

GENERAL DESCRIPTION

ZENITH TELEVISION RECEIVERS

Zenith direct view television receivers have many outstanding features. These include gated automatic gain control, turret tuning with replaceable channel strips and main chassis break down into easily interchangeable sub-chassis. The primary differences between chassis is in the size, type and method of mounting the picture tube and the type of power supply. Table model receivers use a specially shielded power transformer to prevent magnetic interaction with the receiver sweep circuits-

MODEL NO.	CHASSIS	SCREEN	TYPE OF SET	NAME
27T965R	27F20	"B"	Console - Mahogany	Broadmoor
28T925R	28F22	"A"	Table - Mahogany	Mayflower
28T925E	28F22	"A"	Table - Blonde	Biltmore
28T926R	28F25	"B"	Table - Mahogany	Claridge
28T926E	28F25	"B"	Table - Blonde	Saratoga
28T960E	28F20	"B"	Console - Blonde	Waldorf
28T960K	28F20	"B"	Console - Cordovan	Derby
28T961E	28F21	"A"	Console - Blond	Wilshire
28T962R	28F20	"B"	Console - Mahogany	Warwick
28T963R	28F21	"A"	Console - Mahogany	Newport
28T964R	28F23	"C"	Console - Mahogany	Stratosphere
G2951	29G20	"C"	Console - Walnut	Stratosphere
G2951R	29G20	"C"	Console - Mahogany	Stratosphere
G2952R	29G20	"C"	Console - Mahogany	St. Regis
37T998RLP	28F20	"B"	Radio-Phono-TV	Gotham
37T996RLP	28F23	"C"	Radio-Phono-TV	Sovereign
42T999RLP	28F23	"C"	Radio-Phono-TV	Marlborough

Power Consumption - 350 Watts

Power Supply - 110V 60 Cycles AC

Antenna Impedance
Balanced 300 ohms.

Audio Output - Undistorted 3.5 Watts
Maximum 6.5 Watts

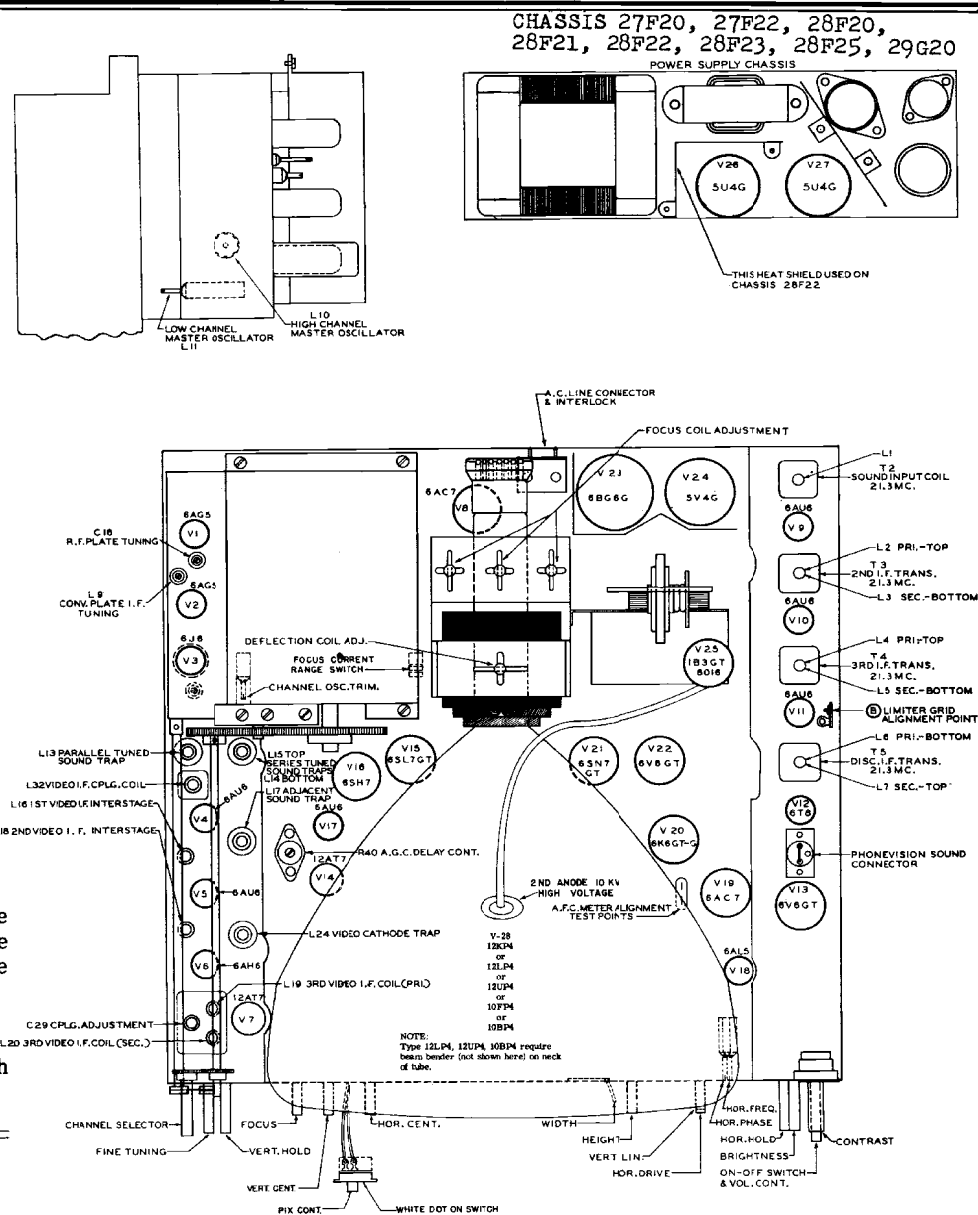


Fig. 31. Tube & Trimmer Layout for
Chassis No. 28F20-207-21-22-23&25

NOTE: For additional data: See Chassis 28F20 etc.
TV2 Page 2-1 through 2-27,28.

SUPPLEMENT

Most of the alignment and adjustment information presented in the first part of this manual applies to early production receivers. Later production receivers, identified by the fused and shielded high voltage power supply, incorporated revisions in the sweep, A.G.C., A.F.C., and I.F. circuits which necessitated changes in alignment and adjustment procedures.

The following section of the manual outlines the new procedures which are to be used with the revised 28F20, 28F21, 28F22 and the new 27F20, 27F20Z, 28F25 and 29G20 chassis.

Later model receivers with the new narrow band I.F.'s (identified by the green paint marks on the third picture I.F. can and at the rear of the sound chassis) must be aligned in the manner described under Narrow Band I.F. Alignment whereas the earlier model wide band receivers must be aligned as described on page 15 of this manual. Sound I.F. alignment procedure on all receivers to date, will be as described on page 17.

Zenith television receivers are now being manufactured with either the conventional clear glass picture tubes or the new Glare-Ban "Black" tubes. Those receivers with the Glare-Ban picture tubes are to be identified by the letters "OX" after the chassis and model numbers.

PICTURE CONTROL SWITCH

A picture control switch has been recently added to Zenith receivers. This switch controls the 6V6GT vertical output. By controlling the vertical output, either a giant circle or a smaller conventional picture may be selected.

27F20 CHASSIS

The 27F20 chassis is similar to the 28F20 except for revisions in the sync separator, AGC, and video amplifier circuits.

Instead of a 6AU6 sync amplifier and a 6SH7 sync clipper tube, as used in the basic 28F20 chassis, a dual triode 6SN7GT is used as a picture clipper and sync amplifier and a 12AT7 tube is used as sync clipper and sync separator.

In the AGC circuit, a 6SL7GT is used as the 1st and 2nd AGC amplifier. The AGC adjustment for this particular receiver may be found elsewhere in this manual.

A narrow band I.F. is used in the 27F20 chassis. When alignment is made, follow the procedure for a narrow band picture I.F. alignment.

With the exception of the AGC adjustment, the RF-IF alignment and all the other adjustments remain the same as for the 28F20 chassis.

27F20Z - 27G20 (OX)

With the exception of the picture tube, which is a metal glass 12UP4, this chassis is the same as the 27F20.

28F25 CHASSIS

This chassis is the same as the 28F20 with the exception of the power supply. A S-15747 table model power supply is used.

28F23 CHASSIS

This chassis, using a 16AP4 long-neck picture tube is similar to the basic 28F20 chassis, except for the focus coil and minor circuit changes. R51 in this chassis is 100,000 ohms and the 1st anode of the picture tube (Pin 10) is connected to the 490 volt tap (lug 4 on T11) instead of 397 volt connection as in the 28F20 chassis.

To prevent electrostatic charges from building up in the chassis, a 220,000 ohm resistor or two 100,000 ohm resistors in series, are connected between Pin 1 of the power socket and chassis to leak off these charges.

Some of the 28F23 chassis have the conventional wide band picture I.F. and must be aligned according to the method outlined on page 15 of this manual. Other models have the narrow band I.F. and must be aligned in the manner prescribed under narrow band I.F. alignment. The narrow band chassis have identifying green paint marks on the 3rd video I.F. transformer, and at the rear of the sound I.F. chassis.

CAUTION: The outside metal cone of the 16AP4 picture tube used in this chassis is "hot", and it may be desirable to pull out the 6K6GT horizontal oscillator tube V20 in order to remove the high voltage during alignment and while adjustments are made which necessitate handling of the chassis, but do not require a picture.

29G20 CHASSIS

The 29G20 chassis is similar to the basic 28F20 chassis except for revisions in the sweep output circuits. The 16EP4 short-neck picture tube, which requires a greater beam deflection angle, necessitates the use of two 6BG6 tubes in parallel for increased horizontal output.

There are other minor circuit revisions, however, the R.F.-I.F. alignment and all the adjustments are the same as for the 28F20 chassis.

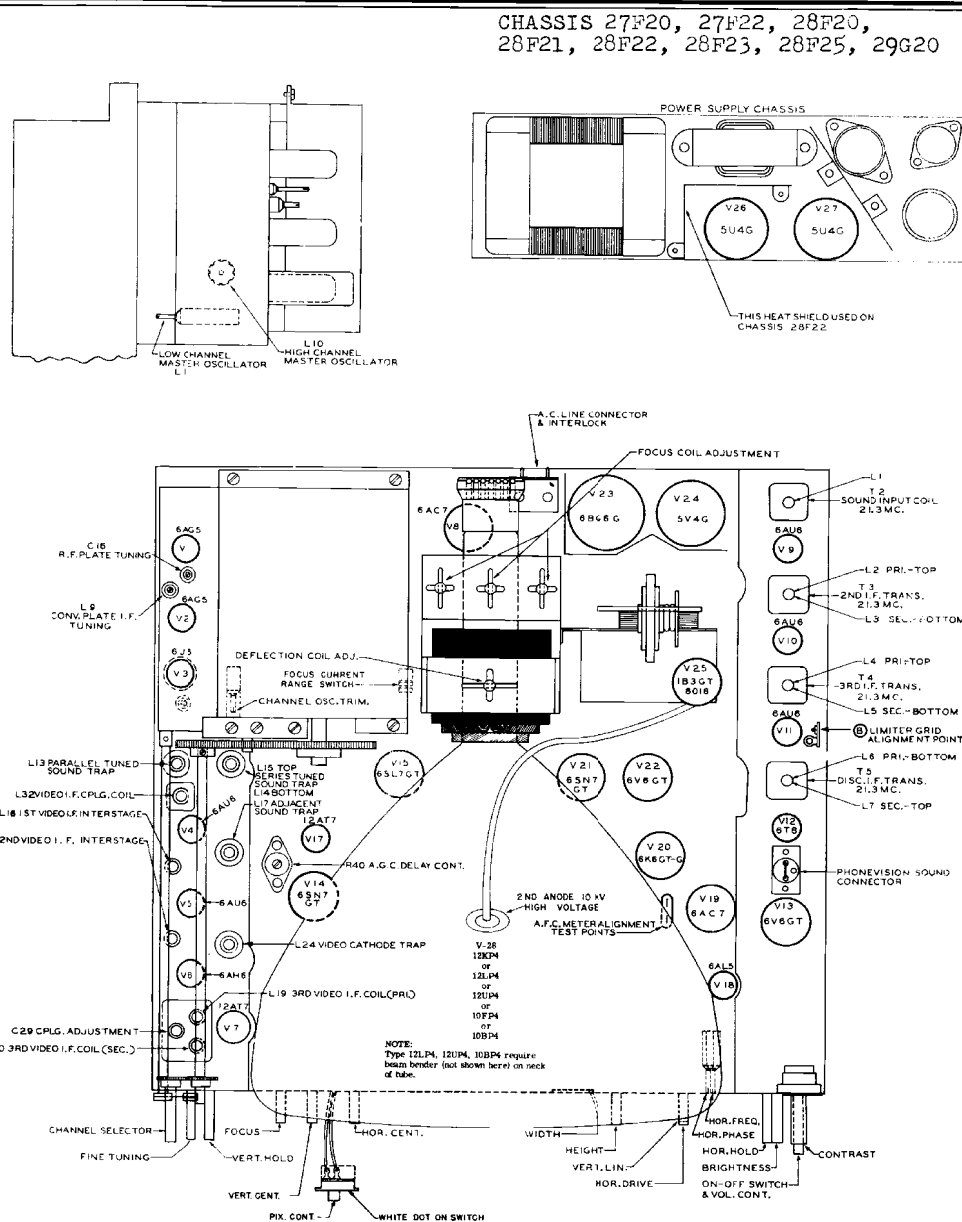


Fig. 50 Tube and Trimmer Layout 27F20 Chassis

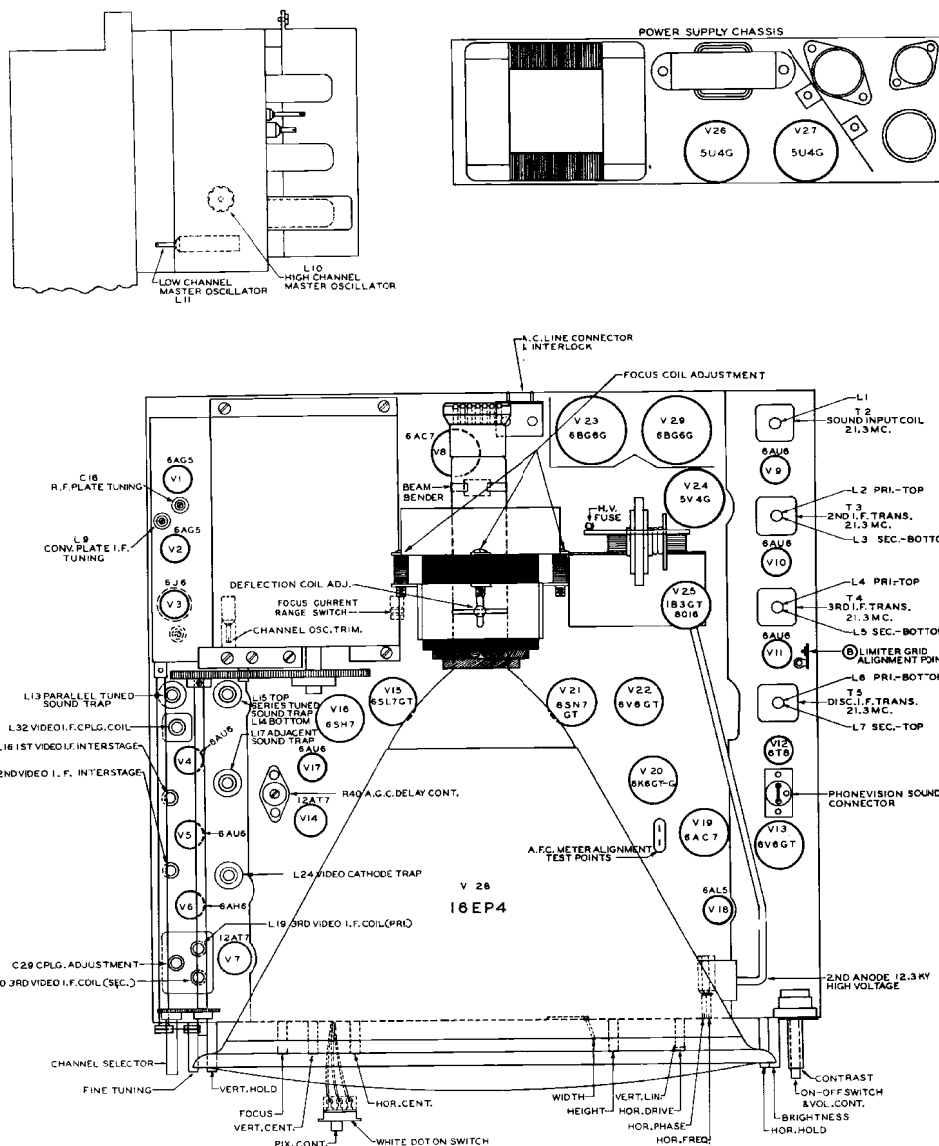
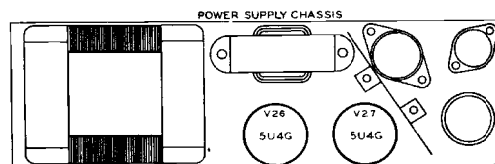


Fig. 51 Tube and Trimmer Layout 29G20 Chassis



The 29G20 chassis requires the narrow band L.F. alignment procedure.

The metal cone of the 16EP4 picture tube used in this chassis is "hot". Use the same precautionary measures as outlined under 28F23 chassis.

ADJUSTMENTS

ZENITH S15370 BIAS TEST FIXTURE

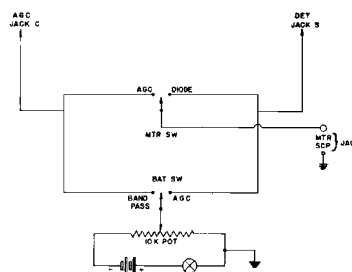


Fig. 52 Schematic Diagram S-15370 Bias Test Fixture

The S-15370 Bias Test Fixture is designed to plug into jacks "C" and "S" at the rear of the television chassis to supply an adjustable bias voltage for use during RF-IF alignment and for AGC adjustments.

The VTVM or scope connections are to be made between the SCP-MTR. jack and fixture chassis. IN ORDER TO CONSERVE BATTERY LIFE, ALWAYS TURN THE BIAS CONTROL KNOB TO THE OFF POSITION AFTER USE.

IF-RF ALIGNMENT

1. Plug the Bias Fixture into jacks "C" and "S" at the rear of the chassis and set the BAT. Switch to BAND PASS.
2. Set the MTR. Switch to AGC and adjust the Fixture Bias Control for -1.5V VTVM indication at the SCP-MTR jack.
3. Set MTR. Switch to DIODE and connect the scope to the SCP-MTR. Jack.

After the Bias Fixture adjustments have been made, proceed with the alignment as outlined in the Service Manual.

REVISED AGC ADJUSTMENT PROCEDURE

The procedure outlined below applies to all Zenith TV receivers (except 27F20-27F20Z) in which a fused high voltage power supply is used. All receivers manufactured prior to the inclusion of the fused unit must be adjusted in the manner outlined on page 12 of this manual.

After the receiver has been properly identified, disconnect the antenna, short out the antenna terminals, remove V14 (12AT7) and V17 (6AU6) tubes, turn the HORIZONTAL HOLD control fully clockwise, and set the channel selector switch to Channel 10.

1. Plug the S-15370 Bias Fixture into jacks "C" and "S" at the rear of the television chassis. Set both the BAT and MTR

CHASSIS 27F20, 27F22, 28F20, 28F21, 28F22, 28F23, 28F25, 29G20

switches to AGC. The VTVM indication at the SCP-MTR jack should be -8 volts or higher.

2. Insert V14 into its socket. Leave the BAT switch at AGC and set the MTR switch to DIODE. Adjust the Bias Fixture control for -2 volt indication at the SCP-MTR jack.
3. Set the MTR switch to AGC and adjust the AGC Delay Control (on receiver) for -6 volts indication at the SCP-MTR jack.
4. Leave the BAT switch at AGC, and set the MTR switch to DIODE. Adjust the Bias Fixture control for -1V indication at the SCP-MTR jack. Set the MTR switch to AGC and observe the VTVM indication at the SCP-MTR jack. This voltage should not exceed -1.5 volts.
5. Insert V17 into its socket, remove the Bias Fixture, and check operation of receiver.

AGC ADJUSTMENT PROCEDURE CHASSIS 27F20 & 27F20Z

Before the AGC adjustment is made disconnect the antenna, short out the antenna terminals, turn the HORIZONTAL HOLD control fully clockwise and set the channel selector switch to channel 10.

1. Plug the S-15370 Bias Fixture into jacks "C" and "S" at the rear of the television chassis. Set both the BAT and MTR switches to AGC. With a screwdriver turn the AGC Delay Control (R40 on receiver) fully counter-clockwise. The VTVM indication at the SCP-MTR jack should be -8 volts or higher.
2. Leave the BAT switch at AGC and set the MTR switch to DIODE. Adjust the Bias Fixture control for -2 volt indication at the SCP-MTR jack.
3. Set the MTR switch to AGC and adjust the AGC Delay Control (on receiver) for -6 volts indication at the SCP-MTR jack.
4. Leave the BAT switch at AGC, and set the MTR switch to DIODE. Adjust the Bias Fixture control for -1V indication at the SCP-MTR jack. Set the MTR switch to AGC and observe the VTVM indication at the SCP-MTR jack. This voltage should not exceed -1.5 volts.

HORIZONTAL FREQUENCY AND PHASE ADJUSTMENTS

The purpose of the HORIZONTAL FREQUENCY and PHASE adjustments is to align the horizontal oscillator in order to keep it in the proper frequency and phase relationship with the transmitted synchronizing pulses.

Correct FREQUENCY adjustment is indicated by the ability of the receiver to stay in horizontal synchronization through most, if not the entire range, of the HORIZONTAL HOLD CONTROL, even if the signal is temporarily removed by switching to another channel and back.

The PHASE adjustment is used to position the picture on the raster. In order to check this adjustment the horizontal size of the picture must be reduced to view the sides (See Fig. 53). Proper adjustment is indicated when the HORIZONTAL HOLD CONTROL is in its electrical center position (See Step 4) and equal blanking exists on both sides of the picture.

It must be remembered that there is some interaction between the HORIZONTAL FREQUENCY and PHASE adjustments, and that the adjustment of one may necessitate the readjustment of the other.

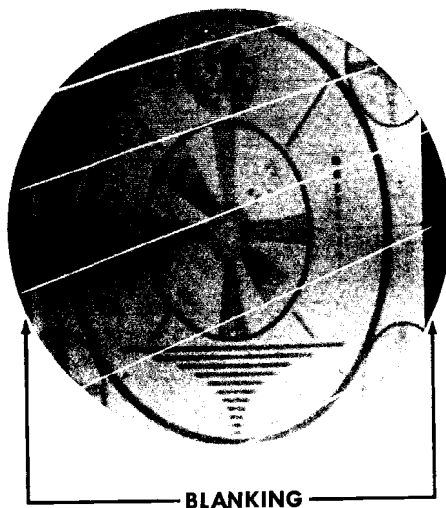


Fig. 53 Horizontal Size of Picture Reduced to Show Relative Position of Picture and Raster.

After the above checks have been made and cause has been determined for readjustment, proceed as follows:

1. Tune in a TV station and turn the HORIZONTAL FREQUENCY adjustment screw until the picture remains synchronized through most, if not the entire range of the HORIZONTAL HOLD CONTROL.
2. Connect the common lead of a VTVM to pin 1 of the 6AL5 phase detector and the other lead to the junction of R69 and R38 (470K and 560 ohm resistors in the grid circuit of the 6AC7 reactance tube. Later production receivers include a terminal strip for the meter connections. This strip is mounted on top of the chassis adjacent to the 6AC7 reactance tube socket. The VTVM common lead must always be connected to the terminal with the white lead).
3. Set the HORIZONTAL FREQUENCY adjustment so that maximum clockwise or counter-clockwise rotation of the HORIZONTAL HOLD control produces equal voltage swings of opposite polarity on the VTVM.
4. Set the HORIZONTAL HOLD control to the zero position midway between the equal positive and negative swings of the VTVM. Reduce the size of the picture with the WIDTH control until the sides are plainly visible. (On some receivers it may be impossible to reduce the width sufficiently to view both sides at once. If this is the case, the raster size should be further reduced with the HORIZONTAL DRIVE control, however, do not change the position of the HORIZONTAL DRIVE when the picture is restored to normal size after adjustment. Use the WIDTH control only. A remote case may arise where the raster size cannot be reduced sufficiently and it may be necessary to shift the raster with the HORIZONTAL CENTERING control in order to view a side at a time.) Turn the

CONTRAST and BRIGHTNESS controls counter-clockwise. Advance the BRIGHTNESS control until the left and right sides of the picture are clearly distinguishable from the raster (See Fig. 53). The HORIZONTAL PHASE control should now be adjusted until the picture is centered on the raster, with approximately 3/8" blanking on either side. Whenever a change in the HORIZONTAL PHASE adjustment is made, a corresponding check and possible readjustment of the HORIZONTAL FREQUENCY adjustment must also be made (Step 3).

PICTURE IF ALIGNMENT (Narrow Band)

The alignment procedure outlined below applies to those receivers which have an identifying GREEN PAINT mark on top of the 3rd video IF can and at the rear of the sound IF chassis. Receivers which do not have an identifying paint mark must be aligned in the manner outlined on page 15.

See Figures 29 and 37 for test equipment, bias and oscilloscope connections. A battery bias must be applied to the receiver during alignment. This bias may be obtained from the Zenith S-15370 Bias Test Fixture (See page 25) or from a 1 1/2 V. battery, connecting the negative lead to jack "C" and the positive lead to chassis.

Connect output #1 between point "F" (picture IF strip) and chassis. Adjust the Mega-Sweep for maximum output and turn the coarse frequency adjustment control until the pattern is centered on the oscilloscope screen. It is possible to obtain two modes of operation from the Mega-Sweep. Select the mode which sweeps from low to high frequency. When the proper mode is selected, the low frequency peak of the IF response curve will appear on the left side of the oscilloscope screen (22.6 Mc., Fig. 54). With the Mega-Marker attenuator off, adjust the Mega-Sweep Attenuator for approximately -1.5 volts output at the Video Detector (Jack "S"). Do not exceed this voltage during alignment. The vertical gain on the oscilloscope and the Mega-Sweep Amplitude Controls should now be adjusted for a sizeable pattern on the oscilloscope screen. The oscilloscope Horizontal Gain Control must be adjusted so that both ends of the sweep are visible. After these initial adjustments have been made, proceed as follows:

1. Set the Mega-Marker to 22.6 Mc. and adjust L19 and L20 until the two over-coupled response curves are equal in amplitude with the low frequency peak corresponding to the 22.6 Mc. marker. To avoid distortion, always use minimum marker amplitude. Set the Mega-Marker to 25.9 Mc. and adjust C29 until the high frequency peak corresponds to 25.9 Mc. Check the 22.6 mc. peak and repeat adjustment if necessary.



Fig. 54 3rd Picture I.F. Response

2. Connect output #1 between point "G" and chassis. Adjust the Mega-Sweep attenuator for approximately -1.5 V detector output at jack "S". Do not exceed this voltage during alignment. Set the Mega-Marker to 25.3 Mc. and adjust L18 until the I.F. peak corresponds to the 25.3 Mc. marker.

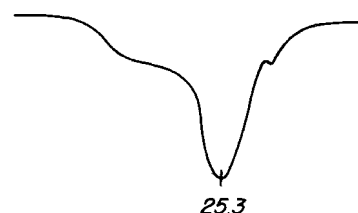


Fig. 55 2nd Picture I.F. Response

3. Connect output #1 between point "H" and chassis. Adjust the Mega-Sweep attenuator for -1.5 V output at jack "S". Set the Mega-Marker to 23.2 Mc. and adjust L16 until the low frequency

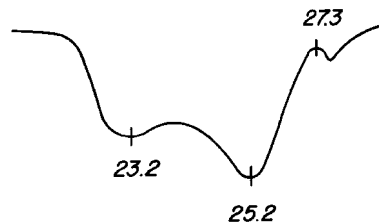


Fig. 56 1st Picture I.F. Response

CHASSIS 27F20, 27F22, 28F20, 28F21, 28F22, 28F23, 28F25, 29G20

peak corresponds to 23.2 Mc. The high frequency peak should fall at approximately 25.2 Mc. Set the Mega-Marker to 27.3 Mc. and adjust trap L17 for minimum marker indication. Use maximum marker amplitude for all trap adjustments.

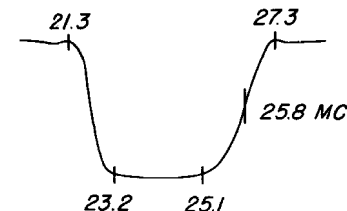


Fig. 57 Over-all Picture I.F. Response

4. Connect output #1 to the converter coupling ring (Zenith Part No. S-15371) and fit the ring over the 6AG5 converter tube. Because of the low coupling capacity of the ring, it will be necessary to increase the Mega-Sweep output to maximum in order to obtain approximately -1.5V indication at jack "S". Set the Mega-Marker to 21.3 Mc. and adjust trap L13 for minimum indication on the scope. Set Mega-Marker to 27.3 Mc. With a 68-7 alignment wrench adjust trap L14 (Lower slug) for minimum indication on the scope. (Because of the high attenuation of the combined 27.3 Mc. traps L14 and L17, it may be necessary to use maximum trap injection and vertical gain of the scope in order to see the "pip". In some cases, it may be necessary to temporarily detune L17 by inserting a 68-14 tuning wand into its field, however, never detune L17 by turning its adjustment screw.) Move the oscilloscope connection to the limiter grid (Point "B" Fig. 43). Reduce the sweep amplitude on the Mega-Sweep and observe the sound I.F. response curve (See Fig. 42). Adjust L15 (Upper slug) for maximum response. Return the scope connections to the video detector (jack "S") and adjust L32 and L9 (L9 is on the RF shelf) alternately until the response curve has a reasonably

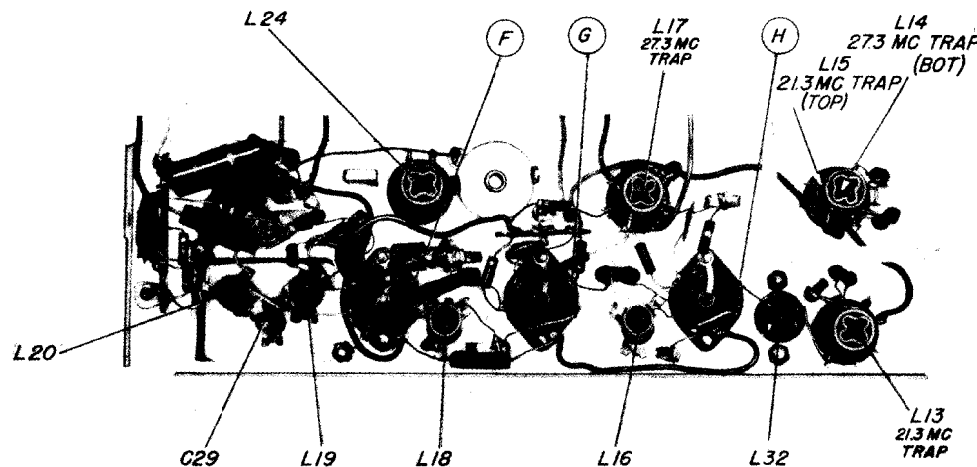


Fig. 58 Narrow Band Picture I.F. Sub-Chassis

flat top (See Fig. 57). Set Mega-Marker to 27.3 Mc. and re-check traps L14 and L17. A slight readjustment may be necessary. Set Mega-Marker to 25.8 Mc. and check the 50% point and the over-all response.

4.5 MC. TRAP ADJUSTMENT

The high shunt capacity C30 in the 4.5 Mc resonant circuit insures high frequency stability. Adjustment in most cases is unnecessary unless the unit is tampered with or replaced.

If adjustment becomes necessary, an accurate signal generator, crystal calibrated at 4.5 Mc. such as the Zenith version of the Mega-Marker and a RF VTVM capable of indicating voltages at frequencies up to 5 Mc. is required. The procedure is as follows:

1. Connect the 4.5 Mc. signal to the grid (Pin 7) of the 12AT7 1st video amplifier V7B.

2. Connect the probe of the VTVM to the grid of the picture tube.

3. Advance the Mega-Marker output and the receiver contrast control for approximately 1-volt indication on the meter. It may be necessary to temporarily disconnect the Mega-Marker from the Mega-Sweep in order to get an increased 4.5 Mc. output for this adjustment.

4. Adjust slug L24 for minimum indication on the meter. A pronounced dip will be noted at resonance.

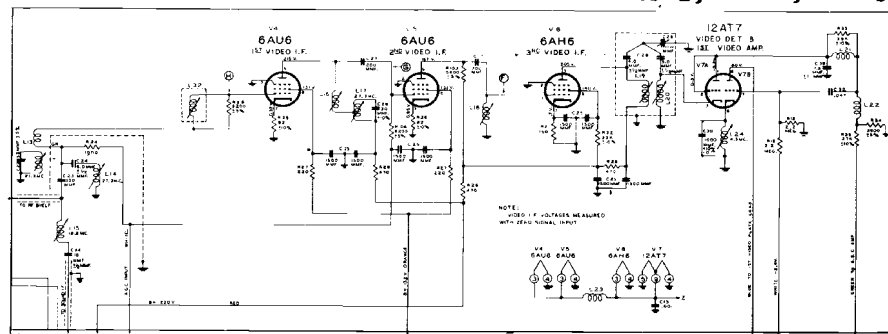


Fig. 59 Schematic Diagram, Narrow Band I.F.

CIRCUIT LEGEND

The following is a composite listing of electrical parts used in Zenith TV chassis listed below:

"X" Indicates Models 28F20, 21, 22, 23, & 25.

"7" Indicates Model 27F20

"9" Indicates Model 29G20

R-93 Used on 28F22 & 25 only.

T-17 Used with 12UP4 Picture Tube Only

DIAG. NO.	PART NO.	DESCRIPTION	POWER SUPPLY	STRAP	SHIELD	MAIN CHASSIS	DIAG. NO.	PART NO.	DESCRIPTION	POWER SUPPLY	STRAP	SHIELD	MAIN CHASSIS
C-1	22-1876	15 MFD. ELECTRO. 250 V.	X				R-1	63-1580	10 OHM	2 1/2	X		
C-2	22-1877	40 MFD. ELECTRO. 400 V.	X				R-2	63-1573	88 OHM	1/2 1/2	X		
C-3	22-1878	20 MFD. ELECTRO. 475 V.	X				R-3	63-1571	6800 OHM	2 1/2	X		
C-4	22-1879	100 MFD. ELECTRO. 300 V.	X				R-4	63-1870	100K OHM	1/2 1/2	X		
C-5	22-1880	0.012 MFD.	600 V.				R-5	63-1874	47K OHM	1 1/2	X		
C-6	22-1881	0.047 MFD.	600 V.				R-6	63-1875	100K OHM	1/2 1/2	X		
C-7	22-1882	25 MMF. CER.	500 V.				R-7	63-1878	100K OHM	1/2 1/2	X		
C-8	22-1883	0.005 MFD. (DISC.)	450 V.				R-8	63-1869	100K OHM	1/2 1/2	X		
C-9	22-1884	500 MMF. CER.	500 V.				R-9	63-1861	15 MEGOHM	1/2 1/2	X		
C-10	22-1885	1000 MMF. CER.	500 V.				R-10	63-1862	210K OHM	1/2 1/2	X		
C-11	22-1886	0.022 MFD.	600 V.				R-11	63-1882	210K OHM	1/2 1/2	X		
C-12	22-1887	0.047 MFD.	600 V.				R-12	63-1890	310K OHM	1/2 1/2	X		
C-13	22-1888	0.047 MFD.	600 V.				R-13	63-1892	220 OHM R.P.	1 1/2	X		
C-14	22-1889	3.0 MMF. CER.	500 V.				R-14	63-1910	1.0 MEGOHM	1/2 1/2	X		
C-15	22-1890	0.01 MFD.	550 V.				R-15	63-1722	47 OHM	1/2 1/2	X		
C-16	22-1891	TRIMMER CAP. ASS'Y.					R-16	63-1841	210K OHM	1/2 1/2	X		
C-17	22-1892	1.2 MMF.	500 V.				R-17	63-1784	100K OHM	1/2 1/2	X		
C-18	22-1893	SPECIAL CAP. (DISC. TYPE)					R-18	63-1795	2.2 MEGOHM	1/2 1/2	X		
C-19	22-1894	1.8 MMF. CER.	500 V.				R-19	63-1792	820 OHM	1/2 1/2	X		
C-20	22-1895	47 MMF. CER.	500 V.				R-20	63-1859	568 OHM	1/2 1/2	X		
C-21	22-1896	45 MMF. CER.	500 V.				R-21	63-1943	670K OHM	1 1/2	X		
C-22	22-1897	52 MMF. CER.	500 V.				R-22	63-1855	47K OHM	1/2 1/2	X		
C-23	22-1898	100 MMF. CER.	500 V.				R-23	63-1701	310 OHM	1/2 1/2	X		
C-24	22-1899	6 MMF. CER.	500 V.				R-24	63-1784	100K OHM	1/2 1/2	X		
C-25	22-1900	DISC. CAP. (2 X 1500 MMF.)					R-25	63-1804	210K OHM	1/2 1/2	X		
C-26	22-1901	30 MMF. CER.	500 V.				R-26	63-1740	82 OHM	1/2 1/2	X		
C-27	22-1902	200 MMF. CER.	500 V.				R-27	63-1758	210 OHM	1/2 1/2	X		
C-28	22-1903	100 MMF. CER. (5 MMF. - 4 MMF.)					R-28	63-1774	470 OHM	1/2 1/2	X		
C-29	22-1904	1.8 MMF. TRIMMER					R-29	63-1818	670K OHM	1/2 1/2	X		
C-30	22-1905	500 MMF. SILVER MICA DISC. (200)					R-30	63-1789	310K OHM	1/2 1/2	X		
C-31	22-1906	200 MMF. CER.	500 V.				R-31	63-1751	110 OHM	1/2 1/2	X		
C-32	22-1907	0.047 MFD.	400 V.				R-32	63-1848	210 OHM	1/2 1/2	X		
C-33	22-1908	9.0 MMF. TRIMMER					R-33	63-1852	39K OHM	1/2 1/2	X		
C-34	22-1909	1.5 MMF.	500 V.				R-34	63-1809	270K OHM	1/2 1/2	X		
C-35	22-1910	13 MMF. CER.	500 V.				R-35	63-1845	310K OHM	1/2 1/2	X		
C-36	22-1911	1.8 MMF. SLUG TUNING TRIM					R-36	63-2022	100 OHM	3 1/2	X		
C-37	22-1912	4.5 MMF. CER.	500 V.				R-37	63-1801	210K OHM	1/2 1/2	X		
C-38	22-1913	7.5 MMF. CER.	500 V.				R-38	63-1775	565 OHM	1/2 1/2	X		
C-39	22-1914	9 MMF. CER.	500 V.				R-39	63-1975	32K OHM	1 1/2	X		
C-40	22-1915	22 MMF. CER.	500 V.				R-40	63-1690	4000 OHM DELAY CONTROL		X		
C-41	22-1916	7.5 MMF. CER.	500 V.				R-41	63-1919	1.5 MEGOHM	1/2 1/2	X		
C-42	22-1917	19 MMF. CER.	500 V.				R-42	63-1866	81K OHM	1/2 1/2	X		
C-43	22-1918	2.5 MMF. CER.	500 V.				R-43	63-1826	47K OHM	1/2 1/2	X		
C-44	22-1919	14 MMF. CER.	500 V.				R-44	63-1781	310 OHM	1/2 1/2	X		
C-45	22-1920	15 MMF. CER.	500 V.				R-45	63-1840	33K OHM	1/2 1/2	X		
C-46	22-1921	12 MMF. CER.	500 V.				R-46	63-1867	100K OHM CONTRAST CONTROL		X		
C-47	22-1922	10 MMF. CER.	500 V.				R-47	63-1824	820K OHM	1/2 1/2	X		
C-48	22-1923	40 MMF. ELECTRO.	350 V.				R-48	63-1830	11K OHM	1/2 1/2	X		
C-49	22-1924	10 MFD. ELECTRO.	200 V.				R-49	63-1578	680K OHM	2 1/2	X		
C-50	22-1925	48 MMF.	300 V.				R-50	63-1861	100K OHM CONTRAST CONTROL		X		
C-51	22-1926	100 MFD.	200 V.				R-51	63-1821	320 OHM	1/2 1/2	X		
C-52	22-1927	470 MMF. MICA	500 V.				R-52	63-1841	100 OHM	1 1/2	X		
L-1	ON T2	SOUND INPUT COIL					L-1	ON T2	SOUND INPUT COIL				
L-2	ON T3	2ND IF TRANS.					L-2	ON T3	2ND IF TRANS.				
L-3	ON T4	2ND IF TRANS.					L-3	ON T4	2ND IF TRANS.				
L-4	ON T4	3RD IF TRANS.					L-4	ON T4	3RD IF TRANS.				
L-5	ON T4	3RD IF TRANS.					L-5	ON T4	3RD IF TRANS.				
L-6	ON T5	DISC. IF TRANS.					L-6	ON T5	DISC. IF TRANS.				
L-7	ON T5	DISC. IF TRANS.					L-7	ON T5	DISC. IF TRANS.				
L-8	5-15062	ANT. COIL ASS'Y.					L-8	5-15062	ANT. COIL ASS'Y.				
L-9	5-15064	CONV. PLATE COIL ASS'Y.					L-9	5-15064	CONV. PLATE COIL ASS'Y.				
L-10	5-15062	HIGH FREQ. OSC. COIL ASS'Y.					L-10	5-15062	HIGH FREQ. OSC. COIL ASS'Y.				
L-11	5-15068	100K FREQ. OSC. COIL ASS'Y.					L-11	5-15068	100K FREQ. OSC. COIL ASS'Y.				
L-12	5-15065	FLUORESC. COIL ASS'Y.					L-12	5-15065	FLUORESC. COIL ASS'Y.				
L-13	5-15068	POWER SUPPLY TRANS. COIL ASS'Y.					L-13	5-15068	POWER SUPPLY TRANS. COIL ASS'Y.				
L-14	5-15071	SERIES SOUND TRAP COIL					L-14	5-15071	SERIES SOUND TRAP COIL				
L-15	5-15071	1ST VIDEO INTERSTAGE COIL ASS'Y.					L-15	5-15071	1ST VIDEO INTERSTAGE COIL ASS'Y.				
L-16	5-15071	ADJUSTMENT SOUND TRAP COIL ASS'Y.					L-16	5-15071	ADJUSTMENT SOUND TRAP COIL ASS'Y.				
L-17	5-15071	2ND VIDEO INTERSTAGE COIL ASS'Y.					L-17	5-15071	2ND VIDEO INTERSTAGE COIL ASS'Y.				
L-18	5-15071	3RD IF COIL ASS'Y.					L-18	5-15071	3RD IF COIL ASS'Y.				
L-19	5-15071	VIDEO IF COIL ASS'Y.					L-19	5-15071	VIDEO IF COIL ASS'Y.				
L-20	5-15071	VIDEO DET. COIL ASS'Y.					L-20	5-15071	VIDEO DET. COIL ASS'Y.				
L-21	5-15071	VIDEO INT. COIL ASS'Y.					L-21	5-15071	VIDEO INT. COIL ASS'Y.				
L-22	5-15071	VIDEO INT. COIL ASS'Y.					L-22	5-15071	VIDEO INT. COIL ASS'Y.				
L-23	5-15071	VIDEO INT. COIL ASS'Y.					L-23	5-15071	VIDEO INT. COIL ASS'Y.				
L-24	5-15071	VIDEO INT. COIL ASS'Y.					L-24	5-15071	VIDEO INT. COIL ASS'Y.				
L-25	5-15071	VIDEO INT. COIL ASS'Y.					L-25	5-15071	VIDEO INT. COIL ASS'Y.				
L-26	5-15071	VIDEO INT. COIL ASS'Y.					L-26	5-15071	VIDEO INT. COIL ASS'Y.				
L-27	5-15071	VIDEO INT. COIL ASS'Y.					L-27	5-15071	VIDEO INT. COIL ASS'Y.				
L-28	5-15071	VIDEO INT. COIL ASS'Y.					L-28	5-15071	VIDEO INT. COIL ASS'Y.				
L-29	5-15071	VIDEO INT. COIL ASS'Y.					L-29	5-15071	VIDEO INT. COIL ASS'Y.				
L-30	5-15071	VIDEO INT. COIL ASS'Y.					L-30	5-15071	VIDEO INT. COIL ASS'Y.				
L-31	5-15071	VIDEO INT. COIL ASS'Y.					L-31	5-15071	VIDEO INT. COIL ASS'Y.				
L-32	5-15071	VIDEO INT. COIL ASS'Y.					L-32	5-15071	VIDEO INT. COIL ASS'Y.				
L-33	5-15071	VIDEO INT. COIL ASS'Y.					L-33	5-15071	VIDEO INT. COIL ASS'Y.				
L-34	5-15071	VIDEO INT. COIL ASS'Y.					L-34	5-15071	VIDEO INT. COIL ASS'Y.				
L-35	5-15071	VIDEO INT. COIL ASS'Y.					L-35	5-15071	VIDEO INT. COIL ASS'Y.				
L-36	5-15071	VIDEO INT. COIL ASS'Y.					L-36	5-15071	VIDEO INT. COIL ASS'Y.				
L-37	5-15071	VIDEO INT. COIL ASS'Y.					L-37	5-15071	VIDEO INT. COIL ASS'Y.				
L-38	5-15071	VIDEO INT. COIL ASS'Y.					L-38	5-15071	VIDEO INT. COIL ASS'Y.				
L-39	5-15071	VIDEO INT. COIL ASS'Y.					L-39	5-15071	VIDEO INT. COIL ASS'Y.				
L-40	5-15071	VIDEO INT. COIL ASS'Y.					L-40	5-15071	VIDEO INT. COIL ASS'Y.				
L-41	5-15071	VIDEO INT. COIL ASS'Y.					L-41	5-15071	VIDEO INT. COIL ASS'Y.				
L-42	5-15071	VIDEO INT. COIL ASS'Y.					L-42	5-15071	VIDEO INT. COIL ASS'Y.				
L-43	5-15071	VIDEO INT. COIL ASS'Y.					L-43	5-15071	VIDEO INT. COIL ASS'Y.				
L-44	5-15071	VIDEO INT. COIL ASS'Y.					L-44	5-15071	VIDEO INT. COIL ASS'Y.				
L-45	5-15071	VIDEO INT. COIL ASS'Y.					L-45	5-15071	VIDEO INT. COIL ASS'Y.				
L-46	5-15071	VIDEO INT. COIL ASS'Y.					L-46	5-15071	VIDEO INT. COIL ASS'Y.				
L-47	5-15071	VIDEO INT. COIL ASS'Y.					L-47	5-15071	VIDEO INT. COIL ASS'Y.				
L-48	5-15071	VIDEO INT. COIL ASS'Y.					L-48	5-15071	VIDEO INT. COIL ASS'Y.				
L-49	5-15071	VIDEO INT. COIL ASS'Y.					L-49	5-15071	VIDEO INT. COIL ASS'Y.				
L-50	5-15071	VIDEO INT. COIL ASS'Y.					L-50	5-15071	VIDEO INT. COIL ASS'Y.				
L-51	5-15071	VIDEO INT. COIL ASS'Y.					L-51	5-15071					



**FOR FURTHER INFORMATION REFER TO
CIRCUIT LEGEND**

John F. Rider

C-67					63-1573	2700 ohm (Insulated) 10% 1W
C-68	22-1836	Dry Electrolytic 20 Mfd. -300Vx20Mfd.	R-78	63-1578	150 ohm (Insulated) 20% 2W	
C-69		-.475V.x40 Mfd. -25V	R-49	63-1579	6200ohm (Insulated) 5% 2W	
C-51	22-1839	.001 Mfd. (or 22-1343) 200V	R-85	63-1581	4.7 ohm W.W.(Insulated) 10% 1/2 W.	
C-58	22-1841	.1 Mfd. (or 22-1844) 600V		63-1668	Focus Control (Used with one 63-1573 as temp.sub for 63-2009)	
C-65	22-1842	.0047 Mfd. 200V				
C-65	22-1843	.01 Mfd. 600V	R-81	63-1669	Horizontal Center Control	
C-80	22-1844	.047 Mfd. 600V	R-68	63-1670	Vertical Center Control	
C-63	22-1845	.0022 Mfd. 600V		63-1671	Vertical Hold Control (or 63-2025)	
C-83	22-1846	.01 Mfd. 400V	R-73	63-1672	Horizontal Hold Control	
C-6	22-1847	.0047 Mfd.(Use 22-3) 200V.		63-1673	Vertical Size Control (or 63-2036)	
C-76	22-1849	.0047 Mfd. 600V	R-67	63-1674	Vertical Linearity Control	
C-75	22-1850	.015 Mfd. 200V	R-77	63-1675	Horizontal Drive Control	
C-80	22-1851	.001 Mfd. 1000V	R-79	63-1679	15K ohm W.W. (Insulated) 20% 20W.	
C-59	22-1901	.033 Mfd. 600V	R-50	63-1682	Intensity Control	
C-70	22-1903	Dry Electrolytic 20 Mfd. -25V	R-52	63-1684	10K ohm (Insulated) 10% 7W. Zipohm	
C-71		Dry Electrolytic 500 Mfd.	R-83	63-1685	620 ohm (Insulated) 10% 10W.Zipohm	
C-72	22-1904	3 V. x 20 Mfd. -25V.		63-1689	4500 ohm (Insulated) 10% 10W.Zipohm	
	22-1948	Dry Electrolytic 50 Mfd. 50V	R-40	63-1690	Delay Control (4K ohm)	
C-89	22-2033	Dry Electrolytic 40 Mfd.	R-23	63-1701	10 ohm (Insulated) 10% 1/2 W.	
C-90		450 V x 20 Mfd. 25 V	R-31	63-1751	150 ohm (Insulated) 20% 1/2 W.	
C-79	22-2034	680 Mmfd. Mica. 5% 500V				

Diag. No.	Part No.	Description	Diag. No.	Part No.	Description	Diag. No.	Part No.	Description	Diag. No.	Part No.	Description
R-91	63-1754	180 ohm (Insulated) 10% 1/2 W.		80-690	Spring - Indicator Detent						
R-38	63-1775	560 ohm (Insulated) 10% 1/2 W.		80-731	Spring - Width Control Tension	S-15263		Anode Clip & Wire Assem. (Used on S-15202)	80-679		Spring - Shaft Tension (or 80-701)
	63-1779	1200 ohm (Insulated) 10% 1/2 W.		83-1567	A.F.C. - Terminal Board				83-1560		Master Terminal Strip
R-44	63-1781	820 ohm (Insulated) 5% 1/2 W.		83-1569	C.R.T.-Mtg. Rubber Strip (or 83-1605)	S-15204		Osc. Cam Drive Shaft & Pulley Assy.	83-1570		Antenna Terminal Strip
R-19	63-1782	820 ohm (Insulated) 10% 1/2 W.		83-1573	Insulator Strip (C.R.T.Socket Wire)	S-15205		Osc. Cam Control Ext. Shaft & Pulley Assem.	93-216		.015 x .155 x 7/16" Steel Washer
R-25	63-1806	3300 ohm (Insulated) 10% 1/2 W.		83-1585	Insulator Strip	S-15206		Osc. Cam Drive Cord & Eyelet Assy.	93-952		Bakelite Washer
R-90	63-1820	680 ohm (Insulated) 10% 1/2 W.		85-238	Focus Current Range Switch	S-15207		C.R.T. Socket & Wire Assem.	93-959		Fibre Washer (Use 93-973 Bakelite Washer on later Prod)
R-47	63-1824	8200 ohm (Insulated) 10% 1/2 W.	S-2	93-946	Cup Washer	S-15208		Phone Vision Dummy Plug & Wire Assem. (or use 58-178)	94-647		Osc. Coil Mtg. Bushing
R-53	63-1827	10K ohm (Insulated) 10% 1/2 W.		93-947	Cup Washer	S-15209		Electrostatic & Heat Shield Assem.	112-732		Calibrating Screw
R-61	63-1831	12K ohm (Insulated) 10% 1/2 W.		93-952	1/16" x .144x3/8" Bakelite Washer (3 used)	S-15210		Beam Bender Unit (Used only with 12LP4)	112-742		Trimmer Adjusting Screw (Used on S-15211)
R-48	63-1838	18K ohm (Insulated) 10% 1/2 W.		93-953	Indicator Drive Gear Washer	S-15343		Contrast Indicator Pulley, Bushing, and Disc. Assem.	126-622		Miniature Tube Shield (Alt. for 126-615)
R-35	63-1845	27K ohm (Insulated) 10% 1/2 W.		93-955	1/16" x 11/64" x 1/2" Bakelite Washer (2 used)	S-15344		Contrast Indicator Pulley & Bushing Assem.	126-597		Internal Shield
R-32	63-1848	33K ohm (Insulated) 10% 1/2 W.		94-645	Coupling Bushing	S-15345		Tuning Shaft Brkt & Plate Assem.	128-53		Osc. Coil Tuning Cam (3 used)
R-45	63-1849	33K ohm (Insulated) 20% 1/2 W.		94-653	Focusing Coil Bushing	S-15346		Channel Indicator Disc. & Gear Assy.	149-62		Iron Core & Screw (Used on S-15064)
R-33	63-1852	39K ohm (Insulated) 10% 1/2 W.		95-1110	Deflection Yoke	S-15347		Contrast Indicator Cord & Eyelet	149-74		Iron Core (Used on S-15082)
R-22	63-1855	47K ohm (Insulated) 10% 1/2 W.	T-9	95-1111	Focus Coil	S-15348		Anode Clip, Terminal & Washer	149-75		Iron Core & Screw (Used on S-15064)
R-43	63-1856	47K ohm (Insulated) 20% 1/2 W.	L-80	95-1111	Vertical Output Transformer	S-15349		Deflection Yoke Mtg. Assem.	188-34		Retaining Ring (Used on 78-533)
R-20	63-1859	56K ohm (Insulated) 10% 1/2 W.	T-8	95-1112	Vertical Blocking Osc. Transformer	S-15350		Indicator - Brkt. & Stud Assem.	S-15027		R.F. Shelf Assem. (Complete)
R-42	63-1865	82K ohm (Insulated) 10% 1/2 W.	T-7	95-1113	Filament Transformer	S-15614*		Horizontal Size Control Assem.	S-15028		Tuning Washer Assem.
R-4	63-1870	100K ohm (Insulated) 10% 1/2 W.	T-13	95-1116	Channel Indicator Stud	S-15711*		C.R.T. Retaining Brkt & Grommet Assem. (R.H)	L-10	S-15043	High Frequency Osc. Coil & Capacitor Assem.
R-51	63-1873	120K ohm (Insulated) 10% 1/2 W.		100-36	Dial Light Bulb (2 used)	S-15719*			L-8	S-15062	Antenna Coil Assem.
T-6	63-1876	150K ohm (Insulated) 10% 1/2 W.	P1-1	112-88	#8-32 Thumb Screw (3 used)				L-9	S-15064	Converter Plate Coil Assem.
R-92	63-1880	180K ohm (Insulated) 10% 1/2 W.		113-9	#8-32 x 1/4" Hex. Hd. Slotted M.S. (Lockwasher attached - 7 used)				L-12	S-15065	Filament Choke Coil Assem.
R-11	63-1883	220K ohm (Insulated) 10% 1/2 W.		114-39	#8x1/4" Hex. Hd. S.T.Screw (18 used) (Or 114-326)				L-11	S-15066	Low Frequency Osc. Coil Assem.
R-88	63-1884	220K ohm (Insulated) 20% 1/2 W.		114-307	#8-32x1 1/4" Hex. Hd. Slotted M.S.				C-16	S-15211	Trimmer Capacitor Assem.
R-89	63-1891	330K ohm (Insulated) 20% 1/2 W.		114-316	#8-32x1 1/4" Hex. Hd. Slotted M.S. (2 used)						
R-57	63-1896	470K ohm (Insulated) 5% 1/2 W.		125-72	Rubber Grommet (C.R.T.Mtg. - 2 used)						
T-83	63-1898	470K ohm (Insulated) 20% 1/2 W.		126-613	Fire Shield						
R-56	63-1901	560K ohm (Insulated) 10% 1/2 W.		138-16	Fuse 1/4 amp.						
R-14	63-1910	1 Megohm (Insulated) 5% 1/2 W.		149-71	Iron Core (Used on S-15126 & 27)						
R-55	63-1912	1 Megohm (Insulated) 20% 1/2 W.		149-77	Iron Core & Insert (Used on S-15042)						
	63-1914	1.2 Megohm (Insulated) 5% 1/2 W.		149-78	Iron Core & Screw (2 used on S-15041)						
	63-1917	1.5 Megohm (Insulated) 5% 1/2 W.		166-50	C.R.T. Support Bumper						
R-65	63-1918	1.5 Megohm (Insulated) 10% 1/2 W.		168-27	Retaining Ring (2 used)						
R-41	63-1919	1.5 Megohm (Insulated) 20% 1/2 W.		188-32	Retaining Ring						
R-18	63-1926	2.2 Megohm (Insulated) 20% 1/2 W.		188-34	Retaining Ring						
R-65	63-1940	4.7 Megohm (Insulated) 20% 1/2 W.		188-75	Retaining Ring (2 used)						
		(Use 63-1919)		214-7	Indicator Drive Chain						
	63-1965	150 ohm W.W.(Insulated) 20% 2W.		S-15015	Horizontal Sweep Trans. Assy. (Used on S-15202)						
		(Alt. for 63-1578)		S-15020	R.F.Shelf & Turret Tuner Assy. (Complete)						
	63-1967	1500 ohm (Insulated) 10% 1W.		S-15025	Turret Drive Gear & Bushing Assy.						
	63-1995*	150 ohm (Insulated) 20% 3W.Zipohm		S-15041	Horizontal Osc. & A.F.C. Trans. Assembly						
		(Alt. for 63-1578)		S-15042	Horizontal Size Control Assembly (Use S-15711)						
R-32	63-2009	Focus Control (Use one each 63-1573 & 63-1668 as temp. sub. on 1300 chassis)		S-15045	Sound Chassis Assem. (Complete)						
R-80	63-2011	3K ohm W.W.(Insulated) 10% 10W. (one 63-1889 maybe in parallel with one 63-1884 as a sub. for 63-2011)		S-15046	Video I.F. Strip Assem. (Complete)						
				S-15067	C.R.T. Tie Down Strip & Brkt. Assy. (83-1566)						
R-71	63-2017	4K ohm Zipohm(Insulated) 10% 5W		S-15114	Osc. Coil Assem. (Used on S-15041)						
	69-154	#6-32x2 1/4" R.H.M.S. Steel N.P.		S-15124	A.F.C. Coil Assem. (Used on S-15041)						
	69-265	#8-32x2 1/2" R.H.M.S. Steel N.P.		S-15125	1st Video Peaking Coil Assem.						
	73-21	#8-32x3/16" Headless Set.Screw		S-15126	2nd Video Peaking Coil Assem.						
		Cuppoint (8 used)		S-15127	2nd Video Series Peaking Coil Assem.						
	73-24	#8-32x1/4" Hex. Hd.Set Screw		S-15128	B+ Choke Coil Assem.						
		Cuppoint (2 used)		S-15132	A.C. Plug & Brkt.						
	73-30	#6-32x1/4" Hex. Hd. Set Screw		S-15134	Chain Gear & Washer Assem.						
		Cuppoint (2 used)		S-15202	Horizontal Sweep Trans. & Socket Assem.(or S-15710 & S-15711)						
	76-536	Idler Shaft									
	76-537	Tuning Shaft									
	78-706	Socket - Octal Tube									
	78-755	Socket - Octal Tube (4 used)									
	78-788	Socket - Miniature Tube (9 contact)									
	78-791	Socket Seven Contact									
	78-807	Socket - Miniature Tube (2 used)									
	78-826	Socket - Eleven Contact									
	78-829	Socket - C.R.T. (Used on S-15207)									
	78-834	Socket - Octal Tube (Low Loss)									
	78-835	Dial Light Socket & Wire									
	80-402	Spring Drive Cord Tension (3 used)									
	80-686	Spring - Grounding									

Diag. Part			Diag. Part			Diag. Part			Diag. Part		
No.	No.	Description	No.	No.	Description	No.	No.	Description	No.	No.	Description
C-41	22-1900	7.5 Mmfd. Ceramic 500 V.(Used on S-15035)	C-32	22-1775	.047 Mfd.	400 V.					
C-37	22-1951	4.5 Mmfd. Ceramic 500 V. (Used on S-15030)	C-38	22-1852	7.5 Mmfd. Ceramic	500 V.					
C-35	22-1952	13 Mmfd. Ceramic 500 V (Used on S-15029)	C-24	22-1869	8 Mmfd. Ceramic	500 V.(2 used)					
	22-2094	7.5 Mmfd. Ceramic 500 V. (1 ea. used on S-15037 - 38 - 39 - 40)	C-22	22-1870	52 Mmfd. Ceramic	500 V.					
46-779		Adjusting Wrench Knob & Set Screw	C-26	22-1871	30 Mmfd. Ceramic	500 V.					
56-263		Groove Pin Type 1 1/8" Dia. x 1/4" Lg. (Replaces 56-253)	C-29	22-1882	Trimmer (Used on S-15054)						
			C-15	22-1888	.001 Mfd. Ceramic	500 V.					
57-1428		Bearing Plate	C-84	22-1895	10 Mmfd. Ceramic	500 V.					
57-1497		Adjusting Plate (Rear Bearing)		22-2050	5 Mmfd. Ceramic	500 V.					
R-25	63-1806	3300 Ohm 1/2 W. 10% Ins. Res. (1 ea. used S-15029-30-31)		22-2059	4 Mmfd. Ceramic	500 V.					
R-87	63-1813	4700 Ohm 1/2 W. 10% Ins. Res. (1 ea. used S-15032 & 33)	C-25	105-17	Dual Ceramic (2X1500 Mmfd.)						
R-90	63-1820	6800 Ohm 1/2 W. 10% Ins. Res. (1 used on S-15029)		105-18	Dual Ceramic (5 mmfd.-6 mmfd.)						
			C-23	105-20	(Use 1 ea. 22-2050 & 2059 as alt.)						
68-12		Adjusting Wrench			4-5 Mmfd Dual Capacitor (use 22-2050 and 22-2059 as alt.)						
73-24		#8-32 x 1/4" Hex. Hd. Slotted Set Screw Cuppoint (2 used on S-15024)	C-30	27-108	Silver Mica Disc. (2 used) 500 Mmfd.						
73-119		Special Set Screw 10-32 x 1/2		54-271	#6-32 x 1/4" Hex. Palmnut (Inverted) (4 used)						
73-122		Special Set Screw 1/4-28x3/4	R-26	63-1740	32 ohm (Insulated) 10% 1/2 W.						
80-697		Adj. Wrench Return Spring	R-31	63-1751	150 ohm (Insulated) 20% 1/2 W.						
80-743		Index Spring (Used on S-16016)	R-27	63-1758	220 ohm (Insulated) 20% 1/2 W.						
83-1071		Threaded Insert (36 used)	R-28	63-1772	470 ohm (Insulated) 20% 1/2 W.						
94-677		Index Spring Bushing	R-24	63-1786	1K ohm (Insulated) 20% 1/2 W.						
113-7		#4-40 x 1/4" B.H.M.S. Steel N.P. (Ext. Shakeproof Lockwasher)	R-25	63-1806	3300 ohm (Insulated) 10% 1/2 W.						
113-8		#6-32 x 1/4" Hex. Hd. Slotted M.S. (Int. Shakeproof Lockwasher)	R-34	63-1809	3900 ohm (Insulated) 5% 1/2 W.						
113-9		#6-32x 1/4" Hex. Hd. Slotted M.S. (Int. Shakeproof Lockwasher)		63-1812	4700 ohm (Insulated) 5% 1/2 W. (or 63-1818)						
126-596		R.F. Shelf Shield (or S-15497)	R103	63-1816	5600 ohm (Insulated) 5% 1/2 W.						
149-76		Iron Core & Screw (Alt. for 139-83)	R-29	63-1818	6200 ohm (Insulated) 5% 1/2 W.						
149-86		Iron Core (Sub for 149-40) (36 used)	R-35	63-1845	27K ohm (Insulated) 10% 1/2 W.						
184-14		Steel Ball 1/8" Dia.	R-32	63-1848	33K ohm (Insulated) 10% 1/2 W.						
184-15		Steel Ball 5/32" Dia.	R-33	63-1852	39K ohm (Insulated) 10% 1/2 W.						
184-16		Steel Ball 1/2" Dia.	R-18	63-1926	2.2 Megohm (Insulated) 20% 1/2 W.						
S-15019		Turret Tuner Housing Assem.		64-451	Brass Eyelet (Used on 57-1054)						
S-15020		R.F. Shelf & Turret Tuner Assy. (Complete)		78-788	Socket - Noval Tube						
S-15021		Turret Tuner Assem. (Mechanical)		78-807	Socket - Miniature Tube (3 used)						
S-15022		Turret Tuner Cover Assem.		86-182	Capacitor Lug						
S-15023		Idle Gear & Brkt. Assem.		94-538	Tuning Slug Insert (Used on S-15048-50-53-and 57)						
S-15024		Tuning Shaft Gear & Bushing Assem.		125-69	Rubber Grommet (4 used as shock mounts for coils)						
S-15029		Channel Strip Assem. #2		149-39	Iron Core (Used on S-15050)						
S-15030		Channel Strip Assem. #3		149-62	Iron Core & Screw (Used on S-15049-51-52 and 54)						
S-15031		Channel Strip Assem. #4		149-71	Iron Core (Used on S-15059-60)						
S-15032		Channel Strip Assem. #5		149-85	Iron Core (Used on S-15048-53-57)						
S-15033		Channel Strip Assem. #6		S-15046	Video I.F.Strip Assy.(Complete) (or S-15808)						
S-15034		Channel Strip Assem. #7	L-13	S-15048	Parallel Tuned Sound Trap Coil Assem.						
S-15035		Channel Strip Assem. #8			Video L.F. Coupling Coil Assem.						
S-15036		Channel Strip Assem. #9	L-32	S-15049	Series Tuned Sound Trap Coil Assem. (or S-15727)						
S-15037		Channel Strip Assem. #10		S-15050	1st Video I.F. Coil Assem.						
S-15038		Channel Strip Assem. #11	L-16	S-15051	2nd Video I.F. Coil Assem.						
S-15039		Channel Strip Assem. #12	L-18	S-15052	Adjacent Sound Channel Trap Coil Assem.						
S-15040		Channel Strip Assem. #13	L-17	S-15053	Assem. (or S-15727)						
S-16016		Index Spring & Bushing Assem.			1st Video I.F. Coil Assem.						
					2nd Video I.F. Coil Assem.						
					Adjacent Sound Channel Trap Coil Assem.						
					3rd I.F. Transformer Assem.						
					3rd I.F. Coil Assy.(Use S-15054)						
					Video Cathode Trap Coil Assem.						
					Video Detector Series Coil Assem. (Peaking)						
					Video Detector Shunt Coil Assem. (Peaking)						
					Filament Choke Assem.						
					Video I.F. Coil Assem. (3rd Secondary) (Use S-15054)						
19-166		Coil Mtg. Clip (Used on S-15051 & 52) (or 18-181)	L-22	S-15059							
19-179		Coil Mtg. Clip (Used on S-15049 & 54)	L-23	S-15060							
C-27	22-1668	200 Mmfd. Ceramic 500 V.	L-20	S-15242							
C-23	22-1669	100 Mmfd. Ceramic 500 V. (or 22-162)									

CHASSIS 27F20, 27F22, 28F20, 28F21, 28F22, 28F23, 28F25, 29G20

TUBES

1 6AH6
1 12AT7
2 6AU6

SOUND CHASSIS

Diag. No.	Part No.	Description
		Vol. Cont. Mtg. Brkt.
C-14	12-1540	3 Mmfd. Ceramic 500 V. (or 22-1896)
C-9	22-1703	.0005 Mfd. 500 V.
C-8	22-1706	.005 Mfd.(Disc. type) 450 V.
C-13	22-1782	.0047 Mfd. 600 V.
C-10	22-1811	.0047 Mfd. 400 V.
C-12	22-1813	.022 Mfd. 600 V.
C-6	22-1847	.0047 Mfd. 200 V.
C-5	22-1880	.0012 Mfd. 600 V.
C-11	22-1886	.001 Mfd. Ceramic 500 V.
C-7	22-1887	25 Mmfd. Ceramic 500 V.
SP-1	49-649	10" P.M. Speaker
		208-649 Cone & Voice Coil
	54-139	#3/8-32x9/16" Hex. Palmnut
	54-267	#6-32x5/16" Hex. Palmnut (Inverted) (4 used) (or 54-271)
	58-88	Three Prong Plug
	58-177	Three Prong Adaptor Plug
R-5	63-1194	47K ohm (Insulated) 10% 1 W.
R-13	63-1227	220 ohm W.W. (Insulated) 10% 1W.
R-3	63-1571	6800 ohm (Insulated) 10% 2W.
R-46	63-1667	Dual Con. & A.C.Switch (Volume and Contrast)
R-2	63-1737	68 ohm (Insulated) 20% 1/2 W.
R-7	63-1828	10K ohm (Insulated) 20% 1/2 W.
R-10	63-1842	22K ohm (Insulated) 20% 1/2 W.
R-8	63-1869	100K ohm (Insulated) 10% 1/2 W.
R-4	63-1870	100K ohm (Insulated) 20% 1/2 W.
R-6	63-1876	150K ohm (Insulated) 10% 1/2 W.
R-11	63-1883	220K ohm (Insulated) 10% 1/2 W.
R-12	63-1890	330K ohm (Insulated) 10% 1/2 W.
R-55	63-1912	1 Megohm (Insulated) 20% 1/2 W.
R-9	63-1961	15 Megohm (Insulated) 10% 1/2 W.
	63-1968	6800 Ohm (Insulated) W.W. 10% 2W. (Alt. for 63-1571)
	63-1997	6800 ohm (Insulated) 10% 2 W. (Alt. for 63-1571) Zipohm
	78-363	Socket - Three Contact
	78-755	Socket - Octal Tube
	78-788	Socket - Noval Tube
	78-807	Socket - Miniature Tube (3 used)
T-6	95-1114	Output Transformer
	95-1118	2nd I.F. Transformer
T-3	95-1119	3rd I.F. Transformer
T-4	95-1120	Discriminator Transformer
T-5	95-1121	Sound Input Coil (or 95-1155)
	114-201	#8x5/16" Hex. Hd. Slotted S.T.scr.
S-15045		Sound Chassis Assy. (Complete)

TUBES

3 6AU6
1 6V6GT
1 6T8

POWER SUPPLY

Diag. No.	Part No.	Description
C-1	22-1826	Dry Electrolytic - 15 Mfd. 250V
C-2	22-1827	Dry Electrolytic - 40 Mfd. 400V
C-3		
C-4	22-1828	Dry Electrolytic - 20 Mfd. 475V x100 Mfd. - 350V #10-32x5/16" Hex. Nut (4 used to mount 95-1115)
	54-42	Seven Prong Plug (Used on S-15009)
P-1	58-169	10 ohm W.W.(Insulated) 5% 2W. (or 63-1996)
R-1	63-1580	Socket - Electrolytic
	78-229	Socket - Electrolytic
	78-274	Socket - Tube (2 used)
	78-755	Filter Choke (2 used)
L-78	95-1109	Power Transformer
T-1	95-1115	#10-32x3/8" Hex. Slotted Washer Hd. M.S. (4 used to Mount) (95-1115)
	114-43	Heat Shield
	126-604	Power Supply Assem. (Complete)
W-1	S-15007	Power Supply Cable Assem.
	S-15009	

TUBES

2 5U4G

POWER SUPPLY FOR 28T925EU AND 28T925RU

Diag. No.	Part No.	Description
	19-9	Cable Retaining Clip
C-1	22-1826	Electrolytic Condenser 15 Mfd.250V.
C-2	22-1827	Electrolytic Condenser 40 Mfd.400V.
C-3	22-1828	Electrolytic Condenser 100 Mfd. 350V-20 Mfd. - 475V
	54-34	#6-32x1/4"x3/32" Hex. Nut Steel N.P. (Used on 19-9)
	54-42	#10-32x5/16"x3/32" Hex. Nut Steel N.P. (4 used to Mt. 95-1124)
	57-1465	Cover Plate
R-1	63-1580	10 ohm W.W.(Insulated) 5% 2W. (or 63-1996)
R-93	63-2015	33 ohm W.W. (Insulated) 20% 2 W (or 63-2016)
	71-24	1/4-20x1/2" Flat H.M.S. Steel Plain (Used on 57-1465)
	78-229	Electrolytic Condenser Socket
	78-274	Electrolytic Condenser Socket
	78-755	Octal Tube Socket (2 used)
	93-125	#6 Internal Shakeprf. Lockwasher #1206 (1 used on 19-9)
	93-127	#10 Internal Shakeprf. Lockwasher #1210 (4 used to Mt. 95-1124)
	95-1109	Filter Choke
T-1	95-1124	Power Transformer
L-82	95-1154	Filter Choke
	114-43	10-32X3/8 Hex. Slotted Washer H.M.S. Steel N.P. (4 used to Mt. 95-1124)
	114-255	6-32x 5/16 Hex. Acorn H.M.S. Steel N.P. (1 used on 19-9)
	114-297	#6x1/4" Hex. Hd. Slotted S.T.Screw N.P. Stan. Tap (4 used to mt heat shields)
	126-604	Heat Shield
	S-15009	Cable Assem.
	S-15376	Heat Shield & Brkt Assem.
	S-15747	Power Supply Assy. (Complete)

Diag. Part			Diag. Part			Diag. Part			Diag. Part		
No.	No.	Description	No.	No.	Description	No.	No.	Description	No.	No.	Description
						28F21, 28F22, 28F23, 28F25, 29G20					
<u>TUBES</u>											
2 5U4G			28T962R & 28T960K (Chassis 28F20)			34-192 Drive Gear					
28T960E (Chassis 28F20)						73-21 #8-32X3/16" Hdless Set Screw Cuppoint (4 used)			MODEL 28T925E (Chassis 28F22)		
CABINET PARTS						76-536 Idler Shaft			Model 28T925E is the same as Model 28T960E except for the following:		
7-11 Bezel (12" tube)			7-13 Bezel (12" tube)			76-537 Tuning Shaft					
11-106 Line Cord & Plug (9 ft. long)			11-106 Line Cord & Plug (9 ft. long)			188-27 Retaining Ring					
17-105 Bezel Clamp (4 used on 7-11)			17-105 Bezel Clamp (4 used)								
19-180 Control Cover Retaining Clip (3 ea. used on S-15341-42)			19-180 Cover Retaining Clip (3 ea. used on S-15363-64)								
24-446 A.C. Line Cord Plug Cover			24-479 Control Cover - Outer (R.H.)			<u>TUBE</u>			<u>OMIT</u>		
24-477 Outer Control Cover (R.H.)			24-480 Control Cover - Outer (L.H.)			1 12KP4			7-11 Bezel (12" Tube)		
24-478 Outer Control Cover (L.H.)			46-771 Vertical Hold & Horizontal Hold Control Knob (4 used)						49-649 10" P.M. Speaker		
46-752 Vertical Horizontal Hold Control Knob (4 used)			46-773 Channel Selector Knob			<u>ADD</u>			208-649 Cone & Voice Coil		
46-761 Channel Selector Knob			46-774 Contrast Control Knob			S-15319 Tie-Down Strip & Brkt Assem.			112-289 #8-32x1 3/8" Swedge Hd. M.S. (4 used)		
46-762 Contrast Control Knob			46-775 Volume Control & "On-Off" Sw. Knob			S-15917 C.R.T. Brkt & Adapter Brkt Assem.			138-32 Speaker G-ill		
46-763 Volume Control & "On-Off" Sw. Knob			46-783 Dial Light Switch Knob			S-15320 Beam Bender Unit (Used only when using 10BP4)			192-122 Protective Glass		
46-782 Dial Light Switch Knob			49-649 10" P.M. Speaker			12-1533 Tube Adaptor Bracke: (2 used)			196-115 Bezel Gasket		
49-649 10" P.M. Speaker			54-30 208-649 Cone & Voice Coil			75-532 Tuning Shaft			196-113 Protective Glass Gasket		
54-30 #8-32x5/16"x7/64" Hex. Nut (4 used)			56-261 13 Ga. x 3/8" lg. Brass Esc. Pin			93-767 .020 x .385 x 5/8 Steel Washer (used on 76-532)			202-672 Instruction Book		
56-261 #18 Ga. x 3/8" lg. Brass Esc. Pin (2 used)			57-1464 Name Plate			113-9 #8-32X1/4" Hex. Hd. Slotted M.S. Steel N.P. (#8 Int. Lockwasher #1208 Attached)			S-15007 Power Supply Assem.		
57-1463 Name Plate			57-1481 Bezel Clamping Plate (4 used)						<u>ADD</u>		
57-1481 Bezel Clamping Plate (4 used)			58-75 Switch Plug						7-12 Bezel (10" Tube)		
58-75 Switch Plug			70-86 #8x5/8" Washer Hd. Wood Screw Steel St. atuary Bronze (4 used)						49-654 5 1/4" P.M. Speaker		
70-86 #6x5/8" Washer Hd. Wood Screw Statuary Bronze (4 used)			70-149 #4x1/2" Phillips R.H. Wood Screw Steel Cad. Plate (10 used)						208-654 Cone & Voice Coil		
70-149 #4x1/2" Phillips B.H.W.S. (10 used)			74-55 Ventilating Screen			<u>TUBE</u>			74-56 Ventilating Screen		
74-55 Ventilating Screen			78-787 Two Contact A.C. Socket			1 10FP4 (use 10BP4 as alt. if required)			74-57 Ventilating Screen		
74-56 Ventilating Screen			83-1630 Strip (2 used on C.R.T. in shipment)			MODEL 28T961E (Chassis 28F21)			112-142 Speaker Mounting Screws (2 used)		
74-57 Ventilating Screen			85-448 Dial Light Switch (Used on S-15424)			Model 28T961E is the same as Model 28T960E except for the following:			192-123 Protective Glass		
78-787 Two Contact A.C. Socket			93-968 .46x.171 x 1/2" Steel Washer - Cad. Pl. (4 used)			<u>OMIT</u>			196-117 Bezel Gasket		
83-1630 Strip (2 used on C.R.T. in shipment)			112-289 #8-32x1 3/8" Swedge Hd. M. Screw (4 used)						196-119 Protective Glass Gasket		
85-448 Dial Light Switch (used on S-15424)			112-744 Latch Adjusting Screw (2 used)						202-681 Instruction Book		
93-263 1/32 x 3/16" x 1/2" Steel Washer (4 used)			112-745 #4-40x1/4" Flat Hd. S.T. Screw (8 used)						202-682 Unpacking & Installation Inst. Sheet		
112-289 #8-32 x 1 3/8" Swedge Hd. M.S. (4 used)			114-80 #1/4-20 x 1 3/8" Eex. Washer Hd. M.S. (7 used)						S-15375 Power Supply Assem. or S-15747 Cabinet Back & A.C. Cord Assem.		
112-744 Latch Adjusting Screw (2 used)			114-313 #8x1/2" Hex. Hd. Slotted S.T. Screw (4 used)								
112-745 #4-40X 1/4" Flat Hd. S.T. Screw (8 used on 17-105)			138-33 Speaker Grille						<u>MODEL 28T925R (Chassis 28F22)</u>		
114-80 #1/4-20X1 3/8" Washer Hd. M.S. (7 used)			171-9 Indicator Prism (2 used)						Model 28T925R is the same as Model 28T925E except for the following:		
114-313 #8x1/2" Hex. Hd. Slotted S.T. Screw (4 used)			184-14 Steel Ball - 1/8" Dia. (To be inserted in shaft of V. C. knob)								
138-32 Speaker Grille			188-102 Clamping Ring								
171-9 Indicator Prism (2 used)			192-122 Protective Glass								
184-14 Steel Ball-1/8" Dia. (To be inserted in shaft of V.C. Knob)			196-116 Gasket (Bezel)								
188-102 Clamping Ring			196-118 Protective Glass Gasket								
192-122 Protective Glass			202-672 Instruction Book (Operating Guide)								
196-116 Bezel Gasket (used on 7-11)			202-673 Unpacking & Installation Instruction Sheet								
196-118 Protective Glass Gasket			S-15363 Control Cover & Clip Assem. (R.H.)								
202-672 Instruction Book (Operating Guide)			S-15364 Control Cover & Clip Assem. (L.H.)								
202-673 Unpacking & Installation Inst. Sheet			S-15424 Dial Light Switch & Wire Assem.								
S-15424 Dial Light Switch & Wire Assy.			S-15471 Cabinet Back & A.C. Cord Assem.								
S-15471 Cabinet Back & A.C. Cord Assem.			S-15341 Control Cover & Clip Assem. (R.H.)								
S-15341 Control Cover & Clip Assem. (R.H.)			S-15342 Control Cover & Clip Assem. (L.H.)								
S-15342 Control Cover & Clip Assem. (L.H.)			S-15521 Line Cord & Connector (Less back cover screen)								
S-15521 Line Cord & Connector (Less back cover screen)			28F21 Main Chassis same as 28F20 Main Chassis except:								
			<u>OMIT</u>								
			S-15067 Tie Down Strip & Bracket Assem.								
			S-15919 C.R.T. Retaining Brkt & Grommet Assem.								
			34-186 Drive Gear (2 used)								
			<u>ADD</u>								
			192-122 Protective Glass 12"								
			196-116 Rubber Gasket (Bezel)								
			196-118 Rubber Gasket (Protective Glass)								
			<u>MODEL 28T963R (Chassis 28F21)</u>								
			Model 28T963R is the same as Model 28T962R except for the following:								
			<u>OMIT</u>								
			192-122 Protective Glass 12"								
			196-116 Rubber Gasket (Bezel)								
			196-118 Rubber Gasket (Protective Glass)								
			<u>ADD</u>								
			192-123 Protective Glass 10"								
			196-117 Rubber Gasket (Bezel)								
			196-119 Rubber Gasket (Protective Glass)								

Diag. No.	Part No.	Description
	46-775	Volume Control & "On-Off" Switch Knob
	46-783	Switch Knob
	57-1464	Nameplate
	S-15365	Control Cover & Clip Assem. (R.H.)
	S-15364	Control Cover & Clip Assem. (L.H.)

28F22 Power Supply Same As 28F20 Power Supply Except:

OMIT

S-15007	Power Supply Final Assem. (Complete)
95-1115	Power Transformer

ADD

S-15375	Power Supply Final Assem. (Complete) or S-15747
96-1124	Power Transformer

SPECIAL TEST EQUIPMENT FOR T.V.

68-13	Alignment Tool
68-14	Tuning Wand
78-851	Adaptor Socket (To improve vertical synchronization in fringe areas)
S-15369	Generator Test Unit
S-15370	Eias Test Fixture
S-15371	Coupling Ring
S-15521	A.C. Test Cord for T.V. Chassis
S-15627	Balance Transformer (Antenna)
S-15729	Balance Transformer (Receiver)

MODEL 27T965R (Chassis 27F20)

Diag. No.	Part No.	Description
C61	22-162	100 Mmfd (Molded) 500V
	22-1532	47 Mmfd (Molded) 500V
	22-2081	.1 Mfd. (Molded) 400V
	22-2083	.115 Mfd. (Molded) 800V
	24-509	Cover (Used on S-15041)
	24-517	Switch Cover (85-469)
	34-192	Drive Gear
	44-25	Pilot Light Jack
	57-1512	Indicator Mtg. Plate
	63-1065	15K Ohm 1 W. 10% Ins. Res.
	63-1101	8200 Ohm 2 W. 10% Ins. Res.
	63-1193	5600 Ohm 2 W. 10% Ins. Res.
	63-1620	1800 Ohm 2 W. 10% Ins. Res.
	63-1771	470 Ohm 1/2 W. 10% Ins. Res.
	63-1784	1000 Ohm 1/2 W. 5% Ins. Res.
	63-1785	1000 Ohm 1/2 W. 10% Ins. Res.
R58	63-1799	2200 Ohm 1/2 W. 10% Ins. Res.
R87	63-1813	4700 Ohm 1/2 W. 10% Ins. Res.
R-98	63-1897	470K Ohm 1/2 W. 10% Ins. Res.
	63-1901	560K Ohm 1/2 W. 10% Ins. Res.
	63-1974	3300 Megohm 1 W. 10% Ins. Res.
	63-1975	12K Megohm 1 W. 10% Ins. Res.
R60	63-2025	Vertical Hold Control

Diag. No.	Part No.	Description
R62	93-2036	Vertical Size Control
	93-2049	1000 Ohm 1/2 W. 10% Ins. Res.
	93-2061	Intensity Control
	93-1605	Rubber Strip (C.R.T. Mtg.)
	95-469	Picture Control Switch
	93-216	.015 x .255 x 7/16" Steel Washer (Used on S-15343)
	93-787	.020 x .385 x 5/8" Steel Washer (Used on 78-537)
	93-965	Rubber Washer (Used on S-15203)
	114-295	#8x 5/16 Hex Hd. Sl. S.T. Screw (Used on 12-1545)
	199-81	Steel Sleeve (Used on S-15344)
	S-15617	Gear & Bushing Assem.
	S-15710	Horizontal Sweep Trans. & Socket Assem.
	S-15769	Horizontal Osc. & A.F.C. Coil & Terminal Board Assem.
	S-15808	Video I.F. Strip Assem.
	S-15897	Deflection Yoke, Focus Coil & Brkt. Assem.
	S-15898	A.C. Plug, Brkt. & Wire Assem.
	S-15947	1st Video Peaking Coil Assem.
	S-16049	Horizontal Size Control Assem.

CABINET PARTS

7-13	Bezel
17-105	Bezel Clamp (4 used)
24-479	Control Cover (Outer R.H.)
24-480	Control Cover (Outer L.H.)
46-771	Vertical & Horizontal Hold Control Knob
46-773	Channel Selector Knob
46-774	Contrast Control Knob
46-775	Vol. Control & On-Off Switch Knob
46-783	Switch Knob
49-670	7 1/2" P.M. Speaker
	208-670 Cone & Voice Coil
56-261	#18 Ga. x 3/8 Lg. Brass Esc. Pin (2 used on 57-1559)
57-1559	Nameplate
57-1481	Bezel Clamping Plate
70-86	#6 x 5/8" Washer Hd. Wood Screw Steel St. at. Br. (6 used on S-15471)
70-149	#4x1/2" Phill. R.H. Wood Screw Steel (2 used on 85-448-2 used on 171-9)
70-151	#4x1/2" Phill. R.H. Wood Screw Steel (3 ea. used 24-479 & 24-480)
74-55	Ventilating Screen
78-787	Two Contact A.C. Socket
85-448	Dial Light Switch
112-745	#40-40x1/4" F.H.S.T. Screw (8 used on 17-105)
112-787	Latch Adj. Screw
114-80	1/4-20 x 1 3/8 Hex. Washer (3 used on S-15007)
114-313	#8x 1/2" Hex. Hd. Sl. S.T. Screw (4 used on 7-13)
171-9	Indicator Prism (2 used)
188-102	Clamping Ring (46-774)
192-122	Protective Glass
196-116	Gasket (Bezel)
196-118	Gasket (Glass)
202-745	Instruction Book
S-15007	Power Supply Assem. (Complete)
S-15363	Cover & Clip Assem. (R.H.)
S-15471	Cabinet Back Assem. (Complete)
S-16052	Cover & Clip Assem. (L.H.)

The following parts are used on 27F20Z Only

S-16023	Anode Clip & Wire Assem.
S-16025	Beam Bender Unit
S-16190	Indicator Disc. Assem.
S-16191	Horizontal Sweep Transformer Assem.
12-1643	Gasket Reinforcing Brkt.

Diag. No.	Part No.	Description
	12-1644	C.R.T. Mtg. Brkt.
	80-745	C.R.T. Mtg. Brkt.
	114-45	#8x3/8 Hex. Hd. S.T. Screw (2 used)
	114-332	#10-32 x 1" Hex. Hd. S.T. Screw
	196-129	Plastic Gasket

MODEL 42T999RLP (Chassis 28F23)

24-509	Cover (used on S-15041)
44-25	Pilot Light Jack
54-108	#3/8-32 x 9/16" Hex. Palmnut Cad. Pl. (Inverted; 8 used)
54-271	#6-32 x 1/4 Hex. Palmnut (3 used to mount S-15579)
57-1511	Front Bearing Plate
57-1512	Indicator Mounting Plate
63-1789	1200 Ohm 1/2 W. 10% Ins. Res.
R-58 63-1799	2200 Ohm 1/2 W. 10% Ins. Res.
R-8 63-1869	100 K Ohm 1/2 W. 10% Ins. Res.
R-60 63-2025	Vertical Hold Control
R-62 63-2036	Vertical Size Control
80-717	Focusing Coil Mtg. Spring
95-1147	Focus Coil
114-295	#8x5/16" Hex. Hd. Sl. S.T. Screw Shakeproof (2 used on 12-1545)
114-299	1/4-20 x 1/2" Hex.Hd. M.S. Ext. Lockwasher Attached (4 used on S-15995)
114-324	#10-32 x 1 1/4 Hex. Hd. Sl. M.S. Steel (3 used on S-15996)
114-326	#8 x 1/4" Hex. Hd. S.T. Screw (16 used)
125-17	Rubber Grommet (2 used on S-15710)
126-620	Fire Shield
149-88	Iron Core & Insert (used on S-15711 only)
199-81	Steel Sleeve (used on S-15344)
S-15598	C. R.T. Tube Socket & Wire Assem.
S-15614	Indicator Plate & Stud Assem.
S-15615	Tuning Shaft Brkt & Plate Assem.
S-15709	Horizontal Sweep Trans. Assem.
S-15710	Horizontal Sweep Trans. & Socket Assem.
S-15728	Beam Bender Unit
S-15769	Horiz. Osc. & A.F.C.Coil & Terminal Board Assem.
S-15857	Yoke & Focusing Coil Mtg. Brkt. Assy.
S-15898	A.C. Plug, Brkt. & Insulator Assy.
S-15995	C.R.T. Hook B-kt & Ins. Assy.
22-2065	45 Mmfd. Ceramic 500 V.
80-736	Spring, Shaft Tension
93-952	Bakelite Washer 1/16" x .144 x 3/8"
S-15985	Tuning Washer Assy (Replaces S-15028)
S-15727	Series Tuned Sound Trap Coil
S-15808	Video I.F. Strip Assem. (Complete)
12-1589	Volume Control Brkt
22-3	.01 Mfd. Ceramic (Disc.) 500 V.
49-661	12" P.M. Speaker
	208-661 Cone & Voice Coil
54-271	#6-32x 1/4" Hex. Palmnut Cad. Pl. (Inverted Type -4 used)
95-1155	Sound Input Coil
S-15618	Sound Chassis Assem. (Complete)

Cabinet Parts

7-16	Bezel
15-65	Cap & Insulator (S-15554)
15-67	Cap & Insulator (S-15554)
15-79	Cap & Insulator (S-15554)
17-80	Cable Retaining Clamp
17-106	Glass Retaining Clamp
19-9	Cable Clamp
19-123	Phono Unit Mtg. Clip
24-388	Record Changer Compt. Cover
24-485	Control Cover (Outer) (R.H.)

CHASSIS 27F20, 27F22, 28F20, 28F21, 28F22, 28F23, 28F25, 29G20

Diag. No.	Part No.	Description
	24-486	Control Cover (Outer) (L.H.)
	46-771	Vertical Hold & Horizontal Hold Control Knob (4 used)
	46-773	Channel Selector Knob
	46-774	Contrast Control Knob
	46-775	Volume Control & On-Off Switch Knob
	46-783	Dial Light Switch Knob
	49-661	12" P.M. Speaker
		208-661 Cone & Voice Coil Assem.
	56-261	#18 Ga. x 3/8" Lg. Brass. Esc. Pin. (2 used on 57-1464)
	57-1066	Dial Esc.
	57-1284	Strike Plate
	57-1289	Ornamental Plate (Zenith) (Used on S-3484)
	57-1454	Name Plate
	57-1465	Power Supply Cover Plate
	57-1481	Bezel Clamping Plate
	58-133	9 Prong Plug (Used on S-15554)
	68-1	Automatic Tuning Adj. Wrench
	70-3	#5x 1/2" R.H.W.S. Steel N.P. (2 used on 17-80)
	70-86	#6x 5/8" Washer H.W.S. Steel Stat. Bronze (8 used to Mt. T.V. Back)
	70-149	#4 x 1/2" Phill. R.H. Wood Screw Steel Cad. (6 used)
	70-151	#4 x 1/2" Phill. R.H. Wood Screw Steel Stat. Bronze (3 ea. used on 24-485 & 486)
	71-24	1/4-20X 1/2 Flat Head M.S. Steel (3 used on 57-1465)
	71-32	#6-32 x 1" Flat H.M.S. Steel N.P. (4 used on 24-388)
	74-55	Ventilating Screen
	78-582	9 Prong Socket (2 used on S-15554)
	78-703	Pilot Light Socket & Wire
	78-761	Pilot Light Socket & Wire
	78-787	Two Contact Socket (Used on S-15559)
	78-840	A.C. Socket (Used on S-15559)
	80-423	Chassis Lift Spring (2 used)
	80-463	Phono Unit Mtg. Spring (4 used)
	83-1246	Record Changer Trim Strip
	83-1260	Cover Retaining Strip (2 used 24-388)
	83-1262	Cover Retaining Strip (1 used 24-388)
	85-448	Dial Light Switch
	93-392	3/32 x 3/64 x 1" Brown Felt Washer (3 used)
	106-36	Dial Light Bulb - Mazda #44
	112-558	#10-32 x 7/8" Phill. Flat H.M.S. Steel Stat. Bronze (4 used on chassis mtg.)
	112-670	Record Changer Mounting Screw
	112-671	Record Changer Mounting Screw (3 used)
	112-767	Latch Adj. Screw
	112-758	#4-40 x 1/4" R.H.S.T. Screw Cad Shakeproof (8 used)
	114-80	1/4-20 x 1 3/8 Hex Washer Hd. M.S. (4 used)
	114-248	6-20 x 5-16 Hex. Hd. Slotted S.T. Shakeproof (2 used on 24-388)
	114-313	#8x1/2" Hex. Hd. Sl. S.T. Screw Shakeproof (4 used on 7-16)
	136-34	Metal Cabinet Grill
	156-35	Bullet Catch (4 used)
	161-9	Metal Glide (2 used)
	161-14	Metal Glide (4 used)
	171-7	Pilot Light Lens (2 used)
	171-9	Indicator Prism (2 used)
	186-102	Clamping Ring
	192-96	Dial Glass
	192-125	Protective Glass
	196-121	Glass Gasket
	196-124	Glass Gasket
	202-517	Station Identification Tabs
	202-691	Inst. Book (T.V.)
	202-693	Instruction Book (Radio Phono)

CHASSIS 27F20, 27F22, 28F20,
28F21, 28F22, 28F23, 28F25, 29G20

Diag. No.	Part No.	Description	Diag. No.	Part No.	Description	Diag. No.	Part No.	Description	Diag. No.	Part No.	Description
202-697	F.M. Instruction Book	58-75	Switch Plug	95-1166	Vertical Output Trans.	8-14012	Non-Intermixer L.P. Changer				
8-11640	Pre-Amp Unit. Assem.	70-149	#4 x 1/2" Phillips B.H. Wood Screw	126-621	Fire Shield	8-14195	Loading Coil Assem.				
S-11918	Chassis Comp. Hinge Assem.(R.H.)		Steel Cad. Pl.(2 ea. used on 85-448 and 171-9)	194-12	Stand-Off Insulator (2 used)	S-15363	Cover & Clip Assem. (R.H.)				
S-11919	Chassis Comp. Hinge Assem. (L.H.)			6BG6G	Tube (one added)	S-15364	Cover & Clip Assem. (L.H.)				
S-12319	Chassis Mtg. Strip & St ud Assem.	70-151	#4x 1/2" Phillips B.H. Wood Screw	16EP4	Picture Tube	S-15528	Low Impedance Loop Assem.				
S-12545	Phono Lift Spring & Bushing Assy.		Steel Stat. Bronze (3 ea. used on 24-479 and 24-480)	S-15045	Sound Chassis Assem. (Complete) (See 28F20 for breakdown)	S-15529	Interconnecting Cable Assem.				
S-13058	F.M. Dipole & Short Wave Antenna Assy	72-84	#8 x 1/2" Phillips Flat Hd. W.S. Steel (2 used on 152-170)	S-15345	Tuning Shaft Brkt. & Plate Assy.	S-15536	Record Changer Compartment Hinge Brkt. & Link Assem. (2 used)				
S-13484	Record Changer Mtg. Frame Assy.			S-15859	Deflection & Focus Coil Mtg. Brkt. Assem.	S-15538	Record Changer Mtg. Frame & Arm Assem.				
S-13672	Tuning Knob & Ring Assem. (3 used)	74-55	Ventilating Screen	S-15860	C. R. T. Mtg. Brkt. Assem.	S-15542	Cabinet Back Assem. Complete (Television Section)				
S-13673	Wavemagnet Assem.	78-787	Two Contact A.C.Socket (Used on S-15777)	S-15911	Horizontal Sweep Trans. Assem.	2-146	Cabinet Back (Radio-Phono Section)				
S-14011	Dual Speed Intermixer Record Changer			S-15912	Horizontal Sweep Trans. & Socke: Assem.	7-13	Bezel				
S-15363	Cover & Clip Assem. (R.H.)(TV)(Inner)	85-448	Dial Light Switch			12-1547	Tone Arm Rest Bracket				
S-15364	Cover & Clip Assem. (L.H.)(TV)(Inner)	112-767	Latch Adjusting Screw	S-16043	C.R.T. Mtg. Brkt. & Insulator Assem.	15-82	Plug Cap & Insulator (Used cn S-15529)				
S-15552	Phono Comp. Hinge Assem. (R.H.)	114-80	1/4-20 x 1 3/8" Hex Washer Hd. M.S. (3 used to mt. S-15007 and 4 used to mt. chassis)	S-16048	Horizontal Size Con. Assem.						
S-15553	Phono Comp. Hinge Assem.(L.H.)			S-16100	Picture Control Switch & Wire Assem.	17-105	Bezel Clamp (4 used)				
S-15554	Interconnecting Cable Assem.			S-16101	Anode Clip & Wire Assem.	19-169	Record Changer Mounting Clip (4 used)				
S-15559	Cabinet Back Assem.(Complete)TV	114-200	#6x5/16" Hex. Hd. Slotted S.T.Screw Stan. Tap Steel (2 used on S-15777)	S-16192	C.R.T. Mtg. Brkt.,Insulator, Plate and Strap Assem.	19-171	Loop Connector Clip (2 used)				
	C. R. T. Mounting	114-313	#8x1/2" Hex Hd. St. S.T. Screw (4 used on 7-17)			46-697	Tuning Control Knob (2 used)				
	For sets not using web straps:	152-170	Chassis Retaining Block		MODELS G2951-G2951R-G2952R (Chassis 29G20)	46-718	Band Switch Knob				
93-982	Armite Washer - Large (2 used)	165-9	Metal Glides (4 used)	7-18	Bezel	46-726	Phono Switch Knob (2 used)				
93-983	Armite Washer - Small (6 used)	171-9	Indicator Prism (2 used)	17-106	Bezel Clamp (4 used)	46-771	Vertical Hold & Horizontal Hold Control Knob (4 used)				
113-24	#8-32x3/8" Hex. Hd. M.S.'Ext. Shakeproof Lockwasher (5 used)	188-102	Clamping ring (46-774)	24-479	Control Cover - Outer (R.H.)	46-773	Channel Selector Knob				
114-299	1/4-20 x 1/2" Hex. Hd. M.S. Ext. Shakeproof Lockwasher (2 used)	192-125	Protective Glass	24-480	Control Cover - Outer (L.H.)	46-774	Contrast Control Knob				
194-11	Stand-Off Insulator (3 used)	202-691	Instruction Book	46-771	Vertical Hold & Horizontal Hold Control Knob (4 used)	46-775	Volume Control Knob				
194-12	Stand-Off Insulator (2 used)	S-15007	Power Supply Assem. (Complete)	46-773	Channel Selector Knob	46-783	Switch Knob				
194-13	Stand-Off Insulator	S-15363	Cover & Clip Assem. (R.H.)	46-774	Contrast Control Knob	49-660	12" P.M. Speaker				
S-15611	Deflection & Focus Coil Mtg. Brkt Assem.	S-15777	Cabinet Back Assem. (Complete)	46-775	Volume Control & "On-Off" Switch Knob	56-261	208-660 Cone & Voice Coil #18 Ga. X 3/8" Lg. Brass Esc. Pin				
S-15612	C.R.T. Mtg. Brkt. Assem. (3 used)	S-16052	Cover & Clip Assem. (L.H.)	46-783	Switch Knob	57-1353	Diffusing Plate				
S-15613	C.R.T. Clamp Assem.			49-649	10" P.M. Speaker	57-1464	Nameplate				
S-15616	Yoke Ring & Brkt. Assem.	22-1775	.047 Mfd. Molded 400 V.	56-261	#18 Ga. x 3/8 Lg. Brass Esc. Pin (2 used on 57-1464)	57-1471	Dial Escutcheon				
	For sets using web straps:	22-1809	.01 Mfd. Molded 200 V.	57-1559	Nameplate	57-1481	Bezel Clamping Plate (4 used)				
12-1545	C.R.T. Support Brkt	63-1169	2700 Ohm W.W. 10% 2 W. Ins.	57-1481	Bezel Clamping Plate (4 used)	58-169	Seven Prong Plug (used on S-15529)				
12-1637	C.R.T. Support Brkt (R.E.)	63-1198	10K Ohm 10% 2W. Ins.	58-75	Switch Plug (Used on 85-448)	70-86	#6 X 5/8 Washer Head Wood Screw-Stat. Bronze (4 used on S-15542 & 7 used on 2-146)				
12-1638	C.R.T. Support Brkt (L.E.)	63-1578	150 Ohm 20% 2W. Ins.	70-86	#6 x 5/8" Washer Hd. Wood Screw Steel-Stat. Bronze (8 used to mt. S-15921)	72-58	#2 X 3/8" Phillips Flat Hd. Wood Screw Steel-Brass (6 used cn 57-1471)				
57-1536	Strap Clamp Plate	63-1581	4.7 Ohm W.W. 10% 1/2 W. Ins.	70-149	#4x 1/2" Phill. B.H.Wood Screw Steel Cad. Pl. (2 ea. used on 85-448 and 171-9)	74-55	Ventilating Screen				
82-22	Cloth Strap	63-1682	Intensity Control			78-703	Pilot Li ght Socket & Wire				
113-9	#8-32 x 1/4" Hex.Hd. Slotted M.S. (steel N.P. 4 used)	95-1110	Deflection Yoke	70-151	#4x 1/2" Phill. B.H. Wood Screw Steel St. at. Bronze (3 ea. used on 24-479 & 24-480)	78-750	Six Contact Socket (used with S-15529)				
114-201	#8x5/16" Hex. Hd. Sl. S.T. Screw (4 used)	95-1112	Vertical Output Trans.	72-84	#8 x 1 1/2" Phill.F.H.W.S.Steel (used on 152-170)	78-761	Pilot Light Socket & Wire				
166-50	C.R.T. Support Bumper	126-620	Fire Shield			80-678	Record Changer Mounting Spring (4 used)				
194-15	Stand-Off Insulator (2 used)	149-77	Iron Core & Insert	74-55	Ventilating Screen	83-1220	Pilot Light Socket Mtg. Strip				
	MODEL 28T964R (Chassis 28F23)	S-15209	Electrostatic & Heat Shield Assem.	78-787	Two Contact A.C.Socket	83-1245	Record Changer Trim Strip				
	Cabinet Parts	S-15392	Anode Clip, Terminal & Washer Assem.	80-771	Bezel Grounding Spring	85-448	Dial Light Switch				
7-17	Bezel	S-15612	C.R.T. Mtg. Brkt. Assem.	80-776	Shaft Tension Spring	93-392	Brown Felt Washer 3/32" X 33/64" X 1" (3 used)				
17-106	Bezel Clamp	S-15615	Tuning Shaft Brkt. & Plate Assem.	85-448	Dial Light Switch	100-36	Pilot Light Bulb (2 used)				
24-479	Control Cover - Outer (R.H.)	S-15618	Sound Chassis Assem. (Complete)	112-767	Latch Adjusting Screw	112-712	Record Changer Mtg. Screw (4 used)				
24-480	Control Cover - Outer (L.H.)	S-15709	Horizontal Sweep Trans. Assem.	112-745	1/4-20 x 1 3/8 Hex. Washer Hd. M.S. (Chassis Mtg.)	112-745	4-40 X 1/4" Flat Hd. S.T. Screw Cad. Shakeprf. Type 23 (8 used on 17-105)				
46-771	Vertical Hold & Horizontal Hold Control Knob (4 used)	S-15710	Horizontal Sweep Trans & Socket Assem.								
46-773	Channel Selector Knob	S-15711	Horizontal Size Con. Assem. (or S-15775)	114-313	#8x 1/2" Hex. Hd. Slotted S.T. Screw (4 using 7-18)	112-767	Latch Adj. Screw (2 used)				
46-774	Contr.st Control Knob	S-15857	Yoke & Focusing Coil Mtg. Brkt. Assem.	152-170	Chassis Retaining Block (2 used)	113-17	#6-32 X 1/4 R.H.M.S.Steel N.P. Internal Shakeprf. Lockwasher (2 used on 12-1547)				
46-775	Volume Control & On-Off Switch Knob	S-15995	C.R.T. Hook Brkt. & Insulator Assem.	171-9	Indicator Prism (2 used)	114-80	#1/4-20 X 1-3/8" Hex Washer Hd. M.S. (3 used on S-15007 & 4 used on S-15047)				
46-783	Switch Knob	16AP4	Picture Tube	188-102	Clamping Ring (46-774)	114-128	#10 X 1-1/16" Hex Washer Hd. S. T. Type Z-Cad. (Radio Chassis Mtg. 4 used)				
49-649	10" P.M. Speaker			192-127	Protective Glass	114-313	#8 X 1/2" Hex. Hd. Slotted S.T. Screw Cad. Shakeprf. Type #23 (4 used on 7-13)				
56-261	208-649 Cone & Voice Coil #18 Ga. x 3/8 Lg. Brass Esc. Pin (2 used on 57-1559)	22-3	.01 Mfd. 500 V.	196-128	Gasket (Glass)						
57-1481	Bezel Clamping Plate (4 used)	22-2983	.015 Mfd. Molded 600 V.	196-134	Gasket (Bezel)						
57-1559	Nameplate	22-2112	850 Mmfd. Ceramic 500 V.	202-746	Instruction Book						
		34-192	Drive Gear (2 used)	S-15007	Power Supply Assem. (Complete)						
		63-965	1K Ohm 10% 1 W. Ins.	S-15363	Cover & Clip Assem. (R.H.)						
		63-1744	100 Ohm 20% 1/2 W. Ins.	S-15921	Cabinet Back Assem.(Complete)						
		63-1817	5600 Ohm 10% 1/2 W. Ins.	S-16052	Cover & Clip Assem. (L.H.)						
		63-1918	1.5 Megohm 10% 1/2 W. Ins.								
		63-1973	100 Ohm 10% 2W. Ins.								
		63-2022	10K Ohm 10% 5W. Zipohm								
		63-2061	Intensity Control								
		85-472	Picture Control Sw.								
		95-1155	Deflection Yoke								
			</								

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REVISED SCHEMATIC DIAGRAM CHASSIS 28F20 and 28F20 Z
(Chassis 28F21 and 28F22 same as 28F20 except V28 is 10P4 or 10BP4)

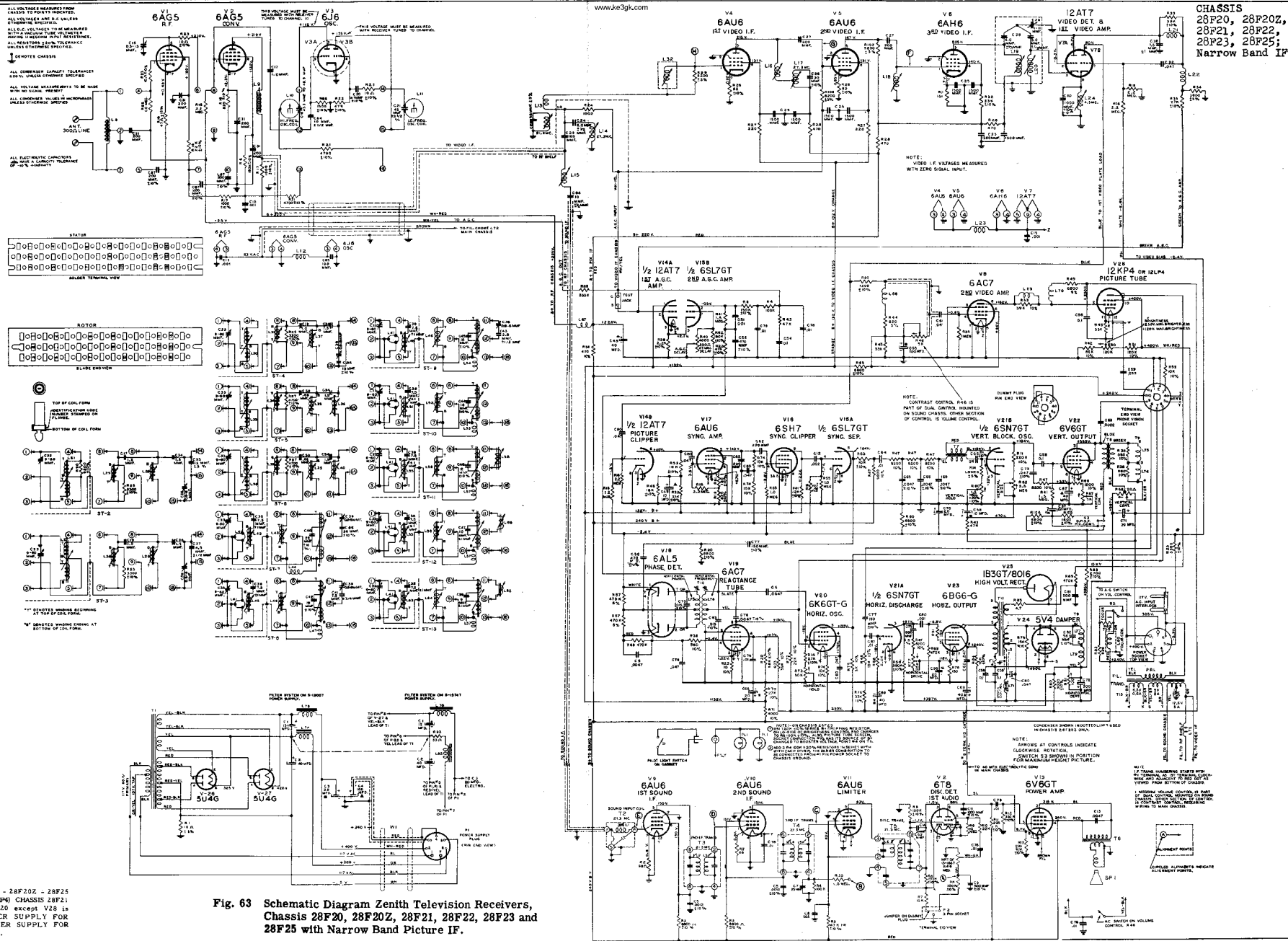
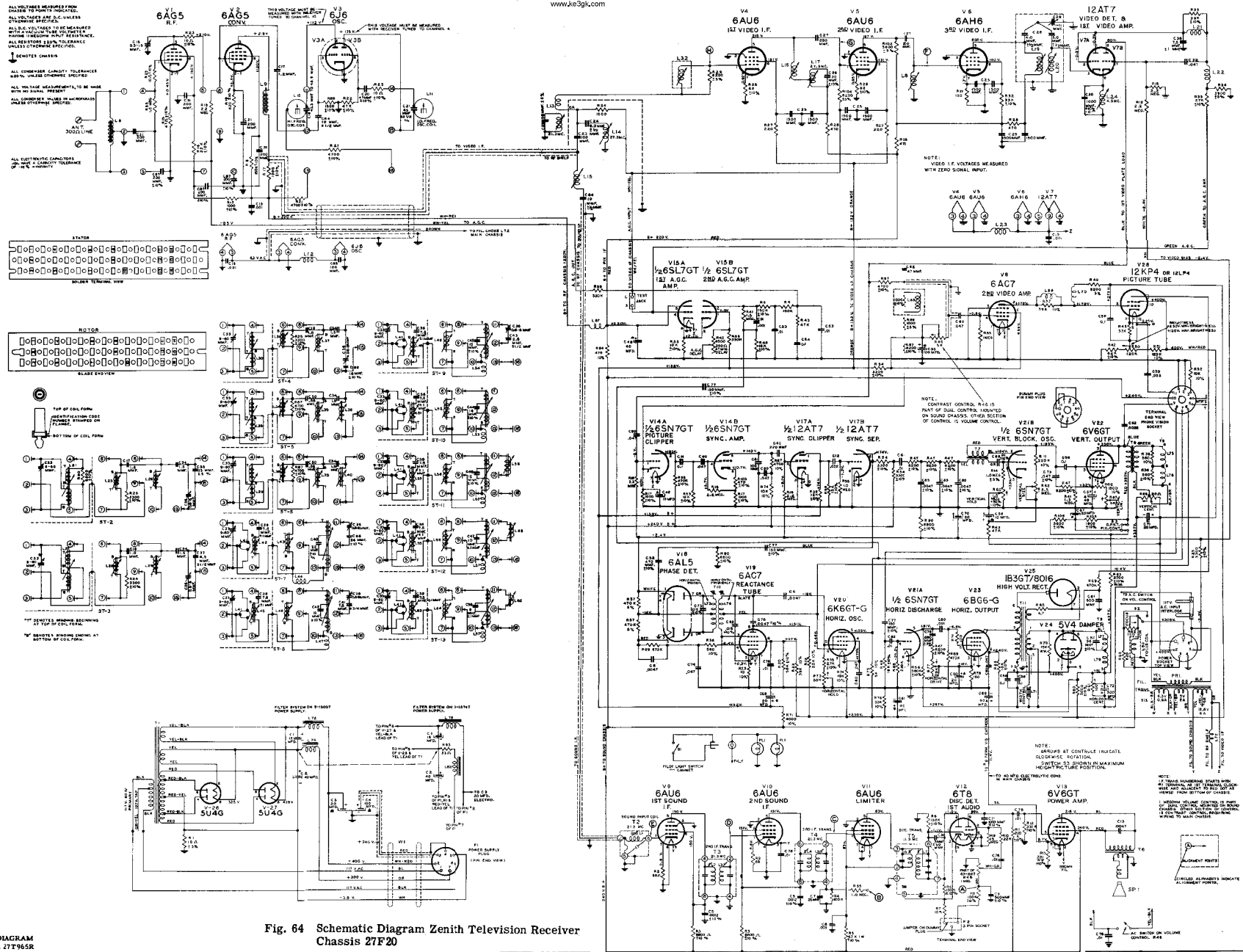


Fig. 63 Schematic Diagram Zenith Television Receivers, Chassis 28F20, 28F20Z, 28F21, 28F22, 28F23 and 28F25 with Narrow Band Picture IF.



REVISED SCHEMATIC DIAGRAM
CHASSIS 27F20 MODEL 27F65R

