

**OPERATING AND
ALIGNMENT INSTRUCTIONS
SKYRIDER 5-10
MODEL S-21**

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CHICAGO**

OPERATING INSTRUCTIONS

SKYRIDER "5-10" - MODEL S21

The SKYRIDER "5-10" is a 2 band 8 tube superheterodyne receiver designed to give the maximum in performance throughout its ultra high frequency tuning range.

The frequencies covered by the "5-10" are:

Band 1 - 27 MC to 42 MC

Band 2 - 40 MC to 68 MC

The band switch directly below the calibrated main dial enables the operator to easily place the proper coils in the circuit to cover the desired frequencies.

Antenna:

For operation on both bands very satisfactory reception can be secured through the use of an inverted L antenna approximately 60 ft. long overall. Much better reception can be obtained, however, through the use of a 1/2 wave antenna cut for the definite frequency to which you wish to listen. The length of 1/2 wave antenna can be easily

computed by using the formula $L = \frac{492,000}{F} \times .94$ where L is the length in feet and F

is the frequency in kilocycles. The length of a 1/2 wave antenna for operation in the center of the 5 meter band is approximately 7.97 feet long overall. An antenna for the center of the 10 meter band would be approximately 15.93 feet long. Consideration should be given to the fact that under certain conditions a horizontal antenna will be more effective than a vertical and vice versa. The antenna input impedance on both bands is approximately 400 ohms. Should the "5-10" be used with a 5 or a 10 meter transmitter, the transmitting antenna should work exceptionally well on the receiver after a change over switch or relay has been provided to transfer the antenna to the receiver during listening periods.

It is suggested that the antenna being used should be coupled to the receiver with an open wire transmission line. If the antenna can be located in an area free from ignition and other man-made interference, it will be to your advantage to transpose the transmission line, so as to minimize the pickup of that type of interference. Where a transmission line is used for feeding the antenna energy, remove the wire jumper between the A2 post and the ground post.

So many different types of antennas and feed systems can be used, it is difficult to cover them in this manual. For more detailed treatment of your antenna problem, you are referred to either the ARRL or Radio Handbook.

A good ground connection is essential to the reduction of interference and usually increases the effectiveness of the antenna. Run a heavy copper wire, #16 or heavier to the nearest cold-water pipe or other good metallic ground, making the length of lead as short as possible.

Operation:

Unless otherwise indicated the "5-10" Model S21 receiver is designed to be operated from 110 volt 60 cycle alternating current. Direct current operation is treated in detail later in this manual. After connecting the aerial to the receiver, connect it to its power source and turn the "tone" control to the right. After waiting a few moments for the tubes to reach operating temperature, the receiver is ready for use.

The gain of the receiver can be adjusted with the R.F. and audio gain controls. The R.F. gain control should be advanced to the point where the desired amount of sensitivity is obtained. When the R. F. gain control is turned as far as it will go to

the right you will operate a switch which is mounted on the rear of the control. This switch, should an SM21 carrier level meter have been purchased as an accessory unit, must be closed in order to connect the meter into the circuit. The A.V.C. switch must also be ON to make the meter indicate. The SM21 meter is plugged into the socket marked MTR appearing on the rear chassis apron.

As is indicated by the marks on the panel, the Beat Frequency Oscillator is turned on when the A.V.C. - B.F.O. control is turned to the right. When this is done the Automatic Volume Control circuit is disconnected. Neither A.V.C. action or B.F.O. output is secured with this control in the center or "OFF" position.

The Dickert noise limiter circuit is used in this model. Through its use quite satisfactory attenuation of objectionable ultra high frequency interference is obtained. The Dickert silencer is particularly effective on ignition and other pulsating types of interference.

The noise limiter can be used, if so desired, with the expander switch in either the broad or sharp position merely by carrying the rotation of the expander switch in the proper direction past the "Broad" or "Sharp" designation to the "AML" ON position on either side.

The audio gain control will prove helpful in adjusting the volume of the receiver to the proper level for satisfactory reception. The apparent background noise can be greatly reduced by reducing the R.F. gain and increasing the Audio gain. In most cases, reception on the 30 megacycle band will be best with the receiver in the sharp position. For stand-by operation or for operation on the 60 megacycle band where frequency modulated signals are being received, the set should be switched to the broad position. Frequency modulated signals will sound very distorted when the receiver is in the sharp position. Crystal controlled 5 meter transmission will come through very nicely, however, with the receiver in the "sharp" position.

The pitch control, through the low capacity condenser it operates, will allow you to vary the frequency of the beat note to one most pleasing to you. The control functions only when the "A.V.C. - B.F.O." switch is on the B.F.O. position. The Send-receive switch, in the send position, removes plate voltage from the tubes and makes the receiver inoperative during stand-by periods.

Inasmuch as no direct current flows in the headphone jack circuit, crystal, or any other type headphones can be plugged into the fone jack. When the phones are plugged in the speaker is disconnected.

D. C. Operation:

Because of the possibility for mobile use on the ultra high frequency ranges for which the receiver has been designed, it has been adapted for DC operation. On the rear apron of the chassis next to the MTR plug you will find another socket into which fits an octal male plug which jumpers soldered in place. Should A.C. operation be desired, this plug must be in the socket. In case D.C. operation is wanted, this plug is removed from the socket and a Model XP4 Hallicrafters Vibrapack unit is plugged into the socket hooked up as indicated by the "DC operation" schematic.

The tube lineup of the Model S21 SKYRIDER "5-10" receiver is as follows:

- 1852 - R. F. Amplifier
- 6L7 - First Detector
- 6J5 - High Frequency Oscillator
- 6K7 - 1st I. F. Amplifier
- 6P7G - 2nd I. F. Amplifier, B.F.O.
- 6Q7G - 2nd Detector, A.V.C., 1st Stage of Audio
- 6F6G - Audio Output tube
- 80 - Rectifier

The SKYRIDER "5-10" draws 74 watts at 117 volts 60 cycle A.C.

The Hallicrafters, Inc., reserve the right to make changes in design or to add improvements to instruments of their manufacture without incurring any obligations to install the same in any instrument previously purchased.

ALIGNMENT PROCEDURE FOR SKYRIDER "5-10" Model S21

Intermediate Frequency Alignment

Have the controls set as follows:

Broad-sharp switch to sharp position.

A.V.C. - B.F.O. switch in "OFF" position.

Set R. F. and A. F. gain controls at maximum.

Set band switch on Band #1.

Adjust main dial to minimum capacity or #24 on the Vernier scale.

Remove the 6L7 grid cap - connect the signal generator to this tube, through an .01 mfd condenser.

Now set the signal generator for 1600 KC output.

Adjust trimmers on T1, T2, T3 transformer for exact resonance which will be indicated by maximum output.

For adjustment of the Beat Frequency Oscillator turn the knob on the "pitch control" unit until the dot is straight up. Remove modulation from the 1600 KC signal being fed into the I. F. amplifier and then adjust T4 for zero beat.

R. F. Alignment

Replace the 0.1 mfd condenser in series with the generator to the receiver with a 400 ohm resistor. Connect the generator to the A1 terminal on the antenna terminal strip to be found on the rear apron of the chassis. Leave the jumper connected between A2 and G. There is only one pad adjustment on the "5-10" receiver and that is for the low frequency end of Band #1. This pad is adjusted from the top of the chassis.

Band #1

Place the band switch on Band #1. Set the generator and tuning dial to 28 mc and adjust pad C43 for maximum signal. Reset tuning dial and generator to 40 mc and set oscillator trimmer CA. Now recheck pad C43 and trimmer CA until no change in frequency calibration is noted. When this is accomplished adjust trimmers CB, CC for maximum gain. When making these latter adjustments it is advisable to "rock" the tuning control slightly until the point of exact resonance and maximum output is obtained.

Band #2

Set signal generator and tuning dial to 60 mc and adjust oscillator trimmer CD to signal. Then adjust CE, CF for maximum gain, slightly rocking the tuning gang while making the adjustment.

There is no pad on Band #2.

NOTE: Should the noise picked up by the receiver interfere seriously with the alignment, increase the signal generator output and reduce the R. F. gain. The noise limiter may also be left on during alignment.

RESISTOR PARTS LIST - SKYRIDER 5-10 Model S21

NO.	OHMS	WATTAGE	PARTS NO.
R1	180	1/3	22-011
2	100,000	1/3	20-093
3	1,000	1/3	20-033
4	600	1/3	22-125
5	30,000	1	22-075
6	2,500	1/3	22-044
7	100,000	1/3	20-083
8	500	1/3	22-026
9	10,000	1/3	25-029
10	2,500	1/3	22-044
11	100,000	1/3	20-093
12	500	1/3	24-040
13	50,000	1/3	20-084
14	50,000	1/2	22-082
15	1,000	1/3	20-033
16	20,000	1/3	22-071
17	1,000,000	1/3	22-018
18	500,000	1/3	25-018
19	100,000	1/3	20-093
20	100,000	1/3	20-093
21	250,000	1/3	20-099
22	300	1/3	20-021
23	500,000	1/3	25-031
24	25,000	1	20-073
25	20,000	1	20-070
26	150	1/3	22-011
27	100,000	1/3	20-093
28	500	1/3	24-040
29	500,000	1	22-101
30	10,000	1/3	20-061
31	50,000	1/3	20-084
32	5,000	2	

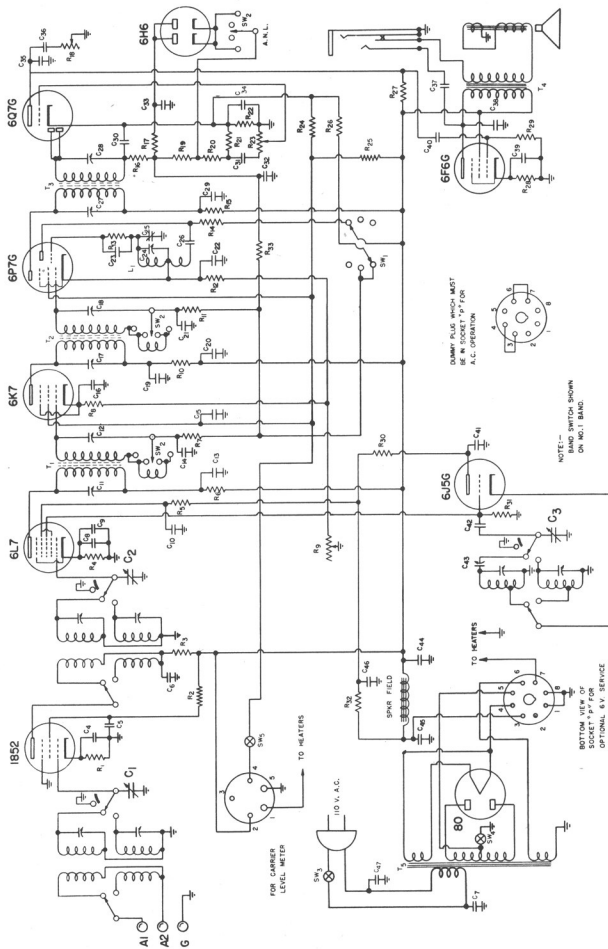
CONDENSER PARTS LIST - SKYRIDER 5-10 Model S21

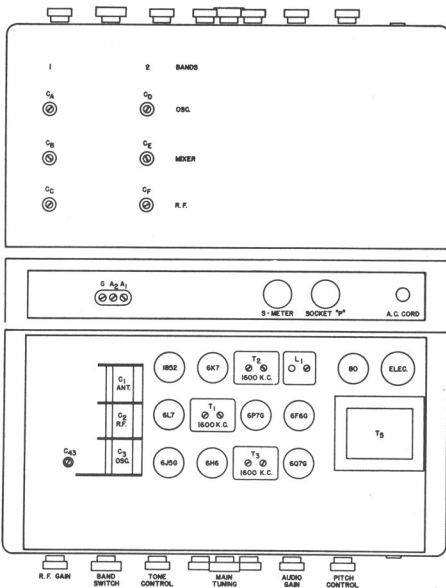
NO.	CAPACITY	TYPE	VOLTAGE	PARTS NO.
C1	80 mmfd per section	main tuning		48-033
2		gang		
3		"		
4	.005 mfd.	mica		40-013
5	.002 "	"		41-001
6	.01 "	"		400
7	.01 "	"		800

CONDENSER PARTS LIST - SKYRIDER 5-10 Model S21 - continued

NO.	CAPACITY	TYPE	VOLTAGE	PARTS NO.
C8	.002 mfd.	mica		40-013
9	.05 "	"	200	41-004
10	.05 "	"	400	41-005
11	Tuning Condenser in I.F. Transformer	"		
12	"	"		
13	.01 mfd.	"	400	41-001
14	.01 "	"	200	41-000
15	.05 "	"	400	41-005
16	.01 "	"	400	41-001
17	Tuning Condenser in I.F. Transformer	"		
18	"	"		
19	.01 mfd.	"	400	41-001
20	.25 "	"	400	
21	.01 "	"	200	41-000
22	.01 "	"	400	41-001
23	.00025 "	mica		40-024
24	Pad	"		
25	.00025 "	air		
26	.01 "	"	400	48-021
27	Tuning Condenser in I.F. Transformer	"		41-001
28	"	"		
29	.02 mfd.	"	400	
30	.0001 "	mica		41-002
31	.02 "	"	400	40-003
32	.0001 "	mica		41-002
33	.05 "	"	200	40-003
34	.1 "	"	200	41-004
35	.0001 "	mica		40-006
36	.01 "	"	400	40-003
37	.01 "	"	800	41-001
38	.01 "	"	600	45-002
39	.01 "	"	800	45-002
40	.05 "	"	25	42-025
41	.002 "	mica		41-005
42	.0001 "	"	400	40-013
43	.400 mmfd.	Pad		40-003
44	10. "	"	450	44-037
45	10. "	"	450	
46	10. "	"	450	42-024
47	.01 "	"	900	45-002
51	A.V.C. - B.F.O. On-Off Switch			
52	Automatic Noise Limiter and I.F. Expander Switch			
53	A.C. On-Off Switch on Tone Control			
54	Stand By SPST			
55	Meter Switch on R.F. Gain Control			

SCHEMATIC DIAGRAM — SKYRIDER 5-10 — MODEL S-21





POWER SUPPLY FOR 6 VOLT OPERATION —
MODEL XP-4

