

IMPROVING THE ATLAS 210X TRANSCEIVER

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The Atlas 210X must be one of the best mobile transceivers on the market today due to its small size, light weight, and solid state final. It covers five HF bands with an output of around 90 watts and operates directly from a 12 volt supply. However, it does have some limitations and the following notes may be of interest to other users.

SENSITIVITY

Although the specifications for the Atlas 210X state sensitivity to be better than 0.4 microvolts for a 10 dB signal-plus-noise to noise ratio from 80 to 20 metres, about 0.4 uV on 15 metres and 0.6 uV on 10 metres, the set under test did not meet this specification on 10 and 15 metres. In comparison with another older valve transceiver it did not show up very well on these bands, so the problem was taken up with the manufacturer.

The Customer Service Manager suggested peaking the receiver input coils, making sure the VFO injection voltage was at least 0.4 volt, and if the sensitivity was still down, that a pre-amplifier would be found helpful, especially on 10 metres.

RF PRE-AMPLIFIER

No RF stage is used in the Atlas ahead of the mixer stage and a pre-amplifier will be found to be a worthwhile modification. The circuit suggested by Atlas is shown in Fig. 1. It uses a 2N3866 and really improves the sensitivity of this transceiver especially on 10 metres. The sensitivity on this band is now around 0.3 uV for 10 dB signal plus noise to noise ratio. The extra gain also improves the operation of the AGC system which now works in a much more satisfactory manner.

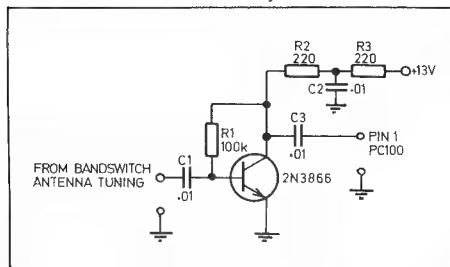


FIG. 1: Preamplifier.

The pre-amp was made on a small PCB by VK4UA and is about 2 inches long by 1 inch high. It could be made on a strip of Veroboard. It will fit the area of the



ATU and AC Supply.

Atlas PCB No 900, mounted at the top rear and using the two holes in this board to mount two 3/8 inch long stand-offs. The pre-amp fits neatly in place at the rear side of the dial drum.

The pre-amp is connected into the circuit by mini-coax between the band change switch for the antenna tuning circuits and pin 1 of socket for PCB No PC100. Plus 13 volts is taken from pin 10 of the socket for PC100. The ground connection is to the chassis nearby.

Due to the increased RF gain a resistor of 2,700 ohms is connected between the RF gain control R6—10k ohms and R7 (470 ohms). The additional resistor is supported on a small tag-strip near the gain control. The circuit alteration is shown in Fig. 2.

It was also found desirable to reduce the range of the audio gain control by disconnecting the lead from pin 22 on PC 300C and connecting it to the moving arm of a 20k ohm tab pot connected between

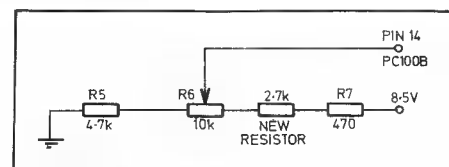


FIG. 2: Extra Resistor to reduce gain.

pin 22 and ground. The desired audio level can now be pre-set to give a better range for the audio gain control. See Fig. 3.

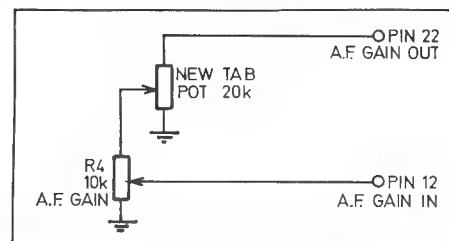


FIG. 3: New Tab Pot to reduce AF gain.

The gain was found to be too high on the lower frequencies. A pre-set mark about two thirds maximum permits adjustment for excessive RF gain and "S" meter readings on the lower frequency bands.

ANTENNA TUNER

The Atlas does not make provision for adjustment to various load impedances, and it will only deliver its maximum power when the load is between 50 and 53.5 ohms non-reactive.

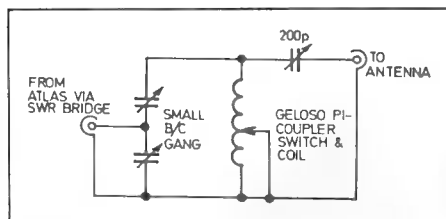


FIG. 4: Transmatch for Atlas.

Fig. 4 shows a circuit of a transmatch that has proved very satisfactory, the inductance being a Geloso Pi-Coupler, C1, a small two gang broadcast tuning capacitor and C2 any single gang around 200 pF. Two of these units have been built for the Atlas, one installed in the boot of the car. All knobs have numbered scales making it easy to pre-set the antenna tuner to any band. The unit in the boot of the car is a more compact version. An SWR bridge is used to adjust the tuner which is set up for minimum SWR. With helical whips mounted on the rear bumper there is only a short length of co-ax to the tuner in the boot. The tuner should be adjusted with the boot lid closed. Thus it takes some time to arrive at correct settings for all bands.

PORTABLE 240V AC POWER SUPPLY

The Atlas portable power supply was not available at the time of purchase, so one was made from locally available parts for a considerable saving in cost.

The circuit shown in Fig. 5 is similar that in the Atlas handbook. Many other designs were considered but this one is simple to get going and can be made very compact, yet is adequate for the job of a portable AC power pack.

This supply fits into a home-made metal box 3½ inches wide, 5 inches high and 9 inches long. On the front panel are mounted the three fuse holders, two DC outlet sockets, the mains switch, and mains lead into the supply. On the rear is the heat sink holding the 2N3055.

As with the Atlas supply the high current output is not regulated. A simple regulator is used for the low current circuits up to about 1 amp.

The two outlet sockets are a 6 pin Painton for the main supply with two pins in parallel for each circuit, the other a four pin Painton providing only the regulated 13 volts for other equipment (in this case for an IC502).

One suitable transformer is the Ferguson PF3788 which has two secondary windings each of 15 volts with a tap at 12 volt. Each winding is rated at 4 amps.

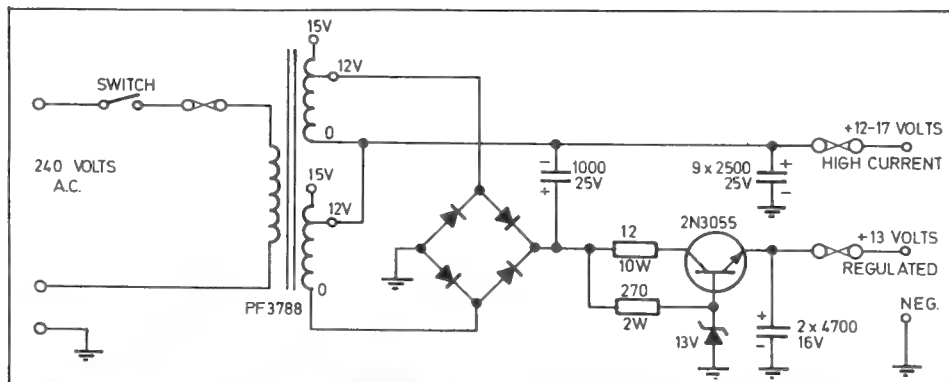
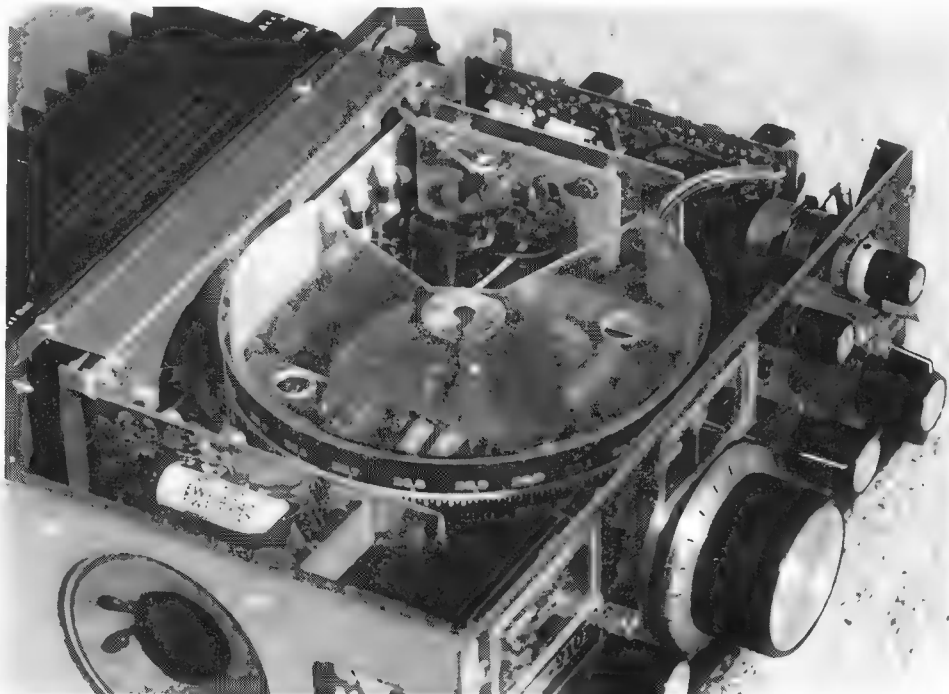


FIGURE 5: Power Supply.



View of RF Preamp installed.

The bridge rectifier is a PB40 rather than separate diodes. Nine 2500 microfarad capacitors were mounted on a plug-in Veroboard for the filter and the remaining parts were mounted on another piece of plug-in board.

The main high current circuit will supply about 10 to 12 amps at about 11 volts under CW conditions which has proved ample for portable use.

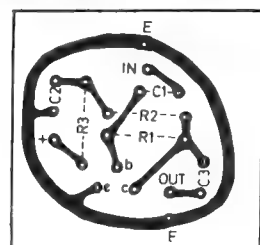
POWER SUPPLY LEADS

Several power supply leads have been made up to allow the Atlas to be used from various power supplies.

In all cases an automotive diode is connected across the plug in the reverse direction to take care of the Atlas should the connecting leads be connected to the wrong polarity. Another precaution has been to terminate all leads in a 4 pin connector and fit a suitable socket to the power supply source.

A small piece of aluminium bent into shape holds the two banana sockets and plug for connecting the Atlas.

Leads are used to operate the Atlas from a 12 volt 9 amp hour motorcycle



PCB Artwork.

battery. To operate the receiver section only from a small 12 volt 300 mA supply and also the main transmitter AC supply.

PA COLLECTOR IDLING CURRENT

This is adjusted to approximately ½ amp by the trim pot R515, it is mounted on the component side of the heat sink and provided with an access hole from the rear of the heat sink underneath the transistor Q503-40582, this is mounted on the rear side of the heat sink.

A small plastic bolt 3/16 in. x ¾ in. long was filed down to fit into the slot, making a shaft for this trim pot, making adjustment more convenient as the idle current varies when changing to different supplies.