

NO 1-23  
 AMPLIFIERS  
 116A & 119A  
 3-14-39

**GENERAL**

THIS IS A SELF-CONTAINED, A-C OPERATED, VOLTAGE AMPLIFIER DESIGNED TO PROVIDE CONVENIENT AND FLEXIBLE CONTROL OF PROGRAM SYSTEMS. IT IS INTENDED TO BE USED BETWEEN PROGRAM SOURCES SUCH AS MICROPHONES AND PHONOGRAPH PICK-UPS AND A PROGRAM LINE OR A POWER AMPLIFIER SUCH AS THE 116A. ONE SEPARATE INPUT AMPLIFIER STAGE, THE 116A AMPLIFIER IS FURNISHED. PROVISION IS MADE FOR INCORPORATING UP TO THREE ADDITIONAL INPUT STAGES.

**ELECTRICAL CHARACTERISTICS**

- GAIN..... 82 DB FOR 30 OHM GENERATOR AND 600 OHM LOAD; 85 DB FOR 250 OHM GENERATOR AND 600 OHM LOAD
- OPERATES FROM..... NOMINAL 30 OR 250 OHM IMPEDANCES.
- INTERNAL INPUT IMPEDANCE.. OPEN CIRCUIT.
- OPERATES INTO..... NOMINAL 600 OHM LOAD.
- INTERNAL OUTPUT IMPEDANCE.. APPROX. 200 OHMS.
- OUTPUT POWER..... +17 DB\* WITH 5% TOTAL HARMONIC DISTORTION.
- OUTPUT NOISE..... -40 DB UNWEIGHTED; -50 DB WITH PROGRAM NOISE WEIGHTING
- FREQUENCY CHARACTERISTIC.. SEE FIG. 1.
- POWER SUPPLY..... 105-125 VOLTS, 50-60 CYCLES, 50 WATTS. FUSE FOR 1/2 AMPERE.
- NO. OF INPUT MIXER CHANNELS..... FROM 1 TO 4 - 116A AMPLIFIERS MAY BE USED.
- MASTER GAIN CONTROL..... GAIN CONTROL ACHIEVED BY VARYING BIAS OF VARIABLE MU TUBE. THE CONTROL MAY BE EITHER LOCAL OR REMOTE. IT IS NOT SUPPLIED.
- MIXER GAIN CONTROL..... GAIN CONTROL OF 116A MIXER AMPLIFIERS ACHIEVED INDEPENDENTLY BY VARYING BIAS OF VARIABLE MU TUBE. THE CONTROL MAY BE EITHER LOCAL OR REMOTE. IT IS NOT SUPPLIED.
- EXTERNAL PILOT..... THROUGH THE USE OF A STD. ELECTRON-RAY TUBE ADAPTER AND A 6E5 VACUUM TUBE AN INDICATION OF OUTPUT LEVELS IN EXCESS OF .06 WATTS MAY BE OBTAINED. THE ADAPTER IS NOT FURNISHED.
- EQUALIZER..... SCRATCH AND SPEECH EQUALIZATION. SEE OPERATING INSTRUCTIONS.

\* ALL LEVELS REFERRED TO .006 WATT.

**EQUIPMENT CHARACTERISTICS**

- CHASSIS LENGTH..... 18-13/16"
- CHASSIS DEPTH..... 10-7/16"
- OVERALL CHASSIS DEPTH OVER SWITCH LEVERS..... 11-1/4"
- HEIGHT..... 8-3/4"
- WEIGHT..... 20 LBS.
- MOUNTING..... HORIZONTAL CHASSIS MOUNTING IN CABINET DIMENSIONS AND HOLES PERMIT VERTICAL MOUNTING ON STANDARD 19" RELAY RACK.
- FINISH..... ALUMINUM.

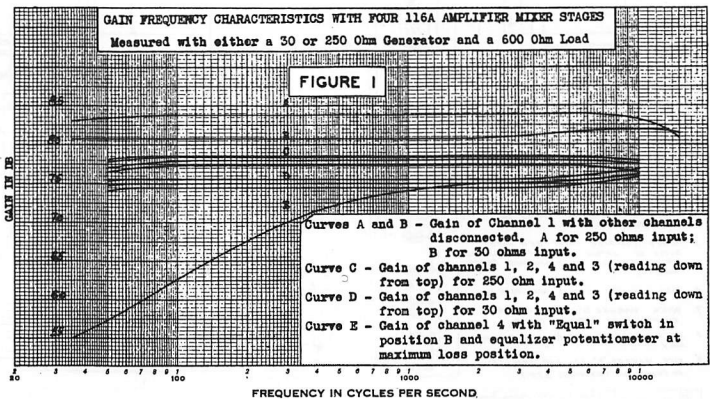
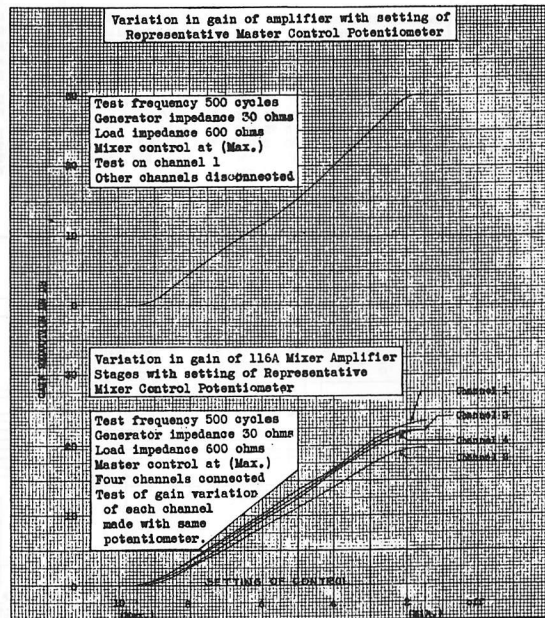
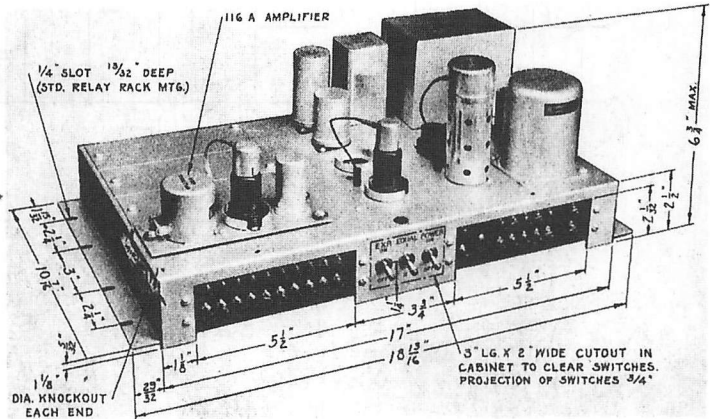
**VACUUM TUBES**

(MUST BE ORDERED SEPARATELY)

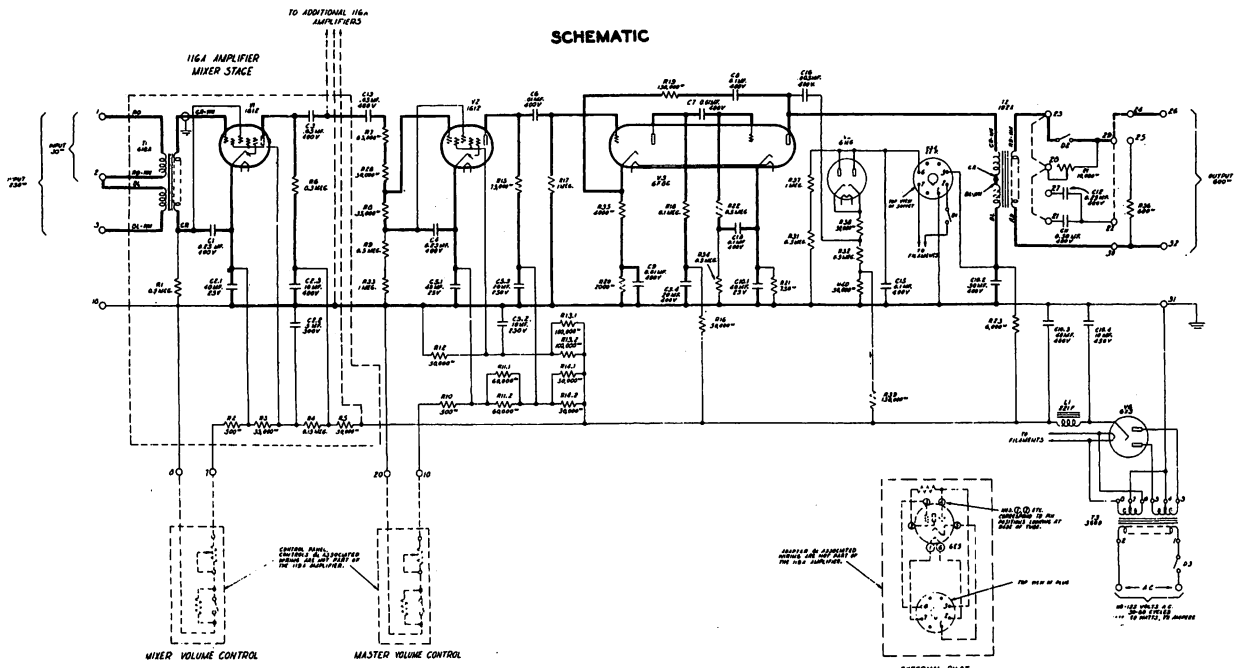
METAL	GLASS
TWO 16L2	OR TWO 16L2G
ONE 6X5, WITH EXTERNAL PILOT	OR ONE 6FG
ONE 6H6	OR ONE 6H6G
	OR ONE 6E5

**REFERENCES**

- ESA-745248 - "SCRATCH" EQUALIZER CHARACTERISTIC
- ESA-745249 - PHASE SHIFT
- ESA-745250 - "SPEECH" EQUALIZER CHARACTERISTIC
- ESA-745251 - GAIN VS. FREQUENCY CHARACTERISTIC
- ESA-745252 - DISTORTION MEASUREMENTS
- ESA-745253 - DISTORTION MEASUREMENTS
- ESA-745254 - GAIN CONTROL VARIATIONS
- ESR-614931 - ASSEMBLY
- ESXX-614932 - SCHEMATIC
- ESR-614933 - WIRING DIAGRAM
- ESR-614935 - VERTICAL MTG. DATA
- ESO-614936 - HORIZONTAL MTG. DATA
- ESA-745292 - DIMENSIONAL PHOTO.
- ESR-745293 - SERVICE SCHEMATIC
- ESA-675142 - OPERATING INSTRUCTIONS
- INSTRUCTION BULLETIN NO. 929P
- PHOTOGRAPHS 83263, 83264, 83265, 83478
- ESR-614934 - INTERCONNECTING DIAGRAM



SCHMATIC



PARTS LIST FOR 116A AMPLIFIER

C5.1	40 mf-25 V
C5.2	10 mf-250 V Mallory Electro-
C5.3	20 mf-250 V lytic Cond.Type
C5.4	20 mf-400 V FP
C10.1	40 mf-25 V Mallory Electro-
C10.2	30 mf-400 V lytic Cond.Type
C10.4	10 mf-450 V FP
C5, C7	TYC-481-4
C8	TYC-481-4
C13	TYC-485-4
C16	TYC-485-4

C9	.01 mf-400 V Type ZB Cornell-
C18	0.1 mf-400 V Dubilier Cond.
C4, C12	0.25 mf-400 V Type ZB Cornell-
C11	0.5 mf-400 V Dubilier Cond.
C15	0.1 mf-400 V with Mtg. Strap

**I.R.C. FT-1/2 Resistors**

R35	4,000 Ohms	R16, R28, R38	50,000 Ohms
R7	65,000 "	R17, R35, R37	1 Megohm
R8	35,000 "	R18	0.1 "
R15	75,000 "	R19	0.15 "
R20	2,000 "	R9, R22	0.5 "
R21	750 "	R31, R32, R34	0.5 "
R10	500 "	R40	30,000 Ohms

**I.R.C. FT-1 Resistors**

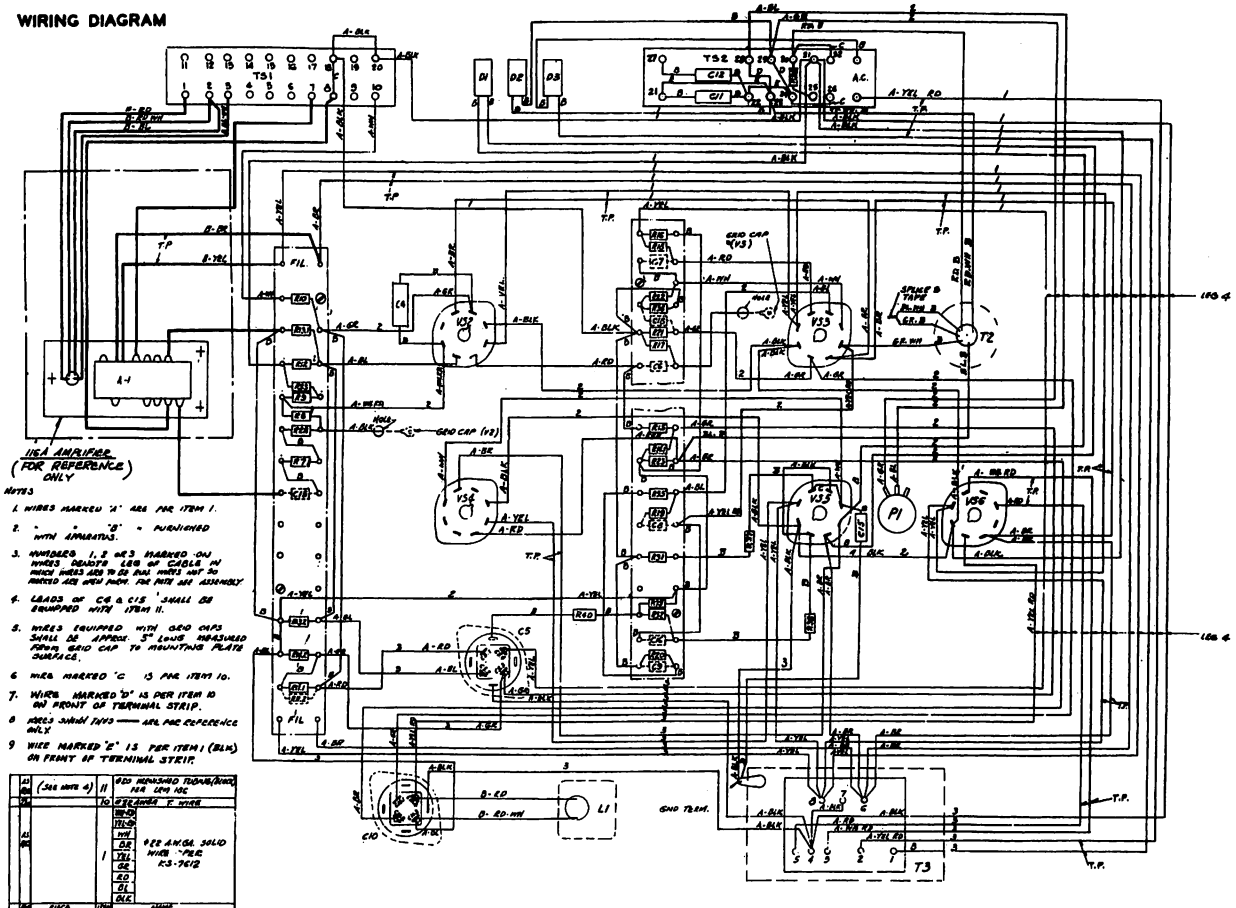
R15.1, R15.2	0.1 Megohm
R11.1, R11.2	60,000 Ohms
R26	600 Ohms
R14.1, R14.2, R12	50,000 Ohms
R25	6,000 Ohms
R29	150,000 Ohms

**DI, D2, D3** BH #80595 SWS1 Switch  
**F1** I.R.C. 10,000 Ohms CS  
**FC** Curve A  
**L1** 221F Retard Coil  
**T2** 192A Output Transformer  
**T3** 360D Power Transformer  
**T1** 39-1-E H.H. Eby Mfg. Co.  
**V1** V.T. Sockets

PARTS LIST FOR 116B AMPLIFIER

C1	0.25 mf-400 V Type ZB Cornell-
C3	TYC-485-4 Dubilier Cond.
C2.1	40 mf-25 V Mallory Electrolytic
C2.2	5 mf-300 V Cond. Type FP
C2.3	10 mf-400 V
R1	0.5 megohm
R2	500 ohms
R3	35,000 ohms
R4	0.15 megohm
R5	50,000 ohms
R6	0.3 megohm
T1	616A Input Transformer
V1	39-1-E H.H. Eby Mfg. Co. V.T. Socket

WIRING DIAGRAM



**116A AMPLIFIER (FOR REFERENCE) ONLY**

1. WIRES MARKED "A" ARE PER ITEM 1.
2. "B" - PUBLISHED WITH APPARATUS.
3. NUMBERS 1, 2, 3 ARE MARKED ON WIRES LEADING TO OR FROM THE 116A AMPLIFIER. THESE WIRES ARE TO BE MARKED AS SHOWN IN THE WIRING DIAGRAM AND ASSEMBLY.
4. LEADS OF C6 & C15 SHALL BE SHUNTED WITH ITEM 11.
5. WIRES EQUIPPED WITH GND CAPS SHALL BE APPROX. 5" LONG AND SHUNTED FROM GND CAP TO MOUNTING PLATE SURFACE.
6. WIRES MARKED "C" IS PER ITEM 10.
7. WIRES MARKED "D" IS PER ITEM 10 ON FRONT OF TERMINAL STRIP.
8. WIRES MARKED "E" ARE PER REFERENCE ONLY.
9. WIRES MARKED "F" IS PER ITEM 1 (BLK) ON FRONT OF TERMINAL STRIP.

11	RED SHUNTED FROM/TO GND CAP
12	RED SHUNTED FROM/TO GND CAP
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