

# NOV.

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## THE PROPAGATOR

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MONTHLY NEWSLETTER OF THE ILLAWARRA AMATEUR RADIO SOCIETY

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

IARS is a Member Club of the Wireless Institute of Australia

PRESIDENT

Keith Curle, VK2OB  
24 Beach Drive  
Woonona 2517

SECRETARY

John Doherty, VK2NHA  
7 Risley Road  
Figtree 2525

EDITOR

Kieran Kennedy, VK2DAN  
166 Osborne Parade  
Warilla 2528

MONTHLY MEETING- Second Monday of each month, 7.30pm at:-

The Congregational Hall, Coombe St. Wollongong.

CLUB STATION- VK2AMW

CLUB REPEATERS- VK2RAW, Channel 5 2 metres.  
VK2RUW, Channel 1 70 centimetres.

MONTHLY BROADCAST- 7.15pm EAST on the Sunday preceeding the meeting night. IARS Broadcast frequency:-

Repeater Ch5 or Simplex Ch40

Relay on 28.460 MHz & UHF repeater Ch1

CLUB NETS- 6 Metres 8.30am Sundays - 52.525 MHz FM.  
10 Metres 8.00pm Sundays - 28.460 MHz USB.

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## AUCTION:

THIS MONTH'S MEETING-

There will be an auction, so bring along that piece of gear that you have been thinking of selling.

CONDITIONS OF AUCTION;

1. No useless junk ( only good junk please )
2. Reserve prices may be set by seller.
3. A commission of 10% paid to club. (Max. limit \$10.00 comm.)

COMING SOCIAL EVENT;

The committee is organizing a bar-b-que outing at Sadleback Mountain on Sunday 16-Dec-79.

Cooking facilities will be provided. ( BYO )

NEXT MEETING- 12-Nov-79.



**MACELEC PTY. LTD.**

Professional & Industrial  
Electronics



<u>KENWOOD</u>	TL120 - Linear Amplifier 3-30MHZ.....	\$234.00
<u>KENWOOD</u>	TS520S - H.F. Transceiver.....	\$650.00
<u>KENWOOD</u>	TS8205 - H.F. c/w Digital Display (1 only).....	\$890.00
<u>KENWOOD</u>	TS120V - H.F. Mobile 10 Watt Output.....	\$600.00
<u>KENWOOD</u>	TS120S - H.F. Mobile 100 Watt Output.....	\$730.00
<u>KENWOOD</u>	AT200 - Antenna Tuner-SWR.....	\$160.00
<u>KENWOOD</u>	AT120 - Antenna Tuner-SWR.....	\$96.00
<u>KENWOOD</u>	RD300 - Dummy Load 300 Watt to 150 MHZ ( 1 KW Peak ).....	\$79.00
<u>KENWOOD</u>	MC501C - New Economy Base Station Microphone.....	\$29.00

\* \* NEW PRODUCTS AVAILABLE SOON \* \*

* <u>KENWOOD</u>	R1000 - Digital Reciever 200KHZ to 30 MHZ P.L.L.....	\$498.00
* <u>KENWOOD</u>	TR2400 - Digital Hand-Held 2M Transceiver L.C.D. - 10 Memories - Scanning.....	\$ POA
* <u>KENWOOD</u>	Programmable Digital World Time Clock.....	\$ POA

\* \* \*

We also Stock.....

H.F. Antenna's - Ringo Rangers - Morse Keys - Oscilloscopes  
- Digital Multimeters -

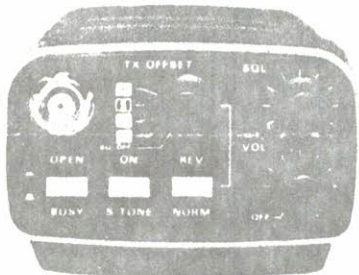
AND DISTRIBUTORS FOR THE SCALAR RANGE OF ANTENNA'S

MACELEC Pty Ltd,  
99 Kenny Street,  
WOLLONGONG. N.S.W. 2500



# ...synthesized, BIG LCD, 10 memories, scanning...and more!

**Kenwood TR-2400...it's a synthesized 2 meter hand-held transceiver...the answer to any Amateur's operating requirements! Its many advanced features include:**



## CONVENIENT TOP CONTROLS

- **LCD digital readout**
  - Readable in direct sunlight (better than LEDs)
  - Readable in the dark (with lamp switch)
  - Virtually no current drain (much less than LEDs) and display stays on
  - Shows receive and transmit frequencies and memory channel
- **10 Memories** (always retained with battery backup)
- **Automatic memory scanning** (for "busy" or "open" channels)
- **Mode switch for the following operations:**
  - Simplex
  - Standard repeater by offsetting the transmit frequency + 600 kHz or - 600 kHz
  - Repeater with nonstandard splits by offsetting the transmit frequency to any frequency stored in memory 10
- **REVERSE** momentary switch for the following applications:
  - Checking signals on the input of a repeater
  - Determining if a repeater is "upside down"
- **Built-in Touch-Tone generator** using 16-button keyboard
- **Keyboard selection** of 5-kHz channels from 144 000 to 144 995 MHz
- **UP/DOWN manual scanning** and operation from 143 900 to 148 495 MHz in single or fast continuous 5-kHz steps. Even operates on MARS repeaters within this range by using memory 10 for transmit offset frequency.
- **LCD "arrow" indicators**
  - "ON AIR"
  - Memory recall
  - Battery status
  - Lamp switch on
- **Two lock switches** to prevent accidental frequency change and accidental transmission
- **Subtone switch** (subtone module not Kenwood supplied)
- **BNC antenna connector**
- **1.5 watts RF output**

**The TR-2400 comes with the following standard accessories:**

- Flexible rubberized antenna with BNC connector
- Nicad battery pack
- Battery charger

**Optional accessories include:**

- Leather case
- Base Stand (for quick charge and easy base-station operation)
- DC (automobile) quick charger



**ST-1 BASE STAND (OPTIONAL)**



**MACELEC PTY. LTD.**

Professional & Industrial  
Electronics



(Subject to FCC approval)

**SEE YOUR AUTHORIZED  
KENWOOD DEALER FOR MORE  
INFORMATION ON THE TR-2400.**



...pacesetter in amateur radio

**TRIO-KENWOOD COMMUNICATIONS INC.**  
111 WEST WALTON, COMPTON, CA 90220

C Q... C Q... IC 228 owners.....

If any of you are contemplating adding external programming switches, the following table may be a little more convenient than carrying around a full list of possible frequencies and their binary address equivalents.

SWITCH;	"N";	=	144.4 + .....
D0	1	=	0.025 MHz
D1	2	=	0.050 "
D2	4	=	0.100 "
D3	8	=	0.200 "
D4	16	=	0.400 "
D5	32	=	0.800 "
D6	64	=	1.600 "
D7	128	=	3.200 "

e.g. lets say we want to program our local repeater Ch 5:-  
i.e. 146.250 MHz,  
we look at the table and find that 146.250 is equivalent to 144.400

+ 1.600 = D6  
+ 0.200 = D3  
+ 0.050 = D1  
146.250

Therefore: Ch 5 = 01001010

VK2DAN

#### 228 MHz generator.

This 288MHz generator was designed for use in a transverter to allow a two-metre transceiver to operate on the 70 cm band. During the transmission the 288MHz signal is mixed with the 144MHz output of the transceiver, the sum frequency being the desired 432MHz signal. During reception the incoming 432MHz signal is mixed with the 288MHz signal, the resultant 144MHz difference frequency being fed to the transceiver input. For this system to work the 288MHz signal must be extremely stable, which makes crystal control mandatory.

Unfortunately it is not practicable to design a 288MHz crystal oscillator, so instead a 96MHz oscillator driving a frequency tripler is employed.

The oscillator circuit is constructed around T1 and uses a 96MHz third or fifth overtone crystal. L3, connected across the crystal, neutralises the effect of the stray capacitance of the crystal can, which is necessary at this high frequency. Transformer L1/L2 is tuned to exactly 96MHz by means of C3, C4 and trimmer C5.

L2 couples the 96MHz signal into the inputs of a balanced frequency tripler built around T2 and T3. To peak up the output of the tripler the test circuit shown, which consists of a germanium diode and a multimeter, is connected to C14. VR1 and C9 are then adjusted for maximum deflection on the meter. The output of the frequency tripler is coupled out via L5 and C11 to a 288MHz tuned amplifier built around T4. This stage can also be peaked up by connecting the test circuit to the output (L7) and adjusting C14 for maximum reading on the multimeter. The output power of the circuit is approximately 1mW into a 50 Ohm load (220mV RMS, 300mV Peak).

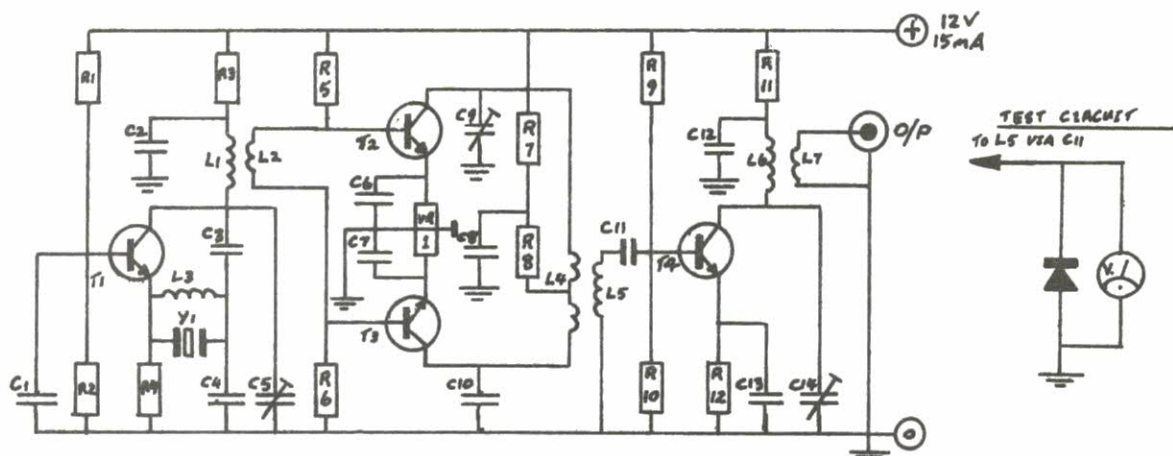


# 288MHz generator cont'd.....,

When constructing the circuit normal RF practice should be followed. All leads should be as short as possible and the three sections of the generator (oscillator, tripler and output stage) should be screened from each other. All capacitors should be disc ceramics and transistors should be from a reputable manufacturer. All coils are aircored with 1mm spacing between turns, with the exception of L3, which is close-wound, and L5, which is wound between the turns of L4 such that the turns of the two coils touch. L2 is wound next to the earthy side of L1 and L7 next to the earthy side of L6.

## COIL WINDING DETAILS (All enamelled copper wire)

URNS;-	S.W.G.	COIL Int. Diam.
L1 6	21	6mm
L2 1	21	6mm
L3 6	36	4mm
L4 2 C/tapped	21	6mm
L5 2	21	6mm
L6 1	21	6mm
L7 0.5	21	6mm



R1 15K  
R2 1K5  
R3,R7 100  
R4 220  
R5 120K  
R6 12K  
R8 1K  
R9 18K  
R10 2K2  
R11 10  
R12 68

C1 22p  
C2,C12 10n  
C3 18p  
C4 68p  
C5,C9,C14 1.5-9p trimer  
C6,C7,C8,C13 1n  
C10 4p7  
C11 470p

T1,-T4 BF 494

Y1 96MHz crystal.

VK2DAN

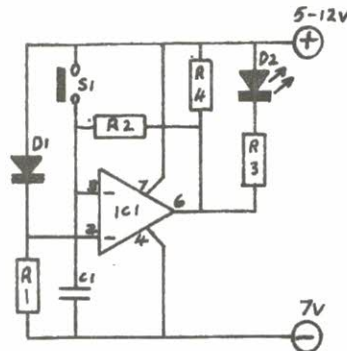
## SUPPLY FAILURE INDICATOR

Many circuits, such as random access memories and digital clocks, must have a continuous power supply to ensure correct operation. If the supply to a RAM is interrupted then the stored information is lost, as is the time in the case of a digital clock.

The supply failure indicator described here will sense the interruption of the power supply and will light a LED when the supply is restored, thus informing the microprocessor user that the information stored in RAM is garbage and must be re-entered, and telling the digital clock owner that his clock must be reset to the correct time.

When the supply is initially switched on the inverting input of IC1 is held at 0.6V below positive supply by D1. Pressing reset button takes the non-inverting input of IC1 to positive supply potential, so the output of IC1 swings high, holding the non-inverting input high even when the reset button is released. LED D2 is therefor not lit.

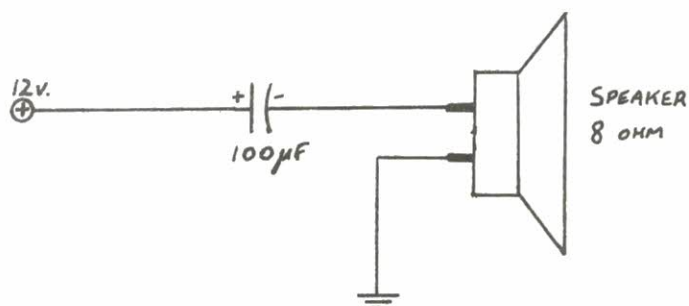
When the supply is interrupted all voltages, of course, fall to zero. Upon restoration of the supply the inverting input is immediately pulled up to its previous potential via D1. However, C1 is uncharged and holds the non-inverting input low, so the output of IC1 remains low and D2 lights.



R1	100K
R2	1-10K
R3	1K
R4	10K
C1	10n
D1	Gen. purpose 1N914, 1N4148 etc.
D2	LED.
IC1	741
S1	P/button N.O.

VK2DAN

This simple circuit tells you if there's anything wrong with your car alternator by analyzing the whine. A clean-sounding whine means the alternator's OK. Whine with a buzz means one or more diodes burnt out. If whine frequency doesn't keep pace with motor speed, the fan belt is loose.



VK2DAN



## THE 1979 F.A.C.T. SYMPOSIUM.

The 1979 Future amateur communications techniques symposium was held at NOAH'S NORTHSIDE GARDENS HOTEL in North Sydney on the weekend 29Sept.- 1 Oct. .

This was organised by Roger Harrison VK2ZTB who is acting editor of ELECTRONICS TODAY. The symposium was sponsored by that magazine. The rollup was fairly small with about 50 amateurs attending. This was probably due to time sharing with the Young convention. VK2's were just about outnumbered by visitors from VK1, VK3, VK4, ZL and P29.

There were nine papers presented covering propagation methods and predictions, amateur microwaves, use of microprocessors and computers, and solid state amplifier design.

The papers that particularly caught my imagination were on microwaves and the use of microprocessors.

Des Clift VK2AHC regards 1296 MHz as being one of the D.C. bands.

Des had a large amount of equipment on display and described among other things how to set up a station on 10 GHz. Did you realise that 98% of all bandwidth available to the amateur is above 432 MHz?

Equally fascinating were talks and demonstrations by Jeff VK2BYY and John VK2ZPC. Jeff described the control system now installed in the channel 8 repeater at Dural. It uses a microprocessor to coordinate the control functions and to supply metering information on demand. He also described and demonstrated his foxhunting antenna system which consists of six  $\frac{1}{4}$  waves mounted in a circle of  $\frac{1}{2}$  wavelength diameter on top of his car. The antennas are switched to his F.M. receiver in sequence around the circle at a rate of 1000 revolutions per second. He can tell the direction of the fox from the difference in doppler shift between signals received from opposite pairs of whips.

John's foxhunting antenna is a motor driven rotating yagi. Using a microprocessor, he samples the received signal strength at about each 10 degrees of rotation and plots the results on a small V.D.U.. This tells him both direction and signal strength.

The conference highlighted two types of amateur activity, the designing, building, fiddling with and improving type of activity and the communication and propagation research activity. As pointed out by Ken VK2CAX, who is getting project ASERT (amateur service experiment in radio transmission) under way, amateurs can and are doing research into propagation that is not economically possible for other groups to do. It is prohibitively expensive for research organisations to set up and man stations suitable for propagation research they would like to do in numbers of locations. In many cases, there are already amateurs there and all they need is some coordination.

It was a good conference. I am glad I went. Met some very nice people too!. How about the VK3 who showed photos of his 118 ft. tower. It has an internal stairway and a platform at the top, big enough to walk around on! .

CHARLIE VK2BOZ



## BLUE MOUNTAINS AMATEUR RADIO CLUB **VK2AUX/VK2NCM**

President: Steve Leatheam VK2BGL  
Secretary: Debbie Leatheam

P.O. Box 54,  
SPRINGWOOD. 2777.

26th August, 1979

The Secretary,

The Illawarra A.R.S.

Dear Fellow Amateurs,

The Blue Mountains Amateur Radio Club is having its Annual Field Day this year on Sunday, November 25th, at the Springwood High School.

We would like to take this opportunity to extend an invitation to all the members of your club to bring their family for an enjoyable outing on this day. A programme of the events has been enclosed, and we would further draw your attention to the various competitions in which you can take part: Homebrew competition  
QSL Card competition  
Auction.



Items for these events may be submitted beforehand, or presented upon Registration on the day. Registration will cost \$2.00 for OM's and \$1.00 for students; family 'extras' are free. A range of food and drinks will be on sale, or there is room for a picnic lunch.

Registrations will open at 0900 Hours. For any further information regarding our Field Day, please contact the Secretary, P.O. Box 54 Springwood.

Looking forward to seeing you in November,

Cheers,  
  
Steve Leatheam.  
(for Field Day Committee)

#### FIELD DAY PROGRAMME.

9.00	Registration Opens
9.00 - 9.30	Scramble VHF/HF (submit logs to Registration table when completed)
10.00 - 10.30	Pedestrian Sniffer Hunt
10.30 - 11.30	Mobile/Pedestrian Fox Hunt (with Sniffers)
11.30 - 12.00	Radio throwing contest -- Ladies only.
12.00 - 12.30	Pedestrian Sniffer Hunt
12.30 - 1.30	Talk-In Fox Hunt (maps provided)
2.00 - 3.00	Mobile Fox Hunt (with Sniffers)
3.15 - 4.00	Auction
4.00	Prize Giving and Close.

#### Blue Mountains Amateur Radio Club Award.

Have you tried out for this Award? The certificate is available to amateurs who have made five separate contacts with members of the Blue Mountains Amateur Radio Club.

Look at your Scramble Log...Are you eligible?  
Submit all log details to the Registration table and collect your award, for only 50 cents.

Otherwise, applicants should forward 50 cents in stamps, money order or personal cheque to the Secretary, P.O. Box 54, SPRINGWOOD. 2777

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Amateur Radio Society

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