RESTRICTED

COLLINS INSTRUCTION BOOK

MANUFACTURED BY

COLLINS RADIO COMPANY

CEDAR RAPIDS 10 WA U. S. A.

RESTRICTED

INSTRUCTION BOOK

Serial No. 71 - 6

For

MODEL TCA

RADIO TELEPHONE TRANSMITTING EQUIPMENT

15 Watts Telephone

3,000 Kc to 10,000 Kc

This instruction book is furnished for the information of commissioned, warrant, enlisted and civilian personnel of the Navy whose duties involve design, instruction, operation and installation of radio and sound equipment. The word "RESTRICTED" as applied to this instruction book signifies that this instruction book is to be read only by the above personnel, and that the contents of it should not be made known to persons not connected with the Navy.

Manufactured by

COLLINS RADIO COMPANY

CEDAR RAPIDS, IOWA

71-6

Contract NOs-66284

Dated 22nd April, 1939

WARNING

OPERATION OF THIS EQUIPMENT INVOLVES THE USE OF HIGH VOLTAGES WHICH ARE DANGEROUS TO LIFE. OPERATING PERSONNEL MUST AT ALL TIMES OBSERVE ALL SAFETY REGULATIONS. DO NOT CHANGE TUBES OR MAKE ADJUSTMENTS INSIDE EQUIPMENT WITH HIGH VOLTAGE SUPPLY ON. DO NOT DEPEND UPON DOOR SWITCHES OR INTERLOCKS FOR PROTECTION BUT ALWAYS SHUT DOWN MOTOR GENERATORS OR OTHER ASSOCIATED POWER EQUIPMENT AND OPEN MAIN SWITCH IN POWER SUPPLY CIRCUIT. UNDER CERTAIN CONDITIONS DANGEROUS POTENTIALS MAY EXIST IN CIRCUITS WITH POWER CONTROLS IN THE OFF POSITION DUE TO CHARGES RETAINED BY CAPACITORS, ETC. TO AVOID CASUALTIES ALWAYS DISCHARGE AND GROUND CIRCUITS PRIOR TO TOUCHING THEM.

* * *

Since the use of high voltages which are dangerous to human life is necessary to the successful operation of the radio transmitting equipment covered by these instructions, certain reasonable precautionary measures must be carefully observed by the operating personnel during the adjustment and operation of the equipment.

The major portions of the equipment are within shielding enclosures, provided where necessary with access doors which are generally fitted with safety interlock switches which act to shut off dangerous voltages within the enclosures when the access doors are open.

While every practicable safety precaution has been incorporated in this equipment, the following rules must be strictly observed:

It should be borne in mind that interlocks are provided only on normal access doors on certain major units and therefore side, back or top screens, commutator covers, if removed, will not cause interlocks to function and will thereby allow access to circuits carrying voltages dangerous to human life.

KEEP AWAY FROM LIVE CIRCUITS

Under no circumstances should any person be permitted to reach within or in any manner gain access to the enclosure with interlocked gates or doors closed or with power supply line switches to the equipment closed; or to approach or handle

any portion of the equipment which is supplied with power, or to connect any apparatus external to the enclosure to circuits within the equipment; or to apply voltages to the equipment for testing purposes while any non-interlocked portion of the shielding or enclosure is removed or open. Whenever feasible in testing circuits, check for continuity and resistance rather than directly checking voltage at various points.

DON'T SERVICE OR ADJUST ALONE

Under no circumstances should any person reach within or enter the enclosure for the purpose of servicing or adjusting the equipment without the immediate presence or assistance of another person capable of rendering aid.

DON'T TAMPER WITH INTERLOCKS

Under no circumstances should any access gate, door or safety interlock switch be removed, short circuited, or tampered with in any way, nor should reliance be placed upon the interlock switches for removing voltages from the equipment.

THE ATTENTION OF ENGINEER OFFICERS, RADIO OFFICERS AND OPERATING PERSONNEL IS DIRECTED TO BUREAU OF ENGINEERING CIRCULAR LETTER NO. 5a OF 3 OCTOBER 1934, OR SUBSEQUENT REVISIONS THEREOF ON THE SUBJECT OF "RADIO - SAFETY AND PRECAUTIONS TO BE OBSERVED".

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CONTRACTUAL GUARANTEE

The equipment, including all parts and spare parts, except vacuum tubes, shall be guaranteed for a service period of <u>one year</u> with the understanding that, as a condition of this contract. all items found to be defective as to design, material. workmanship or manufacture shall be replaced without delay and at no expense to the Government, provided that such guarantee and agreement shall not obligate the contractor to make replacement of defective material unless the failure, exclusive of normal shelf life deterioration, occurs within a period of two years from the date of delivery of the equipment to and acceptance by the Government and provided further, that if any part or parts (except vacuum tubes) fail in service or are found defective in ten per cent (10%) or more of the total number of equipments furnished under the contract, such part or parts, whether supplied in the equipment or as spares, shall be conclusively presumed to be of defective design, and as a condition of contract subject to one hundred per cent (100%) replacement of all similar units supplied on subject contract by suitable redesigned replacements. Failure due to poor workmanship while not necessarily indicating poor design. will be considered in the same category as failure due to poor design. Redesigned replacements which will assure proper operation of the equipment shall be supplied promptly, transportation paid, to the Naval activities using such equipment, upon receipt of proper notice and without cost to the Government. All defective parts originally furnished under contract shall be held subject to rejection and return to the contractor.

This period of two years and the service period of one year shall not include any portion of the time that the equipment fails to give satisfactory performance due to defective items and the necessity for replacement thereof, and provided further, that any replacement part shall be guaranteed to give one year of satisfactory service.

| Contract No. 65264 Date of Contract | 22na | oi Apri | 1 1737 |
|--|------|---------|--------|
| Serial No. of Equipment | | | |
| Date of Acceptance by the Navy | | | |
| Date of Delivery to Contract Designation | | | |
| Date of Completion of Installation | | | |
| Date Placed in Service | | | |

REPORT OF FAILURE

Report of failure of any part of this equipment, during its service life, shall be made to the Bureau of Engineering in accordance with current instructions. The report shall cover all details of the failure and give the date of installation of the equipment. Refer to latest revision of Bureau of Engineering Circular Letter No. 40 for instructions concerning Reports of Failures, etc.

When making out requisition for replacement parts the following information should be furnished to insure procurement of the proper component:

Item No. - Same as in parts list and on schematic drawing and same as labeled in actual unit.

Part No. - Obtain from "Parts List."

Navy Type No. - Where applicable.

Specification - Obtain from "Parts List."

Serial No. of Unit in which part became defective.

GENERAL

The Navy Type TCA Transmitter is a complete 15-watt 4-channel radiotelephone transmitter designed for voice communication services requiring a rapid change of frequency. The unit is designed to operate on any one of four pre-selected frequencies in the range 3000 to 10,000 kc. by the manipulation of a single rotary-type switch. The audio frequency response and harmonic content are held to such values as will give high quality transmission for the service for which the transmitter is designed.

The transmitter is completely housed in a single cabinet 10" high, 20" wide and 16" deep. The transmitter cabinet is of the console type suitable for table mounting. Ventilating louvers are provided in the top, back and two sides, assuring that all heat producing elements secure sufficient ventilation. The construction consists of heavy gauge, resistance welded steel with St. James Gray crinkle finish on the outside and flat gray finish on the inside.

The unit chassis type of construction is used. These units consist of power supply, modulator, radio frequency section and panel. All wiring is independent of the cabinet. All units may be quickly removed from the cabinet for inspection or replacement.

The proper operation of the transmitter is indicated by a complete set of meters mounted on the top part of the front panel. Other features incorporated in the transmitter are a combined meter and stage selector switch for simplifying the tuning and push-to-talk operation. The complete installation consists of a transmitter and microphone. After these components are connected, the only other external connections necessary are an a-c line to the power source and the antenna connections to the rear of the transmitter.

LIST OF EQUIPMENT

1 - 49DA Cabinet Assembly
1 - 101L Panel Assembly
1 - 33K R. F. Unit

1 - 9Z Modulator Unit

LIST OF EQUIPMENT (CONTINUED)

1 - 411B Power Supply 1 - 115F-4 Filter Unit 1 - 977N18 Microphone

2 - Mounted Crystals 2 - 190E Output Coils 1 - 7000C Oscillator Coil

Tubes as follows:

3 - 6L6G

1 - 807

1 - 605G

2 - 523

PANEL ASSEMBLY

The power controls, the frequency selector switch and indicating meters are mounted upon the front panel assembly, This assembly contains all of the inter-unit cables for the connections between the major units of the transmitter. All cable connections are made by means of multi-conductor plug connectors which are readily removable. The panel assembly is constructed so that it may be easily removed from the cabinet by taking out the mounting screws along the edge of the panel.

RADIO FREQUENCY SECTION

The radio frequency section of the TCA Transmitter consists of a 6L6 oscillator and power amplifier. The oscillator employs a harmonic type oscillator circuit. In this circuit the frequency of operation is independent of the plate circuit. Power output may be obtained on the harmonic frequencies as well as upon the fundamental frequency of the crystal. A unique feature of this circuit is the isolation between the crystal oscillator section and the plate circuit. This circuit provides isolation equivalent to an additional buffer stage. The oscillator employs a low temperature coefficient "A" cut crystal which operates with low r-f current, assuring good frequency stability. Plug-in tank circuits are used in the oscillator

stage. These are pretuned and selected from the front of the panel by means of a band selector switch.

FINAL AMPLIFIER

The final amplifier consists of a single 807 beam power tube. Highly efficient operation of this stage is provided by use of Class C operation. Screen potential is obtained by means of a resistor in series with the plate voltage. Grid leak bias is employed. The plate circuit of the 807 consists of an unbalanced pi section network capable of operation directly into an unbalanced radiating system or a transmission line. The use of this type of network greatly simplifies tuning. As this network is a low pass filter, harmonic attenuation is attained. The elements of the network are of such values that a large range of output impedances may be matched. The output coils are provided with "V" groove sliders which permit the choice of the number of turns at will.

After the final tank circuits are once adjusted, they are automatically selected when the frequency change switch is rotated to the desired frequency band. The output condenser of the network is bridged by a pair of jacks so that a padding condenser may be used to extend the range of the network for lower frequency operation.

AUDIO SECTION

Transformer input is provided to the first 605 audio amplifier stage. This transformer is designed for operation with a single button carbon microphone. An arrangement is provided whereby the microphone current is balanced out, thus preventing saturation of the core on the input transformer.

A socket is provided on the input of this amplifier so that a resonant filter system may be put in place to limit the frequency response, providing better intelligibility in voice transmissions.

When using the type 115F-4 filter which is supplied with the transmitter, a frequency response characteristic within 2 db from 500 to 2500 cycles is attained. This arrangement provides

sharp cut-off below 500 cycles and above 2500 cycles. The 60 cycle response of the combination is down 30 db as is the 5000 cycle response.

The modulator stage consists of two 6L6G tubes operating in Class AB push-pull circuit. This stage provides sufficient power to completely modulate the 15 watt Class C amplifier. Bias for the modulator stage is obtained from a cathode resistor. A section of this resistor is arranged in a bridging circuit to provide microphone current for the single button carbon microphone. This circuit is adequately filtered to prevent any unwarranted feedback.

A push-to-talk button associated with the microphone is arranged to operate a relay providing push-to-talk control of the transmitter.

POWER SUPPLY

The power supply unit consists of a single high voltage rectifier circuit and filter section. This circuit provides 350 volts d.c. for the operation of the speech amplifier, modulator and radio frequency circuits. A single 6.3 volt filament transformer supplies the heater power for the transmitting tubes. The power circuits are protected by means of two fuses so interlocked that no damage can result in event an overload occurs.

CONTROL CIRCUIT

A simplified power control circuit is used in the TCA Transmitter. Separate filament power and plate power switches are employed. These switches are connected in such a manner that the plate power can not be turned on until after the filament power switch has been operated. Operation of the filament power switch is indicated by means of a green pilot light on the left-hand side of the transmitter panel. Operation of the plate power switch is indicated by means of a red pilot light on the right-hand side of the transmitter panel. When push-to-talk operation is desired, the "PUSH-TO-TALK" button on the microphone may be used to turn on the plate power of the transmitter.

A selector switch provides for application of plate power to successive r-f stages and provision is made for the application of plate voltage to the final amplifier through a dropping resistor to facilitate tuning.

II INSTALLATION

<u>UNCRATING</u>

Remove the transmitter from the crate and inspect it carefully to be certain that it has not been damaged in shipment. All transmitters are carefully tested and inspected before shipment. In case of damage, file all claims promptly with the transportation company. In this regard it is desirable to preserve the original packing material for the transportation company's inspection.

ELECTRICAL CONNECTIONS

The only electrical connections required are antenna to terminals on the rear of the cabinet and power line plugged into convenient receptacle on the rear of the transmitter. The microphone is connected through the receptacle on the side of cabinet. The radio frequency output terminals located on the rear of the cabinet are arranged for the use of either four separate antennas or a single antenna. When a single antenna is employed, all four terminals are connected together and to the antenna. Terminals are also provided for the connection to the receiver antenna post when it is desired to use the same antenna for transmitting and receiving. A ground connection is available. Refer to the rear view photograph which indicates the proper terminal connections.

FUSES

All fuse positions are designated with the proper value of fuse. The locations are also indicated in the top view photograph of the transmitter. It is important that proper size fuses be employed as fuses of too large capacity will endanger equipment in case of overload or short circuit.

III ADJUSTMENT OF APPARATUS

WARMING

BEFORE PROCEEDING WITH THE ADJUSTMENT OF THE APPARATUS, PLEASE REFER TO THE "WARNING" PARAGRAPH AT THE FRONT OF THIS BOOK. TAKE CARE TO OBSERVE ALL PRECAUTIONARY MEASURES.

PRELIMINARY

Be certain that the power switches are in the "OFF" position. Connect the transmitter to 110 volt, 50 or 60 cycle source. Place first the FILAMENT SWITCH and then the PLATE SWITCH in the ON position and note if any fuses fail due to short circuits which might have occurred should the transmitter be damaged in transit. Return the switches to the OFF position.

Be certain that the audio gain control (see Figure 1) is in the counterclockwise position and that the selector switch is in position 1.

INSERTION OF TUBES, CRYSTALS AND COILS

The positions of all tubes, crystals and coils are indicated in the photographs of the top view of the transmitter. The tubes may be inserted using this photograph as a guide.

GENERAL PRELIMINARY ADJUSTMENT

Remove shield cans from the oscillator coil by means of the two screws located in opposite corners in the top of the shield. Replace the shields with dummy shield cans containing access holes for tuning the condensers. The oscillator coils have been tuned and locked at the factory and should require no further adjustment. However, this procedure is being outlined in event that retuning is required at any time.

Caution: Never tune the oscillator coils without the dummy shield in place, as the tuning adjustments will not hold when the proper shields are again put in place.

ADJUSTMENT OF APPARATUS

ADJUSTMENT OF OSCILLATOR

Place the FREQUENCY SELECTOR switch in the $\frac{\mu}{\nu}$ 1 position. Be certain that the microphone is not in the circuit. Advance the FILAMENT POWER switch to the ON position and allow the transmitter to warm up for a period of 30 seconds. Now place the PLATE POWER switch in the QN position. Tune the proper tuning condenser to resonance as indicated by minimum excitation plate current and maximum grid current to the final amplifier. The crystal may stop oscillating at exact resonance, consequently the oscillator tuning should be set slightly on the low capacity side of resonance so that stable and quick operation of the oscillator is assured. Return the PLATE POWER switch to the OFF position. Caution: Never change the position of the selector switch or frequency band selector switch without the transmitter in the OFF or STAND-BY position. Care should be used in making internal adjustments with the PLATE POWER on and it is suggested that the plate power be in the STAND-BY position while making internal adjustments unless such adjustments are made with an insulated screw driver.

ADJUSTMENT OF FINAL AMPLIFIER

It is suggested that a preliminary test of the final amplifier be made by use of a 25 watt, 110 volt lamp for a dummy antenna load. A jumper should be connected between antenna terminals and the lamp connected between antenna terminals and ground. This procedure will aid the operator in familiarizing himself with the proper adjustment of the transmitter. Reference to the General Transmitter Test Records will show results obtained when using lamp load of this type. Note that the test data shows the plate current for each stage. Set antenna tuning condenser 1 at maximum capacity. Set the rider on coil 1 to the desired number of turns, using the number of turns showing on the test data as a rough estimate.

- 1. Advance the selector switch to position 2. In this position plate power is supplied to the final amplifier tube through a series current limiting resistor.
 - 2. Place PLATE POWER switch in the ON position.

ADJUSTMENT OF APPARATUS

- 3. Adjust the final amplifier tuning condenser #1 to resonance as indicated by minimum final amplifier plate current. Always adjust to the exact minimum plate current as the system is working under conditions of maximum efficiency at this point.
- 4. If the plate current is greater than 50 to 60 ma., it should be reduced by adding more turns to the final amplifier coil by adjusting the rider and then reestablishing resonance with the final amplifier tuning condenser.
- 5. If the final amplifier plate current is less than 50 to 60 ma., it may be increased by decreasing the capacity of the antenna tuning condenser, retuning the final amplifier tuning condenser to resonance. If this procedure will not increase it sufficiently, decrease the number of turns in the final amplifier coil. Should the number of turns have to be decreased to the point where the final amplifier tuning condenser will not establish resonance, this condenser may be bridged by a pad.
- 6. Return the plate power switch to the OFF position and advance the selector switch to number 3 position. In this position, full plate voltage is applied to the final amplifier tubes. Place the power switch in the ON position and adjust the loading (final amplifier plate current at resonance) to 86 ma. The loading in this case is adjusted in the same manner as outlined above.

The transmitter is now under operating conditions and the lamp load should attain nearly full brilliance. The microphone cord may be plugged into the receptacle on the side of the cabinet and the selector switch placed in the $\frac{\mu}{\pi}$ 4 position for indication of modulator plate current. If the plate power switch is returned to the OFF position, the transmitter may now be started by pressing the push-to-talk button associated with the microshone. The gain control (see top view photograph) should be rotated clockwise until when talking into the microphone at what corresponds to normal voice level, the modulation meter reads up to 50 on the voice peaks. The modulation indicator has the limitations common to all pointer type indicators in that it shows only the average level of modulation and its calibration is numerically correct only for pure tone inputs. Voice modulation consists of complex wave forms which invariably contain peaks of considerable amplitude. Consequently, the transmitter will be completely modulated at voice inputs when the modulation indicator reads between 30 and 50%. The audio gain should be adjusted with these facts in mind.

ADJUSTMENT OF APPARATUS

The transmitter may now be connected to the antenna. Should four unbalanced antennas be used, these should be connected to terminals 1, 2, 3, and 4 as shown on the back view photograph of the transmitter. Place the selector switch in the #2 position and adjust the final amplifier tuning condenser to resonance. The final amplifier should be loaded to 60 ma. as already described. Return the plate power switch to the stand-by "OFF" position and advance the selector switch to #3 position. Turn the power switch on and load the transmitter to 86 ma. as described for the artificial load above. When this procedure is completed and the circuits checked for exact resonance, the identical procedure should be repeated for each of the other frequency bands.

FREQUENCY SHIFTING

After the transmitter has been tuned up on all frequencies, changing from one frequency to another will merely involve the rotation of the frequency selector switch to the desired frequency band position. This should always be done with the transmitter in the stand-by position.

IV MAINTENANCE

OPERATION

In service the following practice should be observed when starting the transmitter after all tuning adjustments have been made:

- 1. Place the FILAMENT POWER switch in the ON position.
- 2. After 30 seconds, the transmitter may be turned on by placing the PLATE POWER switch in the ON position. The pushto-talk button on the microphone is used if a short transmission is contemplated. In this case the PLATE POWER switch must be turned to the OFF position in order for the push-to-talk button to function.
- 3. Check tuning at any time meters do not show normal readings.

REPLACEMENT PARTS

Fuses - In case of a burned out fuse, circuits should be tested to determine the reason for the fuse failure. Replacement fuses should have the current rating as specified in the parts list.

Tubes - This transmitter has been tested at the factory and found to perform satisfactorily. Improper operation of the equipment is most often caused by tube failure. Tested tubes of the same type specified should always be used for replacements.

Other Components - Replacement parts may be secured from the factory. When placing an order, be certain to specify item number, part number and descriptive specifications of parts ordered, and serial number of unit in which part became defective.

V PERFORMANCE DATA

TYPICAL METER READINGS

| Selector Position | 1 | 2 | _3_ | 4 |
|-----------------------|----|------|----------------|-----|
| <u>Meters</u> | | | | |
| Final Amplifier Plate | 30 | _50_ | 86 | 120 |
| Grid Current | | | 2,5 | 2.5 |
| Modulation Meter | | | <u>0~35%</u> * | - |

*With normal voice level input.

TUNING DATA

The table below shows the operating frequency and crystal frequency for each of the frequency selector positions. The blank spaces are provided for recording the approximate condenser settings and the number of turns used in the final amplifier coil at the time of installation.

| Switch Position | <u> </u> | 2 | 3 | 4 |
|------------------------------|----------|---|---|---|
| Operating Frequency - kc. | | | | |
| Crystal Frequency - kc. | | | | |
| Oscillator Condenser - % | | | | |
| Final Amplifier Condenser -% | | | | |
| Antenna Condenser - 1/2 | | | | |
| Coil Turns | | · | | |

PERFORMANCE DATA

TROUBLE SHOOTING

The most general cause of improper operation of radio transmitters is tube failure. A complete set of tested tubes of the same type specified should be kept on hand at all times. If faulty operation of the transmitter is observed and tube failure suspected, each tube may be checked by replacing it with a like tube known to be in good condition.

In case an open fuse is found, it is a definite indication of overload on some circuit in the transmitter. If the line fuse is open, the filaments in all tubes will cease to glow. If the plate power fuse only is open, the filaments will remain lighted, but no evidence of plate voltage will be obtainable. A blown fuse indicates a short circuit somewhere in the equipment. The short circuit may be caused by a foreign article having been dropped into the cabinet, a defective condenser, defective tubes or a high voltage arc. A direct short caused by a foreign article or a defective condenser is most readily found by means of a continuity meter. The d-c resistance of the various circuits is checked in order to locate the short. Defective tubes which cause a short in the power circuits are generally located on inspection by sputtering or heating. High voltage arcs are generally caused by bent condenser plates or wiring, or by dust and corrosion.

One of the most prolific sources of trouble in equipment near the sea is corrosion. This may result in failure of the equipment for no apparent reason. This trouble is found in connection with all wiping contacts such as switch points, cable plug connectors and tube prongs. For this reason, periodic examination of all wiping contacts should be made and all contacts polished.

Failure of the equipment to operate properly may be caused by sluggish operation of the oscillator circuit. This is noticed by low excitation to the amplifier, slowness in start of oscillation or by failure to oscillate at all. After checking the circuit and components as described above and the trouble is not located, remove the crystal from its holder and clean the crystal and contact plates. Any condensation of moisture in the crystal holder will surely prevent the crystal from oscillating.

TCA TRANSMITTER

| Item. | Part No. | Description | Specification | Mfgr. | Mfgr. Type | Navy Type No. |
|--|---|--|---|---|---|------------------|
| 101L- | PANEL ASS | EMBLY - | | | • | |
| 101 102 103 104 105 106 107 108 109 110 111 112 | 260N101 260N101 454N1 450ND200 450ND10 262N136 262N237 262N236 262N331 281N118 269N12 200N102 200N107 | Filament Power Switch Plate Power Switch Modulation Meter Plate Current Meter Grid Current Meter Pilot Light Socket Pilot Light Colored Disk Pilot Light Colored Disk Pilot Light Bulb Switch Knob 4 Pos. Switch Shaft Rubber Grommet Rubber Grommet | DPST Long Toggle DPST Long Toggle 0-1 ma.; 2" round ±2% 0-200 ma; 2" round ±2% 0-10 ma.; 2" round ±2% Candelabra Base Green 13/16" Diam. Red 13/16" Diam. 125 V. 3 W. Candelabra Bakelite 2-1/16" Detent and Shaft Round 5/16" Size Round 7/8" Size | H & H H & H Weston Weston Weston Drake Drake Craybar K.K. Oak Con.Rub. Con.Rub. | 80302 80302 506 506 506 75 S-311-3BB Type "H" 903 2979 | |

| <u>Item</u> | Part No. | Description | Specification | Mfgr. | Mfgr. Type | Navy Type No. |
|--------------|------------------|----------------------------|--------------------------|----------|---------------|------------------|
| | | | | | | |
| 33K-3 | R. F. UNIT | | | | | |
| 201 | 704N50M | Osc. Grid Resistor | 50,000 ohm 1 w. ±10% | IRC | B T 1 | CIR-63288 |
| 202 | 710NA1500 | Osc. Cathode Resistor | 1500 ohm 10 w. +10% | Ohmite | BD | COM-63493 |
| 203 | 706N50M | Osc. Screen Resistor | 50,000 ohm 2 w. +10% | IRC | BT2 | CIR-63474 |
| 204 | 710NA20M | Amp. Grid Resistor | 20,000 ohm 10 w. +10% | Ohmite | BD | , |
| 205 | 701N27 | Osc. Grid Suppressor | 27 ohm 1/2 w. +10% | AB | EB2701 | • |
| 206 | 710NA15M | Amp. Screen Resistor | 15,000 ohm 10 w. ±10% | Ohmite | BD | COM-63571 |
| 20 7 | 710NC3M | Tuning Resistor | 3,000 ohm 25 w. ±10% | Ohmite | 0209 | |
| 208 | 909N425D | Osc. Grid Condenser | .000025 mfd. 900 v. +10 | %Sangamo | Type D | |
| 209 | 910N32 <i>5A</i> | Osc. Cathode Condenser | .00025 mfd. 1000 v. +10 | %Sangamo | A-10 | CAN-48007B-10 |
| 210 | 910N260A | Osc. Sereen Condenser | .006 mfd. 1000 v. +10% | Sangamo | A-10 | CAN-48025B-10 |
| 211 | 910N350A | Osc. Plate Block. Cond. | .0005 mfd. 1000 v. +10% | | A-10 | CAN-48011B-10 |
| 212 | 918N5 | No. 1 amp. Grid Coupl.Com | d5-100 mmfd. | Hamm. | TPS-F100 | |
| 213 | 918N5 | No. 2 Amp. " " | 5-100 mmfd. | Hann. | TPS-F100 | |
| 214 | 918N5 | No. 3 " " " " | 5-100 mmfd. | Hamm. | TPS-F100 | |
| 215 | 918N5 | No. 4 " " " " " | 5-100 mmfd. | Hamm. | TPS-F100 | |
| 216 | 950N220A | Amp. Plate Block. Cond. | .002 mfd. 5000 v. ±10% | Sangamo | A-50 | CAN-48037B-10 |
| 217 | 910N260A | Amp. Screen Condenser | .006 mfd. 1000 v. +10% | Sangamo | A-10 | CAN-48025B-10 |
| 218 | 922N14 | No. 1 Output Condenser | 325 mmfd. variable | Hamm. | | CHC-48908A |
| 219 | 922N14 | No. 2 " " | " " | 11 | | 11 |
| 220 | 922N14 | No. 3 " " | 11 11 3 11 | ** | | . 19 |
| 221 | 922N14 | No. 4 " " | 11 11 11 | Ħ. | | 11 |
| 222 | 922N14 | No. 1 Plate Tank Condenses | r ⁿ n | 11 | | 11 . |
| 223 | 922N14 | No. 2 " " " | 11 ' 11 | Ħ | | . 11 |
| 224 | 922N14 | No. 3 " " " | ii B | 11 | | . 11 |
| 225 | 922N14 | No. 4 " " " | . 11 | 17 | | 11 |
| 226 | 240N2 | Osc. Cathode Choke | 2.5 mh. 125 ma. 50 ohm | National | R-100 | CNA-47122 |
| 227 | 240N2 | Osc. Plate Choke | 11 11 11 | 11 | 11 | 11 |
| 2 2 8 | 240N2 | Amp. Grid Choke | ff 11 11 | 11 | 11 | ,11 , |
| 229 | 240N2 | Amp. Plate Choke | 11 11 11 | | 11 | 11 |

33K-3 R. F. UNIT (CONTINUED)

| <u>Item</u> | Part No. | Description | Specification . | Mfgr. | Mfgr. Type | Navy Type No. |
|---------------------------|--|---|--|--------------------------------|--|--|
| 230 231 | 407N37 259N88 | Antenna Relay Selector Switch | 110 V. AC DPDT 6 Pole; 5 Pos.; 3 Sec. | Leach | 1127 | |
| 232 233 | 703N2 7 269N8 | Amp. Grid Suppressor Tap Switch Section | Iso. 27 ohm 1 w. +10% Bakelite 1 Pole, 11 Pos | Centralab AB | EB2701 | |
| 234 235 | 269N9-6 190NBI1 | Tap Switch Shaft Ceramic Feedthru Button | 1 Section 6" long, "H" Section | Oak " | Туре "Н" | • |
| 236 23 7 238 | 367N115 367N215 301N11 | Cable Connector | 1/2" Ceramic 16 Contact Plug 16 Contact Socket | Iso. H.J. | 484 1507-9 | CBU-61017 |
| 239 240 241 242 | 220N183 220N153 220N177 360N202 | Insulated Plate Clip Osc. Tube Socket Crystal Sockets Osc. Coil Sockets Amp. Coil Jacks | 8 D==== 0 | Allied Amphenol | E-6331 SS8 SS5 SS7L | CPH-38351A CPH-38347A CPH-38350A |
| 243 244 245 246 | 220N105 281N114 190E-1 190E-2 | Rubber Grommet Bar Knob Output Coil Output Coil | Round 1/2" Size 1 1/4" Bakelite 12/uh. | Cont .Rub. Crowe Collins | #74 CRV:1518 286 190E-1 190E-2 | Jog/wa |

| Item | Part.No. | Description | Specification | Mfgr. | Mfgr. Type | Navy Type No. |
|--|--|---|--|--|--|----------------------|
| 411B-3 | POWER SUPI | PLY | | | | |
| 301 302 | 710NC5M 710NC50M | Section H.V. Bleeder | 5000 ohm, 25 w. ±10% 50,000 ohm 25 w. ±10% | Ohmite Ohmite | 0212 02 24 | COM-63521 |
| 305 306 | 930N11 930N11 | H. V. Filter Output Cond. H. V. Filter Condenser | | C.D. | KGU-3100 KGU-3100 | CD-48867 CD-46867 |
| 308 309 310 311 312 313 314 315 316 317 318 319 320 321 | 662S509C 662S458A 662S603 668S75B 668S75B 410N1 264N103 264N106 368N1 220N141 265N101 367N115 367N215 200N105 | Rectifier Filament Trans. Plate Power Transformer R.F. & Audio Tube Fil Tran Input Filter Choke Output Filter Choke Push-to-Talk Relay Plate Power Fuse Line Fuse A.C. Line Input Receptach Type 80 Tube Socket Fuse Receptacles Cable Connector Cable Connector Black Rubber Grommet | 500/500 V. 212 ma. 1.6.3 V. 5 A. C.T. 4 hy. 0.4 Amp. 4 hy. 0.4 amp. 6 V. A.C. N.O. 3 A. Plug Type 6 A. Plug Type | Chi. T. " Guardian Economy Economy Hubbell Amphenol Bryant H.J. H.J. Con.Rub. | CD-509C 3386-C CD603 2926-C 2926-C 40-5-A2 5703 5706 6808 S4 4063 1507-9 1507-9 CRW1518 | CPH-38346 |

ERRATA

| Item | Part No. | Description | Specifications | Mfgr. | Mfgr. Type | Navy Type No. |
|-----------------|--------------|------------------------|-------------------------|--------|---------------|------------------|
| 9 Z -3 N | ODULATOR UNI | <u>tt</u> | | | | |
| | | | DELLETE: | | | |
| 423 | 702N25M | 6C5 Grid Resistor | 25,000 ohm 1/2 w. ±10% | I.R.C. | BT2 | |
| | | | ADD: | | • | |
| 423 | 707N500 | Filter Matching Resist | or 500 ohm ±10%, 1/2 w. | I.R.C. | BW2 | |

NOTE: The above changes are effective in TCA Transmitters whose serial numbers are: 7061-2, 7061-3, 7061-4

| | | | | | Mfgr. | Navy |
|-------------|---------------------------|--|---------------------------------|----------------|----------------|-----------|
| <u>Item</u> | Part No. | Description | Specification | Mfgr. | Type | Type No. |
| 9Z-3 1 | CODULATOR U | NIT | | | | |
| 401 | 710NA50 | Micr. Current Bal. Resist | or 50 ohm 10 w. +10% | Ohmite | BD · | |
| 402 | 377N225 | Audio Gain Control | 10,000 ohm potentiomete | | MIOMP | |
| 403 | 706n2 <i>5</i> 00 | 6C5 Cathode Resistor | | IRC | BT2 | CIR-63474 |
| 404 | 706N50M | 605 Plate Decoupling Res. | 50,000 ohm 2 w. +10% | IRC | BT2 | CIR-63474 |
| 405 | 704N20M | Mod. Grid Decoupling Res. | 20,000 ohm 1 w. ±10% | IRC | BT1 | CIR-63288 |
| 406 | 710NA50 | · | 50 ohm, 10 w. ±10% | Ohmite | BD | |
| 40 7 | 710NA150 | Mod. Cathode Resistor | 150 ohm, 10 w. ±10% | Ohmite | BD | |
| 408 | 376 N902 | Modulation Meter Adjustme | | | CP | OTD COARA |
| 409 | 706N2OOM | Modulation Meter Multipli | | IRC | מתמ | CIR-63474 |
| 410 411 | 930N62 930N62 | 605 Decoupling Condenser Mod. Screen By-pass Cond. | | Solar Solar | BT2 | |
| 412 | 931N14A | Mod. Cathode By-pass Cond | | CD | DAR-4200 | CD-48403 |
| 413 | 931N14A | Micr. Current Filter Cond | | CD | DAR-4200 | CD-48403 |
| 414 | 930N61 | Mod. Meter Coupling Cond. | | Solar | | |
| 415 | 6675388A | | Pri. 250 ohm; Sec. | | | |
| | | | 500 ohm | | . CD-388A | |
| 416 | 667S210J | Filter Coupling Trans. | 500 olm Line to Grid | •• | 3226J | |
| 417 | 6675228F | Mod. Input Transformer | 20,000 ohm to Grid | 71 | 322 7F | |
| 418 | 66 7 5409 A | Modulation Transformer | 8000 ohm Pri.; 8000 ohm Sec. | | CD409A | |
| 419 | 667S244E | Rec. Coupling Transformer | | | 0D407A | |
| , | 00102412 | noot coupzing in anoion mor | ohm line | n | 34 09 Z | |
| 420 | 3 <i>5</i> 3N3 | Mod. Meter Rectifier | | Conant | M-2 | |
| 421 | 115J - 4 | Filter Network | | Collins | | |
| 422 | 930N62 | Mod. Cathode By-pass | 4 mfd. 600 v. ±10% | Solar | | |
| 423 | 702N25H | 6C5 Grid Resistor | 25,000 ohm ½ w. ±10% | IRC | BT2 | |

And the William and the

| <u>Item</u> | Part No. | Description | Specification | Mfgr. | Mfgr. Type | Navy Type No. |
|--------------|------------------|---------------------|--------------------|-----------|---------------|------------------|
| 9 Z-3 | MODULATOR U | NIT (CONTINUED) | | | | |
| 424 | 365N408 | Cable Connector | 8 Terminal Plug | H.J. | P-308-FHT | |
| 425 | 36 <i>5</i> N412 | 18 | 12 " " | 11 | P-312-FHT | |
| 426 | 367N115 | 11 11 | 16 " " | 11 | 1507-9 | |
| 427 | 367N215 | 11 11 | 16 Terminal Socket | 11 | 1507-9 | |
| 428 | 220N181 | 6L6G & 6C5G Sockets | 8 Prong, Octal, | | • , | |
| * | | | Bakelite | Amphenol | s 8 | CPH-38351 |
| 429 | 366n208 | Cable Connector | 8 Terminal Socket | H.J. | S-308AB | |
| 430 | 366N204 | 11 19 | 4. """ | | S-304AB | |
| 431 | 200N105 | Rubber Grommet | Round, 1/2" Size | Cont. Ruh | .CRW-1518 | |
| 432 | 366N212 | Cable Connector | 12 Terminal Socket | H.J. | S-312AB | |

| <u>Item</u> | Part. No. | Description | Specification | Mfgr. | Mfgr. Type | Navy Type No. |
|---------------|--------------------|--|--|--------|---------------|---|
| 49D-3 | CABINET ASS | BENBLY | | | | |
| | 15N222 | Door Hinge | Concealed | A.C.H. | 4970 | * |
| | 200N502 15N400 | Rubber Bumper Bullet Door Catch | 1" x $5/8$ "; $1/4-20$ Stud 3/8" x $7/16$ " mtg. size | Rbr. | 25 Cavity | |
| | | | 3, 1 1 1, 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | 3302 | |
| 115F-4 | BAND PASS | FILTER | | | | |
| 1 2 | 932N5 | 0.082 mfd. 1% accy. | 800 v. mica condenser | C.D. | ZB-40J1 | |
| 2 | 931N68 | 0.015 mfd. ±10% | 800 v. tubular cond. | C.D. | DT-4S15 | |
| 4 | 931N61 | 4.0 mfd. 400 v. cond. +10 | | C.D. | TT- 36 | , |
| 5 6 | 932N5 | 0.082 mfd. 1% accuracy | | C.D. | ZB-40J1 | |
| | 931N58 | 1.0 mfd. 800 v. condenser | <u>+</u> 10% | C.D. | DT-4W1 | |
| 7 8 | 6685612 | 50 mh. audio reactor | | Chi.T. | CD-612 | |
| | 6685611 | 0.491 hy. Audio reactor | \$ · | 11 | CD-611 | |
| 9 | 668s611 365N2O4 | 0.491 hy. audio reactor 4 Terminal Cable Connector | · | n | CD-611 | •. |
| | 3-72- | Plug | | H.J. | P-304-AB | |

VII SPARE PARTS FURNISHED PER TRANSMITTER

TCA TRANSMITTER

| Ite | m Amount | Function | | Navy Type Design. | Mfgr. | Mfgr. Type or Design. | Tolerance or Mod- ification | Collins Part Number |
|------|-------------|-----------------------|-------------------------|-------------------------|--------------|-----------------------------|-----------------------------------|---------------------------|
| , | | | MISCELLANEOUS ELECTRIC | AL PARTS | | | | |
| 31 | 5 10 | Line Fuse | 6 amp. plug type | | Economy | 5706 | , | 264N106 ' |
| 314 | 10 | Plate Power Fuse | 3 amp. plug type | | tt | 5 7 0 3 | | 264N103 |
| 31 | | Push-to-Talk Relay | 6 V. AC Coil - Contact | N.O. | Guardian | 4C-5-A2 | | 410N1 |
| 109 | | Pilot Light Bulb | 125 V. 3 W. Candelabra | | Graybar | | | 262N331 |
| 10 | | Filament Power Sw. | DPST Toggle 125 V. 15 | | н а н | 80302 | | 260N101 |
| 11: | | Freq. Sw. Detent | Detent & Shaft | | Oak | H | | 269N12 |
| 23 | | Freq. Change Tap Sw. | | | - | | | |
| - 3. | , – | Section | position | | Oak | H | | 269 n8 |
| 23: | l 1 | Selector Switch | 6 pole, 5 pos. 3 sec. | | Centralab | | | 259N88 |
| 230 | | Antenna Relay | 110 V. A.C. Coil | | 001101 4141 | • | | |
| | , 1 | mitema neray | DPDT Contact | | Leach | 1127 | | 407N37 |
| 420 |) 1 | Mod. Meter Rectifier | Instrument Rectifier | | Conant | M-2 | | 353N3 |
| | _ | | | | | | | , |
| | | | METERS | | | | | |
| 104 | ı ı | Plate Current Meter | 0-200 ma. 2% Acc. 2" R | ound | Weston | 506 | | 450ND200 |
| 10 | _ | | 200 200 2000 | | ,, 02 0000 | | | ., |
| | | | R.F. CHOKE | | | | | |
| 229 |) 1 | Amp. Plate Choke | 2.5 mh. 125 ma. 50 ohm | CNA-47122 | National | R-100 | | 240N2 |
| , | . – | | | | | | | |
| | | | TRANSFORMERS | | | | | |
| 417 | 1 1 | Mod. Input Transforme | | | Chi Tran. | 3227F | | 667S228F |
| 41 | | | 5. 500 ohm line to grid | | 10 | 3226J | | 667S210J |
| | _ | 1 - 3 - | · • | | | | | |
| | | | CAPACITORS | | | | | |
| 306 | 1 | H.V. Filter Condenser | · 10 mfd. +10% 600 V.DC | Wkg. CD-48867 | CD | KGU-3100 |) | 930N11 |
| 412 | 2 1 | Mod. Cathode By-pass | - , | • | | • | | |
| | | Condenser | 2 mfd. +10% 400 V. DC | Wkg. CD-48403 | CD | DAR-4200 | | 931N14A |
| 413 | 1 | Mod. Screen By-pass | — = , | | - | | | , , |
| | _ | Condenser | 4 mfd. +10% 600 V. DC | ∀kg. | Solar | Special | | 930N62 |
| | | | | U - | | Cond. | | /201102 |
| | | • | | | | OOHTO. | | |

SPARE PARTS FURNISHED PER TRANSMITTER

TCA TRANSMITTER

| Item | Amount | <u>Function</u> | Description | Navy Type Design. | Mfgr. | Mfgr. Type or Design. | Tolerance or Mod- ification | Collins Part Number |
|------|--------|-------------------------------|-------------------------------------|-------------------------|-----------|-----------------------------|-----------------------------------|---|
| | | | CAPACITORS | (CONTINUED) | | | | |
| 414 | 1 | Mod. Meter Coupling Condenser | 2 mfd. ±10% 600 V. DC | Wkg. | Solar | Special Cond. | | 930N61 |
| 222 | 1 | Plate Tank Condenser | 325 mmfd025 gap | CHC-48908A | Hamm. | MC | Mod .X-3068- | |
| 212 | 1 | | .5-100 mmfd. 500 V. Te | | 17 | TPS-F100 | | 918N5 |
| 216 | 1 | | .002 mfd. +10% 2000 V | | Sangamo | | | ,, |
| | | | DC Wkg. | CAN-48037B-10 | Sangamo | A-50 | | 950N220A |
| 211 | 1 | Osc. Plate Blocking " | 500V.DC 7kg0005 mmf | | | | | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
| | | _ | 1000 V. | CAN-43011B-10 | Sangamo | A-10 | | 910N350A |
| 210 | 1 | Osc. Screen Condenser | .006 mfd.+10% 500V. | | 0 | | | , |
| | | | DC Wkg. | CAN-48025B-10 | Sangamo | A-10 | | 910N260A |
| 209 | 1 | Osc. Cathode By-pass | | | | | | , |
| | | - | 500 V. DC Wkg. | CAN-480078-10 | Sangamo | A-10 | | 910N32 5A |
| 208 | 1 | Osc. Grid Condenser | .000025 mfd. +10% | | 3 | | | ,, |
| | | | 500 V. DC Wkg. | | Sangamo | D | | 909 N425D |
| | | | RESIST | | | | | |
| 201 | 1 | Osc. Grid Resistor | 50,000 ohm +10% 1 w. | CIR-63288 | IRC | BTl | | 704N50M |
| 203 | 1 | Osc. Screen Resistor | | CIR-63474 | IRC | BT2 | | 706N50M |
| 405 | | | s. 20,000 ohm $\pm 10\%$ lw. | | IRC | BT1 | | 704N2OM |
| 409 | 1 | Meter Multiplier Res. | 200,000 ohm $\pm 10\%$ 2 w. | CIR-63474 | IRC | BT2 | | 706N2OOM |
| 403 | 1 | 6C5 Cathode Resistor | | CIR-63474 | IRC | BT2 | | 706N2 5 00 |
| 408 | | Mod. Meter Adjustment | | | IRC | C P | $Mod-X-3068\frac{1}{4}$ | 376 N9 02 |
| 407 | | Mod. Cathode Resistor | | | Ohmite | BD | | 710NA150 |
| 401 | 1 | Micr. Current Bal.Res | | | Ohmite | BD | | 710NA50 |
| 207 | 1 | Tuning Resistor | 3000 ohm <u>+</u> 10% 25 w | | 11 | 0209 | | 71ONC3M |
| 206 | 1 | Amp. Screen Resistor | 15,000 ohm ±10% 10 w. | COM-63571 | 11 | BD | | 710NA15M |
| 204 | | Amp. Grid Resistor | | | 11 | BD | | 710NA20M |
| 202 | | Osc. Cathode Resistor | | COM-63493 | ** | BD | | 710NA1500 |
| 302 | 1 | H.V. Bleeder Resistor | 50,000 ohm +10% 25 w | | 46 | 0224 | | 710NC50M |
| 301 | 1 | H.V. Bleeder Resistor | 50,000 ohm 10% 25 w. | | 11 | 0212 | | 710NC5M |
| | _ | | MISCELLANEOUS MECH | HANICAL PARTS | | | | • |
| | 1 | Dummy Coil Shield | 2" x 2" x $4\frac{1}{2}$ " 20 Ga. A | 11. | Alum.Good | 3 | ModX-477 | 141N2O7 |

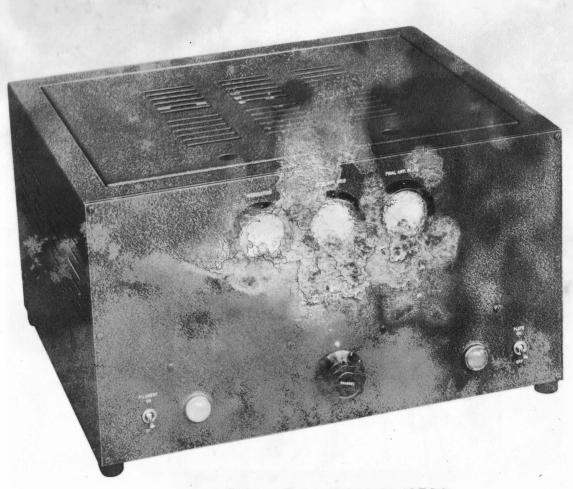


FIG.I TCA TRANSMITTER FRONT VIEW

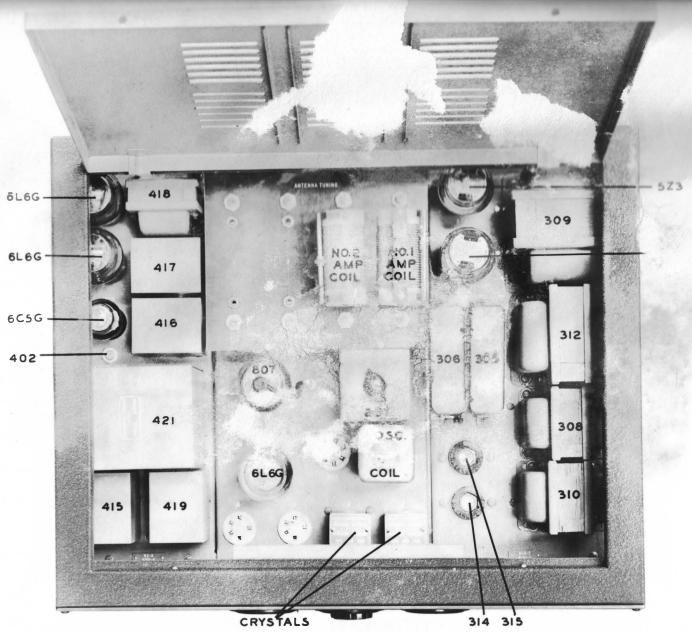


FIG. 2 TCA TRANSMITTER TOP VIEW

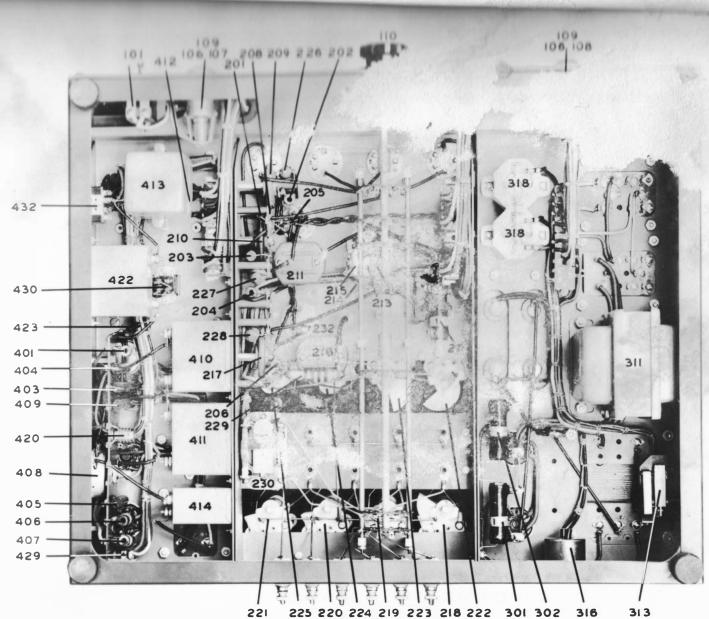


FIG. 3 TCA TRANSMITTER BOTTOM VIEW

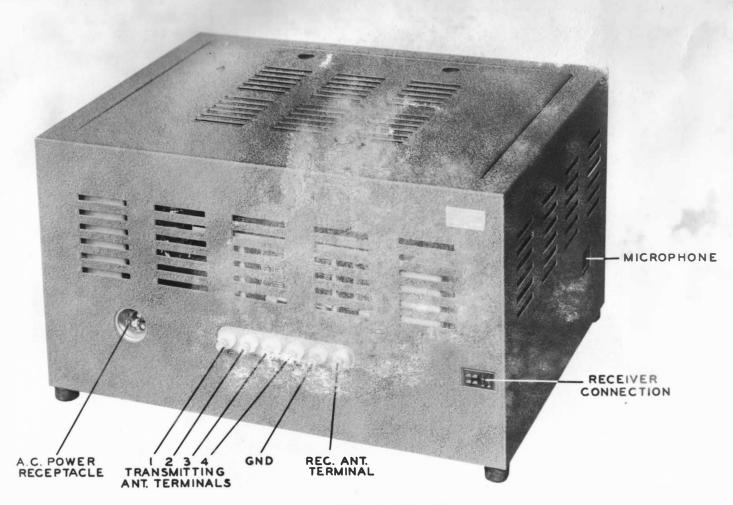


FIG.4 TCA TRANSMITTER REAR VIEW

IX TUBE DATA

RCA-5Z3

FULL-WAVE HIGH-VACUUM RECTIFIER

| Filament Voltage Current | Coated 5.0 3.0 | a-c volts amp. |
|---|----------------------|--|
| Maximum Overall Leng Maximum Diameter Bulb Base Pin 1-Filament Pin 2-Plate | gth ② ③ ① 4 | 5-3/8" 2-1/16" ST-16 Medium 4-Pin Pin 3-Plate Pin 4-Filament |

FULL-WAVE RECTIFIER

Operating Conditions: Condenser - or Choke - Input to Filter

| Filament | 5.0 | volts |
|-----------------------------|------------------|-------|
| A-C Plate Voltage per Plate | e (RMS) 500 max. | volts |
| Peak Inverse Voltage | 1400 max. | volts |
| D-C Output Current | 250 max. | ma. |

TUBE DATA

6C5 AMPLIFIER TRIODE

| Heater | Coated Unipotential Cathode | |
|----------------|-----------------------------|------------------|
| Voltage | 6.3 | a-c or d-c volts |
| Current | 0.3 | amp. |

Direct Interelectrode Capacitances:

| | Type 6C5 | Type 6C5-G |
|---------------------------------|-------------------|-----------------|
| Grid to Plate | 1.8 | = mni. |
| Grid to Cathode | 4 | - mmf. |
| Plate to Cathode | 13 | - nmf. |
| Maximum Overall Length | n 2-5/8 " | 4- 1/8" |
| Maximum Diameter | 1~5/16" | 1-9/16" |
| Bulb | Metal Shell, MT-8 | ST-12 |
| Base | (Small Wafer | (Small Shell |
| Dase | (Octal 6-Pin | (Octal 6-Pin |
| n. ,(6C5, Shell | (5) ⁵ | Pin 5 - Grid |
| Pin 1(6C5, Shell (6C5-G, Shield | 3-1-1 | Pin 7 - Heater |
| Pin 2 - Heater | 2-1-7 | Pin 8 - Cathode |
| Pin 3 - Plate | 1 kev 8 | |
| | BOTTOM VIEW | |
| Mounting Position | • | |

AMPLIFIER - Class A

| | ons and Characteristics: | |
|------------|--------------------------|--------|
| Heater - | 6.3 | volts |
| Plate | 250 | volts |
| Grid* | . _8 | volts |
| Amp. Fact. | 20 | |
| Plate Res. | 10000 | ohms |
| Transcond. | 2000 | /unhos |
| Plate Cur. | 8 | ma. |

^{*}The d-c resistance in the grid circuit should not exceed 1.0 megohm.

6L6-G

BEAM POWER AMPLIFIER

| Heater | Coated | Unipotential | Cathode | • | |
|-----------------|--------|-------------------|---------|-------|--------------|
| Voltage | | 6.3 | | a-c | or d-c volts |
| Current | | 0.9 | | | emp. |
| Maximum Overall | Length | | | | 5-5/16" |
| Maximm Dianete | r | | | | 2-1/16" |
| Bulb | | | | | ST-16 |
| Base | | 4 5 | Medium | Shell | Octal 7-Pin |
| Pin 1-No Conn | ection | ര [്] ്× | | Pin | 5-Grid |
| Pin 2-Heater | | | | Pin | 7-Heater |
| Pin 3-Plate | | @ 1 @ | | Pin | 8-Cathode |
| Pin 4-Screen | | | | | |
| | | (A) (B) | | | |
| | | BOTTOM VIE | ₩ | | * |

PUSH-PULL AMPLIFIER - Class AB1

| Plate Voltage | | 400 max. | v olts |
|--|------|------------|---------------|
| Screen Voltage | | 300 max. | volts |
| Plate & Screen Dissipation (total) | | 24 max. | |
| Screen Dissipation | | 3.5 max. | |
| Typical Operation - 2 tubes: With Values are for | | | |
| Heater Voltage | 6.3 | 6.3 | volts |
| Plate Voltage | 400 | 400 | volts |
| Screen Voltage | 250 | 300 | volts |
| Self-Bias Resistor | 190 | 200 | ohms |
| Peak A-F Grid-to-Grid Voltage | 43.8 | 5 7 | v olts |
| Zero-Sig. Plate Current | 96 | 112 | ma. |
| MaxSig. Plate Current | 110 | 128 | ma. |
| Zero-Sig. Screen Current | 4.6 | 7 | ma. |
| MaxSig. Screen Current | 10.8 | 16 | ma. |
| Load Res. (plate to plate) | 8500 | 6600 | ohms |
| Harmonic Distortion: | | | |
| Total | 2 | 2 | % |
| Third | 2 | 2 | % |
| Max. Sig. Power Output | 24 | 32 | watts |

TUBE DATA

807 TRANSMITTING BEAM POWER AMPLIFIER

| Heater | Coated Unipotential Cathode | | |
|-----------------|-----------------------------|----------------|------|
| Voltage | 6.3 | a-c or d-c v | olts |
| Current | 0.9 | a | m. |
| Transconductanc | e for | | _ |
| plate current | of 72 ma. 6000 approx. | ,toi | nhos |
| Direct interele | ctrode Capacitances: | / | |
| Grid to Plate | (with external shielding) | 0.2 max. /y | of. |
| Input | | 11 /4/ | uf. |
| Output | | 7 /4 | af. |
| Maximum Overall | Length | 5_ | 3/4" |
| Maximum Diamete | r | 2-1, | /16" |
| Bulb | | ST | -16 |
| Cap | | Small M | etal |
| Base | M edi: | um 5-Pin, Cera | mic |

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS PLATE-MODULATED R-F POWER AMPLIFIER - Class C Telephony

Carrier conditions per tube for use with max. modulation fact. of 1.0

| D-C Plate Voltage | | | | 475 | max. | Volts |
|-----------------------------|-------|-----|------------|-------------|------|---------------|
| D-C Screen Voltage (Grid No | 0. 2) | | | 300 | max. | Volts |
| D-C Grid Voltage (Grid No. | | | | | max. | |
| D-C Plate Current | | | | 83 | max. | na. |
| D-C Grid Current | | | | 5 | max. | ma. |
| Plate Input | | | | 40 | max. | watts |
| Screen Input | | | | 2.5 | max. | watts |
| Plate Dissipation | | | | 16.5 | max. | watts |
| Typical Operation: | | | | | | |
| Heater Voltage | 6.3 | 6.3 | 6.3 | 6.3 | | volts |
| D-C Plate Voltage | 275 | 325 | 400 | 475 | | volts · |
| D-C Screen Voltage | 250 | 225 | 225 | 225 | | volts |
| D-C Grid Voltage | -45 | -45 | -50 | ~ 50 | | volts |
| Peak R-F Grid Voltage | 75 | 70 | 7 0 | 70 | | volts |
| D-C Plate Current | 80 | 80 | 80 | 83 | | ma. |
| D-C Screen Current | 10 | 9 | 9 | 9 | | ma. |
| D-C Grid Current | 3.3 | 3 | 2 | 2 | | ma. approx. |
| Driving Power | 0.22 | 0.2 | 0.13 | 0.13 | | watt approx. |
| Power Output | 12 | 15 | 19 | 24 | | watts approx. |

TRACED BY: R.G.A. DATE: 9 - 22 - 1939 CEDAR RAPIDS. IOWA

UNIT: 115F-4 BAND PASS FILTER SCHEMATIC

TRACED BY: R.G.A. DATE: 9 - 22 - 1939 CEDAR RAPIDS. IOWA

DATE: 7 - 11 - 1939 CEDAR RAPIDS. IOWA

DRAWING NO. 798A-1

RESTRICTED

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