard learning is good learning.

The computer I wrote you about is an old IBM compatible machine. It's a 286-16 MHz, 1MB RAM-EGA, 40MB hard drive, 1.2 MB floppy with 3 1/4 and 5 1/4" drive inputs, serial port, parallel port. I just had a board put in for a joystick and mouse. Now let me tell ya that most of what I just wrote (above) is still Greek to me. The next thing I plan to do is to get the 1 MB RAM up to at least 4 MB RAM. What do you think about this?

**ED:** No, Henry, no! Don't spend a dime more than you have to on that old clunker! Hey, she's a jewel for her age and a wonderful teething ring for you, but don't spend a buck on it! You'll find good uses for it later as a stand-alone controller for a scanner or for something else that doesn't require a lot of computer power. Instead, save your shekels; watch the ads; and invest in a modern Windows™ machine after you know what you're doing. Very powerful 486 machines with SVGA, 4-Mb RAM, and 400-Mb hard drives can be had for \$1500 or less! Really!

Do you know of any programs out in the market place that I can buy that can store scanner frequencies? With four or more scanners and new frequencies coming out every day, it's hard to keep track of things. I picked up a Pro/File program at Radio Shack and tried to use it to store frequencies, but promptly lost them. I tried to look up my problem in the Pro/File manuals but they were too heavy to pick up.

**ED:** I know....I know. You are on the steep part of your learning curve right now where even remembering how to turn the damn thing off is a monumental chore, much less turn it back on. Still, I advise patience and spending NO MONEY until you've reached a working knowledge level. Give it another 3-mos, and use ONLY shareware for the time being. Tell ya what...YOU send ME a high density disk in a mailer with some stamps for return postage and I'll load the sucker up for you with utilities and

things to keep busy with as you're learning what the hell's going on with these newfangled computing machines.

You know sometimes a computer can make a person's self esteem go "CTRL-ALT-DEL." I got *DOS For Dummies*, and now I'm working my way up to dummy, dah! I wish I could have found *DOS for Idiots!* Well, I'll let you go with only two questions. I know you are a very busy person. I still envy people like you that are smart in electronics and computers. As well as any animal that has more hair than me. Say "Hi" to Cindy for me; I'll say "ESC" for now.

**ED:** Two questions? I just saw one. But I can answer more for you. Some folks say MS-DOS is dead; some say not. Doesn't matter because the truth is that no one is developing any great programs for DOS anymore. Windows is where the action is and where you probably need to be. Now don't get me wrong, because we Windows users also use the hell out of DOS. The best of both, see?

Now your 286-16 is not capable of running Windows, regardless of what you've been told. DON'T TRY IT! Instead, hang loose until you and the good woman feel right about investing in a decent machine, and I can tell you on no uncertain terms that it's a 486/33 or better! So wait! Now one thing you could spend a buck on is the MS-DOS upgrade to 6.2 or 6.22, which is worth it! The on-line HELP is great. At any prompt just type HELP followed by the DOS command with which you need help and bingo! (Ex: C:\help copy) MS-DOS 6.2 or 6.22 are worth it, but DO NOT use the "DoubleSpace" or "DriveSpace" feature. Never mind why not; just don't.

One fantastic Windows program that will handle much of your present and future needs is Microsoft *Works For Windows*, an integrated cluster of word processor, database manager, and spreadsheet, plus utilities, all of which are learnable and more than adequate for even small businesses, not to mention avid hobbyists. Your need for a frequency program would be readily resolved by MS-WORKS, you see....and you'd get so much more at the same time! Ask me more questions and we'll make a running column for computer assistance, especially related to radio and scanning. First, we gotta get you up to speed, so ask away. Make me think! ☺

# World Scanner Report – Vol. 4, No. 10

**From: J. P. Lynn; Chula Vista, CA** I enjoy your column on letters with scanner problems and your answers. And, it goes without saying that the most interesting part is the modifications, no matter how large or small.

**ED:** *I keep thinking we've invented everything that can be invented, but then something new pops up. Hang loose!*

**From: Dino Papas, Leavenworth, KS**

I'm still anxiously awaiting the Macintosh version of software to run a CE-232! I would buy one immediately (if not sooner...) if it were available. (Supposedly Optoelectronics is working on a version for their interface). Keep up the great work!

**ED:** *I'm not a developer and I don't know Macintoshes from Oranges, but Ron Mansfield & Associates had a Mac program under development for the CE-232: FAX (818) 790-2369 or write to: 448 Knight Way, La Canada, CA 91011.*

**From: Tony Thornton, Mize, MS**

Dear Mr. Cheek: I just started subscribing to the WSR. It's great! I also ordered all the back issues and can't wait 'till they arrive so I can read them all. But, on to the reason for my letter. Mr. Paul Alpiser wrote asking about a DPL/DSC Decoder and a Morse Code Decoder. I don't know of any DPL/DSC Decoder's in the \$150.00 price range that he mentioned, but a company here in my state, MFJ Enterprises, Box 494, Miss. State, MS 39762 (800) 647-1800 has a nice CW Decoder #MFJ462. It decodes RTTY, ASCII, CW & AMTOR.

**More From: Tony Thornton, Mize, MS**

Dear Cindy & Bill: Thank you for the excellent publication that you produce. I hope you don't think bad of me for using first names, but after getting & reading four years of back issues, I feel that we are friends and on a first name basis. If not, please forgive me...but on to my comments.

**ED:** *Everything will be just fine so long as you do not call us "late for dinner" nor by our middle names, David & Petunia. Those are fighting matters.*

After reading V1N1 through V4N9 I can say that I am very happy to have found something to read that is 99% scanner related. After all, computers are the future of scanning so I do not consider the computer-related columns to be anything but more scanner info and improvements to scanners and the hobby.

I don't have a computer at the moment (not one that works anyway...lightning ☹), but am

in the process of getting back on line. Ignore the computer complaints, as much as you can stand anyway.

I've reviewed several complaints and think that the people that wrote them just need to start their own magazine if they are rich. If not, they should shut up. Ten times as much info in "Monitoring Times"? I think that they need to take and compare the WSR and "Monitoring Times" and see which has the most usable scanner info. Color pictures?! The cover is color but the rest is not. That pretty cover doesn't help me with any projects. The color rear cover advertisement doesn't help anyone except maybe Icom or whomever to sell overpriced equipment. Don't get me wrong, I read "MT" and "Pop-Com" but I know ahead of time most equipment reviews will be positive and most of the scanner articles will be only of limited use, compared to the WSR. And, as you have stated before, it's your publication! I like it!! The way it is!! Just charge more and have more pages (a semi-joke!)

After all this aimless rambling, do you believe that I have not used any of your information except for that copper pipe dipole antenna (great, works great!) After listening to a satellite talk show host go on for three years about how wonderful an Icom R-100 was, I purchased one. It's a great quality piece of equipment, but as you stated early in the WSR, it's not a true scanner and too expensive a risk hacking around in. The service manual alone is \$45.00! So I am in the process of selling it and getting a PRO-2006 and a PRO-43. (Lots of PRO-2006s left around in small town Radio Shacks around my fairly thin populated state.) So as for my views on the WSR, keep on as you are. Make the improvements as you see the need and direction. After reading four years worth of the WSR over this past weekend, any changes that you made were improvements and any you make in the future will only add to the quality and desirability of the WSR to it's readers that understand it's true use and direction. I like your politics, I like the way you tell it like it is. So keep up the same outstanding work as you have in past issues.

A little about me, I'm 39 years old, been disabled (Chrohns Disease) for ten years, listen to short-wave, watch satellite TV, have a scanner on 24 hours a day, have a wife and two kids. By the time V4N10 arrives I will have a PRO-2006 and a hot soldering pencil! Thank you for your publication.

**ED:** *Thanks for your positive feedback and welcome to the WSR. I have never been one to mince words nor to run from a fight. I can't tell you how many times I've saluted "the bosses" with middle-finger held high and subsequently rode off into the sunset leaving behind perfectly good jobs and fringe benefits. Actually, I am a very mild-*

*mannered sort, even tempered, and rather easy to get along with until those qualities are perceived as a weakness by some Town Bully type. God, Country, Motherhood, and hot apple pie are the reinforcement steel of my foundations, though I have no religious preference; and I've voted Republican about as often as Democratic over the years. Ma passed away 13 years ago, but Cindy mothered two great kids now under my wing and she bakes a mean apple pie. Various hobby & business leaders and individuals think I need psychological help. I mentioned this to my analyst who agreed. (Time for a new analyst...) Some people love me; some hate me, but that's balanced by mutual feelings. Mostly I stand for oppressed minorities, and those who can't find enough to eat to survive. When the herd goes one way, I go the other, sometimes off a cliff, but so what? Free-fall is exciting.....*

*I believe a Free Society requires three basic commodities to assure its Freedom: Transportation, Self Defense, Communications. I can't walk and chew tobacco at the same time, so I have to focus on one, which happens to be communications, of which radio is just one little facet. Me, I'm really nobody special. I just walk through Life with respect and without fear ☺. I believe that a feller who won't stand for something will fall for anything, but you can't stand if your knees wobble with fear. Oh, I stand for kids and education, too. I have no clue but what I might come this way again sometime. If I do, the only way I'll find a better world is if our kids make it better. But you and I both know they won't do it unless we teach them how. There's a saying that floated around a few years ago that seems an appropriate note on which to end this chat: "We did not inherit the world from our parents; rather we borrowed it from our children." And there's another: "Life has meaning only in the struggle. Triumph or defeat is in the hands of the gods.... So let us celebrate the struggle." -Swahili Warrior Song-. If you like the WSR and what I stand for, perhaps it is because you see yourself in a mirror and you like what you see. If you like yourself, then all is well, despite the tests and challenges Life has thrown upon you. Eh?*

**From: J. Mathias, Clifton, NJ:** I think I may have figured out why so many people have problems with parts orders through their local Radio Shack. It's not simply that the people at the local store are the problem. The people at the National Parts Center, have been screwing up as much as the stores.

Case in point! I ordered 2 spare IC-8's for the PRO-2006. Before I printed the order out, I called the Parts Center on

their 800 line, verified the part number, price, shipping and sales tax. Used their nomenclature, part number and prices when I fired up the old PC & did up the order letter. What I got was 2 parts in a plastic bag with a computer label that identified them as something NOT listed in my service manuals for the PRO-2006, the PRO-43 or the Frequency Counter, although it resembled IC-9 a bit!

So I called Tandy, told them what happened and the lady agreed they sent me the wrong number. she gave me an RMA # and said to send 'em back, they'd ship me what I wanted. I told her I also needed some other parts and she said to include them in a letter with the return, and to make sure I put the RMA someplace prominent on the order letter, so they wouldn't screw up. Naturally, I had the lady verify the part #'s and prices again.

The shipment arrived today -- I must admit they did send two IC-8's this time. But they shorted me one item, because (when I called to find out why) I "didn't send enough money". It seems Tandy lost the letter that explained what I wanted, and didn't apply a credit (for the two wrong items sent) to the total of the order (which was the 2 IC-8's I still needed and the other new parts I wanted). Instead, they processed a refund check (generously for twice the amount it should have been) for the two returned parts and "shorted" my order one item because I didn't include payment for the two IC-8's along with sales tax on that amount.

Now I knew what was supposed to be in the order and how much it cost. If this had been ordered thru a store, the person who unpacked the order probably wouldn't have known what the customer REALLY wanted and stashed away the stuff for the customer. When the customer came in and asked a salesperson for the IC-8's, no one could have found them and a short-fused customer would have left "railing on" about the stupid salesperson.

So the moral is, NEVER order parts thru your local store, call Tandy/Fort Worth direct yourself. Make sure you verify the part numbers and prices not only with your manual but with the Tandy order-taker. And still brace yourself for errors to occur! Since parts ordered at the local store would include your paying for

shipping as well as any local sales tax (same as when you order them yourself direct from Fort Worth) and involving the people at your local store introduces lots of margin for additional errors, misplaced orders and who-knows-what-else and makes it take longer to actually get your mitts on the parts you need, it makes little sense to order any other way than direct from Fort Worth (800-442-2425 8AM-6PM Central Time) yourself!

BTW, if you call the Parts Center, ask for June, she is the person I spoke with today and she caught on to what had happened right away and seems to be an all-right person to deal with for future parts orders! Normally, I'd send this compliment in to the supervisor, but I suspect in this case, it might result in Tandy firing all the people involved with the orders I sent in that went a bit awry!

**ED:** *Unrelated to the subject of your astute observation, it pays to scope out the needed parts first. In the case of your IC-8's for the PRO-2006, they're available as generic parts in every RS store as 7805 regulators, cat #276-1770 at \$1<sup>12</sup> each. There was no need to special order those puppies, but yeah, I get your drift and have advised hackers for years to order direct from Tandy National Parts. Personally, I can't recall ever having a problem with the Ft. Worth Headshed, but I'm sure they're capable of failure, too. You liked June; one of my favorites is Janet. She's so good that all you have to do is say, "I need three of those dealy-bobs next to IC-301...." and she'll say, "Oh, you mean three X-301's?" "Yes, ma'am!"*

**From: J. Rommelt, Williamsport, PA**

In the 1995 Radio Shack catalog, page 30, an option is available for the PRO-2036 (Uniden 890 XLT): **CTCSS Squelch Decoder**. For monitoring services using tone squelch on shared channels - programmable so you only hear desired service. Can the PRO-2006 be modified to do this?

**ED:** *In a word, no. But, yes, in a roundabout way that's a lot more costly and complicated. Call Automated Industrial Electronics, (803) 532-9256 for one set of possibilities, and Communications Specialists (800) 854-0547 for a different approach. Refer to MOD-31 in Vol-2 of my book for details of this last alternative which is the cost effective way to do it.*

Can the JIM 75 pre-amp be modified with some type of low loss bypass so you don't have to disconnect the pre-amp when it is turned off to get signal through?

**ED:** *Practically speaking, no. If that's what you wanted to do, the M-100 model would have been the correct choice. Such a modification could be done, but I'm afraid it would ruin the qualitative aspects of the preamp.*

Does the Icom R-7100 do a better job at receiving than the PRO-2006? Is the Icom R-7100 worth \$1400.00? Could the difference in the Icom R-7100 and the 7100A (which has the 800-900 MHz deleted) be just a microprocessor chip? Can you take the chip that belongs to the R-7100 and put it in the R-7100A and then have a no gap radio? If so, what is the part number?

**ED:** *The R-7000/7100/7100A are better receivers than the PRO-2006 like a Rolls Royce is a better car than a Ford. In my opinion, the \$1000 difference is not worth it, notably when a little work can make a PRO-2006 run circles around the Icom. I can't attest to the difference between the 7100 and the 7100A, but most likely it is the CPU and if so, most likely a replacement with a 7100 version would do the trick. However, I don't know this to be the case. I don't hack the Icom rigs, so it's not likely that I'll be the one to make the discovery.*

Is it possible to design a 45 MHz directional beam antenna for cordless phone reception? Would it pull signals in from a further distance than a vertical antenna?

**ED:** *Yes to both....Yagi-Uda designs are found in most any ham radio book.*

What would be the best antenna for receiving cordless phones in the 902-928 MHz range (mobile and base)? How about a directional beam antenna for receiving cordless phones in the 902-928 MHz range? I would like to max out the range of my 900 MHz cordless phone.

**ED:** *Conventional Yagi-Uda antennas become ineffectual above 800 MHz, though I suppose at 900 MHz, it could still be done. The wavelength at 900 MHz is 0.333 meters or a tad over a foot.  $\lambda$  stubs would be 3-4 inches long and so other things like boom diameter and element thickness become super*

# World Scanner Report – Vol. 4, No. 10

critical as dimensions shrink. Other techniques are better, but beyond the scope of anything short of a major, feature article here. Scannists are not overly excited about the roll-your-own types of antennas. Ham radio antenna books will offer great designs for 902-928 MHz and I shall refer you to those resources for the time being.

I take it that the Rubber Ducky Antenna (on the handset) and the compact metal antenna (on the base) are a compromise. **ED:** Somewhat, but less so at 900 MHz than 49 MHz. Is it possible to put a BNC chassis jack on the base and run low loss coaxial cable to the outside and up to the peak of the roof to the antenna? **ED:** Yes, but a TNC connector is preferred over a BNC at those frequencies. Would it be a good idea to shield the plastic case with aluminum foil? **ED:** No, I think not in the case of 900 MHz. Would it be a good idea to ground the base? **ED:** Not especially, but there would be no harm in it. How do I increase the transmitting power output from base and handset? **ED:** You don't, not at 900 MHz. Is it possible to use some type of transmission amplifier on both the base and handset? **ED:** Not unless you found something expressly made for that band, or studied the ham books for power amplifier techniques at 900 MHz. Sorry for the brevity on these Q&A, but 900 MHz transmitting is well out of our scope here.

Is there any way to modify a scanner to receive spread-spectrum? **ED:** No. What frequencies do wireless FM intercoms

(that plug into an AC wall outlet) communicate on? **ED:** 100-KHz current carrier or 49 MHz Part 15. What frequencies do wireless phone jack systems work on? These systems plug into an ac wall outlet and transmit the phone signal on the electrical wiring so you can add an extension anywhere you have an outlet. **ED:** Sounds like VLF current-carrier, typically 100 KHz.

## PROFESSOR PEABODY WRAPS UP LOOSE ENDS CORRECTS ERRORS

Greetings Scannfans, my gourd went soft with another bonehead error on you unsuspecting folks. A very nice fellow, Gary Mumma, logged on to the *Hertzian Intercept BBS* and discovered a fatal flaw in my *Burst Filter* that was added to the *AutoTagger* circuit. Please haul out your *WSR*, July '93, V3N6 and turn to pg 7. At the top left of the page find Figure 2. Look at the line of text directly above Figure 2 and find the place where it says "oneshot, U1 Pin 2 REF V2N6 July 1992 WSR."

Cross out Pin 2 and replace it with Pin 1. This will correspond with the Figure 2 text that refers to Pin 8 of the 74HC132 that connects to Pin 1 of the 74HC123 of the *AutoTagger*. Next, add a note inside of the Figure 2 box that states "Pin 2 of 74HC123 is now connected to +5 volts or pin 16 of the 74HC123". Please take note that the changes to the 74HC123 are only needed if you are using the *Burst Filter* with the *AutoTagger* circuit. But I recommend the use of the *Burst Filter* along with the

*AutoTagger* as it adds a tenfold increase in performance of the *AutoTagger*.

Finally, Gary asks about the squelch input from the PRO-2005/6 scanners and if it is the same for the *Burst Filter* Pins 1 & 2. **Yes!** The burst filter needs a digital low or zero volt input for more than one second to activate Pin 8 of the 74132 which will go high until the squelch closes and then Pin 8 will drop low to activate the *AutoTagger* which will cause the key closure of the "LOCKOUT" function.

As a final note in my text of the *Burst Filter* V3N6, I mention Gates A,B,C, and D as doing this or that. Well to clarify what's going on here, when I originally sent in the article to the *WSR* my schematic was broken down to individual gates for better understanding. To make the circuit easier to build, Bill put it into a block diagram mode as it would be while hooking up things to the actual IC chip. There's nothing wrong with this but you now have to refer to a data book showing the gates, to be able to read along with my text. I guess all writers have to put up with the quirks of their editors, heh, heh.....

While we're on the subject of corrections, open V4N6 and look on Pg 1 to the schematic of the *AutoCrystalSwitch*. Notice in the upper left-hand corner of the circuit box there is a block with the nomenclature "PRO-2005/6 CPU" and it's pretty much blank. Well, the purpose of reprinting the circuit was to show how the ACS should be hooked up to the CPU pins in a generic sense. There is a circuit diagram inside of the CPU representation which did not make the papers so to speak. My intention was to show how the ACS

11/25/94 - 4:50 PM - The "World Scanner Report" © 1991-94; Volume 4, No 10; Page 9

CONFIDENTIAL. SUBSCRIPTION ORDER. Please Print Clearly!		Subscriber No.	11/02/94. SUBSCRIPTION RATES & ORDER BLANK. V4N10	
NAME:		USA RATES shown: Canada add 15%; Other Foreign +25% surff/+50% Air		
STREET		<b>BACK ISSUES ONLY Single copy 1 ea \$ 4.00 s</b>		
CITY: STATE: ZIP:		1991 (1st Year, Jan-Nov/Dec)-----10 ea \$21.00 s		
Work Ph: ( ) - Career or		1992 (2nd Year, Jan-Nov/Dec)-----10 ea \$23.00 s		
Home Ph: ( ) - Profession		1993 (3rd Year, Jan-Nov/Dec)-----10 ea \$25.00 s		
TYPE OF SCANNERS >>		1991-93 (All the above)-----30 ea \$65.00 s		
METHOD OF Payment >> <input type="checkbox"/> Cash <input type="checkbox"/> M.O. <input type="checkbox"/> Visa <input type="checkbox"/> MtCard <input type="checkbox"/> COD (+ \$8.50)		<b>WSR CURRENT SUBSCRIPTIONS</b>		
PAYMENT >> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		Half Year 5 ea \$15.00 s		
Credit Card		One Year 10 ea \$25.00 s		
Acc't No: >>		Two Years 20 ea \$45.00 s		
Expiration Date: / /		<b>OTHER PRODUCTS</b>		
Signature Required (for credit card purchases)		Scanner Mod Hndbk, Vol-1: \$17.95 + \$4.00 S&H * \$		
US FUNDS PAYABLE TO: <b>COMMtronics Engineering</b>		Scanner Mod Hndbk, Vol-2: \$17.95 + \$4.00 S&H * \$		
		Scanners & Secret Frequencies \$19.95 + \$4 S&H * \$		
X		* Canada US\$ S&H; Other Foreign US\$9 S&H; all add extra for Air \$		
		CE-232 interface kit: \$194.95 + \$5 S&H; All Foreign add 25% surff \$		
		Hertzian Intercept BBS SUBS: \$2/mo \$15/3-mo \$25/6-mo \$40/yr \$75/2-yr \$		
		HOBBY RADIO BUYER'S DIRECTORY \$14.95 ppd. surff \$		
		Callf residents: Sales Tax - 7.0% on all orders except WSR subs \$		
		<b>TOTAL THIS ORDER: &gt;&gt;&gt; \$</b>		

# World Scanner Report – Vol. 4, No. 10

to show how the ACS could be hooked up to any scanner CPU as long as the hacker did his or her homework and looked to see how the internal circuitry was laid out. The gate circuitry is pretty much the same in all CPUs and as long as you make similar connections from your CPU to the ACS you should have no problems at all. If you're not sure of the hookup, then try this before you disconnect anything. Turn off power but have the radio plugged into its power source and make sure it has a backup battery installed if it needs one. Connect the black or minus lead of your DC voltmeter to chassis and use your red meter lead to carefully probe both crystal connection pins on the CPU. One of the CPU pins should read a much higher voltage than the other. The higher voltage pin should be connected to the junction of the two crystals and the resistor but the resistor is already a part of the scanner. It's there to ensure startup of the oscillator. Another one is not needed or recommended.

The "missing" circuit inside CPU block in the schematic is reproduced below and would you please take a second and draw it in for your future reference.

Well, I have to go and dig into my bunker as my humble editor will be barking at me and lobbing hand grenades.

**ED replies to the Prof:** *Yo, Prof, what's happening, man? You sho'nuff went soft on me. Must be all that overtime you're putting in these days! I can't for the life*

*of me, figure out what you meant in the column to the left 'cuz you never sent me a CPU diagram nor indicated that you wanted one printed. Or I lost it, if you did. Send me one line you want it and I'll put it in. Now I did redraw your schematics to show actual hardware wiring paths because that makes it a lot easier for the guys 'n gals who don't know much about this stuff to just do the job and t'heck with makes the sucker tick. It ain't many like you & me who want to know HOW it works. And those that do can always get a data sheet.*

## WINDOWS 95 COMING!

I am now free to tell you that I have been beta testing Microsoft's "Chicago" (now called Windows 95) operating system for the last several months. Wow! All you Windows™ haters and lovers just hang on to your hats because *something good is coming down to forever change the way we use our personal computers!* Space left here doesn't allow me to tell you much about Windows 95, but I can advise you to be on the lookout for a full entitlement *Pre-Release version* to come out on or about the New Year, priced at \$30. The Full Release version is expected to cost around \$100 and be available 30-60 days thereafter. Believe me, boys & girls, Windows 95 is all about our favorite subject: Radio!

You can do some mighty slick things with Windows 95 that are either not possible under MS-DOS or are difficult and not fun. Stay tuned!

## WANT TO SAVE SOME BUX?

No, of course not, @ but if you did, you'd want to scope out the **bright pink 'coupon'** enclosed with this and last month's WSR. There a whopper of a sale going on for the hot **CE-232 Scanner-Computer Interface** that's good until midnight, Christmas Eve (12/24/94). No, the CE-232 is not being closed out. We just made up a bunch of Kits & Assembled/Tested boards for the Christmas Rush. Doing things in volume like that saves \$\$\$ that can be passed on to you.



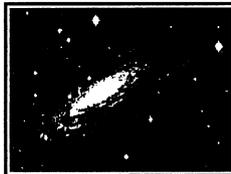
The CE-232 is a full 2-way controller and data acquisition system for the PRO-2004/5/6 scanner series, and a potent 1-way Keyboard Controller/AutoProgrammer for a variety of other scanners, including the new PRO-2035, PRO-2022, PRO-43, PRO-37, PRO-34, and probably quite a few more. Explicit and very detailed assembly & installation instructions are available for the above scanners and we'll be happy to work with you on the more popular scanners that are not listed. Inquire.....

Technical support is offered on the *Hertzian Intercept BBS* and we stick with you until success! Most people are successful the first time out; the rest do fine with our superb tech support on the first one or two contacts.

The CE-232 is an unparalleled labor reducer that adds immeasurable value to the arts and sciences of scanning. Potent 3rd party support from PerCon, (FCC Database on CD-ROM) and Intercept Technologies (VADER) combine with the CE-232 to make an immensely powerful, affordable communications center that can fit on your desktop. See the back issues of the WSR and sales brochures for details! Or call (619) 578 9247, 1:30pm-5:30pm

MERRY CHRISTMAS  
HAPPY NEW YEAR

11/25/94 ~ 9:15 PM - The "World Scanner Report" © 1991-94; Volume 4, No 10; Page 10



COMMTRONICS ENGINEERING'S  
"WORLD SCANNER REPORT"  
PO BOX 262478  
SAN DIEGO, CA 92196-2478

941101V4N10P10

TIME TO CHECK YOUR EXPIRE DATE!

LAST ISSUE OF 1994

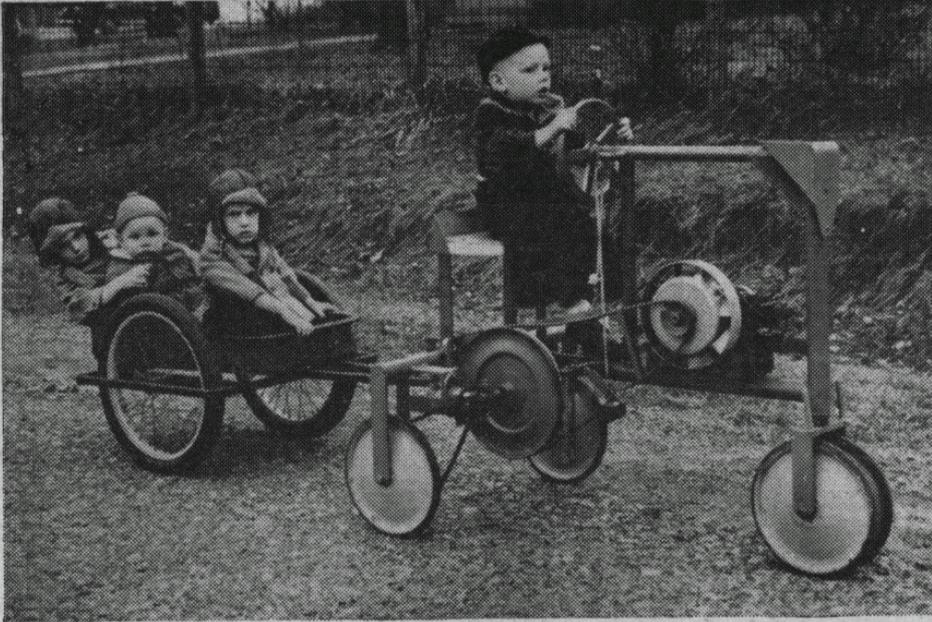
IN THIS ISSUE

ISSN-1061-9240

FIRST CLASS MAIL

+ Last Issue of 1994 - Renew Soon! ~ PRO-2035 Is Hot Stuff! ~ PRO-2035 Mods!  
+ PRO-2035/CE-232 Beta Testers Wanted ~ Add a Hold Function to RS Freq Counter  
+ Frequency Counters for Scammists? ~ StarTech Frequency COUNTERS  
+ PerCon Introduces a new FCC Database CD-ROM ~ Smart Computer Buying  
+ Macintosh Control Program for the CE-232 ~ Radio Shack Parts Ordering Tips  
+ Antenna Tips ~ Professor Peabody Wraps Up Loose Ends; corrects errors  
+ Windows 95 is Coming Soon - Get Ready  
+ CE-232 Interface on Sale 'til 12/24/94

## Bonus



### Pint-Size Tractor Has Gas Engine

Driving his own gasoline-engine tractor, three-year-old Gus Dobert of Nashville, Tenn., is the envy of youngsters of his neighborhood. Made by his father, a machinist, the small tractor has a two-cycle washing-machine engine. Power is transmitted by a V-belt and sprocket chain. The gear ratio insures lots of power but little speed. The clutch pedal tightens the belt on the pulleys.

From *Popular Mechanics*, November 1948.

If you did something like this today, you'd be arrested and probably have your kids taken away.

## **End of Issue #68**



**Any Questions?**

### **Editorial and Rants**

*When did lazy, selfish, useless, cross-dressing, brain-dead Canadians become an "ally?"*

### **Pentagon E-Mails Suggest Distrust Over Ally Canada**

December 3, 2009 – From: [apnews.myway.com](http://apnews.myway.com)

WASHINGTON (AP) – How much does the U.S. government really trust Canada? Maybe less than you think.

Espionage warnings from the Defense Department caused an international sensation a few years ago over reports of mysterious coins with radio frequency transmitters, until they were debunked. The culprit turned out to be a commemorative quarter in Canada.

But at the height of the mystery, senior Pentagon officials speculated whether Canadians were involved in the spy caper.

"I don't think it is an issue of the Canadians being the bad guys," the Pentagon's counterintelligence chief wrote in an exchange of e-mails obtained this week by The Associated Press, "but then again, who knows."

In the e-mails, released to the AP under the U.S. Freedom of Information Act with names blacked out but job titles disclosed, Pentagon officials question whether they should warn military officers in the U.S. Northern Command, who regularly met Canadian counterparts about classified subjects inside bug-proof, government meeting rooms. The rooms are known as secure compartmentalized information facilities, or SKIFs.

"Isn't the Canadian piece something that should be briefed to Northcom since the Canadians sit in their SKIFs?" asked the Pentagon's deputy director for counterintelligence oversight, in e-mails marked "Secret/NoForn."

"Good point," replied the Pentagon's acting director for counterintelligence. "It is possible that DSS (the U.S. Defense Security Service) sent their report to Northcom. Then again, I don't think it is an issue of the Canadians being the bad guys, but then again, who knows."

Who knows?

Canada is among the closest of U.S. allies, its continental northern neighbor and the leading oil supplier for the U.S. The intelligence services of the two countries are extraordinarily tight and routinely share sensitive secrets. President Barack Obama chose Canada as the destination of his first foreign trip, to underscore what he described as the two countries' long-standing and growing friendship.

In sensational warnings that circulated publicly in late 2006 and early 2007, the Pentagon's Defense Security Service said coins with radio transmitters were found planted on U.S. Army contractors with classified security clearances on at least three occasions between October 2005 and January 2006 as the contractors traveled through Canada.

In January 2007, the government abruptly reversed itself and said the warnings weren't true. But the case remained a mystery until months later, when AP learned that the flap had been caused by suspicions over the odd-looking Canadian "poppy" quarter with a bright red flower. The silver-colored 25-cent piece features the red image of a poppy – Canada's flower of war remembrance – inlaid on a maple leaf.

What suspicious contractors believed to be "nanotechnology" on the coins actually was a protective coating the Royal Canadian Mint applied to prevent the poppy's red color from rubbing off. The mint produced nearly 30 million such quarters in 2004 commemorating Canada's 117,000 war dead.

The Pentagon turned over the latest e-mails from inside its Office of the Undersecretary for Defense for Intelligence nearly two years after the AP requested them under the Freedom of Information Act. Many of the e-mails were censored over what the Pentagon said was national security and personal privacy.

One e-mail included a curious message on the same day the Defense Security Service publicly disavowed its warning about the spy coins. "I am guessing y'all know the status of the Canadian coin situation," it read. It called for an internal meeting "to chat about the next step to put Humpty together again" and suggested notifying the media – and the Canadians.



*Races in Laredo, Texas: Hispanic (94.1%); Other race (13.9%); White Non-Hispanic (5.0%); Two or more races (2.5%); American Indian (0.6%)*

## **Laredo Could be Largest U.S. City Without Bookstore**

December 16, 2009 – From: [finance.yahoo.com](http://finance.yahoo.com)

LAREDO, Texas (AP) --- The final chapter has been written for the lone bookstore on the streets of Laredo.

With a population of nearly a quarter-million people, this city could soon be the largest in the nation without a single bookseller.

The situation is so grim that schoolchildren have pleaded for a reprieve from next month's planned shutdown of the B. Dalton bookstore. After that, the nearest store will be 150 miles away in San Antonio.

The B. Dalton store was never a community destination with comfy couches and an espresso bar, but its closing will create a literary void in a city with a high illiteracy rate. Industry analysts and book associations could not name a larger American city without a single bookseller.

"Corporate America considers Laredo kind of the backwater," said the city's most prolific author, Jerry Thompson, a professor at Texas A&M University International who has written more than 20 books.

Since the closing was announced, book lovers in Laredo have flocked to the small store located between City Trendz ("Laredo's No. 1 Underground Hip Hop Shop") and a store that offers \$4 indoor go-kart rides to stock up on their favorite titles.

Schoolchildren even wrote letters to the parent company, Barnes & Noble, begging for the store to stay open.

"Without that store, my life would be so sad and boring," wrote a fifth-grader named Bryanna Salinas, who signed her name with a heart.

The Laredo store is among 49 remaining B. Daltons nationwide that Barnes & Noble will close by next year.

The company believes a bookstore is viable in Laredo and has identified a location for a large-format Barnes & Noble, but the space will not be available for at least 18 months, said David Deason, Barnes & Noble vice president of development.

In the meantime, without a single independent bookseller, Laredo may be in a league of its own among big cities.

Though an independent bookstore is the only one of its kind in Newark, N.J., a city of nearly 288,000, big chains are nearby in the suburbs or New York City. Laredo is surrounded by nothing more than rural ranching towns on its side of the border.

"We suffer, but we don't suffer to the extent that a Laredo would," said Wilma Grey, director of the Newark Public Library.

Some worry that the closing could send a message that books and reading are not priorities in Laredo, a hot, steamy city of 230,000 that is choked by smog from trucks lining up at the border, which is home to the nation's biggest entry point for trucks and trains.

**Nearly half of the population of Webb County, which includes Laredo, lacks basic literacy skills, according to the National Center for Education Statistics.**

**Fewer than 1 in 5 city residents has a college degree. And about 30 percent of the city lives below the poverty level, according to the 2000 census.**

Laredo residents can still purchase books online, but civic leaders fear that without a bookstore, many residents will not have the opportunity to buy books.

Many also feel that the stigma of not having a bookstore hurts Laredo's reputation.

Outsiders, even other Texans, do not always distinguish between "los dos Laredos," the relatively peaceful city in Texas, and Nuevo Laredo, across the border in Mexico, which has been wracked by drug-war violence.

But some bookstore supporters are undaunted.

Maria Soliz, Laredo Public Library director, is leading the charge to get a bookstore back. The city's library system was already planning to open two more branches over the next two years to meet demand. That's in addition to the two-story main library painted in bold, Mexican-inspired colors that serves about 400,000 visitors annually.

"It's not reflective of the city that they're closing," Soliz said. "I know this city can support a bookstore."

Deason said the Laredo store is profitable, but its profits are not significant when factoring in the expenses of running a chain that's being phased out.

Some people also question the city's priorities. As Elaine Perry walked out of the bookstore earlier this month with a heavy bag of hardcovers, she criticized a recent proposal to build an indoor snow park.

"A snowboarding park in Laredo," Perry said. "Have you ever heard of anything so stupid?"

Bookstore customers tend to be well educated and to have disposable income, said Michael Norris, an analyst with Simba Information. But that demographic is hardly what makes or breaks the business, he said.

A bookstore is "either the cultural center in its community, or it's a pile of books with a roof over it," Norris said.

The B. Dalton in Laredo certainly skews toward the latter. It has narrow aisles, no coffee for sale and not a single chair to sit and read.

City Trendz employee Seve Perez said much of the traffic at Mall del Norte comes from Mexico, both from Nuevo Laredo and deal-seeking shoppers bused in from the country's interior.

Standing behind a rack of sale T-shirts that read "Save Texas Rap," the 66-year-old said his bookish daughters will be crushed when the bookstore leaves.

Next door, Laredo resident Misti Saenz walked out of B. Dalton with a sack of nine romance novels for her teenage daughter. She was stocking up before the store closes Jan. 16.

"It's going to be a total bummer," Saenz said. "It made me wish I had shopped there more."

---

*How's that Chicago-style Obama/Ayers/Democrat "leadership" working out?*

*Funny you didn't hear much about this, huh? LOL! Change!*

## **9 Slain In Bloody Holiday Weekend**

November 30, 2009 – From: [cbs2chicago.com](http://cbs2chicago.com)

It was a violent and deadly holiday weekend in the Chicago area, with nine people reported slain between Wednesday and Sunday nights. The violence began around 5 p.m. Thanksgiving eve, when Shannon Moore, 18, was found lying on the ground with gunshot wounds in the hallway of a building at 537 E. 44th St. A witness who saw Moore involved in an argument went to call police, and as he was going to make the call he heard multiple gunshots, Perez said.

Moore was taken to Northwestern Memorial Hospital, where he died at 4:45 p.m. Saturday, according to the Cook County Medical Examiner's office. In the early morning hours of Thanksgiving Day, a shooting at an Englewood gas station left one man dead.

Ricky Coleman, 21, was shot at the gas station at 810 W. 59th St., and was pronounced dead at 1:35 a.m. at Saint Bernard Hospital and Health Care Center, according to the Cook County Medical Examiner's office. The man was in the street when an unidentified gunman approached on foot and fired several shots at him about 12:30 a.m., police News Affairs Officer Hector Alfaro said.

On Friday, two separate incidents of murder-suicide were reported, including a newlywed couple on the city's West Side and a Markham man who shot himself after shooting his ex-girlfriend and another man in south suburban Sauk Village.

At about 9:10 p.m., Sauk Village police responded to a call at 22454 Jeffrey Avenue on Friday night and found a woman who had been shot. In a nearby driveway, police also found 43-year-old Robert Allen of Carthage, Miss., fatally shot.

The suspect, Paul Gunn, was later stopped by police in the area of 162nd and Dixie Highway in Markham. Gunn, who was armed, turned the weapon on himself and died of a gunshot wound to the chest. He was taken to Ingalls Memorial Hospital in Harvey, where he was pronounced dead at 10:44 p.m., according to the medical examiner's office. The woman who was shot was reportedly Gunn's girlfriend or ex-girlfriend, according to a source.

Earlier that day, a woman was found murdered in an East Garfield Park neighborhood apartment, possibly shot to death by her husband—who then took his own life.

Claudette Coleman, 30, was found fatally shot in her home at 3429 W. Madison St. Police responded to the apartment building where she lived just before 2 a.m. — three hours after Coleman's husband was found with an apparent self-inflicted gunshot wound on the street at 3311 W. Monroe St., police said.

Antwone Coleman, 28, also of the Madison Street address, reportedly shot himself and was taken to Mount Sinai Hospital where he was pronounced dead at 12:20 a.m., according to the medical examiner's office.

At least two others lost their lives to gunshots in the Chicago area on Friday, both on the West Side.

During an armed robbery on the West Side, Anthony Bryant, 40, was fatally shot at about 11 a.m. Friday, News Affairs Sgt. Antoinette Ursitti said.

Bryant was at a home in at 2741 W. Wilcox St., according to the Cook County Medical Examiner's office. A second man, in his 30s, was with the victim, although he was not harmed, Ursitti said. News Affairs Officer Ron Gaines said the robber got away with a cell phone and cash.

Nearby, an Austin man was also fatally shot in his home on the West Side.

Robert Barber, 36, was shot at 435 S. Central Ave. and taken to Mount Sinai Hospital where he was pronounced dead at 4:07 p.m., according to the Cook County Medical Examiner's Office. He had a gunshot wound to his chest, authorities said.

The violence on the West Side continued on Saturday. On Saturday, 29-year-old Roy Williams died after being shot multiple times by two men in the North Lawndale neighborhood. The shooting occurred shortly after midnight on the 1300 block of South Central Park Avenue, Perez said.

After he was initially shot while sitting in his car, he tried to drive away from his assailants but he crashed into a parked car and was shot again, before collapsing in the street and dying about 40 minutes after he was found by emergency personnel, Perez said. In the same night, at about 2:30 a.m., police found a Dolton man fatally shot in the South Side's Auburn-Gresham neighborhood. Corday Keys, 29, of Dolton, was fatally shot at 1858 W. 80th St., according to the Cook County Medical Examiner's office. He was dead on the scene.

Police responded to a call of shots fired at the 80th Street address at 2:30 a.m. and found Keys in the street with multiple gunshot wounds to the head, back and arms, Perez said. He also said Keys is believed to have had gang affiliations.

In south suburban Summit, a man also died early Sunday after he was fatally shot less than one mile from his home.

Treondes Spriggs, 28, of 7651 W. 62nd St., was shot at 7543 W. 61st Pl., a spokesman for the Cook County Medical Examiner's office said. Spriggs was taken to Loyola University Medical Center in Maywood where he was pronounced dead at 5:05 a.m., the spokesman said.



So the latest thing which has all the brain-dead liberal's panties-in-a-twist is Glenn Beck's support for those companies which buy and sell gold.

The stupid fucks at places like the Huffington Post, Slashdot, Fark, Digg, and The Daily Show (I know, I know) actually *think* Glenn Beck possesses the power to manipulate the gold market!

Just one little problem, the price of gold has been going up *long* before Glenn Beck started his little television show.

The high price of gold has more to do with the dirty Jews at the Federal Reserve "finding" dollars left-and-right, which lowers their overall value, than a hour-long program on the FOX News Channel.



From: [corner.nationalreview.com](http://corner.nationalreview.com)

"In a meeting with the press in China, President Obama said that Khalid Sheikh Mohammed would be 'convicted' and had 'the death penalty applied to him' ... and then said he wasn't 'pre-judging' the case. He made the second statement after it was pointed out to him – by NBC's Chuck Todd – that the first statement would be taken as the president's interfering in the trial process. Obama said that wasn't his intention. I'm sure it wasn't – he's trying to contain the political damage caused by his decision – but that won't matter. He has given the defense its first motion that the executive branch, indeed the president himself, is tainting the jury pool. Nice work."

**And this dumb nigger used to be a lawyer...**





