

JOHNSON

Viking Mobile Kit



gang tuning . . . efficient antenna loading . . .
instantaneous bandswitching . . . 60 watts input . . .
100% modulation . . . high efficiency



E. F. JOHNSON COMPANY

WASECA, MINNESOTA

Here's another outstanding **JOHNSON** the **VIKING MOBILE KIT . . .**

GET THE MOST OUT OF MOBILE OPERATION . . . CHECK THESE FEATURES MAKING THE VIKING MOBILE OUTSTANDING . . . Gang tuning . . . Instant bandswitching, 75, 40, 20, 15, 11 - 10 meter bands . . . Efficient antenna coupling circuits . . . All stages metered—illuminated meter . . . High overall efficiency . . . Flexibility in power supply requirements . . . Front panel control—dash mounting . . . Plenty of audio gain and power . . . Up to 60 watts PA input.

To tune up the VIKING MOBILE all you need do is select the proper bandswitch position, resonate all stages with one knob! Oscillator, buffer and PA capacitors are gang tuned and adjusted to track throughout the band. Three ganged, adjustable coupling links, automatically selected by the bandswitch, insure easy antenna loading. Fixed series tuning of links for reactance cancellation together with specific antenna recommendations provide predictable impedance values throughout the antenna system. Gang tuning does not, in any way, impair your ability to change frequency without antenna loading coil adjustment. In fact, antenna tuning is much broader than that of competitive transmitters. When operating on 75 or 40 meters, where loaded mobile antennas become very sharp, excursions of more than 25 kcs. each side of the antenna resonant frequency may be made without perceptible change in field strength.

RF SECTION THE RF section consists of a 6BH6 oscillator, a 6AQ5 buffer/frequency multiplier and an 807 output amplifier.

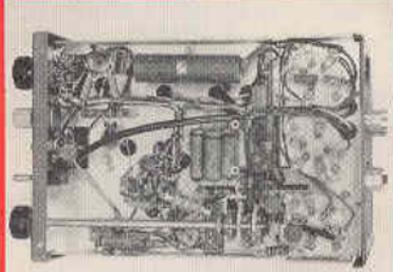
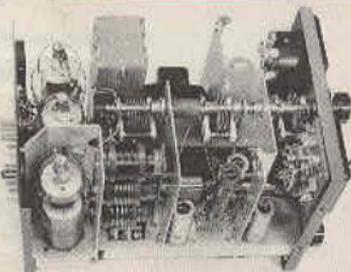
The crystal/VFO selector switch and multiple crystal socket assembly incorporated in the front panel permit instant frequency changes. The oscillator is a Pierce with an electron coupled plate circuit and serves as an RF amplifier with the crystal switch in the VFO position. No changes are required to use the VIKING MOBILE VFO, a miniaturized variable frequency oscillator with excellent stability. VFO power and RF input receptacles are located on the rear of the transmitter.

More than adequate amplifier excitation is provided on all bands by the 6AQ5 buffer. Screen potential is varied by the drive control located on the front panel and serves to adjust the PA grid current.

The 807 output stage utilizes three separate tank inductors to cover the 75, 40, 20, 15 and 10 meter amateur bands. These are permanently mounted in the transmitter and are selected by the bandswitch. While the final amplifier tuning capacitor is ganged with the oscillator and buffer, it is equipped with a trimmer capacitor operated from the front panel. This trimmer serves to tune out antenna reactance on the low frequency bands when a change in operating frequency is desired without changing adjustment of the antenna mounted loading coil.

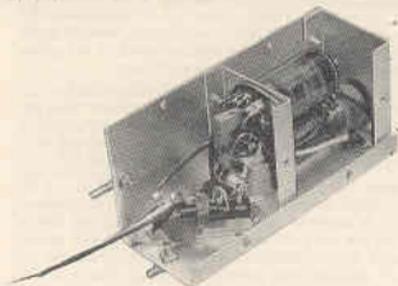
Plate circuit efficiency is high and tank circuit "Q's" are such that with a 300 volt DC supply 30 watts input can be achieved. Any other plate supply voltage up to 600 volts DC may be used without modification of the transmitter. Under maximum input conditions of 600 volts, 100 ma., output is approximately 42 watts.

AUDIO SYSTEM You can use either dynamic or carbon microphones with the VIKING MOBILE. A 6BH6 speech amplifier and 6BH6 driver provide ample gain for the push pull class AB₁ modulators. Audio response, limited to the communications range of frequencies and 100% amplitude plate and screen modulation give the VIKING MOBILE plenty of punch. Optional "push to talk" and front panel gain control contribute to its operating convenience.



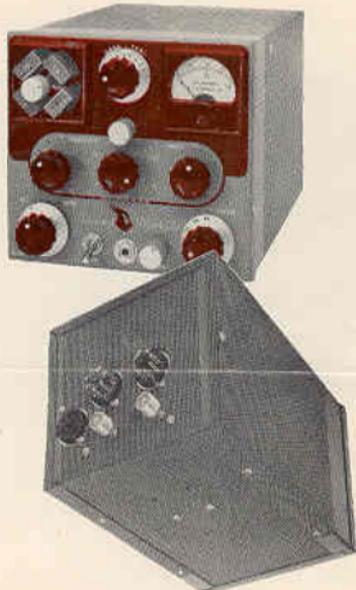
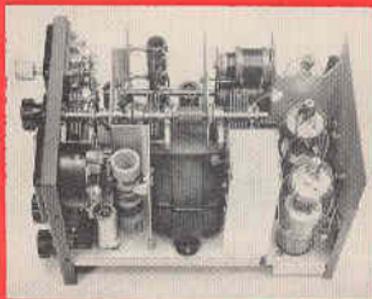
TRANSMITTER

BIAS SUPPLY A unique and exclusive feature of the VIKING MOBILE is its RF type fixed bias supply. Utilizing one triode of a 12AU7 as an oscillator operating around 4.5 mcs. and the other triode as a half wave rectifier, the supply provides fixed bias for the 807 modulators, 807 final amplifier and 6AQ5 buffer/multiplier. By this means cathode bias and its consequent loss of plate supply voltage is eliminated from these stages. Furthermore, RF tubes are protected in the event of excitation failure. The most important function of the bias supply however is to keep modulator "no signal" current low thus greatly improving efficiency by reducing the total battery power required for each transmitting cycle. The bias supply is well shielded and decoupled from other circuits—radiation is negligible.



TUBE LINE-UP

- 6BH6—Oscillator
- 6AQ5—Buffer/Freq. Multiplier
- 807—RF Amplifier
- 6BH6—Speech Amplifier
- 6BH6—Driver
- PP807s—Modulator
- 12AU7—Bias Oscillator



OPERATION The VIKING MOBILE owner has his choice of two methods of operating control. An integral part of the MOBILE is the "TUNE—TRANSMIT—RECEIVE" switch which performs the following functions.

TRANSMIT position—energizes dynamotor contactor, disables receiver, connects antenna to the transmitter.

RECEIVE position—cuts plate voltage off all transmitter stages, connects antenna to receiver, restores plate voltage to receiver.

TUNE position — (VFO operation) — receiver is permitted to operate with the antenna connected, plate power applied to the VFO power receptacle but to none of the other transmitter stages. This enables the operator to "zero in" on any desired signal and roughly tune the transmitter by audible means.

TUNE position — (crystal control) — receiver is disabled and plate voltage applied to the exciter only. Tuning the exciter will automatically adjust the amplifier close to its final setting.

The mobile enthusiast who demands "push to talk" operation will find that his needs have been anticipated. The only additional item required to complete the "push to talk" system built into the VIKING is a 6 or 12 volt RF type DPDT relay (may be a SPDT coaxial relay with SPDT auxiliary contacts). Tuning convenience afforded by the "TUNE—RECEIVE—TRANSMIT" switch is not affected.

POWER SUPPLIES



The VIKING MOBILE is designed to operate with good efficiency at plate supply voltages ranging from 300 volts to 600 volts. High permeance 807s were selected for modulator and RF amplifier because of their excellent performance throughout this range.

For the user who desires a "complete package" JOHNSON 239-102 (6 volt primary) and 239-104 (12 volt primary) dynamotors are available. Either will deliver 500 volts at 200 ma. furnishing 50 watts input to the final amplifier while powering all the other stages of the transmitter. The required voltage dropping circuits for speech amplifier and exciter as well as the primary contactor are incorporated in the base of the dynamotor. In the 150 to 200 ma. output range, the dynamotor primary current is practically a linear function of output current. Therefore, in cases where full carrier power is not required, it is possible, by decoupling the antenna, to operate the VIKING MOBILE at less than full power and thereby reduce primary current several amperes.

A second accessory item available to the VIKING MOBILE owner is the 239-101 (6 volt) or 239-103 (12 volt) Dynamotor Base Assembly Kit. This unit will serve as a mounting for PE-103s or similar dynamotors and houses the dropping resistor for low voltage stages, the primary contactor, fuses and receptacles.

It is not required that exciter and speech amplifier stages of the VIKING be powered by the same supply used for the modulator and amplifier. A separate supply, capable of delivering 260 to 300 volts at 70 ma. may be used to power speech and exciter stages. In some mobile installations the associated receiver will be capable of supplying this power. Switching circuits of the MOBILE have been designed to permit the receiver supply to be used for this purpose while the receiver is in a "standby" state.

METERING

To facilitate tuning and operation of the VIKING MOBILE the transmitter has been provided with a complete metering system. Using 100 mv. shunts permanently connected in oscillator, buffer, PA and modulator cathode circuits, also in the PA grid circuit, the 2" illuminated meter can be instantly switched to read the current in any stage.

ASSEMBLY

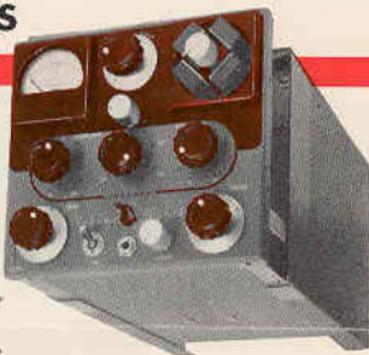
The VIKING MOBILE is another outstanding JOHNSON transmitter furnished in kit form. Included are all necessary component parts, punched and formed chassis and cabinet, wiring harness and hardware. Assembly instructions are carefully written and the order of assembly worked out so that no difficulty will be encountered even though the finished unit is extremely compact. Instructions include photos at various stages of assembly, supplemental drawings, alignment data, receiver interconnection, antenna suggestions, etc. The experienced amateur will find that the VIKING MOBILE is easy to assemble and convenient to use. VIKING MOBILE is also available, at somewhat higher cost, assembled, tested and aligned. See your JOHNSON distributor for details.

MECHANICAL FEATURES

Overall dimensions of the VIKING MOBILE are only 6—7/16" high, 7—1/8" wide, 10—5/16" deep. The transmitter is designed for under-dash mounting and all controls are located on the front panel. To provide maximum visibility the meter is illuminated. Control knobs have raised white indicator marks making them visible from wide angles and enabling the operator to judge their positions by sense of touch. Locations of meter and crystal selector assembly are reversible, their positions dependent upon whether the transmitter is located to the right or left of the steering column.

Ready accessibility to the chassis has been a paramount design consideration. Front panel, rear cover, bottom plate and chassis are all one assembly. The cabinet is a sturdy steel cover consisting of top and sides, open at the ends and with lips at the bottom supporting the chassis. It is thus possible to slide the chassis out of the cabinet without even the necessity of disconnecting cables. Since the cabinet is open at the bottom, the empty cabinet can be very simply and easily mounted. The VIKING MOBILE is equipped with receptacles for the following functions:

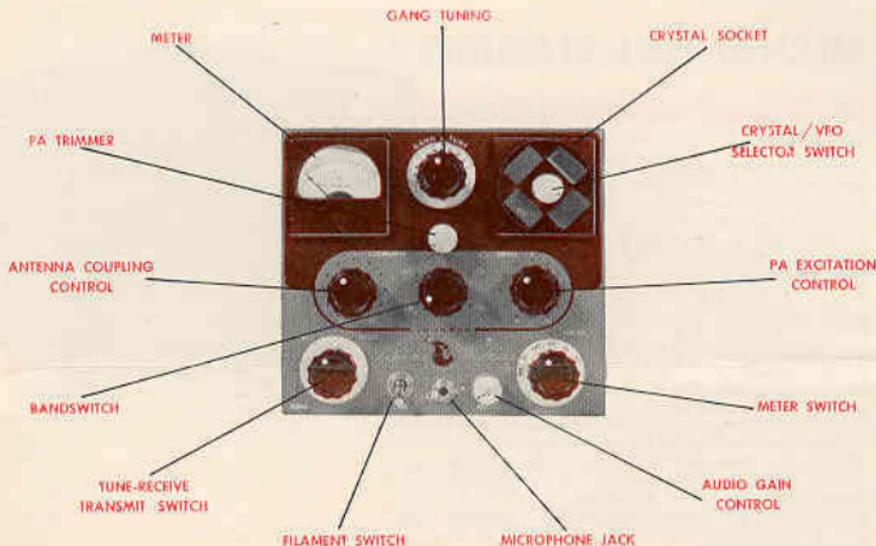
- VFO RF input cable
- RF output coaxial connector
- Octal female VFO power receptacle
- Male octal power and control cable
- Male 7 prong receiver disabling, antenna and power transfer cable
- Microphone input



240-141 VIKING MOBILE KIT complete less tubes, microphone, crystals and power supply	AMATEUR NET \$99.50
239-102 (6 volt) assembled dynamotor power supply including 1-78-PF7S, 1-86-PM8 and 1-78PF8 Amphenol connectors	\$89.50
239-104 (12 volt) as above	\$92.50
239-101 (6 volt) base kit only less dynamotor but including 1-78-PF7S, 1-86-PM8 and 1-78PF8 Amphenol connectors	\$16.50
239-103 (12 volt) as above	\$17.40

For push to talk operation a relay similar to Leach 227, Leach 1077BF, Advance 1604, Ward Leonard 507-532 or a coaxial relay with SPDT auxiliary contacts is required. Suitable microphones for use with the VIKING MOBILE ARE: Astatic 10M5; Electro-Voice 600D, 210, 208; Shure 101C, 102C, 505C.

Relays, microphones and connectors (other than those furnished with dynamotors and dynamotor base kits) must be obtained from sources other than JOHNSON.



CONNECTOR AND CABLE REQUIREMENTS

FUNCTION	CONNECTORS	CABLE ¹
RF, VFO to transmitter ¹	1 83-15P Amphenol ²	RG59/U ³
Power, transmitter to VFO ¹	1 86-PM8 Amphenol ²	3 x No. 22 shielded ²
Transmitter to antenna	1 83-15P Amphenol	RG8/U
Battery to dynamotor	Solder terminals	2 x No. 4 automotive primary
Dynamotor to transmitter	1 78-PF8 Amphenol	
Microphone to transmitter	1 86-PM8 Amphenol	2 x No. 18, 5 x No. 22
BC receiver to antenna relay or transmitter (optional)	1 PL-68	3
HF converter to antenna relay or transmitter	1 78-PF75 ⁷ Amphenol	2 x No. 20 shielded
Transmitter to antenna relay, RF (push to talk operation)	----- ⁶	RG59/U ²
Transmitter to antenna relay, relay power, receiver muting (push to talk operation)	1 83-15P Amphenol	RG8/U
	1 78-PF75 ⁷	2 x No. 18 shielded, 2 x No. 20

1 Required only when VFO is used.

2 Furnished with 240-152 VIKING MOBILE VFO.

3 Appropriate cable furnished with microphone.

4 Minimum wire sizes have been listed, should be stranded equivalent to B & S gauges listed.

5 Cable furnished with converter should be used if available.

6 Connects to 78-PF7 connector where push to talk operation is not used.

7 Only one 78-PF7 connector is required in any case.

8 Only one 83-15P connector required for the transmitter RF output. Additional 83-15P connectors may be required depending upon choice of antenna relay (if used) and antenna.

NOTE A: Accessory items 239-101, 239-102, 239-103, 239-104 each include 1-78-PF75, 1-86-PM8, 1-78-PF8 and two solder terminals for dynamotor primary connection.

NOTE B: Connectors listed in bold face type above are the minimum number required for normal operation of the transmitter.

JOHNSON VIKING MOBILE

SPECIFICATIONS

Overall size: 6 7/16" high, 7 1/8" wide, 10 5/16" deep.

Weight: 12.75 pounds net, shipping weight 16 pounds.

Frequency range: 3.75-4.0 mcs., 7.0-7.3 mcs., 14.0-14.35 mcs., 21.0-29.7 mcs. in four bands.

Power output*: 300 volt DC supply—18 watts.

500 volt DC supply—32 watts.

400 volt DC supply—42 watts.

Frequency control: Quartz crystals; VFO power and RF input receptacles provided.

Power requirements: Filament— 6.0 volts AC or DC 4.0 amperes or 12.0 volts AC or DC 2.0 amperes.

Plate supply (ICAS rating):

30 watts PA input	50 watts PA input	60 watts PA input
300 V DC, 200 ma.	(option 1) 270-180 V DC, 55-70 ma. 500 V DC, 150 ma. (option 2) 475-525 V DC, 200-240 ma.**	[option 1] 270-300 V DC, 55-70 ma. 400 V DC, 148 ma. [option 2] 400 V DC, 200-240 ma.

Modulation: 100% amplitude.

Audio Frequency response: 250-3000 c.p.s. for voice communication.

Tube requirements: 3—807 modulator, RF power amplifier.

3—6BH6 speech amplifier, audio driver, crystal oscillator.

1—6AQ5 buffer amplifier.

1—12AU7 bias oscillator and rectifier.

*Usable power actually delivered to the antenna terminals at any frequency throughout the operating range.

**JOHNSON 239-101 or 239-101 dynamotor supply or equal.



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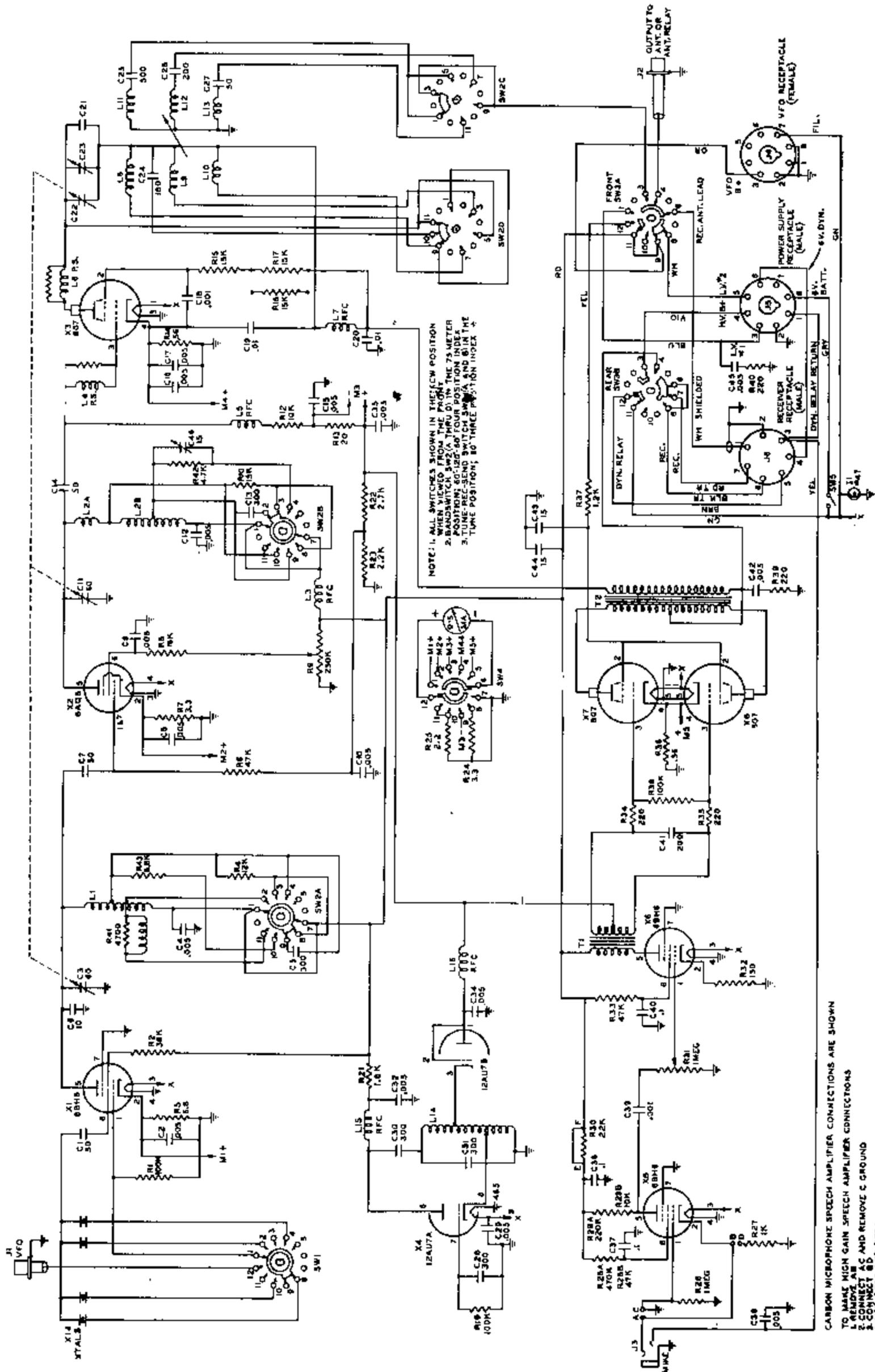


FIG. 8 VIKING MOBILE SCHEMATIC