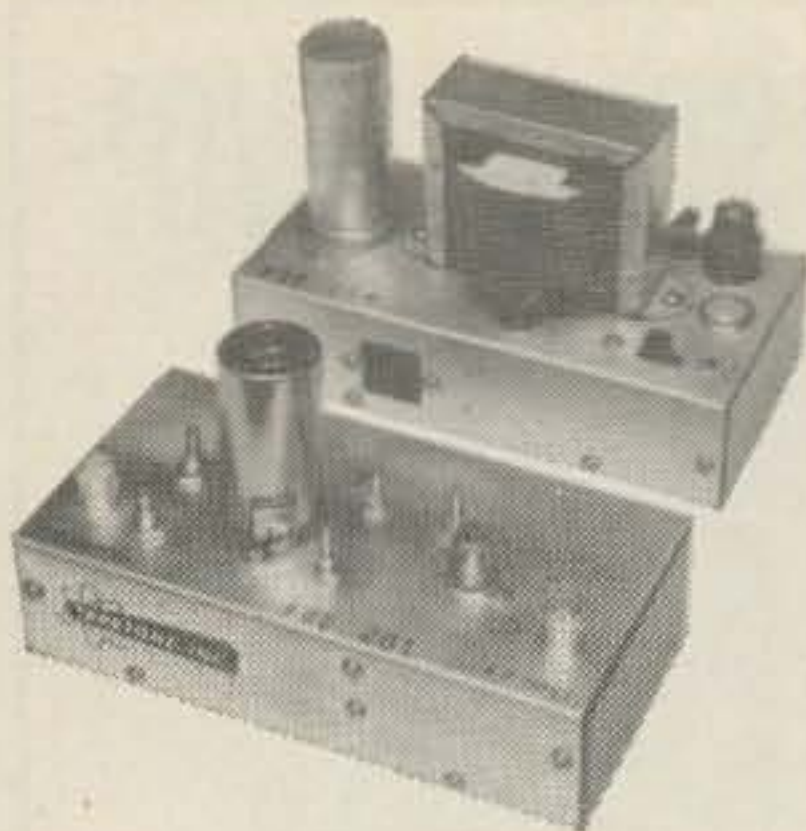




73 tests the Telco 201 Converter

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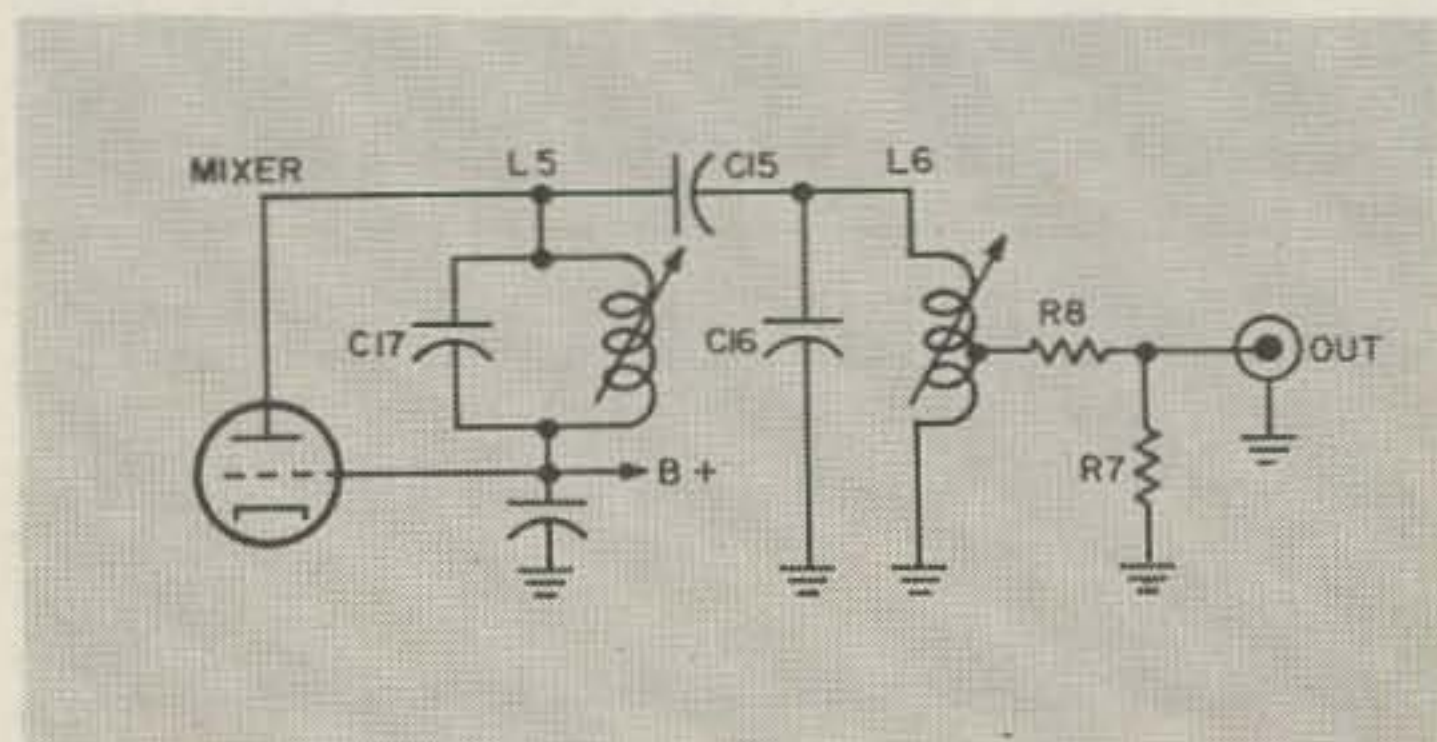
IN most heavily populated areas, 6 meter operation is getting to be a problem. There are so many stations on six that one or two strong stations are sure to be close enough to overload your six meter converter. With conventional 6 meter converters, the overload can be controlled, but only at the expense of noise figure. Such a compromise is usually a poor one, as it doesn't do much good to eliminate the overload if, after you do, you can't hear the station that you're trying to work. If you have a problem of this kind, the answer is a Telco 201 converter. The 201 is a low noise 6 meter nuvistor converter that is almost impossible to overload. Built and designed with the same quality that Tapetone is famous for, the 201 is undoubtedly the best 6 meter converter that I have ever heard. Tapetone rates the noise figure as better than 3 db. On the converter tested, the noise figure is considerably better than 3 db, probably between 2 and 2½ db. The reason that I say probably is that I can't measure a noise figure better than 2½ db with my present test equipment.

Anyhow, Tapetone is extremely conservative in their ratings, giving, a very conservative and true figure instead of an advertising fudge figure (true noise figure x .69 or something). This is achieved by the use of a 6CW4 nuvistor in a grounded grid rf amplifier. The rf stage is designed to provide maximum protection against overload without sacrificing noise figure. The cathode is carefully matched to the line, which should be a reasonably flat 50 ohm unbalanced one, by a tapped coil which is tuned for optimum performance. The plate circuit is one of Tapetone's double-tuned types which offers almost flat response across the entire 6 meter band, dropping off sharply at either end. The mixer uses ½ of a 6U8 in a circuit designed to reduce overload.

Tapetone did quite a bit of experimenting before they decided to use the 6U8. They were trying to find the best tube for noise figure as well as resistance to overload, a combination that requires several contradictory qualities. The 6U8, with the circuit values chosen, is a perfect choice. The noise figure is exceedingly low and it is as resistant to overload as a mixer is going to get. One unusual feature, and one that is getting extremely important

as the band is getting more and more crowded, is the mixer output circuit. They use two coils, in a bandpass configuration, to provide almost perfect response across four megacycles. It is then matched, by a tap on the second coil and two resistors, to a flat 50 ohm output. (See Fig. 1). This is the only converter that I have seen using this, and it is important because it is just about impossible to get a flat response out of the conventional single coil that everybody seems to be using. This means that the converter using one of these coils has a flat response over 1 mc of the band at most, and the majority of them do not even have that much. With the increasing activity on the band it is not uncommon now to hear stations as high as 52 mc or more, and the ancient converters that were designed when you didn't have to tune over 50.1 mc to cover all the activity are now well outdated. It should be pointed out that while, with luck, a coil will tune 1 or 1½ mc reasonably flat at 50 mc, it will only tune less than ½ mc at 14 mc, since the bandwidth decreases with frequency. Since the rf bandpass is 4 mc and the output response is also 4 mc, this converter not only has a flat response over the entire band, but it also has a fantastic image rejection and suppression of feedthrough. This is because the more tuned circuits that there are, the greater the skirt selectivity. In the 201 there are two sets of bandpass circuits and the rejection of signals outside the passband is greatly increased.

The signal from the oscillator is fed into the cathode of the mixer. The Telco 201 only comes with an *if* of 14-18 mc, probably because Tapetone felt that image rejection would suffer if a lower *if* was used and most receiver's performance drops off if a higher one is



used.

I mentioned that the converter is hard to overload. How hard? For a test, I loaded my 100 watt transmitter into my 11 element beam and pointed it at a receiving dipole about 50 feet away. There was no interference with a received signal that was S-3 15 kc away from my transmitter except on strong modulation peaks. Even this disappeared about 20 kc away from my signal, and the overloading was probably due to my receiver.

While this test is a little rough for any converter and, I'm sure that Tapetone never designed it to resist overload like that, it performs perfectly under these conditions. Part of this quality, I think, comes from the fact that the rf amplifier has no more gain than is needed. The converter has more than enough gain for even the simplest receiver and yet not enough to cause overload. This seems to be against the current trend to provide so much gain that the receiver doesn't need an "S" meter. It is only necessary to connect an O-1 ma "S" meter to measure the grid current of the mixer tube to tell the strength of the received signal. When an "S" meter is used, it reads 60/9 whenever a car starts up within a mile.

I would like to point out that the cause of cross modulation and related side effects is the fact that when a signal is strong enough to overcome the bias on positive signal peaks, the mixer will draw grid current and act as a detector. The audio voltage that is detected will modulate the received signals in the same way that a transmitter is grid modulated. This causes the effect of hearing one station's audio on all signals received. The 201 has the proper amount of gain and, therefore, these effects are missing. Even if there's no other stations within 100 miles of your mountain-top QTH, the 201 is still an ideal converter. Since, with a given bandwidth, the limitation of band (cosmic) noise still exists, the 201 will receive the signal perfectly, if it is at all possible to receive it. The noise figure of the 201 is well below natural noise in even the quietest location.

Even with all this, the Telco 201, at \$37.40, is priced below the cost of a parametric amplifier. It is also more compact, being built on a 1½x3x6 inch chassis. The black and silver chassis is an attractive addition to any ham station. The connectors are the "BNC" type, which have a much lower loss than the "UHF" or Motorola types, besides being smaller and more convenient to work with. In conclusion, the Telco 201 is an amazingly low noise converter for 6 meters that is a real bargain at \$37.40.

Gripes

Being of the type that has to find something to complain about, I have one complaint about this converter: Why didn't Tapetone make this sooner? . . . WA2INM



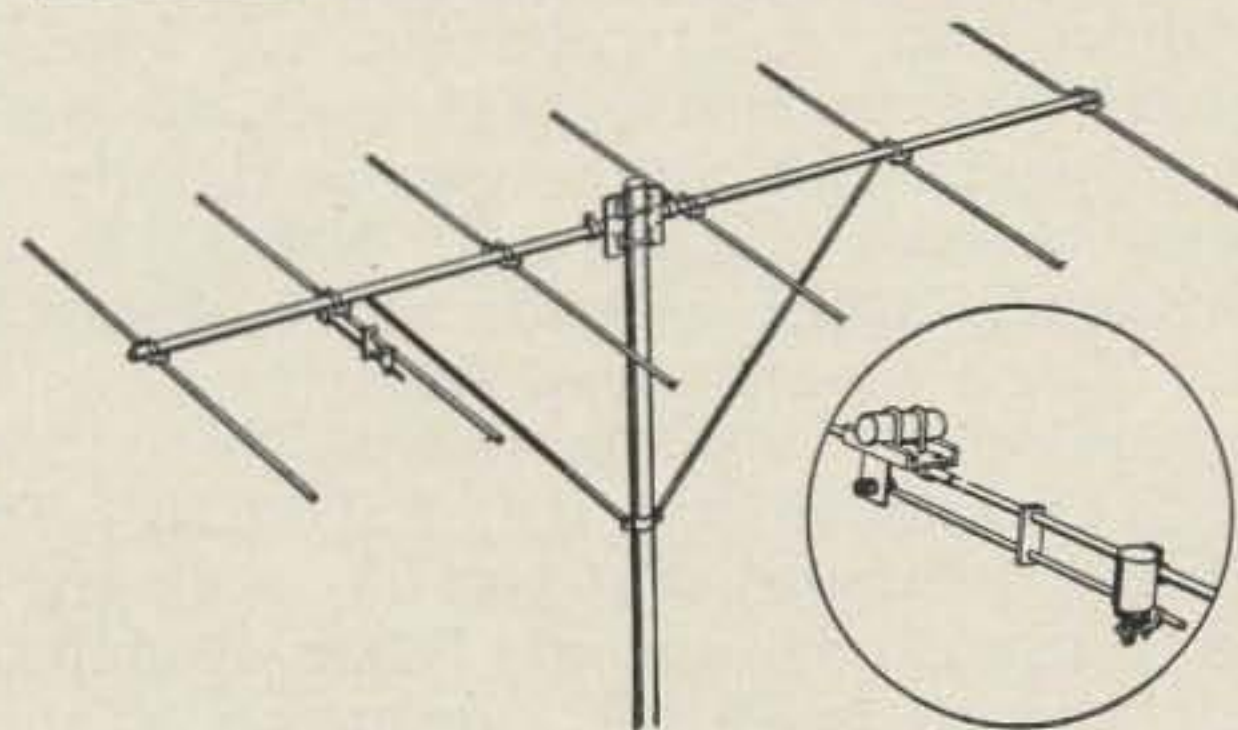
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