# Siltronix SSB-23A Owner's Manual

# SSB AND AM

## CITIZENS BAND TRANSCEIVER

## OPERATION AND MAINTENANCE

*SILTRONIX*

# SSB—23A

# 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 IC, 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, and is operated from 23 to 46 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 on 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 limitter (only AM), RF attenuator, fine tune, public address and P-S meter. It is designed for mobile operation such as auto mobiles or ships, and its standard power supply is DC 12V.

**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 VI, FCC RULES AND REGULATIONS from the U.S. Government Printing Office, Washington, D.C. 20402 on an order blank included with the license applicaction instructions.

# SPECIFICATIONS

**General specifications:**

| | |
|---|---|
| * Frequency range | 26.965/27.255 MHz. |
| * Modulation mode | Conventional AM and suppressed carrier SSB |
| * Channel composition | Crystal synthesizer type |
| * Frequency stability | * At room temperature (Within 50 Hz. deviation from assigned frequency)<br>* Temperature varies from −20°C to +50°C. (Within 500 Hz. deviation from assigned frequency) |
| * Polarity of power supply | Both Positive and Negative ground (DC 13.8V) |

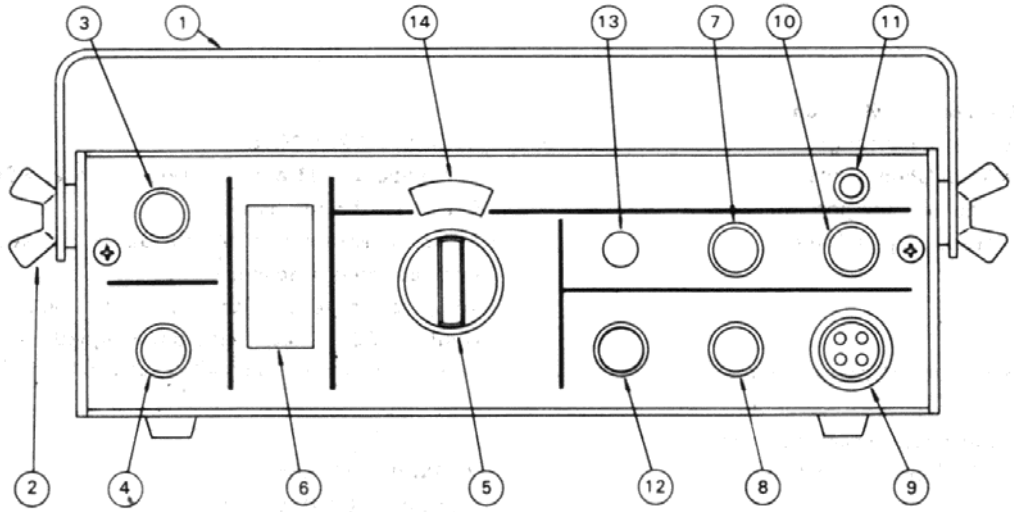
**1. Transmitter specifications:**

| | |
|---|---|
| * RF output on SSB mode | 25 Watts PEP input.<br>12 Watts PEP (Max. rate) |
| * RF output on AM mode | 4 Watts (average carrier power) |
| * Modulation method | Filter method. (SSB) |
| * Spurious radiation | 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 | Hum and noise on RF signal are more than 40dB below the signal. |
| * Antenna impedance | Adjustable for 50 or 52 ohm antenna. |
| * Carrier suppression | More than 40dB below the either signal of two tone on SSB. |

**2. Receiver specifications:**

| | |
|---|---|
| * Reception method on SSB | Single conversion super heterodyne. |
| * Reception method on AM | Double conversion super heterodyne. |
| * Intermediate frequency | 7.8 MHz. (2nd 455 KHz. on AM mode). |
| * Selectivity on SSB | ± 1.2 KHz. at 6 dB, ± 2.3 KHz. at 50dB |
| * Selectivity on AM | ± 3 KHz. at 6dB, ± 10 KHz. at 50dB. |
| * Suprious response | More than 50dB spurious signal requires to produce same amount of audio output as desired signal does. |
| * Audio output | 2 Watts at 10% distortion. |
| * Current drain approx. | 350mA when no audio. |

# OPERATING CONTROLS AND FEATURES




1. Mounting bracket:

Specially designed bracket simplifies mobile installation — has "quick-release" feature for fast removal of transceiver.

2. Wing NUT:

To attach bracket and unit.

3. 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.

4. PWR/VOL:

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

5. Channel Selector:

Dial shows 1-23 channels. The selected channel appears at channel indicator window(14), and also selects "black" mode (between channels 22 and 23).

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$\mu$V.

7. Fine tune:

Permits slight adjustment of receiver tuning used for clarity on SSB reception and fine tuning of stations on AM reception.

**8. Mode switch:**

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

**9. Microphone socket:**

**Four-pin socket for push-to-talk dynamic microphone with curl cord and dependable screw-on connector.**

10. CB/PA Volume:

CB operation to be on when it is rotated fully counter-clockwise, and PA operating when rotated clockwise. PA volume controls PA audio level.

11. Transmit indicator:

To indicate transmit using visible light emitting diode.

12. RF Gain:

Reduces RF gain of receiver on strong signals by rotating it counter clockwise. Usually, it should be kept at fully clockwise position.

**13. Noise Blanker;**

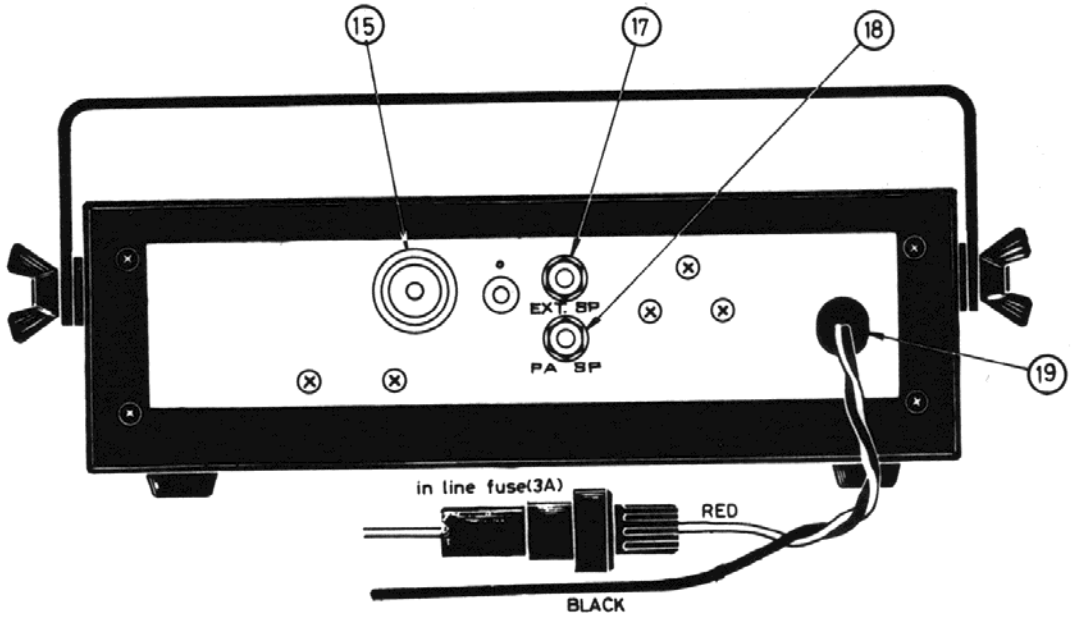
**To push a push button switch on to control noise blanker. Which is very effective against ignition noise.**

**14. Channel indicator window:**

**To indicate transceive channel.**

**15. Antenna connector:**

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




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. |

17. 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

18. 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.

19. Power line:

Power supply available for DC operation only. Red cord is hot (plus) and black cord cold (minus)

# 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 pannel controls as follows:

| | |
|---|---|
| CB/PA VOL | – To be fixed at CB position |
| 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 as "THRESHOLD LEVEL". At this point, the receiver will be quiet under "no-signal" conditions. Speaker must be operated in case that incoming signal overcomes squelch set above threshold level.

RF Gain (AM and SSB reception)

Noise Blanker is specially designed to combat pulsetic noise such as ignition noise. But it is not designed for use against interferences to be caused by neon, atmospheres 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 counter clockwise. Usually, volume to be kept at full clockwise position for best sensitivity.

**"S" Meter (AM and SSB reception)**

During reception, this meter provides a relative indication of signal strength of a receiving signal. Adjustment to be made in accordance with AM signal, at S9 on 100$\mu$V.

**Receive Mode SSB**

Set all controls initially as follows;

| | | |
|---|---|---|
| CB/PA VOL. | — | To be set at CB position (Depressed) |
| 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 | — | To be turned on clockwise and switch to be turned on. "VOL" to be set at optional position. |

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 other 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 VOL | — | To be set at CB. |
| 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 of meter fluctuates in accordance with your voice as you transmit the single sideband signal. This provides 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:—**

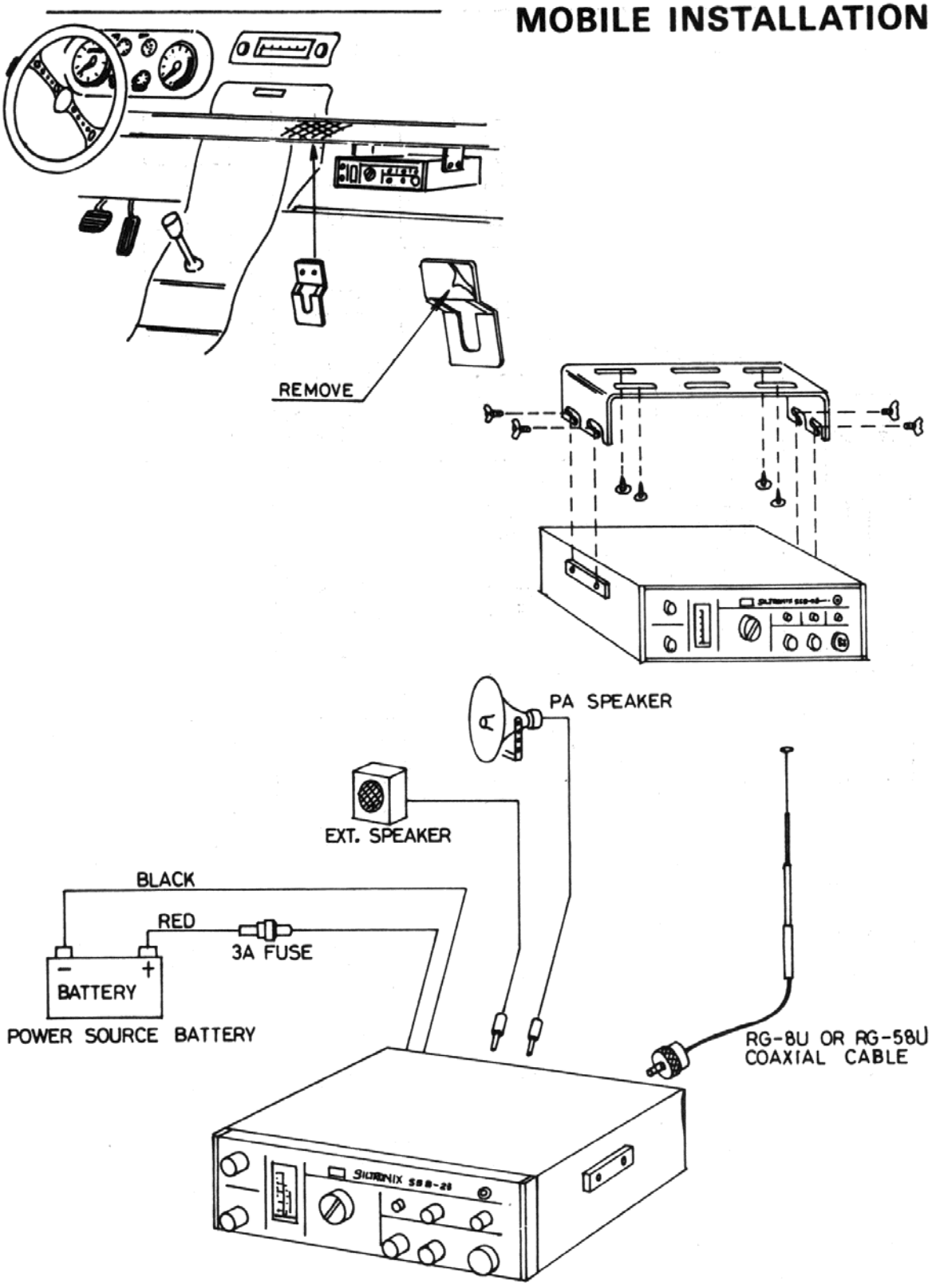
Switch on clockwise "CB/PA VOL" switch and use an external 8-16 ohm speaker connected to "PA SP" Jack. Press the push-to-talk button on the microphone and talk into it setting (4) "PA VOL" at minimum position. Adjustment of output from PA speaker should be done by "PA VOL". Rotating "VOL" clockwise, and output should be increased.

**CRYSTAL FREQUENCY CHART**

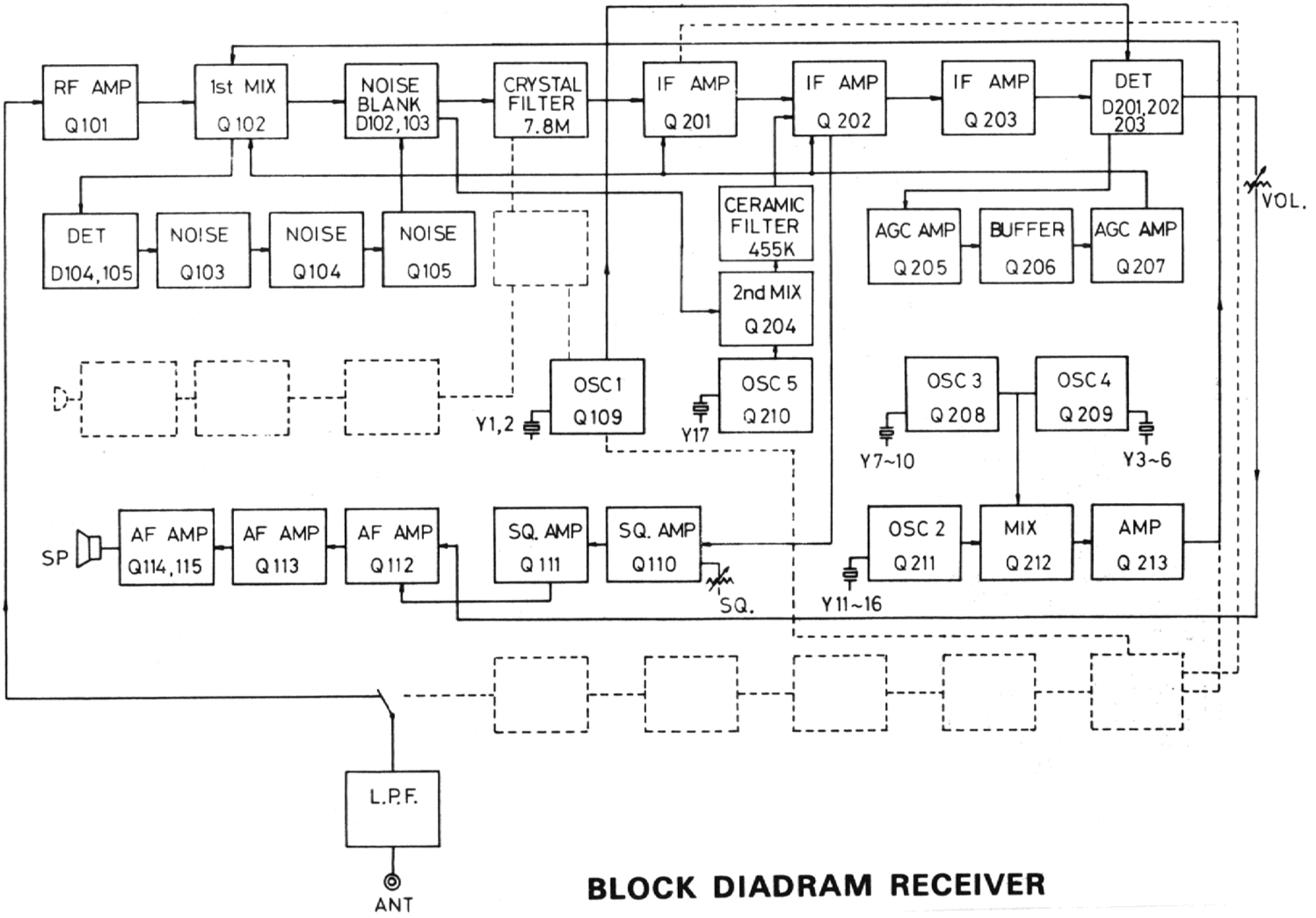
| | 11,705M | 11,755 | 11,805 | 11,855 | 11,905 | 11,955 |
|---|---|---|---|---|---|---|
| LSB 7,4585M<br>AM. USB 7,4615 | 1 | 5 | 9 | 13 | 17 | 21 |
| LSB 7,4685M<br>AM. USB 7,4715 | 2 | 6 | 10 | 14 | 18 | 22 |
| LSB 7,4785M<br>AM.USB 7,4815 | 3 | 7 | 11 | 15 | 19 | |
| LSB 7,4985M<br>AM.USB 7,5015 | 4 | 8 | 12 | 16 | 20 | 23 |

| | | | | | |
|---|---|---|---|---|---|
| 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 | | | | |

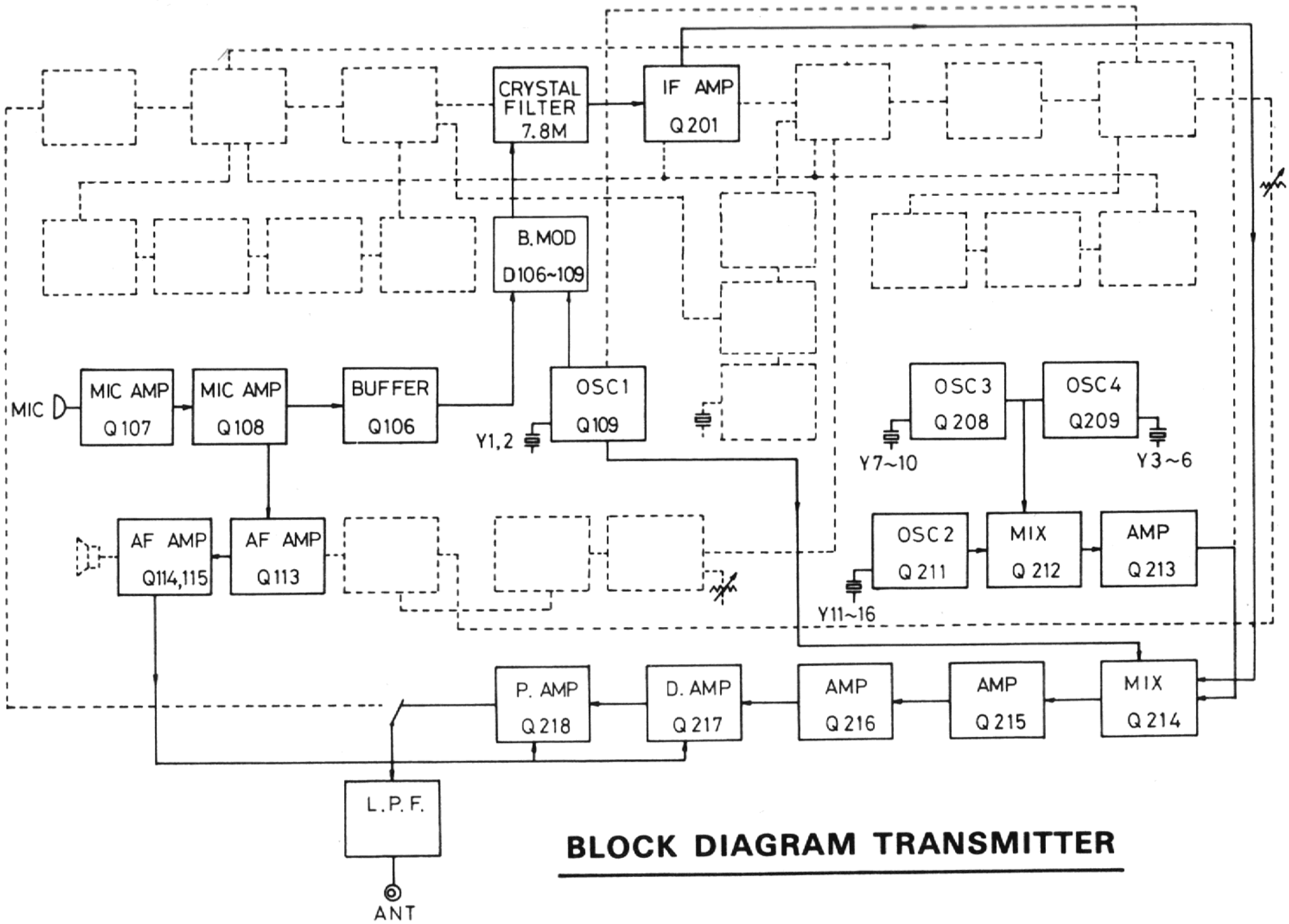
# MOBILE INSTALLATION




# INSTALLATION




**BLOCK DIADRAM RECEIVER**




# BLOCK DIAGRAM TRANSMITTER