REPEATER

PROGRESS LINE

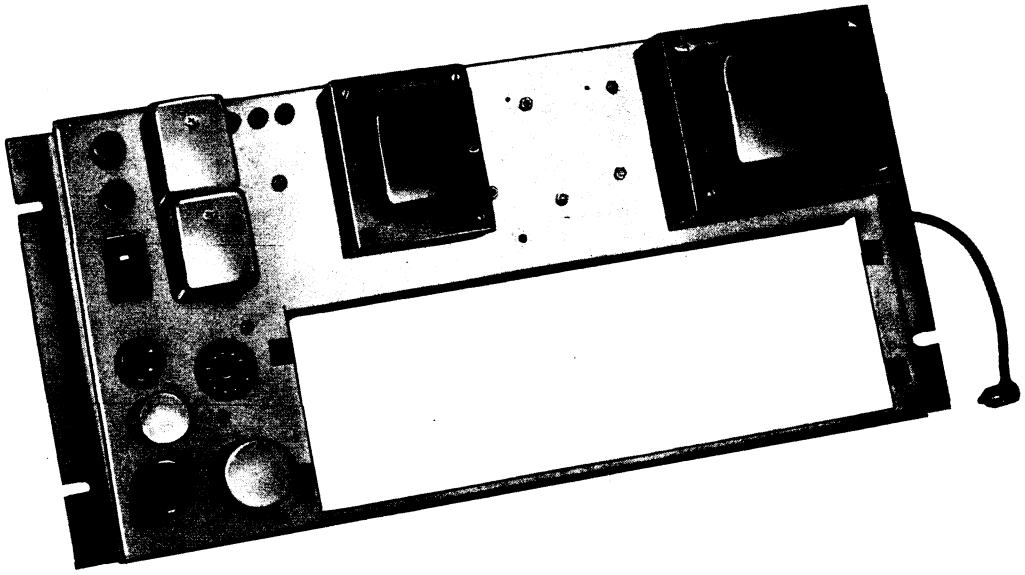
COMMUNICATION EQUIPMENT

SPECIFICATIONS

CHASSIS PT-6

4EP4A3 Rev 6

Ser# 1204



Type	EP-4-A.
Description	Power supply for station transmitter
Nominal input voltage	117 volts, 50/60 cps.
Maximum power input	When used with:

SERIES	STANDBY	TRANSMIT
17	42.0 watts	320.0 watts
36	50.0 watts	258.0 watts
42	50.0 watts	200.0 watts

Output capacity

To transmitter:
660 volts at 285 milliamperes: Series 17 only
OR
425 volts at 320 milliamperes: Series 36
OR
425 volts at 150 milliamperes: Series 42 only
AND
330 volts at 110 milliamperes
200 volts at 30 milliamperes
−25 volts bias at 10 milliamperes
6.3 volts a-c at 6.0 amperes
5.8 volts d-c at 650 milliamperes

Used with	Chassis T-36 (transmitter Type ET-21-A). 144-174 mc Chassis T-16 (transmitter Type ET-23-A). 25-54 mc Chassis T-42 (transmitter Type ET-24-A). 450-470 mc
Rated duty cycle	Continuous: Blower may be required for associated transmitter.
Type of circuit	Full-wave bridge using transformer and high-temperature silicon rectifier cells.
Size	19" long x 8¾" wide x 7¼" high.
Weight	20½ lbs.

SCOPE OF SPECIFICATIONS—In the construction of the equipment described herein, the full intent of the specification will be met. It is assumed, however, that any departure from the specification, desirable for reasons of improved design or operation, will be permissible.

The equipment described above meets or exceeds all applicable EIA (RETMA) specifications.

GENERAL ELECTRIC

COMMUNICATION PRODUCTS DEPARTMENT

DESCRIPTION AND MAINTENANCE INSTRUCTIONS FOR STATION TRANSMITTER POWER SUPPLY MODEL 4EP4A2, 3

General Electric Station Transmitter Power Supply Models 4EP4A2, 3 have been designed for use with Progress Line transmitters in standard 19-inch, rack-mounted installations. The transmitter mounts on the power supply chassis and makes all connections through plug and cable connections to the power supply. This permits rapid replacement of the transmitter, using only a screwdriver to make the change. Jacks are provided for metering the transmitter B-plus voltages. The ON-OFF switch, fuses F509 and F502 and a microphone jack, J506, are located on the front of the power supply chassis. Components and wiring points on the power supply are fully accessible for servicing.

For continuous operation of the transmitter, a blower, mounted on the power supply chassis, provides forced-air cooling for the transmitter PA tubes. The blower is supplied as a part of the Blower Kit for station combinations.

CARBON MICROPHONE MODIFICATION

The following modification should be made if the customer desires to use a carbon microphone with the transmitter instead of a controlled-reluctance microphone.

1. Add a piece of .025-inch bus wire with sleeving between J509-2 and terminal 5 of terminal board TB5.

2. Remove the lettering "DYN" over the microphone receptacle.

3. Stamp "M9" in the OPTION pad on the Transmitter Power Supply nameplate.

MAINTENANCE

To obtain optimum performance from the equipment, a program of regular preventive maintenance should be followed. This preventive maintenance should include the following.

1. A mechanical inspection of the unit for loose, broken or damaged components.

2. An inspection of the power-control cable connection to the transmitter.

3. A check of the input voltage.

4. Measurement of the transmitter B-plus voltages at the "LV-B+" jack, M505 (red-positive), and at the "HV" jack, J507 (red-positive). A 1-volt deflection on a 20,000 ohm-per-volt voltmeter at J505 indicates a B-plus reading of 100 volts. A 1-volt deflection at J507 indicates 300 volts of B-plus.

5. Blower and relay maintenance as described below.

BLOWER

If a blower has been installed on the power supply chassis to cool the transmitter PA tubes, it should be cleaned periodically to maintain its efficiency. The frequency of cleaning will depend upon the average amount of dust in the air near the transmitter, the percentage of time the transmitter is in operation and whether the blower operates continuously or only when the transmitter is keyed.

Unless the impeller blades have become coated with oil, the dust which collects on them can be loosened with a small, stiff brush and removed with a vacuum hose to prevent its being blown into the transmitter. If a source of high pressure compressed air is available, the blower may be removed from the power supply chassis and the dust blown out. Check to see that the PA housing is also free from dust.

If the impeller blades have become coated with oil, they should be removed, washed in grease solvent and hot water, dried thoroughly and replaced.

The frequency of oiling the blower bearings also depends upon how much the blower is used. When running continuously, the bearings should be oiled about once every three months. Since the bearings are impregnated with "Gulfcrest C" oil, use the same grade of oil for reoiling. This oil is sold as Gulf Electric Motor Oil in 4-ounce cans or gallon containers. Blowers operating in locations having an unusually high ambient temperature must be oiled somewhat more frequently. Do not allow oil to get onto the impeller blades.

RELAYS

The relays in these units require little care. However, they should be inspected periodically to assure maximum operating efficiency. If the contacts become pitted, they should

be cleaned with a burnishing tool to smooth out any metallic deposits. When relay contacts carry little or no current, the contacts do not clean themselves and an insulating coating is apt to form. This coating may be removed by cleaning the contacts with a burnishing tool. Do not oil the relay bearings. When relays are in dusty locations, lubricated bearings will collect dust and grit and will wear more rapidly than nonlubricated bearings. Some of the relays used are of the multiple-contact type and, in the unenergized position, should have contact spacings of approximately .1625 to .125 inch. More important, the contact spacings on any multiple-contact relay should be equal so that the contact pressures will be equal when the relay is energized. The back pressure of the antenna relay should be at least 15 grams. Low back pressure will shorten the life of contacts, due to excessive arcing, and may also cause noise in the receiver, due to chatter of the antenna relay contact under vibration.

CIRCUIT ANALYSIS

Station Transmitter Power Supply Model 4EP4A2, or 4EP4A3 supplies all operating voltages for the station transmitter and mounts the transmitter chassis in standard 19-inch racks. All connections to the transmitter are made through plug cable connections to the power supply.

The 117-volt a-c input to the station is connected across terminals 9 and 10 of TB502. The station interlock switch, connected between terminals 10 and 11, interrupts the input voltage, if the rear door of the cabinet is opened, to protect service personnel from high voltages. With the door closed, turning the ON-OFF switch (S502 on Model 4EP4A2 and S503 on Model 4EP4A3) to the ON position applies power to the primary of power transformer T506. On Model 4EP4A3 a second set of contacts on the ON-OFF switch (S503) provides interlocking for LB+ and filament circuits if desired.

The BR-BR secondary winding of T506 (4EP4A2) or T515 (4EP4A3) (brown lead to brown lead) provides 6.3 volts a-c for the transmitter's filaments and for control uses. The a-c voltage across the G-G secondary is rectified by full-wave bridge rectifier CR510 to provide relay-energizing voltage.

OSCILLATOR AND MULTIPLIER B-PLUS

B-plus voltages for the oscillator and multiplier stages of the transmitter are obtained by rectifying the a-c voltage developed across the R-R winding of T506 or T515. Rectification is provided by full-wave rectifier bridge CR529 thru CR536

and filtering by capacitor C502-A, C and D, resistors R528 and R529 on the Model 4EP4A2 and resistors R586, R587 and R529 on the Model 4EP4A3. R534 is a bleeder resistor.

NEGATIVE BIAS

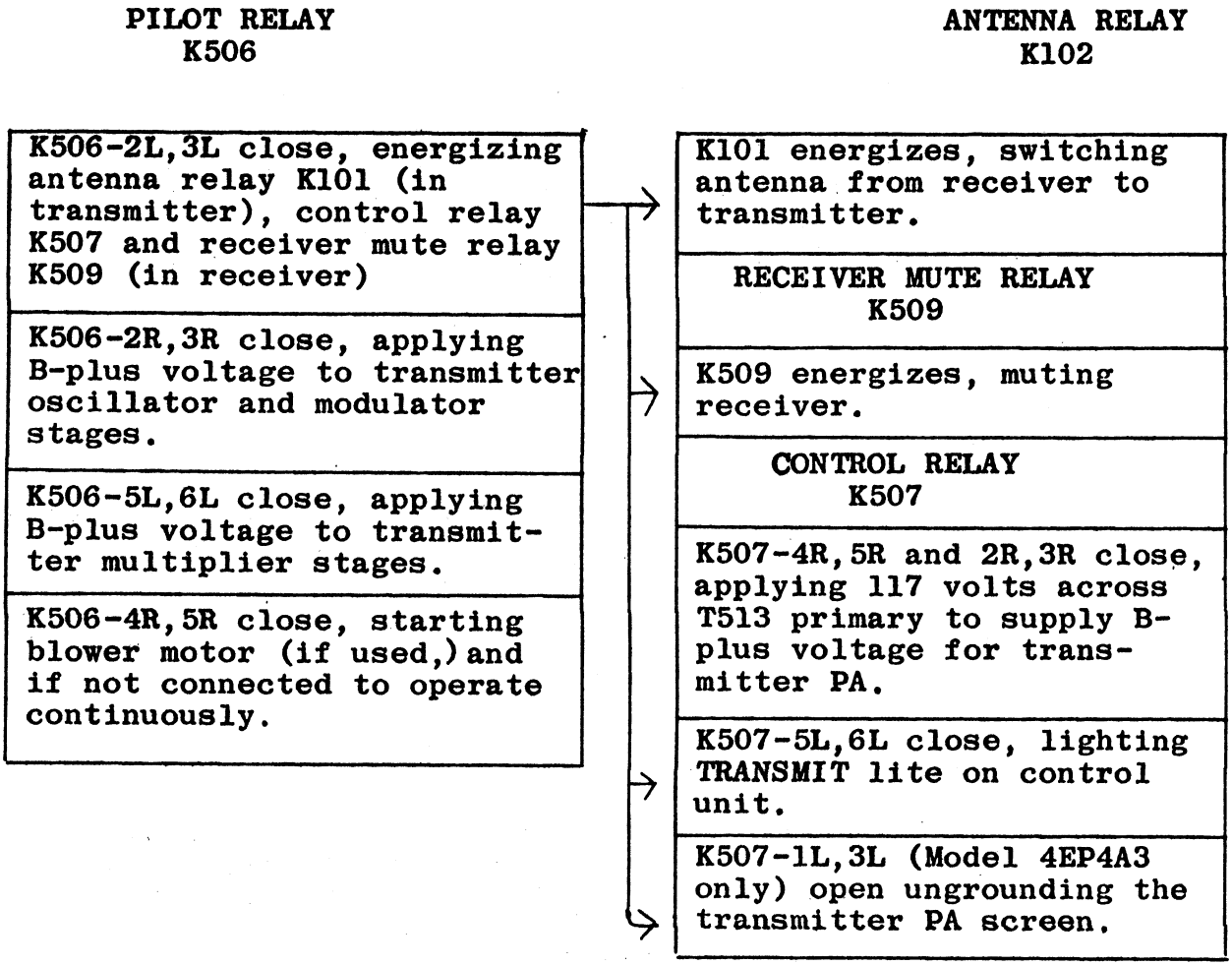
The a-c voltage across the Y-Y secondary winding (yellow lead to yellow lead) of transformer T506 or T515 is rectified by half-wave rectifier CR537 and filtered by CR511 to supply negative bias for the transmitter fourth multiplier and power amplifier control grids. This negative bias is present as a protective measure to limit cathode current in the PA tube when the PA is untuned. R509 in the bias supply is a surge resistor.

POWER AMPLIFIER B-PLUS

A separate transformer, T513, which operates only when the transmitter is keyed, is provided to furnish B-plus voltage for the power amplifier stage of the transmitter. The R-RY section of the secondary winding of T513 is used for 144-174 Mc Transmitter Type ET-21-A. For 25-54 Mc Transmitter Type ET-23-A, the full R-RBK section of the secondary is used for 100-watt operation, or the R-RY section is used for 50-watt operation. 100-watt operation of Transmitter Type ET-23-A requires the use of blower kit PL-7146797-G1. The R-RG section of the secondary is used for 450-470 Mc Transmitter Type ET-24-A. The high voltage across the secondary is rectified by a full-wave rectifier bridge consisting of CR517 thru CR528 and is filtered by capacitors C540A, C540-B and C502-B and by the choke L507. R591 thru R594 provide balance voltages across C504-C540B and C541-C540A. A fuse F505 provides protection against overload in the Power Amplifier B-Plus circuit.

RELAY CIRCUITS

Keying the transmitter energizes Pilot Relay K506, which initiates the sequence of operation outlined on the following page:



METERING CIRCUITS

Three metering jacks, the "HV" jack (J507), the "LV-B+" jack (J505) and the "GND" jack (J508), are provided on the power supply chassis to facilitate measuring the transmitter B-plus voltages. All readings are those read on a 20,000 ohm-per-volt voltmeter.

The voltage read at the "LV-B+" jack (J505) must be multiplied by 100 to obtain the actual voltage across metering resistors R513 and R514.

The "HV" jack (507) has been provided for metering the B-plus voltage on the transmitter PA tubes. The meter reading must be multiplied by 300 to obtain the actual B-plus voltage across metering resistors R567, R511 and R512. These resistors also serve as bleeders.

AUDIO CIRCUITS

Resistors R530 and R531 are impedance-matching resistors used to match the audio input to the transmitter first audio. C509 is a d-c blocking capacitor. For intercommunication over phone lines between the transmitter and the control unit location, microphone current for a carbon microphone is obtained from the negative bias section of the power supply through current-limiting resistor R533. R532 is a line-matching resistor and C511 is provided for audio return.

BLOWER KIT

For continuous operation of the station transmitter, a blower is mounted on the power supply chassis to provide forced-air cooling for the transmitter PA tube(s). The blower connects to terminals 1 and 3 of TB503 on the power supply. If it is desired to have the blower operate only when the transmitter is keyed, instead of continuously, the jumper between terminals 2 and 3 of TB503 should be removed.

CARBON MICROPHONE MODIFICATION

Although a controlled-reluctance microphone is normally supplied with the Progress Line Mobile Combinations, a simple modification, described earlier in this EBI, permits the use of carbon microphone. Microphone Current is obtained from the negative bias circuit in the power supply.

PRODUCTION CHANGE SHEET
FOR
TRANSMITTER POWER SUPPLY MODEL 4EP4A3, REV. E

The revision letter appearing on the Power Supply nameplate indicates that all of the following production changes, up to and including that letter, have been made on the unit.

REV. A

Purpose of Change

To help balance voltages across C542-C540B & C541-C540A and to provide better protection against overload in P.A. B+ supply circuit.

Part Changed	Was	Changed To
R591 thru R594	Added.	Resistor, composition: 150,000 ohms ± 10%, 1/2-watt. G-E Part No. C-3R77-P154K.
F502	Fuse: 2-amp at 250 v, type 3AG, quick-to-medium blowing. Littelfuse Cat. #312002, Bussman Cat. #AGC-2. G-E Part No. K-1R16-P5.	Deleted.
F505	Added.	Fuse: 1/2-amp at 250 v, Type 3AG, quick-to-medium blowing. Littelfuse Cat. #312.500. Bussman Cat. #AGC-1/2 G-E Part No. K-1R16-P1.

Text Change

Description and Maintenance Instructions EBI-41339, under Power Amplifier B-Plus, the following was added; R591 thru R594 provide balance voltages across C504-C - C540-B &

C541 - C540-A. A fuse, F505 provides protection against overload in the Power Amplifier B-Plus circuit.

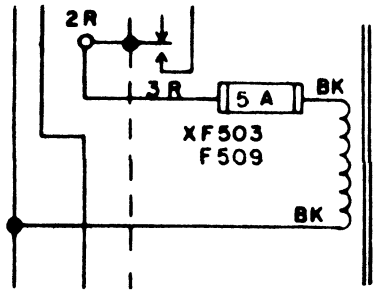
References to F502 were deleted from text.

References to F505 were added to text.

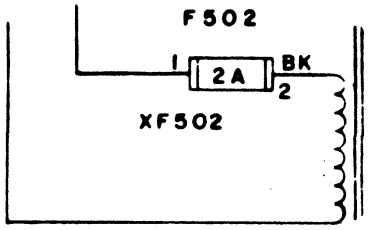
Elementary Diagram Changes

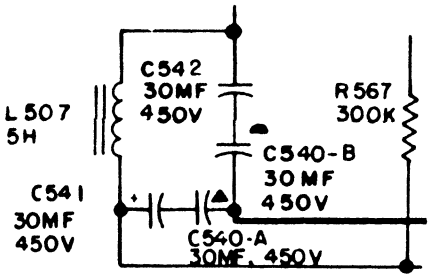
Was:

T513



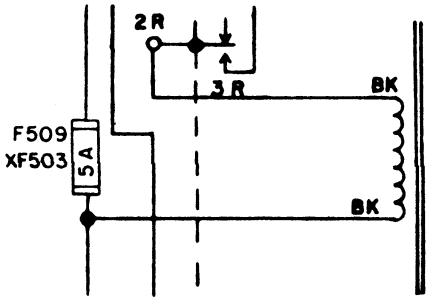
T516



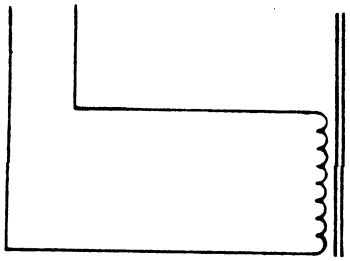


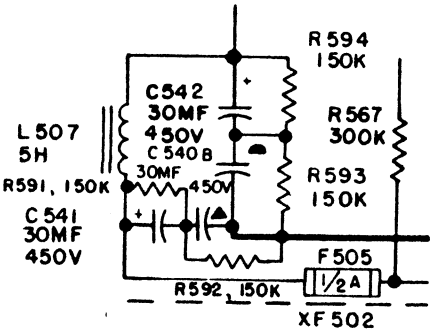
Changed To:

T513



T516





Outline Diagram Changes

Deleted references to F502.

Added F505 - 1/2 Amp.

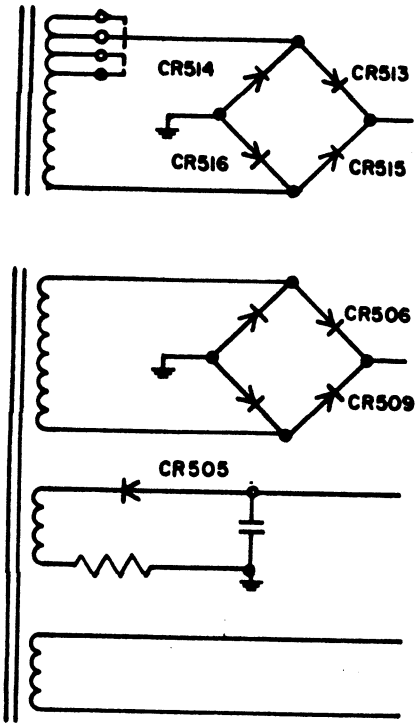
REV. B - To improve reliability by using high quality silicon rectifiers.

Part Changed	Was	Changed To
CR506 and CR507	Rectifier: selenium, forward current 50 ma, peak inverse 800 v per arm, connected for doubler. G-E Cat. #6RS21PD12BB1. G-E Dwg.No. A-7144141-P2.	Replaced by CR529 thru CR536.
CR505	Rectifier: selenium, 1 cell, forward current 150 ma, peak inverse 64V. G-E Cat.#6RS21PH-1AT1. G-E Dwg.No. A-7144141-P2.	Replaced by CR537.
CR513 thru CR516	Rectifier: selenium, half-wave, forward current 0.150 amp d-c input 650 V RMS forward drop 15.5 V RMS, reverse current 24.0 ma RMS. G-E Cat. #6RS22PH14BAD1. G-E Part No. B-7489163-P2.	Replaced by CR517 thru CR528.
CR517 thru CR537	Added in place of selenium rectifiers.	Rectifier: silicon; half-wave peak volts 400, capacitive load inverse 300, resistive load 500 ma. Similar to Westinghouse 1N1199. G-E Dwg. No. B-5490415-P2.
R595	Added.	Resistor: composition, 10 ohms ± 10%, 2 w. G-E Part No. C-3R79-P100K.

Part Changed	Was	Changed To
R596	Added.	Resistor: wirewound, wire leads, 10 ohms ± 10%, 5 w. G-E Part No. B-7487415-P109.

Elementary Diagram Changes

Was:



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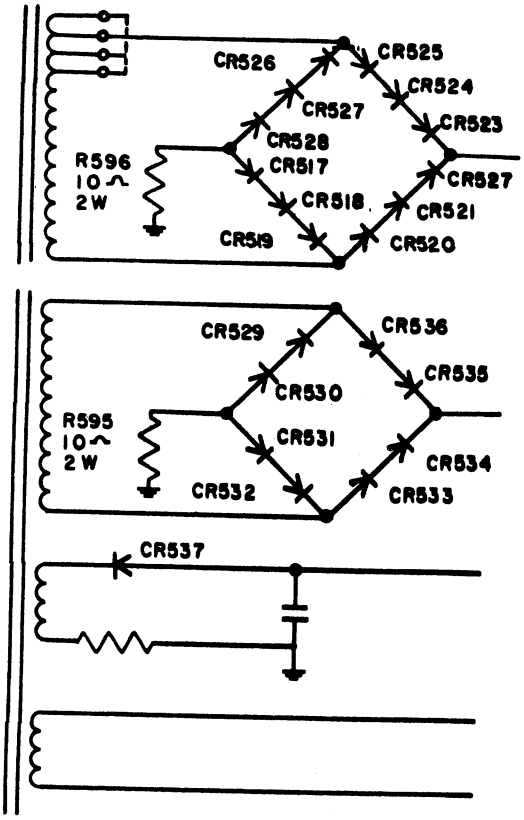


Outline Diagram Changes

Added silicon rectifiers in place of selenium rectifiers.

Text Changes

References to CR506 and CR507, CR505, and CR513 thru CR516 were changed to CR517 thru CR537.

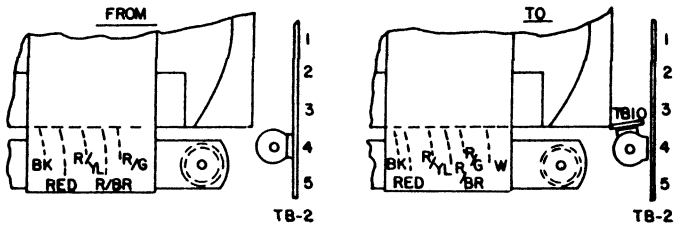
REV. C

Purpose of Change

To provide a tap for continuous duty extended life transmitter operation.

Part Changed	Was	Changed To
TB10	Added.	Terminal board: Phenolic Nema grade XXXP-tan, 1-brass terminal. G-E Dwg. 7775500-P144.

Outline Diagram Changes



Elementary Diagram Changes

REV. D

Purpose of Change

To eliminate possibility of resistor failure.

Part Changed	Was	Changed To
R534	Resistor: composition, 47,000 ohms ± 10%, 2w. G-E Dwg. C-3R79-P473K.	Resistor: composition, 100,000 ohms ± 10%, 2w. G-E Dwg. C-3R79-P104K.
R600	Added.	Resistor: composition, 100,000 ohms ± 10%, 2w. G-E Dwg. C-3R79-P104K.

Elementary Diagram Changes

R600 added in parallel with R534.

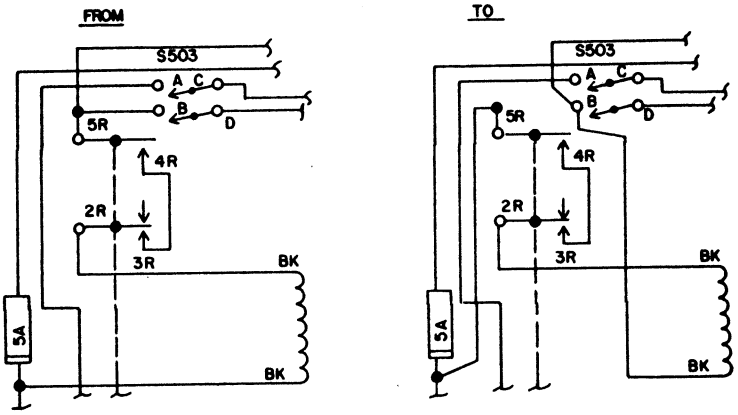
REV. E

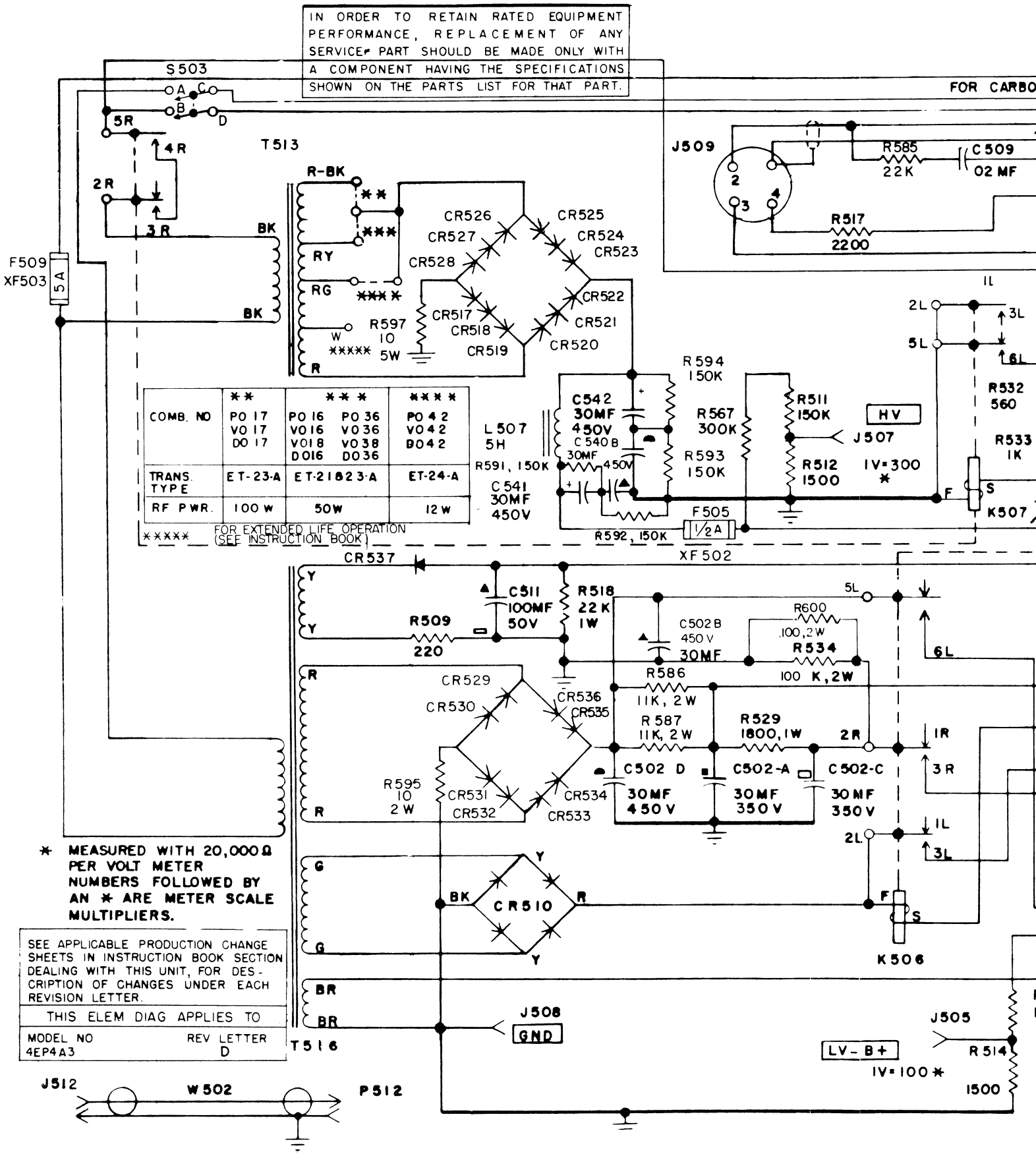
Purpose of Change

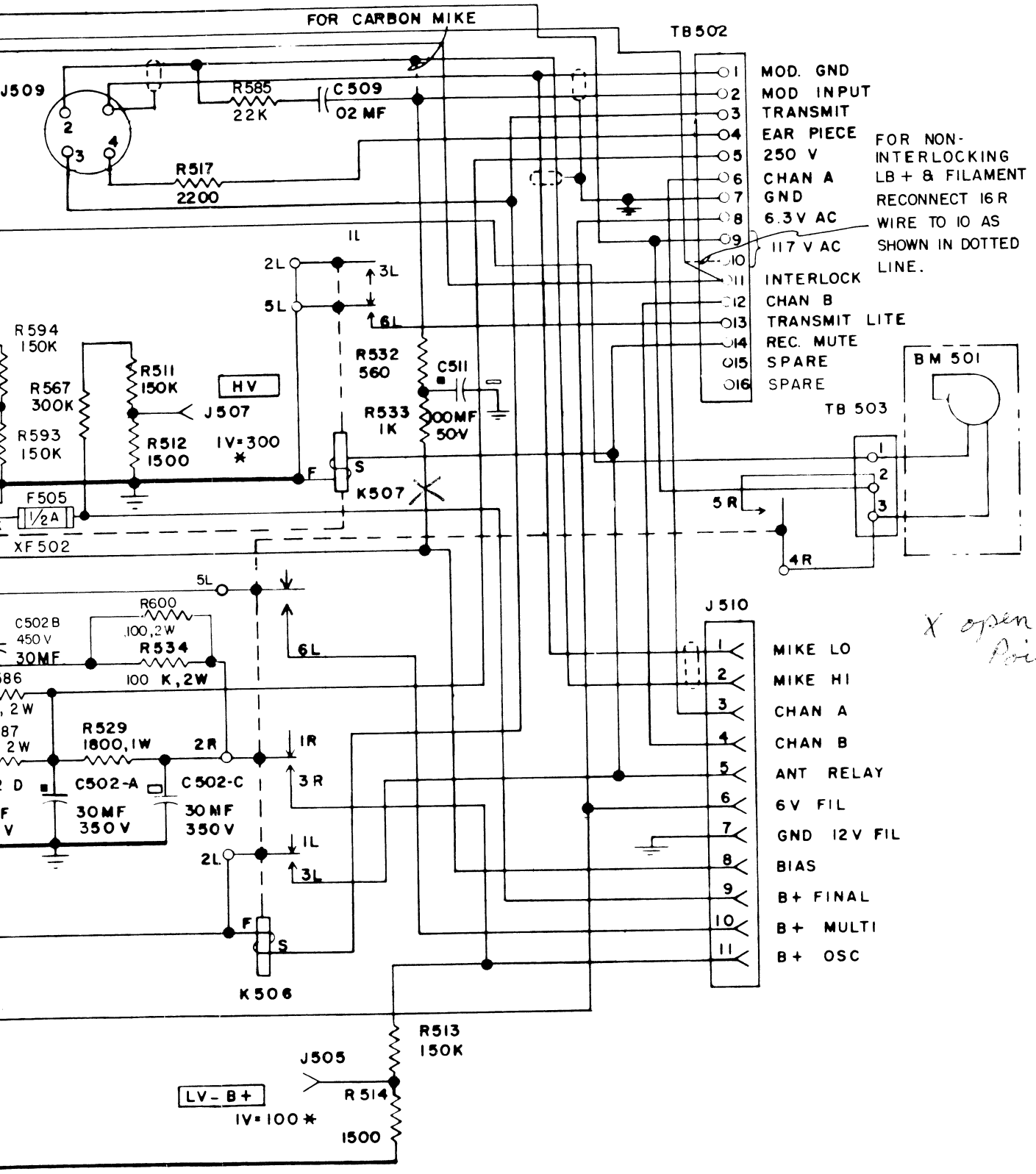
To prevent relay arc-over and burn out due to lightning or live surges.

Part Changed	Was	Changed To
K507	Relay: resistance 28 ohms ± 10%, pick up 4.5 v d-c or less, operate 7.2 v d-c or less, single 1 form A, 3 form C contacts. Contact pressure 25 gms min. Potter Brumfield Cat. #MJ-1195. G-E Dwg. C-7774180-P6.	Relay: miniature, telephone type, coil resistance 28 ohms ± 10%, P/U 4.5 v d-c or less, max. operate 7.2 v d-c, contacts left stock 2-form C, right stock 1-form A, 1 form C, 25 gms min. contact pressure. Davis Elec. Co. #DA1090A. G-E Dwg. B-5490230-P1.

REV. E (Cont'd)


FROM
S503
A
C
B
D
5R
4R
2R
3R
BK
BK
5A
TO
S503
A
C
B
D
5R
4R
2R
3R
BK
BK
5A


IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.
S503
A
B
C
D
5R
4R
2R
3R
T513
R-BK
BK
RY
RG
W
R
F509
XF503
5A
CR526
CR525
CR527
CR524
CR523
CR528
CR522
CR517
CR521
CR518
CR520
CR519
R597
10
5W
J509
2
3
4
R585
22K
C509
02 MF
R517
2200
FOR CARBO
1L
2L
3L
5L
6L
R532
560
R533
1K
R594
150K
C542
30MF
450V
C540B
30MF
450V
R567
300K
R593
150K
R511
150K
HV
J507
R512
1500
1V=300 *
L507
5H
R591, 150K
C541
30MF
450V
F505
1/2A
R592, 150K
F
S
K507
XF502
CR537
C511
100MF
50V
R518
22K
1W
R509
220
C502B
450V
30MF
R600
100,2W
R534
100 K,2W
R586
11K, 2W
CR529
CR530
CR536
CR535
R587
11K, 2W
R529
1800,1W
2R
1R
3R
C502 D
30MF
450V
C502-A
30MF
350V
C502-C
30MF
350V
R595
10
2W
CR531
CR532
CR534
CR533
CR510
K506
BR
J508
GND
T516
J505
LV-B+
1V=100 *
R514
1500
J512
W502
P512
COMB. NO	**	***	****
	PO 17 VO 17 DO 17	PO 16 VO 16 VO 18 DO 16 PO 36 VO 36 VO 38 DO 36	PO 42 VO 42 BO 42
TRANS. TYPE	ET-23-A	ET-21823-A	ET-24-A
RF PWR.	100 W	50W	12 W
***** FOR EXTENDED LIFE OPERATION (SEE INSTRUCTION BOOK)
* MEASURED WITH 20,000Ω PER VOLT METER NUMBERS FOLLOWED BY AN * ARE METER SCALE MULTIPLIERS.
SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.
THIS ELEM DIAG APPLIES TO
MODEL NO 4EP4A3
REV LETTER D



Elementary Diagram

TRANSMITTER POWER SUPPLY
MODEL 4EP4A3, REV. D

(C-5494811, Rev. 8)

PARTS LIST

TRANSMITTER POWER SUPPLY MODEL 4EP4A3, REV. D

PL-7774169-G21

SYMBOL	DESCRIPTION	G-E DRAWING & PART NO.
	CAPACITORS	
C502	Electrolytic, polarized, twist prong base; 30-30-30-30 mfd, 450-350-450-350 v d-c w. Mallory Type FP.	P-7772415-P46
C509	Ceramic, insulated, miniature. Hi-K disk; 0.02 mfd +60% -40% at 25°C, 250 v d-c w.	B-7487478-P3
C511	Electrolytic, non polarized, twist prong base; 100-100 mfd +250% -10%, 50-50 v d-c w.	C-7775492-P1
C540	Electrolytic, polarized, twist prong base, with insulating sleeve; 30-30 mfd +50% -10%, 450-450 v d-c w. Mallory Cat. #FP-237.	B-7772471-P14
C541 and C542	Electrolytic, tubular; 30 mfd +50% -10%, 450 v d-c w. PR Mallory Cat. #TC-77.	C-7774786-P44
	RECTIFIERS	
CR505#	Selenium, 1 cell, forward current 150 ma, peak inverse 64 V. G-E Cat. #6RS21PH1AT1. Deleted by Rev. B.	A-7140806-P1
CR506# and CR507#	Selenium, 24 cells in stack, forward current 120 ma, for units connected as a full wave bridge, use 1/2 this rating for half wave or doubler operation, peak inverse 380 v per ARM, connected for doubler. G-E Cat. #6RS21PD12BB1. Deleted by Rev. B.	A-7144141-P2
CR510	Selenium, 4 cells in stack, approx d-c output with aged stack 18 V, forward current or d-c output 1.25 amp, max peak inverse or peak a-c input 37 V. G-E Cat. #6RS25GB1BA1.	B-7488065-P1
CR513# thru CR516#	Selenium, half wave; forward current 0.150 amp d-c input 650 V RMS forward drop 15.5 V RMS, reverse current 24.0 ma RMS. G-E Cat. #6RS22PH14BA01. Deleted by Rev. B.	B-7489163-P2
CR517# thru CR537#	Silicon rectifier, half wave; peak volts 400, capacitive load, inverse 300, resistive load 500 ma. Similar to Westinghouse 1N1169. Added by Rev. B.	B-5490415-P2
	FUSES	
F502#	Deleted by Rev. A.	
F505#	Fuse; 1/2 amp at 250 V, type 3AG, quick to medium blowing. Littelfuse Cat. #312.500. Bussman Cat. #AGC-1/2. Added by Rev. A.	K-1R16-P1
F509	Slow blow, Type 3AG, 5 amp at 125 v. Littelfuse Cat. #313005. Bussman Cat. #MDX-5.	B-7478924-P19
	JACKS AND RECEPTACLES	
J505	Test point jack, phenolic or urea. Alden Products Co. Type 110BCS-red.	A-7143966-P2
J507	Test point jack, phenolic or urea. Alden Products Co. Type 110BCS-red.	A-7143966-P2
J508	Test point jack, phenolic or urea. Alden Products Co. Type 110BCS-black.	A-7143966-P1
J509	Chassis connector; 4 female contacts. Amphenol Type 91-PC4F.	K-7117934-P2
J510	Connector and ring; 11 female contacts, mica filled phenolic. Cinch Cat. #13786.	A-7140824-P2
J512	Jack, part of cable W502.	
	RELAYS	
K506 and K507	Resistance 28 ohms ± 10%, pick up 4.5 v d-c or less, operate 7.2 v d-c or less, single 1 form A, 3 form C contacts. Contact pressure 25 gms min. Potter Brumfield Cat. #MJ-1195.	C-7774180-P6
	INDUCTOR	
L507	Reactor: inductance 5 h at 0.3 amps d-c, d-c resistance 80 ohms max, peak a-c ripple 100 v at 120 cycle, operating 1000 v d-c.	B-5490104-P1
	PLUG	
P512	Plug, part of cable W502.	

SYMBOL	DESCRIPTION	G-E DRAWING & PART NO.
	RESISTORS	
R509	Composition, 220 ohms ± 10%, 1 w.	C-3R78-P221
R511	Composition, 0.15 megohm ± 5%, 1/2 w.	C-3R77-P154
R512	Composition, 1500 ohms ± 5%, 1/2 w.	C-3R77-P152
R513	Composition, 0.15 megohm ± 5%, 1/2 w.	C-3R77-P154
R514	Composition, 1500 ohms ± 5%, 1/2 w.	C-3R77-P152
R517	Composition, 2200 ohms ± 10%, 1/2 w.	C-3R77-P222
R518	Composition, 22,000 ohms ± 10%, 1 w.	C-3R78-P223
R529	Composition, 1800 ohms ± 10%, 1 w.	C-3R78-P182
R532	Composition, 560 ohms ± 10%, 1/2 w.	C-3R77-P561
R533	Composition, 1000 ohms ± 10%, 1/2 w.	C-3R77-P102
R534*	Composition, 100,000 ohms ± 10%, 2 w. Changed by Rev. D.	C-3R79-P104
R567	Composition, 0.30 megohm ± 5%, 1/2 w.	C-3R77-P304
R585	Composition, 22,000 ohms ± 10%, 1/2 w.	C-3R77-P223
R586 and R587	Composition, 11,000 ohms ± 10%, 1/2 w.	C-3R79-P113
R591# thru R594#	Composition, 0.15 megohm ± 10%, 1/2 w. Added by Rev. A.	C-3R77-P154
R595	Composition, 10 ohms ± 10%, 2 w. Added by Rev. B.	C-3R79-P100
R596	Wirewound, 10 ohms ± 10%, 5 w. Omit wire leads. Added by Rev. B.	B-7487415-P1
R600#	Composition, 100,000 ohms ± 10%, 2 w.	C-3R79-P104
	SWITCH	
S503	Toggle type, dpst, 10 amp at 250 v, 15 amp at 125 v, 60 cycles. Hart Mfg. Co. Cat. #2160A.	A-7143613-P1
	TRANSFORMERS	
T513	Power, rectifier, single phase. Pri: 117 v, 50/60 cycles; sec #1: 545/375/350 v, 0.575/0.595/0.385 amps.	B-5490007-P1
T516	Filament and rectifier, single phase. Pri: 117 v, 50/60 cycles; sec #1: 270 v, 0.210 amp; sec #2: 18.0 v, 0.054 amp; sec #3: 9.0 v, 1.85 amp; sec #4: 6.3 v, 12.0 amp.	B-7487265-P2
	CABLE	
W502	Cable assembly; includes connector, chassis receptacle. Amphenol Cat. #83-1R. Signal Corp. #SO-239. G-E Dwg. and Part No. M-2R22-P3. Hood Type UG-177/U similar to Amphenol Cat. #83-765. G-E Dwg. and Part No. K-7114629-P1 and a cable assembly of 15.50" long of RG-58/U cable with a short pin silver plated phone plug molded on one end. Color black. G-E Dwg. and Part No. B-7488600-P91.	A-7146725-G3
	SOCKETS	
XF502 and XF503	Fuse holders. Bussman Mfg. Type HKP.	K-7115179-P1

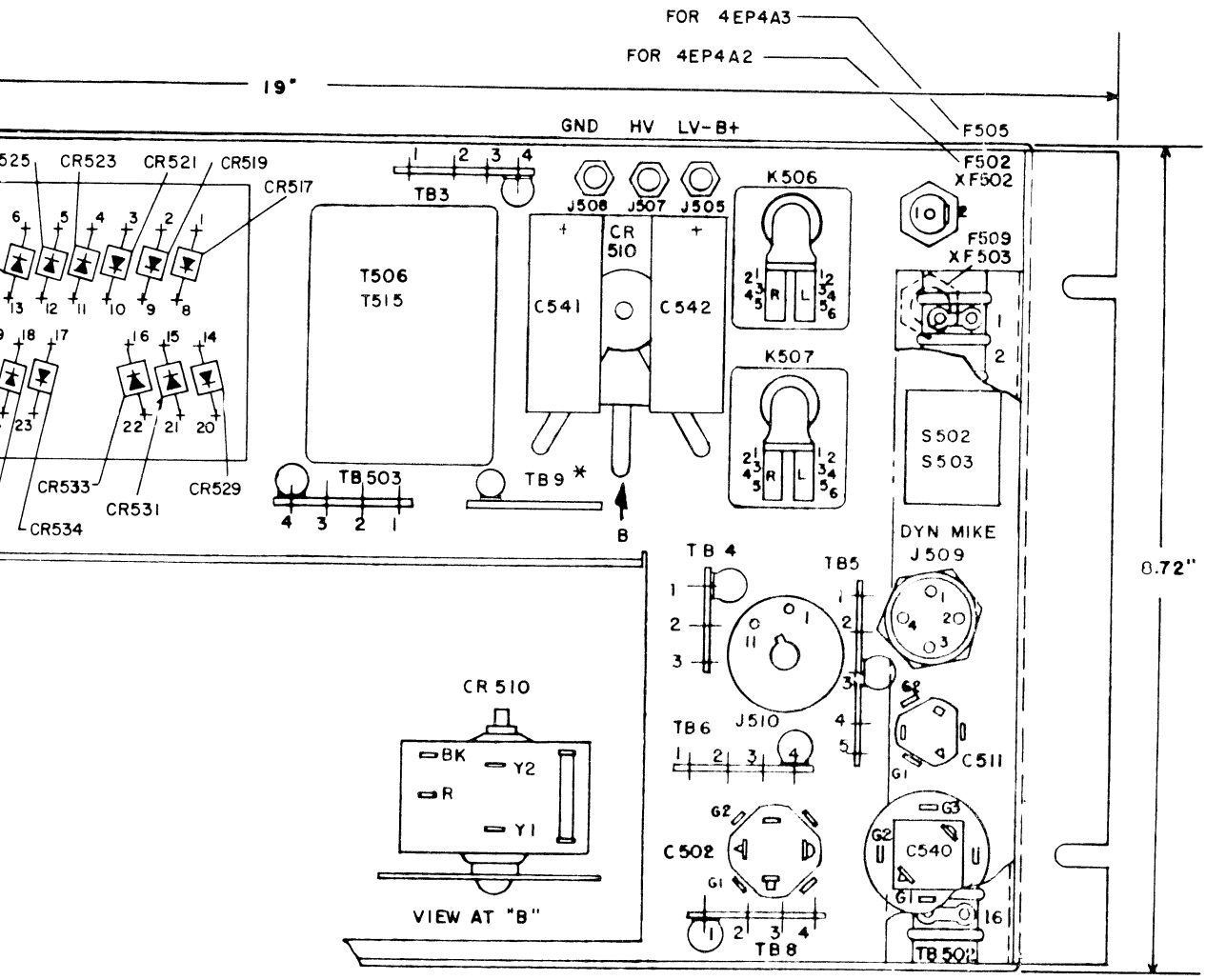
HINTS FOR SERVICING

The following list of service hints, in addition to the table of Typical Metering Voltages and the Voltage-Resistance Chart (see reverse side of page) will assist the serviceman in locating the source of trouble if the Power Supply Should fail to operate properly.

SYMPTOM	SERVICE HINTS
Transmitter completely dead.	Check line voltage at terminals 9 and 11 of TB502.
	Check power fuse F502 (2-amp).
	Check output voltages at J510 with those listed on reverse side of page.
Transmitter filaments lit, but no power output.	Check HV-B+ fuse F509 (5-amp).
Low B-plus (HV).	Open rectifier (CR513,CR514,CR515,or CR516).
Low B-plus (LV).	Open rectifier (CR506 or CR507).

TYPICAL METERING VOLTAGES

METER JACK	CIRCUIT	MULTIPLIER METER READING BY	VOLTAGE
LV-B+ J505	Oscillator and Multiplier B-plus	100	200 volts
HV-B+ J507	Power Amplifier B-plus	300	420 volts (144-174 MC and 450-470 MC band)
			660 volts (25-54 MC band)



METER READINGS AT TB502

NO	VOLTAGE	RESISTANCE
1	0	∞
2	−22	30
3	8.0/0	70K
4	0	∞
5	380	150K
6	0	∞
7	0	0
8	6.6 AC	0
9	—	—
10	—	—
11	—	—
12	0	∞
13	0	∞
14	0/6.0	15
15	0	∞
16	0	∞

CONDITIONS OF MEASUREMENT:

1. ALL MEASUREMENTS MADE FROM INDICATED POINT TO CHASSIS WITH ALL CABLES DISCONNECTED FROM UNIT.
2. VOLTAGES ARE TYPICAL READINGS ON A 20,000 OHM-PER-VOLT DC METER, UNLESS OTHERWISE NOTED, WITH 117 VOLTS AC APPLIED BETWEEN PINS 9 AND 11 OF TB502.
   A - READINGS FOLLOWED BY "AC" WERE OBTAINED WITH A 1000 OHM-PER-VOLT AC VOLTMETER.
   B - WHERE TWO VOLTAGES ARE GIVEN FOR ONE POINT (I.E. 0/6.0 V), FIRST READING IS FOR "STANDBY" AND SECOND IS FOR "TRANSMIT." POWER SUPPLY CAN BE KEYED BY GROUNDING PIN 3 OF MICROPHONE JACK J509.
3. ALL MEASUREMENTS MADE WITH A METER RANGE THAT GIVES ONE-THIRD TO FULL-SCALE DEFLECTION OF THE METER.
4. ALL DC VOLTAGES ARE POSITIVE WITH RESPECT TO CHASSIS, UNLESS MARKED "−" FOR NEGATIVE.
5. RESISTANCES ARE TYPICAL READINGS WITH ALL VOLTAGES REMOVED.

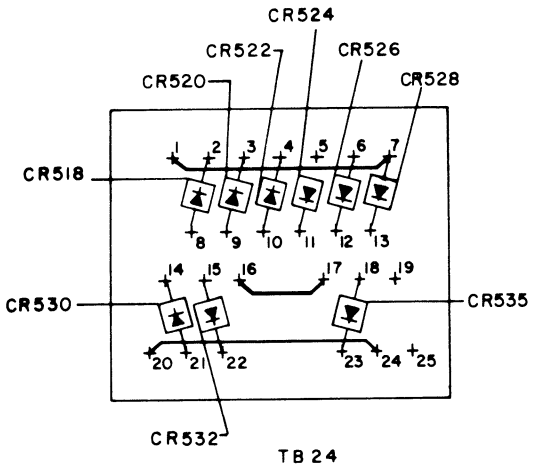
CK	1 VOLT DEFLECTION ON A 20,000 OHM-PER-VOLT VOLTMETER EQUALS
05	100 VOLTS
07	300 VOLTS

, CR515 & CR516 CHANGE
TO R FOR 4EP4A3.

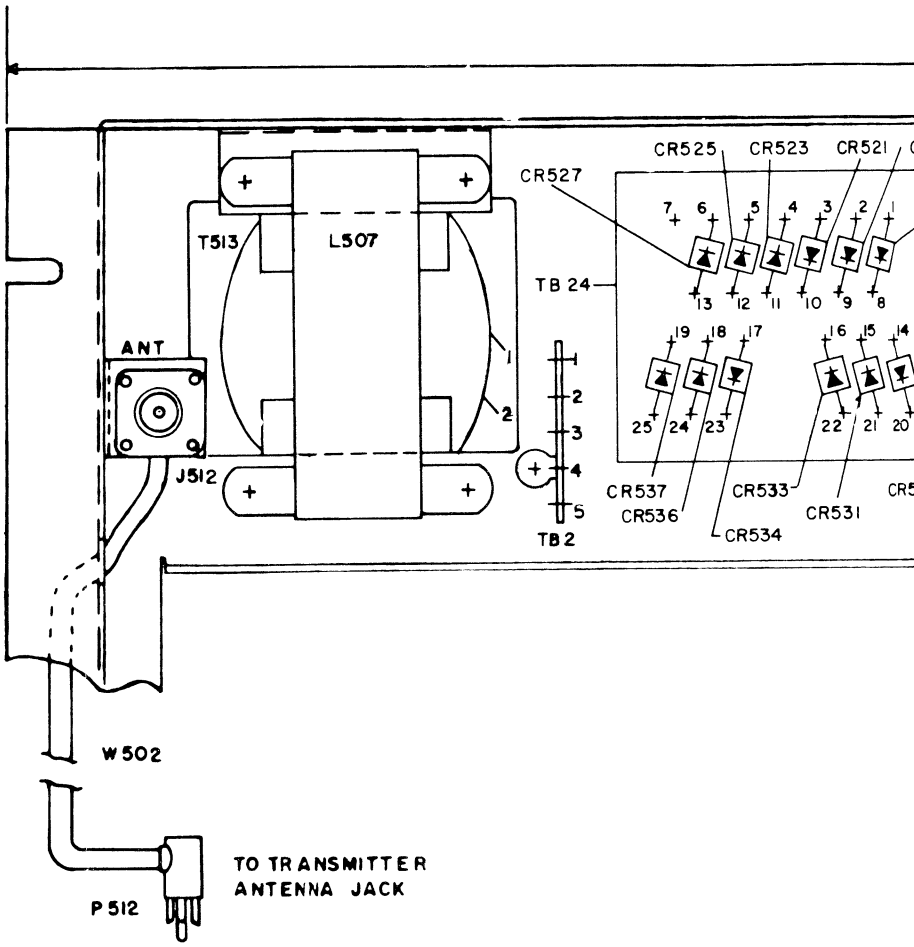
Service Outlin

STATION TRANSM
POWER SUPPLY M
4EP4A2 & 3

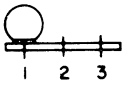
(D-5497691 Re



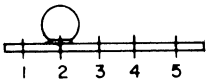
TB 24
REAR VIEW



FOR 4EP4A2

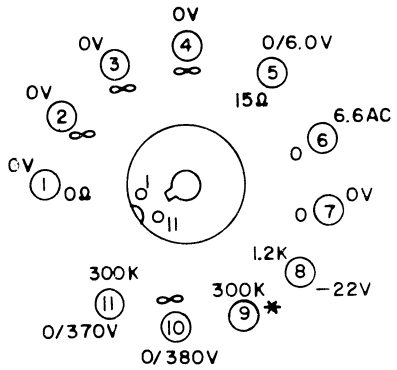


FOR 4EP4A3



* TERMINAL NUMBERING FOR TB9

COMBINATION NUMBER	PO 17 VO 17 DO 17	PO 16 PO 36 VO 16 VO 36 VO 18 VO 38 DO 16 DO 36	PO 42 VO 42 DO 42	
TRANSMITTER TYPE	ET-23-A	ET-21 & 23-A	ET-24-A	
RF POWER	100 W	50 W	12 W	
J510-9 * METER READING	810 V	530 V	510 V	



METER READINGS
AT J510

METERING JACK		1 VOLT DEFLE 20,000 OHM- VOLTMETER
LV - B+	J505	100 VOLTS
HV	J507	300 VOLTS

△ ON CR506, CR507, CR515 & CR516 C
R TO BK & BK TO R FOR 4EP4A3.