



Broadcast Equipment

BTX-101 SCA Generator

MI-561061

IB-8025128



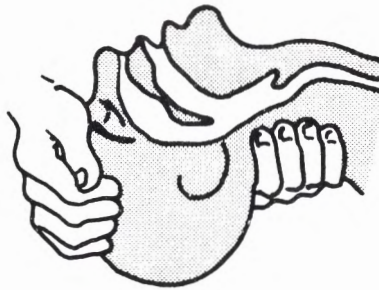
WARNING

VOLTAGES THAT ARE DANGEROUS TO LIFE ARE INVOLVED IN THE OPERATION OF THIS ELECTRONIC EQUIPMENT. OPERATING PERSONNEL MUST AT ALL TIMES OBSERVE ALL SAFETY REGULATIONS. DO NOT CHANGE TUBES OR MAKE ADJUSTMENTS INSIDE THE EQUIPMENT WITH VOLTAGES APPLIED. DANGEROUS CONDITIONS MAY EXIST IN CIRCUITS WITH POWER CONTROLS IN THE OFF POSITION DUE TO CHARGES RETAINED BY CAPACITORS, ETC. ALWAYS DISCHARGE AND GROUND CIRCUITS PRIOR TO TOUCHING THEM TO AVOID PERSONAL INJURY OR LOSS OF LIFE.

EMERGENCY FIRST AID INSTRUCTIONS

Personnel engaged in the installation, operation, or maintenance of this equipment or similar equipment are urged to become familiar with the following rules both in theory and practice. It is the duty of all operating personnel to be prepared to give adequate Emergency First Aid and thereby prevent avoidable loss of life.

RESCUE BREATHING



1. Find out if the person is breathing.

You must find out if the person has stopped breathing. If you think he is not breathing, place him flat on his back. Put your ear close to his mouth and look at his chest. If he is breathing, you can feel the air on your cheek. You can see his chest move up and down. If you do not feel the air or see the chest move, he is not breathing.

2. If he is not, open the airway by tilting his head backward.

Lift up his neck with one hand and push down on his forehead with the other. This opens the airway. Sometimes doing this will let the person breathe again by himself. If it does not, begin rescue breathing.

3. If he is still not breathing, begin rescue breathing:

Keep his head tilted backward. Pinch his nose shut. Put your mouth tightly over his mouth. Blow into his mouth once every five seconds. Do Not Stop Rescue Breathing Until Help Comes.

LOOSEN CLOTHING – KEEP WARM

Do this when the victim is breathing by himself or help is available. Keep him quiet as possible and from becoming chilled. Otherwise, treat him for shock.

BURNS

SKIN REDDENED: Apply ice cold water to burned area to prevent burn from going deeper into skin tissue. Cover area with clean sheet or cloth to keep away air. Consult a physician.

SKIN BLISTERED OR FLESH CHARRED: Apply ice cold water to burned area to prevent burn from going

deeper into skin tissue. Cover area with clean sheet or cloth to keep away air. Treat victim for shock and take to hospital.

EXTENSIVE BURN-SKIN BROKEN: Cover area with clean sheet or cloth to keep away air. Treat victim for shock and take to hospital.

RCA BTX-101 SCA Generator

ADDENDUM

INSTRUCTIONS: Make the following changes to IB-8025128.

- PROCEDURE:**
1. Cut out and affix the enclosed pressure sensitive MI number over MI-561061 appearing on the front cover of your Instruction Book.
 2. Cut out and affix the pressure sensitive IB number over IB-8025128 on the front cover of your Instruction Book.
 3. Repeat steps 1 and 2 on the title page (page 1) of your Instruction Book.
 4. On page 4, correct the MI number of the BTX-101 SCA Generator Less Audio LPF from MI-561061 to MI-561062.

DISPOSITION: Upon completion, this sheet may be discarded.

MI-561062

MI-561062

IB-8025128A

IB-8025128A

WARRANTY ITEMS

Particular parts and/or equipment covered by warranty are specifically stated as such in the warranty or contract given to the customer at the time of sale. The warranty or contract also stipulates the conditions under which the warranty may be exercised.

To obtain a new replacement for such warranty items, contact your local RCA sales office and please supply Product Identification (including the Original Invoice Number, MI Number, Type Number, Model Number, and Serial Number) and Replacement Part Identification (including Stock Number and Description). Requests for warranty replacements may be unduly delayed if all this information is not supplied.

EQUIPMENT LOST OR DAMAGED IN TRANSIT

When delivering the equipment to you, the truck driver or carrier's agent will present a receipt for your signature. Do not sign it until you have (a) inspected the containers for visible signs of damage and (b) counted the containers and compared with the amount shown on the shipping papers. If a shortage or if evidence of damage is noted, insist that notation to that effect be made on the shipping papers before you sign them.

Further, after receiving the equipment, unpack it and inspect thoroughly for concealed damage. If concealed damage is discovered, immediately notify the carrier, confirming the notification in writing, and secure an inspection report. This item should be unpacked and inspected for damage WITHIN 15 DAYS after receipt. Report all shortages and damages to RCA, Commercial Communication Systems Division – Camden, New Jersey 08102.

RCA will file all claims for loss and damage on this equipment so long as the inspection report is obtained. Disposition of the damaged item will be furnished by RCA.

FIELD ENGINEERING SERVICE

RCA Field Engineering Service is available at current rates. Requests for field engineering service may be addressed to your RCA Broadcast Field Representative or the RCA Service Company, Incorporated – Broadcast Service Division – Camden, New Jersey 08102. Telephone (609) 338-3434.

TECH ALERT

Emergency 24 hour telephone consultation service for technical problems is available. Call TECH ALERT at (609) 338-3434. Telex messages will be forwarded to the addressee upon receipt. Western Union telex number is 83-4450.

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LIST OF EQUIPMENT

BTX-101 SCA Generator Less Audio LPF	MI-561061
Plug-in 5 kHz Audio LPF	MI-561065
Complete set of connector plugs for the BTX-101 SCA Generator (required only when Interface Panel MI-561071 and/or Interconnecting Cable MI-561067 are not used (optional)).	MI-561070
Set of chassis slides for servicing (optional).	MI-561073
Drilling template for mounting units (optional).	3742738

TECHNICAL SUMMARY

PERFORMANCE

Modulation Frequency Modulation
Center Frequency As specified, 30 to 110 kHz
Frequency Stability +400 Hz (30 to 75 kHz)
. +500 Hz (75 to 110 kHz)
Deviation Capability +15% of center frequency
Audio Input Impedance Resistive, 600 ohms, balanced
Audio Input Level Adjustable, -15 to +10dBm @ 100 Hz
Output Level Adjustable, up to 3 volts, p-p
Harmonic Distortion (20 - 12,000 Hz Bandwidth) 1% or less
Pre-emphasis Time Constant 0 and 150 usec*
Audio Frequency Response Within 1 dB of chosen pre-emphasis curve
FM Noise Level At least 55 dB below +peak deviation
. of 10% of center frequency
AM Noise Level At least 55 dB below unmodulated carrier
Muting Delay 0.5 to 5 sec., adjustable
Automatic Mute Level 0 to -40 dB below audio input level
Injection Level** 9 to 30%
Main-to SCA Crosstalk** -50 dB referred to +7.5
kHz deviation of the subcarrier by a 400 Hz tone. Main channel modulated
70% by 30-15,000 Hz tone and 30% by subcarrier, measured using narrow band
detector.
SCA-to-Main Crosstalk** -60 dB referred to +7.5
kHz deviation of the main carrier by a 400 Hz tone. SCA modulated 7.5 kHz
by 30-5,000 Hz tones, main carrier modulated 30% by SCA. Measured using
narrow band detector.

ELECTRICAL

Power Line Requirements 120 or 240 volts, single phase, 50/60 Hz
Combined Line Voltage Variation and Regulation +10%
Power Consumption 10 watts max.

MECHANICAL

Dimensions, inches (cm):
Width 1.19 (48.3)
Height 1.75 (4.4)
Depth 9 (22.9)
Weight, pounds (kg) 7.125 (3.23)
Altitude, feet (meters) 7500 (2286) max.
Ambient Temperature -20°C to + 70°C (-4°F to +140°F)

*May be altered to other values.
**Specifications applicable when operated with a BTE-115 Exciter.

INSTALLATION

GENERAL

The following procedure covers installation of the BTX-101 SCA Generator when used with the BTE-115 FM Exciter in the following RCA transmitters:

BTF-3ES1 Referred to in text as BTF-3/5
 BTF-5ES2

BTF-5ES1
 BTF-10ES1 Referred to in text as BTF-5/10/20
 BTF-20ES1

This procedure can generally be applied to other FM exciters and transmitters as well. Drilling and tapping of the required mounting holes in the cabinet, and other installation procedures for the exciter unit and stereo generator, should have been accomplished (see instruction manuals supplied with these units).

MOUNTING INTERCONNECT CABLE

If the interconnecting cable assembly has been installed, proceed to the CONNECTIONS TO MAIN CABLE CONNECTOR section below. The required cable, MI-561067-2, -3, -4, -5, or -6 interconnects the BTE-115 exciter, BTS-101 Stereo Generator (if used) and the BTX-101 SCA Generator(s), and also provides for audio inputs to the system.

In the BTF-5/10/20 transmitters, the cable is mounted along the inside edge of the front left hand mounting rail in the transmitter, using flat head screws and the cable ties provided with the cable as required. The cable should be positioned so the end with the 24 pin connector will extend down toward the bottom of the transmitter, and such that the two, three, or four branches of the cable break out in the area where the associated units will mount.

The cable is connected to the existing transmitter wiring, and any excess length is coiled in the bottom of the transmitter.

For the BTF-3/5 transmitter, mount the cable as shown in figure 7 of either the BTF-3ES1 (IB-8027593-1) or the BTF-5ES2 (IB-8027984-1) Instruction Book.

When the optional chassis slide rails are used, refer to the separate instructions provided with the chassis slide rails for installation details.

CONNECTION TO MAIN CABLE CONNECTOR

The 24 pin plug on the interconnect cable provides for audio inputs to and remote control of the exciter system. Connect as described in the following paragraphs.

BTF-3/5 Transmitter

Connections are made to the mating connector supplied with the interconnect cable as item 2. Bring audio input and remote control lines through the hole in the side of the transmitter directly into the connector as follows:

Circuit	Pin Nos.
SCA #1 Audio Input	10 and 11
Shield for above	12
SCA #2 Audio Input	13 and 14
Shield for above	15
SCA #1 Remote On	19
SCA #1 Remote Off	20
Common for above	21
SCA #2 Remote On	22
SCA #2 Remote Off	23
Common for above	24

NOTE: Shorting a Remote Off or Remote On pin to its associated common will cause the indicated change in operational mode of the SCA unit.

BTF-5/10/20 Transmitter

If the transmitter is not equipped with a 24 pin plug to mate with the interconnect cable, use the connector supplied with the interconnect cable as item 2. Remove existing connectors from cables Nos. 201 through 204 and connect these cables to the 24 pin plug as follows:

Cable	To Pin No.		Shield	Circuit
	Red	Black		
201	1	2	No Connection	Left Audio In
202	4	5	No Connection	Right Audio In
203	7	8	No Connection	SCA #1 Audio In
204	10	11	No Connection	SCA #2 Audio In

Using wires numbered 504, 505, 506 and 507 from the cable harness that was removed from the transmitter during installation of the BTE-115 Exciter, connect these wires from 1TB6 to the 24 pin connector as follows:

Wire No.	From	To Pin No.	Circuit
504	ITB6-5	20	SCA #1 Remote Off
505	ITB6-6	21	SCA #1 Common
506	ITB6-7	23	SCA #2 Remote Off
507	ITB6-8	24	SCA #2 Common

NOTE: Shorting the Remote Off to common will mute the SCA Generator, overriding the setting on the SCA unit front panel AUTO MUTE switch.

FINAL MOUNTING

Interface/Radiate Panel

Mount the panel in place and connect the 4 pin plug and ac twistlock connector to the panel. Dress associated cables so as to not interfere with removal of the exciter or stereo generator for servicing.

Exciter Unit

Connect the umbilical cord extending from the interface panel to the 6 pin control connector on the rear of the exciter. Connect the 10 pin plug on the interconnect cable to the mating input connector on the exciter. Associated with this connector are 1, 2, or 3 cables with BNC connectors. Connect the cable(s) which are marked "SCA" to SCA INPUTS (1 and 2) on the exciter. (If there is another cable, it should connect to the COMPOSITE INPUT jack on the exciter.) Connect the rf output and ac power cables to the exciter, and mount in place.

Stereo Generator (if used)

Connect the 12 pin connector on the interconnect cable to the INPUTS connector of the stereo generator, and the associated BNC connector to the OUTPUT jack. Plug the ac cord into the outlet on the interface panel. Mount the stereo generator.

SCA Generator(s)

Connect the 8 pin connector on the interconnect cable to the INPUTS connector of the SCA generator(s) and the associated BNC connector to the OUTPUT jack. Be careful not to connect this cable to the telemetry (TELE) input jack. Plug the ac cord into the outlet on the interface panel. Mount the SCA generator(s).

Blank Panels

Fill unused space(s) with blank panels.

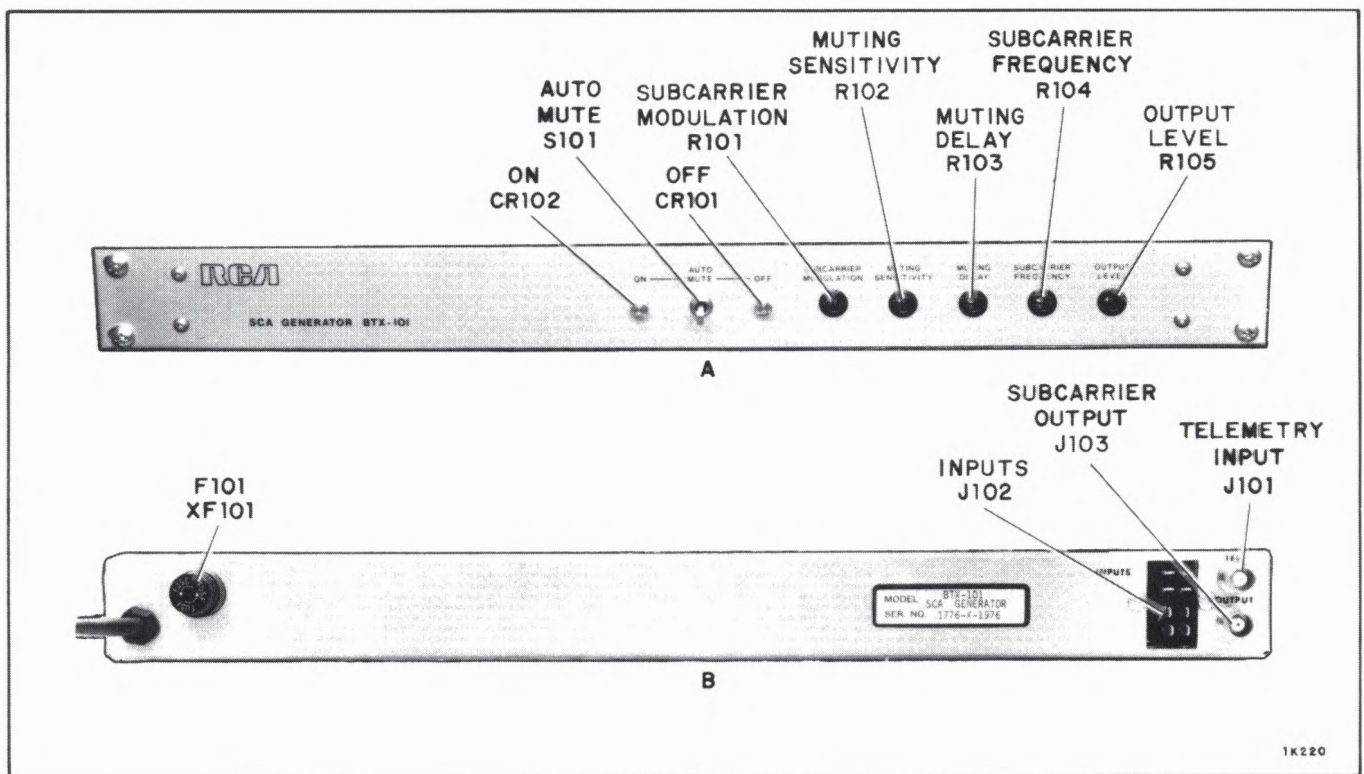


Figure 1. BTX-101

ROUTINE OPERATION

SUBCARRIER MODULATION

The program audio applied to the BTX-101 should be controlled by a frequency-conscious peak limiter, of the general type used for the main channel modulation control. The degree of limiting used in that device will depend on the kind of programming being processed. The output of the limiter ideally should be set to +10 dBm. Then set the SUBCARRIER MODULATION control R101 on the BTX-101 for the desired peak deviation (Refer to figures 1 and 4). Normally it is set for 4 kHz deviation during stereophonic transmission or 6 kHz deviation during monaural transmission. Unless filtering is a part of the preceding audio processing, be sure that the BTX-101 audio lowpass filter FL1 is switched IN. More precise control of the modulation may be achieved if the preceding audio limiter has precise 150 microsecond pre-emphasis and is operated without any de-emphasis. Under these conditions the BTX-101 pre-emphasis circuitry is to be switched out by operating the PRE-EMPHASIS switch S1 to the OFF position.

SUBCARRIER FREQUENCY

The center frequency of the BTX-101 should be checked periodically to be sure that it is within legal specifications. The frequency may be checked with either the subcarrier monitor or a frequency counter. If a counter is used, employ a gate time of the order of one second; shorter gate time will tend to give erroneous readings due to the presence of frequency modulation of the subcarrier during gate time. The front-panel SUBCARRIER FREQUENCY control R104 may be readjusted to place the subcarrier at the desired center frequency, commonly 67 kHz. A common alternate frequency (for use during monaural transmission only) is 41 kHz. If the SUBCARRIER FREQUENCY control is near one end of its range, then the internal COARSE FREQ control R36 may be readjusted. To change from one subcarrier frequency to another, for example from 67 kHz to 41 kHz, component value changes are required. These include the values of the timing capacitors C13 and C14 in the modulated oscillator and the subcarrier output bandpass filter FL2. Refer to figures 3 and 7.

MUTING SENSITIVITY AND MUTING DELAY

Generator output is normally muted when there is no program input. Therefore, the SCA receivers' audio systems will mute and eliminate any residual background noise during idle periods. The level of programming which turns on the subcarrier is adjustable, as is the time delay between removal of audio and muting of the subcarrier. The MUTING SENSITIVITY control R102 is normally set so that audio levels of about 10 dB below normal will just barely

turn on the subcarrier. The MUTING DELAY control R103 is adjusted so the subcarrier is muted within one or two seconds of removal of the audio. Because some subcarrier receivers have muting systems that are more graceful than others, it is advisable to take into account the sound as delivered from the subcarrier receiver when performing these adjustments.

OUTPUT LEVEL

This control (R105) adjusts the amount of modulation of the main carrier caused by the subcarrier. This is called injection. It is standard to operate at an injection level of 9% (10% maximum) during stereophonic transmission. During monaural transmission, it is customary to operate at an injection level of about 20%. Should two subcarriers be in operation simultaneously, however, the total injection must not exceed 30%. Values of injection are read using the subcarrier modulation monitor. Modulation must be removed from the subcarrier (which must then be manually switched on) during this measurement.

When a suitable value of injection has been decided upon, the associated BTE-115 FM Exciter injection meter calibration control may be readjusted to yield a 0 dB reading on the panel meter.

MODE CONTROL

As mentioned above, the output of the SCA Generator will normally be muted when program material is absent. To accomplish this, set the front panel switch, S101, to the AUTO MUTE position. This switch may be set to the ON or OFF positions, thus disabling the muting circuit and causing the SCA to remain on or off, regardless of the presence or absence of program signal. The ON and OFF functions may be remote controlled via J102 terminals 7 and 8.

The remote control terminals override both the program muting circuit and the front panel switch. Grounding the ON terminal (J102 pin 7) turns the subcarrier on, unless the OFF terminal (J102 pin 8) is grounded. When the OFF terminal is grounded, the subcarrier is turned off regardless of program signal, the front panel switch, or the status of the ON terminal.

DETAILED CIRCUIT DESCRIPTION

Program audio is applied to the INPUTS connector J102 on the rear of the BTX-101. See figure 1. FL101 and FL102 provide rf filtering. Resistors R1 through R5 provide input termination. T102 converts the input from balanced and floating to unbalanced. The front-panel SUBCARRIER MODULATION control R101 permits adjusting the subcarrier modulation (also called deviation).

The selected portion of the signal from R101 is applied to the main electronics printed wiring board. R6 and C1 provide additional on-board rf filtering. Protection against transients when the input program source is a telephone interconnection is provided by CR5 and CR6. Compensation is provided by R7, R8 and C2 so a clipping-type processor may be used for modulation control. Amplifier U1 provides gain as well as continuously adjustable pre-emphasis. The pre-emphasis may be switched off by operating S1.

Telemetry signals (in the 20 Hz to 5 kHz range) from an affiliated remote control system may be applied to the TELE jack, J101, at the rear of the BTX-101. This signal, after rf filtering by FL103, R15 and C10, is applied to internal TELEMETRY INJECTION control R16.

The pre-emphasized program modulation from U1 is applied (along with the telemetry signal from R16) to U2. This stage acts as a summing amplifier and as a limiter. Limiting is accomplished by simply clipping modulation in excess of that desired for routine operation. Clipping symmetry may be adjusted by CLIPPING SYMMETRY control R21. The output of the limiter stage is applied to the audio lowpass filter FL1 via series terminating resistor R24. The filter is terminated by the combination of R26, R31, R32, and the series divider consisting of R28 through R30. Observe that the limiter provides a ceiling to the upper modulating rate. In this manner the resultant subcarrier spectrum is controlled without the use of distortion-producing sharp-cutoff subcarrier bandpass filters. The audio lowpass filter may be bypassed by operating S2.

A portion of the audio lowpass filter output is applied to the modulation buffer U3 via the internal DEVIATION CEILING control R31. The modulator oscillator uses transistors Q1 through Q4 and associated components. The center frequency is controlled by COARSE FREQ control R36 and front panel SUBCARRIER FREQUENCY control R104. Differing subcarrier frequencies are selected by using different values of timing capacitors at locations C13 and C14. Thermistor R37 provides temperature compensation for the oscillator.

The output of the modulated oscillator is applied to buffer Q5, which provides a signal to the series gate using CR12 and CR13. The output of the gate is applied to the subcarrier bandpass filter FL2. This filter has little influence on subcarrier performance; its prime function is to remove harmonics of the subcarrier. The output of the bandpass filter is applied to the output amplifier U4. The required amount of subcarrier is selected by the front-panel OUTPUT LEVEL control R105. The output of this control is applied to the OUTPUT connector J103.

A sample of the summed, amplitude and band-limited program modulation is applied to the deviation metering buffer U5, via METER CAL control R29. This buffer applies a sample of the modulation to

the affiliated RCA BTE-115 FM Exciter metering system, via the IN-PUTS connector J101 pin 2 on the rear of the BTX-101.

The same limited sample is also applied to the front-panel MUTING SENSITIVITY control R102. The output from this control is applied to amplifier U6. The response of this amplifier has been rolled off at both low and high audio frequencies. The output of U6 is applied to rectifier CR9, which charges capacitor C20 when audio is present. This capacitor discharges primarily through resistor R56, in series with front-panel MUTING DELAY control R103. The voltage across C20 is applied to schmitt trigger U7. The U7 output is applied to lamp drivers Q6 and Q7 then to the series sub-carrier gate via timing circuitry around CR10 and CR11. Muting rise time is determined by the time required for C23 to discharge through R72 and CR11 in parallel with R73, while fall time is determined by the time required for C23 to charge through R73.

The BTX-101 utilizes a conventional full wave power supply using a split primary power transformer. Voltage regulation is provided by integrated circuit regulators.

INTERNAL ADJUSTMENTS

The following adjustments are not meant to be accomplished routinely, but rather after component replacement or to correct long-term aging. Refer to figures 3 and 4.

PRE-EMPHASIS

The pre-emphasis in the BTX-101 is both adjustable (using R12) and switchable (using S1). To adjust the pre-emphasis, be sure S1 is ON and adjust R12 for the flattest frequency response obtainable using the normal demodulator. If it is desired to operate at exactly 150 microseconds (standard), adjust R12 for a gain increase of 3 dB at a frequency of 1061 Hz and measure the subcarrier modulation with the pre-emphasis switched out (S1 OFF). Then switch the pre-emphasis ON and adjust R12 for a gain increase of 3 dB. The pre-emphasis may be switched out if the preceding frequency-conscious limiter is operated with its output network in the flat mode.

CLIPPING SYMMETRY

The internal limiter amplifier (clipper) has adjustable clipping symmetry. The symmetry may be adjusted by applying a test tone to the audio input terminals and observing the yellow test point, TP2. Increase the level of the audio tone (400 Hz is suggested) until clipping is observed. Adjust CLIPPING SYMMETRY control R21 for symmetrical clipping.

DEVIATION CEILING

When sufficient program level is applied to the BTX-101, the limiter will go into clipping. Under these conditions, the limiter will control the modulation amplitude while the following audio low-pass filter FL1 will control the maximum modulating rate. This system can positively prevent any subcarrier sidebands from penetrating the stereophonic subchannel while modulating the SCA subcarrier. When clipping is used, either in the preceding audio limiter or in the BTX-101, the audio lowpass filter FL1 must be switched in. Apply the audio tone as in the clipping symmetry section. While in heavy clipping, adjust the DEVIATION CEILING control R31 for a stereo monitor subchannel reading of no more than -60 dB relative to 100% modulation, using various test tone frequencies.

Such crosstalk into the stereo subchannel will normally be most evident at an audio test frequency of about 4.5 kHz. Adjust R31 at the worst test frequency for the -60 dB reading. Other criteria may be applicable for the adjustment of this control, for example, prohibiting deviation in excess of some figure such a 6 kHz.

COARSE FREQUENCY

The subcarrier frequency of the BTX-101 is set by using the appropriate values of timing capacitors for the modulated oscillator and by the use of the correct subcarrier output bandpass filter. The frequency is then set to the selected value by using the internal COARSE FREQ control R36 and then by using the front-panel SUBCARRIER FREQUENCY control R104. To adjust the internal COARSE FREQ control, set the front-panel SUBCARRIER FREQUENCY control to midrange; then, adjust R36 for the correct subcarrier frequency. The front-panel SUBCARRIER FREQUENCY control should then have a vernier range of about +2kHz. Significant frequency shifts, for example from 67 kHz to 47 kHz, require new values of oscillator timing capacitors as well as a new subcarrier bandpass filter.

TELEMETRY INJECTION

In operations using the subcarrier as a means of returning telemetry (metering) data back to the studio or control point, this data is normally applied to the subcarrier as a signal of low level (about 14 dB below program) and low frequency (upper limit about 30 Hz). Internal TELEMETRY INJECTION control R16 allows the level to be adjusted to this value. Applying the telemetry tone and adjusting R16 sets this tone to one-fifth of that modulation caused by program deviation at 4 kHz peak, with the telemetry at 800 Hz peak

deviation. The frequency response of the telemetry input is very flat from 20 Hz to 5 kHz. Pre-emphasis is not applied to the telemetry signal.

Meter Calibration: There is no metering as such on the BTX-101. However, when this subcarrier generator is used with the RCA BTE-115 FM Exciter, that exciter has provisions for metering the deviation of the subcarrier. Assuming that the subcarrier generator is satisfactorily connected to the exciter, adjust the internal METER CAL control R29 for a 0 dB indication on the affiliated exciter (meter switch in the appropriate position) when the subcarrier generator is being modulated fully. This is an arbitrary calibration for maintenance purposes only.

PARTS ORDERING INFORMATION

REPLACEMENT PARTS

Replacement parts bearing a Stock Number should be ordered by Item, Description, and Stock Number from RCA, Distributor and Special Products Division, Deptford, New Jersey 08096. Items listed under a Master Item (MI) Number should be ordered from RCA, Commercial Communications Systems Division, Camden, NJ 08102.

Because of possible products modifications and/or the unavailability of parts, the item which will be supplied against an order for a replacement part may not be an exact duplicate of the original part. As a result, some of the replacement parts received may require a mount-

ing modification of the customer's design. In some cases, parts and/or instructions for adapting the substitute parts will be supplied. In no way will the substitute parts impair the operation or performance of the equipment.

For information regarding the use of any parts received, write RCA, Tech Alert, Bldg. 2-8, Camden, NJ 08102, or call (609) 338-3434.

EMERGENCY PART SERVICE

For emergency part service during working hours, contact RCA Distributor and Special Products Division, telephone (609) 848-5900 or (609) 541-3636 extension 2234 or 2235. After working hours (Eastern time) telephone (609) 853-0560.

LOCATION	ORDERING INSTRUCTIONS
Continental United States, including Alaska and Hawaii	Replacement Parts bearing a STOCK NUMBER should be ordered from RCA Distributor and Special Products Division - 2000 Clements Bridge Road - Deptford, NJ 08096.
	Replacement Parts bearing a MASTER ITEM (MI) NUMBER should be ordered from RCA, Commercial Communications Systems Division - Camden, NJ 08102 or your nearest RCA Regional Office.
	Replacement Parts with NO STOCK or MASTER ITEM (MI) NUMBER are standard components. They are not stocked by RCA and should be obtained from your local electronics distributor.
Dominion of Canada	Order from your local RCA Sales Representative or his office or from: RCA Victor Limited, 1001 Lenoir Street, Montreal, Quebec.
Outside of Continental United States, Alaska, Hawaii, and the Dominion of Canada	Order from your local RCA Sales Representative or from: RCA International Division, Clark, New Jersey - U.S.A. - Wire: RADIOINTER
	Emergency: Cable RADIOPARTS, DEPTFORD, NJ

REPLACEMENT PARTS

Symbol	Stock No.	Drawing No.	Description
			BTX-101 SCA GENERATOR MI-561062
			MAIN FRAME
	223973 444328		CONNECTOR CONNECTOR
CR101	441035		LED - AMBER
CR102	441035		LED - AMBER
F101	427383		FUSE - 1/4 AMP 250 V
FL101 THRU FL108	427389		3000PF 500V FILTER CAP.
L101	425949		REACTOR
R101	444323		10000 OHM LINEAR VARIABLE, SUBCARRIER MODULATION
R102	444322		100000 OHM LINEAR VARIABLE, MUTING SENSITIVITY
R103	444322		100000 OHM LINEAR VARIABLE, MUTING DELAY
R104	444324		1000 OHM LINEAR VARIABLE, SUBCARRIER FREQUENCY
R105	444324		1000 OHM LINEAR VARIABLE, OUTPUT LEVEL
S101	444329		SWITCH AUTO MUTE
T101	444327		TRANSFORMER - POWER
T102	426792		TRANSFORMER - AUDIO
U101	444326		I C - TYPE UA7812KC
U102	444325		I C - TYPE UA7912KC
XF101	429892		HOLDER, FUSE
XU101	248369		SOCKET - KIT
XU102	248369		SOCKET - KIT
			SCA PW BOARD
C1	230245		150 PF 5% 500V MICA
C2	420261		.47 UF 3% 100V FILM
C3	441040		2200PF 1% 500V MICA
C4	423708		100000 PF 20% 25V CER PLATE
C5	420073		47 UF 10% 20V TANT
C6	423708		100000 PF 20% 25V CER PLATE
C7	420073		47 UF 10% 20V TANT
C8	423708		100000 PF 20% 25V CER PLATE
C9	423708		100000 PF 20% 25V CER PLATE
C10	230245		150 PF 5% 500V MICA
C11	230245		150 PF 5% 500V MICA
C12	420073		47 UF 10% 20V TANT
C13	425178		3300PF 10% 100V MICA
C13	234853		1100 PF 1% 500V MICA
C13	234981		4300 PF 5% 500V MICA
C14	425178		3300PF 10% 100V MICA
C14	234853		1100 PF 1% 500V MICA
C14	234981		4300 PF 5% 500V MICA
C15	426027		10000 PF 20% 50V CER DISC
C16	444331		500UF 75V ELECT
C17	444331		500UF 75V ELECT
C18	423708		100000 PF 20% 25V CER PLATE
C19	428055		22PF 5% 500V MICA
C20	420073		47 UF 10% 20V TANT
C21	426027		10000 PF 20% 50V CER DISC
C22	426027		10000 PF 20% 50V CER DISC

Symbol	Stock No.	Drawing No.	Description
C23	420073		47 UF 10% 20V TANT
C24	420073		47 UF 10% 20V TANT
C25	423708		100000 PF 20% 25V CER PLATE
C26	420073		47 UF 10% 20V TANT
C27	423708		100000 PF 20% 25V CER PLATE
C28	423708		100000 PF 20% 25V CER PLATE
	241490		470 PF 20% 500V FEED-THRU
CR1 THRU			
CR4	234552		DIODE - TYPE 10D2
CR5	423780		DIODE - TYPE 1N4734
CR6	423780		DIODE - TYPE 1N4734
CR7 THRU			
CR13	242220		DIODE - TYPE 1N4154
Q1	237840		TRANSISTOR - TYPE 2N3646
Q2	426236		TRANSISTOR - TYPE 2N4058
Q3	426236		TRANSISTOR - TYPE 2N4058
Q4	237840		TRANSISTOR - TYPE 2N3646
Q5	426236		TRANSISTOR - TYPE 2N4058
Q6	248024		TRANSISTOR - TYPE 2N2924
Q7	248024		TRANSISTOR - TYPE 2N2924
R1	502112		120 OHMS 5% 1/2W COMP.
R2	502112		120 OHMS 5% 1/2W COMP.
R3	502168		680 OHM 5% 1/2W COMP.
R4	502112		120 OHMS 5% 1/2W COMP.
R5	502112		120 OHMS 5% 1/2W COMP.
R6	502222		2200 OHMS 5% 1/2W COMP.
R7	502356		56000 OHMS 5% 1/2W COMP.
R8	502356		56000 OHMS 5% 1/2W COMP.
R9	502222		2200 OHMS 5% 1/2W COMP.
R10	502210		1000 OHM 5% 1/2W COMP.
R11	502210		1000 OHM 5% 1/2W COMP.
R12	436795		100000 OHM LINEAR VARIABLE, PRE-EMPHASIS
R13	502268		6800 OHM 5% 1/2W COMP.
R14	502222		2200 OHMS 5% 1/2W COMP.
R15	502222		2200 OHMS 5% 1/2W COMP.
R16	436791		10000 OHMS LINEAR VARIABLE, TELEMETRY INJECTION
R17	502333		33000 OHMS 5% 1/2W COMP.
R18	502310		10000 OHM 5% 1/2W COMP.
R19	502510		1000000 OHMS 5% 1/2W COMP.
R20	502410		100000 OHMS 5% 1/2W COMP.
R21	436795		100000 OHM LINEAR VARIABLE, CLIPPING SYMMETRY
R22	502410		100000 OHMS 5% 1/2W COMP.
R23	502433		330000 OHMS 5% 1/2W COMP.
R24	502267		4700 OHMS 5% 1/2W COMP.
R25	502015		15 OHM 5% 1/2W COMP.
R26	502256		5600 OHMS 5% 1/2W COMP.
R27	502210		1000 OHM 5% 1/2W COMP.
R28	502433		330000 OHMS 5% 1/2W COMP.
R29	436795		100000 OHM LINEAR VARIABLE, METER CAL.
R30	502267		4700 OHMS 5% 1/2W COMP.
R31	436795		100000 OHM LINEAR VARIABLE, DEVIATION CEILING
R32	502310		10000 OHM 5% 1/2W COMP.
R33	502233		3300 OHMS 5% 1/2W COMP.
R34	502267		4700 OHMS 5% 1/2W COMP.
R35	502233		3300 OHMS 5% 1/2W COMP.
R36	427380		5000 OHM LINEAR VARIABLE, COARSE FREQ.
R37	444330		THERMISTOR
R38	502133		330 OHMS 5% 1/2W COMP.
R39	502222		2200 OHMS 5% 1/2W COMP.
R40	502310		10000 OHM 5% 1/2W COMP.
R41	502267		4700 OHMS 5% 1/2W COMP.
R42	502210		1000 OHM 5% 1/2W COMP.
R43	502215		1500 OHMS 5% 1/2W COMP.
R44	502222		2200 OHMS 5% 1/2W COMP.
R45	502222		2200 OHMS 5% 1/2W COMP.
R46	502215		1500 OHMS 5% 1/2W COMP.
R47	502210		1000 OHM 5% 1/2W COMP.

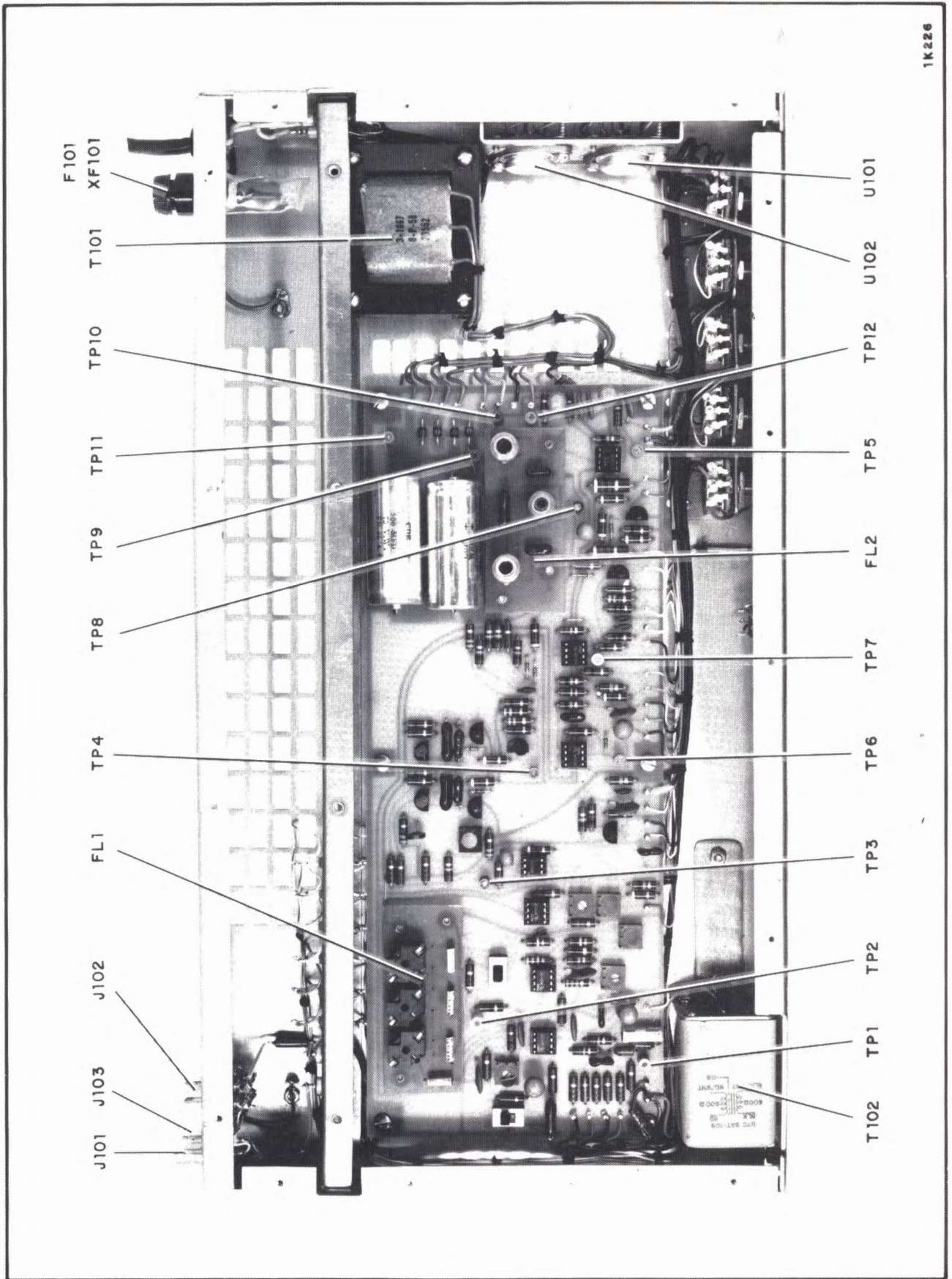
Symbol	Stock No.	Drawing No.	Description
R48	5n2210		1000 OHM 5% 1/2W COMP
R49	5n2247		4700 OHMS 5% 1/2W COMP.
R50	5n2133		330 OHMS 5% 1/2W COMP.
R51	5n2210		1000 OHM 5% 1/2W COMP
R52	5n2233		3300 OHMS 5% 1/2W COMP.
R53	5n2233		3300 OHMS 5% 1/2W COMP.
R54	5n2310		10000 OHM 5% 1/2W COMP
R55	5n2522		2200000 OHMS 5% 1/2W COMP.
R56	5n2247		4700 OHMS 5% 1/2W COMP.
R57	5n2322		22000 OHMS 5% 1/2W COMP.
R58	5n2210		1000 OHM 5% 1/2W COMP
R59	5n2315		15000 OHMS 5% 1/2W COMP
R60	5n2310		10000 OHM 5% 1/2W COMP
R61	5n2368		68000 OHMS 5% 1/2W COMP.
R62	5n2210		1000 OHM 5% 1/2W COMP
R63	5n2010		10 OHMS 5% 1/2W COMP.
R64	5n2233		3300 OHM 5% 1/2W COMP
R65	5n2222		2200 OHMS 5% 1/2W COMP.
R66	512147		470 OHMS 5% 1W COMP.
R67	5n2010		10 OHMS 5% 1/2W COMP.
R68	5n2247		4700 OHMS 5% 1/2W COMP.
R69	5n2210		1000 OHM 5% 1/2W COMP
R70	512147		470 OHMS 5% 1W COMP.
R71	5n2222		2200 OHMS 5% 1/2W COMP.
R72	5n2222		2200 OHMS 5% 1/2W COMP.
R73	5n2222		2200 OHMS 5% 1/2W COMP.
R74	5n2310		10000 OHM 5% 1/2W COMP
R75	5n2310		10000 OHM 5% 1/2W COMP
R76	5n2247		4700 OHMS 5% 1/2W COMP.
R77	5n2310		10000 OHM 5% 1/2W COMP
R78	5n2310		10000 OHM 5% 1/2W COMP
R79	5n2222		2200 OHMS 5% 1/2W COMP.
RA0	5n2433		3300 OHMS 5% 1/2W COMP.
RA1	5n2168		680 OHM 5% 1/2W COMP
RA2	5n2310		10000 OHM 5% 1/2W COMP
RA3	5n2122		220 OHMS 5% 1/2W COMP.
S2	424866		SWITCH
TP1	425993		JACK
TP2	425992		JACK
TP3	425994		JACK
TP4	425990		JACK
TP5	425989		JACK
TP6	425988		JACK
TP7	425997		JACK
TP8	425991		JACK
TP9	425996		JACK
TP10	425996		JACK
TP11	425990		JACK
TP12	425990		JACK
U1 THRU			
U3	423797		I.C. - TYPE SN72741P
U4	425504		I.C. - TYPE LM318N
U5 THRU			
U7	423797		I.C. - TYPE SN72741P
X01 THRU			
X07	422416		SOCKET
XU1 THRU			
XU7	444332		SOCKET

Symbol	Stock No.	Drawing No.	Description
			CARRIER BANDPASS FILTER
			41 KHZ PW CARD
C1	428775		680 PF 5% 500V MICA
C2	423894		.0047 UF 3% 100V
C3	428775		680 PF 5% 500V MICA
L1	444320		INDUCTOR 15MH
L2	444319		INDUCTOR 2.2MH
L3	444320		INDUCTOR 15MH
			67 KHZ PW CARD
C1	227692		360 PF 5% 500V MICA
C2	426769		2870PF 2% 500V MICA
C3	227692		360 PF 5% 500V MICA
L1	421950		INDUCTOR 22 MH
L2	444321		INDUCTOR 3.3MH
L3	421950		INDUCTOR 22 MH
			AUDIO LOW PASS FILTER
C1	425886		.0075 UF 3% 100V FILM
C2			NOT USED
C3	425882		.0124 UF 3% 100V FILM
C4			NOT USED
C5	425882		.0124 UF 3% 100V FILM
C6			NOT USED
C7	425886		.0075 UF 3% 100V FILM
L1			NOT USED
L2	444318		CUP CORE
L3			NOT USED
L4	444317		CUP CORE
L5			NOT USED
L6	444318		CUP CORE

SUGGESTED EQUIPMENT SPARES

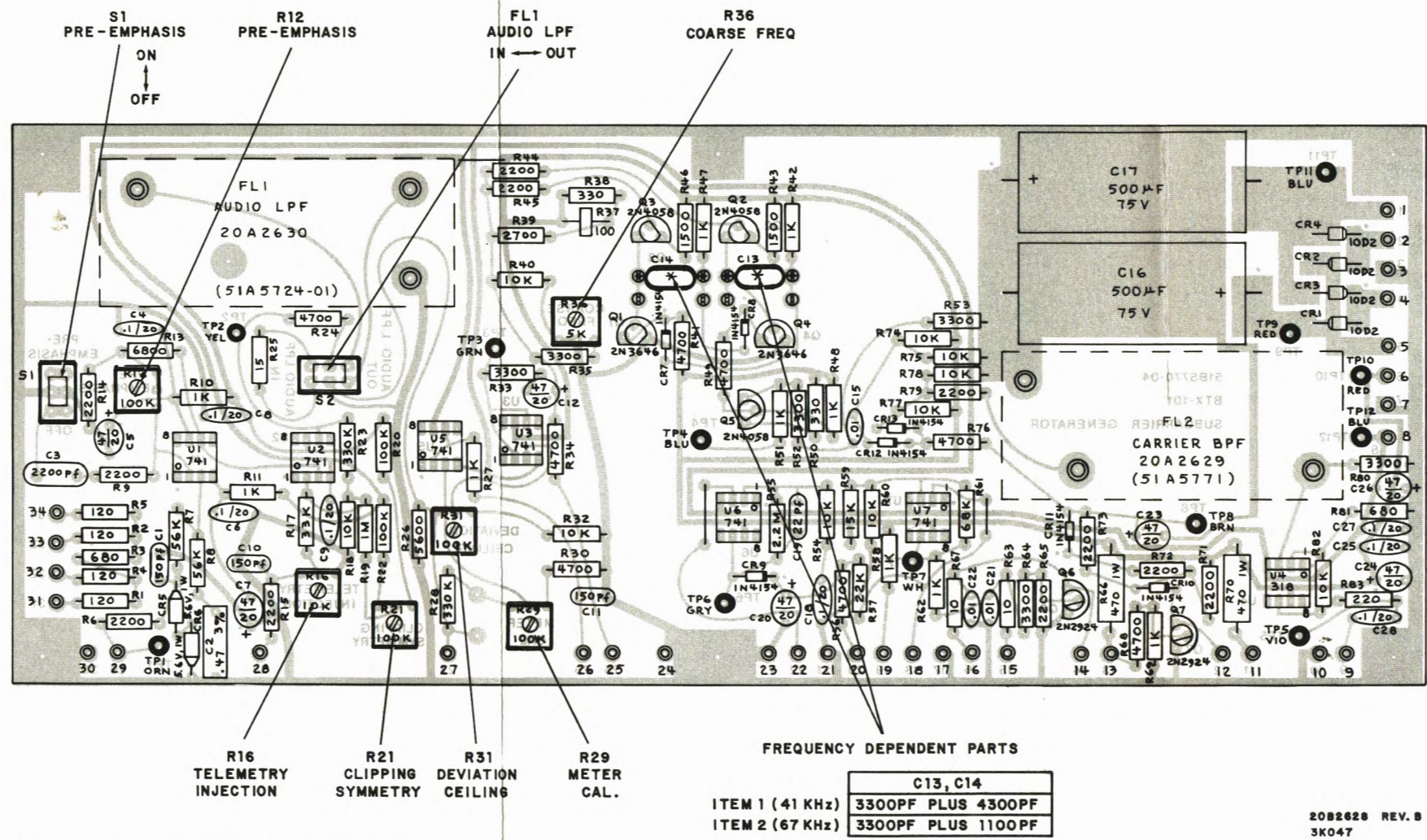
Description	Location	Stock No.	Quantity	
			Domestic	*Foreign
Integrated Circuit, 72741P	U1 thru U3, U5 thru U7	423797	1	2
Integrated Circuit, LM318	U4	435504	1	1
Integrated Circuit, 7812	U101	444326	1	1
Integrated Circuit, 7912	U102	444325	1	1
Transistor, 2N2924	Q6, Q7	248024	1	1
Transistor, 2N3646	Q1, Q4	237840	2	2
Transistor, 2N4058	Q2, Q3, Q5	426236	2	2
Diode, 1N4154	CR7 thru CR13	242220	2	2
Diode, 1N4734	CR5, CR6	423780	2	2
Diode, Amber LED	CR101, CR102	441635	0	1
Diode, 10D2	CR1 thru CR4	234552	4	4
Transformer, power	T101	444327	0	1
Transformer, input	T102	426792	0	1
Capacitor, filter 500/75	C16, C17	444331	2	2
Fuse, MDL 1/4 A	F1	427383	5	5
Potentiometer, 100K	R12, R21, R29 R31	436795	1	1
Potentiometer, 10K	R16	436791	1	1
Potentiometer, 5K	R36	427350	1	1
Potentiometer, 1K, panel	R104, R105	444324	1	1
Potentiometer, 10K, panel	R101	444323	1	1
Potentiometer, 100K, panel	R102, R103	444322	1	1

*Foreign or remote area installations.



1K226

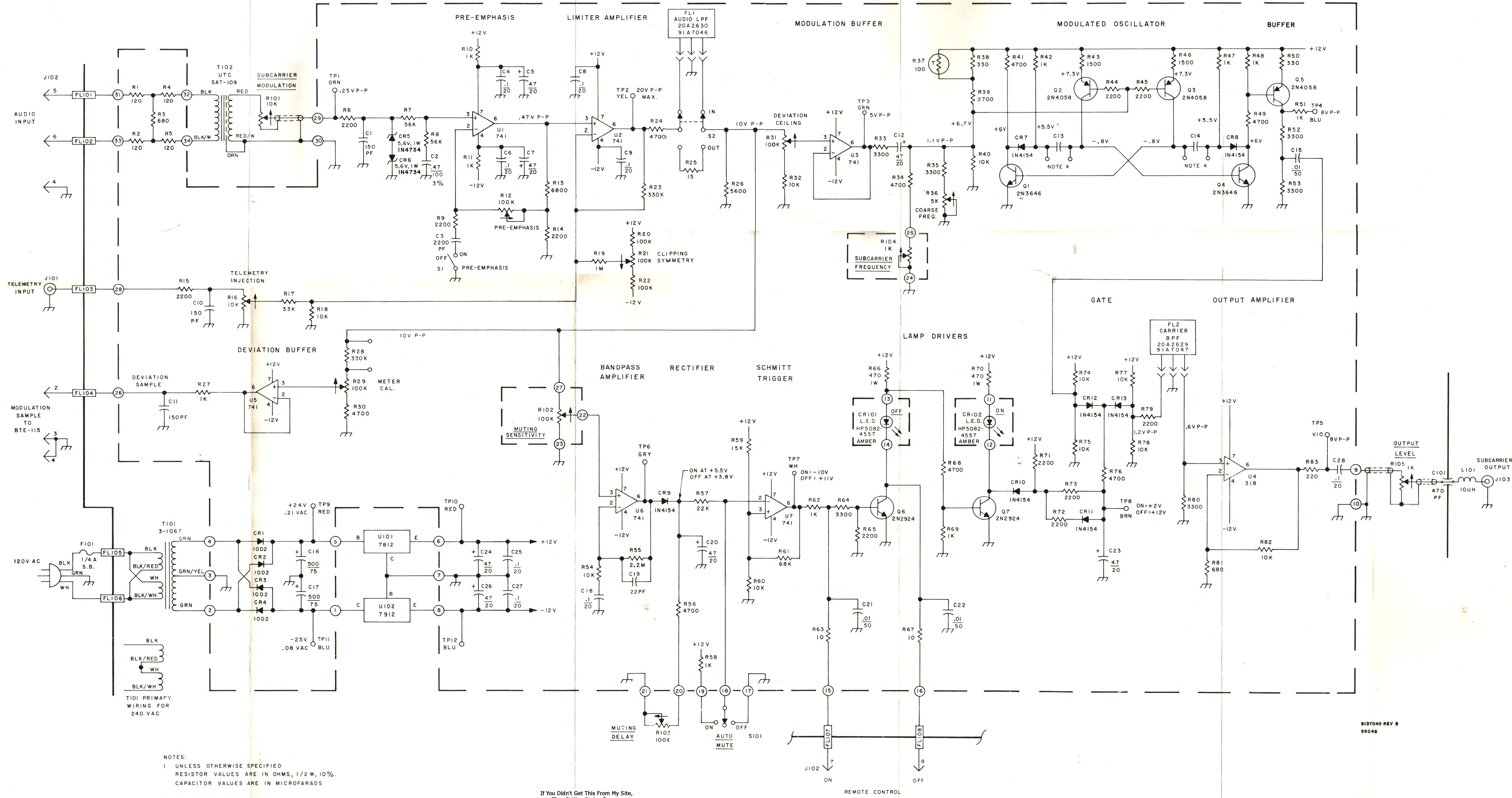
Figure 2. BTX-101 Top View



NOTE: FOR COMPONENTS LAYOUT SEE FIGURE 9.

Figure 3. PW Board Switches and Adjustments

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- NOTES:
- UNLESS OTHERWISE SPECIFIED RESISTOR VALUES ARE IN OHMS, 1/2 W, 10%. CAPACITOR VALUES ARE IN MICROFARADS
 - P. C. BOARD 51B5770.
 - COMPONENT LAYOUT 20B2628.
 - C13 AND C14 ARE EACH 3300PF PLUS 4300PF FOR 41 KHZ. " " " " 3300PF PLUS 1100PF FOR 67 KHZ.

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81D7040 REV B 3K048

Figure 4. BTX-101 SCA Generator Schematic

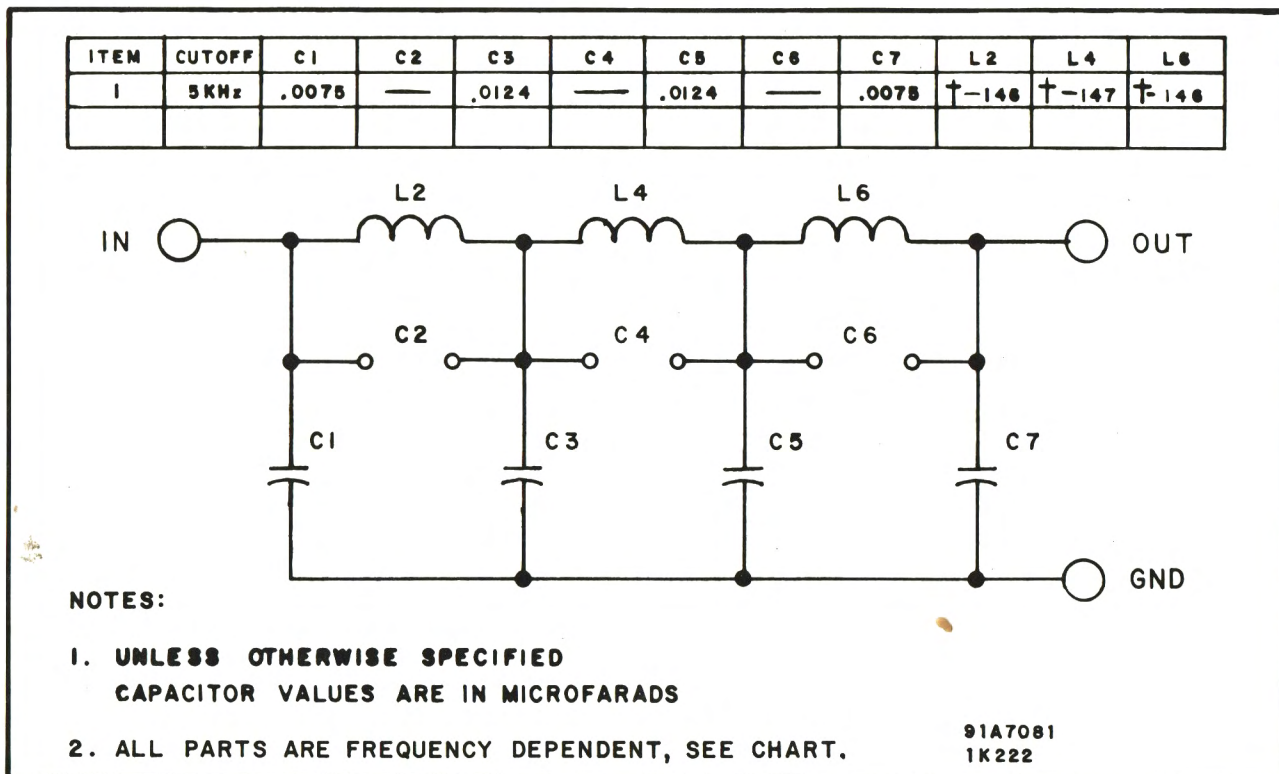


Figure 5. Audio Low Pass Filter Schematic

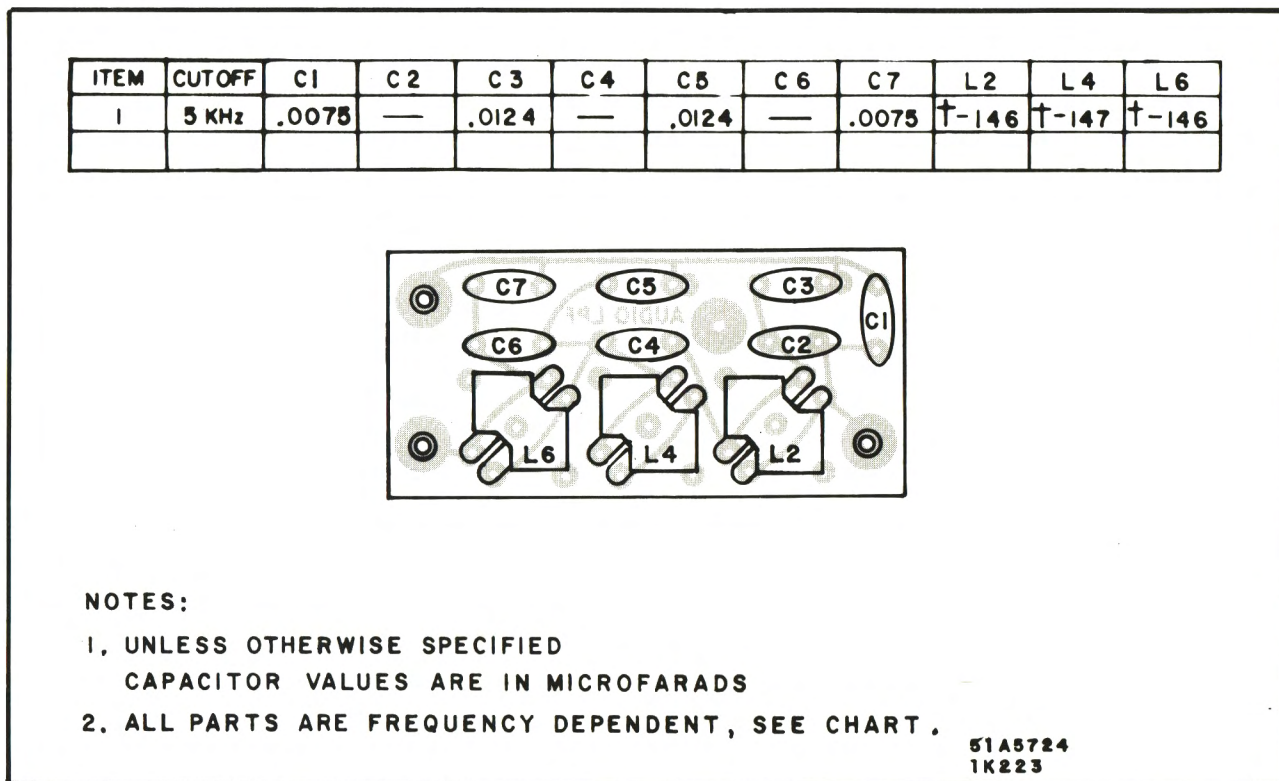


Figure 6. Audio Low Pass Filter Components Layout

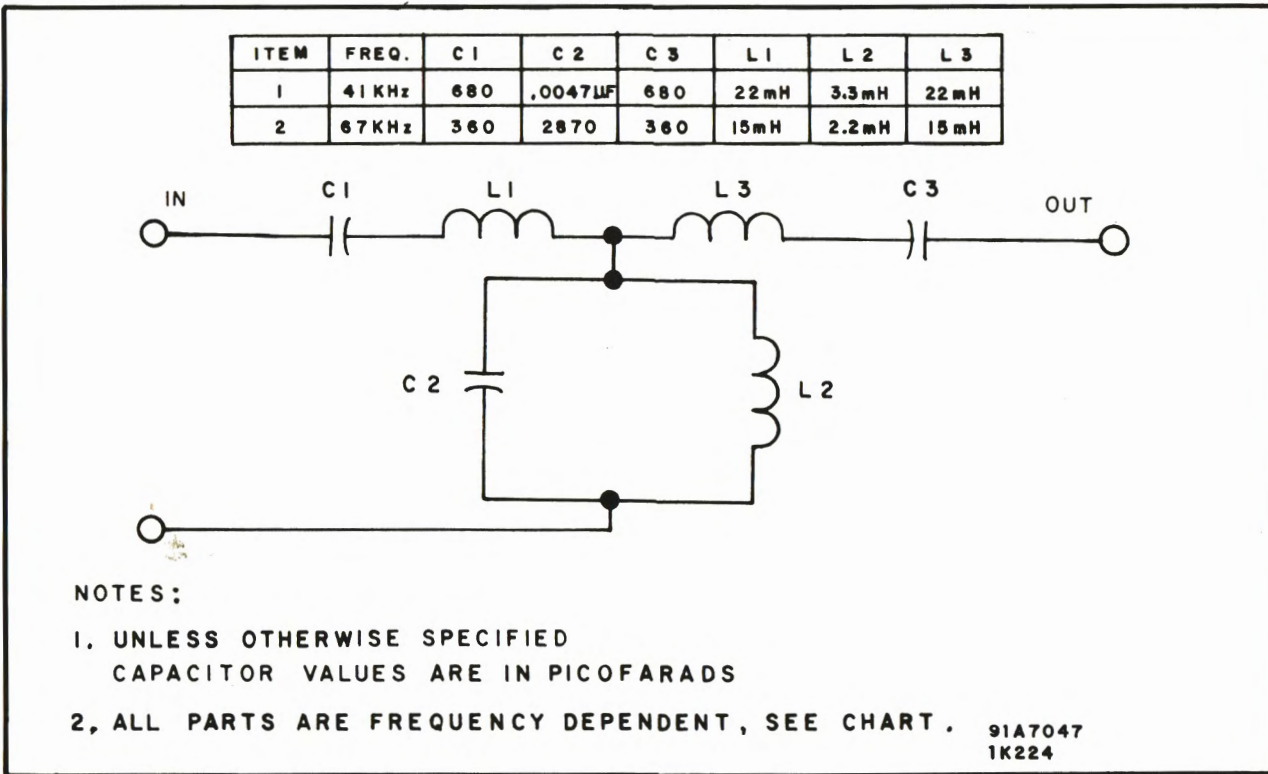


Figure 7. Carrier Band Pass Filter Schematic

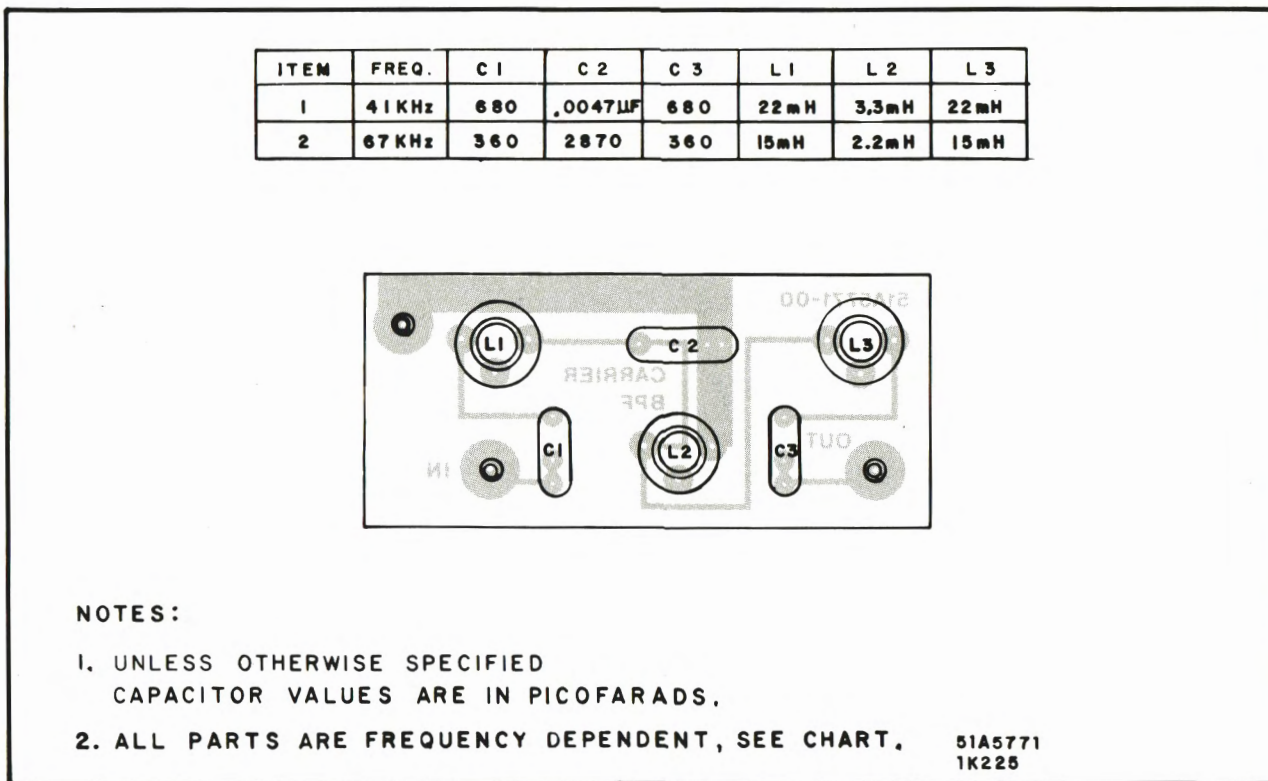
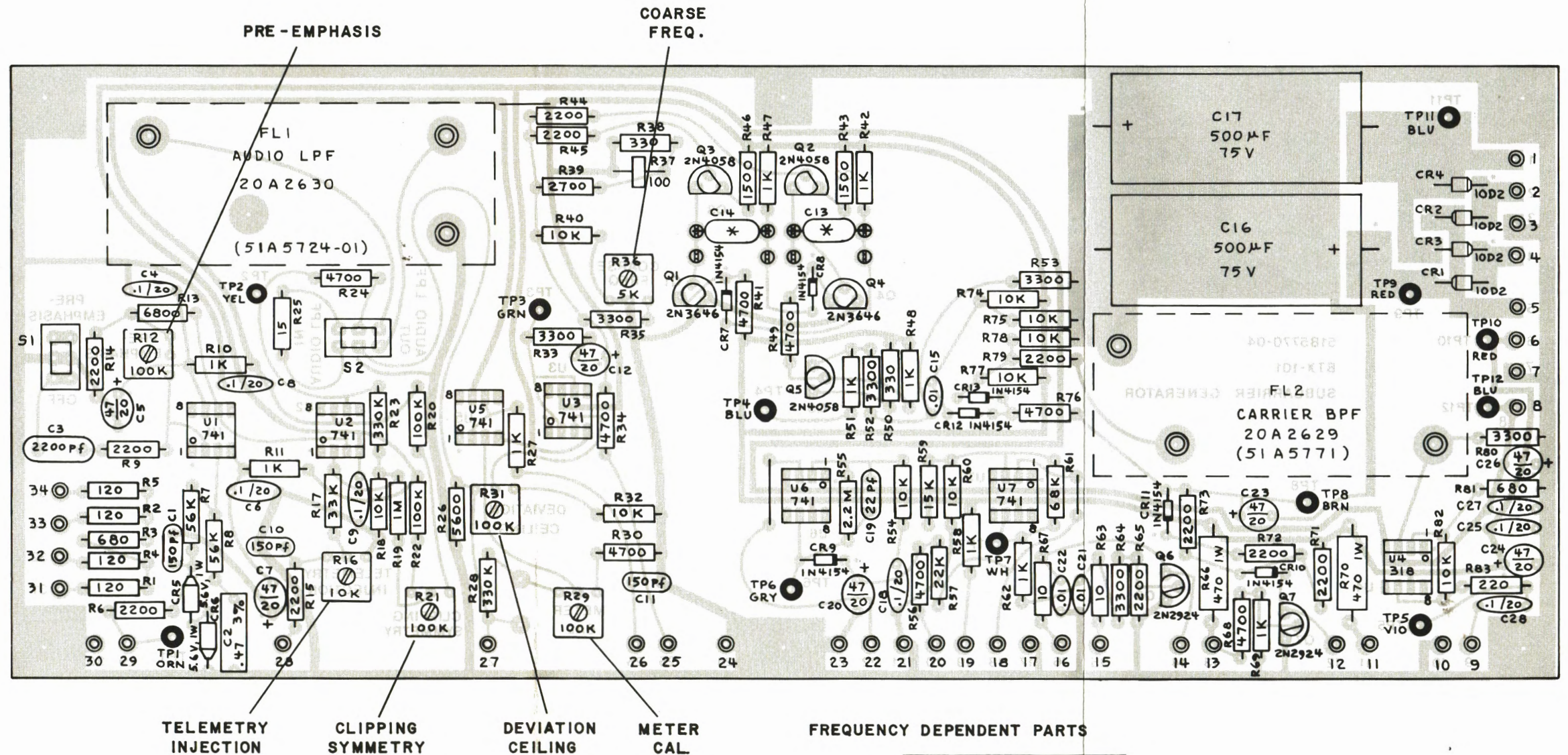


Figure 8. Carrier Band Pass Filter Components Layout



NOTE:
 1. UNLESS OTHERWISE SPECIFIED
 RESISTOR VALUES ARE IN OHMS, 1/2 W, 10%
 CAPACITOR VALUES ARE IN MICROFARADS.

	C13, C14
ITEM 1 (41 KHz)	3300PF PLUS 4300PF
ITEM 2 (67 KHz)	3300PF PLUS 1100PF

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20B2628 REV. B
 3K046

Figure 9. BTX-101 SCA Generator
 Components Layout

RCA Commercial Communications
Systems Division

Commercial Communications Systems Division | Front and Cooper Streets | Camden, N.J., U.S.A. 08102
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