

## Learning to Test CRTs with the CR70's Universal Adapter

The CRT sockets supplied with the CR70 Universal CRT Analyzer and Restorer allow you to test most of the CRTs found in receivers, monitors, scopes, cameras, or any product with a CRT. A few CRTs, however, use special sockets that do not match any of the CR70's supplied sockets. The Universal Adapter lets you connect the CR70 to these special CRT bases.

The Universal Adapter, a CR70 supplied accessory, has one socket-like end that plugs into the CR70 test cable and one end

that extends out to five clips. Along with the CR70, the Universal Adapter lets you compensate for any CRT wiring scheme, enabling you to test any CRT built.

### Advantages of Using the Universal Adapter

Conventional CRT testers require you to buy special sockets to test special CRTs. The Universal Adapter saves you time and money since you don't have to pay extra money or wait for unneeded sockets. You

may pay 15 to 30 dollars, wait up to eight weeks for delivery, and then only use the oddball socket once. With the Universal Adapter and the CR70, you can test the special CRT on the spot without hassle.

### What's the Difference Between Sockets and the Universal Adapter?

There really isn't much difference between using the regular sockets and using the Universal Adapter. When you use a regular

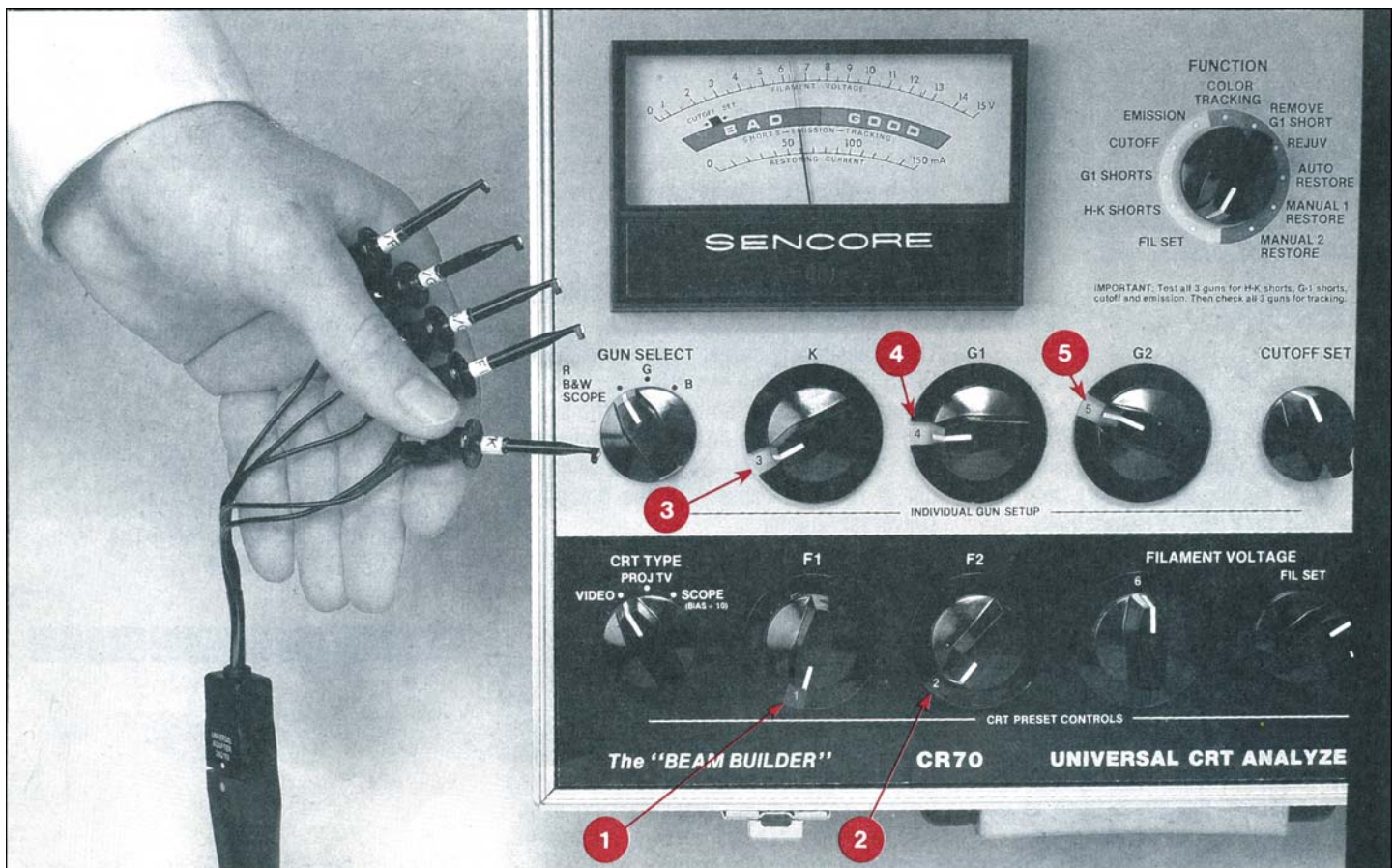


Figure 1. The human eye sees energy in a small slice of the electromagnetic spectrum as visible light.

socket, the CR70's setup switches match the individual testing elements to the actual pin numbers on the tube through the socket.

When you use the Universal Adapter, however, you adjust the CR70 front panel switches to match the testing elements of the Universal Adapter. Then you use the numbers in the setup book to hook the Universal Adapter's clips to the base of the CRT. Figure 2 shows you the switch settings required on the CR70 to match the Universal Adapter. Once you set the CR70 switches to these special settings and hook up the Universal Adapter clips to the CRT, you're ready to test the tube.

CR70 Setup

When using the Universal Adapter with the CR70, the CR70 front panel switches **MUST** be set as follows:

CR70 Switch	CR70 Special Setting	Marking on Universal Adapter Clip
F1	1	1/F1
F2	2	2/F2
K	3	3/K
G1	4	4/G1
G2	5	5/G2

Fig. 2: The CR70 switch settings for the Universal Adapter.

The CR70 must be set to the above setting because the Universal Adapter is wired in this manner. The F1 clip is wired in the pin 1 slot, the F2 clip is wired in the pin 2 slot, and so on. By having the F1 and F2 switches set to 1 and 2 respectively, the filament voltages are switched to the F1 and F2 clips. If the switches are at any other setting, the CR70 won't match the Universal Adapter wiring. For example, if the F1 and F2 switches were set at 4 and 5, the filament voltage would come out on the 4/G1 and 5/G2 pins. Or if the F1 and F2 switches were set on 6 and 7, the filament voltage wouldn't reach a single Universal Adapter clip since none of the clips are wired to the pin 6 and 7 slots.

If you forget what the Universal Adapter's special setting is, there is a reminder on the Universal Adapter's clips themselves. Each clip has a number followed by a slash and the testing element's name printed on it as

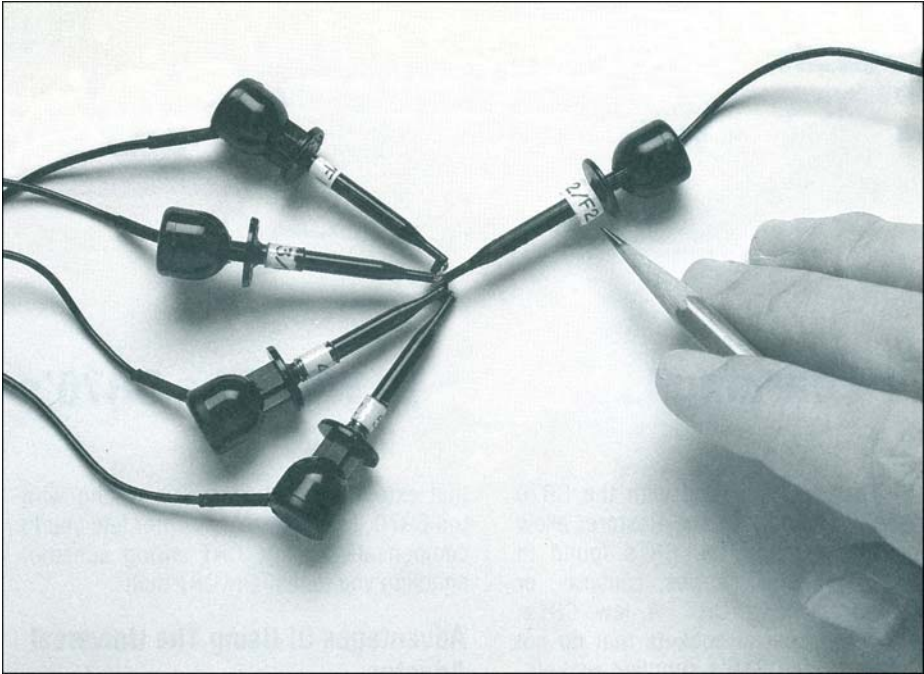


Fig. 3: Each CR70 switch setting is printed on the Universal Adapter clips.

shown in Figure 3. The testing element symbol corresponds to the switch on the CR70 front panel. The number preceding it is the correct setting of the corresponding switch when using the Universal Adapter. For example, the "K" clip has 3/K printed on it. That means the K switch on the CR70 must be set to 3 when using the Universal Adapter. The remaining clips use the same format.

Hookup to the CR70 Test Cable

The Universal Adapter hooks up to the CR70 test cable the same familiar way the regular sockets do. Simply plug the socket end of the Universal Adapter into the end of the CR70 test cable. Be sure to align the dot of the test cable with the dot of the Universal Adapter.

Counting CRT Pins

The next thing you do is hook the Universal Adapter to the base of the CRT. Since you use the setup information to hook up the Universal Adapter to the CRT pins, you need to count pins correctly on a CRT. You simply start counting clockwise at the keyway or focus pin when looking at the CRT base. If there is a keyway, the first pin clockwise from the keyway is pin 1. A keyway is a notch on the plastic or ceramic assembly in the center of the pins. If there is no keyway, the focus pin is pin number 1, and you count

clockwise from the re. The focus pin will be set off by itself, sometimes surrounded by a plastic shield.

There may be empty positions on the CRT base that count as pins and must be taken into consideration when making connections to the CRT with the Universal Adapter. Also note that the skipped positions around the focus connectors are not a keyway that references pin number 1. Figure 4 shows examples of both kinds of base configurations and pin counting methods.

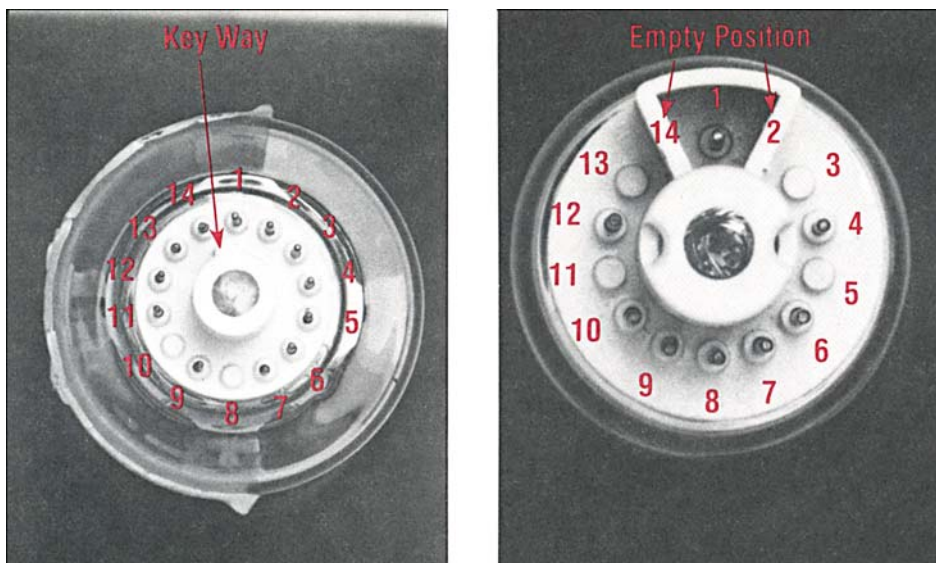
Hook the Universal Adapter Up to the CRT

Now you can hook the Universal Adapter clips up to the pins of the CRT base one at a time. To make things easier, we'll use a typical example from the CR70 Setup Book, tube number A36JAR53X. The setup information is listed below:

CRT NUMBER	SKT	CRT TYPE	F1	F2	FIL	NEG BIAS	GUN	K	G1	G2
A36JAR50X	UA	VIDEO	4	5	6, 3	68V	R	7	6	8
							G	9	6	8
							B	3	6	8
A36JAR53X	UA	VIDEO	4	5	6, 3	68V	R	7	6	8
							G	9	6	8
							B	3	6	8
A36JAR60X	UA	VIDEO	4	5	6, 3	68V	R	7	6	8
							G	9	6	8
							B	3	6	8
A36JAR63X	UA	VIDEO	4	5	6, 3	68V	R	7	6	8
							G	9	6	8
							B	3	6	8

Start with the F1 and F2 clips. The setup information says F1 is 4 and F2 is 5. Simply





**Fig. 4: Examples of pin numbering on two different kinds of CRT bases.**

hook the F1 clip to pin 4 and the F2 clip to pin 5. Since these are the filament connections, they will stay on these pins for all three guns.

Next, hook up the K, G1, and G2 clips. The setup information for red in the setup book says 7, 6, and 8 for K, G1, and G2, respectively. That means you hook the K clip to pin 7, the G1 clip to pin 6, and the G2 clip to pin 8. Now that you've set up the CR70 switches and hooked up the Universal Adapter clips, you're ready to test the tube.

### Testing the CRT with the Universal Adapter

Whether you're using the Universal Adapter or regular sockets, the CR70 test procedures are very similar. If you're using the Universal Adapter, there is only one step that differs from the regular socket procedure. When you finish testing one gun and move on to

the next gun, you don't move the INDIVIDUAL GUN SETUP switches on the CR70 front panel. Instead you move the K, G1, and G2 clips of the Universal Adapter to the pins designated in the setup for that gun (or just the K clip if the tube has common grids).

For the example tube we're using, when you move on to test the green gun, the only thing you move is the K clip of the Universal Adapter which goes to pin 9. The G1 and G2 clips stay where they are since all three guns use common grids. The only CR70 switch you have to move is the GUN SELECT switch, which is switched over to the "G" position for the green gun's test. The GUN SELECT switch is moved to store the three emission readings which are used later for the Color Tracking test.

The bias and filament voltages are set up the same familiar way. Then you perform the

tests for shorts, cutoff, and emission before moving to the next gun. After the last gun has been tested, you turn the CR70 function switch to COLOR TRACKING; rotate the GUN BALANCE switch through its three settings. The tube has now been thoroughly tested with the Universal Adapter and the CR70.

### Practice Makes Perfect

After you've used the Universal Adapter a couple times, you won't need instructions to use it anymore. A little practice with it and you'll see that it makes perfect sense. Just remember to set the CR70 to the special setting, use the setup information to hook the Universal Adapter clips up to the CRT, and you'll be all right. Remember, the CR70's special setting is printed right on the Universal Adapter clips.

### Sencore Always has Current Setup Information

If you ever have questions about using the Universal Adapter or the CR70, give Sencore a call and ask for Application Engineering. They'll help you with any question you may have. Sencore also has the most current information on new CRTs that aren't listed in the setup book.

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