

SWAN ENGINEERING COMPANY
417 VIA DEL MONTE
OCEANSIDE, CALIF.

OPERATING INSTRUCTIONS - - - - - SW-120, SW-140, SW-175

FREQUENCY RANGE: SW-120: 14.2 - 14.35 MC, UPPER SIDEBAND
SW-140: 7.2 - 7.3 MC, LOWER SIDEBAND
SW-175: 3.8 - 4.0 MC, LOWER SIDEBAND

TECHNICAL SPECIFICATIONS:

240 WATTS PEP INPUT TO 60Q5 POWER AMPLIFIER.

TUBE COMPLEMENT: V1 - 6DQ5 P.A., V2 - 12BY7 DRIVER, V3 - 12BE6 TRANS. MIXER, V4 - 12AU6 VFO, V5 - 6BA6 REC. RF, V6 - 12 BE6 REC. MIXER, V7 - 6BZ6 1ST IF, V8 - 6BA6 2ND IF, V9 - 7360 BAL. MOD, V10 - 6V6GTA AF OUTPUT, V11 - 12 AU7 MIC. AMP., V12 - 12AX7 PROD. DET., V13 - 6BA6 CAR. OSC., V14 - OD3 VOLT. REG., V15 - 12AV6 A. F. OSC.

HIGH FREQ. CRYSTAL LATTICE FILTER, 3 KC NOMINAL BANDWIDTH. UNWANTED SIDEBAND DOWN APPROXIMATELY 40 DB. CARRIER SUPPRESSION APPROXIMATELY 50 DB. RECEIVER SELECTIVITY ALSO DETERMINED BY CRYSTAL FILTER.

RECEIVER SENSITIVITY LESS THAN 1 MICROVOLT AT 50 OHMS INPUT IMPEDENCE FOR SIGNAL-PLUS-NOISE/NOISE RATIO OF 6 DB.

TRANSMITS AUTOMATICALLY ON RECEIVING FREQUENCY.

MECHANICAL, ELECTRICAL, AND THERMAL STABILITY EXCEPTIONALLY HIGH. OSCILLATORS ARE VOLTAGE REGULATED AND TEMPERATURE COMPENSATED.

CONTROLS INCLUDE: MAIN TUNING, VOLUME, CARRIER BALANCE, MIC. GAIN, EXCITER TUNING, P.A. TUNE, P.A. LOAD, T-R SWITCH, SUPPLY ON-OFF SWITCH, AND TUNE SWITCH.

MICROPHONE JACK PROVIDES FOR PUSH-TO-TALK OPERATION.

TRANSMITS ON AM, (SINGLE SIDEBAND WITH CARRIER), WITH CARRIER POWER OF APPROXIMATELY 25 WATT OUTPUT.

AUDIO RESPONSE ESSENTIALLY FLAT FROM 300 TO 3000 CYCLES ON BOTH RECEIVE AND TRANSMIT.

METER READS P.A. CATHODE CURRENT, 300 MA. FULL SCALE.

SIZE: 13¹/₂ IN. WIDE, 5 - 5/8 IN. HIGH, 11 IN. DEEP. WEIGHT 11 POUNDS.

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WARRANTY POLICY:

SWAN ENGINEERING WARRANTS THIS EQUIPMENT AGAINST DEFECTS IN MATERIAL OR WORKMANSHIP, UNDER NORMAL SERVICE FOR A PERIOD OF 90 DAYS FROM THE DATE OF ORIGINAL PURCHASE. THIS WARRANTY IS VALID ONLY WHEN THE ENCLOSED CARD IS PROPERLY FILLED IN AND MAILED TO THE FACTORY WITHIN 10 DAYS OF PURCHASE DATE. Do NOT SHIP EQUIPMENT TO THE FACTORY WITHOUT PRIOR AUTHORIZATION. THIS WARRANTY IS LIMITED TO REPAIRING OR REPLACING ONLY THE DEFECTIVE PARTS, AND IS NOT VALID IF THE EQUIPMENT HAS BEEN TAMPERED WITH, MISUSED OR DAMAGED.

INSTALLATION:

A MOUNTING BRACKET IS SUPPLIED WITH THE TRANSCEIVER WHICH WILL ACCOMMODATE MOST UNDER-DASH INSTALLATIONS. THE BRACKET MAY BE ATTACHED TO THE BOTTOM SIDE OF THE DASH WITH MACHINE BOLTS, OR WITH SELF-THREADING SCREWS OF ABOUT 1/8 INCH DIAMETER.

THE TRANSCEIVER IS ATTACHED TO THE MOUNTING BRACKET BY A PAIR OF 10-32 FLATHEAD MACHINE SCREWS WHICH ARE MOUNTED ON THE SIDES OF THE CABINET. THESE SCREWS SHOULD BE MOUNTED IN THE VENTILATION HOLES WHICH WILL POSITION THE TRANSCEIVER IN THE DESIRED LOCATION UNDER THE DASH. THEY ARE SECURED TO THE CABINET WITH A FLAT WASHER, A SHAKEPROOF WASHER, AND A HEX NUT. WING NUTS ARE USED TO CLAMP THE BRACKET TO THESE SCREWS.

SPEAKER CONNECTIONS:

AUDIO OUTPUT FROM THE TRANSCEIVER IS PROVIDED AT PIN 12 OF THE JONES PLUG. THE OTHER SPEAKER LEAD GOES TO THE COMMON CHASSIS GROUND OF PIN 6. OUTPUT IMPEDENCE IS 3 TO 4 OHMS. THE SPEAKER CABLE MAY BE PLASTIC INSULATED LAMP CORD, OR SIMILAR 2 CONDUCTOR CABLE.

IN MOBILE INSTALLATION, THE REGULAR CAR RADIO SPEAKER MAY BE USED. A SINGLE POLE DOUBLE THROW SWITCH SHOULD BE INSTALLED AS A SELECTOR. THIS SWITCH MAY BE INSTALLED IN THE BOTTOM EDGE OF THE DASH AND WIRED SO THAT IN ONE POSITION THE CAR SPEAKER CONNECTS TO THE CAR RADIO, AND IN THE OTHER POSITION IT CONNECTS TO THE TRANSCEIVER.

IF THE CAR RADIO SPEAKER PLACEMENT IS NOT SATISFACTORY FOR MOBILE OPERATION SUCH AS BEING TOO FAR OVER ON THE PASSENGER SIDE, OR THE LIKE, A SEPARATE SPEAKER MAY PROVE DESIREABLE. A SMALL SHALLOW SPEAKER, SUCH AS A QUAM 4A07, MAY BE MOUNTED IN THE HEADLINER OF MANY CARS, EITHER ABOVE THE WINDSHIELD OR ABOVE THE LEFT DOOR.

FOR FIXED STATION OPERATION, SELECT A FAIRLY GOOD SPEAKER, AN 8 IN. DIAM. OR A 6 X 9 IN. OVAL TYPE OR SIMILAR, WITH A GOOD CABINET OR BAFFLE AS THIS WILL AID GREATLY IN PRODUCING PLEASANT VOICE QUALITY.

HEADPHONES MAY ALSO BE USED BY CONNECTING THEM TO THE SPEAKER LEADS IN PLACE OF THE SPEAKER. HIGH IMPEDENCE PHONES MAY BE USED. THE POWER LOSS CAUSED BY THE LARGE MISMATCH WILL DROP THE VOLUME LEVEL TO ABOUT THE DESIRED AMOUNT FOR HEADPHONES.

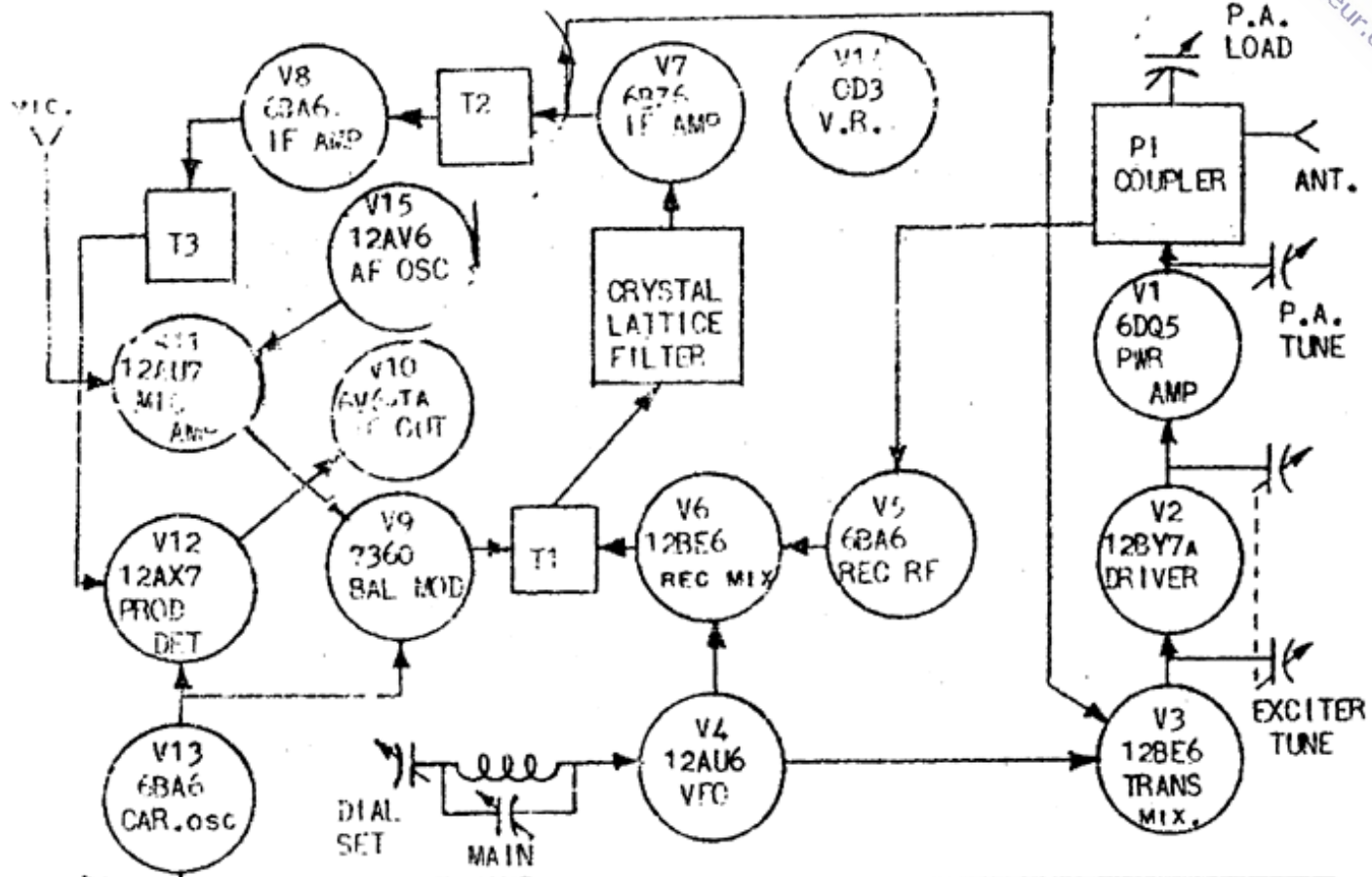


FIG. 1 BLOCK DIAGRAM
SW-100 SERIES, SSB TRANSCEIVER

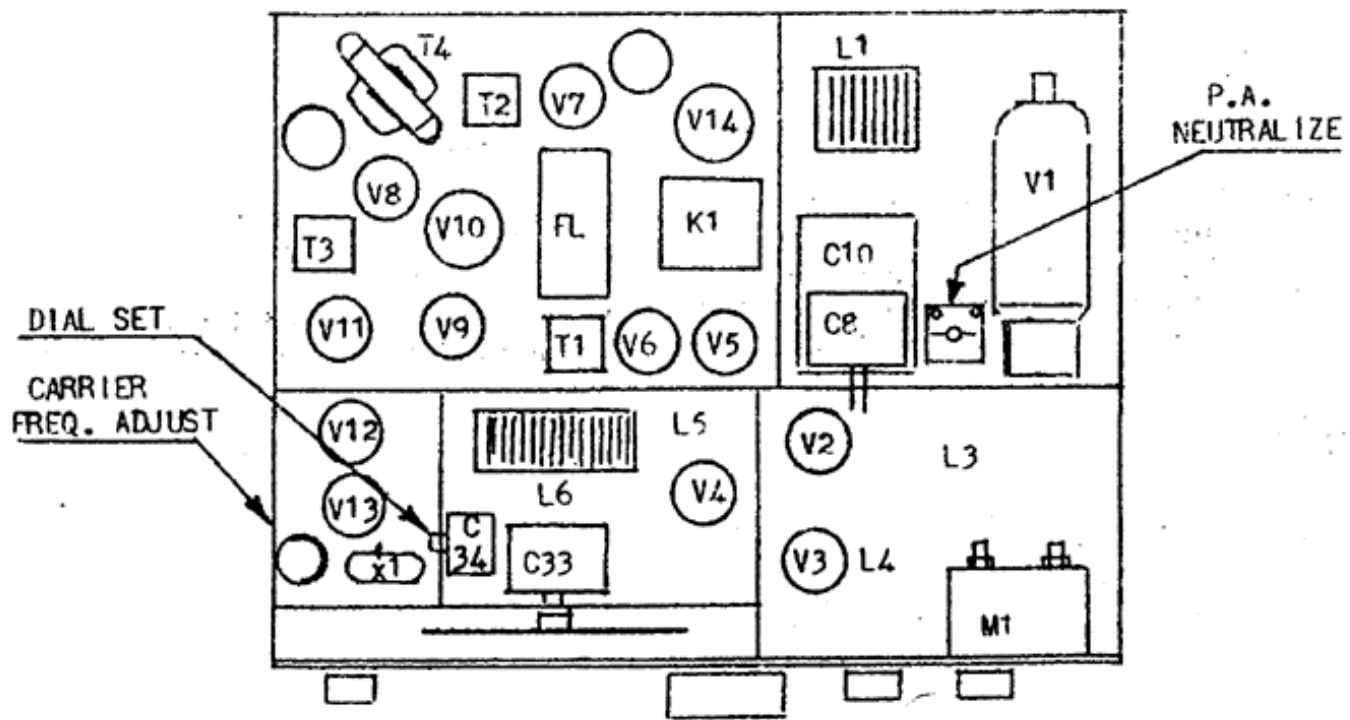


FIG. 2 TOP VIEW, TUBE LOCATIONS
AND ADJUSTMENTS.

Antenna Input is designed for 50 or 75 ohm coaxial cable. The Pi coupling network in the P.A. plate circuit allows for considerable mismatch on the transmission line, but a reasonably low SWR is always to be recommended, of course. The Pi coupling also tunes the input to the receiver section.

Microphone Input is designed for high impedance, low level microphones' only. The choice of microphone is very important for good speech. The crystal lattice filter in the Swan Transceiver provides all the restriction on audio response that is required and it is not necessary that the microphone produces any further restriction. It is more important to have a microphone with a smooth, flat response throughout the speech range. For mobile work, the Shure Ten-Four, Model 405C is an excellent choice.

Microphone Plug for the Swan Transceiver should be a standard 1/4 in. diam. 3 circuit type. The tip connection is for the push-to-talk relay control. The ring connection is the microphone terminal, and the sleeve connection is the common chassis ground. Directions furnished with the various microphones will show how the microphone cable should be connected to the plug. With most microphones, the push-to talk button must be pressed in order to make the microphone operative, even though the panel T-R switch is in Trans. position. This feature may be disabled, if desired by disassembling the microphone case, and spreading the contacts which short the microphone. In this way, the Mic. button need not be pressed in order for the microphone to operate.

OPERATING INSTRUCTIONS

WARNING: DANGEROUS HIGH VOLTAGE IS PRESENT ON THE PA PLATE CIRCUIT WHENEVER THE POWER SUPPLY IS ENERGIZED. NEVER TURN POWER ON WHEN THE PA COVER IS REMOVED. HIGH VOLTAGE IS ALSO PRESENT AT TERMINAL #8 OF THE POWER CONNECTOR. ALLOW ONLY QUALIFIED PERSONNEL TO SERVICE EQUIPMENT.

Receiving:

- (A) Set the T-R switch to Rec. position, tune switch down in operate position (lower right hand toggle switch).
- (B) Connect the power supply, antenna and speaker to the Transceiver.
- (C) Turn the power supply on. After about 15 seconds a background hiss will be heard in the speaker.
- (D) Set P.A. Tune, P.A. Load, and Exciter tuning to midscale positions. Turn up the volume and tune on a signal. Then adjust these controls for maximum volume.

Transmitting:

Preliminary 1: Check for proper operation of the Transmit-Receive relay by snapping the T-R panel switch to Trans. position, and back to Rec., listening for the click of the relay. Plug the microphone into the Mic. Jack on the rear of the Transceiver, and check relay operation by pressing the Mic. button., (if so equipped).

PRELIMINARY 2: P.A. BIAS ADJUSTMENT: THIS ADJUSTMENT MUST BE MADE WHEN FIRST OPERATING FROM A NEW POWER SUPPLY, BUT REQUIRES ONLY OCCASIONAL CHECKING THEREAFTER.

- (A) TUNE SWITCH DOWN, IN OPERATE POSITION.
- (B) MOVE THE T-R SWITCH TO TRANS. POSITION. ADJUST CAR. BAL. FOR MINIMUM METER READING.
- (C) USE THE P.A. BIAS CONTROL ON THE BACK OF THE TRANSCEIVER TO ADJUST THE METER READING TO 25 MA. ALWAYS BE SURE THAT CAR. BAL. IS SET TO MINIMUM METER READING WHEN MAKING THIS ADJUSTMENT. THIS IDLING OR RESTING CURRENT MAY VARY SOMEWHAT FROM TIME TO TIME, BUT SHOULD BE HELD WITHIN THE 20 TO 30 MA. RANGE.

TRANSMITTER TUNING:

STEP 1: (A) SET TUNING DIAL TO DESIRED PART OF BAND. (B) SET P.A. LOAD TO MINIMUM, FULL CCW POSITION. (C) SET MIC. GAIN TO 12 O'CLOCK.

STEP 2: (A) THROW TUNE SWITCH UP TO TUNE POSITION. (B) ADJUST P.A. TUNE FOR DIP IN METER READING. (C) ADJUST EXCITER TUNING FOR MAXIMUM READING. (D) INCREASE P.A. LOAD, (CLOCKWISE) UNTIL METER READS APPROX. 175 MA., RE-ADJUST P.A. TUNE FOR DIP. (E) ADJUST P.A. LOAD AGAIN UNTIL P.A. TUNE DIPS TO ABOUT 175 MA. (F) BE SURE EXCITER TUNING IS ADJUSTED FOR PEAK READING. **CAUTION:** DO NOT HOLD THE TRANSCEIVER IN TUNE POSITION FOR LONGER THAN 20 TO 30 SECONDS AT A TIME. THE 6XQ5 P.A. TUBE IS OPERATING AT MAXIMUM DRIVE AND DISSIPATION DURING TUNE-UP, AND TUBE LIFE WILL BE IMPAIRED IF IT IS HELD FOR LONGER PERIODS. IF LONGER TUNE-UP TIME IS REQUIRED, GIVE THE TUBE A REST PERIOD OF A MINUTE OR SO. ONCE EXPERIENCE IN TUNING HAS BEEN GAINED, 20 SECONDS WILL BE MORE THAN ENOUGH TIME. **NOTE:** (A) THE CATHODE CURRENT TO WHICH THE P.A. MAY BE LOADED IS NOMINALLY 175 MA. BUT WILL VARY SOMEWHAT, WITH POWER SUPPLIES. IF SUPPLY VOLTAGE HOLDS UP TO 500 VOLTS, OR SO, THE P.A. MAY BE LOADED UP TO 200 MA. WITHOUT DANGER, AS LONG AS THE TUNE-UP PERIOD IS HELD QUITE SHORT. (B) EXCITER TUNING WILL APPEAR BROAD IN TUNE POSITION. THIS IS A NORMAL CONDITION.

STEP 3: AFTER P.A. TUNE, P.A. LOAD, AND EXCITER CONTROLS HAVE BEEN ADJUSTED, RETURN THE TUNE SWITCH TO "OPERATE" POSITION. THEN MOVE THE T-R SWITCH TO TRANS. POSITION, AND ADJUST THE CAR. BAL. CONTROL FOR MINIMUM METER READING.

STEP 4: TURN MIC GAIN TO ABOUT 12 O'CLOCK, AND MODULATE. THE METER READING WILL SWING UP TO ABOUT THE SAME PEAK THAT WAS REACHED DURING TUNE-UP. IT IS VERY IMPORTANT THAT THE MIC. GAIN CONTROL BE CORRECTLY SET. IF IT IS TOO HIGH, VOICE PEAKS WILL OVERDRIVE THE P.A. PRODUCING WHAT IS REFERRED TO AS "FLAT-TOPPING" OF THE OUTPUT WAVEFORM, WITH THE ATTENDANT GENERATION OF SPURIOUS EMISSIONS. EXACT SETTING WILL DEPEND ON THE MICROPHONE BEING USED, AND HOW CLOSE AND LOUD THE OPERATOR SPEAKS. A GOOD RULE OF THUMB TO FOLLOW IS TO OBSERVE HOW HIGH THE METER READS WITH A SUSTAINED "AAHH" OR WHISTLE INTO THE MICROPHONE. THEN SET THE MIC. GAIN SO THE METER AVERAGES ABOUT ONE-HALF OF THIS READING WHILE SPEAKING. ONLY AN OCCASIONAL VOICE PEAK SHOULD SWING TO MAXIMUM OUTPUT. ON-THE-AIR REPORTS WILL HELP TO DETERMINE THE OPTIMUM SETTING, BUT SUCH REPORTS MUST BE CAREFULLY SCREENED. SOME OPERATORS ARE WELL QUALIFIED AND EQUIPPED TO CHECK THE SIGNAL QUALITY, WHILE OTHERS ARE NOT.

IN MOBILE OPERATION, IT WILL BE BEST TO SET THE MIC. GAIN FOR CLOSE, FAIRLY LOUD SPEAKING. THIS WILL HELP IN LIMITING WIND AND AUTOMOTIVE NOISES FROM TRANSMISSIONS.

NOTE: IT WILL BE FOUND THAT ONCE THE P.A. TUNE AND P.A. LOAD ADJUSTMENTS HAVE BEEN MADE, THEY WILL SELDOM NEED TO BE TOUCHED IN MOVING FROM ONE END OF THE BAND TO THE OTHER. EXCITER TUNING SHOULD BE PEAKED FOR THE PORTION OF THE BAND BEING USED.

AM RECEPTION: AM STATIONS ARE RECEIVED BY ZERO BEATING THE CARRIER. NEARBY CARRIERS WILL STILL PRODUCE UNDESIREABLE HETERODYNES, OF COURSE, BUT NO MORE THAN WITH OTHER METHODS OF DETECTION.

AM TRANSMISSION: TUNE THE TRANSCEIVER FOR MAXIMUM OUTPUT, JUST AS DESCRIBED IN THE PRECEDING STEPS. THEN, ADJUST CAR. BAL. FOR A READING OF 100 TO 110 MA. SET THE MIC. GAIN SOMEWHAT LOWER THAN FOR SUPPRESSED CARRIER OPERATION. THE METER SHOULD FLICKER UPWARD ONLY SLIGHTLY WHEN SPEAKING. TRANSMISSION IS NOW SINGLE SIDEBAND, WITH CARRIER AND RESULTS WILL BE COMPARABLE TO THE AVERAGE 50 TO 60 WATT PLATE MODULATED AM TRANSMITTER. CARRIER OUTPUT IS APPROXIMATELY 25 WATTS.

NOTE: SW-175's: AS WITH ALL 75 METER MOBILE ANTENNAS, RESONANCE IS EXTREMELY SHARP, AND IMPEDANCE MATCHING TO THE PI COUPLING NETWORK OF THE TRANSCEIVER WILL BE QUITE CRITICAL. THE PI HAS BEEN DESIGNED SO THAT IT WILL MATCH A 50 OHM RESISTIVE LOAD WHEN THE LOAD CAPACITOR IS SET TO APPROXIMATELY 11 O'CLOCK. AT THIS POINT THE P.A. CATHODE CURRENT SHOULD DIP TO ABOUT 175 MA. A SIMPLE WAY FOR RESONATING THE ANTENNA IS TO ADJUST IT UNTIL THIS CONDITION OCCURS, THAT IS, UNTIL THE P.A. TUNE CONTROL DIPS TO 175 MA. WITH THE P.A. LOAD AT 11 O'CLOCK. THIS CONDITION WILL HOLD TRUE OVER A NARROW FREQUENCY RANGE, OF COURSE, SO THE ANTENNA MUST BE ADJUSTED FOR THE DESIRED FREQUENCY OF OPERATION.

SERVICE ADJUSTMENTS:

DIAL SETTING: ADJUSTMENT IS PROVIDED ON THE TRANSCEIVER LEFT SIDE FOR CORRECTING DIAL CALIBRATION ACCURACY. AGING OF COMPONENTS WILL GRADUALLY SHIFT THE DIAL READING UNTIL IT MAY BECOME DESIREABLE TO RESET THE CALIBRATION. A LONG, SLIM SCREWDRIVER WILL REACH THE ADJUSTMENT THROUGH ONE OF THE FRONT VENTILATION HOLES ON THE LEFT SIDE OF THE CABINET. THE ADJUSTMENT IS AN APC TYPE TRIMMER ON THE SIDE OF THE VFO COMPARTMENT.

OTHER ADJUSTMENTS: THESE WILL SELDOM, IF EVER, REQUIRE ATTENTION, BUT ARE LISTED AND DESCRIBED BELOW FOR REFERENCE.

CARRIER FREQUENCY: TOP ADJUSTMENT 5-25 MMF TRIMMER C79, ALONGSIDE CARRIER CRYSTAL, X5. FEED AUDIO OSCILLATOR INTO MIC. JACK. ADJUST C79 FOR 6DB ROLL-OFF TRANSMITTER OUTPUT AT 250 CYCLES.

P.A. NEUTRALIZING: CONNECT A WATTMETER OR DUMMY LOAD WITH RELATIVE OUTPUT INDICATOR TO THE TRANSCEIVER, AND TUNE UP FOR MAXIMUM POWER OUTPUT. WHEN PROPERLY NEUTRALIZED, MAXIMUM OUTPUT WILL BE REACHED VERY CLOSE TO THE SAME POINT WHERE P.A. TUNE ADJUSTS TO MINIMUM P.A. CATHODE CURRENT. ADJUST NEUTRALIZING CAPACITOR, C18, (BOTTOM ADJUSTMENT) FOR THIS CONDITION. CAUTION: DO NOT HOLD THE P.A. AT FULL POWER FOR MORE THAN 20 TO 30 SECONDS AT A TIME.

NOTE: C17 HAS BIVOLTAGE ON IT.

L3 and L4 Adjustment: With exciter tuning at midscale, adjust L3, (bottom adjustment), and L4 (top adjustment), for maximum transmitter output. Main tuning dial should also be at midscale during this adjustment.

L5 Adjustment: Connect a VTVM to Pin 1 of V6, (12BE6 rec. mixer). Set Main tuning dial to midscale. Adjust L5, (bottom adjustment) for maximum reading. (Approximately - 3 to - 6 volts).

T1: Factory setting. Do not adjust.

T2: Adjust for maximum transmitter output. This is a single core adjustment, and may be made from the top or bottom of T2 with a hexagon nylon tool.

T3: Adjust for maximum receiver output. This is a single core adjustment and may be made from the top or bottom of T3.

TUNING KNOB FRICTION ADJUSTMENT: A spring friction washer is located in back of the main tuning knob, and may be used for adjustment for tuning friction. The bottom cover must be removed in order to hold the back end of the tuning shaft. Loosen the knob set screw, press in on the knob, compressing the friction washer the desired amount, and then tighten the set screw firmly. Occasional lubrication of the washer as well as the other moving parts of the tuning dial system is recommended. (Lubriplate or similar type grease).

COMPONENT LIST - SW-120, SW-140, SW-175

Resistors: (K - indicates multiplier of 1000)

<u>SCHEMATIC NUMBER</u>		<u>DESCRIPTION</u>
R18 - 19	27	Ohm 1/2 watt 10% composition
R6 - 20-38-42	47	Ohm 1/2 watt 10% composition
R5	100	" " " " "
R51	270	" " " " "
R3 -14-25-31-37-40-44-50-59	1K	" " " " "
R54	2.2K	" " " " "
R34	4.7K	" " " " "
R9 - 15-23-60-62	27K	" " " " "
R8 - 22-26-27-29-32-39-43-48-64-65	47K	" " " " "
R28 - 36-57	100K	" " " " "
R7 - 30-41-46-63-66	150K	" " " " "
R16 - 45-53-55-56-67	270K	" " " " "
R33 -52	470K	" " " " "
R17 - 47-58-61	1 Meg.	" " " " "
R11	4.7K	"1 watt 10% composition
R2	10K	" " " " "
R10 -24	22K	" " " " "
R4	220	" 2 watt 10% composition
R12 -13	1750	" 10 watt wirewound
R1	5000	" 1 watt linear potentiometer
R21	10,000	" 2 watt rev. log. pot.
R35	5000	" 2 watt linear pot.
R49	1 Meg.	1/4 watt log. taper pot.

CAPACITORSSchematic NumberDESCRIPTION

C14 - 24	11 mmf. variable (2 sections, SW-175, 50 mmf.)
C17	15 mmf. Trimmer (P.A. Neutralize)
C79	5-25 mmf. Trimmer (Carrier freq.)
C10	467-467 mmf. 2 gang variables
C63 A-B	30-10 mfd., 475 wv. electrolytic can
C42 -49	0.1 mfd., 200 wv paper
C54	0.1 mfd., 400 wv paper
C69 A-B-C	40-40-40 mfd., 25 wv, electrolytic can
C70	.015 mfd., 1000 wv paper
C11 -(SW-175, 3 paralleled)	100 mmf. 5% 1KV-NPO Disc. Ceramic
C22-67	100 mmf. 10% 500V-NPO Disc. Ceramic
C55-85	150 mmf. 10% 500V-NPO Disc. Ceramic
C56-65-73-76-84	270 mmf. 10% 500V-NPO Disc. Ceramic
C41-59-77	10 mmf. 5% NPO Tubular Ceramicon
C28-29-45-81	50 mmf. 5% N750 Tubular Ceramicon
C18	10 mmf. 10% 3KV-Disc. Ceramic
C53-71-72-75-86	.001 mfd. 20% 500V Disc. Ceramic
C16-26	.002 mfd. 10% 500V Disc. Ceramic
C6-13	.002 mfd. GMV-2KV-Disc. Ceramic
C1-2-3-20-23-43-51-52-57-61 66-78-82	.01 mfd. 300 V Disc. Ceramic
C4-5-19-21-27-31-32-44-47-48 50-58-60-62-64-68-74-80	.01 mfd. 1KV Disc. Ceramic
C7	.0005 mfd. 2500 wv. mica.
C83	1 mmf. 10% Ceramic

Schematic No.

C8	50 mmf. Var.	100 mmf. Var.	100 mmf. Var.
C9	None	51 mmf. 6KV	2-51 mmf. 6KV
C12	None	.002 Disc.	None
C15 - 25	100 mmf. Disc.	200 mmf. Disc.	200 mmf. Disc.
C30	100 mmf. Disc.	100 mmf. Disc.	100 mmf. Disc.
C33	35 mmf. Var.	35 mmf. Var.	35 mmf. Var.
C34	25 mmf. Trimmer	25 mmf. Trimmer	25 mmf. Trimmer
C35	270 mmf. 2%	300 mmf. 2%	220 mmf. 2%
C36	33 mmf. N330	68 mmf. N330	33 mmf. N330
C37	300 mmf. 1%	160 mmf. 1%	240 mmf. 1%
C38 - 39	50 mmf. N750	50 mmf. N750	50 mmf. N750
C40*	10mmf.*	10mmf.*	10mmf.*
C46	30 mmf. N750	None	None

* Coefficient of C40 may be N220, N330, N470 or N750, depending on factory tests and adjustments.

C28	None	None	50 mmf. N750
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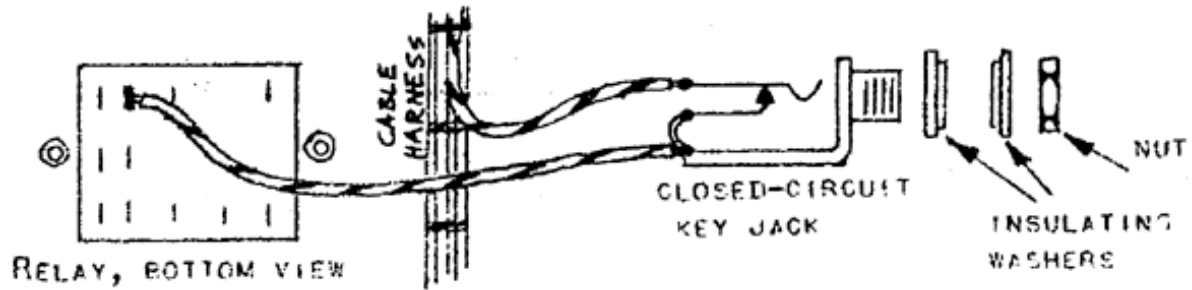
COMPONENT LIST - Continued

<u>SCHEMATIC NUMBER</u>	<u>DESCRIPTION</u>
T1	Balanced Modulator Transformer
T2 - 3	I.F. Transformer
T4	Audio Output Transformer
RFC1	1 Millihenry, 300 Ma. choke
✓RFC2-7	200 Microhenry Choke

TUBE COMPLEMENT:

V1	6DQ5	V9	7360
V2	12BY7A	V10	6V6GTA
V3, V6	12BE6	V11	12AU7
V4	12AU6	V12	12AX7
V5, V7, V8, V13	6BA6	V14	OD3
		V15	12AV6

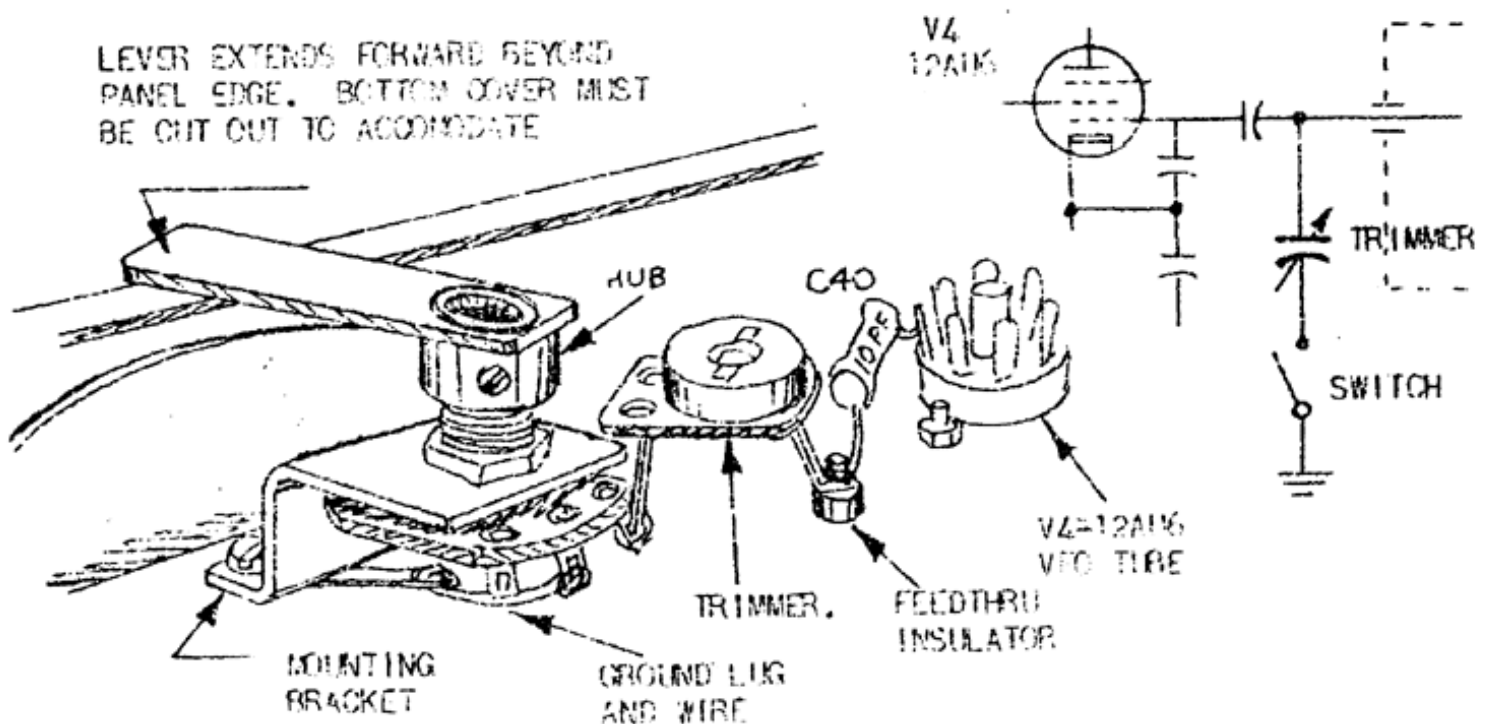
MODIFICATION INSTRUCTIONS FOR CW OPERATION: OWNERS INTERESTED IN USING GRID BLOCK KEYING FOR CW MAY INSTALL A KEY JACK ON THE BACK OF THE CHASSIS AS ILLUSTRATED BELOW. REFERRING TO THE BOTTOM TERMINALS ON THE T-R RELAY, A WHITE WIRE WITH BLACK TRACER WILL BE FOUND GOING FROM ONE OF THE RELAY TERMINALS TO THE CABLE HARNESS. A CLOSED CIRCUIT JACK MAY BE INSTALLED IN SERIES WITH THIS LEAD, AS ILLUSTRATED:



NOTE THAT THE JACK MUST BE INSULATED FROM THE CHASSIS. POTENTIAL FROM THE JACK TO THE CHASSIS IS ABOUT 45 VOLTS DC AT LOW CURRENT, AND RESULTS IN ONLY A MINOR SHOCK PROBLEM.

FREQUENCY RANGE: THE SWAN SSR TRANSCEIVER CAN BE MODIFIED TO OPERATE IN THE CW PORTION OF THE BAND BY ADDING A SMALL ROTARY SWITCH UNDER THE CHASSIS AND A SMALL TRIMMER TYPE CAPACITOR WHICH WILL ADJUST TO ABOUT 5 KMC. THIS MAY BE DONE AS SHOWN IN THE SKETCH BELOW. THE SWITCH MAY BE A SPOT "TONE SWITCH", OR SIMILAR TYPE WITH PHENOLIC OR CERAMIC INSULATION. A COMMON TRIMMER RANGE IS 1.5 TO 7 MME. A COMPRESSION TYPE MICA TRIMMER WILL ALSO WORK, BUT IS NOT AS STABLE AS THE CERAMIC TYPE. THE MOUNTING BRACKET, LEVER, AND SHAFT HUB ARE NOT STANDARD ITEMS, AND MUST BE FABRICATED BY THE INSTALLER.

WITH THE SWITCH IN CLOSED POSITION, THE TRIMMER IS ADJUSTED TO COVER THE DESIRED SEGMENT OF THE CW BAND. ON 20 METERS THE TRIMMER CAN BE SET TO COVER ABOUT 125 KC OF THE CW BAND, ON 40 METERS ABOUT 90 KC, AND ON 75 METERS ABOUT 125 KC. THE DIAL SET TRIMMER ON THE UPPER LEFT SIDE OF THE VFO COMPARTMENT WILL PROBABLY HAVE TO BE ADJUSTED SLIGHTLY AFTER INSTALLING THE CW SWITCH AND TRIMMER.



"R" Receive Position
 "T" Transmit

VOLTAGE CHART

Socket Pin Number

			1	2	3	4	5	6	7	8	9
V1	6DQ5	R T	-70 *	6-6.6 " AC	∅ ∅	∅ 180	-70 *	∅ ∅	12.6 " AC	∅ 180	CAP 800 *
V2	12BY7A	R T	∅ 3.5	-43 ∅	∅ ∅	∅ ∅	12.6 AC "	6.3 AC "	275 "	180 "	∅ ∅
V3	12BE6	R T	-46 -7,-12	∅ ∅	∅ ∅	12.6 AC "	275 240	275 100	-46 ∅		
V4	12AU6	R or T	-2,5,-4	∅	∅	12.6 AC	140	100	∅		
V5	6BA6	R T	∅ -65	∅ ∅	6-6.6 " AC	∅ ∅	275 275	70 ∅ 170	.75 ∅ 30		
V6	12BE6	R T	-3,-6 -3,-6	∅ ∅	12.6 AC "	∅ ∅	178 182	80 ∅	∅ -70		
V7	6BA6	R T	∅ ∅	∅ ∅	∅ ∅	6-6.6 " AC	170 175	60@175 60@60	.7@30 .7@.7		
V8	6BA6	R T	∅ -70	∅ ∅	∅ ∅	6-6.6 " AC	165 180	55 125	.7@30 ∅		
V9	7360	R T	∅ 2.7	18- 105	-42 -3,-5	∅ ∅	6-6.6 " AC	178 135	178 135	18 "	18 "
V10	6V6GTA	R T	NC NC	6-6.6 " AC	260 275	180 185	∅ -68	85 85	∅ ∅	9 ∅	
V11	12AU7A	R T	8 13	-.5 -.5	∅ ∅	6-6.6 " AC	6-6.6 " AC	8 20	∅ ∅	.3 .7	∅ ∅
V12	12AX7	R T	120 180	-3 -65	∅ ∅	∅ ∅	∅ ∅	85 85	∅ ∅	.8 .8	6-6.6 " AC
V13	6BA6	R or T	-10,-15	∅	∅	6-6.6 " AC	40	90	∅		
V14	OD3	R or T	NC	∅	NC	NC	135-150	NC	NC	NC	
V15	12AV6	R	∅	8.0	∅	12.6 AC	NC	NC	185		

Note @ Reading with volume control at minimum.

Note * Do not measure

-All voltages are positive DC potential unless otherwise specified

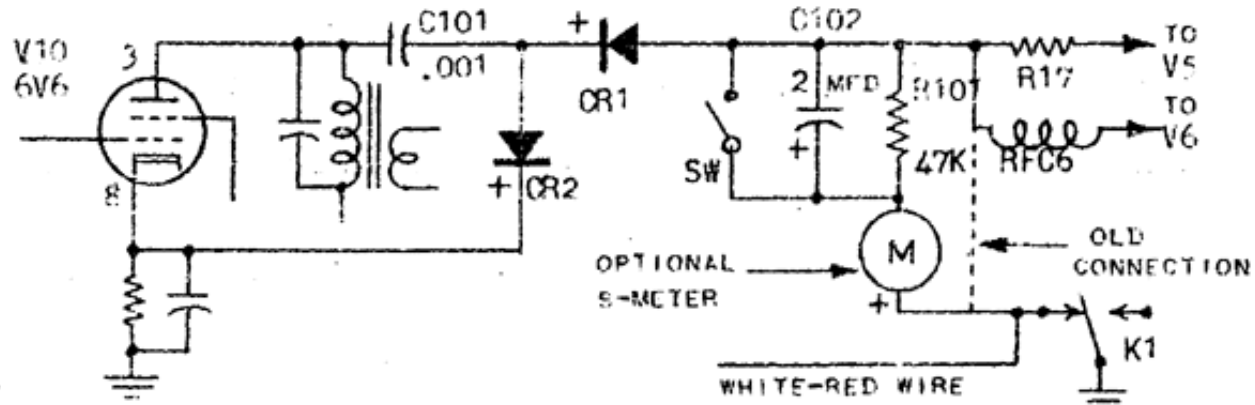
-All measurements made with VTVM

-Control settings during measurements: Volume at Maximum, carrier Balance at minimum meter reading, P.A. Bias set for 25 ma. idling.

Tuning dial at midscale. Other control settings not critical during voltage measurements.

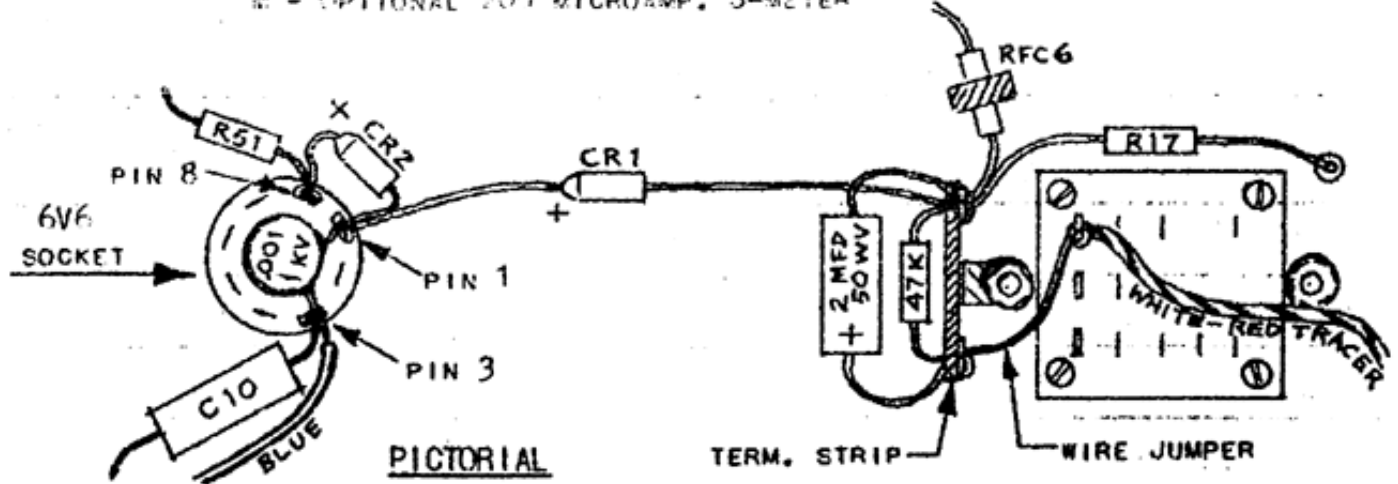
-Power Supply Voltages: H.V., 800 VDC Med. Volt., 275 VDC
 Bias, -90 VDC. Fil., 12.6 V AC

AVC MODIFICATION THE FOLLOWING INFORMATION IS FOR OWNERS OF THE SWAN SSP TRANSCEIVER WHO WISH TO ADD AUTOMATIC VOLUME CONTROL. THE CIRCUIT WILL HAVE PRACTICALLY NO EFFECT ON WEAK SIGNALS, BUT WILL AUTOMATICALLY LIMIT STRONG SIGNALS. AS CAN BE SEEN FROM THE SCHEMATIC, CONTROL VOLTAGE IS TAKEN FROM THE OUTPUT AUDIO STAGE, RECTIFIED, AND APPLIED AS A BIAS TO THE FIRST TWO STAGES OF THE RECEIVER. A FAST ATTACK, SLOW RELEASE CIRCUIT IS EMPLOYED, WITH DELAY BIAS SO THAT THE SYSTEM DOES NOT BEGIN WORKING UNTIL SIGNALS REACH A MEDIUM LEVEL. RELEASE TIME IS CONTROLLED BY THE CAPACITY OF C102, AND CAN BE INCREASED OR DECREASED AS DESIRED BY CHANGING THIS CAPACITOR. THE COMPONENTS REQUIRED ARE AVAILABLE AT YOUR DEALER, EITHER SEPARATELY OR AS A PACKAGE KIT, AND MAY BE INSTALLED BY REMOVING THE BOTTOM COVER OF THE TRANSCEIVER.



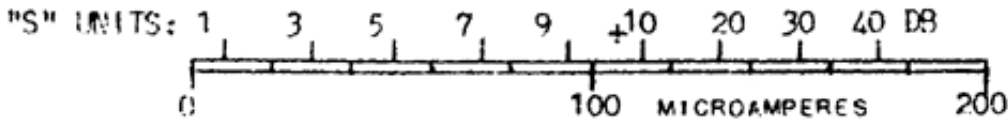
SCHEMATIC

- COMPONENTS:**
 C101 - .001 MFD., 1000 WV, PAPER OR CERAMIC CAPACITOR.
 C102 - 2.0 MFD., 50 WV, ELECTROLYTIC CAPACITOR.
 R101 - 47K OHM, 1/2 WATT RESISTOR (27K OPTIONAL FOR REDUCED AVC ACTION)
 CR1, CR2 - SILICON RECTIFIERS, 200 PIV OR MORE, 100 MA. OR MORE.
 SW - OPTIONAL AVC ON-OFF SWITCH, SPST SLIDE OR TOGGLE.
 M - OPTIONAL 200 MICROAMP. S-METER



PICTORIAL

NOTE: A 0-200 MICROAMMETER MAY BE INSTALLED IN SERIES WITH THE 47 K RESISTOR TO SERVE AS AN S-METER. PIN JACKS, OR SOME SORT OF CONNECTOR MAY BE INSTALLED ON THE BACK OF THE CHASSIS FOR CONNECTION TO THE METER, WHICH CAN BE MOUNTED IN A SMALL METER CASE AND SET ON TOP OR BESIDE THE TRANSCEIVER. IT WILL INDICATE RELATIVE SIGNAL STRENGTH, AND MAY BE CALIBRATED APPROXIMATELY AS SHOWN.



POWER SUPPLY REQUIREMENTS

The transceiver is designed to operate with the following voltages and currents:

	Nominal	Minimum	Maximum
High Voltage Transmit Only	800 volts DC 25-275 ma.	250 volts (Low Power)	900 Volts 300 Ma.
Medium Voltage Trans. & Receive	275 volts DC 100 Ma.	225 volts	325 volts
Bias Voltage Trans. & Receive	-90 volts DC 6 Ma.	-70	-100
Filament Supply	12.6 volts AC or DC 3.45 amps	11 volts	14.5 volts
Relay Supply	12 volts DC, 10 100 Ma.	10 volts	15 volts

All power supply speaker connections are made through the Jones Plug, which is furnished with the Transceiver. If other power supplies are to be used, refer to Fig. 3 and Fig. 4 for DC or AC operation, plug connections, etc.

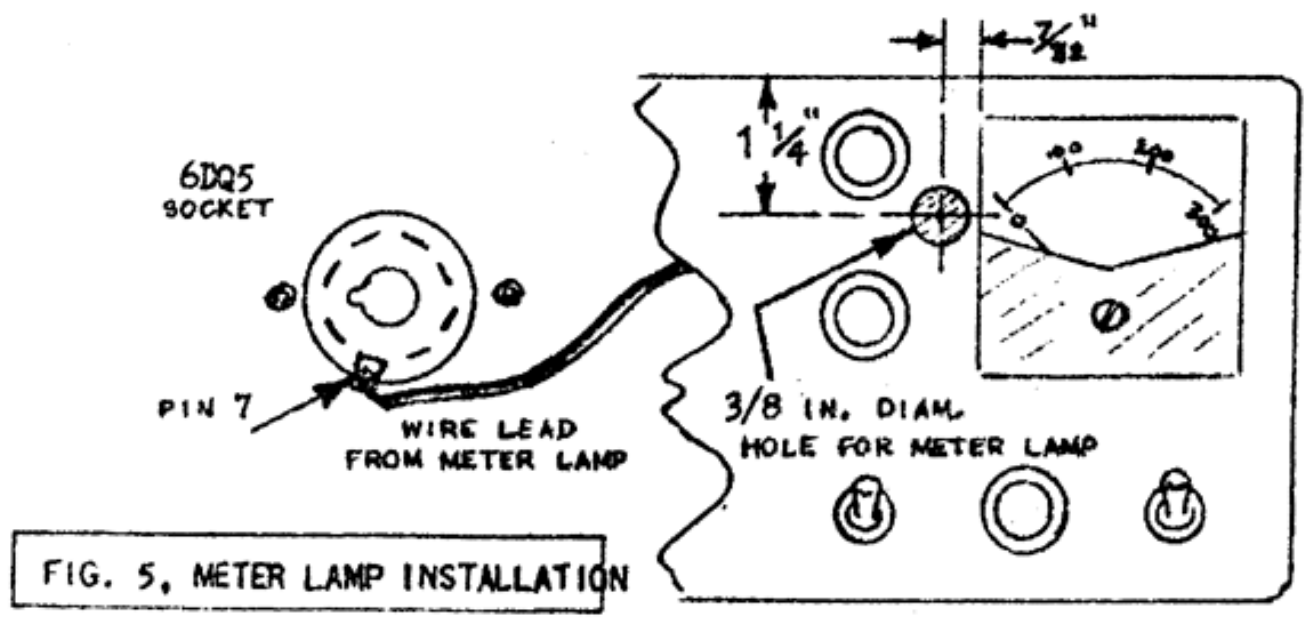
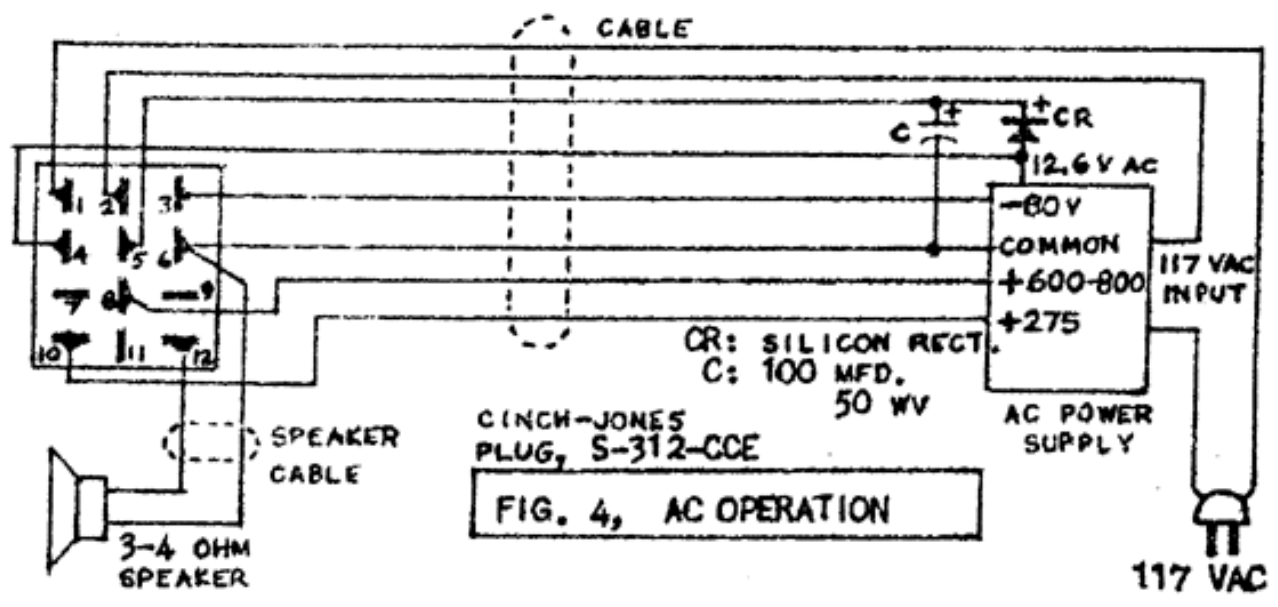
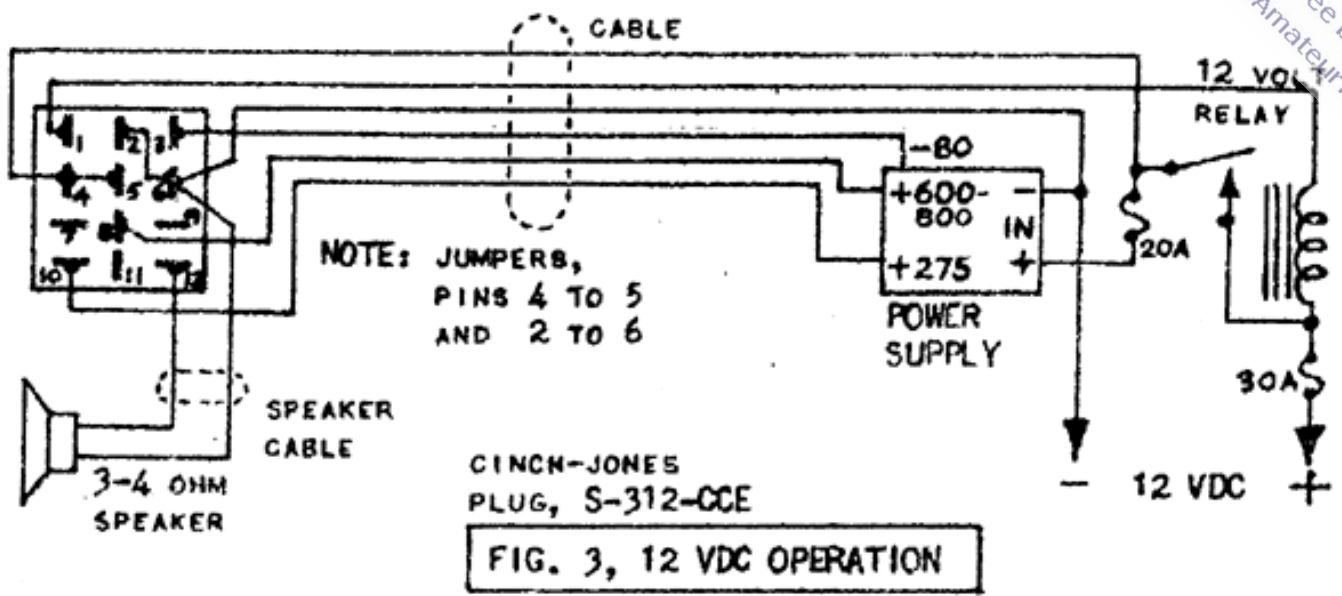
The following Power Supplies are recommended for use with the SWAN Transceivers.

12 Volt DC Supply:

- (A) Heath HP-10 Kit
- (B) Topaz Model # C10WDG
- (C) Adcom (Linear Systems) Model #250
- (D) Collins Model # MP-1

117 Volt AC:

- (A) Heath HP-20 Kit
- (B) Collins AC Model # 516F-2



MODIFICATION INSTRUCTIONS FOR USING HEATHKIT HP-10 TRANS. POWER SUPPLY

The Heath HP-10 power supply is designed to deliver 600 volts DC, 300 volts DC and -125 volts bias from a 12 volt DC source. With the following modifications, it will furnish the Swan Transceiver with the necessary operating voltages, and drive the power amplifier to approximately 130 watts PEP input.

Additional Parts Required: (A) 4700 ohm 10% tolerance, 1 watt resistor. (B) 20 amp. 3 AG fuse. (C) 30 amp. cartridge fuse with holder. (D) 2 feet of #16 or #18 insulated wire.

Step 1: Remove the wire running from Pin 6 of the octal output socket to the positive 12 volt input terminal. Then, connect an insulated length of #16 or #18 wire from pin 6 of the output socket to terminal (3) of the relay. (Junction with R6 and the transistor emitters).

Step 2: Make the lead which goes from Pin 7 of the octal output socket to the negative input terminal with #16 or #18 insulated wire.

Step 3: Remove the wire running from Pin 1 of the octal output socket to terminal 1 of terminal strip, (A). In place of this wire, connect the new resistor of 4700 ohms, 1 watt, from pin 1 of the output socket to terminal 1 of the terminal strip (A). (Junction of R9, C7, and CR5).

Step 4: Replace the 15 amp. fuse supplies in the kit with the new 20 amp, 3 AG fuse, this change is recommended because current drain at this point may exceed 15 amperes briefly during tune-up. Although this current is reached for only short periods, not long enough to cause overheating of the power supply, the 15 amp. fuse may blow. The 20 amp. fuse will still provide adequate protection to the power supply. Note: This fuse protects only the transistor supply. An additional fuse of 30 ampere rating should be installed as a main fuse in series with the positive input lead going to the battery. Failure to install this fuse could cause serious damage and possibly fire in the event of a short circuit in the power supply, transceiver, or connecting cables.

Step 5: Connect the multi-conductor cable which is furnished with the HP-10 kit to the octal plug and the Jones plug according to the following chart. Cut the cable to the minimum required length, plus a foot or so for slack. If the power supply is mounted under the hood of the car, the cable must be passed through a fire-wall hole before both plugs are attached, unless the opening is made large enough to pass the plug. The octal plug is supplied with the HP-10 kit, and the Jones plug is supplied with the transceiver.

Step 6: Locate the wire lead running from the terminal 2 of the relay, (one of the coil terminals), to Pin 6 of the octal output socket. Connect it instead from terminal 2 of the relay to terminal 4 of the relay. (Note that terminal 4 also connects to the plus 12 volt input terminal).

HEATH HP-10

for free by
RadioAmateur.euCABLE CONNECTION CHART, DC POWER SUPPLY

Octal Plug Pin No.	Cable Wire Color	Jones Plug Pin No.
7	Black	6
6	Red	4
4	Orange	8
3	Blue	10
1	White	3
8	Yellow	1
#22 Wire jumper from Pin 2 to Pin 7.		#22 Wire jumper from Pin 2 to Pin 6, and #22 wire jumper from Pin 4 to Pin 5.

Connect speaker cable, (3-4 ohm voice coil leads), to Pins 6 and 12 of the Jones Plug.

MODIFICATION INSTRUCTIONS FOR USING HEATHKIT HP-10 TRANS. POWER SUPPLY

The Heath HP-10 power supply is designed to deliver 600 volts DC, 300 volts DC and -125 volts bias from a 12 volt DC source. With the following modifications, it will furnish the Swan Transceiver with the necessary operating voltages, and drive the power amplifier to approximately 130 watts PEP input.

Additional Parts Required: (A) 4700 ohm 10% tolerance, 1 watt resistor. (B) 20 amp. 3 AG fuse. (C) 30 amp. cartridge fuse with holder. (D) 2 feet of #16 or #18 insulated wire.

Step 1: Remove the wire running from Pin 6 of the octal output socket to the positive 12 volt input terminal. Then, connect an insulated length of #16 or #18 wire from pin 6 of the output socket to terminal (3) of the relay. (Junction with R6 and the transistor emitters).

Step 2: Make the lead which goes from Pin 7 of the octal output socket to the negative input terminal with #16 or #18 insulated wire.

Step 3: Remove the wire running from Pin 1 of the octal output socket to terminal 1 of terminal strip, (A). In place of this wire, connect the new resistor of 4700 ohms, 1 watt, from pin 1 of the output socket to terminal 1 of the terminal strip (A). (Junction of R9, C7, and CR5).

Step 4: Replace the 15 amp. fuse supplies in the kit with the new 20 amp, 3 AG fuse, this change is recommended because current drain at this point may exceed 15 amperes briefly during tune-up. Although this current is reached for only short periods, not long enough to cause overheating of the power supply, the 15 amp. fuse may blow. The 20 amp. fuse will still provide adequate protection to the power supply. Note: This fuse protects only the transistor supply. An additional fuse of 30 ampere rating should be installed as a main fuse in series with the positive input lead going to the battery. Failure to install this fuse could cause serious damage and possibly fire in the event of a short circuit in the power supply, transceiver, or connecting cables.

Step 5: Connect the multi-conductor cable which is furnished with the HP-10 kit to the octal plug and the Jones plug according to the following chart. Cut the cable to the minimum required length, plus a foot or so for slack. If the power supply is mounted under the hood of the car, the cable must be passed through a fire-wall hole before both plugs are attached, unless the opening is made large enough to pass the plug. The octal plug is supplied with the HP-10 kit, and the Jones plug is supplied with the transceiver.

Step 6: Locate the wire lead running from the terminal 2 of the relay, (one of the coil terminals), to Pin 6 of the octal output socket. Connect it instead from terminal 2 of the relay to terminal 4 of the relay. (Note that terminal 4 also connects to the plus 12 volt input terminal).

MODIFICATION INSTRUCTIONS FOR USING HEATHKIT HP-20 AC POWER SUPPLY

The Heath HP-20 Power Supply is designed to deliver 600 volts DC, 300 DC, and -130 volts DC from a standard 117 volt, 60 cycle power source. With the following modifications, it will furnish the transceiver with the necessary operating voltages, and drive the power amplifier to approximately 130 watts PEP input.

Additional parts required:

- (A) Silicon rectifier, Sarks Tarzian #2F4 or 10H, or equivalent.
- (B) 100 mfd., 50 wv electrolytic capacitor, Mallory TC-3501, or equiv.
- (C) 40 mfd., 450 wv electrolytic capacitor, Mallory TC-78, or equiv.
- (D) 4700 ohm 10%, 1 watt resistor.
- (E) 100 ohm, 5 or 10 watt wirewound resistor.

Step 1: Connect the filament wiring for 12.6 volts, as described in the Heath instruction manual.

Step 2: Remove the filament lead from Pin 6 of the octal output socket and connect the lead to a chassis ground instead. Also, connect Pin 2 of the output socket to a chassis ground with a short piece of bare wire.

Step 3: Connect the additional silicon rectifier (item "A" above) to terminals 7 and 8 of the octal output socket, with the positive lead (cathode) of the rectifier so it does not touch anything else.

Step 4: Connect the 100 mfd., 50 wv capacitor (item "B" above) from terminal 8 to a chassis ground with the positive lead going to terminal 8. Connect the 40 mfd., 450 wv capacitor (item "C" above) from terminal 3 of the output socket to a chassis ground, with the positive lead going to terminal 3. Locate these capacitors conveniently so they do not crowd other components, and so their leads do not short to other connections. Use sleeving over the capacitor leads, if necessary.

Step 5: Remove the orange lead from terminal 3 of the octal output socket to the 125 mfd. electrolytic can. Replace it with the new 100 ohm, 5 to 10 watt wirewound resistor (item "E" above). Position this resistor so it does not touch other wires or components.

Step 6: Insert the new 4700 ohm, 1 watt resistor (item "D" above) in series with the wire running from Terminal 1 of the octal output socket to the terminal strip junction of C10 to R6. Anchor one end of the resistor to this terminal strip junction, and connect the wire lead from terminal 1 of the output socket to the other end of the resistor. Insulate this end with sleeving or tape, and position the resistor so it does not touch any other components.

Step 7: Connect a wire lead from Pin 5 of the octal output socket to one terminal of the on-off toggle switch. Connect another wire lead from Pin 6 of the output socket to the other terminal of the toggle switch. These leads will allow the power supply to be turned on and off from the transceiver from panel. (Supply on-off switch).

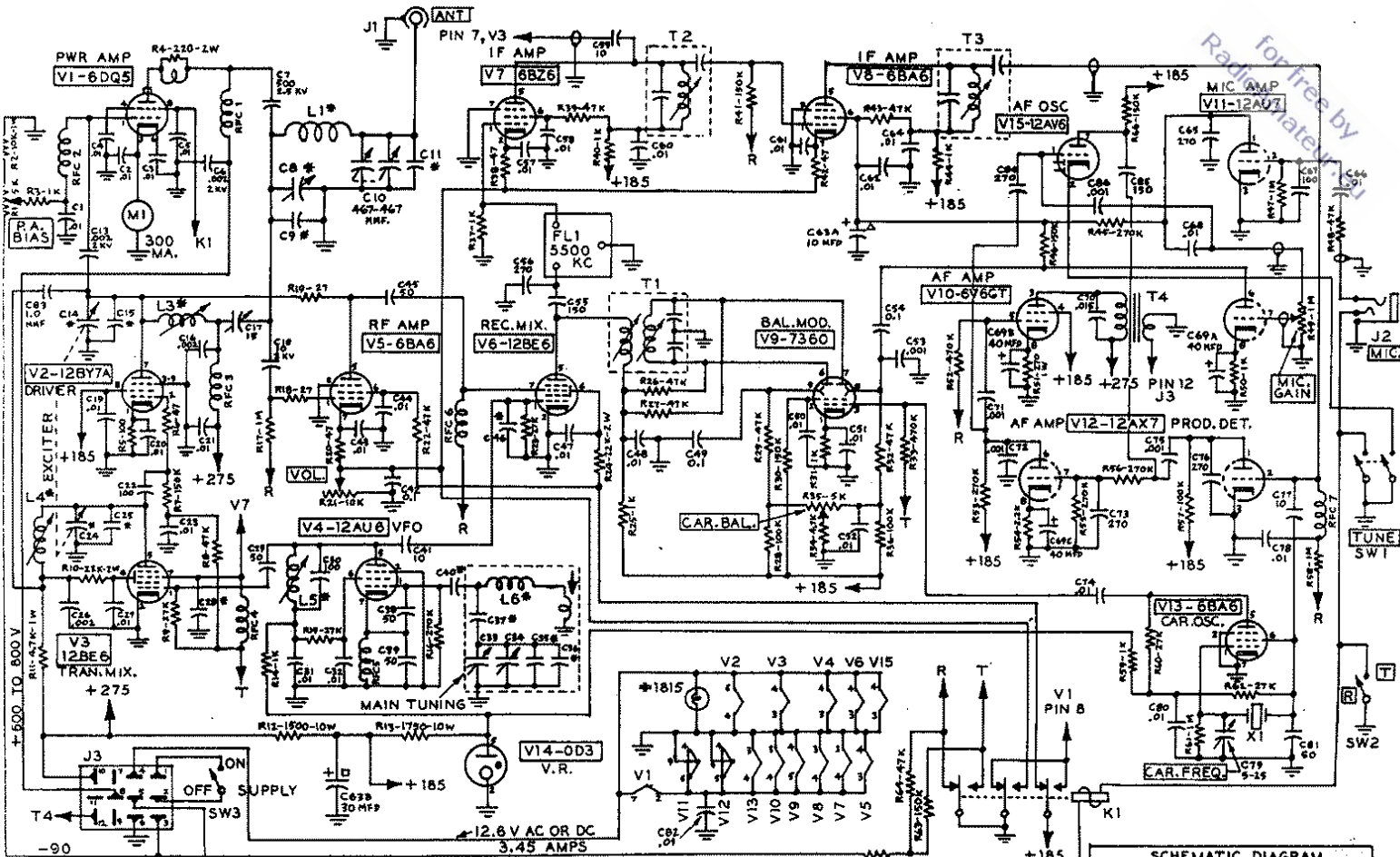
Step 8: Connect the multi-conductor cable furnished with the HP-20 kit, to the octal plug, also furnished with the kit, and to the Jones plug, which is supplied with the transceiver, according to the following chart:

CABLE CONNECTION CHART /C POWER SUPPLY

Octal Plug Pin No.	Cable Wire Color	Jones Plug Pin No.
2	Black	6
7	Red	4
4	Orange	8
3	Blue	10
1	White	3
8	Yellow	5
5	Brown	1
6	Green	2

Connect speaker cable (3-4 ohm voice coil leads), to Pins 6 and 12 of the Jones Plug.

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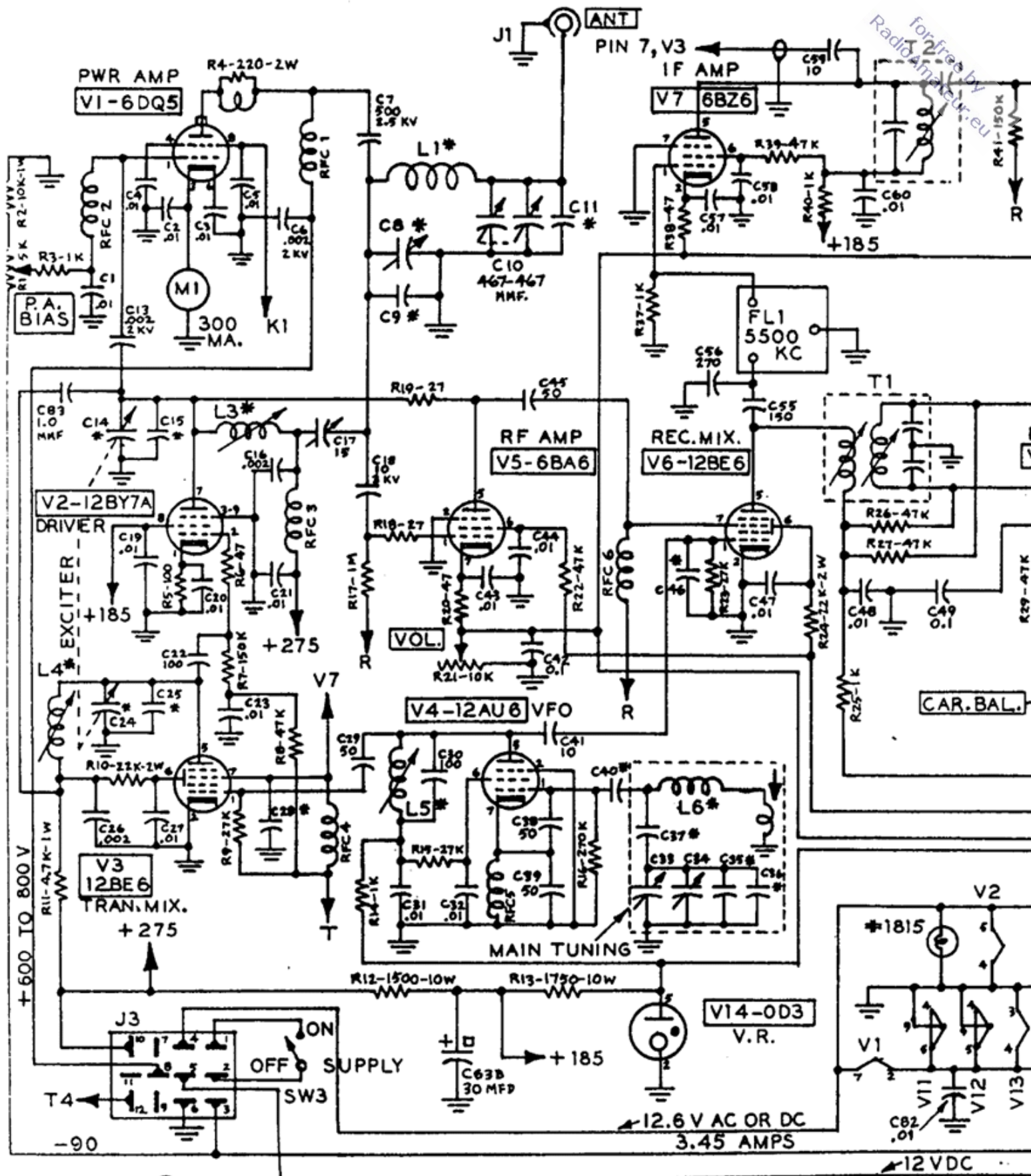


9-27-62 (D)

* VALUE DEPENDS ON MODEL REFER TO PARTS LIST

CAPACITY VALUES: WHOLE NUMBERS, MMFD. DECIMAL NUMBERS, MFD.

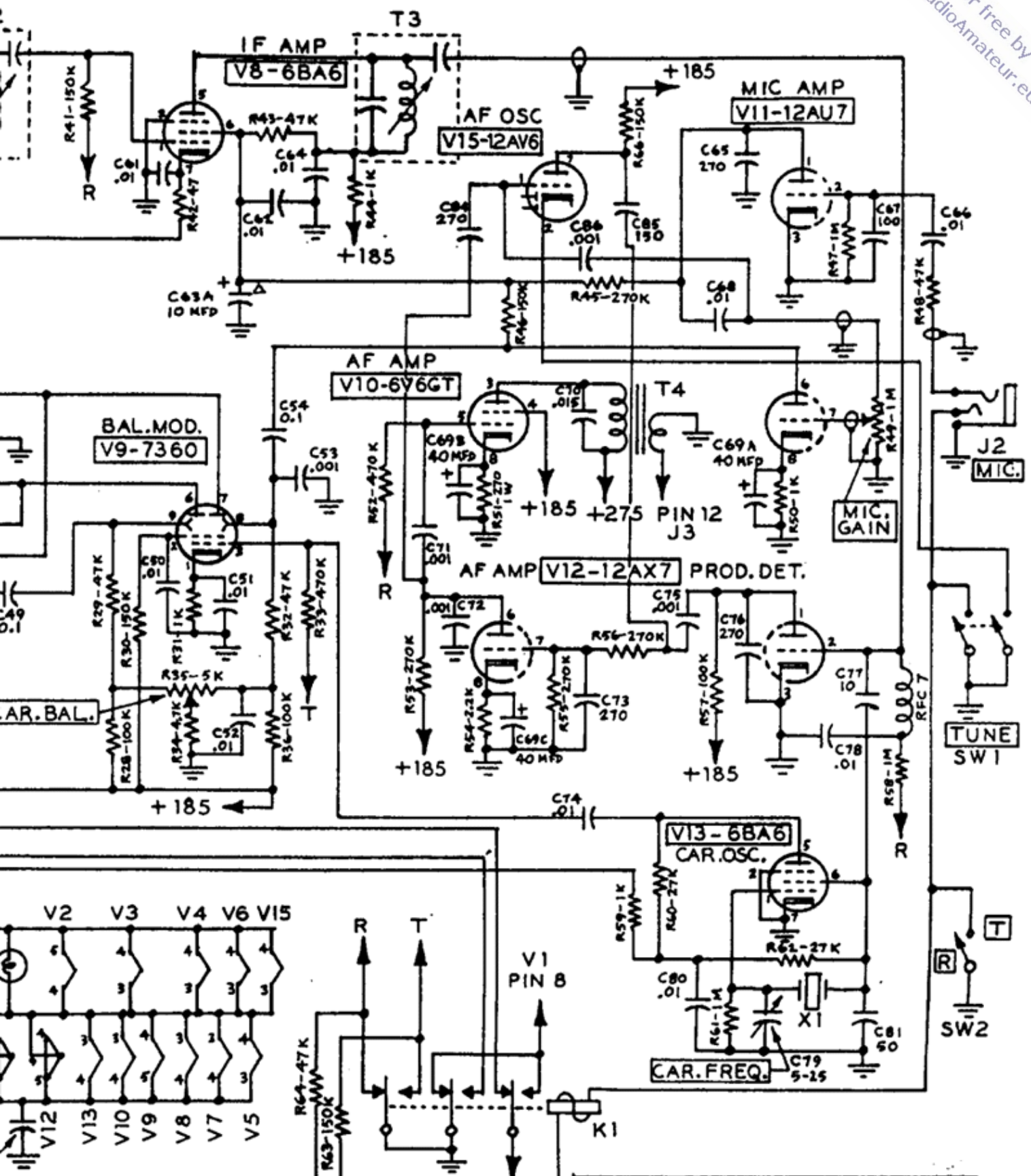
SCHEMATIC DIAGRAM
SERIES 100
55B TRANSCEIVER
SWAN ENG. CO. OCEANSIDE, CALIF.



9-27-62 (D)

* VALUE DEPENDS ON MODEL REFER TO PARTS LIST

CAPACITY VALUES: W D



VALUES: WHOLE NUMBERS, MMFD.
DECIMAL NUMBERS, MFD.

SCHEMATIC DIAGRAM
SERIES 100
SSB TRANSCEIVER
SWAN ENG. CO. OCEANSIDE, CALIF.