

MASTER COPY
DO NOT DESTROY
TECHNICAL MANUAL
FOR
STRIP RECEIVER
MODEL STR-5A
IN3020A



THE TECHNICAL MATERIEL CORPORATION
MAMARONECK, N.Y. **OTTAWA, CANADA**

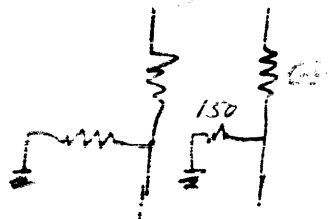
STR-5

A10540-5
4. on AM card insert K11, 500K4

5. on A-10670-5 input card

add L PADS

pins 14, 15: 68 Ω in series with
150 Ω resistor to gnd

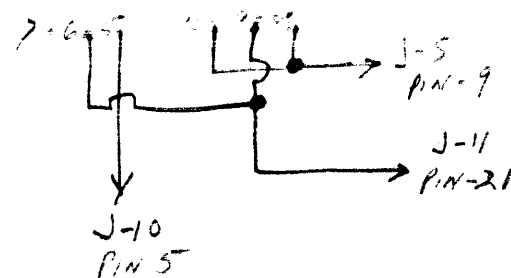


CR-110-1 to

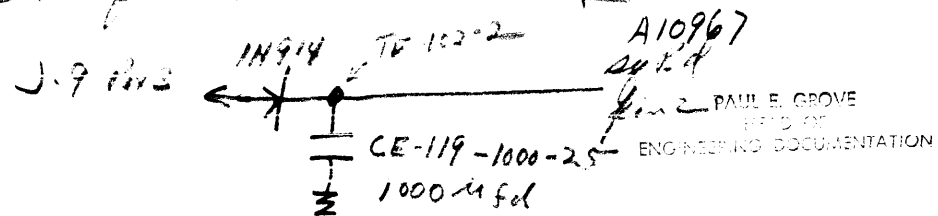
6. Change XTAL from CR-110-3.
Because of removal of oven.

disconnect jumper AFB
on
TTAR-LJD
FIG. 1
pg 7-3

K1



3. Speech Release delay



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Addendum
 Technical Manual
 Model STR-5

IN 3020A

30 March 1971

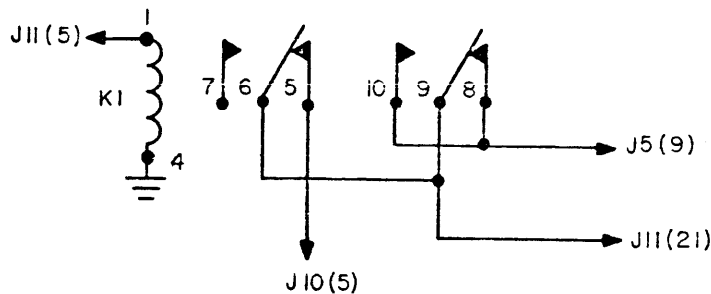
STR-5 changes to STR-5A for operation with the COR-4B() system.

Purpose of change: Issued as an addendum to the STR-5 and TTRR-()D manual when they are to be used as part of the COR-4B() system.

STR-5 manual

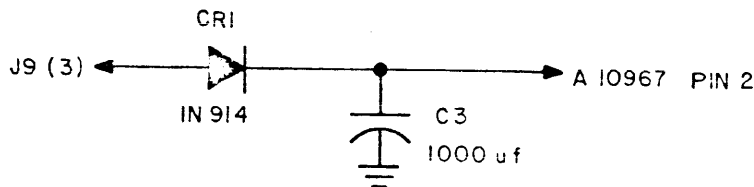
Page 7-3, figure 7-1 of Squelch addendum

Add K1 as per below schematic to squelch the AM/IF when using the test RF oscillator in the R to -1A for testing the SSB circuits.



- PARTS
 K1-RL156-19
 TS171-1
 Bracket - MS2665-25

Add CR1 and C3 as per below schematic to delay release of squelch during voice transmission with a low sybolic rate.



- PARTS
 CR1 - 1N914
 C3 - CE119-1000-25

Page 7-7, figure 7-3 (A10840-5)

Remove R11.

Change Y1 part number to CR110-3.

Add: R9, resistor, fixed, composition: 68 ohms $\pm 5\%$, RC07GF680K.

R10, same as R9.

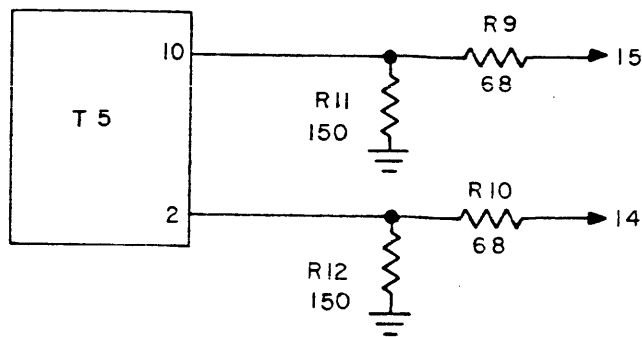
R11, resistor, fixed, composition: 150 ohms $\pm 5\%$, RC07GF151J.

R12, same as R11.

Page 7-3, figure 7-1

Remove jumper between terminal A and B to remove oven heater voltage (oven not used).

Add R9 thru R12 as per below schematic for isolation.



TECHNICAL MANUAL CHANGE NOTICE

DATE: Feb. 25th, 1971

MODEL AFFECTED: Strip Receiver STR-5

MANUAL NO. IN 3020

PURPOSE OF CHANGE: Issued as an addendum to basic STR-5 manual, when STR-5 Receiver is fitted with one or two A10967 squelch PC boards.

SECTION 4, PRINCIPLES OF OPERATION

Page 4-2: After para(h), DC POWER SUPPLY
ADD para (i)

SQUELCH BOARD:- The squelch board provides a means for automatically squelching the audio output of one or both channels (if two boards are fitted) when the received signal drops below a certain level. The level at which squelch action takes place is adjustable by SQUELCH ADJUST potentiometer (s) R2 (and R3 if two squelch boards are fitted). A means is provided for remote indication of squelch status.

Comparator Amplifier IC1 compares the preset DC level at pin 3 of the board (from SQUELCH ADJUST potentiometer) to the STR-5 AGC voltage at pin 2. When the AGC voltage rises above the voltage at pin 3 due to a signal received at the antenna input of the STR-5, the Comparator Amp IC1 turns 'on' pin 6 of IC1 then goes 'high' and turns 'on' relay driver Q1. Relay K1 actuates, providing remote squelch status indication on board pins 7,8, and 9, whilst board pin 5 goes 'low' (through CR2 and Q1) thereby putting a short circuit across the squelch line of the STR-5 audio circuit. This reduces the received audio output to zero.

SECTION 6, PARTS LIST

Page 6-2, Main Chassis Assembly
ADD: R2 Resistor, Variable, Composition, 500 \pm 10%
RV106-UX8B501A

AFTER Page 6-14
ADD: SQUELCH BOARD, A10967-5

<u>REF. SYM.</u>	<u>DESCRIPTION</u>	<u>TMC PART #</u>
C1	Capacitor: 0.015uF	CC10011-2
C2	Same as C1	
C3	Same as C1	
C4	Capacitor: 0.1uF	CC10011-8
C5	Capacitor: 220pF	CM111E221J

<u>REF. SYM.</u>	<u>DESCRIPTION</u>	<u>TMC PART#</u>
C6	Same as C4	
CR1	Diode	1N4002
CR2	Diode	1N34A
IC1	Integrated Circuit	NW10010
K1	Relay, 12v SPDT	RL10041
Q1	Transistor NPN	2N3904
R1	RES. Fxd, Comp.1K	RL07GF102J
R2	Same as R1	
R3	RES. Fxd, Comp.2.2K	RL07GF222J
R4	Same R1	
R5	RES. Fxd. Comp. 390K	RL07GF394J
R6	RES. Fxd. Comp. 1.5K	RL07GF152J
R7	Same as R3	
R8	Same as R3	

SECTION 7, SCHEMATIC DIAGRAMS

Page 7-3, Figure 7-1

DELETE and ADD new fig. 7-1 supplied.

ADD: CK10811, SQUELCH BOARD

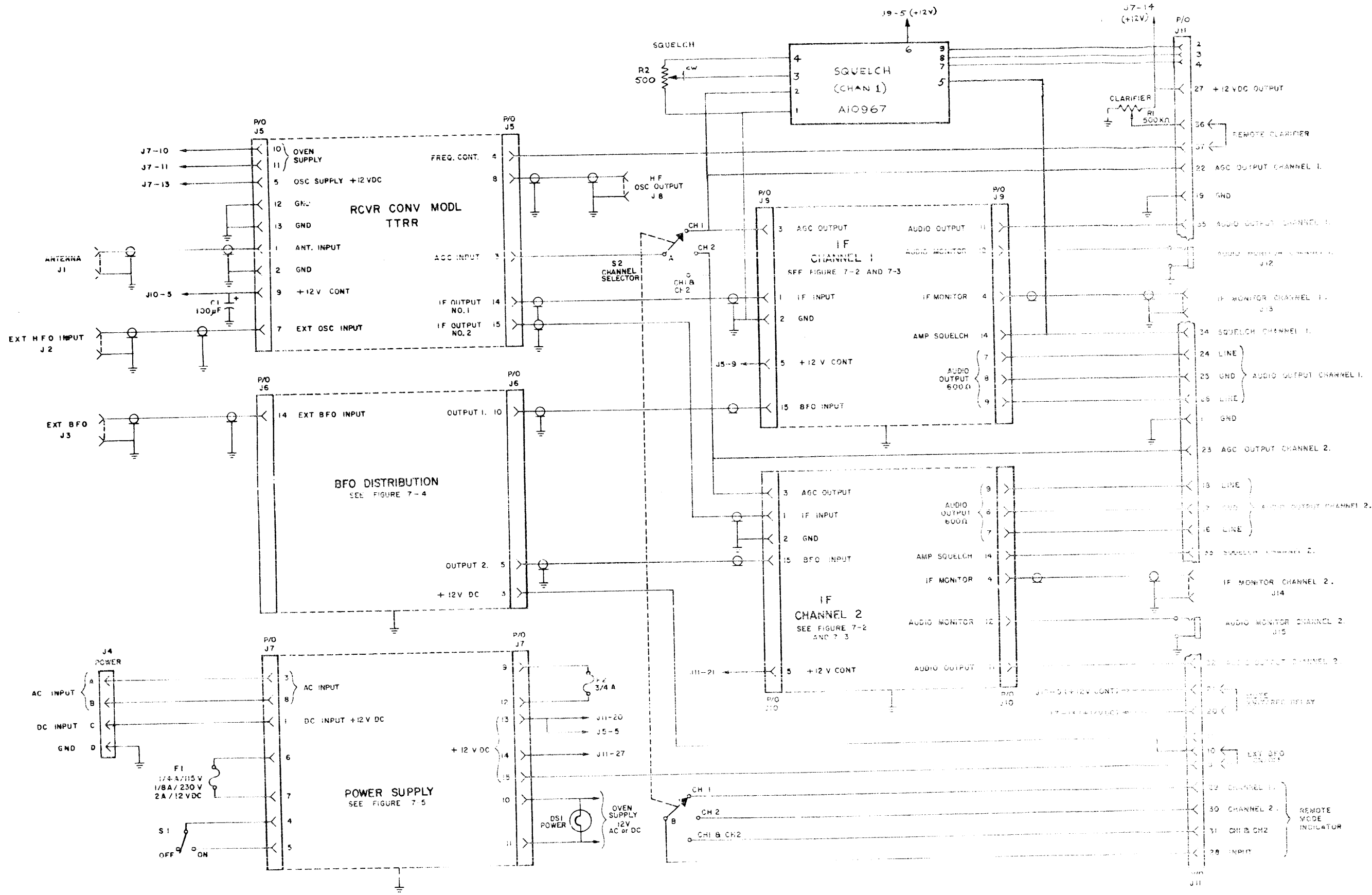


FIGURE 7-1. SCHEMATIC DIAGRAM, STR-5

IF IT IS FOUND DESIRABLE TO CHANGE ANY TOLERANCE OR OTHER DETAIL SPECIFIED ON THIS DRAWING NOTIFY THE PURCHASER PROMPTLY

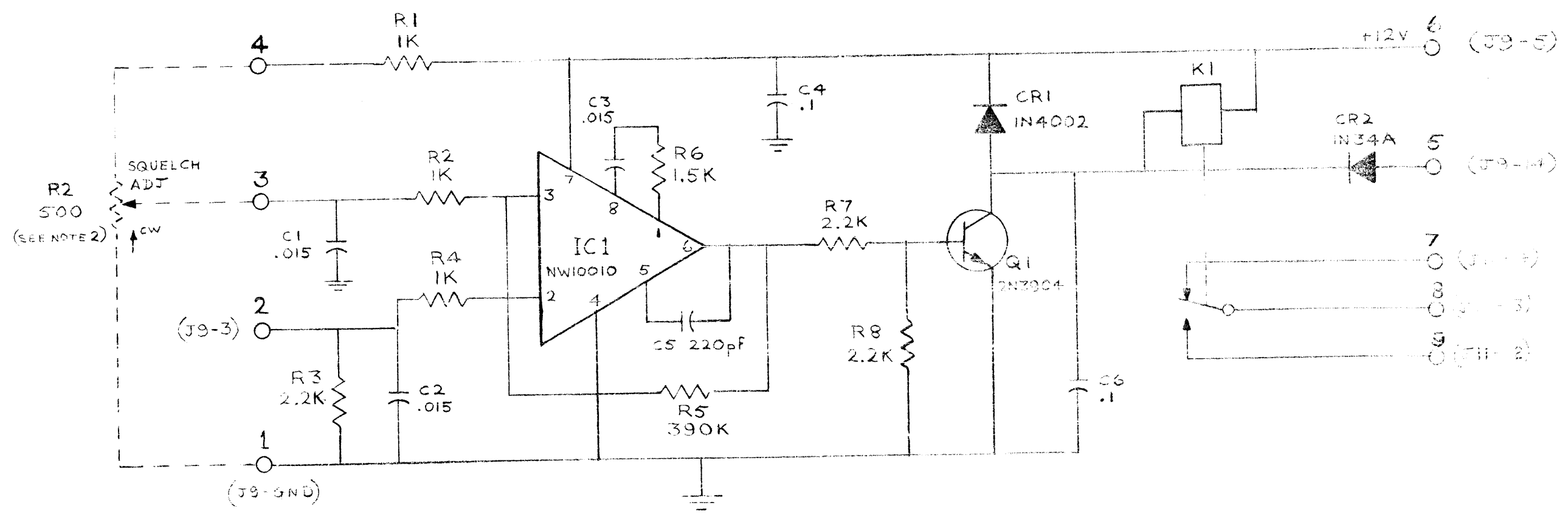
MAXIMUM ALLOWABLE TOLERANCES HAVE BEEN DETERMINED AND DEVIATIONS WILL BE CAUSE FOR REJECTION REMOVE ALL BURNS AND SHARP EDGES

DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED

CK10811

REQ	ITEM	PART NO	DESCRIPTION	SYMBOL
-----	------	---------	-------------	--------

ISSUE	ITEM	CHANGED FROM	DATE	LN NO	DRAFTS	CHECKER	ENG. APP
1		PROD RELEASE	FEB 25/71		JGP	AFP	AG



- NOTES
1. RESISTANCE IN OHMS
CAPACITANCE IN μ F UNLESS SHOWN OTHERWISE
 2. POT. R2 (DOTTED) ON STR-5 MAIN CHASSIS
 3. J NUMBERS IN PARENTHESIS REFER TO STR-5 MAIN CHASSIS

TMC (Canada) LIMITED OTTAWA ONTARIO	
SQUELCH BOARD (STR-5 MODEL 117-01)	
DATE	1/71
DESIGNED BY	AG
CHECKED BY	AFP
APPROVED BY	
FINISH SPEC NO	117-01

TOLERANCES UNLESS OTHERWISE SPECIFIED	SCALE
ALL DIMENSIONS	DRILL, PUNCH, COMMERCIAL STOCK SIZES AND MANUFACTURERS TOLERANCES ARE NOT INCLUDED
DEC DIM $\frac{1}{64}$	X = .05
FRAC DIM $\frac{1}{64}$	XX = .01
ANGULAR DIM $0^{\circ}30'$	XXX = .005

STR-5	119/71	A10967	FEB 25 71
MODEL	PROJECT NO	ASSY NO	DATE



TMC (Canada) LIMITED

TELECOMMUNICATIONS ENGINEERS

MAILING ADDRESS: R.R. No. 5, Ottawa, Ontario

A Subsidiary of The Technical Materiel Corporation, Mamaroneck, N.Y.

W a r r a n t y

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.

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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:

T M C (*Canada*) LIMITED

Engineering Services Department

R.R. No. 5, Ottawa, Ontario

Telegraphic Address: TEPEI, Ottawa.

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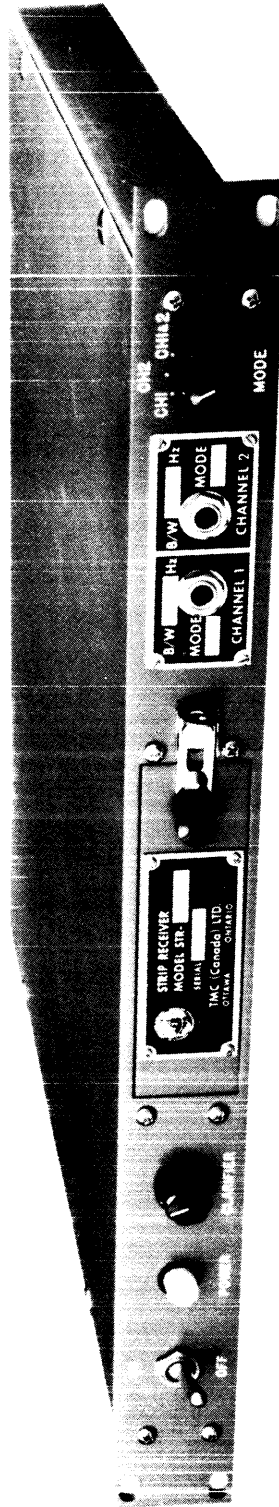


FIGURE 1-1. STRIP RECEIVER, MODEL STR-5

SECTION 1
GENERAL DESCRIPTION

1-1 FUNCTIONAL DESCRIPTION

a. **GENERAL** – The Strip Receiver, Model STR-5, is a superheterodyne communications receiver operating in the 2 to 32 MHz frequency range. The STR-5 uses one of eight fixed-tuned, crystal-controlled plug-in modules, Model TTRR(), for its RF section. The operating frequency of the STR-5 is determined by selection of the TTRR module (refer to paragraph 1-4). The operator may readily change frequencies by changing plug-in modules.

The STR-5 is a versatile unit, capable of receiving SSB (single sideband), AM (amplitude modulation), AME (amplitude modulated equivalent), and CW (continuous wave) transmissions. It is a dual IF channel receiver available in several configurations, depending on the type of signals to be received. The model numbers for the various configurations are as follows:

Model No.	Type of Reception
STR-5U	USB/CW/AME
STR-5L	LSB/CW/AME
STR-5U/L	USB and LSB/CW/AME
STR-5A	AM
STR-5A/U	AM and USB/CW
STR-5A/L	AM and LSB/CW

The model number required must be specified at the time of order.

Other features of the STR-5 include:

- (1) High sensitivity for good reception under weak signal conditions.
- (2) Use of transistors and integrated circuits throughout.
- (3) Two high impedance (5 Kohms) jacks on the front panel to permit monitoring of the audio outputs.
- (4) Two 50 ohm monitor points to permit monitoring of the channel 1 and channel 2 IF signals (AM only).
- (5) A clarifier control for fine tuning of the HFO in the TTRR module (minimum variation $\pm .005\%$).
- (6) A 50 ohm monitor output of the HF oscillator signal.
- (7) Monitor outputs of the channel 1 and channel 2 AGC signals (+1 to +5v).
- (8) Provision for independent squelch for channel 1 and channel 2.
- (9) Provision for a remote indication of the channel selected.

- (10) Provision for remote adjustment of the clarifier control signal.
- (11) Provision for remote control of the BFO signal.
- (12) Provision for connection of a remote relay to cut off the +12 Vdc operating power for the STR-5.

NOTE

The +12 Vdc supplied to the HFO is present at all times to maintain stability.

b. **OPTIONS** – The following features of the STR-5 are variable and must be specified at the time of order.

- (1) The configuration of the STR-5 is determined by the type of signals to be received (refer to paragraph 1-1a).
- (2) The power input to the STR-5 may be +12 Vdc or 104, 115, 125, 208, 230, or 250 Vac. The ac power supply assembly is provided as part of the STR-5 when an ac input is used. When a +12 Vdc input is used, the dc adapter board is provided.
- (3) A BFO signal at a level of 1v peak to peak may be provided from an external source rather than by the STR-5.

NOTE

A BFO signal is not required for AM reception.

- (4) A HFO signal at a level of 3v peak to peak may be provided from an external source rather than by the STR-5.
- (5) The following components in the STR-5 may be other than listed on the parts list (section 6) if a special request is made at the time of order.
 - the filter (FL1) on the IF board
 - the oscillator (Z1) on the BFO distribution board

1-2 PHYSICAL DESCRIPTION

a. **EXTERNAL** – The STR-5 is designed for mounting in a standard 19 inch wide rack. The top cover is removeable to allow access to internal components. All operator controls are located on the front panel. A receptacle into which the TTRR module is inserted is also located on the front panel and is covered by a hinged cover.

b. **INTERNAL** – Most of the components in the STR-5 are located on printed circuit boards which are mounted to the chassis. The remaining components are mounted directly to the chassis. The semiconductor and integrated circuit complement of the STR-5 is given in table 1-1.

TABLE 1-1. SEMICONDUCTOR AND INTEGRATED CIRCUIT COMPLIMENT

REF. DESIGNATION	TYPE	FUNCTION
AC power supply assembly CR1 to CR4 U1	1N4002 NW10002	Rectifier Regulator
DC power supply adapter board, A10674-5 CR1	1N4002	Protects against reversing polarity of dc supply.
BFO distribution board, A10668-5 Q1 and Q2	2N3904	Emitter follower buffers
SSB IF board, A10669 CR1 and CR2 CR3 and CR4 CR5 Q1 Q2 Q3 U1 and U2 U3 U4 U5	1N753A 1N34A 1N34A MPF105 2N3906 MPF105 NW - MC1550 NW - MC1550 NW - CA3020 NW - CA3028	6v Zener Regulators Voltage doubler Directional protection Buffer amplifier AGC dc amplifier AGC dc amplifier IF amplifiers Product detector (SSB) Audio output amplifier (SSB) AGC amplifier
AM IF board, A10840 CR1 CR2 and CR3 CR4 and CR5 CR6 Q1 Q2 Q3 Q4 Q5 U1 and U2 U3 U4	1N753A 1N4370 1N34A 1N753A MPF105 2N3906 MPF105 2N3906 MPF105 NW - MC1550 NW - CA3020 NW - CA3028	6v Zener Regulator 2.4v Zener Regulator Voltage Doubler 6v Zener Regulator Buffer Amplifier AGC dc Amplifier AGC dc Amplifier AGC dc Amplifier AGC dc Amplifier AGC dc Amplifier IF Amplifiers Audio detector and output amplifier AGC Amplifier

1-3 LOOSE ITEMS SUPPLIED

Table 1-2 lists the loose items supplied with the STR-5.

TABLE 1-2. LOOSE ITEMS SUPPLIED

NAME	DESIGNATION	FUNCTION	QTY.
Cable Assembly	CA10528	AC Power Cord (only supplied when unit is to operate from AC primary power)	1
Straight plug	MS3106A-14-S2S	Provides for connection to power connector J4 (only supplied when unit is to operate from +12 Vdc primary power).	1
Cable clamp	MS3057-6		1
Connector assembly	A10685	Provides for connection to J11 on rear panel.	1
RF connectors	UG88/U	Provide for connection to jacks on rear panel.	6
Technical Manual	1N3020A	Instructions for operation and maintenance of STR-5.	1

1-4 TECHNICAL SPECIFICATIONS

Frequency range

2 to 32 MHz divided into eight bands using the following TTRR modules:

Band 1A:	2-3 MHz,	TTRR-(1A)D
Band 1B:	3-4 MHz,	TTRR-(1B)D
Band 2A:	4-6 MHz,	TTRR-(2A)D
Band 2B:	6-8 MHz,	TTRR-(2B)D
Band 3A:	8-12 MHz,	TTRR-(3A)D
Band 3B:	12-16 MHz,	TTRR-(3B)D
Band 4A:	16-24 MHz,	TTRR-(4A)E
Band 4B:	24-32 MHz,	TTRR-(4B)E

Tuning system

Each TTRR module is fixed-tuned to a particular frequency within its band. (Refer to the appropriate TTRR manual). The STR-5 is tuned by inserting the appropriate TTRR module.

Frequency control	Crystal-controlled oscillators are used throughout the STR-5.
Oscillator stability	1 part per million per day.
Types of reception	SSB, AM, AME, CW
Sensitivity	SSB: 1 uV input, 15 dB signal plus noise to noise ratio. AM: 3 uV input, 10 dB signal plus noise to noise ratio.
Audio bandwidth	300 to 3000 Hz
IF bandwidth and ripple	SSB: 2.7 kHz \pm 2 dB AM: 6 kHz \pm 2 dB symmetrical
Image rejection	A minimum of 60 dB from 2-16 MHz; minimum of 50 dB from 16-32 MHz.
Intermodulation	Intermodulation products are at least 40 dB below a 100 uV two tone input at the antenna
AGC Action	With 100 dB change in input signal from 1 uV(SSB) or 3 uV(AM) the output will not vary more than 10 dB.
Hum and noise level	At least 40 dB below full output.
Antenna input impedance	50 ohms nominal, unbalanced.
Audio outputs	Three are provided from each channel: <ol style="list-style-type: none"> 1. Up to +8 dBM into 600 ohm balanced line (adjustable). 2. Up to 500 mV into 5 Kohms. 3. Up to 500 mV into 5 Kohms (front panel monitor point)
AGC monitor outputs	Two are provided, one for each channel. Output voltage varies between +1 and +5 volts.
HFO monitor output	150 mV into 50 ohms.
External HFO input (if used)	3v p-p into 50 ohms
External BFO input (if used)	1v p-p into 50 ohms
I.F. monitor outputs	Two 50 ohm outputs are provided (one for each channel) at a level of 1 mV.
Primary power requirements	+12v dc or 104/115/125/208/230/250 Vac \pm 10% 50/60 Hz
Dimensions:	Length: 15 inches Width: 19 inches Height: 1 $\frac{3}{4}$ inches
Weight:	10 pounds approximately

SECTION 2 INSTALLATION

2-1 UNPACKING AND HANDLING

The STR-5 is shipped from the factory in a packing case to ensure maximum protection from damage in transit. The inside of the case contains additional packing material to protect the unit not only from breakage due to shock, but also from the elements. The equipment supplied with the STR-5 (table 1-2) is packed in the box as loose items.

As soon as the receiver is unpacked it should be visually inspected to make sure that it is not damaged. This examination should include the testing of each front-panel control. All of the covers on the unit should be removed, and the inside of the unit checked carefully for damaged components and loose items. With respect to damage to the equipment for which the carrier is liable, TMC (Canada) Limited will assist in describing methods of repair and the furnishing of replacement parts.

2-2 POWER REQUIREMENT

The STR-5 can operate with +12 Vdc power, or 104 Vac, 115 Vac, 125 Vac, 208 Vac, 230 Vac or 250 Vac power. If an STR-5 wired for operation for an ac power source is to be operated from a different ac power source, the wiring of transformer T1 in the ac power supply assembly must be modified. Figure 2-1 illustrates the wiring of T1 for all possible ac power inputs. For operation from 104 Vac, 115 Vac, or 125 Vac, fuse F1 on the rear panel must be a 0.25 A fuse; for 208 Vac, 230 Vac or 250 Vac, F1 must be a 0.125 A fuse. For dc operation a 2A fuse is used.

2-3 EQUIPMENT LOCATION

The STR-5 should be located so that there is sufficient clearance for insertion and removal of the TTRR plug-in modules and so that front-panel controls are easily accessible to the operator. Sufficient space for fuse replacement and access to rear panel connectors is required at the back of the unit. Because its solid-state construction eliminates heat problems, several STR-5's may be installed one above the other in a rack.

2-4 ELECTRICAL INSTALLATION

Make the following connections from external equipment to the STR-5. The rear panel of the STR-5 is illustrated in figure 2-2.

a. **POWER** – Connect primary power to POWER INPUT connector J4. When ac power is provided, use the power cable CA10528 supplied. For dc operation, connect +12 Vdc to pin C of J4. Pin D of J4 is a ground connection.

b. **ANTENNA** – Connect a 50-ohm unbalanced antenna with coaxial cable lead-in to ANTENNA jack J1 on the rear panel of the STR-5.

c. **EXTERNAL HFO INPUT** – When an external HF oscillator signal is being provided for the TTRR module, connect this input to EXT HFO INPUT jack J2 on the rear panel of the STR-5. Connect jumpers in the TTRR module as required for operation with an external HFO input (refer to TTRR manual).

d. **EXTERNAL BFO INPUT** – When the BFO input to the IF boards (for SSB operation) is to be provided from an external source, connect the input to EXT BFO INPUT jack J3 on the rear panel of the STR-5. Remove resistor R1 from the BFO distribution board.

e. **HFO OUTPUT** – An output of the HFO signal is provided for use by remote equipment at HF OSC OUTPUT jack J8 on the rear panel of the STR-5.

f. **IF MONITOR JACKS** – IF MONITOR CHANNEL 1 jack J13, and IF MONITOR CHANNEL 2 jack J14 are provided on the rear panel of the STR-5 to permit monitoring of the IF signals (for AM operation).

g. **AUDIO MONITOR JACKS** – CHANNEL 1 and CHANNEL 2 monitor jacks J12 and J15 are provided on the front panel of the STR-5 to permit monitoring of the audio output signals.

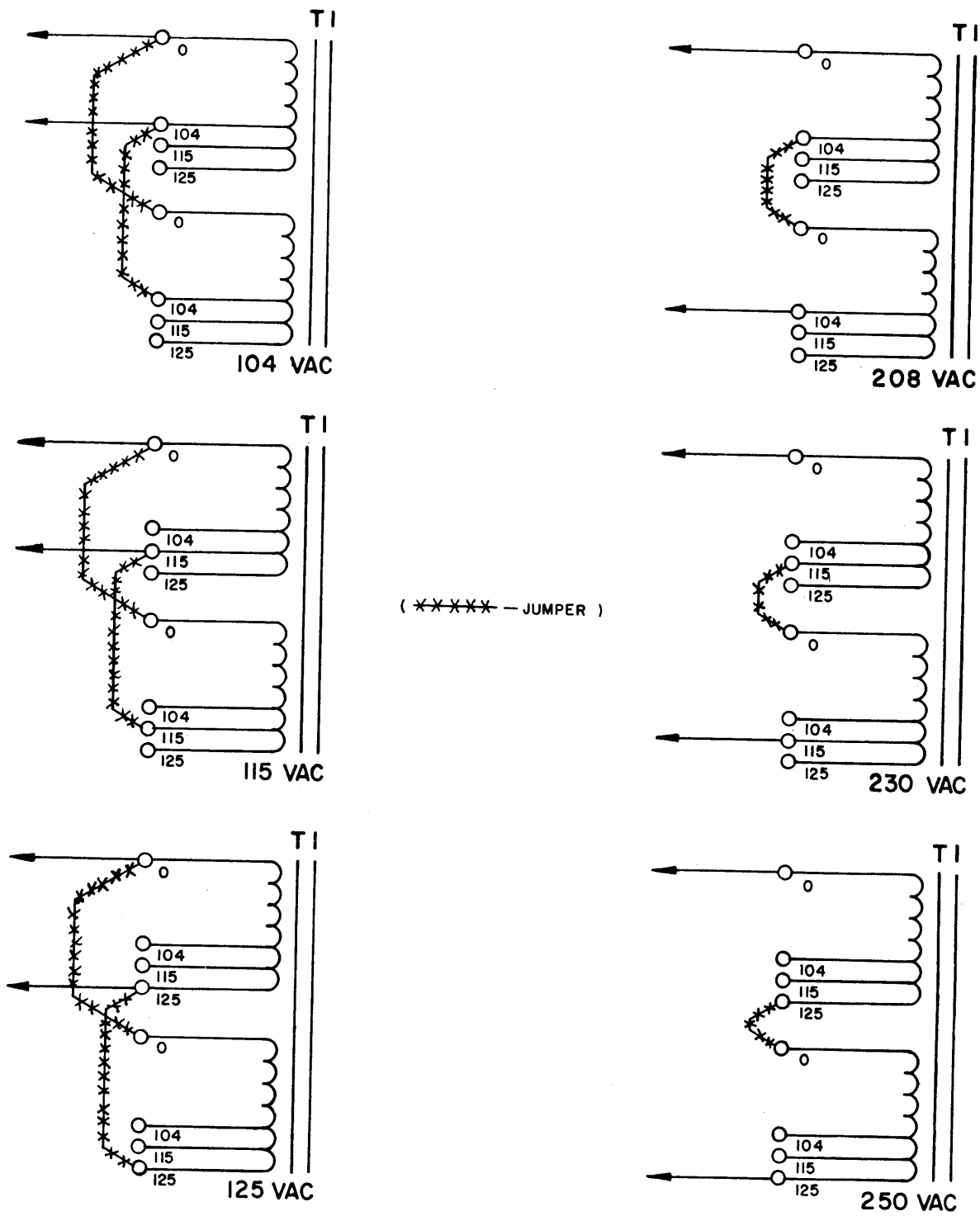


FIGURE 2-1. AC POWER TRANSFORMER WIRING



FIGURE 2-2. REAR PANEL, STR-5

h. **REMOTE CLARIFIER CONTROL** – When a remote clarifier control unit is used in conjunction with the STR-5, remove the jumper across pins 36 and 37 of connector J11 (on rear panel) and connect the remote unit. A +12 Vdc output for use by the remote unit is provided at pin 27 of J11 and pin 12 provides a ground connection. This circuit is high impedance, and long remote cables can be used. When a 500K ohm remote clarifier is used, the loop resistance should not exceed 10K ohms. The clarifier gives a range of a minimum of .005% of the operating frequency.

i. **AUDIO OUTPUTS** – Balanced, 600-ohm audio outputs are provided on pins 24, 25, and 26 of J11 (channel 1) and pins 16, 17 and 18 of J11 (channel 2). In addition, single-line audio outputs are provided on pins 35 and 32 of J11 for channels 1 and 2 respectively.

j. **AGC OUTPUTS** – Outputs of the channel 1 and 2 AGC signals from the IF boards are provided at pins 22 and 23 of J11 respectively.

k. **SQUELCH** – To squelch the audio outputs make a connection between ground and pin 34 of J11 (channel 1) or pin 33 of J11 (channel 2).

m. **+12 VDC CONTROL** – When it is desired that an external transmit/receive relay be used to cut off reception by the STR-5, remove the jumper across pins 20 and 21 of J11 and connect the relay to this

point. The 12 Vdc output from the STR-5 is provided at pin 20, and the return signal from the relay should be connected to pin 21.

n. **REMOTE MODE INDICATION** – Connections are provided on pins 28, 29, 30 and 31 of J11 for a remote indication of the position of the MODE switch S2.

o. **REMOTE BFO ON/OFF CONTROL** – When a remote BFO on/off switching device is to be used, remove the jumper across pins 9 and 10 of connector J11, and connect the switch across the pins.

NOTE

On models STR-5A/U and STR-5A/L, jumpers are connected between pins 9 and 28, between pins 10 and 29, and between pins 11 and 31. In this way, the channel selector switch is used to cut off the BFO signal during AM (channel 2) operation. For channel 1 or both channel operation however, the BFO signal is present.

2-5 PERFORMANCE CHECK

Immediately after the receiver has been installed it should be checked for proper operation. This test consists simply of attempting to receive a signal. When a signal is received, the operation of each front panel control should be checked.

**SECTION 3
OPERATION**

3-1 CONTROLS AND INDICATORS

Before attempting to operate the STR-5, the operator should become familiar with the controls and indicators listed in table 3-1 and shown in figure 1-1. The

type and purpose of each control is described in the table. Note that these descriptions are not operating instructions; specific operating instructions are given in paragraph 3-2.

TABLE 3-1. OPERATOR CONTROLS AND INDICATORS

Control or Indicator	Description
Power ON/OFF switch (S1 on main chassis)	Controls primary power to the STR-5, either ac or dc power.
POWER lamp (DS1 on main chassis)	Lights when primary power is supplied to the STR-5 and the power ON/OFF switch is turned to ON.
CLARIFIER control (R1 on main chassis)	Permits fine tuning of the TTRR module.
MODE switch (S2 on main chassis)	Permits selection of channel 1, channel 2 or both channels.

3-2 OPERATING PROCEDURES

- a. Check that the correct TTRR module is inserted in the STR-5. Ensure that its frequency range covers the carrier frequency of the signal to be received.
- b. Set the ON/OFF switch to the ON position.
- c. Select the channel required with the MODE switch (channel 1, channel 2 or both channels).
- d. Adjust the CLARIFIER control for maximum

voice or audio tone clarity. This will be at approximately the mid-point of adjustment.

NOTE

This adjustment may be made by the remote clarifier control unit when one is connected to the STR-5.

- e. If it is desired to squelch the audio output from one or both channels, connect a ground signal to pin 34 of J11 (channel 1 squelch) or pin 33 of J11 (channel 2 squelch).

SECTION 4 PRINCIPLES OF OPERATION

4-1 GENERAL

This section explains the principles of operation of the STR-5. For purposes of discussion a model STR-5A/U will be described. Both ac operation and dc operation are covered. The TTRR module is described only briefly. For a more detailed analysis, refer to the appropriate TTRR manual.

4-2 CIRCUIT ANALYSIS (refer to figure 4-1)

a. **RECEIVER CONVERTER MODULE** – The RF input to the STR-5 is provided through ANTENNA jack J1 to the TTRR module inserted in the STR-5. The TTRR module includes an RF amplifier, an HF oscillator and a mixer. The module amplifies the RF signal and converts it to the IF frequency. The HF oscillator is tuned 1.75 MHz above the carrier frequency of the received signal. Thus the spectrum of the received frequencies is inverted. The carrier frequency of the IF signal is 1.75 MHz.

b. **IF BOARD-GENERAL** – Two types of IF board are available; one type for SSB, CW and AME signals and the other for AM signals. The type of IF board(s) provided in the STR-5 depends upon the model number. For the STR-5A/U, one AM type board is provided for the AM inputs, and one SSB (upper sideband) is provided for SSB, CW or AME inputs of USB frequencies. Each IF board produces an independent 600-ohm, balanced audio line output. The principles of operation for the IF boards are described separately in the following paragraphs, but it will be seen that in many respects the circuits are identical.

c. **SSB TYPE IF BOARD** – The IF signal from the TTRR module is provided to buffer amplifier Q1 on the IF board. From Q1 it passes to filter FL1 which is a highly selective filter with a bandpass of 2.70 kHz. Since the RF input to the STR-5 is inverted by the TTRR module, the signal provided to FL1 is opposite in sideband to the RF input signal. Hence for an upper sideband RF input, FL1 is a filter which passes frequencies from 1747.000 to 1749.700 kHz, (for a lower sideband RF input, FL1 would be a filter which passes frequencies from 1750.300 to 1753.000 kHz).

The output from FL1 passes through IF amplifiers U1 and U2 to product detector U3. The product detector is also provided with a BFO input from the BFO distribution board (refer to paragraph e). The IF input and BFO signal beat together in the product detector to derive the audio information from the IF signal. The audio signal is then amplified by audio amplifier U4 and supplied to connection J11 as the 600-ohm, balanced audio line output. Two additional single-wire outputs of the audio signal are provided as well for monitoring purposes. When a squelch signal (ground) is provided to audio amplifier U4, the audio outputs are cut off.

The output from product detector U3 is also provided through AGC amplifier U5 to voltage doubler CR3-CR4. The output from the voltage doubler is a dc signal which is amplified by Q3, passes through emitter follower Q2 and provides the AGC output. This AGC signal is fed back to the IF amplifiers U1 and U2, and to the RF amplifier in the TTRR module through switch S2. In addition, it is provided as an output at connector J11.

d. **AM TYPE IF BOARD** – As on the SSB type IF board, the IF input passes through buffer Q1, filter FL1, and IF amplifiers U1 and U2. However, filter FL1 is a 6 kHz filter which passes both sidebands of the IF signal. The signal then passes directly to U3 which acts as an audio detector and amplifier to produce the 600-ohm, balanced audio line output at connector J11, and the two single-line audio monitor outputs. The audio outputs may be cut off by providing a squelch signal (ground) to U3.

Part of the IF output from amplifier U2 is fed to amplifier U4 through C19 to provide an AGC signal which is rectified and doubled by diodes CR4, CR5.

The DC voltage from the doubler controls DC amplifiers Q4 and Q5, which provide an AGC voltage to the IF stages U1 and U2. The doubler voltage is also fed to transistors Q2 and Q3 which provide an AGC output to the RF stages.

An IF monitor output is also provided from IF amplifier U2 on the AM type IF board.

e. **BFO DISTRIBUTION BOARD** – The BFO distribution board provides BFO inputs to the IF boards. These signals can be produced either using a BFO signal from an external source or by generating a BFO signal using oscillator Z1 on the BFO distribution board itself. When the externally provided BFO signal is to be used, resistor R1 must be removed from the BFO distribution board. The BFO signal (externally provided or internally produced) is applied to emitter followers Q1 and Q2 from which are provided two identical BFO outputs for use by the channel 1 and channel 2 IF boards.

A remote switch may be used to cut off the +12 Vdc supply to the BFO distribution board, so that no BFO signals are produced.

For the STR-5A/U and STR-5A/L, the BFO signal is required for operation of the SSB type IF board, but not for operation of the AM type IF board. Furthermore, it is desirable to cut off the BFO to the AM type IF board to reduce noise. To achieve this, terminal 9 is jumpered to terminal 28, 10 to 29, and 11 to 31. In this way, the +12 Vdc supply to the BFO distribution board is provided when channel 1 is selected (SSB operation), and hence a BFO signal is supplied to the channel 1 IF board. When channel 2 is selected (AM operation), the +12 Vdc supply to the BFO distribution board is cut off and no BFO signal is supplied to the IF board. When operation of both channels is required, it is necessary to provide the BFO signal for operation of the SSB type board, therefore the +12 Vdc supply is provided to the BFO distribution board.

f. **POWER SUPPLY** – The STR-5 is provided with an ac power supply board and associated circuitry when it is required to operate from 104, 115, 125, 208, 230 or 250 Vac power. When the STR-5 is to be operated from a +12 Vdc supply, however, a dc power supply adapter board is provided instead. The principles of operation for the ac and dc power supplies are described in the following paragraphs.

g. **AC POWER SUPPLY** – The primary ac power input is provided to the ac power supply from pins A and B of J4. The input is applied to the primary winding of transformer T1 through fuse F1 and ON/OFF switch S1. Figure 2-1 shows the jumper connections at the primary windings of T1 for all possible ac inputs. T1 produces two outputs. One of these is a 12 Vac signal that is applied to power lamp DS1 and the HFO oven. The second output from T1

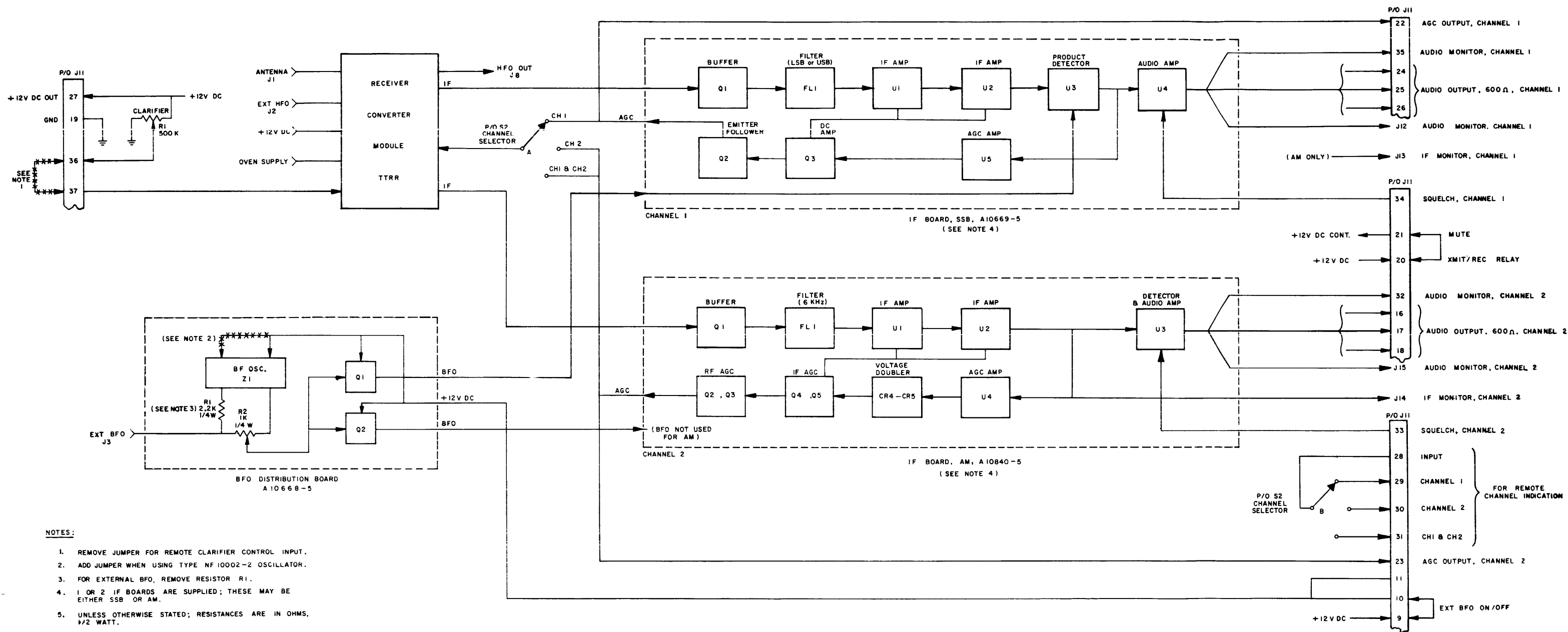
is applied to rectifier CR1-CR4 and regulator U1. The output from U1 is a regulated +12 Vdc signal which is provided through fuse F2 to three output connections for distribution throughout the STR-5.

One of the three +12 Vdc outputs from the power supply is routed directly to the clarifier control R1. A second is routed to the oscillator assembly in the TTRR module and also to pin 20 of J11. These are present at all times when ON/OFF switch S1 in ON and the primary input power is supplied, thus ensuring stable operation of the oscillator. The +12 Vdc output routed to pin 20 of J11 may be connected to an external transmit/receive relay. A +12 Vdc return signal to pin 21 of J11 is provided only when the relay is closed. This “controlled” +12 Vdc signal is then routed to various points in the STR-5. When no transmit/receive relay is used, pins 20 and 21 are jumpered together so that the +12 Vdc controlled signal is present whenever the +12 Vdc signal is present.

The third +12 Vdc output from the power supply is the power input for the BFO distribution board. It is connected to pin 9 of J11 from which it may be supplied to an external on/off switching device. When the switch is closed, the +12 Vdc signal is returned to the BFO distribution board through pin 10 or pin 11 of J11. For models STR-5A/U and STR-5A/L, however, the +12 Vdc signal provided to pin 9 may be jumpered to pin 28 so that it is routed to channel selector switch S2. When channel 1 or both channels are selected, the +12 Vdc signal is returned to the BFO distribution board through pins 29 and 10 or 31 and 11 respectively. When channel 2 is selected the +12 Vdc signal is not returned to the BFO board.

h. **DC POWER SUPPLY** – The primary +12 Vdc power input is provided to the dc power supply adapter board from pin C of J4. The input goes through fuse F1 and ON/OFF switch S1. From S1, the signal is applied across power lamp DS1 along with a ground signal, and these two signals then form the +12 Vdc oven supply output. The signal from switch S1 is also applied through diode CR1 to three output points for distribution throughout the STR-5. Diode CR1 provides protection against reversing polarity of the +12 Vdc primary supply.

The three +12 Vdc outputs from the dc adapter board are distributed in the same way as the outputs from the ac power supply (refer to paragraph g).



- NOTES:
1. REMOVE JUMPER FOR REMOTE CLARIFIER CONTROL INPUT.
 2. ADD JUMPER WHEN USING TYPE NF 10002-2 OSCILLATOR.
 3. FOR EXTERNAL BFO, REMOVE RESISTOR R1.
 4. 1 OR 2 IF BOARDS ARE SUPPLIED; THESE MAY BE EITHER SSB OR AM.
 5. UNLESS OTHERWISE STATED; RESISTANCES ARE IN OHMS, 1/2 WATT.

FIGURE 4-1. BLOCK DIAGRAM, STR-5

SECTION 5 MAINTENANCE

5-1 GENERAL

This section describes preventive maintenance troubleshooting, repair and alignment procedures for the STR-5. For maintenance procedures for the TTRR modules, refer to the appropriate TTRR manual. The following equipment is required to perform STR-5 maintenance procedures.

- a. RF Signal Generator, Hewlett Packard Model 606A, or equivalent.
- b. Volt-Ohm-Milliammeter, Simpson Model 260 or equivalent.
- c. Oscilloscope, Tektronix Model 545, or equivalent.
- d. Two 600-ohm 1/2 watt resistors.

5-2 PREVENTIVE MAINTENANCE

Preventive maintenance for the STR-5 consists of routine visual inspection and cleaning. Cleaning is necessary because dust may accumulate on components and not only reduce the efficiency of the receiver, but also increase component wear. Either a vacuum cleaner or compressed air hose should be used to clean the unit.

Visually checking the unit when it is opened for cleaning can reduce downtime due to component failure. Often a deteriorating component will look bad before it actually affects the operation of the unit. Some indications of trouble are; discoloration, dirty or pitted switch or relay contacts, warped printed circuit boards, and damaged wiring. Any deteriorating component should be replaced. In addition, all hardware should be checked for tightness.

5-3 TROUBLESHOOTING

- a. Disconnect external wiring from J11, but ensure that jumpers are connected between terminals 36 and 37, and between terminals 20 and 21. A jumper should also be connected between terminals 9 and 10, except for models STR-5A/U and STR-5A/L. For these models, jumpers should be connected between terminals 9 and 28, between terminals 10 and 29, and between terminals 11 and 31.
- b. Connect a 600 ohm, 1/2 watt resistor across

terminals 24 and 26 of J11, and another across terminals 16 and 18 of J11.

- c. Check that the +12 Vdc inputs are present at the following terminals:

1. Terminals 5 and 9 of J5 on the receiver converter module.
2. Terminal 3 of J6 on the BFO distribution board.
3. Terminal 5 of the connector (J9 or J10) on the IF board(s).
4. Terminal 27 of J11.

- d. Connect an oscilloscope to terminal 15 of the IF board(s) to check the BFO input. When an external BFO signal is being used, ensure that resistor R1 has been removed from the BFO distribution board. The signal level observed on the oscilloscope should be between 0.2 of 0.5 volts, peak-to-peak. If this level is not observed, check emitter followers Q1 and Q2 on the BFO board, and the BF oscillator Z1 or the external BFO input.

- e. Check the TTRR module following the procedures in the appropriate TTRR manual.

- f. Remove the TTRR module from the STR-5.

- g. Connect an RF signal generator to terminal 1 of the IF board(s) and adjust it to deliver a 30 uV signal, approximately, at 1750 kHz. This signal should be modulated when checking an AM type IF board. The 600 ohm audio line output on terminals 7, 8 and 9 on the IF board should be 0 dBm but may be set to other levels with audio pot R18(SSB) or R9(AM). If this level is not obtained, perform steps h and i.

- h. Apply a modulated, approximately 2 mV signal to terminal 1 of the IF board(s). Check for the presence of a signal at the following points to locate faulty components (refer to figures 7-5 and 7-6) using an oscilloscope. Connect the oscilloscope between ground and the check point.

1. Junction of R1 and pin 9 of T1.
2. Output of buffer amplifier Q1.
3. Pin 1 of IF amplifier U1.
4. Pin A of T2.
5. Pin 1 of IF amplifier U2.

6. Pin A of T3.
7. Junction of T3 and C20 (AM type IF board) or pin 1 of product detector U3 (SSB type IF board).
8. Pin 6 of product detector U3 (SSB).
9. Check for an audio signal at the wiper of R18(SSB) or R9(AM).

i. Check for 6 Vdc across CR1 and CR2(SSB) or CR1 and CR6(AM). If this voltage is not observed, check the respective diodes.

j. SSB. With no input to the IF board, check that the voltage at the collector of Q2 is between 1.8 and 2.5 Vdc. If this voltage level is not observed, check the AGC circuit for defective components.

AM. With no input to IF board, check that the voltages at the junction of R16 and CR2, and R22 and CR3 are more than 2.5 Vdc. If these voltages are not observed, check the AGC circuit for defective components.

5-4 REPAIR

In most cases, repair of the STR-5 will consist of replacement of an electrical component. The following precautions should be observed.

- a. Always replace a defective component with its exact duplicate.
- b. Always place a new component in the same position as the one it replaces. In general, never change the existing chassis layout, whether in the routing of wiring or component placement.
- c. Never use a soldering iron with a power rating of more than 100 watts. Use a pair of longnose pliers as a heat sink to protect components while soldering.
- d. Be extremely careful when replacing components on printed circuit boards as excessive heat applied to a board may cause the printed wiring to lift off.
- e. Always double check any solder joints made. Cold or loose solder connections can cause trouble at a later time.

5-5 ALIGNMENT

a. Disconnect external wiring from J11, but ensure that jumpers are connected between terminals 36 and 37 and between terminals 20 and 21. A jumper should also be connected between terminals 9 and 10, except for models STR-5A/U and STR-5A/L. For these models, jumpers should be connected between terminals 9 and 28, between terminals 10 and 29, and between terminals 11 and 31.

b. TTRR MODULE

1. Set C2, C4, C8, and C9 to mid position.
2. Set R7 in oven to mid position.
3. Turn R6 fully clockwise and then turn back ninety degrees.
4. Turn R2 fully counter clockwise, and then back ninety degrees.
5. Connect signal generator to Antenna input (J1).
6. Peak the signal, adjusting C2, C4, C8, and C9. Continue this adjustment decreasing the input signal level by stages until a 1uV (SSB), or 3uV input (AM), gives at least 0 Dbm audio output. (Meter connected to Pins 16 and 18 of J11).

c. SSB IF BOARD (A10669-5)

1. The transformer cores are factory adjusted and should not be moved.
2. The only other component to be adjusted is R18 (See para. 5-5, b, 6). Too much clockwise adjustment of this resistor may cause the audio amplifier (U4) to saturate, apparently deteriorating the AGC action.

d. AM IF BOARD (A10840-5)

1. The transformer cores are factory adjusted and should not be moved.
2. Audio output level is adjustable at R9. (Normally set about 45 degrees from counter clockwise position).
3. Variable resistors R20, and R25 control the RF, and IF AGC respectively. They should initially be set fully clockwise.
4. To ensure correct AGC action.
 - a) For 100 Db increase in input signal level (from 3uV to .3V) the audio output should increase by no more than 10 Db.

b) If the AGC is not functioning correctly.

- 1) Increase the signal generator input level by 10Db. Adjust R25 to obtain same audio output as for 3uV input level.
- 2) Decrease input level to 3uV. Change in audio output level should be less than 1Db.

3) Ensure AGC Mode switch set to channel 2. Increase input level to .3V.

4) Adjust R20 until audio output wave-form is seen to be a clean sine wave.

5) Change of input signal level from 3uV to .3V will now give only 10Db or less change in audio output level.

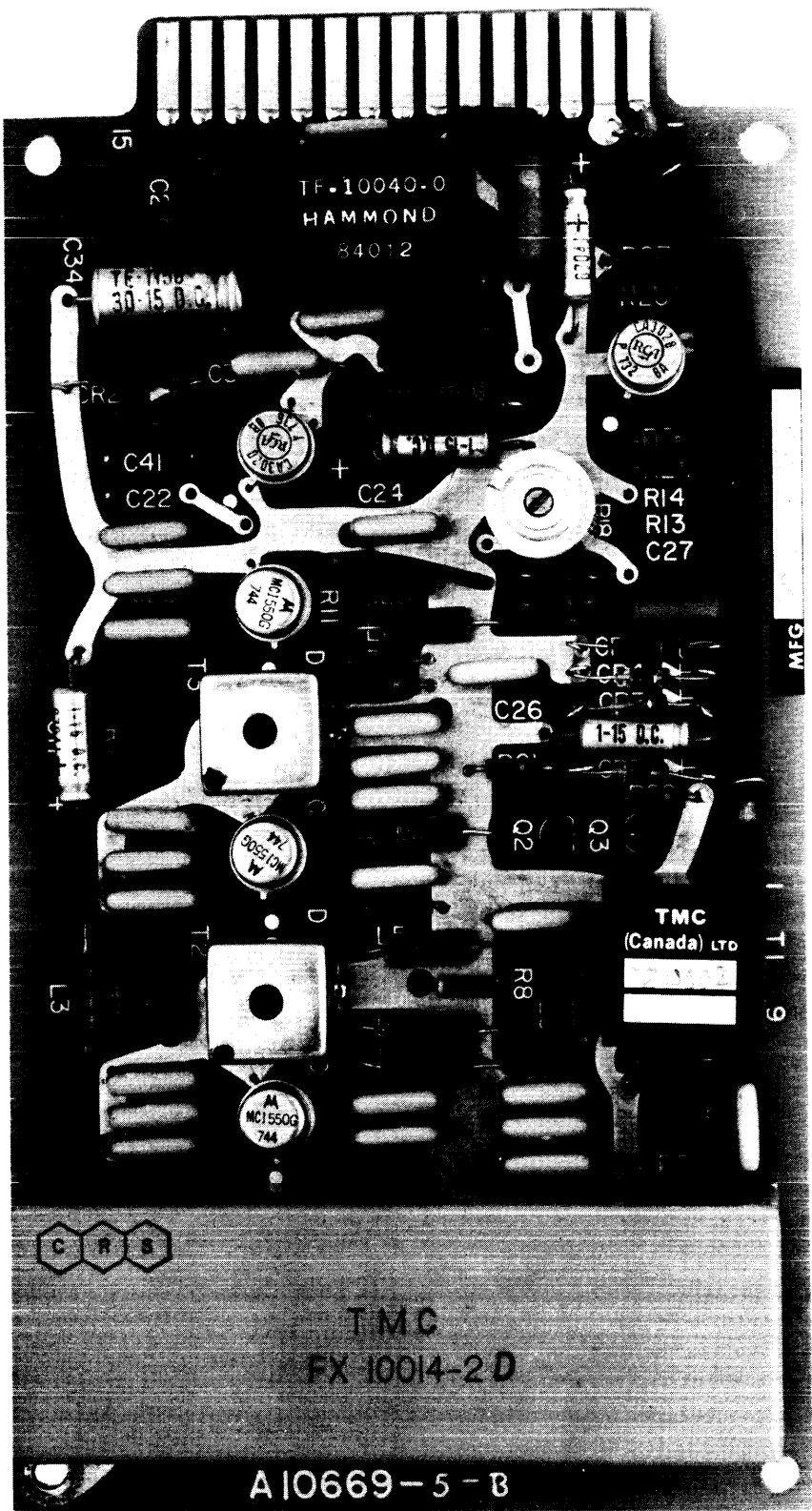


FIGURE 5-2. IF BOARD, SSB TYPE

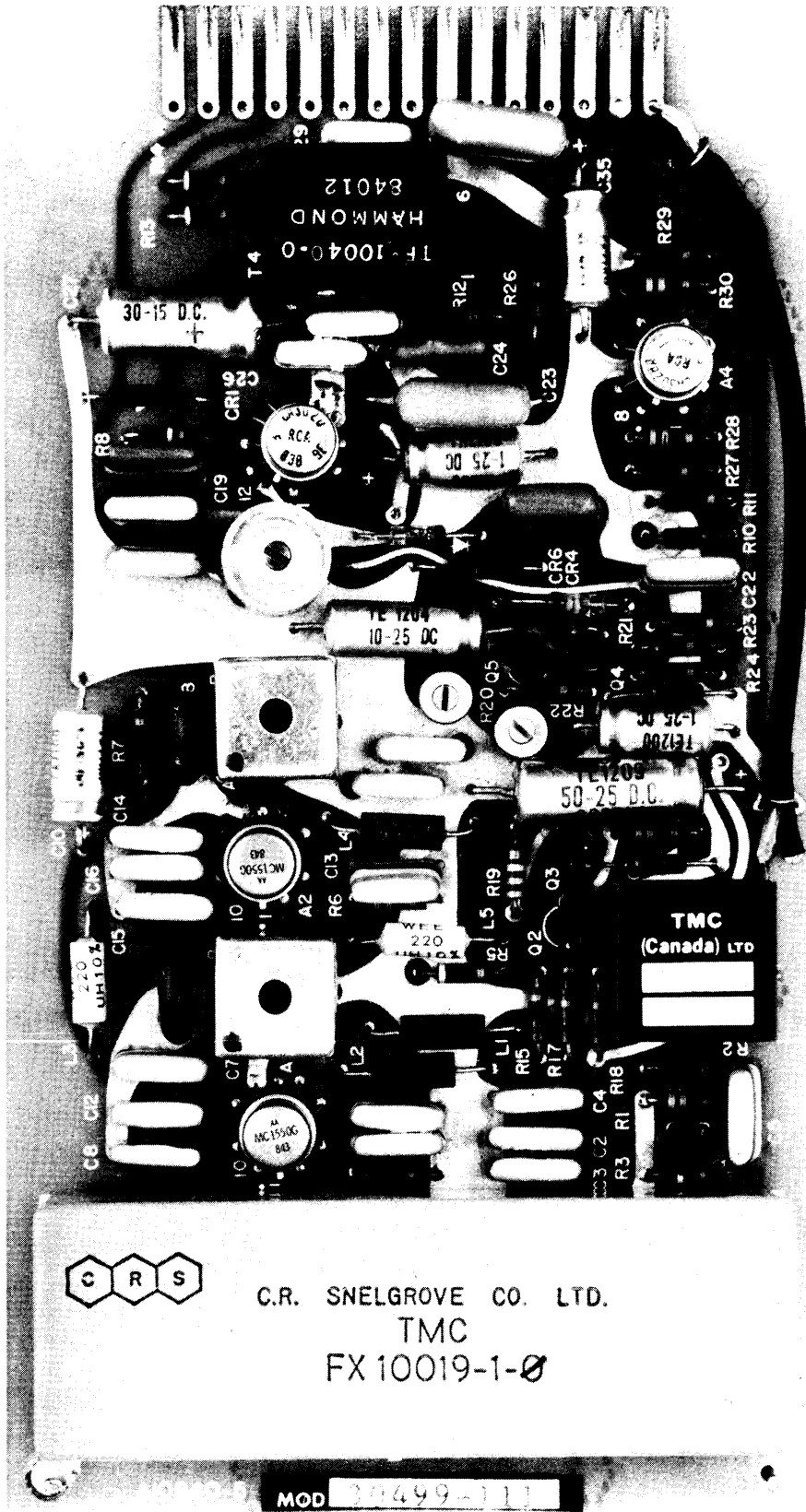


FIGURE 5-3. IF BOARD, AM TYPE

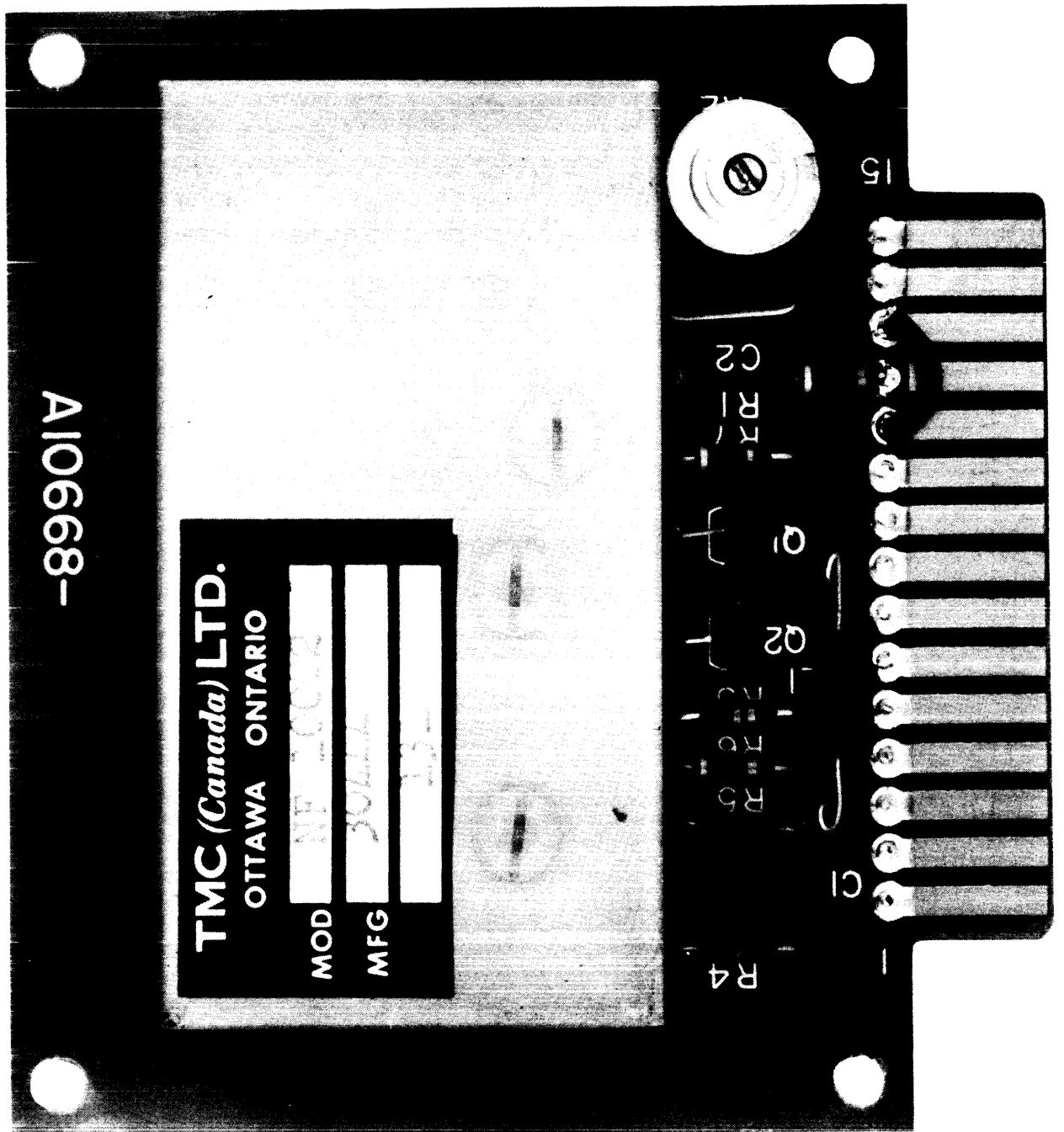


FIGURE 5-4. BFO DISTRIBUTION BOARD

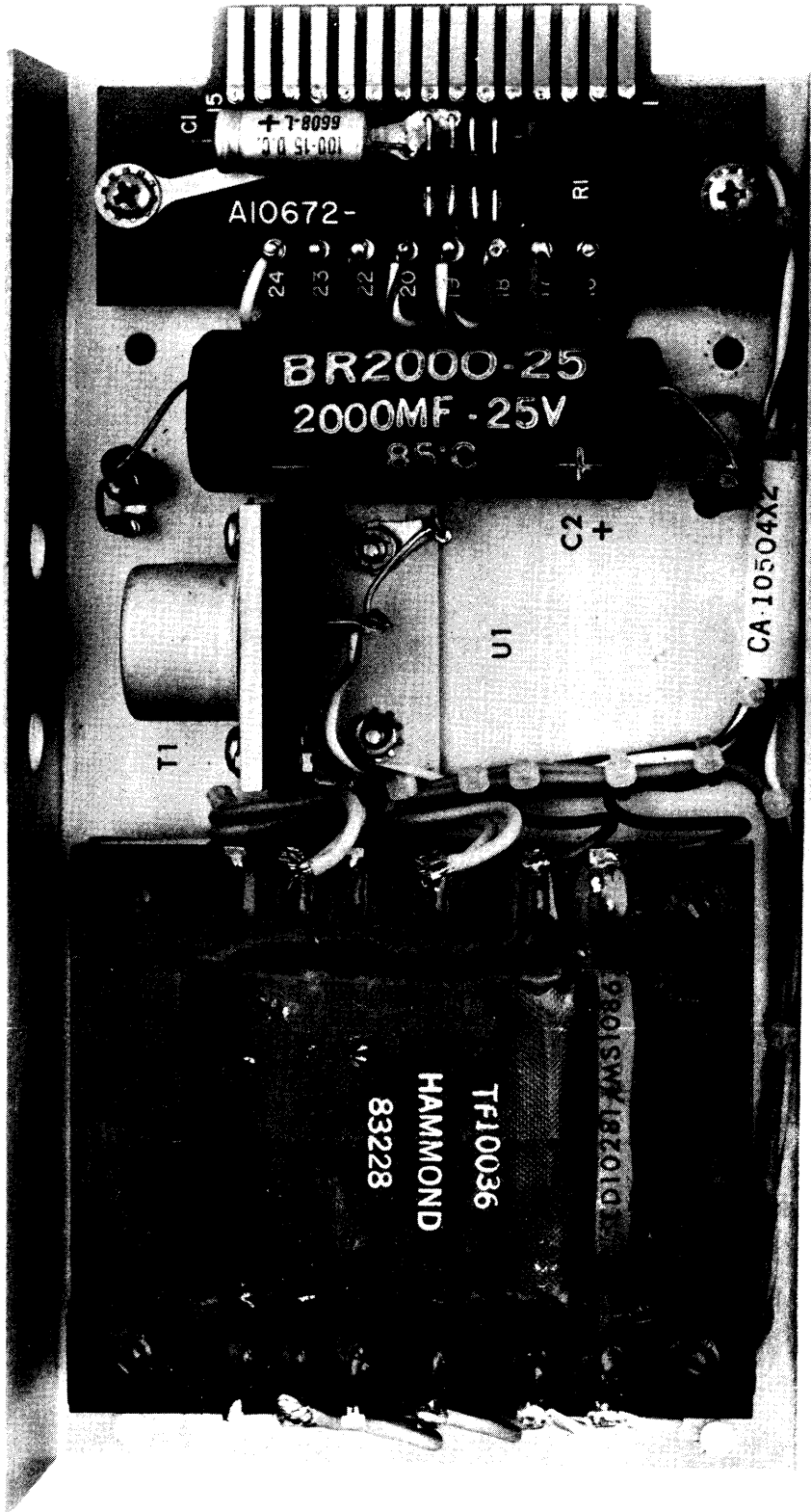


FIGURE 5-5. AC POWER SUPPLY BOARD

SECTION 6 PARTS LIST

6-1 INTRODUCTION

Reference designations have been assigned to identify all electrical parts of the equipment. These designations are used for marking the equipment (adjacent to the parts they identify) and are included on drawings, diagrams and the parts list. The letters of a reference designation indicate the kind of part (generic group), such as resistor, capacitor, transistor, etc. The number

differentiates between parts of the same generic group. Sockets associated with a particular plug-in device, such as transistor or fuse, are identified by a reference designation which includes the reference designation of the plug-in device. For example, the socket for crystal Y101 is designated XY101. To expedite delivery, when ordering replacement parts specify the TMC part number and the model number of the equipment.

MAIN CHASSIS ASSEMBLY

DESIGNATION	DESCRIPTION	TMC PART NUMBER
C1	CAPACITOR, FIXED, ELECTROLYTIC: 100 uf, 15 WVdc	CE 105-100-25
DS1	LAMP, INCANDESCENT: single contact, miniature T-1 3/4 bulb; 14.OVac or dc; 0.08 A; 750 hours life	BI110-6
F1	FUSE, CARTRIDGE: slow-blow; 1/8 A; for use with 208, 230 or 250 Vac power	FU102-.125
F1	FUSE, CARTRIDGE: slow-blow; 1/4 A, for use with 104, 115 or 125 Vac power	FU102-.250
F1	FUSE, CARTRIDGE: slow-blow: 2 A; for use with 12 Vdc power supply	FU102-2.00
F2	FUSE, CARTRIDGE: slow-blow: 3/4 A	FU102-.750
J1	CONNECTOR, BNC, BULKHEAD MOUNTING: 1 female connector; bayonet type	UG625/U
J2	Same as J1	
J3	Same as J1	
J4	CONNECTOR, RECEPTACLE, BOX MOUNTING: pin type contacts	MS3102A-14S-2P
J5	CONNECTOR, PC BOARD: 15 eyelet type contacts	JJ10010-015-01
J6	Same as J5	
J7	Same as J5	
J8	Same as J1	
J9	Same as J5	
J10	Same as J5	
J11	CONNECTOR, SUBMINIATURE: non-removeable contacts	PL10007-8
J12	JACK, TELEPHONE	JJ034
J13	Same as J1	
J14	Same as J1	
J15	Same as J12	
R1	RESISTOR, VARIABLE, COMPOSITION: 500 Kohms $\pm 10\%$	RV4NAYSA504A
S1	SWITCH, TOGGLE, SPST	ST12A
S2	SWITCH, ROTARY	SW10042

DESIGNATION	DESCRIPTION	TMC PART NUMBER
C1	CAPACITOR, FLAT, FOIL: 0.1 uF; 250 Vdc	CC10011-8
C2	CAPACITOR, FLAT, FOIL: 0.01 uF; 250 Vdc	CC10011-1
L1	COIL, RF, FIXED: 470 uH	CL275-471
Q1	TRANSISTOR	2N3904
Q2	Same as Q1	
R1	RESISTOR, FIXED, COMPOSITION: 2.2K ohms $\pm 5\%$; 1/4 watt	RC07GF222J
R2	RESISTOR, VARIABLE, COMPOSITION: 1Kohm $\pm 10\%$	RV111U102A
R3	RESISTOR, FIXED, COMPOSITION: 22 Kohms $\pm 5\%$; 1/4 watt	RC07GF223J
R4	RESISTOR, FIXED, COMPOSITION: 18 Kohms $\pm 5\%$; 1/4 watt	RC07GF183J
R5	Same as R4	
R6	RESISTOR, FIXED, COMPOSITION: 4.7 Kohms $\pm 5\%$; 1/4 watt	RC07GF472J
R7	Same as R6	
Z1	OSCILLATOR, CONTROL, TEMP., COMPENSATED: 12 Vdc reg. (max.) /10 mA	NF10002 *
	<p data-bbox="525 1402 931 1434">* a. NF10002 supplied as standard.</p> <p data-bbox="558 1465 1047 1528">b. NF10001 (not temperature compensated) supplied as option at customer request.</p> <p data-bbox="558 1560 1030 1623">c. Oscillator omitted for external BFO operation as option at customer request.</p>	

AC POWER SUPPLY

DESIGNATION	DESCRIPTION	TMC PART NUMBER
C1	CAPACITOR, FIXED, ELECTROLYTIC: 100 uF -10%, +150%; 15 WVdc	CE105-100-15
C2	CAPACITOR, FIXED, ELECTROLYTIC: 2000uf -10%, +150%; 150 WVDC	CE116-5VN
CR1	DIODE	1N4002
CR2	Same as CR1	
CR3	Same as CR1	
CR4	Same as CR1	
R1	RESISTOR, FIXED, COMPOSITION: 3.0 ohms $\pm 5\%$; 2 watts	RC32GF3ROJ
T1	TRANSFORMER, POWER	TF10036
U1	MODULE, REGULATOR	NW10002

DESIGNATION	DESCRIPTION	TMC PART NUMBER
CR1	DIODE	1N4002

DESIGNATION	DESCRIPTION	TMC PART NUMBER
C1	CAPACITOR, FLAT, FOIL: 0.1 μ F; 250 Vdc	CC10011-8
C2	CAPACITOR, FLAT, FOIL: 0.047 μ F; 250 WVdc	CC10011-5
C3	Same as C2	
C4	Same as C2	
C5	Same as C2	
C6	Same as C2	
C7	Same as C2	
C8	Same as C2	
C9	Same as C2	
C10	CAPACITOR, FIXED, MICA: 180 pF $\pm 5\%$; 100 WVdc	CM111E181J1S
C11	CAPACITOR, FIXED, ELECTROLYTIC: 1 μ F, -10% $\pm 150\%$; 15 WVdc	CE105-1-15
C12	Same as C2	
C13	Same as C2	
C14	Same as C2	
C15	Same as C2	
C16	Same as C2	
C17	Same as C2	
C18	Same as C2	
C19	Same as C2	
C20	Same as C2	
C21	Same as C10	
C22	Not used	
C23	Same as C2	
C24	Same as C2	
C25	CAPACITOR, FLAT, FOIL: 0.01 μ F; 250 WVdc	CC10011-1

DESIGNATION	DESCRIPTION	TMC PART NUMBER
C26	Same as C2	
C27	Not used	
C28	Same as C2	
C29	CAPACITOR, FLAT, FOIL: 0.22 uF; 250 WVdc	CC10011-10
C30	Same as C2	
C31	Same as C29	
C32	Same as C25	
C33	Same as C11	
C34	CAPACITOR, FIXED, ELECTROLYTIC: 30 uF, -10% +150%; 15 WVdc	CE105-30-15
C35	Same as C2	
C36	Same as C2	
C37	Same as C2	
C38	Same as C11	
C39	Same as C1	
C40	Same as C11	
C41	Not used	
C42	Same as C29	
CR1	DIODE	1N753A
CR2	Same as CR1	
CR3	DIODE	1N34A
CR4	Same as CR3	
CR5	Same as CR3	
FL1	FILTER: 1750.300 to 1753.000 kHz bandwidth	FX10014-1 *
FL2	FILTER: 1747.000 to 1749.700 kHz bandwidth	FX10014-2 *
L1	COIL, RF, FIXED: 1000uH	CL275-102
	* Subject to customer requirement	

DESIGNATION	DESCRIPTION	TMC PART NUMBER
L2	Same as L1	
L3	COIL, RF, FIXED: 220 uH	CL275-221
L4	Same as L1	
L5	Same as L3	
L6	COIL, RF, FIXED: 100 uH	CL275-100
Q1	TRANSISTOR	MPF105
Q2	TRANSISTOR	2N3906
Q3	Same as Q1	
R1	RESISTOR, FIXED, COMPOSITION: 3.3 Kohms $\pm 5\%$; 1/4 watt	RC07GF332J
R2	RESISTOR, FIXED, COMPOSITION: 390 ohms $\pm 5\%$; 1/4 watt	RC07GF391J
R3	RESISTOR, FIXED, COMPOSITION: 510 ohms $\pm 5\%$; 1/4 watt	RC07GF511J
R4	RESISTOR, FIXED, COMPOSITION: 100 ohms -5% ; 1/4 watt	RC07GF101J
R5	RESISTOR, FIXED, COMPOSITION: 5.6 K ohms $\pm 5\%$; 1/4 watt	RC07GF562J
R6	RESISTOR, FIXED, COMPOSITION: 33 ohms $\pm 5\%$; 1/4 watt	RC07GF330J
R7	Same as R5	
R8	RESISTOR, FIXED, COMPOSITION: 470 ohms $\pm 5\%$; 1/4 watt	RC07GF471J
R9	RESISTOR, FIXED, COMPOSITION: 68 ohms $\pm 5\%$; 1/4 watt	RC07GF680J
R10	RESISTOR, FIXED, COMPOSITION: 12 ohms $\pm 5\%$; 1/4 watt	RC07GF120J
R11	Not used	
R12	RESISTOR, FIXED, COMPOSITION: 1.8K ohms $\pm 5\%$; 1/4 watt	RC07GF182J

DESIGNATION	DESCRIPTION	TMC PART NUMBER
R13	Not used	
R14	Not used	
R15	RESISTOR, FIXED, COMPOSITION: 82 ohms $\pm 5\%$; 1/4 watt	RC07GF820J
R16	RESISTOR, FIXED, COMPOSITION: 510K ohms $\pm 5\%$; 1/4 watt	RC07GF514J
R17	Not used	
R18	RESISTOR, VARIABLE, COMPOSITION: 5K ohms $\pm 10\%$; 1/4 watt at 70°C	RV111U502A
R19	RESISTOR, FIXED, COMPOSITION: 4.7K ohms $\pm 5\%$; 1/4 watt	RC07GF472J
R20	Same as R19	
R21	Same as R3	
R22	RESISTOR, FIXED, COMPOSITION: 1 Mohm $\pm 5\%$; 1/4 watt	RC07GF105J
R23	Same as R5	
R24	RESISTOR, FIXED, COMPOSITION: 2.2K ohms $\pm 5\%$; 1/4 watt	RC07GF222J
R25	Same as R1	
R26	Same as R1	
R27	RESISTOR, FIXED, COMPOSITION: 2.7K ohms $\pm 5\%$; 1/4 watt	RC07GF272J
R28	RESISTOR, FIXED, COMPOSITION: 18 ohms $\pm 5\%$; 1/4 watt	RC07GF180J
R29	Same as R4	
R30	Same as R22	
T1	TRANSFORMER, RF, FIXED	TZ10002
T2	TRANSFORMER, RF	TT10003
T3	Same as T2	

DESIGNATION	DESCRIPTION	TMC PART NUMBER
T4	TRANSFORMER, AF	TF10040
U1	INTEGRATED CIRCUIT	NW-MC1550
U2	Same as U1	
U3	Same as U1	
U4	INTEGRATED CIRCUIT	NW-CA3020
U5	INTEGRATED CIRCUIT	NW-CA3028

DESIGNATION	DESCRIPTION	TMC PART NUMBER
C1	CAPACITOR, FLAT, FOIL: 0.22 uF; 250 Vdc	CC10011-10
C2	CAPACITOR, FLAT, FOIL: 0.047 uF; 250 Vdc	CC10011-5
C3	Same as C2	
C4	Same as C2	
C5	Same as C2	
C6	Same as C2	
C7	Same as C2	
C8	Same as C2	
C9	Same as C2	
C10	CAPACITOR, FIXED, ELECTROLYTIC: 1 uF, -10% + 150%; 15 WVdc	CE105-1-15
C11	CAPACITOR, FIXED, MICA: 180 pF \pm 5%; 100 WVdc	CM111E181J1S
C12	Same as C2	
C13	Same as C2	
C14	Same as C2	
C15	Same as C2	
C16	Same as C2	
C17	Same as C2	
C18	Same as C11	
C19	CAPACITOR, FLAT, FOIL: 0.01 uF; 250 Vdc	CC10011-1
C20	Same as C2	
C21	Same as C2	
C22	Same as C2	
C23	CAPACITOR, FLAT, FOIL: 0.22 uF; 250 Vdc	CC10011-10
C24	Same as C19	
C25	Same as C10	
C26	Same as C2	

DESIGNATION	DESCRIPTION	TMC PART NUMBER
C27	CAPACITOR, FIXED, ELECTROLYTIC: 30 uF, -10%, +150%; 15 WVdc	CE105-30-15
C28	Same as C2	
C29	Same as C2	
C30	CAPACITOR, FIXED, ELECTROLYTIC: 50 uF, -10%, +150%; 25 WVdc	CE105-50-25
C31	Same as C10	
C32	CAPACITOR, FIXED, ELECTROLYTIC: 10 uF, -10%, +150\$, 25 WVdc	CE105-10-25
C33	Same as C1	
C34	Same as C2	
C35	Same as C10	
CR1	DIODE	1N753A
CR2	DIODE	1N4370
CR3	Same as CR2	
CR4	DIODE	1N34
CR5	Same as CR4	
CR6	Same as CR1	
FL1	FILTER, AM, 4 POLE: 1750 kHz carrier; 6 kHz nominal bandwidth	FX10019-1*
L1	COIL, RF, FIXED: 100 uH	CL275-102
L2	Same as L1	
L3	COIL, RF, FIXED: 220 uH	CL275-221
L4	Same as L1	
L5	Same as L3	
Q1	TRANSISTOR	MPF105
Q2	TRANSISTOR	2N3906

* A 4 pole filter (FX10019-1) is supplied as standard; however, an 8 pole filter (FX10019-2) will be supplied instead when requested.

DESIGNATION	DESCRIPTION	TMC PART NUMBER
Q3	Same as Q1	
Q4	Same as Q2	
Q5	Same as Q1	
R1	RESISTOR, FIXED, COMPOSITION: $\pm 5\%$, 1/4 watt	3.3 Kohms RC07GF332J
R2	RESISTOR, FIXED, COMPOSITION: $\pm 5\%$; 1/4 watt	510 ohms RC07GF511J
R3	RESISTOR, FIXED, COMPOSITION: $\pm 5\%$; 1/4 watt	390 ohms RC07GF391J
R4	RESISTOR, FIXED, COMPOSITION: $\pm 5\%$; 1/4 watt	100 ohms RC07GF101J
R5	RESISTOR, FIXED, COMPOSITION: $\pm 5\%$; 1/4 watt	470 ohms RC07GF471J
R6	RESISTOR, FIXED, COMPOSITION: $\pm 5\%$; 1/4 watt	33 ohms RC07GF330J
R7	RESISTOR, FIXED, COMPOSITION: $\pm 5\%$; 1/4 watt	8.2 Kohms RC07GF822J
R8	RESISTOR, VARIABLE, COMPOSITION: $\pm 5\%$; 1/4 watt	510 Kohms RC07GF514J
R9	RESISTOR, FIXED, COMPOSITION: $\pm 10\%$; 1/4 watt at 70°C	5 Kohms RV111U502A
R10	RESISTOR, FIXED, COMPOSITION: $\pm 5\%$; 1/4 watt	1.5 Kohms RC07GF152J
R11	RESISTOR, FIXED, COMPOSITION: $\pm 5\%$; 1/4 watt	56 ohms RC07GF560J
R12	RESISTOR, FIXED, COMPOSITION: $\pm 5\%$; 1/4 watt	82 ohms RC07GF820J
R13	RESISTOR, FIXED, COMPOSITION: $\pm 5\%$, 1/4 watt	4.7 ohms RC07GF472J
R14	Same as R13	
R15	RESISTOR, FIXED, COMPOSITION: $\pm 5\%$; 1/4 watt	18 ohms RC07GF180J
R16	Same as R1	

DESIGNATION	DESCRIPTION	TMC PART NUMBER
R17	Same as R4	
R18	RESISTOR, FIXED, COMPOSITION: 820 ohms ± 5%; 1/4 watt	RC07GF821J
R19	RESISTOR, FIXED, COMPOSITION: 330 Kohms ± 5%; 1/4 watt	RC07GF334J
R20	RESISTOR, VARIABLE: 50 Kohms	RV10007-13
R21	Same as R12	
R22	RESISTOR, FIXED, COMPOSITION: 2.7 Kohms ± 5%; 1/4 watt	RC07GF272J
R23	Same as R4	
R24	Same as R18	
R25	Same as R20	
R26	RESISTOR, FIXED, COMPOSITION: 5.6 Kohms ± 5%; 1/4 watt	RC07GF562J
R27	RESISTOR, FIXED, COMPOSITION: 2.2 Kohms ± 5%; 1/4 watt	RC07GF222J
R28	Same as R1	
R29	Same as R22	
R30	Same as R1	
T1	TRANSFORMER, RF, FIXED	TZ10002
T2	TRANSFORMER, RF, FIXED	TT10004
T3	Same as T2	
T4	TRANSFORMER, AF	TF10040
U1	INTEGRATED CIRCUIT	NW-MC1550
U2	Same as U1	
U3	INTEGRATED CIRCUIT	NW-CA3020
U4	INTEGRATED CIRCUIT NW-CA3028	

SECTION 7
SCHEMATIC DIAGRAMS

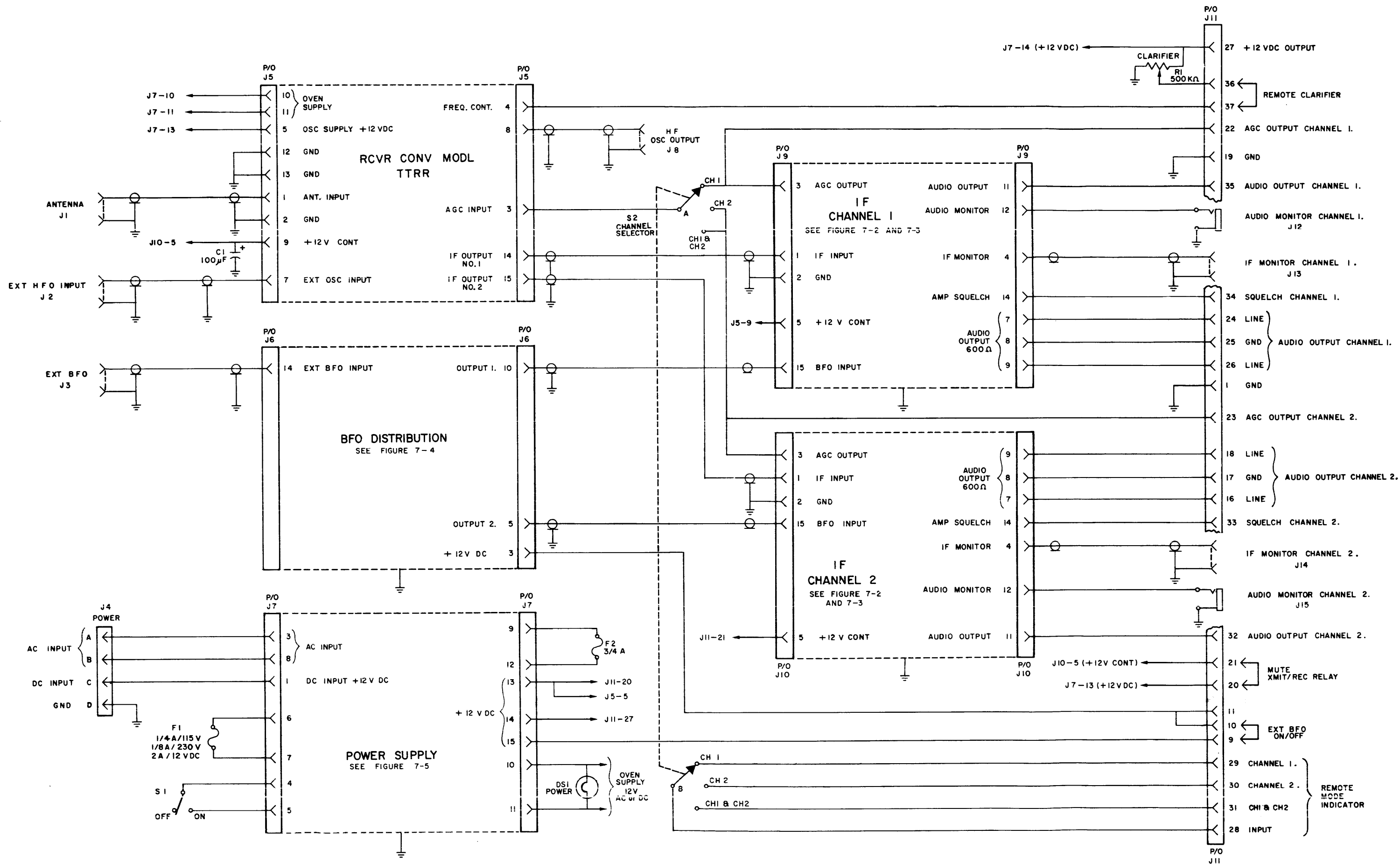
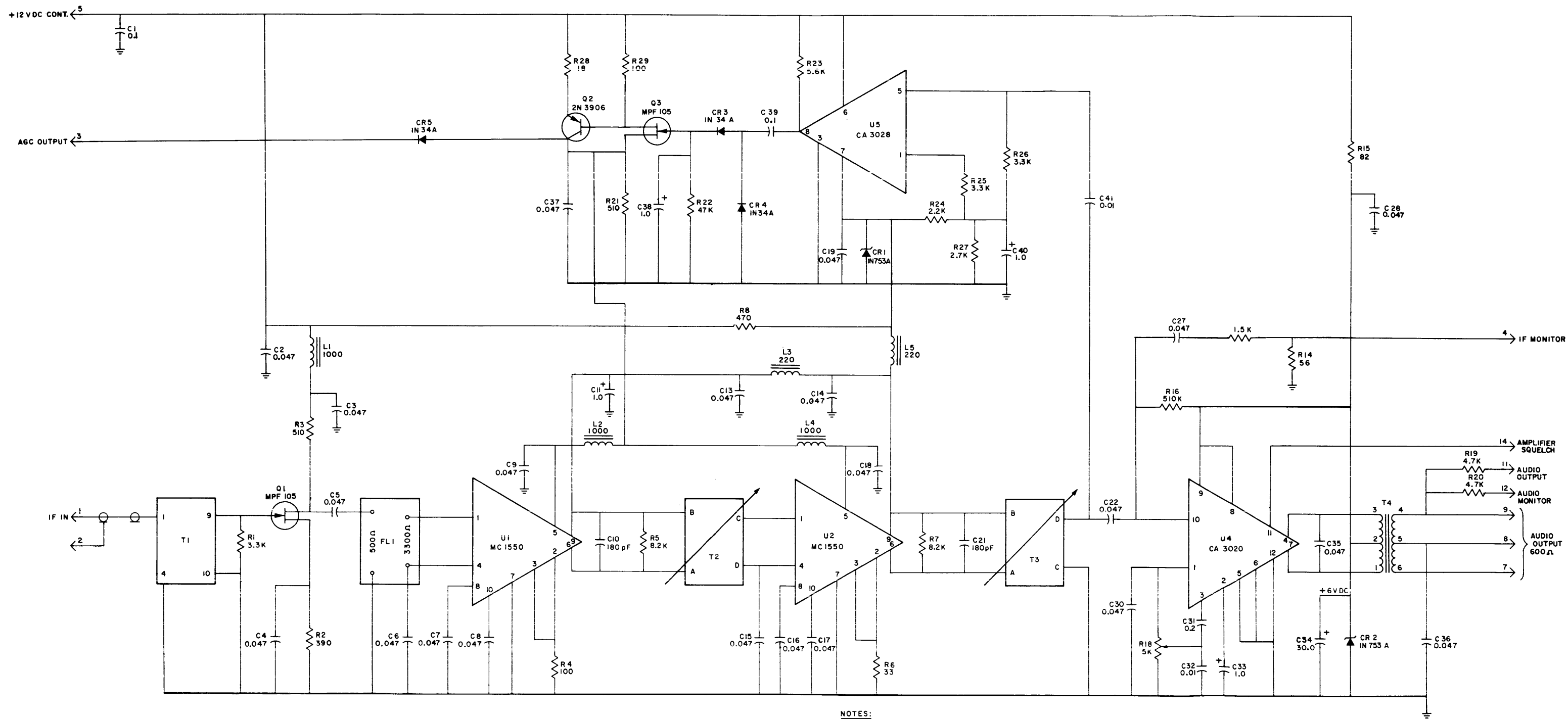
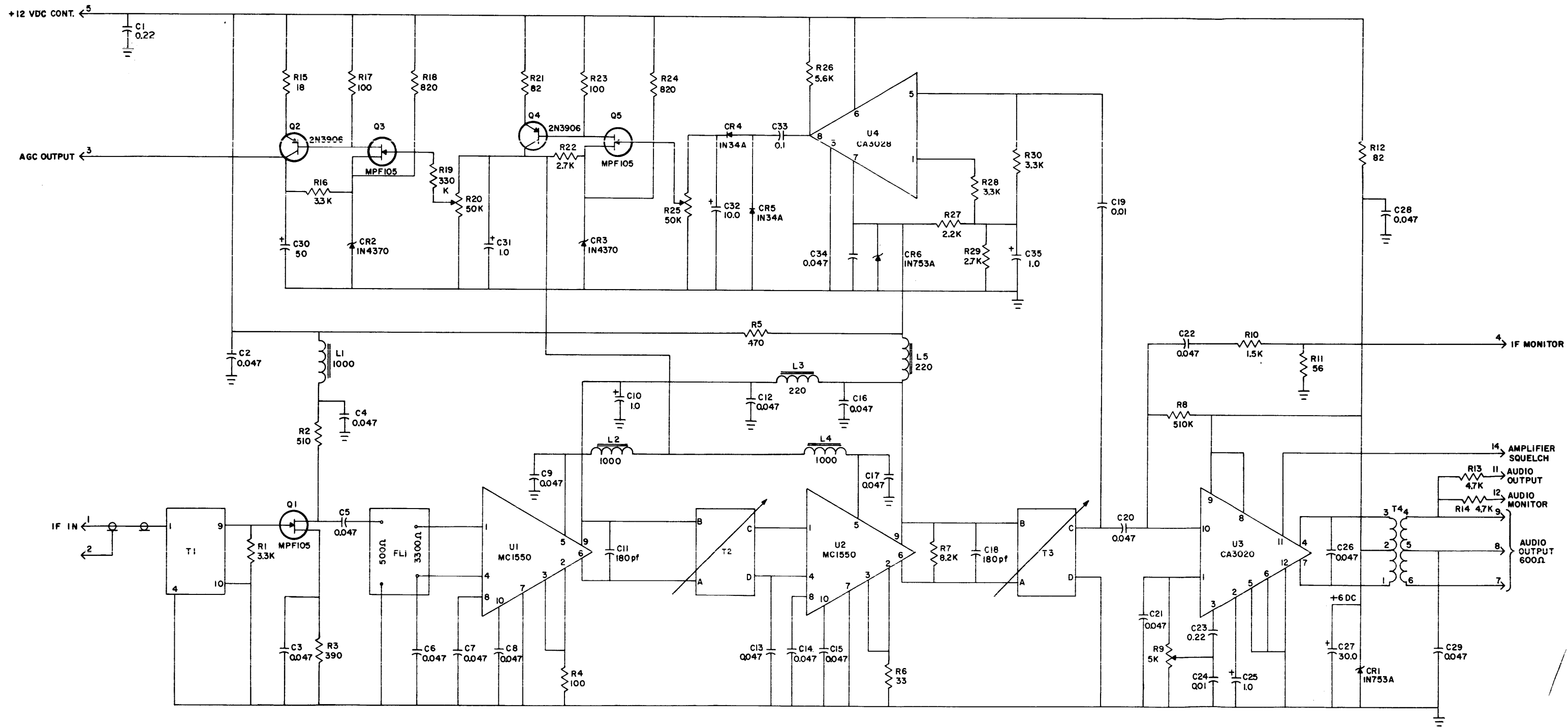


FIGURE 7-1. SCHEMATIC DIAGRAM, STR-5



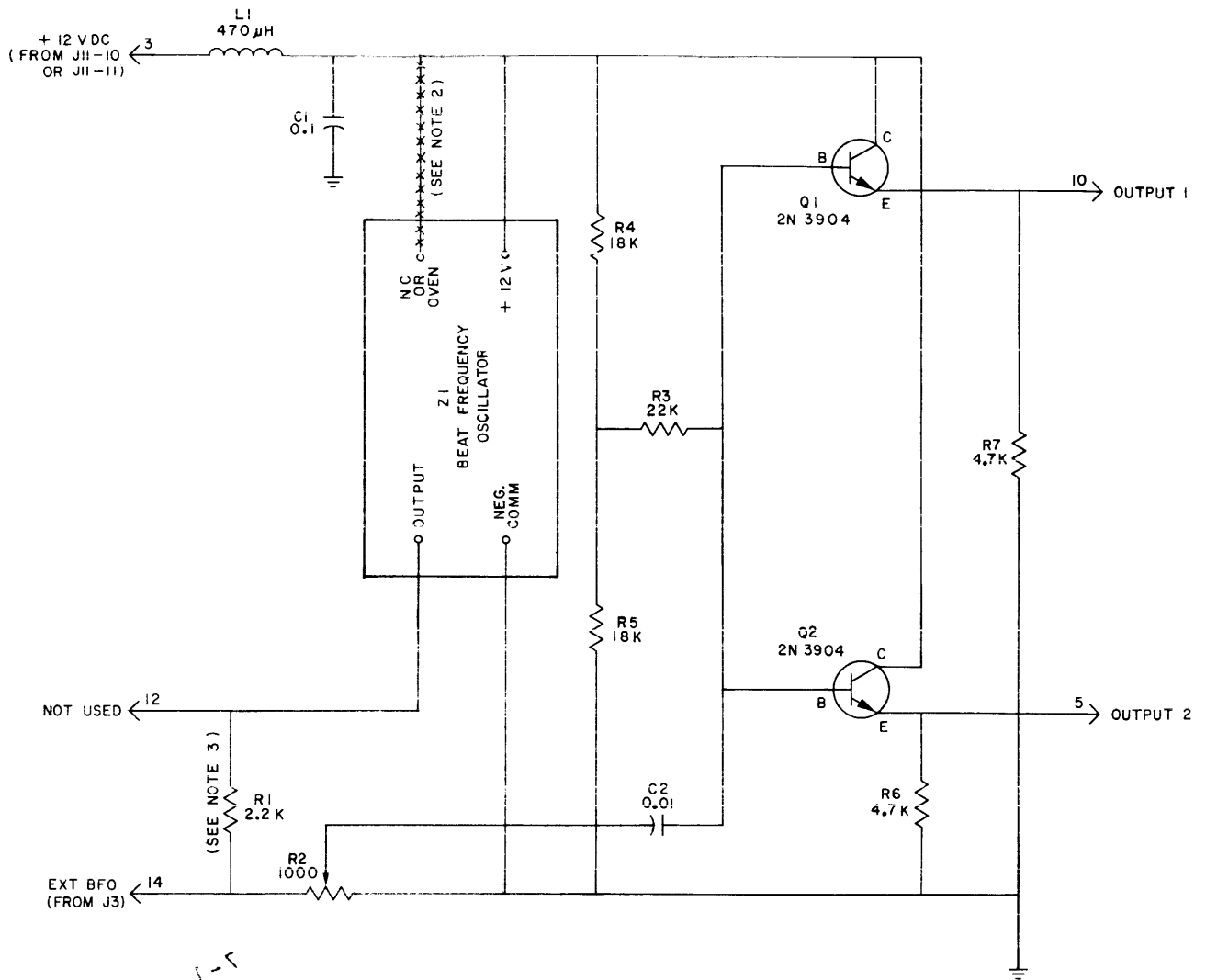
NOTES:
 UNLESS OTHERWISE STATED;
 RESISTANCES IN OHMS, 0.25 WATTS.
 CAPACITANCES IN μ F.
 INDUCTANCES IN μ H.

FIGURE 7-2. SCHEMATIC DIAGRAM, SSB TYPE IF BOARD, STR-5



NOTES
 UNLESS OTHERWISE STATED:
 RESISTANCE IN OHMS · 0.25 WATTS
 CAPACITANCE IN μ F
 INDUCTANCE IN μ H

FIGURE 7-3 SCHEMATIC DIAGRAM, AM IF BOARD, STR-5



NOTES:

1. UNLESS OTHERWISE STATED ;
ALL RESISTORS IN OHMS 1/4 WATT
ALL CAPACITORS IN μ F
2. ADD BUMPER WHEN USING NF10002-2
3. FOR EXTERNAL BFO REMOVE RESISTOR R1 (2.2K)

FIGURE 7-4. SCHEMATIC DIAGRAM, BFO DISTRIBUTION BOARD, STR-5

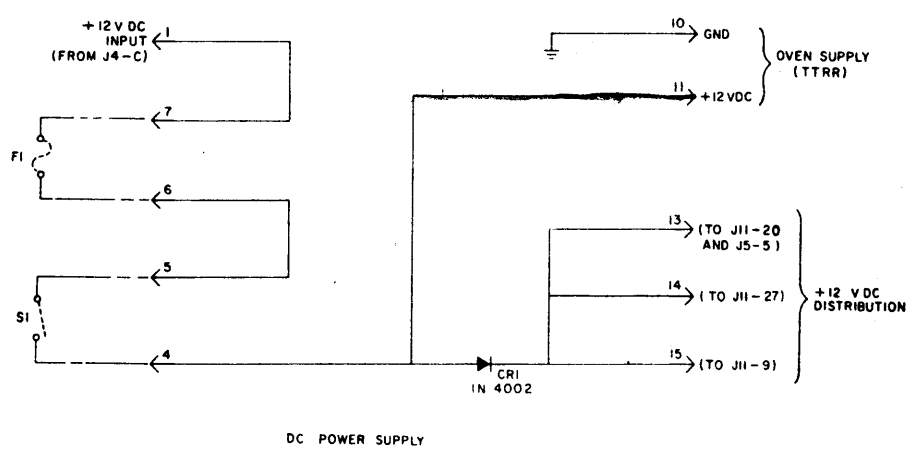
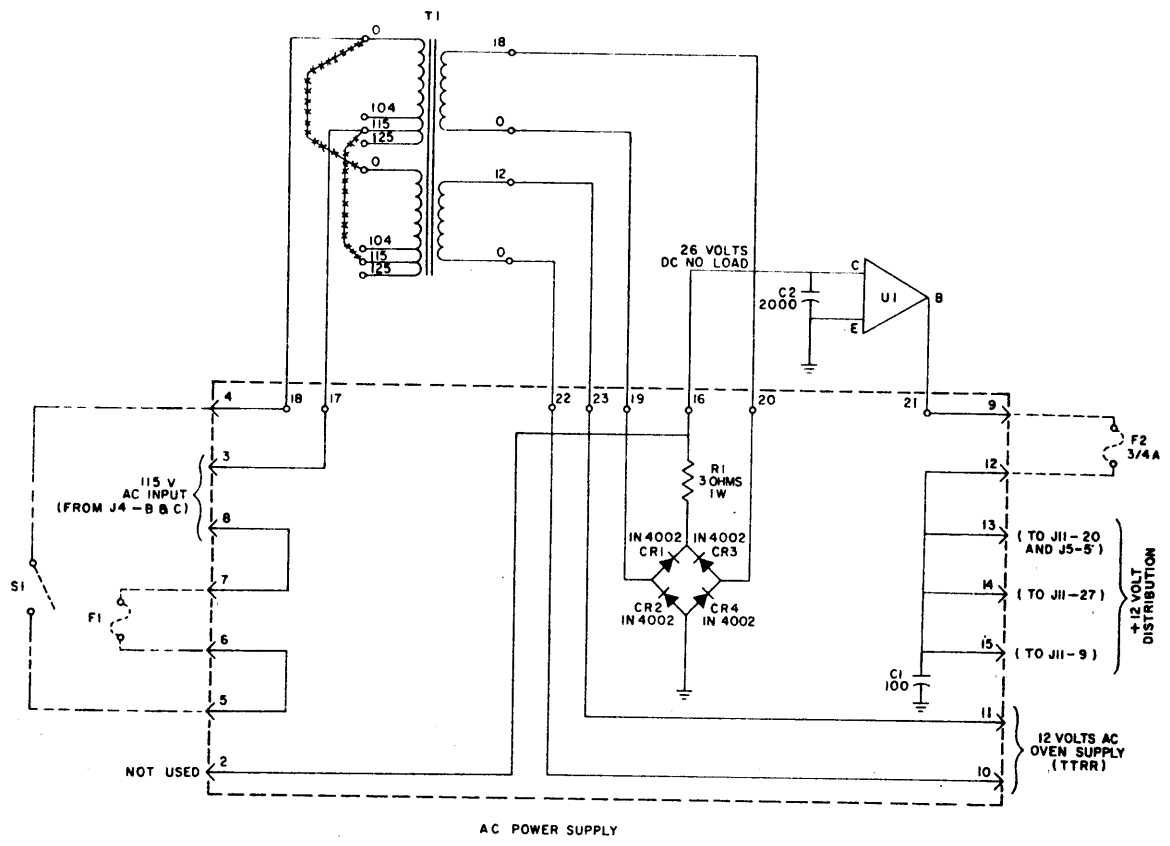


FIGURE 7-5. SCHEMATIC DIAGRAM, POWER SUPPLIES, STR-5