

Lab Report: Some rare Japanese WW2 radio gear

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Some rare Japanese wartime kit has caught my eye, and I have located it within US Army Field Manual TM-E11-227A *“Signal Communication Equipment Directory: Japanese Radio Communication Equipment, 1944”*. This document is available from the “Internet Archive”. It indexes most of the Japanese wireless kit captured in the Pacific wars. I don’t think much of it arrived in the UK.

It also provides a guide to Japanese equipment labels (see below), and I have used Google Translate/Lens to help with the translation – sometimes this didn’t work very well.

These bits of kit illuminate the 400-volt supply problem, and also some aspects of Radio-frequency coils.

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INTRODUCTION

The radio equipments described in this directory have been named in accordance with a system of nomenclature rapidly being adopted by the Army, Navy, and British forces. A wide variety of translations in the past, led to a great deal of confusion in identifying equipment, particularly when the Japanese introduced slight changes in the original model.

Characters have been translated as shown in the accompanying figure, and every attempt is being made to have these translations used by all parties dealing with captured equipment and documents.

式	SHIKI	(MODEL)
号	GŌ	(MARK)
改	KAI	(IMPROVEMENT)
型	GATA	(TYPE)

SAMPLE TRANSLATION

92	MODEL	3	TYPE	IMP.	1
九	二	式	三	型	改
Approved translation of Japanese characters.					

Up to the present time, the Japanese Army has used nomenclature for communication equipment based on one of the Japanese year systems. This system began in 660 B.C. when the Japanese empire was founded. The calendar year 1940 is the Japanese year 2600 (1940 plus 660). For model numbers on communication equipment the Japanese customarily use the last two digits of the Japanese calendar year in which the model was introduced. When the last two digits are from 01 to 09, the last digit only is sometimes used. The nomenclature Model 92 would indicate the set was introduced in 1932, and the nomenclature Model 2 would indicate the set was introduced in 1942.

Information in this manual is incomplete. When more information is available for publication, it will be added by means of additional loose-leaf pages.

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1. The 400 volt problem

Like many transmitters of that time, the valves in Japanese military HF transmitters required a constant voltage of 400 volts, though the current was less than 1 amp. There were only three ways to achieve this: a very large battery pack – ten nominal

40-volt packs in series; a bulky transformer, rectifier and smoothing circuit for use in the mains at a base location; or a dynamotor.

A dynamotor is a rotary transformer with an input from a vehicle battery (or two batteries in series). The examples below give an output of 400 volts.

The first example is from a Mark 405 transmitter in vehicle configuration. See the e extracts from the TM below.

RESTRICTED
MOBILE WIRELESS SET C MARK 1: MARK 305 TYPE TRANSMITTER

FREQUENCY RANGE: 20 to 30 mc.

POWER OUTPUT: 6 w.

TYPE OF SIGNAL: Mcw, voice.

USE: Probably tank set.

POWER SOURCE: Dynamotor. Output: 400 v.

ANTENNA: 14' vertical whip.

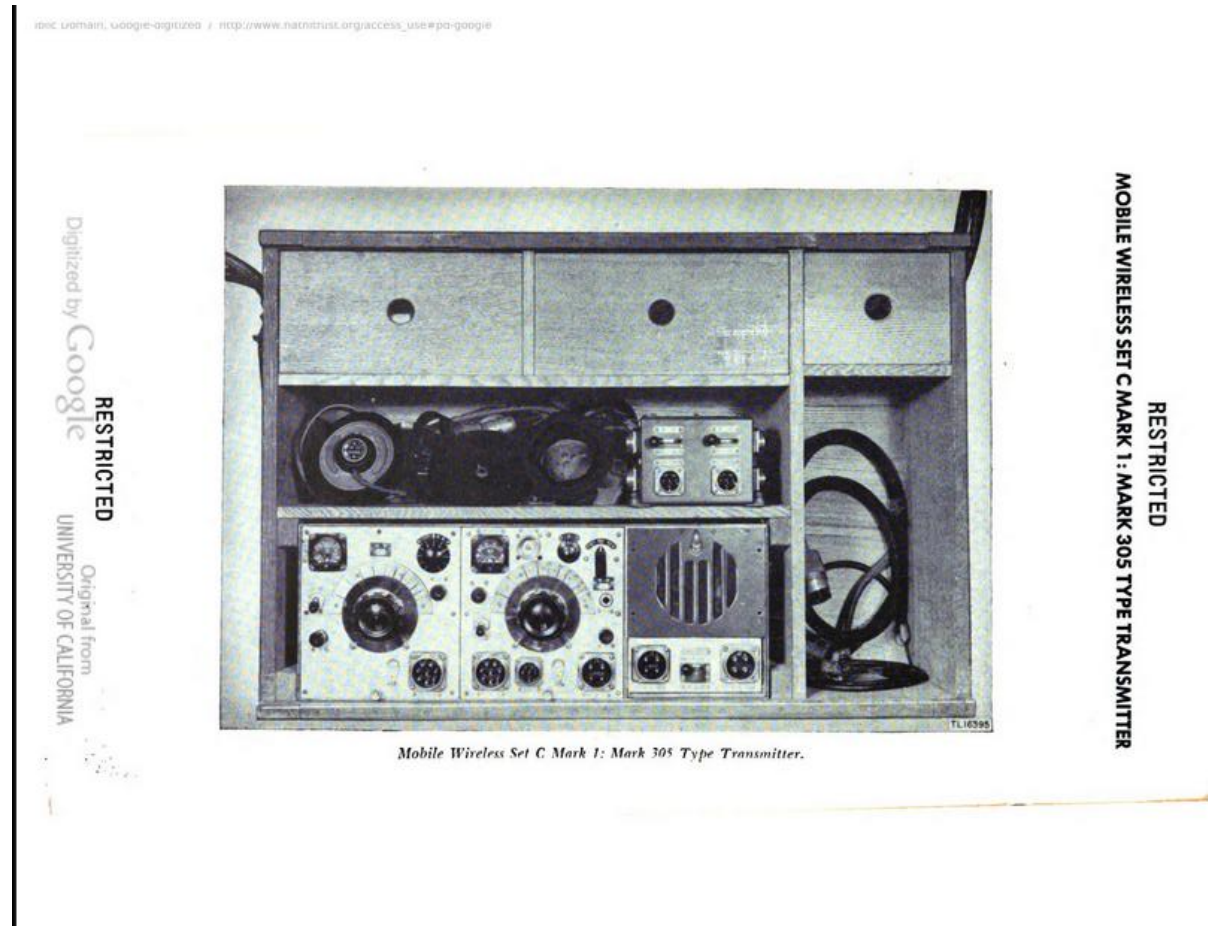
TRANSPORTATION: Probably in tank.

TUBES: Xmtr: UY807A r-f, UY807A mod, UT6F7 interphone, UT6F7 xtal calibration osc. Rcvr: UT6F7 r-f amplr, UT6F7 superregen detect and quench osc, UT6F7 a-f amplr.

TUNING: Mo.

<i>Principal components</i>	<i>Dimensions (in.)</i>			<i>Weight (lb.)</i>
	<i>Height</i>	<i>Width</i>	<i>Depth</i>	
Entire set	19 $\frac{3}{4}$	31	10	

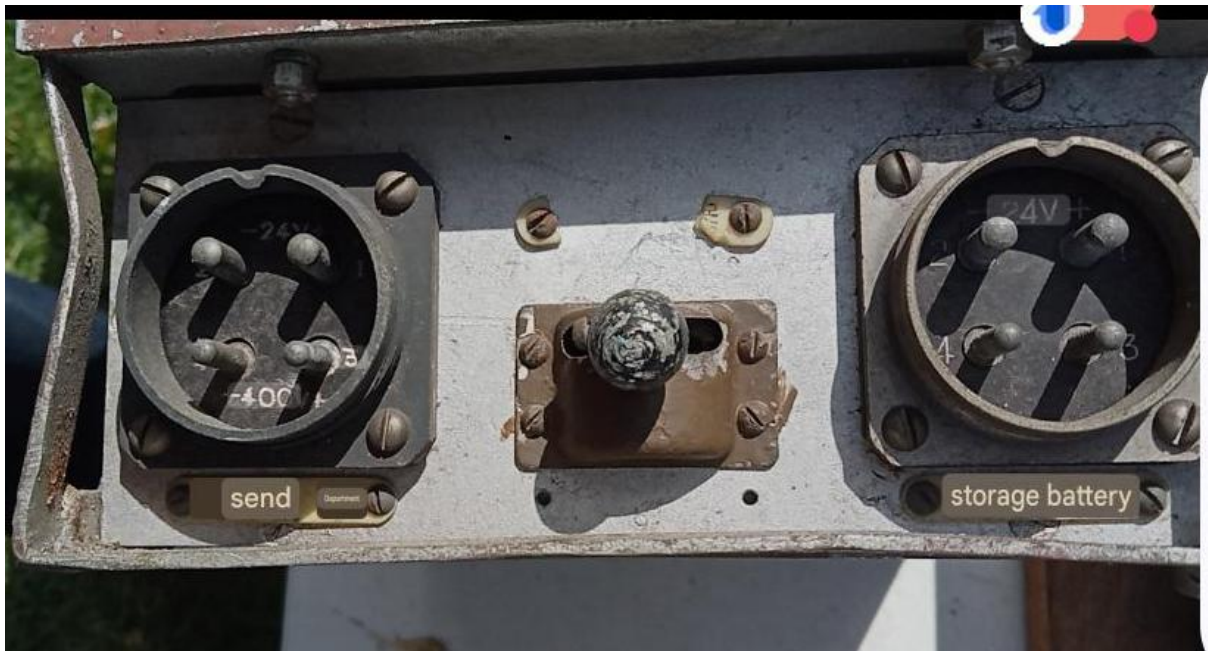
REMARKS: Equipment consists of xmtr, rcvr, carrying case, key, microphone, headset, junction box, and dynamotor. Case and chassis parts are made of aluminum, coil forms and insulators of brown bakelite type phenolic. Nickel plating is used throughout. Xmtr has low undistorted modulation capability, no satisfactory antenna tuning system. Rcvr has poor tracking in osc and amplr tuning.



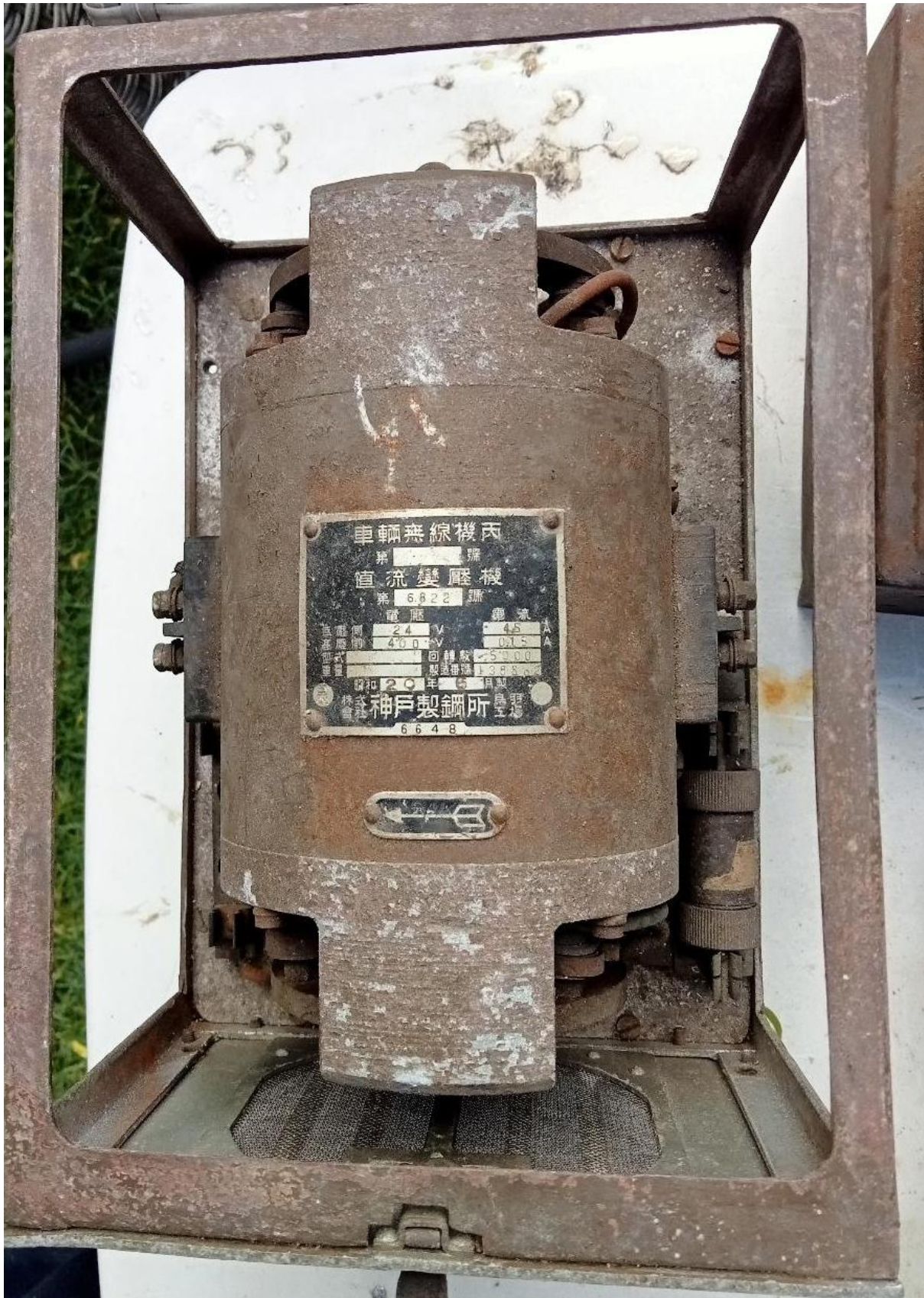
Note the round grille to the bottom right of this installation. Here is my edition "6648":



At the bottom of the front panel are the sockets for out (left hand side) and in (right hand side), which translated are:

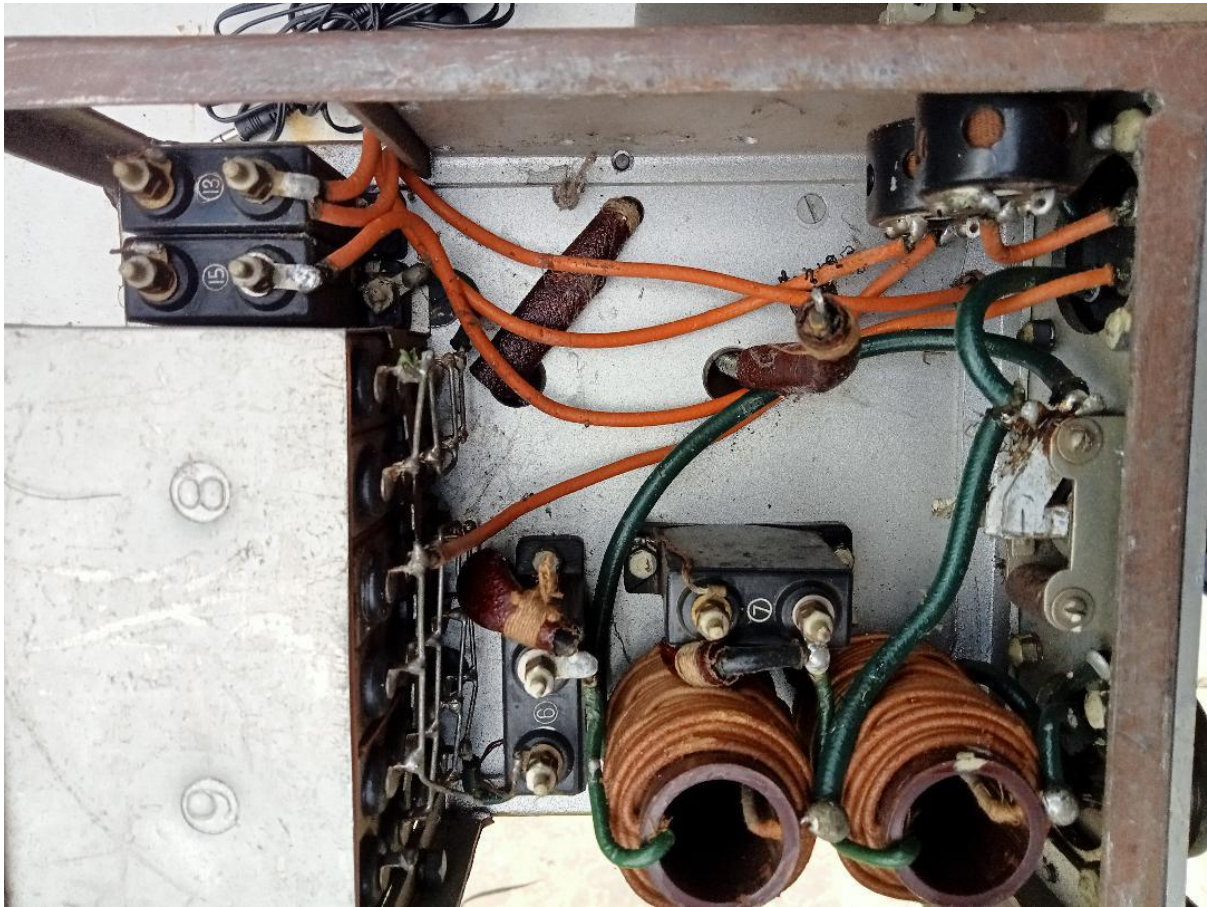


From the top of this unit you can see the dynamotor inside:



Note the thick wires to the side.

Inside the assembly (underneath) you can see the smoothing coils and capacitors:



But there is a wire in the centre that comes from the dynamotor side and has been cut.



24 volts at 4.8 A in and 400 volts at 150 mA out. The high current draw on the input would have been very demanding on the vehicle battery.



This is Google's translation.

The factory name is clear and the date year "6" which under the convention in the in the TM must be 1936.

The second and third dynamotors appear to be similar but mounted in different ways.

The most complete one "5 3" is mounted on a chassis and has a worn identifying label:



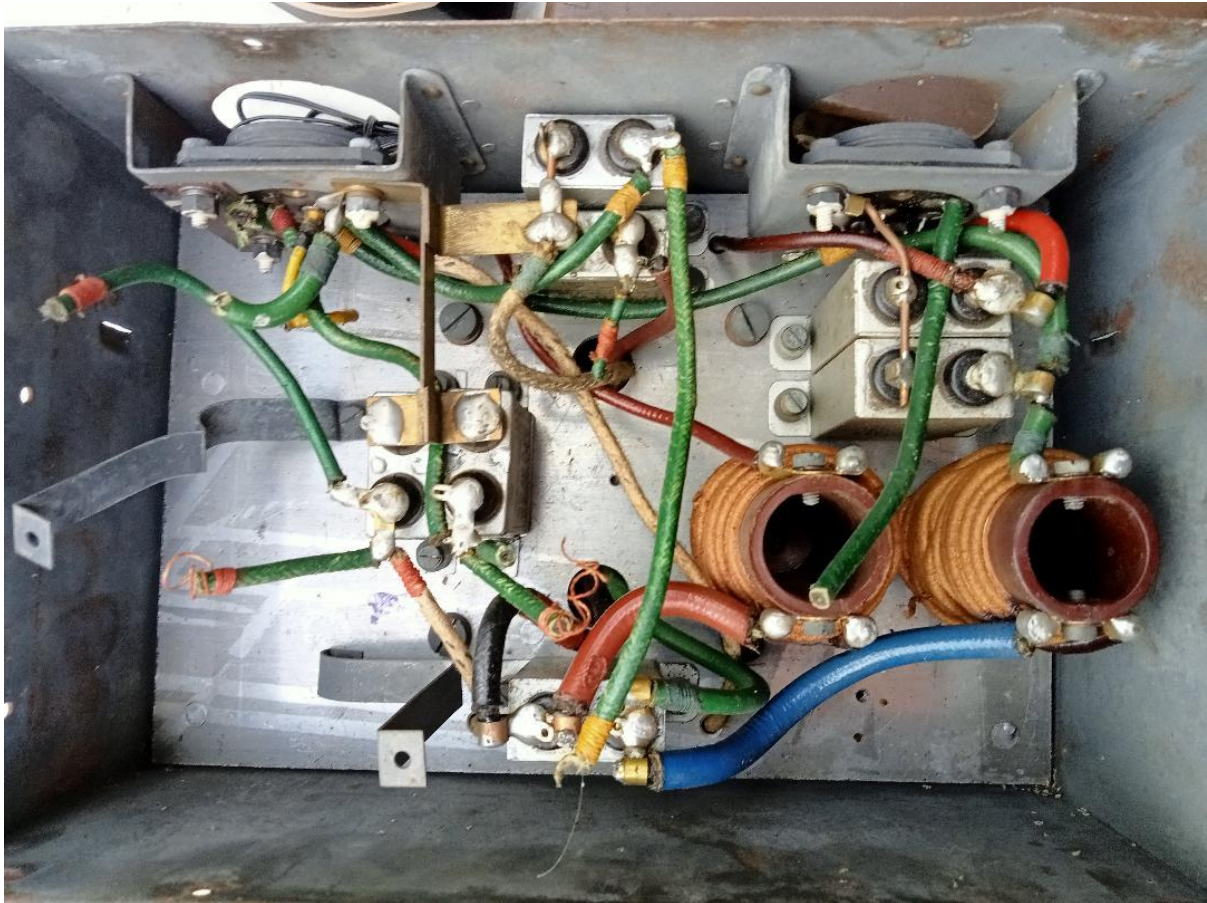
The Google translation identifies the factory, but the construction year and month are indistinct.

The unit lacks a guard to the left:

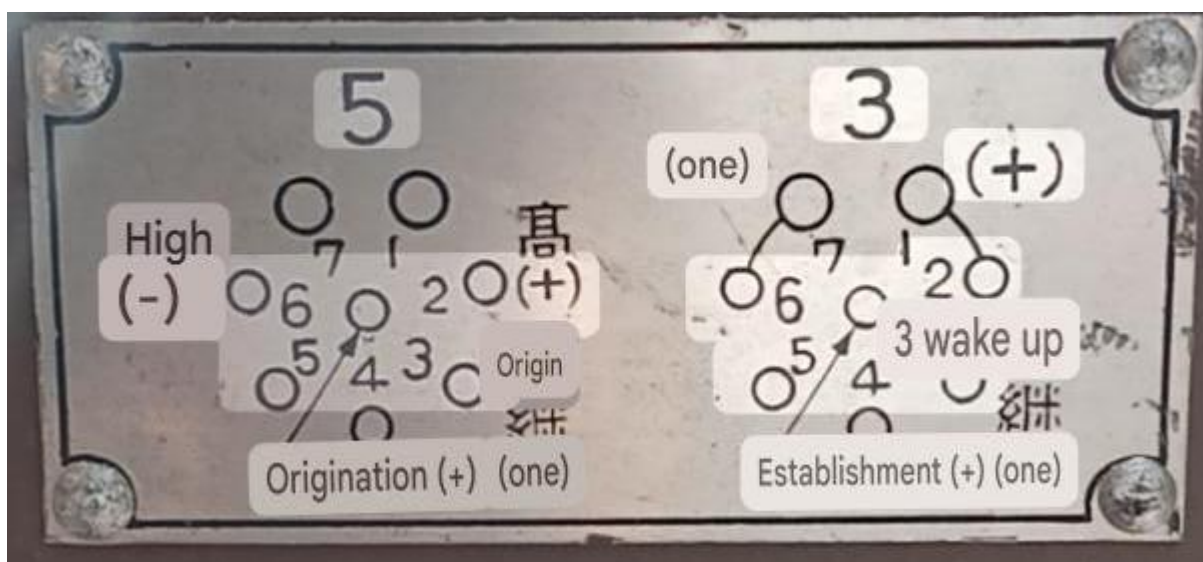


The fuse box is clearly visible (no fuse inside!).

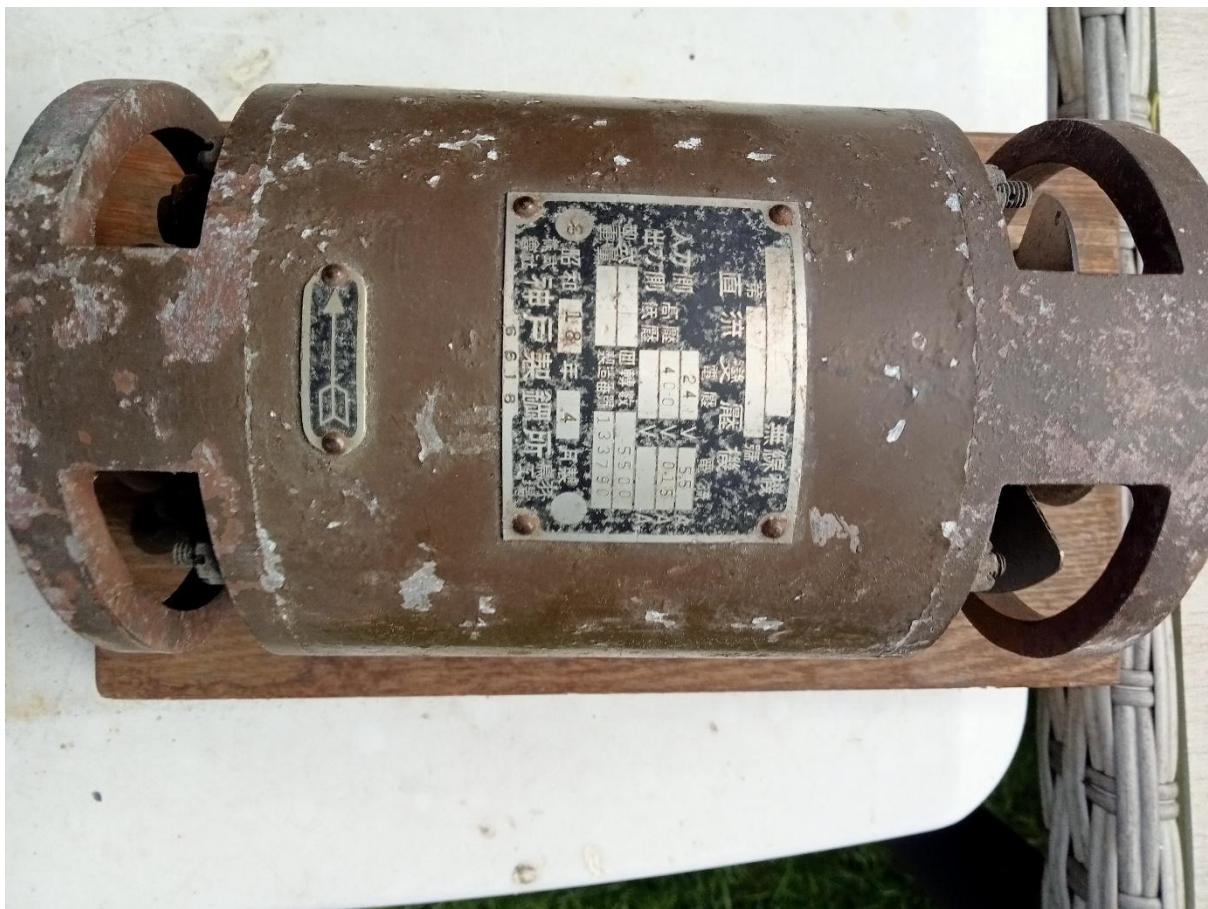
Inside the chassis the chokes and capacitors are visible, but there is something missing from the four green wires:



Finally, there is a label for the sockets, although the google translation isn't very helpful:



The third dynamotor “6618” is mounted on a wooden board without and smoothing circuitry. Input and Output are marked in English language labels.



This is labelled:





The factory is identified, and Year 18 is presumably 1938.

The only other vehicular transmitter identified in in the TM is here:

RESTRICTED
TTK MODEL 147 MOBILE WIRELESS SET B

FREQUENCY RANGE: 1.5 to 5.5 mc.

POWER OUTPUT: 30 w high pwr; 5 w low pwr.

TYPE OF SIGNAL: Cw, mcw, voice.

USE: Communications between mechanized units.

POWER SOURCE: Dynamotor.

ANTENNA: Whip type.

TRANSPORTATION: Vehicular.

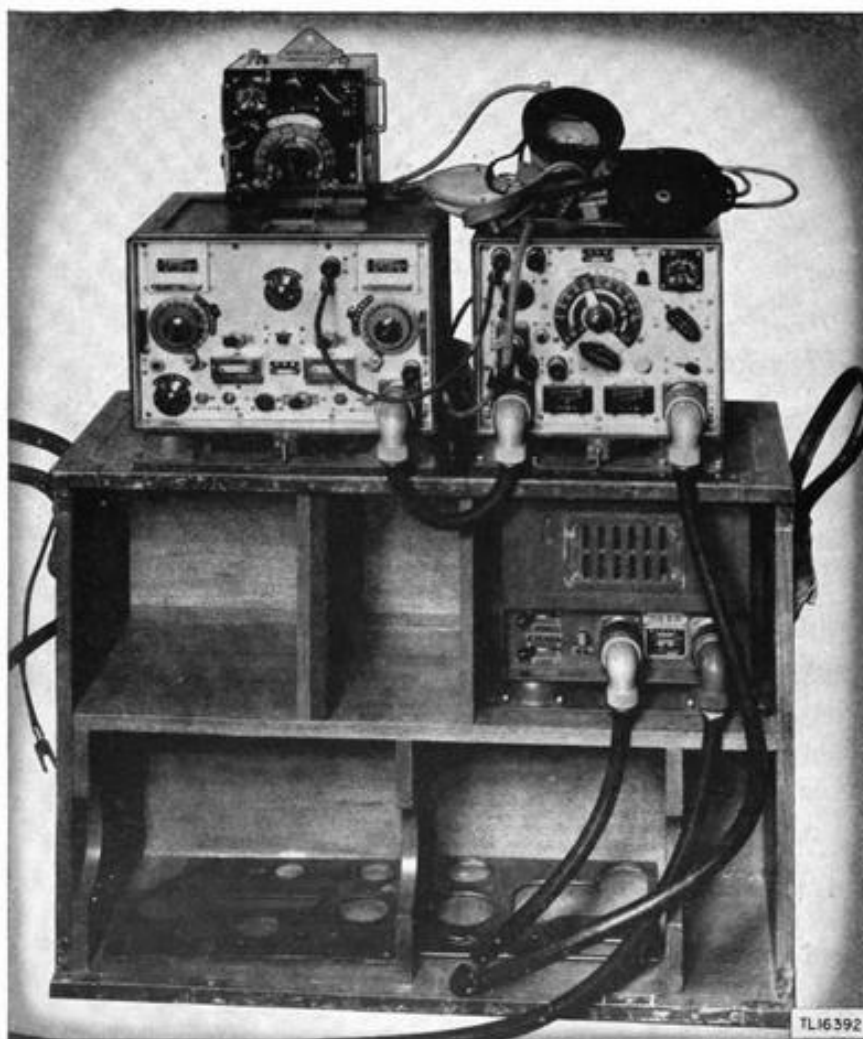
TUBES: Xmtr: 807 xtal osc, 807 pwr amplr, 807 tone gen. Rcvr: Six 6F7.

TUNING: Xtal.

<i>Principal components</i>	<i>Dimensions (in.)</i>			<i>Weight (lb.)</i>
	<i>Height</i>	<i>Width</i>	<i>Depth</i>	
Xmtr	9	8½	8	
Rcvr	11½	8½	8	
Dynamotor	9	8½	8	
Total weight				65.0

REMARKS: Rcvr is superheterodyne with two r-f channels selected by switch on front panel. It uses three plug-in coils. Xmtr has two xtal-controlled frequencies selected by switch on front panel.

RESTRICTED
TTK MODEL 147 MOBILE WIRELESS SET B



TTK Model 147 Mobile Wireless Set B.

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RF Coils

A wooden tray of coils was part of the purchase:



Here the frequency range of each coil is shown clearly in KHz (Kc/s).

Upside down, the coils look like this:



In translation, the labels clearly identify the equipment, although some of the translation is unhelpful:



The "III" is the coil number or frequency range.

When I copy the Japanese into my handwriting,

周波数

41
線車輪

Google Translate/Lens gives me "line wheel" and "frequency" which are better translations.

This is the Type 41 receiver in its two configurations:

RESTRICTED**MODEL 94 MARK 3C WIRELESS SET:
MARK 33 TYPE D TRANSMITTER, MARK 41 TYPE D RECEIVER**

FREQUENCY RANGE (mc): Xmtr: 0.4 to 5.7 using four sets of plug-in coils; No. 1, 0.4 to 0.75; No. 2, 0.75 to 1.5; No. 3, 1.5 to 2.9; No. 4, 2.9 to 5.7. Rcvr: 0.3 to 6.0 using five sets of plug-in-coils; No. 1, 0.3 to 0.55; No. 2, 0.55 to 0.85; No. 3, 0.85 to 1.6; No. 4, 1.6 to 3.1; No. 5, 3.1 to 6.0 approx.

POWER OUTPUT:

TYPE OF SIGNAL: Cw, voice.

USE: Portable field set.

POWER SOURCE: Xmtr: hand-driven gen with two cranks; requires two men. Power output: 62 w; plate, 400 v; fil, 8 v. Rcvr: batteries in rcvr case; plate, 135 v; screen, 90 v; fil, 1.5 v; bias, 3 v.

ANTENNA:

TRANSPORTATION: Man pack; three men transport complete set.

TUBES: Xmtr: UY47B speech amplr, UY47B osc, UY202A pwr amplr, UY202A mod. Rcvr: UF134 tetrode r-f amplr, UZ135 converter, UF134 tetrode i-f amplr, UF111A tetrode detecr, UF109A tetrode a-f amplr, UY133A pentode a-f output.

TUNING: Xtal, mo. Removing xtal connects mo.

<i>Principal components</i>	<i>Dimensions (in.)</i>			<i>Weight (lb.)</i>
	<i>Height</i>	<i>Width</i>	<i>Depth</i>	
Xmtr	13½	10	6½	
Rcvr	13½	10	6½	
Gen	13½	9½	6½	

REMARKS: This medium-size, portable field set consists of xmtr, hand-driven gen, rcvr and accessories, headset, connecting cords and plugs, and coils. Wiring diagrams of xmtr and rcvr are mounted in cases. Xmtr and rcvr may be operated together or separately. Send-receive switch on xmtr panel quiets rcvr during transmissions. Patch cord permits use of one antenna and counterpoise for both xmtr and rcvr. Xmtr includes xtal-controlled osc or mo, pwr amplr, plate mod and one-stage speech amplr. Rcvr uses standard superheterodyne circuit with regen-detecr for c-w reception. Five controls must be used to tune in one station. Set is poorly wired; there is no protection against moisture or fungi; set is difficult to repair.

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**MODEL 94 MARK 3C WIRELESS SET:
MARK 33 TYPE D TRANSMITTER, MARK 41 TYPE D RECEIVER**



*Model 94 Mark 3C Wireless Set: Mark 33 Type D
Transmitter, Mark 41 Type D Receiver.*

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And as a Weather receiver:

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WEATHER WARNING RECEIVER

FREQUENCY RANGE (mc): 0.0375 to 0.15 and 0.545 to 15.0 using 6 plug-in coils; No. 1, 0.0375 to 0.078; No. 2, 0.078 to 0.15; No. 3, 0.545 to 1.33; No. 4, 1.33 to 3.41; No. 5, 3.41 to 7.35; No. 6, 7.35 to 15.0.

POWER OUTPUT: Adequate for headset use.

TYPE OF SIGNAL:

USE: Weather warning.

POWER SOURCE: External battery pack. Output: plate, 90 v at 12 ma; fil, 1.5 v at 325 ma; bias, 4.5 v.

ANTENNA:

TRANSPORTATION:

TUBES: UF134 r-f amplr, UF134 detectr, UY133A 1st a-f amplr, UF109A 2d a-f amplr.

TUNING:

<i>Principal components</i>	<i>Dimensions (in.)</i>			<i>Weight (lb.)</i>
	<i>Height</i>	<i>Width</i>	<i>Depth</i>	
Carrying case	12	15 $\frac{3}{4}$	10	

REMARKS: This portable regen rcvr with spare plug-in coils and headset is housed in an iron-bound wooden carrying case with leather handle. On front panel are main tuning dial, vernier tuning control, on-off power switch, meter switch, regen control, fil rheostat, pwr cable connector, antenna and ground binding posts, and phone jack. Rcvr sensitivity is rather high, selectivity poor.

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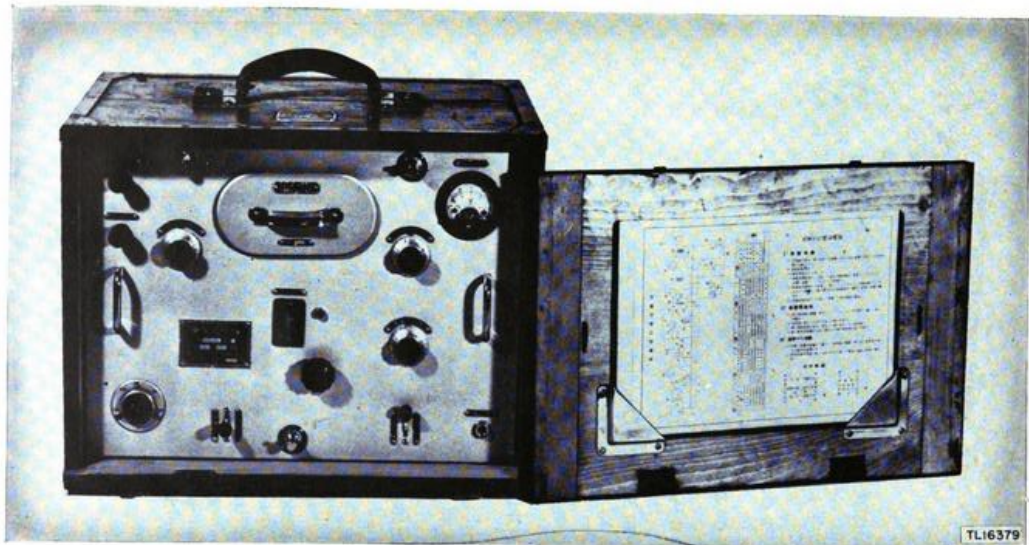
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WEATHER WARNING RECEIVER



Weather Warning Receiver.

Finally, there is this device:



The captions on the left are “Current flow meter” and “Tuned capacitor”.

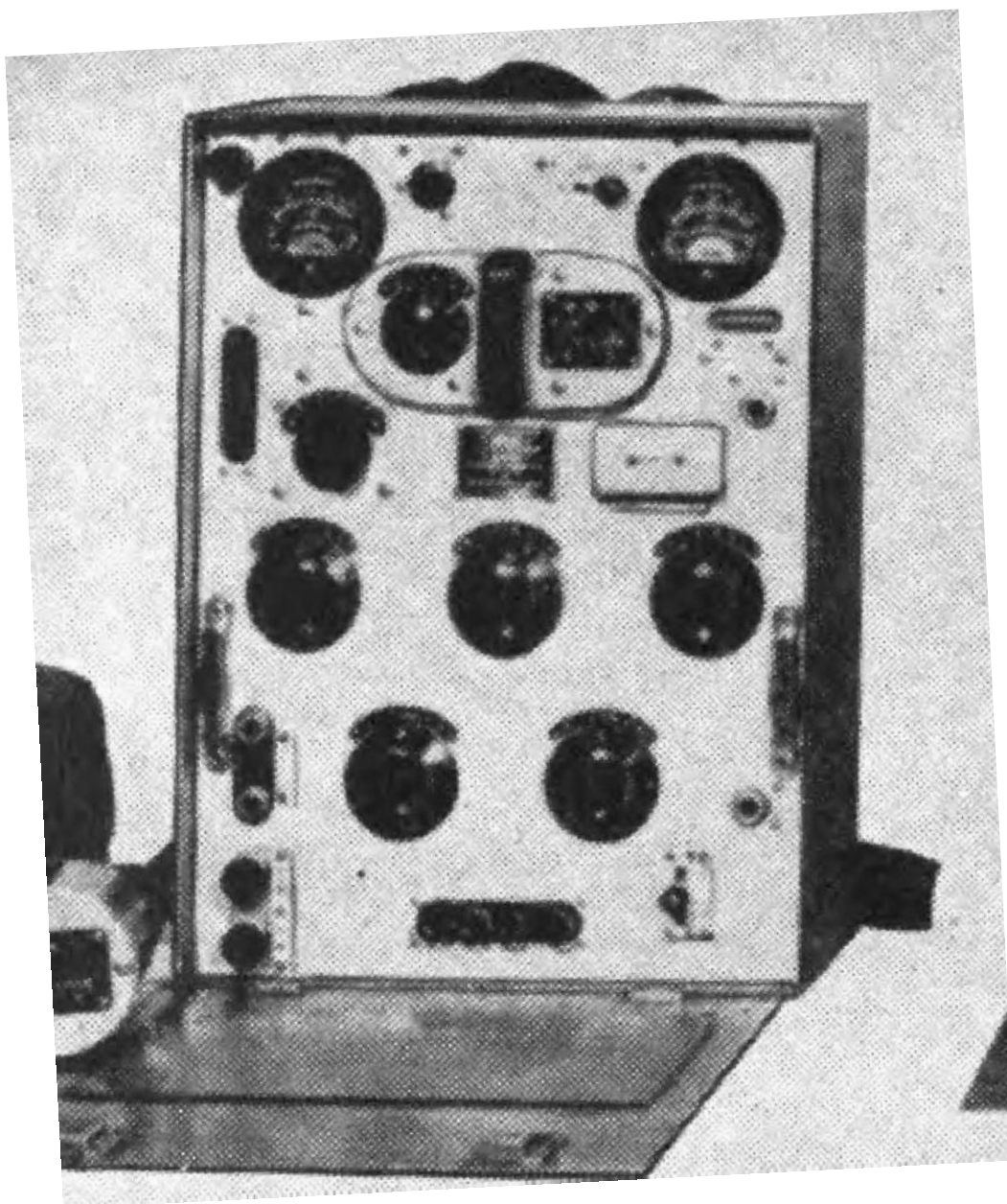


The wooden box has been butchered.

Inside view:



This (to me) looks like a partially-restored absorption wavemeter, lacking a sense coil (to wire in the back) inductively linked to a tuning coil across the capacitor and on the top. It looks like it uses a vernier knob and meter as in the receiver:



73 de Andy G0SFJ

21 April 2026