

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

June 1976
Vol.6 No.3

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Launceston
Tas. 7250

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MEETINGS

- June 8th North West Branch, Lakins Hall, Ulverstone. 8 p.m.
June 11th Northern Branch, S.E.S. rooms, Charles St. 8 p.m.

Y.R.C.S. MEETINGS

- June 12th no class due to school holidays
June 26th Kings Meadows High School, 10 a.m.

A.O.C.P. Classes

- June 7 & 14th no classes due to school holidays
June 21 & 28 Kings Meadows High School, block B, room 35
CW, 7.30 p.m. and Radio theory at 8 p.m.

CONTESTS

- June 5-13 Townsville Pacific Festival Contest
June 12-13 RSGB National Field Day
June 12-14 Midwinter Field Day (VHF)
June 26-27 ARRL Field Day
July 24-25 ARRL Bicentennial

Notes from the Northern Branch by Norman VK7NR

The chairman, Brian VK7ZBY, and 33 members attended the May meeting of the Branch, with apologies being received from VK7's TE, ZAX, LZ, KW, ZWW, H.Skegg and J.Allum.

Reports were received from all officers, including a comprehensive report from our Federal Councilor Peter VK7PF, on the recent Federal convention held in Melbourne.

Peter VK7PD presented the following trading figures;

<u>April</u>	Sales	\$983	<u>May</u>	Sales	\$ 359.00
	Income	\$146		Income	\$ 17.50
Cash at Branch		\$885	Cash at Branch		\$1262.00

An application from Max Fraser, for associate membership was presented and approved.

John VK7JV is still looking for articles for QRM and this request includes items for the Ladies Page, so what about it

The 1976 Hamfest will be organised by the Northern Branch under the leadership of Lindsay VK7ZLD, who will be expecting 4 or 5 volunteers to help him out. He is particularly looking for new ideas and perhaps some of our younger members can come up with some. Why not tell Lindsay YOUR IDEAS ? The dates, November 13 and 14, the venue is Evandale, provided the hall is available.

Peter VK7PF offered his services as Repeater Co-ordinator for the Branch. His offer was accepted.

One thing I forgot about the Hamfest was, an offer by Joe VK7ZGJ to come up with a "Sniffer" for Foxhunting that works.

A suggestion was made that perhaps we might put on a display at the next Launceston Show, your Hon. Sec. will follow this up and advise accordingly.

Also a request was sent to the Superintendent of the Radio Branch to change the Branch call sign from VK7NZ to VK7NB. This change of call sign would, it is felt, be more in keeping with our new constitution.

And that about sums it up for this Branch meeting, which was followed by a couple of interesting films, courtesy of Wall VK7ZWX our Lecture officer.

One final comment, last months QRM contained a form asking for members views on Club rooms, some were returned, but not enough for your executive to fully ascertain your needs. To those who returned forms, I say many thanks for your interest, to those who have not yet returned them, please bring them to the next meeting or post it to Box 1010 Launceston, or give them to any member of the executive, or any member you know will be attending the next meeting at the S.E.S. rooms on June 11th, 1976.

Notes from the North West Branch. by Lindsay Johnson

The monthly meeting was held at Lakins Hall Ulverstone on the 11th May. Although the weather was fairly cold a good attendance was present, some eighteen in all (with the associates again nearly outnumbering the full members).

The president Ian VK7ZIE and the secretary treasurer Max VK7MX were in the chair. With a good turn up of Devonport, Latrobe, Burnie and Wynyard members and only four associates from Ulverstone. The meeting went off very well. Graeme VK7ZAQ reported that the new 2 metre North West repeater, being situated and installed on a site behind Lonah (which is between Ulverstone and Penguin along the old coast Rd.) will be operational shortly, on short tests given recently, it was found to be a bit of a fizzer in some parts and o.k. in others, so it looks as if Graeme and his worth while assistant Ivan Lamberton will be burning up the midnight oil again to rectify the troubles, knowing of Graeme's knowledge of electronics we are sure the troubles will soon be overcome and all 2 metre operators will then get a good coastal coverage.

Towards the end of the meeting the secretary treasurer was busy collecting subs from members for QRM, by the way the subs were coming in I guess most must now be financial. The meeting closed at 9.45 p.m. and was followed by supper, the Burnie members being the hosts and doing a very fine job of it.

Following supper Graeme VK7ZAQ held a mobile clinic with his frequency counter, which went over very successfully and created much interest as was shown by the amount of rigs which were brought in by members for Graeme to give the once over. I think this an opportune time and place to thank Graeme for all the hours of voluntary and untiring work he donates to us here in the North West Branch and else where.

Following the mobile clinic there was the usual after meeting discussions and the meeting was wound up at 10.15 p.m. But this was not the end of the evenings outing for some Devonport and Latrobe members who on the way home called in on a Ulverstone member who had recently purchased a movie camera and had just received back his first ever home made movie. The visitors were privileged to be able to see the premier screening and had to admit, not bad for the first one.

Two Wynyard members who are very active on 2 metres are, Kirby VK4ZGR/7 and Brian VK7ZBL, Brian, who has purchased a welding plant, is in the process of designing and building a tower, from what he tells us, when it is completed it will be the answer to simplicity in erection and strength, good luck with your project Brian, we are looking forward to yet stronger signals than your already strong ones.

Kirby VK4ZGR/7 is also very active on 2 metres and is being heard mobile from different parts of the coast or his QTH using the ZIE special aerial and putting in some quite strong signals.

Definition, of a half wave. A greeting to someone you don't really like.

HF notes by Frank VK7BC

A general improvement has been noticed (or imagined) this month, with the band remaining open a little longer than of late. Multipath echoes have been observed quite often during the past 2 weeks on 20 metre CW signals, which in itself would indicate an improvement in conditions. The 10 and 160 metre bands have not been monitored this month.

QSP For those old friends of the Rev, "Ham" VE3BWY. Ham will be in VK for a period of three month commencing 22nd of November. The first three weeks will be spent in VK7 where he will be quite QRL with the business of his calling, however he is looking forward to some eyeball QSO's with his old contacts. More later.

New Country, St.Paul Island, VYØ in Cabot Strait, approx. 47.20 N, 60.10 W,.

New Country, Sable Island, VXØ, 44.00 N, 60.00 W.

Col VK7LZ was the first VK to get St.Paul Isl. followed by VK7BC and VK7DK.

Now that Col is full time operator at 7LZ there will not be many DX plumbs that remain on the branches for long and we can look forward to seeing him right up on top of the DXCC listings.

QSL's XJ3ZZ/I St.Paul Isl., via VE3BMV.
VP1BH via VE2AKZ
ZF1MA Box 459 Grande Cayman, W.I.
CT2BS via WA4CAD
VP5SF via WB4SHB
YJ8AN via Box 219 Vila.

80 metres 0700Z - 1100Z. CW, VE1ZZ, W1EWD, VE2BPT, CO2JA
JA's and ZL's

40 metres 0500Z - 1000Z. CW, YJ8KG, W1EWD, CT2BS, VP5SF,
YV3AGT, VE2EGC, W2AIW, VE6CCM, VE1AXT, G3RTE,
XJ3ZZ/I, KH6GI.

SSB, VE8RA, G8PY, G3RUV, W's and VE6/7's.

20 metres 0001 - 0400Z, CW, 9N1MM, HC1XG/HC8, ON4FL, G6ZO
ZE6JL, SM7DLH, OH2BAH, PAØNYK, G3SGQ plus all
mainland and USA.

0400Z - 0800Z, VE2LI, VE3BQL, F6CGU, plus W's

SSB, 0200Z- 0600Z, VKØLD, ZS1J, ZS1AU, ZS2OM,
ZE6JL, VQ9HCF, ZS5LJ, ZS1OU, ON4FL, ZF1MA,
KJ6CF, VE4BD, VE5BX, VE7DTA, YS1BW, VEØMCD,
I1BJU, G3RTE, CEØAE, VE8AM (Yukon), KS6DV,
YJ8AN, VR6TC, VP1BH and W's.

15 metres 0100Z - 0400Z, SSB, JA's, WB5KRU/4, W5OFY,
ZS5LJ, ZS2OM, VS5DB.

VHF notes by Joe Gelston VK7ZGJ.

To date there have been no openings on 6 metres, the only contacts being local ones.

The 6 metre beacon was switched on at 1530 hours (local) 24th April 1976. A little trouble was experienced with RF (7EX) getting into the NE555 timer, the unit now idents every 20 seconds, after RF bypassing the timer circuit.

The beginning of the month commenced with a very good opening to VK3 on 2 metres. The first indication of the opening was via the Melbourne FM station on 012.7 Mhz, it was S9 for several hours and audible for two days.

Between 09.52 and 12.27Z on 1 - 5 - '76 both myself and Kevin VK7ZAH worked VK3's, AKC, YJU, ZXO, ZQV and AZG, the next morning we worked VK3ZQV again, all signals were R5 and strengths varied from S1 to S9.

This is all I have for this month, dont forget to listen for the mid winter DX openings on 6 metres. Ch0 TV is one of the best indicators of a band opening, also keep a listen on the beacon frequencies (listed in A.R.).

73 Joe VK7ZGJ

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Jottings from Lindsay Johnson.

Tony VK7AX is busy laying tiles we hear and is becoming somewhat of an expert, but with all of Tony's activities he still finds time to be an active, on air, member, he is doing a good job with the rebroadcast of the Sunday morning news broadcast.

I would like to mention the lot of the Sunday morning broadcast officer, he is the chap that goes on air every Sunday morning for around thirty minutes with news of what is happening around the various Branches, and all of us sit back and listen to that broadcast, in fact, we look forward to 9.30 a.m. every Sunday morning. But do we ever stop and think of just how much time, effort and phone calls go into making this broadcast possible, that is us, who have never prepared or done a broadcast and very likely never done anything about channeling a bit of news along to the broadcast officer. Remember one phone call from you, is little compared to a dozen or more from him, trying to seek out the news. It would be appreciated if he could have these bits and pieces of news at least a day before, giving him time to sift through them and save that last minute rush.

WANTED

WANTED

WANTED

WANTED

WANTED

Bill VK7TE requires a crystal, any of the following will do, 3.5 MHz, 4 MHz, 7 MHz or 7.5 Mhz. If you can help please contact Bill at 44 Mayne St. or phone 262297

SHACK CLEARANCE SALES

Printed circuit boards for FM building blocks as per A.R. 1975
TX and RX \$5.00 each

Remote control unit RC1A \$12.00

Various variable capacitors, from 30¢

19" rack c/w power supplies AC & DC , control panel for AWA
UHF base station \$5.00

2 Miniphones \$1.00 each. 2 - 12" speakers 50¢ each

pair of bookshelf speaker enclosures \$45.00

70 MHz Pye A.M. mobile - free

Plus many other bits and pieces

Joe VK7ZGJ, phone 443882, 40 Lavender Gr.

FT200, home brew power supply, all 10 metre xtals, transverter
52-54 MHz with xtal oven \$350

VK3ASC spider quad hub fitted with new bamboo spreaders \$30

MR6 converted to 52.525 with xtals \$25

MR6 converted to 2 metres without xtals \$15

Malcolm VK700, phone 441848

FT200 spotless condition, complete with AC power supply \$300

National NCX3, 80-40-20, SSB rig with home brew power supply \$130

6 metre Belcon Liner SSB and AM \$200

2 metre Belcon Liner SSB \$200

6 metre IGL converter, xtal for 28 Mhz I.F. \$10.00

2 metre IGL converter, xtal for 28 MHz I.F. \$10.00

4KD6 valves (FTDX400 etc.) new \$4.50 each

4-6JS6 valves (FT200 etc.) new \$4.00 each

4 sockets for the above, new \$1.00 each

2-6883b valves (12v 6146b) new \$3.00 each

Dow-key coax relay 12 volt, new \$10.00

9Mhz Pye crystal filter with USB & LSB xtals \$20.00

3 TV sets (B.W.) not working \$5.00 each

2 sets 6/40 anode clips \$1.00 per set

6/40 valve sockets \$2.00 each

Peak 1 amp DC meter, type KR65 \$5.00

100 micro amp meter, type KR65 \$5.00

65ft. UR67 coax cable (used) \$4.00

90ft. UR67 coax cable (new) \$8.00

50ft. 70 ohm coax cable (new) \$3.00

Norman VK7NR, phone 272928, 11 Fort St. Riverside
continued on Page

More of 7NR's SHACK REMODELLING SALE.Transformers

2 x 12.6 volt @ 2.5 Amps	\$4.00	12 volt @ 5 Amps	\$3.00
1000 volt @ 400 mA	\$5.00	50 volt @ 200 mA	\$2.00
500 volt @ 400 mA, 280 volt @ 200 mA			\$5.00
285 volt @ 80 mA, 2 x 6.3 volt @ 2 Amps, 6.3 volt @ 2 Amp			\$2.50
285 volt @ 100 mA, 2 x 6.3 volt @ 3 Amp			\$2.50
50 volt tapped 40-33-25-19 volt @ 2.5 Amp			\$3.00
2- STC TA20 hybrid audio power amps			\$5.00 each
Stereo pre amp board complete			\$6.00
TAA300 amplifier complete			\$3.00
A.M. tuner module			\$3.00
Vernier slow motion drive			\$2.00
2- 11 pin plugs (FT200)			\$1.00 each
2- Tag strips complete with 6-RAS 310A diodes and 470pf, 5 Kv capacitors			\$3.00 each
10 Henry 200 mA choke			\$1.00
6 x SL640 I.C.	\$2.50 each	4-6"x3" PCB	30¢ each
2 x SL621 I.C.	\$2.50 each	2-5½"x3" PCB	25¢ each
2 x SL610 I.C.	\$2.00 each	1-6"x3" dble sided	50¢
1 x SL612 I.C.	\$2.00	1-12"x6" PCB	50¢
1 x AWM1306	\$1.00	2-5½"x4½" heatsink	\$1.00
5 x TAA300	\$2.00 each	1-11"x3¾" veroboard	\$1.00
2 x LM380	\$2.00 each	1-5"x2½" veroboard	50¢
6 x 2N3005 trans.	\$1.00 each	1-4½"x3½"x1" die cast box	80¢
2 x BLY90	\$12.00 each	1-4½"x2½"x1½" die cast box	80¢
2 x BLY88A	\$7.00 each	1970, 1972 ARRL	\$2.50 each
Set of 4 transistors for 432Mhz P.A.			\$50.00
432MHz transistor PCB			\$4.00
230 volt AC relay, 3 c/o, 10 amps per contact			\$2.50
50 Watt F.M. power amp. complete, 12 volt			\$50.00
12 volt in, enough out to drive 6/40 base station			\$10.00
A.R. power supply 4.5 - 12 volt 5 amp regulated			\$12.00
4- 220 mFd @ 350 volt electrolytics (new)			\$1.30 each
5- 100 mfd @ 350 volt electrolytics (new)			\$1.20 each
Various miniature 12 volt relays and much more, come up and look, bring your cheque book.			
Norman VK7NR, 11 Fort ST. Riverside. phone 272928			

PRACTICAL DESIGN OF SMALL POWER TRANSFORMERS.

by John Simmons of the Launceston Technical College.

The first consideration in the design of any transformer is the output. The output is stated in so many volt-amperes, because in alternating current apparatus, the product of the volts and amperes does not always give the true watts. Where there is more than one output, the total output is found by adding the separate outputs.

e.g. A transformer is required to have three outputs. One of 6 volts at 10 amperes, one 100 volts at 0.5 amperes and one 20 volts at 1 ampere.

$$6 \times 10 = 60 \text{ volt amperes}$$

$$100 \times .5 = 50 \text{ volt amperes}$$

$$20 \times 1 = 20 \text{ volt amperes}$$

$$\underline{\underline{130 \text{ volt amperes}}}$$

When the total output of the transformer has been determined, the next consideration is the sectional area of the core. The core of a transformer is that part of the iron on which the coils are wound. The yoke of a transformer, or that part of the iron outside the coils, must have a total cross-sectional area at least equal to the area of the core. A simple rectangular core has a uniform section, the coils being wound on one side of the rectangle. In the more usual arrangement of the T-U or E-I stampings, the core section is twice the area of the yokes since there are two paths for the magnetic flux from the ends of the core. Figures 1 and 2 show the difference between the two types of cores.

The mathematical determination of the optimum area of the core is extremely complicated and the best average values are given for outputs of 10 - 1000 volt-amperes in table 1.

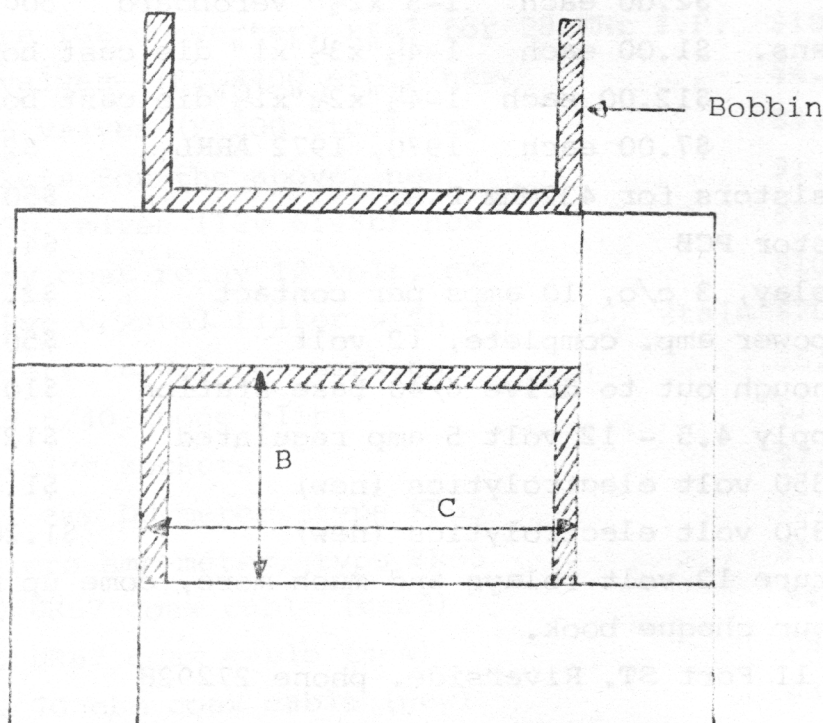


Fig. 1

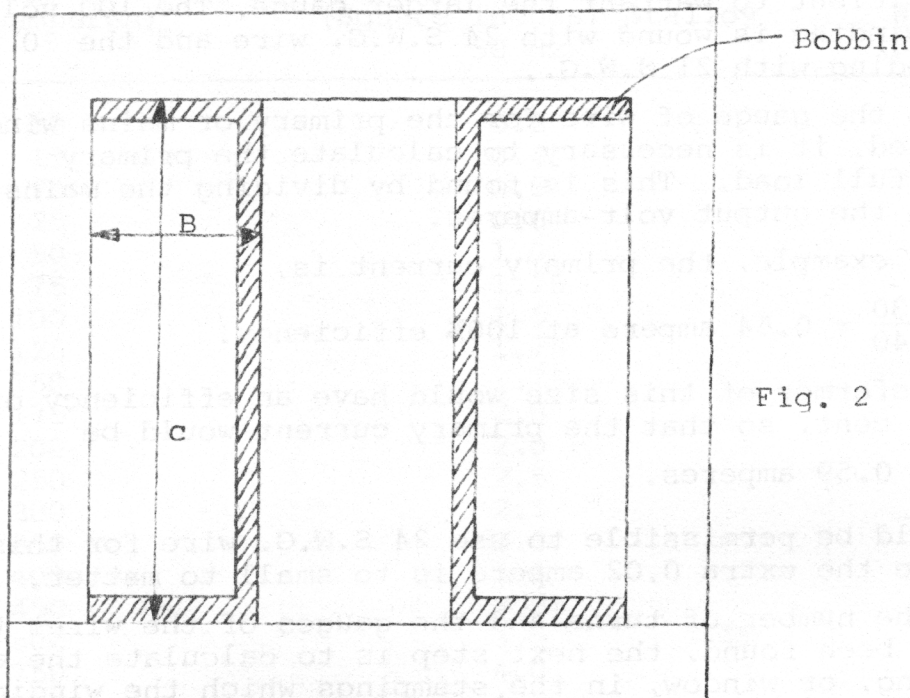


Fig. 2

To continue the design of the practical example, where an output of 130 volt-amperes is required, refer to Table 1 and choose the next largest output which is 150 volt-amperes. The core section will therefore be 1.75 square inches of Stalloy transformer steel.

When the area of the core has been found from Table 1, the number of turns on the various windings is estimated from Table 2.

To continue the example design, look down column 1 for a core section of 1.75 square inches then across to column 2 where it is found that four turns per volt must be used. That is to say, that for every volt across a winding on this particular transformer, there must be four turns. Take the primary winding first, this is to be connected to a 240 volt main, therefore the number of turns will be $4 \times 240 = 960$.

When estimating the number of secondary turns an allowance of five per cent extra turns is made to compensate for the drop in volts due to the current in the windings. Where extreme accuracy in the voltage output is required, the resistance of the windings must be pre-determined and the number of turns necessary to compensate for the drop in volts on load, or the regulation as it is called, must be calculated. An easier and more certain method is to adjust the number of secondary turns until an alternating current volt meter gives the desired reading when connected across the winding loaded at the normal current.

Table 3 gives the wire sizes and their current carrying capacity at 1500 amperes per square inch, which is a satisfactory value for continuous working.

When the current shown in column 1 Table 3 does not exactly correspond with the output current, the next highest value is taken. Thus in the practical example, the 6 volt 10 ampere winding is wound with 13 S.W.G. wire, The difference being insufficient to warrant the larger gauge, The 100 volt 0.5 ampere winding is wound with 24 S.W.G. wire and the 20 volt 1 ampere winding with 21 S.W.G..

Before the gauge of wire for the primary or mains winding can be settled, it is necessary to calculate the primary current for full load. This is found by dividing the mains voltage into the output volt-amperes.

In our example, the primary current is,

$$\frac{130}{240} = 0.54 \text{ ampere at 100\% efficiency.}$$

A transformer of this size would have an efficiency of about 92 per cent, so that the primary current would be $0.54 \times \frac{100}{92} = 0.59 \text{ amperes.}$

It would be permissible to use 24 S.W.G. wire for this current since the extra 0.02 ampere is too small to matter.

When the number of turns and the gauges of the wires to be used have been found, the next step is to calculate the area of the opening, or window, in the stampings which the winding will occupy. For the transformer which is being considered as an example, this is done as follows.

The primary winding has 960 turns of 24 S.W.G. wire. From Table 3, it is seen that this gauge of wire winds 1775 turns per square inch. The area occupied by the primary is therefore $\frac{960}{1775} = 0.54 \text{ square inch.}$

Similarly the 6 volt winding which would have 24 (6 x 4) turns of 13 S.W.G. has a winding area of $\frac{24}{108} = 0.222 \text{ square inch.}$

The 100 volt winding will occupy $\frac{100 \times 4}{1775} = 0.226 \text{ square inch,}$

and the 20 volt winding $\frac{20 \times 4}{865} = 0.0925 \text{ square inch.}$

The total winding area is now $0.54 + 0.222 + 0.226 + 0.0925 = 1.08 \text{ square inches.}$

It is now necessary to add about 20% allowance for the insulation between the layers, the space occupied by the bobbin and insulation between windings. The area now becomes

$$1.08 \times 1.2 = 1.3 \text{ square inches.}$$

TABLE 1

Output (Volt-amperes)	Core Section (Square inches) Stalloy 50 Hz	Approx. Winding area (Square inches)
10	0.3	5/8
15	0.4	3/4
20	0.5	7/8
25	0.6	7/8
50	1.0	1
75	1.25	1 1/4
100	1.5	1 3/8
125	1.75	1 1/2
150	1.75	1 5/8
175	2.0	1 3/4
200	2.0	1 7/8
250	2.5	2
300	2.5	2 1/4
350	3.0	2 3/8
400	3.0	3
450	3.25	3 1/8
500	3.5	4
750	4.0	5
1000	4.5	5 3/4

TABLE 2

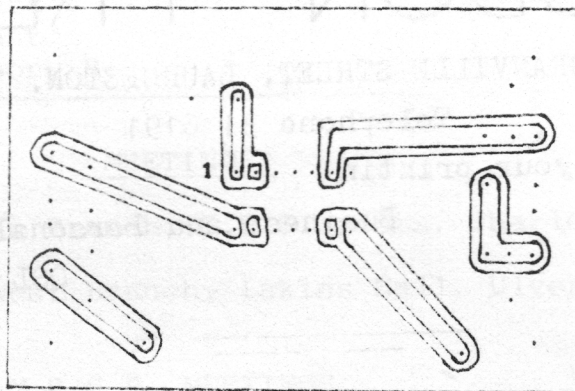
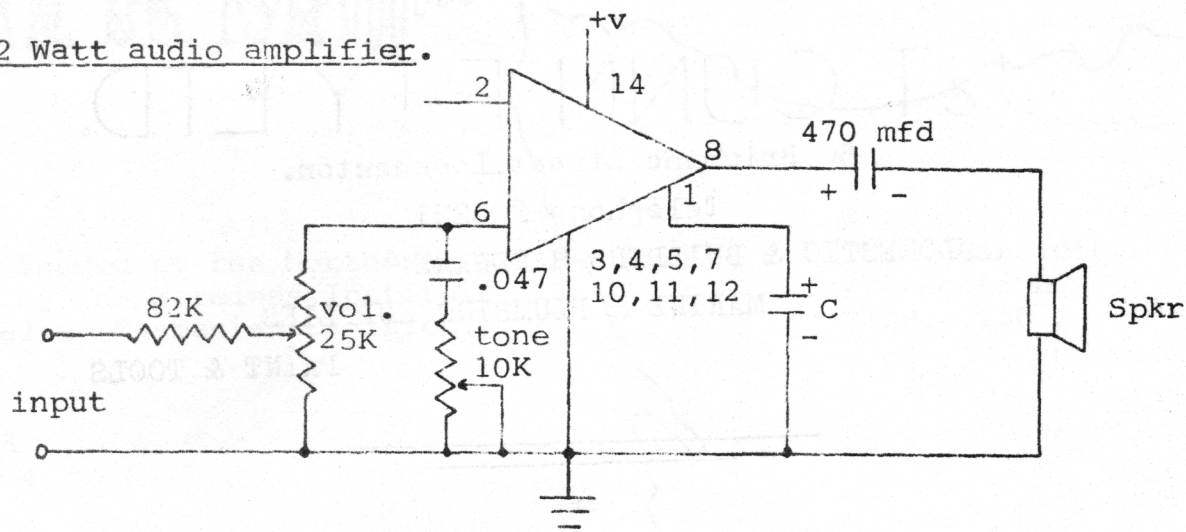
Sectional Area of Core (Square inches)	Turns per Volt
0.3	23.3
0.4	17.5
0.5	14.0
0.6	11.7
0.7	10.0
0.8	8.75
0.9	7.8
1.0	7.0
1.25	5.6
1.5	4.65
1.75	4.0
2.0	3.5
2.25	3.1
2.5	2.8
2.75	2.5
3.0	2.33
3.25	2.16
3.5	2.0
3.75	1.86
4.0	1.75
4.5	1.55

TABLE 3

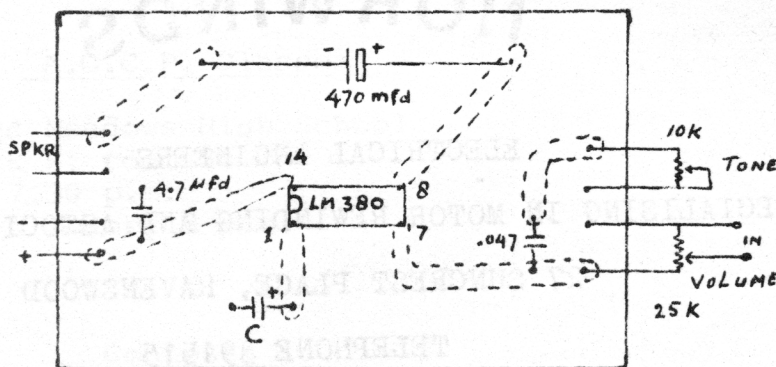
Showing wire sizes and their current carrying capacity at 1500 amperes per square inch.

Current (Amperes)	Wire Size S.W.G.	Turns per Square inch.
19.3	10	57
15.8	11	69
12.7	12	85
9.9	13	108
7.5	14	139
6.1	15	172
4.8	16	213
3.7	17	272
2.7	18	376
1.9	19	560
1.5	20	680
1.2	21	865
0.92	22	1,110
0.68	23	1,510
0.57	24	1,775
0.47	25	2,120
0.38	26	2,560
0.32	27	3,120
0.26	28	3,760
0.22	29	4,390
0.18	30	5,380
0.158	31	6,060
0.137	32	6,890
0.118	33	7,900
0.100	34	9,610
0.083	35	11,250
0.068	36	13,450
0.054	37	16,400
0.042	38	20,400
0.032	39	28,250
0.027	40	32,450

WHEN USING A REPEATER ALWAYS LEAVE
A 3 SECOND PAUSE
 FOR POSSIBLE PRIORITY TRAFFIC
 OR OTHER USERS

LM380, 2 Watt audio amplifier.

PCB pattern



component side

NOTES.

- 1) Use 4 ohm load for 6 to 12 volt supply and 8 ohm load for 12 to 18 volt supply.
- 2) The printed circuit board is adequate heat sink for 2.5 watts to 25°C and 1.5 watts up to 70°C.
- 3) The bypass capacitor from pin 1 to earth can be;
 - 0.047 manufacturers recommendation
 - 0.47 mfd for -18db @ 100Hz
 - 4.7 mfd for -38db @ 100Hz

for power supply ripple rejection (figures supplied by VK3AIW)

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