

uniden®

40-CH FM CB TRANSCEIVER

Model AX31



AX31 CB RADIO OWNERS MANUAL

SPECIFICATION

GENERAL:

Frequency Control	Phase Locked Loop (PLL) Synthesized Circuit
Frequency Coverage	CH 1-40 26.965 to 27.405 MHz
Microphone	Plug-in Dynamic Type, 600 ohm
Operating Voltage	13.2V DC Nominal (Positive or Negative ground).
Semiconductors	22 Transistors 17 Diodes 4 I/C's
Internal Speaker Impedance	16 ohm
External Speaker Impedance	8 ohm
Size	160mm(W) x 55mm(H) x 217mm(D)

TRANSMITTER:

RF Output	.2W (HI) 0.2W (LOW)
Modulation	FM
Emission Type	F3
Frequency Tolerance	±0.002% Nominal
Output Impedance	50 ohm, Unbalanced

RECEIVER:

Sensitivity for 20 dB S/N	0.7 μ V Nominal
Selectivity	.6 dB at 6 KHz, 60 dB at 10 KHz
Intermediate Frequency	Double Conversion: 1st 10.695 MHz 2nd 455 KHz
IF and Image Rejection	.70 dB Nominal
Audio Output (Nominal)	1.8W at 10% THD.

WARNING:

Before installation of your transceiver ensure that the instructions are read carefully, as operation of the unit in the transmit mode without a suitable aerial may result in damage to internal electronic components.

Licencing Conditions:

The model AX31 is designed to operate under Home Office rules and regulations. Operation of this unit is not permitted until you have obtained the necessary licence to allow use on the permitted 27 MHz C.B. frequencies.

Operating Frequencies:

Channel	MHz	Channel	MHz
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	37.385
19	27.185	39	27.395
20	27.205	40	27.405

Description:

The AX31 is an all transistor 2-way radio transceiver suitable 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.

Current drain on 12 volts D.C. is exceptionally low and operation over long periods is feasible even with your engine turned off.

Receiver:

The receiver is a sensitive and highly selective dual-conversion superheterodyne type, providing crystal controlled PLL operation on all 40 C.B. channels. The circuit incorporates a number of features designed to provide optimum reception. 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 received.

Transmitter:

The transmitter offers crystal-controlled operation on all 40 C.B. channels, 2 watt of R.F. power is available which is the legal limit of power for the Citizens Band Service.

OPERATING INSTRUCTIONS:

(1) On/Off switch and Volume control:

Clockwise rotation of the control knob will produce an audible "Click" which will switch on the unit. Further clockwise rotation will increase the output from the speaker.

(2) Squelch Control:

Used to quiet the receiver during the absence of receiver signals. The squelch control should be slowly rotated in a clockwise direction to the point where noise in the loud speaker disappears.

(3) Channel Selector:

This rotary switch selects one of the 40 channels for transmit and receive operation.

(4) Channel Indicator:

L.E.D. Display indicates the channel selected by the 40 position rotary switch (3).

(5) Mic Gain:

This control is used to adjust, as required, the microphone input sensitivity for optimum amount for modulation during transmission.

(6) R.F. Gain:

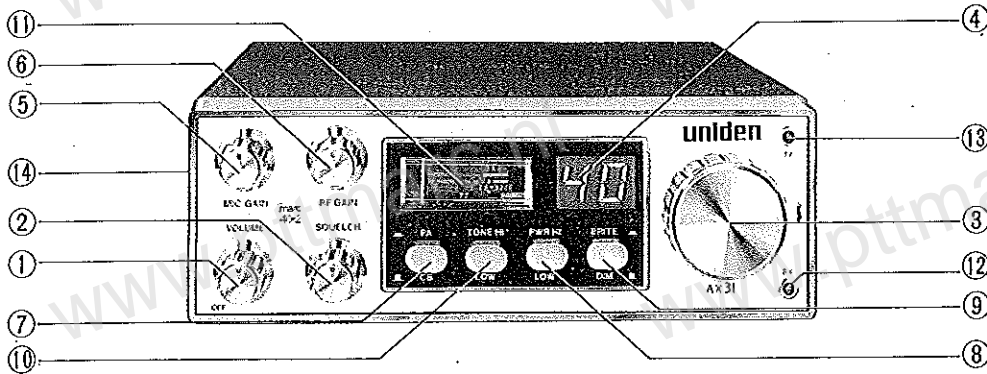
This control is used to adjust the sensitivity of the receiver section. Clockwise rotation will increase the receiver sensitivity.

(7) P.A./C.B. Switch:

Connect an 8 ohm loudspeaker to the P.A. jack (16). The public address amplifier operates when the switch (7) is in the P.A. position (pushed in); speech in the microphone is amplified and heard in the P.A. loudspeaker. For radio communication the switch should be set to its C.B. position (out).

(8) Power Hi/Low Switch:

With the switch in the Hi position (pushed in) the R.F. output power will be 2 watts. With the switch



in the Low position (out) the R.F. output will be reduced to 0.2 watts. This is a reduction in output power of 10 dB.

(9) Dimmer Switch:

This switch is used to adjust the brightness of the LED channel display and the meter. DIM position reduces brightness.

(10) Tone Hi-Low Switch

With the switch in the Low position (out) treble is attenuated.

(11) Power Meter:

When receiving the meter indicates the strength of the incoming signal in so called S units. During transmission the power meter indicates the relative R.F. output power.

(12) R.X. Indicator:

Light Emitting Diode (L.E.D.) which indicates the mode of operation. It indicates green for receiving.

(13) T.X. Indicator:

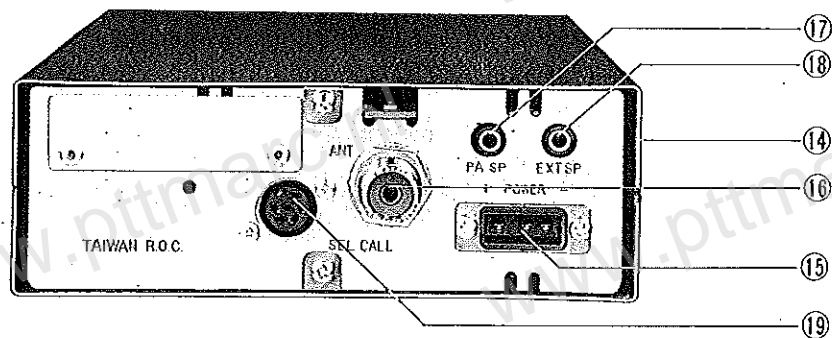
Light Emitting Diode (L.E.D.) which indicates the mode of operating. It indicates red while transmitting.

(14) Microphone Socket:

Connection of the microphone is via the socket at the side of the transceiver. On the microphone there is a pushbutton for switching between transmit and receive, a so called Push-To-Talk switch. NOTE! The switch must not be operated if there is no suitable antenna connected to the socket (16). Otherwise the transmitter can be damaged. To transmit: push in the PTT switch and speak in a normal voice into the microphone, 5-10cm(2-4") in front of your lips. When the PTT button is released the transceiver goes back into receiving. In the transmit position the T.X. L.E.D. (13) lights up.

(15) Power Socket:

This transceiver can be connected to 12V system



with negative as well as positive ground. Most cars use negative ground, but it is easy to verify which one of the poles of the battery is connected to the chassis.

(16) Aerial Connector:

Connect a suitable aerial especially designed for the C.B. band to connector (16). The aerial and its feeder cable should be of 50 ohms impedance.

DO NOT OPERATE THE TRANSCEIVER IN THE TRANSMIT MODE WITHOUT A SUITABLE AERIAL CONNECTED. FAILURE TO COMPLY WITH THIS WILL RESULT IN DAMAGE OCCURRING TO THE TRANSISTOR CIRCUITRY WITHIN THE TRANSCEIVER.

(17) External P.A./Speaker Jack:

An external 8 ohm 4-watt speaker must be connected to the P.A. SPKR 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 the P.A. at high output levels.

(18) External Speaker Jack:

The External Speaker is used for remote receiver monitoring. The external speaker should have 8 ohm impedance and be rated to handle at least 4.0 watts. When the external speaker is plugged in, the internal speaker is automatically disconnected.

(19) Selectivity Call Jack:

The transceiver is ready for connection of a selective call unit.

The selective call unit responds only to calls with its own special tone code and there is no need for listening to a lot of other traffic on the channel.

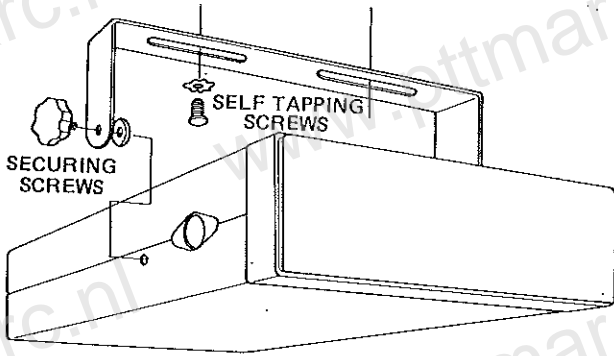
INSTALLATION INSTRUCTIONS:

Mounting:

The transceiver may be mounted to the underside of the dash board of a car, truck etc., using the special bracket provided.

Always mount the unit to enable the controls to be readily accessible, but in a suitable position that is least likely to cause injury in case of collision.

Attach the bracket to the underside of the dashboard using the self tapping screws supplied. Attach the transceiver to the bracket using the two knurled securing screws provided and tilt the unit to the most convenient angle before tightening.

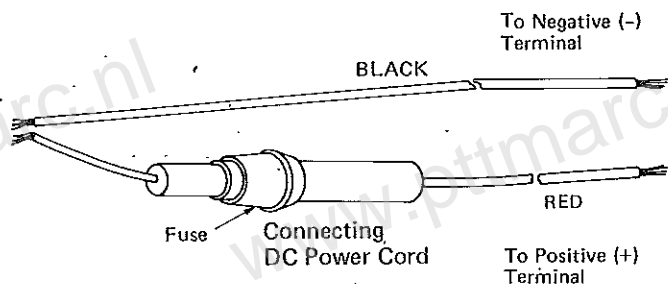


Power Connection:

The transceiver is designed to operate from a battery source of 12 volts D.C. It may be installed in a vehicle employing a positive or negative earth system. The fused D.C. power cable supplied is used to make the necessary power connection to the transceiver.

The Red lead (with inline fuse holder) is connected to the positive (+) side of the electrical system. The Black lead is connected to the negative (-) side of the system. In a negative earth vehicle connect the Red lead to a suitable terminal on the fuse box or the accessory wire on the ignition switch. Connect the Black lead to a suitable metal section of the car body. In a positive earth vehicle connect the Black lead to a suitable terminal on the fuse box or the accessory wire on the ignition switch. Connect the Red lead to a suitable metal section of the car body.

The transceiver draws a maximum current of 2 amps, thus connection is satisfactory to the accessory or radio terminal on the ignition switch. Connection at this point will ensure the power is automatically cut off to the transceiver when the ignition key is removed.



Microphone Bracket:

Attach the microphone bracket provided in any convenient location.

Microphone Connection:

Insert the 4 pin plug at the end of the coiled lead into the microphone socket of the transceiver (13).

ANTENNA INSTALLATION AND CONNECTION

To enable the AX31 transceiver to be used it will be necessary to install a suitable antenna on the vehicle.

Due to the many types of antenna there are available for 27 MHz C.B. operation specific details of installation are impracticable. There are a wide variation in the type of antenna available also many different attachments to enable temporary or permanent mounting of the antenna to the vehicle.

When selecting an antenna please remember the following points:—

- (1) It must be so designed for use in the 27 MHz C.B. frequencies.
- (2) It must conform to Home Office regulations i.e. It should not have an overall length greater than 1.5 meters.
- (3) The antenna and its feeder cable must be of 50 ohms impedance.

After a suitable antenna has been installed on the vehicle and has been connected to the antenna socket (15) it is essential that it is correctly adjusted to ensure optimum performance is obtained.

For adjustment an S.W.R. (standing wave ratio) meter is required to be connected in line with the antenna lead. With the transceiver switched on select a suitably clear channel preferably between 18–22 and push the PTT button on the microphone.

Following the manufacturers instructions for the S.W.R. meter a reading of the S.W.R. will be obtained. Slight adjustment to the length of the antenna may be required to achieve the lowest reading possible on the S.W.R.

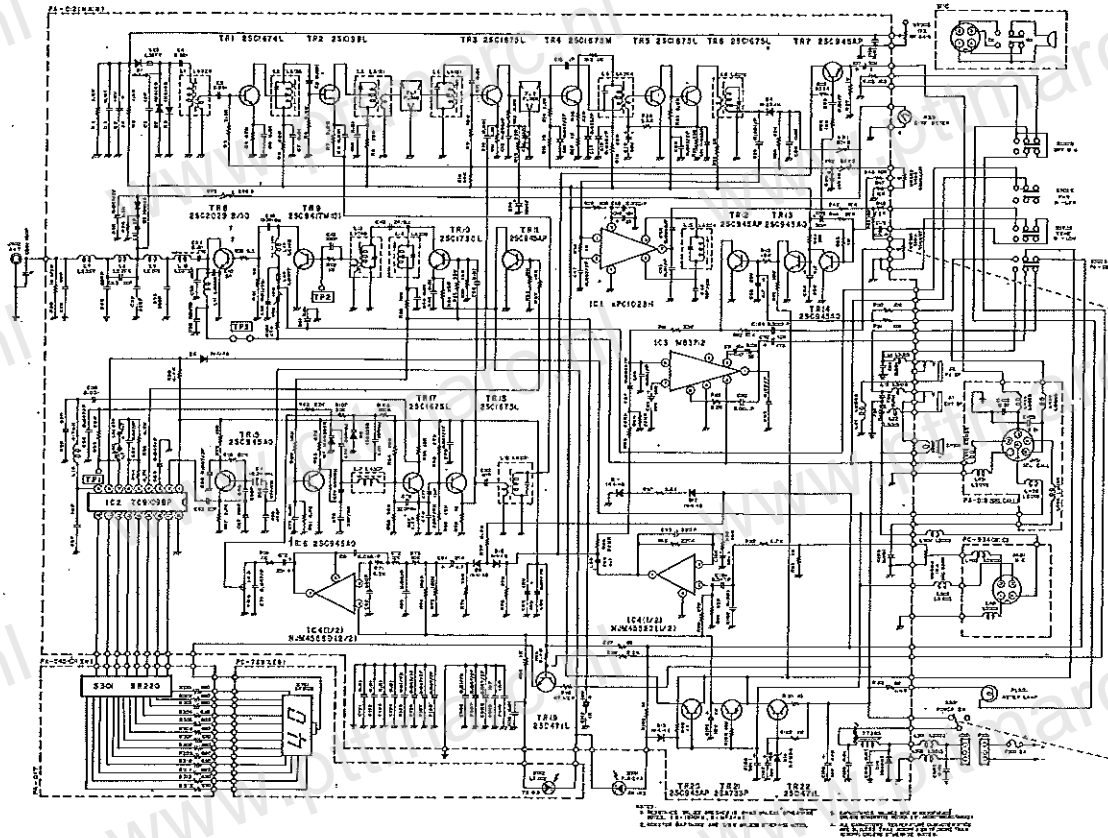
meter. (Any adjustments made to the antenna should be made with the transmitter switched off).

After the length of the antenna has been altered to achieve the lowest reading on the S.W.R. meter (any figure lower than 1.4 is satisfactory) repeat the S.W.R. measurement on channels 1 and 40 to ensure they also give a satisfactory reading.

If at any time during the S.W.R. measurement a result of 1:3 is achieved immediately release the transmit button otherwise damage may occur to transistor circuitry within the transceiver.

If a satisfactory S.W.R. measurement cannot be obtained, points to check are: Ensure the antenna being used is designed for 27 MHz operation. Any surplus cable to the antenna should not be coiled in a neat coil but left unevenly distributed e.g. under the rear seat.

SCHEMATIC DIAGRAM



MEMO