

QRM

Bulletin issued by the Northern
Branches of the Wireless Institute
of Australia, Tas. Division.

PO Box 1010
Launceston
Tas. 7250

July 1974

Vol.4 No 4

Registered at GPO Hobart
for transmission by post
as a periodical. Category B.

Price 20¢

This month I am not going to have a say, other than to ask you to think about our hobby and the W.I.A. for a moment. Is there anything you can contribute other than holding a callsign and operating on FM from the car. There are many jobs in the branches that need someone to take an interest in them, for instance, raising money for the clubroom accounts, broadcasts, social functions, articles for QRM (HI), YRCS can always use more man power, and last but not least Intruder Watch, its no use complaining about interference from non-amateur type signals, do something about it. Log their frequency, date, time, type of signal, type of messages and if possible record them, then report them to Intruder Watch (7MZ). The South and North West will have their annual general branch meeting in August, attend this time and be prepared to accept rather than decline a nomination.

73 John VK7JV

MEETINGS

- July 2nd North West Branch, Lakins Hall, Ulverstone.
July 12th Northern Branch, AEB rooms, High st.
Lecture by Joe VK7ZGJ, FM alignment.
July 13th Council meeting at the QTH of VK7ZBY,
1.30 p.m.

YRCS

- July 13 and 27th room 38, Kings Meadows High School.

Northern notes by Reg VK7KK.

While winter brings a slow down in many activities there still seems to be plenty of activity in the branch. On the financial front it's been agreed to build up the interest of the clubhouse funds by placing \$1200 in an investment account.

Members are still buying plenty, treasurer Kevin had \$250 worth of accounts to present for payment.

Gordon 7GW got something for his investment when he won a cheese in the raffle at the meeting, (the only brand MADE backwards), be prepared to be "fleeced" in similar ways at future meetings.

"Talks man" Wally 7ZWX has a good line up for meetings from here to January.

July - Our man in AWA, Joe 7ZGJ will talk on the correct alignment procedure of FM equipment.

August - To be announced

September- TV translator networks, by R.Greenwood 7UV (PMG)

October - Equipment display

November - Diamond tool life, by R.Kerrison (Repco)

December - Barbeque

All it needs now is your attendance. Judging by the interest shown it is likely that a party to the hotel Tasmania cabaret will be arranged for the near future, stay tuned.

Robin 7RH advises that he is keen to help C.W. aspirants, if you are seriously interested in learning morse give Robin a ring on 442324.

It's good to see volunteers coming forward to assist with broadcasts. Different voices, noise and hum types is a change, and creates a talking point.

Harvey 2ZYZ is now a Launcestonian fleeing from warmer lands, he operates on ch. 48 and 40 but hasn't a VK7 call yet.

There is no truth in the rumour that Steve 7OA has taken shares in Ansett to get some of his own back.

It would seem to be connected somehow with the frequent trips to VK3 and back of him and Norma VK3AYL.

Norm 7NR has been promoted to the rank of "Captain" since the purchase of a boat. If you're looking for a name Norm how about "IHIF" (I hope it floats). We hope to work Captain Richardson maritime mobile soon. How about the crew Norm ? all females ?

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VHF notes by Joe VK7ZGJ.

As I mentioned last month, things happen on 6 metres even in winter.

On the 2nd of July the band opened around 1250 local time to VK2 and later to VK5, in all 14 stations were worked, over a period of 3 hours. Most signals were around S9 with little QSB. The following week provided no activity, the only signals heard were the VK2 and VK5 beacons on meteor scatter.

It is rather dissapointing that only the regular operators, 7JV, 7ZAH and myself are there to take advantage of the activity.

With the MUF above 100Mhz on July 14, Northern VK4's were working into VK2,3,5 and 7, I managed to work 4-VK4's around the Rockhampton area.

Cont. Page 5

North West notes by Max VK7MX

At times I have written some controversial stuff and look out I am at it again.

This time it is the Sunday morning broadcast callback. From time to time we hear some long drawn out replies which coupled with a big callback becomes somewhat boring and results in some not waiting to report in.

A 30 minute broadcast plus a 30 minute callback is equivalent to a one hour QSO and this is rarely done.

Personally I prefer a short concise broadcast followed by a brief callback and afterwards the band is wide open for rag chews etc. To sum up, we want to hear the news, the broadcast officer wants to know if he has been copied, and this is the object of the exercise.

The mob generally are not interested in the fact that my baby has cut a couple of teeth (heaven forbid) or that my SWR is 10 to 1. If Sandy wants to know I can tell him later.

Maybe I am getting old and crochity which is possible, as I passed retiring age during the month. But I can't do much about that either.

Now to the news. Our meeting was held on 4th June at the usual place, right at the finish of a thunderstorm.

Maybe this kept a few away as the attendance was only fair.

Routine business was completed in good time with nothing very important coming up. At the conclusion of the meeting we were treated to a most interesting talk by Les 7LH, on the workings of diesel-electric locomotives.

We were taken on an imaginary journey which at times was so realistic that we could hear the wheels clattering over the joints. It was surprising to find how little we know about what goes on around us everyday.

Thanks Les, a fine effort.

We were pleased to see Terry 7TT and Ken 7AI in our midst again. Apparently Ken is still heavily involved in 12 o'clock high activities but we still have to work him aero mobile. Terry displayed a very neatly constructed Dick Smith 30 watt solid state 2 metre final, it certainly looked the part, hope it works.

It is mooted that our branch may hold a little personal dinner at annual meeting time, more later.

En route to the meeting we worked Charlie 7CF on 2 metres. Good show and we hope to hear more of you old timer.

Phil 3APO has again left the Bass Trader for some leave and his next assignment is unknown at this stage.

Harvey 2ZYZ passed through our area recently complete with Siamese cat which modulated well from the car. Bad luck he arrived at the end of the trout season.

Graham 7ZAG has changed his place of work and has now joined the ranks of Norm and Joe. Very interesting he reports and we are hopeful he will stir up some Branch interest in 7AR

On 9th June Tony 7AX did the Divisional Broadcast from his QTH at Ulverstone. Seems that it was a pretty good effort. He certainly set a high standard for those who have to follow on. It is many years since the broadcast came from the North West. Old timers may remember that it was done once following a dinner from my QTH, but that is history.

What a lot of junk I hear some say. Well in that case get the pen out and make a journalistic offering. Show how it should be done. I am sure the Editor will be happy to include it in QRM.

C.U.L. 7MX



LADIES PAGE

Lucy's (XYL 7MX) article in the May issue has prompted me to pluck up some courage and relate to you all the intercom setup at our place. One of its greatest advantages is its convenience. The intercom is mounted on a wall in the diningroom. I just push a button, say my piece, let it go, and the OM (in the garage) replies to my plea of "come and get dinner" or "telephone for you" or "someone at the door for you" (his popularity rating has by now, inflated his ego to its outer limits!). The intercom proves very handy indeed in rainy weather (all is vanity - it prevents me from getting wet running from the back door to the garage) but mainly it saves time.

Another little innovation has been the installation of a microphone in the hallway connected in the garage, to the above mentioned intercom system. The OM selects either the microphone in the hallway or the intercom in the dining room, as the spirit moves him. The reason for the hallway microphone is so that, if I happen to be out at night, the OM becomes a sort of "invisible babysitter", and is able to hear the children should they decide they are not so sleepy or that all is not well.

However, the microphone is so sensitive that it does not permit one to emit certain obscenities which before would have been entirely in private.

It needs to be remembered now that Big Brother is listening (perhaps). Now everything I say about the OM at night, in the "privacy" of home, is complementary.

Vote 1 for free speech!

73s, Diane XYL 7ZBY

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Whinge to the Editor.

Dear Sir

The new Ladies page in your magazine is really a great idea, but the name of the contributors just has to change. Take June for example, "VK7ZAH's XYL Judith" Now really! Makes it sound like HIS pet dog or something, and why X? YF is much nicer. Shades of male chauvenism! This sort of thing is just not on for today's liberated and free woman. After all, the only reason I read your magazine is because it's Q.R."Mary"!

Lots of love Ms.Greer

As the writer used a pseudonym, I imagine she had a fair idea what kind of reception it was going to get. Well you got it, but I can't print it. For the benefit of those who may agree, all articles are signed as received by the Editor.

As far as your example goes, no doubt you will abhor at the thought that some Ladies (not liberated women) are proud to be regarded as their husbands PET.

As for liberated women, most of them look better with their bra on.

The Editor

DX notes by Den VK7DK.

This last month has produced results between really good to very poor. June 1st and 2nd was a little unusual as there was a short path opening to VQ9 area at 0400Z, and the same days, a very good opening to Europe a little later on.

FR7ZU is on Juan de Nova for 3 weeks as from June 10, not yet heard. FR7ZQ on Europa (counts the same) as from June 20th, length of stay not known.

KP6 is said to be activated by the n. California DX club, and is expected to be in operation as from approximately June 25th depending on weather, and should be there for 5 days.

Now for a round up of DX heard.

80 metres, W's, XV5AC, LU, VR4BS.

40 metres, 1930Z, W's, 0700Z, W's, XE1J, VR3AG, JA's, 1200Z
UA and JA.

20 metres, 01/0200Z, 9M2DQ, 9V1OH, YB0, 9Y4, VR1, TI2, W's
02/0300Z, VP2DH, VP2MHK (qsl via W0MHK)
04/0600Z, FR7ZU, M1D, G3BVK/mm (near VQ9R, short path)
06/0700Z, W's, VE's, 9G4, G4, EA8, 5U7, ZS3,
HH2 (qsl via WA2JDT).
07/0800Z, JD1, OX3, XV5AB, 9M2, JA.
1200Z W5, G4, JA, UK6, and some nights....NOTHING.
1500Z G3, OZ, YO, UK2, GI3, I3, OH2, DM2, OK1.
1800Z SM, UR2, UA3, G3, OK, DK, OH, UK9, EI4.
21/2400Z, 9Y4's, 8R1, 6Y5, 9M2, YV1, G6, KG6, JA,
UA3, DJ, LU3, and KC6JC who is none other
than VK7CL Merve, who wishes to be
remembered to all his friends in VK7.

15 metres, KH6, JA, JD1 Marcus Isl.

conditions have been very patchy, one day good DX and the next day at the same time completely unproductive. Thats the way the band is.

The All Asian Contest was held on the 15/16th of June and the band conditions were not good. But it was surprising the number of JA's that were active where as normally we hear only a few. There must be something in these contests. Apart from JA's the only other Asian stations heard were, UL7 (53), UA9, HM, 9V1 and UA0.

73 Den VK7DK

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VHF notes continued from Page 2

Next day while talking to 73AH, Lindsay 44IM broke in and 5/5 signal reports were exchanged, VK4QO was also worked about an hour later.

Monday 16th was most fruitfull, the first contact was at 1130 with 4ZHG at Gympie, a total of 8-VK's were worked as well as Barry 22AY who was there untill 1650.

At 1715 the VK8 beacon was 2 S points above the noise.

Little has happened since then. Kevin has been hearing the VK6 beacon on meteor scatter over the last week.

Tunable 2 metre activity is almost non-existent, Graeme 74GG has been trying to get his DSB operating but so far no success.

Other stations worked on 6 metres this month include.

Graeme 74GG, Malcolm 700 and Wally 72FX down the bottom end, and Allen 70H, Brian 7RR and Ian 7ZIF on 52.525.

73 Joe VK74GJ

THE VIDICON TUBE.

Adapted from R.C.A. application notes on 7038 Vidicon
by Frank Richards VK7ZFR.

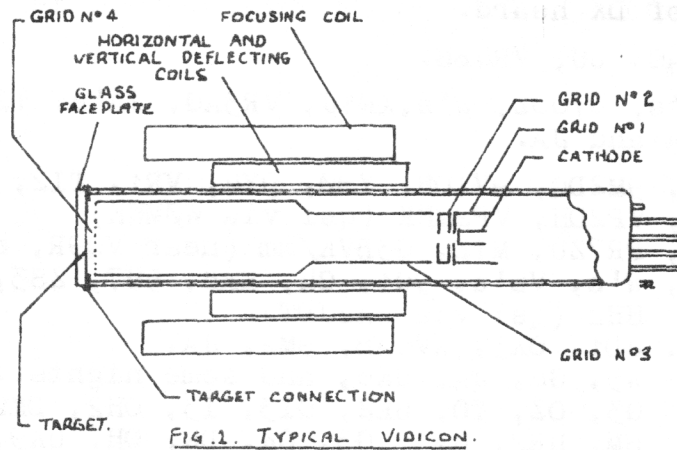


FIG.1. TYPICAL VIDICON.

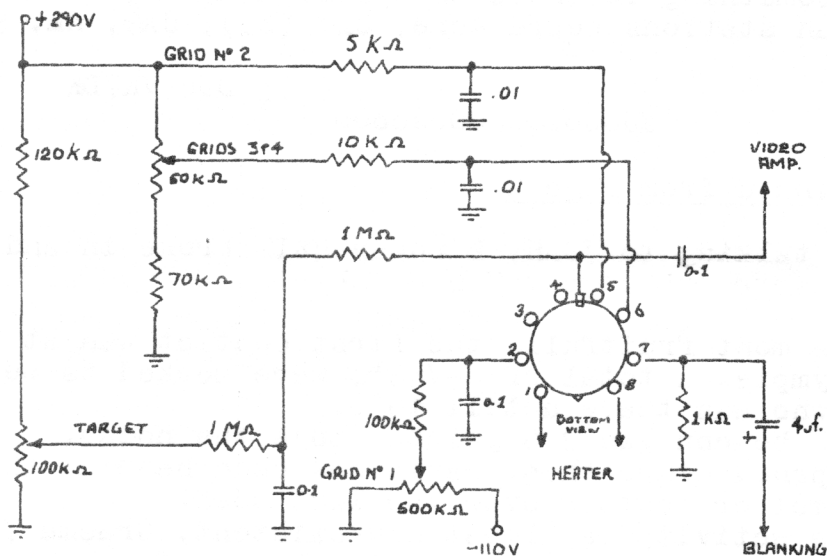


FIG.2. TYPICAL VOLTAGES ETC.

THE VIDICON TUBE.

Unlike normal tubes the vidicon is a sensitive device that reacts to electrons and light like nothing else in the amateur arena.

The target area consists of a photo conductive layer which by its name conducts when light illuminates the face of the tube. This layer is not as a photo diode as a whole but as if the area was a mass of individual photo diodes each insulated from one another.

The electron beam scans these diodes and the light level allows different values of current to flow causing voltage changes at the target terminal, these voltages are amplified and become the non composite video signal.

There are different types of vidicons, separate mesh, integral mesh and the later silicon type which is sensitive to very low light levels.

Connection to the target is best made by a bronze spring bearing on the target ring at the tube face (usually integral with yoke).

Because of the inherent high impedance of the device capacity is important and the smaller and shorter this connection the better.

The focus coil is energised so that north pole is at the tube face.

DANGER

Underscanning will cause permanent damage to tube.

Scan failure will cause permanent damage to tube.

Strong light (sunlight, flash etc. through the lens will also cause permanent damage to the tube.

These are called burn marks and are a permanent reminder of the fatal mistakes one makes.

Sequence of adjustment of the camera, assuming that all systems are functioning normally, see Fig. 2

- 1) Adjust for maximum horizontal and vertical scan.
- 2) Adjust grid 1 for maximum negative (minimum beam current)
- 3) Adjust target for minimum voltage.
- 4) Place mask $\frac{1}{2}$ " X $\frac{3}{8}$ " centred on tube face with lens set on highest F stop ie. minimum light and switch on.
- 5) Decrease grid 1 -ve till highlights just show.
- 6) Adjust grid 3&4 in conjunction with lens stop and optically focus for best picture.
- 7) Adjust scan to mask area or slightly larger.
- 8) Adjust alignment so that picture centre does not vary as the voltage on grid 3&4 is altered.
- 9) Open lens and adjust aperture for good white level of the scene to be shot and adjust target volts for the type of use.

For, live pickup, low illumination 60 - 100 volts
 live pickup, good illumination 30 - 50 volts
 back light, slides etc. with high illumination
 levels will need lower voltages still.

Target current is usually measured but as it is about .004 to .2 micro amps a trip to one of the local studios will be needed.

Best of luck and remember you see the results on the monitor so look forward to seeing all those vidicons from the monitor end.

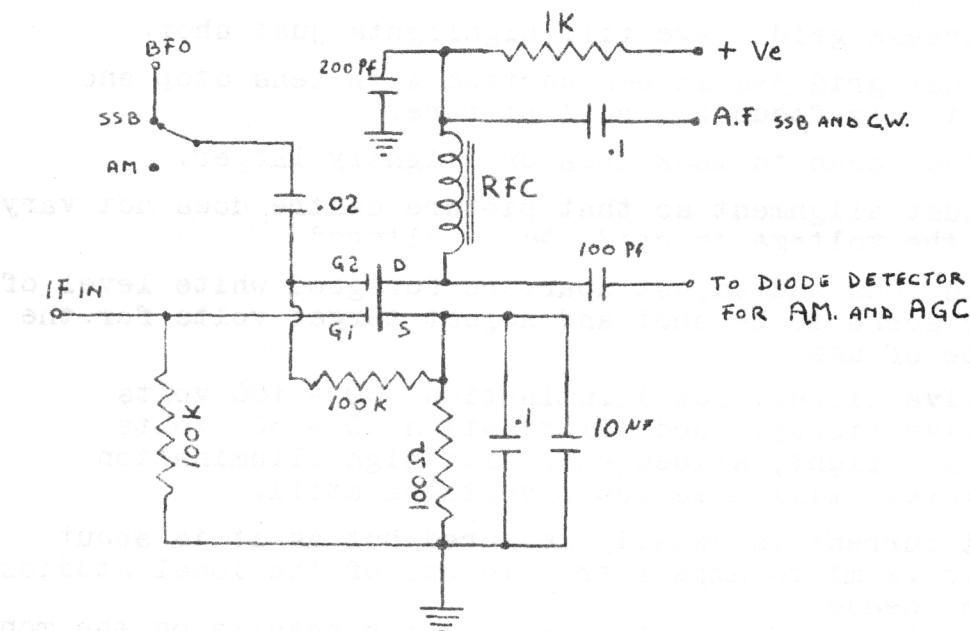
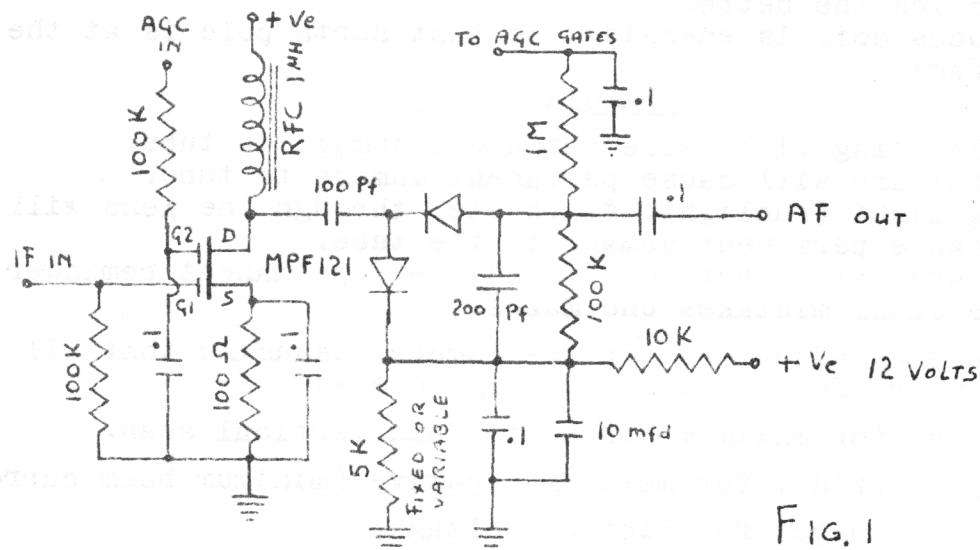
Using the dual gate MOSFET. by Russell VK7ZAC

The dual gate MOSFET is the solid state equivalent of the pentode vacuum tube, it can be used as a direct replacement in most applications, the only major difference being the voltage rating.

When used in R.F. I.F. amplifiers gate 2 is used for a.g.c., this poses a problem since the gain of the device is directly proportional to the voltage on this gate, this requires the gate to be up to 4 volts positive in respect to source for maximum gain.

A way of achieving this is to float the diode detector up to 6 volts above negative ground as per fig. 1, this can be used to apply manual gain control by the use of a pot.

A method of using the 2nd I.F. amp. as an S.S.B. detector is shown in fig.2, this circuit has not been tried as yet but has been included for the interest it may arouse since the device in the role of mixer has no peer, it being a true square law detector.



Reprinted from "6UP" Vol. 2, No 5.

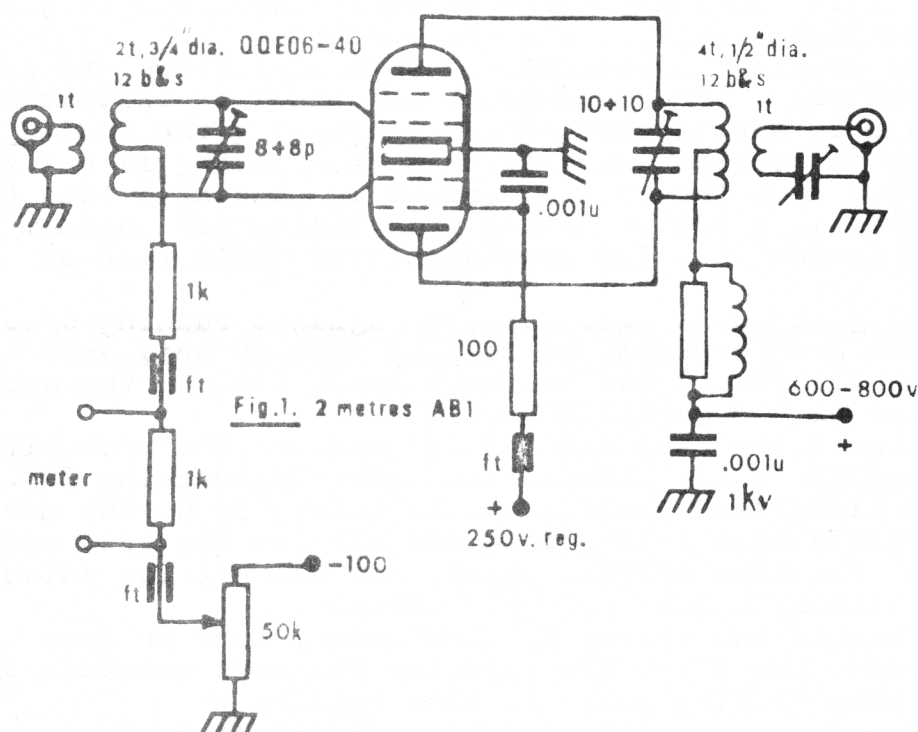
6/40 Linears

Mike Farrell VK2AM

The 6/40 makes an excellent linear amplifier for medium power SSB and the tube will stand up to intelligent (watch the screen current) abuse quite well.

The simplest circuit is the AB1 linear. Plate volts can be anything between 600-800 volts with 250 volts regulated on the screens. Grid bias volts may be supplied by a simple negative supply, with potentiometer adjustment, provided no grid current flows. Standing current should be about 30-40 mA and efficiency 40-50 %. The maximum safe power input should be 180-200 watts peak. See fig. 1.

Provided good circuit layout is used and grid and plate circuits are well isolated, no instability troubles should be experienced as the 6/40 is self neutralised. If problems are encountered a damping resistor of 22K or so can be placed across the grids. A point which should be appreciated with linear amplifiers is that the tank circuit should provide a good match to the dynamic plate impedance of the tubes used at the particular plate voltage and that the loading should be adjusted for good linearity consistent with power output, rather than the other way around. This rather involved topic is explained far better by the RSGB handbook than by the ARRL. This point is usually the explanation for difficulties experienced with obtaining power output from linear amplifiers. (unless your 6/40 is crook) Split stator capacitors and centre tapped tank coils can be a little unwieldy on 6 metres. The two sections of a 6/40 can be paralleled and a pi-coupler used as a tank with great success, however neutralisation then becomes necessary, although this is simply done. Harmonic output is very low. A typical example is shown in fig. 2.



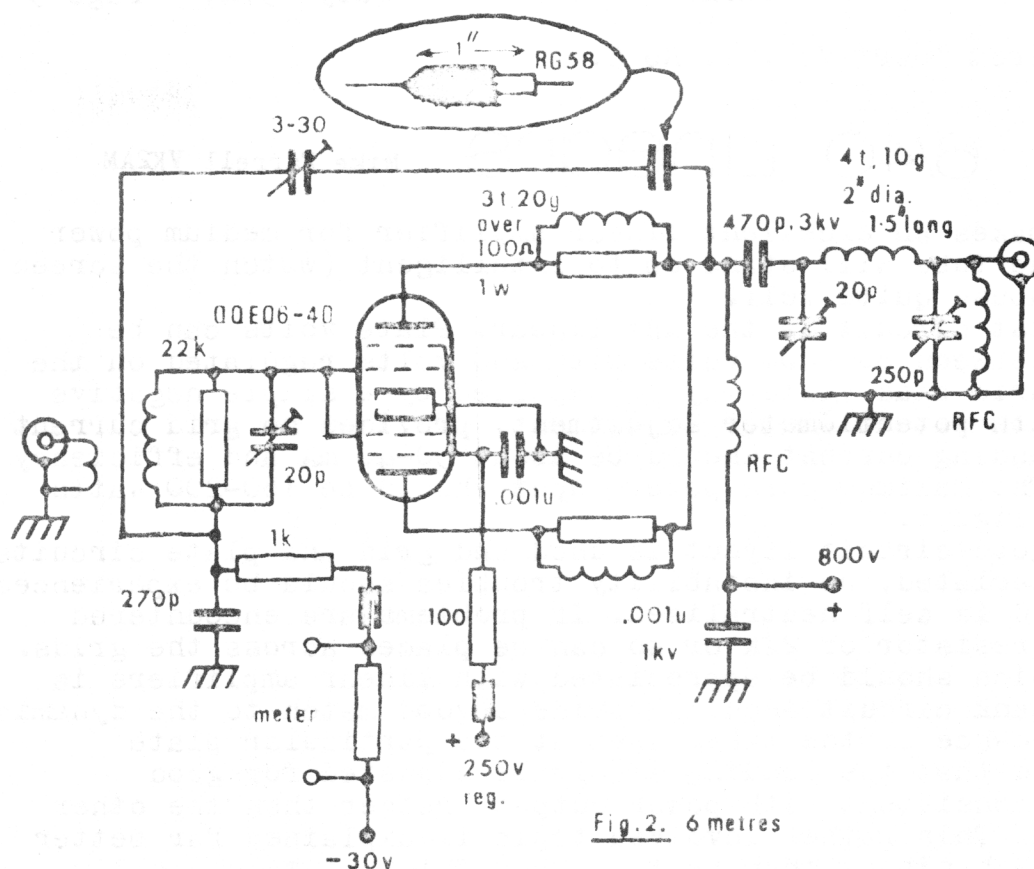


Fig.2. 6 metres

To neutralise the amplifier first disconnect the heater voltage and then drive the amplifier with a 52MHz signal. A diode voltmeter on the output socket will allow all circuits to be peaked for maximum 52MHz signal.

The neutralising capacitor is then adjusted for minimum feedthrough of the signal, always ensuring that all circuits are peaked for maximum. The 1pF capacitor is made from coax, its value may have to be adjusted for best results.

Once neutralised this amplifier is very stable and is quite broad in tuning so quick Q's are possible.

Tune up and loading adjustments of both amplifiers are easily made by monitoring screen current. Resonance is indicated by a sharp peak in screen current and increasing the loading will reduce the screen current, thus the loading is set at the correct value when the screen current is peaking 8-10mA (for a 6/40). This is a better method than tuning for maximum RF out as the screen is a lot more sensitive indication of resonance.

Most of the good books will warn you against running 6/40 linears into grid current, ie keeping them in AB1, as distortion will result due to the varying load on the driver and negative bias regulation problems.

Provided that these problems can be overcome the 6/40 will operate happily in AB2 with efficiencies approaching 70%. The driver distortion problem can be solved by having more drive available than is required for AB1 (ie the grid current of the 6/40 requires driving power) and using a low value damping resistor in the 6/40 grid circuit.

This will enable the driver to work into a more or less constant load, the lower the resistor the more constant the load, but more driving power is then required.

Note that a large proportion of the driving power is dissipated in the resistor.

The bias supply voltage must be well regulated and it must also have a low impedance output, although this is not as important as the driver problem.

However if the bias supply impedance is high, the bias voltage will rise with grid current, limiting the maximum plate current, sort of simple ALC!

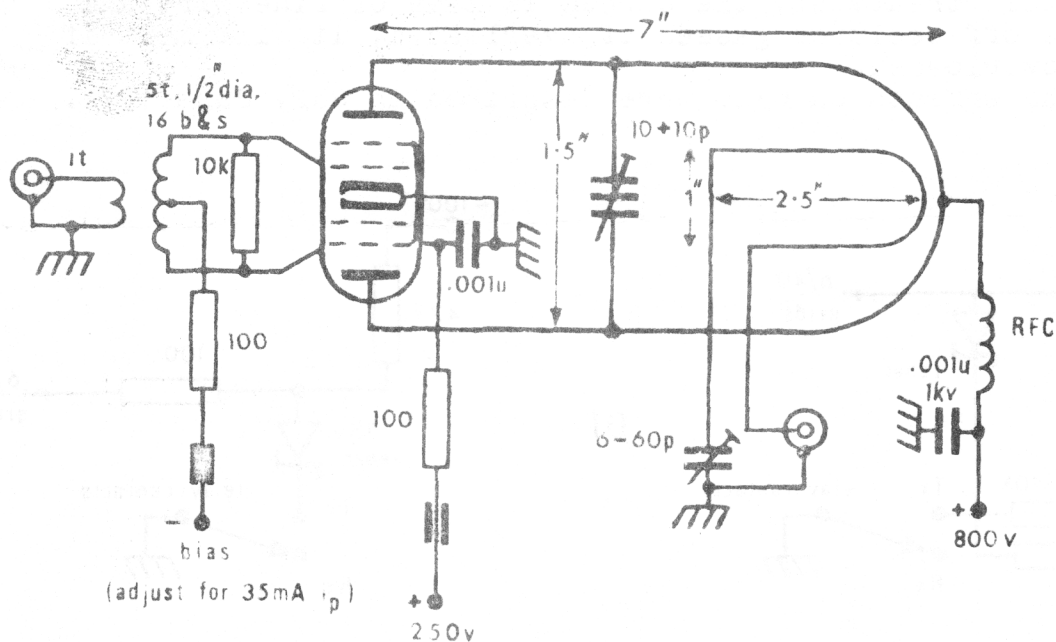
Fig. 3 shows a typical linear amplifier circuit for 144Mhz.

The tank circuit consists of a $1/4$ wave hairpin made of 1" wide strip of 16g copper with the dimensions as shown.

The output coupling loop is made from 16g copper wire mounted inside the tank loop. The grid coil is adjusted for resonance by expansion or compression of the turns spacing.

This can be safely done with the plate and screen voltages removed, then adjust the spacing for maximum grid current (heaters on).

Replace the plate and screen voltages and then set the standing current at 35mA. Introduce sufficient carrier to increase the plate current to 50mA or so and tune for maximum RF out, the output coupling loop should be coupled fairly tightly to the plate tank and the associated capacitor peaked for maximum output.



A broad dip in plate current will be noticed at this stage. Remove drive and check that the amplifier is stable by monitoring plate current and swing the plate tuning capacitor through its range, no change in plate current should be observed. Now drive the amplifier up to maximum plate current, this will depend on the actual plate voltage, for 800 volt about 180mA and for 600 volt about 200mA.

Peak input should not exceed 200 watts or the 6/40 will not last long. RF power out should be repeaked at maximum drive.

For maximum linearity monitor the screen current and resonate the tank circuit by adjusting for a peak in the screen current. The loading should be varied to obtain a peak screen current of 8-10mA. If the drive is varied from zero to maximum it will be noted that the plate current increases in proportion to the drive, then tends to flatten off as the stage is driven into class C.

Voice peaks should be adjusted to just cause the plate to reach the point where it begins to flatten off. At this point grid current will peak at several milliamps. It was previously mentioned that rectified grid current will cause the bias to increase if a poorly regulated supply is used. If the bias supply is used for the linear and the preceding stages "ALC" action will take place and will tend to limit the maximum plate current. If this is the problem a low impedance supply must be used.

VK3ASQ has devised a simple arrangement which overcomes the problem. Fig. 4 shows the typical circuit. The bias voltage required to hold the linear at its standing current should be measured and a zener diode string used to regulate the bias at this value. Generally 35-40 volts is required.

The 829 B is an older version of the 6/40 and will work well as a linear, but it will not accept as great a power input as the 6/40, apparently due to the maximum voltage rating of the internal neutralising capacitors.

As mentioned initially, a 6/40 may be gently thrashed, a plate voltage of 1000 has been used successfully but if you do this, make sure you turn the microphone off when you cough. As long as the screen current is held down, the 6/40 will survive this treatment, the screen is made of fine wire and will give off occluded gasses if overloaded, it will melt if grossly overloaded.

Deleterious effects on 6/40 were described in 6UP, June 1972.

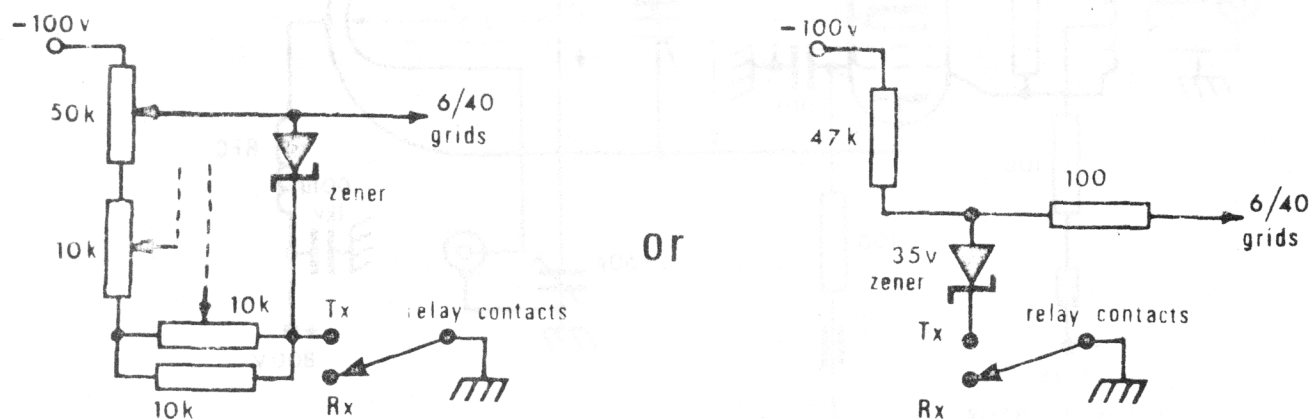


Fig.4. VK3ASQ 6/40 BIAS SYSTEMS

FOR SALE FOR SALE FOR SALE FOR SALE FOR SALE FOR SALE

Bendix frequency meter in perfect condition, without power supply. What offer?

A.J.Manning VK7LR
or contact VK7MX

Equipment store, available now. 1000pF feedthroughs (solder in type) 10¢, 100 mF electrolytics 15¢, 47 mF electrolytics 12¢

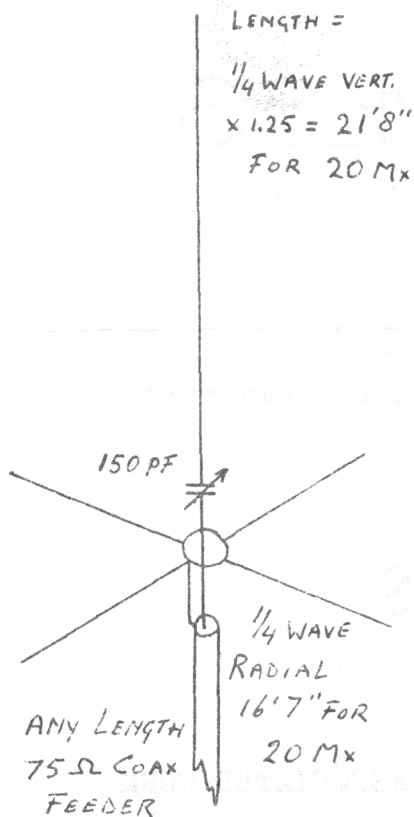
THE 113° GROUND PLANE.

Reprinted from the Westlakes Radio Club Newsletter, May 1972

This is an adaption of the popular $1/4$ wave ground plane, but it has several advantages. The main advantage is that it provides a direct match into 75 ohm coaxial cable and by means of a capacitor at the base of the antenna, the whole aerial can be tuned for the lowest SWR. This capacitor saves trimming the length of the antenna to obtain resonance.

Here is how it works. The normal $1/4$ wave ground plane has a feed impedance of approximately 30 ohms, which is not a good match for 75 ohm coax.

If the antenna length is increased beyond a quarter wavelength to a certain point, the resistive component rises to 75 ohm with a series inductive reactance. This inductive reactance is easily tuned out with a series capacitor in the base of the antenna. This is done so that final matching to the 75 ohm coaxial cable may be accomplished.



Now that the aerial has been properly tuned, which operation is carried out by observation of the SWR bridge, it will be noticed that it is much less dependent on a ground plane than is the classical $1/4$ wave type.

It appears from experiments conducted 113° model, that three radials each of a quarter wavelength, are sufficient to ensure efficient results.

In constructing the antenna, any available materials may be pressed into service. However, it will be found that aluminium tubing of some convenient diameter will be best for the vertical section. The radials are best made of wire and for optimum results should be at right angles to the vertical section.

The lengths given for the unit in the diagram are for 20 metres. However it is quite possible that this aerial can be used on 15 or 10 (with changed lengths) and there is no reason to suppose that it would not function efficiently on VHF. As will be seen the lengths can be calculated very approximately by using the conventional $1/4$ wave formula for the vertical and multiplying this by 1.25.

The name, "113° Groundplane", is derived from the electrical length of this aerial. A quarter wave is 90 electrical degrees so the 113° model must be 23 electrical degrees longer than a quarter wave. It seems that this array may be a half size version of the "five-eighth vertical" now popular among the VHF men. In fact this aerial is, if you like it that way, a "five-sixteenth" vertical. It may be added that the aerial described in this article has been exhaustively tested by the club over a period of several months on 20 metres. It gives superior results to the groundplane and has been responsible for its owner getting among the DX on several occasions. Its omnidirectional characteristics would make it an ideal SWL aerial for either the beginner or the experienced amateur.

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