

PLAIN TALK

AND

Technical Tips

a monthly publication for the service industry prepared by:



RCA VICTOR



VOL. **9**

NO. **5**

MAY, 1966

PRODUCT PERFORMANCE
RCA SALES CORPORATION

CONTINUING CHASSIS

The KCS 144

Black and white television instruments for 1967 incorporate "continuing" chassis series as well as new chassis in its product line. This popular three IF receiver is transformerless powered and employs a 4 circuit tuner, the KRK 124. UHF is tuned by means of the transistorized KRK 120 UHF tuner.

Other features include: preset fine tuning, stay set volume control, built in dipole antenna, loop type UHF antenna, 20 KV high voltage, push button circuit breaker, high level video drive, automatic scene control, noise stabilization circuits, keyed AGC, quiet warm up, dark heater tubes and solid state silicon rectifiers.

The KCS 152

Another continuing chassis is the KCS 152D, a 16" portable receiver. A single solid copper circuit board contains the major part of the receiver circuits. It is a transformerless powered, two IF chassis using the KRK 123C VHF tuner (frame grid RF and converter) a three circuit tuner. A new high gain picture tube is employed, the 16CHP4.

Other features include a slide switch for internal-external VHF antenna selection, built-in UHF loop antenna and KRK 122 compact transistorized UHF tuner.

The KCS 155

The KCS 155 chassis is a 19" portable with top front tuning styled along the lines of the 16" portable. A three circuit KRK 127 tuner is used with frame grid RF and converter. UHF is tuned by the KRK 122. A VHF dipole and UHF loop type antenna are built-in.

The two IF circuitry along with most of the receiver circuit is contained on a single solid copper circuit board. An auto-transformer is used to power the low voltage power supply while the filament circuit is series connected across the AC line.

THE KCS 161 AND KCS 162

This year the KCS 161 chassis is used in several 21" black-and-white portable models. The power transformerless chassis uses 2 IF circuitry with a frame grid KRK 125 VHF tuner. Two solid copper circuit boards are used on the vertically mounted chassis. Circuit features include: Dipole VHF, loop type UHF antenna, voltage double B+ supply, adjustable AGC, fixed sync stabilization, adjustable width coil, vertical—horizontal blanking, and 20 kv high voltage. The KCS 161 uses the KRK 122 transistorized UHF tuner.

The KCS 162 portable chassis is similar to the KCS 161 with the exception of the VHF tuner which is a four circuit KRK 128 nuvistor type. Two IF circuitry, vertical chassis, two solid copper circuit boards characterize this 21" transformerless chassis. Additional features include an adjustable width coil, vertical and horizontal blanking and 20,000 volts of high voltage.

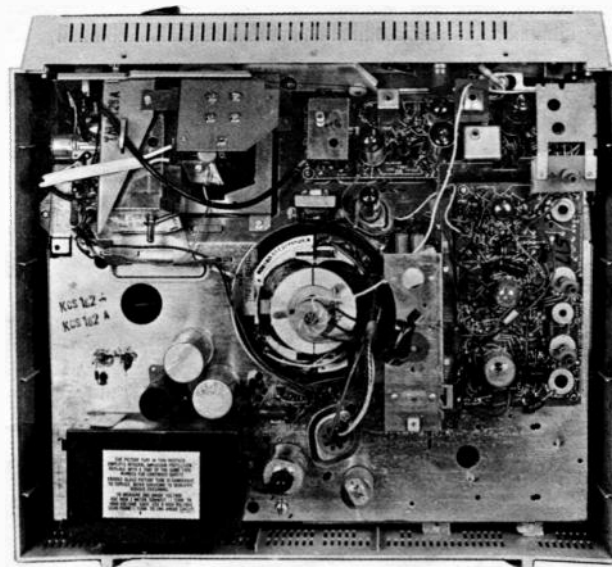


Figure 1—KCS 162 Chassis

THE KCS 136

Several lowboy consolettes employing the popular KCS 136 chassis continues in 1967. The KCS 136M chassis using a 23" picture tube, and a KRK 124 VHF with the KRK 120 UHF tuner delivers high performance large screen black and white pictures. Some of the features of the KCS 136M are: 22,500 volts of high voltage, horizontal and vertical blanking, three IF circuitry, 4 circuit VHF tuner, power transformer, lighted numerals on VHF and UHF channel indicators, two 7" x 5" oval speakers, and many other circuit refinements.

THE KCS 153X

The 12" transistorized portable television continues in 1967 as the KCS 153X. This solid state receiver now incorporates an *Integrated Circuit* in the sound section of the chassis. The KCS 153X by making use of this advanced device becomes the first TV in history to utilize the integrated circuit.

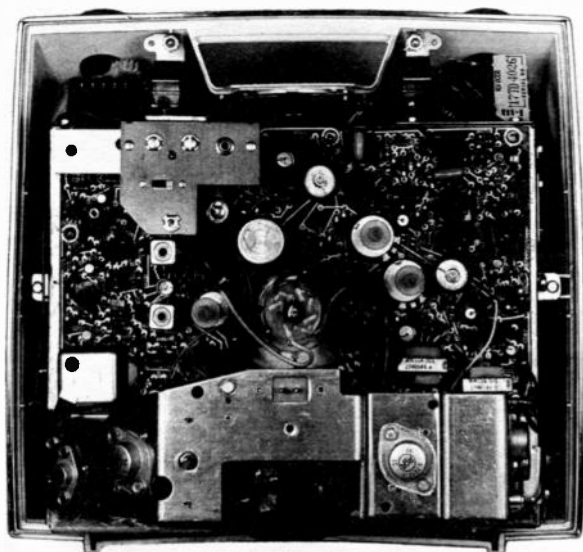


Figure 2—KCS 153X Rear View

Other changes in the basic KCS 153 include a video bias adjustment which sets the operating level of the video amplifiers. It is adjusted for a reading of 20 to 25 volts at the 2nd video collector with the picture IF stage biased off. A new RF amplifier transistor, type 3504 is used in the KRK 126B VHF tuner. An accessory stand is available which permits rotating the instrument to various viewing positions.

THE KCS 159

The KCS 159 is a transformer powered horizontally mounted chassis. Instruments using the KCS 159 use the 19DQP4 picture tube. This continuing chassis includes a solid state AGC stage, and a solid state sound IF stage. The two stage IF circuit uses a 6EH7 frame grid tube in the first IF to match the input circuitry to the KRK 133 VHF tuner, and a 6JC6 frame grid tube is used as the second IF.

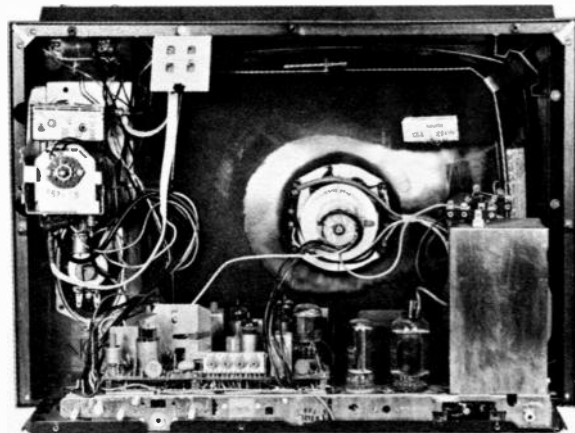


Figure 3—KCS 159 Chassis

The KCS 159 uses a separate "sync and sound amplifier," the pentode section of a 6GH8A.

The AGC transistor (NPN type 3505) receives a positive pulse from the horizontal output circuit driving it into conduction during sync time. Sync

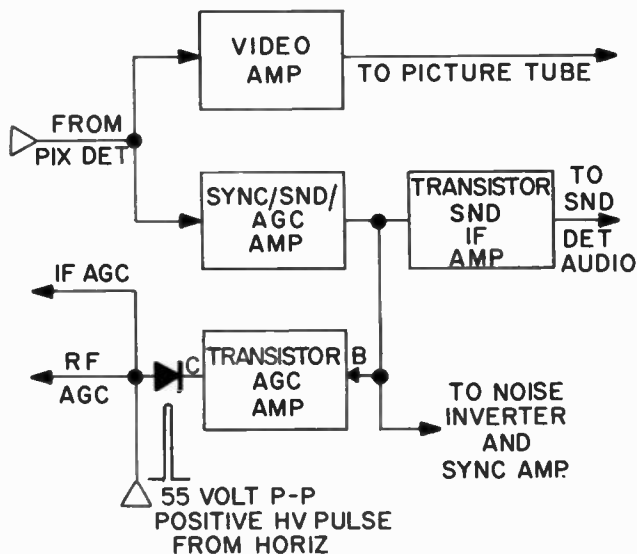
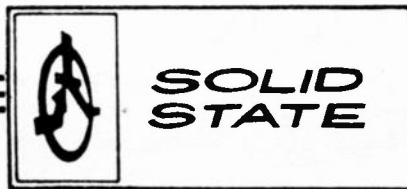


Figure 4—KCS 159 Solid State Sound IF and AGC

tips are fed to the base of the transistor and an AGC control establishes its base bias. A negative voltage proportional to signal level is produced at the collector and is used for AGC control of the RF amplifier and the first IF amplifier. A diode is used at the collector of the AGC amplifier to prevent the forward biasing of the collector-base junction by the developed AGC voltage.



THE INTEGRATED CIRCUIT

RCA recently introduced the first TV set in history to employ an INTEGRATED CIRCUIT. The 12-inch, black-and-white portable model (KCS 153X) is a solid state unit with an integrated circuit chip that performs the functions of 26 conventional components in the set's sound system. Integrated circuits in home entertainment products means greater reliability, improved performance characteristics and longer operating life.

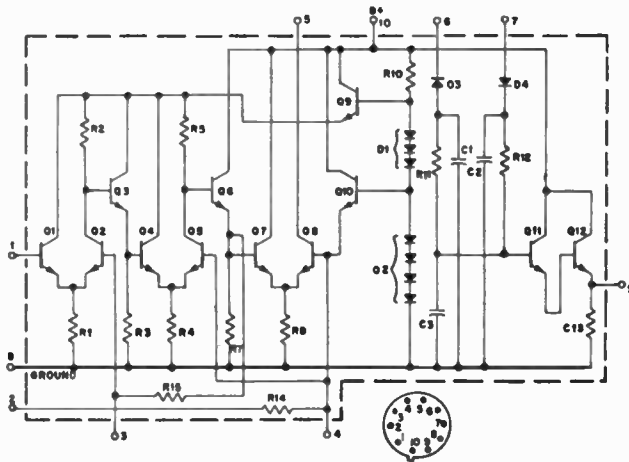


Figure 5—Integrated Circuit-Equivalent Circuit

Making The Integrated Circuit

Integrated circuits are made on a silicon disc or wafer through selective alteration—an extension of the transistor technology. Oxides are grown on the wafers, then covered with photo-sensitive lacquers. A special process is used to etch circuit patterns into the oxides;

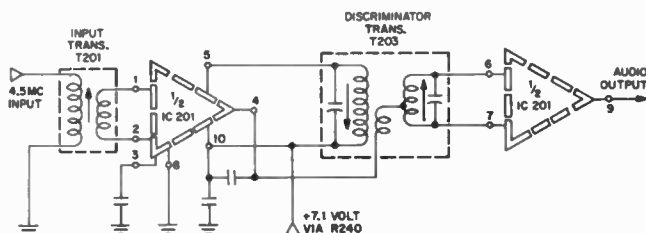


Figure 6—Schematic Of IC Sound Section

the wafer is further processed by diffusing minute quantities of dopants such as phosphorous, boron, or arsenic into the silicon. The process is repeated until the various circuit components—capacitors, resistors, transistors, transistor emitters, and diode cathodes—are completed. Interconnections of the various com-

ponents are then accomplished by vapor deposition of aluminum in desired patterns to form the completed circuits.

The wafer, containing hundreds of integrated circuit "chips" is then scored with precision accuracy, the chips are then separated and mounted on ceramic or metal bases. Thin aluminum wires are bonded between the circuit connection points terminal leads of the unit. The assembly is then hermetically sealed in a case ready for installation in a product.

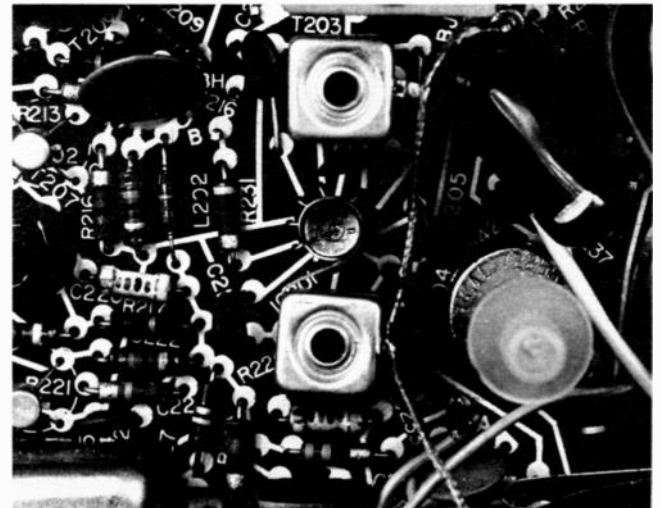


Figure 7—Close Up Of The Integrated Circuit

Servicing The Integrated Circuit

It is recognized that the Integrated Circuit is a rugged unit and does not damage easily. Therefore, in the event of audio trouble, the "chip" should be considered the least likely cause of audio trouble.

A general procedure to follow when servicing is:

- (1) By means of signal injection determine whether or not the circuits following and preceding the Integrated Circuit are functioning.
- (2) Pass a signal through the circuit which incorporates the Integrated Circuit. If the trouble appears to be in this area . . .
- (3) Check voltages on the pin connections of the Integrated Circuit device. These voltages are given in the service literature and are very significant.
- (4) Check all external components associated with the Integrated Circuit before replacing the "chip".

If replacement is required exercise care in removal and installation of the unit.

SEALED SPEAKER SYSTEM

New this year in RCA's top-of-the-line VHT 71 and VHT 75 high fidelity stereo instruments is the use of **HIGH COMPLIANCE** sealed speaker systems. The sealed speaker system reproduces with great clarity a frequency range of 30-20,000 cps. In order to fully utilize the capabilities of the speakers an RS 211-C amplifier together with an RC 1218T-tuner is used to make up the complete music system.

The closed-back cabinet offers more realistic bass reproduction for a given instrument size than is obtainable using open-back cabinets. The SEALED, closed-back speaker system makes it possible for a stereo instrument to deliver unbelievably powerful bass that extends to the lowest limit of hearing.

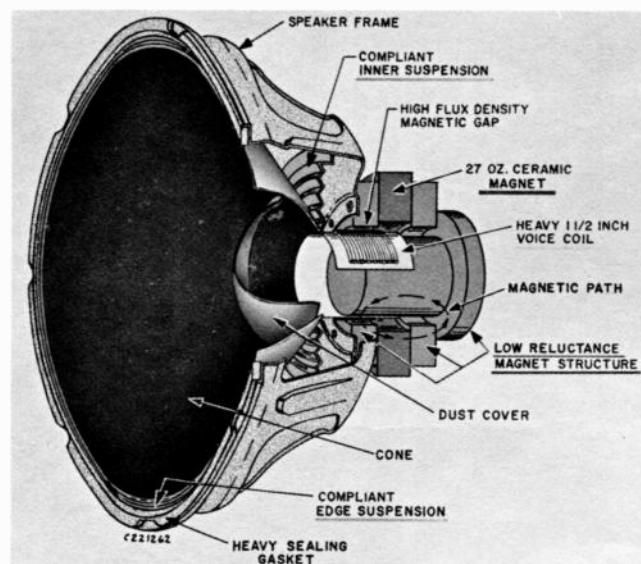


Figure 8—15" High Compliance Speaker

The 15 inch low frequency speaker (woofer) has a 27 ounce CERAMIC magnet assembly, this together with a heavy-duty 1½ inch voice coil makes the speaker capable of handling the high power peaks that are necessary for faithful bass reproduction. Due to the sturdy cone and compliant suspension the woofer has a free air resonance of about 15 cps. The speaker system also includes a special sealed type 7x5 inch speaker and a 2 kc exponential horn, for reproduction of the mid-range sound. The high frequencies up to 20,000 cps are reproduced by a special hard cone 3½ inch speaker.

The 15" woofer when driven must move against the cushion of air that is trapped in the sealed enclosure. This air cushion very effectively controls and limits the excursion of the cone and raises the speaker resonance to a practical value.

THE KCS 160

This 19" chassis is used in model series AH-066. A vertical chassis is used with 2 IF circuitry. The low voltage supply is furnished through an autotransformer while the filament circuit is series connected across the line.

Some of the chassis features of the KCS 160 are: KRK 127 frame grid 3 circuit VHF tuner. KRK 122 miniature transistor type UHF tuner. 20 KV high voltage, fixed AGC and SYNC stabilization. Adjustable width control (potentiometer) monopole VHF antenna, loop type UHF antenna, spot elimination in brightness control circuit, vertical and horizontal blanking.

THE KCS 164

The KCS 164 19" portable is used in model series AH-074. This chassis while similar to the KCS has several variations which add to its performance. A dipole antenna for VHF and a loop type UHF is used. Autotransformer B+ supply with series connected tube filaments is used in this 2 IF receiver. A new



Figure 9—KCS 164 Chassis

frame grid 4EH7 1st picture IF amplifier is employed and the RF unit is the KRK 133C nuvistor, 4 circuit VHF tuner. The KRK 122 miniature, transistor type UHF tuner serves for UHF reception. Other features of this chassis include: 20 KV high voltage, spot elimination, vertical and horizontal blanking, fixed AGC circuitry and a width potentiometer.

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