



THE PROPAGATOR

MONTHLY NEWSLETTER OF THE ILLAWARRA AMATEUR RADIO SOCIETY.

P.O. Box 1838. WOLLONGONG. N.S.W. 2500.

CLUB STATION VK2AMW. CLUB 2m REPEATER VK2RAW.

I.A.R.S. is a Member Club of the Wireless Institute of Australia.

| <u>PRESIDENT.</u> | <u>SECRETARY:</u> | <u>EDITOR.</u> |
|--|--|---|
| Jim Potts, VK2BBG, 14 John St., WOONONA. 2517. | Brian Boseley, VK2BCI, Figtree Hotel, FIGTREE. 2525. | Ian Bowmaker, VK2ZJA, 15 Akuna St., Keiraville. 2500. |

MONTHLY MEETING. Held on the Second Monday of each Month,
at 7.30 pm, at the Wollongong Town Hall Meeting Room.

I.A.R.S. MONTHLY BROADCAST.

The Monthly Broadcast takes place on the Sunday preceeding Meeting night each month, at 1915 Hours EAST.

Frequency used by VK2AMW for the broadcast is -
Repeater Channel 5, or Simplex Channel 40.
Relay by Brian, VK2BCI, on 28.460 MHz.

5/78

MAY 1978

5/78

MAY MONTHLY MEETING Monday, 8th May 1978.

Members are advised that the Monthly Meeting of the Illawarra Amateur Radio Society will be held at the Wollongong Town Hall Meeting Room at 7.30 pm on Monday, 8th May 1978.

AGENDA

1. Apologies and welcome to Visitors
2. Minutes of previous Monthly Meeting.
3. Correspondence.
4. Financial Report.
5. General Business.
6. FILM - on either Antennas, or Propagation.

FILM FOR MAY MEETING.

We should have an instructive film for the meeting, on loan through the National Film Library. Our problem at time of going to press is that the past arrangements for showing of films have been lost as the Wollongong Library has moved and has taken all their projection equipment. It is anticipated that equipment will be made available for us. For the future, we will have suitable films at each alternate meeting.

Something for the newcomers this month.

Below is an item reprinted from Amateur Radio, December 1977.

We all freely use abbreviations, especially when talking with others interested in the hobby of Amateur Radio, but just think, do we all use the same abbreviations? It is quite important that abbreviations be standardised so we give you this list to learn the commonly used ones - maybe the old hands could do with some revision as well.

AMATEUR ABBREVIATIONS

Many abbreviations are in common use in amateur radio (including Hamads). A short list is presented here - punctuations omitted. Note use of capital letters (in some cases optional).

A — Ampere (Amp)
AC, ac — Alternating current
AF, af — Audio frequency
agc — Automatic gain control
AH — Hamads — at home or private number. After hours
ALC, alc — Automatic level control
AM, am — Amplitude modulation
AMSAT — The Radio Amateur Satellite Corporation
ant — Automatic noise limiter
AOCP — Amateur Operator's Certificate of Proficiency
AR, ar (s) — Amateur radio (service), Amateur Radio magazine
ASCII — American Standard Code for Information Interchange
ATV — Amateur television
avc — Automatic volume control
balun — Balanced to unbalanced transformer
bc — Broadcast
BCD, bcd — Binary coded decimal
bci — Broadcast interference
BFO, bfo — Beat frequency oscillator
bit — Binary digit
Bus — Hamads — business or working hours, office hours
CB — Citizens band
CCIR — ITU — Comité Consultatif International des Radio communications
Ch — Channel
cm — Centimetre
coax — Coaxial cable
CRO — Cathode Ray Oscilloscope
CW, cw — Continuous wave, carrier wave (Morse)
dB — Decibel
DC, dc — Direct current
DX, Dx — Distance (relative)
EHF, ehf — Extra High Frequency (30-300 GHz)
ENT, ent — Extra High Tension (V)
EMC — Electromagnetic Compatibility
EME — Earth-moon-earth (moonbounce)
emf — Electromotive force (V)
ERP, erp — Effective radiated power
F — Farad
FCC — Federal Communications Commission (USA)
FET — Field effect transistor

FM, fm — Frequency modulation ("NB" — narrow band)
fsd — Full scale deflection
FSK — Frequency shift keying (F1 mode)
g — Gram
GDO, gdo — Grid dip oscillator
GHz — Gigahertz (1000 MHz)
h — Hour (24 hour clock), hecto
H — Henry
HF, hf — High frequency (3-30 MHz)
Hi, hi — Greetings
HT, ht — High tension (V) (also hV, HV)
Hz — Hertz (cycles per second)
IARU — International Amateur Radio Union
IC, ic — Integrated circuit
IF, if — Intermediate frequency
ITU — International Telecommunications Union
k — Kilo (1000) — e.g. kilo-ohm (1000 ohms)
kg — Kilogram
kHz — Kiloherz (1000 Hz)
km — Kilometre
kV — Kilovolt
kW — Kilowatt
LAOCP — Limited Amateur Operator's Certificate of Proficiency
LC — Inductance capacitance (ratio)
LED — Light emitting diode
LF — Low frequency (30-300 kHz)
LT — Low tension (V)
m — Metre
m — Milli (one thousandth, 0.001)
M — Mega (1,000,000; e.g. 1 MHz = 1000 kHz)
u — Micro (0.000001) (one millionth)
uA — 0.000001A (also uF, uH, uV)
mA — Milliampere (0.001A) (also mM, mV, mW)
MCW — Modulated CW (A2 mode)
meg — Usually megohm
MF — Medium frequencies (300-3000 kHz) (medium waves)
MHz — Megahertz (1000 kHz)
mic — Hamads — microphone (also mike)
micromicro — Same as pico, obsolete term
mm — Millimetre
mox — Manual operated transmissions
MUF — Maximum usable frequency
NL — Noise limiter
ns — Nanosecond (0.000000001) (one thousand millionth of a second)
OSC — Oscillator
OSCAR — Orbiting Satellite Carrying Amateur Radio
om — Old man
P, p — Power (p page, pp pages)

p — Pico (0.000000000001) (one million millionth)
PA, pa — Power amplifier
PCB — Printed circuit board
pep — Peak envelope power
pF — Picofarad
Ph — Hamad — telephone No. (STD code first)
Phone — (fone) Telephony-segment, voice transmission
piv — Peak inverse voltage
PM, pm — Pulse modulation, phase modulation
ppi — Plan position indicator (radar)
PSU — Power supply unit
Q — Reactance-resistance ratio, transistor
Q code — CW abbreviations — see Handbook for amateur operators
QTHR — Hamad — address correct in current WIA call book
RF, rf — Radio frequency
RFC, rfc — Radio frequency choke
rfi — Radio frequency interference
RI — Radio Inspector
RMS, rms — Root-mean-square
RST — Readability, strength, tone (reporting signals) (RS only for telephony)
RT — Radio Telephony
RTTY — Radio teletype (teleprinter)
Rx — Hamads — receiver
SAE — Also sase. Self Addressed Stamped Envelope
SHF — Super High Frequencies (3-30 GHz) (microwave regions)
S/N, s/n — Signal to noise (ratio)
SS — Solid State
SSB — Single Sideband (suppressed carrier) — A3J mode
SSTV — Slow Scan Television
Std — Standard
SWL — Short Wave Listener
SWR — Standing Wave Ratio
Tcwr — Hamads — transceiver
TPI — Turns per inch
lptg — Tuned plate tuned grid
TV, tv — Television
TVI, tvi — Television interference
Tx — Hamads — transmitter
UHF — Ultra high frequencies (300-3000 MHz)
V — Volt
VFO, vfo — Variable frequency oscillator
VHF — Very high frequencies (30-300 MHz)
VLF — Very low frequencies (3-30 kHz)
vox — Voice operated transmission
VOX — Voice operated transmission
VU — Volume unit
VXO — Variable crystal oscillator
W — Watt

WANTED WANTED

Wanted to buy. FT-200 with matching P.S. Any condition, working or not.
See Richard, VK2ZF0 at Meeting or on 2 Metres most afternoons.

FOR SALE.

TRIO 195D Communications Receiver. 500 KHz-30 MHz.
S meter, BFO, etc,etc. \$130.00

John, VK2BNG. QTHR.

SUBSCRIPTIONS FOR 1978

If you have not yet renewed your subscription to the Propagator, this may be the last issue you will receive.

To those who have not paid the 1978 subscription, a further renewal slip is attached to this issue of the Propagator and we urge you to return promptly so that we can keep our address records up to date.

NOTE THIS IS YOUR LAST REMINDER NOTE

The subscriptions cover the costs of postage of the Propagator and the cost of hire of the Meeting Room. Other club costs and the costs of running and maintaining the IARS Repeater channel 5 are met from the proceeds of raffles and the sales of components through the Store. Thus to maintain the Society financially, we need your subscription NOW.

STORE NEWS.

Please note that there has been a revision of the prices of some items. Committee has considered this necessary to maintain the profitability of the store, yet all of the items are still very reasonably priced.

The store Sub-committee consists of John Doherty, VK2NHA, Richard Fox, VK2ZFO, and Gerry Rosam, VK2APG.

We wish to update the stock held in the Store. If there are items which you would like to see kept in stock for ready purchase on meeting nights, please let one of the Sub-Committee members know so that we are able to keep a stock of the items that you want! We don't know your preferences unless you tell us!

The Store is in operation on Meeting nights from 7.15 to 7.30, and after the conclusion of the formal meeting and talk or film.

WARC '79

At the April 1978 Monthly Meeting, a cheque for \$400 was presented to Tim Mills, VK2ZTM, President of the NSW Division of the Wireless Institute of Australia, by Brian Boseley, VK2BCI, Secretary of the IARS. The money represented the proceeds of the raffle held late 1977 to raise funds for the WIA participation in WARC '79.

On accepting the cheque, Tim expressed thanks to the members of IARS for their initiative and generosity in raising the money. He spoke further on the role that the WIA plays in protecting the interests of Amateurs.

In thanking Tim for attending the meeting, Jim Potts, VK2BBG, President of IARS, spoke of the importance of all Amateurs being members of the WIA as the P&T Department takes notice of the WIA as being the official voice of the Amateurs, rather than taking any notice of representations from individuals. He concluded by asking members to ask themselves the question "what can I do for the WIA, rather than what does the WIA do for me".

MONTHLY BROADCAST - VK2AMW - Channel 5

The Broadcast for April was conducted by Richard Fox, VK2ZFO, in the absence of regular broadcaster John Hodgkinson, VK2BHO.

It has been decided by Committee that future broadcasts will be handled jointly by these two operators. This will enable more up to date information from the Committee to be communicated directly to members.

Any notes or news items for inclusion in the monthly broadcast should be given directly to either John or Richard. The only items which are not able to be broadcast are "for sale" items.

REPEATER NEWS

As indicated at the April Monthly Meeting, the Committee has gone ahead with the purchase of a Ringo three half-waves in phase Antenna for the Repeater, and also has ordered 100m of RG8U coaxial cable for use with the Repeater. Along with the relocation of the mast further up the hill, these changes will result in better coverage from the repeater. It will obviously be necessary to hold some working bee's to carry out these changes to the installation. More details will be announced when plans are finalised.

Members are reminded that one of the main purposes of our funds is to maintain and operate the Repeater, thus the purchase of equipment is a means of distributing the costs over ALL the members, rather than just using the labour of a very small number of members.

CO-AXIAL CABLE

All of us at some time need Co-Ax. How's your supply ? As noted above, the IARS has arranged for the purchase of cable, at the right price of course.

From the same source, both RG8U and RG58U cable is available. Once again we are offering cable to members at a good price.

If you would be interested in the purchase of Co-Axial cable please indicate to the Store Sub-committee what length and which type of cable you would like. We need this information as the purchase can only be made in lengths of 100m.

Below is a guide to the cable types:

| Cable. | Inner Conductor. | Outside Diameter. |
|--------------|------------------|-------------------|
| RG8U (UR67) | 7/.029 | .405 ins. |
| RG58U (UR76) | 19/.0068 | .195 ins. |

Both types have capacitance of 30 pF per foot, and are quite suitable for all VHF applications as well as HF use.

NAME BADGES.

Committee is currently investigating the availability of suitable lapel badges for use by members on meeting nights and at Society events. As the members attending meetings is growing, it is becoming difficult to keep up with "who's who".

In order to avoid omissions and errors on the name badges, please ensure that your name and call sign are correct in our listings. Check with Ian Bowmaker, VK2ZJA, if you have any corrections to make in your listed particulars.

QSL . QSL . QSL

A new batch of QSL cards has arrived from the Bureau. The cards are in the hands of Gerry Rosam, VK2APG, and will be available for collection on meeting nights.

IARS DISPLAY BOARD

It has become apparent that when the Society has put on any display for the general public, we do not have suitable display material. We are looking for any photographs of members' activities in the Radio field for copying and enlarging for mounting on a display board.

Jim Giblin, VK2BOU, has offered to enlarge from any type or size of photograph. How about searching through the album, or boxes if that is where you keep them, and see what you have in the way of Amateur Activities. We can assure you that your originals will not be harmed in any way. Please contact Jim should you require further details.

SIX METRE ACTIVITY

For those who have Six Metre gear and find it frustrating that the band is only open towards the end of the year, there are spasmodic openings throughout the year.

For example, Easter Monday (27/3/78) at 0530 GMT, I was tuning around 52.000 - 52.100 MHz not really expecting anything when to my surprise on 52.010 MHz JH8FMA was heard calling CQ DX. I immediately pounced on him and we exchanged 5-9 reports.

Between 3.30 - 4.00 pm EAST that afternoon I worked the following:

JH8FM8 JA7HPI JH7UXT JH8BRZ JF3DNO JH7IZB JA7WIM
JA7WRR JA7MPI JE2PIS JR2HCB

Even though the band was open only for one half hour, it was good to be there after months of just listening for an opening. So those of you who have lost faith in 6 metres, or like me who was contemplating selling the gear, perhaps the preceeding may have helped you to change your mind; it did to me anyway.

So get that rig from under the bench, blow the dust off it, fire it up and you too can get contacts. Good luck, and good DX.

73 de Richard, VK2ZF0.

Moonbounce Report - May 1978.

It has been recommended that the dish and associated equipment be moved from West Dapto to another University site to the west of the city of Wollongong. A preliminary check indicates that this location should be acceptable for the Moonbounce Project to continue from the radio interference point of view and that our transmissions should not be a problem to other services in the area, but this will have to be officially confirmed in due course.

In the present rather stringent economic times, the cost of the move will probably be the deciding factor. We would thus very much appreciate assistance from anyone who is experienced in the transport of large and fairly heavy equipment and who is prepared to advise on the matter. The 30 foot diameter dish is of all welded steel construction and is becoming a little fragile with age, so it will most likely have to be transported in one piece.

Satellite News

The Oscar 8 beacons have been heard on 435.095 MHz (mode J) and on 10 metres (mode A) and signals have also been heard on both modes. The mode A signals were of better strength than those heard on this mode through Oscar 7.

Lyle VK2ALU.

Peter Schulz Electronics Sales

Distributors of COMMUNICATIONS TRANSCEIVERS

HF TRANSCEIVERS

| | |
|---|---------|
| ASTRO - 200 digital solid state 200 W.P.E.P. | \$1,000 |
| TRIO KENWOOD new model TS-520-S | \$ 685 |
| TRIO KENWOOD model TS-820S AC only 160 to 10 M with digital readout. | \$1,050 |
| TRIO KENWOOD MODEL TS-820 AC only 160 to 10 M. | \$ 900 |
| TRIO KENWOOD model TS-600-A FM - AM | \$ 680 |
| TRIO KENWOOD model TR-7400 2 meter FM transceiver 10 to 25 watts output Frequency range 144.00 to 147.995 MHz | \$ 400 |

ICOM

VHF TRANSCEIVERS SSB

| | |
|---|---------|
| ICOM model IC-502 6 M SSB portable transceivers 52-53 MHz | \$ 215 |
| ICOM model IC-245 | \$ 450 |
| ICOM 701 new model | \$1,160 |
| ICOM model IC-211 | \$ 785 |

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| YAESU MUSEN FT 901 new model | \$1,575 |
| YAESU MUSEN FT 7 new model | \$ 570 |
| YAESU MUSEN model FT-101-E AC-DC transceivers 10 to 160 M with speech processor | \$ 849 |
| YAESU MUSEN model FL-2100-B Lineal Ampl. | \$ 569 |
| YAESU MUSEN FRG-7 Wadley Loop Receiver All solid state, 0.5-29.9 MHz in thirty 1MHz bands. Electronic band selection | \$ 338 |
| YAESU MUSEN FL110 Solid State Linear Amplifier. Companion unit to FT-301S. 10-15W drive, 200W PEP Input, 160-10mx. | \$ 249 |
| YAESU MUSEN YC-500E 500MHz Freq. Counter. Accurate to .02ppm. | \$ 574 |
| YAESU MUSEN YC-500S 500MHz Freq. Counter. Accurate to 1ppm. | \$ 446 |
| YAESU MUSEN YC500J 500MHz Freq. Counter. Accurate to 10ppm. | \$ 319 |
| YAESU MUSEN YO100 Monitorscope. Matches the FT-101E, but can be used with other Yaesu equipment. (IF kits 455 kHz and 9MHz optional extra). (IF Kits \$12.00 each) | \$ 285 |
| YAESU MUSEN FTV-650B Six Metre Transverter. Converts 28 MHz. SSB to VHF, and includes receiving converter. 50W PEP. Primarily designed for coupling with Yaesu transmitters. | \$ 249 |
| YAESU MUSEN FTV-250 Two Metre Transverter. Similar FTV-650B. 10W-15W output, but all solid state and built-in AC PS. | \$ 249 |
| YAESU MUSEN FT227 New model | \$ 370 |
| YAESU MUSEN QTR-24 24 Hour World Clock. At a glance the time anywhere in the world can be read. | \$ 33 |

AUSTRALIA'S SOLE DIST. OF KLM PRODUCTS

KLM SOLID STATE POWER AMPLIFIERS

| | | | |
|---------|---------------------|-------------------|--------|
| (MHz) | 144-148 PA10 - 80BL | 80 OUTPUT (watts) | |
| | " PA10 - 140BL | 140 " | |
| | " PA 10 - 160BL | 160 " | |
| | " PA 2 - 70BL | 70 " | |
| 400-470 | PA10 - 70CL | 70 " | |
| | PA 2 - 12B | 12 Watts | |
| | PA 2 - 25BL | 25 Watts | P.O.A. |

New Shipment expected soon.

For personal attention: **24 KURRI STREET, LOFTUS**
P.O. BOX 184, SUTHERLAND, 2232 TELEPHONE: 521-7573

MARK MOBILE ANTENNAS

| | |
|---|-------|
| HW - 40, 6 feet long for 40M | \$ 25 |
| Swivel mounts and chrome-plated springs for all | \$ 13 |

ANTENNA ROTATORS

| | |
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| KEN model KR-400 for all medium size hf beams with internal disc brake | \$ 138 |
| KEN KR500 | \$ 150 |
| All models rotators come complete with 230-volt AC indicator-control units. 6-conductor cable for KR-400-500 | 65 cents per metre |

Emotator.

| | |
|---------------------------------|---------|
| 1213 Mast clamp for 502CXX | \$29.50 |
| 300 Mast Stay bearing for above | \$32.00 |
| 301 Tower top bearing | \$32.00 |

HF ANTENNAS

| | |
|--|---------|
| HADAKA VS 40-80 Vertical | \$ 115 |
| HADAKA VS 33 Tribender | \$ 265 |
| DX 33 Western | \$ 240 |
| HADAKA VS-22-3 Element 15-10m in balun | \$ 173 |
| HADAKA VS-RG Radial kit for VS41 | \$33.50 |

COAX CABLE CONNECTORS

| | |
|-------------------------|---------|
| PL-259 | \$ 1.20 |
| SO-239 Chassi Mount | \$ 1.20 |
| Male to male joiner | \$ 1.20 |
| Female to female joiner | \$ 1.20 |
| Angle connector | \$ 2.00 |
| T-connector | \$ 2.50 |

SWR METER

| | |
|--|-------|
| Twin meter model: Y.M. - I.E. 3.5 to 145 MHz prof quality | \$ 28 |
| DRAKE TV - 3300 TV 1 lowpass filter | \$ 34 |

CRYSTAL FILTER, 9MHz, similar to

| | |
|-------------------------------------|-------|
| FT-200 ones. With carrier crystals. | \$ 35 |
| APOLLO 3 position co-ax switches | \$ 15 |

MORSE KEYS

| | |
|---|--------|
| EK-127 Electronic Keyer | \$ 99 |
| EK-150S Single Paddle Electronic Keyer | \$ 136 |
| EK-150D Double Paddle Electronic Keyer | \$ 136 |
| MK-1024 Programmable Keyer, 1024 bit memory | \$ 233 |

HI-MOUND

| | |
|--|-------|
| HK-710 De luxe heavy duty morse key. Heavy base. A really beautifully constructed and finished unit. Fitted with a dust cover, standard knob and knob plate. Ball bearing shaft. | \$ 45 |
| HK-808 Similar HK-710 but with full miniature ball race bearings and more precise adjustments | \$ 75 |
| HK-707 Similar to above but with dust cover and standard knob. On standard base | \$ 19 |
| MK-701 Side Swiper key to actuate an Electronic keyer | \$ 45 |
| BK-100 (BUG) Semi-automatic bug key, fully adjustable | \$ 49 |

VALVES 572 B \$55, 6KD6 \$12.50, 6JS6 \$10.50
 6JM6 \$9.50, S2001 (6146B) \$13.50, 12GB7 \$8.50
 7360 \$14.50, 6GK6 \$6.

Go RTTY with DOVETRON'S MPC - series multy path Diversity Terminal Units. The Rolls Royce of all terminal units. We are appointed distributors.

HAL ST5000 - Economy terminal unit. 170-450-850 shifts. We have locally built units for lower prices, SOON AVAILABLE.
 SSTV with Robot 400 - Vidio Display Units
 KEY BOARDS - Write for PRICE DETAILS.

SIDE BAND ELECTRONICS SALES OPEN ON SATURDAYS TILL 12 NOON PETER SCHULZ, VK2ZXL

All prices quoted are net SYDNEY, N.S.W., on cash with order basis, sales tax included in all cases, but subject to changes without prior notice. ALL-RISK INSURANCE from now on free with all orders over \$100; small orders add 50c for insurance. Allow for freight, postage or carriage; excess remitted will be refunded.

CHANNELS AND FREQUENCIES OF 2 METRES FM

From time to time I hear operators on 2 metres say, "I don't know what frequency that channel is, I'll look it up." I have therefore decided to outline the rules by which one may determine these quantities in one's head. The rules rely on the present fact that channels, both Simplex and Repeater, are spaced at 50 KHz intervals.

SIMPLEX

$$1) \text{ Frequency (MHz)} = \frac{\text{Channel Number}}{20} + 144.00$$

Thus the frequency of Channel 51 is given by:

$$F \text{ (MHz)} = \frac{51}{20} + 144.00 = 2.55 + 144.00 = 146.55 \text{ MHz.}$$

2) The process can be reversed;

$$\text{Channel Number} = (\text{Frequency (MHz)} - 144.00) \times 20$$

Thus Repeater Channel 12 "out frequency" (your receiver frequency) is on Simplex Channel 64.

$$\begin{aligned} \text{Channel Number} &= (147.20 - 144.00) \times 20 \\ &= 3.2 \times 20 = 64. \end{aligned}$$

The simplex channel for 145.80 MHz is likewise seen to be Channel 36.

DUPLEX - REPEATER

- A. 1) For Channels 1-8 the Repeater "in frequency" (your transmit frequency) is 0.60 MHz lower than its "out frequency" (your receive frequency).
2) Channel "0" is 146.00 MHz.

Thus for Channels 1-8 the repeater "in frequency", F, is given by;

$$\text{Frequency (MHz)} = \frac{\text{Channel Number}}{20} + 146.00$$

Channel 1 "in frequency" is therefore:

$$F \text{ (MHz)} = \frac{1}{20} + 146.00 = 146.05 \text{ MHz}$$

$$\text{Out frequency is } 146.05 + 0.60 = 146.65 \text{ MHz.}$$

Channel 6 "in frequency" is given by:

$$F \text{ (MHz)} = \frac{6}{20} + 146.00 = 146.30 \text{ MHz}$$

$$\text{Out frequency is } 146.30 + 0.60 = 146.90 \text{ MHz.}$$

- B. For Channels 9-12 the "out frequency" (your receive frequency) is given by:

$$\text{Frequency (MHz)} = \frac{\text{Channel Number}}{20} + 146.60$$

Thus the "out frequency" for Channel 9 Repeater is:

$$F \text{ (MHz)} = \frac{9}{20} + 146.60 = 0.45 + 146.60 = 147.05 \text{ MHz.}$$

The Repeater "in frequency" (your transmit frequency) is 0.60 MHz higher, i.e., 147.65 MHz for Channel 9 Repeater.

You are not likely to want to know what Repeater Channel a particular frequency corresponds to, but if you do, these two last formulae can be inverted.

In closing, I observe that the "out frequency" (your receive frequency) for Channel 12 Repeater, is 147.20 MHz. If the reference crystal of your PLL happens to be 6.40 MHz then its 23rd harmonic is exactly 147.20 MHz.

Tom Barnes, VK2ABI.

MACELEC
 99 KENNY STREET WOLLONGONG
 PHONE 29 1455

| | |
|--|-----------|
| TS 820S H.F. Transceiver 10-160M With Digital Display | \$1100.00 |
| TS 520S H.F. Transceiver 10-160M | \$ 699.00 |
| TR 7500 - All New 2M FM Mobile | \$ 350.00 |
| DG5 Digital Display / Frequency Counter for TS 520S | \$ 170.00 |
| DK5 Adaptor Kit-Touse Digital Display with TS520 ... | \$ T.B.A. |
| TS 600 All mode 6 metre Transceiver | \$ 734.00 |
| TS 700 All mode 2 metre Transceiver | \$ 675.00 |
| SP 520 Extension Speaker to suit TS520-820 | \$ 36.00 |
| TR2200A 2 metre FM Portable | \$ 192.00 |
| TR7200 2 metre FM Mobile | \$ 249.00 |
| TR3200 70CM FM Portable | \$ 291.00 |
| TR7400A 2 metre FM Digital 25W Mobile | \$ 434.00 |
| R300 Communication Receiver | \$ 260.00 |
| MC 50 Desk Microphone | \$ 49.00 |
| MC 10 Hand Microphone | \$ 13.00 |
| MC 2 Ham Clock | \$ 32.00 |
| M 25 2 Metre Hi-Gain Mobile Antenna | \$ 17.25 |
| MB Mobile Base only | \$ 3.62 |
| M25T 2 metre Hi-Gain (Top Only) | \$ 13.75 |
| Hansen FS5 SWR - Power Meter | \$ 36.00 |
| Hansen SWR - 6 Field Strength - SWR Meter | \$ 26.00 |
| B & K 1627 6 Digit Auto Ranging Frequency Counter .. 100 HZ - 30 MHZ. | \$ 228.85 |

New Products Available Soon --

Kenwood Antenna Tuning Unit With Inbuilt S.W.R.

Hansen R.M.S and Peak Reading Power Meters 20 Watt and 200 Watt
P.E.P Full Scale.

We also stock a range of Audio Generators - Signal Generators
Digital Multimeters - Power Supplies ECT.

With the Recent Revaluation of the Japanese Yen, Prices are
Expected to Rise Soon.

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 PHONE 29 1455 OR CONTACT BARRY HARTLEY VK2FE

COMPONENTS FOR SALE

Disc Capacitors. .001, .0047, .01, .022. ... 8 cents.
 .047 ... 10 cents. .1 ... 15 cents.

Electrolytic condensers, 25V, double ended.
 4.7 uF ... 10c. 100 uF ... 15c.
 220 uF ... 20c. 470 uF ... 25c.

Trimmer Condensers.
 Ceramic trimmer, mica insulation. 30c.
 Wire wrap type trimmers. 10c.
 Ceramic bolt-down trimmers. 10c.

Tantalum Capacitors.
 .47 mF ... 20c. .1 mF ... 20c.
 4.7 mF ... 20c. 10 mF ... 25c.
 22 mF ... 45c. 47 mF ... 65c.

PCB mounting trimmers, 3-13 pF. ... 15 cents ea.

| | | |
|-----------------|------|-----------------------------|
| SEMICONDUCTORS. | | NEOSID. Formers, cans, etc. |
| BC 109 | 20c. | Formers. 8c. |
| 5486 FETS | 65c. | Balun formers, small. 12c. |
| 1N4148 | 10c. | large. 15c. |
| 0A91 | 12c. | Cans. single. 10c. |
| | | double. 12c. |

Coil Former, complete with can. ... 10 cents each.

ANTENNA BASE, 'Belling Lee' mobile type. ... \$4.00 ea.

METERS

| | |
|--|--------|
| S Meter 400uA 1 7/8" x 5/8" | \$2.50 |
| Level Meter dual 200uA meters, illuminated | \$3.00 |
| 0 - 1 mA Meter 50mm square | \$4.00 |
| 0 - 1 mA Meter 75mm x 50mm. | \$5.00 |
| 2" sq. 100mA centre zero meters. | \$6.00 |

RESISTORS

Bag of 160 1/2 watt resistors.
 10 each of values 10, 47, 68, 100, 220, 470, 680, \$4.00
 1K, 2.2K, 4.7K, 6.8K, 10K, 22K, 47K, 68K, and 100K.

ANTENNA WIRE

Bronze alloy wire, single strand, 1.2mm diameter. See sample at meeting.
 Lengths cut to order 5c/metre

| | |
|---|--------|
| Pair meter leads with alligator clips | 30c |
| Vernier dials 35 mm. 4 turns knob for 1/2 turn dial | \$1.50 |
| DPDT slide switches | 30c |
| Four pin plug and socket - pair | 20c |
| Alligator clips - large, insulated. Red or Black | 20c |
| Ground Plane Antenna Base | \$1.00 |
| Edge connectors | \$1.00 |

WESTLAKES NOVICE MANUALS. New stock. \$3.50

The I.A.R.S. Store is stocked with selected purchases of good quality components. A small profit is marked up on these items yet prices are very reasonable. The profit goes towards expanding the range of items kept in stock.
 Bring your money on meeting nights and keep stocked up with those often needed components.

WOLLONGONG, NSW 2500

P.O. Box 1838,

I.A.R.S.

MR.L. PATISON VK2ALU
98 HEASLIP STREET
WOLLONGONG
2500
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THE PROPAGATOR
Newsletter of the Illawarra
Amateur Radio Society
Registered for posting as a publication
CATEGORY B.

I.A.R.S.
POSTAGE PAID
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