

ARKANSAS POWER & LIGHT COMPANY
COMMUNICATION EQUIPMENT MANUAL

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I. INTRODUCTION

The purposes of this Communications Equipment Manual are twofold. First, to provide the user with a general understanding of the design and capabilities of the communications system available to support an emergency response related to Arkansas Nuclear One; and second, to provide the user with the detailed instructions necessary to operate the various types of communications equipment. To accomplish these objectives, this manual has been organized into two parts. "General Descriptions" discusses the design and capabilities of each communications system available. "Operating Instructions" provides the detailed instructions for operating each type of communications equipment.

II. GENERAL DESCRIPTIONS

A. TELEPHONE SYSTEMS

Two intertied telephone systems are available to support an emergency response related to Arkansas Nuclear One. These are the Arkansas Power & Light Company (AP&L) Telephone System and the Public Telephone System (Continental Telephone and Southwestern Bell). It is intended that these telephone systems serve as the primary means of communication for an emergency response.

The proposed interconnections of these two telephone systems are shown in Figure 1-1. This configuration allows for redundant interconnection pathways should portions of the system fail.

1. AP&L Telephone System

The AP&L Telephone System allows for interconnections between key AP&L locations without dependence on the Public Telephone System.

For an AP&L telephone, the system is accessed by simply dialing the four digit extension number of the desired AP&L telephone.

From a non-AP&L telephone (e.g. home phone) the AP&L Telephone System can be accessed by dialing a special code. However, this requires that the non-AP&L telephone be a touch-phone and not a rotary dialer. Two codes are provided, one a Little Rock number and the other a Russellville number, to minimize long distance charges. Both numbers are accessible through conventional long distance dialing if necessary.

The primary components of the proposed AP&L Telephone System are switches (exchanges) to be located in the ANO Administration Building, the Emergency Control Center 0.65 miles north of ANO, and the AP&L 9th and Louisiana Building in Little Rock. These switches are shown as the apexes of the triangle in Figure 1-1 and are interconnected by either microwaves or fiber optics. This configuration allows for considerable capacity and redundant pathways of communication between locations without placing any operating requirements on the user. Additional switches which would be involved in an emergency response are located at the First National Bank Building in Little Rock and at the AP&L Russellville District Office.

An additional feature of the proposed AP&L Telephone System is direct telephone link between the Onsite Technical Support Center, the Secondary Technical Support Center in the ECC, and the Control Rooms. This feature provides a hotline between these centers which does not require the support of any switch.

2. Public Telephone System

Public telephone communications between the Little Rock and the Russellville area are provided by a combination of Continental Telephone (Russellville area) and Southwestern Bell (Little Rock area).

From an AP&L telephone, the public telephone system is accessed by dialing 9 followed by the desired seven digit telephone number.

The public telephone system can be used to access ANO and ECC Numbers by dialing 964 - and the desired AP&L extension. The ANO Switchboard operator can be reached on the public telephone system at 964-3100. The ECC Switchboard operator can be reached at 964-6800. Public telephone numbers to the control rooms are 968-7410 and 968-6383, to the onsite technical support center are _____, _____, _____, and _____, to the secondary support center are 968-8383, 968-8384, 968-8385, and 968-8386, and to the Russellville District office is 968-5050.

The public telephone system can be used to access Little Rock AP&L numbers by dialing 371- and the desired AP&L extension. The AP&L Little Rock switchboard operator can be reached on the public system at 371-4000.

Access from the public telephone system to the AP&L telephone system after normal working hour can also be achieved as described in Section A.1, "AP&L Telephone System".

3. Mobile Telephones

Mobile telephones are provided to certain members of the Emergency Response Organization in order that they may be reached via the public telephone system when they are traveling in their cars. These individuals include:

- Mr. W. C. Cavanaugh III,
- Mr. J. M. Griffin,
- Mr. C. Kelly,
- Mr. J. P. O'Hanlon,
- Mr. E. Deaton

In the Little Rock area, out to a radius of approximately 17 miles, mobile telephones may be dialed like any other public telephone. Outside the Little Rock area, operator assistance maybe required.

4. NRC Emergency Notification System (NRC "Hotline")

The NRC "Hotline" telephones are red telephone sets with no dialing features. They are dedicated emergency phones; when the receiver is picked up, the telephone in the NRC Headquarters Operators Center in Bethesda, Maryland rings automatically. NRC "Hotline" is intended for use as the primary means for the site to report emergencies and other significant events to NRC/IE Headquarters. When the NRC Operations Center is activated in response to a site emergency, the phone becomes the dedicated and continuous line to the NRC for the transmission of operational data.

5. NRC Health Physics Network

The Nuclear Regulatory Commission's Health Physics Network (HPN) connects all Nuclear Power Plants and Fuel Facilities to NRC Regional Offices and to NRC Headquarters Operations Center. Its primary purpose is to support the Health Physics operation during a nuclear incident by providing voice coordination between the affected site, the Regional Office and NRC Headquarters Operations Center. Daily administrative and facsimile traffic will also be sent over the network.

The NRC Headquarters Operations Center, the Regional Office, Power Plants and Fuel Facilities on each circuit are connected on a type of "Party line" (Figure 1-6). Calling may either be Station to Station, Group, or Broadcast to all station.

The HPN provides the following features:

Station to Station Calling - A location may be "called" on an individual basis by dialing the assigned two-digit station code.

Group Calling - a predetermined group on a circuit may be called by dialing the assigned two-digit code. The HPN's group code signals all Resident Inspector telephones on that circuit.

Broadcast - a universal two-digit code which when dialed simultaneously signals all stations on a circuit. This network has a separate code for voice and facsimile broadcast.

Conferencing - the calling party may "conference" stations anytime during the conversation by simply dialing the appropriate code(s). Any number of stations may be added in this manner.

Privacy - This feature is achieved automatically as the desired station code is dialed. It permits only those stations selected by the originator to be included on the call. All other stations are "locked out" and will hear a steady high-pitched tone if they lift their receiver. Privacy is maintained until the originator hangs up.

Circuit Busy Lamp - The Resident Inspector's telephone will be equipped with this lamp to provide a visual indication of circuit availability. The circuit buttons on the telephone at Regional Offices and NRC Headquarters Operations Center will serve the same function.

- Dark lamp - circuit available for use
- Lighted lamp - circuit busy
- Flashing lamp - incoming call

Privacy Override - NRC Headquarters and Regional Offices may seize a circuit by pushing the non-locking privacy override button on their telephone. Operation of the override button places a short burst of high level tone on the circuit, removes the station busy tones and darkens all busy lamps. The overriding party may then place the call. If the overridden parties have not hung up, they are disconnected as the overriding party begins to dial.

INTER-Circuit Switching

The ability to dial from one circuit to another is provided by this feature. This is accomplished by dialing the appropriate interconnect code. An interconnect code is a unique two digit code associated with each circuit, used to gain access to the circuit from other circuits. Specific dialing instructions for this and all other types of calls are explained in System Operations.

Error Correction - The HPN includes an error correction feature. A complete explanation of this feature is explained under Systems Operations.

FACSIMILE Transmission - Customer provided facsimile (FAX) machines are located at NRC Headquarters Operations Center, Regional Offices and each Resident Inspector's Office. A switch will be provided allowing the FAX machine to be used on the HPN circuit or commercial circuit.

6. ANO Public Address System (GAI-Tronics)

GAI-Tronics Transistorized Communications (GTC) is an industrial communication system designed to provide voice communication between two or more locations, even in areas of extreme noise.

This system provides two (2) separate and independent communication channels, i.e.

The Page channel may be used to call personnel over the speakers as well as to issue plant-wide instructions. The Page channel may also be used for intercommunication between two or more handset stations. During this operation all system speakers (except those silenced) carry the conversation.

The Party Line channel may be used to carry on intercommunications after the page call is completed, thereby making the Page channel available to others.

Simultaneous conversations can take place, one on each of the above channels, without interference.

B. RADIO SYSTEMS

The AP&L radio system for Arkansas Nuclear one is an Ultra High Frequency (UHF) System. It is a very secure system which should always be operated in the coded (scrambled) mode in order to prevent unauthorized listening. The system allows the option to operate in uncoded form should the coder (scrambler) fail, or should communications with a non-AP&L radio be necessary. During normal operations, the primary use of the radio system is to assist in plant maintenance and security activities. In the event of an emergency it would serve as a means of communicating with individuals that cannot be reached by phone, such as individuals traveling in cars and radiological monitoring teams. it also serves as a backup to the telephone systems.

1. Frequencies

The Arkansas Nuclear One radio system provides for three sets of frequencies which are designated as the maintenance, security and emergency frequencies. Sets of frequencies are used in order to discriminate between received and transmitted messages which enables wider coverage of handheld radio by utilization of radio repeaters. The ANO radio system also provides for interties with the Office of Emergency Services (OES) high band radio frequency and with the Sheriff's low band radio frequency.

The coverage area of the radio system is shown in Figure 1-2. The maintenance and security frequencies are transmitted from the ANO Administration Building and can only be received in the Russellville area. The emergency frequency is transmitted from either the Emergency Control Center in Russellville or from the Prospect Building in Little Rock and can be received in either area. The OES frequency and the Sheriff's frequency are transmitted from ANO and are primarily received in the Russellville area. The coverage of the OES frequency can be extended by activating the state-wide repeating radio network.

2. Multi-channel Control Console

The ANO radio system includes seven multi-channel control consoles, each of which has 3 channels. The inter-relations of consoles and frequencies are shown in Figure 1-3. Multi-channel control consoles are located as follows:

- Unit 1 Control Room (Master Control Console)
- Unit 2 Control Room
- Central Alarm Station
- Secondary Alarm Station
- Onsite Technical Support Center
- Secondary Technical Support Center
- Emergency Control Center

The Unit 1 Control Room console, as the master control console, has the capability of switching off the channel of any other console if it is improperly used.

Channel 1 on these consoles selects the maintenance set of frequencies. It is used by maintenance personnel at ANO for routine maintenance activities and can be used for additional communications capacity in the event of an emergency. hand-held two way radios assigned to ANO Maintenance can only be reached on this channel.

Channel 2 on these consoles selects the security set of frequencies. Its intended use is for security personnel. Hand-held two way radios assigned to ANO Security can only be reached on this channel.

Channel 3 on these consoles selects the set of emergency frequencies transmitted in the Russellville area. It is intended that this be the primary channel used during an emergency by individuals other than security personnel. It is not intended to be used during normal operations. Should this channel become over-crowded during an emergency situation, then the maintenance set of frequencies (Channel 1) should be used. The Dardanelle Dam operator can only be reached on this channel.

Channel 4 on these consoles selects the set of emergency frequencies transmitted in the Little Rock area. By selecting this channel, communications are transmitted via telephone link for Russellville to the Prospect Building antenna in Little Rock and broadcast in only the Little Rock area. Transmissions on this channel can not be received in the Russellville area.

Channel 5 on these consoles can be wired to allow selection of the early warning transceiver which utilizes one of the emergency frequencies. The purpose of this channel is as a backup to Channel 3 and it should be wired and selected

should Channel 3 failed. Transmissions on Channel 5 are only received in the Russellville area. The early warning transceiver cannot be used as a repeater by emergency frequency hand held radios.

Channel 6 on these consoles selects the Office of Emergency Services Frequency. The purpose of this channel is as a backup should telephone communications with OES fail. Transmissions on this frequency are received primarily in the Russellville area unless OES repeating radio network is activated to amplify and retransmit the radio signals. Transmissions on this frequency are not encoded.

Channel 7 on these consoles selects the Sheriff's frequency for Pope, Yell, Logan and Johnson Counties. Its purpose is as a backup communications link with the sheriffs should telephone communications fail. It also satisfies a requirement of the Security Plan. Transmissions on this channel are not encoded.

Channel 8 on these consoles is presently not used.

An intercom button on each of the multi-channel consoles allows any console to talk directly to the other consoles via phone link without any radio transmissions.

A phone patch on the Unit 1 Control Room console allows the operators to interconnect the radio system with the telephone system.

3. Single Channel Consoles

The ANO radio system includes four single channel consoles. These consoles are located in the Little Rock Control Center at 901 Louisiana the First National Bank Building in Little Rock, the Health Department in Little Rock and the National Guard Armory in Russellville. The LRCC and FNB consoles select the emergency set of frequencies transmitted in Little Rock. Transmissions on this channel can only be heard in the Little Rock area or be monitored at a console. A car radio in the Russellville area cannot be reached from this console unless another console operator at ANO serves as an intermediary.

The Health Department and National Guard Armory Consoles. Select one of the Emergency Frequencies which is transmitted by the early warning transceiver in Russellville. Transmissions on this channel can only be heard in the Russellville area. Its primary function is to activate the Voice Command Radio and early warning siren system.

The LRCC and FNB single channel consoles also provide an intercom capability for direct communications to all other consoles without radio transmissions. Both of these single channel consoles offer a phone path to allow the dispatcher or radio operation to interconnect the radio system with the telephone system.

The Health Department and National Guard Armory Consoles only provide an intercom capability for direct communications to each other without radio transmissions.

4. Vehicle Radios

Four channel radios are provided in selected ANO and Little Rock vehicles. Russellville area vehicles without radio transmissions.

AP&L furnished radios include:

- ANO General Manager Vehicle*
- Russellville District Superintendent Vehicle
- ANO Datsun Pickup
- ANO Security Datsun Pickup
- ANO Van

Little Rock vehicles with AP&L furnished radios are those of:

- Mr. W. C. Cavanaugh III*
- Mr. J. M. Griffin *
- Mr. D. Rueter*
- Mr. D. Sikes *
- Mr. C. Kelly*
- Mr. C. Dunn*
- Mr. T. Kilgore

*(Special Coding Feature)

Channel 1 on these radios selects the maintenance set of frequencies. This channel is functional in the Russellville area only.

Channel 2 on these radios selects the security set of frequencies. This channel also is functional in the Russellville area only.

Channel 3 on these radios selects the emergency set of frequencies. This should be the primary channel used in an emergency response. Depending on the location of the vehicle, transmissions on this channel will be received by either the ANO radio repeaters or by the radio repeater on the Prospect Building in Little Rock, amplified and retransmitted. This allows a vehicle in Little Rock to communicate with any other vehicle in the Little Rock coverage area (See Figure 3). Similarly, a vehicle in the Russellville area may communicate with any other vehicle in the Russellville area. However, vehicles in the Little Rock area may not communicate with vehicles in the Russellville area, and vice-versa, unless a console operator at ANO serves as an intermediary.

Channel 4 on these radios selects one frequency of the emergency set of frequencies and allows the users to talk directly to each other without using the radio repeater. This is called "talk around". Transmissions on this

channel are not received and retransmitted by the radio repeaters so the coverage on this channel is limited to approximately line of sight around the transmitting vehicle. This channel is provided in order to allow at least a limited amount of communication between vehicles when the radio repeater fails.

All radios are identical except that seven have an additional special coding feature. This feature allows the Little Rock area vehicles to communicate between themselves without being overheard anywhere else in the system.

5. Hand-Held Radios

a. Maintenance Portables

There are 15 two-channel portable radios assigned to ANO Maintenance. These are kept and issued by the ANO storeroom for normal maintenance activities. Channel 1 on these radios selects the maintenance set of frequencies. Transmissions on this channel are received, amplified and retransmitted by the maintenance radio repeater, thereby allowing any maintenance portable to communicate with any other maintenance portable located within the coverage area of the maintenance antenna. The maintenance portables may communicate freely with each other and with a console, if Channel 1 is selected. Channel 2 on these radios also selects one of the frequencies of the maintenance set of frequencies. However, transmissions on this channel are not amplified and retransmitted by the maintenance radio repeater so coverage is limited to approximately line of sight around the transmitting portable radio. This channel is provided to allow a limited amount of communication should the maintenance radio repeater fail. Maintenance portables cannot talk to a console when Channel 2 is selected, although transmissions from the console can continue to be received on the portable radio.

b. Security Portables

There are 50 two-channel portable radios assigned to the ANO Guard Force. These are intended to be kept and issued by each guard station. Channel 1 on these radios selects the security set of frequencies. Transmissions on this channel are received, amplified and retransmitted by the security radio repeater, thereby allowing any security portable to communicate with any other security portable located within the coverage area of the security antenna. The security portables may communicate freely with each other and with a console if Channel 1 is selected. Channel 2 on these radios also selects one of the frequencies of the security set of frequencies. However, transmissions on this channel are not amplified and retransmitted by the security radio repeater so coverage is limited to approximately line of sight around the transmitting portable radio. This channel is provided to allow a limited amount of communication should the security radio repeater fail. Security portables cannot talk to a console when Channel 2 is selected, although transmissions from a console can continue to be received on the portable radio.

c. Emergency Portables

There are 25 four channel portable radios assigned to the Emergency Planning Coordinator for use in the event of an emergency. These radios are stored in key locations at ANO and are not used during normal operations.

Channel 1 on these radios selects the maintenance set of frequencies. This channel is intended to be used as a backup when the emergency set of frequencies becomes overcrowded.

Channel 2 on these radios selects the security set of frequencies. Use of this channel should be limited to use by the security force as much as possible.

Channel 3 on these radios selects the emergency set of frequencies. This should be the primary channel selected by individuals using these portable radios. Transmissions on Channels 1, 2 or 3 on these radios are received, amplified and retransmitted by the appropriate radio repeater in order to provide broad coverage over the Russellville area.

Channel 4 on these radios also selects one of the frequencies of the emergency set of frequencies. However, transmissions on this channel are not amplified and retransmitted by the emergency radio repeater so coverage is limited to approximately line of sight around the transmitting radio. This channel is provided to allow a limited amount of communication should the maintenance, security and emergency radio repeaters fail. Emergency portables cannot talk to a console when Channel 4 on the portable radio is selected, although transmissions from a console can continue to be received on the portable radio.

6. Dardanelle Dam Radio

A single channel base station has been provided by AP&L to the Corps of Engineers and located at the Dardanelle Dam site. This radio utilizes the emergency set of frequencies in the uncoded mode only. Communications with the Dardanelle Dam radio can be established only if Channel 3 on an ANO console is selected.

7. AP&L Russellville District Office Radio

A three channel base station has been provided in the AP&L Russellville District Office. Channel 1 accesses the maintenance set of frequencies, Channel 2 accesses the security set of frequencies, and Channel 3 accesses the emergency set of frequencies. Unlike the ANO consoles, this station cannot access the OES frequency, the Sheriffs frequency, or the standby transceiver for the emergency set of frequencies. Also, this station does not provide an intercom link with any other console.

8. Pagers

Pagers (beepers) are assigned to key members of the AP&L organization in order that these individuals may be reached when they are away from telephones or radios. There are two separate paging systems utilized within AP&L to assist in an emergency response for ANO. The first of these is operated by the ANO Radio System and the second is operated by the AP&L radio network centered in Little Rock.

a. ANO Pagers

ANO pagers are permanently assigned to:

- ANO General Manager
- Duty Emergency Coordinator
- Shift Technical Advisor
- AP&L Russellville District Manager

In addition, 16 other pagers are stored at ANO to be assigned as needed at the time of an emergency. Each of these pagers is a one-way radio capable of receiving but not transmitting messages.

The ANO pagers can be activated from the Control Room of either Unit using the emergency set of frequencies. It is intended that Unit 1 Control Room serve as the primary paging center and Unit 2 Control Room serve as a backup. To reach individuals wearing ANO pagers in the Russellville area, either Channel 3 or 5 on the Control Room console must be selected and a two tone code transmitted to activate the pager. When individuals wearing ANO pagers are in the Little Rock area, they may be reached by selecting Channel 4 on the Control Room Console and transmitting the appropriate two tone code. Channel 4 on the Control Room consoles selects the set of emergency frequencies transmitted in the Little Rock area.

When an ANO pager is activated, the wearer should return a call to the Unit 1 Control Room.

b. Little Rock Pagers

Little Rock pagers are assigned to:

- Mr. W.C. Cavanaugh III
- Mr. J.M. Griffin
- Mr. D. Rueter
- Mr. D. Sikes
- Mr. C. Kelly
- Mr. C. Dunn

In addition, three other pagers are available to be assigned as needed at the time of an emergency. These pagers are only capable of setting off a tone. They cannot transmit or receive messages.

The Little Rock pagers can only be activated from the Little Rock Control Center at 901 Louisiana by using the AP&L Radio Network (not the ANO Radio System). The antenna for this network is located in the Heights in West Little Rock and provides coverage out to a radius of 25 to 30 miles. The Little Rock pagers cannot be activated outside the Little Rock area. When a Little Rock pager is activated, the wearer should return a call to the Little Rock Control Center at 901 Louisiana.

C. EARLY WARNING SYSTEM

An Early Warning System has been installed by Arkansas Power & Light Company as required by Federal regulations in order to provide the public in an area out to ten miles from ANO with an early warning of an emergency at ANO. Regulations require that this system be activated in the event of a Site or General Emergency, and that it be capable of notifying the entire population within this area within a specified time of activation of the system.

The Early Warning System installed around ANO consists of a mixture of 51 sirens, approximately 1800 tone-alert AM radios and 15 Voice Command Receivers. For reasons of cost effectiveness, sirens have been located in the more densely populated areas and tone alert radios will be distributed to the less densely populated areas.

1. Sirens

The sirens used in this Early Warning System are capable of producing a steady tone to warn of tornadoes, chemical spills, nuclear plant emergencies, etc., and a warbled tone to warn of nuclear attack. The siren coverage area is shown in Figure 1-4. The siren locations are shown on Figure 1-5. In order that these sirens may be used to warn of tornadoes, chemical spills, or other emergencies which affect limited area, the siren coverage area has been divided into five zones. These are the:

- Logan County Zone
- Johnson County Zone
- Yell County Zone
- Russellville Area Zone of Pope County
- London Area Zone of Pope County

Each of these siren zones is activated by the transmission of a two-tone audible code over the emergency set of frequencies of the ANO Radio System. If desired, the five zones may be activated simultaneously by the transmission of a special two-tone audible code. The location of the primary tone encoder for activation of the sirens is to be the State Health Department Offices on Markham St. in Little Rock backup tone encoder is provided in the National Guard Armory in Russellville should it not be possible to reach the Health Department, or should the Health Department tone encoder fail. The backup tone encoder is to be used by the Arkansas Nuclear Planning & Response Program (ANP&RP) Office only. A two-tone audible code transmitted over the emergency set of frequencies will turn off the sirens when appropriate.

2. Tone-Alert Radios

Tone alert radios will be made available free of charge by AP&L to residents living outside the siren coverage areas but within the 10-mile Emergency Planning Zone. These tone alert radios are single channel AM radios permanently tuned in to KARV radio station and which are activated by the Emergency Broadcast System (EBS). Unlike the siren portion of the Early Warning System, the tone-alert radios cannot be activated by zones. When the EBS signal is transmitted by KARV radio station, all tone alert radios in the KARV coverage area will activate.

3. Voice Command Receivers

In order to provide notification to radio station KARV, area schools and sheriffs that the Early Warning System is to be activated the Early Warning System includes 15 Voice Command Receiver which will be distributed as follows:

- 2 to KARV
- 7 to schools
- 4 to sheriffs of Pope, Yell, Johnson and Logan Counties
- 2 ANP & RP

These radios are activated by means of a two-tone audible code transmitted over the emergency set of frequencies on the ANO Radio System. These radios are activated by the Health Department in a manner similar to activation of the sirens using the same tone encoder as for activation of the sirens.

Special features allow activation of these Voice Command Receivers in a variety of groupings. These Voice Command Receivers can receive or monitor uncoded transmissions on the ANO emergency set of frequencies, but cannot transmit messages.

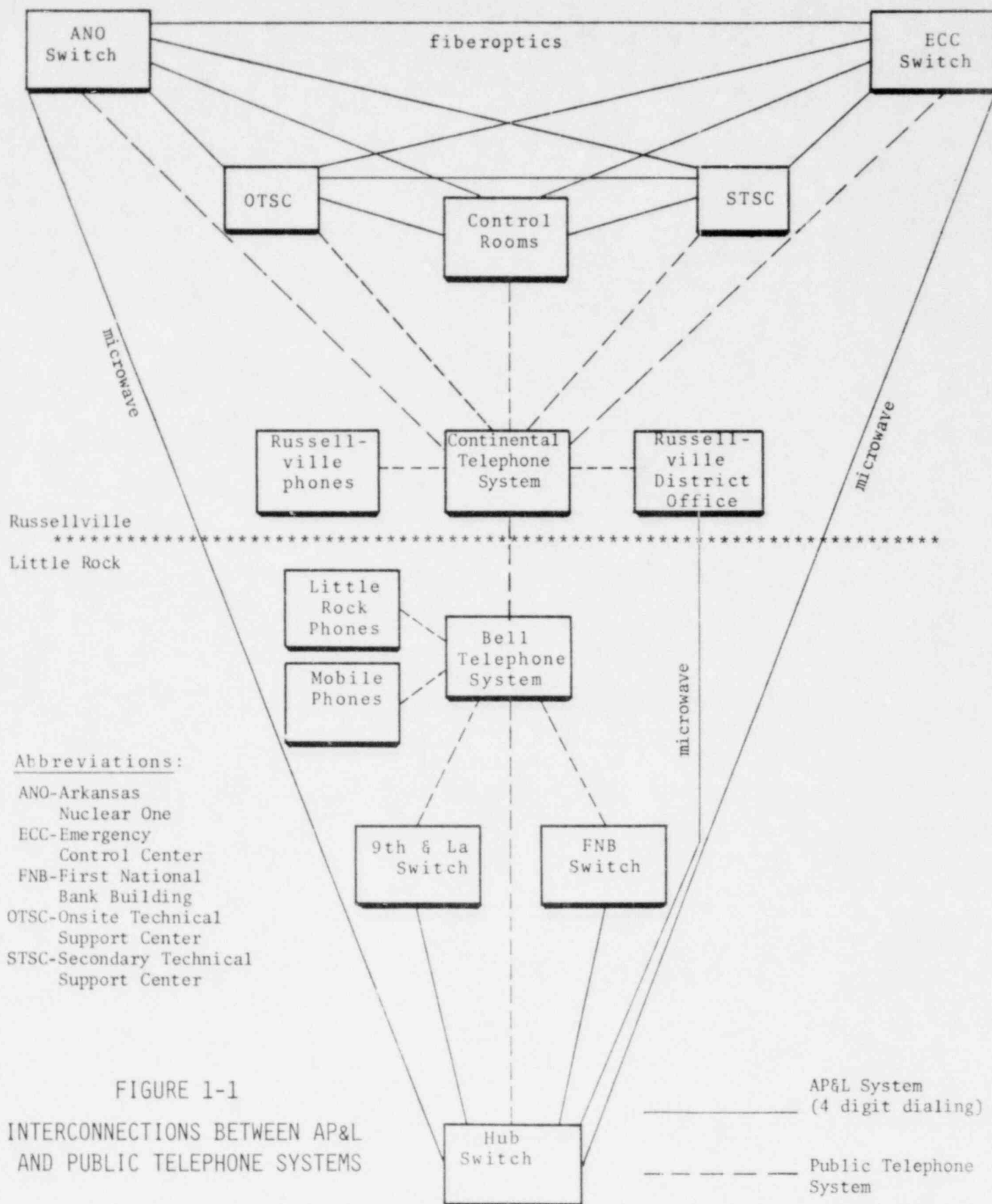


FIGURE 1-1
INTERCONNECTIONS BETWEEN AP&L
AND PUBLIC TELEPHONE SYSTEMS

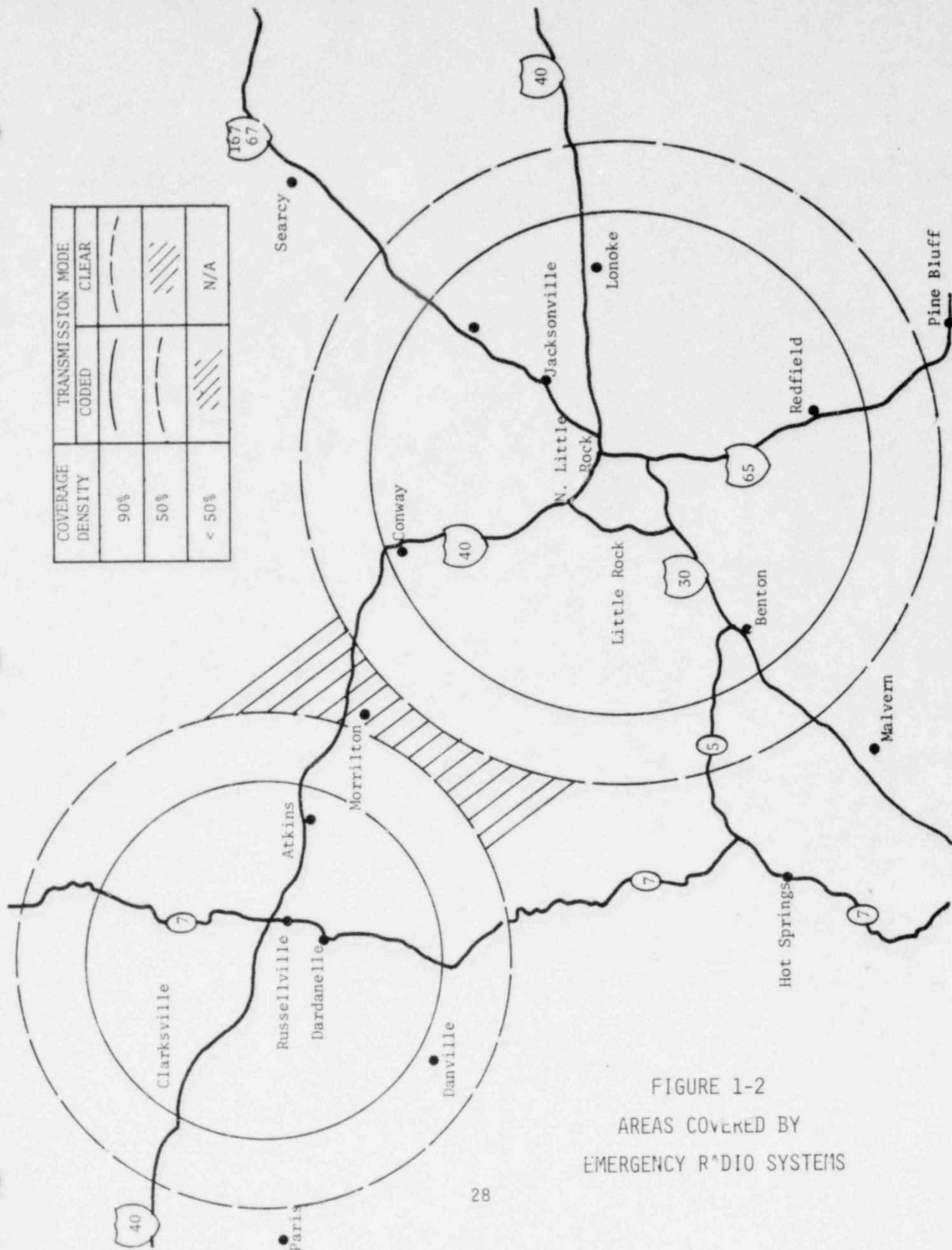


FIGURE 1-2
AREAS COVERED BY
EMERGENCY RADIO SYSTEMS

Figure 1-3

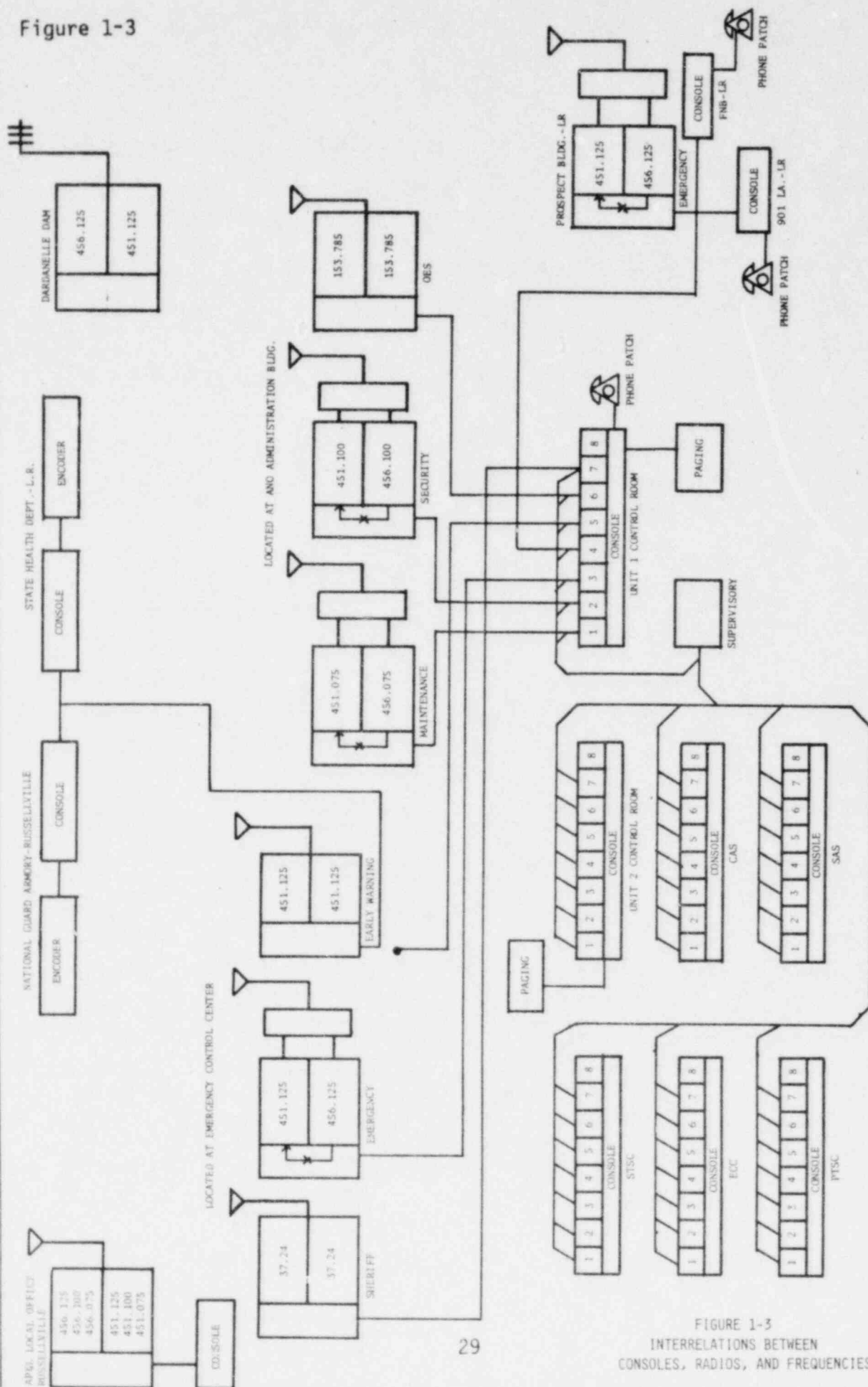


FIGURE 1-3
INTERRELATIONS BETWEEN
CONSOLES, RADIOS, AND FREQUENCIES

Figure 1-4

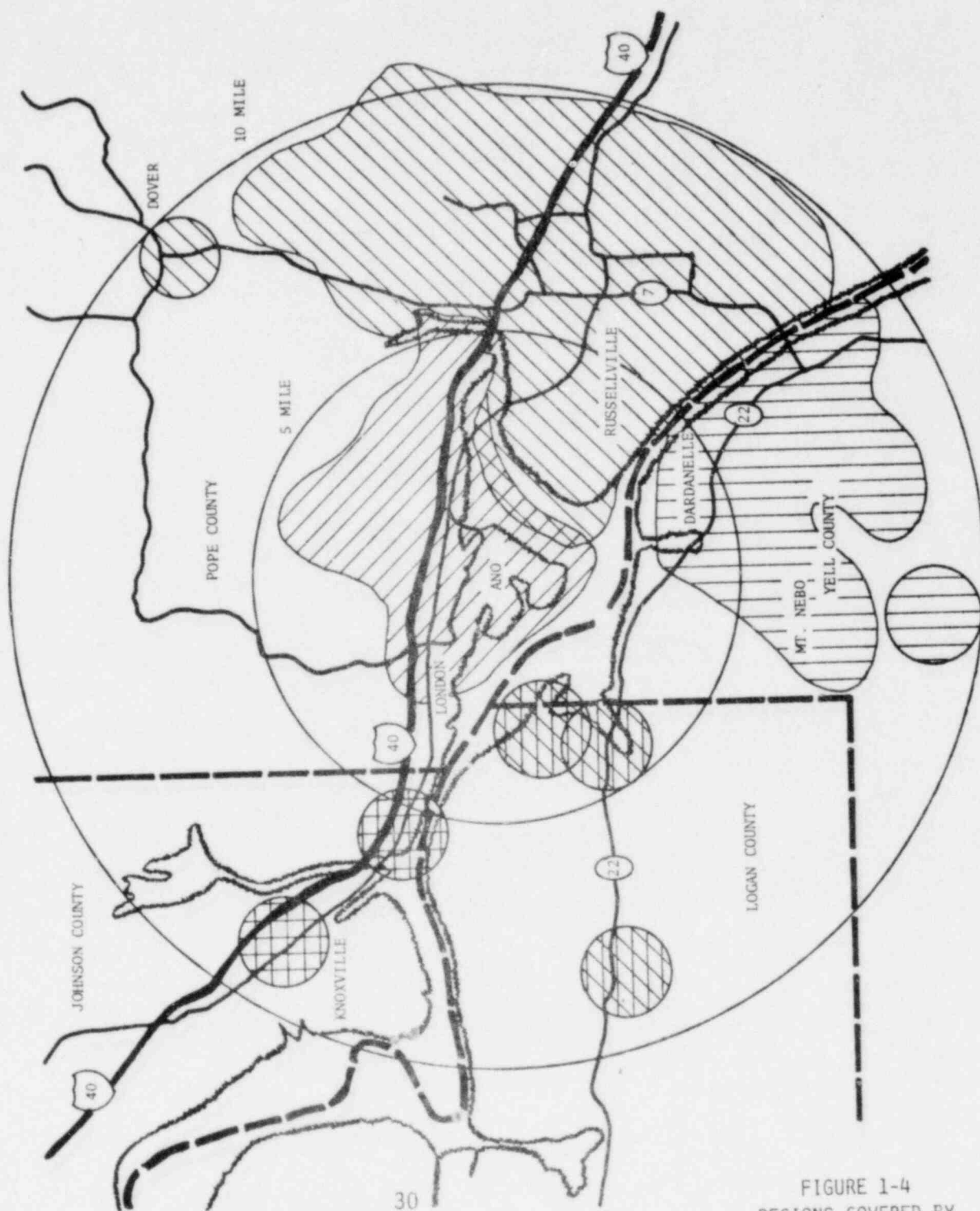


FIGURE 1-4
REGIONS COVERED BY
EARLY WARNING SIRENS

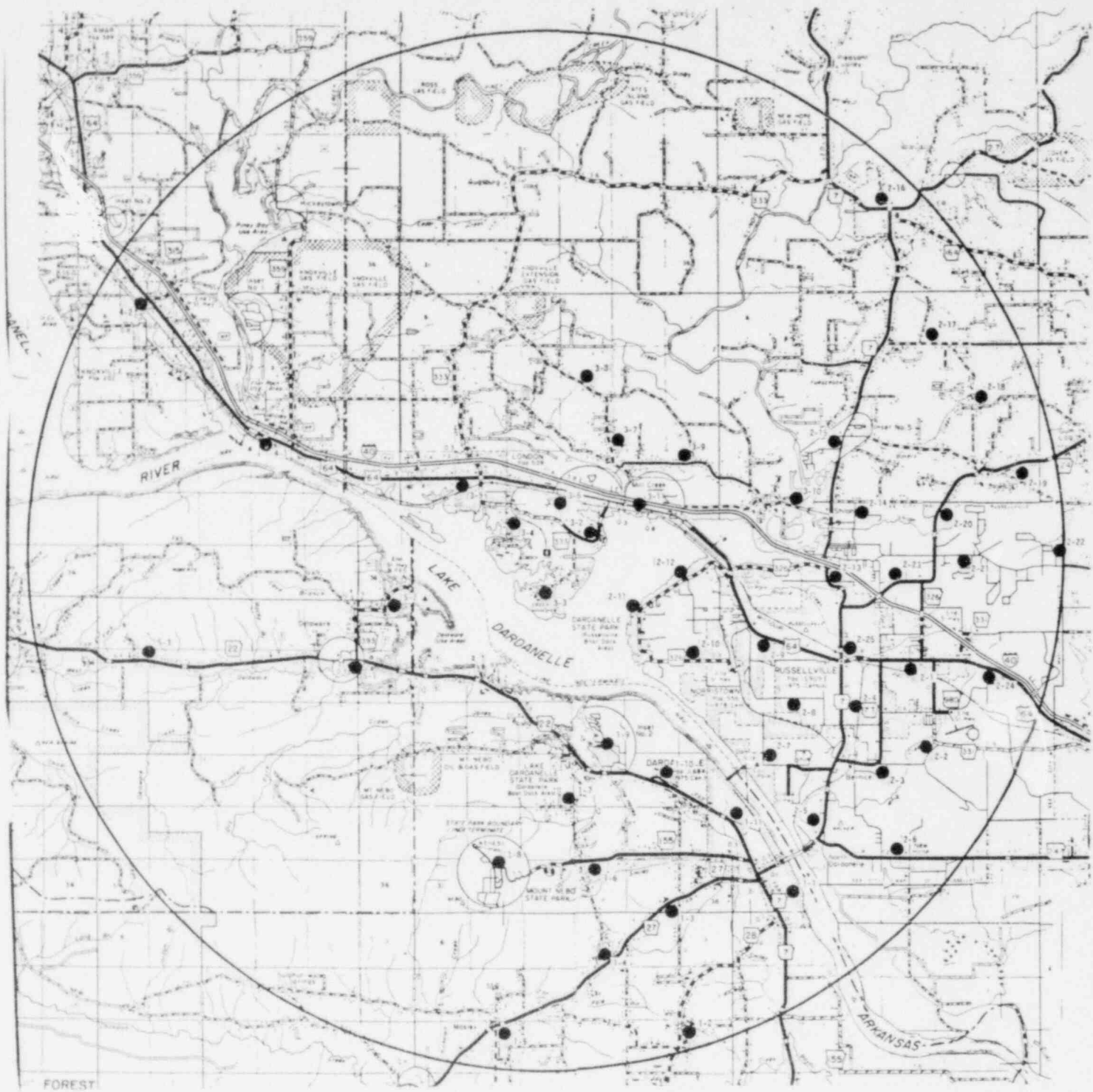


FIGURE 1-5
EARLY WARNING
SIREN LOCATION

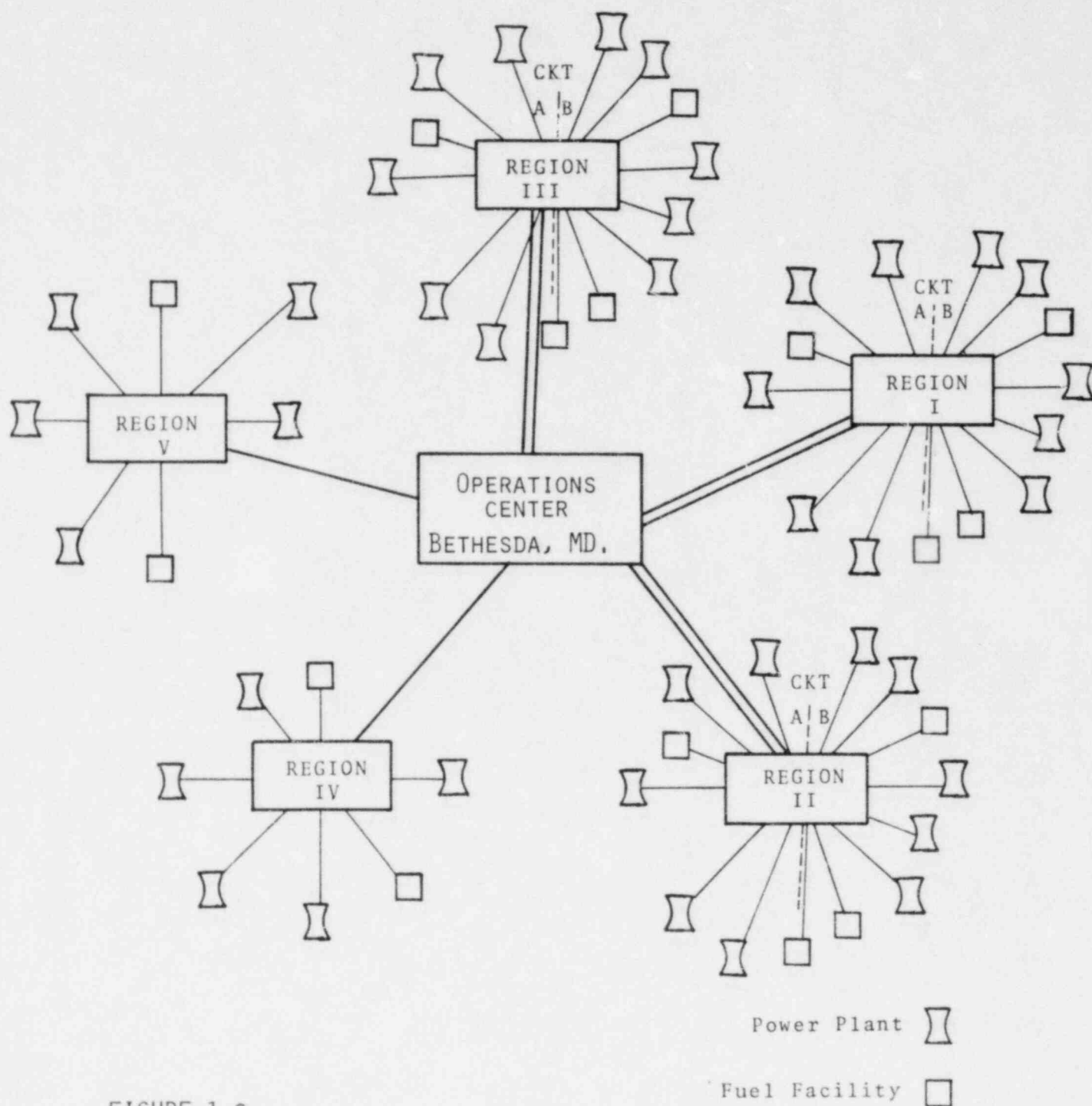


FIGURE 1-6
HEALTH PHYSICS NETWORK

III. OPERATING INSTRUCTIONS

A. TELEPHONE SYSTEMS

1. AP&L Telephone System (ROLM CBX)

a. Switchhook FLASH

Before requesting a particular CBX feature, you must have a dial tone. You'll automatically hear a dial tone if you've just lifted your handset. But often you'll want to request a CBX feature while you're engaged in a phone conversation.

To obtain a dial tone while engaged in conversation, FLASH the switchhook (plunger) located in the cradle that holds your handset. That is, just depress the switchhook for about one second and release it.

Don't worry about losing your party; disconnection occurs only if you depress the switchhook for an extended period of time.

REMEMBER:

To request a CBX feature you must have a dial tone. If you don't have a dial tone, FLASH to receive it.

b. Audible Signals

This list and brief description of the CBX audible signals will introduce, and provide a reference for, the features described on the following pages.

(1) Dial Tones

Internal	Medium Pitch	Indicates you can place an internal call or request a special feature. Obtained by lifting your handset.
Holding	High Pitched	Indicates you have a call holding on your extension and may request a special feature. Obtained by flashing while engaged in a conversation.
External	Low Pitched	Indicates you can make an external call. Obtained by dialing an access code--usually 9--to gain access to the public network.

(2) Special Tones

Pulse Tone	Short Pulse	Tone heard immediately after you flash the switchhook plunger. Followed by a dial tone.
------------	-------------	---

Busy Tone	Standard	
-----------	----------	--

Call Waiting/ Camp-On Tone	Single Burst of Tone(beep)	Heard during a call, this tone indicates that someone is waiting to talk with you.
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Barge-In	Single Half-Ring	Heard during a call, this tone indicates that someone will be entering your conversation.
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Do Not Disturb Tone	High Pitched Busy Tone	Heard after dialing an internal extension, this tone indicates that the person you dialed is in the Do Not Disturb mode.
---------------------	---------------------------	--

All Trunks Busy Tone	Fast Busy Tone	Indicates all trunk facilities are busy.
-------------------------	-------------------	--

Error Tone	Warble	(see NOTE)
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NOTE ON ERROR TONE: If you hear a warble after requesting a feature, it could mean one of the following:

- (a) Your Class of Service does not include the feature you requested.
- (b) The feature you requested is unavailable due to the condition of the called party. For example, the party you want to Camp-On already has a party Camped-On.
- (c) You made an error in dialing, or the access code is incorrect.

Whatever the reason, just FLASH and proceed again (in case of error) or follow another course of action (for example, reconnect to a held party).

(3) Ringing Tones

Internal Extension	Single Interrupted Ringing
Com Group	Succession of Long Rings
External or Operator/ Attendant	Double Interrupted Ringing

c. Internal Calls

To place a call to another extension:

Lift handset. Receive dial tone KEY IN: Extension number You'll hear the called party's phone ring with a single interrupted ring.

To place a call to a Com Group Member:

Lift handset. Receive dial tone. KEY IN: Two-digit Com Group Number

You'll hear the called party's phone ring in a succession of long rings, even if it is in Do Not Disturb or if party has forwarded their called to another extension.

d. External Calls

To place an outside call:

Lift handset. Receive dial tone. KEY IN: 9 Receive external dial tone. Dial desired number. You'll hear the called party's phone ringing.

To place an outside call from a restricted phone:

Lift handset. Receive dial tone. KEY IN: 0 (Zero) Request attendant to place call for you.

NOTE: In either case, if no trunk lines are available you'll hear a rapid busy tone, and may try again later, or queue for the trunk (see "Callback Queuing").

e. To Hold A Call

To place a call on hold:

FLASH Receive pluse tone and high-pitched holding tone. KEY IN: * 9 You'll hear a high-pitched dial tone indicating your party is On Hold. Hang up.

To reconnect to your party:

Lift handset. Receive high-pitched holding tone. KEY IN: * 1 If you don't reconnect within approximately 75 seconds, your telephone will automatically ring. If you answer your phone you'll be connected directly to your party. But if you don't answer your phone within approximately 15 seconds (usually 3-4 rings), your call will be returned to the attendant.

f. Consultation Calls

This feature enables you to consult with either an internal or an external party while you hold another party on your line.

Lift handset. FLASH Receive pulse tone and high-pitched holding tone. To consult with an internal party: KEY IN: Desired Extension To consult with an external party: KEY IN: 9 + number obtain desired information.

To alternate between both parties:

FLASH Receive pulse tone and high-pitched holding tone. KEY IN: * 1

To return to your original party:

Hang up. Your phone will ring and the holding party will be on your line.

g. To Transfer A Call

To transfer a call to another extension:

Request that the caller wait. FLASH Receive the pulse tone and high-pitched holding tone. KEY IN: * 7 + extension number When the extension is answered, announce the caller and hang up.

To transfer a call to the attendant:

Request that caller wait. FLASH Receive pulse tone and high-pitched holding tone. KEY IN: * 7 0 (Zero) When attendant answers, announce the caller and hang up.

To return to original caller:

If the extension to which you are transferring the call is busy, not answered, or if the called party prefers not to take the call--return to the original caller.

FLASH KEY IN: * 1

NOTE: Until you hang up or reconnect, the party you are transferring will remain on hold. If you transfer a call when another call is waiting for you, you'll be connected to that waiting call immediately after dialing the transfer extension number. The transfer is completed although you are unable to announce it.

h. To Park An External Call

If you are talking with an external party and want to continue your conversation at another location, you may Park the call--Transfer and Hold--at that new location.

To Park:

FLASH Receive pulse tone and high-pitched holding tone. KEY IN: * 6 + new extension number. When you hear the standard internal dial tone, hang up: your call is then parked at the new extension but will not ring.

To re-establish connection:

Lift handset of new extension within 75 seconds. Receive high-pitched holding tone. KEY IN: * 1. If you don't reconnect within approximately 75 seconds, the new extension will ring usually 3-4 times. If you still don't reconnect, your call will automatically revert to the attendant.

NOTE: Calls parked on multi-extension telephone using ROLM adapters will wink on hold. To reconnect, depress the winking button. If you park a call on a busy extension, the person on that extension will hear a Call Waiting Tone and may choose to connect to the call. Or, when that extension is no longer busy, the call will automatically be connected.

i. Camp-On Calls

If you hear a short "beep" tone while talking with someone, your attendant has a caller waiting to speak to you, or someone has parked a call on your extension.

To accept a Camp-on Call:

Complete your first conversation and hang up. The camped-on call will automatically ring on your telephone.

To accept the Camp-On Call and maintain connection with your original party:

After hearing the Camp-On tone, FLASH Receive pulse tone and high-pitched holding tone. KEY IN: * 1

NOTE: To alternate between parties, use the Connect Code (* 1). If you are unable to accept a Camp-On Call, you can ignore the Camp-On Tone; the call will return to the attendant.

j. Camp-On Callback (Automatic Callback)

If you place an internal call and receive a busy tone, you can key in the special Camp-On Callback Code. Then, the CBX will automatically call your back when the extension you desire is free.

For Automatic Callback:

FLASH Receive pulse tone and high-pitched holding tone. KEY IN: # 1 If you don't hear a tone after entering the Camp-On Code, you have successfully camped-on. HANG UP AND WAIT FOR CALLBACK. When the busy extension is free, your telephone will ring in succession of long rings. Lift your handset, and the previously busy extension will ring.

NOTE: If you hear an Error Tone after attempting Automatic Callback, callback is not available, because another caller is already held or camped-on the extension you requested. Callback service is cancelled if you don't answer your telephone within about 15 seconds--usually 3-4 rings--after you are called back.

To Cancel Automatic Callback:

KEY IN: # # 1

k. Conference Calls

This feature allows you to add up to eight (in some cases four) parties on one call, two of which may be external parties.

To initiate conference:

FLASH Receive pulse tone and high-pitched holding tone. With an Internal Party-KEY IN extension number
With an External Party-KEY IN 9 + number

Inform additional party of conference, then

To add-on new party:

FLASH Receive pulse tone and high-pitched holding tone. KEY IN: * 4

You may repeat this entire process as many times as allowed by your conference number limit. The conference is concluded when all internal parties hang up. Though it is not necessary for the conference originator to stay in the conference, at least one internal party must remain involved for the conference to continue.

1. Call Pick-Up

You can answer a call ringing or on hold at one extension from your own--or any other--extension.

To pick-up a ringing call:

Lift handset of any extension. Receive dial tone. KEY IN: * 3 + (ringing) extension number.

You will then intercept the call ringing, or held, at that extension.

To pick-up held group call:

Lift handset of any extension. Receive dial tone. KEY IN: * 3 + extension number.

m. Call Forwarding

This feature enables you to divert all of your calls to another extension.

To forward your calls:

Lift handset. Receive dial tone. KEY IN: # 9 + extension number All your calls will now be re-routed to this new extension.

To cancel Forwarding: (From original extension) KEY IN: # # 9 (From forwarded extension) KEY IN: Original extension

You will hear a dial tone, but ignore it and hang up. Call Forwarding may be continued to additional extensions, if you want to leave one forwarded extension and move to a new one.

To continue Forwarding: KEY IN: Your original extension Receive dial tone. KEY IN: New extension number

NOTE: The attendant may cancel forwarding arrangements on a system-wide basis, and has the ability to set and clear forwarding for your extension.

n. System Speed Calling (Abbreviated Dialing)

Frequently called business numbers are listed in your System Speed Calling Directory.

To place a system speed call:

Refer to directory for code number. Lift handset. Receive dial tone. KEY IN: # 6 + code number. Wait until your call is processed.

NOTE: If trunk lines are unavailable, you'll hear a rapid busy tone. You can try again later or queue for a trunk.

o. Repeat Number Dialed (Store and Re-Dial)

If you place an external call and find: --the number is busy, --the called party doesn't answer, or --if you wish to continue an in-progress call at a later time. . .you can store the number for later use. Then, you need only key in an access code, not the whole number, to make your call.

To store a number:

FLASH Receive dial tone. KEY IN: # 4 (either after dialing a busy or unanswered call, or during a conversation) Then hang up, if your call was not completed, or continue your conversation.

To re-dial a saved number:

Lift handset. Receive dial tone. KEY IN: # 7. The CBX automatically re-dials the number you stored.

p. Do Not Disturb

To temporarily block incoming calls:

Lift handset. Receive dial tone. KEY IN: # 5 Anyone who calls you will receive a busy signal except Com Group Members who use your Com Group Number to call you.

To cancel:

Lift handset. Receive dial tone. KEY IN: # # 5

NOTE: The attendant can cancel Do Not Disturb arrangements on a system-wide basis. Do Not Disturb is temporarily overridden when a Com Group member dials your Com Group Number instead of your extension number.

q. Callback Queuing

Your system may be provided with this optional feature. Call Queuing enables you to place yourself in a waiting position for a busy trunk--for instance, a busy WATS line. Once the trunk is free, the CBX will ring you back and dial your number for you. (The process is similar to Camping-On a busy internal extension). If, after dialing an outside number, you hear a rapid busy tone, you can assume that the desired trunk is busy.

To Queue for a trunk:

FLASH Receive dial tone. KEY IN: # 1 Hang up. The CBX will call you back with long rings when your trunk is available. When you answer, you will hear a high-pitched holding tone indicating that the trunk is not holding for you.

To make your call:

KEY IN: * 1 The CBX will dial your number for you.

NOTE: In some cases the CBX cannot automatically dial your number for you when you are called back. If after being called back by the CBX and keying in * 1 you just hear the standard external dial tone, simply dial the desired number yourself.

To postpone placing your call:

After the CBX calls you back and you receive the holding dial tone, hang up. You will be called back again in approximately 10 minutes.

To cancel Callback Queuing:

KEY IN: # # 1

NOTE: If you do not answer the ringing callback within approximately 15 seconds, your queue will be cancelled. You may only have one call queued at a time.

r. Standby Call Queuing

Standby Queuing provides a method for you to place yourself in a waiting position for a busy trunk while remaining offhook. If after dialing an external number you hear a rapid busy tone, you can assume that the desired trunk is busy.

To Standby Queue:

Remain off-hook. Ignore the rapid busy tone. (After approximately 10 seconds you will be connected to music if your system so provides.) When a trunk is available, you'll hear a beep tone, and the CBX will then place your call for you.

If you do not wish to wait, you can convert the Standby Queue to a Callback Queue.

To convert to Callback Queue:

FLASH Receive pulse tone and high-pitched holding tone. KEY IN: # 1 (The same process then applies as described for Callback Queuing.)

s. Executive Override

If your Class of Service includes the Executive Override feature, you can enter calls in progress or interrupt extensions in the Do Not Disturb mode. You cannot use Executive Override to barge-in on Private Calls.

To override a busy extension number:

FLASH Receive pluse tone and high-pitched holding tone. KEY IN: # 8 The party at the busy extension will hear a brief ringing tone. After eight seconds you will both be joined in a conference call. If the extension is in Do Not Disturb, the call will immediately ring through.

t. Handling Night Calls (Night Answer)

To answer an incoming call when the night chimes sound (when attendant is off duty):

Lift handset Receive dial tone. KEY IN: # 3 0 (Zero) You will be connected to the outside caller.

To place a call on hold before paging:

FLASH KEY IN: # 9 You will hear the high-pitched holding tone.

To Page:

KEY IN: Instruct the paged party to pick-up your extension number. Hang up.

NOTE: Placing a call on hold at your extension allows you to exercise control over the call. If no one responds to your Page within approximately 75 seconds, your phone will ring, and you will be reconnected to the calling party. Likewise, if you want to check on the status of a call, lift your handset; if you hear a high-pitched holding tone, no one has responded to your Page. You may then wish to Page again or reconnect to the party. If you hear the standard internal dial tone, the call has been picked up.

u. Paging (at ANO only)

To page.

Lift handset. Receive dial tone. KEY IN: 197 Speak slowly and distinctly. Repeat your message twice.

NOTE: Paging capability may be restricted to evening hours and weekends.

2. Mobile Telephones

a. Introduction

Control switches, indicators, and major components of a mobile telephone (radio telephone) are illustrated in Figure 2-1. The purposes of the switches and indicators are also identified on Figure 2-1.

The handset display provides a visual indication of those entries made via the push button pad as follows:

- As telephone numbers are entered via the push button pad (either to place a call or to load the memory), they will appear on the handset display.
- After the Snd button is depressed, the display will momentarily blank with each digit reappearing as it is outputted.
- When the handset is taken off hook (or the Off-Hook button is actuated), the last number entered will automatically appear on the handset display (last number recall feature).
- Telephone numbers called from memory will appear on the display.
- Channel designation numbers will appear on the display before they are programmed into the roam list.

The handset display is a seven digit indicator. Since some telephone numbers may be as great as 16 digits length. The Nbr button is provided for reviewing and verifying the accuracy of a number. Repeatedly depressing the Nbr button will cause the number to sequence across the handset display from first to last digit. When the Nbr button is pressed once, the display blanks; when pressed a second time, the first (left) digit appears at the right of the display. When the Nbr button is pressed a third time, this digit will shift one place to the left and the second digit will appear to its immediate right. This process may be repeated, stepping the number across the display until the entire number has been reviewed.

b. Notes and Precautions

- (1) Occasionally, difficulties may be experienced in transmitting or receiving while the car is in motion. In extreme cases, the signal may appear weak or "choppy" near the fringe of a coverage area or while traveling through congested areas. When this occurs, parking the car in an area where the reception is satisfactory will allow uninterrupted continuation of a conversation.
- (2) When using the mobile telephone while the vehicle is parked, keep the motor running to minimize battery drain.
- (3) For greatest clarity, speak in a normal tone of voice.
- (4) After you finish a call, be sure to hang up the handset properly so your set will be ready to receive new calls.

c. Instructions for Operation

NOTES:

- Potential callers should be instructed to let their phone ring from 6 to 10 times to ensure that their call is received by the mobile telephone.
- Callers should be informed of the route of the mobile telephone; since, in order to place a call, the caller will need to request the local telephone operator to connect him to the mobile operator nearest the mobile telephone's estimated position.

(1) Home Mode Calling

- Step 1 Turn the automobile ignition switch on.
- Step 2 Turn the mobile telephone on.
- Step 3 Place the unit in home mode by repeatedly depressing the Home/Roam/Man selector button until the display indicates Home.
- Step 4 Enter the desired telephone number via the push button dial pad. The number will appear on the handset display.

- Step 5 Lift the handset off hook. If a channel is available the green Xmit light will come on and a dial tone will be received. If all available home channels are busy, the red Bsy/Call indicator will come on accompanied by an audible busy signal.
- Step 6 The radio unit is equipped with MACS, the MACS circuitry will be enabled as you hang up after receiving the busy signal. The MACS mode is indicated by the flashing Bsy/Call light; the mobile telephone is awaiting an available channel. When a channel has been secured, a short right will alert you, and you may proceed with the call as described in the next paragraph. Sometimes, when the system is very busy, the MACS mode will time-out before a channel becomes available. This timeout, which occurs after about four minutes, is indicated by two short bursts of ring. If you wish to proceed with the call, you must reinitiate the call attempt. However, it will not be necessary to redial the desired phone number since it has been stored in the last entered phone number memory. Merely lift the handset to proceed with the call.
- Step 7 After MACS has alerted you that it has secured a channel, lift the handset and listen for dial tone. Optionally you may depress the Off-Hook button and utilize the "on-hook" calling procedure.
- Step 8 When a dial tone is obtained, momentarily depress the Snd button. Your call will be processed automatically. When your party answers, conduct your conversation as you would on a home or business phone.
- Step 9 To discontinue MACS at any time, lift the handset from the cradle and replace, or depress OFF-HOOK and the CLEAR.

(2) Answering A Call

- Step 1 An incoming call is indicated by the control head ringer.
- Step 2 After an incoming call has been indicated, pick up the handset. The green Xmit light will come on. Answer in a normal voice and conduct your call.
- Step 3 When your call is completed, announce your mobile telephone number and hang up.

(3) On-Hook Calling

To process your call without removing the handset:

- Step 1 Enter the desired number (or recall a stored number, see below) via the push button pad.
- Step 2 Momentarily depress the Off-Hook button. The external speaker if used, is now activated.
- Step 3 When the Xmit indicator is illuminated and a dial tone is received, momentarily depress the Snd button. You can now monitor the entire processing of the call over your speaker.
- Step 4 When the called party answers, lift the handset off hook and proceed with your conversation.
- Step 5 If the called number is busy, press the Clear button to return the mobile telephone to the on-hook condition. The call may be placed later by pressing the Off-Hook and the Snd button.
- Step 6 If all channels are busy when the Off-Hook button is pressed, a busy indication (red Bsy/Call light on and the busy tone heard through the external speaker) will be received for about two seconds. Then the MACS mode will automatically be enabled as indicated by the flashing Bsy/Call

light; the mobile telephone is now awaiting an available channel. When a channel has been secured, a short ring will alert you and you may proceed with the call. Sometimes, when the system is very busy, the MACS mode will time-out before a channel becomes available. This timeout, which occurs after about four minutes, is indicated by two short bursts of ring followed by a constant busy signal (red Bsy/Call light on and busy tone heard through speaker). Press the Clear button to terminate the signal. If you wish to proceed with the call, you may reinitiate the call attempt by depressing the Off Hook button again.

- Step 7 When dial tone is received, proceed with the normal "on-hook" calling procedure.
- Step 8 To discontinue MACS at any time, depress the Clear button.

(4) Roam Mode Calling

- Step 1 Select Roam mode by momentarily depressing the Home/Roam/Man mode selector button until the display indicates Roam mode.
- Step 2 Proceed as you would for a home mode call. (Steps 4 through 9)

(5) Manual Mode Calling

Several types of manual mode systems may be encountered when using your Mobile Telephone. If in doubt as to which system you are using, consult your local representative or the Telephone Company operator.

In all manual mode systems, the PTT bar must be depressed when you wish to speak. It is not necessary to release the PTT bar to listen since the receiver remains operative while the transmitter is "on-the-air" (duplex operation).

- Step 1 Select manual mode.
- Step 2 Lift handset off-hook.

- Step 3 By repeatedly depressing the Chan button, monitor all channels until a channel with no conversation is obtained.
- Step 4 Depress the PTT bar for approximately two seconds. The operator will answer and help you proceed with your call.

(6) Mode Selection

Refer to Figure 2-2.

- a. Little Rock Area - Home - Channels 3, 15, 19 & 23.
- b. Conway Area - Roam - Channel 7.
- c. Russellville - Manual - Channel 5.
- d. Refer to Figure 2-3 for other areas.

(7) Loading The Telephone Number Memory

The Mobile Telephone is equipped with a memory which stores up to ten often used telephone numbers. Memory locations 1 and 2 (corresponding to push buttons 1 and 2) will store numbers up to 16 digits in length; locations 3 through 0 have 11 digit capability. To load telephone numbers into memory:

- Step 1 With the handset on-hook, enter the desired telephone number via the push button pad.
- Step 2 Momentarily depress the Store button.
- Step 3 Momentarily depress the desired memory location button on the push button pad. If there is already a number stored in this location, it will be deleted and the new number stored in its place.
- Step 4 Repeat the above for each number you wish to store.

Should you wish to enter a new number in an already occupied memory location, follow the procedure described above. The new number will automatically replace the old number.

(8) Placing A Call Using Telephone Number Memory

To place a call using the telephone number memory:

- Step 1 With the handset on-hook, momentarily depress the Mem button.
- Step 2 Momentarily press the desired memory location push button. The stored number will be displayed in the dialed number display on the handset.
- Step 3 Lift the handset off-hook.
- Step 4 When dial tone is received, momentarily depress the Snd button.

(9) Originating A Call In Systems Requiring An Access Code

To place a call in systems requiring an access code:

- Step 1 With the handset on hook, enter the access code via the push button pad. The access code will appear on the handset display.
- Step 2 Momentarily depress the Snd button. The access code will be followed by a dash -.
- Step 3 Enter the next access code as above or desired telephone number via the push button pad. The numbers will appear on the seven digit handset display. Should the total number of digits exceed the handset display capability, the access code will be displaced.
- Step 4 Lift the handset off hook.
- Step 5 After receiving dial tone, momentarily depress the Snd button; the access code will be outputted.

- Step 6 When the system is obtained, a second dial tone will be received. Momentarily depress the Snd. The telephone number will be outpulsed and your call processed. Proceed as described for a basic call. The access code will be stored along with the phone number; if the line is busy, the call may be placed later without re-entering the telephone number and access code.

(10) Loading The Roam List

The Mobile Telephone will automatically scan all non-prohibited channels ("roam all" condition) whenever roam mode is selected. However, to prevent your mobile telephone from selecting a weak channel or channel not allocated for your use, you may desire to program your mobile telephone to scan a selected list of channels (roam list).

- Step 1 Determine the channel numbers you wish to enter.
- Step 2 With the handset on hook, select Roam mode.
- Step 3 Momentarily depress the cradle Delete/Roam All button twice. The cradle display will show a double bar --.
- Step 4 Enter the desired channel designation number via the dial pad. The number will appear on the handset display.
- Step 5 Momentarily depress the cradle Store button.
- Step 6 The channel designation number will then appear on the cradle display and the handset display will blank.
- Step 7 Repeat the two previous steps for each channel you wish to enter.
- Step 8 The mobile telephone will automatically reject any erroneous channel. An erroneous channel will be indicated by an EE on the cradle display.

Step 9 The roam list may be reviewed by repeatedly depressing the Chan button on the push button pad while the Roam mode.

(11) Deleting A Single Channel From The Roam List

Step 1 While in roam mode, repeatedly depress the Chan button until the channel to be deleted is indicated on the cradle display.

Step 2 Momentarily press the Delete/Roam All button once.

3. NRC Emergency Notification System (NRC "Hotline")

a. TO CALL:

Pick up receiver. When the NRC Duty Officer answer, continue with your message.

NOTE: If the "red phone" is inoperable, contact should be made through commercial phone service by calling 817/334-2841.

b. TO ANSWER:

Pick up receiver. Continue with your communication.

4. NRC Health Physics Network

As soon as the telephone receiver is lifted, the calling party may dial. NO DIAL TONE IS HEARD. The particular interconnect code for each circuit can be found in Attachments 1 through 8.

The calling party does not hear an audible ringing signal after dialing the desired code(s). Ringing is heard at the called station to indicate an incoming call. This ringing steps when the telephone is answered or at the end of thirty seconds. Even though the called telephone stops ringings, it can still be answered since the calling party may be waiting on the circuit. The calling party may, however, dial again if the call has not been answered in approximately 30 seconds.

Many locations have more than telephone associated with a station code. In these cases after one of the telephone is answered, ringing will continue at the other until they are answered or the ringing times out. There is no privacy between telephones sharing the same code. To insure the circuit is not in use, a challenge phrase such as "Circuit busy?" may be required if your telephone has no visual busy indication.

An automatic time-out period of six seconds is provided on the HPN to prevent a tie-up if only one digit has been dialed. This means that the desired code must be dialed within six seconds or the call will not complete. NRC Headquarters Operations Center and Regional Offices may not use the "HOLD" button on their telephone's HPN circuits. Operation of the "HOLD" button during a call will disconnect the privacy feature.

Before initiating any call on the HPN from a Touch-tone phone an asterisk (*) must be dialed.

a. Placing Voice Calls

- (1) Obtain station code (s) of desired location(s).
- (2) Check circuit availability (busy lamp or busy tone).
- (3) To call a station (s) on your own circuit: Dial the appropriate two digit individual station code. (Locations with Touch-tone must dial an asterisk (*) before initiating any call.)

- (4) To call a station (s) on another circuit: Dial the appropriate interconnect code; then dial the two-digit individual station code in a three digit format, formed by inserting the digit "1" between the first and last digits. For example, to signal station "53" on circuit GDA02060, dial it's interconnect code "00", followed by "513". If the circuit is busy, the caller will hear a low level circuit busy tone.
- (5) Conference Calls: Dial the desired individual state code(s), group code(s) or broadcast code. A conference call to a location(s) on your circuit and one(s) on another circuit may be accomplished by dialing in the individual formats described above. Example: To place a conference call to Headquarters - code 22, individual station codes 53 and 63 on your own circuit (GDA02060), and all the Resident Inspectors on circuit GDA02061 - group code 26; you would dial the following : 22 53 63 02 216. Pausing between numbers is not necessary. Additional locations can be added by the originator at any time during conversation.

NOTE: A call party may hang up on the conversation and reaccess the call later if the originator is still on the line. If the originator hangs up, the other parties can continue conversation, but privacy has been lost. In this case, one of the parties should simply dial the code of the other party to reactivate the privacy feature.

- (6) Hang up telephone when conversation is completed.

b. Error Correction Procedures

- (1) For calls placed to a location your own circuit: If an error is made in dialing the first digit of an individual station code, it may be cancelled by dialing the digit "1". Pausing six (6) seconds also cancels the error. No correction is possible if the second digit is dialed incorrectly, just dismiss the answering party and dial again.

EXAMPLE: On a call placed to individual station code 33 an error is made in dialing the first digit--a 2 is dialed instead of a 3--simply stop then dial the digit "1", followed by the correct desired number 33.

- (2) To cancel an error on a call placed to a location on another circuit, dial "11" after the first digit of the individual station code.

EXAMPLE: On a call placed to individual station code 73 on circuit GDA02061 from a different circuit an error is made in dialing the first digit of the individual station code. To correct, dial "11", followed by the correct desired number. Again, no correction is possible if the second digit is dialed incorrectly.

c. Processing Facsimile Calls

(1) Operation Center

- To Originate:
- Depress appropriate circuit button
 - Lift receiver
 - Dial the desired voice station code
 - Discuss transmission, if necessary
 - Depress the non-locking data button to connect your FAX machine to the data circuit
 - Leave your receiver off hook during transmission

- To Receive:
- Telephone rings and circuit button flashes
 - Depress circuit button and light become steady
 - Discuss transmission
 - Depress data button
 - FAX machine turns on automatically
 - Leave your receiver off hook during transmission
 - Operate machine according to local procedures

(2) Regional Office

- To Originate:
- Lift receiver on telephone of desired circuit
 - Dial asterisk if originating telephone is touch-tone
 - Verify the FAX machine is plugged into the desired data jack
 - Dial your own FAX data code and the desired FAX code
 - Leave your receiver off hook during transmission
 - FAX machine turns on automatically
 - Operate machine according to local procedures

- To Receive from Operation Center
- Appropriate telephone rings
 - Lift receiver to discuss transmission
 - Verify FAX machine is plugged into correct data jack
 - Dial your own FAX code
 - Leave your receiver off hook during transmission
 - Operate machine according to local procedures

- To Receive from Resident
- Appropriate telephone rings
 - Resident Insepctor requests you to originate a call to him as he has a message to send you
 - Follow normal originating procedures above.

(3) Resident Inspection's Office

- To Originate:
- Lift receiver
 - Dial desired location's voice code to verify FAX machine is available. Ask that location to originate the call to you
 - Hang up
 - Your FAX machine will turn on automatically as soon as your number has been dialed.
 - Operate FAX machine according to local procedure
- To Receive:
- Verify the FAX machine is switched to the HPN circuit
 - The FAX machine will turn on automatically to receive data

d. Trouble Reporting

To assure good service, any trouble which may be encountered on the HPN should be reported immediately.

- (1) Call collect to the trouble reporting number: 301-588-2736.
- (2) Give the telephone company the following information:

Your name

Organization's name (Nuclear Regulatory Commission)

Station Location (include building, floor and room number)

Call back number (other than your HPN number)

Circuit number (e.g. GDA02061) - see Directories section to determine what your circuit number is.

Time trouble occurred

(3) Describe type of Trouble

Exampless: echo

reaching wrong number

cross-talk

5. ANO Public Address System (GAI-TRONICS)

a. Introduction

The major features of the Gai-Tronics public address system are as follows:

(1) Telephone-type Handset

Used for paging while paging pushbutton is depressed; used for private conversation while paging pushbutton is released.

(2) Handset Hang-up Switch

Used for hanging up the handset.

(3) Paging Pushbutton

Used for selecting paging feature of the system.

(4) Party Line Channel Select Switch

Used for selecting one of four channels for conversations via the handset. (Some wall stations have fifth channel; however, the fifth channel is not available for use.)

b. Instructions for Operation

(1) To Page:

- Step 1 Select channel by rotating party line channel select switch.
- Step 2 Lift handset from cradle. If a conversation is heard, select another channel.
- Step 3 Depress, or twist to lock, the paging pushbutton. Page desired party and identify the channel you are on (i.e. "John Doe, line 3").
- Step 4 Release paging pushbutton and wait for your party to answer your page.

(2) To Answer A Page:

- Step 1 Select channel (line) announced in the page.
- Step 2 Lift handset from the cradle. You are now connected to your party.

B. RADIO SYSTEMS

1. Radio System Protocol

a. Introduction

The AP&L radio network is licensed for business use by the Federal Communications Commission (FCC). The purpose of the radio license is to register the station(s) with the FCC, to assign official radio call sign(s), to specify frequency(s) to be used, to indicate type and class of radio service, and other requirements governing the equipment and their use. Penalties or revocation of the license may be made by the FCC for violations of the Rules and Regulations governing this service.

Although AP&L personnel utilizing the radio network are not required to have an individual operator's license, these personnel should be trained and should perform radio communications in a professional manner. This is especially important when communicating on non-AP&L frequencies (i.e. state OES and law enforcement).

This section of the AP&L Communications Manual provides general guidance for using the radio network within regulatory requirements and in a professional manner.

b. Improper Actions

Personnel utilizing the radio network shall not engage in the following which violate FCC regulations:

- (1) Violation of any act or treaty binding on the United States, or violation of a Rule or Regulation of the FCC;
- (2) Failure to carry out a lawful order of the person lawfully in charge of the radio equipment which he is operating;
- (3) Willfully damaging or permitting someone else to damage radio equipment;
- (4) Transmitting unnecessary or unidentified messages or false call signs;
- (5) Use of profane or indecent language;
- (6) Willfully interfering with other radio communications;

- (7) Use of radio communications to interfere with law enforcement functions.

c. Guidance for Proper Radio Usage

When operating the radios, personnel can obtain maximum efficiency by observing and exercising the following:

- (1) Limit your communications on the network directly relating to AP&L business; personal messages should be avoided.
- (2) Always make sure that there is no "traffic" (talking) on a channel before you start transmitting. If you start transmitting without first listening to make certain that the channel is "clear" (not currently used), you may be interrupting someone else's message. If you transmit while another station is transmitting, the odds are that neither of you will be able to complete your traffic.
- (3) Think before you transmit. Know what you want to say to avoid unnecessary time on the air, especially in an emergency situation--BE AS BRIEF AS POSSIBLE. If the message is detailed, you may want to make notes to refer to and stop transmitting after a few seconds before continuing to ensure the receiving party is getting all of your message.
- (4) To eliminate unnecessary verbiage in the interest of brevity and to relieve overcrowding on the radio, some personnel--especially ANO security, law enforcement, and the state OES--may use 10-signal codes. In order to decipher these codes for the respective frequency (channel) refer to the following:

Attachment 9 - ANO Ten Signals
Attachment 10 - Sheriff Ten Signals
Attachment 11 - State OES Ten Signals
(Note that certain 10-signals differ in meaning in these lists)

If AP&L personnel use these codes, make sure that you use the correct 10-signal for the intended message, corresponding to the appropriate frequency. All CB jargon should be avoided.

- (5) Use your radio "identification" in calling and answering calls so that everyone knows who they are talking to and that proper acknowledgement is made before continuing with a message, as suggested in the following examples:

(call) "Arkansas Nuclear One to State OES"
(answer) "OES, go ahead Arkansas Nuclear One"
(ANO may now begin its message)

(call) "Mobile One to Emergency Control Center:
(answer) "Emergency Control Center to Mobile One, "Stand by" (Mobile One has been acknowledged, but the ECC is not yet prepared to receive his message)

(call)" Emergency Control Center to Mobile One, go ahead"
(answer) "Mobile One to Emergency Control Center, what is the current status . . .
. (continuation of message)"

- (6) Upon completion of your transmission, sign off the air by using your complete call sign, especially a lease station (console). Not only does this comply with FCC Rules and Regulations, but it indicates to the operators waiting to use the frequency that you have completed your business and signed off, so that they may use the channel. For the above examples:

- (ANO completes its message to the State OES)
- "10-4"--(OES acknowledges message received)
- "Arkansas Nuclear One clear, WFR476"--(ANO has no other message at this time.)
- "(OES base call sign)"--(OES also signs off, completing the transmission.)
- "10-4 Mobile One, what is your location?" (ECC acknowledges and transmits message)
- "Interstate 40 and the Russellville exit"
- "10-4, ECC clear, KMF327"--(ECC acknowledges and signs off)
- "Mobile One clear." (Mobile One signs off)

2. Types of Transmissions

Most of the radios utilized for AND communications are equipped to transmit and receive three types of signals: coded, dedicated and general signals. The signals are described in this section to permit a better understanding of the instructions for use of each radio.

Coded signals are voice signals which have been scrambled in a predetermined manner by the transmitting radio. The manner of scrambling is controlled by a unique code which has been inserted into the radio with a Code Programmer (see Section B.12 for instructions in the use of the Code Programmer). A receiving radio will unscramble (decode) the scrambled signals only if it has the identical, unique code as the transmitting radio. Otherwise, the voice transmission will not be heard by the intended receiving party in this transmission mode.

Dedicated signals are uncoded voice signals which are "labeled" automatically by the transmitting radio with a concurrent but separate signal. This signal is unique to AP&L radios which may be set by the user to receive only those voice signals which are labeled with this AP&L specific signal, thereby discriminating signals generated by non-AP&L radios which may be on the same radio frequency. Radios not set to receive only AP&L signals will still receive the signals in addition to all other signals on the selected frequency.

General signals are standard transmissions which are neither "coded" nor "labeled". Transmissions made with general signals may be heard by all company radios, non-AP&L radios, and scanners if they are on the same radio frequency.

3. Multi-channel Control Consoles

a. Introduction

Control switches and indicators on a multi-channel control console and desk microphone are shown in Figure 2-4.

The control switches on the desk microphone and the purpose of each are as follows:

- Transmit Switch

While depressed, the Transmit switch turns on the selected radio transmitter.

- Monitor Switch

While depressed, the Monitor switch allows the operator to monitor all on-frequency signals to determine if the selected channel is in use before making a transmission.

The control switches and indicators on the multi-channel control console are grouped by function either on the front panel or on the control panel. The front panel indicators and controls relate to monitoring functions of all eight channels simultaneously. The control panel controls select one of the eight channels for transmission, monitoring, intercom, and single tone commands.

The following describes the controls and indicators on the control panel of the console:

- On-Off Switch

The On-Off switch controls power to all circuits in the console with the exception of the clock. The clock keeps running as long as the line cord plug is connected to an AC outlet.

- Channel Select Switches

The Channel Select switches (CH1 through CH8) allows selection of one of the eight channels for transmission, monitoring, intercom, or single tone commands. Only one channel may be selected at one time; depressing one channel select switch resets all other channel select switches. When a selection is made, receive audio for that channel is switched from the unselect speaker on the front panel to the select speaker on the control panel.

- Select Speaker Volume Control

The Select Speaker Volume Control on the control panel adjusts the volume of the select speaker.

- Speaker Mute Switch

When actuated, the Speaker Mute switch reduces the volume of the audio to the select speaker by a predetermined amount.

- Intercom Switch

While depressed, the Intercom switch permits two-way communications over a selected channel between the multi-channel and single-channel control consoles without activating the transmitter. An Intercom indicator lights while the switch is depressed.

- All Mute Switch

When actuated, the All Mute switch reduces the volume of the received audio on the Unselected Speaker and the Select Speaker. An All Mute indicator next to the switch lights to indicate the all mute condition. When actuated a second time, normal volume is restored.

- Single Tone Switches

Actuation of ST3 activates the OES repeater.

- Supervisory Takeover Switches

Only the Master Control Console is equipped with Supervisory Takeover switches (CH1 through CH8) on the control panel. Depression of one or more switches for the channels on which takeover is desired removes all other consoles from those channels. Depression of the switch or switches a second time cancels the takeover and permits all other consoles to use those channels again.

The following describes the controls and indicators on the front panel of the console:

- CALL Indicator

The CALL Indicator flashes whenever receive audio is present on the associated channel. This indication assists in selecting the associated transmit channel to respond to a call.

- BUSY Indicator

When two or more operators use the same channel, the BUSY indicator next to the associated channel on all consoles lights if any one of the operators places a call on that channel. When the channel is BUSY, all other operators are locked out. Another operator cannot place a call on the busy channel while the BUSY indicator is on.

- MUTE Indicator

A MUTE indicator lights to indicate that the associated channel is in the mute condition. A Mute indicator is activated by its associated Channel Mute Switch.

- Channel Mute Switch

When actuated, the Mute switch reduces the volume of the associated channel audio by a preset level. A MUTE indicator lights to indicate the mute condition. Actuation of the Mute switch a second time restores the volume.

- Unselect Speaker

The Unselect Speaker provides audio received on all unselected channels simultaneously.

- Unselect Speaker Volume Control

The Unselect Volume Control on the front panel adjusts the volume of the unselect speaker.

- Channel Volume Control Switches

A Channel Volume Control switch allows the operator to adjust the audio level on the unselect speaker for individual channels with which it is used.

- Scrambler Switch

When actuated, the Scrambler switch turns on the scrambling (coding) function of the transmitter associated with the selected channel on the control panel. The "On" indicator lights to indicate the non-scrambling condition. In this situation, transmissions will be with (uncoded) AP&L dedicated signals.

Since the same channel on all consoles uses the same transmitter, selection of the scrambler function on any one console results in the scrambling of transmissions from all other consoles on the same channel even if the scrambler function is not selected on the other consoles. The scrambler "On" indicator will light only on these consoles having an actuated Scrambler and will not automatically light on all other consoles.

The scrambling function of a transmitter is programmed with a Code Programmer as described in Section B.12.

- VU Meter

The VU Meter provides the console operator with both transmit and receive signal strength indications. The pointer in the meter deflects to the right whenever a voice signal or tone signal is transmitted or received.

- Clock

The clock is a 24-hour digital clock. The clock keeps running as long as the line cord plug is connected to an AC outlet; it is not affected by the "On-Off" switch on the control panel.

A power failure is indicated by a flashing display. A power failure indication will be given any time the AC power to the console is interrupted.

- Clock Control Switches

The Clock Control switches adjust the time displayed by the clock. The clock is set by using the "Fast" and "Slow" set switches to the left of the clock. The "Fast" set switch advances the time approximately one hour per second, while the "Slow" set switch advances the time by two minutes per second.

b. Instructions for Operation

(1) Initial Adjustments

- Step 1 Turn on the console by turning the "On-Off" switch to "On". (The line cord plug must be connected to an AC outlet.) The green power-on-light will illuminate. The console should now be

providing all audio that is present on all eight channels. The CALL indicators flash whenever receive audio is present on their associated channels. Receive audio on their associated channels. Receive audio on the channel that is selected (the depressed Channel Select switch on the control panel) is heard only on the Select Speaker on the left side of the control panel. Receive audio on the unselected channels is heard only on the Unselect Speaker on the right side of the front panel.

- Step 2 Adjust the volume of the Select Speaker by turning the Select Speaker Volume control.
- Step 3 Adjust the volume of the Unselect Speaker by turning the Unselect Speaker Volume control.
- Step 4 If desired, the volume of any unselected channel as heard on the Unselected Speaker may be lowered to a muted level by pushing the associated Channel Mute switch. By pushing the same Channel Mute switch a second time, normal volume for that channel is restored.
- Step 5 If desired, the volume of the selected channel as heard on the Select Speaker may be lowered to a muted level by pushing the speaker Mute switch. By pushing the Speaker Mute switch a second time, normal volume is restored.
- Step 6 If desired, the volume of all channels as heard on the Unselect and Select speakers may be lowered to a muted level simultaneously by pushing the All Mute switch. By pushing the All Mute switch a second time, normal volume of all channels is restored.

(2) To Receive:

- Step 1 To hear coded and AP&L dedicated signals on a particular channel, depress the desired channel select switch on the control panel. Audio on this channel is transferred from the

Unselect Speaker to the Select Speaker. All coded and AP&L dedicated signals on the unselected channels are heard on the Unselect Speaker.

- Step 2 To monitor all on-frequency signals (coded signals, AP&L dedicated signals, and general signals) on the selected channel, depress the Monitor switch on the desk microphone. Monitoring all on-frequency signals before transmission is necessary to avoid interfering with other users.

(3) To Transmit Coded Messages:

NOTE: Only channel 1, 2, 3, and 4 may be used for transmitting coded messages. Channels 6 and 7 may be used to transmit only general messages.

- Step 1 Select the desire channel (CH1 through CH4) by depressing the desired Channel Select switch on the control panel.
- Step 2 Verify that the Scrambler switch indicator is "On". If it is "Off", push Scrambler switch once. The "On" indicator lights to indicate the signal scrambling condition. If it is "On", push scrambler switch twice. This verifies that no other console has turned the scrambler "Off" since last used.
- Step 3 Verify that the BUSY indicator on the front panel for the selected chanel is not lit.
- Step 4 Verify that the selected channel is clear by depressing the Monitor switch on the desk microphone and listening to the audio on the Select Speaker.
- Step 5 Depress the Transmit switch on the desk microphone and speak into the microphone. The red Transmit Light should illuminate. At the end of the message, release the Transmit switch.
- Step 6 The radio is now ready to receive coded signals on the selected channel.

(4) To Transmit (Uncoded) AP&L Dedicated Messages:

NOTE: Only channels 1, 2, 3, and 4 may be used for transmitting AP&L dedicated messages. Channels 6 and 7 may be used to transmit only general messages.

- Step 1 Select the desired channel (CH1 through CH4) by depressing the desired Channel Select switch on the control panel.
- Step 2 Verify that the Scrambler switch indicator is "Off". If it is not "Off" indicator lights to indicate that the scrambling function is deactivated. However, push the scrambler switch twice. This verifies that no other console has turned the scrambler "On" since last used.
- Step 3 Verify that the Busy indicator on the front panel for the selected channel is not lit.
- Step 4 Verify that the selected channel is clear by depressing the Monitor switch on the desk microphone and listening to the audio on the Select Speaker.
- Step 5 Depress the Transmit switch on the desk microphone and speak into the microphone. The red Transmit Light should illuminate. At the end of the message, release the Transmit switch.
- Step 6 The radio is now ready to receive AP&L dedicated signals on the selected channel.

(5) To Transmit General (Uncoded) Messages:

NOTE: Only channels 6 and 7 may be used for transmitting general messages. Channels 1, 2, 3, and 4 may not be used to transmit general messages.

- Step 1 Select the desired channel (CH6 or CH7) by depressing the desired Channel Select switch on the control panel.
- Step 2 Verify that the Busy indicator on the front panel for the selected channel is not lit.

Step 3 Verify that the selected channel is clear by depressing the Monitor switch on the desk microphone and listening to the audio on the Select Speaker.

Step 4 Depress the Transmit switch on the desk microphone and speak into the microphone. The red Transmit Light should illuminate. At the end of the message, release the Transmit switch.

Step 5 The radio is now ready to receive general signals on the selected channel.

Step 6 To activate the OES repeater when Channel Select switch CH6 has been selected, depress the Single Tone switch ST3. Verify that the needle on the VU meter has returned to the left before proceeding with transmission as described in Step 4 above. Depress "Off" Single Tone switch when the OES repeater is not longer desired.

(6) To Remove Consoles From A Channel (Supervisory Takeover):

NOTE: Only the Master Control Console is equipped with Supervisory Takeover switches.

Step 1 Depress once the Supervisory Takeover switch(es) for the channel(s) on which takeover is desired.

Step 2 Depress a second time the Supervisory Takeover switch(es) for the channel(s) on which takeover is no longer desired.

(7) To Communicate With Other Consoles Via Intercom:

Step 1 Verify that the Selected Channel is clear.

Step 2 To talk, depress the Intercom switch and speak into the microphone, but do not use the Transmit switch.

Step 3 To talk, depress the Intercom switch and speak into the microphone, but do not use the Transmit switch.

(8) To Use Telephone-To-Radio Patch:

- Step 1 If the telephone caller desires a radio patch, place the telephone in the "hold" condition or tell the caller to "stand by" while the radio call is being selected.
- Step 2 Call the desired radio unit in the normal manner.
- Step 3 When the radio user has acknowledged the call, inform him that phone patch operation will follow and identify the telephone caller.
- Step 4 Release the telephone from the "hold" condition and inform the caller that the patch is ready.
- Step 5 Instruct the telephone user in speaking techniques for phone path operation as follows:
 - (a) Use a "key" word (any one-syllable word) at the beginning of each voice transmission. It is the voice signal that turns on the transmitter. Since the radio system has a trunon delay, this "key" word may be not transmitted. It is used merely to key the transmitter so that the beginning of the actual voice message which follows is not cut off.
 - (b) Do not pause too long between words or syllables; the trnasmmitter will turn off after 1 to 3 seonds (depending upon internal adjustment setting in the Phone Patch) of silence. Pre-plan your entire message to prevent long pauses.
 - (c) Voice can be sent in only one direction at a time. Do not try to answer when the other party is still speaking; your reply will not be heard.

- (d) Pause briefly after the other party stops speaking before answering. There is approximately 1 to 3 seconds turn-off delay (depending upon internal adjustment setting in the phone patch) after the radio user stops speaking before the Phone Patch will allow your reply to be transmitted.

Step 6 Pull upward on the telephone hookswitch. This activates the Phone Patch and may disable the telephone handset (depending on the type of handset being used). Leave the handset offhook until the conversation is completed.

Step 7 Monitor both sides of the conversation. When the telephone user is talking the red Transmit Light on the front panel is lighted and his voice is heard on the Select Speaker. Adjust to the desired listening level with the Select Speaker volume control.

NOTE: It must be remembered that the person using the phone patch may not be familiar with FCC rules and regulations. It is therefore the responsibility of the console operator to monitor the phone patch, when in use, to assure that no violations of these regulations occur.

Step 8 When the radio user is talking, his voice is heard on the Select speaker. (The radio system cannot be used by the dispatcher for another call when a patch is in use.)

Step 9 If the console operator must interrupt the patch for any reason, push down the telephone hookswitch. Talk to the telephone caller over the telephone handset and to the radio over with the desk microphone.

Step 10 At the end of the conversation, place the telephone handset on-hook. This action pushes down the hookswitch and de-activates the Phone Patch.

(9) To Use Radio-To Telephone Patch:

- Step 1 Answer the radio call in the normal manner.
- Step 2 If the radio user desires a telephone patch, have him "stand by" while the call is being set up.
- Step 3 Pick up the telephone handset and dial the number of the desired party.
- Step 4 When the telephone user answers, inform him that radio patch operation will follow and identify the caller. Instruct the telephone user in speaking techniques for phone patch operation as given in step (6) of the Telephone-To-Radio-Patch operating instructions.
- Step 5 Inform the radio caller that the patch is ready.
- Step 6 Pull upward on the telephone hook-switch. This activates the Phone Patch and disables the telephone handset. Leave the hand set off-hook until the conversation is completed.
- Step 7 Monitor the conversation and disconnect the Phone Patch at the end of the conversation as instructed in steps 8 through 11 of the Telephone-to-Radio Patch instructions in the preceding section.

(10) To Set The Clock:

NOTE: The clock is a 24 hour clock.

- Step 1 To advance the clock through large time intervals, push the "F" (fast) switch. The "F" switch advances the time at approximately one hour per second.
- Step 2 To advance the clock through small time intervals, push the "S" (slow) switch. The "S" switch advances the time by one minute per second.

4. Single-Channel Control Consoles

a. Introduction

Control switches and indicators on a single-channel control console and desk microphone are shown in Figure 1.

The control switches on the desk microphones and the purpose of each are as follows:

- Transmit Switch

While depressed, the Transmit switch turns on the radio transmitter. The red Transmit indicator on the single-channel console above the On-Off switch lights while the Transmit switch on the desk microphone is depressed.

- Monitor Switch

While depressed, the Monitor switch allows the operator to monitor all on-frequency signals to determine if the channel is in use before making a transmission.

The control switches and indicators on the single-channel control console, and the purpose of each, are as follows:

- On-Off Switch

When the On-Off is turned on, the green power-on light above the On-Off switch lights.

- Volume Control

Self Explanatory.

- Intercom Switch

While depressed, the Intercom switch permits two-way communications over the Channel without activating the transmitter. An Intercom indicator lights while the switch is depressed.

- Scrambler Switch

When activated, the Scrambler switch turns on the scrambling (coding) function of the transmitter associated with that Channel. The "On" indicator lights to indicate the scrambling condition. Actuation of the Scrambler switch a second time turns the scrambling function off. The "On"

indicator light goes out to indicate the non-scrambling condition. In this situation, transmissions will be made with AP&L dedicated signals.

Since the same channel on all consoles uses the same transmitter, selection of the scrambler function on any one of the single-channel control consoles results in the scrambling of transmissions from all other consoles utilizing that Channel even if the scrambler function is not selected on the other consoles. The scrambler "On" indicator will light only on the console(s) that have an actuated Scrambler switch and will not light on all other consoles.

The scrambling function of a transmitter is programmed with a Code Programmer as described in Section B.12.

b. Instructions for Operation

(1) Initial Adjustments:

- Step 1 Turn on the console by turning the "On-Off" switch to "On". (The line cord must be connected to an ac outlet.) The green power-on-light will illuminate. The console should now be providing all audio that is present on the Channel.
- Step 2 Adjust the volume by turning the Volume Control switch.

(2) To Receive:

- Step 1 To hear coded signals, verify that the Scrambler indicator is illuminated. If the Scrambler indicator is not illuminated, depress the Scrambler switch once.
- Step 2 To hear AP&L dedicated signals, verify that the Scrambler indicator is not illuminated. If the Scrambler is illuminated, depress the Scrambler switch once.

Step 3 To monitor all on-frequency signals (coded signals, AP&L dedicated signals, and general signals), depress the Monitor switch on the desk microphone. Monitoring all on-frequency signals before transmission is necessary to avoid interfering with other users.

(3) To Transmit Coded Messages:

Step 1 Verify that the Scrambler switch indicator is illuminated. If the Scrambler switch indicator is not illuminated, depress the Scrambler switch once. The indicator illuminates to indicate the signal unscrambling condition.

Step 2 Verify that the channel is clear by depressing the Monitor switch on the desk microphone and listening to the audio.

Step 3 Depress the Transmit switch on the desk microphone and speak into the microphone. The red Transmit Light should illuminate. At the end of the message, release the Transmit switch.

Step 4 The radio is now ready to receive coded signals.

(4) To Transmit AP&L Dedicated Messages:

Step 1 Verify that the Scrambler switch indicator is not illuminated. If the Scrambler switch indicator is illuminated, depress the Scrambler switch once to extinguish it.

Step 2 Verify that the Channel is clear by depressing the Monitor switch on the desk microphone and listening to the audio.

Step 3 Depress the Transmit switch on the desk microphone and speak into the microphone. The red Transmit Light should illuminate. At the end of the message, release the Transmit switch.

Step 4 The radio is now ready to receive AP&L signals.

(5) To Transmit General Messages:

This console may not be used for transmitting general messages.

(6) To Communicate With Other Consoles Via Intercom:

- Step 1 Verify that the Channel is clear.
- Step 2 To talk, depress the Intercom switch and speak into the microphone, but do not use the Transmit switch.
- Step 3 To receive a reply, release the Intercom switch.

(7) To Use Telephone-To-Radio Patch:

- Step 1 Answer the call on the telephone.
- Step 2 If the telephone caller desires a radio patch, place the telephone in the "hold" condition or tell the caller to "stand by" while the radio call is being selected.
- Step 3 Call the desired radio unit in the normal manner.
- Step 4 When the radio user has acknowledged the call, inform him that phone patch operation will follow and identify the telephone caller.
- Step 5 Release the telephone from the "hold" condition and inform the caller that the patch is ready.
- Step 6 Instruct the telephone user in speaking techniques for phone patch operation as follows:
 - (a) Use a "Key" word (any one-syllable word or a sound such as clearing the throat) at the beginning of each voice transmission. Since it is the voice signal that turns on the transmitter and the radio system has a turn on delay, this "key" word may not be transmitted. It is used merely to key the transmitter so that the beginning of the actual voice message which follows is not cut off.

Step 3 To monitor all on-frequency signals (coded signals, AP&L dedicated signals, and general signals), depress the Monitor switch on the desk microphone. Monitoring all on-frequency signals before transmission is necessary to avoid interfering with other users.

(3) To Transmit Coded Messages:

- Step 1 Verify that the Scrambler switch indicator is illuminated. If the Scrambler switch indicator is not illuminated, depress the Scrambler switch once. The indicator illuminates to indicate the signal unscrambling condition.
- Step 2 Verify that the channel is clear by depressing the Monitor switch on the desk microphone and listening to the audio.
- Step 3 Depress the Transmit switch on the desk microphone and speak into the microphone. The red Transmit Light should illuminate. At the end of the message, release the Transmit switch.
- Step 4 The radio is now ready to receive coded signals.

(4) To Transmit AP&L Dedicated Messages:

- Step 1 Verify that the Scrambler switch indicator is not illuminated. If the Scrambler switch indicator is illuminated, depress the Scrambler switch once to extinguish it.
- Step 2 Verify that the Channel is clear by depressing the Monitor switch on the desk microphone and listening to the audio.
- Step 3 Depress the Transmit switch on the desk microphone and speak into the microphone. The red Transmit Light should illuminate. At the end of the message, release the Transmit switch.
- Step 4 The radio is now ready to receive AP&L signals.

(5) To Transmit General Messages:

This console may not be used for transmitting general messages.

(6) To Communicate With Other Consoles Via Intercom:

- Step 1 Verify that the Channel is clear.
- Step 2 To talk, depress the Intercom switch and speak into the microphone, but do not use the Transmit switch.
- Step 3 To receive a reply, release the Intercom switch.

(7) To Use Telephone-To-Radio Patch:

- Step 1 Answer the call on the telephone.
- Step 2 If the telephone caller desires a radio patch, place the telephone in the "hold" condition or tell the caller to "stand by" while the radio call is being selected.
- Step 3 Call the desired radio unit in the normal manner.
- Step 4 When the radio user has acknowledged the call, inform him that phone patch operation will follow and identify the telephone caller.
- Step 5 Release the telephone from the "hold" condition and inform the caller that the patch is ready.
- Step 6 Instruct the telephone user in speaking techniques for phone patch operation as follows:
 - (a) Use a "Key" word (any one-syllable word or a sound such as clearing the throat) at the beginning of each voice transmission. Since it is the voice signal that turns on the transmitter and the radio system has a turn on delay, this "key" word may not be transmitted. It is used merely to key the transmitter so that the beginning of the actual voice message which follows is not cut off.

- (b) Do not pause too long between words or syllables; the transmitter will turn off after 1 to 3 seconds (depending upon internal adjustment setting in the Phone Patch) of silence. Pre-plan your entire message to prevent long pauses.
- (c) Voice can be sent in only one direction at a time. Do not try to answer when the other party is still speaking; your reply will not be heard.
- (d) Pause briefly after the other party stops speaking before answering. There is approximately 1 to 3 seconds turn-off delay (depending upon internal adjustment setting in the phone patch) after the radio user stops speaking before the Phone Patch will allow your reply to be transmitted.

Step 7 Pull upward on the telephone hookswitch. This activates the Phone Patch and disables the telephone handset. Leave the handset off-hook until the conversation is completed.

Step 8 Monitor both sides of the conversation. When the telephone user is talking the red Transmit Light on the front panel is lighted and his voice is heard on the Select Speaker. Adjust to the desired listening level with the Select Speaker Volume control.

NOTE: It must be remembered that the person using the phone patch may not be familiar with FCC rules and regulations. It is, therefore, the responsibility of the Console operator to monitor the phone patch, when in use, to assure that no violations of these regulations occur.

Step 9 When the radio user is talking, his voice is heard on the Select Speaker. (The radio system cannot be used by the dispatcher for another call when a patch is in use.)

- Step 10 If the console operator must interrupt the patch for any reason, push down the telephone hookswitch. Talk to the telephone caller over the telephone handset and to the radio user with the desk microphone.
- Step 11 At the end of the conversation, place the telephone handset on-hook. This action pushes down the hookswitch and de-activates the Phone Patch.

(8) To Use Radio-To-Telephone

- Step 1 Answer the radio call in the normal manner.
- Step 2 If the radio user desires a telephone patch, have him "stand by" while the call is being set up.
- Step 3 Pick up the telephone handset and dial the number of the desired party.
- Step 4 When the telephone user answers, inform him that radio patch operation will follow and identify the caller. Instruct the telephone user in speaking techniques for phone patch operation as given in step (6) of the Telephone-To-Radio-Patch operating instructions.
- Step 5 Inform the radio caller that the patch is ready.
- Step 6 Pull upward on the telephone hookswitch. This activates the Phone Patch and disables the telephone handset. Leave the handset off-hook until the conversation is completed.
- Step 7 Monitor the conversation and disconnect the Phone patch at the end of the conversation as instructed in steps 8 through 11 of the Telephone-To-Radio-Patch instructions in the preceding section.

5. Vehicle Radios

a. Introduction

Vehicle radio systems provided in selected ANO and Little Rock vehicles are comprised of four major components:

- Control head
- Microphone & Hang-up switch box
- Speaker
- Radio

A typical arrangement of the four components is illustrated in Figure 2-6. The control head and microphone with hang-up switch box are installed on or near the dash of the vehicle within easy reach of the driver. The speaker is also installed on or near the dash of the vehicle. The radio is installed in the trunk or rear of the vehicle.

Operation of the radio system requires manipulation of control switches on the control head, microphone and microphone hang-up switch box. These control switches are described below and are referenced in the instructions which follow. The speaker and radio require no operation by the user; only the control head, microphone and hang-up switch box require operator manipulation.

The control head is illustrated in Figure 2-7. Control switches requiring operation by the user, indicators, and the purpose of each are as follows:

- On-Off Switch
Self explanatory.
- Volume Control
Self explanatory.
- Squelch Control
Eliminates background noise while optimizes reception of signals.
- Frequency Selector

Allows selection of one of four frequencies (or "channels"). The channel (1, 2, 3 or 4) selected is displayed directly above the frequency selector wheel.

- Received Signal Mode Indicators (RCV MODE)

An incoming signal will illuminate either the "Pvt" or "Std" indicator. Illumination of the "Pvt" indicator means that the incoming signal is coded. Illumination of the "Std" indicator means that the incoming signal is either an AP&L dedicated or general signal.

Coded or dedicated signals are decoded and heard through the speaker only if the microphone is in place in the hang-up switch box and the slide switch on the hang-up switch box is in the down position. Coded signals are not decoded and are heard as random noise if the microphone has been removed from the hang-up switch box or the slide switch on the hang-up switch box is in the up position.

AP&L dedicated signals are also heard if the microphone is in place in the hang-up switch box and the slide switch on the hang-up switch box is in the down position.

By keeping the microphone in the hang-up switch box while the slide switch on the hang-up switch box is in the down position, the radio operator will be receiving transmissions sent by AP&L personnel only and will not be distracted by transmissions made by other radio operators.

All AP&L dedicated and general signals are heard if the microphone has been removed from the hang-up switch box or the slide switch on the hang-up switch box is in the up position.

- Transmit Mode Select Switches and Indicators (XMIT MODE)

Allows selection of either the "Pvt" or "Std" mode of transmission by pushing one of two buttons. An indicator lamp above the pushed button will illuminate indicating the selected mode.

When "Pvt" is selected, the signal will be transmitted in code (see "Multi Code Select Switches and Indicators" below) if the control head is equipped with two code selectors on the top right-hand corner on front panel of control head. If the control head is not equipped with the two code selectors, the radio will automatically transmit in Code 1 when the "Pvt" select button is pushed.

When "Std" is selected, the signal will be transmitted uncoded.

- Transmit Indicator

Illuminates when the push-to-talk button on the microphone is depressed.

- Multi Code Select Switches and Indicators
(CODE SELECT)

Allows selection of either Code 1 or Code 2 for transmitted signals. An indicator lamp above the pushed button will illuminate indicating the selected code. "Pvt" transmit mode must be selected when desiring to code transmissions either in Code 1 or Code 2. Vehicles not equipped with Code 1 or Code 2 selectors will automatically transmit in Code 1 when the "Pvt" select button is pushed.

The hand held microphone is equipped with a push-to-talk button on its side. The push-to-talk button must be depressed while transmitting messages. Conversely, it must be released (out position) while receiving messages. The microphone hang-up switch is illustrated in Figure 2-8. The hang-up switch box is equipped with a positive detent slot in the front and serves as a receptacle for the metal disc on the back side of the microphone when the microphone is not in use. The hang-up switch box is also equipped with a slide switch on its left-hand side that can be moved up or down. When the microphone is mounted on the hang-up switch box, the position of the slide switch determines whether or not a received signal will be heard on the speaker. If the slide switch is down, only coded signals and AP&L dedicated signals with a frequency matching the selected frequency will be heard. If the slide switch is up, all on-frequency signals (coded signals, AP&L dedicated signals, and general signals) will be heard. However, in this case the coded signals will not be uncoded and will appear as random noise on the speaker. Removal of the microphone from the hang-up switch box automatically allows all on-frequency signals to also be heard in this fashion. Monitoring all on-frequency signals before transmission is necessary to avoid interfering with other users.

b. Precaution

Retention of the code occurs while the radio is off. However, removal or disconnection of the radio from the vehicle or removal of power to the radio, such as disconnection of the battery cable from the car battery, completely erases the stored code.

c. Instructions for Operators

(1) Initial Adjustments:

- Step 1 Turn on vehicle ignition switch. To conserve the battery, the engine should be running while transmitting.
- Step 2 Turn on the radio set by pressing upward on the ON-OFF power switch projecting from the bottom of the control head. The green frontal area of the ON-OFF switch will appear on the top of the control head and the graphics will be illuminated.
- Step 3 Rotate the frequency selector to the desired channel. The selected channel number (1, 2, 3, or 4) will appear in the window directly above the frequency selector.
- Step 4 Either remove the microphone from its hang-up switch or move the slide switch in the up position.
- Step 5 Unsquench the radio by turning the squelch control counterclockwise until the background noise is heard.
- Step 6 Adjust the volume control for a comfortable listening level.
- Step 7 Turn squelch control slowly clockwise until the background noise just stops. This is the threshold setting. Do not adjust the control further. Excessive squelch reduces the radio sensitivity and may prevent reception. Once the squelch control has been set, it is not necessary to readjust it when other channels are selected.

(2) To Receive:

- Step 1 To hear only on-frequency coded signals or AP&L dedicated signals, push the slide switch on the hang-up switch box in the down position and place the microphone in the hang-up box.
- Step 2 To monitor all on-frequency signals (coded signals, AP&L dedicated signals and general signals), either remove the microphone from the hang-up switch or push the slide switch on the hang-up switch in the up position. Monitoring all on-frequency signals before transmission is necessary to avoid interfering with other users.
- Step 3 If necessary, readjust volume control to a comfortable listening level with a received signal. An illuminated lamp indicates whether the received signal is "Pvt" (coded) or "Std" (uncoded AP&L dedicated).

(3) To Transmit Coded Messages:

- Step 1 Push button under "Pvt" indicator. The "Pvt" indicator will illuminate.
- Step 2 On control heads equipped with Code 1 and Code 2 selection buttons, select desired code by pushing the appropriate button. An indicator lamp above the pushed button will illuminate indicating the selected code. Vehicles not equipped with Code 1 and Code 2 selectors will automatically transmit in Code 1 when the "Pvt" select button is pushed.
- Step 3 Select desired channel and observe the received signal mode indicators. If the frequency is clear, both lamps will be off. Do not transmit unless the frequency is clear. On-frequency traffic may also be monitored by listening to the speaker while either the microphone is removed from the hang-up switch box or placing the slide switch in the up position.

- Step 4 Remove the microphone from the hang-up switch box. Hold the microphone about 1 inch from the mouth and turned approximately 30 degrees away from the face.
- Step 5 After verifying that the selected frequency is clear, press the push-to-talk button on the side of the microphone. The red transmit indicator lamp on the left side of the control head will illuminate. Speak slowly and clearly across the microphone in a normal or slightly louder-than-normal voice. At the end of the message, release the push-to-talk button.
- Step 6 Replace the microphone in the hang-up switch box. The radio is now ready to receive coded signals on the selected frequency.

(4) To Transmit AP&L Dedicated Messages:

- Step 1 Push button under "Std" indicator. The "Std" indicator will illuminate.
- Step 2 Select desired channel and observe the received signal mode indicator. If the frequency is clear, both lamps will be off. Do not transmit unless the frequency is clear. On frequency traffic may also be monitored by listening to the speaker while either the microphone is removed from the hang-up switch box or moving the slide switch in the up position.
- Step 3 Remove the microphone from the hang-up switch box. Hold the microphone about 1 inch from the lips and turned approximately 30 degrees away from the face.
- Step 4 After verifying that the selected frequency is clear, press the push-to-talk button on the side of the microphone. The red transmit indicator lamp on the left side of the control

head will illuminate. A short alert tone is heard in the speaker at the initiation of each "Std" mode transmission. This serves as a reminder to not transmit a message in the "Std" (uncoded) mode which needs to be transmitted in "Pvt" (coded) mode.

Step 5 Speak slowly and clearly across the microphone in a normal or slightly louder-than-normal voice. At the end of the message, release the push-to-talk button.

Step 6 Replace the microphone in the hang-up switch box. The radio is now ready to receive AP&L dedicated signals on the selected frequency.

(5) To Turn "Off":

Depress the ON-OFF power switch until the green frontal area of the switch disappears and the light illuminating the graphics goes out.

6. Hand Held Radios

a. Introduction

Control switches, indicators and major components on a typical hand held radio are illustrated in Figure 2-9.

The control switches, indicators and major components are described below and are referenced in the instructions which follow.

- Volume/On-Off Switch

Self explanatory.

- Squelch Control

The squelch control eliminates background noise while optimizes reception of signals.

- Squelch Switch

The Squelch switch allows selection of coded signals, AP&L dedicated signals, or general signals for transmission and reception (see section B.2 for a description of the signals).

During transmission, signals are coded only when the Squelch switch is in the left-hand position ("Q" position). During reception, coded signals are heard only when the squelch switch is either in the left-hand position ("Q" position) or right-hand position ("O" position). However, decoding occurs only when the Squelch switch is in the "Q" position; in the "O" position, decoding does not occur and the signals are heard as random noise.

AP&L dedicated signals are transmitted only if the Squelch switch is in the middle position ("M" position). However, these signals can be received with the Squelch switch in any of the three positions ("Q", "M", or "O" positions).

General signals can be transmitted and received only if the Squelch switch is in the right-hand position ("O" position).

The types of signals transmitted or received for each position of the Squelch switch are summarized in the following table.

Position of Squelch Switch			
Mode	0	1	2
Transmission	(1)	(2)	(3)
Reception	(1), (2)	(2)	(1)*, (2), (3)

Key: (1) Coded Signals

(2) AP&L Dedicated Signals

(3) General Signals

* Although coded signals are received in this switch position, there signals are not decoded and are heard only as random noise on the speaker.

- Frequency Select Switch

The Frequency Select Switch allows selection of the desired frequency (or "channel"). The channels are marked on the top of the switch.

- Push-To-Talk Switch

The Push-To-Talk Switch must be depressed while transmitting messages. Conversely, it must be released (out position) while receiving messages.

- Battery Release

The Battery Release allows removal of the battery for replacement.

b. Notes and Precautions

- (1) If you cannot silence the receiver noise with the squelch control in the maximum clockwise position, the battery probably discharged. Be sure the red "Battery Status and Transmit Indicator" is lighted while transmitting. Replace the battery with a fresh battery if the battery status indicator dims or does not light when the "Push-To-Talk" Switch is depressed.

- (2) If you cannot receive in fringe areas, check the squelch control setting. It must be set to threshold position as described in the operating instructions.
- (3) If operation of the radio is poor, check the antenna. It must be undamaged and operated in the vertical position for maximum range.

c. Instructions for Operation

(1) Initial Adjustments:

- Step 1 Turn on the radio by rotating the volume control one-half turn clockwise.
- Step 2 Select desired channel by rotating the frequency select switch to the desired position (F1, F2, etc.). The radio is equipped with either two or four channels.
- Step 3 Unsquelch the radio by turning the squelch control to the fully counterclockwise position. Background noise from the speaker will be heard.
- Step 4 To monitor all on-frequency signals, place the squelch switch in the extreme right-hand position ("0" position).
- Step 5 Listen for a broadcast and adjust the volume control for a comfortable listening level. In the absence of a broadcast, cursory volume adjustment can be made by adjusting the volume control until the background noise resulting from completion of Step 3 is at a comfortable listening level.
- Step 6 When the channel is clear, slowly rotate the squelch control clockwise until the background noise just stops. This is the threshold setting. Do not adjust the control further. Excessive squelch reduces the radio sensitivity and may prevent reception. Once the squelch control has been set, it is not necessary to readjust it when other channels are selected.

(2) To Receive:

- Step 1 Select desired channel by rotating the frequency switch to the desired position.
- Step 2 To monitor all on-frequency signals (coded signals, AP&L dedicated signals and general signals), place the squelch switch in the extreme right-hand position ("0" position). Coded signals, however, will not be uncoded in this situation and will appear as random noise on the speaker. Monitoring all on-frequency signals before transmission is necessary to avoid interfering with other users.
- Step 3 To hear only on-frequency AP&L dedicated signals, place the squelch switch in the middle position (" " position).
- Step 4 To hear only on-frequency coded signals or AP&L dedicated signals, place the squelch switch in the extreme left-hand position ("Q" position).

(3) To Transmit Coded Messages:

- Step 1 Select desired channel by rotating the frequency select switch to the desired position (F1, F2, etc.)
- Step 2 Place the squelch switch in the extreme right-hand position ("0" position) to monitor the selected channel. Listen for broadcasts on the channel.
- Step 3 After verifying that the selected frequency is clear, place the squelch switch in the extreme left-hand position ("Q" position).
- Step 4 Hold the radio in a vertical position with the speaker-microphone grille two or three inches from the mouth.
- Step 5 Press the push-to-talk switch on the side of the radio. The red "Battery Status and Transmit Indicator" lamp should illuminate. If it does not illuminate, then the battery requires recharge or exchange with a charged

battery. Speak slowly and clearly into the microphone in a normal or slightly louder-than-normal voice. At the end of the message, release the push-to-talk switch.

Step 6 The radio is now set to receive coded signals on the selected frequency.

(4) To Transmit AP&L Dedicated Messages:

Step 1 Select desired channel by rotating the frequency select switch to the desired position (F1, F2, etc.).

Step 2 Place the squelch switch in the extreme right-hand position ("0" position) to monitor the selected channel. Listen for broadcasts on the channel.

Step 3 After verifying that the selected frequency is clear, place the squelch switch in the middle position (" position).

Step 4 Hold the radio in a vertical position with the speaker-microphone grille two to three inches from the mouth.

Step 5 Press the push-to-talk switch on the side of the radio. The red "Battery Status and Transmit Indicator" lamp should illuminate. If it does not illuminate, then the battery requires recharge or exchange with a charged battery.

Step 6 Speak slowly and clearly into the microphone in a normal or slightly louder-than-normal voice. At the end of the message, release the push-to-talk switch.

Step 7 The radio is now set to receive AP&L dedicated signals on the selected frequency.

(5) To Transmit General Messages:

Step 1 Select desired channel by rotating the frequency select switch to the desired position (F1, F2, etc.).

Step 2 Place the squelch switch in the extreme right-hand position ("0" position) to monitor the selected channel. Listen for broadcasts on the channel.

Step 3 Hold the radio in a vertical position with the speaker-microphone grille two to three inches from the mouth.

Step 4 After verifying that the selected frequency is clear, press the push-to-talk switch on the side of the radio. The red "Battery Status and Transmit Indicator" lamp will illuminate. If it does not illuminate, then the battery requires recharge or exchange with a charged battery.

Step 5 Speak slowly and clearly into the microphone in a normal or slightly louder-than-normal voice. At the end of the message, release the push-to-talk switch.

Step 6 The radio is now set to receive general signals on the selected frequency.

(6) To Turn "Off":

Rotate the volume control fully counterclockwise until a click is heard.

d. Maintenance

Step 1 Turn the radio off.

Step 2 Hold the radio in the left hand and press the battery release with the left thumb as shown in the illustration.

Step 3 While holding the battery release depressed, rotate the battery counterclockwise.

Step 4 Rotate the battery about 180 degrees, until the cam lock is clear, and remove the battery from the radio.

Step 5 To install a freshly charged battery, reverse the procedure. First, engage the cam lock, then rotate the battery clockwise until it latches in the proper position. Be sure the battery engages the slot on the bottom of the radio as shown in the illustration.

7. Dardanelle Dam Radio

a. Introduction

Control switches and indicators on the single channel Dardanelle Dam Radio are shown in Figure 2-10.

The control switches on the desk microphone and the purpose of each are as follows:

- Transmit Switch

While depressed, the Transmit switch turns on the radio transmitter.

- Monitor Switch

While depressed, the Monitor switch allows the operator to monitor all on-frequency signals to determine if the channel is in use before making a transmission.

The control switches and indicators on the radio control box, and the purpose of each, are as follows:

- Volume/On-Off Control

Self explanatory.

- Power On Indicator

The green Power on indicator lights when the radio is turned "On".

- Squelch Control

The Squelch control eliminates background noise while optimizes reception of signals.

- Transmit Indicator

The Transmit indicator lights red while the Transmit switch on the desk microphone is depressed.

b. Instructions for Operation

(1) Initial Adjustments:

Step 1 Turn on the radio by rotating the Volume/ON-Off control clockwise.

- Step 2 Unsquench the radio by turning the Squelch control to the fully counter-clockwise position.
- Step 3 To monitor all on-frequency signals, depress the Monitor switch on the desk microphone.
- Step 4 Listen for a broadcast and adjust the volume control for a comfortable listening level.
- Step 5 When the channel is clear, slowly rotate the Squelch control clockwise until the background noise just stops. This is the threshold setting. Do not adjust the control further. Excessive squelch reduces the radio sensitivity and may prevent reception.

(2) To Receive:

- Step 1 To hear only on-frequency AP&L dedicated signals, no adjustments beyond the initial adjustments described above are needed.
- Step 2 To monitor all on-frequency signals (coded signals, AP&L dedicated signals and general signals), depress the Monitor switch on the desk microphone. Coded signals, however, will not be uncoded by this radio and will appear as random noise on the speaker. Monitoring all on-frequency signals before transmission is necessary to avoid interfering with other users.

(3) To Transmit AP&L Dedicated Messages:

- Step 1 Verify that no transmissions are in progress on the channel by depressing the Monitor switch on the desk microphone and listening to the broadcasts. (See Step 2, To Receive.)
- Step 2 Release the Monitor switch and depress the Transmit switch on the desk microphone. The Transmit indicator on the radio control box will light red.

Step 3 While depressing the Transmit switch, speak slowly and clearly into the microphone in a normal or slightly louder-than-normal voice. At the end of the message, release the Transmit switch.

Step 4 The radio is not set to receive AP&L dedicated signals.

(4) To Turn "Off":

Rotate the Volume/On-Off control fully counterclockwise until a click is heard.

8. AP&L Russellville District Office Radio

Introduction

Control switches and indicators on the AP&L Russellville District Office radio are similar to those shown in Figure 2-5.

The control switches on the desk microphone and the purpose of each are as follows:

- Transmit Switch While depressed, the Transmit switch turn on the radio transmitter for the selected channel.
- Monitor Switch While depressed, the Monitor switch allows the operator to monitor all on-frequency signals to determine if the selected channel is in use before making a transmission.

9. ANO Pagers (Motorola "Spirit" Models)

a. Introduction

Control switches on the ANO pagers are shown in Figure 2-11. The control switches and the purpose of each are as follows:

- On/Off Switch & Volume Control Self explanatory.
- Reset Bar The Reset Bar is used to reset the pager after receiving a message. While depressed, it can also be used to generator background noise for cursory volume adjustment and to test the battery.

b. Instructions for Operation

(1) To Use:

- Step 1 Turn on the pager by rotating the On-Off Switch & Volume Control clockwise toward the Reset Bar.
- Step 2 While holding the Reset Bar depressed, adjust the On-Off switch & Volume Control by rotating it clockwise to a comfortable listening level. It may be necessary to readjust to volume when a voice signal is present.
- Step 3 Hold the Reset Bar depressed for approximately five seconds and listen to the background noise. If the noise begins to fade, recharge or replace the battery as described in sections "TO CHARGE BATTERY" or "TO REPLACE BATTERY". The pager is now set to receive a voice message.
- Step 4 When a page is received, the pager will emit an alerting tone, followed automatically by a voice message. The level of both the alerting tone and voice message can be adjusted by rotating the On-Off Switch & Volume Control.

Step 5 After receiving a message, depress and release the Reset Bar to reset the pager for the next page.

NOTE: If the Reset Bar is accidentally depressed while receiving a message, all or part of the message will be lost unless the Reset Bar is held down until the end of the message.

Step 6 To turn off the pager, rotate the On-Off Switch & Volume Control counterclockwise away from the Reset Bar.

(1) To Change Battery:

NOTE: The pager can be operated with either a throwaway (non-rechargeable), N-size, mercury battery (Motorola type NLN6199A) or a rechargeable, N-size, nickel-cadmium battery (Motorola type NLN6965A).

Step 1 Locate the "silver" batter retainer button on the bottom of the pager housing.

Step 2 Using a coin, rotate the button counterclockwise about 1/8 turn until a "stop" position is reached. At this position, the "dot" on the battery button and the "dot" on the pager housing will be aligned.

Step 3 Remove the battery button.

Step 4 Remove the battery by tilting the pager to an upright position; in this position the battery will slide from the battery compartment.

Step 5 Insert the N-size battery (negative end first) into the battery compartment.

Step 6 Place the battery retainer button over the battery compartment so that the "dot" on the button is aligned with the "dot" on the pager housing.

Step 7 Using a coin, slightly press the button and rotate clockwise about 1/8 turn until locked.

10. Little Rock Pagers (Motorola "Pageboy II" Models)

a. Introduction

The single control switch on the Little Rock Pagers is shown in Figure 2-12. The switch can be put into three positions: "Off", "On", and a middle setting marked by a "dot" between "On" and "Off". The middle setting is equivalent to the "On" position for AP&L pagers. The control switch can also be depressed to stop the pulsating "beep" emitted by the pager during the initial turn-on and receipt of a page.

When the pager is turned "On", a pulsating "beep" is emitted by the pager. The speed of the "beep" indicates the battery condition. The speed of the "beep" increases as the battery wears out, both during initial turn-on and receipt of a page. The speed of "beeping" is distinctly faster when the battery nears the end of its usefulness. Experience will enable the user to use this as a guide as to when to replace or recharge the battery.

b. Instructions for Operation

(1) To Use:

- Step 1 Turn on the pager by sliding the On-Off switch to the "On" position (Figure 2). A pulsating "beep" indicates the battery condition. If the speed of "beeping" is distinctly faster than normal with recharged or fresh batteries, recharge or replace the battery as described in sections, "TO RECHARGE BATTERY" or "TO REPLACE BATTERY".
- Step 2 To stop the "beeping", depress the control switch. If the control switch is not depressed, the "beeping" will stop automatically. The pager is now set to receive a "beeping" page.
- Step 3 When the user is paged, the pager emits a pulsating "beep".
- Step 4 To stop the "beeping", depress the control switch. If the control switch is not depressed, the "beeping" will stop automatically after a few seconds. The pager is now reset to receive the next page.

Step 5 To turn off the pager, slide the control switch to the "Off" position.

(2) To Change Battery:

NOTE: The pager can be operated with either a throwaway (non-rechargeable) battery. The battery adapter must be used when a rechargeable battery is used. The following table provides a guide to the batteries recommended.

Manufacturer	Number	Size	Type
Mallory	MN1500	AA	Throwaway
Everready	1015	AA	Throwaway
Motorola	NLN8276	N	Re-chargeable

Step 1 Place the pager in the left hand. With the right thumb, firmly depress the top of the clip. This unlocks the positive latch mechanism.

Step 2 Place the right index finger on the bottom of the clip and slide the clip assembly toward the top of the pager.

Step 3 When the cover is stopped by another latch, the pager is fully opened for battery replacement.

Step 4 With a pencil, push the battery out of the pager.

Step 5. Place the new battery into the battery compartment, inserting the positive end first.

NOTE: Be certain the new battery is properly inserted. With the battery backwards, the pager will not function.

Step 6 Close the plastic battery insulator flap and slide the metal cover all the way back down until it locks. The pager is now ready for use.

11. Battery Chargers

a. Pagers are charged as follows:

Step 1 For Motorola "Pageboy II" Models, verify that the battery is a Motorola Type NLN8276 prior to recharging. This is a rechargeable, N-size nickel-cadmium battery.

For Motorola "Spirit" Models, verify that the battery is a Motorola Type NLN6965A prior to recharging. This is a rechargeable, N-size nickel-cadmium battery.

Step 2 To recharge the battery while it is in the pager, insert the pager into the pocket of the charger. The clip on the pager must be lined up with the notches in the pocket of the charger. The charge indicator next to the pocket will glow, indicating that the battery is charging.

NOTES:

(1) The pager may be left "On" while in the charger. However, longer charging times will be required in this situation to place the same charge on the battery than if the pager was "Off". The following table provides a guide to the number of operating hours that can be expected from different charging times.

Pager Off in Charger		Pager On in Charger	
Recharge Time	Hours Operation	Recharge Time	Hours Operation
12 hrs.	40 hrs.	12 hrs.	32 hrs.
6 hrs.	20 hrs.	6 hrs.	16 hrs.
3 hrs.	10 hrs.	3 hrs.	8 hrs.
2.4 hrs.	8 hrs.	2.4 hrs.	6 hrs.

(2) Keep batteries away from sources of heat. The charger senses degree of charge by temperature. A warm or hot battery will not be charged.

Step 3 To recharge the battery while it is out of the pager, insert the battery into the charger. The charge indicator next to the pocket will glow, indicating that the battery is charging.

b. Hand Held Radios Are Charged As Follows:

Step 1 Insert battery, with or without the radio attached, into the pocket of the charger. The battery must mate with the fingers in the pocket. If reversed, the charger will not operate.

Step 2 Observe that the red lamp glows beside the pocket. This indicates that battery is charging.

Step 3 Remove the battery after 14 hours. If desired, the battery may be left in the charger indefinitely.

NOTE: Keep batteries away from sources of heat. The charger senses degree of charge by temperature. A warm or hot battery will not be charged.

c. Code Programmers are charged in an identical manner as described above for hand held radios except that a fast charger is used. With a fast charger, charging is completed in 1 hour.

12. Code Programmer

a. Introduction

The Code Programmer is a hand-held, calculator type device designed for programming and proper code into AP&L radios equipped to transmit and receive coded signals.

Operating controls and indicators are shown in Figure 2-13. The operating controls and indicators and the purpose of each are as follows:

- Power On/Off Switch

The On/Off switch controls the main power to the Code Programmer; however, the memory circuit for storing the code is powered continuously.

- LED Power On Indicator

The LED indicator will illuminate whenever the On/Off switch is turned on.

- Keyboard

The Code Programmer contains an eleven (11) button keyboard, eight of which are code character keys with digits 0 through 7 and three are function control keys (CLR, SEQ, and RDY)

- RDY (Ready) key activates the code programmer circuits after no action or other conditions, such as low battery, that may have placed the unit in a standby mode. A zero will appear on the LED display indicating that the unit is ready for input.
- SEQ (Sequence) key is used only during code programming to permit sequencing the display through the set of code characters entered via the numerical keys.
- CLR (Clear) key is used only during code programming to erase the digits of the sequence currently displayed and to reenter any other six digits if desired.

- LED Display

A seven (7) digit LED display is provided to show the digits entered from the keyboard when inserting a code into the programmer. The display handles the 24-digit string of a complete

code by displaying four groups of six digits each. Each group of six digits is called a sequence. The left-most character in the display is called the control character. The control character indicates the sequence number and is also used to indicate system status.

- Key Plug

The unit features a lock-out key plug which prevents unauthorized personnel from modifying the existing stored code or inserting a new code. The key plug will allow activation of the entries keyboard; with the key plug removed, only the RDY key is active. A stored code cannot be displayed or modified unless the key plug is in place.

- Enter Switch

The "ENTER" switch is used to cause the code entered from the keyboard to be stored in the code programmer memory and to cause the code resently stored in the memory to be programmed into a radio.

- Interconnect Cable

The interconnecting cables are used to connect the Code Programmers to the appropriate radio in order for the code to be transferred properly. Two (2) cables are utilized:

- Motorola PKN6000A interconnects the Code Programmer to hand-held radios; and
- Motorola PKN6001A interconnects the Code Programmer to a base or mobile radio.

Each cables has a Code Programmer connector plug and a radio connector plug which must be inserted properly in the respective unit.

b. Precautions

- (1) The Code Programmer cannot be used with any radio unless that radio has the capability to transmit and receive coded signals.
- (2) Code considerations--to conserve battery life and to minimize errors in inserting digits into the unit, the digit string to be used should be decided upon prior to turning on the unit. A series of 24 digits using a combination of the digits "0" through "7" must be entered into the

code programmer using the keyboard to generate a new code. Only two restrictions are placed on the combinations of digits. First, codes that contain all zeros in the first 21 locations sacrifice some of the scrambling properties of the coding scheme and should not be used. Second, the last of 24th digit of the string should be a 0, 1, 2, or 3.

- (3) Low battery alert--the control character will flash a 9 to indicate a low battery condition. This low battery alert lasts for approximately 5 seconds and will be followed by the automatic power down sequence. When the low battery indication occurs, the code programming circuits are disabled to prevent the entry of a wrong code into a radio being programmed. A fully charged battery will provide from one to two hundred code programming cycles.
- (4) No-Code Alert--the control character will flash 7 to indicate the absence of a valid code in the code programmer due to improper input technique or loss of code in the memory. The flashing no-code alert will last approximately 5 seconds and will be followed by the automatic power down sequence. When the no-code alert indication occurs, the code insert circuits are disabled to prevent entry of an invalid code in the radio.
- (5) Automatic Power Down/Loss of Power--to prolong battery life, the unit measures the time from the last valid keyboard input and turns off the power within a preset period of 45 seconds in the programming mode. All inputs are destroyed and complete digit insertion must be started from the beginning unless a completed code had been stored by executing "ENTER" prior to the power down/loss of power. If the power down/loss of power occurs while a radio is connected to the Code Programmer, restarting the programmer will destroy the code stored in the radio. Disconnect the radio from the Code Programmer before restarting or make sure the code is entered into the radio again.

c. Instructions for Operation

The Code Programmer has two operating modes: insert and programming.

"Insert Mode"--the operator uses the Code Programmer to input and edit a new sequence of digits into the Code Programmer via the keyboard and to enter the new code in the programmer memory, and program the stored code into a radio.

"Programming Mode"--the operator uses the Code Programmer to program the stored code into a radio. All other functions are inoperative in this mode.

(1) Insert Mode Procedure:

- Step 1 Insert the key plug into the connector on the code programmer.
- Step 2 Switch the main power switch ON. The power on indicator should light.
- Step 3 Push the "RDY" button on the keyboard. A zero control character will be displayed indicating that the unit is ready for input. The first digit must be inserted within 45 seconds (see Precaution #5).
- Step 4 Using the "0" through "7" keys on the keyboard enter the series of 24 digits (see Precaution #2). When the first digit is entered from the keyboard the control character will change to a 1 and the digit selected will appear to the right. If a code was present in the unit it is destroyed when the first digit is entered. Successive inputs will continue to fill the display to the right until six input digits have been accepted. (A space separates the control character from the input digits for readability.) When the seventh digit is depressed the first sequence will be blanked and the new input will be displayed with a 2 for the control character. This process will continue until 24 digits have been inserted and the forth sequence is completely full (i.e., until all four groups of six digits are entered). Input digits are now no longer accepted by the processor.

- Step 5 Use the "CLR" button at any time to erase the digits of the sequence currently displayed. This will cause the displayed sequence to be deleted regardless of the number of digits entered. A new string of six digits must be entered after the "CLR" button is used.
- Step 6 Use the "SEQ" button after all 24 digits have been accepted by the system. The "SEQ" button is used to step through the four sequences to check their contents. The "CLR" may again be used to erase and reenter any six digits if desired.
- Step 7 Once the digit string is determined to be correct (see Precaution #4), push the ENTER switch at the side of the programmer. Depressing the ENTER switch at the side of the programmer. Depressing the ENTER switch will have the following effect: the display will be blanked, the code will be generated from the current keyboard input, and the programming cycle within the Code Programmer will take place. The appearance of a zero for the control character indicates completion of the programming cycle. The code is now stored in the continuously powered memory and can be used repeatedly to program radios.

(2) Programming Mode Procedure:

- Step 1 Connect the code programmer to the radio with the interconnecting cable. Turn the radio on.
- Step 2 Set the On/Off switch on the top of the Code Programmer to the On position. The power indicator will light.
- Step 3 Push the "RDY" button on the keyboard to power up the processor. A zero will be displayed by the control character indicating the Code Programmer is ready.

Step 4 Press the ENTER switch to cause the code presently stored in the standby memory to be programmed into the radio. When the key is pushed the display will blank indicating that the programming cycle has begun. A successful programming cycle will be followed by a 1 second tone burst from the radio. Reappearance of the control character zero indicates completion of the cycle. If tone verification does not occur, check the interconnect cable connections and press the "ENTER" switch again.

Step 5 Disconnect the radio from the Code Programmer without restarting the processor otherwise the radio may need to have the code re-entered. (See Precaution #5)

d. Maintenance

(1) Battery Replacement Procedure:

- Step 1 Turn the Code Programmer off.
- Step 2 Hold the code programmer in the left hand and press the battery release with the left thumb.
- Step 3 While holding the battery release depressed, rotate the battery counterclockwise.
- Step 4 Rotate the battery about 180 degrees, until the cam lock is clear, and remove the battery from the code programmer.
- Step 5 To replace the battery, reverse the procedure. First engage the cam lock, then rotate the battery clockwise until it latches in the proper position. Be sure the battery engages the slot on the bottom of the code programmer.

NOTE: The battery must be replaced within one minute of removal to prevent loss of code storage in the code programmer.

(2) Fuse Replacement Procedure:

- Step 1 Remove the battery as described in the Battery Replacement procedures.
- Step 2 Unscrew the fuse cap and remove the fuse.
- Step 3 Replace the fuse with a new one and replace the fuse cap making sure it is screwed on securely.
- Step 4 Reinstall the battery as described in the Battery Replacement procedure.

ATTACHMENT 1

Circuit: GDA02060
Interconnect Code: 00

REGION 1 - AREA CODES

LOCATION	Individual Station Code	Resident Inspector Code	Resident Insp. Group Code	Broadcast Code	FAX Code	FAX Broadcast Code
NRC Region 1 office	23			25	29	24
NRC Headquarters	22			25	22	24
Beaver Valley Nuclear Plant	33	32	26	25	34	24
Calvert Cliffs Nuclear Plant	43			25		
J. A. Fitzpatrick Nuclear Plant	53			25		
Nine Mile Point Nuclear Plant	63			25		
R. E. Ginna Nuclear Plant	73			25		
Peach Bottom Nuclear Plant	83	82	26	25	84	24
Three Mile Island Nuclear Plant	93	92	26	25	94	24
Salem Nuclear Plant	38	37	26	25	39	24
B&W Plutonium Lab	48	47	26	25	49	24
Westinghouse Electric Corporation	58			25		
Nuclear Fuel Services	68			25		

ATTACHMENT 2

Circuit: GDA02061
Interconnect Code: 02

REGION 1 - AREA CODES

LOCATION	Individual Station Code	Resident Inspector Code	Resident Insp. Group Code	Broadcast Code	FAX Code	FAX Broadcast Code
NRC Region 1 Office	23			25	29	24
NRC Headquarters	22			25	22	24
Haddam Neck Nuclear Plant (Conn. Yankee Nuclear Plant)	33			25		
Indian Point Nuclear Plant	43	42	26	25	44	24
Maine Yankee Nuclear Plant	53	52	26	25	54	24
Millstone Nuclear Plant	63	62	26	25	64	24
Oyster Creek Nuclear Plant	73			25		
Pilgrim Nuclear Plant	83			25		
Vermont Yankee Nuclear Plant	93			25		
Yankee Rowe Nuclear Plant	38			25		
Texas Instrument	48			25		
United Nuclear Corporation (Montville)	58			25		
United Nuclear Fuels Corp. (Woodriver)	68			25		

ATTACHMENT 3

Circuit: GDA02062
Interconnect Code: 03

REGION 2 - AREA CODES

LOCATION	Individual Station Code	Resident Inspector Code	Resident Insp. Group Code	Broadcast Code	FAX Code	FAX Broadcast Code
NRC Region 2 Office	23			25	29	24
NRC Headquarters	22			25	22	24
Browns Ferry Nuclear Plant	33	32	26	25	34	24
Crystal River Nuclear Plant	43	42	26	25	44	24
J. M. Farley Nuclear Plant	53			25		
E. I. Hatch Nuclear Plant	63	62	26	25	64	24
Oconee Nuclear Plant	73	72	26	25	74	24
St. Lucie Nuclear Plant	83			25		
Turkey Pt. Nuclear Plant	93	92	26	25	94	24

ATTACHMENT 4

Circuit: GDA02063
Interconnect Code: 04

REGION 2 - AREA CODES

LOCATION	Individual Station Code	Resident Inspector Code	Resident Insp. Group Code	Broadcast Code	FAX Code	FAX Broadcast Code
NRC Region 2 Office	23			25	29	24
NRC Headquarters	22			25	22	24
Brunswick Steam Generating Plant	33	32	26	25	34	24
North Anna Power Station	43	42	26	25	44	24
Robinson Nuclear Plant	53	52	26	25	54	24
Surry Power Plant	63	62	26	25	64	24
B&W Naval Nuclear Fuel Division	73			25		
B&W Research Center	83			25		
Nuclear Fuel Services	93	92	26	25	94	24

ATTACHMENT 5

Circuit: GDA02064
Interconnect Code: 05

REGION 3 - AREA CODES

LOCATION	Individual Station Code	Resident Inspector Code	Resident Insp. Group Code	Broadcast Code	FAX Code	FAX Broadcast Code
NRC Region 3 Office	23			25	29	24
NRC Headquarters	22			25	22	24
Big Rock Point Nuclear Plant	33			25		
Davis Besse Nuclear Plant	43	42	26	25	44	24
Dresden Nuclear Plant	53	52	26	25	54	24
Kewaunee Nuclear Plant	63			25		
Point Beach Nuclear Plant	73			25		

ATTACHMENT 6

Circuit: GDA02065
Interconnect Code: 06

REGION 3 - AREA CODES

LOCATION	Individual Station Code	Resident Inspector Code	Resident Insp. Group Code	Broadcast Code	FAX Code	FAX Broadcast Code
NRC Region 3 Office	23			25	29	24
NRC Headquarters	22			25	22	24
Donald C. Cook Nuclear Plant	33	32	26	25	34	24
Duane Arnold Nuclear Plant	43			25		
LaCrosse Nuclear Plant	53	52	26	25	54	24
Monticello Nuclear Plant	63			25		
Palisades Nuclear Plant	73	72	26	25	74	24
Prairie Island Nuclear Plant	83	82	26	25	84	24
Quad Cities Power Station	93	92	26	25	94	24
Zion Nuclear Plant	38	37	26	25	39	24
Kerr McGee Cimmaron Plant	48			25		

ATTACHMENT 7

Circuit: GDA02066
Interconnect Code: 07

REGION 4 - AREA CODES

LOCATION	Individual Station Code	Resident Inspector Code	Resident Insp. Group Code	Broadcast Code	FAX Code	FAX Broadcast Code
NRC Region 4 Office	23			25	29	24
NRC Headquarters	22			25	22	24
Arkansas Nuclear Power Plant	33	32	26	25	34	24
Cooper Nuclear Station	43			25		
Ft. Calhoun Nuclear Station	53			25		
Ft. St. Vrain Generating Station	63	62	26	25	64	24

ATTACHMENT 8

Circuit: CDA02067
Interconnect Code: 08

REGION 5 - AREA CODES

LOCATION	Individual Station Code	Resident Inspector Code	Resident Insp. Group Code	Broadcast Code	FAX Code	FAX Broadcast Code
NRC Region 5 Office	23			25	29	24
NRC Headquarters	22			25	22	24
Energy Systems Group	33			25		
Rancho Seco Power Station	43	42	26	25	44	24
San Onofre Nuclear Plant	53	52	26	25	54	24
Trojan Nuclear Plant	63	62	26	25	64	24
EXXON Nuclear Company	73			25		
General Atomic Company	83			25		
General Electric Vallecitos Plant	93			25		
Diablo Canyon Nuclear Plant	38	37	26	25	39	24

ATTACHMENT 9

ANO
Ten Signals

10- 1 Receiving poorly.
10- 2 Receiving well.
10- 3 Stop transmitting.
10- 4 Message received ok.
10- 5 Relay.
10- 6 Busy.
10- 7 Out of service or off duty.
10- 8 In service or on duty.
10- 9 Repeat.
10- 10 Out of service--subject to call.
10- 12 Officials or visitors present.
10- 13 Advise road-weather conditions.
10- 14 Convoy or escort.
10- 15 Suspect in custody.
10- 17 Pick up papers or packages.
10- 18 Complete assignment A.S.A.P
10- 19 In route to or go to.
10- 20 What is your location?
10- 21 Call _____ by telephone.
10- 22 Disregard last information.
10- 23 Standby until no interference.
10- 24 Trouble at _____, all units report at once at _____.
10- 25 Do you have contact with _____?
10- 27 Any answer that number?
10- 28 Check with local Law Enforcement Agency for registration.
10- 30 Does not conform to rules and regulations.
10- 33 Emergency traffic.
10- 34 Clear all station on this leg.
10- 35 Confidential information.
10- 36 Correct time.
10- 37 Operator on duty.
10- 42 _____ now at his home.
10- 44 Station _____ has traffic for your station.
10- 49 Pick up party at _____.
10- 50 Traffic check or no traffic.
10- 51 Request approval for vehicle
10- 52 Request approval for visitor.
10- 53 Is (vehicle) on LDV list?
10- 63 Net is directed.
10- 64 Net is free
10- 77 No response.
10- 82 Reserve room at _____.
10- 88 Advise telephone number _____.
10- 97 Arrived at scene.
10- 98 Finished with last assignment.
10- 100 Request restroom break.

ATTACHMENT 10

Sheriff Ten Signals

(Later)

ATTACHMENT 11

State OES Ten Signals

(Later)

FIGURE 2-1
RADIO TELEPHONE SWITCHES
AND INDICATORS

CRADLE CONTROLS

STORE BUTTON

When in the on-hook condition the store button loads telephone numbers or roam list channel designations into the memory.

BUSY/TRANSMIT INDICATORS

Provides visual indication of transmit, busy signal or incoming call, when in standby mode.

HOME/ROAM/MAN INDICATORS AND SELECTOR SWITCH

Enables selection of desired mode of operation.

OFF-HOOK BUTTON

Simulates removing the handset from the cradle to enable on-hook call processing.

KEYLOCK SWITCH

Turns on the mobile telephone and provides security from unauthorized use.

DELETE/ROAM ALL BUTTON

When depressed once, deletes roam channel indicated on the cradle display. (DELETE function). When depressed twice, enters all available channels into the roam list (ROAM ALL FUNCTION).

CHANNEL DISPLAY

Provides visual indication of channel designation numbers.

HANDSET RELEASE BAR

Allows handset to be released from locked in position by simply touching release bar when removing handset.

VOLUME CONTROL

Adjusts audio level of external speaker.

AUXILIARY ALERT/PARTY FUNCTION

Enables auxiliary alert function while handset is on hook; activates mobile-to-mobile revertive call when handset is off hook.

HANDSET CONTROLS

PUSH TO TALK BAR

Used in manual and revertive calling

NUMBER BUTTON

If a telephone number exceeds seven digits, repeatedly depressing the number button will allow you to view the entire number by stepping the number across the handset display.

MEMORY BUTTON

Used to recall stored telephone numbers.

CLEAR BUTTON

Used to clear all instructions and displays. May also be used as a momentary on-hook switch when handset is in the off-hook position.

HANDSET DISPLAY

Seven digit display provides visual indication of telephone numbers.

PUSH BUTTON PAD

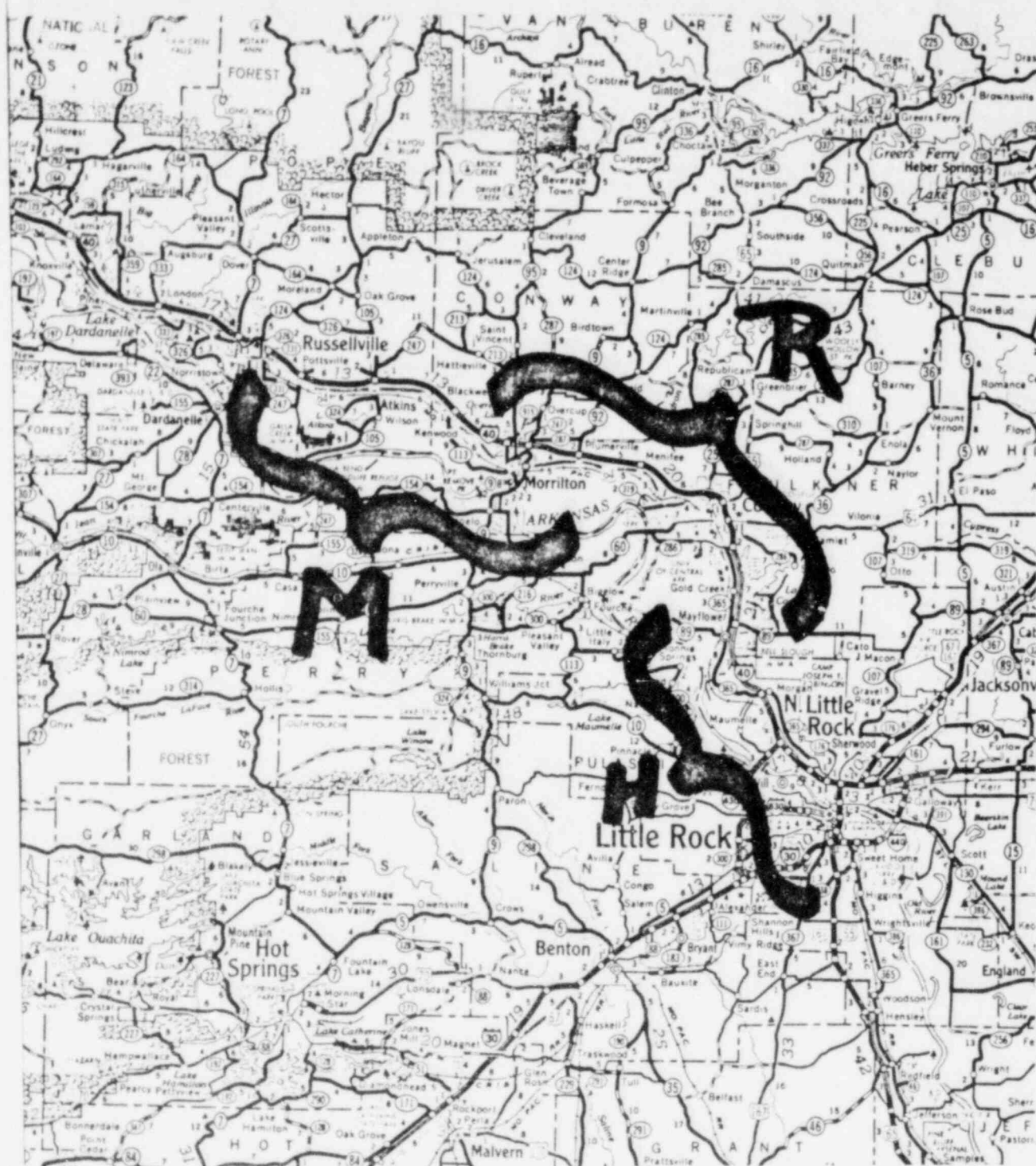
Standard telephone format pad used to enter telephone numbers and channel designation numbers (for storage).

CHANNEL BUTTON

Allows review of home and roam channel lists and selection of manual channels.

SEND BUTTON

Initiates transmission of entered telephone number.



H - Home
R - Roam
M - Manual

FIGURE 2-2
MOBILE TELEPHONE OPERATING
MODES ALONG I-40

FIGURE 2-3

ARKANSAS MOBILE TELEPHONE SERVICE AREA LISTINGS

MOBILE SERVICE AREAS	152-162 MHz CHANNELS												TELEPHONE COMPANY
	JL	YL	JP	YP	YJ	YK	JS	YS	YR	JK	JR		
	3	5	7	9	11	13	15	17	19	21	23		
Alma	φ											Continental Telephone Co. of Arkansas	
Bald Knob						φ						Bald Knob Tel. Co	
Blytheville										0		Southwestern Bell Telephone Co.	
Booneville			φ									Continental Telephone Co. of Arkansas	
Bull Shoals		φ										Northern Arkansas Telephone Co.	
Clarendon								0				United Tel. Company of Arkansas	
Clarksville											φ	Continental Tel. Co. of Arkansas	
Conway			0									Southwestern Bell Telephone Company	
Crossett				φ								Allied Utilities Corp.	
DeQueen										0		Allied Tel. Co. of Arkansas, Inc.	
Dumas											0	Lincoln-Desha Tel. Co., Inc.	
Elaine							φ					Allied Tel. Co. of Arkansas, Inc.	
El Dorado	X								X			Southwestern Bell Telephone Co.	
Fayetteville									0			Southwestern Bell. Telephone Company	
Fordyce									*			Allied Tel. Co. of Arkansas, Inc.	

FIGURE 2-3

ARKANSAS MOBILE TELEPHONE SERVICE AREA LISTINGS (CONT'D)

MOBILE SERVICE AREAS	152-162 MHz CHANNELS											TELEPHONE COMPANY
	JL	YL	JP	YP	YJ	YK	JS	YS	YR	JK	JR	
	3	5	7	9	11	13	15	17	19	21	23	
Forrest City		0										Southwestern Bell Telephone Company Southwestern Bell Telephone Company
Fort Smith					0	0			0			
Harrison			0									Boone County Tel. Company Southwestern Bell Telephone Company
Hope					X							
Jonesboro									0			Southwestern Bell Telephone Company Walnut Hill Telephone Co.
Lewisville								R				
Little Rock	0						0		0		0	Southwestern Bell Telephone Company E. Ritter Tel. Co.
Marked Tree							X				X	
McCrory										0		General Tel. Co. of the Southwest Southwestern Bell Telephone Co.
McGehee			0									
Mountain Home						φ						Mountain Home Telephone Company, Inc. Mountain View Telephone
Mountain View				0								
Newport	X											Southwestern Bell Telephone Company Continental Telephone Company of Arkansas
Paris				φ								
Prairie Grove										φ		Prairie Grove Telephone Company

FIGURE 2-3

ARKANSAS MOBILE TELEPHONE SERVICE AREA LISTINGS (CONT'D)

MOBILE SERVICE AREAS	152-162 MHz CHANNELS											TELEPHONE COMPANY
	JL	YL	JP	YP	YJ	YK	JS	YS	YR	JK	JR	
	3	5	7	9	11	13	15	17	19	21	23	
Pine Bluff		0				0						Southwestern Bell Telephone Company Redfield Tel. Co. of Arkansas
Redfield					φ							
Russellville		*										Continental Telephone Company of Arkansas, Lincoln-Desha Tel. Co., Inc.
Star City										0		
Stuttgart				*								General Telephone of the Southwest Allied Telephone Co. of Arkansas Inc.
Wilmot								φ				

- X Manual service with access to an operator
- 0 IMTS 2-way dial service with automatic channel selection and access to an operator.
- R IMTS 2-way dial service; equipped roamers may dial all station-to-station calls; service to manual units is not available.
- * 2-way dial service with access to an operator.
- φ 2-way dial service without access to an operator.

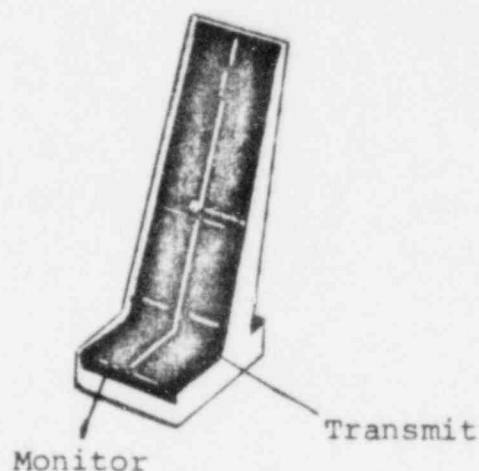
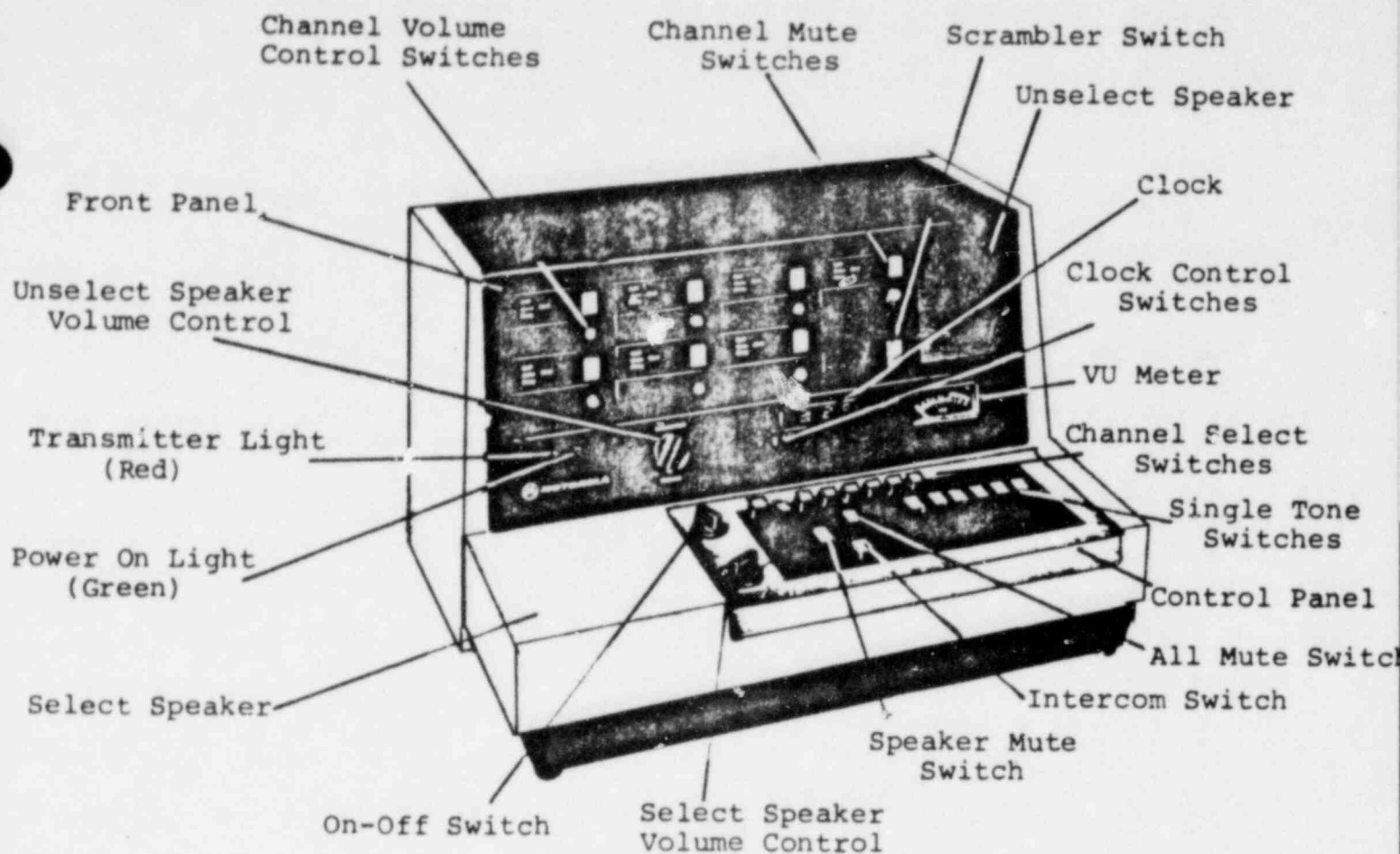


FIGURE 2-4
MULTI-CHANNEL CONTROL CONSOLE
AND DESK MICROPHONE

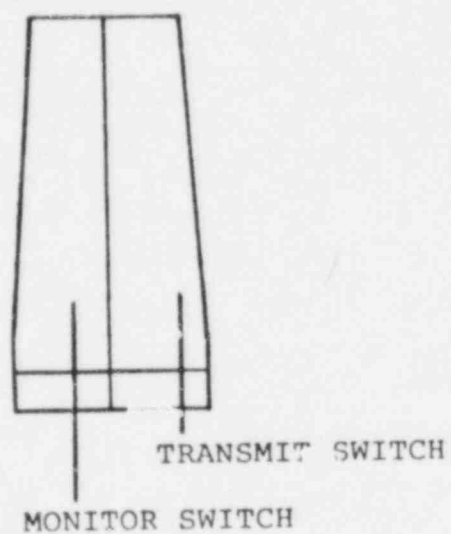
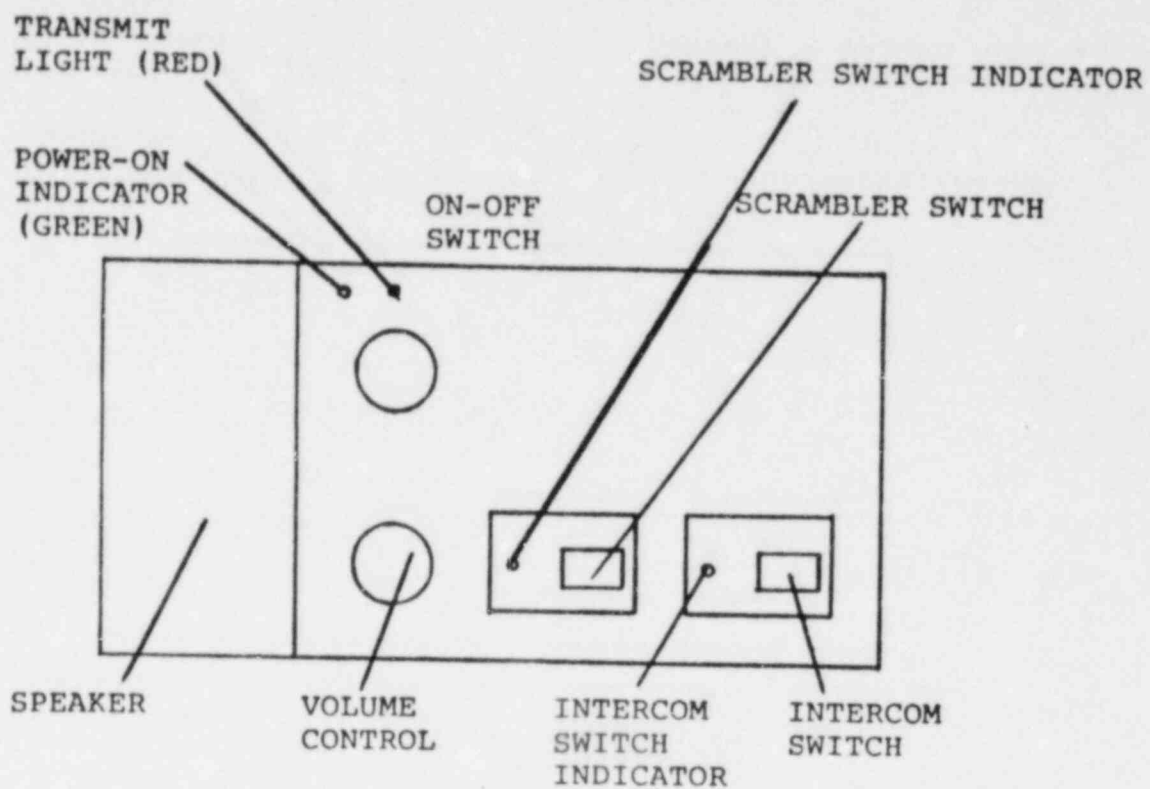


FIGURE 2-5
SINGLE-CHANNEL
CONTROL CONSOLE AND DESK
MIKE

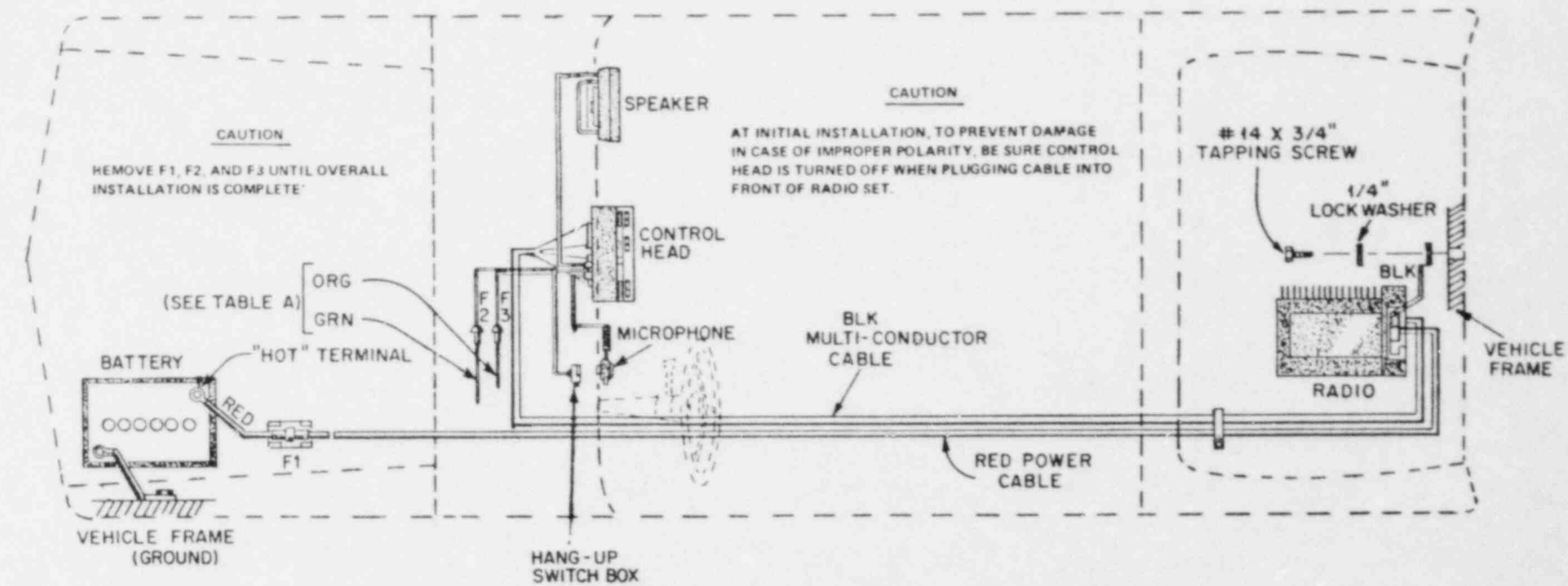


FIGURE 2-6
TYPICAL ARRANGEMENTS
OF RADIO COMPONENTS

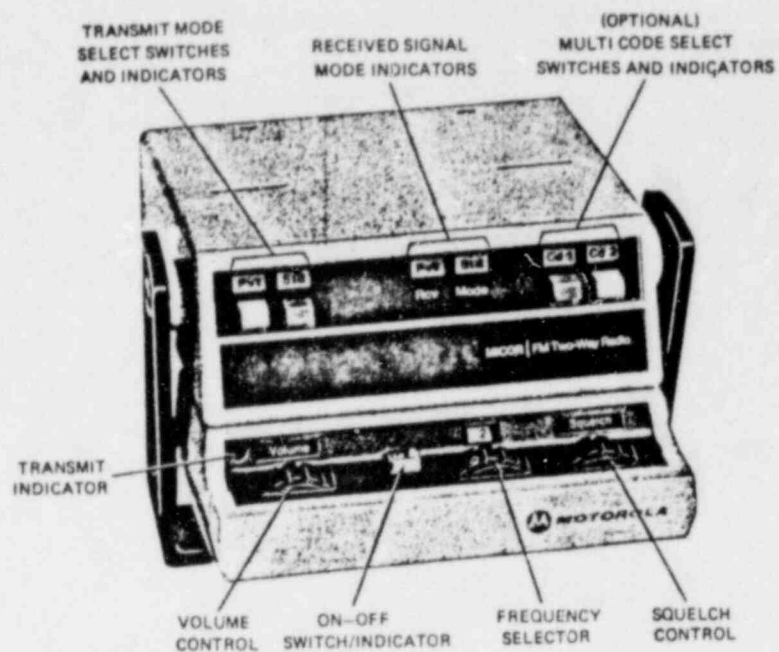


FIGURE 2-7
CONTROL HEAD

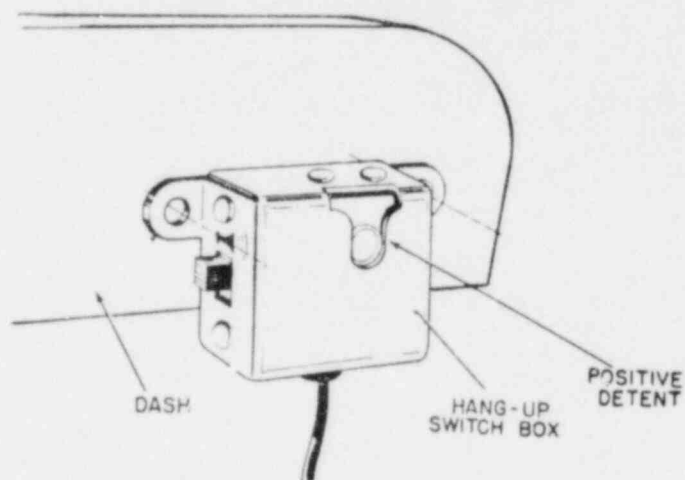


FIGURE 2-8
MICROPHONE HANG-UP
SWITCH BOX

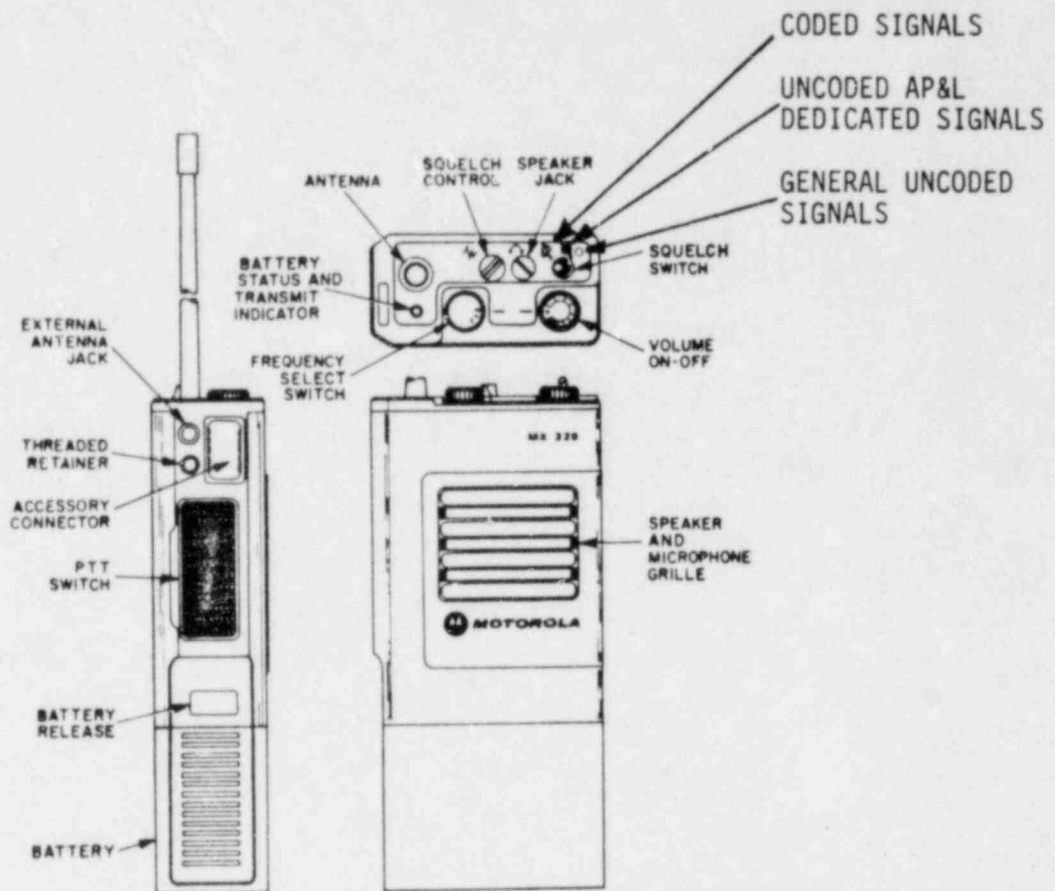


FIGURE 2-9
TYPICAL HAND HELD RADIO

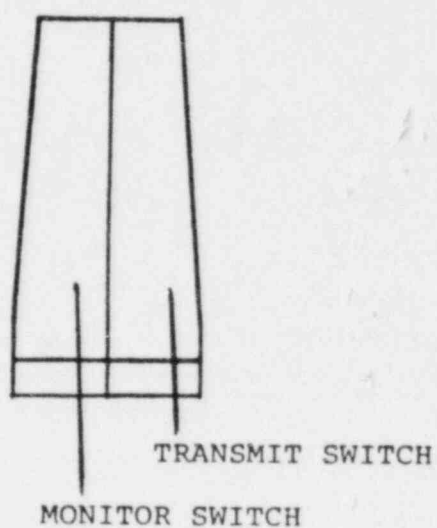
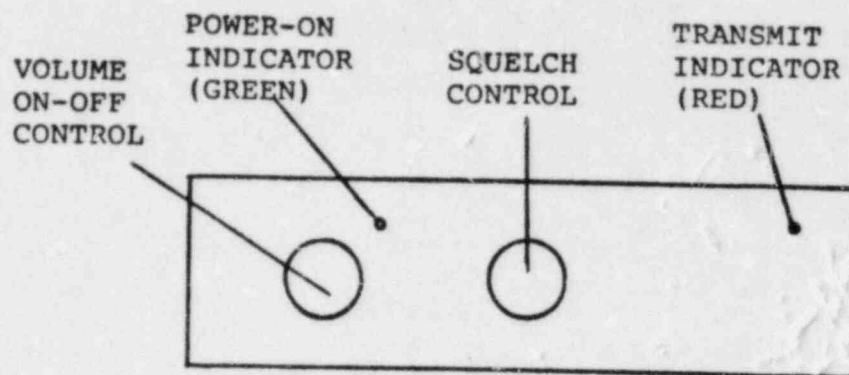
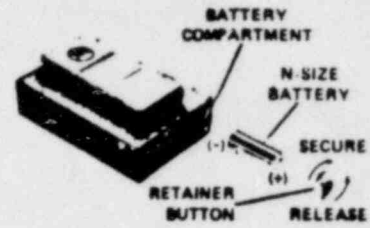
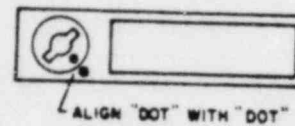
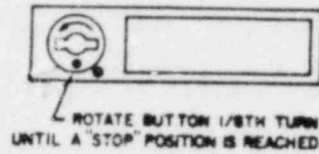


FIGURE 2-10
DARDANELLE DAM RADIO
AND DESK MICROPHONE



BATTERY REMOVAL



BATTERY INSTALLATION

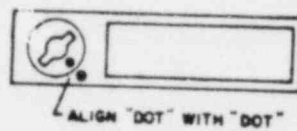


FIGURE 2-11
MOTOROLA "SPIRIT" PAGER

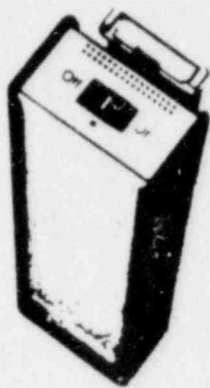


FIGURE 2-12
MOTOROLA "PAGEBOY" II PAGER

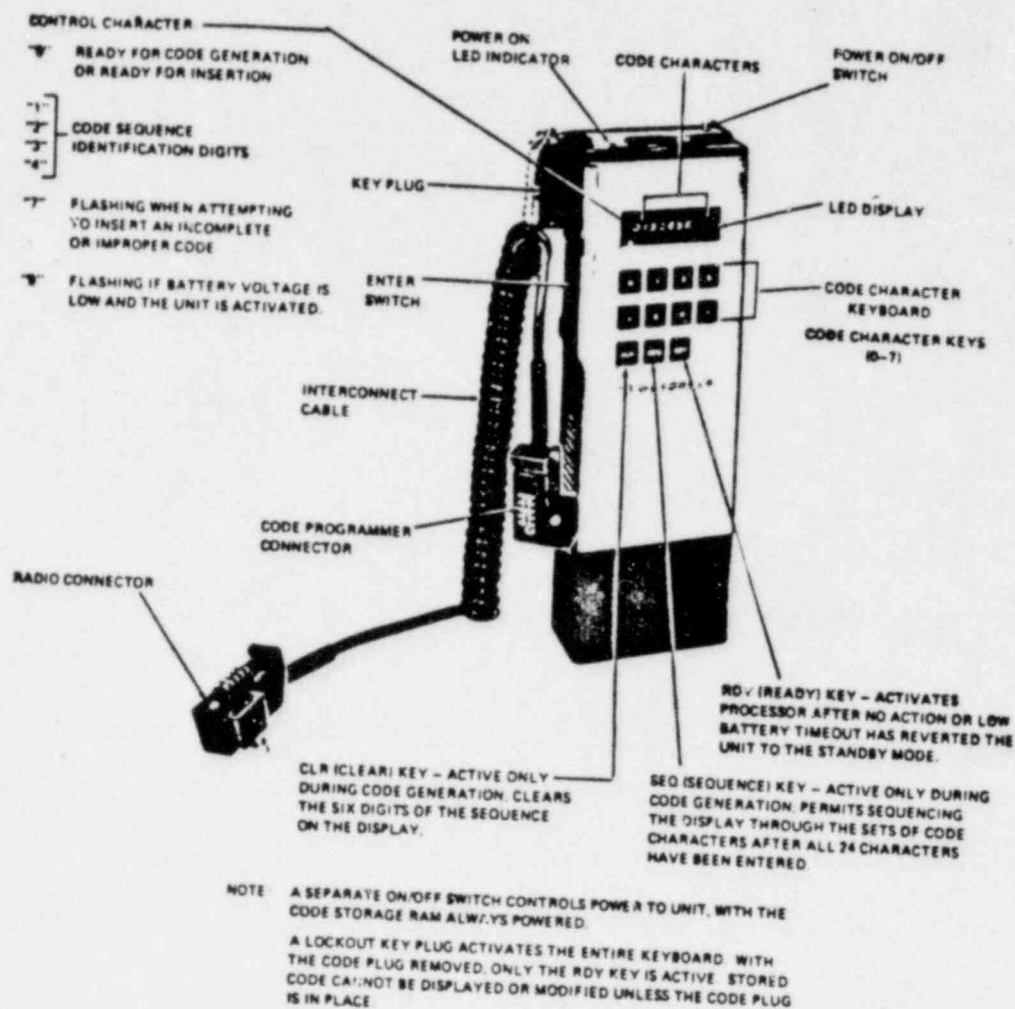


FIGURE 2-13
CODE PROGRAMMER