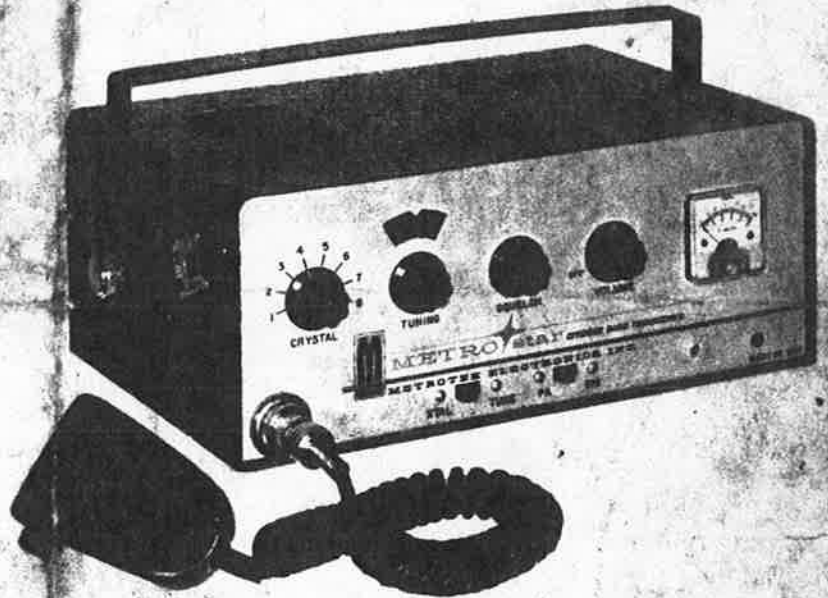


# METROstar®

## CITIZENS BAND TRANSCEIVER

The newly-designed METROSTAR offers the most performance per dollar of any Citizens Band transceiver on the market. With a power packed 5 watts input, maximum permitted by the FCC, the METROSTAR provides you with the ultimate in Citizens Band communications from your home, office, boat, or car. With a METROSTAR Citizens Band communications system, you are never isolated. Regardless of where you are, your home, or in your auto miles away, in the event of unexpected difficulties or emergencies, assistance is only moments away, and your METROSTAR is always waiting to serve you.



## OUTSTANDING FEATURES

- Tuned R. F. stage for maximum possible sensitivity, 1 microvolt usable.
- Double conversion receiver for maximum interference rejection and excellent sensitivity.
- Powerful multistage transmitter with 5 watts input, and 3.5 watts output, 100% modulation for maximum CB communications.
- Push to talk electronic switching.
- Separate crystal and variable receiver oscillators for good stability.
- Tunable receiver covering all CB channels.
- Temperature compensated tunable oscillator.
- Crystal controlled second conversion oscillator for maximum stability.
- Adequate receiver gain for optimum noise limiter performance.
- Positive acting squelch that can be set to trip on any signal strong enough to be understood. No "ignition noise" leak-through typical of audio squelch circuits.
- Built-in provision for addition of selective call and other accessories such as telephone hand set, remote speaker, etc.
- "Pi" network output circuit permits adjustment for maximum power into any antenna.
- Adequate power amplifier grid drive reserve for linear upward modulation even with weak tubes.
- Protective circuits prevent damage to any tubes or components if equipment is improperly adjusted or crystal is not installed.
- Eight crystal controlled channels, both transmit and receive.
- Combined S-meter and power input meter.
- Built in power supplies for 110V AC and 12V DC operation.
- Meets all FCC requirements.

**H. W. HERMAN**  
REEDSVILLE, PA.

**METROTEK ELECTRONICS, INC.**



205 W. Cabarrus St.  
Raleigh, North Carolina  
P. O. Box 9591  
Telephone: 828-8481  
Cable Address: Metrotek

M E T R O S T A R  
CITIZENS BAND TRANSCEIVER

Instruction Booklet

The METROSTAR is a complete Citizens Band two-way station and may be employed for any communication purposes covered by Part 19 Citizens Band Service of FCC Rules and Regulations.

Transmission with this equipment must not be attempted until authorization in the form of a license has been received from the Federal Communications Commission.

Before operating, make sure the proper fuse is installed. If operated on 117V AC, the 1 amp 3 AG fuse must be installed. Use of the 10 amp fuse on 117V AC can result in serious component damage. The 1 amp fuse will blow immediately on 12 V DC. DO NOT use a larger fuse than that specified.

CIRCUIT DESCRIPTION

The dual conversion superheterodyne receiver consists of one 6AU6 RF amplifier, one 6EZ8 mixer, variable oscillator and crystal oscillator, one 6BE6 mixer and oscillator, one 6BA6 455 kc IF amplifier, 1/2 6GW8 gated audio amplifier, 1/2 6GW8 audio output. The 6GW8 tetrode audio output section also functions as a modulator in the transmit position. The transmitter consists of 1/2 6CL8 microphone amplifier, 1/2 6CL8 oscillator doubler, one 6GK6 power amplifier. Silicon diodes are used for power rectifiers, squelch clamp and noise limiter.

This unit is designed to operate from 117V 50/60 cycles AC or 12V DC. Its operation may be changed from AC to DC by interchanging the plug-in power cables. No internal modifications are necessary since jumpers for the appropriate voltage are contained in the plug-in power cables.

The most commonly used controls, ie., transmit channel selector, receiver variable/crystal oscillator switch and receiver tuning are located on the left side of the unit for ease of operation in mobile service.

Each unit is shipped from the factory with a channel 11 (27.085 mc) transmit crystal and a channel 11 receive crystal installed in switch position 1 on the transmit channel selector. Seven additional transmit crystals may be installed.

If crystal controlled reception is desired on any of the eight switch positions on the transmit channel selector appropriate crystals may be installed by removing the crystal access door located on the bottom of the cabinet.

No adjustment of the transmitter is required for operation of this unit except for antenna loading adjustment. All other adjustments have been made at the factory.

With no signal a front panel squelch control permits cutting out background noise. The squelch control does not affect the sensitivity of the receiver if properly adjusted. It controls an audio stage only, reducing the gain of the stage during the absence of a signal and returning the gain to maximum when a signal is present. A signal of  $.5 \mu\text{v}$  or less will operate the squelch circuit.

The transmitter and receiver crystals are not interchangeable. Transmit crystals are fundamental mode CR18/U or equivalent cut to operate at one-half the output frequency of the transmitter. For example, channel 11 transmit crystals would be cut for  $1/2$  27.085 mcs or 13.5425 mcs. Do not attempt to use "overtone" crystals in this transmitter. Receiver crystals are third overtone series mode CR23/U or equivalent cut for the receiver frequency desired minus 1.65 mc. For example, channel 11 receive crystals would be cut for 25.435 mcs.

The operating point of the 6CW8 audio output and modulator stage has been designed to permit over 30% modulation yet prevent over modulation regardless of the audio input level. Speak in normal tones directly into the microphone. Some distortion may be noticed with loud close talking but over modulation will not result.

O P E R A T I N G I N S T R U C T I O N SVOLUME CONTROL

This control determines the volume level. Clockwise rotation of the control turns the unit ON and increases the volume. Counter-clockwise rotation decreases volume.

SQUELCH CONTROL

This control eliminates background noise in the absence of a signal. Turning the control in a clockwise direction will decrease the amount of squelch. Where the background noise is high, this control should be rotated in a counter-clockwise direction until the background noise is just eliminated. Do not adjust beyond this point or weak signals will not be heard.

XTAL-TUNE SWITCH

This slide switch located between the words "XTAL" and "TUNE" changes operation from crystal control reception to tunable reception. In the left or "XTAL" position the receiver will remain on the channel determined by the receiver crystal if a receiver crystal is installed. A maximum of eight receiver crystals can be installed in this unit. When the switch is pushed to the right or "TUNE" position any frequency between channels 1 and 22 may be selected by adjustment of the tuning knob.

TUNING CONTROL

With the "XTAL-TUNE" switch in the "TUNE" position, this control tunes the receiver to any of the channels marked on the tuning dial.

CHANNEL SELECTOR

This control, located above the word "CHANNEL", selects one of eight possible transmit channels. It also selects one of eight possible receive crystals when the "XTAL-TUNE" switch is in the "XTAL" position. Do not operate your unit on any channel that does not have a crystal installed. This control does not affect receiver frequency when the "XTAL-TUNE" switch is in the "TUNE" position.

### PA - SIG SWITCH

This slide switch located between "PA" and "SIG", changes the function of the meter from indicating signal strength to indicating current in the Power Amplifier stage.

### "S" METER

With the "PA-SIG" switch in the "SIG" position, the "S" Meter will indicate the relative strength of incoming signals. The antenna should always be disconnected before the "S" Meter is zeroed with the S-Meter zero control located on the rear panel of the chassis. With the antenna connected, the needle will move slightly up scale as it indicates random noise being picked up by the receiver. With the "PA-SIG" switch in the "PA" position, the meter will indicate the current being drawn by the 6GK6 power amplifier and this current can be read directly on the lower scale of the meter.

### POWER INDICATOR

This is the lamp with the clear lens located in the lower right hand corner of the front panel. When lit, it indicates that the power supply section of the unit is operating. If it does not light when the unit is turned on, see the "IN CASE OF DIFFICULTIES" section of this manual.

### TRANSMIT INDICATOR

This is the lamp with the red lens located in the lower right hand corner of the front panel. When lit, it indicates that the transmitter is operating. If it does not light when the transmitter is keyed, see the "IN CASE OF DIFFICULTIES" section of this manual.

Use the mobile mounting bracket to tilt up the front of the unit when resting on a flat surface such as a desk top. The speaker is mounted in the bottom of the unit and tilting is necessary to prevent loss of sound.

V O L T A G E - R E S I S T A N C E C H A R T




1. All readings taken with EICO Model 232 VTVM or equivalent.
2. All readings measured with respect to chassis ground.
3. Settings for resistance measurements:
  - 3.1 Power cable connected to unit but not connected to 117V AC receptacle.
  - 3.2 Volume control fully counter-clockwise in off position.
  - 3.3 Squelch control full clockwise.
  - 3.4 "PA-SIG" switch in "SIG" position.
  - 3.5 "XTAL-TUNE" switch in "TUNE" position.
4. Settings for receive voltage measurements:
  - 4.1 Unit connected to 117V AC.
  - 4.2 No signal input.
  - 4.3 Volume control fully clockwise.
  - 4.4 Squelch control fully clockwise.
  - 4.5 "PA-SIG" switch in "SIG" position.
  - 4.6 "XTAL-TUNE" switch in "TUNE" position.
  - 4.7 S-Meter zeroed.
  - 4.8 100 k $\Omega$  isolation resistor used on end of meter probe.
5. Settings for transmit voltage measurements.
  - 5.1 Unit connected to 117V AC.
  - 5.2 "PA-SIG" switch in "PA" position.
  - 5.3 "XTAL-TUNE" switch in "TUNE" position.
  - 5.4 Channel selector in position NO. 1. (Make sure crystal is in socket.)
  - 5.5 No modulation.
  - 5.6 Transmitter loaded into a 50  $\Omega$  dummy load for maximum output.
  - 5.7 100k  $\Omega$  isolation resistor used on end of meter probe.

"T" Denotes voltage with transmitter keyed.

"R" Denotes voltage in receive, or not keyed.

" $\Omega$ " Denotes resistance readings in ohms.

TUBE	PIN NUMBER								
	1	2	3	4	5	6	7	8	9
V101	T 0	0	0	6.2AC	12.4AC	+235	+160	0	5.8
6CLO	R 0	0	0	6.2AC	12.4AC	+260	+260	+80	0
	$\Omega$ inf.	inf.	inf.	0.37	0.37	75k	100k	90k	47k
V102	T +3.6	-20	0	12.4AC	6.2AC	0	+260	+210	0
6GK6	R +80	0	0	12.4AC	6.2AC	0	+290	+290	0
	$\Omega$ 700k	47k	0	0.40	0.37	inf.	75k	85k	0
V103	T -114	-60	12.4AC	6.2AC	+230	+60	+6		
6AU6	R -.8	-.8	12.4AC	6.2AC	+255	+125	+1		
	$\Omega$ 2.2meg	1.2meg	0.40	0.37	75k	200k	130		
V104	T 0	-13	+235	0	6.2AC	+119	-4.2	-2.6	-.7
6EZC	R +5.4	-.2	+260	0	6.2AC	+120	-4.5	-1.8	-.6
	$\Omega$ 2.2k	1M	75k	0	0.37	110k	47k	inf.	4.7k
V105	T -10	+7	6.2AC	12.4AC	+235	+75	-58		
6BE6	R -11	+0.97	6.2AC	12.4AC	+260	+95	-0.8		
	$\Omega$ 22k	90	0.36	0.37	80k	100k	2meg		
V106	T -58	-58	6.2AC	0	+230	+89	0		
6BA6	R -0.8	-0.8	6.2AC	0	+250	+46	+0.34		
	$\Omega$ 2meg	1.5meg	0.37	0	75k	60k	68		

V107	T	-21	-21	0	0	6.2AC	+40	+10	0	-.6
6CL3	R	-.8	-.8	0	0	6.2AC	+250	+210	+80	+0
	$\Omega$	540k	540k	0	0	0.37	650k	2.4meg	80k	330k
V108	T	+0	+76	+235	0	6.2AC	+255	+6.2	0	+40
6GWS	R	+17	+84	+260	0	6.2AC	+200	+7.0	+0.01	+250
	$\Omega$	1meg	10k	75k	0	0.37	75k	180	470k	700k
C152										
Power	T	+230	+275	+275	+265					
Supply	R	+260	+290	+295	+290					

### I N S T A L L A T I O N I N F O R M A T I O N

#### Fixed Location Installation:

Generally speaking, for best all around coverage a good choice of antenna is the "ground plane type". This type of antenna is non-directional and is vertically polarized, which is ideal for fixed to mobile operation where the location of the mobile unit is not known or predictable.

The antenna should be installed as high as is possible within the legal limits as specified in the FCC Rules and Regulations. If possible, the antenna should be located to avoid excessively long antenna lead-in lengths.

#### Mobile Installation:

The use of a full one-quarter wave length whip antenna will provide more reliable operation and greater range than the shorter length base or top loaded type whip antenna which is normally adequate for short range communications.

The mounting position of the unit should be such that it is easily reached for operation while driving, and it should be securely fastened to some solid surface using the mounting bracket supplied with the unit or a bracket suitable for your particular installation. The microphone hanger bracket may be attached to the cabinet of the unit, or it can be mounted elsewhere, if desired.

A suggested location for connecting the "hot" lead of the DC power cord assembly is the accessory side of the ignition switch. This would allow the unit to be operated without having to start the motor of the vehicle. The "hot" lead is supplied extra long, and should be trimmed to fit the installation. The "ground" wire should be attached to the ground connecting point located on the

rear apron of the unit and securely fastened to the vehicle chassis; such as, beneath the head of the screw attaching the mounting bracket to the vehicle.

Ignition Noise Interference:

This type of interference can generally be reduced by the use of one or more of the following corrective measures:

1. A resistive suppressor in the high tension lead from the coil to the distributor.
2. Individual suppressors at each spark plug or by the use of "resistor" spark plugs.
3. Coaxial bypass capacitors in the primary, or low voltage, leads to the ignition coil.
4. A coaxial capacitor in the lead to the armature connection of the generator.
5. Appropriate bypass components on the voltage regulator.
6. Electrically ground the tail pipe or tail pipes to the vehicle frame at several points.

Ignition noise comes from many causes and these are but a few. Many other possibilities exist but variations between vehicles make it impractical to go into greater detail.

Before attempting any of the above remedies a qualified person experienced in 2-way radio service should be consulted.

PERFORMANCE TESTING AND INSTALLATION ADJUSTMENT

NOTE: The microphone and the jumper plug for the accessory socket have to be installed before the transmitter and receiver will operate.

Preliminary Transmitter Testing:

Connect to 117V AC and allow three minutes for the unit to warm up. Disconnect antenna, if connected, and connect a #47 bulb dummy load. Key transmitter on channel 11. Bulb should light very brightly and increase in brightness with loud whistle into microphone. With "PA-SIG" switch in "PA" position, meter should read approximately 3 (bottom scale) and should flicker with modulation. Red transmit indicator should light.



Receiver Check:

Release push-to-talk button and set "XTAL-TUNE" switch to "XTAL" if receiver crystal for channel 11 is installed; if not, set "XTAL-TUNE" switch to "TUNE" and adjust variable tuning to channel 11. Turn squelch control maximum clockwise and volume control maximum clockwise. Set "PA-SIG" switch to "SIG". A noticeable hiss should be heard from the receiver, and the meter should read close to zero with no antenna connected. Disconnect the dummy load and touch the antenna connector with some metallic object such as a screw driver. A loud click should be heard and the meter will flicker. Readjust the squelch control slowly counter-clockwise until the hiss just disappears. Again touch the antenna terminal several times with a small metallic object; the click should be heard.

Repeat the above steps for the transmitter on each channel switch position that has a crystal installed. Repeat receiver tests on each channel position that has a receiver crystal installed.

All of the above steps may also be performed with the unit installed in a vehicle and operating from a 12 volt battery. (NOTE: Check to make sure that the proper fuse is installed, i.e., 10 amp. 3 AG.)

Transmitter Antenna Adjustment:

Reconnect the unit to the antenna it will actually be used with. While transmitting, with the "PA-SIG" switch in the "PA" position, adjust C113, with a small screw driver, for minimum meter reading. (C113 is directly under the small hole in the top left rear of the cabinet.) If the meter reads less than 3.00 adjust C114 (antenna loading control located on the rear apron of the chassis) a small amount clockwise, and then readjust C113 for minimum. Always adjust C113 last. Repeat this process several times for best results. For maximum performance, these adjustments should be made with a "field strength meter" or "SWR Meter".

COMPLETE RECEIVER AND TRANSMITTER ALIGNMENT

<u>Equipment required for complete alignment:</u>	Approximate S-Meter readings versus input signal:
1. VTVM	
2. Signal Generator: 26.9-27.3 mcs, .1 $\mu$ v to 1000 $\mu$ v min, 50 $\Omega$ output, AM modulation.	S3 equals .2 - .4 $\mu$ v. S5 equals .6 - 1.0 $\mu$ v.
3. Sig source; 27.085 mcs $\pm$ .005% (NOTE: Another CB unit may be used for 27.085 mcs.).	S7 equals 2 - 4 $\mu$ v. S9 equals 7 - 15 $\mu$ v.
4. 50 $\Omega$ 0-5 watt dummy load.	S9 + 10 equals 15 - 30 $\mu$ v.
5. Frequency meter; 26.9-27.3 mcs $\pm$ .0025% or better.	S9 + 30 equals 60 - 150 $\mu$ v.

Receiver Alignment:

Set up unit for normal receive operation on 117V, crystal controlled on channel 11 or some other channel where a receiver crystal is installed. The following instructions assume channel 11 (27.085 mcs) will be used. If another channel is used all reference to 27.085 should be to the frequency used.

Connect signal generator to antenna jack. Set generator to approximately 27.085 mcs with no modulation. Key another CB unit on channel 11 and "zero-beat" generator frequency. Adjust output level of generator, if necessary, to obtain a clear "zero-beat". Unkey channel 11 source and reduce generator output until S-Meter reads S3 or less. Peak T104, T103, T102, T101 and C113 respectively for maximum meter reading reducing generator output as necessary to keep S-Meter reading under S5. Do not attempt to make final alignment of IF stages with signal generator set at the IF frequency.

Check setting of L104 to make sure it is one turn counter-clockwise from the setting producing maximum negative grid voltage on V104C. This step is necessary to insure the receiver crystals will oscillate under low voltage conditions. The negative voltage on V104C grid can be measured at the termination of the insulated wire on the front section of SW102 (the crystal selector switch). Be sure to use a 100 k $\Omega$  isolation resistor on the end of the VTVM probe. Do not depend on the internal probe resistor.

Recheck adjustment of T101 at 27.085  $\pm$ 20 kc for maximum meter reading. This transformer is close to critical coupling and must be adjusted carefully to give uniform sensitivity over the entire 26.9 to 27.3 range.

As a final check on sensitivity adjust the squelch control, with the signal generator off, but connected, so that the receiver is just squelched. Turn generator on and the squelch should open with less than  $.4 \mu\text{v}$ .

#### Variable Oscillator Calibration:

When adjusting the receiver variable oscillator remember that adjustment of T101 or L104 will affect the variable receiver oscillator frequency. These adjustments must be made with the receiver operating crystal controlled on  $27.085 \text{ mcs} \pm 20 \text{ kc}$ . Do not readjust after receiver variable oscillator has been adjusted.

Before continuing with the calibration of the variable oscillator, the physical orientation of the dial should be checked. With the plates of the variable capacitor fully meshed, counter-clockwise, the numeral of, and the marker for, channel 1 should appear to the left of the pointer in the top of the window in the panel. Exact positioning is:  $.2''$  from the top of the marker to an imaginary vertical center line through the tip of the pointer in the window.

After the receiver has been adjusted for normal crystal controlled operation, and has been in operation for at least 20 minutes, switch to tunable operation and carefully adjust the slug in L105 for proper variable oscillator frequency by using an external signal, near or on channel 11, known to within  $\pm .005\%$ . Always start adjustment of L105 with the slug all the way out of the coil winding. When adjusting, do not go beyond the first peak. The receiver variable oscillator must operate  $1650 \text{ kc}$  above the incoming signal frequency and the crystals  $1650 \text{ kc}$  below to give correct dial calibration and avoid "crystal locking" of the variable oscillator. Use extreme care when making this adjustment since a fraction of a turn will change dial calibration by many channels.

#### Transmitter Adjustments:

If the antenna that the unit is to be used with is not conveniently available, a  $50 \Omega$  calibrated load should be used as most antennas are close to  $50\Omega$ . Adjust L101 for minimum cathode current as read by the self contained meter with the "PA-SIG" switch in the "PA" position. This should be done on channel 11.

If other channels at ends of the Citizens Band are installed a compromise adjustment may be required. Adjustment of L101 should result in at least -10V at TP1 after complete transmitter adjustment on all channels. Use a VTVM with an external 100 k $\Omega$  isolation resistor for this check.

C113 (PA plate tuning) and C114 (antenna loading) form a conventional pi network. With the "PA-SIG" switch in the "PA" position, C113 should always be adjusted for minimum as read on the self-contained meter. C114 increases loading and thus PA current as it decreases in capacitance (clockwise rotation of its shaft as viewed from the back of the chassis). C113 should always be adjusted last after C114.

#### IN CASE OF DIFFICULTY

Transmitter and Receiver inoperative, dial light and white panel power indicator inoperative.

Check fuse to see if correct value is installed and not blown. Check power source.

Transmitter and receiver inoperative, white power indicator inoperative, but dial light on.

Check vibrator and replace if required. Check CR102, CR103 and T106.

Transmitter and receiver inoperative, dial light and white power indicator both lighted.

Check to make sure jumper plug is installed in accessory socket. Check channel switch setting to make sure it is on a position where crystals are installed. Check microphone switch and cable for bad contact or broken lead.

Operation normal except red transmit indicator does not light.

Check power input with meter switch in PA position. If bottom scale reading is below 2.5 or above 3.25 check adjustment of C113 and C114. If meter reading is still abnormal, check V101, V102 and crystal.

Operation normal except no receiver speaker volume. S-Meter reads properly on signals.

Check to see if microphone and accessory jumper plug are installed. Check V103.

Operation normal except dial calibration poor.

Adjust L105 particularly if V104 has been recently replaced.

Operation normal except receiver weak.

Check V103 through V107. Check alignment.

Operation normal except signals weak or distorted in crystal receive position.

Transmitter being received off frequency. Receiver crystal off frequency or low in activity. V104 weak. T102 through T104 not aligned for proper IF frequency.

AC operation normal. DC operation in car noisy.

Check for ignition, generator, regulator and local power line noise. Check vibrator. Check for break in antenna coax shield at set connector and base of antenna.

Excessive vibrator failures.

Check voltage regulator in vehicle. Voltage should not exceed 14.7 volts with engine racing. Check C164 and C153.

AC operation normal, fuse blows in DC operation in car.

Wrong fuse installed. Hot and ground leads reversed. Vibrator defective.

Weak transmission and reception.

Poor antenna location, loose antenna connector, or coax cable shorted or open.

Receiver noisy on AC operation.

Local power line or ignition noise. Also check CR104, noise limiter diode.

Operation normal except squelch inoperative.

Check CR101, V106, V108 and C139.

S-Meter will not zero in Signal position.

Strong local signal on channel. Check V103 and V105.

W A R R A N T Y

The METROTEK equipment described herein is sold under the following warranty:

The manufacturer, Metrotek Electronics, Inc. agrees to repair or replace, without charge, any equipment, parts or accessories which are defective as to design, workmanship or material which are returned to the factory; transportation charges prepaid, provided:

- (a) Notice of claim is made within ninety (90) days from date of delivery to the end user but not to exceed six (6) months from date of shipment from the factory and the defective goods are returned to the factory in accordance with the manufacturer's instructions.
- (b) Upon examination of the defective item, the fault - in the opinion of the manufacturer - was not caused by mis-use, exposure to abnormal atmospheric conditions, improper installation or adjustment or incorrect wiring in the field; the equipment has not been improperly repaired, altered or damaged; and the equipment serial number has not been removed, defaced or changed.
- (c) Failure to mail warranty card at the time of sale or to include warranty card with unit returned by Metrotek's dealer shall void the warranty.

This warranty is in lieu of all other warranties, expressed or implied and no representative, agent or person is authorized to assume any other liability on the manufacturer's behalf in connection with the sale or use of METROTEK products.

CRYSTAL LOCATION CHART

Pos. 1 - TY1	TY8 - Pos. 8
Pos. 2 - TY2	TY7 - Pos. 7
Pos. 3 - TY3	TY6 - Pos. 6
Pos. 4 (Front Panel)	TY5 - Pos. 5
Pos. 1 - RY1	RY8 - Pos. 8
Pos. 2 - RY2	RY7 - Pos. 7
Pos. 3 - RY3	RY6 - Pos. 6
Pos. 4 - RY4	RY5 - Pos. 5

Ty -Transmit

Ry -Receive

Pos.-Switch  
Position

FRONT OF UNIT.



Bottom View

- NOTES: 1. THIS CIRCUIT IS BASED ON THE ASSUMPTION THAT THE OPERATOR WILL BE USING THE CIRCUIT AS A VOICE TRANSMITTER. 2. THE CIRCUIT IS NOT DESIGNED TO OPERATE AS A VOICE RECEIVER. 3. THE CIRCUIT IS NOT DESIGNED TO OPERATE AS A VOICE TRANSMITTER AND RECEIVER.

