WARRANTY

"The Hallicrafter's Company warrants each new radio product manufactured by it to be free from defective material and workmanship and agrees to remedy any such defect or to furnish a new part in exchange for any part of any unit of its manufacture which under normal installation, use and service discloses such defect, provided the unit is delivered by the owner to our authorized radio dealer, wholesaler, from whom purchased, or, authorized service center, intact, for examination, with all transportation charges prepaid within ninety days from the date of sale to original purchaser and provided that such examination discloses in our judgment that it is thus defective.

This warranty does not extend to any of our radio products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation, or to use in violation of instructions furnished by us, nor extended to units which have been repaired or altered outside of our factory or authorized service center, nor to cases where the serial number thereof has been removed, defaced or changed, nor to accessories used therewith not of our own manufacture.

Any part of a unit approved for remedy or exchange hereunder will be remedied or exchanged by the authorized radio dealer or wholesaler without charge to the owner.

This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our radio products."

the hallicrafters co.

DSP-014557

094-904625
267

Printed in U.S.A.

hallicrafters

TRANSISTORIZED CITIZENS BAND TRANSCEIVER

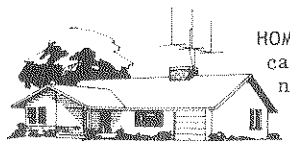
MODEL CB-21



156-009882

OWNER'S MANUAL

NEVER OUT OF TOUCH
WITH YOUR *hallicrafters* CITIZENS BAND RADIO
UNLIMITED APPLICATIONS. . . .Business, Pleasure, Safety



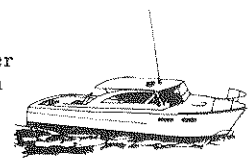
HOME . . . . . Your Hallicrafters citizens band transceiver can be a valuable home convenience. Husband and wife need never be out of touch. Invaluable for salesmen, insurance adjustors, distributors, lawyers, anyone who uses their home as a primary or secondary office.

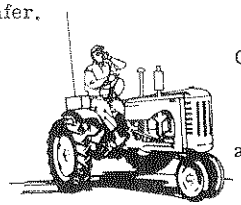
AUTO . . . . Doctors, business men, for all who must be in constant contact with his or her office or home while driving, can now escape the inconvenience of constantly stopping at the nearest phone to "check in". With your Hallicrafters transceiver, just talk or receive messages while driving.



OFFICE . . . . A citizens band transceiver is ideal for office-to-field, or home-to-office. Project progress or problems can be dealt with quickly and conveniently, saving time and, therefore, money.

BOATING . . . . Keep in contact with land or other water craft with a citizens band transceiver. The unit can function as a convenience or as a two-way safety factor. With some form of radio contact with land, boating can be so much safer.





COMMERCIAL . . . . A citizens band transceiver can serve in commercial applications. . . . dispatcher to truck or taxi, tractor to home, plant to delivery vehicle, service station to tow truck, any of hundreds of practical business applications that will increase efficiency.

Where You Will Find It

Citizens Band — A Few Facts About It . . . . . Page 3
The Citizens Radio License . . . . . Page 4
Introduction and Description. . . . . Page 6
Unpacking . . . . . Page 7
Installation . . . . . Page 7
Antennas. . . . . Page 7
Operating your Transceiver. . . . . Page 9
Chassis Removal . . . . . Page 10
Operating and Service Questions. . . . . Page 10
Adding New Channels . . . . . Page 11

CITIZENS BAND — A Few Facts About It

As its name implies, Citizens Band Radio (or "CB" for short) is a new low cost kind of two-way radio system which may now be purchased and operated by any citizen over 18 years of age for personal or business communications.

Until a few years ago, all radio communication was rigidly restricted for public service, broadcasting, amateur (ham) radio, and other specific uses. Ordinary citizens simply could not use two-way radio. However, the Federal Communications Commission (F.C.C.) recognizing the public's growing need for some means of communications while away from home, has set aside one radio "band" of 23 separate channels reserved exclusively for such necessary personal use. Technically, this is called the "27 megacycle" band; commonly referred to as the "Citizens Band."

Each CB radio (called a "transceiver") is actually a complete radio broadcasting station - both transmitter and receiver all in one compact cabinet. They are extremely simple to operate - actually easier to use than a TV set!

Each transceiver is equipped with a built-in loudspeaker, and a microphone. To talk, you pick up the mike, press a button and talk. To listen, you release the button and listen. It's really that simple.

WHO MAY USE CB RADIO? — Today people from all walks of life, are taking advantage of this new media of communication. Most frequently a user will install one radio in his home and another in his automobile. There are hundreds of uses for CB radio. Tens of thousands are being used in trucks, tractors, boats, - even airplanes! If you are a small business owner, you may keep in touch with your delivery trucks via CB. On the way home, you may "call" your wife enroute to put the dinner on. For your weekend boating trip, you'll use your CB unit for ship-to-shore communication. And when your daughter is out in the car at night, relax - she can reach help instantly by radio if she runs out of gas.

Anyone in your immediate family, or connected with your business, may use your equipment at any time, with your permission.

Most of your communication will, of course, be with other radios under your own license. However, it is perfectly permissible to talk to friends or associates who have their own equipment under different license. Such communication must, however, be conducted only on seven channels — channels 9 through 14, and channel 23. The remaining 16 channels are reserved for talking between stations of the same license only.

After establishing communication by using your call numbers (assigned by the F.C.C.) you may carry on a normal conversation, as though you were using a telephone. However, it is both courteous to others waiting, to use the channel, and time-saving for you, to be brief.

TALKING DISTANCES -- LEGAL REQUIREMENTS — Citizens Band is intended specifically for local, rather than long distance, communications. For this reason, the F.C.C. restricts both antenna height (20 feet) and the input of power to a CB transceiver (5 watts). These determine primarily how far your signal will carry. Normally you get an effective range of 10-15 miles between a vehicle and a "base" station, and somewhat less (6-8 miles) between vehicles. Reason: the antennas used on vehicles are necessarily smaller and therefore less effective. From one base station to another, (for the opposite reason) normal distance will be greater - perhaps 25 to 30 miles. Remember, these are generalizations. Many factors can affect your actual talking distance at a given time . . . .such as the terrain, weather, antenna location, quality of your equipment, etc.

HOW MANY CHANNELS MAY BE USED — Legally you are allowed to use any of the 23 available channels, although you'll actually need only a few for normal operation. Most CB radios are capable of transmitting and receiving on a number of channels. The Channel Selector knob lets you choose the channel you want in much the same manner you would choose a channel on your TV set. It automatically switches both your transmitter and your receiver to the same desired frequency. What you are doing is selecting a set of crystals which are inside the radio.

F.C.C. RULES AND REGULATIONS — Your CB radio is operated under Part 95 of F.C.C. Rules and Regulations, which must be read and understood before you can receive your license. However, you will find these rules to be very logical, simple and helpful. They are designed to help rather than hinder you — far less restrictive than for any other radio service. The principal restrictions are common-sense rules like these:

Your must "call" another person by his call (license) number, and identify yourself by your own.

You may talk for five minutes only, and then you must wait five minutes before making another call. No abusive or obscene language permitted.

You may not use your radio to sell anything, nor may you charge anyone for using it.

You may not use your radio for merely "passing the time of day" - you should have a definite purpose in making the call.

Otherwise-in-general-you may use your CB radio freely, anytime you wish, for normal personal or business communication. However, be sure to read Part 95!

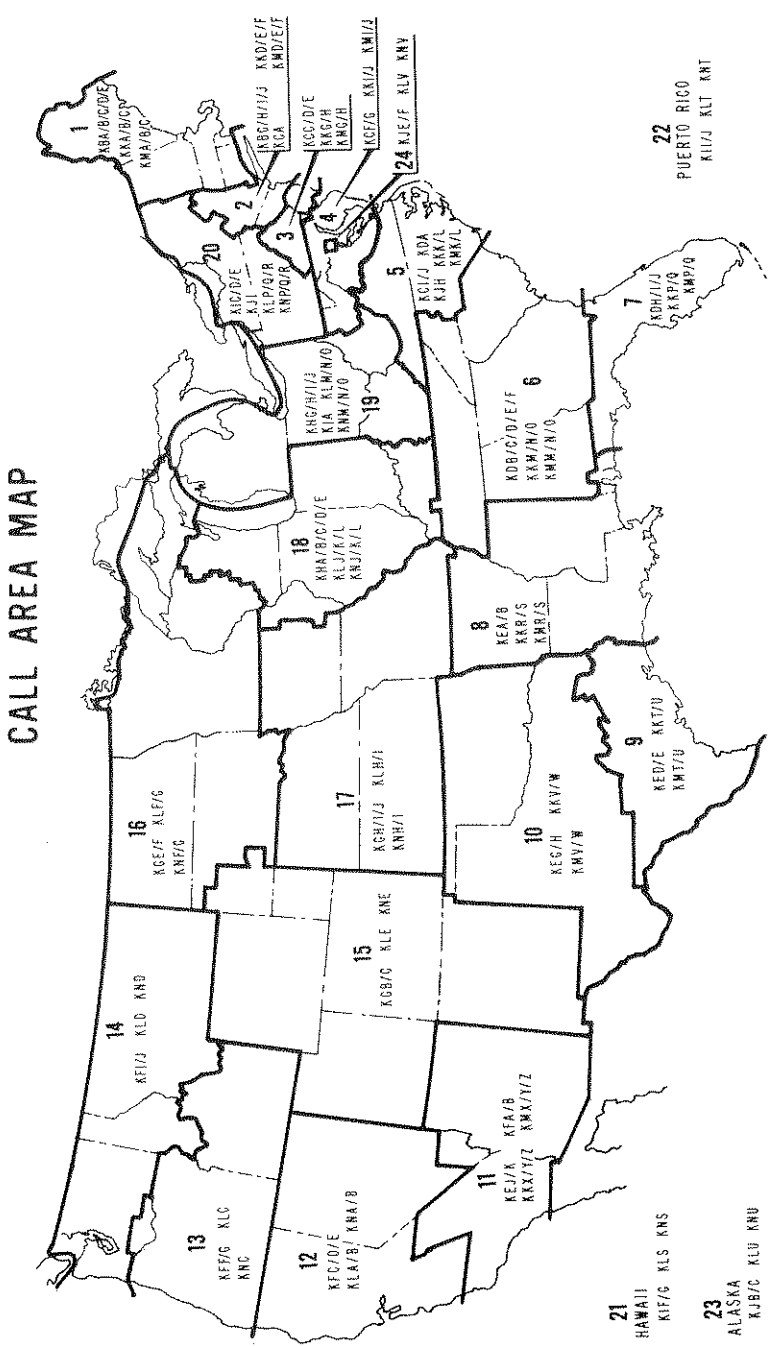
THE CITIZENS RADIO LICENSE

CAUTION

IT IS ILLEGAL TO OPERATE THE TRANSMITTER UNLESS A STATION LICENSE AND CALL SIGN HAVE BEEN ISSUED BY THE FEDERAL COMMUNICATIONS COMMISSION (F.C.C.).

Every citizens band radio transmitter must be licensed by the F.C.C. prior to its use. If you do not have a citizens band license, fill out the license applications (F.C.C. form 505) obtainable from any F.C.C. office, as soon as possible and forward it, along with the required license fee (See Part 95 F.C.C. Rules and Regulations), to Federal Communications Commission, Gettysburg, Pennsylvania, 17325. You will be assigned a call number, which is then used on the air for identification.

Before filling out form 505, read the instructions carefully - they are clear and easy to read. NOTE: When you sign F.C.C. form 505, you are affirming that you are in possession of, understand, and agree to abide by all of the rules and regulations of the Citizens Radio Service. Be sure you have a copy of them in your possession and, while waiting for the F.C.C. to process your license (normally about 3-8 weeks), take the time and thoroughly understand all of them.



INTRODUCTION AND DESCRIPTION

Hallicrafters Model CB-21 Citizens Band Transceiver is a completely transistorized transmitter-receiver, providing up to eight-channel operation in the Class D, citizens-band service.

Two of these units can provide convenient, reliable voice communication between your home, car, or between your office and truck, at distances ranging up to eight or ten miles. Communication over longer distances is possible depending upon local conditions, antennas and terrain.

It is recommended that you read and become familiar with the installation and operating procedures, and rules given in this manual before attempting on-the-air operation.

Channels are shared on a party-line basis; that is licensees are not assigned individual private channels, but rather, are permitted to operate on any of 23 channels, assigned by the F.C.C., as they choose. The transceiver is supplied ready for operation on channel 11 (position A). Operation on any one of eight channels is possible by selecting additional transmitting and receiving crystals for the desired channels and installing these crystals in the sockets provided. The transmitting crystals are third overtone CR-81/U with a tolerance of 0.005%. The receiving crystals are the same as those of the transmitter, except 1650KC higher in frequency.

IMPORTANT

The crystals required for your transceiver are precision-ground, close-tolerance units. In order to achieve maximum performance and to avoid off-channel operation, additional Hallicrafters crystals should be obtained from local Hallicrafters dealers.

The Model CB-21 incorporates a three-stage, transistorized transmitter capable of the full authorized power limit (5 watts) with high level modulation capabilities. It contains a completely transistorized superheterodyne receiver with dual conversion for excellent image and adjacent-channel rejection and a series-type noise limiter to reduce automobile and other local interference. It has a push-to-talk dynamic microphone, a self-contained speaker, and is housed in a smartly-styled cabinet, permitting easy access to transistors and crystals.

An external speaker jack is conveniently located on the rear apron of the unit. This jack accepts a phono pin plug which is supplied with the set.

UNPACKING

After unpacking the equipment, examine it for damage which may have occurred in transit. Should any sign of damage be apparent, immediately file a claim with the carrier stating the extent of the damage. Carefully check the instructions on all shipping labels and tags before removing or destroying them.

INSTALLATION

The Model CB-21 Transceiver as supplied, provides mobile operation from 12 to 15 volts DC (13.6 volts nominal) as found in most cars, trucks, etc.

MOBILE INSTALLATION.

Figures 1 and 2 show installation methods for mobile operation.

CAUTION

Check chassis polarity of vehicle before operating the transceiver. The unit will not operate and will continue to blow fuses if the wiring polarity is incorrect. If the vehicle does not utilize distributed-resistance high tension wire, it may be necessary to install suppressors at each plug and on the distributor. A number of publications describe additional noise suppression techniques that may be desirable.

BASE STATION INSTALLATION.

The Hallicrafters Co. has available an accessory power supply (Model PS-20) for use with your transceiver operating as base-station equipment. The power supply provides the necessary DC potentials required to operate the transceiver.

NOTE

In base installations where RF feedback problems may be encountered, the transceiver case should be returned to an earth ground. This can be accomplished by attaching the black lead from the transceiver and a longer lead to the grounding stud (knurled nut at rear of unit). Connect the free end of the lead to an earth ground. Keep lead length as short as possible.

ANTENNAS

Your transceiver has been adjusted at the factory to give optimum performance using a 50-ohm antenna. There are a number of antennas of this type available for citizens band use. For base-station installations, a ground-plane or half-wave vertical antenna is recommended for good all-around performance. For mobile use, a quarter-wave vertical antenna, either helical wound or of a whip type mounted as high on the vehicle as possible, is generally satisfactory. The helical type, being considerably shorter, can be mounted on the trunk lid with good results. For limited range applications (1 or 2 miles), a short base-loaded whip antenna may be used.

Probably the most practical antenna for mobile use is the newly developed universal type antenna (i.e., it serves both the CB unit and the AM car radio). This type antenna can normally be installed in place of the existing AM broadcast antenna; thus, making it unnecessary to drill an additional hole in the vehicle.

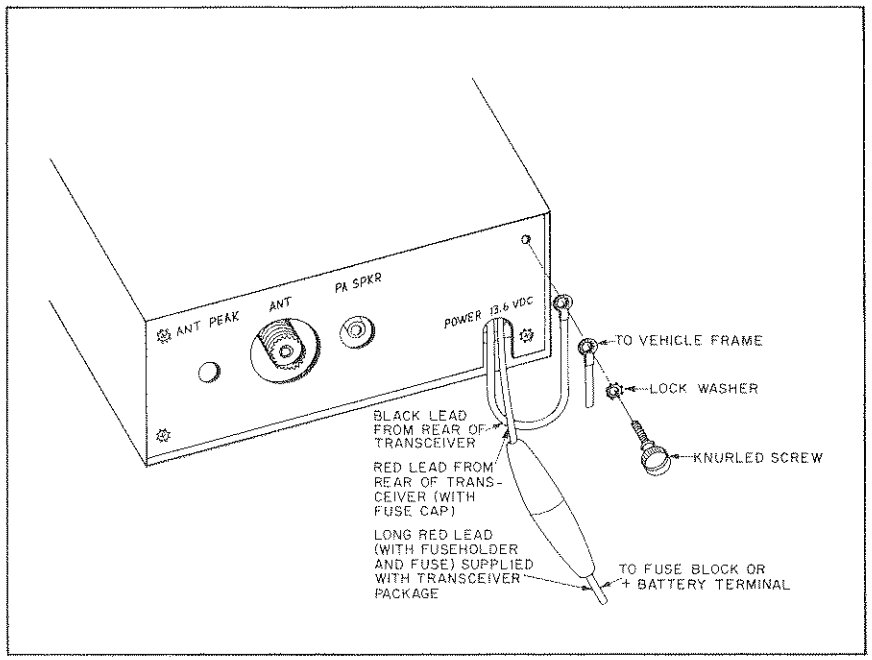


Figure 1. Rear View Showing Installation and Electrical Connections.

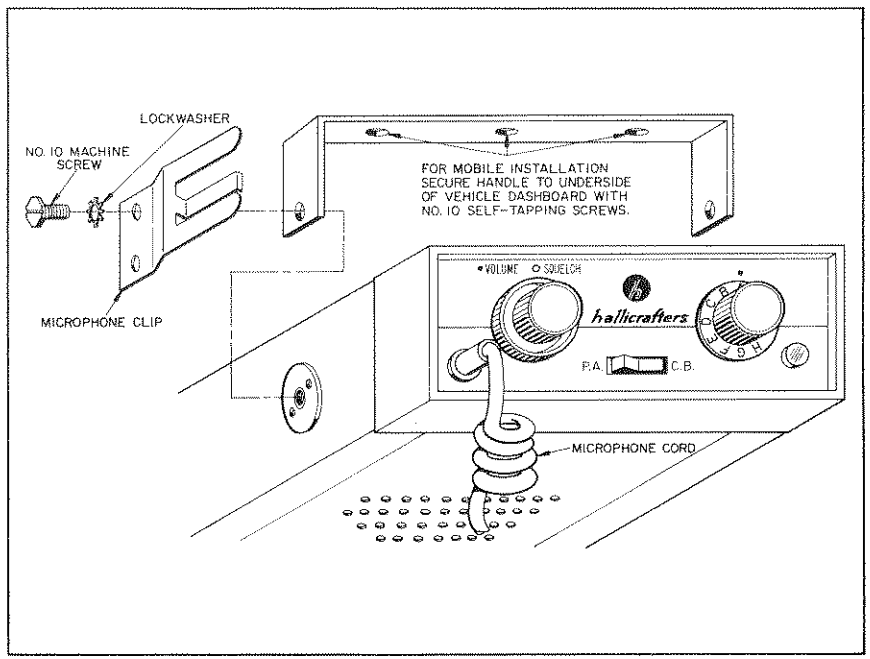


Figure 2. Mobile Installation of Transceiver Mounting Bracket and Microphone Clip.

The antenna should be connected to the antenna socket on the rear of the unit with RG-8/U or RG-58/U coaxial cable (RG-8/U is recommended for lengths in excess of 50 feet) and a shielded, PL-259 type connector.

Because of its compact size, the case of the CB-21 is inadequate for use as either a ground plane or counterpoise for a one-quarter wave-length antenna. Therefore, it is not recommended that the antenna be mounted above or on the rear of the cabinet.

Additional information concerning antennas may be obtained from your Hallicrafters dealer.

OPERATING YOUR TRANSCEIVER

OPERATING CONTROLS.

VOLUME, On-Off Control. — Turns power On and Off, also adjusts loudness of received signals. Volume increases as you turn clockwise.

SQUELCH Control. — Quiets background noise (static) in the absence of a signal. In the counterclockwise position the transceiver is unsquelched (i. e., no noise quieting). In the fully-clockwise position, the unit is squelched for even relatively strong signals; therefore, in practice this control should be carefully set slightly beyond the point that just quiets the noise.

Channel Selector Switch. — Is an eight position switch that set both transmit and receive frequencies simultaneously. Operating frequencies are determined by quartz crystals installed in the unit, one for transmitting and one for receiving. Since the transceiver comes factory equipped with crystals installed in position A, the Channel Selector switch must remain in position A until additional crystals are installed.

Press-To-Talk Switch. This switch is located on the microphone. When transmitting press and speak in a normal voice into the microphone, release when receiving.

P.A. - C.B. Switch. — This two position switch set to C.B. for normal citizens band communication. When the public address feature is utilized set to P.A.

OPERATION.

The power cable and antenna cable should be connected prior to operation. For citizens band communication insure that the P.A. - C.B. switch is set to C.B.

1. Turn the unit on by rotating the VOLUME control clockwise until a click is heard.

2. Set Channel Selector switch to the desired position (if more than one channel is available).

3. Set the SQUELCH control counterclockwise. The receiver is instantaneous in operation and other citizens band stations or atmospheric nosie will be heard.

4. Adjust VOLUME control to the desired listening level.

5. With only noise present (no signals heard), turn the SQUELCH control slowly clockwise slightly beyond the point where noise just disappears. In this position, the SQUELCH control is properly set so that transmitted signals will be heard but the receiver will be quiet between transmissions.

IMPORTANT NOTE

Adjusting the SQUELCH control when signals are present will produce an erroneous setting of the proper level. DO NOT turn the SQUELCH control farther than is required as this could result in signals being missed that might otherwise be heard.

6. To transmit depress the microphone push-to-talk switch and speak in a normal voice one or two inches away from the microphone. To receive, release the push-to-talk switch.

7. To use the public address feature merely plug an external speaker into the jack at the rear of the unit, set the P.A. - C.B. switch to P.A., depress the push-to-talk switch and speak into the microphone. The VOLUME control has no effect on this type of transmission, however, the volume of the paging speaker may be controlled by adding a 6 to 8 ohm L - pad type level control in the cable between the speaker and the plug. While in the P.A. position, the receiver will operate the external speaker when the push-to-talk switch is not depressed.

Since citizens-band channels are shared on a party-line basis, standard operating procedures and courtesies should be observed so that full utility of the service can be realized by all users.

Points to remember are:

1. Do not transmit if you hear other stations using the channel.

2. Limit your communication to the minimum possible time required to complete your business.

3. Announce the call sign of your station at the beginning and end of each communication (not each transmission). This is required by FCC rules and can be performed as follows:

   (When initiating a call) "This is ____ (your call sign) unit 1 (2, 3, etc.) calling unit 2 (1, 3, etc.);" and (when completing a call) "This is ____ unit 1 off and clear with unit 2."

CHASSIS REMOVAL

To remove the chassis from the cabinet, unscrew the four screws on the bottom of the cabinet. Slide the cabinet away from the chassis.

OPERATING AND SERVICE QUESTIONS

For further information regarding operation or servicing of this equipment, contact the Hallicrafters' dealer from whom it was purchased. The Hallicrafters Company maintains an extensive system of Authorized Service Centers where any required service will be performed promptly and efficiently at no charge if this equipment is delivered to the service center within 90 days from date of purchase by the original buyer and the defect falls within the terms of the warranty. It is necessary to present the Bill-of-Sale in order to establish warranty status. After the expiration of the warranty, repairs will be made for a nominal charge. All Hallicrafters Authorized

Service Centers display the sign shown at right. For the location of the one nearest you, consult your dealer or your local telephone directory.



Service shipments should not be made to the factory unless instructed to do so by letter, as The Hallicrafters Company will not accept responsibility for unauthorized shipments.

The Hallicrafters Company reserves the privilege of making revisions in current production of equipment and assumes no obligation to incorporate such revisions in earlier models.

ADDING NEW CHANNELS

Two crystals are required for each channel, one for transmit and one for receive. Under no circumstances use other than standard military-type CR-81/U series-resonant, third-overtone crystals. Crystals should be ordered in pairs from your local dealer (see channel allocation chart). Model CB-21 transmitting crystals are stamped with part number 19-3484 and the receiving crystals with 19-3939. When ordering crystals, be sure to indicate: 1) the desired channel, 2) model number CB-21, and 3) the serial number found on the rear of the unit.

One crystal is stamped with the letter T followed by a number and the other crystal with the letter R followed by a number. The number indicates the channel. The T crystal is used in the transmitter circuit and should be inserted in the appropriate crystal socket. The crystal sockets are located on the right side of the chassis, when viewed from the front. The crystal sockets are marked A,B,C, etc. These letter correspond to the letters on the Channel Selector switch. In a similar manner the R crystal is used in the receiver and should be installed in the appropriate socket.

IMPORTANT NOTE

No adjustments are necessary when adding crystals to this equipment. The FCC requires, however, that after the installation of new crystals, the transmitter frequency be checked by a person holding a first or second class commercial operators license.

CHANNEL ALLOCATIONS FOR U.S. CLASS D CITIZENS RADIO SERVICE AND CANADIAN GENERAL RADIO SERVICE

CHANNEL ALLOCATION			CRYSTAL ORDERING INFORMATION			
			Transmitter Crystal		Receiver Crystal	
Frequency (MC)	U.S. Number	Canadian Number	Frequency (MC)	Part Number	Frequency (MC)	Part Number
26.965	1	Do Not Use	26.965	019-003484-1	26.510	019-003939-1
26.975	2	Do Not Use	26.975	019-003484-2	26.520	019-003939-2
26.985	3	Do Not Use	26.985	019-003484-3	26.530	019-003939-3
27.005	4	1	27.005	019-003484-4	26.550	019-003939-4
27.015	5	2	27.015	019-003484-5	26.560	019-003939-5
27.025	6	3	27.025	019-003484-6	26.570	019-003939-6
27.035	7	4	27.035	019-003484-7	26.580	019-003939-7
27.055	8	5	27.055	019-003484-8	26.600	019-003939-8
27.065	9	6	27.065	019-003484-9	26.610	019-003939-9
27.075	10	7	27.075	019-003484-10	26.620	019-003939-10
27.085	11	8	27.085	019-003484-11	26.630	019-003939-11
27.105	12	9	27.105	019-003484-12	26.650	019-003939-12
27.115	13	10	27.115	019-003484-13	26.660	019-003939-13
27.125	14	11	27.125	019-003484-14	26.670	019-003939-14
27.135	15	12	27.135	019-003484-15	26.680	019-003939-15
27.155	16	13	27.155	019-003484-16	26.700	019-003939-16
27.165	17	14	27.165	019-003484-17	26.710	019-003939-17
27.175	18	15	27.175	019-003484-18	26.720	019-003939-18
27.185	19	16	27.185	019-003484-19	26.730	019-003939-19
27.205	20	17	27.205	019-003484-20	26.750	019-003939-20
27.215	21	18	27.215	019-003484-21	26.760	019-003939-21
27.225	22	19	27.225	019-003484-22	26.770	019-003939-22
27.255	23	Do Not Use	27.255	019-003484-23	26.800	019-003939-23