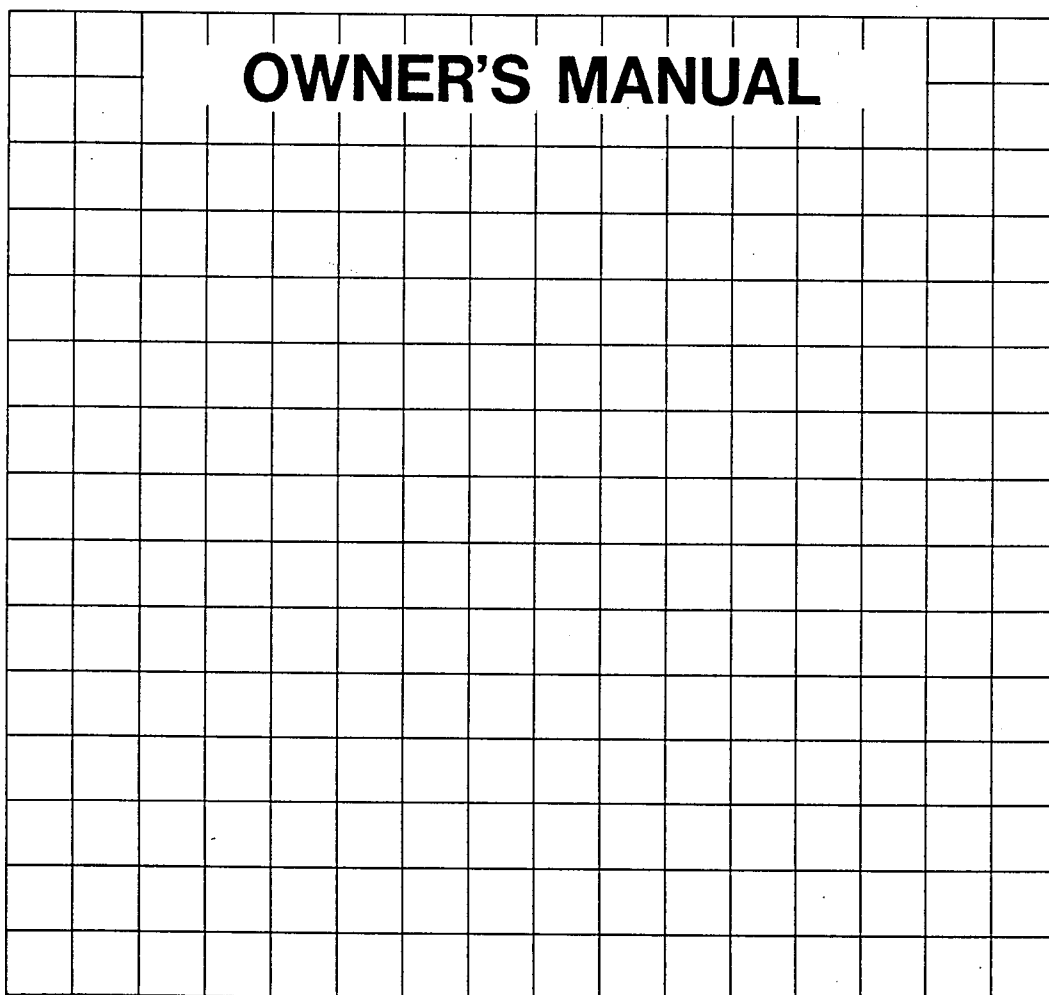




440MHz FM DATA TRANSCEIVER

PCS-9600D

OWNER'S MANUAL



AZDEN CORPORATION

- INTRODUCTION -

Congratulations! You are the owner of one of the advanced state-of-the-art UHF FM data transceivers available today. Please read this manual carefully before attempting to operate your transceiver. This will ensure that you obtain the maximum operating convenience and versatility.

Unpack your PCS-9600D carefully and make sure that it is supplied with the standard accessories listed on page 19. Be sure to send in the warranty card. Notify the carrier immediately if there is any evidence of damage to the unit. Keep the original packing materials in the unlikely event it becomes necessary to return the radio for servicing.

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INSTALLING THE TRANSCEIVER

The rear panel of the transceiver is provided with 1) the power cable with connector, 2) antenna connector(50 ohm impedance) and 3) 3.5mm external speaker jack.

1. Do not operate the unit without the antenna connected. Be sure that the unit is turned off before connecting power, antenna and microphone.
2. Before connecting the unit to a power supply, make sure that you have the polarity correct. The red lead of the power cable should go to the positive (+) terminal of the power supply or battery. The black lead is for the negative(-) terminal.

For mobile installations, note that the unit was designed to work with automobiles having a negative ground electrical system. A negative ground system means that the negative terminal of the automobile battery is grounded to the automobile frame. Most modern automobiles are built this way.

If your automobile has a positive ground system it will be necessary to mount the unit so that the metal cabinet and the shield of the antenna cable are insulated from the automobile frame.

3. The PCS-9600D is designed to operate from a supply voltage of +13.8 VDC, +/-15%. Voltage less than +11.7 VDC, or more than +15.9 VDC, will result in improper operation and may possibly damage the unit.
4. Use an antenna cable having a nominal impedance of 50 ohms. Be sure to attach the cable connector tightly to the female connector on the rear of the unit. Automobile vibration may cause the connector to loosen if it is not properly tightened.
5. When mounting the unit in your automobile, position it to avoid excessive sunlight, and hot air from heater outlets. After long periods of parking in hot weather avoid transmitting until the interior of the automobile has had time to cool.

- MAJOR FEATURES -

1. C-MOS Microcomputer Control

The built-in microcomputer employs the latest in C-MOS technology, providing you with unprecedented operation features. This microcomputer controls all of the scanning channel selection, offset frequencies, subaudible tone operation and display functions. The lithium battery ensures that microcomputer information is retained even when power is off.

2. Unprecedented Wide Frequency Coverage

The PCS-9600D covers 430 to 449.995MHz transmit and 410 to 465MHz receive.

3. Power Output

The powerful and stable final power module provides true 35 watts power output with 10 watts selectable on low power.

4. Large Amber Backlit LCD

The custom-made amber backlit LCD is very large and soft to the eyes, making it possible to easily read it in total darkness or brightest sunlight.

5. 20-Channel Memory plus 1 (Temporary Channel)

2 memory banks, A and B have 10 memory channels each. The memories store RX frequency, RX tone, and TX frequency, TX tone freely as programmed. An extra memory channel that we call TM (Temporary Memory) is provided to allow you to store any operating condition immediately.

6. Versatile Scanning Functions

Dual memory scan, programmable band scanning, hold scan and delay function are provided. The operations are detailed later on.

7. Priority Channel Monitoring

Memory channel A0 (1st channel in Memory Bank A) is the priority channel. While the user is listening to any other channel the PCS-9600D receiver is able to monitor the priority channel every 4 seconds. When a signal is heard on the priority channel a "beep" will be heard.

8. Programmable Frequency Step

Frequency steps are programmable from 5KHz to 20KHz in steps of 5KHz. (European version is programmable from 12.5KHz to 50KHz in steps of 12.5KHz.)

9. Built-in Programmable Tone Encoder

57 different tones are available. Each memory channel can be programmed with a different tone.

10. Feather-touch Tuning Control Keyboard

The illuminated tactile feedback keyboard performs all tuning operations simply by pushing the keys. Key actuation is audibly verified.

11. High Sensitivity Receiver

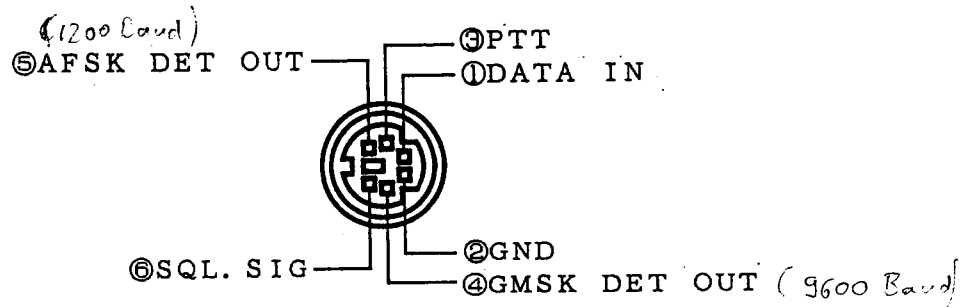
12. Azden Traditional Discriminator Scan Centering

13. Front Panel Data Connector.

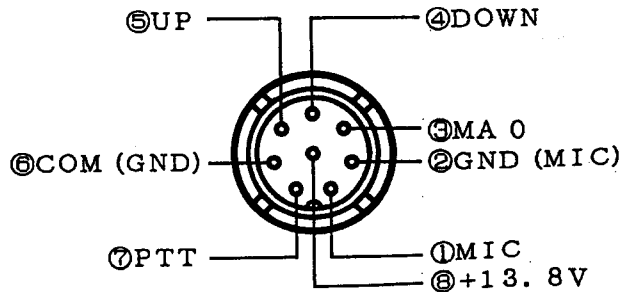
14. Multi-function Microphone

The DTMF tone encoded microphone permits the user to change frequencies or memory channels by using the up/down buttons on the microphone.

Pushing the MA0 button immediately changes to the priority channel. Pushing the MA0 button a second time returns the unit to the channel or frequency that was previously being used. The microphone is also capable of performing manual scanning. The 16 keys are illuminated from the rear by amber colored LED's for easy operation at night.

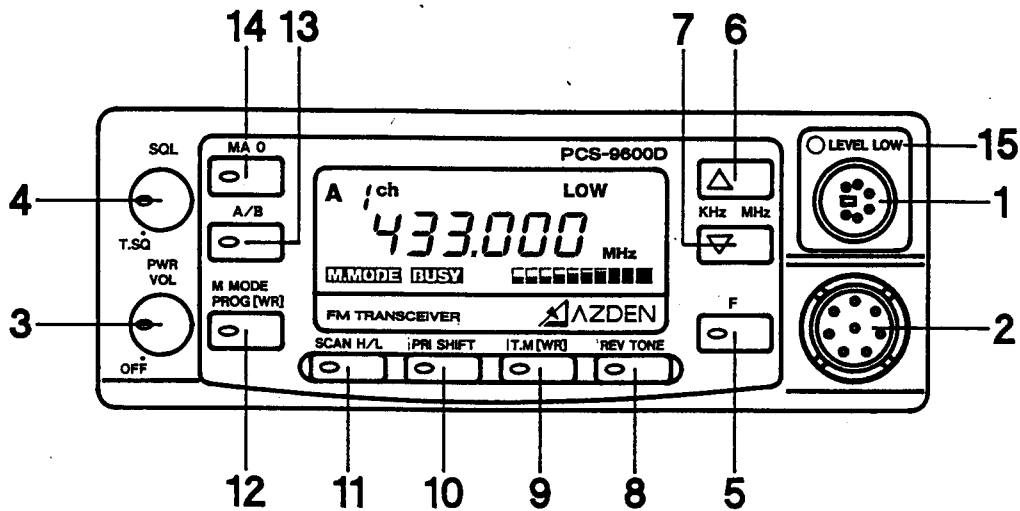


DATA INPUT CONNECTOR DIAGRAM
 (rear view of connector of the PCS-9600D)



MICROPHONE CONNECTOR DIAGRAM

- OPERATING CONTROLS -



- (1) **Data Input** (Refer to page 4)
Digital signals from a TNC are connected to this socket.
- (2) **Microphone Input** (Refer to page 4)
The 8 pin microphone connector plugs into this socket.
- (3) **Volume Control (VOL)**
Turning the knob clockwise will turn the power on and then increase the volume.
- (4) **Squelch (SOL)/Tone Squelch (T.SQ) Control**
This control is used to eliminate annoying background noise when no signal is present. To adjust the control properly for reception, first turn it counterclockwise until background noise is heard. Then, rotate it slowly clockwise until background noise just disappears. Leave the knob at this position for normal use. If the squelch control is turned further clockwise a stronger signal will be required to open the squelch and allow reception. When the knob is set to the "T.SQ" position, the squelch will open only for signals that accompany a certain designated subaudible tone frequency. (An optional tone squelch unit is required)
- (5) **"F" (Function) Key**
Each of the keys (5) through (11) performs two different functions called the "Basic" function and the "Alternate" function.
The "basic" function, is printed (abbreviation used) in white above each button. The "alternate" function is printed (abbreviation used) above each button in yellow.

When any one of the keys (5) through (11) is pressed without first pressing the "F" (Function) key, the basic function of that key will be performed.

When the "F" key is pressed first, and then when any of the keys from (5) through (11) is pressed within 3 seconds afterwards, the alternate function of the key will be performed. Refer to (page 9) "LED Display" to see how these functions are displayed in the screen.

IMPORTANT

When the "F" is pressed, an "F" will appear on the left side of the screen. The "F" will remain for about 3 seconds. While the "F" is on the screen any key pressed will perform its alternate function.

Each time you press a key, (~~4~~⁵) through (11), the "F" will remain on the screen for an additional three seconds. This means that you can press one key several times or press several different keys. Each key will perform it's alternate function.

To return to the Basic Function wait for 3 seconds until the "F" disappears from the screen.

The chart entitled "Summary of key functions" ^(page 8) shows a summary of the basic and alternate functions performed by each key.

(6)(7) Up/Down

BASIC FUNCTION

When operating in the "Direct" mode (for explanations of operating modes refer to OPERATION, on Page 11) pressing these keys will change the frequency displayed on the screen up or down by 5KHz. This standard frequency step of 5KHz can be changed by referring to Changing The Frequency Step Procedure on Page 12. Holding (6) or (7) down for more than 1 second will result in a rapid change of frequencies.

When operating in the "Memory" mode pressing buttons (5) or (6) will cause a shift to the next memory position, up or down.

ALTERNATE FUNCTION

By pressing the "F" button before pressing buttons (5) or (6) the frequency will change up or down by 1MHz.

(8) REV/TONE (Reverse/Tone)

BASIC FUNCTION

When this key is pressed the transmit and receive frequency will be reversed. When working through a repeater you will transmit on the repeater's transmit frequency and receive on the repeater's receive frequency. Press the key again to go back to normal operation.

In the reverse position you are able to directly monitor the signals going to the repeater.

ALTERNATE FUNCTION

When the "F" key is pushed before the REV/TONE button you are able to turn the PL Tone off or on. Watch the screen. If the word "TONE" appears, the tone is on. When on, pressing the keys as directed will turn it off. Pressing this key again will turn the tone on again.

(9) TM/WR (Temporary Memory/Write)

BASIC FUNCTION

When pressed this key will place information stored in the Temporary Memory Bank, on to the screen. The unit will then operate in accordance with the information displayed. Note that the temporary memory bank is not one of the 20 memory channels available in Memory Banks A & B. It is an additional memory position that is easily programmable and is instantly recallable by merely pressing the TM Key.

ALTERNATE FUNCTION

Pressing the "F" key before pressing this key will write into the Temporary memory information presently on the screen.

(10) Pri/Shift (Priority Monitor/Shift)

BASIC FUNCTION

When this key is used the unit will monitor the Priority Channel stored in Memory Channel Bank A, Channel O, every four seconds. To release the priority mode press the key again.

ALTERNATE FUNCTION

Pressing the "F" key before pressing this key performs the alternate function "Shift". By pressing this key several times you can select (+) shift, (-) shift, or no shift. A (+) shift means that the transmit frequency will be higher than the receive frequency. A (-) shift means that the transmit frequency will be lower than the receive frequency. No shift means that the transmit frequency will be the same as the receive frequency.

The preset width of the shift may be changed. Refer to "Changing The Shift Width".

(11) Scan/H-L

BASIC FUNCTION

Pressing this key will cause the unit to scan. If the unit is in the Direct Mode it will scan a band of frequencies. Refer to Page 16, "Programmable Band Scanning" to learn how to set the limits of the band of frequencies to be scanned. If the unit is in the Memory Mode it will scan Memory Banks "A", "B", or "A" and "B", depending on which memory banks are displayed on the screen.

ALTERNATE FUNCTION

When the "F" key is pressed first, this button will change the Power Output from 35 watts High Power, to 10 watts Low Power. When in Low Power the word "LOW" will appear on the screen.

When in Low Power the word "LOW" will appear on the screen.

(12) M Mode/WR Memory mode/write)

BASIC FUNCTION

Pressing this key selects the Mode in which you want the unit to operate. You can select Memory Mode, or Direct Mode. In Direct mode the unit operates on the frequencies and other data displayed on the screen. Watch the lower left hand corner of the screen. When the words "M. Mode" appear, you are in the Memory Mode.

ALTERNATE FUNCTION

Pressing the "F" before this key is pressed places the unit in the Program Write position. In this position you are able to store into memory, data such as frequencies and tone codes. You are also able to change the preset size of the Frequency Step, and the width of the Frequency Shift.

(13) A/B (MEMORY BANK SELECTOR)

THERE IS ONLY ONE FUNCTION FOR THIS KEY

This key selects which memory bank will be used. You can select Bank A, Bank B, or both Banks, A and B. Watch the indicator in the upper left corner of the screen to determine which bank you have selected.

When using both Banks, A & B, the letters A and B will both be displayed on the screen, but the letter that is blinking will be the Bank that is in use. Banks A & B will be connected in series permitting you to scan all 20 channels.

(14) MA 0 (PRIORITY CHANNEL - BANK A, CHANNEL 0) Pressing this key will immediately put the unit on the priority channel which is located in Bank A, Channel 0. Pressing this button again will immediately return the unit to the memory channel or to the simplex frequency that you were using before.

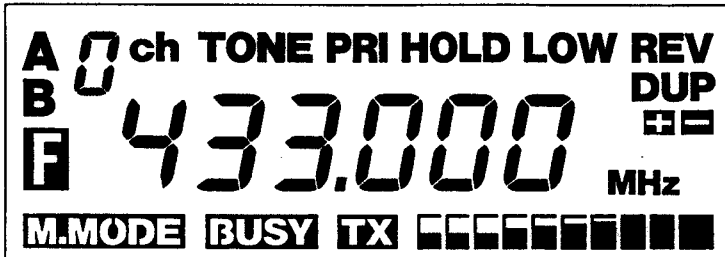
(15) LEVEL LOW (LIGHT) When the switch that is accessible through top cover, is in the UP position, the light will be on.

SUMMARY OF KEY FUNCTIONS

<u>KEY</u>	<u>BASIC FUNCTION</u>	<u>ALTERNATE FUNCTION</u>
(6) UP	Changes frequency up or down in steps or switches memory channels.	Changes frequencies up down by 1MHz.
(7) DOWN		
(8) Rev/Tone	Reverse transmit and receive frequencies.	Turns Tone on or off.
(9) TM/WR	Calls up contents of temporary memory.	Places the present contents of screen in temporary memory.

(10) Pri/Shift	Permits monitoring Priority Channel (MA0)	Selects transmit frequency shift (+), (-), or no shift.
(11) Scan/H-L	Scans memory banks or bands of frequencies.	Selects High or low power output.
(12) M Mode Prog(WR)	Selects Direct Mode or Memory Channel Mode.	Puts unit in program write mode.
(13) A/B	Selects Memory Bank.	None
(14) MA 0	Immediate switch to Priority Channel.	None

- LIQUID CRYSTAL DISPLAY (SCREEN) -



The LCD Screen displays many of the functions selected by the keys on the front panel. These functions are shown on the Screen Drawing shown above.

The meanings of these individual displays is described below.

- (+) When the + is lit the transmit frequency will be above the receive frequency.
- (-) When the - is lit the transmit frequency will be below the receive frequency.
- () If neither + or - is lit the transmit frequency will be the same as the receiver frequency.
- DUP Means Duplex. The transmit and receive are on different frequencies.
- REV The transmit and receive frequencies have been reversed.
- LOW The transmitter is operating in the LOW power position.

SIGNAL INDICATOR

In receive, shows the relative strength of the incoming signal. In transmit, shows the relative output power. Note that even with maximum output all of the indicators may not be lit because of the SWR level.

IMPORTANT: If the SWR is too high the unit may shut down. If it shuts down it will switch to Channel A0 and the display may blink. You will also hear a warning "beep". Immediate steps must be taken to reduce the SWR or the unit can be damaged.

HOLD This indicator is lit when the unit is in Scan, and the SCAN HOLD mode is being used. When the unit is in Scan and this indicator is not lit then the unit is in the SCAN DELAY mode. Refer to "OPERATION, SCANNING HOLD or DELAY" for more information (Refer to page 12.)

TRANSMIT (TX) The TX indicator is lit when the Push to Talk Switch on the microphone is actuated. It is also lit when programming the Transmit Frequencies or Transmit Tones into memory.

TONE This indicator is lit when a transmitted PL Tone has been programmed for the channel being used.

BUSY When lit, a signal (or noise) exceeding the squelch threshold level is being heard. The channel is BUSY.

MEMORY ADDRESS When in Memory Mode shows the number of the memory channel being used. It will be a number from 0-9.

MEMORY BANK When in the Memory Mode, shows the Memory Bank being used. It will be "A" or "B", or "A" and "B". When A and B are both displayed it means that the two banks are connected in series. The letter that is blinking is the bank currently in use. Refer to "OPERATION, MEMORY BANK CHANGE" for more information (page 15).

FUNCTION When lit this indicator shows that you are in the Function Mode. In the function mode, other keys when pressed will perform their alternate function instead of their basic function. Refer to "OPERATING CONTROLS, #4 FUNCTION KEY", for more information (page 5).

- OPERATION -

A) Setting Frequencies in Direct Mode

Before attempting to set a frequency you must be certain that the unit is in the Direct Mode. Check the screen and if the M Mode is lit the unit is in Memory Mode. To get into Direct Mode, from Memory Mode, press the M Mode key once.

Change in KHz

Press the Up or Down keys on either the front panel or on the microphone. Each time you press the key the frequency will change by the preset number of KHz. The size of this step can be changed. Refer to "(C) Changing the frequency step"(page 12).

Rapid Change in KHz

Press and hold down (for at least 1 second) the Up or Down key. This will cause a rapid change in frequency. Release the key just before reaching the desired frequency, and then press the key repeatedly until you get to the desired frequency.

Change in MHz

Press the "F" (Function) key and then within 3 seconds press either the Up or Down key. This will change the frequency by 1MHz. You can press the up or down key repeatedly as long as the "F" is lit on the panel.

Rapid Change in MHz

Press the "F" key and then hold down the Up or Down key. This results in a rapid change in MHz.

NOTE: CHANGING PRESET VALUES

The following three items, (B) Changing the Shift Width, (C) Changing the Frequency Step, and (D) Changing the Scan Mode, involve values which were preprogrammed into memory. The values in memory are the most often used value for the operation. If the user decides to change any of these three values he may do so by the following the instructions shown.

The position in memory where these values are stored is located at the end of the last Memory Channel, B9. The instructions will take you to the proper memory position, and show you how to change the value.

B) Changing the Shift Width

- 1) Push the power key once to turn the power off and a second time to turn the power on again. This places the unit in Memory Channel A0.
- 2) Press the "F" Key, and then the PROG (WR) key, #12. This places the unit in the programming mode.
- 3) Press the Down key once. The display will now show "5 .XXXMHz".

- 4) Press the PROG(WR) Key, #12 and the .XXXMHz will start blinking. This means it is ready to be changed.
- 5) Use the up or down keys to change to the value that you want.
- 6) Press PROG(WR), #12 to complete the change.
- 7) Press the Power Key to turn the power off. This records the change in memory, and exits from the Programming Mode.

C) Changing the Frequency Step

- 1) Push the power key once to turn the power off and a second time to turn the power on again. This places the unit in Memory Channel A0.
- 2) Press the "F" Key, and then the PROG(WR) key, #12. This places the unit in the programming mode.
- 3) Press the Down Key twice. The display will show "4 XKHz".
- 4) Press the PROG(WR) key, #12 and the program "XKHz" will begin blinking telling you that it is ready to change.
- 5) Press the Up or Down key to select the size of the step that you want.
- 6) Press PROG(WR) Key, #12 to complete.
- 7) Press Power Key to turn off power, record the change, and exit from the Programming Mode.

D) Changing the Scan Mode

Preset Value Delay Scan

There is only one Delay Scan Mode but there are two modes for Hold Scan.

Delay Scan

In Delay Scan. the receiver will stop at the first occupied channel, monitor that channel for 6 seconds, and then continue its scan. The time cannot be changed.

Hold Scan

In the hold mode the receiver will stop at the first occupied channel and stay there until the signal is gone. After the signal is gone the receiver will stay on the previously occupied channel for 3 seconds, waiting for the signal to return. If the signal does not return in 3 seconds, it will resume its scan. The 3 second hold time can be changed to 6 seconds. To change from Delay, to Hold 3 seconds, or Hold 6 seconds:

- 1) Push the power key once to turn the power off and a second time to turn the power on again. This places the unit in Memory Channel A0.
- 2) Press the "F" Key, and then the PROG(WR) key, #12. This places the unit in the programming mode.
- 3) Press the Down Key three times. The display will now show "3.00".
 - 3.00 means Delay Hold
 - 3.03 means Hold, 3 seconds
 - 3.06 means Hold, 6 seconds
- 4) Press the PROG(WR) Key, #12. The "00" will begin blinking meaning that it is ready for a program change.
- 5) Press the up or down buttons to select "03" or "06" seconds as the length of the hold.

- 6) Press the PROG(WR) Key, to complete the program.
- 7) Press the Power Key, to turn off the power, record the change, and exit from the programming mode.

E) Actuation of Tone Encoder

The PCS-9600D series, has a built in Transmit Tone Encoder. To select the tone to be transmitted on each channel refer to (H) below, "How to Store Frequencies and Tones in Memory". (A Tone Squelch Decoder for the receiver is available as an option.) While most operators will want the tone to be present on all channels where it has been programmed, there may be instances when it is desirable to temporarily suppress the tone. To suppress the tone press "F" and then immediately press the Tone Key, #8. To reactivate the Tone repeat this same procedure.

F) Change Transmit Power

To change from High Power, 35 watts, to Low Power, 10 watts : Presss the "F" Key and then immediately press the H/L Key, #11. To return to High Power, repeat this procedure.

G) Reverse Frequency Operation

To reverse the transmit and receive frequencies press the REV Key, #8. To go back to normal operation press the REV Key again.

H) How To Store Frequencies and Tones in Memory Channels

The best way to explain how to store frequencies and tones in each of the 20 channels is to use an example. In this example we will store the following information:

EXAMPLE (50MHz used for the example)	
Memory Channel To Be Used	A4
Receive Frequency	433.880MHz
Transmit Frequency	432.880MHz
Transmit Tone	107.2Hz

- 1) Rotate Power Switch, #3 to turn unit on. Unit should now be in the Memory Mode, Channel A0.
- 2) Press "F" Key, #5, and immediately press PROG(WR) Key, #12. A0" should now be blinking. This asks "what channel do you want?"
- 3) Press the Up Key, #6, four times. Each time you press this key you will move up one channel. You should now be on Channel A4.
- 4) Press the PROG(WR) key #12. The frequency will now blink asking you what receive frequency you want.
- 5) First set the correct MHz for the frequency. Do this by pressing the "F" Key #5, and then immediately use the Up and Down keys #6 and #7, to get 433.XXXMHz.
- 6) Wait 3 seconds until you hear a "beep" indicating that the Function (F) mode has ended. Then use the Up and Down keys to enter the last three digits of the frequency, .880. You now have entered the complete receive frequency of 433.880.
- 7) Press the PROG(WR) Key #12, and you will see "00" blinking,

asking you what receive tone code you want to enter. In this example you are not using the optional Receive Tone Decoder so you will accept "00" (which means no code), and go on to the next step.

- 8) Press PROG(WR) again and now you will see the frequency blinking again. This is now asking for the transmit frequency.
- 9) Change the frequency showing on the screen to read 432.880, by using the Up and Down buttons.
- 10) Press the PROG(WR) Key and once again you will see "00" blinking. This time it is asking for the transmit tone code. In our example we want to use a tone of 107.2Hz.
- 11) Referring to the chart of Tone Codes at the end of this section you will find that 107.2Hz is represented by Code 14. Using the Up and Down keys enter "14".
- 12) Press the PROG(WR) Key. You will now find Channel A5, blinking. You have finished programming Channel A4.

You now have 3 choices.

- a) If you have no more channels to program turn the Power Switch off to record the data and exit from the programming mode.
- b) If you want to program Channel A5, repeat steps 4 through 12.
- c) If you want to program or change a different memory channel, use the up and down buttons to reach that channel.
Then follow steps 4 through 12.

NOTE: Be sure to turn off the power when you have completed programming. This procedure is required to get each setting programmed in and then to get out of the programming mode.

Tone Code Table							
Code	Freq. (Hz)	Code	Freq. (Hz)	Code	Freq. (Hz)	Code	Freq. (Hz)
01	67.0	16	114.8	31	192.8	46	1,700
02	71.9	17	118.8	32	203.5	47	1,750
03	74.4	18	123.0	33	210.7	48	1,800
04	77.0	19	127.3	34	218.1	49	1,300
05	79.7	20	131.8	35	225.7	50	2,000
06	82.5	21	136.5	36	233.6	51	2,200
07	85.4	22	141.3	37	241.8	52	2,975
08	88.5	23	146.2	38	250.3	53	2,550
09	91.5	24	151.4	39	500	54	2,295
10	94.8	25	156.7	40	600	55	2,125
11	97.4	26	162.2	41	700	56	1,275
12	100.0	27	167.9	42	800	57	1,445
13	103.5	28	173.8	43	900		
14	107.2	29	179.9	44	1,000		
15	110.9	30	186.2	45	1,600		

I) RECALLING MEMORY CHANNELS

1) Recalling "M A0" (Bank A Channel 0)

Each time the PCS-9600D power is turned on, the unit will start at MA 0. Regardless of which channel or Direct Frequency you are using, when the MA 0 Key is pressed on either the microphone or the front panel, the unit will change to MA 0. Pressing the MA 0 Key again will cause the unit to return to the frequency or memory channel it was originally on.

2) Changing Memory Banks

Make sure that you are in the Memory Mode, then by using the A/B Key, #12, and by watching the "BANK" letters in the upper left corner of the screen, you can select Bank A, Bank B, or both banks, A & B. When A & B are both lit, the two banks are connected in series. The letter that is blinking is the bank that is in use. When you reach the end of one bank you will automatically begin the other bank.

3) Changing Memory Channels

Make sure that you are in memory mode, then use the Up and Down Key on either the microphone or the front panel to change channels. Each time you press the Up Key the unit will move up 1 channel.

When the unit is in Bank A, you can only move in Bank A channels. In Bank B you can move only in Bank B channels. When you are in Banks A and B, you can move through all 20 channels.

4) Programming the Temporary Memory

The temporary memory is not one of the 20 Memory Channels. It is a separate memory position that can be useful. If you are in the Direct mode, and you find a frequency that you want to use and also remember, you can enter this frequency into the Temporary Memory by merely pressing two keys, the F Key and then immediately the TM (WR) Key, #9.

You can also use the Up and Down buttons to enter a frequency on the screen, and then copy that frequency into temporary memory by pressing the F Key and immediately pressing the TM (WR) Key, #9.

You can also enter repeater frequencies by using the Up and Down keys to first enter the receive frequency for your receiver. Don't forget to enter all the digits for the frequency. (433.88 must be written as 433.880.)

After the receive frequency has been entered, enter the Shift for the transmit frequency. Do this by first pressing the F Key #5, and then immediately pressing the Shift Key, #10. Watch the Shift indicator on the screen because you may have to press the Shift Key several times (while the F is lit on the screen) to get the + or - shift that you require. If you hear a "beep" and the F goes out, you must again press the F Key and then quickly press the Shift key to change the direction of shift.

An alternate method of programming repeater data (this method allows you to have a tone in the Temporary Memory) is this.

First find a Memory channel that has the Tone and preferably the Frequency Shift that you require. Then while the PCS-9600D is on that Memory Channel, copy the data into Temporary memory by pressing the F Key #4, and immediately pressing the TM (WR) Key #9. Since the frequency copied is not the frequency that you require (you only wanted the tone and the Shift), use the Up and Down keys to set the correct receive frequency.

Momentarily touch the PTT Button on the microphone and watch the screen to observe the Transmit frequency. If the shift is correct, you then have the Receive and Transmit frequencies plus the Tone programmed into temporary memory. If the shift is in the wrong direction use the F Key #4, and then the Shift Key, #10 to reverse the direction.

5) Recalling Temporary Memory

The Temporary Memory can be recalled while the unit is in either the Direct or The Memory Channel mode. Simply press the TM (WR) Key, #8 (do not press F Key) and the Temporary Memory will appear on screen ready to use. Press the TM (WR) key again and the unit will return to the frequency or memory channel where it was before. This easy access to Temporary Memory can be very useful.

J) MEMORY SCANNING

To initiate memory scanning, press the SCAN Key #11, while the unit is in the memory mode. The scan will begin with the next channel above the channel shown on the screen.

Memory scanning will only occur in the Memory Bank displayed on the screen. If Bank B is displayed only Bank B will be scanned.

If A and B are displayed then all 20 memory channels will be scanned.

K) Programmable Band Scanning

When in the Direct Mode, the unit will scan between any two frequencies designated. Memory channel A8 should be used to store the lower limit frequency for the band scan. Channel A9 should be used to store the high limit for the scan. Another set of limits can be stored in B8 and B9.

If Bank A is shown on the screen the frequencies between A8 and A9 will be scanned. If Bank B is shown on the screen the unit will scan between the frequencies shown on B8 and B9.

If Banks A and B are shown on the screen the unit will scan both bands of frequencies.

L) Stopping the Scan

Memory Scanning or Band Scanning can be stopped at any time by pressing any one of the following keys. Microphone PTT, Up, Down, TM, REV, M MODE, or F.

If the PTT Button is used to stop the scan, push the button a

If the PTT Button is used to stop the scan, push the button a second time to begin transmission.
To resume scanning press the SCAN Key, again.

M) Priority Mode

Pressing the PRI Key, #10, places the unit in a priority mode. In this mode while you are listening on any channel or frequency, every four seconds the receiver will quickly listen to the priority channel A0. If a signal appears on the Priority Channel, A0, a beep will sound.

You can either monitor the signal or communicate on the Priority Channel by pressing the MA 0 key on the microphone. By pressing this key a second time you will return to the frequency that you were at before.

To get out of the priority mode press the PRI Key again. The PRI on the screen will disappear.

To get maximum benefit from the Priority Mode you should use Channel A0 for a frequency that you may want to monitor.

N) CONNECTING THE TNC

CABLE

The cable from your TNC should be connected as shown on page 4. Wiring instructions should be in your TNC instruction manual.

TOP COVER SWITCH

The switch that is accessible through the hole in the top cover turns an amplifier on and off. The UP position requires an input signal of approximately 40mV P-P and the DOWN position requires approximately 2V P-P. The LEVEL LOW light is lit when the switch is in the UP position.

NOTE

1. Keep all RF leads as far as possible from the data leads.
2. It is suggested that ferrite beads should be installed on all leads.
3. Check the radio's deviation when driven by YOUR TNC.
4. Different amounts of deviation are permitted in different parts of the 70cm band. Please check for proper operation.

DTMF MICROPHONE PCM-499

Model PCM-499 is a multi-function dynamic microphone with a 16-key encoder provided as a standard accessory. The 16 amber led-backlit keys offer driving safety while accessing an autopatch at night.

(1) Push-to-Talk(PTT) Switch

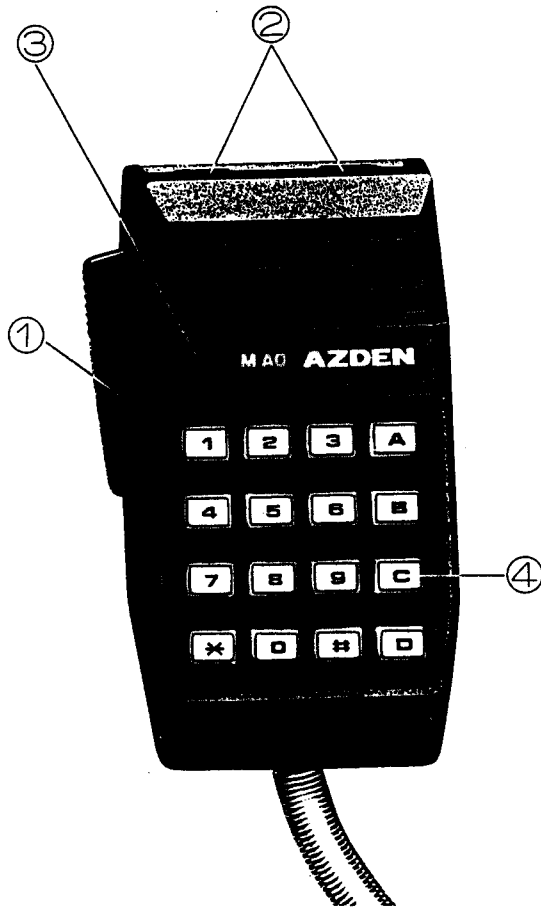
To transmit, press this switch and "TX" will appear on the LCD. Speak slowly and clearly in your normal tone of voice with the microphone a few inches away from your mouth. If the PTT is used to stop scanning, press it again to initiate transmission.

(2) UP/DOWN Buttons

They are practically the same functions as the UP and DOWN keys on the front panel of the unit. The frequency can be advanced up or down according to the preset frequency step. Holding either one of buttons for more than a second allows rapid frequency change for upward or downward.

(3) MA0 CALL Button

This CALL button has the same function as that of the MA0 key on the front panel key board. By depressing the button, the frequency stored in M0 memory on the bank A is directly called up regardless of the current operation mode of the unit. Thus, quick access to a channel which may be in frequent use can be attained.



(4) DTMF KEY ENCODER PAD

The transceiver is put into the transmission mode by pressing the PTT knob, and speaking into the microphone. Release the PTT knob after transmission. To enable the DTMF encoder function, press and hold the PTT button while pressing the keypad buttons in the desired sequence.

- Accessories List -

1. Microphone, PCM-499	1
2. Microphone Hanger	1
3. DC Power Cord	1
4. Spare Fuse	1
5. Mounting Bracket	1
6. Thumb Screws for Mounting Bracket To Radio.....	2
7. Screws	4
8. 6 Pin mini-DIN connector	1
9. Instruction Manual w/schematic diagram	1

-SPECIFICATIONS-

GENERAL

Frequency Coverage	FM 410.000 - 465.000MHz (RX) 430.000 - 449.995MHz (TX)
Display	LCD (Liquid crystal Display)
Frequency Display	Microcomputer-controlled PLL
Emission Type	FM: F1 and F3
Memory channels	20 + 1 Temporary memory
Power requirements	+ 13.8VDC +/-15%, negative ground
Power Consumption, TX	9.0 A (35 watts HI Power) 6.0 A (10 watts LO Power)
Power Consumption, RX	0.3 A
Operating Temperature	-10 to +50 Deg. C.
Antenna Impedance	50 Ohms
Microphone	DTMF dynamic microphone, 500 ohms
Dimensions	2H x 5 1/2W x 7 1/4D inch 50H x 140W x 182D mm
Weight	3 lbs. (1.3Kg.)

TRANSMITTER

RF Output Power	35 watts High , 10 watts Low (adj.)
Modulation System	Data: Direct crystal modulation Voice: Variable Reactance True FM
Frequency Deviation	+/-5 KHz Max.
Spurious Radiation	Better than -60 dB
Offset	Programmable
PL Tone	38 programmable tones

RECEIVER

Receiving System	Double Conversion Superheterodyne
First IF Frequency	45 MHz
Second IF Frequency	455 KHz
Sensitivity	Better than 0.19uV for 12 dB SINAD Better than 1.0uV for 30 dB S/N ratio
Squelch Sensitivity	Better than 0.12uV at threshold
Selectivity	+/- 10KHz at -6dB +/- 25khZ AT -50Db
Audio Output	>2 watts at 8 ohms (10% dis.)
PL decode tone board	38 programmable tones (optional)

NOTE: Specifications are subject to change without notice.