

QRM

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EDITORIAL BY BASIL VE6BB / VK7BL

TWO LOOKS AT TASSIE - WITH 9 YEARS BETWEEN.

"There is no place like home" That's a cliché, very timeworn but just as valid now as when it was first penned.

It's nice to be back on a visit and renew old friendships while striking up new ones.

Naturally the amateur scene in Tasmania, as everywhere else, has altered radically, and an objective appraisal may serve to facilitate some self examination. If I may, I would like to point out some features that have been quite noticeable as compared to 1964 when I left.

On the positive side, there is a very pleasing growth in the use of channelized VHF FM communications. If there is ever going to be an improvement in communications technology it will probably be in the VHF - UHF field, and amateurs here are demonstrating their willingness to be "in the thick of it" at the same time, the proportion of Tasmanian (and Australian) amateurs engaged in satellite communication is quite large compared to, say, Canada. An offshoot of this is the Mt Barrow repeater, its coverage is fantastic, my congratulations to all who participated in its design and erection.

cont. page 2

MEETINGS

SEPT. 4th NORTH WESTERN BRANCH, LAKINS HALL, ULVERSTONE.

SEPT. 14th NORTHERN BRANCH, AEB ROOMS, HIGH ST.

YRCS

SEPT. 22nd KINGS MEADOWS HIGH SCHOOL.

This will be the only class during September due to school holidays.

OCT. 20th - 21st 16th JAMBOREE ON THE AIR.

For details see A.R. July '73 page 20

New faces amongst the 42 people who attended the Northern branch meeting included, Bill Tanner VK7TE, Reg Binns, John Doolan, Bruce Atkinson and Max Brooks.

Two items of correspondence were the letters to and from the contest manager relating to the use of repeaters in the R.D. contest. (this matter has since been taken up by the divisional secretary and has resulted in a reversal of decision)

In his financial report the treasurer VK7ZAH said that sales this month amounted to \$441.00 and that we have a bank balance of \$661.00 John VK7JV reported that the Clubhouse account is still increasing although more slowly now and the ballance is \$915.00

Lindsay VK7ZLD spoke about the Hamfest arrangements and a full report appears on page 4.

It was passed by the meeting that the Hamfest committee be given \$70.00 as a working capital, more later if required.

After the meeting closed members showed some of the equipment they have built in the last year.

VK7ZBY showed the frequency counter as described in QRM

VK7ZLD had quite a selection, an IGL receiver, 2M walkie talkie and a signal source for carphone receiver alignment.

VK7ZRF allso had a 2M walkie talkie as well as a sync pulse generator and a 6 - 30 Mhz receiver.

VK7RH showed a speech compressor that he has been experimenting with.

VK7ZGJ impressed us with his new 6 metre transverter using a 6/40 in the final. this unit will be described in QRM in the near future.

VK7KW has obviously been quietly working away while we weren't looking and produced a Deltahet type receiver.

* * * * *

cont. from page 1

Another very positive is the fact that despite relatively limited (and expensive) parts, in general the state of the art knowledge is extremely commendable and in many cases far exceeds amateur requirements. A very large number of amateurs are still willing to experiment, to try something new, far more than those in Canada. So much for the positive changes, what about the negative points that have been noticed? For one thing friendships now seem a little more restrained(perhaps because of the increased number of amateurs) Ask yourself now, do you really know that amateur down the street, or over the hill? sure you can talk to him on 2, but is that really getting to know him? (for one thing he can't say all he might wish to over the air) Why not cultivate a friendship with somebody living close by, you may be surprised.

There is allso a certain amount of "clique-ishness" which is quite noticeable too, and was certainly not a feature when I left.

Some Hams (and I use the word advisedly) have their own little groups and discourage outsiders, perhaps you even know one or two yourself, other changes that are neither good nor bad include, ofcourse the dominance of SSB as a mode of communication, the consequent large number of bought rather than built stations. The growth of the Northern branch, and the large number of HF directional beams (bought and built) all this makes Tasmania a little different for me now, I am almost a stranger.

In conclusion, I would like to take this opportunity to thank all those who extended their hospitality during my holiday here.

It all helped to make my stay a very memorable one.

Look for me on 20 metres SSB or RTTY.

NORTH WESTERN BRANCH NOTES by MAX VK7MX

To those of you who do not care for my notes, I have news for you, you have another 12 months to get used to me. This month's thought provoker. How much should one do for the W.I.A.? There is no obligation, Why bother at all. Why do we bother with ham radio? To the technically minded it's a challenge, there is no set pattern, rather a dozen different approaches. And so we become absorbed in it. there is some distinction in wearing a W.I.A. badge. We may be screwy but it takes brains. The whole objective is to communicate and to do this we must have the use of frequencies, and they are getting scarcer. The W.I.A. is the one voice that is recognised, the more we support it, the louder the voice. We can all contribute in some small way to the general effort which in the aggregate will constitute a powerfull organisation, one that will be respected and listened to when most needed. Active participation does have its reward and I should know. Now to current events. The Annual meeting of the North West Branch was held on the 7th of August with an attendance of 21. The most important business was the election of officers for the coming year. Results were as follows:

President	MAX VK7MX
Vice Presidents	IAN VK7ZIE and SID VK7SF
Secretary	DAVID VK7MS
Treasurer	GRAHAM VK7ZAA
QSL Officer	HAROLD VK7MZ
BRANCH Correspondent	MAX VK7MX

We were delighted to welcome VK7BL Basil (VE6BB) 7JV, 7KK, 7PD, Steven VK7ZSF and 7RH, thanks chaps for coming.

It was a jolly little meeting, with some unusual happenings but it all worked out and no one was dobbed in.

All were willing to do their bit.

The past President presented his report outlining progress during the year, but allso some caustic remarks directed at most of us, we were all very sad.

After the meeting closed we were entertained with some movies of our star cricketers and it became fairly obvious as to who really won. We allso saw some Ladies and some shots of the last Evandale Hamfest.

Basil presented some slides of his home location in Canada including some of his school. We were fascinated by a number of points in one picture, six in all. We wish Basil the best of luck in the future which from the pictures will be full of opportunity.

Our new secretary turned up beautifully turned out, dressed somewhat like a kaleidoscope, the impact was startling, I'm jealous. David 7MS is the proud owner of a new ACITRON SSB rig, it makes a big noise, locally anyway.

Rumour has it that a local ham now has a circuit board stomach, mistook the glass of ferric chloride for a glass of Fanta and is now suitably etched.

Again rumour has it that some sort of disaster took place in a very small area in the shack of Ian 7ZIE, some beating about the bush on 2 metres rather confirms this but appart from a 20B in the car one can only surmise. Its a cruel world.

7MX in collusion with 7NR have built constant volume amplifiers to poke in front of the SSB rig. Found them to be winter jobs only as in summer flies and mosquitoes will cause heavy QRM.

Harold 7MZ is having a short spell in hospital, he looks fine to me. Back to the cards Harold.

CU next month MAX

50th HAMFEST VK7

24th & 25th NOVEMBER, 1973

EVANDALE MEMORIAL HALL

The Hamfest Committee held their first meeting on Tuesday 7th August at the home of VK7ZLD, who was appointed Chairman for the committee.

The very successful 1971 Hamfest would be used as guide lines for this our 50th Hamfest, and registration fees would possibly be the same as for 1971.

The Hamfest would be centred on the Memorial Hall, caravan and camping would be available at the Evandale Show Grounds which are only a short distance from the hall.

The Committee Member responsible for the various areas :-

Brian VK7ZBY & Bob VK7ZRF ---- Antennas, Entertainment,
Hire of hall and liaison
with Evandale Council.

Joe VK7ZGJ --- Operational Equipment for 6M and above,
and operators for same.

Robin VK7RH --- Provision of HF Equipment and operators.

Gordon VK7GW --- Trade Products and Literature.

Kevin VK7ZAH --- Equipment Store, cordials and sweets.

Lindsay VK7ZLD --- Catering, Equipment Display (old & new).

Norman VK7NR --- "Mobile Clinic" and Test Centre.

Steve VK7ZSF --- Publicity.

Would any members who have ideas please forward them to the committee so this Hamfest will be a "bigger and better" Hamfest, ----- remember it is the 50th Year.

Hamfest Committee.

EQUIPMENT STORE NOTES

Due to the application of surcharges to imported capacitors most capacitors will increase from 2 - 10 cents.

The goodies we have on order for you at the moment include:

LED's (light emitting diodes), electrolytic capacitors all values up to 220 mf, 1000 pf bolt in type feed trough capacitors, 1000 pf ceramics 500 volt, SCR's and 2 pole 4 position wafer switches.

IC's in stock include: 7400, 7404, 7420, 7474, 7490, 7493, and 7495.

IGL transceivers and converters are still very popular and another order is being made up at the moment.

Fibre glass blanks have been received and are almost gone.

Ferric chloride is sold out, if there is sufficient demand we'll get another batch. A batch is 50 Kg.

TECHNICAL ARTICLES OF INTEREST by VK7PFHELICAL MOBILE ANTENNA HAM RADIO DEC. '72

This is a very good article, details are given of how to wind an antenna for a single band and also for one that works on all bands 40 - 10 metres.

This aerial shows resonance and impedance suitable for PI MATCH networks.

Typical resonances are 7.05, 14.2, 21.1, 28.28, 31.8, 37.42, 44.5, 56, 67 etc Mhz and by adding a loading coil can be used on 160 and 80 metres.

HIGH POWER

Eimac advert says a Bendix made phased array radar uses 5.184 of type 4CPX250K tubes of 10KW peak output each, driven by 10.368 planar triodes, the total cost for tubes for this transmitter, \$336.592.

MONOLITHIC MICRO TRANSMITTER Australian Electronic Engineering.

An American company, Lithic Systems Inc. has developed the first commercial of a series of micro transmitters.

The LP 2000 is aimed at HF to low VHF, AM and Pulse modulation applications, later versions will be aimed at VHF FM and SSB applications as well as AM and Pulse.

In a 10 pin TO5 package is included an oscillator followed by buffer and output stages, a power supply regulator, modulator pre amp and modulator output regulator.

To use as an AM transmitter external requirements are, a crystal and output tank circuit, six condensers, four resistors and a small dynamic speaker as microphone.

A 27 Mhz AM transmitter performance, CW output 100 Mw, CW supply current 50 MA, AM output 50 MW, AM supply current 28 MA, AM 90 % modulation with less than 10 % distortion.

HAM RADIO for FEB. 1973 carries an advert for Semiconductor Supermart which says, coming soon the LP 2000 Micro-transmitter.

TUNABLE SIX AND TEN METRE PHASE LOCKED LOOP HAM RADIO Jan. '73

This is a circuit for an tunable injection oscillator for use in converter or transmitter mixer applications.

A free running oscillator or VCO operates on the output frequency and is mixed with a crystal oscillator to produce a low IF which is compared with a tunable oscillator and a correction voltage is developed to make the VCO follow the low frequency oscillator.

This is called a phase locked oscillator. This circuit differs from others through the use of a digital IC type D flip flop as a mixer.

When used in this application it functions as a harmonic mixer in that the crystal oscillator injection need to be only one eights of the required frequency.

The output is compared with the tunable oscillator by using a IC phase comparator MC4044P.

To produce an oscillator tuning 48.4 to 49.4 Mhz for use in a 50 Mhz converter with a 1.6 Mhz IF, a crystal on 6 Mhz will in the D flip flop mix to produce $48.4 - 48 = .4$ Mhz

So a VFO from 400 to 1400 hz will lock the VCO to cover the required range.

TECHNICAL ARTICLE - VK7ZBY

A 250 MHZ FREQUENCY COUNTER

PART 5

Count Gate Control Circuitry

The Count Gate Control Logic (the circuit of which appears at Fig. 10) consists of two J-K flip-flops, a two input exclusive "OR" gate, and one inverter. The two flip-flops are provided by a dual J-K flip-flop type 7473, one half of which is used as the gate control F/F, whose clock input (C) is fed with the selected timebase signal from the timebase select switch. As the gate control must only be allowed to open the counter gate for a single timebase signal period for each measurement, its operation is controlled by a lock-off signal applied to its DC reset terminal (R). The lock-off signal is provided by the second half of the 7473, which switches to the setstate immediately the gate control F/F returns to the reset state after opening and closing the count gate. The lock-off signal is applied to the DC reset input of the gate control F/F via an exclusive "OR" gate (type 7486). The purpose of the "OR" gate is to allow the gate control F/F to be reset, along with the lock-off F/F, by the normal instrument reset pulses.

Before describing the operation of this section we must first understand the operation of some of the devices used in this circuit. First the dual J-K master slave F/F (7473); with a pulse train applied to its clock input "T", the information of the J and K inputs (Logic 1) enters the master section when "T" goes high. Afterwards, when "T" goes low, the information is transferred from the master section to the slave section and appears at the outputs. Because of this method of operation the pulse period of the output is the same as the input. The other section that may need some explanation is the "OR" gate which is a dual device of which only one section is used. The best method to show how this gate operates is by the truth table, which appears below.

A	B	Q
L	L	L
H	L	H
L	H	H
H	H	L

A and B are inputs,
Q is the output.

From the truth table it can be seen that the Q output is low when both inputs are low or high.

Other devices used are 74H04 inverter, a dual NAND power gate 7440, of which only one section is used here and a Quad two input NAND gate 7400. The operation of these devices have been explained in previous articles.

The operation of this section is now as follows: Consider the counter reset prior to the count gate opening and no timebase signal applied to the clock terminal of the gate control F/F. Now apply a pulse train of the correct shape from the timebase via the timebase select switch to the clock terminal of the gate control flip-flop. As explained previously, when the clock terminal "T" goes high the information available at the J and K inputs enters the master section of the F/F, by the Q and Q bar outputs do not change until the clock terminal goes low.

When this occurs, the Q output goes to Logic 1 and the Q bar output goes

TECHNICAL ARTICLE (Cont)

to Logic 0. The Logic 1 from the Q output is applied to both the count gate, thereby opening the gate and to the clock terminal of the lock-off F/F (2nd section of 7475). It can be seen that this effect is exactly the same as in the gate control section F/F in as much as the information at the J and K terminals has entered the master section when the Q output of the gate control F/F went to Logic 1, but cannot appear at the outputs until the Q output of the gate control F/F returns to Logic 0. This occurs when the next pulse input to the gate control F/F clock terminal rises to Logic 1 and back to Logic 0, and in doing so resets the gate control F/F. At this point a number of things occur simultaneously - the count gate closes because the Q output has returned to Logic 0, and the lock-off flip-flop sets. The Q bar output of the lock-off F/F which was at Logic 1 prior to setting, now goes to Logic 0. This Logic 0 is applied to gate A of the exclusive "OR" gate, the other gate (B) is fed from the reset line via an inverter (74H04). As the reset line is at Logic 1 the inverter applies a Logic 0 to gate B. Referring to the truth table of the 7486 will show that the Q output will now go to Logic 0, having been at Logic 1 prior to the lock-off F/F setting. This Logic 0 is applied to the DC reset terminal of the gate control F/F which forces that F/F to remain in the reset condition. Up until now we have opened the count gate, counted the input signal, stored it for displaying and re-closed the count gate. As explained in Part 4 page 7 the counted signal is applied to the readout devices at a count of 7 and at the count of 9 the counter is reset to 0 prior to the count gate reopening. It is at this count of 9 that the gate control circuitry is reset for the next operation.

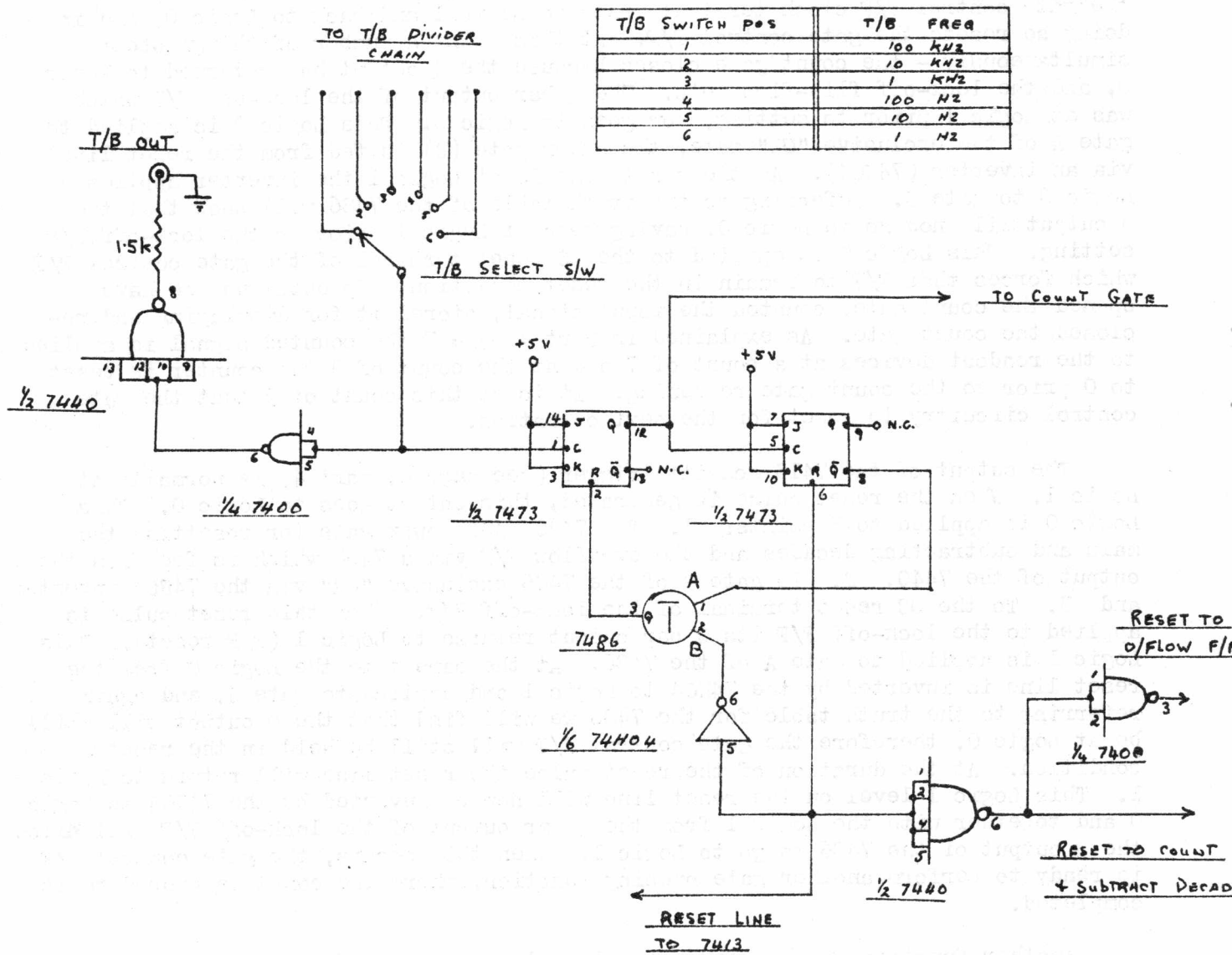
The output of the 7415 schmitt trigger (see page 8, part 4) is normally at Logic 1. When the reset pulse is generated, this output goes to Logic 0. This Logic 0 is applied to 3 points: 1. The 7440 NAND power gate for resetting the main and subtracting decades and the overflow F/F via a 7400 which is fed from the output of the 7440. 2. To gate B of the 7486 exclusive "OR" via the 74H04 inverter and 3. To the DC reset terminal of the lock-off F/F. When this reset pulse is applied to the lock-off F/F its Q bar output returns to Logic 1 (F/F reset). This Logic 1 is applied to gate A of the 7486. At the same time the Logic 0 from the reset line is inverted by the 74H04 to Logic 1 and applied to gate B, and again referring to the truth table for the 7486 we will find that the Q output will still be at Logic 0, therefore the gate control F/F will still be held in the reset condition. At the duration of the reset pulse the reset line will return to Logic 1. This Logic 1 level on the reset line will now be inverted by the 74H04 to Logic 0 and together with the Logic 1 from the Q bar output of the lock-off F/F will allow the Q output of the 7486 to go to Logic 1. When this occurs, the gate control F/F is ready to perform another gate opening function, where the complete procedure is completed.

Another function in this circuit which plays no part of gate control is the provision for bringing the timebase frequencies out to a socket for testing and calibration purposes. This is provided by a 7400 feeding the second half of the 7440 used in the reset circuit. These two gates are fed from the wiper of the timebase select switch. The 7400 is used to reduce loading on the divider chain and loading reflected back from the timebase test socket. The 1.5 K resistor between the socket and the Q output of the 7440 is to protect the 7440 should the output be accidentally shorted to earth.

TECHNICAL ARTICLE (Cont)

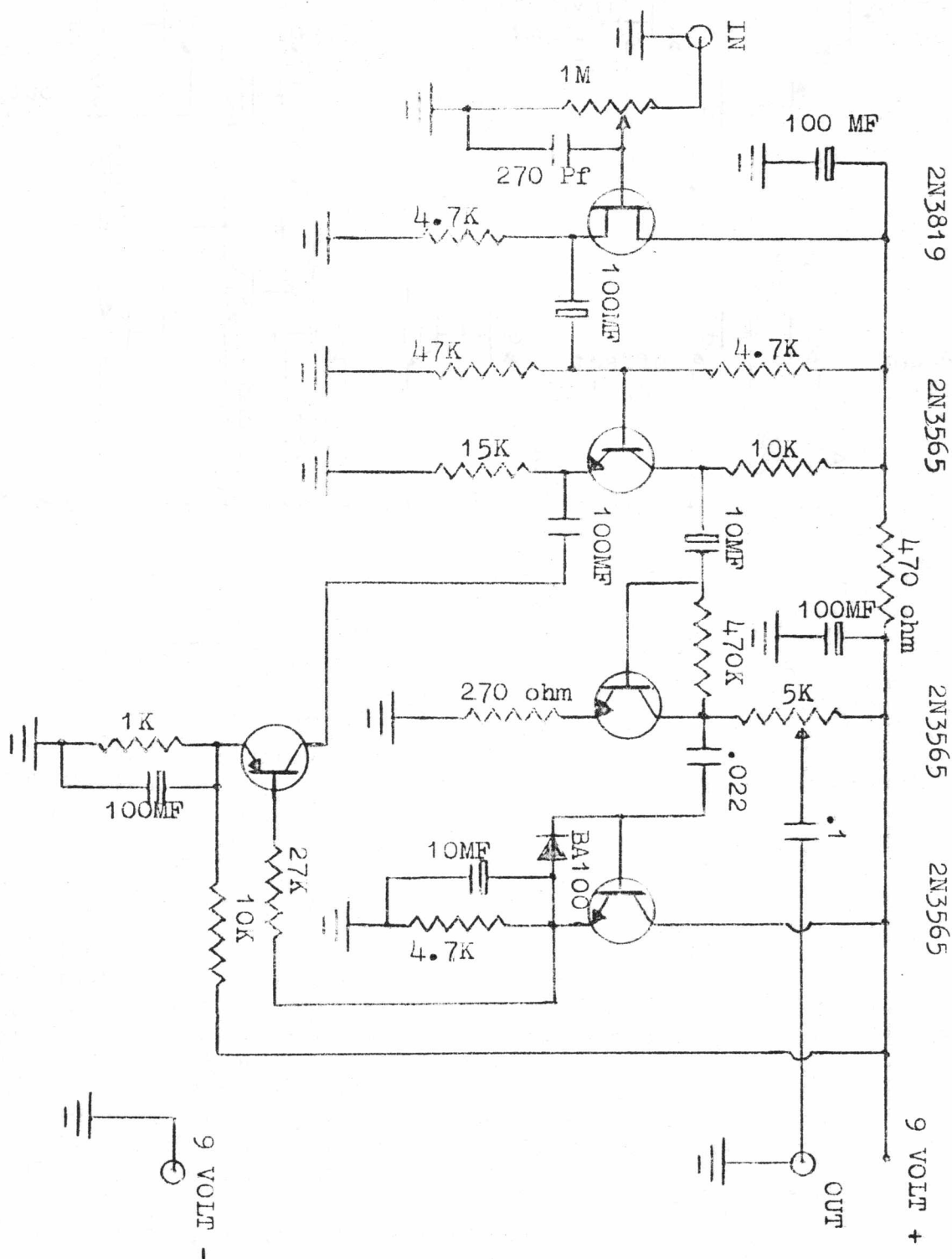
Fig. 10 shows the complete gate control circuitry.

Fig. 10

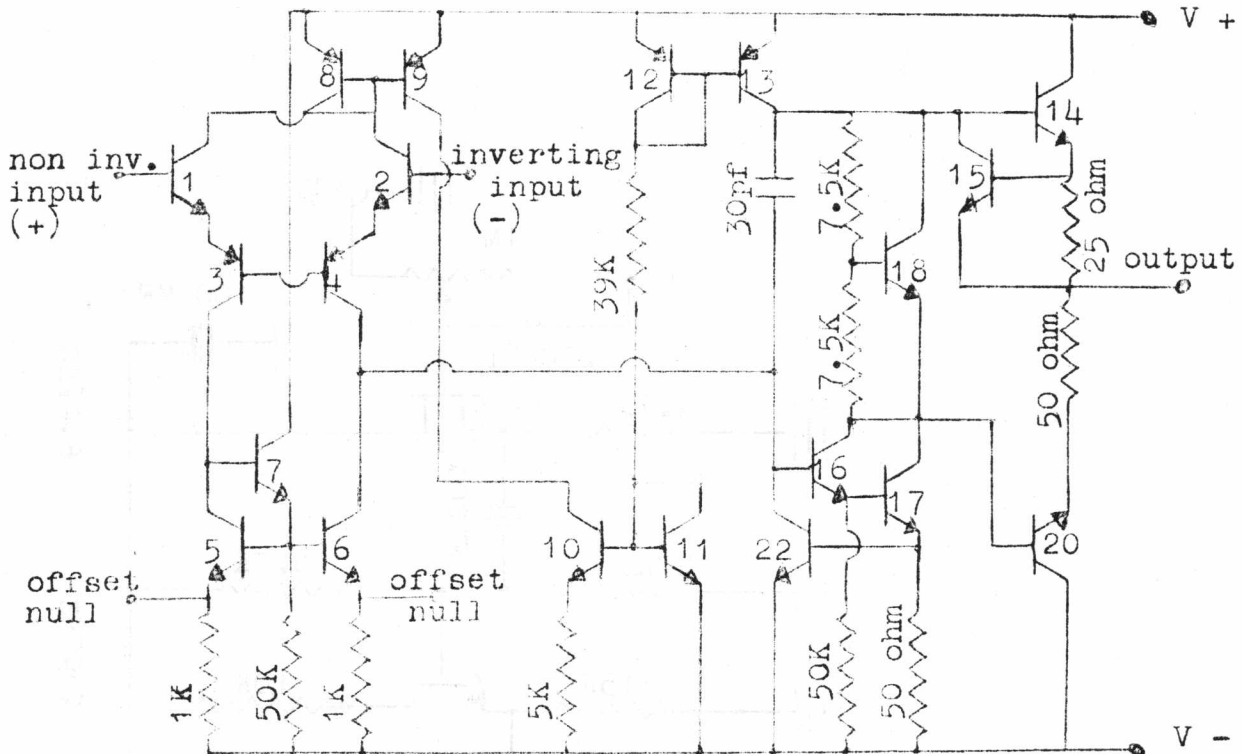


7400, 7404, 7440, 7486 = +5 Volts pin 14, GND pin 7
7473 = +5 Volts pin 4, GND pin 11

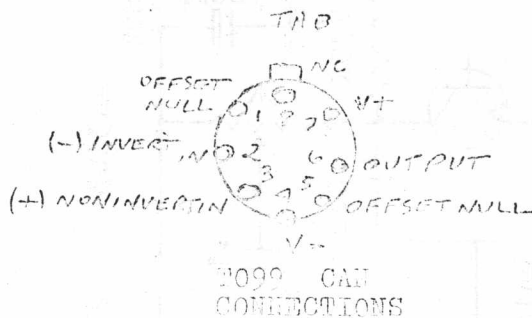
This speech compressor circuit, supplied by John VK3TN is used with an FT101 with excellent results.



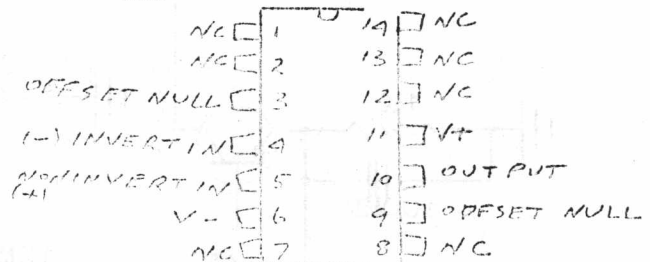
reprinted from Westlakes Radio Club - Newsletter.

AN EXPERIMENTAL DIRECT CONVERSION RECEIVER: PART 3 - by D.CROFTS741 IC

TOP VIEW



TOP



D.I.L. PACKAGE

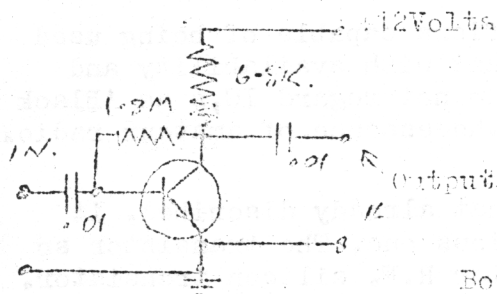
As I promised last month, here is the data including the schematic for the $\mu A741$. The 741 is a monolithic operational amplifier constructed on a single silicon chip, using the planar-epitaxial process. It is designed for ease of application and high performance, requires no external frequency compensation components and is fully protected against short circuit conditions occurring at either the input or output. The amplifier will not 'latch' up AND can accept a wide range of input voltages. Because it is monolithic, the 741 has high reliability with low cost. \$1.35 is very cheap for something that contains 22 transistors.

Maximum ratings : Supply voltage: 18 volts. Power dissipation : 500 mW and the Input voltage is 15 volts.

Characteristics : V_s 15 volts. Supply current : 1.7 mA. Power consumption is 50 mW.

AN EXPERIMENTAL DIRECT CONVERSION RECEIVER : PART 3

-D.Crofts.



Bottom

View

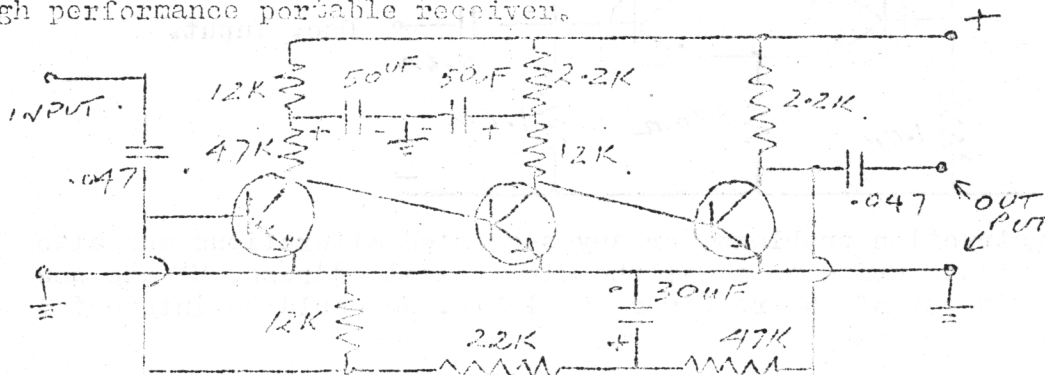
BC109



The first audio amplifier I will show you is a simple pre-amplifier. It uses a 2N3565 2N3693, BC107-8-9, TT641 etc (NPN Silicon). Since we intend to use it as a pre-amplifier it is best to use a low noise transistor, such as the BC109 already mentioned.

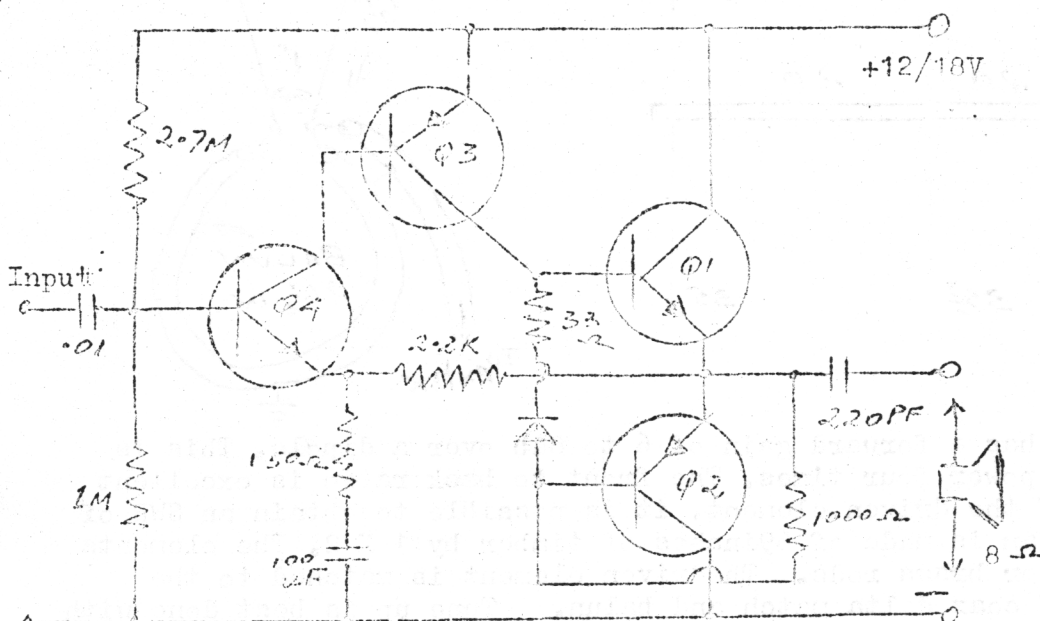
The second audio amplifier is a very high gain type, it is direct-coupled and has a gain in excess of 100 dB. The three transistors used should be of the type mentioned above and my comments regarding noise also apply. Care should be taken to avoid any instability in the amplifier, and this

should be checked before the completion of the receiver - if necessary increasing the value of the decoupling resistors in the first two stages. This amplifier, the Product Detector, Oscillator plus the Audio Filter, could form a complete high performance portable receiver.



Hi-Z phones or to
Amplifier for
loud speaker.

The third amplifier is capable of powering a loudspeaker if provided with the sufficient input, say from 2 pre-amplifiers, to give the receiver enough sensitivity. It is of the standard complementary-symmetry type employing 4 transistors such as amplifier, driver, 2 power amplifiers. Output is in the order of 1.5 Watts. If there is any noticeable crossover distortion REDUCE R1; this will increase the quiescent current and reduce the distortion.

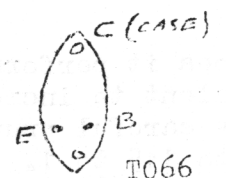


Q1 NPN Power AY8171
TT801

Q2 PNP Power AY9171
TT800

Q3 PNP Driv. 2N3638A
2N4250

Q4 NPN Amp. BC109.8.7
SE4016
TT641

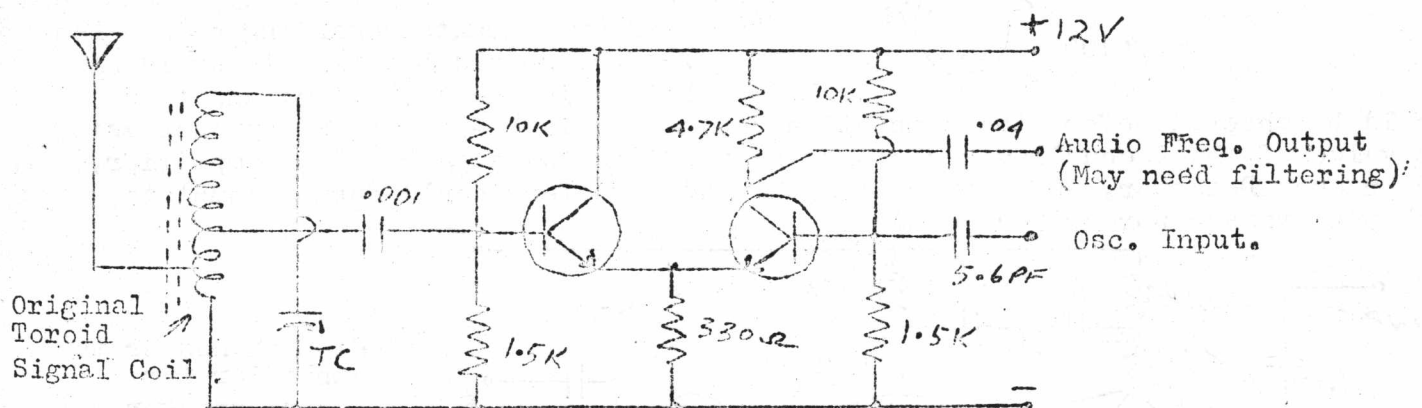


Power
Transistor

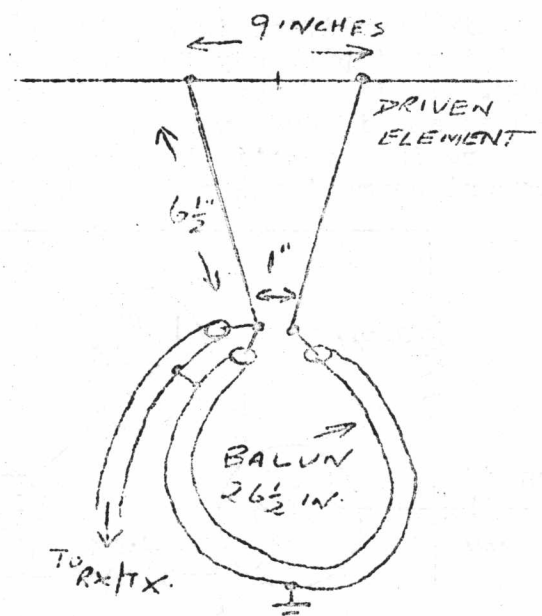
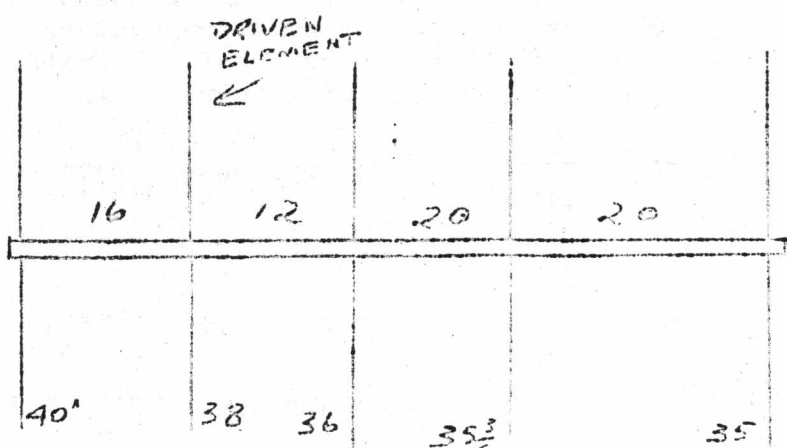
AN EXPERIMENTAL DIRECT CONVERSION RECEIVER : PART 3. CONCLUSION

The amplifiers shown are only a portion of the amplifiers capable of being used in the receiver. Use what you consider best, consistent with availability and cost. Experiment with what you have and above all, do not regard IC's as 'Black Beasts', find out what you can about them - this is the essence of amateur radio.

Finally; I have an alternative Product Detector to that already described, it uses 2 transistors and performs the same as the previous one. The transistor so used, can be : BC107-8-9, BF115, BFJ84-5 or any similar R.F. silicon transistor. The lower cost of this detector may make it more attractive to some constructors. The same oscillator is used.



If anyone has any construction problems, or any suggested alterations and also circuitry additions, please write to me at the Club postal address. We are now thinking of making a kit out of the receiver available. We would be interested in your opinion.

A TWO METRE BEAM ON THE CHEAP.

How does it perform? It has a forward gain of 6 to 8db over a dipole. This is equivalent to increasing power four times. The front to back ratio is excellent and by careful pruning of the driven element, it is possible to obtain an SWR of down to 1:5 to 1. The beam is made of 69 inches of timber by 1 X 2. The elements are made of 3/8 dia copper or brass rods. The driven element is matched to the feedline through a RG8A/U coax delta match and balun. Tune up is best done with the antenna in a clear spot pointed straight up at the sky. Pruning the driven element will give the best SWR match. Mount horizontally for AM and vertically for FM operations.

Q.R.M.

BULLETIN OF THE NORTHERN BRANCHES OF THE W.I.A TAS. DIV.

Sept. 1973

Page 13

NORTH WESTERN BRANCH ANUAL STATEMENT OF ACCOUNT

AS AT 31 - 7 - 1973

DEBIT.

RECEIPTS.

Purchase of equipment	428.57	Cash in hand 1.8.1972	108.67
Hall Rental	18.00	Sale of equipment	446.07
Q.R.M. Donation	15.00	Hall Collections	8.26
Q.S.L. Buro	2.00	Zone Fees	28.00
Subs to Federal Ex.	17.00	Subs.	17.00
Cakes for Ladies night	6.45	Profit on 432MHZ Converters	4.00
Xtal Refund (B.Groom)	10.00	Xtal Refund	49.00
Annual Dinner	274.00	Annual Dinner	288.00
Printing (Dinner)	11.50	Bank Interest	4.46
Cheque Book	1.80		
TOTAL	\$784.32	TOTAL	\$953.46
Balance at Bank	100.42		\$ 953.46
To be paid in	<u>88.72</u>	Less	<u>\$ 784.32</u>
	189.14	TOTAL	\$ 169.14
Less unrepresented cheques	20.00		
TOTAL	\$169.14	Assets Balance in hand	\$169.14
		Equipment on hand	<u>\$ 65.61</u>
		TOTAL ASSETS.	\$234.75

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* * * * *

HAMADS

HAMADS

HAMADS

FOR SALE

AWA MRT 25a carphone with xtals for ch. B, 4, 1.	\$130.00
IGL 6 metre converter with xtal	\$ 12.00
PYE Mk 3 with FET pre amp, xtals for 53.032. 5W out	\$ 12.00
No 10 xtal calibrator unit	\$ 8.00
Sun yagi 14 element, built and tuned	\$ 15.00

WANTED TO BUY OR EXCHANGE

A VARIAC, STATE PRICE AND CONDITION

0 - 30 Pf variable vacuum capacitor 10 KV rating

VK7ZGJ 40 Lavender gr. Launceston

MORSE KEYS ARE AVAILABLE

CLIPSAL MORSE KEY \$9.35 + 15% tax. See Norm VK7NR for orders
