

AMATEUR

QRM

RADIO

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Southern Branches of the Wireless Institute
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JUNE 1979

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VOL. 9 NO. 3

M E E T I N G S

- | | | | | |
|---------|---|---|---|-----------|
| 6 June | - | Southern Branch - SES Rooms Melville Street, | - | 8.00 p.m. |
| 8 June | - | Northern Branch - Clubrooms 34 Bourke Street, | - | 7.45 p.m. |
| 12 June | - | North West Branch - Penguin High School, | - | 7.30 p.m. |

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QRM COMMENT

To set the record straight, the May issue of QRM was published without the notes from the Southern Scribe only because they were received too late. QRM was in the hands of the printer and the format was set. QRM's format takes shape as articles are received and by the 20th (WHICH IS THE DEADLINE FOR ARTICLES) it is just about ready for printing. It goes to the printer on the 21st or 22nd and could be there a few days until it can be fitted in for printing. There is always or usually "filler spaces" of a few lines and these can be utilised up until the minute QRM is actually printed. However to add articles which take up more than filler space is just not practicable. QRM is set to 14 pages (7 both sides) and the sooner articles are received the more likely they will be published. Holding off to the last minute doesn't mean that the article will be published as the format of 14 pages could be filled, or more if necessary.

This comment is directed at the Northern Knockers (gossip is fast) who don't want QRM except when it suits them. It's too bad the Knockers wouldn't put some action where their mouth is by helping to collate, staple, fold, label or supply articles to QRM, but I suppose one can't expect miracles.

73 de VK 7 HE

**J. D. ELECTRONICS**

64 Wentworth Street,

NEWSTEAD

Suppliers of Yaesu Amateur equipment, Test Gear and all Accessories. Antennae and Fittings. Novices check us now for a really good deal.

NEW STATIONS

VK 7 NED K.J. DAVIS as listed in May issue should read VK 7 NKD K.J. DAVIS. Address is as listed.

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A TECHNOLOGICAL SURVEY OF BROADCASTING'S PRE-HISTORY 1876-1920

Loomis-Ward Aerial Conduction Telegraph

19th century thoughts on broadcasting were not limited to land line experimentation. On April 30, 1872, William Henry Ward of Auburn New York, received a patent for a telegraphic tower (No. 126356) that might be said to embody the earliest conception of transmitting signals by wireless from a single antenna to a multiplicity of receiving aerials. In the wording of the patent:

Different towers may be erected on the different continents, and if they are all what is technically called hooked on - that is to say, connected to the earth - a signal given at one tower will be repeated at all the towers, they being connected with each other by the aerial current.

No mention of the telephone, of course, at this early date. However, a word of caution should be mentioned here. The "wireless" system described is that of conduction transmission, a technique developed by telegraph engineers after 1838 when it was discovered that two wires were not necessary to complete a circuit. One could be eliminated and a return made through the ground. All sorts of intriguing possibilities were then thought of, including the idea of communication across bodies of water. The particular technique which Ward envisioned involved the elimination of both wires, the use of the ground and bodies of water as a substitute for one wire and the "conducting atmosphere" in place of the other wire. The inspiration for communicating through the atmosphere in this manner appears to have developed from observations of the effect of the aurora borealis on telegraph lines. Auroral storms created all sorts of havoc on domestic telegraph circuits including the freak ability to send messages over wire line with induced currents, entirely eliminating the need for batteries. If such electricity in the upper atmosphere could be harnessed, what a tremendous boon for global communications! We have no evidence however, that Ward actually built a tower (which, by the way, looks in the patent application drawing very much like a modern space-satellite communications antenna in Andover, Maine - although of course, operating on entirely different principles) and conducted experiments. Ward was principally an independent inventor in mechanical technology, with a concentration in railway car coupling devices. However, during the 1850s and 60s he developed a rather sophisticated semaphore signally system for maritime communication, and published a book describing his coded symbols in some detail. Sometime during this period he appears to have made the acquaintance of Mahlon Loomis and possibly was influenced by the latter's thoughts on 'conduction communication. Loomis' thoughts on wireless transmission date back to the great auroral storm of 1859 which was particularly vexing to telegraph operators in the Northeast United States. Loomis seems to have conducted several tests in the Blue Ridge and Catoctin mountain ranges of Virginia and Maryland in the 1866-72 period but a detailed account of the equipment used and persons present is lacking. However he obtained considerable support in Congress and probably would have received an appropriation had not the financial panic of 1873 struck. The most important question, of course, from the engineering point of view, is whether the Loomis-Ward system could have worked in terms of the design theory assigned to it. The answer is "no," with the qualification that under certain unusual conditions in the ionosphere, some deflection of the receiving galvanometer might be noticed. What is more likely is that Loomis radiated some electromagnetic energy from discharges of atmospheric electricity at the transmission end. Again, firm evidence is not at hand. Loomis was granted a patent for his system July 30, 1872.

de Jim VK 7 NOW

(cont'd)

SCENE & HEARD

First of all for this month, a real DX find, Mongolia. Yes, Radio Ulan Bator was logged on 4765khz at about 1400Z with a tuning call an identification announcements before commencing its programmes in I assume to be Mongolian. Its tuning signal is very similar to that of radio Peking and it tallies to that I have in the World Radio Handbook. The same source gives the information that they are utilizing 50 KW on that frequency. In about two decades of SWLing it is the first time I have logged Mongolia. Its SINPO level was fair to poor - 33232.

Here are some more 60 metre band loggings. Radio Sutatenza in Bogota Columbia can be heard consistently here at about 1100Z. The broadcasts from this commercial station are in Spanish on 5095 khz. There are some key clicks from a nearby RTTY station about 5khz higher.

Radio - Republic Indonesia from Ujung Padang in the Celebes is now on 4740khz formerly 4719khz. It can be heard about 1400Z from this 50KW facility serving Western Indonesia. SINPO 54243.

Apparently I have raised a hornets nest because I have included various PTP and commercial links and their frequencies, ie their publication. It is not my intention to divulge their traffic as that is not ethical nor is it legal, but only to help the serious SWL and DXer to find various 'rare' countries and to assist in propagation predictions for the operator/listener. All of the listings used can be found in World Radio Handbook and in SWL and Amateur Radio Magazines. Apparently there is a clause in the Wireless Telegraphy Act that prohibits the reception of signals without a licence. Domestic radio and television licences for receivers were abolished a few years back, but according to what is in the Act you would need a licence to receive the BBC or even Radio Australia, to listen to 2 metre repeaters or CB. Even an Amateur who is working split frequency on 80 and 40 M are not licenced to receive Stateside Ops on their phone bands and work them, for the licence says we can only work stations on the frequencies allocated.

Until this point is clarified, I will refrain from listening to PTP or Commercial services frequencies. As this condition would apply to the listening of Amateur Services logged and heard, and I would be technically breaching the terms of the Wireless Telegraphy Act. So perhaps this column, even to uninnocuous listening of Radio Australia is in total breach of this Act and therefore would conceivably have to cease. So what do you think?

I also have had comments of why do we have to have a SWL Column in an Amateur Radio Bulletin. (THE KNOCKERS STRIKE AGAIN - Editor). There are many Amateurs who can testify to their interest in electronics and Amateur Radio being awakened by earwiggling on the bands. I also feel that those who have been SWL's make better ops because they do know their on-air procedure. IF ONLY SOME NEW OPERATORS TODAY WOULD LISTEN BEFORE THEY TRANSMIT.

So much for my particular hobby - horse of the moment.

LATE NEWS: The BBC have advised me that they have started broadcasting again on 11 metres to Asia and Australia. It is on the air from 0400Z on 25650khz. Well until next month, when your Intrepid Correspondent will be reporting from the Northern Hemisphere.

73 de 'Earwig'

JUNE 1979

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GELSTON COMMUNICATIONS

TWO WAY RADIO SALES & SERVICE

YOUR LOCAL VICOM AGENT

40 LAVENDER GROVE

P O Box 1311

Phone 443882

LAUNCESTON 7250

TAS

Contact us for your next purchase.

FOR SALE.

SSRI Communication Receiver \$285.00

Magna Base C.B. Aerials Ideal to convert to either 28.MHz or
Two Metres only \$8.50 each

Yaesu FTDK400 exc. cond. has SP-400 speaker PTF mic. and
"Magnum 6" speech processor \$550.00

Yaesu FT620 B 4MHz coverage and callibrator only \$500.00

Yaesu FT220 with repeater crystal \$400.00

9 foot fibre glass whips complete with base \$29.50

Heathkit Distributer

In stock CANTENNA a must for every shack. This is a 50 ohm
load placed inside a large paint tin capable of one Kilowatt input.
VSWR. less than 1.5 to 1 up to 300 MHz.
Coax Switch Four position with aerial grounding facility. \$24.50
Write or phone for catalogue covering the vast range of HEATHKIT
equipment available.

VHF. NOTES

The peak of Six meter activity appears to have passed as I have
not had a contact outside VK7 this month, although the northern
area of Australia and W Land still have some openings usually
of a weekend when there are more amateurs about.

Going back to 24th last month I was working in the workshop
when I heard W6XJ call on 28.885 MHz no one replied so I gave
him a call. He suggested that we might try six metres as the
ZL television was very strong. I asked him to send some C.W. on
52.050 and to my amazement the S meter read S5 on carrier, I picked
up the mike and exchanged 5/5 5/9 report with him. Following
that I was called by K6JY0 then WB6IMV. I then called on repeater 8
but received no reply, following this I rang Col VK7LZ Col heard
Garry W6XJ but no contact was made.

Since then the band has been open on several occasions mainly
to JA area with the best day being the 24 th April when the
band was open most of the day. Garry HL9TG was heard for over
five hours working into VK. One station in VK5 had over 100 contacts
into JA area.

That is all the news I have for this month if you wish to have
anything of interest included in these notes please send them
to P.O. BOX. 1311 Launceston 7250

73 Till next month

Joe Gelston

VK7JG

JOTTINGS

Robin VK 7 RH leaves on Sunday 27th May for a tour of England and
who knows where. Robin is expected to return about the 15th of
August (unless we can move the Island). Have a good time Rob.
Ken Kirkman got his Z Call and David VK 7 ZDB his Full Call. Word
is that Robert Harper passed his Novice.

NORTHERN BRANCH NOTES

The highlight of the May monthly meeting was a report on Federal from Peter VK 7 PF. 64% of licencees in VK 7 are members of the W.I.A.. There are 184 Full, 94 Z and 50 Novices, making a total of 328. (QRM goes to 67 NW, 124 South, 53 Launceston and 26 other than post code 7250 as well as 14 interstate). There were 2100 increase of licences in Australia last year.

A typewriter was obtained and is in use. Lucy VK 7 NSB raised the matter of the club obtaining equipment for use on field days and WICEN. The first items to be obtained will be portable masts and antennas. Joe VK 7 JG is conducting a WICEN exercise on Sunday the 20th. Results will be notified next month. The meeting adjourned around 2140 hrs for supper and chatter.

It is proposed to hold a TRADE TABLE at next months meeting so bring something along as your donation, it doesn't have to be radio gear or components.

QRM

The QRM Library file is short of the following issues and anyone who can provide a copy please bring it to the next meeting or post to PO Box 275 Launceston.

Apr 74	Vol 7 No 10 Mar 78
Aug 75	Vol 8 No 4 Jul 78
Mar 76	Vol 8 No 5 Aug 78
Feb 76	Vol 8 No 7 Oct 78
Vol 6 No 12 Apr 77	Vol 9 No 1 Apr 79

PROGRESSIVE DINNER

A Progressive Dinner will be held by the Northern Branch on Saturday 30th June commencing at 6:30 p.m. at a cost of \$6.00 per head. Money raised will be used to help defray expenses at our Tasmanian Amateur Radio Convention being hosted by the Northern Branch this year.

Progressive dinner will commence at the QTH of Bob (VK 7 ZRF) and Margaret Grant, 13 Old Bridge Road, Perth with pre-dinner drinks and appetizers - from there to Kevin (VK 7 ZAH) and Judith Henricks, 8 Clarendon Street, Youngtown - the main course will be at Ed (VK 7 HE) and Noeleen Hewens, 43 Faulkner Road, Ravenswood with sweets and coffee at Brian (VK 7 ZBY) and Dianne Yeoman's QTH 104 Hardwick Street, Summerhill.

Tickets are on sale from any of the above and also at the Branch Meeting - there is a limit of 40 tickets (20 couples) so be early.

The Ladies Committee will hold there meeting at Annettes, 111 New World Avenue, at 8 p.m. Tuesday 19 June. Would all the Ladies please make an effort to attend and if you have'nt attended a Ladies Meeting now is the time to make yourself known and meet the others.

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QSL BUREAU NOTES

Cards are on hand at the Bureau for the following, a lot of which have been held for some time and which I would like to get rid of. A self addressed stamped envelope or a call at the Bureau will make sure they are not destroyed on 30th June:

VK7AP BI BM DH DW EJ FB GJ HJ IL JD JR LS NL PH RZ NAA NAO NVL
ZIA ZRO ZZZ L70107

You have to feel sorry for the OH who recently forwarded seven cards direct to the Bureau. Six of these were for stations I've never heard of and the other for a legitimate VK7 who does not QSL. The OH will not have a very good opinion of the VK7s when he doesn't get any in reply.

Heard on the bands recently. One Novice to another ditto "Sorry I can't give you a report as this set does not have an "S" Meter" Well ! ! ! Makes you wonder how we ever managed in the not very distant past before "S" meters came into use.

A packet of 251 cards received from an overseas Bureau included only 7 for VK7, the rest being for all other VK Divisions and had to be forwarded on. Included were 94 reports from one SWL.

Surely the biggest optimist I've heard of would be the European SWL who forwarded a report together with self addressed airmail envelope but no return postage.

73 is an old time land line telegraphists abbreviation for "Best Wishes" or "Best Regards". Adding an "s" makes it "Best Regards's" - hardly correct. Nor is "Best 73s". The same applies to 88.

Some of the more interesting cards received at the Bureau lately were FR/BE, J28AG, F511/mm and F6AQQ/mm (en route to Clipperton Is.), VK9YL, PY0MAG, EH6JFI/Kure, VP5SDA and CE0AE.

73 de VK 7 CH

FOR SALE

AWA Signal Generator - VG Condx \$50.00 Second hand TH6DXX Beam with Balun \$150.00 6 Metre Hy-Gain 64B 4 El Yagi 12db gain \$60.00 (unused) Kleinsmidt KSR-Teletype printer, reperforator, tape sender, all together - works off any voltage - 115 transformer supplied - tape and paper \$200.00 Yaesu FT 221 2 metre all mode rig with separate digital readout \$500.00

John VK 7 CCC phone 003-918295

BC221AE Frequency meter mains operated \$25.00 KW Viceroy transmitter MK III \$100.00 Ferrocart VTVM & RF Probe \$20.00 Dow-key coaxial relay 6V ac \$15.00 Heath SB101 with CW filter P.S.U. and speaker v.g. cond \$250.00

Frank VK 7 BC QTHR

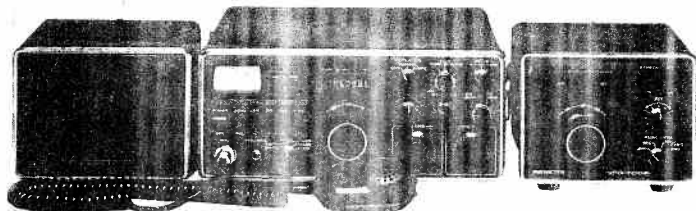
One TS120V. approximately three months old. Please contact V. Jenson of 35 Windsor Street, Kingston Beach - phone (002) 296687 if you are interested. The sale price is \$525.00

8 QRM ADVANCED ELECTRONICS

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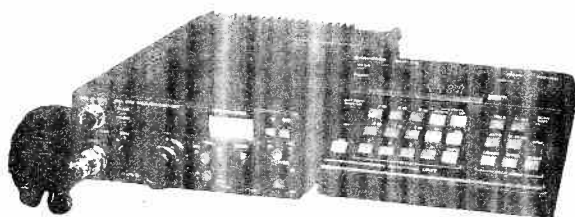
5A THE QUADRANT, LAUNCESTON, TASMANIAN, 7250 — P.O. BOX 328 — PHONE: 31 7075

TS-700SP



The TS-700SP is the all-mode solid state transceiver that provides you with versatility plus over the entire 2 meter band. It's feature-packed design puts you on SSB, FM, CW, and AM. The AC and DC power supplies are built in which allows you to operate the TS-700SP just about anywhere. Equipped with a VFO that enables continuous tuning from 144–148 MHz, the TS-700SP comes complete with built-in digital frequency readout, receiver preamplifier, VOX, sidetone, and microphone.

TR-7600



The new TR-7600 (TR-7625) is a high-performance 2m FM transceiver with memory, designed to permit multichannel (800 channel) operation. Featuring the ability of repeater operation, this transceiver brings you all the convenience and versatility in both mobile and fixed station operation. The TR-7600 (TR-7625) has provision for connection of the optional microprocessor control unit, RM-76 for added versatility.

TR-7600 (TR-7625) SPECIFICATIONS

• Frequency Range: 144.0 to 147.995 MHz • Mode: FM • Frequency Synthesizer: Digital control of phase locked VCO • Synthesizer Stability: Less than ± 750 Hz at 25°C • No. of Channel: 800 • Operating Temperature: -20 to +50°C • Power Voltage: 11.5V DC to 16.0V DC (13.8V DC standard) • Grounding: Negative • Antenna Impedance: 50 Ω • DC Current: Less than 0.5A in receive with no input signal, Less than 3(6)A in HI

AGAIN ONE ONLY THIS UNIT WAS \$419
NOW SAVE AT ONLY \$375.00

SPECIFICATIONS

• Frequency Range: 144.0 to 148.0 MHz • Mode: SSB (USB, LSB), CW, AM, FM • Antenna Impedance: 50 ohms • Frequency Stability: Within ± 3 kHz during one hour after one minute of warm-up, and within 150 Hz during any 30 minute period thereafter • Power Consumption: Transmit: 98 Watts (120/220V AC), 4.0A (13.8V DC), Receive (no signal): 48 Watts (120/220V AC), 1.2A (13.8V DC) • RF Output Power: SSB, FM, CW; 10 Watts, AM; 3 Watts, FM (Low); Approx. 1 Watt • Modulation: SSB; Balanced modulation, FM; Variable reactance frequency shift; AM; Low power modulation • Maximum Frequency Deviation(FM): ± 5 kHz • Carrier Suppression: Better than 40 dB • Sideband Suppression: Better than 40 dB • Spurious Radiation: Better than -60 dB • Microphone: Low impedance microphone (500 ohms) • AF Response: 400 to 2,600 Hz • Repeater Frequency Shift: 600 kHz • Sensitivity: SSB and CW; 0.25 μ V for 10 dB (S+N)/N, AM: 1.0 μ V for 10 dB (S+N)/N, FM; 0.4 μ V for 20 dB noise quieting, 1.0 μ V for 30 dB (S+N)/N • Selectivity: SSB, CW and AM; 2.4 kHz/-6 dB, 4.8 kHz/-60 dB, FM: 12 kHz/-6 dB, 24 kHz/-60 dB • Image Ratio: Better than 70 dB • IF Rejection: Better than 70 dB • Squelch Sensitivity: 0.25 μ V • AF Output Power: 2 Watts/8 ohms load, with less than 10% distortion • AM Output Impedance: 8 ohms • Dimensions: 278 (10-7/8)W x 124 (4-7/8)H x 370 (12-5/8)D mm (incl.) • Weight: 11 kg (24.4 lbs)

VFO-700S SPECIFICATION

• Frequency Range: 8.2–9.2 MHz • Frequency Stability: Within 150 Hz during 30 minute period after warm-up • Dimensions: 160 (6-5/16)W x 123 (4-3/4)H x 200 (7-7/8)D mm (inch) • Weight: 2.4 kg (5.3 lbs)
* Model name and specifications may change according to destination.

ONE ONLY AT THIS CLEARING PRICE
WAS \$935 NOW \$835 THAT IS RIGHT
A SAVING OF \$100.00

TR-7500



AC Power
supply
PS-6

TR7500 WE HAVE TWO OF THESE UNITS
IN STOCK TO CLEAR AT ONLY \$250.00
WAS \$290SAVE \$40

WE ARE PREPARED TO TALK DOLLARS ON ANY OF THESE UNITS SO FOR ANY ENQUIRIES
FEEL FREE TO CONTACT EITHER RICK BECKER OR ROGER WOOLLEY

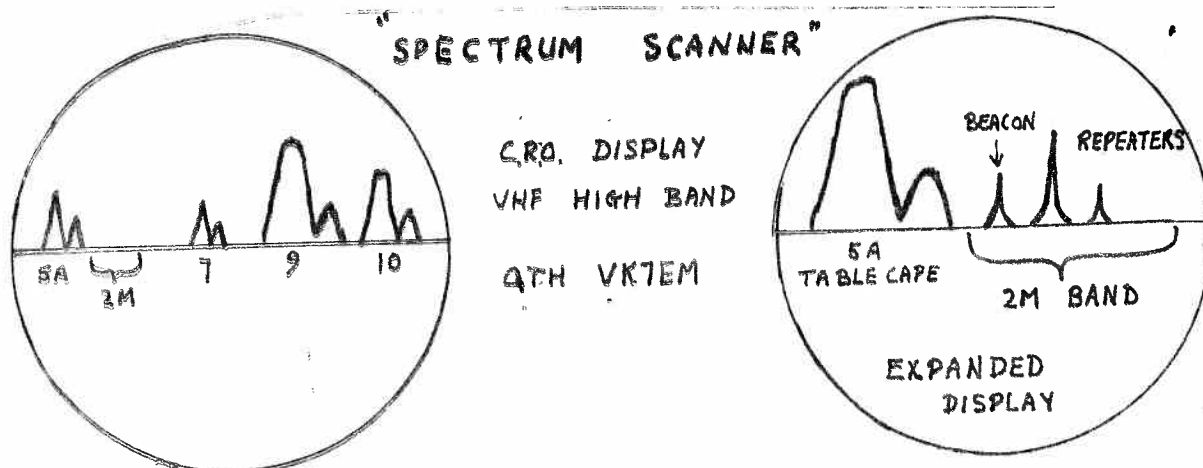
FINANCE CAN BE ARRANGED

A SPECTRUM SCANNER

This device, built from readily available parts enables the VHF Bands from 40 - 220 Mhz. to be viewed on an oscilloscope. Instantly it is possible to see what band conditions are like by observing distant TV channel frequencies. Also, at a glance, 2 metre activity can be seen and appropriate equipment can then be activated.

Theory of Operation:

Briefly a Varicap Tuner (as used in press-button tuned television receivers) can be tuned by applying a voltage, determined by a small potentiometer, one for each channel. The full channel allocation is usually covered in two ranges, while the UHF band can be covered in a third. If then by applying a repetitive sweep voltage covering the complete tuning range which is usually 0 - 30 volts, and with this also driving the X or Horizontal amplifier of an oscilloscope the bands can be swept. Any signals found will be detected and a voltage proportional to the signal strength will, if coupled to the Y or Vertical amplifier will cause "pips" on the horizontal trace. Therefore on FULL SWEEP, either 45 - 140 Mhz. or 140 - 220 Mhz. can be displayed on the CRO at the one time. A section only of the band can be displayed by switching to ADJUSTABLE SWEEP and setting the CENTRE FREQUENCY and SWEEP WIDTH controls until the desired section is located and expanded.

Construction:

.. Varicap Tuner can be obtained from several suppliers at a reasonable cost. The amplifier used in the prototype was from a wrecked Philips monochrome TV receiver. It was re-aligned simply by peaking the relevant tuned circuits and adjusting the traps until a narrow bandwidth, high gain amplifier was obtained. The video amplifier following the detector was retained and the output taken from where the sync separator was fed. Layout of the sweep board is not critical. Almost any CRO can be used providing it can accept external horizontal drive.

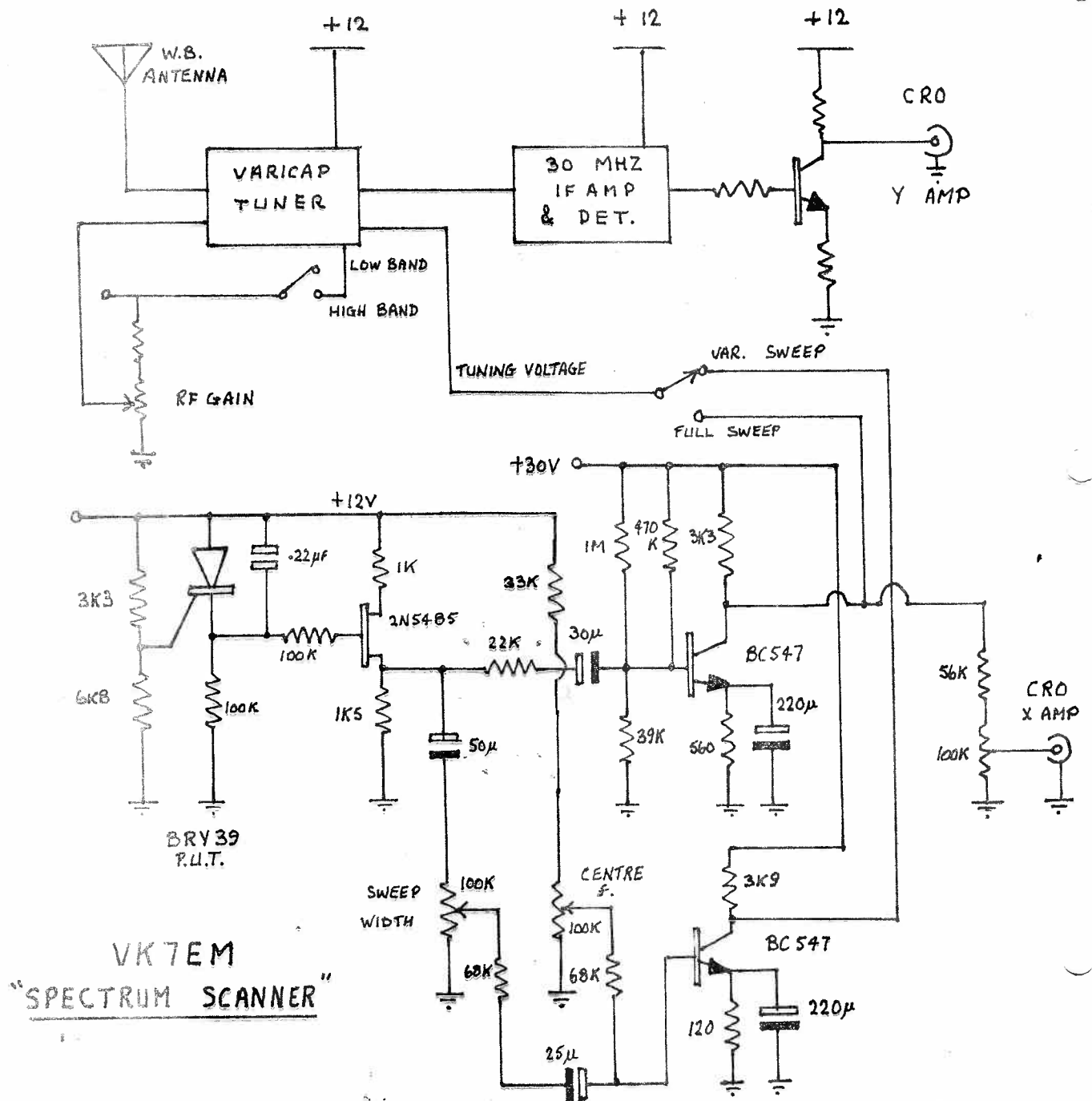
It is fascinating to watch the activity as mainland TV signals fade up out of the noise (or grass), the various two-way services busily occupy their segments and the strength at which home-station receiving equipment local oscillators radiate.

73 Winston VK 7 EM

FOR SALE

Johnson Viking 23 channel SSB AM 28.015 - 28.631 Mhz with 15kc clarifier
 5 watts PEP output = \$100.00. 240V/2 amp power supply for this unit
 \$30.00

VK 7 NAC 003 441584



NEW CALL SIGN ISSUING PROCEDURES

In Tasmania we have been fortunate in the past in being able to "short circuit" government red tape and have call signs issued soon after exam results are known. Frequently permission has been given by P & T for the use of the call sign prior to the forwarding of relevant paperwork. This however, is now past history. Due to some new call sign holders not "playing fair" - not following regulations prior to the receipt of their station regulations. P & T are now following the book, vis;

- no exam results will be given via the telephone
- call signs will not be reserved pending results
- call signs will not be issued over the phone and not before relevant paperwork is completed.

Another example of some thoughtless people ruining advantages for all.

HOME COLOUR FILM & PRINT PROCESSING

Your darkroom can be the laundry or bathroom, even the kitchen, provided the XYL can be convinced of your magic powers. A requirement is running hot and cold water. (Not Barmaids). Develop a sequence for yourself and always put your trays and equipment in the same place, it helps when fumbling around in almost no light.

Now for the "MODUS OPERANDI"

Developing the film: (always assuming it has been exposed)
Find a completely dark place, the bedroom cupboard with the doors closed serves my purposes. Load the film in the spiral and put it in the tank and screw the top on (as for B & W). You can then switch on the lights or work in the daylight. It is assumed that all chemicals have been mixed in accordance with the instructions which come in all the packs.

The most critical temperature-wise is the developer, try and keep it within 1 degree either side of 37.8C (100F). I achieve this by pouring 12 oz in a glass jug and sitting it in a bath of hot water in the stainless steel sink. Stick the thermometer in the jug and keep an eye on it until its approx 37 to 38C. It helps to put the bottles of bleach, fixer and stabiliser also in this bath although temperature for these chemicals is no-where near critical.

After developer has reached proper temperature the following functions should be carried out:

- 1 Pour the developer into the tank and agitate for 3½ minutes.
- 2 Pour the developer out about 10 seconds before time is up.
If you are only doing 1 film don't use the developer again but if doing more than one film it can be retained and reused, add 5 seconds to developing time if reused.
- 3 Pour bleach into tank next (do not wash in between developer and bleach) leave for 6½ minutes with agitation occasionally.
- 4 Wash with ordinary room temp water for 3½ minutes.
- 5 Pour in fixer and agitate for 6½ minutes.
- 6 Wash again for 3½ minutes.
- 7 Pour in stabiliser and leave for 1½ minutes, agitate occasionally.

NOTE: Do not wash after stabilising, just take the film out of the stabiliser and hang to dry in room temperature. The film will have a milky appearance initially but will dry out to a transparent reddish-brown overall colour. When holding the film to a bright light the colours will be evident but of course in reverse. i.e. a colour which should be red will show up in the negative as green, blue will show as yellow and vice-versa plus the in-between colours.

Note 2: the bleach, fixer and stabiliser which has been used can be retained and poured back into the bottles for storage and reuse. It will last for about 6 months normally in practice. Un-used developer will last in practice about 3 months although the pamphlets say only 6 weeks.

Assuming the film turned out OK, and it should have, we will go on to the printing process.

(this article by Peter Harrison, VK 2 NPM - cont'd)

WELLER SOLDERING GUIDE

With Kind Permission of the COOPER TOOL GROUP LIMITED

History

Soldering is both an art and a science. As an art it dates back 4,000 years, as a science it only dates back to the turn of the century. Evidence of silver soldering has been found on vases of as long ago as 2,000 to 3,000 BC. 'Soft' soldering, with lead and alloys of lead has been used in crafts for centuries.

The use of solder as an alloy of tin and lead began with the tin can around about 1900. Alloying precise amounts of tin and lead made joining the metals of tin cans both economical and practical. Increase in the knowledge of solder alloys and fluxes has paralleled the growth of electronics. Soldering is now the most popular method of making good electrical connections.

Soldering means the joining of metals by heat for the purpose of making something structural, or producing a continuous and permanent path for electricity. Metals for structural assembly can be joined by soldering, brazing or welding.

Soldering entails using a low-melting-point alloy, heating it to a liquid state so it flows on to the base metal being joined and alloys with it at the surface. Brazing is at higher temperatures and with different alloys and fluxes. Welding is at still higher temperatures, where the metals are brought to a liquid state and fused together.

The popularity of soldering for electrical connections is born out of the relatively low temperature required to melt the solder (below 800°F./430°C.) thus making tools and techniques simple and practical by comparison for both the technician and the home handyman.

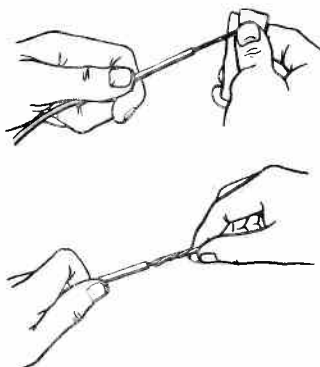
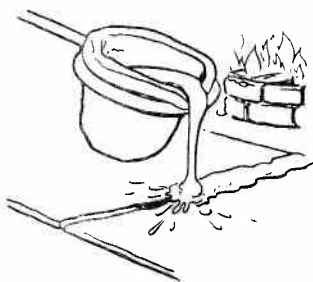
Principles of Soldering

Solder is a soft material and cannot be depended upon to hold two pieces of metal together by itself. Therefore, a good mechanical connection should be made prior to soldering. In the case of electrical wires they should be twisted together before applying any solder. Other types of joints are given later in the booklet.

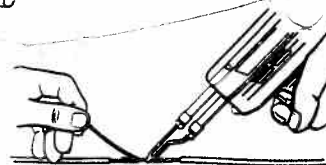
The various stages of making a good solder joint are as follows:

1. Ensure that items to be soldered are perfectly clean. This can be done with wire wool or fine emery cloth. However, just because a piece of metal looks bright and clean, it is not necessarily so. Oxygen oxidises with metals and an oxide film can quickly form on metal surface. Flux will overcome much of this but cleaning with alcohol prior to soldering will ensure against this corrosion.

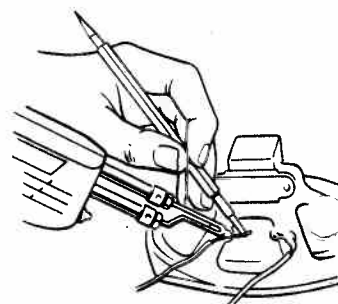
2. Make a good mechanical connection before soldering by wrapping wires around each other or around a terminal post.



3. When applying heat, DO NOT apply it to the solder. Heat should be applied to the base material i.e. wires so that they become sufficiently hot to melt the solder to flow into the joint.

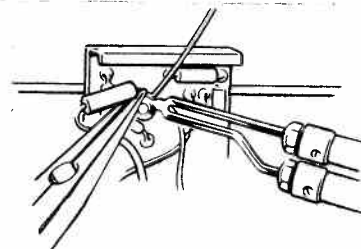


4. When the solder has been applied to the joint smoothly slide the iron away to leave the joint neat. This is a particularly important point when using an instant heat soldering gun. The trigger should never be released before the tip has left the solder joint. Allowing the tip to cool whilst in contact with the solder will result in an untidy joint.



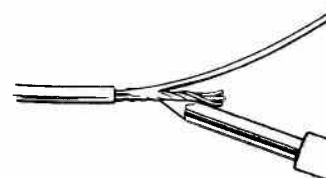
5. To avoid joint or wire moving whilst being soldered a soldering aid tool can be used. Also blowing on the heated solder will speed setting.

6. On electrical and particularly electronic equipment it may be necessary to avoid too much heat reaching the component being soldered. To overcome this, hold the wire from the component with a pair of long nosed pliers. They will act as a heat sink and dissipate the heat away from the component.

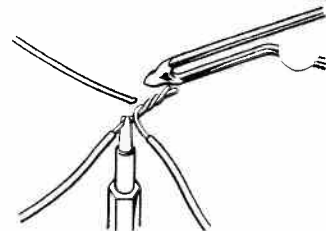


7. Do not apply more solder than is required. Excess solder can fill up tube sockets, freeze switches and causes short circuits.

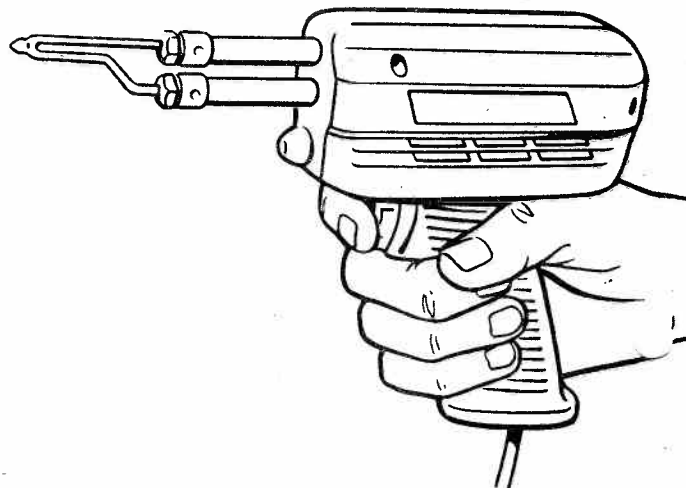
8. It is advisable to tin wires before soldering, especially stranded wire. Twist the strands together then heat and saturate with solder.



9. Sweating a joint is easy after the wires are tinned. Just twist the wires together and apply heat. The result will be a smooth, electrically efficient, soldered joint.



10. To un-solder a joint apply heat and use a soldering aid to separate joint. Be sure to use new solder when re-soldering.



SOUTHERN NOTES

The Auction/Bingo night held last Saturday night, although attended by relatively few amateurs, made a profit - which monies go to swell the slowly increasing building fund. The turn up was rather disappointing considering the purpose of the evening; however, the radio type items listed for auction showed a general trend away from home building and possibly this was one reason for the poor attendance. However, the bingo proved to be very popular and it is intended to have a bingo night in the future.

The next event on the social calendar is a square dancing night on Saturday the 7th of July at the Wentworth Special School Hall (part of the Howrah Infant School). A Caller has been organised and a hot supper will be provided. Tickets are available from Judy Boon and Dorothy Noble at the Western and Eastern shores respectively. Cost is \$5.00 per head and \$2.50 for school children. It would be appreciated if tickets could be purchased as early as possible so we could have some idea of the numbers for catering.

The equipment store has shown a general decline in sales over the past few years, and this fall has accelerated this year. The whole idea of equipment store needs a re-think, so any ideas that amateurs have on this subject - well, let's hear them. The Southern Branch equipment store will be open for business on every Sunday morning after the broadcast at the home of the equipment officer VK 7 ZTX.

If you would like the equipment store to stock a particular item(s) let Lex know. An inventory of items in stock will hopefully be published in next month's Q.R.M.:

Lionel, VK 7 SL, is to be listed as 'phone contact officer for W.I.A. Southern Branch in the next telephone directory. Our thanks go to Lionel for volunteering for this duty.

The next meeting of the Southern Branch is to be held at S.E.S. Headquarters on Wednesday the 6th of June. Don't forget the square dancing evening - we can promise you a night of fun that you won't forget in a hurry, and just think how each step takes us closer to stepping into our own premises.

73 de Sue Morgan VK 7 ZSU/NSU

STATE COUNCIL NOTES

Welcome to the following new members,

John Doran, Moonah VK 7 NEX
Paul Jones, Lindisfarne VK 7 PJ
Steven McDonald, Burnie
John Webster, Penguin
Eric Edwards, Burnie
Robert Bailey, Burnie

Perusing the minutes of April's Council meeting showed a list of 34 items of inward correspondence. This together with a discussion of Federal Convention items meant that the meeting was a marathon - 8 hours in fact.

Amongst matters discussed were;

- (1) The amendment of the Articles of Association to allow our membership to increase over 300.
- (2) P and T have queried the rebroadcast of VHF repeater idents on HF broadcasts.

STATE COUNCIL NOTES cont'd

- (3) QSL Bureau operation - Chas VK 7 CH was present and reported on its strong financial position and the aspects of its operation.
- (4) The Divisions support of QRM. It was decided to cover the Northern Branches 1978 loss of \$107 and offered to contribute \$1.00 per member to them for 1979/80.
- (5) An apparent irregularity in the award of the Wilkinson Award is to be taken up Federally.
- (6) Bank balance \$1300 - around \$500 to be reimbursed to branches

SONY VIDEOTAPE of ARRL publicity films WHO HAS IT ?????

WARC Donation - the Division is about to forward money held for this purpose. Any further amounts please forward to Box 1010 Launceston by 16 June or at your next Branch meeting.

WIA has decided to send a second delegate - one reason being that Australia is one of three countries having Amateurs as an official delegate. PLEASE HELP.

VK 7 AWARD - a draft set of conditions for this award is soon to be circulated - ideas please.

AOCP Examination - the next exam is almost certain to be multi-choice. It will be advisable to try one first. If you want a trial exam one will be held in July. See May 'AR' page 42 for details or contact Reg Emmett VK 7 KK.

Federal Convention - you'll have a short screed in WIA News for June 'AR' and Branch meetings will have had a report from Peter Frith VK 7 PF or Reg Emmett VK 7 KK.

It was mainly an informative exchange with little contentious being discussed. Probably the major output would be from discussions with Minister for P & T Mr. Staley and Mr. J. Wilkinson from P & T. eg stopping the new regulation handbook printing - reaffirmation of channel O and 5A installation ceasing - the effectiveness of our political lobbying.

Contests - what do you think about -

- (1) Dropping the Ross Hull Contest
- (2) No open section in the RD Contest
- (3) Separate days for phone and CW in the RD Contest ie Phone August, CW May.
- (4) No home stations in Field Day Contest
- (5) The WIA run the Westlakes Novice Contest
- (6) The presnt VK-ZL Contest rules.

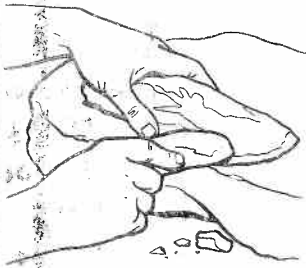
comments to Council members please.

Next Council Meeting, June 16, 2p.m. at P. Blake VK 7 ZPB, 18 Nixon Street, Devonport.

NICHOLSON FILE GUIDE

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History



The file has been with man now for many years and one of the first recordings is in the Bible during the reign of King Saul. This would be approximately 1090 BC and at that time files would have been used for sharpening various types of primitive tools. From the first files the development and evolution can be traced from stone implements to files with teeth running at right angles across the file blank to present day quality machine produced files.

The first attempt to cut files by machine was approximately 1490 AD and resulted from an invention by Leonardo da Vinci. However, the first machine which actually cut files was that made by the Frenchman, Chopitel in 1750.

At this time files were made from mild material and did not require annealing. To produce a hardened surface various preparations were used to carburize the file teeth. But it was the inventions of such men as Bernot, Nicholson, Whipple and Weed which provided machines capable of producing better files than those produced by hand.

How a file is made

Today various kinds of material, product, finish and working condition make file development an industrial science. File manufacture involves the study of file steels, file design and file performance for all file applications.

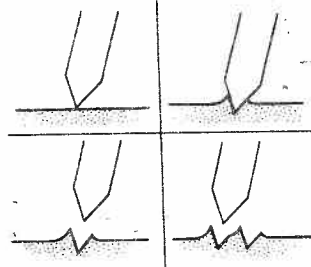
1. File Steel: Is cut to length from various widths, thickness and cross sections such as rectangular, square, triangular, round and half round.

2. Rough shaping: The blank is heated and forged with trip hammers and rollers to shape the tang and point, also done by punching on a punch press after annealing.

3. Annealing: The forged blank is heated and then cooled slowly under controlled conditions to soften the steel for tooth cutting and to make internal steel structure uniform.

4. Final shaping: The annealed blanks are ground or milled to produce a surface necessary for the uniform formation of the teeth.

5. Forming teeth: The teeth are formed by a rapidly reciprocating chisel that strikes successive blows on the file. The hardened chisel cuts into the soft blank displacing and raising the steel into the desired tooth structure.



6. Hardening: The file is then hardened by heating in a molten lead bath to a predetermined temperature. This is followed by immersing the file in a quenching solution. This imparts the maximum hardness to the top of the cutting edges.

7. Finishing: The file is cleaned and sharpened by sand blasting. The tang is reheated to give strength without brittleness.

Files and Rasps have three distinguishing features (1) length, (2) type and (3) cut.

Length: The length of the file is the distance between the heel (the part of the file where the tang begins) and the point (or end opposite).

Type: This relates to the various shapes or styles of files. These are divided from the form of their cross section into three geometrical classes: quadrangular, circular and triangular. These sections are in turn subdivided according to their general contour; taper, blunt etc. A blunt file maintains its thickness throughout its length.

Cut: The cut of files is divided, with reference to the character of the teeth, into single, double, rasp and curved; and with reference to the coarseness of the teeth, into Bastard, Second Cut and Smooth.

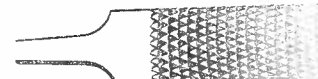
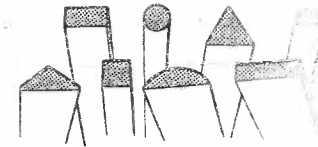
Single cut files are often used with light pressure to produce a smooth surface finish or to put a keen edge on knives, shears, saws etc.

Double Cut are used with heavier pressure for the fast removal of material.

Bastard cut is for more stock removal while Second Cut and Smooth are for finishing.

The Rasp cut is a series of individual teeth produced by a sharp narrow, punch like chisel, it is an extremely rough cut and is used primarily on wood, hooves, aluminum and lead.

Curved tooth files are used to smooth surfaces primarily in the automotive body shops.



How to use a file correctly

Filing is an industrial art—grip, stroke and pressure may vary, to fit the job. It is essential that you use the correct file for the task at hand.

Filing action: There are three elemental ways a file can be put to work. They are:

Straight filing: This consists of pushing the file lengthwise—straight ahead or slightly diagonally—across the workpiece.

Drawfiling: This consists of grasping the file at each end and pushing and drawing it across the workpiece.

Lathefiling: This consists of stroking the file against work revolving in a lathe.

For normal filing, it is advisable to have the vice at approximately elbow height, however, when there is a great deal of heavy filing it is better to have the work slightly lower. If the work is of fine and delicate nature the work can be raised to eye level.

For work that could become damaged in the vice, through pressure, a pair of protectors made of zinc, copper or aluminum sheet should be used between the workpiece and vice jaws.

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