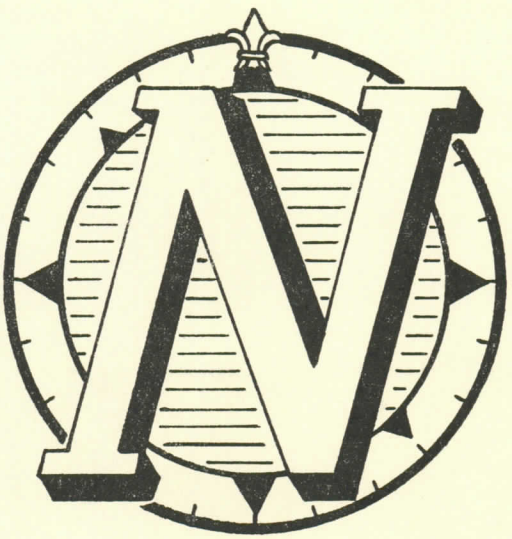


INSTRUCTION BOOK

FOR

200 KC MONITOR AMPLIFIER

NRC 752

TABLE OF CONTENTS

2-10-60 ps

1. PURPOSE

Northern Radio Company 200 KC Monitor Amplifier (NRC 752) is a "plug-in" accessory designed for use with the Northern Radio Type 105 Frequency Shift Keyers, to provide a means of monitoring the output of the 200 KC oscillator.

2. INSTALLATION

Installation of the NRC 752 is very simple. The Oven Cable of the Type 105 Keyer is disconnected by removing Plug P101 from Socket J101 at the rear of the Keyer. The lower screw holding the Oven Cable Bracket to the Oven is removed and the NRC 752 Monitor Amplifier is then plugged into Socket J101 of the Type 105 Keyer. The Monitor Amplifier is mechanically secured to the Type 105 Keyer by replacing the oven cable bracket screw through the hole in the lug on the side of the NRC 752. Plug P101 of the Type 105 Keyer is inserted into Socket J201 of the NRC 752 Amplifier and the mechanical installation is completed.

3. PRINCIPLE OF OPERATION

(Reference Schematic Diagram, Dwg. No. B-9-0081)

As may be noted on Dwg. No. B-9-0081, all terminals of Plug P201 are strapped to corresponding numbered terminals of Socket J201. Thus all of the original connections effected by Plug P101 and Socket J101 of the Type 105 Keyer are now made through the NRC 752 Monitor Amplifier. Therefore, the Keyer will continue to function in its original intended manner.

The 200 KC Monitor Amplifier consists of a two stage transistor amplifier having a high impedance input. The high impedance is obtained by using a very small input coupling capacitance (capacitor C201) and by using an "emitter-follower" input circuit. Capacitor C201 is connected to pin 5 of Plug P201 to pick up the 200 KC input signal for the amplifier. "Loading" of the 200 KC oscillator is quite small. However, Capacitor C202 and Resistor R207 are connected to the 200 KC output (Pin 4 of Plug P201) to insure balanced loading of the oscillator circuit. Transistor Q201 is connected as an "emitter-follower" amplifier feeding

the base circuit of Transistor Q202. Transformer T201 in the collector circuit of Transistor Q202 is provided for proper impedance matching of the output signal to a 100 ohm load. Normal output of the Monitor Amplifier is of the order of one volt rms across a 100 ohm load. Operating power for the Monitor Amplifier is derived from the +105 volt DC "plate" voltage available at Pin 2 of Plug P201, through voltage dropping resistor R201 and "shunt regulating" zener diode CR201. Approximately 15 volts DC is supplied to the transistors.

4. MAINTENANCE

(Reference to Dwgs. No. B-9-0081 and A-9-0087)

Since the Amplifier employs long-life reliable semi-conductor elements and since little heat is generated in the operating device it is anticipated that manitenance requirements will be minimized. In the event of malfunction the cover of the unit may be removed and voltage measurements of appropriate circuit points may be made most easily by connecting one voltmeter probe to the shell of the Zener diode as the transistor circuit "Common" point and touching the wireleads of appropriate components on the etched circuit board with the other voltmeter probe. Drawing No. A-9-0087 is a layout drawing indicating the physical location of all components on the etched circuit board. Use of this drawing in connection with the Schematic Drawing No. B-9-0081 and the Table of Circuit Voltages will serve to quickly localize any troubles.

In the infrequent instances when it is necessary to replace components on the etched circuit board, it is highly desirable that an appropriate small soldering iron with limited heat storage be employed.

5. TABLE OF CIRCUIT VOLTAGES

Transistor Element	Measurement Point	Voltage
Q201 Base	Junction R202 - R203	-1.5 ± 0.4 V
Q201 Collector	Chassis Ground	-15 ± 3 V
Q201 Emitter-Q202 Base	Junction R204-Q202 Base	-1.4 ± 0.4 V
Q202 Emitter	Junction R205-Q202 Emitter	-1.25 ± 0.4 V
Q202 Collector	Black lead of T1	-14.5 ± 3 V

RF Output Voltage at J2 0.5 V RMS minimum across 100 ohm load.

6. ELECTRICAL PARTS LIST

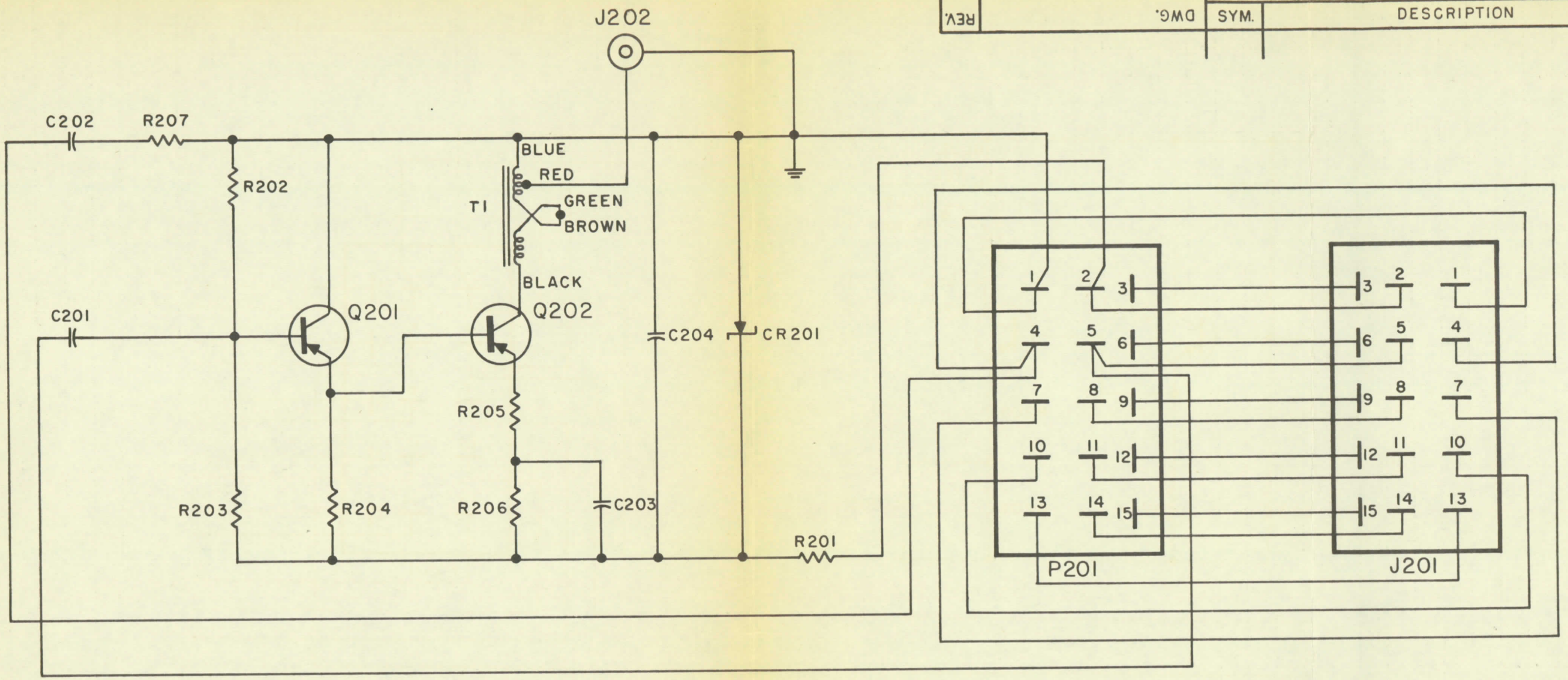
Symbol	Function	Description	Mfr.	Part No.
C201	Input coupling capacitor	10 mmf ± 1 mmf 500 V mica capacitor	SAN	RR 1410
C202	Input balancing capacitor	10 mmf ± 1 mmf 500 V mica capacitor	SAN	RR 1410
C203	Q202 emitter bypass capacitor	0.1 mfd 50 V ceramic capacitor	SPR	TG-P10
C204	Power supply bypass capacitor	0.1 mfd 50 V ceramic capacitor	SPR	TG-P10
CR201	Voltage regulator diode	15 V ± 20% 3/4 watt zener diode	MOT	3/4M15Z
J201	Oven connector	Female connector - 15 contact	HBJ	S-315-AB
J202	200KC monitor output	Female connector - UHF 1 contact	AMP	83-1R
P201	Chassis connector	Male connector - 15 contact	HBJ	P-315EB
Q201	1st amplifier	General purpose germanium transistor high gain 250 milliampere, 200 milliwatt, PNP	MOT	2N652
Q202	2nd amplifier	General purpose germanium transistor high gain 250 milliampere, 200 milliwatt, PNP	MOT	2N652
R201	DC power supply dropping resistor	12K ohms ± 10% 2 watts composition resistor	ALB	HB 1231
R202	Q201 base series resistor	68K ohms ± 10% ½ watt composition resistor	ALB	EB 6831
R203	Q201 base shunt resistor	6.8K ohms ± 10% ½ watt composition resistor	ALB	EB 6821
R204	Q201 emitter resistor	2.2K ohms ± 10% ½ watt composition resistor	ALB	EB 2221
R205	Q202 emitter resistor	150 ohms ± 10% ½ watt composition resistor	ALB	EB 1511

Symbol	Function	Description	Mfr.	Part No.
R206	Q202 emitter stabilizing resistor	150 ohms ± 10% ½ watt composition resistor	ALB	EB 1511
R207	Input balancing resistor	6.8K ohms ± 10% ½ watt composition resistor	ALB	EB 6821
T201	Output transformer	500CT/600	UTC	DO-T-20

MANUFACTURERS' DESIGNATIONS

ALB	Allen Bradley Company
AMP	American Phenolic Corporation
HBJ	Howard B. Jones Division, Cinch Manufacturing Company
MOT	Motorola Semiconductor Prod. Division
SAN	Sangamo Electric Company
SPR	Sprague Electric Company
UTC	United Transformer Company

REV.	DWG. No.	REVISIONS SYM.	DESCRIPTION	DAT



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FINISH:	ENGINEER		
	APPROVAL JH	1/12/60	SCALE: NONE SHEET 1 OF 1 DWG. SIZE B

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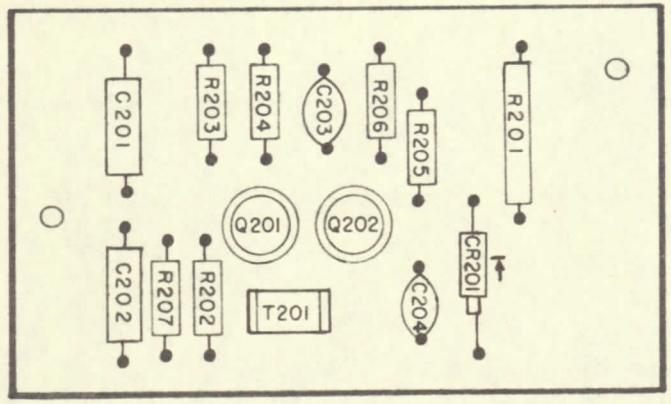

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MATERIAL:	CHECKER		
FINISH:	ENGINEER		
	APPROVAL JF	1-18-60	

NORTHERN RADIO COMPANY
INCORPORATED
143-147 WEST 22ND ST. N.Y. 11
NEW YORK

DWG. No. 9-0087

SCALE: NONE | SH. 1 OF 1 | DWG. SIZE A