SECTION 5.
OPERATION

5.1   TRANSCEIVER FEATURES

The KG106 provides the following features for easy operation of the unit (See Figure 5-1):

1. Power Switch
2. Tone Indicator
3. Channel Indicator
4. Transmit Indicator
5. Volume Control

6. Squelch Control
7. Busy or Repeater On/Off Indicator
8. Channel Selector
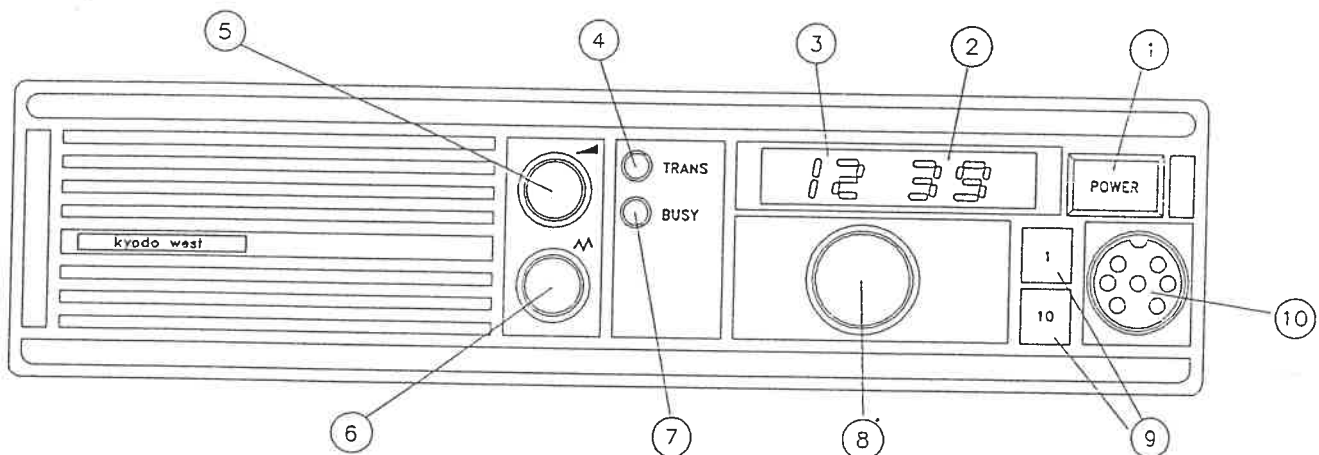9. Tone Select Buttons
10. Microphone Jack

Figure 5-1. Transceiver Controls and Features

5.2   POWER SWITCH

Depress the Power Switch (1) on the upper right of the front panel to turn the radio ON. Pressing it again will shut off the radio. (You will notice that the REP Indicator (7) lights whenever the power switch is first pressed ON. If you need it to work as a mobile instead of a repeater, press the REP OFF button on the microphone, see Figure 5-2.)

Desk top models use a power supply unit. Models installed in vehicles get their power from the vehicle's battery. Only a small amount of current is used when not transmitting. You can reduce any battery drain by turning the radio off when not in use.

5.3   TRANSMIT INDICATOR

The Transmit Indicator (4) lights when you press the Push-To-Talk switch on the external microphone (See Figure 5-2).

5.4   VOLUME CONTROL

Adjust speaker volume by turning the Volume Control knob (5) on the upper left of the control panel. To increase the volume, turn the knob clockwise.

5.5   NOISE SQUELCH CONTROL

The Squelch Control (6) stops the speaker noise that is present when a channel is not busy. Before adjusting the squelch in radios equipped with tone squelch, several steps are necessary. Put the microphone Monitor Switch ON or take the microphone off its hook (See Figure 5-2). This lets you monitor all traffic. To set the squelch control, set the volume at a normal level. Turn the Squelch Control completely counterclockwise. Pick a channel where there is no activity. Slowly turn the Squelch Control clockwise until the noise just stops. Advancing the control past this point can result in failure to receive weaker signals. Note that the repeater function is disabled while in the monitor mode.

5.6   BUSY & REPEATER ON/OFF INDICATOR

On telephone units, the Busy Indicator (7) lights during channel use. Do not send messages when the channel is occupied. When you select a specific tone, you are unable to hear other stations' messages. The Busy Indicator allows you to see the activity you do not hear. On repeater units, the Repeater On/Off Indicator (7) lights when the repeater enable control [REP ON] on the microphone is pressed or when the radio is turned on by the power switch. The REP light tells you that the unit is now ready to operate as a repeater. When the repeater begins working, the Transmit Indicator also will light. You will hear the communication on the speaker. If this is not desired, simply turn down the volume.

To return to mobile operation, simply press the control on the microphone to disable the repeater [REP OFF]. The REP indicator goes dark when the repeater function is not being used.

5.7   CHANNEL SELECTOR & INDICATOR

Turn the Channel Selector knob (8) to select the desired channel. The Channel Indicator (3) displays a digital readout of the channel in use.

5.8   TONE SELECTOR/ TONE INDICATOR

The Tone Selector (9) and Tone Indicator (2) have no fucntion on a KG106 mobile/repeater.

5.9   MICROPHONE JACK

Plug the external microphone into the Microphone Jack (10) on the lower right of the control panel. Refer to Figure 5-2 for microphone operation.

5.10   REPEATER MICROPHONE FEATURES

The external microphone for the KG106R contains the following controls and features (See Figure 5-2):

1. Push-To-Talk Switch
2. Repeater On Button (Reset)
3. Repeater Off Button (Call)
4. Manual Monitor Switch

5.11   PUSH-TO-TALK

Press the Push-To-Talk [PTT] switch (1) on the side of the microphone when you want to talk. Release the switch to hear return messages. The Transmit Indicator lights when you are transmitting (See Figure 5-1).
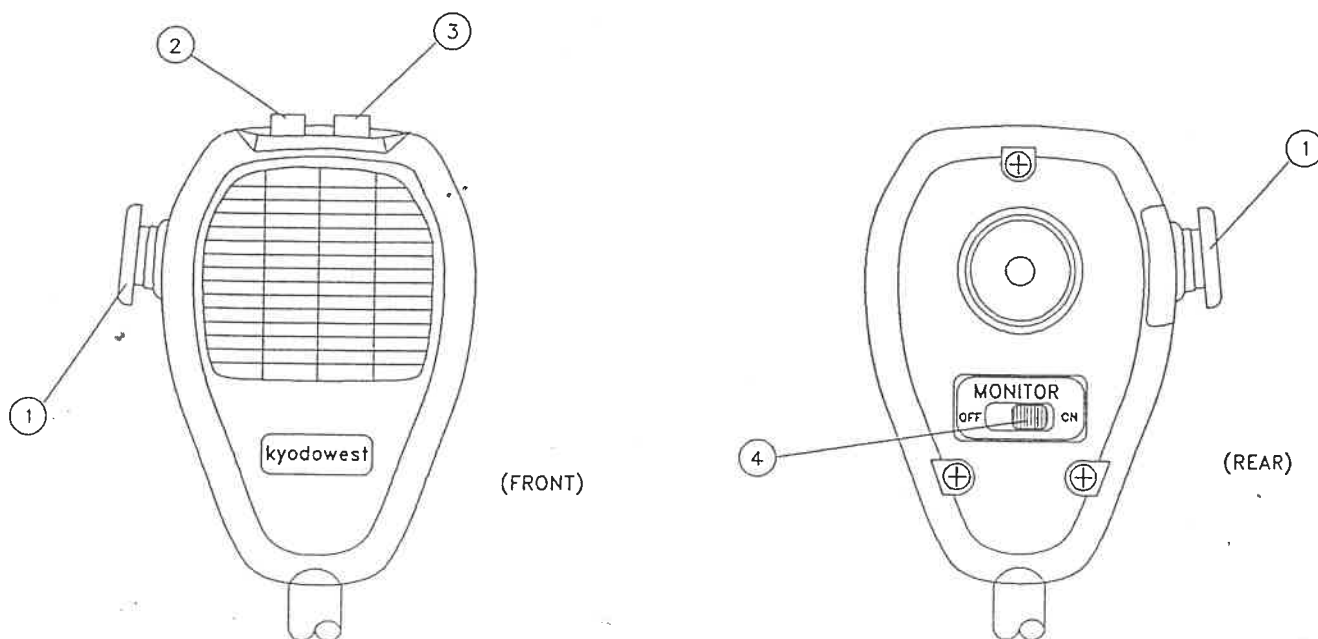

Figure 5-2. Repeater Microphone Controls and Features

Hold the microphone a few inches from your lips. Speak in a normal tone of voice. Shouting will not make your signal stronger because the volume is controlled inside the radio.

5.12   OPERATOR PRIORITY

You can control the functioning of the repeater. Removing the microphone from the hang-up disables the repeater so you can talk. On tone squelch models (CTCSS), the repeater is disabled when in the monitor mode. This prevents unauthorized transmissions from being repeated. However, the REP Indicator remains lit showing you that the unit is ready for repeater use. It will auotmatically be activated as a repeater when the microphone is hung-up or when the monitor mode is turned off.

5.13   REPEATER TIME LIMITER

The repeater unit has a timer that will disable the transmitter after about 3 minutes. Either party can restart the timer by releasing the [PTT] momentarily, then pressing it again. Several seconds of hang time allow the repeater to be accessed and communication to continue without interruption.

5.14   MICROPHONE MONITOR SWITCH

The FCC requires you to monitor a channel before transmitting. You will always hear all traffic on a channel if you have a basic noise squelch radio. If your unit has the CTCSS option, it stays quiet when hung-up until there is communication on your specific tone system. But, when you take the microphone off the clip, you'll hear all traffic on the channel. You should leave the Monitor Switch (4) ON at all times when using a hang-up clip.

If you don't have or use a hang-up clip, the switch acts like one. You monitor channel traffic by turning the switch ON and block it out by turning it OFF. However, you still will hear any traffic on your specific tone system if the switch is OFF. Remember, the repeater function is disabled during monitoring. When you don't use the hang-up clip, the monitor switch stays OFF unless you need to monitor a channel.

5.15   TONE SQUELCH OPTION

Some KG106 users will have the CTCSS option, or Continuous Tone Coded Squelch System. This acts as a "channel quieting" features. Many operators can use the same channel and not hear each other. Different groups of operators are assigned their own tones. With CTCSS, your radio listens for your group's tone. Other traffic on the channel is ignored. Your radio stays quiet until your tone is received. However, when you remove the microphone from its hang-up clip, you'll hear all traffic on the channel. (See Figure 5-3)
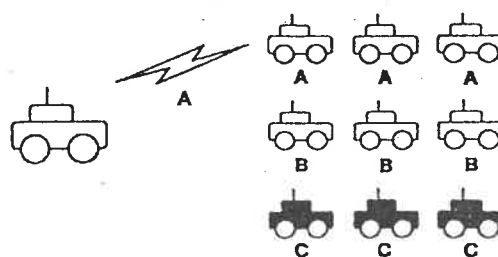

Figure 5-3. Single Tone CTCSS

5.16   HANDSET FEATURES

The handset contains the following controls and features (See Figure 5-4):

1. Push-To-Talk Switch
2. Transmit Indicator
3. Keypad
4. Power Indicator
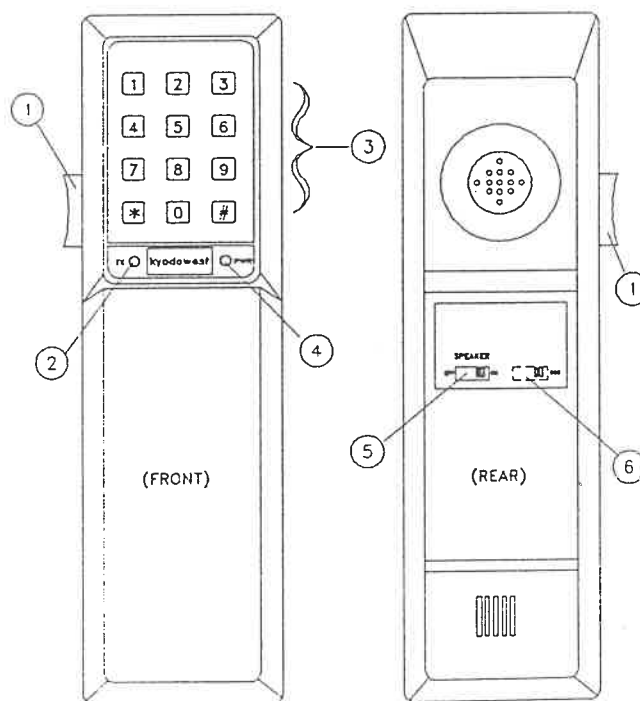5. Speaker On/Off Switch
6. Switch (optional)

Figure 5-4. Handset Controls and Features

5.17 HANDSET (TELEPHONE MODELS)

The handset functions in the same basic way as an autodialing DTMF microphone, with the exception of the earpiece audio and automatic latching [PTT] action (if enabled by the service shop or dealer). In order to use the handset as a microphone, take the handset off the hook (by pulling upward gently at the rear of the handset), listen first for any activity, and then push the side-mounted [PTT] switch to transmit.

5.18 DETERMINING CURRENT DIALING MODE

In order to operate the handset, first determine which user dialing mode has been programmed into the keypad by the dealer. If this information was not supplied with the unit in question, one can determine the current dialing mode as follows:

Table 5-1. Determining Current Dialing Mode

STEP	PROCEDURE
1	With the radio turned on and tuned to any unused channel, press the "0" key on the keypad.
2	If a DTMF "0" is heard, the unit is in the Manual-only DTMF mode.
3	If no tone is heard, release the "0" key, press it again, and quickly (within 2 seconds) lift and press the "0" key again.
4	If a DTMF "0" is heard on the second press, the unit is in Autodialing DTMF mode with the "Timed Manual Entry" feature activated.
5	If no DTMF tone is heard on the second press, the unit is in Autodialing DTMF mode with the "Store and Send" feature activated.
6	If the unit is in the Manual-only DTMF mode, refer to section 5.19 for operating instructions.
7	If the unit is in one of the two Autodialing DTMF modes, see sections 5.20 through 5.22 for operating instructions and programming information.

5.19 MANUAL-ONLY DTMF MODE

When this mode is activated by the dealer, the keypad functions as a normal DTMF keypad, with the exception of the " * " and " # " keys, which send the programmed "ANI-up" and "ANI-down" DTMF sequences (if previously programmed by the dealer or service shop).

NOTE:

If handset main PC board DIP switch number 9 is in the "ON" position in any dialing mode, the handset will automatically key the radio transmitter and send the "ANI-up" sequence (if one has been programmed into memory) whenever the handset is taken off-hook, and will send the "ANI-down" sequence when the handset is placed back on-hook. This feature should only be used in radio systems where pre-transmission monitoring by the user is not required by FCC regulations, or system design.

5.20 GENERAL AUTODIALING INFORMATION

There are two Autodialing DTMF modes of operation in the handset. The modes are identical as far as memory dialing and ANI operation are concerned, and vary only in regard to the way that the user manually dials sequences of numbers.

In order to program numbers into memory locations 1 through 8, the following steps must be taken:

Tabel 5-2. General Autodialing Information

STEP	PROCEDURE
1	Turn the radio ON.
2	Press the "9" key.
3	Press the key corresponding to the memory location (1-8).
4	Then press the digits and/or control codes of the number to be dialed (see table below for an explanation of the Control Codes which may be entered).
5	Press and release the handset PTT switch once to store the number in memory. A 1.2kHz "beep" tone will signify that the number has been stored.

The Control Codes which are available for insertion into Timed Manual Entry sequences, Autodialing memory locations and ANIs are outlined in the following table for user reference.

Table 5-3. Control Codes for Special Functions/Characters

CONTROL CODE	FUNCTION	CONTROL CODE	FUNCTION
#1	DTMF "A"	#5	"Use immediately before codes #0, #6, and #8 to keep radio transmitter on during Pauses and Break Periods"
#4	DTMF "B"	#6	Break until next PTT
#7	DTMF "C"	#0	1 second time delay
#9	DTMF "D"	#8	2 second time delay
#2	Double Dialing Rate	##	DTMF " # "
#3	Half Dialing Rate	#*	DTMF " * "

NOTE:

Control Codes "#2" and "#3" may be used repeatedly to achieve very fast (20 digits per sec.) or very slow (2 sec. per digit) dialing rates.

5.21 "STORE-AND-SEND" OPERATION

This mode allows the user to enter a sequence of DTMF digits and control characters (including the ANI-up character " * ") on the keypad, and then send this sequence with a quick press of the handset [PTT] switch.

Table 5-4. "Store-and-Send" Operation

STEP	PROCEDURE
1	Press the "0" key followed by the digits and Control Codes of the sequence to be sent.
2	The sequence will be sent when the PTT switch is given a quick press.
3	If the sequence includes the "ANI-up" character " * " or is broken up by the break code "#6", the PTT switch must again be pressed.
4	If it is desired to re-dial the sequence entered in the above steps, press the "0" key followed by a quick press of the PTT switch. This redial feature will work over and over again only if the sequence has been completely dialed and no on-hook or off-hook ANIs (or any other DTMF digits) are sent between redial attempts.

NOTE:

A Store-and-Send sequence may be cleared from memory by pressing the [PTT] switch for longer than 2 seconds. A "beep" tone will confirm memory clearing.

5.22 TIMED MANUAL ENTRY

To send numbers in the Timed Manual Entry mode, press the "0" key followed by the desired digits. The unit will remain in this mode as long as no more than 2 seconds of time elapses between key presses. When the keypad is in this mode, the ANI locations and fourth column (ABCD) digits are not accessible.

5.23 IN CASE OF DIFFICULTY

If the unit fails to respond properly to any of the commands entered above, first verify that the unit is in the intended user dialing mode. In the event that the unit still fails to program and/or function in the desired manner, the unit should be returned to the dealer or service shop for memory clearing and re-programming.

5.24 ENTER DEALER PROGRAMMING MODE

Table 5-5. Entering Dealer Programming Mode

STEP	PROCEDURE
1	Turn off power to the handset (preferably with the radio ON-OFF switch) for at least 5 seconds.
2	While pushing the "1", "3", and " * " keys on the handset keypad, turn the handset (radio) power back on.
3	Release the 3 keys pressed in the above step, and wait at least 3 seconds to hear any "beep" tones from the handset. In most cases, the handset will respond to this step with a single "beep" within 1 second of releasing the three keys held above.
4	If the handset has a blank EPROM, the handset will respond with a group of three "beeps" within 3 seconds of releasing the same three keys.
5	All programmable features in the handset are selected by entering a two-digit program code followed by a press of the " # " key. The programming process is terminated only by turning off power to the handset for at least 5 seconds.

5.25 SELECTION OF USER DIALING MODES

The following dialing modes are available to the user during normal operation of the keypad, and are configured by the service shop. In this way, the service shop determines how the user is able to dial the handset during normal operation.

Table 5-6. Dialing Mode

PROGRAM CODE	DIALING MODE
16#	Manual-Only DTMF operation (with or without " * " and " # " key ANI operation--see section 5.26 for ANI programming information)
17#	Autodialing DTMF operation. If this mode is selected, one of the following Manual Dialing modes below must also be selected.
18#	Enables "Store-and-Send" feature (see section 5.21)
19#	Enables "Timed Manual Entry" features (see section 5.22)

5.26   ANI PROGRAMMING

There are two ANI storage locations in the handset, "ANI-up" (" * " key) and "ANI-down" (" # " key). Each of these locations holds up to 21 digits, including control codes. In order to program the "ANI-up" location, the following steps must be taken:

Table 5-7. ANI Programming

STEP	PROCEDURE
1	With the handset placed into service shop programming mode, dial "20#" followed by the desired "ANI-up" sequence. The control codes which may be used in this sequence are shown in table 5-3 for reference.
2	Press the handset PTT switch briefly to store the sequence. A "beep" tone should be heard from the handset immediately after pressing and releasing the PTT switch, indicating that the sequence has been stored in memory.

The "ANI-down" code may be programmed in a similar manner by dialing "21#" followed by the desired sequence of digits and a PTT press as described above.

5.27   OTHER PROGRAMMABLE FEATURES

The remaining programmable features (and the required programming codes) of the handset enabled or disabled while in the service shop programming mode. These codes may be entered in any order. A "beep" tone (indicating acceptance of a code) will be heard after each code entry if the [PTT] switch is depressed while entering the codes. These codes are listed in Table 5-8 for reference:

Table 5-8. Other Programmable Features

PROGRAM CODE	FEATURE DESCRIPTION
10#	Initializes memory to factory default values. Also erases previously stored configuration data and memory numbers, sets default dialing speed to 1200 milliseconds (msec.) per tone with 100 msec. inter-digit spacing (5 digits per sec. rate), and enables the Autodialing DTMF mode with Store-and-Send operation.
11#	Sets Autodialing speed to 10 digits/sec., with 50 msec. digits separated by 50 msec. gaps.
12#	Sets Autodialing speed to 5 digits/sec., with 100 msec. digits separated by 100 msec. gaps.
13#	Sets Autodialing Speed to 2 1/2 digits/sec., with 200 msec. digits separated by 200 msec. gaps.
14#	Disables automatic off-hook ANI transmission if handset DIP switch number 9 is in the "on" position. On-hook ANI transmission will still be enabled if switch number 9 is in the "on" position. No on- or off-hook ANI transmissions will occur if switch number 9 is in the "off" position.
15#	Enables automatic off- and on-hook ANI transmission if handset DIP switch number 9 is in the "on" position. No on- or off-hook ANI transmissions will occur if switch number 9 is in the "off" position.

To exit the service shop programming mode, enter code "22#", or turn off power to the handset.

5.28   ANI PROGRAMMING PROBLEMS

If problems are encountered during any of the previous steps, it is usually best to start over again by repeating the operations listed in part 1 of these instructions. If it is still not possible to successfully program the handset, check to make sure that the power supply voltage to the handset is of the correct polarity and amount (+8 to +16 VDC). In the rare event of total failure to accept programming data, it may be necessary to erase or replace the EPROM on the handset main PC board.