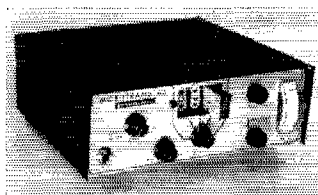


• Recent Equipment —

Mobiltrans "40"

Transmitter-Converter



THE Mobiltrans "40" offers a refreshing change from the complicated circuitry and construction of today's transceivers, electronic keyers, and the like. This little rig is simple and uses straightforward construction and circuits, yet is full of interesting ideas and takes advantage of modern components in its design.

The Mobiltrans "40" consists of a one-band a.m. transmitter and a crystal-controlled converter that heterodynes incoming signals to a tunable i.f. inside the standard a.m. broadcast band. It is available for 160, 75, or 40 meters. Designed primarily for 12-volt negative-ground mobile operation, the unit, when combined with the car's b.c. set, makes a complete one-band mobile a.m. station.

The block diagram of Fig. 1 shows the general layout and functions of the major components. Transistors are used throughout the circuit except for the final r.f. amplifier, V_1 , which is a power pentode Compactron.

The reader may wonder, after a glance at Fig. 1, where the high voltage for the vacuum-tube final amplifier comes from. A novel scheme similar to that used by Meissner¹ in a rig de-

scribed in *QST* a couple of years ago generates high-voltage d.c. by rectifying audio from the speech stages of the transmitter. Low-level audio from a carbon microphone is amplified in a transformer-coupled Class-B transistor stage, Q_1 and Q_2 . Here the audio is split into two channels, one going to the push-pull audio amplifiers, Q_3 and Q_4 . Output from the audio amplifier is transformer-coupled to a bridge rectifier and filter system to produce up to 500 volts peak d.c. with voice signals. With no voice input, the voltage falls to zero. The transmitter literally operates from "talk power".

Other sections of the transmitter and converter operate directly from 12 volts d.c. The crystal-controlled oscillator, Q_5 , is an n.p.n. transistor stage operating at the fundamental crystal frequency. Three crystal sockets and a three-position XTAL switch are provided on the front panel of the unit.

Output from the crystal oscillator drives the S156 r.f. amplifier, V_1 . Its plate circuit is a pi network using a toroid inductance. The tuning and loading capacitors are compression trimmers. The instruction manual does not mention the range of the pi network, but an entire page in the manual is devoted to mobile antenna adjust-

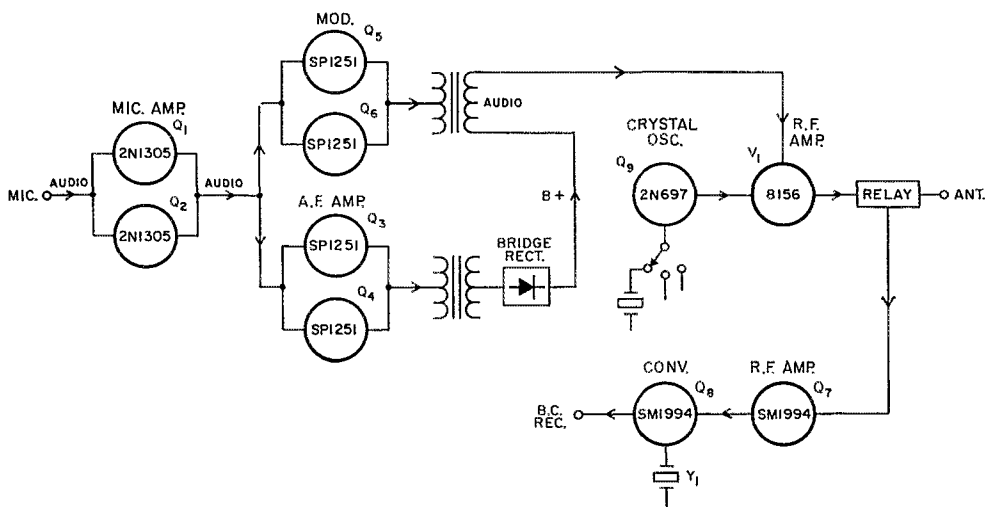
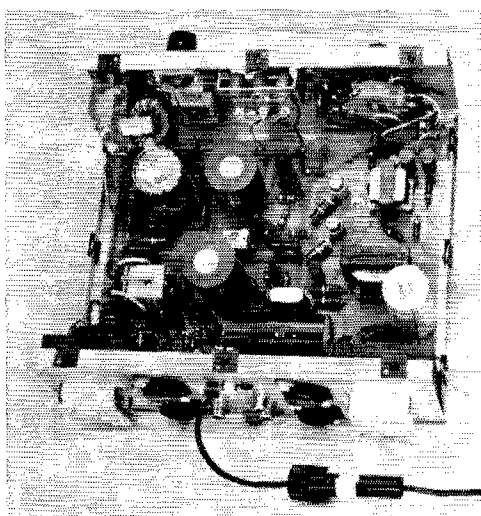


Fig. 1—Block diagram of the Mobiltrans 40

This is a view of the Mobiltrans 40 with part of the cabinet-top removed, looking down on the top and rear of the unit. The final r.f. amplifier, a Compactron, is at the upper left as is the final amplifier toroid tank coil. Power supply, audio transformers, and transistors are mounted on the rear panel and are visible in this shot. Phono connectors on the rear panel are for connections to the antenna and to the broadcast receiver.



ment. If the owner follows the suggestions given in the manual, he shouldn't have any trouble with antenna matching, even on 160 meters.

The Mobiltrans has a built-in relay that transfers the antenna from the transmitter to the converter and also switches the 12-volt power from send to receive. The relay is operated remotely by the push-to-talk circuit.

When receiving, signals from the antenna are amplified in a transistor r.f. stage, Q_7 , and then converted to the broadcast band in a transistor mixer-oscillator, Q_8 . This stage is crystal controlled, with the crystal, Y_1 , on the low side of the incoming signal on 40 and 75 meters, and on the high side on 160 meters. The actual tuning ranges of the system on the three bands are 1.9 to 2.0 Mc., 3.8 to 4.0 Mc., and 7.2 to 7.3 Mc. The car-radio tuning-dial readings for the above ranges are 160 meters, 700 to 600 kc.; 75 meters, 650 to 860 kc.; and 40 meters, 750 to 850 kc. A rear panel switch allows for switching the Mobiltrans out of the h.c. receiver circuit so the car radio can be used for broadcast reception.

Other front-panel components include the already-mentioned final-amplifier TUNE and LOAD controls, the three-position crystal switch, and three crystal sockets. There is a function switch with five positions. At OFF, all circuits are disconnected from the car's battery. At OVER, the converter transistor and the 8156 final amplifier tube heater are energized. When the microphone push-to-talk button is closed, the rig is switched to transmit. At TUNE, the modulator stage, Q_5 and Q_6 , is disabled. When the push-to-talk circuit is closed the microphone amplifiers, Q_1 and Q_2 , oscillate at an audio frequency, driving Q_3 and Q_4 to produce a constant plate voltage so that the final r.f. amplifier stage can be tuned. At SPOT, the crystal-oscillator stage, Q_9 , is turned on but at a reduced level, to give a signal for frequency spotting or to act as a crystal-controlled b.f.o. for detection of c.w. or s.s.b. signals. The AUX setting gives an additional switch contact on four sections of the function switch for

future additions or modifications to the equipment. The other two items on the front panel are the mike jack (3-conductor, 1/4-inch shaft) and the plate and screen current meter (0 to 150 ma.).

Before wrapping up this write-up on the Mobiltrans "40", a few words should be added about the construction and components. There are lots of ideas here that could be adopted by the home constructor. The use of etched or "printed" circuits reduces the size and complexity of the unit and gives it a clean, neat look (the Mobiltrans uses an epoxy-glass printed-circuit board). The cabinet is actually two pieces of U-shaped aluminum held together with shake-proof speed-nuts that simply snap into holes drilled in the aluminum—a method of cabinet construction which could easily be duplicated in the ham workshop. When assembled it has the appearance of a professional one-piece cabinet. The r.f. coils are sealed in plastic tubes filled with epoxy. The coil assembly plugs into a standard miniature-tube socket. The already-mentioned toroid and compression trimmers in the pi network maintain the proper inductance, capacitance and Q , but are substantially reduced in size as compared with conventional components. A diode in the power lead protects the transistors in case the power leads are connected to the wrong polarity, and a 2,000-pf. capacitor across the power input leads discourages voltage transients from damaging the transistors. — E. L. C.

JUSTIN MOBILTRANS "40"

Height: 2 7/8 inches

Width: 8 inches

Depth: 8 1/4 inches

Weight: 5 pounds

Power requirements: 12.6 v.d.c., 6.5 amps. max., 300 ma. standby.

Price class: \$100

Manufacturer: Justin, Inc., Box 135, San Gabriel, California