



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

P.O. Box 1010  
Launceston  
Tas. 7250

September 1976  
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#### MEETINGS

September 10th Northern Branch, S.E.S. rooms, Charles St. 8p.m.  
September 14th North West Branch, Lakins Hall Ulverstone. 8p.m.

#### Y.R.C.S. MEETINGS

September 11 & 25th Kings Meadows High School, 10a.m.

#### A.O.C.P. CLASSES

Sept. 13th  
20th  
27th  
Oct. 4th  
Kings Meadows High School  
block B, room 35

#### CONTESTS

Sept. 4/5 Albatross SSTV Contest  
Sept. 11/12 European Phone Contest  
Sept. 18/19 Scandinavian CW Contest  
Sept. 25/26 Scandinavian Phone Contest  
Oct. 2/3 VK/ZL/OCEANIA PHONE  
Oct. 9/10 VK/ZL/OCEANIA CW

September 21st Deadline for the next issue of QRM

Northern Branch notes by Norman VK7NR.

Greetings to you all. I write these notes possibly for the last time as Hon. Sec. because even though your president didn't mention it, I reluctantly have to give up my position, due to some forth coming changes in my employment, but more of that later. It is possible that Ed VK7HE will take up the reins again and continue where he left off. Also I would like to thank all who supported me in my "shack modernisation sale" recently. I still have some gear to dispose of.

Well the August meeting went off smoothly with members showing interest in all subjects raised. Who said you don't take notice. 30 members, 1 visitor and El Presidente were present.

On the inward correspondence side the most disheartening letter came from John VK7JV your ORM editor, who unfortunately felt he had to tender his resignation, for personal reasons. John has offered to put September's ORM to press to assist and allow time to get another volunteer to carry on this very worthwhile production. Let's face it YOU NEED ORM and so does Tasmania. If that goes, what's left? The insert!!

By the time this goes to press, the progressive dinner will have been held. All tickets were sold with no effort at all. Perhaps we will be able to organise another or something similar for the not too distant future.

Some discussion took place on a change of frequency of the 80 metre Sunday broadcast from 3672 to 3570KHz. This would bring the broadcast into the Novice band and allow them to take part in the proceedings. A sensible suggestion if I may say so. And as some would say "good, let's make them welcome"

The proposed lecture on the Radar Speed Gun will not yet take place, two reasons were given, the first that it has not been legalised yet and secondly the police department have not finalised their technical side.

It is proposed to hold a film session in October, similar to the one held some time ago at the Postal Institute. This time a list of some several hundred films was passed amongst the members and suggestions were asked for the type of programme members desired.

Lindsay VK7ZLD in his usual laconic way assured the meeting that the Hamfest organising was going along nicely and that she would be right mate. Knowing Lindsay, I am sure that it will be. But what about you caravaneers, who wants parking space at the Hall site? We haven't received your applications yet! P.O. Box 1010, Launceston is the address for them.

The treasurer Peter VK7PD reported bumper sales for the last two months and mumbled something like \$4023 with expenditure of \$3373. The equipment store manager said some monies were owing by members and a threat by your scribe to publish a black list had his receipt book going mad after and during the meeting.

Notes from the North West Branch.

The monthly meeting was held in Lakins Hall Ulverstone on Tuesday 10th August at 8 o'clock. There was a good turn up of members with 15 full members and 8 associates. The president Ian VK7ZIE and the secretary Max VK7MX were in their chairs. The minutes of the last meeting were read and confirmed. Apologies were received from Kirby VK7ZKC and Lindsay Johnson. A hearty welcome was extended to a Southern member Dick Ferris VK7ZDF who was up this way and called into the meeting. Also Paul Stott who at our last meeting applied for membership to the WIA, was advised that his application had been accepted. The meeting was a fairly lengthy one and closed off at 9.15p.m. followed by supper.

Following supper Brian VK7ZBL showed a very informative and interesting collection of arial slides, taken by him on some of his arial trips to various parts of the State. A feature of some of these shots were the ones taken over Western Tasmania, how rugged the West looks from up there. I think we are all looking forward to seeing them again in the not too distant future. A big thanks to you Brian, from us all. As well as being a good radio and club member, painter, are fast becoming a first class photographer. The evening closed off at 11.00 p.m. with the usual two metre mobile contacts by members going home. I was unable to attend the meeting, and would like to thank our old friend Max VK7MX who supplied me with most of the happenings at the meeting.

We would all like to extend our congratulation to Kirby VK7ZKC and Gaye on the arrival of their baby son Dale Thomas, another budding on air voice in the future. Going on some of my two metre listening recently I think Kirby has been celebrating the arrival of Dale with his Wynyard mate Brian VK7ZBL, so you had better keep this issue hidden from Gaye if you dont want her to find out.

We hear that our member and friend Cliff VK7CD has been having his share of troubles of late. First of all its rats or mice, then after getting up late one morning he was looking for a sock for an hour only to find that he had the two on one foot, naturally he was late for work. We now hear that he is a high pressure salesman for a well known brand of fly spray, he is now cooking his steak in instead of the latest and correct pressure pack of Pure and Simple. Charlie VK7CF, being an old seaman, swears that the rats on some of the ships were that bad they would eat the buttons of your clothes. He has advised VK7CD to use plenty of traps with walnuts for bait, maybe a tip here for anyone else with a rat problem. Bob VK7ZJS was heard saying he has a little trick up his sleeve for modifying these rat or mouse traps, so contact Bob if you have a rat problem. Enough of this ratty stuff. Typical isn't it.

The remembrance day contest was very well contested here in the North West, Max VK7MX broke his own record for contacts by quite a fair margin. The two metre boys were out in force and they were rather lucky, the band opened up across the Strait and a lot of interstate contacts were made. A lot of North West call signs were heard both day and night.

73 Lindsay Johnson

Northern Branch notes continued from page 2

Mike VK7ZWW resigned due to trade-training as our WICEN co-ordinator, Col VK7KW quickly took up the challenge. Thanks Col, a volunteer is worth etc. etc.

Reg VK7KK is seeking extra help to make up a roster of teacher supervisors for the YRCS classes. He has had an offer from Peter VK7PD and Bob VK7ZRF but still needs more help. Robin VK7RH is having trouble with QRM from a local diathermy device, other than a suggestion to pull the HEC fuses of the offending party it was suggested he contact those intrepid gentlemen of the big stick who when not roaming the island reside in Montpelier Retreat.

Finally some further discussion took place on Club Rooms. Following more discussions with the L.C.C. it was learned that we could only expect a five year lease on Burke St. If we accept this and spent umpteen dollars on decent chairs, heaters and carpet and a bit of paint, the executive thought it wouldn't be a good proposition, but the meeting in general suggested, nay, instructed some budgetary figures be got on the cost of the above items, added to the rent and to be divided by 60 (the number of months in five years) to give a more accurate figure on what such a venture would set us back. As one gentleman suggested we can always take up our carpets and chairs if at the end of five years our lease was not renewed. I guess we could also use any new paint work for Graffiti! So the executive did not get it all their own way, it's back to the drawing board for somebody.

That just about sums up the basic points raised, so those who did not attend can see they missed out. See you at the next meeting.

The evening finished with a film and a sale of donated "JUNK" which raised some \$48.50 for the clubroom account.

One final quip, when are the buyers of some of those high power valves going to get air-borne and fire up those devices.

Will Joe VK7ZGJ drop off that "Z"? Read the next instalment.

73 de Norman VK7NR

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VHF notes by Joe VK7ZGJ

6 metres; The midwinter DX season is almost past. The only recorded opening via sporadic E this month was on the 12th when I worked VK2's, ZFB, ZAY and VK5SU/2. Barry VK2ZAY said that he had been hearing our beacon for about 3 hours.

The weekend of the RD contest VK3YBE was worked by several Launceston stations, Malcolm VK7ZMM was using a IC502 and obtained a 5-4 report.

2 metres; This band has been very active for this time of the year. It was open to VK3 for most of the RD contest, mainly to South Gipsland and repeaters. Stations worked on SSB by Kevin VK7ZAH and myself included VK3's, ZXO, ZQV, AKC, YBE and YJI. Again on the 19th VK3's, ZXO, YJU and AKC.

Kevin has a sked every night at 2000 and has worked VK3ZXO for the past 7 evenings.

That is all for this month.

73 Joe VK7ZGJ

DX and HF bands, from Col VK7LZ.

Only one man's opinion so naturally only a small amount of time can be put aside to listening and a large portion of the 24 hours each day is of necessity not monitored, so other sources of news from members would be appreciated.

General conditions are still very poor and have shown no improvement since last month.

1.8MHz; Has been practically deserted on some nights, however the odd VK5 or ZL is active on phone and CW but you'll have to look for them. The only DX heard has been W4EX, W8ANO and KL7HAQ, all on CW around 1000Z. This band should start to improve soon.

3.5MHz; All reports seem to indicate that this band has not come up to expectations for DX. The odd JA or W has been logged on CW but the only unusual station heard was KG6SZ Saipan Island, using CW on the 5th August with a 569 signal.

7MHz; Until I checked my listing my comments would have been "very poor", however a count of prefixes heard produced the following, F, HI, FW8, KG6, KV4, C2, HK, VS5, KL7, VKØ, DL, I, FK, VE, W, G, GW, XE, VS6, HM, HP, UAØ, OA, CM, YV, 8R2, 6W8, JA, CT, KZ, YU, PJ2, OK, EA, ON, ZL, HB9.

37 countries in 7 continents so there is still DX if you delve for it both on SSB and CW. Those heard on SSB included, 6W8, 8R2, DL, G, XE, FK, F, CT, KZ5, PJ2, JA, W and VKØ, once again all continents heard so don't rubbish 7MHz. All these stations were heard between the hours of 0630 and 1430Z.

14MHz; Being still without a beam this band has been neglected and other than hoards of VE's and W's the only other prefixes listed were, VR8, XE, YJ, FK, DL, I, G, VP1, and 3D2, however for the DX enthusiast 14MHz should never be overlooked.

No listening has been done on 21 and 28MHz.

QSL information. KG6SZ via JA1EMX, 3D2AJ via W6SC,

YJ8KW via K6KII

FW8CO, C/o Airport, Wallis Island.

Two interesting QSL's have been sighted this month, XJ3ZZ/I ST Paul Island, 7J1RL Okino Iori-Shima, if you want to see something unusual in a DXCC country, this card is worth seeing.

Latest information from the Swiss Federal Observatory give the predicted smoothed sunspot numbers for September, October and November as 6, 5, and 4 respectively so there is one consolation, they can't get much lower.

73 Col VK7LZ

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There are several fully solid state, low power SSB transceivers available commercially now and these have made a big impact on the activity on the VHF bands.

However in most cases the low power is a serious limitation to the serious DXer. This also applies to the many homebrew exciters and transverters with only 1 - 3 Watts PEP output.

This amplifier has been designed for use with SSB drive from 1W to 5W PEP and 10 to 12 Watts PEP, depending on the configuration constructed.

The variations to the amplifier are as follows:

- 1) Driver stage only using a 2N5590 will deliver 12W with 1.5W PEP of drive.
- 2) Driver stage only using a 2N5591 will deliver 20 - 22W with 2W of drive.
- 3) Driver stage using 2N5591 and two 2N5591 in the output stage. This combination will deliver 50 - 55W with 2W of drive.
- 4) If the drive available is only 1W a 2N5590 can be used to drive two 2N5591's to 40W output.
- 5) The output stage only can be built using two 2N5591's and will deliver 50W with 10 - 12.5W of drive.

It is only necessary to construct the relevant section of the P.C.B.

A few years ago I used 2N5591's in a broadband linear with very pleasing results. One aspect about using these transistors in linear service that became apparent is the lower output power obtainable compared with the output in class C. Although 30W or more can be obtained in class C service, only 20 - 25W can be obtained from a class AB linear.

The use of a 2N5591 as a driver may seem extravagant but this is necessary to keep intermodulation distortion to a minimum by allowing the driver to loaf along. This allows the output stage to be driven further into the gain compression region before the combined distortion of the two stages becomes excessive. If the drive available is only 1W PEP and 40W output is satisfactory, the 2N5590 is quite suitable as a driver.

Two important aspects that must be considered when designing and building transistor linear amplifiers are bias and supply regulation. The power supply should be regulated to within 0.25 volt for load variations from 1 - 10 Amp. This includes the voltage drop due to leads, fuses, relay contacts and terminals.

To avoid these problem areas, I suggest;

- 1) very short and heavy leads between the power supply and amplifier.
- 2) a short circuit protected power supply.

- 3) instead of switching the supply directly, switch the voltage regulator at a low current point i.e. the base of the main pass transistor or driver.

There are two methods of biasing the RF power transistors,

- a) forward biased diodes
- b) transistor regulated sources

The transistor bias supply is preferred because of its lower output impedance and wider degree of control over its operating parameters. However it is more complicated than the diode method and was considered unnecessary for an amplifier at this power level, where forward biased diodes can provide good results.

The diodes are in contact with the transistor package so that the bias voltage will track the transistor base/emitter voltage variation with temperature.

#### Construction notes.

The amplifier is built on a double sided fibreglass board to aid stability. The only active track on the underside of the board is used to link the supply rail between the two output transistors.

The P.C.B. should be mounted approximately 2mm away from the heatsink so that the transistor leads rest flat on the copper without bending. Before mounting the transistors the leads should be cut to 3/8 inch length, then the outer 1/8 inch bent up vertically, this enables easier installation and removal.

The 1000pF chip capacitors are soldered to the P.C.B. by first tinning the copper track then lying the chip capacitor on the tinned area, apply the soldering iron to the top side of the capacitor until the solder melts under the capacitor.

The links between both sides of the P.C.B. are short lengths of 16 B&S copper wire soldered to the copper.

The three bias diodes rest across the emitter leads of the transistors with some silicone grease or heat conductive glue between them and the transistor.

#### Tune up. To adjust bias:

- 1) terminate the amplifier input and output with 50 Ohm.
- 2) disconnect the supply end of R3, R8 and R9.
- 3) apply 14.5V DC to the amplifier via a 250mA meter.
- 4) connect R3 to the 14.5V supply before the above current meter, i.e. do not allow the current through R3 to indicate on the current meter.
- 5) adjust the value of R3 to give 100 - 120mA of  $I_c$ , then disconnect the supply from R3.
- 6) repeat steps 4) and 5) with R8 and then R9, each time leave the resistor disconnected from the supply after selecting the correct value. The  $I_c$  of TR2 and TR3 should be set at equal values between 100 and 120mA.

- 7) disconnect the supply and solder the three bias resistors in place. Keep them away from the P.C.B. and other components as they become very hot.

#### Tuning the driver stage:

- 1) connect the output of the driver to a power meter. If possible keep a load on the output of the output stage. This stage is quite stable without a load, but it pays to be careful.
- 2) connect the output of the exciter to the driver input via an SWR bridge or directional power meter.
- 3) apply power to the amplifier.
- 4) apply CW drive to the driver at 0.5 - 1W. Start with C2, C10 and C11 at half mesh.
- 5) adjust C10 and C11 for maximum output power.
- 6) adjust C2 for minimum SWR. It should be possible to achieve better than 1.05 : 1, Minimum SWR should correspond to maximum output power.
- 7) increase drive to a maximum of 2W and repeat the adjustments of C10, C11 and C2. If necessary adjust the spacing of the turns of L3 to obtain maximum output.

#### Tuning of the output stage:

- 1) remove the load from the driver and connect to the output of the final stage.
- 2) join the links between the driver and final stage.
- 3) set C14, C27, C29 and C35 to half mesh.
- 4) reduce the output from the exciter to 0.5W.
- 5) apply drive and adjust C27, C29 and C35 for maximum output power. Then adjust C14 for maximum output.
- 6) repeat the adjustments of C27, C29, C35 and C14 for maximum output.
- 7) increase drive to 1W and repeat step 6)
- 8) increase drive to 2W and repeat step 6)

Do not readjust C2, C10 or C11. Do not attempt to tune the whole amplifier in one go.

If the drive available from the exciter exceeds 2W P.E.P. insert small attenuators between the exciter and driver stage. Use standard 50 Ohm attenuator networks and use resistors with power ratings consistent with the power being dissipated in the attenuator. Alternatively use length of lossy coax.

If the driver stage only has been built maximum drive for the 2N5590 is 2W P.E.P., or 4W P.E.P. for the 2N5591.

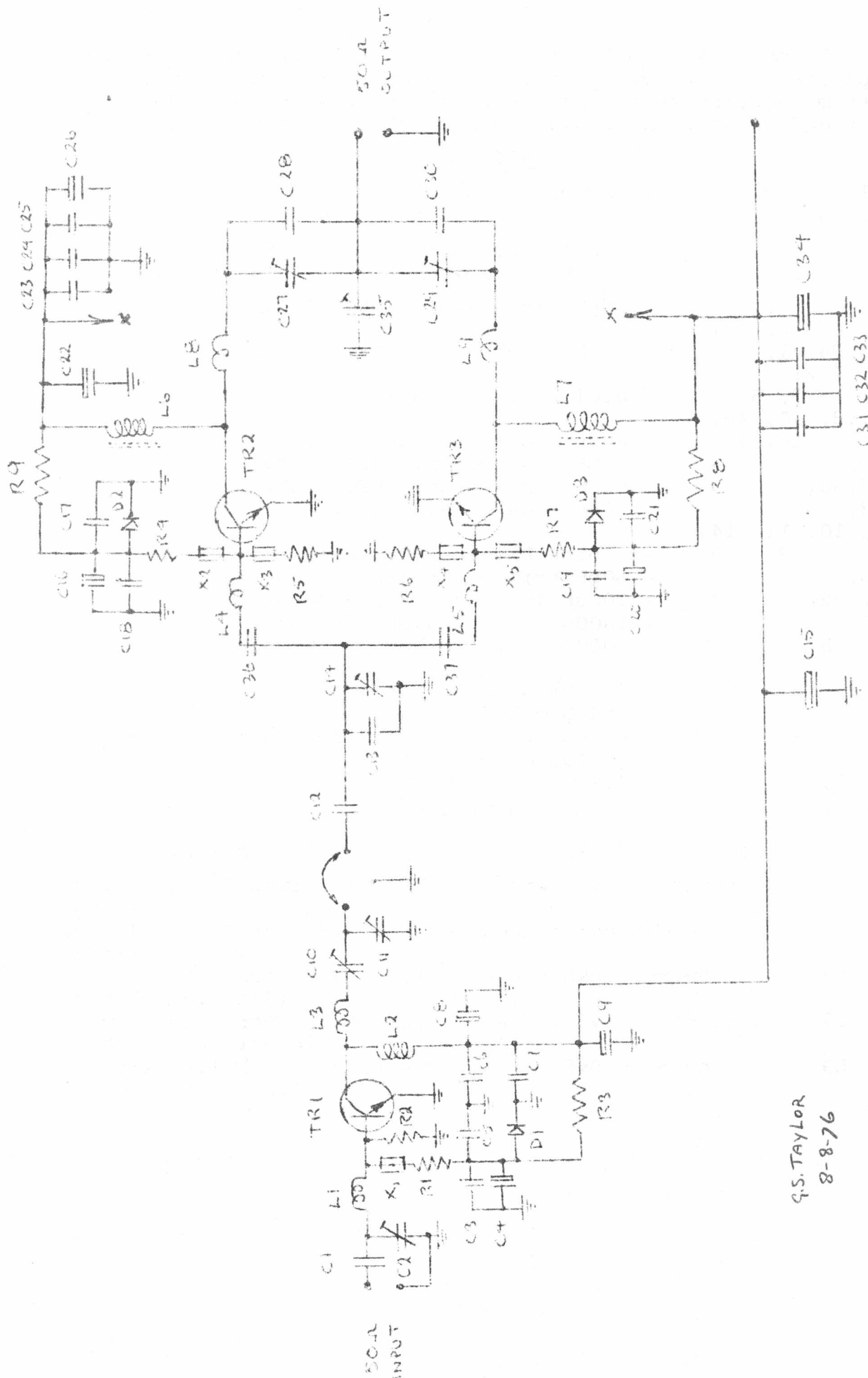
#### Operation.

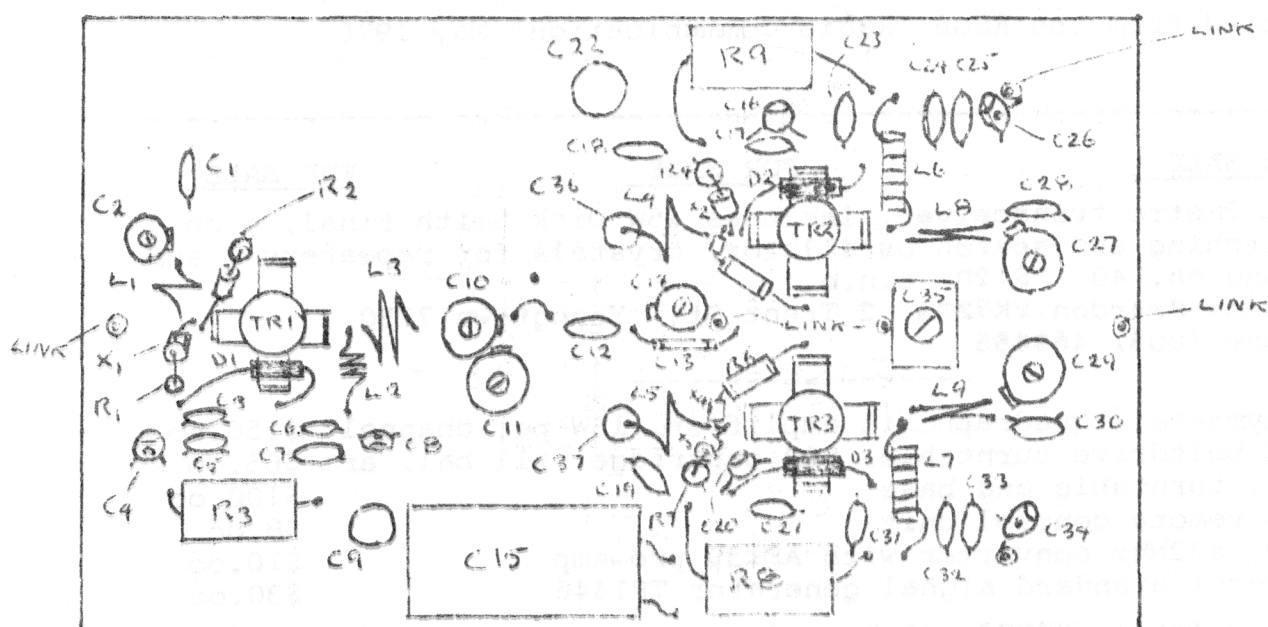
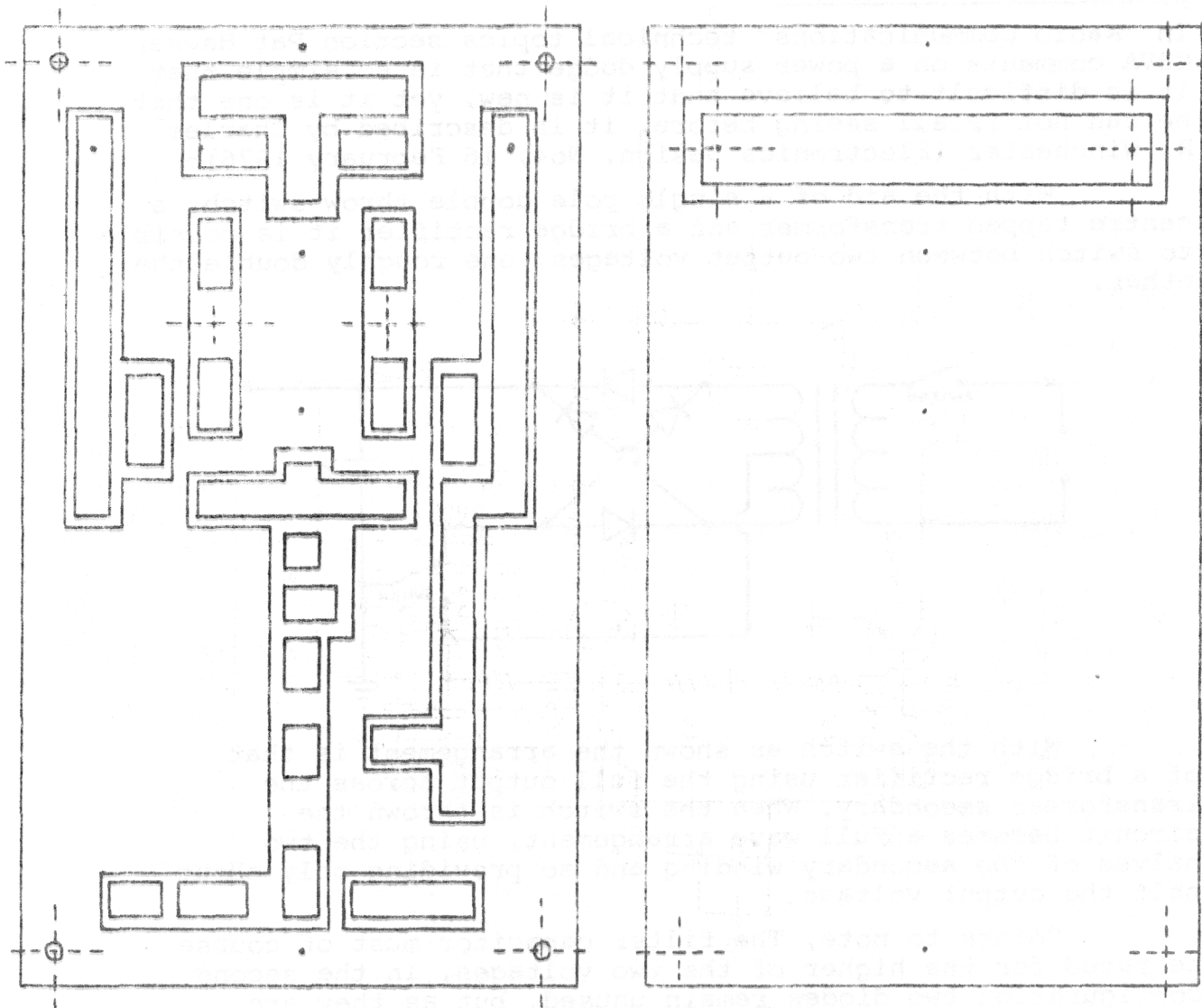
Ensure that the antenna to be used has a very low SWR as any mismatch will degrade the output power and distortion products.

Do not try to achieve more than 50W P.E.P. output as the amplifier will be very non-linear above this power level. Intermodulation tests will be conducted toward the end of the year and these results will be published as soon as possible.

#### PARTS LIST

|                                   |                                                                                      |
|-----------------------------------|--------------------------------------------------------------------------------------|
| TR1                               | - 2N5590 or 2N5591                                                                   |
| TR2, 3,                           | - 2N5591                                                                             |
| D1, 2, 3,                         | - Ferrite bead 5mm x 3.5mm 481 ferrite, these are not particularly critical to type. |
| C1                                | - 18pF disc ceramic NPO 100V                                                         |
| C3, 6, 18, 19,<br>23, 24, 31, 32, | - 1000 pF disc ceramic                                                               |
| C5, 7, 21, 17,<br>25, 33,         | - 0.01uF disc ceramic                                                                |
| C4, 8, 20, 16,<br>26, 34,         | - 4.7uF tantalum capacitor                                                           |
| C12,                              | - 22pF disc ceramic NPO 100V                                                         |
| C28, 30,                          | - 68pF disc ceramic NPO 500V                                                         |
| C13,                              | - 56pF mica encapsulated                                                             |
| C2, 10, 11, 14,<br>27, 29,        | - 5-65pF Philips 808 series                                                          |
| C35,                              | - 60pF trimmer Philips 809 series                                                    |
| C9, 22,                           | - 100uF 16V tubular PCB mount                                                        |
| C15,                              | - 1000uF 16V tubular PCB mount                                                       |
| C36, 37,                          | - 1000pF chip ceramic capacitors                                                     |
| R1                                | - 22 Ohm $\frac{1}{4}$ or $\frac{1}{2}$ Watt                                         |
| R2                                | - 3.3 Ohm $\frac{1}{4}$ or $\frac{1}{2}$ Watt                                        |
| R3, 8, 9,                         | - select on test, 5W wire wound, start at 100 Ohm. see text.                         |
| R4, 7,                            | - 3.9 Ohm $\frac{1}{4}$ or $\frac{1}{2}$ Watt                                        |
| R5, 6,                            | - 27 Ohm $\frac{1}{4}$ or $\frac{1}{2}$ Watt                                         |
| L1                                | - one turn 20 B&S tinned copper, 1/4 inch I.D.                                       |
| L2                                | - 3 turns 20 B&S tinned copper, 1/8 inch I.D., 1/4 inch (long                        |
| L3                                | - 2 turns 18 B&S tinned copper, 3/8 inch I.D., 1/4 inch (long                        |
| L4, L5                            | - one turn 18 B&S tinned copper, 3/8 inch I.D., with (3/16 inch leads                |
| L6, L7                            | - 6 turns 18 B&S tinned copper wound over length of (neosid F29 slug                 |
| L8, L9                            | - one turn 16 B&S tinned copper, 3/8 inch I.D. with (1/4 inch leads                  |

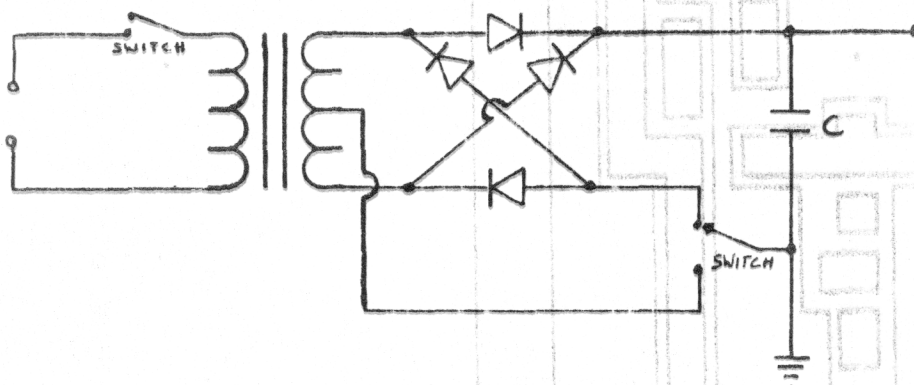




TWO IN ONE POWER SUPPLY.

In "Radio Communications" technical topics section Pat Hawker G3VA comments on a power supply dodge that is so simple that it is difficult to believe that it is new, yet it is one that he can not recall seeing before, it is described by Charles R. Winchester (Electronics Design, No4, 16 February 1976);

With the aid of a single pole double throw switch, a centre tapped transformer and a bridge rectifier it is possible to switch between two output voltages, one roughly double the other.



With the switch as shown the arrangement is that of a bridge rectifier using the full output across the transformer secondary. When the switch is thrown the circuit becomes a full wave arrangement, using the two halves of the secondary winding and so providing only about half the output voltage.

Points to note, The filter capacitor must of course be rated for the higher of the two voltages. In the second configuration two diodes remain unused, but as they are reversed biased there is negligible leakage current.

Copied from the RSGB "Radio Communication" May 1976

FOR SALE

IGL 2metre transceiver, includes 25W Dick Smith final, 4 ch. switching and search oscillator, crystals for repeaters 2 and 8 and ch. 40 \$120 o.n.o.

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| P.E. turntable and base                              | \$100.00 |
| RCA remote control unit                              | \$8.00   |
| 6UP, 432MHz converter with AF139 pre-amp             | \$10.00  |
| Marconi standard signal generator TF1446             | \$30.00  |

Joe Gelston VK7ZGJ, 40 Lavender Gr., Phone 443882

from  
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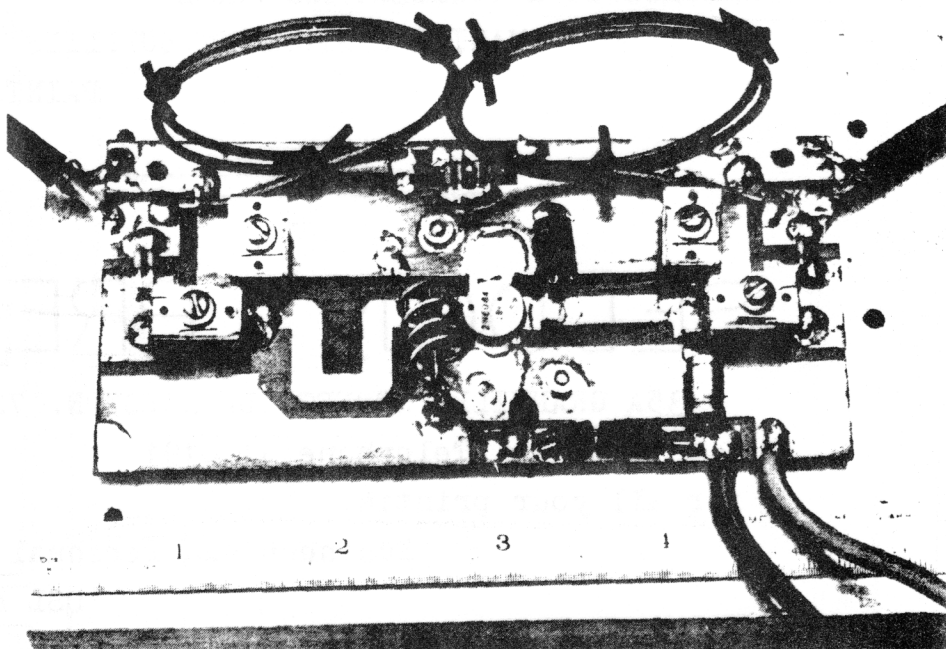
P.O. BOX 57, ROZELLE 2039

**45W TWO METRE BOOSTER AMP.**

This kit was featured in the April issue of Electronics Today International page 56. It delivers 35-45W output from about 10W drive on a 13.6V supply. It features the 2N6084 diode changeover switching simple construction.

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Heatsink ..... \$2.50  
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The 45W two metre RF power amplifier. The 2N6084 transistor is visible in the centre of the p.c. board. The mica compression trimmers located on the right hand side are for tuning the input, those on the left for tuning the output. The printed inductances are readily visible. The two quarter wave coax lines are visible at the top. They may be coiled up as shown or conveniently arranged in some other way. Note that the components are soldered on the copper side of the printed circuit board.

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|        |         | 1-4             | 5up     |
|--------|---------|-----------------|---------|
| B3 12  | 5W out  | \$5.70          | \$4.80  |
| B12 12 | 15W out | \$7.70          | \$7.10  |
| B40 12 | 40W out | \$17.50         | \$17.20 |
|        |         | or \$30 the set |         |

BM70 12 typically 80W out at 146MHz from 9.12W drive at 65% collector efficiency \$46.50

We also stock the popular 2N6084 made by both Motorola and SSS for only \$16.75 or for 10 or more \$16.00

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|-----------|--------|--------------------|
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| 68-250pF  | \$1.95 | \$1.85 68, 82, 100 |
|           |        | 150, 200           |
| 270-500pF | \$2.20 | \$2.10 300, 470    |

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|----------|-------|-----|
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