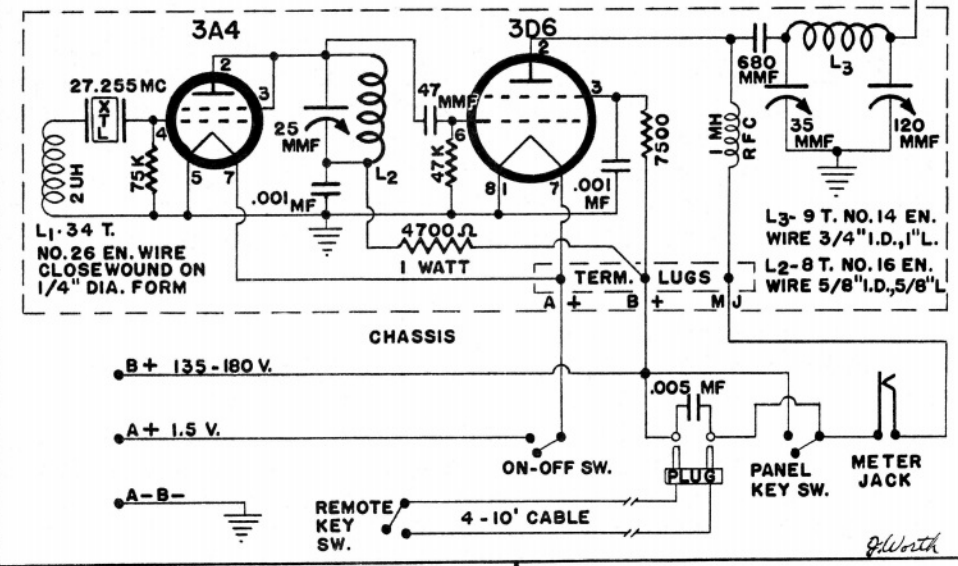
ASSEMBLY NOTES: Follow suggested order of assembly to make sure all connections are made and that each component can be installed without crowding or blocking the later installation of succeeding componets. The amplifier and antenna condenser rotors are grounded internally to the mounting studs-- no additional grounding necessary. Check each condenser to see that the plates do not touch when meshed- use a knife, if necessary, to straighten any minor misalignment that may have been caused in shipment. When soldering to the condenser stator lugs (stationery plates), use a very hot iron and hold it on the joint long enough for complete flowing of the solder- the plates tend to draw the heat away quickly. Keep components low to clear the coils; also, allow for clearance when the condenser plates are rotated, particularly in vicinity of the antenna condenser. Refer to photos frequently as a guide to correct component placement to avoid clearance problems. Use the photos also to note how the coil ends are formed for mounting to the condensers. Check off each step as it is completed: (LT.

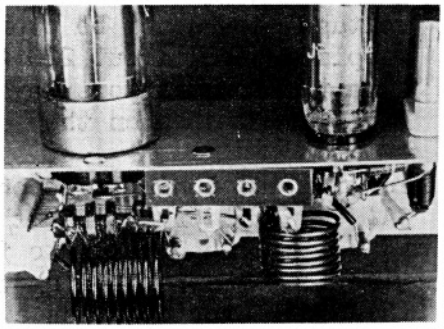
LORENZ M.O.P.A. TRANSMITTER - BASED ON THE ORIGINAL DESIGN IN AUG. 1954 MODEL AIRPL. NEWS



J. Worth

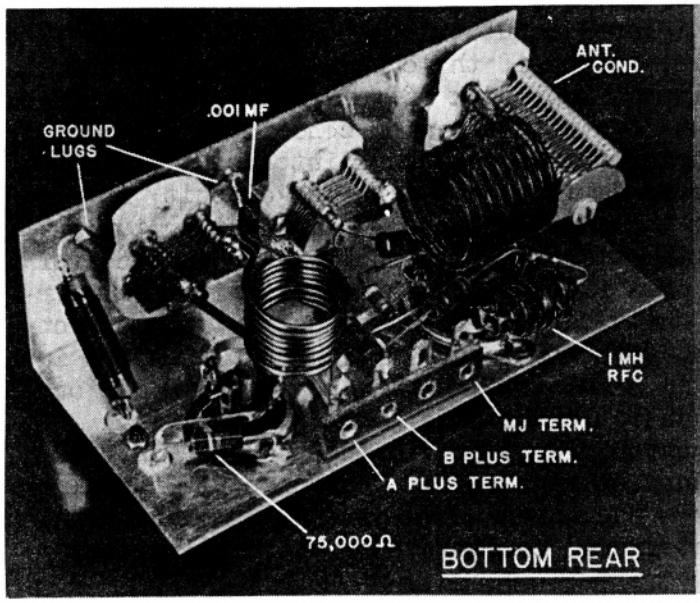
( ) 1. Install oscillator variable condenser, with solder lugs under each mounting stud. Be sure solder lugs do not touch rotor, due to play allowed by large lug holes.
( ) 2. Install amplifier variable condenser.
( ) 3. Install crystal socket with screw and nut- do not overtighten as it may crack.

	Install following components	Connect one end to:	Connect other end to:
( ) 4.	2 uh osc. grid coil, L1	osc. cond. ground lug	crystal socket lug
( ) 5.	1" jumper wire	osc. tube pin 5	osc. tube socket ground
( ) 6.	75,000 ohm resistor	crystal socket then to osc. tube pin 4	osc. tube socket ground
( ) 7.	2½" jumper wire	osc. tube pin 7	(connected later)
( ) 8.	2½" jumper wire	amp. tube pin 7	(connected later)
( ) 9.	1½" jumper wire	osc. cond. stator lug	osc. tube pins 2 & 3
( )10.	47 mmf ceramic cond.	osc. tube pins 2 or 3	amp. tube pin 6
( )11.	47,000 ohm resistor	amp. tube pin 6	amp. tube pin 8 then to amp. tube socket ground
( )12.	.001 mf disc cond.	amp. tube pin 3	amp. tube pin 1 then to amp. tube socket ground
( )13.	oscillator coil, L2	osc. cond. stator lug	osc. cond. rotor lug
( )14.	.001 mf disc cond.	osc. cond. rotor lug	osc. cond. ground lug
( )15.	mount terminal strip		
( )16.	4700 ohm 2 watt res.	osc. cond. rotor lug	B plus terminal lug
( )17.	Both 2½" jumpers	A plus terminal lug	
( )18.	7500 ohm resistor	amp. tube pin 3	B plus terminal lug
( )19.	1 MH RF Choke	amp. tube pin 2	Meter jack term. lug
( )20.	mount ant. var. cond.		
( )21.	680 mmf ceramic cond.	amp. cond. stator lug	amp. tube pin 2
( )22.	mount amp. coil, L3	amp. cond. stator lug	ant. cond. stator lug

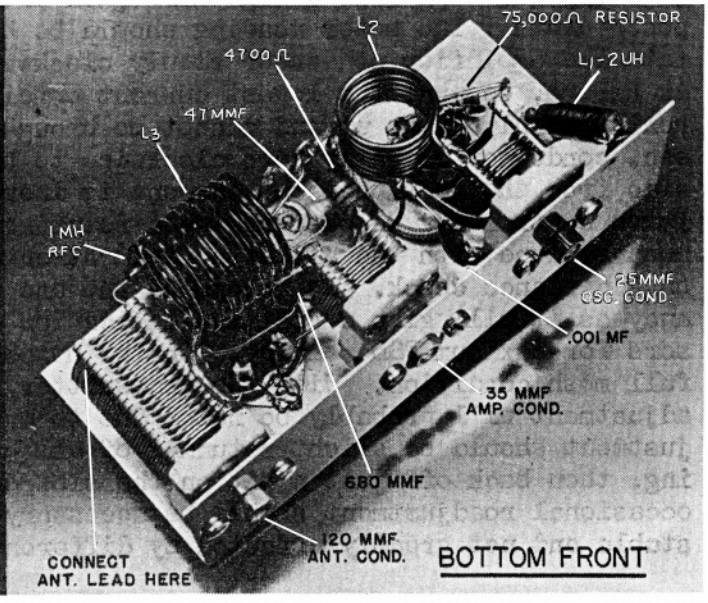


THIS IS A 27.255 MC TRANSMITTER & MUST BE REGISTERED BY FILLING OUT THE LICENSE FORM & MAILING TO THE F.C.C. OFFICE NEAREST YOU. DO NOT EXCEED 5 WATT INPUT (180 V. AT 30 MA). WRITE TO A.M.A., 1025 CONNECTICUTT AVE., WASH. 6, D.C. TO GET FULL DETAILS OF R.C. LICENSES.

CONTROL RESEARCH
BOX 9 — HAMPTON, VIRGINIA —



BOTTOM REAR



BOTTOM FRONT

To mount the chassis assembly in a ease, drill two mounting holes where convenient between the variable condensers and provide similar holes in the case panel. Also, provide three 3/8" dia. holes on the panel to match the condenser rotors — insulate with rubber grommets. Mount the chassis with screws, using spacers to set the assembly back slightly from the panel. Locate the antenna base close by so that not more than a 4 or 5" jumper is required to connect it to the antenna condenser. Mount the jacks and switches where convenient in the case. Be sure the jacks are insulated from the case if the latter is a metal type. Complete wiring between switches, term, strip and jacks.

For maximum output operation, we recommend a vibrator or dynamotor type power supply, Batteries may be used, but they should be as large as possible. The common portable radio type is considered too small for B supply, except for comparatively low power operation at about 135 volts (okay for boats or close range model planes or with sen— sitive type receivers such as the Lorenz 2 tuber for long range). The A battery must be at least equivalent to four flashlight cells in parallel (Burgess 4F or a No. 6 type dry cell recommended). Our own experience favors the 2 v. vibrator type supply which furnishes both A & B voltages from one heavy duty wet cell. In any case, the B voltage should not be over 180 v. with the transmitter operating (most 2 v. r-c power supplies check about 220 to 250 v. output with no load and drop down to 140 to 160 v, with the transmitters keyed good batteries check from 4/5 to 3/4 rated voltage under load - replace when they check less than 3/4 of rated voltage).

For initial tuning, disconnect the antenna. Also, remove the 3B6 tube but plug in the 3A4 tube and crystal so that only the oscillator portion of the circuit will operate. Adjust all condensers to full mesh. Connect a 30 or 50 ma meter in series with the B plus lead (meter jack shown is for amp. only). Hook up both A & B power (note that the oscillator operates at 30 to 50 volts less than the amplifier -- this is taken care of by the 4700 ohm resistor). Close the on-off switch while watching meter -- it will read about 10 to 15 ma. Rotate the osc. condenser slowly clockwise until the current suddenly dips to about half the previous value, note the condenser position at lowest dip, then slowly continue rotation a few degrees to raise the current about 1 ma from lowest value. The minimum dip position is a maximum adjustment but stay away from it just a bit on the slow current rise side to avoid having the circuit pop out of oscil- lation due to hand capacitance, loading effects, etc.

Next, shut off power, plug in the 3B6, connect antenna, connect the meter to the meter jack (splice B plus lead together again after meter is changed over), then switch on power again. The meter reading should be higher -- about twice the previous value. Rotate the amplifier condenser slowly clockwise to see if the current can be reduced. As before, we want the lowest current obtainable then back off slightly. If the current suddenly jumps up and cannot be brought down with the amp. condenser, rotate the osc. condenser slightly more clockwise to bring the circuit back into oscillation. Aside from the fact that the current is increased with the 3D6 in the circuit, no positive control may be observed when rotating the amp. condenser. Any further tuning must be done with the aid of a field strength meter or by tuning to a known receiver on a distance check. We recommend the use of a field strength meter. Set it as far away as it will give a positive indication while varying the amp. and antenna condensers for maximum FSM reading. On the bench, both condensers will probably end up in full mesh condition. With the transmitter in a case sitting on the ground, a different adjustment will probably be noted due to much better antenna loading. The final adjustment should be slight retuning of all condensers to obtain the highest FSM reading, then back off just a bit on the slow current rise side. Once properly tuned, only occasional readjustment should be necessary -- the Lorenz M0PA circuit is exceptionally stable and not greatly affected by different ground conditions or antenna lengths.