CASA SCANNED
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Ex. Est. Jim Mills ZL2BE (Died 1974)
Dec. 1980

communications

OPERATING and SERVICE INSTRUCTIONS

SX-101A

the hallicrafters co.
MANUFACTURERS OF ELECTRONIC EQUIPMENT, CHICAGO 24, U. S. A.

Warranty

"The Hallicrafter's Company warrants each new radio product manufactured by it to be free from defective material and workmanship and agrees to remedy any such defect or to furnish a new part in exchange for any part of any unit of its manufacture which under normal installation, use and service discloses such defect, provided the unit is delivered by the owner to our authorized radio dealer, wholesaler, from whom purchased, or, authorized service center, intact, for examination, with all transportation charges prepaid within ninety days from the date of sale to original purchaser and provided that such examination discloses in our judgment that it is thus defective.

This warranty does not extend to any of our radio products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation, or to use in violation of instructions furnished by us, nor extend to units which have been repaired or altered outside of our factory or authorized service center, nor to cases where the serial number thereof has been removed, defaced or changed, nor to accessories used therewith not of our own manufacture.

Any part of a unit approved for remedy or exchange hereunder will be remedied or exchanged by the authorized radio dealer or wholesaler without charge to the owner.

This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our radio products."

Form No. 94X622

the Hallicrafters co.

094-902012C
9-61



092-104369

Figure 1. Hallicrafters SX-101A Receiver

SECTION I
GENERAL

Your new Hallicrafters SX-101A Selectable Sideband Receiver is precision built to bring you the finest in radio reception. This fifteen tube (including rectifier and regulator) dual conversion superheterodyne receiver tunes the Converter (30. 5 MC to 34. 5 MC), 80, 40, 20, 15 and 10 meter bands, plus several of the MARS frequencies on a large 10-1/2 inch slide-rule type dial. For operating convenience, only the band in use is illuminated. You'll hear many signals which would not be readable on most other receivers. The receiver provides for the reception of CW, AM, and single-sideband signals on all bands, the upper or lower sideband being readily selectable by means of a front panel control. This selectable sideband feature not only greatly simplifies tuning of single-sideband signals but is also useful in eliminating heterodyne interference when receiving AM signals.

Unlike the ordinary dual-conversion receiver, your SX-101A receiver employs dual conversion on all bands. As a result, images are practically non-existent. A high order of selectivity is made possible by the use of an adjustable 50. 75 KC second IF with four high-Q, permeability-tuned circuits. Receiver selectivity is variable in five steps from 500 cycles to 5 KC at 6 DB down and from 5 to 20 KC at 60 DB down.

A tuned RF stage assures maximum sensitivity and a high signal-to-noise ratio for outstanding reception of weak and distant signals. An antenna trimmer, adjustable from the front panel, permits peaking of the RF stage to compensate for loading effects of various antennas. A notch filter circuit allows rejection of an extremely narrow portion of the IF passband. With the notch filter, an interfering signal can easily be "notched out". The position and the degree of notch rejection are adjustable from the front panel.

Outstanding frequency stability is achieved by the use of concentric air trimmers and ceramic coil forms in the 1st conversion oscillator, extensive temperature compensation, voltage regulation of all oscillators, and the use of a crystal-controlled 2nd conversion oscillator.

Tuning is accomplished by a precision gear drive tuning mechanism to insure extremely close calibration and accurate resetability. Smooth flywheel tuning affords maximum traverse speed and operating ease. The tunable portion of the receiver is designed to spread each band over most of the dial, for easy and accurate tuning. Dial graduations are provided for every 5 KC on the 80, 40, 20, and 15 meter bands. On the 10 meter band there is a dial graduation for every 25 kilocycles and every 50 KC on the converter band. A built-in 100 KC crystal calibrator provides marker signals at every 100 KC on the dial for checking calibration accuracy. A trimmer capacitor, accessible from the top of the chassis, permits adjustment of the calibrating oscillator to exactly 100 KC by comparison with the frequency transmitted by station WWV on ten megacycles. Band 7 of this receiver is for tuning in WWV for the purpose of zero-beating the 100 KC crystal calibrator.

A product detector is incorporated in the receiver for detection of SSB and CW signals. When the con-

...ntional diode detector is used for AM reception, the ... detector tube serves as an additional audio amplifier.

An automatic series noise limiter circuit, controlled by a switch on the front panel, effectively reduces interference from electrical equipment, ignition and other forms of pulse type noise. The noise limiter circuit is effective for all types of reception.

Selection of either fast or slow AVC time constants is made by a switch mounted on the front panel. This feature provides a means of adjusting the receiver response time to suit varying band conditions and various types of transmission. The attack time in either switch position is suitably fast to provide AVC action on SSB signals.

An "S" meter is used to indicate the accuracy of tuning and the relative strength of received signals. The meter is calibrated in microvolts, "S" units from 1 to 9, and in decibels above S9 to +80 DB. The "S" meter is operative when AVC is turned off, and may be used as a tuning indicator.

The RECEIVE-STANDBY switch on the front panel silences the receiver but leaves the heater and plate power on to provide instant reception between transmission periods. Provision has also been made in the receiver for remote receive-standby control, and for transmitter switching from the front panel.

Audio output connections include terminals for a 3.2-ohm speaker and a 500/600-ohm output for line or speaker. A front panel jack for headphones is also provided.

Band 1 (Converter) tunes from 30.5 to 34.5 MC and is calibrated directly in frequency for both the 2 and 6 meter bands. It is intended to be used as a variable IF for broad band crystal controlled converters having an output frequency from 30.5 to 34.5 MC.

A separate converter input is provided so that the regular low frequency antenna may remain connected at all times.

Converter power is available at the accessory socket - See paragraph 3-7, "CONVERTER OPERATION".

Band 7 on the receiver is used to check and adjust the 100 KC calibration oscillator. This is accomplished by tuning in the ten-megacycle WWV signal and comparing it with the calibration oscillator signal.

A heating element has been incorporated in the receiver to provide optimum performance by reducing the effects of moisture and humidity.

Electrically, the heating element and oscillator filament transformer are wired across the AC line. Thus, both will be on at all times while the receiver is connected to a 117 VAC outlet, even when the RESPONSE control is in the POWER-OFF position.

NOTE

IT IS IMPORTANT THAT THE RECEIVER BE PLUGGED IN A LIVE OUTLET AT ALL TIMES IN ORDER TO OBTAIN OPTIMUM RESULTS FROM THE HEATING ELEMENT. THE EXCELLENT DESIGN INCORPORATED IN THIS SET WILL BE REALIZED ONLY AFTER IT HAS BEEN PLUGGED INTO SUCH AN OUTLET A MINIMUM OF 24 HOURS.

SECTION II
SPECIFICATIONS

RECEPTION ..... AM, CW and SSB

INTERMEDIATE FREQUENCIES ..... (Double Conversion): 50.75 KC and 1650 KC

FREQUENCY COVERAGE

BAND	CALIBRATED RANGE
Converter	30.5 - 34.5 MC (Dial scale marked 50-54 MC for 6 meters and 144-148 MC for 2 meters)
80 Meters	3.5 - 4.0 MC
40 Meters	7.0 - 7.3 MC
20 Meters	14.0 - 14.4 MC
15 Meters	21.0 - 21.5 MC
10 Meters	28.0 - 30.0 MC
WWV (10 MC)	

SENSITIVITY ..... Less than 1 microvolt for a 10 DB signal to noise ratio except for converter band which is 4 microvolts.

SELECTIVITY ..... Five position switch providing .5, 1, 2, 3 and 5 KC selectivity at 6 DB down.

POWER SOURCE ..... 105 - 125 volts, 50/60 cycles

POWER CONSUMPTION ..... 115 watts

NUMBER OF TUBES ..... 15 (including voltage regulator and rectifier).

SPEAKER OUTPUT ..... 3.2 and 500 (See Section 3-5). Rear chassis mounted 3 contact screw type terminal strip.

HEADPHONE OUTPUT ..... 50 to 5000 ohms (See Section 3-6). Panel mounted phone jack accepts standard 1/4" phone plug.

ANTENNA INPUT ..... 50 - 70 Ohms (See Section 3-3). Rear chassis mounted 3 contact screw type terminal strip for balanced or unbalanced lines, and an SO-239 receptacle accepting an Amphenol 83-1SP connector for coaxial inputs.

CONVERTOR INPUT ..... 50 - 70 Ohms. Rear chassis mounted socket accepts standard R.C.A. type phono plug.

ACCESSORY SOCKET... Control and auxiliary power. Rear chassis mounted Octal socket accepts standard 8P Octal plug (supplied).

DIMENSIONS (Overall).. 20" wide, 10-1/2" high, 16" deep.
SHIPPING WEIGHT..... Approximately 74 LB.
NET WEIGHT..... Approximately 70 LB.

SECTION III
INSTALLATION

3-1. UNPACKING.

After unpacking the receiver, examine it closely for damage which may have occurred in transit. Should any sign of damage be apparent, file a claim immediately with the carrier stating the extent of damage. Carefully check all shipping labels and tags for instructions before removing or destroying them.

3-2. LOCATION.

The receiver may be placed in any location that will permit free air circulation through the ventilation holes and openings in the cabinet. Avoid excessively warm locations such as those near radiators and heating vents. The external speaker may be located in any convenient position although it is recommended that it not be placed on top of the receiver for reasons of ventilation.

3-3. ANTENNAS.

The RF input of the receiver is designed for operation from either a single-wire antenna, or a half-wave doublet or other tuned antenna. The design of the input circuit is versatile to permit the use of transmission lines having an impedance up to 600 ohms. Optimum matching will be effective however, when using transmission line having an impedance in the range of 50 to 70 ohms. Antenna connections are made to a three-terminal strip at the rear of the receiver marked "A1", "A2", and "G". An AN type SO-239 connector for coaxial cable installations is also provided.

3-3-1. SINGLE WIRE ANTENNA.

The simplest antenna and one which will provide satisfactory results throughout all bands is a conventional single-wire antenna. (See Fig. 2.) Simply attach one end of this wire to terminal "A1", connect the jumper link between terminals "A2" and "G", and then run the wire about the room in any convenient manner. If the receiver is operated in a steel constructed building or where receiving conditions are exceptionally poor, an outside antenna, 50 to 100 feet long may be necessary. The outside antenna should be erected as high as possible and kept free from surrounding objects. In some locations, reception may be improved by connecting a ground wire (ordinary copper wire) from terminal "G" to a cold water pipe. While the use of an outside ground rod installed in accordance with Insurance Underwriter's Laboratories requirements is adequate protection against lightning, we strongly recommend an additional connection to the nearest cold water pipe to eliminate any shock hazard.

3-3-2. HALF-WAVE DOUBLET ANTENNA.

For top performance on a particular band, the use of a half-wave doublet or other type of antenna employing a 50 to 70 ohm transmission line is recommended. A typical doublet antenna installation is shown in Fig. 3.

The doublet antenna is directional and should be erected with its entire length facing a desired station for maximum signal pickup.

The doublet antenna may be fed with either a balanced or unbalanced transmission line. When a balanced line such as "twin-lead" or a twisted pair is used, the line connects to terminals "A1" and "A2" and the jumper link between "A2" and "G" is disconnected (See Fig. 3). When using an unbalanced line such as coaxial cable, the inner conductor connects to terminal "A1", the outer metal braid to terminal "A2", and the jumper link connects between terminals "A2", and "G". A ground wire may improve reception when using an unbalanced type line.

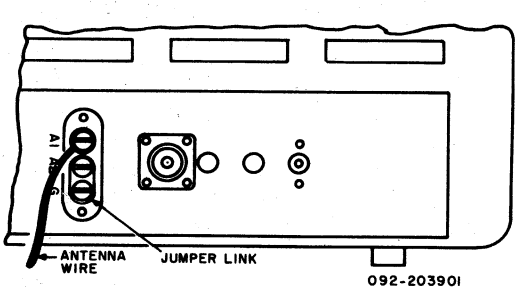


Figure 2. Single Wire Antenna

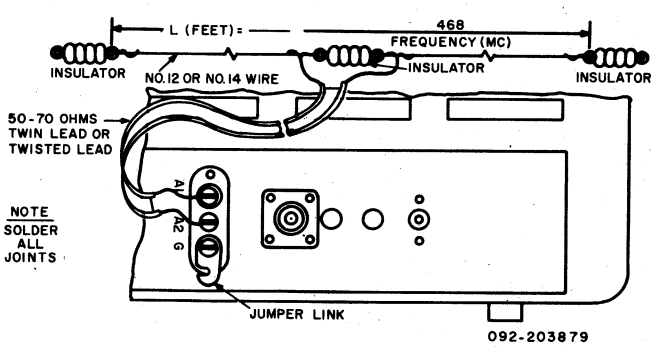


Figure 3. Doublet Antenna Using Twin-Lead Transmission Line

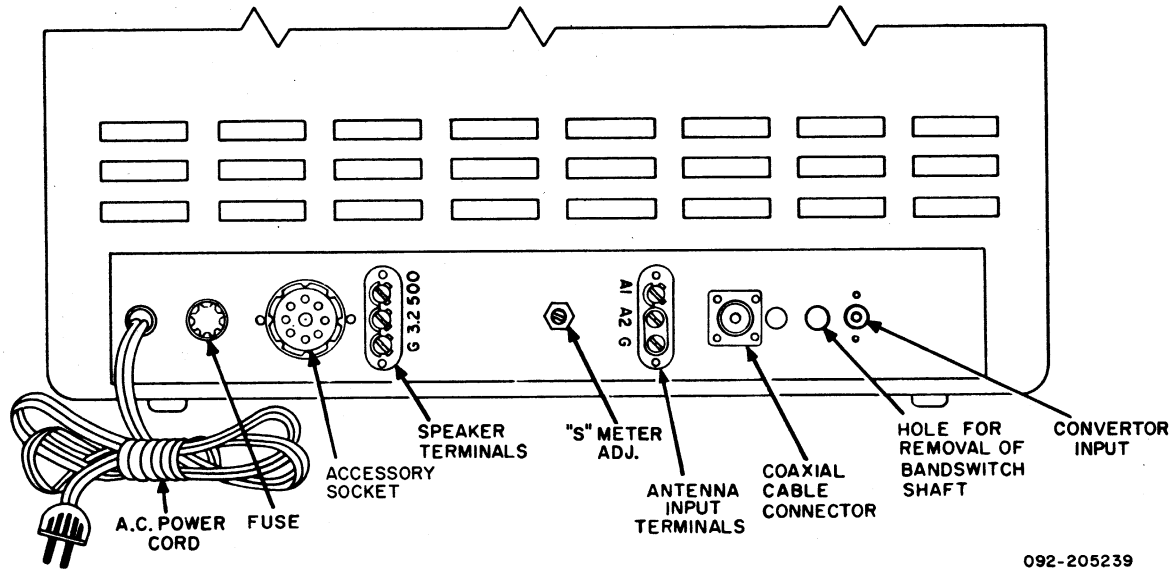


Figure 4. Rear View of Receiver

The doublet antenna provides optimum performance only for the band for which it is cut. Therefore, when using such a doublet antenna, it may be desirable for reception on other bands to utilize the antenna as a single wire type. This is accomplished by connecting the two transmission line leads together and connecting them to terminal "A1". The jumper link in this case should be connected between terminals "A2" and "G".

In an installation where the receiver is used in conjunction with a transmitter, it may be advantageous to use the same antenna for receiving as for transmitting. This is especially true when a directive antenna is used since the directive effects and power gain of the transmitting antenna are the same for receiving as for transmitting. Switching of the antenna from the transmitter to the receiver may be accomplished with a double-pole, double-throw antenna changeover relay or knife switch connected in the antenna leads.

For further information regarding receiving antennas and antenna matching schemes, refer to the "Radio Amateur's Handbook" or the "A. R. R. L. Antenna Book", both published by the American Radio Relay League, West Hartford, Conn., U. S. A.

3-4. POWER SOURCE.

The receiver is designed to operate on 105 to 125 volt, 50/60 cycle AC current. Power consumption is 115 watts.

IMPORTANT: If in doubt about your power source, contact your local power company prior to inserting the power cord into an AC power outlet. Plugging the power cord into the wrong power source can cause extensive damage to the unit, requiring costly repairs.

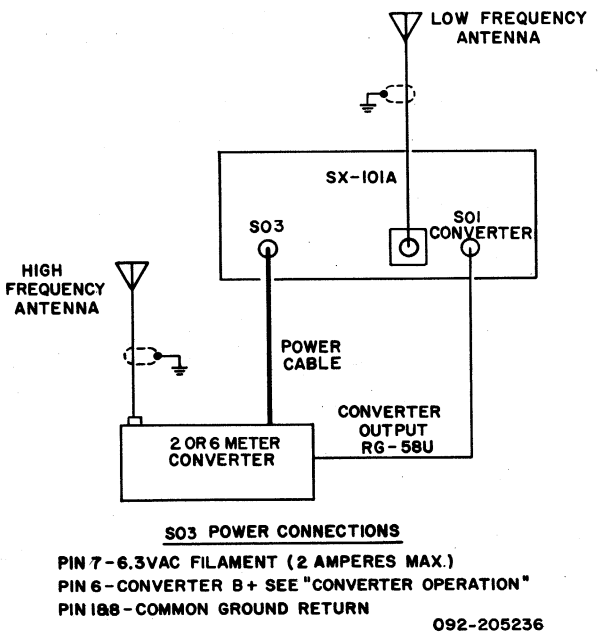


Figure 5. Converter Hookup

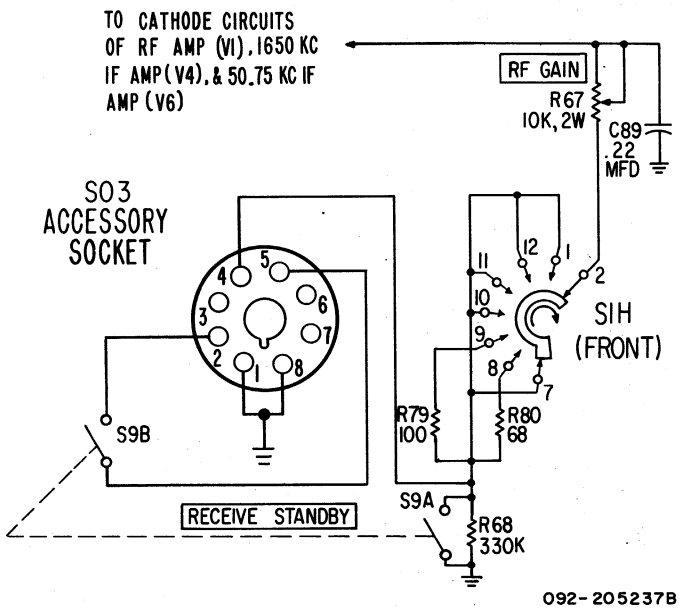


Figure 6. Simplified Sensitivity and Receive-Standby Circuits

3-5. SPEAKER.

A three-terminal strip, marked "G", "3. 2" and "500", is provided at the rear of the receiver for connecting the external speaker that is required with the receiver. (See Fig. 4.) Any permanent magnet speaker with a 3. 2-ohm voice coil can be used by simply connecting the two leads from the speaker voice coil to the terminals marked "3. 2" and "G". If it is desired to use a speaker with a voice coil impedance other than 3. 2 ohms, a matching transformer should be employed to insure optimum performance. The transformer should be mounted on or near the speaker, and should have a 5-watt power rating, a 500-ohm primary impedance, and a secondary impedance to match the impedance of the speaker voice coil. Connect the primary of the transformer to the terminals marked "500" and "G" and the secondary to the speaker voice coil terminals.

The Hallicrafters R-46B and R-47 speakers are both designed for use with your receiver. Either speaker may be connected to the terminals marked "3. 2" and "G".

3-6. HEADPHONES.

The headphone jack, marked "PHONES", is located on the front panel of the receiver and is so wired that the 3. 2 ohm speaker terminal is automatically silenced when the headphones are inserted. The headphone output impedance is not critical, and any commercial low-impedance headphones ranging from 50 ohms to 5000 ohms will provide satisfactory performance. The 500 ohm speaker tap is connected at all times.

3-7. CONVERTER OPERATION.

Band 1 (Converter) is designed for use with broad band crystal controlled 2 or 6 meter converters having an output frequency from 30. 5 to 34. 5 MC. The SX-101A receiver is used to tune to the desired signal in the 30. 5 to 34. 5 MC converter passband.

A separate converter input is supplied so that the regular low frequency antenna may remain connected at all times. Also, filament voltage is applied to the converter whenever the receiver power switch is on, providing instantaneous converter operation.

Generally speaking, receiver operation will be the same as on all other bands; however, with some high gain converters it may be found desirable to reduce the receiver sensitivity by rotating the "RF GAIN" control counterclockwise on very strong signals. See Fig. 5 for typical converter installation and connection.

Converter power is available at the accessory socket (6. 3 VAC at 2 amps maximum). B+ voltage is available through a 2000 ohm current limiting resistor. With the bandswitch in positions other than "CONV" a 100K ohm resistor is connected in series with the converter B+ lead maintaining a small amount of standby plate voltage for the converter tubes. For continuous operation of converters requiring in excess of 30 MA, a separate power supply is recommended. B+ will be approximately 180 volts with a 30 MA load.

3-8. RELAY AND TRANSMITTER SWITCHING.

One half of the dpst RECEIVE-STANDBY switch on the front panel connects to pins 2 and 5 of the ACCESSORY SOCKET at the rear of the receiver, and is available for transmitter switching. (See Fig. 6.) This half of the switch is in the open position when the RECEIVE-STANDBY switch is set at "STANDBY" and closed when set at "RECEIVE".

3-9. REMOTE RECEIVE-STANDBY SWITCH.

The receiver may be disabled from a remote location by connecting a remote spst switch between pins 1 and 4 of the plug located in the ACCESSORY SOCKET at the rear of the receiver. (See Figs. 4 and 6.) To operate the receiver with the remote switch, the RECEIVE-STANDBY switch on the front panel must be left at "STANDBY".

SECTION IV

FUNCTION OF OPERATING CONTROLS

4-1. RF GAIN CONTROL.

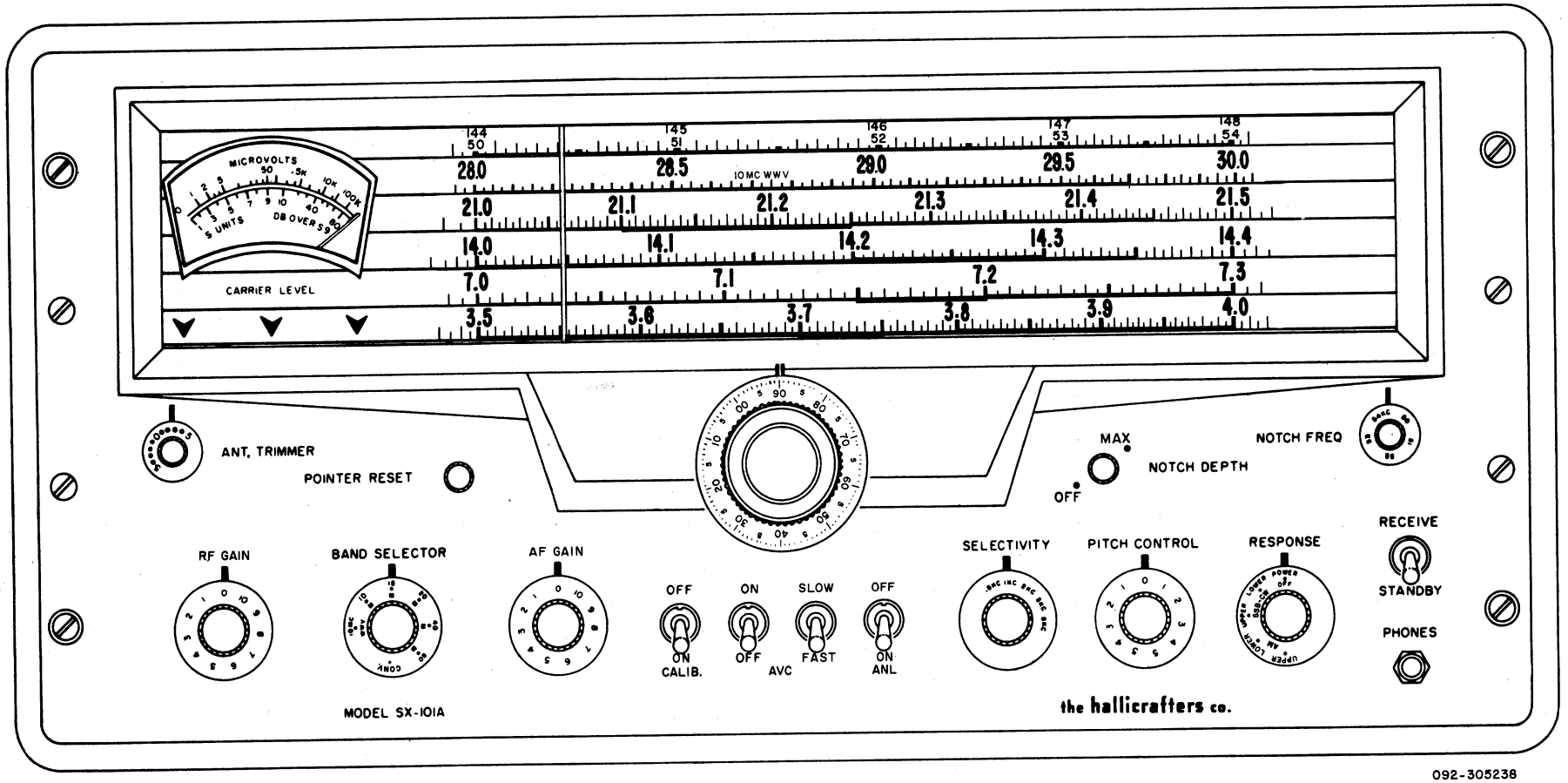
The RF GAIN control varies the gain of the RF amplifier, 1650 KC IF amplifier, and the 6DC6 50. 75 KC IF amplifier stage. Maximum sensitivity is obtained with the control set at "10" (fully clockwise). In this position, the tubes being controlled are operated at maximum gain with minimum cathode bias. As the control is rotated counterclockwise, the bias on the tubes increases with a resultant decrease in gain.

4-2. BAND SELECTOR CONTROL.

The BAND SELECTOR control operates the band switch to place the proper set of coils and capacitors into the circuit to cover the desired band. The band covered by each position of the BAND SELECTOR control is indicated directly on the control. The first six positions are the Converter, 80, 40, 20, 15 and 10 meter bands, respectively. The seventh position tunes in the 10 MC WWV signal, and is indicated on the 10 meter scale with a special marking. This band is available for calibrating the 100 KC crystal calibrator.

4-3. ANTENNA TRIMMER CONTROL.

The ANT. TRIMMER control operates a variable capacitor connected across the secondary of the antenna coil of the band in use. This capacitor adjustment compensates for loading effects of various types of antenna installations. The control is adjusted for maximum signal after the tuning control is adjusted to the desired frequency. Once adjusted, the ANT. TRIMMER control usually requires no further adjustment until the BAND SELECTOR control is operated to select another band.



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Figure 7. Operating Controls

4-4. AF GAIN CONTROL.

The AF GAIN control adjusts the audio level at the speaker terminals and "PHONES" jack. Clockwise rotation of the control increases the signal applied to the grid of the audio amplifier tube, thus increasing receiver volume; counterclockwise rotation decreases volume. In some cases when receiving CW or SSB signals, it may be advantageous to advance the AF GAIN control one-half to three-quarters clockwise, and control receiver volume with the RF GAIN control.

4-5. AVC SWITCH.

The AVC switch, when set at "ON", places the AVC circuit in operation to maintain the output level of the receiver constant regardless of normal input-signal variations. AVC voltage is applied to the RF amplifier stage, 1st mixer, the 1650 KC IF amplifier stage, and the "S" meter stage.

4-6. FAST-SLOW AVC SWITCH.

The FAST-SLOW AVC switch permits selection of either of two time constants for the AVC system. The "SLOW" position provides a release duration approximately 10 times as long as that in "FAST".

4-7. AUTOMATIC NOISE LIMITER SWITCH.

This switch, when set at "ON", places the automatic series noise limiter circuit in operation to reduce pulse type noises such as ignition noise and electrical interference. The limiter circuit is effective on all types of reception, allowing the signal to pass through the receiver unaffected, but making the receiver inoperative for noise amplitudes greater than those of the signal.

The noise limiter circuit "chops" noise peaks received at the detector by means of a biased diode which becomes non-conducting above a predetermined signal level. When the limiter circuit is in operation, the audio output of the detector must pass through the limiter diode to the grid of the audio amplifier. The limiter diode normally acts as a conductor for the audio signal as long as the diode plate is positive with respect to its cathode. When a noise peak is higher in amplitude than the signal, it instantaneously swings the cathode positive with respect to the plate, conduction ceases, and that portion of the signal is automatically cut off from the audio amplifier. The point at which the limiter diode becomes non-conducting is made sufficiently high so that the diode will not clip modulation peaks and thus impair intelligibility, but yet low enough to limit the noise peaks effectively.

This type of efficient noise limiter circuit greatly reduces "listening fatigue" which can accompany long periods of reception.

4-8. SELECTIVITY CONTROL.

The SELECTIVITY control is used to vary the selectivity of the receiver to fit receiving conditions. Five degrees of selectivity are available, ranging from 500 cycles, for CW reception under crowded band conditions, to 5 kilocycles for maximum fidelity when band conditions permit. The five selectivity positions are indicated on the SELECTIVITY control and indicate receiver selectivity at 6 DB down (See Fig. 8).

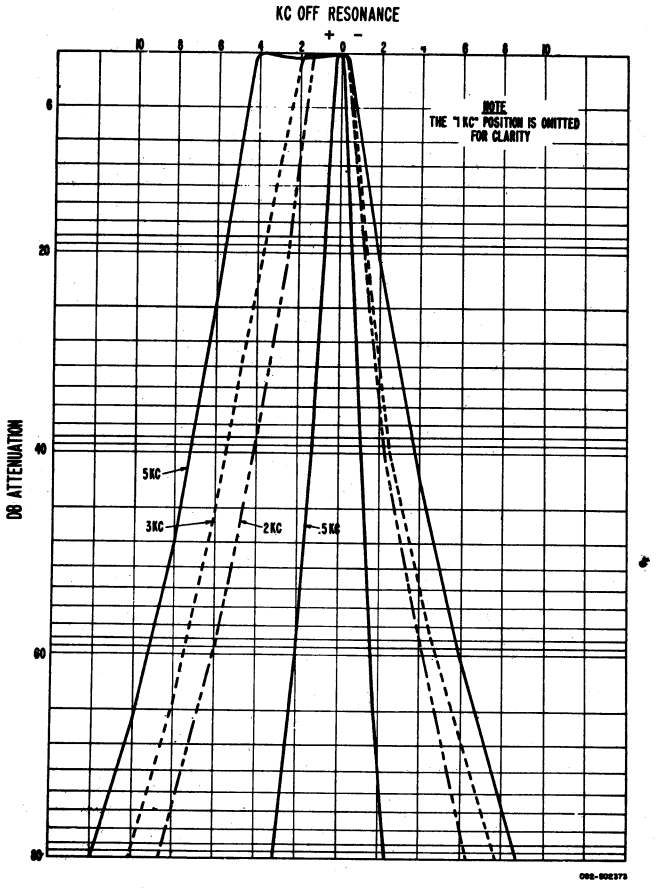


Figure 8. IF Selectivity Curves

As mentioned above, and when conditions permit, the SELECTIVITY control is normally set at 5 KC, the position affording broadest selectivity. Selectivity may be progressively increased and passband decreased by turning the control to the positions marked "3 KC", "2 KC", "1 KC", and ". 5 KC". For reception of the crowded amateur bands, it is generally advisable to sacrifice some fidelity for greater selectivity, since the added selectivity reduces both adjacent-channel interference and background noise by attenuating the higher audio frequencies. Too much selectivity on AM signals, however, will attenuate the high audio frequencies to such an extent that the signal may become unintelligible as a result of excessive sideband cutting. When receiving CW signals, the sharpest selectivity position may be used without the loss of intelligibility experienced in AM reception.

4-9. "T" NOTCH FILTER.

The notch filter circuit provides a means of eliminating or reducing the interfering effect of certain types of heterodynes or CW signals. To obtain maximum results from this feature of your receiver the use of the two controls associated with the notch filter circuit are fully explained in the following.

GENERAL

The manner in which the notch filter will affect the IF selectivity of the receiver is illustrated in Fig. 9. The filter will suppress an extremely narrow band of frequencies within the IF bandpass range of the receiver. The effectiveness of this notch is many times greater than the notch of a quartz crystal filter at 400

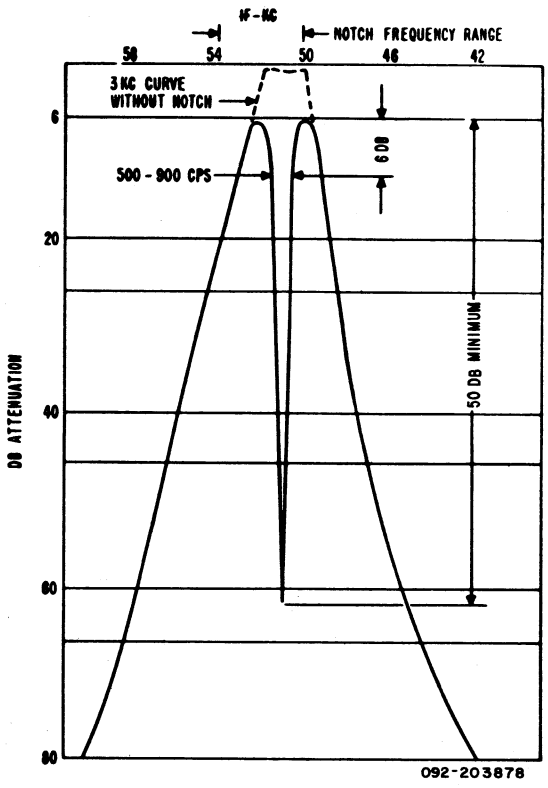


Figure 9. IF Selectivity Curve With Notch

KC to 2 MC. The NOTCH FREQ. control will move the band of suppressed frequencies represented by the notch in the selectivity curve, to any point within the IF passband. The NOTCH DEPTH control will vary the depth of the notch in the selectivity curve to control the degree of rejection of the interfering signal.

Extensive field testing of this feature has shown that the notch filter is highly effective in suppressing the type of interference for which this type of circuit is intended. It must be appreciated, however, that any selective IF filter circuit, including the phasing notch of quartz crystal circuits, affects only a limited range of interfering frequencies. The effectiveness of the notch filter is therefore somewhat dependent upon the exact nature of the interfering signal. For example: a heterodyne within the IF range that is less than 900 cycles in width and has little harmonic content is readily notched out. If the same interfering heterodyne is rich in harmonics it would only be possible to completely suppress the fundamental frequency and the remaining harmonic content may remain almost equally objectionable. It logically follows that if two interfering heterodynes should appear within the IF passband that are separated in frequency by more than 500 to 900 cycles it would be possible to notch out only one of the heterodynes. The interfering signal may also vary in frequency beyond the range of the notch filter and thus reduce the effectiveness of the circuit. Under these conditions, increasing selectivity will generally eliminate its heterodyne. If this heterodyne interference varies in frequency about some mean value it may be necessary to adjust the NOTCH DEPTH control to increase the broadness of the notch. It has been found, however, that the notch filter is sufficiently effective in many instances to make an otherwise useless signal entirely readable.

4-10. NOTCH FREQ. AND DEPTH CONTROLS.

To activate the Notch Filter circuit advance the NOTCH DEPTH control from the "OFF" position.

NOTCH FREQ. CONTROL - This control tunes the notch in the IF passband and may be set anywhere in the range of from 50 KC to 54 KC. The approximate frequency is calibrated on the knob skirt. While tuning this control for maximum suppression of the interfering heterodyne with minimum distortion to the desired signal, try to visualize the notch moving across the selectivity curve (See Fig. 9). It is then readily apparent that improper tuning may notch out the desired signal instead of the heterodyne. It may be necessary to move the notch across the desired signal in order to reach the heterodyne that you desire to suppress. The important consideration is to tune the NOTCH FREQUENCY control for maximum heterodyne suppression with minimum distortion to the desired signal.

NOTCH DEPTH CONTROL - As the position of the NOTCH FREQ. control is changed, the depth of the notch will vary. The NOTCH DEPTH control is provided to readjust the notch for maximum depth at any setting of the NOTCH FREQ. control. Maximum notching occurs at the "MAX" settings of the NOTCH DEPTH control when the frequency is set to the center of the IF passband. The use of the NOTCH DEPTH control is simply a matter of tuning it for maximum suppression each time the position of the NOTCH FREQ. control is changed.

4-11. PITCH CONTROL.

The PITCH control operates the tuning slug in the BFO coil to vary the frequency of the beat frequency oscillator approximately 2 KC each side of its center frequency of 50 KC. The primary function of the PITCH control is to vary the pitch of the audible beat note when receiving CW signals. It should be set at zero when receiving single-sideband signals.

4-12. RESPONSE CONTROL.

The RESPONSE control performs four functions: (1) it turns the receiver on and off; (2) it switches the 2nd conversion oscillator to operate at the required frequency for reception of CW, SSB, and AM signals. (1600 KC in the LOWER sideband positions and 1700 KC in the upper sideband positions); (3) it turns on the receiver BFO in both positions of SSB-CW to provide the heterodyning carrier for reception of these types of signals; and (4) selects either the product detector circuit (in SSB-CW) or the diode detector circuit connecting the product detector tube as an additional audio amplifier (AM).

In the "POWER OFF" position, the receiver is completely shut down except for the heating element and oscillator filament transformer. As the control is turned clockwise to any of the other four positions, the receiver power is turned on.

The SSB-CW positions of the control, "LOWER" or "UPPER" sideband, are used for reception of these types of signals. The AM positions, "UPPER" or "LOWER" sidebands, permit selection of one or the other sideband of an AM signal.

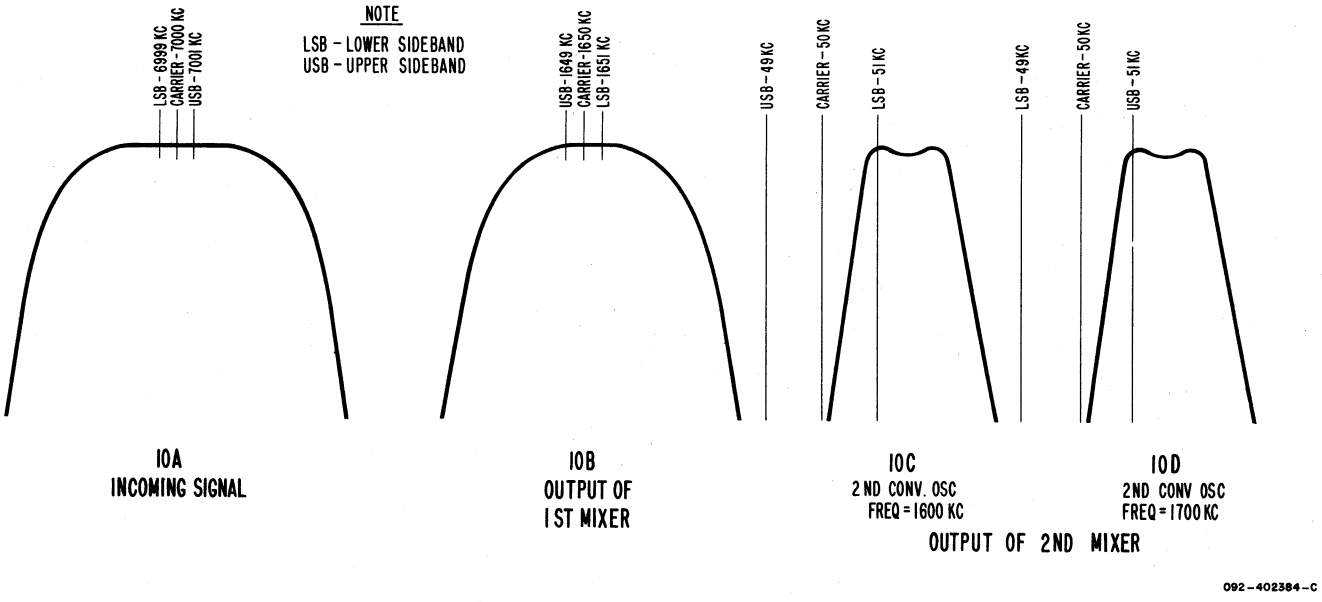


Figure 10. Selectable-Sideband Response Curves

To illustrate how selectable sideband reception is accomplished in the receiver, a numerical example is given. Consider an incoming signal at 7000 KC, modulated 1 KC. Since modulation of a carrier causes the generation of sideband frequencies numerically equal to the carrier frequency plus or minus the modulation frequency, the incoming signal consists of the carrier at 7000 KC, a lower sideband at 6999 KC, and an upper sideband at 7001 KC. (See Fig. 10A.)

The incoming signal is first heterodyned with the output of the 1st conversion oscillator in the 1st mixer stage. The 1st conversion oscillator operates at a frequency higher than the incoming signal by an amount equal to the first-intermediate frequency of 1650 KC. As a result of the frequency conversion process, three new lower frequencies are produced in the output of the 1st mixer: the carrier at 1650 KC, the lower sideband at 1651 KC, and the upper sideband at 1649 KC. (See Fig. 10B.) These signals are amplified by the 1650 KC IF amplifier stage and then heterodyned with the output of the 2nd conversion oscillator in the 2nd mixer stage. The 2nd conversion oscillator is crystal controlled and can be set to operate at either 1600 KC for reception of the lower sideband, or 1700 KC for the reception of the upper sideband, selection being made by means of the RESPONSE control. When the RESPONSE control is set at a "LOWER" sideband position, the 1600 KC signal from the 2nd conversion oscillator is heterodyned with the incoming signal at the first-intermediate frequency of 1650 KC to produce three new frequencies: the carrier at 50 KC, the lower sideband at 51 KC, and the upper sideband at 49 KC. By referring to Fig. 10C, it can be seen that the lower sideband falls within the IF passband and the upper sideband falls outside of the passband. Thus the lower sideband is accepted and the upper sideband is rejected. When the RESPONSE control is set at an "UPPER" sideband position, the 1700 KC signal from the 2nd conversion oscillator is heterodyned with the incoming signal. In the frequency conversion process, the carrier still remains at 50 KC, but now the upper sideband appears at 51 KC, and the lower sideband appears at 49 KC. (See Fig. 10D.) Thus, the upper sideband is accepted and the lower sideband is rejected.

Under conditions of crowded bands, the sideband which is most affected by other interfering signals can be rejected, thereby greatly eliminating much of the interference or "QRM". When receiving an AM signal from a station, it is possible to change sidebands during the course of reception, in order to offset changing "QRM" conditions due to adjacent signals disappearing and reappearing within the band.

4-13. CALIB.-OFF SWITCH.

The CALIB. -OFF switch controls the operation of the built-in 100 KC crystal calibrator. When the switch is set at "CALIB.", the crystal calibrator is turned on to provide marker signals at every 100 KC point on the receiver. The crystal calibrator employs a crystal controlled, pentode oscillator circuit. The output of the crystal calibrator is capacitively coupled to the antenna input circuit. A trimmer capacitor (CRYSTAL ADJ) on the top of the calibrator unit permits adjustment of the calibrating crystal to exactly 100 KC by comparison with the 10 MC signal (band 7, WWV 10 MC) transmitted by WWV. This capacitor has been set at the factory and should normally not require periodic readjustment unless extreme calibration accuracy is required. If adjustment is required, proceed as outlined in paragraph 5-8.

4-14. RECEIVE-STANDBY SWITCH.

The RECEIVE-STANDBY switch, when set at "STANDBY", permits disabling of the receiver during transmission periods, at the same time maintaining the heater and plate supplies operative for instant use when reception is again resumed. The receiver operates normally when the RECEIVE-STANDBY switch is at "RECEIVE".

One section of the RECEIVE-STANDBY switch is available for relay or transmitter switching. For connections and details, refer to paragraph 3-8.

4-15. TUNING CONTROL.

The TUNING control is used to tune the desired sig-

nals within the selected band. The vertical pointer on the slide-rule dial is operated by this control. The dial has six calibrated and individually illuminated scales, one for each of the Converter, 80, 40, 20, 15 and 10 meter bands covered by the receiver. A seventh band, which uses the dial area covering the 10 meter band scale, is purposeful for zero-beating the 10 MC WWV signal for intentions of checking and adjusting the 100 KC crystal calibrator. All bands are illuminated in this position.

It should be noted that the large slide rule dial spreads the amateur bands over most of the total length of the calibrated dial. When checked against the 100 KC crystal calibrator, and dial correction made with the POINTER RESET control, the dial calibration is extremely accurate. This is especially true on the narrower 80, 40, 20 and 15 meter amateur bands. On these bands the receiver has a dial graduation every 5 kilocycles. The dial accuracy is somewhat less on the 10 meter band, where there is a dial graduation every 25 KC and on the converter band with 50 KC graduations.

SECTION V
OPERATION

5-1. AM RECEPTION.

1. Set the front panel controls to their starting positions as outlined below.

RF GAIN	10 (maximum sensitivity)
BAND SELECTOR	At the desired amateur band
AF GAIN	0 (minimum volume)
AVC ON-OFF	ON
AVC FAST-SLOW	As desired
NOISE LIMITER-OFF	OFF
SELECTIVITY	5 KC
RESPONSE	POWER OFF
RECEIVE-STANDBY	RECEIVE
NOTCH DEPTH	OFF
CALIB. -OFF	OFF
POINTER RESET	As adjusted
ANT. TRIMMER	As adjusted
PITCH CONTROL	As adjusted
NOTCH FREQ.	As adjusted

2. Turn the receiver on by rotating the RESPONSE control clockwise and set it at either the AM "UPPER" or "LOWER" sideband position. The tuning dial and "S" meter will be illuminated, indicating the receiver is operative, and the band selected by the BAND SELECTOR will be the only illuminated band on the slide-rule dial. Rotate the AF GAIN control clockwise for the desired volume level.

3. Tune in an AM signal with the tuning control, tuning for maximum indication on the "S" meter. Adjust the ANT. TRIMMER control for maximum indication on the "S" meter. After the signal has been accurately tuned in, readjust the AF GAIN control as desired.

NOTE

The "S" meter indications will be correct only when the AVC switch is set at ON, and the RF GAIN control is set at or near 10 (maximum sensitivity). Setting the RF GAIN control at a setting other than "10" will also somewhat restrict AVC action.

4. Set the SELECTIVITY control for the desired degree of selectivity. For AM reception, the control can be set to 5 KC for maximum fidelity. The positions marked 3 KC, 2 KC, 1 KC, .5 KC provide progressively increasing steps of selectivity. Note that as the selectivity of the receiver is increased, the background noise and interference from adjacent signals is reduced. Too much selectivity, however, may cause excessive sideband cutting. While sideband cutting reduces fidelity, it may be frequently preferable to sacrifice naturalness of reproduction in favor of communications effectiveness. When changing the position of the SELECTIVITY control from a broad to a narrower response (for example: from "2 KC" to "1 KC"), a slight readjustment of the tuning controls may be necessary to recenter the signal in the IF passband.

5. Set the RESPONSE control at either AM "LOWER" or "UPPER" sideband position.

6. If it is desired to operate with AVC off, set the AF GAIN control to a well advanced position, and vary the receiver volume level by means of the RF GAIN control, taking care not to advance the control to a point where strong signals will cause "blocking".

7. If severe electrical disturbances, ignition or other types of pulse type noise interfere with reception, set the NOISE LIMITER switch at "ON" to place the automatic noise limiter circuit in operation.

8. The receiver may be disabled without turning it off by setting the RECEIVE-STANDBY switch at "STANDBY". In this position, the RF, the 1650 KC IF and 50. 75 KC IF stages are cut off but the heater and plate supplies remain operative for instant reception. To resume reception, simply return the switch to the "RECEIVE" position.

9. An undesired signal near the frequency of the desired signal will heterodyne with it to produce an audible beat note equal to their frequency difference. This type of heterodyne interference can be eliminated by using the notch filter circuit. Simply rotate the NOTCH DEPTH control clockwise to its "MAX" position, and adjust the NOTCH FREQ. control to "notch out" the interfering signal. Readjust the NOTCH DEPTH control as necessary to obtain maximum rejection of the interfering signal.

CAUTION

It is possible to eliminate the heterodyne by notching out the desired carrier in place of the undesired signal or carrier. When this occurs an AM signal will sound like a single sideband suppressed carrier transmission.

10. In shortwave reception, it frequently happens that transmission conditions are different for waves of slightly different frequencies. As a result, in the case of voice modulated transmissions, AM particularly, which involve sideband frequencies differing slightly from the carrier frequency, the carrier and sideband components may not be received in the same relative amplitudes and phases they had at the transmitter. This effect, known as selective fading, causes severe distortion of the signal.

    This type of distortion can be reduced considerably by utilizing the selectable sideband feature of the SX-101A receiver operating in an "Exalted Carrier" mode, i. e., the transmitted carrier is positioned out of the receivers IF passband along with one sideband producing a suppressed carrier single sideband signal. The carrier is subsequently reinserted by the receivers BFO and the signal is detected in the same manner as in the case of a SSB signal. The detailed procedure for this type of operation is as follows:

    a. Set the RESPONSE switch to SSB-CW "UPPER" or "LOWER" sideband and the PITCH control to "0".

    b. Carefully tune in the desired signal for "zero beat".

    c. If the receiver BFO is set up properly (See paragraph 5-6) the RESPONSE switch may be alternately set to either the "UPPER" or "LOWER" SSB-CW sideband positions without affecting the "zero-beat" condition.

    d. Leave the RESPONSE control in the SSB-CW "UPPER" or "LOWER" sideband position that affords the best reception.

5-2. CW RECEPTION.

For CW reception, the receiver may be operated with AVC on or off, as desired. Operation of the receiver with AVC on is highly desirable since it not only minimizes fading but also prevents blasting when tuning from a weak to a strong signal. To operate with AVC on, set the AVC switch at "ON", set the RF GAIN control to a well advanced position, and regulate the receiver volume level by means of the AF GAIN control. To operate with AVC off, set the AVC switch at "OFF", set the AF GAIN control at a well advanced position, and vary the receiver volume level by means of the RF GAIN control, taking care not to advance the control to a point where strong signals cause excessive "thumping" (overloading).

CW signals are made audible by the heterodyning action of the beat oscillator with the incoming signal. The beat oscillator is set at a frequency slightly different from the second-intermediate frequency of 50. 75 KC, the difference being equal to the pitch of the audible note desired.

For the reception of CW signals, set the SELECTIVITY control at one of the sharper selectivity positions (2 KC, 1 KC, or . 5 KC), set the RESPONSE control at SSB-CW "UPPER" or "LOWER" sideband, and set the PITCH control at any setting from "0" to "4" on either side of zero, and then tune in the signal for a pleasing beat note.

NOTE

Because of the effective band spread on the bands on this receiver, CW signals are easily tuned when the SELECTIVITY control is set at ". 5 KC".

The beat oscillator may be set on either the high or low frequency side of zero beat. (The oscillator operates on the low side when the PITCH control is set at a position to the left of zero and on the high side when the PITCH control is set at a position to the right of zero.) It may be necessary, after setting the PITCH control, to readjust the receiver tuning slightly to properly position the signal in the IF passband. Alternately adjust the PITCH control and the receiver tuning for a maximum audible signal. With the receiver in the sharpest selectivity position, CW signals will drop in and out more rapidly and a slower rate of tuning is recommended. Once the PITCH control has been set, it need not be reset for each CW signal unless a change of pitch is desired.

NOTE

If the SELECTIVITY control is changed to a different position, it may be necessary to readjust the receiver tuning slightly when changing to a narrower selectivity position in order to properly position the signal in the IF passband.

The setting of the SELECTIVITY control for CW reception is generally best determined by receiving conditions. Note that as the selectivity of the receiver is increased (SELECTIVITY control varies from the "5 KC" to the ". 5 KC" position), the background noise and adjacent-channel interference is considerably reduced and tuning is sharper. For CW reception, the sharpest selectivity position may be used without the loss of intelligibility experienced in AM reception.

5-3. SINGLE SIDEBAND RECEPTION.

Single-sideband signals are transmitted with little or no carrier, and it is necessary to reinsert the carrier in the receiver before proper reception is obtained. In the SX-101A receiver, this is accomplished by mixing the 50. 75 IF with the BFO in the product detector circuit. A single-sideband signal (SSB) can be identified by its unintelligibility, or monkey chatter, and by severe variations in the "S" meter indication corresponding to the speech modulation.

For the reception of single-sideband signals, set the PITCH control at "0", AVC switch at "ON", and SE-

LECTIVITY control at either "2 KC" or "3 KC", depending upon adjacent channel interference and noise. Set the RF GAIN control at maximum and vary the receiver volume level by means of the AF GAIN control. In the case of extremely strong signals it may be desirable to reduce the RF GAIN slightly to prevent overload and cross modulation effects. Set the RESPONSE control at SSB-CW "UPPER" or "LOWER" sideband. The single-sideband signal will be intelligible in only one of these two positions, the proper position depending upon the sideband being transmitted. If the signal is not intelligible after tuning is completed as outlined below, set the RESPONSE control to the other sideband setting and repeat the tuning procedure.

After the controls have been properly set as outlined in the preceding paragraph, very carefully tune in the single-sideband signal for maximum intelligibility. It will be noticed that with incorrect tuning of a single-sideband signal, the speech will sound high or low pitched or very distorted but no trouble should be encountered in tuning once a little experience has been gained.

The "1 KC" position of the SELECTIVITY control permits reception of modulation frequencies up to about 1000 cycles. For reception of modulating frequencies higher than 1000 cycles, set the SELECTIVITY control to the positions marked "2 KC", "3 KC" and "5 KC", depending on the degree of fidelity desired; maximum fidelity is obtained in the "5 KC" position. The notch filter is especially useful during reception of single-sideband signals. An undesired AM or CW signal close in frequency to the desired signal will heterodyne with the beat oscillator to produce an audible beat. The undesired signal may be "notched out" with the notch filter, just as in AM or CW reception.

5-4. USE OF CRYSTAL CALIBRATOR.

The built-in 100 KC crystal calibrator permits accurate checking of dial calibration on the 80, 40, 20, 15 and 10 meter bands by a comparison of the dial calibrations with the marker signals which appear at every multiple of 100 KC on the dial. Crystal calibration points are not provided on the converter band as calibration on this band will largely be dependent on the particular converter in use. The 30. 5 to 34. 5 MC tuning range of this band can be checked if desired by externally connecting the CONVERTER input socket to the A1 antenna terminal on TS1 providing 100 KC crystal check points as on other bands. This jumper should be removed while operating with a converter as the additional "antenna" connected at this point would tend to decrease the signal to noise ratio.

A. CALIBRATION OF THE DIAL.

1. Set the tuning dial at a convenient multiple of 100 KC at the high frequency end of the band in use (or nearest any particular frequency within the band it is desired to tune). Examples of high frequency end check are: 4000 KC on 80 meters, 7300 KC on 40 meters, 14, 400 KC on 20 meters, 21, 500 KC on 15 meters, and 29, 700 KC on 10 meters.

2. Set the RESPONSE control at SSB-CW "UPPER" or "LOWER" sideband, the PITCH control at "0", and the CALIB. -OFF switch at "CALIB.".

3. Very carefully adjust the tuning control for the exact 100 KC frequency mark as indicated by "zero beat". If the vertical pointer on the dial does not fall exactly on this 100 KC mark, adjust the POINTER RESET control until the pointer falls right on the mark. For example, on the 80 meter band, a "zero beat" should be obtained at 3500, 3600, 3700, 3800, 3900, and 4000 KC.

4. The procedure outlined in steps 1 through 3 above provides average calibration accuracy over the entire frequency range of the band in use. For precise calibration accuracy over a particular section of the band, the procedure is identical except that the dial is set at a multiple of 100 KC nearest the desired frequency or range of frequencies, instead of at the high end of the band as in step 1.

5-5. USE OF "S" METER.

The "S" meter provides a visual means of determining whether or not the receiver is properly tuned, as well as an indication of the relative signal strength. The "S" meter circuit consists of a DC milliammeter connected in the cathode circuit of the "S" meter tube (V15), the grid of which is controlled by AVC voltage. Since the cathode current of this tube varies with the strength of the incoming signal, the meter will indicate relative signal strength. The "S" meter is calibrated in microvolts, and also in "S" units from 1 to 9, and in decibels above S9 to +80 DB. The indications on the "S" meter will be correct only when the RF GAIN control is set at or near "10" (maximum sensitivity), and the AVC switch is set at "ON". The AVC "FAST-SLOW" switch will effect the relative response time of the "S" meter as evidenced by slower meter action when the switch is in the "SLOW" position.

NOTE

The "S" meter will also indicate relative signal strength when the AVC switch is at OFF, and/or when the RF GAIN control is not fully clockwise.

The limitations of the microvolt scale should be fully understood before any assumption as to the indicated signal voltages is accepted. The meter indicates approximate microvolts of signal strength as developed at the antenna input terminals when terminated in a 50-70 ohm load, at 14. 3 MC. The indicated microvolt readings at other frequencies may vary slightly from that at 14. 3 MC.

5-6. BFO FREQUENCY CHECK.

The beat frequency oscillator (BFO) has been carefully adjusted at the factory so that its frequency is 50. 0 KC when the PITCH control knob is set at "0". Readjustment of the BFO will normally not be required unless the 6SC7 BFO tube (1/2 of V8) or components in the BFO circuit have been replaced. A slight readjustment sometimes may be necessary occasionally as a result of normal aging of the BFO tube. A simple check can be made to determine if adjustment is necessary as follows:

With the SELECTIVITY control at "5 KC", RESPONSE control at SSB-CW "UPPER" sideband, and PITCH control at "0", very carefully tune in an AM signal for "zero beat". (See Note A below.) Leaving the receiver tuning unchanged, switch the RESPONSE control to the "LOWER" sideband position. If the beat oscillator frequency is correct, a "zero beat" will be obtained in both the "UPPER" and "LOWER" SSB-CW sideband positions. If, however, the beat oscillator is slightly off frequency, a beat note will be heard when switching from the "UPPER" to the "LOWER" SSB-CW sideband position. Adjustment of the beat frequency oscillator is necessary only if the frequency of the audible beat note exceeds 200 cycles.

NOTE A

In instances where the beat oscillator is considerably off frequency, it may not be possible to obtain a "zero beat" when tuning in the signal. In this case, it will be necessary to first "roughly" set the beat oscillator to operate at approximately 50 KC as follows: With the SELECTIVITY control at ". 5 KC", and RESPONSE control at SSB-CW "UPPER" sideband, tune the receiver to a noisy part of the band (not to a signal). Remove the PITCH control knob and adjust the BFO slug for minimum noise on the noise signals. Then set the SELECTIVITY control at "5 KC" and make the BFO frequency check as outlined in the preceding paragraph.

If the BFO frequency check indicates adjustment is necessary, proceed as follows:

Remove the PITCH control knob and turn the BFO slug a few degrees to the left or right so as to lower the beat note frequency, and repeat the BFO frequency check. If the beat note obtained is higher in frequency than that obtained originally, it is an indication that the slug is being turned in the wrong direction. Continue varying the setting of the slug in small steps and repeating the BFO frequency check until "zero beat" is obtained in both the "UPPER" and "LOWER" SSB-CW sideband positions. After the correct slug setting is determined, replace the PITCH control knob with "0" in the top center position, being careful not to disturb the slug setting.

5-7. NOTCH FREQUENCY CHECK.

Readjustment of the notch filter circuit is not normally necessary unless the components in the notch filter circuit are replaced. To check the circuit, proceed as follows:

Check the BFO frequency as instructed in paragraph 5-6. Set the PITCH control at "0", AVC to "ON" and the SELECTIVITY control at "3 KC". Tune in an unmodulated carrier, from a station, a transmitter VFO, or a signal generator, for a "zero beat". Place the RESPONSE control in the AM "UPPER" or "LOWER" sideband position to de-energize the BFO. Rotate the NOTCH DEPTH control to "MAX". Tune the NOTCH FREQ. for a minimum reading on the "S" meter. The NOTCH FREQ. dial should be set at "50 KC".

If the notch frequency check indicates that an adjustment is necessary, proceed as follows:

Loosen the NOTCH FREQ. knob and reset it to indicate "50 KC". Rotate the control to approximately "51 KC". Tune across an unmodulated carrier while observing the "S" meter. (Use an approximate S9 signal.) The meter will indicate two peaks. Readjust the NOTCH FREQ. control as necessary to approximately equalize the peaks. Then tune the receiver for a minimum reading on the "S" meter between the two peaks. Adjust the NOTCH ADJ. control R19, located on bottom of the SX-101A receiver chassis, for a minimum reading on the "S" meter. Refer to Fig. 12 for the location of R19.

5-8. CRYSTAL CALIBRATOR CHECK.

The CRYSTAL ADJ. control on the calibrator chassis operates a trimmer capacitor connected across the 100 KC calibrating crystal. This trimmer capacitor permits slight adjustment of the calibrating crystal to exactly 100 KC comparison with the 10 MC signal transmitted by station WWV. This is done by setting the BAND SELECTOR to "WWV 10 MC" and tuning the receiver to the WWV 10 MC mark on the top scale of the slide rule dial. This capacitor has been set at the factory and should not require periodic readjustment unless extreme calibration accuracy is desired. If adjustment is required, proceed as follows.

Set the RESPONSE switch to AM "UPPER" or "LOWER" sideband, the CALIB. -OFF switch at "OFF", and all other front panel controls as for normal AM reception. Tune in the 10 MC WWV signal and wait for the period during which the signal from WWV is unmodulated. Then switch on the crystal calibrator by setting the CALIB. -OFF switch at CALIB. and adjust its frequency, by means of the CRYSTAL ADJ. control (C 301), until the crystal calibrator signal "zero beats" with the signal received from WWV. If the adjustment is attempted during periods that WWV is modulated, an erroneous zero beat may be obtained with the modulating frequency instead of the desired carrier frequency.

5-9. SERVICE OR OPERATING QUESTIONS.

For any further information regarding operation or servicing of your SX-101A receiver, contact your Hallicrafters dealer. The Hallicrafters Company maintains an extensive system of Authorized Service Centers where any required service will be performed promptly and efficiently at a nominal charge. All Hallicrafters Authorized Service Centers display the sign shown below.



For location of the one nearest you, consult your local dealer or telephone directory. Make no service shipments to the factory as The Hallicrafters Company will not accept the responsibility for unauthorized shipments.

The Hallicrafters Company reserves the privilege of making revisions in current production of equipment and assumes no obligation to incorporate these revisions in earlier models.

SECTION VI

ALIGNMENT

This receiver has been carefully aligned at the factory by specially trained and experienced personnel using precision equipment. Alignment of the receiver should not be attempted until all other possible causes of faulty operation have been investigated. Alignment should not be required unless the receiver has been tampered with or component parts have been replaced in the RF or IF stages. Alignment should be made only by persons familiar with communications receivers and experienced in their alignment. Refer to Figs. 11 and 12 for location of all alignment adjustments.

6-1. EQUIPMENT REQUIRED.

1. Signal generator covering 50 KC to 30 MC.
2. Vacuum tube voltmeter (VTVM) or other high impedance DC voltmeter.
3. Output meter (or AC scale of VTVM). Connect output meter to appropriate speaker output terminals. If a VTVM is used, connect it to terminals "500" and "G" and terminate the output with a 500-ohm resistive dummy load.

6-2. INITIAL CONTROL SETTINGS.

BAND SELECTOR..... As indicated in chart
AF and RF GAIN..... 10 (maximum)
AVC and NOISE LIMITER.....OFF
SELECTIVITY..... As indicated in chart
RESPONSE.....AM "UPPER" sideband
RECEIVE-STANDBY .....RECEIVE
TUNING..... Gang half meshed
NOTCH DEPTH.....OFF
ANT. TRIMMER..... Mid point
POINTER RESET ..... Mid point
CALIB. -OFF..... OFF
PITCH CONTROL..... 0
NOTCH FREQ. ..... As indicated in chart

CAUTION NOTICE: ALL OSCILLATOR TRIMMER CAPACITORS ARE SOLDERED AFTER ADJUSTMENT, AND ANY READJUSTMENT REQUIRES THE REMOVAL OF THIS "FIXING" SOLDER. FOR RECALIBRATING ADJUST SLUGS ONLY.

6-3. ALIGNMENT PROCEDURE.

Step	Signal Generator Connections	Signal Generator Frequency	Band Selector Setting	Output Connections	Selectivity Setting	Remarks
			50.75 KC IF ALIGNMENT			
1	High side directly to alignment point "A" (terminal 1 of T2). See Fig. 12. Low side of chassis.	50.75 KC (unmod.)	80 M	VTVM DC probe to alignment point "B" (junction of R58, R57, and C80). See Fig. 12.	.5 KC	Remove 1st conv. oscillator tube V3 from its socket to prevent signal interference. Adjust top slug of T3, T4, T6 and T7 (50.75 KC IF's) for maximum indication, maintaining approx. 1 volt reading on VTVM.
			ALIGNMENT OF 1700 KC 2nd CONV. OSC. & 1650 KC IF's			
2	High side directly to alignment point "C" (pin 7 of V2). See Fig. 12. Low side to chassis.	1650 KC (mod)	80 M	Output meter across appropriate speaker terminals. (VTVM to alignment point "B" if it is desired to monitor detector voltage.)	5 KC	Replace V3 removed in step 1. Tune generator slowly thru 1650 KC to determine IF passband. Then set generator to center of passband, using sufficient generator output to obtain approx. 1/2 watt receiver output. If no output is obtained, the 1700 KC crystal oscillator may not be oscillating and it will be necessary to

ALIGNMENT OF 1700 KC 2nd CONV. OSC. & 1650 KC IF's (cont)

turn up the generator output and adjust the 1700 KC crystal activity adjustment (bottom slug of T5) until output is obtained. Adjust for maximum output by adjusting the signal generator frequency, crystal activity (bottom slug of T5) and the 1650 KC IF's (top and bottom slugs of T1 and T2). Note that the signal suddenly disappears when the crystal activity slug is turned into the coil and gradually drops in level when the slug is backed out of the coil. Set the crystal activity adjustment (bottom of slug of T5) for a 6 db reduction in level (as indicated on the output meter) on the gentle slope side of maximum response. Then set the generator as near the center of the IF passband and observe the shape of the response. If it is symmetrical, the adjustment is completed; if not, reset the generator frequency near the center of the passband and repeak T1 and T2.

ALIGNMENT OF 1600 KC 2nd CONV. OSC.

Step	Signal Generator Connections	Signal Generator Frequency	Band Selector Setting	Output Connections	Selectivity Setting	Remarks
3	High side directly to alignment point "C" (pin 7 of V2). See Fig. 12. Low side to chassis.	1650 KC (mod)	80 M	Output meter across appropriate speaker terminals. (VTVM to alignment point "B" if it is desired to monitor detector voltage.)	5 KC	Set RESPONSE control at AM-"LOWER" sideband. Tune generator slowly through 1650 KC to determine IF passband. Then set generator to center of passband using sufficient generator output to obtain approx. 1/2 watt receiver output. If no output is obtained, the 1600 KC crystal oscillator may not be oscillating and it will be necessary to turn up the generator output and adjust the 1600 KC crystal activity adjustment (top slug of T5) until output is obtained. Adjust for maximum output by adjusting the signal generator frequency and the crystal activity (top slug of T5). Note that the signal suddenly disappears when the crystal activity slug is turned into the coil and gradually drops in level when the slug is backed out of the coil. Set the crystal activity adjustment (top slug of T5) to a point on the gentle slope side of maximum response that produces the same audio output as when the RESPONSE switch is set in the AM "UPPER" sideband position.

IF SENSITIVITY CHECK

4 With the generator modulated 30% at 400 cycles and connected thru a .05 mfd capacitor to the grid (pin 1) of the 1st mixer tube V2, the IF input required for 1/2 watt receiver output should be approximately 20 microvolts. This assumes the crystal activity has been adjusted as outlined in steps 2 and 3 above.

RF ALIGNMENT

Before proceeding with the RF alignment, check the tuning dial for proper indexing. The dial should index with the low frequency end of the bands when the tuning gang is fully closed.

Use an amplitude modulated (30%) signal.

Set RF GAIN and AF GAIN at "10", AVC and NOISE LIMITER at "OFF", SELECTIVITY at "2 KC", RESPONSE at AM "LOWER" sideband, and RECEIVE-STANDBY at "RECEIVE".

Connect the output meter across the appropriate speaker terminals. (Connect the VTVM to alignment point "B" if it is desired to monitor the detector voltage.) Maintain a 1/2 watt receiver output.

Connect high side of generator thru 50 to 70-ohm carbon resistor to antenna terminal "A1". Connect jumper between "A2" and "G".

The oscillator frequency is higher than the signal frequency on all bands.

Step	Band Selector Setting	Generator & Receiver Frequency	Adjust for Maximum
5	CONVERTER	34. 5 MC	C55 (osc. trimmer) C19 (mixer trimmer) C37 (ant. trimmer at mid point)
	CONVERTER	30. 5 MC	L13 (osc. trimmer) L6 (mixer slug) L1 (ant. slug)

RF ALIGNMENT (cont)			
Step	Band Selector Setting	Generator & Receiver Frequency	Adjust for Maximum
6	80 M (Band 2)	4. 0 MC	C56 (osc. trimmer) C14 (mixer trimmer) C37 (ant. trimmer at mid point)
	80 M (Band 2)	3. 5 MC	L14 (osc. slug) L7 (mixer slug) L2 (ant. slug)
7	40 M (Band 3)	7. 3 MC	C57 (osc. trimmer) L8 (mixer slug) C37 (ant. trimmer at mid point)
	40 M (Band 3)	7. 0 MC	L15 (osc. slug) C38 (mixer pad) L3 (ant. slug)
8	20 M (Band 4)	14. 4 MC	C58 (osc. trimmer) L9 (mixer slug) C37 (ant. trimmer at mid point)
	20 M (Band 4)	14. 0 MC	L16 (osc. slug) C39 (mixer pad) L4 (ant. slug)
9	10 M (Band 6)	30. 0 MC	C61 (osc. trimmer) L10 (mixer slug) C37 (ant. trimmer at mid point)
	10 M (Band 6)	28. 0 MC	L18 (osc. slug) C41 (mixer pad) L5 (ant. slug)
10	15 M (Band 5)	21. 5 MC	C59 (osc. trimmer) C16 (mixer trimmer) C37 (ant. trimmer at mid point)
	15 M (Band 5)	21. 0 MC	L17 (osc. slug) C40 (mixer pad) C3 (ant. pad)
11	10 MC WWV (Band 7)	10. 0 MC	C53 (osc. trimmer) C17 (mixer trimmer) C4 (ant. pad)

BFO ADJUSTMENT
Refer to Section 5-6.

NOTCH FILTER ADJUSTMENT
Refer to Section 5-7.

"S" METER CALIBRATION
See Section 6-7.

Make both the mechanical and the electrical "S" meter zero adjustments.

Connect the signal generator as for RF ALIGNMENT above. Use a 14. 3 MC, 50 UV modulated signal.

Set the receiver controls for AM reception on the 20 M band and accurately tune in the signal.

Set RF GAIN to "10" (maximum), AVC to "ON" and SELECTIVITY to "2 KC".

Adjust R26 for S9 reading on "S" meter.

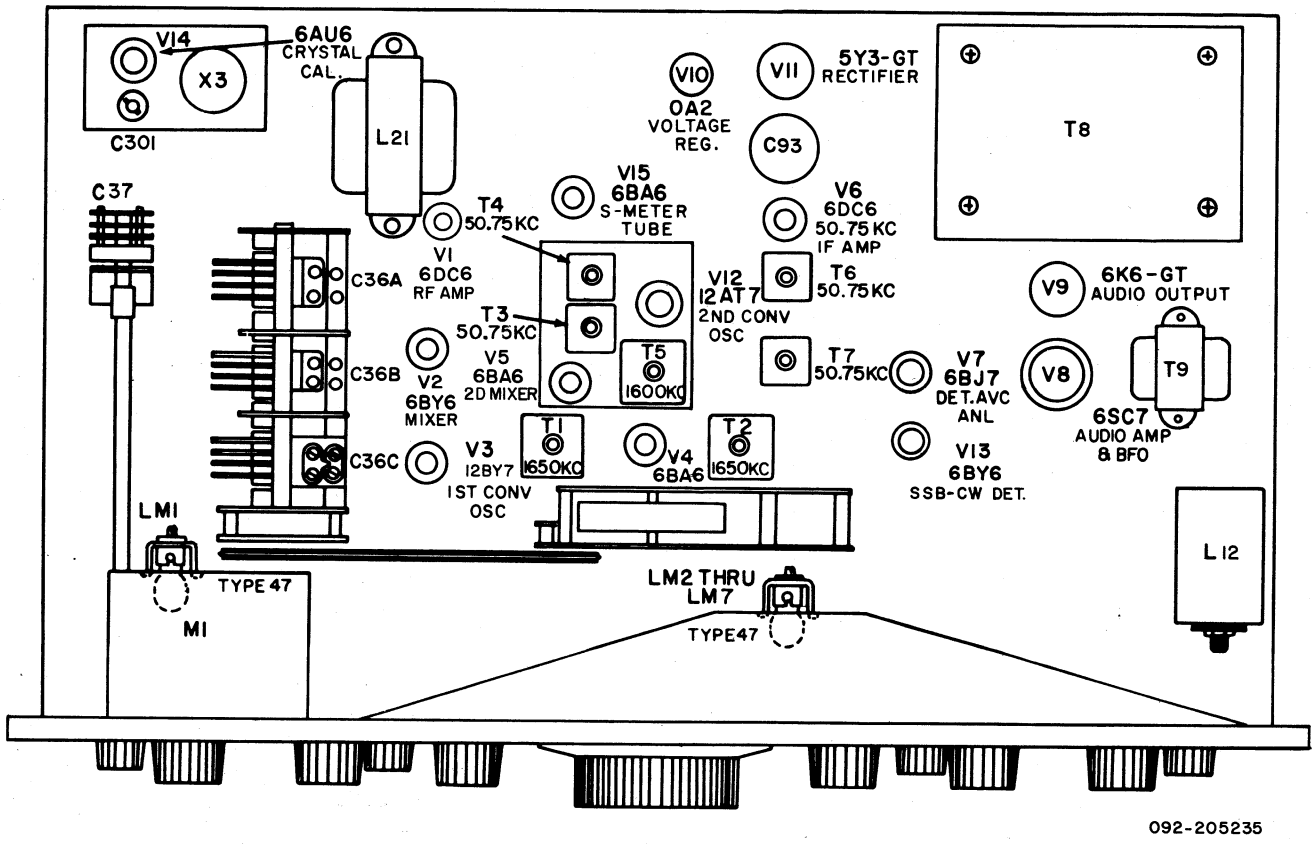


Figure 11. Top View of Receiver

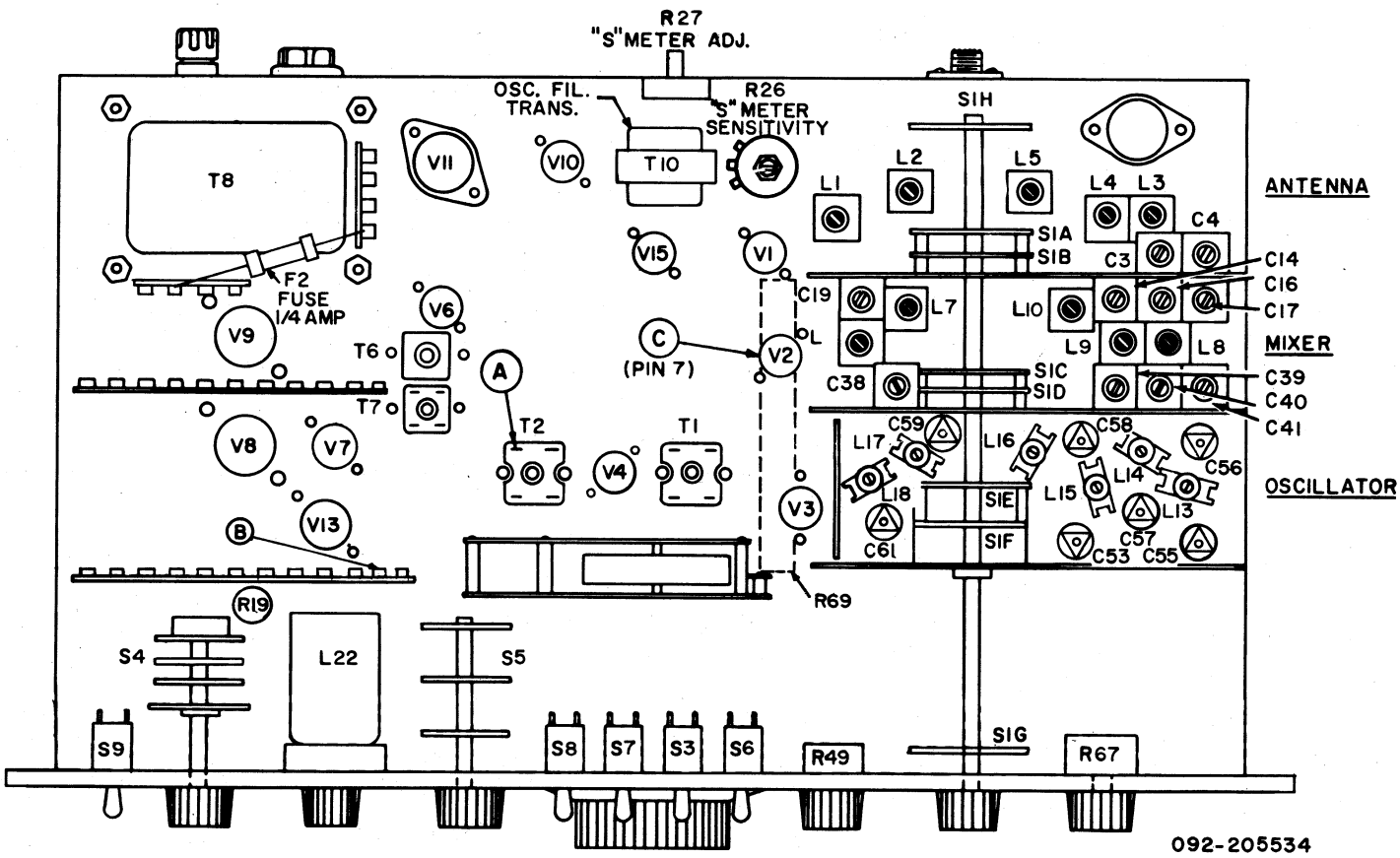


Figure 12. Bottom View of Receiver

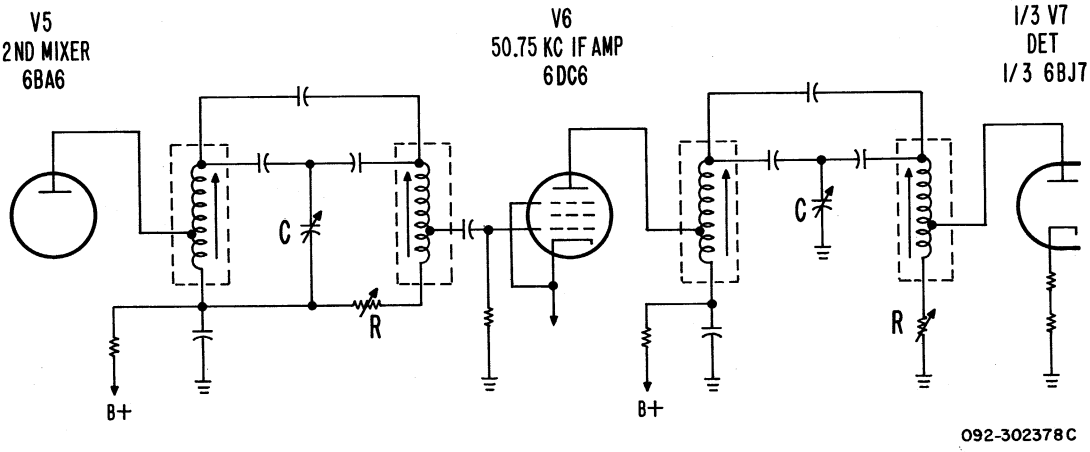


Figure 13. Equivalent Schematic Diagram of the 50.75 KC IF System

SECTION VII
SERVICE DATA

7-1. 50.75KC IF SYSTEM.

Fig. 13 shows the type of coupling used in the 50. 75 KC IF system. Note that inductive coupling is avoided by careful shielding of the IF coils and signal transfer occurs only through capacitance and resistance. By increasing the value of "C" and decreasing "R", the selectivity is made sharper while by decreasing "C" and increasing "R", the selectivity is made broader. The proper values of "C" and "R" are switched in the circuit by means of the SELECTIVITY control. "R" varies the "Q" of the tuned circuit and "C" varies the coupling. This R-C coupling arrangement affords a more accurate means of selectivity control than that readily obtainable by any other method.

7-2. CHASSIS REMOVAL.

The chassis and front panel assembly are removable from the cabinet as a unit by removing two screws (top and bottom) at each side of the front panel and the three screws on the underside of the cabinet.

7-3. TUBE AND DIAL LAMP REPLACEMENT.

To gain access to the tubes and dial lamps, raise the hinged top cover of the cabinet. The tube locations and their functions are shown in Fig. 11.

7-4. "S" METER ADJUSTMENTS.

The mechanical adjustment of the "S" meter is accessible at the rear of the meter. The mechanical adjustment has been accurately set at the factory and will normally not require any further adjustment. Adjustment can be made, if required, by turning off the receiver and carefully rotating the adjustment screw until the meter pointer is in line with the right-hand index mark.

The electrical adjustment is made by carefully turning the "S" METER ADJ. control R27 on the rear of the receiver chassis (Fig. 12), until the pointer is in line with the left-hand index mark. The electrical adjustment should be made with the receiver on, antenna terminals shorted, RF GAIN at "10", RESPONSE switch at AM "UPPER" or "LOWER" sideband, AVC switch at "ON", and RECEIVE-STANDBY switch at "RECEIVE". The settings of the remaining controls do not affect the "S" meter reading.

7-5. DIAL CABLE RESTRINGING.

1. Remove the chassis from the cabinet (See paragraph 7-2).

2. Remove the knobs and front panel. This is done by removing four screws from the front panel and the locknuts from the five toggle switches and the phone jack.

3. Remove the dial panel assembly by removing two screws at each side of the chassis. Carefully lift the dial panel assembly upward and lay it on the chassis; take care not to damage the gears of IF cans and slugs.

4. Turn the tuning shaft fully counterclockwise so that the tuning gang capacitor is fully meshed.

5. Restring the dial cord as follows (Fig. 14):

   a. Attach the end of the cord to the tab (1) and pull the cord down and around the wheel. Proceed clockwise around the wheel (2 and 3) down behind wheel A (4).

   b. Continue up over wheel B (6) up to wheel C (7). Proceed across pointer rail to wheel D (10).

   c. Continue around wheel D to the left and over wheel E (9). Proceed down behind wheel F (10).

d. Finish up by routing the cord into the wheel slot (11) and attach the spring on the tab (12).

6. Set the POINTER RESET shaft at the halfway point of its travel.

7. Set the pointer on the pointer rail and engage the dial cord. Do not crimp the tabs on the pointer at this time.

8. Temporarily set the dial panel assembly in place to line up the pointer. The tuning shaft should be fully counterclockwise and the tuning gang capacitor fully meshed.

9. Line up the pointer on the left-hand frequency marks on the dial.

10. Remove the dial panel assembly and crimp the tabs on the pointer. Place a drop of cement on the pointer tabs and dial cord to permanently secure the pointer and dial cord.

11. Rotate the tuning shaft from the low end to the high end, and back to the low end. Do this several times. Check for backlash or jerky motion of the pointer. If this occurs, it may be necessary to shorten and tighten the dial cord, straighten the pointer, or both.

12. Replace the dial panel assembly, front panel, knobs, and return the chassis to the cabinet.

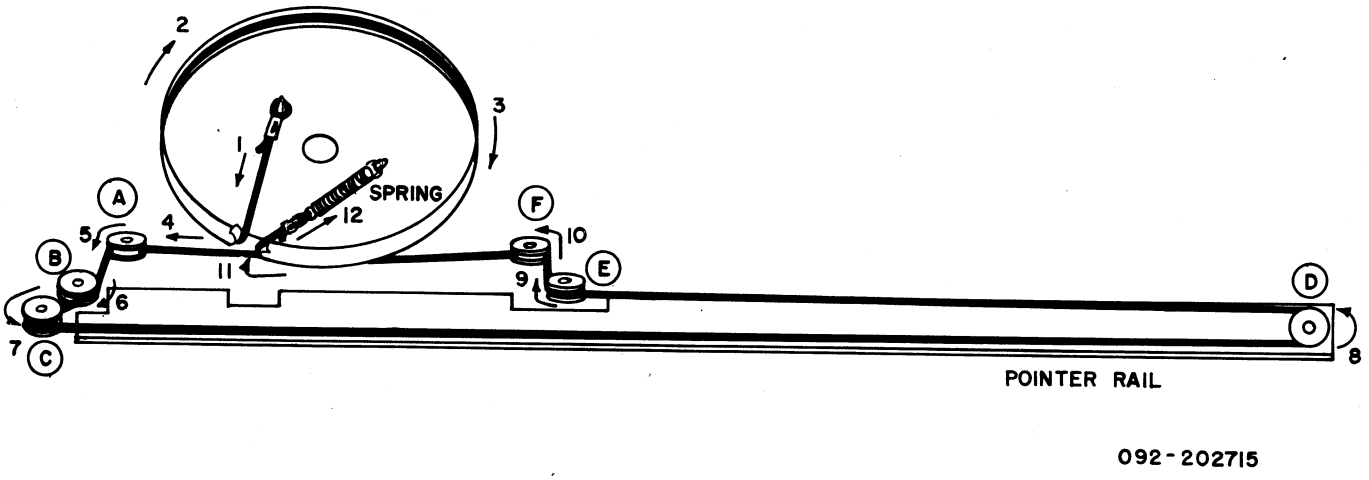


Figure 14. Dial Cord Stringing Diagram

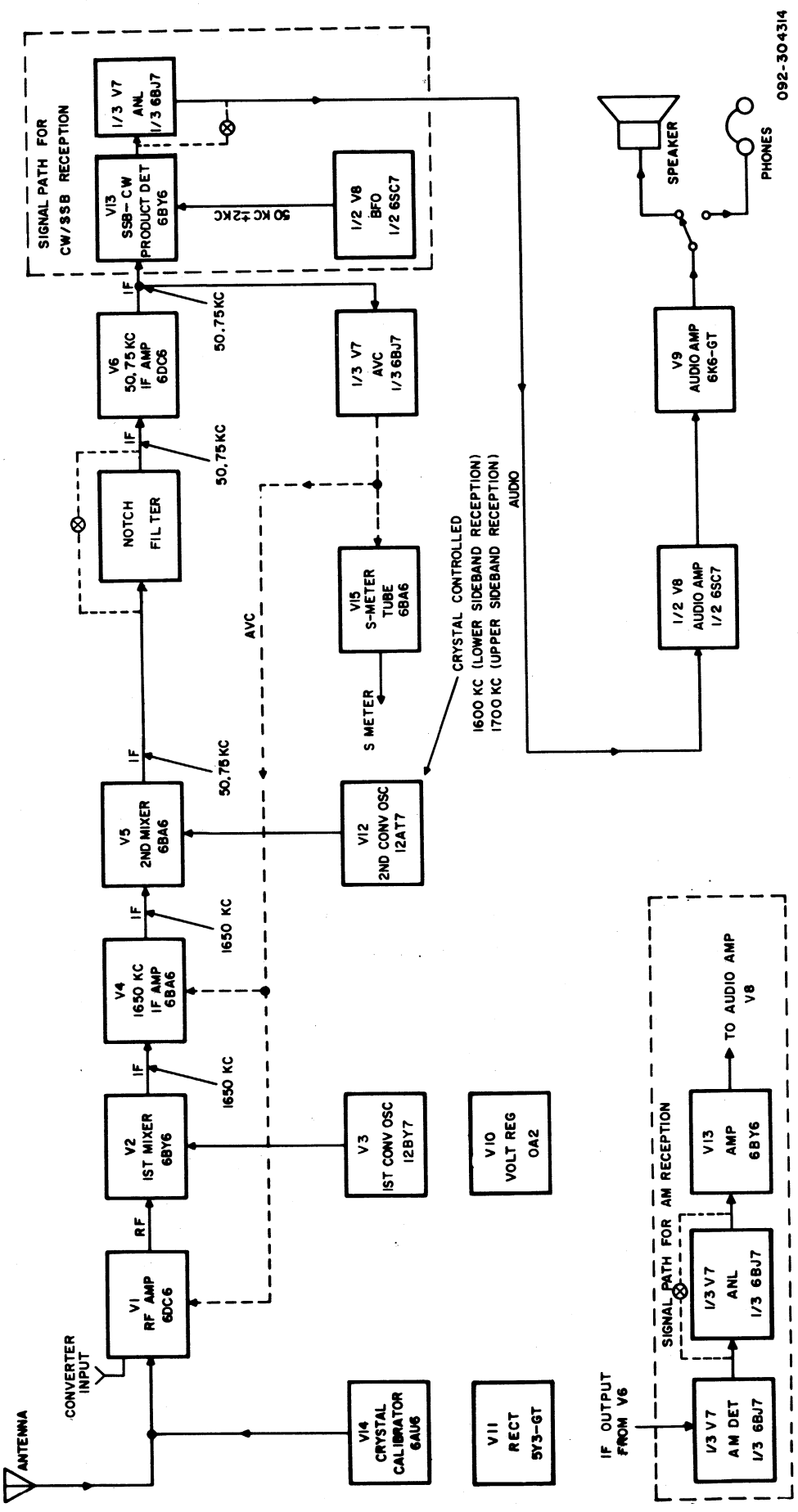


Figure 15. Block Diagram of SX-101A Receiver

NOTES:
VOLTAGE READINGS TAKEN UNDER THE FOLLOWING CONDITIONS:

1. LINE VOLTAGE -117 VOLTS, 60 CYCLES AC.
2. ANTENNA TERMINALS SHORTED, SENSITIVITY AT "10", RECEIVE-STANDBY AT "RECEIVE", AVC AT "ON", NOISE LIMITER AT "OFF", RESPONSE AT "LOWER SIDEBAND AM." SELECTIVITY AT "5 KC", AND BAND SELECTOR AT "80M."
3. ALL VOLTAGES ARE DC. AND POSITIVE UNLESS OTHERWISE SPECIFIED DC VOLTAGES MEASURED WITH VTVM; AC VOLTAGES WITH 1000 OHMS-PER-VOLT METER.
4. ALL VOLTAGES MEASURED BETWEEN TUBE SOCKET TERMINALS AND CHASSIS UNLESS OTHERWISE SPECIFIED
5. VOLTAGES SHOWN FOR V12 ARE WITH RESPONSE CONTROL AT "LOWER SIDEBAND." IN THE "UPPER SIDEBAND" POSITIONS, THE VOLTAGES OF THE TWO TRIODE SECTIONS ARE REVERSED. THE GRID VOLTAGE WILL VARY WITH CRYSTAL ACTIVITY.

* VOLTAGES FOR PINS 2 AND 3 OF V8 ARE TAKEN WITH RESPONSE SWITCH AT "CW-SSB."

** 5 VAC MEASURED ACROSS PINS 2 & 8

*** MEASURED IN CALIBRATE POSITION

**** VOLTAGE VARIES WITH SETTING OF TUNING GANG AND BAND-SWITCH

NM - NOT MEASUREABLE
IC - INTERNAL CONNECTION
NC - NO CONNECTION
H_T - HEATER MID-TAP
IS - INTERNAL SHIELD

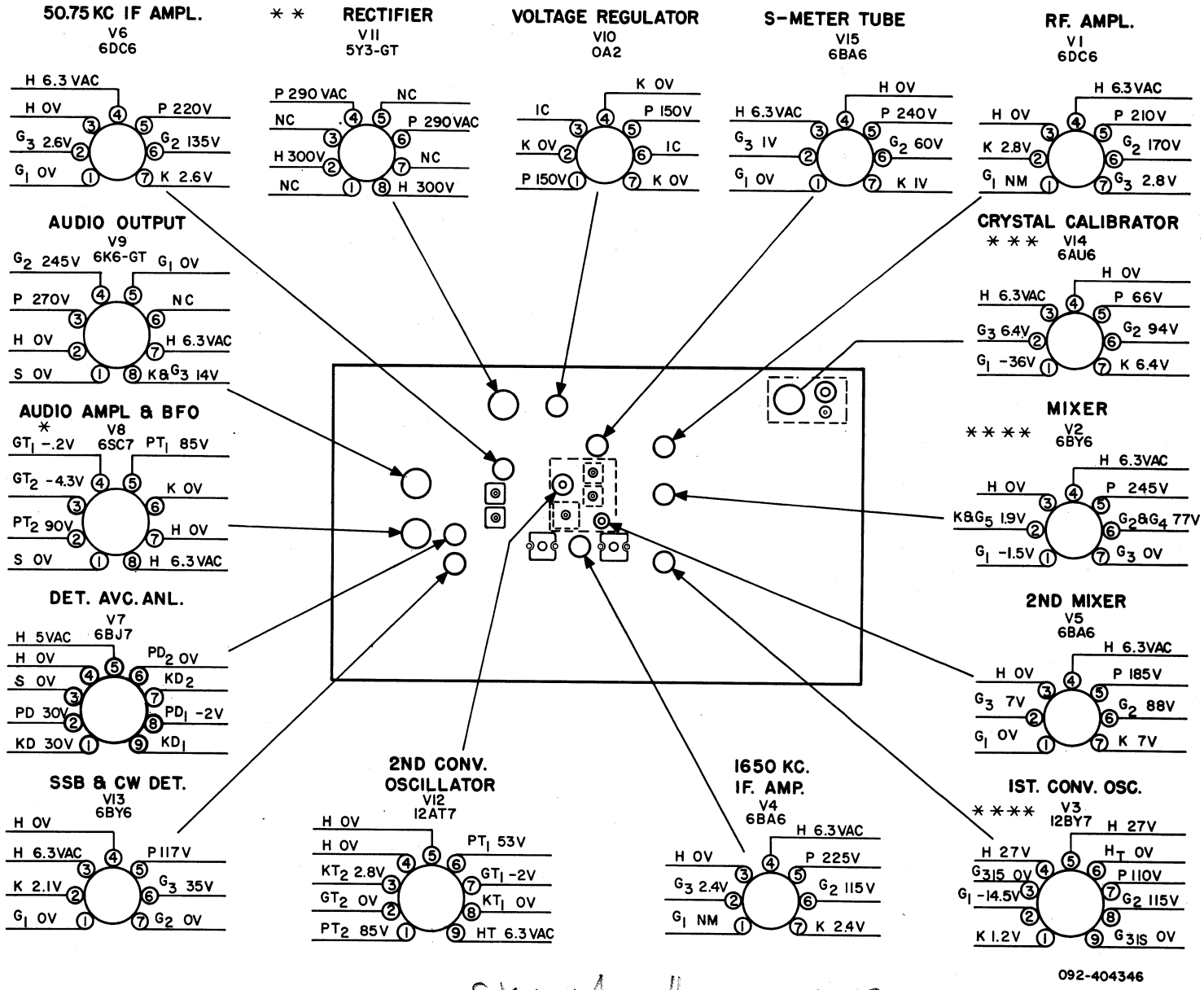


Figure 16. Voltage Chart

SX 101 A HALLICRAFTERS
EX. ESTATE 21 2 BR
JIM MILLS

SERVICE PARTS LIST

Schematic Symbol	Description	Hallicrafters Part Number
	CAPACITORS	
C1	240 mmf., 5%, N750; cer.	491-155241-95
C2	20 mmf., 10%, N750; cer.	491-106200-95
C3, 4	5-80 mmf. and 100-450 mmf. dual trimmer; mica compression	044-200479
C5, 13, 20	51 mmf., 10%, N750; cer.	491-106510-95
C6, 21	.005 mfd., cer. disc	047-200523
C7, 24, 26, 48, 66, 67, 68, 69, 201, 202, 207, 211, 302	.02 mfd., 500V; cer. disc	047-100242
C8, 23, 25	.005 mfd., 500V, +80-20%; cer. disc	047-100168
C9, 35, 52, 206	2.2 mmf., 10%; cer.	047-200403-04
C10	1500 mmf., 500V, 10%; mica	470-213152
C11, 31, 32, 44, 71, 80, 90	.047 mfd., 600V; molded paper	499-034473
C12, 15, 85	15 mmf., 10%, N750; cer.	491-106150-95
C14, 16, 17	5-50, 5-50, 100-350 mmf. trimmer; triple unit compression mica	044-100480
C18	300 mmf., 5%, N750; cer.	491-065301-95
C19	4-80 mmf., Trimmer; mica compression	044-200477
C22, 72, 96, 100	.022 mfd., 600V; molded paper	499-034223
C27	270 mmf., 500V, 10%; mica	470-213271
C28, 29	7500 mmf., 5%; mica	470-422752
C30, 70, 89	.22 mfd., 200V; molded paper	499-014224
C33, 34, 204, 205	390 mmf., 500V, 5%; mica	482-262391
C36A, B, C	Main Tuning Capacitor	048-400387
C37	3-50 mmf.; ant. trimmer	048-200313
C38	3-30 mmf., Trimmer; mica compression	044-200478
C39, 40, 41	5-50 mmf; each section mica compression insulated	044-100475
C42	110 mmf., 500V, 2%; mica	482-161111
C43, 73	.022 mfd., 400V, molded paper	499-021223
C45, 49	4700 mmf., 600V, 10%; molded paper	499-031472
C46, 50, 84, 303, 305	.01 mfd., 500V; cer. disc	047-100224
C47, 51, 75	.022 mfd., 600V; 10%, molded paper	499-031223
C54	180 mmf., 5%, N30; cer.	491-065181-35
C53, 55, 56, 57, 58, 59, 61	3-30 mmf.; air trimmer	048-200415
C60	680 mmf., N750; dura mica	482-261681
C62	100 mmf., N75; cer.	491-064101-42
C63	36 mmf., 2%, N330; cer.	491-004360-73
C64	24 mmf., 5%; dura mica	482-152240
C65	330 mmf., 2%; dura mica	482-161331
C74,	.001 mfd., 500V, 20%; cer. disc	047-100503
C76, 86	220 mmf., 10%, N750; cer.	491-156221-95
C77, 79	220 mmf., 10%; cer.	478-026221
C81	27 mmf., 10% ceramic	478-026221
C82, 94, 102	.001 mfd., 600V; molded paper	499-034102
C83	470 mmf., 20%; cer. tub.	483-221471
C87	.1 mfd., 200V; molded paper	499-011104
C88	.1 mfd., 600V; molded paper	499-034104
C91, 92	.01 mfd., 1400 W.V.D.C. (AC Line By-Pass)	047-200752
C93A, B, C	60-20-20 mfd., 450V; electrolytic	045-200113
C95, 203	100 mmf., 10%; cer.	491-026101-94
C97	560 mmf., 500V, 5%; mica	470-232561
C98	10 mmf., N4700; cer.	479-042100
C99	470 mmf., 500V, 10%; mica	470-213471
C101	10 mfd., 50V, electrolytic	045-100211
C103	470 mmf., 10%; cer. tub.	478-026471
C208, 209, 210	.01 mfd., 600V, 10%; molded paper	499-031103
C301	8-50 mmf., trimmer; N750	044-200437
C304	82 mmf., 500V, 10%; mica	470-213820
	***RESISTORS**	
R1, 6	22 ohm	451-252220
R2, 8, 21, 25, 58	1 megohm	451-252105
R3, 34, 37	180 ohm	451-252181
R4, 11, 17	15K ohm, 2W	451-652153
R5, 16	47K ohm, 1W	451-352473
R7, 77	3.9K ohm, 1W	451-352392
R9, 51, 61, 71, 304	220K ohm	451-252224
R10	330 ohm	451-252331
R12, 24	3.3K ohm	451-252332
R13, 44, 62, 65, 203, 204, 205, 206, 207, 303	100K ohm	451-252104
R14	15 ohm	451-252150
R15, 43, 79	100 ohm	451-252101
R18, 41	3.3K ohm, 1W	451-352332
R19	15K ohm, Variable; NOTCH ADJUST	025-201231
R20	5K ohm, Variable w/switch; NOTCH DEPTH	025-101723
R22	150 ohm	451-252151
R23	39K ohm, 1W	451-352393
R26	2 megohm, Variable; "S" Meter Calibrate	025-201052
R27	200 ohm, Variable; "S" Meter Adjust	025-200714
R28	820 ohm	451-252821
R29, 42	10K ohm, 1W	451-352103
R30	8.2K ohm, 1W	451-352822
R31	470 ohm	451-252471
R32, 33, 74	470K ohm	451-252474
R35, 38	220 ohm	451-252221
R36, 39	390 ohm	451-252391
R40, 48, 50, 52, 55, 63, 73	47K ohm	451-252473
R45, 208	22K ohm	451-252223
R46	10K ohm, 2W, 5%	451-651103
R47	2.5K ohm, 10W, W.W.	453-062252
R49	500K ohm, Variable; AF GAIN	025-201811
R53	10 megohm	451-252106
R54	270K ohm	451-252274
R56, 202	120K ohm	451-252124
R57	820K ohm	451-252824
R59, 60	6.8 ohm	451-252068
R64, 201	2.2K ohm	451-252222
R66	150K ohm	451-252154
R67	10K ohm, 2W, Variable; RF GAIN	025-201720
R68	330K ohm	451-252334
R69	3.3K ohm, 10W, W.W.	024-101218
R70	10K ohm	451-252103
R72	15 megohm	451-252156
R75	390 ohm, 1W	451-352391
R76	47 ohm, 1W	451-352470
R78	2K ohm, 10W, W.W.	453-062202
R80	68 ohm	451-252680
R81	100K, 2W, 20%	451-653104
R82	3.3 ohm, 1W	451-352033
R301	680K	451-252684
R302	4.7K	451-252472
	COILS	
L1	Coil, Ant. (Band 1)	051-202548
L2	Coil, Ant. (Band 2)	051-202291
L3	Coil, Ant. (Band 3)	051-202196
L4	Coil, Ant. (Band 4)	051-202197
L5	Coil, Ant. (Bands 5, 6, 7)	051-202198
L6	Coil, Mixer (Band 1)	051-202546
L7	Coil, Mixer (Band 2)	051-202289
L8	Coil, Mixer (Band 3)	051-202201
L9	Coil, Mixer (Band 4)	051-202202
L10	Coil, Mixer (Bands 5, 6, 7)	051-202203
L11	Choke, RF; 540uh., 10 ohm DC	053-100107
L12	Coil, T Bridge	051-102270
L13	Coil, Osc. (Band 1)	051-202547
L14	Coil, Osc. (Band 2)	051-202336
L15	Coil, Osc. (Bands 3, 7)	051-202337
L16	Coil, Osc. (Band 4)	051-202338
L17	Coil, Osc. (Band 5)	051-202339
L18	Coil, Osc. (Band 6)	051-202340
L19	Coil, RF	053-200475
L20	Choke, RF; 2.2 uh., 1.1 ohm DC	053-200193
L21	Choke, 9HY Filter; 135 ma., 260 ohms DC	056-200281
L22	Coil, BFO	054-200053
L201, 202	Choke, RF	053-400008
	TRANSFORMERS	
T1, 2	Transformer, 1st and 2nd I.F. (1650KC)	050-200733
T3, 4, 6, 7	Transformer, I.F. (50.75 KC)	050-200735
T5	Transformer, 2nd Conversion Oscillator	050-300734
T8	Transformer, Power	052-400678
T9	Transformer, Output	055-300264
T10	Transformer, Filament	052-100540
	SWITCHES	
S1A	Wafer, Antenna Input	062-200109
S1B	Wafer, Antenna Grid	062-200110
S1C	Wafer, Mixer Grid	062-200105
S1D	Wafer, Mixer Plate	062-200106
S1E	Wafer, Osc. Grid	062-200121
S1F	Wafer, Osc. Plate	062-200120
S1G	Wafer, Pilot Light	060-300989
S1H	Wafer, Converter Sw.	062-200149
S2	Switch, NOTCH FILTER; Part of R20	----------
S3, 8	Switch, SPDT TOGGLE; AVC (ON/OFF) and ANL (ON/OFF)	060-100139
S4A, B, C	Switch, RESPONSE	060-202072
S5A, B, C	Switch, SELECTIVITY	060-302073
S6, 7	Switch, SPST Toggle; CALIB/OFF and AVC (FAST/SLOW)	060-100138
S9A, B	Switch, DPST Toggle; RECEIVE/STANDBY	060-100192
	JACKS, PLUGS AND SOCKETS	
PL1	Line Cord and Plug	087-104690
PL2	Plug, Octal; Jumper	035-100003-01
	Socket, Tube; 7 Pin Min ("J" Lock) (V1, 2, 4, 5, 6, 13, 15)	006-200633
	Socket, Tube; 9 Pin Min ("J" Lock) (V3, 7, 12)	006-200672
	Socket, 5 Pin (V14)	006-100186
	Socket, 7 Pin Min (V10)	006-100644
	Socket, Octal (V8, 9, 11)	006-200296
SO1	Jack, Converter Input	036-100041
SO2	Connector, Coax	010-100056
SO3	Socket, Tube, Octal; ACCESSORY OUTLET	006-200296
SO4	Jack, PHONES	036-200210
XV1, 2	Socket, Crystal	006-200873
	TUBES AND LAMPS	
V1, 6	6DC6; RF Amplifier and 50.75KC IF Amplifier	090-901328

*All resistors are 10%, 1/2 watt, carbon type unless otherwise specified.

SERVICE PARTS LIST CONT'D

Schematic Symbol	Description	Hallicrafters Part Number
	TUBES AND LAMPS (cont)	
V2, 13	6BY6; Mixer and SSB-CW Det.	090-901114
V3	12BY7A; 1st Conv. Osc.	090-900041
V4, 5, 15	6BA6; 1650 KC IF Amplifier, 2nd Mixer and "S" Meter Tube	090-901112
V7	6BJ7; AM Detector, AVC and Noise Limiter	090-901113
V8	6SC7; Audio Amp. and BFO	090-900874
V9	6K6GT; Audio Output	090-900856
V10	OA2; Voltage Regulator	090-900001
V11	5Y3GT; Rectifier	090-901111
V12	12AT7; 2nd Conv. Osc.	090-900034
V14	6AU6; Crystal Calibrator	090-900808
LM 1 thru 7	Pilot Light, Type #47	039-100004
	KNOB AND KNOB SKIRTS ASSEMBLIES	
	Knob, PITCH CONTROL	015-001699
	Knob, AF or RF GAIN	015-001700
	Knob, SELECTIVITY	015-001701
	Knob, RESPONSE	015-001697
	Knob, NOTCH FREQUENCY	015-001703
	Knob, NOTCH DEPTH	015-001705
	Knob, BAND SELECTOR	015-001698
	Knob, POINTER RESET	015-001609
	Knob, ANT. TRIMMER	015-001702
	Knob, TUNING and LOGGING	015-001704
	MISCELLANEOUS	
	Bracket, Coil Mtg	067-107363
	Bracket, Dial Scale Mtg.	067-104283
	Bracket, Diffuser Mtg.	067-104296
	Bracket, Rear Ant. Trimmer	067-104293
	Bracket, Front Ant. Trimmer	067-104294
	Bracket, Rail Pointer Assembly	067-205594
	Bracket, Pot. Mtg.	067-104280
	Bracket, Rail Adj.	067-204286
	Bracket, "S" Meter Adj.	067-104204
	Bracket, Shield (Bandswitch)	067-204314
	Bushing, BFO Stop	077-102261
	Cabinet Assembly	066-401446
	Cabinet, Top	066-101444
	Cam Assembly (Main Tuning)	077-200914
	Channel, Rubber	016-200929
	Clip, Glass Mtg.	076-101815

Schematic Symbol	Description	Hallicrafters Part Number
	MISCELLANEOUS (cont)	
	Core, Iron IF and RF	077-100068
	Core, Iron, RF Osc.	003-101543
	Coupler, Flexible	029-100294
	Coupler, Solid	029-100264
	Cover, Bottom	066-302362
X3	Crystal Marker, 100KC	019-202351
	Dial, Cable	038-100042
X1, 2	Matched Crystal Pair Consists of One 1600KC Crystal and one 1700KC Crystal	019-201902
	Escutcheon, Front Panel	007-100751
	Foot, Mtg.	016-100029
F1	Fuse, 2 amp. Slo-Blo	039-100428
F2	Fuse, 1/4Amp. W/Leads	039-100344
	Fuse Holder (F1)	006-100451
	Gear (99 Tooth, 48 Pitch) Fixed	026-200514
	Gear (99 Tooth, 48 Pitch) Loose	026-200515
	Gear (55 Tooth, 48 Pitch)	026-200516
	Gear, Drive	026-200258
	Glass, Dial Scale (Calibrated)	022-400603
	Grommet, Meter	016-100200
	Light Diffuser	069-300954
	Lock, Line Cord (Male)	076-100953-01
	Lock, Line Cord (Female)	076-100953-02
	Panel, Front	068-400890
	Pilot Light Assembly (Meter)	086-200255
	Pilot Light Assembly (Dial)	086-200256
	Plate, Pointer Adjust	063-202365
	Pointer	082-300427
TS1	Post, Binding (Antenna)	088-100032
TS2	Post, Binding (Speaker)	088-100578
	Post, Latch	011-100226
	Rubber Channel, Escutcheon	016-100755
M1	"S" Meter	082-300428
	Separator, Light Diffuser	032-300713
	Shaft, Gear	074-201271
	Shaft, Bandswitch	074-201276
	Shaft, Rail Adj.	074-202154
	Shield, Light	069-400951
	Shield, Tube (7 Pin)	069-201191
	Shield, Tube (9 Pin) (12BY7A)	069-201189
	Shield, Tube (9 Pin)	069-201190
	Spring, Compression	075-200706
	Spring, Dial Wire	075-100570
	Trimount Stud	005-100006
	Window, Escutcheon	022-300537
	100 KC Marker Xtal Assembly	001-903832
CR1	Crystal Diode Type 1N295	019-201980

NOTES

NOTES