

SSB AND AM

23 CHANNELS

CITIZENS BAND TRANSCEIVER

OPERATION MANUAL

GTX-3325

GEMTRONICS

GENERAL DESCRIPTION

This unit is a transceiver employing a frequency synthesizer circuit to provide 23 crystal-controlled transmit and receive channels in the 27 MHz Citizens band. This unit is an all solid stated unit making use of FET, transistor and diode, and is a compact and high capacity transceiver. This unit can be operated over all 23 channels in the conventional AM mode (DSB), or in suppressed carrier Single Sideband (SSB) using either the upper or lower sideband, as desired, which increases from 23 to 69 the effective number of operating channels.

The transceiver has been carefully designed for ease of operation in the SSB mode. Selection of AM, upper sideband or lower sideband is achieved by a mode switch. For transmit on SSB only small consumption of RF power output is required since power output is consumed only when talking. Your SSB signal will reach farther and be heard more clearly than on AM signal. This unit includes every necessary feature for optimum communications — variable squelch, noise blanker, noise limiter (only AM), RF attenuator, fine tune, public address and P-S meter. It is designed for mobile operation such as automobiles or boats and its standard power supply is DC 12V. **Positive or negative ground.**

WARNING

PRIOR TO OPERATING YOUR TRANSMITTER, YOU MUST:

Have posted at your station your own class D Citizens Radio Station License; Have available within your station records and have read and understand a current copy of the FCC Rules and Regulations Part 95; Apply for your station license by filling out an Application for Class D Station License in the Citizens Radio Service, FCC form 505 dated July 1973 or later. You may obtain a License Application from the FCC, Washington, D.C. 20554, from your nearest FCC Field Office or from your local radio dealer. Your copy of the FCC Rules & Regulations is available by subscribing to VOLUME V1, FCC RULES AND REGULATIONS from the U.S. Government Printing Office, Washington, D.C. 20402 on an order blank included with the license application instructions.

SPECIFICATIONS

General specifications:

- * Frequency range
- * Modulation mode
- * Channel composition
- * Frequency stability

- * Power
- * Polarity of power supply

Transmitter specifications:

- * RF output on SSB mode
- * RF output on AM mode
- * Modulation method
- * Spurious radiation

- * Hum and noise

- * Antenna impedance
- * Carrier suppression

2. Receiver specifications:

- * Reception method on SSB
- * Reception method on AM
- * Intermediate frequency
- * Selectivity on SSB
- * Selectivity on AM
- * Spurious response

- * Audio output
- * Current drain approx.

26.965/27.255 MHz.

Conventional AM and suppressed carrier SSB
Crystalsynthesizer type

- * At room temperature (Within 50 Hz. deviation from assigned frequency)
 - * Temperature varies from -20°C . to $+50^{\circ}\text{C}$. (Within 500 Hz. deviation from assigned frequency)
- 13.8V. D.C.
POS. or NEG. GROUND

25 Watts PEP input.

12 Watts PEP (Max. rate)

4 Watts (average carrier power)

Filter method. (SSB)

All spurious and harmonics are more than 50dB below the carrier on both SSB and AM mode.

(In case of SSB mode, this measurement will be made with authorized standard test procedure)

Hum and noise on RF signal are more than 40dB below the signal.

Adjustable for 50 or 52 ohm antenna.

More than 40dB below either signal of two tone on SSB.

Single conversion super heterodyne.

Double conversion super heterodyne.

7.8 MHz. (2nd 455 KHz. on AM mode).

± 1.2 KHz. at 6 dB, ± 2.3 KHz. at 50dB

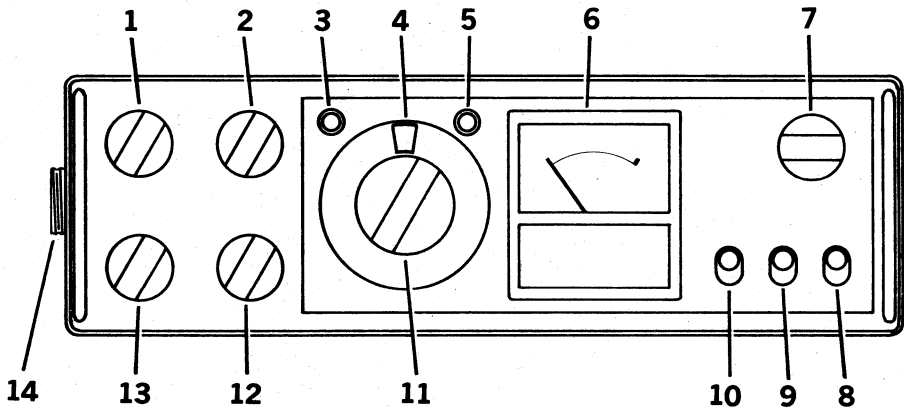
± 3 KHz. at 6 dB, ± 10 KHz. at 50dB.

More than 50dB spurious signal requires to produce same amount of audio output as desired signal does.

2 Watts at 10% distortion.

350mA when no audio.

OPERATING CONTROLS AND FEATURES



1. PWR/VOL:

Varies the audio volume from the speaker. Full clockwise provides Maximum. Incorporates an on-off switch at the extreme counter-clockwise position.

2. Squelch:

This control is used to "quiet" the receiver during no-signal conditions. To adjust squelch threshold level at 12 o'clock (or similar location): Full clockwise provides maximum.

3. Transmit indicator:

To indicate transmit using visible light emitting diode.

4. Channel indicator window:

To indicate transceiver channel.

5. Receive indicator:

To indicate receive using visible light emitting diode.

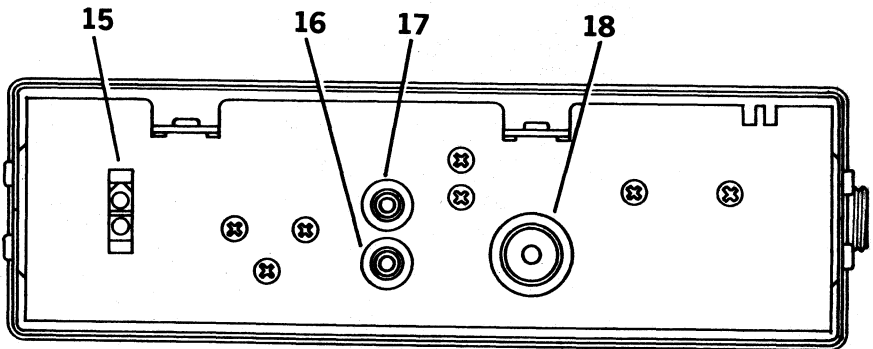
6. S/RF power meter:

This meter is automatically switched to indicate incoming signal strength in the receive mode, and relative RF power output in the transmit mode. "S" scale to be adjusted at "S9" on input 100 μ V.

7. Mode switch:

Selects mode of operation among lower sideband, upper sideband and standard AM.

8. **Speaker Int—Ext Switch:**
Selects internal speaker and external speaker.
9. **Noise Blanker:**
Push button to control noise blanker. Which is very effective against ignition noise.
10. **CB PA SWITCH:**
PA operation to be on when it is pushed.
11. **Channel Selector:**
Dial shows 1-23 channels. The selected channel appears at channel indicator window (4), and also selects "black" mode (between channels 22 and 23).
12. **RF Gain:**
To reduce RF gain of receiver on strong signals.
13. **Fine tune:**
Permits slight adjustment of receiver tuning used for clarity on SSB reception and fine tuning of stations on AM reception.
14. **Microphone socket:**
Four-pin socket for push-to-talk dynamic microphone with curl cord and dependable screw-on connector.



15. Power Connector:

Connect the DC cord.

16. EXT SP:

Jack for connection of external devices such as headphone or speaker.

Insertion of a headphone plug into this jack will automatically disconnect the internal speaker.

17. PA SP:

Special speaker jack for PA. Be sure to use PA speaker only on PA operation since internal speaker is disconnected. Use external speaker having 8 — 16 ohms impedance only.

18. Antenna connector:

For antenna lead-in cable with matching PL-259 connector.

OPERATING INSTRUCTIONS

Never attempt to transmit without an antenna connected to the transceiver. Make sure the transceiver is properly installed for mobile operation and that the antenna and power source are connected. If you have not already done so, plug in the microphone.

Receive Mode AM:

Initially, set front panel controls as follows:

| | |
|--------------|---|
| CB/PA switch | — CB position (Switch-out) |
| RF gain | — Maximum (Fully clockwise) |
| Mode switch | — "AM" |
| Fine Tune | — Center (12 o'clock position) |
| Squelch | — Minimum (Fully counter-clockwise) |
| PWR/VOL | — Rotate clockwise to switch on, and increase for desired volume. |

Squelch Control (AM and SSB Reception)

The squelch control is used for elimination of any annoying background noise when no signals are present. To adjust the SQUELCH control properly during reception, turn up VOLUME until background noise is heard and rotate the "SQUELCH" slowly clockwise until the background noise just disappears. Such position of SQUELCH is called the "THRESHOLD LEVEL". At this point, the receiver will be quiet under "no-signal" conditions. Speaker must be operative in case that incoming signal overcomes squelch set above threshold level.

Noise Blanker (AM and SSB reception)

Noise Blanker is specially designed to combat pulse type noise such as ignition noise. But it is not designed for against interference caused by neon, atmospheric and various types of electrical machinery.

RF gain (AM and SSB reception)

Extremely strong signals can be reduced for more comfortable listening by rotating RF gain. Usually, RF gain to be kept at max. position for best sensitivity.

"S" Meter (AM and SSB reception)

During reception, this meter provides relative indication of signal strength of a received signal. Adjustment to be made using AM signal, where $S_9 = 100 \mu V$.

Receive Mode SSB

Set all controls initially as follows:

- CB/PA switch — CB position (Switch-out)
- RF gain — Maximum (Fully -clockwise)
- Mode switch — To be turned on to USB or LSB.
- Fine Tune — Center (12 O'clock position)
- Squelch — Minimum (Fully counter clockwise)
- PWR/VOL — Turn clockwise to switch on. Increase "VOL" to desired level.

If you are unable to clarify the voice or hear the signal, it is possible that the signal is not on the sideband you are using (Transmitting frequency differs from receiving frequency). Switch the transceiver to the another sideband and repeat the adjustment of the "Fine Tune" control in this mode, until you are able to clarify the voice and make it intelligible. Switch to either the USB or LSB mode. Rotate the "Fine Tune" control Very Slowly on either side of 12 O'clock position (between the 7 o'clock position and the 5 o'clock position). Within this range it should be possible to clarify the sound so that the voice becomes intelligible.

TRANSMIT MODE:

It is illegal to operate the transmitter section of this transceiver prior to receiving a valid station license and call sign. Part 95 of the F.C.C. rules and regulations dealing with the Citizens Radio Service must be obtained, read and understand.

- CB/PA switch — Set at CB. (switch out)
- Mode switch — To be selected LSB, AM or USB.

After you have selected the desired mode of operation by means of the LSB-AM-USB selector switch, simply depress the push-to-talk button on the microphone to transmit. On transmitting in the AM mode, be sure that RF power output meter fluctuates in accordance with your voice. This indicates AM modulation. When the press-to-talk button is pressed while in the single sideband mode, the meter will produce no reading until you speak into the microphone and provide modulation.

PUBLIC ADDRESS OPERATION

Special provision has been made in this unit for public address (PA) operation.

For PA operation:-- (CB/PA SWITCH-IN)

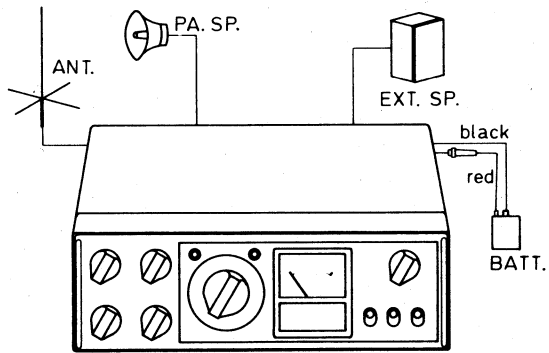
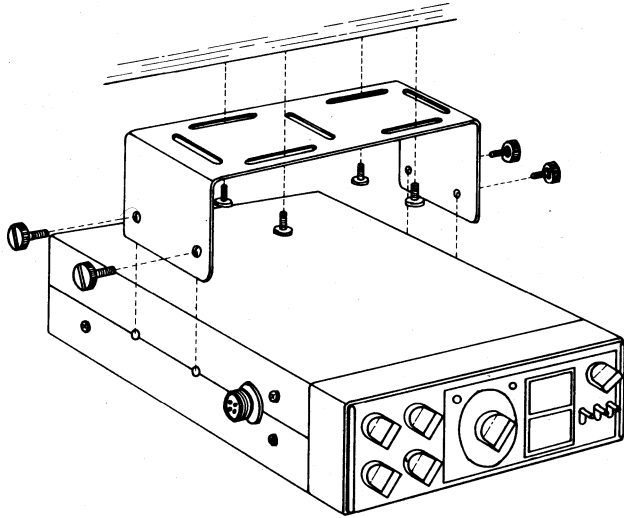
Connect an external 8-16 ohm speaker to "PA-SP" jack. Depress "CB/PA" switch (Switch-In). Press the push-to-talk button on the microphone, speak into the microphone in a normal voice and adjust microphone-lip distance for desired undistorted volume.

CRYSTAL FREQUENCY CHART

| | | 11.000M | 11.050M | 11.100M | 11.150M | 11.200M | 11.250M |
|---------|---------|---------|---------|---------|---------|---------|---------|
| LSB | 8.1635M | 1 | 5 | 9 | 13 | 17 | 21 |
| AM. USB | 8.1665 | | | | | | |
| LSB | 8.1735M | 2 | 6 | 10 | 14 | 18 | 22 |
| AM. USB | 8.1765 | | | | | | |
| LSB | 8.1835M | 3 | 7 | 11 | 15 | 19 | |
| AM. USB | 8.1865 | | | | | | |
| LSB | 8.2035M | 4 | 8 | 12 | 16 | 20 | 23 |
| AM. USB | 8.2065 | | | | | | |

| | | | |
|------|------------|-------|------------|
| 1 ch | 26,965 kHz | 13 ch | 27,115 kHz |
| 2 | 26,975 | 14 | 27,125 |
| 3 | 26,985 | 15 | 27,135 |
| 4 | 27,005 | 16 | 27,155 |
| 5 | 27,015 | 17 | 27,165 |
| 6 | 27,025 | 18 | 27,175 |
| 7 | 27,035 | 19 | 27,185 |
| 8 | 27,055 | 20 | 27,205 |
| 9 | 27,065 | 21 | 27,215 |
| 10 | 27,075 | 22 | 27,225 |
| 11 | 27,085 | 23 | 27,255 |
| 12 | 27,105 | | |

MOBILE INSTALLATION



POWER CONNECTIONS TO VEHICLE

NEGATIVE GROUND:

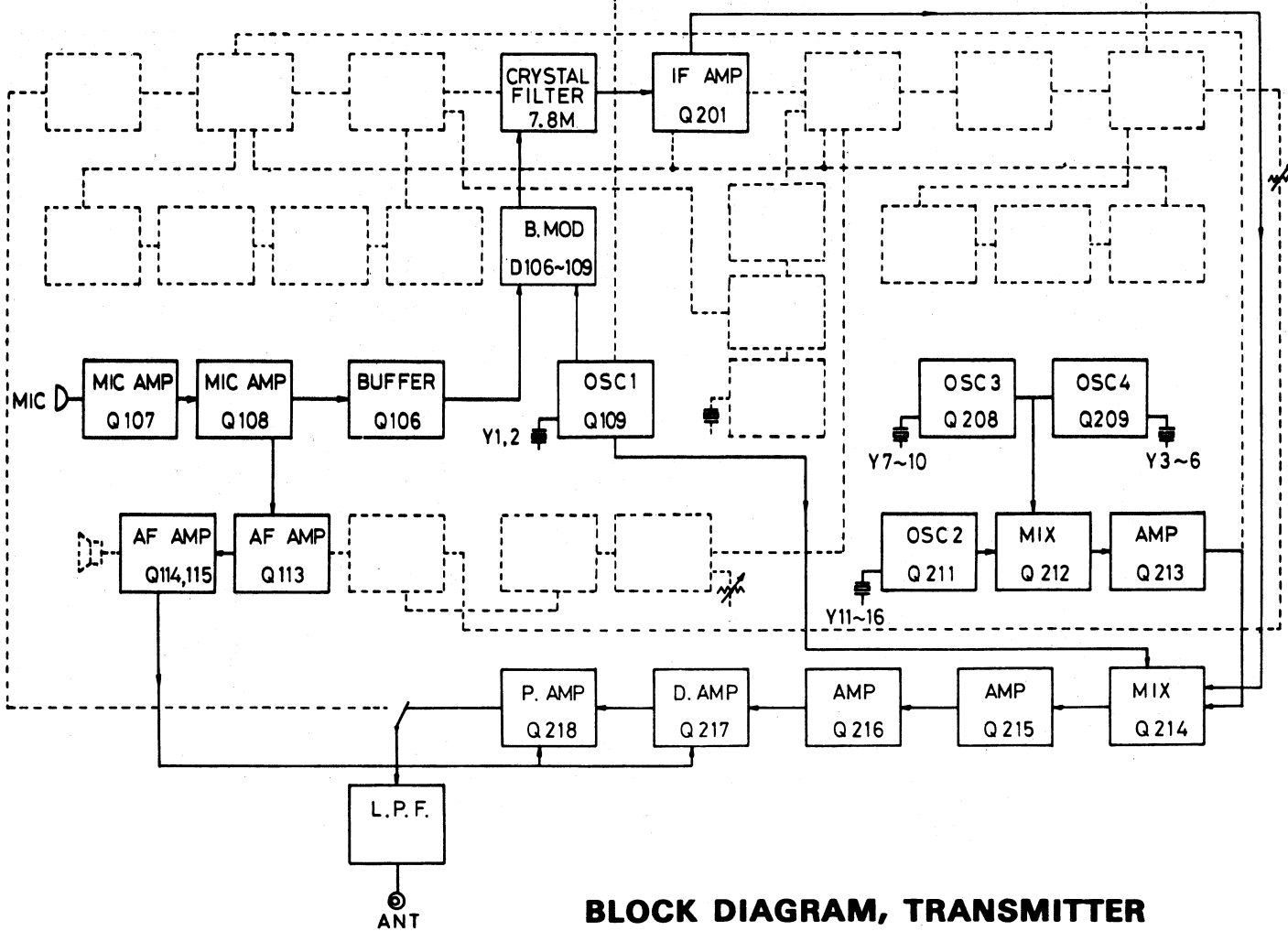
Connect black lead to chassis.

Connect red lead to (POS) hot battery.

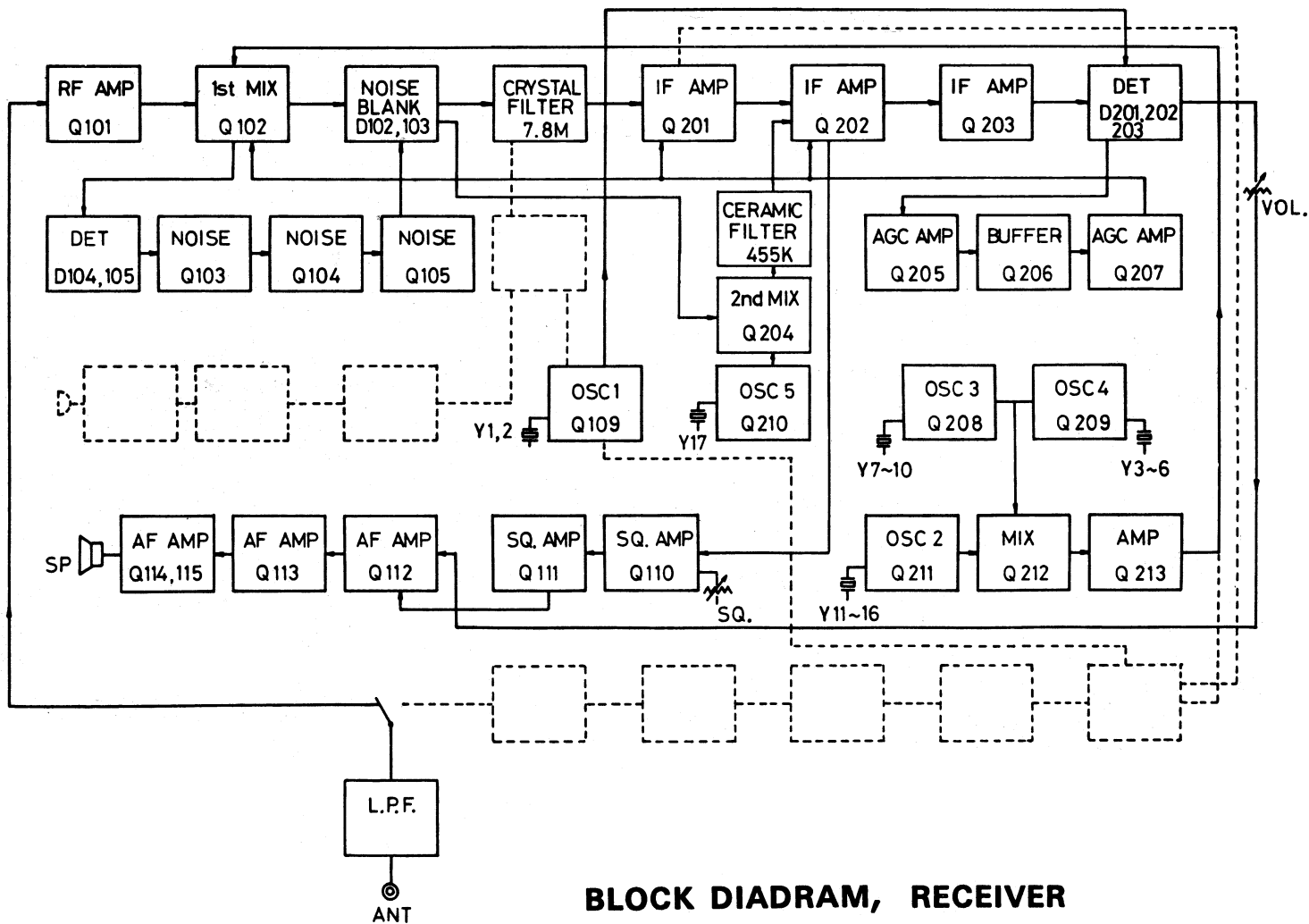
POSITIVE GROUND:

Connect red lead to chassis.

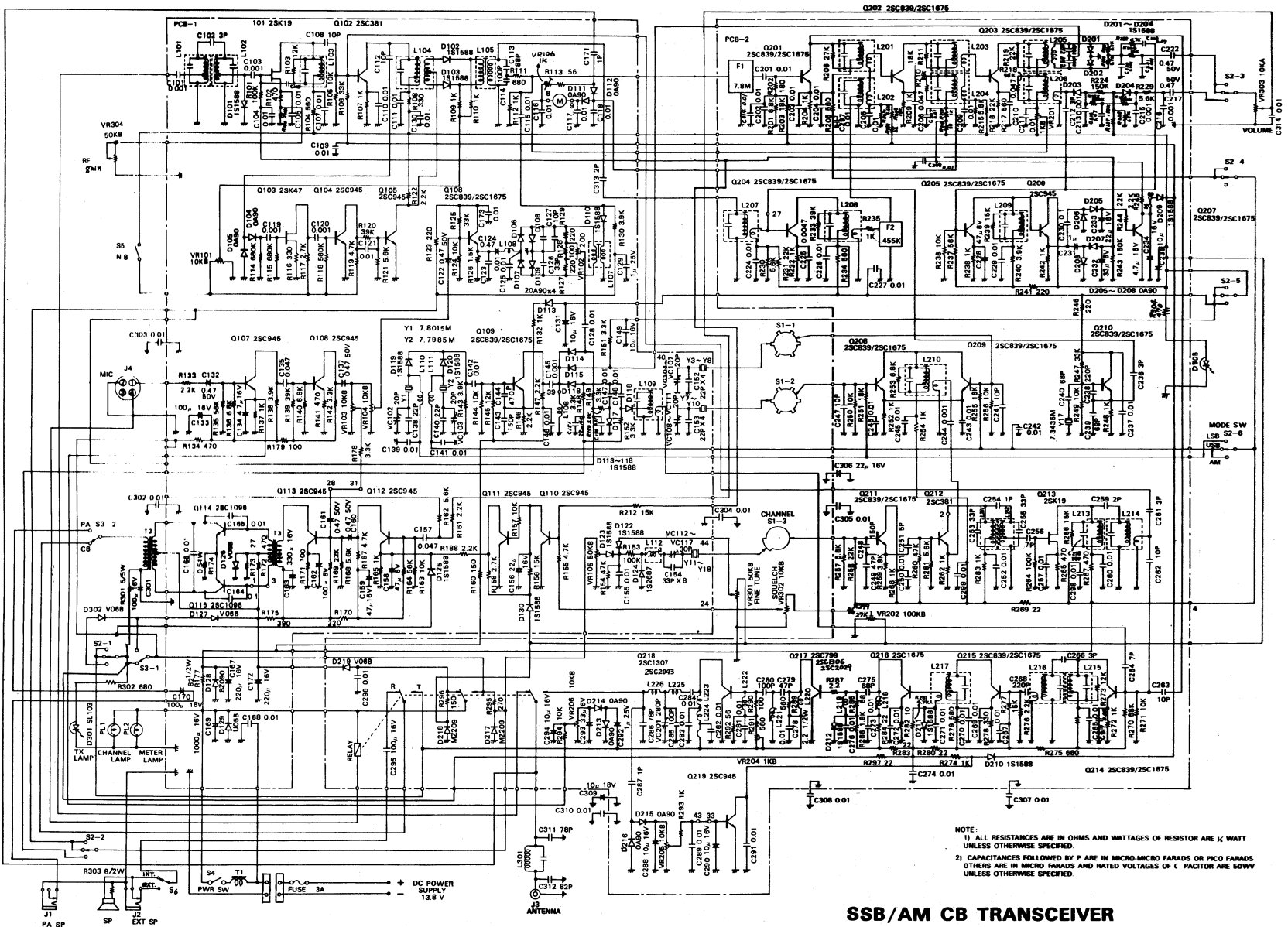
Connect black lead to (NEG) hot battery.



BLOCK DIAGRAM, TRANSMITTER



BLOCK DIAGRAM, RECEIVER



NOTE:
 1) ALL RESISTANCES ARE IN OHMS AND WATTAGES OF RESISTOR ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED.
 2) CAPACITANCES FOLLOWED BY P ARE IN MICRO-MICRO FARADS OR PICO FARADS OTHERS ARE IN MICRO FARADS AND RATED VOLTAGES OF C FACTOR ARE 50WV UNLESS OTHERWISE SPECIFIED.

SSB/AM CB TRANSCEIVER