

NO	12-1A
22D S.I.E.	
GENERAL	

11-23-40

GENERAL

The 22D Speech Input Equipment is a portable equipment intended primarily for use at outside program pickup points in connection with radio broadcasting.

It accommodates a maximum of four microphones and provides for the basic functions of mixing, amplification, gain control, volume indication and power supply and, with the recommended accessories, includes everything required to originate and deliver a program over a line to a central control point.

ELECTRICAL CHARACTERISTICS

Microphones	Designed for use with 618, 650, 632, 633 or 639 type microphones; 250 ohm microphones may be used with 171A Repeating Coils in microphone cords for impedance matching.	
Gain	Approximately 92 db max.	
Frequency Range	30 to 10,000 cycles nominal	
Output	+8 vu to either of two program lines from source impedance of either 150 or 600 ohms.	
Output Noise Levels, Un-weighted	Master Gain Control at Max.	Battery Operation -29 vu A-C Operation -27 vu
	20 db down	Battery Operation -48 vu A-C Operation -42 vu
Volume Indicator	KS-8208 or KS-8218 Meter, not furnished	
Monitoring	Jack provided for 1002F Headset, not furnished	
Power Supply	Batteries or a-c operated Power Unit (See Sheet 3 for details)	

EQUIPMENT CHARACTERISTICS

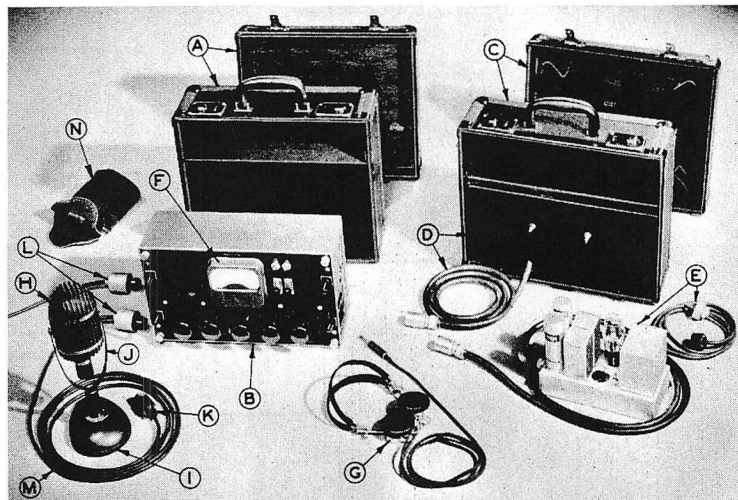
When packed for carrying, this equipment occupies two compact cases, each approximately 14 in. x 16-3/4 in. x 7-3/4 in.

The following parts shown in the photograph are included in the 22D Speech Input Equipment:

	Approximate Weight
(A) Amplifier Carrying Case	12 lbs.
(B) Amplifier-Control Unit	15 lbs.
(C) Power Supply Carrying Case	12 lbs.
(D) Battery Holder with Cord and Plug	3 lbs.
(battery complement, with storage "A" battery)	11 lbs.
(battery complement, with dry-cell "A" battery)	10 lbs.
(batteries not furnished)	

The following accessories, also shown, must be ordered separately:

(E) a-c Power Unit with Cords and Plugs	9-1/2 lbs.
(F) KS-8208 or KS-8218 Volume Indicator Meter	
(G) 1002F Headset	
(H) 639 Type Microphone	
(I) 24A Transmitter Mounting	
(J) 11A Transmitter Attachment	



- (K) 442A Jack with 712A Adapter
- (L) Hubbell No. 23005 Plug Cap (Microphone Plug)
- (M) KS-7133 Cordage (Microphone Cord)
- (N) KS-12000 Transmitter Cover

The small upper compartment of the amplifier carrying case provides storage space for accessories such as microphones, cords, monitoring head set, spare tubes, etc. The upper compartment of the power supply case can be used similarly, or the a-c power unit can be mounted there when duplicate power supplies are required (see sheet 3). The inside of the cover of the power supply case is equipped with hooks to facilitate storing the power supply cord or cords for transportation.

VACUUM TUBES

This equipment requires the following vacuum tubes, which are not included and must be ordered separately:

Amplifier-Control Unit for a-c or battery operation	2-6J7 1-6F6
Optional for battery operation	2-6W7G 1-6G6G
a-c Power Unit (when used)	1-80

POWER SUPPLY

Optional power supply equipments are discussed in detail on Sheet 3. Neither batteries nor a-c power unit are furnished and must be ordered separately.

REFERENCE

Instruction Bulletin - No. 903 (with Supplement A)

NO	12-1B
22D S.I.E.	
AMPLIFIER UNIT	

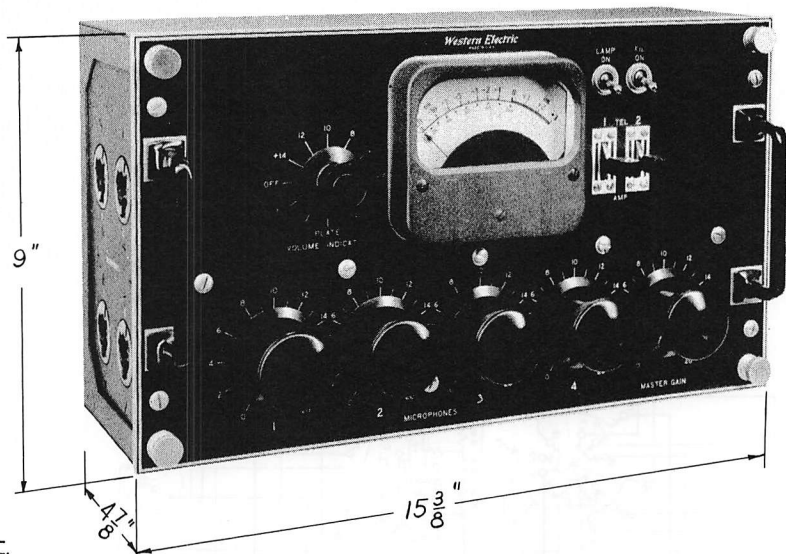
11-23-40

GENERAL

This unit, which is the principal component of the 22D Speech Input Equipment, contains a three-stage amplifier and the necessary operating controls.

ELECTRICAL CHARACTERISTICS

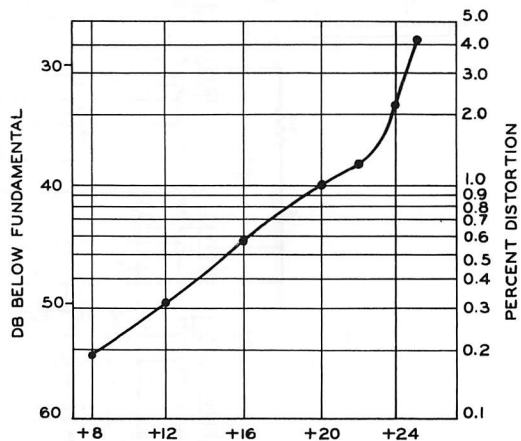
Gain	Approximately 92 db max.
Mixing Circuit	Four channel, parallel
Gain Controls	Master gain control - 20 steps of 2 db; Mixing Controls - 20 steps of 2 db
Operates from	25 to 50 ohm microphones
Internal Input Impedance	25 to 50 ohms depending on mixing control settings
Operates into	150 or 600 ohm load
Internal Output Impedance	150 or 600 ohms, selected by switch, screwdriver - operated on right hand end plate
*Output Level	+4 to +14 vu (+8 vu normal)
Frequency Range	30 to 10,000 cycles
Frequency Response	See curve
*Harmonic Distortion	See curve
Volume Indicator Range	KS-8208 or KS-8218 meter, not furnished +4 to +14 vu in steps of 2 vu
Line Switching	Two output keys permit feeding either of two lines; lines not in use are shorted by "off" positions of output keys for checking; other line key positions connect lines to telephone set (if used)
Use of Telephone Set	For order wire service over spare line; 310A Portable Telephone Set or equivalent (not furnished) connects alternatively to binding posts or to jack
Supply Voltage Checking	By volume indicator meter; using "Fil" and "Plate" positions of VI range switch, minimum voltages for satisfactory operation will give reference deflection ("0") on meter scale.
Filament Supply Drain (6.3 volts, a-c or d-c)	with standard vacuum tube complement 1.3 amperes *with optional low-drain vacuum tube complement 0.45 amperes additional for volume indicator lamps (when operated) 0.3 amps.
Plate Supply Drain (180 volts, d-c)	with standard tube complement 21 ma. *with low-drain tube complement 18 ma.



EQUIPMENT CHARACTERISTICS

Principal Dimensions	See photograph
Approx. Weight	15 pounds
External Connections to Microphones	Four Hubbellock Type BL-23000 Polarized Receptacles on left hand end plate; plate readily replaceable by special plate fitted with any other type receptacle which may be desired
Power Supply	Special Plug Receptacle on right hand end plate, to take jack on end of power supply cord
Telephone Lines and Ground	Push Type Binding Posts on right hand end plate
Telephone Set	Binding Posts, also jack to take 47-Type Plug, on right hand end plate
Monitoring Headset	Two jacks to take 47-Type Plug on right hand end plate
Vacuum Tubes (not furnished)	
Standard Complement	1 - 6F6 2 - 6J7
*Optional Low-Drain Complement	1 - 6G6G 2 - 6W7G
Finish	Front Panel, Black Alumilite; Case, Aluminum Gray Crinkled Lacquer

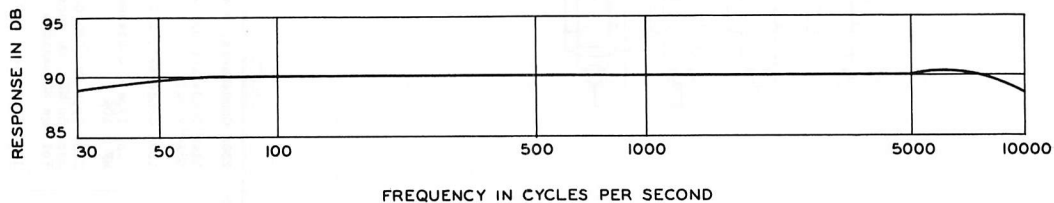
Notes: *Output level and harmonic distortion information shown is for standard vacuum tube complement; with optional low-drain tubes, output level for any given harmonic percentage is about 4 db lower than shown.



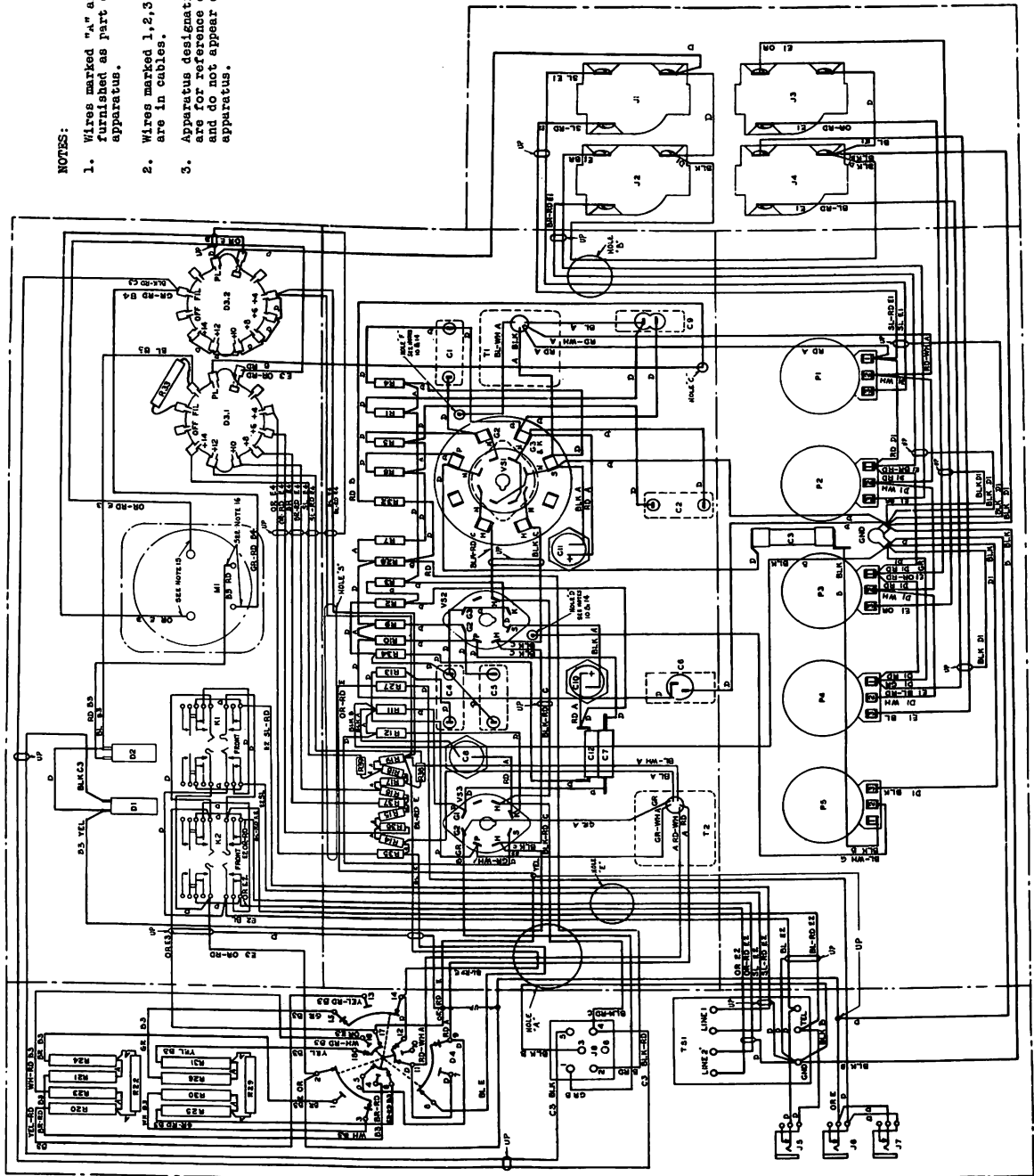
400 C.P.S. OUTPUT LEVEL, DB ABOVE .001 WATT

REFERENCES

ESX-675710 - Assembly
ESR-675711 - Schematic
ESR-675712 - Wiring Diagram



WIRING DIAGRAM



NOTES:

- 1. Wires marked "A" are furnished as part of apparatus.
- 2. Wires marked 1, 2, 3, & 4 are in cables.
- 3. Apparatus designations are for reference only and do not appear on apparatus.

NO	12-1C
22D S.I.E.	
POWER SUPPLY	

11-23-40

GENERAL

Several optional power supply equipments are available for use with the 22D Speech Input Equipment, the choice depending upon operating requirements. These are:

- (Option 1) Storage "A" battery with dry-cell "B" battery (Standard)
- (Option 2) Dry-cell "A" and "B" batteries (alternative)
- (Option 3) A-C operated Power Unit

The power supply carrying case of the 22D Equipment will accommodate any one of these three optional equipments in its lower compartment, leaving the small upper compartment free for carrying tools, cords, spare vacuum tubes or other accessories.

The battery rack supplied with the carrying case will mount either type of battery complement; the standard complement (Option 1) is recommended for lower maintenance cost and superior performance, but the alternative dry-cell equipment (Option 2) will be preferred for applications where storage battery maintenance is impractical.

The a-c power equipment (Option 3) offers minimum maintenance and lighter weight, and may be preferred for use where a reliable source of a-c power is available. If only a-c operation is required the power unit should be installed in the lower part of the carrying case in place of the battery rack.

However, if desired, the power unit can be mounted in the top compartment, and batteries of either type in the battery rack, thus providing duplicate filament and plate power supplies.

This arrangement is facilitated by the provision in the power unit of a receptacle to take the plug on the battery cord, thus routing the battery circuits through the power unit, and two transfer switches to permit switching filament and plate circuits independently to either supply. (This feature was not included in earlier a-c power units).

BATTERIES

Option 1 (Standard)

- Filament 1 - Exide #3-a-c-7 per DB-22334-1A Storage Battery (non-spillable). Weight 6-1/2 pounds.
- Plate 4 - Eveready #738 or 4 - Burgess Z-30-PX - Weight 4-1/2 pounds.

Option 2 (Alternative)

- Filament 2 - Burgess 4F2H (Connected in series) Weight 5-1/2 pounds.
- Plate 4 - Eveready #738 or 4 - Burgess Z-30-PX - Weight 4-1/2 pounds.

BATTERY LIFE

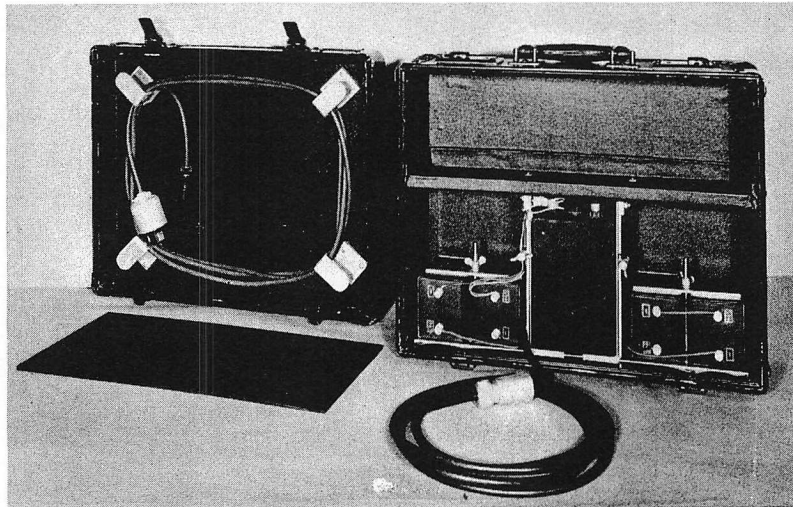
Filament Batteries

- Option 1 (Storage battery) (with standard tube complement) Approx. 8 hours
- *Option 2 (Dry-cells) (with low-drain tube complement) Approx. 12 hours (Continuous operation)
Approx. 24 hours (intermittent operation)

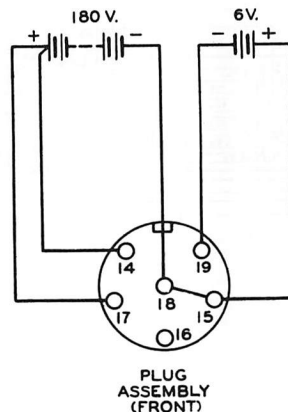
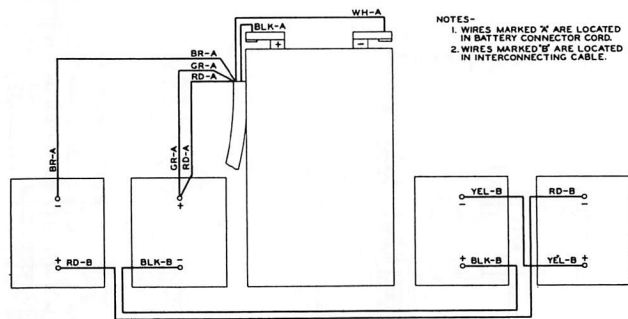
Plate Batteries

- Option 1 or Option 2 (either tube complement) Approx. 12 hours

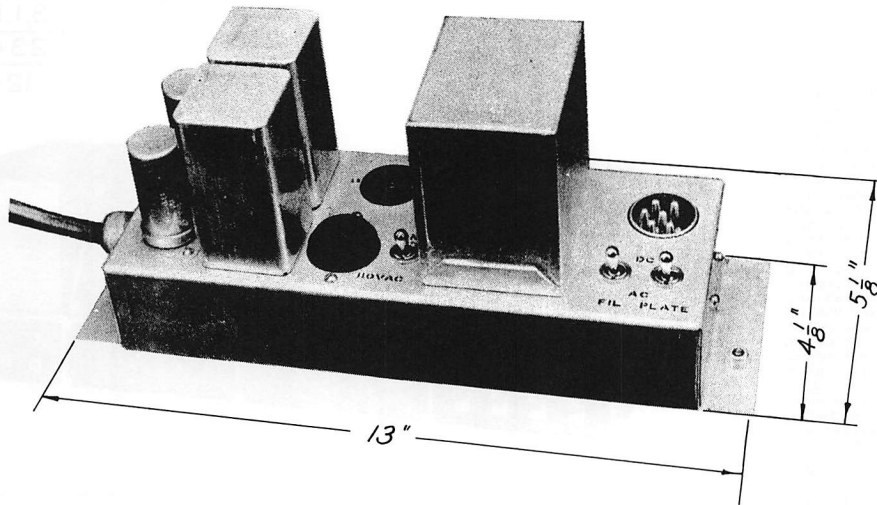
*Use of dry-cell filament batteries with standard tube complement is not recommended. Since volume indicator lamps require nearly as much current as filaments of low-drain tubes, operation of lamps during dry-cell filament battery operation is not recommended. These life figures are based upon tube filament drain only.



WIRING DIAGRAM



5-51 0M
3 1/2
5 1/2
0M-8-51



A-C POWER UNIT

GENERAL

This unit is designed specifically for use with 22-Type Speech Input Equipments in applications where a-c operation is preferred. It includes a vacuum tube rectifier and filter for supplying plate current and an auxiliary transformer winding for supplying low-voltage a-c to the vacuum tube filaments and volume indicator lamps in the amplifier unit of any 22-Type Equipment.

The compact design and light weight of this unit and the provision of plugs and jacks for all external connections make it particularly adaptable to portable equipment service.

ELECTRICAL CHARACTERISTICS

Input	110 to 120 volts, 50 or 60 cycles a-c 28 watts approximate
Output	6.3 volts a-c, 1.6 amps. maximum 180 volts d-c, 25 ma. maximum

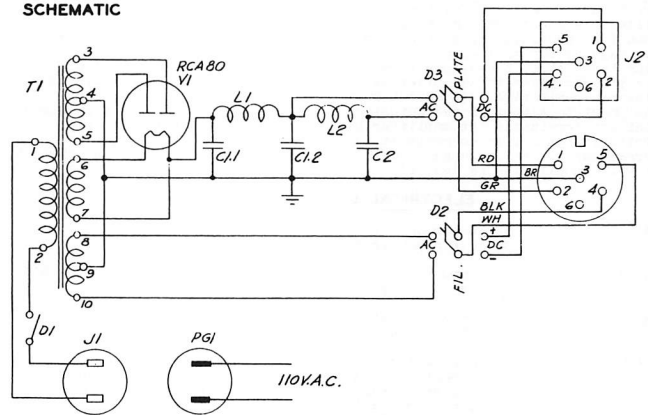
EQUIPMENT CHARACTERISTICS

*Principal Dimensions	See photograph
Weight	8-1/2 pounds
Mounting	Two elastic stop nuts clinched into chassis flange, for bolting through wall of carrying case (either upper or lower compartment) by means of machine screws furnished with unit.
**Transfer Switches	Two, on chassis, for transferring filament and plate loads independently from unit output to associated battery equipment when used.
A-C Input Connection	Flush male receptacle, to take Hubbell #6630 body (furnished) for end of power cord (cord not furnished).
Output Connection	Five-conductor flexible cord, 6 ft. long, ending in special locking female plug to fit power input receptacle of amplifier unit.
**Input from Batteries	Special locking flush receptacle on chassis to take female plug of cord from battery rack.
Vacuum Tr	1-80 (not furnished)

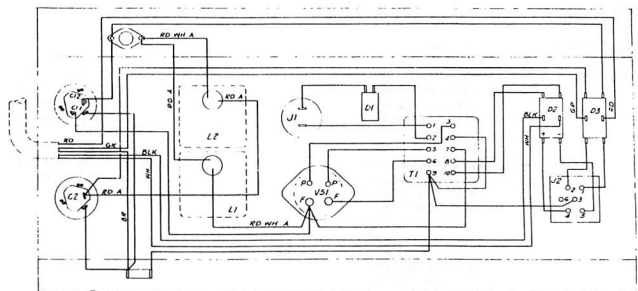
* Dimensions of earlier power units were slightly different, and greater height did not permit mounting in upper compartment of case without interference with cords carried in cover of case.

** Transfer switches and battery input receptacle were not included in earlier power units.

SCHEMATIC



WIRING DIAGRAM



REFERENCES

- ESR-610199 - Assembly
- ES0-610198 - Wiring Diagram
- ES0-677256 - Schematic