

Madison

MODEL 1010002

40-Channel AM/SSB Base Station



Owner's Manual

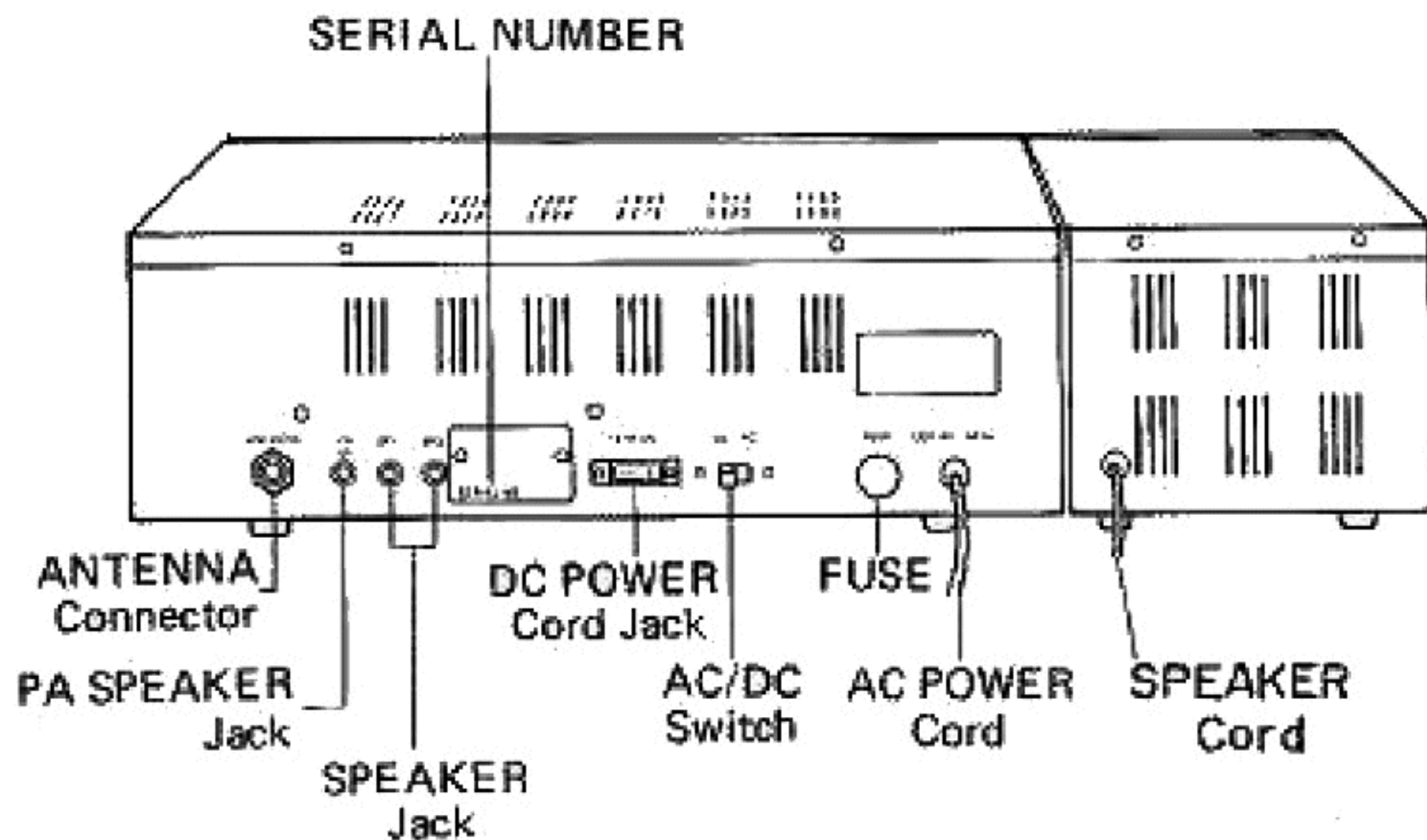
PRESIDENT™

Engineered to be the very best.

President Electronics, Inc., 16691 Hale Avenue, Irvine, California 92714
(714) 556-7355



RADIO BACK PANEL VIEW



IMPORTANT!

The above pictorial display shows the location of the various accessory, antenna, and power receptacles, as well as the SERIAL NUMBER.

You are urged to record your model number and your SERIAL NUMBER in the spaces provided below:

Model _____

SERIAL NUMBER _____

WARNING — TO PREVENT FIRE OR SHOCK HAZARD,
DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

SPECIFICATIONS

GENERAL

F.C.C. type Number	1010002
Channels	40 AM, 40 LSB, 40 USB
Frequency Range	26.965 to 27.405 MHz
Frequency Control	Phase Locked Loop (PLL) synthesizer
Frequency Tolerance	0.0005% Typical
Frequency Stability	0.001%
Operating Temperature Range	-20°C to +50°C
Microphone	Plug-in type; dynamic with push-to-talk switch and coiled cord,
Input Voltage	117V AC nominal. 13.8V DC nominal, (positive or negative ground)
Power Consumption (120V AC)	Transmit: full mod., 100 watts. Receive: squelched, 45 watts.
Current Drain (13.8V DC)	Transmit: AM full mod., 3A SSB, 12 watts P.E.P. output, 2.8A Receive: squelched, 1A Maximum audio output, 2A
Cabinet Dimensions	Transceiver 4-11/16"H x 14-7/8"W x 11-5/16"L Speaker 4-11/16"H x 5-3/4"W x 11-5/16"L
Weight	Transceiver 14.5 lbs. Speaker 3.5 lbs.
Antenna Connector	UHF, SO-239
Meters	Illuminated, indicates relative RF received signal strength, modulation percentage, TX power and SWR.
Semiconductors	50 transistors, 3 field effect transistors, 6 integrated circuits, 68 diodes and 7 light emitting diodes.

TRANSMITTER

Power Output	AM, 4 watts SSB, 12 watts, P.E.P.
Modulation	100% capability.
Intermodulation Distortion	SSB: 3rd and 5th order, better than -25 dB. 7th and 9th order, better than -35 dB.
SSB Carrier Supression	Better than -45 dB
Unwanted Sideband	Better than -45 dB
Frequency Response	AM and SSB: 350 to 2500 Hz.

Output Impedance	52 ohms, unbalanced
SSB Filter	7.8 MHz, crystal lattice type 6 dB @ 2.2 KHz 60 dB @ 4.6 KHz
Output Indicator	Meter shows relative RF output power.

RECEIVER

Sensitivity	SSB: Better than 0.25 μ V for 10 dB (S+N)/N at greater than ½ watt of audio output. AM: Better than 0.5 μ V for 10 dB (S+N)/N at greater than ½ watt of audio output.
Selectivity	SSB and AM: 6 dB @ 2.2 KHz, 60 dB @ 7.5 KHz
Cross Modulation	Better than -60 dB
Image Rejection	Better than -60 dB
I.F. Frequency	AM: 455 KHz SSB: 7.8 MHz
AM and SSB RF Gain Control	Adjustable for optimum signal reception.
Automatic Gain Control	(AGC): Less than 10 dB change in audio output for inputs from 10 to 50,000 micro-volts.
Squelch	Adjustable; threshold less than 0.5 μ V.
Noise Blanker	RF type, effective on AM and SSB.
Clarifier Range	± 1.25 KHz
Audio Output Power	4 watts into 8 ohms
Frequency Response	350 to 2500 Hz
Distortion	Less than 10% at 3.0 watts output.
Speaker (supplied in separate box)	8 ohms

PA SYSTEM

Power Output	3.0 watts into external speaker.
External Speaker for PA	8 ohms (not supplied)



INTRODUCTION

PRESIDENT ELECTRONICS has combined superb workmanship and modern styling with the very latest state-of-art circuitry to bring you the new "MADISON" Citizens Band Transceiver. It has been especially designed to give you maximum performance and reliability. Your "MADISON" is completely factory aligned and quality assurance tested.

To obtain the maximum benefit and pleasure from your MADISON, please read very carefully the contents of this manual before attempting to install or operate the transceiver.

FEATURES

- **ALL SOLID STATE:** Transistorized construction with low current drain for a long, trouble-free life.
- **FULL 40-CHANNEL OPERATION:** PLL frequency synthesizer circuitry allows transmission and reception on all 40 channels without the purchase of any additional crystals.
- **LARGE LED CHANNEL DISPLAY:** Channel number is displayed by use of LED (light emitting diode) display for maximum ease of channel selection.
- **CLEAN SIGNAL:** Transmitter audio processing circuitry produces a clean signal with maximum legal modulation, for best range.
- **QUIET RECEPTION:** Effective squelch and automatic noise limiter and an RF noise blanker for superior quieting.
- **EFFECTIVE AGC:** Receiver amplified automatic gain control (AGC) reduces the effect of differences in received signal strengths.
- **AN EFFICIENT TRANSMITTER:** Provides 4 watts on AM and 12 watts on SSB to the antenna.
- **PUBLIC ADDRESS FUNCTION:** Useful for paging and announcements.
- **EMERGENCY CH 9 SWITCH:** This switch enables you to select emergency channel (CH 9) regardless of the position of the channel selector switch.
- **ANTENNA WARNING INDICATOR:** LED indicator warns you if your antenna system is defective.



CHANNEL INFORMATION

Channel	Channel Frequency in MHz	Channel	Channel Frequency in 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	27.385
19	27.185	39	27.395
20	27.205	40	27.405

To insure that you obtain the maximum performance from this radio, please read carefully the following descriptions and operating instructions.

NOTE: This radio has been designed for operation in the 11 meter Citizens Radio Service. It uses a frequency synthesizing circuit with Phase Locked Loop (PLL) techniques to provide crystal controlled transmit and receive operation on all 40 channels. The PLL circuitry assures ultraprecise frequency control. It is designed to meet the Federal Communications Commission requirements applicable to equipment operating in the Citizens Radio Service, and is not to be used for any other purpose. Part 95 of the F.C.C. regulations defines operation in this service, and you are required to read and understand these regulations prior to operating this equipment. You are also required to complete F.C.C. license application Form 505 and submit it to the F.C.C., GETTYSBURG, PA. 17326 in order to receive your license to operate this unit. While your Form 505 is being processed by the F.C.C., you may use F.C.C. temporary license Form 555-B as a temporary permit. **YOU WILL BE IN VIOLATION OF PART 95 OF THE F.C.C. REGULATIONS IF YOU OPERATE THIS EQUIPMENT ON THE AIR PRIOR TO RECEIVING YOUR LICENSE AND CALL SIGNS OR IF YOU TRANSMIT WITH THIS UNIT WITHOUT COMPLYING WITH THE PROCEDURES EXPLAINED ON F.C.C. TEMPORARY LICENSE FORM 555-B.** F.C.C. Forms 505 and 555-B as well as a copy of Part 95 of the Commissions Rules are packed with the transceiver for your convenience.

Warning: Transmitter section adjustments must be performed by qualified technician holding a valid First or Second Class F.C.C. Radiotelephone License.



INSTALLATION

LOCATION

Prior to operation of the transceiver, a basic installation must be prepared. Installation of the transceiver itself is a rather simple procedure.

In selecting the location for the unit, two factors must be considered:

1. Access to a 117V AC, 60 Hz power source for your BASE STATION installation. Be sure to connect the AC power cord to an AC power source, not to a DC power source.
2. The location must be convenient for running the antenna lead-in cable to your transceiver.

BASE STATION ANTENNA

Since the maximum allowable power output of the transmitter is limited by the F.C.C., the antenna is the most important factor affecting transmission distance. Only a properly matched antenna system will allow maximum power transfer from the 52 Ohm transmission line to the radiating element.

The recommended method of antenna tuning is to use an in-line watt-meter or VSWR bridge to adjust the antenna for minimum reflected power on channel 19.

The radio may be used with any type of 52 Ohm base station antenna. A ground plane vertical antenna will provide the most uniform horizontal coverage. This type of antenna is best suited for communication with a mobile unit. For point-to-point operation where both stations are fixed, a directional beam will usually increase communicating range since this type of antenna concentrates transmitted energy in one direction. The beam antenna also allows the receiver to "listen" in only one direction thus reducing interfering signals.

Antenna height is an important factor when maximum range is desired. Keep the antenna clear of surrounding structures or foliage. F.C.C. regulations limit antenna height to 20 feet above an existing structure.

MOBILE OPERATION/EMERGENCY POWER OPERATION

It is possible to operate the MADISON from an external 13.8V DC power supply for emergency power conditions or from an automobile battery for mobile operation. The MADISON is supplied with a polarized plug for operation with an external DC supply.

Negative lead is black.

Positive lead is red and has the in-line fuse holder as an integral part of the lead.

PUBLIC ADDRESS

An external 8 Ohm, 4 watt speaker may be connected to the PA speaker 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 feed-back.

Physical separation or isolation of the microphone and speaker must be used when operating the PA at high output levels.

SPEAKER JACKS

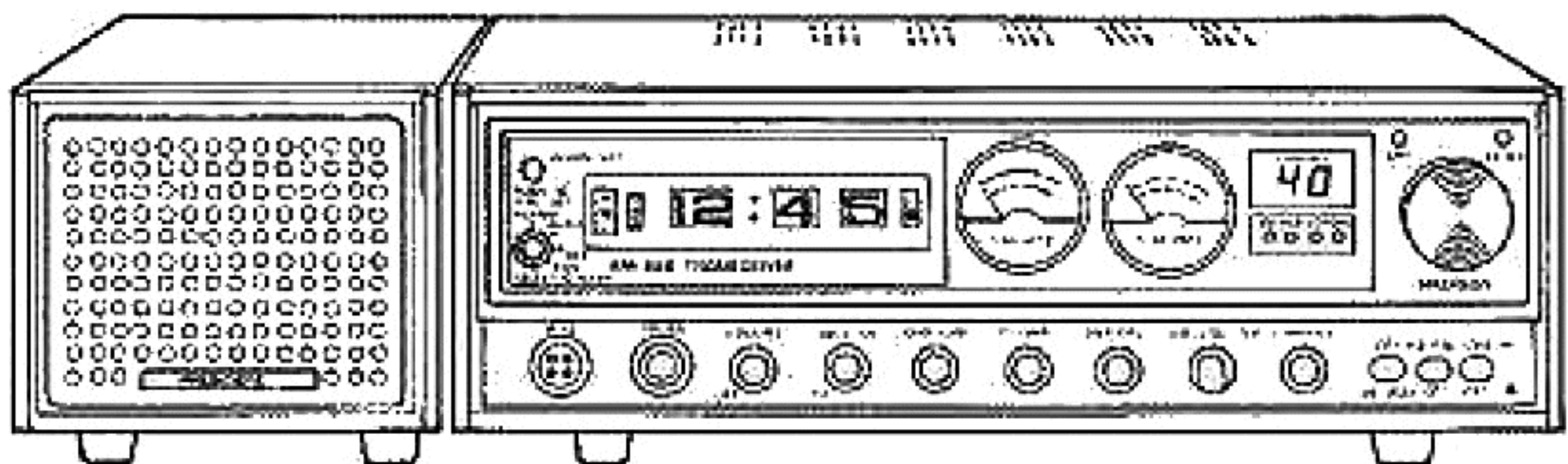
The speaker jacks (SP 1 & SP 2) at the rear of the panel are used for the separate speaker box supplied and for an optional additional speaker to be used for remote receiver monitoring. Any speaker used must have 8 ohms impedance and be able to handle at least 4 watts.



OPERATING INSTRUCTIONS

The MADISON operates on 40 AM channels, 40 upper side band channels and 40 lower side band channels.

When you receive the SSB signal in the proper mode, audio sound may be either too high pitched, or low pitched, indicating that your receiver may not be tuned to the exact same frequency as the transmitter it is listening to. The MADISON is equipped with a Clarifier. By tuning the Clarifier, you can slightly change the frequency of the receiver. This allows you to obtain more natural sounding voice communication.



OPERATING CONTROLS

Your MADISON, designed for ease of operation, is provided with the following operating controls:

1. **OFF/ON VOLUME:** To turn the transceiver on, rotate the control clockwise past click. To turn the transceiver off, rotate the control counterclockwise past click. Rotate the control clockwise for a comfortable audio level.
2. **SQUELCH:** The Squelch control is normally set to a position which eliminates undesired background noise with no signal present. With the audio adjusted to a satisfactory level, rotate the Squelch control clockwise to the point where the sound from the speaker is cut off. In this position, there will be no sound from the speaker until a signal is received. In order to hear weak signals, it may be necessary to rotate the Squelch control counterclockwise, allowing some background noise to be heard.
3. **PA SWITCH:** The PA function is engaged by turning the SQUELCH control fully counter clockwise past the click. The PA function should not be used unless an external speaker is connected. In the CB position, the PA function is disabled and the radio will transmit and receive on the selected channel.



4. **MIKE GAIN:** This control is used to adjust, as required, microphone input sensitivity for optimum amount of modulation in transmit. President Electronics citizen's band transceivers have been designed to permit the user to attain levels of modulation up to 100%, depending on the setting of the microphone gain control, using the microphone provided with the unit. President's automatic compression and peak limiting circuits assure maximum modulation with minimum distortion.
5. **RF GAIN:** This control is used primarily to optimize reception in strong signal areas. Gain is reduced by counterclockwise rotation of the control.
6. **SWR/CAL CONTROL:** This control is used for meter calibration when antenna SWR is to be measured.

In order for you to achieve maximum radiated power and range, it is important that your antenna be in good condition, properly adjusted and matched to your transceiver. The built-in SWR (standing wave ratio) meter lets you easily measure your antenna condition. To operate this function, connect your antenna to the transceiver antenna connector. Select a channel near the middle of the band. Turn the set on and press SWR-RF/MOD switch to set it to SWR position. Press and hold the microphone push-to-talk button, then use the SWR/CAL control. Adjust the meter to read the CAL position indicated on the S/Rf CAL meter face. The SWR/MOD meter simultaneously responds to this adjustment. By setting the S/Rf CAL meter to CAL point, you automatically measure SWR at the same time on the SWR/MOD meter. A reading of 1 is ideal. Generally speaking, readings up to 3 are acceptable, but over 3 indicates that you are losing radiated power, and an antenna adjustment may be advisable. Readings over 6 or 7 indicate trouble and serious loss in radiated signal and may result in damage to the transceiver.

7. **MODE SELECTOR:** This switch selects AM, USB, or LSB mode of operation. This selector changes the mode of operation of both transmitter and receiver simultaneously. Set the selector to the mode on which you wish to communicate.
8. **CLARIFIER:** The clarifier is normally set to the center position. This feature has several uses and can greatly enhance receiver operation. If a received signal is slightly off frequency, this control can be operated to optimize the received signal. This control is primarily intended to tune in SSB signals, but it may also be used to optimize the AM signal.
9. **SWR-RF/MOD:** This switch is used to select the mode of the meter. For meter calibration and SWR measurement, set the switch to the SWR (depressed) position. In the RF/MOD position, the meter shows relative transmitter RF output power, and percentage of modulation when transmitting.
10. **NB/ANL SWITCH:** When the NB/ANL switch is placed in the NB/ANL position both Noise Blanking and Automatic Noise Limiter circuits are activated.
11. **CH 9 SWITCH:** This switch is for use when emergency communication is needed on the emergency channel, CH 9. Pressing the CH 9 switch activates



CH 9 regardless of the position of the channel selector switch. When CH 9 switch is pressed, the channel display is blanked and the CH 9 indicator is activated.

12. **CHANNEL SELECTOR:** This switch is used to select any one of the 40 Citizens Band channels. Channel 9 has been reserved by the F.C.C. for emergency communications involving the immediate safety of life of individuals or immediate protection of property. Channel 9 may also be used to render assistance to a motorist.

INDICATOR FUNCTION

1. **METERS:** The meters are multi-function meters. As explained above, one meter lets you easily measure SWR and modulation percentage. Transmitter relative RF output power and received signal strength are indicated on the other meter.
2. **TX/RX INDICATOR:** This indicator lights in red when the transmitter is in operation and it lights in green when the receiver is in operation.
3. **ANTENNA WARNING INDICATOR:** This indicator comes on when you have a problem with your antenna system such as broken, short circuit, mismatch, etc.
4. **MODE INDICATOR:** This radio is equipped with mode indicator lights for AM, USB and LSB modes. When you set the mode selector to the mode desired, the related indicator light comes on.
5. **CH 9 INDICATOR:** When the CH 9 switch is pressed, the channel display will be blanked and the CH 9 indicator comes on.

HEADPHONE

This radio is provided with a standard $\frac{1}{4}$ inch headphone jack for private listening. To use this feature, just plug the headphone plug into the jack labeled "phone" on the front panel.

RECEIVE OPERATING PROCEDURE

1. Make certain the SQUELCH control is rotated just past the click to turn off the PA function and advance the RF gain control fully clockwise.
2. Turn the set on by turning the VOLUME CONTROL clockwise, past click.
NOTE: Microphone must be plugged in for the receiver to operate.
3. Set the VOLUME CONTROL to a comfortable level.
4. Set the Mode Selector Switch to the desired mode.
5. Listen to the background noise from the speaker. Turn the SQUELCH CONTROL slowly clockwise, until the noise just disappears. The Squelch is now properly adjusted. The receiver will remain quiet until a signal is received. Do not advance the control too far, or some of the weaker signals will not be heard.
6. Set the Channel Selector to the desired channel.
7. Adjust the CLARIFIER to clearly receive SSB or AM signals.



TRANSMIT OPERATING PROCEDURE

1. Select the desired channel of transmission.
2. If the channel is clear, depress the push-to-talk switch on the microphone and speak in a normal voice.

PRESS TO TALK MICROPHONE

The receiver and transmitter are controlled by the press-to-talk switch on the microphone. Press the switch and the transmitter is activated. Release the switch to receive. When transmitting, hold the microphone about three inches from your mouth and speak clearly at a normal voice level.

HOW TO OPERATE THE DIGITAL CLOCK

The digital clock will only operate when the MADISON is connected to an AC power source.

To operate the radio rotate the knob on the lower left side of the clock face to the "ON" position. Next turn the knob on the volume control to the "ON" position. The MADISON is now ready to operate. To turn the radio off you can use the ON-OFF switch on the volume control or the clock.

NOTE: When the radio is operated from a DC power source the clock will not operate.

To set the clock to the correct time, depress the knob on the upper left side of the clock face, and turn it clockwise.

To automatically turn on the MADISON at a desired time, tune in the station you desire in advance and adjust the Volume Control to a desired level. Set the knob on the lower left side of the clock face to "AUTO" position. Set the far left drum to the desired time by rotating clockwise the knob on the upper left side of the clock face (Do not push in). Then turn the ON-OFF switch on the Volume Control to the "ON" position. The MADISON will be automatically switched on at the pre-set time.

The clock is also provided with an alarm buzzer. Follow exactly the same steps as above, except that the knob on the lower left side of the clock face should be set to "ALARM" position instead of "AUTO" position. Then, both the radio and alarm buzzer will be turned on automatically at the pre-set time. If you only want the buzzer sound, turn OFF the ON-OFF switch on the Volume Control in advance. To cut off the alarm buzzer, rotate the knob on the lower left side of the clock face to "ON" "OFF" position. When this knob is rotated to "OFF" position, the radio will be turned off completely, although the clock is on as long as the AC line cord is connected to the power source. If you turn the knob to "ON", the radio will operate.

SLEEP TIMER SETTING

Your MADISON is provided with a Sleep Timer Setting which can be pre-set from 15 to 90 minutes in intervals of 15 minutes (15,30,45,60,75 and 90 minutes). To operate Sleep Timer, pre-set Sleep Timer to the time you desire, then the MADISON will automatically turn off at the pre-set time.



WARNING

Operation of this equipment requires a valid station license issued by the Federal Communications Commission. Do not transmit with your equipment until you have filled out a temporary license Form 555-B. Also, complete F.C.C. form 505 then send it to the F.C.C. office indicated on the application. Illegal operation can result in severe penalties. (A copy of both forms are included with your new transceiver.)

You are required to maintain a current copy of Part 95 of the F.C.C. Rules as part of your station records. A copy of Part 95 is included with your new transceiver. Additional copies of Part 95 are available from the Superintendent of Documents, GPO, Washington, D.C., 20402. Be certain that you have read Part 95 of the F.C.C. Rules and Regulations before operating your station.

F.C.C. Rules require that ALL transmitter adjustments, other than those supplied by the manufacturer as front panel operating controls, be made by or under the supervision of the holder of an F.C.C. issued 1st or 2nd Class Radio Telephone License.

Replacement or substitution of crystals, transistors, regulator diodes or other parts of unique nature, other than recommended by us, may cause violation of the technical regulations of Part 95 of the F.C.C. rules or violation of the Type Acceptance requirements of Part 2 of the rules.



MAINTENANCE AND ADJUSTMENT

This transceiver is especially designed for the environment encountered in base station installations. The use of all solid state circuitry and its light weight result in high reliability. Should failure occur, however, replace parts only with identical parts. Do not substitute.

MAINTENANCE

All repairs on this radio should be performed by a qualified radio technician, holding an F.C.C. first or second class Radiotelephone License. Repairs or adjustments by unauthorized persons can result in damage to the radio or illegal operation.

ADJUSTMENT

This transceiver is factory aligned and should not require any adjustment when used with a 52 ohm antenna. If an antenna other than 52 ohm 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 a licensed technician using a high quality in-line RF wattmeter which will not produce standing waves when inserted in the antenna cable.

SERVICE

PRESIDENT ELECTRONICS has established Authorized President Service Stations around the country for the repair and service of your radio. A list of these stations is enclosed. If you require service, please pack your radio unit in the original shipping container or any other suitable container which will provide adequate protection, enclose a note describing the problem and return, (transportation prepaid) to your nearest warranty station.

President Electronics also maintains a factory service center for the repair and service of your radio. Service may be obtained from the factory in the same way described for Authorized Service Stations except ship to:

President Electronics, Inc.

**16691 Hale Avenue
Irvine, CA 92714**

SERVICE MANUALS

Detailed service manuals are available from the factory for a charge of \$5.00 per copy.

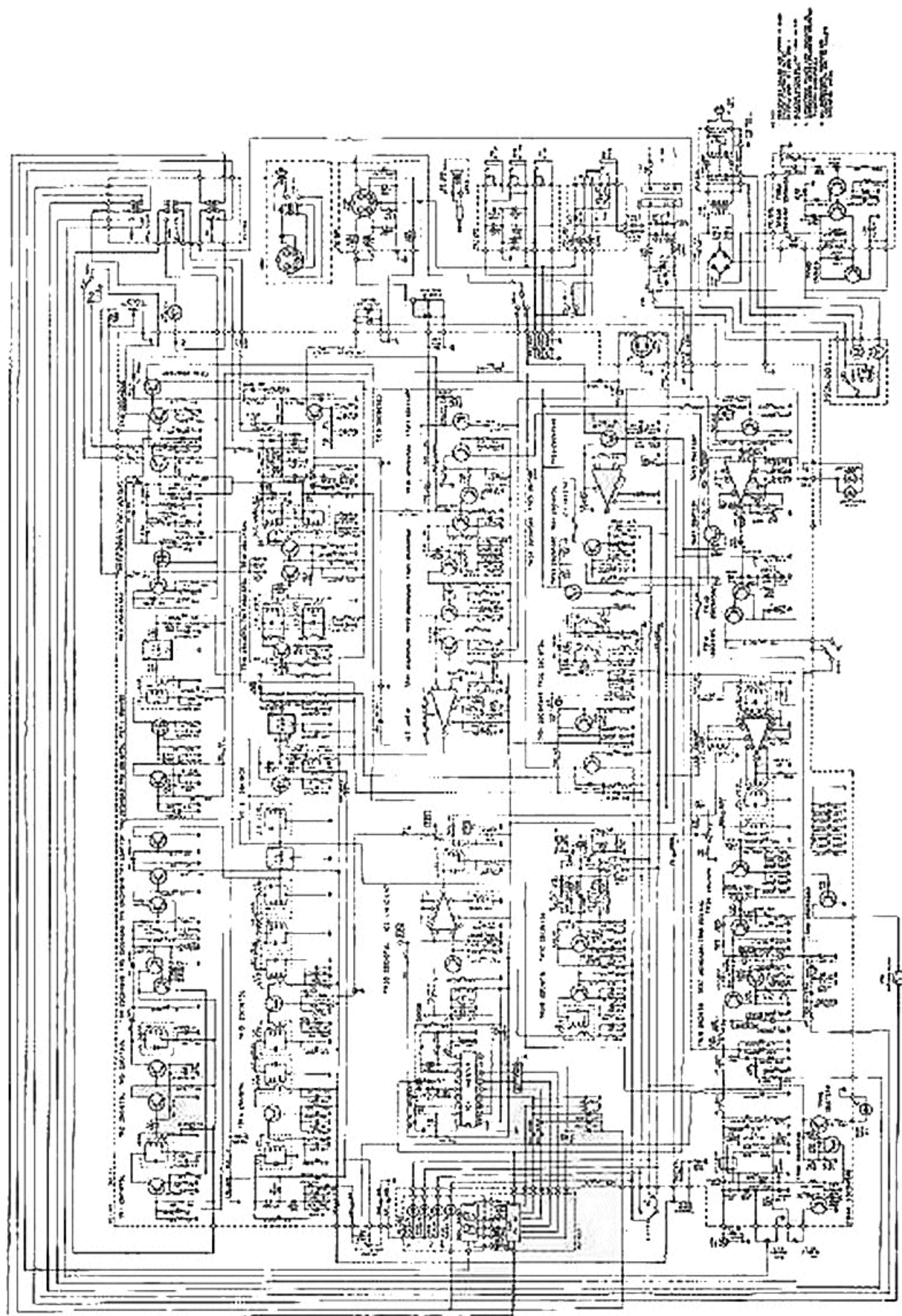


CHANNEL INFORMATION

This radio has been designed for operation in the 11 meter Citizen Band Radio Service. It uses a frequency synthesizing circuit with Phase Locked Loop (PLL) techniques to provide crystal controlled transmit and receive operation on all 80 channels. Provided Hi/Low band switch will enable you to operate on High band and Low band each 40 channels as show below.

LOW BAND		HIGH BAND	
Channel	Channel Frequency in MHz	Channel	Channel Frequency in MHz
1	26.965	1	27.415
2	26.975	2	27.425
3	26.985	3	27.435
4	27.005	4	27.455
5	27.015	5	27.465
6	27.025	6	27.475
7	27.035	7	27.485
8	27.055	8	27.505
9	27.065	9	27.515
10	27.075	10	27.525
11	27.085	11	27.535
12	27.105	12	27.555
13	27.115	13	27.565
14	27.125	14	27.575
15	27.135	15	27.585
16	27.155	16	27.605
17	27.165	17	27.615
18	27.175	18	27.625
19	27.185	19	27.635
20	27.205	20	27.655
21	27.215	21	27.665
22	27.225	22	27.675
23	27.255	23	27.705
24	27.235	24	27.685
25	27.245	25	27.695
26	27.265	26	27.715
27	27.275	27	27.725
28	27.285	28	27.735
29	27.295	29	27.745
30	27.305	30	27.755
31	27.315	31	27.765
32	27.325	32	27.775
33	27.335	33	27.785
34	27.345	34	27.795
35	27.355	35	27.805
36	27.365	36	27.815
37	27.375	37	27.825
38	27.385	38	27.835
39	27.395	39	27.845
40	27.405	40	27.855

CIRCUIT DIAGRAM FOR MADISON



ONE YEAR LIMITED WARRANTY

PRESIDENT ELECTRONICS, INC., warrants to the purchaser of each new President radio that such product shall be free from defects in material and workmanship under normal use and service for a period of one (1) year from the date of sale to the purchaser providing that the properly completed Warranty Registration Card is returned to PRESIDENT ELECTRONICS, INC., within 10 days following the date of purchase.

This warranty will not apply if the radio has been subjected to neglect, misuse, accident, unauthorized modification, improper installation, or if the defect is the result of service by other than a PRESIDENT ELECTRONICS, INC., Authorized Service Station. PRESIDENT ELECTRONICS, INC., reserves the right to repair or replace, at its option, any radios found to be defective under the terms of this warranty.

To obtain warranty repair, the customer must return the radio properly packed, freight prepaid, to PRESIDENT ELECTRONICS or any Authorized PRESIDENT Service Station. It will be returned freight prepaid. A sales receipt must accompany the radio to validate date of purchase. Where permitted by law, this warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability. Some states do not allow limitation on implied warranties so the above limitation may not be applicable. You may have rights as defined by each state law.

PRESIDENT™

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