

EXTRACTS FROM MANUFACTURERS' BULLETINS

CONTACTOR

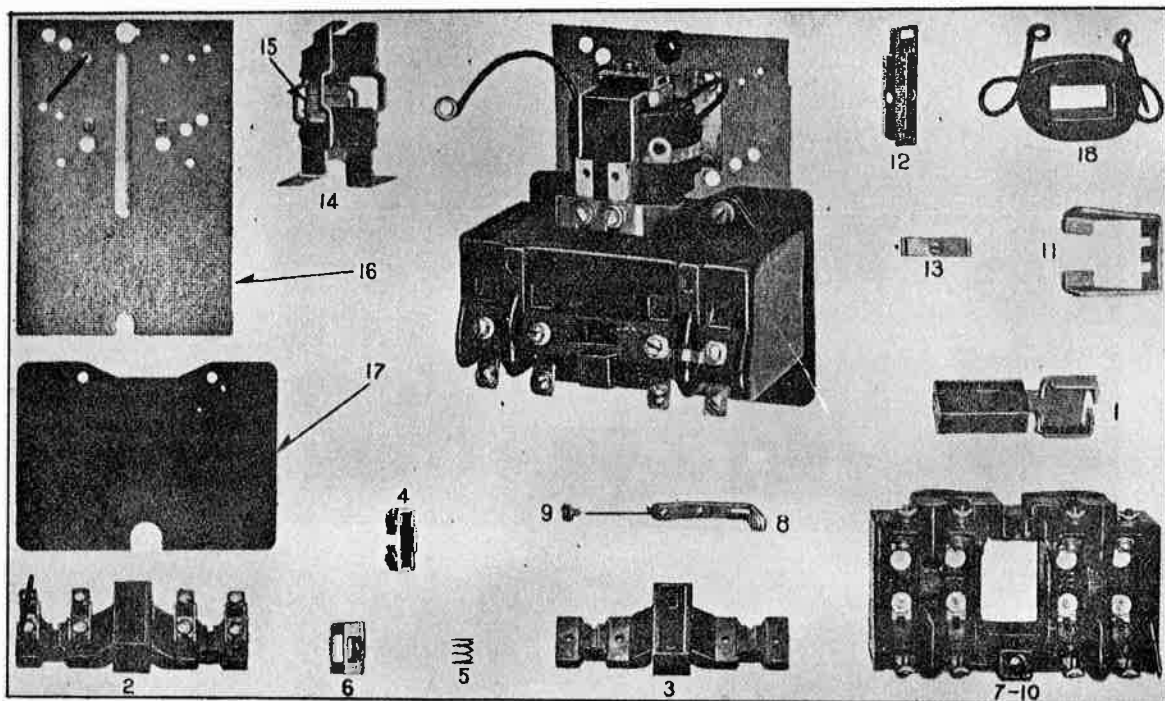
(K410)

Maintenance

The contactor will require little attention. However, it should be inspected periodically to see that no impairment of electrical or mechanical functioning occurs. Accumulations of dust may be removed with a dry cloth or a compressed air jet. Avoid oily cloths, as an oil film quickly attracts dust. The magnet armature should be removed at intervals and accumulations of smudge on it and its guides removed with benzine or a similar solvent.

Ref.	Description of Part
1	Armature Core
2	Cross Bar Complete
3	Cross Bar Only
4	Moving Contact
5	Contact Spring
6	Moving Contact Support

Ref.	Description of Part
7	Arc Box with Stationary Contact
8	Stationary Contact
9	Washer Head Screw
10	Arc Box Only
11	Armature Core Stop
12	Armature Core Guide
13	Holder for Core Guide
14	Stationary Core
15	Shading Coil
16	Mounting Base
16	Mounting Base
17	Base Insulation
×	Terminal Block Single } on
×	Terminal Block Double } Magnet
×	Terminal Block on Arc Box
18	Operating Coil



CONTACTORS

(K411, K417, K428, K433)

Maintenance

Two screws hold the magnet assembly to the base. The entire magnet and coil assembly may be removed by taking out the holding screws at the top of the magnet and removal of the two screws which attach the moving armature to the cross bar. The entire magnet assembly may then be lifted out.

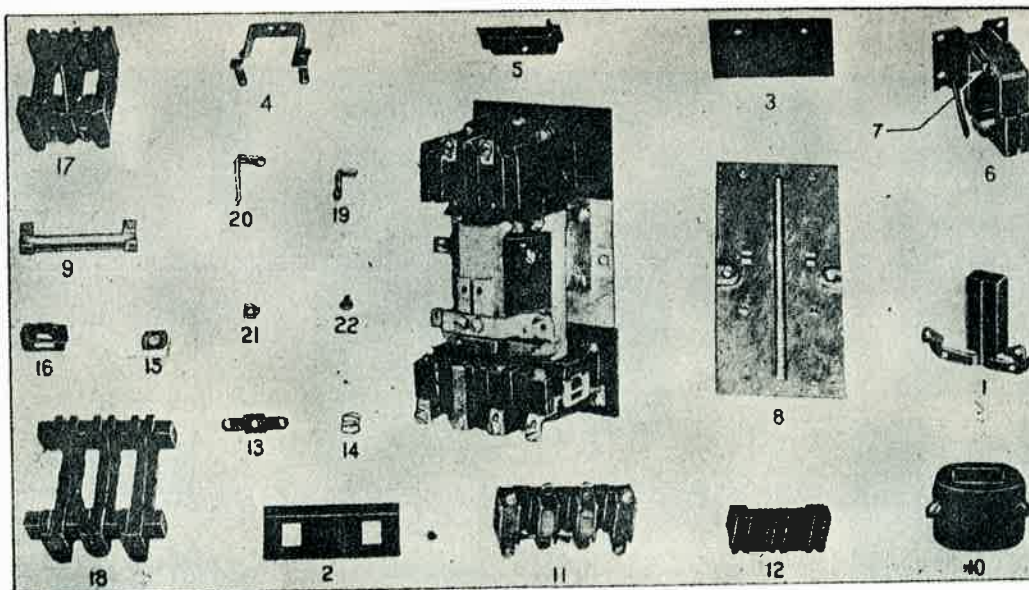
The stationary contacts are held on with mounting screws. The stationary contacts may be removed by taking out the mounting screws. The contacts may thus be renewed, or any pole changed from make to break, or vice versa, by changing the stationary contacts and turning over the moving contacts. A different contact spring is required when changing from make to break, or vice versa, and a spring retainer is required when the moving contact is assembled with the contact button facing up, on an assembly below the magnet and vice versa on an assembly above the magnet.

The moving contact may be removed from the contact support saddle by tilting to approximately a 60° angle, depressing it fully against the spring, and tilting side-wise until the projecting ear clears the saddle on the inside. This may be done without removal of the cross bar. In case it is desired to remove the cross bar, it may be done by removal of the two screws which attach the moving armature to the cross bar, removal of the two

arc box mounting screws, and removal of such long stationary contacts as are on the front side only.

The moving armature should run free and loose in the magnet guides. In case there is any binding or friction from dirt collection or otherwise, the armature should be cleaned and freed. The contacts should not require any filing or dressing, as they are made of silver, and even though they become blackened, they still give good contact. The only attention that should be necessary is replacement of the contacts after they have worn down to somewhat less than one-third of their original thickness.

Ref. No.	Description of Part
1	Armature Core
2	Cross Bar Insulation
3	Stationary Contact Support Insulation
4	Armature Core Stops
5	Armature Core Guide
6	Stationary Core
7	Shading Coil
8	Mounting Base
8	Mounting Base
9	Cross Bar Link
10	Operating Coil



CONTACTORS

(K418, K434)

Maintenance

The contactor should be inspected frequently to see that no impairment of electrical or mechanical functioning occurs in service. Accumulations of dust may be removed with a dry cloth or a compressed air jet. Except only when cleaning the magnet sealing surfaces avoid oily cloths, as an oil film quickly attracts dust.

Bearings—Bearing pins are of wear-resistant nitrided alloy steel. They should not be lubricated as oil collects dust, hindering free operation of the contactor.

Magnet—The surfaces should be cleaned occasionally with a cloth moistened with a light oil to remove deposits of dirt and prevent rusting.

The magnet armature and the bracket supporting it may be easily removed as a unit by removing the two screws securing the bracket to the cross bar.

Contacts—The contact tips should not be lubricated, as the slight wear of dry contacts produces a self-cleaning action. Should excessive roughening or burning occur the tips may be dressed with a fine file. Do not use emery cloth, as abrasive granules left imbedded in the contact surfaces may raise the contact resistance and produce a tendency of the contacts to weld.

Chiefly for reasons of mechanical strength it is advisable to replace the contact tips before they have become worn to one-third their original thickness.

Correct contact pressures should be maintained as follows:

Initial pressure—1 lb. 2 oz.

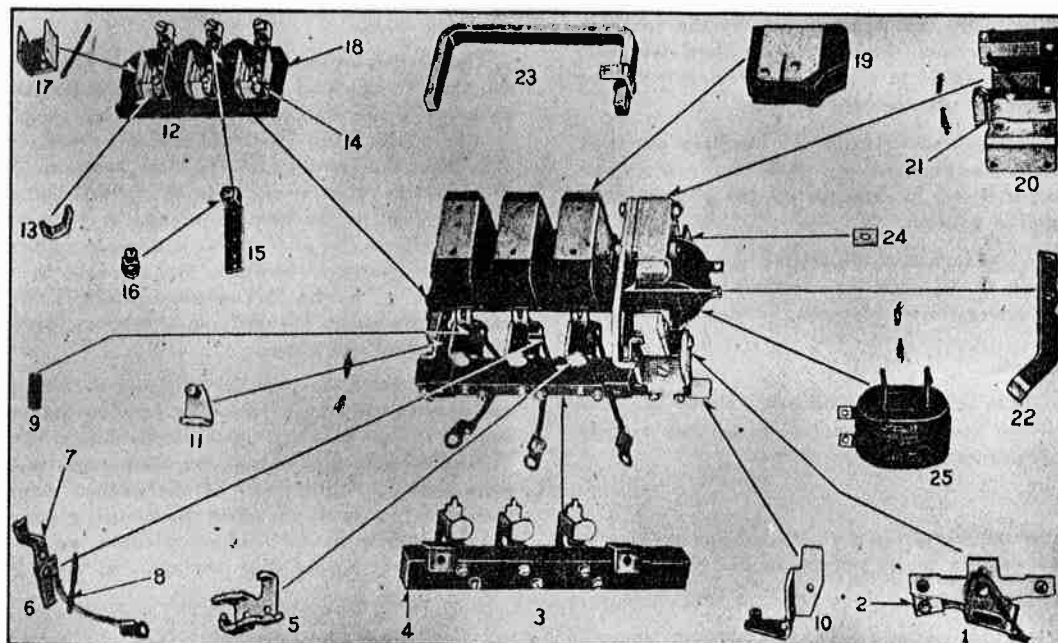
Final pressure—2 lb. 14 oz.

The contact gap, measured at the heels of the contacts in their fully-open position, is 7/16 inch.

Operating Coil—To remove the coil, first remove the armature by taking out the two bolts securing its supporting bracket to the cross bar. Then loosen the bolt which holds the coil to the magnet and separate the rectangular washers until it is possible to lower the coil entirely free of the magnet.

De-ion Arc Quenchers—To remove a De-ion arc quencher, grasp it at its lower end and swing it upward, striking its lower corner upward with the palm of the hand to overcome any initial resistance to movement. The arc quencher is then free to be lifted entirely clear of the contactor.

Ref. No.	Description of Part
1	Armature Iron with Mounting Bracket
2	Non-Magnetic Shim
3	Cross Bar with Moving Contact Bracket
4	Cross Bar
5	Moving Contact Bracket
6	Moving Contact with Shunt
7	Moving Contact
8	Shunt
9	Contact Spring
10	Bearing Bracket—Magnet End
11	Bearing Bracket—Left Hand End
12	Stationary Contact Base Complete
12	Stationary Contact Base Complete
13	Stationary Contact
14	Stationary Con. Screw, 190"-32 x 3/8"
	Fil. Hd. I. M. Sc.
15	Stationary Contact Connector
16	Connection Lug—Solderless
	Stationary Contact Spacer
17	Arc Quencher Support
18	Base
	Barrier
19	Arc Quencher
	Shunt Stud
20	Stationary Core
21	Shading Coil
22	Stop
23	Frame
24	Coil Retaining Washer
25	Operating Coil



PNEUMATIC TIME DELAY RELAYS

(K412, K419, K421, K424, K425, K428, K429, K435, K437, K440, K441)

The AGASTAT is an electro-pneumatic time delay switching device—a reliable and efficient instrument for introducing a time delay into electrical circuits.

A time delay ranging from .1 second to 5 or more minutes may be obtained. Adjustment is secured simply by turning the adjusting screw.

In the type 1 AGASTAT this delay starts when the control circuit is closed; in the type 2 it starts when the control circuit is opened.

The AGASTAT is constructed with few moving parts and is small, compact and easily mounted. It consists principally of a pneumatic timing head, a solenoid assembly, a switch and terminals.

A special diaphragm and cap encase the head, providing an enclosed, dustproof timing chamber in which the air used for timing is recirculated.

Coils for 110 or 220 volt 60 cycle alternating current service consume approximately 6 watts.

AGASTAT is made in two basic types:

Type 1—Time delay starts when coil is energized.

Type 2—Time delay starts when coil is de-energized.
The type 1 AGASTAT functions as follows:

When the control circuit is energized, solenoid action takes place, starting the time delay. At the expiration of the delay interval a switch transfer occurs, breaking one set of contacts and making another. (See contact arrangements.)

The switch remains in this transferred position until the control circuit is de-energized, at which time an instantaneous switch transfer takes place, restoring the contacts to their original positions.

The type 2 AGASTAT functions as follows:

When the control circuit is energized, solenoid action causes an instantaneous switch transfer, breaking one set of contacts and making another. (See contact arrangements.)

The switch remains in this transferred position as long as the control circuit is energized. When the control circuit is de-energized, the time delay starts. At the expiration of this delay interval a switch transfer takes place, restoring the contacts to their original position.

OVERCURRENT RELAYS

(K414, K415, K416, K420, K426, K427, K430, K431, K432, K436, K442, K443)

OPERATION AND MAINTENANCE

In all forms, the moving contacts are operated directly by the plunger assembly.

On forms with mechanical target, the target is lifted by a cross-pin through the plunger rod. On forms with electrical target the target has no mechanical relation with the plunger assembly, but is lifted only by the auxiliary armature. In either form, the target when lifted rises from behind the target shield to a position where it is visible; it latches there and must be reset by hand.

Electric holding is provided by the auxiliary armature holding up the plunger assembly when the auxiliary coil is energized; it is not intended to lift the plunger from the de-energized position.

Hand-reset contact action is provided by connecting the plunger directly to the target lever, so that the target lever holds up the plunger assembly until the target is reset.

Care of Contacts

If the contacts require cleaning use a clean, fine, thin file. Do not use crocus or emery cloth as they tend to embed insulating particles in the surface.

Setting

Any desired setting within the calibrating range may be obtained by turning the armature on the plunger rod.

The armature is provided with an internal locking spring which requires no manipulation.

Adjustments

The relay has been adjusted at the factory, but if a check shows that the adjustments have subsequently been disturbed, the following points should be observed in restoring them.

The normal adjustment of contacts is 3/64 inch wipe; this may be adjusted by bending the contact stops that lie between the stationary contact springs and the ribs on the molded base. The bend should be made about 1/4 inch from the front tip of the stop, so as to obtain an exact setting more easily than it could be obtained by bending next to the base. A change in wipe on a "b" contact affects the pick-up for a given armature setting in the de-energized position. An increase in wipe on either the "a" or the "b" contacts decreases the contact gap and decreases the difference between pick-up and drop-out, and vice versa.

The contact pressure in the fully picked-up or dropped-out position may be adjusted by bending the stationary contact springs near their point of attachment to the base. This adjustment may change the contact gap and contact wipe slightly. Adjustments of the contact stops within the normal range do not affect the contact pressure in the fully picked-up or dropped-out position, as the contact springs are separated from the stops in these positions.

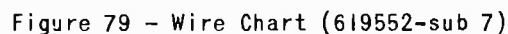


Figure 81 - Schematic Diagram, Control Console (619545-sub 3)



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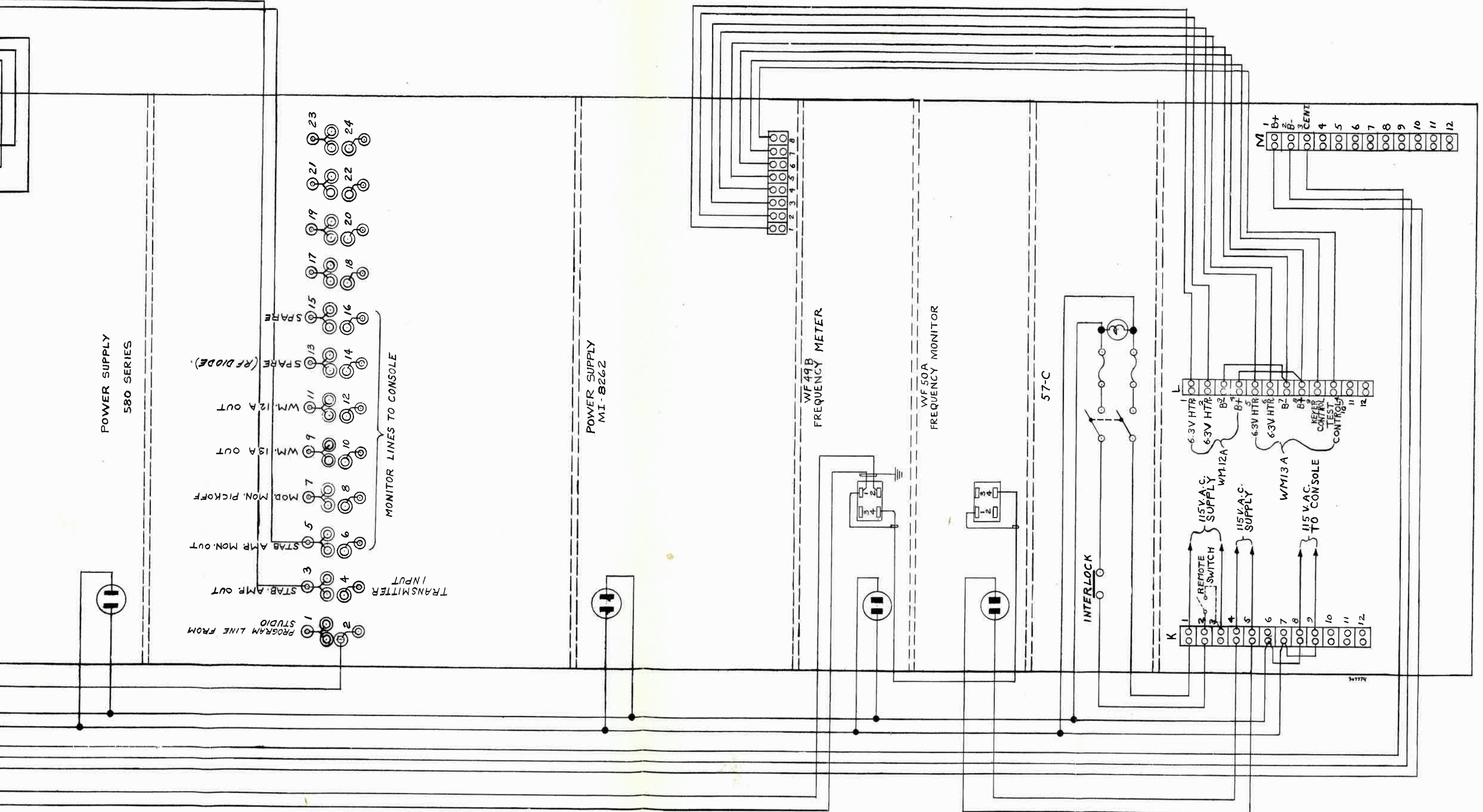
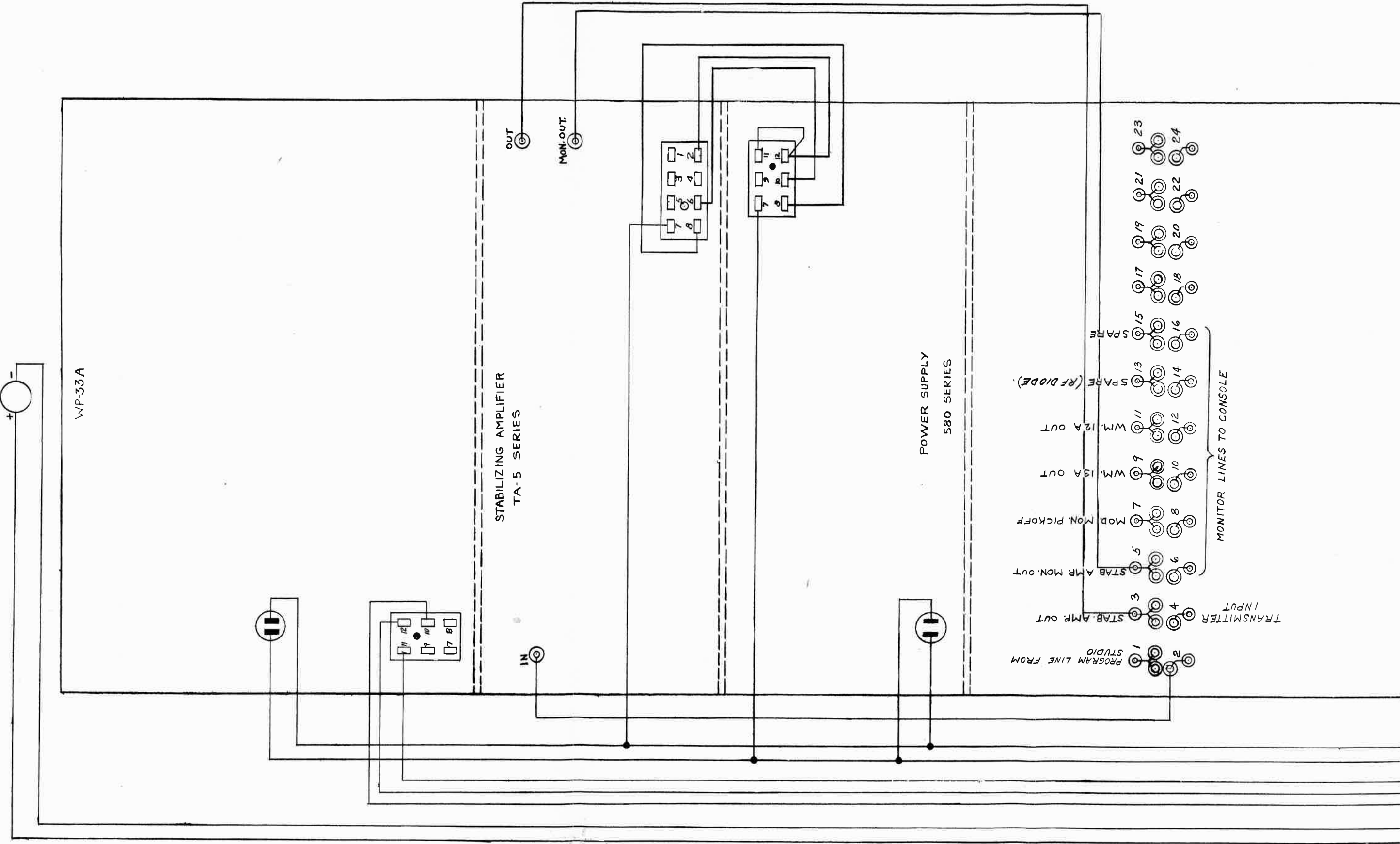


Figure 85 - Schematic Diagram.
Visual Monitor Rack (307774-sub 5) 213,214

A.M. CARRIER DEVIATION METER



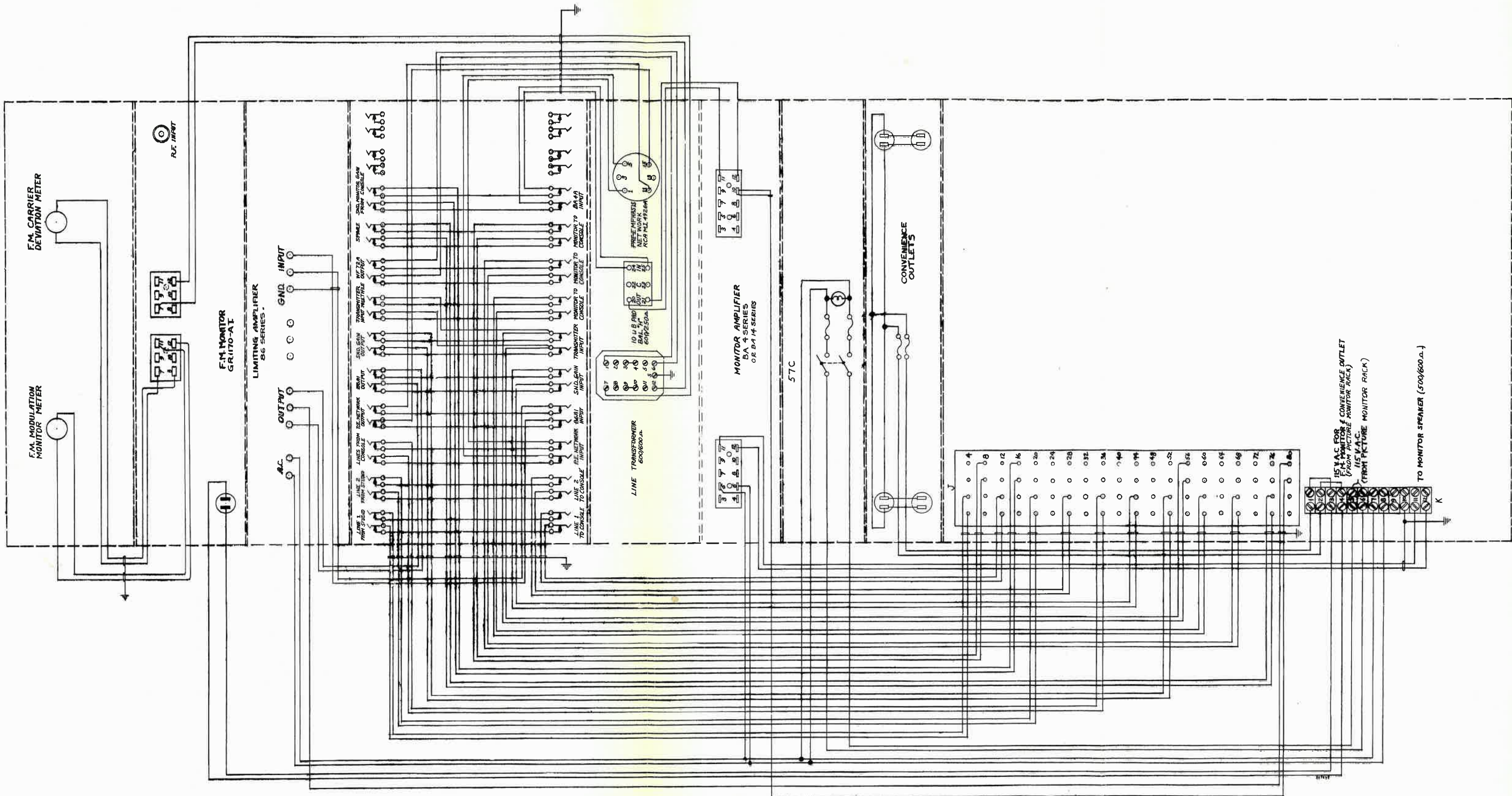


Figure 86 - Schematic Diagram,
Aural Monitor Rack (307629-sub 6)

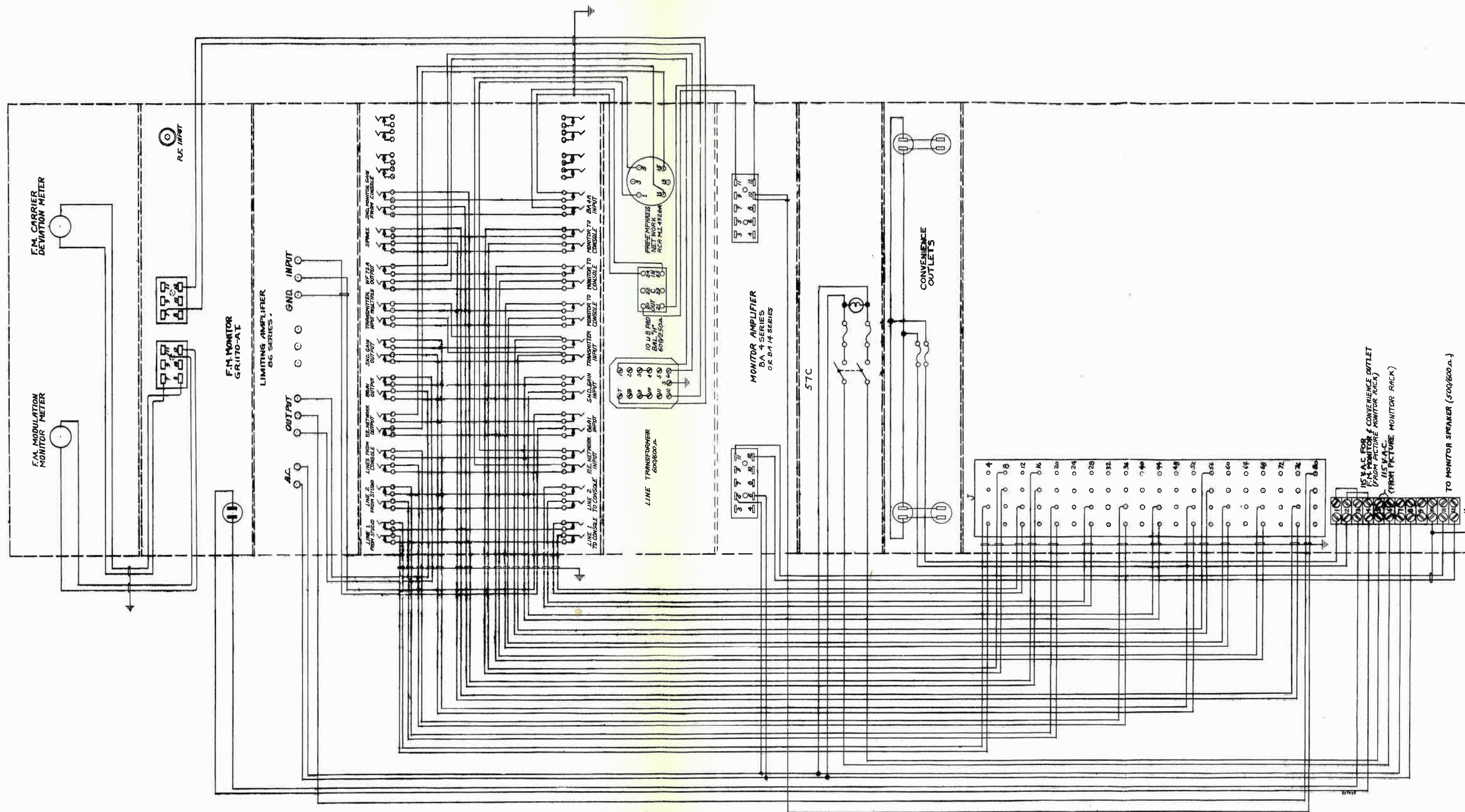


Figure 86 - Schematic Diagram,
Aural Monitor Rack (307629-sub 6)

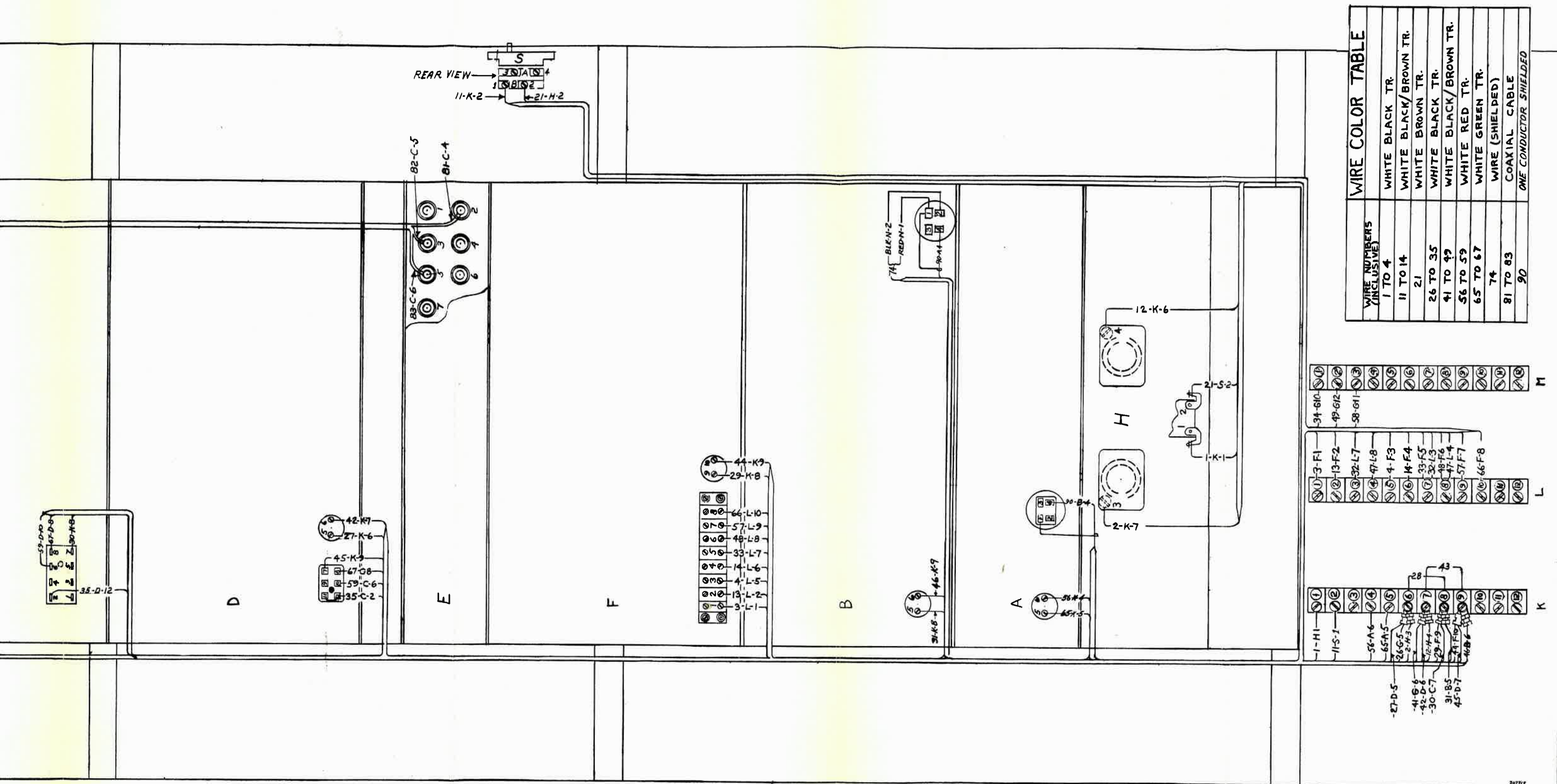
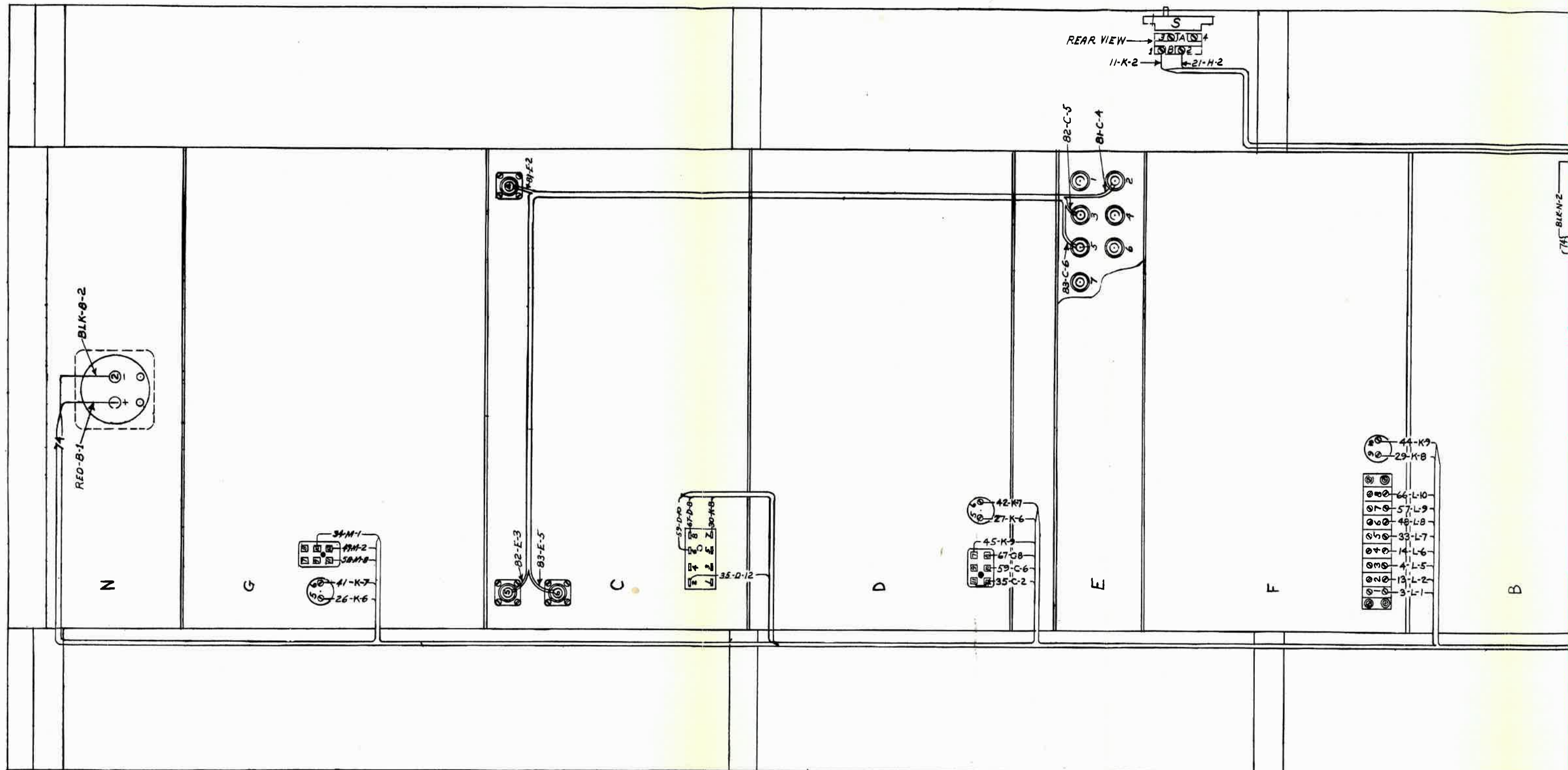
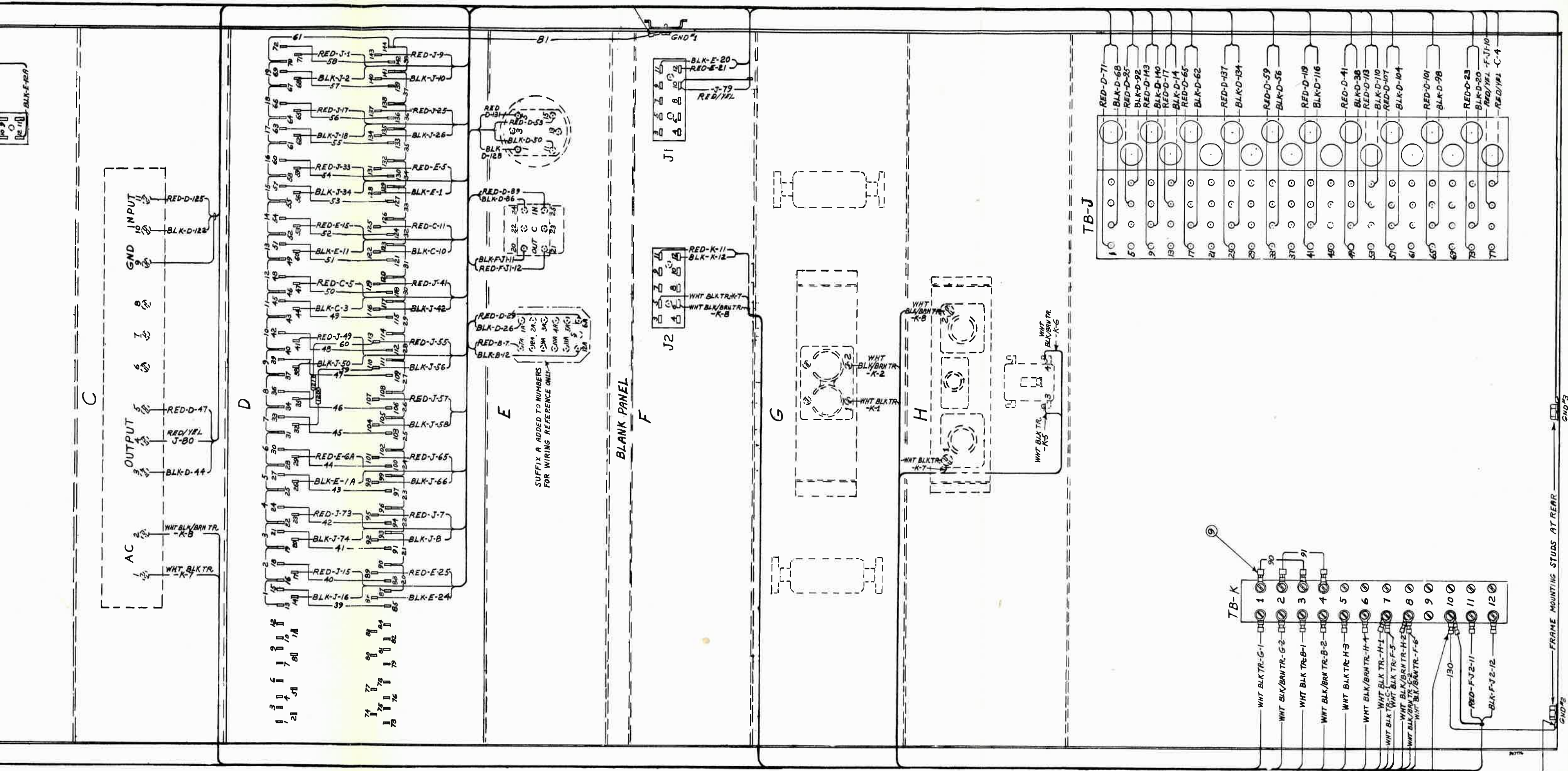


Figure 87 - Connection Diagram,
Visual Monitor Rack (307719-sub 5)





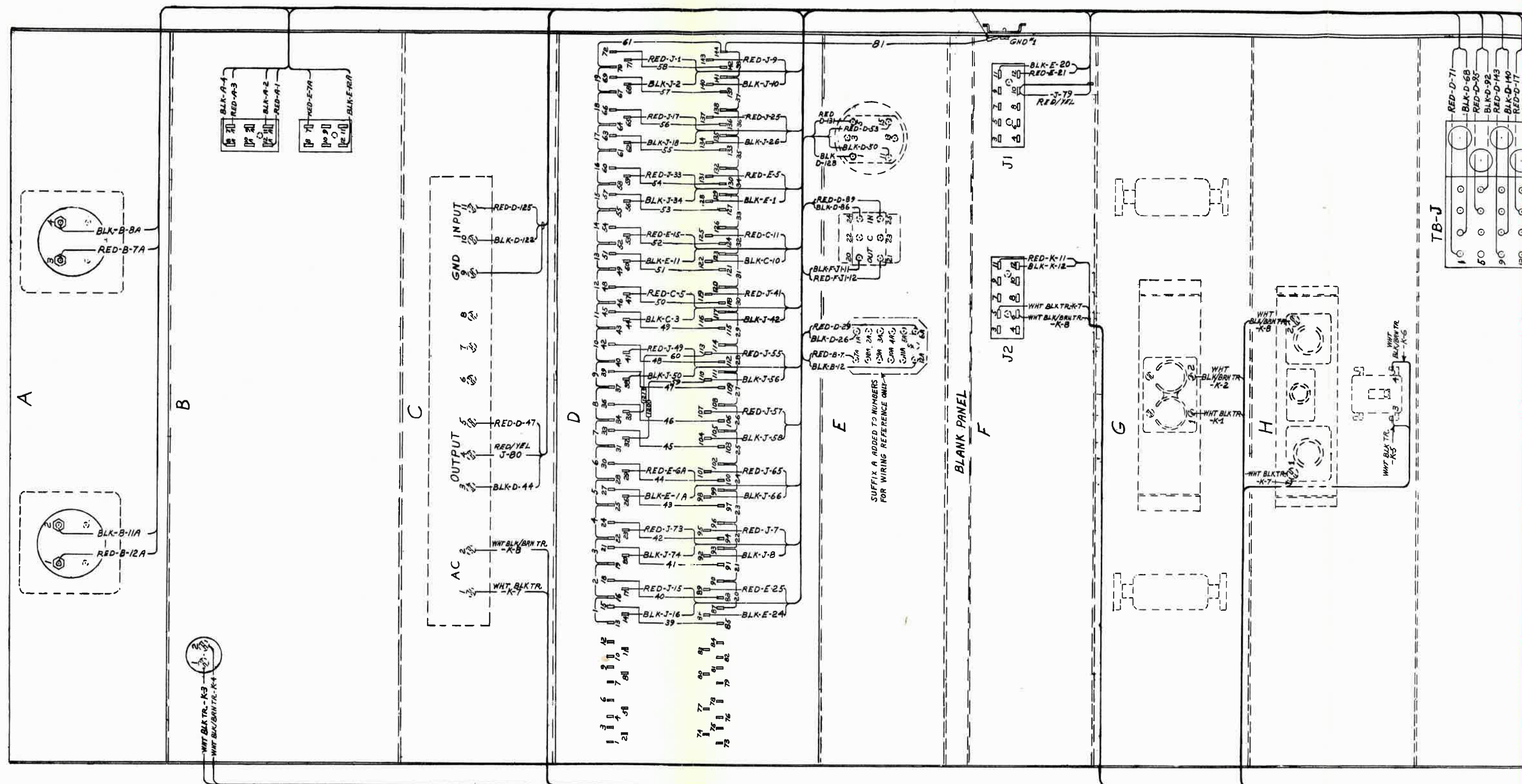
NOTES

NUMBERS IN WIRES REFER TO WIRE TABLE AND WIRE DESTINATION RESPECTIVELY.

CONNECTION TO UNITS SHOW IN DOTTED OUTLINE WILL BE MADE BY PURCHASER.

PART NO. THIS DWG.	DESCRIPTION	WIRE NO. INCLUSIVE
4	PS-663-32 WHT BLK TR. 19/0092	81
5	PS-145 TINNED COPPER WIRE .01210	1 TO 61
6	PS-10 BLACK TUBING .01210	120, 121
11	PS-663-33 WHT BLK TR. 37/0113	90 TO 91
12	TINNED COPPER BRAID 3/16 WIDE	130

Figure 88 - Connection Diagram,
Aural Monitor Rack (307776-sub 5)

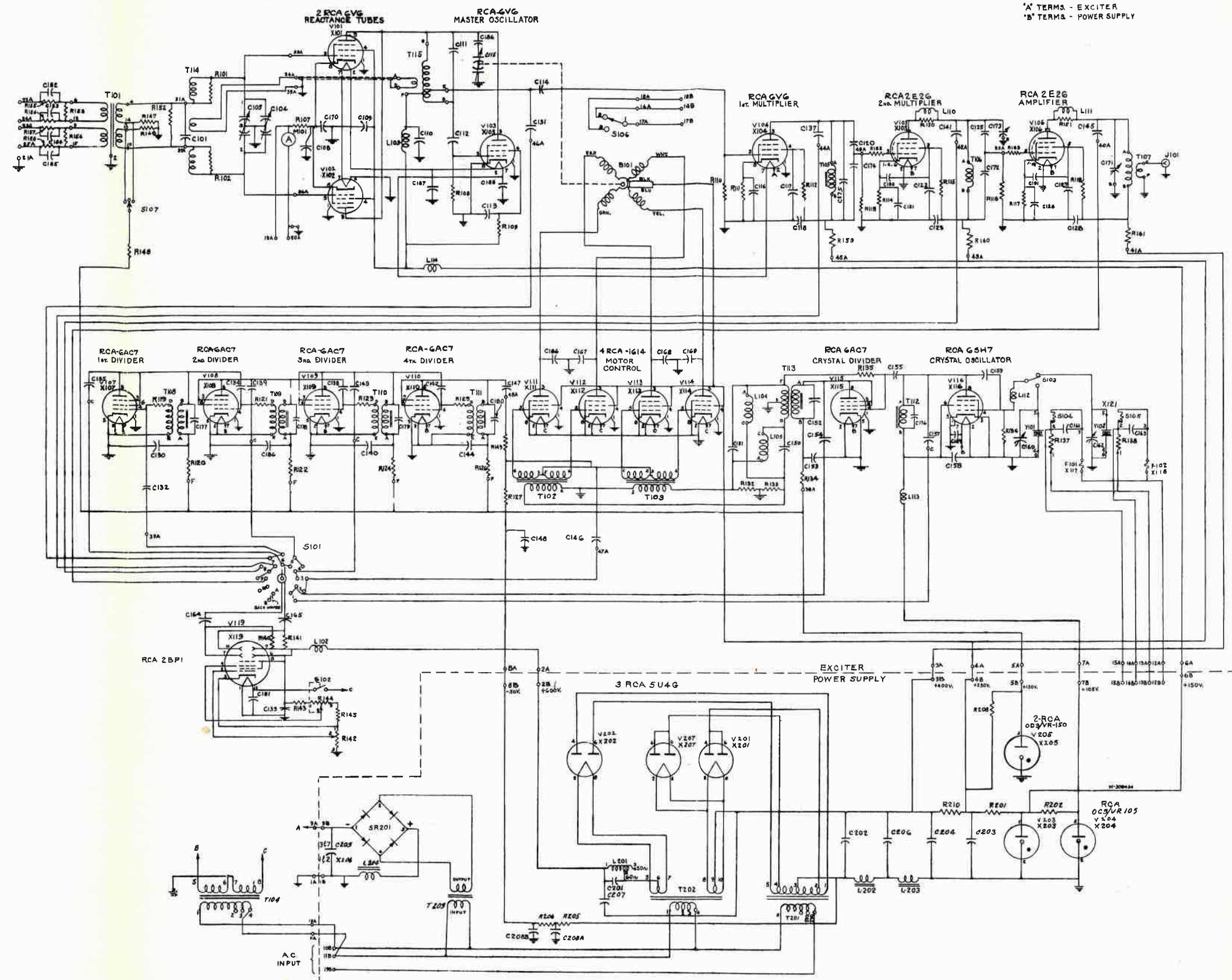


NOTES

NUMBERS IN WIRES REFER TO WIRE TABLE AND WIRE DESTINATION RESPECTIVELY.

CONNECTION TO UNITS SHOWN IN DOTTED OUTLINE WILL BE MADE BY PURCHASER.

WIRE TABLE		
PART NO. THIS DWG.	DESCRIPTION	WIRE INCLUSI
4	RS-663-B3 WHT BLK TR. 19/0092	81
5	RS-105 FINNED COPPER WIRE .030	1 TO
6	RS-50 BLACK TUBING .04210	120, 12
11	RS-663-B3 WHT BLK TR. 37/0113	90 TO 9
12	TINNED COPPER BRAID 3/8 WIDE	130



'A' TERMS - EXCITER
'B' TERMS - POWER SUPPLY

Figure 89 - Schematic Diagram, Exciter and
Exciter Power Supply - Aural (308424-sub 21)

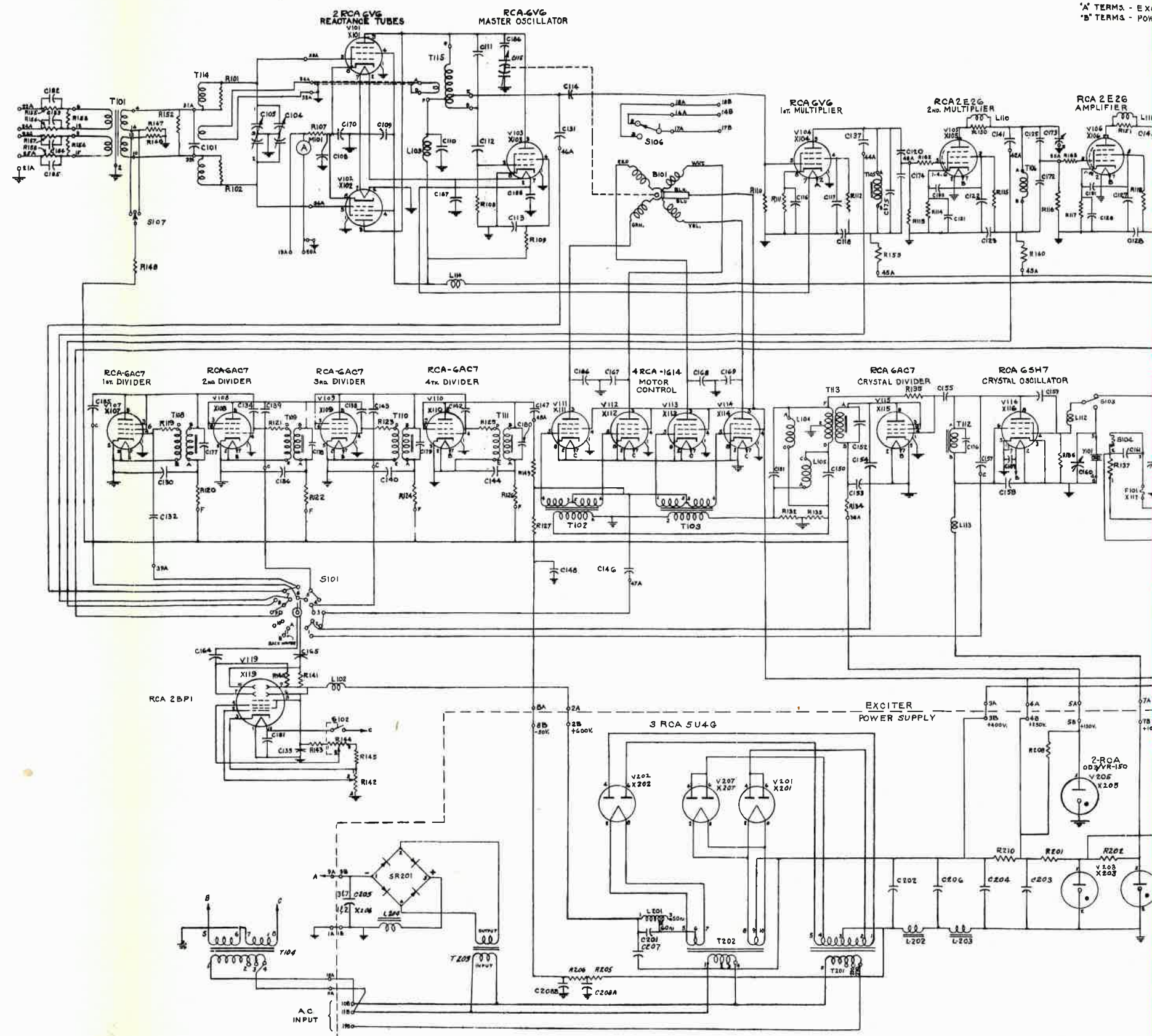
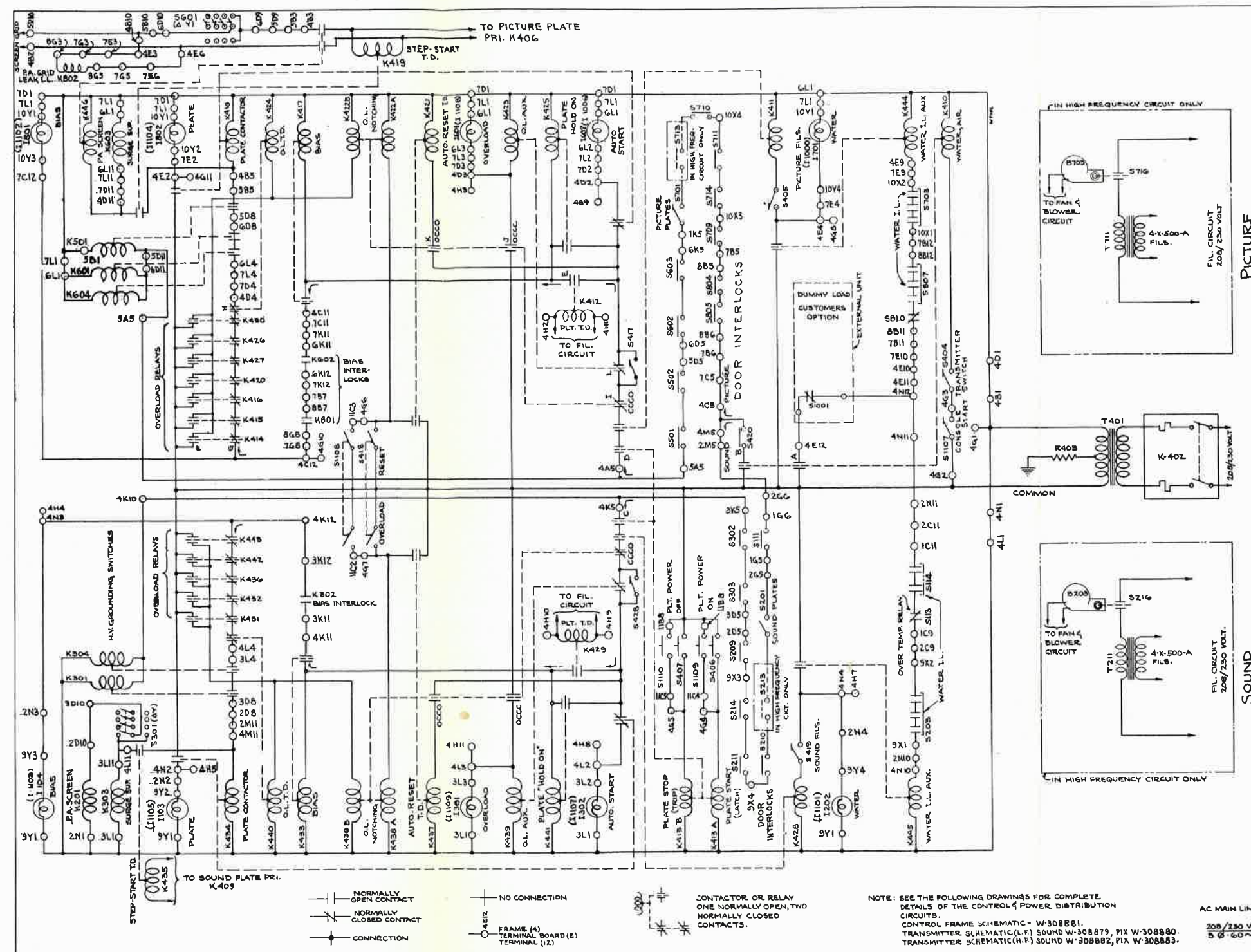
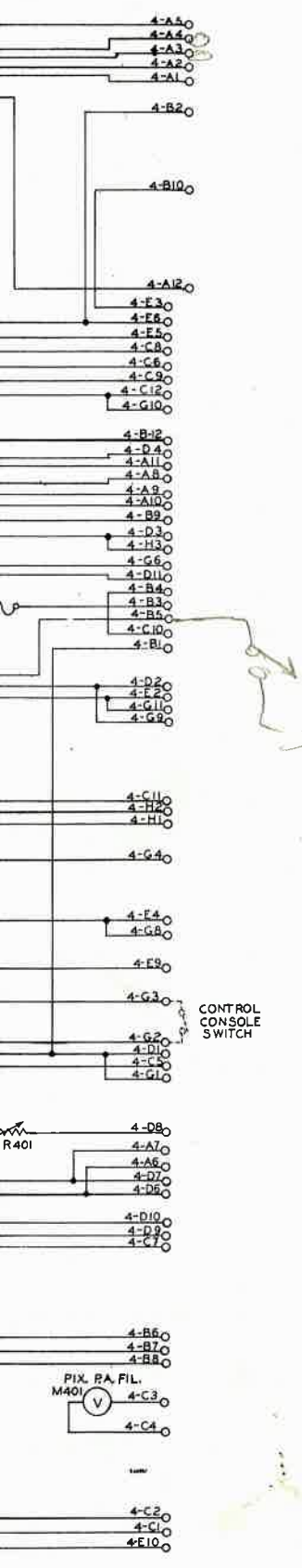
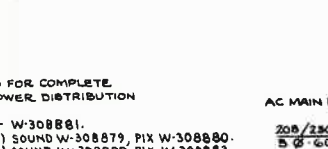
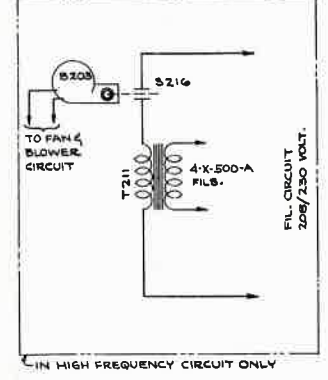
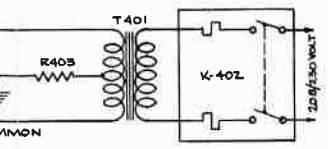
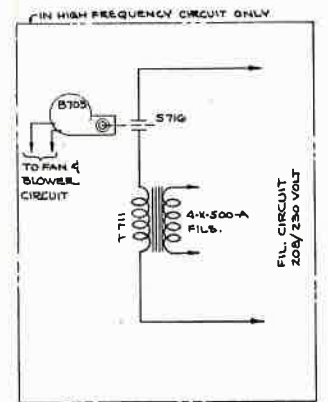


Figure 89 - Schematic Diagram, Exciter and
Exciter Power Supply - Aural (308424-sub

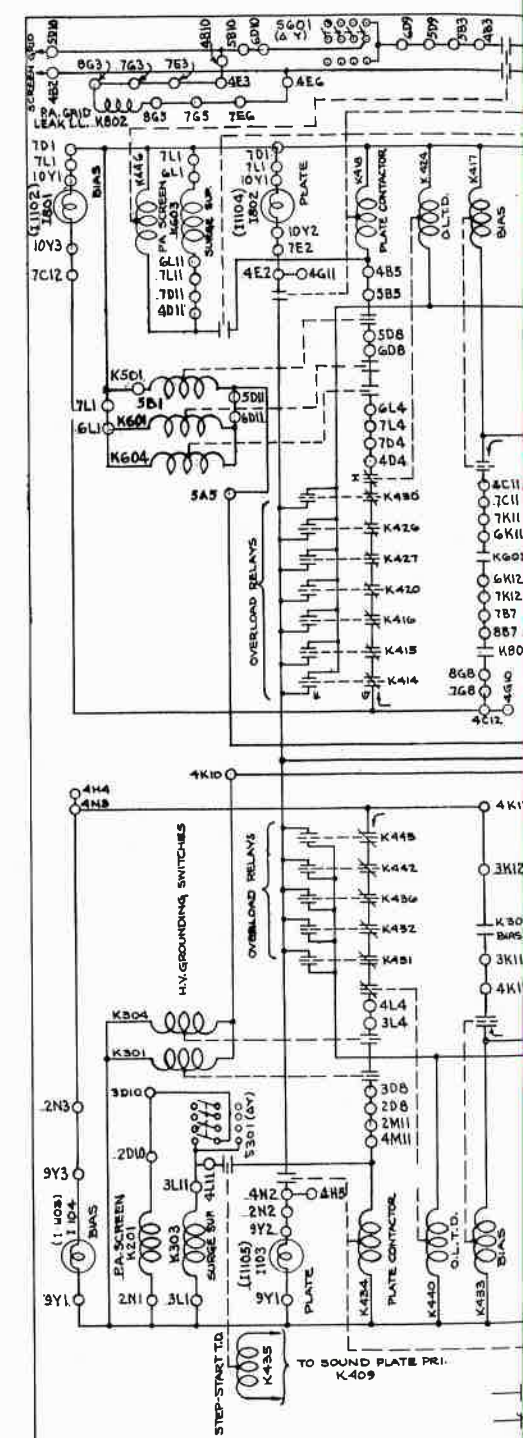
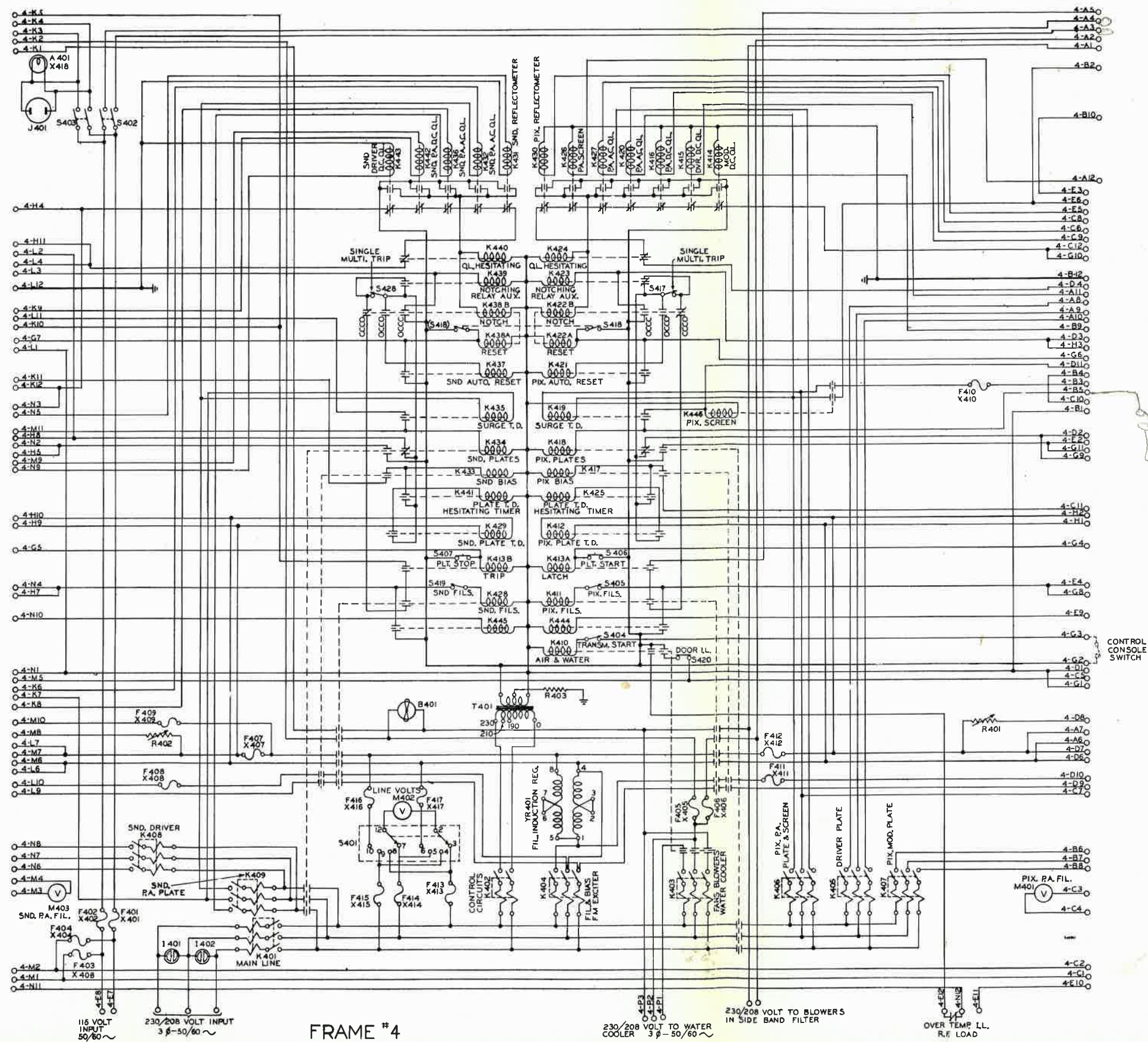


SYMBOL		NAME & FUNCTION
K 601	K 801	DRIVER H.V. GROUNDING SWITCH
K 602	K 802	BIAS INTERLOCK
K 603	K 803	BIAS RELAY
K 604	K 804	RA. H.V. GROUNDING SWITCH
K 410	K 410	AIR & WATER CONTACTOR
K 411	K 411	FILAMENT, FANS, BLOWER CONTACTOR
K 412	K 412	PLATE TIME DELAY RELAY
K 413	K 413	PLATE START-STOP CONTACTOR
K 414	K 414	OVERLOAD RELAY - MODULATOR
K 415	K 415	OVERLOAD RELAY - DRIVER
K 416	K 416	OVERLOAD RELAY - PA. PLATE (DC)
K 417	K 417	BIAS CONTACTOR
K 418	K 418	PLATE CONTACTOR
K 419	K 419	SURGE T.D. RELAY
K 420	K 420	OVERLOAD RELAY PA. PLATE PRI. (AC)
K 421	K 421	AUTOMATIC OVERLOAD RESET T.D. RELAY
K 422	K 422	OVERLOAD NOTCH RELAY
K 423	K 423	NOTCH RELAY AUXILIARY CONTACTOR
K 424	K 424	OVERLOAD HESITATING T.D. RELAY
K 425	K 425	POWER INTERRUPTION HOLD-ON T.D. RELAY
K 426	K 426	OVERLOAD RELAY - RA. SCREEN
K 427	K 427	OVERLOAD RELAY - RA. PLATE - (AC)
K 428	K 428	OVERLOAD RELAY - REFLECTOMETER
K 429	K 429	WATER INTERLOCK AUXILIARY CONTACTOR
K 430	K 430	PA. SCREEN
K 801	K 801	MODULATOR H.V. GROUNDING SWITCH
K 802	K 802	PA. BIAS INTERLOCK
K 803	K 803	PA. GRID LEAK INTERLOCK
R 403	R 403	PROTECTIVE RESISTOR 100,000 OHMS
S 810	S 810	WATER TEMPERATURE INTERLOCK
S 114	S 114	ANODE WATER INTERLOCK
S 203	S 203	CATH., GRID, SCREEN WATER INTERLOCK
S 404	S 404	TRANSMITTER START
S 405	S 405	FILAMENT SWITCH
S 406	S 406	PLATE POWER ON
S 407	S 407	PLATE POWER OFF
S 408	S 408	OVERLOAD MULTIPLE-SINGLE TRIP SWITCH
S 409	S 409	OVERLOAD RESET SWITCH
S 410	S 410	DOOR INTERLOCK (CONTROL PANEL)
S 411	S 411	ANODE & GRID RES. WATER INTERLOCK
S 1001	S 1001	R.F. LOAD OVER TEMP. I.L.
S 1101	S 1101	TRANSMITTER START (CONSOLE)
S 1102	S 1102	OVERLOAD TEST SWITCH
S 1103	S 1103	PLATE POWER ON
S 1110	S 1110	PLATE POWER OFF
T 401	T 401	CONTROL CIRCUIT ISOLATION TRANS.
HIGH FREQUENCY DRIVE		
B 703	B 703	DRIVER BLOWER
S 716	S 716	AIR INTERLOCK (DRIVER BLOWER)
T 711	T 711	FILAMENT TRANSFORMER H.F. DRIVER



NOTE: SEE THE FOLLOWING DRAWINGS FOR COMPLETE DETAILS OF THE CONTROL & POWER DISTRIBUTION CIRCUITS.
 CONTROL FRAME SCHEMATIC - W-308881.
 TRANSMITTER SCHEMATIC (L.F.) SOUND W-308887, PIX W-308880.
 TRANSMITTER SCHEMATIC (H.F.) SOUND W-308882, PIX W-308883.

Figure 90 - Schematic Diagram, Control Ladder - Visual and Aural (619056-sub 2) and Transmitter Control Circuits (308881-sub 1) 223,224



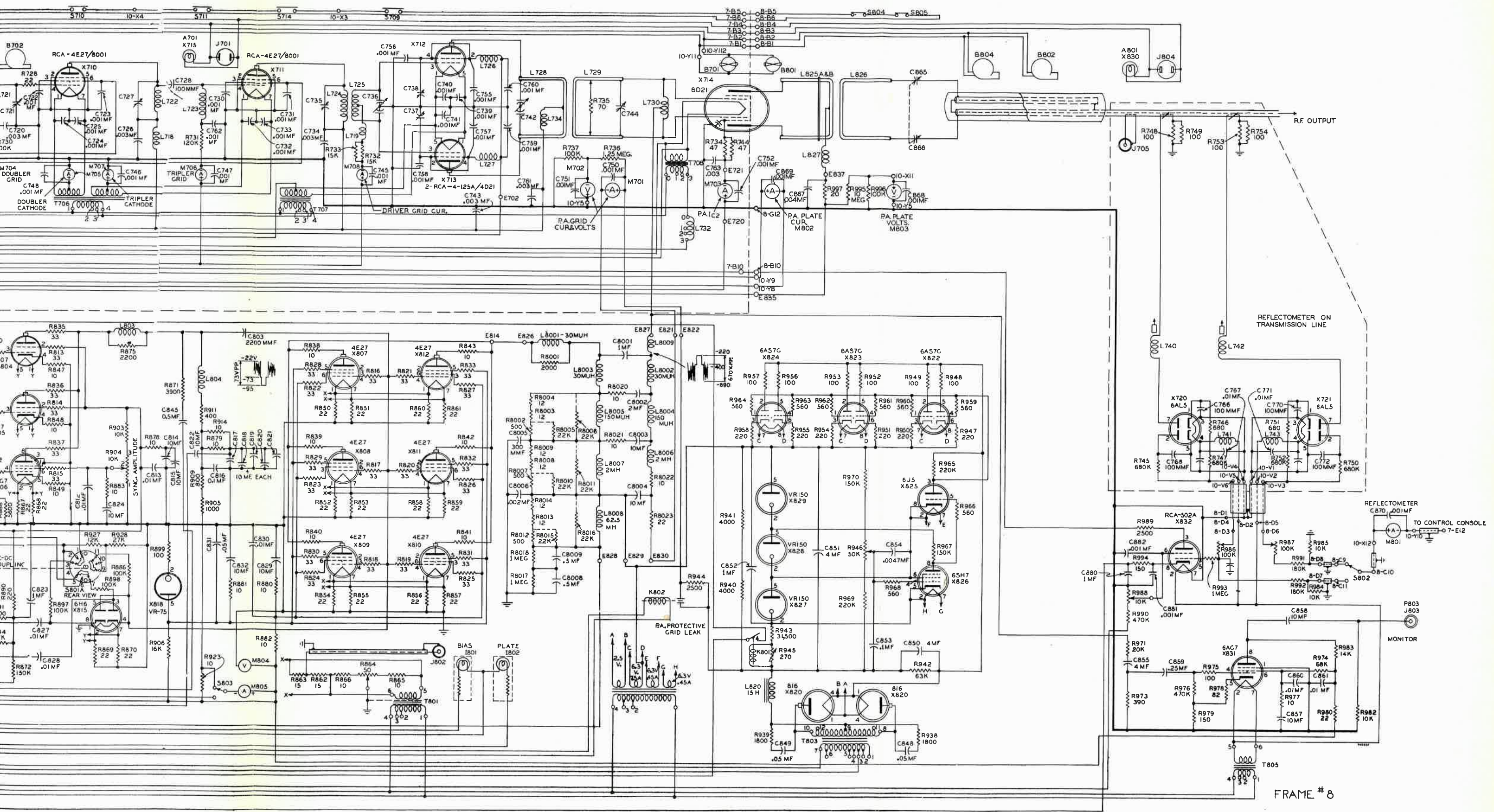
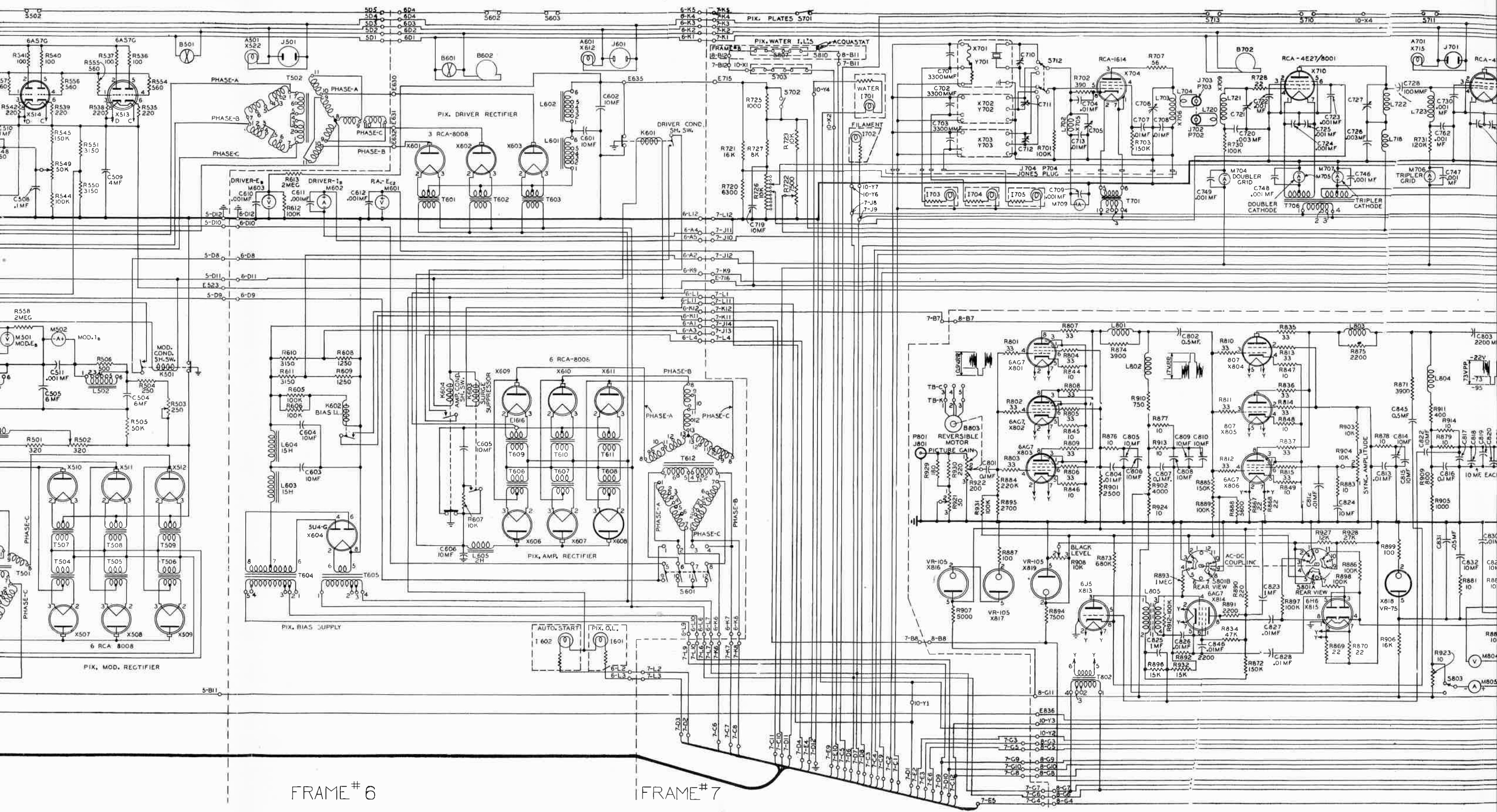


Figure 91 - Schematic Diagram, Channels 2 to 6,
Transmitter Visual Section (308880-sub 0)



FRAME # 6

FRAME # 7



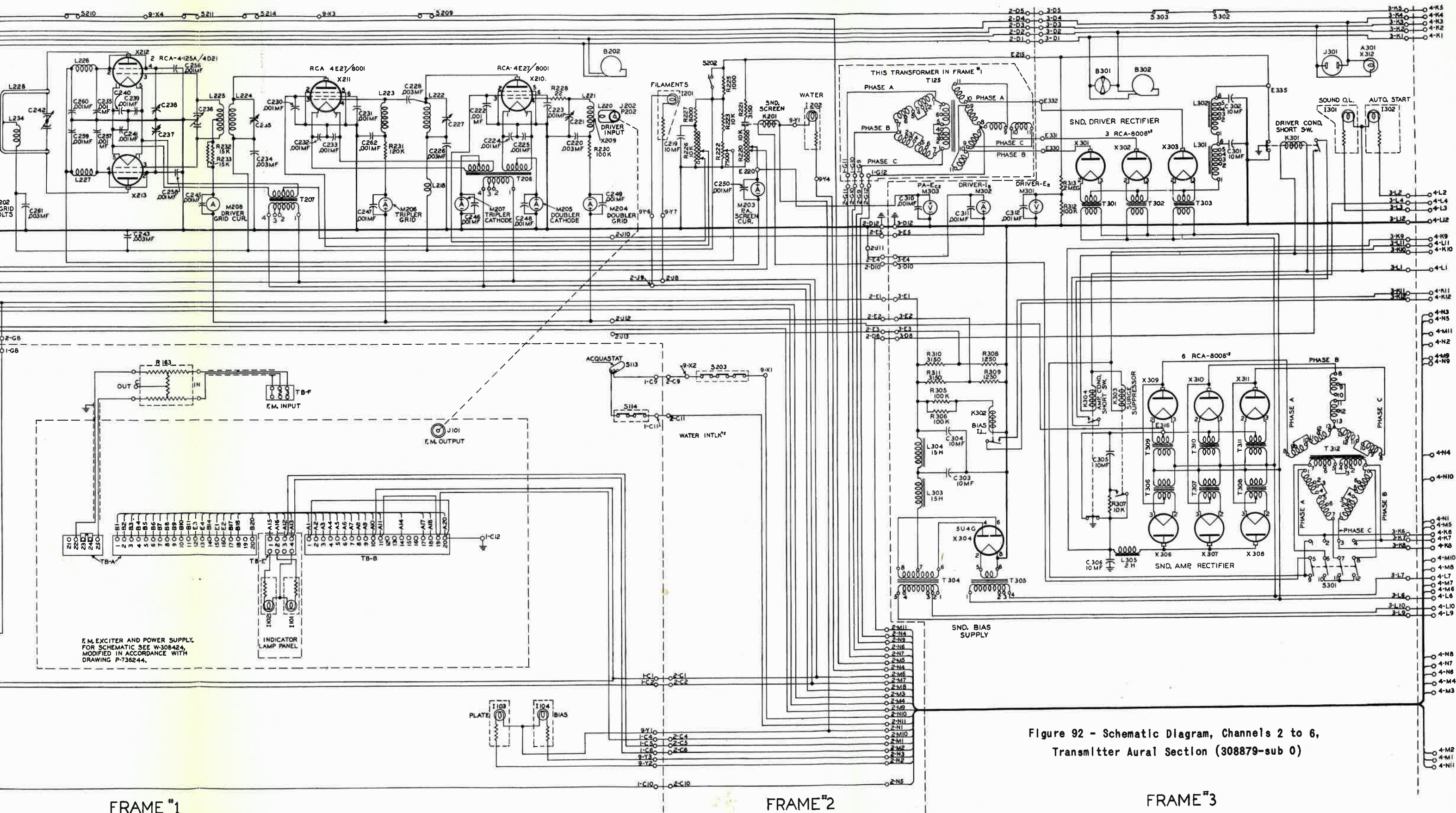


Figure 92 - Schematic Diagram, Channels 2 to 6, Transmitter Aural Section (308879-sub 0)

