RCA
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XL-100 Chassis Service Aids

RCA's XL-100 modular color chassis represent the most serviceable chassis ever produced by RCA. Serviceability is maximized by the use of twelve AccuCircuit® plug-in modules which contain a large percentage of the chassis circuitry. To further enhance serviceability, RCA Parts and Accessories, in cooperation with the Consumer Electronics Division, has made available a "Color TV Module Caddy" (RCA Stock Number 12H190) which contains a kit of the most-used modules. The module caddy features an attractive gray case, with chrome accents and attache-case styling, that will certainly add professionalism to your XL-100 home servicing.

Included in the module caddy is the red "RCA Home Service Handbook" developed by the Technical Training activity of RCA Consumer Electronics. This handy publication contains eight tab-indexed sections which group together problems associated with specific circuit areas. A typical page begins with a "Symptom Description" that often shows a screen photograph of the subject symptom. This is followed by a "Service Procedure" that shows how to correct the problem in a step-by-step manner.

In addition to the module caddy and "Home Service Handbook," a special "XL-100 Components Kit" is available from Parts and Accessories—RCA Stock Number 12H195. This kit contains the power devices (transistors, SCR's, etc.) needed to service RCA modular XL-100 chassis in the home.

Additional XL-100 service aids are the Service Data and Technical Training Programs offered by RCA Consumer Electronics. If you are not participating in the training workshops or wish to renew your Service Data subscription, see your RCA Consumer Electronics Distributor today.

Figure 1—XL-100 Service Aids

PS

A publication for the service industry prepared by RCA Consumer Electronics

Master Chro-Bar/Signalyst

RCA Electronic Components Division is now offering the service industry the most advanced generator for television servicing ever developed by RCA. The new features and functions of the WR-515A Master Chro-Bar/Signalyst introduce entirely new concepts in color TV set-up and servicing procedures.

This new test instrument provides test-signal outputs not only at RF (channel 3), but also at IF (45.75 MHz) and video (4-5 MHz). This choice of output frequencies provides servicing capabilities not possible with other generators. Now, you can use the output signals in stage-by-stage troubleshooting techniques, using the receiver screen to observe the effect of the patterns as they are processed by the various stages. By applying the signals at different points throughout the receiver, defective stages can often be quickly isolated. This troubleshooting system can be very useful in servicing modular TV chassis.

Digital Circuitry

Digital IC circuits are used in the WR-515A to provide stable patterns over a wide temperature range, and line voltage range. Digital circuits means there are no counter-alignment controls to require readjustment. Further stability and trouble-free operation is assured because all signals are derived from crystal-controlled oscillators.

Test Signals

The WR-515A provides the test signals required for adjusting convergence, color-phasing, gray-scale tracking, purity and linearity of color television receivers. Patterns include bars, dots, crosshatch, horizontal and vertical lines, and blank raster. The vertical and horizontal patterns can be selected in groups of three or ten lines. The output level of RF, IF, or video signals is adjustable. The vertical line and dot brightness is also adjustable.

A low-impedance video output is provided which will drive a 75-ohm video amplifier for closed-circuit TV system applications. A choice of positive or negative sync polarity is provided.

A new pattern called **"SUPERPULSE"** has been included in the WR-515A. This signal appears as a white rectangle in the center of the screen. The **SUPERPULSE** has many applications, including adjusting gray-scale tracking (checks high-lights and low-lights simultaneously), and checking for picture problems such as smearing, ringing, and video peaking. For troubleshooting applications, you can inject the **SUPERPULSE** signal at the RF, IF, or video test points and use an oscilloscope to trace the waveforms through the receiver.

The color bar pattern provides the traditional 10 bars, including R-Y, B-Y, −(R-Y), I and Q signals, spaced at 30 degree phase intervals. This pattern useful for checking color phase and matrixing circuits, and adjusting automatic frequency phase control (AFPC). Narrow brightness pulses are added at the edges of each color bar to aid in checking the "fit" or registration of the brightness and color signals.

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Figure 2—WR-515A Master Chro-Bar/Signalyst

Automatic Cassette Eject

The YZD 572 and YZD 573 cassette recorders have a feature that automatically ejects the tape cassette at the end of the tape or when the power is turned "off." A special circuit senses the end of the tape or that the power is "off" and ejects the tape cassette. When the cassette is ejected at the end of a tape, the instrument is turned "off."

Figure-3 shows the simple circuit used for this function. A solenoid (S.D.C.) ejects the cassette when energized by the conduction of transistor Q14. Tape-motion-sensing switch S14 is part of the tape-supply spindle. When the tape is moving, the moveable wiper of S14 alternately closes the contacts of the switch—much like the brushes and communtator of a DC motor. When the tape motion stops, switch S14 can be open or touching either contact. When the tape is moving, transistor Q13 conducts because increased base current is available. The base current for Q13 serves as charging current for capacitor C208. Capacitor C208 never reaches a full charge because the tape-motion sensing switch (S14) alternately connects C209 across C208 and then discharges it. This action assures continuous base bias for Q13 while the tape is in motion. When the tape stops, S14 no longer cycles and C208 assumes full charge. With C208 fully charged, Q13 has no base

Figure 4—Model YZD 573

current and is cut off. When Q13 is not conducting, transistor Q14 conducts and energizes a solenoid. As the cassette is ejected, S10 (discharge switch) closes and discharges C208. This prevents the cartridge from being ejected if it, or another, is immediately reinserted. Diode D3 forms an alternate discharge path for capacitor C208.

The cassette is also ejected when the power is switched "off" because the emitter voltage of Q13 decays much faster than the base voltage due to the charge on capacitor C208. Thus Q13 switches "off" within one second after the power is re-

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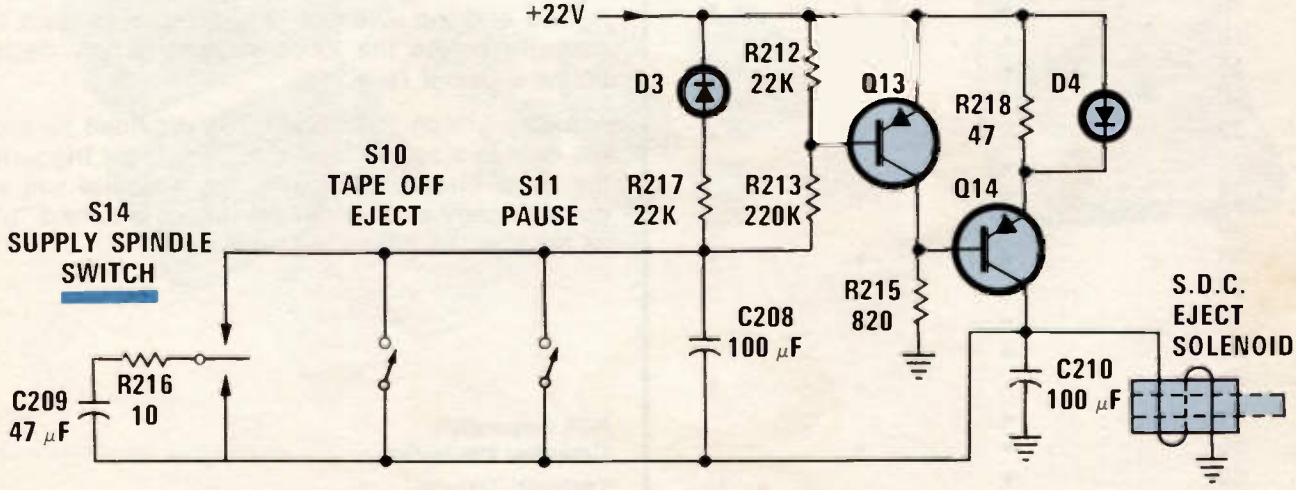

Figure 3—YZD 572 and YZD 573 Automatic Cartridge Eject Circuit

Preferred Values

Have you ever questioned some of the resistor and capacitor values found in electronic equipment?

Have you wondered why designers assign an odd value such as 47K to a resistor instead of 45K or 50K? Or wonder about a .22 μF capacitor? And a 68 ρF capacitor, and ask why not .20 μF and 70 ρF? There is good reason for the selection of such values, and it has to do with convenience in stocking components more than the requirements of the circuit.

A list of preferred values is used for determining component values and the system works like this: Using a base of 10 and a tolerance of 5%, each value should be selected so that the next value will not duplicate or overlap the previous value when the tolerance is considered. For instance, starting with 10$\pm$ 5% (which means anything between 9.5 and 10.5) the next value should have a lower limit (allowing for the tolerance) of 10.5. Thus the next value would be 11. Notice that this is just twice the tolerance (of the previous value) above the previous value. Therefore a series of values can be set up with each successive value picking up where the last value leaves off. A study of the chart shown below reveals how the system works. Notice that in 10% tolerance fewer values are available and in 20% still fewer. The 10% column, which is the most popular resistor tolerance, contains the most familiar resistor values.

VALUES	5%	10%	20%
10	•	•	•
11	•		
12	•	•	
13	•		
15	•	•	•
16	•		
18	•	•	
20	•		
22	•	•	•
24	•		
27	•	•	
30	•		
33	•	•	•
36	•		
39	•	•	
43	•		
47	•	•	•
51	•		
56	•	•	
62	•		
68	•	•	•
75	•		
82	•	•	
91	•		

Master Chro-Bar

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A special color bar "mark" function places a brightness line on the 3rd, 6th and 9th (red, blue, and blue-green) bars. This feature provides positive identification of the bars and eliminates the confusion that can arise if a bar is "missing" due to overscan, or if the colors are out of sequence due to AFPC misalignment.

The WR-515A dot pattern is used primarily in convergence adjustment. The pre-shoot and over-shoot area (small black edging preceding and following each dot) can be used to estimate the overall quality of the receiver alignment.

The crosshatch, vertical line, and horizontal line patterns are used to adjust linearity, overscan, and pincushion in both black and white and color receivers, and as an alternate pattern for adjusting convergence. The line and dot patterns can be selected in combinations of three or ten. A blank raster function is also included. It provides a smooth, noise-free white raster as required for adjusting purity.

The new Master Chro-Bar generator features color-coded pushbutton switches to short out the picture tube control grids as required in convergence and purity adjustments. A removable cable with special piercing clips is provided for connection to the grid leads of the picture tube guns. Accessories supplied include the gun-killer cable, a shielded output cable, a 75-to-300-ohm matching transformer unit, and a direct output unit. A bracket is located on the rear of the instrument for convenient storage of the test leads.

Cassette Eject

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moved and the solenoid is energized to eject the cassette before the 22-volt power supply decays below a useful level.

A pause button (switch S11) is provided to allow the user to stop the tape motion without triggering the eject circuit. Obviously, the cassette will not automatically eject when the power is turned "off" as long as the pause button is "on."

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