

PLAIN TALK

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PRODUCT PERFORMANCE
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NEW RS 238 AMPLIFIER

Deluxe 70 series stereo consoles for 1968 are equipped with the new 500 peak-watt solid-state RS 238 amplifier. This 10 transistor, 6 diode stereo amplifier is constructed on a fabricated steel chassis.

Separate aluminum "wing" type heat sinks, that are insulated from the chassis by use of plastic spacers, serve to cool the four output stage transistors. This means that the heat sinks operate at collector potential

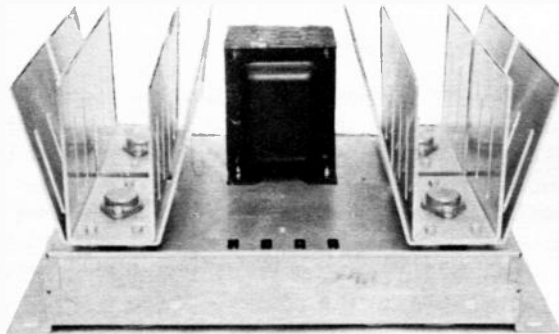


Figure 1—RS238 Chassis View

—so there is a possible 72 volts potential difference between individual heat sinks. Although mica insulators are no longer used, the transistors are still coated with silicon grease to produce a good thermal bond between the transistor cases and the heat sinks.

Resistive losses in the output stages are minimized by wiring the transistors directly into the circuit—sockets are not used, due to the high operating currents.

The chassis side aprons on the RS 238 are equipped with jacks to connect the RC 1218 tuner. Terminals are also provided for loud speaker connections and for record changer power. A two terminal socket is provided for connection of an outboard mounted protective circuit breaker. The circuit breaker interrupts power transformer primary voltage in the event of circuit malfunction.

STEREO TAPE RECORDERS

Three new 7" reel-to-reel stereo tape recorders are included in the 1968 RCA Victor product line. All three stereo recorders are equipped with ¼ track heads (erase and record).

Two models, the YJG 42 and YJG 52 are housed in portable cabinets. These units include a stereo play-back amplifier and speaker system.

The product line also features a tape module attachment that is designed to be used with an external stereo amplifier. The MJG 66 module is mounted in an attractive walnut finished base that harmonizes with most cabinet designs.



Figure 2—Model YJG42

All three models have individual RECORD LEVEL/PLAYBACK LEVEL controls for each channel, individual RECORD LEVEL METERS, SOUND + SOUND, and three speed operation—1⅞, 3¾, 7½ ips. In addition, front panel jacks are provided for the left and right channel microphones and left and right channel auxiliary inputs. Pushbuttons are provided for mechanism control including, Channel 1 Record, Channel 2 Record, Play, Fast Forward, Rewind and Stop.

Model Features

Additional features distinguish the individual models. Both YJG 42 and 52 have individual TONE controls for each channel.

The YJG 42 is housed in a compact cabinet which also contains the two 6½" speakers.

The deluxe YJG 52 features lighted RECORD LEVEL meter and detachable wing speaker systems. Each

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UHF ANTENNAS

UHF antennas in general are smaller, less conspicuous and offer much less wind resistance than VHF antennas. However greater care should be exercised when installing a UHF antenna since the orientation and placement of the antenna is somewhat more critical than with VHF.

The question of which antenna is most suitable for a particular UHF installation is of major concern to the service technician. Simplicity of construction (cost), the ease of installation and the resulting picture quality are the factors to consider in any antenna installation.

With these factors in mind, a standard approach may be taken toward each new UHF installation.

It has been demonstrated that under many conditions, the indoor antenna may perform satisfactorily. When results indicate that the indoor antenna does not produce a satisfactory picture, it will be necessary to make use of an outdoor antenna for UHF reception.

There is a wide selection of good UHF antennas available today. The choice of outdoor antenna type will have to be based upon the actual signal conditions at any given location.

The *Corner Reflector* antenna is designed for high gain and good directivity throughout the UHF band. This is recommended for locations where the signal is weak or reflections are a problem. An illustration of this antenna and the gain characteristics are shown in Figure 3.

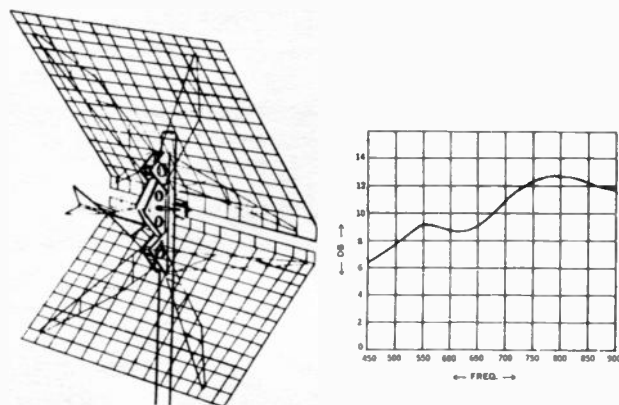


Figure 3—Typical Corner Reflector and Gain Chart

The *"Bowtie"* antenna is an inexpensive antenna which is considered flexible in operation because of the many ways it may be employed. This antenna may be used singly, in pairs, without reflectors or with reflectors. Stacking the dipoles increases gain and adding reflectors provides unidirectional characteristics. The *"Bowtie"* is a very rigid antenna and small in size. Operation at the VHF frequencies is only fair but in strong signal areas it could be used for combination VHF-UHF operation, provided no reflection problems are encountered. An illustration of this antenna and its gain characteristics are shown in Figure 4.

The *Yagi* antenna is useful in the UHF spectrum as

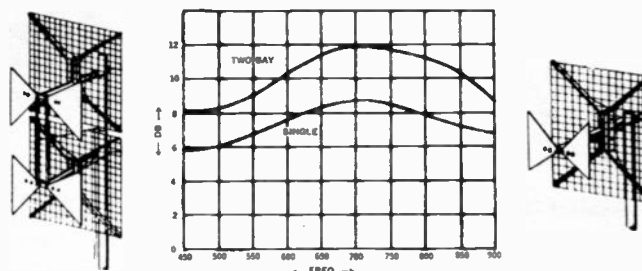


Figure 4—Typical "Bowtie" Antenna and Gain Chart

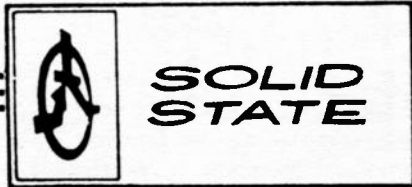
well as in the VHF band. The gain of this antenna is exceptionally high and it has a narrow band characteristic. The Yagi is a high performance antenna with respect to reflection elimination and unwanted signal reduction. Also, in areas where there is only one UHF channel and the receiver is in a fringe section, this antenna will provide the high gain necessary for good reception. These antennas may be "stacked" to provide even higher gain. In general, the Yagi is considered a "one-station" antenna and for this reason its use will be limited compared to the types previously described.

Antenna Installation

One common method of installing an outdoor UHF antenna is to mount the UHF antenna on the existing VHF antenna mast. In this case, either a separate UHF transmission line or a common VHF-UHF line may be used. If a common lead-in is used, a crossover network must be employed to match the outputs of the two antennas to the common lead-in. This network may be installed on the same mast with the antennas for the convenience of making connections.

Since the reception of UHF signals is rather critical with respect to antenna location and orientation, the VHF antenna mast (with a UHF antenna mounted on it) may be found to be situated in a poor location for UHF reception. In such cases it will be necessary to either relocate the VHF-UHF antenna mast for better UHF reception (without a sacrifice to VHF reception) or use a separate mast for the UHF installation. If a separate mast is used, it is advisable to use a separate transmission line which will keep losses at a minimum. However, even though a separate mast is used, it still may be practical to use a crossover network at the UHF antenna and have a common UHF-VHF line from there to the receiver.

Many experienced technicians place strong emphasis on the "survey" system of determining the proper antenna to be used for each installation. This might seem to be an expensive way to make an installation; but if the job is right at the time of initial installation, costly readjustments are eliminated, and optimum performance is realized.



RS 238 CIRCUITRY

Several interesting circuits are used in the new 500-peak-watt RS 238 amplifier. The first circuit area of special interest is the direct coupled predriver/driver circuit.

Predriver/Driver Stages

Due to the higher driver power requirements of the output stages a predriver/driver circuit is used in the RS 238. The predriver is a PNP transistor which acts as a voltage amplifier. The stage has an input impedance of about 1500 ohms to properly match the requirements of the preamplifier in the RC 1218 tuner. The direct-coupled driver stage utilizes an NPN power transistor

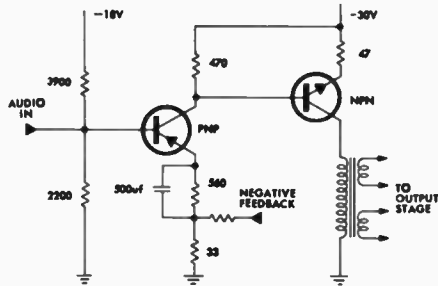


Figure 5—RS238 Predriver/Driver Circuit

—base is directly coupled to the collector of the voltage amplifier transistor. Signal from the predriver stage appears across the 470 ohm predriver collector load resistor. It is evident in Figure 5, that signal from the predriver stage is applied between the base and emitter of the NPN driver transistor and is amplified by the driver transistor.

The Class "A" driver stage operates from a -30 volt source and supplies approximately .3 watts at very low distortion to the bases of the output transistors.

Output Stages

The output stages in the RS 238 employ specially selected high beta alloy junction power transistors. These devices were selected because of their excellent beta linearity—yields low distortion at high power levels. Two power transistors are used in each channel in a familiar stacked Class "B" arrangement utilizing a positive and negative 36-volt supply. These output transistors are required to supply about 25 db's of power gain when driving the 4-ohm sealed speaker system used in the VJT 70 series instruments.

Low distortion and excellent stability result from using negative feedback (in excess of 20 db) to re-

duce the internal amplifier impedance to about 1/3 of an ohm over the entire audio range.

Power Supply

Two independent rectifier/filter systems are used in the RS 238 power supply. The output stages are

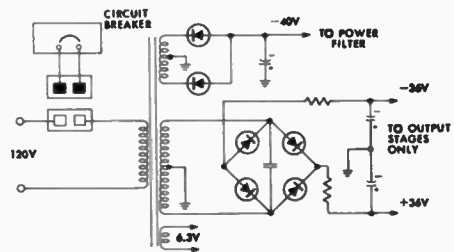


Figure 6—RS238 Power Supply Circuit

powered by a center-tapped bridge that produces ± 36 volts. (A 36 volt supply can be used at these high power levels because the loudspeaker voice coil impedance has been reduced to 4 ohms in instruments using the RS 238 amplifier).

An auxiliary power supply operates from another secondary on the power transformer to furnish power for the remaining amplifier circuits and the RC 1218 tuner. This full-wave circuit serves as a source -40 volts. After filtering, the -40 volts is applied to the collector of a power filter circuit transistor.

Output from the power filter is a well-filtered -30 volts. This 30 volt source furnishes emitter voltage to

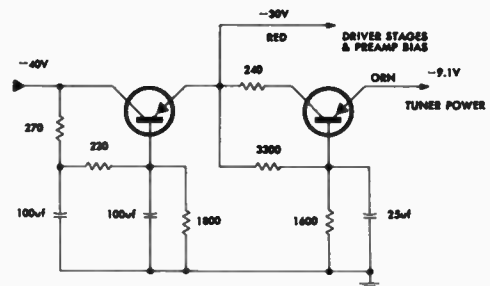


Figure 7—RS238 Power Filter Circuit

the NPN driver transistors. The predriver transistor bases are supplied from -18 volts that is obtained by a dropping resistor from the -30 volt supply.

A second power filter transistor is used to obtain voltage (-9.1V.) for the AM/FM and MPX circuits in the RC 1218 tuner. The voltage at this point is very stable and no zener diode regulation is required.

STEREO TAPE RECORDERS

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Figure 8—Model YJG52

speaker wing contains a 9-inch oval speaker and a 3½ inch high frequency unit.

The MJG 66 tape module has no internal speakers. Its output is terminated via 6-foot cables with standard phono plugs for connection to the external stereo amplifier.

Circuit Description

The record/playback amplifier and bias oscillator circuits used in these tape recorders are similar in most respects. In examining of channel of the stereo tape amplifier it is found that the circuit includes three RC coupled preamplifier stages to feed a transformer coupled driver stage. The driver stage provides signal to a stacked Class "B" output stage.

A push/pull bias oscillator circuit is utilized for each channel providing both AC bias and erase.



Figure 9—Model MJG66

There are however, circuit variations between the individual models. Basically, the deluxe YJG 52 differs from the 42 in two ways. The audio output stages have been modified to produce increased audio power, this also requires higher power supply voltages. The YJG 52 also uses additional sections on the record/play switch to turn the record level meter lamps on and off when the unit is switched between modes.

In the MJG 66 tape module, the driver and power output stage components have been omitted and signal is taken from the last preamplifier stage.

THE RS 237 AMPLIFIER

The new 150 peak-watt RS 237 solid-state stereo amplifier is used in this year's VJT 60 stereo console series—replacing the familiar RS 209. All circuitry is contained beneath a fabricated steel chassis. Two aluminum heat sinks for the output transistors (one for each channel) are located on top the chassis. Tuner power connections, cabinet lighting and speaker system terminals are mounted on the sides of the chassis.

Circuit Description

Six transistors (three in each channel) are used in the RS 237. In each channel a single transistor is used in a Class "A" driver stage which is transformer coupled to a familiar "stacked" Class "B" output stage. A packaged circuit contains most of the driver stage components for both channels.



Figure 10—RS237 Chassis

The "stacked" output stages resemble those of the RS 209 except the dual power supply voltages have been increased to negative and positive 25 volts in order to obtain increased power.

The center tapped bridge power supply employs a packaged silicon bridge rectifier (stud-mounted) and two 1500 mfd filter capacitors to supply ± 25 volts. Negative voltage is applied to the collectors of the output transistors and the positive voltage to the output stage emitters.

Power for the audio driver stages and the RC 1218 tuner is obtained through dropping resistors and decoupling capacitors from the -25 volts supply. Approximately -14 volts is applied to the driver stages. The preamplifier in the tuner is furnished -18 volts. A zener diode regulator supplies 9.1 volts to operate the AM/FM and multiplex circuits in the radio tuner.

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