
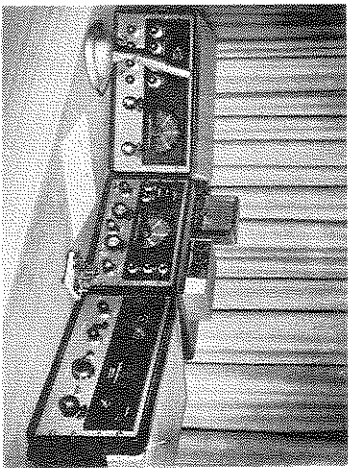
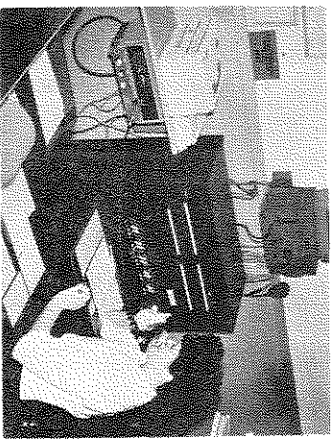


"Quality through Craftsmanship"
 at...  **Hallcrafters**

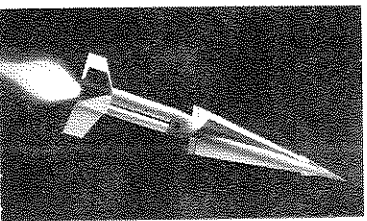


Precision Amateur Radio ♦ One of the few remaining avenues of unencumbered personal communication among the peoples of the world is amateur radio. Hundreds of thousands of individuals from all walks of life, in 92 nations of the world (over half in the United States alone) devote much of their spare time to this fascinating and useful activity. Far more than a hobby, "ham" radio is America's front line of defense in communication in times of national emergency or disaster. Hallcrafters manufactures more precision communications equipment for the amateur than any other company in the world. Its technological leadership has been acknowledged for 30 years.




Personal Communication ♦ In this age of exotic communications, space probes and satellites, has come a simple but tremendously important opportunity for private citizens to communicate. It is called Citizens Band Radio. Any adult with a need for personal two-way radio communication can own and operate a citizens band radio. No operator's license is required, only an easily-obtained station license, making it ideal for business and professional men who must be away from their phones frequently.

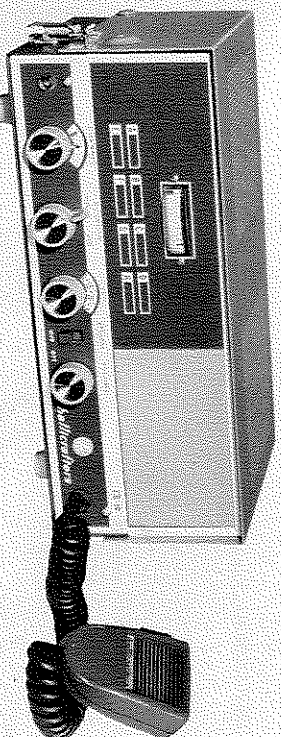
Nearly a million sets are now in use in homes, offices, cars, tractors, boats, and in industry. From its earliest stages, Hallcrafters has been a pioneer in Citizens Band Radio. Many of the major technical developments have come from Hallcrafters electronic research laboratories. Today's Hallcrafters Citizens Band Radios are setting industry standards for competence, for versatility, and outstanding performance. Here, once again, is a working demonstration of "Quality through Craftsmanship".



Aerospace Electronics ♦ For a quarter-century Hallcrafters has played a significant and special role in America's military defense. In addition to its widely used military communications equipment, Hallcrafters pioneered with the United States Air Force in the development of special research and development techniques known as "QRC," or Quick Reaction Capability, which have kept America ahead in the critical race for supremacy in electronic counter measures, reconnaissance, and other electronics warfare equipment. Today, advanced devices designed and manufactured by Hallcrafters aerospace division are at work in every phase of missile development from tracking system to nose cone.

 **Hallcrafters**

**CITIZENS BAND
 TRANSCIVER
 MODEL CB-19**



OWNER'S MANUAL

WARRANTY

"The Hallicrafters Company warrants its products 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 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 and 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 thereon has been removed, defaced or changed, nor to accessories not therewith but 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 product."

The Hallicrafters Co.

156-201523

NOTE: Fill out and return immediately the enclosed WARRANTY CARD.

Record equipment information for future reference

TRANSCIVER:

Model number _____

Serial number _____

Date purchased _____

Purchased from _____

Station call sign _____

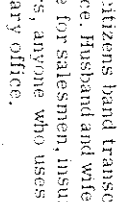
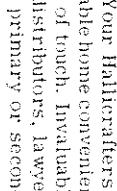
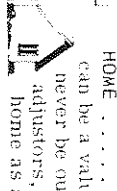
ACCESSORIES:

_____ # _____

_____ # _____

CAUTION: Do not attempt operation of the transmitter until a station license has been obtained.

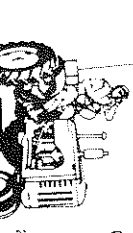
NEVER OUT OF TOUCH WITH YOUR Hallicrafters CITIZENS BAND RADIO UNLIMITED APPLICATIONS . . . Business, Pleasure, Safety



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 transmitter, just talk or receive messages while driving.

OFFICE A citizens band transmitter 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 watercraft with a citizens band transmitter. 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 transmitter 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 2
The Citizens Radio License	Page 3
Unpacking your transmitter	Page 5
Installing your transmitter	Page 5
Antennas	Page 7
General Description	Page 8
Specifications	Page 8
Accessories	Page 8
How to operate your transmitter	Page 9
The TEN signals	Page 10
Chassis removal	Page 10
Operating and service questions	Page 10
Adding new channels	Page 11
Alignment of your transmitter	Page 12

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 (hams) 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, for every conceivable reason, 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. But 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 transmit and receive crystals which are plugged inside the radio. Each radio comes equipped with one set of crystals, normally channel 11. Additional channels may be added merely by plugging in appropriate crystals.

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

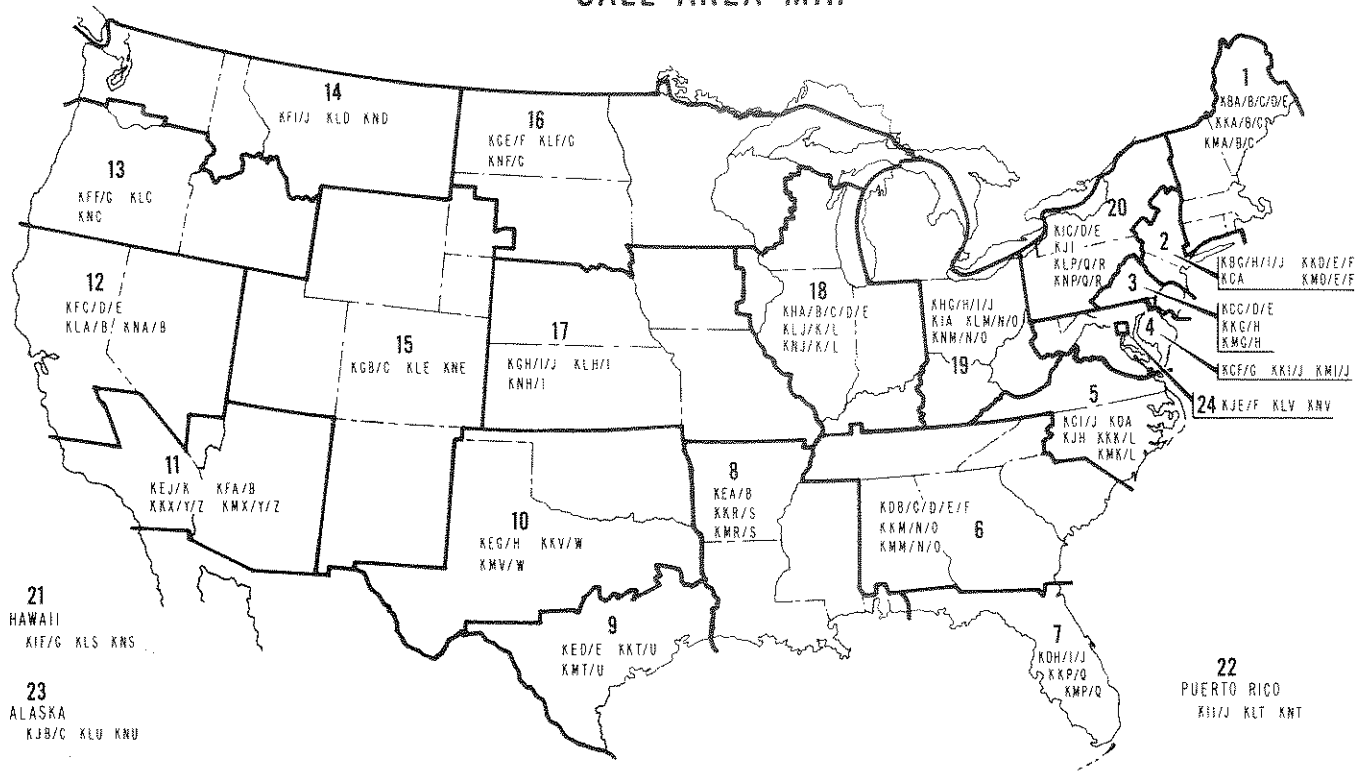
CAUTION

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) packed with your transceiver, or obtainable from any F.C.C. office, as soon as possible and forward it 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.

CALL AREA MAP



156-0055068

UNPACKING YOUR TRANSCEIVER

Your Hallicrafters Model CB-19 is a Citizens Band Transceiver designed and manufactured to the most stringent quality standards. It has been packaged to insure safe arrival.

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. The shipping carton will include the CB-19 transceiver, mounting bracket, DC cable assembly, AC cable assembly, and a separate envelope containing:

- F.C.C. License Application Form 505
- F.C.C. Transmitter Identification Card
- Warranty Registration Card
- Microphone Holder
- Bracket Mounting Screws
- Red Lead with Fuse Holder
- Black Lead

Examine all packaging material carefully to avoid discarding the above items. Carefully check all shipping labels and tags for instructions before removing them. Save the carton and packaging for future use (service return, etc.).

The F.C.C. Transmitter Identification Card should be filled out and then attached to the transceiver with the "stickyback".

INSTALLING YOUR TRANSCEIVER

Figure 1 shows the installation of the transceiver handle, mounting brackets, and microphone clip.

BASE INSTALLATION

In base installations the transceiver is designed to operate from a 115-volt, 60-cycle AC power source. The power cord with the standard two contact, molded plug on one end is used to connect the unit to a 115-volt, 60-cycle outlet.

NOTE

If in doubt about your power source contact your local power company prior to inserting the power cord into any power outlet. Plugging the power cord into the wrong source can cause extensive damage to the unit.

MOBILE INSTALLATION

In home installations, the power cord with the standard two-contact, molded plug on one end is used to connect the unit to a 115-volt, 60-cycle outlet.

In mobile installations, the power lead with the fuseholder in the line is used instead of the AC power cord. It is recommended that the bare end of this power lead be connected directly to the hot (ungrounded) terminal of the battery. If additional length is required, wire no smaller than NO. 12 AWG should be used. Connection of this lead to other points (ammeter, etc.) may introduce ignition interference which would impair reception. Battery polarity is unimportant as the Model CB-19 is designed to operate from either positive or negative grounded systems.

An additional wire is required to be connected from the model CB-19 chassis (thumb-screw terminal on rear) to the firewall or frame of the vehicle. This wire, NO. 12 AWG or larger, completes the other side of the battery circuit.

FOR MOBILE INSTALLATIONS REMOVE RUBBER BUMPERS AND SECURE HANDLE TO UNDERSIDE OF VEHICLE DASHBOARD WITH NO. 10 SELF TAPPING SCREWS.

BRACKETS AS REQUIRED FOR MOBILE INSTALLATION MADE FROM STRAIGHT FLAT PERFORATED STRAP (SUPPLIED). ATTACH TO FIREWALL OF VEHICLE WITH NO. 10 SELF-TAPPING SCREWS AND TO UNIT WITH NO. 8-32 THREAD FORMING SCREWS (SUPPLIED).

TRANSMIT INDICATOR

POSITION OF MICROPHONE CLIP IN BASE STATION INSTALLATIONS. ATTACH TO UNIT WITH NO. 8-32 THREAD FORMING SCREWS (SUPPLIED).

NO. 10-32 MACHINE SCREW AND LOCKNUT

HANDLE SHOWN DOTTED IN LOWERED POSITION.

Figure 1 Transceiver Installation Diagram.

156-007326

ANTENNAS

The Model CB-19 is 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 a half-wave vertical antenna is recommended for good all-around performance. For mobile use, a quarter-wave vertical whip, equipped with a bumper mount, is generally satisfactory.

The antenna should be connected to the antenna socket with RG-8/U or RG-58/U coaxial cable (RG-8/U is recommended for lengths in excess of 50 feet) and a type PL-259 VHF connector with appropriate adapter (Hy-Gain Model P1P). A Switchcraft No. 3502 connector is adequate for use with RG-58/U cable.

For limited range applications (1 or 2 miles), a short, base-loaded whip antenna may be used.

Additional information concerning antennas may be obtained from your local Hallcrafters' dealer.

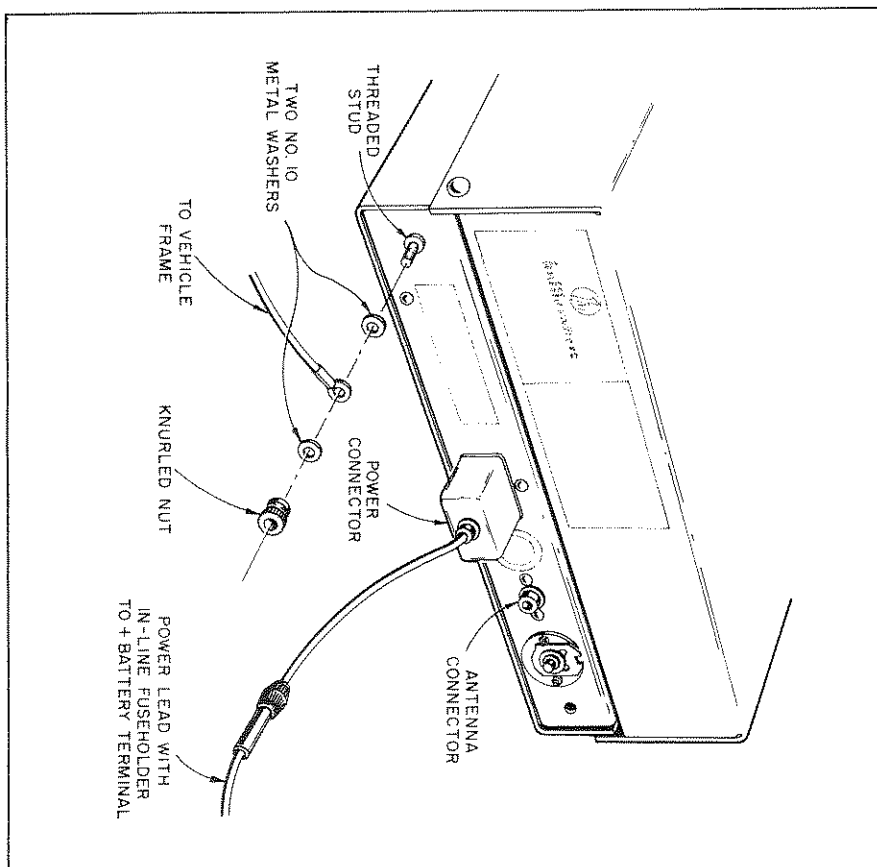


Figure 2. Rear View Showing Mobile Installation Connections.

156-006756

GENERAL DESCRIPTION

Your New Hallcrafters Model CB-19 Transceiver is a compact, self-contained transmitter-receiver designed for class D, 27-megacycle citizens-band service.

Two of these units can provide convenient, reliable voice communication between your home and 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.

All that is required for immediate on-the-air operation is: (1) authorization in the form of a station call sign from the Federal Communications Commission (FCC, see license application enclosed), (2) an appropriate antenna system, and (3) a power source of 115 volts AC (house current) or a 12 volt DC storage battery, as found in an automobile, truck, tractor, or boat.

The citizens band is a group of 23 channels (frequencies) assigned by the FCC for use by private individuals and provides short-range, two-way communication for business or personal use.

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 the 23 channels as they choose. The Model CB-19 is supplied ready for immediate operation on channel 11 (27.085 MC). Operation on any one of eight channels is instantly possible by installing transmitting and receiving crystals for the desired additional channels in the sockets provided.

The Model CB-19 incorporates a two-stage transmitter capable of the full authorized power limit (5 watts) with 100% voice modulation capabilities. It has a dual conversion superheterodyne receiver with three IF transformers for excellent adjacent channel rejection and a noise limiter to reduce automobile and other local interference. It has a push-to-talk ceramic microphone, a VFO (variable frequency oscillator) for all channel reception, a VFO-CAL switch to aid in tuning the receiver to the transmitter frequency, an S-meter for signal strength comparison, a self-contained speaker, and is housed in a cabinet with a hinged cover, permitting easy access to tubes and crystals.

SPECIFICATIONS

TRANSMITTER POWER INPUT 5 watts.
FREQUENCY RANGE 26.965 MC to 27.255 MC.
RECEIVER SENSITIVITY Less than one microvolt for a 10-DB signal-to-noise ratio.

RECEIVER AUDIO POWER OUTPUT 2.5 watts.
TRANSMITTING CRYSTALS Third overtone CR-81-U, $\pm 0.005\%$ tolerance.
RECEIVING CRYSTALS As in transmitter, except 1650 KC higher in frequency.

OUTPUT CIRCUIT 50-ohm link.
TVI SUPPRESSION Second harmonic (54 MC) series-tuned trap, 50 DB minimum.

POWER REQUIREMENTS

AC -- 115-volt, 60-cycle 60 watts.
DC -- 12 volts 5 amperes.

OVERALL DIMENSIONS

Height 5-1/2 inches.
Width 12 inches.
Depth 8 inches.

NET WEIGHT 13 pounds.
SHIPPING WEIGHT 14-1/2 pounds.

HOW TO OPERATE YOUR TRANSCEIVER

The power cable and antenna cable should be connected prior to operation. Turn the Model CB-19 ON by rotating the VOLUME control clockwise until a click is heard. The dial light should illuminate, indicating that power is applied.

NOTE

IN MOBILE INSTALLATIONS, TURN THE MODEL CB-19 OFF BEFORE ENGAGING THE ENGINE STARTER SWITCH. FAILURE TO OBSERVE THIS PRECAUTION MAY MATERIALLY AFFECT THE LIFE OF THE POWER SUPPLY VIBRATOR.

Set the CHANNEL SELECTOR switch to the desired position. If fixed frequency reception is desired, turn the VFO switch to the OFF position. If tunable receiver operation is desired, turn the VFO switch to the VFO position. Set the SQUELCH control fully clockwise (unsquelched) and push the VFO-CAL switch down (OFF). After a warmup of approximately one minute, other citizens-band stations or atmospheric noise will be heard. For tunable receiver reception, set the VFO switch to the VFO position and rotate the VFO control until the desired channel number is centered in the VFO window. When a received signal is properly tuned in, it will sound the loudest and will cause a peak deflection on the S-meter. Adjust the VOLUME control to the desired listening level.

The SQUELCH control should be set when only noise is present (no signals heard). Adjusting the SQUELCH control when signals are present will give an erroneous indication of the proper level. Turn the SQUELCH control slowly counterclockwise to the point where the 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. Do not turn the SQUELCH control further than is required to just silence the noise; this could result in signals being missed that might otherwise be heard.

To find the location of the transmitter frequency on the VFO dial, set the operating controls as follows:

- (1) Set the CHANNEL SELECTOR switch to the desired channel, (2) Turn the VFO switch (bar type knob) to the "VFO" position, (3) Push the VFO-CAL switch up (VFO-CAL now turned ON). The transmitter oscillator is now on and will quiet the CB-19 receiver. Rotate the VFO tuning control until a maximum deflection is observed on the S-meter. The receiver is now tuned to the transmitting frequency. To turn off the CB-19 VFO calibrator (VFO-CAL), push the VFO-CAL switch down. Citizens band stations or noise should now again be heard.

Before transmitting be sure that the VFO-CAL switch is down (VFO-CAL now turned OFF). To transmit, depress the microphone button (push-to-talk switch) and speak in a normal voice one or two inches away from the microphone. To receive, release the button.

An output indicator is located on the front panel to the left of the CHANNEL SELECTOR. This indicator will light during transmissions, indicating normal transmitter operation. You may find that the indicator lights only occasionally or just when actually speaking into the microphone. This may indicate low power source voltage (example: operation in an automobile with motor not running).

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:

Hallicrafters MODEL CB-19 CITIZENS BAND RADIO *Identification of features and controls*

S-METER Provides a convenient indication of the relative signal strength of received signals. It will also show noise interference level and, therefore, will indicate the most opportune times to transmit.

In the transmit mode, the meter indicates the presence of carrier and modulation, thereby providing a convenient performance monitor. The meter does not read power output directly and therefore, cannot be used for transmitter tune-up or adjustment.

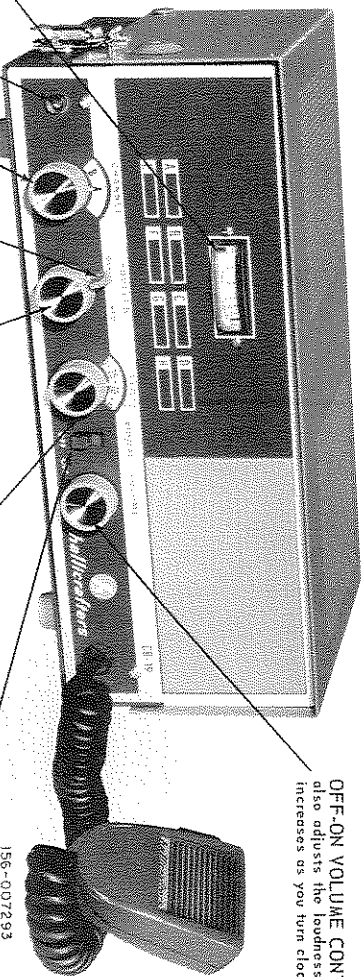
In the receive mode, an incoming signal produces a change in the automatic volume control (AVC) voltage. This voltage, in turn, produces a change in the RF amplifier plate current which is indicated on the S-meter.

The meter scale is calibrated in 5 units, 1 to 9, and in decibels (DB) over S9. The reference level for signal strength has been established so that S9 is equal to 50 microwatts. This level represents a signal that normally affords full noise quieting. Stronger signals are indicated in DB over S9 (i.e., 20 DB, S9 is 10 times stronger than S9, 40 DB, S9 is 100 times stronger, and 60 DB, S9 is 1000 times stronger).

OUTPUT INDICATOR Indicates normal transmitter operation by lighting during transmission.

CHANNEL SELECTOR Is an eight position switch that sets both transmitter and receiver crystal frequencies simultaneously. Operating frequencies are determined by quartz crystals installed in the unit, one for transmitting and one for receiving. The position to which the switch is set is indicated in the small dial window (letters A through H).

Since the transceiver comes factory equipped with crystals installed in position A, no transmission or reception on other channels is possible until additional crystals are installed.



OFF-ON VOLUME CONTROL Turns power ON and OFF, also adjusts the loudness of received signals. Volume increases as you turn clockwise.

156-007293

SQUELCH CONTROL Quits background noise (static) in the absence of a signal. In the fully clockwise position, the transceiver is unsquelched (i.e., no noise quieting). In the fully counterclockwise position, the unit is fully squelched. In practice, this control should be set to the point that just quits the noise.

VFO SWITCH Is a two position switch that can be switched from crystal controlled reception (fixed frequency) to variable frequency reception (variable receiver, no receiver crystals needed). This control in no way affects the transmitter; the transmitter channel is still selected by the CHANNEL selector. When the VFO switch is turned to the left-hand (OFF) position, the CB-19 functions as a crystal-controlled receiver. In the right-hand (variable) position, the receiver crystals in the CB-19 are switched out of the receiver oscillator circuit and the Variable Frequency Oscillator (VFO) is switched in, allowing tunable receiver operation.

VFO-CAL SWITCH Is a slider type switch used in conjunction with the VFO tuning control and S-meter. It allows the operator to tune the receiver of the CB-19 to the transmitting channel being used. In the VFO/CAL position (up) the transmitter oscillator is turned on. If the VFO switch is in the OFF position, the receiver and transmitter of the CB-19 are automatically tuned to the same frequency and the VFO is disabled. For this condition, the S-meter pointer should deflect. If the VFO switch is in the VFO position, the receiver is tuneable and the S-meter will deflect when the receiver is tuned to the transmitting channel being used. When the VFO/CAL switch is in the OFF position, the transmitter oscillator is turned OFF. In order to transmit, the VFO/CAL switch must be down (OFF).

VFO TUNING CONTROL Used to tune-in a station on the citizens-band when the VFO switch is set to the right-hand (variable) position. The channel to which you are tuned is centered in the window above the white dot.

ACCESSORIES.

The HA-3 Electrical Noise Suppression Kit eliminates electrical noise generated by your vehicle that may interfere with proper transceiver operation.

(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."

THE TEN SIGNALS

The following is a list of the most commonly-used citizens-band code signals. Their use increases the efficiency and effectiveness of citizens radio communication by shortening transmission time and by helping to eliminate error in information transmitted, by being easy to understand even under crowded or noisy conditions.

- 10-1 I am receiving you poorly. Not completely understandable, weak signal, or being interfered with by noise and/or other stations.
- 10-2 I am receiving you well. Perfectly understandable — interference slight, if any.
- 10-4 OK acknowledge, understand, affirmative.
- 10-7 Out of service — leaving the air. Not subject to call.
- 10-8 In service, standing by. Subject to call.
- 10-9 Please repeat — I do not understand.
- 10-10 Transmission completed, standing by, subject to call.
- 10-20 What is your location? My location is _____.
- 10-23 Standby please.
- 10-41 I am changing to channel _____, please change to channel _____.

CHASSIS REMOVAL

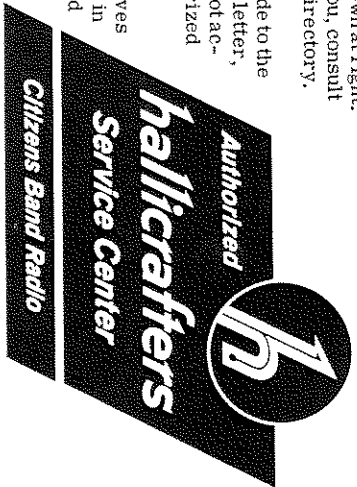
Completely remove the top cover. Remove all knobs and the six screws on the underside of the cabinet. Slide the chassis out of the bottom cover.

OPERATING AND SERVICE QUESTIONS

For further information regarding operation or servicing of this equipment, contact the Hallcrafters' dealer from whom it was purchased. The Hallcrafters 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 Hallcrafters 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 Hallcrafters Company will not accept responsibility for unauthorized shipments.

The Hallcrafters 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

For fixed frequency operation of both the receiver and transmitter sections of the CB-19, the VFO switch should be in the OFF (crystal) position. Two crystals are then required for each channel, one for transmitting and one for receiving. When the VFO switch is in the VFO position, the CB-19 receiver is tunable and only transmitting crystals are required to change channels. Under no circumstances use other than CR-61/U, series-resonant, third-overtone crystals. For fixed frequency operation of both receiver and transmitter, crystals should be ordered in pairs from your local dealer. Hallcrafters Model CB-19 transmitting crystals are stamped with part number 19-3484 and the receiving crystals with part number 19-3483. When ordering crystals, be sure to indicate: (1) the desired channel, (2) model number CB-19, 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 appropriately lettered socket at the REAR of the chassis. The R crystal (1650 KC higher than the channel frequency) is used in the receiver and should be installed in the appropriate socket at the FRONT of the chassis.

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			
Frequency (MC)	U.S. Number	Canadian Number	Transmitter Crystal Frequency (MC)	Hallcrafters Part Number	Receiver Crystal Frequency (MC)	Hallcrafters Part Number
26.965	1	Do Not Use	26.965	019-003484-1	26.615	019-003483-1
26.975	2	Do Not Use	26.975	019-003484-2	26.625	019-003483-2
26.985	3	Do Not Use	26.985	019-003484-3	26.635	019-003483-3
27.005	4	Do Not Use	27.005	019-003484-4	26.655	019-003483-4
27.015	5	1	27.015	019-003484-5	26.665	019-003483-5
27.025	6	2	27.025	019-003484-6	26.675	019-003483-6
27.035	7	3	27.035	019-003484-7	26.685	019-003483-7
27.045	8	4	27.045	019-003484-8	26.705	019-003483-8
27.055	9	5	27.055	019-003484-9	26.715	019-003483-9
27.065	10	6	27.065	019-003484-10	26.725	019-003483-10
27.075	11	7	27.075	019-003484-11	26.735	019-003483-11
27.085	12	8	27.085	019-003484-12	26.755	019-003483-12
27.105	13	9	27.105	019-003484-13	26.765	019-003483-13
27.115	14	10	27.115	019-003484-14	26.775	019-003483-14
27.125	15	11	27.125	019-003484-15	26.785	019-003483-15
27.135	16	12	27.135	019-003484-16	26.805	019-003483-16
27.155	17	13	27.155	019-003484-17	26.815	019-003483-17
27.165	18	14	27.165	019-003484-18	26.825	019-003483-18
27.175	19	15	27.175	019-003484-19	26.835	019-003483-19
27.185	20	16	27.185	019-003484-20	26.855	019-003483-20
27.205	21	17	27.205	019-003484-21	26.865	019-003483-21
27.215	22	18	27.215	019-003484-22	26.875	019-003483-22
27.225	23	19	27.225	019-003484-23	26.895	019-003483-23
27.235		Do Not Use	27.235		26.905	

ALIGNMENT OF YOUR TRANSCIEVER

The Model CB-19 has been carefully aligned and adjusted at the factory by specially-trained personnel using precision equipment. Alignment should not be attempted until all other possible causes of faulty operation have been investigated. Alignment should not be required unless the unit has been tampered with or component parts have been replaced in the RF, IF, or oscillator sections. Alignment should be made only by persons familiar with communications equipment and experienced in their alignment.

EQUIPMENT REQUIRED.

RECEIVER

1. Standard AM signal generator 1650 KC to 27.255 MC, modulated 30% with 400 CPS or 1000 CPS audio.
2. Output meter (or AC vacuum tube voltmeter) connected across speaker terminals.
3. 3-volt battery (two 1-1/2-volt D cells connected in series).

TRANSMITTER

1. 50-ohm, non-reactive dummy load (two 100-ohm, 2-watt resistors in parallel).
2. RF power output indicator connected across load.

GENERAL

1. Plastic screwdriver, 1/8-inch tip.
2. Hexagonal alignment tool (GC No. 9091).

ALIGNMENT PROCEDURE.

CRYSTAL OSCILLATORS

Transmitter: The transmitter oscillator coil, L1, has been adjusted at the factory for series-resonant operation of the transmitter crystals. This coil should not be tampered with as off-frequency, illegal operation may result. The FCC requires that persons making transmitter frequency adjustments be licensed commercial radio-telephone operators, second class or higher, and that they have adequate frequency-measuring equipment. For proper on-frequency operation of the CB-19, use only Hallicrafters' crystals. These are type CR-81/U, third-overtone, series-resonant crystals.

Receiver: The crystal controlled receiver oscillator, like the transmitter, is designed for CR-81/U series-resonant operation. The oscillator can be aligned with a short-wave receiver capable of tuning to the actual receiver crystal frequency (channel 11 receiver crystal = 28.735 MC). To align the receiver oscillator, proceed as follows:

1. Zero beat (with BFO on) the short-wave receiver to the crystal frequency (channel 11). The antenna of the short-wave receiver must be close enough to the Model CB-19 receiver oscillator tube (V3) to pick up the radiated crystal signal.
2. Substitute a 39-ohm, 1/2-watt resistor for the crystal. With the resistor installed in place of the crystal, the circuit should oscillate on or near the crystal frequency. (Note: oscillation will sound quite rough in the short-wave receiver.)
3. Tune the short-wave receiver to pick up the oscillation. If the oscillation is within ± 500 CPS of the crystal frequency, adjustment is adequate. If not, readjust the short-wave receiver, tuning to the crystal frequency. With the resistor installed, carefully adjust the receiver oscillator coil (L8) to frequency. This adjustment is critical.

4. Replace the crystal. The adjustment performed on channel 11 provides uniform performance on all other channels. No readjustment is necessary when changing channels.

RECEIVER VFO ALIGNMENT AND CALIBRATION

Proceed as follows:

- a. Set the VFO dial to channel 1. Transmit with another transceiver on channel 1, adjust coil L11 to receive the transmitted signal.
- b. Set the VFO dial to channel 20. Transmit with another transceiver on channel 20. Adjust trimmer C51A to receive this transmitted signal. Repeat steps a and b until no further improvement in calibration can be obtained.

SWMETER CALIBRATION

Apply power to the CB-19 and disconnect the antenna. Locate the S-meter zero control, R12 (the 10K potentiometer on chassis top, see figure 3). Adjust this control with a screwdriver for zero on the S-meter. This completes the S-meter calibration.

Periodically disconnect the antenna and check the S-meter reference. A slight adjustment may be necessary as the RF amplifier tube ages or if it is replaced.

IMPORTANT

The alignment procedure should be closely followed in order to produce proper overall performance. Do not attempt to adjust the IF transformers (T3, T4, or T5) by any method other than that described. Adjustment of these transformers for maximum output with weak on-the-air signals is not recommended and will result in a loss of selectivity.

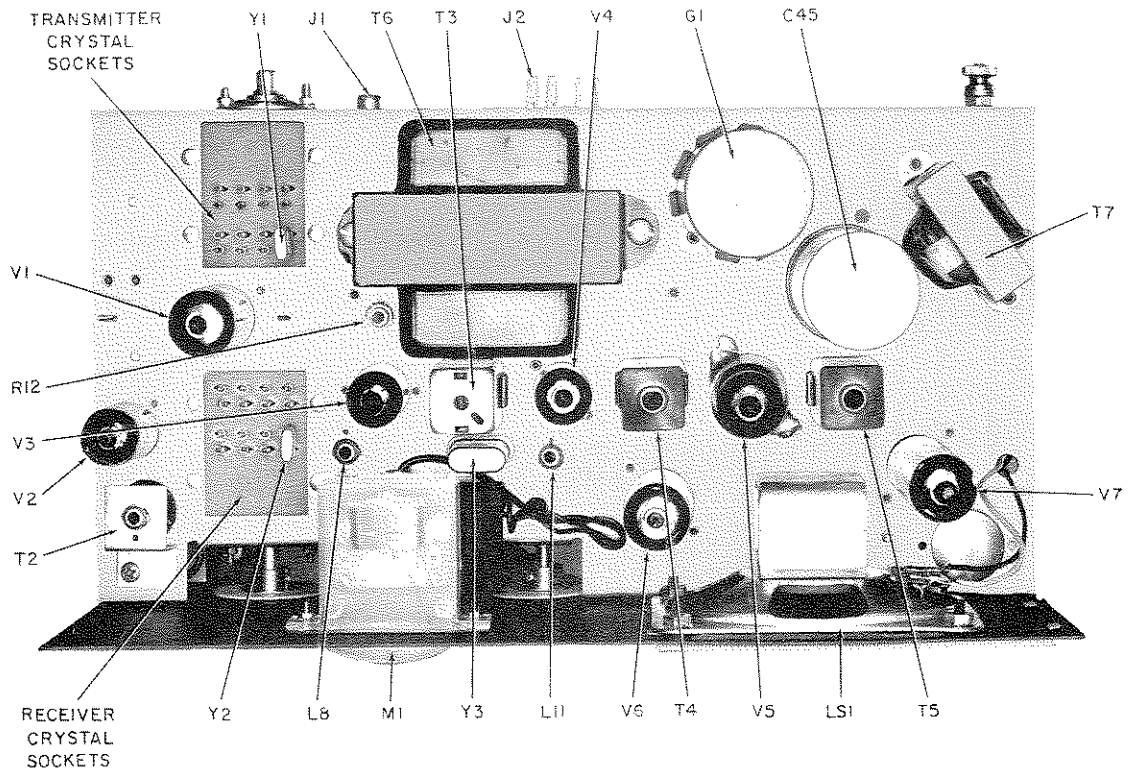
RECEIVER RF AND IF ALIGNMENT

Alignment	Connections	Generator Frequency	Channel Crystal	Adjust
1650 KC and 462 KC	3-volt battery, negative connected to test point (TP), positive to chassis (GND). Signal generator to signal grid of first mixer (pin 7 of V3).	1650 KC	None	Top and bottom of T3, T4, and T5. Keep reducing the generator output to maintain the output meter below 1/2 watt (volume control fully checked).
RF bandpass transformer	Signal generator to antenna input connector. Alternate method: antenna connected to input.	27.085 MC	11 (27.085 MC)	Top and bottom of T2. Adjust with low-level signal generator input for maximum output. Alternately (with antenna), adjust for maximum noise output. Adjust to first peak. When adjusted, cores should be just entering the windings from the outside ends. Under no circumstances should they be between the windings. Aligned in transmit.
RF input	See transmitter adjustment.			

TRANSMITTER RF ADJUSTMENT

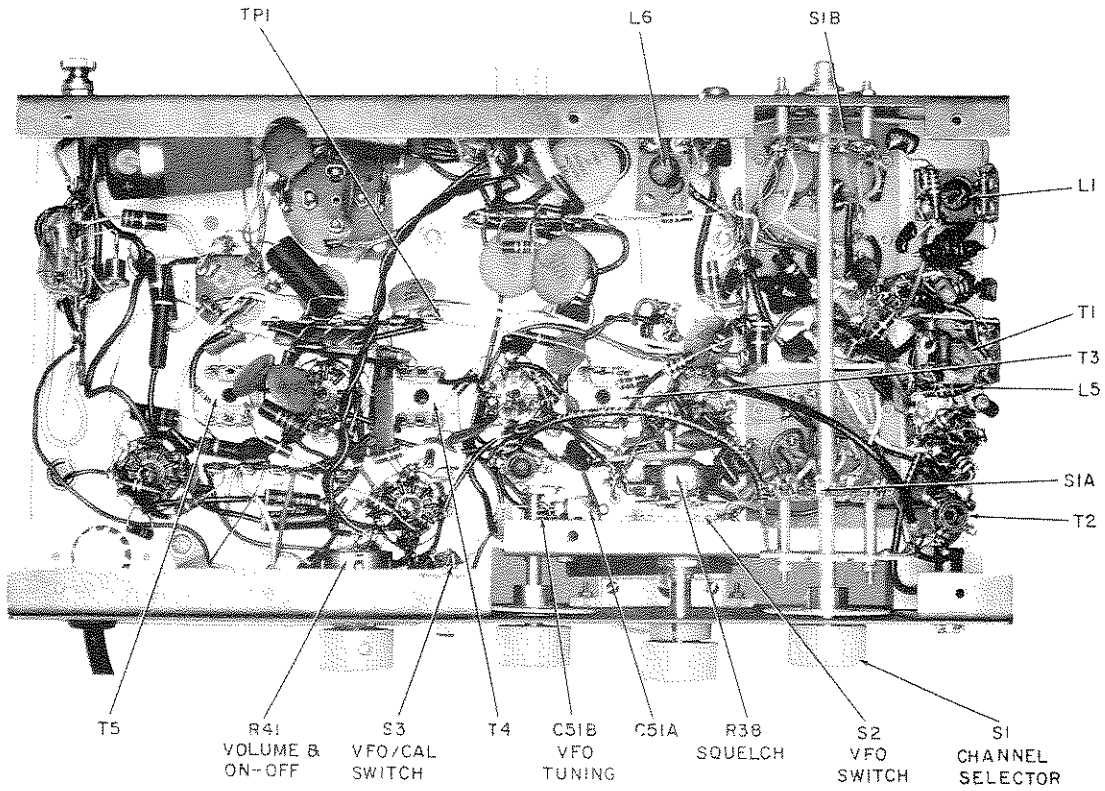
Adjustment	Connections	Channel Crystal	Adjust
Power output	Dummy load to antenna socket. Power output indicator across load.	11 (27.085 MC)	T1 and L5 for maximum power output. Adjustments should be made alternately, a little at a time, until maximum output is obtained. The link coil, L5, should be adjusted so that it always has tendency to spring back to an inductor position. Adjustment should be made only in the event of transmitter interference to local television receivers, (i.e., wavy lines, hearing bells, etc.). Adjust L6 for minimum interference.
Second harmonic trap	Normal installation shown on TV set screen (set to TV channel 2).	11 (27.085 MC)	

Figure 3 Top View of Model CB-19 Chassis.

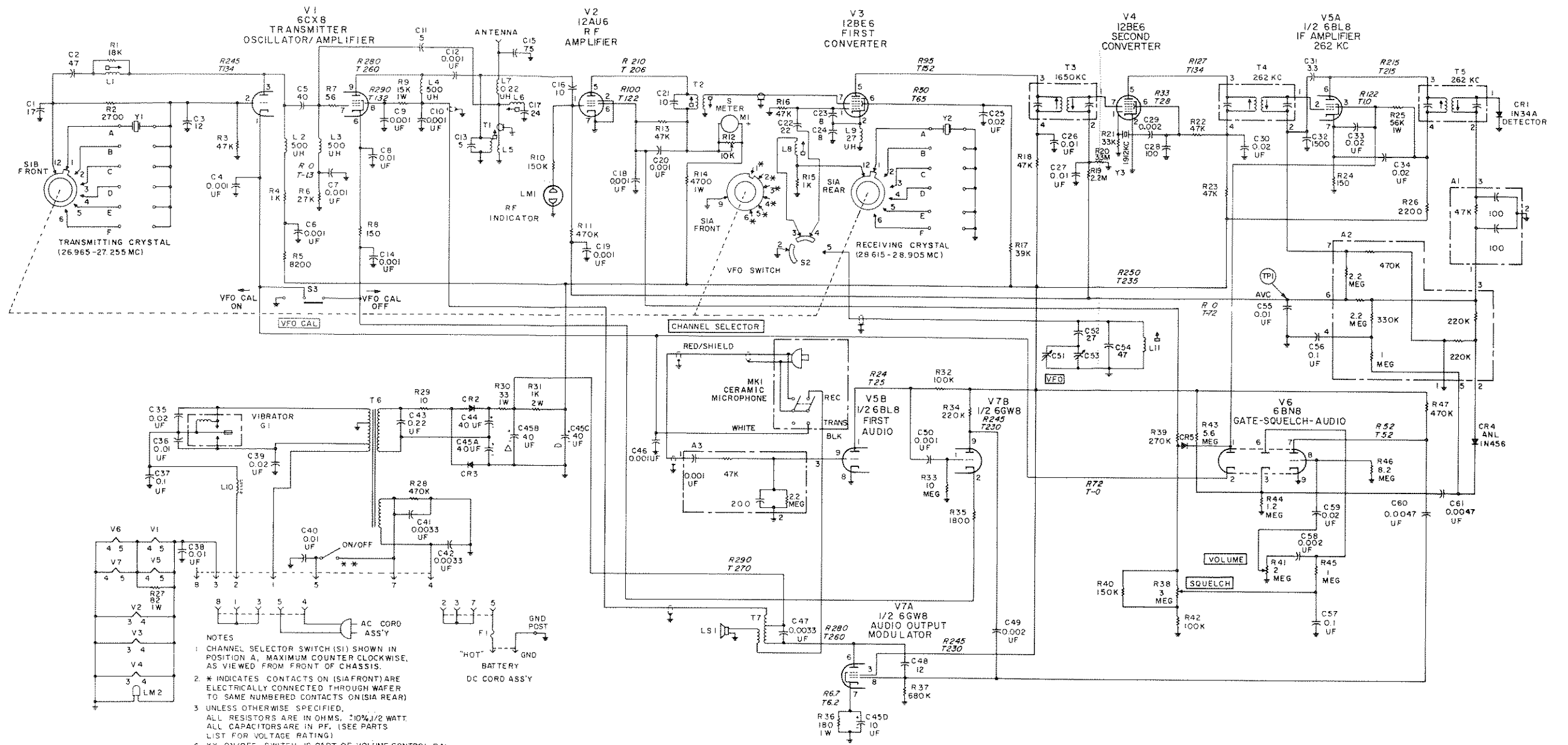


156-007287

Figure 4 Bottom View of Model CB-19 Chassis.



156-007288



- NOTES
- 1 CHANNEL SELECTOR SWITCH (S1) SHOWN IN POSITION A, MAXIMUM COUNTER CLOCKWISE, AS VIEWED FROM FRONT OF CHASSIS.
 - 2 * INDICATES CONTACTS ON (SIAFRONT) ARE ELECTRICALLY CONNECTED THROUGH WAFER TO SAME NUMBERED CONTACTS ON (SIA REAR)
 - 3 UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE IN OHMS, $\frac{1}{2}$ WATT. ALL CAPACITORS ARE IN PF. (SEE PARTS LIST FOR VOLTAGE RATING)
 - 4 ** ON/OFF SWITCH IS PART OF VOLUME CONTROL (R41).
 - 5 VOLTAGE MEASUREMENTS INDICATED WERE MADE WITH A 20,000 OHMS/VOLT METER WITH ONE LEAD CONNECTED TO CHASSIS GROUND
"R" INDICATES MEASURED VOLTAGE ON RECEIVE
"T" INDICATES MEASURED VOLTAGE ON TRANSMIT.
 - 6 RECEIVER VFO SWITCH (S2) SHOWN IN OFF POSITION (CRYSTAL); LEFT HAND POSITION, AS VIEWED FROM FRONT OF CHASSIS.

Model CB-19 Schematic Diagram.

