

CONTROL CARRIER GENERATOR

Model CCG-73.5 Ser. 2

DESCRIPTION

Model CCG-73.5 Series 2 is a crystal-controlled signal generator which produces a single-frequency output of 73.5 MHz. The unit is designed for installation at CATV head-ends to provide control of AGC units installed along trunk lines or of AGC circuits built into trunk line amplifiers, and to have a pilot tone available for test purposes when stations are off the air.

The output level can be varied by means of a potentiometer over a range of 3 dB down from maximum, and can be further decreased in 3-dB steps by plug-in attenuators Model PIP-*. The circuitry employs a fundamental (series) crystal-controlled oscillator followed by an amplifier stage whose gain is controlled by varying its screen grid voltage. The output of the amplifier stage is coupled through a back-matched tap circuit to dual output terminals.

The unit is energized by the power supply stage employing a constant voltage transformer and a gas tube regulator. The unit is designed to provide an r-f output constant within ± 0.25 dB for line voltage fluctuations between 95 and 130 volts.

The RECOMMENDED OPERATING LEVELS given in the specifications should be adhered to for satisfactory system operation.

*PIP-0 (Zero attenuation) shipped with unit.

SPECIFICATIONS

Carrier Frequency	73.5 MHz
Output	46 dBmV*
Gain Control Range Continuously Variable (Pot.) Plug-in Pads (Models PIP-**))	3 dB down from max. 3-dB steps
Recommended Operating Levels TML- Equipment: Starline Equipment:	15 dB below level of high-band pix carrier, with 3 dB block tilt. 5 dB to 15 dB below level of high-band pix carrier, with 5 dB block tilt.
Insertion Loss	0.25 dB nominal, 0.5 dB max.
Impedance, Both Terminals	75 ohms
Match	26 dB min. return loss (VSWR 1.1:1)
Signal-to-Hum Ratio	60 dB min.
Power Requirements	30 W, 117 V, 60 Cycle
Regulation	RF output constant within ± 0.25 dB for line voltage fluctuations between 95 and 130 VAC.

*0 dBmV = 1 mV across 75 ohms.

**PIP-0 shipped with unit.

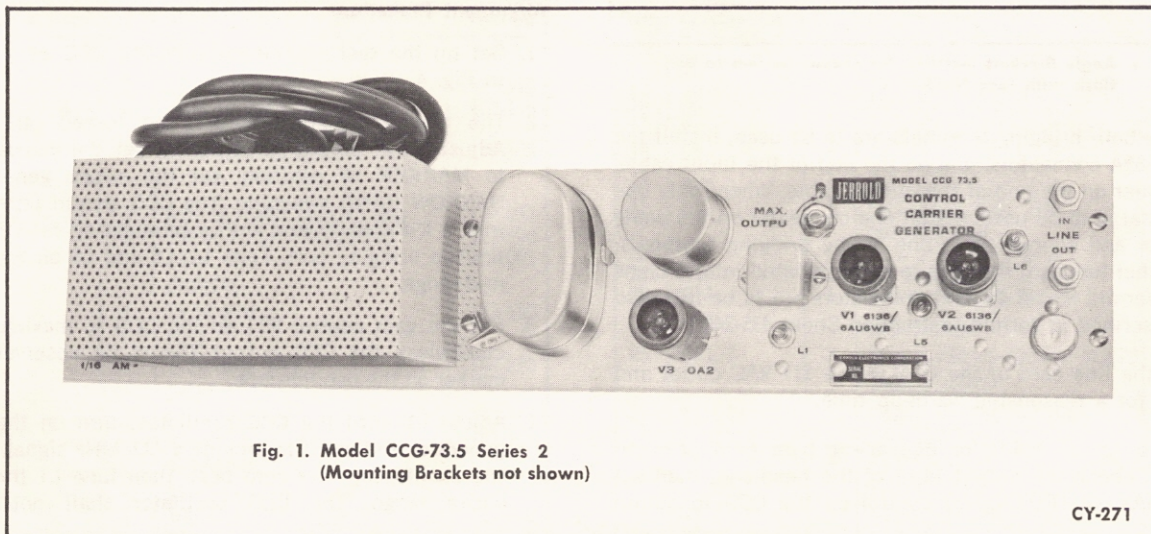


Fig. 1. Model CCG-73.5 Series 2
(Mounting Brackets not shown)

INSTALLATION

1. The following accessories are shipped with the unit:
 - 2 angle brackets for installations on the chassis and rack-mounting the unit;
 - 4 screws for installing the brackets;
 - 4 screws for rack-mounting;
 - 4 speed nuts for rack-mounting, where rack type so requires;
 - 2 coaxial cable connectors Model F-59A for installation on jumper cables.
2. The two angle brackets may be installed on the generator chassis either for flush-mounting the chassis top or for flush-mounting the chassis bottom. Figs. 2 and 3 illustrate both ways.

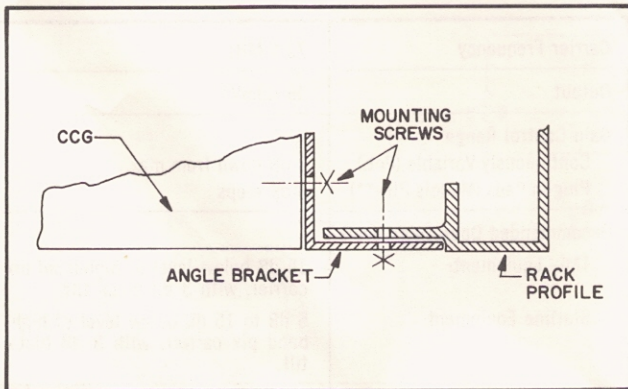


Fig. 2. Angle Brackets installed for chassis top to be flush with rack front.

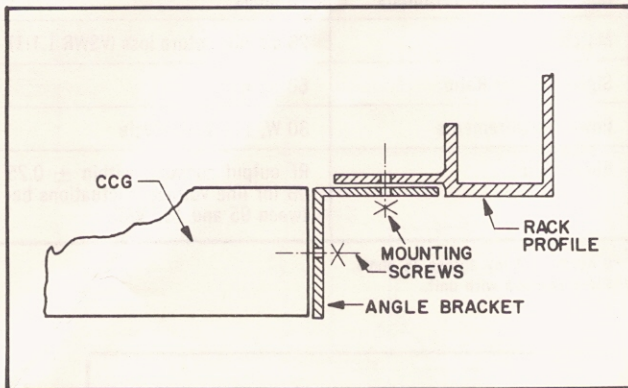


Fig. 3. Angle Brackets installed for chassis bottom to be flush with rack front.

3. Where both bridging terminals are to be used, install the two F-59A connectors, one on the end of the input cable, the other on the end of the output cable. Where only one terminal is to be used, install one connector on the cable jumper and connect it to one of the bridging terminals; the other (unused) fitting is to be terminated into 75 ohms by a Jerrold Model TR-72F. Connectors are to be installed as described in Jerrold Instruction Sheet 435-345.1-14.
4. Plug the line cord of the CCG into a 117 VAC outlet and allow for a reasonable warm-up time.
5. With a Model 704-B, or equivalent type field strength meter, check the output level of the head-end, then set the MAX. OUTPUT (gain) control on the CCG to obtain

the output level of the carrier signal required by system conditions (see SPECIFICATIONS). If necessary replace the PIP-0 pad by one having the required attenuation and then set the MAX. OUTPUT control. After level setting secure the lock nut on the control.

MAINTENANCE

General

The circuit description, replacement parts list, and schematic circuit diagram given here will permit trouble shooting the equipment.

Where either the oscillator tube or the amplifier tube have to be replaced, a complete re-alignment may become necessary to achieve an exact output frequency at the desired level. This procedure should be carried out only by qualified personnel equipped with the necessary instruments and facilities.

Circuit Description

Model CCG-73.5 Series 2 is energized by its power supply section connected to a 117 VAC source. The circuitry employs line-regulating transformer T1, full-wave rectifier pair CR-1 and CR-2, triple filter capacitor C14, and regulator tube V3. A 1/16 ampere fuse F1 protects the unit against short circuits.

The 73.5 MHz signal is generated in the oscillator section employing crystal Y1 and tube V1, with coil L1 tuning the grid on the oscillator tube. The plate output of V1 is then coupled through C3 to the grid of the amplifier stage V2 with Coil L5 tuned to peak the oscillator frequency. The amplifier plate output is tuned by L6 and its level is controlled by potentiometer R11 in the screen grid supply circuit. Further output level reduction can be achieved in 3-dB steps by plug-in pads at socket J3.

The output signal is coupled through C9 to a bridged terminal network with R5 and T2 effecting impedance match to 75 ohms. Terminal J1 serves to connect the head-end output, J2 the trunk-line input. Where only one terminal is used for injection of the generator signal via a coupler into the trunk-line, the other terminal must be terminated into 75 ohms.

Alignment Procedure

1. Set up the test equipment with the CCG as illustrated in Fig. 4.
2. The marker generator should be turned off; set the Adjust-A-Volt output to 117 volts, set the coaxial switch to MARKER IN position, set the sweep generator for NARROW BAND sweeping. The CCG should be equipped with a PIP-0 at J3 and with a terminating resistor at the unused bridging port. Tune L1, L5 and L6 on the CCG to mid-range.
3. Set the gain control R11 on the CCG to maximum (fully clockwise); the CCG output should be observable as a marker on the oscilloscope.
4. Adjust L1 until the CCG oscillates; turn on the marker generator and set it to provide a 73.5 MHz signal. Observe the oscilloscope for zero beat, then tune L1 through its entire range. The CCG oscillator shall not pull or

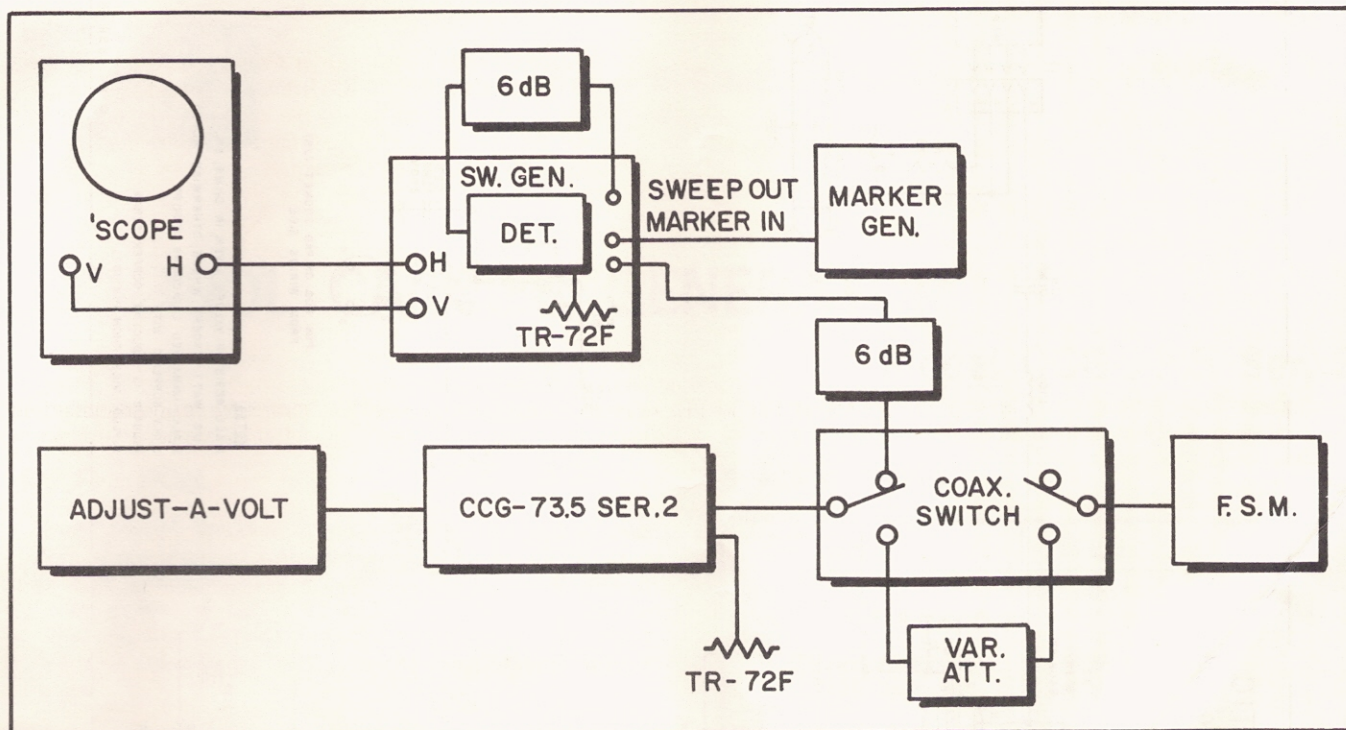


Fig. 4. Test Set-Up of Model CCG-73.5 Series 2

"squeeg"; it shall exhibit an "ON-OFF" characteristic, i.e. it shall be stable. Increased L3 inductance yields higher r-f output but tends toward a squeeging oscillator; decreased L3 inductance yields a lower r-f output but tends toward a more stable oscillator.

5. Pass the CCG output through the other leg of the coaxial switch with the variable attenuator set at 46 dB and then to the 704-B. Set the 704-B to the 3000 microvolt range.
6. Adjust L1 for maximum output indication on the 704-B for symmetrical tuning characteristics. Where the tuning ex-

hibits a fast and a slow side, back L1 off 1 dB from maximum on the slow side.

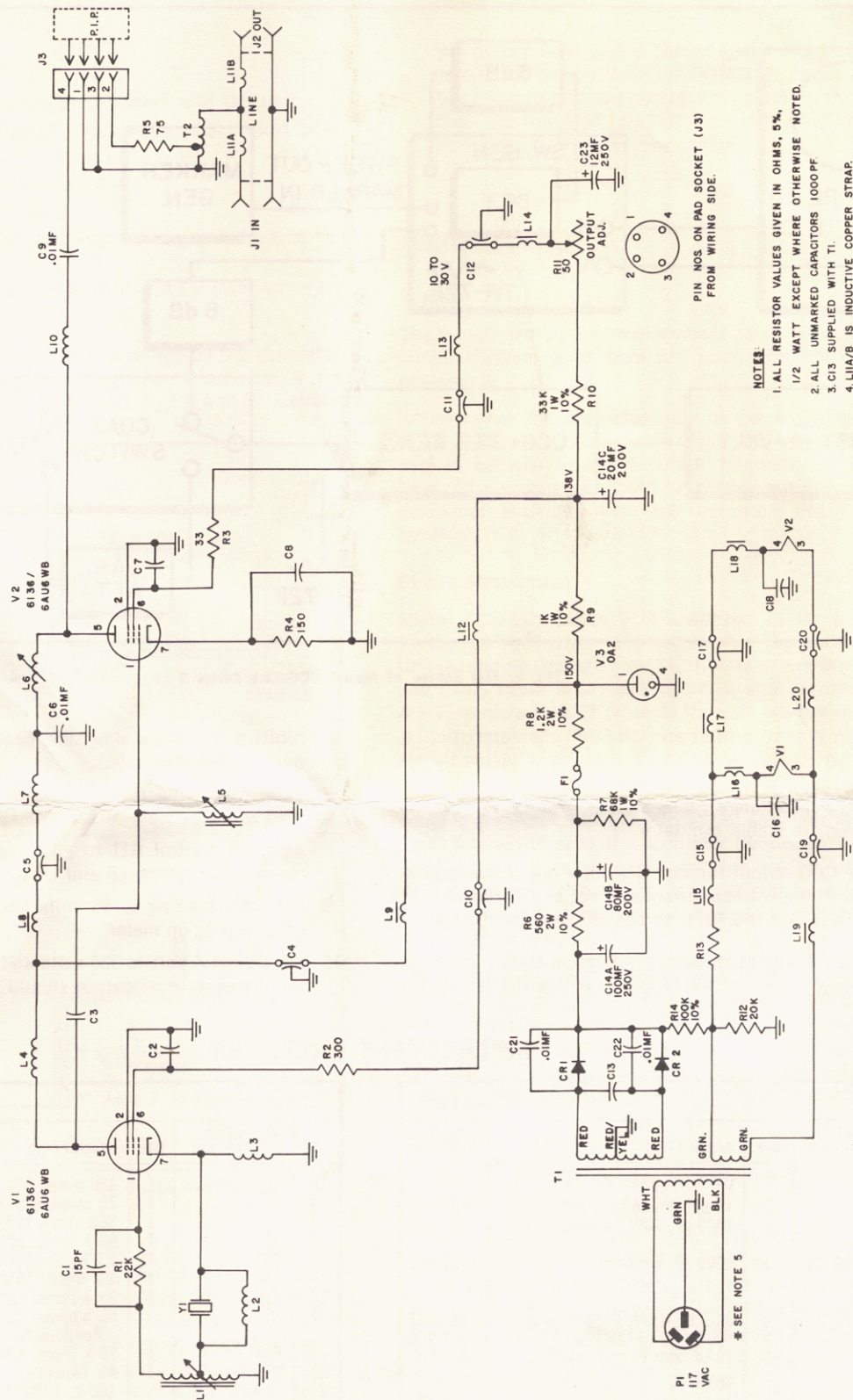
7. Tune L5 and L6 for maximum output; the meter should read a few dBs above zero.
8. Set gain control R11 to give exactly zero indication on meter, then retune L5 and L6 for maximum output.
9. Set Adjust-A-Volt to 95 volts and set R11 to maximum; note reading on meter.
10. Set Adjust-A-Volt to 130 volts and note reading on meter; the increase in r-f output should not exceed 1/2 dB.

REPLACEMENT PARTS LIST

ASSEMBLY		REF. DWG. NO.: 861-886		
ITEM	SCHEMATIC DESIGNATION	QTY.	DESCRIPTION	JERROLD PART NO.
CAPACITORS				
1	C1	1	15 pF, 2%, 600 V, NPO	121-013
2	C2, 3, 7, 8, 16, 18	6	1000 pF, GMV Ceramic	123-115
3	C4, 5, 10, 11, 12, 15, 17, 19, 20	9	1000 pF, Feed-thru	129-200
4	C6, 9, 21, 22	4	0.01 uF, GMV, Ceramic disc	124-031
5	C14	1	100-80-20 uF/250-200-200 V	127-900
6	C23	1	12 uF/250 V	127-001
CRYSTAL				
7	Y1	1	73.53 MHz	139-130
FUSE				
8	F1	1	1/16 amp, 3AG	101-228
JACKS				
9	J1, 2	2	F-61A w/hdwe.	C821-155
10	J3	1	Socket (4 pin), Cinch #2675	182-103
RESISTORS				
11	R1	1	22 k ohms, 5%, 1/2 W	112-527
12	R2	1	300 ohms, 5%, 1/2 W	112-293
13	R3	1	33 ohms, 5%, 1/2 W	112-170

ASSEMBLY		REF. DWG. NO.: 861-886		
ITEM	SCHEMATIC DESIGNATION	QTY.	DESCRIPTION	JERROLD PART NO.
14	R4	1	150 ohms, 5%, 1/2 W	112-254
15	R5	1	75 ohms, 5%, 1/2 W	112-221
16	R6	1	560 ohms, 10%, 2 W	112-334
17	R7	1	68 k ohms, 10%, 1 W	112-594
18	R8	1	1.2 k ohms, 10%, 2 W	112-376
19	R9	1	1 k ohms, 10%, 1 W	112-363
20	R10	1	33 k ohms, 10%, 1 W	112-552
21	R11	1	50 k ohms, 10%, 2W potentiometer	118-024
22	R12	1	20 k ohms, 5%, 1/2 W	112-524
23	R13	1	Air Wound	110-014
24	R14	1	100 k, 10%, 1/2 W	112-614
RECTIFIERS				
25	CR1, 2	2	Silicon, 750 mA-800 PIV, CER 72	137-716
TRANSFORMERS				
26	T1, C13	1	Power, w/matching Cap., Sola 11275-2	S141-117-1
27	T2	1	Assembly	B144-192
TUBES				
28	V1, 2	2	6136/6AU6 WB	131-343
29	V3	1	0A2, VR	132-100

SCHEMATIC
MODEL CCG 73.5
SERIES 2



- NOTES:
1. ALL RESISTOR VALUES GIVEN IN OHMS, 5%, 1/2 WATT EXCEPT WHERE OTHERWISE NOTED.
 2. ALL UNMARKED CAPACITORS 1000PF.
 3. C13 SUPPLIED WITH T1.
 4. L14/A/B IS INDUCTIVE COPPER STRAP.
 5. PLUG VIEW FROM PINSIDE.

D-861-866-0

All data subject to change without notice.

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