

W O R
OPERATING MANUAL

BOOK No. (7)

SEC. No. (C)

"50 KW Trans. & Ant. Equip. Maint."

Tuesday Maintenance Items No. 1 to No. 44

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ITEM 1.

(a) "Control Unit" #1 (A): Proceed to the Rear of this Unit, Feel and at the same time inspect Condensers "C1.1A" - "C1.2A" - "C1.3A" - "C1.4A" - "C1.5A" - "C1.6A" - "C2.1A" - "C2.2A" - "C3.2A" - "C4.1A" - "C4.2A" - "C5.1A" - "C5.2A" and "C6A" for OVERHEATING.

Feel Tops and Sides of Metal Cases for OVERHEATING.

Feel Insulating Bushings on Tops of these Condensers for OVERHEATING.

Inspect Cases and Insulator Bushings for Breakage and Oil Leakage.

(b) "1st Power Amplifier Unit" #3 (E): Proceed to Rear of this Unit: Open Enclosure Door; feel and inspect Condensers "C1E" - "C2E" - "C5E" - "C6E" - "C7E" "C8E" for OVERHEATING.

Use AC Extension Light to locate and check Condensers.

Feel Tops and Sides of Metal Cases of Mica Condensers for OVERHEATING and Leakage of Insulating Compound.

Feel Metal End Plates and Isolantite Cases of Cornell-Dubilier Condensers for Overheating and Leakage of Insulating Compound.

Observe if the Four Counter Sunk Screws in the Top End-Plates of Cornell-Dubilier Condensers are all the way in or partly unscrewed.

CAUTION: DO NOT TURN ANY OF THESE FOUR COUNTER SUNK SCREWS IN THE END PLATES OF DUBILIER CAPACITORS, AS THIS WILL ALTER THE CAPACITY.

Report same on the "50 KW M.O.L."

Note on the "50 KW M.O.L." any Condensers that have excessively Warm or Hot Spots.

BEWARE of this "Spotty" Condition since this indicates a Capacitor "Going Bad".

With a Rag Lightly Dampened with Naphtha, clean all Isolantite Case Condensers.

(c) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit, Feel and at the same time, inspect Condensers "C1F" - "C2F" - "C3F" - "C4F" and "C6F" for OVERHEATING.

Procedure same as Item 1 (b).

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Use "Shorting Stick" and short across the "End-Plates" (the 2 connections), and then feel and inspect Condensers "C7.2F" - "C7.1F" - "C8.1F" - "C8.2F" - "C9.1F" and "C9.2F".

Procedure same as Item 1 (b).

Leave Enclosure Door open.

(d) "2nd Power Amplifier Tuning Unit" #5 (G): Proceed to the Rear of this Unit, Open Enclosure Door; Feel and Inspect Condensers "C1.1G" - "C1.2G" - "C1.3G" - "C1.4G" - "C1.5G" - "C2.1G" - "C2.2G" - "C2.3G" - "C2.4" - "C2.5G" - "C3G" and "C4G" for OVERHEATING.

Procedure same as Item 1 (b).

Leave Enclosure Door open.

Use Small Step Ladder to reach the Outside Top Enclosure; feel and inspect Condensers "C7G and "C8G" for OVERHEATING.

Procedure same as Item 1 (b).

(e) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit; feel and inspect Condensers "C2H" - "C3.1H" - "C3.2H" - "C4.1H" - "C4.2H" - "C5.1H" and "C5.2H" for OVERHEATING.

Procedure same as Item 1 (b).

Use "shorting stick" and short across the End-Plates (the 2 Connections" and then feel and Inspect Condensers "C6.1H" - "C6.2H" - "C7.1H" - "C7.2H" - "C8.1H" - "C8.2H" - "C9.1H" and "C9.2H" for OVERHEATING.

Procedure same as Item 1 (b).

(f) "3rd Power Amplifier Tuning Unit" #7 & #8 (I): Proceed to Rear of this Unit, open Enclosure Door, feel and inspect Condensers "C1.1I" - "C1.2I" - "C1.3I" - "C2.1I" - "C2.2I" - "C2.3I" - "C3.1I" - "C3.2I" - "C3.3I" - "C4.1I" - "C4.2I" - "C4.3I" - "C10.1I" - "C10.2I" - "C11.1I" - "C11.2I" - "C12.1I" - "C12.2I" - "C12.3I" - "C12.4I" - "C12.5I" and "C16I" for OVERHEATING.

Procedure same as Item 1 (b).

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Leave Enclosure Door Open.

(g) "3rd Power Amplifier Tuning Unit" #8 (I): Proceed to the Front of this Unit, open the Metal Panel #2, feel and inspect Condensers "C17I" - "C18I" - "19I" "C20.1I" - "C20.2I" and "C21I", for OVERHEATING.

Procedure same as Item #1 (b).

Leave Enclosure Door Open.

On the Front of this Unit, Open the Metal Panel #3, and feel and inspect Condensers "C7.1I" - "C7.2I" - "C13.1I" - and "C13.2I" for OVERHEATING.

Procedure same as Item #1 (b).

(h) "Antenna Coupling Unit" #9 (J): Proceed to this Unit, open Enclosure Door, feel and inspect Condensers "C1.1J" - "C1.2J" - "C1.3J" - "C2.1J" - "C2.2J" "C2.3J" - "C3.1J" - "C3.3J" - "C3.2J" - "C4.1J" - "C4.2J" - "C4.3J" and "C4.4J" for OVERHEATING.

Procedure same as Item 1 (b).

Leave Enclosure Door Open.

(i) Units Listed Item 1 (a) to (h): Proceed to these Units listed in this sequence.

Use the AC Extension Light and tighten all Bolted Connections.

In some instances it will be found that Condensers are bolted to Support Insulators, and that these Bol ts also connect Two Busses Together.

In this work, exercise CARE NOT TO BREAK OR CHIP Threaded Bolt Hole in End of Stand-off Insulator, which will cause LOOSE BOLTED CONNECTION OF BUSES.

Inspection will show that some of these Insulators do not have any Metal Ends, but that Threaded Holes are in the Isolantite itself.

DO NOT TIGHTEN SUCH BOLTS TOO MUCH - DO NOT JERK.

At the same time, feel Filament Connections of Water-Cooled Power Amplifier Tubes for OVERHEATING.

These Connections are normally Warm, NOT HOT.

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ITEM 2.

(a) "Switch Room": Proceed to this Room and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS.

Merely Grasp Handle of Oil Circuit Breaker and lift it up.

(b) "Control Unit" #1 (A): Proceed to the Rear of this Unit and put "OFF" "Safety Switch" - "DLA", Open hinged door and feel Fuses "F1.1A" - "F1.2A" - "F1.3A" - "F2.1A" - "F2.2A" - "F3.1A" - "F3.2A" - "F4.1A" - "F4.2A" for OVERHEATING. Be sure to rotate Fuses in their Holders, since Burned Spots may be on Lower Sides or Sides turned toward the Panel.

Fuses normally run Warm - NOT HOT.

Technician should be able to keep hand on fuses when checking same.

Replace any Fuse showing a burned or OVERHEATED place on Insulated Body of same.

Spare Fuses are located in the "Portable Fuse and Test Unit" kept in the Main Transmitter Room and in the "Fuse Tester Rack" kept in the Basement Areaaway at the foot of the Basement Stairs.

Fuses should be gripped tightly in Clips and Fuse Block Holders, so that OVERHEATING does not take place at these connections.

Some Fuses are provided with Compression (Variable Clamps to prevent OVERHEATING and to assure full Voltage and Current throughout the Circuit.

Be sure that proper Tension is on these Clamps.

After checking these Fuses, be sure to Close Metal Door, and put "SAFETY" Switch "DLA" - "ON".

(c) "Control Unit" #1 (A): While at the rear of this Unit feel Fuses "F5A" - "F6A" - "F7A" - "F8A" - "F9A" and "F10-A" for OVERHEATING.

Procedure same as Item #2 (b).

Exercise Care not to break the single socket holding each Fuse.

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ITEM 2.

(d) "Oscillator-Modulator Unit" #2 (D): Proceed to the rear of this Unit and feel Fuse "F3D".

Same Procedure as Item #2 (b)

Fuse is located in the Lightning Protective Device Apparatus Panel on Bottom of the Unit.

(e) "17 KV Rectifier Unit" #10 (c): Proceed to this Unit and feel Fuses "FL.1C" and "FL.2C" for OVERHEATING.

Same procedure as Item #2 (b).

These Fuses are located on the Metal Panel supporting "Rectifier Air Blast" Relays on bottom of the Unit.

(f) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to this Unit and feel Fuses "F1H" - "F2H" - "F3H" - "F5H" - "F6H" for OVERHEATING.

Same Procedure as Item #2 (b), except that Knife Type fuse clears Panel Sufficiently to observe any Abnormal Condition.

These Fuses are located on the Bakelite Panel just above the Rear Tubes.

(g) "Basement": Proceed to Basement, and put "OFF" Switch "DLP" "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.

Remove the wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it UP.

(h) "Basement": While in the Basement, put "OFF" switch "DL.1P" "Main Power Disconnect Panel" - Open Metal Door and feel Fuses "FL.1P" - "FL.2P" "FL.3P" - "F2.1P" - "F2.2P" - "F2.3P" - "F20.1P" - "F20.2P" and "F20.3P" for OVERHEATING.

Technician should be able to lay hand on these parts, they should be Warm, Not HOT.

If Blades or contacts are too hot, tighten up Compression Nuts, clean off contacts with Crocus Cloth, wipe with rag dampened with Carbon-tet and lightly coat with "3-in-1" Oil.

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ITEM 2.

After Checking Fuses and Switches, put Switch "D1.1P" - "ON".

(i) "Basement": While in the Basement, put "OFF" Switch "D15P" - "Motor Distribution Panel", open Metal Door and feel Fuses "F4.1P" - "F4.2P" - "F4.3P" "F5.1P" - "F5.2P" - "F5.3P" - "F7.1P" - "F7.2P" and "F7.3P" for OVERHEATING.

Procedure same as Item #2 (b).

Feel Blades and contacts of Switch "D15P" for OVERHEATING.

Procedure same as Item #2 (h).

(j) "17 KV Rectifier Switching Unit" #11 (B): Proceed to the front of this Unit and test Switch for binding.

If the Switch does bind, or does not move freely when placed in the "10 KV" or "17 KV" positions, coat lightly with "3-in-1" Oil.

If the Switch still binds following this, loosen Compression Nuts and remove Bolts and compression Washers, from the "Swingers" pulling the "Swingers" free of rest of the Switch.

Clean the Swinger Contact surfaces with Crocus Cloth, wipe off with Rag dampened with carbon-tet.

Wrap a piece of Crocus Cloth around Narrow Flat File and clean inside of Switch Contacts, then wrap Rag dampened in Carbon-tet about the file and wipe Residue from Switch Contacts.

Put Switch back together again, replace Bolts, Compression Washers and Nuts, tightening them JUST ENOUGH TO SEE THE COMPRESSION WASHERS BEGIN TO FLATTEN. Lightly coat "Swingers" and Switch Contacts with "3-in-1" Oil and again test for Binding.

Technician should be able to move Switch from one position to the other freely and smoothly.

Wipe up all copper dust and other Residue from floor and section where Switch was cleaned.

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ITEM 3.

(a) "Switch Room": Proceed to this Room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS.

Merely grasp the Handle of the Oil Circuit Breaker and lift it up.

(b) "Basement": While in the Basement, put "OFF" Switch "DLP" - "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.

Remove Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it up.

(c) "Control Unit" #1 (A): Proceed to the Rear of this Unit and feel Field Coils of Relays "S2A" - "S3A" - "S4A" and "S14A" for OVERHEATING.

These Relays are located in top rear of this Unit, mounted on a metal Sub-Panel.

These Relay Field Coils will normally run WARM, but NOT HOT.

Technician should be able to keep Hand on them.

Log any that are excessively Warm or Hot on the "50 KW M.O.L."

While at the rear of this Unit, open Door of Metal Box Housing Relay "S1A" and feel Field Coil for OVERHEATING.

Procedure same as Item #3 (c).

Close Door of Metal Box Housing Relay "S1A".

While at the Rear of this Unit, put "OFF" the Series Switches on "1650 Volt Magnetic Switch Contactor" Metal Box, Open Box and feel this Relay Contactor "S7A" Field Coil for OVERHEATING.

Procedure same as Item #3 (c).

Close Door of Metal Box, and put Series Switch "ON".

(d) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit, use "Shorting Stick" discharge Condensers "C7.1F" - "C7.2F" - "C8.1F" - "C8.2F" - "C9.1F" - "C9.2F" - "C10.1F" and "C10.2F" then feel Field Coils of Relays "S1F" - "S2F" - "S3F" and "S4F" for OVERHEATING.

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Temperature of these Relay Field Coils should be BARELY WARM, in no event higher than Room Temperature.

To discharge Condensers, merely place Metal part of "Shorting Sticks" across the two End-Plates of these Condensers.

As each Condenser is discharged, a moderate Arc will be observed when "Shorting Stick" first touches the End-Plates.

Log Any Relay Field Coils that are excessively warm or Hot, on the "50 KW M.O.L."

(e) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the rear of this Unit use "Shorting Stick" and discharge condensers "C6.1H" - "C6.2H" - "C7.1H" - "C7.2H" - "C8.1H" - "C8.2H" - "C9.1H" - "C9.2H" - then feel Field Coils of Relays "S3H" - "S4H" - "S5H" - "S6H" - "S7H" - "S8H" - "S9H" - "S10H" - "S11H" - "S12H" - "S13H" and "S14H" for OVERHEATING.

Same Procedure as Item #3 (d).

(f) "17 KV Rectifier Tube Unit" #10 (C): Proceed to this Unit and feel Field Coils of Relays "S1C" - "S2C" - "S3C" - "S4C" - "S5C" - "S6C" - "S7C" - "S8C" - "S9C" - "S10C" - "S11C" and "S12C" for OVERHEATING.

Temperature of these Relay Field Coils should be BARELY WARM, in no event higher than Room Temperature.

While at this Unit, open door of Metal Box Housing "17 KV Rectifier Air Blast Heater Relay" - "S17C" and feel Field Coil for OVERHEATING.

This Field Coil will run normally Warm not Hot.

Technician should be able to keep Hand on it.

If excessively Warm or Hot, Log on the "50 KW M.O.L."

(g) "17 KV Rectifier Switching Unit" #11 (B): Proceed to this Unit and feel Solenoids of Magnetic Contactors "S4B" and "S5B" for OVERHEATING.

Solenoids of these Contactors run normally warm with Temperature distributed evenly around outside of Casings.

Inspection should be made for OVERHEATING, UNEVENLY distributed Temperature

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(HOT SPOTS), Loose Connections, and condition of Insulation Covering around Outside of Solenoids.

When Insulating Covering around solenoids of "S4B" and "S5B" begins to get bare, apply coat of "BLACK INSULATING VARNISH".

On the Bottom of this Unit, feel Field Coils of Relays "S3B" and "S2B" for OVERHEATING.

Log any Abnormal Condition and work performed on the "50 KW M.O.L."

(h) "17 KV Filter Condenser Charging Contactor and Resistor Unit" #12 (L):

Proceed to this Unit and feel Solenoid of Magnetic Contactor "S1L" for OVERHEATING.

Procedure same as Item #3 (g).

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ITEM 4.

(a) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Front of this Unit, open Glass Front Window, and measure the Filament Current of Tube "V2F". This is performed directly after taking 50 KW Transmitter Carrier "OFF" the Air, (1650 Volt Rectifier "OFF" and 17,000 Volt Rectifier "OFF") but prior to shutting down the Rotating Machinery.

When available, use the Weston Model 45 DC Ammeter; if not available use Jewel Model 171 or other Type DC Ammeter.

These Meters are kept in the "Portable Fuse and Test Unit" in the Transmitter Room, as well as in the "Measuring Bench" in the Basement.

One Technician to go to the Front of Control Unit (#1 -"A") and turn the "Filament Generator" Rheostat "R16A" Clock-wise to reduce Filament Voltage to Minimum.

2nd Technician will loosen Filament Dossert of one Filament Connection of Water Cooled P.A. Tube and lift off the Lead, carefully placing it down in the Hanging position.

(It is preferable to remove the Filament Lead that is not insulated, thereby avoiding the risk of short circuiting the 20 Volt Filament Supply on the top metal Ring of the Tube which would severely burn or damage same.)

CAUTION: While Ammeter is in the Circuit, be sure that Filaments are Lighted otherwise 600 amperes D.C. will flow through the Ammeter and INJURE SAME.

Connect the Model 45 Meter to its 50 Millivolt Shunt by means of the associated Meter Leads.

Set Meter on Small Typewriter Table or rest it against bottom edge of Window.

Connect the Dossert connection on the Meter Shunt to the Filament Terminal on the Tube, exercising care not to damage the Tube; tighten the Dossert.

Connect Filament Dossert to the Male Connection on the Meter Shunt.

Exercise Care not to damage Shunt or connections; tighten the Dossert.

After Ammeter has been placed in the Filament Circuit of the Tube, 1st Technician will adjust "Filament Generator" Rheostat "R16A" Counter-Clockwise to read exactly

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20 Volts on "Amplifier Filament Voltage" Voltmeter "MLA".

2nd Technician will observe reading on Model 45 Voltmeter, keeping Meter very Steady and perfectly horizontal.

When Filament Current Reading is steady, approximately 30 seconds after Filament Voltage was adjusted to 20.0 Volts, 2nd Technician will read Filament Current.

In order to achieve Precision Results with Meters, it is necessary to allow 30 Seconds time for heating of Meter Element, before reading.

Also when Reading these Meters, be careful to avoid Parallax, which is a condition of the focus of the Eyes when too close to an object.

After reading Filament Current, 1st Technician to turn "Filament Generator" Rheostat "RL6A" clockwise to reduce Filament Voltage to Minimum.

(Leave this way until Meter has been placed in series with next Tube Filament to be measured.)

2nd Technician to loosen Dossert, remove the Filament Connection from the Male Connection on the Meter Shunt and let hang.

Loosen the Dossert Connector of the Meter Shunt, lift the Shunt off the Tube Filament Connection and place Meter Shunt on table beside the Meter.

Connect Filament Connection to the Filament Terminal on the Tube and tighten the Dossert.

Fill in Form "TUBE FILAMENT CURRENTS" entering Filament Current measured at 20.0 Volts reading on "Amplifier Filament" Voltage "Voltmeter MLA".

(b) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Front of this Unit open Glass Front Window, and measure the Filament Currents of Tubes "V2H" - "V4H" and "V6H" in this order.

Procedure same as Item #4 (a).

(c) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit and measure the Filament Current of Tube "V1F".

Procedure same as Item #4 (a).

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(d) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit, and measure the Filament Currents of Tubes "V1H" - "V3H" and "V5H" in this order.

Procedure same as Item #4 (a).

(e) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the front of this Unit and measure the Filament Voltage at the Terminals of tube "V2H".

This is performed directly after Item No. 4 (d) is completed, but if sections (a) to (d) are not performed, it is done directly after taking 50 KW Transmitter Carrier "OFF" the Air, (1650 Volt Rectifier "OFF" and 17,000 Volt Rectifier "OFF"), but prior to shutting down the Rotating Machinery.

When available, use the Weston Model 45 D.C. Voltmeter; if not available, use Jewel Model 171, or other type DC Voltmeter.

These Meters are kept in the "Portable Fuse and Test Unit" in the Transmitter Room, as well as in the "Measuring Bench" in the Basement.

One technician to go to the front of the "Control Unit" and adjust "Filament Generator" Rheostat "RL6A" to maintain exactly 20 volts on "Amplifier Filament Voltage" voltmeter "MLA".

2nd Technician will measure the Filament Voltage at the Tube Terminals.

Connect measuring Leads to the 0 and 30 Volt Terminals of Model 45 Voltmeter.

Make the Filament Voltage measurement with Voltmeter and Leads projecting through the Glass Front Window.

This keeps leads out of D.C. Field and will give correct reading.

Set the Voltmeter on a small Typewriter Table or rest it against bottom edge of Window.

Place Test Prods against the two Filament Terminals on top of the Tube and after waiting 30 seconds, read the Filament Voltage.

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ITEM 4.

With "RLOF" Filament Voltage Dropping Resistor in use and 2 Type 232-B Tubes in Service, Voltage at Tube Terminals should read a minimum of 19 Volts.

(MLA Filament Voltmeter reading exactly 20 Volts.)

With "RLOF" Filament Voltage Dropping Resistor NOT IN SERVICE, and 2 Type 342-A Tubes in service, Voltage at Tube Terminals should read a minimum of 19.6 Volts.

("MLA" Filament Voltmeter reading exactly 20 Volts.)

After Filament Voltage is measured, remove Meter Test Prods from Filament Terminals.

Fill in Form "TUBE FILAMENT CURRENTS" entering Voltage measured at the Tube Terminals with "Amplifier Filament Voltage" Voltmeter "MLA" at 20.0 Volts.

If Weston Voltmeters are not available for Voltage Measurements and our Hickok Voltmeter is used, the following procedure will be adhered to in taking these Voltage Readings:

Since our Hickok Voltmeter is designed for A.C. - D.C. use, it is reasonable to assume that POLARITY is a factor when measuring with a Combination Meter of this Type. Take Voltage readings one way, then reverse Voltmeter Terminal Leads and make another reading, add together, divide by two, and the Result is the proper Voltage.

As an Example: -

21.0 Volts One Way

22.5 Volts with Test Leads reversed.

43.5 Volts Total, divided by 2 equals 21.75 Volts.

Correct Voltage reading then, is 21.75 Volts.

Be sure to keep Meter in One Place when measuring, keeping Test Leads out of D.C. Fields.

(f) "3rd Power Amplifier Tube Unit" #6(H): Proceed to the Front of this Unit and measure the Filament Voltage at the Terminals of Tubes "V2H" - "V4H" and "V6H".

Procedure same as Item #4 (e) except that there is no Filament Voltage Dropping Resistor in Service and that Minimum voltage at the Tube Filament Terminals reads 19.8 Volts.

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("MLA" Filament Voltmeter reading exactly 20.0 Volts.)

(g) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit and measure the Filament Voltage at the Terminals of Tube "VLF".

Procedure same as Item #4 (e).

(h) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of the Unit and measure the Filament Voltage at the Terminals of tubes "V1H" - "V3H" and "V51j".

Procedure same as Item #4 (e) except that there is no Filament Voltage Dropping Resistor in Service and that Minimum Voltage at the Tube Terminals reads 19.8 Volts.

("MLA" Filament Voltmeter reading exactly 20.0 Volts.)

Book No. (1) (1) (1) (1) (2) ()

Sec. No. (F) (H) (15) (P) (V) ()

Page No. () () () () () ()

End Item 4.

(i) Whenever a tube is changed in the 2nd P.a. or 3rd P.a. if time permits, perform ^{this} Item # 4 in its entirety. If the change is an emergency, time not permitting, perform this item at 1st Period transmitter is off the air

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day <u>Friday</u>									Date <u>Dec. 28, 1956</u>
Signatures <u>SV-TIC</u>									Fil. Meter Hours <u>80516</u>
2nd PA Bal. Div <u>22</u>									3rd PA Bal. Div. <u>31</u>
Type Tube	342A	342A	342A	342A	342A	342A	342A	342A	342A
Serial #	405296	415905	416945	417702	415909	415907	417703	420360	
Trans. Pos'n	2nd PA	2nd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA
Tube Position	1	2	1	2	3	4	5	6	
Fil. Volts (Meter)	20.0	20.5	20.0	20.5	20.0	20.5	20.0	20.5	20.0
Fil. Volts (Tube)	19.5	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9
Fil. Cur. Amps.	61.5	62.3	60.5	61.1	65.0	65.5	63.0	63.5	64.5

Remarks: RT A checked against Weston 772, 20V = 20V
Bips on all tubes 290 Volts
3rd PA reversing switch 19.9V - 20.2V
3rd PA " " 19.7V - 20.1V

Day <u>Friday</u>									Date <u>Feb. 1 1957</u>
Signatures <u>SV-TIC</u>									Fil. Meter Hours <u>80516</u>
2nd PA Bal. Div <u>22</u>									3rd PA Bal. Div. <u>35</u>
Tube Pos'n	2 PA	2nd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA
Type Tube	342A	342A	342A	342A	342A	342A	342A	342A	342A
Serial #	405296	415905	416945	417702	415909	415907	417703	420360	
Transm. Pos'n	1	2	1	2	3	4	5	6	
Fil. Volts (Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20
Fil. Volts (Tube)	19.9	20.2	19.9	20.2	19.9	20.1	19.9	20.2	19.9
Fil. Cur. Amps.	61.5	62.0	61.5	62.0	64	64.5	64.5	65.0	63.5

Remarks: RT A checked against Weston 772, 20V = 20V
Bips on all tubes 290 Volts
3rd PA reversing switch 19.9V - 20.2V
3rd PA " " 19.7V - 20.1V

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day Friday
Signatures SV-HP
2nd PA Bal. Div. 72

Date MARCH 1, 1957
Fil. Meter Hours 82.002
3rd PA Bal. Div. 35

Type Tube	342A	342A	342A	342A	342A	342A	342A	342A
Serial #	408296	415905	416945	417702	415909	415907	417703	420360
Trans. Pos'n	1	2	1	2	3	4	5	6
Tube Position	2nd PA	2nd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA
Fil. Volts (Meter)	20.0	20.5	20.0	20.5	20.0	20.5	20.0	20.5
Fil. Volts (Tube)	19.9	20.2	19.7	20.2	19.8	20.1	19.9	20.2
Fil. Cur. Amps.	61.5	62.0	61.5	62.0	64.5	65.0	63.5	64.0

Remarks: *M.T.A. checked against Weston 772 20V=20V
Bias on all tubes 290 volts.
3rd PA reversing switch 19.9V-20.2V
2nd PA " " 19.7V-20.1V*

Day Friday
Signatures SV-EF
2nd PA Bal. Div. 72

Date March 9, 1957
Fil. Meter Hours 82.662
3rd PA Bal. Div. 35

Tube Pos'n	1	2	1	2	3	4	5	6
Type Tube	342A	342A	342A	342A	342A	342A	342A	342A
Serial #	408296	415905	416945	417702	415909	415907	417703	420360
Transm. Pos'n	2nd PA	2nd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA
Fil. Volts (Meter)	20.0	20.5	20.0	20.5	20.0	20.5	20.0	20.5
Fil. Volts (Tube)	19.9	20.2	19.9	20.1	19.9	20.2	19.5	20.1
Fil. Cur. Amps.	61	62	61	62	64	64.5	63	64

Remarks: *M.T.A. checked against Weston 772 20V=20V
Bias on all tubes 290 Volts.
3rd PA reversing switch 19.9V-20.2V
2nd PA " " 19.7 20.1V*

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day _____																			Date _____
Signatures _____																			Fil. Meter Hours _____
2nd PA Bal. Div. _____																			3rd PA Bal. Div. _____
Type Tube	342A		342A		342A		342A		342A		342A		342A		342A		342A		
Serial #	408396		415905		416945		417702		423261		415909		417703		420360				
Trans. Pos'n	1		2		4		2		3		4		5		6				
Tube Position	2nd PA		2nd PA		3rd PA		2nd PA		2nd PA		2nd PA		3rd PA		2nd PA				
Fil. Volts (Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	
Fil. Volts (Tube)	19.9	20.1	19.8	20.2	19.9	20.1	19.9	20.2	19.9	20.1	19.8	20.0	19.9	20.1	19.9	20.1	19.9	20.1	
Fil. Cur. Amps.	6.1	6.5	6.6	6.5	6.4	6.5	6.3	6.3	6.5	6.5	6.6	6.5	6.3	6.4	6.5	6.4	6.4	6.5	

Remarks:

Day <u>Friday</u>																			Date <u>May 31</u>
Signatures <u>AKAS</u>																			Fil. Meter Hours <u>4143</u>
2nd PA Bal. Div. <u>72</u>																			3rd PA Bal. Div. <u>32</u>
Tube Pos'n	1		2		1		2		3		4		5		6				
Type Tube	342A		342A		342A		342A		342A		342A		342A		342A				
Serial #	408296		415905		416945		417702		423261		415909		417703		420360				
Transm. Pos'n	2 PA		2 PA		3 PA		3 PA		3 PA		3 PA		3 PA		3 PA				
Fil. Volts (Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	
Fil. Volts (Tube)	19.9	20.2	19.8	20.1	19.9	20.1	19.9	20.2	19.9	20.2	19.8	20.1	19.9	20.1	19.8	20.2	19.8	20.2	
Fil. Cur. Amps.	6.1	6.5	6.5	6.4	6.4	6.5	6.3	6.3	6.5	6.5	6.3	6.3	6.4	6.5	6.4	6.5	6.4	6.5	

Remarks:

**W O R
OPERATING MANUAL**

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day <i>Friday</i>	Date <i>July 5, 1957</i>									
Signatures <i>A/K/RS</i>	Fil. Meter Hours <i>84963</i>									
2nd PA Bal. Div. <i>72</i>	3rd PA Bal. Div. <i>35</i>									
Type Tube	342A	342A	342A	342A	342A	342A	342A	342A	342A	342A
Serial #	408296	415905	416945	417702	423258	423261	417703	420360		
Trans. Pos'n	2PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA
Tube Position	1	2	1	2	3	4	5	6		
Fil. Volts(Meter)	20.265	20.205	20.205	20.205	20.205	20.205	20.205	20.205	20.205	20.205
Fil. Volts(Tube)	19.8	20.2	19.8	20.2	19.9	20.2	19.9	20.2	19.8	20.3
Fil. Cur. Amps.	61	61.5	60.4	60.1	63.6	64	62.5	63	65	65.5

Remarks:
*M.A. checked against Weston 772 20V-20V
 Bias on all tubes 290 Volts
 3rd PA reversing switch 19.9V-20.2V
 2nd PA " " 19.7V-20.1V*

Day <i>Friday</i>	Date <i>Aug 2, 1957</i>									
Signatures <i>W/EF</i>	Fil. Meter Hours <i>85621</i>									
2nd PA Bal. Div. <i>72</i>	3rd PA Bal. Div. <i>35</i>									

Tube Pos'n	1	2	1	2	3	4	5	6		
Type Tube	342A	342A	342A	342A	342A	342A	342A	342A	342A	342A
Serial #	408296	415905	416945	417702	423258	423261	417703	420360		
Transm. Pos'n	2PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA
Fil. Volts(Meter)	20.205	20.205	20.205	20.205	20.205	20.205	20.205	20.205	20.205	20.205
Fil. Volts(Tube)	19.8	20.2	19.8	20.2	19.8	20.2	19.8	20.2	19.7	20.2
Fil. Cur. Amps.	60.0	60.5	60.5	61.0	62.5	67.1	62.0	62.5	63.5	64.0

Remarks:
*M.A. checked against Weston 772 20V-20V
 Bias on all tubes 290 Volts
 3rd PA reversing switch 19.9V-20.2V
 2nd PA " " 19.7V-20.1V*

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day <u>Friday</u>	Date <u>Sept 6 1957</u>
Signatures <u>[Signature]</u>	Fil. Meter Hours <u>86.444</u>
2nd PA Bal. Div <u>72</u>	3rd PA Bal. Div. <u>35</u>

Type Tube	342A	342A	342A	342A	342A	342A	342A	342A	342A
Serial #	415909	415905	416945	417702	423258	423261	417703	420360	
Trans. Pos'n	2PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA
Tube Position	1	2	1	2	3	4	5	6	
Fil. Volts(Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20
Fil. Volts(Tube)	19.9	20.2	19.8	20.2	20.0	20.2	19.8	20.2	19.8
Fil. Cur. Amps.	61.5	62.0	60	60.5	62.5	63	62	62.5	63

Remarks: MIA checked against Weston 772 20V-20V
Bias on all tubes 290 Volts
2nd PA reversing switch 19.9V-20.2V
2nd PA " " " 19.8 - 20.1V

Day <u>FRI.</u>	Date <u>Oct. 4, 1957.</u>
Signatures <u>AL-LP</u>	Fil. Meter Hours <u>87.102</u>
2nd PA Bal. Div <u>72</u>	3rd PA Bal. Div. <u>35</u>

Tube Pos'n	2nd PA	2nd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA
Type Tube	342A	342A	342A	342A	342A	342A	342A	342A	342A
Serial #	415909	415905	416945	417702	423258	423261	417703	420360	
Transm. Pos'n	1	2	1	2	3	4	5	6	
Fil. Volts(Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20
Fil. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9
Fil. Cur. Amps.	62.1	62.9	60	60.9	62.3	63.1	62.0	62.9	64

Remarks: MIA checked against Weston 772 - 20 - 20V
Bias on all tubes 290 V.
3rd PA Rev. Sec. 19.9 - 20.2 V
2nd " " " " 19.8 20.1 V.

**W O R
OPERATING MANUAL**

"Tube Filament Currents"

1st Tuesday

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Day <u>FRIDAY</u>		Date <u>Nov 1 1957</u>	
Signatures <u>LP-RC</u>		Fil. Meter Hours <u>57762</u>	
2nd PA Bal. Div <u>72</u>		3rd PA Bal. Div. <u>35</u>	

Type Tube	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A
Serial #	415709	415708	416745	417702	423258	423261	417703	420360
Trans. Pos'n	2PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA
Tube Position	1	2	1	2	3	4	5	6
Fil. Volts(Meter)	20.2	20.8	20.0	20.5	20.0	20.5	20.0	20.5
Fil. Volts(Tube)	19.5	20.1	19.0	19.9	19.7	20.2	19.9	20.2
Fil. Cur. Amps.	61.5	63.5	60.0	60.5	62.5	63.0	61.0	61.5

Remarks: MIA checked vs Weston 777 200 = 20V
BIAS ALL TUBES 290V
3RD PA REVERSING SW 19.9 - 20.2V
2ND " " " 19.8 - 20.1V

Day <u>FRI</u>		Date <u>Nov 29, 1957</u>	
Signatures <u>CR-AP-CK</u>		Fil. Meter Hours <u>58421</u>	
2nd PA Bal. Div <u>72</u>		3rd PA Bal. Div. <u>35</u>	

Tube Pos'n	342A	342A	342A	342A	342A	342A	342A	342A
Type Tube	415709	415708	416745	417702	423258	423261	417703	420360
Serial #	2PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA
Transm. Pos'n	1	2	1	2	3	4	5	6
Fil. Volts(Meter)	20.0	20.5	20.0	20.5	20.0	20.5	20.0	20.5
Fil. Volts(Tube)	19.5	20.1	19.5	20.1	19.7	20.2	19.9	20.2
Fil. Cur. Amps.	62.2	63.2	60.0	60.4	62.5	63.3	61.5	62.5

Remarks: MIA checked vs Weston 777 200 = 20V
BIAS ALL TUBES 290V
3RD PA REVS SW 19.9 - 20.2V
2ND " " " 19.8 - 20.1V

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day <u>FRI</u>	Date <u>JAN 31 1958</u>
Signatures <u>GC-AP</u>	Fil. Meter Hours <u>89244</u>
2nd PA Bal. Div <u>72</u>	3rd PA Bal. Div. <u>35</u>

Type Tube	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A
Serial #	415969	415905	416945	417702	423258	423261	417703	420360
Trans. Pos'n	2PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA
Tube Position	1	2	1	2	3	4	5	6
Fil. Volts (Meter)	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5
Fil. Volts (Tube)	19.8 20.1	19.8 20.1	19.9 20.2	19.9 20.2	19.9 20.2	19.9 20.2	19.9 20.2	19.9 20.2
Fil. Cur. Amps.	62.5 63.4	60.0 61.0	62.6 63.5	62.5 63.0	64.8 65.5	64.0 65.0	63.0 63.8	62.5 63.0

Remarks: MIA checked VS WESTON 772 20V = 20V
BIAS ALL TUBES 290
3PA REV. SW 19.9V - 20.2V
2ND " " 19.8V 20.1V GC-AP

Day <u>FRI</u>	Date <u>JAN 31 1958</u>
Signatures <u>GC-AP</u>	Fil. Meter Hours <u>89908</u>
2nd PA Bal. Div <u>72</u>	3rd PA Bal. Div. <u>38</u>

Tube Pos'n	1	2	1	2	3	4	5	6
Type Tube	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A
Serial #	415909	415905	416945	417702	423258	423261	417703	420360
Transm. Pos'n	2PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA
Fil. Volts (Meter)	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5
Fil. Volts (Tube)	19.8 20.1	19.8 20.1	19.9 20.2	19.9 20.2	19.9 20.2	19.9 20.2	19.9 20.2	19.9 20.2
Fil. Cur. Amps.	63.0 64.0	60.0 60.8	62.4 63.0	61.4 62.0	64.0 65.0	63.8 64.5	62.8 63.3	62.6 63.9

Remarks: MIA checked VS WESTON 772 - OK
BIAS 174 TUBES 290V
3PA REV. SW 19.9 - 20.2V
2 " " " 19.8 20.1V

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day <u>FRI</u>	Date <u>3-7-58</u>
Signatures <u>AP-BC</u>	Fil. Meter Hours <u>70734</u>
2nd PA Bal. Div <u>72</u>	3rd PA Bal. Div. <u>28</u>

Type Tube	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A
Serial #	415909	417702	416945	K-16-666	423258	423261	417703	420360	
Trans. Pos'n	2nd PA	2 PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA	3rd PA
Tube Position	1	2	1	2	3	4	5	6	
Fil. Volts(Meter)	20.0	20.5	20	20.5	20	20.5	20	20.5	20
Fil. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9
Fil. Cur. Amps.	61.5	62.5	60.8	61.2	60.2	69.0	70.0	63.8	64.6

Remarks:

MIA CHECKED AGAINST WESTON 772
BIAS ALL TUBES 290 V
3RD PA REVERSING SW 19.9V 20.2V
2ND " " " 19.8V 20.1V

Day <u>FRI</u>	Date <u>3-8-58</u>
Signatures <u>AP-414</u>	Fil. Meter Hours <u>71247</u>
2nd PA Bal. Div <u>72</u>	3rd PA Bal. Div. <u>28</u>

Tube Pos'n	1	2	1	2	3	4	5	6
Type Tube	342A	342A	342A	342A	342A	342A	342A	342A
Serial #	415909	417702	416945	K-16-666	423258	423261	417703	420360
Transm. Pos'n	2nd PA	2 PA	3 PA	3 PA	3 PA	3 PA	3 PA	3 PA
Fil. Volts(Meter)	20	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	61.7	62.8	60.0	60.8	61.2	62.0	68.6	69.8

Remarks:

MIA CHECKED AGAINST WESTON 772 OK
BIAS ALL TUBES 290V
3RD PA REV. SW 19.9-20.2V
2ND PA " " 19.8 20.1V

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEM 4

Day FRIDAY Date 5-2-58
 Signatures AP-GK Fil. Meter Hours 97054
 2nd PA Bal. Div. 72 3rd PA Bal. Div. 28

Type Tube	342-A		342-A		342-A		342-A		342-A		342-A		342-A	
Serial #	415909		417702		416945		K10-6062		423258		423261		417703	
Trans. Pos'n	2nd PA		2nd PA		3rd PA		3rd PA		3rd PA		3rd PA		3rd PA	
Tube Position	1		2		1		2		3		4		5	
Fil. Volts (Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts (Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	61.6	62.5	60.0	60.8	60.8	61.4	68.4	69.2	63.6	64.6	62.8	63.5	68	67.6

Remarks:

MAA checked against Weston 772
 Bias All Tubes 290V
 3rd PA Rev. Sec. 19.9 - 20.2 ✓
 2nd " " " 19.8 20.1 ✓

Day FRI Date 6-27-58
 Signatures AP-GK-JC Fil. Meter Hours 93375
 2nd PA Bal. Div. 72 3rd PA Bal. Div. 28

Tube Pos'n	5		6		1		2		1		2		3		4		5		6	
Type Tube	342A		342A		342A		342A		342A		342A		342A		342A		342A		342A	
Serial #	L1060 44		M30 100		415909		416945		K10-6064		K10-6062		423258		423261		417703		420360	
Transm. Pos'n	2nd PA		3rd PA		2nd PA		2nd PA		3rd PA		3rd PA		3rd PA		3rd PA		3rd PA		3rd PA	
Fil. Volts (Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts (Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	61.0	61.6	58.5	57.4	69.0	67.8	67.4	68.2	69.5	63.5	62.5	63.0	61.4	62.0	61.6	62.0	61.6	62.0	61.6	62.0

Remarks:

MAA checked against Weston 772
 Bias All Tubes 290V
 3rd PA Rev. Sec. 19.9 - 20.2
 2nd " " " 19.8 - 20.1

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day	FRI ^o								Date	8-1-58							
Signatures	K-HP-LWH								Fl. Meter Hours	94198							
2nd PA Bal. Div	72								3rd PA Bal. Div.	28							

Type Tube	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A
Serial #	420360	417703	4106064	K-106062	423258	423261	4106044	436100							
Trans. Pos'n	2PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA
Tube Position	1	2	1	2	3	4	5	6							
Fl. Volts(Meter)	20.0	20.5	20.0	20.5	20.0	20.5	20.0	20.5	20.0	20.5	20.0	20.5	20.0	20.5	20.0
Fl. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9
Fl. Cur. Amps.	60.4	61.0	60.4	61.2	68.5	67.6	65.8	66.6	61.6	63.6	61.4	63.0	68.6	69.8	68.8

Remarks: MIA CHD AGAINST WESTON 772
BIAS ALL TUBES 290V
3RD PA REV. SW 19.9V - 20.2V
2ND PA REV. SW 19.8V - 20.1V

Day	FRI ^o								Date	8-29-58							
Signatures	K-HP-JC								Fl. Meter Hours	94808							
2nd PA Bal. Div	72								3rd PA Bal. Div.	28							

Tube Pos'n	2PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA
Type Tube	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A
Serial #	420360	417703	K106064	K106062	423258	423261	4106044	436100							
Transm. Pos'n	1	2	1	2	3	4	5	6							
Fl. Volts(Meter)	20.0	20.5	20.0	20.5	20.0	20.5	20.0	20.5	20.0	20.5	20.0	20.5	20.0	20.5	20.0
Fl. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9
Fl. Cur. Amps.	60.8	61.0	60.9	61.0	67.5	68.6	66.8	67.9	62.6	63.4	61.5	63.0	68.6	69.8	69.0

Remarks: MIA CHECKED VS WESTON 772
BIAS ALL TUBES 290V
3RD PA REV. SW 19.9V - 20.2V
2ND " " " 19.8V - 20.1V

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day Fri^o
Signatures AP-CJK
2nd PA Bal. Div 72

Date 9-26-58
Fil. Meter Hours 85520
3rd PA Bal. Div. 28

Type Tube	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A
Serial #	423258	423261	K10664	K10662	H3-6091	H3-6100	1106044	K10668
Trans. Pos'n	2 PA	2 PA	3 PA	3 PA	3 PA	3 PA	3 PA	3 PA
Tube Position	1	2	1	2	3	4	5	6
Fil. Volts(Meter)	20.5	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	61.6	62.4	61.4	62.2	65.5	66.5	67.1	69.6

Remarks:

MPA CHECKED AGAINST WESTON 772
BIAS ALL TUBES 290V
3RD PA REV. SW 19.9 - 20.2
2ND " " " 19.8 - 20.1

Day Fri^o
Signatures D.J.C.-qk
2nd PA Bal. Div 72

Date 10-31-58
Fil. Meter Hours _____
3rd PA Bal. Div. 28

Tube Pos'n	2 PA	2 PA	3 PA	3 PA	3 PA	3 PA	3 PA	3 PA
Type Tube	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A
Serial #	423258	423261	K10664	K10662	H3-6091	H3-6100	1106044	K10668
Transm. Pos'n	1	2	1	2	3	4	5	6
Fil. Volts(Meter)	20	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts(Tube)	19.9	20.1	19.8	20.1	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	61.8	62.6	61.2	62.0	67.9	68.8	66.4	67.5

Remarks:

MPA CHECKED AGAINST WESTON 772
BIAS ALL TUBES 290V
3RD PA REV. SW 19.9 - 20.2V
2ND " " " 19.8 20.1V

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day FRI Date 11-28-58
 Signatures AP+QR Fil. Meter Hours 77003
 2nd PA Bal. Div 72 3rd PA Bal. Div. 28

Type Tube	342-A		342-A		342-A		342-A		342-A		342-A		342-A	
Serial #	423258	423261	1106664	1106662	436091	436100	1106674	1106668						
Trans. Pos'n	2ND PA		2ND PA		3RD PA		3PA		3PA		3PA		3PA	
Tube Position	1		2		1		2		3		4		5 6	
Fil. Volts(Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	61.0	61.9	60.6	61.2	67.6	68.6	66.4	67.2	69.8	70.8	65.3	69.5	68.6	69.5

Remarks: M.A. checked against Weston 77A
Bias all tubes 290V
3RD PA REV. SW 19.9v 20.2v
2ND PA REV. SW 19.8v 20.1v

Day FRI Date 1-2-59
 Signatures AP-QK-JC Fil. Meter Hours 77828
 2nd PA Bal. Div 72 3rd PA Bal. Div. 28

Tube Pos'n	1		2		3		4		5		6	
Type Tube	342-A		342-A		342-A		342-A		342-A		342-A	
Serial #	423258	423261	1106664	1106662	436091	436100	1106674	1106668				
Transm. Pos'n	2ND		2ND		3RD		3RD		3RD		3RD	
Fil. Volts(Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	61.5	62.2	60.0	61.0	67.3	68.4	65.5	66.5	69.5	70.4	68.5	69.2

Remarks: M.A. checked vs Weston 772
Bias all tubes 290V
3RD PA REV SW 19.9 - 20.2v
2ND PA " " 19.8 20.1v

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day FRI Date 1-30-59
 Signatures AC-TC Fil. Meter Hours 98187
 2nd PA Bal. Div 28 3rd PA Bal. Div. 28

Type Tube	342A	342A	342A	342A	342A	342A	342A	342A	342A
Serial #	42325	42326	K10664	K10662	M3091	M3010	K10674	K10662	
Trans. Pos'n	2PA	2PA	3PA	3PA	2PA	2PA	3PA	3PA	
Tube Position	1	2	1	2	3	4	5	6	
Fil. Volts(Meter)	20	20	20	20	20	20	20	20	20
Fil. Volts(Tube)	19.6	20.1	19.6	20.1	19.9	20.2	19.9	20.2	19.9
Fil. Cur. Amps.	66.1	66.2	66.0	66.0	65.9	66.5	65.1	66.1	66.2

Remarks: MAA CHECKED VS WESTON 770-
BITS ON ALL TUBES 290V
3RD PA REV. SW. 19.9V - 20.2V
2ND PA REV. SW. 19.8V - 20.1V

Day FRI Date 2-21-59
 Signatures IC-FF-4K Fil. Meter Hours 99148
 2nd PA Bal. Div 72 3rd PA Bal. Div. 38

Tube Pos'n	1	2	1	2	3	4	5	6
Type Tube	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A
Serial #	42325	42326	K10664	K10662	M3091	M3010	K10674	K10662
Transm. Pos'n	2PA	2PA	3PA	3PA	3PA	2PA	3PA	3PA
Fil. Volts(Meter)	20	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	66.1	66.2	66.0	66.0	65.9	66.8	65.0	66.2

Remarks: MAA CHECKED VS WESTON 770-
BITS ALL TUBES 290V
3RD PA REV. SW 19.9 - 20.2V
2ND PA " " 19.8 - 20.1V

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day 3-27-59
Signatures EF+SW
2nd PA Bal. Div 12

Date 3-27-59
Fil. Meter Hours 99808
3rd PA Bal. Div. 28

Type Tube	342A		342A		342A		342A		342-A		342-A		342-A		342-A	
Serial #	423258		423261		K106064		K106062		H36091		H36100		K106074		K106068	
Trans. Pos'n	2PA		2PA		3PA		3PA		3PA		3PA		3PA		3PA	
Tube Position	2		1		2		1		3		4		5		6	
Fil. Volts(Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	59.0	60.0	60.0	61.0	65.0	66.0	66.0	67.0	68.0	69.0	67.0	68.0	67.0	68.5	67.0	68.0

Remarks: MIA CHECKED VS WESTON 772

BIAS ALL TUBES 290V
3RD PA REV. SW. 19.9 - 20.2
2ND " " " 19.8 - 20.1

Day 3-1-59
Signatures EF-JC
2nd PA Bal. Div 72

Date 3-1-59
Fil. Meter Hours 651
3rd PA Bal. Div. 29

Tube Pos'n TYPE	342-A		342-A		342-A		342-A		342-A		342-A		342-A		342-A	
Type Tube SERIAL#	H23259		H23261		K106064		K106062		H36091		H36100		K106074		K106062	
TRANS. POS'N	2PA		2PA		3PA		3PA		3PA		3PA		3PA		3PA	
Serial #	2		1		2		1		3		4		5		6	
Trans. Pos'n	2		1		2		1		3		4		5		6	
Fil. Volts(Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts(Tube)	19.7	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	59.0	60.0	60.0	61.0	64.0	65.0	65.0	66.0	67.5	68.5	66.0	67.0	67.0	68.0	66.0	67.0

Remarks: MIA CHECKED VS WESTON 772

BIAS ALL TUBES 290V
3RD PA REV. SW. 19.9 - 20.2
2ND " " " 19.8 - 20.1

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day FRI 5-29-59 Date 5-29-59
 Signatures EF+JC Fil. Meter Hours 0457
 2nd PA Bal. Div. 72 3rd PA Bal. Div. 28

Type Tube	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A
Serial #	423258	K106062	M36090	K106064	M36091	M36100	L106074	K106068	
Trans. Pos'n	2PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA
Tube Position	1	2	1	2	3	4	5	6	
Fil. Volts (Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20
Fil. Volts (Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9
Fil. Cur. Amps.	57.8	60.4	62.8	63.8	68.4	69.2	63.8	64.6	66.0

Remarks: MAA chd vs WESTON #772
 BIAS ALL TUBES 290V
 3RD PA REV. SW. 19.9 - 20.2V
 2ND. " " " 19.8 20.1V

Day FRI 7-3-59 Date 7-3-59
 Signatures EF-JC Fil. Meter Hours 02117
 2nd PA Bal. Div. 72 3rd PA Bal. Div. 28

Tube Pos'n	2PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA
Type Tube	342A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A
Serial #	423258	K106062	M36090	K106064	M36091	M36100	L106074	K106068	
Transm. Pos'n	1	2	1	2	3	4	5	6	
Fil. Volts (Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20
Fil. Volts (Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9
Fil. Cur. Amps.	60.0	61.0	63.0	64.0	69.0	70.0	63.0	64.0	66.0

Remarks: MAA chd vs WESTON #772
 BIAS ALL TUBES 290V
 3RD PA REV. SW 19.9 - 20.2V
 2ND " " " 19.8 20.1V

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day FRI Date 10-2
 Signatures IC-EE-GK Fil. Meter Hours 24263
 2nd PA Bal. Div 72 3rd PA Bal. Div 88

Type Tube	342-A		342-A		342-A		342-A		342-A		342-A		342-A	
Serial #	123258		K-10-6062		436090		4116084		436091		436100		4-10-6074	
Trans. Pos'n	2PA		2PA		3PA		3PA		3PA		3PA		3PA	
Tube Position			2		1		2		3		4		5	
Fil. Volts(Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	59.0	57.8	61.8	62.8	67.8	68.6	68.2	69.5	65.0	66.0	64.2	65.4	63.6	64.8

Remarks:

Day FRI Date 10-30
 Signatures EF+JC Fil. Meter Hours 04924
 2nd PA Bal. Div 72 3rd PA Bal. Div 78

Tube Pos'n	1		2		1		2		3		4		5		6	
Type Tube	342-A		342-A		342-A		342-A		342-A		342-A		342-A		342-A	
Serial #	423258		K-10-6062		436090		4-11-6084		43-6098		436100		4-10-6074		43-6091	
Transm. Pos'n	2PA		2PA		3PA		3PA		3PA		3PA		3PA		3PA	
Fil. Volts(Meter)	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	59.0	60.0	62.0	62.5	67.0	68.5	67.5	69.0	66.0	67.0	65.0	66.0	65.0	66.0	65.0	66.0

Remarks:

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day FRI Date 11-27-59
 Signatures GH-EF Fil. Meter Hours 05582
 2nd PA Bal. Div 72 3rd PA Bal. Div. 28

Type Tube	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A
Serial #	123258	1176662	M36090	H1-6084	M3-6098	M3-6100	L106674	M3-6091	
Trans. Pos'n	2nd PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA	3PA
Tube Position		2	1	2	3	4	5	6	
Fil. Volts(Meter)	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5
Fil. Volts(Tube)	17.8 20.1	19.8 20.1	19.9 20.2	19.9 20.2	19.9 20.2	19.9 20.2	19.9 20.2	19.9 20.2	19.9 20.2
Fil. Cur. Amps.	58.5 59.8	61.0 61.8	67.5 68.4	68.5 70	66.0 67.0	64 65	64.5 65.4	64.5 65	

Remarks:

Day FRI
 Signatures EF-JC
 2nd PA Bal. Div 72

Date 1/1/60
 Fil. Meter Hours 06409
 3rd PA Bal. Div. 28

Tube Pos'n type	342A	342A	342-A	342-A	342-A	342-A	342-A	342-A
Type Tube Serial	1176662	K-10662	M3-6090	L11-6074	441527	M3-6100	441532	M3-6091
Trans. Pos'n	2nd PA	2nd PA	3PA	3PA	3PA	3PA	3PA	3PA
Tube Position		2	1	2	3	4	5	6
Fil. Volts(Meter)	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5	20 20.5
Fil. Volts(Tube)	17.8 20.1	19.2 20.1	19.9 20.2	19.9 20.2	19.9 20.2	19.9 20.2	19.9 20.2	19.9 20.2
Fil. Cur. Amps.	63.5 65	60 61.5	67 68	68 69	66 67	63 64.5	65 66	63 64

Remarks:

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day Fri Date 1-29-60
 Signatures AK-EF Fil. Meter Hours 67074
 2nd PA Bal. Div 72 3rd PA Bal. Div. 28

Type Tube	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A
Serial #	466074	K106062	M3-6090	L-1-6084	441527	M3-6100	441532	425796
Trans. Pos'n	2PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA
Tube Position	1	2	1	2	3	4	5	6
Fil. Volts(Meter)	20	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	63.0	64.0	60.4	61.2	67.0	68.0	67.6	68.6

Remarks: HIA Ckd vs WESTON #72
 BIAS ALL TUBES 290 V
 3RD PA REV SW 19.9-20.2 V
 2ND " " " 19.8-20.1 V

Day Fri Date 2-26-60
 Signatures AK-EF-JC Fil. Meter Hours 67736
 2nd PA Bal. Div 72 3rd PA Bal. Div. 28

Tube Pos'n	1	2	1	2	3	4	5	6
Type Tube	342A	342A	342A	342A	342-A	342-A	342A	342A
Serial #	K106074	K106062	M3-6090	L106084	M2568A	441527	441532	425796
Transm. Pos'n	2PA	2P	3PA	3PA	3PA	3PA	3PA	3PA
Fil. Volts(Meter)	20	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	62.2	63.4	59.7	60.5	65.6	66.8	67.6	68.5

Remarks: HIA Ckd vs WESTON #172
 BIAS ALL TUBES 290 V
 2ND PA REV SW 19.85-20.1 V
 3RD " " " 19.9V-20.2V

W O R
OPERATING MANUAL

"Tube Filament Currents"

1st Tuesday

ITEMS 4

Day FRI
Signatures CK-JC
2nd PA Bal. Div 72

Date 4-29-60
Fil. Meter Hours 09220
3rd PA Bal. Div. 28

Type Tube	342-A	342-A	342-A	342-A	342-A	342-A	342A	342A
Serial #	L106074	446183	446183	L116084	425684	441537	441532	425796
Trans. Pos'n	2PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA
Tube Position	1	2	1	2	3	4	5	6
Fil. Volts(Meter)	20.0	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	61.6	62.8	64.0	65.0	64.8	66.0	67.0	68.0

Remarks: MAA Chd vs. WESTON TYPE 772
BIAS ALL TUBES 290 V
3RD PA REV. SW 19.9v - 20.2v
2ND " " " 19.8v - 20.1v

Day FRI
Signatures CK-JC
2nd PA Bal. Div 72

Date 5-27-60
Fil. Meter Hours 09380
3rd PA Bal. Div. 28

Tube Pos'n	2PA	2	1	2	3	4	5	6
Type Tube	342-A	342-A	342-A	342-A	342-A	342-A	342-A	342-A
Serial #	L106074	436090	446183	L116084	425684	441537	441532	425796
Transm. Pos'n	2PA	2PA	3PA	3PA	3PA	3PA	3PA	3PA
Fil. Volts(Meter)	20	20.5	20	20.5	20	20.5	20	20.5
Fil. Volts(Tube)	19.8	20.1	19.8	20.1	19.9	20.2	19.9	20.2
Fil. Cur. Amps.	65.8	66.5	64.5	65.5	65.3	66.0	65.6	66.5

Remarks: MAA Chd vs. WESTON #772
BIAS ALL TUBES 290 V
3RD PA REV. SW 19.9 - 20.2 V
2ND " " " 19.8 20.1 V

W O R
OPERATING MANUAL

"50 KW Trans. & Ant. Equip. Maint."

BOOK No. (7)

SEC. No. (C)

PAGE No. (18)

1ST TUESDAY

ITEM 5

(a) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Front of this Unit, open Glass Front Window proceed to Measure the Bias Voltage at Grid Terminal on Tube "V2F".

To get Bias Voltage with Transmitter Enclosure Door open, Put "ON" Switch "D17P". Switch "D17P" is mounted on the end of "High Voltage Grounding Switch and Door Interlock Mechanism".

To get Bias Voltage with Glass Front Window Open use a short Test Lead fitted with Battery Clips, and connect Terminals #8 and #11 on "2nd Power Amplifier Tube Unit" #4 (F) Shorting Window Switch "D2F".

When available, use the Weston Model 45 DC Voltmeter, if not available, use Jewell Model 171, or other Type D.C. Voltmeter.

These meters are kept in the "Portable Fuse and Test Unit" in the Transmitter Room, as well as in the "Measuring Bench" in the Basement.

This is performed directly after Item #4 (h) is completed, but occasion may arise when the Supervisor may order Item #4 (a) to (h) not to be performed.

If so, this Item is to be done directly after taking 50 KW Transmitter Carrier "OFF" the Air, (1650 Volt Rectifier "OFF", and 17,000 Volt Rectifier "OFF"), but prior to shutting down the Rotating Machinery.

1st Technician to proceed to the Front of the "Control Unit" and adjust "Bias Generator Rheostat" "R18A" to read exactly 300 volts on "Bias Voltage" Voltmeter "M2A".

2nd Technician to connect measuring Leads to the 0 to 300 Volt Terminals of the Model 45 Voltmeter.

Set Voltmeter on Portable Maintenance Table, connect the Voltmeter Positive Prod to a good "Ground" and connect the Voltmeter Negative Prod to the Grid Terminal on the Tube.

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1st Technician to adjust "Bias Generator Rheostat" "R18A" until Model 45 Voltmeter at the Tube Grid Terminal and "Ground" reads exactly 300 Volts; 1st Technician to note what reading is on "Bias Voltage" Voltmeter "M2A".

This is done to check the amount or error in "Bias Voltage" Voltmeter "M2A" caused by Flash-arcs and Arc-backs.

Always operate 50 KW Transmitter with Bias Voltage Voltmeter "M2A" reading whatever value will provide exactly 300 volts at 2nd and 3rd Power Amplifier Tube Grid to "Ground" Terminals.

If reading on "Bias Voltage" Voltmeter "M2A" differs from the reading of 300 Volts at Grid Stems of tubes in 2nd and 3rd Power Amplifier Units, enter this information on the "50 KW M.O.L."

Use of Hickok Voltmeter in measuring Bias Voltage is same as described in Item #4 (e). Leave Switch "D17P" "ON".

Close Glass Front Window.

Remove Test Lead from Terminals No. 8 and No. 11 on "2nd Power Amplifier Tube Unit" #4 (F), thus removing short from Window Switch "D2F".

(b) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Front of this Unit, open the Glass Front Windows and measure the Bias Voltage at Grid Terminal on Tubes "V2H" - "V4H" and "V6H".

Procedure same as Item #5 (a) except that in order to get Bias Voltage with Window open use short Test Lead fitted with Battery Clips and connect Terminal No. 23 to No. 24 on "3rd Power Amplifier Tube Unit" #6 (H), Shorting Window Switch "D1H".

(c) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit and measure the Bias Voltage at Grid Terminal on Tube "V1F".

Procedure same as Item No. 5 (a).

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(d) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit and measure the Bias Voltage at Grid Terminal on Tubes "V1H" - "V3H" and "V5H".

Procedure same as Item 5 (a).

Put "OFF" Switch "D17P".

Remove Test Lead from Terminals #23 and 24 on "3rd Power Amplifier Tube Unit" #6 (H).

Observe that "Bias Voltage" Voltmeter "M2A" is reading ZERO.

Enter Bias Voltage Measurements on Form "Tube Filament Currents",

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ITEM 6.

(a) "Switch Room": Proceed to this room and put "OFF" Switch #2, "50 KW Distribution Oil Circuit Breaker" for SAFETY REASONS.

Merely Grasp handle of this Oil Circuit Breaker and lift it up.

(b) "Basement": While in the Basement put "OFF" Switch "DIP" - "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.

Remove Wood "Preventer" from between operating handle and overload Tripping Lever, then grasp Handle of O.C.B. and lift it up.

(c) "Control Unit" #1 (A): Proceed to Rear of this Unit and put "OFF" "Safety Switch" - "DLA" for SAFETY REASONS.

(d). "Control Unit" #1 (A): Proceed to space directly behind Main Panel of this Unit and clean Armature and Contacts of Rheostats "R16A" - "R17A" - "R18A" and "R19A".

Inspect all Connections to Rheostats "R16A" - "R17A" - "R18A" and "R19A".

Inspect resistors in series with Rheostats "R16A" and "R18A".

Thoroughly Vacuum Clean equipment and floor adjacent to Rheostats "R16A" - "R17A" "R18A" and "R19A".

Clean Armatures and Contacts of Rheostats with Crocus Cloth.

While it is desirable to use Crocus Cloth for this work, it may be necessary to use "00" Sand Paper to clean severely worn or rough contacts; finally finishing off with Crocus Cloth.

Wipe off Dust from Entire Rheostat, Contacts and all.

Wipe Residue off Rheostat Armature and Contacts with a rag dampened in Carbon-tet.

Lightly coat Armatures and Contacts with "Walscolube", kept in Transfile #44.

Tighten Armature Locking Bolts.

Check all connections to Rheostats.

Inspect Fixed Resistors in Series with Rheostats.

Measure same if excessive discolorations, cracking, chipping or pitting warrants it.

Renew Series Resistors if not within safe operation tolerances.

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Spare 50 KW Transmitter Resistors are kept in Transfile #68, 69, 70, and 71. When Voltage Reading controlled by a given Rheostat is erratic or unsteady, it may be necessary to clean contacts or armature a second time, or lightly coat with "Walscolube".

Do not confuse variations in voltage or current readings caused by Generator Fluctuations or Public Service Line Variations with those caused by dirty Rheostat Contacts, Armatures or other Rheostat troubles.

Smooth operation of Rheostat may be checked with Weston Model #663 or Model #772 Analyzer, after disconnecting one lead to Rheostat.

(e) "17 KV Rectifier Unit" #10 (C): Proceed to this Unit and Clean Armature and Contacts of Rheostat "R7C".

Inspect all connections to Rheostat "R7C".

Thoroughly Vacuum Clean Equipment and floor adjacent to Rheostat "R7C".

Procedure same as Item #6 (d).

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ITEM 7.

(a) "3rd Power Amplifier Tuning Unit" #7 & 8 (I): Proceed to the Rear of this Unit, open Enclosure door, clean all equipment and check all connections.

In cleaning equipment, start at the top and clean down toward the Floor, finally wiping up the Copper Floor with a clean cloth slightly dampened with Water.

Wipe off Wood Form of Inductance Coil "L1I" with a clean dry cloth.

Polish "L1I" Tuning Coil with Noxon Metal Polish, exercising care to wipe off all excess dry polish.

Remove and then, Polish with Noxon all "L1I" Inductance Clips, exercising care to return clips to marked positions on Coil turns from which same were removed to clean.

Polish all Cadmium plated metal busses, strips, and plates with Noxon Metal Polish.

Wipe off all condenser cases with rag dampened in Carbon-tet.

Tighten all Wire connections, Bolts, Nuts and Busses to all Parts.

Where busses are bolted together at a Stand-off Insulator, exercise care not to strip Threads on Insulator.

(b) "3rd Power Amplifier Tuning Unit" #8 (I): Proceed to the Front of this Unit, open 2 Metal Front Doors, clean all equipment and check all connections.

Inspect Bakelite and Wood forms of Harmonic Shunt Coils "L2I" and "L8I" for evidences of OVERHEATING.

Burn marks, charred areas, hot connections are evidences of OVERHEATING.

Scrape away any Burned areas with a Knife or sharp edge of file.

All partially charred or burned Bakelite must be removed, or this condition will continue until a FIRE RESULTS, doing DAMAGE TO EQUIPMENT.

Clean all equipment, starting at the Tops of Sections and cleaning down toward the Floor, finally wiping up Floor with Cloth slightly dampened in Water.

Wipe off Condenser Cases with Cloth dipped in Carbon-tet.

Tighten all Wire Connections, Bolts, Nuts, and Busses to all Parts.

Enter all repairs made to equipment, on the "50 KW M.O.L."

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(a) "2nd Power Amplifier Tube Unit #4 (F): Proceed to this Unit and clean rear and front Tubes "V1F" and "V2F" respectively.

Wipe off the Metal parts with a Rag dampened in Carbon-tet.

Wipe off Glass Envelopes of Tubes, using Clean Cloth dampened with water, then wipe off with Clean Dry Cloth.

If this is insufficient to clean the Glass envelope of tubes, apply a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Cloth, polishing Glass to high Lustre.

When Transmitter is started, observe the condition of the Glass, and if Lint is present, clean off with Clean Dry Cloth.

If this is not the Remedy, use Skin of hand, which will attract Lint, since it discharges the Static Electricity on Glass, originally accumulated from Dry Cloth.

The small amount of remaining Lint may be Blown off the Glass.

In cleaning Glass envelope of tubes, exercise Caution, not to scratch.

Do Not Wear a Ring while cleaning or polishing the Power Amplifier Tubes.

Always be sure to take a Clean New Cloth when Cleaning or polishing Power Amplifier Tubes.

(b) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to this Unit and clean Rear Tubes "V1H" "V3H" "V5H" and front Tubes "V2H" "V4H" "V6H".

Procedure same as Item #8 (a).

(c) "Control Unit" #1 (A): Proceed to this Unit and clean 1650 Volt Rectifier Tubes and sockets positions #1 to #6 inclusive.

Wipe off Tube Glass envelopes with a Rag Dampened in Water, then dry off with Clean Dry Cloth.

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If this is insufficient to clean the Glass Envelope of tubes, apply a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Cloth, polishing Glass to High Lustre.

Wipe off the Bakelite Socket with Clean Dry Cloth.

(d) "Oscillator-Modulator Unit" #2 (D): Proceed to this Unit, Clean Tubes and Sockets positions "V1Y" "V2Y" "V1D" "V2D" "V3D" "V4D" "V5D".

Procedure for "V1Y" and "V2Y": Proceed to Front of this Unit, and clean 2 Type 27L-A Tubes in Crystal Oscillator, Type 700-A Boxes #1 and #2.

Wipe off tube Glass envelopes with Rag dampened in Water, then dry off with Clean Dry Cloth.

If this is insufficient to clean the Glass Envelope of tubes, apply a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Cloth, polishing Glass to High Lustre.

Procedure for "V1D" "V2D" "V3D" "V4D" "V5D":. Ascertain if each of these Tubes is in its socket properly.

Gently push down on Tube to "FEEL IF FILAMENT, PLATE AND GRID Tube Prongs are resting against socket Prong Properly".

Check Tension of Socket Prongs, which should be sufficient to hold Socket Prong tightly against Tube Prong, this Providing GOOD ELECTRICAL CONNECTION.

If Tension is insufficient, (as evidenced WHEN 1650 VOLTS IS APPLIED BEFORE OR AFTER SHUT DOWN, Overheating of Prongs, or variations in Tube Currents when Tube is pushed down in Socket,) increase same by Lifting Socket Prong upward Slightly.

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CAUTION: Do not adjust tension of Socket Spring Contacts with Transmitter Rotating Equipment "ON", use "Tube Change Switch" "D3A", pushing same "OFF" to stop all rotating machinery while this adjustment is made, or during period when Transmitter is completely shut down.

Exercise care in bending Socket Prongs, so as not to break same. Wipe off tube Glass Envelopes with rag dampened in Water, then dry off with Clean Dry Cloth.

If this is insufficient to clean the glass envelope of tubes, apply a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Cloth, polishing Glass to High Lustre.

(e) "1st Power Amplifier Unit" #3 (E): Proceed to this unit, Clean Tubes and Socket Positions "V1E" and "V2E".

Procedure same as Item 8 (d) except Tubes are not removed from sockets and prongs are not inspected for overheating.

(f) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to this unit, Clean Tubes and Sockets Position "V7H".

Procedure is same as Item #8 (d) except Tube is not removed from socket and Prongs are not inspected for overheating.

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(g) "3rd Power Amplifier Tuning Unit" #8-(I): Proceed
to this Unit, Clean Tube and Socket Position "VII".

Procedure same as Item #8 (d) except Tube is not removed from
socket and prongs are not inspected for overheating.

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(a) "Control Unit" #1 (A): Proceed to the Rear of this Unit, feel and at the same time inspect Condensers "C1.1A" - "C1.2A" - "C1.3A" - "C1.4A" - "C1.5A" - "C1.6A" - "C2.1A" - "C2.2A" - "C3.1A" - "C3.2A" - "C4.1A" - "C4.2A" - "C5.1A" and "C6A" for OVERHEATING.

Feel Tops and Sides of Metal Cases for OVERHEATING.

Feel Insulating Bushings on Tops of these Condensers for OVERHEATING.

Inspect Cases and Insulator Bushings for Breakage and Oil Leakage.

(b) "1st Power Amplifier Unit" #3 (E): Proceed to the rear of this Unit, open Enclosure Door, feel and inspect Condensers "C1E" - "C2E" - "C5E" - "C6E" - "C7E" - "C8E" for OVERHEATING.

Use AC Extension Light to locate and check Condensers.

Feel Tops and Sides of Metal Cases of Mica Condensers for OVERHEATING and Leakage of Insulating Compound.

Feel Metal End Plates and Isolantite Cases of Cornell-Dubilier Condensers for Overheating and Leakage of Insulating Compound.

Observe if Four Counter Sunk Screws in the Top End-Plates of Cornell Dubilier Condensers are all the way in or partly unscrewed.

CAUTION: DO NOT TURN ANY OF THESE FOUR COUNTER SUNK SCREWS IN THE END PLATES OF DUBILIER CAPACITORS, AS THIS WILL ALTER THE CAPACITY.

Report same on the "50 KW M.O.L."

Note on the "50 KW M.O.L." any Condensers that have excessively warm or Hot Spots. BEWARE of this "Spotty" Condition since this indicates a Capacitor Going Bad.

With a Rag lightly dampened with Naptha, clean all Isolantite Cases of Condensers.

(c) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit, feel and at the same time inspect Condensers "C1F" - "C2F" - "C3F" - "C4F" and "C6F" for OVERHEATING.

Procedure same as Item #9 (b).

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Use "Shorting Stick" and short across the End-Plates (The 2 Connections) and then feel and inspect Condensers "C7.1F" - "C7.2F" - "C8.1F" - "C8.2F" - "C9.1F" - "C9.2F" - "C10.1F" - "C10.2F" for OVERHEATING.

Procedure same as Item #9 (b).

Leave Enclosure Door Open.

(d) "2nd Power Amplifier Tuning Unit" #5 (G): Proceed to the Rear of this Unit, open Enclosure Door, feel and inspect Condensers "C1.1G" - "C1.2G" - "C1.3G" - "C1.4G" - "C1.5G" - "C2.1G" - "C2.2G" - "C2.3G" - "C2.4G" - "C2.5G" - "C3G" and "C4G" for OVERHEATING.

Procedure same as Item #9 (b).

Leave Enclosure Door Open.

Use the Small Step Ladder to reach the Outside Top of Enclosure, feel and inspect Condensers "C7G" and "C8G" for OVERHEATING.

Procedure same as Item #9 (b).

(e) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit, feel and inspect Condensers "C2H" - "C3.1H" - "C3.2H" - "C4.1H" - "C4.2H" - "C5.1H" and "C5.2H" for OVERHEATING.

Procedure same as Item #9 (b).

Use "Shorting Stick" and short across the End-Plates (The 2 Connections) and then Feel and Inspect Condensers "C6.1H" - "C6.2H" - "C7.1H" - "C7.2H" - "C8.1H" - "C8.2H" - "C9.1H" - "C9.2H" for OVERHEATING.

Procedure same as Item #9 (b).

(f) "3rd Power Amplifier Tuning Unit" #7 & #8 (I): Proceed to the Rear of this Unit, open Enclosure Door, feel and inspect Condensers "C1.1I" - "C1.2I" - "C1.3I" - "C2.1I" - "C2.2I" - "C2.3I" - "C3.1I" - "C3.2I" - "C3.3I" - "C4.1I" - "C4.2I" - "C4.3I" - "C10.1I" - "C10.2I" - "C11.1I" - "C11.2I" - "C12.1I" - "C12.2I" - "C12.3I" - "C12.4I" - "C12.5I" - "C16I" for OVERHEATING.

Procedure same as Item #9 (b).

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Leave Enclosure Door Open.

(g) "3rd Power Amplifier Tuning Unit" #8 (I): Proceed to the Front of this Unit, open the Metal Panel #2, feel and inspect Condensers "C17I" - "C18I" - "C19I" - "C20.1I" - "C20.2I" - "C21I" for OVERHEATING.

Procedure same as Item #9 (b).

Leave Enclosure Door Open.

On the Front of this Unit, open the Metal Panel #3, feel and inspect Condensers "C7.1I" - "C7.2I" - "C13.1I" - "C13.2I" for OVERHEATING.

Procedure same as Item #9 (b).

(h) "Antenna Coupling Unit" #9 (J): Proceed to this Unit, open Enclosure Door, feel and inspect Condensers "C1.1J" - "C1.2J" - "C1.3J" - "C2.1J" - "C2.2J" - "C2.3J" - "C3.1J" - "C3.2J" - "C3.3J" - "C4.1J" - "C4.2J" - "C4.3J" and "C4.4J" for OVERHEATING.

Procedure same as Item #9 (b).

Leave Enclosure Door Open.

(i) Units Listed Item #9 (a) to (h): Proceed to these Units listed in this sequence, use the AC Extension Light and tighten all Bolted Connections.

In some instances, it will be found that Condensers are bolted to Support Insulators, and that these Bolts also connect Two busses together.

In this work, exercise CARE NOT TO BREAK OR CHIP Threaded Bolt Hole in End of Stand-off Insulator, which will cause LOOSE BOLTED CONNECTION OF BUSES.

Inspection will show that some of these Insulators do not have Metal Ends, but that Threaded Holes are in the Isolantite itself.

DO NOT TIGHTEN SUCH BOLTS TOO MUCH - DO NOT JERK.

At the same time, feel Filament Connections of Water-Cooled Power Amplifier Tubes for OVERHEATING.

These Connections are Normally Warm but NOT HOT.

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(a) "Switch Room": Proceed to this Room and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS.

(b) "Control Unit" #1 (A): Proceed to the Rear of this Unit, put "OFF" "Safety Switch" "D1A", open hinged door and feel Fuses "F1.1A" - "F1.2A" - "F1.3A" "F2.1A" - "F2.2A" - "F3.1A" - "F3.2A" - "F4.1A" - "F4.2A" for OVERHEATING.

Be sure to rotate Fuses in their Holders, since Burned Spots may be on Lower Sides, or sides toward the Panel.

Fuses normally run Warm but Not Hot.

Technician should be able to keep hand on fuses when checking same.

Replace any Fuse showing a burned or OVERHEATED place on Insulated Body of same.

Spare Fuses are located in the "Portable Fuse and Test Unit" kept in the Main Transmitter Room and in the "Fuse Tester Rack" kept in the Basement Areaway at the foot of the Stairs to the Basement.

Fuses should be gripped tightly in Clips and Fuse Block Holders, so that OVERHEATING does not take place at these Connections.

Some Fuses are provided with Compression (Variable) Clamps, to prevent OVERHEATING and assure full voltage and current throughout the Circuit.

Be sure that proper Tension is on these Clamps.

After checking these Fuses, be sure to Close Metal Door and put "Safety Switch" "D1A" - "ON".

(c) "Control Unit" #1 (A): While at the rear of this Unit, feel Fuses "F5A" - "F6A" - "F7A" - "F8A" - "F9A" and "F10A", for OVERHEATING.

Procedure same as Item #10 (b).

Exercise care not to break the single socket holding each Fuse.

(d) "Oscillator-Modulator Unit" #2 (D): Proceed to the rear of this Unit, and feel Fuse "F3D".

Same Procedure as Item #10 (b).

Fuse is located on the Lightning Protective Device Apparatus Panel on bottom

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of the Unit.

(e) "17 KV Rectifier Unit" #10 (C): Proceed to this Unit and feel Fuses "FL.1C" and "FL.2C" for OVERHEATING.

Same Procedure as Item #10 (b).

These Fuses are located on the Metal Panel supporting "Rectifier Air Blast" Relays on bottom of this Unit.

(f) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to this Unit and feel Fuses "F1H" - "F2H" - "F3H" - "F5H" and "F6H" for OVERHEATING.

Same Procedure as Item #10 (b) except that Knife Type fuse clears Panel Sufficiently to observe any Abnormal Condition.

These Fuses are located on the Bakelite Panel just above the Rear Tubes.

(g) "Basement": Proceed to the Basement, put "OFF" Switch "D1P" - "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.

Remove Wood "Preventer" from between Operating Handle and Overload Tripping Lever then grasp Handle of O.C.B. and lift it UP.

(h) "Basement": While in the Basement, put "OFF" Switch "D.1.1P" - "Main Power Disconnect Panel", open Metal Door and feel Fuses "F1.1P" - "F1.2P" - "F1.3P" "F2.1P" - "F2.2P" - "F2.3P" - "F20.1P" - "F20.2" and "F20.3P" for OVERHEATING.

Procedure same as Item #10 (b) except that Knife Type fuses clear the Panel sufficiently to observe for any Abnormal Condition.

Feel Blades and Contacts of Switch "D1.1P" for OVERHEATING.

Technician should be able to lay hand on these parts, they should be Warm not Hot. If Blades or contacts are too hot, tighten up Compression nuts, clean off contacts with Crocus Cloth, wipe with rag dampened in Carbon-tet and lightly coat with "3-in-1" Oil.

After checking Fuses and Switches, put Switch "D1.1P" - "ON".

(i) "Basement": While in the Basement, put "OFF" Switch "D15P" - "Motor Distribution Panel", open Metal Door and feel Fuses "F4.1P" - "F4.2P" - "F4.3P"

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"F5.1P" - "F5.2P" - "F5.3P" - "F7.1P" - "F7.2P" and "F7.3P" for OVERHEATING.

Procedure same as Item #10 (b).

Feel Blades and Contacts of Switch "D15P" for OVERHEATING.

Procedure same as Item #10 (b).

(j) "17 KV Rectifier Switching Unit" #11 (B): Proceed to the Front of this

Unit and test "Delta-Star" Transfer Switch "DLB" for binding.

If the Switch does bind, or does not move freely when placed in the "10 KV" or "17 KV" Positions, coat lightly with "3-in-1" Oil.

If the Switch still binds following this, loosen Compression Nuts and remove Bolts and Compression Washers from the "Swingers", pulling the "Swingers" free from rest of Switch.

Clean the "Swinger" contact surfaces with Crocus Cloth, wipe off with Rag dampened with Carbon-tet.

Wrap a piece of Crocus Cloth around Narrow Flat File and clean inside of Switch Contacts, then wrap Rag dampened in Carbon-tet about the File and wipe Residue from Switch Contacts.

Put Switch back together again, replace Bolts, Compression Washers and Nuts, tightening them JUST ENOUGH TO SEE THE COMPRESSION WASHERS BEGIN TO FLATTEN.

Lightly Coat "Swingers" and Switch Contacts with "3-in-1" Oil and again test for Binding.

Technician should be able to move Switch from one position to the other freely and smoothly.

Wipe up all Copper dust and other Residue from floor and section where Switch was cleaned.

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End Item 10.

ITEM 11.

(a) "Switch Room": Proceed to this Room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS.

Merely grasp the Handle of the Oil Circuit Breaker and lift it up.

(b) "Basement": While in the Basement, put "'OFF" Switch "D1P" - "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.

Remove the Wood " Preventer" from between Operating Handle and Overload Tripping Lever, then grasp handle of O.C.B. and lift it up.

(c) "Control Unit" #1 (A): Proceed to the Rear of this Unit and feel Field Coils of Relays "S2A" - "S3A" - "S1A" and "S11A" for OVERHEATING.

These Relays are located in top rear of this Unit, mounted on a Metal Sub-Panel.

These Relay Field Coils will normally run WARM, but NOT HOT.

Technician should be able to keep Hand on them.

Log any that are excessively Warm or Hot on the "50 KW M.O.L."

While at the rear of this Unit, open Door of Metal Box housing Relay "S1A" and feel Field Coil for OVERHEATING.

Procedure same as Item #11 (c).

Close Door of Metal Box housing Relay "S1A".

While at the Rear of this Unit, Put "OFF" the Series Switch on "1650 Volt Magnetic Switch Contactor" Metal Box, Open Box and feel this Relay Contactor "S7A" Field Coil for OVERHEATING.

Procedure same as Item #11 (c).

Close Door of Metal Box and put Series Switch "ON".

(d) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit, use "Shorting Stick" discharge Condensers "C7.1F" - "C7.2F" - "C8.1F" - "C8.2F" - "C9.1F" - "C9.2F" - "C10.1F" - "C10.2F", then feel Field Coils of Relays "S1F2" - "S2F" - "S3F" and "S4F" for OVERHEATING.

Temperature of these Relay Field Coils should be BARELY WARM, in no event higher than Room Temperature.

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ITEM 11.

To discharge Condensers, merely place Metal part of "Shorting Stick" across the two End-Plates of these Condensers.

As Each Condenser is discharged, a moderate Arc will be observed when "shorting stick" first touches the End-Plates.

Log any Relay Field Coils that are excessively Warm or Hot, on the "50 KW M.C.L."

(e) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit, use "Shorting Stick" discharge Condensers "C6.1H" - "C6.2H" - "C7.1H" - "C7.2H" - "C8.1H" - "C8.2H" - "C9.1H" - "C9.2H", then feel Field Coils of Relays "S3H" - "S4H" - "S5H" - "S6H" - "S7H" - "S8H" - "S9H" - "S10H" - "S11H" - "S12H" - "S13H" - "S14H" for OVERHEATING.

Same Procedure as Item #11 (d).

(f) "17 KV Rectifier Tube Unit" #10 (C): Proceed to this Unit and feel Field Coils of Relays "S1C" - "S2C" - "S3C" - "S4C" - "S5C" - "S7C" - "S6C" - "S8C" - "S9C" - "S10C" - "S11C" and "S12C" for OVERHEATING.

Temperature of these Relay Field Coils should be BARELY WARM, in no event higher than Room Temperature.

While at this Unit, open door of Metal Box housing "17 KV Rectifier Air Blast Heater Relay" - "S17C" and feel Field Coil for OVERHEATING.

This Field Coil will run normally Warm not Hot.

Technician should be able to keep hand on it.

If excessively Warm or Hot, Log on the "50 KW M.O.L."

(g) "17 KV Rectifier Switching Unit" #11 (B): Proceed to this Unit and Feel Solenoids of Magnetic Contactors "S4B" and "S5B" for OVERHEATING.

Solenoids of these Contactors run normally VERY WARM, with Temperature distributed evenly around outside of Casings.

Inspections should be made for OVERHEATING, UNEVENLY distribution of Temperature (HOT SPOTS), loose connections, and condition of Insulation covering around Outside of Solenoids.

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ITEM 11.

When Insulating Covering around Solenoids of "S4B" and "S5B" begins to get bare, apply coat of "BLACK INSULATING VARNISH."

On the Bottom of this Unit, feel Field Coils of Relays "S2B" and "S3B" for OVERHEATING.

Log any abnormal Condition and work performed on the "50 KW M.O.L."

(h) "17 KV Filter Condenser Charging Contactor and Resistor Unit" #12 (L):

Proceed to this Unit and feel Solenoid of Magnetic Contactor "S11" for OVERHEATING.

Procedure same as Item #11 (g).

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ITEM 12.

(a) "17 KV Rectifier Unit" #10 (C): Proceed to this Unit, clean both sides of Isolantite Slabs Tube Position "V1C" to "V7C", clean Metal Covers of Relays "S7C" - "S8C" - "S9C" - "S10C" - "S11C" and "S12C".

With a Rag lightly dampened in Naptha clean both sides of Isolantite Slabs, tube positions "V1C" to "V7C" inclusive.

Exercise care not to damage equipment mounted on Slabs while cleaning.

Start at front of Slabs, cleaning from Top to Bottom.

Clean Rear of Slabs, removing Metal Covers or Relays "S7C" to "S12C" inclusive, then cleaning Slabs at points where Covers were Removed.

GENTLY CLEAN ISOLANTITE OPERATING ROD for Relays "S7C" to "S12C" inclusive, with a rag slightly dampened in Naptha.

Exercise care not to damage "Pig-tail" connections on bottom hinges of Isolantite Rods.

Carefully brush off the top and bottom Hinges of Isolantite Operating Rods for Relays "S7C" to "S12C" inclusive, using soft Camel's Hair Maintenance Brush.

Carefully brush off Field Coils of Plate Overload Relays "S1C" to "S6C" inclusive.

Carefully brush off all connections on Isolantite Slabs, using Soft Camel's Hair Maintenance Brush.

Clean covers of "D-Spec" Relays "S7C" to "S12C" and replace over Relays.

(b) "2nd Power Amplifier Tube Unit" #11 (F): Proceed to the rear of this Unit, clean both sides of Isolantite Slabs, tube positions "V1F" and "V2F", clean metal covers of Relays "S3F" and "S4F".

Procedure same as Item #12 (a) except that Anti-sing Choke Assemblies "L5F"

"R7F" - "L6F" - "R4F", Plate Overload Relay Voltage Dropping Resistors "R8F" "R9F" and Field Coils of Plate Overload Relays "S1F" and "S2F" are brushes off with soft Camel's Hair Maintenance Brush.

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ITEM 12.

(c) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit, clean both sides of Isolantite Slabs tube positions "V1H" to "V6H", clean Metal covers of Relays "S9H" - "S10H" - "S11H" - "S12H" - "S13H" and "S14H". Procedure same as Item #12 (a) except that Anti-Sing Choke Assemblies "L4H" - "R2H" - "L6H" - "R4H" - "L8H" - "R6H" - "L5H" - "R3H" - "L7H" - "R5H" - "L9H" - "R7H"; Plate Overload Relay Voltage Dropping Resistors "R8H" - "R9H" - "R10H" - "R11H" - "R12H" - "R13H" and Field Coils of Plate Overload Relays "S3H" - "S4H" "S5H" - "S6H" - "S7H" and "S8H" are brushes off with Soft Camel's Hair Maintenance Brush.

(d) "17 KV Rectifier Unit" #1 O (c): Proceed to this Unit and Test Plate Overload Relays "S1C" to "S6C" inclusive for normal operation directly after Transmitter is Started, but prior to putting Carrier "On" the Air. On morning following cleaning of Isolantite Slabs etc., as per Item No. 12, (a) to (c), after Filament are applied to the Tubes of 50 KW Transmitter, it is the duty of One Technician to test all Tube Plate Overload Relays. First note whether or not Isolantite Operating Rod is Clear and not Binding. If it is Binding, GENTLY LIFT UP Rod and reseal in Hinge. Second, Touch Relay Armature and pressure exerted on same should cause Relay Contacts to open and "Plate Voltage Trip Relay" "S4A" to drop Out, energizing Lockout Relay "S5A". Associated Lamp Indicating Relay should work, extinguishing light. Reset "Lockout Relay" - "S5A" (Turn Knurled adjustment nut counter-clockwise,) and Push "Lamp Reset Key" Switch "D5A". This will assure us all Relays are clear and possible Link between Contacts show up. If contacts of Plate Overload Relays are held open by piece of Lint or dirt, associated Indicator Lamp will remain extinguished, but "S4A" - "Plate Voltage Trip Relay" will "Drop Out" with its back contacts energizing Solenoid of Lockout Relay "S5A".

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In this condition, Plunger of "Lockout Relay" "S5A" will be up with relay notched in position #1, 2, or 3. If notched in Position #3, Red Light over "Lockout Relay" "S5A" will be illuminated, but it will NOT BE POSSIBLE TO RESET "S5A" "Lockout Relay". Remedy is to clean contacts of Plate Voltage Overload Relays "S1C" to "S6C" using "265-B Relay Cleaning Tool" kept in the "Portable Fuse and Test Unit". Make this Inspection and Test VERY CAREFULLY.

Log this Test on reverse of T. & A.E. TALLY SHEET per examples:

Tuesday, March 9, 1943.

3:40 am. - T. & A.E. Item #12 completed, all relays tested OK. - FN.

or

3:40 am. - T. & A.E. Item #12, paragraph #1 completed, all relays tested OK. - Rob.

If not OK, indicate on reverse of T. & A.E. TALLY SHEET the nature of trouble and what was performed to remedy cause.

(e) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit and test Plate Overload Relays "S1F" and "S2F".

Procedure same as Item #12 (d).

(f) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the rear of this Unit and test Plate Overload Relays "S3H" - "S4H" - "S5H" - "S6H" - "S7H" and "S8H".

Procedure same as Item #12 (d).

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ITEM 13.

(a) "Transmitter Room": Go to the "High Voltage Grounding Switch and Door Interlock Mechanism" DL3P" and remove ONE KEY FROM LOCK POSITION No. 2 to No. 5, KEEP ON PERSON UNTIL ALL OF ITEM No. 13 IS COMPLETED, for SAFETY REASONS.

(b) "Switch Room": Proceed to this Room and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS.

Merely grasp the Handle of the Oil Circuit Breaker and lift it up.

(c) "Basement": Proceed to the Basement, and put "OFF" "DIP" - "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.

(d) "Transformer Vault": Proceed to this Vault, clean up all Equipment, inspect all Oil Levels in High Voltage Transformers, then have Porter clean up floor of Vault.

Begin to clean equipment at the top and work toward the Floor.

Wipe off all High Voltage A.C. and D.C. Busses (Lacquered) with clean dry cloth.

Wipe off all Wall Insulators with Rag dampened in Carbon-tet, then polish with Soft Dry Cloth.

Loosen Metal Clamps on two ends of "R5P" 20 KV Voltmeter "M1A" Multiplier, remove the Resistor, wipe off entire Unit with Rag dipped in Carbon-tet.

Polish Cadmium Plated Ends of "R5P" Resistor with "NOXON" Metal Polish, being careful to clean off excess dry Polish with Soft Dry Cloth.

Replace "R5P" Resistor in Metal Mounting Clips and tighten Metal Clamps on ends of "R5P"

Wipe off Entire "Thyrite" "PLP" Buss, Insulator, and Iron Case with Soft Dry Cloth.

If Dry cloth is insufficient to clean insulator, clean it with Rag dampened in Carbon-tet.

Clean and Polish Ball-Gap "G4P" and Brass Support Rods and mounting Nuts with Noxon Metal Polish.

Wipe off excess Polish with Dry Cloth.

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ITEM 13.

If "Noxon" Metal Polish is insufficient to properly clean "G4P" Ball Gap, use "00" Sandpaper.

Use Crocus Cloth.

Polish off with "Noxon" Metal Polish, wiping off excess metal polish.

Be sure the "G4P" Ball Gap is Polished SMOOTH AS SILK, otherwise we will have to renew.

After Cleaning "G4P" Ball Gap measure Spacing, which should be exactly 5/8 on an inch.

Use "Allen Set Screw Wrench" to loosen Locking Nut, set "G4P" Ball Gap to correct spacing and tighten locking Nut.

Special Tool for adjustment of Ball Gap are kpt in Leather Tool Kit "In Portable Fuse and Test Unit."

Wipe off "Varistors" R8P" and "R9P" with clean Dry Cloth.

Wipe off insulators on Transformer "T1P" with Carbon-tet then polish with dry cloth.

Wipe off entire Metal Case of High Voltage Transformer "T1P" (No. 1) with Rag lightly dampened with Carbon-tet.

Wipe off Temperature Indicators and Oil Level Gauge Glasses.

Polish Oil Drain Valve with Noxon Metal Polish.

Proceed to High Voltage Transformer "T2P" (No. 2); High Voltage Transformer "T3P" (No. 3); also Spare 17 KV Transformer, and perform same Maintenance work as performed on Transformer "T1P" (No. 1.)

Wipe with A Dry Cloth the Tops, Fronts, Left and Right Sides of "Carteret and Rahway" - "120 A.C. Volt Emergency Service" Transformers; "115 Volt A.C. Transformers No. 1, No. 2, and No. 3; "230 Volt A.C. Transformers No. 1, No. 2, and

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ITEM 13.

No. 3; "480 Volt A.C. Transformers No. 1, No. 2, No. 3 and Spare.

NOTE: DO NOT WIPE IN THE REAR OF THESE TRANSFORMERS AS THERE IS 4150 VOLTS
A.C. ON TRANSFORMER PRIMARIES AND CONNECTING BUSSES. *Danger*

Inspect No. 1, No. 2, No. 3 and Spare High Voltage Transformer Gauge Glasses for
Proper Oil Level.

Correct Oil Level is even with the mark when Transformer is in use, or shortly
after Load has been removed; this Level will be too low when Transformers have
been idle for an hour or more.

Correct Level then will be one half inch above the Mark on Gauge Glasses.

If Oil Level should be low, report this to Supervisor and enter data on reverse
of the "50 KW M.O.L." *Under I.*

If any Oil should show at the drain Plugs of any other transformer, tighten Plug
Slightly.

Wash with
DO NOT CLEAN HOLE WITH WIRE, wipe it off.

Enter data on reverse of the "50 KW M.O.L." ✓

After work is completed in Transformer Vault, have Porter clean floor behind 17
KV High Voltage Transformers. *Spec. Operations*

Remove the Rug and thoroughly sweep with corn Broom, then Clean and Buff Main
Floor, replacing the Rug Runner. ✓

PORTER IS NOT TO CLEAN BEHIND transformers of "Rahway" and "Carteret" - "120 Volt
Emergency Service"; "115 Volt A.C."; "230 Volt A.C." and "480 Volt A.C." *Danger*

Technician will be the ONLY PERSON TO CLEAN BEHIND THESE TRANSFORMERS, AND ONLY
WHEN DIRECTLY AUTHORIZED TO DO SO. *Danger*

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ITEM 14.

(a) "Control Unit" #1 (A): Proceed to the rear of this Unit and thoroughly clean the floor.

Equipment required to perform this Item will be:

A.C. Extension Light.

Maintenance Kit No. 1 and No. 3.

Clean Rags.

Vacuum Cleaner, brush and nozzle attachments.

Wipe off adjacent Iron Framework and equipment, then clean the Concrete Floor under this Unit with a lightly dampened rag.

Use Vacuum Cleaner with Special Attachment to get dirt from corners, etc.

(b) "Oscillator-Modulator Unit" #2 (D): Proceed to the rear of this Unit and thoroughly clean the floor.

Procedure same as Item No. 14 (a).

(c) "1st Power Amplifier Unit" #3 (E): Proceed to the rear of this Unit and Thoroughly clean the floor.

Procedure same as Item No. 14 (a).

(d) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the rear of this Unit Open Right Metal Door and thoroughly clean the Floor.

Procedure same as Item No. 14 (a).

(e) "2nd Power Amplifier Tuning Unit" #5 (G): Proceed to the Rear of this Unit, and thoroughly clean the floor.

Procedure same as Item No. 14 (a).

(f) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit, and thoroughly clean the floor.

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Procedure same as Item No. 14 (a).

(g) "3rd Power Amplifier Tuning Unit" #7 & #8 (I): Proceed to the Rear of this Unit, open Enclosure Door, and thoroughly clean the Floor.

Procedure same as Item No. 14 (a).

(h) "Antenna Coupling Room" #9 (J): Proceed to this Room, open the Door, polish Inductance Coil "L1J" and "L2J"; Polish Meters "M1J" - "M2J" - "M3J" - "M4J" and "M5J"; check all connections, and thoroughly clean the Floor.

Polish with Noxon All Cadmium plated turns of Inductance Coils "L1J" and "L2J". Remove Inductance Clips From "L1J" and "L2J", polish Coil turns at these points, clean and polish Clips with Noxon Metal Polish, BEING CAREFUL TO REPLACE CLIPS ON THE MARKED PLACES FROM WHICH THEY WERE REMOVED.

TO AVOID ERROR, IT IS BEST TO REMOVE CLIPS ONE AT A TIME, CLEAN, POLISH AND REPLACE ON THE COIL.

Be sure to clean excess Metal Polish from Coil and Isolantite Insulators supporting turns of Inductances.

Wipe off Wood forms of Inductance Coils "L1J" and "L2J" with a dry cloth.

Clean all insulators with rag dampened in Naptha.

Polish Ammeters, "M1J" - "M2J" - "M3J" - "M4J" and "M5J" with Stafford's Polish.

Tighten all Connections.

Clean cases of Condensers "C1.1J" - "C1.2J" - "C1.3J" - "C2.1J" - "C2.2J" - "C2.3J" - "C3.1J" - "C3.2J" - "C3.3J" - "C4.1J" - "C4.2J" - "C4.3J" - "C4.4J".

Polish all Cadmium plated Busses and connector strips on Condensers with Nxon.

Wipe off Copper Busses to Coil "L1J" and "L2J".

CAUTION: If 5 KW Transmitter Carrier is "ON" the Air during performance of this Maintenance Item, STAY AWAY FROM ANTENNA CHANGEOVER SWITCH.

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ITEM 14.

TUNING ADJUSTMENTS - ANTENNA AND TRANSMISSION LINE COUPLING CIRCUITS.

ANTENNA COUPLING ROOM UNIT #9 (J).

"LLJ" - - - - - 10.1 Turns
"L2J" - - - - - 2.9 "
"C1J" - - - - - .0024 MFD.
"C2J" - - - - - .0018 MFD.
"C3J" - - - - - .0018 MFD.
"C4J" - - - - - .002 MFD.

All settings as made, are marked with Red Paint, directly on the Inductance Turns.
The Top 6 turns and bottom 6 turns (End Turns) of Inductance Coil "LLJ" are
shorted.

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ITEM 15.

(a) "17 KV Rectifier Unit" #10 (C): Proceed to this Unit and clean Brass Parts of Rectifier Tube Plate Connector Plugs "PG1C" - "PG2C" - "PG3C" - "PG4C" - "PG5C" - "PG6C" - "PG7C" and large brass Clamping Nuts on fronts of Rectifier Plate Connector Jacks "J1C" - "J2C" - "J3C" - "J4C" - "J5C" - "J6C" and "J7C" with Noxon Metal Polish.

Remove the "PG#C" Plugs, from Terminal Jack clean with Noxon Metal Polish, then wipe off excess Polish with rag dampened in Carbon-tet.

While Plug is removed from Jack, clean brass front of the Jack with Noxon Metal Polish, wiping excess polish off with Rag daupened with Carbon-tet.

After each "PG#C" Plug and Jack is cleaned and polished, replace Plug in Jack, pushing it firmly in place.

Straighten braided connector Plugs so that same are symmetrically in place directly above the Cadmium Plated Hinged Rectifier Tube Plate Connector.

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ITEM 16.

- (a) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to this Unit and clean Rear and Front Tubes "V1F" and "V2F" respectively.
Wipe off the Metal parts with a Rag dampened in Carbon-tet.
Wipe off Glass Envelopes of Tubes, using Clean Cloth dampened with water, then wipe off with Clean Dry Cloth.
If this is insufficient to clean the Glass envelope of Tubes, apply a small amount of "Windex" using the Spray Nozzle on the Bottle.
Wipe off with Clean Dry Cloth, polishing Glass to high lustre.
When Transmitter is started, observe the condition of the Glass and if Lint is present, clean off with Clean Dry Cloth.
If this is not the remedy, use Skin of hand, which will attract Lint, since it discharges the Static Electricity on Glass, originally accumulated from Dry Cloth.
The small amount of remaining Lint May be Blown off the Glass.
In cleaning Glass envelope of tubes, exercise Caution, not to Scratch.
Do Not Wear a Ring while cleaning or polishing the Power Amplifier Tubes.
Always be sure to take a Clean New Cloth when Cleaning or polishing Power Amplifier Tubes:
- (b) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to this Unit and clean Rear Tubes "V1H" "V3H" "V5H" and Front Tubes "V2H" "V4H" "V6H".
Procedure same as Item 8 (a).
- (c) "Control Unit" #1 (A): Proceed to this Unit and clean 1650 Volt Rectifier Tubes and sockets positions #1 to #8 inclusive.
Wipe off Tube Glass envelopes with a Rag Dampened in Water, then dry off with Clean Dry Cloth.

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ITEM 16.

If this is insufficient to clean the glass Envelope of Tubes, a
apply a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Rag, polishing Glass to High Lustre.

Wipe off the Bakelite Socket with Clean Dry Cloth.

(d) "Oscillator-Modulator Unit #2 (D): Proceed to this Unit,

Clean Tubes and Sockets Positions "V1Y" "V2Y" "V1D" "V2D" "V3D" "V4D"
"V5D".

Procedure for "V1Y" and "V2Y": Proceed to Front of this Unit, and
Clean 2 Type 271-A Tubes in Crystal Oscillator, Type 700-A Boxes #1
and #2.

Wipe off Tube Glass envelopes with Rag dampened in Water, then dry off
with Clean Dry Cloth.

If this is insufficient to clean the Glass Envelopes of Tubes, apply
a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Cloth, polishing Glass to High Lustre.

Procedure for "V1D" "V2D" "V3D" "V4D" "V5D": Ascertain if
each of these Tubes is in its socket properly.

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ITEM 16.

Gently push down on Tube to "FEEL IF FILAMENT AND GRID Tube Prongs are resting against socket Prongs Properly".

Check Tension of Socket Prongs, which should be sufficient to hold Socket Prong tightly against Tube Prong, thus providing GOOD ELECTRICAL CONNECTION. If Tension is insufficient, (as evidenced WHEN 1650 VOLTS IS APPLIED BEFORE OR AFTER SHUT DOWN, Overheating of prongs, or variations in Tube Currents when Tube is pushed down in Socket), increase same by Lifting Socket Prong upward Slightly.

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ITEM 16.

CAUTION: Do not adjust tension of Socket Spring Contacts with Transmitter Rotating Equipment "ON", use "Tube Change Switch" "D3A", pushing same "OFF" To Stop all Rotating Machinery while this adjustment is made, or during period when Transmitter is completely shut down. Exercise care in bending Socket Prongs, so as not to break same. Wipe off Tube Glass Envelopes with Rag Dampened in Water, then Dry off with Clean Dry Cloth.

If this is insufficient to clean the Glass Envelope of Tubes, apply a small quantity of "Windex" using Spray Nozzle on the Bottle.

Wipe off with Clean Dry Cloth Polishing Glass to High Lustre.

(e) "1st. Power Amplifier Unit" #3 (E): Proceed to this Unit Clean Tubes and Socket Positions "V1E" and "V2E".

Procedure same as Item #8 (d) except Tubes are not removed from sockets and prongs are not inspected for overheating.

(f) "3rd. Power Amplifier Tube Unit" #6 (H): Proceed to this Unit, Clean Tubes and Sockets Position "V7H".

Procedure is same as Item #8 (d) except Tube is not removed from Socket and Prongs are not inspected for overheating.

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ITEM 16.

(g) "3rd. Power Amplifier Tuning Unit" #8-(I); Proceed

to this Unit, Clean Tube and Socket Position "VLI".

Procedure same as Item #8 (d) except Tube is not removed from Socket
and Prongs are not inspected for overheating.

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ITEM 17.

(a) "Control Unit" #1 (A): Proceed to the Rear of this Unit, feel and at the same time inspect Condensers "C1.1A" - "C1.2A" - "C1.3A" - "C1.4A" - "C1.5A" "C1.6A" - "C2.1A" - "C2.2A" - "C3.1A" - "C3.2A" - "C4.1A" - "C4.2A" - "C5.1A" "C5.2A" and "C6A" for OVERHEATING.

Feel Tops and Sides of Metal Cases for OVERHEATING.

Feel Insulating Bushings on Tops of these Condensers for OVERHEATING.

Inspect Cases and Insulator Bushings for Breakage and Oil Leakage.

(b) "1st Power Amplifier Unit" #3 (E): Proceed to the Rear of this Unit, open Enclosure Door, feel and inspect Condensers "C1E" - "C2E" - "C5E" - "C6E" "C7E" - "C8E" for OVERHEATING.

Use AC Extension Light to locate and check Condensers.

Feel Tops and Sides of Metal Cases of Mica Condensers for OVERHEATING and LEAKAGE of Insulating Compound.

Feel Metal End-plates and Isolantite Cases of Cornell-Dubilier Condensers for OVERHEATING and Leakage of Insulating Compound.

Observe if the Four Counter Sunk Screws in the Top End-plates of Cornell-Dubilier Condensers are ALL THE WAY IN OR PARTLY UNSCREWED.

CAUTION: DO NOT TURN ANY OF THESE FOUR COUNTER SUNK SCREWS IN THE END-PLATES OF DUBILIER CAPACITORS, AS THIS WILL ALTER THE CAPACITY.

Report same on the "50 KW M.O.L."

Note on the "50 KW M.O.L." any Condensers that have excessively Warm or Hot Spots.

BEWARE of this "SPOTTY" Condition since this indicates a Capacitor "Going Bad". With a Rag lightly dampened with Naptha, clean all Isolantite Cases of Condensers.

(c) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this

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Unit, feel and at the same time inspect Condensers "C1F" - "C2F" - "C3F" - "C4F" and "C6F" for OVERHEATING.

Procedure same as Item #17 (b).

Use "Shorting Stick" and short across the End-plates (The 2 connections) and then feel and inspect Condensers "C7.1F" - "C7.2F" - "C8.1F" - "C8.2F" - "C9.1F" - "C9.2F" - "C10.1F" - "C10.2F" for OVERHEATING.

Procedure same as Item #17 (b).

Leave Enclosure Door Open.

(d) "2nd Power Amplifier Tuning Unit" #5 (G): Proceed to the Rear of this Unit, open Enclosure Door, feel and inspect Condensers "C1.1G" - "C1.2G" - "C1.3G" - "C1.4G" - "C1.5G" - "C2.1G" - "C2.2G" - "C2.3G" - "C2.4G" - "C2.5G" - "C3G" and "C4G" for OVERHEATING.

Procedure same as Item #17 (b).

Leave Enclosure Door Open.

Use the Small Step Ladder to reach the Outside Top of Enclosure, feel and inspect Condensers "C7G" and "C8G" for OVERHEATING.

Procedure same as Item #17 (b).

(e) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit, feel and inspect Condensers "C2.1H" - "C3.1H" - "C3.2H" - "C4.1H" - "C4.2H" - "C5.1H" and "C5.2H" for OVERHEATING.

Procedure same as Item #17 (b).

Use "Shorting Stick" and short across the End-plates (The 2 connections) and then feel and inspect Condensers "C6.1H" - "C6.2H" - "C7.1H" - "C7.2H" - "C8.1H" - "C8.2H" - "C9.1H" and "C9.2H" for OVERHEATING.

Procedure same as Item #17 (b).

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(f) "3rd Power Amplifier Tuning Unit" #7 & #8 (I): Proceed to the Rear of this Unit, open Enclosure Door, feel and inspect Condensers "C1.1I" "C1.2I" - "C1.3I" - "C2.1I" - "C2.2I" - "C2.3I" - "C3.1I" - "C3.2I" - "C3.3I" "C4.1I" - "C4.2I" - "C4.3I" - "C10.1I" - "C10.2I" - "C11.1I" - "C11.2I" - "C12.1I" - "C12.2I" - "C12.3I" - "C12.4I" - "C12.5I" - "C16I" for OVERHEATING. Procedure same as Item #17 (b).

Leave Enclosure Door Open.

(g) "3rd Power Amplifier Tuning Unit" #8 (I): Proceed to the Front of this Unit, open the Metal Panel #2, feel and inspect Condensers "C17I" - "C18I" "C19I" - "C20.1I" - "C20.2I" - "C21I" for OVERHEATING. Procedure same as Item #17 (b).

Leave Enclosure Door Open.

On the Front of this Unit, open the Metal Panel #3, feel and inspect Condensers "C7.1I" - "7.2I" - "13.1I" - "C12.2I" for OVERHEATING. Procedure same as Item #17 (b).

Leave Enclosure Door Open.

(h) "Antenna Coupling Unit" #9 (J): Proceed to this Unit, open Enclosure Door, feel and inspect Condensers "C1.1J" - "C1.2J" - "C1.3J" - "C2.1J" - "C2.2J" "C2.3J" - "C3.1J" - "C3.2J" - "C3.3J" - "C4.1J" - "C4.2J" - "C4.3J" and "C4.4J" for OVERHEATING.

Procedure same as Item #17 (b).

Leave Enclosure Door Open.

(i) Units Listed Item #4 (a) to (h): Proceed to these Units listed in this sequence, use the A.C. extension Light and tighten all Bolted Connections.

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ITEM 17.

In some instances, it will be found that Condensers are bolted to support Insulators, and that these Bolts also connect Two Busses together.

In this work, exercise CARE NOT TO BREAK OR CHIP Threaded Bolt Hole in End of Stand-Off Insulator, which will cause LOOSE BOLTED CONNECTIONS OF BUSES. Inspection will show that some of these Insulators do not have Metal Ends, but that Threaded Holes are in the Isolantite itself.

DO NOT TIGHTEN SUCH BOLTS TOO MUCH - DO NOT JERK.

At the same time, feel Filament Connections of Water-cooled Power Amplifier Tubes . for OVERHEATING.

These connections are normally Warm, Not Hot.

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ITEM 13.

(a) "Switch Room": "Proceed to this Room and put "OFF" Switch #2 "50 KW Distribution Oil CBT Breaker" for SAFETY REASONS.

Merely Grasp Handle of the Oil Circuit Breaker and lift it up.

(b) "Control Unit" #1 (A): Proceed to the Rear of this Unit, put "OFF" "Safety Switch" "DIA", open hinged door, and feel Fuses "F1.1A" - "F1.2A" - "F1.3A" - "F2.1A" - "F2.2A" - "F3.1A" - "F3.2A" - "F4.1A" - "F4.2A" for OVERHEATING.

Be sure to rotate Fuses in their Holders, since Burned Spots may be on Lower Sides or sides toward the Panel.

Fuses normally run Warm not Hot.

Technician should be able to keep hand on fuses when checking same.

Replace any Fuse showing a burned or OVERHEATED place on Insulated Body of same.

Spare Fuses are located in the "Portable Fuse and Test Unit" kept in the Maint Transmitter Room and in the "Fuse Tester Rack" kept in the Basement Acreway at the foot of the Stairs to the Basement.

Fuses should be gripped tightly in Clips and Fuse Block Holders, so that OVERHEATING does not take place at these Connections.

Some Fuses are provided with Compression (Variable) Clamps, to prevent OVERHEATING and assure Full Voltage and Current Throughout the Circuit.

Be sure that proper Tension is on these Clamps.

After checking these Fuses, be sure to Close Metal Door, and put "Safety Switch" "DIA" "ON".

(c) "Control Unit" #1 (A): While at the rear of this Unit feel Fuses "F5A" - "F6A" - "F7A" - "F8A" - "F9A" and "F10A" for OVERHEATING.

Procedure same as Item #13 (b).

Exercise Care not to break the single socket holding each Fuse.

ITEM 18.

(d) "Oscillator-Modulator Unit" #2 (D): Proceed to the rear of this Unit, and feel Fuse "F3D".

Same Procedure as Item #18 (b).

Fuse is located on the Lightning Protective Device Apparatus Panel on bottom of the Unit.

(e) "17 KV Rectifier Unit" #10 (C): Proceed to this Unit and feel Fuses "F1.1C" and "F1.2C" for OVERHEATING.

Same Procedure as Item #18 (b).

These Fuses are located on the Metal Panel supporting "Rectifier Air Blast" Relays on bottom of the Unit.

(f) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to this Unit and feel Fuses "F1H" - "F2H" - "F3H" - "F5H" and "F6H" for OVERHEATING.

Same procedure as Item #18 (b) except that Knife Type fuse clears Panel sufficiently to observe any Abnormal Condition.

These fuses are located on the Bakelite Panel just above the Rear Tubes.

(g) "Basement": Proceed to the Basement, put "OFF" Switch "D1P" "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.

Remove the Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of M.C.B and lift it UP.

(h) "Basement": While in the Basement, put "OFF" Switch "D1.1P" "Main Power Disconnect Panel", open Metal Door and feel Fuses "F1.1P"- "F1.2P" - "F1.3P" - "F2.1P" - "F2.2P" - "F2.3P" - "F20.1P" - "F20.2P" and "F20.3P for OVERHEATING.

Procedure same as Item #18 (b). except that Knife Type fuses clear the Panel sufficiently to observe for any Abnormal condition.

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Feel Blades and Contacts of Switch "D1.1P" for OVERHEATING.

Technician should be able to lay Hand on these parts, they should be Warm not Hot.

If Blades or Contacts are too hot, tighten up Compression Nuts, clean off contacts with Crocus Cloth, wipe with rag dampened in Carbon-tet and lightly coat with "3-in-1" Oil.

After checking Fuses and Switches, put Switch "D1.1P" "ON".

(i) "Basement": While in the Basement, put "OFF" Switch "D15P" "Motor Distribution Panel" open Metal Door and feel Fuses "F4.1P" - "F4.2P" - "F4.3P" "F5.1P" - "F5.2P" - "F5.3P" - "F7.1P" - "F7.2P" and "F7.3P" for OVERHEATING.

Procedure same as Item #18 (b).

Feel Blades and Contacts of Switch "D15P" for OVERHEATING.

Procedure same as Item #18 (h).

(j) "17 KV Rectifier Switching Unit #11 (B)": Proceed to the front of this Unit and test "Delta-Star" Transfer Switch "D1B" for binding.

If the Switch does bind, or does not move freely when placed in the "10 KV" or "17 KV" positions, coat lightly with "3-in-1" Oil.

If the Switch still binds following this, loosen Compression Nuts and remove Bolts and compression Washers, from the "Swingers" pulling the "Swingers free of rest of the Switch.

Clean the "Swinger" Contact surfaces with Crocus Cloth, wipe off with Rag dampened in Carbon-tet.

Wrap a piece of Crocus Cloth around Narrow Flat File and clean inside of switch contacts, then wrap Rag dampened in Carbon-tet about the File and wipe residue from Switch Contacts.

Put Switch back together again, replace the Bolts, Compression Washers and

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ITEM 18.

Nuts, tightening them JUST ENOUGH TO SEE THE COMPRESSION WASHERS BEGIN TO FLATTEN.

Lightly Coat "Swingers" and Switch Contacts with "3-in-1" Oil and again test for Binding.

Technician should be able to move Switch from one position to the other freely and smoothly.

Wipe up all Copper dust and other Residue from floor and section where Switch was cleaned.

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ITEM 19.

(a) "Switch Room": Proceed to this Room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS.

Merely grasp the Handle of the Oil Circuit Breaker and lift it up.

(b) "Basement": While in the Basement, put "OFF" Switch "DLP" "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.

Remove the Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it up.

(c) "Control Unit" #1 (A): Proceed to the Rear of this Unit and feel Field Coils of Relays "S2A" - "S3A" - "S4A" and "S14A" for OVERHEATING.

These Relays are located in top rear of this Unit, mounted on a Metal Sub Panel.

These Relay Field Coils will normally run WARM, but not HOT.

Technician should be able to keep Hand on them.

Log any that are excessively Warm or Hot on the "50 KW M.O.L."

While at the rear of this Unit, open Door of Metal Box housing Relay "S1A" and feel Field Coil for Overheating.

Procedure same as Item No. 19 (c).

Close Door of Metal Box housing Relay "S1A".

While at the Rear of this Unit, put "OFF" the Series Switch on "1650 Volt Magnetic Switch Contactor" Metal Box, Open Box and feel this Relay Contactor "S7A" Field Coil for OVERHEATING.

Procedure same as Item #19 (c).

Close Door of Metal Box, and put Series Switch "ON".

(d) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit, use "Shorting Stick" discharge Condensers "C7.1F" - "C7.2F" - "C8.1F" - "C8.2F" - "C9.1F" - "C9.2F" - "C10.1F" - "C10.2F", then feel Field Coils of Relays "S1F" - "S2F" - "S3F" and "S4F" for OVERHEATING.

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ITEM 19.

Temperature of these Relay Field Coils should be BARELY WARM, in no event higher than Room Temperature.

To discharge Condensers, merely place Metal part of "Shorting Stick" across the two End-Plates of these Condensers.

As each Condenser is discharged, a moderate Arc will be observed when "Shorting Stick" first touches the End-Plates.

Log Any Relay Field Coils that are excessively Warm or Hot, on the "50 KW M.O.L."

(e) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit, use "Shorting Stick" discharge Condensers "C6.1H" - "C6.2H" - "C7.1H" - "C7.2H" - "C8.1H" - "C8.2H" - "C9.1H" - "C9.2H", then feel Field Coils of Relays "S3H" - "S4H" - "S5H" - "S6H" - "S7H" - "S8H" - "S9H" - "S10H" - "S11H" - "S12H" - "S13H" - and "S14H" for OVERHEATING.

Same Procedure as Item #19 (d).

(f) "17 KV Rectifier Tube Unit" #10 (C): Proceed to this Unit and feel Field Coils of Relays "S1C" - "S2C" - "S3C" - "S4C" - "S5C" - "S6C" - "S7C" - "S8C" - "S9C" - "S10C" - "S11C" - and "S12C" for OVERHEATING.

Temperature of these Relay Field Coils should be BARELY WARM, in no event higher than Room Temperature.

While at this Unit, open door of Metal Box housing "17 KV Rectifier Air Blast Heater Relay" "S17C" and feel Field Coil for OVERHEATING.

This Field Coil will run normally Warm not Hot.

Technician should be able to keep Hand on it.

If excessively Warm or Hot, Log on the "50 KW M.O.L."

(g) "17 KV Rectifier Switching Unit" #11 (B): Proceed to this Unit and feel Solenoids of Magnetic Contactors "S4B" and "S5B" for OVERHEATING.

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ITEM 19.

Solenoids of these Contactors run normally very WARM, with Temperature distributed evenly around outside of Casings.

Inspections should be made for OVERHEATING, UNEVENLY distributed Temperature (HOT SPOTS), loose Connections, and condition of Insulation covering around Outside of Solenoids.

When Insulating Covering around Solenoids of "S4B" and "S5B" begins to get bare, apply coat of "BLACK INSULATING VARNISH."

On the Bottom of this Unit, feel Field Coils of Relays "S2B" and "S5B" for OVERHEATING.

Log any abnormal condition and work performed on the "50 KW M.O.L."

(h) "17 KV Filter Condenser Charging Contactor and Resistor Unit" #12 (L):

Proceed to this Unit and feel Solenoid of Magnetic Contactor "S1L" for OVERHEATING.

Procedure same as Item #19 (g).

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ITEM 20.

(a) "Switch Room": Proceed to this Room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS.

Merely grasp the Handle of the Oil Circuit Breaker and lift it up.

(b) "Control Unit" #1 (A): Proceed to the rear of this Unit and put "OFF" "Safety Switch" "DLA".

Merely pull down the Handle on the right Side of Metal Fuse Box stencilled "DLA".

(c) "Basement": Proceed to the Basement and put "OFF" Switch "DLP" "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.

(d) "Basement": While in the Basement, put "OFF" Switch "DL1P" "Main Power Disconnect Panel" for SAFETY REASONS.

(e) "Basement": While in the Basement, put "OFF" Switch "DL5P" "Motor Distribution Panel" for SAFETY REASONS.

(f) "Transmitter Room": Proceed to this Room and gather all Cleaning Equipment and Tools needed to properly clean Relays, A.C. Contactors, and Motor Switch Contacts.

Relay Cleaning Tools are kept in Small Leather Kits in "Portable Fuse and Test Unit." Maintenance Kit No. 3 is kept in Bin No. 3 in "Spare Tube Room".

List of Tools and equipment needed to perform Relay Cleaning Maintenance Item #20:
Leather Kit of Relay Tools, containing "H429621 Cleaning Tool", "265-B Burnishing Tool" - "Crocus Cloth Tools" - "Pieces of Wrapping Paper" cut to size 1/4 inch by 2 inches.

Small Bottle of Carbon-tet.

One half sheet of Crocus Cloth.

One A.C. Extension Light.

One Soft Clean Polishing Cloth.

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One 4 inch small Flat Steel File.

Place all in Maintenance Tray No. 3.

(g) "17 KV Rectifier Unit" #10 (C): Proceed to this Unit and clean Contacts of Relays "S1C" - "S2C" - "S3C" - "S4C" - "S5C" and "S6C" with Relay Cleaning Tool "H429621".

Gently push Contacts of Relay Open with forefinger of left hand, grasp "H429621" Burnishing Tool in right hand and insert it between contacts with flat side of the tool against Contacts.

Allow Relay contacts to close on the Burnishing Tool, placing forefinger of left hand on back side of movable contact arm and exert TRIFLE amount of pressure.

Rub Burnishing Tool through Contacts 2 or 3 times.

Remove Burnishing Tool from between Relay Contacts.

GENTLY Push Relay Contacts apart and inspect with A.C. Extension Light.

They should appear Clean and Bright.

If they are not, clean them a second time.

CAUTION: These Relays are delicate, and should be cleaned with Care to avoid damaging or altering adjustments.

(h) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit and clean contacts of Relays "S1F" and "S2F" with "H429621 Burnishing Tool." Procedure same as Item #20 (g).

(i) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit and clean contacts of Relays "S3H" - "S4H" - "S5H" - "S6H" - "S7H" - and "S8H" with "H429621 Burnishing Tool."

Procedure same as Item #20 (g).

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(j) "17 KV Rectifier Unit" #10 (C): Proceed to this Unit, remove Metal covers of Relays "S7C" - "S8C" - "S9C" - "S10C" - "S11C" and "S12C", then clean contacts of Relays with PIECE OF WRAPPING PAPER.

Cut piece of Stiff Wrapping Paper into several Strips 1/2 inch by 2 inches.

GENTLY PUSH Armature to the Left, place Piece of Paper dipped in Carbon-tet, between Right Contacts, push armature contact against the paper, exert trifle pressure and pull paper out.

Do this 3 times.

Keep Wrapping Paper Wet with Carbon-tet.

GENTLY Push the Relay Armature to the Right then Left, inspecting Contacts with aid of the A.C. Extension Light.

They should appear clean and bright.

If they do not, it may be necessary to clean them with the "265-B Burnishing Tool."

In using the "265-B Burnishing Tool", First dip in Carbon-tet, then RUB ONCE between contacts in same manner as the Wrapping Paper was used.

Again inspect Relay Contacts with the aid of the A.C. Extension Light.

It is important that no paper particle, dirt or residue of cleaning be left between contacts, hence the use of Carbon-tet, which not only cleans and polishes, but will remove this Residue at the same time.

After cleaning these Relays, do not replace Metal Covers, place on the floor adjacent to the Relays.

(k) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit, remove the Metal Covers of Relays "S3F" and "S4F" and then clean contacts of Relays with PIECE OF WRAPPING PAPER.

Procedure Same as Item #20 (j).

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(l) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit remove the Metal Covers of Relays "S9H" - "S10H" - "S11H" - "S12H" - "S13H" "S14H" - "S15H" and "S16H" - then clean contacts of Relays with PIECE OF WRAPPING PAPER.

Procedure same as Item #20 (j).

(m) "Oscillator - Modulator Unit" #2 (D): Proceed to the Rear of this Unit remove the Metal Cover of Relays "SLD" and "S2D", and Clean Contacts of these Relays. Place "H429621 Burnishing Tool" against the right stationary contact of Relay "SLD" with right hand, push armature of Relay into the operating position with thumb of left hand and exert Pressure on right movable contact of Relay with forefinger of left hand.

Rub Burnishing Tool between Contacts 2 or 3 times.

Clean left contacts of Relay "SLD" by same procedure.

After cleaning Contacts, inspect with aid of A.C. Extension Light.

Relay Contacts should be clean and bright, if they are not, clean them a second time.

Unscrew small holding Bolt, remove Metal Cover, from Relay "S2D".

CAUTION: DO NOT REMOVE OR CHANGE THE PLACING OF THE THIN PIECE OF PAPER BETWEEN THE Armature and end of Magnet.

Purpose of this paper is to reduce RESIDUAL.

TIMING OF RELAY OPERATION IS DETERMINED BY THIS PIECE OF PAPER, AS WELL AS OTHER ADJUSTMENTS.

Cut piece of Wrapping Paper 1/2 inch by 2 inches.

Dip Paper in Carbon-tet place between contacts of Relay, GENTLY squeeze contacts together and pull the paper out.

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Do this operation 3 times.

Inspect Relay Contacts with aid of A.C. Extension Light.

Relay Contacts should be clean and bright.

After cleaning Relay "S2D", carefully replace cover and secure in place by tightening the Holding Bolt.

(n) "17 KV Rectifier Switching Unit" #11 (B): Proceed to this Unit, remove covers of Relays "S2B" and "S3B" and clean relay contacts.

"S2B" Procedure: GENTLY PUSH Armature to the Left, place "265-B Burnishing Tool" dipped in Carbon-tet between right Contacts, push Armature Contact against the burnishing tool and rub contacts ONCE.

GENTLY Push Armature to the Right, place "265-B Burnishing Tool" dipped in Carbon-tet between Left Contacts, push Armature contact against the burnishing tool and rub ONCE.

"S3B" Procedure same as Item #20 (j).

(o) "17 KV Rectifier Unit" #10 (C): Proceed to this Unit, remove the covers of Relays "S13C" and "S14C" and then clean contacts of Relays.

"S13C" and "S14C" Procedure same as Item #20 (j).

"S15C" Procedure same as Item #20 (n) (Procedure for Relay "S2B".)

(p) "Control Unit" #1 (A): Proceed to the rear of this Unit and clean contacts of Relays "S2A" - "S3A" - "S4A" - "S14A" - "S10A" - "S13A" - "S11A" - "S12A" "S8A" - "S9A" - "S6A" - "S1A" and "S7A".

Cleaning Procedure "S2A" and "S3A" and "S14A":

Place flat side of Crocus Cloth Tool against Stationary Right Contact.

Grasp "Crocus Cloth Tool" in right Hand, placing flat part against Stationary Right Contact.

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Push Armature up to operating position with thumb of left hand and exert Pressure on right movable contact of relay with Forefinger of Left Hand.

Rub "Crocus Cloth Tool" between contacts several times.

After cleaning Contacts with Crocus Cloth Tool, wrap small piece of clean cloth about a second Crocus Cloth Tool, dip in Carbon-tet, and wipe off both right contacts by same method as they were cleaned.

After cleaning contacts inspect with aid of A.C. Extension Light.

Relay Contacts should be clean and bright.

If they are not, clean them a second time.

Clean left Contacts of these Relays by same procedure.

Cleaning Procedure "S4A":

This Relay is fitted with Front and Back Stationary Contacts.

Clean Front Stationary and Movable Contacts with the "H429621" Cleaning Tool.

Grasp Cleaning Tool in Right hand, place against the stationary Contact, push the relay Armature into the Operating Position with thumb of the left hand, exert pressure on movable contact with forefinger of the left hand and rub the tool between the contacts several times.

Clean the back stationary and movable Contacts with the "H429621 Cleaning Tool".

Grasp Cleaning Tool in right hand, push armature up triple to permit placing Relay cleaning tool against back stationary contact, allow the armature to drop back, and exert pressure on movable contact with forefingers of the left hand, and rub the tool between the Contact several times.

After cleaning Contacts, inspect with aid of A.C. Extension Light.

Contacts should be clean and bright.

If they are not, clean them a second time.

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Cleaning Procedure Relays "S10A" - "S13A" - "S11A" - "S12A" is a same procedure as Item #20 (j).

Cleaning Procedure Relays S6A and "S9A":

Remove Glass Front metal covers, GENTLY separate the contacts of the Relay with forefinger of left hand, place "H429621 Cleaning Tool" between contacts, allow them to close, exert pressure against the Movable contact with forefinger of left Hand, and rub cleaning tool between contracts several times.

Push contacts apart and inspect them with aid of A.C. extension light.

They should be clean and bright.

If they are not, clean them a second time.

Cleaning procedure for Relay "S6A":

Pull out the Spring Locking Catches on top and bottom of Relay cover, then carefully remove Cover from Relay.

OBSERVE THE STRING TIED TO THE BAKELITE CATCH PASSING THROUGH THE HOLE IN THE SIDE OF THE RELAY COVER.

Move Cover along the String and place it on top of "DLC" Fuse Box.

Lift the Movable contact of the Motor operating pair, place "H429621 Cleaning Tool" against the stationary contact, allow movable contact to drop, exert pressure against this movable contact with finger of the left hand and rub between the contacts several times.

Place "H429621 Cleaning Tool" against the stationary contact of the 17 KV Time Delay Pair of Contacts, lift the movable contact with forefinger of the left hand exerting pressure, then rub tool between contacts several times.

After cleaning contacts, inspect them with aid of A.C. Extension Light.

Contacts should be clean and bright.

If they are not, clean them a second time.

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Straighten out a small paper Clip. secure one drop of oil to wire and apply at each small Oil Tube on bakelite base of Relay.

These Oil Tubes may be located just above the Field Coil against the bakelite base of relay.

After cleaning and oiling Relay, replace the Cover on relay, pull out Spring clamps, put clamps in place and release against the catches.

Cleaning Procedure Relay "SLA": Push "IN" the Catch on the right side of door of metal box housing Contactor "SLA" and swing Door open.

Remove the Hard Asbestos Flame Arrestor by lifting it straight up about 1/2 inch then pull out.

Exercise care not to break the Flame arrestor as it is Fragile.

Note that Flame arrestor is supported by two bakelite flanges, which also serve as the front halves of the Hinge of the Contactor.

Remove the two Bolts holding Bakelite front halves of Hinge, exercising care not to break bakelite.

Bakelite assembly holding the 6 movable contacts may now be pulled out and let down carefully.

Remove each pair of Movable Contacts (2 are on one support, 3 pairs total) by squeezing the ends of the Spring Clips where they protrude through the Bakelite mounting assembly.

Clean contacts by rubbing with Crocus Cloth until all burn marks and Oxidation marks are cleaned off.

Note that these contacts are CONVEX, consequently rub the whole contact evenly so as to retain the CONVEX surface, avoid excessive rubbing across the peak of the surface which WILL FLATTEN THE CONTACT.

After cleaning Contacts wipe residue off with a rag dipped in Carbon-tet.

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Then squeeze Flange ends of the Contact supporting mechanism and insert in the Bakelite support assembly.

Clean the two other pairs of Movable contacts by the same procedure.

Clean the 3 pairs of stationary Contacts with Crocus Cloth.

These Contacts may be cleaned without removing them.

Note that they are also CONVEX, consequently rub whole contact evenly so as to retain the CONVEX Surface, avoid excessive rubbing across the peak of the surface which will FLATTEN THE CONTACT.

After cleaning contacts wipe residue off with rag dipped in Carbon-tet.

Replace the Bakelite Assembly holding the 3 pairs of Movable contacts in the Bakelite Hinge half, then replace the movable Bakelite Front hinge halves in place and bolt in place.

AVOID TIGHTENING THE BOLT TOO MUCH AS IT IS EASY TO BREAK THESE BAKELITE PARTS. BOLTS ARE FITTED WITH LOCK WASHERS, MERELY TIGHTEN UNTIL THE LOCK WASHER IS FLATTENED.

After reassembling Contactor, test it for free motion by lifting the Armature, which should operate the Contactor to the "Operating Position" with no Binding. Movable part of the Contactor is mounted in the Hinge very loosely to avoid Binding. After cleaning Contactor, close and latch the Door of Metal Box housing same.

Cleaning Procedure Relay "S7A": Put "OFF" safety Switch on right side of the Metal box housing this Contactor (Pull it toward you and then down), open the door and clean and service all 6 contacts.

Cleaning procedure is same as Item #20 (p) (Procedure for cleaning "S1A".)

After cleaning Contacts, close the door of the Metal Box housing the Relay, place associated Safety Switch "ON" (Lift it up and push away from you.)

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(q) "17 KV Rectifier Unit" #10 (C): Proceed to this Unit and clean contacts of Relays "S17C" and "D1C".

Cleaning Procedure Relay "S17C": Cleaning Procedure is same as Item #20 (p).

(Procedure for Cleaning Relay "S7A".)

Cleaning Procedure Contactor "D1C": Cleaning Procedure is same as Item #20 (p).

(Cleaning Procedure for Relay "S1A".)

(r) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the rear of this Unit, remove Metal Cover and clean contacts of Relay "S5F" with "H429621 Burnishing Tool".

Lift off the Metal Cover.

Open Contacts of Relay by lifting the operating linkage with forefinger of left hand.

Grasp "H429621 Burnishing Tool" in right Hand, place against the stationary contact, allow movable contact to close against the tool.

Pinch the 2 contacts together with thumb and forefinger of left hand and rub Burnishing Tool between contacts several times.

After cleaning Contacts, inspect them with aid of the A.C. Extension Light.

They should be clean and bright.

If they are not, clean them a 2nd time.

After cleaning contacts, replace the Metal Cover being careful to seat it properly over the Base.

(s) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the rear of this Unit, remove the Metal Covers of Relays "S1H" and "S2H", and clean contacts with "H429621 Burnishing Tool."

Procedure same as Item #20 (r).

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(t) "17 KV Filter Condenser Assembly Unit" #12 (L): Proceed to this Unit and Clean Contacts of "S1L" with Crocus Cloth.

Clean off Large Stationary Copper Contact and two small movable contacts on Resistor "RLL" shorting portion, and the 2 Cadmium plated Indicator Light "ON" contacts with Crocus Cloth.

Wipe off all Contacts with cloth dipped in Carbon-tet.

After cleaning contacts, inspect them with aid of the A.C. Extension Light.

They should be clean and bright.

If they are not, clean them a second time.

If the large Copper Contact on "RLL" shorting portion of the Contactor is pitted too deeply for Crocus Cloth to clean, clean it with "00" Sandpaper, then Crocus Cloth and finally wipe off residue with a rag dampened in Carbon-tet.

(u) "Control Unit" #1 (A): Proceed to the front of this Unit, remove Glass front metal cover, and clean contact of "S5A".

Push down catch on front of Relay, lift up and out the Glass front Metal Cover of Relay "S5A".

Clean Front and back contacts with "Crocus Cloth Tool" rubbing each contact surface until clean and bright.

After cleaning contacts, wrap small piece of clean cloth about 2nd "Crocus Cloth Tool" dip in carbon-tet, and wipe residue from Contacts.

Replace Glass front Metal Cover, EXERCISING CARE NOT TO DAMAGE IT BY TURNING THE KNURLED RESETTING ADJUSTMENT A TRIFLE COUNTER CLOCKWISE SO THAT IT WILL CLEAR FRONT EDGE OF METAL FLANGE BELOW THE LEATHER BELLOWS.

Cover should seat flat and without Binding.

After cleaning contacts, inspect them with aid of A.C. Extension Light.

They should be clean and bright.

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If they are not, clean them a Second Time.

(v) "3rd Power Amplifier Tuning Unit" #6 (I): Proceed to the front of this Unit, open top Metal Panel Door and clean contacts of Relays "S1I" - "S2I" - "S3I".

Cleaning Procedure Relay "S1I": Cleaning Procedure is same as Item No. 20 (j).

Cleaning Procedure Relays "S2I" and "S3I": Cleaning Procedure is same as Item 20 (g).

(w) "Basement": Proceed to Basement, clean Contacts of Relays listed in following sequence: "S1P" - "S4P" - "S7P" - "S2P".

Cleaning Procedure Relay "S1P": Open Hinged Metal Cover marked "S1P" on left front of "Motor Distribution Panel" Box.

Turn the 3 Tension Springs Clockwise until free, then lift off.

Lift the 3 flat Cadmium plated Contactors off.

Clean all burn and pit marks from these flat movable contactors with "00" Sandpaper, then Crocus Cloth, finally wiping off with rag dampened in Carbon-tet.

Clean the Stationary Contacts with short 1/2 inch wide flat file, then Crocus Cloth and finally wipe off with cloth dampened in Carbon-tet.

After cleaning Contacts, inspect them with A.C. Extension Light they should be clean and bright.

If they are not, clean them a Second Time.

After cleaning contacts, replace the movable contacts, replacing the Tension Springs and turning springs Clockwise to lock them in place.

Test Contactor by pushing Armature in to the operating position.

Note that Contactor operates without binding.

Cleaning Procedure Relay "S4P": Procedure same as Item No. 20 (p) procedure for cleaning Relay "S2A".

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Cleaning Procedure Relay "S6P": GENTLY Force the 2 contacts of this relay apart, place "H429621 Burnishing Tool" between contacts, exert pressure on Contacts with Thumb and Forefinger of left hand and rub contacts several times.

After cleaning, inspect Contacts with aid of A.C. Extension Light.

Contacts should be clean and bright.

If they are not, clean them a Second Time.

Cleaning Procedure "S2P": Procedure same as Item No. 20 (p) cleaning procedure for Relay "SLA".

(x) "Basement": While in the Basement, clean the contacts of 50 KW Transmitter Motor Switches "D2P" - "D3P" - "D6P" - "D7P" - "D4P" - "D5P" "D9P" and "D10P".

Remove the cover from Motor Switch Box.

Turn the Contact Tension Spring Counter-Clockwise and lift off.

Lift off the Cadmium Plated movable Contacts.

Clean Movable and stationary contacts with Crocus Cloth.

After Cleaning Switch Contacts, wipe off with a cloth dampened in Carbon-tet.

Inspect both Movable and stationary contacts with aid of A.C. Extension Light.

Switch Contacts should be clean and bright.

If they are not, clean them a second time.

(y) "Transmitter": Directly after Transmitter is Started per Book No. (3) Sec. No. (A) Page No. 1 to 69 inclusive, Technician No. 1 will enter the transmitter Enclosure and Test Relays S1C to to "S6C inclusive. Relays "S1F" - "S2F" - "S3H to "S8H" inclusive; and "S8A" and "S9A".

Procedure in testing all these relays except "S8A" and "S9A" is as follows:

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Touch Armature of Relay, pushing it GENTLY in to the "Operating Position".
As each Armature is touched the Associated Lamp Indicator Relay will operate and extinguish such indicating lamp on the Front of the "Control Unit" #1 (A).
Remove the Glass front metal covers of Relays "S8A" and "S9A", lift Armature and allow it to fall back in place.

Replace the Metal Covers.

These two relays are located on the left side of the channel iron at Bottom of the "Control Unit" #1 (A).

Proceed to front of the "Control Unit" #1 (A) and observe that all the Associated Indicator Lamps are extinguished.

Push "Lamp Reset" Button to relight these indicator Lamps.

This is normal operation - relays function correctly.

(2) "Summary of Cleaning Methods and Relay Operating Data" The following Summary is written to aid Technician in knowing that Adjustments are Correct following Cleaning.

On FLAT SURFACE CONTACTS, the Armature movement is such that the CONTACTS TOUCH THEN WIPE INTO POSITION.

If cleaning caused undue Pressure on the Contact Arms, Contacts may not wipe when Operated.

It is ABSOLUTELY NECESSARY TO USE THE EXTENSION LIGHT WHEN CLEANING ALL RELAYS, thereby assuring yourself that Adjustments are not being altered in the Process of Cleaning.

Where Crocus Cloth or "Crocus Cloth Tool" is used to clean contacts, BE CAREFUL TO WIPE CONTACTS OFF WITH PIECE OF CLEAN CLOTH DIPPED IN CARBON-TET, as RESIDUE MIGHT HOLD A PAIR OPEN, RENDERING RELAY AND OTHERS ASSOCIATED WITH THIS RELAY INOPERATIVE.

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On HEAVY CURRENT CARRYING RELAY CONTACTS, and Contactors, be careful NOT TO CLEAN MORE THAN IS NECESSARY.

Remember that Contacts wear very easily and CARELESS RUBBING WILL MAKE SURFACES CONVEX, thereby reducing Contact Surfaces.

POOR SURFACE CONTACTS ARE DANGEROUS TO OPERATION AND MOST DIFFICULT TO LOCATE IN CASE OF TROUBLE.

If power amplifier tube Plate Overload Relay Contacts or 17 K.V. Rectifier Tube Overload Contacts are held open, Plate Trip Relay S4A will remain inoperative, thus prevent the application of High Voltage.

Residue between Contacts on the Lamp Relays will cause abnormal condition also, i.e., if Armature is held to the LEFT, Lamp indicator will be out, now push "D5A", and if Lamp relights, condition is normal and Armature will move to the right.

This is normal operation.

If not normal, first be sure that the Tube Overload Relay Contacts are clean and CLOSED, then the only remaining thing to check is Contacts of Lamp Relay, (LEFT PAIR).

If they are still dirty, Clean them again.

With Armature of Lamp Relay in the RIGHT Position, the Lamp Indicator will be lit.

If such is not the case, clean these Contacts again.

Improper or non-operation of Lamp Indicator Relay will not prevent Transmitter Radio Frequency Carrier Output, it will fail to indicate Flash-arcs or Arc-backs, in Tube in question, since Indicator Lamp will either remain LIT or remain EXTINGUISHED.

Clean Contacts of the A.C. Contactors of the "S1A" type, using Crocus Cloth, these Contacts may easily be cleaned by removing Contacts.

If condition of movable Contacts do not warrant removing them for cleaning,

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they may be cleaned in position with Crocus Cloth, then wiped with clean rag dipped in Carbon-tet.

Clean all burned marks and oxidation.

Note that these Contacts are CONVEX.

Flat surface Relay Contacts requiring the use of Crocus Cloth must be cleaned by the small Crocus Cloth Tool - this will prevent too much cleaning.

NO ADJUSTMENTS TO RELAYS ARE TO BE MADE BY TECHNICIAN PERFORMING MAINTENANCE.

IF RELAY OPERATED CORRECTLY BEFORE CLEANING, IT IS OBVIOUS THAT INCOMPLETE CLEANING IS RESPONSIBLE FOR LACK OF OPERATION, AND NOT ADJUSTMENTS.

Cleaning Relay Contacts requires very careful work, performed with definite precision.

Discussion of methods with Supervisor is in order.

Method of adjusting 50 KW Relays follows:

The method of adjusting the 2nd and 3rd Power Amplifier Plate Current Overload Relays and the High Voltage Rectifier Arc-back Relays is outlined below.

The mechanical adjustments are the same for both groups of Relays; the difference being only in the Current requirements.

The residual Air-gap of the Relay is adjusted by means of the residual screw in the center of the Armature so that the distance between the armature and the Core is 0.005 inch, when the Relay is operated.

A 74-D Gauge may be used to measure this separation.

It is necessary to remove the Relay from the Isolantite Base (Slab) in order to adjust the Heel-piece Air-gap.

The Armature Yoke Screw is then loosened and with the aid of a 74-D Gauge, the distance between the Armature and the Heel-piece is adjusted to a separation

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between the limits of 0.004 Inch and a Just Perceptible clearance as indicated by light visible across the length of the Heel-piece as required to meet the Electrical and Contact pressure requirements.

This separation is measured when the Armature is in the operating position. In remounting the Relay on the Isolantite Plate it should be placed so that the Armature arm rests slightly to the left of the bend in the rod operating arm. If it is impossible to move the Relay far enough to accomplish this, it will be necessary to flatten the end of this spring so that no extra Friction will be caused by the motion of the arm at this point.

Align and adjust the Isolantite Rod Bearings for light tension which will permit easy rotation without looseness.

Lock these adjustment.

Reduce the pressure as far as possible on the Tension Spring by means of the Tension Screw of Detail 1-A ESL-603294.

The fixed Contact should now be adjusted so that the Contact Separation is approximately 0.020 inch when the Relay Armature is operated.

Then adjust the Tension Screw on the Spring Assembly until approximately 25 Grams Contact Pressure is obtained as measured by means of a No. 68 Tool or equivalent.

The final adjustments of these Relays are made by the use of a Storage Battery to check the Operating Values.

The final adjustments of the Plate Current Overload Relays are made so that when a Current of 2.4 Amperes is passed through the Shunt "RX", the Relay will not operate and when the Current is increased to 2.6 Amperes, the Relay will operate.

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Final adjustment of the Tension Springs and the position of the Fixed Contact will cause the relay to operate at 2.6 Amperes and non-operate at 2.4 Amperes and provide approximately 25 Grams Contact Pressure with 0.015 inch to 0.020 Contact separation when the Relay is Operated.

Adjust the Armature Arm-Back-Stop so that when in a non-operative position, the Armature does not have excessive play.

The Adjustment of the High Voltage Rectifier Arc-back Relays is the same with the exception that the relay should operate when a 6 volt Storage Battery is connected across the Relay's Shunts R_x and R_y by means of two 10 foot leads of No. 12 Copper Wire with the positive lead connected to R_x .

These Relays should be adjusted so that the least possible voltage will operate them while maintaining the Contact Pressure and separation requirements.

The Relay should not operate at 6 volts when the polarity is reversed.

The following is Relay and Magnetic Switch Data, 50 KW Transmitter:

"S17C - "S2P" - and "S1A" are all alike, - data is:

CR 2811 - C2A Magnetic Switch, 110 Volts, 60 cycles.

Catalogue 3885954 - G 102 GEJ 22 9.

Solenoid #22 D 2 G 2.

S7A Data: CR 7008 ALA.

Cat. 4386954 - G 102.

110 Volts, 60 cycles.

Solenoid #22 D 2 G 2.

D1C Data: D1C Motor Starting Switch.

CR 7008 ALA.

Cat. 4386954 G 104

440 Volts, 60 Cycles GEH 882 A.

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Solenoid #22 D 2 G 4.

Antenna Transfer Switch Data:

Monitor Controller Company #124581, 20 Amperes.

120 Volts, 60 Cycles.

Type SP 730, Solenoid #34 M 19
380

Interlocking Antenna Switch is #124582

120 - 240 Volts 60 Cycles.

Type SP 755, Monitor Controller Co.

Coils are OSL2G (3 Coils)
GL580

The following are Rectifier Relay Adjustments:

The Contacts will open a minimum of 3/64 inch when a 6 volt Storage Battery is connected through two 10 foot lengths of #12 wire across the Shunt (R_x - R_y).

The polarity should be such that the Positive side of the Battery is connected to the Terminal R_x.

The Current ~~will~~ drain should be approximately 50 Amperes.

The Contacts will not open when the Polarity of the Battery connections are reversed.

The Contacts will not open when the 6 volt Storage Battery is replaced with 4 Volts.

The Contact Pressure at Contact points is a minimum of 20 Grams, correct Pressure being between 20 and 30 Grams.

Additional information for testing of Relays will be found in the "W.E. 306-A
50 KW Transmitter Instruction Book" Page 51.

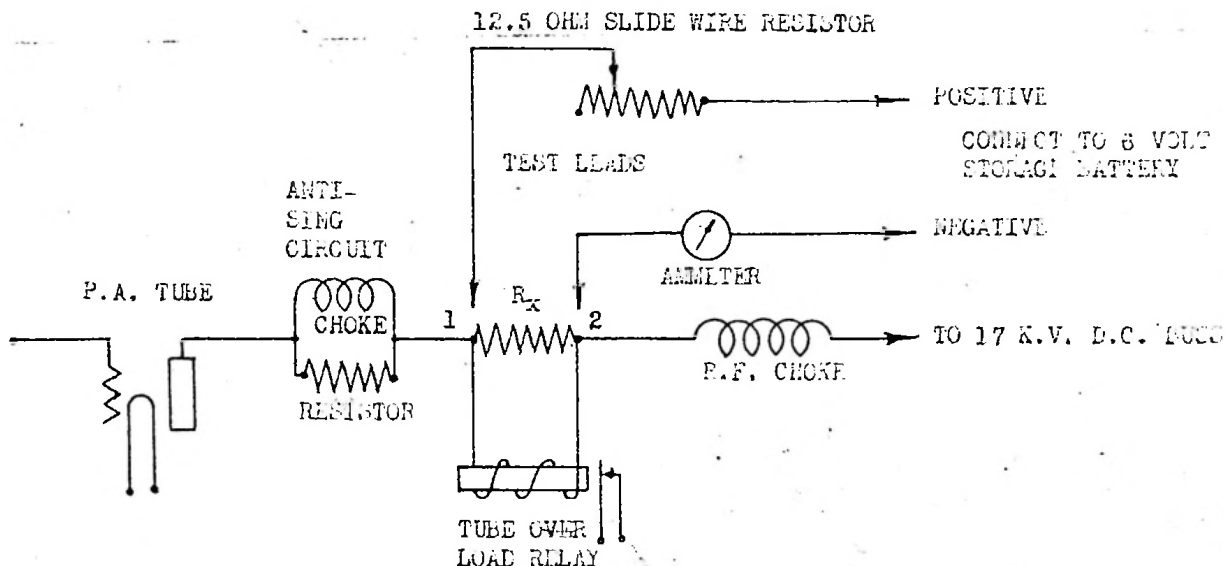
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POWER AMPLIFIER TUBE OVERLOAD RELAY TEST CIRCUIT



INSTRUCTIONS:

Use 150 Ampere Hour Storage battery and #14 Wire.

Connect Test Clips #1 and #2 across Overload Relay Shunt R_x - Vary Slide Wire Resistor to read Values specified.

Final Adjustments of these Relays are made so that when Current of 2.4 amperes is passed through the Shunt Resistor R_x , the Relay will not operate, and when the Current is increased to 2.6 amperes, the Relay will operate.

- Anti-Sing Resistor 400 ohms Carbon Red. KS 6226
- Anti-Sing Choke 11 turns stiff Cadmium plated #10 wire Diameter 3" X 1 1/2"
- R_x Manganin Resistor 0.2 ohm
- Slide Wire Resistor 12.5 ohms Variable Resistor, 15 Amperes Max. H-R Co.
- Ammeter 0 - 3 Amperes D.C. Weston Model 201 with External Shunt
- Tube Overload Relay W.E. ESO-602055 - Proposition CH-3043.
- Relay Parts W.E. ESO-601897.

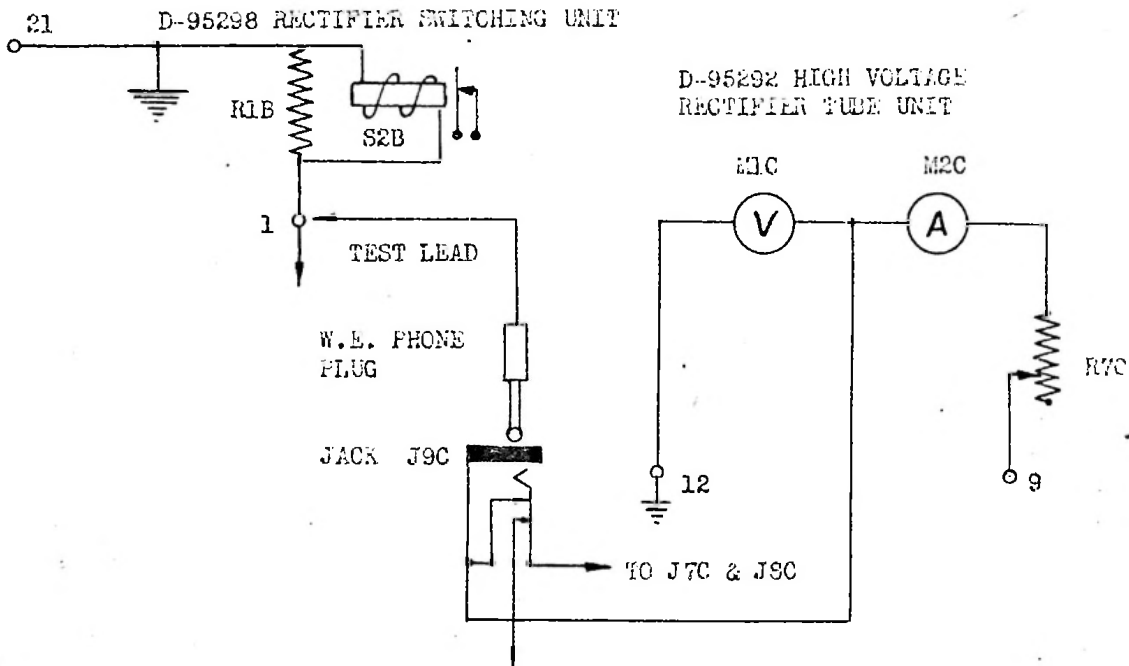
Test Leads are kept in compartment #11 of "Portable Fuse and Test Unit"

12.5 Ohm Slide Wire Resistor is kept in Transfile ~~31~~ #52

Ammeter is kept on "Measuring Bench" in basement.

17 K.V. D.C. OVERLOAD RELAY S2B TEST CIRCUIT

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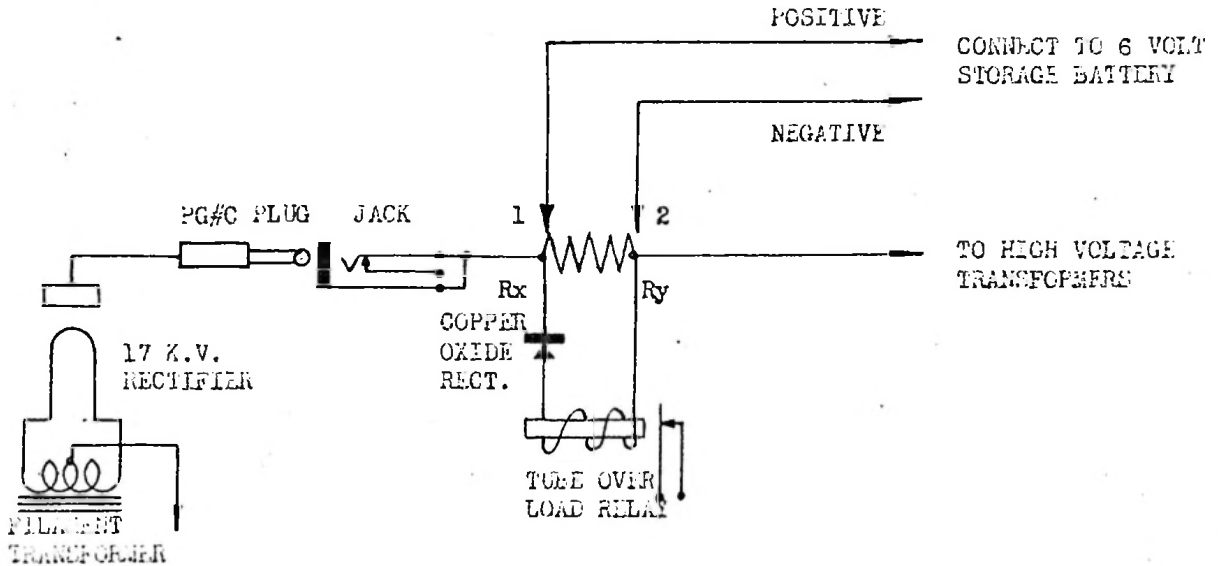
INSTRUCTIONS:

Remove Feed Wire from Terminal #1 on the D-95298 Rectifier Switching Unit. Place Test Lead on Terminal #1 - Insert Western Electric Phone Plug into Jack J9C and vary Rheostat R7C to read between 15 and 20 Amperes on Meter M2C. Relay S2B should operate. If Relay operates at less than 15 Amperes, increase Tension adjustment on S2B. If more than 20 Amperes are necessary to operate S2B, decrease Tension adjustment on S2B. Turning the Screw Bearing on the Armature Spring in the Clockwise direction increases the Current required to trip Relay S2B.

- R1B Manganin Resistor 0.00 ohm
 - S2B Western Electric D-31973 Relay
 - J9C RCA Receiver Jack #20C
 - M1C Voltmeter Model 301 62 ohms per V. 0 to 25 Volts(Steel Plate)
 - M2C Ammeter Model 301 0 to 5 Amperes D.C. (Steel Plate)
 - R7C Arc drop Test Current Rheostat 2 ohms total.
- M1C and M2C are both D.C. Instruments mounted on a Steel plate at an angle for easy reading. Instruments are Panel mount Type.
Test Lead is kept in compartment #11 in "Portable Fuse and Test Unit".

17 K.V. RECTIFIER TUBE OVERLOAD RELAY TEST CIRCUIT

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INSTRUCTIONS:

Clip Positive Lead on Jack side of Relay Shunt R_x (#1)
Touch the Negative Lead for an instant to the buss side of Shunt R_y (#2)
Relay should operate at 6 Volts and be non-operative at 4 Volts.
If Polarity is reversed, Relay will not operate.

Filament Transformer . . . W.E. KS 7210 .300 KVA Pri 100 V - Sec 5 or 2.5 V
Rx Ry ResistorManganin Resistor 0.06 Ohm
Tube Overload Relay - . . W.E. ESO-602053 Proposition CH 3043.
6 Volt Storage Battery is kept in "Storage Room".
Positive and Negative Test Leads are kept in compartment #11 of "Portable Test and Fuse Unit".

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DATA ON WESTERN ELECTRIC INDICATOR LAMPS:

"Control Unit" #1 (A): Type A-1 Lamps are used in sockets of the following;

"L.P.D."

"Blower".

"17,000 V. A.C. Overload"(Top) (Phase "A").

"17,000 V. A.C. Overload"(Bottom) (Phase "C").

"17,000 V. Rectifier Tubes" 1 - 2 - 3 - 4 - 5 - 6 .

"2nd Power Amplifier Tubes" 1 - 2.

"3rd Power Amplifier Tubes" 1 - 2 - 3 - 5 - 4 - 6.

"17,000 V. D.C. Overload".

"1600 V. D.C. Overload".

These Type A-1 Lamps are supplied by the "Rectox" Unit "XLP" - Output of which is 21 Volts D.C.

A-1 Lamp Ratings are: 24 Volts at 33 to 45 Milliamperes.

All Lamps are connected in parallel, with the Main Positive Feed from the "Rectox" and then wired to Resistor "R43.1A" (10 Ohms), placing this Resistor in Series with all Lamps for "Ground" Negative Return to the "Rectox" thru Resistor "R43.2A" (10 Ohms.)

"R43.1" Is mounted adjacent to Indicator Lamp Sockets on rear of "Control Unit".

"R43.2A" Is mounted inside the "Rectox" Unit "XLP" which is located on the Iron Frame Work supporting the "High Voltage Grounding and Door Interlock Mechanism" Switch "DL3P".

"XLP" Rectox Unit is rated 24 Volts at 1.1 Amperes.

Procedure in replacing Type A-1 Lamps.

Use the Type 319-B Special Pliers to remove the outer "Marker Bullseye".

Merely squeeze the sharp edges of the Pliers GENTLY OVER the rim of the Bullseye

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and lift straight out.

Push "D5A" - "Lamp Reset" Key, holding finger on it while removing lamp.

This will extinguish all Type A-1 Indicator Lamps by shutting off the D.C. Supply from the "Rectox" - "XLP" to these Lamps. (Will not shut off the "Rectox" itself.)

GENTLY Insert the Western Electric Type 116 Tool into the Socket and GENTLY push it over the Lamp, then lift lamp straight out.

Remove the defective Lamp from the Type 116 Tool.

Hold Finger on "Lamp Reset" switch "D5A" then insert the Lamp into the Socket with the Middle Flat side of each Lamp Contact resting against the Socket Flat Spring Contact. (Insert Lamp with Fingers only.)

Lamp is IMPROPERLY place in the Socket when either flat outside edge of the Lamp Contact is placed against the Socket Flat Spring Contact.

After inserting the Lamp, lift finger off the "Lamp Reset" Button "D5A".

Lamp should Light.

If it does not (Adjacent Lights being illuminated) remove it and insert another.

Push the "Marker Bullseye" back in the Lamp Socket (Use Fingers only.)

Straighten "Marker Bullseye" so that numbers are vertical.

A Type A-1 Lamp, improperly placed in any one of these Indicator Light Sockets, supplied by 24 Volts D.C. from the "Rectox" Unit "XLP" will "Short Circuit" the "Rectox" D.C. Output Voltage, by "Grounding" the positive Socket Contact, and extinguish all such lights.

These Lamps are properly mounted in the Socket when the Middle Flat side of each Lamp contact rests against the Socket Flat Spring Contact.

Lamp is IMPROPERLY placed in Socket when either Flat outside edge of the Lamp Contact is placed against the Socket Flat Spring Contact.

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With the "Rectox" Unit "XLP" - "ON" and all these Lamps extinguished, the remedy is to test for an improperly mounted Indicator Lamp.

Merely remove these Lamps one at a time until the "Short Circuit" is removed, (Lamps will light.)

(b-1) "Con-trol Unit" #1 (A): Type B-2 Lamps are used in sockets of the following:

"Cooling Water".

"Coupling House Gate".

"Windows".

"Transmitter Gate".

Green Light over "Master Control Switch" "D2A" (Power Available.)

Red " " " " " " (Power "ON".)

Green Light over "1600 Volt Rectifier" Switch "D10A" (Power Available.)

Red " " " " " " (Power "ON".)

Green Light over "17,000 Volt Rectifier" Switch "D9A" (Power Available.)

Red " " " " " " (Power "ON".)

Type B-2 Lamps are operated from 115 Volts A.C. from Control Transformer "TLA" Through Resistors each of which is 2500 Ohms.

These Resistors are Western Electric "H" Type; they are located on sub-panel in rear of this Unit, just below Relay "S2A".

Type B-2 Lamp Ratings are: 18 Volts at 36 to 48 Milliamperes.

The procedure in changing Type B-2 Lamp is exactly same as changing type A-1 Lamps, except that it is not necessary to Hold Finger on "Lamp Reset" Button "D5A" since power supply is not from "Rectox."

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(c-1) "Oscillator-Modulator Unit" #2 (D): Western Electric Type B-2

Lamps are used in sockets of indicator lights for "Osc. No. 1" and "Osc. No. 2".

Power Supply is from the 120 Volt Emergency Service.

(d-1) "Bay No. 2 Panel No. 4 Audio Facilities Control Room": Western Electric

Type E-3 Indicator Lamp is used in the Type "1126-A Program Amplifier."

It is necessary to remove all the controls and take front mat off the "1126-A Amplifier" (Actually the 126-A Amplifier position, Panel No. 2) in order to change a pilot lamp.

It is Operated on 6 Volts A.C.

Lamp Rating is: 6 Volts at 120 to 160 Milliamperes.

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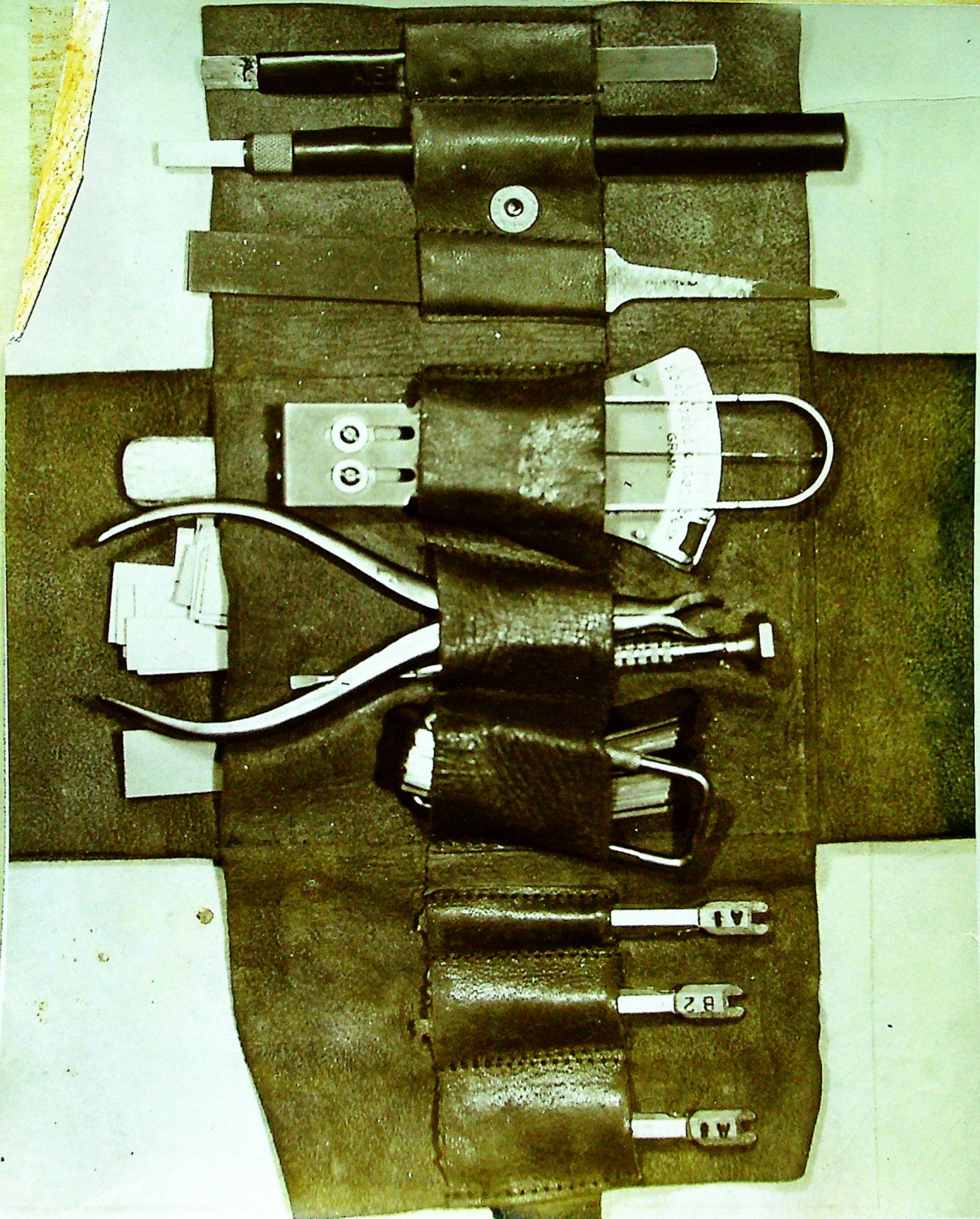
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"Relay - Ball Gap - Indicator Lamp Tools - Kit No. 1"

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"Relay - Ball Gap - Indicator Lamp Tools - Kit No. 2"

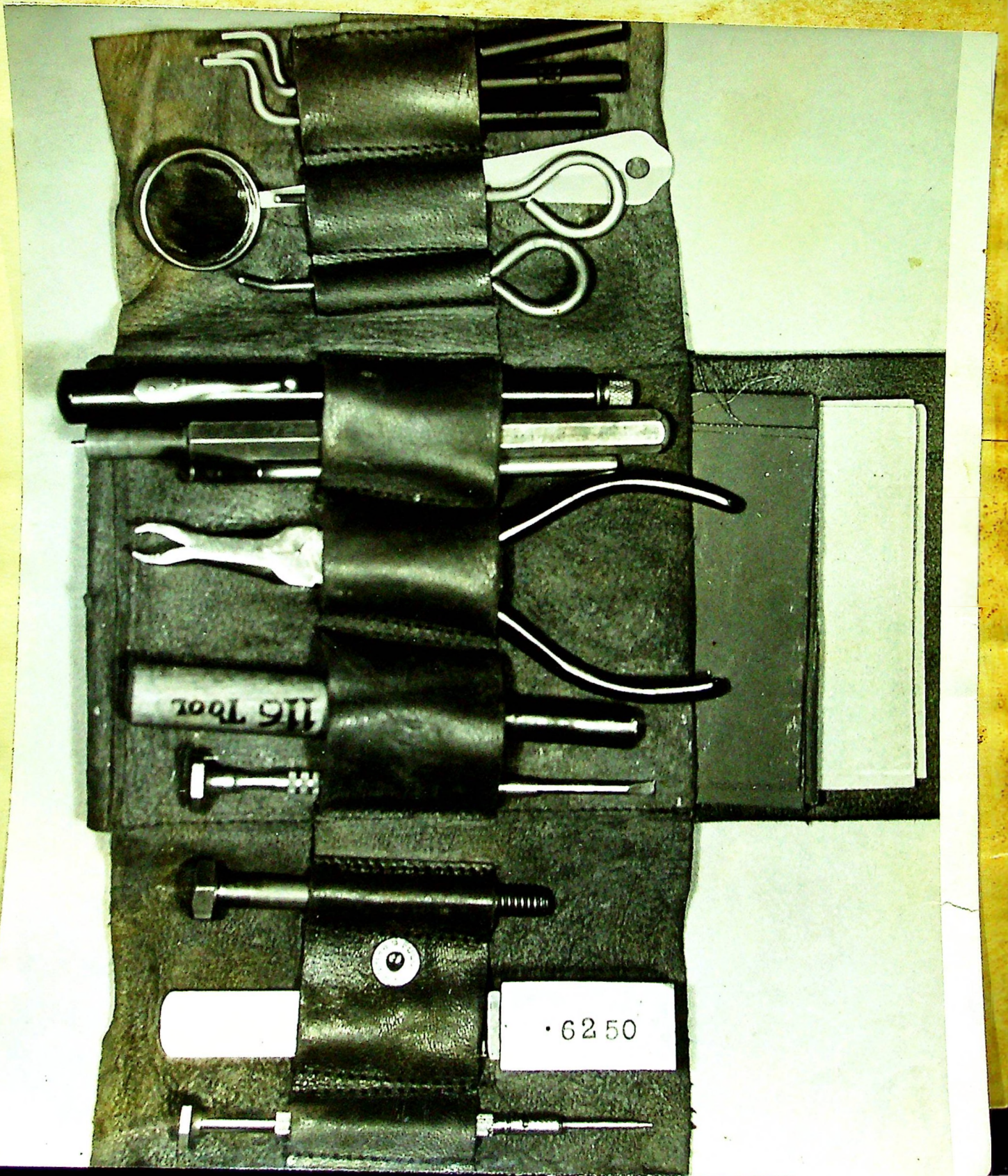
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"Relay Cleaning and Adjusting Tools"

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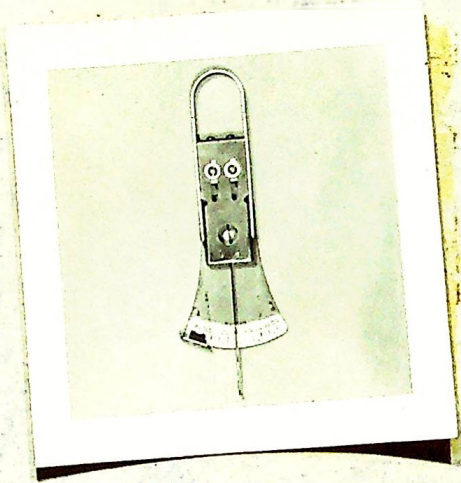


Fig. No. 3.

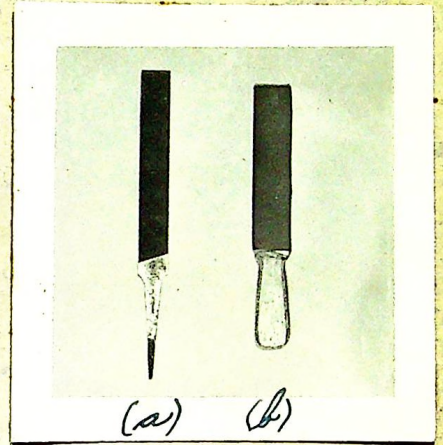
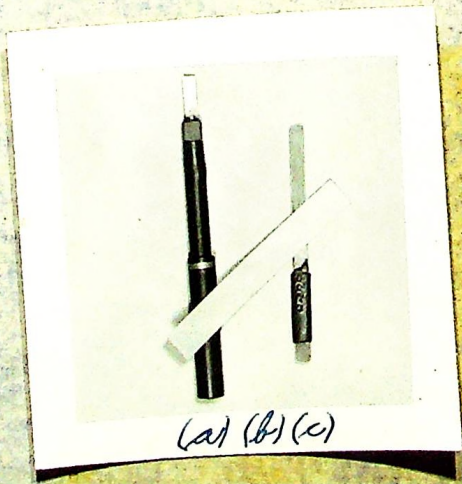
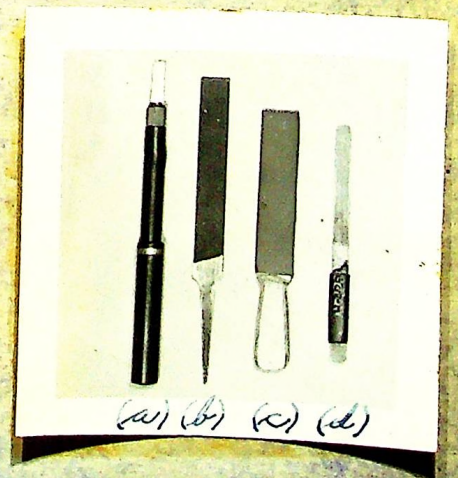


Fig. No. 4.



(a) (b) (c)

Fig. No. 5.



(a) (b) (c) (d)

Fig. No. 6.

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"Relay Cleaning and Adjusting Tools"

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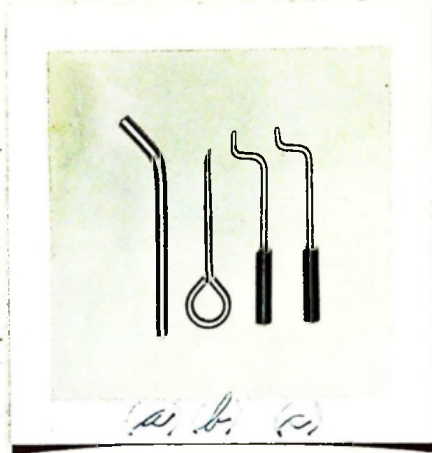


Fig. No. 7.

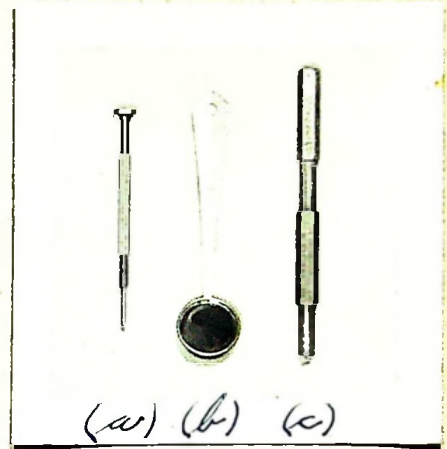


Fig. No. 8.

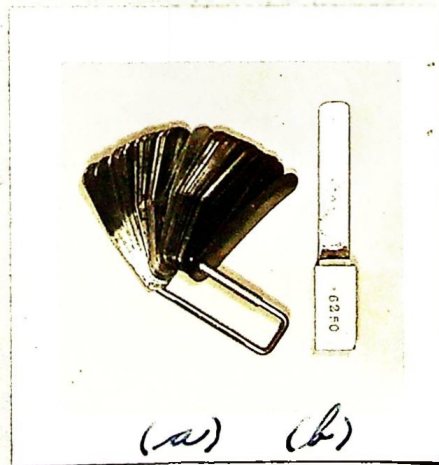


Fig. No. 9.

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"W.E. Indicator Lamp Replacement Tools"

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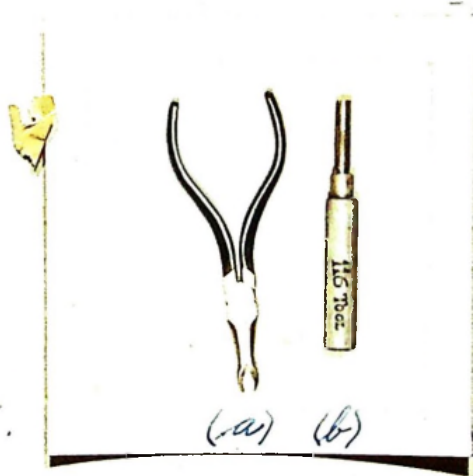


Fig. No. 10:

- (a) Western Electric Type 319-B Bull's-eye Removing Pliers.
- (b) Western Electric Type 116 Indicator Lamp removing Tool
(Lamps A-1, B-2, E-3).

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"Relay - Ball Gap - Indicator Lamp Tools - Kit No. 1"

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Fig. No. 1:

Contents Kit No. 1: (Top to Bottom)

- 1 - - - - Western Electric Type H-429621 Relay Cleaning Tool.
- 1 - - - - Western Electric Type 265-B Relay Cleaning Tool.
- 1 - - - - Fine cut Flat File 3" X 7/16" X 1/16", Relay & Switch Contact
Cleaning Tool.
- 1 - - - - Western Electric Type 70-D Gram Pressure Tool.
- 1 - - - - Western Electric Type 319-B Indicator Lamp Bull's-eye removing Pliers.
- 1 - - - - Small Precision Screwdriver - 3 1/2" with 3/32" Screwdriver Edge.
- 1 - - - - Type R-1931 Set of Thickness Gauges, Relay Contacts & Ball Gap
Spacing Tool.
- 1 - - - - Western Electric Type "A-1" Indicator Lamp.
- 1 - - - - Western Electric Type "B-2" Indicator Lamp.
- 1 - - - - Western Electric Type "A-1" Indicator Lamp.
(Kept in Sleeve Compartment, top to bottom.)
- 1 - - - - Crocus Cloth Cleaning Tool (Relay Contacts)
- 15 - - - Pieces of Wrapping Paper 2" X 1/4" (Relay Contacts Cleaning Tool.)

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"Relay - Ball Gap - Indicator Lamp Tools - Kit No. 2"

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Fig. No. 2:

Contents Kit No. 2: (Top to Bottom)

- 3 - - - - Western Electric Type 340 Relay Adjusting Tools.
- 1 - - - - "Utility" Type Dentists off-set Mirror.
- 2 - - - - Western Electric Type 212 Relay Adjusting Tools.
- 1 - - - - Western Electric Type 265-B Relay Cleaning Tool.
- 1 - - - - Western Electric Type 72 Screwdriver and Hexagon Nut Tightening Tool.
- 1 - - - - WOR Type 340-A Relay Adjusting Tool size $3\frac{1}{2}$ " X $3/16$ ".
- 1 - - - - Western Electric Type 319-B Indicator Lamp Bull's eye removing pliers.
- 1 - - - - Western Electric Type 116 Indicator Lamp Removing Tool
(For Type A-1 and B-2 Lamps)
- 1 - - - - Small Precision Screwdriver $3\frac{1}{2}$ " with $1/16$ " Screwdriver edge.
- 1 - - - - WOR Type No. 10-A $\frac{1}{4}$ " Ball Gap Spacing Tool.
- 1 - - - - WOR Type No. 12-A Ball Gap Spacing Tool - .089 - .6250 - $\frac{1}{2}$ " - $5/8$ ".
- 1 - - - - Small Precision Screw Driver $3\frac{1}{2}$ " with $3/32$ " Screw Driver Edge.
(Kept in Sleeve Compartment, left to right.)
- 6 - - - - Pieces of Crocus Cloth, cut to size 5" X 3".
- 6 - - - - Pieces of #00 Sandpaper cut to size 5" X 3".

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"50 KW Trans. & Ant. Equip. Maint."
"Relay - Ball Gap - Indicator Lamp Tools"

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Fig. No. 3:

- (a) Western Electric Type H-429621 Cleaning Tool.
- (b) Crocus Cloth Cleaning Tool.
- (c) Fine Cut Flat Steel File 3" long X 7/16" wide X 1/16" thick.
- (d) Western Electric 265-B Cleaning Tool.

Fig. No. 4:

- (a) Crocus Cloth Cleaning Tool.
- (b) Fine Cut Flat Steel File 3" X 7/16" X 1/16"

Fig. No. 5:

- (a) Western Electric 265-B Cleaning Tool.
- (b) Piece of Wrapping Paper cut to size 2" X 1/4"
- (c) Western Electric Type H-429621 Cleaning Tool.

Fig. No. 6:

Western Electric Type 70-D Gram Pressure Measuring Tool.

Fig. No. 7:

- (a) WOR Type 340-A Adjusting Tool.
- (b) Western Electric Type 212 Adjusting Tool.
- (c) Western Electric Type 340 Adjusting Tools.

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"Relay - Ball Gap - Indicator Lamp Tools"

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Fig. No. 8:

- (a) Precision Screwdriver $3\frac{1}{2}$ " long with $1/16$ " Screwdriver edge.
- (b) "Utility" Type Dentists off-set Mirror.
- (c) Western Electric Type 72 Screwdriver and Hexagon Nut Tightening Tool.

Fig. No. 9:

- (a) Type R-1931 Set of Thickness Gauges.
- (b) WOR Type No. 12-A Ball Gap Spacing Tool .089 - .6250 - $\frac{1}{2}$ " - $5/8$ ".

Fig. No. 10:

- (a) Western Electric Type 319-B Bull's eye Removing Pliers.
- (b) Western Electric Type 116 Indicator Lamp Removing Tool (for Type A-1, B-2, and E-3 Lamps).

INSTRUCTIONS

DEFINITE-TIME CONTROL
RELAY

TYPE MC-16

GENERAL  ELECTRIC

SCHENECTADY, N.Y.

*File 7 tem 20
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DEFINITE-TIME CONTROL RELAY

TYPE MC-16

The Type MC-16 relay is for use on a-c circuits and is essentially a contact mechanism, actuated by an induction motor and an electro magnet.

The contact mechanism is furnished in two different forms.

One form has one set of time-delay circuit-closing contacts, one set of time-delay circuit opening contacts, and one set of instantaneous circuit-closing contacts.

The other form has two sets of time-delay circuit-closing contacts and one set of time-delay circuit-opening contacts.

The different sets of contacts in either form are electrically separate from each other.

The relay may be furnished with frequency ratings of 25, 30, 40, 50, or 60 cycles at 115, 230, 460, or 575 volts.

All of the contacts can carry 3 amp. They can make 10 amp at 230 volts, a-c; 0.75 amp at 125 volts, d-c; 0.15 amp at 275 volts, d-c; or 0.10 amp at 600 volts, d-c.

The motor coils take about 0.12 amp at 230 volts, 60 cycles, and the holding coils take about 0.10 amp at 230 volts, 60 cycles.

The relay will operate satisfactorily at 75 per cent rated voltage or more. Time delay is not appreciably affected by ordinary voltage changes.

INSTALLATION

Unpacking

Unpack and closely examine the relay to see that it has not been damaged in shipment. After the relay is mounted in its permanent location, take off the cover and remove the cords or bands which temporarily hold the movable parts.

Location

Mount the relay in a vertical position. The relay should be placed in a clean, dry, well lighted place where it will be subjected to minimum vibration.

The general dimensions of the relay, size of spacing studs, etc., are shown in Fig. 4.

Connections

Before connections are made, see that the contact surfaces of the nuts and the terminals are bright, and that the threads have not been injured. If a nut tends to screw on too tightly, the stud or nut should be rethreaded.

ADJUSTMENTS

1. Make sure that the armature is loose and free to move in its cradle.

2. The latch should move freely.

3. With the relay in normal de-energized condition, the pawl is not in mesh with the train of small gears. Closing of the magnet armature meshes the pawl in one of the gears rotated by the motor. The armature should move a short distance before meshing the pawl. When the armature is completely closed, the pawl arm should just start to move from the slotted guide in which it rests.

4. For proper operation of relay, certain air gaps should be maintained in the mechanism. The latch prevents the contact in contact arm (A), Fig. 1, from closing with contact (B) until a definite time has elapsed. There should be $\frac{1}{8}$ -in. gap between the end of the latch and contact arm (A) when the armature is open and against the stop. There should be a gap of $\frac{3}{16}$ in. between the contact in arm (A) and contact (B) when the armature is closed and the latch in its normal position. The contact in arm (G) must be closed with contact (C) at all times, except when the latch has released contact arm (A) at which time, with the magnet energized, the distance between the contact in arm (G) and contact (C) should be at least $\frac{1}{16}$ in. When the latch releases contact arm (A) the contact in the arm should close with contact (B). The contact in arm (H) should be closed with contact (D) when the armature is closed.

GEH-1142 Type MC-16 Definite-time Control Relay

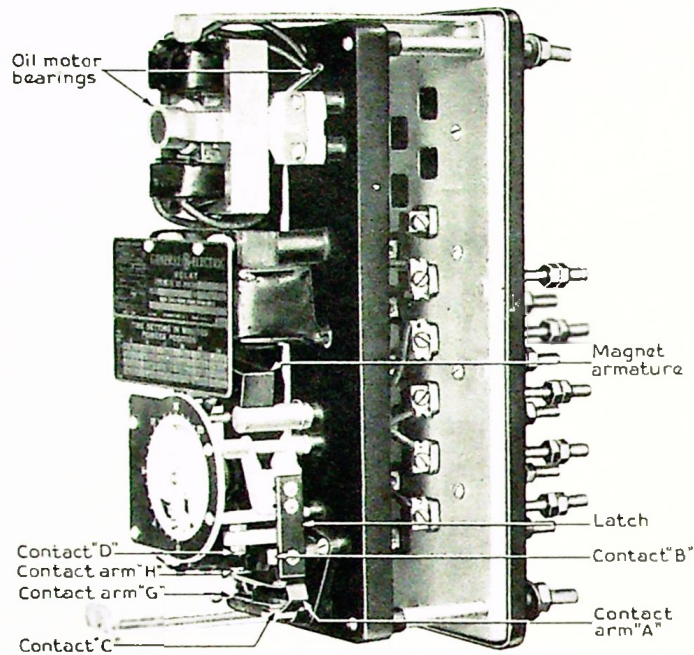


Fig. 1. Type MC-16 Definite-time Control Relay, Right Side, Front View with Cover Removed

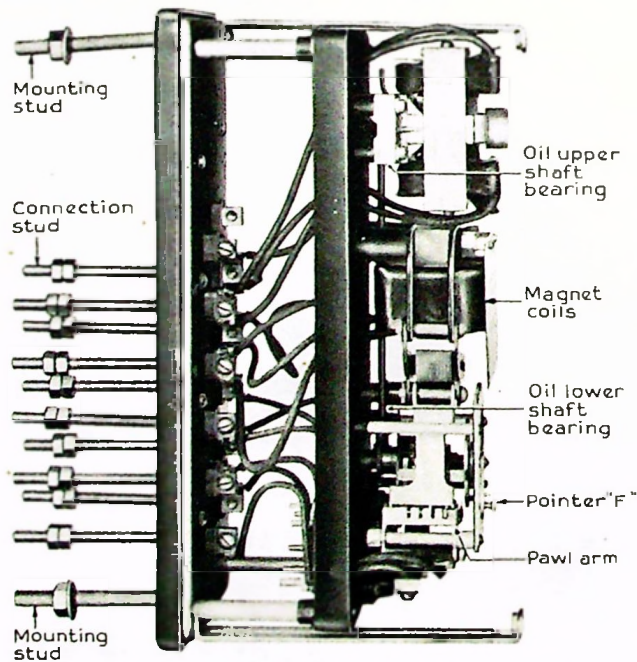


Fig. 2. Type MC-16 Definite-time Control Relay, Left Side, Front View with Cover Removed

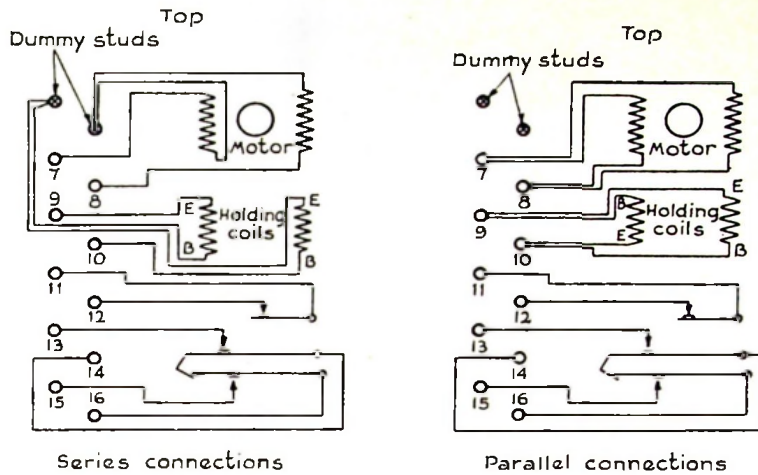


Fig. 3. Internal Connections

Time Delay

There are two means by which time-delay adjustments may be obtained.

The first or coarse adjustment is made by placing the pawl arm, which is located behind the left-hand corner of the circular scale plate, in one of the four notches.

The second or fine adjustment is made by rotating the pointer (F), Fig. 2, on the circular scale to the desired setting.

Time delays corresponding to the various pointer positions with each of the four pawl positions are tabulated on the index plate mounted on the front of the relay. The approximate maximum and minimum calibration which may be obtained is shown in the table below.

For accurate time adjustment the values on the index plate of a particular relay should be followed.

OPERATION

A complete operating cycle of the relay may be described as follows:

When the relay is not energized, contact arms (A) and (H) are in the open position, and contact arm (G) is in the closed position. Closing the magnet circuit by a push button or other means causes the pawl arm to engage the planetary gear train, and contact arm (A) is pulled against the end of the latch, closing the instantaneous circuit-closing contacts consisting of the contact in arm (H) and contact (D). External connections should be such that the relay motor starts simultaneously when the magnet circuit is energized; also the magnet circuit is energized continuously. Due to rotation of the relay motor the latch releases contact arm (A) after a definite time delay, determined by the pointer and pawl arm settings. When the latch releases contact arm (A), spring action of the arm causes the

TIME IN MINUTES

Pawl Position	60 CYCLES		50 CYCLES		25 CYCLES	
	Min	Max	Min	Max	Min	Max
Back	0.04	0.48	0.045	0.59	0.16	1.88
Second	0.19	2.33	0.18	2.67	0.57	9.20
Third	0.74	8.80	0.79	10.90	2.80	37.00
Front	2.64	33.50	3.12	43.50	8.00	142.00

GEH-1142 Type MC-16 Definite-time Control Relay

time-delay circuit-closing contacts, consisting of the contact, this arm, and contact (B) to close. Contact arm (A), after being released by the latch, pulls on contact arm (G) causing the

Ordinarily the time-delay circuit-opening contacts, consisting of the contact in arm (G) and contact (C), are used to shut down the relay motor. If these contacts are used for some other purpose, external provisions should be made to shut down the relay motor immediately after the latch releases contact arm (A), since further rotation may injure the mechanism.

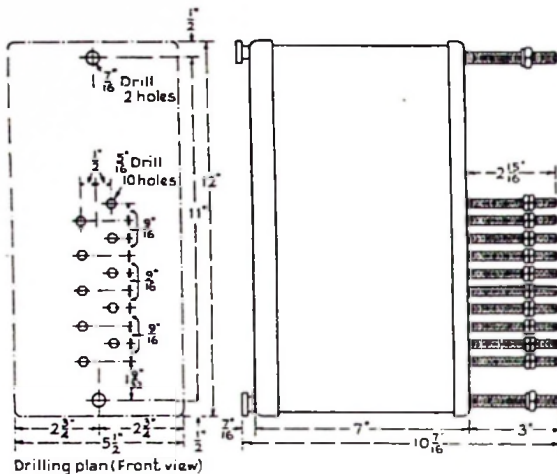


Fig. 4. Outline Dimensions and Panel Drilling

time-delay circuit-opening contacts, consisting of the contact in arm (G) and contact (C), to open. Opening the holding-coil circuit allows the relay to reset to its original (de-energized) position and the relay is then ready for another operating cycle.

RENEWAL PARTS

Periodic inspections should be made to see that all movable parts move freely and that no excessive wear has occurred at any point. At intervals of approximately 100 hours of running time, a few drops of a good grade of light spindle oil should be applied to the bearings of the moving parts, see Fig. 1 and 2. Particular care should be taken to see that the relay motor bearings are properly lubricated or trouble is sure to result. When oiling the relay or making mechanical inspection, care should be taken to keep away from all live circuits.

MAINTENANCE

When ordering renewal parts, refer to the nearest sales office of the General Electric Co. Give the Cat. No. and the complete nameplate rating, and describe the part in detail.

WHEN SERVICE IS REQUIRED

THE facilities of our engineering departments and factories are available to purchasers of G-E apparatus through G-E service shops and sales offices, a list of which is given below.

When it is necessary to renovate, repair, or change apparatus to meet a new operating condition or a new application, the facilities of the nearest G-E service shop are at your disposal. Each of them is equipped to turn out work of the same high quality, both as to workmanship and materials, as at the factory. If it is necessary that the work be done on the customer's premises, the service shop is prepared to send trained, competent, and dependable men who will do it promptly and efficiently. Similarly, the sales office nearest you will be glad to help you with any engineering problems that may be involved.

SERVICE SHOPS

Atlanta, Ga.	496 Glenn Street, Southwest	Milwaukee, Wis.	640 West St. Paul Avenue
Buffalo, N. Y.	318 Urban Street	Minneapolis, Minn.	410 Third Avenue, North
Charleston, W. Va.	306 MacCorkle Avenue, Southeast	New York, N. Y.	416 West Thirteenth Street
Chicago, Ill.	849 South Clinton Street	Philadelphia, Pa.	429 North Seventh Street
Cincinnati, Ohio	215 West Third Street	Pittsburgh, Pa.	6519 Penn Avenue
Cleveland, Ohio	4966 Woodland Avenue	St. Louis, Mo.	1110 Delmar Boulevard
Dallas, Texas	1801 North Lamar Street	Salt Lake City, Utah	141 South Third West Street
Detroit, Mich.	5950 Third Avenue	San Francisco, Calif.	361 Bryant Street
Houston, Texas	1312 Live Oak Street	Seattle, Wash.	1508 Fourth Avenue, South
Kansas City, Mo.	819 East Nineteenth Street	West Lynn, Mass.	920 Western Avenue
Los Angeles, Calif.	5203 Santa Fe Avenue		

Special service divisions are also maintained at the following Works of the Company: Eric, Pa.; Ft. Wayne, Ind.; Pittsfield, Mass.; Schenectady, N. Y.; and West Lynn, Mass. (West Lynn Works)

SALES OFFICES (Address nearest office)

Akron, Ohio	335 South Main Street	Milwaukee, Wis.	940 West St. Paul Avenue
Atlanta, Ga.	187 Spring Street, Northwest	Minneapolis, Minn.	12 South Sixth Street
Baltimore, Md.	39 West Lexington Street	Nashville, Tenn.	234 Third Avenue, North
Bangor, Me.	115 Franklin Street	Newark, N. J.	744 Broad Street
Binghamton, N. Y.	19 Chenango Street	New Haven, Conn.	129 Church Street
Birmingham, Ala.	600 North Eighteenth Street	New Orleans, La.	837 Gravier Street
Bluefield, W. Va.	Appalachian Building	New York, N. Y.	570 Lexington Avenue
Boston, Mass.	140 Federal Street	Niagara Falls, N. Y.	253 Second Street
Buffalo, N. Y.	1 West Genesee Street	Oklahoma City, Okla.	119 North Robinson Street
Butte, Mont.	20 West Granite Street	Omaha, Nebr.	409 South Seventeenth Street
Cedar Rapids, Iowa	203 Second Street, Southeast	Philadelphia, Pa.	1405 Locust Street
Charleston, W. Va.	306 MacCorkle Avenue, Southeast	Phoenix, Ariz.	435 West Madison Street
Charlotte, N. C.	200 South Tryon Street	Pittsburgh, Pa.	535 Smithfield Street
Chattanooga, Tenn.	832 Georgia Avenue	Portland, Me.	477 Congress Street
Chicago, Ill.	840 South Canal Street	Portland, Ore.	920 Southwest Sixth Avenue
Cincinnati, Ohio	215 West Third Street	Providence, R. I.	111 Westminster Street
Cleveland, Ohio	4966 Woodland Avenue	Reading, Pa.	31 North Sixth Street
Columbus, Ohio	40 South Third Street	Richmond, Va.	700 East Franklin Street
Dallas, Texas	1801 North Lamar Street	Roanoke, Va.	202 South Jefferson Street
Davenport, Iowa	511 Pershing Avenue	Rochester, N. Y.	89 East Avenue
Dayton, Ohio	25 North Main Street	St. Louis, Mo.	112 North Fourth Street
Denver, Colo.	650 Seventeenth Street	Salt Lake City, Utah	200 South Main Street
Des Moines, Iowa	418 West Sixth Avenue	San Antonio, Texas	201 Villita Street
Detroit, Mich.	700 Antoinette Street	San Diego, Calif.	861 Sixth Avenue
Duluth, Minn.	14 West Superior Street	San Francisco, Calif.	235 Montgomery Street
El Paso, Texas	109 North Oregon Street	Schenectady, N. Y.	202 State Street
Eric, Pa.	10 East Twelfth Street	Seattle, Wash.	821 Second Avenue
Evansville, Ind.	123 Northwest Fourth Street	Spokane, Wash.	421 Riverside Avenue
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Fort Worth, Texas	408 West Seventh Street	Springfield, Mass.	95 State Street
Grand Rapids, Mich.	149 Monroe Avenue, Northwest	Syracuse, N. Y.	113 South Salina Street
Hartford, Conn.	410 Asylum Street	Tacoma, Wash.	1019 Pacific Avenue
Houston, Texas	1312 Live Oak Street	Toledo, Ohio	420 Madison Avenue
Indianapolis, Ind.	110 North Illinois Street	Tulsa, Okla.	409 South Boston Street
Jackson, Mich.	212 Michigan Avenue, West	Utica, N. Y.	258 Genesee Street
Jacksonville, Fla.	237 West Forsyth Street	Washington, D. C.	806 Fifteenth Street, Northwest
Kansas City, Mo.	106 West Fourteenth Street	Waterbury, Conn.	95 North Main Street
Knoxville, Tenn.	602 South Gay Street	Wichita, Kan.	200 East First Street
Los Angeles, Calif.	212 North Vignes Street	Worcester, Mass.	165 Commercial Street
Louisville, Ky.	455 South Fourth Street	Youngstown, Ohio	25 East Boardman Street
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Canada: Canadian General Electric Company, Ltd., Toronto
Motor Dealers and Lamp Agencies in all large cities and towns

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ITEM 21.

(a) "Antenna Coupling Room" #9 (J): Proceed to this Room, open Enclosure door and clean Contacts of "Antenna Changeover Switch".

CAUTION: Perform this Maintenance Item when Transmitter IS CLOSED DOWN & THE CARRIER IS "OFF" THE AIR COMPLETELY.

Before proceeding to do this Item, enter 5 KW Transmitter Enclosure, place Switch "D18C" - "5 KW Crystal Selector & Master Start Relay S5A" to the Left, thus supplying 115 Volts A.C. for "Crystal Heater" and "S5A" - "Master Start Relay" from secondary of Transformer "T1C".

Now proceed to "Audio Facilities Control Room" and put "OFF" Switch #34 in Wall Panel Box.

This Switch #34 shuts "OFF" 115 Volts A.C. Power from "Antenna Changeover Switch" and shuts "OFF" the "1-C Frequency Monitor" located on right side of the Transmitter Room Desk.

Clean Cadmium-plated Large Surface Contacts of 50 KW Transmitter, 5 KW Transmitter, and "Swingers" positions with Crocus Cloth.

Clean Residue from Contacts using a clean cloth dampened in Carbon-tet.

Inspect Contacts with aid of A.C. Extension Light.

They should be clean and bright.

If they are not, clean them a Second Time.

Clean all Cadmium-plated "Operating" Contacts and all Cadmium-plated "Inter-locking" Contacts with "Crocus Cloth Tool."

Merely separate these Contacts, place "Crocus Cloth Tool" between contacts, pinch them together with Thumb and fore finger of Left hand and rub Tool between them several times.

After cleaning these contacts, wrap small piece of Clean cloth about a second "Crocus Cloth Tool", dip in Carbon-tet, and clean off residue by same method

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ITEM 21.

as they were cleaned.

Inspect Contacts with aid of A.C. Extension Light.

They should be clean and bright.

If they are not, clean them a Second Time.

NOTE: The "Antenna Changeover Switch" may manually be put to 5 KW position or 50 KW Position at will by merely pushing Armature "IN" or lifting the mechanical Catch and allowing the Armature to "Drop Out" respectively.

(b) "Engine Driven Generator Room": Proceed to this Room, open metal Box housing "Ant. Transfer Switch Controls" and clean "Selector Contactors" also the "Xmtr Interlocks" of 50 KW Transmitter and 5 KW Transmitter.

Place small piece of Crocus Cloth flat against the stationary contacts of "Selector Contactors", exert trifle pressure with flat part of Thumb and twist left and right several times.

This method will assure a clean contact and at the same time maintain the flat surface.

Clean all 4 of these flat Stationary Contacts of "Selector Contactors" by the same procedure.

After cleaning contacts wipe off with cloth dipped in Carbon-tet.

Inspect contacts with aid of A.C. Extension Light.

They should be clean and bright.

If they are not, clean them a Second Time.

Place a small piece of Crocus Cloth against the rounded movable Contacts of "Selector Contactors" and rub them with circular motion several times.

This will assure clean contacts and at the same time maintain the rounded surfaces.

Clean all 4 of these rounded movable contacts of Selector Contactors by the same procedure.

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After cleaning contacts, wipe off with cloth dipped in Carbon-tet.

Inspect contacts with aid of A.C. Extension Light.

They should be clean and bright.

If they are not, clean them a Second Time.

Place the "H429621" Tool between Movable and Stationary Contacts of "Xmtr Interlocks" exert trifle pressure against the back Stationary Contact (It is fitted with a Spring and will move slightly) then rub tool between contacts several times.

Clean both "Xmtr Interlocks" by the same procedure.

After cleaning, inspect the contacts with aid of A.C. Extension Light and small "Dentist's Mirror".

They should be clean and bright.

If they are not, clean them a Second Time.

After cleaning "Selector Contactors" and "Xmtr Interlock" proceed to the "Audio Facilities Control Room" and put "ON" Switch #34 in the Wall Panel Box.

Enter 5 KW Transmitter Enclosure and put Switch "B1C" to the Right, thus supplying 115 Volts A.C. for operation of "Crystal Heaters" and "S5A" - "Master Start" Relay from regular 115 Volt A.C. Service.

After this Item is thoroughly completed, test "Antenna Changeover Switch" by transferring it from 50 KW to 5 KW Transmitter positions several times.

Proceed to the right Turret of the Transmitter Room Desk, put "ON" - "Ant. Switch" Button (Normally is "ON".)

Push "Ant Transf 50 KW" . . "Antenna Changeover Switch" in "Antenna Coupling Room" should swing over to 50 KW Transmitter.

Amber Light marked "Antenna Transfer 50 KW" should Light.

Push "Ant Transf 5 KW" . . "Antenna Changeover Switch" in "Antenna Coupling Room" should swing over to 5 KW Transmitter.

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Purple Light marked "Antenna Transfer 5 KW" should Light.

Repeat this process two or three times, leaving "Antenna Changeover Switch"
in 50 KW Transmitter position.

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ITEM 22.

(a) "Switch Room": Proceed to this Room and clean the contacts of the "Emergency 120 Volt Service Relay" with "Crocus Cloth Tool".

These Switches are located in small Metal Box in this Room.

It is not necessary to shut "OFF" the Current to clean these Contacts.

CAUTION: TO AVOID GETTING SHOCK FROM 115 VOLTS A.C., DO NOT TOUCH CONTACTS WITH FINGERS WHILE CLEANING.

Merely place flat part of "Crocus Cloth Tool" against contact, and rub several times to clean.

There are a total of 27 Contacts to be cleaned.

After cleaning contacts, wrap a small piece of clean cloth about a 2nd "Crocus Cloth Tool", dip in Carbon-tet and wipe residue off all these contacts.

Inspect Contacts with aid of A.C. Extension Light.

They should be clean and bright.

If they are not, clean them a Second Time.

(b) Summary of Operation of "Emergency 120 Volt Service": Note that when Contacts are separated to clean, "Emergency Lights" will be extinguished, and Transmitter Room also Basement Electric Clocks will stop; after cleaning and wiping, Lights and Clocks will go "ON" again.

While this Maintenance Item will require about 15 Minutes, great care is necessary to be sure that all contacts are clean and wiped dry.

After finishing this Maintenance Item, check position of "Voltage Hunting Armature".

It is important that it be in position to illuminate the Emergency Light directly over this Relay Box in "Switch Room" which will indicate to the Technician correct operation of the "Emergency 120 Volt Service Relay".

This will also indicate that Transmitter Room and Basement Clocks are running, and all "Emergency Service Lights" will be illuminated.

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CAUTION: Both Clocks will be between 15 seconds to 1 minute SLOW due to short periods of "Open Circuit" while cleaning and wiping.

Get correct time check from WR Master Control or other source and reset Clocks.

Inspect the "Voltage Hunting Armature" of "Emergency 120 Volt Service Relay".

Normally it is in the DOWN position, that is set to the "Carteret" Feeders, and will remain thus so long as "Carteret" 4150 Volt Service is OK, no matter which Service, i.e., "Carteret" or "Rahway" is being used for Transmitters.

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ITEM 23.

- (a) "Switch Room": Proceed to this Room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS. Merely grasp the Handle of the Oil Circuit Breaker and lift it up.
- (b) "Basement": While in the Basement, put "OFF" Switch "D1P" - "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS. Remove the Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it up.
- (c) "Basement": While in the Basement, put "OFF" Switch "D1.1P" - "Main Power Disconnect Panel" for SAFETY REASONS.
- (d) "Basement": While in the Basement, put "OFF" Switch "D15P" - "Motor Distribution Panel" for SAFETY REASONS.
- (e) "Control Unit" #1 (A): Proceed to the Rear of this Unit and put "OFF" "Safety Switch" - "DLA" for SAFETY REASONS.
- (f) "Transmitter Room": Gather all Tools and Equipment needed for performance of this item.

TOOL

WHERE KEPT

Maintenance Tray No. 1 - - - - - Bin No. 3 in Spare Tube Room

Maintenance Tray No. 3 - - - - - Bin No. 3 in Spare Tube Room

Relay Tools - Kit No. 1 - - - - - Compartment No. 11 in "Portable Fuse and Test Unit".

Relay Tools - Kit No. 2 - - - - - Compartment No. 11 in "Portable Fuse and Test Unit".

One Small Flat File 6"X1"X1/8" - - - - - Drawer No. 9 of Basement Work Bench

0 to 6 Lbs. "Fisherman's Scale" - - - Maintenance Tray No. 2 on "Maintenance Bench" in Basement.

115 Volt A.C. Extension Light - - - - - Basement

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TOOL

WHERE KEPT

115 Volt A.C. Vacuum Cleaner

and Special attachments - - - - - "Maintenance Bench" Basement

Place all Tools and Equipment except contents of Maintenance Tray No. 1 in
Maintenance Tray No. 5.

(g) "17 KV Rectifier Switching Unit" #11 (B): Proceed to Rear of this
Unit and lift the Asbestos Flame Arrestor Guards off stationary contacts of A.C.
Contactors "S4B" and "S5B".

Be careful not to drop Guards as they are FRAGILE and will break.

File the Contacts of both Stationary and Movable Arms of "S4B" and "S5B" until
all burns, pits, or raised places are removed.

NOTE THAT CONTACT SURFACES ARE FLAT CROSS-WISE, and SLIGHTLY CURVED LENGTHWISE.
Exercise care in filing Contacts, so as not to remove either the FLAT OR CURVED
SURFACES.

Be sure to use Fine File, but most of all, have surfaces smooth.

After cleaning contacts, inspect them with aid of A.C. Extension Light.

They should be clean and bright, free of burns and pits, etc.

If they are not, clean them a Second Time.

After cleaning contacts, thoroughly brush out all associated parts with Soft Dry
Maintenance Brush.

This will remove all Copper particles, etc., from equipment.

Place Heel of Hand against the top edge of the Armature and GENTLY push in until
Contacts just Close.

All 6 Contacts should be making contact at the same instant.

If they are not, adjust for correct closing.

Place heel of right hand against top edge of the Armature and quickly force it
against the end of the Field Piece.

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Note that Movable Contacts touch Stationary Contacts and then they rock into place.

Check Pressure on Contacts as follows: Place "Weighing Clip" on end of Scale at about the middle position of Movable Contactor and pull straight out.

Contactor should move out against its coiled steel spring at approximately $8\frac{1}{2}$ lbs pressure.

(h) "17 KV Rectifier Switching Unit" #11 (B): While at this Unit, clean Contacts of "Associated Pendulum Relays" - "S4B" and "S5B" with Crocus Cloth Tool. Grasp the "Crocus Cloth Tool" in Left Hand and place flat against the Stationary Contacts of "Associated Pendulum Relay" "S4B", rest backs of forefinger and 2nd Finger of the Right Hand against "Crocus Cloth Tool", exerting trifle pressure. Rub Contacts with "Crocus Cloth Tool" several times.

After cleaning these 2 Stationary Contacts, take 2nd "Crocus Cloth Tool", place small piece of clean cloth about it, dip in Carbon Tet, and wipe residue off Contacts.

Tear a piece of Crocus Cloth about 1 inch by 4 inches and clean the Convex Movable Contacts of "Associated Pendulum Relay" - "S4B".

After cleaning Contacts, wipe off residue with a small piece of clean cloth dampened in Carbon Tet.

After cleaning Contacts, inspect them with aid of A.C. Extension Light.

They should be clean and bright.

If they are not, clean them a second time.

Remove the Knurled Locking Nut, carefully remove the Bakelite Cover and inspect the Mechanical Ratchet operating mechanism and gears, also the linkage on this Relay. Apply a very small amount of "3-in-1" Oil if required.

Replace Bakelite Cover, tighten knurled locking nut a trifle until compression

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washer is tight, but not flat.

Service "Associated Pendulum Relay" - "S5B" by the same procedure.

(i) "17 KV Rectifier Switching Unit" #11 (B): While at this Unit clean inside and outside of Asbestos Flame Arrestors previously removed from A.C. Magnetic Contacts "S4B" and "S5B".

Clean inside of Asbestos Flame Guards with small piece of Crocus Cloth, wiping out residue with rag dampened in Carbon Tet.

AVOID TOO MUCH RUBBING OF INSIDES OF FLAME ARRESTORS, MERELY CLEAN OFF THE COPPER PARTICLES DEPOSITED THERE BY OPERATION OF THE CONTACTORS.

Wipe off outside of Flame arrestors with clean dry cloth.

After cleaning replace Asbestos Flame Arrestors over stationary contacts of A.C. Contactors "S4B" and "S5B".

Place heel of hand against Armatures and push to "Operating Position" to test for binding caused by flame arrestors.

If Flame Guards are properly placed, they will not cause binding.

(j) Brief Summary of Operation of A.C. Magnetic Contactors "S4B" and "S5B". DO NOT TEST TRANSMITTER AT THIS INSTANT, UNLESS NECESSARY, but following Data is for guidance of Technician when starting STransmitter.

Push "ON" Switch "D9A" - "17,000 Volt Rectifier" and operation of "Main Starting Contactor" - "S4B" is instantaneous.

"Operating Contactor" - "S5B" will automatically go "ON" 3 seconds after "S4B" operated to "ON" Position.

"S1L" - "Filter Condenser Charging Resistor Short-Circuiting Contactor" will automatically go "ON" 4 seconds after "S5B" operated to "ON" position.

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If the A.C. Magnetic Contactors "S4B" and "S5B" and "S1L" do not come up in the proper time, Item 23 (a) - (b) - (c) - (d) - (e) - (f) and (h) must be performed again in sequence, if time allows, before going on the Air for the Day. If there is no time for adjustment, enter Data on reverse of T & AE Tally Sheet. Maintenance Watch on next Shut-down will adjust or clean "Associated Pendulum Relay" Contacts.

Write details on separate report to Supervisor.

Wipe all copper dust from top and sides of large Rectangular Conduit Box directly below "S4B" with a soft clean cloth.

Use Maintenance Brush to clean all Copper Dust off both sides of Relay Apparatus Panel including "R1B" - "S2B" - "S3B" and Terminal Strip "TSLB".

Thoroughly Vacuum Clean floor in front of and adjacent to 17,000 Volt Rectifier Switching Unit.

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(a) "Control Unit" #1 (A): Proceed to this Unit and check the Time Delay Adjustment of "Plate Voltage Delay Relay" - "S6A".

Directly after putting "ON" - "D2A" - "Master Control" Start Button per Book No. (3) Sec. No. (B) Page No. (1) to (16), Item on "Analysis Method Procedure Before Placing 50 KW Transmitter Carrier on the Air" Paragraphs (f) begin to count the time.

"S6A" Minimum Time 10 Minutes, Maximum Time 12 Minutes.

(b) "Control Unit" #2 (A): Proceed to this Unit and check Time Delay Adjustment of Lockout Relay "S5A".

No. 2 Technician will go to the "2nd Power Amplifier Tube Unit" and touch the Armature of Plate Overload Relay "S1F" slowly 3 times until "S5A" Relay has locked out.

Each time Technician touches armature of Plate Overload Relay "S1F", "Plate Voltage Trip Relay" - "S4A" will drop out and its back contacts will energize the Solenoid of "Lockout Relay" - "S5A" causing it to move up One Notch.

On the third test, Lockout Relay "S5A" will Lock out as evidenced by the Red Pilot light over "S5A" being "ON".

At this instant No. 1 Technician will begin to observe time required for Plunger Latching Device to come to rest by dropping down, i.e., the Notch on "S5A" flips outward and Spring automatically turns Clockwise.

"S5A" Relay is now restored to "Operating Position" and Time Delay Sequence is finished.

After Sequence is finished, to turn knurled Reset Knob Counter-Clockwise.

"S5A" Minimum Time 25 seconds Maximum time 35 seconds.

(c) "Control Unit" #1 (A): Proceed to this Unit and Check time required for A.C. Magnetic Contactors "S4B" - "S5B" and "S1L" to operate.

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ITEM 24.

Operating time required for A.C. Magnetic Contactors "S4B" and "S5B", and "S1L" may be measured during per Book No. (3) Sec. No. (B) Page No. (4) to (9) inclusive, Item on "Degassing Procedure" Paragraph (j).

"S4B" "Main Starting Contactor" Instantly "ON" after "D9A" - "17,000 Volt Rectifier Control" Button is "ON".

"S5B" - "Operating Contactor" normal period of operation is 3 seconds.

"S1L" - "17 KV Filter Condenser Charging Resistor R1L Shorting Contactor" normal period of operation is 4 seconds.

(d) Enter Operating Times of Relays "S6A" - "S5A" - "S4B" - "S5B" and "S1L" on Form "Time Delay Adjustments of Relays."

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YEAR 1953

Month	Day	S4B	S5B	S6A	S5A	Sign
Jan.						
Feb.	25	3 Sec.	5 Sec.	11 Min.	32 Sec.	QK-TD
Mar.	18	3 Sec.	5 Sec.	11 Min.	32 Sec.	HS-JK
Apr.	21	3 SEC	5 SEC	11 MIN	32 SEC	TD-CG
May.	19	3 SEC	5 SEC	11 MIN	30 SEC	QK-GM
June.	16	3 SEC.	5 SEC.	11 MIN.	30 SEC.	JL-HS
July.	21	3 SEC	5 SEC.	11 MIN	30 SEC	QK-GM
Aug.	18	3 SEC	5 SEC	11 MIN	30 SEC	TD-GM
Sept.						
Oct.	20	3 SEC	5 SEC.	11 MIN.	30 SEC.	AL-HW
Nov.	17	3 SEC	5 SEC	11 MIN	30 SEC	TD-GM
Dec.	15	3 SEC	5 SEC	11 MIN	30 SEC	QK-JK
JAN-1954	19	3 SEC	5 SEC	11 MIN.	32 Sec.	AL-GM
FEB-1954	16	3 SEC	5 SEC	11 MIN	30 SEC	QK-TD
Remarks						
	2/25/53.	S2L	DELAY	4 SEC.		QK-TD
	3/18/53	S2L	DELAY	4 SEC.		HS-JK
	4/21/53	S11	DELAY	4 SEC		TD-CG
	5-19-53	S2L	DELAY IS	4 SEC		QK-GM
	6-16-53	S2L	DELAY IS	4 SEC.		JL-HS
	7-21-53	S2L	DELAY IS	4 SEC.		QK-GM
	8-18-53	S1L	DELAY IS	4 SEC		TD-GM
	10-20-53	S1L	DELAY IS	4 SEC.		AL-HW.
	11/17/53	S1L	DELAY IS	4 SEC		TD-GM
	12-15-53	S2L	DELAY	4 SEC.		QK-JK
	1-19-54	S4L	Delay	4 Sec.		AL-GM.
	2-16-54	S2L	DELAY	4 SEC		QK-TD

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"Time Delay Adjustments Of Relays"

YEAR 1954

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Month	Day	S4B	S5B	S6A	S5A	Sign
Jan.						
Feb.	16	3 SEC	5 SEC	11 MIN	30 SEC	OK-TD
Mar.	16	3 SEC	5 SEC	11 MIN.	30 sec	HS-RH
Apr.	21	3 SEC	5 SEC	11. MIN	30 SEC	TD-WC
May.	18	3 SEC	5 SEC	11 MIN.	30 Sec.	AL-AJ
June.	15	3 SEC	5 SEC	11 MIN	30 SEC	OK-OM
July.						
Aug.						
Sept.	20	3 sec.	5 sec.	11 min	30 sec	RO-AJ
Oct.	18	3 sec	5 sec	11. MIN	30 sec	RO-TD
Nov.	16	3 SECS.	5 SECS.	11 min 40 sec	30 SECS.	RO-JL
Dec.	21	3 SEC.	5 SEC.	12 MIN.	30 SEC.	RO-JL

Remarks

2-16-54	SIL DELAY	4 SEC	OK-TD
3-16-54	SIL DELAY	4 SEC.	HS-RH
4-21-54	SIL DELAY	4 SEC	TD-WC
5-18-54	SIL DELAY	4 SEC	AL-AJ
6-15-54	SIL DELAY	4 SEC	OK-OM
9-20-54	SIL DELAY	4 SEC	RO-AJ
10-18-54	SIL DELAY	4 SEC	RO-TD
11-16-54	SIL DELAY	4 SECS.	RO-JL
12-21-54	SIL DELAY	4 SEC.	RO-JL

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3RD TUESDAY

ITEM 24

YEAR 1955

Month	Day	S4B	S5B	S6A	S5A	Sign
Jan.	18	3 SEC.	5 SEC.	11 MINS. 43 SECS.	30 SEC.	RD-LP
Feb.	15	3 SEC.	5 SEC.	11 MINS. 43 SECS.	30 SEC.	RD-AJ
Mar.	15	3 SEC.	5 SEC.	11 MINS. 44 SECS.	30 SECS.	RD
Apr.	19	3 SEC.	5 SEC.	11 MINS. 43 SECS.	30 SEC.	RD-AJ
May.	17	3 SEC.	5 SEC.	11 MINS. 47 SECS.	30 SECS.	RD
June.	21	3 SEC.	5 SEC.	11 MINS. 45 SECS.	30 SECS.	RD
July.	19	3 SECS.	5 SECS.	11 MINS. 44 SECS.	30 SECS.	RD
Aug.						
Sept.	20	3 SECS.	5 SECS.	11 MINS. 43 SECS.	30 SECS.	RD
Oct.	21	3 SECS.	5 SECS.	11 MIN. 44 SECS.	30 SECS.	AJ
Nov.	18	3 SEC.	5 SEC.	11 MIN. 45 SECS.	20 SECS.	RD-OK
Dec.	16	3 SEC.	5 SEC.	11 MIN. 45 SECS.	30 SEC.	AJ-LP
Remarks	1-18-55	SIL DELAY - 4 SEC.		RD-LP		
	2-15-55	SIL DELAY - 4 SEC.		RD-HS		
	3-15-55	SIL DELAY - 4 SEC.		RD		
	4-19-55	SIL DELAY - 4 SEC.		RD-AJ		
	5-17-55	SIL DELAY - 4 SEC.		RD		
	6-21-55	SIL DELAY - 4 SEC.		RD		
	7-19-55	SIL DELAY - 4 SECS.		RD		
	9-20-55	SIL DELAY - 4 SECS.		RD		
	10-21-55	SIL DELAY - 4 SECS.		AJ		
	11-18-55	SIL DELAY - 4 SEC.		RD-OK		
	12-16-55	SIL DELAY - 4 SEC.		AJ-LP		

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YEAR 56

Month	Day	S4B	S5B	S6A	S5A	Sign
Jan.	13	3 SEC	5 SEC	11 min 11.5 sec	30 SEC	OK-TD
Feb.	10	3 SEC	5 SEC	11 min 40 sec	30 SEC	OK-LP
Mar.	30	3 SEC	5 SEC	11 min 40 sec	30 SEC	OK-TD
Apr.						
May.	18	3 sec	5 sec	11 min 40 sec	30 sec	OK-RS
June.	15	3 sec	5 sec	11 min 40 sec	30 sec	OK-RS
July.						
Aug.	17	3 sec	5 sec	11 min 40 sec	30 sec	OK-RS
Sept.	21	3 sec	5 sec	11 min 40 sec	30 sec	OK-RS
Oct.	19	3 sec	5 sec	11 min 40 sec	30 sec	OK-SV
Nov.	16	3 SEC	5 SEC	11 min 40 sec	30 SEC	SV-TK
Dec.	21	3 SEC	5 SEC	11 min 40 sec	30 SEC	SV-TK
Remarks	1-13-56 SIL VELA 4 SEC OK					
	2-10-56 SIL DELAY 4 SEC OK					
	3-30-56 SIL DELAY 4 SEC OK					
	5-18-56 SIL DELAY 4 Sec. O.K.					
	5-18-56 SIL DELAY 4 Sec. O.K.					
	8-18-56 SIL DELAY 4 Sec. O.K.					
	9-21-56 SIL DELAY 4 Sec. O.K.					
	10-19-56 SIL DELAY 4 Sec. OK-SV					
	11-16-56 SIL DELAY 4 SEC SV					
	12-21-56 SIL DELAY 4 Sec. SV					

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YEAR 1957

Month	Day	S4B	S5B	S6A	S5A	Sign
Jan.	18	3 sec	5 sec	11 min 40 sec	30 sec	SV-JK
Feb.	15	3 sec	5 sec	11 min 40 sec	30 sec	SV-AP
Mar.	15	3 sec	5 sec	11 min 40 sec	30 sec	SV-AP
Apr.	19	3 sec	5 sec	11 min 40 sec	30 sec	J.K.-AS
May.						
June.	21	3 sec	5 sec	11 min 40 sec	30 sec	J.K.-AS
July.	19	3 sec	5 sec	11 min 40 sec	30 sec	J.K.-RS
Aug.	16	3 sec	5 sec	11 min 40 sec	30 sec	J.K.-RS
Sept.	20	3 sec	5 sec	11 min 40 sec	30 sec	J.K.-RS
Oct.	15	3 sec	5 sec	11 min 40 sec	30 sec	AP-GR
Nov.						
Dec.	20	3 sec	5 sec	11 min 55 sec	30 sec	GR-AP
Remarks	1-18-57 SIL Delay 4 sec - SV					
	2-15-57 SIL Delay 4 sec - SV					
	3-15-57 SIL Delay 4 sec - SV					
	4-19-57 SIL Delay 4 sec - J.K.					
	6-21-57 SIL Delay 4 sec - J.K.					
	7-19-57 SIL Delay 4 sec - J.K.					
	8-16-57 SIL Delay 4 sec - J.K.					
	9-20-57 SIL Delay 4 sec - J.K.					
	10-15-57 SIL " " J.P.G.-JK					
	12-20-57 SIL " " AP-GR OK					

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3RD TUESDAY

YEAR: 1958

Month	Day	S4B	S5B	S6A	S5A	Sign
Jan.						
Feb.						
Mar.						
Apr.	18	3 sec.	5 sec.	11 min 30 sec	30 Sec.	RK/AP
May						
June						
July						
Aug.						
Sep.						
Oct.	10	3 sec.	5 sec.	11 min 15 sec	30 sec.	RK/AP
Nov.	14	3 sec.	5 sec.	11 min 30 sec	30 sec.	RK/AP
Dec.	12	3 sec.	5 sec.	11 min 20 sec	30 Sec	RK/AP

REMARKS:

4/18/58 SIL Delay 4 sec
 10/10/58 SIL Delay 5 sec.
 11/17/58 SIL Delay 4 sec.
 12-12-58 SIL DELAY 5 SEC.

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3RD TUESDAY

YEAR: 1960

Month	Day	S4B	S5B	S6A	S5A	Sign
Jan.	15	3SEC	6SEC	11-30SEC	30SEC	OK
Feb.						
Mar.						
Apr.						
May						
June						
July						
Aug.						
Sep.						
Oct.						
Nov.						
Dec.						

REMARKS:

1-15-60 S4B 5SEC.

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3RD TUESDAY

ITEM 25.

- (a) "Switch Room": Proceed to this Room in the Basement and put "OFF" Switch #2 "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS. Merely grasp the Handle of the Oil Circuit Breaker and lift it up.
- (b) "Basement": While in the Basement, put "OFF" Switch "DLP" - "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS. Remove the Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it up.
- (c) "Transmitter Room": Proceed to the "High Voltage Grounding Switch and Door Interlock Mechanism" - "D13P", remove one Key from any one of Lock positions No. 2 to No. 5 inclusive and keep on person until Item No. 25 is completed.
- (d) "3rd Power Amplifier Tuning Unit" #7 & 8 (I): Climb up on top of this Unit, clean and polish 3rd P.A. Meters and Extension Antenna Ammeters, M1-I" - "M2I" - "M3I" - "M7I" - "M8I" - "M9I" with Stafford's Polish or Simoniz. Procure 9 foot Step Ladder and "Working Boards". Place Step Ladder against the Iron Cage of this unit, take boards, climb up the ladder, and lay boards across the top of the cage of this Unit. Technician may sit on or walk on these "Working Boards" while doing this Item, to prevent damaging Grille work on top of Unit. Wipe off Cases of meters with soft clean cloth. Polish cases of Meters with Stafford's Polish. If no Stafford's Polish is on hand, use Simoniz. Wipe off glass Fronts of these Meters with SLIGHTLY DAMP RAG. Wipe off Isolantite Stand-off Insulators with SLIGHTLY DAMP RAG. If this is insufficient for cleaning Insulators, clean them with Naptha. Wipe off Plate Current Ammeter Shunts with Dry Cloth.

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3RD TUESDAY

ITEM 25.

Check Connections on all these Meters.

Tighten any loose Mounting Screws and Bolts holding Meters on Supporting Insulators.

Wipe off sides and bottoms of these Meter Recessed Spaces with SLIGHTLY DAMP RAG.

Clean insides of Glass Windows with small amount of "Windex" applied from Spray Nozzle, polishing Glass with Soft Clean Dry Cloth.

(e) "3rd Power Amplifier Tuning Unit" #7 (I): While on Top Rear of this Unit, clean Plaster Wall above.

Wipe off Entire Wall above the (I) Unit Meters with soft dry cloth.

Start at the top as far as can be reached, and clean down toward the bottom.

When finished, remove the "Working Boards" and Step Ladder.

Proceed to the Front of this Unit and Clean outsides of Glass Windows with "Windex".

Apply small amount with Spray Nozzle, and polish off to a high Lustre.

Wipe all finger marks and smudges from front of Panels and Style Strips.

(f) "2nd Power Amplifier Tuning Unit" #5 (G): Proceed to the front of this Unit, remove Glass Front Panel, clean and polish Meters "M1G" - "M2G" and "M3G" with Stafford's Polish or Simons.

Remove the 4 Chromium plated Bolts holding Each Black Metal Style Strip in place.

Remove Style Strips.

Remove Screws on Glass Front Panel in following Order:

Remove 2 middle lower screws.

Remove all the screws on the Left and Right Sides.

Remove the 2 screws on top of the Panel, and at same time hold panel in place from falling.

Use Handles and exercise extreme care in handling, lifting off the Glass Front Panel.

Polish Meter cases with Stafford's Polish or Simons.

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3RD TUESDAY

ITEM 25.

Wipe off Glass fronts of these Meters with SLIGHTLY DAMP RAG.

Polish Bakelite Sub-panel behind Meters with Stafford's Polish.

Check position of Indicating Needles of these 3 Meters.

Reset to Zero if required.

Stand directly in front of the Meter and turn Zero Corrector with small Screwdriver.

Enter on T. & A.E. TALLY SHEET when Meters are Reset, and how much Plus or Minus they were observed to be in error.

Clean both sides of Glass Window with small amount of "Windex".

Apply with Spray Nozzle, polishing to high lustre with soft clean cloth.

After cleaning Meters and Glass Front Panel, replace Panel, replacing the 2 Middle Top Screws first, then Screws on both sides and finally those on the Bottom.

Replace the 2 Style Strips and tighten Chromium plated mounting screws.

(g) "2nd Power Amplifier Tuning Unit #5 (G): Proceed to the Rear of this Unit, clean Meter Shunts, Stand-off Insulators and associated busses of Meters "M1G" - "M2G" and "M3G".

Procure small 9 foot Step Ladder, climb up on top of this Unit, CAREFULLY clean Meters with dry cloth.

Wipe off Stand-off Insulators with SLIGHTLY DAMP RAG.

If this is insufficient to clean insulators, wipe them off with Naptha.

Wipe off Cadmium-plated Busses.

Tighten all bolted connections to and from Meters, Shunts and Insulators.

Wipe off top of this Unit with SLIGHTLY DAMP RAG.

Inspect this Maintenance work with A.C. Extension Light to be sure all is clean and all connections are tight and in order.

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3RD TUESDAY

ITEM 25.

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Sec. No. (M) () () () () () ()

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End Item 25.

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3RD TUESDAY

ITEM 26.

(a) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to this Unit and clean Rear and Front Tubes "V1F" and "V2F" respectively.

Wipe off the Metal parts with a rag dampened in Carbon-tet.

Wipe off Glass Envelope of Tubes, using Clean Cloth dampened with Water, then wipe off with Clean Dry Cloth.

If this is insufficient to clean the Glass envelope of Tubes, apply a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Cloth, polishing Glass to High Lustre.

When Transmitter is started, observe the condition of the Glass and if Lint is present, Clean off with Clean Dry Cloth.

If this is not the remedy, use Skin of Hand, which will attract Lint, since it discharges the Static Electricity on Glass, originally accumulated from Dry Cloth.

The small amount of remaining Lint may be blown off the Glass.

In cleaning glass envelope of Tubes, exercise caution, not to scratch.

Do Not Wear a Ring while cleaning or polishing the Power Amplifier Tubes.

Always be sure to take a Clean New Cloth when Cleaning or polishing Power Amplifier Tubes:

(b) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to this Unit and clean Rear Tubes "V1H" - "V3H" "V5H" and Front Tubes "V2H" "V4H" "V6H" procedure same as Item 8 (a).

(c) "Control Unit" #1 (A): Proceed to this Unit and clean 1650 Volt Rectifier Tubes and sockets positions #1 to #6 inclusive.

Wipe off Tube Glass envelopes with a rag dampened in Water, then dry off with Clean Dry Cloth.

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3RD TUESDAY

ITEM 26.

If this is insufficient to clean the glass envelope of Tubes, apply a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Rag, polishing Glass to High Lustre.

Wipe off the Bakelite Socket with Clean Dry Cloth.

(d) "Oscillator-Modulator Unit #2 (D): Proceed to this Unit, Clean Tubes and Sockets Positions "V1Y" "V2Y" "V1D" "V2D" "V3D" "V4D" "V5D".

Procedure for "V1Y" and "V2Y": Proceed to Front of this Unit, and Clean 2 Type 271-A Tubes in Crystal Oscillator, Type 700-A Boxes #1 and #2.

Wipe off Tube Glass envelopes with Rag dampened in Water, then dry off with Clean Dry Cloth.

If this is insufficient to clean the Glass envelopes of Tubes, apply a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Cloth. polishing Glass to High Lustre.

Procedure for "V1D" "V2D" "V3D" "V4D" "V5D": Ascertain if each of these Tubes is in its socket properly.

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3RD TUESDAY

ITEM 26.

Gently push down on Tube to "FEEL IF FILAMENT AND GRID Tube Prongs are resting against socket Prongs Properly".

Check Tension of Socket Prongs, which should be sufficient to hold Socket Prong Tightly against Tube Prong, thus providing GOOD ELECTRICAL CONNECTION. If Tension is insufficient, (as evidenced WHEN 1650 Volts is applied before or after shut down, Overheating of prongs, or variations in Tube Currents when Tube is pushed down in Socket), increase same by Lifting Socket Prong upward Slightly.

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ITEM 26.

3RD TUESDAY

CAUTION. Do not adjust tension of Socket Spring Contacts with Transmitter Rotating Equipment "ON", use "Tube Change Switch" "D3A", pushing same "OFF" To stop all Rotating Machinery while this adjustment is made, or during period when Transmitter is completely shut down. Exercise care in bending Socket Prongs, so as not to break same. Wipe off Tube Glass Envelopes with Rag Dampened in Water, then dry off with Clean Dry Cloth.

If this is insufficient to clean the Glass Envelope of Tubes, apply a small quantity of "Windex" using Spray Nozzle on the Bottle.

Wipe off with Clean Dry Cloth Polishing Glass to High Lustre.

(e) "1st. Power Amplifier Unit" #3 (E): Proceed to this Unit Clean Tubes and Socket Positions "V1E" and "V2E".

Procedure same as Item #8 (d) except Tubes are not removed from sockets and prongs are not inspected for overheating.

(f) "3rd. Power Amplifier Tube Unit" #6 (H): Proceed to this Unit, Clean Tubes and Sockets Position "V7H".

Procedure is same as Item #8 (d) except tube is not removed from Socket and Prongs are not inspected for overheating.

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3RD TUESDAY

ITEM 26.

(g) "3rd. Power Amplifier Tuning Unit" #8 (I): Proceed
to this Unit, Clean Tube and Socket Position "VII".

Procedure same as Item #8 (d) except Tube is not removed from Socket
and Prongs are not inspected for overheating.

Book No. (1) (1) (1) (1) () ()

SEC No. (F) (H) (E) (J) () ()

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End Item 26.

ITEM 27.

(a) "Control Unit" #1 (A): Proceed to the Rear of this Unit , feel and at the same time inspect Condensers "C1.1A" - "C1.2A" - "C1.3A" - "C1.4A" "C1.5A" - "C1.6A" - "C2.1A" - "C2.2A" - "C3.1A" - "C3.2A" - "C4.1A" - "C4.2A" "C5.1A" - "C5.2A" and "C6A" for OVERHEATING.

Feel Tops and Sides of Metal Cases for OVERHEATING.

Feel Insulating Bushings on Tops of these Condensers for OVERHEATING.

Inspect Cases and Insulator Bushings for Breakage and Oil Leakage.

(b) "1st Power Amplifier Unit" #3 (E): Proceed to Rear of this Unit, open Enclosure Door, feel and inspect Condensers "C1E" - "C2E" - "C5E" - "C6E" "C7E" and "C8E" for OVERHEATING.

Use A.C. Extension Light to locate and check Condensers.

Feel Tops and Sides and Metal Cases of Mica Condensers for OVERHEATING and Leakage of Insulating Compound.

Feel Metal End Plates and Isolantite Cases of Cornell-Dubilier Condensers for OVERHEATING and Leakage of Insulating Compound.

Observe if the Four Counter Sunk Screws in the Top End-Plates of Cornell-Dubilier Condensers are all the way in or partly unscrewed.

CAUTION: DO NOT TURN ANY OF THESE FOUR COUNTER SUNK SCREWS IN THE END PLATES OF DUBILIER CAPACITORS, AS THIS WILL ALTER THE CAPACITY.

Report same on the "50 KW M.O.L."

Note on the "50 KW M.O.L." any Condensers that have excessively Warm or Hot Spots.

BEWARE of this "Spotty" Condition since this indicates a Capacitor "Going Bad".

With a Rag lightly dampened with Naptha, clean all Isolantite Cases of Condensers.

(c) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit, feel and at the same time, inspect Condensers "C1F" - "C2F" - "C5F" - "C4F" and "C6F" for OVERHEATING.

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4TH TUESDAY

ITEM 27.

Use "Shorting Stick" and short across the End-plates (The 2 Connections) and then feel and inspect Condensers "C7.1F" - "C7.2F" - "C8.1F" - "C8.2F" - "C9.1F" - "C9.2F" - "C10.1F" - "C10.2F" for OVERHEATING.

Procedure same as Item #27 (b).

Leave Enclosure Door Open.

(d) "2nd Power Amplifier Tuning Unit" #5 (G): Proceed to the Rear of this Unit, open Enclosure Door, feel and inspect Condensers "C1.1G" - "C1.2G" - "C1.3G" - "C1.4G" - "C1.5G" - "C2.1G" - "C2.2G" - "C2.3G" - "C2.4G" - "C2.5G" - "C3G" and "C4G" for OVERHEATING.

Procedure same as Item #27 (b).

Leave Enclosure Door Open.

Use the Small Step Ladder to reach the Outside Top of Enclosure, feel and inspect Condensers "C7G" and "C8G" for OVERHEATING.

Procedure same as Item #27 (b).

(e) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit, feel and inspect Condensers "C2H" - "C3.1H" - "C3.2H" - "C4.1H" - "C4.2H" - "C5.1H" and "C5.2H" for OVERHEATING.

Procedure same as Item #27 (b).

Use "Shorting Stick" and short across the End-plates (The 2 Connections) and then Feel and Inspect Condensers "C6.1H" - "C6.2H" - "C7.1H" - "C7.2H" - "C8.1H" - "C8.2H" - "C9.1H" - "C9.2H" for OVERHEATING.

Procedure same as Item #27 (b).

(f) "3rd Power Amplifier Tuning Unit" #7 & #8 (I): Proceed to the Rear of this Unit, open Enclosure Door, feel and inspect Condensers "C1.1I" - "C1.2I" - "C1.3I" - "C2.1I" - "C2.2I" - "C2.3I" - "C3.1I" - "C3.2I" - "C3.3I" - "C4.1I" - "C4.2I" - "C4.3I" - "C10.1I" - "C10.2I" - "C11.1I" - "C11.2I" - "C12.1I" -

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4TH TUESDAY

ITEM 27.

"C12.2I" - "C12.3I" - "C12.4I" - "C12.5I" and "C16I" for OVERHEATING.

Procedure same as Item #27 (b).

Leave Enclosure Door Open.

(g) "3rd Power Amplifier Tuning Unit" #8 (I): Proceed to the Front of this Unit, open the Metal Panel #2, feel and inspect Condensers "C17I" - "C18I" "C19I" - "C20.1I" - "C20.2I" - "C21I" for OVERHEATING.

Procedure same as Item #27 (b).

Leave Enclosure Door Open.

On the Front of this Unit, open the Metal Panel #3, feel and inspect Condensers "C7.1I" - "C7.2I" - "C13.2I" and "C13.1I" for OVERHEATING.

Procedure same as Item #27 (b).

Leave Enclosure Door Open.

(h) "Antenna Coupling Unit" #9 (J): Proceed to this Unit, open Enclosure Door, feel and inspect Condensers "C1.1J" - "C1.2J" - "C1.3J" - "C2.1J" - "C2.2J" "C2.3J" - "3" "C3.1J" - "C3.2J" - "C3.3J" - "C4.1J" - "C4.2J" - "C4.3J" and "C4.4J" for OVERHEATING.

Procedure same as Item #27 (b).

Leave Enclosure Door Open.

(i) Units Listed Item #27 (a) to (h): Proceed to these Units listed in this sequence, use the A.C. Extension Light and tighten all Bolted Connections. In some instances, it will be found that Condensers are bolted to Support Insulators, and that these Bolts also connect Two Busses together. In this work, exercise CARE NOT TO BREAK OR CHIP Threaded Bolt Hole in End of Stand-off Insulator, which will cause LOOSE BOLTED CONNECTIONS OF BUSES. Inspection will show that some of these Insulators do not have Metal Ends, but that Threaded Holes are in the Isolantite itself.

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4TH TUESDAY

ITEM 27.

DO NOT TIGHTEN SUCH BOLTS TOO MUCH - DO NOT JERK.

At the same time, feel Filament Connections of Water-Cooled Power Amplifier
Tube for OVERHEATING.

These Connections are normally Warm, not HOT.

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(a) "Switch Room": Proceed to this Room and put "OFF" Switch #4, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS.

Merely Grasp Handle of the Oil Circuit Breaker and lift it up.

(b) "Control Unit" #1 (A): Proceed to the Rear of this Unit, put "OFF" "Safety Switch" - "D1A", open hinged door, and feel Fuses "F1.1A" - "F1.2A" - "F1.3A" - "F2.1A" - "F2.2A" - "F3.1A" - "F3.2A" - "F4.1A" - "F4.2A" for OVERHEATING.

Be sure to rotate Fuses in their Holders, since Burned Spots may be on Lower Sides, or sides toward the Panel.

Fuses normally run Warm but not HOT.

Technician should be able to keep hand on fuses when checking same.

Replace any Fuse showing a burned or OVERHEATED place on Insulated Body of same.

Spare Fuses are located in the "Portable Fuse and Test Unit" kept in the Main Transmitter Room and in the "Fuse Tester Rack" kept in the Basement Areaway at the foot of the Stairs to the Basement.

Fuses should be gripped tightly in Clips and Fuse Block Holders, so that OVERHEATING does not take place at these Connections.

Some Fuses are provided with Compression (Variable) Clamps, to prevent OVERHEATING and assure Full Voltage and Current throughout the Circuit.

Be sure that proper Tension is on these Clamps.

After checking these Fuses, be sure to Close Metal Door, and put "Safety Switch" "D1A" - "ON".

(c) "Control Unit" #1 (A): While at the rear of this Unit feel Fuses "F5A" - "F6A" - "F7A" - "F8A" - "F9A" and "F10A" for OVERHEATING.

Procedure same as Item #28 (b).

Exercise care not to break the single socket holding each Fuse.

(d) "Oscillator-Modulator Unit" #2 (D): Proceed to the Rear of this Unit,

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and feel Fuse "F3D".

Same Procedure as Item #28 (b).

Fuse is located on the Lightning Protective Device Apparatus Panel on bottom of the Unit.

(e) "17 KV Rectifier Unit" #10 (c): Proceed to this Unit and feel Fuses "F1.1C" - "F1.2C" for OVERHEATING.

Same Procedure as Item #28 (b).

These Fuses are located on the Metal Panel supporting "Rectifier Airblast" Relays on bottom of the Unit.

(f) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to this Unit and feel Fuses "F1H" - "F2H" - "F3H" - "F5H" - "F6H" for OVERHEATING.

Same Procedure as Item #5 (b) except that knife Type fuse clears Panel Sufficiently to observe any Abnormal Condition.

These fuse are located on the Bakelite Panel just above the Rear Tubes.

(g) "Basement": Proceed to the Basement and put "OFF" Switch "D1P" - "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.

Remove the Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it UP.

(h) "Basement": While in the Basement, put "OFF" Switch "D1.1P" - "Main Power Disconnect Panel", open Metal Door and feel Fuses "F1.1P" - "F1.2P" - "F1.3P" - "F2.1P" - "F2.2P" - "F2.3P" - "F20.1P" - "F20.2P" and "F20.3P" for OVERHEATING.

Procedure same as Item #28 (b) except that Knife Type fuses clear the Panel sufficiently to observe for any Abnormal Condition.

Feel Blades and Contacts of Switch "D1.1P" for OVERHEATING.

Technician should be able to lay Hand on these parts, they should be Warm, not HOT.

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If Blades or Contacts are too hot, tighten up Compression nuts, clean off contacts with Crocus Cloth, wipe with rag dampened in Carbon-tet and lightly coat with "3-in-1" Oil.

After checking Fuses and Switches, put Switch "DL1P" "ON".

(i) "Basement": While in the Basement, put "OFF" Switch "DL5P" - "Motor Distribution Panel" open Metal Door and feel Fuses "F4.1P" - "F4.2P" - "F4.3P" "F5.1P" - "F5.2P" - "F5.3P" - "F7.1P" - "F7.2P" and "F7.3P" for OVERHEATING.

Procedure same as Item #28 (b).

Feel Blades and contacts of Switch "DL5P" for OVERHEATING.

Procedure same as Item #28 (h)

(j) "17 KV Rectifier Switching Unit #11 (B)": Proceed to the Front of this Unit and test Delta-Star Transfer Switch "DLB" for binding.

If the Switch does bind, or does not move freely when placed in the "10 KV" or "17 KV" positions, coat lightly with "3-in-1" Oil.

If the Switch still binds following this, loosen Compression Nuts and remove Bolts and compression Washers, from the "Swingers", pulling the "Swingers" free of rest of the Switch.

Clean the "Swinger" Contact surfaces with Crocus Cloth, wipe off with Rag dampened in Carbon-tet.

Wrap a piece of Crocus Cloth around Narrow Flat File and clean inside of Switch Contacts, then wrap Rag dampened in Carbon-tet about the File and wipe the residue from Switch Contacts.

Put Switch back together again, replace the Bolts, Compression Washers and Nuts, tightening them JUST ENOUGH TO SEE THE COMPRESSION WASHERS BEGIN TO FLATTEN.

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Lightly coat "Swingers" and Switch Contacts with "3-in-1" Oil and again test for Binding.

Technician should be able to move Switch from one position to the other freely and smoothly.

Wipe up all Copper dust and other Residue from floor and section where Switch was cleaned.

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- (a) "Switch Room": Proceed to this Room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS.
Merely grasp the Handle of the Oil Circuit Breaker and lift it up.
- (b) "Basement": While in the Basement, put "OFF" Switch "DLP" - "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.
Remove the Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it up.
- (c) "Control Unit" #1 (A): Proceed to the rear of this Unit and feel Field Coils of Relays "S2A" - "S3A" - "S4A" and "S14A" for OVERHEATING.
These Relays are located in top rear of this Unit, mounted on a Metal Sub Panel. These Relay Field Coils will normally run WARM, but not HOT.
Technician should be able to keep Hand on them.
Log any that are excessively Warm or Hot on the "50 KW M.O.L."
While at the rear of this Unit, open Door of Metal Box housing Relay "S1A" and feel Field Coil for OVERHEATING.
Procedure same as Item #29 (c).
Close Door of Metal Box housing Relay "S1A".
While at the Rear of this Unit, Put "OFF" the Series Switch on "1650 Volt Magnetic Switch Contactor" Metal Box, Open Box and feel this Relay Contactor "S7A" Field Coil for OVERHEATING.
Procedure same as Item #29 (c).
Close Door of Metal Box, and put Series Switch "ON".
- (d) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit, use "Shorting Stick" discharge Condensers "C7.1F" - "C7.2F" - "C8.1F" - "C8.2F" - "C9.1F" - "C9.2F" - "C10.1F" - "C10.2F", then feel Field Coils of Relays "S1F" - "S2F" - "S3F" and "S4F" for OVERHEATING.

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Temperature of these Relay Field Coils should be BARELY WARM, in no event higher than Room Temperature.

To discharge Condensers, merely place Metal part of "Shorting Stick" across the two End-plates of these Condensers.

As each Condenser is discharged, a moderate Arc will be observed when "Shorting Stick" first touches the End-plates.

Log any Relay Field Coils that are excessively Warm or Hot, on the "50 KW M.O.L."

(e) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit, use "Shorting Stick" discharge Condensers "C6.1H" - "C6.2H" - "C7.1H" - "C7.2H" - "C8.1H" - "C8.2H" - "C9.1H" - "C9.2H" - then feel Field Coils of Relays "S3H" - "S4H" - "S5H" - "S6H" - "S7H" - "S8H" - "S9H" - "S10H" - "S11H" - "S12H" - "S13H" and "S14H" for OVERHEATING.

Same Procedure as Item #29 (d).

(f) "17 KV Rectifier Tube Unit" #10 (C): Proceed to this Unit and feel Field Coils of Relays "S1C" - "S2C" - "S3C" - "S4C" - "S5C" - "S6C" - "S7C" - "S8C" - "S9C" - "S10C" - "S11C" - and "S12C" for OVERHEATING.

Temperature of these Relay Field Coils should be BARELY WARM, in no event higher than Room Temperature.

While at this Unit, open door of Metal Box housing "17 KV Rectifier Air Blast Heater Relay" - "S17C" and feel Field Coil for OVERHEATING.

This Field Coil will run normally Warm not Hot.

Technician should be able to keep Hand on it.

If excessively Warm or Hot, log on the "50 KW M.O.L."

(g) "17 KV Rectifier Switching Unit" #11 (B): Proceed to this Unit and feel Solenoids of Magnetic Contactors "S4B" and "S5B" for OVERHEATING.

Solenoids of these Contactors run normally very WARM, with Temperature distributed

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evenly around outside of Casings.

Inspections should be made for OVERHEATING, UNEVENLY distributed Temperature (HOT SPOTS), loose Connections, and condition of Insulation covering around Outside of Solenoids.

When Insulating Covering around Solenoids of "S4B" and "S5B" begins to get bare, apply coat of "BLACK INSULATING VARNISH".

On the Bottom of this Unit, feel Field Coils of Relays "S2B" and "S3B" for OVERHEATING.

Log Any abnormal Condition and work performed on the "50 KW M.O.L."

(h) "17 KV Filter Condenser Charging Contactor and Resistor Unit" #12 (L):

Proceed to this Unit and feel Solenoid of Magnetic Contactor "S11" for OVERHEATING.

Procedure same as Item #29 (g).

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- (a) "Transmitter Room": Proceed to the "High Voltage Grounding Switch and Door Interlock Mechanism" - "D13P", remove One Key from any One of Lock Positions No. 2 to No. 5 inclusive and keep on person until Item No. 30 is completed.
- (b) "Switch Room": Proceed to this room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS.
Merely grasp the Handle of the Oil Circuit Breaker and lift it up.
- (c) "Basement": While in the Basement, put "OFF" Switch "D1P" - "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.
Remove the Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it up.
- (d) "Basement": While in the Basement, put "OFF" Switch "D1.1P" - "Main Power Disconnect Panel" for SAFETY REASONS.
- (e) "Basement": While in the Basement, put "OFF" Switch "D15P" - "Motor Distribution Panel" for SAFETY REASONS.
- (f) "Basement": Gather all tools needed to measure Hose Nipples and Targets for Electrolytic Disintegration.

TOOL:

WHERE KEPT:

50 KW Nipple Disintegration Measuring Tool	Display Board, Work Bench.
12 Inch Rule	" " " "
Open End Wrench 1/2" & 7/16"	" " " "
12 Inch Monkey Wrench	" " " "
9 Inch Monkey Wrench	" " " "
Small Pair of Gas Pliers	" " " "
Pair of Tin Shears	" " " "
5 Gallon Water Pail	Pump Room.
Can of Wraplock	Transfile No. 106.

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2 Quart Kitchen Skillet.

Kitchen.

Maintenance Tray No. 3

Bin No. 3, Spare Tube Rm

Place all Tools and equipment in the Maintenance Tray except the 5 Gallon Pail and the 2 Quart Skillet.

(g) "Pump Room": Proceed to this Room, open Drain Valve "X" and drain approximately 25 Gallons of Water from the 50 KW Distilled Water System.

Do not open Valve "X" Wide, merely open it 1 turn for 15 seconds, then close tightly.

Valve "X" is located between 50 KW Distilled Water Pumps #1 and #2.

The Above pertains to Procedure when Storage Tank is full.

When Tank is partially Empty or entirely empty, all that is necessary when removing Hose Nipples is to drain the Distilled Water back into the Tank and procedure executed.

(h) "Basement": Go out into Basement, climb Step Ladder at the Header over Pump Room Door, and close Valves "A2" - "B2" - "C2" - "D2" - "E2" - "F2". These Valves are located directly over the Pump Room Door.

These are Input and Output Valves to each Individual Hose leading from the Header to "2nd Power Amplifier Tube" Sockets "3rd Power Amplifier Front" and "3rd Power Amplifier" Rear Tube Sockets.

DO NOT TOUCH THE THROTTLE VALVES "G2" - "H2" and "I2".

(i) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit, measure the Top Curved Targets in the Porcelain Pipes in Output of Tube Socket No. 2 and Input to the Tube Socket No. 1.

Use the Small Open End Wrench; twist the Hexagonal Clamping Nut Counter-clockwise, removing the Nut.

Use the Gas Pliers and lift out the Curved Target.

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Use the 12 Inch Rule to measure length of the Target.

Renew the Top Curved Targets when same are shortened 2 inches or more.

Refer to Print of Top Curved Target "Template" Book No. (7) Sec. No. (C)

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When New, the Top Curved Targets are 5 inches Long.

Hexagonal Clamping Nuts are fitted with small Asbestos filled Copper ring Gaskets.

Because of flattening of washer due to its use, it remains on the Clamping Nut; it will not fall off.

Renew these gaskets only in emergency when leaks develop.

After measuring Targets, push back into the receptacle on Metal Elbow.

Replace the Hexagonal Clamping Nut and turn clock-wise until just trifle more than hand tight.

Observe that Vertical Porcelain Pipes in these 2 positions, are fitted with Chromium plated Metal Elbows.

The Coupling Nuts on ends of Metal Elbows are fitted with regular Nipple Rubber Washers.

It is not necessary to touch these couplings, or renew these Washers each time the Targets are measured unless Leaks Develop.

(j) "2nd Power Amplifier Tube Unit" #4 (F): While at the Rear of this Unit measure the Electrolytic Disintegration of Hose Nipples in Output of Socket Position No. 2 and Input to Socket Position No. 1.

Remove the Battery Clip connection from Tube Socket Mounting Nut.

This Clip bonds "Wraplock" Loops to the Water-Cooled Tube Socket. (17 KV D.C.)

Use the 9 inch Monkey Wrench to loosen, then remove Nipple Coupling Nut.

Unscrew the Coupling Nut entirely and pull end of Hose away from the tube Socket.

Use 2 Qt. Skillet to catch small amount of water dripping from tube socket nipple.

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Rubber hoses will remain in upright position, being held there by the Horizontal Clamping Bar directly beneath Tube Sockets.

Remove the Rubber Gasket from Coupling Nut and put in 2 quart Skillet.

Push "Disintegration Measuring Tool" into the open end of Hose and "Feel for end of Nipple" with the Hook on end of "Disintegration Measuring Tool".

In using the Tool, remember that Disintegration is uneven, so rotate the Tool to find point of Greatest Disintegration which will be point at which the Tool goes least distance into the Hose during Rotations.

"Disintegration Measuring Tool" is calibrated in inches; will register amount of Electrolytic Disintegration in inches on Scale of the Tool at point even with end of the Nipple. (Not Coupling Nut.)

Renew Hose Nipple when same is shortened 2 inches or more.

Procedure in renewing Nipple is as follows:

Use the Tin Shears to cut "Wraplock" loops loose.

Remove Bonding Connection from End of Rubber Hose.

Use Gas Pliers to twist Nipple in end of Hose until Free.

Keep a twisting motion and pull the Nipple out of Hose.

Slip the Large Hexagonal Nut off the Removed Nipple, put it over a new Nipple and with the aid of the Gas Pliers and a twisting motion, insert a new Full Length Nipple in the Hose, leaving $\frac{3}{4}$ of one inch of Nipple exposed on Hose End. ($\frac{3}{4}$ Inch of Nipple Exclusive of the Coupling Nut.)

Lay flat Bonding connection on hose end, so that 2 loops of "Wraplock" will cover it.

Cut 2 pieces of "Wraplock" $12 \frac{1}{4}$ inches long.

Fold $\frac{1}{2}$ inch of one end of each "Wraplock" strip over, slip through flat Metal Locking Loop and flatten end of the "Wraplock" strip over same.

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Make One turn of "Wraplock" around the Rubber Hose about 1/2 inch down from end. "Wraplock" is passed around the hose once, then through the Loop, again around the Hose at same point and again through the Loop.

Approximately 3/4 inch of "Wraplock" will be showing through the Flat Locking Loop.

Use the "Wraplock Tightening Tool" and twist end of "Wraplock" Strip under itself until tight.

Do not tighten too much as it will score the Rubber Hose, causing Cracks, Breaks and Buldges later on.

Tighten "Wraplock" using the Tool with steady even pull.

"Wraplock" will be tight when same bends the "Flat Metal Locking Loop" through which the Strip was passed without making a depression in the Hose.

Install a 2nd "Wraplock" loop around the Hose about 1/2 inch down from first "Wraplock" Loop.

Place new Black Rubber Gasket in Hose Nipple, laying flat against end of Nipple. Move End of Hose to point directly below nipple on Tube Socket, turn Hose Nipple coupling Nut until it "Catches" the Threads on Sockets, then tighten Coupling Nut. Avoid tightening too much as Gasket may be scored and will leak when Transmitter is started.

Use 9 inch Monkey Wrench and tighten 1/2 turn beyond Hand tight.

Replace Battery Clip Bonding Connection on Tube Socket Mounting Nut.

New Brass Nipples are kept in Transfile No. 108.

New Rubber Washers for Coupling Nuts are kept in Transfile No. 103.

Enter all Data on Form "Hose Nipple Disintegrations" - Book No. (7)

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When Hose Nipple is renewed put an Asterisk in the Space, and in the "Remarks"

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Column write the Date and "Renewed".

When it is not necessary to renew a Hose Nipple after measuring its Electrolytic Disintegration, install a new Black Rubber Washer and screw the Nipple Coupling Nut back on Tube Socket.

Tighten the Coupling Nut with 9 inch Monkey Wrench 1/2 inch turn beyond Hand Tight. Enter amount of Disintegration in proper Space on Form "Hose Nipple Disintegration" Book No. (7) Sec. No. (C) Page No. (147).

When the "2nd Power Amplifier Series Loop" (Hose from Front Socket #2 Output to Rear Socket #1 Rear Input) was installed, it was not "Grounded" at mid-point. It has been found that there is No Electrolytic Disintegration in Any Targets, Nipples or Couplings in this "Series Loop".

With the aid of the A.C. Extension Light, inspect Ends of Hoses near Coupling Nuts for Buldges, Breaks and Cracks.

Inspect "Wraplock" Loops to see that Loops are tight and that Wire used to connect Loops to Tube Sockets are actually connecting Loops to terminations.

EXAMPLE OF INSPECTION AND RESULT.

A serious Bulding of a Water Hose at the Coupling Nut to the Tube Socket is found. Procedure same as Item No. 30 (f) (g) and (h), then add the following:

Remove the Battery Clip Connection from Tube Socket Mounting Nut.

This Clip bonds the "Wraplock" Loop to the Water-Cooled Tube Socket.

Use the 9 inch Monkey Wrench to loosen, then remove Nipple Coupling Nut.

Unscrew the Coupling Nut entirely and pull end of Hose away from the tube Socket.

Hose will remain upright, being held in position by Horizontal clamping bar beneath tube sockets.

Use 2 Quart Skillet to catch small amount of Water dripping from the Tube

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Socket Nipple.

Remove the Rubber Gasket from Coupling Nut and put in the 2 Qt. Skillet.

Use the Tin Shears to cut "Wraplock" Loops loose.

Remove the Bonding Connection from End of Rubber Hose.

Use Gas Pliers to twist Nipple in end of Hose until free.

Keep a twisting motion and pull the Nipple out of Hose.

If it is extremely difficult to remove Nipple from bulged End of the Hose, take a Razor Blade or sharp knife and slit end of hose length-wise about 5 inches down from end of hose.

Cut the Slit through the Hose till Knife touches the Nipple.

Twist the Nipple free and remove it from end of Hose.

After cutting End off the Hose, loosen Thumb Nuts on Wood Clamping Bar and pull Hose up into operating position and measure clearance between the Hose and the square hole in Concrete Floor.

If the clearance is sufficient (5 Inches or more,) merely put old coupling Nut over a new Nipple, insert Nipple into Hose-end, place Bonding Wire on hose, install "Wraplock" Loops and replace Coupling Nut and Bonding Connection on Tube Socket as previously outlined.

If there is not enough clearance between Hose and Concrete Ceiling to cut out bad portion and replace Nipple, procedure is as follows:

Take the "Wraplock" Bonding Clip and Coupling Nut off the Tube Socket as outlined.

Remove the Washer, Nipple and Coupling Nut as outlined.

Cut off the bad portion of the Hose.

Hose will remain upright, being supported by the Wood Clamping Bars just below the Tube Socket.

Put old Coupling Nut over new Nipple.

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Install new Nipple, Bonding Connection and "Wraplock" as outlined.

Proceed to the Basement, climb up on Step Ladder with 5 Gallon Pail.

Balance yourself, hold the pail in left hand, and loosen the Nipple Coupling Nut on end of this Hose.

As soon as the Nut is loosened, water will begin to drip; have the 5 Gallon Pail ready and catch this water until this one hose is empty.

Entirely remove the Coupling Nut from Header but not from hose.

Go back to tube socket end of the Hose, loosen the Thumb Nuts on Wood Clamping Bar, pull up the Hose, place the Coupling Nut on Tube Socket Nipple, turn Coupling Nut until it "Catches" the Threads and tighten in place 1/2 turn beyond Hand tight.

A new piece of Hose must be cut exactly 2 inches shorter than the piece of Hose cut off; (Brass Coupling will make up the difference.)

Take 2 new Hose Nipples, put Coupling nuts over them and insert the Nipples in the ends of the Hose, with approximately 3/4 inch of nipple extending out of Hose. (Exclusive of the Coupling Nut.)

Use Special double ended Brass Coupling to connect Hose to new Repair Section. Put New Rubber Washer in ends of both Hoses, screw in the Coupling and tighten both Coupling Nuts 1/2 turn beyond hand tight.

Now put a new Rubber washer in far end of the repair section, and screw this coupling onto the Header, tightening 1/2 turn beyond hand tight.

Another type of Hose nipple is kept in stock also.

This Nipple is One piece and is fitted with Male Threaded end.

When Used, it is placed in one end of a Hose, but a regular Nipple fitted with separate coupling Nut must be used in end of Hose to be joined to it.

Where possible, Hoses are always installed 6 to 8 inches too long, to permit cutting off ends at the tube sockets when these ends show Serious Bulding,

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ITEM 30.

Cracking, Breaking or Leaks which cannot be stopped with new "Wraplock".

(k) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit and measure the Electrolytic Disintegration of Hose Nipples in Input to Socket position No. 1; in Output of Socket position No. 5; Input to Socket position No. 2; and Output of Socket position No. 6.

Procedure same as Item #30 (j) except add the following:

Note that the Series Loppes between Rear Sockets No. 1 Output to No. 3 Input; No. 3 Output to No. 5 Input; and Front Sockets No. 2 Output to No. 4 Input; No. 4 Output to No. 6 Input are Porcelain Pipes.

These Porcelain Pipes are fitted with Chromium Plated Elbows.

There are no Targets in these Pipes since both ends of Pipes are at the same potential of 17 KV at all times.

The Coupling Nuts on ends of Metal Elbows are fitted with regular Nipple Rubber Washers.

It is not necessary to touch these Couplings, or renew these Washers each time Hose Nipples in "3rd Power Amplifier Tube Unit" are measured, unless Leaks develop.

Observe that a small square of "Insulating Fibre Board" is placed between end of Metal Elbow of Series Porcelain pipes and the Rubber Hose where it passes adjacent to keep from pushing sharp indentation in the Rubber Hose.

In measuring Rubber Hoses in this Unit, first remove the piece of "Insulating Fibre Board".

After replacing Hoses, replace the "Insulating Fibre Board" in positions from which they were removed.

A small amount of pressure of Rubber Hoses keeps "Insulating Fibre Boards" in place.

(l) "Basement": Proceed to Basement, Climb on Step Ladder and measure

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the Electrolytic Disintegration of bottom Horizontal Target and Nipple at Output of Front Socket Position No. 2; and bottom Horizontal Target and Nipple at Input to Rear Socket Position No. 1.

Hold Skillet in left Hand to catch Water that will drip from Target Socket.

Use small open-end wrench, twist ~~counter-clockwise~~ and remove the Target.

Hexagonal Clamping Nut is soldered to the Target itself.

Use the 12 inch Rule to measure Length of the Target.

Renew the Bottom Straight Targets when same are shortened One Inch or More.

Refer to Print of Bottom Straight Target "Template", Book No. (7)

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When new, the Bottom Straight Targets are 9 inches long.

Hexagonal Clamping Nuts are fitted with small Asbestos filled Copper Ring Gaskets.

Because of flattening of Washer due to its use, it remains on the Clamping Nut; it will not fall off.

Renew these Gaskets only in emergency when leaks develop.

After measuring Targets, push back into the Receptacle on Metal Elbow.

Turn Hexagonal Clamping Nut ~~counter-clockwise~~ ^{Clockwise}, tightening until just trifle more than hand tight.

Observe that Vertical Porcelain Pipes are fitted with chromium plated Metal Right Angle fittings.

The coupling Nuts on end of Hoses are secured to these metal right angle fittings.

If the Bottom Straight Targets SHOW NO ELECTROLYTIC DISINTEGRATION, it will not be necessary to measure the Hose Nipple.

If however, Bottom Straight Target measures shorter than specified, Electrolytic Disintegration is taking place as will be evidenced by the Shortened Target and the "Crumbly Red End" of the Target.

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In this case also measure the Hose Nipple for Electrolytic Disintegration as outlined.

Entire Procedure same as Item No. 30 (j).

(m) "Repair Sections": Measure Hose Nipples on both ends of all Repair Sections of Rubber Hose.

Refer to Form

for list and locations of these "Repair Sections".

When "Repair Sections" are in use, "Wraplock" Loops on joining ends of Hoses and the Special Double ended Threaded Coupling are all bonded together by means of piece of wire.

Merely push the wire thru the circular ends of the "Wraplock" made by the "Wraplock Tightening Tool" then twist about the "Special Double Ended" Coupling and pass thru the looped ends of other two "Wraplock Loops".

If a piece of Rubber Hose is cut off the end of the "Series Loop" merely insert new Nipple and tighten back on the Metal Elbow of Vertical Porcelain Pipe.

Note that Hose of "Series Loop" is one piece, laying flat in the "Hose Trough". Hose Trough is fitted with a Center Dividing Wall of Wood.

When piece of Hose is cut off the end, remaining Hose must be long enough to lay flat on Trough at the extreme end, not be held up in top of dividing Wall of wood.

This will shorten the Hose too much and place it too close to Concrete Ceiling.

In this case a New Piece of Hose must be cut and inserted as a "Repair Section".

Procedure same as Item #30 (j).

(n) Return 50 KW Transmitter Distilled Water System to Normal and test for Leaks as follows:

Inform all Technicians that 50 KW Transmitter Rotating Machinery is about to be started to test Distilled Water System for Leaks before placing any Switches "ON".

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All Technicians doing Maintenance Work requiring Switches to be "OFF" will at once stop such work.

"Basement": Proceed to the Basement, climb Step Ladder at the Header over the Pump Room Door, and open Valves "A2" - "B2" - "C2" - "D2" - "E2" and "F2".

These Valves are located directly over the Pump Room Door.

DO NOT TOUCH THE THROTTLE VALVES "G2" - "H2" and "I2".

"Switch Room": Proceed to this Room in the Basement and put on "ON" Switch #2, "50 KW Distribution Oil CKT Breaker".

Merely grasp the Handle of the Oil Circuit Breaker and push it down firmly until "Latched in place".

"Basement": While in the Basement, put "ON" Switch "D1P" - "Master 480 Volt Oil Circuit Breaker".

Merely Grasp the Handle of the Oil Circuit Breaker and push it firmly down until "Latched in place".

Place the Wood "Preventer" between the Operating Handle and Overload Tripping Lever.

"Basement": While in the Basement, put "ON" Switch "D1.1P" - "Main Power Disconnect Panel".

"Basement": While in the Basement, put "ON" Switch "D15P" - "Motor Distribution Panel".

"Transmitter Room:" Proceed to the Transmitter Room, enter the 50 KW Transmitter Enclosure, and put "ON" - "Rectox" 115 volt A.C. Power Supply Switch.

"Pump Room": One Technician to go to the Pump Room and "Stand-by" to look for Leaks.

If there are any Leaks in the "Pump Room" or out in the Basement during the process of refilling the 50 KW Transmitter Distilled Water System, this Technician will immediately shut off Switch "D16P" located on the Wall in the Pump Room.

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This will stop the 50 KW Transmitter Filler Pump

"Measuring Equipment Room": Proceed to this Room, push "ON" Switch "DLLP".

This Switch is located on the Rear Wall just to the right of the "5 KW Distilled Water System Expansion Tank".

A gurgling noise in the Expansion Tank will indicate that Water is being pumped into the System by the Filler Pump, located in the Basement Pump Room.

Continue to operate this Pump until Water in the "50 KW Distilled Water Exap Expansion Tank" is even with "Water Level" mark.

If Water should leak out of the Air Release Valve _____ during the time of filling the System, GENTLY TAP it with Hammer to properly seat the Valve.

To prevent Water from leaking out of the Air Release Valve _____ in the Pump Room, because of Air in the Hose that was repaired, or improper seating of Air Release Valve _____ when filling the system, proceed in the following manner:

First, open Valves at the Header of Hoses not worked on, Start the Transmitter as outlined in Item #30 (n) Paragraph "Control Unit" #1 (A) and after Distilled Water is circulating (Air Release Valve _____ is properly seated if IT DOES NOT LEAK) open Valves at the Header of the Repaired Section.

"Control Unit" #1 (A): Proceed to the Front of this Unit turn "Filament Generator Rheostat" - "R16A" all the way to minimum (Clockwise).

Push "ON" - "D2A" - "Master Control Start" Button.

Look through the front windows of the "2nd Power Amplifier Tube Unit" and "3rd Power Amplifier Tube Unit" for leaks at all Hose Coupling Nuts.

If any leaks are found, quickly go inside 50 KW Transmitter and push "OFF" "D5A" - "Tube Change Switch".

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This will stop (All Rotating Machinery) Distilled Water Circulating Pump.

First expedient is to tighten coupling nut, etc., at point where leak is.

If unable to stop a leak by tightening a coupling nut, a new Rubber Washer must be installed.

In any case it is necessary to drain some of the Water out of the System and take connection loose, then install Washer, and put Coupling back and again test for leaks.

After assuring yourself that no leaks are present, go to the "Measuring Equipment Room" and again put "ON" Switch "DLIP" to bring Level of Water in the 50 KW Transmitter Distilled Water Expansion Tank to Correct Level Mark.

It will be necessary to repeat this 3 or 4 times during the 15 minute that Rotating Machinery is operating in order to test for Leaks and properly Fill the System.

Continue to add Water to the System until Water Level in Expansion Tank remains constant.

Use A.C. Extension Light to inspect for leaks at Tube Sockets.

Normal Pressures are:

Distilled Water Pump Output Pressure: Minimum 45 Lbs., Maximum 100 Lbs.

Trans. Room Dist. Water Pressure Minimum 38 " Maximum 55 "

"2nd P.A. Differential Pressure" Minimum 13 " Maximum 21 "

"3rd P.A. Front Differential Pressure" Minimum 13 " Maximum 21 "

"3rd P.A. Rear Differential Pressure" Minimum 13 " Maximum 21 "

If all Differential Pressures are wrong, adjust by means of Main Throttle Valve "D" located in the Pump Room.

Turn Valve Handle Clockwise to lower Pressure and counter-clockwise to raise Pressure.

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If one or more Differential Pressures should be wrong, adjust the Vertical Throttle Valve for the Section at the Header over the Pump Room.

"Control Unit" #1 (A): As soon as all is checked as normal, proceed to the front of this Unit, and push "OFF" - "D2A" - "Master Control Stop" Button.

"R16A" - "Filament Generator Rheostat" remains adjusted to minimum.

(o) "Pump Room": Maintain Level of Water in Distilled Water Storage Tank Full to the Top before going off Watch by filling from 5 Gallon Bottles. Put the "Still" - "ON" and proceed to have all Bottles refilled.


50 KW TRANSMITTER DISTILLED WATER HOSES AND NIPPLES - PORCELAIN PIPES:


All ODD numbered Nipples are INPUTS - All EVEN numbered Nipples are OUTPUTS.


Inputs are in the Center of the Water Jacket.

Outputs are on the edge of the Water Jacket.

All Nipples and Wraplock are bonded to the Equipment to which they are attached, except at the Header.

 - - Indicates Hose Nipple.

 - - Indicates Venturi Tube.

 - - Indicates Porcelain Pipe.

X - - Indicates Throttle Valve.

Porcelain Pipes connecting Nipples 7 to 23 and 6 to 24 are mounted vertically, and are fitted with Standard Top Curved Diagonal Targets and Bottom Horizontal Targets; One Top and One Bottom Target to each Pipe.

Porcelain Pipes between 3rd P.A. Jackets 1 to 3 - 3 to 5 - 2 to 4 and 4 to 6 are not fitted with any Targets at all.

When measuring Nipples and Targets, enter Date, Signature and amount of Electrolytic Disintegration in Inches.

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METHOD OF CALCULATING RATE OF WATER FLOW:

G Equals Gallons of Water per Minute.

K Equals Venturi Tube Constant.

P Equals Differential Tube Constant.

FORMULA: $G = K \text{ Square Root of } P.$

Venturi Tube Constants: 2nd P.A. Unit - K is 3.804

3rd P.A. Unit - K is 6.192

Main - K is 3.23

LENGTHS OF RUBBER HOSE - OTHER DATA - DISTILLED WATER SYSTEM 50 KW TRANSMITTER:

On Monday and Tuesday, October 6 and 7, 1941, all New Rubber Hoses were installed in the 50 KW Transmitter, total length of Rubber Hose 231 Feet 2 Inches.

Rubber Hose is White Shawmut Brewer's Hose P-802, 4 Ply, manufactured by the United States Rubber Company.

Complete Renewal Time 6 Hours.

Repair Section Nipples 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21 and 22 have been eliminated.

HOSE LENGTHS:

2nd P.A. Front Input, from Header to Tube Socket Input Nipple 32 Ft. 10 Inches.

2nd P.A. Front Output, from Tube Socket position #2 to Input of Tube Socket #1, known as Series Loop, 47 Ft. 3 Inches.

Series Loop connects to both 51 Inch Vertical Porcelain Pipe Assemblies below the Tube Sockets.

2nd P.A. Rear Output, from Header to Tube Socket Output Nipple 31 Ft. 10 Inches.

2nd P.A. Rear Output, from Header to Leakage Current Meter Metal Insert $9\frac{1}{2}$ Inches.

3rd P.A. Front Input, from Header to Tube Socket Input Nipple 28 Ft. $3\frac{1}{2}$ Inches.

3rd P.A. Front Output, from Header to Tube Socket Output Nipple 28 Feet.

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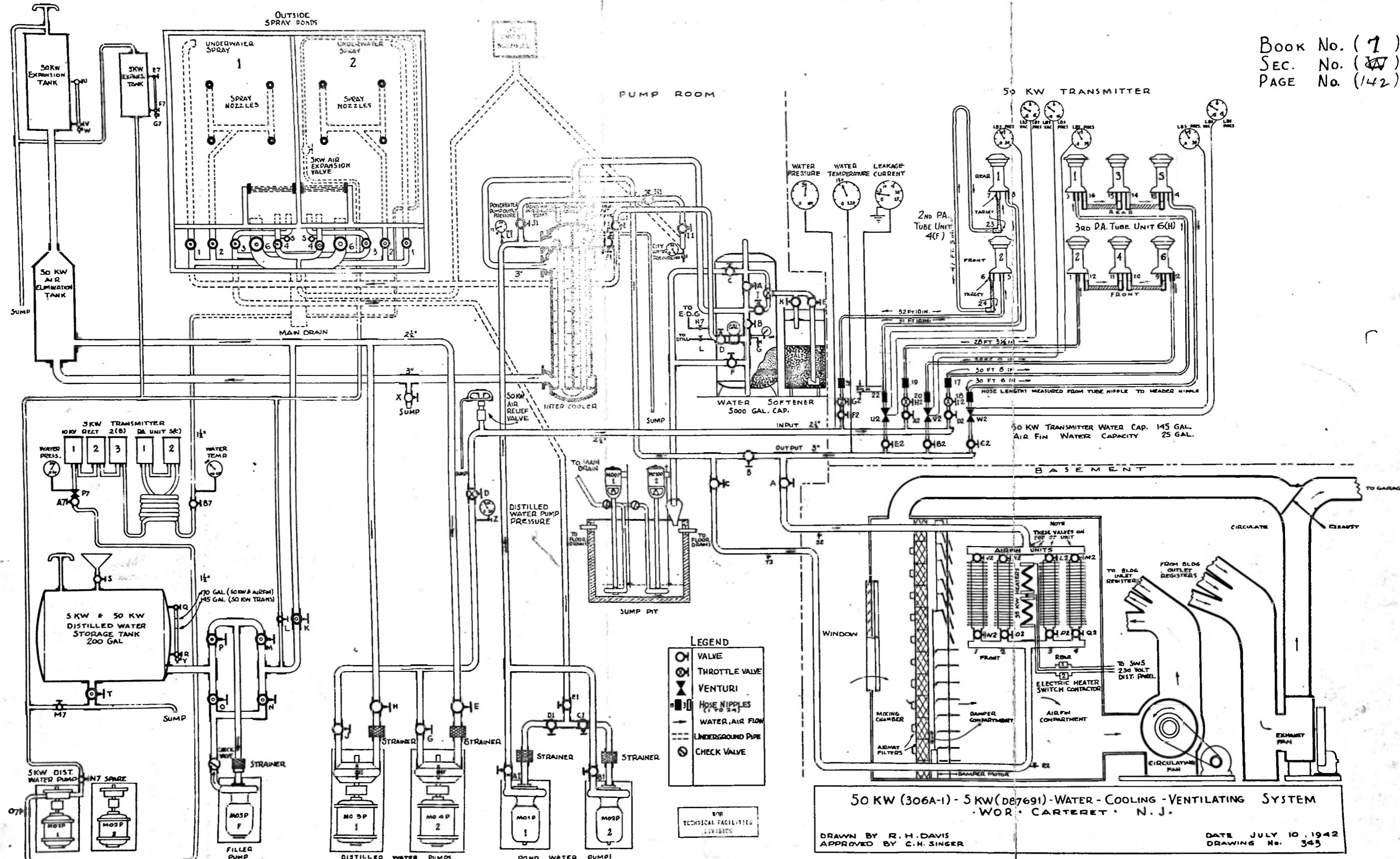
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3rd P.A. Rear Input, from Header to Tube Socket Input Nipple 30 Ft. 8 Inches.

3rd P.A. Rear Output, from Header to Tube Socket Output Nipple 30 Ft. 6 Inches.

NOTE: If it should be necessary to replace Porcelain Pipes between sockets of 3rd P.A., cut Rubber Hose to exactly 2 Ft. and fit regular Nipples to each end. If it should be necessary to replace Porcelain Pipes in 2nd P.A., cut Rubber Hose to same length of Porcelain Pipe Assemblies, i.e., 51 inches, fit regular Nipples to each end.

Regular Nipples and Coupling Nuts are "KS-6432".



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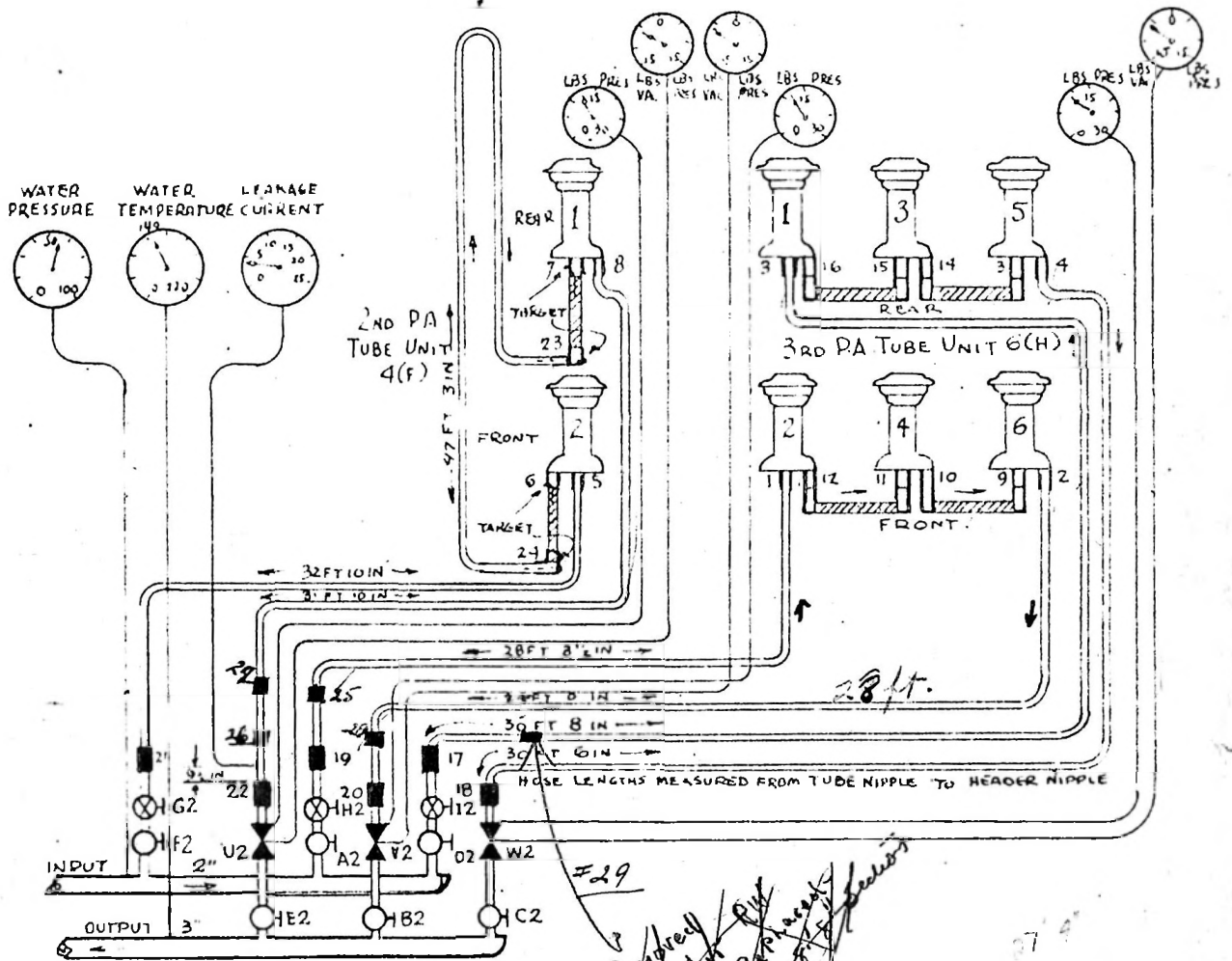
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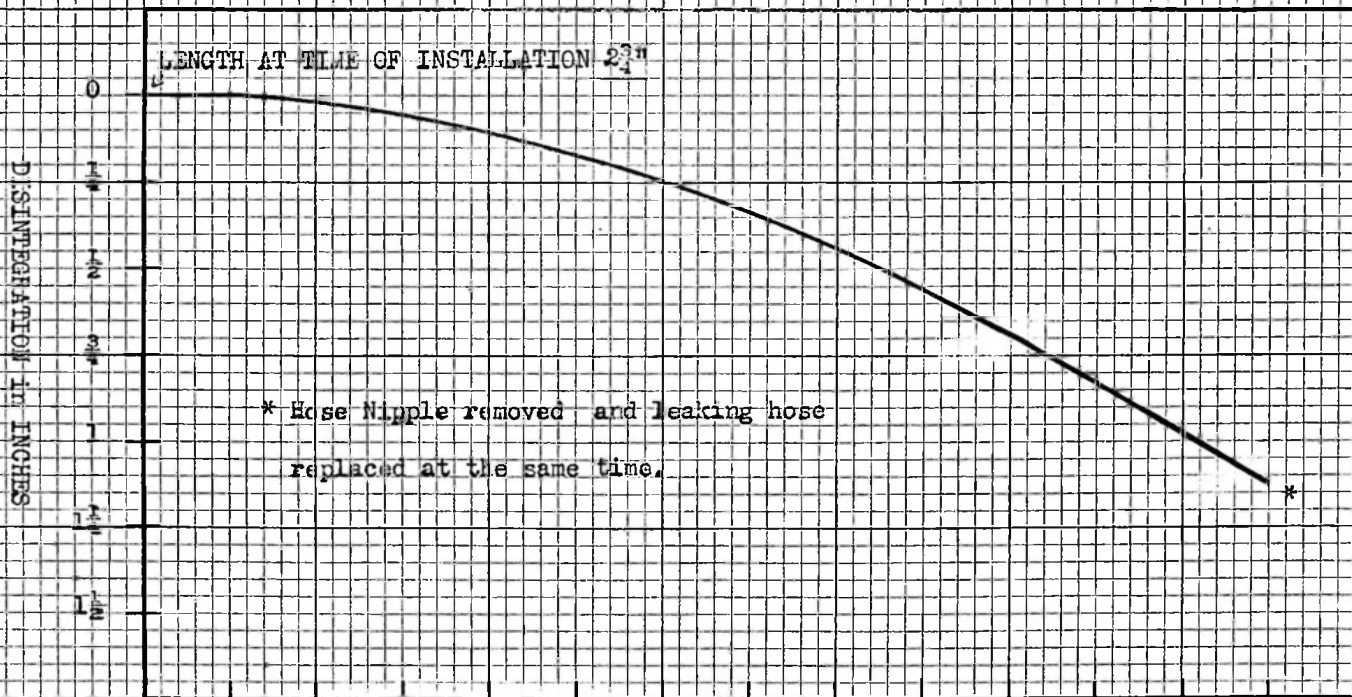
"50 KW Trans. & Ant. Equip. Maint."
"50 KW (306A-1) Water Cooling System."

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WOR Transmitter Division
50 KW Transmitter
DISINTEGRATION OF A TYPICAL HOSE NIPPLE
NIPPLE #5
2nd PA Front - Input



DEC. '46 JAN. FEB. MAR. APRIL MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. '48
----- 1947 -----
MONTHS

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"List of Repair Sections"

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YEAR _____

DATE INSTALLED	NIFFLE NO'S	Location and Description of Repair Section
FEB 27 1945	Same	New hose, length of which is 30'6"; installed in 3rd PA Rear with new nipple at #4 & #18 RW-RS-FG
June 19 1945	#21	Repair section of 26" length installed at nipple #21, 2nd P.A. input header RS & FG.
SEPT 26 1945	#3 w. #17 Ho. Dec.	New Hose 3rd PA #1 Rear. to Header. 1 22' & 1 8'8" sections AL-RW-Sg
Oct. 1 1945	#1 25	New Hose 3RD PA Front Input 28 Feet 3 1/2" Long. AL-SG-GS
JAN. 25 1946.	#8 22	New Hose 2ND PA Output (Rear) 31 feet 10" Long. FN-AL-FG
May 14, 1946	#5 to 21	New Hose 2nd PA Input (FRONT) 32 Feet 10" Long. FG-JG-AJ
AUG 6, 1946	#23 To 24.	NEW HOSE 2ND P.A. LOOP 47 FEET 3" LONG F2-RQ-AM
Oct 1. 1946'	4 to 18	24" Repair Section installed at nipple #18. 3RD PA Output Header. AL-FG.
Nov 20, 1946	#5 to 21	36" Repair Section installed at Nipple #21. 2ND PA Input Header. AL-RW
MAR. 13 1947	#1 25	New Hose 3rd PA Front Input 28' 3/2" Long. AL-FG
MAR 14 1947	20 28	Renewed repair section 3rd PA Front out. length 2 1/2'. To increase length of hose to normal - FG
MAR 14 1947	17 29	Replaced repair section to increase overall length of hose to normal - FG

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"List of Repair Sections"

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YEAR _____

DATE INSTALLED	NIPPLE NO'S	Location and Description of Repair Section
April 21 1947	2 to 20	New hose, installed 3 RD PA Front Output 28' 3" Long. AL - FG.
July 15 1947	# 5 to 21	94" Repair Section installed at Nipple 21, 2 nd PA Input Header. AL - AJ
Feb. 15 1948	# 8 to # 22	New Hose 2nd PA Output (Rear) 31 feet 10" long. RW - AL.
June 15/48	4-18 3-17	New Hose 3 rd PA Rear Output = New " " " " Output =
June 15 1948	8-22 5-21	New Hose 2 nd PA output = New Hose and PA input =
Nov 9 1948	2-20 1-19	New Hose 5 th PA Front Output } New Hose 3 rd PA Front Output } 28' ft each.
May 12 1949	5-21	New Hose 2nd PA input (2 pieces) 32' 10" - AL - JD
June 5 1951	# 21	24" repair section installed at 2nd PA Input header, nipple # 21 - GA - JK
July 11, 1951	Leakage Current Pipe	4' repair section installed in 2nd PA Output hose, at point where hose connects to Leakage Current Pipe. - JK
Aug. 13, 1951	# 21	4' repair section installed at 2 nd P.A. Input header, nipple # 21 H.S. + QK
AUG-16 1951	3-17	3' 6" repair section installed at 3 rd PA input header AL - JK
AUG-17 1951	8-27	7' repair section installed at 2nd PA output header. GM - LL

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"List of Repair Sections"

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YEAR 1951

DATE INSTALLED	NIPPLE NO'S	Location and Description of Repair Section
AUG. 27, 1951.	23 + 24	New hose 2nd PA Loop, 47' 3" - Ro/JR
AUG. 27, 1951.	21 + 5 8 + 22	New hose 2nd PA Input - 32' 10" New hose 2nd PA Output - 31' 10" + 9 1/2" R/JA
AUG. 28, 1951	3 + 17 4 + 18	New hose 3rd PA Rear Input - 30' 8" New hose 3rd PA Rear Output - 30' 6" R/JA
AUG. 28, 1951	1 + 19 2 + 20	New hose 3rd PA Front Input - 28' 3 1/2" New hose 3rd PA Front Output - 28' R/JA
MAY 15, 1954	23 + 24	New hose 2nd PA Loop 47' 3" - AJ/JK
MAY 15, 1954	21 + 5 8 + 22	New hose 2nd PA Input - 32' 10" New hose 2nd PA Output - 31' 10" + 9 1/2" AJ/JK
MAY 15, 1954	3 + 17 4 + 18	New hose 3rd PA Rear Input - 30' 8" New hose 3rd PA Rear Output - 30' 6" AJ/JK
MAY 15, 1954	1 + 19 2 + 20	New hose 3rd PA Front Input - 28' 3 1/2" New hose 3rd PA Front Output - 28' AJ/JK
NOV. 30, 1956	19	10' Repair section installed at Headers, 3rd PA Front, Input - Ro - JV
MAY 3, 1957	22	9 1/2" section in Teease circuit connector renewed. - JK/EF/AS
MAY 10, 1957	23 + 24	New hose 2nd PA Loop 47' 3" - FN-AJ-EF
MAY 10, 1957	21 + 5 8 + 22	New Hose 2nd PA input 32' 10" " " " " output 31' 10" + 9 1/2" {FN AJ EF}
MAY 10, 1957	3 + 17 4 + 18	New Hose 3rd PA Rear input 30' 8" " " " " " output 30' 6" {FN AJ EF}

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"Top Curved Diagonal Targets Lengths"

BOOK No. (7)

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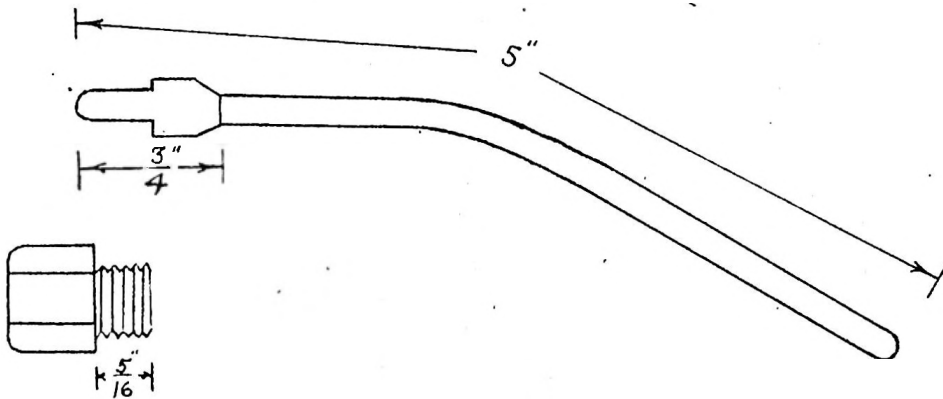
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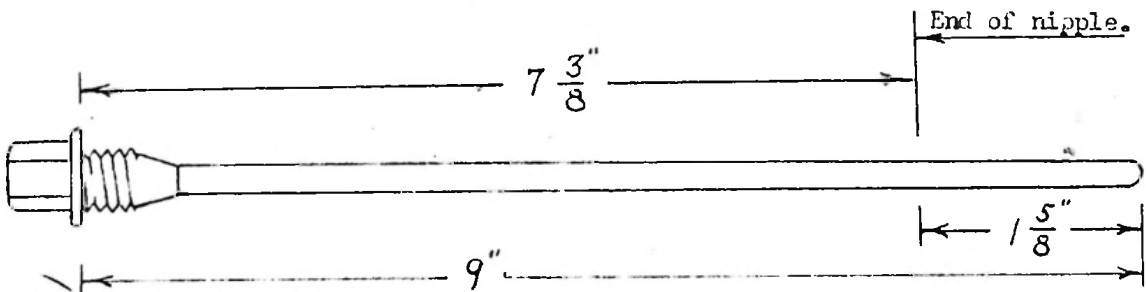
Below is a diagram and measurements of the Top Curved Diagonal Targets installed in all porcelain pipes this date. Note that targets are in 2 parts, the target itself and the clamping nut.

Template of exact bend
and size of Target.



"Bottom Horizontal Target Lengths."

Actual length of the #6 tinned copper wire making up the target for bottom positions is 9 and 1/4 inches which when set in the screw fitting will measure 9 inches from end of wire to flat end of screw fitting where same rests against the fitting on end of pipe. This permits 1 and 5/8 inches of target wire extending beyond end of nipple. Actual length of brass nipple with its rubber washer is 3 and 3/4 inches.



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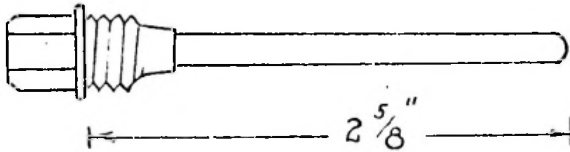
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"Top Diagonal Target Lengths"

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Actual length of the #6 tinned copper wire making up the target for the top Diagonal positions is 2 and 3/4 inches, which when set in the screw fitting will measure 2 and 5/8 inches from end of wire to flat end of screw fitting where same rests against the fitting on pipe.



Discontinue use except
in case of Emergency 1/20/40
Use "Top Curved Diagonal
Target" in Top Position.

(I)

(W)

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"Hose Nipple Disintergration"

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YEAR 1956

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Day	20	17				22	27	24		26	31	28
#1	1/16	1/16				1/16	1/16	1/16		1/16	1/16	1/16
#2	0	0				0	0	0		0	0	0
#3	1/16	1/16				1/16	1/16	1/16		1/8	1/8	1/8
#4	1/8	1/8				1/8	1/8	1/8		1/8	1/8	1/8
#5	0	1/16				1/16	1/16	1/16		1/16	1/16	1/16
#6	0	0				0	0	0		0	0	0
#7	1/16	1/8				1/8	1/8	1/8		3/16	3/16	3/16
#8	1/16	1/16				1/16	1/16	1/16		1/16	1/16	1/16
#9												
#10												
#11												
#12												
#13												
#14												
#15												
#16												
#17	0	0				0	0	0		0	0	0
#18	0	0				0	0	0		0	0	0
#19	0	0				0	0	0		0	0	0
#20	0	0				0	0	0		0	0	0
#21	0	0				0	0	0		0	0	0
#22	0	0				0	0	0		0	0	0
#23	0-0	0-0				0-0	0-0	0		0-0	0-0	0-0
#24	0-0	0-0				0-0	0-0	0		0-0	0-0	0-0
#25												
#26												
#27												
#28												
#29												
#30												
Sign	WPK	WPK				WPK	WPK	WPK	WPK	WPK	WPK	WPK
Remarks												

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"Hose Nipple Disintergration"

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YEAR 1957

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Day		22	22	26		28	26	23	27	25		29
#1		1/16	1/16	1/16		0	0	0	0	0		0
#2		1/16	1/16	1/16		0	0	0	0	0		0
#3		1/8	1/8	1/8		0	0	0	0	0		0
#4		0	0	0		0	0	0	0	0		0
#5		1/16	1/16	1/16		0	0	0	0	0		0
#6		1/16	1/16	1/2		0	0	0	0	0		0
#7		1/16	1/16	1/8		0	0	0	0	0		0
#8		1/16	1/16	1/16		0	0	0	0	0		0
#9												0
#10												
#11												
#12												
#13												
#14												
#15												
#16												
#17		0	0	0	0		0	0	0	0		0
#18		0	0	0	0		0	0	0	0		0
#19		0	0	0	0		0	0	0	0		0
#20		0	0	0	0		0	0	0	0		0
#21		0	0	0	0		0	0	0	0		0
#22		0	0	0	0		0	0	0	0		0
#23		0-0	0-0	0-0	0-0		0-0	0-0	0-0	0-0		0-0
#24		0-0	0-0	0-0	0-0		0-0	0-0	0-0	0-0		0-0
#25												
#26												
#27												
#28												
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Sign		SV/AP	SV/EF	PK/EF		PK/RS	PK/RS	PK/EF	SV/EF	LP/QK		AP/GC
Remarks												

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"Hose Nipple Disintegration"

4TH TUESDAY

YEAR 1958

ITEM 30

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Day	24	28	27	27	23			22				17
#1	0	0	0	0	0			0				0
#2	0	0	0	0	0			0				0
#3	0	0	0	0	0			0				0
#4	0	0	0	0	0			0				0
#5	0	0	0	0	0			0				0
#6	0	0	0	0	0			0				0
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Remarks:

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4TH TUESDAY

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YEAR 1959

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Day				17	22	14	24	21	23	20		21
#1				0	0	0	0	0	0	0		0
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#3				0	0	0	0	0	0	0		0
#4				0	0	0	0	0	0	0		0
#5				0	0	0	0	0	0	0		0
#6				0	0	0	0	0	0	0		0
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Remarks:

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YEAR _____

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
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Remarks:

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YEAR _____

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
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YEAR _____

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
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ITEM 31.

(a) "Switch Room": Proceed to this Room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS.

Merely grasp the Handle of the Oil Circuit Breaker and lift it up.

(b) "Basement": While in the Basement, put "OFF" Switch "DLP" - "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.

Remove the Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it up.

(c) "Basement": While in the Basement, put "OFF" Switch "DL1P" "Main Power Disconnect Panel" for SAFETY REASONS.

(d) "Basement": While in the Basement, put "OFF" Switch "DL5P" "Motor Distribution Panel" for SAFETY REASONS.

(e) "Control Unit" #1 (A): Proceed to the rear of this Unit, and put "OFF" "Safety Switch" - "DLA" for SAFETY REASONS.

(f) Proceed to the Basement, climb up on tall Step Ladder, clean Distilled Water Hose Troughs, Hoses and Insulators.

Use a Rag dipped in VERY SMALL AMOUNT OF KEROSENE, climb on Step Ladder wipe off the sides and bottoms of all wood Hose Troughs.

Clean out insides of Hose troughs with Vacuum Cleaner with Special Nozzle.

If Vacuum Cleaner does not properly clean Inside of Hose Troughs because of Guminess, etc., clean them by raising Hoses and wiping out with Rag dipped in Naptha.

Use A.C. Extension Light and check all Hose Nipples for Water Leaks.

If any Hose Nipples at Repair Sections show evidences of leaking, Distilled Water must be removed from Hose, new Rubber Gasket installed, coupling Nuts

Tightened, then Water replaced in System per Book No. (7) Sec. No. (C)

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ITEM 31.

Carefully inspect entire length of Water Hoses for pin hole leaks.

These cause high voltage arcing between leaking places and Wood Hose Trough base, burning the Hose Trough and damaging the hose.

Careful performance of this Item will prevent Time Off the Air due to defective Hose.

Wipe off all Isolantite Stand-off Insulators with rag dipped in Naptha.

(g) "Basement": While in the Basement touch up with aluminum where needed, on Metal End Plates of Isolantite Stand-off Insulators supporting Hose Troughs.

(h) "Engine Driven Generator Room": Proceed to this room in the Basement clean all Single (Main), and Double Concentric Transmission Lines and Junction Boxes on Transmission Lines.

Use the Tall Step Ladder to reach Concentric Transmission Lines.

Wipe Lines and Junction Boxes off with soft Clean Cloth.

(i) "Basement": Proceed out into the Basement, wipe off Insulators and Wood covering of 17 KV D.C. Buss.

Stand on tall Step Ladder and wipe off Insulators with a rag dampened in Carbon-tet.

Stand on Step Ladder and wipe off Wood Covering of 17 KV. Buss from Transformer Vault wall to Opening in 3rd P.A. Tube Unit, with dry cloth.

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End Item 31.

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ITEM 32.

- (a) "Transmitter Room": Proceed to the "High Voltage Grounding Switch and Door Interlock Mechanism" - "DL3P", remove one Key from any ONE of Lock Positions No. 2 to No. 5 inclusive and keep on person until Item No. 32 is completed.
- (b) "Switch Room": Proceed to this room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS. Merely grasp the Handle of the Oil Circuit Breaker and lift it up.
- (c) "Basement": While in the Basement, put "OFF" Switch "DLP" "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS. Remove the Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it up.
- (d) "Basement": While in the Basement, put "OFF" Switch "DL1P" "Main Power Disconnect Panel" for SAFETY REASONS.
- (e) "Basement": While in the Basement, put "OFF" Switch "DL5P" "Motor Distribution Panel" for SAFETY REASONS.
- (f) "Basement": Gather Tools and cleaning equipment needed for performance of this Maintenance Item.

TOOL:

WHERE KEPT

Maintenance Tray No. 1	Bin No. 3, Spare Tube Room.
Supply of Cleaning Rags	Storage Room.
9 Foot Step Ladder.	Switch Room.
115 Volt A.C. Extension Light.	Basement.
Vacuum Cleaner.	Basement.

- (g) "Basement": Proceed to the Basement, climb up on the Step Ladder, Inspect Inside and Outside of "Square Ducts", then thoroughly clean Outside. Connect the 115 Volt A.C. Extension Light Plug into a convenience Outlet on

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ITEM 32.

Basement Wall.

Place Step Ladder under Ducts over the 20 Volt Filament Motor-Generators.

Climb up on Ladder and open the front Hinged sides of Each Duct, beginning on top Duct.

Side nearest the Transformer Vault Wall is the Hinged Side.

Lift up the Side and inspect Wires and Cables inside for signs of Fraying, or deterioration of Insulation.

Use Maintenance Brush or Brush Nozzle on the Vacuum Cleaner to clean Cables and insides of Duct.

There are 3 of these "Square D Ducts" extending from directly above the 20 Volt Motor-Generators to the Wall adjacent to the 300 Volt Bias Motor-Generators.

After inspecting all in One Duct within Reach, close the Duct and Wipe off Top, Bottom and Sides of that Duct, with Rag dipped in Naptha.

Get down off the Ladder, move it to new position, again climb up, open up the same Duct, inspect and clean within the Duct, close it and clean outside.

Repeat this process until all three Ducts are thoroughly inspected and cleaned, doing one Duct at a time.

Cover all frayed wires or breaks in insulation with Friction Tape, then apply coat of Black Insulating Varnish over the Tape to keep it from drying out.

Repair any connections found to be vroken or about to break.

Never jerk on wires.

Enter all Abnormal conditions observed and any repairs made on the Reverse of the "50 KW M.O.L."

Also include this information on Routine Report to Supervisor.

Following Inspections and Cleaning Work, close Covers of all "Square D Ducts" then remove Step Ladder from position under the Ducts, replacing same in the

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ITEM 32.

Switch Room.

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ITEM 33.

(a) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to this Unit and clean Rear and Front Tubes "V1F" and "V2F" respectively.

Wipe off the Metal parts with a Rag dampened in Carbon-tet.

Wipe off Glass envelope of Tubes, using Clean Cloth dampened with Water, Then wipe off with Clean Dry Cloth.

If this is insufficient to clean the Glass envelope of Tubes, apply a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Cloth, polishing Glass to High Lustre.

When Transmitter is started, observe the condition of the Glass and if Lint is present, Clean off with Clean Dry Cloth.

If this is not the remedy, use Skin of Hand, which will attract Lint, since it discharges the Static Electricity on Glass, originally accumulated from Dry Cloth.

The small amount of remaining Lint may be blown off the Glass.

Do Not Wear a Ring while cleaning or polishing the Power Amplifier Tubes.

Always be sure to take a Clean New Cloth when Cleaning or polishing Power Amplifier Tubes:

(b) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to this Unit and clean rear Tubes "V1H" "V3H" "V5H" and Front Tubes "V2H" "V4H" "V6H".

Procedure same as Item 8 (a).

(c) "Control Unit" #1 (A): Proceed to this Unit and clean 1650 Volt Rectifier Tubes and sockets positions #1 to #6 inclusive.

Wipe off Tube Glass envelopes with a Rag Dampened in Water, then dry off with Clean Dry Cloth.

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ITEM 33.

If this is insufficient to clean the glass envelope of Tubes,
apply a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Rag, polishing Glass to High Lustre.

Wipe off the Bakelite Socket with Clean Dry Cloth.

(d) "Oscillator-Modulator Unit #2 (D): Proceed to this Unit,
Clean Tubes and Sockets Positions "V1Y" "V2Y" "V1D" "V2D" "V3D" "V4D"
"V5D".

Procedure for "V1Y" and "V2Y": Proceed to Front of this Unit, and
Clean 2 Type 271-A Tubes in Crystal Oscillator, Type 700-A Boxes #1
and #2.

Wipe off Tube Glass envelopes with Rag dampened in Water, then dry off with
Clean Dry Cloth.

If this is insufficient to clean the Glass Envelopes of Tubes, apply
a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Cloth, polishing Glass to High Lustre.

Procedure for "V1D" "V2D" "V3D" "V4D" "V5D": Ascertain if
each of these Tubes is in its socket properly.

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ITEM 33.

Gently push down on Tube to "FEEL IF FILAMENT AND GRID Tube Prongs are resting against socket Prongs Properly".

Check Tension of Socket Prongs, which should be sufficient to hold Socket Prong tightly against Tube Prong, thus providing GOOD ELECTRICAL CONNECTION. If Tension is insufficient (as evidenced WHEN 1650 VOLTS IS APPLIED BEFORE OR AFTER SHUT DOWN, Overheating of prongs, or variations in Tube Currents when tube is pushed down in Socket), increase same by Lifting Socket Prong upward Slightly.

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ITEM 33.

CAUTION: Do not adjust tension of Socket Springs Contacts with Transmitter Rotating Equipment "ON", use "Tube Change Switch" "D3A", pushing same "OFF" To stop all Rotating Machinery while this adjustment is made, or during period when Transmitter is completely shut down.

Wipe off tube Glass Envelopes with Rag dampened in Water, then dry off with Clean dry Cloth.

If this is insufficient to clean the Glass Envelope of Tubes, apply a small quantity of "Windex" using Spray Nozzle on the Bottle.

Wipe off with clean dry Cloth Polishing Glass to High Lustre.

(e) "1st. Power Amplifier Unit" #3 (E): Proceed to this Unit Clean Tubes and Socket Positions "V1E" and "V2E".

Procedure same as Item #8 (d) except Tubes are not removed from sockets and prongs are not inspected for overheating.

(f) "3rd. Power Amplifier Tube Unit" #6 (H): Proceed to this Unit, Clean Tubes and Sockets Position "V7H".

Procedure is same as Item #8 (d) except Tube is not removed from Socket and Prongs are not inspected for overheating.

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(g) "3rd Power Amplifier Tuning Unit" #8 (I): Proceed
to this unit, Clean Tube and Socket Position "VLI".

Procedure same as Item #8 (d) except Tube is not removed from Socket
and Prongs are not inspected for overheating.

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5TH TUESDAY

ITEM 34.

(a) "Control Unit" (a #1 (A)): Proceed to the Rear of this Unit. Feel and at the same time inspect Condensers "C1.1A" - "C1.2A" - "C1.3A" - "C1.4A" "C1.5A" - "C1.6A" - "C2.1A" - "C2.2A" - "C3.1A" - "C3.2A" - "C4.1A" - "C4.2A" "C5.1A" - "C5.2A" and "C6A" for OVERHEATING.

Feel Tops and Sides of Metal Cases for OVERHEATING.

Feel Insulating Bushings on Tops of These Condensers for OVERHEATING.

Inspect Cases and Insulator Bushings for Breakage and Oil Leakage.

(b) "1st Power Amplifier Unit" #3 (E): Proceed to the Rear of this Unit; open Enclosure Door; feel and inspect Condensers "C1E" - "C2E" - "C5E" - "C6E" "C7E" - "C8E" for OVERHEATING.

Use A.C. Extension Light to locate and check Condensers.

Feel tops and Sides of Metal Cases of Mica Condensers for OVERHEATING and LEAKAGE of Insulating Compound.

Feel Metal end-plates and Isolantite Cases of Cornell-Dubilier Condensers for OVERHEATING and Leakage of Insulating Compound.

Observe if the Four Counter-sunk Screws in the Top End-plates of Cornell-Dubilier Condensers are all the way in or partly unscrewed.

CAUTION: DO NOT TURN ANY OF THESE FOUR COUNTER SUNK SCREWS IN THE END PLATES OF DUBILIER CAPACITORS, AS THIS WILL ALTER THE CAPACITY.

Report same on the "50 KW M.O.L."

Note on the "50 KW M.O.L." any Condensers that have excessively Warm or Hot Spots.

BEWARE of this "Spotty" Condition since this indicates a Capacitor "Going Bad."

With a Rag lightly dampened with Naptha, clean all Isolantite Cases of Condensers.

(c) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit, feel and at the same time, inspect Condensers "C1F" - "C2F" - "C3F" - "C4F" and "C6F" for OVERHEATING.

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ITEM 34.

Procedure same Item #34 (b).

Use Shorting Stick and short across the End-Plates (the 2 connections), and then feel and inspect Condensers "C7.1F" - "C7.2F" - "C8.1F" - "C8.2F" - "C9.1F" - "C9.2F" - "C10.1F" and "C10.2F" for OVERHEATING.

Procedure same as Item #34 (b).

Leave Enclosure Door Open.

(d) "2nd Power Amplifier Tuning Unit" #5 (G): Proceed to the Rear of this Unit, open Enclosure Door; Feel and inspect Condensers "C1.1G" - "C1.2G" - "C1.3G" - "C1.4G" - "C1.5G" - "C2.1G" - "C2.2G" - "C2.3G" - "C2.4G" - "C2.5G" - "C3G" and "C4G" for OVERHEATING.

Procedure same as Item #34 (b).

Leave Enclosure Door Open.

Use the Small Step Ladder to reach the Outside Top of Enclosure, feel and inspect Condensers "C7G" and "C8G" for OVERHEATING.

Procedure same as Item #34 (b).

(e) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit, feel and inspect Condensers "C2H" - "C3.1H" - "C3.2H" - "C4.1H" - "C4.2H" - "C5.1H" and "C5.2H" for OVERHEATING.

Procedure same as Item #34 (b).

Use "Shorting Stick" and short across the End-Plates (the 2 connections) and then feel and inspect Condensers "C6.1H" - "C6.2H" - "C7.1H" - "C7.2H" - "C8.1H" - "C8.2H" - "C9.1H" and "C9.2H" for OVERHEATING.

Procedure same as Item #34 (b).

(f) "3rd Power Amplifier Tuning Unit" #7 & #8 (I): Proceed to the Rear of this Unit, open Enclosure Door; feel and inspect Condensers "C1.1I" - "C1.2I" - "C1.3I" - "C2.1I" - "C2.2I" - "C2.3I" - "C3.1I" - "C3.2I" - "C3.3I" - "C4.1I"

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"C4.2I" - "C4.3I" - "C10.1I" - "C10.2I" - "C11.1I" - "C11.2I" - "C12.3I" -
"C12.4I" - "C12.5I" and "C16I" for OVERHEATING.

Procedure same as Item #34 (b).

(g) "3rd Power Amplifier Tuning Unit" #8 (I): Proceed to the Front of
this Unit, open the Metal Panel #2, feel and inspect Condensers "C17I" - "C18I"
"C19I" - "C20.1I" - "C20.2I" - "C21I" for OVERHEATING.

Procedure same as Item #34 (b).

Leave Enclosure Door Open.

On the Front of this Unit, open the Metal Panel #3, feel and inspect Condensers
"C7.1I" - "C7.2I" - "C13.1I" and "C13.2I" for OVERHEATING.

Procedure same as Item #34 (b).

Leave Enclosure Door Open.

(h) "Antenna Coupling Unit" #9 (J): Proceed to this Unit, open Enclosure
Door, feel and inspect Condensers "C1.1J" - "C1.2J" - "C1.3J" - "C2.1J" - "C2.2J"
"C2.3J" - "C3.1J" - "C3.2J" - "C3.3J" - "C4.1J" - "C4.2J" - "C4.3J" - "C4.4J"
for OVERHEATING.

Procedure same as Item #34 (b).

Leave Enclosure Door Open.

(i) Units Listed Item #34 (a) to (h): Proceed to these Units listed in
this sequence.

Use A.C. Extension Light and tighten all Bolted Connections.

In some instances it will be found that Condensers are bolted to Support Insulators
and that these Bolts also connect Two Busses together.

In this work, exercise CARE NOT TO BREAK OR CHIP Threaded Bolt Hole in End of
Stand-off Insulator, which will cause LOOSE BOLTED CONNECTION OF BUSES.

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Inspection will show that some of these Insulators do not have any Metal Ends,
but that Threaded Holes are in the Isolantite itself.

DO NOT TIGHTEN SUCH BOLTS TOO MUCH - DO NOT JERK.

At the same time, feel Filament Connections of Water-cooled Power Amplifier
Tubes for OVERHEATING.

These Connections are normally Warm, NOT HOT.

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(a) "Switch Room": Proceed to this Room and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS.

Merely grasp Handle of the Oil Circuit Breaker and lift it up.

(b) "Control Unit" #1 (A): Proceed to the Rear of this Unit and put "OFF" "Safety Switch" - "DIA", Open hinged door and feel Fuses "F1.1A" - "F1.2A" - "F1.3A" "F2.1A" - "F2.2A" - "F3.1A" - "F3.2A" - "F4.1A" - and "F4.2A" for OVERHEATING.

Be sure to rotate Fuses in their Holders, since Burned Spots may be on Lower Sides, or Sides turned toward the Panel.

Fuses normally run Warm, Not HOT.

Technician should be able to keep hand on fuses when checking same.

Replace any Fuse showing a burned or OVERHEATED place on Insulated Body of same.

Spare Fuses are located in the "Portable Fuse and Test Unit" kept in the Main Transmitter Room and in the "Fuse Tester Rack" kept in the Basement Areaway at the foot of the Basement Stairs.

Fuses should be gripped tightly in Clips and Fuse Block Holders, so that OVERHEATING does not take place at these connections.

Some Fuses are provided with Compression (Variable) Clamps to prevent OVERHEATING and to assure full Voltage and Current Throughout the Circuit.

Be sure that proper Tension is on these Clamps.

After checking these Fuses, be sure to Close Metal Door, and put "SAFETY SWITCH" "DIA" - "ON".

(c) "Control Unit" #1 (A): While at the rear of this Unit feel Fuses "F5A" - "F6A" - "F7A" - "F8A" - "F9A" and "F10A" for OVERHEATING.

Procedure same as Item #35 (b).

Exercise care not to break the single socket holding each Fuse.

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(d) "Oscillator-Modulator Unit" #2 (D): Proceed to rear of this Unit and feel Fuse F3D".

Same Procedure as Item #35 (b).

Fuse is located on the Lightning Protective Device Apparatus Panel on bottom of the Unit.

(e) "17 KV Rectifier Unit" #10 (C): Proceed to this Unit and feel Fuses "F1.1C" and "F1.2C" for OVERHEATING.

Same Procedure as Item #35 (b).

These Fuses are located on the Metal Panel supporting "Rectifier Air Blast Relays" on bottom of the Unit.

(f) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to this Unit and feel Fuses "F1H" - "F2H" - "F3H" - "F5H" and "F6H" for OVERHEATING.

Same Procedure as Item #35 (b) except that Knife Type fuse clears Panel sufficiently to observe any Abnormal Condition.

These Fuses are located on the Bakelite Panel just above the Rear Tubes.

(g) "Basement": Proceed to Basement, and put "OFF" Switch "D1P" "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.

Remove the Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it UP.

(h) "Basement": While in the Basement, put "OFF" switch "D1.1P" "Main Power Disconnect Panel", open Metal Door and feel Fuses "F1.1P" - "F1.2P" "F1.3P" - "F2.1P" - "F2.2P" - "F2.3P" - "F20.1P" - "F20.2P" - "F20.3P" for OVERHEATING.

Technician should be able to lay Hand on These parts, they should be Warm, not Hot.

If Blades or contacts are too hot, tighten up Compression nuts, clean off

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contacts with Crocus Cloth, wipe with Rag dampened with Carbon-tet and lightly coat with "3-in-1" Oil.

After Checking Fuses and Switches, put Switch "D1.1P" - "ON".

(i) "Basement": While in the Basement, put "OFF" Switch "D15P" - "Motor Distribution Panel", open Metal Door and feel Fuses "F4.1P" - "F4.2P" - "F4.3P" "F5.1P" - "F5.2P" - "F5.3P" - "F7.1P" - "F7.2P" and "F7.3P" for OVERHEATING.

Procedure same as Item #35 (b).

Feel Blades and contacts of Switch "D15P" for OVERHEATING.

Procedure same as Item #35 (h).

(j) "17 KV Rectifier Switching Unit" #11 (B): Proceed to the front of this Unit and test Switch for binding.

If the Switch does bind, or does not move freely when placed in the "10 KV" or "17 KV" positions, coat lightly with "3-in-1 Oil".

If the Switch still binds following this, loosen Compression Nuts and remove Bolts and compression Washers, from the "Swingers", pulling the "Swingers" free of rest of the Switch.

Clean the "Swinger" Contact surfaces with Crocus Cloth, wipe off with Rag dampened with Carbon-tet.

Wrap a piece of Crocus-Cloth around Narrow Flat File and clean inside of Switch Contacts, then wrap Rag dampened in Carbon-tet about the file and wipe Residue from Switch Contacts.

Put Switch back together again, replace the Bolts, Compression Washers and Nuts, tightening them JUST ENOUGH TO SEE THE COMPRESSION WASHERS BEGIN TO FLATTEN.

Lightly coat "Swingers" and Switch Contacts with "3-in-1 Oil" and again test for Binding.

Technician should be able to move Switch from one position to the other freely

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and smoothly.

Wipe up all copper dust and other Residue from floor and section where Switch was cleaned.

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- (a) "Switch Room": Proceed to this Room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS.
Merely grasp the Handle of the Oil Circuit Breaker and lift it up.
- (b) "Basement": While in the Basement, put "OFF" Switch "DLP" "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.
Remove the Wool "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.O.B. and lift it up.
- (c) "Control Unit" #1 (A): Proceed to the Rear of this Unit and feel Field Coils of Relays "S2A" - "S3A" - "S4A" and "S14A" for OVERHEATING.
These Relays are located in top rear of this Unit, mounted on a Metal Sub-Panel. These Relay Field Coil will normally run Warm, but Not Hot.
Technician should be able to keep Hand on them.
Log any that are excessively warm or Hot, on the "50 KW M.O.L."
While at the rear of this Unit, open Door of Metal Box housing Relay "S1A" and feel Field Coil for OVERHEATING.
Procedure same as Item #36 (c).
Close Door of Metal Box Housing Relay "S1A".
While at the Rear of this Unit, put "OFF" the Series Switch on "1650 Volt Magnetic Switch Contactor" Metal Box, Open Box and feel this Relay Contactor "S7A" Field coil for OVERHEATING.
Procedure Same as Item #36 (c).
Close Door of Metal Box, and put Series Switch "ON".
- (d) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit, use "Shorting Stick" discharge Condensers "C7.1F" - "C7.2F" - "C8.1F" - "C8.2F" - "C9.1F" - "C9.2F" - "C10.1F" - "C10.2F" then feel Field Coils of Relays "S1F" - "S2F" - "S3F" and "S4F" for OVERHEATING.

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Temperature of these Relay Field Coils should be BARELY WARM, in no event higher than Room Temperature.

To discharge Condensers, merely place Metal part of "Shorting Stick" across the two End Plates of these Condensers.

As each Condenser is discharged, a moderate ARC will be observed when "Shorting Stick" first touches the End Plates.

Log any Relay Field Coils that are excessively Warm or Hot, on the "50 KW M.O.L."

(e) "5rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit, use "Shorting Stick" discharge Condensers "C6.1H" - "C6.2H" - "C7.1H" - "C7.2H" - "C8.1H" - "C8.2H" - "C9.1H" - "C9.2H" - " then feel Field Coils of Relays "S3H" - "S4H" - "S5H" - "S6H" - "S7H" - "S8H" - "S9H" "S10H" - "S11H" - "S12H" - "S13H" and "S14H" for OVERHEATING.

Same Procedure as Item #36 (d).

(f) "17 KV Rectifier Tube Unit #10 (C): Proceed to this Unit and feel Field Coils of Relays "S1C" - "S2C" - "S3C" - "S4C" - "S5C" - "S6C" - "S7C" "S8C" - "S9C" - "S10" - "S11C" and "S12C" for OVERHEATING.

Temperature of these Relay Field Coils should be BARELY WARM, in no event higher than Room Temperature.

While at this Unit, open door of Metal Box housing "17 KV Rectifier Air Blast Heater Relay" - "S17C" and feel Field Coil for OVERHEATING.

This Field Coil will run normally Warm not Hot.

Technician should be able to keep Hand on it.

If excessively Warm or Hot, Log on the "50 KW M.O.L."

(g) "17 KV Rectifier Switching Unit" #11 (B): Proceed to this Unit and feel Solenoids of Magnetic Contactors "S4B" and "S5B" for OVERHEATING.

Solenoids of these Contactors run normally very WARM, with Temperature distributed

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evenly around outside of Casings.

Inspections should be made for OVERHEATING, UNEVENLY distributed Temperature (HOT SPOTS), loose Connections, and condition of Insulation covering around Outside of Solenoids.

When Insulating Covering around Solenoids of "S4B" and "S5B" begins to get bare, apply a coat of "BLACK INSULATING VARNISH".

On the Bottom of this Unit, feel Field Coils of Relays "S2B" and "S3B" for OVERHEATING.

Log any abnormal Condition and work performed on the "50 KW M.O.L."

(h) "17 KV Filter Condenser Charging Contactor and Resistor Unit" #12 (L):

Proceed to this Unit and feel Solenoid of Magnetic Contactor "S11" for OVERHEATING.

Procedure same as Item #36 (g).

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(a) "Switch Room": Proceed to this Room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS .

Merely grasp the Handle of the Oil Circuit Breaker and lift it up.

(b) "Basement": While in the Basement, put "OFF" Switch "DLP" - "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.

Remove the Wood "Preventer" from Between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it up.

(c) "3rd Power Amplifier Tuning Unit" #7 & 8 (I): Proceed to rear of this Unit, enter Enclosure, clean End-seals of Double Concentric Transmission Lines No. 1 and No. 2, check Stand-off Insulators for Cracks and Breaks, tighten Bolted Connections on Insulators.

These End-Seals are located within this Unit, just to the left of Transmission Line Condensers "CL2I".

Clean End-Seals with a Rag lightly dampened in Carbon-tet.

If Carbon-tet is insufficient to Clean them, clean them with Crocus-Cloth, then wipe off Residue with a Rag dipped in Carbon-tet.

If required, test End-Seals for Leaks with Diluted Soap Solution.

Procedure same as Item #1 (d).

Check all Stand-off Insulators for cracks and breaks.

Replace any insulator not properly supporting a piece of Apparatus.

Check all bolted Connections where Buses are connected together at Stand-off Insulators.

Tighten these bolted connections a TRIFLE if required.

Exercise Care not to break or chip threads on end of Insulator in tightening Bolts.

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(d) "Antenna Coupling Room" #9 (J): Proceed to this Room, clean End-Seals of Double Concentric Transmission Lines No. 1 and No. 2, check Stand-off Insulators for cracks and breaks, tighten Bolted Connections on Insulators.

Procedure same as Item #37 (c).

(e) "Control Unit" #1 (a): Proceed to the rear of this Unit, check all Insulators for cracks and breaks, tighten all bolted connections on Insulators. Inspect ends of Stand-off Insulators where Busses are terminated with bolts, or where 2 or more busses are connected together by a single bolt in threaded hole on end of Insulator.

Tighten these connections a TRIFLE IF REQUIRED.

AVOID TOO MUCH TIGHTENING SINCE IT IS VERY EASY TO BREAK OR CHIP ENDS OF INSULATORS. Replace Stand-off Insulators where Connections cannot be tightened due to damaged insulators.

(f) "Oscillator-Modulator Unit" #2 (D): Proceed to the rear of this Unit, open up compartments of "Radio Frequency Amplifier" and "Modulating Amplifier", check all insulators for cracks and breaks, tighten all bolted connections on Insulators.

Procedure same as Item #37 (e).

(g) "1st Power Amplifier Unit" #3 (E): Proceed to the rear of this Unit, open Compartment, check all Insulators for cracks and breaks, tighten all bolted connections on Insulators.

Procedure same as Item #37 (e).

(h) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the Rear of this Unit, check all Insulators for cracks and breaks, tighten all bolted connections on Insulators.

Procedure same as Item #37 (e).

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(i) "2nd Power Amplifier Tuning Unit" #5 (G): Go to the rear of this Unit, open Compartment, check all Insulators for cracks and breaks, tighten all bolted connections on Insulators.

Procedure same as Item #37 (e).

(j) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the rear of this Unit, check all insulators for cracks and breaks, tighten all bolted connections on Insulators.

Procedure same as Item No. 37 (e).

(k) "Transformer Vault": Proceed to this room in the Basement, check all Insulators for cracks and breaks, tighten all bolted connections on Insulators. Procedure same as Item #37 (e) except that Technician must also observe if Sealing Compound has broken or fallen from center holes of these Insulators.

If part of Sealing Compound has broken away, dust, dirt and Noxon Metal Polish will fall into the opening, causing High Voltage Arc, which will over-heat Insulator perhaps breaking or damaging it.

Remedy is to remove the Buss from the Insulator, then clean inside of Insulator, removing all Sealing Compound residue.

Wipe out inside of Insulator with Rag dipped in Carbon-tet.

Clean and polish Buss at point where it passed through the Insulator hole.

Cut 2 circular pieces of Lucite with holes through centers same size as the Buss.

Pass Buss through Insulator, put one piece of Lucite on top of Insulator and the other on bottom of Insulator and cement to Insulator with Carron Cement.

Solder or bolt Buss back into proper place in the circuit.

Enter data on "50 KW M.O.L." and write separate report to Supervisor.

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- (a) "Switch Room": Proceed to this Room in the Basement, and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS.
Merely grasp the Handle of the Oil Circuit Breaker and lift it up.
- (b) "Basement": While in the Basement, put "OFF" Switch "DLP"
"Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.
Remove the Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp the Handle of O.C.B. and lift it up.
- (c) "Basement": While in the Basement, put "OFF" Switch "D1.1P"
"Main Power Disconnect Panel" for SAFETY REASONS.
- (d) "Basement": While in the Basement, put "OFF" Switch "D15P"
"Motor Distribution Panel" for SAFETY REASONS.
- (e) "Control Unit" #1 (A): Proceed to the Rear of this Unit, clean wall above Unit, then vacuum clean inside of Unit.
Use A.C. Extension Light to locate all places to be cleaned.
Use Vacuum Cleaner with Special Narrow Nozzle to clean channel irons, behind wires, cables, etc.
Clean and dust all parts of this Unit.
Make general use of the Vacuum Cleaner for all Dust and dirt difficult to clean by hand.
- (f) "Oscillator-Modulator Unit" #2 (D): Proceed to the rear of this Unit,
Clean Wall above Unit.
Open up compartments of "Radio Freq. Amplifier" and Modulating Amplifier" then Vacuum Clean inside of Unit.
Procedure same as Item #38 (e).
- (g) "1st Power Amplifier Unit" #3 (E): Proceed to the rear of this Unit

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clean Wall above Unit, open up Compartment, then vacuum clean inside of Unit.

Procedure same as Item #38 (e).

(h) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the rear of this Unit, clean Wall above Unit, then Vacuum Clean inside of Unit.

Procedure same as Item #38 (e).

(i) "2nd Power Amplifier Tuning Unit" #5 (G): Proceed to the rear of this Unit, clean Wall above Unit, open up Compartment, then vacuum clean inside of Unit.

Procedure same as Item #38 (e).

(j) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the rear of this Unit, clean Wall above Unit, then vacuum clean inside of Unit.

Procedure same as Item #38 (e).

(k) "3rd Power Amplifier Unit" #7 & 8 (I): Proceed to the rear of this Unit, clean Wall above Unit, open enclosure, then vacuum clean inside of Unit.

Procedure same as Item #38 (e).

(l) "Antenna Coupling Room" #9 (J): Proceed to this Room, enter enclosure then Vacuum Clean entire Unit.

Procedure same as Item #38 (e).

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- (a) "Transmitter Room": Proceed to the "High Voltage Grounding Switch and Door Interlock Mechanism" "D13P", remove one Key from any one of Lock Positions No. 2 to No. 5 inclusive and keep on person until Item #39 is completed.
- (b) "Switch Room": Proceed to this room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS. Merely grasp the Handle of the Oil Circuit Breaker and lit it up.
- (c) "Basement" While in the Basement, put "OFF" Switch "D1P" Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS. Remove the Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it up.
- (d) "Basement": While in the Basement, put "OFF" Switch "D1.1P" "Main Power Disconnect Panel" for SAFETY REASONS.
- (e) "Basement": While in the Basement, put "OFF" Switch "D15P" "Motor Distribution Panel" for SAFETY REASONS.
- (f) "17 KV Filter Choke L4P Unit" #12: Proceed to this Unit, check Spacing of Ball Gap "G3P".
Reset Ball Gap to correct Spacing if required.
Clean and Polish Ball Gap.
Ball Gap "G3P" is mounted on top of the 17 KV Main Filter Choke.
Ball Gap measuring Tool is kept in Leather Kit in "Portable Fuse and Test Unit".
Ball Gap "G3P" is connected in Shunt to "L4P", "Main Filter Reactor Choke".
Ball Gap "G3P" correct spacing is .089 Inch.
GENTLY place Measuring Tool between both Balls of the Gap.
Separation of Gap must be such that both Balls touch the Tool at the same time with a Tight Fit.
If Spacing of Gap should be found different than indicated hereon, it must be
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corrected.

Merely loosen both Locking Nuts on One Ball supporting Shaft and twist the Shaft to widen or narrow the Spacing.

When Separation is correct, tighten Locking Nuts.

Remove the Measuring Tool.

When Spacing has to be corrected, a separate note to Supervisor must be made.

Clean and polish Ball Gap with Crocus Cloth.

Wipe off Residue with Rag dampened in Carbon-tet.

Polish Ball Gap with Noxon.

BE SURE TO HAVE A CLEAN ROUND SURFACE AND IT MUST BE SMOOTH.

REPORT CRACKED, CARBONIZED AND "OUT OF ROUND" GAPS IMMEDIATELY TO SUPERVISOR.

If required, use "00" Sandpaper first, then Crocus Cloth, and finally finish finishing off with Metal Polish.

(g) "Antenna Coupling Room" #10 (J): Proceed to this Room, enter Enclosure, check Spacing of Ball Gaps "G1J" - "G2J" and "G3J".

Reset Ball Gaps to correct spacings if required.

Clean and polish all Ball Gaps.

Ball Gap "G1J" is connected in Shunt "to K1J" Primary "Oscillation Transformer".

Ball Gap "G1J" correct Spacing is ~~1/2 Inch.~~ *changed to 3/4 " 4/20/43*

Ball Gap "G2J" correct Spacing is 1/2 Inch.

Ball Gap "G2J" is connected in shunt to Transmission Line No. 2, Condensers "C2J".

Ball Gap "G3J" was removed from position in Shunt to Transmission Line No. 1, Condensers "C3J" - 2/27/40.

Ball Gap "G3J" correct Spacing is 1/2 Inch.

Procedure, same as Item #39 (f).

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(h) "Transformer Vault": Proceed to this Room, check Spacing of Ball Gap "G4P".

Reset Ball Gap to correct Spacing if required.

Clean and polish Ball Gap.

Ball Gap "G4P" is connected in Shunt to Secondary of High Voltage Transformer No. 1 "T1P".

Ball Gap "G4P" correct Spacing is 5/8 Inch.

Procedure same as Item #39 (f) except that Set Screws to loosen or tighten Supporting Shaft for Gap are moved by means of "Hexagon Shaped Tool".

Note that Balls are merely wedged on ends of Shafts, they are not screwed on.

Tighten Balls on ends of supporting Shafts by twisting motion exerting Pressure at the same time.

(i) "Transformer Vault": While in this Room, check Spacing of Ball Gap "G5P".

Reset Ball Gap to correct Spacing if required.

Clean and polish Ball Gap.

Ball Gap "G5P" is connected in Shunt to Secondary of High Voltage Transformer No. 2 "T2P".

Ball Gap "G5P" correct Spacing is 5/8 Inch.

Procedure same as Item #39 (f) and (h).

(j) "Transformer Vault": While in this Room check Spacing of Ball Gap "G6P".

Reset Ball Gap to correct Spacing if required.

Clean and polish Ball Gap.

Ball Gap "G6P" is connected in Shunt to Secondary of High Voltage Transformer No. 3 "T3P".

Ball Gap "G6P" correct Spacing is 5/8 Inch.

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Procedure same as Item #39 (f) and (h).

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(k) "A.C. Power Panel" Unit #1 (A): Proceed to the Front of this Unit, hold finger on "STOP" Button of "Master Control" Switch "D3A" and next put "OFF" "Power Supply" Switch "D4A".

(l) Enter Transmitter Enclosure (Leave Door Open) and Open "High Voltage Transformer Disconnect Switch" "D5A" (Unit #1 (A) on bottom rear of the Unit.)

(m) "10 KV Power Supply Unit" #7 (G): Proceed to this Unit and check the Spacing of Ball Gaps "G1G" - "G2G" and "G3G".

Reset Ball Gaps to Correct Spacing if Required.

Clean and polish Ball Gaps.

Ball Gap "G1G" Horn Gap, 10 KV Transformer "T1B" Secondary to "Ground" - - 1 Inch

Ball Gap "G2G" Horn Gap, 10 KV Transformer "T2B" Secondary to "Ground" - - 1 Inch

Ball Gap "G3G" Horn Gap, 10 KV Transformer "T3B" Secondary to "Ground" - - 1 Inch

These Ball Gaps are mounted on the Iron Framework directly above the 10 KV Transformer.

Measure separation between both inside edges of Horn Gap with 6 inch Rule.

If Spacing of Gap should be found different than indicated hereon, it must be corrected.

Merely loosen bolts on Compression fitting and Slide one or both sections of Horn Gap in or out to correct spacing.

When separation is correct, tighten Locking Compression Bolts.

Remove the Rule.

When Spacing has to be corrected, a Separate Note to Supervisor must be made.

Clean and polish Horn Gaps, rubbing sharp insides of the Gap with Crocus Cloth.

Wipe off Residus with Rag dipped in Carbon-tet.

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ITEM 39.

(n) "10 KV Power Supply Unit" #7 (G): While at this Unit, check the spacing of Ball Gaps "G4G" and "G5G".

Reset Ball Gaps to correct Spacing if required.

Clean and polish Ball Gaps.

Ball Gap "G4G" Shunt to 10 KV Filter Condenser ("C2G") - - - - - .295 Inch

Ball Gap "G5G" Shunt to 10 KV Filter Choke (Reactor "L6G") - - - - - .18 Inch

Ball Gap "G4G" is mounted on Iron Framework directly above Filter Choke "L6G".

Ball Gap "G5G" is mounted on top of Filter Choke "L6G".

Procedure same as Item #39 (f).

(o) "Tuning Unit" #6 (F): Proceed to the Rear of this Unit and check the spacing of Ball Gap "G1F".

Reset Ball Gap to correct Spacing if required.

Clean and Polish Ball Gap.

Ball Gap "G1F" Shunt to Concentric Transmission Line (Main) - - - - - .018 Inch

Ball Gap "G1F" is mounted on the iron framework of this Unit, just to the left of the "Final Amplifier Tuning Capacitors".

Procedure same as Item #39 (f).

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"Ball Gap Spacing Measurement Tool"

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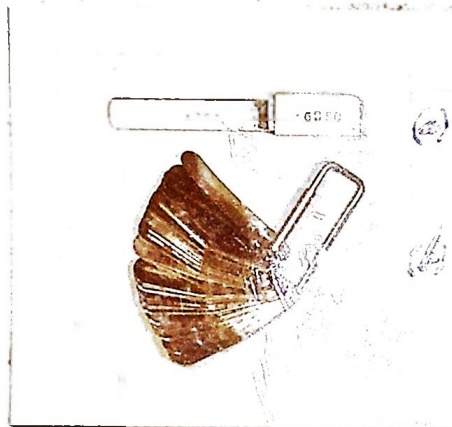


Fig. No. 1:

- (a) Ball Gap Spacing Tool - .089 - .6250 - 1/2 inch - 5/8 inch.
- (b) Set of Type R-1931 Thickness Gauges.

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ITEM 40.

- (a) "Basement": Proceed to the Basement and observe that the 480 Volt A.C. "Ground Detector" Neon Lamps on phases "A" - "B" - "C" are ILLUMINATED. These "Ground Detector" Neon Lamps are mounted on front of small metal box located on top of Cabinet marked "D1.P" "Maint Power Disconnect Panel". When illuminated these Lamps will indicate to the Technician THAT INPUT AND OUTPUT CONTACTS OF "D1P" "Master 480 Volt Oil Circuit Breaker" ARE ALIVE (Power On.)
- (b) "Switch Room": Proceed to this Room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS. Merely grasp the Handle of the Oil Circuit Breaker and lift it up.
- (c) "Basement": Proceed to "D1.P" "Main Power Disconnect Panel" and observe that "Ground Detector" Neon Lamps on Phases "A" - "B" - "C" are EXTINGUISHED. This will indicate to the Technician that INPUT AND OUTPUT CONTACTS OF "D1P" "Master 480 Volt Oil Circuit Breaker" ARE DEAD (No Power On.)
- (d) "Basement": Put "OFF" Switch "D1P" - "Master 480 Volt Oil Circuit Breaker, remove the Oil Filled Cover, clean and service Contacts for OVERHEATING and OXIDATION.
- Check Temperature of Oil Filled Container on "Tel-Temp".
Minimum Temperature is 15 Degrees Centigrade, Maximum Temperature is 42 Degrees Centigrade.
- Procedure in removing Oil Filled Metal Cover is quite easy for one Technioian if performed in sequence:
- Loosen then remove 2 Large Wing Nuts diagonally opposite to each other from top of Metal Cover.
- Assume a "Squatting Position" placing both knees directly underneath Metal Cover. Object of this is to carry weight of Oil filled cover while loosening remaining two Wing Nuts.

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When balanced and able to bear weight of cover, loosen then remove remaining two large wing nuts.

Note that the Cover is full of SPECIAL INSULATING OIL, be careful when removing this cover, not to shake up the Oil, so that the Contents may be inspected for Cloudiness and sediment.

Grasp Oil Filled Metal Cover in both hands and carefully lower it to floor directly beneath.

If unable to lower Metal Cover by yourself, call another Technician to assist. BEFORE TOUCHING CONTACTS OF THIS CIRCUIT BREAKER, take 480 Volt Test Lamp, hanging up on Wood Display Board adjacent to this Breaker, push the prods into any 115 Volt A.C. Outlet.

If the Lamp lights dimly, it WILL INDICATE TO TECHNICIAN THAT THE LAMP IS GOOD. Remove Test Prods from 115 Volt Outlet, and touch Input and Output Contacts of "DLP" - "Master 480 Volt Oil Circuit Breaker" with Test Prods.

If the lamp remains EXTINGUISHED, IT WILL INDICATE TO THE TECHNICIAN THAT BOTH INPUT AND OUTPUT CONTACTS OF "DLP" ARE DEAD (Power is OFF.)

Allow oil to drip off contacts into cover directly beneath, until it stops. Lay a clean cloth over top of cover to prevent dropping dirt and residue into the oil.

Use A.C. Extension Light to inspect Contacts for OXIDATION.

Oxidation will be identified as the Brownish Coating over the Copper Contacts. Clean all 6 Movable Contacts with "00" Sandpaper, then Crocus Cloth, finally wiping off the Residue with a rag dipped in Carbon-tet.

Procedure in cleaning the Stationary Contact Fingers is slightly different.

Wrap a piece of "00" Sand paper around a flat file about 6 inches long, by 1 inch wide and 1/8 to 1/4 inch thick.

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ITEM 40.

Rub Sandpaper covered File between all Stationary Contacts several times, remove and wrap Crocus Cloth about the same File.

Rub Crocus Cloth covered File through Contacts several times.

Remove the Crocus Cloth and dip a clean cloth in Carbon-tet, wrap about the File and clean Residue from all Stationary Contacts.

Inspect all Movable and stationary Contacts with aid of A.C. Extension Light. They should be clean and bright.

If they are not, clean them a 2nd time.

Inspect Stationary Contact Finger Springs.

They should hold the Stationary Contacts vertical.

Renew any heavy duty contact Finger Spring observed to be bent.

Grasp Handle of the Breaker and put "ON".

Inspect all Contacts while in the "Operating Position".

If found incorrect, adjust same by screwing in or out of the Nipple on the End of the Operating Rod.

This adjustment will raise or lower the Movable Contacts so as to place same correctly.

Correct placement of all contacts is pictured in Westinghouse Bulletin on Types F-11 and F-22 Oil Circuit Breakers, Page 3.

This Bulletin is a part of Operating Manual Book No. 15.

Note that Cover is full of Special Insulating Oil to "Oil Level Mark" which is _____ inches below top edge of this Cover.

If Oil Level is not correct, add Oil to Cover until it is.

Inspect Oil for Cloudiness, dirt and sludge.

If in doubt, remove small sample of Oil for Supervisor to analyze.

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ITEM 40.

Tighten all Assembly nuts and bolts of Switch parts to be covered when Metal Cover is replaced.

One Technician can replace this Cover by following procedure.

Assume a "Squatting Position" on left side of "DLP" Breaker.

Grasp cover in both hands, lift up and put in place with 4 holding bolts through holes in top metal supporting plate.

Screw 2 Wing Nuts on bolts diagonally placed on top of Metal Cover.

Tighten these Wing Nuts in place.

Put 2 remaining Wing Nuts on Bolts and tighten them.

If unable to replace Metal Cover by yourself, call another Technician to assist.

Check all Connections, making sure that same are tight.

When needed, revarnish with Insulating Black Varnish all Wires and tape coverings.

Tighten all Mechanical Support Nuts and Bolts.

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ITEM 41.

(a) "Transmitter Room": Proceed to the "High Voltage Grounding Switch and Door Interlock Mechanism" - "D13P", remove One Key from any one of Lock positions No. 2 to No. 5 inclusive and keep on person until Item #41 is completed.

(b) "Switch Room": Proceed to this Room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS. Merely grasp the Handle of the Oil Circuit Breaker and lift it up.

(c) "Basement": While in the Basement, put "OFF" Switch "D1P" "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS. Remove the Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it up.

(d) "Basement": While in the Basement, Put "OFF" Switch "D14P" "300 Volt Bias Motor-Generator Selector Switch", open compartment, clean Switch, tighten connections.

This Switch is "OFF" when Handle is in the Horizontal position.

Compartment cannot be opened until the Switch is "OFF".

Clean Blades of Switch "D14P" with rag dipped in Carbon-tet.

Polish contacting surfaces of Switch Blades with Crocus Cloth.

Wipe Residue off Switch Blades with rag dipped in Carbon-tet.

Dip a small piece of rag in Carbon-tet, wrap around a flat file about 1/8 inch thick and wipe off insides of all Switch stationary Contact surfaces.

Remove and wrap a piece of Crocus Cloth around the file, then rub between Switch stationary contacts.

Remove Crocus Cloth, wrap clean piece of cloth dipped in Carbon-tet around the file and clean residue from between Switch Stationary Contacts.

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ITEM 41.

Inspect Switch Blades of Stationary Contacts with aid of A.C. Extension Light.

They should be clean and Bright.

If they are not, clean them a Second Time.

After cleaning, apply light coat of "3-in-1 Oil" to Contact surfaces on
Switch Blades, and inside surfaces of Stationary Contacts.

Tighten all connections to Switch with Screw driver and Gas pliers.

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ITEM 42.

(a) "Transmitter Room": Proceed to the "High Voltage Grounding Switch and Door Interlock Mechanism" - "D13P", remove one Key from any One of Lock Positions No. 2 to No. 5 inclusive and keep on Person until Item #42 is completed.

(b) "Switch Room": Proceed to this Room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS. Merely grasp the Handle of the Oil Circuit Breaker and lift it up.

(c) "Basement": While in the Basement, put "OFF" Switch "D1P" "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS. Remove the Wood "Preventer" from between Operating Handle and Overload Tripping Lever, then grasp Handle of O.C.B. and lift it up.

(d) "Control Unit" #1 (A): Proceed to the Rear of this Unit, check all connections, inspect condition of Hook up Wire and inspect all Insulator Bushings for OVERHEATING and DAMAGE. Use A.C. Extension Light and inspect all Soldered and bolted connections on all equipment within this Unit.

All connections, whether Soldered, Bolted, Screwed to terminals, must be inspected and tightened if necessary.

If Soldered connections appear loose, broken, or oxidized, apply a Hot Iron and resolder.

Never pull on Wires, where Lugs are used or not.

Feel and inspect Lugs for OVERHEATING.

In tightening connections, exercise care not to damage Threads, Screw Heads, Bolt Heads and Nuts.

Twist or pull on Tools with STEADY PRESSURE - NEVER JERK.

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ITEM 42.

In checking for OVERHEATING, remember that the Connection should not be warmer than its associated piece of Equipment.

Communicated heat from a Condenser or Resistor will raise Temperature of connections.

If a Connection is warmer than the Condenser or Resistor to which it is secured, OVERHEATING is the cause, and DAMAGE WILL RESULT IN A LOOSE CONNECTION or even an OPEN CIRCUIT.

In soldering Connections on Resistors, exercise care not to break Tab Connections which might be more fragile than the Stiff Wire used to connect same.

Check condition of Hook up Wire used to make connections, noting if Insulation is in good order, frayed, broken, chipped, etc.

If wires have to be taped, apply a coat of Black Insulating Varnish over the Tape which will keep same in place and prevent drying out of Tape.

Exercise care not to move any connections from whatever positions same are found in.

Note that Some Leads are ORIENTED to minimize Radio Frequency Fields.

Inspect all Bakelite or other type Bushings, raised Insulator Connections for OVERHEATING of other causes likely to result in Carrier Failure.

Replace any doubtful Insulators or bushings.

Carefully wipe off all Resistors with Clean Dry Cloth.

See that they are done so with UTMOST CARE TO PREVENT BREAKING TABS.

(e) "Oscillator-Modulator Unit" #2 (D): Proceed to the Rear of this Unit, Open Compartments of "R.F. Amplifier" and "Modulating Amplifier".

Check all Connections, inspect condition of Hook up wire, and inspect all insulator bushings for OVERHEATING or DAMAGE.

Procedure same as Item #42 (d) except that 50 KW Crystal Heater Circuits remain on 24 Hours a Day and that they must be shut off when doing this maintenance work in this Unit.

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ITEM 42.

Put "OFF" Switch "D2D", 115 Volt A.C. Supply to Crystal Heater Circuits.

This Switch is located on the "Crystal Heater Power Panel" directly behind Meters on the Main Panel, being mounted on a metal Sub-panel.

After finishing Maintenance Work on this "Crystal Heater Power Panel" procedure is as follows:

Put "OFF" Switch "D13D" - "Power Supply to Crystal No. 1 Heater".

(Plate Current from Rectifier Tube "V6D".)

Put "OFF" Switch "D14D" - "Power Supply to Crystal No. 2 Heater".

(Plate Current from Rectifier Tube "V7D".)

Put "ON" Switch "D2D" - "115 Volt A.C. Power Supply to Crystal Heater Circuits".

Put "ON" Switch "D13D" - "Power Supply to Crystal No. 1 Heater".

Put "ON" Switch "D14D" - "Power Supply to Crystal No. 2 Heater".

Filament of Type 287-A Thyratron Tubes "V6D" and "V7D" will be illuminated, with a purple Glow about the Anode.

Indicator Lights, "Osc. No.1" and "Osc. No.2" located on the front of the "Oscillator-Modulator Unit" #2 (D) will be illuminated, indicating that Crystals No. 1 and No. 2 are being heated.

If these 3 Switches are left off for any great period of time, Temperature of Crystals No. 1 and No. 2 will drop and frequency of Carrier when put on the air, will be in error more than the allowable 20 cycles.

(f) "1st Power Amplifier Unit" #3 (E): Proceed to the rear of this Unit, check all Connections, inspect condition of Hook up wire, and inspect all Insulator bushings for OVERHEATING and DAMAGE.

Procedure same as Item #42 (d).

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ITEM 42.

(g) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to the rear of this Unit, check all Connections, inspect condition of Hook up wire, and inspect all Insulator Bushings for OVERHEATING or DAMAGE.

Procedure same as Item #42 (d).

(h) "2nd Power Amplifier Tuning Unit" #5 (g): Proceed to the rear of this Unit, open compartment, check all connections, inspect condition of Hook up wire, and inspect all Insulator Bushings for OVERHEATING or DAMAGE.

Procedure same as Item #42 (d).

(i) "3rd Power Amplifier Tube Unit" #6 (H): Proceed to the Rear of this Unit, check all connections, inspect condition of Hook up wire and inspect all Insulators Bushings for OVERHEATING or DAMAGE.

Procedure same as Item #42 (d).

(j) "3rd Power Amplifier Tuning Unit" #7 & 8 (I): Proceed to the rear of this Unit, open enclosure, check all connections, inspect condition of Hook up wire, and inspect all Insulator Bushings for OVERHEATING or DAMAGE.

Procedure same as Item #42 (d).

(k) "Antenna Coupling Room" #9 (J): Proceed to this Room, open Enclosure door, check all connections, inspect condition of Hook up wire, and inspect all Insulator Bushings for OVERHEATING or DAMAGE.

Procedure same as Item #42 (d).

(l) "17 KV Rectifier Unit" #10 (C): Proceed to this Unit within the 50 KW Transmitter Enclosure, check all connections, inspect condition of Hook up wire, check and inspect all insulator Bushings for OVERHEATING or DAMAGE.

Procedure same as Item #42 (d) and Item #4 (a).

(m) "17 KV Rectifier Switching Unit" #11 (B): Proceed to this Unit, check all connections, inspect condition of Hook up wire, and inspect all insulator

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ITEM 42.

Bushings for OVERHEATING or DAMAGE.

Procedure same as Item #42 (d).

(n) "L4P Main Filter Reactor Choke" #12 (P): Proceed to this Unit, check all connections.

Merely Tighten any loose connections of bolts and nuts.

Inspect Lugs, resoldering if necessary.

(o) "C1L Filter Condenser Assembly Unit" #13 (L): Proceed to this Unit, check all Connections, inspect condition of Hook up wire and inspect all Insulator Bushings for OVERHEATING or DAMAGE.

Procedure same as Item #42 (d) and Item #4 (a).

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ITEM 43.

(a) "2nd Power Amplifier Tube Unit" #4 (F): Proceed to this Unit and clean Rear and Front Tubes "V1F" and "V2F" respectively.

Wipe off the Metal parts with a Rag dampened in Carbon-tet.

Wipe off Glass Envelope of Tubes, using Clean Cloth Dampened with Water, then wipe off with clean dry Cloth.

If this is insufficient to clean the Glass envelope of Tubes, apply a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Cloth, polishing Glass to High Lustre.

When Transmitter is started, observe the condition of the Glass and if Lint is present, clean off with Clean Dry Cloth.

If this is not the remedy, use Skin of Hand, which will attract Lint, since it discharges the Static Electricity on Glass, originally accumulated from Dry Cloth.

The small amount of remaining Lint may be blown off the Glass.

In cleaning Glass envelope of Tubes, exercise Caution, not to scratch.

Do Not Wear a Ring while cleaning or polishing the Power Amplifier Tubes.

Always be sure to take a Clean New Cloth when Cleaning or polishing Power Amplifier Tubes:

(b) 3RD Power Amplifier Tube Unit" #6 (H): Proceed to this Unit and clean Rear Tubes "V1H" "V3H" "V5H" and Front Tubes "V2H" "V4H" "V6H".

Procedure same as Item 8 (a).

(c) "Control Unit" #1 (A): Proceed to this Unit and clean 1650 Volt Rectifier Tubes and Sockets positions #1 to #6 inclusive.

Wipe off Tube Glass envelopes with a Rag Dampened in Water, then dry off with Clean Dry Cloth.

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ITEM 43.

If this is insufficient to clean the glass Envelope of Tubes,
apply a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Rag, polishing Glass to High Lustre.

Wipe off the Bakelite Socket with Clean Dry Cloth.

(d) "Oscillator-Modulator Unit #2 (D): Proceed to this Unit,

Clean Tubes and Sockets Positions "V1Y" "V2Y" "V1D" "V2D" "V#D" "V4D"
"V5D".

Procedure for "V1Y" and "V2Y": Proceed to Front of this Unit, and
Clean 2 Type 271-A Tubes in Crystal Oscillator, Type 700-A Boxes #1
and #2.

Wipe off Tube Glass envelopes with Rag dampened in Water, then dry off with Clean
Dry Cloth.

If this is insufficient to clean the Glass Envelopes of Tubes, apply
a small amount of "Windex" using the Spray Nozzle on the Bottle.

Wipe off with Clean Dry Cloth, polishing Glass to High Lust e.

Procedure for "V1D" "V2D" "V3D" "V4D" "V5D": Ascertain if
each of these Tubes is in its socket properly.

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ITEM 43.

Gently push down on Tube to "FEEL IF FILAMENT AND GRID tube Prongs are resting against socket Prongs Properly".

Check Tension of Socket Prongs, which should be sufficient to hold Socket Prong Tightly against Tube Prong, thus providing GOOD ELECTRICAL CONNECTION. If Tension is insufficient, (as evidenced WHEN 1650 VOLTS IS APPLIED BEFORE OR AFTER SHUT DOWN, Overheating of prongs, or variations in Tube Currents when Tube is pushed down in Socket), increase same by Lifting Socket Prong upward Slightly.

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ITEM 43.

CAUTION. Do not adjust tension of Socket Spring Contacts with Transmitter Rotating Equipment "ON", use "Tube Change Switch" "D3A", pushing same "OFF" To stop all Rotating Machinery while this adjustment is made, or during period when Transmitter is completely shut down. exercise care in bending Socket Prongs, so as not to break same. Wipe off Tube Glass Envelopes with Rag Dampened in Water, then Dry off with Clean Dry Cloth.

If this is insufficient to clean the Glass Envelope of Tubes, apply a small quantity of "Windex" using Spray Nozzle on the Bottle. Wipe off with Clean Dry Cloth Polishing Glass to High Lustre.

(e) "1st. Power Amplifier Unit" #3 (E): Proceed to this Unit Clean Tubes and Socket Positions "V1E" and "V2E".

Procedure same as Item #8 (d) except Tubes are not removed from sockets and prongs are not inspected for overheating.

(f) #3rd. Power Amplifier Tube Unit" #8 (H): Proceed to this Unit, Clean Tubes and Sockets Position "V7H".

Procedure is same as Item #8 (d) except tube is not removed from Socket and Prongs are not inspected for overheating.

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ITEM 43.

(g) "3RD. Power Amplifier Tuning Unit" #8 (I): Proceed
to this Unit, Clean Tube and socket Position "VII".

Procedure same as Item #8 (d) except Tube is not removed from Socket
and Prongs are not inspected for overheating.

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End Item 43.

ITEM 44.

- (a) "Switch Room": Proceed to this Room in the Basement and put "OFF" Switch #2, "50 KW Distribution Oil CKT Breaker" for SAFETY REASONS. Merely grasp the Handle of the Oil Circuit Breaker and lift it up.
- (b) "Basement": While in the Basement, put "OFF" - "DIP" "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS. Remove the Wood "Preventer" from between Operating Handle and Overloading Tripping Lever, then grasp Handle of O.C.B. and lift it up.
- (c) "Oscillator-Modulator Unit" #2 (D): Proceed to the Rear of this Unit, remove Tubes "V1D" - "V2D" - "V3D" - "V4D" and "V5D" from Sockets; take Expanded Metal Cover off top of Unit then check and clean all equipment. In removing the Tubes, write down on piece of paper numbers and types, and positions they are to be returned to. Carefully place tubes vertically in "Spare Tube Room" rack. Remove all the screws around the outer edge of the top "Expanded Metal" Cover, then GENTLY lift up rear edge of Cover slip over top edges of tube sockets and carefully remove it. Place on floor inside Transmitter Enclosure (Out of way.) Carefully feel all condensers for OVERHEATING per Item #34. Carefully feel all resistors for OVERHEATING per Item #56. Carefully feel all equipment for OVERHEATING per Item #36. Use A.C. Extension Light and Vacuum Cleaner with Special "High Velocity" Nozzle and thoroughly clean out the recessed space. Wipe off tops and sides of all condensers, resistors, switches, equipment, with clean dry cloth. Use Maintenance Brush to clean and dust connections and inaccessible places. Carefully check all connections.

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ITEM 44.

Tighten any loose bolted Connections.

Resolder any loose or broken solder connections.

Leave the "Expanded Metal" Cover off top of Unit, but replace all Tubes "V2D" to "V5D" inclusive.

Proceed to front of this Unit, loosen the 4 Wing Nuts on top of Metal Cover over the "Buffer Amplifier Tube Unit", then remove the cover and place on floor (Out of way.)

Proceed to clean and check equipment within this space in same manner as was done in main recessed space beneath the "Expanded Metal Cover" of Main Unit.

Leave the Metal Cover off this Unit, but replace Tube "V1D".

(d) "Oscillator-Modulator Unit #2 (D): Proceed to rear of this Unit, remove the "Expanded Metal Front Cover" of the "Feed Back Rectifier Tube Unit", remove Tube "V-1" then check and clean all equipment.

Loosen 2 Wing Nuts and remove cover.

Procedure same as Item #44 (c) except that it is not necessary to use the Vacuum Cleaner for this.

Leave Metal Cover off this Unit, but replace Tube "V-1".

(e) "1st Power Amplifier Unit" #3 (E): Proceed to rear of this Unit, remove Tubes "V1E" and "V2E".

Remove the "Expanded Metal" Front Cover of the Unit, open the door of Compartment then check and clean all equipment.

Procedure same as Item #44 (c).

(f) "Transmitter:" Inform all Technicians that Oil Circuit Breakers are about to be put "ON", that Transmitter will be Started to make measurements of tube Voltages.

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ITEM 44.

Technicians performing work requiring that the Transmitter be COMPLETELY SHUT DOWN will stop such work at once.

They may proceed to other Items not requiring performance of Item #44 (a) to (b) inclusive.

(g) "Switch Room": As soon as all Technicians are clear, proceed to this Room in the Basement and put "ON" Switch #2, "50 KW Distribution Oil CKT Breaker". Merely grasp the Handle of the Oil Circuit Breaker and push down until latched in place.

(h) "Basement": (All Technicians in the Clear.) While in the Basement, put "ON" - "D1P" - "Master 480 Volt Oil Circuit Breaker".

Merely grasp the Handle of the Oil Circuit Breaker and push down until latched in place.

Insert the Wood "Preventer" between the Operating Handle and Tripping Lever.

(i) "Control Unit" #1 (A): Proceed to this Unit and Adjust Transmitter Filament Rheostat "R16A" to Minimum per Book No. (3) Sec. No. (A) Page No. (23).

Push "ON" - "D2A" - "Master Control" Start Button per Book No. (3) Sec. No. (A) Pages No. (23) to No. (26).

After 5 minutes turn "Filament Generator Rheostat" - "R16A" counter-clockwise to read exactly 20 volts on "Amplifier Filament Voltage" Voltmeter "M1A".

On the Front of this Unit, place Voltmeter Selector Switch "D4A" to position marked "Rectifier Filament".

Adjust "Rectifier Filament Rheostat" - "R17A" to read exactly 408 volts on "Line and Rectifier Filament Voltage" Meter "M3A".

Throughout the balance of this Item while measuring Filament Voltages be sure to maintain these two voltages as outlined.

Continued to next Page

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(j) "Control Unit" #1 (A): Proceed to the rear of this Unit, and measure the A.C. Filament Voltage at the Filament Prongs of 258-B Rectifier Tubes "V1A" to "V6A" inclusive.

Use Model No. 433 Weston A.C. Voltmeter.

Tubes remain in the Sockets.

Merely place Voltmeter Prods on the Filament prongs of the Sockets.

Minimum 2.4 Volts: Maximum 2.5 Volts.

Enter on Form Book No. (7) Sec. No. (C) Page No. (203).

(k) "Oscillator Modulator Unit" #2 (D): Proceed to the Rear of this Unit and measure the D.C. Filament Voltage at the Filament Prongs of Tubes "V2D" to "V5D" inclusive.

Use Model No. 45 Weston D.C. Voltmeter.

Tubes remain in their sockets.

Merely place Voltmeter Prods on the Filament Prongs of the Socket.

Hold Voltmeter leads up and away from the D.C. Field.

"V2D" - "Radio Freq. Amplifier" Tube type 276-A Minimum 9.7 Volts; Maximum 10.0 Volts.

"V3D" - "Modulating Amplifier" Tube Type 276-A Minimum 9.7 Volts; Maximum 10.0 Volts.

"V4D" - "Audio Input Amplifier" Tube Type 276-A Minimum 9.7 Volts; Maximum 10.0 Volts.

"V5D" - "Audio Power Amplifier" Tube Type 212-E Minimum 13.7 Volts; Maximum 14.0 Volts.

Enter on Form Book No. (7) Sec. No. (C) Page No. (203).

(l) "Oscillator-Modulator Unit" #2 (D): Proceed to the Front of this Unit and measure the A.C. Filament Voltage at the Filament Prongs of Tube "V1D".

Use Model No. 433 Weston A.C. Voltmeter.

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Tube remains in Socket.

Merely place Voltmeter Prods on the Filament Prongs of the Socket.

"VLD" - "Buffer Amplifier" Tube Type 271-A Minimum: 4.8 Volts Maximum 5.0 Volts.

Enter on Form, Book No. (7) Sec. No. (C) Page No. (203).

(m) "Oscillator-Modulator Unit" #2 (D): While at the front of this Unit, measure the A.C. Filament Voltage at the Terminal Strip beneath Type 700-A "Oscillator No. 1" and "Oscillator No. 2".

Use Model No. 433 Weston A.C. Voltmeter.

Tubes remain in sockets.

Terminal Strips are located directly underneath each Crystal Oscillator Box.

Terminals are numbered 1 to 7 inclusive, from left to right.

Terminals No. 1 and No. 4 on each Crystal Oscillator Box are the A.C.

Filament connections.

Both "VLY" and "VZY" Type 271-A Tubes Minimum 4.8 Volts; Maximum 5.0 Volts.

Enter on Form, Book No. (7) Sec. No. (C) Page No. (203).

(n) "Oscillator-Modulator Unit" #2 (D): Proceed to the Rear of this Unit and measure the D.C. Filament Voltage at Terminal No. 8 and output connection from Resistors "R8.1" - "R8.2" and "R8.3".

Use Model 45 Weston D.C. Voltmeter.

"V1" - "Feedback Rectifier" Tube Type 274-A (Type 80 or Type 5Z3 can be used as replacement) Minimum 4.0 Volts; Maximum 5.0 Volts.

Enter on Form, Book No. (7) Sec. No. (C) Page No. (203).

(o) "1st Power Amplifier Unit" #3 (E): Proceed to the Rear of this Unit and measure the D.C. Filament Voltage at the Filament Prongs of Tubes "V1E" and "V2E". Minimum 13.8 Volts; Maximum 14.0 Volts.

Use Model 45 Weston D.C. Voltmeter.

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Tubes remain in the Sockets.

Merely place Voltmeter Prods on the Filament Prongs of the Socket.

Enter on Form, Book No. (7) Sec. No. (C) Page No. (203).

(p) "17 KV Rectifier Unit" #10 (C): Proceed to this Unit and measure the A.C. Filament Voltage at the Filament Prongs of Tubes "V1C" to "V7C" inclusive. Put "ON" The Associated Filament Switch for Tube No. 7 Position ("V7C") (5 Volt Tap.)

Wait 5 minutes before measuring "V7C" Tube Filament Voltage.

Use Model No. 433 Weston A.C. Voltmeter.

Tubes remain in the Sockets.

Merely place Voltmeter Prods on the Filament Prongs of each Tube.

Minimum 4.8 Volt; Maximum 5.1 Volts.

Enter on Form, Book No. (7) Sec. No. (C) Page No. (203).

After measuring all Rectifier Filament Voltages put "OFF" Filament Switch "D&C" Tube "V7C".

(q) "3rd Power Amplifier Tuning Unit" #8 (I): Proceed to the front of this Unit, open Metal Panel in front of the "R.F. Monitor Tube Mounting Base" and measure the D.C. Filament Voltage at the Filament Prongs of Tube "V1I". Use Model 45 Weston D.C. Voltmeter.

Tube remains in the Socket. Minimum 9.5 Volts; Maximum 10.0 Volts.

Merely place the Voltmeter Prods on the Filament Prongs of the Socket.

Enter on Form, Book No. (7) Sec. No. (C) Page No. (203).

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After the Filament Voltages, on the specified Tubes, have been measured, proceed to measure the "Bias Voltage" on the following Tubes:

"V1D" - "V2D" - "V3D" - "V4D" - "V5D" - "V1E" - "V2E".

(r) "17 KV Rectifier Unit" #10 (C): Proceed to this Unit to the High Voltage Grounding Switch and Door Interlock mechanism and put "ON" Switch "E17P", which is located on the end of this Grounding Switch assembly.

(s) In measuring the Bias Voltage on the above Tubes, use the Weston Model #772 Voltmeter, kept in top compartment of "Portable Fuse and Test Unit" Transmitter Room.

Toggle Switch at lower left side of Meter should be set at "DC Volts" Position.

The Center Selector Switch should be set on "250 Volt" Scale.

Take the two Rubber Test leads and insert the "Red" lead in the Pin Jack marked "+" and the "Black" lead in the Pin Jack marked "-".

This pair of Pin Jacks are located at the Upper Right corner of Meter .

This Voltmeter is a 20,000 Ohm per Volt D.C. Meter.

(t) "Oscillator - Modulator Unit" #2 (D): 1st. Technician to proceed to the Front of "Control Unit" and adjust "Bias Generator Rheostat" "R18A" to read exactly 300 Volts, as read on "Bias Voltmeter" "M2A".

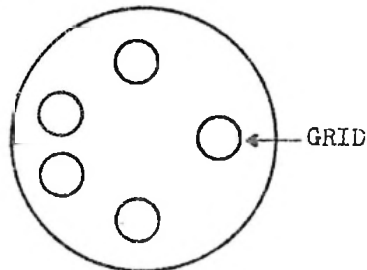
2nd. Technician to proceed to the Front of "Oscillator - Modulator Unit" and prepare to read Bias Voltage on "V1D" - 271-A Buffer Amplifier.

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(u) "Oscillator - Modulator Unit" #2 (D): "V1D" is located between the Xtal Units #1 & #2.

The Grid Terminal on this socket is the "Odd" Pin in spacing.

Below is "Top" view of socket.



Take the "Red" lead of "+" of Voltmeter and securely fasten to good Ground point on frame.

The "Black" lead of "-" of the Meter is touched to the Grid Pin of Socket.

For this particular Voltage, the Selector Switch, on the Meter may be turned to the "50" Volt Scale for a more accurate reading.

Upon completing this reading, turn it back to the "250" Volt Scale.

When 1st. Technician has 300 Volts on Meter "M2A" take a reading on Meter and enter same in proper space on form, Book No. (7) Sec. No. (C) Page No. (204).

(v) "Oscillator - Modulator Unit" #2 (D): Technician #2 will proceed to rear of Unit and measure Voltage on Tube "V2D" 276-A Radio Frequency Amplifier.

Take the Small Step Ladder to facilitate reaching the Tube Prongs.

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2nd & 3rd Power Amplifier Filament Voltages & Currents, Form: "Tube Filament Currents" Book No. (7) Sec. No. (C) Page No. (17)

DATE & SIGN		1/30/45 R ₁	7/31/56 FG	10/30/44 F ₂	4/29/46 R ₂
VOLTAGES	RATED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE
V1A - 258-B 1650 VOLT Rect. Position #1	2.5	2.40	2.30	2.5	2.45
V2A - 258-B 1650 VOLT Rect. Position #2	2.5	2.40	2.30	2.5	2.45
V3A - 258-B 1650 VOLT Rect. Position #3	2.5	2.40	2.30	2.50	2.45
V4A - 258-B 1650 VOLT Rect. Position #4	2.5	2.40	2.30	2.50	2.45
V5A - 258-B 1650 VOLT Rect. Position #5	2.5	2.40	2.30	2.50	2.45
V6A - 258-B 1650 VOLT Rect. Position #6	2.5	2.40	2.30	2.50	2.45
V1D - 271-A Buffer Amplifier	5.0	4.70	4.71	4.75	4.75
V2D - 276-A Radio Freq. Amplifier	10.0	10.0	10.20	10.1	10.2
V3D - 276-A Modulating Amplifier	10.0	10.0	10.50	10.3	10.2
V4D - 261-A Audio Input Amplifier	10.0	9.85	10.00	9.90	10.0
V5D - 212-E Audio Power Amplifier	14.0	13.80	13.80	14.0	14.0
V1Y - 271-A Oscillator #1	5.0	4.72	4.72	4.71	4.72
V2Y - 271-A Oscillator #2	5.0	4.75	4.72	4.72	4.72
V1 - 274-A Feed Back Rectifier	5.0	4.60	4.50	4.80	4.6
V1E - 212-E 1st Power Amplifier Position #1	14.0	13.60	13.20	13.70	14.4
V2E - 212-E 1st Power Amplifier Position #2	14.0	13.60	13.25	13.78	14.4 - 20 14.9 - 20
V1C - 266-B 17 K.V. Rect. Position #1	5.0	5.05	5.08	5.09	5.08
V2C - 266-B 17 K.V. Rect. Position #2	5.0	5.05	5.08	5.09	5.08
V3C - 266-B 17 K.V. Rect. Position #3	5.0	5.05	5.08	5.08	5.08
V4C - 266-B 17 K.V. Rect. Position #4	5.0	5.05	5.08	5.08	5.08
V5C - 266-B 17 K.V. Rect. Position #5	5.0	5.05	5.08	5.08	5.08
V6C - 266-B 17 K.V. Rect. Position #6	5.0	5.05	5.08	5.08	5.08
V7C - 266-B 17 K.V. Rect. Position #7	5.0	4.90	4.99	4.92	4.94
V1I - 276-A Radio Freq. Monitor	10.0	9.55	9.30	9.40	9.40

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DATE & SIGN		1/30/45 RQ			1/29/45 SG 2/29/46 RQ
VOLTAGES	RATED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE
V1D - 271-A BUFFER AMPLIFIER	37*	42	43	36	36
V2D - 276-A RADIO FREQ. AMPLIFIER	70	70	70	70	70
V3D - 276-A MODULATING AMPLIFIER	70	70	70	70	70
V4D - 261-A AUDIO INPUT AMPLIFIER	68	70	70	70	70
V5D - 212-E AUDIO POWER AMPLIFIER	68	70	70	70	70
V1E - 212-E 1st PWR. AMPLIFIER POS'N # 1	72	72	72	72	72
V2E - 212-E 1st PWR. AMPLIFIER POS'N #2	72	72	72	72	72
REMARKS: * WILL VARY WITH VARIATIONS OF R.F. INPUT.					
WESTON MODEL #772 VOLT OHMMETER USED IN TAKING ABOVE READINGS. _____ RQ.					
July 31/45 - All Bias Voltages measured with Weston #772 V.O.M. set at 2000 ohms/v. - FG + SG					
7/31/45 (Page 203) A.C. Fil Volt. measured with Weston #433 A.C. volt meter					
7/31/45 (Page 203) D.C. Fil Volt. measured with Weston #45 D.C. Voltmeter _____ SG + FG					
10/30/45 - Same as above - FG					
4-29-46 = All Bias Voltages Measured with Weston #772 - J.G. R.Q.					
A.C. Fil Volts Measured with Weston #433 A.C. Voltmeter					
D.C. Fil. Volts Measured with Weston #772 -					
METER AND WESTON D.C. METER #45 WAS NOT AVAILABLE.					
56-4/29/46					

J.G.
R.Q.

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2nd & 3rd Power Amplifier Filament Voltages & Currents, Form: "Tube Filament Currents" Book No. (7) Sec. No. (C) Page No. (17)

DATE & SIGN			12/21/46	7/10/47	7/10/47 RB
VOLTAGES	RATED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE
V1A - 258-B 1650 VOLT Rect. Position #1	2.5	2.45	2.5	2.45	2.50
V2A - 258-B 1650 VOLT Rect. Position #2	2.5	2.45	2.5	2.45	2.50
V3A - 258-B 1650 VOLT Rect. Position #3	2.5	2.45	2.5	2.45	2.50
V4A - 258-B 1650 VOLT Rect. Position #4	2.5	2.45	2.5	2.45	2.50
V5A - 258-B 1650 VOLT Rect. Position #5	2.5	2.45	2.5	2.45	2.50
V6A - 258-B 1650 VOLT Rect. Position #6	2.5	2.45	2.5	2.45	2.50
V1D - 271-A Buffer Amplifier	5.0	4.75	4.80	4.75	4.80
V2D - 276-A Radio Freq. Amplifier	10.0	10.3	10.0	10.0	10.0
V3D - 276-A Modulating Amplifier	10.0	10.3	10.1	10.0	10.0
V4D - 261-A Audio Input Amplifier	10.0	10.3	10.0	10.0	10.0
V5D - 212-E Audio Power Amplifier	14.0	14.1	13.85	14.0	14.0
V1Y - 271-A Oscillator #1	5.0	4.7	4.75	4.80	4.80
V2Y - 271-A Oscillator #2	5.0	4.7	4.75	4.80	4.80
V1 - 274-A Feed Back Rectifier	5.0	4.6	4.6	5.1	4.85
V1E - 212-E 1st Power Amplifier Position #1	14.0	14.9	14.1	14.0	14.1
V2E - 212-E 1st Power Amplifier Position #2	14.0	14.9	14.0	14.0	14.1
V1C - 266-B 17 K.V. Rect. Position #1	5.0	5.08	4.92	5.1	5.1
V2C - 266-B 17 K.V. Rect. Position #2	5.0	5.08	4.92	5.1	5.1
V3C - 266-B 17 K.V. Rect. Position #3	5.0	5.08	4.92	5.1	5.1
V4C - 266-B 17 K.V. Rect. Position #4	5.0	5.08	4.92	5.1	5.1
V5C - 266-B 17 K.V. Rect. Position #5	5.0	5.08	4.92	5.1	5.1
V6C - 266-B 17 K.V. Rect. Position #6	5.0	5.08	4.92	5.1	5.1
V7C - 266-B 17 K.V. Rect. Position #7	5.0	4.90	4.80	4.80	4.8
V1I - 276-A Radio Freq. Monitor	10.0	7.38	9.60	9.50	9.45

BIAS VOLTAGES AT THE TERMINALS

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DATE & SIGN		12/21/46 46-RW		9/30/47 RB (a)	
VOLTAGES	RATED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE
V1D - 271-A BUFFER AMPLIFIER	32.5	34.8	35.0	38.0	
V2D - 278-A RADIO FREQ. AMPLIFIER	70	70	65.0	68.0	
V3D - 278-A MODULATING AMPLIFIER	70	70	65.0	68.0	
V4D - 281-A AUDIO INPUT AMPLIFIER	70	70	65.0	68.0	
V5D - 212-E AUDIO POWER AMPLIFIER	70	70	65.0	68.0	
V1E - 212-E 1st PWR. AMPLIFIER POS'N # 1	72	72	68.0	69.0	
V2E - 212-E 1st PWR. AMPLIFIER POS'N #2	72	72	68.0	69.0	

REMARKS:

*All Readings taken with Weston #772
V.M. meter. (46-RW - 9/21/47. 46-RW
V.M. meter (46-RW) (46-RW
30, 500 - 46-RW.)*

*All A.C. Readings taken with Weston #772
V.M. meter. Bias voltages taken
with Weston #772. D.C. Filament
voltages taken with Weston #45 - (RB (a))*

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2nd & 3rd Power Amplifier Filament Voltages & Currents, Form: "Tube Filament Currents" Book No. (7) Sec. No. (C) Page No. (17)

DATE & SIGN		3/30/48 RW FB	8.11.50	11/30/48 AL	3/29/49 AL
VOLTAGES	RATED VOLTAGE	MEAS VOLTAGE	MEAS VOLTAGE	MEAS VOLTAGE	MEASURED VOLTAGE
V1A - 258-B 1650 VOLT Rect. Position #1	2.5	2.45	2.6	2.5	2.5
V2A - 258-B 1650 VOLT Rect. Position #2	2.5	2.45	2.6	2.5	2.5
V3A - 258-B 1650 VOLT Rect. Position #3	2.5	2.45	2.6	2.5	2.5
V4A - 258-B 1650 VOLT Rect. Position #4	2.5	2.45	2.0	2.5	2.5
V5A - 258-B 1650 VOLT Rect. Position #5	2.5	2.45	2.0	2.5	2.5
V6A - 258-B 1650 VOLT Rect. Position #6	2.5	2.45	2.3	2.5	2.5
V1D - 271-A Buffer Amplifier	5.0	4.80	4.7	4.7	4.7
V2D - 276-A Radio Freq. Amplifier	10.0	10.0	10.0	10.0	10.0
V3D - 276-A Modulating Amplifier	10.0	10.0	10.0	10.0	10.0
V4D - 261-A Audio Input Amplifier	10.0	10.0	10.0	10.0	9.9
V5D - 212-E Audio Power Amplifier	14.0	14.0	13.7	13.7	13.6
V1Y - 271-A Oscillator #1	5.0	4.80	4.7	4.7	4.9
V2Y - 271-A Oscillator #2	5.0	4.80	4.7	4.7	4.9
V1 - 274-A Feed Back Rectifier	5.0	4.6	4.6	4.6	4.9
V1E - 212-E 1st Power Amplifier Position #1	14.0	14.0	13.7	13.7	13.8
V2E - 212-E 1st Power Amplifier Position #2	14.0	14.0	13.7	13.7	13.8
V1C - 266-B 17 K.V. Rect. Position #1	5.0	5.1	5.2	5.00	5.2
V2C - 266-B 17 K.V. Rect. Position #2	5.0	5.1	5.2	5.00	5.2
V3C - 266-B 17 K.V. Rect. Position #3	5.0	5.1	5.2	5.00	5.2
V4C - 266-B 17 K.V. Rect. Position #4	5.0	5.1	5.2	5.00	5.2
V5C - 266-B 17 K.V. Rect. Position #5	5.0	5.1	5.2	5.00	5.2
V6C - 266-B 17 K.V. Rect. Position #6	5.0	5.1	5.2	5.00	5.2
V7C - 266-B 17 K.V. Rect. Position #7	5.0	4.8	5.0	4.8	5.0
V1I - 276-A Radio Freq. Amplifier	10.0	9.5	9.5	9.5	9.5

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PAGE No. (203)

"Filament Voltages at Tube Terminals"

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2nd & 3rd Power Amplifier Filament Voltages & Currents, Form: "Tube Filament Currents" Book No. (7) Sec. No. (C) Page No. (17)

DATE & SIGN		5/31/49 ^{AL}	11/29/49	8/29/50	1-30-51
VOLTAGES	RATED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE
V1A - 258-B 1650 VOLT Rect. Position #1	2.5	2.5	2.5	2.5	2.5
V2A - 258-B 1650 VOLT Rect. Position #2	2.5	2.5	2.5	2.5	2.5
V3A - 258-B 1650 VOLT Rect. Position #3	2.5	2.5	2.5	2.5	2.5
V4A - 258-B 1650 VOLT Rect. Position #4	2.5	2.5	2.5	2.5	2.5
V5A - 258-B 1650 VOLT Rect. Position #5	2.5	2.5	2.5	2.5	2.5
V6A - 258-B 1650 VOLT Rect. Position #6	2.5	2.5	2.5	2.5	2.5
V1D - 271-A Buffer Amplifier	5.0	4.8	4.8	4.8	4.8
V2D - 276-A Radio Freq. Amplifier	10.0	10.0	10.0	10.0	10.0
V3D - 276-A Modulating Amplifier	10.0	10.0	10.0	10.0	10.0
V4D - 261-A Audio Input Amplifier	10.0	10.0	10.0	10.0	10.0
V5D - 212-E Audio Power Amplifier	14.0	14.0	14.0	14.0	14.0
V1Y - 271-A Oscillator #1	5.0	4.7	4.8	4.8	4.8
V2Y - 271-A Oscillator #2	5.0	4.7	4.8	4.8	4.8
V1 - 274-A Feed Back Rectifier	5.0	4.7	4.8	4.8	4.8
V1E - 212-E 1st Power Amplifier Position #1	14.0	13.8	13.8	14.0	14.0
V2E - 212-E 1st Power Amplifier Position #2	14.0	13.8	13.8	14.0	14.0
V1C - 266-B 17 K.V. Rect. Position #1	5.0	5.15	5.1	5.1	5.15
V2C - 266-B 17 K.V. Rect. Position #2	5.0	5.1	5.1	5.0	5.1
V3C - 266-B 17 K.V. Rect. Position #3	5.0	5.1	5.1	5.1	5.1
V4C - 266-B 17 K.V. Rect. Position #4	5.0	5.1	5.1	5.1	5.15
V5C - 266-B 17 K.V. Rect. Position #5	5.0	5.1	5.1	5.1	5.15
V6C - 266-B 17 K.V. Rect. Position #6	5.0	5.1	5.1	5.1	5.1
V7C - 266-B 17 K.V. Rect. Position #7	5.0	5.0	5.0	4.8 ⁹	5.0
V1I - 276-A Radio Freq. Amplifier	10.0	9.7	9.7	9.7	9.75

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BIAS VOLTAGES AT TUBE TERMINALS

BOOK No. (7)

SEC. No. (C)

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YEAR _____

5TH TUESDAY

ITEM 44

DATE & SIGN	RATED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE
AL-25 5/31/49					
11/29/49					
8/29/50					
1-30-51					
VOLTAGES	RATED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE
V1D - 271-A BUFFER AMPLIFIER	36.5	36.5	36.5	36.5	
V2D - 276-A RADIO FREQ. AMPLIFIER	65	65	65	65	
V3D - 276-A MODULATING AMPLIFIER	65	65	65	65	
V4D - 261-A AUDIO INPUT AMPLIFIER	65	65	65	65	
V5D - 212-E AUDIO POWER AMPLIFIER	65	65	65	65	
V1E - 212-E 1st PWR. AMPLIFIER POS'N # 1	65	65	65	65	
V2E - 212-E 1st PWR. AMPLIFIER POS'N #2	65	65	65	65	
REMARKS:					
DC & AC Voltages measured using					
Weston 772 VM - AC					
11/29/49 DC & AC Voltage measured using Weston					
# 772 VM - AC.					
8/29/50 D.C. & AC voltages measured using					
Weston # 772 VM - AC					
1/30/51 DC & AC VOLTAGES MEASURED USING					
WESTON # 772 VM - PK					

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2nd & 3rd Power Amplifier Filament Voltages & Currents, Form: "Tube Filament Currents" Book No. (7) Sec. No. (C) Page No. (17)

DATE & SIGN		5/29/51	JK-LH 1/29/52	CG-LV 4/30/52	CG-SK 7/12/52
VOLTAGES	RATED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE
V1A - 258-B 1650 VOLT Rect. Position #1	2.5	2.5	2.5	2.5	2.5
V2A - 258-B 1650 VOLT Rect. Position #2	2.5	2.5	2.5	2.5	2.5
V3A - 258-B 1650 VOLT Rect. Position #3	2.5	2.5	2.5	2.5	2.5
V4A - 258-B 1650 VOLT Rect. Position #4	2.5	2.5	2.5	2.5	2.5
V5A - 258-B 1650 VOLT Rect. Position #5	2.5	2.5	2.5	2.5	2.5
V6A - 258-B 1650 VOLT Rect. Position #6	2.5	2.5	2.5	2.5	2.5
V1D - 271-A Buffer Amplifier	5.0	4.8	4.8	4.8	4.8
V2D - 276-A Radio Freq. Amplifier	10.0	10.0	10.0	10.0	10.0
V3D - 276-A Modulating Amplifier	10.0	10.0	10.0	10.0	10.0
V4D - 261-A Audio Input Amplifier	10.0	10.0	10.0	10.0	10.0
V5D - 212-E Audio Power Amplifier	14.0	14.0	14.0	14.0	14.0
V1Y - 271-A Oscillator #1	5.0	4.7	4.7	4.7	4.7
V2Y - 271-A Oscillator #2	5.0	4.7	4.7	4.7	4.7
V1 - 274-A Feed Back Rectifier	5.0	4.8	4.8	4.8	4.8
V1E - 212-E 1st Power Amplifier Position #1	14.0	14.0	14.0	14.0	14.0
V2E - 212-E 1st Power Amplifier Position #2	14.0	14.0	14.0	14.0	14.0
V1C - 266-B 17 K.V. Rect. Position #1	5.0	5.1	5.1	5.1	5.1
V2C - 266-B 17 K.V. Rect. Position #2	5.0	5.0	5.0	5.0	5.0
V3C - 266-B 17 K.V. Rect. Position #3	5.0	5.0	5.0	5.0	5.0
V4C - 266-B 17 K.V. Rect. Position #4	5.0	5.1	5.1	5.1	5.1
V5C - 266-B 17 K.V. Rect. Position #5	5.0	5.1	5.1	5.1	5.1
V6C - 266-B 17 K.V. Rect. Position #6	5.0	5.1	5.1	5.1	5.1
V7C - 266-B 17 K.V. Rect. Position #7	5.0	4.9	4.9	4.9	5.0
V1I - 276-A Radio Freq. Monitor	10.0	9.8	9.8	9.8	9.8

"Filament Voltages at Tube Terminals"

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2nd & 3rd Power Amplifier Filament Voltages & Currents, Form: "Tube Filament Currents" Book No. (7) Sec. No. (C) Page No. (17)

DATE & SIGN	19-11-52	19-11-52	CPK-GH 12-30-52	TD-GH 6-30-53	TD-JK 12-28-53
VOLTAGES	RATED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE
V1A - 258-B 1650 VOLT Rect. Position #1	2.5	2.5	2.6	2.5	2.5
V2A - 258-B 1650 VOLT Rect. Position #2	2.5	2.5	2.6	2.5	2.5
V3A - 258-B 1650 VOLT Rect. Position #3	2.5	2.5	2.6	2.5	2.5
V4A - 258-B 1650 VOLT Rect. Position #4	2.5	2.5	2.6	2.5	2.5
V5A - 258-B 1650 VOLT Rect. Position #5	2.5	2.5	2.6	2.5	2.5
V6A - 258-B 1650 VOLT Rect. Position #6	2.5	2.5	2.6	2.5	2.5
V1D - 271-A Buffer Amplifier	5.0	4.8	4.8	4.8	4.8
V2D - 276-A Radio Freq. Amplifier	10.0	10.0	10.0	10.0	10.0
V3D - 276-A Modulating Amplifier	10.0	10.0	10.0	10.0	10.0
V4D - 261-A Audio Input Amplifier	10.0	10.0	10.0	10.0	10.0
V5D - 212-E Audio Power Amplifier	14.0	14.0	14.0	14.0	14.0
V1Y - 271-A Oscillator #1	5.0	4.7	4.8	4.7	4.7
V2Y - 271-A Oscillator #2	5.0	4.7	4.8	4.7	4.7
V1 - 274-A Feed Back Rectifier	5.0	4.8	4.8	4.8	4.8
V1E - 212-E 1st Power Amplifier Position #1	14.0	14.0	14.0	14.0	14.0
V2E - 212-E 1st Power Amplifier Position #2	14.0	14.0	14.0	14.0	14.0
V1C - 266-B 17 K.V. Rect. Position #1	5.0	5.1	5.1	5.1	5.0
V2C - 266-B 17 K.V. Rect. Position #2	5.0	5.0	5.0	5.0	5.0
V3C - 266-B 17 K.V. Rect. Position #3	5.0	5.0	5.1	5.0	5.1
V4C - 266-B 17 K.V. Rect. Position #4	5.0	5.1	5.1	5.1	5.1
V5C - 266-B 17 K.V. Rect. Position #5	5.0	5.1	5.1	5.1	5.1
V6C - 266-B 17 K.V. Rect. Position #6	5.0	5.1	5.1	5.1	5.1
V7C - 266-B 17 K.V. Rect. Position #7	5.0	5.0	5.0	5.0	5.0
V1I - 276-A Radio Freq. Monitor	10.0	9.8	9.8	9.8	9.9

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"Filament Voltages at Tube Terminals"

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2nd & 3rd Power Amplifier Filament Voltages & Currents, Form: (7) Sec. No. (C) Page No. (17)
"Tube Filament Currents" Book No. (7) Sec. No. (C)

DATE & SIGN		PK-RH 2-30-54	PK-TO 4-29-54		PK-RH
VOLTAGES	RATED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE
V1A - 258-B 1650 VOLT Rect. Position #1	2.5	2.5	2.5		2.5
V2A - 258-B 1650 VOLT Rect. Position #2	2.5	2.5	2.5		2.5
V3A - 258-B 1650 VOLT Rect. Position #3	2.5	2.5	2.5		2.5
V4A - 258-B 1650 VOLT Rect. Position #4	2.5	2.5	2.5		2.5
V5A - 258-B 1650 VOLT Rect. Position #5	2.5	2.5	2.5		
V6A - 258-B 1650 VOLT Rect. Position #6	2.5	2.5	2.5		
V1D - 271-A Buffer Amplifier	5.0	4.9	4.8		
V2D - 276-A Radio Freq. Amplifier	10.0	10.0	10.0		
V3D - 276-A Modulating Amplifier	10.0	10.0	10.0		
V4D - 261-A Audio Input Amplifier	10.0	10.0	10.0		
V5D - 212-E Audio Power Amplifier	14.0	14.0	14.0		
V1Y - 271-A Oscillator #1	5.0	4.7	4.8		
V2Y - 271-A Oscillator #2	5.0	4.8	4.7		
V1 - 274-A Feed Back Rectifier	5.0	4.8	4.8		
V1E - 212-E 1st Power Amplifier Position #1	14.0	14.0	14.0		
V2E - 212-E 1st Power Amplifier Position #2	14.0	14.0	14.0		
V1C - 266-B 17 K.V. Rect. Position #1	5.0	5.0	5.1		
V2C - 266-B 17 K.V. Rect. Position #2	5.0	5.0	5.0		
V3C - 266-B 17 K.V. Rect. Position #3	5.0	5.1	5.0		
V4C - 266-B 17 K.V. Rect. Position #4	5.0	5.1	5.1		
V5C - 266-B 17 K.V. Rect. Position #5	5.0	5.1	5.1		
V6C - 266-B 17 K.V. Rect. Position #6	5.0	5.1	5.1		
V7C - 266-B 17 K.V. Rect. Position #7	5.0	5.0	5.0		
V8C - 266-B 17 K.V. Rect. Position #8	5.0	9.8	9.9		

"Filament Voltages at Tube Terminals"

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2nd & 3rd Power Amplifier Filament Voltages & Currents, Form:
"Tube Filament Currents" Book No. (7) Sec. No. (C) Page No. (17)

DATE & SIGN		<i>Rc - JL</i> <i>3-29-55</i>			
VOLTAGES	RATED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE
V1A - 258-B 1650 VOLT Rect. Position #1	2.5	2.5			
V2A - 258-B 1650 VOLT Rect. Position #2	2.5	2.5			
V3A - 258-B 1650 VOLT Rect. Position #3	2.5	2.5			
V4A - 258-B 1650 VOLT Rect. Position #4	2.5	2.5			
V5A - 258-B 1650 VOLT Rect. Position #5	2.5	2.5			
V6A - 258-B 1650 VOLT Rect. Position #6	2.5	2.5			
V1D - 271-A Buffer Amplifier	5.0	4.8			
V2D - 276-A Radio Freq. Amplifier	10.0	10.0			
V3D - 276-A Modulating Amplifier	10.0	10.0			
V4D - 261-A Audio Input Amplifier	10.0	10.0			
V5D - 212-E Audio Power Amplifier	14.0	14.0			
V1Y - 271-A Oscillator #1	5.0	4.8			
V2Y - 271-A Oscillator #2	5.0	4.7			
V1 - 274-A Feed Back Rectifier	5.0	4.8			
V1E - 212-E 1st Power Amplifier Position #1	14.0	14.0			
V2E - 212-E 1st Power Amplifier Position #2	14.0	14.0			
V1C - 266-B 17 K.V. Rect. Position #1	5.0	5.1			
V2C - 266-B 17 K.V. Rect. Position #2	5.0	5.0			
V3C - 266-B 17 K.V. Rect. Position #3	5.0	5.0			
V4C - 266-B 17 K.V. Rect. Position #4	5.0	5.1			
V5C - 266-B 17 K.V. Rect. Position #5	5.0	5.1			
V6C - 266-B 17 K.V. Rect. Position #6	5.0	5.1			
V7C - 266-B 17 K.V. Rect. Position #7	5.0	5.0			
V1I - 276-A Radio Freq. Monitor	10.0	9.9			

"Filament Voltages at Tube Terminals"

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2nd & 3rd Power Amplifier Filament Voltages & Currents, Form: "Tube Filament Currents" Book No. (7) Sec. No. (C) Page No. (17)

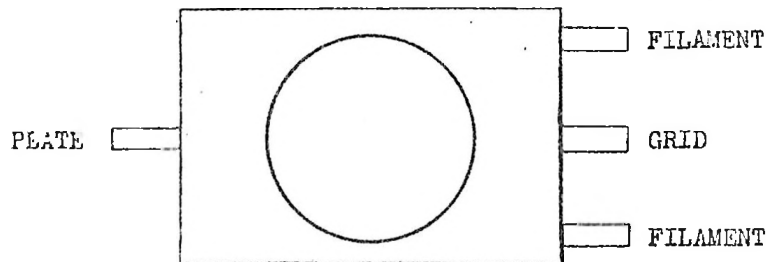
DATE & SIGN		2P-4K 2-2/50	5V-AP 11/50/50	AP-2-2-50	AP-10-24-58
VOLTAGES	WATTS VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE	MEASURED VOLTAGE
V1A - 258-B 1650 VOLT Rect. Position #1	2.5	2.5	2.5	2.5	2.5
V2A - 258-B 1650 VOLT Rect. Position #2	2.5	2.5	2.5	2.5	2.5
V3A - 258-B 1650 VOLT Rect. Position #3	2.5	2.5	2.5	2.5	2.5
V4A - 258-B 1650 VOLT Rect. Position #4	2.5	2.5	2.5	2.5	2.5
V5A - 258-B 1650 VOLT Rect. Position #5	2.5	2.5	2.5	2.5	2.5
V6A - 258-B 1650 VOLT Rect. Position #6	2.5	2.5	2.5	2.5	2.5
V1D - 271-A Buffer Amplifier	5.0	4.8	4.8	4.8	4.8
V2D - 276-A Radio Freq. Amplifier	10.0	10.0	10.0	10.0	10.0
V3D - 276-A Modulating Amplifier	10.0	10.0	10.0	10.0	10.0
V4D - 261-A Audio Input Amplifier	10.0	10.0	10.0	10.0	10.0
V5D - 212-E Audio Power Amplifier	14.0	14.0	14.0	14.0	14.0
V1Y - 271-A Oscillator #1	5.0	4.7	4.6	4.7	4.7
V2Y - 271-A Oscillator #2	5.0	4.7	4.6	4.7	4.7
V1 - 274-A Feed Back Rectifier	5.0	4.8	4.7	4.8	4.7
V1E - 212-E 1st Power Amplifier Position #1	14.0	14.0	14.0	14.0	14.0
V2E - 212-E 1st Power Amplifier Position #2	14.0	14.0	14.0	14.0	14.0
V1C - 266-B 17 K.V. Rect. Position #1	5.0	5.0	5.0	5.0	5.0
V2C - 266-B 17 K.V. Rect. Position #2	5.0	5.0	5.0	5.0	5.0
V3C - 266-B 17 K.V. Rect. Position #3	5.0	5.1	5.0	5.0	5.0
V4C - 266-B 17 K.V. Rect. Position #4	5.0	5.1	5.1	5.0	5.1
V5C - 266-B 17 K.V. Rect. Position #5	5.0	5.1	5.1	5.1	5.1
V6C - 266-B 17 K.V. Rect. Position #6	5.0	5.1	5.1	5.1	5.1
V7C - 266-B 17 K.V. Rect. Position #7	5.0	5.0	5.0	5.0	5.0
V1I - 276-A Radio Freq. Monitor	10.0	10.0	9.9	10.0	10.0

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On the 276-A Tube, the "Grid" Terminal is the lug that is between the two Filament Terminals on one end of the Socket.

The lone Terminal on the opposite end of the Socket is the "Plate".

Below is "Top" view of Socket. This is a W.E. 112-A Socket.



Take the "Red" lead or "+" of the Meter and Fasten to a good Ground point on the frame.

The "Black" lead or "-" of the Meter is touched to the "Grid" Terminal of Tube "V3D".

When the 1st. Technician has 500 Volts on Meter "M2A" take a reading on the Weston #772 Meter and enter same in proper space provided on form, Book No. (7) Sec. No. (C) Page No. (204).

(w) "Oscillator - Modulator Unit" #2 (D): Proceed to measure Bias Voltage of Tube "V3D" 276-A "Modulating Amplifier", in exact procedure as for Tube "V2D" and enter reading in proper space provided on form, Book No. (7) Sec. No. (C) Page No. (204).

(x) "Oscillator - Modulator Unit" #2 (D): Proceed to measure Bias Voltage of Tube "V4D" 261-A "Audio Input Amplifier" in exact procedure as for Tube "V2D" and "V3D" and enter reading in proper space provided on form, Book No. (7) Sec. No. (C) Page No. (204).

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(y) "Oscillator - Modulator Unit" #2 (D): Proceed to measure Bias Voltage of Tube "V5D" 2L2-E "Audio Power Amplifier" in exact procedure as for Tubes "V2D" - "V3D" - "V4D" and enter reading in proper space provided on form, Book No. (7) Sec. No. (C) Page No. (204).

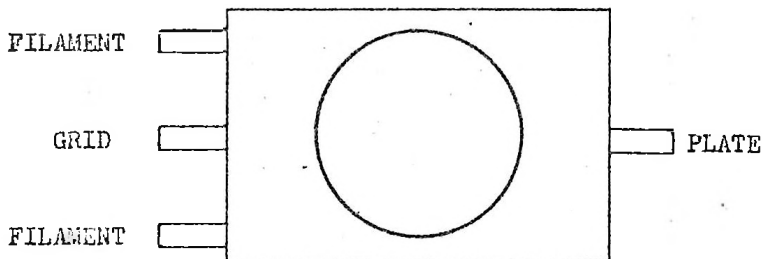
(z) "1ST Power Amplifier Unit" #3 (E): Technician #2 will proceed to Rear of Unit and measure Bias Voltage on "V1E" and "V2E".

Use the small Step Ladder to facilitate reaching Tube Terminals.

On the Tube "2L2-E", the "Grid" Terminal is the Center one on the side that contains 3 Terminals.

The lone terminal on the opposite end of the Socket is the "Plate".

Below is "Top" view of Socket. This is a W.E. 113-A Socket



Take the "Red" lead or "+" of the Weston #772 Meter and fasten to a good Ground point on the frame.

The "Black" lead or "-" of the Meter is touched to the "Grid" Terminal of Tube "V1E".

When the 1st. Technician has 300 Volts on Meter "M2A", take a reading on the Weston Meter and make a "Mental Note" of same.

Take the "Black" lead from "Grid" Terminal of "V1E" and put it on the "Grid" Terminal of "V2E".

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"50 KW Trans. & Ant. Equip. Maint".

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Before taking a reading on this Tube, check with the 1st. Technician and see that he is maintaining 500 Volts on "M2A".

When you get an "OK", proceed to take reading.

Enter these two readings in proper space on form, Book No. (7)

Sec. No. (C) Page No. (204).

(aa) The measurement of Bias Voltages has now been completed.

Proceed to the High Voltage Grounding Switch and Door Interlock Mechanism and put Switch "D17P" to "OFF" Position.

Remove leads from Weston Meter and place in Compartment designated for same.

Place Selector Switch to 1000 Volt Scale.

Put cover on Meter and place it in the proper Compartment of "Portable Fuse and Test Unit" Transmitter Room.

(bb) "Control Unit" #1 (A): Proceed to the Front of this Unit, Reduce "Filament Generator Rheostat" - "R16A" to minimum (Turn Clockwise.)

(cc) "Switch Room": Proceed to this Room in the Basement and put "Off" Switch #2, "50 KW Distribution Oil CKT Breaker" For SAFETY REASONS.

Merely grasp the Handle of the Oil Circuit Breaker and lift it Up.

(dd) "Basement": While in the Basement put "Off" Switch "D1P" "Master 480 Volt Oil Circuit Breaker" for SAFETY REASONS.

(ee) "Oscillator - Modulator Unit" #2 (D): Proceed to the Rear of this Unit, remove Tubes "V2D" to "V5D" inclusive from Sockets placing in "Spare Tube Room".

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Place "Expanded Metal Cover" on top of Unit with rear edge slightly higher than the Front, slip it over edges of Tube Sockets and into place.

Replace all Tubes "V2D" to "V5D" inclusive in proper Sockets.

Replace all Screws then tighten same.

(ff) "Oscillator - Modulator Unit" #2 (D): While at the Rear of this Unit, Replace the "Expanded Metal Cover" on front of the "Feedback Rectifier Tube Unit" and tighten the Wing Nuts.

(gg) "Oscillator - Modulator Unit" #2 (D): Proceed to the front of this Unit, remove Tube "V1D" from Socket, replace Metal Cover on top of "Buffer Amplifier Unit", tighten Wing Nuts in place, then replace Tube "V1D".

(hh) "1st Power Amplifier Unit" #3 (E): Proceed to the rear of this Unit, remove Tubes "V1E" and "V2E" from Sockets placing in "Spare Tube Room". Place "Expanded Metal Cover" on top of Unit with rear edge slightly higher than the Front, slip it over edges of Tube Sockets and into place.

Replace Tubes "V1E" and "V2E" in proper Sockets.

Replace all Screws, then tighten same.

Close Door of Compartment and tighten Thumb Nuts.

Book No. (1) (1) (1) (1) (1) ()

Sec. No. (A) (D) (E) (C) (I) ()

Page No. () () () () () ()