

WIRELESS

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MEETINGS

- August 6th North West Branch, Lakins Hall, Ulverstone.
- August 9th Northern Branch, AEB rooms, High st.
Lecture by Phill VK7SS
- August 10th Council meeting at the QTH of VK7PF, 2.00 p.m.

YRCS

August 10th and 24th room 38, Kings Meadows High School.

CONTESTS

- August 10th and 11th - Argentinian phone contest
- August 10th and 11th - European CW contest
- August 24th and 25th - all Asian CW contest
- August 17th and 18th - REMEMBRANCE DAY CONTEST

Northern Notes by Reg VK7KK

Is it the winter nights or aren't you getting what's wanted? Only 28 attended the July meeting and four of those were visitors! Hope that 7OA, 7AX, 7ZIE and Wayne Gibson enjoyed their visit to the meeting. Good to have Harvey 2ZYZ with us and it is hoped that this first visit will become a regular affair.

Joes' demonstration showed us how to tune an FM receiver with equipment that every good shack should have. Whilst there were many asides suggesting alternative methods, such as Norm's calibrated earhole to replace a \$600 CRO, I'm sure all gained something whether it be ideas or the basis for a later argument. Jokes aside, thanks Joe for your efforts- shows we have lecturer material in our midst.

You may have noticed a new activity at the last two meetings. Lindsay, 7ZLD, has undertaken to provide a raffle to give you the chance for a 'take away' and to help defray supper expenses. So far a cheese and a pair of HI FI phones have found a home. Having become the winner of the phones last meeting I can personally recommend Lindsay's efforts.

An extra last meeting was a windfall of cells dropped through the efforts of Brian, 7RR. Thanks Brian from all those whose torches, Kens and transistor radios received an extra boost.

Due to a member's suggestion we're now listed on the Northern Regional Library's register of clubs. They are also considering subscribing to 'Amateur Radio' magazine. As a result of discussions during their recent Early Radio Exhibition a suggestion for an Amateur Radio exhibition was made by the Library staff. Norm 7NR has offered to coordinate this activity and would, no doubt, appreciate offers of historical equipment, suitable photographs and old records. Despite this being a few months away your thoughts would be appreciated. Can YOU help?

A visitor for a weekend recently was Malcolm 3MW who spent a weekend in Launceston. Seems Malcolm was impressed with the activity noted on Channel 48. Advice has been received that Gordon Dawes, VK3ZLA, will be visiting Tasmania during the week August 12-16 and would welcome meeting locals whilst here(contact via Dr. Wood, Westbury).

You have a chance to keep up with the local electronics scene at our August meeting. The Furneau Group Radio Concentration System will be explained by Phil Thomson, 7SS. Seems this is a series of base stations and a subscribers' phone system searches until it finds an available base. Anyhow.... Phil has slides and plenty of know-how to tell you all about it. Noted Phil referred to as a "Southern*....." on a recent broadcast! Make Phil's retreat North worthwhile and find out what "professional communicators" are doing in our region.

Y.R.C.S. Activities

It has been decided to fill in off weeks of YRCS meetings by an activities day. The prime reason was to allow work on a club project but it was thought that it may be worth making it an open session. The following sorts of activities are envisaged;

1. Operating club HF and VHF equipment.
2. Group CW practise.

North West notes by Max VK7MX.

During the last few weeks I have had ample time to think a great deal about many things including ham radio. Being incapacitated for several weeks, to one who is active can be a great trial, but as usual radio has played its part. Instead of bemoaning my lot I have spent some pleasant time in the operating chair, chatting all and sundry and thankful that I had the brains to become a ham. One is never isolated, has plenty of friends and its hard to feel sorry for oneself with a QSO in progress. The moral is to keep the rig in good order so that it is ready for action at any time.

In early July a very severe solar flare took place, this made things very interesting, with blackouts in some areas and most unexpected signals from rare places.

Branch news is rather scarce but we had a most interesting meeting in early July. There wasn't much business, the main item being that the dinner idea was abandoned. Seems most people are too busy with various interests to afford a night for branch jollifications.

Following the meeting we were treated to a most interesting talk by Harry VK7AR, on the change and progress in commercial mobile units over the years. This was ably demonstrated by a host of units from vintage to modern which Harry had amassed. Very interesting particularly to the VHF boys.

Thanks Harry and we look forward to the next one.

We were pleased to welcome Cliff VK7CD once again.

Our worthy councillor Graham has had a spell in hospital, something in the nature of a impedance mismatch but last report he is coming good.

Tony has been fraternising with the king of beast or some such so we have missed him on a couple of occasions. He is in Hobart at present, training course we believe.

Peter VK7PF is having a rugged time at the local salt mine and can be heard dashing about between Devonport and Wynyard even at weekends.

Charly VK7CF has been heard from Burnie on 2m on several occasions. So 7ZJS now has a local contact.

I will finish on a few suggestions-

How to Handle a Woman ELECTRICALLY.

If she is wrong - rectifier.

If her hand is cold - heater.

If she wants a vacation - transmitter.

If she talks too much - interrupter.

If she is narrow - amplifier.

If her views do not coincide - corrector.

If she flirts - eliminator.

If she wants a date - meter.

If she wants to call - receiver.

If she wants an escort - conductor.

If she wants to be an angel - transformer.

If she proves your fears are wrong - compensator.

If you think she is going out with others - detector.

And if none of these work, brother you're short circuited.

CUL Max 7MX



LADIES PAGE

Time sure flies by, its almost R.D. contest time again and boy I know what I'm in for.

John usually operates for the full 24 hours and every half hour or so there's a call from the shack "coffee" or "how about something to eat" and then when I do take something in to him I get nothing but "sshhhh" or "don't speak I am having a contact", talk about annoying!

But thats nothing compared with his constructing new pieces of equipment, as the hamshack is already overflowing, he usually brings his bits and pieces into the dining-room which means we eat our dinner in the lounge off our lap.

QRM is another problem, when the table is cleared of bits and pieces it is QRM time again and the mess of papers, pens and typewriter remains there for 2 weeks or more!

Well at least the kitchen is mine, that is untill he brings his photographic equipment out.

But I'm proud of his hobbies and wouldn't like it any other way! or would I?

73 Joy Mrs.VK7JV

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Spiced cookies

- 1 lb flour
- $\frac{1}{2}$ lb butter
- $\frac{1}{2}$ lb soft brown sugar
- 1 tablespoon milk
- 1 tablespoon cinnamon
- 4 teaspoons baking powder
- 1 teaspoon salt
- 1 teaspoon ground cloves
- 1 teaspoon nutmeg
- $\frac{1}{2}$ teaspoon pepper
- $\frac{1}{2}$ teaspoon anise powder
- blanched almonds if required

Cream butter and sugar, add spices, then mix in flour and milk. After working dough into a plyable ball, roll out very thin and cut into shapes.

Half almonds may be pressed into top of each biscuit.

Bake at 425° for 7 minutes then at 325° for 25 minutes.

Joy Mrs. VK7JV

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DX notes by Den VK7DK

Well, as all you avid DXers will know, the DX has not been too available over the last month, and the pickings have indeed been slim.

The W stations are the only ones that have been coming through with any consistency, particularly the West coast. They have been coming through from 0200Z till almost 0800Z, and at strengths up to S9+. Even on 40 metres the W's have been quite good.

The openings to Europe have been quite poor, with the I's being the more prominent.

The central American countries have been coming in very well on occasions, around 0400Z with sigs up to S9 plus. A few of the Carribean countries heard at good strength around the same time.

40 metres does still warrant close attention, as you never know when a DX station may appear. I was idly tuning 40 at 0650Z one day when I lobbed on to a S8/9 signal and found it to be 5W1AU, Phill. We had a yarn and he wished me to let all and sundry know that he is on 20 most nights 04/0600Z and on 40 (7095) about 0700Z, QSL via W6KNH or via the bureau. I will add here that HE IS the bureau over there.

80 metres has an occasional surprise, such as ZK1CL one night. ZK1 is not that far away, but we dont hear many of them, even on 20.

Night time is all but a dead loss on 20, but one sleepless night I wandered in the shack and was surprised to hear some weak W's at 1500Z. One way skip was very evident as I was getting them no better than S6 yet the return reports were S9. I dont know, but it may be a case of elastic 3 meters some of the W's appear to have, Hi.

The Following times and stations may be of some help, but of course the band conditions change from day to day.

40	07/0800Z	W's, 5W1, JA's, K5622.
	10/1400Z	W's, UK0, JA and V56.
20	00/0200Z	ON5, HK, TI2, EA6, PJ, I's, DL, EA1, GW4, YV, G4, SM.
	02/0400	W's, 5D2, V5.
	04/0600	W's, VE, (West Coast), OA4.
	06/0800	W's, VE, VA(prefix), AE, I, YJ8, FC.
	23/2400	ON, DL, UY5, OK1, UC2, EA2.
		(short path has not been very reliable)

Any contributions to these notes would be very welcome as there must be a lot I miss.

73 Den

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VHF Notes by Joe VK7GJ

Mid winter openings on 6 metres provided plenty of activity although this month Kerry VK5BU is the only station worked via the usual mode, sporadic E.

From 20/7/74 to 17/8/74 Amateur Communications Advancements, publishers of "6UP" are running a VHF state of the art contest. for details see page 22, July A.R.

For those interested I am maintaining skeds at 0600 (local) on 52.1 Mhz every morning with VK2ZJF, it usually takes 15 minutes to complete a contact, also VK2ZXF has been worked.

cont. page 13

A.T.V. Cameraby VK2ZPM/T, compiled by VK7ZFR

Well for ease of conscience here is an article that is at least topical. It appears that "A.R." will also produce this Camera (probably in more detail) but at least this beats them to the Press. Although not written by the constructor, circuits are as supplied from him, layouts as I interpret them and I will attempt to construct the unit as I proceed.

I am told that the camera has resolution to Commercial standards but it does not have the facility to operate in simple closed circuit as it requires external Vertical and Horizontal drive at 2;1 interlace and also an external processing amplifier to give composite video. So if you are like me you'll be tidying up that S.P.G. (still half built) or getting on with a unit to give the necessary pulses. An article on the Processing Amp. will follow that on the camera also, if not previously published by 'AR' one on a grey scale generator. All circuits supplied by 2ZPM/T. So, if YOU want to help, I have the circuits, you prepare the article and QRM will print it.

The camera is driven from a dual supply having +, - 12 volt and + HT for the tube, a 7038 or equivalent integral mesh tube and planned around yokes that were purchased from a Japanese supply around two years ago. Some ended up in VK7 but I believe there are no more left at present. Increase demand could cause a supply. Bob 7RF could be approached and bled a little for details of winding your own. Perhaps, Bob, an article for QRM.

As stated earlier, the camera is a driven unit needing Vertical drive to the vertical board for Vertical deflection and Horizontal drive to the horizontal board. Outputs from both of these are fed to a Vidicon Protection circuit on the Vertical board which blocks the Vidicon with loss of either or both drive so protecting the Vidicon target. The horizontal board also has the focus circuit which is an electronic current regulator. The head amp is on a separate board.

Personal preference is to keep these boards as separate as possible to allow for modifications without upsetting the rest of the camera.

Books worth reading;

CQ TV all issues
VHF Communication Dec 1972, June 1973
Amateur Radio 1952, 1958

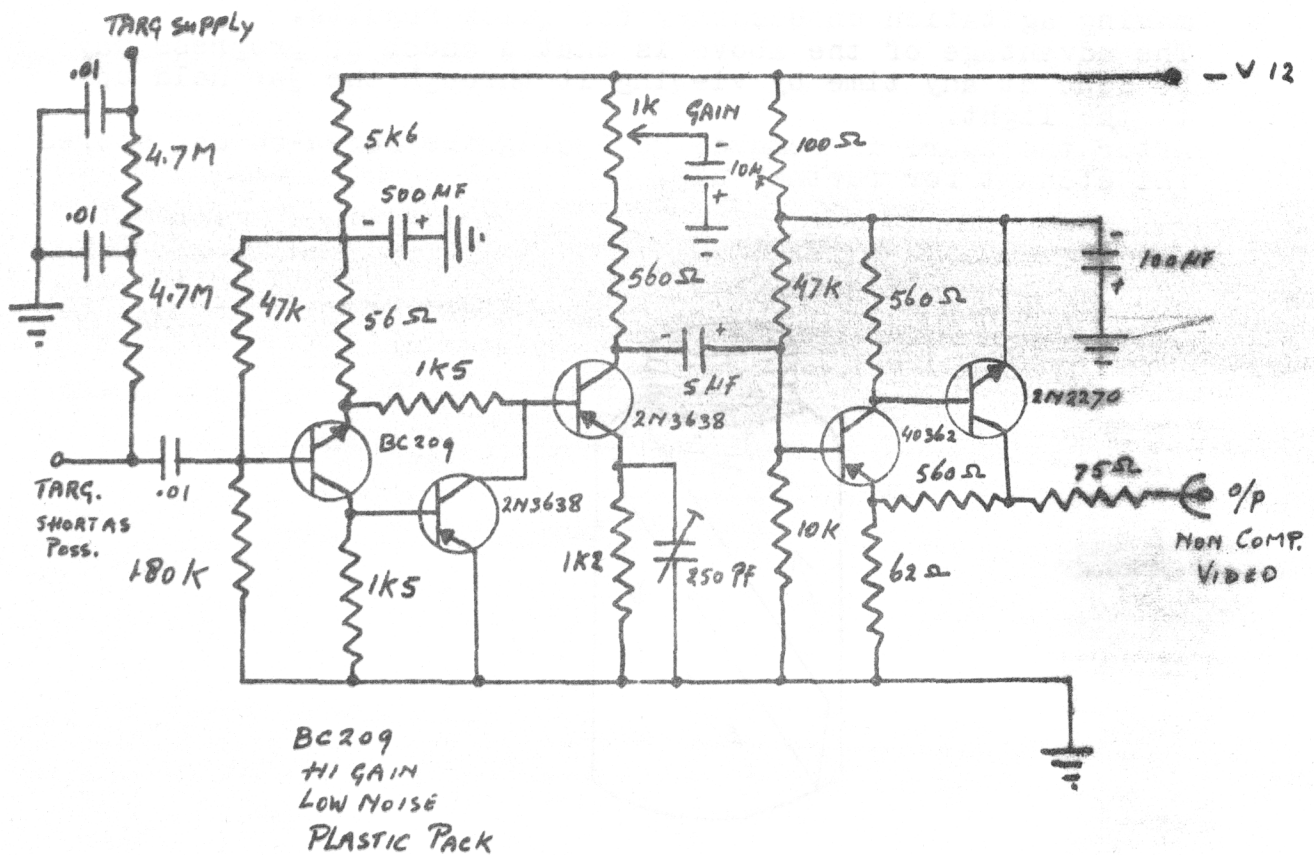
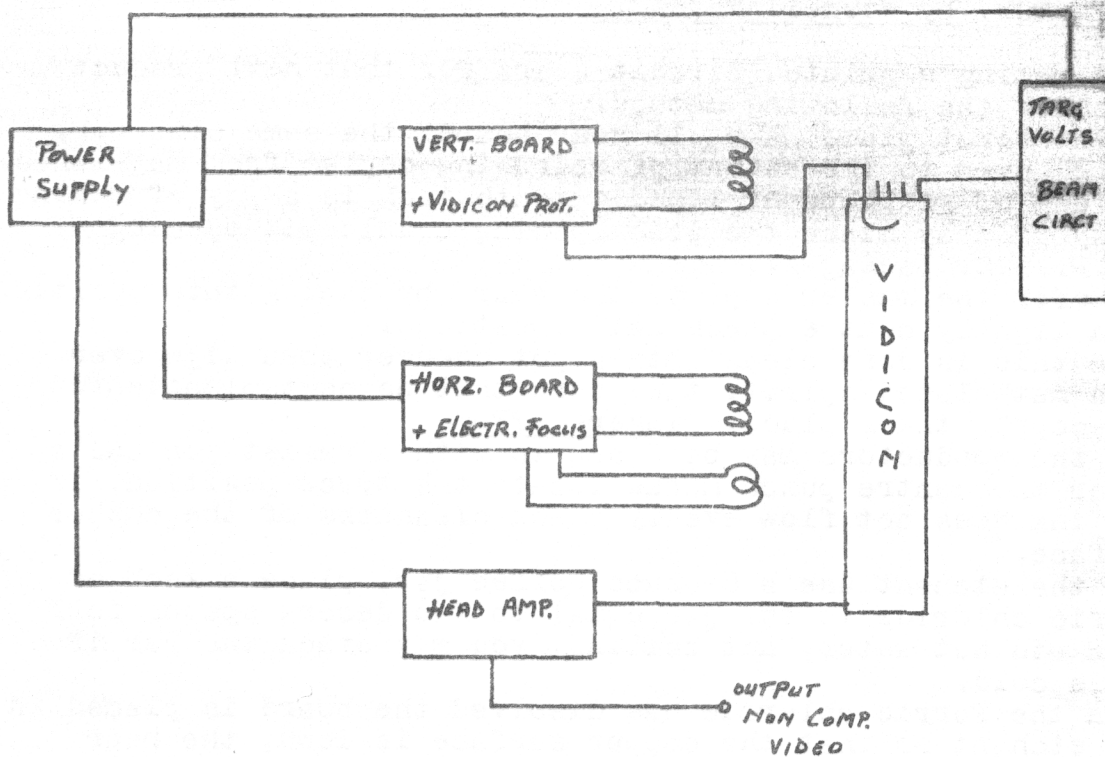
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Cont. from Page 2

3. Work on individual projects.

4. Use of test gear available (CRO, sig gen, multi-meters, simple Oscillators, Counters, GDO etc)

Even if you're not a YRCS type and any of the above fills your needs drop in at Kings Meadows High School (Room 38, block B) on the first and third saturdays of each month.



Next month, Horizontal and vertical circuits.

EASY ETCH. by Russell VK7ZAC.

When making a printed circuit board for that next project consider the following method.

In the first place make all your boards the same size e.g. 5"x 2" even to the extent of redrawing copies from magazines. The use of graph paper lined 1 tenth inch is a way of making a layout easy since the line spacing equals pin spacing of D.I.P. I.C. packages.

Transfer the master copy to the board by taping into position then lightly centre punch hole locations.

When this is done clean with a pot scourer then wipe over with metholated spirit, take care that no contamination of the copper takes place. Fingers OFF.

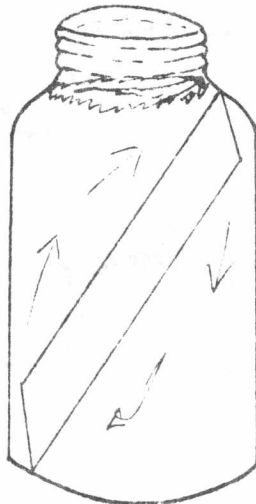
Now the conductors may be drawn in with a resist pen and a ruler the centre punch marks locate the track position, if the ink does not flow evenly check cleanness of the copper surface.

For the etchant use a 6 ounce coffee jar, place a knob of ferric chloride in the jar equal to two desert spoons full then add hot water, not boiling, you may crack the jar if it is cold.

When the ferric chloride has dissolved the board is placed in the etchant so that the copper surface is down, the near vertical position encourages the circulation of etchant, making agitation unnecessary for quick results.

The advantage of the above is that a check of progress may be done at any time by viewing it through the jar held up to the light.

After the board is removed replacing the screw-on cap stores the etchant for further use.



Etch resist pens for your circuit boards are still available from the Northern Branch Equipment store, we also have a few LM723 IC's as used in the regulated power supply described in July A.R.

Reprinted from, AMSAT newsletter July 1974.

Getting on Oscar 7: 432Mhz equipment suggestions and bibliography.
by Joe Reymann, W6PAJ

The imminent launch of AMSAT-OSCAR-B (to be known as AMSAT-OSCAR 7 once in orbit), with its 432 to 144 Mhz translator, has created a surge of interest in transmitting equipment for the 432 Mhz band. For those who prefer not to design from scratch, or who lack the time to do it right, this article will serve as a reference source for enough equipment of various types to be able to assemble a 432 Mhz transmit capability.

CW Transmitters

Keep in mind that the preferred modes on Oscar 7, as on Oscar 6, are cw and ssb. The lower duty cycle of these modes provides more efficient utilization of the limited spacecraft rf power than does fm, am, rtty (fsk or afsk), and sstv although all such modes have been used through Oscar 6.

CW will probably be the most popular (at least in terms of number of users!). There are two inexpensive and "easy" methods of generating stable 432Mhz cw power: Modifications of commercial 450 Mhz equipment, and building or buying a varactor-tripler from 144 Mhz.

Readily available on the commercial surplus market are several varieties of 450 Mhz fm transmitter strips, at \$10 and up. The author has had experience with the Motorola units (from T44 and J44 etc stations), which put out about 15-18 watts at 450 Mhz. Follow the simple conversion instructions in the popular FM Schematic Digest for Motorola units and then disable the modulator and provide a method for keying as in the September, 1971 QST article. Schematic information is also available for GE units. Almost every area of sizable ham population has someone up on the latest availability and conversion of commercial gear. A few minutes with him will answer many questions. Some commercial power amplifiers are also available; see that section below.

The varactor multiplier has a lot going for it. It is relatively easy to build and needs no power supply. Its overall efficiency is decent. Operating at medium power levels (20-40 watts input), it does generate some strong 'auxillary' signals wich need to be suppressed. However, considering the cost and speed of construction, it will be a favorite for hams new to 432 Mhz. Several circuits have been described in ham literature, both doublers and triplers. The tripler circuits should be more popular since 144 Mhz transmitters are more numerous than 216 Mhz ones. Commercially built units are also available.

SSB

A single sideband (or all mode) transmitter can be made relatively inexpensively. Anyone with 28, 50, or 144 Mhz cw-ssb equipment can generate 432 Mhz cw/ssb with any of several transverters described. The author has one of the neat little 28-432 Mhz units described in VHF Communications. It is solid state, works on 12 volt d.c. and works at low signal levels. This last is a matter of choice, but the author prefers to generate a low-level signal on frequency and follow that with linear signal amplification. Generating high-level signals has an apparent advantage of needing fewer stages, but the unwanted products are harder to filter out.

Anyway, the VHF Communications unit costs less than \$35 for the basic components kit and is available through Bob Eide at the address shown. It puts out 150-250 mw depending on 'B+' voltage on the final transistor amplifier, but the disadvantages of this are outweighed by the opportunity of being in the technical forefront with a 432 Mhz ssb signal.

There are transverter circuits operating from 10, 6, and 2 meters. At least one unit is available commercially made, in addition to the VHF Communications unit just mentioned. Braun in West Germany, which used to have representation in the U.S., has a unit advertised in foreign VHF publications. The transverter in general is more complex to build than the varactor multiplier, but has the advantage that it is not mode limited. The transverter, operating on the heterodyne principle rather than multiplication, can be used on any mode the exciter can generate. It is therefore the better long term solution to getting on 432 Mhz.

Power Amplifiers

AMSAT estimates that 300-400 watts erp (effective radiated power = rf power delivered to the antenna multiplied by antenna gain) will be needed to work through the 432-144 Mhz translator. I imagine that the AMSAT nets will have more information on this as launch time approaches.

Most users therefore will consider a power amplifier. Remember that the best and cheapest power amplifier will probably be a better antenna, but more on that later.

A good starting point for 432 power amplifiers is the June 1971 article in Ham Radio magazine. From there the bibliography lists several circuits of varying complexity and outputs. For those not familiar with vhf circuit construction, the best advice is do your homework in the VHF Manuals, select one of the less complex circuits and proceed with care. Nothing is particularly difficult, but vhf construction practices are somewhat different.

A neat solid state three stage amplifier has just been described in the Spring 1974 issue of VHF Communications magazine. Operating on 12v d.c. it is a natural companion for the transistorised transverter mentioned above.

A great source of power amplifiers is the Motorola T44 (or J44 etc.) unit mentioned earlier. The largest part (for me) of a 432 power amplifier is the plumbing or metal work. Commercial 450 Mhz fm units have that already done for you. A major benefit of the Motorola T-110 or TU-204 series transmitters (used in the -44 series) is the ease of removal. Take out twelve screws, clip half a dozen or so wires, and you have a ready to tune two stage 2C39 amplifier (actually a 150-450 Mhz tripler and a 450 Mhz power amplifier). Both tune down to the 432 Mhz region. Together with the VHF communications solid state up-converter from 10 meters, you'll have a pretty easy job of generating 432 ssb at a reasonable power level (10-40 watts depending on power supply voltages). With a decent antenna and little line loss, that should be enough to get through Oscar 7, or this setup makes a great exciter for a higher power amplifier. By the way if you do get your 2C39 power amplifier this way, save the rest of the chassis. It is a complete 2m fm transmitter ending in a 2E26 or 6146 with little or no conversion needed.

Motorola and others make several pieces of 450 Mhz commercial band equipment which operate at power output levels of 50-250 watts. While conversion information is not readily available on a step-by step basis, the circuits are not nearly as complex as the exciter circuitry, so conversion should be much easier. Many will tune to 432 Mhz as is. A limiting factor for many will be availability of schematic diagrams, but most power amplifier conversions don't really require access to schematics. Remember the local help available in many places from the ham fm fraternity, or local hams involved in servicing commercial equipment.

Antennae

As we said earlier, a good antenna is probably the cheapest way of obtaining gain. Let's digress just a bit to amplify our earlier statements on erp, for those not familiar with its application in ham circles. Your effective radiated power is the power input of your transmitter with losses considered; amplifier efficiency (100 watts input might give 65 watts out) and tank losses, loss in the coax cable (your transmission line might eat up 75% of your 432 energy!), multiplied by antenna gain. Antenna gain must be a pure number, not in dB. A 10 dB gain just happens to be a real gain of 10 times, but other dB numbers require some interpretation. A gain of 13 dB is a multiplier of 20, a gain of 6 dB is a multiplier of 4, and so on.

Antennae for the 432 Mhz band are very easy and inexpensive to make. A few hours with a hand drill, hacksaw and file will result in an 11 element beam described in the ARRL VHF Manual (2nd edition). With a little extra effort, a nice crossed yagi can be made by doing everything twice. Materials necessary; one piece of 1" by 1" timber, a few aluminum or brass welding or brazing rods, a u-bolt for mounting, and coax connector and coax for the feed.

In choosing your antenna, remember that a power gain of 10 dB is easier and faster to obtain by switching from an omni-directional antenna to a yagi. Even a gain of 13-16 dB is obtained at 432 Mhz in a very small antenna. Of course you also gain the necessity of tracking the satellite by antenna rotation every few minutes, which is unnecessary with an omni-directional antenna. But even vertical omni-directional antennae have a cone of silence upward from the end, resulting in some periods of unusability on near overhead passes.

For antenna tune-up, build a cheap but effective reflected power meter. I have build both the one in the ARRL VHF Manual and the one from Ham Radio magazine. Both are easy and effective, but the HR unit is a breeze to assemble from the kit and is almost foolproof.

Azimuth-Elevation Mounts

Choosing a directional antenna implies that you are going to rotate it to point in the general direction of the satellite. The ordinary rotator is designed to point the antenna in azimuth, or horizontal direction. That approach is usable for satellite work, but the more gain your antenna has the narrower is its pattern. While most amateur antenna systems will have a pattern of at least 45° this is narrow enough to limit your signal into the satellite on orbits whose track is closer than 500 miles from your location. It helps to mount your beam on the rotator so that it points about 15-20 degrees above the horizon.

Whatever rotators you choose, pick one with set and forget controls rather than the hold down the bar type. Watching an azimuth or elevation indicator is not for the satellite tracker. I use two alliance rotators, a U-225 for azimuth and a U-100 for elevation. The less expensive U-100 can be used for both functions. Make sure you pick an elevation rotator of the type where the boom goes entirely through the rotor.

In the bibliography which follows, some units are described in several different places: for example, in the Handbook and the VHF Manual. The plurality of references is given to facilitate location by hams who might not have access to a particular publication.

Amplifiers:

FM and Repeaters, ARRL p.69
Ham Radio Magazine, Sept. 1968, p.6
Ham Radio Magazine, Apr. 1970, p.40
Ham Radio Magazine, June 1971, p.6
QST, April 1972, p.49 and May 1972, p.59
QST, Oct. 1972, p.31
Radio Amateurs Handbook (ARRL), 1970 or 1971, p.453
1973 or 1974, p.226, 232
RSGB VHF Manual, p.6-50, 6-54, 6-58
VHF Communications Magazine, Nov. 1970, p.236
Aug. 1972, p.144
Spring 1974, p.30

QST, Jan. 1972, p.36 and March 1972, p.101
QST, Jan. 1973, p.21
Radio Amateurs VHF Manual (ARRL), 2nd Ed. p.220
3rd Ed. p.211

CQ, Dec. 1970, p.42
 QST, May 1973, p.62
 QST, June 1973, p.11

Alliance Manufacturing Company, Alliance, Ohio (rotors)
CushCraft, 621 Hayward st., Manchester, New Hampshire 03103
(antennas)

Carmichael Communications, P.O. Box 256, Carmichael, Calif. 95608
(transverters)

J-Beam antennas, C/o VHF Communications Magazine

Karl Braun, Bauvereinstrasse 40, 3500 Nurnberg, West Germany.
(varactor triplers and transverters)

Spectrum International, Box 1004, Concord, Mass. 01742 (multipliers)

Commercial Surplus:

FM Schematic Digest (Motorola), \$6.50 to S. Wolf, P.O. Box 535
Lexington, Mass. 02173 (see description QST, Jan. 1971)

QST, Sept. 1971, p.39

QST, Dec. 1972, p.28 and Feb. 1973, p.36

Test Equipment:

Ham Radio Magazine, Dec. 1972, p.22

QST, April 1972, p.21

VHF Manual (ARRL) 2nd Ed. p.282

3rd Ed. p.317

ARRL Handbook, 1973 or 1974, p.636

Transmitters:

RSGB VHF-UHF Manual, p.6-79

Transverters:

Ham Radio Jan. 1970, p.48 and June 1970, p.79

Ham Radio June 1971, p.6

QST, Nov. 1973, p.47 and March 1974, p.83

VHF Manual ARRL, 2nd Ed. p.246

3rd Ed. p.290

VHF Communications, May 1971, p.39

Varactor Multipliers:

FM and Repeaters (ARRL) p.68

Ham Radio, Oct. 1969, p.38

Radio Amateurs Handbook (ARRL) 1970, p.444; 1971, p.443
1973 and 1974, p.217

VHF Manual (ARRL) 2nd Ed., p.243

3rd Ed., p.288, 289

RSGB VHF-UHF Manual, p.6-16

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VHF notes by Joe VK7ZGJ

If you require further information give me a ring on 443862 or
a call on Ch.48.

Two metres has been very quiet with no inversion around this
time of the year, so this is a good opportunity to check out
your equipment for the R.D. contest.

Till next month

73 Joe VK7ZGJ

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