UNCLASSIFIED

TECHNICAL MANUAL

for

SIDEBAND STRIP RECEIVER,

MODELS STR-2B/-2C

THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N.Y. OTTAWA, ONTARIO

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NOTICE

THE TECHNICAL MATERIEL CORPORATION
COMMUNICATIONS ENGINEERS
700 FENIMORE ROAD MAMARONECK, N. Y.

Warranty

The Technical Materiel Corporation, hereinafter referred to as TMC, warrants the equipment (except electron tubes,* fuses, lamps, batteries and articles made of glass or other fragile or other expendable materials) purchased hereunder to be free from defect in materials and workmanship under normal use and service, when used for the purposes for which the same is designed, for a period of one year from the date of delivery F.O.B. factory. TMC further warrants that the equipment will perform in a manner equal to or better than published technical specifications as amended by any additions or corrections thereto accompanying the formal equipment offer.

TMC will replace or repair any such defective items, F.O.B. factory, which may fail within the stated warranty period, PROVIDED:

1. That any claim of defect under this warranty is made within sixty (60) days after discovery thereof and that inspection by TMC, if required, indicates the validity of such claim to TMC's satisfaction.
2. That the defect is not the result of damage incurred in shipment from or to the factory.
3. That the equipment has not been altered in any way either as to design or use whether by replacement parts not supplied or approved by TMC, or otherwise.
4. That any equipment or accessories furnished but not manufactured by TMC, or not of TMC design shall be subject only to such adjustments as TMC may obtain from the supplier thereof.

Electron tubes* furnished by TMC, but manufactured by others, bear only the warranty given by such other manufacturers. Electron tube warranty claims should be made directly to the manufacturer of such tubes.

TMC's obligation under this warranty is limited to the repair or replacement of defective parts with the exceptions noted above.

At TMC's option any defective part or equipment which fails within the warranty period shall be returned to TMC's factory for inspection, properly packed with shipping charges prepaid. No parts or equipment shall be returned to TMC, unless a return authorization is issued by TMC.

No warranties, express or implied, other than those specifically set forth herein shall be applicable to any equipment manufactured or furnished by TMC and the foregoing warranty shall constitute the Buyers sole right and remedy. In no event does TMC assume any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of TMC Products, or any inability to use them either separately or in combination with other equipment or materials or from any other cause.

*Electron tubes also include semi-conductor devices.

PROCEDURE FOR RETURN OF MATERIAL OR EQUIPMENT

Should it be necessary to return equipment or material for repair or replacement, whether within warranty or otherwise, a return authorization must be obtained from TMC prior to shipment. The request for return authorization should include the following information:

1. Model Number of Equipment.
2. Serial Number of Equipment.
3. TMC Part Number.
4. Nature of defect or cause of failure.
5. The contract or purchase order under which equipment was delivered.

PROCEDURE FOR ORDERING REPLACEMENT PARTS

When ordering replacement parts, the following information must be included in the order as applicable:

1. Quantity Required.
2. TMC Part Number.
3. Equipment in which used by TMC or Military Model Number.
4. Brief Description of the Item.
5. The *Crystal Frequency* if the order includes crystals.

PROCEDURE IN THE EVENT OF DAMAGE INCURRED IN SHIPMENT

TMC's Warranty specifically excludes damage incurred in shipment to or from the factory. In the event equipment is received in damaged condition, the carrier should be notified immediately. Claims for such damage should be filed with the carrier involved and not with TMC.

All correspondence pertaining to Warranty Claims, return, repair, or replacement and all material or equipment returned for repair or replacement, within Warranty or otherwise, should be addressed as follows:

THE TECHNICAL MATERIEL CORPORATION
Engineering Services Department
700 Fenimore Road
Mamaroneck, New York

RECORD OF CORRECTIONS MADE

Change No.	Date of Change	Date Entered	Entered By

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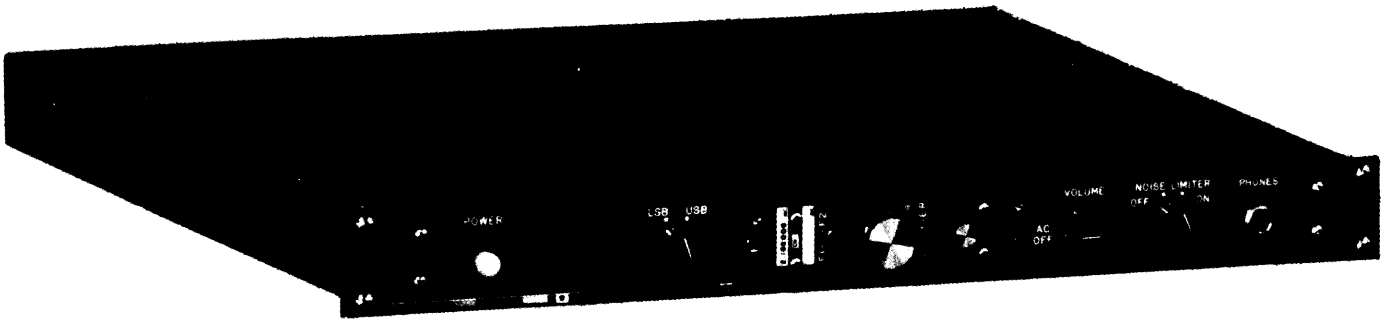

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Figure 1-1. Strip Receiver, Models STR-2B and STR-2C

SECTION 1

GENERAL INFORMATION

1-1. FUNCTIONAL DESCRIPTION.

Strip Receivers, Model STR-2B and STR-2C (figure 1-1) are completely transistorized superheterodyne communications receivers, that operate at a fixed frequency in the 2- to 32-mc (MHz) range for AM and MCW reception.

The STR-2C is similar to the STR-2B except that the STR-2C incorporates a bandpass crystal filter in the antenna input circuit that provides a 7.5 kc (kHz) bandpass at the customer-selected frequency. A change in operating frequency must be accompanied by a corresponding change in filter.

The STR uses one of four fixed-tuned, plug-in modules (Model TTRR) for its r-f section. This r-f module has two selectable, crystal-controlled, local oscillation frequencies; when the antenna-input filter of STR-2C is by passed, these two selectable oscillation frequencies permit reception of either signal frequency (F1 or F2) within the r-f bandpass of the TTRR without re-alignment of the tuned circuits. A RECEIVER CLARIFIER control (located on the front panel) provides fine-tuning of the crystal controlled local oscillator. Other features of the STR include:

a. A sharp cutoff i-f bandpass filter for optimum selectivity.

b. Double conversion for high image ratio.

c. Adjustable squelch circuit that mutes loudspeaker and earphone audio outputs when no signal is being received. This circuit also provides relay contact closure for operating an external alarm.

d. Low power consumption (a-c or d-c), and subsequent low heat dissipation.

e. Self contained power supply.

The STR produces two separate audio outputs; 500 milliwatts for 4-ohm speaker or earphones, and 1 milliwatt for a 600-ohm balanced load. The speaker and earphone level can be varied by means of a front panel VOLUME control. A rear panel LINE LEVEL control varies all of the audio outputs. The speaker is automatically disconnected when the phone jack is used.

1-2. PHYSICAL DESCRIPTION.

a. EXTERNAL. - The STR is designed for mounting in a standard 19-inch wide rack. All operator's controls, with the exception of the LINE LEVEL and SQUELCH controls, and the BATT/AC switch, are located on the front panel. The rear panel contains the LINE LEVEL and SQUELCH controls, the antenna input and i-f output jacks, the a-c power connector, the a-c line fuse, and a terminal strip. The top cover is removable to allow access to the internal components and to the BATT/AC switch.

b. INTERNAL. - Most of the smaller components in the STR are located on printed circuit boards that are mounted to the chassis. Most of the larger components are mounted to the chassis.

1-3. TECHNICAL SPECIFICATIONS.

The technical specifications for the STR are listed below:

Frequency Range:	2 to 32 megacycles (MHz) divided into four bands using the following TTRR modules. BAND 1: 2-4mc (MHz), TTRR-1 BAND 2: 4-8mc (MHz), TTRR-2 BAND 3: 8-16mc (MHz), TTRR-3 BAND 4: 16-32mc (MHz), TTRR-4
Tuning System:	Model TTRR fixed-tuned r-f plug-in module.
Frequency Control:	All oscillators are crystal controlled.
Types of Reception:	AM and MCW.
Sensitivity:	3 uv, modulated 30%, for 10 dB signal + noise to noise ratio.

1-3. TECHNICAL SPECIFICATIONS (Cont).

Intermediate Frequencies:	First i-f, 1.75 mc; Second i-f, 250 kc.
I-F Selectivity:	6 kc.
Image Rejection:	A minimum of 50 dB from 2 to 28 mc, a minimum of 40 dB from 28 to 32 mc.
AGC:	No more than 5 dB increase in output for input variations from 3 microvolts to 100,000 microvolts.
Antenna Input Impedance:	50 ohms (nominal) unbalanced.
RF Bandpass:	Approximately 0.5% of frequency to which the TTRR module is tuned. STR-2C with antenna input filter FL1501 7.5 kc ±10% at 3 dB points.
Outputs:	1. 500 milliwatts audio for 4-ohms speaker or earphones. 2. 1 milliwatt audio for 600-ohm load (telephone line, etc.). 3. 250 kc second i-f signal for operation of associated equipment.
Power Requirements:	24 vdc or 104/115/208/230 vac, single phase, 50/60 cps; 8 watts.
Environmental Conditions:	Operable from 0°C (32°F) to 50°C (122°F) with relative humidity up to 95%.
Dimensions:	19 inches wide x 1 3/4 inches high x 15 inches deep.
Weight:	10 pounds (uncrated).

SECTION 2
INSTALLATION

2-1. INITIAL INSPECTION.

Each STR has been calibrated and tested at the factory before shipment. Upon arrival at the operating site, inspect the packing case and the contents immediately for possible damage. Unpack the equipment carefully. Inspect all packing material for parts which may have been shipped as "loose items". With respect to damage to the equipment for which the carrier is liable, The Technical Materiel Corporation will assist in describing methods of repair and the furnishing of replacement parts.

2-2. POWER REQUIREMENTS.

The STR is designed for either 104, 115, 208 or 230 volt a-c or 24 volt d-c power operation. Normally, the receiver is shipped wired for 115 volt a-c operation. However, if the receiver is to be operated with a-c power other than 115 volts, the wiring of transformer T902 must be modified (refer to figure 2-1). For 104 or 115 volt a-c operation Fuse F907 is .25A; for 208 or 230 volt a-c operation, Fuse F907 is .125A. Make sure that the crystal oven used in the associated TTRR module is compatible with the power source.

2-3. INSTALLATION.

a. MECHANICAL. - The STR should be located so that front-panel controls are accessible to the operator. The solid-state circuitry used in the unit generates only a minimum amount of heat; therefore, several STR receivers may be installed in a rack, one above the other.

Place the STR in the desired location in the rack, and fasten the front panel to the rack with four screws. The rear of the receiver must be suitably supported in order to prevent excessive strain on the front panel. If the STR is located in an area where it is subjected to vibration, the rear of the unit should be rigidly supported to prevent possible damage.

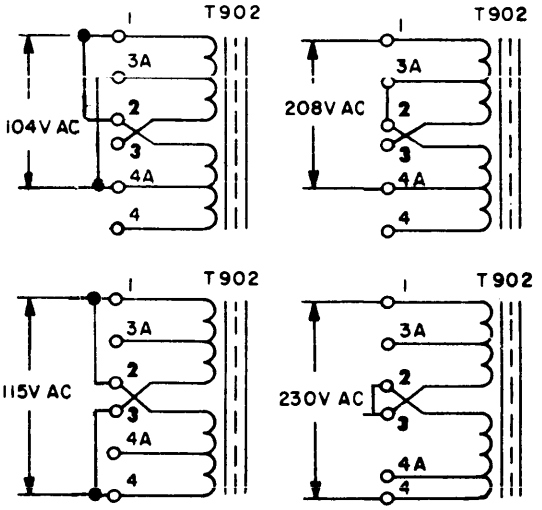

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Figure 2-1. Power Transformer Wiring

b. ELECTRICAL. - Electrical connection to the STR should be accomplished in accordance with operational requirements (Refer to table 2-1 and figure 2-2).

2-4. INITIAL ADJUSTMENTS.

Since the STR is adjusted at the factory, no internal adjustments are required other than the setting of BATT/AC switch S1513 (Refer to figure 5-1 for location of BATT/AC switch).

TABLE 2-1. REAR PANEL CONNECTIONS

Item No. (Fig 2-2)	Panel and Component Designation	Function
1	ANT jack	50-ohm unbalanced antenna input (Input connector, BNC).
2	IF OUT jack	Provides 250 kc receiver i-f output for connection to single-sideband adaptor or other device requiring 250 kc i-f signals for operation.

TABLE 2-1. REAR PANEL CONNECTIONS (CONT)

Item No. (Fig 2-2)	Panel and Component Designation	Function
3	TB1501 terminal board	
	Terminals 1 and 2	Spare
	Terminals 3, 4 and 5	600-ohm balanced audio output. Terminals 3 and 5, 600-ohm balanced output. Terminal 4, 600-ohm center tap.
	NOTE *When STR is used with a speaker, a 560-ohm 1/4 watt resistor should be connected across terminals 3 and 5 of TB1501.*	
	Terminals 6, 7 and 8	External squelch alarm indicator. In squelch conditions Terminals 6 and 7 normally closed, terminals 7 and 8 normally open.
	Terminals 9 and 10	4-ohm audio output for speaker or phones.
	Terminals 11 and 12	24 vdc BATT input for STR circuits Terminal 11 plus terminal 12 minus.
4	AC INPUT receptical	A-C input STR power supply circuits.
	NOTE *BATT/AC switch S 1513 (see Figure 5-1) must be set to the appropriate position depending upon the type of power employed.*	
5	F907	A-C line fuse, protects STR power supply in the event of overload.

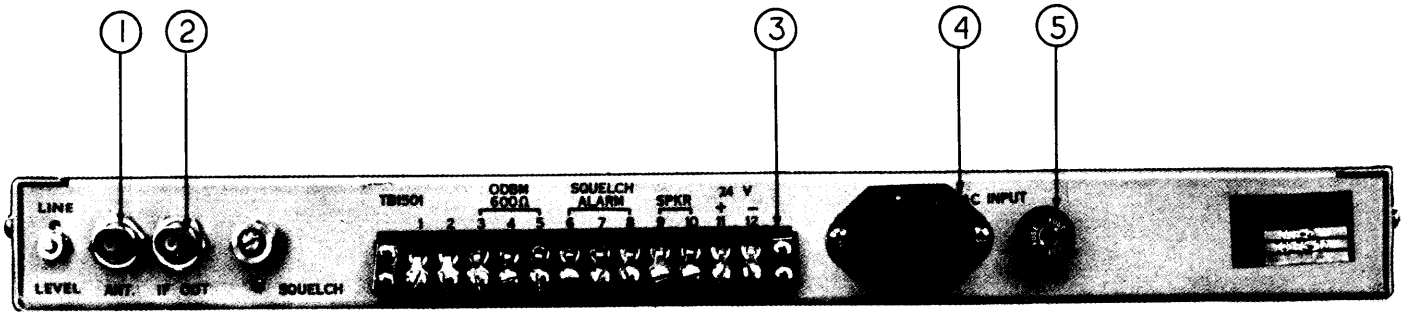

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Figure 2-2. Rear View, STR

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SECTION 3

OPERATOR'S SECTION

3-1. CONTROLS AND INDICATORS.

The operating controls and indicators for the STR are listed in table 3-1 and are illustrated in figure 3-1.

3-2. OPERATING PROCEDURE

Proceed as follows:

(1) Ensure that correct TTRR module is employed for the frequency to be received, and that the STR-2C has the correct FL1501 installed.

(2) Set F1/F2 switch (3) at proper position for desired frequency.

NOTE

For STR-2C operation on a frequency other than the one displayed on FL1501, the filter must be replaced or bypassed.

(3) Rotate VOLUME control (5) clockwise, POWER lamp (1) should light. Adjust VOLUME control for comfortable listening level.

(4) Adjust RECEIVER CLARIFIER control (4) to minimize distortion of received signal.

NOTE

Improved image rejection may be obtained by changing the setting of LSB/USB switch.

(5) If noise-limiting action is desired, set NOISE LIMITER switch (6) at ON.

(6) For receiver squelching, proceed as follows: with no signal being received, rotate SQUELCH control fully clockwise. Then, rotate SQUELCH control counterclockwise until noise abruptly disappears. Do not rotate control beyond point at which noise disappears.

(7) Adjust 600-ohm audio output as follows: at rear panel, connect bridging-type VU meter across terminals 3 and 5 of TB1501 (0 dBM/600). Adjust LINE LEVEL control for desired level (normally "0" dB).

TABLE 3-1. CONTROLS AND INDICATORS

REFERENCE DESIGNATION (Figure 3-1)	PANEL DESIGNATION	FUNCTION
1	POWER indicator lamp DS1501	A white indicator that lights when the VOLUME control is turned clockwise from AC OFF. (Operative when using a-c power only.)
2	LSB/USB switch S1503	A two-position rotary switch that selects one of two intermediate frequency oscillators.

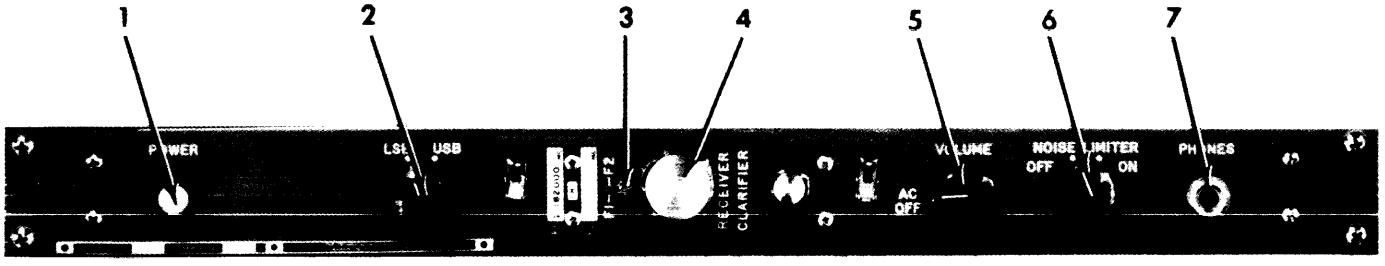


Figure 3-1. Front Panel, STR

TABLE 3-1. CONTROLS AND INDICATORS (CONT)

REFERENCE DESIGNATION (Figure 3-1)	PANEL DESIGNATION	FUNCTION
3	F1/F2 switch (S101 in TTRR-1 S201 in TTRR-2 S301 in TTRR-3 S401 in TTRR-4)	A two-position screwdriver-controlled switch that selects appropriate local oscillator frequency for reception on either F1 frequency or F2 frequency.
4	RECEIVER CLARIFIER control (C121 in TTRR-1 C221 in TTRR-2 C321 in TTRR-3 C421 in TTRR-4)	A trimmer capacitor that permits fine tuning of the local oscillator in the TTRR module for optimum clarity of the audio output.
5	VOLUME control with AC OFF switch (S1512, R1546)	A SPST switch ganged to a potentiometer. The switch is the power on-off switch when using a-c power. The potentiometer controls the level of the audio output to the phones and speaker.
6	NOISE LIMITER, OFF/ON switch S1520	A 2-position rotary switch. When in ON position introduces noise limiting action to STR.
7	PHONES jack J1516	A standard phone jack for earphone connection. The speaker is automatically disconnected when a headset is plugged in. The line output is not affected.
	SQUELCH control R1547 (at the rear of receiver, refer to figure 2-2).	A potentiometer whose setting determines the point to which rf input level must drop before the receiver is squelched. When the receiver is squelched the speaker and phone audio outputs are disconnected. *NOTE* *The 600-ohm balanced line is not effected by settings of the SQUELCH control.*
	LINE LEVEL control R1556 (at rear of receiver, refer to figure 2-2).	A rheostat that controls all audio output levels.
	BATT/AC switch (Inside receiver, refer to figure 5-1).	When set at AC position, connects STR circuits to the regulated output of STR's a-c power supply. When set at BATT position, connects STR circuits to terminals 11 and 12 of TB1501.

3-3. STOPPING PROCEDURE.

Rotate AC OFF/VOLUME control fully counter-clockwise until switch clicks off; POWER lamp should go off.

3-4. CHANGING TTRR MODULES.

NOTE

TTRR module changes must be accompanied by FL1501 changes.

(1) De-energize receiver.

(2) Slide catches on TTRR module downward to release module.

(3) Pull module out of receiver. A knob is provided in the center of the module for this purpose.

(4) Insert new module with its nameplate facing LSB/USB switch.

(5) Slide catches located on each end of module upward to lock module in place.

3-5. OPERATOR'S MAINTENANCE.

Operator's maintenance consists of replacing lamps or fuses, and checking that all controls are functioning properly. If abnormal performance is noted, report the nature of malfunction to technical personnel.

WARNING

Never replace a fuse with one of higher current rating. If a fuse burns out immediately after having been installed, do not replace it a second time unless the cause of trouble has been corrected.

SECTION 4

PRINCIPLES OF OPERATION

4-1. BLOCK DIAGRAM ANALYSIS.

Refer to figure 4-1. The STR is a fixed tuned, single channel, AM communications receiver that operates in the 2 to 32 mc (MHz) frequency range. STR comprises two major sections, a plug-in receiver converter (TTRR), and i-f and audio stages (Main chassis).

Within the STR, incoming signals are extended via antenna bandpass filter FL 1501 to the TTRR module where they are amplified and mixed with the output of a local oscillator to produce the 1.75 mc (MHz) i-f output of the TTRR module.

The 1.75 mc (MHz) output from the TTRR module is amplified and applied to a mixer stage where it is beat with the output of either an LSB or USB crystal oscillator to produce a 250-kc (kHz) i-f signal.

The 250-kc (kHz) output of the mixer is applied simultaneously via i-f bandpass filter FL1801 to the AGC circuits and to a two-stage emitter follower amplifier and is applied via envelope detector and noise Limiter circuits to an audio amplifier stage.

The output of the audio amplifier stage is applied simultaneously via LINE LEVEL control to the line amplifier and to the volume control. The line amplifier output is then applied directly to the 600-ohm balanced output of the STR. The audio applied to the volume control is extended via three audio amplifier stages and contacts of the squelch relay to PHONES jack and speaker terminals.

4-2. CIRCUIT ANALYSIS.

a. TTRR PLUG-IN MODULE. - Refer to Technical Manual for TTRR. The r-f signals received by the antenna are extended to the TTRR module through ANT jack J1502 and r-f bandpass filter FL1501. The TTRR module and r-f bandpass filter are fixed-tuned to a preselected frequency. Therefore any change in frequency must be accompanied by a change in r-f filter and either re-alignment or replacement of the TTRR module.

The TTRR module contains three tuned r-f amplifiers and a mixer stage. In the mixer stage the r-f signal is mixed with a local oscillator to produce the 1.75 mc (MHz) i-f output of the TTRR module.

b. I-F AND MIXER STAGE. - The 1.75 mc (MHz) output of the TTRR module (The first of two i-f frequencies used in STR) is applied via two i-f amplifier stages to the base of mixer Q1802. Within Q1802 the 1.75 mc (MHz) signal is mixed with the output of either the LSB (1.5 mc) or the USB (2.00 mc) crystal oscillator, to produce a 250-kc (kHz) second i-f.

LSB oscillator Q1806 and USB oscillator Q1807 are crystal-controlled oscillators that are selectable by a front-panel LSB/USB switch. The LSB oscillator is tuned to exactly 1.5 mc by C1832 and the USB oscillator is tuned to exactly 2.0 mc by C1834. The output of each oscillator is taken from its base. Only one oscillator is activated at a time depending upon the position of LSB/USB switch S1503. In the LSB position, +12 v is applied across LSB ADJ R1554 The positive voltage controlled by variable resistor R1554 forward biases Q1806 and controls the output level of the LSB oscillator. The USB oscillator transistor is not forward biased and therefore is cut off. The magnitude of the voltage determines the magnitude of the oscillator output; maximum output occurs when the oscillator is biased at its maximum gain point. When the LSB/USB switch is set at USB; Q1807 is forward biased by the setting of variable resistor R1555 and performs the same function as R1554 for the USB oscillator.

The output of the selected oscillator is capacitively coupled to the emitter of mixer Q1802 through buffer amplifier Q1808, which minimizes the loading of the oscillator so that its frequency and its output magnitude are stable.

The 250 kc (kHz) output of mixer Q1802, the second i-f, is supplied to crystal-bandpass filter FL1801. This is a highly selective filter with a bandpass of 6 kc. The output of the filter is supplied to two stages: emitter follower Q1803; and 250-kc (kHz) amplifier Q1809 in the AGC circuit.

c. DETECTOR AND NOISE LIMITER CIRCUITS. The 250 kc (kHz) i-f signal from the emitter of Q1803 is simultaneously applied to the IF OUT jack J1535 and to i-f amplifier Q1804.

The amplified output at the collector of Q1804 is extended through an envelope detector, a low pass filter, to a noise limiter circuit that is capacitively coupled to the base of emitter follower amplifier Q1805. The low pass filter comprising C1820, L1809 and C1848 provides a low impedance path to ground for the

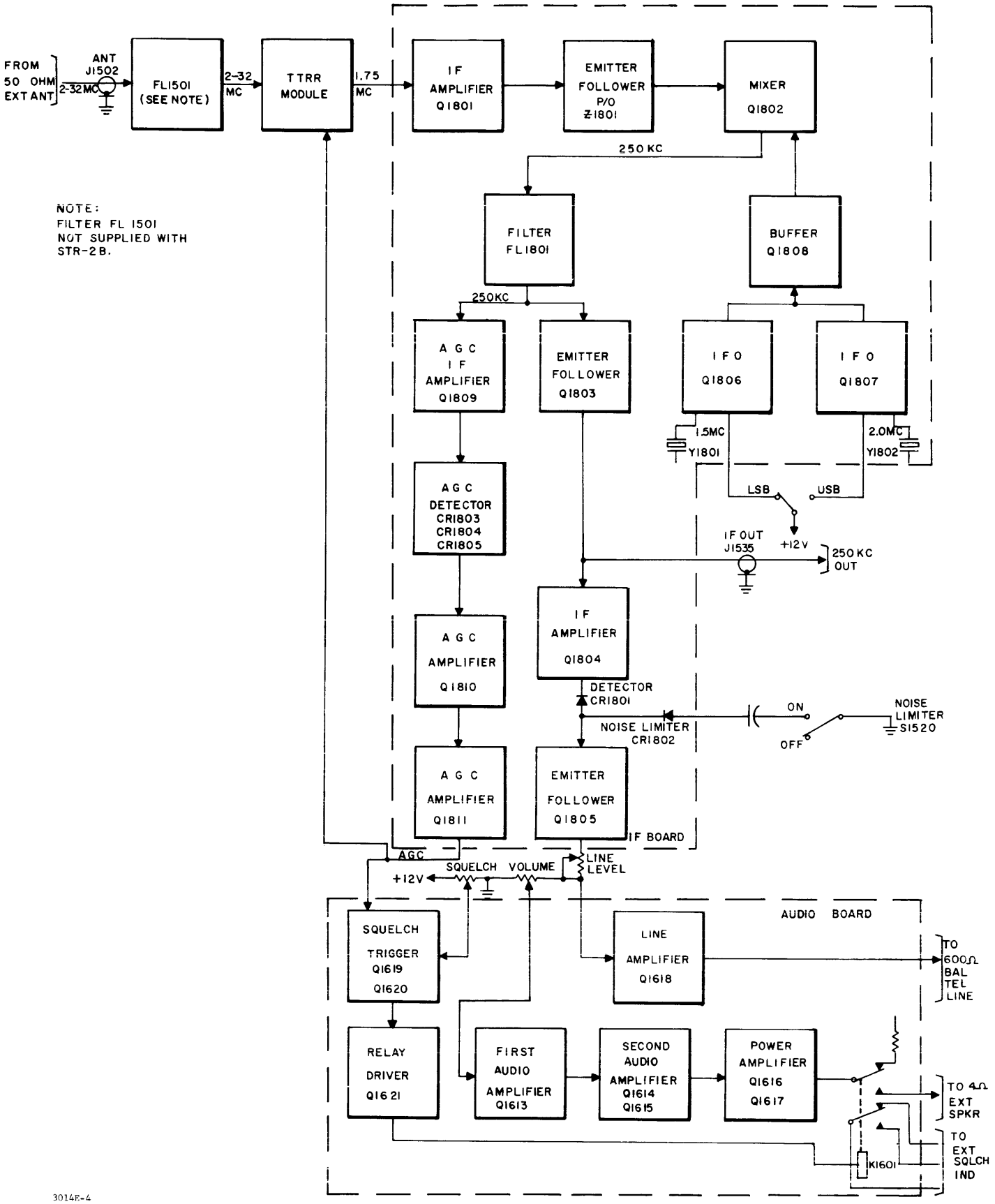


Figure 4-1. Functional Block Diagram, STR-2B and STR-2C

250 kc (kHz) i-f but has little or no effect to the audio intelligence. The noise limiter circuit comprising C1821 and CR1802 provides a low-impedance path to ground for negative transients when NOISE LIMITER switch S1520 is set at ON.

d. AUDIO AMPLIFIERS. - The audio output at the emitter of Q1805 is extended through LINE LEVEL control R1556 and is applied to VOLUME control R1546.

The signal developed across VOLUME control R1546 is supplied via line amplifier Q1618 to the balanced 600-ohm output of the STR.

The signal from the arm of R1546 is amplified by first audio amplifier (phase inverter) and is applied to the push-pull second amplifier stage comprising Q1614 and Q1615. The output at the collectors of Q1614 and Q1615 is transformer coupled to audio power amplifiers Q1616 and Q1617. The output of amplifiers Q1616 and Q1617 is applied to transformer T1605 to produce the 4-ohm audio output which is extended to PHONES jack and rear-panel speaker terminals via contacts of squelch relay K1601.

The PHONES jack is wired to disconnect the speaker when head phones are used.

e. AGC AND SQUELCH CIRCUITS. - The i-f output at FL1801 is transformer coupled to the base of first agc-amplifier Q1809. The output at the collector of Q1809 is applied to the agc detector (CR1803 and CR1804) which produces a delayed agc voltage that is supplied through first and second agc amplifiers Q1810 and Q1811 to the TTRR module and to the squelch circuit.

Bistable amplifier Q1619 and Q1620 controls relay driver Q1621 which in turn controls squelch relay K1601. When a signal is being received by the STR, the bistable amplifier is held in its unsquelched state (Q1619 is on, Q1620 is off) by the agc voltage, and relay driver Q1621 is on. When the signal level decreases, the agc drops to a level selected by SQUELCH control R1547, the bistable amplifier changes to its squelched state relay driver Q1621 is on, K1601 is energized, and the audio power-amplifier output is connected to the PHONE jack and to the speaker. When the relay driver is off, K1601 is de-energized, the output of the audio power-amplifier is disconnected from the speaker and PHONE jack, and dummy load R1660 is connected instead. Thus, the receiver output is muted when a received signal is not present. The other set of contacts of K1601 can be used to provide squelched indications for external alarm circuitry.

f. POWER SUPPLY. - The power supply produces regulated +12 vdc and -12 vdc outputs for the operation of STR. It also produces an unregulated 115-vac output for the operation of an optional crystal oven in the TTRR module. The power supply is energized by switch S1512, which is ganged to VOLUME control R1546. During d-c input operation, the power supply is disconnected by BATT/AC switch, S1513.

SECTION 5

MAINTENANCE

5-1. PREVENTIVE MAINTENANCE.

a. The STR has been designed to provide long-term, trouble-free operation under continuous duty conditions. However, in order to prevent failure of the equipment due to corrosion, dust, or other destructive elements, it is suggested that a schedule of preventive maintenance be set up and adhered to.

b. At periodic intervals, the equipment should be removed from its mounting for cleaning and inspection. All accessible covers should be removed and the wiring and all components inspected for dirt, corrosion, charring, discoloring or grease. Remove dust with a soft brush or vacuum cleaner. Remove dirt or grease on other parts with any suitable cleaning solvent. Use of carbon tetrachloride should be avoided due to its highly toxic effects. Trichlorethylene or methyl chloroform may be used, providing the necessary precautions are observed.

NOTE

When using toxic solvents, make certain that adequate ventilation exists. Avoid prolonged or repeated breathing of vapor. Avoid prolonged or repeated contact with skin. Flammable solvents shall not be used on energized equipment or near any equipment from which a spark may be received. Smoking, "hot work", etc. is prohibited in the immediate area.

CAUTION

When using trichlorethylene, avoid contact with painted surfaces due to its paint removing effects.

5-2. TROUBLESHOOTING.

a. GENERAL. - Since STR is a multi-circuit board unit, troubleshooting consists of localizing the malfunction to a specific area. Table 5-2 troubleshooting chart should be used as a guide in locating and repairing troubles that might occur in STR. Once the trouble or malfunction has been localized to a particular circuit, refer to the detailed circuit analysis given in section 4 and the schematic diagram contained in section 7.

b. TEST EQUIPMENT. - Table 5-1 lists test equipment (or equivalent) required to troubleshoot and align STR.

TABLE 5-1 TEST EQUIPMENT FOR TEST AND ALIGNMENT

QTY	ITEM	MANUFACTURER MODEL OR TYPE
1	Frequency Counter	Hewlett Packard Model 524C or equivalent
1	Oscilloscope	Tektronix Model 581 or equivalent
1	AC VTVM	Ballantine Model 314 A or equivalent
1	Signal Generator	Hewlett Packard Model 606 or equivalent
1	VTVM	Hewlett Packard Model 410B or equivalent
1	Audio Signal Generator	Hewlett Packard Model HP200 or equivalent
1	Extension Module	Technical Materiel Corp. Model AX436 or equivalent
1	600-ohm 1/2 watt Resistor	
1	4-ohm Speaker	
1	Head Phones	

TABLE 5-2 TROUBLESHOOTING CHART

STEP	OPERATION	NORMAL INDICATION	PROBABLE CAUSE OF ABNORMAL INDICATION
1	Remove all rear panel connections and connect a 600-ohm 1/2 watt resistor across terminals 3 and 5 of TB1501, also connect a 4-ohm speaker across terminals 9 and 10 of TB1501. Set VOLUME control to mid-position (A-c power on).	a. POWER lamp should light	a. Open filament, or defective fuse F907
		b. +12 vdc should be present at terminal 7 of the i-f board and terminal 11 at the audio board.	b. Defective Q900, CR910 or CR911 stage.
		c. -12 vdc should be present at terminal 8 of the i-f board and terminal 14 of the audio board.	c. Defective Q901, CR913 or CR914 stage.
2	Parallel connect on a-c VTVM and audio signal generator to terminals 10 and 13 (13 ground) of the receiver i-f board. Adjust generator output to 1 kc (kHz).		
	a. Slowly increase the output of the audio Generator.	a. 1-kc audio tone is heard in speaker.	a. Defective Q1613. R1556, R1546, Q1614, Q1615, Q1616, Q1617 or K1601 stage.
	b. Insert phones plug in PHONES jack.	b. 1-kc tone should be heard only in phones.	b. Defective J1516 stage.
	c. Rotate SQUELCH control maximum counter clockwise.	c. 1-kc tone should stop abruptly.	c. Defective Q1809, Q1810, Q1811, R1547, Q1619, Q1620 or Q1621 stage.
	d. Increase audio generator output to 10 mv and remove AC VTVM.	d. 780 mv indication on AC VTVM at terminal 3 and 5 of TB1501.	d. Defective Q1618 stage.
3	a. Connect RF signal generator, set at TTRR's operating frequency, to ANT jack J1501. Adjust generator output to 100 uv.	a. Scope should indicate 500 milivolts peak-to-peak at terminals 3 and 4 (4 ground) of J1501.	a. Defective TTRR module. Refer to TTRR Technical Manual.
	b. Module signal generator output 80% with 1-kc.	b. 1-kc note should be heard in speaker.	b. Defective Q1801, Z1801, Q1802, Q1803, Q1804 or Q1805 stage.
	c. Set NOISE LIMITER switch at off and hit Q1803 with a non-metalic object.	c. Scope connected to terminals 3 & 5 will display a sine wave with noise transients.	
	d. Set NOISE LIMITER switch at on and repeat step c.	d. Scope should indicate no change in amplitude of received signal, but transient noise should be reduced.	d. Defective CR1802 or C1821 stage.

5-3. REPAIR OF PRINTED CIRCUITS.

a. GENERAL. - Although the troubleshooting procedures for printed circuits are similar to those for conventional circuits, the repair of printed circuits requires considerably more skill and patience. The printed circuits are small and compact; therefore, personnel should become familiar with the special servicing techniques required.

The defective part should be pinpointed by a study of the symptoms and by careful and patient analysis of the circuit before attempting to trace trouble on a printed circuit board. Ascertain whether the conducting strips are coated with a protective lacquer, epoxy resin, or similar substance. If so, carefully scrape it away.

Breaks in the conducting strip (foil) can cause permanent or intermittent trouble. In many instances, these breaks will be so small that they cannot be detected by the naked eye. These almost invisible cracks (breaks) can be located only with the aid of a powerful hand- or stand- held magnifying glass.

b. MULTIMETER CHECKOUT. - The most common cause of an intermittent condition is poorly soldered connections. Other causes are: broken boards, broken conducting strips, fused conducting strips, arcover, loose terminals, etc.

To check out and locate trouble in the conducting strips of a printed-circuit board, set up a multimeter (one which does not use a current in excess of 1 ma) for making point-to-point resistance tests, using needle-point probes. Insert one point into the conducting strip close to the end of the terminal, and place the other probe on the terminal or opposite end of the conducting strip. The multimeter should indicate continuity. If the multimeter indicates an open circuit, drag the probe along the strip (or if the conducting strip is coated, puncture the coating at intervals) until the multimeter indicates continuity. Mark this area, then use a magnifying glass to locate the fault in the conductor.

CAUTION

Before using an ohmmeter for testing a circuit containing transistors or other voltage-sensitive semiconductors, check the current it passes under test on all ranges. DO NOT use a range that exceeds 1 ma.

c. HOW TO REPAIR THE BREAK. - If the break in the conducting strip is small, lightly scrape away any coating covering the area of the conducting strip to be repaired. Clean the area with a firm-bristle brush and approved solvent. Then repair the cracked or broken area of the conducting strip by flowing solder over the break. Considerable care must be exercised to keep the solder from flowing onto an adjacent strip.

If a strip is burned out or fused, cut and remove the damaged strip. Connect a length of insulated wire across the break or from solder-point to solder-point.

After the repairs are completed, clean the repaired area with a stiff brush and solvent. Allow the board to dry thoroughly, and then coat the repaired area with an epoxy resin or similar compound. This coating not only will protect the repaired area, but will help to strengthen it.

CAUTION

After repairs, always scrutinize the board for solder droppings that may cause possible shorts.

Frequently, a low-resistance leakage path will be created by moisture and/or dirt that has carbonized onto the phenolic board. This leakage can be detected by measuring the suspected circuit with a multimeter. To overcome this condition, thoroughly clean the carbonized area with solvent and stiff brush. If this does not remove it, use a scraping tool (spade end of a solder-aid tool or its equivalent) to remove the carbon, or drill a hole through the leakage path to break the continuity of the leakage. When the drilling method is used, be careful not to drill into a part mounted on the other side of the board.

5-4. ALIGNMENT

a. GENERAL. - Alignment given in this paragraph are continuous and must be performed in the order given. The circuit boards and components of STR are accessible by removing the top cover of the unit. Refer to figure 5-1 for location of printed circuit cards and STR components.

CAUTION

When performing any procedures given in the following paragraphs, do not remove or insert TTRR modules when power is on.

b. TEST EQUIPMENT REQUIRED. - Table 5-1 lists test equipment required to align the STR.

c. TTRR MODULE ALIGNMENT. - TTRR module alignment procedures are contained in the Technical Manual for TTRR and are therefore not given in this manual.

d. RECEIVER IF BOARD ALIGNMENT. - To align the i-f board proceed as follows:

(1) Disconnect all wiring connected to TB1501 and remove the TTRR module.

(2) Make the following connections at TB1501:

TERMINAL NO.	CONNECTION
9 and 10	4-ohm speaker
3 and 5	600-ohm 1/2 watt resistor

(3) Set STR's Controls as follows:

CONTROL	SETTING
LSB/USB	LSB
R1554	Clockwise
R1555	Clockwise
VOLUME	Mid-position (a-c power on)
LINE LEVEL	Clockwise
SQUELCH	Clockwise
NOISE LIMITER	OFF

NOTE

Because the controls are preset in the same way before each alignment, individual procedures can be performed without referring to any others for previous control settings. Deviations from the preliminary settings are given in each procedure.

(4) Connect frequency counter to the emitter lead of Q1802 and adjust C1832 for a frequency indication of 1.5 mc (MHz) ±2 cps (Hz).

(5) Repeat step (4) with LSB/USB switch set at USB and adjust C1834 for a frequency of 2.0 mc (MHz) ±2 cps (Hz). Remove frequency counter.

(6) Set the LSB/USB switch at LSB and disable the LSB oscillator by removing crystal Y1801.

(7) Connect a-c VTVM between the base of Q1802 and ground.

(8) Connect signal generator, set at 1.75 mc (MHz) ±50 cps (Hz) as indicated on the frequency counter, to terminals 1 and 2 (terminal 2 ground).

(9) Set signal generator level to 1-mv, (VTVM meter should deflect) adjust C1802 and C1804 for maximum indication on VTVM (Reduce signal generator output as required). Remove all test equipment and replace crystal Y1801.

e. OVERALL RECEIVER ALIGNMENT. - Before overall receiver alignment can be accomplished, Receiver i-f alignment contained in step d must be accomplished.

To complete STR alignment proceed as follows:

(1) Make the connections to TB1501 as indicated in step d (2) and insert TTRR module in STR using AX-436 extention module.

(2) Connect a-c VTVM to terminals 3 and 5 of TB1501.

(3) Connect signal generator, set to the operating frequency of the TTRR module (±50 cps) as indicated on frequency counter, to the ANT jack J1502.

(4) Modulate signal generator output 80% at 1-kc (KHz) and adjust signal generator output level until the 1-kc (KHz) note just exceeds the noise.

(5) Adjust tuning capacitors A through E of TTRR in that order for peak indication on VTVM. Signal generator output should be reduced as required to maintain signal level just above the noise.

(6) With LSB/USB switch set at LSB, adjust R1554 fully counterclockwise then clockwise until a peak is indicated on VTVM (approximately 10 mv) that back off slightly.

(7) Repeat step 6 with LSB/USB switch in the USB position and adjust R1555. The settings of R1554 and R1555 should be balanced as closely as possible.

Remove all test equipment and re-connect all external wiring to TB1501.

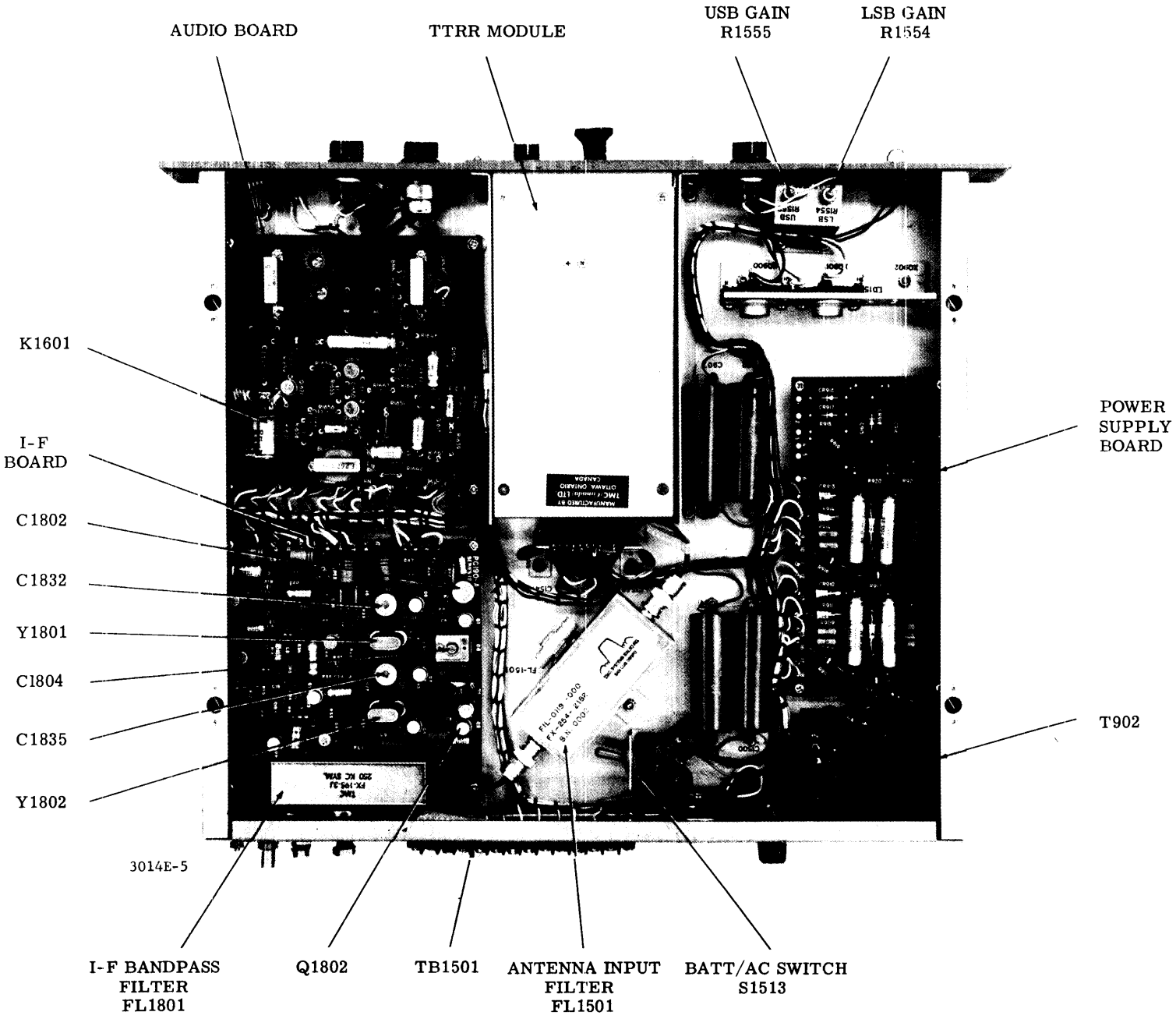


Figure 5-1. Major Component Locations, STR

SECTION 6
PARTS LIST

6-1. INTRODUCTION

The parts list presented in this section is a cross-reference list of parts identified by a reference designation and TMC part number. In most cases, parts appearing on schematic diagrams are assigned reference designations in accordance with MIL-STD-16. Whatever practicable, the reference designation is marked on the equipment, close to the part it identifies. In most cases, mechanical and electro-mechanical parts have TMC part numbers stamped on them.

To expedite delivery when ordering any part, specify the following:

a. Generic name.

b. Reference designation.

c. TMC part number.

d. Model and serial numbers of the equipment containing the part being replaced; this can be obtained from the equipment nameplate.

For replacement parts not covered by warranty (refer to warranty sheet in front of manual), address all purchase orders to:

The Technical Materiel Corporation
Attention: Sales Department
700 Fenimore Road
Mamaroneck, New York

PARTS LIST
FOR
POWER SUPPLY, MAIN CHASSIS

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C900 thru C906	NOT USED	
C907	CAPACITOR, FIXED, ELECTROLYTIC: 2,000 uf, 25 WVDC; polarized; hermetically sealed.	CE116-5VN
C908	CAPACITOR, FIXED, ELECTROLYTIC: 100 uf, -10%+150% at 120 cps at 25°; 25 WVDC; polarized.	CE105-100-25
C909	Same as C908.	
C910	Same as C907.	
C911	Same as C907.	
C912	Same as C908.	
C913	Same as C908.	
CR900 thru CR909	NOT USED	
CR910	SEMICONDUCTOR DEVICE, DIODE.	1N547
CR911	Same as CR910.	
CR912	SEMICONDUCTOR DEVICE, DIODE.	1N3022B
CR913	Same as CR910.	
CR914	Same as CR910.	
CR915	Same as CR912.	
F900 thru F906	NOT USED	
F907	FUSE, CARTRIDGE: 1/4 amp; time lag; 1-1/4" lg. x 1/4" dia.; slow blow. (For 115 VAC operation)	FU102-.250
F907	FUSE, CARTRIDGE: 1/8 amp; time lag; 1-1/4" lg. x 1/4" dia.; slow blow. (For 208/230 VAC operation)	FU102-.125

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
J900 thru J903	NOT USED	
J904	CONNECTOR, RECEPTACLE, ELECTRICAL: male; polarized; rated for 10 amps, 250 V or 5 amps, 125 V; midget size, twist lock.	JJ299
L900	NOT USED	
L901	NOT USED	
L902	COIL, RADIO FREQUENCY: fixed; 3 PI; 1 mh inductance; 23 ohms, ±10% resistance; current rating 75-100 ma max.	CL101-2
L903	Same as L902.	
Q900	TRANSISTOR: germanium. 2N350A	
Q901	Same as Q900.	
R900 thru R908	NOT USED	
R909	RESISTOR, FIXED, WIREWOUND: 10 ohms, ±5%; 3 watts.	RW123-100J
R910	Same as R909.	
R911	RESISTOR, FIXED, COMPOSITION: 100 ohms, ±10%; 1 watt.	RC32GF101K
R912	Same as R911.	
R913	NOT USED	
R914	Same as R909.	
R915	Same as R909.	
R916	Same as R911.	
R917	Same as R911.	
T900	NOT USED	
T901	NOT USED	

PARTS LIST (CON'T)
POWER SUPPLY, MAIN CHASSIS

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
T902	TRANSFORMER, POWER, STEP-DOWN: primary input (#1) 104/115 or 208/230 VAC; secondary (#1, #2) 24 volts at 300 ma, (#3) 80 volts at 100 ma, CT; 15 solder lug type terminals; open frame case.	TF298
XF900 thru XF906	NOT USED	
XF907	FUSEHOLDER: extractor post type, moveable end terminals.	FH100-1
XQ900	SOCKET, SEMICONDUCTOR DEVICE: 2 pin contact, polarized.	TS166-S1
XQ901	Same as XQ900.	

PARTS LIST
FOR
MAIN CHASSIS

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C1500	CAPACITOR, FIXED, ELECTROLYTIC: 2,000 uf, 25 WVDC; polarized, hermetically sealed.	CE116-5VN
C1501, C1545	NOT USED	
C1546	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 10,000 uuf, GMV; 500 WVDC.	CC100-16
C1547, C1548	Same as C1546.	
CP1500	NOT USED	
CP1501	ADAPTER, CONNECTOR, ELECTRICAL: BNC. (Used when Filter, FL1501 is not used)	UG914*/U
DS1500	NOT USED	
DS1501	LAMP, INCANDESCENT: single contact, rated for 28.0 VAC/VDC, 0.04 amps; T-3-1/4 bulb.	BI110-7
FL1500	NOT USED	
*FL1501	FILTER, BANDPASS, ANTENNA: min. bandpass at 3 db points, 7 Kc, max. bandpass at 60 db points, 17.5 Kc.	FX254-XXX
J1500, J1501	NOT USED	
J1502	CONNECTOR, RECEPTACLE, ELECTRICAL: 1 round female contact, straight type; series BNC to BNC. Part of W1502.	JJ172
J1503, J1510	NOT USED	
J1511	CONNECTOR, RECEPTACLE, ELECTRICAL: printed circuit board type; 20 female contacts, 5 amps continuous current rating; 600 V RMS.	JJ287-20
J1512, J1515	NOT USED	
J1516	JACK: phone.	JJ315-1
J1517, J1534	NOT USED	

*Frequency of FL1501 determined by operating frequency.

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
J1535	Same as J1502.	
P1500	NOT USED	
P1501	CONNECTOR, PLUG, ELECTRICAL: BNC; 1 male contact rated at 500 V; bayonet polarization; twist lock type. P/O W1501	PL224-1
P1502	Same as P1501. P/O W1502	
R1500 thru R1518	NOT USED	
R1519	RESISTOR, FIXED, COMPOSITION: 1,000 ohms, ±5%; 1/2 watt.	RC20GF102J
R1520 thru R1533	NOT USED	
R1534	RESISTOR, FIXED, COMPOSITION: 4,700 ohms, ±5%; 1/2 watt.	RC20GF472J
R1535 thru R1544	NOT USED	
R1545	RESISTOR, FIXED, COMPOSITION: 3.3 ohms, ±5%; 1 watt.	RC32GF3R3J
R1546	RESISTOR, VARIABLE, COMPOSITION: 5,000 ohms, ±20%; 2 watts; taper A; consists of a SPST normally open switch, symbol no. S1512.	RV4NBYSA502-BYY
R1547	RESISTOR, VARIABLE, COMPOSITION: 5,000 ohms, ±20%; 2 watts; taper A.	RV4LAYSA502B
R1548 thru R1553	NOT USED	
R1554	RESISTOR, VARIABLE, COMPOSITION: 50,000 ohms, ±10%; continuous power rating 0.5 watt at 70°C; 350 V RMS; linear taper.	RV106UX8B501A
R1555	Same as R1554.	
R1556	RESISTOR, VARIABLE, COMPOSITION: 50,000 ohms, ±10%; miniature type.	RV106UX8B503A

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
S1500 thru S1502	NOT USED	
S1503	SWITCH, ROTARY: tap; 1 deck, 2 non-shorting type contacts; AC current type; max. voltage 115 V; max. current switching capacity 1 amp resistive; 10 amps continuous current rating; solder lug type terminals.	SW336-1
S1504 thru S1511	NOT USED	
S1512	See R1546.	
S1513	SWITCH, TOGGLE: DPDT. ST22N	
S1514 thru S1519	NOT USED	
S1520	Same as S1503.	
TB1500	NOT USED	
TB1501	TERMINAL BOARD, BARRIER: 12 terminals; 6-32 thd. x 1/4" long binder head screws; phenolic black bakelite.	TM100-12
W1500	NOT USED	
W1501	CABLE, ASSEMBLY, ELECTRICAL: RF; consists of 6" of black coaxial cable RG174/U, 1 connector symbol P1501.	CA480-96-6
W1502	CABLE, ASSEMBLY, ELECTRICAL: RF; consists of 12" of black coaxial cable RG174/U and two connectors, symbols J1501, P1502.	CA480-15-12
XDS1500	NOT USED	
XDS1501	LIGHT, INDICATOR: with white translucent lens.	TS153-5

PARTS LIST
FOR
RECEIVER AUDIO FREQUENCY

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C1600 thru C1638	NOT USED	
C1639	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 10,000 uuf, GMV; 500 WVDC.	CC100-16
C1640 thru C1645	NOT USED	
C1646	CAPACITOR, FIXED, ELECTROLYTIC: 10 uf, -10%+150% at 120 cps at 25°C; 15 WVDC; polarized; insulated tubular case.	CE105-10-15
C1647	CAPACITOR, FIXED, ELECTROLYTIC: 50 uf, -10% +150% at 120 cps at 25°C; 15 WVDC; polarized; insulated tubular case.	CE105-50-15
C1648	Same as C1646.	
C1649	Same as C1647.	
C1650	CAPACITOR, FIXED CERAMIC DIELECTRIC: 1,000 uuf, GMV; 500 WVDC.	CC100-29
C1651	CAPACITOR, FIXED CERAMIC DIELECTRIC: 100,000 uuf, +80% -20%; 100 WVDC.	CC100-28
C1652	Same as C1647.	
C1653 thru C1659	NOT USED	
C1660	CAPACITOR, FIXED, ELECTROLYTIC: 200 uf, -10% +150% at 120 cps at 25°C; 15 WVDC; polarized; insulated tubular case.	CE105-200-15
EQ1600 thru EQ1615	NOT USED	
EQ1616	HEAT SINK: transistor heat dissipating element.	HD101
EQ1617	Same as EQ1616.	
K1600	NOT USED	

PARTS LIST (CON'T)
FOR
RECEIVER AUDIO FREQUENCY

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
K1601	RELAY, ARMATURE: 4PDT; 185 ohms, ±10% DC resistance; operating voltage 12 VDC; current rating 60 ma; 700 ma at 25°C; 14 contracts rated for 2 amps at 20 VDC resistance; clear high impact styrene dust cover case.	RL156-2
Q1600 thru Q1612	NOT USED	
Q1613	TRANSISTOR: germanium; PNP; JEDEC type 2N1307-4 transistor with a controled hfe limit of 60-75; JEDEC type T09 case.	TX107
Q1614	Same as Q1613.	
Q1615	Same as Q1613.	
Q1616	TRANSISTOR: germanium; PNP.	2N1039
Q1617	Same as Q1616.	
Q1618	TRANSISTOR: germanium; PNP; JEDEC type 2N1370-7 transistor with a controlled hfe limit of 120-150; JEDEC type T05 case.	TX108
Q1619	Same as Q1613.	
Q1620	Same as Q1613.	
Q1621	TRANSISTOR: germanium; PNP.	2N2001
R1600 thru R1637	NOT USED	
R1638	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/2 watt.	RC20GF103J
R1639	RESISTOR, FIXED, COMPOSITION: 4,700 ohms, ±5%; 1/2 watt.	RC20GF472J
R1640	RESISTOR, FIXED, COMPOSITION: 22 ohms, ±5%; 2 watts.	RC42GF220J
R1641	RESISTOR, FIXED, COMPOSITION: 3,300 ohms, ±5%; 1/2 watt.	RC20GF332J
R1642	Same as R1638.	

PARTS LIST (CON'T)
FOR
RECEIVER AUDIO FREQUENCY

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
R1643	Same as R1641.	
R1644	Same as R1641.	
R1645	RESISTOR, FIXED, COMPOSITION: 680 ohms, ±5%; 1/2 watt.	RC20GF681J
R1646	RESISTOR, FIXED, COMPOSITION: 10 ohms, ±5%; 1/2 watt.	RC20GF100J
R1647	RESISTOR, FIXED, COMPOSITION: 100,000 ohms, ±5%; 1/2 watt.	RC20GF104J
R1648 thru R1650	NOT USED	
R1651	Same as R1638.	
R1652	RESISTOR, FIXED, COMPOSITION: 3,900 ohms, ±5%; 1/2 watt.	RC20GF392J
R1653	RESISTOR, FIXED, COMPOSITION: 2,200 ohms, ±5%; 1/2 watt.	RC20GF222J
R1654	RESISTOR, FIXED, COMPOSITION: 1,000 ohms, ±5%; 1/2 watt.	RC20GF102J
R1655	Same as R1647.	
R1656	Same as R1641.	
R1657	RESISTOR, FIXED, COMPOSITION: 22,000 ohms, ±5%; 1/2 watt.	RC20GF223J
R1658	Same as R1653.	
R1659	RESISTOR, FIXED, COMPOSITION: 33 ohms, ±5%; 1/2 watt.	RC20GF330J
R1660	RESISTOR, FIXED, COMPOSITION: 3.3 ohms, ±5%; 1 watt.	RC32GF3R3J
R1661	RESISTOR, FIXED, COMPOSITION: 470 ohms, ±5%; 1/2 watt.	RC20GF471J
R1662	RESISTOR, FIXED, COMPOSITION: 1,800 ohms, ±5%; 1/2 watt.	RC20GF182J
R1663	NOT USED	

PARTS LIST (CON'T)
FOR
RECEIVER AUDIO FREQUENCY

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
R1664	NOT USED	
R1665	Same as R1639.	
R1666	Same as R1640.	
R1667	RESISTOR, FIXED, COMPOSITION: 27 ohms, ±5%; 2 watts.	RC42CF270J
T1600 thru T1602	NOT USED	
T1603	TRANSFORMER, AUDIO FREQUENCY: fixed; primary impedance 4,000 ohms, CT; DC resistance 370 ohms, ±20%; secondary impedance 600 ohms, CT; DC resistance 60 ohms, ±20%; operating frequency range 200-15,000 cps; frequency response ±3 db at 250 to 3,500 cps.	TF267-3
T1604	TRANSFORMER, AUDIO FREQUENCY: fixed, primary impedance 3,000 ohms, CT; DC resistance 260 ohms, ±20%; secondary impedance 1,000 ohms, CT; DC resistance 105 ohms, ±20%; operating frequency range 200-15,000 cps; frequency response ±3 db at 250 to 3,500 cps.	TF267-2
T1605	TRANSFORMER, AUDIO FREQUENCY: fixed; primary impedance 500 ohms, CT; DC resistance 26 ohms, ±20%; secondary impedance 3.2 ohms; DC resistance 0.3 ohms, ±20%; operating frequency range 150-45,000 cps, frequency response +0.2 db at 1,000 cps, ref; 150-45,000 cps.	TF267-5

PARTS LIST
FOR
RECEIVER INTERMEDIATE FREQUENCY

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C1800	NOT USED	
C1801	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 100,000 uuf, +80% -20%; 100WVDC.	CC100-28
C1802	CAPACITOR, VARIABLE, CERAMIC DIELECTRIC: 10-75 uuf; operating temperature range -55°C to +85°C; 350 WVDC.	CV109-8
C1803	CAPACITOR, FIXED, MICA DIELECTRIC: 1,600 uuf, ±2%; 500 WVDC.	CM100-11
C1804	CAPACITOR, VARIABLE, MICA DIELECTRIC: 280 uuf max. when tight, 25 uuf max. at 3 turns; 175 WVDC.	CV114-1
C1805	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 200,000 uuf, +80% -20%; 25 WVDC.	CC100-33
C1806	NOT USED	
C1807	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 25,000 uuf, +80% -20%; 500 WVDC.	CC100-25
C1808	CAPACITOR, FIXED, MICA DIELECTRIC: 510 uuf, ±5%; 500 WVDC; char. F.	CM15F511J03
C1809	Same as C1801.	
C1810 thru C1813	NOT USED	
C1814	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 470,000 uuf, ±20%; peak working voltage 100 VDC; radial lead type.	CC112R474M
C1815	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 1,000 uuf, ±10%; 500 WVDC.	CC100-9
C1816 thru C1818	Same as C1814.	
C1819	Same as C1815.	
C1820	Same as C1815.	
C1821	Same as C1814.	

PARTS LIST (CON'T)
FOR
RECEIVER INTERMEDIATE FREQUENCY

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C1822	Same as C1814.	
C1823	CAPACITOR, FIXED, ELECTROLYTIC: 50 uf, -10% +150% at 120 cps at 25°C; 15 WVDC; polarized.	CE105-50-15
C1824	CAPACITOR, FIXED, ELECTROLYTIC: 10 uf, -10% +150% at 120 cps at 25°C; 15 WVDC; polarized.	CE105-10-15
C1825	CAPACITOR, FIXED CERAMIC DIELECTRIC: 10,000 uuf, GMV; 500 WVDC.	CC100-16
C1826 thru C1828	Same as C1801.	
C1829	CAPACITOR, FIXED, MICA DIELECTRIC: 270 uuf, ±5%; 500 WVDC.	CM15F271J03
C1830	Same as C1805.	
C1831	CAPACITOR, FIXED, MICA DIELECTRIC: 24 uuf, ±5%; 500 WVDC.	CM15C240J03
C1832	CAPACITOR, VARIABLE, CERAMIC DIELECTRIC: 8-50 uuf; operating temperature range -55°C to +85°C; 350 WVDC.	CV109-6
C1833	Same as C1831.	
C1834	Same as C1832.	
C1835	Same as C1801.	
C1836	Same as C1829.	
C1837	CAPACITOR, FIXED, MICA DIELECTRIC: 1,000 uuf, ±2%; 500 WVDC.	CM20F102G03
C1838	Same as C1805.	
C1839	Same as C1801.	
C1840	Same as C1825.	
C1841	Same as C1805.	

PARTS LIST (CON'T)
FOR
RECEIVER INTERMEDIATE FREQUENCY

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C1842	CAPACITOR, FIXED, ELECTROLYTIC: 6 uf, -10% +150% at 120 cps at 25°C; 15 WVDC; polarized.	CE105-6-15
C1843	Same as C1805.	
C1844	CAPACITOR, FIXED, ELECTROLYTIC: 25 uf, -10% +150% at 120 cps at 25°C; 15 WVDC; polarized.	CE105-25-15
C1845	Same as C1801.	
C1846	Same as C1825.	
C1847	Same as C1801.	
C1848	Same as C1815.	
CR1800	NOT USED	
CR1801	SEMICONDUCTOR DEVICE, DIODE.	1N294
CR1802	Same as CR1801.	
CR1803	SEMICONDUCTOR DEVICE, DIODE.	1N68
CR1804	Same as CR1803.	
CR1805	Same as CR1803.	
FL1800	NOT USED	
FL1801	FILTER, BANDPASS: operating frequency 250 KC; bandwidth 6 KC; input and output impedance 10K ohms.	FX195-3
L1800	NOT USED	
L1801	COIL, RADIO FREQUENCY: fixed; 47,000 uh, ±5%; 452 ohms DC resistance; current rating 27 ma.	CL275-473
L1802	COIL, RADIO FREQUENCY: fixed; 56,000 uh, ±5%; 499 ohms DC resistance; current rating 26 ma.	CL275-563
L1803	COIL, RADIO FREQUENCY: fixed; 220 uh, ±10%; current rating 200 ma; molded case.	CL140-6
L1804	Same as L1803.	
L1805	NOT USED	

PARTS LIST (CON'T)
FOR
RECEIVER INTERMEDIATE FREQUENCY

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
L1806	COIL, RADIO FREQUENCY: fixed, 1,000 uh, ±5%; 16.0 ohms DC resistance; current rating 140 ma.	CL275-102
L1807	Same as L1803.	
L1808	Same as L1803.	
L1809	COIL, RADIO FREQUENCY: fixed, 10,000 uh, ±5%; 76.6 ohms DC resistance; current rating 66 ma.	CL275-103
L1810	COIL, RADIO FREQUENCY: fixed; 150 uh, ±5%; 3.3 ohms DC resistance; current rating 315 ma.	CL275-151
Q1800	NOT USED	
Q1801	TRANSISTOR: germanium; PNP; JEDEC type 2N2084 transistor with a controlled hfe limit of 100-150; JEDEC type T033 case.	TX109
Q1802 thru Q1804	Same as Q1801.	
Q1805	TRANSISTOR: germanium, PNP.	2N404A
Q1806 thru Q1808	Same as Q1801.	
Q1809	TRANSISTOR: germanium; PNP.	2N1190
Q1810	TRANSISTOR: NPN.	2N697
Q1811	Same as Q1810.	
R1800	NOT USED	
R1801	RESISTOR, FIXED, COMPOSITION: 100 ohms, ±5%; 1/2 watt.	RC20GF101J
R1802	RESISTOR, FIXED, COMPOSITION: 8,200 ohms, ±5%; 1/2 watt.	RC20GF822J
R1803	RESISTOR, FIXED, COMPOSITION: 5,600 ohms, ±5%; 1/2 watt.	RC20GF562J
R1804	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/2 watt.	RC20GF103J

PARTS LIST (CON'T)
FOR
RECEIVER INTERMEDIATE FREQUENCY

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
R1805	RESISTOR, FIXED, COMPOSITION: 1,000 ohms, ±5%; 1/2 watt.	RC20GF102J
R1806	RESISTOR, FIXED, COMPOSITION: 12,000 ohms, ±5%; 1/2 watt.	RC20GF123J
R1807	RESISTOR, FIXED, COMPOSITION: 470 ohms, ±5%; 1/2 watt.	RC20GF471J
R1808	Same as R1803.	
R1809	RESISTOR, FIXED, COMPOSITION: 560 ohms, ±5%; 1/2 watt.	RC20GF561J
R1810	RESISTOR, FIXED, COMPOSITION: 47 ohms, ±5%; 1/2 watt.	RC20GF470J
R1811	Same as R1807.	
R1812	RESISTOR, FIXED, COMPOSITION: 4,700 ohms, ±5%; 1/2 watt.	RC20GF472J
R1813	Same as R1804.	
R1814	RESISTOR, FIXED, COMPOSITION: 330 ohms, ±5%; 1/2 watt.	RC20GF331J
R1815	Same as R1802.	
R1816	RESISTOR, FIXED, COMPOSITION: 100,000 ohms, ±5%; 1/2 watt.	RC20GF104J
R1817	Same as R1812.	
R1818	RESISTOR, FIXED, COMPOSITION: 15,000 ohms, ±5%; 1/2 watt.	RC20GF153J
R1819	RESISTOR, FIXED, COMPOSITION: 39,000 ohms, ±5%; 1/2 watt.	RC20GF393J
R1820	Same as R1803.	
R1821	Same as R1812.	
R1822	NOT USED	
R1823	Same as R1812.	

PARTS LIST (CON'T)
FOR
RECEIVER INTERMEDIATE FREQUENCY

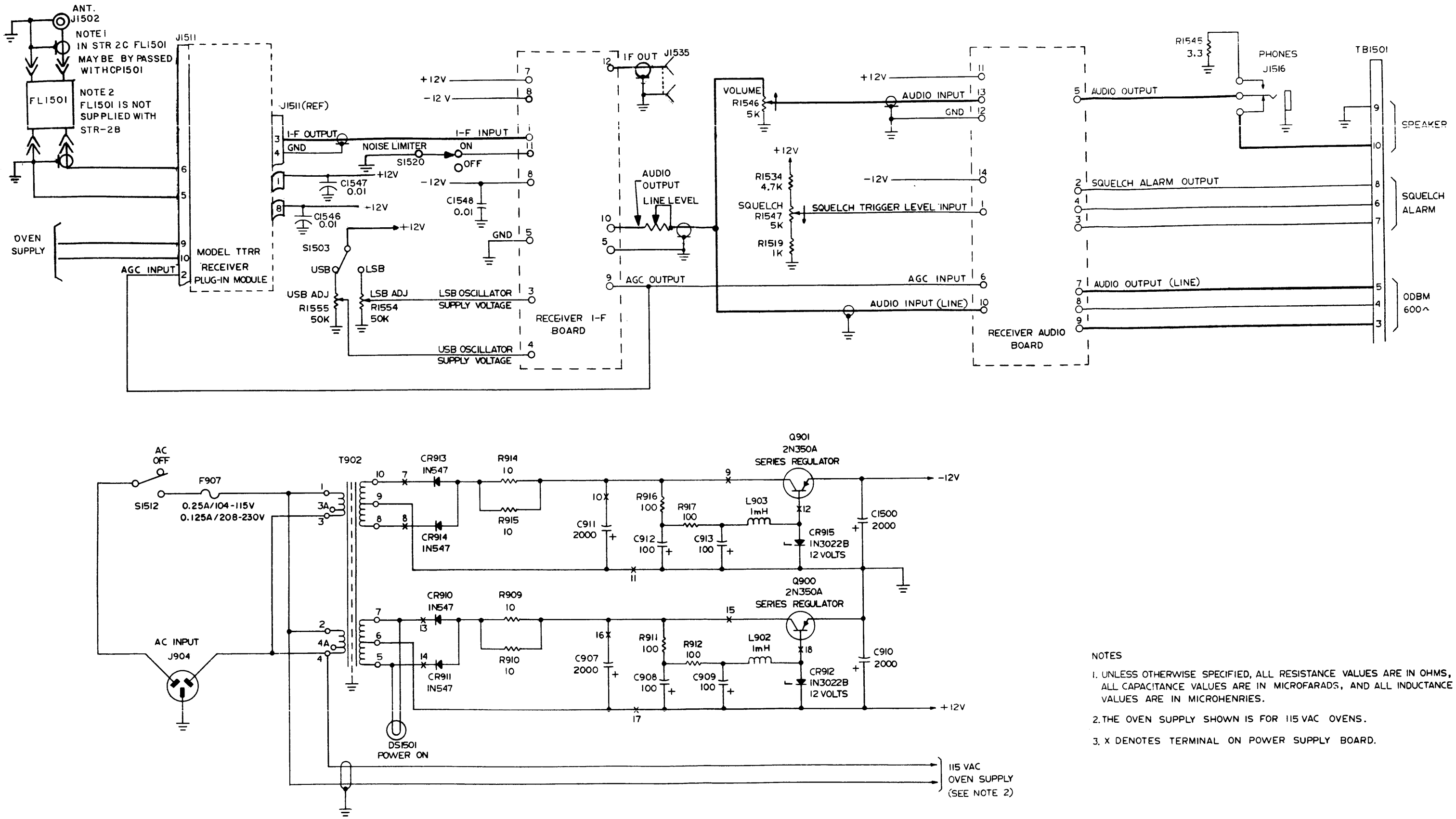
REF SYMBOL	DESCRIPTION	TMC PART NUMBER
R1824	Same as R1804.	
R1825	Same as R1805.	
R1826	Same as R1805.	
R1827	Same as R1812.	
R1828	Same as R1804.	
R1829	Same as R1809.	
R1830	RESISTOR, FIXED, COMPOSITION: 6,800 ohms, ±5%; 1/2 watt.	RC20GF682J
R1831	Same as R1807.	
R1832	Same as R1805.	
R1833	Same as R1804.	
R1834	RESISTOR, FIXED, COMPOSITION: 2,700 ohms, ±5%; 1/2 watt.	RC20GF272J
R1835	Same as R1804.	
R1836	Same as R1805.	
R1837	Same as R1816.	
R1838	RESISTOR, FIXED, COMPOSITION: 220 ohms, ±5%; 1/2 watt.	RC20GF221J
R1839	Same as R1806.	
R1840	Same as R1805.	
R1841	Same as R1816.	
T1800	NOT USED	
T1801	NOT USED	
T1802	TRANSFORMER, PULSE: 3 windings; winding (#1), 4.7 mh; turns ratio 5:5:1.	TF228K15
XY1800	NOT USED	

PARTS LIST (CON'T)
FOR
RECEIVER INTERMEDIATE FREQUENCY

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
XY1801	SOCKET, CRYSTAL: female contacts, 0.505 pin dia. and 0.486 spacing.	TS104-2
XY1802	Same as XY1801.	
Y1800	NOT USED	
Y1801	CRYSTAL UNIT, QUARTZ: 1.5 MC, HC-6/U holder.	CR18A/U 1.500 000MC
Y1802	CRYSTAL UNIT, QUARTZ: 2 MC, HC-6/U holder.	CR18A/U 2.000 000MC
Z1800	NOT USED	
Z1801	I-F BOARD ASSEMBLY: consists of one capacitor, (C49) 10 uuf, part number CM111C100J5, one coil, (L11), part number CL400; one transistor, (Q12) part number 2N2084; one resistor, (R41) 47K, part number RC07GF473J.	A4469

SECTION 7

SCHEMATIC DIAGRAMS



NOTES

1. UNLESS OTHERWISE SPECIFIED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN MICROFARADS, AND ALL INDUCTANCE VALUES ARE IN MICROHENRIES.
2. THE OVEN SUPPLY SHOWN IS FOR 115 VAC OVENS.
3. X DENOTES TERMINAL ON POWER SUPPLY BOARD.

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Figure 7-1. Schematic Diagram, Models STR-2B, STR-2C (Sheet 1 of 3)

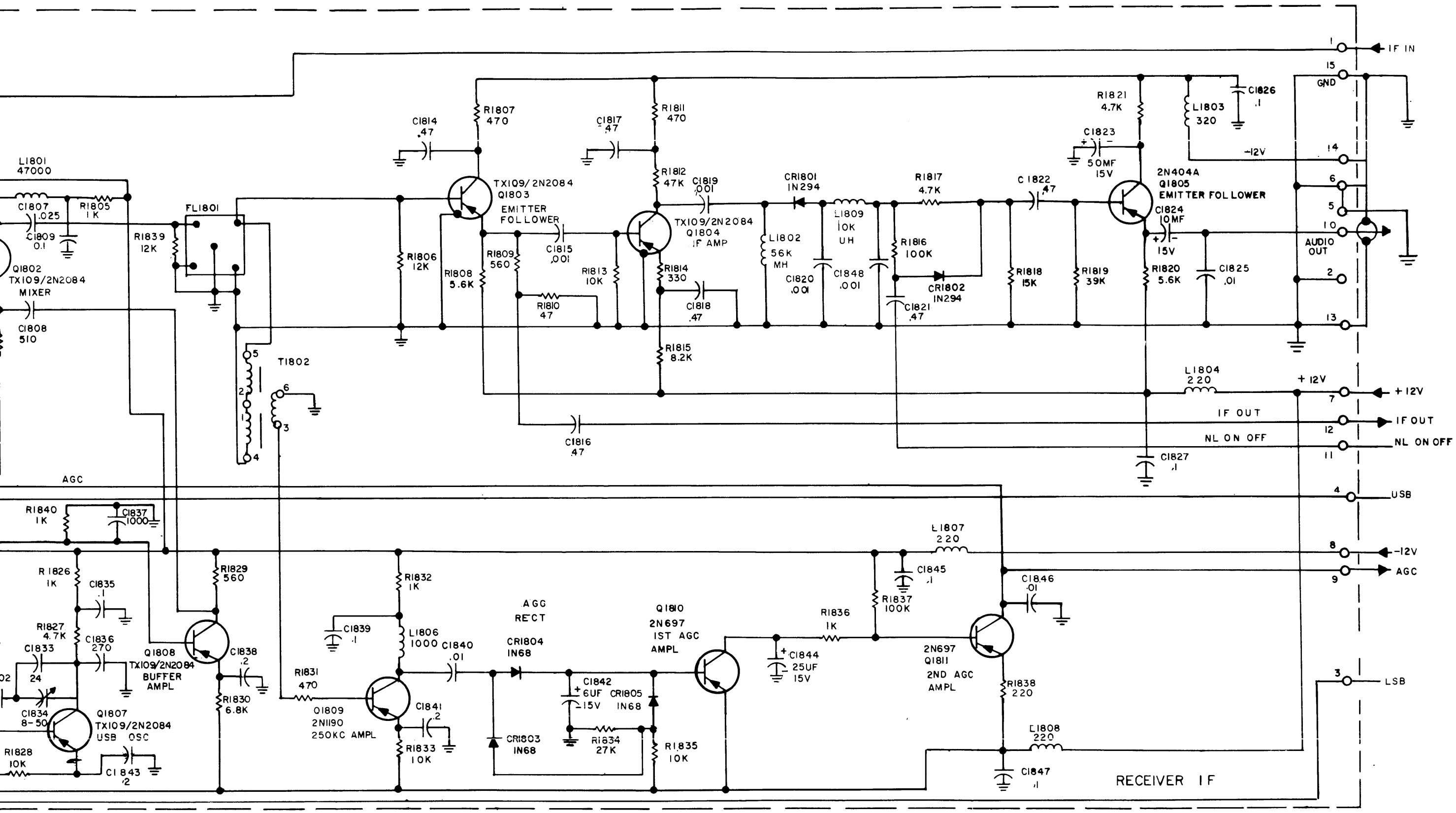
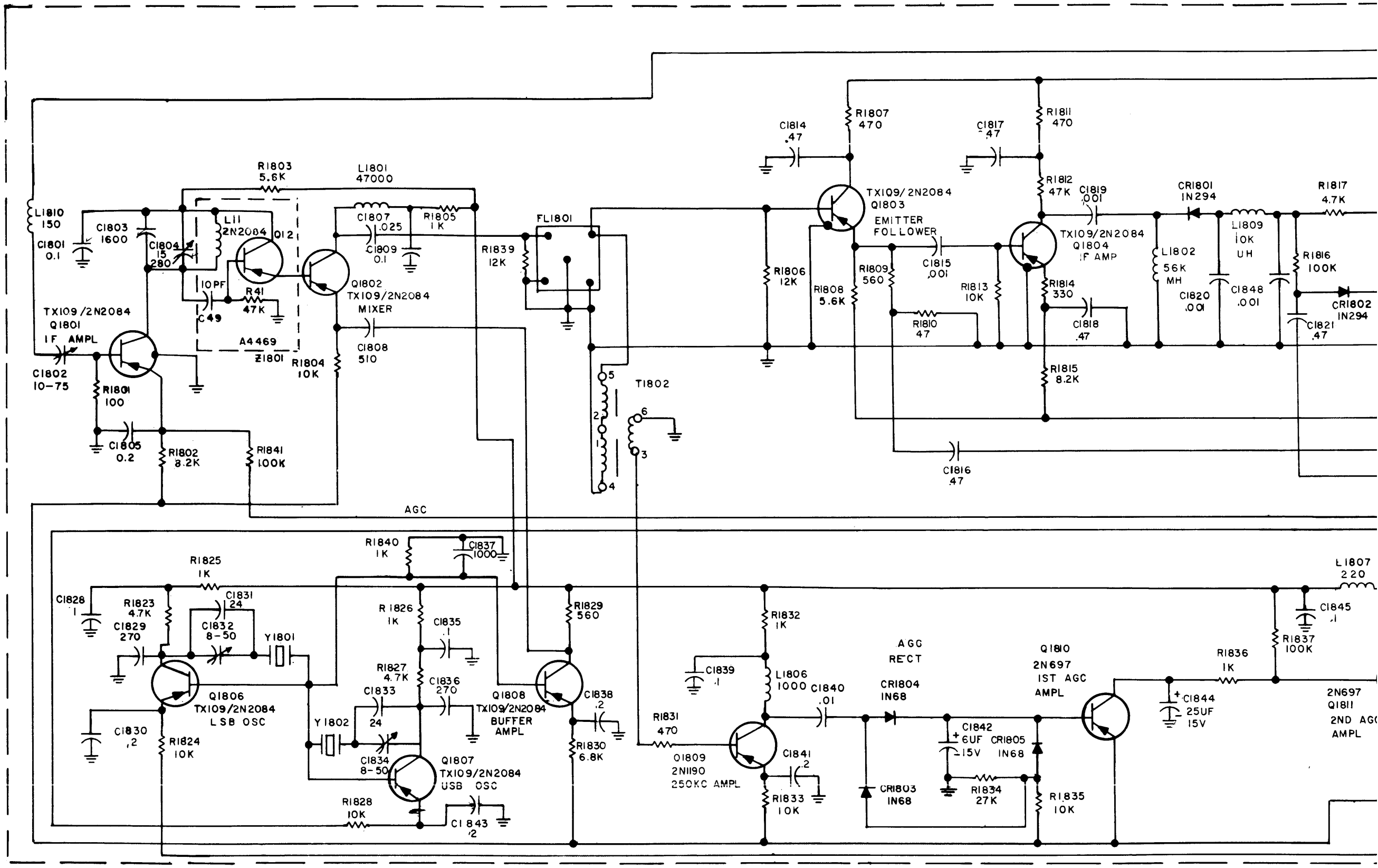


Figure 7-1. Schematic Diagram, Models STR-2B, STR-2C (Sheet 2 of 3)



3014E-7 (CK1158B)

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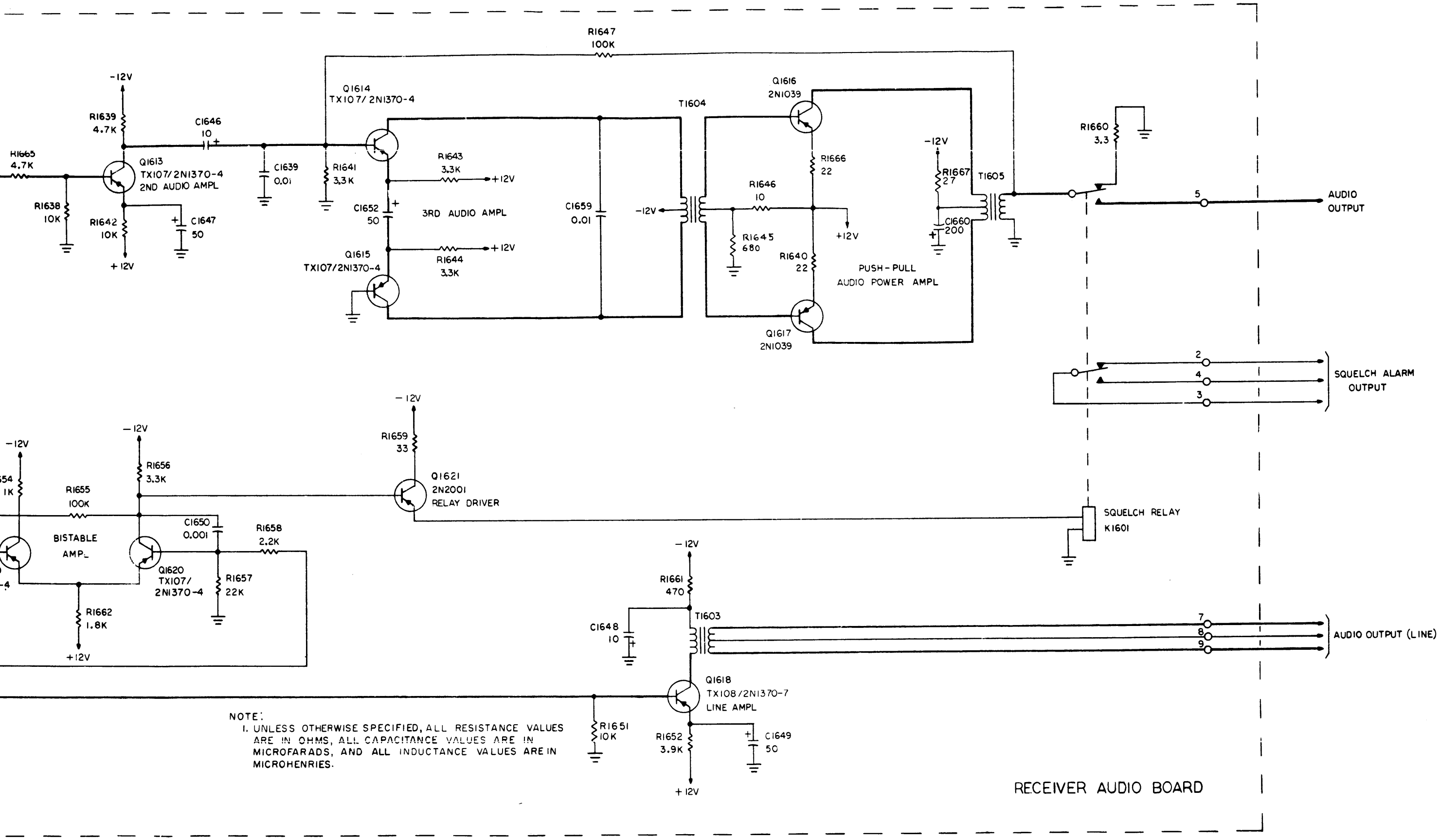
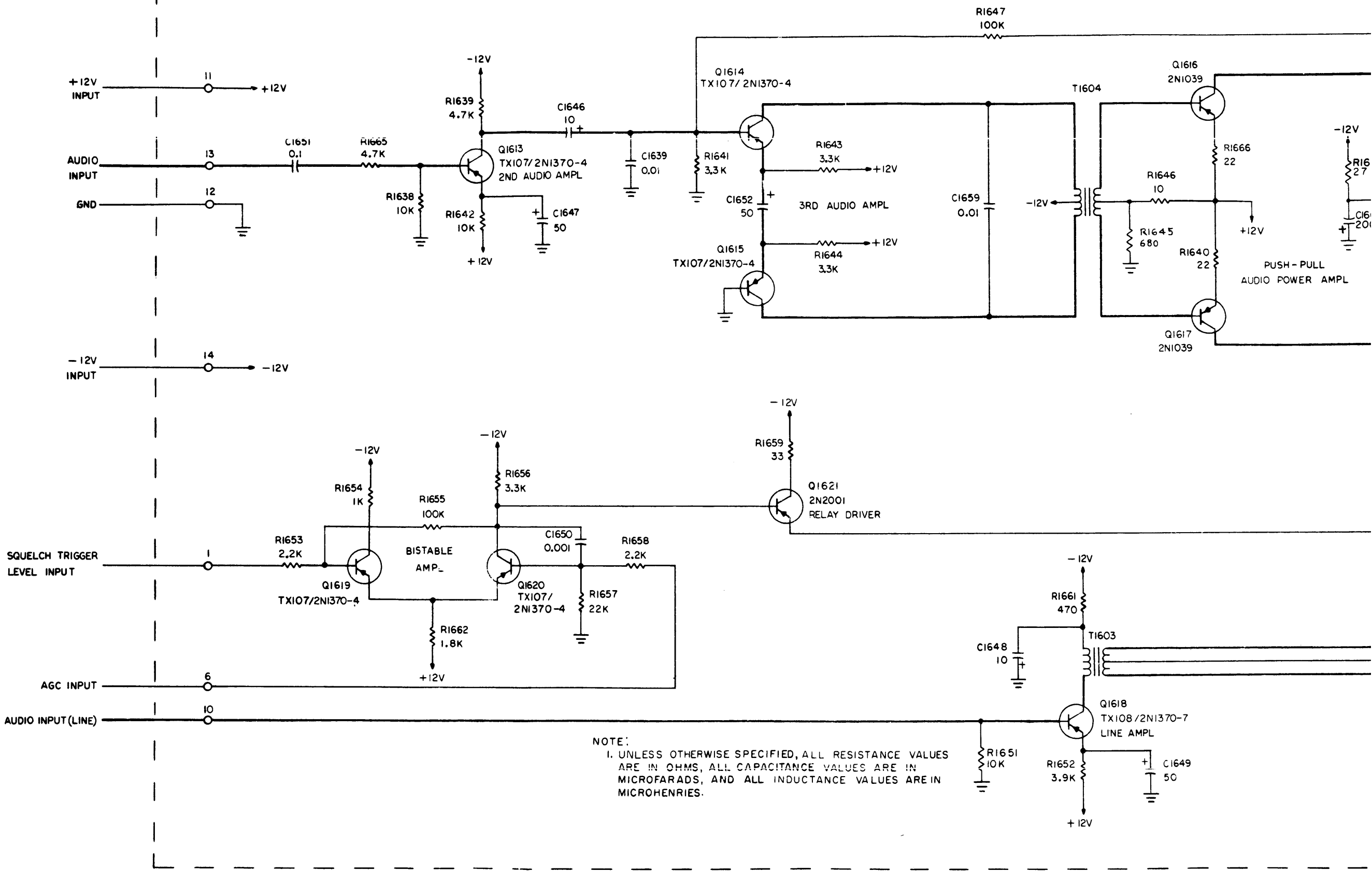


Figure 7-1. Schematic Diagram, Models STR-2B, STR-2C (Sheet 3 of 3)



NOTE:
1. UNLESS OTHERWISE SPECIFIED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN MICROFARADS, AND ALL INDUCTANCE VALUES ARE IN MICROHENRIES.

3014E-8 (CK1158B)

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