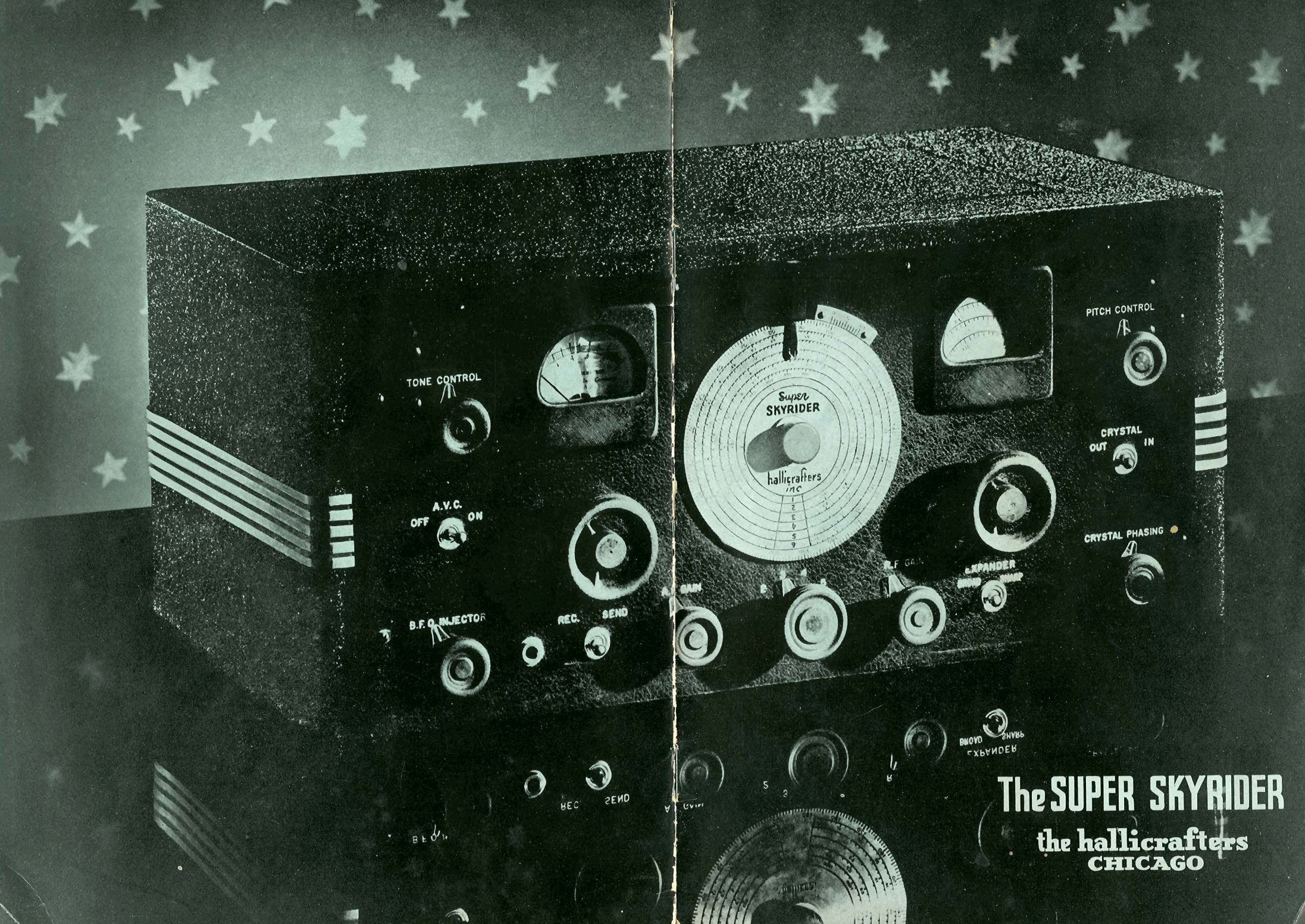


The SUPER SKYRIDER

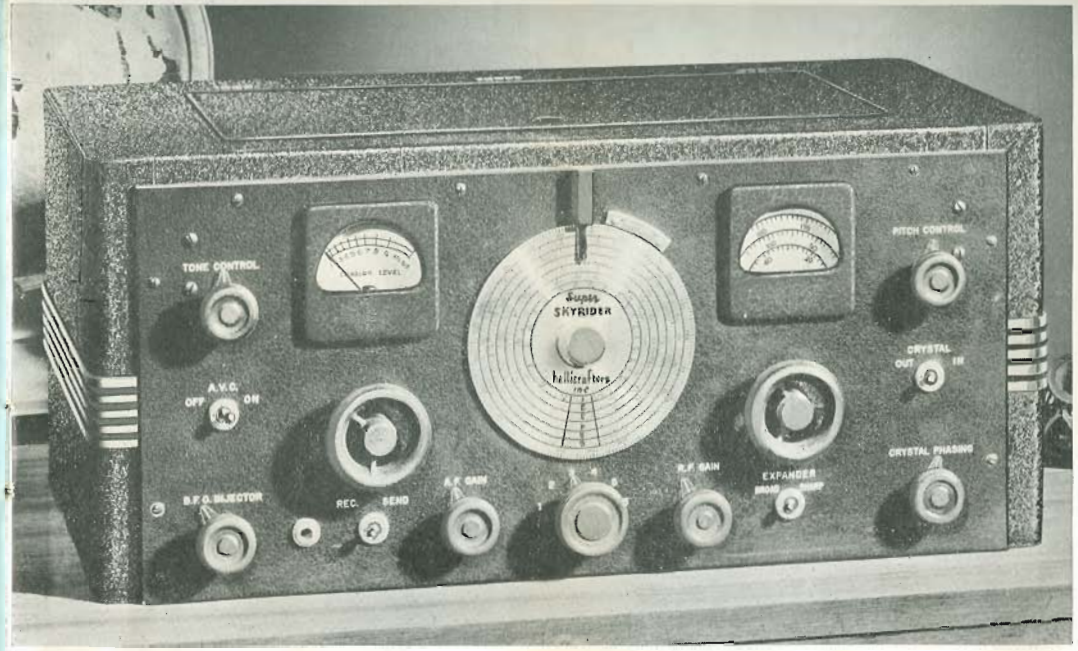
the hallicrafters
CHICAGO

WHAT DOES "COMMUNICATIONS RECEIVER" MEAN?

There still seems to exist in the minds of some that a ***communications receiver*** is just another name for ***short-wave receiver.*** A communications receiver ***is*** a short-wave receiver to be sure, but whereas the latter is fundamentally a broadcast receiver with extended ranges to include short-wave broadcast and possibly amateur stations, the former is a receiver especially designed for high frequency reception. The difference does not end here, however. The broadcast short-wave receiver is used solely for entertainment, whereas the communication receiver as used by the modern radio amateur is something far more than that. True an amateur gets pleasure out of working his transmitter and talking to friends the world over. But remember—his hobby is a scientific one, and the "air" is to him his laboratory. Amateur experimenting has contributed much in the way of radio advancement.

A communications receiver is therefore more than just a broadcast short-wave receiver. Their functions are entirely different. Where one will solely be used in the home for entertainment, the other may be operated under adverse conditions; in damp tropical surroundings, exposure to sea air or even the cold of the Arctic. Communications receivers must be solidly constructed and electrically fool-proof to stand up under such hard going, and the amateur must always be ready to turn from the role of experimenter to a much greater role when national emergencies—such as fires, floods, hurricanes—arise. It is therefore imperative that his equipment be trustworthy in such emergencies where the ability of the equipment to function properly may be the only means of obtaining aid in a stricken area. It must not fail.

And we, an organization devoted to the building of fine communications equipment well understand these facts, for many of us are old time amateur operators ourselves with stations of our own. Some of us operated our first transmitters twenty and more years ago, back in the days of spark transmitters and crystal detectors. Later, many of us were among the first amateurs to use the Lee Deforest Audion and we still remember the thrill we got out of our first regenerative receiver. Today finds us known as ***"The Hallicrafters,"*** building fine communications receivers. We take pride in our receivers; we believe they are the best we or anyone else can build.

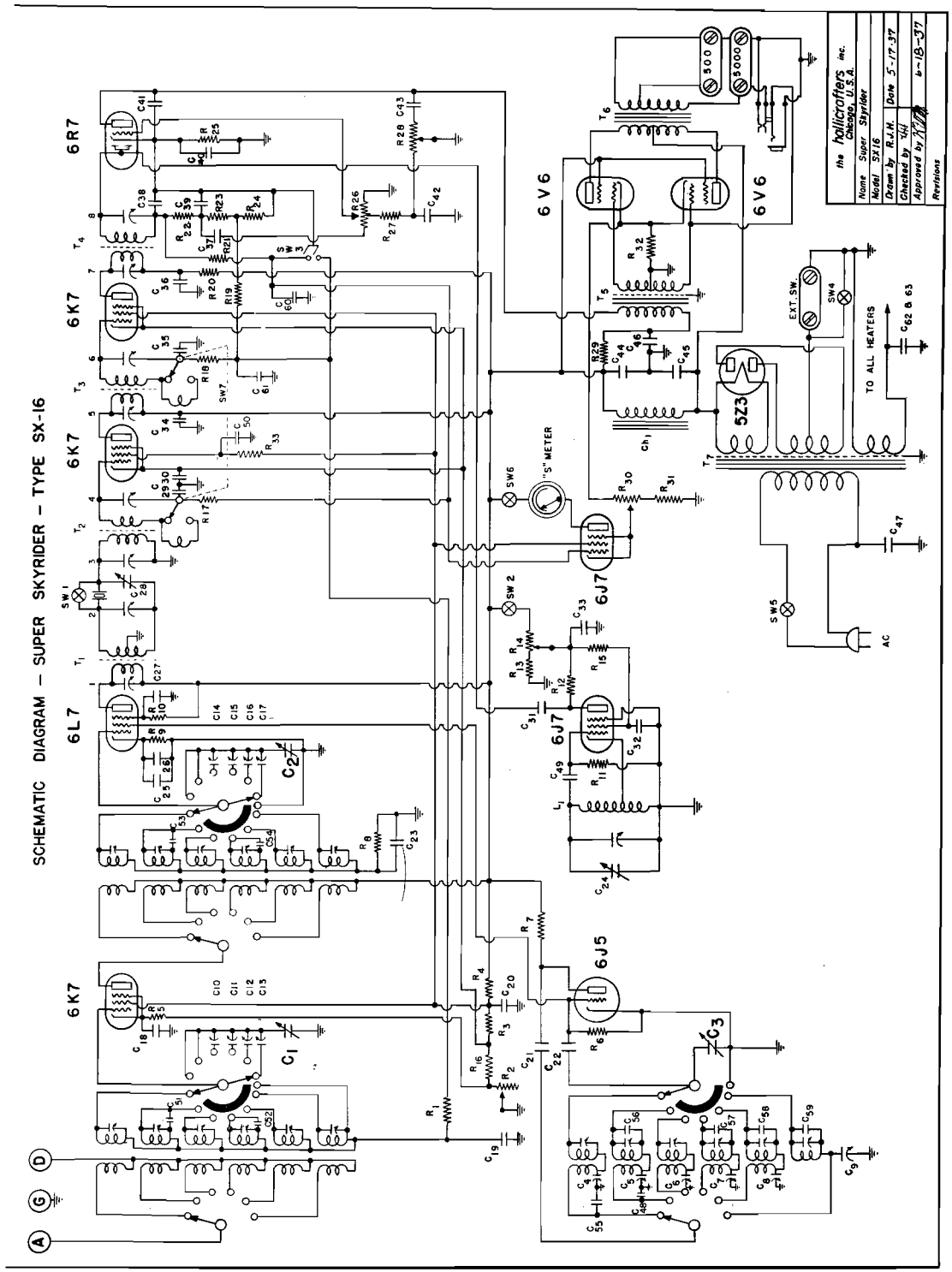


★ AMERICA'S No. 1 COMMUNICATIONS RECEIVER

Even in this day of extravagant claims, we realize that it's taking in a lot of territory to say: "We sincerely believe that this is the finest all-round communication receiver on the market today!" Yet the new 1938 Super Skyrider is designed to be just that.

We visualized a receiver tuning from 5 meters to the top of the broadcast band, with high sensitivity on all amateur bands (not merely the 20 or 10 meter band); wide range, variable selectivity (single signal razor sharpness to broad high fidelity); an effective, efficient band spread that would equal or better the standards set by the A.R.R.L. Handbook; improved image and signal to noise ratio, and finally, an "S" meter that would work on weak signals. It was a large order. But thanks to Mr. Karl W. Miles, and his competent staff, including Mr. J. L. A. McLaughlin, co-designer with Mr. James J. Lamb of the famous "dual diversity receiver"—every challenge was successfully met.

Of course, there are several other excellent receivers on the market today, but they cost considerably more than the new 1938 Super SKYRIDER . . . and even they do not offer the 5-meter band. Only ONE of them (at more than twice the price) offers variable selectivity and high fidelity. That's why we say—and you'll agree with us—***that here's America's No. 1 Communications receiver!***



OPERATING INSTRUCTIONS

The 1938 Super SKYRIDER is a 6 band 11 tube superheterodyne receiver covering the following frequencies.

Band No. 1— 545 KC to 1555 KC
Band No. 2—1545 KC to 4300 KC
Band No. 3—4.2 MC to 10.2 MC
Band No. 4—9.8 MC to 20.5 MC
Band No. 5—19 MC to 36 MC
Band No. 6—35 MC to 62 MC

Separate coils are used to cover each band. Inductive coupling to the antenna permits the maximum transfer of signal energy from each separate primary to the particular secondary coil in the circuit. The unused coils are shorted.

The coil range in use is indicated by the pointer in front of the main dial. This pointer moves vertically when changing bands. This dial is calibrated in kilocycles on bands No. 1 and 2 and in megacycles on the remaining four bands. The calibration on the main dial will hold accuracy only when the band spread dial reads "O" or minimum capacity position.

ANTENNA

In the back center of the chassis will be found the insulated antenna and doublet binding posts. If a doublet antenna is used, remove the jumper from the one insulated post to the chassis and connect the two wires from the doublet to the insulated posts. Please remember that the regular short wave doublet antenna is designed to work best on the short-wave broadcast frequencies. This means that it will not perform equally well on the amateur bands or frequencies in between the short wave broadcast channels. When using the conventional flat-top and lead-in type of antenna, connect the lead-in to the insulated post farthest to the left, being sure that the wire jumper is connected to the chassis and the other insulated post. Antenna location, length and type play a most important part in the successful operation of the set, especially on the three high frequency ranges. On the 5th and 6th bands it is particularly important to use the proper type of antenna. FOR MAXIMUM PERFORMANCE ON THE "ULTRA HIGH" FREQUENCIES YOU ARE REFERRED TO THE ANTENNA DESIGN SECTION OF THE A. R. R. L. HANDBOOK AND CURRENT RADIO PERIODICALS. IT IS SUGGESTED THAT A LITTLE EXPERIMENTING BE DONE WITH ANTENNAS SO THAT MAXIMUM PERFORMANCE WILL BE SECURED.

OPERATION

Plug the cord on the receiver into the power socket. (Unless otherwise specified the receiver operates on 60 cycle, 110 volt alternating current.) Turn the control marked "Tone" to the right. This will turn the receiver on. During the time the receiver is warming up also turn the "R.F. Gain" and "A.F. Gain" knobs to the right. The receiver is shipped with the band-change switch in the highest frequency range. Adjust the "Bands" switch until the pointer on the calibrated main dial indicates the band you wish to tune. We suggest that you familiarize yourself with the operation of the receiver on Bands No. 1 and No. 2 before trying the higher frequencies. Turn the large knob (directly below the silver dial) until the desired range is in the circuit. When listening for distant or possibly weak stations, it is recommended that the control marked "BFO INJECTION" be used by turning the knob to the right. Once these signals are located, it should be turned off or a continuous whistle will result. When listening to C.W. transmissions the control must be left turned on. The "PITCH CONTROL" knob will prove most helpful in changing the beat note to the one most pleasing to the operator. When "BFO INJECTION" control is "ON" the "AVC" switch should always be in the "OFF" position.

PHONE RECEPTION

When receiving voice, whether broadcast or short wave, it is recommended that the "AVC" switch be left in the "ON" position. The "R.F. GAIN" control with "AVC" switch in the "ON" position should be turned as far as it will go to the right. It will be noticed that with the "AVC" switch "OFF" and the "R.F. GAIN" wide open the set will block on strong signals. If maximum sensitivity is desired the "AVC" switch can be left in the "OFF" position. The sensitivity may be manually controlled with the "R.F. GAIN" control. It will be found that by optional adjustment of both

Chart of Frequency Assignments in the Radio Spectrum Covered by the New Super Skyrider and conditions for Best Reception.

METERS	KILOCYCLES	
545	550	
	BROADCAST BAND (B.C.)	
200	1,500	
	B.C. EXPERIMENTAL	
	1,600	
	POLICE FIRE MARINE, ETC.	
	1,715	
	AMATEUR CODE	
	1,800	
160	AMATEUR PHONE	
	2,000	
	TELEVISION	
	2,096	
	SHIP HARBOR B.C. PICKUP, ETC.	
	2,208	
	POLICE	
	2,500	
	COASTAL HARBOR	
	2,600	
	AVIATION & GOV'T.	
	2,750	
	TELEVISION B.C. PICKUP	
	2,850	
100	AVIATION & GOV'T.	
	3,015	
	AVIATION GOV'T. SHIPS & COASTAL	
	3,265	
	POINT TO POINT	
	3,410	
	EXP. GOV'T. & AIR	
	3,500	
80	AMATEUR CODE	
	3,900	
	AMATEUR PHONE	
	4,000	
	GOVERNMENT PRESS SHIPS AVIATION POINT TO POINT EXP. COASTAL, ETC.	
	4,800	
	AVIATION GOV'T. POINT TO POINT SHIPS & COASTAL	
	6,000	
49	RELAY B.C. EXP.	
	6,150	
	AVIATION EXP. GOV'T. SHIPS PRESS COASTAL	
	6,700	
	POINT TO POINT	
	7,000	
	AMATEUR CODE	
	7,300	
40	POINT TO POINT & GOVERNMENT	
	8,200	
	EXP. PRESS GOV'T. SHIPS & COASTAL	
	8,700	
	POINT TO POINT GOVERNMENT	
	9,500	
31	RELAY B.C. EXP.	
	9,600	
	POINT TO POINT & GOVERNMENT	
	11,000	
	MISCELLANEOUS	
	11,700	
25	RELAY B.C. EXP.	
	11,900	
	AVIATION COASTAL GOVERNMENT POINT TO POINT	
	14,000	
	AMATEUR CODE & PHONE	
20	14,400	
	POINT TO POINT	
	15,090	
	RELAY B.C. EXP.	
19	15,340	
	AVIATION COASTAL GOVERNMENT POINT TO POINT	
16	17,760	
	RELAY B.C. EXP.	
	17,800	
	POINT TO POINT GOVERNMENT	
14	21,440	
	RELAY B.C. EXP.	
	21,540	
	MISCELLANEOUS	
	23,000	
	EXPERIMENTAL & GOVERNMENT	
	28,000	
	AMATEUR PHONE	
	29,000	
10	AMATEUR CODE	
	30,000	
7½	2-WAY POLICE EXPERIMENTAL TELEVISION GOVERNMENT	
	56,000	
	AMATEUR PHONE & CODE	
5	60,000	
METERS	KILOCYCLES	

BAND 1 — Ability to receive distant stations increases with darkness.

BAND 2 — Darkness is the greatest aid to distance reception, although greater distances can be accomplished in daylight than on the lower frequencies. "Skip effect" (inability to receive close transmissions depending upon conditions) becomes noticeable on the higher frequencies in this band.

BAND 3 — Darkness becoming less of a contributing factor in reception over greater distances. "Skip effect" more pronounced at night. Under usual conditions nearby transmissions not heard and when audible seemingly distorted. Static is bothersome on this range during warm weather.

BAND 4 — On this range more consistent distance reception can be had. During cold weather this range normally goes dead at nightfall. During warm weather it is usually open twnety-four hours a day and remarkable DX can be heard. Normally stations cannot be heard on this band unless they are at least 400 miles from point of reception.

BAND 5 — This range is normally usable only during the daylight hours. Frequencies in this range are most affected by conditions. "Skip effect" limits reception to ground waves of nearby stations (15 or 20 miles) or those stations removed by at least 700 to 1000 miles from the point of reception.

BAND 6 — Unless conditions are very freaky, the maximum distance to be received on this range rarely exceeds fifty miles. Signals over this relatively short distance are received equally well in daylight and darkness. So far, this highly experimental range has "opened up" over 50 miles only at night. Do not feel that the set is performing incorrectly if some 5 meter signals are unintelligible—to receive signals well on this band the signals themselves must be stable and amplitude, not frequency, modulated.

"R.F." and "A.F." gain controls the most favorable ratio of signal to noise will be secured. THE CARRIER INTENSITY METER will function only when the "AVC" switch is "ON" and the "R.F." gain control is completely "ON," or turned to the right as far as it will go.

ON THE BACK OF THE CHASSIS IS A SCREWDRIVER ADJUSTMENT FOR SETTING THE "CARRIER" METER. THIS CONTROL SHOULD BE ADJUSTED SO THAT THE METER READS "O" WITH THE "R.F." CONTROL ON FULL, THE "AVC" ACTION ON AND THE ANTENNA DISCONNECTED.

C.W. RECEPTION

For the reception of C.W. Signals, the "AVC" switch should be in the "OFF" position and the "BFO INJECTION" control turned on. Variation of this control changes the output of the beat oscillator. Weak signals which would normally be inaudible with a strong beat oscillator are easily copied with the control just on. Turning the knob as far as it will go to the right gives maximum beat oscillator output.

THE TUBE LINE-UP

6K7—Preselector, R.F. amplifier
6L7—1st Detector-mixer
6J5—Signal frequency oscillator
6K7—1st I.F. amplifier
6K7—2nd I.F. amplifier
6R7—2nd Detector; "AVC"; 1st Stage of audio
2-6V6's—Push-pull power ouput 2nd audio stage
6J7—Beat frequency oscillator
6J7—Signal indicator amplifier
5Z3—Full-wave rectifier

The 6K7 R.F. stage gives maximum gain in inverse relation to frequency and provides increased selectivity and a reduction of image.

The first detector-mixer is a 6L7. The ouput from the 6J5 signal frequency oscillator is electron coupled to the injector, or No. 3 grid, of the 6L7. Because no oscillator plate current flows in the 1st detector, the ratio of signal to noise is more favorable than that obtained in a composite tube, or in circuits where the cathodes of two tubes are tied together.

The 6J5 oscillator has separate coils for each band. Superior overall performance of the new Super SKYRIDER is in part due to the design of the signal frequency oscillator. No harmonics of the oscillator are used on any of the bands.

The 6R7 second detector gives half-wave diode detection, "AVC" and the triode section of this tube is the first stage of audio amplification. The plate of this section of this multi-purpose tube is transformer coupled to the grids of the push-pull 6V6's.

The push-pull 6V6 stage running straight Class "A" delivers 13 watts of undistorted audio power. Before actually drawing any grid current the output is in the neighborhood of 18 watts.

The beat oscillator is a 6J7 electron-coupled to the diode section of the 6R7.

The high-current 5Z3 rectifier provides ample current for the complete receiver with its push-pull 6V6 audio output stage.

I.F. AMPLIFIER

All intermediate frequency transformers are of the iron-core type and resonate at 465 KC. The I.F. amplifying system in the new Super SKYRIDER is of the expanding type providing a width expanded of 20 KCS at 100 X resonant input. Because of this feature, it is convenient to use the receiver in the broad position when covering the band and looking for a call. Once located, the desired station can then be sharpened by switching to "SHARP" position. Fidelity of broadast reception is materially improved with the I.F. amplifier "BROAD." This type of transformer has so definitely demonstrated its superiority over the air core type as to warrant its use in the new 1938 Super SKYRIDER. Tremendous gain, better signal to noise ratio, sharp or broad selectivity are but a few of the advantages of the iron-core system.

The crystal input transformer is made up of three coils so placed that a signal of maximum strength is impressed on the low impedance primary of the crystal output transformer. The crystal filter with its phasing condenser is inserted between those transformers. With proper adjustment of the phasing condenser single signal operation can be secured. When the crystal is shorted, or the crystal switch is in the "OUT" position, the signal is impressed directly on the crystal output transformer which feeds the grid of the 6K7 first I.F. stage.

The second and third I.F. transformers are similar and provide maximum stabilized gain. The use of four iron-core I.F. transformers gives an order of

gain and selectivity which has heretofore never been obtained in communication receivers.

SPEAKER, HEADPHONE, ETC.

On the lower right hand corner on the back of the chassis you will find a terminal strip marked 5000 ohms. To this strip connect the permanent magnet speaker. The terminal strip marked 500 ohms directly above the 5000 ohm strip can be connected to a load of that impedance. The other terminal strip to the right of these two and marked "External Switch" is used to turn the set on or off for stand-by during transmissions. This strip when connected to a relay on the transmitter or a separate set of contacts on an external switch will turn the set on and off temporarily by opening the "B" supply to the receiver when the "Send-Receive" switch on the front panel is in the "Send" position.

In this receiver the speaker is not a portion of the filter system. This allows the receiver to be operated independently of the speaker itself. A permanent magnet 5000 ohm speaker capable of handling 18 watts is the type we recommend being used with this receiver.

The headphone jack is connected to the plate of the 6R7 through a condenser. The possibility of shock to the operator is eliminated by having no direct current on the phones. Crystal type headphones can be used on this receiver without using a special coupling transformer.

The total consumption of power by this receiver is 110 watts at 115 volts 60 cycle A.C.

CRYSTAL OPERATION

To properly adjust the crystal circuit for best performance the following procedure should be carefully followed.

Be sure that the "BFO INJECTION" control is in the "OFF" position.

Tune to some station transmitting continuously, being very careful to get the signal on the nose. After you are sure you have the signal resonated perfectly, turn on the "BFO INJECTION" control to nearly maximum position.

Check your tuning and be sure you still have the signal perfectly tuned-in.

Now change the "PITCH CONTROL" being sure that it is operating properly. Proper operation of this control will be indicated by hearing the signal twice in one complete rotation of the knob, there being two positions in which no signal will be heard. These are known as the "zero beat" positions.

Snap the crystal switch to the "ON" position. You will notice a great reduction in noise. Carefully retune the signal on the "BAND SPREAD" dial. Notice how sharply the signal peaks, with normal volume again obtained. Now tune through the signal and find which side of the signal is the weaker. Tune in the weaker side and then carefully adjust the "PHASING" condenser control until the weaker signal is inaudible. Retuning to the other side of the signal should find no change in its volume and knife-like selectivity resulting. Whichever side of the zero-beat adjustment of the "PITCH CONTROL" gives the greater rejection of the interfering signal, that is the adjustment to be used for maximum selectivity. The phasing condenser affects the selectivity of the receiver whether the crystal is in the circuit or not. The crystal may be used in the reception of phone signals with some sacrifice in their quality.

Again you are reminded to tune this receiver with care. Because of its extreme selectivity, you may expect the most satisfactory results only after familiarizing yourself with its operation.

MAKING USE OF THE VERNIER SCALE

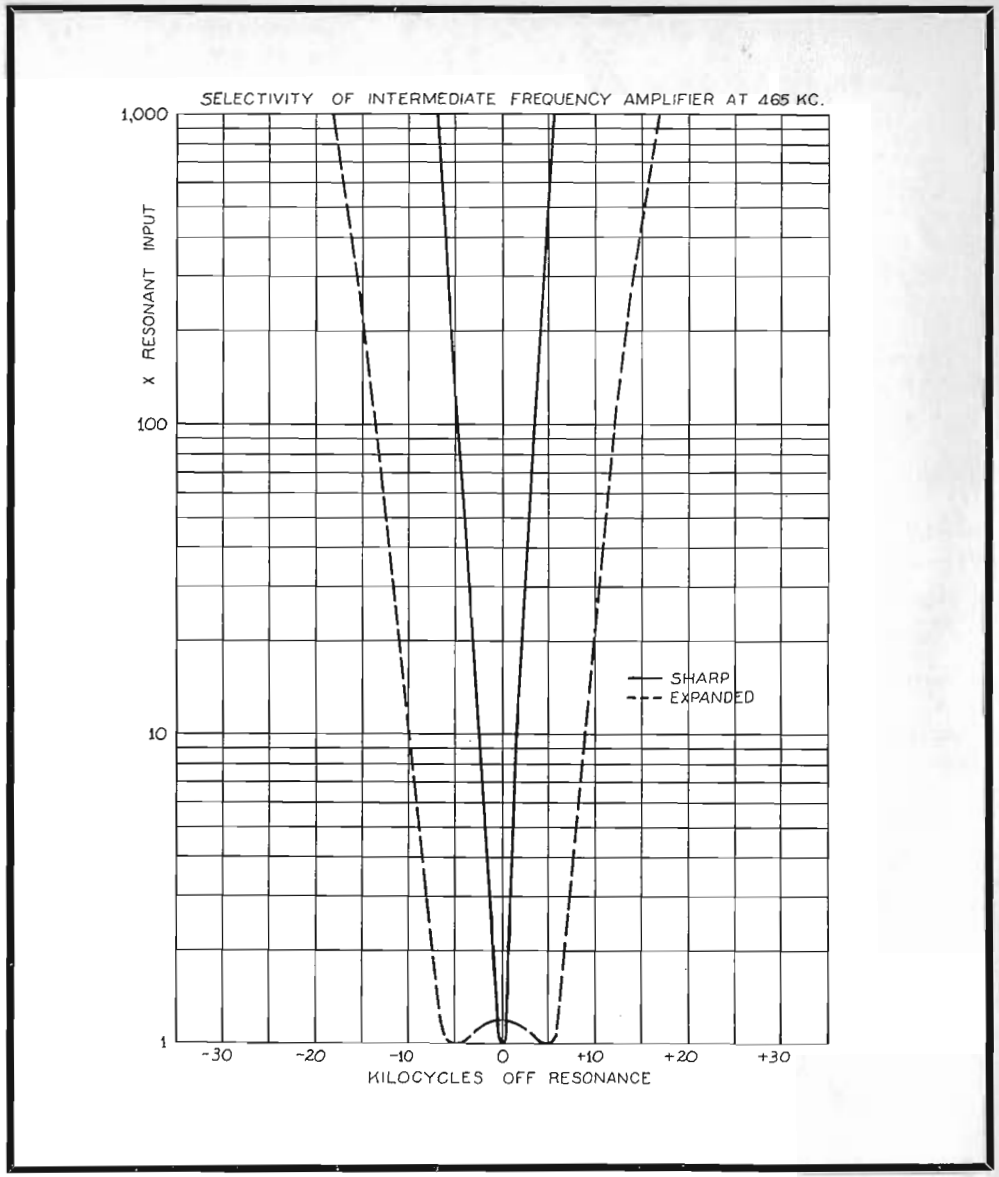
By means of the vernier scale, the main dial may be read and reset to one tenth of a division with an accuracy of one part in two thousands.

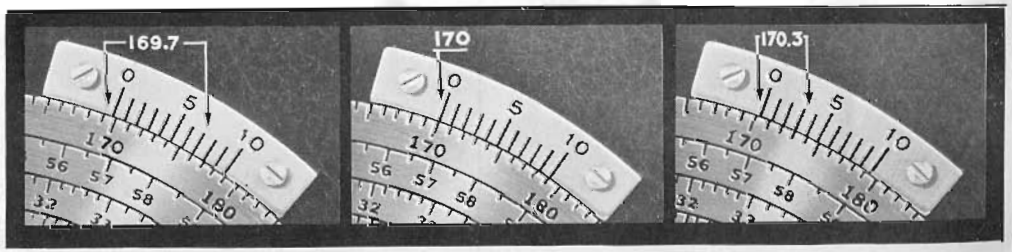
The three pictures on the right hand page illustrate the correct readings for three typical settings. The fraction of the whole number is always that division on the vernier scale which lines up with a division on the main dial. Take for example the first illustration:—

The zero on the vernier scale indicator falls between 169 and 170, so the whole number will be 169 and the fraction will be found by glancing along the vernier scale until a division on it lines up with one on the main dial. In this case it is 7 so the correct reading is 169 + 0.7 = 169.7.

The number 170 in the middle illustration falls exactly under the zero indicator and the proof of this is that 10 on the vernier scale is the only division which lines up with a division on the main dial —actually the correct reading is 169 + 1.0 = 170 and NOT 170 + 1.0.

The third illustration shows the correct reading for 170.3.

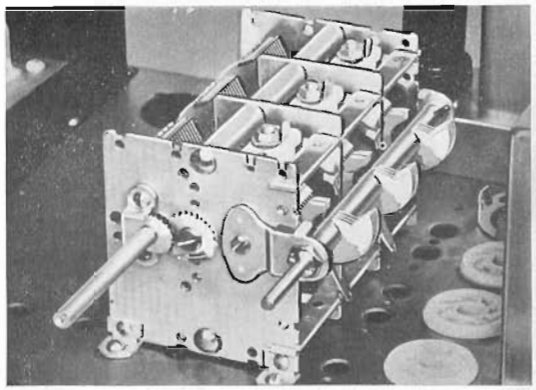




Look at these Features ☆

ELECTRO-MECHANICAL BAND SPREAD ★

An exclusive Super Skyrider feature! Gives 1000° of Band Spread better than 5 KC per division on the 20 meter band; proportional spread on other bands. Special high frequency condenser with double rotors and single stator units makes the band spread section of the tuning unit an integral part of the main condenser.

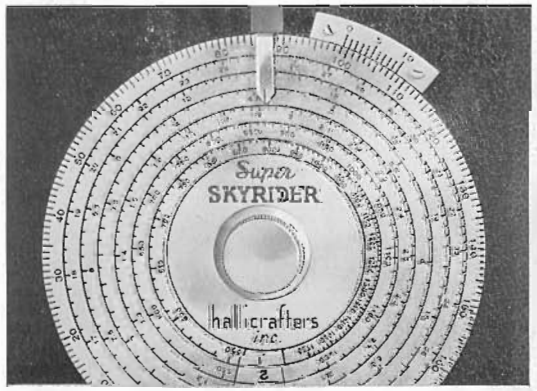


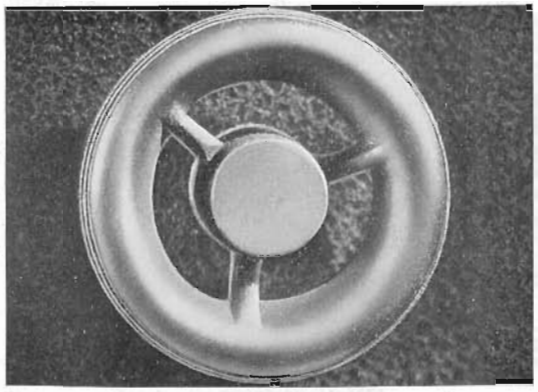
SIGNAL INTENSITY METER ★

Calibrated in "S" Signal calibration. Here's an "S" meter that will really work on weak signals. Large face . . . long scale. Unique indirect illuminated meter dial. Properly damped for tuning ease. Its just one more reason why Hams the world over will applaud this 1938 Super Skyrider Receiver!

THE ONLY TUNING DIAL OF ITS KIND! ★

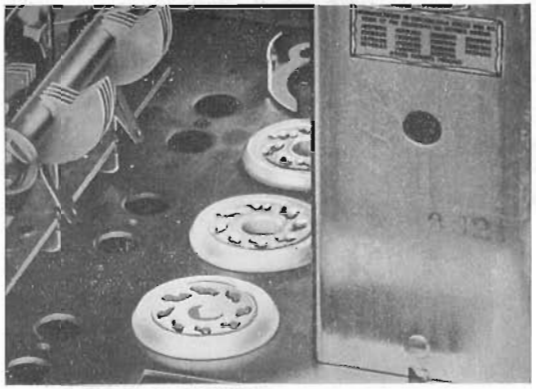
There's one physical feature alone that distinguishes the Super Skyrider from all other receivers—the central tuning dial. Accurately, directly calibrated for all six bands . . . no charts or graphs needed to read this dial. Automatic band pointer . . . always indicates the frequency band on which you are tuning.





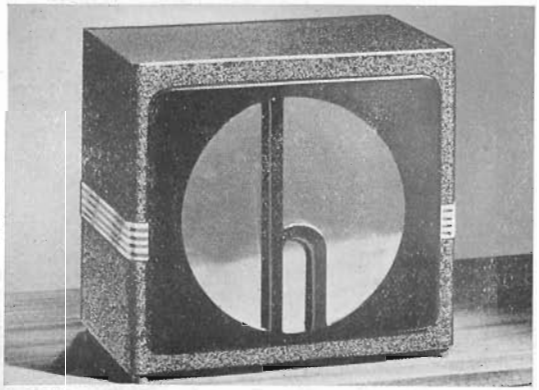
★ INERTIA TUNING

A single flip of the big, easy-grip knob and you cover half the band. Slow, sure, smooth tuning on band spread adjustment. Large knobs easy to handle; eliminate "tuning cramps" and fatigue. A feature that's bound to find favor with both the old timer and the new Ham. Found only on the Super Skyrider!



★ CERAMIC INSULATION

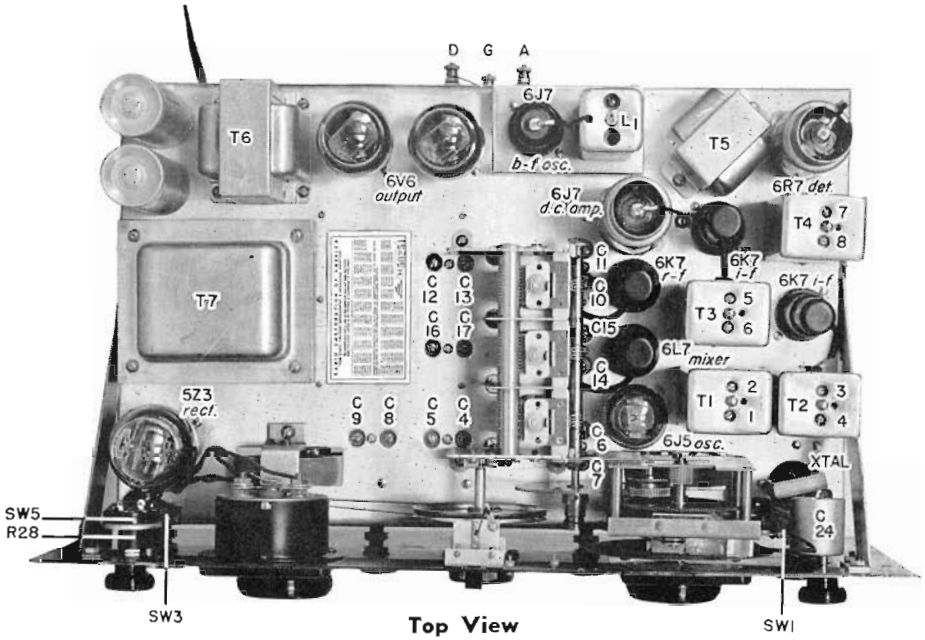
Ceramic (low loss insulation) in tuning tank circuits and R.F. sockets. On high frequencies, it is absolutely necessary to use the finest insulation possible. Ceramic was chosen, not only for its low loss qualities, but because it is non-hydroscopic. Retains its high efficiency under all climatic conditions.



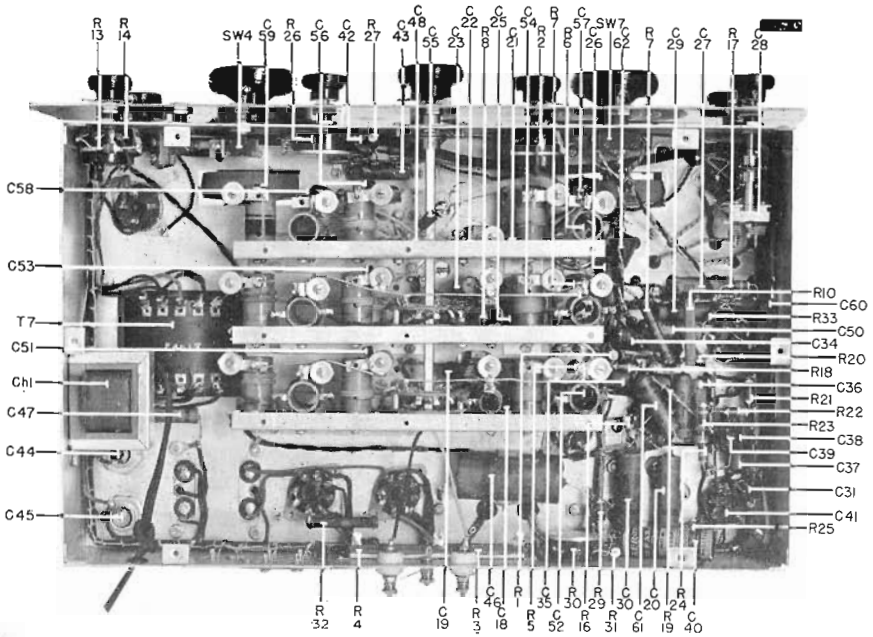
★ LARGE MATCHING HALLICRAFTERS SPEAKER

12-inch PM Dynamic speaker. Impedance matches receiver output to produce high fidelity audio. Metal cabinet acoustically treated with wood baffle front to eliminate vibration. Customary high quality Hallicrafters construction; sleek modern lines match the modern design of the 1938 SUPER SKYRIDER cabinet.

Parts Placement in SX-16



Top View



Bottom View

PARTS LIST

CONDENSERS

No.	Capacity	Type	Voltage	Parts No.
C_1	420 mmfd			
C_2	420 mmfd	Main Gang		48017
C_3	420 mmfd			
C_4	100 mmfd			44019
C_5	100 mmfd			
C_6	310 mmfd			44020
C_7	880 mmfd			
C_8	1,400 mmfd			44018
C_9	590 mmfd			
C_{10}	1,000 mmfd			44017
C_{11}	350 mmfd			
C_{12}	180 mmfd			44016
C_{13}	120 mmfd			
C_{14}	1,000 mmfd			44017
C_{15}	350 mmfd			
C_{16}	180 mmfd			44016
C_{17}	120 mmfd			
C_{18}	.002 mfd	Mica		40013
C_{19}	.05 mfd		200	41004
C_{20}	.1 mfd		400	41007
C_{21}	.002 mfd	Mica		40013
C_{22}	.0001 mfd	Mica		40003
C_{23}	.05 mfd		200	41004
C_{24}	.000025 mfd	Air		48012
C_{25}	.002 mfd	Mica		40013
C_{26}	.05 mfd		200	41004
C_{27}	.05 mfd		400	41005
C_{28}	.000025 mfd	Air		48012
C_{29}	.05 mfd		200	41004
C_{30}	.25 mfd		200	41008
C_{31}	.000010 mfd	Mica		40021
C_{32}	.01 mfd		400	41001
C_{33}	.01 mfd		400	41001
C_{34}	.05 mfd		400	41005
C_{35}	.05 mfd		200	41004
C_{36}	.05 mfd		400	41005

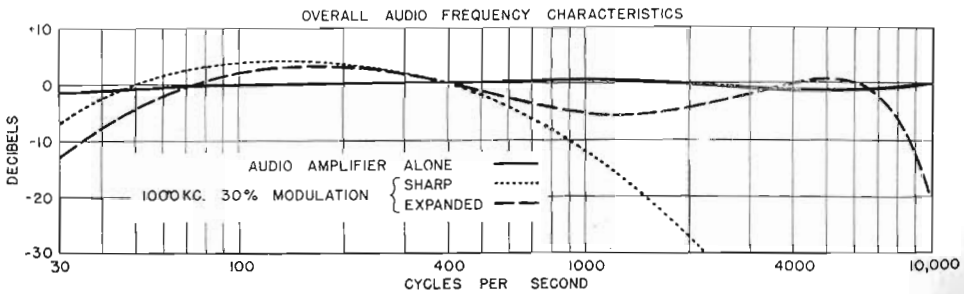
No.	Capacity	Type	Voltage	Parts No.
C_{37}	.05 mfd		200	41004
C_{38}	100 mmfd	Mica		40007
C_{39}	100 mmfd	Mica		40007
C_{40}	10. mfd	Electrolytic	25	42002
C_{41}	.0005 mfd	Mica		43008
C_{42}	.005 mfd		600	45003
C_{43}	.02 mfd		400	41003
C_{44}	16. mfd	Electrolytic	400	42019
C_{45}	16. mfd	Electrolytic	400	42019
C_{46}	1. mfd		400	41013
C_{47}	.01 mfd		400	41001
C_{48}	.000050 mfd	Mica		40002
C_{49}	.00025 mfd	Mica		40007
C_{50}	.05 mfd		400	41005
C_{51}	.000010 mfd	Mica		40021
C_{52}	.000010 mfd	Mica		40021
C_{53}	.000010 mfd	Mica		40021
C_{54}	.000010 mfd	Mica		40021
C_{55}	.000050 mfd	Mica		40002
C_{56}	.000010 mfd	Mica		40021
C_{57}	.000010 mfd	Mica		40021
C_{58}	.000010 mfd	Mica		40021
C_{59}	.000025 mfd	Mica		40024
C_{60}	.05 mfd		200	41004
C_{61}	.05 mfd		200	41004
C_{62}	.002 mfd	Mica		40013
C_{63}	.002 mfd	Mica		40013

S_1	Crystal Switch SPST
S_2	Beat Osc. Switch on B.F.O. Injection Control
S_3	A.V.C. Switch DPST
S_4	Send-Receive Switch SPST
S_5	A.C. Switch on Tone Control
S_6	Meter Switch on R.F. Gain Control
S_7	Selectivity Switch DPDT

RESISTORS

No.	Ohms	Wattage	Part No.
R_1	100,000	⅕	20093
R_2	5,000		25021
R_3	10,000	2.5	24037
R_4	10,000	2.5	24037
R_5	285	⅕	22020
R_6	50,000	⅕	20084
R_7	10,000	1.	20061
R_8	100,000	⅕	20093
R_9	285	⅕	22020
R_{10}	29,000	1.	22075
R_{11}	50,000	⅕	20084
R_{12}	50,000	⅕	20084
R_{13}	50,000	⅕	20084
R_{14}	500,000		25024
R_{15}	100,000	⅕	20093
R_{16}	380		22021
R_{17}	100,000	⅕	20093

No.	Ohms	Wattage	Part No.
R_{18}	100,000	⅕	20093
R_{19}	1,000,000	⅕	20108
R_{20}	1,000	⅕	20033
R_{21}	1,000,000	⅕	20108
R_{22}	20,000	⅕	20072
R_{23}	100,000	⅕	20099
R_{24}	100,000	⅕	20099
R_{25}	950	⅕	22032
R_{26}	1,000,000		25023
R_{27}	20,000	⅕	20072
R_{28}	1,000,000		25013
R_{29}	10,000	⅕	20063
R_{30}	500		25022
R_{31}	95	½	22007
R_{32}	235	1.	22015
R_{33}	1,000	⅕	20033

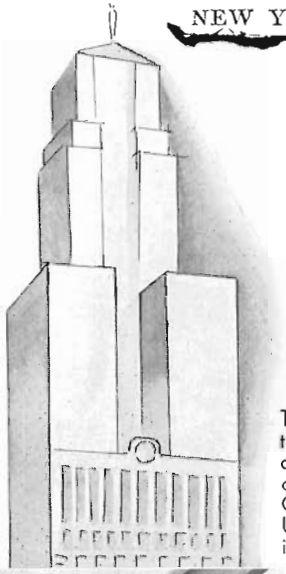


Here and there with Skyriders

During the flood disasters of last winter, amateur radio again played an heroic role. ***Above***—handling flood traffic with a SUPER SKYRIDER at NDS, U. S. Naval Reserve Armory, Chicago. ***Right***—Lt. Comm. Mathews (USNR) looks on at Flood Control Station, W9NLP, where a SKY CHIEF and SUPER SKYRIDER are seeing service.

As part of their regular headquarters Two-way communications equipment, the crack Flint (Mich.) Police Dept. relys on an ULTRA SKYRIDER.

"Ultramodern as well as ultra short wave" says ***Popular Mechanics*** of the ULTRA SKYRIDER. Photo below shows receiver in operation in the shielded testing room of Popular Mechanics radio laboratory.



The "radio club in the sky," W9ZBX, atop the Board of Trade Building, Chicago. Note the ULTRA SKYRIDER in use.

That ace radio columnist of the N. Y. World Telegram, Ted Rogers, has a good word to say for the SUPER SKYRIDER.

COUNT FELIX von LUCKNER, famous World War hero, enjoys the SKY CHIEF at the home of BARONESS von BONIN in Berlin, Germany.

NEW YORK WORLD-TELEGRAM, SATURDAY, APRIL 17, 1937.

Up Among the Megacycles

Short Wave Set Meets Test When Yugoslavian Diplomats Arrive Seeking Program Broadcast in Belgrade.

By TED ROGERS

With warm weather coming on (Okay! Let's not get technical) things are picking up noticeably on the 19 and 25-meter bands, and while 31 meters still continue to produce excellent results for the DX hunter, the 49-meter sector is slumping rapidly.

Owing to the vast preponderance of South Americans on the 49-meter band this territory has been pretty much neglected by the average listener throughout the winter, when it is supposed to be at its best; after all, who wants to mess around with a band that offers nothing but rhumbas and tangoes, all played by the same three-piece orchestra consisting of drum, guitar and flute, and with never a word of announcement in English?

* * *

Visited by Diplomats.

On Wednesday evening I was honored to entertain B. P. Stoyanovitch, Consul General of Yugoslavia, and his staff while we listened to a special broadcast up among the megacycles from Belgrade.

With a battery of five communications receivers which had been warming up for hours, I sat down, full of confidence and started spinning dials. Well, maybe not confidence, exactly, but hope, anyway. But imagine my embarrassment when minutes passed and we logged practically everything in the world except Belgrade.

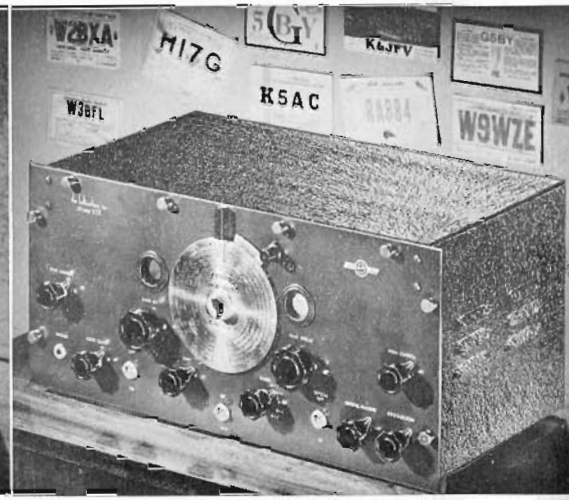
[illegible] of the end of about fifteen minutes we [illegible] in a speech in an unfamiliar language, and immediately Mr. Stoyanovitch burst forth in happy smiles. It was the voice of the [illegible] of Yugoslavia and the receiver that did the trick was the old reliable SX11 superskyrider. After trying for a few minutes to log [illegible] on the other receivers, just by way of something to fall back on in case of emergency, but having no luck, we turned off the others and sat back to listen. And if you don't think a terrible weight was lifted from my brow when the skyrider did its stuff, then you never had eleven officials of a foreign nation standing skeptically by while you try to produce results in short wave radio reception.

* * *

Identified as Berlin.

[illegible] carrier wave [illegible] has been [illegible] our F[illegible]

Other Members of the Hallicrafters Family



★ the Sky Challenger

The most talked about communications receiver in amateur radio! The SKY CHALLENGER has everything that present day practice demands for efficient high frequency reception. It will outperform any receiver in its price class and many costing much more. Extreme tuning range—38 MC to 535 KC (7.9 to 540 meters). Covers all the active amateur bands including the increasingly popular 10-meter band, the regular broadcast, short wave broadcast, police and aviation. Tuning is made remarkably easy with a smooth electrical band spread and 5 band 338° dial. Solid mechanical construction for steadier signals. Sensitivity and selectivity better than many higher priced communications receiver.

JUST CHECK THESE MANY TECHNICAL FEATURES: Iron core I.F. transformer (2 stages). Air trimmed R.F. Preamplifier. Direct calibration tuning—no charts—no tables. Automatic Volume Control. Beat Frequency Oscillator. Tone Control. Send-Receive (Standby) Switch. Headphone Jack. Hum Free Power Supply. Undistorted power output—4 watts. 9 tubes, 6 metal—3 glass: 6K7—RF-Preamplifier; 6L7—Mixer; 6C5—oscillator; 6K7—1st RF stage; 6K7—2d RF stage; 6Q7G—2d detector, AVC and 1st AF stage; 6F6G—Power Output Stage; 80—rectifier; 6K7—Beat Frequency oscillator. Size: 8 13/16 by 18 1/8 by 10 1/4 in. deep. Ship. wt. 37 lbs. For 110-120 volt, 60 cycle A.C.

★ the Ultra

Tune in 5 meter stations with no more trouble than you'd find on lower frequencies. Direct dial calibration–not charts or tables. Unique electro-mechanical band spread system. Image frequency rejection achieved by choosing an I.F. of 1600 KC. Band expander circuit can be cut in to reduce the bad "wabulation" typical of ultra high frequency transmission, by broadening the selectivity curve of the I.F. amplifier sufficiently to allow the carrier shift of the transmitter without attenuation.

Frequency range: 5.65 to 79.5 MC (3.75 to 53 meters). 4 band 338° calibrated illuminated dial—Band 1: 5.65 to 11.45 MC; Band 2: 10.5 to 21.35 MC; Band 3: 19.6 to 38.3 MC; Band 4: 36.4 to 79.5 MC. A.V.C. and tone control. Send-receive (standby) switch. Headphone jack. Preamplifier. Iron core I.F. transformers. Air trimmers. Single signal crystal control, beat frequency oscillator (variable input control). Undistorted power output of 3.5 watt, 10 metal tubes; 6K7, RF preamplifier; 6L7, 1st detector—Mixer; 6C5, oscillator; 6K7, 1st I.F. amplifier; 6L7, 2nd I.F. amplifier; 6R7, 2nd detector, AVC and beat frequency oscillator; 6J7, noise silencer amplifier; 6Q7, 1st audio, noise silencer rectifier; 6F6, power output stage; 5Z4, rectifier.

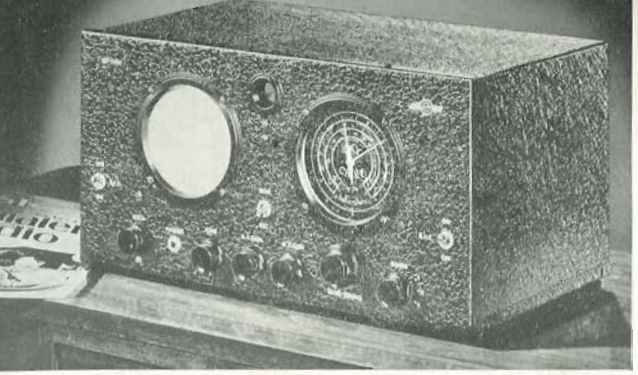
Size: 8 3/4 by 19 by 10 inches deep. Ship. wt. 45 lbs. For 110-120 V., 50-60 cycle A.C.

★ the Commercial

A special receiver covering in 5 bands the frequencies of 100 KC to 11.5 MC (3000 to 26.1 meters). Splendid sensitivity and selectivity characteristics Improved image frequency rejection at the higher frequencies is achieved by the use of highly efficient iron core I. F. transformers tuned to 1600 KC. Calibrated 338° main tuning dial eliminates all complicated charts and tables.

Illuminated dial. Preamplifier. Iron core I.F. transformers (two stages) tuned to 1600 KC. Air trimmers. Automatic volume control, and tone control. Signal strength indicator. Single signal crystal control. Beat frequency oscillator (variable input control). Send-receive (standby) switch. Headphone jack. Hum free power supply. Undistorted power output of 14 watts. 11 tubes, 10 metal, and 1 glass: 6K7, RF preamplifier; 6L7, 1st detector—mixer; 6C5, oscillator; 6K7, 1st IF stage; 6K7, 2nd I.F. stage; 6R7, 2nd detector, AVC and 1st A.F.; 6K7, electron coupled beat frequency oscillator; two 6L6's, push-pull power output stage; 5Z3, rectifier, and 6G5, signal strength indicator.

5 Bands: Band 1—100 to 280 KC; Band 2—250 to 610 KC; Band 3—600 by 1530 KC; Band 4—1715 to 4300 KC; Band 5—4300 to 11,500 KC. Size 8 3/4 by 19 to 10 inches deep. Ship. wt. 48 lbs. For 110-120 V., 50-60 cycle A.C.



★ the Sky Chief

A complete communication receiver with every control need for efficient reception. Remarkable sensitivity and selectivity made possible with a high gain iron core I.F. transformer, equal in performance to 2 conventional air core stages and specially designed preamplifier. Added selectivity and image frequency rejection given by preselector ahead of the first detector. Variable beat frequency oscillator for CW and weak signal reception. R.F. and audio gain control. Automatic volume control and send-receive switch. Signal strength indicator. Illuminated main and band spread dial. Hum-free power supply affords quiet headphone operation. Rigid construction assures steady signals. Mechanical band spread. Built-in speaker. Headphone jack. Three bands, from 18 MC to 540 KC: Band 1—540 to 1700 KC; Band 2—1600 to 5400 KC; Band 3—5300 to 18000 KC. Seven tubes: 78—RF preamplifier, 6A7—detector-oscillator; 6F7—I.F. amplifier and beat frequency oscillator; 75—2nd detector, AVC and A.F. amplifier; 42—power output stage. Size: 8¾ by 17¼ by 10 inches deep. Shipping weight, 29 lbs. For 110-120 volt, 50-60 cycle A.C. operation.

★ the Sky Buddy

A real junior model communication receiver that's hard to beat in sensitivity and selectivity even when it's compared with higher priced sets! Look at these features—and then look at this price! Tuning from 545 KC to 18.1 MC (16.6 to 555 meters) in three bands. Band 1—545 KC to 1680 KC; Band 2—1680 to 5500 KC; Band 3—5500 to 18,100 KC. Single iron core I.F. stage and improved mechanical band spread (16 to 1). Direct calibration tuning eliminates complicated charts and tables. Illuminated main dial. Automatic volume control. Beat frequency oscillator. Headphone jack. Hum-free self contained power supply. Built-in speaker. 5 tubes: 6A7—1st detector-oscillator; 6F7—intermediate amplifier and beat frequency oscillator; 75—2nd detector, AVC and 1st audio amplifier; 42—power output stage; 80—rectifier.

Size: 17 by 7½ by 8⅝ inches deep. Shipping weight 20 lbs. For use on 110-120 volt, 50-60 cycle A.C. current.

NAVY DEPARTMENT
NINTH NAVAL DISTRICT
NAVAL COMMUNICATION RESERVE

February 12, 1937

Hallicrafters, Inc.,
Chicago, Illinois

Gentlemen:

I have just completed a detailed report to the Commandant relative to the work of members of this unit in the recent flood emergency in the lower Ohio River Valley, but I can hardly consider my report complete without a word to you on the exceptional results obtained with the Hallicrafter receivers under the most adverse and trying conditions.

Five of the Sky Riders were used at our strategic points in the flood zone. They received the acid test if any receiver ever did. Bounced around in army trucks, over detours in the flood area and juggled about in frail outboard motor boats, they arrived at their destinations none the worse for the shaking up.

Four of the Sky Riders are owned by members of this unit; the fifth was borrowed.

One of the sets owned by Seman Starner, Radioman First Class, was set up in the National Guard message center at Eldorado, Illinois. Another set owned by Carl Beck, Radioman Second Class, saw more than two weeks active and continuous duty at portable station NDS2 at Ridgway, an important base for operations for both the National Guard and Naval Militia. A third Sky Rider, owned by Chief Radioman M. E. Overholt, did yeoman duty at Effingham, a relay point. The other two were located at DX9G, alternate control station for the Illinois Communication Reserve radio net and LC9H, alternate control station for the Centralia Unit.

Selectivity; quick band changing; tone control and calibrated dial made it possible to handle thousands of words of important relief messages with a minimum of effort. Thanks to good calibration of these receivers, the schedules went off like clock work, despite the fact that some points were on the police frequency, others on the naval reserve frequency of 2650 kilocycles and still others in the middle of the 80 meter CW band.

Sincerely yours,

J. M. Hill, Lt (jg) C-V(s) USNR
Commander Unit 7 Section 4.

the hallicrafters inc.
2611 INDIANA AVENUE
CHICAGO

ALIGNMENT PROCEDURE

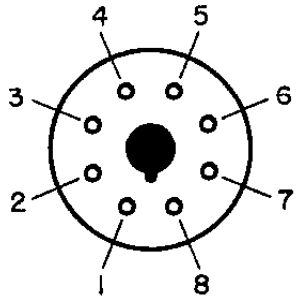
SUPER SKYRIDER

Models S-16 SX-16

the hallicrafters inc.
2611 INDIANA AVENUE
CHICAGO

Alignment Procedure for Super-Skyrider Models S-16, SX-16

The following measurements made with 1000 ohms per volt meter and taken from the point indicated to ground. Antenna and Ground disconnected and R. F. and A. F. gain controls set at maximum. Line voltage of 115 at time measurements were taken. Normal tolerance allows variation plus or minum 10% from values indicated. "DL" indicates Dead Lug but will indicate voltage when used as a Tie.



Bottom view of socket

Tube	Function	1	2	3	4	5	6	7	8
6K7	R.F. Amp.			275	110	7	0 ON 60 OFF	6.3	7
6L7	Mixer			275	100	0	DL	6.3	2.5
6J5G	Osc			180	DL	0	DL	6.3	0
6K7	IF Amp (1)			270	110	6.5	DL 140	6.3	9
6K7	IF Amp (2)			270	110	6.5	0 ON 60 OFF	6.3	9
6R7G	2nd Det. A.V.C.			190	4.5	4.5	0	6.3	-7
6V6G	1st Audio output			315	275	0	DL	6.3	14.5
6V6G	output			315	275	0	DL	6.3	14.5
6J7	Beat Osc.			150	150	0	DL 300	6.3	0
6J7G	Sig. Amp.			275	110	5	DL 300	6.3	8

INTERMEDIATE FREQUENCY ALIGNMENT (465KC)

Have the controls set in the following positions:

B.F.O. Injector "OFF"
A.F. and R.F. gain controls on full.
Selectivity switch on "SHARP" position.
Crystal phasing condenser midway (pointer straight up).
A.V.C. switch "OFF".
Crystal switch "IN".

(IF ALIGNMENT CONTINUED)

BAND SWITCH ON #1 BAND - TUNING GANG OPEN.
REMOVE OSCILLATOR TUBE.
REMOVE 6L7 GRID CAP.
CONNECT SIGNAL GENERATOR TO GRID OF 6L7 TUBE THROUGH A .1 MFD CONDENSER. TUNE SIGNAL GENERATOR TO 465 KC AND THEN ADJUST THE FOLLOWING TRIMMERS FOR MAXIMUM OUTPUT: T4-#7,8; T3-#5,6; T2-#3,4; T1-#1,2; THROW CRYSTAL SWITCH TO "OUT" POSITION AND READJUST TRIMMERS # 2, 3 FOR MAXIMUM OUTPUT. WHEN THE "SELECTIVITY" SWITCH IS SNAPPED INTO THE "BROAD" POSITION A SLIGHT DROP IN GAIN SHOULD BE INDICATED. A RECTIFIER TYPE METER IS SUGGESTED AS OUTPUT INDICATOR.

ALIGNMENT USING 465 KC CRYSTAL

SHOULD THE RECEIVER BE A CRYSTAL MODEL IT IS NECESSARY THAT THE CRYSTAL BE USED IN AN EXTERNAL OSCILLATOR IN PLACE OF A SIGNAL GENERATOR SUCH AS THE ABOVE. THE OUTPUT OF THIS CRYSTAL CONTROLLED OSCILLATOR IS THEN FED TO THE GRID OF THE 6L7 TUBE AND THE ABOVE PROCEDURE FOLLOWED. WHEN THE IF AMPLIFIER HAS BEEN ALIGNED FROM THE CRYSTAL OSCILLATOR'S OUTPUT, RE-INSERTING THE CRYSTAL IN THE RECEIVER WILL SHOW VERY LITTLE DIFFERENCE IN OUTPUT WHETHER THE CRYSTAL IS "IN" OR "OUT" OF THE CIRCUIT AS INDICATED BY THE CRYSTAL SWITCH.

R. F. ALIGNMENT PROCEDURE

ON BAND #1, OR BROADCAST, USE A .0002 MFD CONDENSER IN SERIES WITH OUTPUT LEAD FROM GENERATOR TO RECEIVER. ON THE OTHER BANDS USE A 400 OHM RESISTOR. BE SURE JUMPER FROM DOUBLET POST TO GND. REMAINS CONNECTED WHEN ALIGNING THE RECEIVER.
ALL PAD ADJUSTMENTS (LOCATED ON THE TOP OF THE CHASSIS) ARE FOR THE LOW FREQUENCY ENDS OF THE BANDS.
ALL TRIMMER ADJUSTMENTS (LOCATED ON THE BOTTOM OF THE CHASSIS) ARE FOR THE HIGH FREQUENCY ENDS OF THE BANDS.
REDUCE R.F. GAIN CONTROL BELOW THE POINT OF BLOCKING OR OVERLOADING; ALSO BE SURE THAT THE CRYSTAL SWITCH IS IN THE "OUT" POSITION AND THE A.V.C. SWITCH IS IN THE "OFF" POSITION.
<u>BE SURE TO CHECK IMAGES</u> - IMAGES WILL FALL A LITTLE LESS THAN 1000 KC LOWER IN FREQUENCY THAN THE FUNDAMENTAL OR HARMONIC OF SIGNAL.

THE TUNING GANG MUST BE ROCKED WHEN MAKING THESE ADJUSTMENTS.

NOTE #1 HARMONICS OF SUITABLE FREQUENCIES MAY BE USED IF THE FOLLOWING FREQUENCIES SUGGESTED ARE NOT AVAILABLE.

" #2 IT IS NECESSARY TO REPEAT EACH PAIR OF OPERATIONS SEVERAL TIMES UNTIL NO CHANGE IS NOTED.

OPR.	BAND	RECEIVER DIAL SETTING	SIGNAL GENERATOR FREQUENCY	ADJUST OSC. WITH	TRIMMERS ADJ. FOR MAX GAIN	ADJUST OSC. WITH	PADDERS ADJ. FOR MAX GAIN
1	1	600KC	600KC	------	--------	C9	--------
2	1	1400KC	1400KC	CA	CB - CC	------	--------
3	2	1800KC	1800KC	------	--------	C8	--------
4	2	4000KC	4000KC	CD	CE - CF	------	--------
5	3	5000KC	5000KC	------	--------	C6	C14 - C10
6	3	9000KC	9000KC	CG	CH - CI	------	--------
7	4	10,000KC	10,000KC	------	--------	C7	C15 - C11
8	4	18,000KC	18,000KC	CJ	CK - CL	------	--------
9	5	20,000KC	10,000KC	------	--------	C5	C16 - C12
10	5	30,000KC	10,000KC	CM	CN - CO	------	--------
11	6	40,000KC	20,000KC	------	--------	C4	C17 - C13
12	6	60,000KC	20,000KC	CP	CQ - CR	------	--------

SERVICING SUGGESTIONS

TO MAKE A RAPID CHECK OF THE RECEIVER REMOVEGRID CAP OF THE 6R7 TUBE AND TOUCH THE GRID OF THE TUBE WITH YOUR FINGER. IF A LOUD HUM IS HEARD THE AUDIO END OF THE RECEIVER IS OK.

DEAD SET. CHECK BIAS OF THE R.F. TUBES. IF THE BIAS IS TOO HIGH CHECK THE R.F. GAIN CONTROL FOR AN OPEN. ADDITIONALLY, CHECK THE PLATE AND SCREEN VOLTAGE OF THE R.F. TUBES - (SEE CHART). CHECK "BPLUS" FOR A SHORT TO GROUND - IF SO CHECK ALL TUBES.

IF THE RECEIVER DEVELOPS A HIGH-PITCH AUDIO SQUEAL REVERSE THE GRID WIRES OF THE AUDIO INPUT TRANSFORMER.

NOISY GANG WHEN JARRED - INCREASE THE TENSION ON THE GANG WIPERS.

NOISY COIL ASSEMBLY - LIGHTLY TAP THE TRIMMERS OF THE PARTICULAR BAND IN WHICH NOISE OCCURS. ONCE LOCATED THE TRIMMER SHOULD BE REPLACED.

IF LOW SIGNAL AND HIGH NOISE LEVEL DEVELOPS REPLACE THE 6L7 TUBE.

DEAD BEAT OSCILLATOR - IF 6J7 SHOULD SHORT TO GROUND IT WILL OPEN THE BO CONTROL. CHECK #1 - "BPLUS" TO BO COIL FOR A GROUND. CHECK #2 - CHECK THE BO INJECTION CONTROL FOR AN OPEN CIRCUIT. IN MOST CASES A NEW 6J7 WILL CORRECT A DEAD BO.

VIOLENT OSCILLATION - CHECK ALL 6K7 TUBES. ALSO IF A 300 OHM BIAS RESISTOR IS USED ON THE LAST 6K7 IF AMPLIFIER REPLACE WITH A 400 OHM RESISTOR.

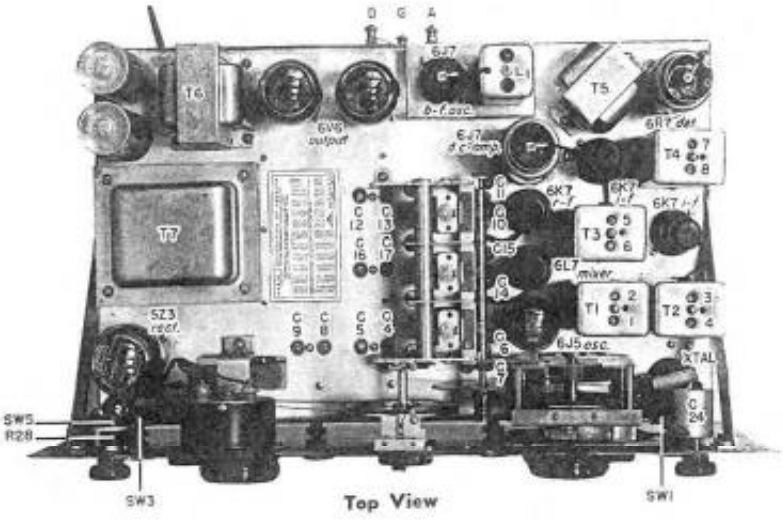
List of Resistors Super-Skyrider Models S-16, SX16

No.	Ohms	Wattage	Parts No.	No.	Ohms	Wattage	Parts No.
R1	100,000	1/5	20-093	R18	100,000	1/5	20-093
R2	5,000		25-021	R19	1,000,000	"	20-108
R3	10,000	2.5	24-037	R20	1,000	"	20-033
R4	10,000	"	24-037	R21	1,000,000	"	20-108
R5	700	1/5	24-038	R22	20,000	"	20-072
R6	50,000	"	20-084	R23	100,000	"	20-099
R7	10,000	1.	20-061	R24	100,000	"	20-099
R8	100,000	1/5	20-093	R25	950	"	22-032
R9	285	"	22-020	R26	1,000,000		25-023
R10	29,000	1.	22-075	R27	20,000	"	20-072
R11	50,000	1/5	20-084	R28	1,000,000		25-013
R12	50,000	"	20-084	R29	10,000	"	20-063
R13	50,000	"	20-084	R30	500		25-022
R14	500,000		25-024	R31	95	1/2	22-007
R15	100,000	"	20-093	R32	235	1.	22-015
R16	380		22-021	R33	1,000	1/5	20-033
R17	100,000	"	20-093				

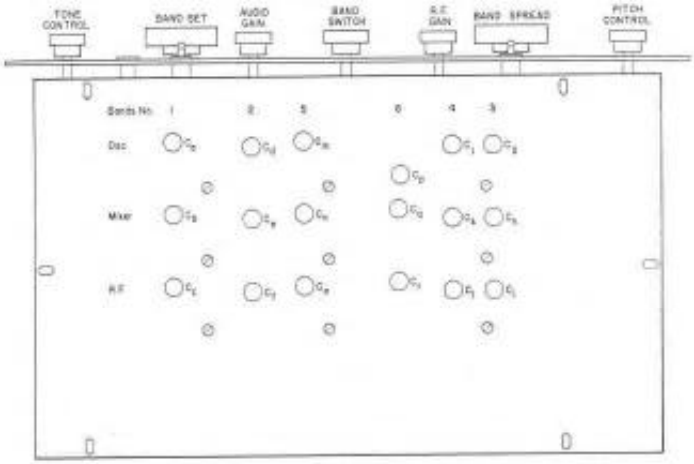
List of Condensers Super-Skyrider Models S-16, SX-16

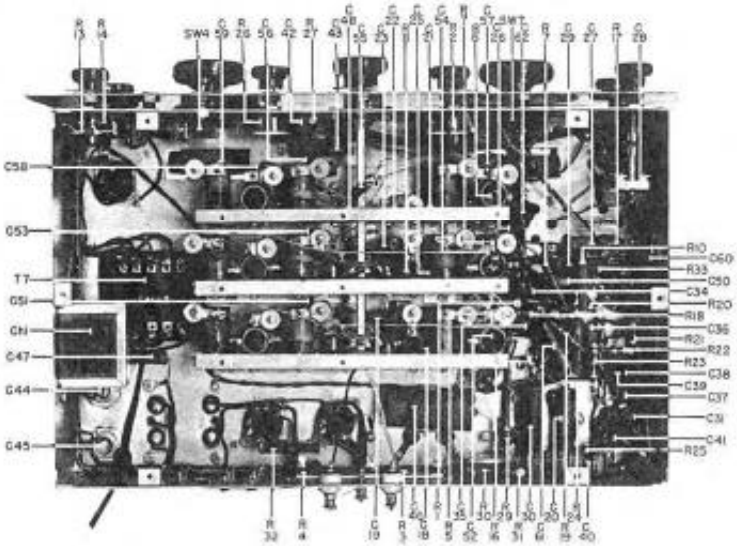
No.	Capacity	Type	Voltage	Parts No.
C1	420 MMFD	MAIN		
C2	420 "			48-017
C3	420 "	GANG		
C4	100 "			44-019
C5	100 "			
C6	310 "			44-020
C7	880 "			
C8	1,400 "			44-018
C9	590 "			
C10	1,000 "			44-017
C11	350 "			
C12	180			44-016
C13	120 "			
C14	1,000 "			44-017
C15	350 "			
C16	180 "			44-016
C17	120 "			
C18	.002 MFD	MICA		40-013
C19	.05 "		200	41-004
C20	.1 "		400	41-007
C21	.002 "	"		40-013
C22	100 MMFD	"		40-003
C23	.05 MFD		200	41-004
C24	25 MMFD	AIR		48-021
C25	.002 MFD	MICA		40-013
C26	.05 "		200	41-004
C27	.05 "		400	41-005
C28	25 MMFD	AIR		48-012
C29	.05 MFD		200	41-004
C30	.25 "		200	41-008
C31	10 MMFD	MICA		40-021
C32	.01 MFD		400	41-001
C33	.01 MFD		400	41-001
C34	.05 "		400	41-005
C35	.05 "		200	41-004
C36	.1 "		400	41-007
C37	.05 "		200	41-004
C38	100 MMFD	MICA		40-007
C39	100 "	"		40-007
C40	10 MFD	ELEC	25	42-002
C41	.0005 "	MICA		43-008
C42	.005 "		600	45-003
C43	.02 "		400	41-003
C44	16 "	ELEC	400	42-019
C45	16 "	"	400	42-019
C46	1 "		400	41-013
C47	.01 "		400	41-001
C48	50 MMFD	MICA		40-002
C49	250 "	"		40-007
C50	.05 MFD		400	41-005
C51	10 MMFD	"		40-021
C52	10 "	"		40-021
C53	10 "	"		40-021
C54	10 "	"		40-021
C55	50 "	"		40-002
C56	10 "	"		40-021
C57	10 "	"		40-021
C58	10 "	"		40-021
C59	25 "	"		40-024
C60	.05 MFD		200	41-004
C61	.05 "		200	41-004
C62	.002 "	"		40-013
C63	.002 "	"		40-013

S1 Crystal Switch SPST
S2 Beat Osc. Switch on B. F. O. Injection Control
S3 A. V. C. Switch DPST
S4 Send-Receive Switch SPST
S5 A. C. Switch on Tone Control
S6 Meter Switch on R. F. Gain Control
S7 Selectivity Switch OPDT

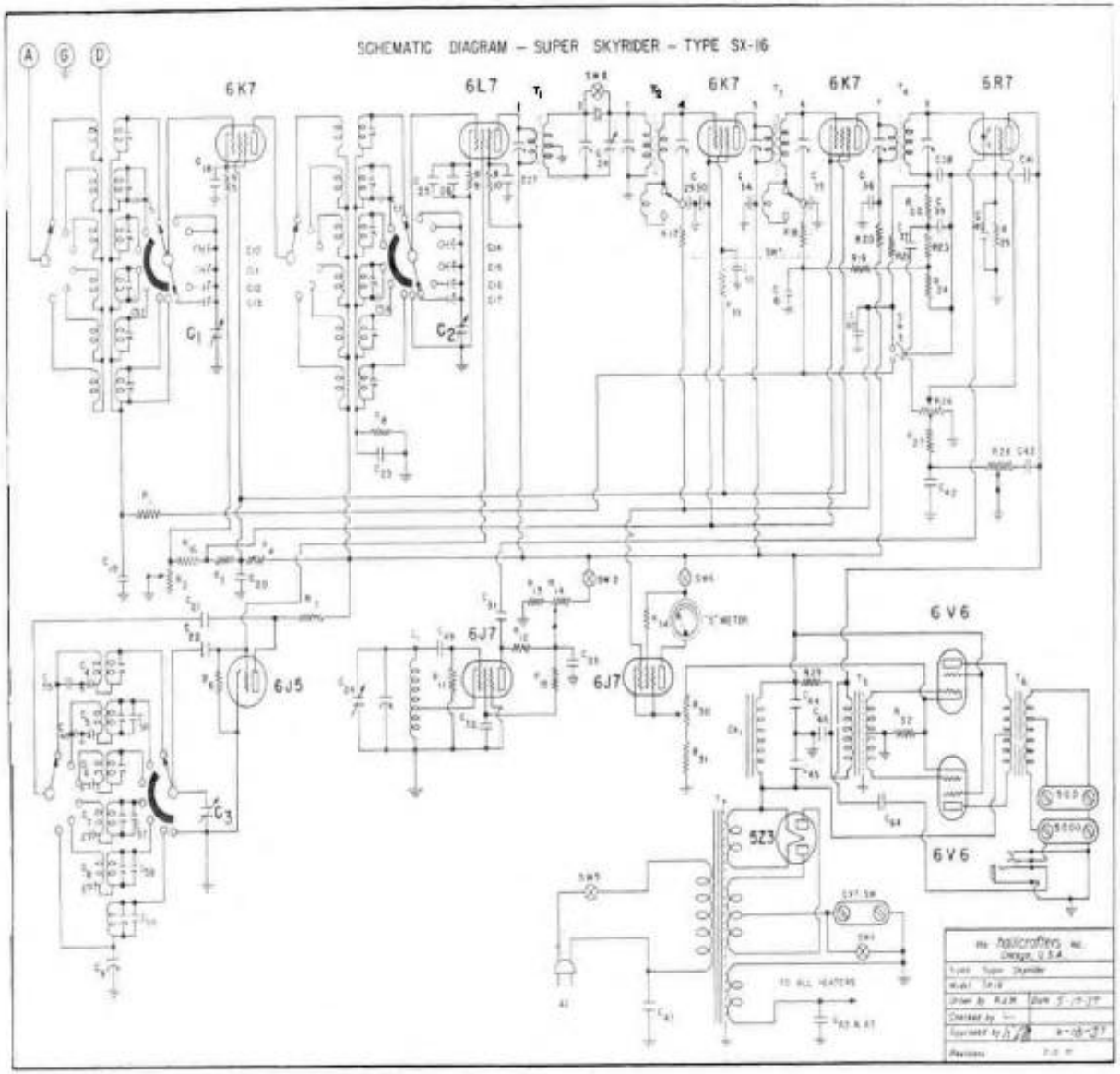


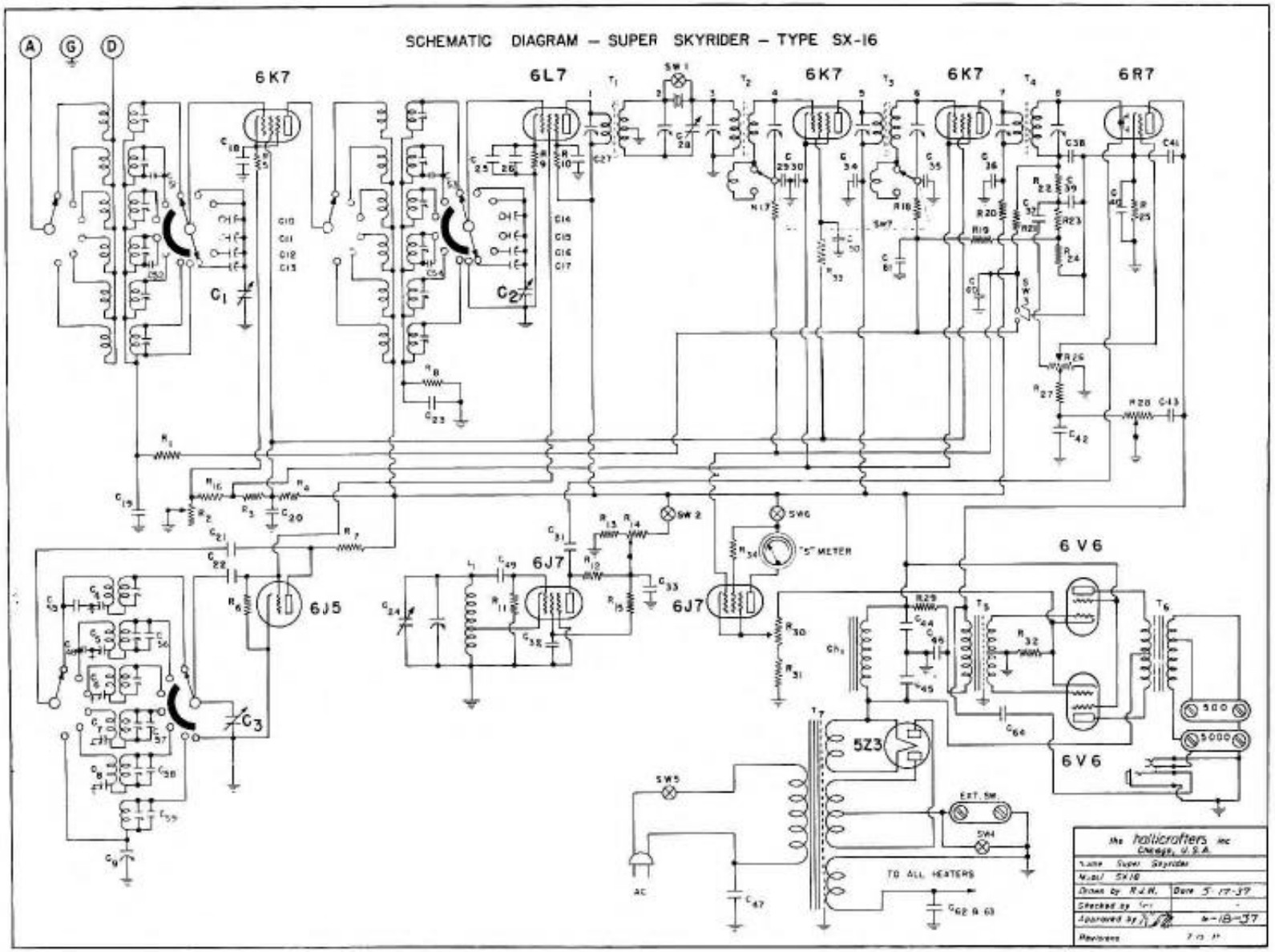
Top View





Bottom View


SCHEMATIC DIAGRAM – SUPER SKYRIDER – TYPE SX-16
6K7
6L7
6K7
6K7
5R7
6J5
6J7
6J7
6V6
6V6
5Z3
"S" METER
TO ALL HEATERS
hallicrafters INC.
Chicago, U.S.A.


SCHEMATIC DIAGRAM — SUPER SKYRIDER — TYPE SX-16
6K7
6L7
6K7
6K7
6R7
6J5
6J7
6J7
6V6
6V6
5Z3
"S" METER
TO ALL HEATERS
AC
the hallicrafters inc
Chicago, U.S.A.