

QRM

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

November 1976
Vol.6 No.8

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Launceston
Tas. 7250

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MEETINGS

Nov. 9th North West Branch, Lakins Hall, Ulverstone. 8 p.m.
Nov. 12th Northern Branch. S.E.S. rooms, Charles St. 8 p.m.

Y.R.C.S. MEETINGS

Nov. 13th Kings Meadows High School, 10 a.m.
27th

A.O.C.P. Classes

Nov. 8th Kings Meadows High School
" 15th Block B, room 35
" 22nd CW at 7.30 p.m.
" 29th Radio Theory 8 p.m.
Dec. 6th

CONTESTS

Nov. 6&7th RSGB 7MHz phone
Nov. 27/28th CQ WW DX CW
Dec. 11th - Jan. 16th Ross Hull VHF Memorial

NOV. 13/14th VK7 HAMFEST AT EVANDALE
Nov. 22nd QRM deadline

NORTHERN BRANCH NOTES, by Joe VK7JG.

The last Northern Branch meeting was very well attended with 34 people present, this included 2 visitors, namely Ian Clemments and our guest speaker Professor R.H.Thorpe, chairman of The Australian Consumer Association. Apologies were received from VK7NR and VK7AK.

The meeting adjourned after about 30 minutes to hear the lecture by professor Thorpe and continued again at 21.35 to discuss general business.

Two new members were accepted by the Branch they were Ian Clemments and Alan Bourke. Alan passed his telegraphy and regulations for the Novice license at the last exam and will be sitting for his theory next month. Ian is a student at the AOCP classes and is sitting for his AOLCP next February. Best of luck to both of you.

The next Northern Branch meeting is to be an equipment display night, so bring along your newly aquired piece of equipment or something that you have constructed. The display will only be as good as you make it !

The Christmas meeting will be in the form of a B.B.Q. at the QTH of Peter Dowde VK7PD, 77 Talbot Rd. starting at 5 p.m. on the 11th December.

Lindsay VK7ZLD reported that Hamfest arrangements were well in hand, Bob VK7ZRF has designed a fox hunt receiver and to date two have been built and used successfully, this was at a trial fox hunt held on Friday 22nd when about 10 people used equipment ranging from the above mentioned receiver to IC202 SSB 2m transceivers.

Catering arrangements are being capably handled by Sue Dowl (Mrs VK7ZLD), if you can help Sue by making caseroles, desserts etc. please phone Sue on 444690. Any expenses incurred in making any such items will be reimbursed.

Congratulations go to Lionel Hillard in being successful at the last AOCP exam, Lionel now holds the call VK7HL.

Professor Thorpe's lecture on the role of the Consumer Council was very well received, a number of Choice magazines were given away and almost everyone took home a cumulative index covering from April 1960 up to September 1975, with this you can see what type of merchandise Choice examines. One point of interest raised was that of the cost of living, to calculate present day cost of an item take it's price of 20 years ago, multiply by 10 and covert to Dollars, try it on a few things it's not far out.

A New Years Eve Dinner Dance is to be held at the Town House Motel, anyone interested in going please contact Brian Yeoman VK7ZBY, phone 918218 before the next Northern Branch meeting, cost is \$6.00 for a 3 course meal and \$7.00 for a 4 course.

73 Till next month, Joe VK7JG

NOTES FROM THE NORTH WEST BRANCH, by Lindsay Johnson.

The monthly meeting was held in Lakins Hall Ulverstone on Tuesday the 12th October and commenced at 8.10 p.m. The President Ian VK7ZIE and the Secretary Max VK7MX were in the chairs. The meeting opened with apologies being received from VK7's, TT, ZAQ, ZKC, CF and ZBL. The minutes were read and confirmed. The correspondence was then read by Max, these were quite numerous and took up a lot of time. The treasurer reported a very sound bank balance and I quote \$358.00. The equipment officer, Adrian VK7ZAT had quite an assortment of gear for sale, this included, ARRL handbooks, AM FM radio boards, switches, gauges etc. Winston VK7EM reports a bit of beacon trouble a blown fuse, also a valve went haywire but this has since been rectified.

Following next months meeting Bob VK7ZJS has something or is working on something for the after meeting talk. The president reminded all of the coming Hamfest at Evandale on the 13th and 14th of November, also that the AGM will be held on the 2nd of April 1977 in Hobart. The December meeting here in the North West will be held at the Latrobe QTH of Jim Davies, don't forget to bring along the XYL and make this one a bumper meeting.

There was a very good turn out of members and visitors, with a total of 23, (10 grade A and 10 associates and 3 visitors) The meeting closed at 9.05 p.m.. Following the meeting Jim Davies entertained us all with a very fine and interesting 1½ hours of movies, including some of the olden days when they were termed as the flicks, after seeing them we all understand why, they were in very good order for their age. This was only a sample of Jim's collection. Following the films supper was served very efficiently by the Devonport and Ulverstone members, the evening finished off at 11.00 p.m.

In answer to many letters and phone calls I have received recently, asking if I knew or would find out why, when a certain Devonport member comes on 2 metres, there is a very distinct sound of heavy breathing, This has been very hard to pinpoint, but as I am a very dedicated listener I can now report that I have found out. After listening to this Devonport member on 2 metres mobile a few weeks ago returning from Hobart. He came on and said he was approaching Perth where he and his XYL were going to have a big steak dinner. OK that's fine, but later on he comes on air again with a terrible back ground noise and complaining he couldn't hear a bit of what the other fellow was saying, so he says, oh well I will just have to pull up and give her a bottle of water or something. So this is how we discovered the truth behind the heavy breathing, the recent arrival must eat, if nothing else but water, why not the microphone. My apologies to his XYL, we know it's not her fault, she is just onother very understanding XYL.

73 Lindsay Johnson

It has been suggested that the December meeting at the QTH of Jim Davies should be held on a Friday or Saturday, this will be an item for discussion at the next meeting so please be there if you want to express your view on this.

JOTTINGS FROM THE DX BANDS, by Col VK7LZ.

It appears that the most active stations around Launceston lately have been VK7's BC and HE and judging by the QSL's that have gone to the bureau its been a successful operation. Congratulations also to VK7HL, Lionel was heard working SM3PZ on the long path one evening, so it looks as though we have another keen DXer coming up.

Conditions are still fairly good considering the low sunspot activity, if one delves into the noise and does plenty of listening.

1.8 MHz; has been very noisy and consequently the normal good period of the equinox has been lost.

3.5 MHz; this band also has had more than its share of QRN so little listening was done and therefore nothing to report.

7 MHz; can be full of surprises and is well worth watching particularly on CW from 05.30Z. A glance through the stations heard list may give you a surprise.

14 MHz; also comes to life at odd times with Europeans coming in long path around 10.30Z also HL, JA, KR6, VS6, 9M2, UA9 and UAØ etc. during our evenings local time. JW7FD on Bear Island advises that he is quite active around 14.225 MHz and was QSO'ed here at 12.17Z although he had been S9 from 11.30Z. TF5TP has also been heard on 14.225MHz at 11.30Z together with WB4ZKG/KC6 Pig Island which counts as the Western Carolines for DXCC.

Evidently the Yasme Foundation have gone "walkabout" again as I QSO'ed them from the Virgin Islands on 7 MHz C.W. This team really move around so the Caribbean area would be worth watching in the next few weeks.

21 MHz; all I've heard has been JA's and as they belong to VK7BC I have kept well away.

The following list of stations heard (all at workable strength) over the last 4 weeks includes 61 countries and all continents so DX can still be interesting.

1.8 MHz; C.W. - W1HGT, W1PBW, W6PBV, ZL and VK.
SSB. - VK's and ZL's.

7 MHz; C.W. - CN8AD, CO2HT, DJ6ZM, DL8AN, DL8BL, DK8NG, DL8NF, DJØUP, DM3XBB, DM2DEO, EA's, F3NB, F6CGU, F9BB, G4DUW, G6ZO, G6FB, GM6RV, HBØNL, HC2SL, HM2JN, HI8NQG, I3GNQ, JA's, LA2B, JTØOAQ, LZ2ZX, OK3BDE, OZ3Y, PAØRE, SMØCCE, SP6CTY, SP2AJO, SV1DO, UK1AAA, VE3DZV, VP1MPW, VP1FOC, VS6BB, W's, YO3RF, YU3DBC, 4H1EL, W6KG/AJ3.
SSB. - CT2BS, CT4AT, DJ9GB, F5II, F6BII, FO8EX, G3CLW, GW4NZ, HB9AWW, HK4BXE, I1DFS, ON4LJ, XF3A.

14 MHz; C.W. - JA, UAØ, W, HL9.
SSB. - BV2B, CR9AJ, DJ9GD, DU1REX, DU6BG, EA3ANW, EA3AMS, EA3JO, EA8JJ, F3EG, Fo'EX, HC2CF, HL9TO, HL9WP, I4GKJ, IØAAF, IT9ZNW, JA8AYN, JW7FD, KG6RT, KJ6DL, KG6RL, KC4AAA, KA6JH, LA8NH, LX1RG, OH1AA, OH8TI, PAØGMW, P29RJ, SM3PZ, TF5TP, UK9AAN, UKØYAA, UA9VB, UK5BE, UR2QD, VK9JA, VR1AA, VR3AK, VR4DH, VR4DN, VS6BE, W's, YU2RTT, 4Z4GH, 4Z4ZH, 9M2SS, 9M6SN, 9M6MU, 9V1NR, WB4ZKG/KC6.

21 MHz; C.W. & SSB, Only JA's heard here.

QSL information; CT4AT via W1YRC, FO8EX via F6AUS

JW7FD via LA5NW, KG6RT via W6IAE

WB4ZKG/KC6 via WA7ZTL, 9M6MU via DJ8XW

HI8NQG, P.O. Box 1157 Santo Domingo, Dominican Republic.

VR4DN, P.O. Box 81 Guadalcanal B.S.I.

W6KG/AJ3, via Yasme Foundation. P.O. Box 2025 Castro Valley,
California 94546.

A QSL received back in 1934 showed a cat walking along the top of a paling fence followed by five kittens and the caption read " You've gotta make calls to get results", this still applies however you can also get very good results by careful and methodical listening and you save a lot of power too.

73 Till next month, Col VK7LZ

VHF NOTES, by Kevin VK7ZAH.

To my knowledge no 6 metre openings have occurred during the month. The only DX type contacts I had on 6 metres was with Mike VK7MC at Park Beach, Joe VK7JG works Mike quite successfully. I understand there is very little hope of any VK9's being active this DX season.

On the 2 metre band there is little more to report than on 6 metres. Early in October VK7RR and others visited the Ch2 repeater site on Mt. Wellington to check the repeater equipment after the winter period. During their investigations a loose coax connector was found on the TX aerial feeder. After this was repaired I am once more able to read the repeater at my QTH. I haven't heard how work is progressing on the North West repeater but I understand there are several busy people trying to overcome the problems.

On the lower part of the 2 metre band (SSB) interest appears to be increasing. Tony VK7AX went out portable with his IC202 and $\frac{1}{4}$ wave whip, he was able to read my SSB signals from two high spots in Ulverstone, but due to his low power (3 Watts P.E.P.) I was not able to read him. I believe VK7ZIE has a IC202 on order so it looks like Tony will have somebody to talk to on SSB. Mike VK7MC at Park Beach gave me a report of R5 - S6 on 2 metres SSB and I was able to read his 20W P.E.P. signal. Brian VK7RR running his FT221 (15W P.E.P.) was also worked with some difficulty, I was using my ringo antenna at the time. At the same time as Brian was being worked Winston VK7EM called on the repeater to say he was also reading me. Further tests with Winston showed that he was able to read me with my beam pointed to VK3.

Several VK3's have been worked during the month, the most consistent being Ron VK3AKC who can be worked just about every night. For those interested in listening Ron calls at 20.30 hrs nearly every night on 144.070 MHz. The VK3 beacon on 144.700 MHz can be heard most nights.

VHF notes continued

I heard a whisper that the Devonport 2 metre beacon is to be moved to the repeater site at Ulverstone, this move I know will please our friends in VK3 and VK5 who regularly complain that signals have to be at least 20db over S9 before the beacon can be heard.

Now for news on the 432 MHz band. The beacon at Ulverstone failed the other week but was quickly restored to normal by Winston VK7EM. Ron VK3AKC rang Winston to tell him it was off the air. On the 27th September Ian VK3YJI was hearing the beacon at very good strength and piped it over repeater 8. Daniel VK7ZDA has resurrected his 432 MHz transverter after dropping a hammer upon it and can get into Oscar with 1 Watt output. In Hobart 432 MHz SSB seems to be the in thing with VK7AZ and VK7ZAK recently purchasing rigs for this band with the main purpose to work through Oscar.

That is all the news I have for you this month, I hope that next month I will be able to report about the DX which has been worked on 2 and 6 metres.

STOP PRESS

On Saturday 23rd October the 6 metre band opened at about midday to Northern VK4. Signals were generally poor but several stations were worked. At approximately 04.00Z John VK7JV heard JH1ECU calling CQ, John called him on the frequency with the result that a VK4 answered him. Kevin VK7ZAH listened on 52.050 MHz and heard a JA working a VK3, after the QSO with the VK3 finished Kevin called the JA and had a contact with him. From then on for about an hour a lot of JA's were heard, some very weak and difficult to read. The total number of JA's worked were, VK7JV - 9, VK7JG - 5 and VK7ZAH - 5.

It is believed that this is the first JA opening to VK7 since about 1968 when a number of JA's were worked with AM equipment.

Athol Johnson Memorial Contest.

Only 9 logs were received and congratulations go to Malcolm VK7ZMM who had the top scoring log of 160 points.

Some bearings and distances that may be of interest.
These are centred on Launceston.

<u>Location</u>	<u>Bearing in degrees from true North</u>	<u>Distance in km</u>
Norfolk Isl.	60	2329
Lord Howe Isl.	48	1529
Sydney	24	914
Brisbane	21	1642
Papua & New Guinea	0	3549
Melbourne	335	443
Christmas Isl.	298	5305
Perth	281	2963
Hobart	175	162
Mc Quarrie Isl.	153	1700

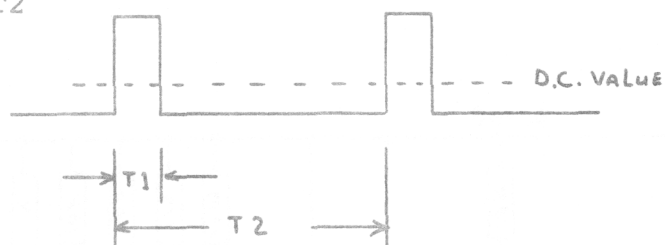
A SIMPLE DIRECT READING CAPACITANCE METER, 0pF - 1pF.Trevor Briggs VK7TB

I'm sure at some stage all of us mad fiddlers of electronics have wished they had the facility of a reasonably accurate capacitance meter or bridge. The problem of measuring capacitance of low value has always been a bit of "hit & miss", at least when associated with amateur fiddling.

On reading an article by WA5SNZ published in that very good technical magazine "HAM RADIO". I decided it was time to give this simple circuit a go, the idea looked excellent and so were the final results.

Theory; since the readout is a D.C. meter, it is desirable that there be a linear relationship between the capacitance to be measured and the D.C. output of the measuring circuit. It so happens that the average D.C. value of a pulse waveform has a direct linear relationship to the duty cycle of that waveform. Duty cycle can be defined as the ratio of pulse width to the time between the beginning of each pulse.

$$\text{D.C. value} = \frac{T_1}{T_2}$$



The width of the pulse (T_1) can be made directly proportional to the value of the capacitor under test by the use of a monostable multivibrator arrangement, using a NE555 timing I.C. This means that the pulse width is directly proportional to the timing capacitor, enabling a linear direct reading to result.

The circuit by WA5SNZ needed some rethinking to enable some locally available components to be used. It is important to note that for the ranges of capacitance values to be measured the frequency of the trigger oscillator is quite critical, if not reasonably accurate, it will cause errors at the top end of the lower ranges. The trigger circuit should operate at a frequency of 500 Hz and have a pulse duration of 1 μ S. As the reference is obtained from the power supply a regulated D.C. source is a must.

Operation; Set the range switch to 100pF, with no capacitor connected to the test terminals adjust the zero knob for a meter reading of zero, the zero pot is necessary to balance out the stray capacitance of pins 6 & 7 of the NE555 and the switch wiring etc., you will find that the stray C will only have to be balanced out on the 100 and 1000pF ranges. Now connect a 100pF, 5% mica capacitor to the test terminals and adjust the 10K calibration trimpot for a full scale meter reading of 1 mA. This completes the calibration. Since A.C. is not applied to the capacitor under test, polarized capacitors may be tested but care should be taken that the negative lead of the capacitor is connected to the grounded test terminal.

Extending the range of the FRG7 receiver down to 200KHz.by Peter Frith VK7PF

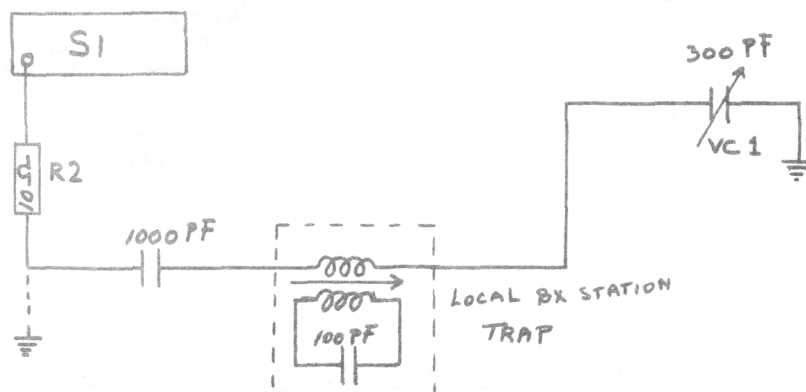
The FRG7 will work down to this low frequency but is limited by the pre-selector tuning range. Even if the pre-selector could be made to tune it would require frequent re-peaking while tuning.

What I have done is to make the input circuit broadband, this introduces some problems but these can be solved.

Modification; This is done in such a way that the receiver can be restored to normal at any time. I have made use of the ATT switch to make the 500 - 600KHz band broad banded when the ATT switch is in the LOCAL position. The receiver behaves normally in the NORMAL or DX position.

Procedure; On the ATT switch nearest the chassis under the blue coax will be found a 10 Ohm resistor, disconnect the earth end or easier still cut the earth end of the resistor at its top. Connect a 1000pF capacitor from the top of the resistor to the fixed plates of the rear section of the pre-select gang. To tune down below 500KHz just leave the pre-select tuning at 500KHz and put the ATT switch to LOCAL.

If broadcast signals cause interference to wanted signals a trap is required. The problem can be due to mixing in the mixer, in my case a spurious on 300KHz was found to be due to 7EX 1010KHz minus 7NT 710KHz. I used a transistor radio 455 KHz IF transformer with the tuning capacitor replaced with 100pF to resonate on 1010KHz . Tune into spurious then tune trap to remove the spurious.



What can be heard on these frequencies ? Many NDB (non directional beacon) used for aircraft and ship navigation, all with MCW idents and many with continuous weather information.

<u>Location</u>	<u>Call</u>	<u>Frequency</u>
Nile	NIE	230KHz
Launceston	LT	242KHz (weather)
Devonport	DV	281KHz (weather)
Flinders Isl.	FI	296KHz
Wynyard	WY	302KHz (weather)
Ship to shore, 400 to 500KHz MCW.		

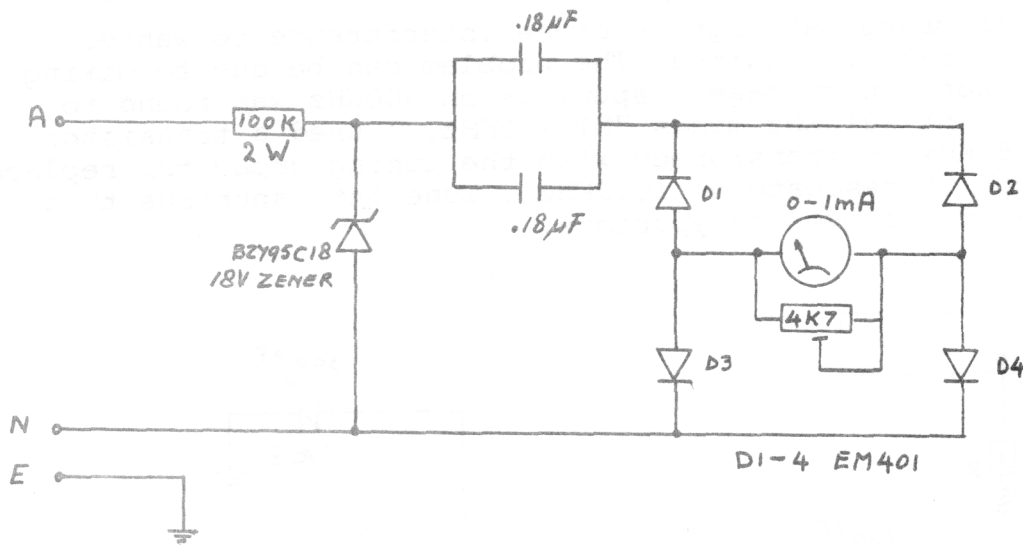
A SIMPLE 0 - 100Hz FREQUENCY METER, by Daniel Apted VK7ZDA.

The idea was to make a simple 0-100Hz frequency meter using a 0-1mA meter and a linear readout.

The meter can be used to monitor the mains, portable or fixed generating plants and D.C. to A.C. invertors. The construction can be left to the builder so lets deal with the electrics only.

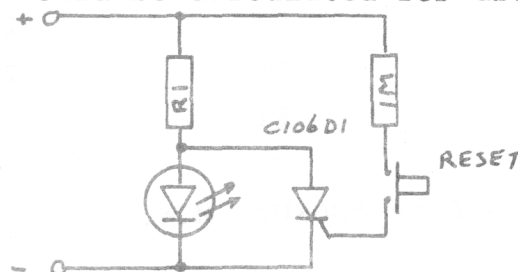
The 240V A.C. is applied to the input via a 100K, 2W resistor and is clipped to produce a 18.7V approximately square wave pulses by the zener diode. The pulses are fed via a capacitor to the bridge rectifier and the meter, with the meter current being directly proportional to the size of the capacitor and the pulse frequency, therefor the value of the capacitor is reasonably important in obtaining the desired meter range of 0 - 100Hz.

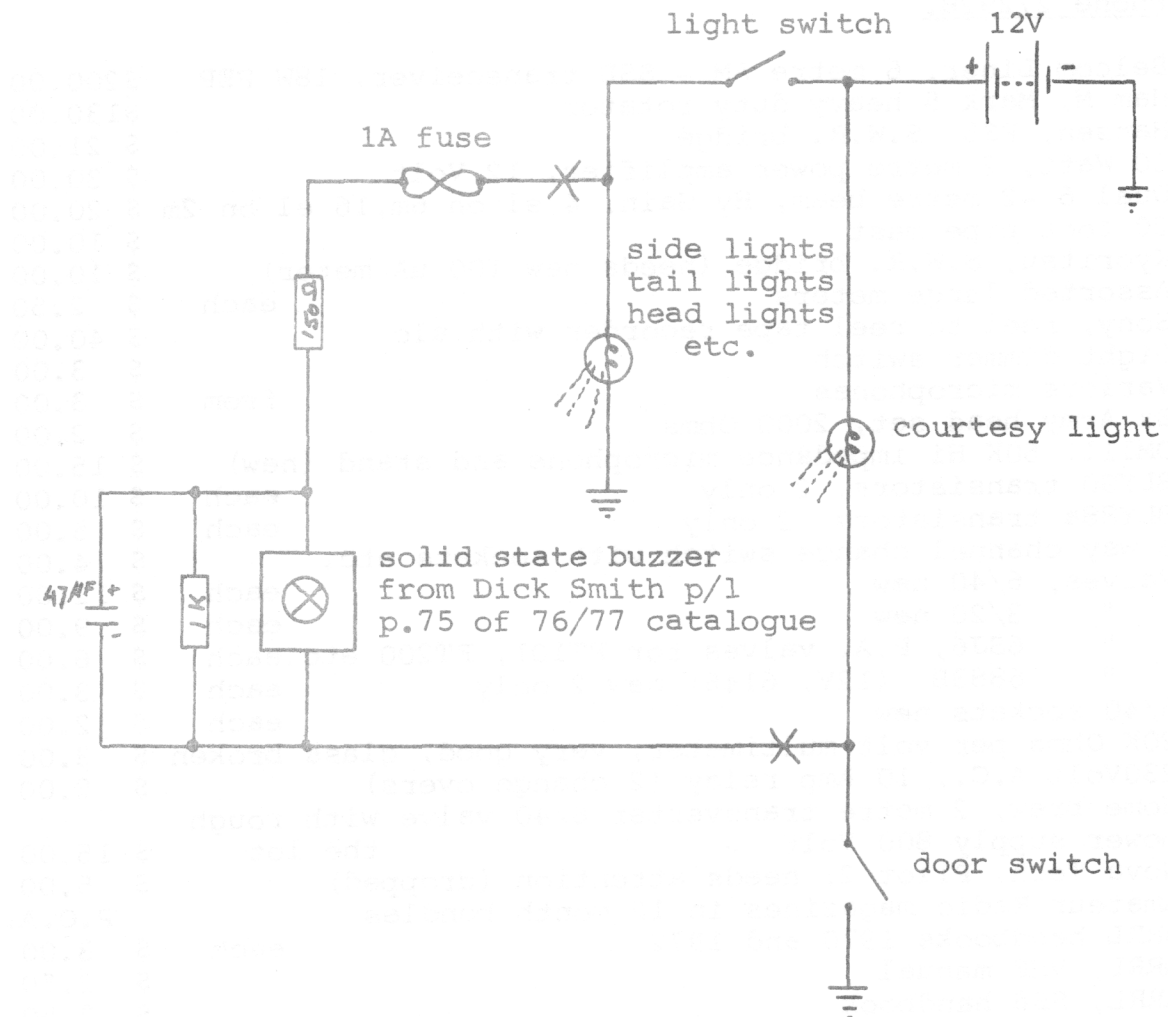
I used the 50Hz mains to calibrate the frequency meter, the unit is connected directly across the mains and the 4K7 Ohm calibration pot is adjusted to give a half scale reading of 0.5mA which corresponds to 50Hz.

Mains Failure Indicator for Digital Clocks. by John VK7JV.

As my digital clock hasn't any form of indication to show that the mains has failed and therefore the time shown is inaccurate, we devised this little circuit.

An LED will light, indicating the mains has failed. After resetting the time you will also need to reset the SCR to extinguish the LED. The value of R1 will depend on the supply rail voltage, R1 should be calculated for about 15mA.



Lights on reminder, by Wally Morphett VK7ZWX.

To drive safely in foggy condions, its usual to turn on either parking lights or full headlights.

The "lights on reminder" gives an audible warning to the motorist that the lights are still on when attempting to get out of the car.

Coding of Green-cap capacitors

<u>Value in uF</u>	<u>Numbers on capacitor</u>
.22	2a224
.1	2a104
.082	2a823
.068	2a683
.056	2a563
.01	2a103
.0068	2a682
.0047	2a472
.0039	2a392
.0012	2a122
.001	2a102

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

Shack clearing sale at Norm Richardson VK7NR, 11 Fort St.
Phone 272928.

Belcom Liner, 6 metre AM - SSB transceiver, 18W PEP	\$200.00
Ham M, Mark 5 heavy duty rotator	\$130.00
Hansen, FS5 S.W.R. bridge	\$ 21.00
50 Watt, 2 metre power amplifier, 12 Volt	\$ 30.00
Dual 6 -2 metre beam, Hy Gain. 4 el on 6m, 16 el on 2m	\$ 20.00
20 foot pipe mast	\$ 10.00
Kyoritsu, S.W.R. bridge (needs new 100 uA meter)	\$ 10.00
Assorted large meters	each \$ 2.50
Sony, reel to reel tape recorder with alc	\$ 40.00
Light dimmer switch	\$ 3.00
Various microphones	from \$ 3.00
Ex Army head set, 2000 Ohms	\$ 2.00
DM111, 50K Hi impedance microphone and stand (new)	\$ 15.00
BLY90 transistors, 2 only	each \$ 10.00
BLY88a transistors, 2 only	each \$ 5.00
6 way channel change switch with sockets etc.	\$ 4.00
Valves, 6/40 new	each \$ 12.00
" 3/20 new	each \$ 9.00
" 6SJ6, P.A. valves for FT101, FT200 etc.	each \$ 6.00
" 6883B (12V, 6146) new 2 only	each \$ 3.00
6/40 sockets new	each \$ 2.00
20K Ohms per volt multimeter, very good, glass broken	\$ 3.00
230Volt A.C., 10 Amp relay (2 change overs)	\$ 2.00
Home brew, 2 metre transverter 6/40 valve with rough	
power supply 800 Volt	the lot \$ 15.00
Nova Tech, Pilot 2, needs attention (dropped)	\$ 5.00
Amateur Radio magazines in 12 month bundles	P.O.A.
ARRL handbooks 1970 and 1972	each \$ 3.00
ARRL, VHF manual	\$ 2.50
ARRL, SSB handbook	\$ 2.50

Many other items, to many to list come up and make
a fair offer.

Galaxy 5, Mrk 2, 5 band SSB transceiver with heavy duty
power supply, very good unit, would also suit Z call for
transverting to 6m or 2m SSB.
can be seen at the QTH of John VK7JV \$300.00
o.n.o.

CH.	FREQUENCY	USE	CH.	FREQUENCY	USE
37	145.850	Ch. A	50	146.500	simplex
41	146.050	repeater 1	53	146.650	repeater 1
42	146.100	input 2	54	146.700	output 2
43	146.150	" 3	55	146.750	" 3
44	146.200	" 4	56	146.800	" 4
45	146.250	" 5	57	146.850	" 5
46	146.300	" 6	58	146.900	" 6
47	146.350	" 7	59	146.950	" 7
48	146.400	" 8	60	147.000	" 8
40	146.000	Ch. B			

COMMUNICATIONS COMPONENTS AND KITS

from

AMATEUR COMMUNICATIONS ADVANCEMENTS

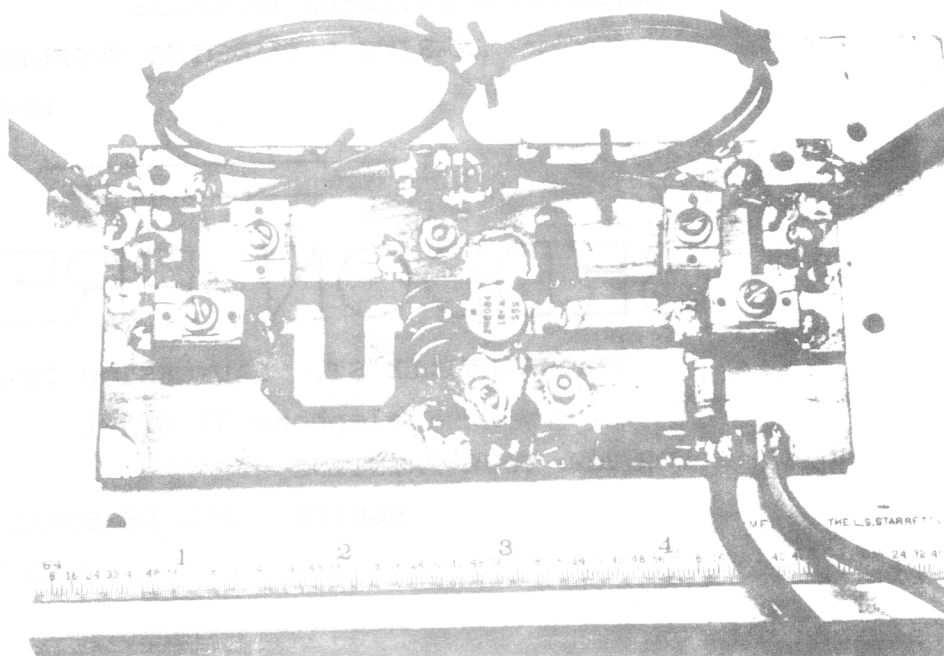
P.O. BOX 57, ROZELLE 2039

45W TWO METRE BOOSTER AMP.

This kit was featured in the April issue of Electronics Today International page 86. It delivers 35-45W output from about 10W drive on a 13.6V supply. It features the 2N6084 diode changeover switching, simple construction

only
\$26.50! + 60c P&P

Heatsink \$2.50
+ 60c P&P



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.

RF POWER TRANSISTORS

We are proud to present these premium quality RF power transistors by C.T.C. They are rated to withstand infinite VSWR at all phase angles and are suitable for use in class AB or C circuits up to 220MHz from a 12.5V supply. The set of three is suitable for a three stage 1/2W to 40W power amplifier.

		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

BM 70-12 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

POST & PACKING is 20c for a single device, 40c for up to five, 60c for more

SPECIAL CAPACITORS FOR RF APPLICATIONS

These are suitable for RF tuned circuit, DC blocking and bypass applications to several gigahertz at power levels to many hundreds of watts. Silver-mica construction rated at 350V DCW. Extensively used in high power solid state RF power amplifiers.

22-62pF	\$1.85	\$1.75	33pF, 47pF
68-250pF	\$1.95	\$1.85	68, 82, 100, 150, 200
270-500pF	\$2.20	\$2.10	300, 470

POST AND PACKING

30c for 10 or less, 60c for more than ten.

metal-clad mica's

ELMenco trimmers for RF power uses to 500MHz

7-60pF		75¢
35-160pF	...	75¢
25-280pF	...	95¢

Other types for RF power to 200MHz, suit HF uses

4-28pF		50¢
10-110pF		50¢
10-160pF		50¢

P&P: 20c/5 or less, 40¢ up to 20, 60¢ for more

We also stock VITRAMON, 'Vee-Jem' NPO ceramic chip cap's

These are suitable for RF applications well into the microwave region. Standard E12 series in values between 1pF and 1000pF stocked. Sizes below 820pF: 2x1.3x1.3mm, 820 & 1000 pF: 2.3x1.8x1.3mm. All 50 VDCW.

ONLY 10¢ each

P & P: 20¢ any quantity

SPECIAL — MA4060 power varactors FOR MULTIPLIERS, 144-432 etc

\$7.50

J & T GUNN PTY. LTD.

50 BRISBANE ST. LAUNCESTON

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