SERVICE NOTES

B&W MODEL 5100 TRANSMITTER

The Service Notes attached herewith have been compiled as a supplement to the maintenance and service data given in the Instruction Manual furnished with each Model 5100 Transmitter.

Each registered owner of the Model 5100 is requested to be thoroughly familiar with such information as provided in the Instruction Manual and these additional notes as well, in order that certain normal functions of the equipment are clearly understood.

Each of the service notes has been written in brief form, but they will serve as clues to certain causes of difficulties, if such are encountered.

The Back-Wave Modification is same as used in converted Model 5100's for SSB operation. It is highly recommended for CW or Phone break-in type operation, particularly when a separate receiving antenna is permanently connected to the receiver and no antenna change-over relay is used.

Other notes included, such as TVI and Sub-Harmonic Radiation, have been provided for the purpose of disclosing certain facts and conditions beyond normal control.

BARKER & WILLIAMSON, INC.

BRISTOL, PENNA.

SERVICE NOTES

MISCELLANEOUS

BASSY MODULATION - Improper Mod. Resting Plate current, Defective Microphone or Tubes, Defective cathode resistor in 6AQ5 Audio Driver - R37. Replace with 470 ohm 1 watt. Defective cathode bypass condenser C-53, defective audio feedback resistor R35. Defective Modulation Transformer - defective Audio Control - R-30- Any one or a combination of two or more of the above can be the cause for this condition. Also make sure 500 ohm Terminal Jumpers on Terminal Strip are not shorting against shield cover.

BACK-WAVE - See modification to Buffer and bias voltage system - attached.

CABINET VIBRATION- Caused by magnetic field of High Power Transformer T-3. Replace cork wedges between cabinet and transformer - they may have fallen off during shipment. Tighten all lamination bolts and chassis mounting bolts and nuts.

CRACKING-FRYING-BUZZING NOISE - Caused by expansion or contraction of R-53 AC Line Voltage dropping resistor element. This is a normal condition.

EXCITATION CONTROL HAS LITTLE EFFECT - This is a small variable condenser in the grid circuit of the Final Amplifier. It functions in conjunction with broadly resonant coils. Its affect is more pronounced at the higher frequencies and becomes less apparent at the lower frequencies. It is functioning as intended in the design. Hence, it is a normal condition.

EXCESSIVE DRIVE - Normally caused by high AC Line Voltage or improper loading of Final Amplifier, defective screen and/or cathode bypass condensers in Multiplier section causing regeneration.

LOW DRIVE - Normally caused by low AC line voltage, overloading of Final Amplifier, also defective tubes in R.F. stages preceding Final. High bias will also cause low drive. A few early Model 5100's do not include a bias loading resistor R62 - 10 watt 2000 ohm unit. Check and if missing in your equipment, connect an R62 as given above between Pin #3 of V15 to ground. All equipments with serial numbers higher than 553 have R62 included.

ERRATIC OPERATION - Check all tubes for standard performance - check for possible loose soldered connections to each Tube Socket, Jones Plug and Socket Connectors, Rotary and Toggle Switch solder connecting points. Check connections to Control Relay and its operation. Check all shielded wire connections and make sure outer shield braid is dressed back away from inner conductor avoiding possibility of a short. This instruction applies to all shielded wires entering and leaving the VFO-Buffer Units or other points where shielded wire is used. Proceed as further directed on Pages 7 and 8 of Instruction Manual. Also check for shorted leads under Jones Plug Connector covers.

FUSE BLOW-OUTS - Caused by defective Final Amplifier tubes, shorted components, high A.C. Line Voltage. When it is determined that no shorts exist and tubes are all normal, but fuses still blow out, replace present 5 Amp. fuse with 7 or 10 Amp. types physically same as originals.

HUM AND SCRATCHY QUALITY ON PHONE - Check for defective 6BJ6 tube in VFO, also check for defective VR tube which may be oscillating. Check resonating capacitor C74 across CHI.

INCREASE IN PLATE CURRENT ON CW VERSUS PHONE - Please refer to information given below under Meter Switch.

METER SWITCH - In the Grid Position the reading obtained is Screen Grid Current of Final Amplifier. Do not mistake this reading for Grid Current of Final. A reading of 17 to 20 mils with Function Switch in Phone Position is normal, depending on local AC Line Voltage which has an influence on this reading. Full scale value of meter is 40 mils with Meter Switch in Grid Position.

When Function Switch is in C.W. Position the meter reading will be higher - approximately 20 to 40 mils, again depending on AC line voltage. The increase in reading is due to higher voltage applied to Plate and Screen of Final in CW position. Refer to Page 5 of the Instruction Manual - Paragraph #3 under Meter Switch for other details in Meter Readings.

PLATE CURRENT CREEPS ON PHONE OPERATION - Caused by low drive or defective 6146 in Final. Check screen current for proper value, if low, check line voltage, 6AQ5 tubes in Multiplier, 5Y4G Rectifier and D.C. Plate voltage on Multipliers.

PLATE CURRENT GOES OFF SCALE - Normally caused by defective 6146 tube in Final, no bias voltage or shorted component. Check Final tubes, C40, C44 and bias voltage divider R-49. Also check continuity of Control Relay Coil.

ROUGH NOTE ON C.W. - Check for a defective VR tube which may be oscillating.

R. F. FEEDBACK - Caused by high SWR in feed line circuit, Poor Ground, Balun located too close to transmitter. When corrections have been made to causes given above and trouble persists, insert a 10,000 ohm ½ watt resistor in series with high side of microphone lead back of microphone connector on underside of chassis inside of shield cover. Late Model 5100's with serial numbers higher than 553 have the 10,000 ohm resistor included in this circuit.

RESTING PLATE CURRENT - Should be 50 mils. for both Modulator and Final. Adjust clip #2 on R-49 for correct value on modulator and clip #4 for Final. When modification for SSB operation and latest Back-Wave elimination using two Potentiometers have been made, the Pots are adjusted instead, since R-49 has been deleted, Resting Plate Current of Mod. and Final will vary from normal settings with Local Line Voltage fluctuations. No readjustment of the bias voltages are required under temporary line voltage changes.

NO FINAL PLATE CURRENT READING - PLATE VOLTAGE CHECKS NORMAL - Caused by excessive high bias on final - check R-49 bias voltage divider for open circuit. Final bias should be approximately 65 volts minus when checked between clip #4 of R-49 to ground.

SELF OSCILLATION - This is normally recognized by a fluttering condition of the Final Plate and Screen current reading on the meter. In a few early Model 5100's,

a shielded lead approximately 4 inches long with Phono plugs on each end is used to interconnect the output of the Buffer and input of Multiplier R.F. Final Amplifier. Removing the shield braid of this lead will correct this difficulty as well as Hum, Rough CW note and possibly TVI in some cases.

SLIPPING DIAL DRIVE - This is caused by a tightly strung dial drive cord. To correct, pull chassis from cabinet part way only and just enough to expose Dial Drive Drum. Turn Dial until slot in Drum faces upward. This will bring dial cord tension spring into view. Using a long nose pair of pliers, grip the dial cord at a point immediately above the tension spring and pull upwards enough to stretch the tension spring a degree or two enough to loosen the cord a little. Try out and if slipping is still evident, re-eat operation given above until dial runs smoothly without slipping. Lubricate dial pointer slide with lubriplate.

VR TUBES DO NOT IGNITE - Cause is low AC line voltage when VR105 is the case. Shorted components will cause both VR tubes to go out. Cause in both cases may also be defective VR tubes.

VR-105 TUBE GLOWS TOO BRIGHT AND FLICKERS - See information given under Low Drive regarding high bias etc.

SUB-HARMONIC RADIATION - See separate service note attached.

SCHEMATIC ERRORS - See corrected circuits attached to these Service Notes.

TELEVISION INTERFERENCE - TVI - See separate service note attached.

SERVICE NOTES

TVI

Every precaution has been taken in the design and production of the B&W Model 5100 Transmitter to eliminate the basic causes of TVI. These precautions include effective by-passing and filtering of the most critical leads likely to contribute to this cause of interference and adequate shielding. The Low Pass Filter employed as an integral unit, provides more than 100 D.B. of attenuation to harmonics related to TV channel #2 and better than 85 D.B. throughout other TV channels.

Even though all of these precautions have been taken and included in the 5100, no claim is made with respect to freedom from Television Interference because it is still possible to cause interference due to other causes outside of the Transmitter.

One source of outside causes is the result of rectification of the fundamental frequency currents induced in conductors in the vicinity of the transmitting antenna. Such rectification can take place at any point where two conductors are loose and in poor electrical contact. These conditions can occur and frequently exist in water pipes, electrical conduits, downspouting and other miscellaneous metallic objects normally found in a residence. Poorly soldered or clamped joints in an antenna system are especially bad. Another common source of this interference is nearby TV receiving antennas which have been erected for extended periods and having corroded joints.

There is nothing that can be done at the transmitter or TV receiver when this type of external rectification takes place, which probably explains, why Joe Doaks has no TVI, while John Doe is plagued with it.

The only remedy in such cases is to find the source and eliminate the poor contacts either by separating the conductors causing the trouble or bonding them firmly together.

Still another source of outside causes of TVI for which the transmitter is not responsible is front-end overloading of the TV receiver, when TV receiving antennas and the transmitting antenna are in close proximity to each other. The intense R.F. signal from the transmitter's fundamental may overload one or more of the TV receivers circuits to produce spurious responses.

Additional harmonic suppression at the transmitter will do no good in such cases, but any means taken to reduce the transmitted fundamental strength at the front end of the TV receiver will effect an improvement. A High Pass Filter properly installed in the front end of the TV receiver will in most cases cure this type of interference.

There are also other causes of TVI which fall into the classification of outside causes. Among these are insufficient selectivity of TV receivers. (Unfortunately many of the older type thus affected are still in use.) Mixing of an amateur frequency and that of an FM station producing a beat or third frequency which by sheer chance happens to be equal to a local TV frequency is still another source of outside causes.

Space does not permit covering others, but those given above cover the most common sources of Television Interference when it is reasonably expected that the Transmitter is not at fault.

A good source of information along these lines with proven methods of cure is the book titled "Television Interference" published by Mr. Philip Rand, W1DBM. Other valuable information may be found in the ARRL Handbook.

MODEL 5100 - SERVICE NOTES
SUB-HARMONIC RADIATION

The circulating power in an R.F. Final Amplifier Tank circuit is composed of the fundamental output power in a major degree. However, other frequencies in a lesser degree are also contained. These other frequencies include power from preceding multiplier stages and related higher order harmonics of the fundamental.

This is a common condition in all Transmitters - composit home built types and commercially built equipments alike. The magnitude of these undesirable frequencies depends largely on design features and means taken to keep them at a minimum. However great these efforts have been in design, toward attenuation of the unwanted frequencies, a small percentage is always present. In most commercially built equipments, the value of such undesirable frequencies amounts to only a fraction of a watt.

Although a fraction of a watt does not sound like much power, it can radiate over considerable distance, depending on certain factors which include band conditions and local antenna types and installation methods.

In most cases these unwanted frequencies are not radiated, particularly when fundamental type antennas are used. These include the beam and single frequency half wave type antennas which have an effect of discriminating against all frequencies except the fundamental, for which the antenna has been cut.

Use of Multiband type antennas exaggerates the radiation of harmonics and sub-harmonics as well, when the antenna is resonant at these frequencies. This is due to the broad acceptance nature of the Multiband antenna which offers no discrimination against unwanted signals and thus proceeds to radiate the operating frequency along with the unwanted signals within its fundamental and harmonic range.

However, the Multiband antenna is not to be condemned because of this fault, since its advantages in providing a means for many operators to utilize other bands when space does not permit erection of separate antennas for each band, are not to be overlooked.

Experience with the B&W Model 5100 Transmitter, based on reports from owners of these equipments using the popular "Windom" Multiband antenna, indicates that a few are experiencing 80 meter sub-harmonic radiation when operating on the 40 meter band.

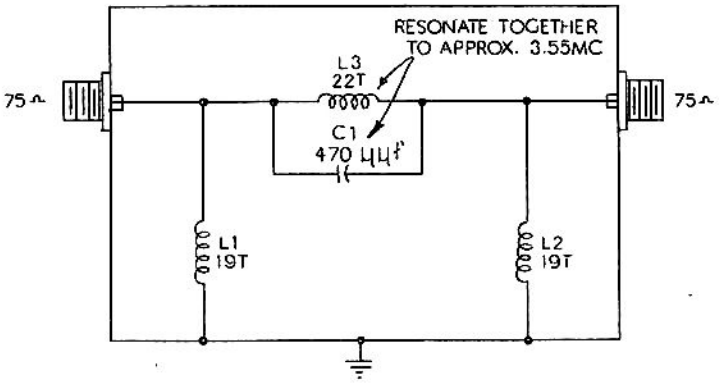
Many users of the Windom Antenna with the Model 5100 are not similarly affected, and it is assumed that this condition when evident, is the combination of the factors outlined above.

An adequate means of correcting the 40 meter sub-harmonic in troublesome cases, is the use of a High Pass Filter connected in series with the output of the transmitter.

A circuit diagram of an easily constructed and effective High Pass Filter is attached. It is understood that this filter must be removed from the feed line circuit when operating on 80 meters, but it may be left in the circuit when operating on any of the other bands. Its use will provide at least 25 D.B. attenuation of the 40 meter sub-harmonic.

FILTER NETWORK

(80 METER REJECTION FOR 40 METER OPERATION)



1 ALL COILS ARE MODIFIED #3011 MINIDUCTORS
2 CAPACITOR IS 2500V. TRANSMITTING TYPE
3 FOR BEST RESULTS, ASSEMBLY SHOULD BE SHIELDED
4 MAY BE LEFT IN TRANSMISSION LINE FOR ALL BANDS EXCEPT 80 METERS

BACK - WAVE INTERFERENCE

The B&W Model 5100 employs a free running oscillator (VFO) for stability purposes. When the A. C. Line Voltage Switch is turned on, the VFO is immediately energized and runs continuously thereafter unless crystal operation is desired and the Crystal-VFO Selector Switch is thrown to the Crystal Position. This switch de-energizes the VFO.

Under conditions of spot frequancy operation on phone or break-in type C.W. where separate antennas are used for Receiving and Transmitting, back-wave from the VFO will be noticed. The degree of this interference is a matter dependent on the sensitivity of the Receiver and proximity of the Receiving and Transmitting Antennas with respect to each other as well as the strength of the received signal. This interference is evident on the 40 and 80 meter bands only.

When a single antenna fed with coax line is used for both transmitting and receiving and an appropriate coax type antenna change-over relay is used in conformance with recommendations given in the supplementary sheets included with each Instruction Manual, the back-wave interference is suppressed to a level where it does not interfere with any signals received on the operating frequency.

Since there are many cases where break-in type operation is paramount, a modification has been prepared for eliminating the back-wave interference. This modification includes complete drawings showing wiring changes and step by step instructions covering the changes required to the Buffer stage and Final Amplifier Bias system as well as the placement of a few new parts required.

This same modification is included with Model 5100-S transmitters which are factory produced models for use in conjunction with the Model 51SB Single Sideband Generator which provides a combination assembly for operation on AM-CW and SSB utilizing either Crystal or VFO for any mode of operation.

MODIFICATION TO REDUCE BACKWAVE

This modification will reduce the back wave on 80 and 40 meters by at least 100 db. The modification consists of two parts:

1. The buffer is modified by a simple circuit change, and the addition of one resistor and one capacitor.

2. The Bias circuitry is rewired so that the R.F. final amplifier is cut off when the key is up. Bias adjustments to the modulator tubes, and the R.F. final amplifier are simplified by the addition of bias potentiometers.

Note that the procedure for adjusting the R. F. final amplifier CW resting current is modified. When the two modifications described above have been completed, the CW and Modulator resting current should be checked in accordance with the attached instructions.

Remove Model 5100 transmitter from its cabinet, pull out all tubes from chassis to prevent breakage, and remove Multiplier.

1

BUFFER MODIFICATIONS

Proceed as follows:

1. Remove the "Buffer-Xtal Osc." Unit from the Transmitter.

2. Remove bottom shield from the unit by removing the six screws on the sides.

3. Referring to the accompanying drawing, disconnect the parallel combination of L4 and C11 from the ground lug of J1, and connect and solder to junction of R64 and C82 as shown.

4. Connect and solder other end of C82 to ground lug as shown.

5. Connect and solder R64 and R7 as shown.

The Buffer Modification is now complete, and should be checked to make sure that this wiring agrees with that shown on the drawing. The shield may then be placed back on the Buffer Chassis, and the Unit reinstalled in the Transmitter.

2

BIAS MODIFICATION

Layout and drill 4 holes in the chassis as shown on the accompanying drawing. After drilling holes, turn transmitter on its side (so under side of chassis is easily accessible for modification).

Proceed as follows:

1. Place two 5,000 ohm pots. (R84 & R85) in 13/32" dia.holes, and secure in place.

2. Place five terminal tie point (TP2) in 5/32" dia. holes. Tighten the nut nearest the front panel, leave other nut loose for mounting of sub assembly #1. At this point connect and solder resistors R66, R67, R68, and R69 as shown, also connect jumper wire between 3 and 5 of TP2.

3. Prepare Sub Assembly #1

a. Carefully remove C70 from terminal 4, of J5 (12 pin Jones Conn.) and ground lug on mounting screws (nearest back of chassis) of R49.

b. Prepare Sub-Assembly #1 by using 4 terminal tie point (TP3) and two resistors (R71 & R70), and C70 (removed in (a)). Connect these items as shown by attached drawing. (Observe polarity on C70). Also connect jumper between terminals 1 and 2 of TP3, and attach 2" Blue lead to Terminal 3 of TP3.

c. After completing sub-assembly #1 attach the entire sub-assembly to TP2 by means of mounting tab on TP3. Tighten nut to secure position.

d. At this time connect other end of 2" Blue lead to Terminal 1 of TP2.

4. Delete resistor (R55) which is connected from SW4 Section B Terminal 4, and terminal 6 of R49 (end towards back of chassis).

5. Delete R49 by unsoldering all wires, and removing mounting screws.

a. The one terminal tie point (TP1) is then mounted in mounting hole of R49 (one nearest back of chassis). Place solder lug over mounting screw before securing into place.

b. Connect wires removed from R49 to TP1 as shown by attached dwg. Two leads (WH-Red & Wh-Grn-Blk) are to have additional lengths added. (Be sure to tape wires securely after splicing). One 12" (Wh-Orn) lead is added at this point.

6. Remove switch SW4 from its bracket, and solder jumper wire (yellow) between Contact 1 of Section B and Contact 3 of Section E. Also solder a 12" (Wh-Orn-Blu) lead to contact 1 of Section B. Place switch back in its brackets and secure.

7. Connect other end of (Wh-Orn-Blu) lead used in step 6 to terminal 1 of TP2.

8. Connect other end of (Wh-Orn) lead used in step 5 (b) to terminal 5 of TP2.

9. After you have checked with the drawing to see that all connections are correctly made, dress wires into cable.

10. Replace Multiplier Unit and all Tubes.

11. Make sure that the bias potentiometers are in the extreme counter-clockwise (maximum bias) position before application of plate voltage.

Bias modification is now complete. R84 adjusts the grid bias on the final R.F. tubes, while R85 adjusts the grid bias on the Modulator Tubes.

PROCEDURE FOR ADJUSTING MODULATOR RESTING CURRENT

1. Set the transmitter into Phone operation, and check the MOD current. Adjust the bias potentiometer R85 until 55 MA. is indicated.

PROCEDURE FOR ADJUSTING CW RESTING CURRENT

With CW operation, the resting current can no longer be set properly under Key-up conditions. Under Key-up conditions, the R.F. final amplifier is biased to cut-off. To adjust the resting current, proceed as follows:

1. Remove the excitation plug P2 from the excitation Jack J2 on the Multiplier Unit.

2. Warm up the Transmitter by throwing the A.C. Line Switch to the ON position, the meter switch to the AMP position, and the function switch to the CW position.

3. Throw the plate switch to the ON position. If the plate current is below 100 MA., throw the Tune-Operate switch to the Operate position. If the plate current is above 100 MA. in the Tune position, check for faults.

4. Adjust the bias potentiometer R84 until 55 MA. is indicated.

5. Turn off the Transmitter, and replace the excitation plug P2 in J2.

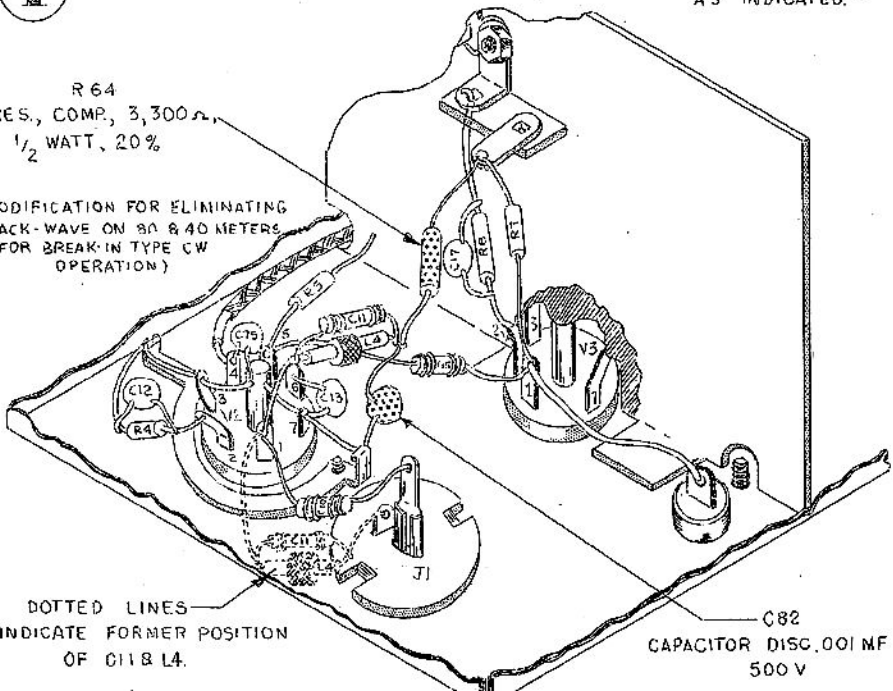
6. Set the Transmitter into CW operation, and check the operation to see that it is functioning properly.

7. Check the operation of the Transmitter on Phone and CW. If the transmitter is functioning properly, turn it off and return it to its cabinet.

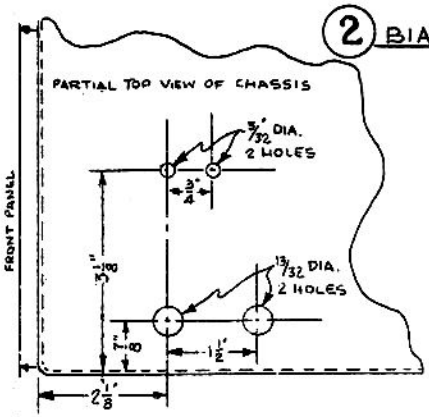
1

PARTIAL WIRING DIAGRAM
BUFFER-XTAL OSC.

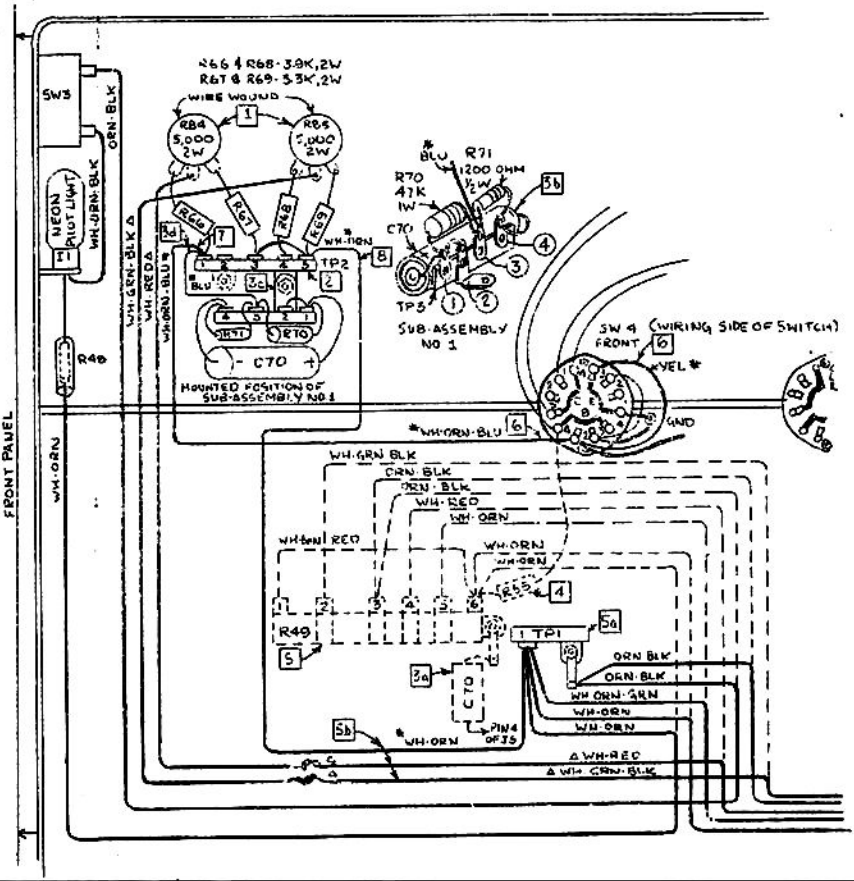
R64 & C82 TO BE ADDED
CHANGE POSITION OF C11 & L4
AS INDICATED.



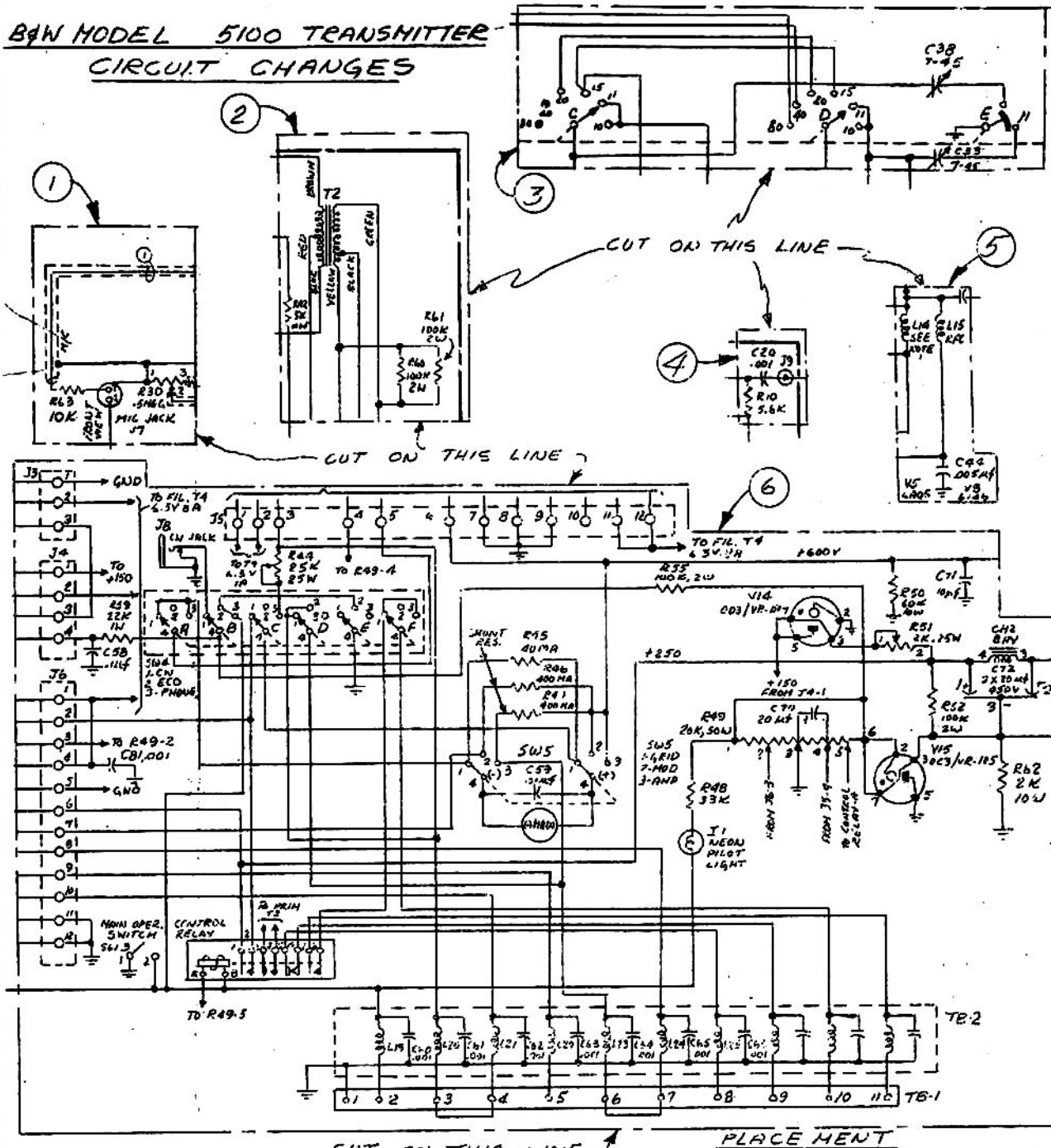
(2) BIAS MODIFICATION



NOTES:
1. ▼ INDICATES 4 ADDITIONAL WIRES (WH-OR, WH-ORN-BLU, BLU & YEL)
2. Δ INDICATES EXISTING WIRES WHICH ARE TO BE SPLICED FOR ADDITIONAL LENGTH (WH-RED & WH-GRN-BLK)
3. DASHED LINES (- - - -) INDICATE FORMER ARRANGEMENT, SOLID LINES & HEAVY CONNECTIONS (——) SHOW MODIFICATION.



B&W MODEL 5100 TRANSMITTER CIRCUIT CHANGES



NOTE:
THESE CORRECTED CIRCUITS HAVE BEEN DRAWN TO SCALE. CUT OUT AS SHOWN AND PASTE ON INSTRUCTION MANUAL SCHEMATIC IN PROPER PLACES AS INDICATED BY CIRCLED NUMBERS (1)(2)(3)(4)(5)(6).

INSTRUCTIONS FOR ADAPTING THE B&W MODEL 5100 TRANSMITTER FOR USE WITH THE B&W MODEL 51SB SINGLE SIDEBAND GENERATOR

Read these instructions over Carefully and Completely before proceeding on Modifications

1. After making sure that it is functioning properly, remove the Model 5100 Transmitter from its cabinet, then remove the Multiplier-Final Amplifier Unit from the Transmitter.

2. Remove all tubes from the Multiplier-Final Amplifier Unit.

3. Before making any changes, study the layout at the rear of the unit and compare with the accompanying modification drawing. Note that no parts are removed from the unit in the modification. We do however, add a switch and bracket assembly, three capacitors, one resistor, and the necessary hardware, wires, and cables. When properly wired, the function of the switch in the "SSB" position is to connect the RF output of the multiplier section to the RF input of the Model 51SB, and at the same time, connect the RF output of the Model 51SB to the grids of the RF power amplifier. It also provides for metering the grid current of the power amplifier tubes by means of the meter on the Model 51SB. Placing the switch in the "Norm" position restores the Model 5100 Transmitter to normal operation for conventional AM telephony or CW.

4. Delete spaghetti covered wire connecting excitation control C36 to R24. (This is the wire passing through grommet [6] , and is deleted in drawing.)

5. Remove switch nut and washers, [1] , and mount terminal strip, item (3) , with two shakeproof washers, item (1) , and $\frac{1}{2}$ x 5-40 nut, item (2) , while holding switch bolt from inside of chassis to prevent bolt from turning.

6. Remove switch nut and washers, [2] , and mount lockwasher type solder lug, item (4) , with the $\frac{1}{2}$ x 5-40 nut, item (2) , while holding switch bolt from inside of chassis to prevent bolt from turning.

7. Fasten solder lug and lockwasher, items (5) and (6) , under screw [3] .

8. Solder jumper wires between switch contacts as shown on detail of switch wafer.

9. Remove top screw, [5] , from chassis; attach switch and bracket assembly, item (7) , to chassis by means of screw, [5] , and lockwasher, item (6) .

10. Drill hole (7/64" dia. or #35 drill) through chassis, using mounting hole in switch bracket as template. Before drilling hole, make sure that top edge of bracket is parallel to top edge of chassis.

11. Add screw, item (8) , and lockwasher, item (6) , to secure switch bracket to chassis.

12. Solder capacitor, C403, item (14) to switch contact, solder lug, and terminal strip as shown in note 2 and drawing.

13. Fasten solder lug, item (5) , under nut [4] .

14. Solder green lead "G" between switch contact and terminal strip as shown. (Make lead short as possible.)

15. Solder White-Green lead, "E", between switch contact and terminal strip as shown. (Make lead short as possible.)

16. Solder shielded input cable assembly, item (11) , to terminal strip, item (3) , and solder lug, item (4) , as shown.

17. Solder R401 and C401, items (9) and (10) , between switch contact, terminal strip, items (3) , and solder lug, item (4) , as shown.

18. Remove screw [8] from chassis (shown deleted on drawing), and solder violet lead, "C", to switch contact and excitation control C36, passing wire through hole left by removing screw [8] . (DO NOT pass this wire through the grommet hole [6].)

19. Solder meter cable assembly, item (12) , to switch (White-Green) and terminal strip (Green) as shown.

20. Solder capacitor, C402, item (14) , between terminal strip and solder lug, item (5) , as shown.

21. Solder output cable, item (13) , to switch and ground lug of V9 as shown.

22. Fasten cable clamp, item (15) , over cables, item (11) and (12) , by means of screw [7] and lockwasher, item (6) , as shown.

23. After checking carefully to make certain that all connections are properly made, replace all tubes in the unit. Before reinstalling the unit back in the transmitter, make the necessary modifications on the Crystal Oscillator and Buffer Unit, and on the bias voltage circuits in accoradance with the instructions supplied with each kit.

Before replacing the transmitter back in its cabinet, holes must be drilled or punched on the right side of the cabinet. These include four (4) 5/16" Dia. holes for bolts, and two (2) 1" Dia. holes for cables.

Proceed as follows:

24. Remove the Model 51SB Single Sideband Generator from its cabinet by removing the two retaining screws on bottom of cabinet and the six retaining screws on the front panel.

25. Place the two cabinets, side by side, on a flat surface with the Model 51SB cabinet on the right side of the Model 5100 cabinet. Making sure that the front ends and the tops of the cabinets are flush with each other, clamp with two cabinets together to prevent one from moving with respect to the other while marking hole locations. Using the 51SB cabinet as a template, mark the hole locations on the 5100 cabinet by means of a scriber, or other sharp instrument. After separating the two cabinets, and locating the hole centers, drill or punch the holes in the 5100 cabinet. The bolt holes should be 5/16" Dia. while the other two should be 1" Dia. or somewhat larger.

26. Again place the two cabinets side by side and bolt them together using the four sets of bolts, nuts, flatwashers, and lockwashers provided placing, flatwashers between cabinets.

27. Replace the units in their respective cabinets and secure.

28. Connect output cable, item (13) , to RF output terminal and ground lug on RF Unit of the 51SB through forward cable hole.

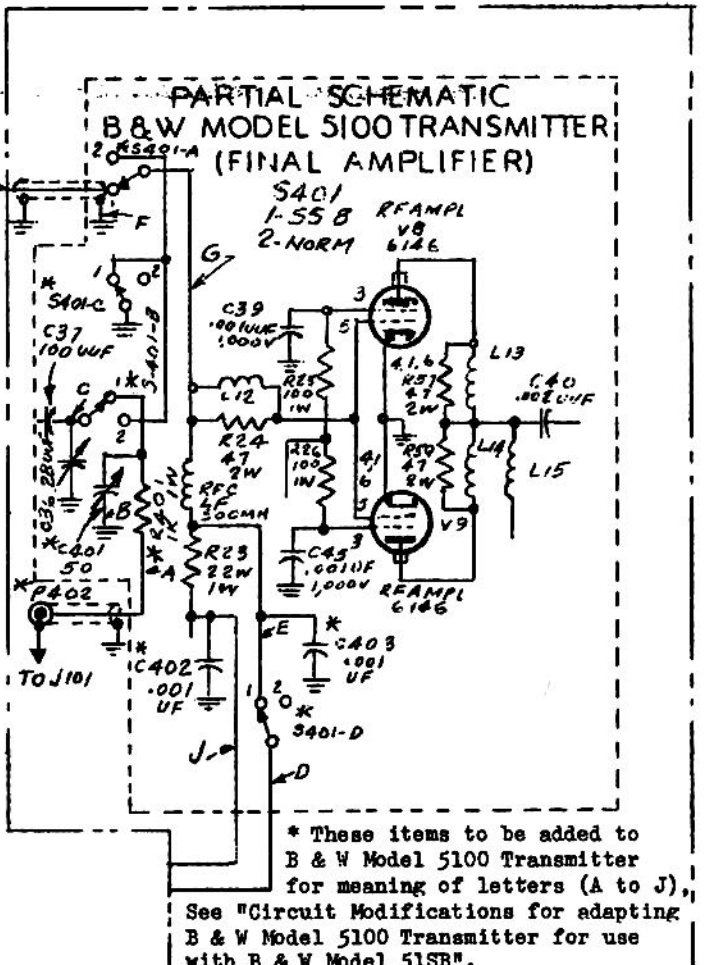
29. Plug P402 into J101 and P401 into J305 through rear cable hole.

30. Place the "SSB-Norm" switch in the "Norm" position and check the operation of the Model 5100 Transmitter as a conventional AM-CW transmitter. After making sure that operation is normal, turn the equipment off.

31. Place the "SSB-Norm" switch in the "SSB" position. The equipment is now ready to be put into operation as a Single Sideband Suppressed Carrier Transmitter. BEFORE ATTEMPTING TO DO SO, HOWEVER, BE SURE TO READ, CAREFULLY, THE MODEL 51SB INSTRUCTION MANUAL SO THAT ITS FUNCTIONS ARE FULLY UNDERSTOOD.

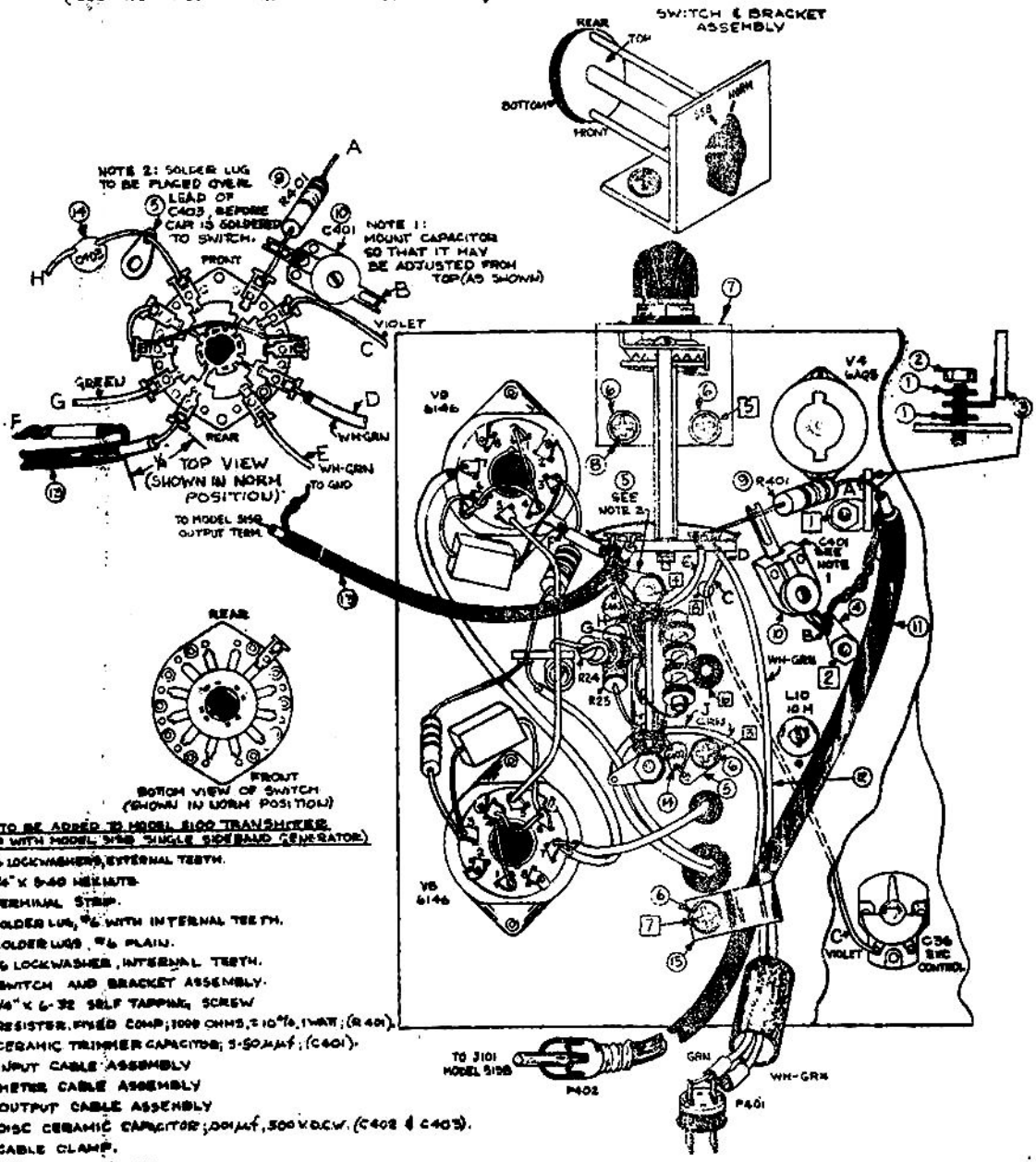
CUT SCHEMATIC ALONG OUTSIDE LINE

PASTE OVER SAME SECTION ON INSTRUCTION BOOK SCHEMATIC.



* These items to be added to B & W Model 5100 Transmitter for meaning of letters (A to J). See "Circuit Modifications for adapting B & W Model 5100 Transmitter for use with B & W Model 51SB".

CIRCUIT MODIFICATIONS FOR ADAPTING E&W MODEL 5100 TRANSMITTER FOR USE WITH E&W MODEL 5188 SINGLE SIDEBAND GENERATOR
(SEE INSTRUCTION SHEET FOR PROCEDURE)



ITEMS TO BE ADDED TO MODEL 5100 TRANSMITTER
(SUPPLIED WITH MODEL 5188 SINGLE SIDEBAND GENERATOR)

1. 2 - #6 LOCKWASHERS, EXTERNAL TEETH.
2. 2 - 1/4" X 6-40 HEX NUTS.
3. 1 - TERMINAL STRIP.
4. 1 - SOLDER LUG, #6 WITH INTERNAL TEETH.
5. 2 - SOLDER LUGS, #6 PLAIN.
6. 4 - #6 LOCKWASHER, INTERNAL TEETH.
7. 1 - SWITCH AND BRACKET ASSEMBLY.
8. 1 - 1/4" X 6-32 SELF TAPPING SCREW
9. 1 - RESISTOR, FIXED COMP; 1000 OHMS, ± 10%, 1 WATT; (R 401).
10. 1 - CERAMIC TRIMMER CAPACITOR; 5-50 μμf; (C401).
11. 1 - INPUT CABLE ASSEMBLY
12. 1 - METER CABLE ASSEMBLY
13. 1 - OUTPUT CABLE ASSEMBLY
14. 2 - DISC CERAMIC CAPACITOR; .001 μf, 500 V.D.C.W. (C402 & C403).
15. 1 - CABLE CLAMP.
16. #16 & #22 AWG BUS WIRE.
17. #22 AWG HOOK-UP WIRE (VIOLET, GREEN, WH-GREEN).

INSTRUCTION MANUAL - MODEL 5100 TRANSMITTER

ADDENDA SHEET #1

NOTE

The following changes have been made to current production units. These changes are not indicated by the schematic diagram in the present instruction manual, however, the parts list is up to date and includes the items used for the changes indicated below, —

1. Add 2 Resistors R60 & R61 — 100K, 2 watts in parallel, shunted across secondary of Modulation transformer T2.
2. Add 2K Resistor 10 watts R62 from terminal #3 on V15 to ground.
3. Connection change on high voltage screen feed suppy lead — from SW4 section [C] contact #3 to J#5 terminal #3.
4. Buffer — XTAL — OSC. Unit — change circuit symbol reading P2 to read J9.
5. Multiplier Final Amplifier — change value of C44 from .005 MMF. to read .005 MF.
6. Add 10,000 ohm ½ watt 20% Resistor (R63) in series with high side of microphone lead. Change to take place inside of chassis, under shield cover.
7. MICROPHONE CORD CONNECTOR FITTING
   The Microphone Cord Connector (Not Supplied) is an Amphenol 80-MC2M. Refer to page 6 of the instruction Manual for proper wiring polarity.
8. CAMLOCK FASTENERS
   Reference to the 2 Camlock Fasteners and cutaway drawing contained on page 6 under the title of "Maintenance" should be deleted. These items have been omitted due to the difficulty they produced in withdrawing the chassis from the Cabinet.
9. MODEL 5100 TUNING GUIDE
   The following dial settings are average when the Model 5100 Transmitter is terminated into a 75 ohm noninductive load circuit. Antenna loads should be such that the following settings be approximated as closely as possible.
   Final plate current for the following settings is 220 ma. in the "FONE" position. "CW" position will vary somewhat from this value.
10. CAUTION
    When no microphone is attached to the front panel connector, the audio gain control MUST be retarded to the full counter-clockwise position. Failure to do so may produce arcing at the modulation transformer output safety gap.

DIAL SETTINGS

Frequency (KC's)	Loading	Tuning
3500	3.0	8.0
4000	5.0	6.0
7000	2.0	5.0
7300	2.5	4.5
14000	2.0	4.5
14350	2.1	4.0
21000	3.0	2.5
21450	3.1	2.5
26960	2.0	4.0
27230	2.0	4.0
28000	2.0	3.5
29700	2.5	2.5

K4XL's  BAMA

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