

bright red handles from old telephone jack switches. Suitable substitutes could be made from wooden dowels or binding post heads, or commercial switches may be purchased.

At the proper distance below the panel are supported two small masonite panels on which the spring switch-levers made by cutting up condenser plates are bolted. Holes are made for passage of the push button screw heads, and thin bakelite strips are supported just below to carry the machine screws which form the lower contacts. Brass strips form the upper contacts.

The tubular 1/4 mfd. condenser is visible at the back of one of these panels as is the 150,000 ohm neon shunt resistor which prevents the bulb from glowing on tiny leakages from normal tubes.

The push buttons as seen from the front are not lettered, but reading from left to right they are numbered 2, 3, 4, 5, 6 and 8 and above No. 8 is the grid cap button. These markings were omitted as they are not needed.

In wiring be sure to make good soldered joints. If the 7 prong socket is omitted it must be remembered in making the 7 to octal adapter that socket terminal No. 1 is connected to plug pin No. 2 and No. 2 of the socket is connected to No. 8 of the octal plug. This arrangement is necessary as pin No. 1 of the octal socket is blank.

In the illustration a 25Z5 tube is being tested. In the cover is a 201A tube used as a line voltage standard. It is inserted in its socket and the primary tap adjusted so that the tube gives a previously logged reading with the selector at 72. The cover also contains a pair of test leads, roll of tube stockers and tube characteristics chart.

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## TUBE CHARACTERISTICS CHART (FOR TUBE TESTER)

Type	Q	K	Type	Q	K	Type	Q	K	Type	Q	K
<b>1.4 Volts</b>											
1A5G.....	70	—	35/51-S.....	50	4	6E5.....	85	5	81.....	15	4
1A7G.....	80	—	45.....	52	—	6E6.....	52	4	83.....	46	5
1C5G.....	65	—	46.....	50	—	6E7.....	44	6	85AS.....	40	5
1H5G.....	80	—	47.....	50	—	6F5-G.....	40	8	89.....	42	5
1N5G.....	80	—	53.....	28	4	6F6-G.....	46	8	96.....	26	3
<b>2 Volts</b>											
1A4-T.....	65	—	55-S.....	42	5	6F7-S.....	48	6	98.....	15	4
1A4P.....	65	—	56-S.....	46	4	6F8-G.....	30	4-8	1221.....	44	5
1A6.....	70	—	57-S.....	32	5	6G5.....	90	5	1223.....	44	8
1B4.....	74	—	58-S.....	40	5	6G6G.....	45	8	1603.....	70	5
1B4P.....	74	—	59.....	42	6	6H6-G.....	15	4-8	1612.....	32	8
1B5.....	62	—	82.....	52	—	6J5-G.....	30	8	KR1.....	26	3
1C6.....	62	—	G84.....	72	—	6J7-G.....	38	8	<b>7.5 Volts</b>		
1C7G.....	62	—	879.....	80	—	6J8G.....	50	8	10.....	70	—
1D5GT.....	65	—	Wond. A.....	52	5	6K5G.....	26	8	50.....	66	—
1D5GP.....	65	—	<b>3.3 Volts</b>			6K6G.....	54	8	81.....	82	—
1D7G.....	70	—	20.....	85	—	6K7-8.....	42	8	1602.....	70	—
1E5G-T.....	74	—	22.....	75	—	6K8.....	40	8	<b>12.6 Volts</b>		
1E5GP.....	74	—	X99.....	100	—	6L5-G.....	48	8	12A7.....	20	4-6
1E7G.....	35	—	<b>5.0 Volts</b>			6L6-G.....	28	8	1223.....	14	3
1F4.....	54	—	00A.....	60	—	6L7-G.....	32	8	18.....	44	5
1F5G.....	54	—	01A.....	72	—	6N5.....	50	5	HZ50.....	14	3
1F6.....	64	—	5Z3.....	38	—	6N6G.....	60	8	<b>25.0 Volts</b>		
1F7G-V.....	64	—	12A.....	50	—	6N7-G.....	26	8	25A6-G.....	30	8
1G5G.....	65	—	40.....	70	—	6P5G.....	45	8	25B6G.....	26	8
1H4C.....	68	—	71A.....	54	—	6Q6G.....	36	8	25L6-G.....	22	8
1H6C.....	62	—	80.....	40	—	6Q7-G.....	25	8	25Y5.....	15	2-5
1J5G.....	60	—	83.....	15	—	6R7-G.....	25	8	25Z5.....	10	3-4
1J6G.....	55	—	83V.....	16	—	6S7-G.....	48	8	25Z6-G.....	10	4-8
15.....	70	4	182A.....	54	—	6T5.....	36	8	43.....	30	5
19.....	55	—	182B/482B.....	56	—	6T6.....	40	8	25B5.....	50	5
25S.....	62	—	183/483.....	53	—	6U5.....	90	5	25N6.....	50	8
30.....	68	—	485.....	48	—	6V6-G.....	32	8	<b>Miscellaneous</b>		
31.....	70	—	<b>6.3 Volts</b>			6V7G.....	46	8	26.....1.5V	66	—
32.....	70	—	1V.....	26	3	6W7-G.....	42	8	48.....30V	28	5
33.....	56	—	6A3.....	34	—	6X5-G.....	20	8	<b>Special Tubes</b>		
34.....	70	—	6A4/LA.....	31	—	6Y5-V.....	18	4	5T4.....	24	8LX
49.....	62	—	6A8-G.....	42	8	6Y6G.....	30	8	5U4G.....	38	8LX
950.....	65	—	6A8-G.....	42	8	6Y7G.....	30	8	5V4G.....	24	8LX
951.....	74	—	6B4-G.....	30	—	6Z3.....	26	3	5W4.....	48	8LX
<b>2.5 Volts</b>											
2A3.....	28	—	6B5.....	58	5	6Z4.....	15	4	5X4G.....	38	A
2A5.....	42	5	6B7-S.....	54	6	6Z5G.....	38	8	5Y3.....	50	8LX
2A6.....	42	5	6B8-G.....	54	8	6Z7G.....	28	8	5Y4G.....	40	A
2A7-S.....	40	6	6C5.....	58	5	6Z8.....	12	4	5Z4.....	30	8LX
2B6.....	50	5-6	6C6-G.....	46	8	6Z9.....	12	4	6P7G.....	48	A
2B7-S.....	54	6	6C7.....	40	6	6Z9.....	12	4	6Z5.....	15	2LX
2E5.....	85	5	6C8G.....	25	4-8	6Z9.....	12	4	12A5.....	30*	5-6
2S/4S.....	80	4	6D5.....	55	8	6Z9.....	12	4	25A7G.....	20+	1-3
2Z2/G84.....	74	—	6D6.....	44	5	6Z9.....	12	4	4A6G.....	65*	A
24A-S.....	50	4	6D7.....	44	6	6Z9.....	12	4	1231.....	52	A
27-S.....	45	4	6D8G.....	52	8	6Z9.....	12	4			
2711M.....	46	4									

Abbreviations and notes: Q: Setting of "Quality" dial (meter shunt). K: cathode terminal (RMA numbering system). Press corresponding button to test tube. Dash indicates no button. The "special" tubes marked "A" require adapters. Those in which the cathode button is marked with the subscript "LX" the button must be held down for the tube to light but do not release button as this will put 30 volts across fil. and meter causing possible damage. \*12.6 volts. Hold button 6 half way down. Press 5 to test. +Adapter needed, or temporarily wire pin No. 1 to pin No. 8. \*4 volts, try 3.2 v.

## THE ANDREA V-A RECEIVER



*Building your own tele-receiver is not as hard as you think. Especially when everything is preset for you.*

**B**UILDING your own television receiver is an entirely practical project, and with reasonable skill, the simplest tools, and the usual facilities of the kitchen table workshop you can turn out a sight and sound set that will give fine results.

The Andrea television kit is a 17-tube a.c.-operated set, made up of over 269 parts, one of which is a dynamic loudspeaker built into the front panel. The old design had everything mounted on a bakelite front panel. This new equipment is assembled on a steel chassis, closed on the bottom with a base plate.

All the parts are mounted on the top of the chassis, simplifying the wiring and assembly. There are two separate power supply transformers and circuits—one for the vacuum tubes, and another for the picture tubes. Also, there are two separate superheterodyne i.f. amplifiers—one terminating in the loudspeaker, and the other in

the video (image) control circuit.

Another piece of factory construction, planned to ease the work of the set builder, is the r.f. unit. This is supplied completely assembled and wired on the steel plate, ready to be slipped into an opening at the front of the chassis.

All the tuning controls are arranged at the front. They comprise a tone control, power switch and volume control, brilliance control to regulate the overall brilliance of the images, focus control which determines the size of the spot, station selector switch to provide 44-50 mc. or 50-56 mc. tuning and the contrast control which determines the difference between the lightest and darkest parts of the image.

The controls at the rear vertical hold, horizontal hold, vertical size, horizontal size, and the height and width centering. These are put at the rear

(More tele-data on page 49)



**Video Reporter**  
(Continued from page 10)

team ever to face a television camera. Grover A. Whalen, president of the New York World's Fair 1939, took part in the television experiment as well as the broadcast from the fair grounds, when he pointed out the sights to the visitors from a mythical Harlem.

**Tele-Casts**

**T**HE Farnsworth Radio & Television Corp. plans to take over the factories of the Capehart company at Fort Wayne, Ind., and the U. S. Radio & Television Company at Marion, Ind., as well as the laboratories of the former Farnsworth organization at Philadelphia.

E. A. Nicholas, former head of the RCA license division, will head the new company as president, and Philo Farnsworth will be vice-president in charge of research. Ray Cummings, for years in charge of transmitter engineering and design for General Electric and RCA, will be assistant vice-president. The new Farnsworth corporation plans to manufacture television receivers and transmitters under the Farnsworth patents.

Allen D. DuMont Labs, has an elaborate lithographed two-color 2½x3½ foot wall chart showing a large cross-section view of a cathode ray tube with lettered components and corresponding explanatory notes. A dozen typical screen patterns with brief explanations, cover the various broad applications of the tube. The chart is particularly applicable for use in classrooms, and servicemen's gatherings. There is a charge of 50 cents for the chart and for additional information write to the above company, Passaic, N. J. This same company have just printed a new 1939 catalog on cathode ray tubes for oscillograph and television purposes, that can be had for the asking.

Television reproduction was not very flattering to Gov. Lehman, Mayor LaGuardia, and District Attorney Dewey at the annual dinner of the Inner Circle, New York's political writers association, recently held at the Waldorf Astoria. Probably the lighting or some technical detail was out of step. This is certainly excusable considering the fine tele demonstrations which have taken place in the last month.

The radio parts industry looks forward with a great deal of optimism to television's official bow at the end of this month. A television receiver consists of a great many parts, i.e. ten or more controls, numerous resistors and condensers and other parts, all of which is good news to the industry and likewise to the radio parts jobber.

Prof. H. H. Sheldon of New York University has just started a fifteen week lecture course in television.

**Andrea Receiver**  
(Continued from page 24)

because, once adjusted, they need no further attention.

The front panel carries the loud-speaker. This can be separated from the chassis by pulling out a plug which fits into a small socket on the chassis.

From the video and sound carriers included in a 6-mc. television channel, a 6J5 oscillator tube produces the separate video and i.f. frequencies. The video i.f. is fed through two wide-band amplifiers using 1852 tubes, into a 6H6 second detector and synchronizing clipper. Next comes the 6V6G amplifier which controls the brightness of the spot in the picture tube. The clipper portion of the 6H6 feeds one 1852 sync. separator, the output of which goes to two 6N7 deflection oscillators (vertical and horizontal). Each of these feeds a 6F8G push-pull deflection amplifier, connected in turn to the picture tube.

The 1852 sound i.f. amplifier goes

into a 6SQ7 second detector on AVC, then from a 6V6G amplifier in to the loudspeaker. Voltages for the vacuum tubes and the picture tubes are supplied by a 5V4G and 879 rectifier tube.

The Teleceptor television antenna is constructed of a two-piece mast, 8 ft. high, carrying at the top a wooden block which supports two lateral wooden arms, and serves as a mounting for the Telecoupler. Brass rods, constituting the di-pole, are fastened to the Telecoupler, and are braced by insulators on the wooden arms. These arms have been found essential not to brace the brass rods, but to keep them from whipping around in the wind. This arrangement may not be as pretty as the unsupported rods, but it does eliminate any tendency for the wind to cause a modulation of the received images.

The Telecoupler of porcelain, is sealed against the weather and the accumulation of carbon soot deposits. From this unit, a special twisted pair lead is brought down to the receiving set.

It is easy to mount this antenna, for the complete Teleceptor is so light that it can be held at arm's length. Several mounting devices are supplied, to take care of all contingencies.

Generally, the Teleceptor should be mounted as high as possible, for the gain in signal strength more than offsets the loss due to increasing the length of the lead-in. Best reception is generally obtained with the rods at right angles to the line of reception. If reflections are received, they can be eliminated usually by swinging the rods until the reflections disappear.

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# Andrea

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