

TEL TONE®

INNOVATING SOLUTIONS

Technical Practice Section 106-211UL

Installer's Aid

Issue 1, April 15, 1991

M-106

Remote Service Access Unit

SECTION 106-211UL

Issue 1, April 15, 1991

This Installer's Aid provides step-by-step instructions for the installation and testing of a TELTONE® M-106* Remote Service Access Unit, Issue 2. Perform each applicable step in sequence, checking it off before proceeding to the next applicable step. Refer to Teltone Technical Practice 106-120 for FCC Part 68 requirements and additional information.

Note: If several M-106's are to be installed at once, installing and testing them one at a time helps guard against repeated mistakes.

Preliminary Procedures

- ☐ 1. Assure that the battery supply is -50 ± 6 VDC (M-106-01 and M-106-05) or -24 ± 4 VDC (M-106-02 and M-106-06).
- ☐ 2. Assure that the site selected for the M-106 is within cable range of the telephone company installed USOC wall jacks and the PBX/KTS terminal strip.
- ☐ 3. If the installation incorporates a remote Night Transfer Switch, or if the Seize Feature is implemented to start and stop equipment connected to the M-106, run leads from these devices to the PBX/KTS terminal strip or another convenient location.

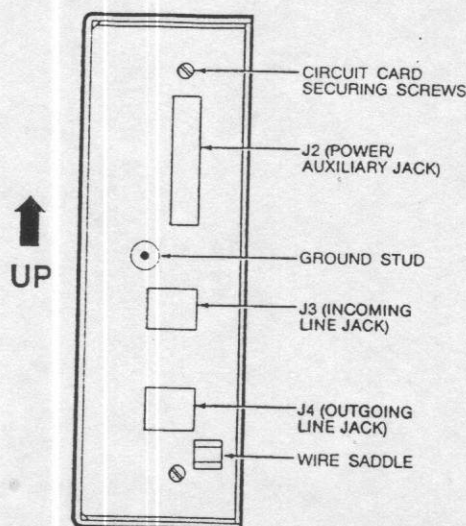


Figure 1 Housing Rear Panel

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*The M-106 is manufactured under U.S. Patent 3,961,141.
Other patents pending.

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CAUTION

MOS DEVICE. MAY BE
DAMAGED BY STATIC DISCHARGE.
OBSERVE HANDLING PRECAUTIONS.

Table 1 Option Switch Settings

| SWITCH | POSITION | FUNCTION |
|---|----------|--|
| S1-1 | ON | Disables the Tone-to-Pulse Converter (Note 1) |
| | OFF | Enables the Tone-to-Pulse Converter |
| S1-2 | ON | Enables Early Line Split operation |
| | OFF | Disables Early Line Split operation |
| S1-3 | ON | Tone-to-Pulse Timer sets/resets for 8 seconds (see also S1-5) |
| | OFF | Tone-to-Pulse Timer sets/resets for 16 seconds (see also S1-5) |
| S1-4 | ON | Converter shut down by # keyed for less than one second (Note 2) |
| | OFF | Converter not shut down by a keyed signal |
| S1-5 | ON | Tone-to-Pulse Timer starts when first digit is detected |
| | OFF | Tone-to-Pulse Timer starts when Outgoing Line is seized |
| S1-6 | ON | Disables the Simulated Switchhook Flash Feature (Note 2) |
| | OFF | Enables the Simulated Switchhook Flash Feature (Note 3) |
| S4 (10 Sections) | (Note 4) | Converter Shutdown After First Digit |
| NOTES: 1. If S1-1 is set to ON, only S1-6 is operational. The remaining four sections of S1, and all ten sections of S4, have no effect. 2. If S1-6 is set to ON, either # or * keyed for less than one second shuts down the Converter. 3. This feature requires that the M-106 be connected either as a PBX/KTS station or on a CENTREX line with call transfer capabilities. 4. Each section set to ON causes the corresponding digit (section 10 = digit 0) to shut down the Converter, whenever that digit is the first digit received after validation of the Security Code. | | |

Table 2 Lorain Repeater Sensitivity Adjustments

| OPTION | CHANGE IN TURN-ON LEVELS (dB) | | TYPICAL 1kHz TURN-ON LEVELS (dBm) | |
|--------|-------------------------------|--------------|-----------------------------------|--------------|
| | CALLED SIDE | CALLING SIDE | CALLED SIDE | CALLING SIDE |
| 1 | - | - | - 44 | - 44 |
| 2S | - 2 | + 4 | - 42 | - 48 |
| 2O | + 4 | - 2 | - 48 | - 42 |
| 3S | - 3 | + 7 | - 41 | - 51 |
| 3O | + 7 | - 3 | - 51 | - 41 |

M-106 Circuit Card Adjustments

4. Using Figure 1 as a guide, unscrew the two screws which secure the M-106 card to the rear panel of the housing, unlock and detach the front panel of the housing, and then remove the card.
 5. Inspect the card to assure that it is undamaged. Then compare the card with Figure 2 to assure that it is correct for the application:
 - The M-106-01 and M-106-05 contain the -07 card, designed for use with -48 VDC battery supplies and are identified by the large 200-ohm resistor located near the heat sink.
 - The M-106-02 and M-106-06 contain the -08 card, designed for use with -24 VDC battery supplies and are identified by the small 0-ohm resistor or insulated jumper located near the heat sink.
 - The M-106-01 and M-106-02 also contain a factory-installed Lorain Products voice frequency repeater.
- Warning:** M-106 units may be damaged if used with battery supplies for which they were not designed.
6. Using Table 1 as a guide, set option switch packages S1 and S4 as required by the application.

Lorain Repeater Adjustments

(M-106-01 and M-106-02 Only)

7. Detach the Lorain repeater by removing the panhead screw located on the back of the M-106 card and then lifting the vertical card contacts from J1.
8. Adjust the gain of the repeater by setting the four switches on the small repeater card attached to one end of the main repeater card. See Figure 3. These switches provide gains of 1, 2, 4, and 8 dB respectively. For example, if the switches are set as shown in Figure 3, the gain of the repeater is 4 dB plus 8 dB, for a total of 12 dB.

Note: The repeater automatically reduces the gain when input signals become large enough to exceed -9 dBm after amplification at the programmed gain. If the input signal is -9 dBm or greater, the gain of the repeater is 0 dB.

9. Adjust the sensitivity of the repeater by positioning the movable jumper on the small repeater card. For the turn-on level change associated with each position, see Table 2.

Note: Sensitivity adjustments do not affect turn-on levels above about -40 dBm.

10. Reattach the repeater to the M-106 card.

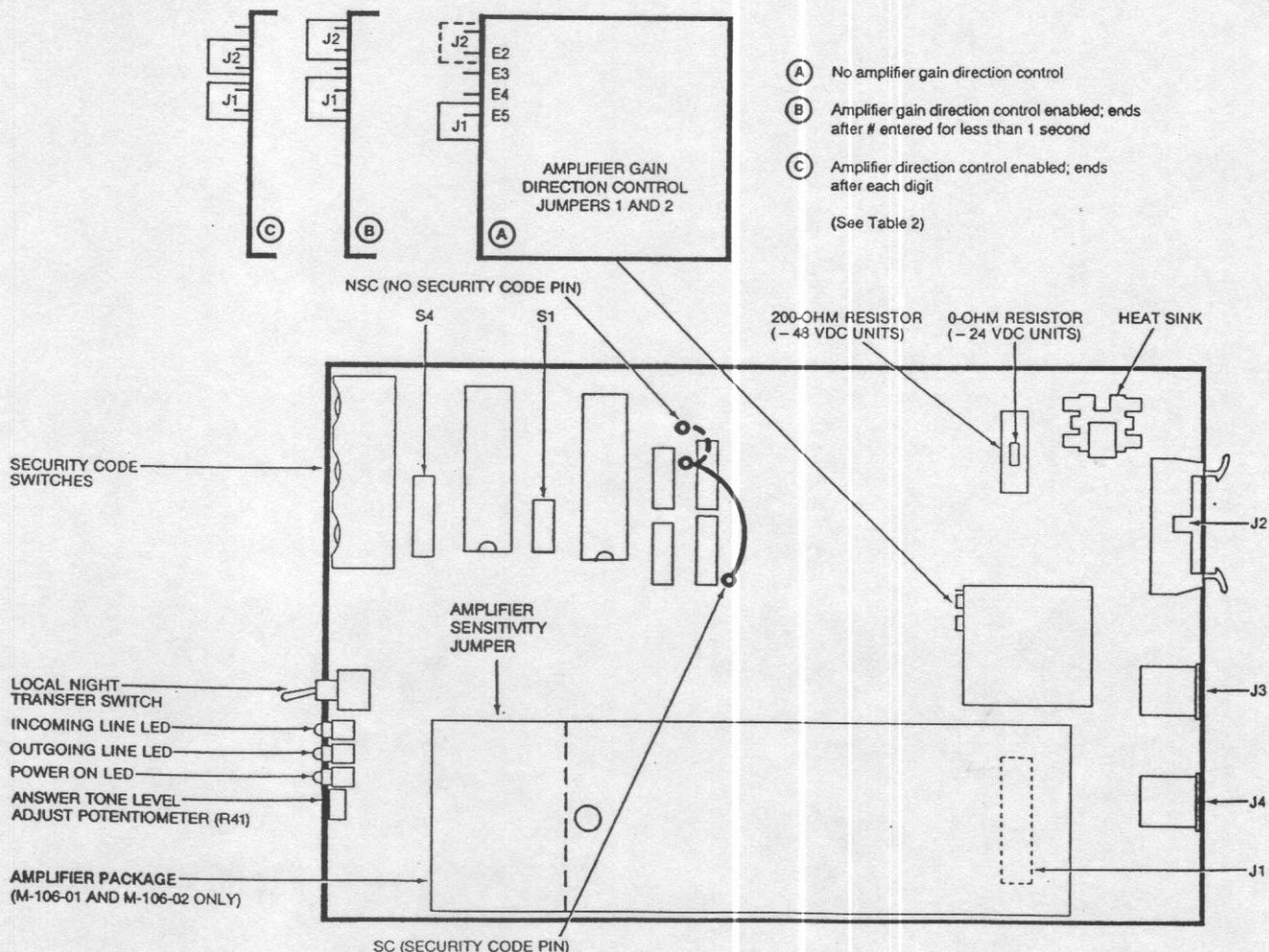


Figure 2 M-106 Circuit Card

Mechanical Installation

- 11. Resecure the M-106 card to the rear panel of the housing using the two screws removed in Step 4. The housing front panel need not be replaced at this time.
- 12. Reposition the top and bottom mounting flanges, if required. Then mount the unit, using up to No. 12 USS (5 mm ISO) hardware (obtained locally).

Note: Because the M-106 contains position-sensitive, mercury-wetted relay contacts, assure when mounting the unit that J2 is at the top of the rear panel and that the plane of the panel is perpendicular to the floor.

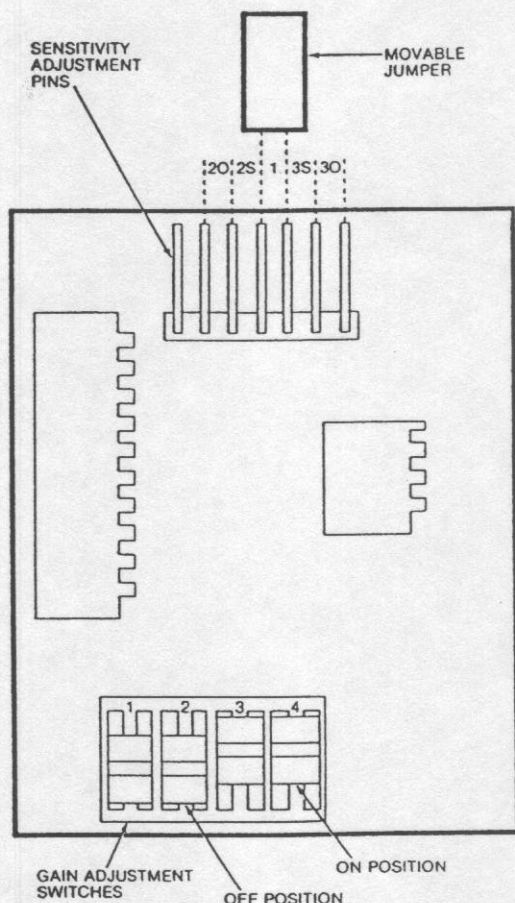


Figure 3 Lorain Repeater Adjustments

Electrical Installation

- 13. Using Table 3 and Figure 4 as a guide, make whatever Power/Auxiliary Cable connections the application requires. Then plug the cable connector into J2.
- 14. Plug the 8-position end of the Incoming Line Cable into J3. Then plug the other end of the cable into the incoming line USOC wall jack.
- 15. Plug the 8-position end of the Outgoing Line Cable into J4. Then plug the other end of the cable into the outgoing line USOC wall jack.

Installation Tests

Note: The following tests require a voltmeter with needle probes, a wristwatch or clock with a second hand, and a Touch-Tone® telephone located in the vicinity of the M-106. Only the applicable tests need be performed. In the event of a test failure, see Teltone Technical Practice 106-121UL.

- 16. **Power:** Set the local and/or remote Night Transfer Switch(es) to ON. The green POWER ON indicator should light.
- 17. **Remote Switch (optional):** Test all possible ON/OFF combinations of the local and remote Night Transfer Switches as follows:
 - If the switches are connected in series, the M-106 should be enabled only when both switches are set to ON and disabled when either switch is set to OFF.
 - If the switches are connected in parallel, the M-106 should be enabled when either switch is set to ON and disabled only when both switches are set to OFF.
- 18. **Protector Ground:** Unplug the Power/Auxiliary Cable from J2. Using a voltmeter, test the plug positions of the two red leads. Both positions should reveal ground. Plug the cable connector back into J2.
- 19. **Incoming Line:** Place a call to the M-106. The red INCOMING LINE indicator should light. Remain off-hook.
- 20. **Answer Tone:** The M-106 Answer Tone (440 Hz lasting 1.5 seconds) should be heard shortly after the indicator lights. Remain off-hook.

Note: The level of the tone can be adjusted by rotating the adjustment slot of potentiometer R41 clockwise (to increase level) or counterclockwise (to decrease level). See Figure 2.

- ☐ **24. Outgoing Line:** Place a call through the M-106. The call should be completed. Remain off-hook.

Note: If a call cannot be completed, hold down the buttons on the keypad or use the HIGH setting of the tone generator. If a call still cannot be completed, set the option switches for tone-to-pulse conversion and try again.

- ☐ **25. Retrial:** Key * for more than one second. The called party should be disconnected and dial tone should be heard after about five seconds of silence. Remain off-hook.

- ☐ **26. Simulated Switchhook Flash (S1-6 OFF):** Place another call through the M-106. Then attempt to transfer the call by keying * for less than one second. The transfer should be successful.

Note: If the M-106 Tone-to-Pulse Converter is disabled (S1-1 ON), proceed directly to the Note following Step 32.

- ☐ **27. Tone-to-Pulse Conversion (S1-1 OFF):** Key a Retrial and then the number of a rotary dial activated service. The OUTGOING LINE indicator should blink (indicating outpulsing) and the service should be connected. Remain off-hook.
- ☐ **28. Keyed Shutdown (S1-4 ON):** Key a Retrial. Then key # for less than one second, followed by several high-value digits. The OUTGOING LINE indicator should not blink. Remain off-hook.

- ☐ **29. Timed Shutdown:** Key a Retrial and then begin timing according to the setting of S1-5:
- If S1-5 is set to OFF, note when the OUTGOING LINE indicator relights.
 - If S1-5 is set to ON, key a digit for which the corresponding section of S4 is set to OFF and note when the OUTGOING LINE indicator ceases blinking.

In either case, after 8 seconds or 16 seconds (depending on the setting of S1-3), key several high-value digits. The OUTGOING LINE indicator should not blink. Remain off-hook.

- ☐ **30. Timer Reset:** Key a Retrial and then begin timing as described in Step 29. Just before the Timer is scheduled to time out, key a digit for which the corresponding section of S4 is set to OFF. Wait three or four seconds and then key the digit again. Conduct the same test, substituting a Retrial and then a Simulated Switchhook Flash for the first digit. In each case, the OUTGOING LINE indicator should blink. Remain off-hook.

- ☐ **31. First Digit Shutdown (one or more sections of S4 ON):** For each section of S4 set to ON, key a Retrial, then the digit associated with that section, and lastly several high-value digits. The OUTGOING LINE indicator should not blink each time the high-value digits are signaled. Remain off-hook.

- ☐ **32. Early Line Split (S1-2 ON):** Key a Retrial and then the number of DTMF-sensitive equipment connected to the M-106. The equipment should be unaffected by the signaling. Remain off-hook.

Note: Do not proceed with testing until the Call Timer test (Step 23), if performed, has been completed.

- ☐ **33. Seize Feature (optional):** Place a call to the M-106, enter the Security Code, and proceed as follows:

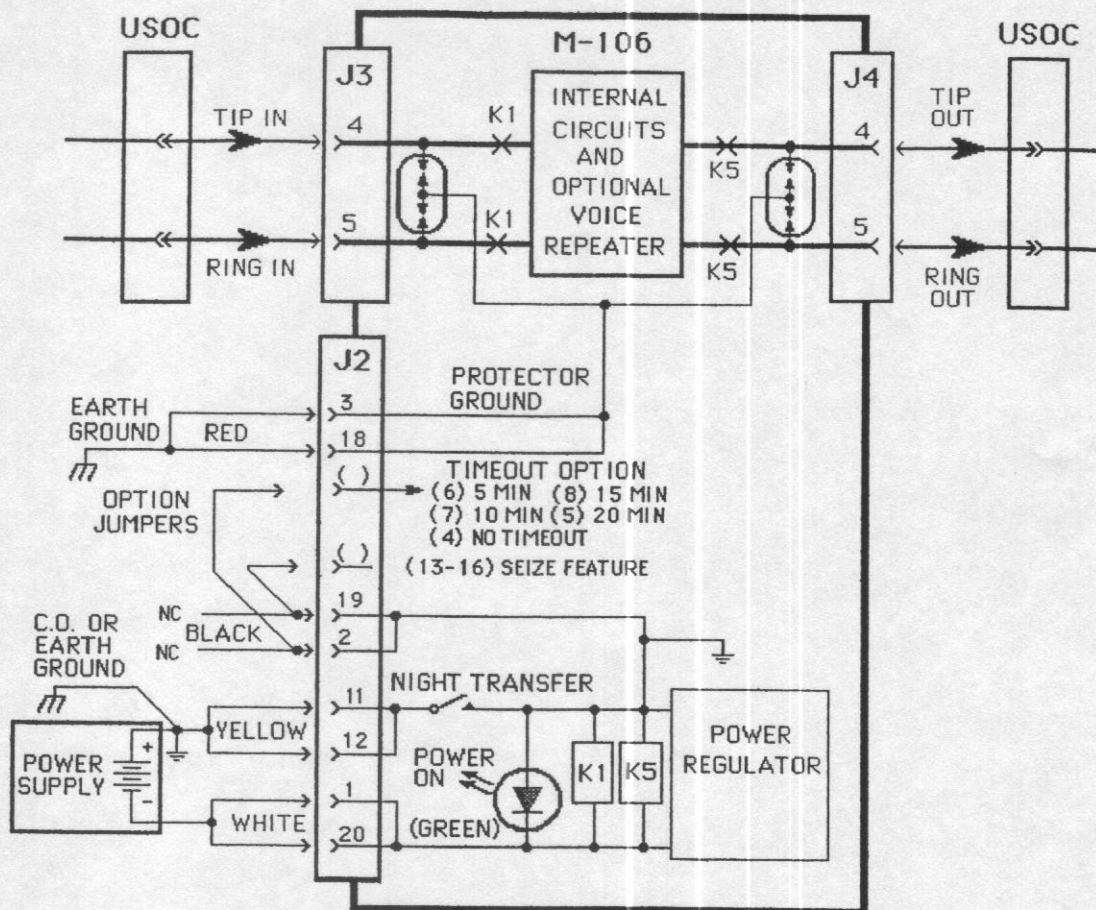
- If the Seize Feature is implemented to enable a particular device, that device should be enabled. Remain off-hook.
- If the Seize Feature is implemented to supply ground to the M-106, set the Night Transfer Switch(es) to OFF. The green POWER ON indicator should remain lighted. Set the switch(es) back to ON and remain off-hook.

- ☐ **34. Keyed Disconnection:** Key # for more than one second. The M-106 should disconnect and only the green POWER ON indicator should remain lighted.

- ☐ **35. Lorain Repeater (M-106-01 and M-106-02 only):** Place a call through the M-106. If the voice transmission is not satisfactory, see Steps 8 and 9.

Final Procedures

- ☐ **36.** Set the Security Code Switches as required by the application. The top switch represents the first digit, the middle switch represents the second digit, and the bottom switch represents the last digit of the code.
- ☐ **37.** Replace and lock the front panel of the housing.
- ☐ **38.** To put the M-106 into service, set the Night Transfer Switch(es) as required by the application and the time of day.



TYPICAL BASIC DEDICATED WIRING DIAGRAM

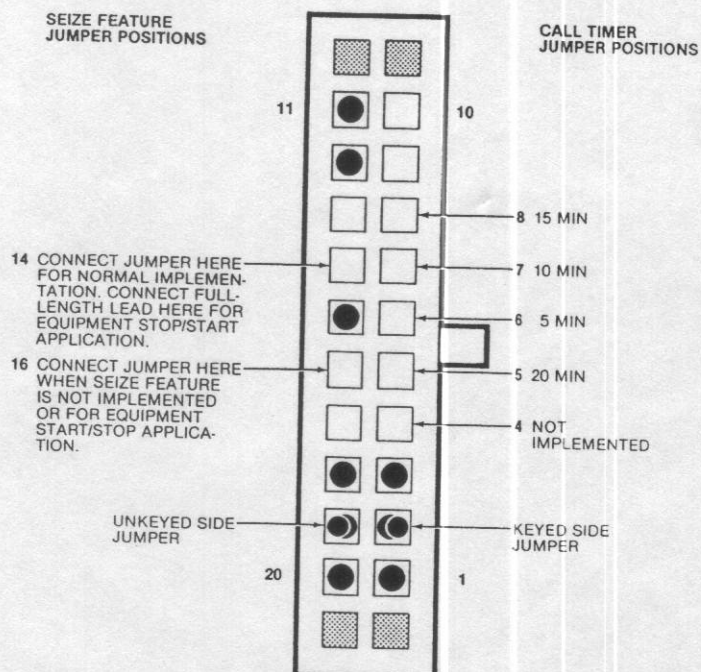
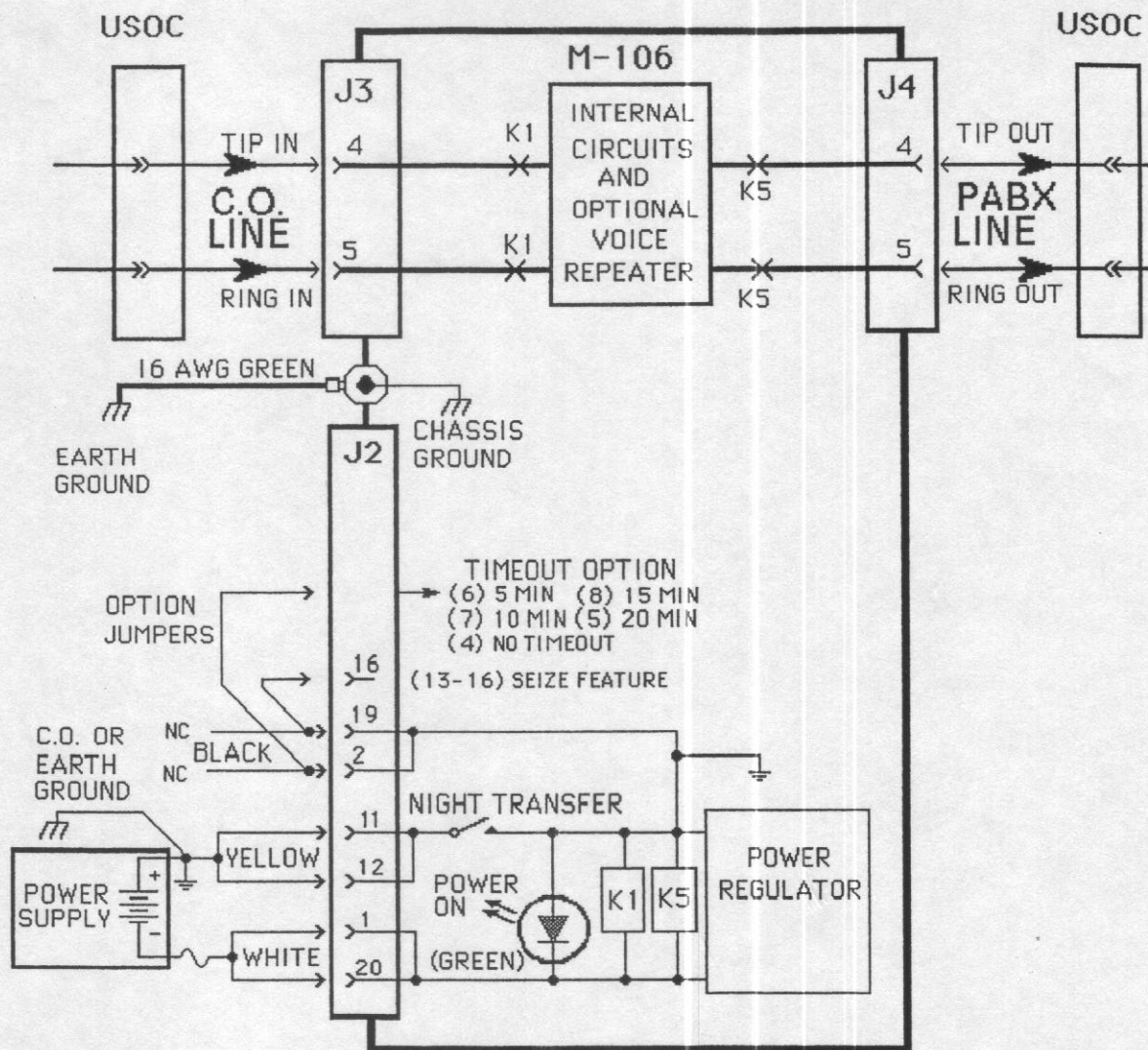


Figure 4 Power/Auxiliary Cable Jumper Connections



TYPICAL BASIC DEDICATED WIRING DIAGRAM

FIGURE 8

UL VERSION

