OFFICIAL NEWSLETTER FOR THE WEST AUSTRALIAN VHF GROUP(INC)
P.O. BOX 189, APPLECROSS WA 6153.

MEETINGS ON THE FOURTH MONDAY OF EACH MONTH AT WIRELESS HILL
TELECOMMUNICATIONS MUSEUM, ALMONDBURY RD, ARDROSS

VK6WH VK6WH

PATRON MR. F.W. DAWSON

PRESIDENT	BOB BLINCO	VK6KRC H277 7049	SECRETARY	BOB PINE	VK6ZFY	H 339 3273
VICE PRES	PETER TAIT	VK6ZPT	TREASURER	BERT MEUWISSEN	VK6ME	H 457 3892
COUNCILLOR	TERRY LEITCH	VK6ZLT H332 7008	BULLETIN ED.	JACK BORTHEN	VK6KDX	H 447 5933
COUNCILLOR	BRUCE DOUGLAS	VK6BMD	MUSEUM REP.	BOB PINE	VK6ZFY	
COUNCILLOR	COLIN MURRAY	VK6ZCR	MUSEUM REP.	TOM BERG	VK6ZAF	
ACTIVITIES	TERRY LEITCH	VK6ZLT	PUBLICITY	PHIL MALEY	VK6AD	
MATERIALS	COLIN MURRAY	VK6ZCR	LIBRARIAN	ILMAR BELTS	VK6AIB	

CALENDAR

JULY	20	COMMITTEE MEETING	SEPT	21	COMMITTEE MEETING
	25	FOXHUNT		26	FOXHUNT
	27	GENERAL MEETING		28	GENERAL MEETING
AUGUST	17	COMMITTEE MEETING	OCT	19	COMMITTEE MEETING
	22	FOXHUNT		24	FOXHUNT
	24	GENERAL MEETING		26	GENERAL MEETING

JULY 92

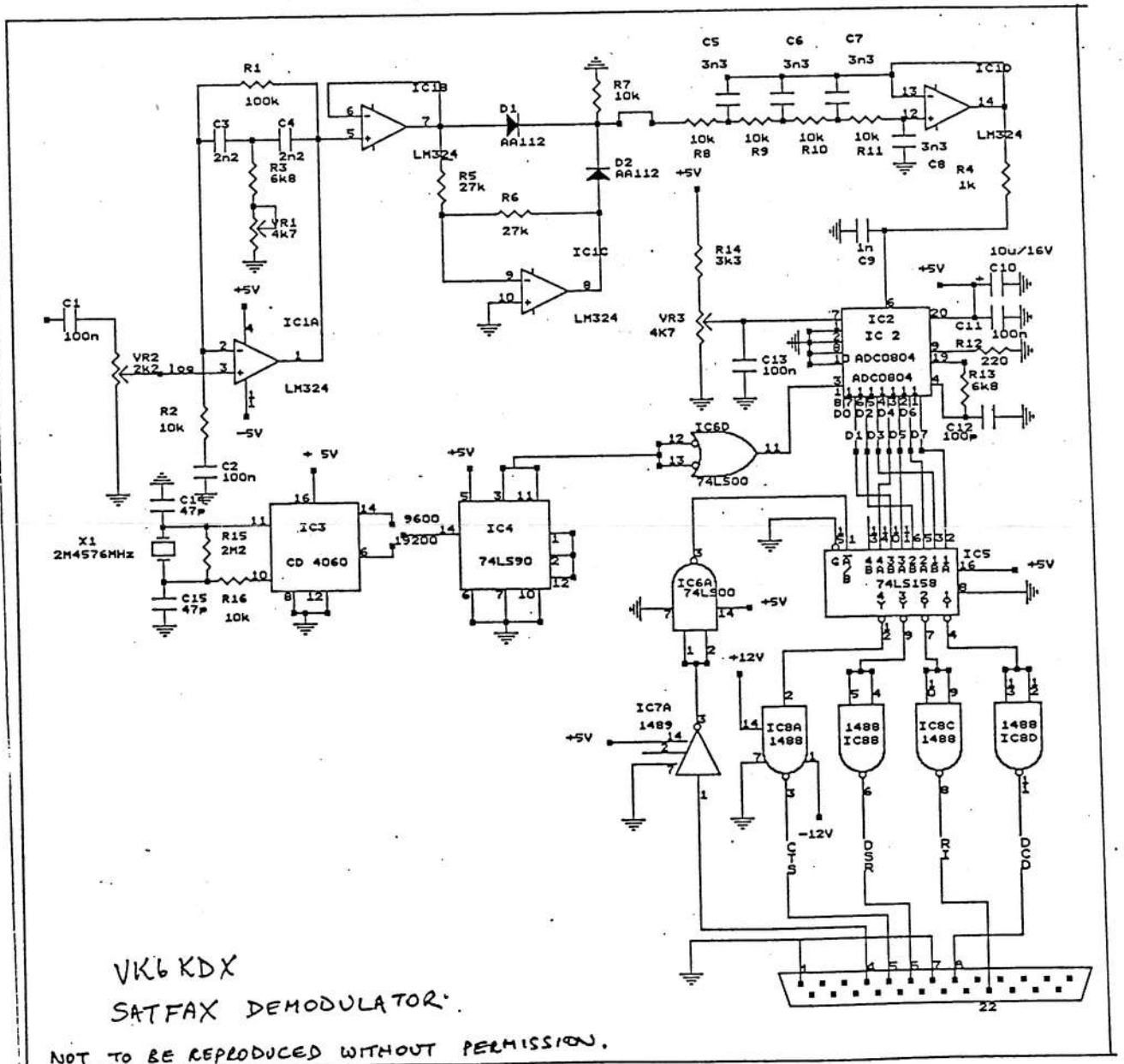
Subscriptions are now due

Your prompt payment will assist the Group.

Thank You

Parts List

1	1	IC1	LM324	15	1	R15	2M2
2	1	R1	100k	16	2	C3,C4	2n2
3	2	R3,R13	6k8	17	1	X1	2M4576MHz
4	1	VR2	2k2 log	18	1	IC2	ADC0804
5	2	R5,R6	27k	19	1	IC3	CD 4060
6	7	R7,R2,R8,R9,R10,R11,R16,10k		20	1	IC4	74LS90
7	2	D1,D2	AA112	21	1	IC6	74LS00
8	4	C5,C6,C7,C8	3n3	22	1	IC7	1489
9	1	C9	1n	23	1	IC5	74LS158
10	1	C10	10u/16V	24	1	VR3	4K7
11	4	C11,C1,C2,C13	100n	25	1	R4	1k
12	1	R12	220	26	1	IC8	1488
13	1	C12	100p	27	1	VR1	4k7
14	1	R14	3k3	28	2	C14,C15	47p



VK6 KDX

SATFAX DEMODULATOR.

SATFAX DEMODULATOR

I decided some months ago to document a SATFAX demodulator which I built several years ago. Little did I know that just about every AR publication would do the same. However in all modesty I have yet to see a better performer than this one, which truth is a conglomeration of a number of ideas from other demodulators. .

Before getting down to details I would like to point out that he circuit was produced after the demodulator was constructed and hopefully when you build yours it will perform as well as mine. I built mine using a Tandy board of about 4 x 4 inches and tenth inch grid of holes. I used wirewrap construction which allows considerable scope for changes. All the components were purchased from World Wide Electronics.(Support the local good guys).

I used good quality capacitors (little yellow square ones) and multiturn pots for ease of adjustment. Now to the circuit description, which due the time that has passed and my general technical incompetence, may not satisfy the purists. Mind you it would be nice if some these purists would build something and send me an article to print. If you start at the input, C1, the first three op amps make up a bandpass filter . Then there is a jumper shown which was to allow the insertion of some circuitry for a FM demodulator but I have not found a need for this. Following this another filter circuit the function of which I have long forgotten and would appreciate some enlightenment. Following this, is the A/D chip which converts the varying voltage to a digital signal.

To the left is some self evident clock circuitry for clocking the A/D chip at the correct speed for the FAX 4.0 software which is available on the VK6ZMH bulletin board. The output from the A/D chip is a parallel 8 bit number representing the gray scale of the input signal. Because the software uses the RS 232 port on the IBM compatible PC, which has only four inputs, it is necessary to be clever to get the 7 bit (64 grayscale) signal into the PC. To do this the program uses a 74LS158 as a multiplexor and controls it through pin 4 of the RS 232 interface. The 1488 and 1489 chips are RS 232 driver interface chips. This as I warned earlier is a far from rigorous explanation of the operation of this device. However it should be enough to help you understand the principles of operation.

I recently purchased a copy of SATFAX 5.0 from M R Delahunty in VK4 which has the option of the parallel input of data. Using an I/O board plugged into my AT I was able to use the seven outputs taken direct from A/D chip to drive the SATFAX program. This is the advantage of using wirewrap.

Tuning the demodulator (or whatever you call getting it to work) requires some patience unless you are fortunate enough to have a good audio oscillator. I also built a LED display which connects to the output of the A/D chip to help tuning. It is simply a red LED for each output which flicker indicating the state of the output. Vr2 controls the audio level (which incidentally is taken from the speaker output and offers scope for better matching)and VR1 controls the bandpass characteristics of the filter. In theory IC1b should output a range of 0 to 5 volts for the input frequencies of ,say, 800 to 3000 hertz. Then the A/D chip can do its job. However because this is not easily achieved VR3 controls a reference voltage with which you can adjust the output gray scale. Read up your theory on A/D convertors if you don't understand. When you get it working don't fiddle with it. You can make adjustments to the picture quality using the volume control.

I should have mentioned earlier that this works with an IBM compatible PC. I have used it on an XT and an AT. The program indicates it will work on a 386 as well. However be warned the documentation for FAX 4.0 is in German.

You may contact me if you are having problems and I will do my best. All I ask is that you give it a fair go first and dont expect me to build it for you. Finally I reserve all rights to the design and it may not be published without my prior consent.

73 VK6KDX

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM N3FKV HEWITT, TX July 4, 1992 BID:$ORBS-186.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83 58 B 92173.76516272 -.00000017 00000-0 99998-4 0 8760
2 14129 26.4523 77.1364 6035873 354.3377 1.2126 2.05882475 67582
UO-11
1 14781U 84 21 B 92179.09851449 .00000464 00000-0 83825-4 0 2878

2 14781 97.8481 214.5216 0013199 52.6531 307.5874
14.68593323444590
NOAA-9
1 15427U 84123 A 92182.97344179 .00028734 00000-0
15220-1 0 1226
2 15427 99.1412 210.2700 0016113 79.0563 281.2472
14.13423810389161
MIR
1 16609U 86 17 A 92182.83839957 .00008766 00000-0
12975-3 0 3963
2 16609 51.5960 178.4184 0016708 228.8671 131.0956
15.56007606364407
NOAA-10
1 16969U 86 73 A 92182.99969446 .00037526 00000-0
16035-1 0 9701
2 16969 98.5348 202.1106 0012048 257.8917 102.0945
14.24698849300623
RS-10/11
1 18129U 87 54 A 92182.87010734 .00000175 00000-0
18085-3 0 2606
2 18129 82.9261 138.2738 0010651 207.3073 152.7480
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AO-13
1 19216U 88 51 B 92151.59699100 .00000000 00000-0
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2 18820 82.5439 118.8219 0018299 37.6973 322.5465
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1 19336U 88 64 A 92181.82973956 .00000028 00000-0
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2 19336 82.5426 111.2927 0016097 258.3902 101.5437
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NOAA-11
1 19531U 88 89 A 92182.11914547 .00000024 00000-0
23195-4 0 8603
2 19531 99.0810 145.9449 0011922 353.7693 6.3334
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MET-2/18
1 19851U 89 18 A 92180.49316214 .00000058 00000-0
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2 19851 82.5185 356.8796 0015786 81.9916 278.3035
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MET-3/3
1 20305U 89 86 A 92180.66436144 .00000043 00000-0
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2 20305 82.5529 54.2826 0015289 280.2354 79.7067
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2 20437 98.6384 264.4733 0011336 130.8670 229.3496
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AO-16
1 20439U 90 5 D 92177.52062735 .00000141 00000-0
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2 20439 98.6440 259.8805 0011601 143.7461 216.4509
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DO-17
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2 20440 98.6441 261.2026 0011819 139.9801 220.2254
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WO-18
1 20441U 90 5 F 92178.69833644 .00000136 00000-0
60660-4 0 4824
2 20441 98.6440 261.2144 0012426 140.8713 219.3370
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1 20442U 90 5 G 92178.72171836 .00000137 00000-0
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2 20442 98.6441 261.3514 0012659 140.8867 219.3232
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FO-20
1 20480U 90 13 C 92171.23377425 -.00000004 00000-0
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2 20480 99.0758 89.3958 0540465 188.2008 170.9976
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HST
1 20580U 90 37 B 92183.13197867 .00000761 00000-0
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2 20580 28.4696 164.6729 0004654 323.3653 36.6643
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1 20670U 90 57 A 92180.70660738 .00000105 00000-0
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FY-1/2
1 20788U 90 81 A 92178.39033838 -.00000106 00000-0 -
58507-4 0 3955
2 20788 98.8942 208.3430 0014854 207.5883 152.4496
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MET-2/20
1 20826U 90 86 A 92180.53413641 .00000060 00000-0
49214-4 0 4364
2 20826 82.5251 357.7373 0011998 264.9053 95.0738
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RS-12/13
1 21087U 91 6 A 92182.96029427 .00000078 00000-0
76069-4 0 4492
2 21087 82.9454 312.7307 0034057 281.6540 78.0780
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AO-21
1 21089U 91 7 A 92180.50358962 .00000037 00000-0
33289-4 0 2852
2 21089 82.9234 184.3680 0028561 312.5061 47.3682
13.73995300 69959
GRO
1 21225U 91 27 B 92181.56855444 .00012944 00000-0
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2 21225 28.4645 318.1820 0007234 19.5337 340.5582
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MET-3/4
1 21232U 91 30 A 92180.80961099 .00000043 00000-0
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2 21232 82.5420 317.6095 0017559 190.4816 169.5943
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NOAA-12
1 21263U 91 32 A 92182.11137192 .00000379 00000-0
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2 21263 98.6946 211.8276 0013619 149.3939 210.8022
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UO-22
1 21575U 91 50 B 92179.21191065 .00000185 00000-0
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2 21575 98.5084 254.3495 0007123 281.8205 78.2182
14.36669371 49699
SARA
1 21578U 91 50 E 92180.72616510 .00000745 00000-0
26140-3 0 3015
2 21578 98.5109 256.1079 0004164 284.6728 75.3995
14.37808519 49927
MET-3/5
1 21655U 91 56 A 92172.83456571 -.00000415 00000-0 -
10952-2 0 2972
2 21655 82.5580 269.7018 0013193 207.4151 152.8388
13.16805770 40860

MMICs

What do you know about MMICs?
Did I hear you say what are MMICS ?
Well unfortunately I don't think I can successfully do much more than whet your appetite here but I recommend any serious microwaver(has this something to do with the law?) should have a good look at these devices.

They are available through the group from VK5 at a very reasonable price. See BOB B.
To start I will quote the following from Elektor January 1988

" A small 4 pin device that, together with a few external passive components, can be used for building an unconditionally stable RF amplifier which guarantees a moderate noise figure and high amplification from DC(yes!) to well over 1,00MHz, without the need of extensive bias circuits, decoupling, and cable matching at input or output."

Sounds like a useful device. This particular article goes on to describe the construction and application of MMICs. Silicon MMICs (MMIC stands for monolithic microwave integrated circuit) have usable gain to about 4GHz and GaAs technology have usable gain in excess of 16 GHz. In the US some of these devices sell for less than two bucks. The term is also used for more complex chips but here I am referring to the single stage devices.

MMICS have 50 ohm input and output impedances, are immune to source or load impedance variations, have no alignment points and by easily paralleled or cascaded for extra power. They are powered through an external bias resistor and a small choke requiring 5 or 6 volts dc. They not necessarily the best choice for rf front ends as they typically have a noise figure 3 - 6 dB.

The ARRL UHF/MICROWAVE Experimenter's Manual pages 7-32 through 7-47 gives an excellent run down on the devices including a number of practical amplifiers. The earlier referenced ELEKTOR article also has several pages on the devices. The ARRL Handbook has also given coverage and circuits for a number of years. So there it is, a microwave device as simple to use as a common old op amp .

73s VK6KDX

RECESSION HITS VHF GROUP NEWSLETTER.

Well there must be some reason why no one has sent me anything to publish. If you don't I will just continue to publish what ever drivel I can put together myself.
A couple of items I would like to see include an oscillator in the 400-500 MHz range with a clean output and some practical circuits using the Motorola parallel-input PLL frequency Synthesizer chip MC145152-2 to replace crystals in the numerous high band and UHF FM rigs which are lying about all our shacks. The CMOS Application Specific Standard ICs data book DL130, from Motorola, gives some good ideas.

HAMFEST

Is the VHF Group once again going to be conspicuous by its apathetic response to this great event? It is an opportunity to promote the group, our side of the hobby (which is slowly but surely being taken over by other groups) and even a chance to make a few bob for the group. I believe it is one the years great events, certainly beats staying home doing the garden. If you have some ideas or wish to help us take part please come forward.

SUBS

ARE

NOW

DUE

THE WEST AUSTRALIAN V.H.F. GROUP BULLETIN

JULY 1992

PERTH
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6000

POLLUTION
COMMON CAUSE
FOR
CONCERN

LONG-TAILED DUNNART
ENDANGERED SPECIES

The West Australian V.H.F Group (INC)
P.O. BOX 189 APPLECROSS W.A. 6163