

**"Blue Ribbon" Radio Control Equipment**

# Aristrol "MOPA" 27.255 mc. Transmitter Available in Kit or Finished Form



Most readers probably know that "MOPA" means master oscillator-power amplifier; the new Aristrol unit is the only CW transmitter in present production which uses this type of circuit. The MOPA's outstanding feature is that the crystal oscillator is isolated from the antenna; the crystal cannot be damaged if the outfit is tuned up with no antenna, and touching, or even tightly holding onto the antenna has no effect on frequency, although it will reduce power output.

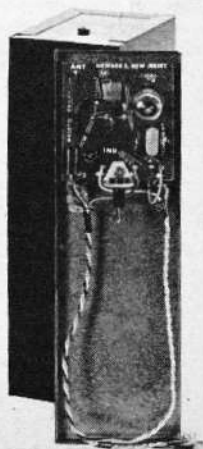
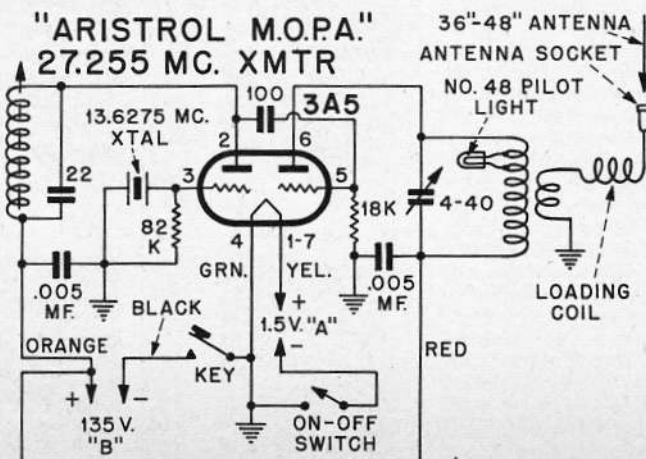
An MOPA circuit has another advantage; the output stage is considerably more efficient than is a crystal oscillator. This means that for the same amount of DC battery power put into the stage, you will get more RF output. Naturally, the power expended in the crystal stage is "lost" as far as actual output goes. As used in the Aristrol transmitter, the output stage efficiency is somewhat reduced over that to be had with a straight amplifier, since it works as a frequency doubler; this fact has its advantages, though, since a doubler normally requires no neutralization. We end up therefore, with a transmitter which has perhaps the same overall efficiency as the more usual power oscillator (where the single crystal oscillator tube is directly coupled to the antenna), but we still have the most worthwhile advantages that the crystal is used only for frequency stabilization—as it was intended to be used—and the antenna can be brought near or can even touch conducting surfaces without putting the transmitter out of operation.

Functions of oscillator and doubler are combined in a single tube, the old faithful 3A5. The oscillator section (pins 2 and 3 in the circuit—the filament is

common to both tube sections) uses a fundamental type crystal of 13.6275 mc.; circuit operates without need of regeneration, and is therefore almost impossible to tune up to the wrong frequency. This 13 mc. power is fed to the second section of the 3A5 where it is doubled to the desired 27½ mc. output. A low-power pilot lamp is connected across a small portion of the doubler plate coil, and may be used to check tuning and output. It is perfectly safe to tune the transmitter up and use it for lengthy periods for shop testing without an antenna; when this is done, the pilot lamp glows rather brightly. With an antenna in place (and the doubler circuit retuned to resonance) the bulb will be considerably dimmer, or may even go out. It should always glow however with the antenna removed; if it doesn't, it's time to check on tuning, or condition of batteries.

Transmitter can be had either as a kit or in finished form. No antenna is supplied in either case; you buy a standard 3' length of 3/32" music wire for this purpose. This wire alone will give good output, but if you want still more, a 12" length of 3/32" OD brass tubing may be used for the base section, into which is soldered a 3' length of 1/16" music wire. Slight retuning will be needed with the longer antenna. The oscillator slug, once it has been properly tuned, should never require resetting, unless tube or crystal is changed.

The Aristrol MOPA is fitted into a green hammertone steel case; all parts are carried on the front panel, which is removed to replace batteries. Practically all electrical parts (everything except the key and switch) are fitted on a printed-circuit plate, held to the panel with 3



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screws. A nice touch is that one screw runs directly into the tube socket—where most of the strain on the plate will normally center, when the tube is inserted or removed.

A 14 page instruction booklet is furnished, and covers assembly, tuning and trouble-shooting very completely. Also included is an F.C.C. license form and another sheet giving full details on the license, and addresses of all F.C.C. Field Offices.

**SPECIFICATIONS:** Aristrol MOPA  $27\frac{1}{4}$  mc. CW transmitter. Case size is  $3\frac{1}{4}$  x  $4\frac{1}{4}$  x 10" high. 36-48" long antenna required (not furnished). Front panel has ON-OFF switch, Key, Tuning Indicator, holes to reach Oscillator and Doubler tuning points. Single 3A5 tube acts as fundamental crystal oscillator and frequency doubler. 13.6275 mc. hermetically sealed Aristrol crystal furnished. Transmitter weight with all batteries and antenna is about  $4\frac{1}{2}$  lbs.

**BATTERY REQUIREMENTS:**A — Single  $1\frac{1}{2}$  V. unit (Eveready #742 or equivalent); A current—200 ma. B supply; two  $67\frac{1}{2}$  V. batteries (Eveready 467 or equiv.); 135 V. Current drain with antenna in place—27-32 ma. Oscillator draws 8-10 ma. of total B current, doubler all the rest.