

PACK RATS'



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MT. AIRY VHF RADIO CLUB, INC.

CHEESE BITS



MT. AIRY VHF RADIO CLUB., "THE PACK RATS", PHILADELPHIA, PA. W3CCX
NET FREQUENCIES: 50.125, 144.150, 222.125, 224.58/222.98, 432.110, 903.100, 1296.100 MHz
AFFILIATED CLUB: AMERICAN RADIO RELAY LEAGUE ARNS

Meetings: Third Thursday of each month at 8:00 PM
Southampton Free Library, 947 E. Street Road
Southampton, Pennsylvania 18966

SCANNED TO PDF BY BERT, K3IUV, 2013

VOLUME XXXIV

NOVEMBER 1992

NUMBER 11

THE PREZ SEZ

As I write this report the 1992 Hamarama and Mid Atlantic States VHF Conference are now history. I want to thank Al Boblitt, K3EOD and John Sortor, KB3XG for the hard work and time spent preparing for this event. I also want to take the opportunity to thank each of you who took the time to help the Club at the events. Without your help these event's would not be possible. The weather this year cooperated and we had a good turnout. The board is looking for volunteer's to be the Conference and Hamarama chairman for 1993.

It is now time to shift our sights to preparing for the next BIG EVENT. The January VHF Contest chairman is Phil, WA3NUF. All of us should take stock now of what needs to be fixed or what new bands you want to get on. Lets all call an inactive member on the phone and get them motivated. Let your needs be known. Antenna work should be done now not in January. I will leave the rest to all of you. Take a good look at the contest gavels on display at the November meeting. We have a long tradition of success, but no guarantee. Our friends in Rochester are close behind and want the 1993 gavel. Let's have an all out club effort from all members. So lets dust off that equipment and get on the air.

73's

William T. Murphy
WORSJ FN20JR

New Club Member: "Doc" Whitticar, W3GAD
28 Twining Bridge Road
Newtown, PA 18940
215-968-6397

Calendar of Coming Events -November 1992

- 2 Check into the 6 Meter Net on 50.125 MHz at 7:30 PM EST.
- 2 Check into the 903 MHz Net on 903.100 MHz at 10:00 PM EST.
- 3 Election Day
- 4 Predicted peak of the Taurids meteor shower at 1838 UTC.
- 7-9 ARRL November CW Sweepstakes. See Oct. QST, page 121 for rules.
- 9 Check into the 2 Meter Net on 144.150 MHz at 8:00 PM EST.
- 9 Check into the 1296 MHz Net on 1296.100 MHz at 10:00 PM EST.
- 11 Veterans Day
- 12 Packrat board of directors meeting at the QTH of Paul, WA3JYO, 31 Main Blvd., Trenton, NJ. Call 609-538-1687 for directions. All interested parties invited.
- 14-15 ARRL International EME Competition. See Sept. QST page 124 for rules.
- 15 Central Pennsylvania Repeater Association Hamfest at the Hershey Armory, 28th Infantry off 422 on Baum Ave., Hershey, PA. TI on 144.87/145.47.
- 16 Check into the 222 MHz Net on 222.125 MHz or 224.58/R at 8:30 PM EST.
- 17 Predicted peak of the Leonids meteor shower at 0405 UTC.
- 19 Regular meeting of the Mt. Airy VHF Radio Club at the Southampton Free Library on Street Rd. in Southampton, Pa. All VHFers are encouraged to come and enjoy the evening with us. You need not be a member. The program will be on low noise amplifiers by Goeff, WA2GFP. Do you need to attend this meeting to qualify for club contest minimum attendance? Come anyway and bring a friend.
- 21-23 ARRL November Phone Sweepstakes. See Oct. QST, page 121 for rules.
- 23 Check into the 432 MHz Net on 432.110 MHz at 9:00 PM EST.
- 23 Check into the 903 MHz Net on 903.100 MHz at 10:00 PM EST.
- 26 Thanksgiving
- 28-29 CQ World-Wide DX Contest - CW. See Oct. QST, page 124 for rules.

TID BITS:

Mark your 1993 calendar: Ladies night/Club Banquet for May 1, 1993.

Nov. Club Meeting Technical Talk: Low Noise Amplifiers by Goeff, WA2GFP.

Congratulations to Gary, WA2OMY and Jennifer on the birth of their new son, Andrew Garrison Hitchner.

Don't forget to send in your contest questionnaire to Phil, WA3NUF.

There's a new beacon, VE2TWO/BCN in FN58JO on 144.277 MHz running 25 watts into an omni directional antenna. Contact Bernie, VE2LC for reception reports.

Pack Rats CHEESE BITS is a publication of the Mt. AIRY VHF RADIO CLUB, INC. Philadelphia, PA. and is published monthly.

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MONDAY NIGHT NETS

TIME	FREQ.	NET CONTROL
7:30 PM	50.125 MHz	K3EOD
8:00 PM	144.150 MHz	W2EIF
8:30 PM	222.125 MHz	WB2YEH
8:30 PM	224.58R MHz	K3ACR
9:00 PM	432.110 MHz	WA3AKV
9:30 PM	1296.100 MHz	WA3NUF
10:00 PM	903.100 MHz	N3AOG

COMMITTEE CHAIRMEN

LADIES' NIGHT: WA3YUE 215-666-1558
 JUNE CONTEST: N3CX 215-679-7293
 HAMARAMA: K3EOD 215-742-3312
 VHF CONFERENCE: KB3XG 215-270-3158



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SWAP SHOP

Send non commercial swap shop items to the editor.

For Sale: Six Meter KW, Arcos type with 2 4CX250B's in parallel with tubes and antenna relays, 600 watts output, \$450.00. 2304 MHz TRC-29 Cavity Amplifier (7289 not included), 50-75 watts output, \$125.00. WR187 Waveguide to N adapters, \$10.00. Icom AG-25 2 meter mast mounted preamp, \$50.00. Bruce Wood, N2LIV, 3 Maple Glen Lane, Nesconset, NY, 11767, (516) 265-1015 (H) or (516) 576-0770 (W).

Wanted: 222 and 432 MHz Power Amplifiers with tubes, relays and power supplies in "on-the-air" condition and minimum of 600 watts output. Will pickup up to 250 miles from Albany, NY. Contact John, WA2FUZ at (518) 966-8654 or WA2FUZ @ WA2PVV.ENY.NA.

Wanted: Rotator plate for a Rohn 6 tower. Call Al, K3EOD at (215) 742-3312.

Wanted: Approximately. 2 ft. dish for 3 and 5 GHz. Also a happy home for a Commodore 64 with color monitor, disk drive and lots of software and manuals. Not free but cheap if you really are going to use it.

COMMERCIAL AD

LOOP YAGIS: 902 MHz 33 element \$89 kit, \$109 assembled and tested. 1296 MHz 45 element, \$89 kit, \$109 assembled and tested. 1296 MHz 55 element "Sooper Looper" \$99 kit, \$124 assembled and tested. 2304 MHz 45 element \$75 kit, \$89 assembled and tested. Also available: element and hardware kits for the above. 2 and 4-way power dividers. Discount on complete arrays. Solid State Linear Power Amps, 13 VDC: 1296 - 8W in 35W out \$315, 1W in 20W out \$265, 4W in 70W out \$695. GaAs FET Preamps: 903 MHz .8dB NF \$90, 1296 MHz .8 dB, 2304 MHz 1 dB max NF \$140. SHE SYSTEMS No-tune Transverter kits, w/144 MHz IF now available for 903 through 3456 MHz. Write or call for complete catalog. DOWN EAST MICROWAVE, Bill Olson, W3HQT, Box 2301 RR-1, Troy, Maine. For information and orders telephone (207) 948-3741.

VE SESSIONS

(from the Penn Wireless X-MITTER)

Bring original of your license, certificates of completion, personal identification and a \$5.25 fee.

Levittown first Thursday of the month, 7PM- .Contact Dave Heller, K3TX, at 946-1040 or 736-3333.

Falsington Penn Wireless Association, Contact George LeNoir, WR3B at 943-4886.

Warminster WARC. Contact Tom Michaud at 343-3494.

Philadelphia Philmont Radio Club. Contact Dusty Rhoads, ND3Q at 482-0386/879-0505.

Telford RF Hill ARC. Contact Warren Erdman at 679-5764.

Morrisville Contact Dave Munson, NM3K at 788-7515.

Bryn Mawr Mid-Atlantic ARC. Contact Bob Hasse at 293-1919.

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Nov. 92

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Proposed Constitution Change

The following amendment to the constitution of the club has been proposed and approved by the Board of Directors for a vote by club members at the next meeting. The club constitution requires that 51% or more (approximately 40 members) of the voting members be present to be able to vote on this change. The first meeting at which there is a 51% attendance of the voting members present, a vote will be taken.

Thank you
Constitution Change Committee

Add the following to ARTICLE IX of the Constitution as section 4:

If 51% of the voting membership does not attend the meeting at which the amendment is proposed a proxy vote may be initiated by order of the President. Proxies shall be mailed to voting members stating complete changes. Returns shall be sent to the president and remain sealed until the next meeting at which a re-vote is taken on the results of the amendment. Proxies shall be opened and counted along with the results of the vote of the voting members present at the regular meeting of the club. The proxies and the voting members present will be counted for the 51% quorum requirement.

HAMARAMA '92

By Al, K3EOD

This year's HAMARAMA turned out to be a bigger and better one than last year. The weather was perfect and we noted a larger number of sellers with approximately the same number of buyers as last year. I am proud to announce that we had 32 Packrats and their friends participating in the hard and tiring work of running the hamfest. Without their support, HAMARAMA '92 would not have been the great success it was. I would like to thank the following for their help:

KF6AJ	N3AOG	N3CX	N3DEQ	WB3DNI	K3EOD	K3ESJ
N3EVV	N3EXA	WA2GFP	W3GXB	K3GYS	WA3IAC	KB3IB
W3IIT	N3ITT	K3JUZ	WA3JUF	WB3JYO	WC2K	W3KKN
WA3MGB	N3NGE	WA3NUF	WA2OMY	K3PHY	WORSJ	WA2VLA
KB3XG	WB2YEH	WA3YUE	Angie (harmonic of WA3IAC)			

Visitors at the October Meeting

Leonard Martin, N3NGE, Terre Hill, PA.
John Miller, N3NIA, Kintnersville, PA.

Dave Foster, WD5BRP, Easton, PA.
Glen Codeick, WA3TUL, Glenside, PA.

Health and Welfare

Ex Packrat Charlie Cloud, WB3CPW recently became a silent key. Charlie lived in the Blue Bell area until his retirement when he moved to the Poconos.

Bill, W3HQT, is recovering from triple bypass surgery and is busy making loopers for the Jan VHF Sweepstakes.

Ex Packrat Greg Adams, KD6KD, is on the sick list and is undergoing tests.

Address Change

Bruce Loss, WA3YUE, 2387 Norrington Drive, Jeffersonville, PA. 19403, Phone 215-630-1875.

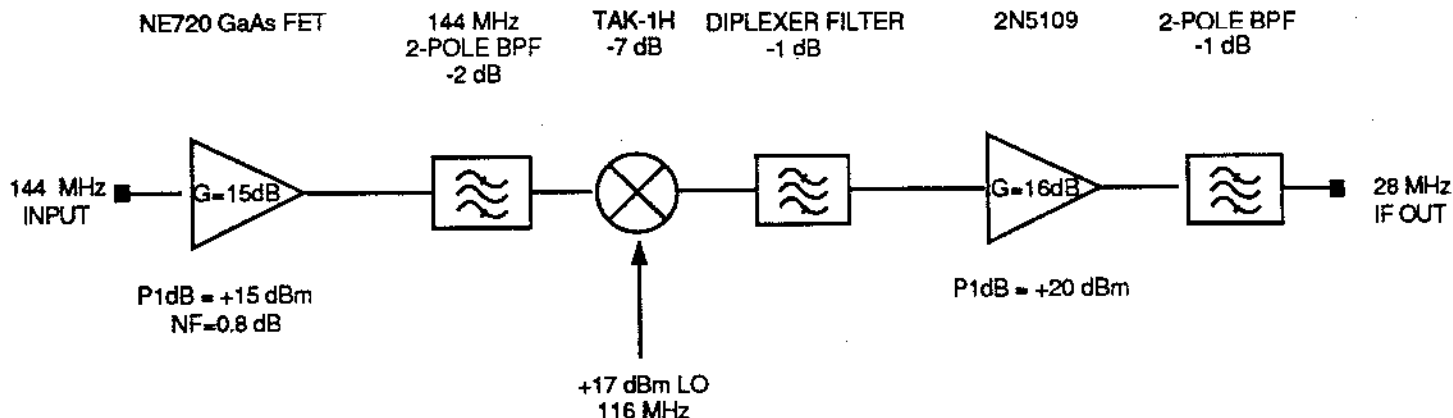
A "CRUNCH-PROOF" 144 MHz RECEIVE CONVERTER

Circuits for a complete 50 MHz transmit and receive converter were presented in Cheesebits over the past several months. A companion 144 MHz transverter will also be presented over the next several issues; a block diagram of the receiver is shown below.

The receive converter was designed for contest operation in high signal level environments; considerable effort went into making it as overload-proof as possible without sacrificing sensitivity. The converter has been in use for two years and handles strong signals very well. Several individuals have already built this transverter; all circuits use straightforward point-to-point construction and are easily duplicated.

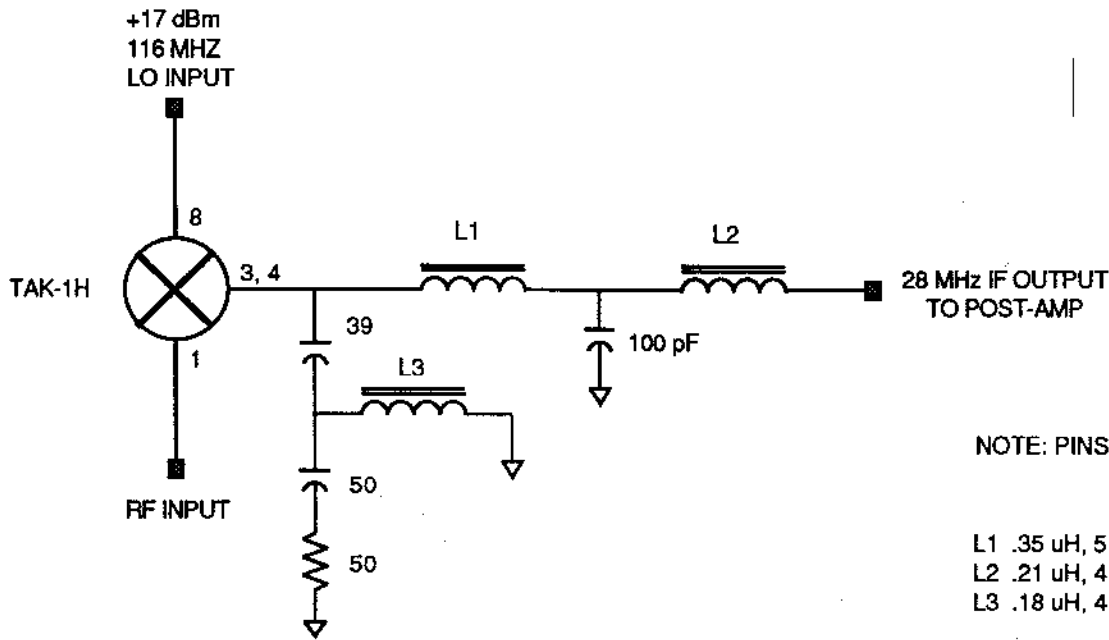
The heart of the receive converter is the Mini-Circuits high level TAK-1H mixer, also used in the transmit converter. The TAK-1H requires a 50 mW (+17 dBm) LO, to be presented next month. While the 50 MHz Transverter uses an SRA-1H, the TAK-1H offers slightly better performance. By using a high level mixer larger signals can be handled without the mixer going into compression. Careful attention was made to limit the conversion gain to provide good sensitivity without driving the 28 MHz IF rig into distortion. Both the preamp and postamp have moderate gain and have been biased for best compression characteristics to minimize distortion. An optional attenuator may be used following the postamp to reduce the gain if needed.

WB3JYO 9-92

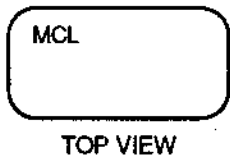


144 MHz RECEIVE CONVERTER
USING HIGH-LEVEL MIXER
WB3JYO 9-92

144 MHZ RECEIVE MIXER AND DIPLEXER FILTER

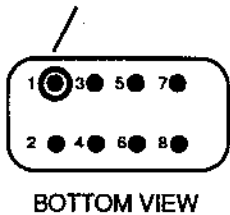


MINI-CIRCUITS TAK-1H



LO	8
RF	1
IF	3,4 (CONNECT TOGETHER)
GND	2,5,6,7

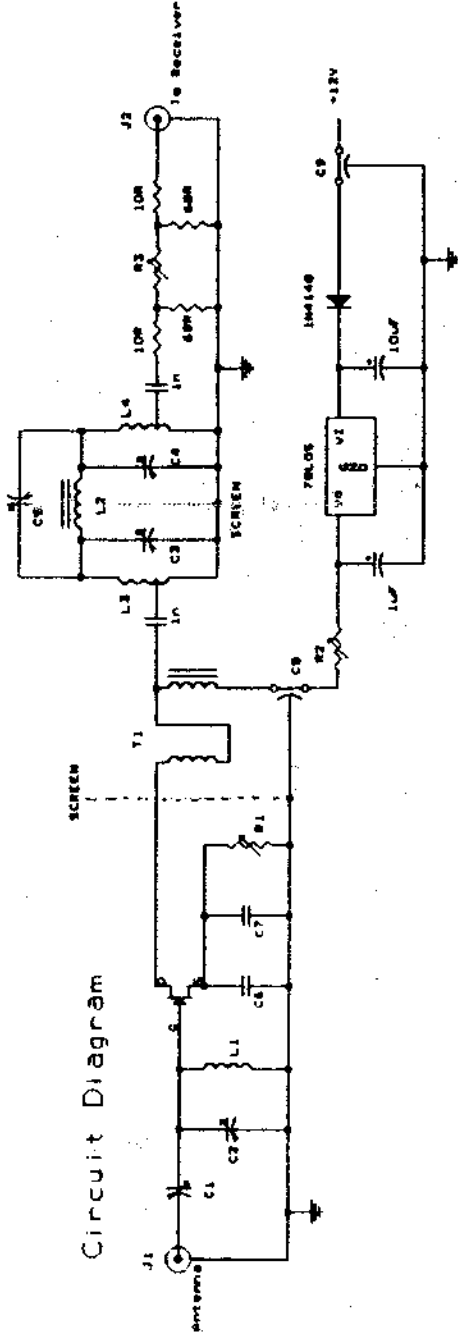
BLUE BEAD INDICATES PIN 1



A diplexer filter follows a Mini-Circuits TAK-1H high-level mixer providing a broadband 50 ohm resistive match for improved third order distortion characteristics. An optional 28 MHz post-amp may follow.

144MHz GaAsFET Preampifier

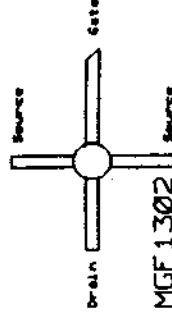
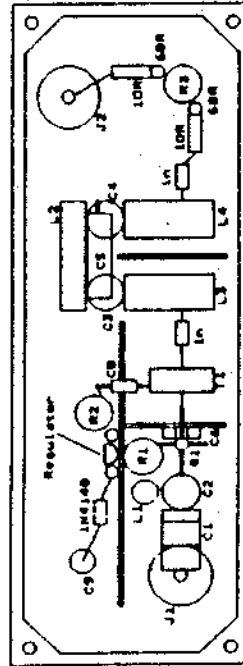
Circuit Diagram



Components

- C1-C4 0.8-10pF piston trimmers Johnson 8200 or equiv.
- C5 0.2-3pF piston trimmer Johnson 8800 or equiv.
- C6-C7 1000pF ceramic chip
- C8-C9 1000pF feedthrough
- L1 9 turns of 22aug. diam ID, spaced 1 wire diameter
- L2 27 turns of 28aug wound on T37-10 toroid
- T1 .10 turns of 28aug bifilar wound on T28-12 toroid
- R1-R2 100K Cermet Trimmer
- J1,J2 8MC or N-type sockets
- D1 MGF 1302 MGF1302, MGF1402, MGF1013L or equivalent
- L3,L4 7 turns of 18aug. diam ID, spaced 1 wire diameter
- L5 1.5 turns

Layout



78L05



Viewed from above

Paul Beestel	
Title	144MHz GaAsFET Preamplifier
File Number	61M8Z/9
REV	1
DATE	11-17-1978

144 MHz GaAsFET Preamplifier

This preamplifier was constructed for EME use. The main consideration was a low noise figure rather than strong signal handling. The result is a preamp that works well off the moon but would be useless in a contest.

The basic design is a standard L input preamp with a 4:1 transformer on the output followed by a filter and an output attenuator to allow the gain of the preamp to be set to match the system it is used with.

The preamp itself is based on designs by W6PO¹, WA5VJB² and WB3JYO³. The filter is a WB3JYO⁴ design and the output attenuator is from G3SEK⁵. The filter was added because a lot of 144MHz preamps have a very wide frequency response which can cause image rejection problems with transverters.

The filter has an inductor, L2, in parallel with the coupling capacitor, C5. These two components together form a trap for 88MHz, the image frequency of 2 metres when using a 28MHz IF. C5 is made variable to allow the notch frequency to be accurately set. It provides about 75dB of attenuation at 88MHz.

All trimmer capacitors in the design were Johanson types. The capacitors are expensive but offer excellent performance. They are available from Piper Communications in the UK. I also used silver plated wire to try to keep losses to a minimum on L1, L3 and L4. This was done in an attempt to improve the circuit Q to provide lower input losses and sharper frequency responses.

R1 sets the current through the device and R2 sets the voltage across it. Initially the device should have about 3V across it and draw 20mA.

My own version of the preamplifier was built into the lid of a diecast box, "dead bug" style. This is the recommended method of construction as it keeps lead lengths and hence losses to a minimum. The box I used was a Maplin one type LH70M with dimensions 96x48x21mm. The layout diagram was based on using this box.

The preamp was initially set up using an off air signal and when measured gave a 0.47dB noise figure and 12dB of gain. After tweaking the preamp gave a 0.33dB noise figure, 14dB of gain and an IP₃ of 5dBm.

The preamp has been successfully used of the moon at G4ZAP and proved very sensitive. The only problem was overload from out of band signals (possibly police) which occurred in the preamp, before the filter. Possible future developments include a cavity design to try and improve the selectivity before the preamp and possibly using a power GaAsFET for an even lower noise figure.

Paul Beastall, G1WBZ - April 1992.

Notes:

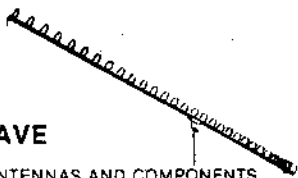
- 1 "Some GaAsFET Preamplifiers" - Bob Sutherland, W6PO, Eimac EME Note.
- 2 "GaAsFET Preamplifiers for 144 and 220MHz" - Kent Britain, WA5VJB, ARRL Handbook, 1988. Pages 31-5 and 31-6.
- 3 "Linear Transverters for 144 and 220MHz" - Paul Drexler, WB3JYO, ARRL Handbook, 1988. Pages 31-17 to 31-28.
- 4 "144 or 220MHz Band-pass Filter" - Paul Drexler, WB3JYO, ARRL Handbook, 1988. Page 31-29.
- 5 "Modern VHF/UHF Front-end Design" - Ian White, G3SEK, RadCom, July 1985. Page 538.

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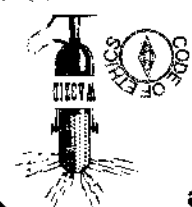
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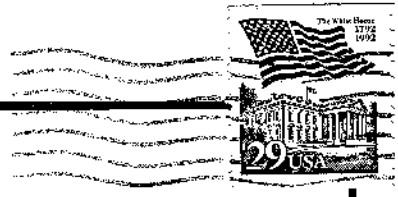
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