WOR

1440 BROADWAY

NEW YORK 18, N. Y.

WOR
OPERATING MANUAL

BOOK No. 15

P.E.-T&A.E. REF.
BOOK

Book No. 11.12 - Contents:-

FRED M. LINK 125 West 17th Street NEW YORK CTIY

DESCRIPTIVE SPECIFICATIONS
Frequency Meter Monitor
Model B

~~D~~ H. F.

The Model B Frequency Meter Monitor has been designed for accurate frequency adjustment of equipment used in relay broadcast service. It is capable of checking four separate frequencies between 1500 kilocycles and 40 megacycles with an accuracy of .01% or better. Electrically the monitor has been designed for flexibility, easy operation, extreme portability, and ruggedness.

The monitor contains a variable oscillator that covers a range of approximately .2% of the selected frequency. Four separate inductances are selected for the variable oscillator circuit by means of a four position switch on the front panel. A heavy, widely spaced condenser and a National micrometer dial are used to tune the variable oscillator. The inductances are slug tuned to permit changing of the frequencies to be checked by about 20% if such change should be desirable to meet future frequency allocations.

A crystal oscillator with crystals ground to the four frequencies, or their submultiples, is provided for self-calibration of the variable oscillator at the operating frequencies. The crystals are "AT" cut to reduce temperature drift to a minimum. Selection of the crystal corresponding to the inductance used in the variable oscillator is accomplished simultaneously by the four position switch. A sensitive untuned grid leak detector permits reception of the signal to be monitored and a stage of audio amplification following the detector provides ample output for earphone operation. Switches on the front panel turn on the filament voltage, and select either or both the variable and crystal oscillator. Thus, the monitor may be used to:

A. Check 4 frequencies directly against the crystal oscillator.
B. Check 4 frequencies against the variable oscillator.
C. Monitor the radiated signal through the untuned detector.
D. Radiate a signal from either oscillator for receiver alignment.

The tube complement inculudes a 1C5G as variable oscillator, a 1A5G-1C5G as crystal oscillator, a 1N5G as untuned detector, and a 1A5G as audio amplifier. These low current drain tubes permit the use of a battery power supply that, while small enough to be contained in the monitor case, has practically shelf life. The battery terminals are brought out on the front panel to pin jacks so that the battery voltage can be checked without removing the monitor from its case. The monitor is contained in an aluminum carrying case fitted with a cover, carrying handle and rubber feet. The dimensions of the case with the cover in place are 12" high, 7" wide, and 8" deep. Aluminum construction throughout results in a weight for the complete monitor, including batteries, of only 12½ pounds.

NOTE: 10/25/50 - EQUIPMENT MODIFIED BY LINK RADIO CORP. TO CHECK THE FOLLOWING NEW FREQ. ASSIGNMENTS:

26.13 mc 26.37 mc
26.17 mc 26.47 mc
26.27 mc

FRED M. LINK 125 West 17th Street NEW YORK CITY

OPERATING INSTRUCTIONS FREQUENCY METER-MONITOR MODEL B.

This type Frequency Meter-Monitor has been designed for accurate frequency adjustments on equipment operating within relatively narrow frequency bands. It may be supplied for operation at 4 frequencies and is variable over a range up to approximately ± .2% of the stated frequencies. It consists essentially of a stable electron-coupled oscillator, a self-contained crystal controlled check oscillator, a heterodyne detector, and amplifier.

Switches are provided so that either oscillator may be turned on at will. This unit, Ser. No. 2, is adjusted to operate primarily on ~~35,620~~ 26,130 ~~26,170~~ ~~26,270~~ ~~26,370~~ & 26,470 ~~35,260~~, ~~37,340~~, ~~39,620~~, and may be used for accurately checking these frequencies. Four low drift crystals are supplied with the unit for accurate self-calibration on the operating frequencies.

Normal operation of the monitor is accomplished as follows. The unit has a self-contained battery supply and may be turned on with the filament switch. Set the main tuning dial at ~~50~~ (see curves), plug in a pair of phones and the antenna rod and put both the crystal and variable oscillator switches in the "ON" or up positions, determine from the calibration chart which channel is to be used and put the channel switch in the corresponding position. By means of the ~~zero beater~~ knob adjustment to the left of the tuning dial, adjust the beat note heard in the phones to zero beat. This operation places the variable oscillator in exact calibration at the operating frequency. To check the frequency of a transmitter, place the monitor close to the transmitter so that a small voltage may be picked up by the monitor antenna. With only the variable oscillator on, tune the monitor to zero beat and note the dial reading. By means of the calibration chart this dial reading may be interpreted directly in percentage off frequency. Obviously the unit may also be used as a radiating signal generator for receiver checks.

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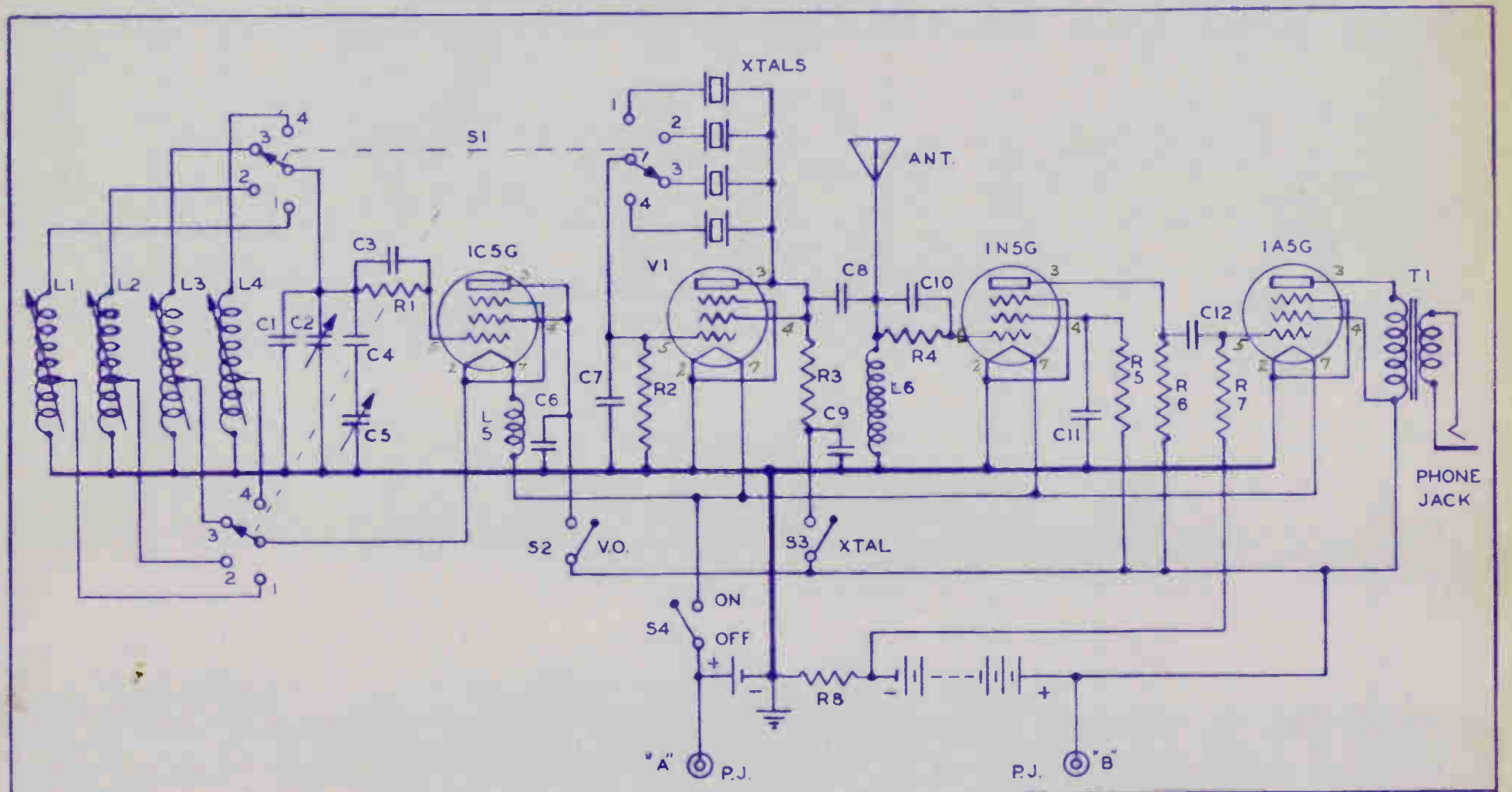
OPERATING INSTRUCTIONS
FREQUENCY METER-MONITOR
MODEL B.

The monitor is so constructed that it may be adjusted to monitor frequencies other than those for which it was originally set at the factory. The percentage bandwidth in each case remains constant because the fixed and variable capacitors in the oscillator circuit are not changed from one channel to another. Instead, four separate inductances are used and each is brought into the proper range by a movable iron core which adjusts the inductance to the proper value. The coils are graduated in inductance range so that the entire frequency range of 30 mc to 45 mc may be covered.

To adjust a channel to a new frequency, the procedure is as follows. Plug in the crystal corresponding to the new frequency in the proper channel. The channels cover the frequency range roughly as follows. Channel 1 30 mc to 37.1 mc; Channel 2 32.25 mc to 39.25 mc; Channel 3 36.8 mc to 45 mc; Channel 4 39.5 mc to 44.8 mc. Set the main tuning dial at 50, the trimming condenser at approximately mid-scale, and bring the variable oscillator to zero beat with the crystal by adjusting the iron core in the coil being used. This is done from the top of the chassis by loosening the locknut on the adjusting screw and rotating the screw to place the iron core in the proper position, thereby changing the inductance to the necessary value.

Test positions are supplied on the front panel for checking battery condition. Either voltage is checked against ground. The high voltage should be 90 V. maximum, and the low voltage 1.5 V. maximum. When the voltage has decreased 20% below these values, the batteries may be replaced by removing the panel and chassis from the case. The batteries are held in place by a metal clamp which may be removed by loosening the knurled thumb screw. Replacements may be ordered from Burgess Battery Company under the numbers 2PBP for the filament battery, and Z30IX for the plate batteries.



V1 - ON HIGH FREQUENCY - 1C5G
ON INTERMEDIATE FREQUENCY - 1A5G

MODEL B - 4 BAND
CRYSTAL FREQUENCY MONITOR

FRED M. LINK
125 W. 17 ST. N.Y.C.

DRAWN BY - GEC
CKD BY -
APPROVED BY -

DWG. NO. 519 - 1
DATE - 8-25-39.

PARTS LIST
Dwg. 519-1
Ultra High Frequency
Model B 4 Band Crystal Frequency Monitor

C1 - 125 mmfd. Silver Mica cond.
2 - 28 mmfd. National SSU28
3 - 100 mmfd. Type C
4 - 7 mmfd. Silver Mica cond.
5 - 5 mmfd. A.P.C. Special
6 - .004 mfd. Type C
7 - 50 mmfd. Type C
8 - 1 mmfd. (Wire capacity)
9 - .004 mfd. Type C
10 - .0002 mfd. Type C
11 - .05 mfd. 400 V. Paper
12 - .05 mfd. 400 V. Paper

S1 - Oak 3 wafer 4 position switch
2 - S.P.S.T. Toggle Switch
3 - " " "
4 - " " "

Batteries:
1 - 1½ V. Burgess #2FBP
2 - 2- 45 V. Burgess #Z30NX

R1 - 50 M ohms 1 watt
2 - 10 M ohms "
3 - 20 M ohms "
4 - 1 megohm "
5 - 2.5 megohm "
6 - 500 M ohms "
7 - 1 megohm "
8 - 500 ohms "

L1 - Variable Inductance
2 - " "
3 - " "
4 - " "
5 - R.F. Choke Special
6 - 2.5 mh. R.F. Choke

T1 - Kenyon KR19M

P.J. - Pin Jack Yaxley
Phone Jack - Yaxley

XTALS

Band 1 3952.5 Kc Ser. # 1650
" 2 4407.5 " " 1651
" 3 4667.5 " " 1653
" 4 4952.5 " " 1655

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SUPPLEMENTARY INSTRUCTIONS
FOR MODEL MODEL-MONITOR
MODEL B SERIAL NO.

In order to maintain a high degree of stability, the variable oscillator is on a sub-multiple of the frequency to be checked.

For Band 1- ~~31,620 KC~~ 26,170 KC the variable oscillator is set at ~~15,810 Kc~~ 13065 KC and its 2nd harmonic is utilized.

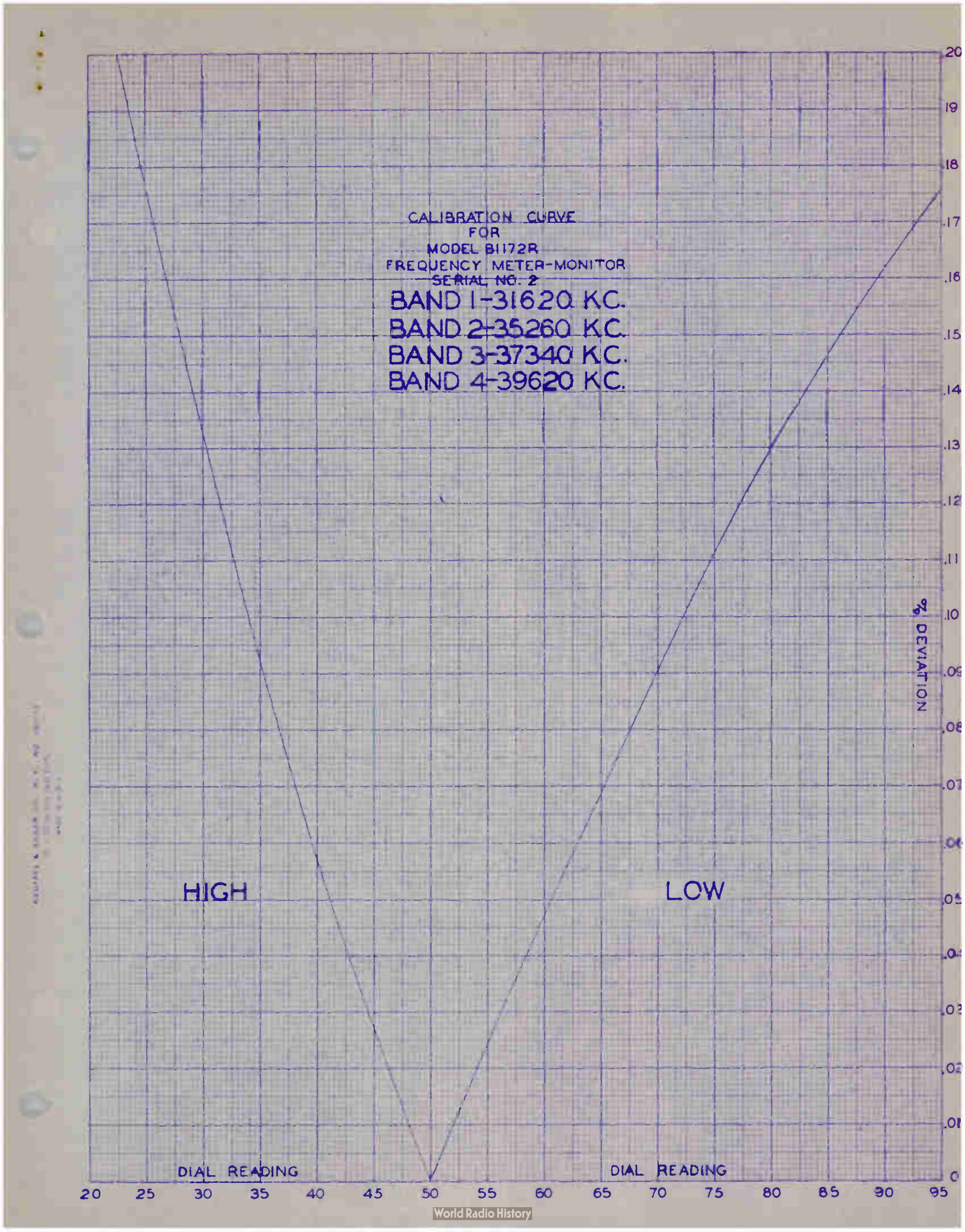
For Band 2- ~~35,260 KC~~ 26,170 KC the variable oscillator is set at ~~17620 Kc~~ 13085 KC and its 2nd. harmonic is utilized.

For Band 3- ~~37,340 KC~~ 26,270 KC the variable oscillator is set at ~~18,670 Kc~~ 13135 KC and its 2nd harmonic is utilized.

For Band 4- ~~39,620 Kc~~ 26,370 KC the variable oscillator is set at ~~19,810 Kc~~ 13185 KC and its 2nd harmonic is utilized.

The crystals are on the ~~8th.~~ 6th sub-multiple of the frequencies to be checked.

For Band 5 - 26,470 KC the variable oscillator is set at 13235 KC and its 2nd harmonic is utilized.



FRED M. LINK 125 W. 17 ST NEW YORK

B1172R

TYPE [redacted] FREQUENCY MONITOR

FREQUENCY CHECK RECORD

SERIAL NO. 2

DATE	FREQ.	DIAL	CHECKED BY
7/26/39	31620, 35360 37340, 39620	50	FRED M. LINK
10/3/40	31620, 35360 37340, 39620	50	FRED M. LINK