THE

RME

MODEL DB-22A

RADIO FREQUENCY AMPLIFIER AND PRESELECTOR

OPERATING and SERVICE MANUAL

RADIO MFG. ENGINEERS, INC.
PEORIA 6, ILLINOIS

OPERATING INSTRUCTIONS FOR THE RME MODEL DB-22A PRESELECTOR

SECTION I

General Description

1.1 Introduction

The Model DB-22A R. F. amplifier and Preselector has been designed to perform several valuable functions in communication work. These functions are as follows:

A. To increase the total amount of R.F. gain available in a receiving equipment.

B. To reduce the side channel interference.

C. By virtue of its several selective circuits to reduce the image interference normally present in regular on and two stage R.F. superheterodyne receivers using relatively low intermediate frequency (i.e. 455 kc or thereabouts).

D. To increase, somewhat, the signal to noise ratio in a receiving system.

The DB-22A provides these functions and does so smoothly and in a stable manner. A collateral function which is many times of importance is the isolation provided between the antenna and the associated receiver. This isolation results in greatly reduced radiation by the receiver of its local oscillator energy and, consequently, provides a means of greatly reducing interference between receivers operating in close proximity where such interference is normally caused by receiver oscillator energy reaching the antenna connected to the receiver.

1.2 Specifications

Power Supply: 115 Volts, 50-60 Cycles.
Power Consumption: 10 Watts
Input Impedance: 300 ohms
Output Impedance: 300 ohms
Gain (av): 30 db
Frequency Range (tunable): 540 kc - 44,000 kc.
Image Ratio (min.): 40 db (DB-22A alone) with average communication receiver having one stage of R.F. amplification the overall image rejection at 38 mc will be approximately 60 db or 1,000/1.
Cabinet Dimension Std.**: 12" long, 11" wide, 11" high.
Type S: 10 1/4" long, 10 3/16" deep, 9 1/8" high.
Weight Std. - - 17 lbs. 5 oz.
Type S - - 14 lbs. 13 oz.

1.3 Tube Complement

Qty.	Type	Use	Symbol
2	6BA6	RF Amp.	V_1, V_2
1	6X4	Rect.	V_3

** The DB-22A is supplied in two types of cabinets. The standard matches the RME Model 45 Receiver and the Type S matches the RME Model 84 Receiver.

* On special order the DB-22A can be obtained for use with power supply voltages from 115 - 230 V and from 25 - 60 cycles.

SECTION II

Installation

2.1 Inspection

The Model DB-22A Preselector should be carefully checked on receipt for any mechanical damage that may have resulted in transit. If any such damage is found, a claim should be filed with the carrier. No claim can be filed at the shipping point and Radio Mfg. Engineers, Inc. cannot be responsible for any damage incurred while in the hands of the carrier.

2.2 External Connections

To place the DB-22A in operation, the line cord should be plugged into a suitable power source. The regular model is designed for operation on 110-120 V, 50-60 cycles AC line only. Use of the instrument on any other voltage or frequency may result in damage to the instrument.

The output cable (Fig. 1B) should be connected to the antenna terminals of the associated receiver. This cable has two shielded leads and a ground lead each terminated in a lug. On receivers which have provision for doublet or transmission line type of input such as the RME-45 and the RME-84 receivers, the BLUE lead connects to the outside (furthest from ground) terminal of the receiver input terminal strip. This is usually marked "A"; and the RED lead is then connecte. to the center terminal marked "A" and the WHITE lead is connected to ground terminal "G". On receivers not equipped with three input terminals the BLUE output lead is connected to the terminal marked "A" and the RED and WHITE lead together are connected to the terminal marked "G".

2.3 Antenna

Antennas such as are normally used in conjunction with the receiver alone can be used as the antenna for the DB-22A. A three terminal input is provided and possible connections are shown in Fig. 3B. Of course, variations of these arrangements can be made within limits, but in any case, the transmission line or antenna input impedance as presented to the input terminal of the DB-22A will produce optimum results when possessing an impedance of 300 ohms.

SECTION III

Operation

3.1 General

The connection of the DB-22A ahead of a receiver is productive of higher gain and higher selectivity than to be had using the receiver alone. This result is dependent on the setting of the gain control (See Fig. 1A) and is contingent on the DB-22A tuning being set so that the frequency as indicated on its tuning indicator is identical to that to which the receiver is tuned. This latter condition is easily determined by the rise in receiver audio response or carrier level indicator meter occasioned by the coincidence of tuning. Care should be taken not to tune the DB-22A to a frequency higher than the correct frequency lest it amplify image signals instead of the correct signals and actually reduce the image rejection ratio. This higher frequency is usually 900 to 950 kc higher depending, on the receiver I.F. used. At any rate, it is exactly 2 x I.F. frequency higher than the desired signal (this is only for superheterodyne receivers in which the oscillator is higher in frequency than the signal). If the oscillator is on the low frequency side of the signal the image response will increase when the DB-22A is tuned 2 x I.F. lower than the correct setting as indicated by the receiver setting.

3.2 Line Switch and Gain Control

The functions of line switch and gain control are controlled by the same knob (Fig 1A). The control is marked and when set so the pointer is at "off", the line switch is open and power is disconnected from the DB-22A. As the control is advanced clockwise, the switch is closed, connecting the 115 V signal to the DB-22A and as the rotation is continued clockwise, the control acts to increase the R.F. gain of the unit. At minimum gain setting (the setting arrived at just prior to turning "off") the gain of the unit is approximately one (0 db). In this position the unit still retains its inherent selectivity and has all the image rejection characteristics of any other setting of the gain control.

3.3 Changeover Switch

This switch makes it possible to switch the antenna which is connected to the input terminals of the DB-22A from either the input circuits of the DB-22A ("IN" position) or directly to the Receiver input circuits and bypassing the DB-22A ("OUT" position).

3.4 Tuning

The entire range of the DB-22A is covered in 4 bands. They are as follows:

Band 1.	540 kc	- 1,650 kc
Band 2.	1,650 kc	- 5,000 kc
Band 3.	5,000 kc	- 15,000 kc
Band 4.	15,000 kc	- 44,000 kc

Where two frequencies are available, one on the low frequency end of one band and the other on the high frequency end of the next lower frequency band, it is advisable to tune so that the setting at the high frequency end of the lower frequency band is used, since somewhat better performance will result. In any case, the DB-22A must be tuned to the same frequency as that of the receiver, see discussion in Paragraph 3.1.

SECTION IV

Maintenance and Service

4.1 Introduction

No maintenance of importance is required on the DB-22A. It is suggested that dust that may accumulate in the cabinet be blown out periodically. If any re-alignment and calibration becomes necessary, it can be done with the receiver connected and the change over switch in the "in" position and using the receiver as a standard of calibration and its meter as the peak alignment indicator. Of course, the exact calibration of the DB-22A is not of real importance. The important feature of any alignment is the coincidence of peak tuning of the circuits at any given frequency for purposes of obtaining maximum performance.

4.2 Alignment

The alignment of the various circuits of the DB-22A is achieved by adjusting the shunt trimming capacities for the 3 circuits on all bands. These trimmers are peaked at approximately 1/3 of the way in from the high frequency end of each band and all adjustments should be made with the antenna connected and with the change-over switch set to position "in" and the output cable of the DB-22A connected to the receiver.

In the case of band 1 and band 2, the inductances are also trimmed and these adjustments should be made at the low frequency end of band 1 and band 2 for the respective slug adjustments involved approximately 10% of the way in from the low end of the band. When both the inductance and the capacity are out of adjustment by a significant amount, it may be necessary to readjust each one several times in order to compensate for their inter-action while making an alignment adjustment for these bands. In the case of bands 3 and 4, no inductance variation is provided for since the capacity trimming is adequate. All adjustments are made and left at the setting which gives the maximum signal response, as indicated either by the audio output of the associated receiver or the reading of the carrier level indicator meter of the receiver. All alignment should be done using a signal generator whose frequency is rather closely known and the DB-22A should be set at the frequency of the signal which is being used for test to insure calibration and alignment at the desired frequency instead of at the image frequency.

4.3 Circuit Voltages

1. V-1 Plate (pin 5) to ground - 58 V.
2. V-2 Plate (pin 5) to ground - 61 V.
3. V-1 Screen (pin 6) to ground - 58 V.
4. V-2 Screen (pin 6) to ground - 61 V.
5. V-3 (pin 7) to ground - 110 V.
6. V-1 (pin 7) to ground (gain control set for maximum gain) -.75 V.
7. V-1 (pin 7) to ground (gain control set for minimum gain) - 35 V.
8. V-2 (pin 7) to ground - .71 V.
9. V-3 (pin 1) to ground - 100 V. A..C.
10. V-3 (pin 6) to ground - 100 V. A. C.
11. V-3 (pin 4) to ground - 6.3 V. A. C.

NOTE* All measurements, unless otherwise noted, are made with the gain control set at maximum gain position. Line voltage 115 V. A.C.

** These voltages, as stated above, can vary as much as plus or minus 10% between various instruments without delecterious effects to the performance of the unit.

LU-DB22A
RME

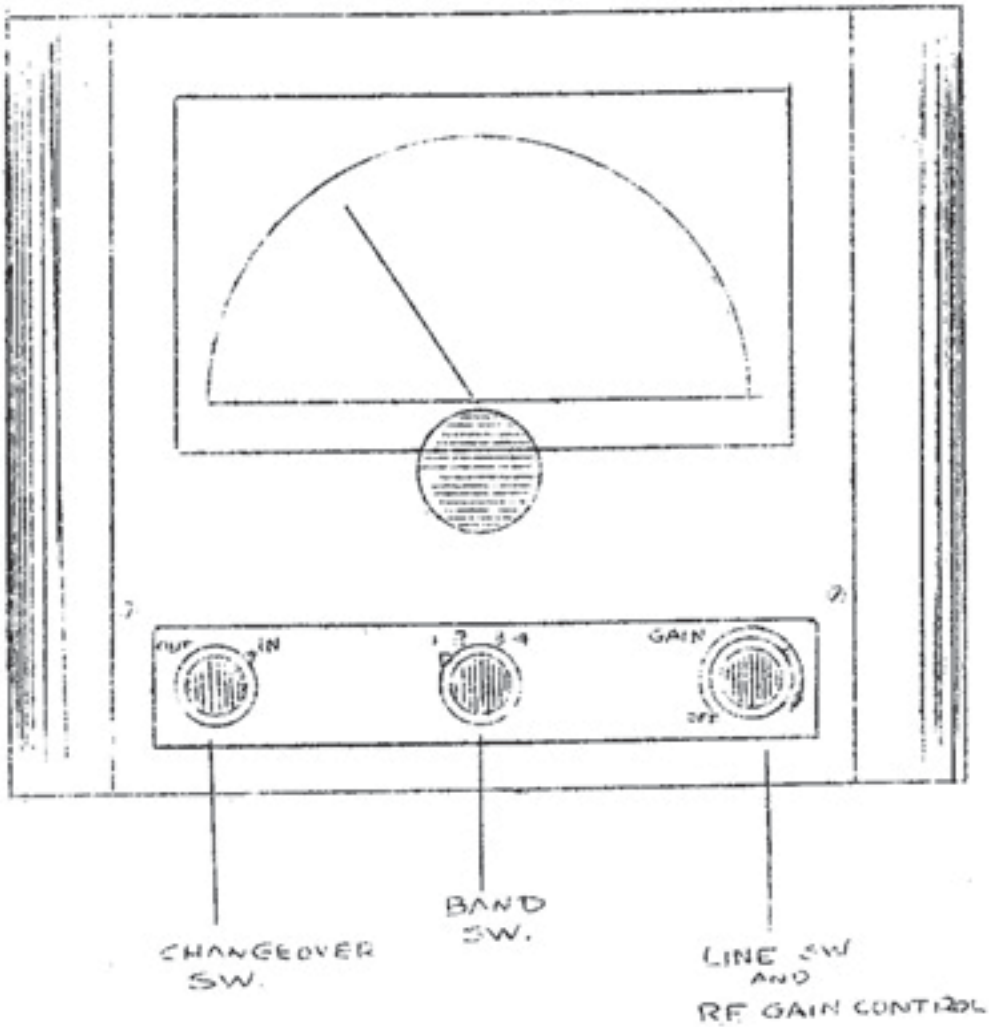
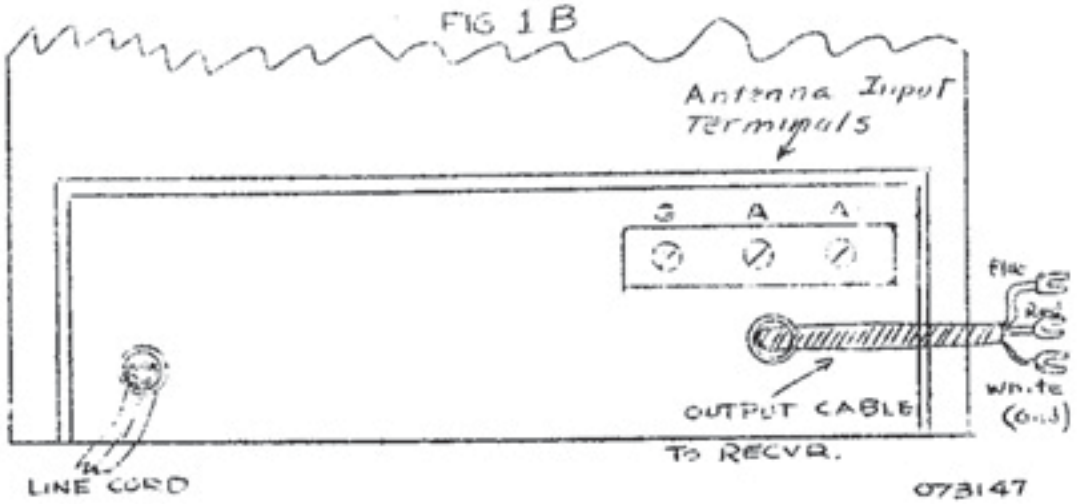
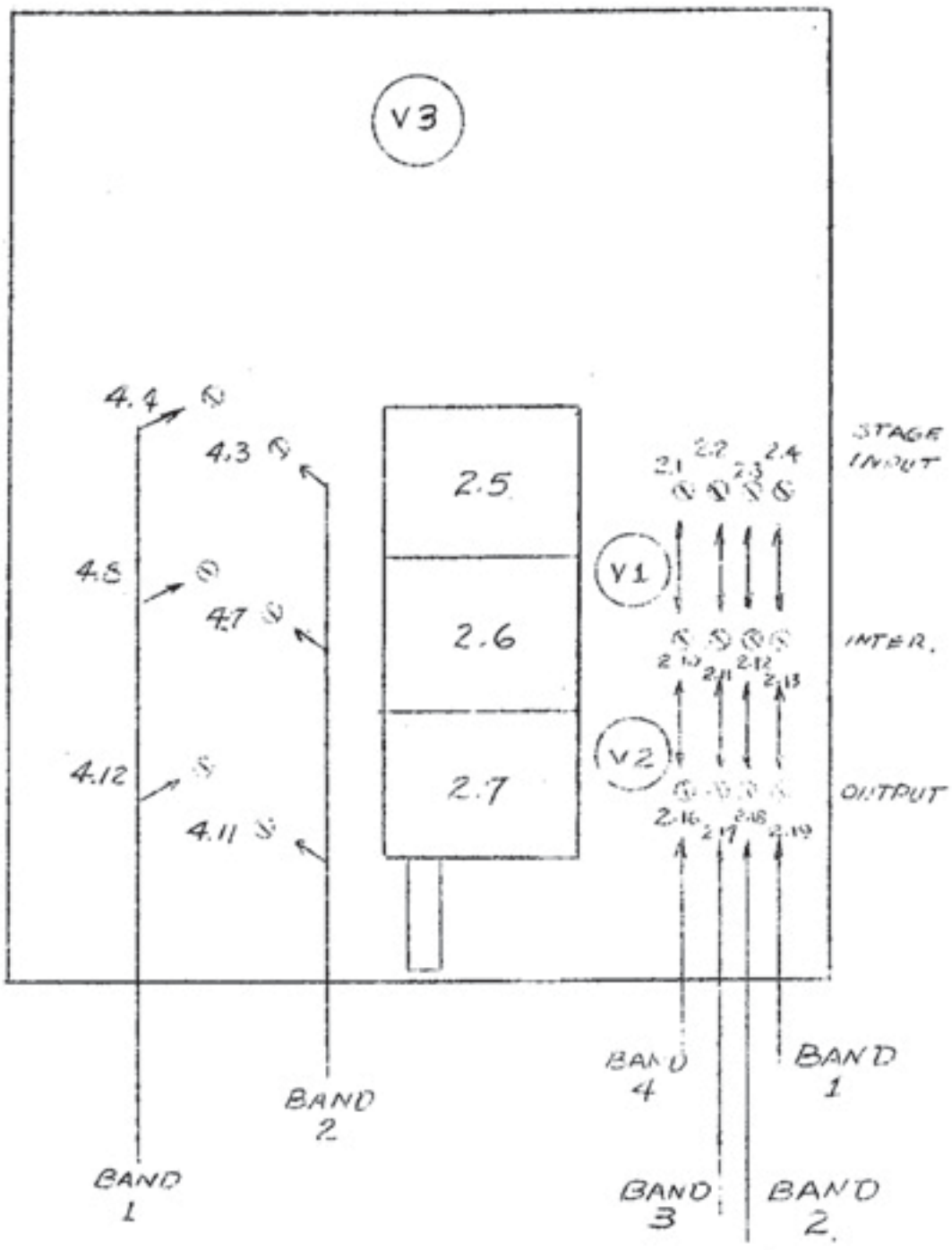


FIG 1A

FIG 1B





TOP VIEW OF CHASSIS

FIG. 2

RMS
IB-UB22A

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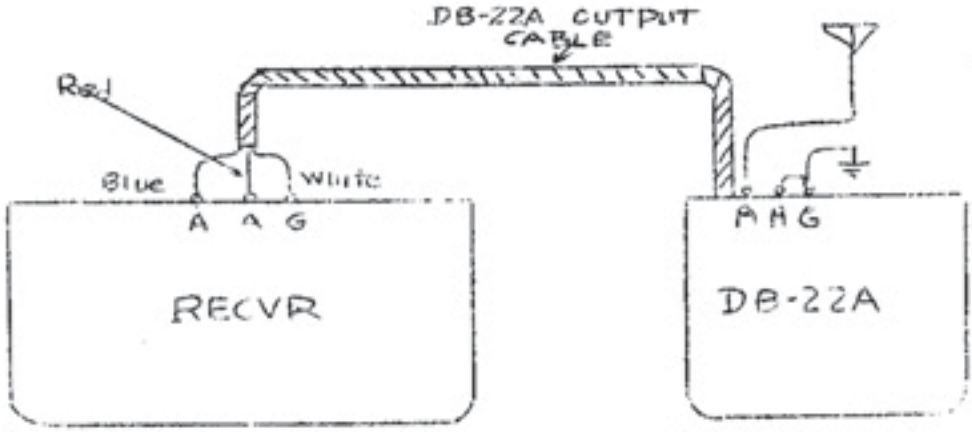
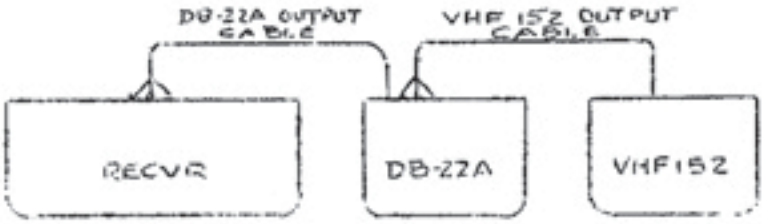


FIG. 3A



IN AN ARRANGEMENT OF THIS TYPE EITHER THE VHF 152 OUTPUT OR THE ANTENNA FED TO THE "LF" TERMINALS OF THE VHF152 CAN BE FED THRU THE DB-22A OR AROUND IT DEPENDING ON THE POSITION OF THE CHANGEOVER SWITCHES.

FIG. 3B

FIG. 3C.

RME
IB-DB22A

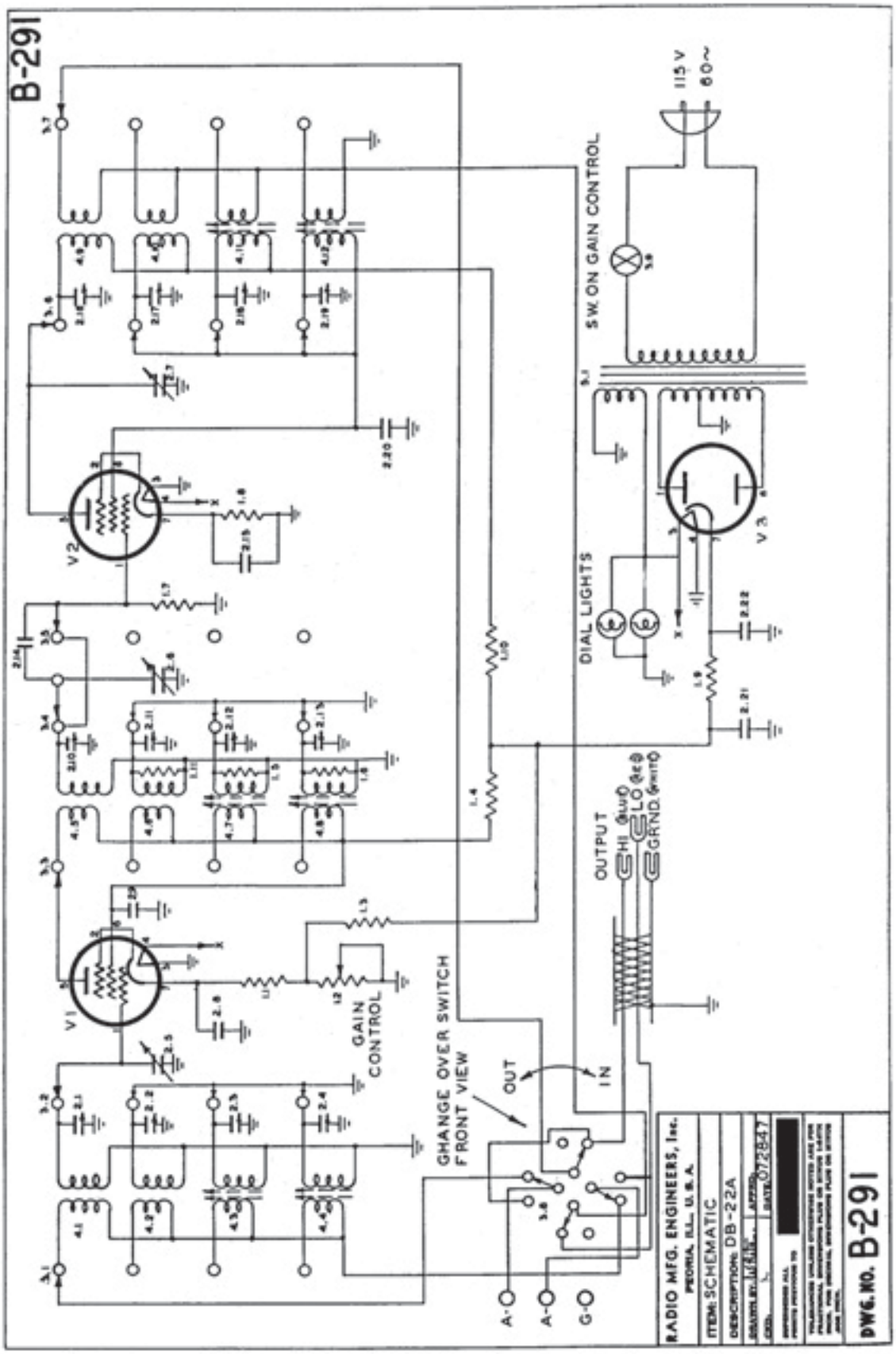
073047-

No.	Component
RESISTORS	
1.1	100 ohm 1/2 watt ±10% carbon
1.2	30K ohm Potentiometer
1.3	47K ohm 1/2 watt ±20% carbon
1.4	2.2K ohm 1/2 watt ±20% carbon
1.5	4.7K ohm 1/2 watt ±20% carbon
1.6	4.7K ohm 1/2 watt ±20% carbon
1.7	47K ohm 1/2 watt ±20% carbon
1.8	100 ohm 1/2 watt ±10% carbon
1.9	2K ohm 5 watt-wire wound
1.10	2.2K ohm 1/2 watt ±20% carbon
1.11	10K ohm 1/2 watt ±20% carbon
CONDENSERS	
2.1	40 μμfd. Mica Padder
2.2	40 μμfd. Mica Padder
2.3	40 μμfd. Mica Padder
2.4	40 μμfd. Mica Padder
2.5	Tuning Condenser Section
2.6	Tuning Condenser Section
2.7	Tuning Condenser Section
2.8	.01 μfd. 200 volt paper
2.9	.01 μfd. 200 volt paper
2.10	40 μμfd. Mica Padder
2.11	40 μμfd. Mica Padder
2.12	40 μμfd. Mica Padder
2.13	40 μμfd. Mica Padder
2.14	5 μμfd. Ceramic
2.15	.01 μfd. 200 volt paper
2.16	40 μμfd. Mica Padder
2.17	40 μμfd. Mica Padder
2.18	40 μμfd. Mica Padder
2.19	40 μμfd. Mica Padder
2.20	.1 μfd. 200 volt paper
2.21	20 μfd. 200 volt electrolytic
2.22	20 μfd. 200 volt electrolytic
SWITCHES	
3.1	Band Switch Sections
3.2	Band Switch Sections
3.3	Band Switch Sections
3.4	Band Switch Sections
3.5	Band Switch Sections
3.6	Band Switch Sections
3.7	Band Switch Sections
3.8	4P DT "IN-OUT" Switch
3.9	SPST Line Switch on gain control

No.	Component
COILS	
4.1	Band IV Input Coil
4.2	Band III Input Coil
4.3	Band II Input Coil
4.4	Band I Input Coil
4.5	Band IV Input Coil
4.6	Band III Input Coil
4.7	Band II Input Coil
4.8	Band I Input Coil
4.9	Band IV Input Coil
4.10	Band III Input Coil
4.11	Band II Input Coil
4.12	Band I Input Coil
TRANSFORMER	
5.1	Power Transformer
TUBES	
V.1	6BA6
V.2	6BA6
V.3	6X4

080447

DB-22A-I.B.


B-291
115 V
60~
SW. ON GAIN CONTROL
DIAL LIGHTS
V2
V3
V1
OUTPUT
HI
LO
GRND.
GAIN CONTROL
GHANGE OVER SWITCH
FRONT VIEW
OUT
IN
A-
A-
G-
RADIO MFG. ENGINEERS, Inc.
PEORIA, ILL. U.S.A.
ITEM: SCHEMATIC
DESCRIPTION: DB-22A
DWG. NO. B-291

K4XL's BAMA

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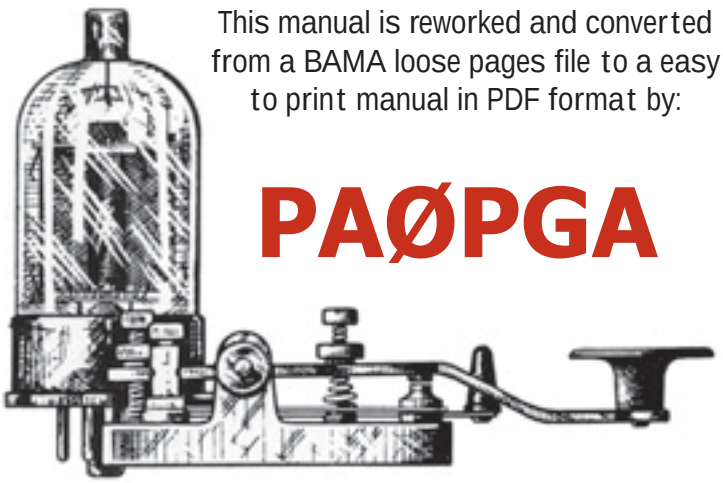

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