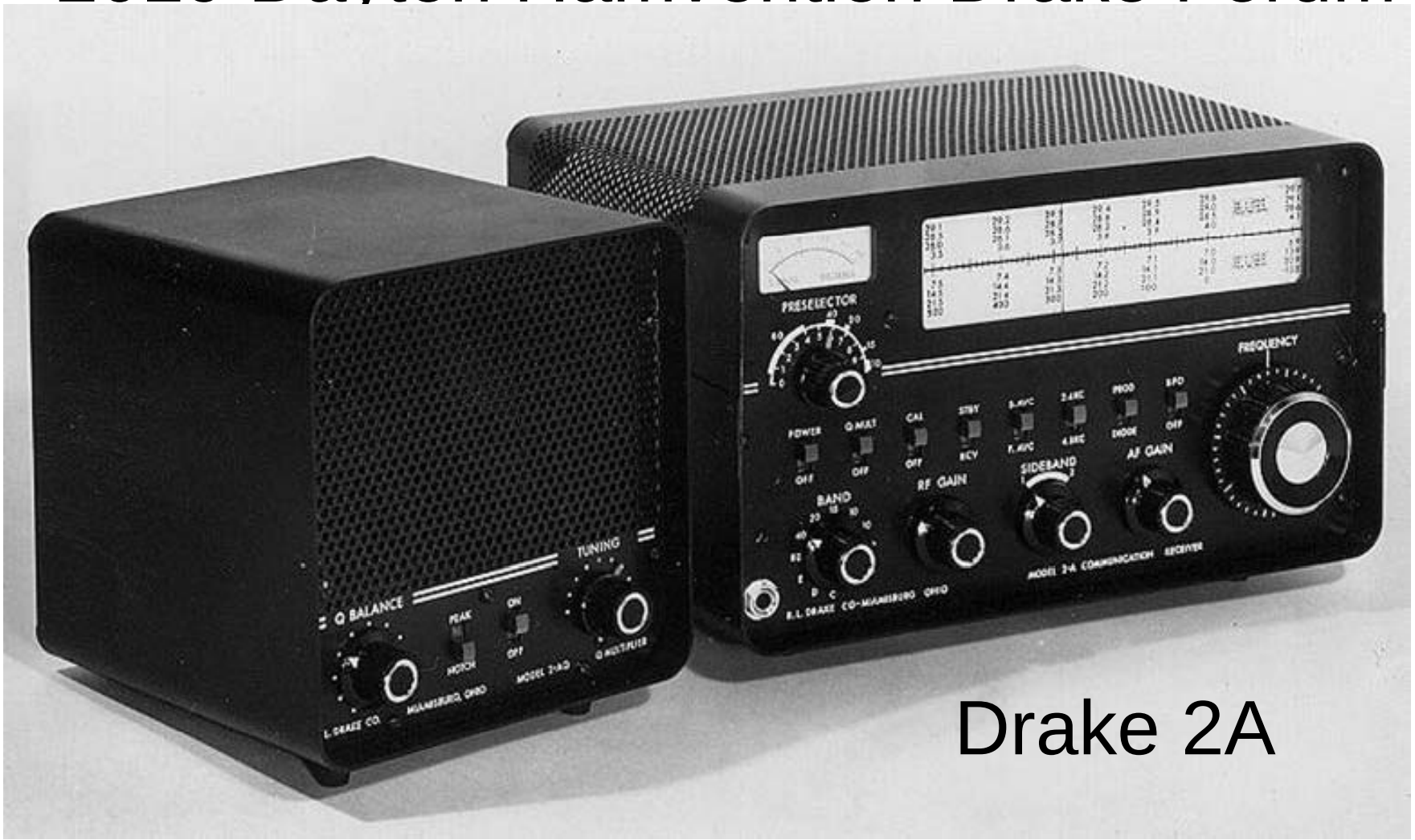
2019 Dayton Hamvention Drake Forum



Drake 2A

- **Drake Forum Committee**

- **Mark Gilger – WB0IQK**
- **Peter Shilton – VE7PS**
- **Mike Bryce – WB8VGE**
- **Jeff Covelli – WA8SAJ**

Agenda

Introduction – Mark Gilger

Drake Trivia – Peter Shilton

The Heathkit Shop Drake Equipment Upgrades – Mike Bryce

R.L. Drake Chief Engineer, Milt Sullivan. – Jeff Covelli

Question & Answer Session

Drake Trivia

M.V.G. May 2016

- The ***early*** **R-4A** receiver had 13 tubes, while the ***later*** version had only 11 tubes.

- **Which *two* tubes were replaced by solid state devices in the later version?**

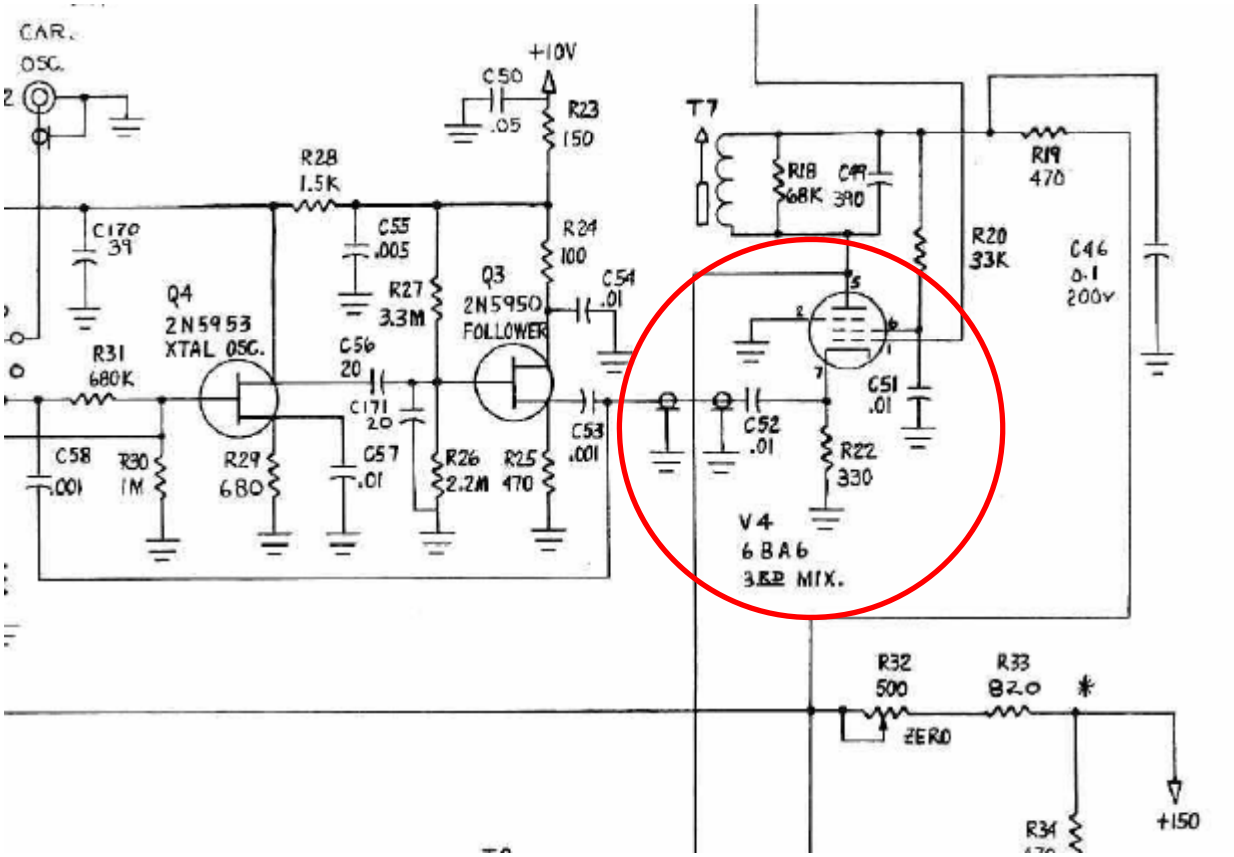
- Answer: **6GX6** (Product Det/AF Amp) and **12AV6** (AVC Amp/Rect) (with thanks to Donnie Garrett, WA9TGT)**.**

R4A (13 Tube) Early Version) 11/65	R4A (11 Tube) Late Version 10/66
V1-12BZ6-RF Amp	V1-12BZ6-RF Amp
V2-6HS6-1st Mixer	V2-6HS6-1st Mixer
V3-12BE6-2nd Mixer	V3-12BE6-2nd Mixer
V4-12BA6-50KC IF Amp	V4-12BA6-50KC IF Amp
V5-12BA6-50KC IF Amp	V5-12BA6-50KC IF Amp
V6-6GX6 Prod Det/AF Amp	V6-Not Used
V7-6EH5-AF Output	V7-6EH5-AF Output
V8-6HS6 Pre Mixer	V8-6HS6 Pre Mixer
V9-12BA6 50 KC Amp/NB	V9-12BA6 50 KC Amp/NB
V10-12AX7A-NB/Pulse Shaper Amp	V10-12AX7A-NB/Pulse Shaper Amp
V11-OB2 Voltage Reg	V11-OB2 Voltage Reg
V12-12BA6-Xtal Cal	V12-12BA6-Xtal Cal
V13-12AV6 –AVC Amp/Rect	V13- (None)

- While we're on the topic of receivers, ***early*** **R-4C**'s were characterized by a 4 position Function switch, and 6HS6's in the 1st Mixer and Premixer positions, while in ***later*** **R-4C**'s, the Function switch had 5 positions, and 6EJ7's in the 1st Mixer, Premixer, and 3rd Mixer positions.

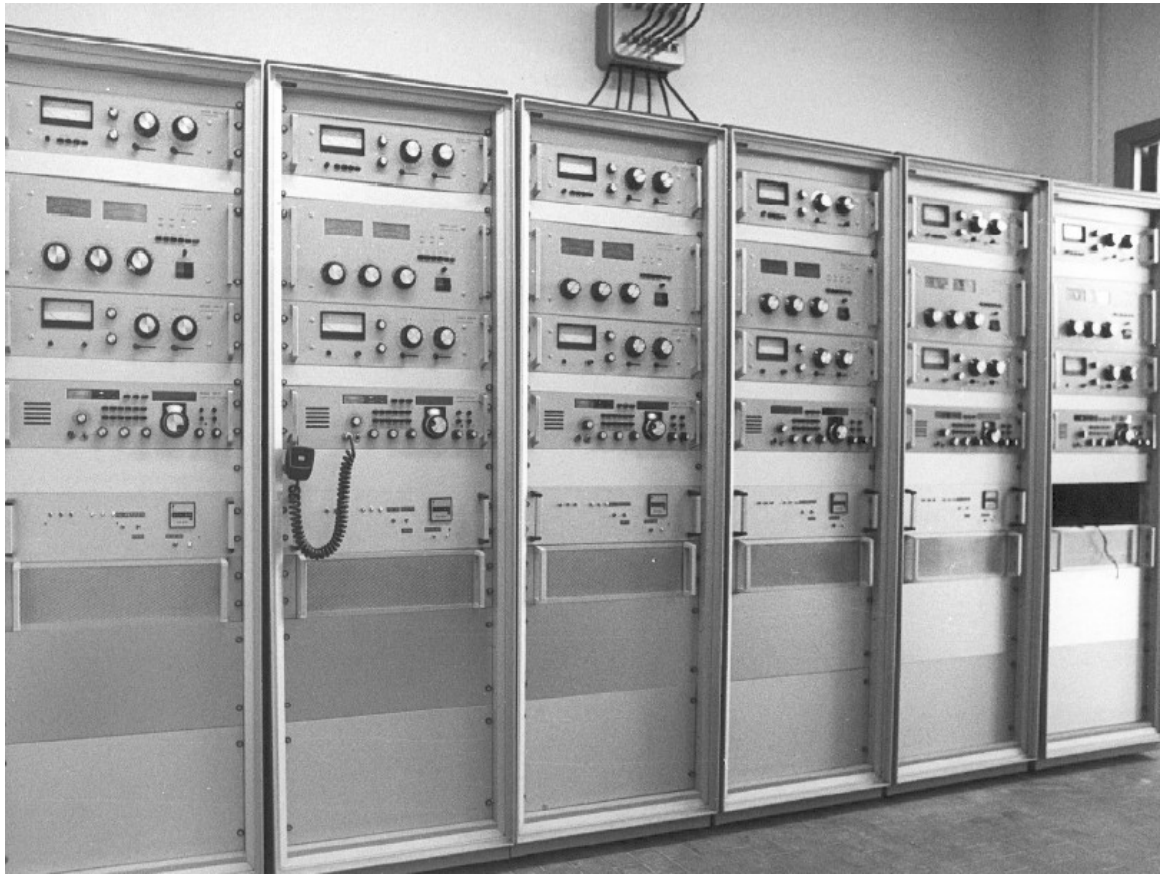
- **What was the 3rd Mixer tube in the early R-4C's?**

- Answer: **6BA6**


CAR.
OSC.
+10V
C50
.05
R23
150
T7
R28
1.5K
R18
68K
C49
390
R19
470
C170
39
C55
.005
R24
100
R20
33K
C46
0.1
200V
Q4
2N5953
XTAL OSC.
R27
3.3M
Q3
2N5950
FOLLOWER
C54
.01
R31
680K
C56
20
C171
20
C51
.01
C52
.01
R22
330
C58
.001
R30
1M
R29
680
C57
.01
R26
2.2M
R25
470
C53
.001
V4
6BA6
MIX.
R32
500
ZERO
R33
820
R34
+150

Drake Trivia Questions – Xenia 2019

- From 1979 to 1990, Radio Monaco operated a 6-band marine communication system supplied by R.L Drake, set up to run one marine band from each of six 19” rack cabinets. Each rack contained nearly identical equipment with a transceiver, low power tuner, amplifier, and a high power tuner, together with the necessary power supplies. **Which Drake transceiver was used in these stations?**



Drake Trivia Questions – Xenia 2019

- **Answer: TR-7/R**

- (Note: These racks also included a Drake L-7E/R amplifier, an MN-77 (or MN-4438) low power tuner, and a high power MN-2700/R (or MN-4439) tuner. Other purchases by Radio Monaco included the Drake TR-4310 (rack-mounted TR-7 with internal digital VFO), the TR-4305 (fixed frequency version of the TR-4310), the TR-77 (early rack-mounted TR-7), the R-7/R and R-77 (early rack-mounted R-7 or RR-3), and the R-4245 (RR-3 with digital VFO).

- When the “Witches of Miamisburg” (*and I use that term <u>not</u> with a negative connotation, but with the greatest of respect*) worked their magic winding the Drake 4-line PTO’s, things didn’t always go as planned. Drake saved the “off spec” PTO’s for what model?

- Answer: **SW-4**

- More on receivers again……!
- The Drake **RR-1** receiver was the rack-mounted marine reserve equivalent of the **SPR-4** shortwave receiver. It was followed by the **RR-2**. What was the main difference between the two models?

- Answer: The **RR-2** had a built-in synthesizer that eliminated the 23 position band crystals in the **RR-1**.

- This is a special version of the dial for the **SPR-4**. Who was it produced for, and what is the significance of the red digits?
- Answer: **The FCC**. The red digits show the CB channels.

DRAKE

Mike Bryce – TheHeathkitShop.com

Dayton Flea Market space # 7823, 7824 & 7825

The Heathkit Shop

Keeping the green flame burning

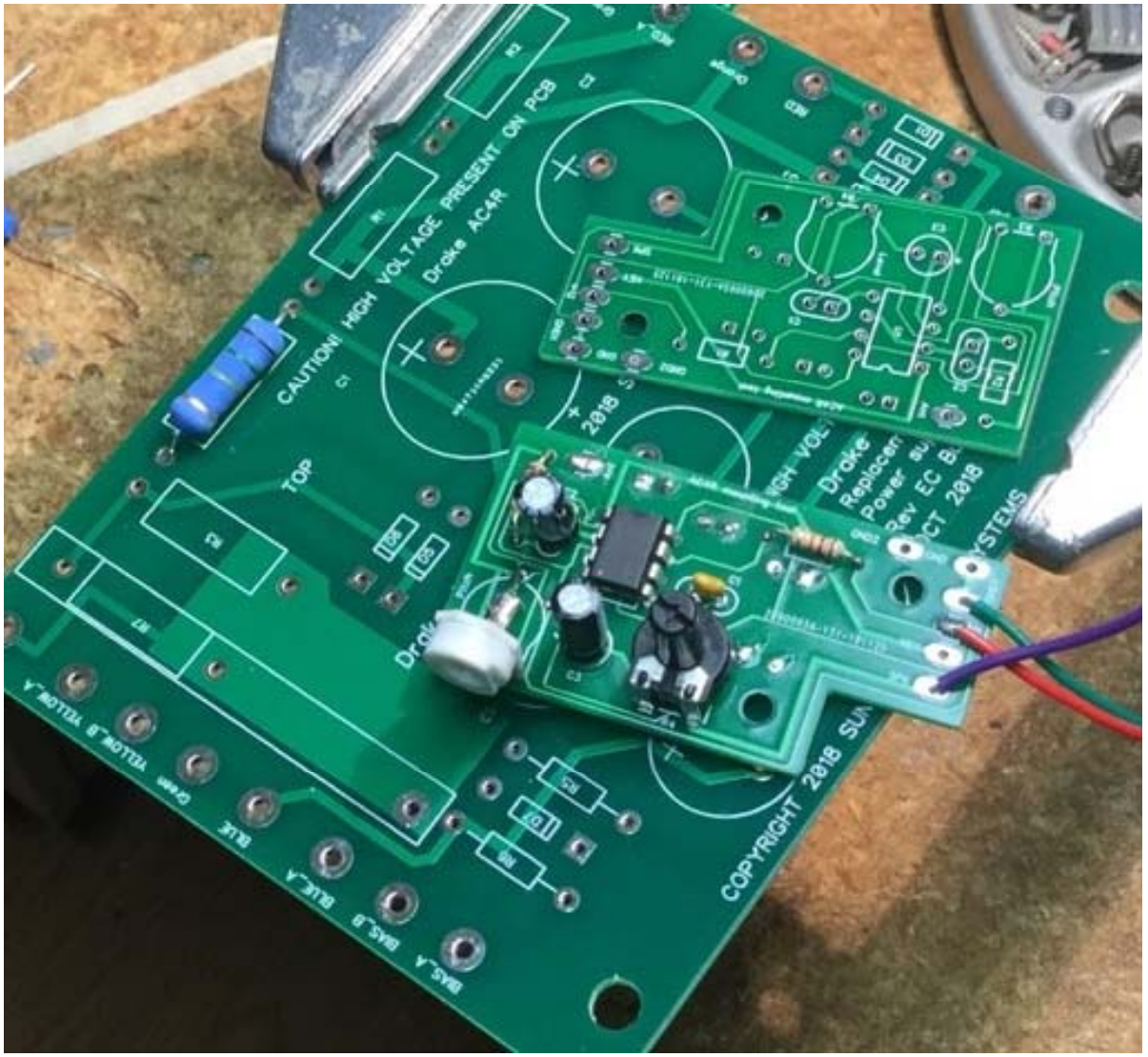
- Home
- Ampkeyer
- Heathkit projects and kits
- Heathkit SB-200 Hard Key
- Heathkit HP-23RL
- Who we are
- Ten Tec
- Micro M+
- Drake
- Fan Controller
- Contact me
- Drake L4 upgrade
- Dentron
- Drake AC4R Upgrade kit

Welcome to the Heathkit Shop

AC-4/R UPGRADE

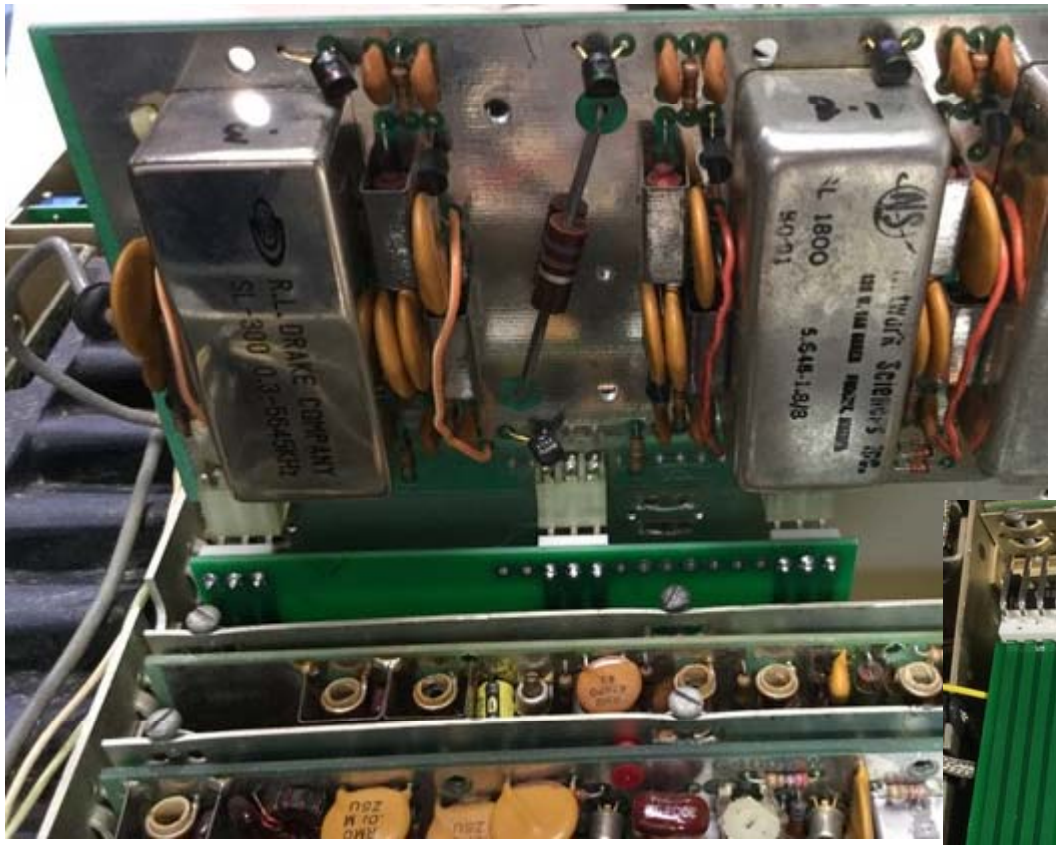
Spacer board used to mount parts on AC4R pcb

Spacer pcb maybe used as either a CPO or FS meter.

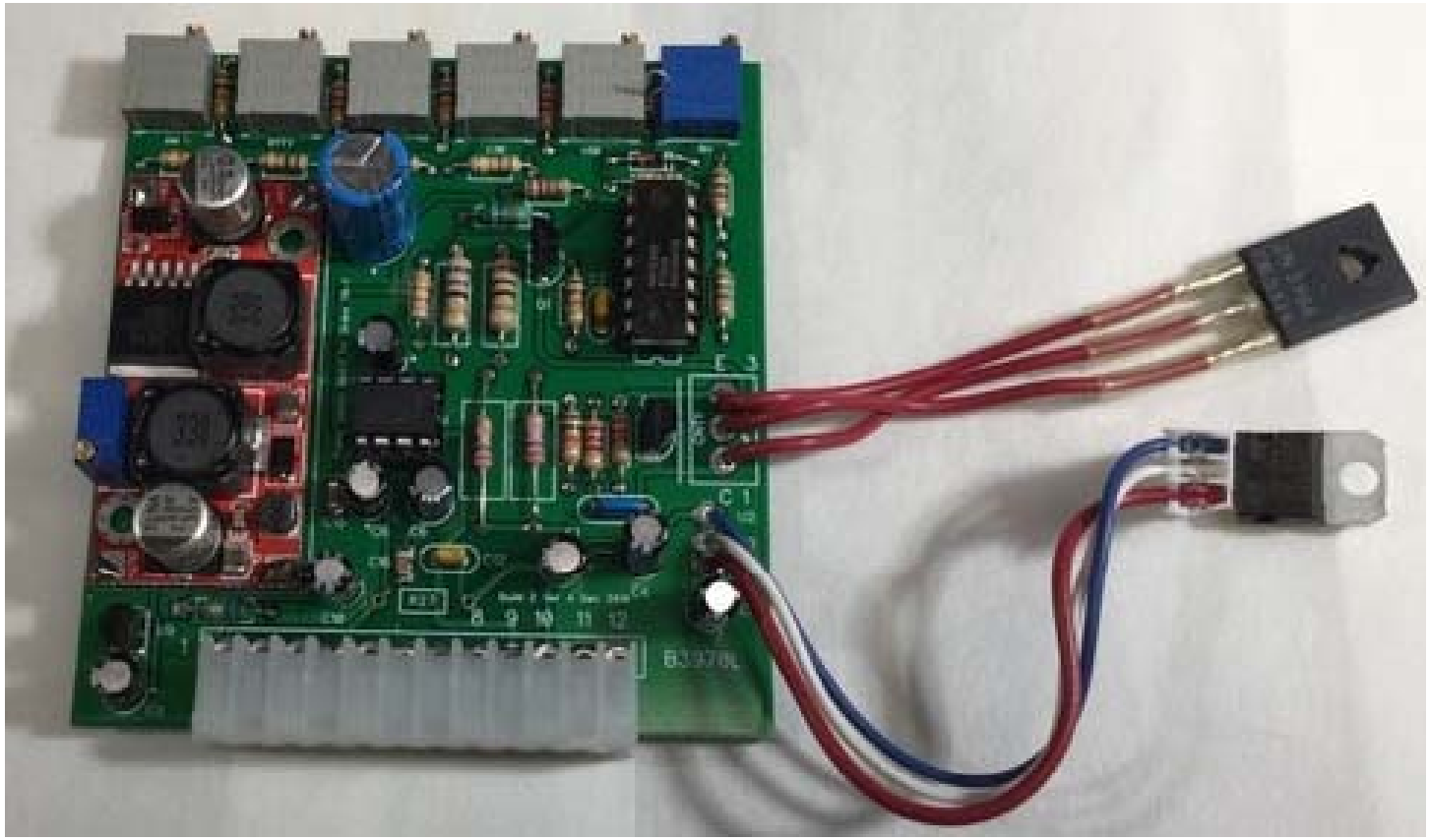


The Heathkit Shop
TR-7 Extender Boards

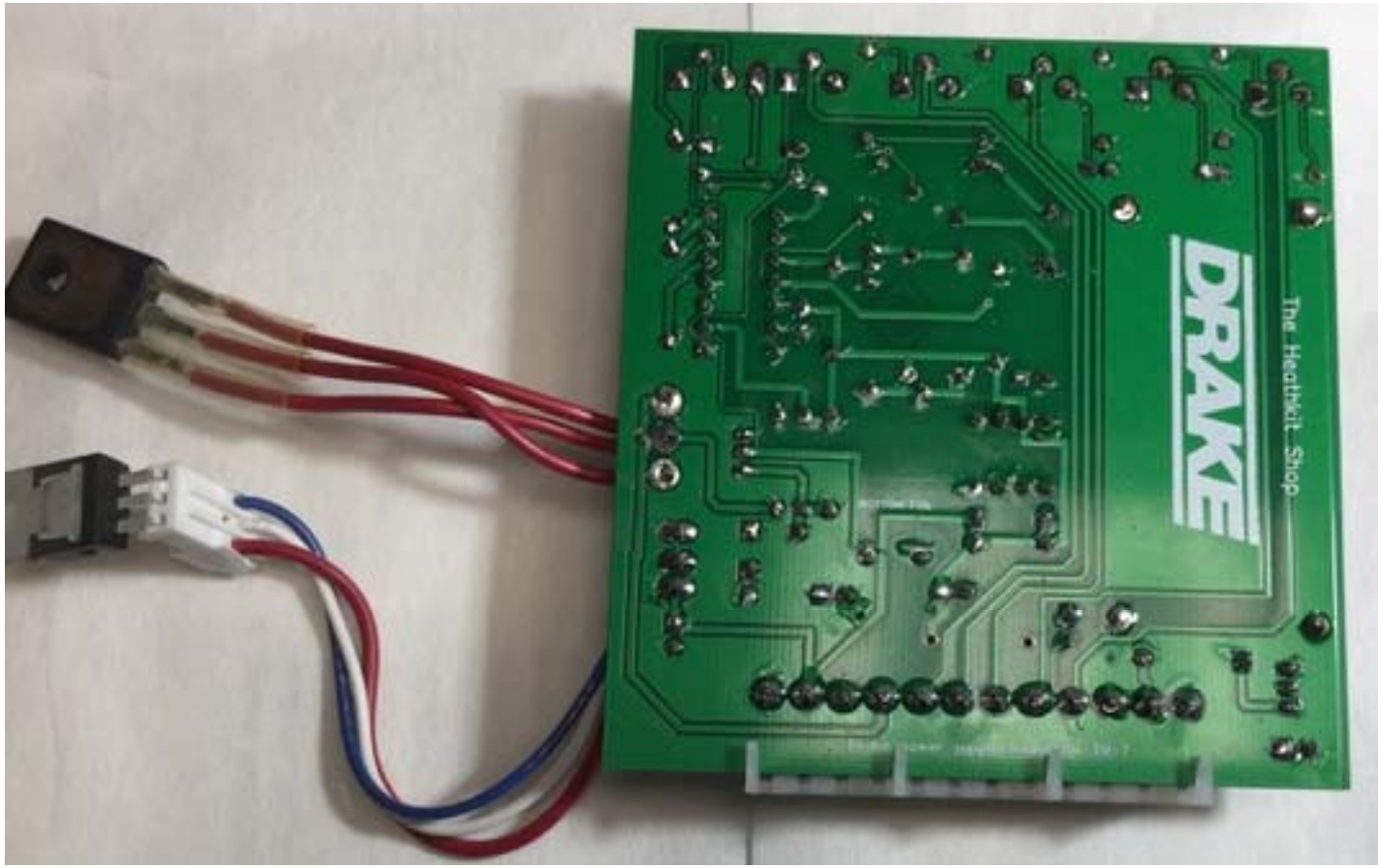
The Heathkit Shop
TR-7 Extender Boards



The Heathkit Shop
TR-7 Power supply/oscillator Control board



The Heathkit Shop
TR-7 Power supply/oscillator Control board

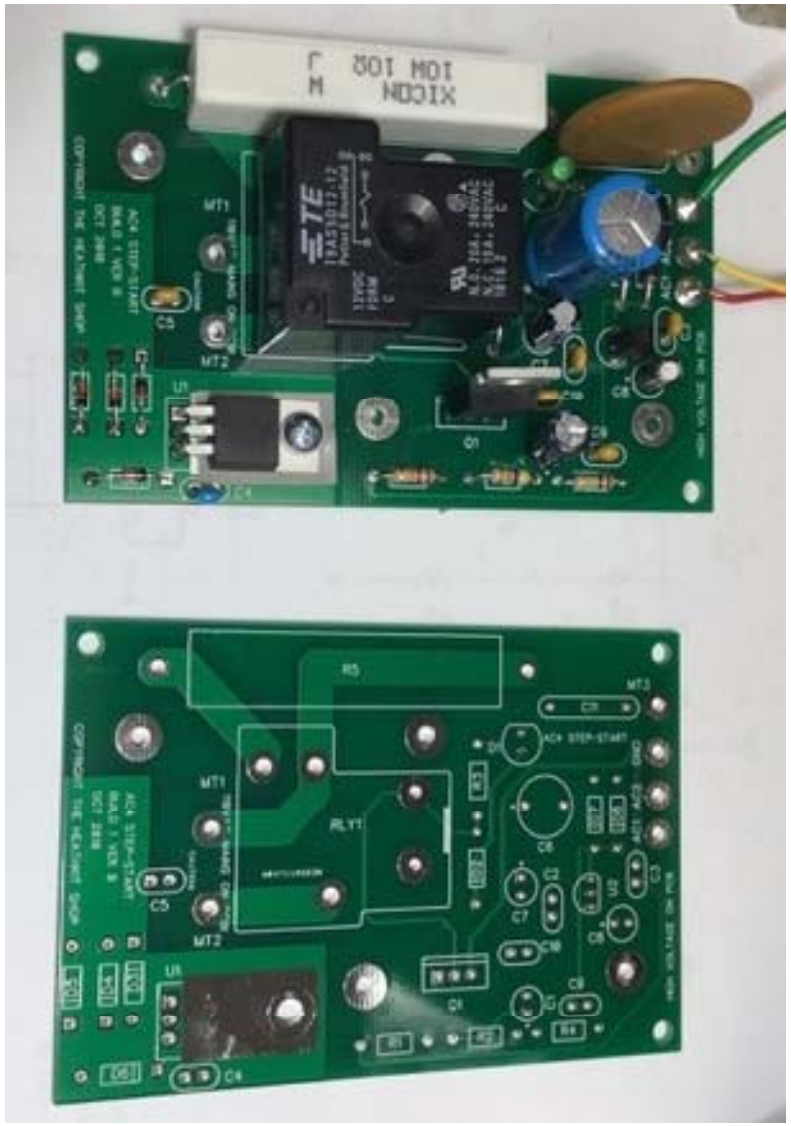


DDS (Direct Digital Synthesis) amplifier/buffer

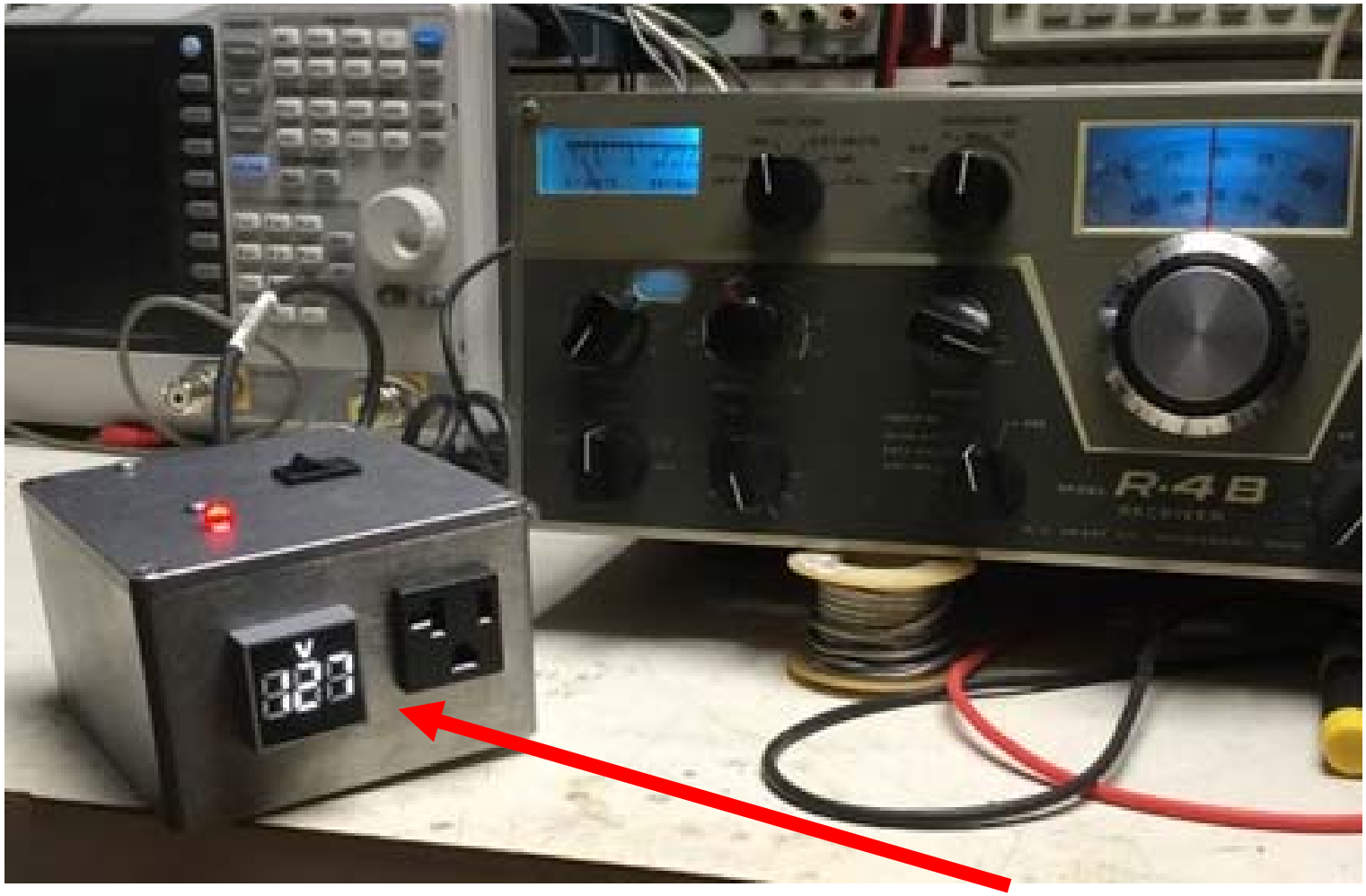
Step-Start for AC-4 supply

Step-Start mounted in AC-4 supply

AC-4 STEP START



STEP-START



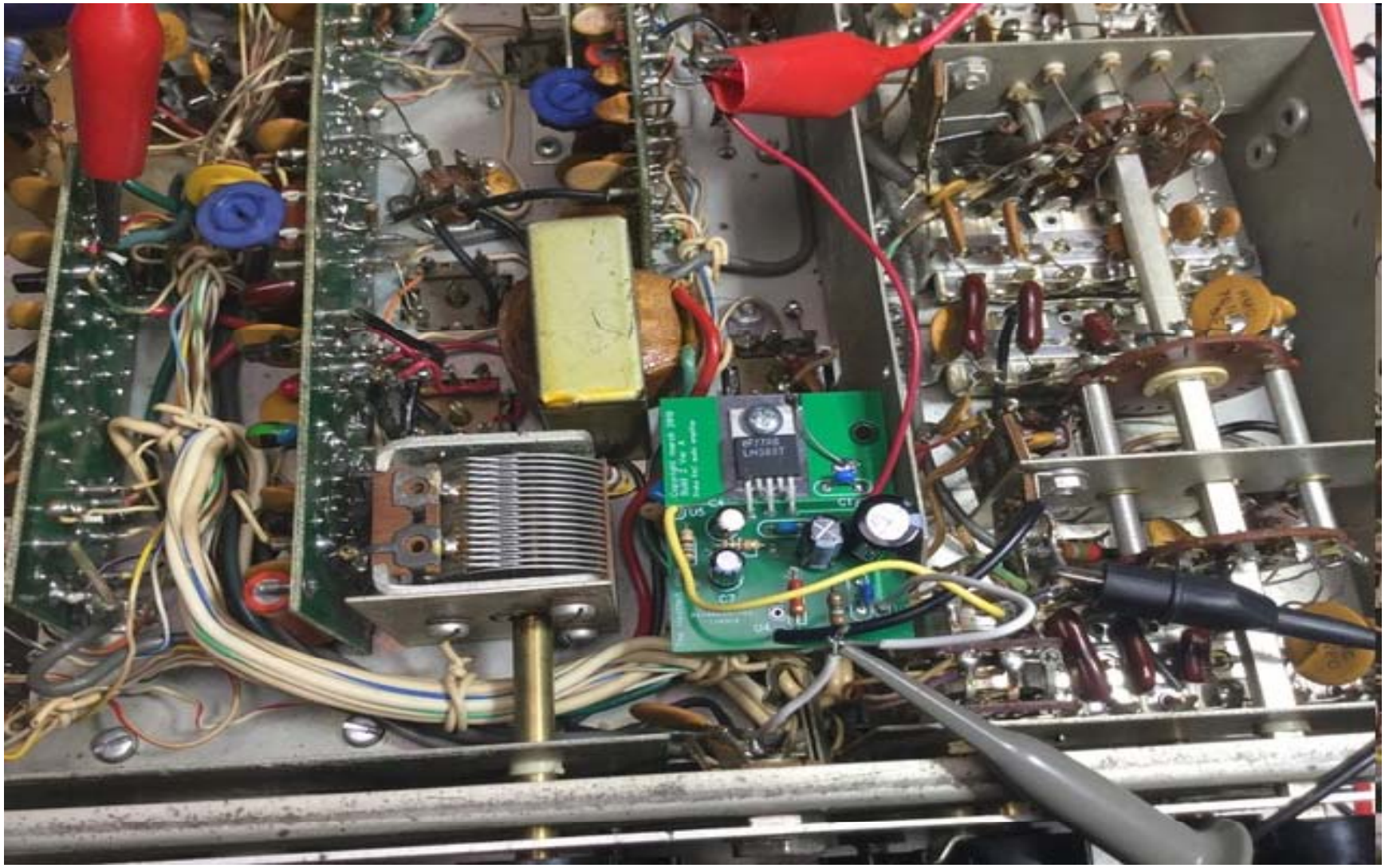
Step-Start assembled into a small aluminum box for remote use. Notice my high mains voltage at 127 V

FAN CONTROLLER

2A, 2B & 2C Calibrator

Sold fully assembled.

R4C audio amp



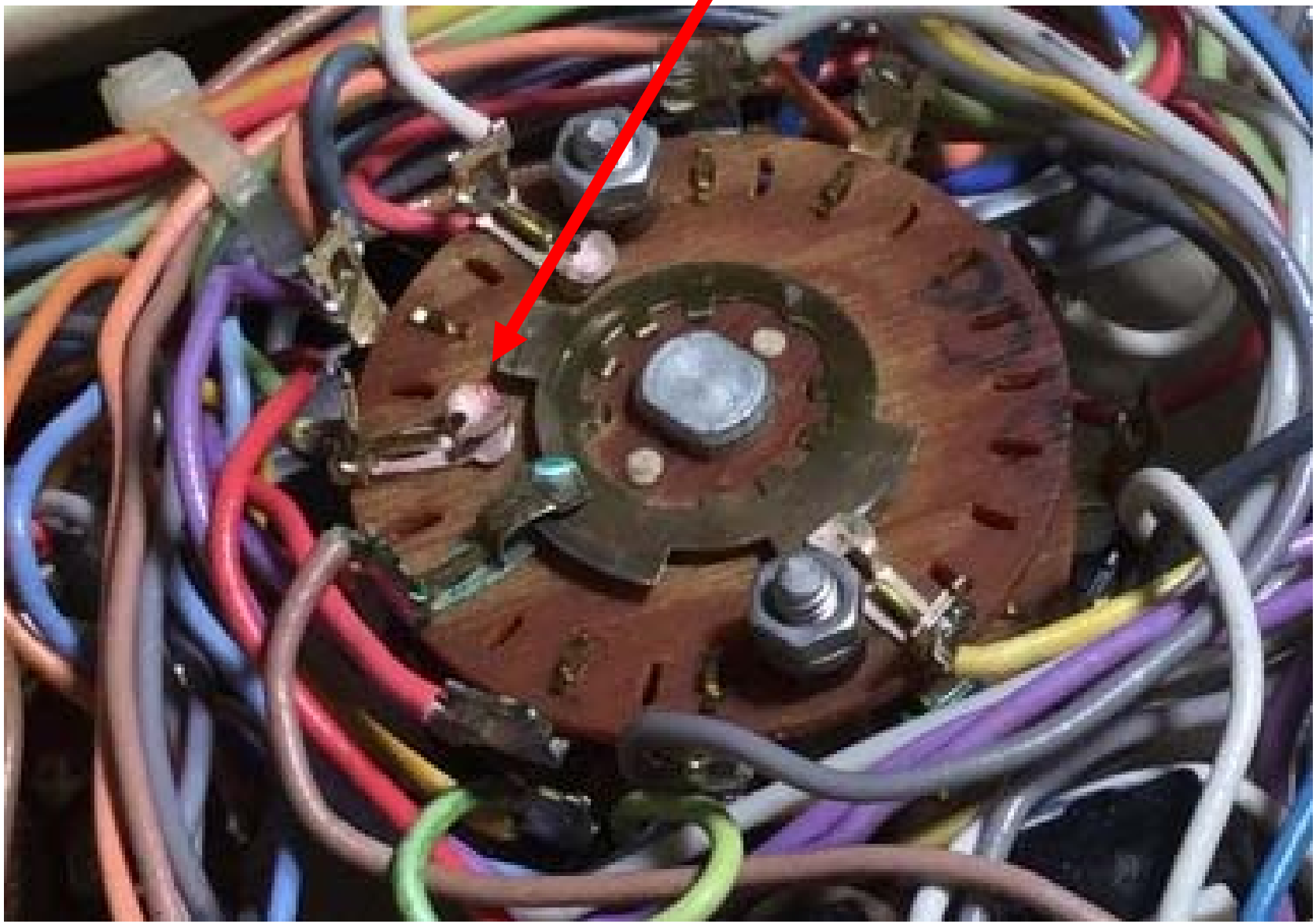
TheHeathkitShop.com - Mike Bryce, WB8VGE
Dayton Space #7823, 7824, & 7825.

The Heathkit Shop

Available Products:

2A Calibrator
Ampkeyer
DDS amp
R4C Audio Upgrade
Fan Control Board
L4 Interface
L4R Power Supply Upgrade
AC4R Power Supply Upgrade
AC4 Step Start

TR-7 Twisted Switch Segment



DRAKE

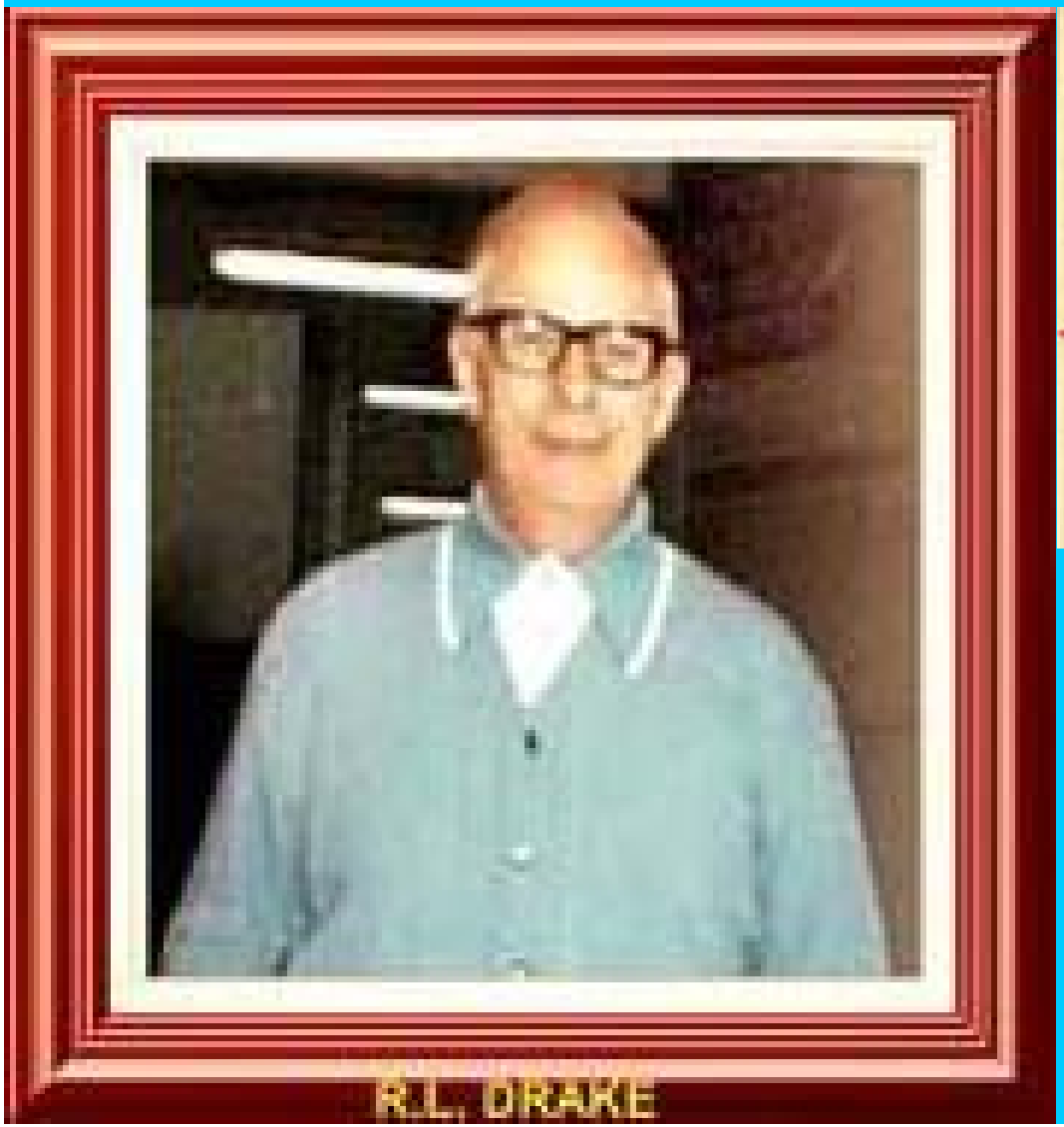
Dayton Hamvention 2019

Jeff Covelli WA8SAJ

The R.L. Drake Co.
Started in 1942 during WW II
Manufacturing
R.F. filters
&
Jamming
devices for the military.

There was also a three tube receiver covering 70 to 150 MHz manufactured Model #BC-1225A

Robert Lloyd Drake (1970's)




R. R. 1, MIAMISBURG, OHIO

W8CYE

Amateur Radio Station ... Confirming our QSO of
154 ... at ... M., ST. ... Mc. ... report was
Q ... S ... Antenna ... Receiver
Xmtr. ... Watts input
Remarks ...

By "Mac" WWIBL

Pse QSL OM Tnx

R. L. Drake

R.F. Filters

DRAKE

BC-1225A

The Year
1946

After the war was over <u>Bob Drake</u> needed help to grow the company and he hired a young engineer

<u>Milt Sullivan</u> from the University of Cincinnati.

Milt Sullivan (K8YDO)
Drake's Chief Engineer
1946 to 1983 (37 Years Service)
Plus 4 Years Consulting for Drake

Milt's Job Application in 1946
Hired for 86 cents per Hour.

Date November 11, 1946

Applicant's Name Milton Arnold Sullivan, Jr.

Job Classification Title

Date to Begin Nov. 4, 1946

Hourly Rate .86

The above named applicant has been interviewed on the above date and hired in

Engineering Department.

E. L. Drake

Supervisor

R.L. Drake continued to manufacture accessories:

Chokes

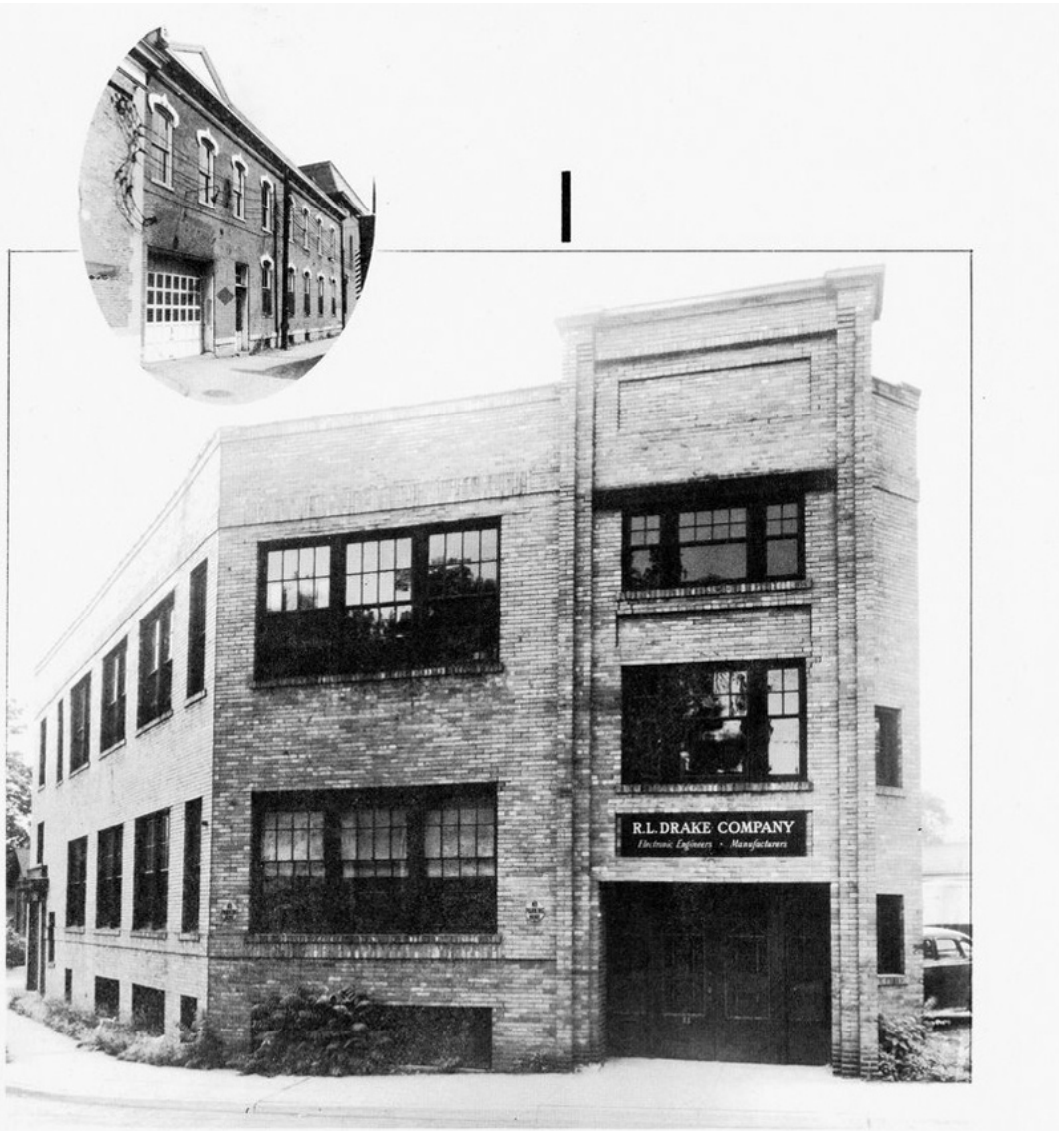
R.F. filters

Q-multipliers

Phone-Patches

Transformers ! !

Drake
1951 Catalogue



R. L. Drake Co.

11 Longworth St.
Dayton 2, Ohio
MIchigan 5689

DRAKE

Power Supply for the ART-13 Transmitter

Model 505A Power Supply

AN/ART-13 Transmitter
with
R. L. Drake Model 505A Power Supply

Specifications

GENERAL

The Model 505A Power Supply is designed to operate the ART-13A Transmitter through a wide range of power line voltage and frequency conditions. Through the use of forced air cooling and with little sacrifice in overall efficiency the size and weight of this power supply has been brought to a minimum. The power supply is easily carried and is of rugged construction making it readily portable. A canvas cover is provided to protect the unit from weather. All switching with the exception of the main line switch is done automatically from the front panel of the transmitter. No hum is noticeable in the transmitter output. A standard ART-13 power cable connector is used. No changes in the transmitter are required. All circuits are protected against overload with a circuit breaker. Tubes are protected against premature application of anode voltage during warm-up with a time delay switch.

INPUT

100 to 130 volts AC, 50 to 400 cps, 10 Amperes.

OUTPUT

1200 V. DC @ 250 MA (less than 1% ripple), 400 V. DC @ 250 MA (less than 1% ripple) and, 28 V. DC @ 8 Amperes (less than 5% ripple).

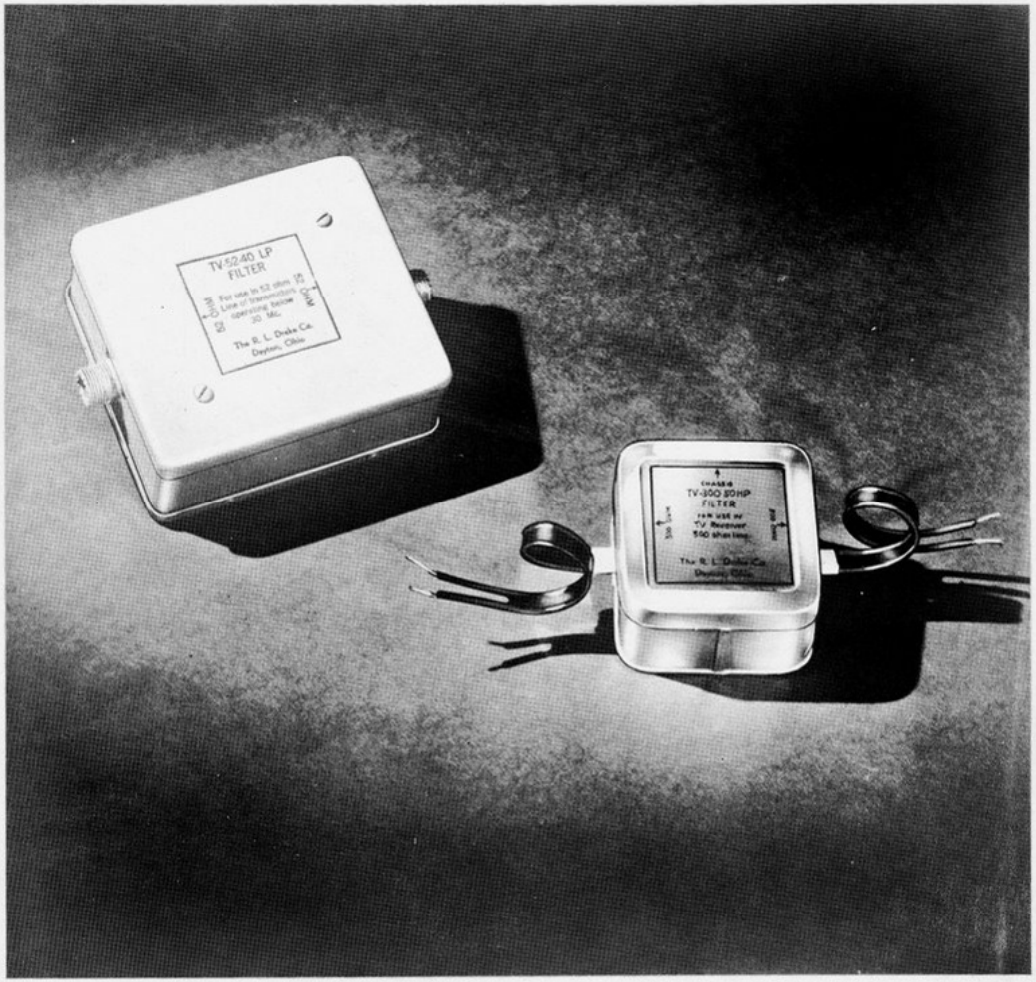
PHYSICAL

Volume - 1.25 cubic feet, weight - Approximately 65 pounds with overall dimensions of 10-3/4" x 13" x 15" high.

This power supply can be supplied with fungicide treatment if desired. Can also be supplied for 220 volt operation.

DRAKE

TVI Filters



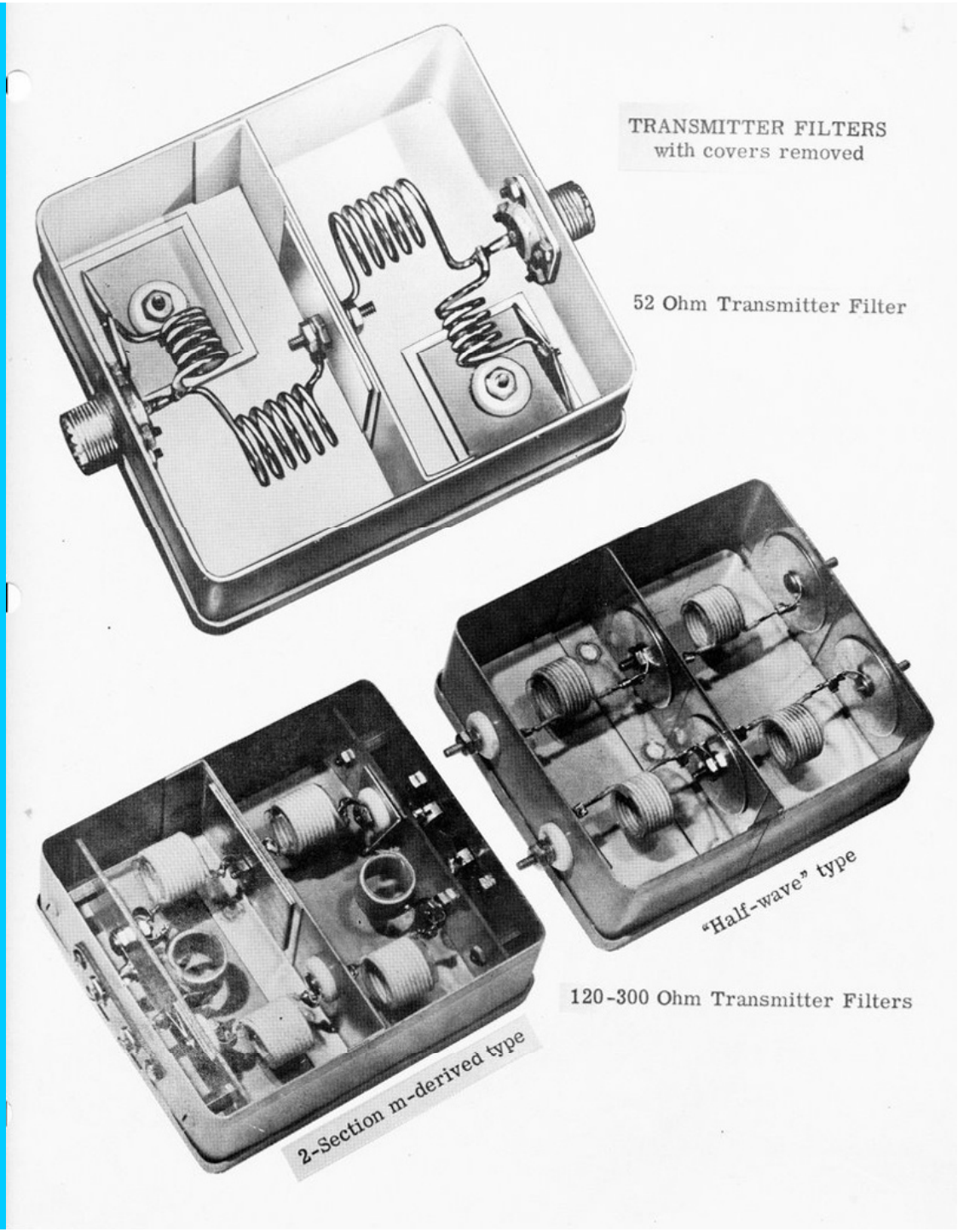
TELEVISION INTERFERENCE FILTERS

A low-pass filter
for transmitter.

A high-pass filter for
television receiver.

DRAKE

Transmitter TVI Filters



TRANSMITTER FILTERS
with covers removed

52 Ohm Transmitter Filter

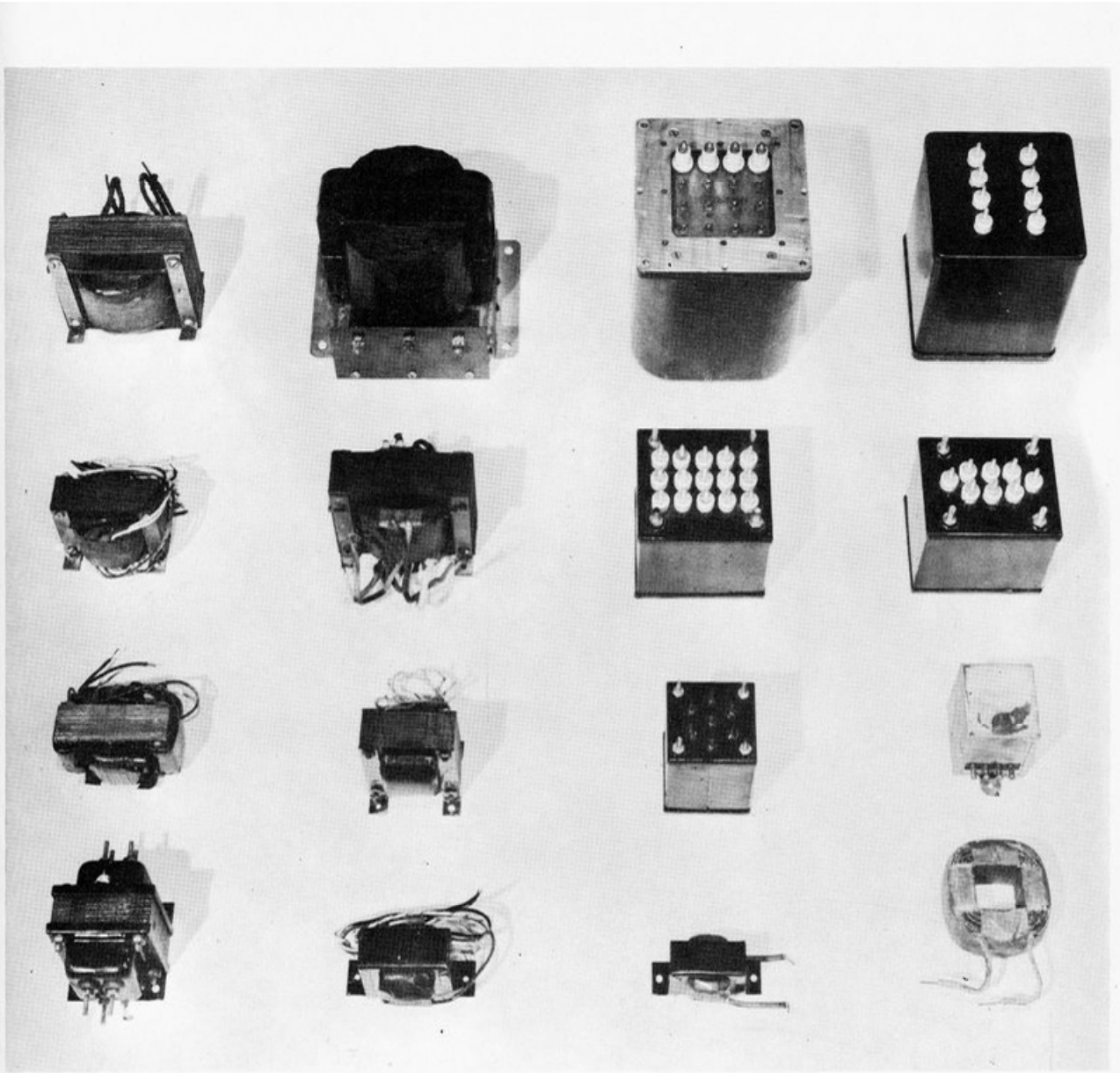
"Half-wave" type

120-300 Ohm Transmitter Filters

2-Section m-derived type

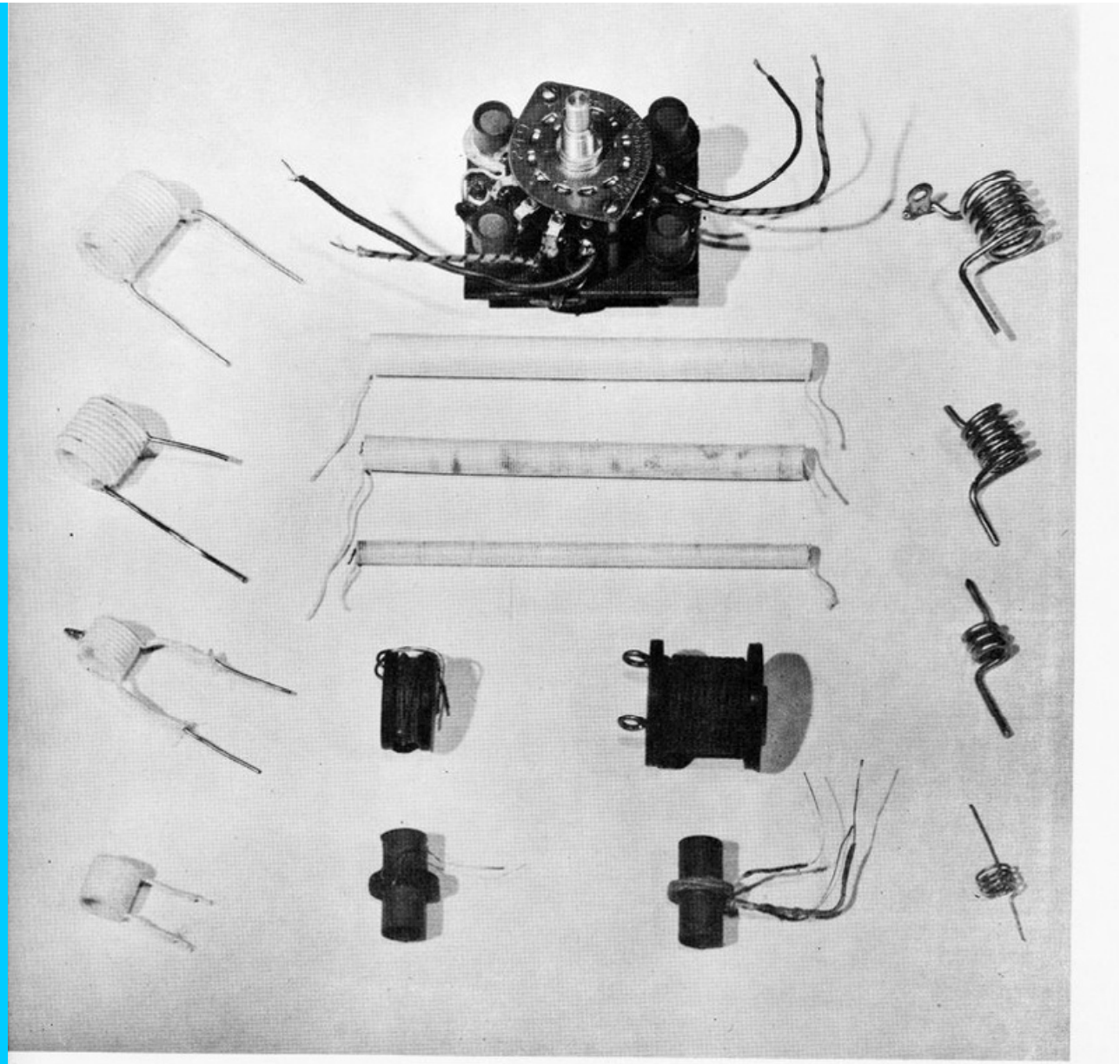
DRAKE

Transformers



MISCELLANEOUS TRANSFORMERS
Types built by R. L. Drake Company

Coils



MISCELLANEOUS COILS
Wound By R. L. Drake Co.

Chokes – Filters – Phone-Patch

1956

Bob Drake & Milt Sullivan

Came up with a fresh approach for an extremely stable SSB receiver that looked like a "bread box"

that could snuggle up next to the large receivers of the day; which could not detect SSB very well.

Drake tried to convince:

National

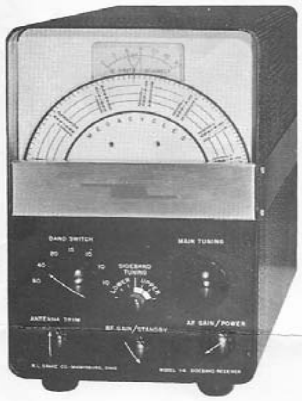
Hallicrafters

Hammarlund

Bob & Milt had a better idea for a great <u>SSB</u> receiver and they all declined ! !

(1956)
Drake
1-A
SSB Receiver

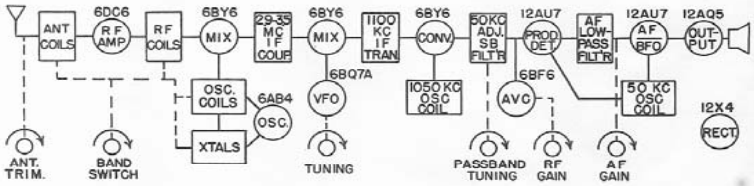
Milt's First Receiver Design

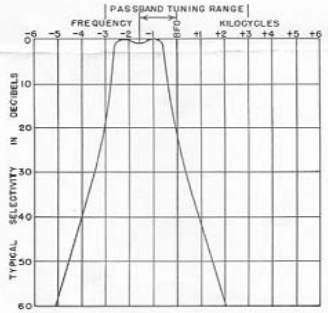


Model 1-A
$259.00

NEW

A SIDEBAND RECEIVER





FEATURES OF R. L. DRAKE COMPANY MODEL 1-A SIDEBAND RECEIVER

Crystal Controlled High Frequency Conferter -- Seven "ham" band tuning ranges 80, 40, 20, 15, 10, 10, 10

High Stability VFO -- New circuit does not need voltage regulator or filament ballast

Triple Conversion
Same tuning rate and stability on all bands -- each band 600 kc wide -- 10 meter band in three sections

Sideband Tuning -- 2.3 kc sideband filter tunes with front panel control through both sidebands

Sideband A.V.C. -- fast charge -- slow discharge -- full A.V.C. without pumping and clicking

Full tuning meter action on sideband

Muting and speaker connections arranged for best sideband and patch operation

Audio low pass filter built in for best signal to noise ratio

Product detector for distortion-free sideband reception

Inverse feedback audio for better low frequency response and minimum distortion

Built in the shape of a "scope" for portability and minimum desk space. Set it beside that old general purpose receiver.

Eleven tubes -- 6DC6 1st R.F. - 6BY6 1st mixer - 6BY6 2nd mixer
6BY6 3rd Converter - 12AU7 Product Detector
6BF6 A.V.C. amplifier and rectifier - 6AB4 crystal oscillator
6BQ7A V.F. oscillator - 12AU7 L.F. oscillator and 1st audio
12AQ5 output audio - 12X4 rectifier

Weight 17.5 pounds

Size 6-3/4 x 11 x 15"

Power consumption 45 watts at 115V A.C.

R. L. DRAKE COMPANY MIAMISBURG, OHIO

Milt's Pride and Joy !
The Drake 2-B & 2-BQ

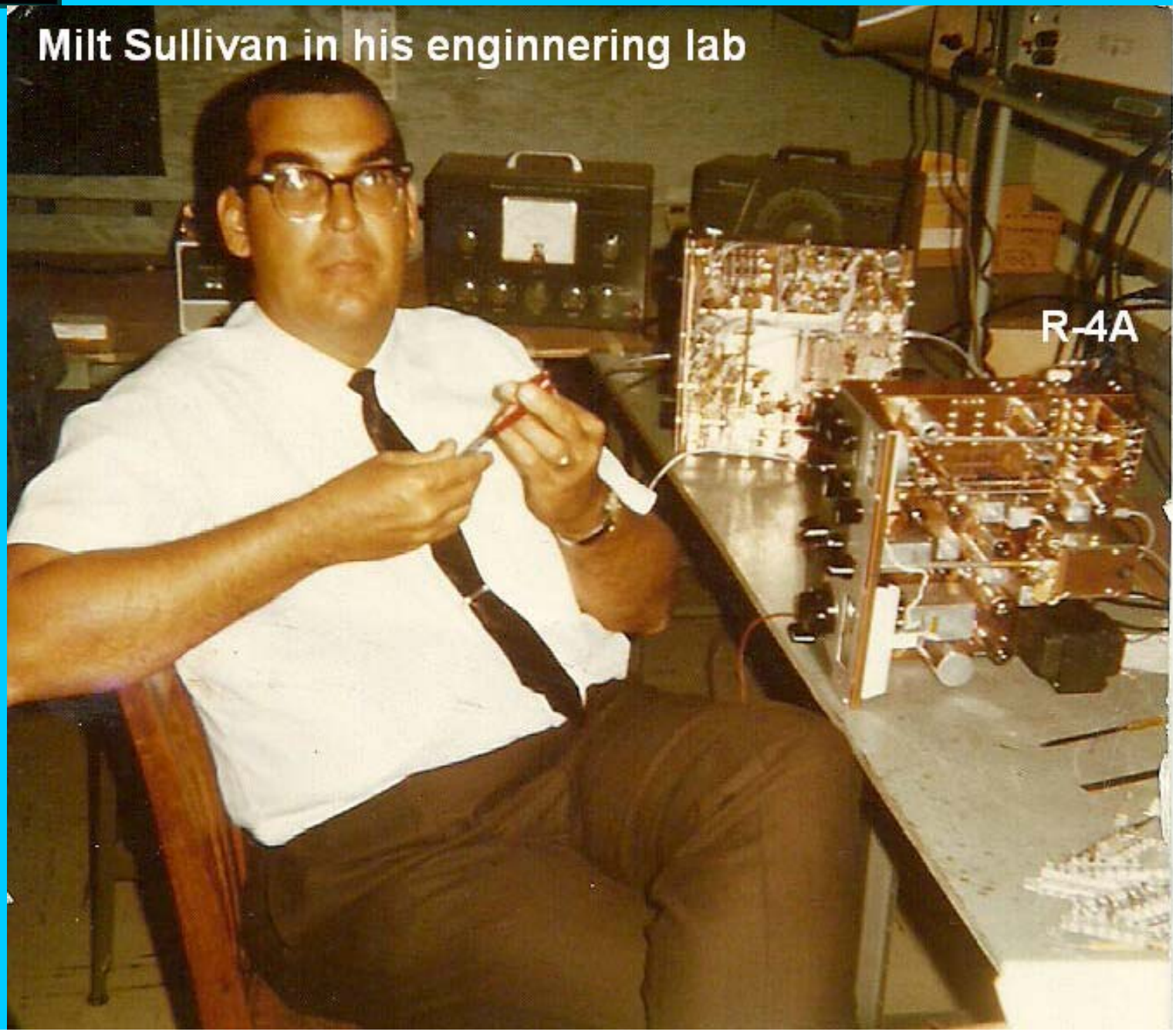
DRAKE

(1965)

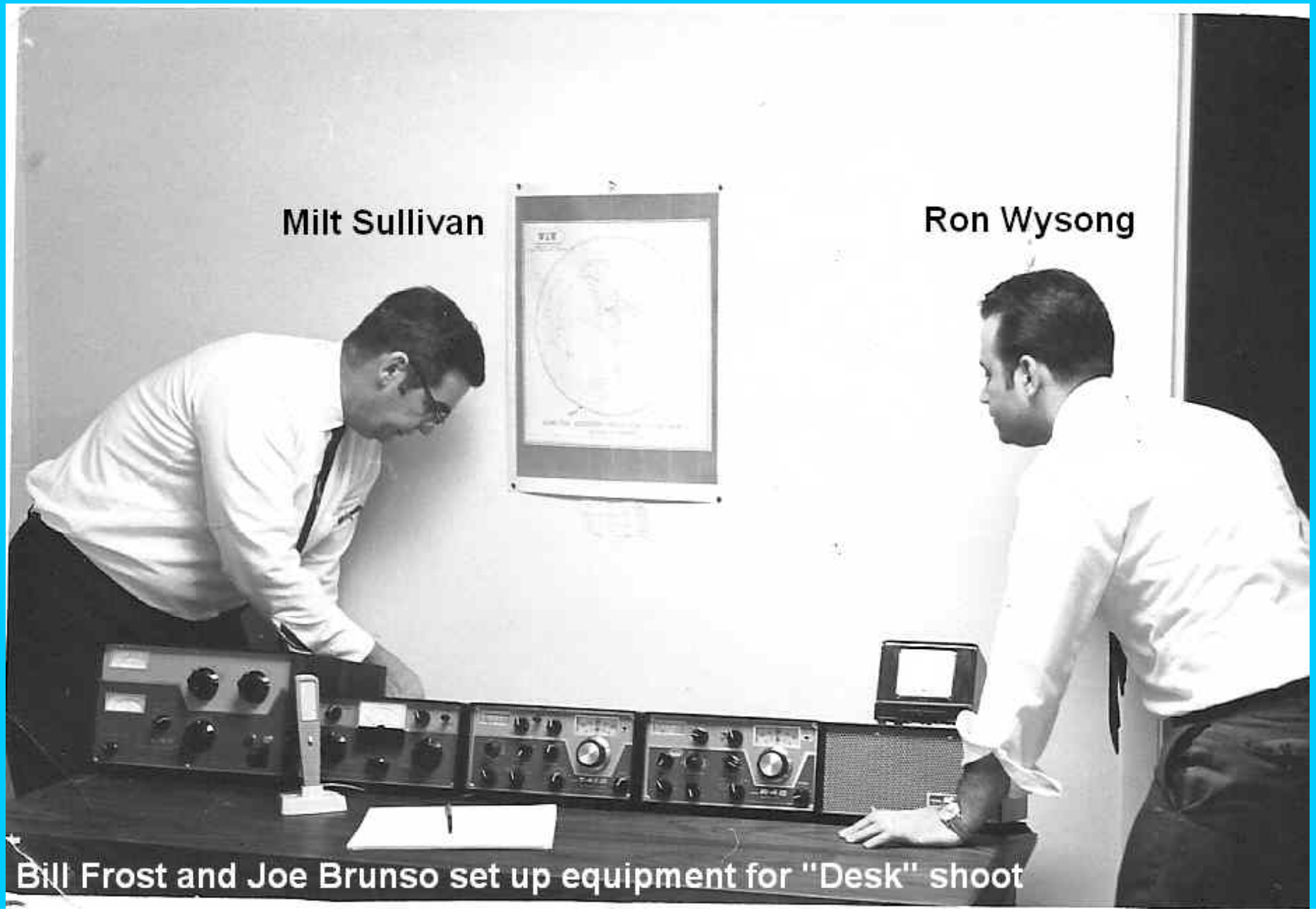
Drake

“A”

Line



Drake B-Line (1968)

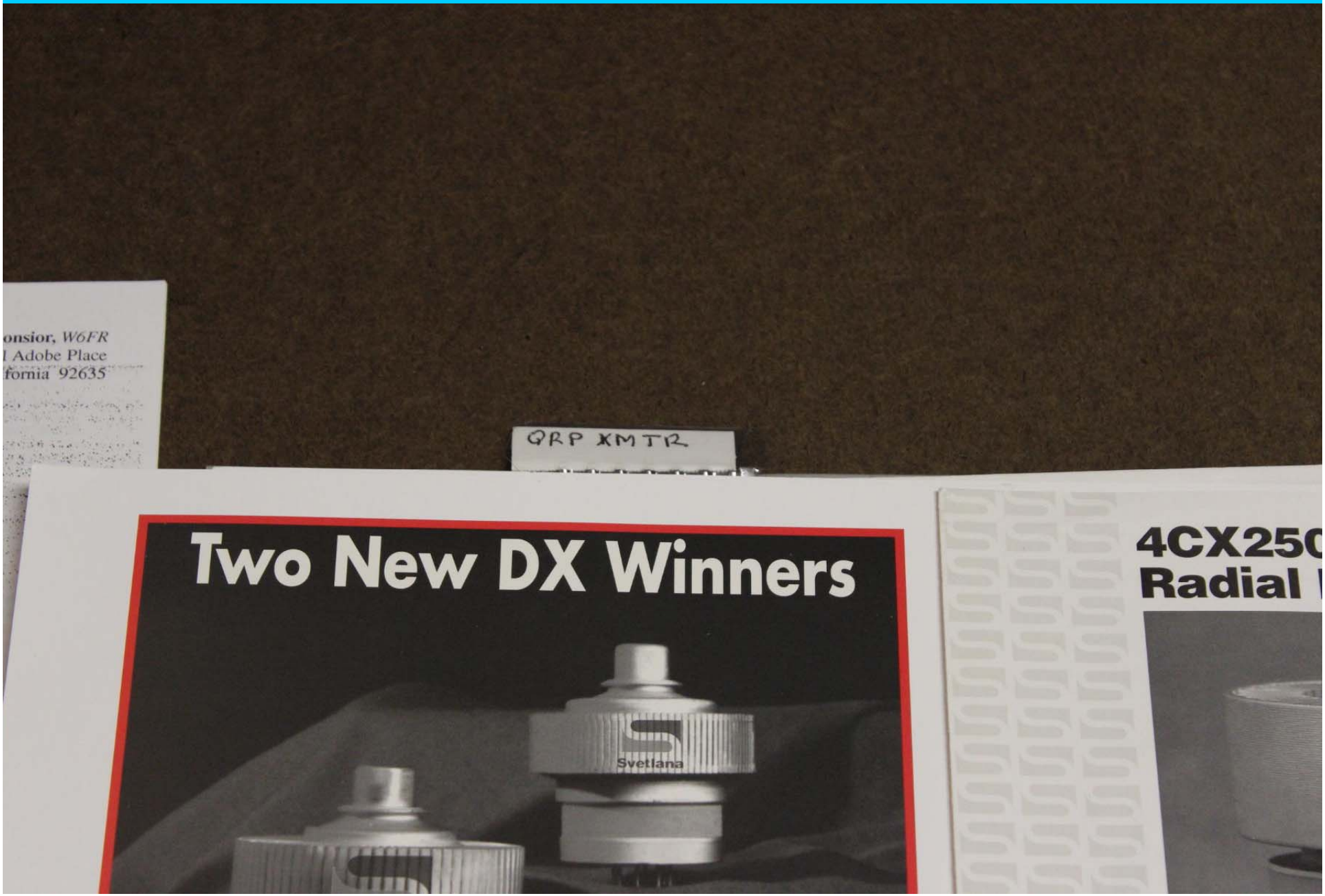


Milt's File Box sent to me in 2015

Thousands of Notes

DRAKE

QRP File (note the high power tube) !



Plenty of High Power notes !

Marv Gonsior, *W6FR*
418 El Adobe Place
Fullerton, California 92635

POWER ON A BUDGET

Using the Russian Svetlana 4CX1600B power tetrode in modern amplifier designs

Something new has been added for high-power linear amplifier designs. It's from Russia with love—a conservative legal limit, cost-effective power tetrode tube.

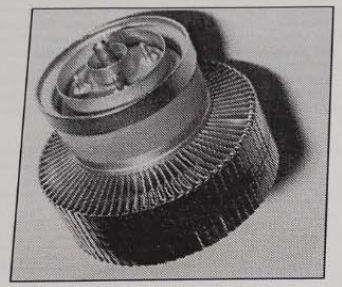


Photo A. Svetlana 4CX1600B. Photo by W6FR.

Background

There was a film some time ago titled, "The Russians are Coming." The introduction of a rather complete line of high quality RF amplifier tubes manufactured in St. Petersburg, Russia, which employ the modern external anode technology, makes this a reality. A very large company—Svetlana Electron Devices, Inc., privatized in 1992—now sells its products worldwide. Recent descriptions in *Communications Quarterly*[1] of two of their tubes, gave me the incentive to try one to revitalize my needy homebrewed Class AB1 amplifier. The application data and results are presented here.

etlana 4CX1600B aracteristics

he tube, and its custom SK3A socket, are n in **Photos A** and **B**. It's a ceramic-to- l external anode tetrode whose original cation was in a military transmitter, which s to its ruggedness and quality construc- This tube was called the 4CX1600A, and much smaller cooler.) Thanks to several design features, the 4CX1600B exhibits erformance when operated in class AB1 latively low anode voltage.

The anode was recently enlarged and is now essentially identical to the 8877 in size and configuration. Unfortunately, its matching chimney hasn't yet been modified to fit. To overcome this problem, I designed one of my own. I've been told that a compatible chimney will be available in the near future. For the general tube mounting outline, dimensions, and construction details of my homebrewed chimney, please refer to **Figure 1**.

Figure 2 shows the tube's specifications, along with my actual operating parameters, while running the tube as a grid driven amplifi-

Communicat

QRP XMTR

4CX250BC/ Radial Bear

The Svetlana 4CX250BC, compact metal/ceramic beam tetrode with a pl tion rating of 250 watts with for cooling. The 4CX250BC is inte Class AB SSB linear RF amplifi intended for stationary and m ment designs with power amp frequencies up to 500 MHz. T has an indirectly-heated oxid which operates at a low temp heater voltage for extended

The Svetlana 4CX250BC is the Svetlana factory in St. P Russia, and is designed to b replacement for the 4CX25 manufactured in the Unit

R.L. Drake
Engineering Practices

Clean slate from the start.

Using as few parts without compromising performance.

Calculating <u>all cost</u> involved to produce a good quality product at a reasonable price to the customer.

Extensive pre-testing of all components before installing them into a radio.

We make everything ourselves.

Nothing is brought from the outside.

The finished product had to fit within our machinery, tools, & production line.

The following was made from “nothing”:

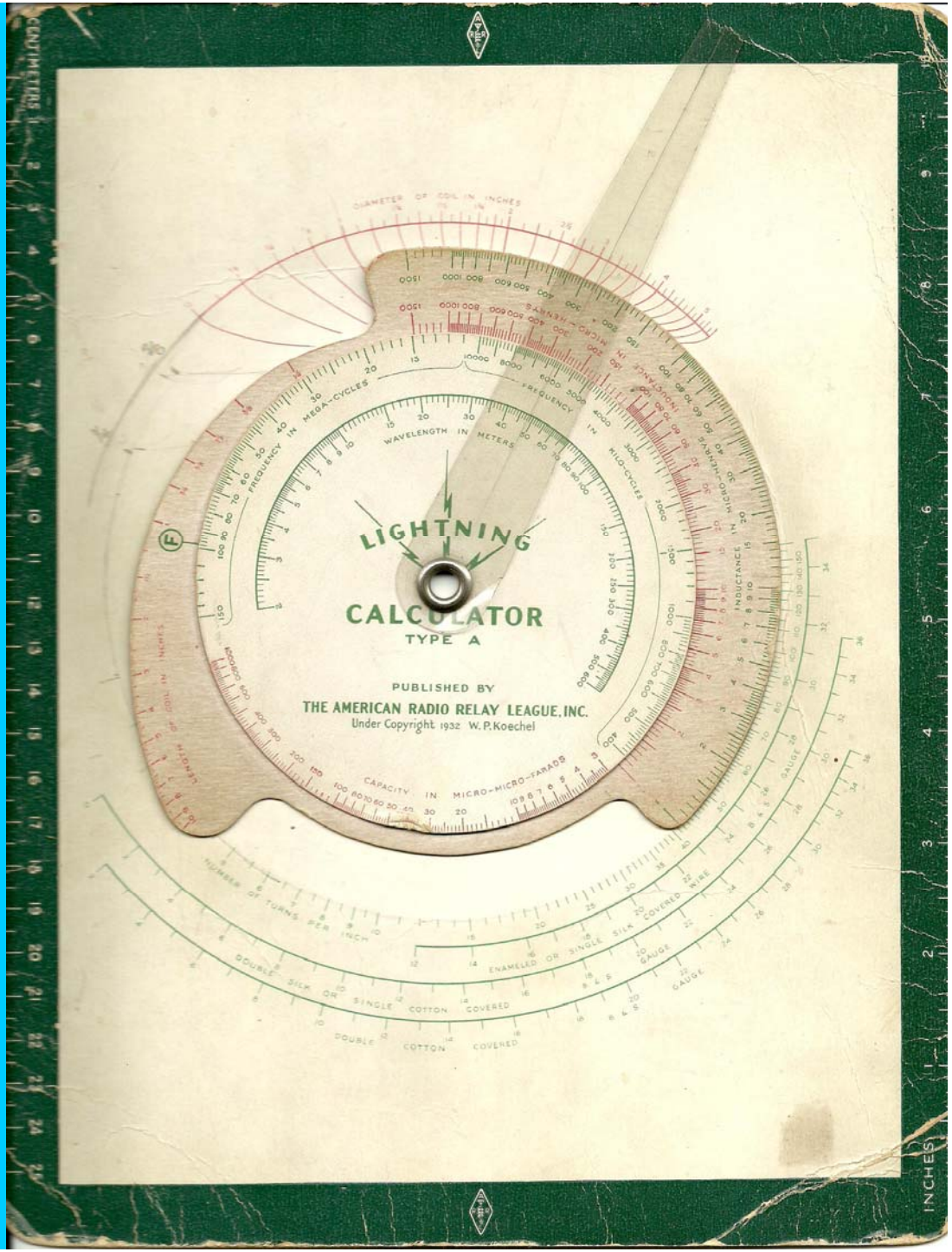
PTO, Crystal Filter, Pass-band Tuner, Cabinets.

DRAKE

Circa:1932 !

ARRL
LIGHTNING
CALCULATOR

This is for calculating
Inductance
Capacitance
Frequency
for Tuned Circuits

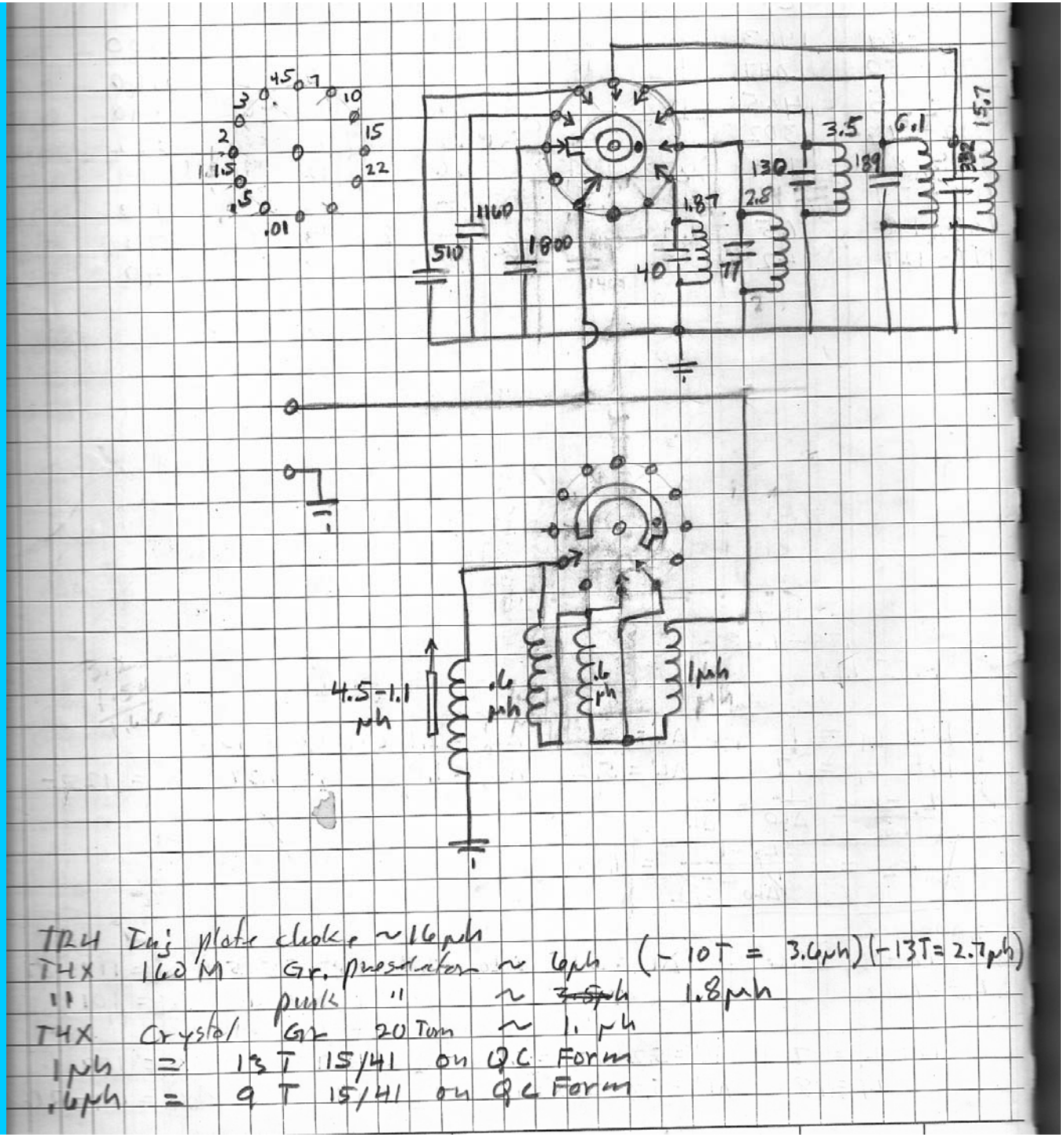


DRAKE

(1960's)

Drake TR-4 & T-4X

Inductance values on the Band-Switch

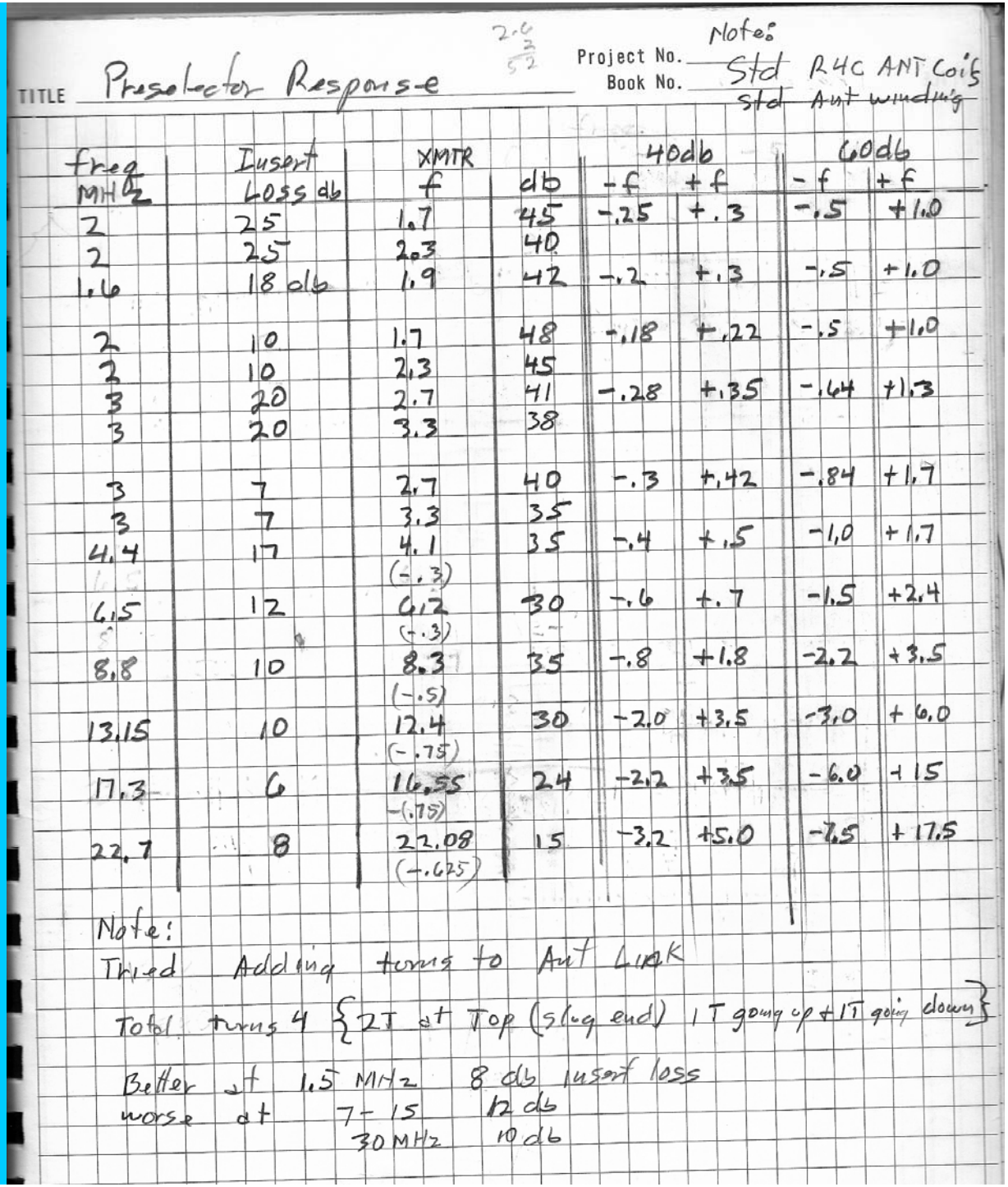


DRAKE

(1970's)

Drake R-4C

Pre-Selector Band-Pass Response



TITLE Preselector Response

Project No.

Book No.

Note: Std R4C ANT Coils
Std Ant windings

freq MHz	Insert Loss db	XMTR f	db	40db -f	40db +f	60db -f	60db +f
2	25	1.7	45	-.25	+.3	-.5	+1.0
2	25	2.3	40				
1.6	18 db	1.9	42	-.2	+.3	-.5	+1.0
2	10	1.7	48	-.18	+.22	-.5	+1.0
2	10	2.3	45				
3	20	2.7	41	-.28	+.35	-.64	+1.3
3	20	3.3	38				
3	7	2.7	40	-.3	+.42	-.84	+1.7
3	7	3.3	35				
4.4	17	4.1 (-.3)	35	-.4	+.5	-1.0	+1.7
6.5	12	6.2 (-.3)	30	-.6	+.7	-1.5	+2.4
8.8	10	8.3 (-.5)	35	-.8	+1.8	-2.2	+3.5
13.15	10	12.4 (-.75)	30	-2.0	+3.5	-3.0	+6.0
17.3	6	16.55 -(.75)	24	-2.2	+3.5	-6.0	+15
22.7	8	22.08 (+.625)	15	-3.2	+5.0	-7.5	+17.5

Note:
Tried Adding turns to Ant Link

Total turns 4 {2T at Top (slug end) 1T going up +1T going down}

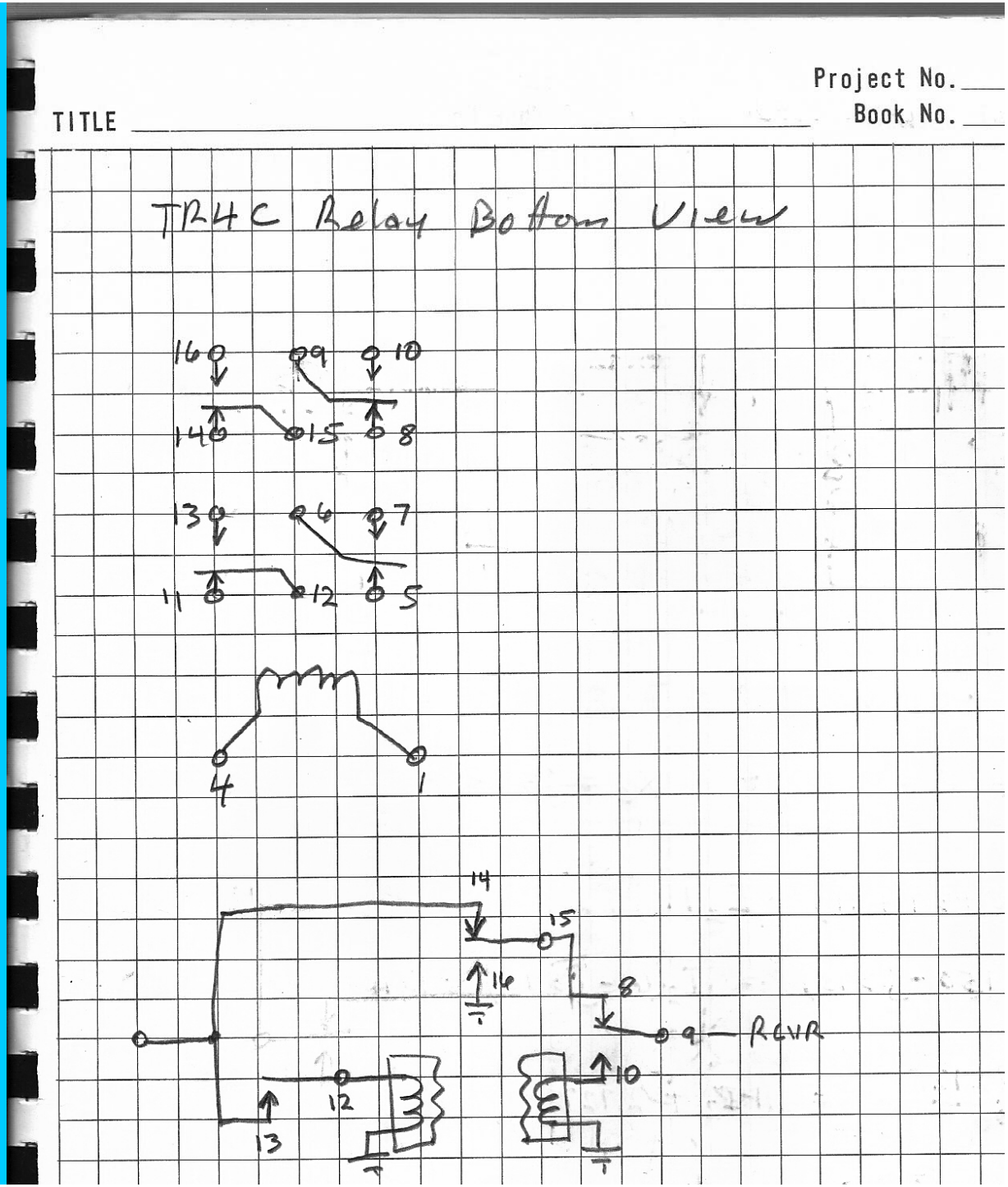
Better at 1.5 MHz 8 db insert loss
worse at 7-15 12 db
30 MHz 10 db

DRAKE

(1970's)

Drake TR-4C

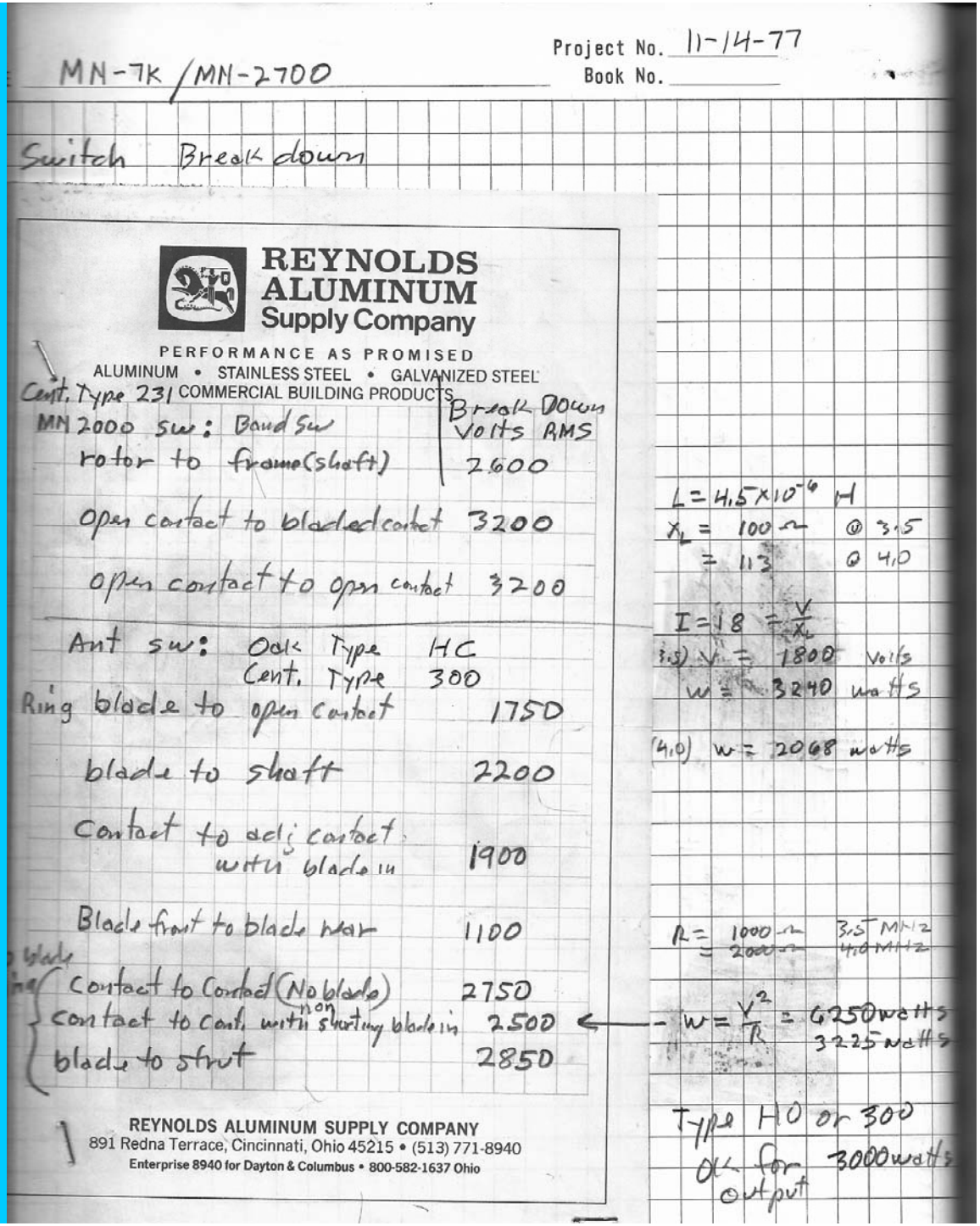
Main Relay Bottom View



DRAKE

MN-7 & MN-2700

Band Switch RMS Voltage Breakdown



MN-7K / MN-2700

Project No. 11-14-77

Book No.

Switch Break down

REYNOLDS ALUMINUM Supply Company

PERFORMANCE AS PROMISED

ALUMINUM • STAINLESS STEEL • GALVANIZED STEEL

COMMERCIAL BUILDING PRODUCTS

Cent. Type 231

	Break Down Volts RMS
MN 2000 sw: Band Sw	
rotor to frame (shaft)	2600
open contact to bladed contact	3200
open contact to open contact	3200
Ant sw: Oak Type HC / Cent. Type 300	
Ring blade to open contact	1750
blade to shaft	2200
contact to adj contact with blade in	1900
Blade front to blade rear	1100
Contact to Contact (No blade)	2750
contact to cont. with non shorting blade in	2500
blade to strut	2850

REYNOLDS ALUMINUM SUPPLY COMPANY
891 Redna Terrace, Cincinnati, Ohio 45215 • (513) 771-8940
Enterprise 8940 for Dayton & Columbus • 800-582-1637 Ohio

$L = 4.5 \times 10^{-6}$ H

$X_L = 100\ \Omega$ @ 3.5

$= 113$ @ 4.0

$I = 18 = \frac{V}{X_L}$

(3.5) $V = 1800$ Volts

$W = 3240$ watts

(4.0) $W = 2068$ watts

$R = 1000\ \Omega$ 3.5 MHz

$= 2000\ \Omega$ 4.0 MHz

$W = \frac{V^2}{R} = 6250$ watts

3225 watts

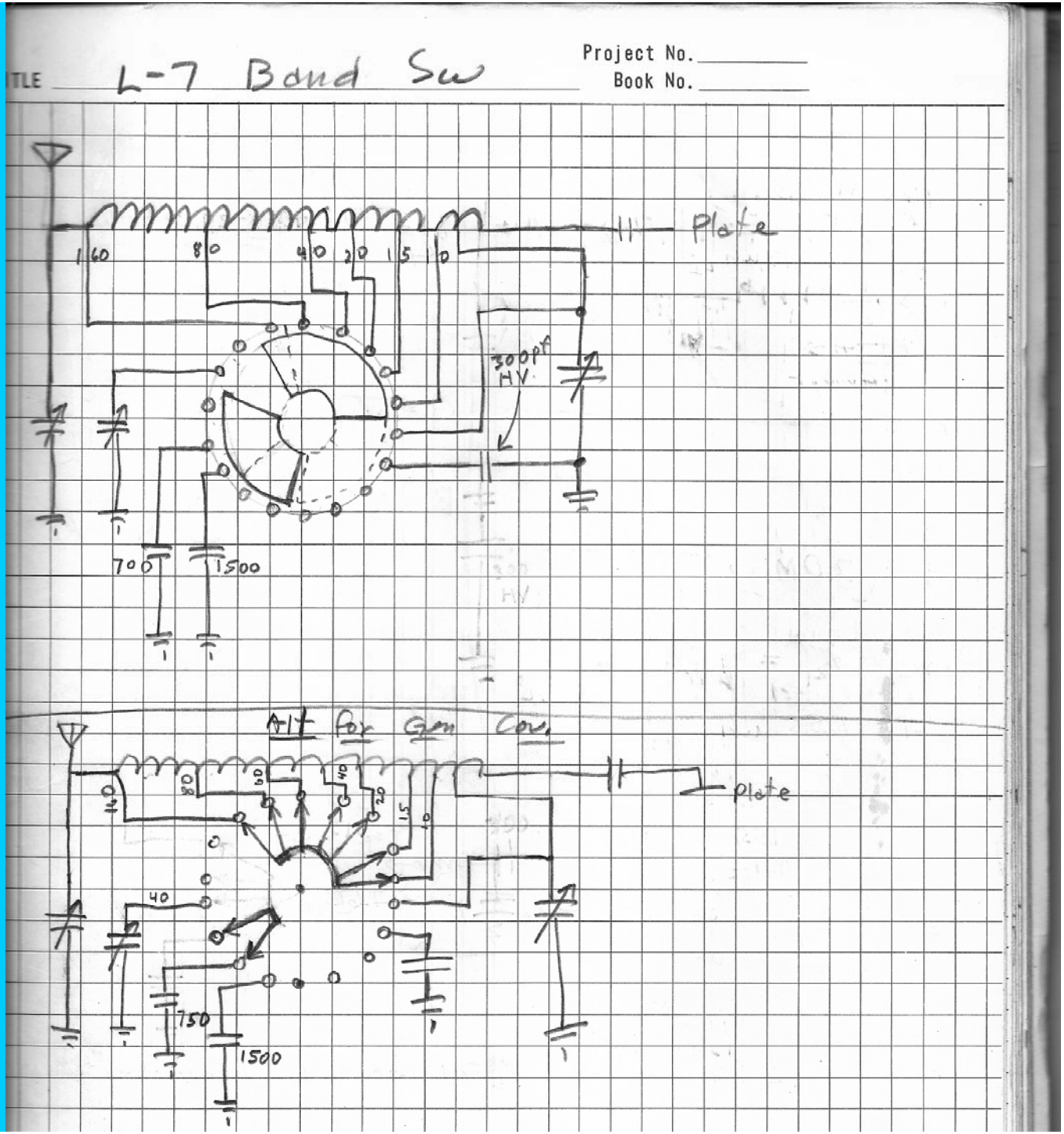
Type HO or 300 OK for 3000 watts output

DRAKE

(1977)

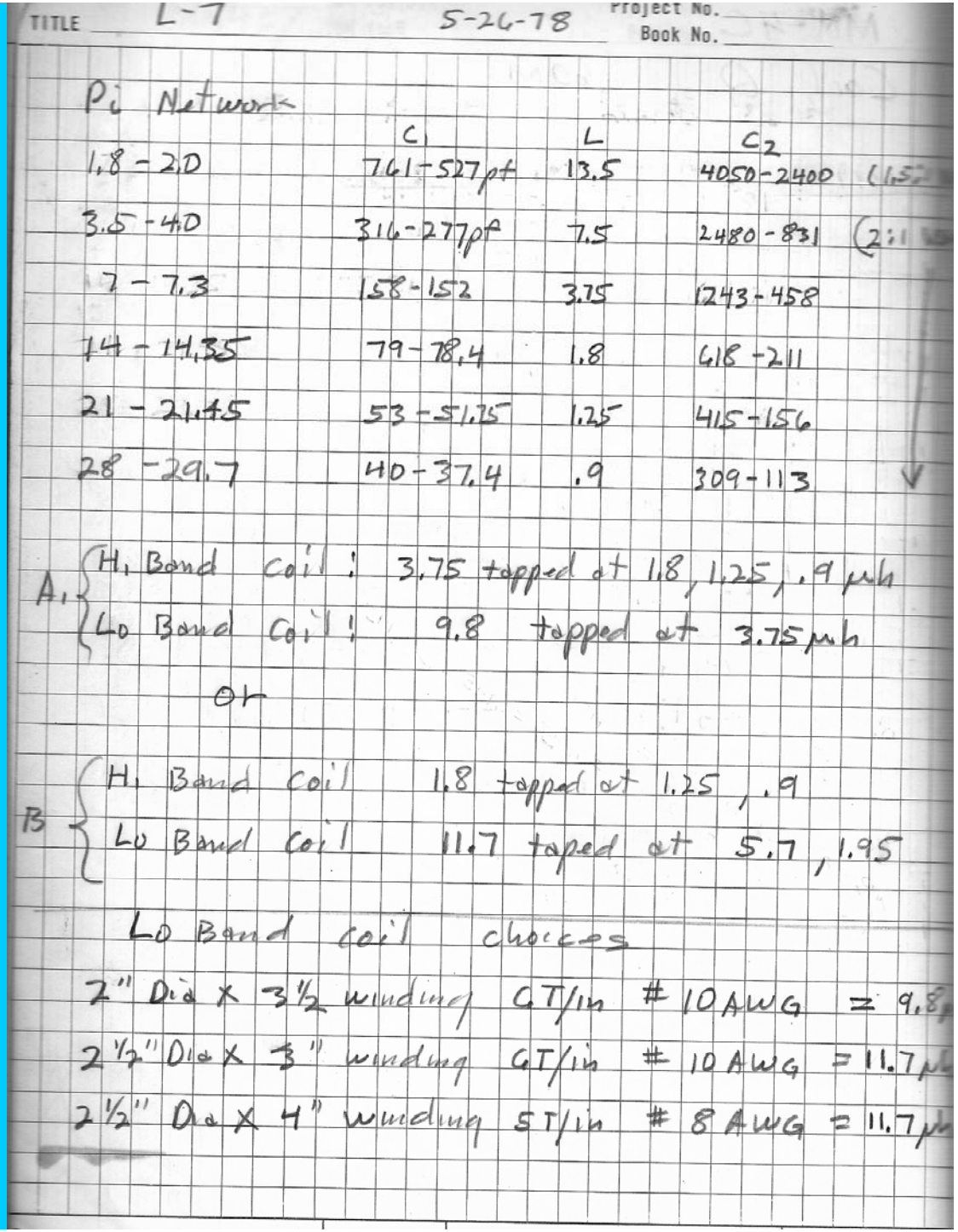
L-7 Amplifier

Tank Circuit Specs



(1978)

Drake L-7 Amplifier Pi-Network Notes



TITLE L-7 5-26-78 Project No. Book No.

Pi Network

	C1	L	C2
1.8 - 2.0	761 - 527 pf	13.5	4050 - 2400 (1.5:
3.5 - 4.0	316 - 277 pf	7.5	2480 - 831 (2:1
7 - 7.3	158 - 152	3.75	1243 - 458
14 - 14.35	79 - 78.4	1.8	618 - 211
21 - 21.45	53 - 51.25	1.25	415 - 156
28 - 29.7	40 - 37.4	.9	309 - 113

A. Hi Band Coil: 3.75 tapped at 1.8, 1.25, .9 µh
Lo Band Coil: 9.8 tapped at 3.75 µh

or

B. Hi Band Coil 1.8 tapped at 1.25, .9
Lo Band Coil 11.7 taped at 5.7, 1.95

Lo Band coil choices

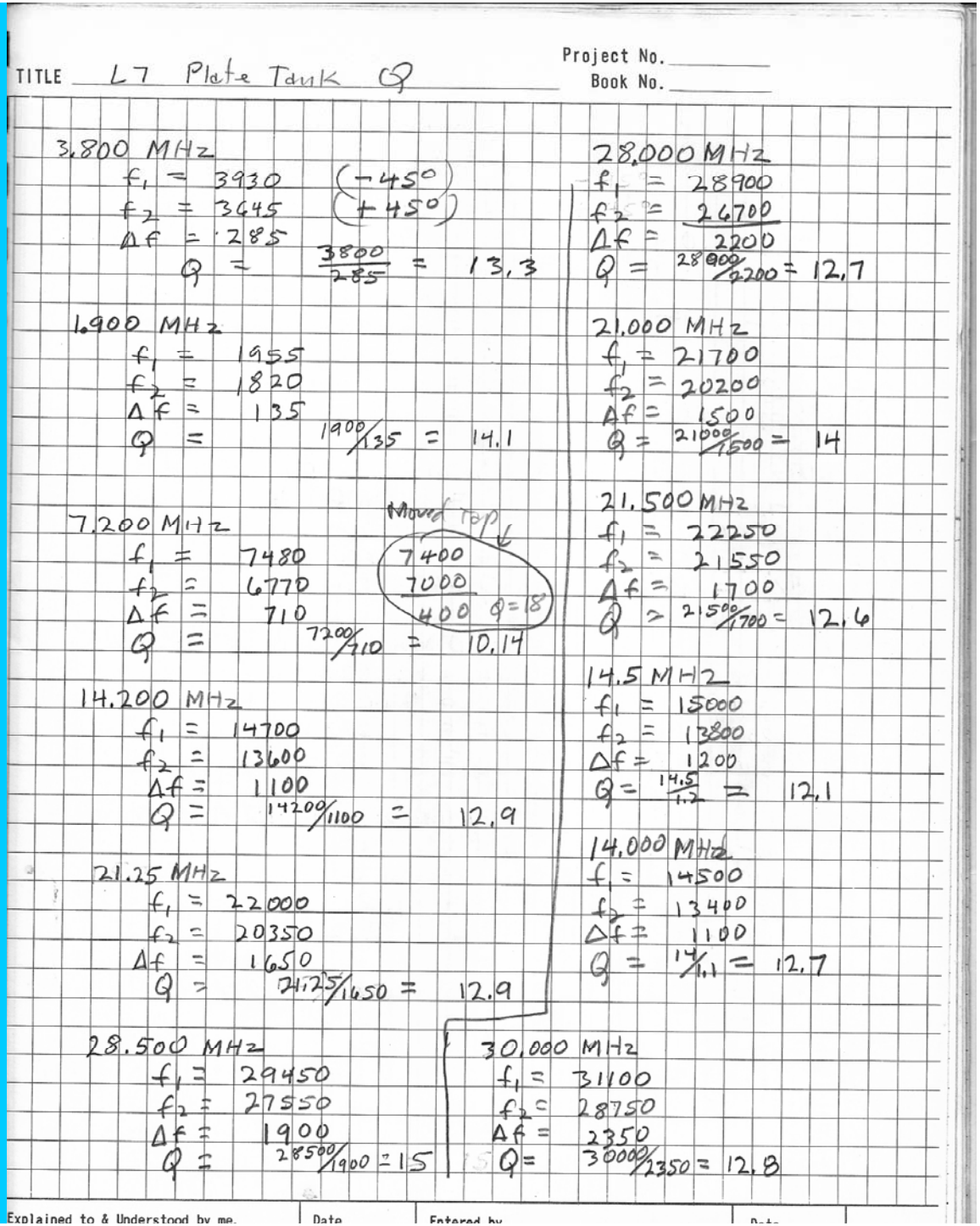
2" Dia x 3½ winding 6T/in #10 AWG = 9.8
2½" Dia x 3" winding 6T/in #10 AWG = 11.7 µ
2½" Dia x 4" winding 5T/in #8 AWG = 11.7 µ

(1977)

Drake

L-7 Amplifier

Plate Tank Circuit "Q"



TITLE L7 Plate Tank Q

Project No.

Book No.

3.800 MHz
f_1 = 3930 (−45°)
f_2 = 3645 (+45°)
Δf = 285
Q = 3800/285 = 13.3

1.900 MHz
f_1 = 1955
f_2 = 1820
Δf = 135
Q = 1900/135 = 14.1

7.200 MHz
f_1 = 7480
f_2 = 6770
Δf = 710
Q = 7200/710 = 10.14

Mount top
7400
7000
400 Q = 18

14.200 MHz
f_1 = 14700
f_2 = 13600
Δf = 1100
Q = 14200/1100 = 12.9

21.25 MHz
f_1 = 22000
f_2 = 20350
Δf = 1650
Q = 21.25/1650 = 12.9

28.500 MHz
f_1 = 29450
f_2 = 27550
Δf = 1900
Q = 28500/1900 = 15

28.000 MHz
f_1 = 28900
f_2 = 26700
Δf = 2200
Q = 28000/2200 = 12.7

21.000 MHz
f_1 = 21700
f_2 = 20200
Δf = 1500
Q = 21000/1500 = 14

21.500 MHz
f_1 = 22250
f_2 = 21550
Δf = 1700
Q = 21.5%/1700 = 12.6

14.5 MHz
f_1 = 15000
f_2 = 13800
Δf = 1200
Q = 14.5/1.2 = 12.1

14.000 MHz
f_1 = 14500
f_2 = 13400
Δf = 1100
Q = 14/1.1 = 12.7

30.000 MHz
f_1 = 31100
f_2 = 28750
Δf = 2350
Q = 30000/2350 = 12.8

Explained to & Understood by me. | Date | Entered by | Date

DRAKE

(1977)

Drake L-7 Amplifier

Plate Transformer

Specifications & Cost

TITLE L-7 Plate Transformer Project No. _____ Book No. _____

Drake Construction

Lamination E1-212 5 5/16 x 6 3/8 x 2 1/8 center leg
stack 3 1/8"
gage = .018"
weight of core = .92 x 15.35 x 3.125/2.125 = 20.77 lbs
No core pcs .018 ga = 160
Total weight of Transformer meas = 30.125 lb
weight of copper = 9.357 lb

Cost of copper @ 1.30/lb = 12.16
cost of Core @ 91.50/mpcs = 14.64
$ 26.80

Cintran price $31.55

PS-7 Transformer

Lamination E1-212
Stack 1 1/2
gage = 018
weight of Core = .92 x 15.35 x 1.5/2.125 = 9.97 lb
No core pcs = 70 pcs
Meas wt of Trans = 17.25 lb
weigh of copper = 7.28 lb

Cost of copper @ 1.30/lb 9.46
Cost of core @ 91.50/M 6.41
$ 15.87

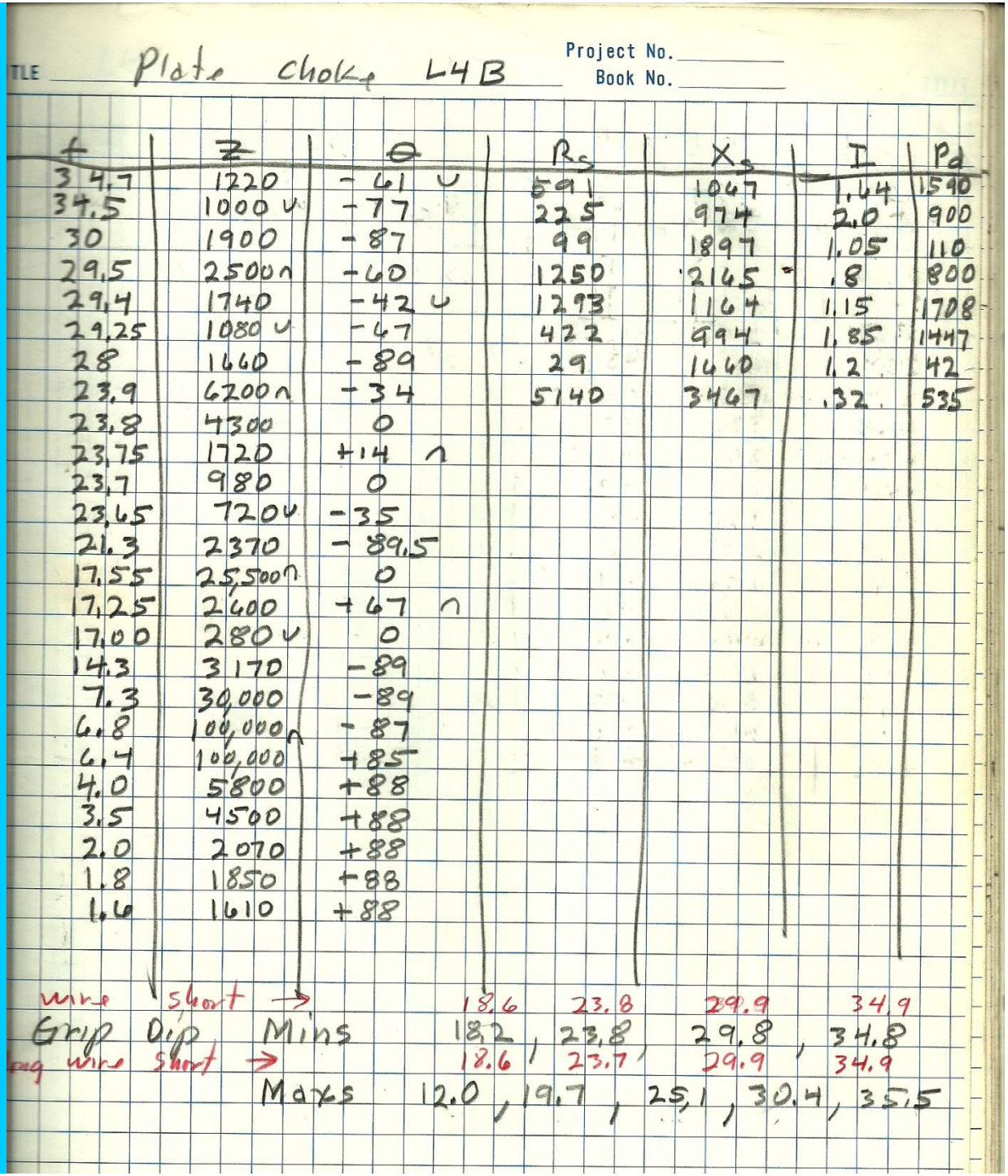
Cintran price $ 21.50

DRAKE

(1970's)

Drake L-4B Amplifier

Plate Choke Specs



TLE Plate Choke L4B Project No. ____ Book No. ____

f	Z	Θ	R_s	X_s	I	Pd
34.7	1220	-61 ↓	591	1047	1.44	1590
34.5	1000 ↓	-77	225	974	2.0	900
30	1900	-87	99	1897	1.05	110
29.5	2500 ∩	-60	1250	2165	.8	800
29.4	1740	-42 ↓	1293	1164	1.15	1708
29.25	1080 ↓	-67	422	994	1.85	1447
28	1660	-89	29	1660	1.2	42
23.9	6200 ∩	-34	5140	3467	.32	535
23.8	4300	0				
23.75	1720	+14 ∩				
23.7	980	0				
23.65	720 ↓	-35				
21.3	2370	-89.5				
17.55	25,500 ∩	0				
17.25	2600	+67 ∩				
17.00	280 ↓	0				
14.3	3170	-89				
7.3	30,000	-89				
6.8	100,000 ∩	-87				
6.4	100,000	+85				
4.0	5800	+88				
3.5	4500	+88				
2.0	2070	+88				
1.8	1850	+88				
1.6	1610	+88				

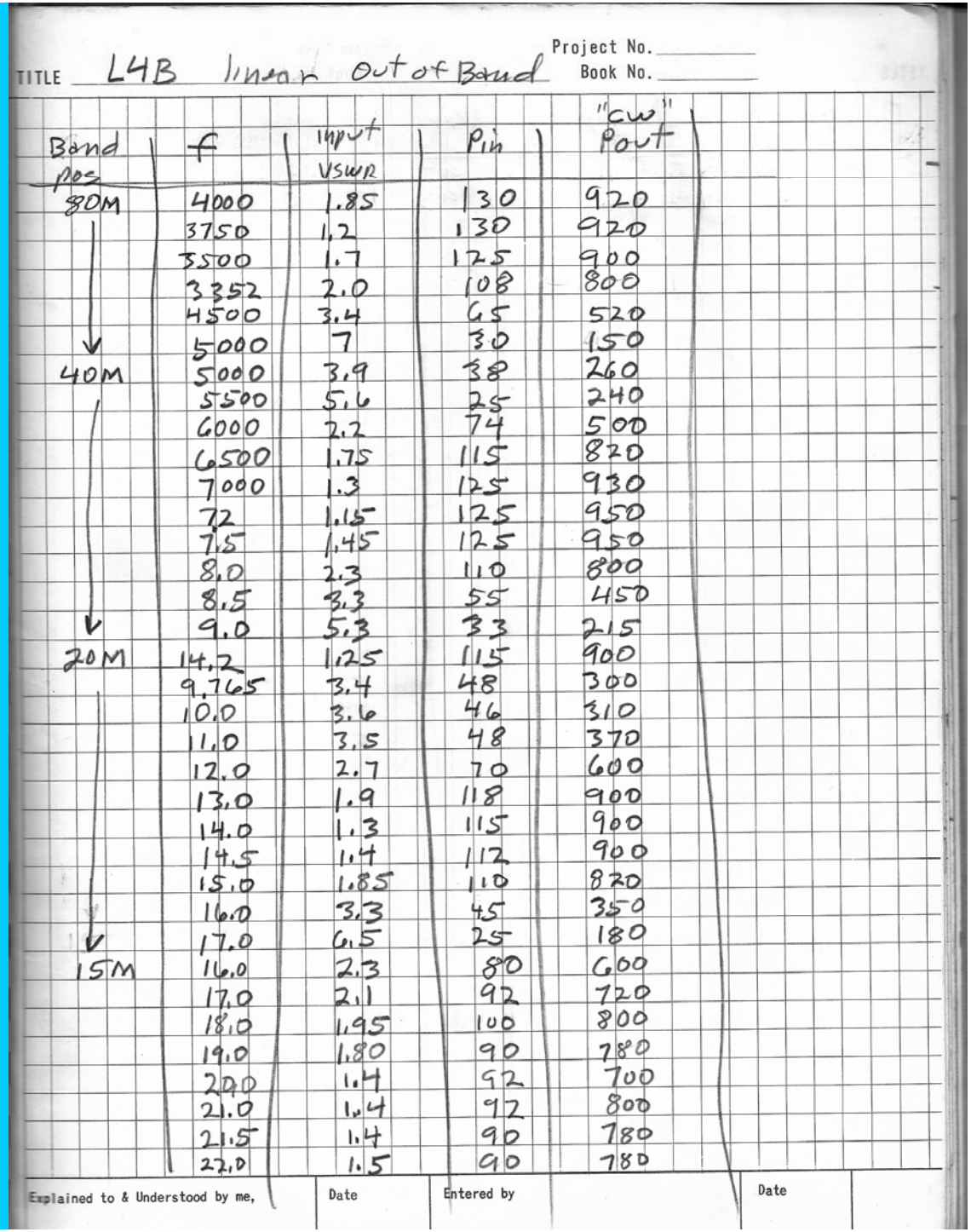
wire	short →		18.6	23.8	29.9	34.9
Grip	Dip	Mins	18.2 ,	23.8 ,	29.8 ,	34.8
long wire	short →		18.6 ,	23.7 ,	29.9 ,	34.9
		Maxs	12.0 ,	19.7 ,	25.1 ,	30.4 , 35.5

DRAKE

(1970's)

Drake L-4B Amplifier

Out of Band Specs



TITLE L4B linear out of Band Project No. ____ Book No. ____

Band pos	f	Input VSWR	Pin	"cw" Pout
80M	4000	1.85	130	920
	3750	1.2	130	920
	3500	1.7	125	900
	3352	2.0	108	800
	4500	3.4	65	520
↓	5000	7	30	150
40M	5000	3.9	38	260
	5500	5.6	25	240
	6000	2.2	74	500
	6500	1.75	115	820
	7000	1.3	125	930
	7.2	1.15	125	950
	7.5	1.45	125	950
	8.0	2.3	110	800
	8.5	3.3	55	450
↓	9.0	5.3	33	215
20M	14.2	1.25	115	900
	9.765	3.4	48	300
	10.0	3.6	46	310
	11.0	3.5	48	370
	12.0	2.7	70	600
	13.0	1.9	118	900
	14.0	1.3	115	900
	14.5	1.4	112	900
	15.0	1.85	110	820
	16.0	3.3	45	350
↓	17.0	6.5	25	180
15M	16.0	2.3	80	600
	17.0	2.1	92	720
	18.0	1.95	100	800
	19.0	1.80	90	780
	20.0	1.4	92	700
	21.0	1.4	92	800
	21.5	1.4	90	780
	22.0	1.5	90	780

Explained to & Understood by me, Date Entered by Date

DRAKE

(1977)

Drake TR-7

PA Load Effect On Power

Project No. _____
Book No. _____

TITLE TR-7 PA Load Effect on Pwr

Limits of Max output (Point where Pwr just starts to drop)

f	Z	Θ	SWR (upper)	R	X
3.8	34	+26	1.75	30.5	15
	58	-37	2.6	46	-35
	40	+30	1.75	34.6	20
	46	-37	2.4	37	-28
	92	+5	1.9	92	8
	26	-10	1.9	25.6	-4.5
	74	+26	1.7	66.5	32
	40	+35	1.7	32.8	23
	40	-32	2.45	34	-21.2
1.8	26	+23	2.0	24	10.2
	68	-29	2.25	59.5	-33
	31	+29	1.9	27	15
	57	-33	2.25	48	-31
	49	-34	2.4	40.6	-27.4
	83	-20	2.4	78	-26.4
	85	0	2.0	85	0
	68	+16	1.5	65.4	18.7
	34	+31	1.75	31	18.5
	60	+23	1.4	55	23.4
	22	+2	2.3	22	.8
	35	-30	2.3	30.3	17.5
7.2	46	+34	1.7	38.1	25.7
	38	-30	2.4	33	-19
	55	-35	2.5	45	-31.5
	74	+25	1.75	67	31.3
	91	+12	1.8	89	19
	95	-14	2.4	92	23
	96	0	2.0	96	0
	27	0	2.0	27	0

DRAKE

(1970's)

Drake

Cooling Fan

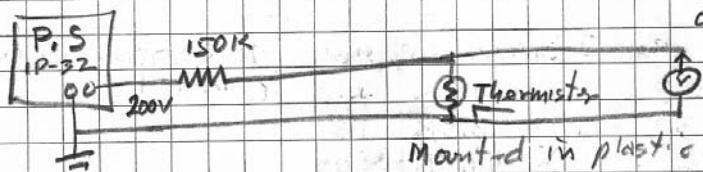
Specs

TITLE Cooling Fans

Project No. _____

Book No. _____

Note → Voltage is function of Air flow thru Tube



Mounted in plastic Tube 9/32 ID x 1 1/4 lg.

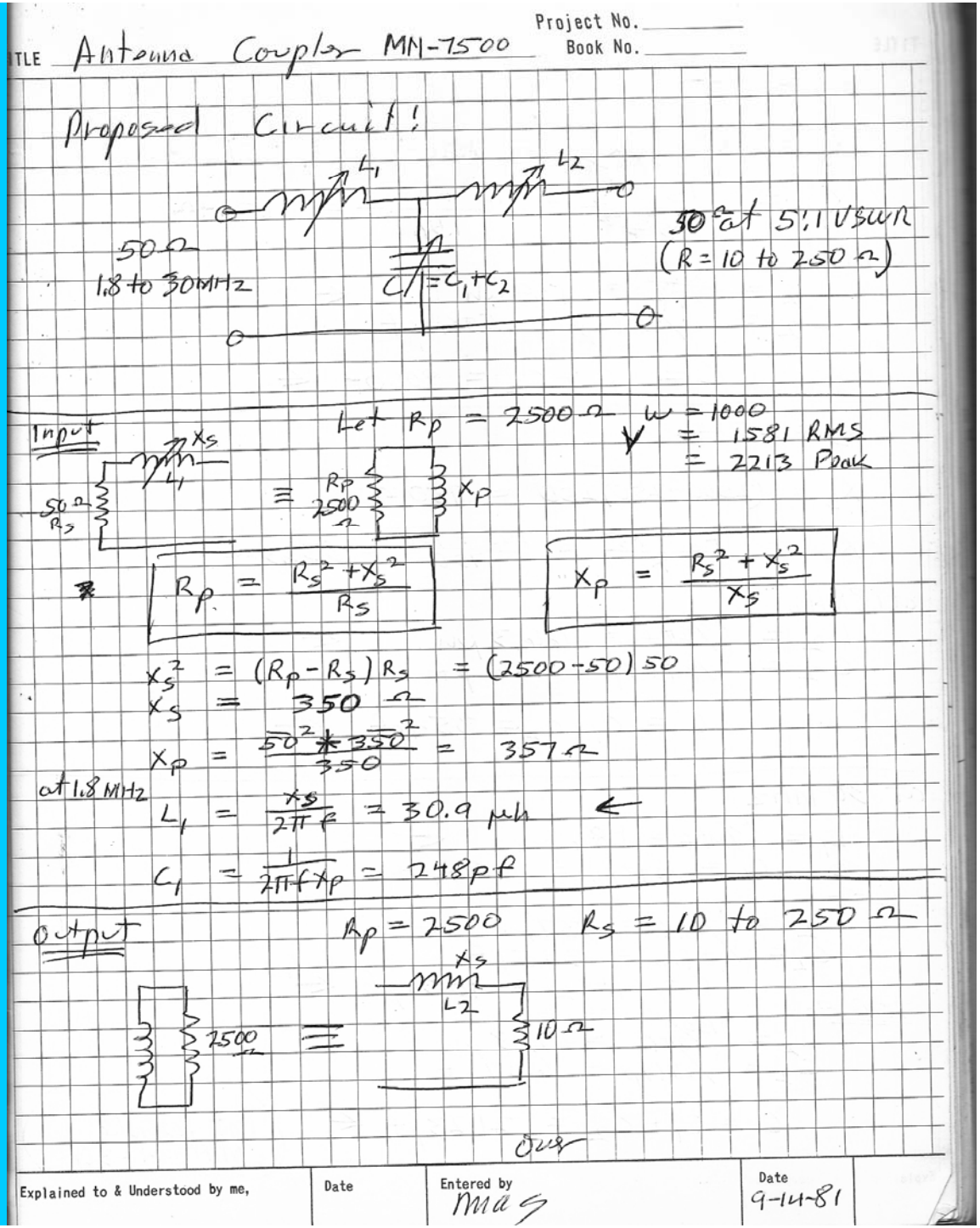
Fan Type	Voltage fan off	Voltage fan on	ΔV	HUM 1→10	Noise 1→10
IMC WS2107FL9	11.72	12.65			
IMC WS2107FL-2	11.73	12.80			
Rotron WR2A1	11.72	12.88			
PAMOTOR 4500C	12.50	14.90		8	10
IMC WS2107-FL		14.83		5	8
TORIN TA450 S		14.54		6	6
IMC WS2107-FL2		14.30		2	3
ROTRON WR2A1		14.27		4	4
IMC WS2107-FL9		14.07		1	1
ETRI 133-LY-21-52	12.13	14.23		3	2
ETRI	12.71	14.76			
FL-9	12.71	14.57			
FL-9	12.60	14.44			
Rotron WR2A1	12.30	14.33			
FL-9		14.12			
FL-2		14.16			
Rotron		14.20			
FL-2		14.16			
FL-9		14.02			
Rotron		14.09			
FL-2		14.09			
FL-2	12.04	14.07			
ETRI		14.02			
FL-9		13.86			

DRAKE

(1981)

Drake "NEW"

MN-7500 Antenna Tuner



Thank You

For Watching

Questions & Answers

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