



AUTOSCAN 5000

40 CHANNEL CITIZENS BAND FM
SCANNING TRANSCEIVER



Dear Customer . . .

You have wisely purchased a Magpie Autoscan Citizens' band transceiver. This unit (microphone excepted) has been designed and manufactured in Great Britain specifically for the British user. It has undergone extensive field trials in this country during which time the design has been improved and modified in order to produce a product suited to our own conditions and problems. Particular attention was paid to the design of the receiver, for example, to ensure high immunity from adjacent channel interference, and bleed-over, (intermodulation) a problem only too apparent to CB users in many of our urban environments.

The all metal front panel and attractive mechanical design reflect the quality of mechanics and components used in the electronics within the box. We have used the most modern design techniques and components throughout, employing, of course, a digitally controlled phase locked loop synthesizer for precise channel selection, using only one crystal for improved stability in conjunction with some of the most selective ceramic filters available and high dynamic range double balanced mixers in the receiver. All this 'jargon' means one of the most stable, sensitive and selective transceivers available in Britain today. It has already received enthusiastic acclaim from those users involved in the field trials.

THIS RIG IS UNIQUE. Channel selection is by UP and DOWN control buttons on the microphone. These control an electronic channel selector — No complicated 40 position mechanical rotary switch to go wrong. Press both buttons at once and you instantly select channel 14. The rig is always on channel 14 when first switched on. It will search automatically to stop at each occupied channel or you can command it to search out a free channel. It has a very bright luxury blue vacuum fluorescent channel display instead of the usual LED an obvious advantage to anyone who has tried to view a display in bright daylight. The display automatically dims at night . . . etc.

These are real useful benefits and not just gimmicks.

Other features you would also expect from a top quality rig are:

- ★ Adjustable receiver sensitivity using RF gain control.
- ★ Adjustable microphone sensitivity to suit your voice characteristics.
- ★ Instant channel 9 selection by emergency switch.
- ★ Public address facility.
- ★ 4 Watt/400 mWatt transmitter power selectable on front panel.
- ★ Microphone connector screw-on type and on the right hand side of the front panel for right hand drive cars.
- ★ Dual mode squelch operation works on background noise for weak signals and meter reading for strong signals.
- ★ Transmitter output stage immune to destruction due to antenna mismatch (poor SWR). This is achieved by use of an advanced 'V-mos' output transistor.
- ★ All metal, front panel and solid aluminium knobs.

In spite of all these refinements and unique features the rig is still delightfully simple to use.

Please read this instruction manual carefully and ensure you understand all the controls properly before switching on. This could possibly save much head scratching and avoid returning for repair a rig which is in fact working perfectly except for perhaps a blown fuse!

We hope your Magpie rig will give you many hours of enjoyment.

Magpie Electronics Ltd

Your Magpie Autoscan 5000 is guaranteed for parts and labour for one year from the date of purchase provided it has not been tampered with in any way or incorrectly used.

Please keep your receipt dated and stamped with your serial no. This is your proof of purchase and is necessary in the unlikely event of any guarantee work being required.

SPECIFICATIONS

GENERAL

FREQUENCY RANGE:	27.60125 MHz --- 27.99125 MHz.
CHANNELS:	40 channel 10 KHz spacing PLL synthesized. Frequencies in accordance with home office requirements published in MPT1320.
CHANNEL SELECTION:	Internal electronic counter selection controlled by push buttons on Microphone or front panel.
CHANNEL DISPLAY:	7 segment vacuum fluorescent display with automatic dimming.
SPECIAL FEATURES:	a) Search mode enables automatic search for busy channel or free channel as required. b) Instantaneous channel 14 selection.
OPERATING TEMPERATURE RANGE:	-5°C to + 45°C.
POWER SOURCE:	+10.8V DC to + 15.6V DC (+13.2V DC nominal).
CURRENT DRAIN:	Approx. 300mA on receive. 1.2A on transmit (fused at 2A).
DIMENSIONS:	Width 182mm (7.16") Height 56mm (2.2") Depth 175mm (6.9")

TRANSMITTER

OUTPUT POWER:	4W high power setting. 400mW (-10dB) low power setting.
FREQUENCY ACCURACY:	Better than ± 1.5 KHz over temperature range.
TYPE OF MODULATION:	FM
DEVIATION	Nominal ± 1.5 KHz. Max. permissible ± 2.5 KHz for + 20 dB input overload from 300 Hz to 3KHz.
SPURIOUS EMISSIONS:	a) Adjacent channel <10 microwatts b) Out of band <10nW within the bands: 80-85 MHz 87.5-118 MHz 135-136 MHz 174-230 MHz 470-862 MHz <250nW elsewhere

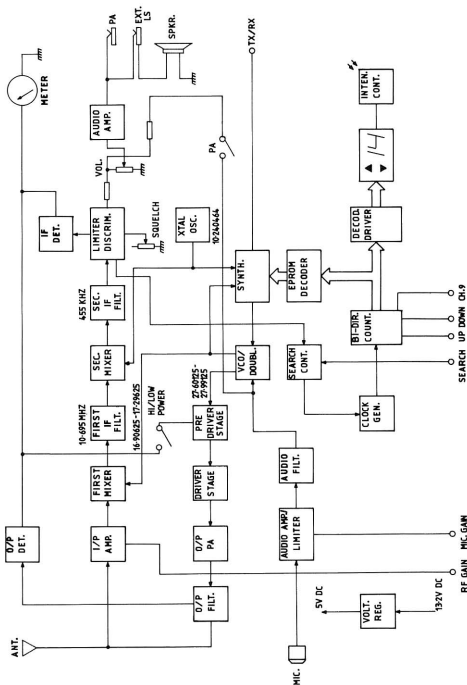
RECEIVER

CIRCUIT TYPE:	Dual conversion superheterodyne.
SENSITIVITY:	1 μ V for 20dB noise quieting (typical 0.7 μ V)
IF BANDWIDTH:	$\geq \pm 3$ KHz (-6 dB)
ADJACENT CARRIER REJECTION	> 80 dB (typical 100dB)
IMAGE REJECTION:	> 60 dB
AM REJECTION:	> 40 dB
2 TONE INTERMODULATION:	3rd order intermodulation products for 2 inputs of 1mV typically $< 0.25\mu$ V.
RF GAIN CONTROL:	30dB.
SQUELCH RANGE:	0.3 μ V to 10 μ V.
AUDIO OUTPUT POWER:	1.5W into 8 Ω 3W into 4 Ω

OPERATING FREQUENCIES

Your transceiver is designed for FM transmission and reception on the following frequencies:

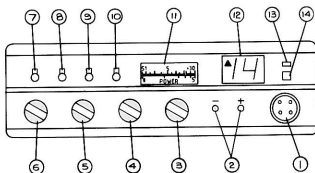
Ch. 1	27.60125 MHz	Ch. 21	27.80125 MHz
Ch. 2	27.61125 MHz	Ch. 22	27.81125 MHz
Ch. 3	27.62125 MHz	Ch. 23	27.82125 MHz
Ch. 4	27.63125 MHz	Ch. 24	27.83125 MHz
Ch. 5	27.64125 MHz	Ch. 25	27.84125 MHz
Ch. 6	27.65125 MHz	Ch. 26	27.85125 MHz
Ch. 7	27.66125 MHz	Ch. 27	27.86125 MHz
Ch. 8	27.67125 MHz	Ch. 28	27.87125 MHz
Ch. 9	27.68125 MHz	Ch. 29	27.88125 MHz
Ch. 10	27.69125 MHz	Ch. 30	27.89125 MHz
Ch. 11	27.70125 MHz	Ch. 31	27.90125 MHz
Ch. 12	27.71125 MHz	Ch. 32	27.91125 MHz
Ch. 13	27.72125 MHz	Ch. 33	27.92125 MHz
Ch. 14	27.73125 MHz	Ch. 34	27.93125 MHz
Ch. 15	27.74125 MHz	Ch. 35	27.94125 MHz
Ch. 16	27.75125 MHz	Ch. 36	27.95125 MHz
Ch. 17	27.76125 MHz	Ch. 37	27.96125 MHz
Ch. 18	27.77125 MHz	Ch. 38	27.97125 MHz
Ch. 19	27.78125 MHz	Ch. 39	27.98125 MHz
Ch. 20	27.79125 MHz	Ch. 40	27.99125 MHz



OPERATING CONTROLS

FRONT PANEL LAYOUT

Figure 1.



1. 4pin screw on Microphone socket for MAGPIE microphone. If you wish to connect a power microphone contact your dealer or MAGPIE ELECTRONICS LTD for suitability.

2. UP/DOWN CHANNEL SELECT CONTROLS. These are normally used only if you fit your own microphone and are identical to the buttons on the top of the microphone. Depress the UP (+) button and the channel selector will count up one channel. If you keep the button depressed the selector will continue to count through all the channels. At channel 40 the counter resets to 01 and then continues. The DOWN (—) button works in the same way for counting down through the channels.

If both buttons are depressed together the rig selects channel 14.

3. ON/OFF VOLUME CONTROL. This controls the output volume during receive. Turning this control fully anti-clockwise (click-stop) switches the rig off. Switching the rig ON automatically sets it to channel 14.

4. SQUELCH CONTROL. This allows the receiver to automatically cut out unwanted background noise between received messages. This should be adjusted to suit the strength of signal being received and when properly set you will hear only the wanted message with quiet periods between transmissions.

5. RF GAIN CONTROL. This is normally used at the maximum gain position (fully clockwise). In this position the receiver is most sensitive. However for strong interfering stations nearby, reception may be improved by reducing the gain setting.

6. MICROPHONE GAIN CONTROL. When set to fully clockwise the microphone is at its most sensitive and will provide full clarity at about 12–15" away at a normal voice level. If you wish to speak closely into the microphone, e.g. in a car or with a lot of background noise, voice clarity may be optimized by reducing the microphone sensitivity to suit the conditions.

7. PA SWITCH. In the UP position the rig functions normally. In the DOWN position the rig operates as a public address amplifier. Under these conditions the meter illumination is extinguished and the channel display shows 'PA'. Volume is controlled by both the mic. gain and volume controls.

In order to operate the PA function, an external speaker designed for the purpose must be used. It is connected by means of the 3.5mm jack socket on the rear panel. This is labelled 'PA'. All other speaker connections are automatically disabled. Returning from PA to CB sets the rig to channel 14.

8. **CHANNEL 9 PRIORITY.** When down this immediately sets the channel selector to channel 9. The channel indicator will show 09 and will flash. Switching back to normal use automatically sets the rig to channel 14.

9. **POWER.** In the 'Hi' position the normal transmitter output power of 4 Watts is selected. In the 'Lo' position the output power is reduced by 10dB to 400mW — a legal requirement.

10. **SEARCH CONTROL.** This switch has 3 positions. In the centre position channel selection is normal.

a) In the 'BUSY' position the rig can automatically scan for a busy channel. If one of the channel select controls on the microphone or front panel (2) is depressed and held, the rig will count through all the channels in order until it encounters a channel being used, where it will stop allowing you to monitor that channel. If the button is depressed again the selector will leave that channel and stop at the next channel in use.

In this way, you can quickly and effortlessly see who is on channel and where.

b) In the 'FREE' position the procedure is similar except the channel selector will automatically stop at a free channel. This enables a vacant channel to be found quickly in busy conditions e.g. in urban areas without tedious manual searching.

N.B. The rig decides whether a channel is free or busy from the squelch circuit. It is therefore important to adjust the squelch control (4) correctly when using search mode. You can set the signal strength you wish the channel selector to detect by adjusting the squelch as desired.

11. **S/R F METER.** This indicates relative incoming signal strength on receive (top scale) or relative output power on transmit (lower scale).

12. **CHANNEL INDICATOR.** Shows selected channel in bright royal blue digits and incorporates arrows which illuminate as the selector counts up or down. The display automatically dims for subdued lighting conditions to avoid glare e.g. in the car at night.

13. **TRANSMIT LED.** Illuminates red when the transmit key on the microphone is depressed.

14. **MAGIC EYE.** This senses the light level and dims the channel display (12) in subdued light.

REAR PANEL CONNECTIONS

There are four rear panel sockets. These are:

1. **POWER SOCKET.** This accepts the two pin power plug moulded on to the red and black supply leads provided and is the connection for the + 13.2V DC power for the rig.

2. **PA EXTENSION SOCKET.** This is used for the public address facility and accepts a 3.5mm jack plug, which should be connected to a 4 ohm or 8 ohm public address speaker. This socket is inactive during CB use.

3. **EXTENSION LS SOCKET.** This accepts a 3.5mm jack plug connected to an external speaker for CB use. When the plug is inserted the internal speaker is disabled.

4. **ANTENNA SOCKET.** This accepts the PL-259 plug on your antenna cable. It is important to ensure a good connection at this socket to ensure efficient operation of your rig.

OPERATION

Refer to Figure 1 and the section explaining the controls and be sure you understand their operation before attempting to use the rig.

- Connect the transceiver to a suitable 13.2V power source ensuring the red wire is connected to the positive terminal.
- Connect your antenna to the antenna socket.
- Ensure the following controls are set:
 - Mic. gain fully clockwise
 - RF gain fully clockwise
 - Squelch fully anti-clockwise
 - Volume OFF
 - PA switch OFF (Up)
 - Ch. 9 switch OFF (Up)
 - Hi/Lo power switch as required Hi = 4 Watts. Lo = 400mW
 - Search control OFF (Centre Position)
- Connect your MAGPIE Microphone to the socket on the front panel.

TO RECEIVE

Switch on by rotating the volume control. The display will show channel 14 and the meter will illuminate. As the volume is increased a hissing sound will be heard from the speaker. Adjust the volume for a comfortable level of sound.

Rotate the squelch clockwise until the noise disappears. At this stage if there are signals being received these will break through the squelch and the rig should remain silent between signals. By adjusting the squelch control you can select the strength of signal which will be heard.

Change channel by pressing the red button on the microphone for 'up' and the black for 'down'. An arrow on the display will indicate which way the channel selector is moving. A single press will change one channel. If the button is held down for longer than half a second the selector automatically moves quickly through the channels. Release the button when you reach the channel you require. With a little practice you will soon become proficient at changing and will reach any channel with speed and ease.

To return to channel 14, press both buttons together.

The top scale on the meter indicates relative field strength of the incoming signals.

Occasionally, under conditions of strong interference, you may find that reception of some signals can be improved by reducing the RF gain. This control should be rotated anti-clockwise away from its normal position – until the least amount of background noise is heard whilst listening to the wanted signal. As you rotate it the field strength meter reading should decrease.

TO TRANSMIT

Press the lever on the side of the microphone. The 'Tx' light will glow red and you are 'on the air'. Talk in a normal voice with the microphone held about 12" away from your mouth. Do not release the lever until you have finished. If it is necessary to talk closer to the microphone, when driving say, the microphone gain control may be rotated anti-clockwise for best clarity. You will soon learn the best setting for your own voice but we recommend an initial setting of about one third maximum gain under these conditions.

Power setting. The normal power setting is 'Hi'. This is recommended for mobile operation. However, the Home Office license requires that if your antenna base is more than 7 metres above the ground you must use low power. It is also good manners to use low power wherever possible in consideration to other nearby CB'ers whose receivers you might be overloading. So when operating as a home base do try to switch to low power if you can.

CHANNEL SEARCH

This powerful feature is available on no other transceiver we know about in Britain today.

To search for a busy channel — With the squelch control set as described above set the 'search' switch to 'busy' and press one of the channel select buttons. The channel selector will scan in the normal way but will stop at the first busy channel enabling you to monitor that channel. To stay on that channel release the button. To pass on to the next busy channel press the button again.

In this way you can quickly hear who is 'on channel' by the press of a single button.

To search for a free or quiet channel — Set the search switch to 'free' and continue as above. The channel selector will scan through and stop at the first free channel. This facility enables you to find a clear channel for your own use in a busy area or to locate the quietest one when skip conditions are bad.

NOTE: The signal strength at which the channel selector decides whether a channel is busy or free is adjustable by means of the squelch control.

CHANNEL 9 PRIORITY

This selects channel 9 instantly in the case of an emergency. To activate this mode switch the channel 9' switch to the 'on' position. The display will flash '09' as a reminder that you are on the emergency channel.

PUBLIC ADDRESS

Switch the 'PA' switch to 'on'. The meter illumination will extinguish and the channel display will read 'PA'. Your public address speaker should be connected to the PA socket on the rear panel. To talk press the transmit lever on the microphone in the normal way and the output volume is controlled by both the microphone gain and volume controls.

INSTALLATION

Your MAGPIE AUTOSCAN is provided with a mounting bracket for mounting ideally under the dashboard of your car although other suitable places may be found. In all cases take care to mount the rig in a safe position where it will not interfere with the driver. Fixing of the mounting bracket is self explanatory. Once the bracket is fixed, the side fixing screws on the rig may be slid into place in the bracket after being loosened; and then tightened onto the bracket sides, thus fixing the rig firmly in place. To remove, simply loosen the screws and slide the rig out.

Power connection is made via the power lead provided.

N.B. The rig is designed for use in vehicles with negative earth only. Firstly check that the correct fuse is fitted in the in-line fuse holder (2A). The black lead (-ve) is connected to a suitable earthing point on your car chassis, and the red lead (+ve) is connected to a suitable power point. (Consult your car handbook). The power plug is then inserted into the socket on the back of the rig. This plug will only enter the socket the correct way round.

N.B. If the power leads are connected the wrong way round no damage to the rig should result. The in-line fuse will simply blow when the rig is switched on. This fuse is there to protect your rig and a higher value should never be substituted in its place.

The transceiver may, of course, also be powered from a suitable 13.2V DC power supply connected to your domestic mains when used as a home base. Consult your local dealer for advice on a suitable power supply.

SERVICE AND MAINTENANCE

The MAGPIE AUTOSCAN 5000 transceiver is covered by our full guarantee for one year from purchase. However, should your rig need repair please return it stating the nature of your fault and we will replace or repair it free of charge promptly. But before you do return it please check that you have not done anything incorrectly.

Please check:

- Is the power supply of the correct type and connected the right way round?
- Is the 2A fuse in the red lead intact?
- Have you connected your microphone? Do not operate your transceiver without the microphone connected, even on receive.
- Is your antenna properly connected?
- Have you understood the functions of all the controls and are they correctly adjusted?