

QRM

BULLETIN ISSUED BY THE NORTHERN ZONES OF THE
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PAGE 1

FOR a few months now we have been printing basic circuits with explanations on how they operate; to date we haven't had any correspondence to say that this meets a demand or whether it's a waste of time and space.

We do hear a lot of people say that QRM fulfills the need for a Northern bulletin and that it is very informative but very few of you take pen in hand and drop us a line. How about you making a New Year's resolution to help with QRM by writing a few lines. Anything will help - from a couple of lines about some new gear to a technical article, editorial or even a disagreement with some of the material printed. So let's hear from you in the very near future.

JOHN VK7JV,
EDITOR.

COMING EVENTS

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| FEB. 1 | N.W. MEETING, LAKIN'S HALL, ULVERSTONE. |
| FEB. 11 | NORTHERN ZONE MEETING AT A.E.B. ROOMS, <u>51 YORK ST. LAUNCESTON.</u> |
| FEB. 27 | ANNUAL PICNIC, FIELD DAY AND CRICKET MATCH AT PORT SCRELL. |
| FEB. 5-6 | ARRL PHONE DX CONTEST. |
| FEB. 12-13 | NATIONAL FIELD DAY CONTEST 1972 - REF. NOV. A.R. PAGE 13. |

The January meeting was well attended, however there weren't enough office bearers present to meet the quorum requirements. We apologise for this but I guess it gave you all the chance to discuss things off the record.

Peter 7PF acted as chairman.

It was reported that the problem with off frequency transmissions into the repeater had been solved. Some discussion took place on constitutional matters.

THE FEBRUARY MEETING WILL NOT BE AT 8 HIGH ST. THE ROOMS ARE REQUIRED FOR FESTIVAL OF TASMANIA ACTIVITIES.

THE MEETING WILL BE AT ADULT EDUCATION BOARD ROOMS, 51 YORK STREET.

We hope to have TIM 7ZX at Port Sorell on the 27th to report on the most important event of the year - THE CRICKET MATCH!

CONGRATULATIONS to ROBIN HARWOOD who passed his exams and now holds the call 7RH. Robin has been heard quite a bit on 40 meters using his FT 200.

TREVOR 7TB found that the protective covering around his FT 101 in the form of a Holden Torana is not waterproof!

LEE PRETTY 7ZLP was home from VK3 during the holidays. We had a chat with him about regulated power supplies and active filters and he promised that he would send us an article on these subjects for QPM.

BRIAN 7RR has given up travelling to Launceston and is now residing here permanently.

QUITE a few new voices heard on channel 4, including 7ZEC, 7LZ, 7AX, 7MZ, 7WH, 7PS, 7ZRO and even VK3BBB (Brian) and 3ZXM (Max) on Mt. Tassia are coming through regularly.

NORTH-WESTERN ZONE NOTES

We trust that all members and friends enjoyed their Christmas celebrations and are on the threshold of a bright and prosperous New Year.

Good hamming to all.

No meeting in January so news is scarce.

I met Bob 7ZAA away in the bush the other day. I believe he came out loaded with gem stones.

Harold 7MZ is holidaying on the mainland, visiting harmonic I believe. We miss him on 2M.

As loss to the zone is 3NR who has left on the "Australian Trader" for an extended holiday. We will miss his cheery voice. I understand that Bill Dunn 3AJD will be replacing Noel. Can't say if he has 2M gear.

Ken 7KH has been on holiday at Green's Beach. He has been on 20 and 40 etc. Mobile and the rig really works.

Look out for Tony 7AM on repeater channel. He gets through CK from Ulverstone.

I need about 200 volunteers with picks and shovels to move the hill which is isolating me from the repeater.

Peter 7PF spent a week or two in our area and certainly left a few grateful chaps as a result of a few very useful jobs that he found time for.

A couple of Southern boys camped in our area recently and we enjoyed 2M contacts with them. Winston 7WH at Ulverstone and John 7ZJG at Devonport.

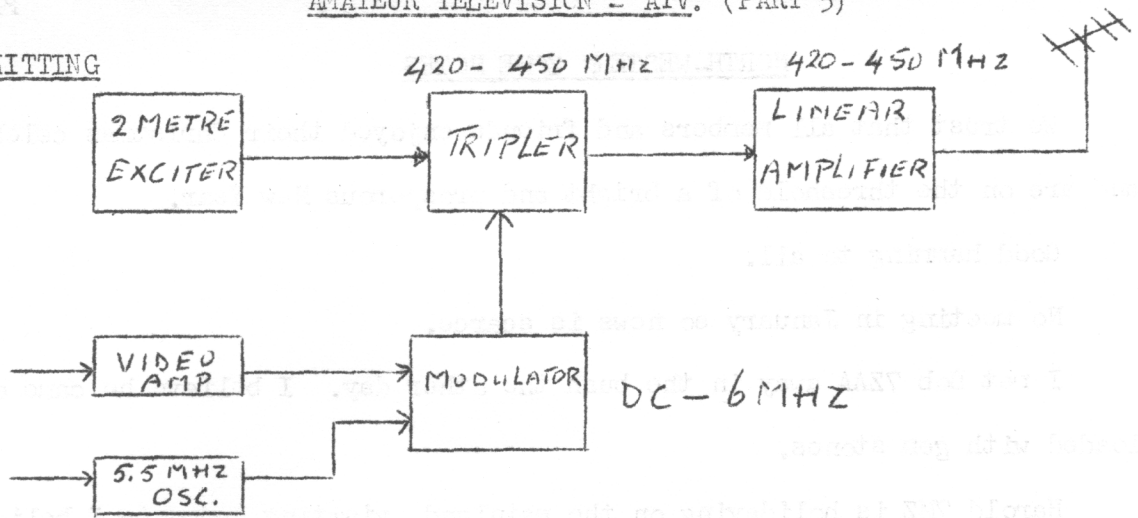
In December we enjoyed the cheery voice of Tom 7AL dashing round the place for a week. We are always pleased to welcome visitors to the area.

Those who were wise and fortunate enough to be at the Hamfest all agree that it was an excellent show. Great credit is due to the organisers with a particular thanks to the ladies - after a great deal of chat about it, we still can't figure how they did it. Thanks girls, from the N.W. Zone.

I hope to have some more news after the next meeting.

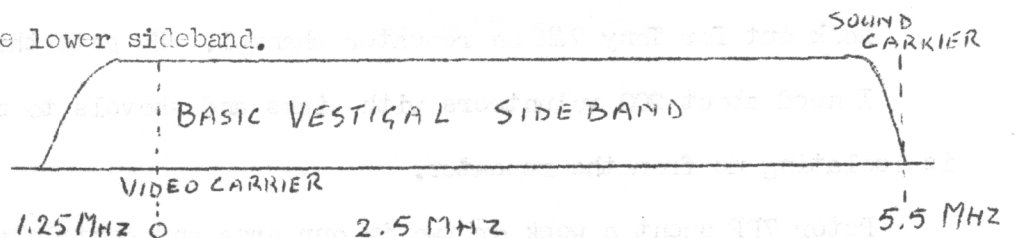
7MX.

TRANSMITTING



One may tend to consider a T.V. transmitter to be simply a wideband version of a sound transmitter. Unfortunately this is not quite as easy as first expected from reasons below:-

1. Normal video and sound transmission require two separate transmitters, the sound transmitter carrier being 5.5 MHz above the video transmitter carrier. The video transmitter is of the vestigial sideband type, i.e. the upper sideband plus a proportion of the lower sideband.



If we are intending to use the 420-450 MHz band, it becomes obvious that so long as we keep to the centre of the band, there is no reason why double sideband cannot be transmitted, thus saving the necessity of fancy vestigial sideband filters etc. The sound can simply be frequency modulated against a 5.5 MHz sub-carrier and mixed with the video in a modulator and finally applied to the transmitter. This idea does not require the use of a separate sound transmitter. Refer to block diagram at beginning. The A.T.V. converter and T.V. receiver can then be tuned to the upper sideband only.

2. The modulator needs special considerations with regard to the D.C. component especially the "black" level etc.

3. The widebandwidth required, means that the efficiency methods of modulation are out. Plate and screen modulation can, however, be used in the transmitter at one of the low level stages. This requires the use of a power valve as a cathode follower in the modulator. In the main, most transmitters use grid modulation.

AMATEUR TELEVISION - A.T.V. (contd.)

From the above it can be appreciated that the largest degradation of a Television signal within a television system, can easily occur through the transmitter, (bandwidth, phase distortion, and non linearity) being some of the main problems. It is thus essential to monitor the signal simultaneously before transmission (monitor) and after transmission, (normal T.V. with converter) to evaluate transmission quality.

A short article next month re "Aerials for A.T.V." will conclude this series of articles for the present. It is hoped to be able to list a few reference articles also.

TONY (VK7AX/T)

THOSE that participated in fox hunts in the days of A.M. can vouch for the fun those events produce.

At the hamfest it was illustrated that directional fox hunts are feasible, yet there was a disappointing roll-up for the hunt arranged for the 21st January. By comments heard, members want more activities to allow social contact; fox hunts appear an ideal way to combine this with some challenging activity. Surely there are plenty of members with channel B gear and the only other item required is a beam described in December QRM. Have a go next time it's no disgrace to get lost. You couldn't get into a bigger mess than Peter 7PF tangled up in the Glen Dhu Caravan Park at a late hour.

Your skill will improve with practice so let's see you at the next hunt.

REG. 7KK.

FOR SALE

1 ONLY VK3. 144 Mc CONVERTER WITH XTAL FOR 15Mc I.F. - \$15.00

1 ONLY VK3 432 Mc CONVERTER WITH XTAL FOR 6.3Mc. I.F. - \$23.00

1 ONLY VK3 52 Mc CONVERTER WITH DUAL GATE MOSFET PREAMP AND XTAL FOR 7Mc I.F. -

\$13.00

ALL IN WORKING ORDER FROM JOE GELSTON VK7ZGJ.

WANTED

5 6P7 CATHODE RAY TUBES WITH OR WITHOUT YOKES AND SHIELDS -

JOHN VAN STAVEREN VK7JV

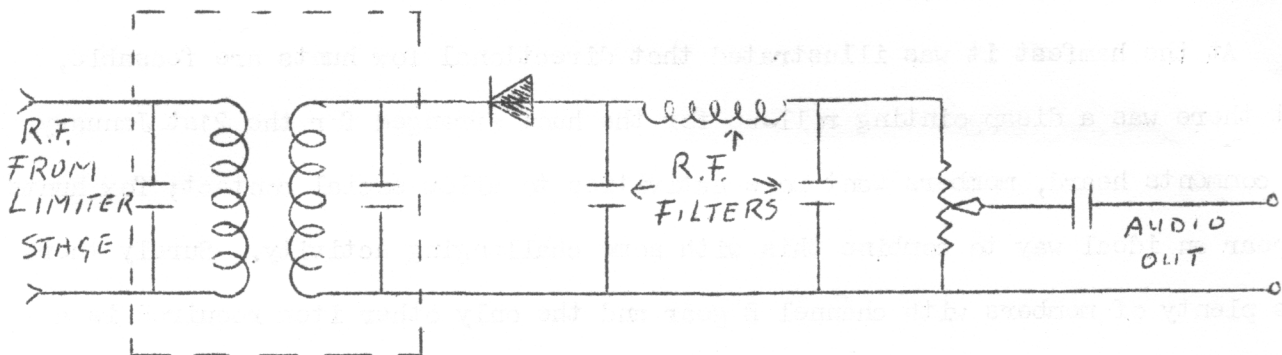
One of the simplest forms of f.m. detection is a system called slope detection. Slope detection involves the use of a simple A.M. detector, its theory of operation can be easily explained by a careful study of the diagrams below.

R.F. appearing across the secondary parallel resonant circuit is half wave rectified. Audio is derived from the R.F. component by the low pass filter.

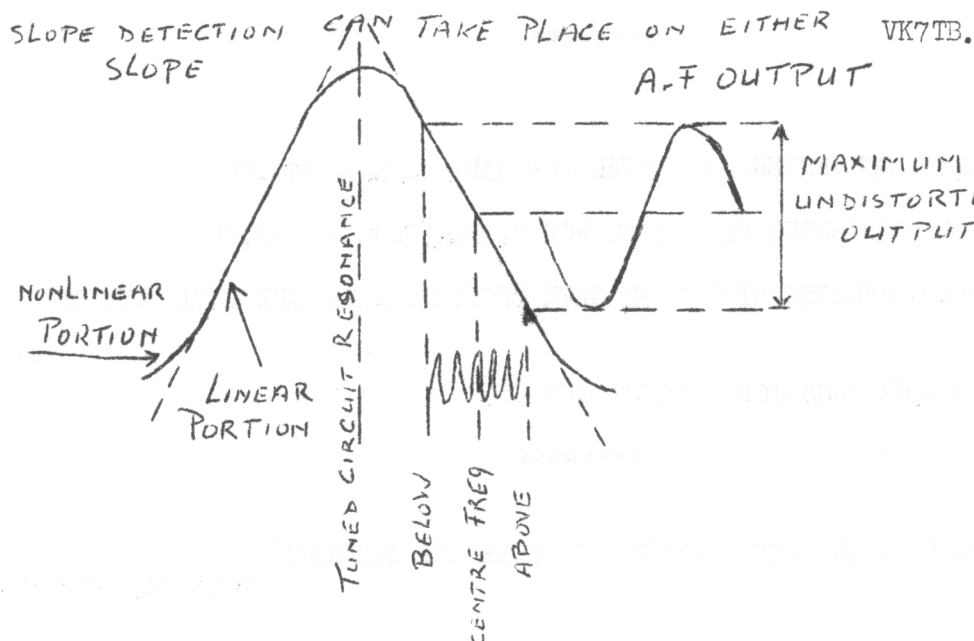
Most simplified circuits are subject to operating limitations, and the simple slope detector is no exception.

1. It is very necessary (as is with most f.m. demodulators) that sufficient limiting takes place in the limiting stages ahead of the detector; the detector must see a constant level regardless of signal level being received - reference to diagram.

2. It is important that the deviation of f.m. signal remains within the linear portions of the resonance curve, if not, a distorted a.f. output signal will result. The typical resonance curve seen by the detector, (see diagram) can handle only a small amount of signal due to the short length of the linear portion.



Next month more on f.m. demodulators.



(FULLY SOLID STATE)

The unit was developed so that a tape recorder could be switched off at a predetermined spot on the tape. Off the cuff the idea seemed quite a simple one, but after some further thought and some hours of experimenting it was found, that for a unit to operate successfully a minimum of 10 semiconductors were necessary.

Reasons -

1. The switch had to be a separate unit, with no interference or modification to the tape recorder.
2. It had to be 100% reliable and not to be triggered into the off state by spurious signals on the tape - (a time delay network).
3. Once triggered it must remain in that state until it is manually reset.
4. On principle it had to be fully solid state - (no relays). The circuit shown below is that of a practical working model; the parts used were those that were available at the time of construction.

Circuit Operation

An audio signal of 10.5 KHz is recorded on the tape at the desired switch off point - (of average level) and for a duration of about 10 seconds.

The tone signal is taken from the extension speaker socket, (or across the speaker at a load between 4 Ohm and 15 Ohm). The only important factor at this stage is that the level from the tape recorder be at least 0.04 v.p.p. On most tape recorders this level is often 10 times the above figure.

Q1 is a tuned collector grounded base amplifier. Why grounded base.

1. The input impedance is low.
2. It has a high voltage gain.
3. Its high output impedance can be connected directly across the parallel resonant circuit (10.5 KHz). L1 and L2 are coils wound in a pot core former. The LC ratio was selected to give a selectivity of about 3.0 KHz (for switch operation). L2 is an untuned secondary winding (voltage step up).

Q2 is a grounded emitter clipping limiter; by driving Q2 to saturation a constant voltage level will appear across its collector. The square wave information is rectified by a voltage doubler and turns Q3 hard on; the + voltage on Q3 collector falls to zero leaving Q4 in an unbiased condition. With Q4 at zero bias the potential of Q4 collector will rise to almost full supply voltage (9V). The C.R. network of 10K Ohm and 100MF presents a suitable delay of about 3.5 to 4 seconds before the unijunction transistor conducts. The unijunction will fire when its emitter is at 6 volts + with respect to the negative rail. When fired the unijunction will present a negative impedance across the capacitor "C", this will discharge the "C" very quickly and in so doing will cause base current to flow in the 27 Ohm and 470 Ohm resistors. This base current will be seen as very short duration pulses (positive going across the 27 Ohm). It was thought at this stage that these + going pulses (every 4 seconds approx) would trigger the bi-stable multivibrator directly; however due to the low impedance circuitry of the bi-stable (Q7, Q8) Q6 was needed as a trigger transistor.

What is a bistable multivibrator.

Briefly, it is an oscillator which has two stable states, and can be suitably triggered from one stable state to another. The important point here is that when it is triggered into the second state where Q8 conducts, it will remain in that state until it is reset by S.W.1. When Q8 conducts Q9 will be turned off which will turn on Q10. The collector of Q10 will be at earth potential, removing the firing voltage from the gate of the triac; zero current will flow in the load circuit - the unit will be switched off. It will remain in that state until the multi-vibrator is reset. You might ask why use Q9 and Q10, why not the output from the bistable to trigger the gate directly. Reason - the gate of a CD40 triac draws about 30 mA, this current would load the bistable too heavily.

