

## SWAN SERVICE BULLETIN #9 B

Subject: 15 meter spurious radiation with 350 and 400 transceivers.

We have received a few reports of spurious radiation from 350 and 400 owners while operating in the lower portion of the 15 meter CW band. It will be reduced to an acceptable level by the following:

Disconnect the wire connecting pin 9 of the balanced modulator tube to the REC-TUNE CW switch. Cut at pin 9 and insulate or remove.

When this is accomplished, the tuning procedure must be revised as follows:

1. In the REC. position of the function switch, key microphone and with, CARRIER BALANCE control insert a small amount of carrier. Unkey microphone.
2. With CW key installed, place function switch to the TUNE-CW position.
3. Quickly depress key and peak PA GRID CONTROL for maximum meter reading. Release key.
4. Depress key, quickly tune PA PLATE CONTROL for minimum meter reading.
5. Depress key, quickly check the PA PLATE control for "dip" or minimum reading. If the meter dips to less than 500 ma., increase loading by rotating the PA LOAD CONTROL clockwise. After each increase in PA LOAD, resonate the PA PLATE again; that is, adjust it for dip. Continue increasing PA LOAD until the PA PLATE dips to 450-500 ma. Then switch back to receive position of the function switch.
6. Key microphone and balance out carrier with CARRIER BALANCE control.

CAUTION: Do not hold the transceiver in key position for more than 30 seconds at a time, even though PA PLATE is resonated. With full grid drive to the 6HF5 PA tubes, which you have in TUNE position, they are dissipating considerably more power than they do during normal voice transmission, so a short tuning period must be observed.

### CW OPERATION Special Note

1. Tune transmitter to full output same as for SSB operation. Then, adjust CAR. BAL. for a meter reading of approximately two-thirds the maximum tune-up reading. For example: if the tune-up results in 400 ma. cathode current, adjust CAR. BAL. for approximately 275 ma. or, if tune-up reading is 500 ma., then reduce to approximately 350 ma. for CW, etc.

NOTE- This reduction in drive is essential on 15 meters in order to eliminate a possible spurious radiation. Full power input can be used on all other bands.

2. Add a .47 or .5 mf 200 volt capacitor across the Key. This capacitor may be added internally to the 350 if desired.

4. Switch to TUNE-CW position to transmit. Back to RECEIVE for receiving.

## SERVICE BULLETIN # 10

Swan Electronics Corporation

February 1967

On units (350's and 400's) produced prior to June 1966, a few cases of low loading on one or two bands was caused by over-heating of L-306 RF choke. Replacement of the RF choke, in such cases, restored normal operation.

On these models, medium voltage is present on the plates of the rear section of the PA (variable) grid capacitor when the unit is operated on 80 and 40 meters. Foreign particles between these plates can cause a momentary DC short to ground which results in over-heating of L-306. (This is the green body RF choke in screen circuit of 6GK6 driver tube). This condition can be corrected by installing a .002 mfd disc ceramic capacitor in series with the lead to the rear section of the PA grid capacitor. Leads of the .002 capacitor should be cut short and soldered close to the tab of the PA grid cap.

### TEN METER LOADING:

Drive can be increased on the 10 meter band by re-peakng the PA grid control for maximum cathode current while the unit is in the "tune" position.

### FINAL AMPLIFIER TUBE - Replacement:

When replacing the 6HF5 final amplifier tubes in the Swan 350 or 400, it is recommended that GE tubes be used. It has been our experience that some of the other brands are extremely difficult to neutralize.

## SWAN SERVICE BULLETIN #11

Subject: 15 Meter Spurious Radiation

SB-11-A

15 Meter Trap:

The 15 meter trap is to be installed as follows: drill a 5/16" hole in chassis between the VFO amplifier coils and mixer coils (near the 15 M mixer coil). Install toroid trap on topside of chassis. The sleeved lead of the 5 pf coupling cap is to be routed through the same hole as present lead of the front section of PA variable grid capacitor C-1-A. This lead of the 5 pf coupling cap is to be soldered to the "Hot Side" of the 15 meter mixer coil. Ground lug of 15 M toroid trap can be attached under existing screw of the OA2 socket. Trap to be aligned as follows: load transceiver for normal operation at 21,000 KC. Disconnect the -10V lead to VFO printed circuit board. Turn function switch to "tune" position. Completely unbalance the carrier balance control fully clockwise. Adjust compression capacitor of 15 meter toroid trap for minimum output (as checked with scope, FS meter, SWR bridge or watt meter.) Re-connect -10V lead to VFO printed circuit board. On earlier models, it might be necessary to increase lead length of 5 pf coupling cap. In which case, sleeving should be used.

A better method of alignment would be to use an external receiver that will tune the unwanted signal. Key the mic., insert carrier, and adjust the compression trimmer capacitor to minimize the unwanted signal. The null is quite sharp, so a critical adjustment of the compression capacitor should be made.

General:

Units produced after May 1966 have a modification made to balanced modulator (V-13) which requires carrier to be inserted with carrier balance control during "tune-up." This modification is recommended and may be accomplished as follows: cut and remove the wire connecting Pin 9 of V-13 (7360 balanced modulator tube) to the REC-TUNE switch.

Revised tune-up procedure will be as follows:

- (1) Turn the CAR. BAL. control clockwise until a slight increase in meter reading is obtained.
- (2) Rotate the PA GRID control for maximum meter reading.
- (3) Rotate the PA PLATE control for minimum meter reading.
- (4) Adjust CAR. BAL. for a reading of 150 ma.

IMPORTANT - Tuning the PA PLATE for minimum, or "dip", is known as "resonating" the power amplifier plate circuit, and is very important to preserving tube life. If the transceiver is held in Transmit or Tune position for more than a few seconds

while out of resonance and with some grid drive, the 6HF5 tubes may be severely damaged. For this reason we repeat: CAUTION - Do not hold the transceiver in Transmit or Tube position for any length of time without "dipping" the PA PLATE control. The PA GRID must first be "peaked" as in (b), above, and this requires some carrier supplied as described in (a), so it can be seen that these steps must be performed quickly. If the PA LOAD control is too far clockwise, it may not be possible to find a "dip" with the PA PLATE control.

- (5) Rotate the REC. TUNE switch to TUNE position. Quickly check the PA PLATE control for "dip" or minimum reading. If the meter dips to less than 500 ma., increase loading by rotating the PA LOAD controls clockwise. After each increase in PA LOAD, resonate the PA PLATE again; that is, adjust it for dip. Continue increasing PA LOAD until the PA PLATE dips to 450-500 ma. Then switch back to RECEIVE.

CAUTION: Do not hold the transceiver in TUNE position for more than 30 seconds at a time, even though PA PLATE is resonated. With full grid drive to the 6HF5 PA tubes, which you have in TUNE position, they are dissipating considerably more power than they do during normal voice transmission, so a short tuning period must be observed.

- (5) A. Key mic and balance carrier out with carrier balance control.

- (6) Transmitter Tuning With SWR Bridge or Field Strength Meter:

If either of these instruments is available, they are highly recommended as a better method of tuning the PA Amplifier, since they provide a direct indication of relative output. With the SWR Bridge in forward position, or with the Field Strength Meter set to pick up a portion of the radiated power, simply adjust the PA TUNE and PA LOAD controls for maximum output. This must be done quickly, limited to about 30 seconds, to limit tube dissipation as previously mentioned. This method will result in maximum possible output and efficiency, as well as maximum linearity. You will probably find that cathode current readings end up somewhat less than 500 ma. on 10 meters because grid drive is the least on this band. On 80 meters where grid drive is the greatest, maximum output will be reached at more than 500 ma. These are a normal condition.

NOTE- The cathode current level to which the PA is loaded will have no bearing on tube life. When transmitting with normal voice modulation, average power input will be the same regardless of how high or low the PA was loaded while tuning. Peak output, linearity, and lowest distortion will go along

with maximum loading. In other words, you will not extend tube life by loading to a lesser degree. The secret to long tube life is simply to keep TUNE-UP periods short and not too frequent.

CW OPERATION Special Note

- (1) Tune transmitter to full output; same as for SSB operation. Then, adjust CAR. BAL. for a meter reading of approximately 275 ma. Or, if tune-up reading is 500 ma., then reduce to approximately 350 ma. for CW, etc.

Note- this reduction in drive is essential on 15 meters in order to eliminate a possible spurious radiation.

- (2) Insert CW Key in the Key Jack provided on the back of the 350. Use a standard 1/4 inch diameter 2 circuit phone plug.
- (3) Add a .47 or .5 mf 200 volt capacitor across the Key. This capacitor may be added internally to the 350 if desired.
- (4) Switch to TUNE-CW position to transmit. Back to RECEIVE for receiving.

## VFO TEMPERATURE COMPENSATION

Swan 350, 400, 500

The VFO on the model 350<sup>\*</sup> is individually compensated on each of the bands. The disc temperature compensating capacitors are mounted on the individual VFO coil for each band. The VFO coils are identified on the VFO cover.

If the VFO drift requires the VFO dial to be tuned higher in frequency, this means that a capacitor with a higher negative temperature co-efficient should be used. If the VFO dial has to be tuned lower in frequency, a temperature compensating capacitor with a lower negative temperature co-efficient should be used.

The negative temperature co-efficient of the capacitors used can vary with the production runs, since these are "selected-in-test" for proper compensation. Typical values are as follows:

80 meters:	5NPO	40 meters:	10N150
	10N75		30NPO 10NPO
10 meters:	5N150	15 meters:	39NPO
			10N75
			10N150

Example: If it is necessary to tune the VFO up frequency 2 KC during 40 meter warm-up, change the 10NPO to 10N75. Re-check stability and re-compensate as required.

If it is necessary to turn the VFO down frequency 2 KC during warm-up, change the 10N150 to 10N75. Re-check stability and re-compensate as required.

This same procedure of re-compensating would be required for any of the bands effected. If it is necessary, the equipment may be returned to the factory for service, with a note attached detailing problems, bands effected, etc.

A selection of capacitors is provided with this letter.

SWAN ELECTRONICS  
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\* The information on this sheet is for our 350, 400, & 500.

## SWAN 350 and 400 PRODUCT DETECTOR MODIFICATION

### Additional Parts Required:

- (1) 1K  $\frac{1}{2}$  watt resistor
- (1) 270 ohm  $\frac{1}{2}$  watt resistor
- (1) 150 pf SM capacitor
- (1) 10K  $\frac{1}{2}$  watt resistor
- (1) .22 mfd 200 volt capacitor

### Remove:

- 1. L 1001 RF choke
- 2. C 1001-2 pf capacitor
- 3. R 1001-1 meg resistor
- 4. C 1002-.01 capacitor
- 5. Ground lead from pin 3 of V-10A
- 6. Ground lead from pin 7 of V-14. Make sure that pin 2 of V-14 remains grounded. (V-15 on Swan 400)

### Install:

- 1. L-1001 RF choke from pin 3 of V-10A to vacant lug of terminal strip.
- 2. 1K resistor in series with L-1001 to ground.
- 3. 270 ohm resistor from pin 7 of V-14 to ground. (V-15 on Swan 400)
- 4. 150 pf SM coupling capacitor from pin 7 of V-14 to pin 3 of V-10 A.
- 5. 10K resistor from pin 2 of V-10A to ground.
- 6. .22 capacitor from pin 8 of V-10 B to ground.

Note: In some of the earlier models, pin 8 of V-10 B is grounded. Remove ground and install 2.7K resistor from pin 8 to ground. Re-peak second IF transformer for maximum background noise.

Replacing R-906-270K with a 150K resistor will permit higher "S" meter reading. R-1104 - 27K can be replaced with a 2.7K  $\frac{1}{2}$  watt resistor for improved receiver audio.

(This circuit is similar to that as used in the Swan 500 and 250. It is not a Swan Modification on the Swan 350, and is furnished for your information.)

V-10A

