

# GBPPR 'Zine



Issue #23 / The Monthly Journal of the American Hacker / February 2006

*"Bin Laden found other things to like about Sudan, including the slave trade. He began purchasing small children to pick marijuana on his farms in the Nile River valley just north of Khartoum. He also put the slave children to work on his large sunflower plantation. The price for such slaves was most reasonable. He could purchase a healthy young boy or girl of eight or nine who had been snatched from Uganda for one AK-47."*

---- Excerpt from *Al Qaeda – Brotherhood of Terror* by Paul L. Williams.

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# Drop & Block Wiring at Aerial Cable Terminals

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AT&TCo Standard

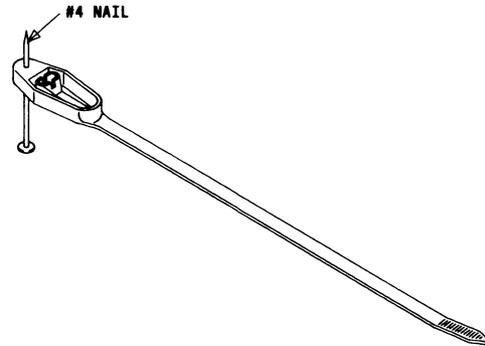
SECTION 462-260-201  
Issue 3, December 1983

## DROP AND BLOCK WIRING AT AERIAL CABLE TERMINALS

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vision arrows are used to emphasize significant changes.

**1.03** ¶The B drive tie (Fig. 1) is intended for holding cable or wire to wood surfaces. The B drive tie is a 1-piece black-plastic tie with a number four galvanized flathead nail protruding through a tab at one end. Installation is by driving the nail into a wood surface or a plastic anchor. The B drive tie will hold wire or cable up to 1-1/8 inches in diameter. ¶



**Fig. 1—¶B Drive Tie¶**

**1. GENERAL**

**1.01** This section covers drop and block wire runs at aerial cable terminals. Its purpose is to provide a guide for the neat and orderly placement of wire rings for the support of drop and block wire.

**1.02** This section is reissued to introduce the use of B drive ties (AT-9012) for attaching cable or wire to wood surfaces. The B drive tie is intended as a supplement to existing fasteners. Figures have been changed to illustrate the use of B drive ties. Re-

**1.04** When local requirements indicate the necessity for using guard arms, refer to Section 462-300-200.

**1.05** Information covering the various cable terminals referred to in this practice may be found in the following sections as needed:

| SECTION     | TITLE  |
|-------------|--|
| 462-030-100 | Drop, Block, and Cross-Connect Wiring—Insulated Wire |

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# Drop & Block Wiring at Aerial Cable Terminals

**SECTION 462-260-201**

- 462-300-200 Drop and Block Wiring Pole, Strand, and Tree Attachments Climbing Space
- 462-400-211 Drop and Block Wiring, Pole-to-Building and Pole-to-Pole Runs
- 620-216-013 Clearances on Jointly Used Poles.

**1.06** At each visit to the terminal location, perform the following:

- Fingertighten the nuts on all unused binding posts to keep all contact areas as clean as possible.
- Brush the faceplate with a water tool brush to remove any dirt that may have accumulated.

***DANGER: When cutting the ends of wire terminated on binding posts, wear eye protection and place the free hand over the binding post before cutting the wires.***

- Trim frayed ends of wires which might cause leakage to adjacent wires or binding posts.

**1.07** No more than two conductors shall be bridged on each binding post. Where additional bridging is necessary, wire terminals should be used.

**2. SAFETY**

**2.01** Safety, quality, and quantity (in that order) are three very important factors to consider in the performance of any telephone job.

**2.02** All employees engaged in working on poles should be familiar with the following practices:

| SECTION     | TITLE   |
|-------------|---|
| 081-705-102 | 188A Test Set (Stop Lite) — Description and Use   |
| 620-105-010 | B Voltage Tester Use on Joint-Use Poles and Other Equipment                                       |
| 620-131-010 | Precautions To Be Taken Before Climbing Poles or Working From Strand- or Pole-Supported Equipment |
| 629-720-200 | Buried Service Wire Terminations.   |

# Drop & Block Wiring at Aerial Cable Terminals

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## 3. STRAND-MOUNTED TERMINALS

**3.01** Run drop wires to the terminal from the adjacent pole (Fig. 2), except where they distribute from a cable extension arm or from a span clamp. A drop wire from a span clamp should be run directly from the span clamp to the terminal when the span clamp is adjacent to the terminal.

**3.02** Route the drop or block wires through the three hangers below the terminal, around the hanger at the far end, and below the terminal to the proper wire entrance holes of the assigned binding posts.

**3.03** Cut wire to the proper length for terminating.

**3.04** Remove the required amount of insulation from the wire to terminate on the binding post.

**3.05** Using long-nose pliers or other suitable tool, break through the wire entrance hole adjacent to or below the proper pair of binding posts.

**3.06** Insert the wire through the wire entrance hole and terminate it on the binding post so the end of the insulation is about 1/8 inch from the washers.

## 49-TYPE TERMINAL

**3.07** Refer to Fig. 2, 3, and 4 for typical arrangements of drop wires terminated in 49-type terminals on aerial cable. **Limit the number of drop wires in ready access 49-type terminals to eight (8).**

**3.08** When placing new connections, the wire should be run through all the hangers below the terminal to provide enough slack to enable any wire to reach any pair of binding posts in the event of changes in cable pair assignments. **Warning: Wire should be loosely placed to avoid sharp bends at the B drive ties which may cause damage to the wire insulation.**

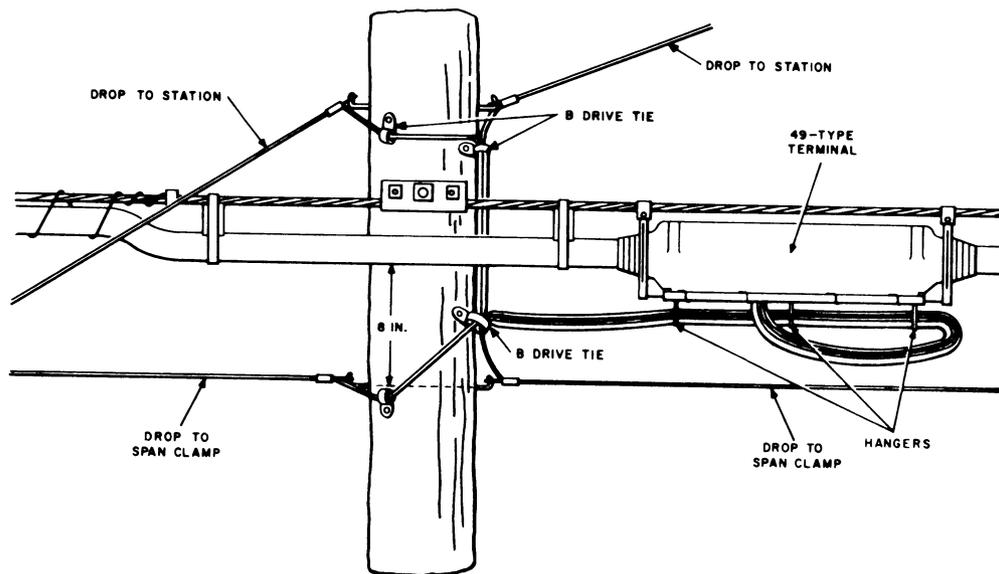


Fig. 2—Running Drop Wire to 49-Type Terminal at Pole

# Drop & Block Wiring at Aerial Cable Terminals

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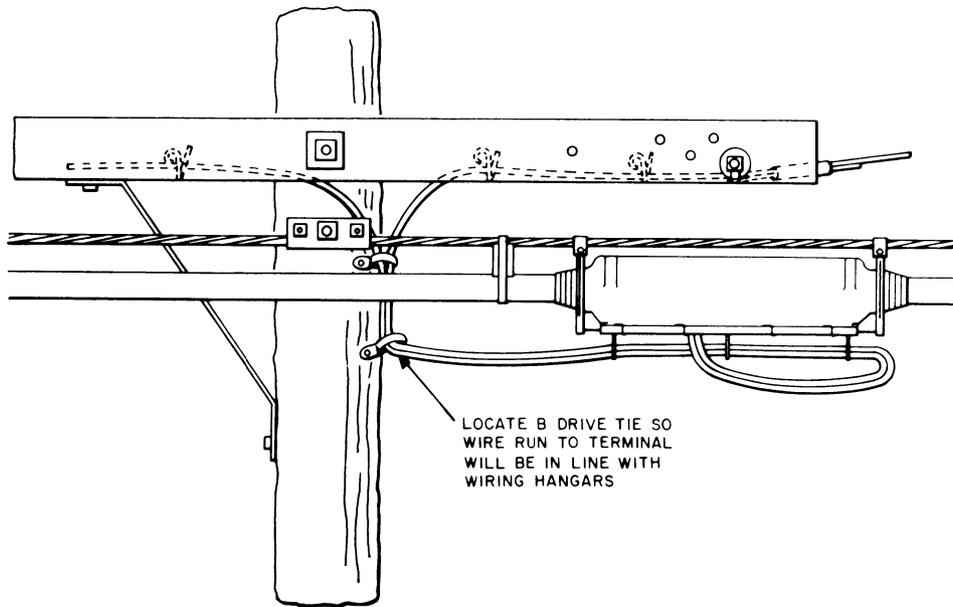


Fig. 3 —Running Drop Wires to 49-Type Terminal From Guard Arm

# Drop & Block Wiring at Aerial Cable Terminals

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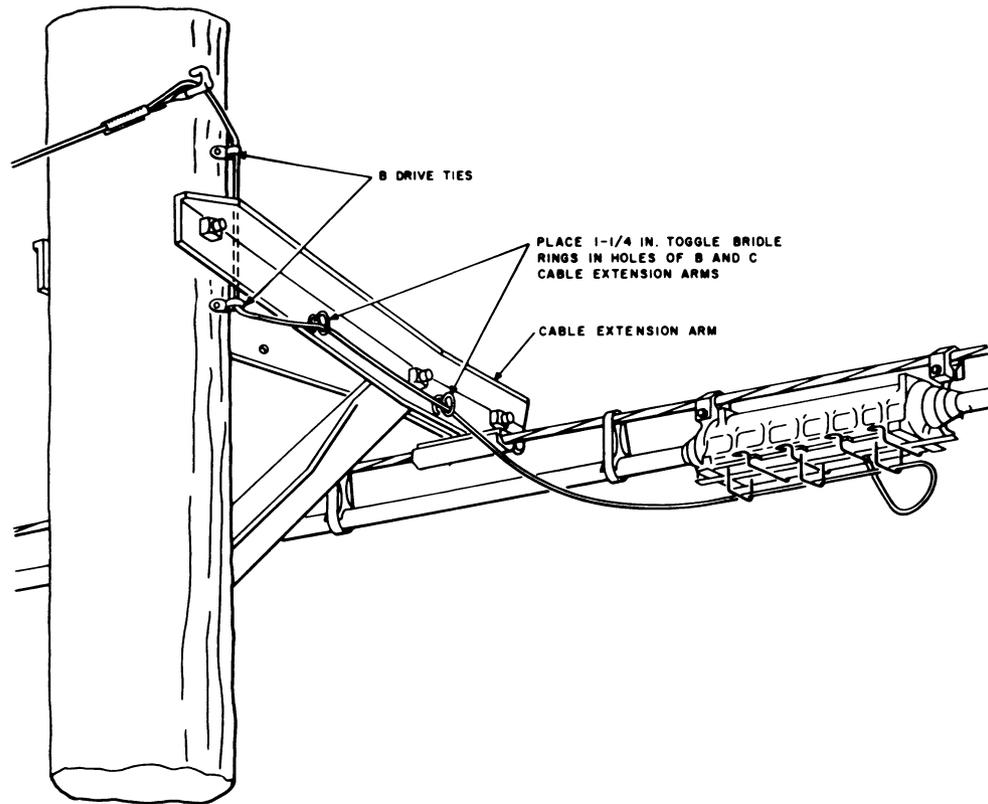


Fig. 4 — Running Drop Wires to 49-Type Terminal From Cable Extension Arm

# Drop & Block Wiring at Aerial Cable Terminals

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### 61-TYPE TERMINALS

3.09 Refer to Fig. 5 for a typical arrangement of drop wires at a 61-type terminal.

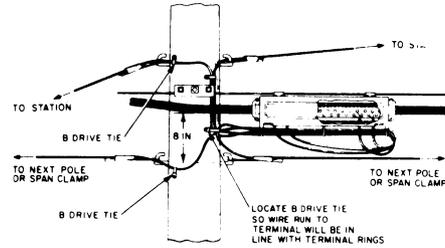


Fig. 5 —Running Drop Wires to 61-Type Terminal

### 104- OR 105-TYPE TERMINALS

3.10 Refer to Fig. 6, 7, and 8 for typical arrangements of drop wires at 104- or 105-type cable terminals on aerial cable.

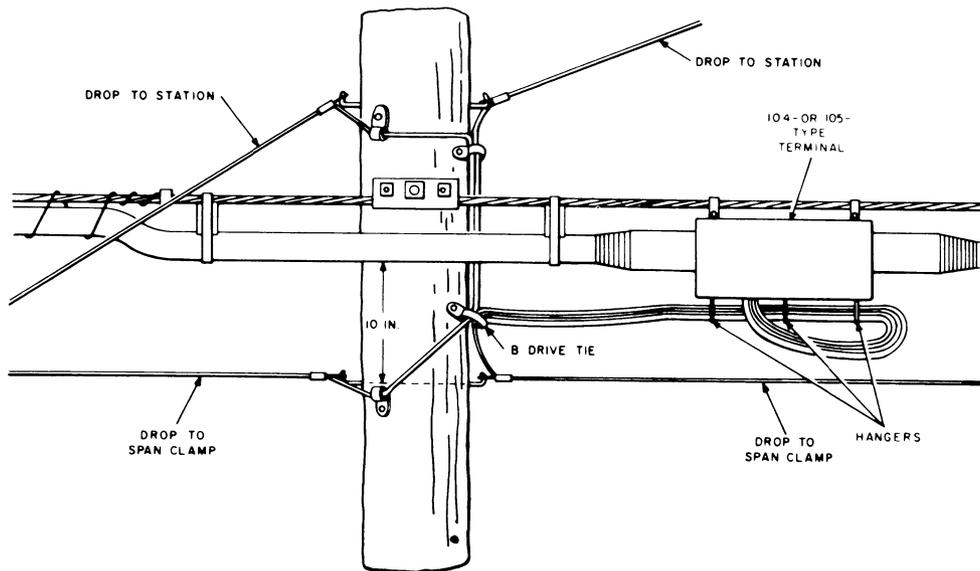


Fig. 6—Running Drop Wires to 104- or 105-Type Terminal at Pole

# Drop & Block Wiring at Aerial Cable Terminals

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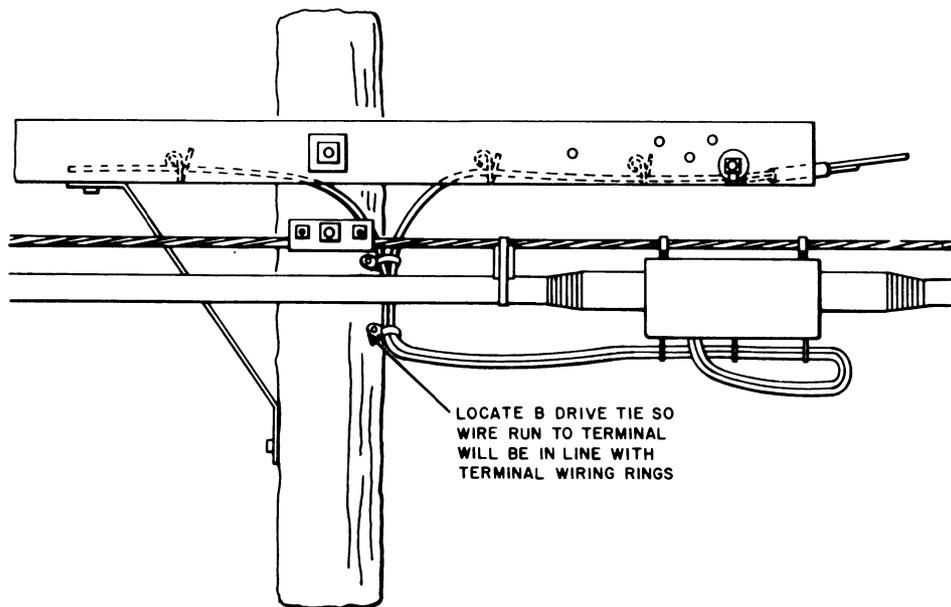


Fig. 7—Running Drop Wires to 104- or 105-Type Terminal From Guard Arm

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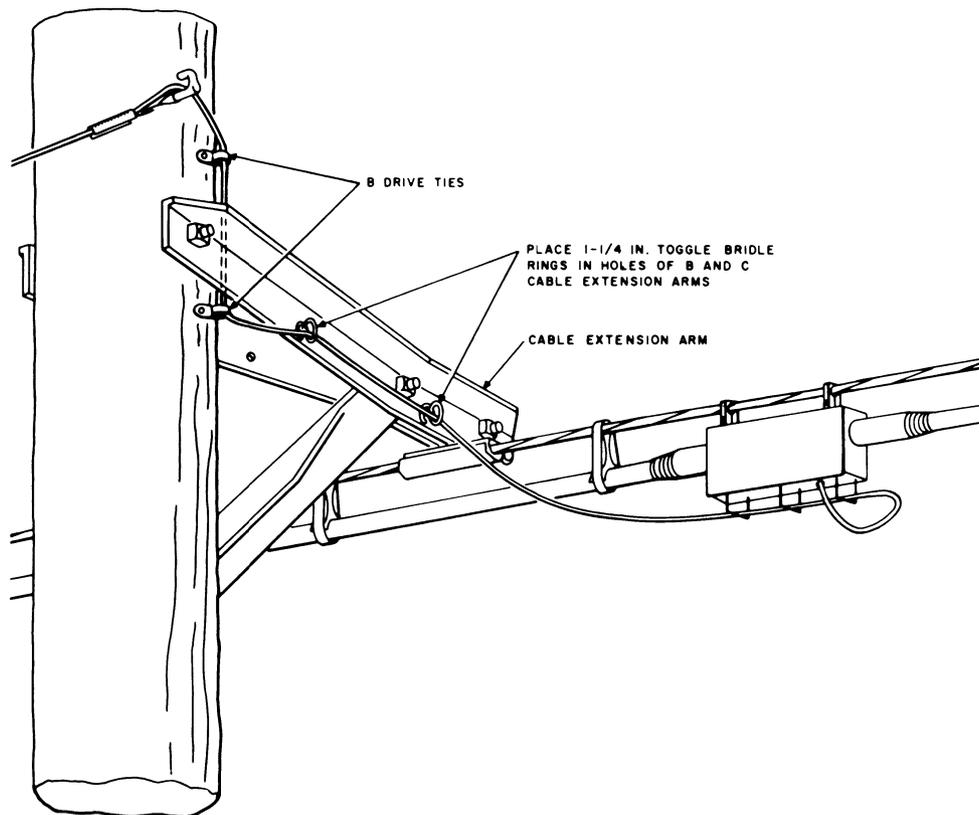


Fig. 8 —Running Drop Wire to 104- or 105-Type Cable Terminal From Cable Extension Arm

# Drop & Block Wiring at Aerial Cable Terminals

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## N-TYPE TERMINAL

3.11 Refer to Fig. 9, 10, and 11 for typical arrangements of drop wires at N-type terminals. Note that the arrangements of wires are similar at all strand-mounted cable terminals.

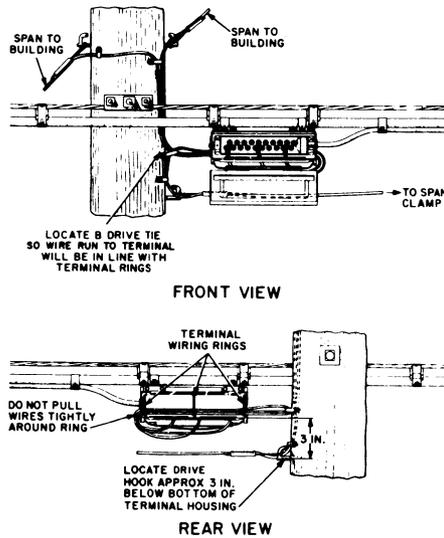


Fig. 9 — Running Drop Wire to N-Type Cable Terminal From Pole

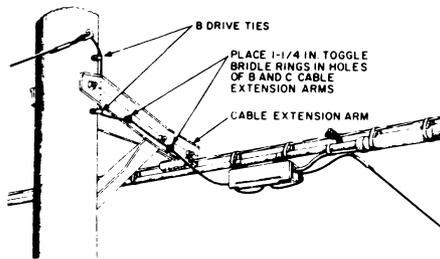


Fig. 10 — Running Drop Wire to N-Type Cable Terminal From Cable Extension Arm

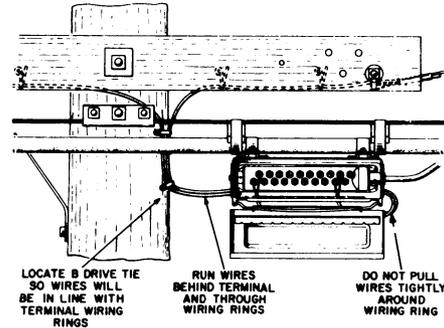


Fig. 11 — Running Drop Wire to N-Type Cable Terminal From Guard Arm

## 4. POLE-MOUNTED TERMINALS

4.01 All vertical drop and block wire runs on poles should be secured by  $\Phi$ B drive ties. The  $\Phi$ B drive ties should be spaced in a straight line, approximately 24 inches apart. This line of  $\Phi$ B drive ties should be about 45 degrees around the pole from the face or side of the pole on which the terminal is mounted.

4.02 Wires should be routed through the  $\Phi$ drive tie and then to the terminal entrance hole.

4.03 Cut the wire to the proper length for terminating.

4.04 Remove the required amount of insulation from the wire to terminate on the binding post.

4.05 Insert the wire through the wire entrance hole and terminate it on the binding posts so the end of the insulation is about 1/8-inch from the washers on the binding post.

# Drop & Block Wiring at Aerial Cable Terminals

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### N-TYPE TERMINALS

4.06 Refer to Fig. 12 and 13 for typical arrangements of drop wires at N-type terminals which are mounted on poles.

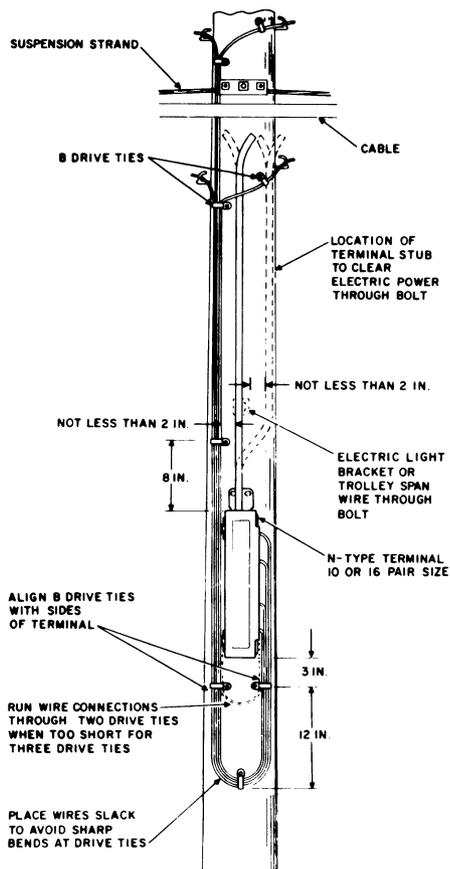


Fig. 12—Running Drop Wire to 10 or 16 Pair N-Type Cable Terminal Mounted on Pole

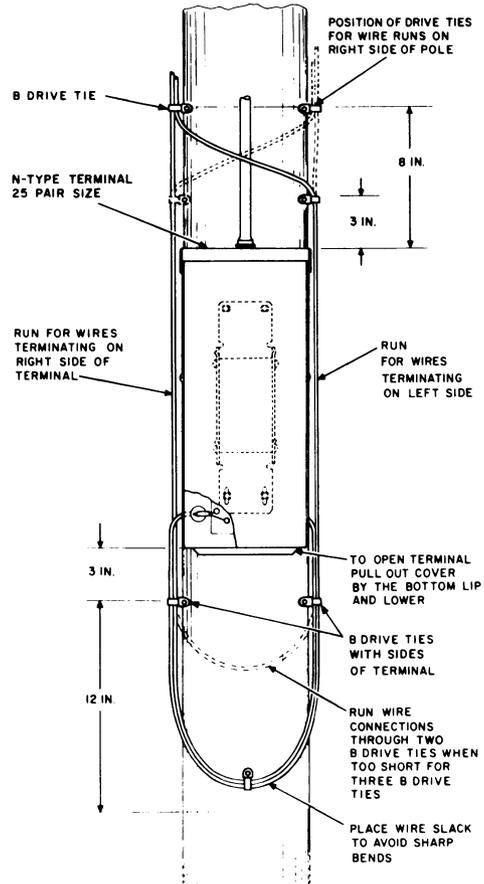


Fig. 13—Running Drop Wire to 25 Pair N-Type Cable Terminal Mounted on Pole

# Drop & Block Wiring at Aerial Cable Terminals

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## POLE-MOUNTED CROSS-CONNECTING TERMINALS

4.07 Install drop wire in accordance with the following procedure:

- (1) Place  $\text{B}$  drive ties on the pole as shown in Fig. 14

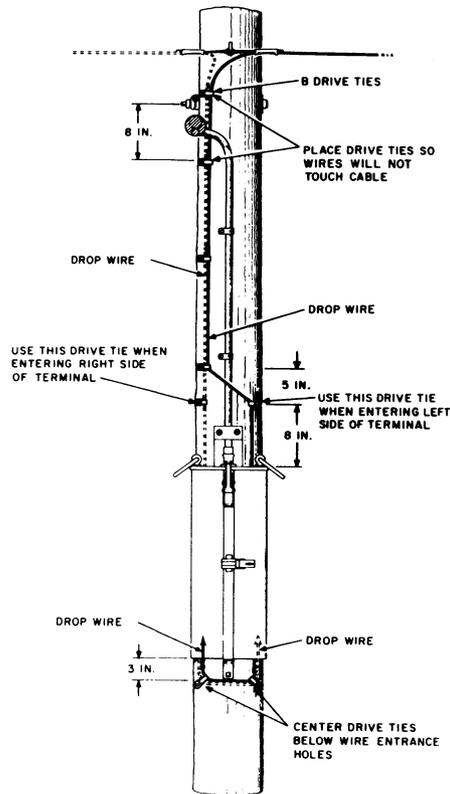


Fig. 14—Running Drop Wire at Cross-Connecting Terminal

- (2) Where a drop wire is to be terminated on the right side of the terminal chamber, run the wire down the right side of the pole behind the terminal, through the two  $\text{B}$  drive ties below the terminal, and into the wire entrance holes on the bottom left of the terminal box. Where the drop wire is to be terminated on the left side of the terminal chamber, run the wire down the left side of the pole behind the terminal, through the two  $\text{B}$  drive ties below the terminal, and into the wire entrance holes on the bottom right of the terminal box.

- (3) Install cross-connecting wire between the feeder pair binding posts and a vacant drop wire binding post. Then terminate the drop wire as shown in Fig. 15 and 16.

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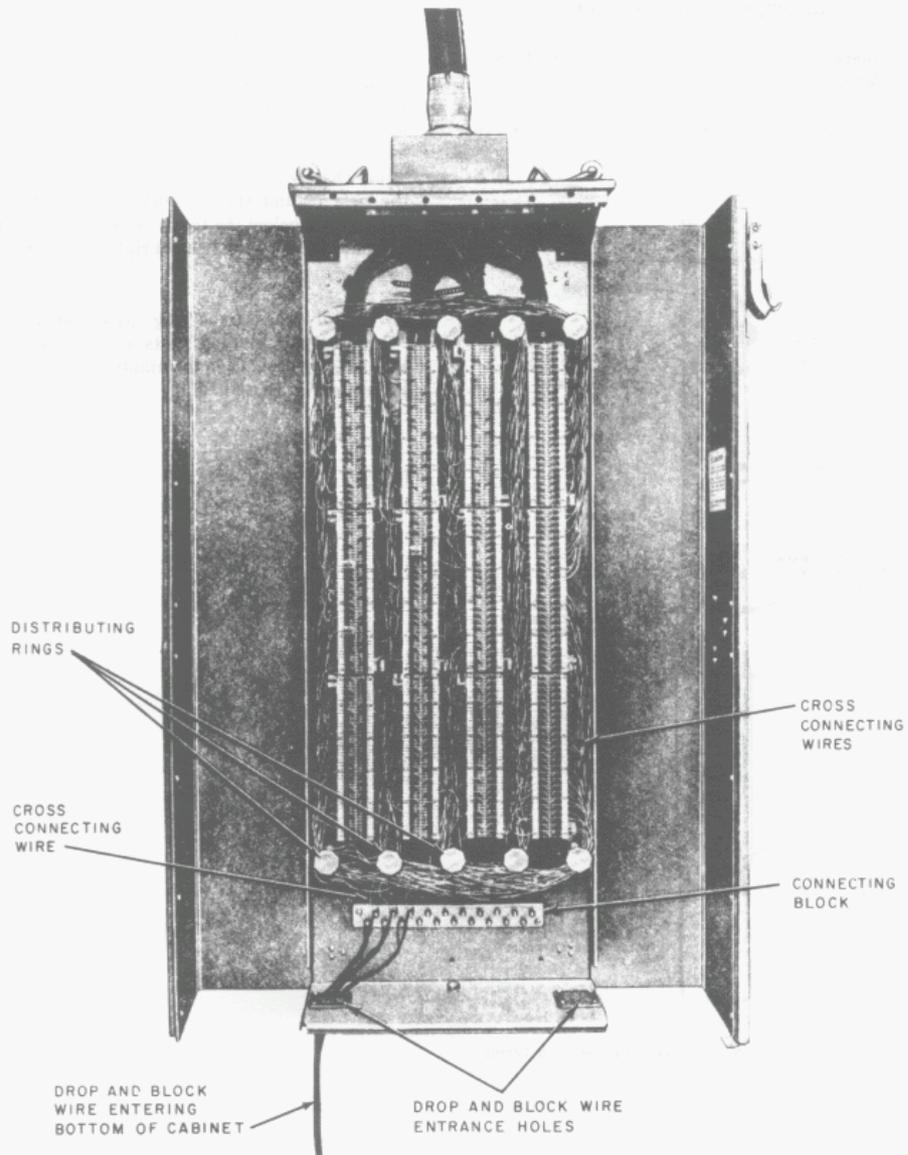


Fig. 15—Terminating Drop Wire—101-Type Cable Terminal

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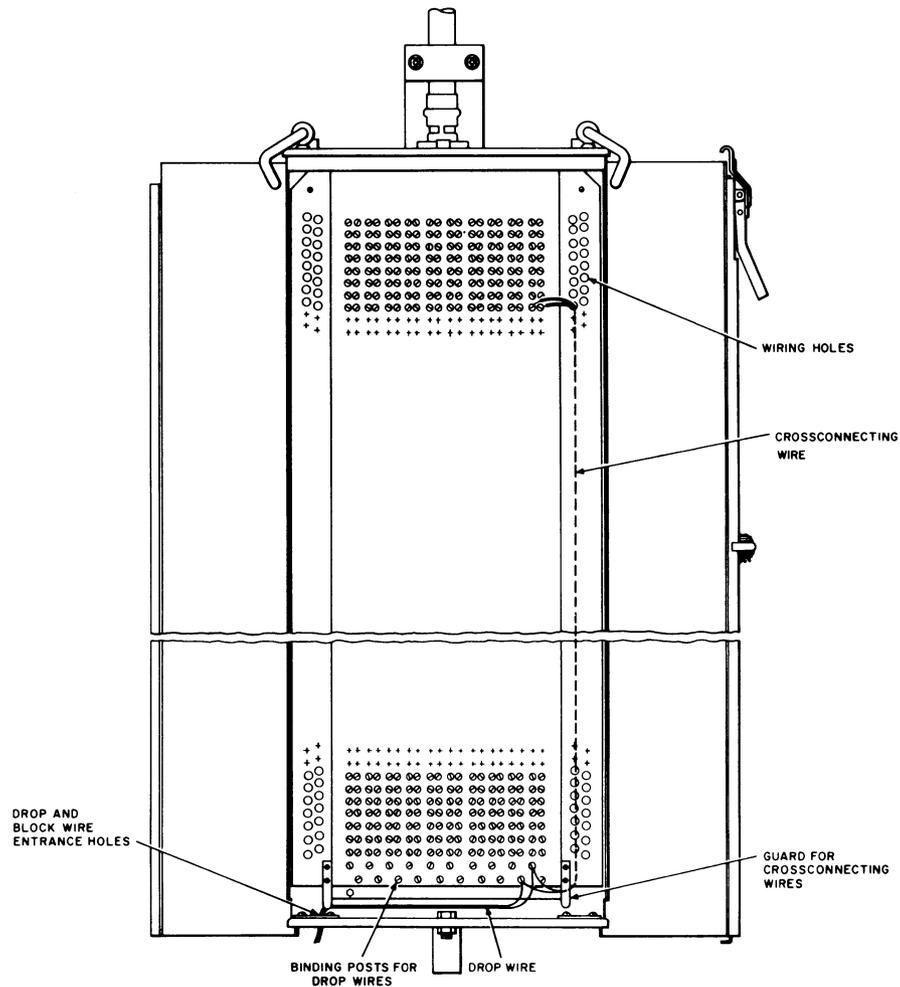


Fig. 16—Terminating Drop Wire—B-Type Cable Terminals

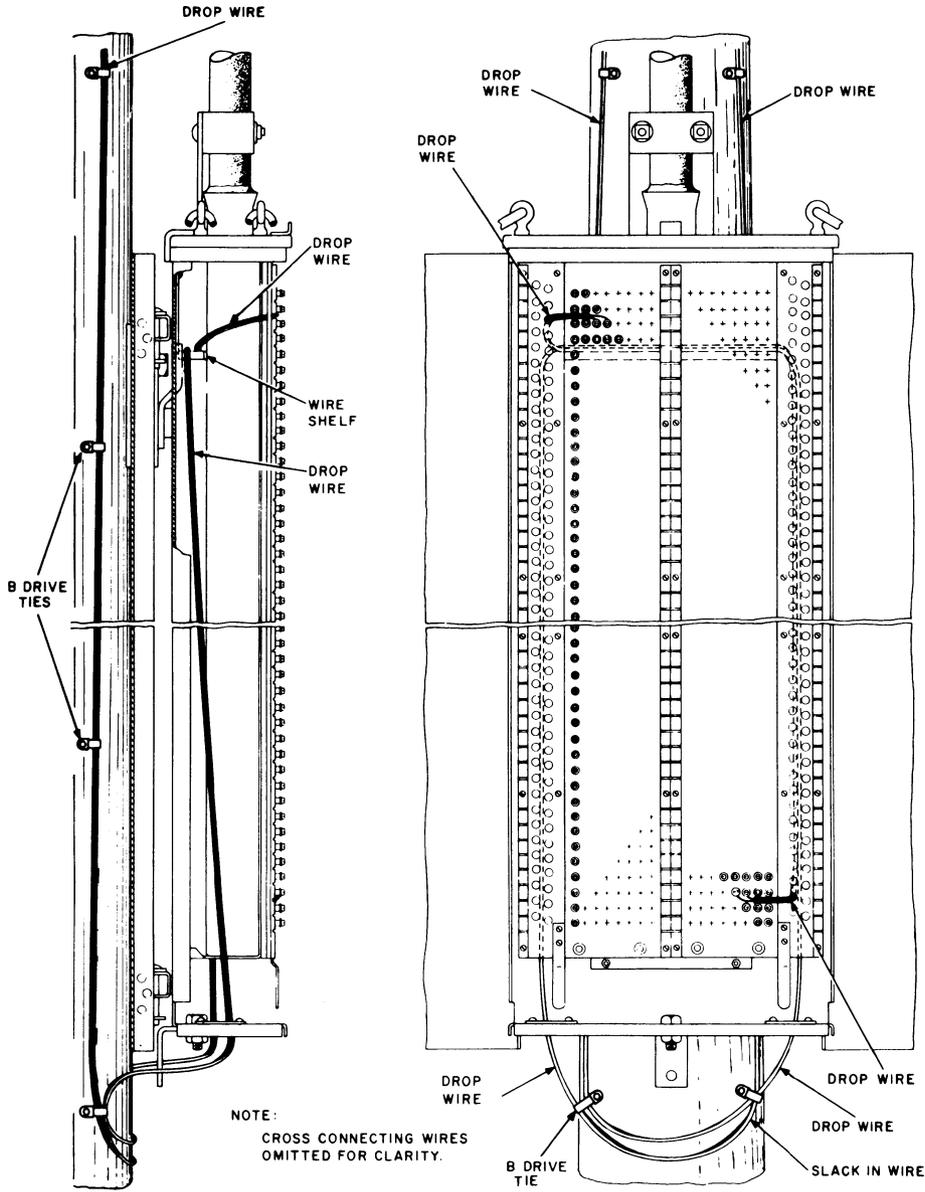
**4.08** Binding posts for terminating drop wire are not provided on the superseded BD and BE terminals. Drop wires are installed in these terminals as follows:

- (1) Proceed as in paragraph 4.07 (1) and (2).
- (2) Run the drop wire upward in the wiring channel behind the faceplate extension on the side

of the chamber opposite the binding posts on which it is to be terminated, then over the top wiring shelf or the two rings located at the top of the housing, and downward to the proper wiring hole. The routing of wires entering the terminal on the left and right sides is illustrated in Fig. 17. Terminate drop wire between washers on the binding posts of the feeder pair unless two wires are already terminated on these posts. Where one of

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**Fig. 17—Terminating Drop Wire—Superseded BD and BE Cable Terminals**

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these two wires is a cross-connecting wire, terminate the second drop wire on the distribution cable pair, but not more than two wires should be bridged on the binding posts of the distribution cable pair. Where more than two wires are to be bridged to the same cable pair, install a 101-type wire terminal on the pole outside the terminal, and bridge the new drop and one of the existing drops in the wire terminal.

(3) Insert the wire into the proper wiring hole, cut the wire to the proper length, and terminate on the binding post with the tracer conductor to the right. Place the wire under the lower washer unless the space is occupied by an existing wire; in which case, place the second wire between washers.

**4.09** When slack is required in connection with transferring a drop to another cable pair or reinstalling a wire, reroute the drop around the bottom of the chamber in a terminal equipped with wiring shelf or remove wire from the M rings at the top of the terminal. Where still more slack is needed, splice wire inside the terminal and run the spliced wire over the top as in the case of a new connection.

**4.10** Install cross-connecting wires in accordance with the following procedures:

(1) Insert one end of the wire through the proper wiring hole for the binding posts of distribution cable pair. For binding posts to the right of the wiring holes, select a hole immediately above the line of binding posts; for those to the left of the wiring holes, select a hole immediately below the line of binding posts. Select the inner of the two wiring holes of the 300-, 400-, and 600-pair terminals for wires to be terminated on the nearest two pairs of binding posts, and the outer hole for connections to the farthest binding posts.

(2) Terminate the cross-connecting wire under the lower washers on the binding posts of a distribution cable pair. Connect the tracer conductor to the right-hand post.

(3) When cross-connection is to be made on the same side of the chamber, run the wire in the wiring channel behind the faceplate extension and

through the proper wiring hole for the binding posts of the cable pair.

(4) When cross-connection is to be made between opposite sides of the chamber, proceed as follows:

(a) In 100-, 200-, 300-, and 400-pair terminals equipped with wiring shelves, route cross-connecting wire terminating on the top third of the feeder cable pairs over the wiring shelf as illustrated by cross-connecting wires in Fig. 18. Run cross-connecting wire to the remaining feeder cable pairs around the bottom of the chamber behind the wire guards. In the case of the 600-pair terminal, route cross-connecting wires over any of the three wiring shelves in the back of the chamber or around the bottom of the chamber, whichever provides the shortest routing.

(b) In terminals not equipped with wiring shelves, route cross-connecting wire around the bottom of the chamber. Do not run cross-connecting wires through the M bridle rings provided at the top of the terminal housing. These rings are intended for drop wire connections.

(5) Allow about 2 inches of slack in each cross-connecting wire. Where, on a subsequent line change, a wire is found to be too short, run a new connection rather than splicing out the short one.

(6) Where it is necessary to assign two distribution cable pairs to form a party line, cross-connect both distribution cable pairs to the feeder cable pair. Terminate one cross-connecting wire under the lower washer and the other wire between washers on binding posts of the feeder pairs. When more than two distribution cable pairs are required for bridging, cross-connect the first two distribution cable pairs to the feeder cable pair as previously outlined. The additional bridges are connected one to each of the associated distribution cable pairs. Terminate one wire under the lower washer and the other wire between washers on the binding posts of the distribution pair.

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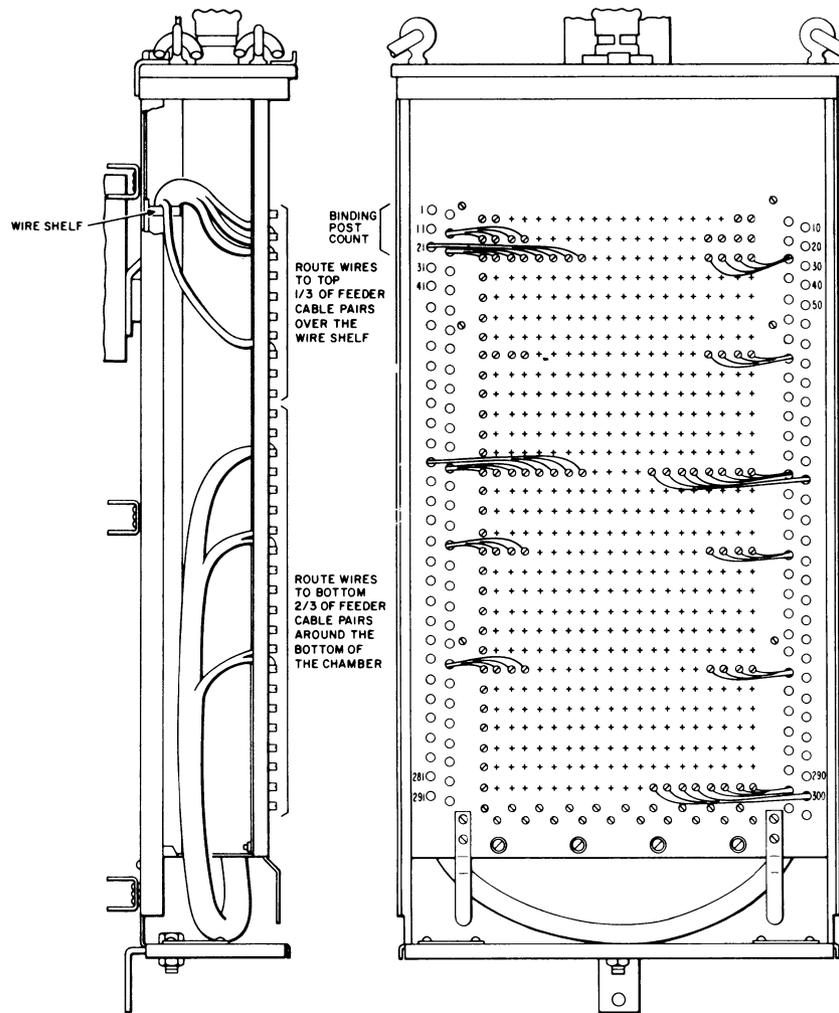


Fig. 18—Running Cross-Connecting Wire

# Drop & Block Wiring at Aerial Cable Terminals

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## 5. WALL-MOUNTED TERMINALS

5.01 The wiring arrangements at wall-mounted terminals is very much like the arrangements at strand- and pole-mounted terminals, and should always be done in a neat and orderly fashion. Refer to Fig. 19 through 26 for arranging drop and block wires at wall-mounted terminals.

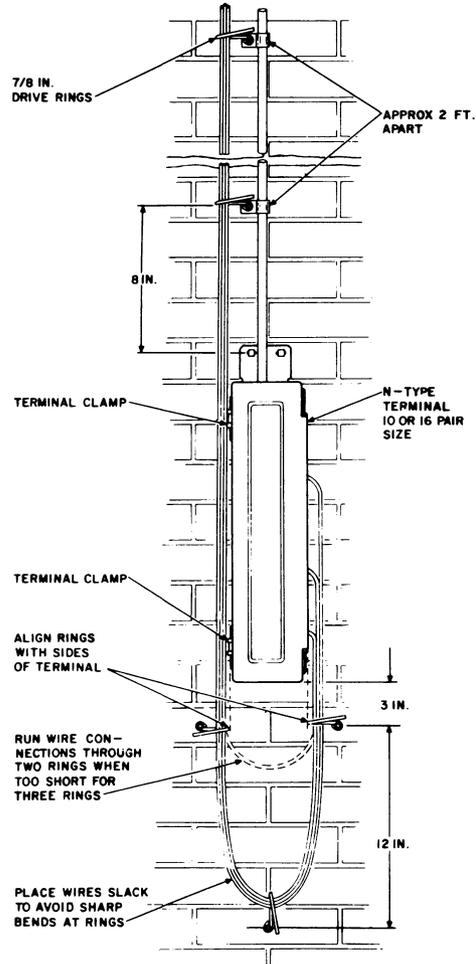


Fig. 19—Wall-Mounted 10- or 16-Pair Cable Terminal With Stub at Top

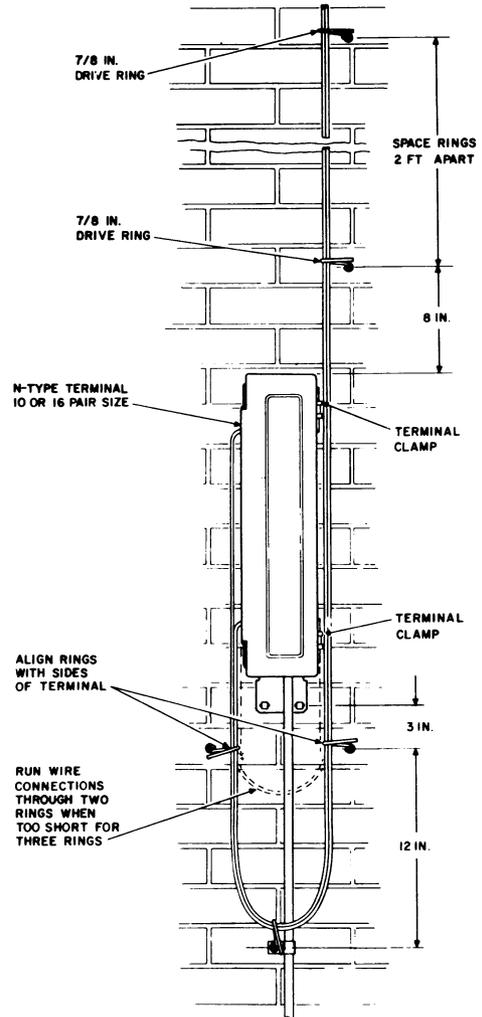


Fig. 20—Wall-Mounted 10- or 16-Pair Cable Terminal With Stub at Bottom

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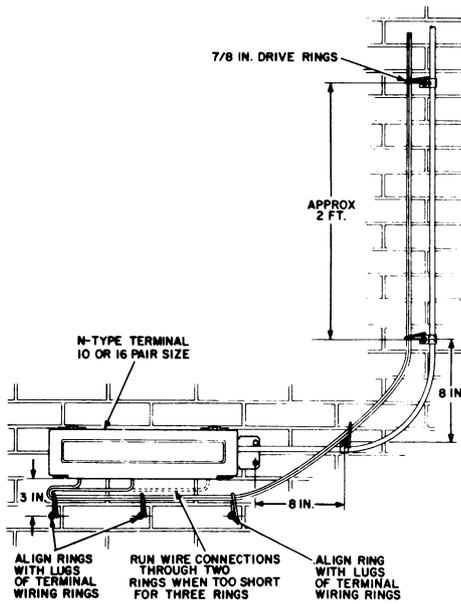


Fig. 21—Horizontal-Mounted Cable Terminal With Stub Turned Up

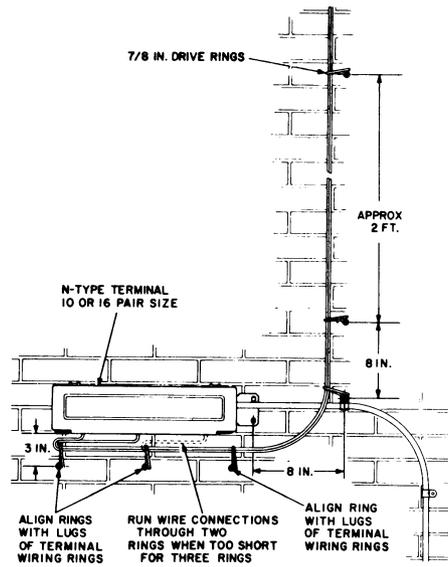


Fig. 22—Horizontal-Mounted Cable Terminal With Stub Turned Down

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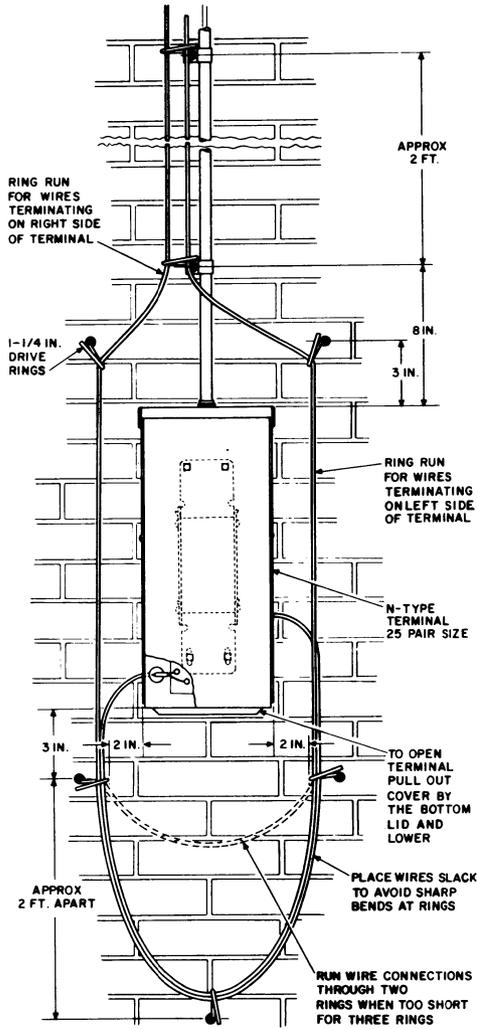


Fig. 23—Wall-Mounted 25-Pair Cable Terminal With Stub at Top

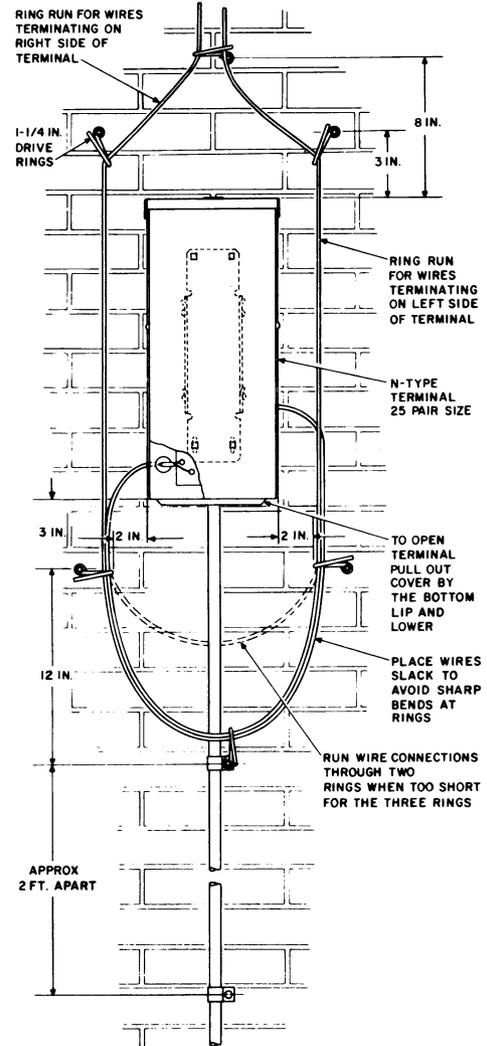


Fig. 24—Wall-Mounted 25-Pair Cable Terminal With Stub at Bottom

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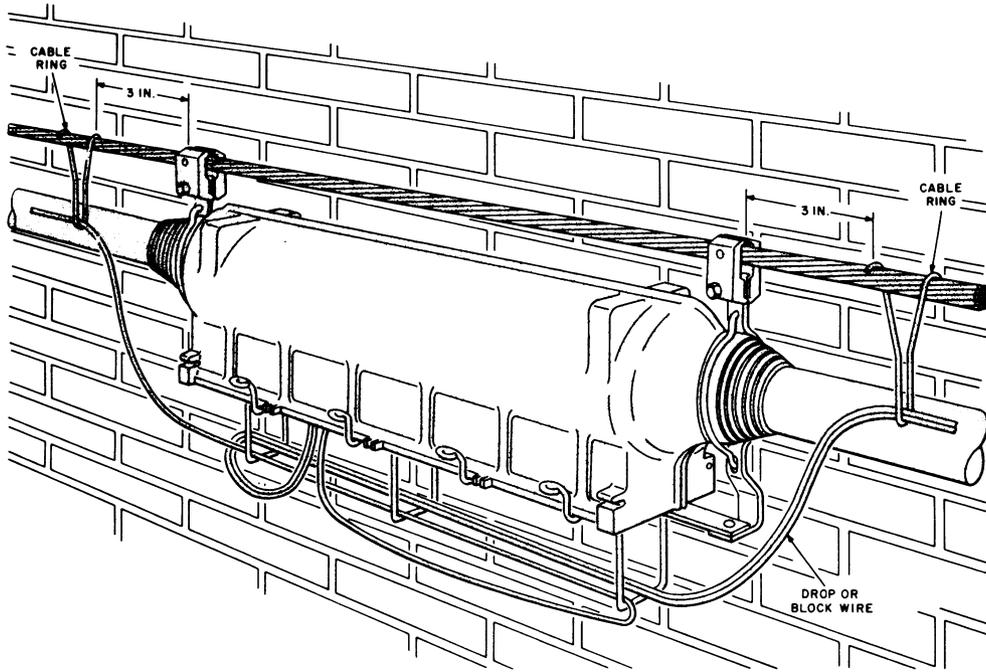


Fig. 25 — Wall-Mounted 49-Type Cable Terminal

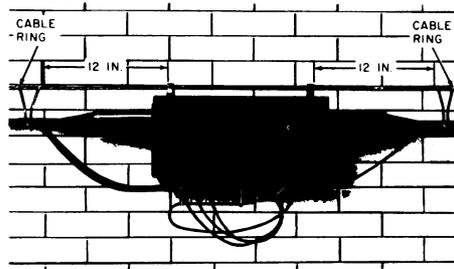


Fig. 26 — Wall-Mounted 104- or 105-Type Cable Terminal

# Drop & Block Wiring at Aerial Cable Terminals

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5.02 See Section 462-240-120 for a description of the 101-type wire terminals. The 101B2 wire terminal supersedes both the 101A and 101B wire terminals. It is used for making party line taps in drop and block wire runs, in distributing drops from cable and open wire lines, and in placing fusible links. The 101-type wire terminal should be mounted on poles and walls as shown on Fig. 27, 28, 29, and 30.

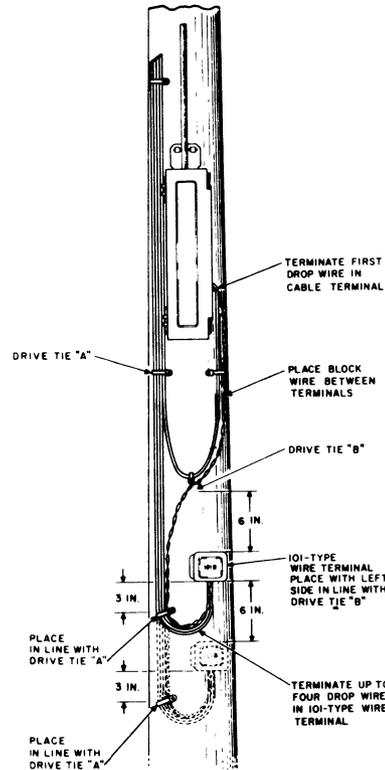


Fig. 27—Wiring 101-Type Terminal at Pole-Mounted Cable Terminal

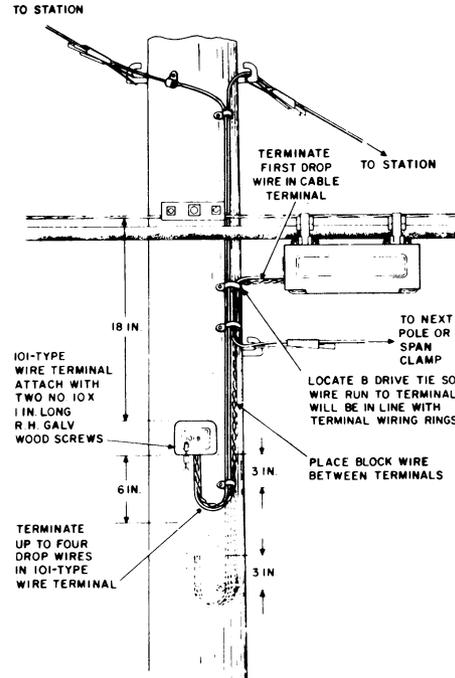


Fig. 28—Wiring 101-Type Terminal at Strand-Mounted Cable Terminal

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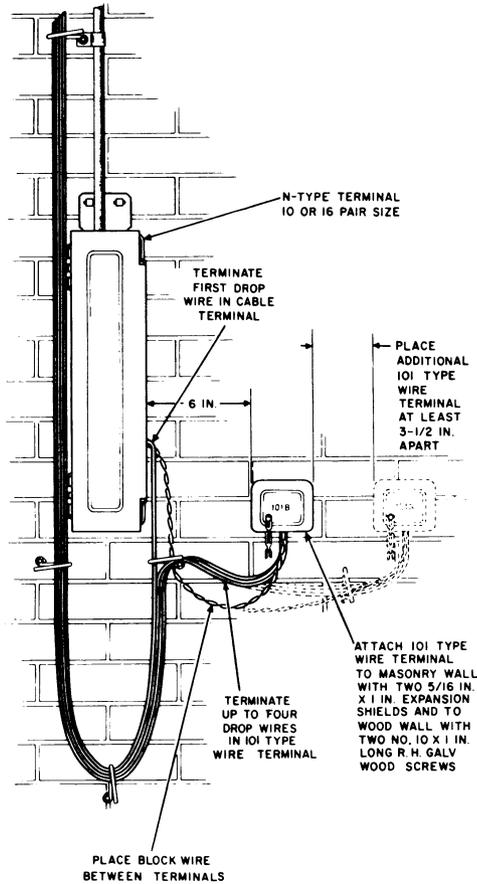


Fig. 29—Wiring 101-Type Terminal With Vertical Wall-Mounted Cable Terminal

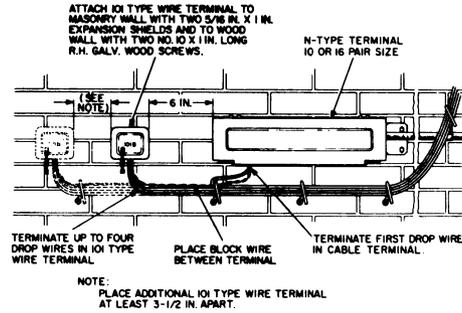


Fig. 30—Wiring 101-Type Terminal With Horizontal Wall-Mounted Cable Terminal

¶5.03 The B, C, and D customer service closures may be used for the same purposes as the 101-type wire terminals. See Section 462-242-101 for a description of B, C, and D customer service closures (AT-8813).¶

## 6. BINDING POST CAPS AND INSULATORS

6.01 These instructions cover the placing of binding post caps and binding post insulators in cable and wire terminals as protection against accidental contacts on special service lines and as a means for minimizing faceplate leakage. ¶Binding post caps and insulators may also be used to prevent corrosion.¶ Table A lists the binding post caps and usage.

**Note:** Special service lines cover such circuits as program supply, radio and television network services, picture transmission, teletypewriter, fire, police, power remote control, burglar alarm, etc.

# Drop & Block Wiring at Aerial Cable Terminals

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**TABLE A**  
**BINDING POST CAPS**

| BINDING POST CAP | COLOR        | USAGE  |
|------------------|--------------|--|
| B                | Red or Black | On nonworking posts of N, T, and 61-type cable terminals   |
| C                | Red or Black | On working posts of N, T, and 61-type cable terminals  |
| D                | Red or Black | On 7A fuses installed in L type fuse chambers  |
| E                | Red or Black | On 49-type cable terminals   |
| F                | Red or Black | On B buried cable terminals and connecting blocks equipped with insulation crushing washers — 30-2, 57B, and 57A types |
| G                | Red or Black | On 30-type connecting blocks   |
| H                | Red or Black | On 31-type connecting blocks   |

**6.02** The B binding post cap is a molded neoprene cap which completely covers nonworking binding posts in N, T, and 61-type cable terminals.

**6.03** The C, E, F, G, and H binding post caps are similar to the B cap in design, except they have a hole and slit on the side to permit their installation over wires terminated on binding posts.

**6.04** The D binding post cap is similar to the B cap except it has a small opening at one end. This cap is designed to fit over the end of a 7A fuse installed in L-type fuse chambers.

**6.05** Binding post caps are supplied in red and black colors as a means of identifying the types of circuits on which they are being used. The red cap is intended for use on special service lines as protection against accidental contacts and the black for minimizing faceplate leakage and other purposes.

**6.06** The binding post insulator is a phenol fiber sleeve, open at both ends and slotted lengthwise to admit wire terminated on the binding post. These insulators have a red enamel finish. Binding post insulators are intended as protection against accidental contacts for special service lines which are terminated in terminals not suited to the use of binding post caps.

**6.07** Particular care shall be exercised not to dislodge the red binding post caps or binding post insulators associated with special service lines while working in terminals, nor should they be removed without proper authorization.

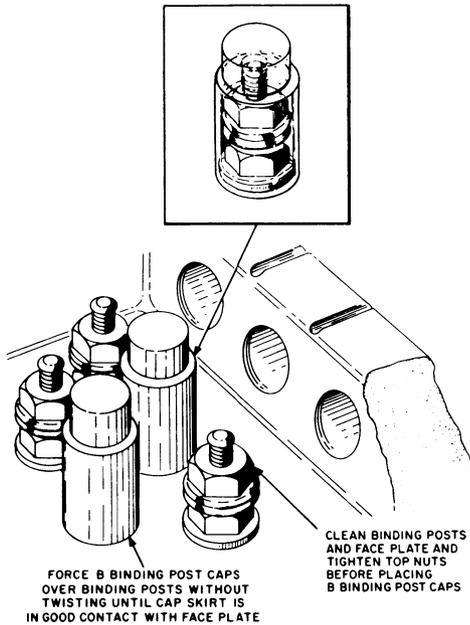
**PLACING BINDING POST CAPS**

**6.08** In normal usage of B binding post caps, clean the binding posts and faceplate thoroughly before placing caps. Install the caps after all moisture is removed from around the binding posts.

# Drop & Block Wiring at Aerial Cable Terminals

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**6.09** When installing the B binding post caps, first turn down the nut of the binding post fingertight. Force the cap over the binding post, without twisting, until the skirt of the cap is in good contact with the faceplate. If the cap is twisted while being forced over the binding post, the skirt of the cap may fold under instead of seating squarely on the faceplate as desired. Figure 31 shows a properly placed binding post cap.

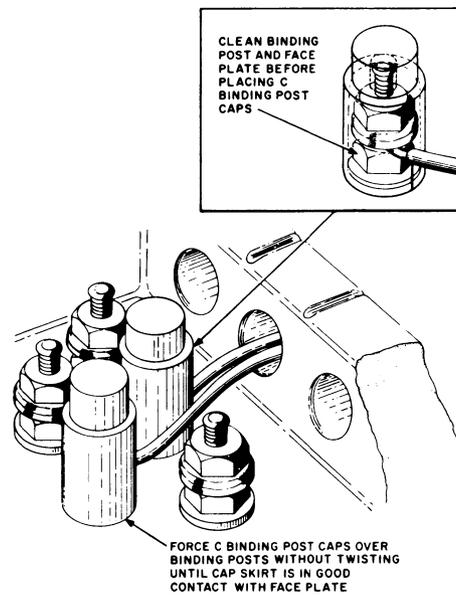


**Fig. 31—Placing B Binding Post Caps**

**6.10** Binding post caps come in seven sizes and are used as listed in Table A.

**6.11** Prepare the binding posts for the placing of C, E, F, G, and H binding post caps as indicated in paragraph 6.08 for the B caps.

**6.12** Place the caps over the binding post with the slit in the line with the terminated wire. Force the cap down over the binding post with terminated wire in the slit until the skirt of the cap is in good contact with the faceplate. Adjust the terminated wire so that it is positioned inside the hole of the cap as indicated in Fig. 32.



**Fig. 32—Placing C Binding Post Caps**

# Drop & Block Wiring at Aerial Cable Terminals

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6.13 The C binding post caps are shown in Fig. 32. The E, F, G, and H binding post caps are installed in the same general manner. Figure 33 illustrates an E binding post cap placed inside a 49-type terminal.

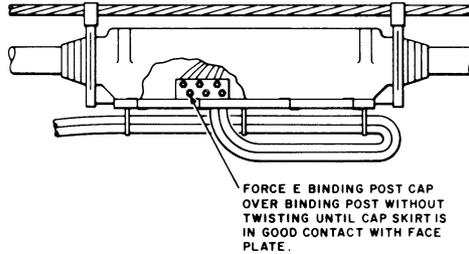


Fig. 33—E Binding Post Caps Placed in 49-Type Cable Terminal

6.14 To place the D binding post cap on 7A fuses installed in L-type fuse chambers, force the cap down over the end of fuse until properly seated.

## PLACING BINDING POST INSULATORS

6.15 Install binding post insulators snugly over binding posts. Where the insulator fits loosely, place a piece of tape around the binding post inside the insulator to obtain a snug fit.

6.16 Binding post insulators come in four sizes and are used as listed in Table B.

TABLE B

BINDING POST INSULATORS

| COLOR | BINDING POST INSULATOR NO. | USAGE  |
|-------|----------------------------|--|
| Red   | 1                          | On binding posts having 3/8-inch nuts and also the 7T fuse   |
| Red   | 2                          | On binding posts having 7/16-inch nuts and also the 7A fuse  |
| Red   | 3                          | On screw-type binding posts of BD terminals  |
| Red   | 6                          | On terminations of alarm and contactor circuits in T pressure contactor-terminals and 3-pair gastight terminals. |

# ***Understanding Nortel DMS-100 Capacity Administration***

## **Purpose**

The purpose of this guide is to provide the Nortel DMS-100 family capacity administrator with descriptions of the capacities of traffic sensitive switch components and to suggest methods and procedures to observe how these capacities are being used by an inservice switch. Traffic sensitive components are those major parts of the switch that are susceptible to service degradation as the offered load is increased and approaches the engineered capacity level.

Monitoring capacity is an essential administrative function because it determines if the switch is operating under the conditions projected for the engineered period. Deviations from the projections may alter the end of design date (forecast date when additional resources will be needed) for the switch.

**Note:** Remote modules are not addressed in this article. Information on remote equipment may be found in the *Operational Measurements Reference Manual*.

## **Capacity Definitions**

Typically, the capacities of the DMS-100 family switches are addressed in accordance with terms used by the design engineers. These terms, which reflect the different capacity concepts that are employed in the provisioning process, have been adopted for use in the day-to-day monitoring activities. These terms include:

- Physical (Termination) Capacity
- Traffic Capacity
- Real-Time Capacity
- Memory Capacity

### **Physical Capacity**

Physical capacity is the total number of terminations that can be accommodated by a switch component or group of components, for example, the total number of terminations for lines in a Line Concentrating Module (LCM) or group of LCMs.

### **Traffic Capacity**

Traffic capacity is the maximum number of terminations or requests for service that can be accommodated by a component or group of components while still meeting established delay and blocking service standards.

### **Real-Time Capacity**

Real-time capacity, as applied to the DMS-100 family central processing unit (NT40) or DMS-Core (SuperNode), is the maximum number of call attempts that the Central Processing Unit (CPU) or DMS-Core can process while meeting the High-Day Busy Hour (HDBH) service objective of not exceeding 20 percent dial tone delay (delay greater than 3 seconds).

## **Memory Capacity**

Memory can be a call limiting factor for a DMS–100 family switch and should be monitored to assure that there is sufficient memory at all times to meet the engineered call capacity of the CPU. Memory capacity administration is not addressed in this article, but information on the subject can be found in *Memory Administration Guide* and the *Office Parameters Reference Manual*.

## **Administration Functions**

Administration of capacity includes monitoring capacity use and the effects that it may have on the DMS–100 family switch. To monitor the use, data is gathered through performance indicators such as Operational Measurements (OMs), logs, and capacity tools such as MEMCALC, and various Maintenance and Administration Position (MAP) status reports and counts.

## **Definitions of Administration Terms**

### **Traffic Sensitive Switch Components**

Traffic sensitive switch components are the specific components or resources that are susceptible to performance degradation. Performance degradation may occur when the traffic load on a component or resource approaches or exceeds its engineered limits, or when a component or resource failure occurs.

The traffic sensitive components of the DMS–100 family of switches discussed in this article are listed below (excluding those in the remote applications):

- Central Processing Unit (NT40)
- DMS–Core (SuperNode)
- Line Module (LM)
- Line Concentrating Module (LCM)
- Enhanced Line Concentrating Module (LCME)
- Trunk Module (TM)
- Digital Trunk Controller (DTC)
- Line Group Controller (LGC)
- Line Trunk Controller (LTC)
- Outside Plant Module (OPM)
- Service Circuits
- Networks

## **Busy Hours**

The DMS–100 family switches are engineered based on empirical data or forecast data for the busiest hour for individual components or for the entire office (switch). These hours are referred to as *busy hours*. Listed below are the most commonly used busy hours and their definitions.

### **Call Busy Hour**

The *call busy hour* is the time–consistent 60 minute period having the most call originating plus incoming ( $O + I$ ) attempts per main station or Network Access Line (NAL). This hour is used primarily for the development of processor real–time capacities.

## **Usage Busy Hour (Office Busy Hour)**

The *usage busy hour* is the time-consistent 60 minute period producing the most originating plus terminating (O + T) use per main station or NAL. This hour is used primarily for gathering data for load balancing and provisioning of switching hardware and software.

## **Service Busy Hour (Dial Tone Busy Hour)**

The *service busy hour* is the time-consistent 60 minute period when the highest percentage of customers originating a call must wait more than 3 seconds for dial tone.

## **Component Busy Hour**

The *component busy hour* is the time-consistent 60 minute period when call attempts or use are the highest for a particular switch component, for example, Digitone receivers, tones, and announcements. These hours may coincide, or each may be in a separate time period and administered separately.

## **Busy Hour Determination**

Busy hours are derived from studies that are taken just prior to the office busy season. The busy season is defined as the three months (not necessarily consecutive) that have the highest average business day traffic during the office busy hour.

Busy hour determination studies are usually conducted for 5–15 days between the hours of 8 a.m. and 11 p.m. The busy hour that is determined is then used during the following busy season.

Busy hour studies may be conducted on a manual basis or through the use of a mechanized system. By whatever means, the studies should select the time periods that provide call data that can be used to engineer the switch most effectively and measure the level of service being rendered to the subscribers.

The characteristics of the office determine the periods of the day to be studied. In some offices, the calling patterns do not change significantly from one busy season to another. For those offices, a five day study is sufficient to verify that the hour has not changed. The hours chosen should be the known busy hour and the hours on either side of that hour. In other offices, several hours may carry loads of approximately the same level, so a longer study period (10 to 15 days) and the full range of hours (8 a.m. to 11 p.m.) should be considered. All data should be collected at least on a half-hourly basis.

The criteria for changing the designated busy hour from one time period to another is determined by the operating company.

## **Grade of Service**

The basic design philosophy of the DMS-100 family is based on delay criteria from the peripheral originator (line or trunk) up to the network. The network and all terminating paths are designed based upon blockage criteria. Blockage is defined as the failure to find an idle channel and is referred to as matching loss. The rates of delay and blockage are referred to as the Grade of Service (GOS). The higher these rates become, the lower the GOS that is experienced by the subscriber.

Delay in the DMS-100 family occurs in the form of Dial Tone Delay (DTD) for originating calls and Incoming Start to Dial Delay (ISDD) for incoming calls. The percentage of delays greater than 3 seconds is used to assess the GOS for the overall switch design.

The criteria are 1.5 percent DTD and ISDD greater than 3 seconds for the Average Busy Season Busy Hour (ABSBH) and 20 percent for the High-Day Busy Hour (HDBH).

### **Service Criteria**

Service criteria are those objective levels of call blocking and delay that are set for the measured busy hour. Effective capacity administration will ensure that these service objectives are met. Service criteria have been developed on the basis of judgment and experience. The overall objective is to provide the best possible service at a reasonable cost.

To establish a service standard, it is necessary to have a measurement that quantifies the inconvenience a customer experienced because of call blocking or call delay. When a call is blocked, a tone or message is delivered to the customer who then must hang up to try the call again. When a call is delayed, the customer is only considered to be inconvenienced if the delay exceeds some maximum tolerable value. The DMS-100 family design applies a mixture of loss and delay criteria.

### **Loss Criteria**

All the line modules are engineered to meet objective service levels during the worst case of Incoming Matching Loss (IML) during either the ABSBH or HDBH. Incoming matching loss is defined as that condition when a call cannot be completed because an idle path cannot be found between an incoming trunk and an idle line. Nortel engineering tables are based on IML objectives.

The existing published matching loss criteria are stated for the entire office. They have two sources, peripheral matching loss and network matching loss. The peripheral portion is the predominant part of the HDBH criteria. The recommended incoming matching loss criteria for a DMS-100 are shown below:

---

*Nortel Recommended Matching Loss Criteria*

| <b>Busy Hour</b>                         | <b>Overall</b> | <b>Peripheral</b> | <b>Network</b> |
|--|----------------|-------------------|----------------|
| Average Busy Season Busy Hour<br>(ABSBH) | 2.0%           | 1.9%              | 0.1%           |
| High-Day Busy Hour<br>(HDBH)             | 5.0%           | 4.0%              | 1.0%           |

---

### **Delay Criteria**

When subscribers and calls are served on a delay basis, the concern is usually more with the duration of the delay than the probability of delay. At the present time, delays of less than 3 seconds are considered acceptable to the subscriber, or at least they do not annoy the subscriber if they do not happen too frequently. The delay criteria that are used for engineering purposes are as follows:

---

## Delay Criteria

| Delay Criteria                      | Description   |
|-------------------------------------|---|
| Dial Tone Delay (DTD)               | The probability that a customer will experience a dial tone delay of more than 3 seconds  |
| Incoming Start to Dial Delay (ISDD) | The probability that an incoming trunk to a multifrequency receiver will experience a delay of more than 3 seconds before the receiver becomes available. |

---

The current recommended delay criteria are shown below:

---

## Recommended Engineering Delay Criteria

| Delay Measurement | DMS-100 |       | DMS-250  |          |
|-------------------|---------|-------|----------|----------|
|                   | ABSBH   | HDBH  | 10HDBH   | HDBH     |
| DTD               | 1.5%    | 20.0% | See Note | See Note |
| ISDD              | 1.5%    | 20.0% | 8.0%     | 20.0%    |

---

**Note:** Not applicable to this office type.

---

With configurations that require a high penetration of Meridian Digital Centrex (MDC) or Multiple Appearance Directory Number (MADN) features, a line peripheral can become limited by high-day busy hour attempts. The load service relationship for an attempt limited line peripheral is dial tone delay. The attempt capacity can be obtained by using the Nortel `PRTCALC` tool. Staying within this attempt limit maximizes throughput, minimizes any delay caused by the peripheral, and supports an overall DTD of 20 percent during the high-day busy hour.

The traffic capacity tables, associated with line peripherals and the `PRTCALC` program, assume an even (balanced) flow of traffic across all line modules. This `PRTCALC` function is usually performed by the traffic engineer. The administrator may get the required information from the engineer that is responsible for the office in question.

## **Measurement Methods**

The following section describes methods for measuring the capacity in a DMS-100 family switch. These methods are based on the measurements that are currently available in the data collection system.

## **Performance Indicators**

Performance indicators are measurements or records of events that occur during a given period of time or in a time sequence. For the DMS-100 family switch, performance indicators take the form of Operational Measurements (OMs) and log reports. In addition, a method to measure and control the balance of traffic load offered to like components of the product or system is employed. This measurement method is developed by the operating company and uses the standard operational measurements provided by the DMS-100 family switch.

## Operational Measurements

The administration of capacities in the DMS-100 switch makes use of the switch's data collection system. This system collects groups of data designated OMs. Operational measurements are derived by monitoring certain events in the switch and entering the results into registers in the data store. Each register has a unique name. The registers are scored individually each time an event occurs, or when the state of an item is scanned (sampled) at regular intervals regardless of the time of the occurrence of an event. Scan rates are either 100 seconds or 10 seconds.

Single events, measured individually, are referred to as *peg counts*. Sampled measurements are used to determine the degree of use of DMS-100 hardware and software resources and are referred to as *usage counts*.

Because each register can record either a single event or a group of similar events, the registers are provided on an office basis, or a unit basis. For example:

- Register CP\_CPLEV measures the amount of real-time spent by the CPU at the call processing level. One register is required for each office.
- Register TRK\_NATTMPT records the number of call attempts allowed access to an outgoing trunk group. A register is provided for each trunk group.

The peg counts and usage counts are stored in active registers that are updated whenever new data are entered. The OM data in the active registers are useful only if related to the specific period of time of collection. Therefore, OM data cannot be copied directly from the active registers because of the probability that additional counts may occur during the copying process that would result in an inaccurate data output.

To prevent inaccurate data, two complete sets of registers are provided. During any collection period, one set is used to collect current data and is known as the active class. The other set, known as the holding class, contains the data collected in the previous collection period and is used to provide data to reports or to the various accumulating classes.

At the end of the collection period, data in the active registers are transferred to the holding registers and the active registers are zeroed. This transfer of data from active to holding occurs at the same time for all counts. Operating company defined accumulating registers are used to accumulate data over longer periods of time than the basic period (a day or week). The data accumulation process adds the contents of the holding class registers to the accumulating class registers just prior to the next data collection period. The accumulated data are available to the end of the accumulating period. At the end of the accumulating period, the registers are unloaded to a printer or other recording device and the registers are zeroed.

The control of the length of the basic time periods is in the table designated as OFCENG. The office parameter OMXFR in OFCENG defines the timing value OMXFERPERIOD. This value is set at either 15 or 30 minutes.

Whenever an active register count exceeds its 65,536 limit, an extension register needs to be assigned or the data will be understated. The extension register will peg once each time the limit is exceeded. The count on the regular register is added to the product of the extension register count multiplied by 65,536, for example:

```

-----
Regular Register Count      = 236
Extension Register Count   = 2
236 + (2 x 65,536)        = 131,308 (true total for this register)
-----

```

The **OMDUMP** command (input at the MAP) may be used to determine which registers have been assigned extension registers. The command is as follows:

```
>OMDUMP CLASS (class name) FORMAT
```

The following figure shows an example of a portion of a printout containing a register value and its extension register value:

*Example of a Register and its Extension Register*

```

-----
      INOUT2      INTONE      NIN
      OUTMFL      OUTRMFL     OUTOSF
      ORIGANN     ORIGKT      ORIGOUT
      ORIGTONE    NORIG       NORIG2
      TRMNWAT2    TRMMFL     TRMBLK
      0           111        31642
      0           0          101
      1993        10         32146
      1480        11205[1]    1[2]
      0           1          0
-----

```

```

[1] NORIG Register
[2] NORIG Extension Register
-----

```

If an accumulating register is expected to exceed the register limit, then it should be assigned to double-precision. This assignment raises the limit to 4,294,967,296 counts (65,536 x 65,536) with a printout limit of 8 characters. Double-precision uses two registers as previously described. When changing a class precision from single precision to double-precision, all OM groups must first be deleted from the class. Refer to the *Basic Administration Procedures*, under command **OMACCGRP**, for detailed procedures.

The output from the OMs may be sent to a local printer or collected on a mechanized system, for example, the Engineering and Administrative Data Acquisition System (EADAS).

*Example of a Double-Precision Register*

```

-----
      INOUT2      INTONE      NIN
      OUTMFL      OUTRMFL     OUTOSF
      ORIGANN     ORIGKT      ORIGOUT
      ORIGTONE    NORIG       NORIG2
      TRMNWAT2    TRMMFL     TRMBLK
      0           375        91141
      0           0          13
      1993        10         150585[2]
      1480        325569[1]    0
      0           1          0
-----

```

```

[1] NORIG Double-Precision Register
[2] ORIGOUT Double-Precision Register
-----

```

## Log Reports

A *log report* is a message from the DMS–100 whenever a significant event has occurred in the switch or one of its peripherals. Log reports include status and activity reports as well as reports on hardware or software faults, test results, and other events or conditions likely to affect the performance of the switch. A log report may be generated in response to a system or manual action. Complete descriptions of all log reports are contained in the *Log Report Reference Manual*.

## Subscriber Trouble Reports

Subscriber trouble reports are another source for monitoring the capacity of switch components. These reports can often point to off–busy hour capacity problems that otherwise may go undetected.

## Capacity Factors

Capacity factors are those events that affect the capacity of a hardware or software component of the switch. The status of the capacity of switch components is measured by capacity indicators such as operational measurements and log reports. Capacity factors include such items as:

- Holding Time
- Call Rate
- Call Blockage
- Circuit Failure
- Average Work Time
- Call Processing Messaging

## Automated Tools

Several automated tools are available to the administrator that will aid in the monitoring of capacity. Nortel developed these tools to assist in the initial provisioning of an office and for use in the ongoing surveillance of a working switch.

## **REAL::TIME**

`REAL : : TIME` is a PC program designed to provide an estimate of the DMS–100 family CPU real–time requirements. The DMS–100 switch provides distributed processing over many switching entities. The call attempt capacity of each of these switching entities must be predicted to establish operating guidelines. These guidelines are used to determine the loading levels for specific applications, including residential services. The real–time can be predicted by using the anticipated call mix and timing per call.

Using traffic criteria along with detailed office provisioning data, `REAL : : TIME` generates an estimated occupancy for the central processor. `REAL : : TIME` can be used in the following office configurations:

- DMS–100 Plain Old Telephone Service (POTS), MDC (including MADN) or both, in an Equal Access End Office (EAEO)
- DMS–200 in an access tandem operation
- DMS–100/200 in a combination of the above
- TOPS applications
- Signaling System #7 trunking applications
- Enhanced 800 Service
- Integrated Services Digital Network (ISDN) applications

## **REAL::QUICK**

REAL::QUICK is an abbreviated form of REAL::TIME. Some assumptions and considerations are applicable to each processor. If there is a significant variance from these assumptions and considerations, a more detailed study should be performed using PRTCALC or REAL::TIME.

## **PRTCALC**

PRTCALC is a PC program designed to provide an estimate of DMS-100 family peripheral real-time requirements. PRTCALC can be used to calculate the real-time call attempt capacity for peripheral modules. PRTCALC is composed of three sections:

- An input section used to organize the controller call data and feature requirements.
- A work sheet section that contains the PRTCALC call mix calculations. The call types derived from the input data are combined with the pre-call timings to determine the real-time requirements.
- An output section that is a summary of the input and the work sheet calculations.

Input for PRTCALC comes either from projected (forecast) data based on current operational measurement trends, or from inputs to the NT-ACCESS tool.

## ***Nortel DMS-100 Announcement Table (ANNS)***

### **Table Name**

Announcement Table

### **Functional Description of Table ANNS**

This table contains data for each analog and digital announcement that is assigned in the switching unit.

For all line connections to announcements, the Central Control (CC) instructs the connecting Peripheral Modules (PM) to use a 0 dB (zero) pad level on the line card gain setting. This is a default value and cannot be administered. A 0 dB pad level is the Nil Pad Group (NPDGP). For further information, refer to table PADATA (Pad Data).

### **Datafill Sequence & Implications**

The following tables must be datafilled *before* table ANNS:

- CLLI (Common Language Location Identifier)
- DRAMS (Digital Recorded Announcement Machine)

The following tables must be datafilled *after* table ANNS:

- ANNMEMS (Announcement Members)
- DRAMTRK (Digital Recorded Announcement Machine Track)
- DRMUSERS (Digital Recorded Announcement Machine Users)

Before a Subscriber Activated Call Blocking (SACB) announcement can be entered in table ANNS, an announcement CLLI must first be entered in table CLLI. An entry for SACB announcements can then be entered in table ANNS. Once value SACB is entered in table ANNS, the data for each announcement member must be entered in table ANNMEMS, and the phrases recorded on the Digital Recorded Announcement Machine (DRAM) cards must be entered in table DRMUSERS.

DMS-100 Service Switching Point (SSP) standard announcements are datafilled in table ANNS and are mapped to the system announcement ID in table AINANNS (Advanced Intelligent Network Announcement). DMS-100 SSP customized announcements are datafilled in tables ANNS and DRMUSERS and are mapped to the system announcement ID in table AINANNS.

### **Table Size**

0 to 255 tuples.

Memory for table ANNS is allocated dynamically.

**Note:** The size of table ANNS increases if tables CUSTANN (Customer Group Announcement) and NSCANNS (Number Service Code Announcement) and if options XN26AA (announcement enhancements) or X983AB (SSP private virtual networking) are present in the office. With these tables, the size of table ANNS increases to 2,047 tuples. This increase is needed to support a larger number of customer groups (300 to 500).

## Datafill

The following table describes datafill for table ANNS:

-----  
*Table ANNS Field Descriptions*

| <b>Field</b> | <b>Subfield</b> | <b>Entry</b>   | <b>Explanation and Action</b>  |
|--------------|-----------------|--|--|
| CLLI         |                 | Alphanumeric<br>(1 to 16<br>characters)  | <p><i>Announcement CLLI Keys</i><br/>Enter the code that represents the announcement in table CLLI.</p> <p>If the Attendant Busy feature is present in the switching unit, the suggested CLLI for Attendant Busy is "ATTBUSY".</p> <p>If the Music-on-Hold feature is present in the switch, the suggested CLLI for the Music-on-Hold announcement is "MUSIC".</p> <p>Each loudspeaker location must have its own announcement CLLI associated with it.</p> <p>Enter fixed CLLI "TOPSACTS" if field ANTYPE is set to "ACTS" for Automatic Coin Toll Service. Office parameter TOPS_ACTS must be set to "Y" (yes) in table OFCENG.</p>  |
| ANNTYP       |                 | ACTS, AIN<br>AIS, AOSSVR,<br>CFPA, CFRA,<br>CLASS, CNAL,<br>CNALT, CNAT,<br>CSMI, DMCT,<br>ECWTPA, IN,<br>MCCS, MDS,<br>NFRA, NTC,<br>RCTL, SACB,<br>SLEENG, SLEFRE,<br>SPP, STND,<br>TOPSVR,<br>or VPSA | <p><i>Announcement Type</i><br/>Enter the announcement type as follows:</p> <ul style="list-style-type: none"><li>* ACTS to specify Automatic Coin Toll Service.</li><li>* AIN to specify a given DMS-100 user interface for each customer group.</li><li>* AIS to specify Automatic Intercept System Announcement if the switch has the AIS feature.</li><li>* AOSSVR to specify AOSS Voice Response.</li><li>* CFPA to specify Call Forwarding Programming Announcement.</li><li>* CFRA to specify Call Forwarding Remote Access Announcement.</li><li>* CLASS to specify Custom Local Area Signaling Services Announcement.</li><li>* CNAL to specify Calling Number Announcement playback to a line.</li><li>* CNAT to specify Calling Number Announcement playback over a trunk to a loudspeaker.</li><li>* CSMI to specify Call Screening, Monitoring, and Intercept.</li><li>* DMCT to specify Denied Malicious Call Termination.</li></ul> |



For switches with package X085AA, the range of values for the traffic separation number depends on office parameter TFAN\_OUT\_MAX\_NUMBER in table OFCENG.

For switching units without package X085AA, the range of values for the traffic separation numbers is 0 to 15.

Reserve the traffic separation numbers 1 to 9 for generic traffic separation numbers.

Refer to table TFANINT (Traffic Separation Intersection) for more information.

---

MAXCONN 1 to 255

*Maximum Connections*

Enter the maximum number of simultaneous connections that are permitted on the announcement. An entry outside this range is invalid.

If ANNTYPE is equal to VPSA or CNAT, a value of 255 must be entered.

For XA-Core, Nortel recommends "255" be entered.

---

CYTIME 1 to 18, or 0

*Cycle Times*

Enter the time, in seconds, for one announcement cycle on one channel (see the second, third, and fourth tables in this document). An entry outside this range is invalid and will cause the recorded announcement to be cut-off, at which point the line will be placed in a SYSBSY state.

**Note 1:** If the announcement cycle is longer than 18 seconds, field CYTIME can be changed to 0 (zero). This allows flexible announcement timing, which does not have a maximum limit for announcement length. The length of the announcement is always matched without datafill change.

**Note 2:** If your office is equipped with a Cook or equivalent announcement machine and table AUDIO is datafilled as ANNS, 0 is datafilled in field CYTIME.

**Note 3:** The cycle time for an Audichron is 0 (zero) due to the variable length announcement feature on Audichron. By setting the value of this field to 0 (zero), the length of the announcement is always matched.

---

MAXCYC 1 to 255

*Maximum Cycles*

Enter the maximum number of times the complete announcement is heard before the call is advanced to the next route in the route list. An entry outside of this range is invalid.

This field must be set to "1" for multilingual NTC service. For multilingual NTC service, since one tuple represents one language and one announcement cycle contains several

languages, each tuple in table DRMUSERS is used only once before advancing to the next tuple (language) in the same cycle. Thus, the number of announcement cycles datafilled in table ANNS must be one to ensure that languages are repeated in the proper sequence.

This field should be set to "1" for ADS announcements.

-----  
-End-

The following table shows the times for one cycle of prerecorded announcement. Use this table to datafill field CYTIME.

If Special Information Tone (SIT) or silence is the first phrase for the announcement in the DRAMTRK table, add one second to the values shown.

The time shown has been rounded off to the next second. The value in parentheses is the actual value:

-----  
*One-Cycle Prerecorded Announcement Time*

| <b>Announcement</b>         | <b>Time (Seconds)</b> |
|-----------------------------|-----------------------|
| No Circuit (NCA)            | 10 (9.25)             |
| Sender Overload (SOA)       | 10 (9.25)             |
| Reorder (ROA)               | 9 (8.96)              |
| Vacant Code (VCA)           | 12 (12.03)            |
| Unauthorized Code (UCA)     | 12 (12.03)            |
| Receiver Off-Hook (ROH)     | 13 (12.54)            |
| Vacant Disconnect           | 7 (6.21)              |
| Misdirected Centralized     | 11 (10.59)            |
| Toll Access Code Not Dialed | 10 (10.02)            |

-----

The following table shows cycle times for digits:

-----  
*One-Cycle Digit Time*

| <b>Digit</b> | <b>Duration (Seconds)</b> |
|--------------|---------------------------|
| 0            | 1 (0.61)                  |
| 1            | 1 (0.51)                  |
| 2            | 1 (0.54)                  |
| 3            | 1 (0.54)                  |
| 4            | 1 (0.64)                  |
| 5            | 1 (0.77)                  |
| 6            | 1 (0.64)                  |
| 7            | 1 (0.67)                  |
| 8            | 1 (0.54)                  |
| 9            | 1 (0.67)                  |

-----

The following table shows cycle times for special symbols:

*One-Cycle Special Symbol Time*

**Special Symbol                      Duration (Seconds)**

|           |          |
|-----------|----------|
| Silence   | 1 (1.02) |
| Test Tone | 1 (0.16) |
| Prompt    | 1 (0.99) |

**Datavill Example**

The following example MAP display shows sample datavill for table ANNS:

| CLLI     | ANNTYP | TRAFSNO | MAXCONN | CYTIME | MAXCYC |
|----------|--------|---------|---------|--------|--------|
| CNALINE  | CNAL Y | 0       | 1       | 4      | 1      |
| PSPD     | STND Y | 26      | 30      | 10     | 2      |
| TDND     | STND Y | 25      | 30      | 10     | 2      |
| CKTBSY   | STND Y | 25      | 30      | 10     | 2      |
| MLA      | STND Y | 25      | 30      | 10     | 2      |
| MCA      | STND Y | 25      | 30      | 10     | 2      |
| OHQANNC  | STND Y | 25      | 30      | 10     | 2      |
| VDN      | STND Y | 25      | 30      | 10     | 2      |
| VCA      | STND Y | 25      | 30      | 10     | 2      |
| EA4      | STND Y | 25      | 30      | 10     | 2      |
| EA3      | STND Y | 25      | 30      | 10     | 2      |
| WND      | STND Y | 0       | 90      | 15     | 2      |
| VACT     | STND Y | 0       | 90      | 15     | 2      |
| BLDN     | STND Y | 0       | 90      | 15     | 2      |
| CLASSANN | CLASS  | 30      | 1       | 0      | 1      |
| CFRAANN  | CFRA   | 25      | 1       | 0      | 2      |
| ARCONF   | STND Y | 0       | 90      | 16     | 2      |
| ACBBUSY  | STND Y | 0       | 90      | 16     | 2      |
| ARBUSY   | STND Y | 0       | 90      | 16     | 2      |
| ACBSTD   | STND Y | 0       | 90      | 16     | 2      |
| ARSTD    | STND Y | 0       | 90      | 16     | 2      |
| ACBLTD   | STND Y | 0       | 90      | 16     | 2      |
| ARLTD    | STND Y | 0       | 90      | 16     | 2      |
| ACBDEACT | STND Y | 0       | 90      | 16     | 2      |
| ARDEACT  | STND Y | 0       | 90      | 16     | 2      |
| ARDN     | STND Y | 0       | 90      | 16     | 2      |
| ARPRIV   | STND Y | 0       | 90      | 16     | 2      |
| ACBCONF  | STND Y | 0       | 90      | 16     | 2      |
| CONFOT   | STND Y | 0       | 90      | 16     | 2      |
| FAILCOT  | STND Y | 0       | 90      | 16     | 2      |
| PRMT1COT | STND Y | 0       | 90      | 16     | 2      |
| PRMTNCOT | STND Y | 0       | 90      | 16     | 2      |
| SLEENG1  | SLEENG | 25      | 1       | 0      | 1      |
| SLEENG2  | SLEENG | 25      | 1       | 0      | 1      |
| ADBFANN  | STND Y | 30      | 30      | 0      | 3      |
| PVNCOLA  | STND Y | 0       | 1       | 4      | 2      |
| PVNCOLB  | STND Y | 0       | 1       | 3      | 2      |
| PVNCOLC  | STND Y | 0       | 1       | 9      | 2      |
| PVNCOLD  | STND Y | 0       | 1       | 2      | 2      |

# Defeating Passive Infrared Motion Sensors

## Overview

A **very experimental** method of using a "heat beacon" to defeat the most common type of passive infrared motion sensor. The idea is to slowly bring up a masking source of infrared radiation, using a common heat lamp in this case, to saturate the area with radiation that is close to the same wavelength as the infrared radiation emitted from a human being. Since infrared motion sensors detect the *movement* of a "heat" source through its field-of-view, stationary "heat" sources *should not* set off the sensor, but temporarily blind the sensor in that particular area. Or something like that... Does it really work? Sorta. Testing showed the theory is sound, but far from perfect for those covert black-bag operations. It is something fun to mess with, though.

The idea is, the infrared heat lamp is first placed in the "target" area to be blocked or saturated. Next, over a period of about four minutes, the heat lamp is brought up in intensity via a standard dimmer switch controlled by a stepper motor. This is to avoid creating any sudden temperature differentials which could set the motion sensor off. After a period of approximately thirty minutes (to do your work), the heat lamp will then begin to lower its output intensity. You should allow a few more minutes for the entire beacon assembly to cool down to the surrounding room temperature. Slowly remove the beacon from the area and finish covering your tracks. **Do not pass in front of the beacon!** At all times, move *very slowly*, remain *very low*, and always stay *behind* the beacon's output to avoid setting off the motion sensor.

Mounting the beacon (or beacons, you'll need several of them) on top of large Radio Controlled (RC) toy cars is a very good idea. This will allow you to properly position them from a remote location. Slap on a wireless video camera to get even more information about the target area. The heat lamp will be powered via a high-wattage AC inverter which, in turn, is connected to a high-current capable rechargeable battery. Car batteries are perfect for this application.

You may wish to experiment with using different types of lenses and mirrors to control and tweak the output beam of the heat lamp. The stock heat lamp has a very *wide* beamwidth, whereas this application requires a very *narrow* beamwidth centered directly on the motion sensor's pyroelectric sensor. However, some lenses contain coatings which block the longer wavelengths of infrared radiation. Remember, plastic lenses will melt!

## How Infrared Motion Sensors Work

*Stolen from the Internet. Covers the Nippon Ceramic Co. RE200B infrared sensor.*

### **Infrared Radiation**

Infrared radiation exists in the electromagnetic spectrum at a wavelength that is longer than visible light. Infrared radiation cannot be seen but it can be detected. Objects that generate heat also generate infrared radiation including animals and the human body whose radiation is strongest at a wavelength of 9.4 micrometers ( $\mu\text{m}$ ).

### **Pyroelectric Sensors**

The pyroelectric sensor is made of a crystalline material that generates a surface electric charge when exposed to heat in the form of infrared radiation. When the

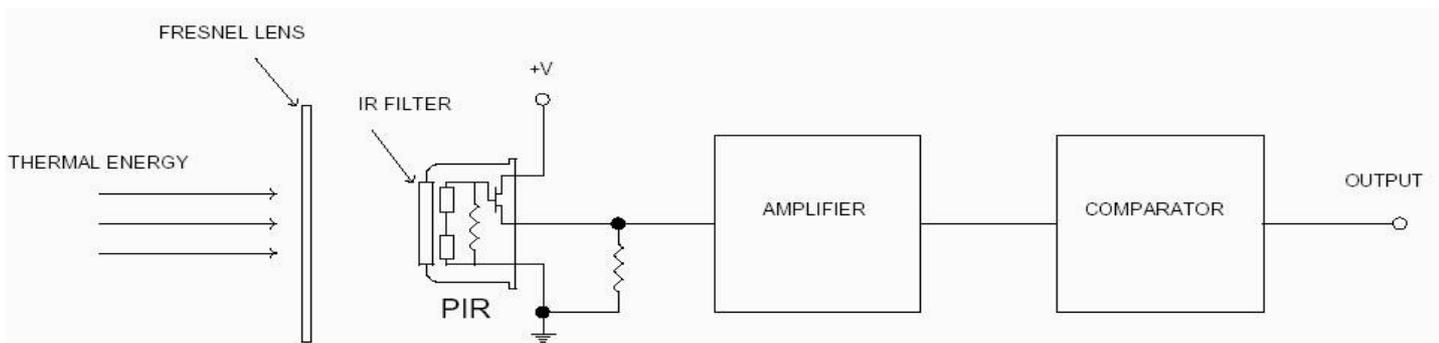
amount of radiation striking the crystal changes, the amount of charge also changes and can then be measured with a sensitive FET device built into the sensor. The sensor elements are sensitive to radiation over a wide range so a filter window is added to the TO-5 package to limit incoming radiation to the 8 to 14  $\mu\text{m}$  range which is most sensitive to human body radiation.

*Figure 1* shows how typically, the FET source terminal pin 2 connects through a pulldown resistor of about 100 kohms to ground and feeds into a two stage amplifier having signal conditioning circuits and a gain of 10,000 that produces a 0 to  $V_{cc}$  transition at its output. A well filtered power source of from 3 to 15 volts should be connected to the FET drain terminal pin 1. The amplifier is typically bandwidth limited to about 10 Hz to reject high frequency noise and is followed by a window comparator that responds to both the positive and negative transitions of the sensor output signal.

The RE200B sensor has two sensing elements connected in a voltage bucking configuration. This arrangement cancels signals caused by vibration, temperature changes and sunlight. A body passing in front of the sensor will activate first one and then the other element as shown in *Figure 2* whereas other sources will affect both elements simultaneously and be cancelled. The radiation source must pass across the sensor in a horizontal direction when sensor pins 1 and 2 are on a horizontal plane so that the elements are sequentially exposed to the infrared source.

*Figure 3* shows the RE200B electrical specifications and layout in its TO-5 package.

*Figure 4* shows a typical application circuit that drives a relay.  $R_{16}$  adjusts the amount of time that  $RY1$  remains closed after motion is detected.



**Figure 1 – RE200B Block Diagram**

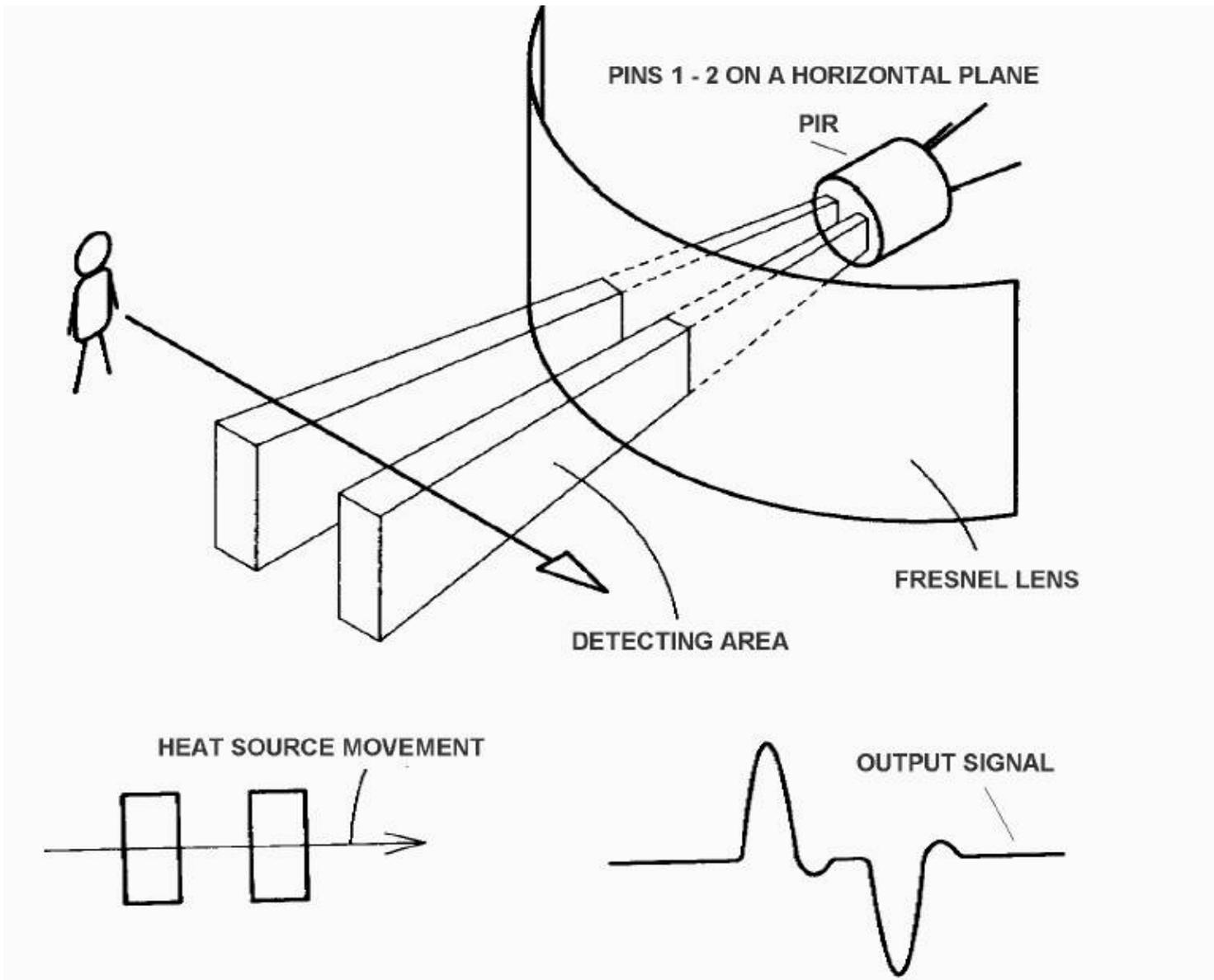
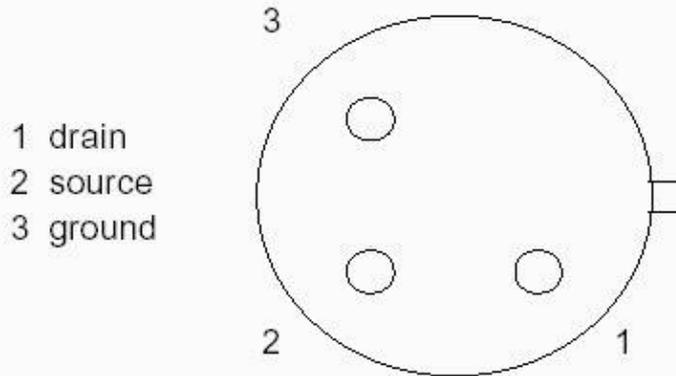


Figure 2 - Sensor Activation

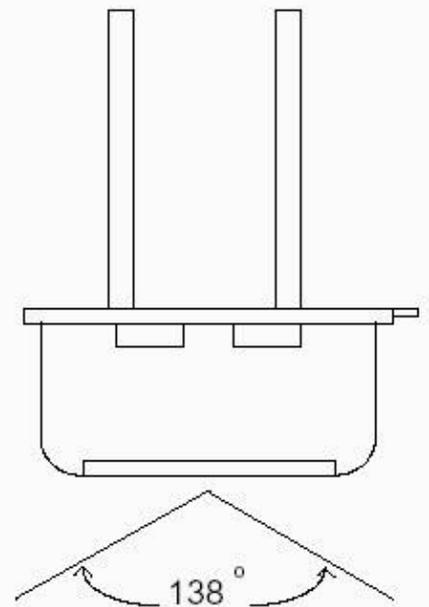
### BOTTOM VIEW



## RE200B

SENSITIVE AREA 2 ELEMENTS  
SPECTRAL RESPONSE 5 - 14  $\mu\text{m}$   
OUTPUT VOLTAGE mv pp 20  
NOISE mv pp 0.4  
OFFSET VOLTAGE volts 0.1  
SUPPLY VOLTAGE volts 2.2 - 15  
OPERATING TEMP c 30 - 70

Test Conditions for output voltage:  
Supply voltage = 5 volts  
100K load resistor from pin 2 to 3  
IR source = Hand moving 6" from sensor



### TOP VIEW

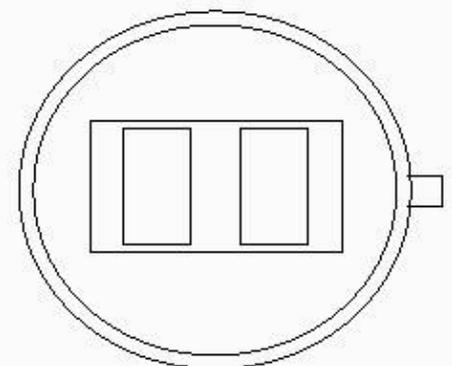


Figure 3 - RE200B Specifications

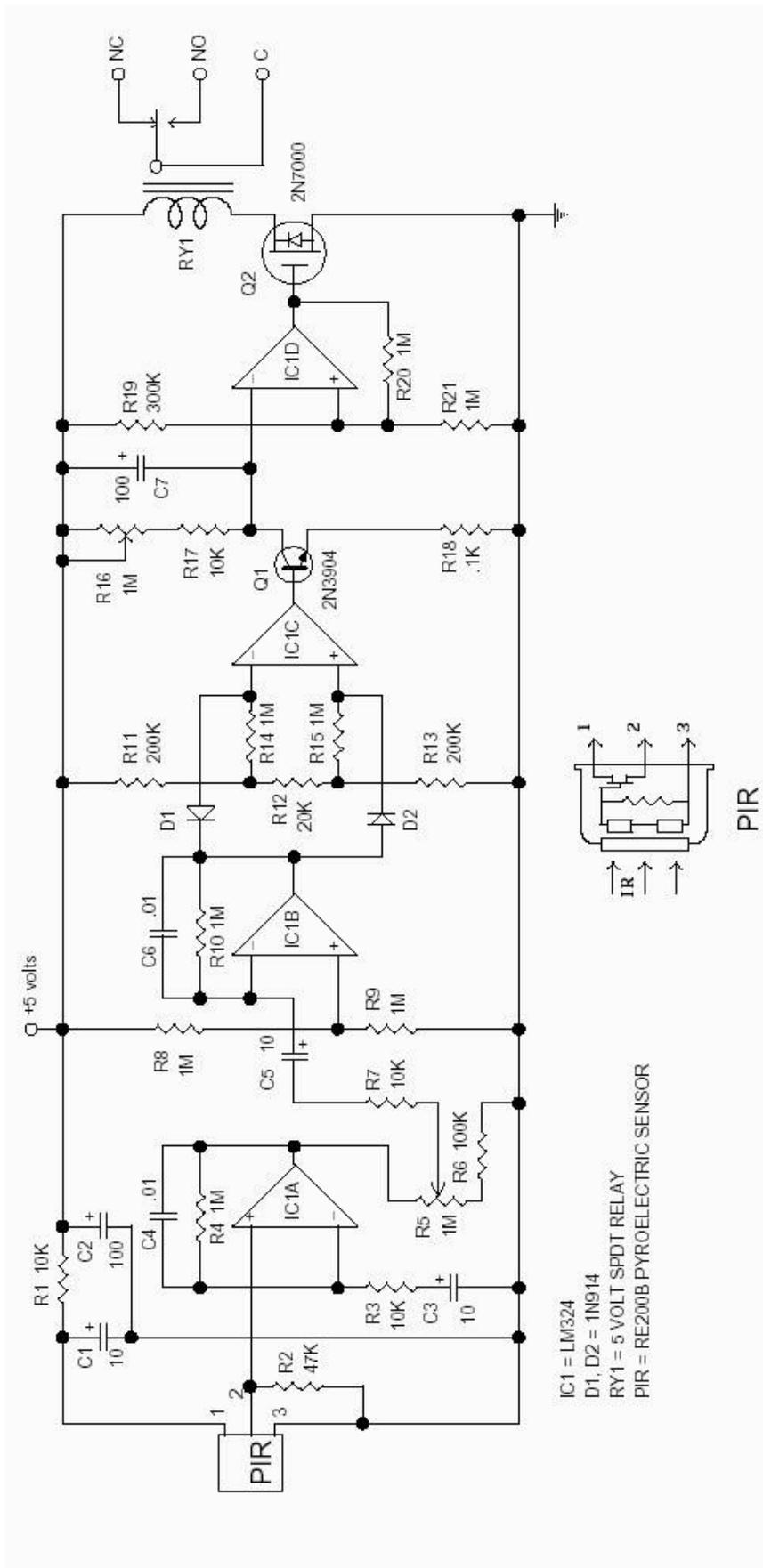


Figure 4 - RE200B Application Schematic

## Construction

The construction of this device was mostly for fun. Significantly smaller and less complicated methods can be used to control the output of the heat lamp. A stepper motor and a dimmer switch were used in this version as they are easily available.

You'll need to take apart a standard light dimmer switch and *carefully* study and reverse engineer the internal components and layout. The control knob of the dimmer switch will have a little metal clip that slides along a black carbon path. This is the dimmer switch's version of a potentiometer. Measure the resistance of this path. Mine was around 250 kohms. You'll need to find a panel-mount potentiometer of that same value. If you wish, you can remove the components from the dimmer switch module and mount them on the stepper motor control board to save space.

Refer to the pictures for a basic idea on what to do with the rest of the construction and hardware mounting. Some scrap aluminum stock is used to make a mounting bracket for the stepper motor and the panel-mount potentiometer. Connect their shafts together with a coupler (or some tape). The idea is that the stepper motor will *slowly* turn the potentiometer in one direction, then pause a few minutes, then *slowly* turn back in the other direction. The new panel-mount potentiometer is used in place of the stock potentiometer on the dimmer switch's circuit board. If everything goes right, and it will need a lot of tweaking, the heat lamp should increase and then decrease in intensity via the stepper motor controlled potentiometer. If it does this backwards, you wired the potentiometer wrong!

The salvaged stepper motor (I have no idea where I found it) used in this particular project is labeled:

COPAL ELECTRA STEP MOTOR SP-57  
12V / 36 ohm / 7.5°

The 12V refers to the maximum phase coil winding voltage and the 36 ohms is the windings resistance. Current draw per phase coil is around 300 mA, or 600 mA total for each step. The stepper motor also gets 7.5° of turn *per step*. So it would take 48 steps to do a complete 360° revolution. For controlling a panel-mount potentiometer, you'll need around 44 steps, or about 330° of revolution.

Several of these beacons should then be mounted to radio controlled toy trucks and remotely pre-positioned in front of the motion sensor to create a "shadow" zone which a human being could operate in. It should be noted that infrared motion sensors have *maximum* sensitivity to movement *across* (parallel) their field-of-view and *minimum* sensitivity to any movement *towards* (perpendicular) the sensor's field-of-view. Always try to plan your attack route to slowly move towards the sensor when crossing its path. Longer, safer routes are much better than short, dangerous routes.

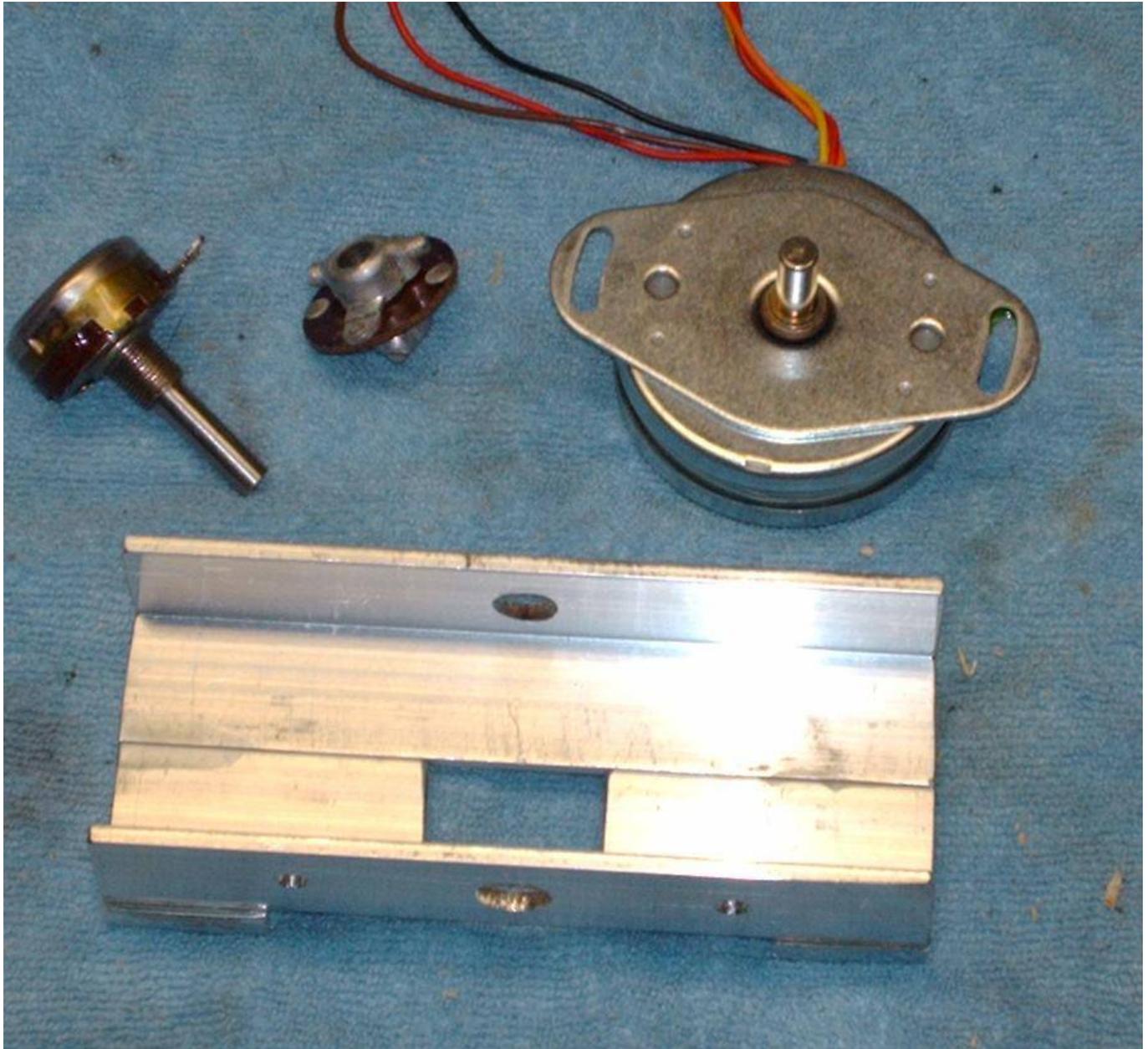
| <b>Stepper Motor Truth Table</b> |                   |                     |                      |
|----------------------------------|-------------------|---------------------|----------------------|
| <b>Phase Coil</b>                | <b>16F84 Port</b> | <b>Binary Value</b> | <b>Decimal Value</b> |
| 4                                | B0                | 0001                | 1                    |
| 2                                | B1                | 0010                | 2                    |
| 3                                | B2                | 0100                | 4                    |
| 1                                | B3                | 1000                | 8                    |

To "step" the motor, you need to activate two of the four phase coils in a particular sequence shown below:

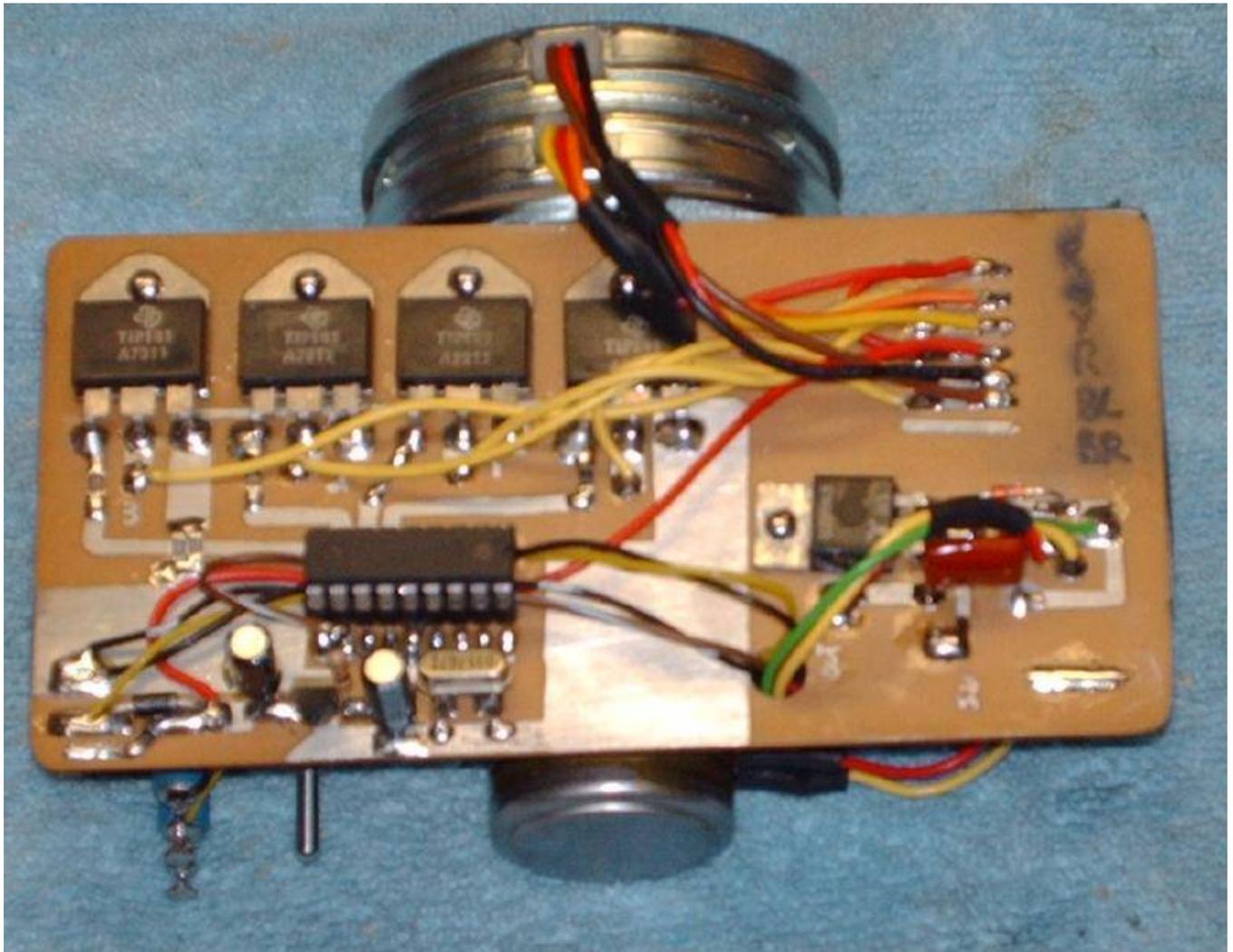
| <b>Stepper Motor Operation – Clockwise</b> |                     |                     |                     |                     |
|--|---------------------|---------------------|---------------------|---------------------|
| <b>Motor Step</b>                          | <b>Phase Coil 1</b> | <b>Phase Coil 2</b> | <b>Phase Coil 3</b> | <b>Phase Coil 4</b> |
| 1  | <b>ON</b>           | <b>OFF</b>          | <b>ON</b>           | <b>OFF</b>          |
| 2  | <b>OFF</b>          | <b>ON</b>           | <b>ON</b>           | <b>OFF</b>          |
| 3  | <b>OFF</b>          | <b>ON</b>           | <b>OFF</b>          | <b>ON</b>           |
| 4  | <b>ON</b>           | <b>OFF</b>          | <b>OFF</b>          | <b>ON</b>           |

By viewing the two above tables, we can see that we need the four ports on the 16F84 to output a continuous binary value of 1100, 0110, 0011, 1001 for a clockwise operation of the stepper motor. In decimal that would be: 12, 6, 3, 9. It's kinda confusing, so study that a bit. Reverse this sequence to reverse the stepping action: 9, 3, 6, 12.

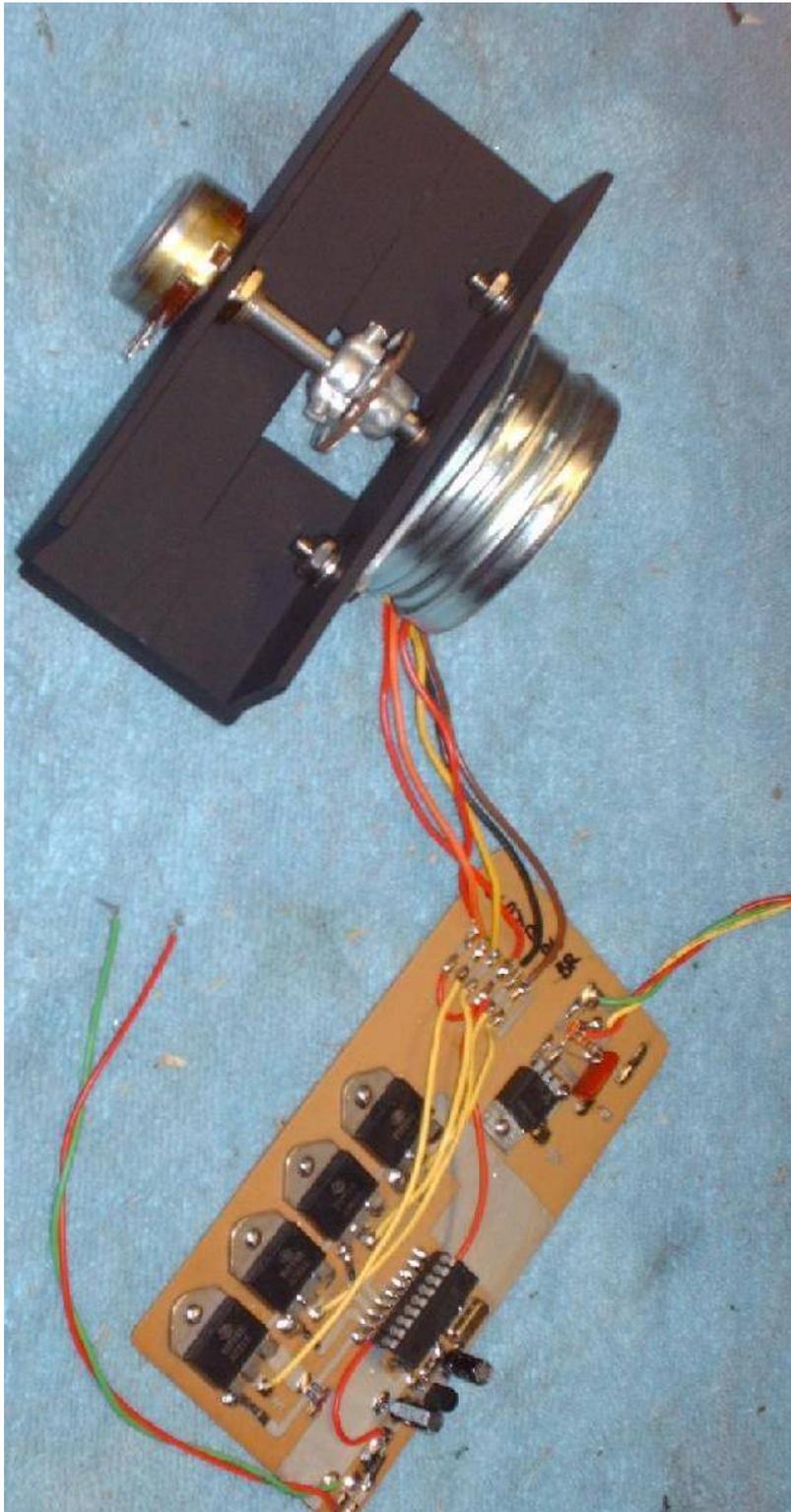
## Pictures



Overview of the stepper motor, dimmer switch control potentiometer (250 kohms), the shaft coupler, and right-angle aluminum stock to mount everything on. The aluminum pieces are epoxied together which makes construction very simple. The large cutout is for the shaft coupler.



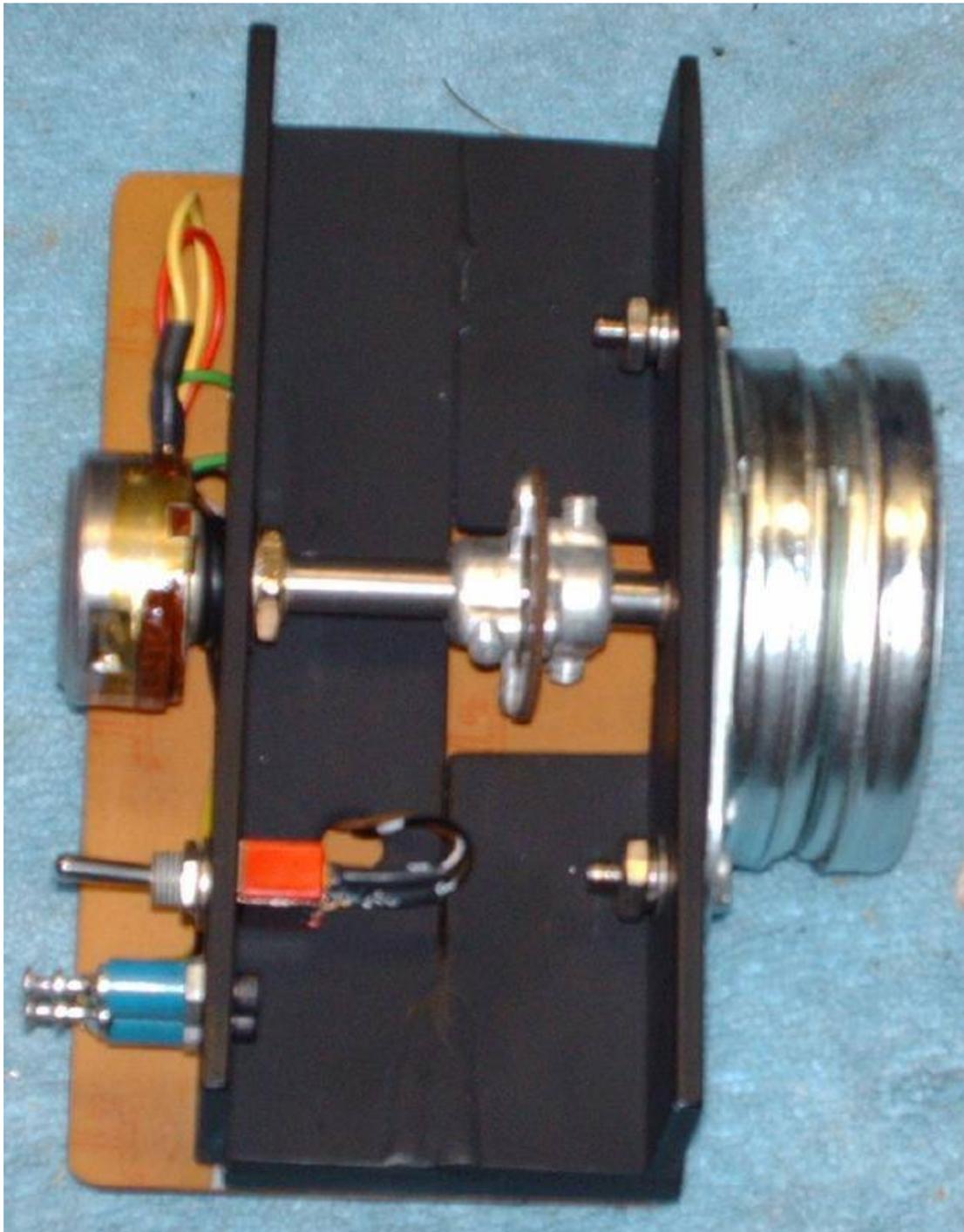
Stepper motor control board. A Microchip PIC16F84 controls four TIP-141 darlington transistors which, in turn, control the phase coils of the stepper motor. The components on the lower left are from a dimmer switch. The dimmer switch's components were removed from the switch housing and mounted on the PC board. Note the six wires for the stepper motor. Each stator cup has three wires, two for the phase coils and a common. The unipolar stepper motor is actually made up of two motors connected together.



Overview of the stepper motor control for the dimmer switch's control potentiometer.



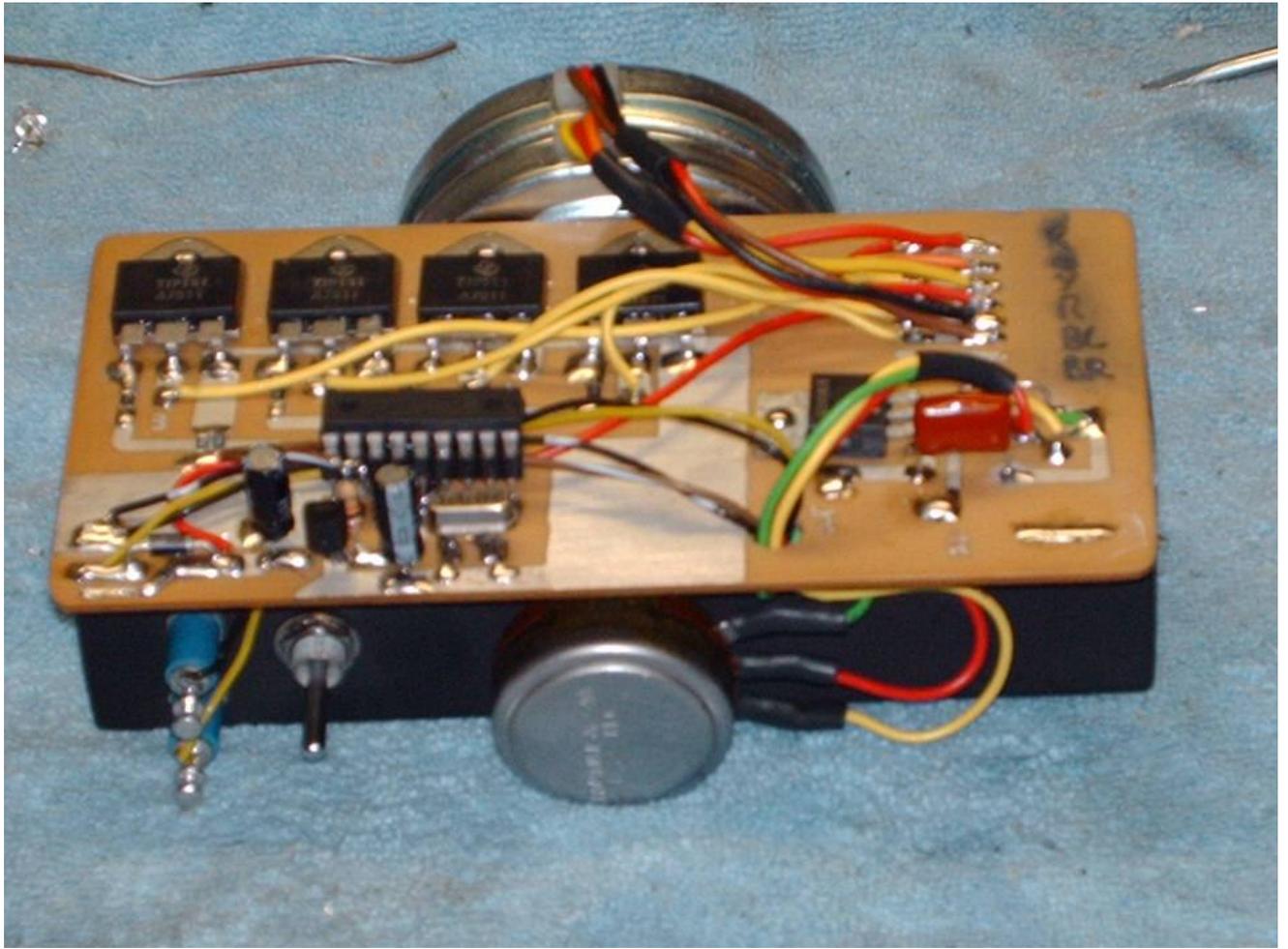
Another overview. The two terminal posts were added for the control board's **+12 VDC** and **GROUND** wires. The switch controls the time delay before the heat lamp begins lowering its intensity.



Side view. Note the rubber O-ring for the potentiometer. This allows a little bit of "play" for the potentiometer's shaft to meet the coupler, in case it doesn't properly line up.



Rear view of the stepper motor.



Completed beacon control board. The two large solder pads on the left are for the AC input to the light dimmer control.



Overview of the infrared heat lamps used. A stock one is on the left. High-temperature, black grill/stove paint is used on the back of the lamps to prevent any light from seeping through (there is alot). It also prevents the lamp from being easily seen.



Hardware from a common clip-on lamp holder, minus the reflector, will be used to position the heat lamp.



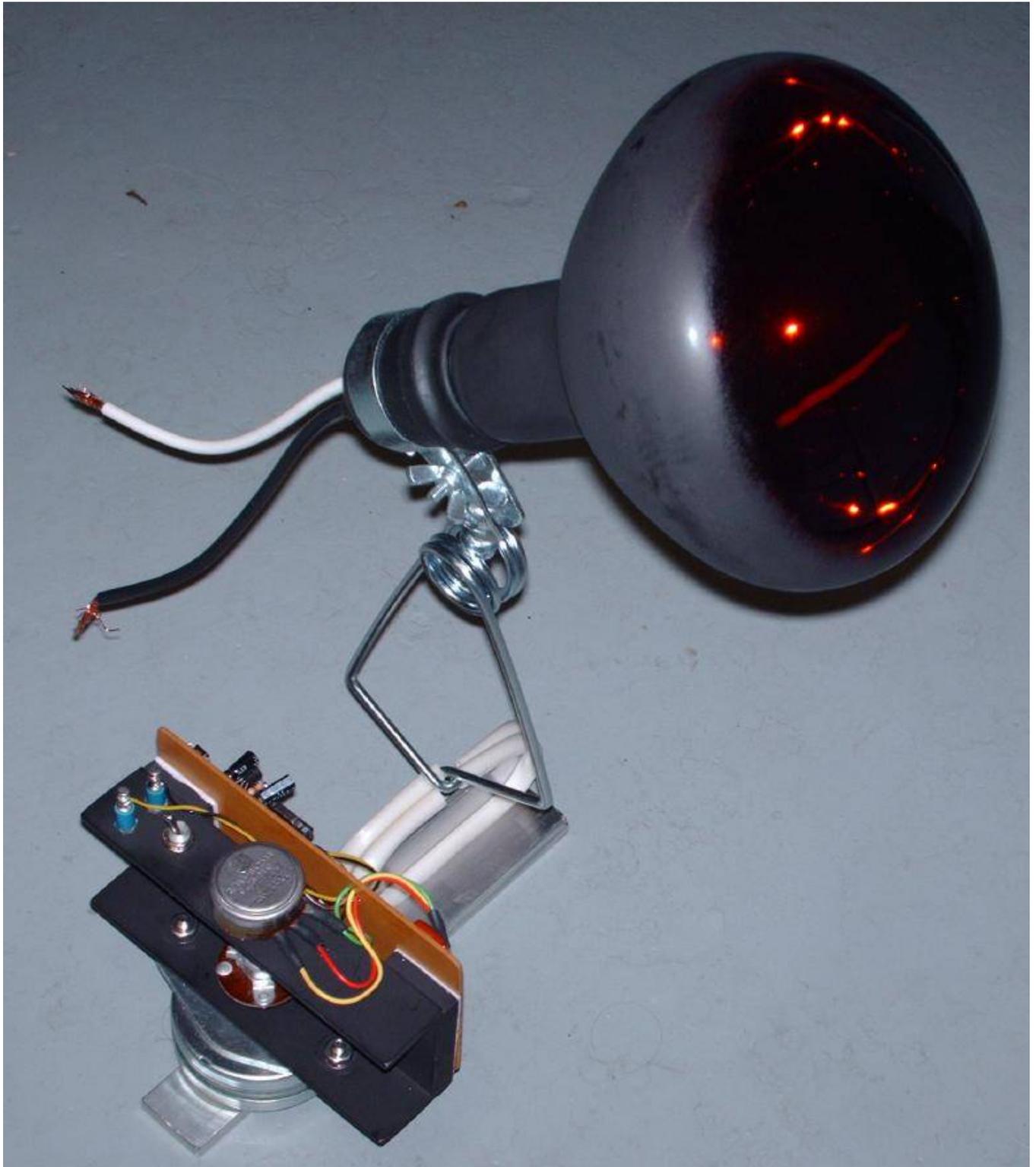
Heat lamp in operation. The visible output is a deep red.



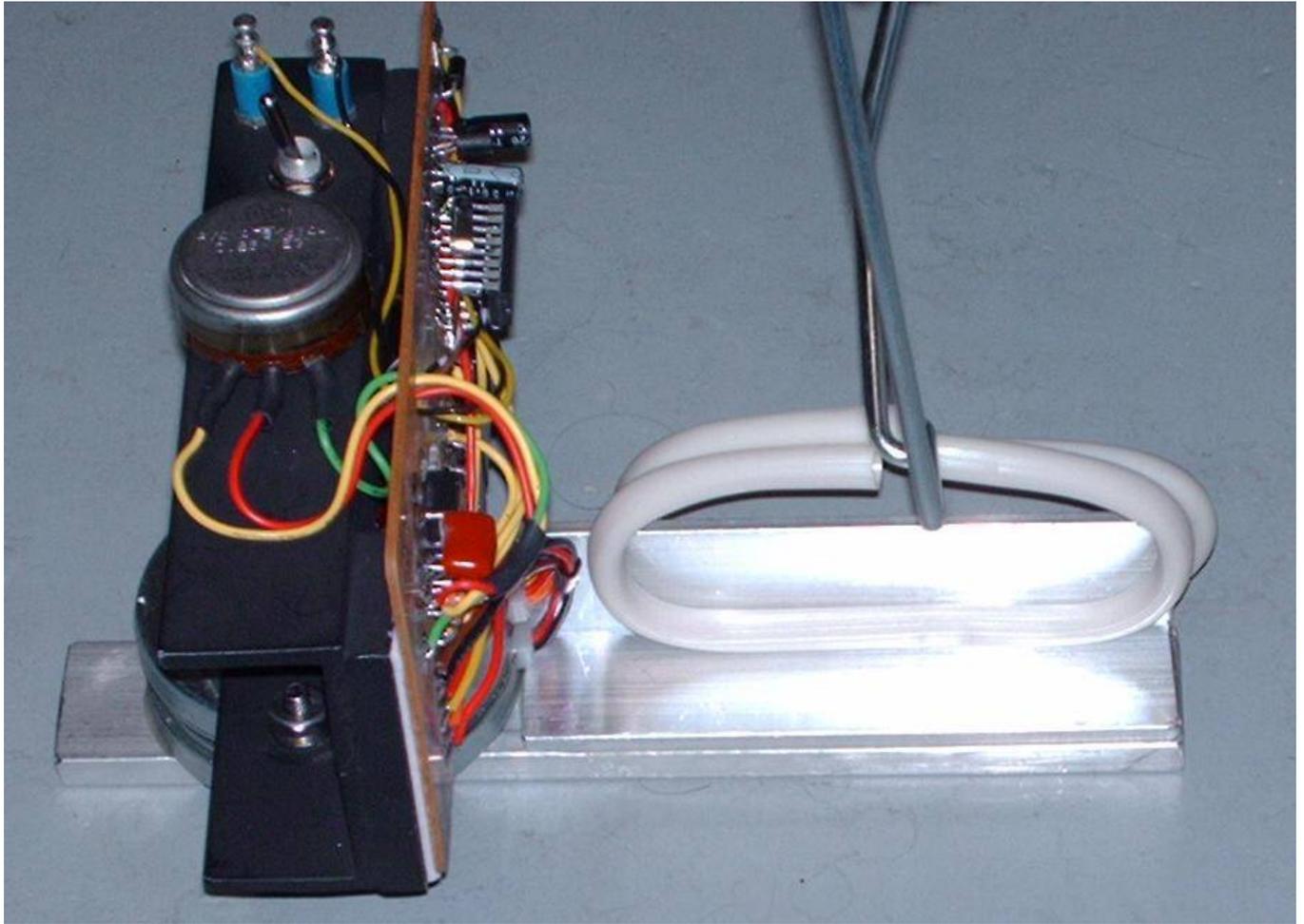
I found a neat little black rubber lamp socket at the hardware store. This will replace the stock socket on the clip-on lamp holder.



This is what the lamp holder should look like when finished.



Test setup. The clip-on lamp holder is attached to a piece of right-angle aluminum.



Closeup picture of the clip-on holder and the angle bracket.



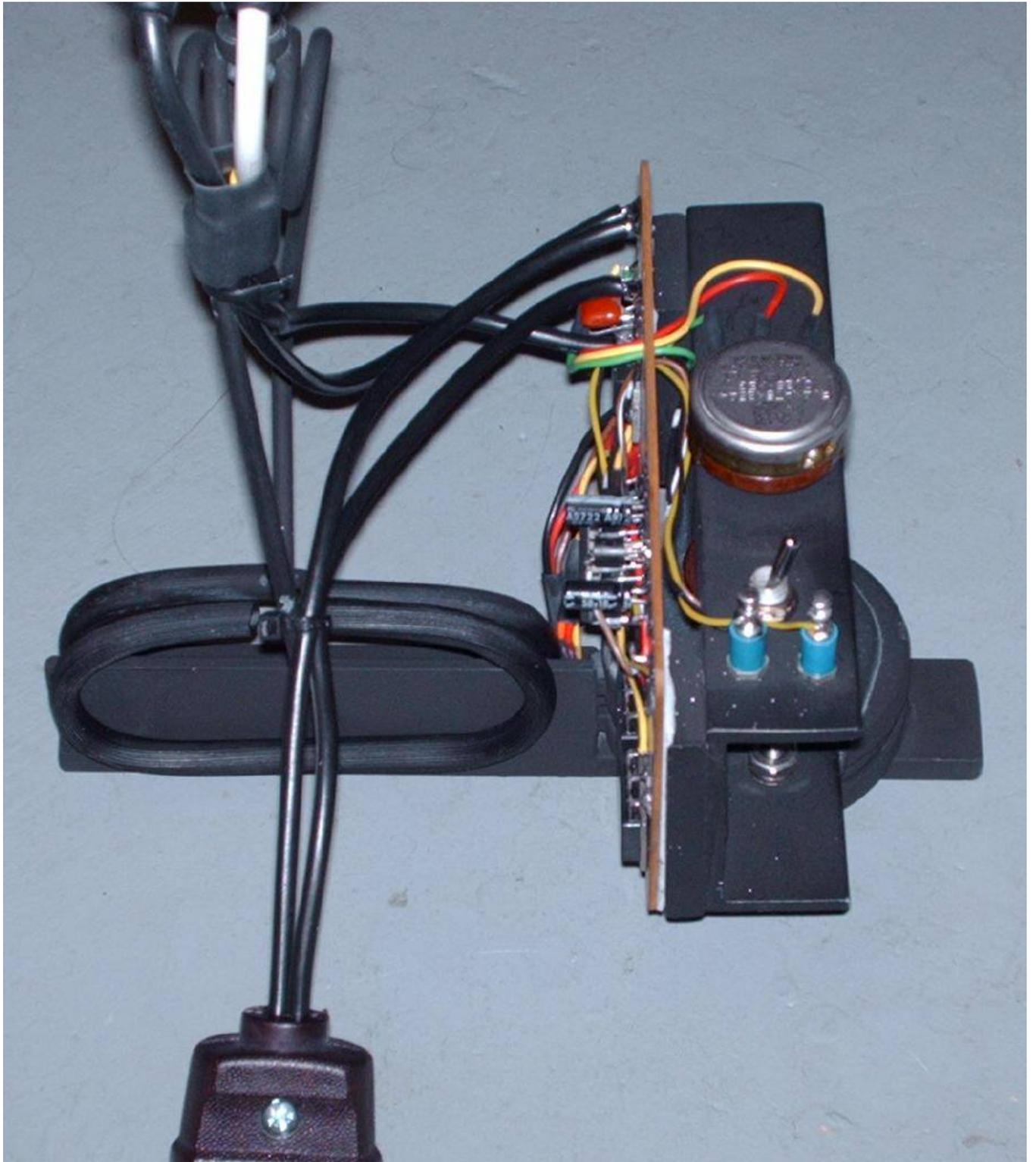
Experimental test setup. The ammo box contains a large 12 volt lead–acid battery. This will power both the beacon's control board and a 400 watt AC inverter. The AC inverter shown in the picture is a piece of junk, and only sources around 250 watts continuous. Get a good 800 watt or larger AC inverter to avoid any problems with long lamp run times. Run power to the beacon and lamp using two runs of 2–conductor "zip" wire.



Close up of the completed beacon. The cord and socket are for the lamp's AC voltage. The AC power cable goes through the dimmer switch controller then onto the heat lamp.



Side view.

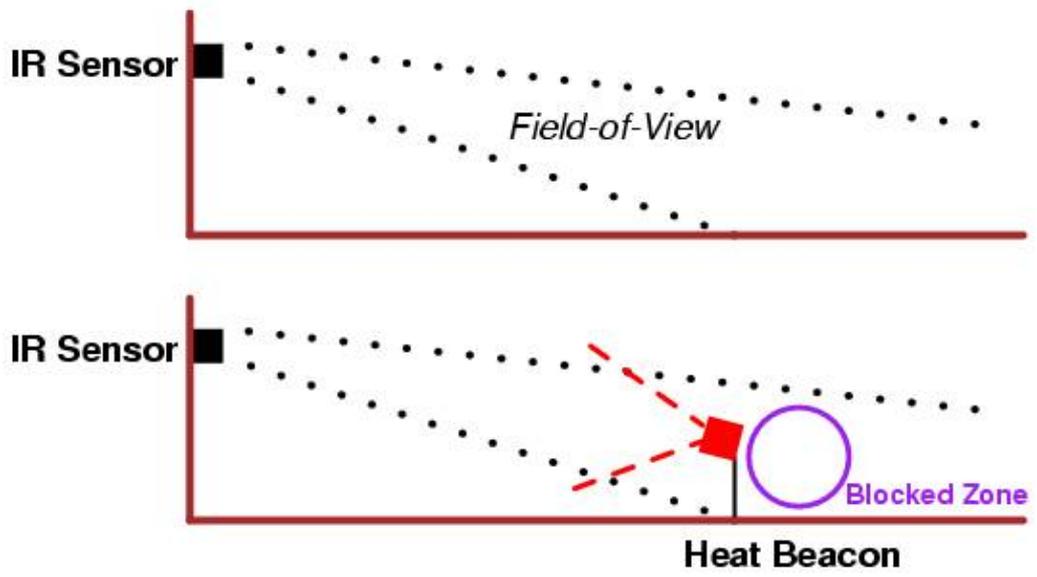


Rear view.

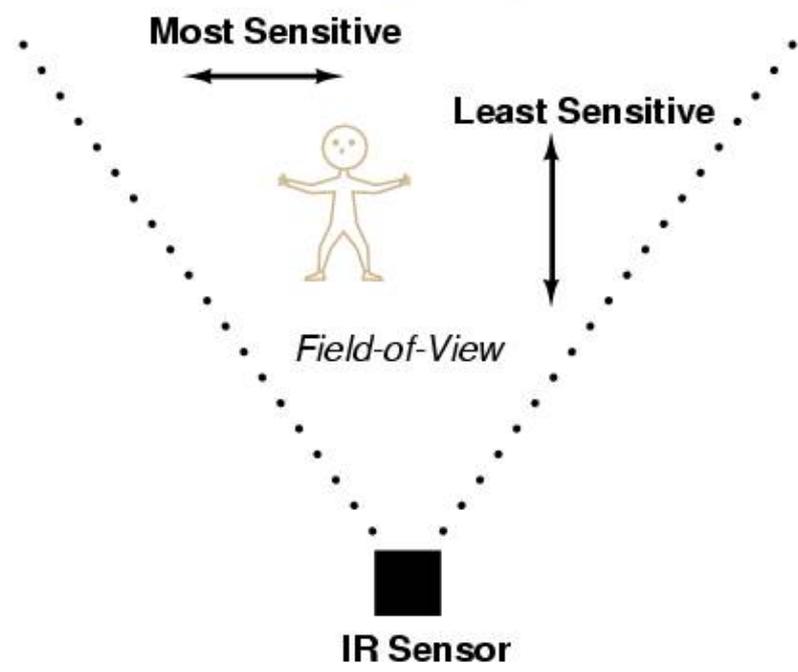


Completed infrared beacon. The flat black paint really reduces the overall visibility of the beacon.

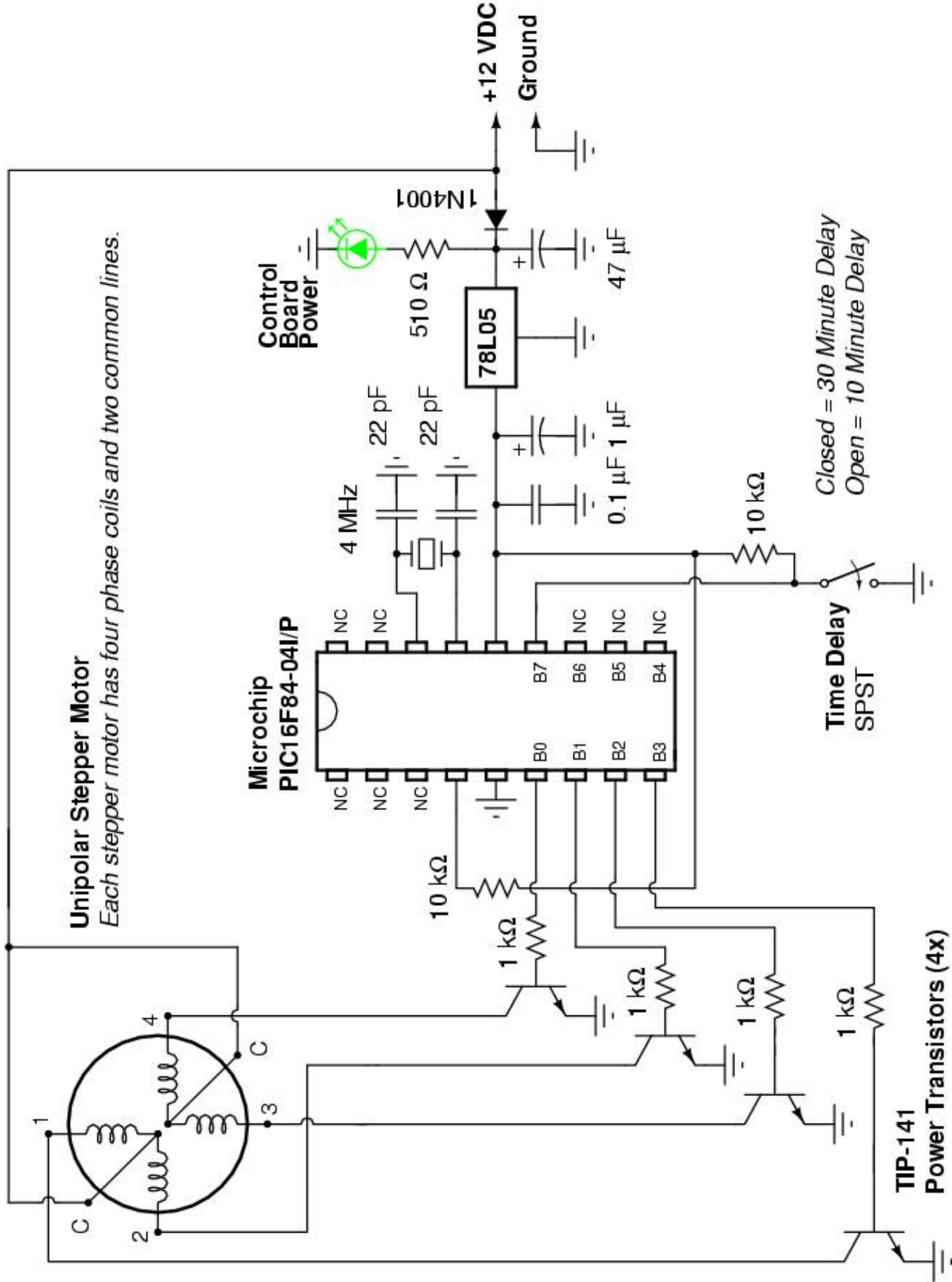
## IR Zones Side View



## Sensitivity Top View



# Infrared Heat Beacon Control



## PICBasic Source Code

```
' Heat Beacon Stepper Motor Control
'
' "Defeating Infrared Motion Sensors" - GBPPR 'Zine #23

i var Byte          ' Set variables
B1 var Byte

i = 0               ' Initialize everything to 0
B1 = 0

Pause 5000         ' Wait a bit

Poke 134, 128     ' Set Port B1-6 output, Port B7 input

For i = 1 to 11   ' Step motor 44 times, increase intensity
  Gosub Stepper1  ' 44 * 7.5 = 330 degrees of travel
Next i            ' 44 * 5 seconds = 220 seconds or 3.6 minutes

Button 7, 0, 255, 0, B1, 1, Loop1 ' Check time delay switch, if open:
Sleep 600         ' 600 seconds or 10 minutes

Loop2:
For i = 1 to 11   ' Reverse direction of pot, lower intensity
  Gosub Stepper2
Next i

Low 0             ' Power stepper motor down
Low 1
Low 2
Low 3

End              ' Touching of little boys

Loop1:           ' If time delay switch is closed:
Sleep 1800       ' 1,800 seconds or 30 minutes
Goto Loop2

Stepper1:
  Poke 6, 12     ' Output: 1100
  Pause 5000     ' Wait 5 seconds
  Poke 6, 6      ' Output: 0110
  Pause 5000     ' Wait 5 seconds
  Poke 6, 3      ' Output: 0011
  Pause 5000     ' Wait 5 seconds
  Poke 6, 9      ' Output: 1001
  Pause 5000     ' Wait 5 seconds
  Return

Stepper2:
  Poke 6, 9      ' Output: 1001
  Pause 5000     ' Wait 5 seconds
  Poke 6, 3      ' Output: 0011
  Pause 5000     ' Wait 5 seconds
  Poke 6, 6      ' Output: 0110
  Pause 5000     ' Wait 5 seconds
  Poke 6, 12     ' Output: 1100
  Pause 5000     ' Wait 5 seconds
  Return
```

## PIC16F84 Hex Code

```
:100000008C282A20A0000408A200080090002208E2
:1000100084002008272084130005181C20060319DB
:1000200024281008031D1C281608FF3E031C252841
:100030000A303C2016082528100AFF30031924280E
:10004000100B2428170825289909990C872884174C
:10005000800487289400063094190530840000300D
:100060008A00140807398207013402340434083442
:1000700010342034403480348F018E00FF308E07DE
:10008000031C8F07031C872803308D00DF304A20B4
:100090003E288D01E83E8C008D09FC30031C53285E
:1000A0008C07031850288C0764008D0F50280C18FB
:1000B00059288C1C5D2800005D28080093019200DF
:1000C0001C308E006F308F0071200F30831681043A
:1000D0008312FF3063008C07031C8D0703186A2806
:1000E0008728103094008D018C01930C920C031C16
:1000F0007F280E088C070F0803180F0F8D078D0C33
:100100008C0C910C900C940B752810088728831385
:100110000313831264000800A701A401A501A6012E
:1001200013308F0088303D20831680308600831284
:100130000130A70064000C3027020318A228D42045
:10014000A70F9A28073001209801FF3096009701E9
:100150000130990026080620A6000318CF28023097
:10016000930058305F200130A70064000C30270254
:100170000318BD28ED20A70FB5280610831606101A
:1001800083128610831686108312061183160611B9
:10019000831286118316861163008312CC280730E0
:1001A000930008305F20B3280C30860013308F0096
:1001B00088303D200630860013308F0088303D2087
:1001C0000330860013308F0088303D2009308600D0
:1001D00013308F0088303D2008000930860013302E
:1001E0008F0088303D200330860013308F00883028
:1001F0003D200630860013308F0088303D200C30C3
:0C020000860013308F0088303D2008007D
:02400E00F53F7C
:00000001FF
```

# Infrared Flashlight Modification

## Overview

This is a very simple modification to a common 16–element Light Emitting Diode (LED) flashlight which is sold at most hardware stores.

The stock flashlight has 16 white LEDs wired in parallel and is powered from three 1.5 volt "D" batteries. The internal resistance of the three batteries limits the total current draw, so the overall flashlight circuit design is very simple. Just some batteries, LEDs, wire, and a switch.

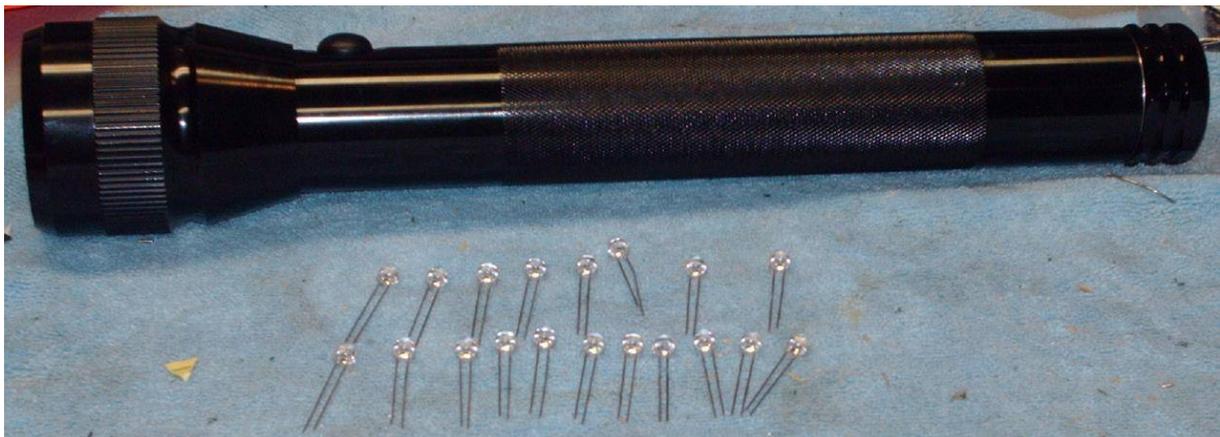
To turn this device into a useful night vision aid, all you'll need to do is replace the white LEDs with ones that transmit in the *infrared* spectrum. These are available from Mouser or Digi-Key, or you can scrounge them from old remote controls. If your wallet is big enough, Radio Shack also carries them. Be sure to get through-hole, T1-3/4 (5 mm) size, 780 nanometer wavelength (anything between 780–940 nm will work) infrared LEDs. You can also fiddle with different optical power outputs and beamwidths. Higher output power LEDs will draw more current, which will reduce the lifespan of the batteries. Lower optical beamwidths will give the flashlight a narrower focus.

After replacing the white LEDs with infrared LEDs, you'll need to then add a series 5 ohm, 2 watt resistor (or two 10 ohm, 1 watt resistors in parallel) to make up for the differences in voltage drops between the white (3.6V) and infrared (1.2V) LEDs.

That should be it. This is a handy device for taking pictures of documents covertly (with a modified CCD camera) or for adding "night vision" capabilities to a video camera. The range isn't too great, though. You can also use red LEDs instead of infrared LEDs if you wish to make a low-observable flashlight, like for map reading or signaling. Increase the series resistor value to compensate for the 1.8 volts red LEDs normally use. Battery time can be extended by "pulsing" the LEDs using a 555-timer (50 Hz, 50% duty cycle) and a MOSFET power driver controlling the LEDs in series.

When not in use, the flashlight makes a good device to bash Emmanuel Goldstein's head with.

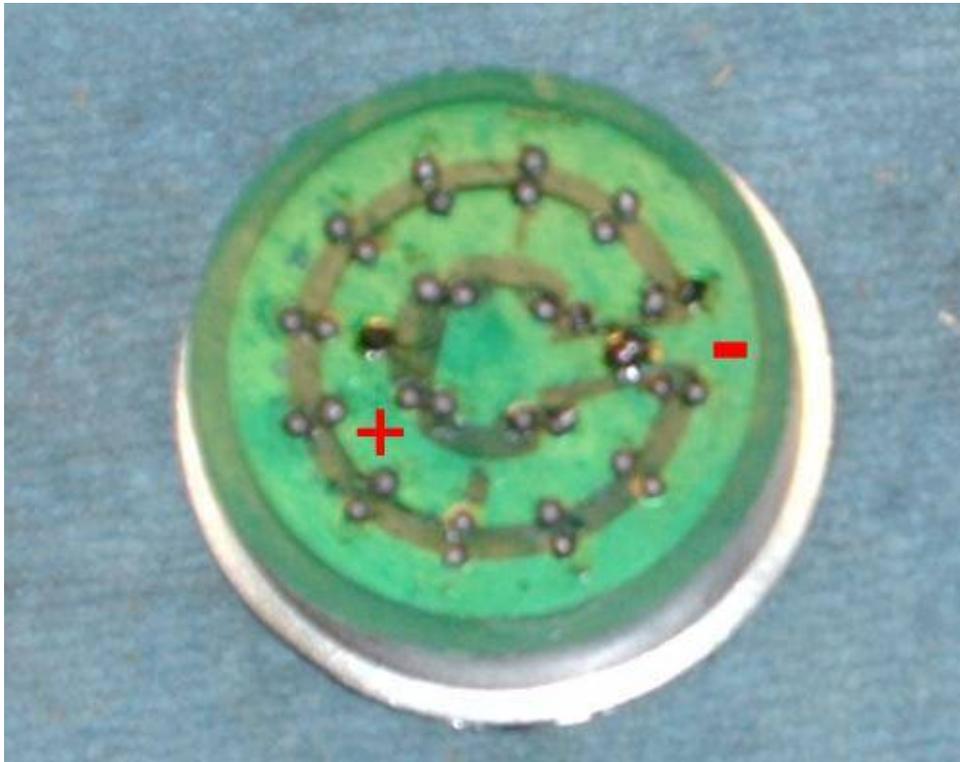
## Pictures



Overview of the stock flashlight and the new infrared LEDs which will replace the white LEDs.



Taking it apart. The reflector just slips over the LEDs. The **RED** wire is for **+4.5 VDC** from the batteries, and the **BLUE** wire is **GROUND**.



Solder side of the LED PCB. The outer ring is **GROUND** the inner ring is **+4.5 VDC**.



Picture of the plastic reflector removed from the LEDs.



Removed the old white LEDs and started inserting the new infrared LEDs. Be sure to watch the polarity on the LEDs! The "flat" side of the LED is the **GROUND**.



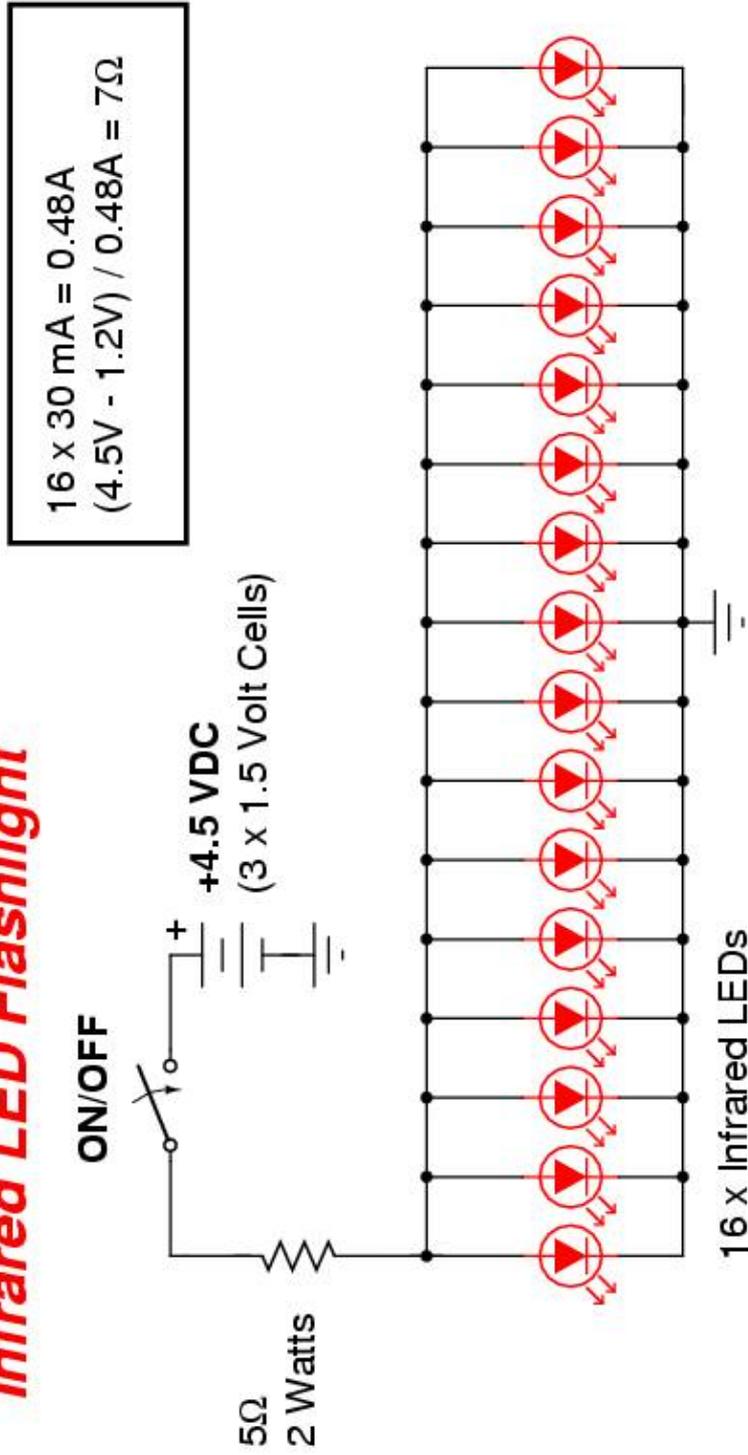
The infrared LEDs are installed and a series 5 ohm power resistor is soldered to the + ring.



Infrared flashlight in operation. Infrared light is suppressed in most CCD or video cameras, so the beam doesn't look very bright.

Schematic

# Infrared LED Flashlight



**Bonus**



**"Here's a message from Milwaukee"**

This thoughtful wife knows that the moment her husband tunes in on Schlitz the reception is good. For Schlitz has a very special taste that beer-lovers are changing to with ultra high frequency. Taste Schlitz, yourself. You'll soon know why—

Schlitz tastes so good to so many people,  
it's first in sales in the U.S.A.

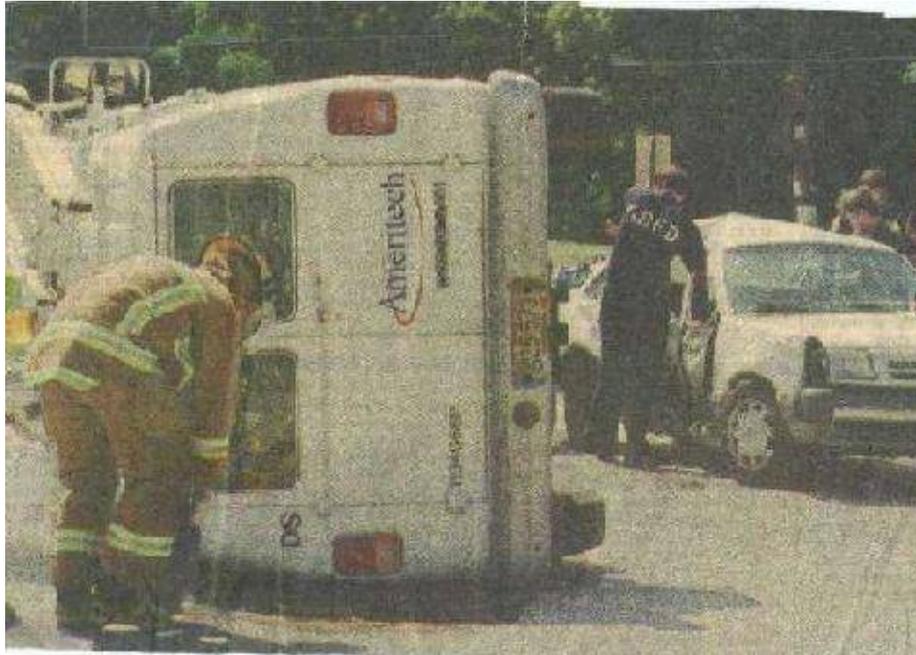
RADIO HEADLINES: "The Path of Ivy", with the Ronald Colman, Westwood, NBC.  
TELEVISION HIT: "Schlitz Rhapsody of Stars", Friday, CBS-TV.



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**The Beer that made Milwaukee Famous**

## End of Issue #23



**Any Questions?**

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### **Editorial and Rants**

*Next they'll ban certain words or even cartoons...*

#### **Council Bans Australian Flag**

January 2, 2006 – From: [www.news.com.au](http://www.news.com.au)

By Amy Coopes

The New South Wales Government has urged a Sydney beachside council to rethink its decision not to fly the Australian flag over the iconic Bondi Pavilion amid suggestions the move was inspired by racial tensions. But Waverley Council's deputy mayor said Premier Morris lemma didn't understand the facts and accused Liberal councillors of hijacking the issue for political gain.

Mr. lemma today urged the council to reconsider its 6–5 vote against flying the flag over the heritage-listed building.

"Our flag is a symbol of national unity and the council decision is just ridiculous, they want to reconsider it and reconsider immediately," he said.

"There's no excuse for anyone else to be saying 'Well, because of the incidents, the riots of two weeks ago we're not going to fly the Australian flag.' That is just ridiculous."

Waverley deputy mayor George Newhouse, who was among councillors who rejected the flag proposal, said it had nothing to do with racial tensions.

"We already fly the flag at Bondi, we proudly fly the flag at Bondi and this decision has absolutely nothing to do with racism or Cronulla. It has everything to do with practical common sense," Mr Newhouse said.

"The Pavilion is a heritage-listed building and it will cost thousands of dollars to perform a heritage study and then erect the poles, which don't exist."

"We already have the flag, we love the flag, there is no problem with the flag and as for council banning the flag, it's absolute nonsense."

Council had first voted against installing the flag in March 2005, Mr. Newhouse said.

"To raise it again in December was purely to manipulate the flag and the Cronulla racism issue," he said.

He accused Liberal councillors of taking advantage of the race riots to raise the issue of the flag again, adding: "That is truly offensive."

Greens state MP Lee Rhiannon said Waverley Council was far from shy of flying the national flag.

"I have lived in Waverley municipality all my life and have seen the Australian flag flying on the council chambers and at appropriate municipal events," Ms. Rhiannon said.

"Community tensions were running high at the time...the no-flag option is a sensible choice."

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*Oh shit...*

### **Cartoon Case: EU and UN Call Denmark to Account**

December 28, 2005 – From: [www.brusselsjournal.com](http://www.brusselsjournal.com)

By Paul Belien

The Danish cartoon case is becoming a never-ending story, which shows that freedom of speech no longer exists in Europe. After the Organisation of the Islamic Conference, the United Nations and the Council of Europe, the European Union is now the fourth multinational organisation to lash out at the Danish government for not calling a Danish newspaper to account for publishing caricatures of the Muslim prophet Muhammad.

Franco Frattini, the vice-President of the European Commission, called the publication of the twelve cartoons "thoughtless and inappropriate" in a time when animosity towards Islam is on the rise. According to Frattini, the EU Commissioner for Justice, Freedom, and Security, the cartoons foment hostility against Islam and foreigners:

"Honestly, these kinds of drawings can add to the growing Islamophobia in Europe. I fully respect the freedom of speech, but, excuse me, one should avoid making any statement like this, which only arouses and incites to the growing radicalisation."

The twelve cartoons were not all disrespectful, but Islam prohibits making pictures of the prophet. The Danish newspaper Jyllands-Posten published the cartoons last September to test the limits of free speech in multicultural Denmark.

The ambassadors of eleven Muslim countries to Copenhagen, including Bosnia and Turkey, asked Danish Prime Minister Anders Fogh Rasmussen to demand that the paper apologize to Muslims, but Rasmussen refused to interfere because the Danish government respects the freedom of speech and freedom of the press.

According to the author Robert Spencer the EU reaction shows that the EU recommends dhimmitude: "Instead of praising Rasmussen for his defense of Western values of free speech, the EU is demanding that he stand down and adopt their policy of appeasement." What the whole affair has so far proved is that Denmark is one of the last Western countries where freedom of speech still exists.

"I am a Catholic myself, and if anyone had created a drawing of a holy Christian symbol with a bomb and a message about death, I would personally take it as an insult," Frattini said. Does he really? Frattini became European commissioner last year because the European Union vetoed the Catholic Rocco Buttiglione because as a Catholic the latter disapproved of homosexuality and abortion.

Meanwhile, the UN has taken its action against Denmark a step further by asking the Danish Prime Minister for "an official explanation." Doudou Diene, a Senegalese investigator appointed by the UN Human Rights High Commissioner Louise Arbour, has asked the Rasmussen government to respond to the question: "Do the caricatures insult or discredit?" Copenhagen is expected to present the UN its "official view" on January 24.

Diene emphasized that the UN are taking the matter very seriously because, he says, "Islamophobia is the greatest component of discrimination within Europe." Earlier on, the Canadian Arbour had stated in a letter to the Organisation of the Islamic Conference that the cartoons were "an unacceptable disrespect."

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*More proof things like the Kyoto Treaty are just scams to steal jobs from the U.S.*

## **Global Warming: Blame the Forests**

January 12, 2006 – From: [www.guardian.co.uk](http://www.guardian.co.uk)

By Alok Jha

They have long been thought of as the antidote to harmful greenhouse gases, sufferers of, rather than contributors to, the effects of global warming. But in a startling discovery, scientists have realised that plants are part of the problem.

According to a study published today, living plants may emit almost a third of the methane entering the Earth's atmosphere.

The result has come as a shock to climate scientists. "This is a genuinely remarkable result," said Richard Betts of the climate change monitoring organisation the Hadley Centre. "It adds an important new piece of understanding of how plants interact with the climate."

Methane is second only to carbon dioxide in contributing to the greenhouse effect. "For a given mass of methane, it is a stronger greenhouse gas, but the reason it is of less concern is that there's less of it in the atmosphere," said Dr. Betts.

But the concentration of methane in the atmosphere has almost tripled in the last 150 years, mainly through human-influenced so-called biogenic sources such as the rise in rice cultivation or numbers of flatulent ruminating animals. According to previous estimates, these sources make up two-thirds of the 600m tonnes worldwide annual methane production.

Frank Keppler, of the Max Planck Institute for Nuclear Physics, who led the team behind the new research, estimated that living plants release between 60m and 240m tonnes of methane per year, based on experiments he carried out, with the largest part coming from tropical areas.

David Lowe, of the National Institute of Water and Atmospheric Research in New Zealand, said the new work, published in *Nature*, is important for two reasons. "First, because the methane emissions they document occur under normal physiological conditions, in the presence of oxygen, rather than through bacterial action in anoxic environments," he wrote in an accompanying article. "Second, because the estimated emissions are large, constituting 10–30% of the annual total of methane entering Earth's atmosphere."

Yadvinder Malhi, a specialist in the relationship between vegetation and climate at Oxford University, said the plant source of methane had probably been missed in the past because scientists have a poor understanding of the way methane circulates in the atmosphere. "There are a variety of sources and sinks of methane and there are huge error bars on those terms," he said. "What's been uncertain is where the methane is coming from and where it's going. Unlike carbon dioxide, methane is much more dynamic; it lasts about 10 years in the atmosphere."

Biogenic methane has traditionally been assumed to come from organic materials as they decompose in oxygen-free environments. But Dr Keppler found plants emit the gas even in normal, oxygen-rich surroundings: between 10 and 1,000 times more methane than dead plant material. When the plants were exposed to the sun, the rate of methane production increased. "Until now all the textbooks have said that biogenic methane can only be produced in the absence of oxygen," Dr Keppler said. "For that simple reason, nobody looked closely at this."

The discovery sheds further light on the complex relationship between greenhouse gases and the environment. "If you're after predictions of global average temperature, it won't make a huge amount of difference," said Dr Betts. "But it shows how complicated it is to exactly quantify reforestation or deforestation in comparison with current fossil fuel emissions."

It will also intensify debates on whether targets in climate change treaties such as the Kyoto Protocol should be based entirely on carbon emissions, which are easily measured, or also take sinks into account, which remove carbon from the atmosphere but are more difficult to measure.

For climate scientists, the new work clears up a few unexplained features in the environment.

"The rate of methane increase in the atmosphere has slowed down in the last 10 years and there was no really convincing explanation of why that's been going on," said Dr Mahli. "This paper argues that tropical deforestation may be a factor there."

In addition, the new research could help to explain the source of plumes of methane observed by satellites over tropical forests. "The sheer biomass of the forest may be a factor there," said Dr Mahli.

The fact that plants produce methane does not mean that planting forests is a bad idea, however. "Putting a tree where there was no tree before locks up a lot of carbon and this [new research] perhaps reduces the overall benefit of that by a fraction," said Dr Mahli.

Some mysteries remain: how and why plants produce methane is unclear. Dr Keppler's team said the search for an answer is likely open up a new area of research into plant biochemistry.

Other surprise results:

### **Tree Planting**

Researchers in North Carolina found that planting trees to soak up carbon dioxide can suck water and nutrients from the ground, dry up streams and change the soil's mineral balance.

### **Aerosols**

A recent study in Nature found cutting air pollution could trigger a surge in global warming. Aerosols cool the Earth by reflecting radiation back into space. Scrapping them would have adverse consequences.

### **Global Dimming**

In 2003 scientists noticed levels of sunlight reaching the Earth's surface had dropped by 20% in recent years because of air pollution and bigger, longer-lasting clouds.

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*Remember: These people are heros to \$2600 Magazine.*

### **Student Killed "For Refusing to Convert to Islam"**

January 4, 2006 – From: [www.lse.co.uk](http://www.lse.co.uk)

LIFE STYLE EXTRA (UK) – A heartbroken mother today described how her son was executed after he refused to convert to Islam.

Accountancy student Adrian Marriott was shot by a rival gang five times in the head at close range in June 2004, a few weeks before his 21st birthday.

Three members of the gang, known as the 'Muslim Boys', were accused of plotting the murder after trying to convert Adrian, a member of south London's 'Peel Den Crew', to Islam.

But Marcus Archer, Aaron Irving-Simpson and Marlon Stubbs, all 24, were found not guilty of conspiracy to murder at the Old Bailey after the prosecution offered no evidence.

Speaking at an inquest at Southwark Coroner's Court, the victim's mother, Ruth Marriott, said she heard her son being gunned down in the park where he walked his dog.

She said: "We heard the shooting. We heard gun fire. The thought did strike me that Adrian could be involved, but it was a fleeting thought. Then we heard from police the following evening what had happened.

"Adrian was told on the Sunday prior to his death that he would be killed if he did not become a Muslim by the Wednesday, which was the day he died."

Asked by Coroner John Sampson whether Adrian had taken the threat seriously she added: "I do not think he did."

Struggling to hold back tears she said the last time she had seen her son was in the afternoon on the day before he was killed.

She said: "He was happy. He was pestering me to order something for him out of my catalogue."

She added that Adrian loved his family very much.

She said: "He liked music and football, but Adrian was very much a family man. He also loved his dog. They would go out together regularly to the park that he died in."

Adrian was found in Barrington Road, Brixton. A post mortem revealed he had died from multiple firearms wounds to the head. The coroner today recorded a verdict of unlawful killing.

He said: "He was found dead having clearly been subjected to an attack with a firearm. I'm going to conclude that he was unlawfully killed."

Detective Sergeant John Stafford, of Operation Trident, who led the murder hunt, told the inquest that Adrian's murder was still under investigation.

He said: "It does indeed remain a live matter. We are effectively reviewing what happened at court and still keen to talk to witnesses."

During the trial in September 2005, the jury were told that Stubbs and Archer had professed to have a 'missionary zeal' for converting people to Islam and had targeted Adrian, his sister Tara and her friend Jade Okai.

The two women had agreed to become Muslims, had made a declaration of faith and had been given hijabs, or headscarfs, the court was told.

But Adrian, of Swinford Gardens on the Angel Town Estate in Brixton, had fallen out with the men, claiming he was threatened and had had a £500 'tax' demanded from him.

After the three were formally acquitted of conspiracy to murder, Archer was jailed for eight years for firearms offences he had admitted earlier.

It was also revealed to the jury that Stubbs is currently serving a four year prison sentence for rape.

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*Canadians are savages. I hope they don't export their brand of terror to the U.S. I'll bet you 100 dead baby seals that this was part of some "honor killing" bullshit.*

### **Husband Who Paid for Arson Attack That Killed 2 Calgary Children Convicted**

January 19, 2006 – From: [www.cbc.ca](http://www.cbc.ca)

Abdulazziz Ellahib, the man who ordered an arson attack that killed two young Calgary children has been found guilty of manslaughter, but a judge has found his wife not guilty.

The case involved an affair between the father of the children and the wife of the man convicted of the crime. Two crack addicts who carried out the firebombing testified during the trial that they were each paid \$60 to set fire to the house.

Ellahib was also found guilty of arson causing bodily harm in the case. His wife, Manar Hussein, was found not guilty on charges of manslaughter and arson causing bodily harm.

Six-year-old Ali al-Mayahi and his four-year-old sister Saja died on Nov. 18, 2004 when a fire started by a Molotov cocktail tore through their Calgary condominium.

Their mother Salima Barih jumped from the second-storey of the home after not being able to reach her children; their father Tahsin al-Mayahi wasn't home at the time.

Michael Sheets and Fernum Kezar both pleaded guilty to manslaughter and arson charges, and have been sentenced to 15 and 16 years in prison.

Crown Attorney Gordon Haight argued that Ellahib hired Sheets and Kezar to set fire to the home, because Tahsin al-Mayahi had an affair with his wife, Manar Hussein, and was speaking badly of her within the Iraqi community.

Al-Mayahi testified that Hussein became angry when he broke off their relationship. Barih testified that Hussein had threatened her family.

Ellahib's lawyer Alain Hepner argued his client only hired Sheets and Kezar to assault al-Mayahi, and had no knowledge of the fire. Both Hussein and Ellahib denied there had been an affair.

Hussein, at the request of Ellahib, took Sheets and Fernum money after the incident, but says she didn't know what it was for.

Sheets and Kezar testified they called Ellahib for confirmation that no one would be home before they set the fire. Testimony showed calls to Ellahib's cell that night went to voice mail.

A third man, Tony DeWitt who the Crown said gave the two men the money to buy gas to make the Molotov cocktail, was found not guilty on a charge of arson.

Ellahib will be sentenced March 3.

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*Bill Gates making money off other peoples ideas: Bad  
Kevin Rose making money off other peoples ideas: Good*

## **Geeks Are Jerks**

January 10, 2006 – From: [damagedintransit.com](http://damagedintransit.com)

Recently Digg.com has been attacking Steve Mallette. They thought that Steve Mallette copied code from digg into his ipod website projects. But in fact he had used an open source digg clone called Pligg. But no one even checked on this. But in fact Pligg is not to blame either! Why? Because Pligg is based on another open source project in Spanish called Meneame.

So digg users decided to attack him with many blog posts and attacks on his personal character.

Digg is out of control. Giving this much power to greedy 12 year olds won't work. The whole "web 2.0 – Ajax – ruby on rails" crap is just that, crap. Digg won't revolutionize the Internet. I use slash dot for all my geeky news because I know it's trustworthy. If they run an article on Steve Mallett they will say they don't know if it's true or not. They won't attack his personal character.

True geeks won't use digg. Why? Because not only is digg full of crappy blog posts and links to sites with no relation to technology but because it is moderated wrong. Removing posts related to Godaddy's hosting package because diggnation has them as a sponsor is stupid. It only protects their podcast. If they want money why don't they make diggnation part of the digg.com company and use some of the 2.8 million they got from VC's to support the show. Deleting a post which was freespeech against Godaddy is like deleting a post that supports George Bush off of cnn.com.

Digg.com is owned by Kevin Rose an ex member of The Screensavers on the old TechTV. He has made IPTV shows like The Broken and systm but recently it looks like his "hacker ethic" has turned into I want money and I will step on all of you.

---

*More Democrat voter fraud. Don't count on Manny Golddigger mentioning this!*

## **Tire-Slashing Boasts Recalled**

January 11, 2006 – From: [www.jsonline.com](http://www.jsonline.com)

By Derrick Nunnally

The key state witness in the election day 2004 tire-slashing trial testified Wednesday that the five defendants had all come into his office "excited, kind of boisterous" that morning to brag about vandalism that stranded 25 vans Republicans had planned to use for taking voters to polls.

"I believe they were telling me they had gone to Bush-Cheney headquarters from the office and punctured the tires of the vans in the staging area," said Opel Simmons III, a Virginia consultant to the Democratic Party who was in Wisconsin for the last days of the campaign.

He was referring to the five local campaign workers – including the sons of two prominent Milwaukee Democratic politicians – now charged with felony property destruction. Sowande Omokunde, son of U.S. Rep. Gwen Moore (D-Milwaukee); Michael Pratt, son of former Acting Mayor Marvin Pratt; and Lewis Caldwell, Lavelle Mohammad and Justin Howell face up to 3 1/2 years in prison and fines of up to \$10,000 if convicted.

Opening statements by some of the defense attorneys had suggested that Simmons might have been more involved in the tire-slashings – either by planning or by participation – than he let on and blamed him and other out-of-state Democratic campaigners for inflaming election-season emotions.

Simmons didn't start out being so cooperative. He was arrested by Milwaukee police later on Nov. 2, 2004, and held for two days before he was released and returned to Virginia. He said Wednesday that he initially told police "a very vague variation of the truth" until he was confronted with evidence from the investigation.

"I didn't want to mention any of the guys," said Simmons, who later gave a complete, video-recorded statement to Assistant District Attorney David Feiss that has become a significant part of the case against Simmons' former campaign co-workers.

His testimony is important because there is no eyewitness, confession or direct evidence linking the five men to the tire-slashings. Instead, Feiss has built a case that leans heavily on getting jurors to believe that Simmons and another operative who came to Milwaukee to work on the election, Levar Stoney, are truthfully repeating what they heard the defendants say around the time the tires were cut.

On direct examination by Feiss, things went by the numbers. Simmons recounted many details close to verbatim from his earlier statements.

The defendants came into Simmons' office, he testified, swapping high-fives and making sounds like air spurting out of tires. He quoted statements by Pratt, Mohammad and Caldwell the same way he had earlier.

"(Pratt) says, 'We've got 'em. They're not going anywhere today,' " Simmons said.

Later on election day, he testified, he met again with Mohammad, who was pointing to an online news story about the tire-slashings.

"He said that he should print out a copy of the article and frame it," Simmons said.

### **Gaps in Testimony Noted**

But cross-examination brought out several inconsistencies between Simmons' trial testimony and his earlier statements. Pratt's attorney, Rodney Cubbie, quizzed Simmons about withholding information from initial statements to police, but changing the story as he remained longer in custody and was confronted with more evidence.

Cubbie pointed out that Simmons said Wednesday that the defendants had mud on their shoes from the van parking lot in the 7100 block of W. Capitol Drive, a detail he hadn't mentioned before. He noted that Simmons had told investigators that another campaign worker, Lashaunda Joy Williams, had been asleep in the Democratic Party office since before the defendants left, yet a gas-station receipt found in a rental car she was later pulled over in – because its license number had been written down by the Republicans' security guard – said someone had bought gas in that car at 3:30 a.m., about the time of the tire-slashings or shortly afterward.

When testimony finished for the day Wednesday, Robin Shellow, who represents Omokunde, was beginning to quiz Simmons on how much his workers had been doing to incite extraordinary enthusiasm in the election.

Simmons had testified that he didn't go to the police as soon as the defendants admitted the tire-slashing to him because he feared Republicans would counterattack, and said Democratic campaigners had been subject to "harassing" behavior, including having their vans followed, a worker "nearly arrested" for either loitering or jaywalking near Democratic offices, and frequent ticketing of campaign vehicles.

"Unfortunately, in Milwaukee, we're all ticketed frequently," Shellow replied.

Simmons' testimony is scheduled to continue today.

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↑  
How animals treat  
their Children  
How Muslims treat  
their Children  
→

A Shiite Muslim man holds his son as another man in the left slashes his head with a razor during the annual ritual to mark Ashoura Day in the southern Lebanese town of Nabatiyeh, on Thursday, March 13, 2003. Thousands of Shiites in south Lebanon marked the 7th century death of their most revered saint Imam Hussein, by slashing their heads with blades on the occasion known as Ashoura. Al Hussein was a grandson of Islam's Prophet Mohammed and is a symbol of martyrdom for Shiite Muslims. People take their children to hairdresser who ritually slashes the children's forehead with a razor, and after the blood is spread by hitting the wound. (AP Photo/Mohammed Zaatari)

## Green Power-South African Style

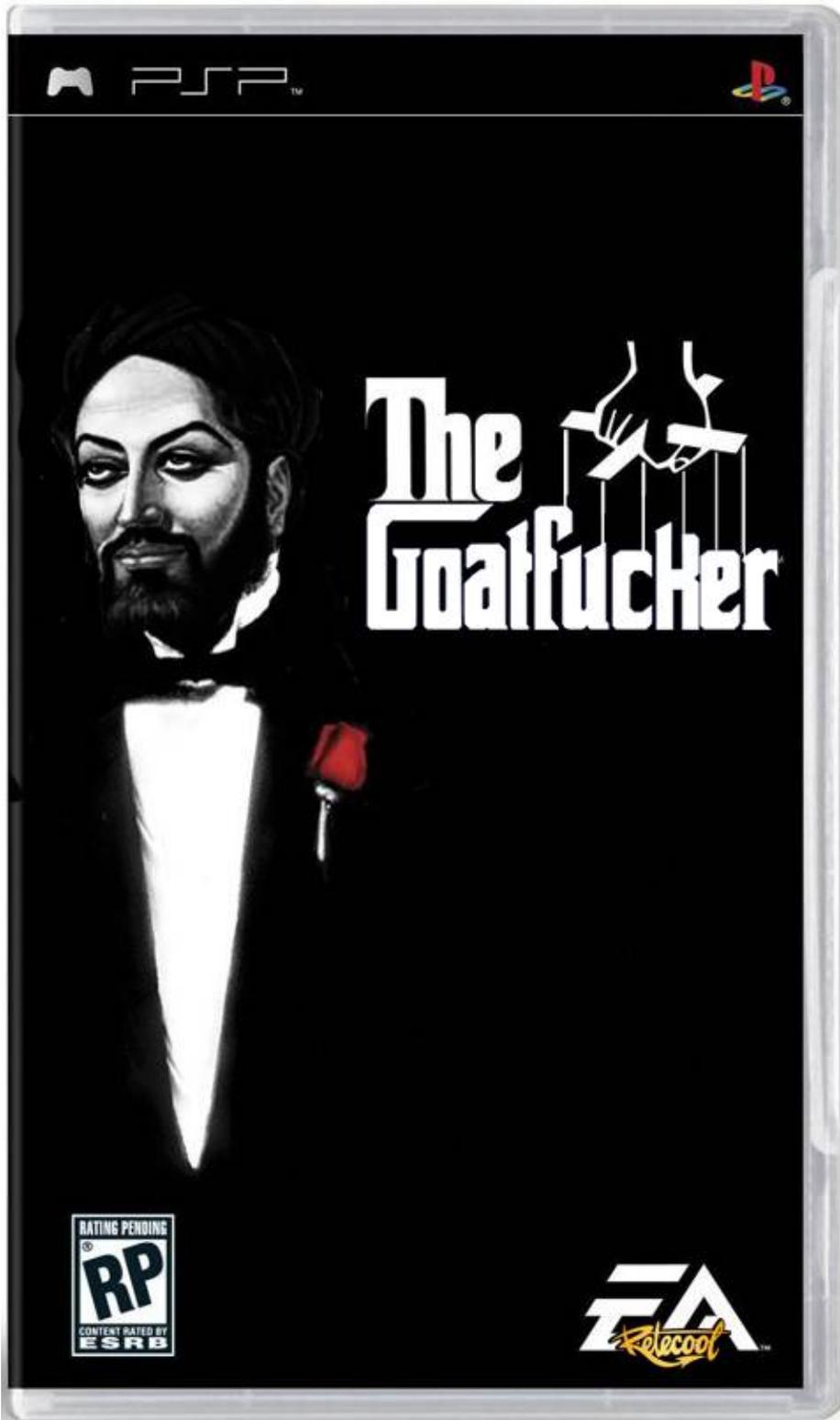
### Green power

SPENDING fever has reached all walks of South African life. Here's a fellow who lives in a squatter camp beyond Somerset West in Western Cape who now

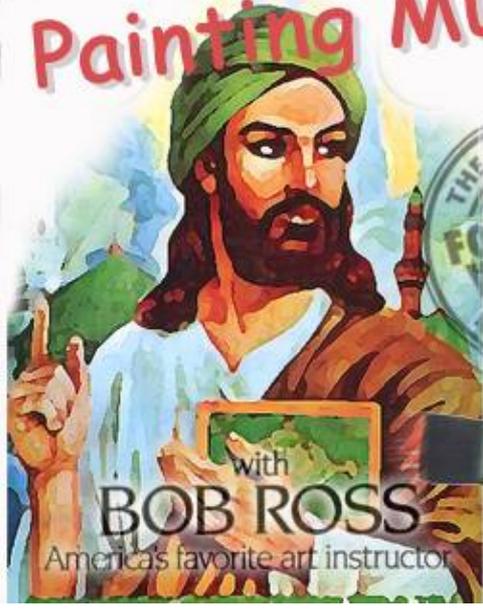
wants a television set — a new one, mind, not that second-hand thing in the pawn-shop window — so he buys one from the High Street furniture retailer.

But he's back next day, saying the thing keeps switching off just at the crucial moment. The shop checks it out and can find nothing wrong, but soon enough he's back with the same complaint.

This time the shop sends out a technician to pop round to see what the problem is. When the technician gets there, he discovers our guy's shack draws its electricity from a nearby traffic light, and that the TV only works when the light is green.



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