

QRM

BULLETIN ISSUED BY THE NORTHERN ZONES OF THE
WIRELESS INSTITUTE OF AUSTRALIA TASMANIAN DIVISION

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LAUNCESTON,
TAS. 7250

AUGUST
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The W.I.A. Tasmanian division requests the pleasure of your company on the 12th and 13th of August for the purpose of participating in the RD contest. It was said last year that Tasmania couldn't have won even if the average of the top six logs had been higher, a few calculations show this to be quite true and in fact shows that it was quite impossible for Tasmania to win unless we can get 50% of the amateur population to participate. Alternatively we need to increase the average score per station by at least 100%. Either of these are not likely to happen. But with a little enthusiasm and a small increase in both we may just be able to make it. WILL YOU TRY.?

JOHN VK7JV
EDITOR.

M E E T I N G S

AUGUST 1st

North West Zone - Lakin's Hall Ulverstone

AUGUST 11th

Northern Zone - A.E.D. Rooms, High Street, Room 10.

THE NORTHERN ZONE Clubroom Account is growing steadily and at the present rate we could have our first \$1000.00 in the bank by the end of the year.

Much of the credit must go to Joe Gelston VK7ZGJ who to date, has been our largest contributor of equipment - THANKS JOE - keep up the good work!

NORTHERN ZONE MEETING

The July meeting was well attended - 32 present and apologies from 7ZWX, 7ZLD and Alf. Willis. We were pleased to have with us some far flung members Ian 7ZIE & Graham 7ZAQ from Devonport and AL BRYAN from Moerinna.

Peter 7PF gave a full report on the recent Repeater conference. Ideas from the conference are subject to ratification, however it was recommended by Pete that we investigate the feasibility of using Channel 3. Present channel 4 will be a hotspot with projected repeaters on Mt. Macedon and Bendigo. New receive frequencies are to be in use by November 1st. We hope to change over as soon as practical.

A request is expected for the zone to be responsible for originating the Sunday WIA broadcast. It is hoped that members will assist in offering ideas and information to ensure a top-rate production. Transmission on the repeater as well as HF is envisaged.

A recommendation by the Executive to allow Institute student members full zone privileges without further fee was approved by the July meeting.

Applications for student WIA membership from T. Polowy, R. Becker and R. Kearle were passed for submission to Council.

Chris. 7UX presented the meeting with a compelling film on the operation at Comalco. His follow-up talk was most informative.

Next meeting will be an equipment display night. Home brew or commercial - it doesn't matter - bring it along. These meetings are generally the high-point of the year - you help it to be!

BELIEVE there are seven sitting for ACCP exams this month - best of luck chaps!

A CHEQUE for \$10.00 was received from the Federation Insurance Company. Don't forget this method of boosting our funds.

PERHAPS a source of club-room finance is being wasted. How about a fine on members not wearing their name tags!

NOTICED the change in address labels for last month's issue. Seems 7JV is getting some typing practise.

A COUPLE of members having vehicle trouble with their employer's units- 7ZGJ rolled his van and 7ZRF discovered his Land Rover's 4-wheel drive was out of action after being stuck in the snow on Mt. Barrow!

NORTH WEST ZONE NOTES

On 4th July we enjoyed our best meeting for several months. Numbered amongst our visitors were Mike 7ZMK, Wal 7ZWX and Joe 7ZGJ. Also 7TT came along to substantiate my forecast. Terry is now heard on 2 metres, and so the gang is growing. Don't forget ladies night on September 5th, so tee up the baby-sitter. Our next meeting on 2nd of August is the Annual Meeting, so come along chaps and get "dubbed in".

It was agreed that Tony 7AX submit some notes for inclusion in the divisional bulletin.

During the meeting, once again Rosemary, XYL Tony, entertained some of the members' wives. Me-thinks they now look forward to the rag-chew.

Some very interesting circuit boards were sighted on the bench at 7AX QTH. Maybe TV Tony.

Ken 7KH was overheard muttering Japanese during the meeting. You must be getting quite fluent now Ken.

Graham 7ZAQ and Ian 7ZIE have successfully converted low band 20B units to the 144 MHz band with output something over 20 watts. Very good effort chaps! Also I understand that Ian is now monitoring the band continuously on tape. This should prove very valuable in checking mobiles and band openings.

7MX.

MR20B

The r.f. section of the receiver should be aligned as follows:-

1. Plug an 0-1 mA meter into the 1st LIM metering socket and a 25-0-25 uA meter into the IISC metering socket.
2. Set the neutralising capacitor (C2) to approximately mid-position.
3. Connect the signal generator to the aerial connector. Tune the generator to signal frequency as indicated by zero reading in the centre-zero meter.
4. Screw the slug of L5 into the position of maximum inductance and adjust the signal input level to produce a reading of approximately 200 uA in the 1st LIM meter.
5. Tune the slugs in L6, L3, L2 and L1 (in that order) for peak readings in the 1st LIM meter, reducing the signal input level as necessary to maintain the meter reading in the vicinity of 200 uA.
6. Tune the slug in L5 for maximum reading in the meter.
7. Switch off and disconnect R3. Switch on again and increase the input level to 100uV.

(continued)

8. Neutralise the r.f. stage by carefully adjusting C2 for a dip in the 1st LIM meter reading.
9. Switch off and reconnect R3.
10. Switch on again and reduce the input level to give a reading of approximately 200 uA in the 1st LIM meter. Carefully adjust the slugs of L6, L5, L3, L2 and L1 (in that order) for maximum reading.

VHF & TV GROUP WIA NSW DIVISION

The Contest Committee of the New South Wales VHF & TV Group invites National participation in a VHF - UHF Contest to be held in August and thereafter annually. This contest is very similar to that sponsored by David Tanner VK8AU, in July of last year. Like David, the Committee feels that contacts via sporadic E do not reflect the operator's use of 'state of the art' equipment and is unfair to those who are experimenting with scatter communications and weak signal techniques. For this reason, contacts via transequatorial propagation are also disqualified.

The minimum distances specified are based on the normal range of 'beginner' type stations running low power to relatively small antennas.

A Trophy, to be known as 'THE JOHN MILLER VK2ANF TROPHY' will be awarded to the outright winner, and certificates will be awarded to the highest scorer in each State or Territory of the Commonwealth.

It should be noted that only individual Amateur stations are eligible to enter. Club or Society sponsored stations (e.g. Illawarra Moonbounce Project) are not eligible for the Trophy or Certificates but may, of course, provide the 'other end' of a scoring contact for an eligible station.

RULES

1. DURATION 000 Hrs. 4th August, 1972 to 2400 Hrs. 20th August 1972. (all times E.A.S.T.) Note that the Perseids Meteor show will occur during this period.
2. There is one Division - Transmitting, (open).
3. All individual Amateur Stations may enter, whether fixed, portable or mobile.
4. All VHF and UHF bands may be used, but cross-band contacts are prohibited. Cross-mode contacts are permitted.
5. Only one contact per band per station is allowed for each calendar E.A.S.T. day.
6. Entrants must operate within the terms of their licences.
7. Before points may be claimed for a contact, serial numbers must be exchanged. The serial numbers of five or six figures will be composed of RS (telephony) or RST (telegraphy) report plus three figures, commencing at 001 for the first contact and increasing by one for each successive contact.
8. On the 52 MHz band, contacts via the modes generally referred to as Sporadic E and Transequatorial propagation will be disallowed. The Committee reserves the right to adjudicate doubtful cases. Contacts over distances below 50 miles on the bands 52 to 450 MHz will be disallowed as will contacts below 25 miles on bands 576 MHz and above. Contacts on net frequencies or through repeaters will be disallowed.
9. Scoring for all contacts will be based on mileage multiplied by a factor dependent on the band being used, as follows:

<u>BAND</u>	<u>FACTOR or MULTIPLIER</u>
52 MHz	1
144 "	2
432 "	3
576 "	4
1215 "	6
above 1300 MHz	8

(continued)

Each log entry must show the claimed mileage and score. In the event of two stations disagreeing on mileage, the average of the two estimates will be taken.

10. All logs must contain the following information: Date and Time (E.A.S.T.) Band Emission, Power, Call sign worked, Serial No. sent, Serial No. received Distance, Points claim.

11. Entries and logs should be forwarded to reach the Contest Committee on or before Friday, September 15th, 1972.

Send entries to: The Chairman,
VHF & TV Group Contest Committee,
14 Atchison St.,
CROWS NEST, 2065

OPERATIONAL AMPLIFIERS

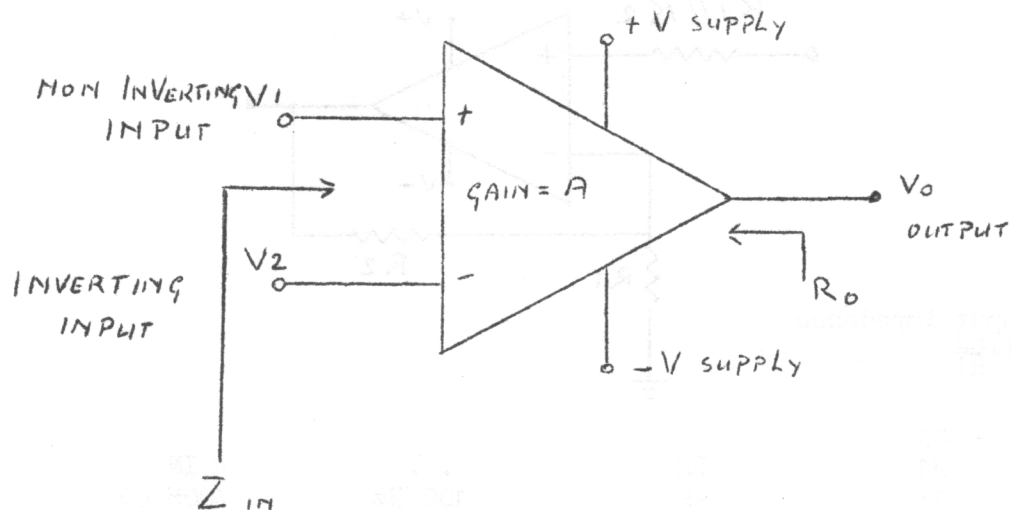
The operational amplifier is an integrated circuit package consisting of a multi-transistor general purpose analogue amplifier on a single chip of semiconductor material.

These devices are characterized by a very high input impedance (typically 2M Ω) very high open loop voltage gain (typically 200,000) and low output resistance (typically less than 100 Ω). The frequency response of individual amplifier configurations vary, but all have flat gain-frequency characteristics from D.C. to several hundred kilohertz.

D.C. voltage gain is achieved by the exclusive use of direct coupling within the amplifier. Special op. amps are available which will amplify in R.F. configurations up to about 200 MHz but single devices such as F.E.T.'s are less noisy.

Due to extremely high open loop voltage gains, these amplifiers must be used with heavy negative feed back to avoid output saturation and latch up (i.e. output voltage swings up to the supply potential and stays there). When negative feed back is employed, very stable gains of up to 60dB result, depending on external circuitry.

SCHEMATIC DIAGRAM OF OPERATIONAL AMPLIFIER



A LARGE (10^5)

The amplifier senses ($V_1 - V_2$)

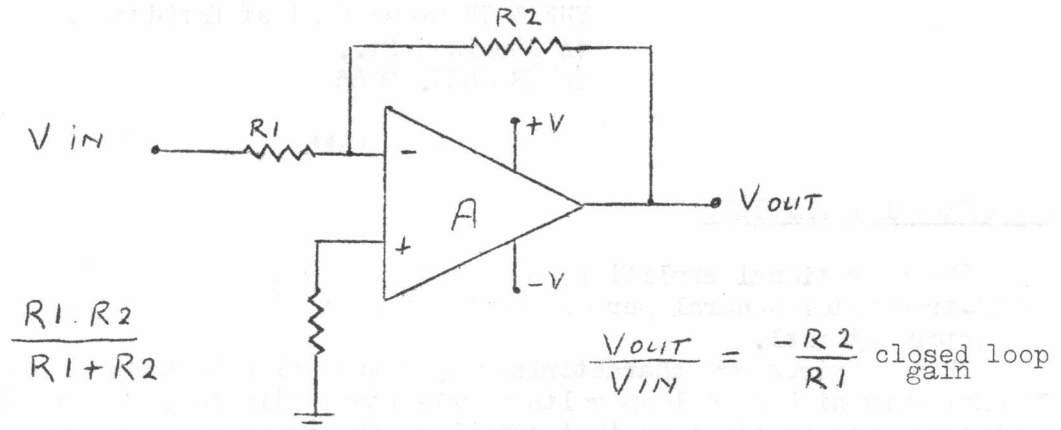
Output

$$V_o = A (V_1 - V_2).$$

The ideal op-amp. Theoretically has an infinite input impedance (Z_{in}), infinitely large voltage gain (A) and zero output resistance (R_o). The circuitry within the "black box" is unimportant to the user.

TYPICAL OP-AMP CIRCUITS:

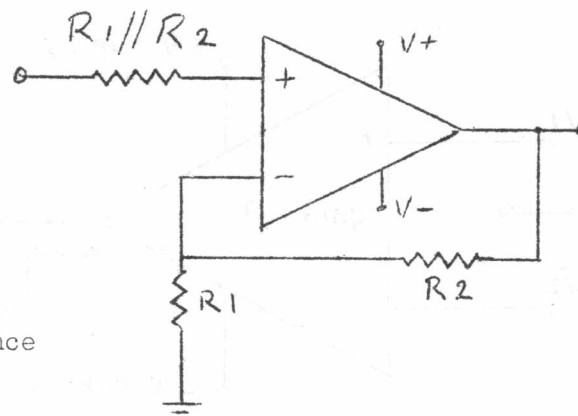
CONSTANT GAIN INVERTING AMPLIFIER:



The R_2 connection constitutes a negative feedback configuration.
For UA741C op-amp

Gain	R_1	R_2	B.W	R_{IN}
1	10k	10k	1MHz	10k
10	1k	10k	100KHz	1k
100	1k	100k	10KHz	1k
1000	100 Ohm	100k	1KHz	100 Ohm

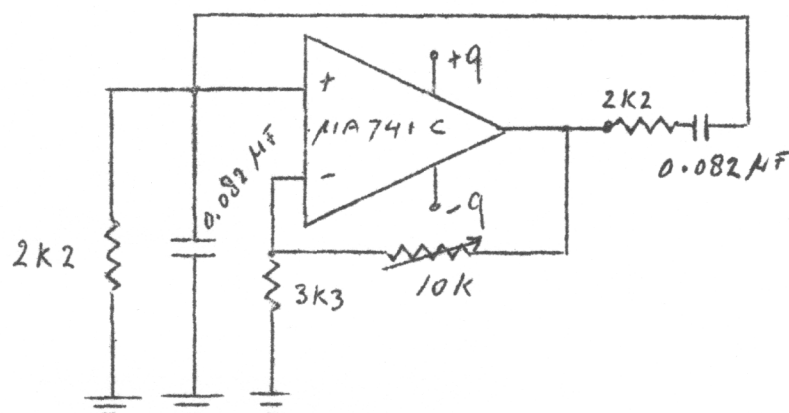
NON-INVERTING AMPLIFIER:



- High input impedance
- Gain $= 1 + \frac{R_2}{R_1}$

For UA741C op-amp

Gain	R_1	R_2	B.W.	R_{IN}
10	1k	9k	100KHz	400M Ohm
100	100 Ohm	9.9k	10KHz	280M Ohm
1000	100 Ohm	99.9k	1KHz	20M Ohm

1KHz Sine Wave Oscillator

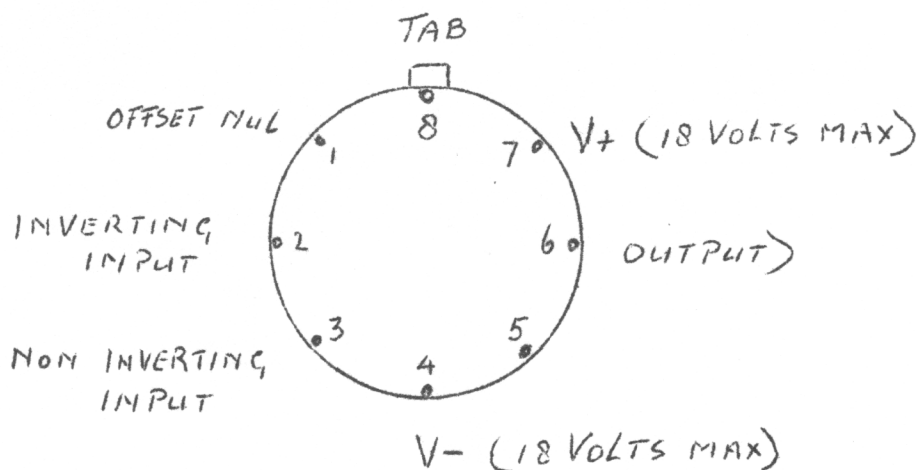
Adjust 15k for undistorted sine wave output (which occurs at a gain of 3 exactly)

A major application of op-amps is in analogue computers, where very accurate, stable voltage gains give rise to accurate calculation and simulation of mathematical models of physical systems.

Other applications for op-amps include clippers, integrators, adders, differentiators, low drift amplifiers, notch filters, digital to analogue converter, schmidt triggers etc.

The only possible disadvantages with such devices is that a positive and a negative power supply is required and the amplifier itself will saturate if over driven.

Most modern op-amps are fairly robust, but never reverse supply polarity, since this destroys the device.

741C PIN CONNECTIONS

(REFERENCE: FAIRCHILD LINEAR I.C. DATA)

WALLY, VK7ZWX.

CONGRATS to GERRY 7ZGD on the birth of his first harmonic.

BELIEVE Joe's days of freedom are fast drawing to a close!!!!
