Lysco
500 & 600
transmitter
403 Vfo

OPERATING INSTRUCTIONS
MODELS 500-500S-600-600S

INTRODUCTION

Model 500 is the standard Transmaster.
Model 600 incorporates TVI Elimination.
Models 500S & 600S have in addition a built-in "Clamp" tube Modulator plus a switching arrangement whereby the Power Amplifier may be turned off to tune-up or zero-beat another signal without blocking the receiver or causing unnecessary interference to other stations on the frequency. This switch also provides a means for switching from phone to C. W. operation.

All units are designed to operate on 160, 80, 40, 20, 15, and 10 meter bands.

Crystal or VFO operation is feasable on all bands.

Installation of these units is extremely simple, requiring only an antenna, key and 115 volts 60 cycles for all Models, plus a high impedance microphone for Models 500S & 600S.

The Power Amplifier operates straight through on all bands.

OPERATION

These Transmasters require approximately 20 minutes warm-up time before operating temperature is reached. A slight amount of drift will be noticed during this time.

These units should at NO TIME be operated without a load as high R. F. voltages may damage the components.

DO NOT SWITCH BANDS WITH THE KEY DOWN.

A 10 ma. LOW RESISTANCE meter plugged into the jack marked METER will measure the grid current of the 807 Power Amplifier on Models 500 & 600. On Models 500S & 600S the meter must be connected across resistor R6.

The Oscillator and Power Amplifier tuning knobs are the only adjustments required for operation on any band.

MODELS 500S & 600S--These Transmasters MUST be tuned up with the KEYING switch in the TRANS (transmit) position and the key held down to obtain proper loading.

For best results with "Clamp" tube modulation the transmitter should be slightly overcoupled. The best point of operation may be found by a little experimenting.

Models 500S & 600S--The Modulator is designed to modulate the Power Amplifier 100% by "Clamping" the screen grid of this amplifier. The 6SJ7 first stage of speech amplification is designed to operate from a Crystal microphone or a high impedance Dynamic microphone. One half of the following 6SN7GT operates as the second stage of speech amplification supplying the remaining half of this tube with a high audio voltage. The audio voltage is then rectified by this section of the tube and the resulting negative d.c. voltage is applied to the grid of the 6V6GT modulator. The modulator then controls the d.c. voltage at an audio amplitude rate. The change in d.c. screen voltage increases the carrier at the same time as modulation appears.

The microphone must be connected to the microphone connector mounted on the modulator sub-chassis. The microphone may be left connected at all times even when operating on C.W., as the modulator is connected only when the switch is in FONE position.

CAUTION -- DO NOT OPERATE THE 600 OR 600S TRANSMASTERS WITHOUT ANTENNA OR DUMMY LOAD AS EXCESSIVE VOLTAGES DUE TO RESONANCE IN THE OPEN CIRCUIT MAY DAMAGE THE LOW PASS FILTER.

For crystal operation the following tabulation indicates the bands and crystals which may be used.

BAND	CRYSTAL
160 Meters	160 Meter
80 Meters	80 Meter
40 Meters	40 Meter
20 Meters	40 Meter
15 Meters	40 Meter
10-11 Meters	40 Meter

THE CRYSTAL SWITCH MUST BE IN THE VFO POSITION FOR VFO OPERATION.

When using a crystal the switch must be in the CRYSTAL position and the crystal frequency may be "rubbered" above the crystal frequency a considerable distance.

The output circuit is designed to operate into a 50 Ohm impedance to either an antenna or Power Amplifier.

In order to operate with a long wire antenna (over 60 feet), it is suggested that a "LYSCO" Model 50 Antenna Coupler be used. This Coupler is designed to operate with these transmitters, and provides a simple convenient method for all band operation.

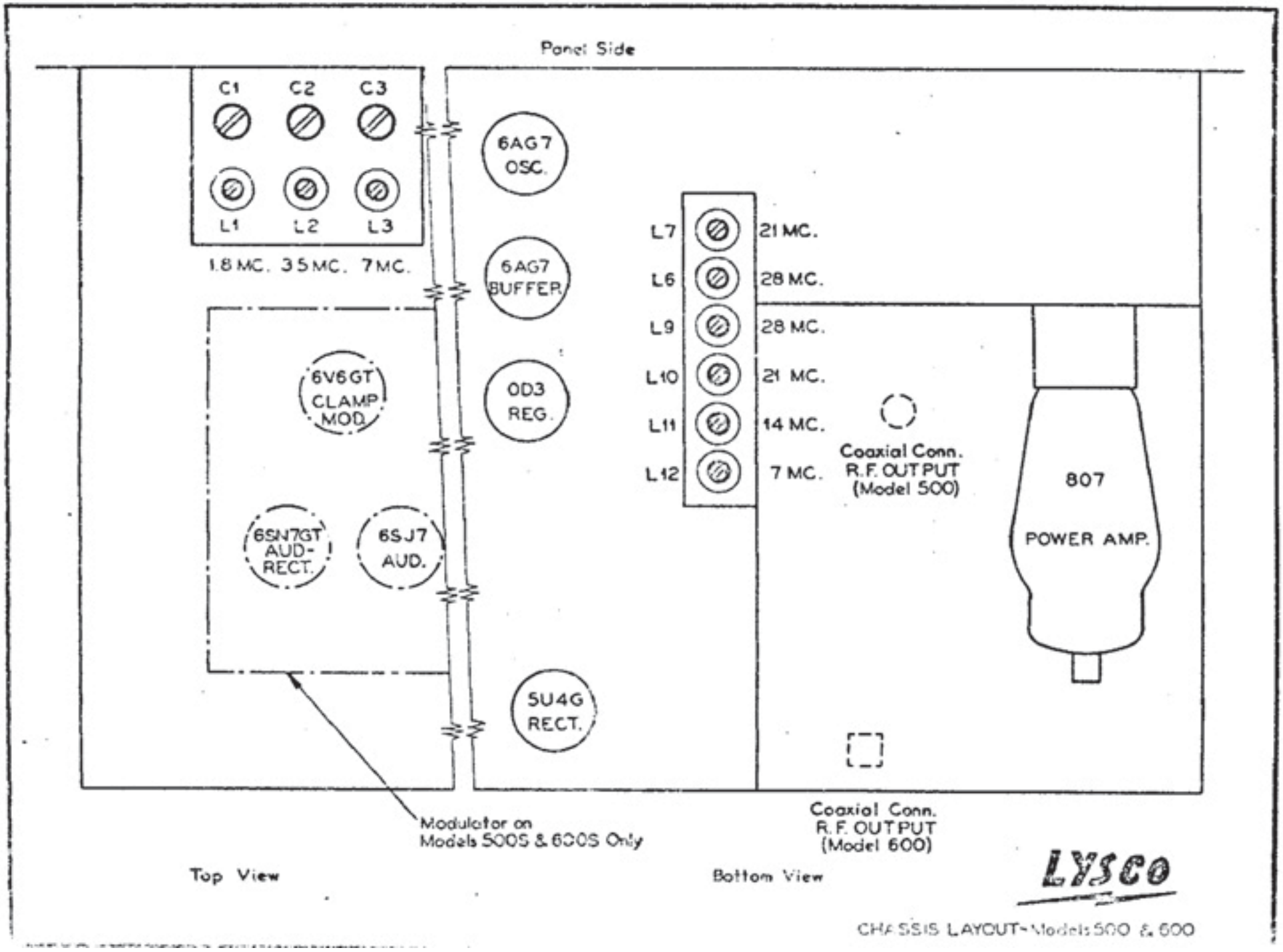
CIRCUITRY

OSCILLATOR - A type 6AG7 vacuum tube in a series tuned "Colpitts" circuit is switched to operate on 160, 80 or 40 meters. The plate circuit is broad tuned to 20 meters when operating on 10 meters and broad tuned to 15 meters when operating on 15 meters. On all other bands the plate circuit is untuned.

BUFFER-DOUBLER- A 6AG7 vacuum tube is used to provide sufficient grid drive to the Power Amplifier on all bands. The plate circuit is broad tuned on the four higher frequency bands and untuned on the 160 and 80 meter bands.

POWER AMPLIFIER - A type 807 vacuum tube is used in a class "C" single ended circuit. Output is straight through on all bands. Under Key-up conditions the plate current of the 807 will read about 10 ma.

KEYING - All stages are keyed simultaneously to provide complete break-in operation. A form of blocked grid keying is used to provide clean, chirpless keying.



CHASSIS LAYOUT—Models 500 & 600

ALIGNMENT

The Transmaster is completely aligned at the factory before shipping. Should it be necessary to re-align it the following procedure should be followed.

OSCILLATOR - The 160, 80 and 40 meter oscillator circuits are aligned seperately. The inductance and capacitance must be trimmed to provide proper tracking at each end of the band as follows:

160 Meters - 1.75 mc. and 2 mc.
80 Meters - 3.5 mc. and 4 mc.
40 Meters - 7.0 mc. and 7.3 mc.

The best method is to set the oscillator on the high end of each band and determine whether the dial reading is higher or lower than the desired reading.
If the reading is lower more inductance and less capacity is required. If the reading is higher less inductance and more capacity is required. Turning the slug clockwise on each band provides more inductance.

BUFFER-DOUBLER - Each slug as designated on the pictorial diagram must be tuned for maximum grid current or minimum resonance Power Amplifier plate current at the center point of each band.

TYPICAL OPERATING DATA

Key Down in VFO Position and P.A. Loaded.

	Screen	Plate
Oscillator	140-150 volts	270-300 volts
Buffer-Doubler	140-150 volts	270-300 volts
Power Amplifier	170-250 volts	370-400 volts

All voltages to ground.

P.A. Current	Grid	Plate
160 Meters	3.5-5 ma.	70-100 ma.
80 Meters	3.5-5 ma.	70-100 ma.
40 Meters	4-5 ma.	70-100 ma.
20 Meters	3-4 ma.	70-100 ma.
15 Meters	3-4 ma.	70-100 ma.
10-11 Meters	2.5-3.5 ma.	70-100 ma.

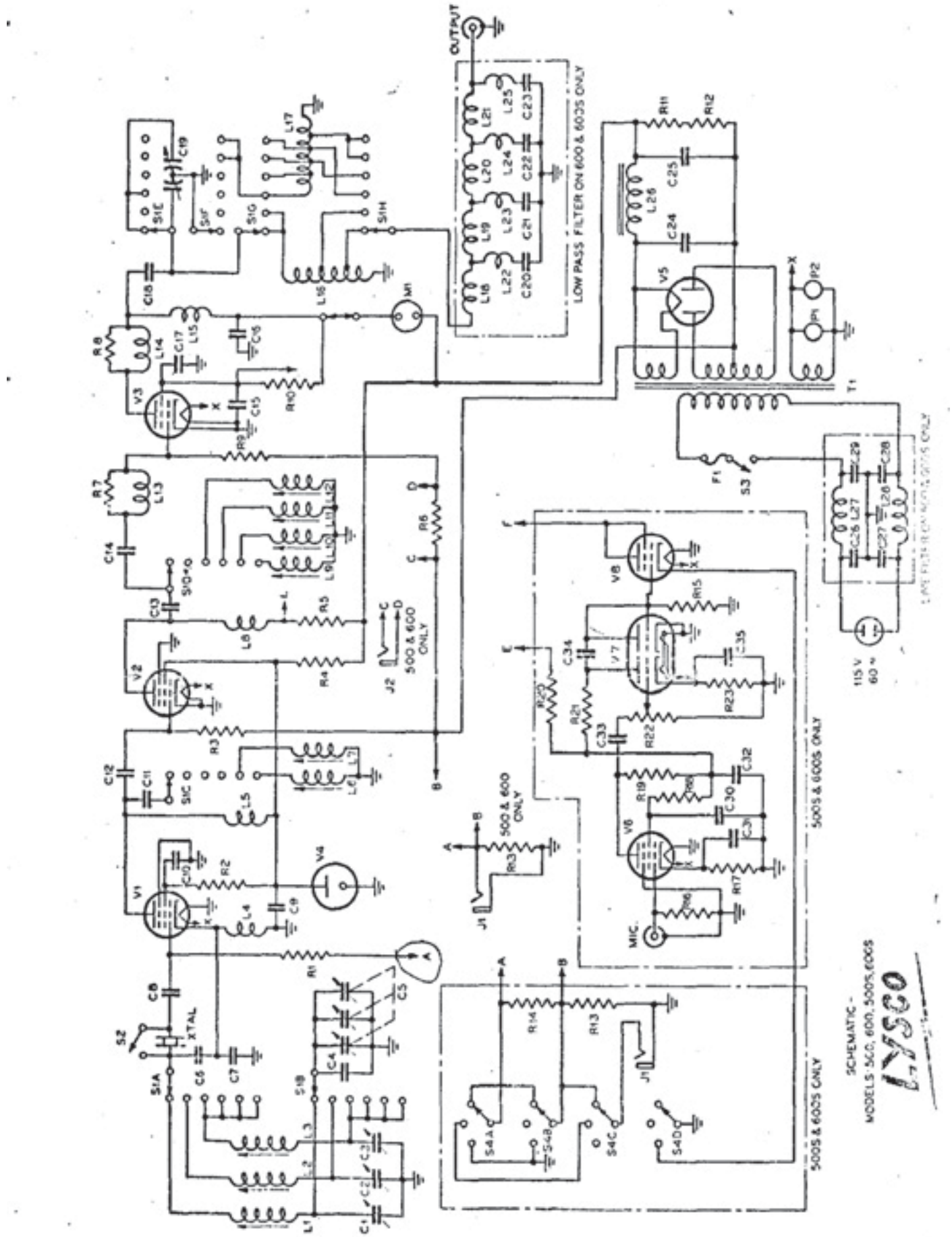
The plate current on Models 500S & 600S must be adjusted to read approximately 25 ma. higher than the above.

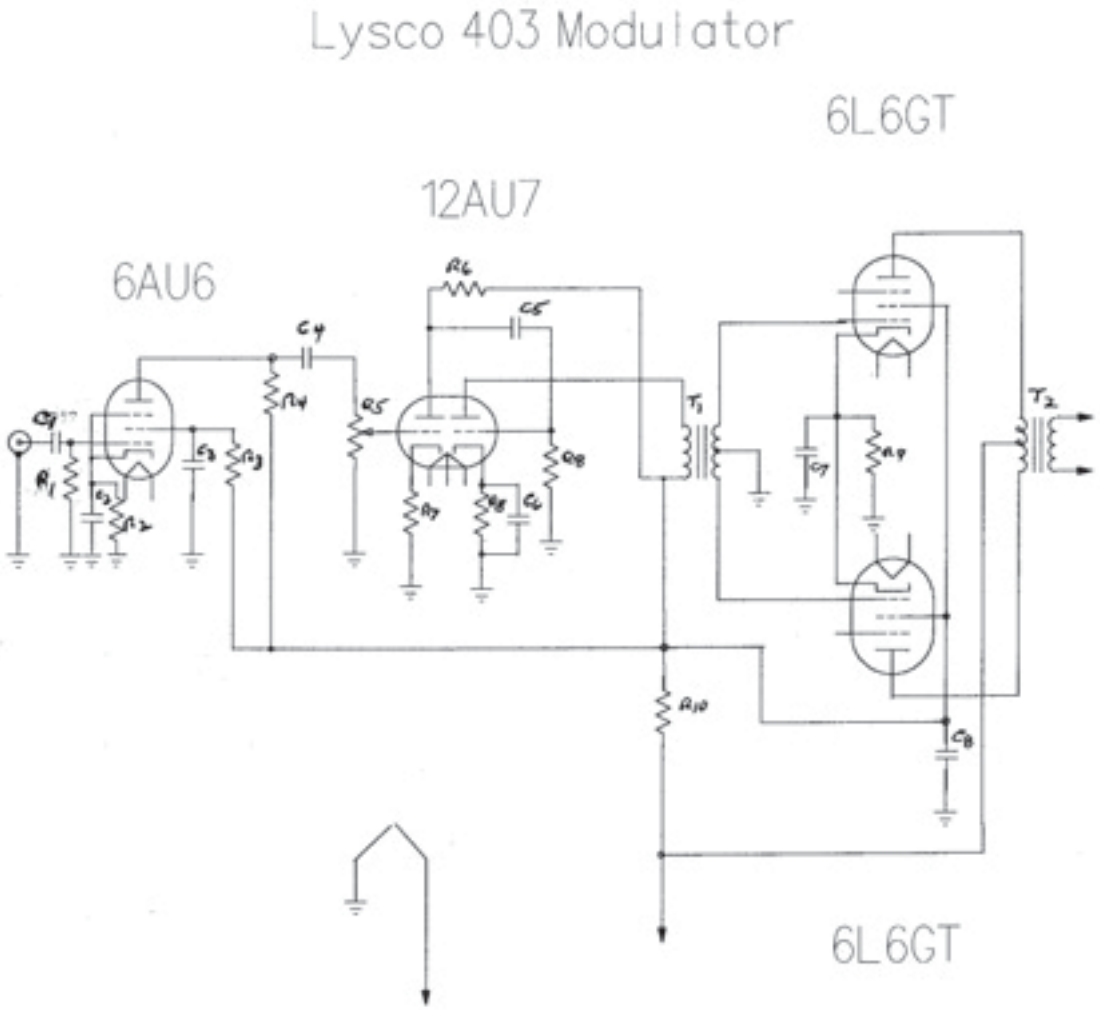
PARTS LIST

C1	160 Meter Oscillator trimmer	100 mmfd. variable Air
C2	80 " " "	100 mmfd. variable Air
C3	40 " " "	100 mmfd. variable Air
C4	Oscillator temperature compensation	24 mmfd. N750 ceramic
		LYSCO #2206
C5	Oscillator tuning	510 mmfd. mica
C6	Oscillator padding	510 mmfd. mica
C7	Oscillator padding	70 mmfd. mica
C8	Osc. grid coupling	.005 ceramic
C9	V2 screen bypass	.005 ceramic
C10	Osc. screen bypass	4700 mmfd. ceramic
C11	Osc. plate blocking	70 mmfd. mica
C12	V2 coupling	4700 mmfd. ceramic
C13	V2 plate blocking	4700 mmfd. ceramic
C14	V3 coupling	50 mmfd. feedthrough
C15	TVI Bypass	.002 mfd. mica 1200 Volt
C16	V3 plate bypass	4700 mmfd. ceramic
C17	V3 screen bypass	.002 mfd. mica
C18	V3 plate blocking	75 mmfd. per section
C19	V3 plate tuning	
C20	Part of low pass filter	
C21	" " " " "	
C22	" " " " "	
C23	" " " " "	
C24	Filter input	4 mfd. 600 Volt Oil Filled
C25	Filter output	40 mfd. 475 Volt electrolytic
C26	A. C. Line filter	.005 ceramic
C27	" " "	.005 ceramic
C28	" " "	.005 ceramic
C29	" " "	.005 ceramic
C30	V6 screen bypass	.1 mfd. 450 Volt paper
C31	V6 cathode bypass	25 mfd. 50 Volt Elec.
C32	V6 Modulator Decoupling Filter	8 mfd. 475 Volt Elec.
C33	V6 Coupling	.05 ufd. 400 V paper
C34	V7 Coupling	.05 mfd. 400 V. paper
C35	V7 Cathode bypass	25 mfd. 50 Volt Elec.

L1	160 Meter Osc. Grid Coil	Lysco #2214
L2	80 Meter Osc. Grid Coil	Lysco #2215
L3	40 Meter Osc. Grid Coil	Lysco #2216
L4	Osc. Cathode Choke	400 uh. Lysco #2217
L5	Osc. Plate choke	2.5 mh.
L6	10 Meter Osc. plate coil	Lysco #2209
L7	15 Meter Osc. plate coil	Lysco #2210
L8	V2 Plate choke	2.5 mh.
L9	10 Meter Buffer-Doubler plate coil	Lysco #2213
L10	15 Meter Buffer-Doubler plate coil	Lysco #2210
L11	20 Meter Buffer-Doubler plate coil	Lysco #2209
L12	40 Meter Buffer-Doubler plate coil	Lysco #2212
L13	Parasitic suppressor	
L14	Parasitic suppressor	
L15	V3 Plate choke	2.5 mh.
L16	Low Frequency V3 plate coil	B & W #3016
L17	High Frequency V3 plate coil	B & W #3014
L18	Part of Low pass filter	
L19	"	
L20	"	
L21	"	
L22	"	
L23	"	
L24	"	
L25	"	
L26	Filter choke	8 henry 145 ohms #20C54
L27	A. C. Line Filter	
L28	A. C. Line Filter	
R1	Osc. grid leak	Fixed 47,000 Ohms ½ W
R2	Osc. screen dropping	Fixed 10,000 Ohm 2 W
R3	Buffer-Dblr grid leak	Fixed 10,000 Ohm 1 W
R4	V4 dropping	Fixed 6,000 Ohm 10 W
R5	V2 plate dropping	Fixed 2,000 Ohm 25 W
R6	V3 grid meter	Fixed 18 Ohm 1 W
R7	Form for L13	Fixed 18 Ohm 1 W
R8	Form for L14	Fixed 18 Ohm 1 W
R9	V3 grid	Fixed 10,000 Ohm 2 W
R10	V3 screen	Fixed 12,000 Ohm 5 W
R11	Bleeder	Fixed 68,000 Ohm 2 W
R12	Bleeder	Fixed 68,000 Ohm 2 W
R13	Keying bias	Fixed 1,250 Ohm 5 W
R14	Osc. keying bias	Fixed 47,000 Ohm ½ W
R15	V8 grid leak	Fixed 1 megohm ½ W

R16	V6 grid leak	Fixed 1 megohm ½ W
R17	V6 Cathode bias	Fixed 3,000 Ohm ½ W
R18	V6 screen dropping	Fixed 1 megohm ½ W
R19	V6 plate load	Fixed 180,000 Ohm ½ W
R20	Decoupling	Fixed 1,000 Ohm ½ W
R21	V7 plate load	Fixed 100,000 Ohm ½ Watt
R22	Audio gain	Variable 500,000 Ohm Carbon
R23	V7 Cathode bias	Fixed 1,500 Ohm ½ W
F1	Line fuse	
J1	Keying	Single Circuit
J2	Meter	Single Circuit
M1	V3 plate & screen	0-150 ma.
P1	Pilot light	6.3 Volt .150 Amp. #47
P2	Pilot light	6.3 Volt .150 Amp. #47
T1	Plate transformer	400-0-400 .200 Amps. 6.3 Volts-5 Amps. 5 Volts-3 Amps.
V1	Oscillator	6AG7
V2	Buffer-Doubler	6AG7
V3	Power Amplifier	807
V4	Voltage regulator	OD3
V5	Rectifier	5U4G
V6	Speech Amplifier	6SJ7
V7	Speech Amplifier-Audio rectifier	6SN7GT
V8	Clamp Modulator	6V6GT
S1	Band switch	Lysco #1266L
S2	Crystal - VFO	SPST
S3	ON-OFF	SPST
S4	Keying selector	4 circuit 3 position #3243





Lysco 403 Modulator Parts List

C1---------- .0047
C2---------- 25ufd 25v
C3---------- .05
C4---------- .01
C5---------- .01
C6---------- 25ufd 25v
C7---------- 25ufd 25v
C8---------- 8ufd 450v

R1---------- 1 meg 1/2w
R2---------- 510 1/2w
R3---------- 1 meg 1/2w
R4---------- 220k 1/2w
R5---------- 1 meg pot
R6---------- 100k 1/2w
R7---------- 1k 1/2w
R8---------- 470k 1/2w
R9---------- 240 5w
R10---------- 2k 10w

T1---------- Interstage Transformer
T2---------- Modulation Transformer

K4XL's BAMA

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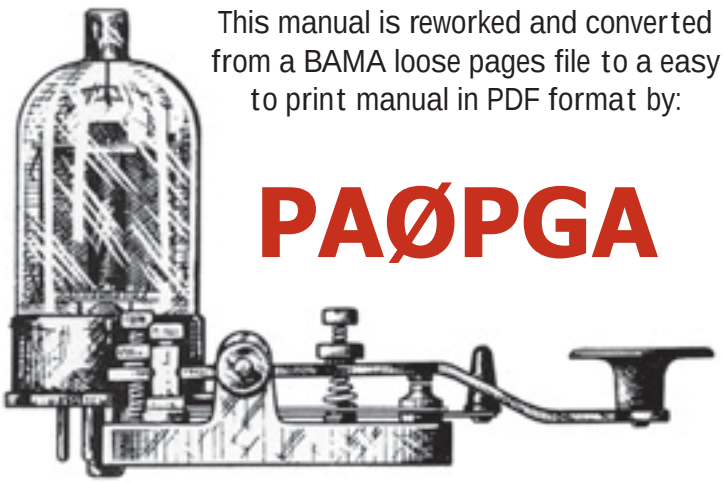

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