JAMES MILLEN
MANUFACTURING COMPANY, INC.

Engineers and Manufacturers 150 *Exchange St. Malden 48, Mass.*

MALDEN 4-4108

April 13, 1956

Mr. Grote Rever
University of Tasmania
Hobart, Tasmania
Australia

Dear Mr. Rever:

Mr. C. H. Schauer of Research Corp. called us this morning to tell us of your need to measure the impedance of low impedance co-axial cable at 500 kc.

We advised Mr. Schauer to call Technical Equipment, our export agents, and have them ship to you by air express

1 - #90672 Antenna Bridge
1 - #46704 Low Frequency Inductor

The #46704 coil is needed to tune your 90651 Grid Dip Meter to 500 kc. Mr. Schauer said we had better send the coil rather than take the time to inquire whether you already have a coil for 500 kc.

Should you find insufficient sensitivity at 500 kc, replace the Bridge coupling coil with a larger coil which is self resonant at a lower frequency than the coil supplied with the Bridge. Possibly, you may resort to a high impedance source of r-f energy directly coupled to the Bridge coil jack.

You may remember the writer as the nephew of Leonard Caywood who visited you in Wheaton, Illinois in the early thirties.

Yours truly,

R. Wade Caywood

R.Wade Caywood
Chief Engineer

RWC/emp
cc: Mr. Augusto Magnani
Technical Equipment Co.
Main & Milton Streets
Rahway, New Jersey

26/9/56

Antenna Terminal open

Antenna Bridge Input Capacity

Ohms Dial	Capacity pf.
5	25
50	86
500	160

2 coil has 14 pf C to ten
5 at center scale the circuit
capacity will be 100 pf.

At 500 KC required inductance is

$L = 1/(6.28 \cdot 5 \cdot 10^6)^2 \cdot 100 \cdot 10^{-12} = 1/1000 = 1\,mh.$

Antenna Terminal at 50Ω

Ohms dial	Capacity pf	Q Measured at 2.2 mc
5	166 pf	20
50	165 pf	30
500	164 pf	20

$\left(\frac{550}{450}\right)^2 \times 165 = 247$

$247 - 165 = 82$ pf variation

= 1.5:1 inductance pf capacity ratio required.

Looking at coil rotor end; the right terminal is ground.

Net adjusting range 4.0 to 7.9 divisions on grid dip meter dial

23/7/56

11/12/56

Low Frequency Antenna meter Coil

Capacity 165 pf fixed.

Frequency range 140-200KC.

Inductance at max frequency

$$L = \frac{1}{\omega^2 C} = \frac{1}{(6.28 \cdot 2 \cdot 10^5)^2 \cdot 165 \cdot 10^{-12}} = \frac{1}{\approx 80}$$

= 3.84 mh with core out

= 7.68 mh " core in

13/12/56

Tuning range 3.6-7.8mh at 1000 cycles.

solid wire coil of 6Pi

17/12/56

Coil heavy Litz

2¼" long, 1⅝" I.D., 2⅛" O.D.

Freq	Q	C
140	190	308
170	168	200
200	145	143

$C_0 = \frac{300 - 4.70.2}{3} = \frac{300 - 280.8}{3}$

$= \frac{19.2}{3} = 6.4$ pf.

Connected to antenna meter with 50pf shunt

Grid dip meter dial 4.1 (approx 165KC)

" " " 4.2 on meter

When grid dip meter tuned thru resonance the antenna meter shows peaks of 7.0 & 8.5 when goes from high to low & low to high.

2/5/57

Apparently no data on either final coil used on antenna meter. These should be measured up.

G.R.

West Point Riviera Hotel

(Proprietors Australian National Hotels Ltd.)

HOBART, TASMANIA

TELEPHONE: 9516 (4 LINES) TELEGRAMS: "WREST POINT" HOBART

17/12/56

Coil 3" dia 5 1/2" long,
approx 330 turns enamelled wire .016

F	Q	C
140	161	325
170	187	211
200	197	152

$C_0 = \frac{200 - 4 \cdot 46.1}{3} = \frac{200 - 184.4}{3} = \frac{15.6}{3} = 5.2$ pf.

Connected to antenna meter with 20 pf shunt.
Grid dip meter 6.5 dial (approx 170 KC)
" " " 3.4 on meter

as grid dip meter tuned thru resonance, the antenna meter shows peaks of 6.0 + 8.0 ma. when going from high to low and low to high respectively. Coupling quite loose.

$$L_0 = \frac{1}{(6.28 \cdot 14 \cdot 10^6)^2 \cdot 330 \cdot 10^{-12}} = \frac{1}{254} = 3.92 \text{ mh.}$$

17/12/56

Coil of 6 Pi solid wire
Slug core. 166pf shunt capacity

Freq	Q	Core
229 kc	14	out
199	12	middle
169	10	in

$C_0 = \frac{386 - 4 \cdot 96}{3} = \frac{386 - 384}{3} =$

$\frac{2}{3} = .66$ with core out (too low) poor readings due to low Q

Connected to grid dip meter with core part way in
Grid dip meter dial 5.4 (approx 170 KC) coupled to antenna meter
" " " 3.1 on meter running type
" " " 3.6 " "
Tuning slope resonance gives peaks of 2.3 either way with no pulling. Very tight coupling
Coil has so much loss it looks like a resistance