INSTALLING ADCOR'S TELGUARD MODEL T-2000M

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February, 1994

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MODEL T-2000M

The following summary instructions are intended to facilitate installation of Adcor's **TELGUARD** Model T-2000M Cellular Alarm Transmission System with all Control/Communicators ("C/C"). The emphasis is on what to do, without much detail on why or how to do it. Where a more detailed explanation is needed, refer to the appendix.

If you need help with installation, call Adcor's Technical Service Department 8 a. m. to 5 p.m. Eastern time at 1-800-229-2326. You may also reach us at other times at (404) 691-8920.

GETTING READY

Look in **TELGUARD** shipping box and be sure you have the following:

1. **TELGUARD** unit, Model T-2000M with one jack-to-jack phone line connecting cable, an antenna with 12 feet of cable and standard 16.5 VAC, 40VA plug in transformer.

2. Motorola cellular handset with cable attached.

3. Programming work sheet showing ESN, mobile phone number and receiver phone number(s).

4. Be sure to bring proper battery to job site, since this is not supplied with **TELGUARD***.

NOTE: **Cellular service has already been activated for this unit. Adcor has NAM programmed the unit and has programmed central station phone number(s) before shipment. The T-2000M is completely ready to communicate with the central station over cellular. Units can be reprogrammed in the field using the cellular handset. See Appendix II and III.**

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* - **TELGUARD** requires a battery for normal operation and for providing backup power when AC is out. 12V, 4AH (or greater) battery is required.

INSTALLATION OVERVIEW

There are five steps in installing **TELGUARD** properly. IF YOU DO NOT PROCEED IN THE ORDER AND MANNER PRESCRIBED, YOU MAY NOT COMPLETE THE INSTALLATION IN THE TIME ALLOCATED. These five steps are summarized below and then explained in detail in the remainder of this manual.

1. CONFIRM VOICE COMMUNICATIONS OVER CELLULAR. First you will be confirming that **TELGUARD**'s cellular service is working, and that the cellular signal is strong enough in the exact location where the antenna will be placed. To do this, you will be using the cellular handset, both to make voice calls and to measure signal strength during antenna placement.

    This is the most important step in the installation, since it is much easier to verify good cellular activation and signal strength using the voice than later when **TELGUARD** is transmitting digital alarm signals from the C/C. Most installation delays occur due to poor initial antenna placement.

2. TRANSMIT ALARM SIGNALS OVER CELLULAR. Next, you will be connecting the C/C's digital dialer output to **TELGUARD** and verifying that alarm signals can be reliably sent through **TELGUARD** over cellular to the monitoring center receiver on 911 receiver phone numbers used.

    Please remember that neither **TELGUARD** or the C/C should be connected to the incoming phone line during this step. All alarm signal transmissions during this step should be from the C/C and through **TELGUARD** over cellular.

3. CONNECT INCOMING TELCO LINE. Once alarms are being successfully transmitted over cellular by the C/C, you will be ready to connect **TELGUARD** to the incoming phone line at the RJ31X and then to be sure it properly switches to and from cellular upon Telco line fault.

    Note that **TELGUARD** must be the first device on the incoming phone line in order to prevent **TELGUARD** from going into Telco Line Fault Condition when a phone device in front of it goes off hook. This is the step where this is checked.

    During this step, **TELGUARD** supervisory trip outputs should not be connected to zone inputs of the C/C, since your testing will cause the C/C to transmit supervisory alarms (such as Line Fault Condition) which would be confusing at this point in the installation.

4. CONNECT SUPERVISORY TRIP OUTPUTS TO C/C ZONE INPUTS. Next you will be ready to hook **TELGUARD**'s supervisory trip outputs to the C/C zone inputs and to be sure they work correctly.

There are two possible trip outs to the host C/C. These are Telephone Line Fault Condition (LFC) and System Trouble Condition (STC). Therefore, this is the point at which a decision must be made as to which supervisory conditions will be reported to the central station and what alarm codes will be used.

5. PERMANENTLY MOUNT CHASSIS AND ANTENNA. Your last step will be to permanently mount the unit and its antenna.

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With this overview of the installation in mind, you should now proceed with the actual installation, following the steps described below.

NOTE: **You must first get the C/C working correctly when transmitting over the incoming Telco line in the standard manner. Do not start installing TELGUARD until the C/C is fully programmed and operating successfully on the phone line through the RJ31X.**

The C/C may need to be specially programmed in order for TELGUARD to recognize which receiver phone number is being dialed by the C/C, if both a primary and a secondary receiver phone number is used. (See Appendix III).

If you come to a road block at any step during installation of **TELGUARD**, call Adcor Technical Services division immediately before going on to the next step, so that we can help you complete each step in the proper order.

Future Testing and Limitations on Use

TELGUARD is part of an advanced design alarm communication system. It does not offer guaranteed protection against burglary and fire. Any alarm communication system is subject to compromise or failure.

The **TELGUARD** will not work without power. Devices powered by AC will not work if the AC power supply is off for any reason, however briefly, and at the same time the backup battery is missing, dead or not properly installed.

The cellular service provider's cellular network, needed to transmit alarm signals from a protected premise to a central monitoring station, may be inoperable or temporarily out of service. Cellular telephone networks are also subject to compromise by sophisticated methods of attack.

This equipment, like any other electrical device is subject to component failure. Even though this equipment is designed to be long lasting, the electrical components could fail at any time.

Due to these limitations, we recommend that arrangements are made with the user to test the system at least once every three months. Moreover, arrangements should also be made for on site inspection/test by a licensed alarm installer at least once each year.

STEP 1: CONFIRM VOICE COMMUNICATIONS OVER CELLULAR.

First, make sure you can conduct a reasonably noise-free voice conversation over cellular through **TELGUARD** while locating the antenna for maximum signal strength and minimum noise.

In checking this, do not connect the host C/C or incoming Telco line to **TELGUARD**.
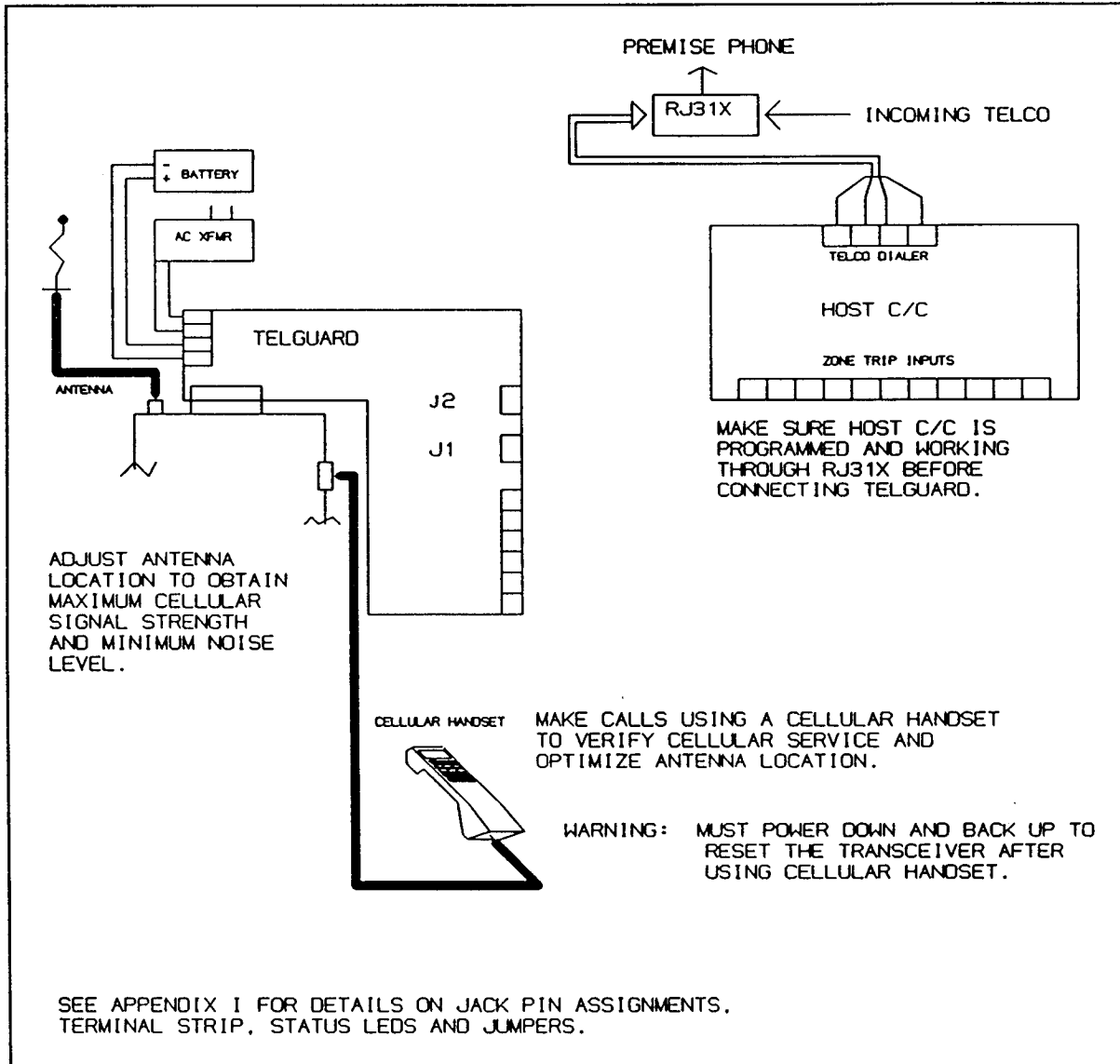
Detailed explanation follows.

1. Locate Unit: Pick a spot next to the C/C where you think TELGUARD will be mounted and place the unit down temporarily in that spot. Do not mount it permanently now, since it may need to be moved to allow for better antenna placement.

2. Connect and Temporarily Place Antenna: Attach the antenna cable to the transceiver connector at the top left side of the unit and temporarily place the antenna where you think it will ultimately be located. Pick a high, visually secure spot, following the guidelines below.

Tips for Improved Antenna Location

- The higher the antenna the better. So, start in the drop ceiling above the unit and proceed up from there, to the roof if necessary. While the C/C may be located in an equipment room, the TELGUARD might need to be located in the ceiling or even higher. (Be sure not to exceed 50 degrees C temperature rating.)

- Remember, the antenna should be as inconspicuous as possible for greatest visual security. If on room, plan to place antenna in PVC tubing or in a custom wooden structure.

- Try to keep antenna away from sources of RF interference, including pumps, compressors, ovens, etc., or where metal objects can shield it or otherwise block the cellular signal.

- Place the antenna perpendicular to the ground, either right side up or upside down. Do not mount antenna horizontally.

3. Connect Cellular Handset: Connect the cellular handset to the transceiver plug on the top right side corner of the transceiver (next to the PCB).

4. Apply Power: To apply power, connect TELGUARD AC power transformer to terminals marked "16 VAC" using stranded copper insulated wire following wire gauge and length recommendations below:

Recommended Wire Size	Length Not to Exceed
18 ga	20 ft
16 ga	40 ft
14 ga	60 ft
12 ga	80 ft

Attach battery leads noting polarity.

Turn on the cellular handset by pressing PWR on the keypad and move antenna to the location with most dashes on the bottom line ("S" line) of LCD. At least four dashes are necessary to assure continuous, trouble free operation. Three dashes are often OK, depending on other factors. Move antenna slowly and check often. Only a few inches can make a great difference in signal strength.

5.   Make Call to Ensure Lowest Noise Level.   Now, make a call over cellular to a cooperating person at other end.

> **NOTE:**   **If you are unsuccessful in dialing out, it is probably because the cellular phone number has been improperly activated or the NAM programming is incorrect.**
>
> **To check this, call the cellular customer service operator in your area by dialing 611 (*611 in some areas). The operator can verify that activation/programming is correct.**

Once you have successfully dialed out and have someone on the other end of the line, move the antenna until you find the spot where the noise level is lowest and the voice conversation is strongest. Recheck signal strength after hanging up to be sure you still have at least four dashes on cellular handset.

If you can not carry on good voice conversations or can not eliminate noise from the line, you will probably need to move the antenna higher, use a cable extension, or switch to a special antenna, as described below.

<div align="center">Antenna Options</div>

Antenna problems are unlikely unless the premise is located in a fringe cellular coverage area, in a building below ground level, or in a metal structure. However, here are your options if problems arise:

-    Standard Antenna With Longer Cable: TELGUARD's standard antenna comes with 12 feet of cable. If this is not enough cable to allow for optimal antenna location, longer cables can be special ordered from Adcor. These come in 35 foot (Adcor P/N MMA-35M) and 50 foot lengths (Adcor P/N MMA-50M), and include another standard antenna with the necessary connectors. It is not possible to splice cable to the existing standard antenna in field. Extension cable is special, low loss type.

-    Directional Antennas. High Gain Directional Antennas are also available from Adcor. These boost signal strength by concentrating power in a single direction, toward the nearest cell. HGDA's come with 35 feet (Adcor P/N HGA-35M) or 50 feet (Adcor P/N HGA-50M) of cable.

6. <u>REMOVE HANDSET AND MOVE ON:</u> Once you have good voice communications over cellular, turn off the cellular handset and disconnect it. **Power down TELGUARD (unplug transformer and disconnect the battery) and then power up again and reconnect the battery.** This is necessary to reset the transceiver after handset use. Proceed to next step.

    <u>NOTE:</u>   **The cellular handset should be removed after being used during installation to ensure proper functioning. The unit will not transmit alarm signals over cellular if the cellular handset is in use.**

7. <u>MOVE ON:</u> Once you have confirmed good voice communications over cellular, move on to **STEP 2.**

STEP 2: TRANSMIT ALARM SIGNALS OVER CELLULAR

Confirm that **TELGUARD** enables the C/C to transmit alarm signals over cellular to the central station digital receiver.

In checking this, **do not connect the incoming Telco line to TELGUARD, or connect TELGUARD'S supervisory trip outputs to the C/C zone inputs.**

PREMISE PHONE

RJ31X ← INCOMING TELCO

BATTERY

USE CABLE (NOT SUPPLIED) THAT NORMALLY CONNECTS C/C DIGITAL DIALER TO RJ31X.

AC XFMR

TELCO DIALER

TELGUARD

HOST C/C

ANTENNA

ZONE TRIP INPUTS

J2

J1

TRIP C/C AND MAKE SURE IT CALLS OUT RELIABLY OVER CELLULAR TO CENTRAL STATION. CHECK PRIMARY AND SECONDARY RECEIVER PHONE NUMBERS.

SEE APPENDIX I FOR DETAILS ON JACK PIN ASSIGNMENTS, TERMINAL STRIP, STATUS LEDS AND JUMPERS.
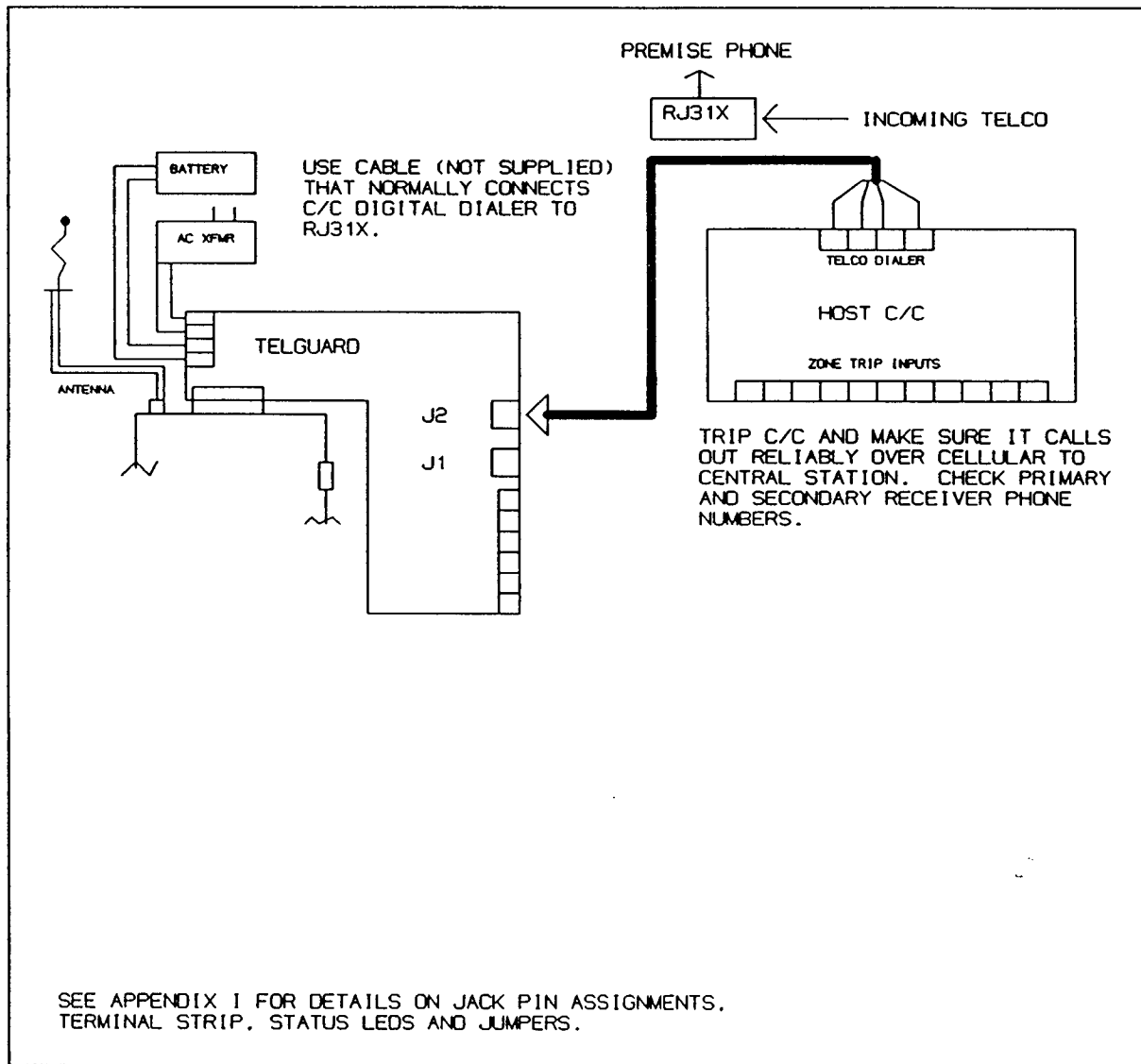
Detailed explanation on next page.

1. <u>PREPARE C/C.</u> Be sure the C/C is powered up and programmed so that it will transmit a simple alarm signal over Telco line through the RJ31X to the central station when not connected to **TELGUARD**.

2. <u>CONNECT C/C TO TELGUARD JACK 2.</u> Unplug the modular jack end of the C/C-to-RJ31X cable (not supplied) from the RJ31X and plug it into **TELGUARD** Jack 2.

   <u>NOTE:</u>   **Since no RJ31X cable is connected to TELGUARD Jack 1 at this point in the installation, TELGUARD will be in continuous Line Fault Condition (LFC), thereby causing all C/C transmissions to go out over cellular during testing in this step.**

3. <u>VERIFY CELLULAR TRANSMISSIONS:</u> Trip an alarm on the C/C and verify that it was received by the central station where appropriate. Test both primary and secondary receiver phone numbers.*

   <u>NOTE:</u>   **Using a lineman's butt set in parallel with the C/C's tip and ring to "listen" to communications with the central station receiver will in most cases cause the audio level to drop, sometimes resulting in a failure to communicate, especially when transmitting over cellular. Therefore, lineman's butt sets are not recommended to be used in this manner.**
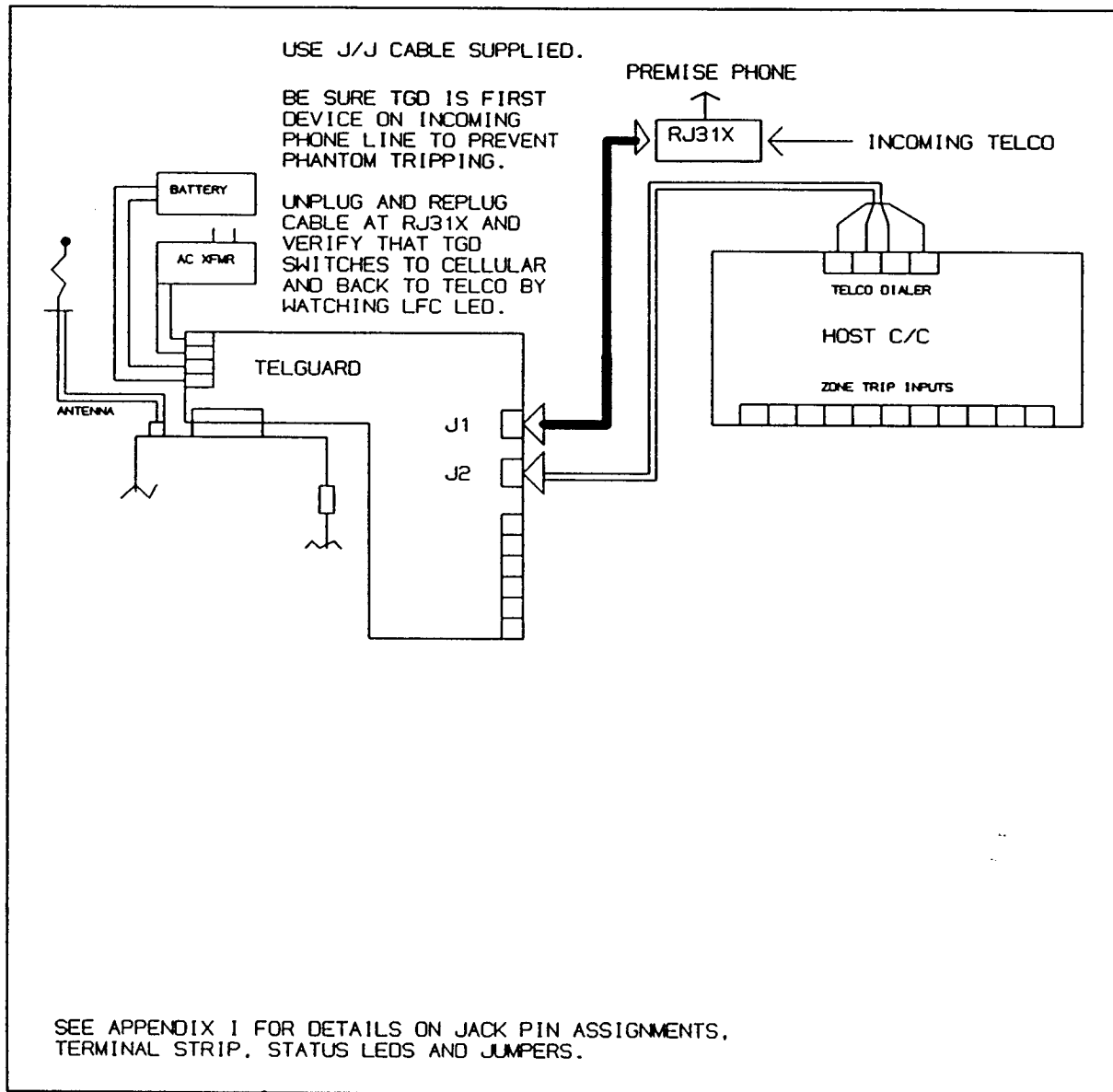
4. <u>MOVE ON:</u> Once you have determined that the C/C can successfully transmit alarm signals over cellular, proceed to next step.

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* - The C/C may need to be specially programmed in order for **TELGUARD** to recognize which receiver phone number is being dialed by the C/C, if both a primary and a secondary receiver phone number is used. (See Appendix III).

STEP 3. CONNECT INCOMING TELCO LINE

Connect the incoming Telco line to **TELGUARD.** Check to be sure it switches to cellular and back to Telco line upon LFC and restoral. Also check to be sure there are no other phone devices connected in front of the RJ31X.

During this step, do not connect TELGUARD supervisory trip outputs to the C/C.

USE J/J CABLE SUPPLIED.

BE SURE TGD IS FIRST DEVICE ON INCOMING PHONE LINE TO PREVENT PHANTOM TRIPPING.

UNPLUG AND REPLUG CABLE AT RJ31X AND VERIFY THAT TGD SWITCHES TO CELLULAR AND BACK TO TELCO BY WATCHING LFC LED.

PREMISE PHONE

RJ31X ← —— INCOMING TELCO

BATTERY

AC XFMR

TELCO DIALER

HOST C/C

ZONE TRIP INPUTS

TELGUARD

ANTENNA

J1

J2

SEE APPENDIX I FOR DETAILS ON JACK PIN ASSIGNMENTS, TERMINAL STRIP, STATUS LEDS AND JUMPERS.

Detailed explanation on next page.

1.	CONNECT RJ31X TO TELGUARD JACK 2: Find the cable supplied with modular jack plug on both ends and connect one end to **TELGUARD** Jack 1 and other end to the RJ31X.

	NOTE:		**If TELGUARD is not first on Telco line, it will switch the C/C to transmit over cellular every time a premise phone goes off hook, even though the Telco line looks good at the RJ31X. We will call this "phantom tripping". This happens because TELGUARD's line fault monitor detects the parallel "taps" to the street side of the RJ31X.**
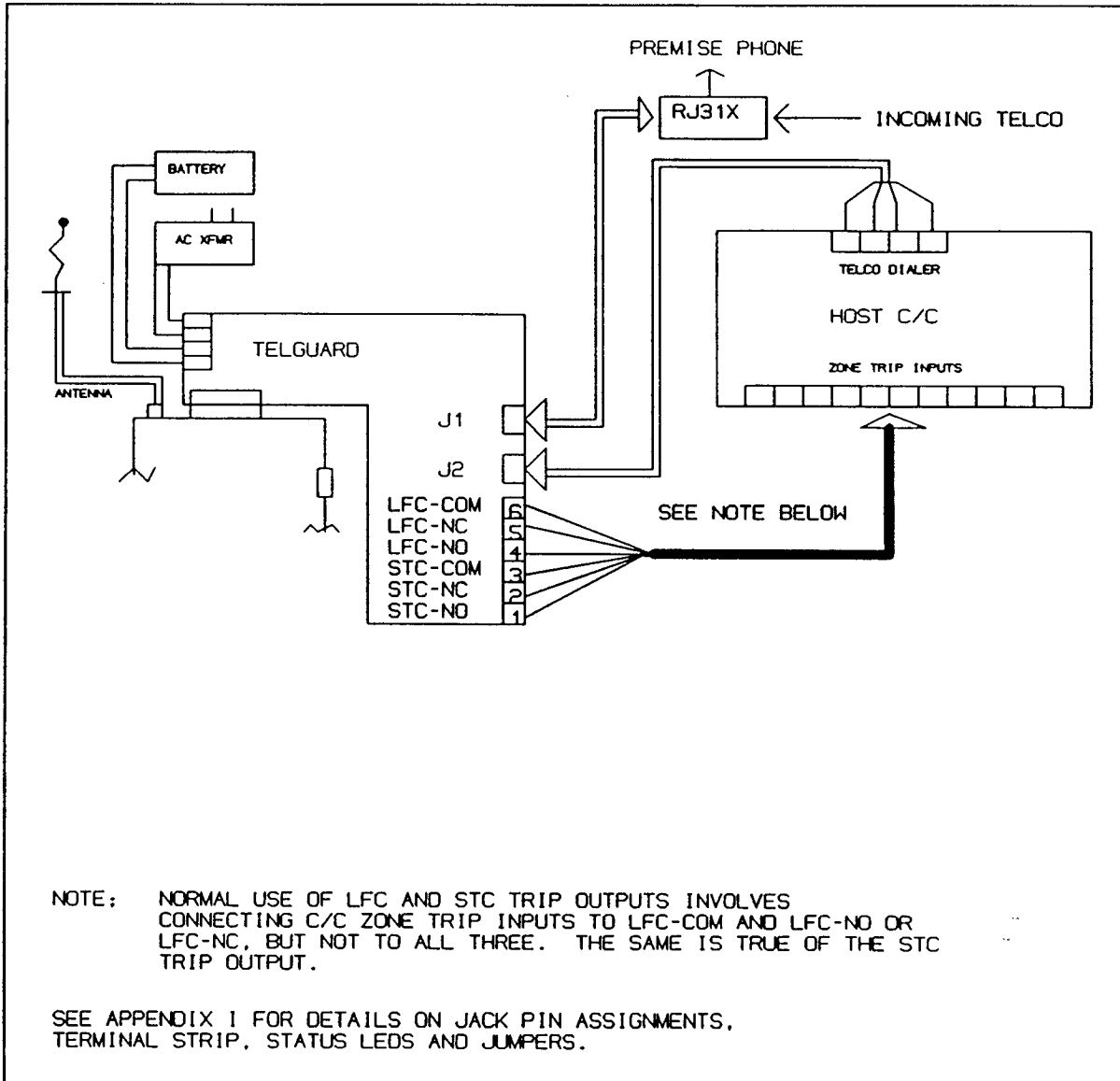
	If you experience phantom tripping or simply want to check for taps, proceed as follows:

	-	Unplug the RJ31X cable from **TELGUARD** Jack 1. Leave the other end of the cable connected to the RJ31X.

	-	Go to each phone on the premise that might be a tap.

	-	Remove the receiver and listen for the absence of Telco dial atone. If a dial tone is present, that device is a tap and must be reconnected in front of the RJ31X.

	-	When finished checking for taps, reconnect the RJ31X cable to **TELGUARD** Jack 1.

2.	CHECK SWITCH TO CELLULAR: Check to be sure LFC LED is not lighted. Then unplug RJ31X cable at **TELGUARD** Jack 1. Wait 2 seconds for LFC LED to light*.

3.	CHECK SWITCH BACK TO TELCO: Reconnect RJ31X cable to **TELGUARD** Jack 1. Wait 2 seconds for LFC LED to extinguish*.

4.	MOVE ON: Once you have verified proper Telco line switching and are certain there are no taps, proceed to next step.

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*	-	When a line fault condition occurs/restores, the LFC LED lights/extinguishes in only 2 seconds. However the switch to cellular occurs 8 seconds after the LFC LED lights. Switching back to Telco happens 60 seconds or 30 (as selected) after the Telco line restores and the C/C goes on hook from the cellular mode.

STEP 4. CONNECT SUPERVISORY TRIP OUTPUTS
TO C/C ZONE INPUTS

      Now you are ready to connect **TELGUARD** supervisory trip outputs from **TELGUARD** terminal strip TB2 to C/C zone trip inputs and to verify their proper operation.

NOTE: NORMAL USE OF LFC AND STC TRIP OUTPUTS INVOLVES
CONNECTING C/C ZONE TRIP INPUTS TO LFC-COM AND LFC-NO OR
LFC-NC, BUT NOT TO ALL THREE. THE SAME IS TRUE OF THE STC
TRIP OUTPUT.

SEE APPENDIX I FOR DETAILS ON JACK PIN ASSIGNMENTS,
TERMINAL STRIP, STATUS LEDS AND JUMPERS.

1. <u>WIRE TRIP OUTPUTS</u>

    Connect LFC and STC supervisory trip outputs from **TELGUARD** terminal strip TB2 to C/C zone trip inputs as follows:

    A.   If the zone trip input that is to be used for LFC is N.O., connect the zone terminals to TB2-6 and TB2-5. If the zone is N.C., connect its terminals to TB2-6 and TB2-4.

    B.   If the zone trip input that is to be used for STC is N.O., connect its terminals to TB2-3 and TB2-2. If the zone is N.C., connect its terminals to TB2-3 and TB2-1.

    <u>HINT</u>: If the C/C is able to report troubles as zone shorts and trips as zone opens, then you can combine the trips on one zone input of the C/C. To do that, connect one terminal of the zone to TB2-6 and TB2-3. The other zone terminal should connect to TB2-1. The terminating resister should connect between TB2-5 and TB2-1. In that arrangement, LFC will report as a trip (open) and STC will report as a trouble (short). STC will be a higher priority alarm.

2. <u>CHECK TRIPS</u>: Confirm that supervisory trip outputs operate correctly.

    A.   Be sure C/C and **TELGUARD** are powered up, with batteries connected and that all cables are attached to **TELGUARD** J1, J2 and TB2.

    B.   <u>LFC:</u>

    -     Disconnect phone line RJ31X cable at **TELGUARD** Jack 1. Confirm that **TELGUARD** LFC LED lights up. Wait 30 or 60 seconds (depending on delay setting, factory default is 60 seconds) for the C/C to be tripped by **TELGUARD**. Verify that central station receives proper LFC alarm code over cellular.

    -     Reconnect phone line RJ31X cable at **TELGUARD** Jack 1. Confirm that LFC LED extinguishes. Wait 30 seconds for restoral. Verify that central station receives LFC restore alarm code over Telco.

    C.   <u>STC:</u>

    -     Disconnect antenna. Confirm that **TELGUARD** STC and NSC LED's light up. Wait 2 or 20 seconds (depending on delay setting, factory default is 20 seconds) for C/C to be tripped by **TELGUARD**. Verify that central station receives proper STC alarm code over Telco.

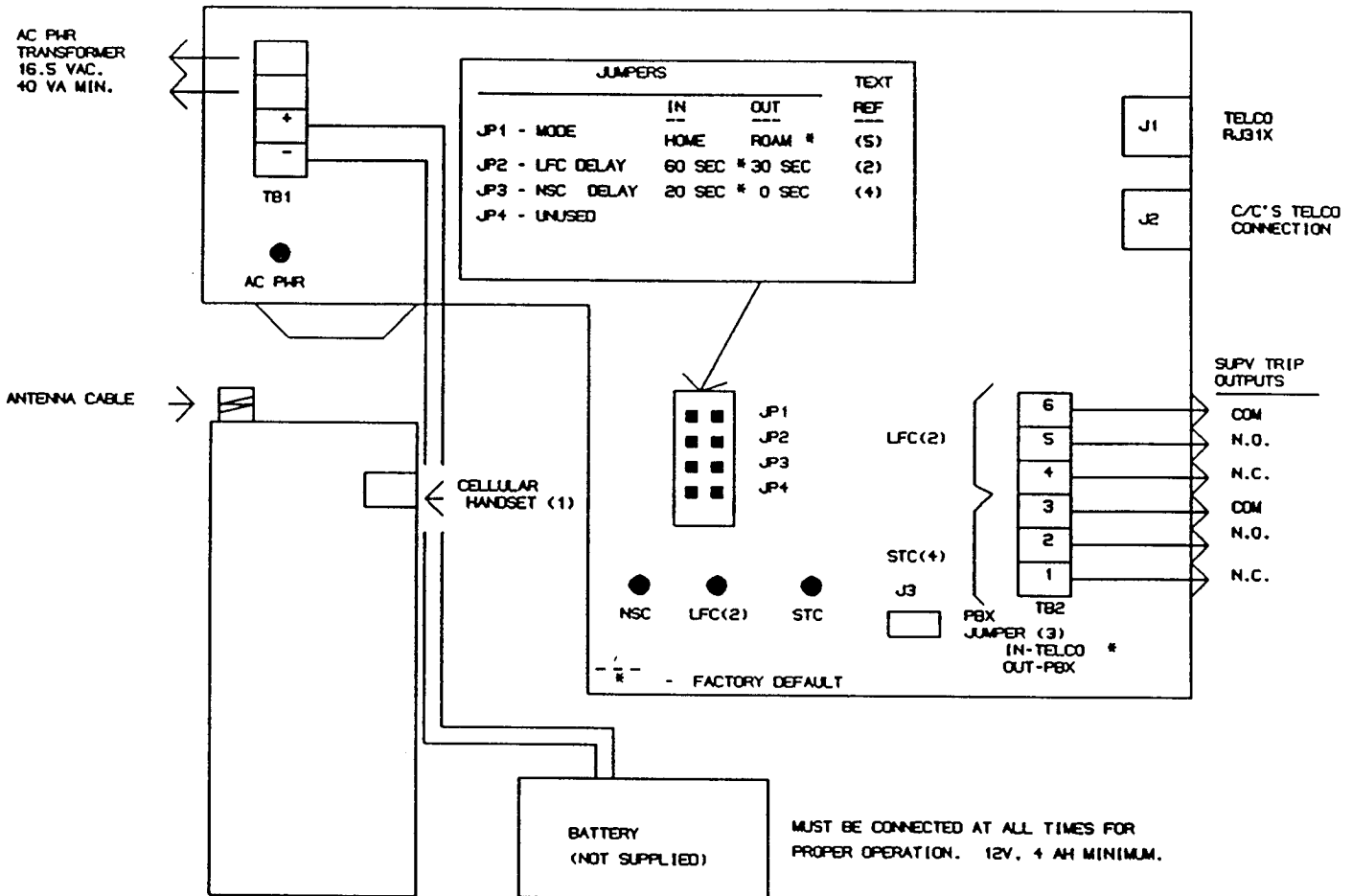- Reconnect antenna. Confirm that STC and NSC LED's extinguish. Wait 20 seconds for restoral. Verify that central station receives STC restore alarm code over Telco.

STEP 5: PERMANENTLY MOUNT CHASSIS AND ANTENNA

When selecting knockouts, try to have all **TELGUARD** cables going out back side of **TELGUARD** for optimum visual security. *Also, be sure antenna is in a safe place where it can not be easily seen.*

FEATURES AND OPERATION

AC PWR
TRANSFORMER
16.5 VAC.
40 VA MIN.

TB1

AC PWR

ANTENNA CABLE

CELLULAR
HANDSET (1)

JUMPERS			TEXT REF
	IN	OUT	
JP1 - MODE	HOME	ROAM *	(5)
JP2 - LFC DELAY	60 SEC *	30 SEC	(2)
JP3 - NSC DELAY	20 SEC *	0 SEC	(4)
JP4 - UNUSED			

JP1
JP2
JP3
JP4

NSC   LFC(2)   STC

- - / - -
  *   - FACTORY DEFAULT

J1   TELCO
      RJ31X

J2   C/C'S TELCO
      CONNECTION

SUPV TRIP
OUTPUTS

LFC(2)

6	COM
5	N.O.
4	N.C.
3	COM
2	N.O.
1	N.C.

STC(4)

J3   TB2

PBX
JUMPER (3)
IN-TELCO *
OUT-PBX

BATTERY
(NOT SUPPLIED)

MUST BE CONNECTED AT ALL TIMES FOR
PROPER OPERATION. 12V, 4 AH MINIMUM.

SEE TEXT EXPLANATION NEXT PAGE

TEXT EXPLANATION

1. <u>Cellular Handset:</u> Handset is used during installation for verifying good voice communications and to read cellular signal strength when locating antenna for optimum cellular reception. Handset also necessary to do NAM programming and to program receiver phone number(s) in the field, if this ever becomes necessary. See Appendix II for how to do NAM programming and Appendix III for how to program receiver phone numbers.

2. <u>Line Fault Condition:</u> Voltage and current on incoming Telco line is continuously monitored by **TELGUARD**. If voltage drops below 35 VDC +/- 5VDC (17.5 VDC +/- 2 VDC*) <u>while current is also</u> below 8.5 MADC +/- 4 MADC, the following occurs:

    -   LFC LED lights up after 2 seconds.

    -   C/C transmission path switches to cellular after 8 seconds.

    -   LFC supervisory trip output relay** on TB2 activates after 60 seconds (selectible at JP2 for 30 seconds delay).

    When voltage and current return to above 35 VDC (17.5 VDC*) and 8.5 MADC respectively, the following occurs:

    -   LFC LED extinguishes after 2 seconds.

    -   C/C transmission path switches back to Telco mode after 30 seconds***

    -   LFC supervisory trip output relay** on TB2 activates (restoral) after 60 seconds*** (Selectable at JP2 for 30 seconds delay).

3. <u>PBX Mode JP5:</u> PBX's and other proprietary phone systems sometimes operate at lower voltage (24VDC) than the standard Telco line, thereby interfering with normal operation of delay times. Therefore a "PBX" jumper selection is available to lower the LFC threshold voltage, yet still maintain the standard detect times. Jumper "in" is for Telco (normal mode, 48VDC operation).

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*   -   If in PBX mode. See explanation #(3).

**   -   Relays are form "C".

***   -   If C/C transmitting in cellular mode at the time Telco restores, switching/activation occurs in the time shown, but after C/C goes back on hook.

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4. System Trouble Condition (STC) Trip Output: STC is signaled at TB2 by a form "C" contact transfer, which occurs because of any of the following:

    a.   No Service Condition: The cellular signal is continually monitored by **TELGUARD**. If signal ⸴is lost (e.g., antenna disconnected, temporary environmental disturbances, cell site malfunction, etc.), the following occurs:

        - NSC LED lights up after 2 seconds

        - STC supervisory trip output relay on TB2 activates after 20 seconds (selectable at JP3 to immediate).

    When cellular service restores, the following occurs

        - NSC LED extinguishes after 2 seconds

        - STC supervisory trip output relay on TB2 activates (restoral) after 20 seconds (selectable at JP3 to immediate)

    b.   Microprocessor Program Malfunction: If the microprocessor program fails, the STC LED will light and the STC trip output contacts will transfer.

    c.   Transceiver Malfunction: If the cellular transceiver fails in any of several functions, then the STC LED will light and the STC contacts will transfer.

Upon restoral from any of the above STC situations, the STC LED will extinguish and STC contacts will revert to their dormant state.

5. Transmission Mode: JP1 is set at factory for roam mode transmission. (Jumper "out") This is the best option for **TELGUARD** operation and will override handset programming of this option when **TELGUARD** power is cycled off, then on.

APPENDIX II

TRANSCEIVER NAM PROGRAMMING

Transceivers must be programmed with their assigned cellular phone number, system ID number and other related parameters in order to transmit in the field. This is caller "NAM PROGRAMMING" and is usually done before shipment. Sometimes our customers do their own programming in the field, hence these instructions.

The method for programming the Motorola KS transceiver in the **TELGUARD** requires using a standard Motorola KS cellular handset. This handset also features a signal strength indicator which can be used to optimize antenna location as well as to program.

NOTE: **The best handset to use is a KS type, available from Adcor. However, most any Motorola handset will work. Please note that some older model Motorola handsets must first be put in the "Programming Mode" by taking special steps. If you have difficulty following the programming instructions below with your handset, call us for instructions on how to put it in Programming Mode.**

Handsets are connected for programming as shown in Exhibit I. Once the handset is connected to the transceiver, proceed to program as follows:

1.   Apply power to the **TELGUARD** by first connecting the battery and then plugging in the transformer.

2.   Turn the handset on by pressing PWR and enter the following sequence.
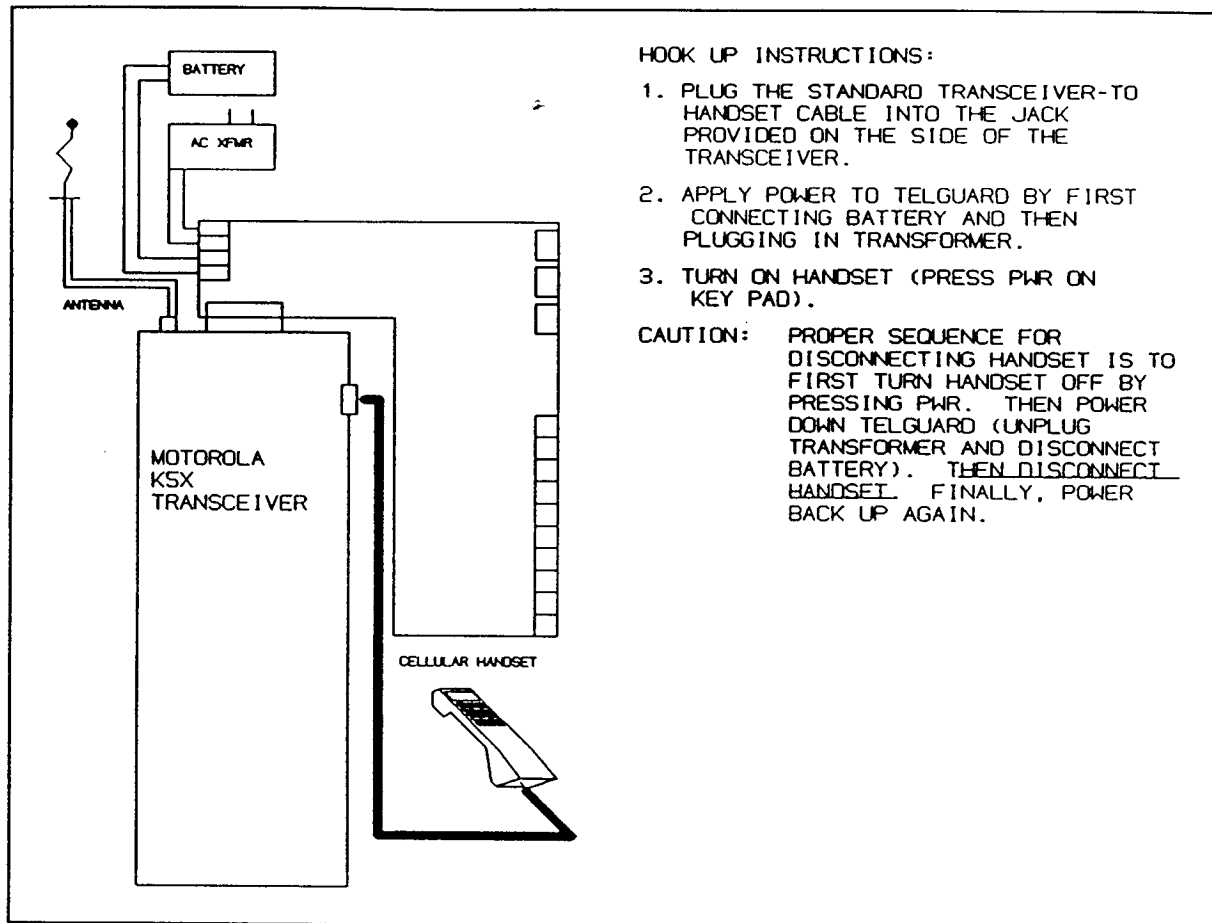
Press "FCN" + "0" + "000000" + "000000" + "RCL"

OR

"(FCN)0000000000000(RCL)"

NOTE: **If a digit is entered incorrectly during programming, press "CLR" and try again. The parameters programmed can be checked by simply scrolling through the main menu using the "*" key. Any mistake can be corrected by retyping the correct number/code.**

There are eleven programming positions indicated 01 through 11 on the handset LCD. The positions preceded by "N" (as in "N-01") in the following instructions must be custom programmed with unique data supplied by the cellular carrier for each unit. These positions are left blank when **TELGUARD** is shipped unprogrammed.

EXHIBIT I

BATTERY

AC XFMR

ANTENNA

MOTOROLA
KSX
TRANSCEIVER

CELLULAR HANDSET

HOOK UP INSTRUCTIONS:

1. PLUG THE STANDARD TRANSCEIVER-TO HANDSET CABLE INTO THE JACK PROVIDED ON THE SIDE OF THE TRANSCEIVER.

2. APPLY POWER TO TELGUARD BY FIRST CONNECTING BATTERY AND THEN PLUGGING IN TRANSFORMER.

3. TURN ON HANDSET (PRESS PWR ON KEY PAD).

CAUTION: PROPER SEQUENCE FOR DISCONNECTING HANDSET IS TO FIRST TURN HANDSET OFF BY PRESSING PWR. THEN POWER DOWN TELGUARD (UNPLUG TRANSFORMER AND DISCONNECT BATTERY). THEN DISCONNECT HANDSET. FINALLY, POWER BACK UP AGAIN.

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The other positions, indicated with "D" (as in "D-04", etc.) are for selecting operating parameters and are factory default programmed by Adcor on all units. As you program the "N" positions, also check to be sure the "D" positions are pre-programmed as indicated below. Be sure that you do not alter the factory default programming.

N-01: System Identification Number (SID)

    Press "*". The handset will display the previously entered SID number. If the unit was not previously programmed, "00000" will be displayed. **Enter the 5 digit SID number** obtained from the cellular carrier. If the number is incorrect, press "CLR" and re-enter the number. Press "*" to move to the next location. The handset will now display "02".

N-02: Cellular Area Code

    Press "*". The handset will display the previously entered Cellular Area Code. If the transceiver was not previously programmed, "111" will be displayed. **Enter the 3 digit Cellular Area Code** which is the first part of the Mobile Identification Number (MIN) obtained from the cellular carrier. Check the number to ensure it was entered correctly and if incorrect, press "CLR" and re-enter the number. Press "*" to move to the next location. The handset will display "03".

N-03: Cellular Phone Number

    Press "*". The handset will display the previously entered Cellular Phone Number. If the transceiver was not previously programmed, "111-1111" will be displayed. **Enter the 7 digit Cellular Phone Number** obtained from the cellular carrier. Check the number to ensure it was entered correctly and if incorrect, press "CLR" and re-enter the number. Press "*" move to the next location. The handset will display "04".

D-04: Station Class Mark (SCM)

    Press "*". The handset should display "08", the SCM programmed at the factory. If not "08", press "CLR" and re-enter "08". Press "*" move to the next location. The handset will display "05".

D-05: Access Overload Class (AOC)

    Press "*". The handset should display "15", the AOC entered at the factory. Check the number to ensure it was entered correctly and if incorrect, press "CLR" and re-enter the number. Press "*" move to the next location. The handset will now display "06".

N-06: Group ID Mark (GIM)

Press "*". The handset will display the previously entered GIM number or "00" if not previously programmed. **Enter the 2 digit GIM number** obtained from the cellular carrier. Check the number to ensure it was entered correctly and if incorrect, press "CLR" and re-enter the number. Press "*" to move to the next location. The handset will now display "07".

D-07: Security Code

Press "*". The handset should display "000000", which is the factory default Security Code. If incorrect, press "CLR" and re-enter the number. Press "*" to move to the next location. The handset will now display "08".

D-08: Unlock Code

Press "*". The handset should display "123", which is the factory default Unlock Code. If incorrect, press "CLR" and re-enter the number. Press "*" to move to the next location. The handset will now display "09".

> **NOTE:** **Be sure to use the factory defaults in D-07 and D-08. If you change these, the unit may not be accessible for programming later in the field.**

N-09: Initial Paging Channel (IPCH)

Press "*". The handset will display the previously entered IPCH or "0334" if not previously programmed. **Enter the 4 digit IPCH** obtained from the cellular carrier (Use "0333" if "A" carrier or "0334" if "B" carrier). Check to ensure it was entered correctly and if incorrect, press "CLR" and re-enter the number. Press "*" to move to the next location. The handset will now display the "10".

D-10: Other Options

Press "*" and the handset should display "010100", the factory default Option Code. If incorrect, press "CLR" and re-enter the number. Press "*" to move to the next location. The handset will now display "11".

The following is the description of each of the six digits entered. Each digit represents a different option where "1" is enabled and "0" is disabled.

Digit (Factory default)	Description (ON-1, OFF-0)
First (0)	Internal Speaker - must be enabled if external speaker is used with the cellular phone.
Second (1)	Local Use Option
Third (0)	Min. Mark Option
Fourth (1)	Auto Recall
Fifth (0)	Second Telephone Number - for dual NAM phones.
Sixth (0)	Space Diversity Reception - one or two antennas.

D-11: More Options

Press "*" and the handset should display "1101" the factory default More Options Code. If incorrect, press "CLR" and re-enter the number. Press "*" to move to the next location. The handset will display "01".

Digit (Factory Default)	Description (ON -1, OFF-0)
First (1)	Motorola Enhanced Scan - Provides improved performance in areas where multiple signaling channels are present.
Second (1)	Long Tone DTMF - Increases the duration of DTMF tones, enabling some low-tier telephone equipment to be accessed via a cellular telephone.
Third (0)	Transportable Internal Ringer/Speaker Routes audio to the accessory speaker.
Fourth (1)	Eight Hour Timeout - Telephone feature to ensure that batteries will not be completely drained, if telephone is inadvertently left on. 1 = Disabled.

The programming of the transceiver NAM is now complete. Press "SND" to save the programming information in the transceiver's NAM and to exit the programming mode.

Set Roaming Characteristics:

Upon exiting program mode, Press "RCL", and page through selections by pressing "*".

If "A" Carrier is being used, set display to Std. "Ab"

If "B" Carrier is being used, set display to Std. "bA"

Press "RCL" when desired choice appears in display.

CAUTION: Be sure to turn off the Motorola KS handset by pressing the "PWR" button before disconnecting the battery and transformer to power down unit. If not, the NAM programming information will be left at factory default.

Once the handset has been turned off and the battery and the transformer disconnected, the handset can be disconnected from the transceiver. Then the unit can be powered up again.

NOTE: Cellular phone number can be recalled out of memory without going into programming mode by pressing RCL, #.

APPENDIX III

PROGRAMMING THE T-2000M AND
THE CONTROL/COMMUNICATOR
TO CALL TWO RECEIVER
PHONE NUMBERS

The **TELGUARD** T-2000M transceiver and the control/communicator must both be programmed with a primary and secondary phone number for dual and/or split reporting.

<u>Programming the T-2000M transceiver*.</u>

1.   The memory locations of the transceiver for storing each receiver phone number is as shown.

<u>   C/C   </u>

Primary	Secondary
Receiver	Receiver
Phone #	Phone #
--------	---------
10 + 12	11 + 13

This appendix deals with dual and/or split reporting as well as simply reporting to a single receiver via one phone number.

2.   Connect cellular handset to the plug on upper right side of **TELGUARD** transceiver. Be sure that the unit is powered up with the battery connected. Turn on the power switch on the Motorola cellular handset by pressing PWR on the key pad. When the display stabilizes, in a few seconds, it should appear as follows:

```
+-----------------+     +-----------------+
|          S      |     |          S      |
| Pwr      Roam   |     | Pwr      No Svc |
|                 |     |                 |
+-----------------+     +-----------------+
```

There may be none or as many as six small "dash" characters displayed after the 'S' and 'No Svc' may not be displayed, in which case a flashing 'Roam' will be displayed.

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* -   Normally this is done by manufacturer prior to shipment. Therefore these instructions are only necessary when transceiver programming must be changed in the field.

3.	Key in the primary receiver's phone number. In this example the number is 1-800-555-1212. The numbers will appear as follows on the display after they are keyed and a prefix '1', if entered, will scroll ahead of the digits that follow. Once there are more than 10 digits the '1' will no longer display. It is still necessary to key it in, however, and it will be in the memory.

```
┌─────────────────────────────┐
│                             │
│         8005551212          │
│                             │
│         Pwr Roam            │
│                             │
│                             │
└─────────────────────────────┘
```

4.	When the correct primary receiver ph one number appears as above in the handset display, PRESS the 'FCN' and 'RCL' key and then the memory location 10. The display will show the location number to confirm the storage.

```
┌─────────────────────────────┐
│                             │
│            10               │
│                             │
│         Pwr   Roam          │
│                             │
│                             │
└─────────────────────────────┘
```

a.	Reporting to a single receiver via one phone number is accomplished by next pressing "FCN", "RCL" and "11", and then repeating that for location "12", "13" and "14".

b.	Reporting to two receivers, as in dual and/or split reporting is done by again pressing 'FCN' and 'RCL' followed by 12, to also store the phone number in location 12. The same process, starting at step 3, is followed to store the secondary receiver phone number in locations 11 and 13. Another phone number is stored in memory location 14 if used.

5.	To review the numbers stored, PRESS 'RCL' followed by the memory location being checked.

6.	Turn off the Motorola handset by pressing the 'PWR' button. Power down, disconnect the battery and disconnect the Motorola handset. Power up and reconnect the battery.

NOTE:	**The cellular handset must be removed after programming since the unit will not transmit alarm signals over cellular when the handset is in use.**

Programming the C/C for Split or Dual Reporting:

1. Programming the C/C to report to a single receiver does not require any special C/C programming.

2. In order for the T-2000M to distinguish between the primary and secondary phone numbers, the C/C must be specially programmed with DTMF mode for the primary phone number and ROTARY mode for the secondary phone number. If the C/C is not capable of selecting DTMF or ROTARY mode dialing, then the secondary phone number must be delayed more than 6 but less than 10 seconds before dialing. If that is also not possible, then only one receiver phone number can be dialed on the T2000M. The panel must be put in installer level programming mode to store the phone numbers. See the C/C manufacturer's installer manual for information on how to program the C/C phone numbers.

    To verify that two separate phone numbers can be successfully dialed over cellular, cause the C/C to place two such calls. The method of forcing the C/C to call both primary and secondary numbers will depend on whether it is programmed for dual or split reporting. If questions, call Adcor Technical Service Department.