October, 1985

PAARA

GRAPHS

Featuring:

An article on the 15 or 20 KHz
2 meter repeater spacing question
by Rich, W6APZ and an article on
the applications of the tube-like
qualities of transistors+more

THE OFFICIAL NEWSLETTER OF THE PALO ALTO AMATEUR RADIO ASSOCIATION

AND

THE MENLO PARK C.D. AMATEUR RADIO CLUB

PAARAgraphs is the official newsletter of
the Palo Alto Amateur Radio Association &
the Menlo Park Civil Defense Radio Club

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October Speaker will Be

KL7JBX

on the subject of

CELLULAR TELEPHONES

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BE THERE!

THE HONORABLE CITY COUNCIL
Palo Alto, California

I feel that the proposals for a cable television system for the Palo Alto service area have neglected an important problem, that of signal leakage from the cable system causing interference with other services.

The draft proposal for the cable television franchise agreement specifies in section 6.13.02 (i), that the cable system shall not interfere with over-the-air broadcast television signals. Other broadcast or public service functions (except the city-owned coaxial cable) are not protected.

We are particularly concerned with the interference to amateur radio operation in the Palo Alto area. The frequency band from 144 to 148 megahertz is one of the most heavily used amateur bands, being used for a wide variety of experimental and public service functions. The cable system operating on frequencies in this band would cause substantial interference to these activities, possibly rendering them impossible in the Palo Alto area.

Amateur satellite activities are conducted within the 144-148 MHz band, utilizing signals that are extremely weak when they return to the earth. A quick calculation indicates that these signals will 10000 times weaker than the allowable leakage from the cable system (at 10 feet). Even 40 feet away from a single point leak, the signals would still be 800 to 1000 times those received from the satellite.

Much of the public service and emergency work of the amateur community is done locally with the use of amateur repeater systems. Two of the prime repeater systems serving the Palo Alto area are on frequencies which are immediately adjacent to the video carrier of the cable channel that is sometimes referred to as mid-band channel E. One of these repeater systems was the primary system used for emergency communications support during the fire near Page Mill and highway 280. Leakage from other systems has made these frequencies unusable in their areas, and it is hoped that this could be avoided here.

In order to preclude these problems, we feel that the cable system should be **forbidden use of the frequency range from 144 to 148 MHz for activity in either direction on the cable system**. This is not expected to provide a significant hardship, since none of the proposals seen use all of the available channels on the cable.

Thank you for your time.

Alan Larson
President,
Palo Alto Amateur Radio Assn.

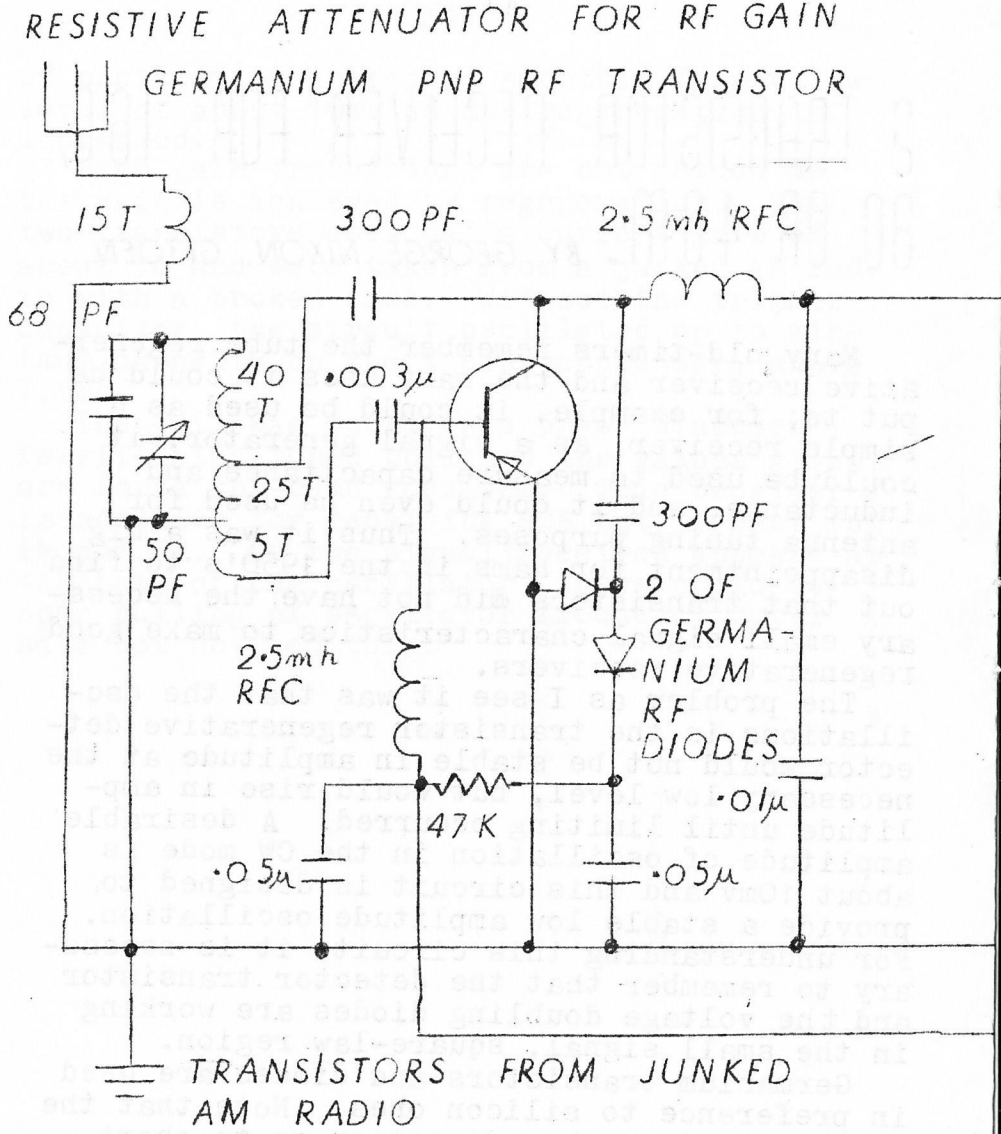
2 TRANSISTOR RECEIVER FOR 160, 80 OR 40M.

BY GEORGE NIXON, G3OEN.

Many old-timers remember the tube regenerative receiver and the many uses it could be put to; for example, it could be used as a simple receiver, as a signal generator, it could be used to measure capacitance and inductance, and it could even be used for antenna tuning purposes. Thus it was a big disappointment for hams in the 1950's to find out that transistors did not have the necessary small signal characteristics to make good regenerative receivers.

The problem as I see it was that the oscillations in the transistor regenerative detector would not be stable in amplitude at the necessary low level, but would rise in amplitude until limiting occurred. A desirable amplitude of oscillation in the CW mode is about 10mv and this circuit is designed to provide a stable low amplitude oscillation. For understanding this circuit, it is necessary to remember that the detector transistor and the voltage doubling diodes are working in the small signal, square-law region.

Germanium transistors and diodes are used in preference to silicon ones. Note that the diodes are in such a direction as to short out the base of the detector transistor if the base voltage was higher. An hf oscilloscope can be attached to the detector base and the operation of the detector observed. The oscilloscope will show that the amplitude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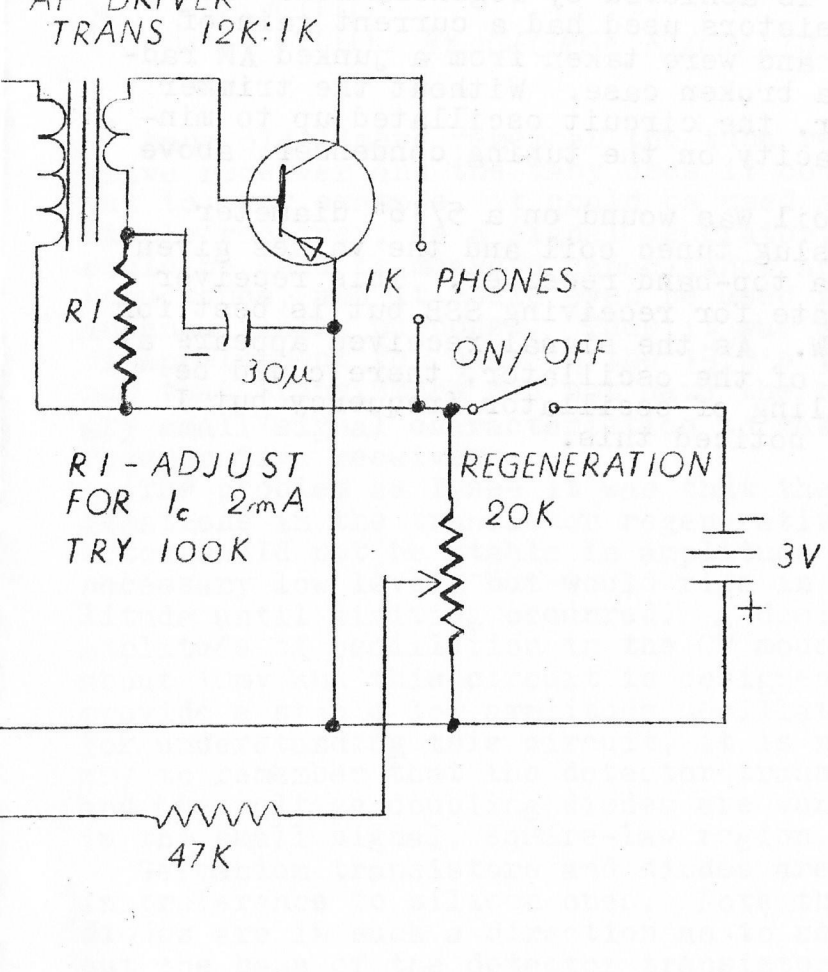

of oscillation increases smoothly from a low level of about 10mv as the regeneration is increased.

High gain transistors are not needed as the gain is achieved by regeneration. The two transistors used had a current gain of about 30 and were taken from a junked AM radio with a broken case. Without the trimmer capacitor, the circuit oscillated up to minimum capacity on the tuning condenser, above 7.5mc.

The coil was wound on a 5/16" diameter ferrite slug tuned coil and the values given are for a top-band receiver. This receiver is adequate for receiving SSB but is best for AM and CW. As the signal received appears at the base of the oscillator, there could be some pulling of oscillator frequency but I have not noticed this.

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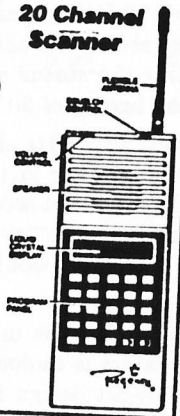

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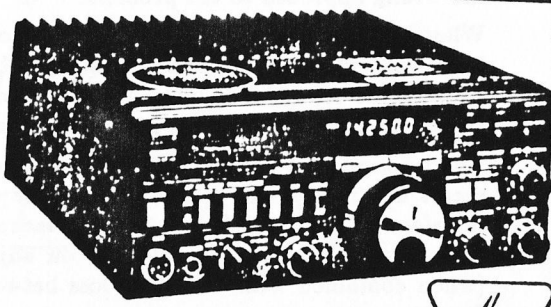

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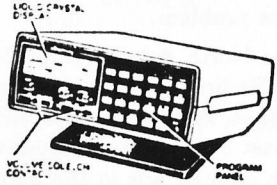

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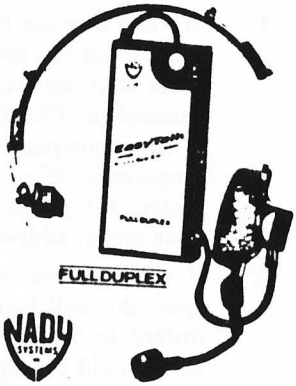

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REPEATER BAND PLANS: 15 OR 20 KHZ

Rich Stiebel, W6APZ

To minimize interference on 2 meters, should we move to 20 KHz? While it would appear that 20 KHz will reduce interference problems, I believe that this is the wrong approach to the problem.

What has disturbed me about the trend toward 20 KHz repeater spacing is that I perceive that Amateur Radio is moving backwards. We should be pushing the state of the art forward instead of just accepting the status quo. In high population areas I feel that we can no longer afford the luxury of 20 KHz spacing.

I understand that commercial FM radio now uses 12.5 KHz channel spacing. The secret is (in part) the design of the slope of the IF filter in the adjacent channel interference can be reduced. If good technical judgement were used in the in the geographic placement of repeaters on adjacent channels, even modest IF filters (when combined with the space loss between repeaters) would provide good performance.

The argument in August "Ham Radio" magazine that the user equipment suffers interference from adjacent 15 KHz spaced repeaters is undoubtedly true in some areas. Our present equipment is not state-of-the-art design in spite of the many bells and whistles. Narrow band IF filters have been built at reasonable prices into two meter single sideband (SSB) equipment. A company such as Icom, Kenwood, or Yaseu could easily produce amateur equipment with sharp frequency roll-off IFs if there were the demand for the equipment. The technology exists; the impetus is lacking.

There are two things that WE can do now to minimize the problem.

1. We can provide that impetus. We can write to the North American headquarters of the principal manufacturers of Amateur Radio equipment telling them that we want to buy HTs and mobile rigs that will reject adjacent channel (at 12.5 KHz spacing) interference by at least 60db. The addresses of these companies are usually shown at the bottom of their ads in the ham magazines. You don't like to write?? Why not just tear out this column (better yet photo copy it so you can send it to several manufacturers), sign your name, address, and call and send it off.
2. If we keep our radios tuned up on frequency, and keep the deviation in spec, this will help. A sweep of the IF bandpass will tell us if our IFs have drifted to broader bandwidths than manufacturer's specifications. We, as a club, could set up a booth to check HTs and mobile units at flea markets and auctions. The test equipment might either be available within the group, or might be borrowed from some of the high-tech companies in Silicon Vally.

I'll share some long-range ideas next month.

What do you think??

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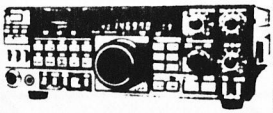

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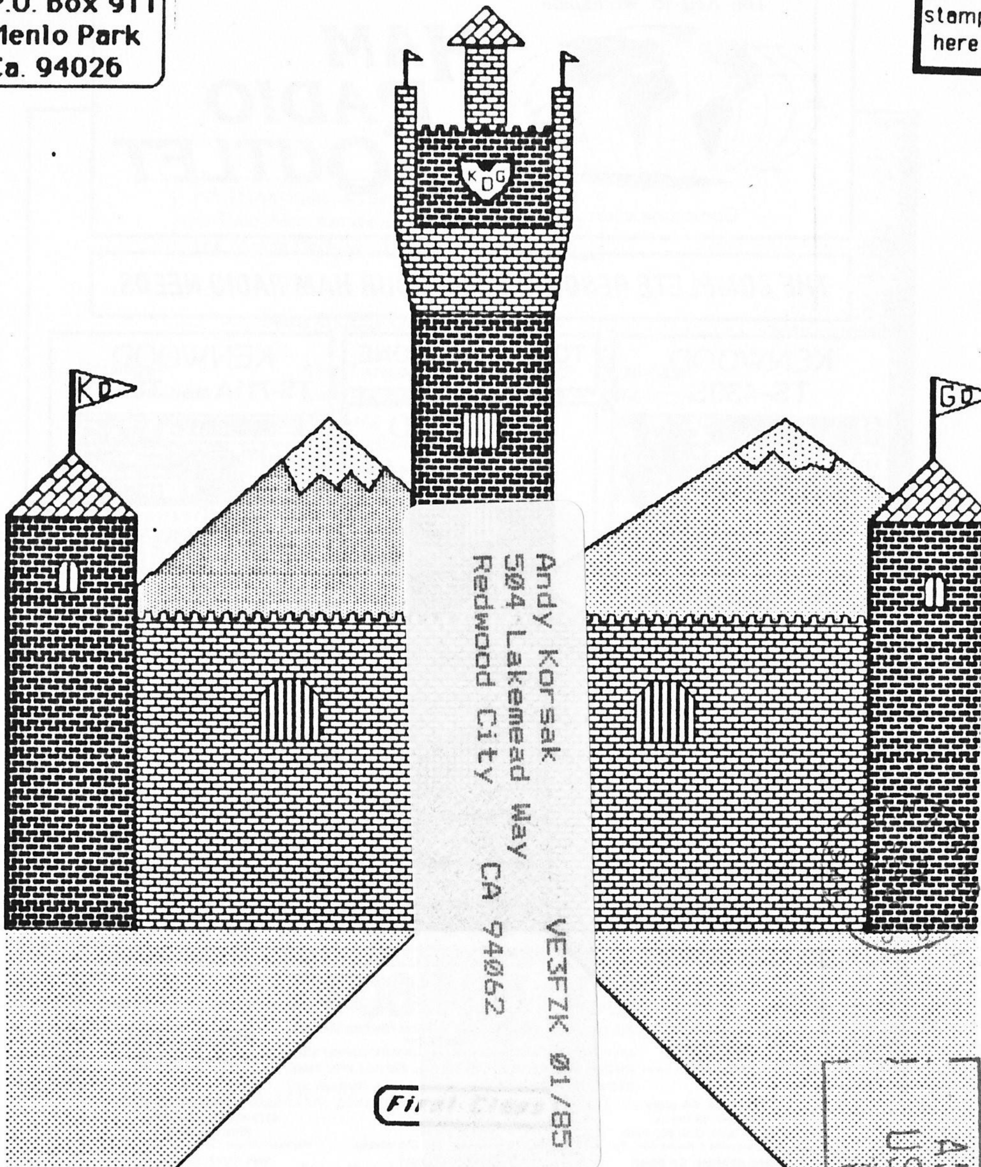

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