

Frequency Measuring Test

FMT

FMT is held in April & November, sometimes there are additional FMT sessions.

CW callup followed by 2 minute solid carrier transmission.

Usually 20m, 40m 80m.



Frequency Measuring Tests



- ARRL Home
- FMT Home
- Data Entry
- Current FMT Results
- Historical Results

0200Z-0225Z Apr 24, Submit Measurements by 0200Z, Apr 27

K5CM 40m (near 7065 kHz)
0200Z Call up for 3 minutes
0203Z Key down for 2 minutes
0205Z End of 40m run

K5CM 80m (near 3599 kHz)
0220Z Call up for 3 minutes
0223Z Key down for 2 minutes
0225Z End of FMT

If the frequency is busy for either run, please standby and the FMT will start as soon as practical.

You don't have to use special lab equipment to enter the FMT. Modern HF transceivers can make frequency measurements quite accurately. SDR transceivers and PC software can make precise measurements of signal frequency.

If you've never entered an FMT before, information on how to measure the frequency of a carrier is available at www.k5cm.com, and in several previous QST articles listed below.

Click on *Data Entry* in the navigation menu near the top of this page to submit your measurements. Results will be available immediately following the data entry deadline. Also, be sure to describe your setup when you submit your measurements online. The *Green Box* in the results shows stations submitting measurements with an accuracy of 1 Hz or better for all FMT frequencies.


FMT Methods

wsjtx Mode → FreqCal

Compare local standard with FMT using fldigi

Compare local standard with FMT using Spectrum Analyser

Compare local standard with FMT using Lissajous pattern



ARRL *The national association for AMATEUR RADIO*

April 2018 Frequency Measurement Test Results

Home	April 6, 2018		
ARRL FMT Page	Actual Radio Frequencies (Hz):		
Data Entry	80m	40m	20m
	K5CM 3,598,169.73	7,064,257.06	14,121,963.34

K5CM All (<=1 Hz):
AA6E, AA6LK, AB1UY, AB2UV, **AC6SL**, AF9A, K1IG, K4BYN, K4CXX, K5ND, K5RKS, K5XL, K6APW, K7KMQ, K8CT, K8DJR, KA1BQP, KA5QEP, KD5MMM, KF7NP, KG5X, KI5EE, KJ6HYC, KM6QX, KN1H, N1IRO, N2GL, N3FG, N3SXI, N6SKM, N7EP, NK6P, VE2IQ, VE3OAT, VE3YX, VE6GRT, W2FD, W2JTM, W2TX, W3DAD, W3JW, W4IVF, W4VU, W4WJ, W5LAC, W6BM, W6DSR, W6OQI, W7DMR, W7GW, W8BL, W8XN, W9GR, W9INE, WA1ABI, WA2DVU, WA4FJC, WA7BNM, WA7IRW, WA9VNJ, WB0OEW, WB4SON, WB8TFV, WD4IYE

Warmed up K3 for several hours

Ran wsjtx Mode → FreqCal

Adjusted K3 REFCLK

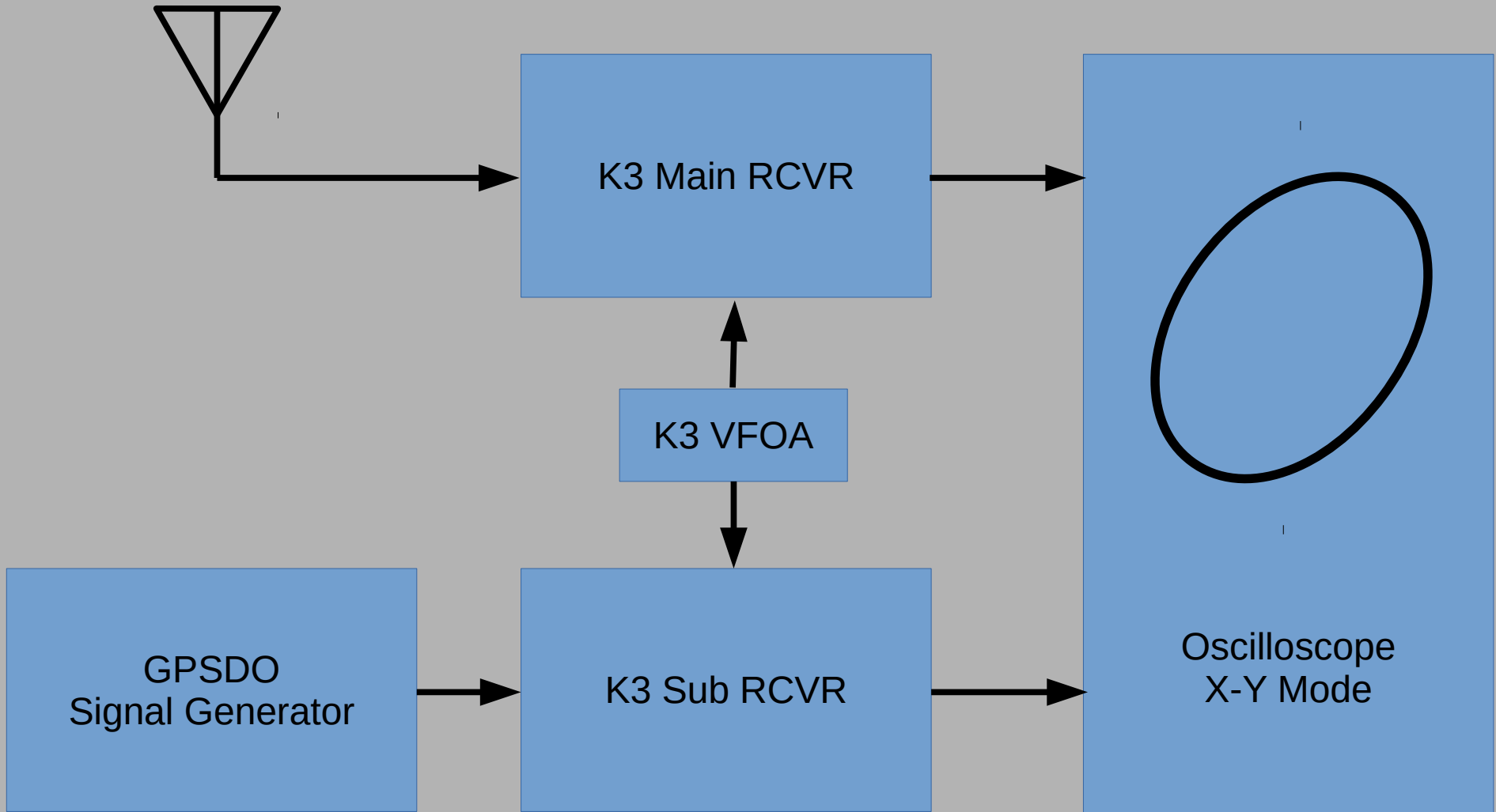
Observed FMT using fldigi while tuning VFO to 600 Hz

Made it to the “Green Box”

Unable to duplicate good result in Nov 2019

FMT Methods

Compare local standard with FMT using Lissajous pattern



FMT Methods

Compare local standard with FMT using Lissajous pattern

On old Tektronix 'scope

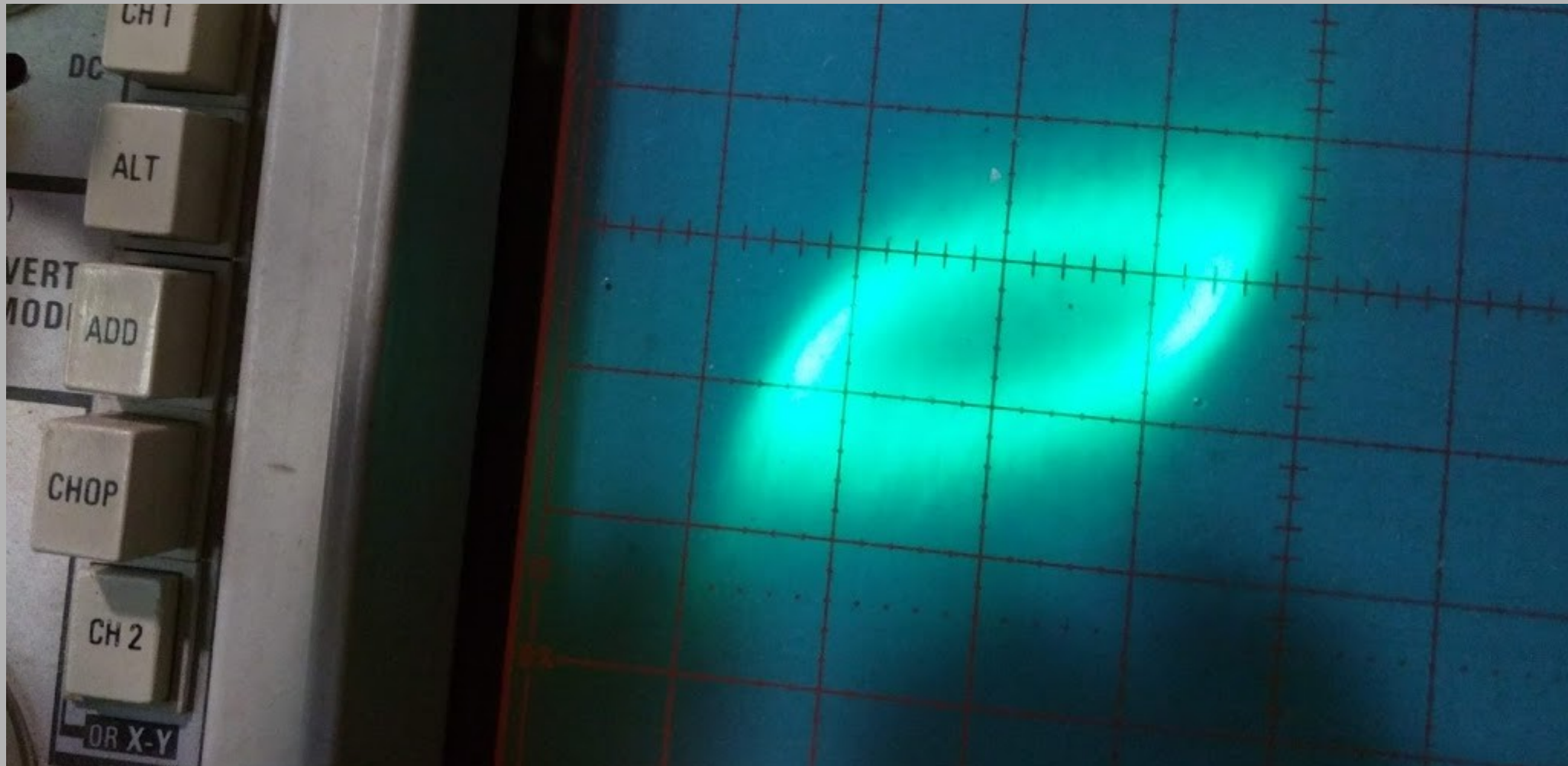


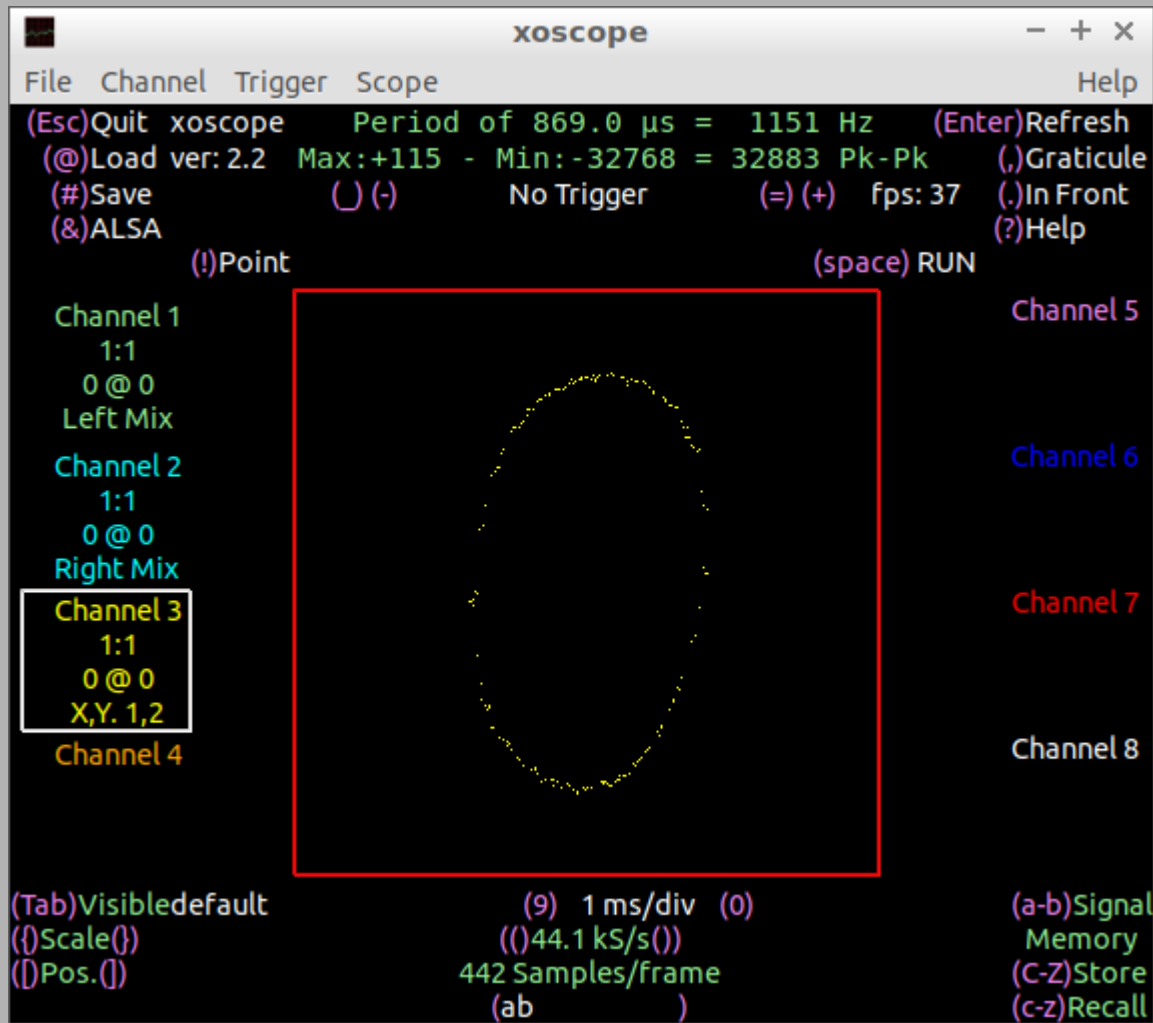
Image was poor, esp. out of focus

Old 'scope took up too much room in shack

FMT Methods

Compare local standard with FMT using Lissajous pattern

Using xoscope, an old open-source linux app



Code for X-Y Mode was missing in most current version.

After considerable study, I wrote a new Math function "X,Y. 1,2".

It has the limitation that no 2 data points can have the same X value. Note the scarcity of points on the vertical sides of the oval.

Using a USB soundcard box, which has stereo input, I can view Lissajous pattern on my shack computer.

GPSDO Signal Generator is tuned until pattern stops rotating.

FMT Methods

Compare local standard with FMT using K3 in diversity receive, viewing Lissajous pattern on xoscope, tuning GPSDO until rotation is minimized.

K5CM FMT May 14/15 2020 UTC

	FMT freq.	My Estimate	Error (Hz)	Accuracy
AC6SL	14121073.387	14121074.000	0.613	4.34E-08
AC6SL	7065327.292	7065327.000	-0.292	4.13E-08
AC6SL	3597772.633	3597760	-12.633	3.51E-06

Results on 20m & 40m were OK, 80m was way-off.

Finding the call-up, getting everything ready, & carrying out a measurement within 2 minutes can be challenging.

My GPSDO stability & ease of rapid tuning are problems.