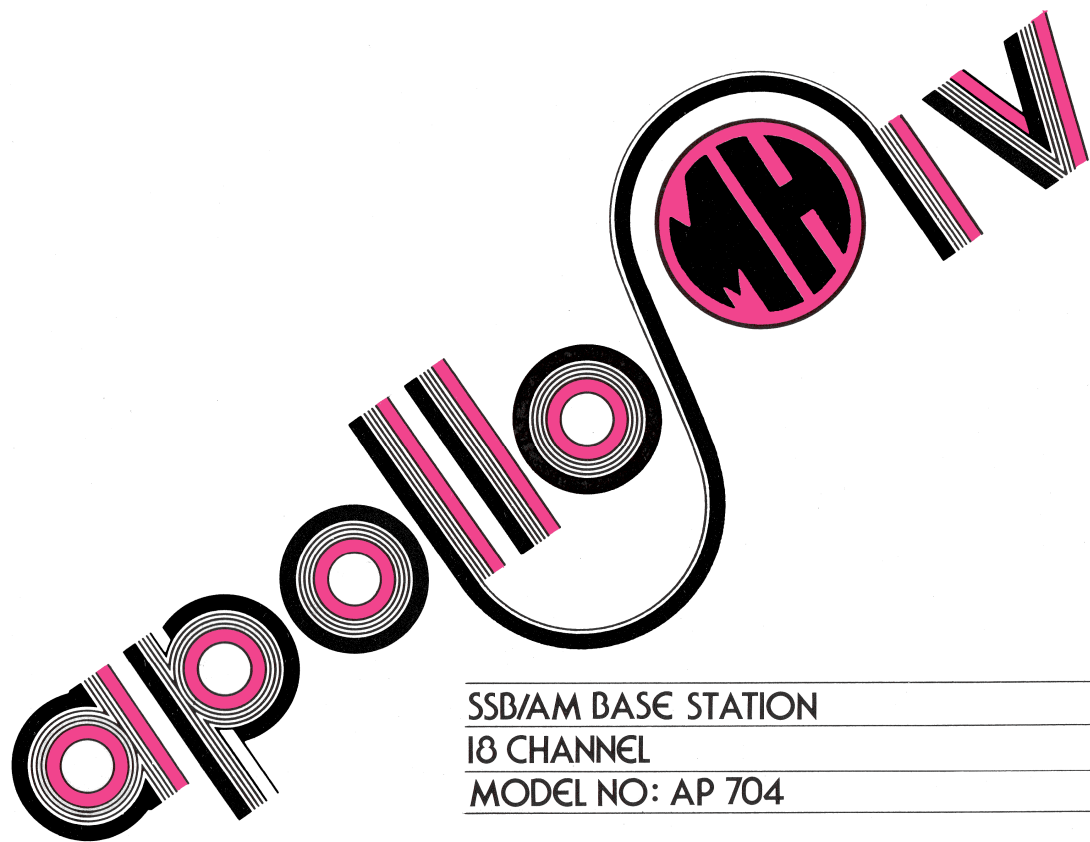


INSTRUCTION MANUAL AND WARRANTY CARD



SSB/AM BASE STATION
18 CHANNEL
MODEL NO: AP 704

Introduction

Thank you for your confidence in selecting **Apollo-IV** two-way radio. We know you will find your transceiver as exciting as it is practical. Only the highest quality components are incorporated into **Apollo-IV** to assure reliability and maximum performance.

Installing and operating the **Apollo-IV** is not complicated, but the flexibility provided by its many features may not be fully appreciated until a little time is spent becoming familiar with its controls and connections.

It will be to your advantage to save all the packing materials — carton, fillers, cushionings, etc., they will prove valuable in preventing damage should you ever have occasion to transport or ship the **Apollo-IV**.

Licensing Information

Operation of this equipment requires a valid station license issued by the **P and T [Postal and Telecommunications Department]**. Do not transmit with your equipment until you have received your license. Be certain that you have read the **P and T Form RB 14** rules and regulations before operating your station. Licensing application is to be made on a **P and T Form RB 13**. A copy of this Form is furnished with your transceiver.

Installation

The transceiver should be placed in a convenient operating location close to an ac power outlet and the antenna lead-in cable. To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

Connections

The **Apollo-IV** is supplied with built-in ac power cord and detachable dc power cable. **Do not use both power supply cable at the same time.** Proceed as follows to complete all necessary connection to the transceiver.

1. Connect the antenna cable plug to the standard receptacle on the rear panel. Most CB antennas are terminated with a type **PL-259** plug and mate with the receptacle of your transceiver.

2. **AC Power Operation.** This transceiver has been designed primarily for ac-power-supplied base station use. Before inserting the ac plug into outlet, make sure your transceiver is **off**. Insert the ac plug at the end of the cable firmly into an ac outlet supplying **240 volts, 50 or 60 Hz ac**. Also make sure, when in ac operation, the dc power cable plug is disconnected from the transceiver. For protection, the ac input circuit of the transceiver is fused at the rear panel.

3. **DC Power Operation.** Your transceiver is capable of operation from a dc power supply source of 13.8 volts with low current drain, such as a battery in the vehicle. This expedient feature exhibits its convenience upon such cases as, power failure, camping site, on board, emergency or mobile. First make sure the vehicle on which you are going to install the transceiver is **negative ground system**. **Do not install the transceiver in a positive ground type vehicle.** Failure to do so may cause irrevocable damage to transceiver and your vehicle. Connect the dc power cable plug to the dc

power socket on rear panel of the transceiver. The **red** lead at the power cable connects to the **positive** [+] pole of the battery or electrical system and the **black** lead connects to the **negative** [-] pole of the battery or suitable chassis ground.

4. Mount the microphone hanger to any convenient location close the transceiver.

Noise Interference

There are several kind of noise interfering you may encounter in base station operation. Some of these noise sources are, from nearby commercial broadcast, electrical appliance, lawnmower etc., florescent buzz, static from electrical storms. Commercial products are available to reduce interference from these sources. Consult with your dealer or CB/amateur radio supply shop.

Antenna

Only a properly matched antenna system will allow maximum power transfer from the **52 ohms** transmission line to the radiating element. **Note** that except in special circumstances approved by **P and T** department, the use of parasitic or driven elements to provide aerial gain is not permitted. However, reactive loading of aeriels may be employed. A vertically polarized quarter wave length antenna provides the reliable operation and greater range. We suggest vertical ground plane antennas are omnidirectional that provide optimum performance for contacting other fixed stations using vertical type antennas in addition to all mobile stations. For a short range communications within buildings, from building to building, or mobile [dc] operation, a short center-

loaded whip antenna is available for use with your transceiver. A standard antenna connector is provided on the transceiver for easy connection to a standard cable termination.

Remote Speaker Connection

The external speaker jack [marked EXT SP] on the rear panel is used for remote receiver monitoring. The external speaker should have 8 ohms impedance and be able to handle at least 3 watts. When the external speaker is plugged in, the internal speaker is disconnected.

Public Address

An external 8 ohms, 3 watts speaker must be connected to the **PA SP** jack located on the rear panel when the transceiver is used as a public address system. The speaker should be directed away from the microphone to prevent acoustic feedback. Physical separation or isolation of the microphone and speaker is important when operating at high output levels.

Control Functions

There are 10 controls and 2 indicators on the front panel of your **Apollo-IV**.

Power Switch. Depress to apply power to the transceiver.

Tone. This switch changes tonal quality of received sound. **Hi** position sounds high-pitched and **Lo** position sounds soft, respectively.

Volume/PA. Turn clockwise to set the desired listening level or PA level.

Squelch. This control is used to cut off or eliminate receiver background noise in the absence of incoming signal. For maximum receiver sensitivity it is desired that the control be adjusted only to the point where the receiver background noise is eliminated. Turn fully

counterclockwise then slowly clockwise until the receiver noise disappears. Any signal to be received must now be slightly stronger than the average receiver noise. Further clockwise rotation will increase the threshold level which a signal must overcome in order to be heard. Only strong signals will be heard at a maximum clockwise setting.

RF Gain. This controls the strength of an incoming signal. If a signal received is very weak, turn the knob clockwise. If you are listening to a very strong signal, turn counterclockwise.

LSB-USB-AM. This control selects the mode of operation in either standard **AM**, **upper sideband** or **lower sideband** mode. Transmissions in the AM or sideband modes can only be communicated to a stations operating in the same mode.

Clarifier. This control provides fine tuning of the receiver. On regular AM reception, this will permit adjustment of off-frequency transmissions. In the SSB modes [either LSB or USB], this control is used as a voice clarifier to adjust for

clearer voice reception.

Channel Selector. This switch selects one of the eighteen Citizens Band channels desired. The selected channel is digitally displayed directly in the window above the Channel Selector knob. Channels 1 through 4, and 7 through 18 may be used for communications between stations operating under the same license. Channel 5 has been reserved for emergency communications involving the immediate safety of life of individuals or immediate protection of property. Channel 6 may also be used for calling particularly.

CB-PA. This switch selects the mode of operation. The PA [public address] function should not be used unless an external speaker is connected as described in **Public Address** section in page 2. In the CB position, the PA function is disabled and the unit will transmit and receive on the selected channel.

NB [Noise Blanker]. In the NB position, the RF noise blanker is activated. The RF noise blanker is very



effective for repetitive impulse noise such as ignition interference.

Channel Indicator. This is an LED [light emitting diode] digital read-out [located above Channel Selector knob] which indicates the channel selected by the Channel Selector.

Meter. This meter shows relative strength of incoming signal from antenna, and transmit output power. The meter is illuminated when power is on.

Push-to-Talk Microphone

The receiver section and transmitter section are controlled by the **Push-to-Talk** switch on the side of microphone [supplied]. Press the switch and transmitter is activated, release switch to receive. When transmitting hold the microphone 5 or 6 centimeters from your lips and speak at a normal voice. The radio will not be operational without connecting the low impedance dynamic microphone supplied with, thus avoiding unauthorized use of your transceiver.

Receive Operation

Connect the microphone to the radio then proceed as follows.

1. Place the **CB-PA** switch in the **CB** position.
2. Rotate the **Squelch Control** in full counterclockwise position.
3. Rotate the **RF Gain Control** in full clockwise position.
4. Temporarily, place the **LSB-USB-AM** switch in **AM** position.
5. Turn the unit on by rotating the **Volume Control** clockwise and set the

knob for a comfortable listening level.

6. Select a channel that is unoccupied by any other station and turn the **Squelch Control** slowly clockwise until the hissing noise just disappears. [Refer to the appropriate section under **Control Functions** in page 2.]

7. Adjust the **LSB-USB-AM** switch and the **Clarifier** for advanced SSB reception. The knack of adjusting the **Clarifier** is very critical and important when listening to an SSB signal. We suggest that you spend some time to get familiar with it by referring to the appropriate section previously mentioned.

Transmit Operation

After you have checked that the channel you have chosen is so clear that no one will be interrupted by your transmission, proceed as follows.

1. Select the mode of transmission, **LSB, USB, or AM.**
2. Again, make sure that the channel is unoccupied.
3. Depress the **Push-to-Talk** switch on the microphone.
4. Speak in a normal tone of conversational voice. Do not transmit the unmodulated wave [carrier] as doing so may result in violation of the rules.
5. To stop transmission and receive release the **Push-to-Talk** switch.

Public Address Operation

For this specially equipped feature of the transceiver, a speaker with an impedance of 8 ohms and power handling

capability of 3 watts at least should be required. Use **PA SP** jack on the rear panel of the radio for its connection using 3.5 millimeter ϕ [subminiature] plug [available from your nearest radio/CB supply shop].

Be sure that there is physical separation between the microphone and the PA speaker itself. If the speaker is located close to the microphone, acoustic feedback will result when the public address is operated at very high volume.

Maintenance

The **transceiver** is specifically designed for the environment encountered in mobile installation. The use of fully transistorized circuitry containing very reliable IC and semiconductors result in high stability and reliability in base operation. Should a failure occur, however, replace parts only with identical parts authorized by **Apollo**. Do not substitute. Refer to the schematic diagram.

Adjustment

The **Transceiver** is factory aligned and should not require any adjustment when used with 52 ohms antenna. If any antenna other than 52 ohms impedance is used, adjustment of the transmitter output circuit may be made to obtain optimum power transfer to the antenna. This adjustment should be made only by qualified personnel using a high quality measurement equipment.

Note

If the performance described in the **Receive and Transmit Operation** section can not be obtained, review the instructions to insure that proper pro-

cedures were followed. If a problem still exists, ask your dealer of **Apollo** or from which you purchased the **Apollo-IV** for specific servicing information. They will meet your needs gratefully.

Technical Specifications

General

Frequency Composition:

PLL [phase locked loop] synthesization.

Frequency Range:

27.015 to 27.225 MHz.

Channels:

18.

Frequency Tolerance:

$\pm 0.005\%$

Operating Temperature:

-30°C to 50°C .

Operating Voltage:

240 volts, 50 or 60 Hz ac, or 13.8 volts [nominal 12 volts] dc.

Emission Type:

Lower sideband, Upper sideband, or AM.

Receive Portion

Sensitivity at 10 dB S/N [AM]:

1 microvolts.

Sensitivity at 10 dB S/N [SSB]:

0.25 microvolts.

IF response at 6 dB down [AM]:

6 kHz.

IF response at 6 dB down [SSB]:

2.5 kHz.

Clarification:

± 800 Hz.

Audio Output Power at 8 ohms:

3 watts.

Squelch Range:

0.5 to 300 microvolts.

Intermediate Frequencies [AM]:

10.695 MHz [1st], 455 kHz [2nd].

Intermediate Frequencies [SSB]:

10.695 MHz.

Transmit Portion

Single Sideband Generation:

Double-balanced modulation with crystal lattice filter.

RF Output Power [AM]:

4 watts maximum per **P** and **T** rules, at 240 volts 50 or 60 Hz ac or 13.8 volts dc.

RF Output Power [SSB]:

12 watts maximum of PEP per **P** and **T** rules, at 240 volts 50 or 60 Hz ac or 13.8 volts dc.

Spurious Suppression:

60 dB down.

Carrier Suppression [SSB]:

40 dB down.

Opposite Sideband Suppression [SSB]:

60 dB down.

Citizens Band Frequency Equivalent Chart

Channel	Frequency [MHz]	[U.S. Radio Channel]
1	27.015	5
2	27.025	6
3	27.035	7
4	27.055	8
5*	27.065	9
6*	27.085	11
7	27.095	—
8	27.105	12
9	27.115	13
10	27.125	14
11	27.135	15
12	27.155	16
13	27.165	17
14	27.175	18
15	27.185	19
16	27.195	—
17	27.205	20
18	27.225	22

* Channel 5 shall be used for emergency, and Channel 6 for calling generally.

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