

# ALPHA

INSTRUCTION MANUAL

FOR

ALPHA 1000 AM/FM

© www.ham-international.eu

## SPECIFICATIONS

### TRANSMITTER SECTION

POWER OUTPUT . . . . .	4 Watt Max (AT 13.8V DC)
EMISSION . . . . .	6A3 (AM), F3E (FM)
SPURIOUS RESPONSE REJECTION . . . . .	All harmonic and spurious suppression greater than F.C.C. and D.O.C. requirements
MODULATION . . . . .	AM. 90% typical
FM DEVIATION . . . . .	±1.5KHz typical

### RECEIVER SECTION

CIRCUIT TYPE . . . . .	Dual conversion superheterodyne with RF stage and 455 KHz ceramic filter
FREQUENCY . . . . .	1 crystal-controlled PLL, 40 channels in the 27 MHz Citizens Band
SENSITIVITY . . . . .	1.0 $\mu$ V for 10 dB S/N
SQUELCH RANGE . . . . .	1mV
SELECTIVITY . . . . .	60 dB down at + 10 KHz
IF FREQUENCY . . . . .	1st IF: 10.695 MHz 2nd IF: 455 KHz
IMAGE REJECTION . . . . .	55 dB
AUDIO OUTPUT . . . . .	2.5 W maximum at 8 ohm load
CURRENT DRAIN . . . . .	250 mA on standby (no signal)
CURRENT DRAIN (MAXIMUM) . . . . .	Less than 1.5A
ANTENNA . . . . .	Nominal 50 ohms impedance
POWER SOURCE . . . . .	Operates from nominal 13.8 volts DC, negative ground system
DIMENSIONS (HOUSING) . . . . .	5.12"W x 6.85"D x 1.34"H
WEIGHT . . . . .	1.9 lbs

## THE FCC REQUIRES A LICENSE BEFORE YOU OPERATE THIS TRANSCEIVER

This model is designed to operate under FCC Rules and Regulations Part 95. Operation of this unit is not permitted until you have obtained the necessary FCC license. The Class D Citizens Band License may be obtained by any citizen over 18 years of age by filling out FCC License application form 505. You are required to read and understand the applicable FCC rules and regulations. These can be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D.C., requesting Volume VI of FCC Rules and Regulations (which includes Part 95). When you sign the application form you certify that you have read the rules and regulations. Remember courtesy on the air is the mark of a good operator. Always listen before you transmit. Choose the least crowded frequency for your communications.

### DESCRIPTION

This model is an all-transistor 2-way radio transceiver for mobile operation. A frequency synthesizer circuit provides 40 crystal controlled PLL transmit and receive channels in the 27 MHz Band, engineered for trouble-free performance. Your transceiver uses heat resistant transistors in all critical areas. Current drain on 12 volts DC is exceptionally low. Operation over long periods is feasible even with your engine turned off. The transceiver may also be operated from A.C. when used with an optional Power Supply.

### RECEIVER

The receiver is a sensitive and highly selective dual-conversion superheterodyne type providing crystal-controlled PLL operation on all 40 CB channels. The circuit incorporates an effective full time Automatic Noise Limiter in the audio stages. A ceramic filter provides sharp selectivity and high adjacent channel rejection. As a result, transmissions on adjacent channels cause minimum interference.

A variable squelch control is incorporated to "silence" the receiver when no signals are being received. The squelch circuit is adjustable providing varying degrees of sensitivity to incoming signals.

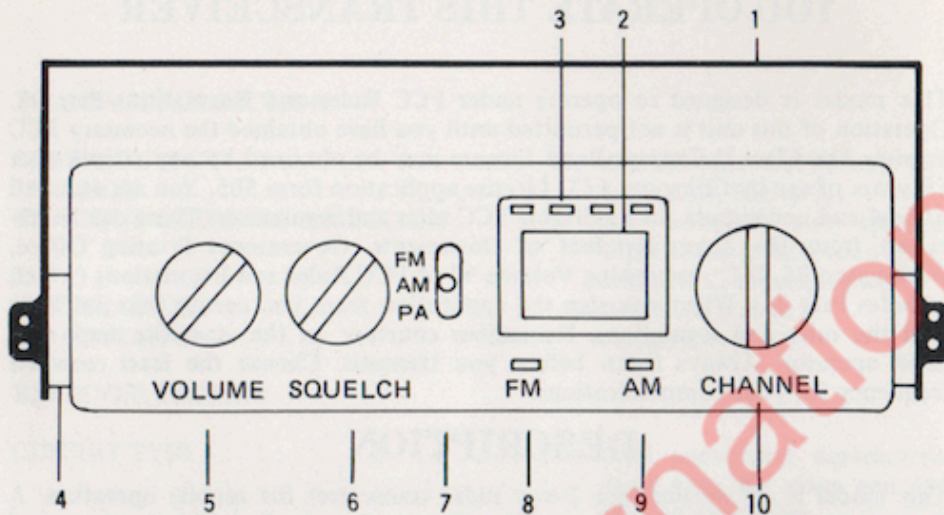
### TRANSMITTER

The transmitter offers crystal-controlled operation on all 40 CB channels, 5 watt DC power input to the final RF with average modulation capabilities is possible by the use of high-efficiency Transistors and low loss components, wiring, and mounting boards, The legal limit of power for this service is provided.

### POWER SUPPLY

The transceiver is ready for connection to a 12 volt DC, negative ground system. DC power is provided to the transceiver by means of a fused power lead.

## OPERATING CONTROL AND FEATURES

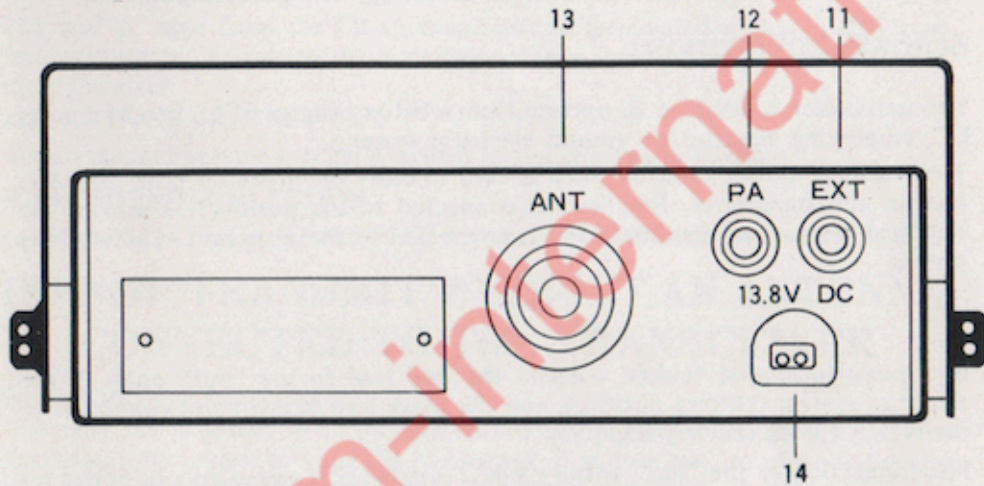


- (1) MOUNTING BRACKET . . . . . Bracket simplifies installation for removal of unit.
- (2) L.E.D. DISPLAY . . . . . L.E.D. (Light Emitting Diode) indicates the channel selected by 40 position rotary-switch.
- (3) TX/RX SIGNAL METER . . . . . At receive mode, some or all of the LEDs will light up indicating the strength of the incoming signals by the number of LEDs. In the transmit mode, it indicates the relative RF power output.
- (4) MICROPHONE INPUT . . . . . 4 pin socket for push-to-talk microphone.
- (5) ON-OFF/VOLUME . . . . . Controls output from the built-in speaker, or external speaker connected to the "EXT SP" or PA jack (rear of transceiver). Incorporates "ON-OFF" power switch at the extreme counter-clockwise position.
- (6) SQUELCH CONTROL . . . . . Used to quiet the receiver during absence of receive signals. Sensitivity to incoming signals is fully adjustable.
- (7) FM/AM/PA SWITCH . . . . . Changes your CB system from a CB function, using the internal speaker, to a Public Address function.

FOR FM OPERATION: set the front slide switch (FM/AM/PA) to FM position and the unit will be fixed to FM mode.

FOR AM OPERATION: set the front slide switch (FM/AM/PA) to AM position and the unit will be fixed to AM mode.

- (8) FM LAMP . . . . . When FM/AM/PA switch select FM mode FM LAMP will be lighted.
- (9) AM LAMP . . . . . When FM/AM/PA switch select AM mode AM LAMP will be lighted.



- (10) CHANNEL SWITCH . . . . . This rotary switch selects one of 40 channels for transmit and receive operation.
- (11) EXTERNAL SPEAKER JACK . . Impedance of any device such as head-phone connected to this jack should be 8-16 ohms. Insertion of plug into jack automatically silences the transceiver internal speaker.
- (12) PA SPEAKER JACK . . . . . For Public Address (PA) operation. Horn impedance should be in 8-16 ohm range.
- (13) ANTENNA CONNECTION . . . . To match antenna lead-in cable (RG-58/U or RG-8U) with PL-259 type coaxial connector.
- (14) DC POWER CABLE . . . . . 12 volts DC for transceiver supplied.

## TRANSCEIVER INSTALLATION

### MOUNTING

Always mount where controls are readily accessible, Unit may be mounted to the underside of the dashboard of a car, truck, etc., utilizing special bracket included with transceiver.

Attach bracket to the underside of dashboard using the self-tapping screws supplied. Attach the transceiver to the bracket using the two knurled securing screws at the side.

Tilt the unit to the most convenient angle before tightening securing screws.

### DC POWER CONNECTIONS

The transceiver is designed to operate from a battery source of 11.5 to 14.5 volts DC, employing negative or ground electrical systems.

The fused DC power cable supplied is used to make the necessary power connection to the transceiver. Red lead is connected to the positive (+) side of the electrical system and the black lead is connected to the negative (-) side of the system.

In a negative ground vehicle, connect the Red lead to the "hot" point in the electrical system (battery positive), and the Black lead to any point connected to the vehicle chassis (battery negative).

For connection to the "hot" battery side a suitable post can usually be found on the fuse block. The transceiver draws a maximum of 1.5 ampere of current, therefore you can use a terminal which supplies power to the Radio or other accessory (Use the unfused input side. The DC power cable is equipped with its own fuse). Connection at this point will ensure DC power is automatically cut off to the transceiver when the ignition is turned off.

**IMPORTANT:** DC VOLTAGE AT THE TERMINAL SELECTED ON THE FUSE BLOCK MUST BE AT LEAST 11.5 VOLTS FOR PROPER OPERATION.

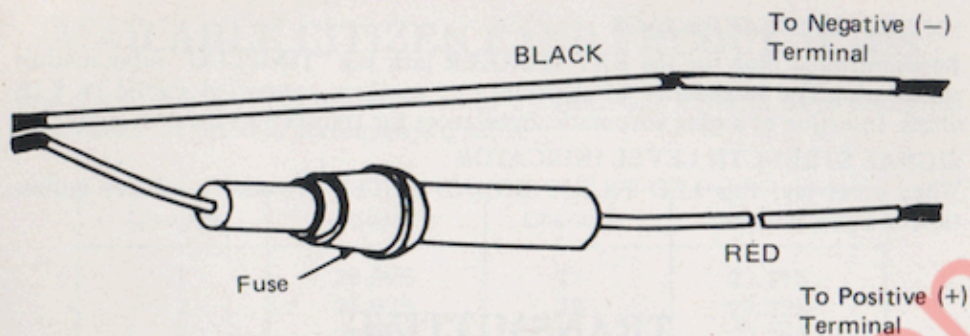


FIGURE 4. CONNECTING DC POWER CORD

#### ANTENNA CONNECTION

The lead-in cable from the CB antenna must be terminated with a PL-259 type male connector. Attach to the matching antenna input connector at the rear of the transceiver.

#### MICROPHONE BRACKET

Attach the microphone bracket provided to any convenient location.

#### MICROPHONE CONNECTION

Insert the 5 pin plug at the end of the coiled cord into the microphone socket.

### DO NOT TRANSMIT WITHOUT AN ANTENNA CONNECTED TO THE TRANSCEIVER.

#### IGNITION INTERFERENCE

Normally the suppression on modern automotive engines is adequate to prevent annoying interference to your CB transceiver. If it does not, consult your dealer who will recommend additional suppression measurements.

#### RECEIVING

1. Select desired channel using the channel Selector Switch.
2. Rotate "squelch" control to the extreme counter-clockwise position.
3. Rotate the "VOLUME/ON-OFF" switch clockwise, to apply power. Operation will be instantaneous.
4. Set the "VOLUME/ON-OFF" switch clockwise to a comfortable listening level (approximately 1/3 setting). The receiver is now ready to operate.

#### SQUELCH ADJUSTMENT

The Squelch control eliminate annoying background noise in the absence of signals. To adjust the SQUELCH control properly turn up VOLUME until background noise is heard. Rotate the SQUELCH slowly clockwise until the background noise just disappear. At this point the receiver will be quiet under "no-signal" conditions, however a reasonable strength incoming signal will overcome the squelch action and be heard. As the control is advanced the squelch action is progressively increased and stronger incoming signals are needed to overcome it. To receive weak signals or to disable the squelch circuit turn the control fully counter clockwise.

#### EXTERNAL SPEAKER JACK

Recommended plug for the EXT SPEAKER jack is a "TINIPLUG" subminiature phone plug. The impedance of earphones or speakers connected should be 8-16 ohms. Insertion of a plug automatically silences the transceivers internal speaker.

#### SIGNAL STRENGTH LEVEL INDICATOR

When receiving, this LED TX/RX SIGNAL METER provides a relative indication of signal strength.

## TRANSMITTING

Prior to operating your transmitter do the following:

1. Your Class D citizens band equipment license must be posted at the main control station location.
2. A properly executed mobile identification card, 452C, must be affixed to the mobile unit.
3. Rules Part 95 must be read and understood.

To transmit, depress the push-to-talk button on the microphone. The Red Transmit Indicator light will come on and will "flicker" slightly as you speak into the microphone. Use the microphone like a telephone speaking several inches from the face. Do not shout, use a normal speaking voice.

When you are transmitting, the receiver is silenced and reception is, therefore, impossible. In the same way, your signal cannot be heard by another station when he is transmitting – each must take turns. To receive again, simply release the microphone push-to-talk button.

#### LED S/P-RF LEVEL INDICATOR

In transmit position the LED TX/RX SIGNAL METER gives a relative indication of antenna RF power output. As you speak, the pointer should "flicker" slightly, indicating you are modulating the RF carrier.

The RF power meter will read true antenna power output when the transceiver is connected to a 50-OHM resistive load. The level indicator indication will not be accurate if the load is mismatched but this will not adversely affect operation if a standard good quality antenna is used.

## USE AS PUBLIC ADDRESS SYSTEM

Provision has been made for Public Address (PA) operation utilizing the microphone and audio stages in the transceiver. For PA operation, use an external high-efficiency public address horn-type speaker with an impedance range of 8 to 16 ohms. Connect to the PA jack on the rear panel of the transceiver. The required plug is a subminiature phone plug. For Public Address (PA) operation, switch CH9/CB/PA SWITCH to PA position.



## AVAILABLE CITIZEN BAND FREQUENCIES

Your transceiver provides operation on all available U.S. Citizens Band channels. Frequencies are listed in accompanying table.

Channel	Frequency	Channel	Frequency
1	26.965	21	27.215
2	26.975	22	27.225
3	26.985	23	27.255
4	27.005	24	27.235
5	27.015	25	27.245
6	27.025	26	27.265
7	27.035	27	27.275
8	27.055	28	27.285
9	27.065	29	27.295
10	27.075	30	27.305
11	27.085	31	27.315
12	27.105	32	27.325
13	27.115	33	27.335
14	27.125	34	27.345
15	27.135	35	27.355
16	27.155	36	27.365
17	27.165	37	27.375
18	27.175	38	27.385
19	27.185	39	27.395
20	27.205	40	27.405

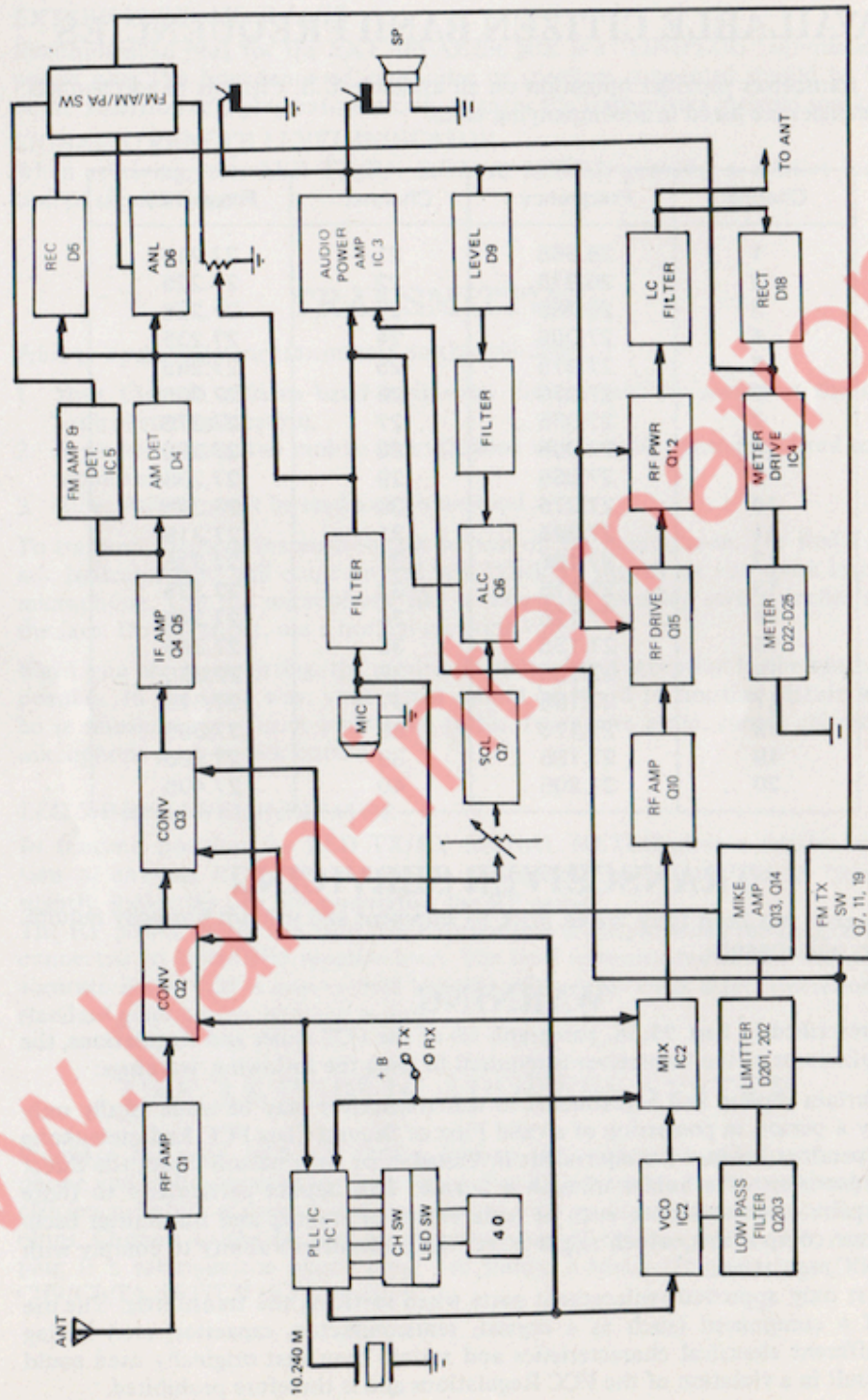
## TRANSCIVER SERVICING

Transceiver has been fully tested prior to shipment and will not normally require further adjustments.

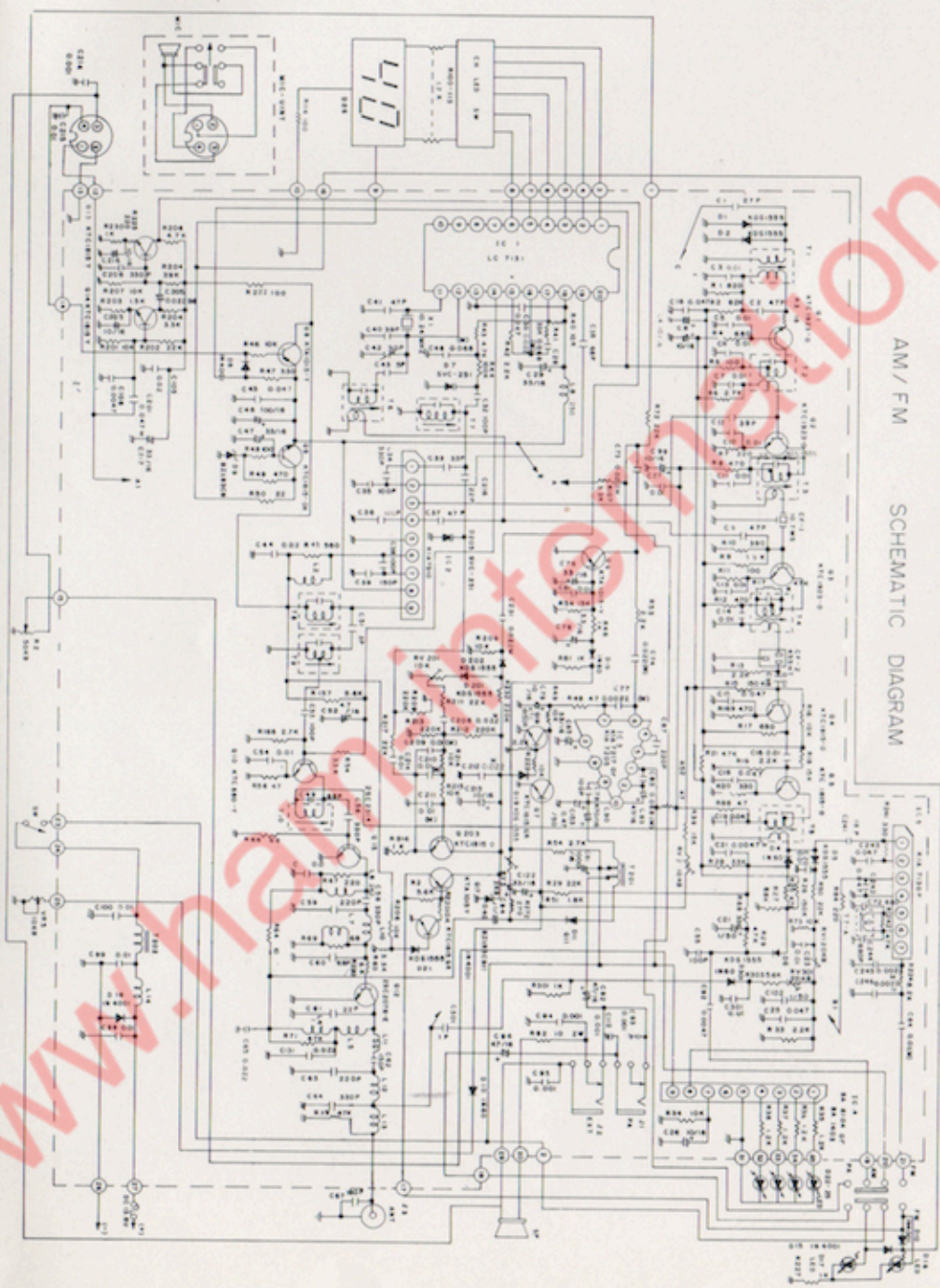
### WARNING

As prescribed in Part 95.58, paragraph (e) of the FCC Rules and Regulations, the manufacturer of the transceiver is required to issue the following warnings:

1. Certain repairs and adjustments to this transceiver may be made legally only by a person in possession of a valid First or Second Class FCC Radiotelephone Operators License (or equivalent in Canada), or by a person under the direct supervision of a holder of such a license. This applies particularly to those repairs or adjustments, such as replacement of crystals and transmitter oscillator components, which might affect the transmitter's ability to comply with FCC regulations.
2. Use only approved replacement parts when servicing the transmitter. The use of a component (such as a crystal, semiconductor, capacitor, etc.) having different electrical characteristics and ratings than that originally used could result in a violation of the FCC Regulations and is therefore prohibited.



FUNCTIONAL BLOCK DIAGRAM



AM / FM SCHEMATIC DIAGRAM

www.nptel.ac.in