INSTRUCTION MANUAL

for the

GLOBE

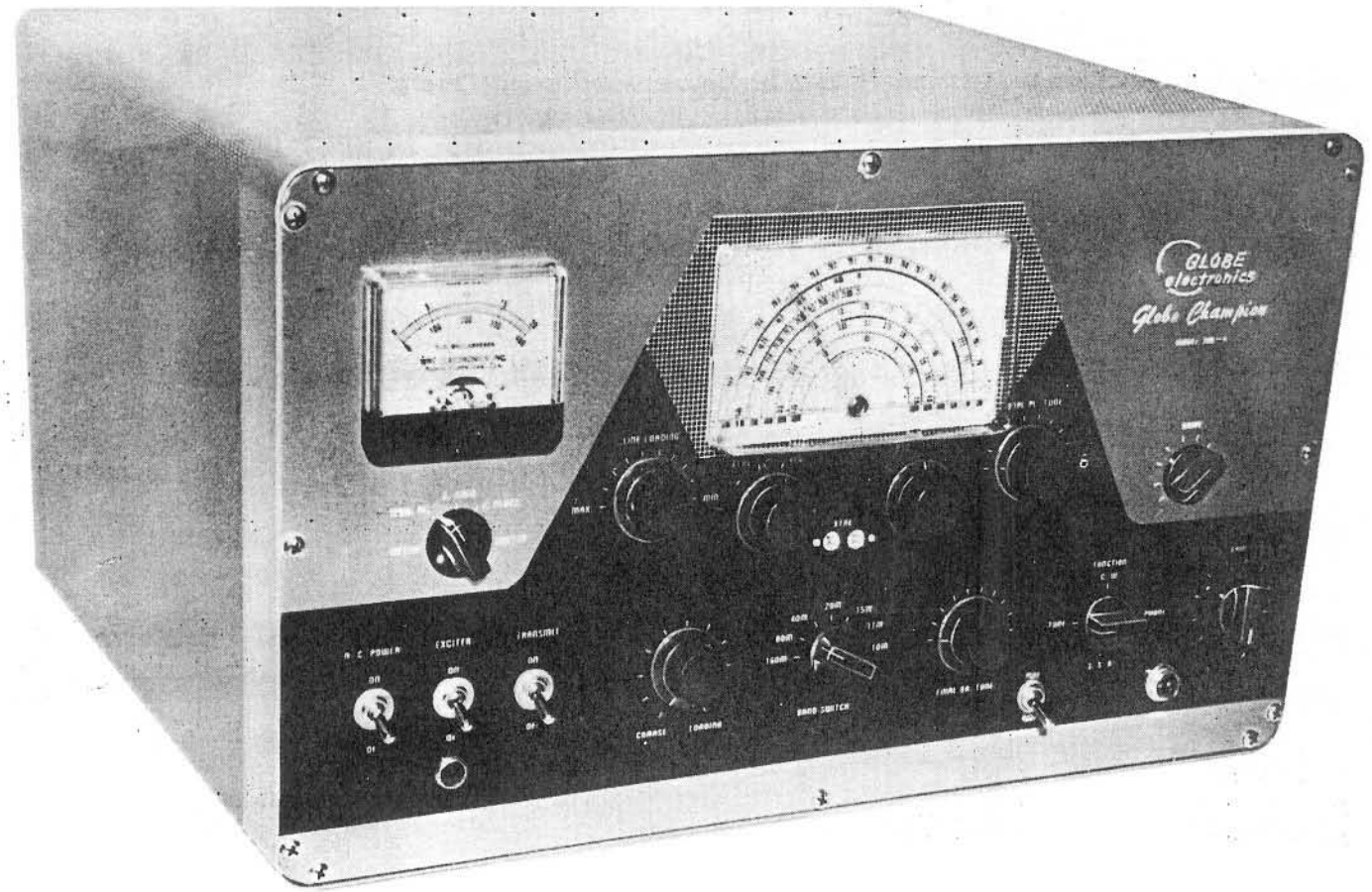
"Globe Champion"

MODEL 300-A

Manufactured by
GLOBE ELECTRONICS, INC.
Council Bluffs, Iowa

MANUFACTURERS OF

World Famous Globe Transmitters



Globe Champion, Model 300-A

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SPECIFICATIONS

FINAL POWER INPUT: 350 watts CW; 275 watts AM Phone; 500 watts SSB Peak Envelope Power (with external SSB exciter).

POWER REQUIREMENTS: 115V AC 5/50 cycles. 700 watts phone; 500 watts CW; 150 watts standby.

OUTPUT: Coaxial into 52-600 ohm antenna.

FREQUENCY CONTROL: Crystal or VFO.

BAND COVERAGE (Crystal Control)

160 Meters	1700-2600 kc
80 Meters	3275-5300 kc
40 Meters	5400-8100 kc
20 Meters	10-15 mc
15 Meters	14-23 mc
10 Meters	20-31 mc

DIMENSIONS: 12 inches high, 17 inches deep, 21-1/4 inches wide.

SHIPPING WEIGHT: 120 pounds.

NET WEIGHT: 105 pounds.

SECTION I

GENERAL DESCRIPTION

1-1. GENERAL

1-2. The Globe Champion transmitter, model 300-A is made by Globe Electronics, Inc. of Council Bluffs, Iowa. The transmitter is rated at 350 watts DC plate input power to the RF power amplifier CW operation; 275 watts radio telephony (AM) operation; or 500 watts PEP single sideband operation (with external SSB exciter that will deliver 8 to 10 watts power at the final grid).

1-3. DESCRIPTION

1-4. The Model 300-A transmitter is completely self-contained in a metal cabinet. Dimensions are 12 inches high, 17 inches deep and 21-1/4 inches wide. The top portion of the cabinet is made of perforated steel material. The use of this material provides three distinct advantages: smart appearance, excellent RF shielding and adequate ventilation for heat dissipation. Complete TVI precautions have been taken. The meter and the VFO dial are fully shielded and external leads are adequately by-passed. The unit may be removed fromthe cabinet for servicing and inspection. Power requirements are 115 volts AC, 50/60 cycles, single phase. Power consumption is 700 watts (AM) phone operation, 500 watts CW operation and 150 watts standby. Net weight is approximately 105 pounds. The tube complement is shown in Table I.

TABLE I. TUBE COMPLEMENT

Quan.	Type	Function
2	AX9909	RF Power Amplifier
1	2E26	Buffer/Doubler
1	6CL6	Xtal Oscillator/VFO Buffer
1	12AU7	Keyer Tube
1	6AU6	Microphone Amplifier
1	12AX7	Speech Amplifier
1	6AQ5	Modulator Driver
2	809	Modulators
1	6AL5	Compression Rectifier
1	6AU6	VFO Oscillator
1	0A2	VFO Regulator
1	0A2	Buffer Screen Regulator
1	5U4GB	Low Voltage Rectifier
2	866A	Hi Voltage Rectifier

1-5. THEORY OF OPERATION

1-6. A 6AU6 tube is employed as the VFO oscillator tube in a series tuned Clapp oscillator circuit. Complete coverage of the 160M and 40M bands is obtained. Maximum operating stability is governed by voltage regulation of the screen grid circuit, plus temperature compensation of the input grid tank circuit. Broad tuning of the plate circuit on the 160M and 40M bands allows maximum drive to the following stage. Capacity coupling is utilized between the VFO and the grid of the next stage. A 6CL6 tube operates as a regenerative crystal oscillator or

serves as a buffer/doubler stage for the VFO. The switching circuit in the grid of the 6CL6 serves two functions; selection of crystal or VFO input to the grid circuit and removes or applies B plus voltage to the VFO stage. Timed sequence keying bias is applied to the VFO grid circuit and to the crystal oscillator grid circuit. Bias timing is accomplished through the 12AU7 keyer stage and its respective RC circuits as follows: Bias on the 6CL6 is obtained directly from the bias line through a decoupling network. The 6AU6 VFO stage is biased through the keyer tube and its RC network in such a manner that closure of the key removes the bias from the VFO first, allowing it to come on first. Opening the key causes the VFO to go off last due to the time delay in the removal of bias to this stage. Since the VFO goes on first and off last, it follows that any transients developed in the VFO stage due to keying will not be transmitted on the air because the following stages are biased to cut off. The plate circuit of the 6CL6 stage is tuned to the 160-40 and 20M bands and is capacity coupled to the following buffer/doubler stage.

1-7. A type 2E26 tube functions as the buffer/doubler stage which drives the final amplifier. The stage is biased to very near cut-off in order to serve efficiently as a doubler. The screen grid circuit is voltage regulated and potentiometer controlled so that any degree of RF output may be obtained from this stage. The plate circuit is shunt fed through an RF choke and is capacity coupled to its tank circuit, which is in effect, the grid tank circuit of the final amplifier. This tank circuit tunes all the bands, 160 through 10 meters, and is used to resonate the buffer plate and final grid circuits to the desired operating frequency.

1-8. The power amplifier stage employs two type AX9909 tubes connected in parallel. Maximum efficiency is obtained on all bands by "straight-through" operation. Fixed and excitation bias are utilized with the fixed bias being variable. This feature allows selection of either Class B of Class C operation. Bridge type neutralization assures completely stable operation and is easily accomplished without any special equipment. The final amplifier plate circuit is shunt fed through an RF choke and is capacity coupled to the pi-network tank circuit. The pi-network output circuit will match a wide range of resistive loads from approximately 50 to 600 ohms. Proper tuning of this circuit provides a good harmonic rejection ratio. High level modulation of the final amplifier plates is employed and the screen grids are self-modulated by means of a high inductance choke in series with them.

1-9. A 6AU6 speech input tube amplifies the microphone output to a pre-determined level. Except for an audio AVC feature (explained later) conventional circuity is employed in this stage. A printed circuit couplate in the plate of the 6AU6 stage permits maximum stage gain and provides a restricted speech range. The 12AX7 speech amplifier stage is capacity coupled to the 6AU6 input stage through the volume control. The high side of the volume control is directly connected to the phone patch input jack so that high level, high impedance audio may be fed from an external source to the input of the 12AX7 speech amplifier. A printed circuit couplate is used in this plate circuit also and adequate de-coupling between stages insures operating stability. The output of the speech stage is capacity coupled to a very efficient speech filter. The speech filter limits the audio range from 200 to 3500 cycles and provides rapid attenuation above and below these frequencies. The speech filter feeds directly into the grid circuit of the 6AQ5 modulator driver stage. The 6AQ5 driver tube is transformer coupled to the grids of the modulator tubes. The output of the 6AQ5 is also

capacity coupled to a voltage doubler rectifier through a suitable filter network. The audio voltage is rectified in the 6AL5 compression rectifier, filtered through an RC network and then applied to the suppressor grid of the 6AU6 input stage as negative bias voltage. The compression ON/OFF switch removes or applies the bias voltage. Thus, it can be seen that as microphone input level increases the driver output, voltage increases; this in turn increases the bias voltage which causes a reduction of amplification in the speech input tube. Such action holds the over-all audio gain to a near constant level regardless of microphone input level. Approximately 7 db of compression is allowed using fixed circuit constants and with the volume control at mid-range. Two 809 modulator tubes are operated Class B with a fixed, regulated bias. The modulator bias is obtained from the main bias line through suitable dropping resistors. Regulation of bias is accomplished by back biasing two series connected selenium rectifiers and using the variable back resistance of the rectifiers. When the modulator grid voltage and current increase, such as during an audio peak, no action occurs until the additional voltage drop across the rectifiers exceeds the applied back bias. When the bias value is exceeded, the back resistance of the rectifiers diminish at a proportional rate so the total bias remains the same under all modulating conditions.

1-10. B plus voltage is supplied to the VFO, RF exciter, keyer, speech amplifier and modulator driver stages by a 5U4GB tube connected as a full wave rectifier circuit with choke input. Two 866A tubes connected as full wave rectifiers, with choke input filter, supply voltage to the RF power amplifiers and the modulator stages.

1-11. A terminal strip on the rear apron of the chassis provides 115V AC with the TRANSMIT switch in the ON position. This voltage may be used for the control of external equipment or accessories. The AC input line is safely fused with a 10 ampere fuse for protection of the equipment in case of a component failure. The push-to-talk circuit employs a half-wave selenium rectifier which rectifies 6.3V AC. The rectified voltage is applied to a condenser input RC filter which builds up and smooths out the rectified voltage. The DC voltage is then applied to a relay, one side of which is grounded by the microphone switch. The relay contacts are in series with the main transmitter power and the 115V AC line. Depressing the microphone switch actuates the relay. Contact closure of this relay applies voltage to the complete transmitter.

1-12. The bias supply also incorporates a half-wave selenium rectifier for rectification of 115V AC to provide a negative voltage. The negative voltage is applied to a condenser input RC filter circuit. The output of the filter circuit is connected through suitable bleeder resistors to ground. The various bias voltages are obtained from appropriate junctions of the bleeder resistors.

SECTION II

OPERATING PROCEDURES

2-1. GENERAL

2-2. The following paragraphs describe the various controls of the Globe Champion transmitter, model 300-A. Tune-up and operating procedures are outlined following the description of the controls. It is recommended that this section be studied thoroughly before any attempt is made to place the transmitter in operation.

2-3. DESCRIPTION OF CONTROLS

2-4. METER SWITCH. Connects the panel meter to any one of the following three circuits: Modulator cathode, final amplifier grid or final cathode.

2-5. AC POWER. Applies AC power to the entire transmitter.

2-6. EXCITER. Completes the low voltage B minus circuit and supplies B plus voltage to the RF exciter section and the audio speech sections.

2-7. TRANSMIT. Duplicates the EXCITER switch function and also applies AC voltage to the high voltage plate transformer and 115V AC to accessory terminal strip TS-1.

2-8. FINE LOADING. Matches the final amplifier plate circuit to the antenna load accurately and to a fine degree.

2-9. COARSE LOADING. Matches the final amplifier plate circuit to the antenna by the addition of capacity in steps of 200 mmfd.

2-10. XTAL-VFO. Connects the crystal or VFO output to the 6CL6 grid circuit. Removes VFO B plus when in XTAL position.

2-11. BANDSWITCH. Selects the proper value of inductance for each band in the following stages: VFO grid and plate, 6CL6 plate circuit, final amplifier plate circuit.

2-12. OSC. TUNING. Varies the VFO tuning capacity for each band of operation.

2-13. FINAL GR. TUNE. Varies the buffer stage plate circuit tuning capacity for each band of operation.

2-14. FINAL. PL. TUNE. Varies the final amplifier plate circuit tuning capacity for each band of operation.

2-15. FUNCTION. A four-position rotary switch. TUNE position: Places a high resistance in series with the final amplifier screen grid circuit to limit the final amplifier plate current. CW position: Shorts the screen grid modulating choke and the modulation transformer secondary. Also removes B plus voltage from the modulator plate circuit. PHONE position: Applies B plus voltage to the modulator tubes, removes the short from the screen grid modulating choke and modulation transformer secondary. SSB position: Changes the final amplifier grid bias voltage for Class B operation. Shorts the screen grid modulating choke and the modulation transformer secondary. Also removes B plus voltage from the modulation tube plates.

2-16. DRIVE. Controls screen grid B plus voltage of the buffer stage thereby controlling RF drive to the final amplifier grid.

2-17. GAIN. Controls the amount of audio drive to the speech amplifier stage thereby controlling the percentage of modulation of the RF carrier. Switch attached to tehis control supplies filament voltage to speech tubes.

2-18. COMPRESSEION. Supplies negative AVC voltage to the suppressor grid of the microphone amplifier stage when in the ON position. This controls the overall gain of the speech and driver stages and prevents over-modulation of the carrier when operated in accordance with procedures outlined in this manual.

2-19. EXTERNAL CONNECTIONS.

WARNING

Before making any external connections to the transmitter, remove the AC power cord plug from the AC source receptacle. Also place the TRANSMIT switch to the OFF position. The first external connection should be a good ground to the GROUND terminal located on the rear of the transmitter. See paragraph 2-26. Do not make any external connections as yet.

2-20. XTAL. Crystal socket. Complete amateur band coverage, 160 through 10 meters, with 160M, 80M and 40M crystals. Located on front panel.

2-21. MIC. Microphone connector on front panel. Pin 1 connects the microphone to the grid of the 6AU6 input tube. Pin 2 connects the microphone switch to one side of the push-to-talk relay.

2-22. PATCH-IN. A phone jack located on rear of chassis. Permits insertion of an external high impedance audio signal to the high side of the audio gain control independently of the microphone input.

2-23. KEYER ADJ. Control located on the rear of the chassis. Regulates the amount of bias voltage to the keyer tube which in turn regulates the VFO keying characteristics.

2-24. SSB. A receptacle located on the rear of the transmitter. Permits the insertion of an external SSB generator signal direct to the final amplifier grids through an isolation condenser.

2-25. KEY. A jack located on the rear of the chassis. Connected to the bias line through an isolation resistor. Controls the operation of the keyer tube and the 6CI6 stage for CW operation.

2-26. GROUND. Terminal located on the rear of the chassis. Attach a good electrical ground to this terminal.

CAUTION

Read paragraph 2-19 before making any external connections.

A No. 10 copper wire connected to a cold water pipe, or to a 6 or 8 foot ground rod driven into the ground is usually satisfactory. Should difficulty be encountered in achieving a good ground on the higher frequency bands, it may be that the length

the following tubes into their respective sockets: two 809, two 866A and two AX9909. Attach the appropriate plate caps. Check the remaining tubes for proper positioning and seating. Slide the chassis back into the cabinet, being careful to keep the AC line cord from being wedged between the cabinet and the rear apron of the chassis. Install the twelve panel mounting screws and the three self-tapping screws that were previously removed. Install the panel mounting screws carefully to avoid marring the panel.

(c) Make certain the AC power cord plug is removed from the AC power source receptacle.

(d) Make certain the TRANSMIT switch is in the OFF position.

(e) Attach a #10 grounding wire to the GROUND terminal of the transmitter.

(f) Connect the antenna feedline to the coaxial receptacle labeled ANTENNA.

(g) Connect the receiver antenna leads to the coaxial receptacle labeled RCVR. ANT.

2-34. Proper tune-up is necessary for optimum performance of the Globe Champion transmitter. Attempted operation of the transmitter without proper tune-up may result in damage to the equipment or spurious radiations outside the assigned amateur bands.

2-35. TUNE-UP PROCEDURE - CRYSTAL OPERATION

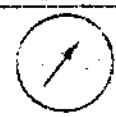
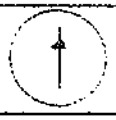
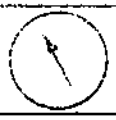
1. Place the three toggle switches, AC POWER, EXCITER and TRANSMIT, in the down or OFF position.
2. Insert the AC power cord plug into a 115V AC-60 cycle source receptacle.
3. Place the AC POWER switch in the up or ON position. Allow a three minute warm-up period.
4. Place the BANDSWITCH to the desired band of operation.
5. Place the XTAL-VFO switch to the XTAL position.
6. Select the proper crystal for the frequency from the crystal chart, Table II. Insert the crystal into the XTAL socket on the front panel of the transmitter.

TABLE II. CRYSTAL CHART

Band	Crystal, Frequency Limits
160 Meters	1800-2000 kc
80-75 Meters	3500-4000 kc
40 Meters	3500-3650 kc
20 Meters	7000-7175 kc
15 Meters	7000-7150 kc
10 Meters	7000-7425 kc

7. Place the FUNCTION switch to the TUNE position.
8. Place the METER switch to the F. GRID position.
9. Place the DRIVE control to the mid-scale position. The white indicator line should point straight up.
10. Rotate the GAIN control to the extreme counter-clockwise position until a click is heard. This turns off the filament voltage to the speech tubes.
11. Rotate the COARSE LOADING control to the extreme counter-clockwise position.
12. Rotate the FINE LOADING control to the MIN. position.
13. Rotate the FINAL GR. TUNE control so the indicator points to the 9 o'clock position.
14. Rotate the FINAL PL. TUNE control so the indicator points to the 9 o'clock position.

TABLE III. TYPICAL KNOB SETTINGS FOR BAND OF OPERATION

Control	160M	80M	40M	20M	15M		10M
Final Grid Tune							
Final Plate Tune							

15. Place the EXCITER SWITCH to the ON position.
16. Advance the FINAL GR. TUNE control slowly in a clockwise direction until the meter indicates maximum grid current.
17. Adjust the DRIVE control, either clockwise or counter-clockwise, in order to obtain a meter indication of 15 ma grid current.
18. Place the exciter switch in the OFF position.
19. Place the METER SWITCH to the F. PLATE position.
20. Place the TRANSMIT switch to the ON position. The meter should now indicate approximately 110 ma and at resonance, will dip to 90-95 ma. Do not rotate the COARSE LOADING or the BANDSWITCH while the TRANSMIT switch is in the ON position. Severe damage to these switches will occur if this precaution is ignored.
21. Slowly advance the FINAL PL. TUNE control in a clockwise direction until a pronounced dip of at least 10 to 20 ma in plate current is indicated. In the event a pronounced dip in plate current cannot be obtained, overloading of the final amplifier plate circuit is indicated. If a dip of 10 to 20 ma in plate current cannot be obtained with the FINAL PL. TUNE control, advance the COARSE LOADING control one position in a clockwise direction and repeat steps 19 through 21. Advance COARSE LOADING control as many positions as necessary.

22. NOVICE OPERATION. Tune the transmitter as described in steps 1 to 21 of the paragraphs.

(a) Adjust the DRIVE control for a final plate current reading of 85 ma.
(b) Insert key plug into KEY jack on rear of transmitter and operate hand key. (Do not switch FUNCTION switch to the CW position for novice operation. FUNCTION switch remains in TUNE position).

23. Place the FUNCTION switch to the CW position. The final amplifier plate current should immediately rise to approximately 260 ma.
24. Re-tune the FINAL PL. TUNE control for minimum dip in plate current.
25. Slowly advance the FINE LOADING control in a counter-clockwise direction toward MAX. position until the final amplifier plate current rises to 330 ma. In the event the final amplifier plate current does not rise to the required value of current, place the TRANSMIT switch to the OFF position and proceed as follows:

    (a) Reset the FINE LOADING control to the MIN. position.

    (b) Rotate the COARSE LOADING control one position either direction to satisfy loading.

    (c) Place the TRANSMIT switch to the ON position.

    (d) Immediately tune the FINAL PL. TUNE control for minimum dip of plate current to prevent damage to the meter or final amplifier tubes.

    (e) Advance the FINE LOADING control in a clockwise direction toward the MAX. position until the final amplifier plate current rises to 330 ma.

26. Re-tune the FINAL PL. TUNE control for minimum plate current.
27. Repeat steps 25 and 26 until the minimum plate current dip of the final amplifier is 330 ma. This is full load current for the final stage and should not be exceeded or an over-loaded final amplifier with poor RF output will be the result.
28. Re-adjust the FINAL GR. TUNE control for maximum grid current.
29. Re-adjust the DRIVE control to indicate 10-12 ma grid current.
30. Insert an SWR bridge or a 2 ampere RF ammeter in series with the transmitter and antenna feedline.
31. Adjust the DRIVE control for maximum output indication of the RF ammeter or SWR bridge indicator. (Under these conditions, the RF output of the transmitter is at maximum even though the final grid and plate current indications are somewhat removed from the typical values given previously in the tune-up procedure. This is the accepted and most accurate method of tuning up a pentode or tetrode final amplifier for maximum operating efficiency).

Plate current of the final amplifier stage must not be allowed to drop below 275 ma or the modulator tubes will not have the proper reflected load applied to them. Such a condition would result in possible flash-over of some components and would also appreciably change the audio response. The recommended final plate currents are as follows:

AM Telephony:	Min. 275 ma - Max. 300 ma
CW	Min. 275 ma - Max. 350 ma

The final grid current for normal operation with maximum RF output will range from 5 ma to 12 ma. A satisfactory compromise grid current would be 8 ma for CW and 10-12 ma for AM telephony.

2-36. The tune-up procedure is now completed. However, before the transmitter may be placed into initial operation the keyer control must be adjusted for the proper keying characteristics. Refer to 2-40, KEYER CONTROL ADJUSTMENT.

2-37. TUNE-UP PROCEDURE - VFO OPERATION

2-38. Tune-up procedure for VFO operation varies only slightly from the crystal operation tune-up. Proper procedure is as follows:

1. Release the press-to-talk switch on the microphone.
2. Make certain the EXCITER and TRANSMIT switches are in the OFF position.
3. Remove the crystal from the XTAL socket.
4. Place the XTAL-VFO switch to the VFO position.
5. Tune the VFO to the desired operating frequency.
6. Proceed with the tune-up procedure as outlined under TUNE-UP PROCEDURE-CRYSTAL OPERATION, steps 7 through 28.

2-39. NEUTRALIZING

The neutralizing plates have been pre-adjusted at the factory to a spacing of 1/4". This spacing is not critical, and no further adjustments need be made.

2-40. KEYER CONTROL ADJUSTMENT

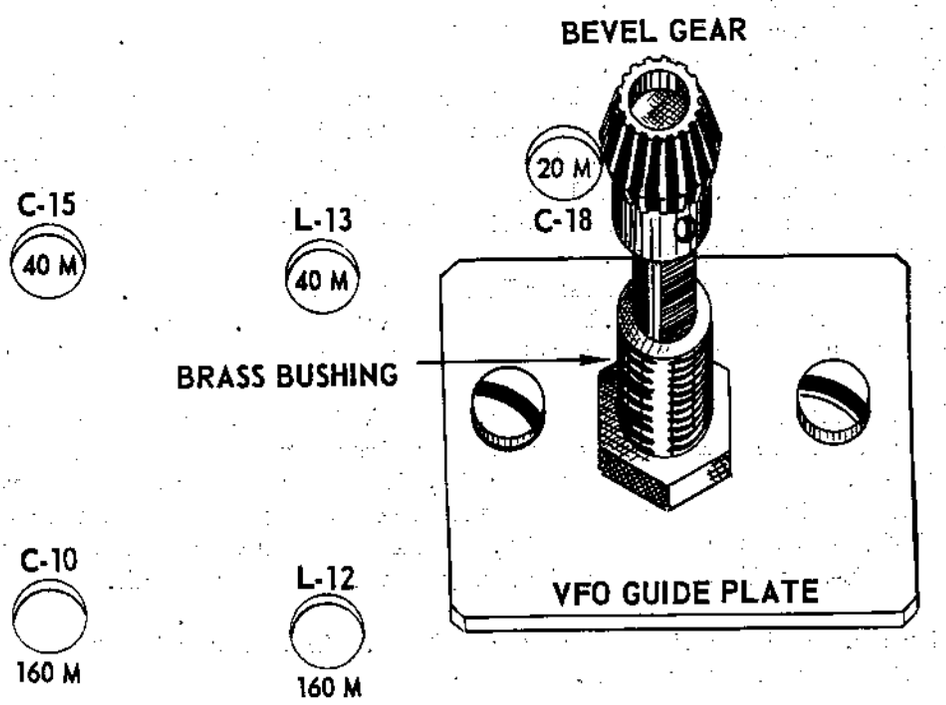
The keying system employed in the Globe Champion, model 300-A, is fundamentally grid block keying. However, several refinements have been incorporated into the basic circuit. The keyer stage utilizes a 12AU7 tube connected as a cathode follower in series with the bias voltage and provides a pre-determined time lag in the application of bias voltage to the VFO tube. The 6CL6 crystal stage is biased directly from the bias source through a suitable R/C de-coupling network. The 6AU6 VFO stage is biased through one-half of the keyer tube. The circuit constants in the keyer stage are such that key closure turns on the VFO first and the crystal stage last. Opening the key disables the VFO stage last and the crystal stage first. Inasmuch as the VFO goes on first and off last, it eliminates the possibility of any keying chirp generated in the VFO stage to be transmitted on the air.

The keyer circuit need be adjusted for the desired keying characteristics only when the transmitter is placed into initial operation. The KEY ADJ. control determines the desired keying characteristics. When this control is in the extreme clockwise position, softest keying is obtained; with the control in the extreme counter-clockwise position, sharper keying with a very slight click is obtained. Optimum operation, with the most pleasant keying, is at the point where the VFO is just cut off. For break-in operation on one's own frequency, it is necessary that the VFO be completely cut off to eliminate interference with the received signal. Proper adjustment is as follows:

1. Rotate the KEY ADJ. control shaft to its extreme clockwise position.
2. Complete the tune-up procedure, VFO OPERATION, on the 40 meter band. It is important that the VFO tune-up procedure be followed, not crystal tune-up.
3. Upon completion of the tune-up procedure, place the TRANSMIT switch to the OFF position, or release the press-to-talk switch on the microphone.
4. Leave the key plug in the KEY jack, close the key contacts.
5. Place the EXCITER switch to the ON position.
6. Tune in the transmitter signal on your receiver.
7. Open the key contacts and advance the receiver gain control until the VFO signal is heard on the receiver.
8. Slowly rotate the KEY ADJ. control in a counter-clockwise direction until the VFO signal is just cut off. Then rotate the control an additional 1/8 turn counter-clockwise to assure complete VFO cut-off.

2-41 The keyer adjustment is now completed. No further adjustment need be made unless the 12AU7 tube is replaced.

2-42. VFO ALIGNMENT



Coil And Capacitor Locations. VFO Alignment.

2-43. In the event it should be necessary for any reason to re-align the VFO, the following procedure should be followed to assure correct alignment:

1. Place all switches in the OFF position.
2. Disconnect all cables and plugs from the rear apron of the transmitter.
3. Remove the 12 panel mounting screws and the 3 self-tapping screws on the rear apron of the cabinet. Slide the chassis out of the cabinet.
4. Place the chassis with its heavier side (T1 and T2) down. Identify the five holes directly under the VFO as shown in Figure 1.

WARNING

Operation of this equipment involves the use of high voltages which are dangerous to life. Observe all safety precautions!

5. Insert the AC power cord plug into a 115V AC source receptacle. Place the AC POWER switch to the ON position. Allow a five minute warm-up period.
6. Place the XTAL-VFO switch to the VFO position.
7. Place the BANDSWITCH to the 160M position.
8. Use a pre-adjusted 100 kc crystal calibrator standard and tune your receiver to 1800 kc.
9. Place the EXCITER switch to the ON position.
10. Set the VFO pointer to 1800 kc.
11. Adjust the slug-in coil L-12 for zero beat with the calibrator.
12. Tune the receiver to 2.0 mc by listening for the calibrator beat then set the VFO pointer to 2.0 mc.
13. Adjust trimmer condenser C-10 for zero beat with the calibrator.
14. Repeat steps 8, 9, 10, 11, 12 and 13 as many times as necessary until the 1800 and 2000 kc points on the VFO dial correspond with these same points on the receiver.
15. Place the transmitter BANDSWITCH to the 10M position.
16. Tune the receiver to 7.0 mc then set the VFO pointer to 28 mc.
17. Adjust the slug-in coil L-13 to zero beat with the receiver.
18. Tune the receiver to 7.4 mc and set the VFO pointer to 29.6 mc.
19. Adjust trimmer condenser C-15 to zero beat with the receiver.
20. Repeat steps 17, 18 and 19 as many times as necessary until the 7.0 and 7.4 mc points on the receiver correspond to the 28 and 29.6 mc points on the VFO dial.
21. Place the transmitter BANDSWITCH to the 20M position.
22. Tune the receiver to 7.1 mc and the VFO to 14.2 mc.
23. Adjust trimmer condenser C-18 to zero beat with the receiver.

2-44. The VFO alignment is now completed. The VFO output coils L-1 and L-2 on top of the VFO chassis should be peaked for maximum drive to the final grid circuit. Coil L-1, the 40 meter output coil, is the coil nearest the rear of the VFO chassis. This coil should be peaked for maximum drive to the final grid on 15 meters. Coil L-2, 160 meter output coil, should be peaked at 3800 kc in the 80 meter band. Coil L-2 will peak very broadly and is not critical.

2-45. VFO alignment and peaking is now complete. The transmitter may be installed in the cabinet for normal operation.

SECTION III

RADIO TELEPHONY OPERATION

3-1. RADIO TELEPHONY (AM) OPERATION

3-2. Once the transmitter has been properly tuned up for CW operation, it may be placed in AM operation as follows:

1. Remove the key plug from the KEY jack, or make certain the key contacts are closed.
2. Place the TRANSMIT and EXCITER switches to the OFF position.
3. Advance the GAIN control in a clockwise direction until the switch click is heard. Closure of this switch applies filament voltage to the speech tubes.
4. Place the FUNCTION switch to the PHONE position.
5. Connect the microphone to the MIC. connector on the front panel of the transmitter. Make certain the connector on the microphone cable is properly wired. Correct connections for use with the Globe Champion transmitter, model 300-A, are as follows: Pin 1 to the microphone element; pin 2 to press-to-talk switch; braided shield to metal shell of connector.
6. Place the COMPRESSION switch to the OFF position.
7. Place the METER switch to the MOD. PL. position.
8. Depress the press-to-talk switch. This action should energize the transmitter and the modulator plate current should rise to a static value of approximately 50 ma.
9. Speak into the microphone in a normal tone of voice and slowly advance the GAIN control in a clockwise direction until the modulator plate current rises from its static value and swings up to 200 ma on voice peaks. This corresponds to 100% modulation. Excessive splatter and distortion will result if this is exceeded.
10. The compression feature may now be utilized by placing the COMPRESSION switch to the ON position. This action will reduce the modulator current peak swing by approximately 15% indicating that a limiting action is taking place. To compensate for the slight reduction in audio output, merely advance the GAIN control in a clockwise direction just enough to bring the peak modulator current swing back up to 200 ma. The compression feature holds the modulation percentage nearly constant regardless of whether you shout or speak normally into the microphone reducing any tendency to over-modulate.

3-3. The transmitter may now be placed into (AM) PHONE operation.

SECTION IV

SIDE BAND OPERATION (SB)

4-1. SIDEBAND OPERATION

4-2. Once the transmitter has been properly tuned up for CW operation, it may be

placed into SB operation as follows:

1. Place the TRANSMIT switch in the OFF position.
2. Remove the crystal from the XTAL socket.
3. Place the XTAL-VFO switch to the XTAL position.
4. Connect a SB signal source to the SB connection on the rear of the chassis. The SB driver unit must deliver 5-10 watts power to the final amplifier grid.
5. Place the FUNCTION switch to the SB position.
6. Place the TRANSMIT switch to the ON position.
7. Inject a steady tone, in the range of 1000 to 1500 cycles, into the audio input of the SB exciter. An audio signal generator is excellent for this purpose. Should no signal generator be available, the operator may whistle into the microphone, holding the tone as steady as possible. The final amplifier grid current SHOULD NOT exceed 5 ma. (A grid current of about 1 ma on peaks is excellent).
8. The final amplifier plate current swing for full input should not exceed 300 ma peak. The resting current will be approximately 60 ma in SB operation. The power amplifier grid and plate current swings are entirely controlled by the amount of excitation from the SB exciter.
9. Settings of the tuning controls will hold over a slight frequency shift. The transmitter should be re-tuned for large frequency excursions.

4-3. The most satisfactory method of tuning any SB amplifier for maximum efficiency is to use a RF current indicating device in the antenna system, along with a scope to monitor linearity. Using the two tone test, adjust drive to the final amplifier for about 1 ma. Load the final amplifier for maximum RF output, as indicated by the RF indicator, so long as the wave-shape stays linear.

SECTION V

ANTENNA CONSIDERATIONS

5-1. ANTENNA CONSIDERATIONS

5-2. The output circuit of the Globe Champion transmitter, model 300-A, utilizes a pi-network which has the capability of matching a considerable range of non-reactive load impedances. As the reactive component increases in the antenna and feedline, the matching range is reduced as the pi-network must compensate with an equal and opposite reactance for proper matching. In some cases, where the reactive component is large in comparison to the resistive component of the load, the matching range of the network may be reduced to as low as 50-100 ohms. Properly, the operator should accurately measure the antenna impedance at the transmitter end of the feedline and correct any large amount of reactance at the antenna rather than trying to tune it out with the pi-network.

5-3. The Windom antenna, when properly constructed, will come closest to supplying

a reasonable impedance match on all bands without the use of an antenna tuner. The greatest disadvantage of this type of antenna is since it is fundamentally a harmonic type of antenna, it will not provide any great degree of attenuation to undesirable harmonics. Careful tuning of the transmitter and pi-network will help considerably to overcome the attenuation deficiency of the antenna and satisfactory results may be obtained.

5-4. There are numerous antenna configurations that will give good all band results. However, in many cases, the impedance presented to the transmitter on one or more bands will not be within the capabilities of the pi-network; in these instances, an antenna tuner will be required. The standard dipole and folded dipole antennas are the easiest to match. While the free space center impedance of the dipole is considered to be 72 ohms, in practive it is usually nearer to 50-60 ohms. This is due to the proximity of the antenna to ground; if the antenna is one-half wave or more above ground, it may be considered to be a 72 ohm free space antenna and may be fed with 72 ohm line. A 52 ohm feedline would be more suitable if the antenna were between one-quarter and one-half wave above ground. The folded dipole is not so greatly affected as to impedance and will generally show a center impedance of close to 270 ohms. A 300 ohm feedline is most suitable for that type antenna. A height of at least one-half wave above ground is highly desirable for any type of antenna.

5-5. One of the most commonly encountered troubles is a feedline that acts as a transformer. Proper loading to the transmitter cannot be obtained in many antenna installations where the measured SWR at the transmitter indicates 1.1:1. This is due to the above mentioned transformer action of the feedline. As an example: A 52 ohm feedline attached to an improperly adjusted beam indicates an SWR of 1.5:1. Due to mis-match at the antenna, the impedance at the transmitter end of the feedline may be 50 to 60 ohms but up to at least 2/3 of this impedance may be reactive. The pi-network must then be adjusted to compensate for the high reactive component and in so doing may lose its capability to match the resistive component of the total load. Here the operator probably shortened or lengthened his feedline to obtain the low SWR, which in turn disguised the original defect of an improperly adjusted antenna.

5-6. All pi-networks may normally have the capability of matching a particular range of resistive impedances but due to compensation for excessive reactances may not be able to match the resistive component properly. A resistive antenna having an impedance the same as the characteristic impedance of the feedline should give no difficulty as the line is flat. Changing the length will not change the feed point impedance. Where the antenna does not have an impedance the same as the feedline, or where the antenna is reactive (off resonance), the feedline should preferably be cut to odd multiples of one-half wave (1/2, 1-1/2, 2-1/2, etc.) taking into account the feedline velocity factor. A close reproduction of the center impedance of the antenna will thus be presented to the transmitter. A feedline cut to one-eighth or one-quarter wave may present a very complex impedance at the transmitter end of the feedline. Such an antenna system, while showing a relatively low SWR, may be virtually impossible to load in many cases.

5-7. On all bands, except 160 meters, the Globe Champion transmitter output circuit can match in excess of 50-600 ohms where a small amount of reactance is present. On 160 meters, the lowest impedance that may be matched is 300 ohms. A one-half wave off-center fed antenna using single wire feed is satisfactory on this band. A very good ground system is imperative with this type of antenna. The exact feed point may be determined experimentally starting at a point approximately 1/3 from either end. The 400 ohm point will probably be the most satisfactory as it allows some leeway for reactance.

5-8. Beam type antennas usually have a very low impedance, often as low as 15 ohms for a close space 3-element array. The feed point impedance of such an antenna may be increased to a high enough value for use with standard feedlines through the use of a folded dipole driven element, a "T" match, a Gamma match, etc. Even so, a very little reactance may present a complex impedance below 50 ohms which may be impossible for the pi-network to match. The best solution is to try to make the impedance presented to the transmitter about 70 ohms as slightly more reactance can be tuned out and still maintain a match.

5-9. The most reliable way to adjust any antenna is by the use of a good SWR bridge. Most bridges cover the range of 50-72 ohms. The bridge should be excited by a low power signal on the operating frequency (power to be determined by the manufacturer's specifications) and the ANTENNA adjusted for the lowest possible SWR. An SWR of 1.5:1 is good. The antenna section of the ARRL Handbook gives many suggestions for antennas, feedlines, etc.

5-10. Keep in mind the fact that many antenna formulas refer only to free space, or theoretical dimensions and impedances which will seldom hold true in practical application. An antenna which may present a certain impedance at one location may be considerably different at another location, even at the same height above ground. Surrounding objects, soil conductivity, etc. will all affect the antenna impedance. Therefore, specified dimensions may have to be corrected for each particular location and the only sure way that an antenna impedance can be determined is to measure it properly.

5-11. ANTENNA FORMULAS

5-12. All formula answers are in feet. One wave length in free space $\frac{300}{\text{Freq.Mc.}}$

One-half wave dipole $\frac{468}{\text{Freq. Mc}}$

One-half wave folded dipole $\frac{462}{\text{Freq.Mc}}$

TABLE VI. RECOMMENDED ANTENNAS

Band	Type of Antenna				
11-10 Meters	Doublet	F.Dipole	1/4 wave vert.	52 ohm beam	******
15 Meters	Doublet	F.Dipole	1/4 wave vert.	52 ohm beam	******
20 Meters	Doublet	F.Dipole	1/4 wave vert.	52 ohm beam	******
40 Meters	Doublet	F.Dipole	1/4 wave vert.	52 ohm beam	******
80 Meters	Doublet	F.Dipole	1/4 wave vert.	*****	Long wire w/ant.tuner
160 Meters	Doublet	*****	1/4 wave vert.	*****	******

SECTION VI

MALFUNCTIONS AND PROBABLE CAUSE - VOLTAGE CHART

6-1. GENERAL

6-2. This section deals with various malfunctions the operator may encounter. The most likely causes for each type of malfunction are given. The operator should be able to ascertain the nature of the malfunction from this chart and thus, easily repair the equipment. A voltage chart is also given as an aid to determining the nature of various malfunctions.

WARNING

Operation of this equipment involves the use of high voltages which are dangerous to life. Observe all safety precautions. Do not attempt to make adjustments inside the equipment or change tubes with any power on. Disconnect--UNPLUG--the AC power cord and short out the filter condensers with a highly insulated shorting bar before touching high voltage components.

6-3. MALFUNCTIONS AND PROBABLE CAUSE

Symptom	Probable Cause
1. Transmitter will not energize.	1-1. Defective fuse FS-1. 1-2. Defective switch SW-1.
2. Meter indicates backward when AC on.	2-1. Internal short in V4 or V5.

3. VFO note rough or chirpy.	3-1. Defective V1. 3-2. Poor VFO shield or chassis bonding.
4. VFO instability.	4-1. Defective V1 or V15. 4-2. Defective C-11, C-12, C-13, C-14. 4-3. Internal transmitter heat excessive.
5. VFO calibration inaccurate.	5-1. Loose or moved VFO dial pointer. 5-2. Loose VFO coil slug screws. 5-3. Contacts of switch SW-4 intermittent.
6. Lack of final amplifier grid current.	6-1. Defective VFO. 6-2. Defective V2 or V3. 6-3. Bandswitch ganging defective. 6-4. Open key contacts or key jack.
7. Insufficient final amplifier grid current.	7-1. Low AC line voltage. 7-2. Weak or defective V3, V4 or V5. 7-3. Improper tuning procedure. 7-4. Improper adjustment of neutralizing discs.
8. Insufficient final amplifier plate current.	8-1. Low AC line voltage. 8-2. Defective V4 or V5. 8-3. Insufficient grid drive and current. 8-4. Defective meter shunt MS-2.
9. Inadequate final amplifier plate loading.	9-1. Defective relay RLY-4. 9-2. Defective C-43, C-44, C-45 or C-46. 9-3. Defective antenna system. 9-4. Defective V4, V5, V18 or V19. 9-5. Defective switch SW-12.
10. Insufficient or low percentage of modulation.	10-1. Defective tube V7, V8, V9, V10 or V11. 10-2. Defective switch SW-7. 10-3. Defective transformer T-3. 10-4. Open choke CH-3. 10-5. Defective couplate PC-81 or PC-91. 10-6. Shorted jack J-3.
11. Inoperative compression circuit.	11-1. Defective tube V7 or V12. 11-2. Shorted capacitor C-54, C-55 or C-60. 11-3. Defective switch SW-8.

12. Inoperative press-to-talk circuit.	12-1. Shorted capacitor C-65. 12-2. Defective selenium rectifier SR-4. 12-3. Defective microphone switch.
13. Insufficient or no low B plus voltage.	13-1. Defective tube V17. 13-2. Defective switch SW-2. 13-3. Open choke CH-1. 13-4. Shorted capacitor C-66.
14. Insufficient or no high B plus voltage.	14-1. Defective tube V18 or V19. 14-2. Open transformer T-2. 14-3. Shorting QQ winding in transformer T-1. 14-4. Open chokes CH-2 and CH-2A. 14-5. Shorted capacitor C-68.
15. Inoperative bias supply.	15-1. Defective winding in transformer T-1. 15-2. Defective selenium rectifier SR-3. 15-3. Open resistor R-17 or R-18. 15-4. Shorted capacitor C-27 or C-28.
16. Fuse blows when transmit switch placed in "ON" position.	16-1. Defective QQ winding in transformer T-1. 16-2. Shorted tube V10, V11, V18 or V19. 16-3. Shorted capacitor C-40 or C-68.
17. No final amplifier plate current.	17-1. Defective tube V4,V5,V18 or V19. 17-2. Open chokes CH-2 and CH-2A. 17-3. Open secondary on transformer T-3. 17-4. Open RF choke RFC-6. 17-5. Open meter shunt MS-2. 17-6. Open relay RLY-1. 17-7. Lack of RF excitation to tubes V4 and V5.
18. No modulator plate current.	18-1. Defective tube V10 or V11. 18-2. Open primary of transformer T-3. 18-3. Defective switch SW-7. 18-4. Excessive grid bias. 18-5. Open secondary of transformer T-4.

6-4. TYPICAL VOLTAGE READINGS

6-5. The voltage readings given in Table V are typical for the conditions as set

forth. Some allowance must be made if the test meter used is not a 20,000 ohm per volt meter. CONDITIONS: AC line voltage 115 volts; test meter 20,000 ohms per volt; FUNCTION switch placed in PHONE position; transmitter tuned on 40 meter band, loaded to 320 ma; grid current 12 ma; no modulation applied; meter connected from specified point to chassis ground except where otherwise noted.
WARNING - Use extreme caution when taking voltage readings. High voltages, dangerous to life, are involved.

TABLE V. TYPICAL VOLTAGE READINGS

Tube Type	Symb.	Tube Pin Number 1	2	3	4	5	6	7	8	9	Plate Cap
AX-9909	V4 V5	6.3AC	Below RFC-5 -105DC	Plus 255DC	Below RFC-6 Plus 950DC	0	0	6.3AC	---	---	---
2E26	V3	0	6.3AC	Plus 25DC	0	Below RFC-3 Minus 110 DC	0	0	0	---	Below RFC-4 Plus 320 DC
6CL6	V2	Plus 2 DC	0	Plus 120DC	0	6.3AC	Plus 225 DC	0	Plus 120 DC	0	----
12AU7	V6	0 Minus 10DC**	0 Minus 25 DC**	Plus 12DC -28DC**	0 0**	0 0**	Plus 225DC Plus 280DC**	0 Minus 90DC**	Plus12DC Minue 28DC**	6.3AC	---
6AU6	V1	0	0	0	6.3 AC	Plus 225DC	Plus 150 DC	0	---	---	---
12AX7	V8	0	0	0	0	0	Plus 200 DC	0	Plus 2 DC	6.3AC	---
6AQ5	V9	0	Plus 14 DC	0	6.3 AC	Plus 225 DC	Plus 230 DC	0	---	---	---
809	V10 V11	3.2 AC	0	Minus 8 DC	3.2 AC	---	---	---	---	---	Plus 920 DC
6AL5	V12	75 AC*	75 AC*	6.3 AC	0	0	0	Minus 160 DC	---	---	---
6AU6	V7	0	Minus 60 DC	0	6.3AC	Plus 80 DC	Plus 20 DC	Plus 75 DC	---	---	---
0A2	V15 V16	0	0	0	0	Plus 150 DC	0	0	---	---	---
5U4GB	V17	Plus 350 DC	Plus 350 DC	---	440AC	0	440 AC	---	5V AC to pin 2	---	---
866A	V18 V19	2.5V AC to pin 4	0	0	Plus 980DC	---	----	---	---	---	1000AC

**FUNCTION switch at CW position; key contacts open. Switch attached to GAIN control in OFF position.
* Modulation swing of 180 ma peak. COMPRESSION switch in ON position. Measured with audio output meter.

PARTS LIST

Circuit Design.		Description	Globe Part No.
C-19		Capacitor, 25 mmf ceramic disc	1101-001
C-20		Capacitor, .002 mfd ceramic disc	1101-009
C-21		Capacitor, 250 mmf silver mica	1102-013
C-22		Capacitor, .005 mfd ceramic disc	1101-003
C-23		Capacitor, 25 mfd 25V electrolytic	1106-003
C-24		Capacitor, 70 mmf mica	1102-002
C-25		Capacitor, .005 mfd ceramic disc	1101-003
C-26		Capacitor, .005 mfd ceramic disc	1101-003
C-27	**	Capacitor, 20 mfd 150V electrolytic	1106-006
C-28	**	Capacitor, 20 mfd 150V electrolytic	1106-006
C-29		Capacitor, .005 mfd ceramic disc	1101-003
C-30		Capacitor, .001 mfd 3000V ceramic disc	1101-028
C-31		Capacitor, 140 mmf variable	1105-001
C-32		Capacitor, .005 mfd ceramic disc	1101-003
C-33		Capacitor, .005 mfd ceramic disc	1101-003
C-34		Capacitor, 200 mmf mica	1102-001
C-35		Capacitor, .005 mfd ceramic disc	1101-003
C-36		Capacitor, .005 mfd ceramic disc	1101-003
C-37		Capacitor, .002 mfd ceramic disc	1101-009
C-38		Capacitor, .002 mfd ceramic disc	1101-009
C-39		Capacitor, 500 mmf-20KV, door-knob	1107-002
C-40		Capacitor, 500 mmf 7.5KV ceramic	1101-010
C-41		Capacitor, 250 mmf variable	1105-013
C-42		Capacitor, 350 mmf variable	1105-004
C-43		Capacitor, .002 mfd 2500V, mica	1102-004
C-44		Capacitor, .0004 mfd-2500V mica	1102-008
C-45		Capacitor, .0006 mfd-1200V mica	1102-009
C-46		Capacitor, .0008 mfd 1200V mica	1102-010
C-49		Capacitor, .1 mfd 200V paper	1100-001
C-51	xxx	Capacitor, 10 mfd 500V can.electrolytic	1106-002
C-52	xxx	Capacitor, 10 mfd 500V can.electrolytic	1106-002
C-53		Capacitor, 25 mfd 25V electrolytic	1106-003
C-54		Capacitor, .1 mfd 200V paper	1100-001
C-55		Capacitor, .002 mfd ceramic disc	1101-009
C-56		Capacitor, 500 mmf ceramic disc	1101-005
C-57		Capacitor, 500 mmf ceramic disc	1101-005
C-58		Capacitor, 500 mmf ceramic disc	1101-005
C-59		Capacitor, 25 mfd 25V electrolytic	1106-003
C-60		Capacitor, .005 mfd ceramic disc	1101-003
C-61	***	Capacitor, 10 mfd 500V electrolytic	1106-002
C-62		Capacitor, .005 mfd ceramic disc	1101-003
C-63		Capacitor, dual .0008 mfd 1600V ceramic disc	1104-002
C-64		Capacitor, 15 mmf tubular	1101-008
C-65		Capacitor, 500 mfd 6V, electrolytic	1106-015
C-66		Capacitor, 8 mfd 450V electrolytic	1106-013
C-68		Capacitor, 6 mfd 1000V oil filled	1103-004
C-71		Capacitor, .005 mfd ceramic disc	1101-003
		Cond. 500 mmf, disc (Quan. 2)	1101-005

C-72	Capacitor, .005 mfd ceramic disc	1101-003
C-73	Capacitor, .005 mfd ceramic disc	1101-003
C-74	Capacitor, .005 mfd ceramic disc	1101-003
C-75	Capacitor, .005 mfd disc	1101-003
C-76	Capacitor, .1 mfd 200V paper	1101-001
C-77	Capacitor, .005 mfd ceramic disc	1101-003
C-78	Capacitor, 250 mmfd ceramic tubular	1101-007
C-79	Capacitor, .005 mfd ceramic disc	1101-003
C-80	Capacitor, 500 mmfd disc	1101-005
C-81	Capacitor, 500 mmfd disc	1101-005
C82	Capacitor 70 mmfd Silver Mica	1102-002
CH-1	Choke, 7h-250 ma	1300-008
CH-2	Choke, 7h-250 ma	1300-008
CH-2A	Choke, 7h-250 ma	1300-008
CH-3	Choke, 4h-50 ma	1300-007
CH-5	Choke, 7h-50 ma	1300-001
CX-1	Connector, coaxial 831R	2000-004
CX-2	Connector, coaxial 831R	2000-004
FS-1	Fuse, 10 ampere	1500-004
J-1	Jack, key, closed circuit	2004-001
J-2	Jack, microphone, 2 circuit	2000-001
J-3	Jack, key, open circuit	2004-002
J-4	Jack, phono tip	2000-002
L-3	Coil, plate orange dot, 20/11M 6CL6	1400-022B
L-4	Coil, plate, yellow dot, 40M 6CL6	1400-023A
L-5	Coil, plate, green dot, 160/80M 6CL6	1400-021A
L-6	Coil, final grid, 160/40M	1400-018A
L-7	Coil, final grid, 20/10M	1400-019A
L-8	Coil, final plate, 10M	1400-049
L-9	Coil, final plate, 80/15M	1400-027B
L-10	Coil, final plate, 160M	1400-028A
L-11	Coil, plate, white dot, 15M 6CL6	1400-081
L-14	Coil, plate, blue dot, 11M 6CL6	1400-040
M	Meter, 0-20-400 ma	2500-009
PC-81	Couplate, PC-81	1109-001
PC-91	Couplate, PC-91	1109-002
PS-1	Choke, parasitic, final plate	1301-010
PS-2	Choke, parasitic, final plate	1301-010
PS-3	Choke, parasitic, buffer plate	1301-009
R-5	Resistor, 1 meg-1/2 watt	1000-023
R-6	Resistor, 500K ohms, potentiometer	2300-001
R-7	Resistor, 220,000 ohms-1/2 watt	1000-019
R-8	Resistor, 100K ohms-1/2 watt	1000-009
R-9	Resistor, 47K ohms-1/2 watt	1000-002
R-10	Resistor, 120 ohms-1/2 watt	1000-003
R-13	Resistor, 22K ohms-1 watt	1001-010
R-14	Resistor, 120 ohms-2 watt	1002-007

R-15	Resistor, 390 ohms-2 watt	1002-005
R-16	Resistor, 4700 ohms-2 watt	1002-012
R-17	Resistor, 56 ohms-1 watt	1001-003
R-18	Resistor, 560 ohms-2 watt	1002-008
R-19	Resistor, 8200 ohms-1 watt	1001-012
R-20	Resistor, 2200 ohms-2 watt	1002-014
R-21	Resistor, 1500 ohms- 2 watt	1002-015
R-22	Resistor, pot,,25K ohms-4 watt,wire wound	2300-003
R-23	Resistor, 8200 ohms-2 watt	1002-011
R-24	Resistor, 120 ohms-1/2 watt	1000-003
R-25	Resistor, 2000 ohms-7 watt	1003-008B
R-26	Resistor, 25K ohms-10 watt	1003-001
R-27	Resistor, 100K ohms-1/2 watt	1000-009
R-28	Resistor, 2.2 meg-1/2 watt	1000-005
R-29	Resistor, 560K ohms-1/2 watt	1000-022
R-31	Resistor, 1 meg-1/2 watt	1000-023
R-32	Resistor, 1 meg-1/2 watt	1000-023
R-33	Resistor, 22K ohms-1/2 watt	1000-008
R-34	Resistor, 4700 ohms-1/2 watt	1000-018
R-35	Resistor, 220K ohms-1/2 watt	1000-019
R-36	Resistor, 22K ohms-1/2 watt	1000-008
R-37	Resistor, 2000 ohms-7 watt	1003-008B
R-38	Resistor, 47K ohms-1/2 watt	1000-002
R-39	Resistor, 390K ohms-1/2 watt	1000-015
R-40	Resistor, 390 ohms-2 watt	1002-005
R-41	Resistor, 47K ohms-1/2 watt	1000-002
R-42	Resistor, 500K potentiometer w/switch	2300-002
R-43	Resistor, 47K ohms-1/2 watt	1000-002
R-44	Resistor, 50K ohms-10 watt	1003-009
R-45	Resistor, 50K ohms-50 watt	1006-002
R-47	Resistor, 68K ohms-2 watt	1002-006
R-49	Resistor, ~~5000~~ 2500 ohms-10 watt	1003-002
R-50	Resistor, 20K ohms-20 watt	1004-001
R-51	Resistor, 47K ohm-1/2 watt	1000-002
RFC-2	Choke, RF, 750 uh-50 ma	1301-006
RFC-3	Choke, RF, 750 uh-50 ma	1301-006
RFC-4	Choke, RF, 204 uh-125 ma	1301-001
RFC-5	Choke, RF, 750 uh-50 ma	1301-006
RFC-6	Choke, RF, 1 uh-500 ma	1301-007
RFC-7	Choke, RF, AC line	1301-011
RFC-8	Chike, RF, AC line	1301-011
RLY-1	Relay, SPDT, 115V AC	3500-007
RLY-4	Relay, SPST, 115V AC	3500-001
RLY-3	Relay, coil	3500-011
RLY-3	Relay, contact	3500-010
SR-1	Rectifier, ~~selenium 65 ma~~	3700-001
SR-2	Rectifier, ~~selenium 65 ma~~	3700-001
SR-3	Rectifier, selenium 65 ma	3700-001
SR-4	Rectifier, ~~selenium, 6V-300~~ ma	3700-007

SW-1	Switch, toggle, DPST	2101-002
SW-2	Switch, toggle, DPST	2101-002
SW-3	Switch, toggle, DPST	2101-002
SW-5	Switch, rotary, XTAL-VFO	2100-012
SW-6	Switch, rotary, exciter bandswitch	2100-009
SW-7	Switch, rotary, function	2100-008
SW-8	Switch, toggle, DPDT	2101-001
SW-9	Switch, rotary, final plate band	2100-007
SW-10	Switch, rotary, meter	2100-005
SW-11	Switch, cover-integral w/R-42	* * * *
SW-12	Switch, rotary, coarse load	2100-011
T-1	Transformer, low voltage power	1201-008A
T-2	Transformer, high voltage plate	1201-001
T-3	Transformer, modulation	1203-005
T-4	Transformer, driver	1203-006
I-1	Lamp, type ~~#47~~ VFO GE 7111	3800-002
I-2	Lamp, type 6S6 Transmit	3800-003
I-3	Lamp, type ~~T6-1/2~~ #1 or 47	3800-001
MS-1	Shunt, meter, .25 ohm	1010-003
MS-2	Shunt, meter, .25 ohm	1010-003

Quan.	Description	Globe Part No.
8	Bearing, panel	3300-019
1	Bearing, panel w/shaft	3300-018
1	Bracket, coil mounting	1901-014
1	Bracket, 15M coil mounting	1901-037
1	Bracket, condenser mounting 1/2"hole	1901-036
2	*Bracket, oil condenser mounting	****
2	** Bracket, resistor mounting	****
3	Bracket, switch mounting	1901-012
1	Shield cover	1902-016
1	Cabinet	1700-014
1	Cord, power, AC	2700-043
1	Chassis, tube, 9909 mounting	1901-013
1	Chassis	1900-003
1	Clamp, cable	3300-030
5	Coupling, shaft, flexible	3300-021
2	Coupling, shaft, rigid	3300-038
1	Dial assembly, VFO	3300-005A 3300-006
1	Dial pointer, VFO	3300-007
1	Fuse retainer	1500-006
2	Gear, bevel	3300-032
12	Grommet, 3/8"	3200-001
2	Grommet, 1/2"	3200-002
2	Insulator, cone, 5/8"	2201-001
4	Insulator, feedthru, 1"	2200-001

Quan.	Description	Globe Part No.
5	Knob, bar	2600-008
6	Knob, round	2600-009
8	Lug, solder, #4	2006-005
35	Lug, solder, #6	2006-004
3	Lug, solder, #6 double	2006-006
1	Lug, solder, #6 teardrop	2006-008
6	Lug, solder, #10	2006-009
2	Neutralizing plates, capacitor	1901-017
23	Nut, hex, 2-56 x 3/16	2901-007
2	Nut, hex, 4-40 x 3/16	2901-001
110	Nut, hex, 6-32 x 1/4	2901-003
7	Nut, hex, 8-32 x 5/16	2901-004
18	Nut, hex, 10-32 x 5/16	2901-005
10	Nut, hex, 3/8"	2901-006
4	Nut, ring	2901-008
1	Panel	1800-007
1	Pilot lamp assembly, red jewel	2400-002
1	Pilot lamp assembly, meter	2400-007 2400-008
1	Pilot lamp assembly, VFO dial	2400-005
1	Plate cap, #24	2005-003
4	Plate cap, 9/16	2005-002
1	***Plate, electrolytic capacitor mounting	1901-021
1	Plate, switch, ON/OFF	2103-001
1	Plate, VFO switch guide	1901-018
1	Receptacle, VFO power	2000-006
23	Screw, 2-56 x 5/16, BH	2900-021
2	Screw, 4-40 x1 1/2, round head	2900-002M
1	Screw, 6-32 x 3/16, BH	2900-018
20	Screw, 6-32 x 1/4, BH	2900-003
80	Screw, 6-32 x 5/16, BH	2900-004
12	Screw, 6-32 x 1/2, BH	2900-005
3	Screw, 6-32 x 7/8, BH	2900-006
1	Screw, 6-32 x 1-3/4, BH	2900-025
6	Screw, 8-32 x 1/2, BH	2900-008
31	Screw, #6 x 1/4, self-tapping	2900-017
41	Screw, 10-32 x 1/2, TH	2900-024
10	Screw, 10-32 x 1/2, BH	2900-009
10	Screw, 10-32 x 1/2, Phillips head	2900-023
1	Shaft, flat, 5-3/4"	3300-047
1	Shaft, full round, 6"	3300-042
1	Shaft, full round, 6-1/4"	3300-043
1	Shaft, full round, 8-1/4"	3300-044
1	Shaft, full round, 10-1/2"	3300-046
2	Shaft, full round, 11-3/4"	3300-045

1	Shield, RF, final plate	1902-008M
1	Shield, RF, final grid	1902-009
1	Shield, miniature tube, short	1600-021
1	Shield, miniature tube, medium	1600-020
1	Shield, miniature tube, long	1600-016
2	Socket, 4 pin, bakelite	1600-025
2	Socket, 4 pin, ceramic	1600-006
1	Socket, octal, mica filled MIP	1600-024
2	Socket, 9 pin, miniature shielded base	1600-015
1	Socket, octal, black bakelite, MIP	1600-023
1	Socket, 7 pin miniature shielded base	1600-019
1	Socket, 9 pin miniature	1600-014
3	Socket, 7 pin miniature	1600-012
1	Spacer, brass, 2-1/4"	3300-052
2	Socket, ceramic, AX9909	1600-010
1	Socket, crystal	1602-002
9	Spacer, brass, 1/2" internal thread	3300-020
20"	Spaghetti, #20 black	2800-008
6"	Spaghetti, #12 yellow	2800-002
2"	Spaghetti, #2 yellow	2800-006
4"	Spaghetti, large, clear	2800-005
1	Terminal strip, 2 screw	2003-002
8	Tie strip, 1-lug	2002-006
7	Tie strip, 2-lug	2002-002
2	Tie strip, 3-lug	2002-003
6	Tie strip, 5-lug	2002-004
1	Tie strip, 1-lug, 3/16" mounting hole	2002-006S
1	VFO assembled	3900-001
90	Washer, lock, #6	3101-002
6	Washer, lock, #8	3101-003
10	Washer, lock, #10	3101-004
5	Washer, lock, 3/8"	3101-005
1	Washer, flat, fiber, 3/8"	3100-004
1	Washer, extruded fiber, 3/8"	3100-003
1	Wheel, friction drive	3300-011
3	Washer, 3/8" steel	3101-008
1	115V AC motor	3400-004
1	Cooling fan	3400-006
2	Tube, AX9909	
1	Tube, 2E26	
1	Tube, 6CL6	
1	Tube, 12AU7	
1	Tube, 6AU6	
1	Tube, 12AX7	
1	Tube, 6AQ5	
2	Tube, 809	
1	Tube, 6AL5	
1	Tube, OA2	
1	Tube, 5U4GB	
2	Tube, 866A	

* Supplied with capacitor C-68
** Supplied with resistor R-45
*** Supplied with triple section capacitor C-51, C-52, C-61
xx Two section 20 mfd-150 volt
xxx Three section 10 mfd-500 volt electrolytic

WIRE-KIT ASSEMBLY KIT

Quan.	Description	Globe Part No.
1	Harness assembly	2703-003
35"	#14 bus wire	2700-040
79"	#16 bus wire	2700-004
95"	#20 bus wire	2700-005
70"	#20 hook-up wire, white,stranded	2700-016
45"	#20 hook-up wire, yellow, solid	2700-001
16"	#16 hook-up wire, yellow, stranded	2700-036
6"	#20 hook-up wire, red, stranded	2700-014
29"	#20 hook-up wire, black, stranded	2700-015
15"	#20 hook-up wire, blue, stranded	2700-013
65"	Shielded wire	2700-003
5"	#20 hook-up wire, green	2700-011
8"	#16 hook-up wire, white	2700-026
20"	Double conductor AC cord	2702-001
12"	#16 hook-up wire, brown	2700-025
15"	#20 hook-up wire, orange	2700-031

SECTION VII
300-A VFO PARTS LIST

Quan.	Description	Cir.Design.	Part No.
1	Capacitor, TCZ 82 mmf ceramic tubular	C-1	1101-012
2	Capacitor, 500 mmf silver mica	C-2,3	1102-007
3	Capacitor, .005 mmfd ceramic disc	C-4,5,7	1101-003
1	Capacitor, TCZ-130 mmf ceramic tubular	C-6	1101-002
1	Capacitor, 70 mmf mica	C-8	1102-001
1	Capacitor, TCZ-1 mmf ceramic tubular	C-9	1101-021
1	Capacitor, 15 mmf variable	C-10	1105-008
1	Capacitor, TCN-120 mmf ceramic tubular	C-11	1101-016
1	Capacitor, TCZ-18 mmf ceramic tubular	C-12	1101-017
1	Capacitor, TCZ-36 mmf, ceramic tubular	C-13	1101-029
1	Capacitor, TCN 18 mmf ceramic tubular	C-14	1101-030
2	Capacitors, 9 mmf variable	C-15,18	1105-010
1	Capacitor, differential variable	C-16	1105-007
	Capacitor,wiring capacity on bandswitch SW-4	C-17	
1	Choke, RF, 2.5 mh, 125 ma	RFC-1	1301-001
1	Coil, plate, 40M	L-1	1400-024
1	Coil, plate 160M	L-2	1400-021A
1	Coil, grid, 160M	L-12	1400-025
1	Coil, grid, 40M	L-13	1400-026
2	Sockets, 7 pin mica		1600-012
1	Chassis, punched		1900-005B
1	Bracket, rear tuning condenser		1901-007
1	Bracket, front tuning condenser		1901-008
1	Bracket, band switch		1901-010
1	Bracket, shield bonding		1901-022
1	Bracket, trimmer condenser mounting		1901-019
1	Cover, shield		1902-002
1	Plug, VFO output		2001-011
2	Tie strip, 3-lug		2002-003
2	Lug, solder, #6		2006-004
1	Lug, solder, #4		2006-005
1	Switch, band change	SW-54	2100-010A
4	Screws, 4-40 x 3/8"		2900-001
1	Nut, 10-32 x 5/16"		2901-005
1	Nut, 3/8" hex		2901-006
10	Screws, 6-32 x 5/16"		2900-004
4	Screws, 2-56 x 5/16"		2900-012
4	Nuts, 4-40 x 3/16"		2901-001
10	Nuts, 6-32 x 1/4"		2901-003
10	Washers, lock, #6		3101-002
1	Washer, lock, #10		3101-004
1	Grommet, 3/8"		3200-002
1	Wheel, cond. drive 4"		3300-004
1	Tube, 6AU6		
1	Tube, 0A2		
10"	#20 hook-up wire		2700-001
3"	#16 bus wire		2700-004
20"	#20 bus wire		2700-005
9"	#20 hook-up wire		2700-015
11"	#20 hook-up wire		2700-016
12"	#20 hook-up wire		2700-036
6"	Shielded wire		2700-046
6"	Shield braid		2700-051
1	56 ohm-1/2 watt	R-1	1000-010
1	100K ohm-1/2 watt	R-2	1000-009
1	15K-1/2 watt	R-3	1000-013
1	4700 ohm-2 watt	R-4	1002-012

Converted to 5894/8643

Serial # BA9226

11 meters Band switch position inoperable

GLOBE CHAMPION Model 300A