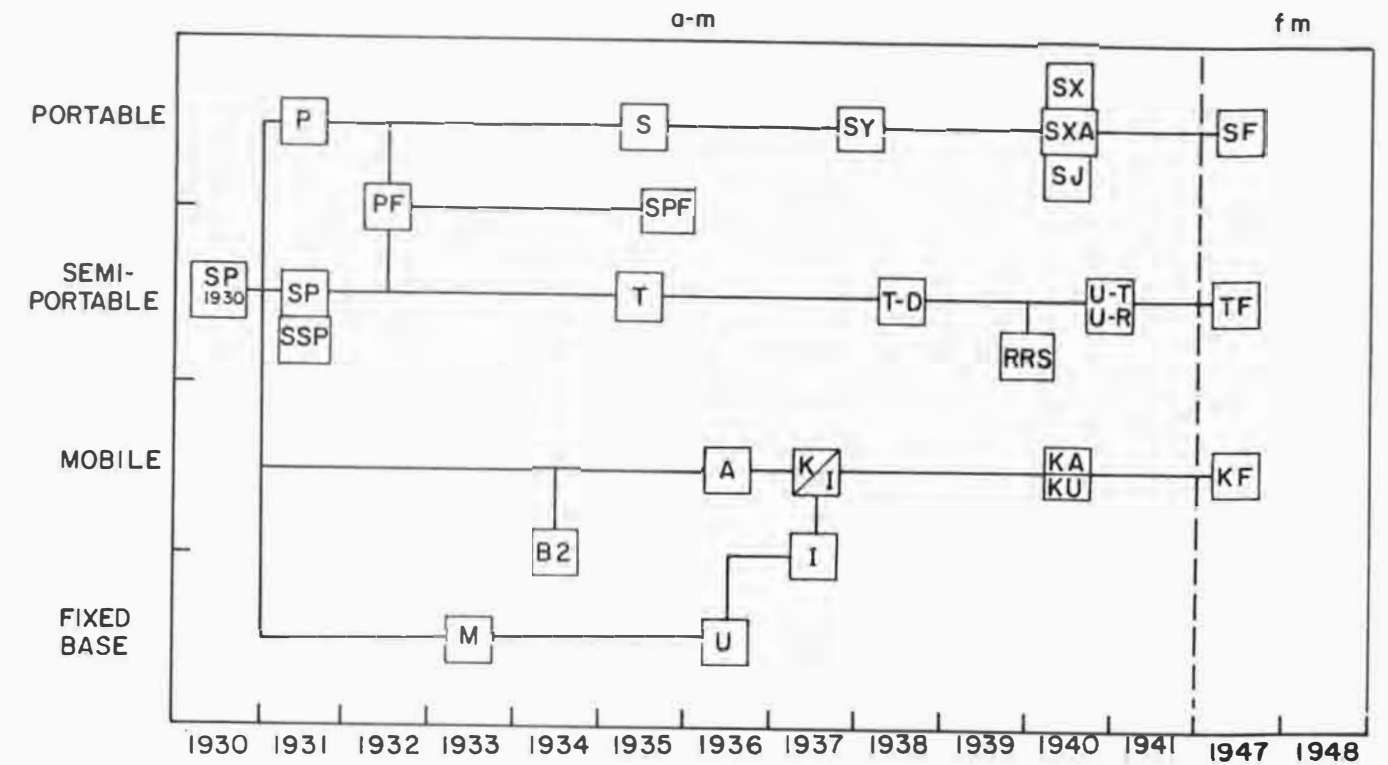


Appendix I

Forest Service Radio Models—Photos, Diagrams, and Data

Chronological Development of Forest Service Radio Sets, by Type and Function



Hf Types

100 meters (2.9–3.5 MHz)

(NA:95G-249757)

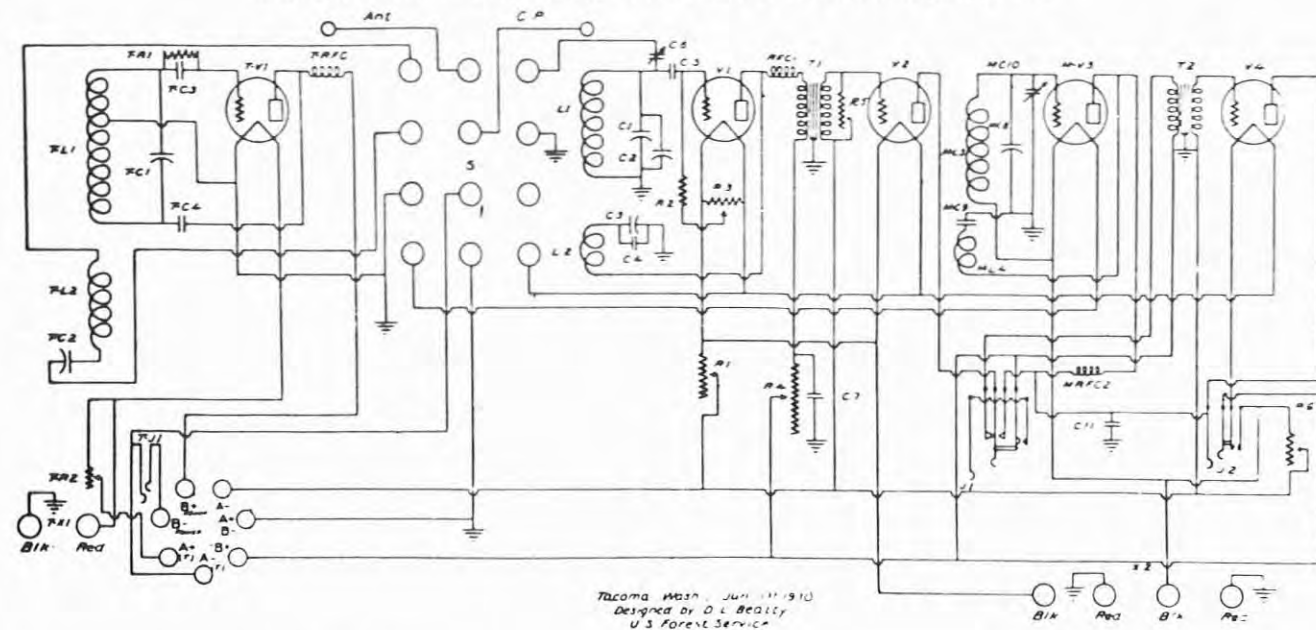


SP - 1930

Designed by:	Dwight L. Beatty, 1930
Number produced:	9
Price:	\$140
Models:	Original only
Frequency:	3 MHz
Transmitter:	1 watt, c.w., AM
Receiver:	Regenerative
Antenna:	Long wire with counterpoise
Dimensions:	6 x 14 x 8" (radio only)
Weight:	17# 14 oz. (79# 5 oz. complete)*
Principal use:	Test purposes

*Comments: Radio: 17# 14 oz.
Equip. case: 11# 11 oz.
Antenna equip: 5# 12 oz.
Battery with case: 44#

COMBINED PORTABLE TRANSMITTER-RECEIVER

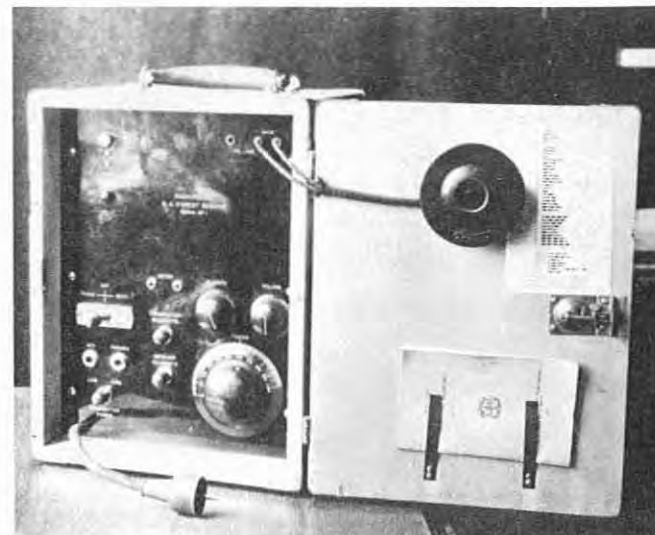


Schematic Diagram, SP-1930

(National Archives:
Record Group 95G-262848)



(NA:95G-274968)



Type SP

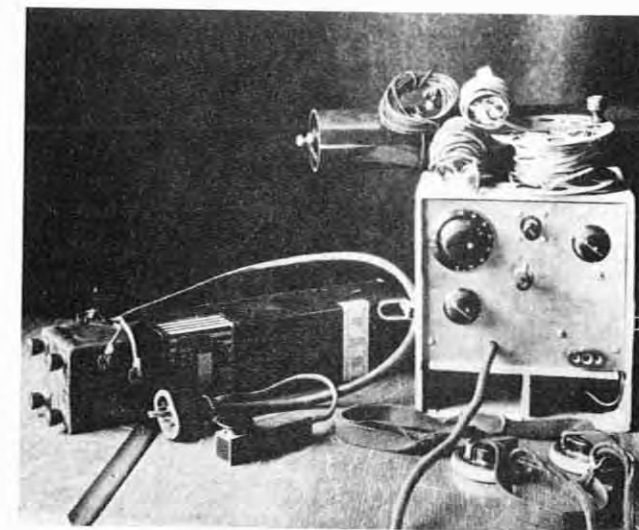
'Semiportable' SP*

SSP*

Designed by:	Harold K. Lawson, 1931	HKL, 1932
Number produced:	500	See SP
Price	\$146	
Frequency	3 MHz	
Transmitter:	1 watt, voice-c.w., AM, VFO	4 1/2 watts
Receiver:	Regenerative, simplex	
Power:	Dry batteries	
Antenna:	135'/75' Center loaded (see text)	
Weight:	20# net, 55# w/batteries	
Dimensions:	9 x 10 x 13"	
Principal use:	Lookouts and other temporary locations	
*Comments:	Both sets used modified circuit of SP-1930 (see diagram) Type SSP had higher first cost, but lower operating cost	

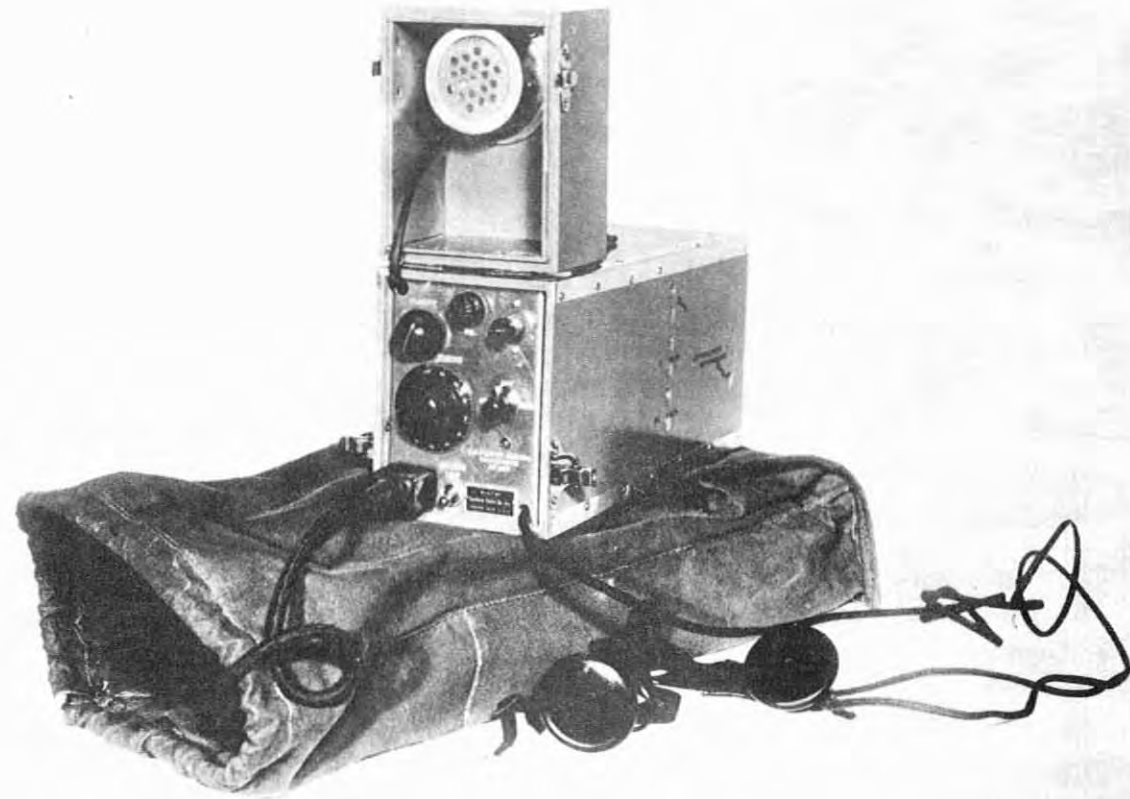
Type P*

'Portable'



(NA:95G-274971)

Designed by:	W. Foy Squibb, 1931
Number produced:	104
Price:	\$50
Frequency	3 MHz
Transmitter:	1 1/4 watts, c.w., AM, VFO (set and lock)
Receiver:	Regenerative, simplex
Power:	Dry batteries
Antenna:	75' Center loaded (see text)
Weight:	5# 9 oz. - 12# complete
Dimensions:	6 x 7 x 7"
Principal use:	Smokechasers, fire scouts, and trail crews
*Comments:	It used a slightly modified circuit of SP-1930 (see diagram)



(Forest Service photo, History Section)

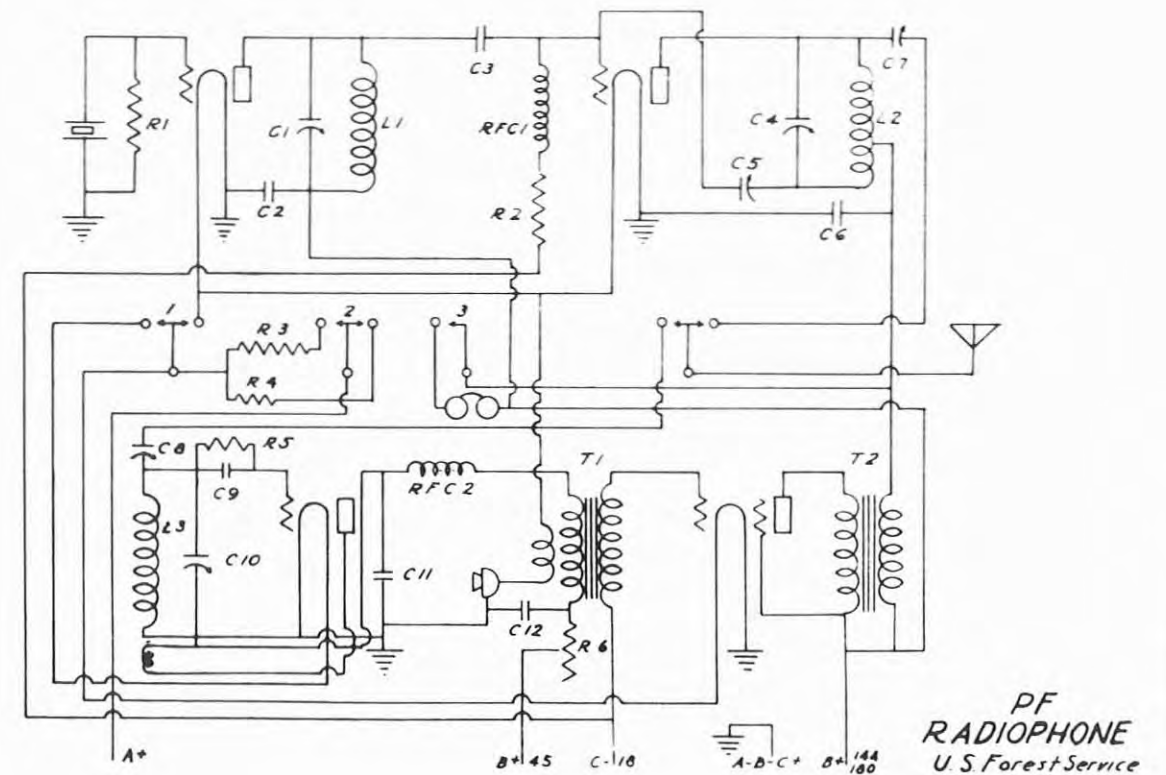
Type PF

'Portable Fone'*

Designed by:	Harold K. Lawson/W. Foy Squibb, 1933
Number produced:	450
Price:	\$60-\$75
Frequency:	3 MHz
Transmitter:	2 1/4 watts, voice-c.w., AM, xtals
Receiver:	Regenerative, simplex
Power:	Dry batteries
Antenna:	Center loaded, half wave (see text)
Weight:	14-15#
Dimensions:	4 x 5 x 16"

Principal use: Smokechasers and work crews

*Comments Sometimes advertised as "Portable Fireman"
PF Kitbox included heavy-duty batteries



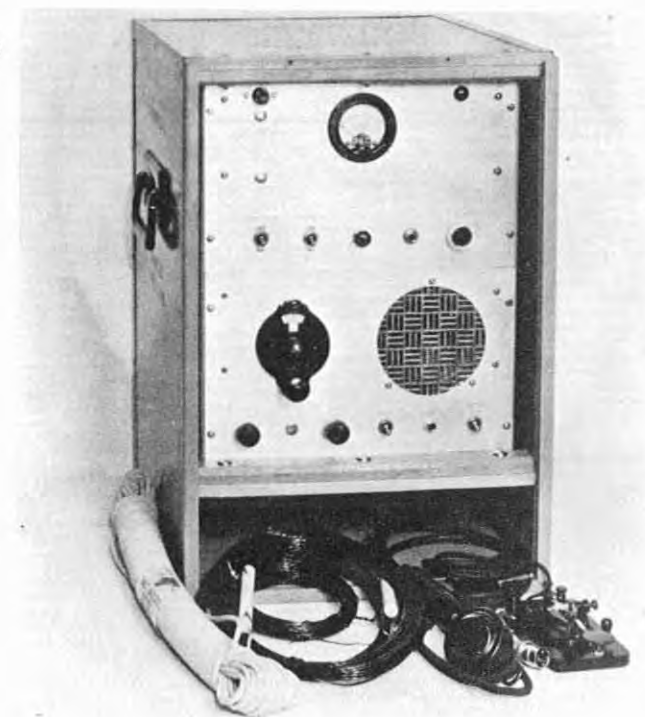
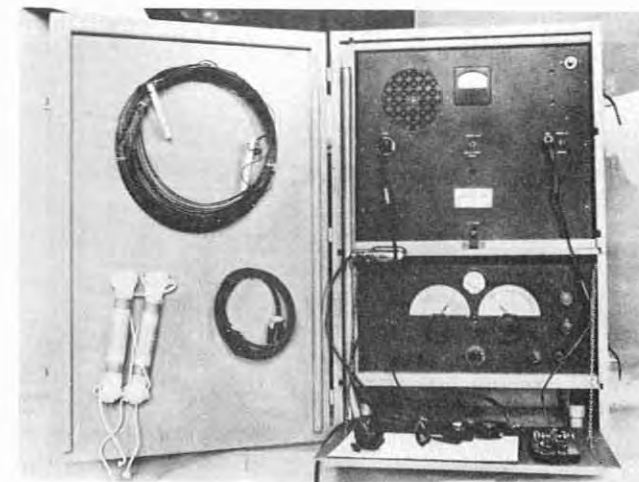
PF
RADIOPHONE
U.S. Forest Service

Schematic Diagram, Type PF

Type M, Model D

(Forest Service photos, History Section)

Type M, Model C



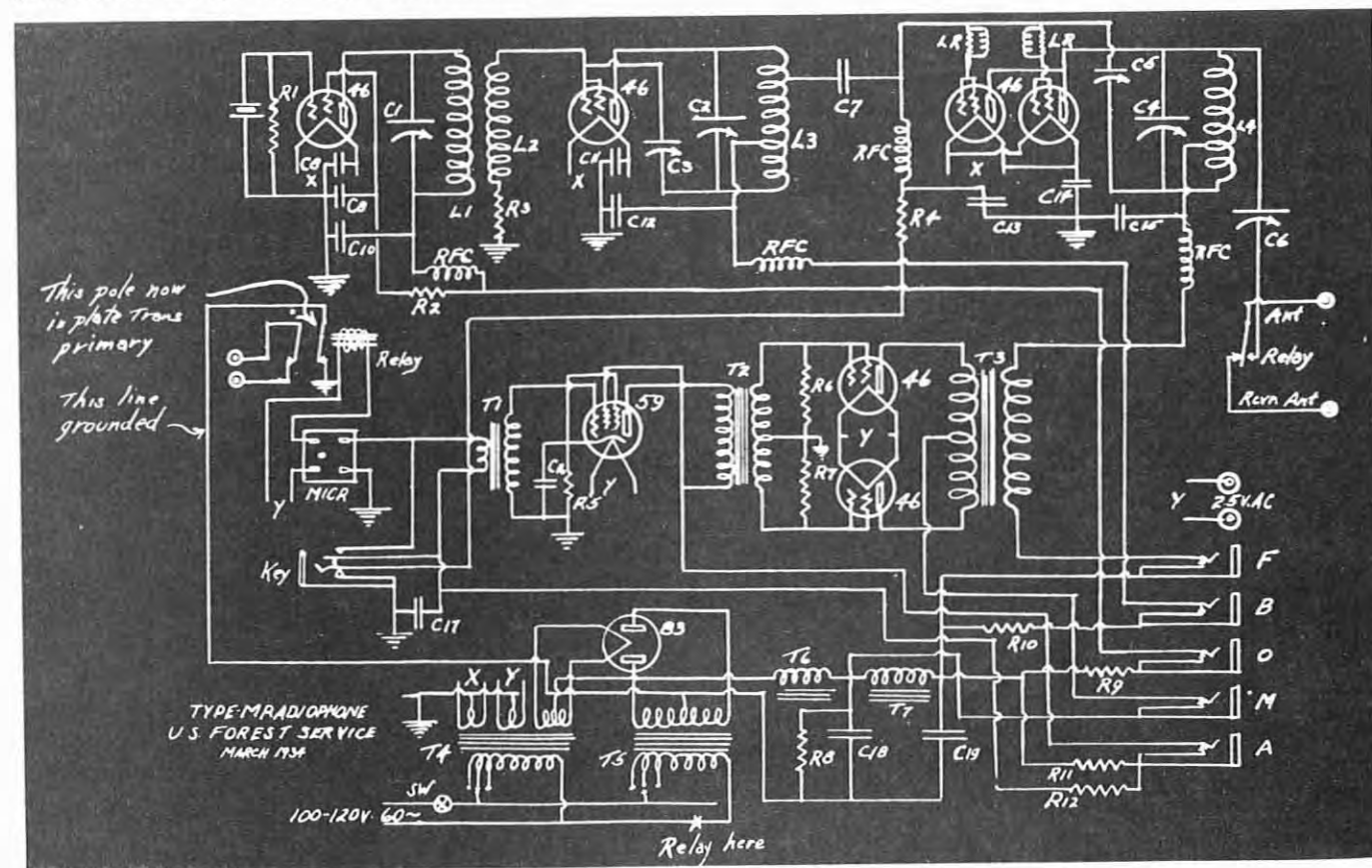
Type M*

'Medium power'

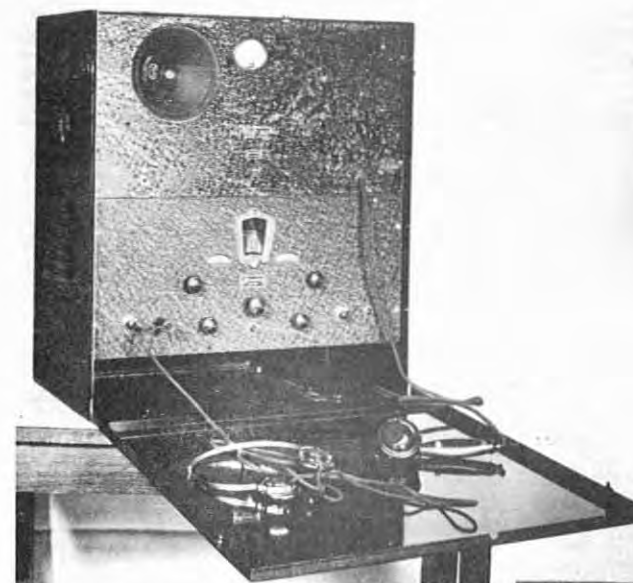
Designed by: Harold K. Lawson, 1933
 Number produced: 210
 Price: \$290
 Models: A, B, C. (Belleville), D (Claypool)
 Frequency: 3 MHz
 Transmitter: 20 watts nominal, voice-c.w., AM, push-to-talk, xtal
 Receiver: Hammurlund Comet Pro and other commercial types; later models Forest Service superheterodyne
 Power: 110 volts (a.c.) or gas engine generator
 Antenna: Half-wave, single wire feeder
 Weight: 75-200# depending on model
 Dimensions: 10 x 14 x 22" (transmitter only)
 Principal use: Central station for fire crews and supervisor's headquarters

*Comments
 Model A (2 units) Serial Numbers 1-96
 Model B (1 unit) Serial Numbers 97-152
 Model C (1 unit) Serial Numbers 154-180
 Model D (1 unit) Serial Numbers 181-210

Schematic Diagram, Type M-Model A



Type M-Model B



(Forest Service photo, History Section)
 Schematic Diagram, Type M-Model B

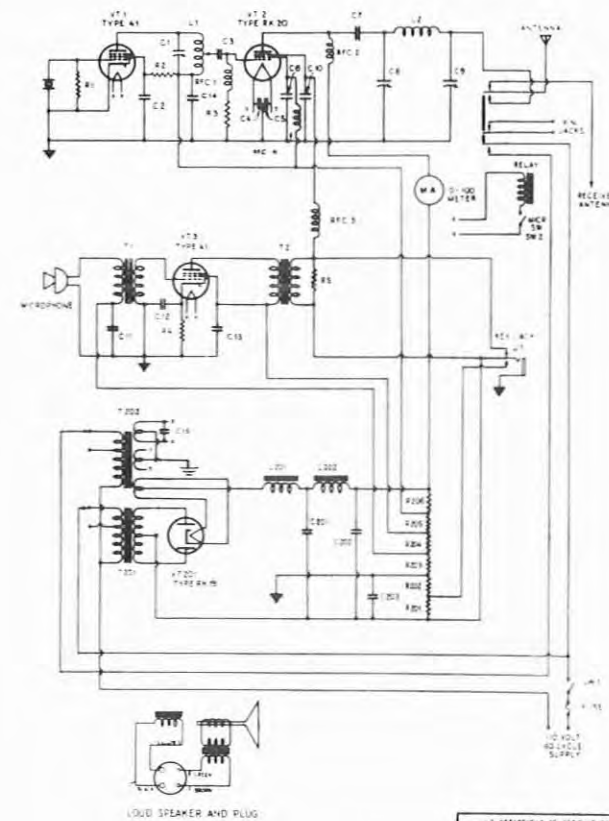
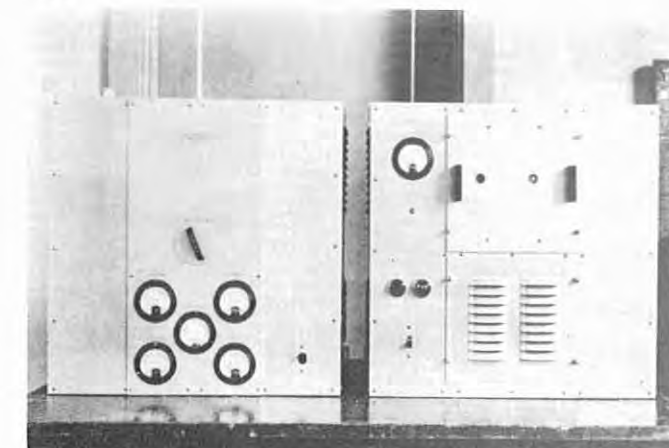


FIG. 2.62

U.S. DEPARTMENT OF AGRICULTURE
 FOREST SERVICE
 TYPE M RADIOPHONE
 MODEL B
 DESIGNED & DRAWN BY L.M.B. APPROVED BY H.H. M.P.F. JUN 12, 1934

Type B



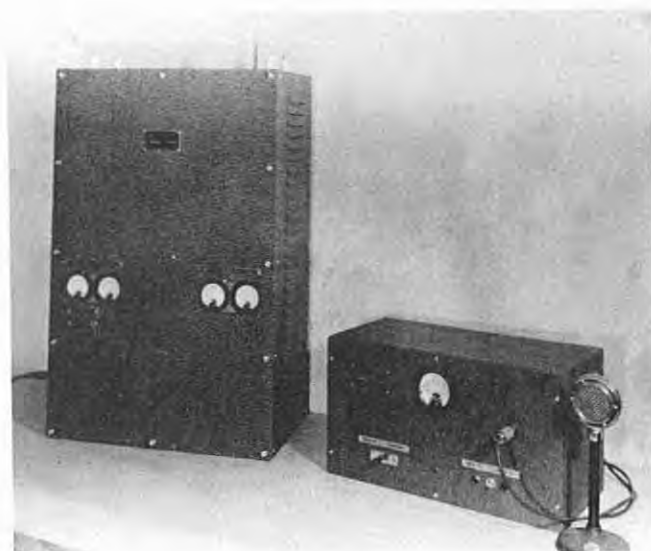
(NA:95G 305779)

Type B*

'Boat'

Designed by: W. S. Claypool, 1934
 Number produced: 8
 Models: B and B2 (Radio Laboratory staff)
 Frequency: 2300 kHz and 4600 kHz
 Transmitter: 200 watts, 2 channel xtal, voice, AM, simplex
 Receiver: Hammurlund Comet Pro
 Power: Gas Engine alternator
 Antenna: Marine Marconi
 Weight: Unknown
 Dimensions: 24 x 24 x 12" each
 Principal use: Ship to shore

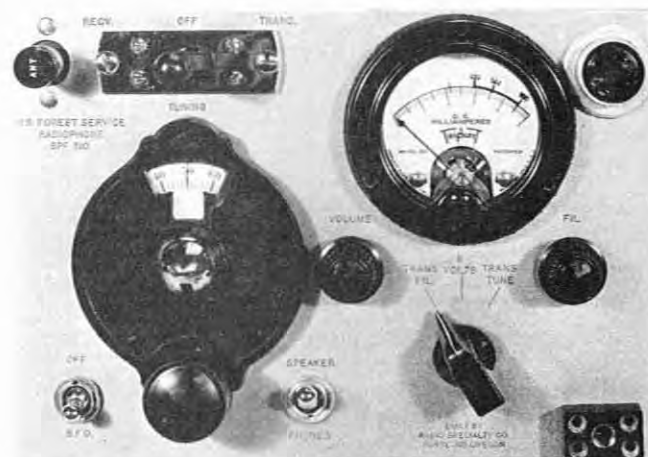
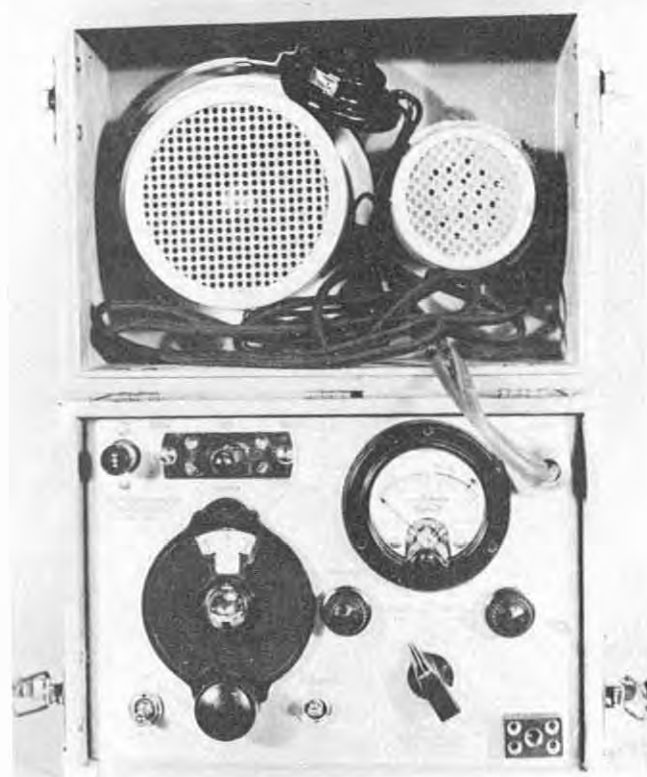
*Comments
 For use on Forest Service patrol boats in Region 10 only
 No schematic diagram available



Type B2

(Forest Service photos, History Section)

Type SPF radio installed in carrying box; speaker, mike, and headset in hinged section on top.



Forest Service SPF radio, Model AA (Serial No. 310), front panel

Type SPF* 'Semiportable Fone'

Designed by: W. S. Claypool and Laboratory staff, 1935-36

Number produced: 1200

Price: \$140

Models: A, AA, AB (or BA), AD, AE, AF

Frequency: 3MHz

Transmitter: 2 1/4 watts, voice-c.w., AM, xtal

Receiver: Superheterodyne, simplex

Power: Dry batteries

Antenna: Half-wave--off-center or end-fed

Weight: 21# w/lt. wt. battery, 60# w/Kitbox

Dimensions: 6 1/2 x 9 x 14 1/2"

Principal use: Fire crews and emergency lookouts

*Comments: PF modified with super-heterodyne receiver

Model A Serial Numbers 1-264

Model AA Serial Numbers 265-480

Model AB Serial Numbers 481-743

Model AD Serial Numbers 744-903

Model AE Serial Numbers 904-966

Model AF Serial Numbers 967-1200

A number of additional SPF sets were produced by industry for the military during World War II (see text)

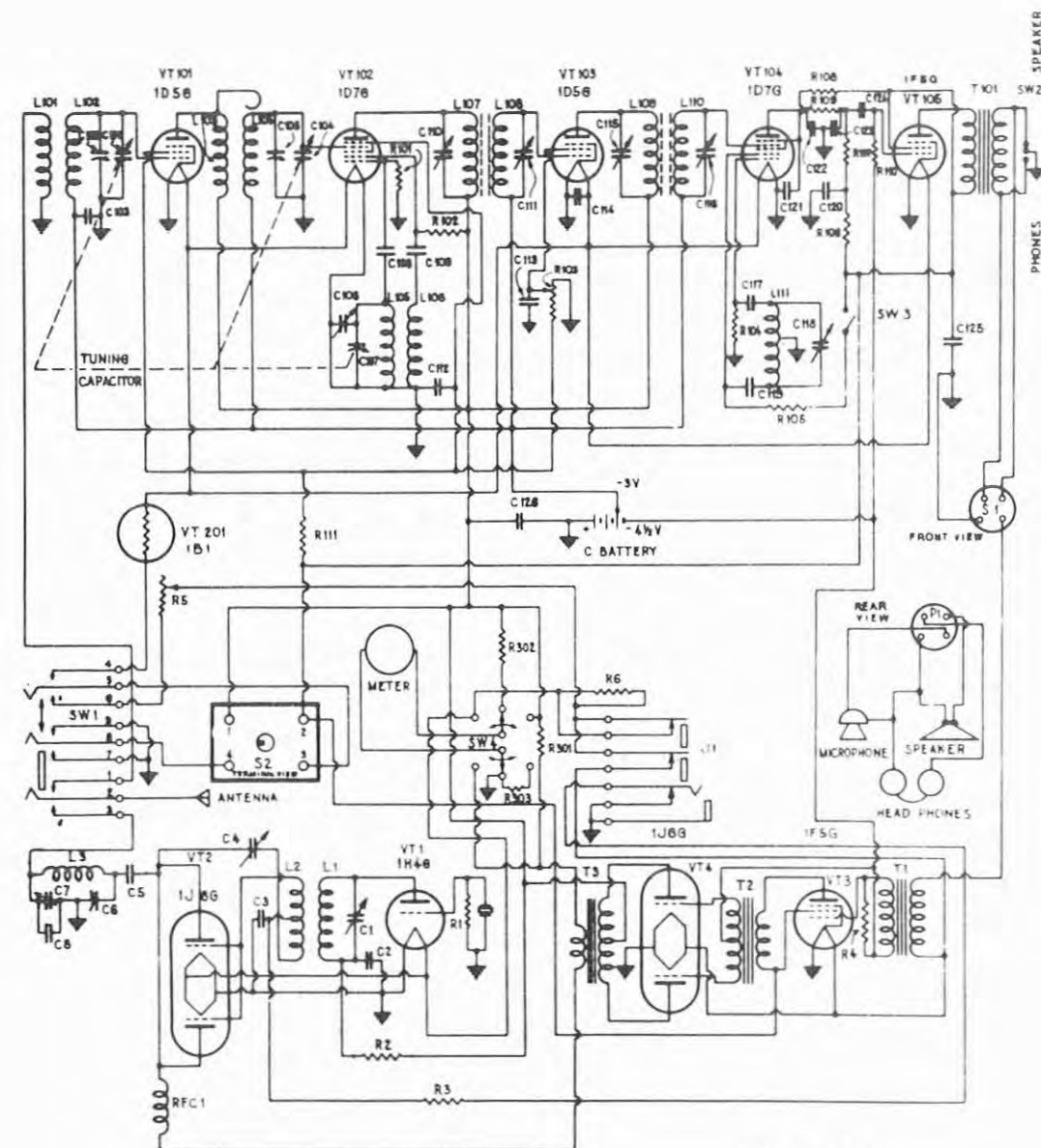
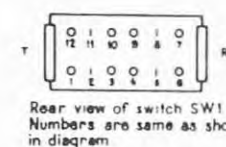


FIG. 2.62



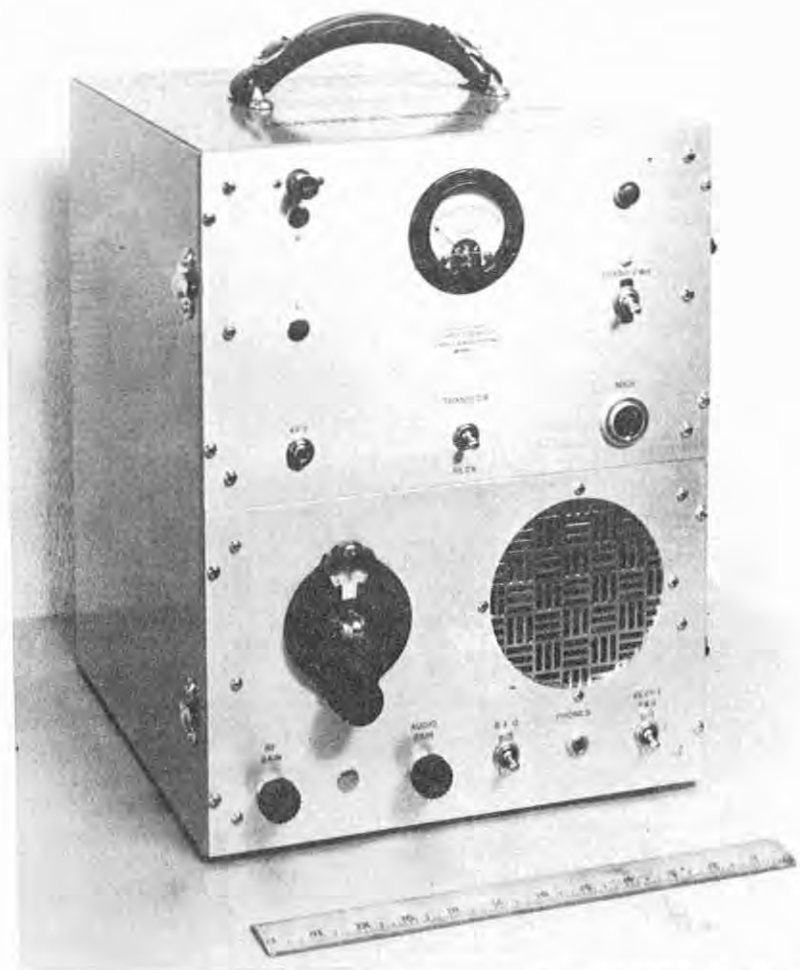
Rear view of switch SW1
Numbers are same as shown in diagram

BATTERY CABLE

- 1 Red = B-180
- 2 Green = B-135
- 3 Brown = A+
- 4 Blue = B-, Black = A-

Schematic Diagram, Type SPF-Model AA





(Forest Service photo, History Section)

Type I*

'Intermediate power'

Designed by:	Radio Laboratory staff, 1937
Number produced:	52
Price:	\$280
Models:	A, B, C (Belleville), D
Frequency:	3 MHz, two channel
Transmitter:	9 1/2 watts, voice-c.w., AM, xtal
Receiver:	Superheterodyne, simplex w/standby
Power:	6-volt storage battery
Antenna:	Half wave, fed off center
Weight:	66# w/accessories, including batteries
Dimensions:	17 1/2 x 19 1/4 x 12 1/4"

Principal use: Fire camps and temporary bases

*Comments: Intermediate in power between SPF and M sets

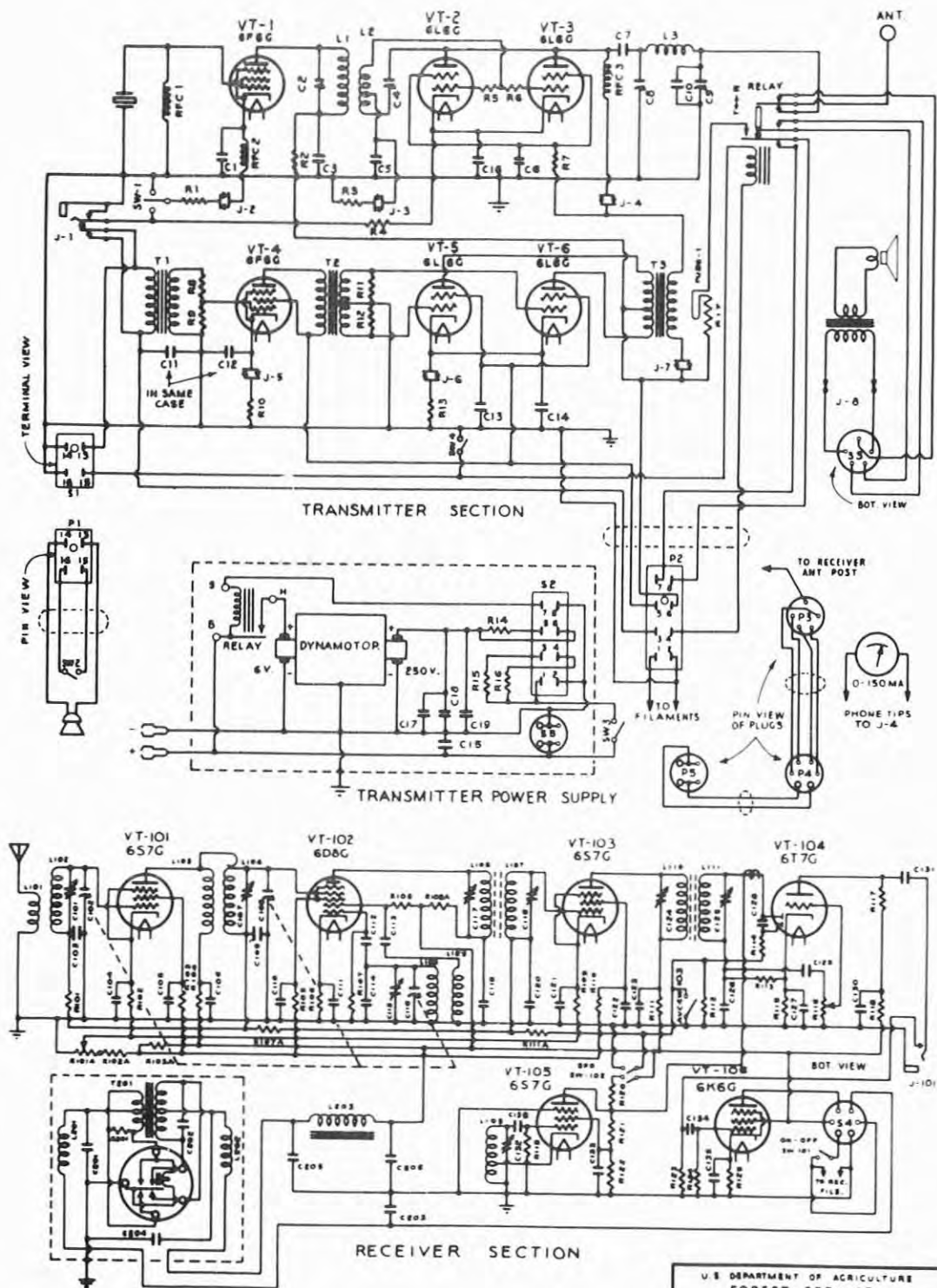
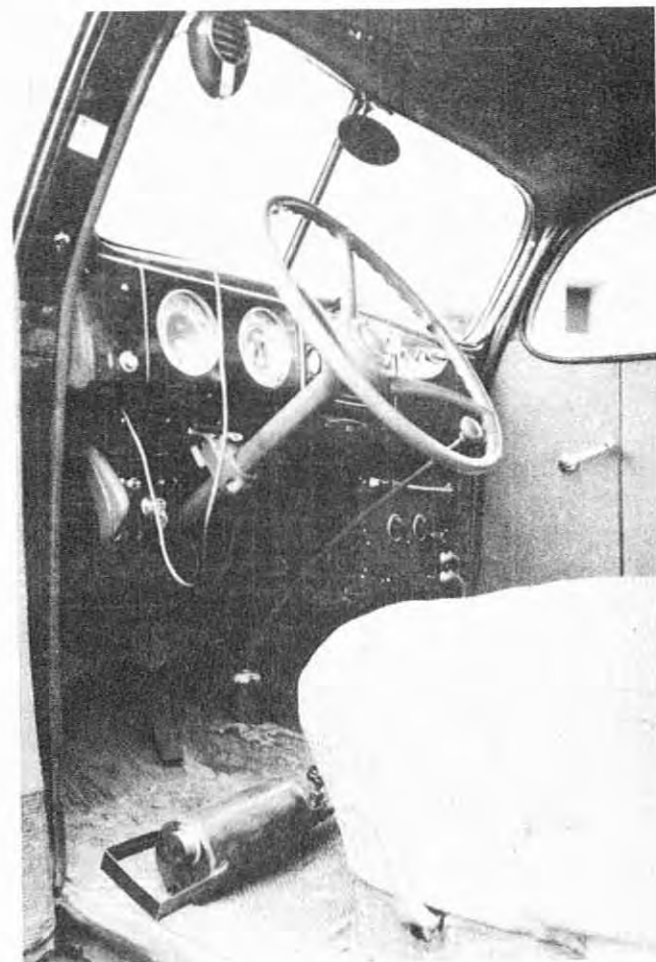
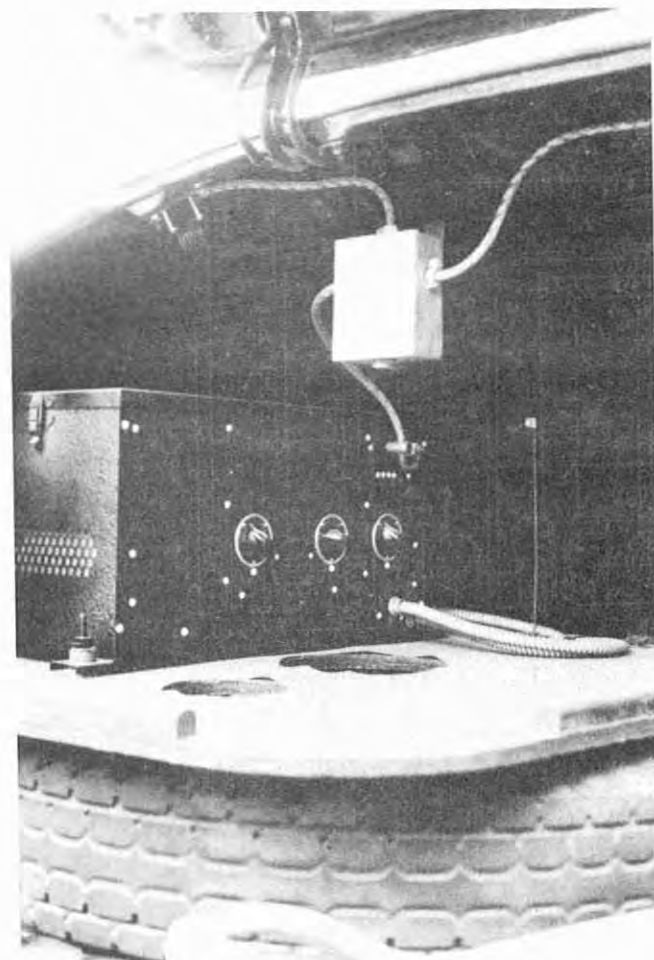


FIG. 2.62

Schematic Diagram, Type I-Model A

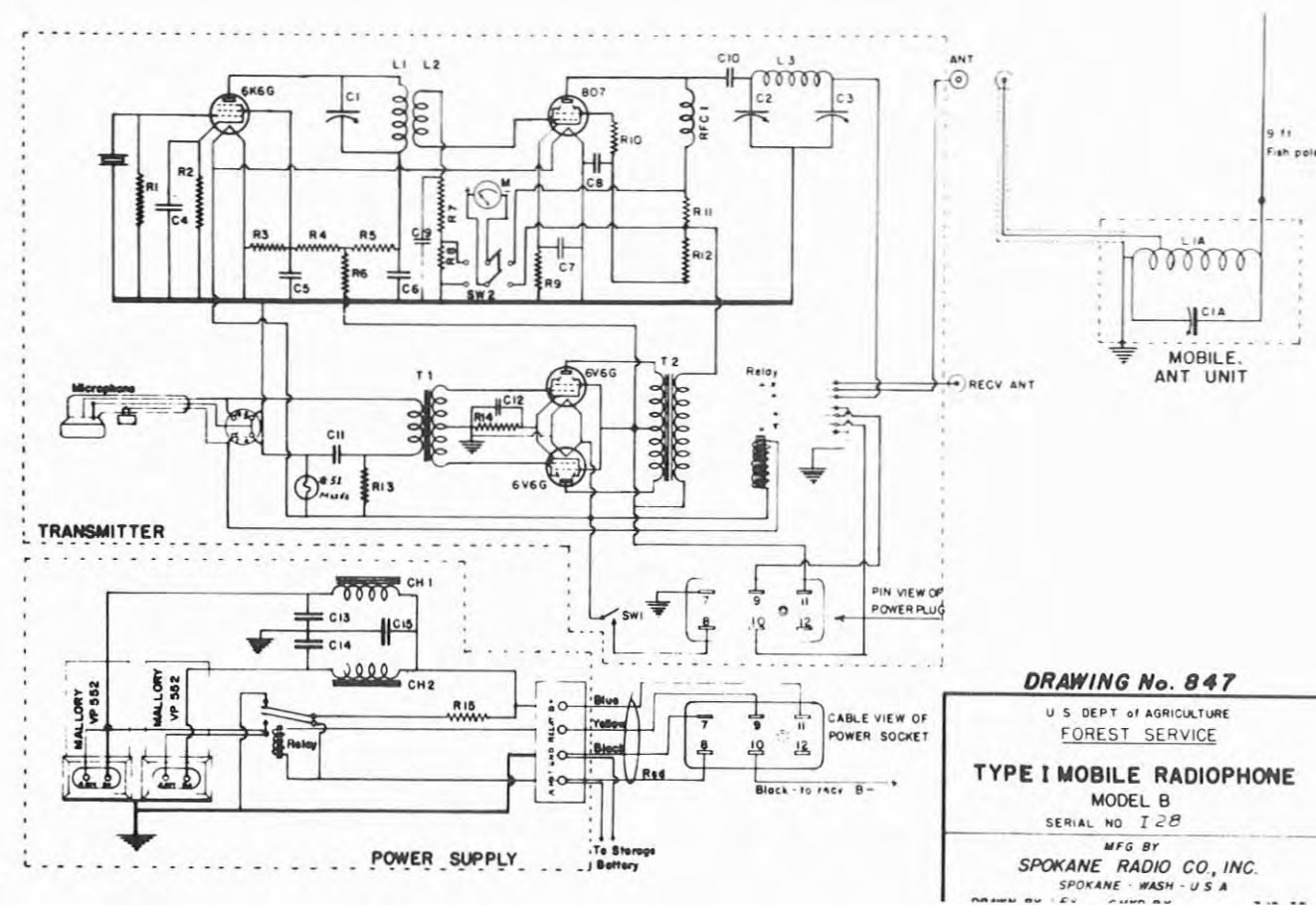
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
TYPE I RADIOPHONE
MODEL A
DRAWN BY P.W.S. APPROVED BY [Signature] DATE - MARCH 25, 1938



(Forest Service photos, History Section)

Type K*
'Kar'

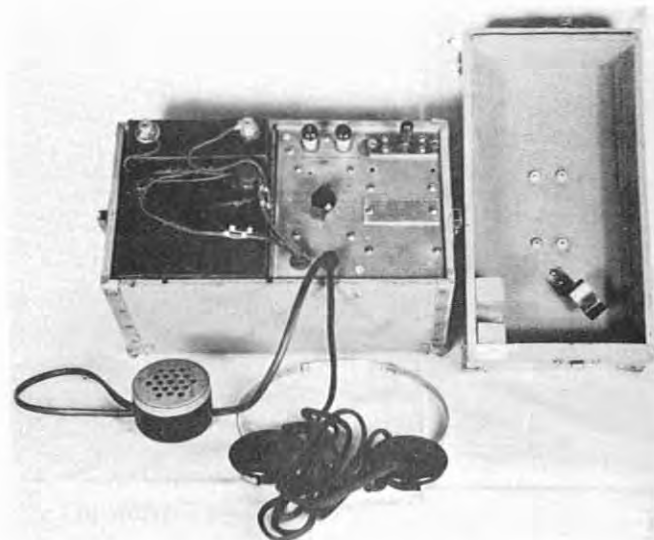
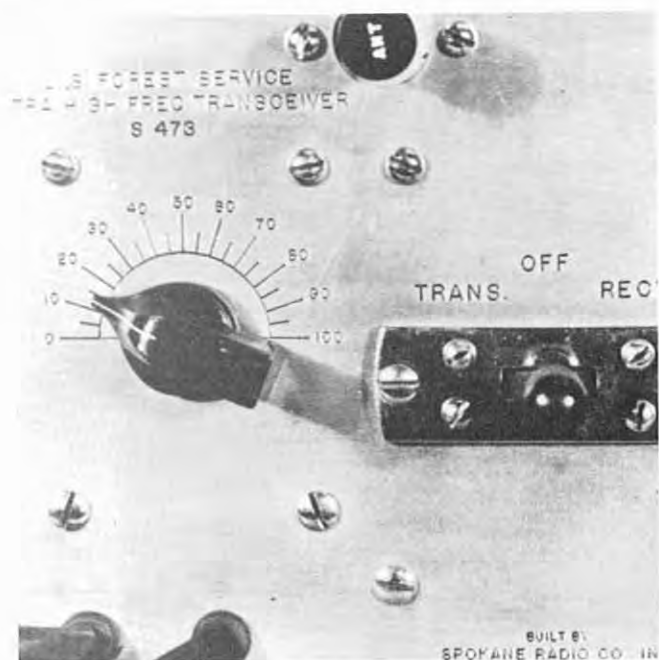
Designed by:	Radio Laboratory staff, 1937
Number produced:	63
Price:	\$270
Models:	A, B, AA, AB*
Frequency:	3 MHz
Transmitter:	9 1/2 watts, voice, AM, xtal
Receiver:	Motorola Police Cruiser (AA-AB), pushbutton
Power:	6-volt car battery
Antenna:	Rod type on tuning box
Dimensions:	Four packages
Principal use:	Mobile
*Comments:	Originally designated Type I-mobile (A and B) Type KA ('Kar-Airplane') was for airplane use



Schematic Diagram, Type K (Type I-Mobile)

DRAWING No. 847
U S DEPT OF AGRICULTURE
FOREST SERVICE
TYPE I MOBILE RADIOPHONE
MODEL B
SERIAL NO I 28
MFG BY
SPOKANE RADIO CO., INC.
SPOKANE - WASH - U S A

Vhf Types
10 Meters (30-40 MHz)



(Forest Service photos, History Section)

Type S*

'Superregenerative'

Designed by:	Harold K. Lawson, 1935
Number produced:	781
Price:	\$47
Models:	A, B*
Frequency:	30-40 MHz
Transmitter:	1/10 watt, voice, AM self-excited oscillator, simplex, transceiver
Receiver:	Superregenerative, tunable
Power:	Dry batteries
Antenna:	14' 7" half wave wire or rod type
Dimensions:	7 x 6 x 11"
Weight:	9# w/batteries

Principal use: Smokechasers, scouts and fire chiefs; occasionally with moving vehicles

*Comments: Offset transmitter-receiver frequencies
Model B added separate transmitter tuning control and slightly more power
Often criticized for spurious signals

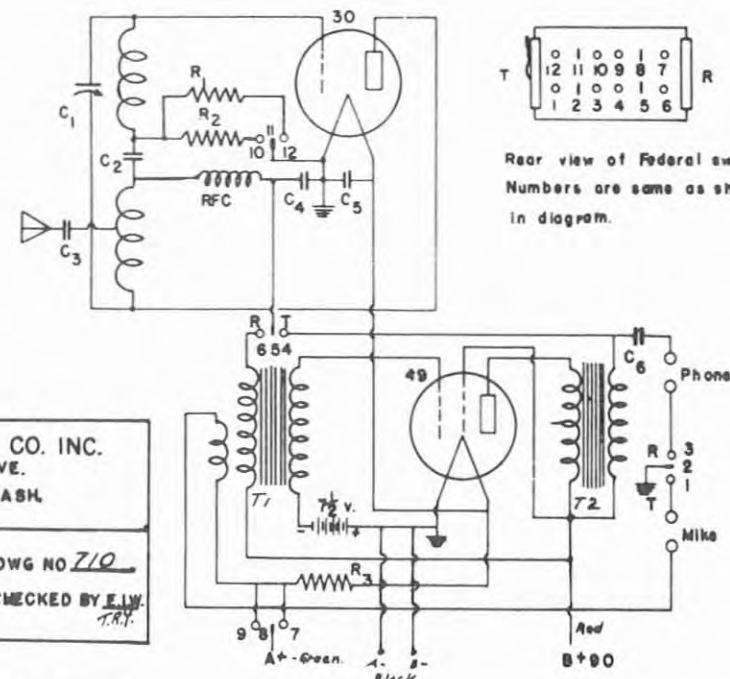
Interior view,
Type S



(Forest Service photo, History Section)

U.S. FOREST SERVICE
TYPE S
ULTRA HIGH FREQUENCY TRANSCEIVER

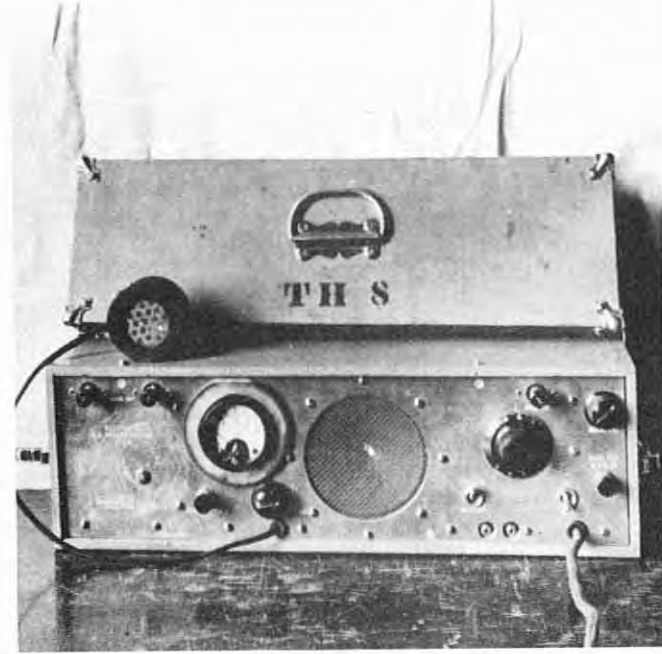
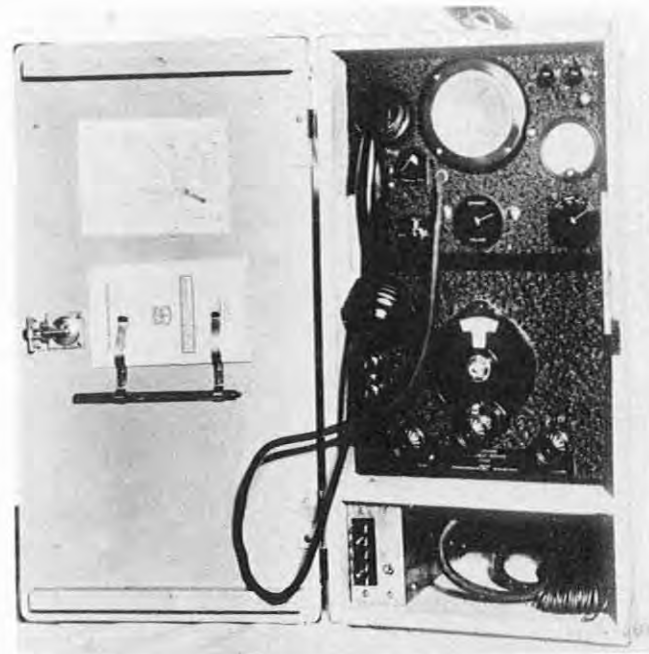
- R₁ 10,000 - ohm
- R₂ 100,000 - ohm
- R₃ 4 - ohm
- C₁ 15 - mmfd
- C₂ 250 - mmfd.
- C₃ .00175 - mfd.
- C₄ .004 - mfd.
- C₅ .00175 - mfd.
- C₆ .05 400 volt
- T₁ - 02426
- T₂ - 02428



SPOKANE RADIO CO. INC.
611 FIRST AVE.
SPOKANE WASH.

DATE 2-9-37 DWG NO 710
DRAWN BY G.E.T. CHECKED BY E.L.W.
T.R.T.

Schematic Diagram, Type S



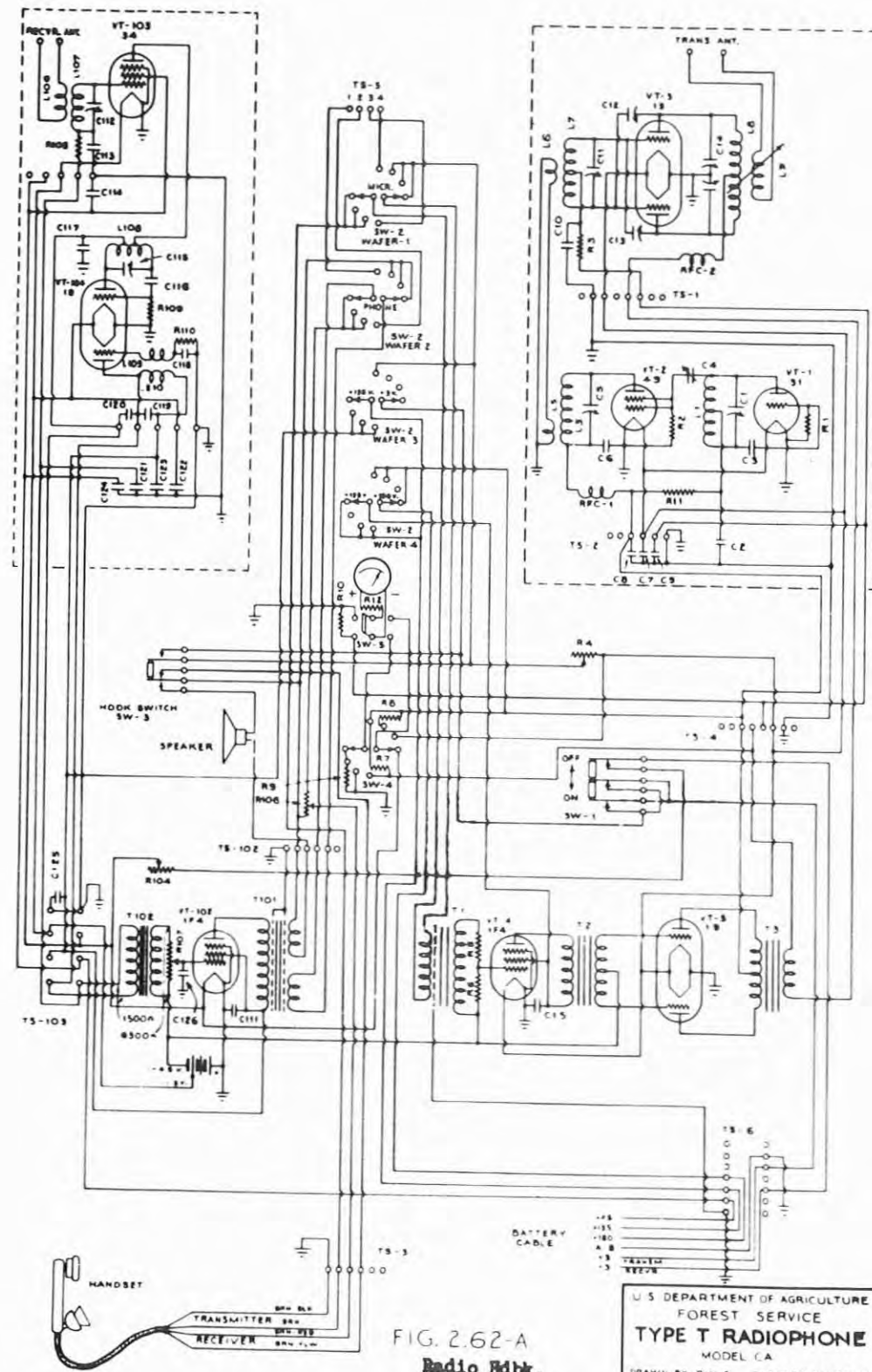
(Forest Service photos, History Section)

Type T*
'Ten meters'

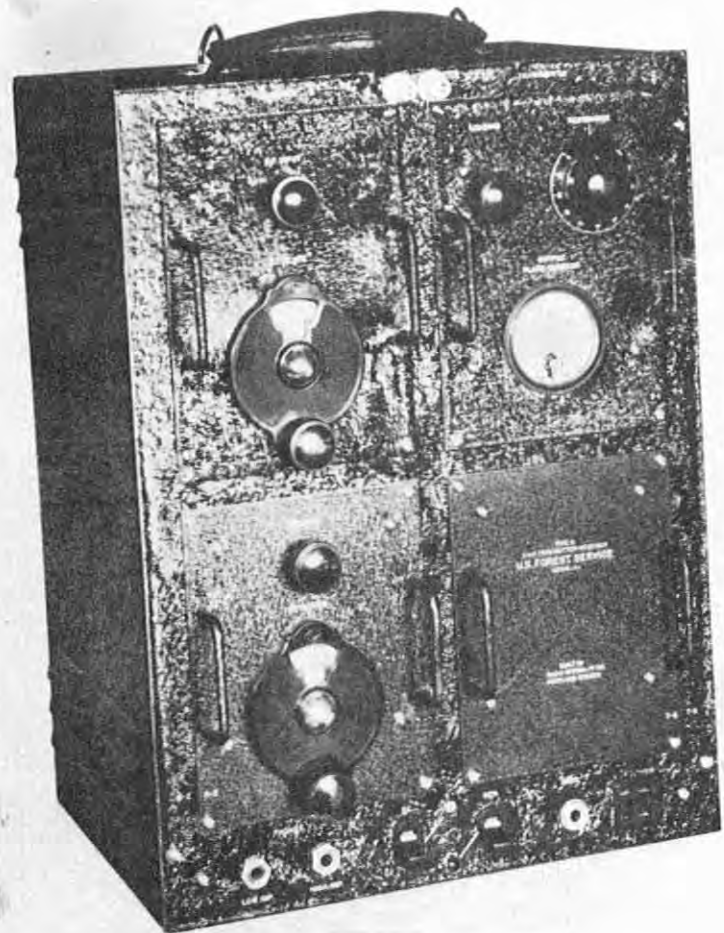
Designed by:	W. Foy Squibb, 1935
Number produced:	Numbers included with T-D
Price:	\$130
Models:	TH-TL; CA, CB, CC
Frequency:	30-40 MHz
Transmitter:	2 1/4 watts, voice, AM, standby, master oscillator
Receiver:	National SW-3; superregenerative
Power:	Dry batteries
Antenna:	Half wave doublet
Dimensions:	22 x 15 x 19"
Weight:	29# including batteries and antenna

Principal use: Lookouts and semi-permanent locations

*Comments: Spurious signals in receiver led to TH-TL for the separation of transmitter-receiver channels, thus H is High and L is Low frequency
Model CC operated simplex; CA and CB duplex
Provisions to connect to telephone line
Required 2 frequency assignments for each National Forest
No relationship to Type T-Model D



Schematic Diagram, Type T



(Forest Service photo, History Section)

Type A*
'Airplane'

Designed by:	Radio Laboratory staff, 1936
Number produced:	50
Price:	\$260
Frequency:	30-40 MHz, w/second channel 160-425 kHz
Transmitter:	3 1/2 watts, voice, AM, xtal push-to-talk
Receiver:	Regenerative, w/tuning
Power:	6-volt battery
Antenna:	13' half wave doublet
Weight:	25#, or 40# w/dynamotor
Dimensions:	18 x 13 x 10 1/2"
Principal use:	Air to ground
*Comments	Advertised 5-mile range in unshielded airplane Could be used with moving vehicles

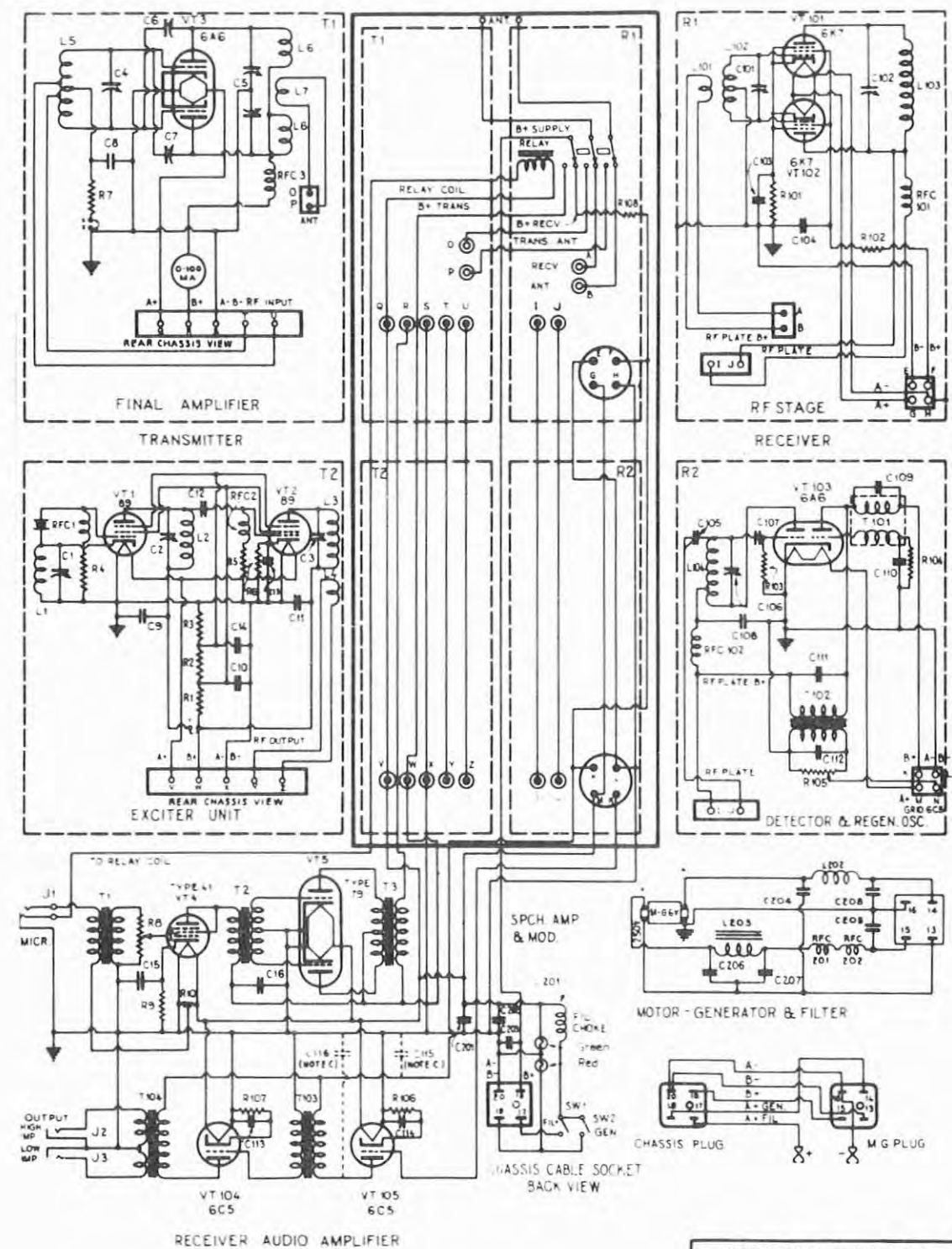
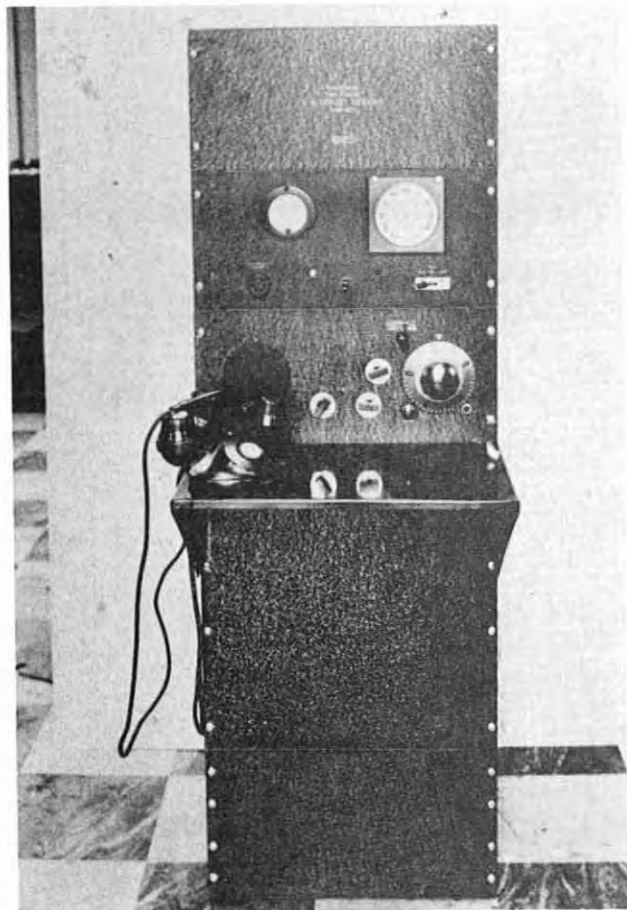


FIG. 2 62
SCHEMATIC DIAGRAM

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
TYPE A RADIOPHONE
MODEL A
DRAWN BY D.L.S. APPROVED DATE AUG 4, 1937



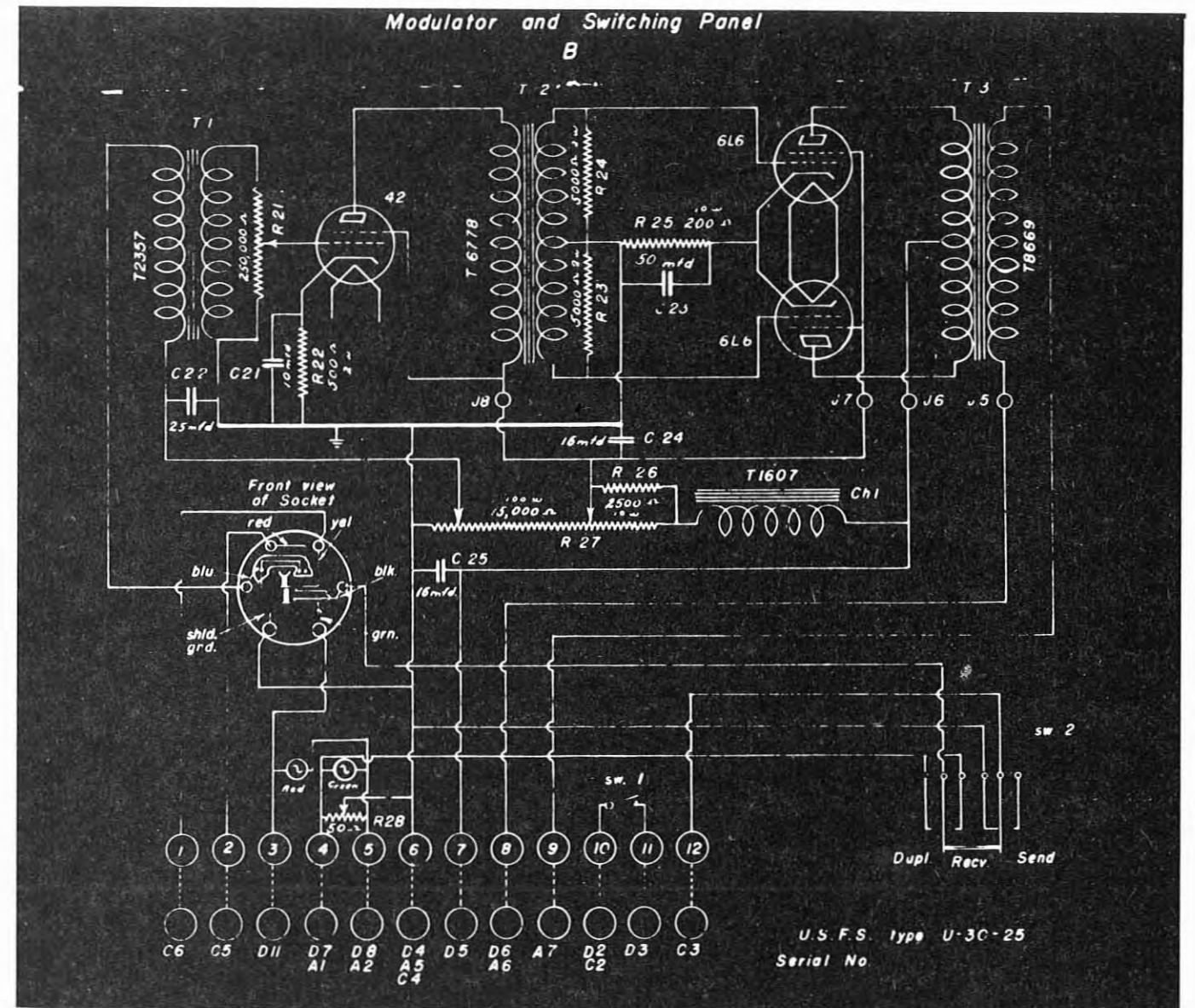
(Forest Service photo, History Section)

Type U*
'UHF'

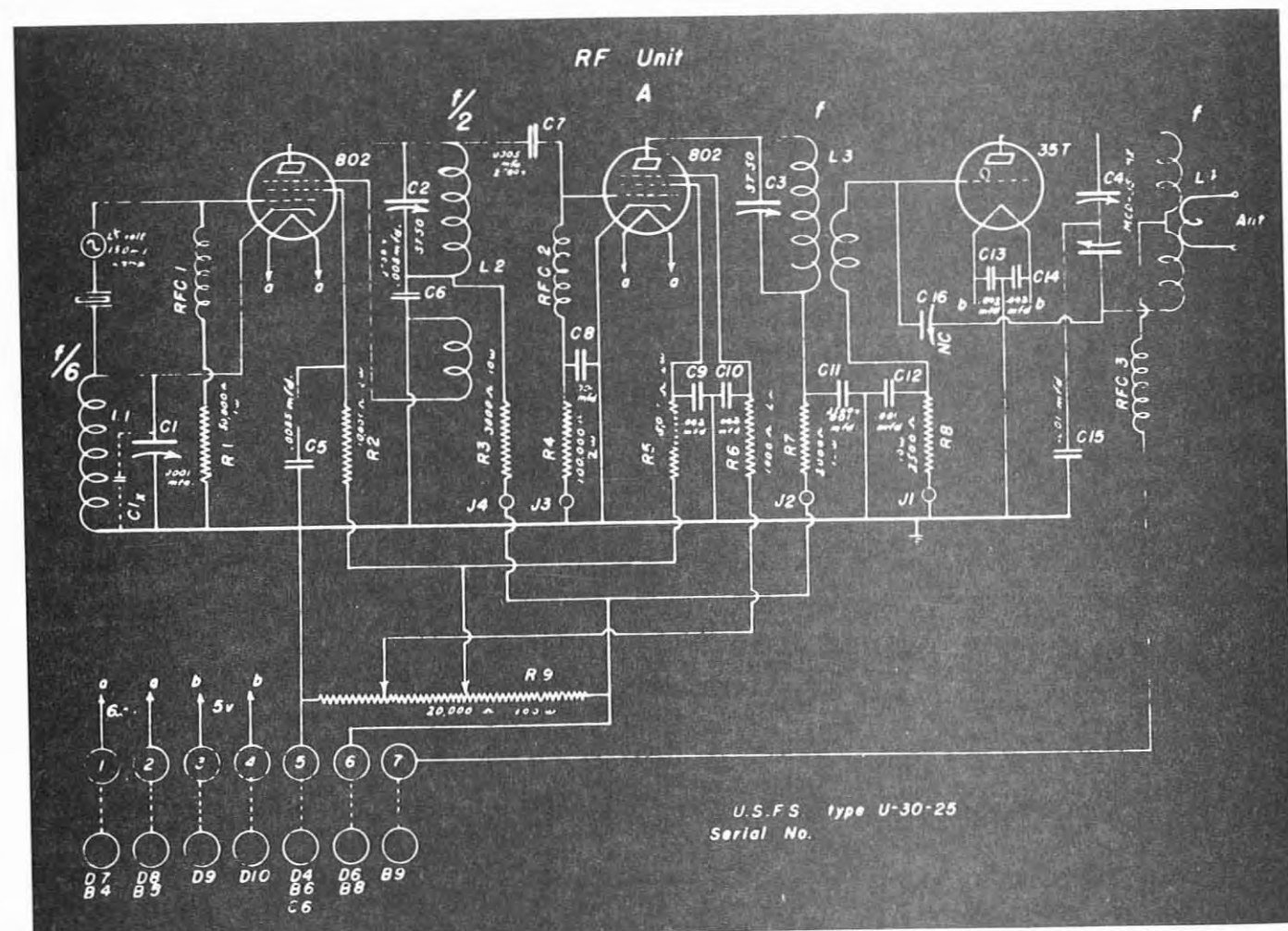
Designed by:	Logan Belleville, 1936
Number designed:	200
Price:	\$400
Models:	A
Frequency:	30-40 MHz
Transmitter:	20 watts, voice, AM, simplex
Receiver:	National superregenerative
Power:	110 volts (a.c.)
Antenna:	Constructed at locations
Dimensions:	4'9" x 19" x 12"
Weight:	300# (shipping weight)

Principal use: Central station, fixed base

*Comments: Speaker on standby, transmitter turned on by lifting handset from cradle
No relationship to U-R/U-T series



Schematic Diagram, Modulator and Switching Panel, Type U



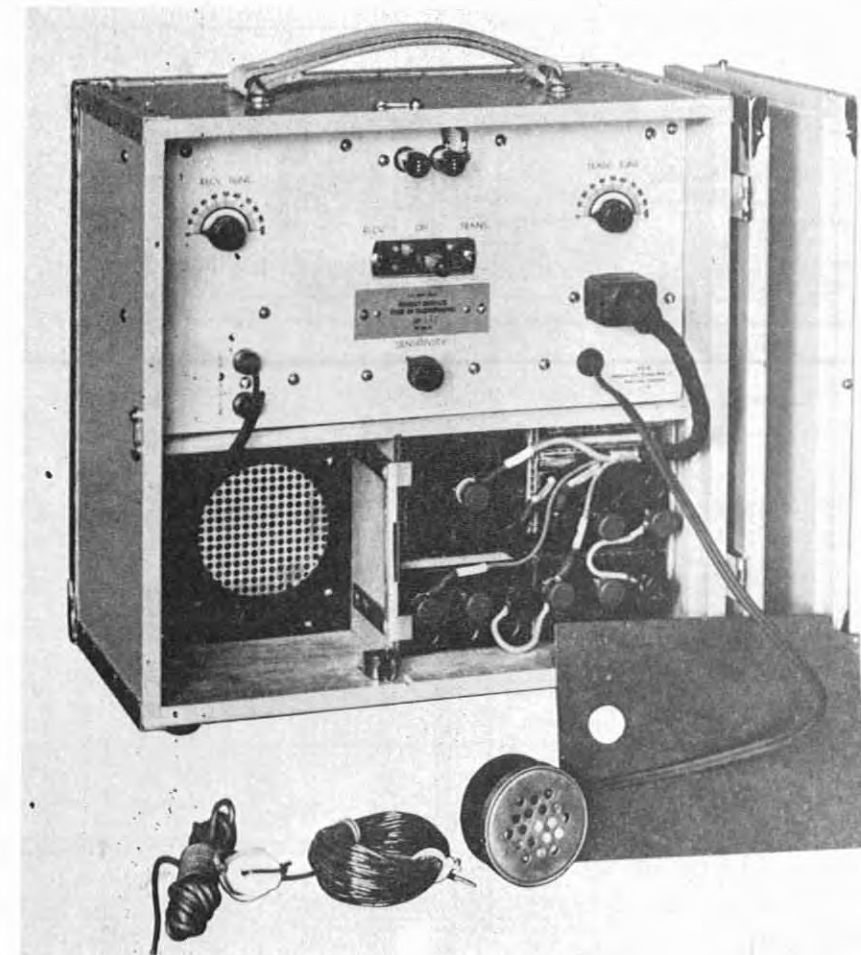
Schematic Diagram, RF Unit, Type U

Type SV*

'Superregenerative Variable' Frequency

Designed by:	Radio Laboratory staff, 1937-38
Number produced:	330
Price:	\$61
Frequency:	30-40 MHz
Transmitter:	1 watt, voice, AM, simplex, self-oscillating
Receiver:	Superregenerative
Power:	Dry batteries
Antenna:	Three-quarter wave, single wire
Dimensions:	6 x 10 x 5" or 12 x 12 x 7" overall
Weight:	18#
Principal use:	Where extreme portability was not essential
*Comments:	Independent transmitter/receiver sections

(Forest Service photo, History Section, 15472)





(Forest Service photo, History Section)

Type RRS*

'Relay Repeater Station'

Designed by: Radio Laboratory staff,
1939-40

Number produced: 470

Models: RA, RB, RD, RF, RG, R-DR,
R-D6T, R-D2T, TRT-F7,
R-RS-16

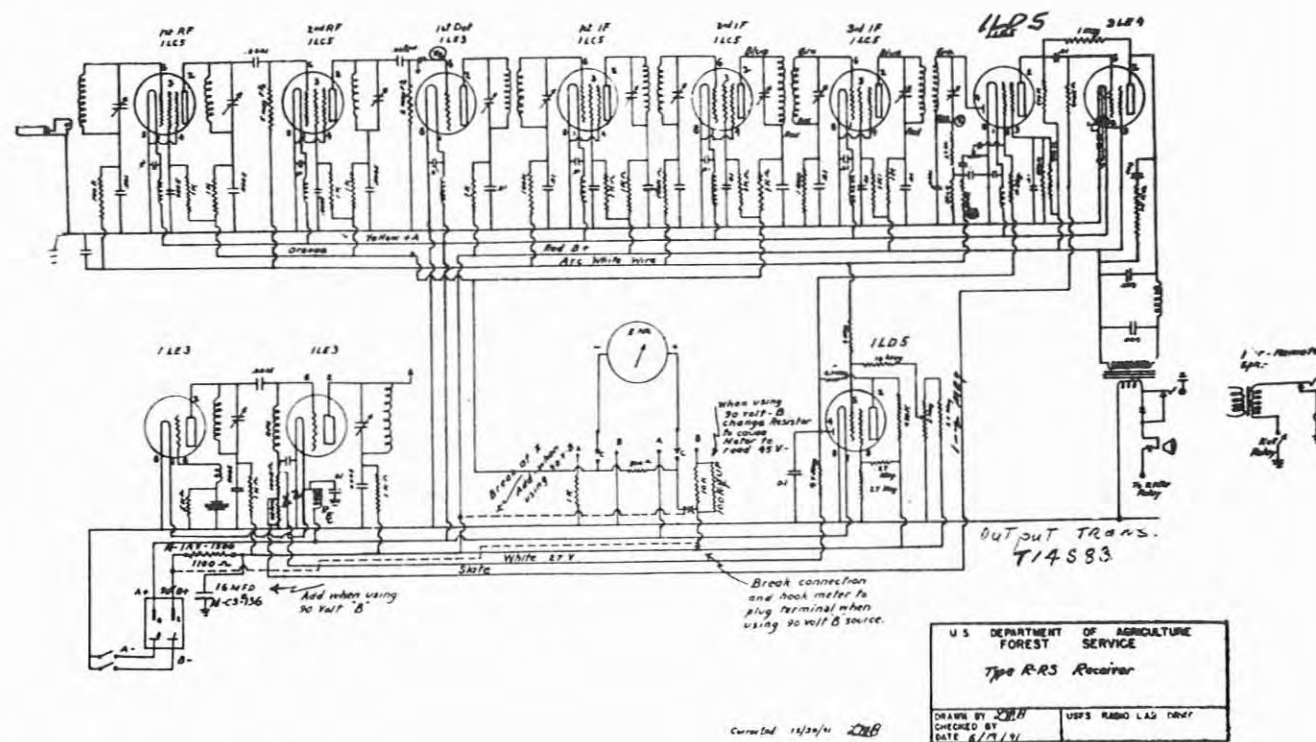
Frequency: 30-40MHz

Principal use: Relay repeater stations
Used extensively in AWS program
Some use in lookout towers as a receiver

*Comments: Specifications varied by model

Schematic Diagram, Type RRS Receiver

- Ⓢ • Scope-vert plate connection through 250000 ohm wall filter
- XI • Disconnect- place backing voltage between bus and ground
- Ⓣ • Mod OSC output (set to 1 K Freq) OSC output runs through Dummy Ant



Type KU*

'Kar UHF'

Designed by: Logan M. Belleville, 1940

Number produced: 575

Price: \$270

Models: R-A; T-A, T-AA, T2; A, B in Type U

Frequency: 30-40 MHz

Transmitter: 9 watts, voice, AM, simplex, xtal controlled

Receiver: Tunable w/single xtal standby

Power: 6-volt vehicle battery

Antenna: Quarter-wave whip

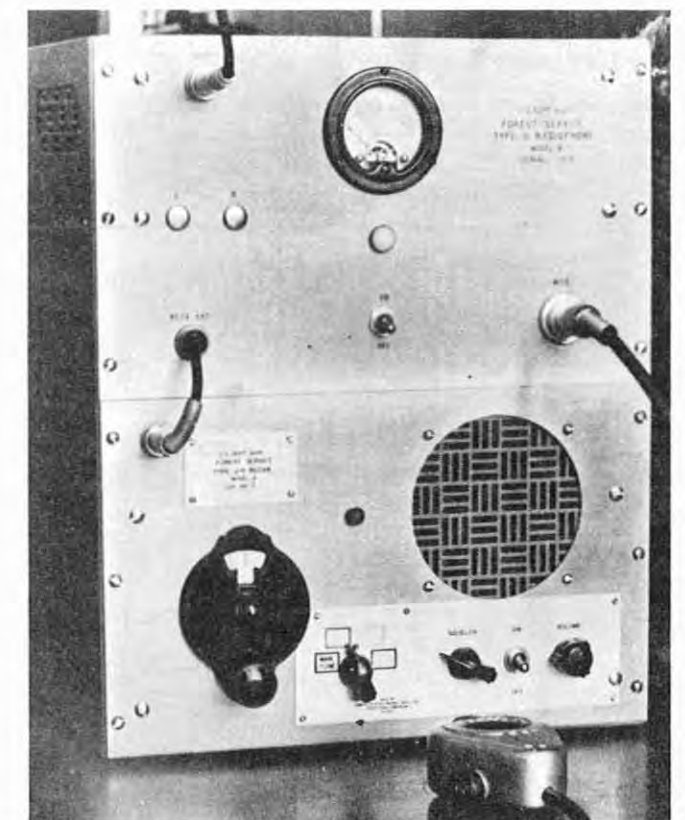
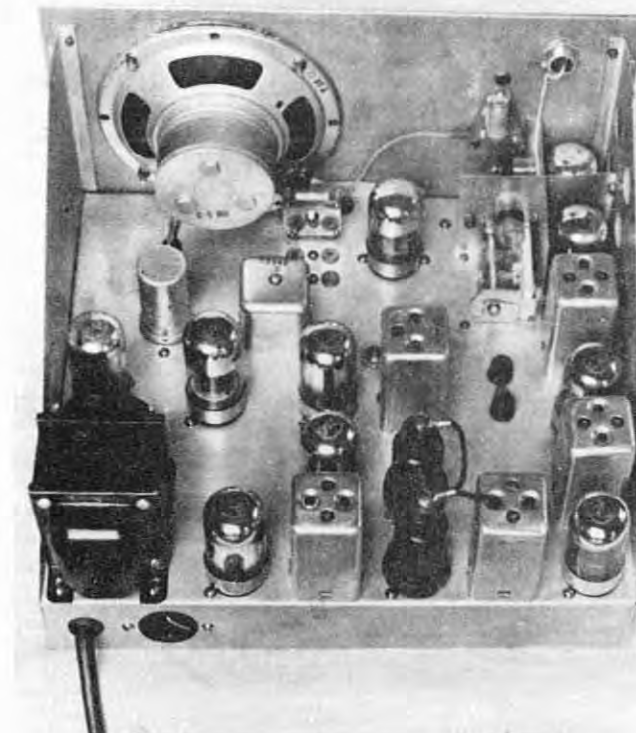
Dimensions: Housed in several units (see figure 74 and text)

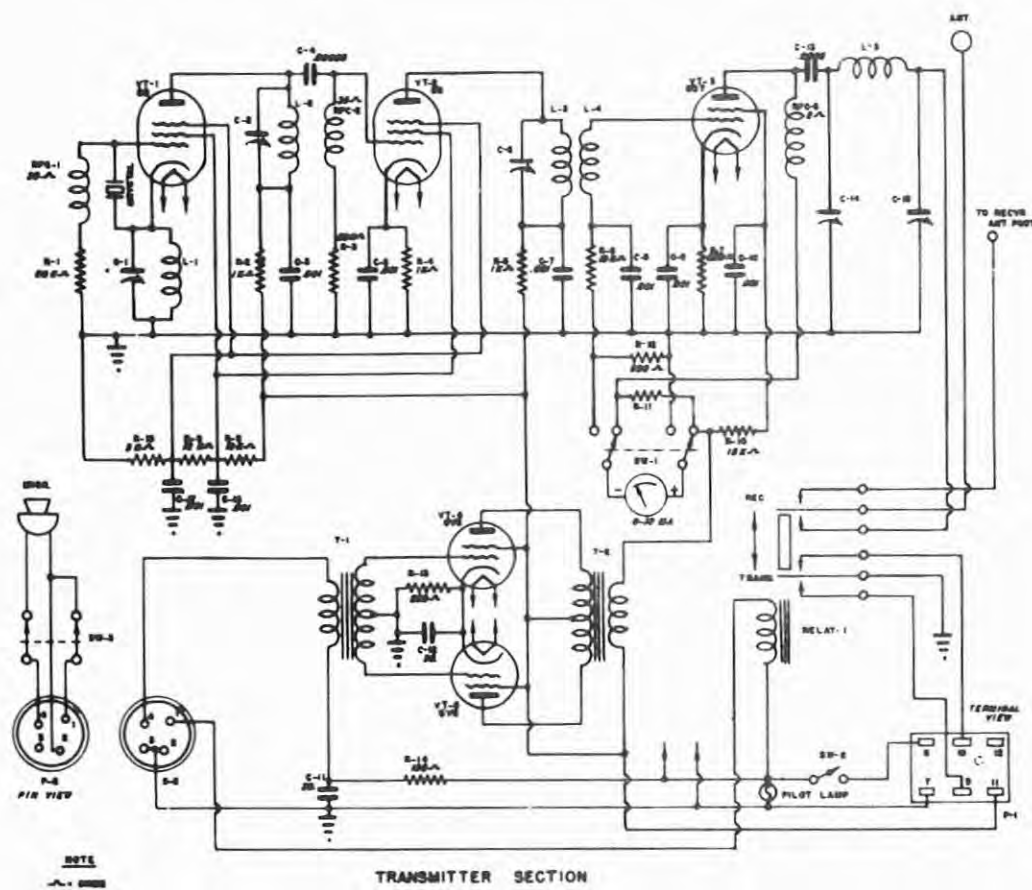
Principal use: Mobile

*Comments: Converted to semiportable for lookout use and designated U-R/U-T
Effective squelch and essentially free of ignition interference
No relationship to earlier type U

Type U-R/U-T*

(Forest Service photos, History Section)

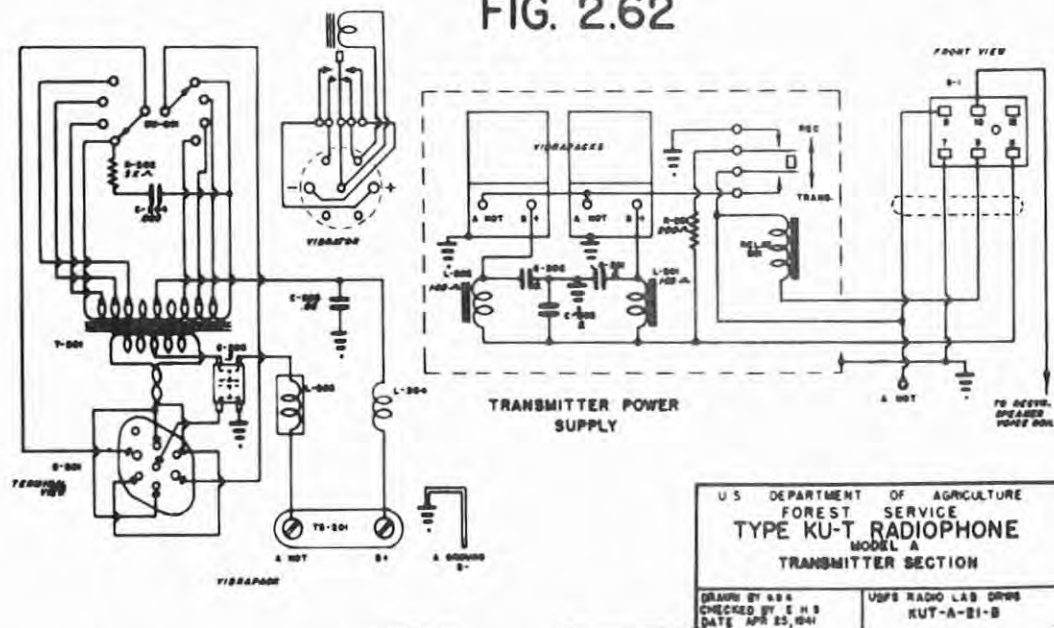




NOTE
 A - 1000 OHMS
 B - 1000 OHMS
 C - 1000 OHMS

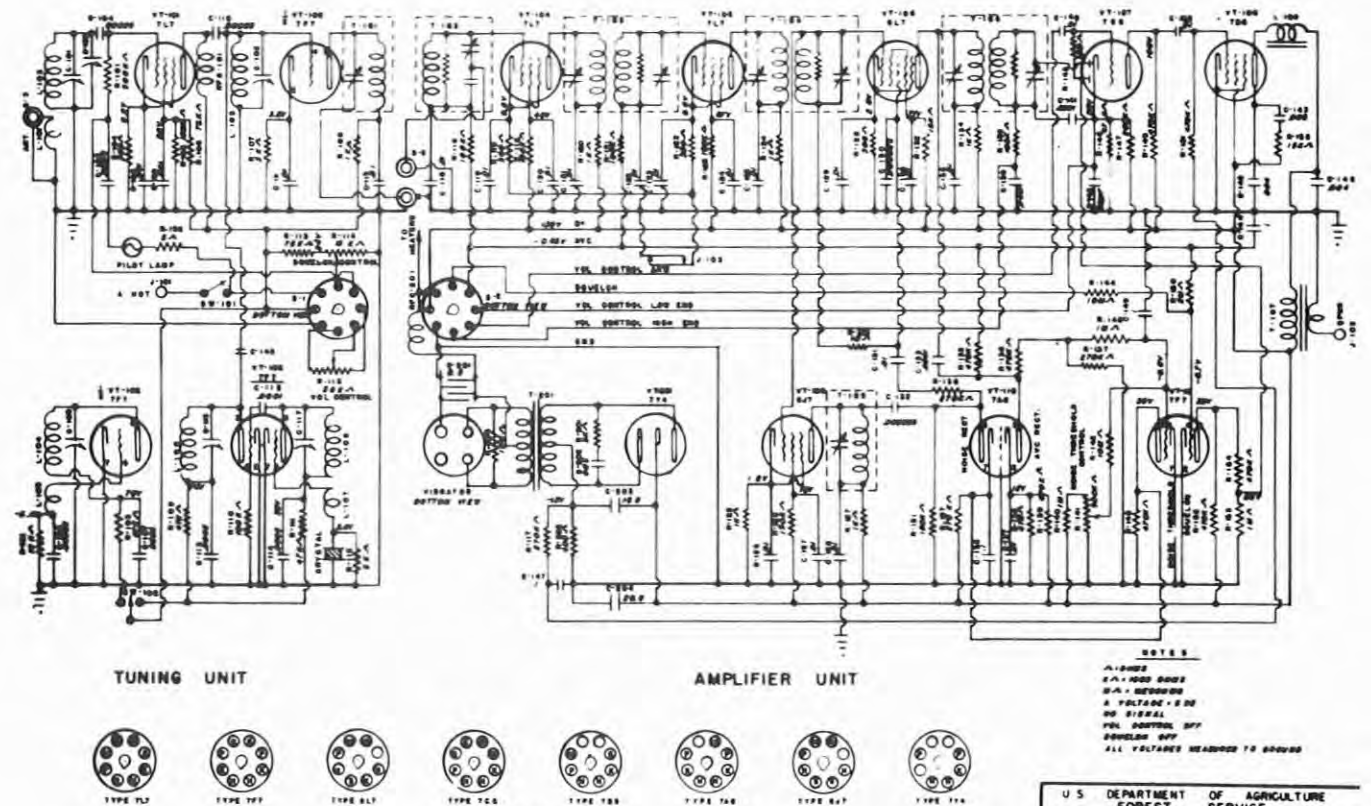
TRANSMITTER SECTION

FIG. 2.62



U.S. DEPARTMENT OF AGRICULTURE
 FOREST SERVICE
 TYPE KU-T RADIOPHONE
 MODEL A
 TRANSMITTER SECTION
 DRAWN BY A.S.S.
 CHECKED BY E.H.S.
 DATE APR 25, 1941
 USFS RADIO LAB DRWS
 KUT-A-81-B

Schematic Drawing, Type KU-T, Model A, Transmitter



TUNING UNIT

AMPLIFIER UNIT

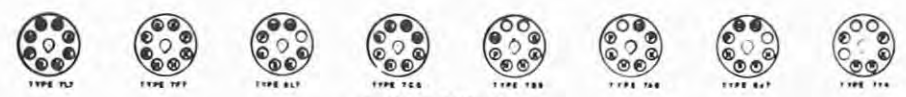


FIG. 2.62

Schematic Drawing, Type KU-R, Model A, Receiver

NOTE B
 A - 1000 OHMS
 B - 1000 OHMS
 C - 1000 OHMS
 D - 1000 OHMS
 E - 1000 OHMS
 F - 1000 OHMS
 G - 1000 OHMS
 H - 1000 OHMS
 I - 1000 OHMS
 J - 1000 OHMS
 K - 1000 OHMS
 L - 1000 OHMS
 M - 1000 OHMS
 N - 1000 OHMS
 O - 1000 OHMS
 P - 1000 OHMS
 Q - 1000 OHMS
 R - 1000 OHMS
 S - 1000 OHMS
 T - 1000 OHMS
 U - 1000 OHMS
 V - 1000 OHMS
 W - 1000 OHMS
 X - 1000 OHMS
 Y - 1000 OHMS
 Z - 1000 OHMS
 ALL VOLTAGES MEASURED TO GROUND
 U.S. DEPARTMENT OF AGRICULTURE
 FOREST SERVICE
 TYPE KU-R RECEIVER
 MODEL A
 DRAWN BY C.W.B.C.P.
 CHECKED BY H.L.L.
 DATE 10-24-41
 USFS RADIO LAB DRWS
 KUR-A-81-B

Type SX*/SJ*

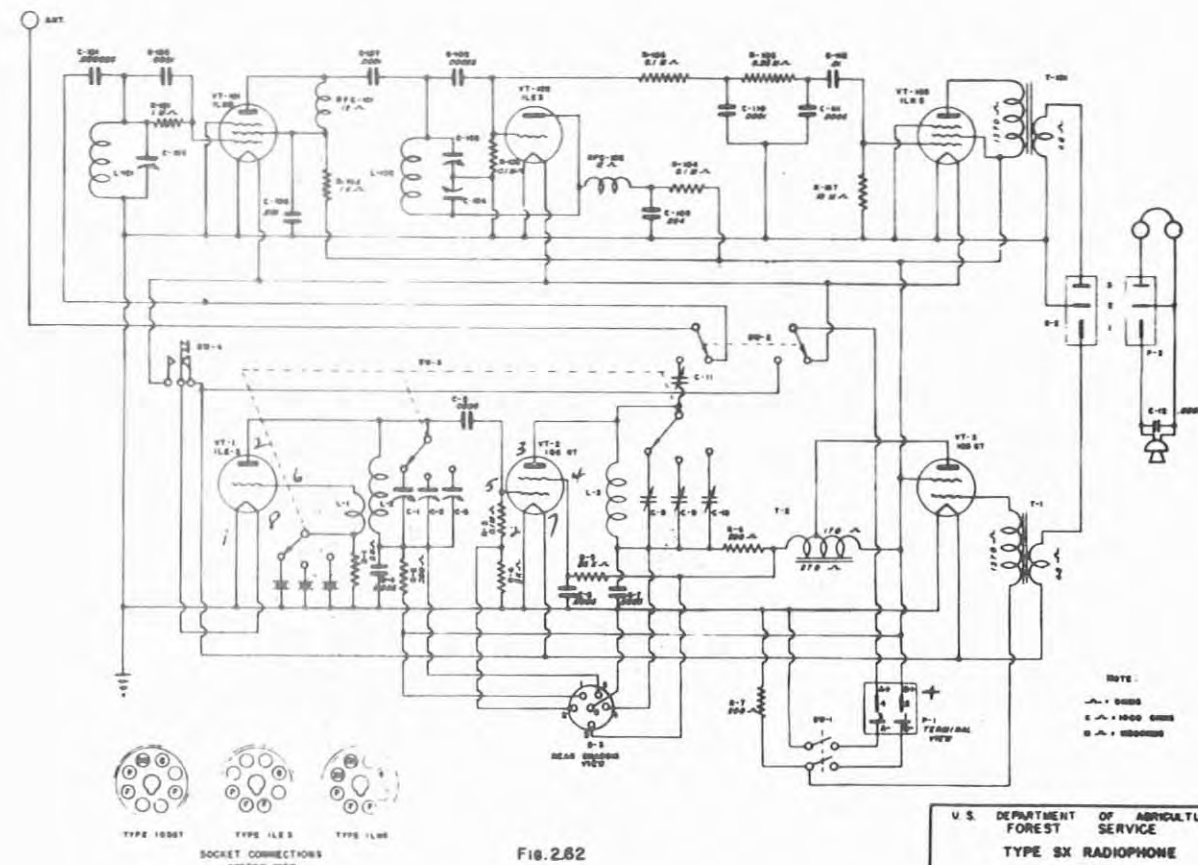
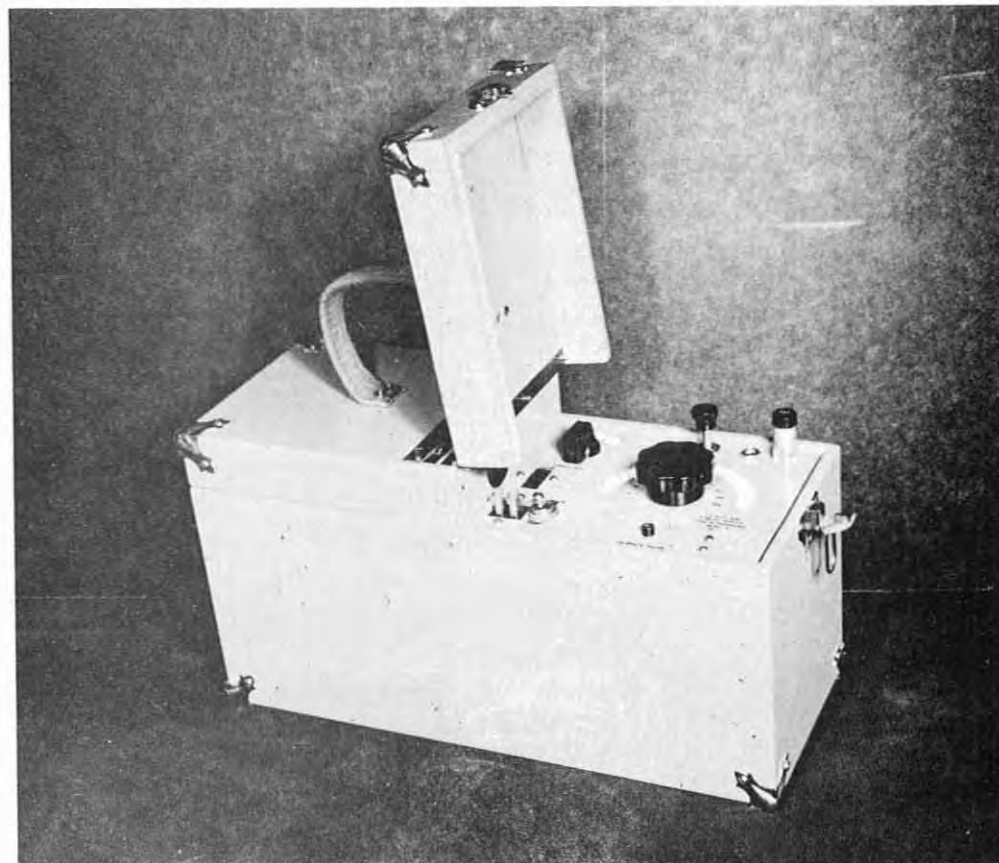
'Superregenerative Xtals/Smoke Jumper'

Designed by: Radio Laboratory staff, 1940-41 (SX/SJ)
 Number produced: 800/22
 Price: \$70/not available
 Frequency: 30-40 MHz/34.22 MHz only
 Transmitter: 1/4 watt, voice, AM, 3 xtals/1 xtal
 Receiver: Superregenerative
 Power: Dry batteries/6-10 hrs. intermittent operation
 Antenna: Type J/rod type
 Weight: 6# 14 oz. net/n.a.
 Dimensions: 13 1/2 x 5 1/2 x 7"/n.a.

Principal use: Portable/smokejumpers

Comments: SJ was a condensed version of the SX (see figures 75, 76)
 SXA ("A" for attachment) was an audio amplifier accessory
 for semiportable use and added \$45 to the price of the SX
 SX replaced type S; SXA replaced type SV

(NA:95G-406995)



Schematic Drawing, Type SX-Model A

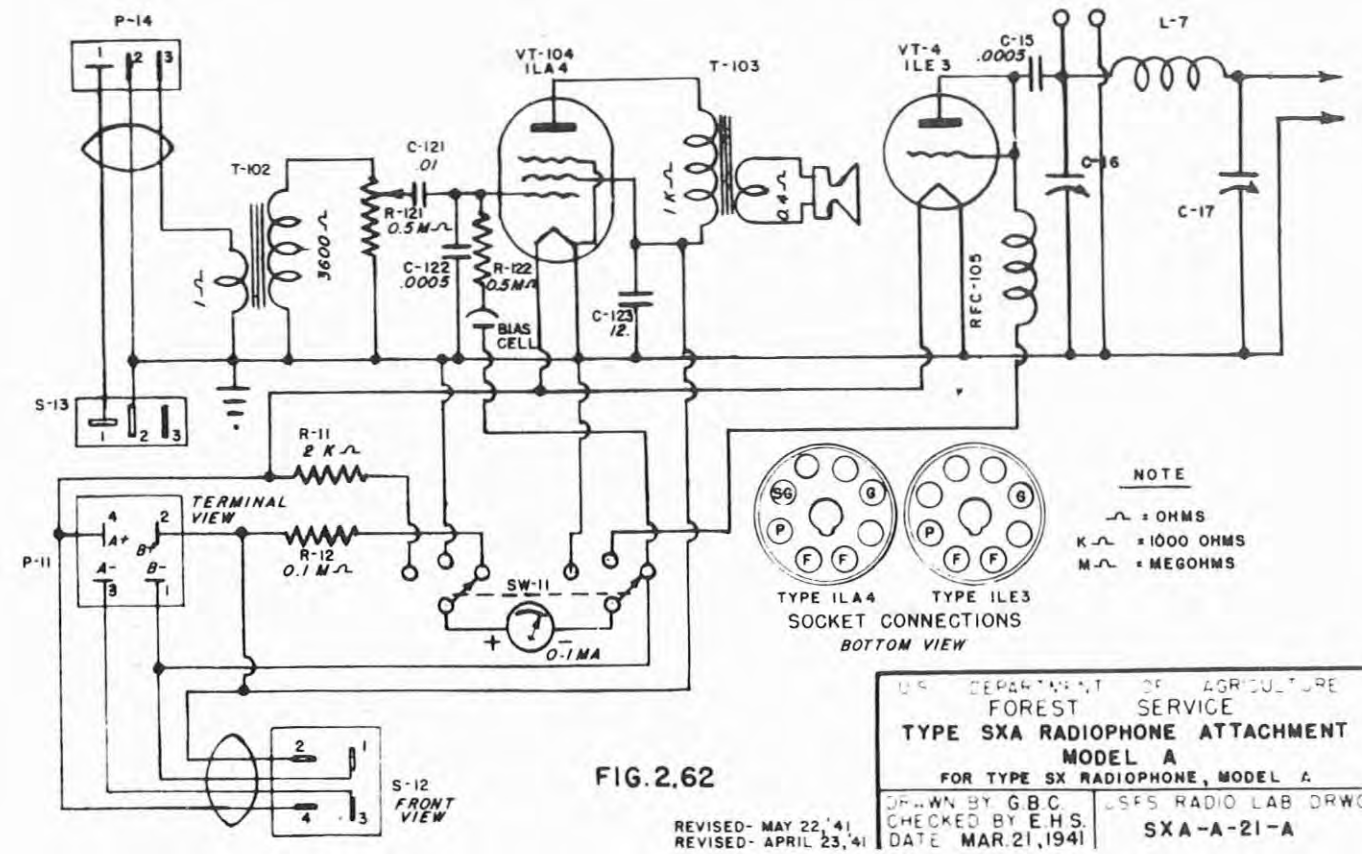


FIG. 2.62

REVISED- MAY 22, '41
REVISED- APRIL 23, '41

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
**TYPE SXA RADIOPHONE ATTACHMENT
MODEL A**
FOR TYPE SX RADIOPHONE, MODEL A
DRAWN BY G.B.C. USFS RADIO LAB DRWG
CHECKED BY E.H.S. DATE MAR. 21, 1941 SXA-A-21-A

Schematic Drawing, Type SXA-Model A

Vhf Types — FM



(Forest Service photo, History Section)

Type SF*

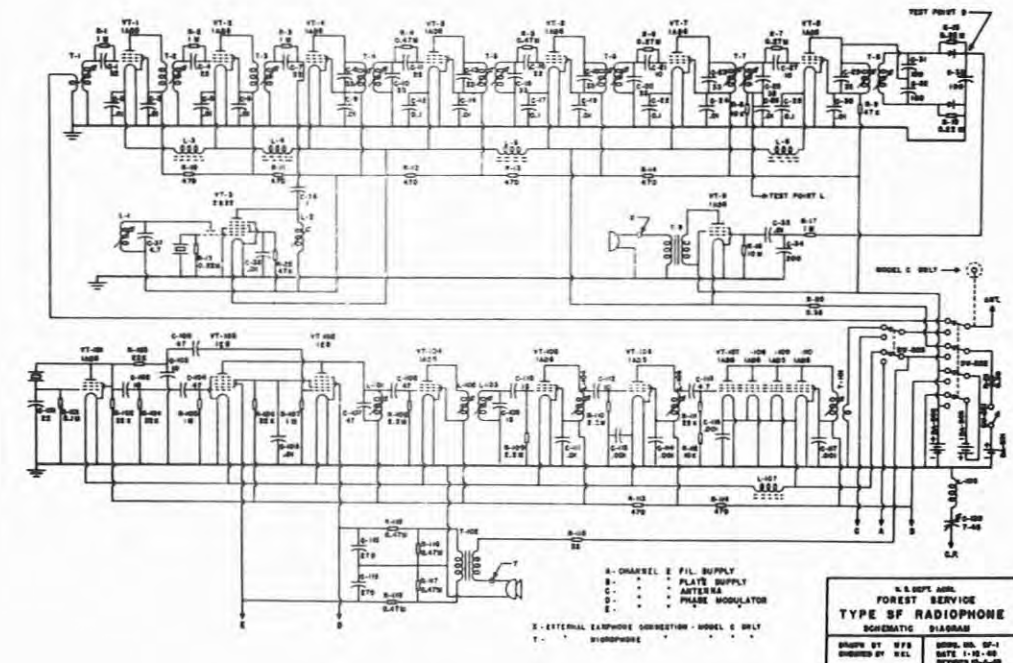
Handie-Talkie with kitbox

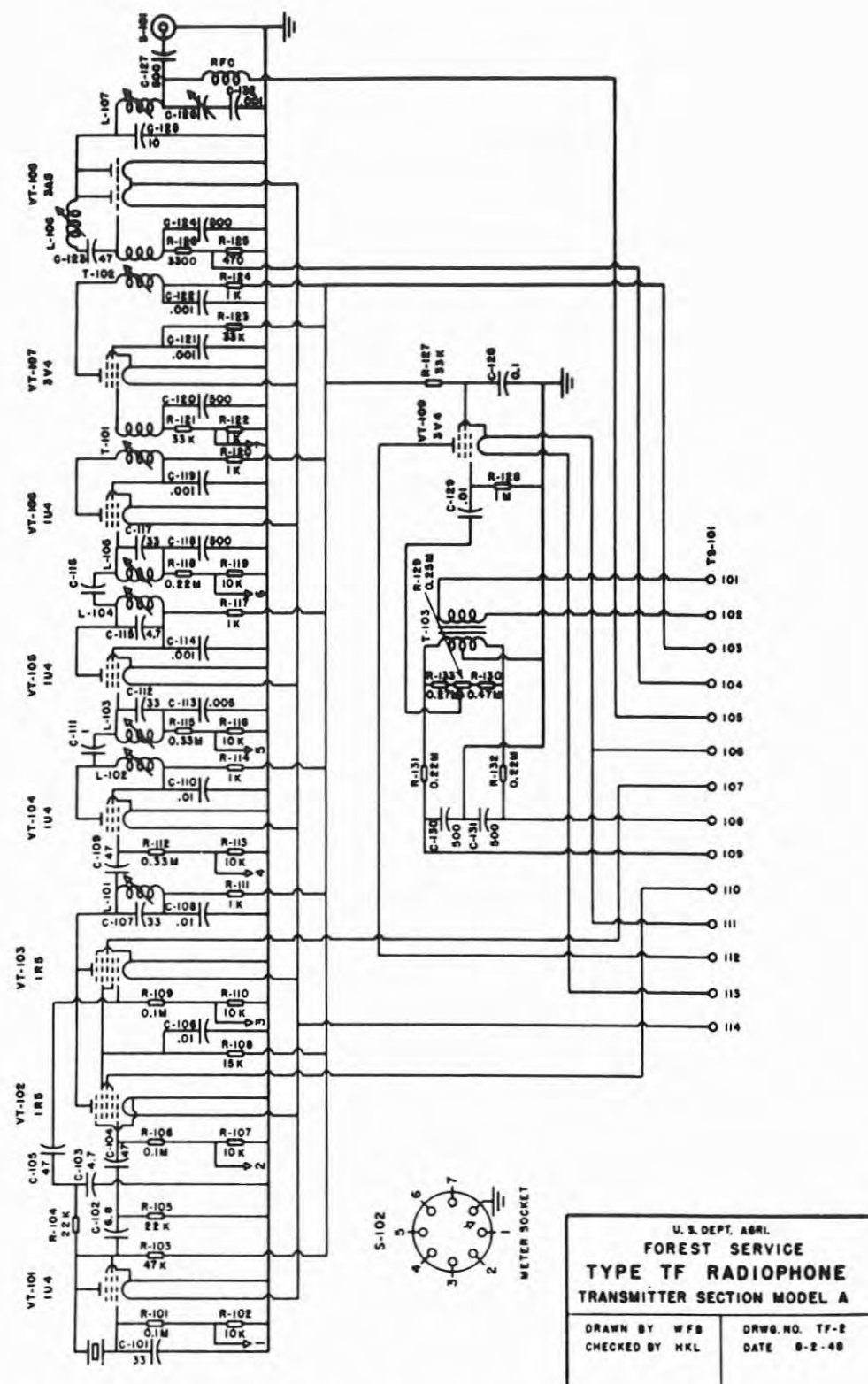
Designed by: Logan M. Belleville, 1947
Number

- produced: 200+
- Price: Not available
- Models: A-T2-R, B-2, C
- Frequency: 30-40 MHz
- Transmitter: 200 mw, dual channel, FM
- Receiver: Superheterodyne, 1 channel
- Power: Dry batteries
- Antenna: 7' collapsible rod
- Dimensions: 4 x 6 x 14"
- Weight: 9# w/batteries
- Principal use: Smokechasers and fire scouts

*Comments: Related to type S only in manner of use ("F" for FM) Latter versions included telephone handset as part of carrying handle. A unit with earphones and sensitive microphone was produced for communications with airplanes.

Schematic Diagram, Type SF



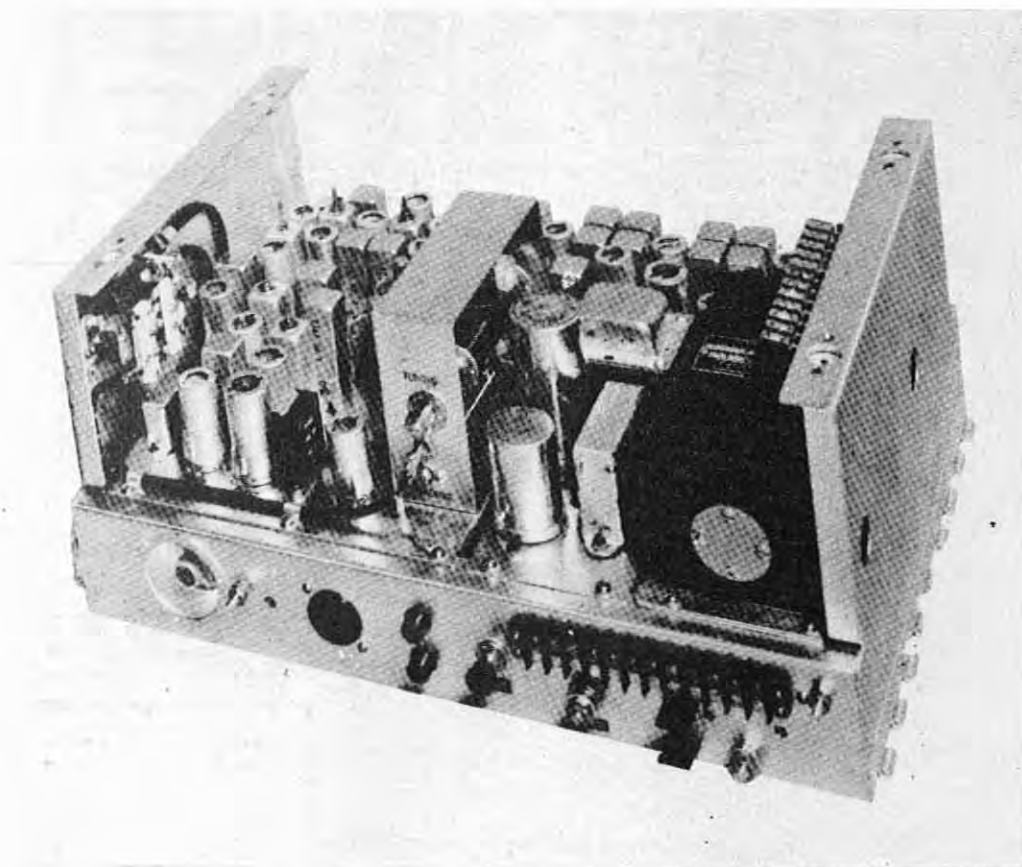


Schematic Diagram, Type TF-Model A, Transmitter

Type KF*

'Mobile FM'

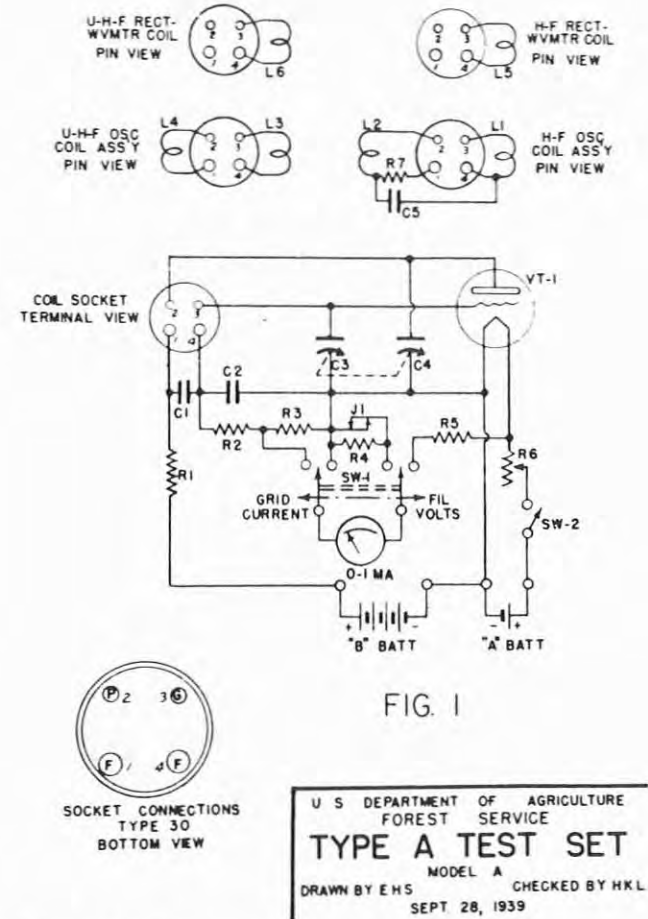
Designed by:	W. F. Biggerstaff, 1947-48
Number produced:	10
Price:	Not available
Models:	A-T2-R
Frequency:	30-40 MHz
Transmitter:	25 watts, 2 channel, xtal, FM
Receiver:	Superheterodyne, 1 channel, xtal
Power:	6-volt auto battery
Antenna:	Mobile rod type
Dimensions:	16 1/2 x 8 1/2 x 15" circuitry 3 x 4 1/2 x 2" controls
Weight:	60#
Principal use:	Mobile
*Comments:	Current drain - 12 amps on standby, 22 amps to transmit Photo is of the first commercially produced model of this set. It is a RSMC-Type 1147 No photo of Lab prototype available



Test Equipment



(Forest Service photo, History Section)
Test Set, Type A



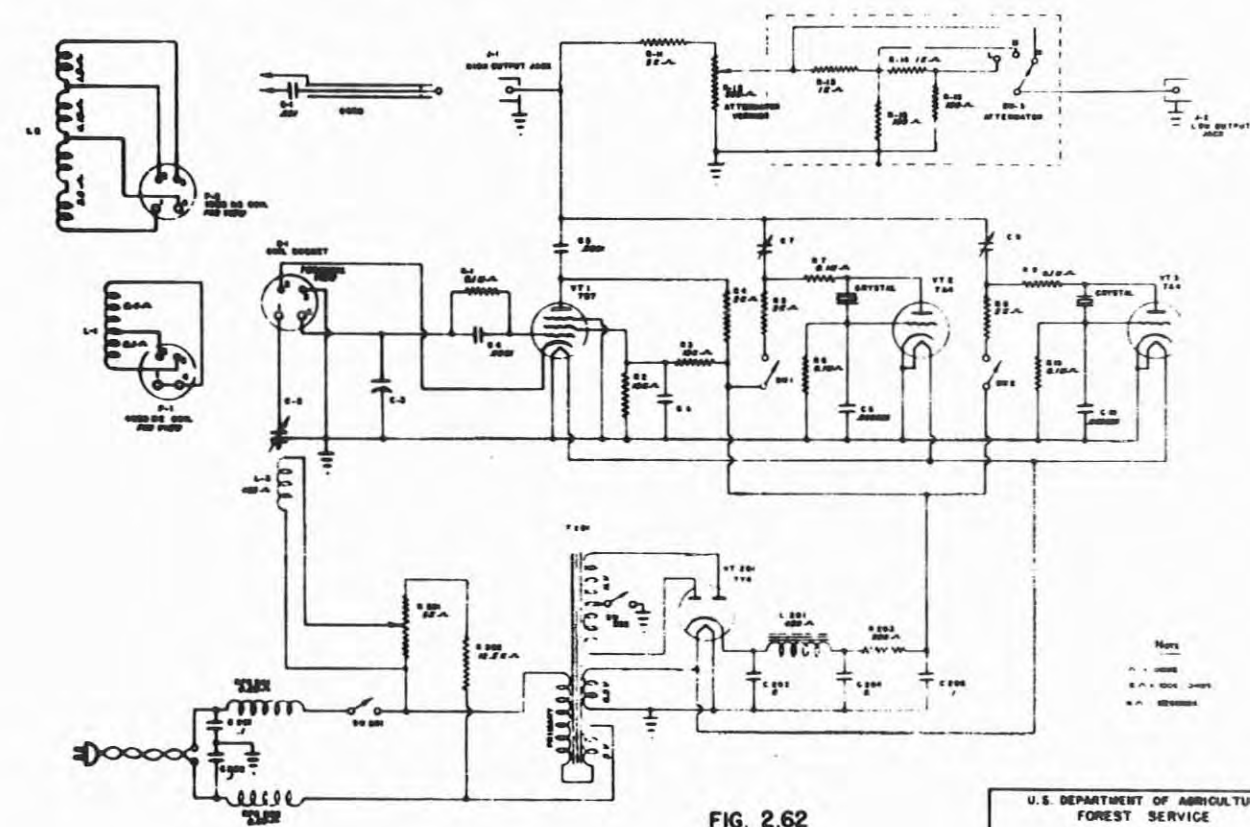
Schematic Diagram,
Test Set, Type A-Model A

Test Set, Type D

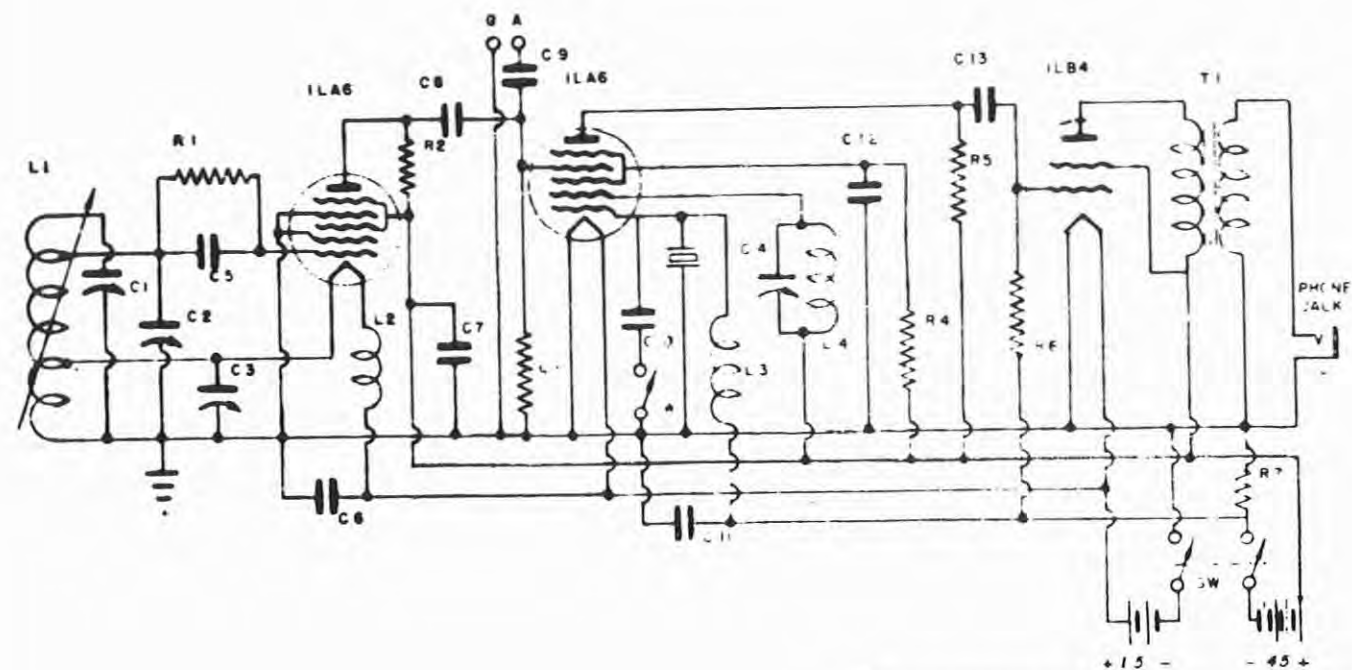


(Forest Service photo, History Section,
15511)

Schematic Diagram, Test Set, Type D-Model A



U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
TYPE D TEST SET
MODEL A
DRAWN BY E.S.C. CHECKED BY E.S.L.
DATE MAY 1, 1940 VSP'S RADIO LAB. SHOP. 9-A-81-B



U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
HETERODYNE FREQUENCY METER
TYPE C MODEL D
DRAWN BY G.B.C. USFS RADIO LAB. DRWG.
CHECKED BY H.K.L. DATE MAY 5, 1940 C-D-21-A

Schematic Diagram, Heterodyne Frequency Meter, Type C-Model D

Appendix II

Abbreviations Used in Text and Reference Notes

a.c.	-	alternating current
af	-	audiofrequency
a.f.c.	-	automatic frequency control
AM	-	amplitude modulation (the early form of radio broadcasting)
ARRL	-	American Radio Relay League
A. T. & T.	-	American Telephone and Telegraph Co.
AWS	-	Aircraft Warning System (Service)
BIFC	-	Boise Interagency Fire Center
BRC	-	Blister Rust Control
CCC	-	Civilian Conservation Corps
c.w.	-	continuous wave (used for transmitting signals in Morse code)
dB	-	decibel (measure of sound level)
Dx	-	long distance
EIA	-	Electrical Industries Association
FM	-	frequency modulation (the later form of radio broadcasting)
FCC	-	Federal Communications Commission
FPL	-	Forest Products Laboratory
FTS	-	Federal Telecommunications System
GAK	-	Gaylord A. Knight Collection
GE	-	General Electric Co.
GPO	-	Government Printing Office
GSA	-	Government Services Administration
hf	-	high frequency
Hz	-	hertz (unit of electromagnetic wave frequency; one cycle per second)
if	-	intermediate frequency