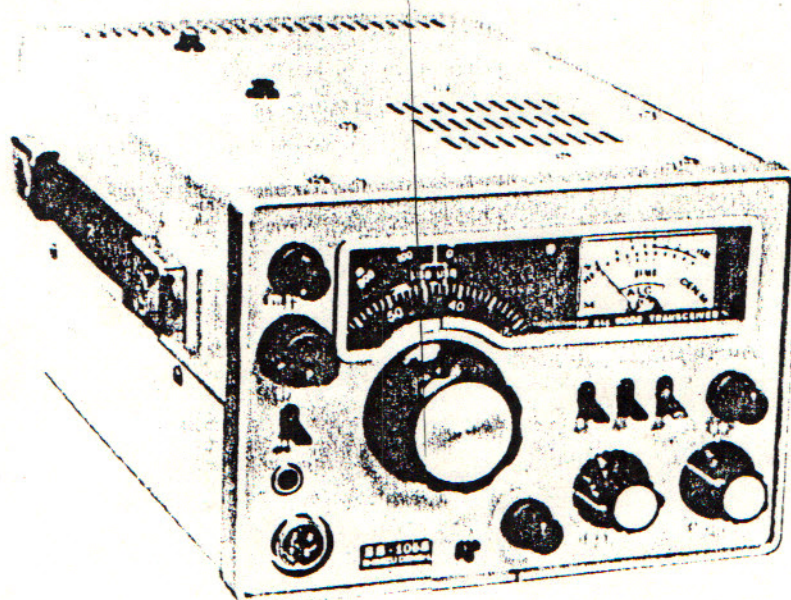

HF ALL MODE TRANSCEIVER

SS-105

ASSEMBLY MANUAL



***** SPECIFICATIONS *****

TX & RX Frequencies	3.5MHz band	3.5MHz - 4.0MHz
	7 MHz band	7.0MHz - 7.5MHz
	10 MHz band	10.0MHz - 10.5MHz
	14 MHz band	14.0MHz - 14.5MHz
	18 MHz band	18.0MHz - 18.5MHz
	21 MHz band	21.0MHz - 21.5MHz
	24.5MHz band	24.5MHz - 25MHz
	28 MHz band	28.0MHz - 30MHz
Type of Emmission	LSB, USB, CW, FM	
Rated transmit Power Output	10W	- S type
	100W	- D type (50W at 28MHz band)
Spurious rejection	-40 dB or better	
Image ratio	Better than 50 dB	
Antenna impedance	50 ohm	
Receive sensitivity	SSB - better than 10 dB S/N at 0.25 μ V	
	FM - 20 dB QS at 0.5 micro V	
Max. frequency deviation (FM)	<u>+5KHz</u> or <u>+10KHz</u> , adjustable by VR	
Modulation	SSB - Balanced modulation	
	FM - Variable reactance direct modulation	
Frequency stability	Less than <u>+1KHz</u> 1-60 min. after warm up.	
	Less than <u>+100KHz</u> for each 30 min.	
	thereafter	
Mike impedance	500 ohm - 50 K ohm	
Audio output	1.5W at 8 ohms	
Power supply	DC 13.5V	3A - S type
		20A - D type
Dimension	124(H) x 178(W) x 272(D) mm	
	(protrusions not included)	
	D-type - Linear amp is added to above.	
Weight	Amp - 120(H) x 110(W) x 87(D) mm	
	5 kgs. (Linear amp - 1.2 kgs.)	

SS-105 HF ALL MODE TRANSCEIVER

1. FEATURES

The model SS-105 is a single conversion premixing system equipped with a balanced mixer. A double tuning circuit coupled with a varicap provides very precise tuning in the RF stage. The RF-AGC (Radio Frequency Automatic Gain Control) automatically attenuates excessive input from a passing car or neighboring stations, giving the SS-105 an excellent S/N ratio and greatly reducing cross modulation and spurious emissions.

A product of the latest PCB technology, the transceiver is very compact. Components are connected to each other by IP connectors, so the transceiver can easily be taken apart for maintenance and servicing.

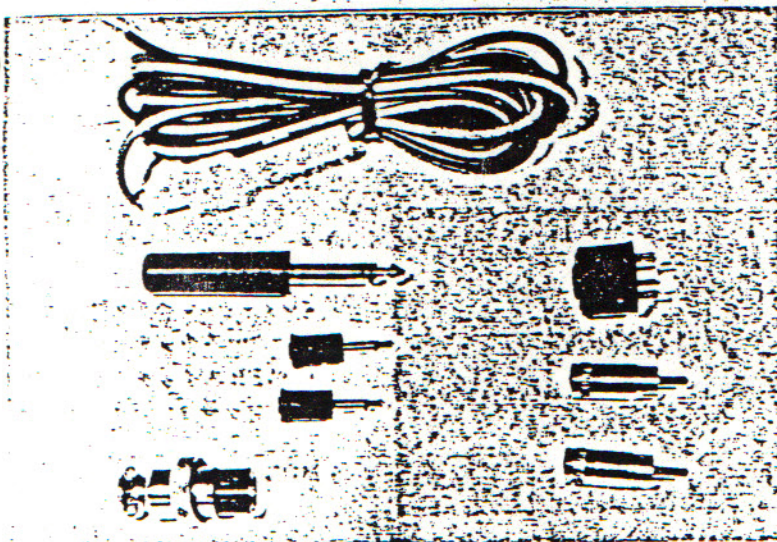
The PCB's consist of : SE-AF, SE-IF, SE-RE, SE-PA, SE-VF, SE-LO, SE-SW, SE-NB, SE-FMT, SE-FMR, SE-LR, SE-LP and SE-MK.

Accessories Supplied

DC cord with a 5A fuse	1	6mm plug for monaural	11
4P micro-connector female	1	9P connector	1
36mm plugs for SP and KEY	2	RCA plugs	2

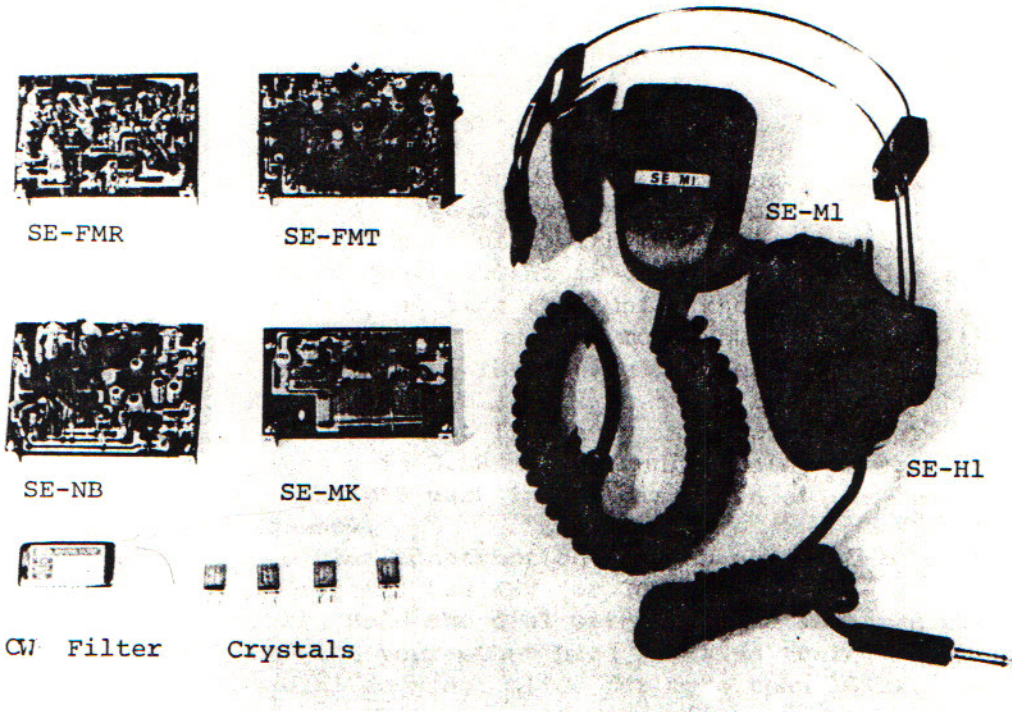
Optional Parts

- CW crystal filter 8999.3 KHz
- SE-NB unit Noise blanker and RFAGC- Highly recommended for maximum transceiver capability.
- SE-FMT unit IF circuit for FM transmit, consisting of a modulation circuit and an IF amplifier.
- SE-FMR unit FM receive circuit to convert 9 MHz to 455 KHz and amplify and detect signals ; equipped with a built-in squelch circuit.
- SE-MK unit. Circuit for 25KHz marker.
- Crystal for receiving the 18 MHz Standard Wave WWV (JJY)
- Crystal for 24.5 MHz, Crystal for 28.5 MHz,
- Crystal for 29.0 MHz
- Crystal for 29.5 MHz
- Microphone: SE-M1
- One-ear headphone SE-M1



Accessories Supplied

Optional Parts



2 PANEL OPERATING CONTROLS



- (1) AF GAIN The AF GAIN controls audio output. Turn it clockwise to increase volume.
- (2) RF GAIN The RF GAIN controls and IF gain in receive. *
- (3) Standby Switch Depress SEND for transmit and RECV for receive.
- (4) PHONE Jack Headphone Jack.
- (5) MIC Microphone connector. Use a 4P plug.
- (6) Name Plate
- (7) RIT Switch At ON position the RIT (Receiving Incremental Tuning) circuit works. At OFF position the RIT circuit stops working, and the receive frequency is equalized to the transmit frequency.
- (8) TUNING Knob This knob selects the desired frequency. Tune it clockwise for higher frequencies.
The dial should be used with the following points in mind.
- 1) Assuming that 7100KHz is the legal band edge of the 7MHz band, setting the tuning knob to 7100KHz will not cause off-band in the LSB mode, but it will in the USB.
 - 2) In the CW mode, the tuning frequency is about 800Hz from the LSB scale mark in the direction of the center frequency if the frequency is 7MHz or higher. If the frequency is 3.5MHz, the tuning point is about 800Hz from the USB mark in the direction of the center frequency.
 - 3) The clutch construction enables the dial to slide for calibration. Use WWV (or JJY) and a well-calibrated marker. Hold the dial with one hand and turn the tuning knob with your other hand for fine tuning. Note that the dial does not slide for more than 10KHz.
- (9) LED Red for transmit. Green for receive.
- (10) Meter The meter functions as an S meter (single strength indicator) in the receive mode. In the FM mode, it also functions as a center meter. In the transmit mode, it has the functions of an RF voltage meter and an ALC (Automatic Level Control) meter.
- (11) PO/NB/ALC SW In the receive function, the up position activates the NB (Noise Blanker) circuit and the down position turns off the NB.
In the transmit function, the up position makes the meter an RF power output voltage meter.
The meter becomes an ALC meter when the switch is in the down position.
- (12) MARKER SW With this switched to the up (ON) position, the marker produces a beat tone for each 25KHz step-up or step-down. For instance, the dial can be calibrated at 0,25,50,75 and 100KHz. The criterion should be the 15.0MHz standard wave of the WWV (or JJY). The optional 29.0MHz crystal is needed for marker calibration.
- (13) POWER SW This is an ON (up)/OFF (down) switch.
- (14) TX TUNE Tune clockwise for higher frequencies. The panel meter indicates the lower band edge.
- (15) MODE SW This knob is used to select LSB, USB, CW, FM, FM-center-meter. Use LSB for 3.5MHz and 7.0MHz. And Use USB for 14, 21 and 28MHz. Note that FM operation generates 3 times as much heat as SSB operation. You should provide sufficient cooling.

(16) BAND SW This knob is used for band switching. In the AUX position, you can operate on any frequency you have the crystals for. **

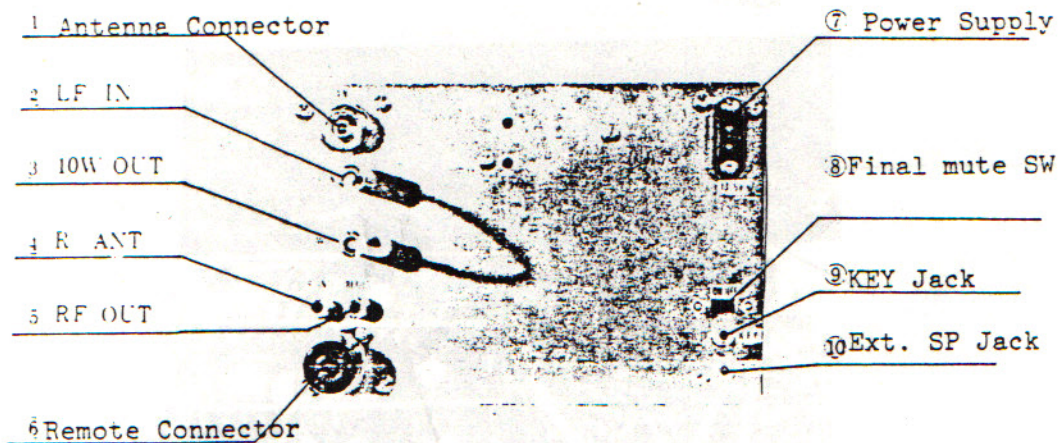
(17) RIT In receive mode only, you can shift the frequency a few Kilo hertz to that of the station with whom you communicate.

*(2) RF GAIN SKELTCH

Turn it clockwise, then S meter swing. Sound become lower for the signal under S.

** (16) At 10 MHz band, turning to counter-clockwise, and down the frequency, then hauling is made, but it is not defective.

REAR PANEL



- | | |
|-----------------------|--|
| (1) ANTENNA CONNECTOR | This is the antenna connector. Use an M type plug. It is a terminal for 10W transmit output, but can also be used with a linear amplifier for 100W output. |
| (2) LF IN | The low pass filter can handle up to 100W. |
| (3) 10W OUT | When the transceiver is used for 10W output, connect (2) and (3) with a coaxial cable. |
| (4) RECV ANT | This terminal is used only for receive. |
| (5) RF OUT | The transmit output at this terminal is about 100mW. Use (4) and (5) for a transverter. In this case, the Final Mute Switch should be turned OFF. |
| (6) REMOTE CONNECTOR | Socket for remote controlling the transceiver. For normal operation, keep the 9P plug plugged in the socket. See the circuit diagram. |
| (7) DC Power Supply | There will be about 3A at this connector for the transmit output of 10W. |
| (8) Final Mute Switch | The OFF position will inactivate the muting circuit is in operation whether the output is 10W or 100W. However, there is still voltage applied to the collector. |
| (9) KEY Jack | Connect your key to this jack with a 3.6mm plug. A tone of about 800Hz will be generated regardless of MODE when the key is depressed. |
| (10) EXT.SP Jack | This is a terminal for an external speaker. |

RF Meter Adjust

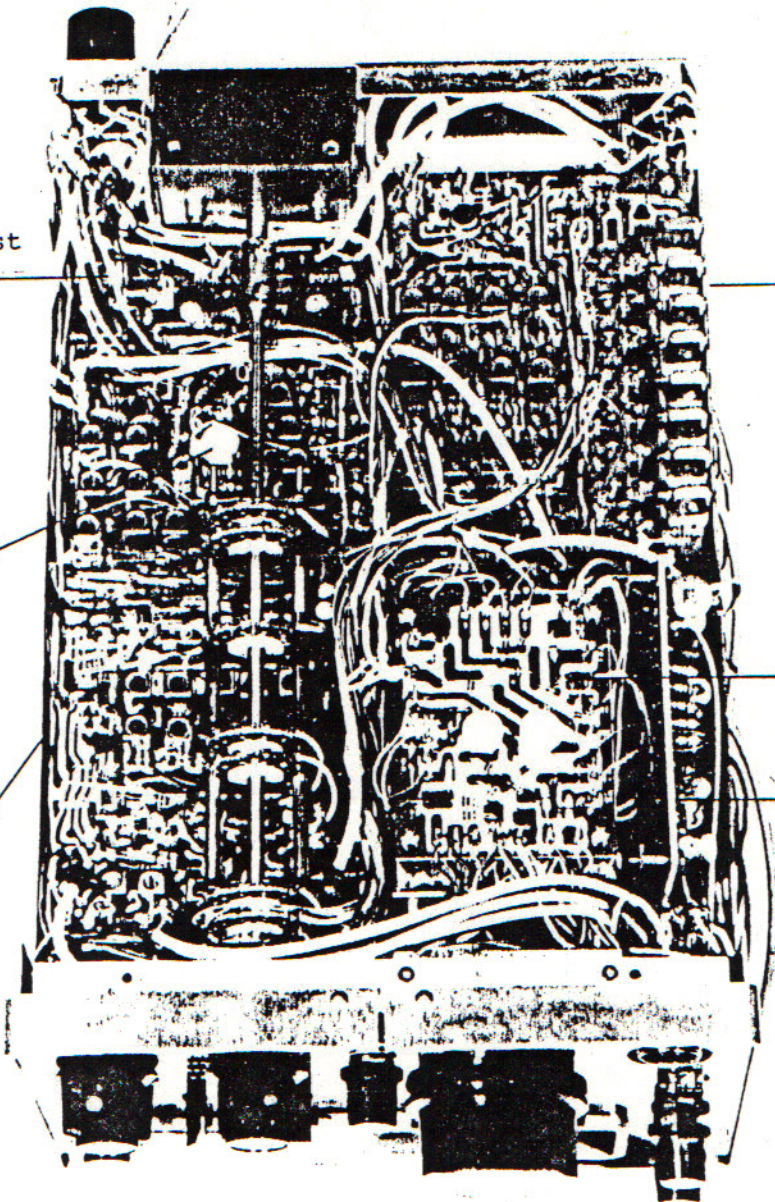
② SE-I.O

ALC Adjust

③ SE-SW

① SE-RF

④ SE-MK



4, PRE-ASSEMBLY INSTRUCTIONS.

Assembly and tuning are needed for the SE-IF and SE-LO units only.
All other units have been pre-assembled and pre-tuned at the factory.
Do not attempt to tune or reassemble.

Tools and Materials Needed

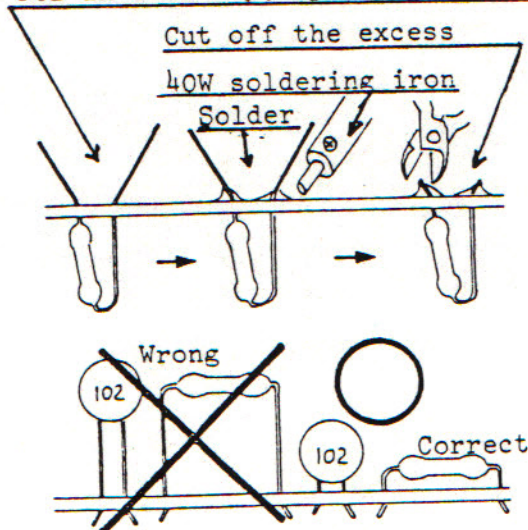
- 1) Long-nosed plier
- 2) Wire-cutter
- 3) Tweezers
- 4) A soldering iron for 30-40W
- 5) Solder(60%) Solder carefully. Good soldering will provide good performance.

**Note: Be sure to use lockwashers or split washers for attaching PCB's. Otherwise the unit may become rickety.

General Precautions

- * The IP connector must be inserted into its mating connector lengthwise and straight. Do not twist connectors, or the spring may be damaged and cause contact noise. If the connection becomes loose, calk the part with long-nosed pliers.
- * Take care in mounting transistors and diodes. If a semiconductor is mounted in the wrong place, it may not only disable the unit but also damage it. Note that an electrolytic capacitor has distinct polarization.
- * It is a good idea to check off a part on the parts list or circuit diagram after you solder it.
- * The heavy red wire is for the 13.5V line +B
- * The heavy green wire has 13.5V in receive RB
- * The heavy orange wire has 13.5V in transmit TB
- * The heavy white wire is the 9V line. Actually the voltage is 8-8.4V. The power is supplied from the SE-AF Unit.

Having passed the lead thru the PCB in this way, open it up slightly.

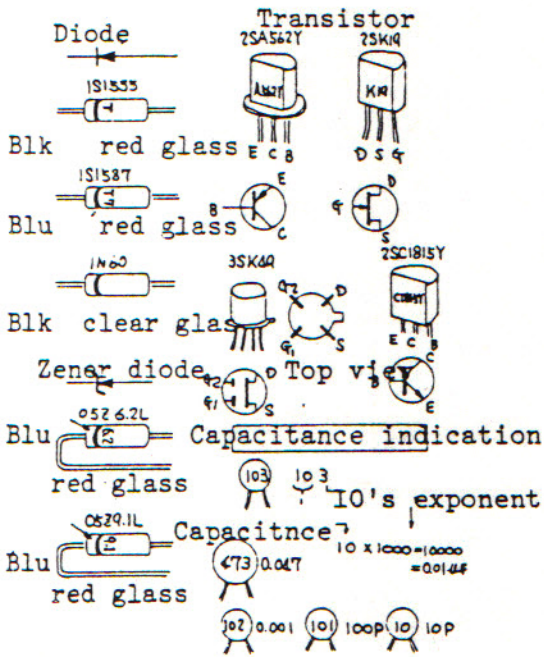


Do not allow too much protrusion of the lead.

- * Fitting hole of base plate or chrysanthemum base of earth should be soldered correctly.

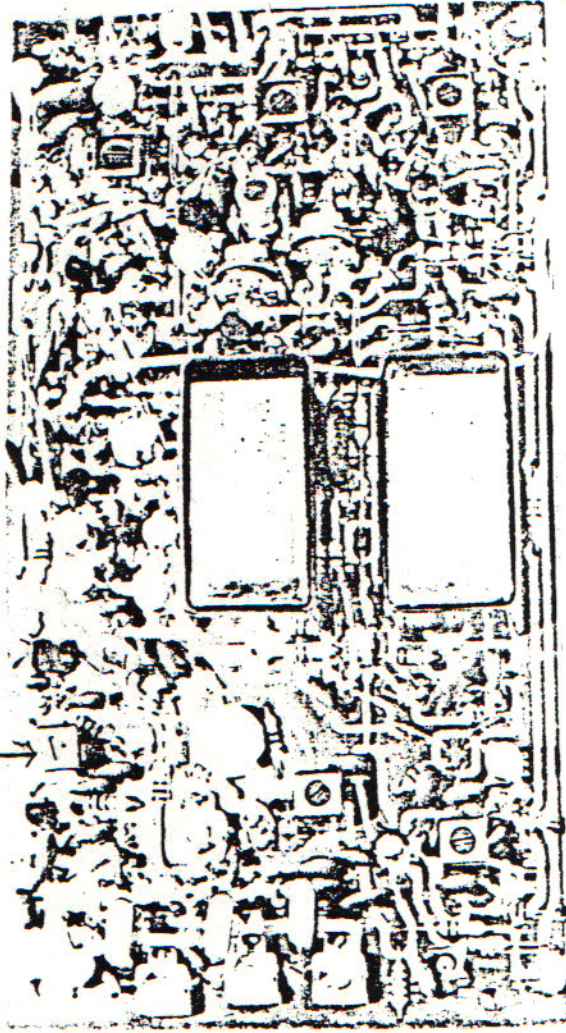
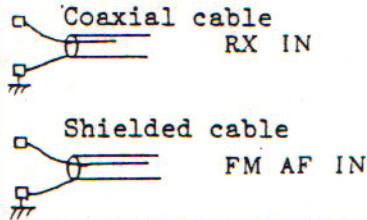
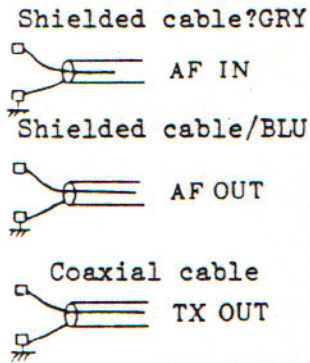
5, ASSEMBLY OF SE-IF UNIT.

Parts



*Bend diode lead on the plus side with colored mark.

- YEL 8998.5
- GRN 8999.3
- BLU 9001.5
- WHT 9v line
- ORG cw filter
- BRN SSB filter
- RED 13.5 V
- RED 13.5 V
- Yel/Grn AGC
- PNK ALC
- BLK ① RF GAIN
- PUR ② RF GAIN
- GRY ③ "
- ORG TB



Note; Use the red coil for Q3 collector

PARTS LIST SE-1F

Parts			Parts		
R ₁	1 K	BRN BLK RED	R ₂₉	1 K	BRN BLK RED
R ₂	150 K	BRN GRN YEL	R ₃₀	1 K	BRN BLK RED
R ₃	1 K	BRN BLK RED	R ₃₁	1 K	"
R ₄	22 K	RED RED ORG	R ₃₂	100 K	BRN BLK YEL
R ₅	22 K	"	R ₃₃	1 K	BRN BLK RED
R ₆	220 Ω	RED RED BRN	R ₃₄	1 K	"
R ₇	1 K	BRN BLK RED	R ₃₅	1 K	"
R ₈	10 K	BRN BLK ORG	R ₃₆	220 Ω	RED RED BRN
R ₉	150 Ω	BRN GRN BRN	R ₃₇	220 Ω	"
R ₁₀	150 Ω	"	R ₃₈	1 K	BRN BLK RED
R ₁₁	470 Ω	YEL PUR BRN	R ₃₉	1 K	"
R ₁₂	100 K	BRN BLK YEL	R ₄₀	100 K	BRN BLK YEL
R ₁₃	100 Ω	BRN BLK BRN	R ₄₁	1 K	BRN BLK RED
R ₁₄	100 Ω	"	R ₄₂	18 K	BRN GRY ORG
R ₁₅	1 K	BRN BLK RED	R ₄₃	5.6 K	GRN BLU RED
R ₁₆	33 K	ORG ORG ORG	R ₄₄	1 K	BRN BLK RED
R ₁₇	10 K	BRN BLK ORG	R ₄₅	100 Ω	BRN BLK BRN
R ₁₈	1 K	BRN BLK RED	R ₄₆	2.2 Ω	RED RED GLD
R ₁₉	3.3 K	ORG ORG RED	R ₄₇	2.7 K	RED PUR RED
R ₂₀	3.3 K	"	R ₄₈	2.7 K	"
R ₂₁	3.3 K	"	R ₄₉	27 K	RED PUR ORG
R ₂₂	100 Ω	BRN BLK BRN	R ₅₀	5.6 K	GRN BLU RED
R ₂₃	5.6 K	GRN BLU RED	R ₅₁	470 Ω	YEL PUR BRN
R ₂₄	18 K	BRN GRY ORG	R ₅₂	2.7 K	RED PUR RED
R ₂₅	330 Ω	ORG ORG BRN	R ₅₃	100 Ω	BRN BLK BRN
R ₂₆	1.8 K	BRN GRY RED	R ₅₄	27 K	RED PUR ORG
R ₂₇	100 Ω	BRN BLK BRN	R ₅₅	5.6 K	GRN BLU RED
R ₂₈	5.6 K	GRN BLU RED	R ₅₆	470 Ω	YEL PUR BRN

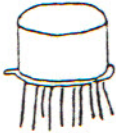
Parts			Parts		
R ₅₇	2.7 K	RED PUR RED	R ₈₆	4.7 K	YEL PUR RED
R ₅₈	100 Ω	BRN BLK BRN			
R ₅₉	4.7 K	YEL PUR RED	C ₁	0.047	
R ₆₀	150 K	BRN GRN YEL	C ₂	33 μ 16 V	
R ₆₁	100 Ω	BRN BLK BRN	C ₃	4.7 μ 25 V	
R ₆₂	1 K	BRN BLK RED	C ₄	"	
R ₆₃	2.7 K	RED PUR RED	C ₅	"	
R ₆₄	1 M	BRN BLK GRN	C ₆	0.01	
R ₆₅	10 K	BRN BLK ORG	C ₇	0.01	
R ₆₆	1 K	BRN BLK RED	C ₈	15 P	
R ₆₇	470 K	YEL PUR YEL	C ₉	100 P	
R ₆₈	56 K	RGN BLU ORG	C ₁₀	220 P	
R ₆₉	15 K	BRN GRN ORG	C ₁₁	0.01	
R ₇₀	5.6 K	GRN BLU RED	C ₁₂	30 P	
R ₇₁	470 Ω	YEL PUR BRN	C ₁₃	3 P	
R ₇₂	470 Ω	"	C ₁₄	0.01	
R ₇₃	5.6 K	GRN BLU RED	C ₁₅	220 P	
R ₇₄	10 K	BRN BLK ORG	C ₁₆	220 P	
R ₇₅	4.7 K	YEL PUR RED	C ₁₇	0.01	
R ₇₆	10 K	BRN BLK ORG	C ₁₈	0.01	
R ₇₇	5.6 K	GRN BLU RED	C ₁₉	10 P	
R ₇₈	220 Ω	RED RED BRN	C ₂₀	0.01	
R ₇₉	1 M	BRN BLK GRN	C ₂₁	10 P	
R ₈₀	10 K	BRN BLK ORG	C ₂₂	0.01	
R ₈₁	1 K	BRN BLK RED	C ₂₃	10 P	
R ₈₂	2.2 K	RED RED RED	C ₂₄	0.01	
R ₈₃	470 K	YEL PUR YEL	C ₂₅	3 P	
R ₈₄	470 K	"	C ₂₆	100 P	
R ₈₅	8.2 K	GRY RED RED			

Parts		Parts	
Diodes		Transistors	
D ₁	1N60	Q ₁	2SC1815Y
D ₂	"	Q ₂	"
D ₃	"	Q ₃	"
D ₄	"	Q ₄	"
D ₅	1S1555	Q ₅	3SK49
D ₆	"	Q ₆	"
D ₇	"	Q ₇	"
D ₈	1S1587	Q ₈	"
D ₉	"	Q ₉	2SC1815Y
D ₁₀	"	Q ₁₀	"
D ₁₁	"	Q ₁₁	"
D ₁₂	1S1555	Q ₁₂	2SK19GR
D ₁₃	"	Q ₁₃	2SA562Y
D ₁₄	"		
D ₁₅	"		
D ₁₆	1N60		
D ₁₇	"		
D ₁₈	0.5 Z 6.2 L (6V zener)	Crystal filter for SSB	1
D ₁₉	1S1555	Transformer IFT 6	
D ₂₀	"	(1 x RED and 5 x BLK)	
D ₂₁	1N60	Crystals	
D ₂₂	"	8998.5 MHz	HC18U
D ₂₃	"	8999.3 MHz	"
D ₂₄	"	9001.5 MHz	"
D ₂₅	1S1555		
D ₂₆	"		
D ₂₇	"		
D ₂₈	05 Z 9.1 L		

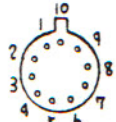
6. ASSEMBLY OF SE-LO UNIT

■ Parts Illustration

MC14964



2SC535



Top view

Capacitor values are shown as

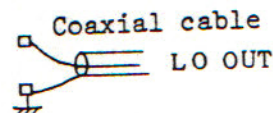
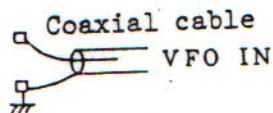
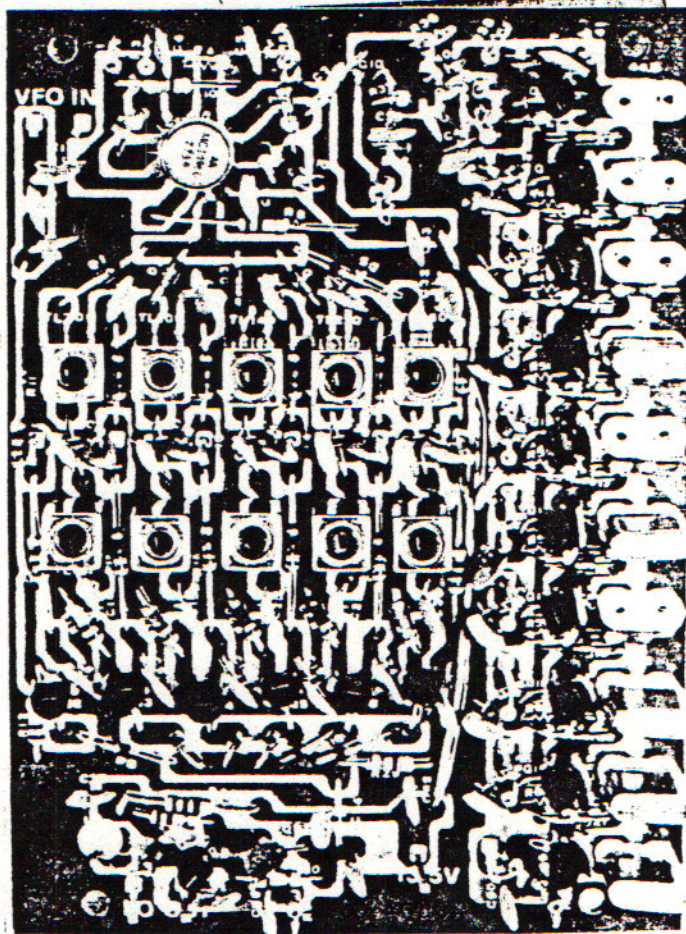


102

1.8



- | | |
|---|--------------|
| <input type="checkbox"/> BRN | 3.5MHz Band |
| <input type="checkbox"/> RED | 7MHz Band |
| <input type="checkbox"/> ORG | 10MHz Band |
| <input type="checkbox"/> YEL | 14MHz Band |
| <input type="checkbox"/> GRN | 18, 21MHz |
| <input checked="" type="checkbox"/> BLU | 24.5, 28MHz |
| <input type="checkbox"/> RED | 7MHz Band |
| <input type="checkbox"/> ORG | 10MHz Band |
| <input type="checkbox"/> YEL | 14MHz Band |
| <input type="checkbox"/> GRN | 18MHz Band |
| <input type="checkbox"/> BLU | 21MHz Band |
| <input type="checkbox"/> PUR | 24.5MHz Band |
| <input type="checkbox"/> GRY | 28.0MHz Band |



⊙ Use 8.5cm of the RED lead for the 13.5V line.

WHITE 28.5 MHz Band
BLACK 29.0 MHz Band
PINK 29.5 MHz Band

RED 13.5V line

PARTS LIST SE-LO

Parts				Parts			
R ₁	33 K	ORG	ORG ORG	R ₂₉	10 K	BRN	BLK ORG
R ₂	330 Ω	ORG	ORG BRN	R ₃₀	100 Ω	BRN	BLK BRN
R ₃	33 K	ORG	ORG ORG	R ₃₁	330 Ω	ORG	ORG BRN
R ₄	330 Ω	ORG	ORG BRN	R ₃₂	220 Ω	RED	RED BRN
R ₅	470 Ω	YEL	VIO BRN	R ₃₃	100 Ω	BRN	BLK BRN
R ₆	1 K	BRN	BLK BRN	R ₃₄	220 Ω	RED	RED BRN
R ₇	820 Ω	GRY	RED BRN	R ₃₅	200 K	RED	BLK YEL
R ₈	10 K	BRN	BLK ORG	R ₃₆	470 Ω	YEL	PUR BRN
R ₉	100 Ω	BRN	BLK BRN	R ₃₇	100 Ω	BRN	BLK BRN
R ₁₀	1.2 K	BRN	RED RED	R ₃₈	2.7 K	RED	PUR RED
R ₁₁	100 Ω	BRN	BLK BRN	R ₃₉	5.6 K	GRN	BLU RED
R ₁₂	10 K	BRN	BLK ORG	R ₄₀	100 Ω	BRN	BLK BRN
R ₁₃	100 Ω	BRN	BLK BRN	R ₄₁	2.7 K	RED	PUR RED
R ₁₄	10 K	BRN	BLK ORG	R ₄₂	5.6 K	GRN	BLU RED
R ₁₅	100 Ω	BRN	BLK BRN	R ₄₃	100 Ω	BRN	BLK BRN
R ₁₆	100 Ω	BRN	BLK BRN	R ₄₄	2.7 K	RED	PUR RED
R ₁₇	10 K	BLU	BLK RED	R ₄₅	5.6 K	GRN	BLU RED
R ₁₈	100 Ω	BRN	BLK BRN	R ₄₆	100 Ω	BRN	BLK BRN
R ₁₉	100 Ω	BRN	BLK BRN	R ₄₇	2.7 K	RED	PUR RED
R ₂₀	10 K	BRN	BLK ORG	R ₄₈	5.6 K	GRN	BLU RED
R ₂₁	100 Ω	BRN	BLK BRN	R ₄₉	100 Ω	BRN	BLK BRN
R ₂₂	100 Ω	BRN	BLK BRN	R ₅₀	2.7 K	RED	PUR RED
R ₂₃	10 K	BRN	BLK ORG	R ₅₁	5.6 K	GRN	BLU RED
R ₂₄	100 Ω	BRN	BLK BRN	R ₅₂	100 Ω	BRN	BLK BRN
R ₂₅	100 Ω	BRN	BLK BRN	R ₅₃	2.7 K	RED	PUR RED
R ₂₆	22K	RED	RED BRN	R ₅₄	5.6 K	GRN	BLU RED
R ₂₇	100 K	BRN	BLK YEL	R ₅₅	100 Ω	BRN	BLK BRN
R ₂₈	100 Ω	BRN	BLK BRN	R ₅₆	2.7 K	RED	PUR RED

Parts			Parts		
R57	100Ω	BRN BLK BRN	C17	0.01	
R58	5.6K	GRN BLU RED	C18	0.01	
R59	2.7K	RED VIO RED	C19	0.01	
R60	100Ω	BRN BLK BRN	C20	20P	
R61	5.6K	GRN BLU RED	C21	20P	
R62	2.7K	RED VIO RED	C22	0.01	
R63	100Ω	BRN BLK BRN	C23	0.01	
R64	5.6K	GRN BLU RED	C24	0.01	
R65	2.7K	RED VIO RED	C25	30P	
R66	100Ω	BRN BLK BRN	C26	47P	
R67	5.6K	GRN BLU RED	C27	0.01	
R68	2.7K	RED VIO RED	C28	0.01	
			C29	0.01	
C1	0.01		C30	30P	
C2	68P		C31	47P	
C3	47P		C32	0.01	
C4	0.01		C33	0.01	
C5	0.01		C34	20P	
C6	0.01		C35	5P	
C7	0.01		C36	0.01	
C8	0.01		C37	0.01	
C9	0.01		C38	0.01	
C10	20P		C39	0.01	
C11	30P		C40	3P	
C12	0.01		C41	47P	
C13	0.01		C42	0.01	
C14	0.01		C43	68P	
C15	20P		C44	0.01	
C16	20P		C45	68P	

Parts		Parts	
C ₄₆	0.01	D ₄	ISI555
C ₄₇	68P	D ₅	"
C ₄₈	0.01	D ₆	"
C ₄₉	68P	D ₇	"
C ₅₀	0.01	D ₈	"
C ₅₁	68P	D ₉	"
C ₅₂	0.01	D ₁₀	"
C ₅₃	100P	D ₁₁	"
C ₅₄	0.01	D ₁₂	"
C ₅₅	100P	D ₁₃	"
C ₅₆	0.01	D ₁₄	"
C ₅₇	150P	D ₁₅	"
C ₅₈	0.01	D ₁₆	"
C ₅₉	150P	D ₁₇	"
C ₆₀	0.01	D ₁₈	"
C ₆₁	150P	D ₁₉	"
C ₆₂	0.01	D ₂₀	"
C ₆₃	0.01	D ₂₁	"
COIL		D ₂₂	05Z91(9V zener)
TL700 TL701 TL140		TRANSISTER	
TL141 TL210 TL211		Q ₁	MC1496G
TL280 TL281 TL100		Q ₂	2SK19GR
TL101		Q ₃	"
L ₁ 1.8μH BRN GRY GOLD or 1.8		Q ₄	"
DYORD		Q ₅	"
D ₁ ISI555		Q ₆	"
D ₂ "		Q ₇	"
D ₃ "		Q ₈	2SC535

Q9	2SC535	
Q10	2SC1815Y	
Q11		
Q12		
Q13		
Q14		
Q15		
Q16		
Q17		
Q18		
Q19		
Q20		
CRYSTAL		
for 7 MHz	21.5MHz	HC25U
10 MHz	24.5MHz	JJY
14 MHz	28.5MHz	
18 MHz	32.5MHz	option
21 MHz	35.5MHz	
24.5MHz	39.0MHz	option
28.0MHz	42.5MHz	
28.5MHz	43.0MHz	option
29.0MHz	43.5MHz	option
29.5MHz	44.0MHz	option
	41.5	

7 PRE ADJUSTMENT INSTRUCTIONS

Items Required

- 1) A power supply unit is needed. We recommend our Model SP-1504S.
- 2) A silk-cord bakelite bar will help in adjusting coil cores, trimmers, etc. A meter bar will damage the coil core. See that the core is inside the coil.
- 3) A 50 ohm dummy-load of more than 10 watts.
- 4) A tester.
- 5) A receiver unit.
- 6) Using an RCA plug and a coaxial cable of about 10 cm, assemble a cord that connects LF IN to 10W out. Short circuit between pin No.8 and No.9 of the remote connector.
- 7) Assemble a probe for measuring RF voltage. Do not attach an alligator clip. It is not necessary to ground the probe.
- 8) Before wiring, check to see that no terminal is short-circuited.
- 9) See that pressing the key connected to the KEY jack produces a tone and that tuning the AF GAIN to the right causes a weak noise.

8 ADJUSTMENT OF THE SE-LO UNIT

- 1) Check the input level of VFO IN. It should be about 0.1V.
- 2) Set the BAND Knob to 7 MHz, 14 MHz, 21 MHz, 28 MHz respectively, and check to see that the crystal oscillation circuit works properly each time by applying the probe to the cross section between R36 and C35. The voltage should be about 3V.
- 3) Set the BAND knob to 7 MHz. Place the probe on LO OUT. Turn the cores of coils TL700 and TL701 alternately until tuning the main tuning dial from 0 to 500 KHz does not cause fluctuations of the output voltage.
- 4) Set the BAND knob to 14 MHz. Place the probe on LO OUT. Adjust the cores of the TL140, TL141 in the same way.
- 5) Repeat the same procedure for 21 MHz and 28 MHz with the TL210 and TL211 coils and the TL280 and TL281 coils respectively.
- 6) In each case, the stabilized output should be approximately 0.6V.

9 ADJUSTMENT OF THE SE-IF UNIT

Adjustment of the Receiver Section

- 1) Connect your antenna to the ANT terminal. If possible, use a doublet for 7 MHz, otherwise a vinyl-coated wire of about 10 meters will do.
- 2) Check to see that there is 13.5V at the 13.5V terminal as well as at the RB terminal.
- 3) Touch the AF OUT terminal with your finger, there should be some noise.
- 4) Check to see that the clockwise and counterclockwise rotation of RF GAIN causes the S meter indicator to move.

Subcarrier Output Adjustment

- 1) Switch MODE to LSB.
- 2) Place the probe on the Q4 emitter and turn the IFT core (Intermediate Frequency Transformer) connected to Q3 for maximum output voltage. The more you push the core into the recess, the weaker will be the output. Adjust it to about 0.4V. (The red coil)
- 3) Repeat the same procedure for USB and CW.
*Note : All the IFT's are identical.

IF Adjustment

- 1) Set BAND to 7 MHz. Switch MODE to LSB.
- 2) Adjust the IFT cores connected to the drains of Q3, Q6, Q7 and Q8 to obtain the maximum S meter reading.

Subcarrier Position Adjustment

- 1) Tune subcarrier to 8998.5KHz while listening to a powerful station, either an amateur station or a broadcasting station, that uses the A3 wave. Adjust the TC2 trimmer and the main dial gradually for the best tone quality. The more remote the frequency of the 8998.5KHz crystal from 9MHz, the more high-pitched will be the tone. The pitch becomes more nasal closer to the 9MHz center frequency. The frequency obtained will be approximately the 30 dB attenuator point.
- 2) Switch MODE to USB and adjust the TC4 trimmer for 9001.5KHz in the same way. If the carrier frequency is too far from the 9MHz center, the tone will be high-pitched. If it is too near the center, the tone will be low and rumbling. The optimum tone is between the two extremes.

S Meter Adjustment

Use VR3 for sensitivity adjustment. Turn it counter-clockwise for greater deflection. VR2 is for zero adjustment. Align S Meter Deflection with the control of RF GAIN. Check to see that the S meter reads S9 when the knob is in the middle with 40 dB input.

Adjustment of the Transmitter Section

- 1) Slide the Final Mute Switch (#8) on the rear panel to the OFF position and mute the 10W final. Set the PO NB ALC switch (#11) on the front panel to ALC and transmit.
- 2) Check to see that there is no voltage on RB and 13.5V on TB.
- 3) Connect the microphone to MIC and turn about 1/3 of MIC GAIN on the SE-AF unit. Adjust the IFT core connected to G1 of Q5 to obtain the maximum ALC meter reading.

Carrier Balance Adjustment

An extra receiver is needed for this adjustment. Disconnect the microphone and transmit. Receive the carrier by the other receiver. Adjust VR1 (200 ohm and TC1 30P) alternately to suppress the carrier till you obtain the lowest reading on the S meter of the receiver.

If the receiver is not sensitive enough, attach a short lead to the RF OUT terminal of the SW-RF unit.

CW Tone Adjustment

In the CW mode, use 8998.5KHz for receive and 8999.3KHz for transmit regardless of the band. The slide-tone for CW monitoring is set at about 800Hz. Adjust the 8999.3KHz crystal through TC3 unit the tone is identical to the side-tone.

- 1) First, transmit on 7MHz in the LSB mode. Use the supplementary receiver to receive the output, which should be a howling sound. Adjust TC3 till the howl is changed in to a singing sound, indicating that your SS-105 and the receiver have been zeroed in. Next, Leave the main tuning knob as it is, switch the MODE to CW and operate the key. Again, adjust TC3 to match the monitor tone and the tone from the supplementary receiver. Double beat zero-in is thus obtained.
- 2) If you do not have the CW crystal filter (optional), place the pin (orange) for the CW crystal filter flush against the pin (brown) for the SSB crystal filter to obtain the CW mode. When the CW crystal is used, the ALC meter will not deflect if the 8999.3KHz is too far from its position, because of the filter's extremely sharp resonance. Optimum tuning is obtained at the peak of the ALC meter.

Adjustment of RIT

- 1) Set the RIT knob on the front panel to the 0 (zero) position.
- 2) While repeatedly switching the RIT switch on and off, adjust VR2 of the SE-SW unit until a stable receive frequency is obtained.
- 3) Adjust VR1 of the same PCB in the same way to obtain a stable receive frequency. The use of supplementary receiver to obtain howl and zeroing in is also recommended for this adjustment.

This completes all the necessary adjustments.

After connecting a power meter, switch MULT on the rear panel to ON and transmit. You will get 10 W output with minor variations depending on the bands you use.

Note : The transceiver will not work unless you short-circuit the No.8 and No.9 pins of the 9 pin socket and connect LFIN and 10W out with a coaxial jumper cable.

10. OPERATIONAL PRECAUTIONS

- 1) It is important to thoroughly tune your antenna for optimum impedance match. Check to see that the VSWR is less than 1.3 : 1.
Do not forget to use the ALC meter for the adjustment of the transmitter section.
- 2) If the clutch of the 1KHz dial has become loose, remove the main tuning knob and tighten the nut on the shaft.
- 3) If you remove the ALC, you can get more than 10W of output. But for protection purposes, the SS-105 is designed to deliver distorted signals when in such a condition.
- 4) With RIT switched OFF, there will be no slippage of transmit and receive frequencies. But while it is switched ON, if there is slippage of VR1 and/or VR2 of the SE-SW unit, the receive frequency will also deviate.
- 5) The front pannel is laid out to allow you to handle knobs with your left hand and take notes with your right hand.

Some notes on the Use of a Transverter

The final stage has to be muted when a transverter is used.

- 1) Use the X-260 for both the 50MHz and 144MHz bands. If the SS-105 is used as a generator, power can be supplied from the X-260.
Use the following pins for 9-pin socket :
 - (1) Remote Control Line
 - (2) 13.5V line
 - (3) Grounding line
- 2) Use the X-407 for the 430MHz band.
If the driving power is insufficient, replace the R1 (47 ohm) resistor of the X-407 with a 470 ohm resistor.

BLOCK DIAGRAM

