

# The Frequency Measuring Test

**E**VERYONE invited to take part—3.5 and 7 m.c. to be used—dates, October 24th and 31st (Saturdays)—mark your calendar now—start checking W1XP, W9XAN and W6XX on the Regular S.F. Transmissions.

Everything is in readiness for our first A.R.R.L. Frequency Measuring Test which received preliminary announcement in July and August *QST*. A receiver and a frequency meter will be all the equipment necessary for anyone who wishes to take part; and where will we find any 1931 amateur station without both? Selected transmitting stations will send on schedule for measurement purposes on each of the dates mentioned above. All that any amateur has to do to take part is to tune in for these stations, measure the frequency as accurately as possible, and report to A.R.R.L.

## THE RADIO DIVISION COÖPERATES

The Radio Division, Department of Commerce has signified its willingness to coöperate to the fullest extent possible in making official measurements at the different Radio Division monitoring stations on each of the transmitting stations that will be designated to send in this test. The individual sending stations will each have tested with one of the nearby monitoring stations before the dates of the test so all will be in readiness for the event. The splendid and unreserved coöperation of the Director of Radio and Radio Supervisors with the sending stations should assure that this test goes off perfectly.

## CERTIFICATES

Every contestant has the opportunity to win one of the Certificates of Accuracy that will be issued to those who measure the official test signals within the prescribed reasonable degree of accuracy. The frequency measurements reported by those taking part will be compared by A.R.R.L. Headquarters with the official measurements on the same transmitting station made at the same time by the government monitoring stations. The degree of accuracy of measurement attained by each entrant in the test will be specified on his certificate. In addition we plan to present an Honor Roll in *QST* with the results of the activity and credit for the worthy who take part and report.

## WHO MUST ENTER

While *everyone* is invited to take part, participation in this test is regarded as a *duty* of one particular A.R.R.L. group, the Official Observers. The test will show very many operators who are proficient in frequency measurement work, and each and every Official Observer must show his qualifications by participation or be recom-

mended by his S.C.M. for replacement by better-qualified men who show merit and availability for appointment as O.O. for the 1931-1932 season. Every O.R.S. appointee will take part in this activity as a matter of course, too, and will be expected to report promptly or give a good excuse for failure to do so. The test while designed particularly for United States and Canadian members is open to amateurs of any country who are able to take part at the hours that will be mentioned. YOU are cordially invited to take part and make the most of this opportunity. Not only are you assured a pleasant and profitable experience through the test, but also participation is a form of insurance against the likelihood of off-frequency operation and the unpleasant consequences that follow to amateur radio as a whole as well as to you individually.

## OFFICIAL TRANSMITTING STATIONS

Transmitting stations are being selected depending on their power, frequency stability, geographical location and the like; crystal control and a d.c. note being specified as requirements. Crystal-controlled stations having a temperature-controlled oven as well as really low oscillator plate voltage have been given preference over others, since frequency drift must be avoided insofar as possible, and the only way other stations can even approximate such frequency stability is by recourse to a long "warming-up" period of several hours duration just in advance of the "test."

The final station line-up cannot be given in this issue since correspondence is still in progress but a skeleton arrangement of the schedule that we shall try to fill is given here with the procedure these stations will use; so by following this schedule on the dates of October 24th and 31st anyone will be able to pick up the transmissions and take part fully, without further information. Special crystals will be lent to participating stations for use in this test. *The transmissions will be arranged to start in the eastern time zone at nine p.m. E.S.T. proceeding progressively west, so that transmissions in the Central, Mountain, and Pacific Standard Time zones will each start at nine p.m. local standard time.* There will be no two transmissions taking place at the same time. During the first half of each hour there will probably be two different transmissions somewhere in the 3500-kc. band; and in the second half hour of each hour two transmissions in the 7000-kc. band. At this writing the following are being considered as official transmitting stations:

W1ASY, W1AXV, W1MK, W6AM, W6CUH, W6EGH, W7AAT, W8DMS, W8GU, W9DFR, W9FFD, W9UZ and W9GY with additional qualified stations yet to be heard from.

You are not expected to measure all the stations that transmit. The time, frequency, skip distance, and effects due to conditions may prevent reception of some stations altogether. It is appreciated that the more stations you can measure the better the results will average and so we are attempting to have enough transmissions each evening of the test to cover the country thoroughly. A report on measurements of not less than two separate test transmissions, which may be made on either one or both dates (at any time at all during the test), will be sufficient to enter you. The following table will serve as a guide in listening-in to pick up the official stations to be measured. Each frequency will be used for just 15 minutes.

#### PROCEDURE

Each test transmission will be divided into five-minute periods. The transmitting stations will each send "QST" and sign their identifying call signal for exactly three and one-half minutes. During the next one and one-half minutes three

**FREQUENCY MEASURING TEST**

From ..... (name) ..... (call) .....

..... (street and number) ..... I use { Phone  
CW (check one or both)

..... (city and state) .....

Transmitting Station	Time (Local Std)	Frequency Meter Dial Setting	Frequency	Do Not Write in This Space

#### PREPAREDNESS

The way to be ready for the Frequency Measurement Test is to obtain a frequency meter if you do not already have one, calibrate it from standard frequency transmissions as many times as you possibly can and use it at every opportunity, to get practice and keep your meter "right on the dot." Frequency meters such as the dynatron type described in *QST* and in the *Radio Amateur's Handbook* are recommended, and several references to articles containing con-

Time Zone of Sending Stations	Frequency Band (look for "QST")	Time (Oct. 24th and 31st — p.m.)				Greenwich Time (Oct. 26th and Nov. 1st)
		E.S.T.	C.S.T.	M.S.T.	P.S.T.	
E.S.T.	3500	9:00-9:15	8:00-8:15	7:00-7:15	6:00-6:15	0200-0215
	3500	9:15-9:30	8:15-8:30	7:15-7:30	6:15-6:30	0215-0230
	7000	9:30-9:45	8:30-8:45	7:30-7:45	6:30-6:45	0230-0245
C.S.T.	3500	9:45-10:00	8:45-9:00	7:45-8:00	6:45-7:00	0245-0300
	3500	10:00-10:15	9:00-9:15	8:00-8:15	7:00-7:15	0300-0315
	3500	10:15-10:30	9:15-9:30	8:15-8:30	7:15-7:30	0315-0330
M.S.T.	7000	10:30-10:45	9:30-9:45	8:30-8:45	7:30-7:45	0330-0345
	3500	10:45-11:00	9:45-10:00	8:45-9:00	7:45-8:00	0345-0400
	7000	11:00-11:15	10:00-10:15	9:00-9:15	8:00-8:15	0400-0415
P.S.T.	3500	11:15-11:30	10:15-10:30	9:15-9:30	8:15-8:30	0415-0430
	7000	11:30-11:45	10:30-10:45	9:30-9:45	8:30-8:45	0430-0445
	7000	11:45-12:00 (mid)	10:45-11:00	9:45-10:00	8:45-9:00	0445-0500
P.S.T.	3500	12:00-12:15 (am)	11:00-11:15	10:00-10:15	9:00-9:15	0500-0515
	3500	12:15-12:30 (am)	11:15-11:30	10:15-10:30	9:15-9:30	0515-0530
	7000	12:30-12:45 (am)	11:30-11:45	10:30-10:45	9:30-9:45	0530-0545
	7000	12:45-1:00 (am)	11:45-12:00 (mid)	10:45-11:00	9:45-10:00	0545-0600

30-second dashes will be sent. *This last period is the one in which all frequency measurements should be made.* This procedure will be repeated completely, three times in all, during fifteen minutes of each schedule, making it possible to get three different readings of frequency, which you should designate in your report as (1), (2) or (3) so we can check against the proper official measurement of the Radio Division. Remember, the "QST" is sent to enable listeners to find the station; the long dashes to enable accurate settings for frequency measurements.

#### FORM FOR REPORT

Special log forms will be mailed in advance to all who request them by a postal card, note or message to A.R.R.L. Headquarters. It is not necessary to obtain these forms, but if you make up your own report, the following form is required. Use letter size paper (8½"x11" approx.) ruling off columns as indicated.

structional information were given last month (page 14, August, 1931, *QST*). Right now is the time to make those weekly calibrations from W1XP, W9XAN, or W6XX S.F. transmissions; also to replace batteries on dynatron or heterodyne-types of meters if a check indicates such attention is necessary. Of course using the weekly calibration transmissions should be a habit with every amateur. Now is the time to start checking to get in practice and to learn any special corrections your meter should have due to room temperature or "warming up" characteristics. Summer and fall too are rebuilding time and any station not equipped can obtain necessary parts and have ample time to get ready for the test. The certificate winners in this test which will open our 1931-1932 season will be the operators who start regular checking of meters early, so lose no time.

One final word: The transmitting stations will adhere closely to the time schedule and all opera-

tors taking part should check their clocks, preferably by radio time signals, just in advance of the dates of the test. Also, these dates have both been made Saturday so that everyone may have opportunity for a final check on the frequency meter on Friday night. Don't forget to mark the calendar and be on hand October 24th and 31st, and pick up all the stations that you can locate sending this special test.

Look for final details in October *QST*.

STANDARD FREQUENCY TRANSMISSIONS,  
SEPTEMBER AND OCTOBER

*Dates of Transmission*

Sept. 4, Friday	BB B A	W1XP W9XAN W6XK
Sept. 5, Saturday	BX	W6XK
Sept. 6, Sunday	C	W9XAN
Sept. 11, Friday	BB B A	W6XK W1XP W9XAN
Sept. 13, Sunday	BB C C	W9XAN W6XK W6XK
Sept. 18, Friday	C	W1XP
Sept. 20, Sunday	C	W1XP
Sept. 25, Friday	A B B	W1XP W9XAN W6XK
Oct. 2, Friday	BB B A	W1XP W9XAN W6XK
Oct. 3, Saturday	BX	W6XK
Oct. 4, Sunday	C	W9XAN
Oct. 9, Friday	BB B A	W6XK W1XP W9XAN
Oct. 11, Sunday	BB C C	W9XAN W6XK W6XK
Oct. 16, Friday	C	W6XK
Oct. 18, Sunday	C	W1XP
Oct. 23, Friday	A B B	W1XP W9XAN W6XK
Oct. 30, Friday	BB B A	W1XP W9XAN W6XK
Oct. 31, Saturday	BX	W6XK

STANDARD FREQUENCY SCHEDULES

Time (p.m.)	Friday Evenings Schedule and Frequency		Friday and Sunday Afternoons Schedule and Frequency		
	A	B	Time (p.m.)	BB	C
8:00	3500	7000	4:00	7000	14,000
8:08	3550	7100	4:08	7100	14,100
8:16	3600	7200	4:16	7200	14,200
8:24	3700	7300	4:24	7300	14,300
8:32	3800		4:32		14,400
8:40	3900				
8:48	4000				

  

Saturday Morning Schedule and Frequency	
Time (a.m.)	BX
	kc.
4:00	7000
4:08	7100
4:16	7200
4:24	7300

The time specified in the schedules is *local standard time at the transmitting station*. W1XP

uses Eastern Standard Time, W9XAN, Central Standard Time, and W6XK, Pacific Standard Time. Schedule BB transmitted by W1XP is intended particularly for European amateurs and starts at 2100 G.C.T. Schedule BX is transmitted especially for amateurs in Oceania and the Far East. It is transmitted starting at 1200 G.C.T. by W6XK. Reports on these special schedules are particularly desired, not only from overseas hams but from those in the Americas.

Although the frequencies of the transmitting stations are not guaranteed as to accuracy, every effort is made to keep to within 0.01% of the announced frequencies. The frequency standards are calibrated against the National Frequency Standard. Frequent checks on the transmissions are made by laboratories equipped with accurate frequency standards and the transmissions are also checked by the U. S. Department of Commerce monitoring stations.

TRANSMITTING PROCEDURE — NEW  
CHARACTERISTIC LETTERS

The time allotted to each transmission is 8 minutes, divided as follows:

2 minutes — QST QST QST de (station call letters).

3 minutes — Characteristic letter of station followed by call letters and statement of frequency. For the month of September, the characteristic letter of W1XP will be "G"; that of W9XAN will be "D"; and that of W6XK will be "F." *Effective October 2nd, however, the characteristic letter used by W9XAN will be changed to "O" and that used by W6XK will be changed to "Z."* W1XP will continue to use "G." The new letters will be more suitable for calibration purposes.

1 minute — Statement of frequency in kilocycles and announcement of next frequency.

2 minutes — Time allowed to change to next frequency.

THE TRANSMITTING STATIONS

W1XP: Massachusetts Institute of Technology, Round Hill Research, South Dartmouth, Mass., Howard A. Chinn in charge.

W9XAN: Elgin Observatory, Elgin National Watch Company, Elgin, Ill., Frank D. Urie in charge.

W6XK: Don Lee Broadcasting System, Los Angeles, Calif., Harold Peery in charge.

REPORT AND TEST BLANKS

Blanks for reporting on the regular S. F. transmissions will be sent postpaid upon request. Just send a card or message to the Standard Frequency System, *QST*, West Hartford, Conn., asking for S. F. blanks. Although no formal entry in the October tests is necessary, log sheets for recording the measurements and schedules of the

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# Guaranteed Bargains!

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**ROYAL HEAVY DUTY TRANSFORMERS**  
Powerful and sturdy! Carefully constructed of the best materials. Guaranteed for one year against any defect. Mounted.  
2000 and 1500 each side of center-tap. 800 Watts. 28 1/2 lbs. \$13.25  
1500 and 1000 each side of center-tap. 375 Watts. 19 lbs. \$9.65  
1500 CT. 7 1/2 CT. 7 1/2 and 2 1/2 CT. 2 1/2 lbs. \$6.45  
1200 CT. 7 1/2 CT. 7 1/2 and 2 1/2 CT. 200 W. 11 lbs. \$5.85  
Filletment: Completely shielded in metal containers.  
2 1/2 V-12A — \$2.25; CT., \$2.75. 7 1/2 V-6A — \$2.75; CT., \$3.20.  
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7 1/2 Volt. 3 Amp. (CT) and 7 1/2 Volt. 3 Amp. (Not CT).....\$3.65  
**ROYAL 30 Henry, 300 Milliampere Extra Heavy Chokes. 80 Ohms. 18 lbs. — \$8.65. 15 H, 300 MA. 75 Ohms. 7 1/2 lbs. \$4.15**  
**ACME Chokes. New Open frame mounting. Very neat. 30 Henry, 200 MA. — \$3.95. 20 Henry, 300 MA. — \$2.75**  
**THORDARSON 30 H., 200 MA. Power Chokes. Completely shielded. 250 Ohms. 2000 Volt insulation. 6 Lbs. — \$2.70**  
**SPECIAL 30 H., 200 MA. Chokes. Very rugged. — \$2.45**  
Double: Each section 30 H., 200 MA. — \$4.65  
**GENERAL ELECTRIC 5 H, 1000 MA. Heavy Duty Choke in metal case. 5,000 Volt insulation. 25 Ohm. 11 lbs. Three for \$7.25. Each — \$2.42**  
**RCA Double. Two 30 H. 125 MA. Chokes in heavy metal case. 1500-Volt insulation. 6 lbs. Special — \$1.85**  
Mounted RF Chokes. 85 MilliHenry.....35c

## SEPTEMBER SUPER-SPECIALS

One to a customer This Month only  
**POLYMET 8 Mfd. Electrolytic Condensers. New ....60c**  
**SANGAMO (Illini) .00025 Mica Condensers. Doz. ....60c**  
**RCA 15 Henry, 50 MA. Power Chokes .....20c**

**New low prices on FLECHTHEIM TRANSMITTING FILTER CONDENSERS**  
Capac. DC Working Voltage  
By 1000(HS) 1000(TC) 1500 2000 3000 5000 7000  
1 Mfd. \$1.35 \$2.02 \$2.43 \$5.88 \$11.76 \$17.64 \$50.  
2 Mfd. 2.43 3.51 4.32 8.82 19.11 32.34 95.  
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**CARDWELL CONDENSERS**  
Receiving (750 Volt): .0001 — \$2.35. .00025 — \$2.50. .00035 — \$2.80. .0005 — \$2.92. .001 — \$6.53. Transmitting (3000 Volt): .00022 — \$3.18. .00044 — \$6.23. .00088 — \$6.23. 6000 Volt: .00023 — \$2.55. .00011 — \$6.23. 7500 Volt — .0003 — \$47.08.  
All other CARDWELL Condensers at 41% off list.  
**JEWELL No. 88. 1000 Volts DC (External resistors) — \$14.95.**  
2000 Volt \$22.45. 1000 ohms per volt. All other types at lowest prices.

Pentode output transformers to voice coil. As used on Wright-Decade Dynamos. Push-Pull or single.....\$1.65  
**VICTOR 30 Henry, 125 Mill chokes.....\$1.25**  
**ROYAL Porcelain Stand-offs. Black or White, ea. 10c. Dozen 94c**  
**CENTRALAB 25,000 or 50,000 ohm Potentiometers.....35c**  
No. 12 Heavy Bus-Bar. 18" long. Per Doz. \$2.15  
**TUNGSOIL metal-cased Condensers: 2, 2, & 2 Mfd. 1100 Volt w/g. — \$2.95. 1 Mfd. 1500 & 2 M-1000 — \$1.95. 6, 1, 1, 1, & 1 Mfd. 1000 V. — \$3.65.**

**BRISTOL Double button Mike Transformers.....\$1.95**  
**COMPLETE TRANSMITTERS AND RECEIVERS ALSO IN KIT FORM**  
**SPECIAL Microphone Transformer for double button mikes. Can also be used for single button. Excellent quality.....\$1.25**  
**WARD-LEONARD 10,000 ohm 9" long — 65c. 4" CT — 45c**  
**HH 50,000 Ohm. 50 Watt Grid Leaks.....70c**  
**CARTER "Hi-Watt" 10,000 ohm wire-wound Potentiometers. .25 Watt. FB for variable grid leak for Xmitter.....85c**  
**RCA 5000 Ohm 50 Watt — 39c. Electrad 50,000 .25 W. — 82c**  
Highest Quality Tubes. Free 15 Day replacement. UX-281 — \$1.45. UX-210, 250 — \$1.95. 280, 245, 171-A, 112-A, 227, 226.....65c

Get our low prices on all  
Acme, Aerovox, Jewell, Weston, Flechtheim, Thordarson, Signal, Cardwell, Electrad, Akra-Ohm, Vibroplex, etc., etc., parts.

**PARCON TRANSMITTING FILTER CONDENSERS**  
Metal-cased with stand-off insulators. Fully guaranteed!  
Working Voltage 1 Mfd. 2 Mfd. 4 Mfd.  
1000 Volts DC.....\$1.20 \$1.85 \$3.10  
1500 Volts DC.....1.85 3.00 5.60  
2000 Volts DC.....2.85 5.25 8.35

First time at these new low prices. Order Now!  
**RCA metal-cased 1 Mfd., 1000-volt Condensers.....65c**  
**FEDRAL 2 Mfd., 1000 Volt working Filter-cased.....\$1.10**  
**DUBILIER .002, 6000 Volt working Mica Condensers.....\$1.75**  
2 Mfd., 200 Volt metal-cased Condensers.....15c  
Uncased By-pass. .1, .25, .5, or 1 Mfd.....10c  
**BRADLEY 500 Watt Radiostat.....\$5.38**

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Special prices to "Cash and Carry" Customers. Drop in!  
Because of the high cost of handling we cannot accept orders under \$2.50. 20% Deposit required. Postage extra.

## HARRISON RADIO CO.

189 Franklin Street Dept. T New York City

of the gang. We have a whole bale of wise cracks stored away in the files.

When using monitor harmonics for checking a transmitter in which doublers are used it is advisable to employ an odd harmonic of the monitor. This eliminates the oscillator and doublers and only the keyed signal is heard.

— W9BJW

W2FP-W2AHI points out that Type '24 tubes with carbonized plates are made that way to eliminate secondary emission. Pick out one with a bright plate for that dynatron frequency meter.

W8QV suggests putting the date of issuance of call letters on QSL cards to keep records in better shape.

Ninth district calls are getting out of hand these days. W9COW worked W9HEN recently and told him he had a "chicky" call, and added that his was no "bull," either. They're thinking of starting a barnyard club.

O. H. Mills, whose high-resistance initials were mentioned in May QST, writes that in spite of his high resistance he also has "mills." HI. He no longer has the call W8DMA, however, but it is now pounding brass on WFOO.

## The S. F. Transmitter at W1XV

(Continued from page 33)

help to answer many of the questions that are being asked regularly by amateurs and observers who use the standard frequency signals; and that it will dispel such ideas as the common one that a large number of accurately calibrated quartz crystals are used to control the transmitter!

## The Frequency Measuring Test

(Continued from page 38)

Official Transmitting Stations will be sent to all who ask for them. It is suggested that amateurs in foreign countries send in their requests for test material as soon as possible, particularly those who will not receive October QST before the tests.

## WWV 5000-KC. TRANSMISSIONS

The Bureau of Standards Station WWV will transmit calibration signals on 5000 kilocycles, accurate to within one part in a million, between 2:00 and 4:00 p.m. and between 10:00 p.m. and 12:00 midnight, E.S.T., on the following Tuesdays: Sept. 8th, 15th, 22nd, 29th; and between 2:00 and 4:00 p.m. and between 8:00 and 10:00 p.m., E.S.T., on the following Tuesdays: Oct. 6th, 13th, 20th, 27th. Reports on the reception of these signals should be sent to the Bureau of Standards, Washington, D. C., or via A.R.R.L. Headquarters.

— F. E. H. and J. J. L.