FEBRUARY 1984-VOLUME III ISSUE 1

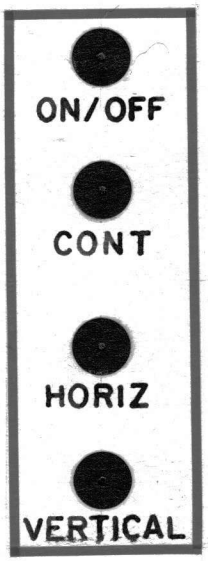
WA8RUT AND WA8RMC

PRESENTS

ATCO

NEWSLETTER

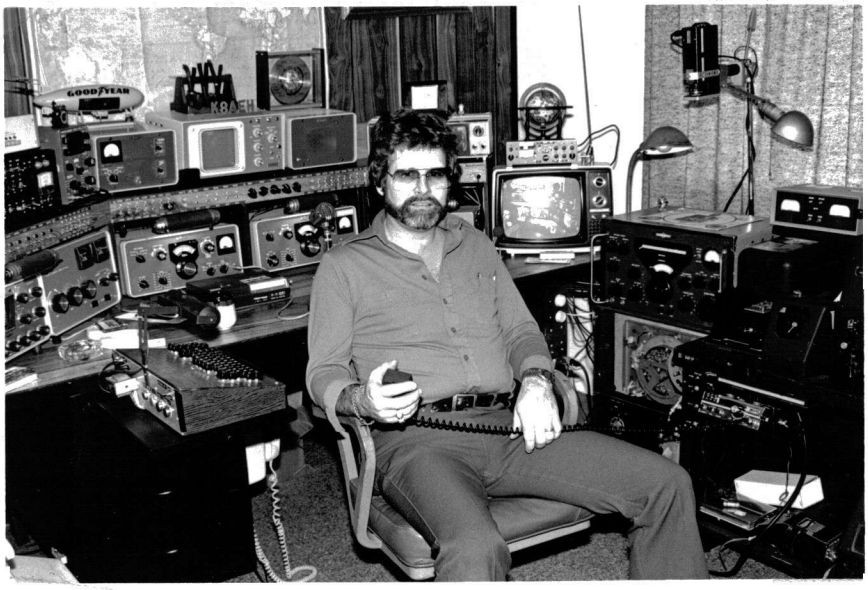
This issue rated P5



Amateur Television in Central Ohio

* Club Activities
* 23cm Primer
* VHF/UHF Preamp Design
* K8DW 23cm GaAsFET Preamp
* Swap-N-Shop
* "P" Chart
* 1983 Antenna Outing

AND MUCH MORE!!!



K8AEH(WILBER) relaxes in his primitive hamshack

NEXT ATCO MEETING

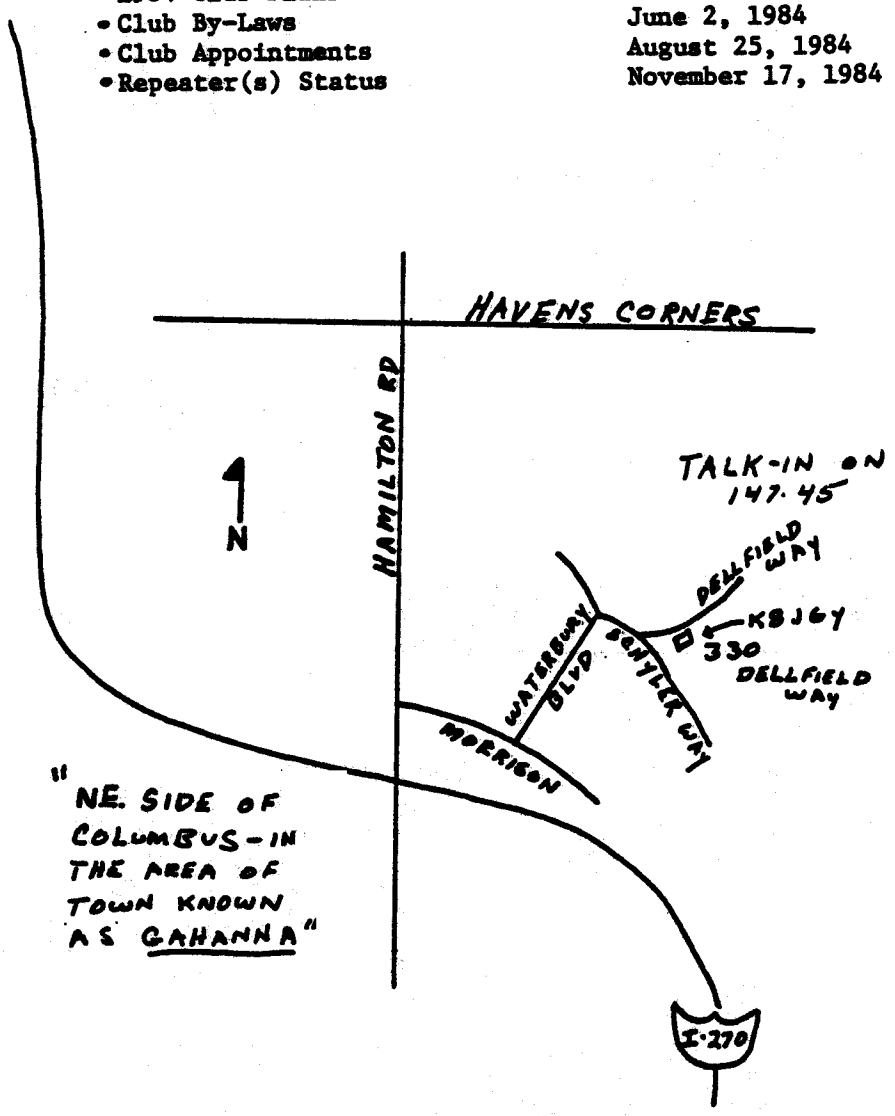
WHEN: Saturday, February 18, 1984
TIME: 1:00 P.M.
WHERE: K8JGY's QTH (See Map)

TOPICS INCLUDE:

- 1984 Club Plans
- Club By-Laws
- Club Appointments
- Repeater(s) Status

1984 GENERAL MEETINGS:

February 18, 1984
June 2, 1984
August 25, 1984
November 17, 1984



ATCO CLUB OFFICIALS

OFFICERS

President: WB8LGA Chuck Beemer

Vice President: WA8RMC Art Towslee

Secretary: W8CCW John Ferrell

Treasurer: K8JGY Fred Yost

TRUSTEES:

WA8RUT - Ken Morris
WB8LGA - Chuck Beemer
WA8RMC - Art Towslee
W8CCW - John Ferrell

ATCO NEWSLETTER STAFF

Editor/Publisher

WA8RUT - Ken Morris
WA8RMC - Art Towslee

Technical Editor

Open

Photo's

WD8NBA - Joe Hahn III
WB8MR - Bill Parker

Copy Shop

WB8FWQ - Chris Vojsak

MEMBERSHIP CHAIRMAN

K8JGY - Fred Yost

ACTIVITIES PROMOTION CHAIRMAN

Open

USATVS REPRESENTATIVE

Open

NET MANAGER

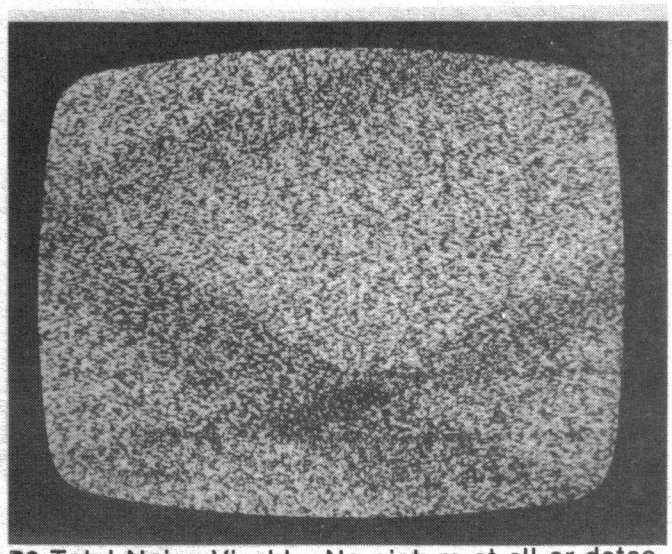
W8AER - Dave Sears

ATCO NEWSLETTER

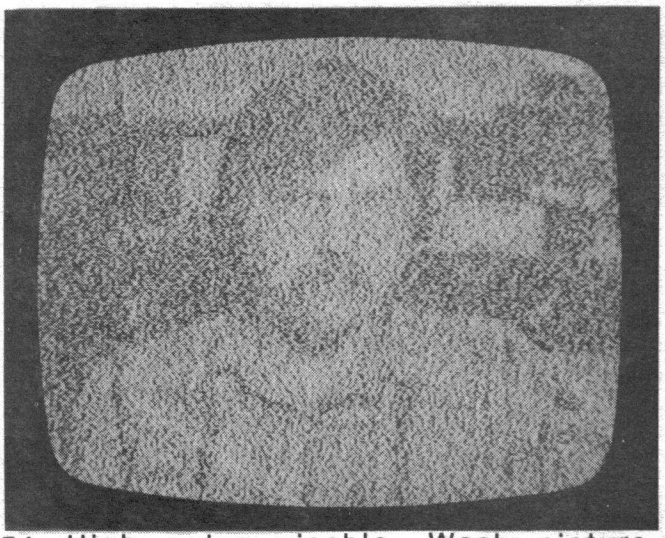
The ATCO Newsletter is published by the Amateur Television in Central Ohio Club. The newsletter is published quarterly (4 times a year) and its sole purpose is to promote ATV activity in Central Ohio. Reprint permission granted subject to providing credit to the ATCO Newsletter and furnishing a copy of the publication to the ATCO Newsletter within 30 days after publication. Address all correspondance to the "ATCO Newsletter", c/o Ken Morris - WA8RUT, 3181 Gerbert Road, Columbus, Ohio 43224, (614) 261-8583, after 6:00 P.M. weekdays.

Membership to ATCO is open to all amateurs. Annual dues are $12.00, payable to K8JGY, Membership Chairman and Treasurer.

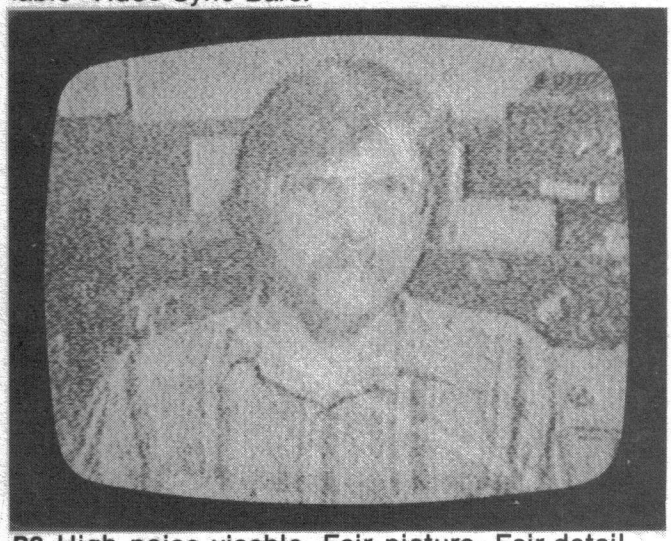
UNITED STATES ATV SOCIETY
AMATEUR RADIO FAST SCAN TELEVISION
VIDEO PICTURE STANDARDS



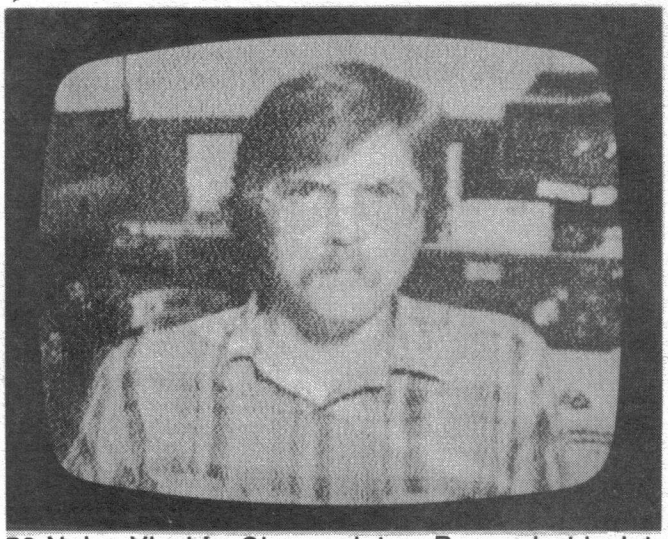
P0 Total Noise Visable. No picture at all or detectable Video Sync Bars.



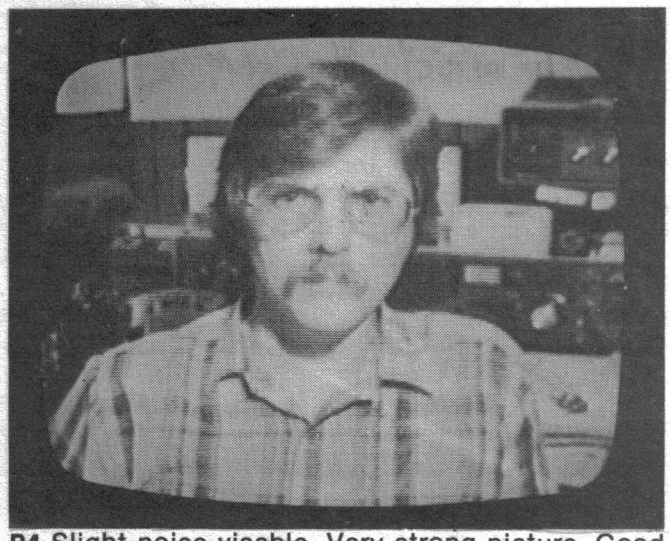
P1 High noise visable. Weak picture.



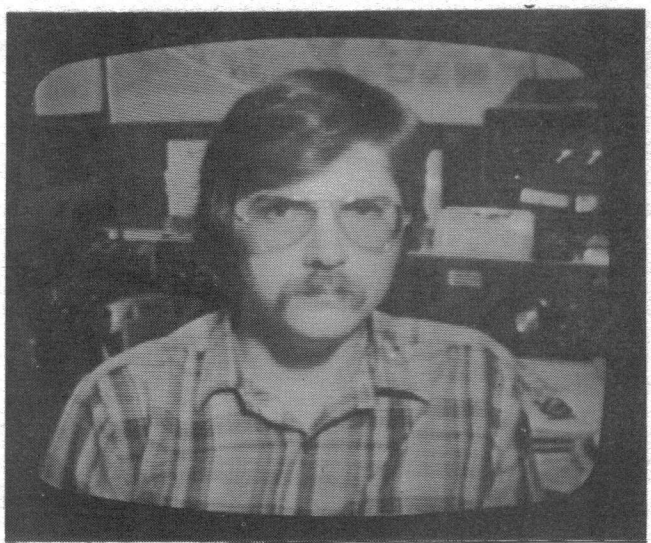
P2 High noise visable. Fair picture. Fair detail.



P3 Noise Visable. Strong picture.Recognizable detail.



P4 Slight noise visable. Very strong picture. Good detail.



P5 No noise visable. Closed circuit picture. Excellent detail.

Photos by Dave Williams WB0ZJP

(JANUARY 1983)

Published with permission of A5 ATV MAGAZINE, P.O. BOX H, LOWDEN, IA 52255

1983 WB8LGA ANTENNA PARTY

Participants at the mid-summer antenna party pictured left to right: Art (WA8RMC), Dave (W8AER), Ken (WA8RUT), Nick (W8UTD), Chuck (WB8LGA), Dale (WB8CJW), Wilbur (K8AEH), Fred (K8JGY), Charlie (K8AOH), John (W8CCW), Paul (WD8KMX), Bill (W8FRQ), Dick (W8RVH); also, Bill (W8DMR) not shown.

The 1984 party (see Schedule on Page 3) promises to be better than ever! The antenna pattern measurement computer is improved, so bring your favorite antenna for a pattern printout.

Charlie (K8AOH) inspects Wilbur's
(W8EFH) Quagi Antenna.

The NASA style operating console

Charlie (K8AOH) inspect
(W8EFH) Quagi Antenna.

Ken, Dale & Chuck fasten corner reflector antenna to mast (it checked + 7DbD)

The NASA style operating console
with an Apple Computer assist

Down range receive antenna & mast in center. Measurement "console" at left.

"See what happens when you feed it lots of RF!!"

In Ohio, it only takes this many people to solder on an "N" connector.

FACTS, TRUTHS, OPINIONS, HALF TRUTHS AND BULL.....

de WA8RUT

Please note the next ATCO Meeting in the inside cover of this newsletter. In addition, the planning staff has tentively set the date for all of ATCO general meetings in 1984. These dates are as follows:

> June 2, 1984 at WB8LGA's QTH -- This will be the annual antenna measuring funfest -- so bring your 70cm and/or 20cm antenna.
>
> August 25, 1984 at AccuRay's Picnic Ground -- This will be the summer picnic/meeting -- be sure to bring the whole family.
>
> November 17, 1984, place to be announced -- General meeting.

These meetings/outings should be a great deal of fun -- so please mark your calendar. Details of these meetings will appear in this newsletter just before the meeting.

ATCO Club By-Laws are in the process of being developed. The initial draft will be completed by the ATCO planning staff with final revisions made by the ATCO general membership.

The purpose of these By-Laws is to set in writing the club's purpose and general rules for operating. The objective is to keep the By-Laws concise and brief.

The Tuesday Night ATCO Net is doing well in the past few months. The net has had an average of 12 - 15 checkins each Tuesday at 8:00 P.M. About 30 - 40 different stations have checked in in the last couple of months. If you would like to try your hand at net control, see Dave, W8AER, Net Manager. The net meets on 147.45, Tuesdays, 8:00 P.M. local.

A club dues reminder system has not been in place up until now. K8JGY committed to either make a phone call or mail a post card to remind those of us (especially me) that dues are due. When's the last time you paid your dues? If you're like me, you can't remember....

The cross-band, 439.25/1278 repeater is doing very well. New mini wheels antennas for the 439.25 receiver has helped the coverage. The next step is to install the new "channel" filter from Spectrum International ($125.00!) on the receiver and increase the power of the 1278 transmitter by 10db. See more on 1278 elsewhere in this issue.

There is a new design antenna on the WB8LGA repeater (439.25/425.25). This antenna developed by Chuck, WB8LGA appears to be outstanding. Details of the antenna are still not announced because of its proprietary design. I don't know if it will make Chuck rich, but it should keep him in new amateur gear for years to come.

Several new appointments will be made by the Planning Staff to help keep the ATCO Club active and help the ATCO Club obtain its objectives. Appointments will be made by the criteria published in the Club By-Laws. If you are interested in one of these posts, please contact WB8LGA.

The ATCO Newsletter wishes to welcome new ATVers N8CSH, ND8U, N8CGX, KA8KPQ, N8FFO and WA8SJV, all in the Columbus area. ATV in the Central Ohio area continue to grow! There is a little more activity now then there was in 1949, isn't there Bill? I wonder how many hours of "snow" W8DMR has watched since 1949?

With regret I would like to report the passing of Nick, W8UTD. Nick often checked into the ATCO Tuesday Night Net. His "silent key" will be missed by all of us.

Reward! for information leading to the re-activity of missing ATVers WD8RXX, WB8ZFM, WA8QQU, W8OZA, WD8NBA, WB8LGH, WD8IYX and WB8DZW (W8ARE almost made this list!). Come on guys, it's time to get the cobb webs out of your ATV rig!

Weather radar via the WB8LGA repeater is being considered. Do you think this would be a worthwhile addition? Let Chuck, WB8LGA know your thoughts.

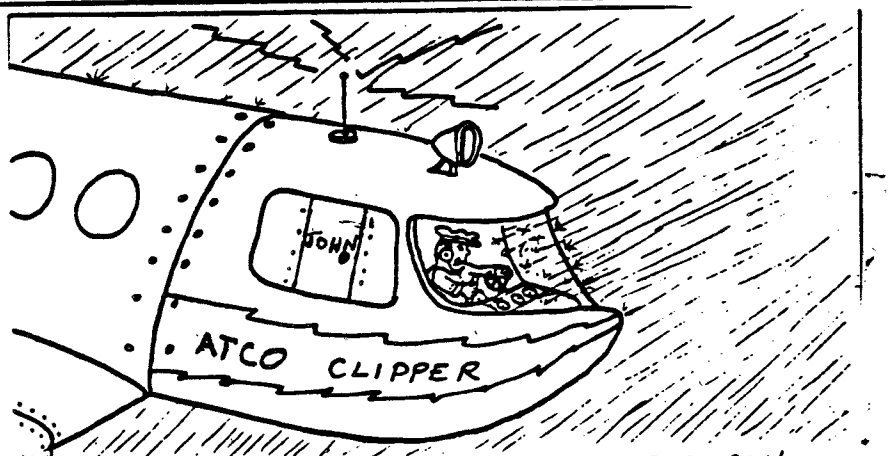
Much praise is deserved for re-transmitting the STS-9 shuttle mission by WB8TMP and others. I hope they continue to re-transmit future shuttle missions. I know there is high interest in Central Ohio to see the video from "mini-mission control".

Reduced prices on J. Beams are now available from Spectrum International in Concord, Mass (617-263-2145). There are two versions of the 70cm J. Beam; a 48 element (15dbD) and an 88 element (18.5 dbD). I have an 88 element J. Beam and it checks out at just over 4db over a 14 element KLM yagi. Although this is not a "product review" of the J. Beam, I can say I wouldn't trade it for anything on the market. The new prices are as follows:

J. BEAM	WAS*	NOW*	BOOM LENGTH
48 element	$75.75	$59.95	6 ft.
88 element	$105.50	≈ $84.00	12 ft.

* Plus shipping cost.

I talked with John Beanland, G3BVU/W1 on January 9th and he told me about the new prices and that he had plenty (2 tons worth!?).



W8DMR THIS IS W8CCW, ON INSTRUMENT APPROACH TO COLUMBUS, ALTIMETER READING 500 FEET, VISABILITY Ø, CEILING Ø, AIR SPEED DROPPING FAST, SNOW AND ICE ARE FREEZING ON WINDSHIELD, FLAPS FREEZING, LANDING GEAR WON'T LOCK IN, EXCEPT FOR THAT EVERYTHING IS O.K."

HOW TO GET ON 23CM ATV (1270MHZ)

de WA8RUT/ATV

Interest in 1278 ATV is very much alive in Central Ohio. With the advent of the Cross Band Repeater (WA8RUT/R - 439.25 in/1278.75 out) and several stations now with receiving capability, I have been asked several times "How do I get started?" The ATCO Newsletter will continue to publish articles on "rolling your own" (there is some "stuff" in this issue), however here is some information for those of you who would prefer to buy. What follows is a brief run down of what's on the market for 23cm ATV.

Converters: There is only one cost effective receive converter on the market. The P.C. Electronic TVC12G. It is designed to mount at the antenna and is tuned from the shack via a control box that's nothing more than a variable power supply. P.C. Electronics sells a control box that also has a pre-amp built in for $59. It's very easy to build one (less pre-amp) using Radio Shack parts (for under $25 or less depending on your junk-box). The TVC12G outputs on Channel 7 or 8.

Transmitting: There are a couple of ways to go to transmit. The most used path is to put your 439 transmitter on 426 or below (suggest 413.66) and use a MMV1296 Varactor Tripler to triple your 70cm to 23cm. Spectrum International in Concord, Mass. (617-263-2145) sells 2 versions (see ad). Normally a good approach is to put the Varactor Tripler in a WX proof box and mount it at the antenna and send 70cm power up the coax to avoid feed line loss at 23cm. The MMV1296 can also be ordered from P.C. Electronics.

A second way of getting a signal on 23cm is the P.C. Electronics 23cm transmitter that's along the lines of their Kreepie Peepie: 1-2 watts out, 4.5 subcarrier, modulator built in, built, tested and post paid, for around $200 (price not announced yet). Full details not yet available.

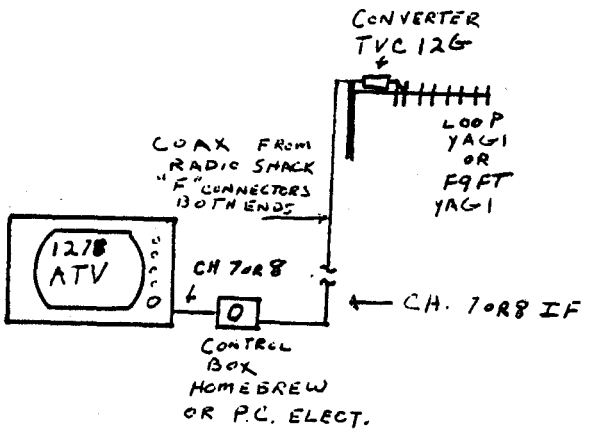
Antenna's: This is an item most hams want to make themselves. However, there are two on the market that are good ones; they are:

- F9FT - 23 element yagi - $49. from P.C. Electronics.
- 1296LY loop yagi - $65. from Spectrum International.

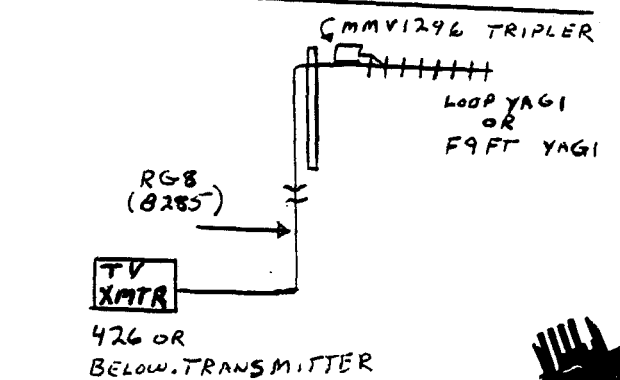
Gain spec's are about equal (18dbd) but the loop yagi has much broader band width than the F9FT. These prices include an "N" connector.

HOW TO GET STARTED

Buy or build an antenna. Then buy a P.C. Electronics (213-447-4565) down converter. Buy or build a control box for it (you will also need coax with "F" connectors on both ends - available from Radio Shack in 75' or 100' lengths). Look for the output of the Cross Band Repeater (transmit on 439.25 and look on 1278.75). If you need help - get in touch with WA8RUT, WB8CJW or WA8RMC.



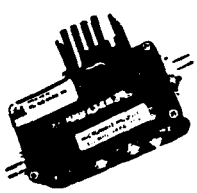
TO RCVR 23 CM BAND ATV



426 OR BELOW. TRANSMITTER

TO TRANSMIT 23CM

DCB DOWNCONVERTER CONTROL BOX.....$59ppd
Supplies adjustable 10 to 18 vdc thru coax line to antenna mounted downconverters. 15 db ch2-ch6 line amp. Use with our TVC-12G, TVC-2G or some microwave conv.



UHF Varactor Triplers

Transmitting Converters

Use your existing transmitter on the next higher band.
Triple from 2M to 70cms or from 70cms to 23cms.
No power supply required. Efficiency approx 50%.
Units aligned at 144 MHz and 432 MHz respectively.
Very wide tuning range for full band coverage.
Use the low power models in receiver L.O. chains.

Directly usable for all modulation modes except SSB.
MMV1296 excellent for COLOUR ATV (1215 - 1300 MHz).

Manufactured with high grade microwave components in a fully screened, rugged, die-cast aluminum box.

TECHNICAL DATA

Model number designates output freq. band.

Model No.	MMV432	MMV432H	MMV432M	MMV1296	MMV1296M
Max Drive	30 W	50-W	70 W	20 W	35 W
Typical o/p	15 W	25-W	35 W	10 W	17 W
				$110	$140

Spurious Suppression, typical, ref peak output.

Frequency	F_{in}	$2xF_{in}$	$4xF_{in}$	Other
432 models	30 dB	50 dB	40 dB	60 dB
1296 models	30 dB	50 dB	40 dB	40 dB

All specifications apply in 50 ohm input/output system.

Size: 4½" x 2½" x 1¼" plus connectors
Connectors: BNC standard, TNC option available.

SPECTRUM INTERNATIONAL, Inc. Concord, Mass. 01742, USA.

VHF AND UHF LOW NOISE PREAMPLIFIERS

The following are excerps from an article by G. H. Krauss (WA2GFP) about UHF preamp design. I believe them to be quite helpful.

TO BREW AN LNA:

1. Choose a device, based on the table data; you make the most important choices based on availability, cost and performance. A key to the manufacturers, or their agents if they do not sell direct in the U.S., is provided.

2. For the chosen device, obtain the input and output circuits. If GaAsFET or 1296 , see Figs. 1 and 2. Use the best components you can obtain; remember that you want to keep input loss as low as possible.

3. Choose a bias circuit (the "active" circuit - is recommended). The GaAsFETs have their own bias circuit in Fig. 1; at 1296 MHz, a separate and well-regulated $-V_1$ supply is necessary.

4. Use the "Universal" layout of Ref. 1, Fig. 8; the vhf GaAsFET layout of Fig. 1 or the 1296 layout of Fig. 2, to build.

5. Tune: monitor the current into, and voltage at, the collector/drain feed-thru capacitor and do not exceed manufacturer's ratings. Tune all L & Cs for maximum gain. Now, set input circuit and bias for minimum noise figure - do not touch output circuit adjustments, if any.

NOTES:

Rs = Source resistance
FET = field-effect transistor
DGFET = dual-gate FET
SZ = single emitter/source lead
DOE = dual, opposed emitter/source leads
BB = broadband
A = Airtech
AMP = Amperex
AND = AND Transistors
DXL = Dexcel
HP = Hewlett Packard
M = Motorola
MA = Microwave Associates
MIT = Mitsubishi (Applied Invention, Hillsdale, N.Y.)
NEC = Nippon Electric (California Electronic Labs)
PAN = Panasonic
RCA = RCA
SIL = Siliconix
TI = Texas Instruments

1296 MHz PREAMPLIFIERS

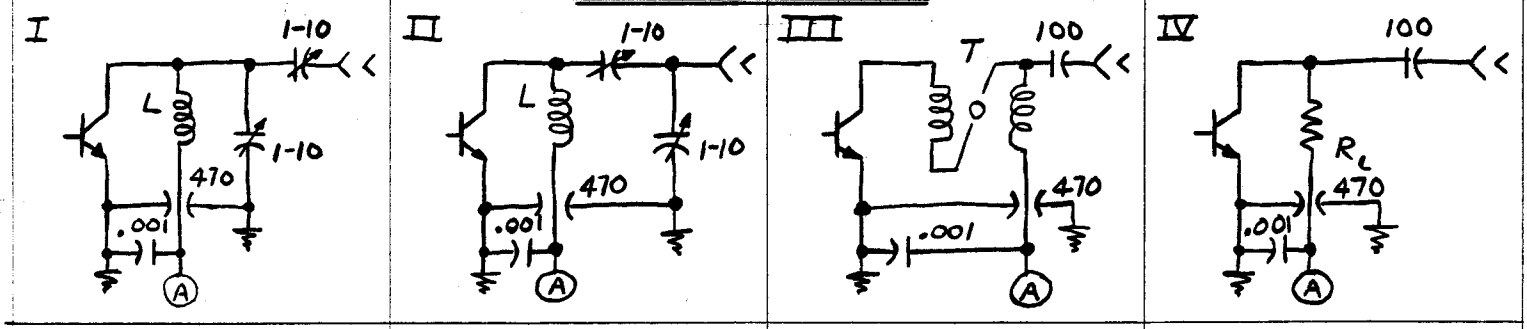
DEVICE	COST $	MFGR	NF (dB)	Ga (dB)	Gr (dB)	Gm (dB)	M (dB)	BW (MHz)	CKT 2	CKT M	FEG	REMARKS
NE21889	75.00	NEC	0.62	18.7	-27	8.3	0.63	40	X		DOE	GaAsFET
MGF1400	23.00	MIT	0.82	16.2	-23	6.8	0.84	45	X		DOE	GaAsFET
NE24483	35.00	NEC	0.83	17.4	-27	9.6	0.84	50	X		DOE	GaAsFET
D432	25.00	DXL	0.97	14.9	-22	7.1	1.00	90	X		DOE	GaAsFET
MGF1200	15.00	MIT	1.03	13.6	-21	7.9	1.07	60	X		DOE	GaAsFET
NE664533	7.50	NEC	1.40	12.0	-16	4.0	1.48	60	X		DOE	
MS2110JE	-13.00	TI	1.49	12.0	-18	6.0	1.57	140	X		DOE	
NE645+ MRF901	14.55	-	1.61	19.9	-37	11.1	1.62	160		X	DOE	WA2AAU DESIGN
AST7701	25.00	A	1.63	13.8	-27	13.2	1.69	120	X		DOE	
NE21935	4.50	NEC	1.74	9.9	-19.2	9.3	1.90	180	X		DOE	
NE21937	4.00	NEC	1.79	9.8	-13	3.2	1.95	100	X		DOE	PLASTIC
RXTR-6105	28.00	HP	1.81	12.2	-24	11.8	1.70	50		X	DOE	
NE73437	3.30	NEC	1.92	6.0	-12	6.0	2.41	200	X		DOE	PLASTIC
HXTR-2101	22.00	HP	2.1	12.0	-21	9.0	2.4	50		X	DOE	
MRF901	1.53	M	2.3	10.1	-16.5	6.5	2.6	120	X		DOE	PLASTIC Avg. of 8 units
			2.3	10.5	-16.6	6.1	2.6	200		X	DOE	PLASTIC Avg. of 2 units
NE22235	4.00	NEC	2.3	14.0	-26	12.0	2.5	115	X		DOE	
BFR-91	3.00	AMP	2.5	7.6	-14.0	6.4	2.9	100	X		SE	PLASTIC
NE02135	3.50	Nec	2.6	12.5	-22	9.3	2.7	115	X		DOE	Avg.of 5 units
			2.6	9.8	-21	11.2	2.9	200		X	DOE	Avg.of 2 units
MRF911	2.00	M	2.7	7.8	-17.4	9.6	3.1	150	X		DOE	PLASTIC
BFR-90	2.70	AMP	2.8	7.3	-17.3	10.0	3.2	100	X		SE	PLASTIC
MRF901+ MRF901	3.10	M	3.1	18.3	-36	17.7	3.2	200		X	DOE	PLASTIC Avg.of 7 units
NE02137	3.00	NEC	2.8	8.3	-12.7	4.4	3.2	100	X		DOE	PLASTIC Avg.of 2 units
NE02135	7.00	NEC	3.0	15.6	-20	23.4	3.0	100		X	DOE	
BFR-96	4.30	AMP	3.0	6.0	-16.5	10.5	3.6	120	X		SE	PLASTIC
MA42162-511	18.00	MA	3.5	14.7	-18	3.2	3.5	140	X		DOE	
MA42141-510	15.00	MA	4.2	7.3	-14	6.7	4.8	140	X		DOE	

432 MHz PREAMPLIFIERS

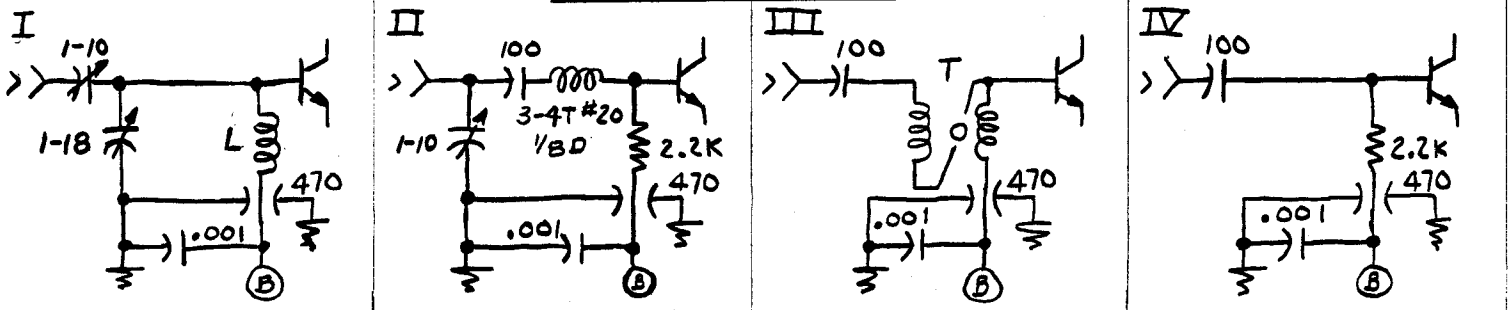
DEVICE	Cost $	MFGR	NF (dB)	Ga (dB)	Gr (dB)	Gm (dB)	M (dB)	BW (MHz	Input CKT	Output CKT	Remarks
MGF1400A	28.30	MIT	0.39	18.2	-27	8.8	0.40	20	I	III	GaAsFET 13-1 +20dBs
D432	25.00	DXL	0.49	18.1	-29	6.9	0.31	50	I	III	GaAsFET 13-1 +21dBs
MGF1400	23.00	MIT	0.52	21.6	-33	11.4	0.52	50	I	II	GaAsFET 13-1 +24dBs
MGF1200	13.00	MIT	0.58	20.4	-28	7.6	0.59	25	I	III	GaAsFET 13-1 +21dBs
NE24483	35.00	NEC	0.75	15.3	-25	9.7	0.76	60	I	II	GaAsFET
NE64535	7.50	NEC	0.86	16.0	-24	8.0	0.88	BB	I	IV	GaAsFET
MS2110JE	-15.00	TI	1.07	20.0	-28	8.0	1.03	BB	I	I	
NE73437	1.75	NEC	1.25	17.1	-25	7.9	1.27	BB	I	I	
NE02135	4.00	NEC	1.27	11.2	-27	15.8	1.36	BB	I	IV	
MRF904	1.25	M	1.38	11.0	-25	14.0	1.48	BB	IV	IV	
3SK97	2.00	PAN	1.39	11.5	-12.8	1.3	1.48	50	I	I	DG GaAsFET
MRF901	1.55	M	1.40	16.1	-22	5.9	1.43	BB	II	IV	
MA42111-509	15.00	MA	1.40	11.3	-19	7.7	1.49	BB	I	I	
MA42141-510	17.00	MA	1.52	14.0	-25	11.0	1.47	BB	I	I	
MA42161-511	25.00	MA	1.57	16.3	-26	9.7	1.61	BB	I	I	
MS300R	10.00	TI	1.59	13.2	-25	11.8	1.66	40	I	I	
NE22235	4.00	NEC	1.60	11.0	-26	15.0	1.71	BB	I	IV	
MA42001-509	11.00	MA	1.73	11.3	-25	13.7	1.89	BB	I	I	
NE21937	3.50	NEC	1.76	20.5	-32	11.5	1.77	BB	II	IV	
BFR91	3.00	AMP	1.78	15.1	-27	11.9	1.33	BB	II	IV	
MP-1006	11.00	AND	1.90	17.7	-28	10.3	1.93	BB	I	I	
TIS-189	0.90	TI	1.90	14.5	-43	29.3	2.04	17	I	I	DGFET
MP-1004	14.00	AND	2.0	12.2	-34	21.8	2.1	BB	II	I	
MA42142-509	14.00	MA	2.2	13.9	-35	21.2	2.3	BB	I	I	
BFQ-23	3.75	AMP	2.2	16.1	-27	10.9	2.3	BB	II	IV	
BFR-90	2.70	AMP	2.2	16.4	-26	9.6	2.3	BB	II	IV	
CN536	3.35	AMP	2.3	14.0	-25	11.0	2.4	BB	II	IV	
MP-1001	8.00	AND	2.4	16.5	-23	6.5	2.5	BB	II	IV	
BFR-96	4.30	AMP	3.0	14.6	-23	8.4	3.1	BB	II	IV	
NE4162E-2	3.30	NEC	3.7	10.3	-18.5	8.2	3.9	BB	I	I	
MA42003-509	5.00	MA	4.3	7.7	-23	15.3	4.8	BB	I	I	
U-310	4.00	SIL	4.7	5.0	-30	25.0	5.6	10	I	I	FET COMMON GATE

2 = CKT. of Fig. 2
M = Microstrip layout

OUTPUT CIRCUITS

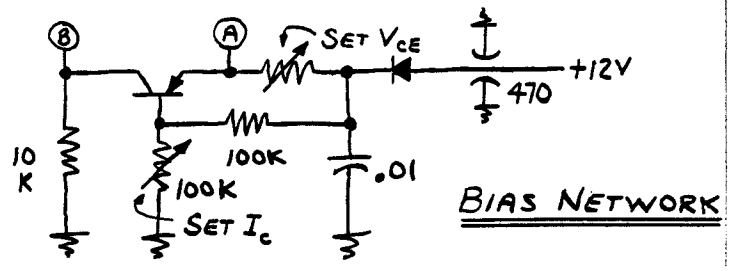


INPUT CIRCUITS



L = 1T OF #16 1/4 DIA OR 2" OF 1/8" DIA TUBING

T = 4T #28 BIFILAR WOUND ON T25-0 CORE



BIAS NETWORK

SWAP-N-SHOP

The following items are for buy-sell-trade between hams. Please correspond directly to the individual or thru me - WA8RMC. All items have negotiable prices - compromise is encouraged. Clean out the shack - let's have a much larger list next time.

TO SELL

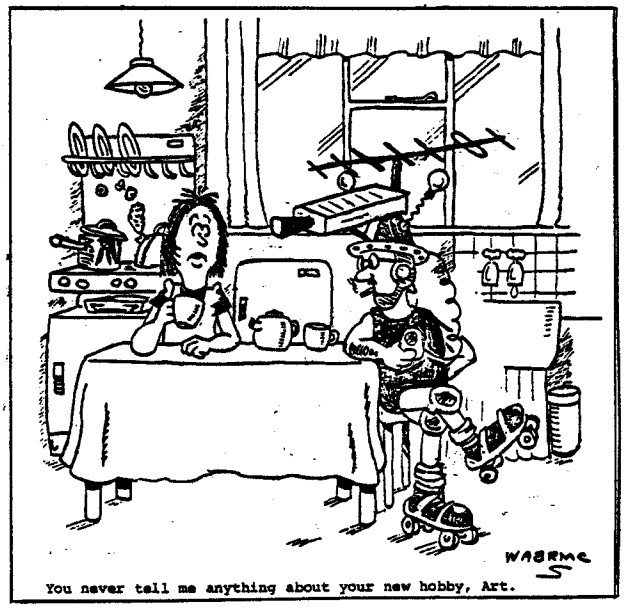
W88FWQ - Work - 614-263-1143 Home - 614-488-7852	PC Electronics Exciter/Mod. (439.25) 10 Watt Amp, 4.5 MHz Subcarrier IC-22S Icom 2M Portable Tranceiver IC-730 w/all filters.80-10 meter Icom Tranceiver IC-45A Icom 440 MHz Transceiver
W8AER	VHF Engineering Exciter 2 Varacter Tuners B & K Converter B & K Scanner
W8OZA	Cartavision B/W camera & Power Supply B/W camera - operational 2 UHF Varacter Converters-One for ATV, the other commercial 8 Element Quagi Antenna
K8AEH	Cartavision Camera with zoom
WA8RMC	Hammarlund HQ100A Ham Band-receiver EICO Vaccuum Tube Voltmeter

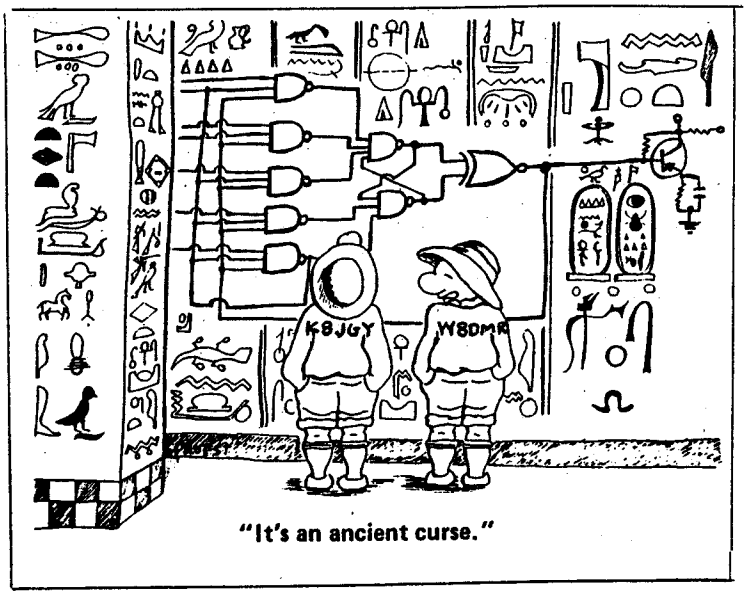
WANTED

WA8SJV	1-2 Pf Caps (Dog Bone Type)
W8RVH	Commodore Software
N8CSH	ATV Xmitter, Low Cost
WA8RUT	Amplifier for 432 MHz-Tube Type is OK-50 Watt Variety.

AVAILABLE FOR LOAN

W8DMR	Blonder Tongue Converter that works on ATV as is.





REMOVE STAPLE CAREFULLY!!!

ATCO Newsletter
Ken Morris, WA8RUT
3181 Gerbert Rd.
Columbus, OH 43224

ATCO NEWSLETTER

JANUARY, 1984