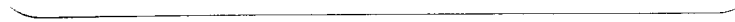
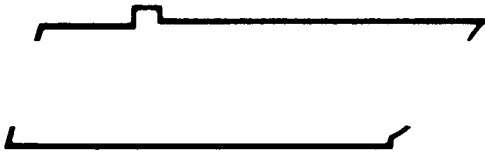


INSTRUCTION MANUAL
FOR
TENNELEC
NIM BIN AND POWER SUPPLY
TB3/TC 911

INSTRUCTION MANUAL
FOR
TENNELEC
NIM BIN AND POWER SUPPLY
TB3/TC 911

PAGE 1 OF 1



INSTRUCTION MANUAL

TB3/TC 911

NIM BIN and POWER SUPPLY

WARRANTY

TENNELEC, INC. warrants that the products or components manufactured by it shall be free from defects in material or workmanship for a period of one year from the date of delivery to purchaser. If such product or component is determined to be defective by TENNELEC, its sole warranty obligation shall be limited to either replacing or repairing such defective product or component or allowing credit therefor, at TENNELEC's option. Such warranty is further conditioned upon the purchaser's giving prompt notice of any such defect and satisfactory proof thereof to TENNELEC's customer service manager, thereafter upon TENNELEC's approval, the purchaser shall return such defective product or component to TENNELEC's factory at Oak Ridge, Tennessee, all transportation charges prepaid. TENNELEC shall be responsible only for transportation charges incurred in returning such product or component to purchaser. All customs, brokerage and duty charges shall be at the expense of the purchaser. Damage in transit due to inadequate packaging will be repaired at purchaser's expense. Any repairs or replacements by the purchaser without TENNELEC's approval, any willful abuse or any evidence that the product or component was not properly used and maintained, would automatically void this warranty.

TENNELEC makes no warranty whatsoever in respect to products or components not manufactured by it but instead the applicable warranties, if any, of the respective manufacturers thereof shall apply. Likewise fuses, batteries and input transistors in ultra low-noise amplifiers are specifically excluded from this warranty.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WARRANTY OF MERCHANTABILITY AND FITNESS.

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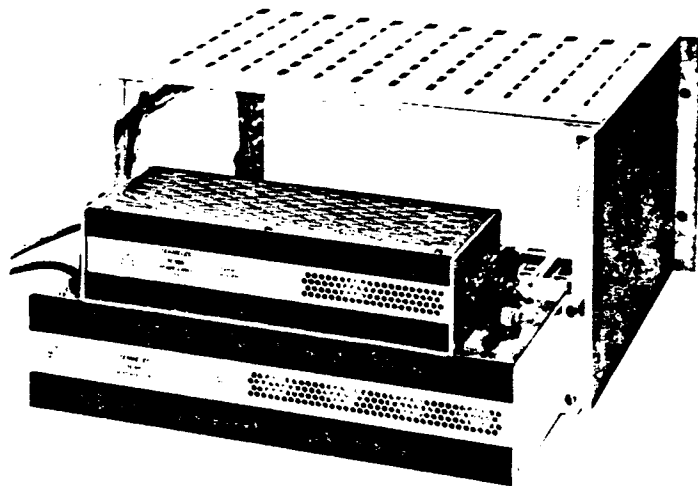
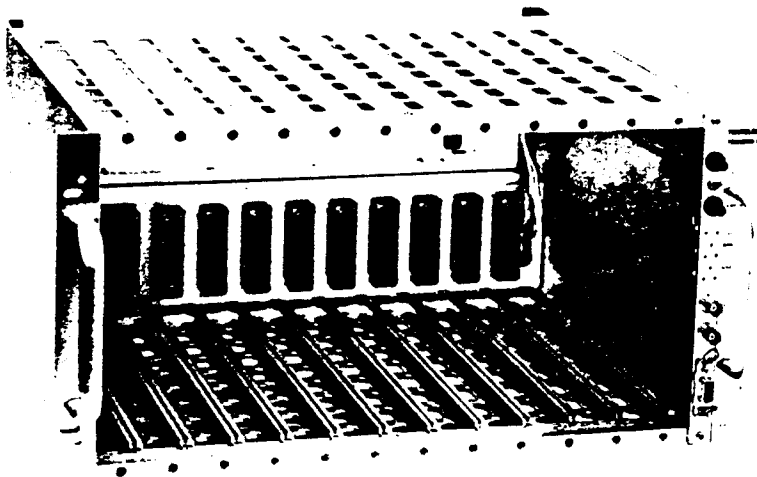
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**INSTRUCTION MANUAL
TB-3/TC 911 & TC 966
NIM BIN
AND POWER SUPPLIES**

MODEL NO. TB-3/TC 911 & TC 966

SERIAL NO.

TENNELEC P. O. Box D / Oak Ridge, Tenn. 37830 / Telephone (615) 483-8405 / TWX 810-572-1018

1.0 INTRODUCTION

The TB-3/911 Tennebin is a rackmounted modular systems bin designed to accommodate up to twelve NIM (Nuclear Instrument Modules) standard width modules. The TB-3 bin is constructed of extruded aluminum panels with top and bottom cover plates. Module guides of machined extruded aluminum provide for precision fit of modules and eliminate warping, distortion and/or breakage associated with die-cast plastic or teflon guides. Floating power connectors allow for easy insertion of out-of-tolerance modules.

The TC 911 rear mounted power supply provides stable regulated power at $\pm 12V$ dc at 2A each, and $\pm 24V$ dc at 1A each and 115 Vac at .5A via AMP 202516-3 floating connectors. In addition, the connectors are provided with a power return ground and a high quality ground for elimination of ground loops. All power connectors are wired in parallel to prevent the cumulative voltage drops associated with "daisy chain" wiring.

Tennebin-3 also features front-panel-mounted BNC connectors which provide access to preamplifier output signals and test pulse inputs as well as an Amphenol 17-10090 connector wired to TENNELEC preamplifier-amplifier specifications.

Options available with Tennebin-3 are external connectors for routing NIM standard voltages to additional modular systems bins and a cover to improve appearance for stand-alone, table-top installations.

TENNELEC's TC 966 is a $\pm 6V$ dc power supply designed to operate in conjunction with the TC 911 NIM power supply. It mounts "piggyback" on top of the TC 911 and is hinged on the rear panel for ease of installation and maintenance. The output of the supply, $+6V$ dc or $-6V$ dc at 5A, 30 VA maximum, is routed to the TC 911 via the PG-16 connector. Overload protection is provided along with a thermal cut out switch which opens in case excessive operating temperatures are reached.

The unit is constructed of iridited aluminum with an extruded aluminum rear panel which serves as the heat sink and features a black anodized finish for rapid heat dissipation. The supply may be purchased attached to the TC 911 NIM supply or may be ordered separately at any future date. Field installations takes less than 15 minutes and requires only a screwdriver.

Part I - TENNEBIN-3 NIM BIN

2.0 SPECIFICATIONS

DIMENSIONS: (Standard EIA Rack) 19-in. W x 8.72-in. H x 11.94-in. D (48.26 cm X 22.15 cm x 29.23 cm).

CONSTRUCTION MATERIAL: All extruded aluminum construction with machined extruded aluminum module guides.

BASIC MODULE WIDTH: 1.35-in. (4.43 cm).

BIN WEIGHT: 10 lbs (4.5 kg).

3.0 CONTROLS, CONNECTORS AND INDICATORS

3.1 CONNECTORS

Power: Twelve, each AMP 202516-3; all wired for $\pm 6V$, $\pm 12V$, $\pm 24V$ and 115V ac power return ground and high quality ground.

Preamplifier Signal Out: BNC (UG-1094/U).

Test Pulse In: BNC (UG-1094/U).

Preamplifier Cable: Amphenol 17-10090 wired to TENNELEC specifications. Can be modified to meet any manufacturer's specifications.

3.2 INDICATORS

Thermal Overload: Red front panel warning lamp. (Lights when power supply temperature exceeds $60^{\circ}C$).

Power ON: Front panel indicator lamp lights when the TC 911 Power Supply is ON.

4.0 OPERATING PROCEDURES

4.1 INSTALLATION

The TENNEBIN-3 may be mounted in a standard relay rack or placed on any flat surface. The ac line cord should be plugged into a grounding outlet. If it is necessary to use an adapter to two-prong outlets, insure that the unit is properly grounded. If it is connected into a system using other ac power, connect all ac cords into the same ac line to prevent ground loop problems.

4.2 OPERATION

Any combination of NIM modules may be used in the TB-3 up to a total of twelve bin widths. Modules should be inserted fully and secured with the screws on the top and bottom of the module. It is recommended that the bin power be turned OFF before inserting or removing modules.

4.3 PREAMPLIFIER CONNECTION

A connector is supplied on the front panel to connect the bin to any TENNELEC preamplifier. This cable connects the bin with the preamplifier TEST INPUT

and OUTPUT, as well as supplying power to the preamplifier. When this connector is used, test pulses may be applied directly at the bin and the preamp OUTPUT may be connected from the bin to the main amplifier.

4.4 THERMAL OVERLOAD

Should the THERMAL OVERLOAD Indicator ever come on while the unit is in operation, it indicates that the power supply temperature has exceeded operational limits (60°C) and the unit should be shut down until the source of the overload is determined.

4.5 TEST POINTS

Jacks are provided on the front panel for monitoring the output voltages of the bin power supply. These can be used for checking and adjusting power supply voltages if necessary.

4.6 SLAVE BIN OPERATION

The TB-3 can be used as a slave bin receiving power from another NIM power supply. NIM specifications do not include 115V ac on slave bin connectors. Therefore, if the customer desires to use modules (such as scalars) needing ac in a slave bin, he should specify this in ordering.

Part II - TC 911 POWER SUPPLY

2.0 SPECIFICATIONS

(USAEC Standard Class A Supply per TID-20893 (Rev. 4))

INPUT: 103V to 129V ac, 50 to 60 Hz. 230V \pm 30V ac, 50 to 60 Hz. (Specify 117V ac or 234V ac.)

OPERATING TEMPERATURE OUTPUT: 0° to 60°C.

OUTPUT: \pm 24V dc at 1A each; \pm 12V dc at 2A each; 115V ac at 0.5A. Total combined output must not exceed 96VA.

REGULATION: Less than 0.05% for line voltage variation of \pm 10% or 100% changes in rated load.

RIPPLE AND NOISE: Less than 3mV peak-to-peak.

THERMAL COEFFICIENT OF OUTPUT VOLTAGE: Less than 0.005%/°C.

STABILITY: Less than $\pm 0.3\%$ per six months at ambient temperature after warm-up and with constant line voltage and load.

RECOVERY TIME: Less than 100 μsec to return within regulation limits for a 100% step-change in rated load.

CIRCUIT PROTECTION: Fully protected against overloads via the internal protection circuitry. When current drain from any voltage bus exceeds rated output by 0.2 to 0.25 amps, the foldback circuitry is activated and currents are limited to 80% or less of the rated output, depending on line voltage (the higher the line voltage, the lower the foldback current). All four buses may be overloaded or shorted to ground indefinitely without damage. When the operation fault is removed, the supply may or may not return to normal operation, depending on where the load current is with respect to the foldback region. Normal operation can always be restored by momentarily turning off the power.

THERMAL OVERLOAD PROTECTION: Thermal warning light is activated if supply temperature exceeds 60°C . Power supply is disabled if interior temperature exceeds 95°C .

OPTIONS: External +6V or -6V supply enters the PG-16 connector in parallel with the PG-14 and PG-15 connectors (+6V or -6V at 5A provided via the TC 966 Power Supply). All output voltages may be connected to other NIM bins from the PG-15 connector thereby providing parallel operating capability.

ORDERING INFORMATION: Specify 117V ac or 234V ac.

NET WEIGHT: 10 lbs (4.5 kg).

SHIPPING WEIGHT: 12.5 lbs (5.6 kg).

WARRANTY: One year.

3.0 CONTROLS AND CONNECTORS

3.1 CONTROLS

The 117V ac/234V ac SELECTOR two-position, recessed slide switch sets the ac transformer for a 117V ac or 234V ac source. It is recommended that selection of the ac input voltage be made prior to application of power.

The screwdriver-adjustable, 20-turn VOLTAGE TRIMMERS allow adjustment of the output voltages; one trimmer is located on each circuit card and is accessible from the top of the supply.

3.2 PG-14, PG-15 and PG-16 CONNECTORS

The PG-14 connector routes the output from the TC 911 to a NIM bin; it carries the six outputs and the sense lines. To operate the supply independent of the bin, an adapter must be used in order to switch on the supply. The optional PG-15 connector allows parallel operation of the supply with more than one NIM bin. The optional PG-16 connector is provided to accommodate a +6V or -6V input; it is wired in parallel with PG-14 and PG-15. (See Figs. 1 and 2.)

4.0 OPERATING PROCEDURE

4.1 INSTALLATION

The TC 911 should be attached to the rear of a twelve-width NIM bin (TB-3) in the following manner: (a) Connect the PG-14 receptacle to the NIM bin power distribution plug PG-13; (b) Bring the power supply frame flush with the NIM bin; (c) The power supply may now be secured to the bin with the four captive mounting screws; avoid trapping any wires between the power supply frame and the bin.

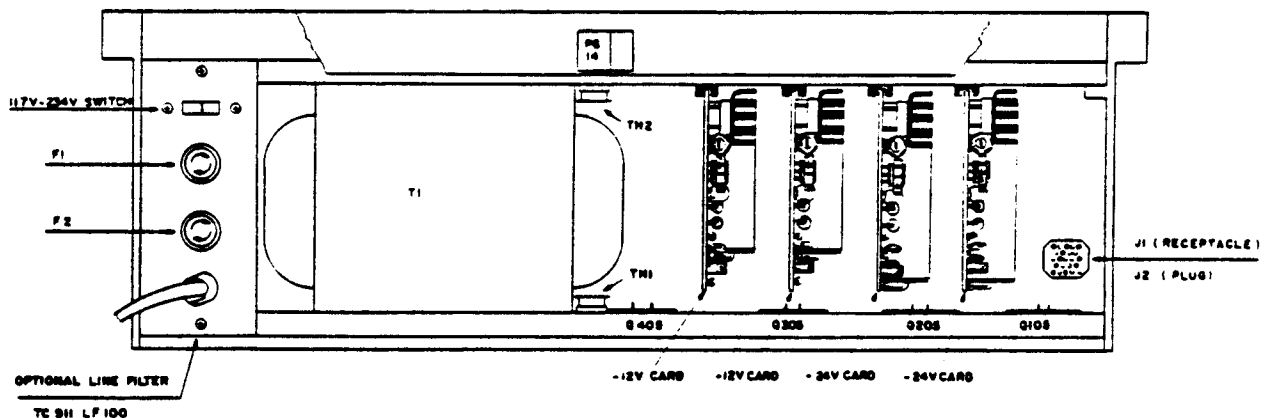


Figure 1 Mechanical and Component Placement

4.2 CIRCUIT CARD INTERCHANGE

Ease of maintenance is the primary advantage of plug-in cards; circuit cards may be easily interchanged. Remove cover plate and carefully extract the plug-in circuit card(s) to be interchanged. It is recommended that the power

supply be OFF before exchanging circuit cards. The dc voltages are not referenced to each other; the loss of one or more voltages (due to a malfunction) will not disable the remaining voltages. All plug-in cards are keyed to prevent the insertion of a card into the wrong slot; i.e., a 12V card will not fit a 24V slot. The proper location of cards is clearly marked on the top cover of the power supply.

4.3 VOLTAGE ADJUSTMENT

The output voltages should be checked with a meter after a 30-minute warm-up period to insure that all outputs are functioning properly. After this 30-minute warm-up period, check the power supply outputs from one of the NIM bin power connectors. If a voltage is not accurate, precise adjustment may be made with the trimmers; using a small screwdriver, simply operate the 20-turn potentiometer while observing the output voltage with a meter. All output voltages are adjustable over a nominal range of $\pm 0.5\%$. The resetability of each output voltage is within $\pm 0.05\%$ of the specified value.

NOTE: Accurate regulation measurements can not be made by loading the test jacks, since the IR drop in the connecting leads exceeds the inherent supply regulation.

4.4 +6V or -6V (OPTIONAL)

The TC 911 is wired to accommodate +6V or -6V. The TC 966 Power Supply was designed expressly for operation in conjunction with the TC 911. The PG-16 connector routes the output from the TC 966 to the TC 911 (see Fig. 2). Refer to Part III for specifications and operation of the TC 966. It is recommended that the TC 911 be switched OFF before connecting the TC 966 output to the TC 911 (PG-16).

4.5 PARALLEL OPERATION (OPTIONAL)

The TC 911 may power more than one NIM bin. This may be accomplished by simply installing a cable between the power distribution plug (PG-13) located at the rear of the NIM bin (SLAVE) and the PG-15 connector on the TC 911. When another bin is connected to the TC 911 at the PG-15 connector, all outputs (including the +6V or -6V, if a TC 966 has been installed) appear at the power connectors in the SLAVE bin. The SLAVE bin will not operate if the MASTER bin is switched off.

4.6 CAPTIVE LINE CORD

The captive line cord should be plugged into a proper receptacle; if a chassis ground receptacle is not available, an adapter can be used. For best results, it is recommended that the adapter's chassis ground terminal be grounded before operation.

5.0 CIRCUIT DESCRIPTION

The power transformer and the power transistors are fastened to the frame. Each plug-in circuit card contains a full-wave silicon rectifier, all of the filter capacitors, a Zener reference diode (D102, IN823A), and an error sensing amplifier. The input stage (IC 101 or IC 201) is a monolithic transistor array to minimize offset due to temperature drift.

The overload current sensing network consists of R118, R119, R111, and Q102. If the IR drop across R118 and R119 exceeds the set-point voltage across R104 and the upper part of R105, Q102 cuts off Q101. The fold-back circuit consists of Q104, R122, and R123, Q104 is normally nonconducting. If the power supply voltage drops too low, Q104 turns on and furnishes signal to Q102 to limit the total output current. In effect, an auxiliary feedback amplifier circuit overrides the path through IC 101.

The basic circuit of each of the cards is the same, differing only in component values and component series number. Above description is for -24V card. +24V card (200 series), +12V card (300 series), and -12V card (400 Series).

Part III - TC 966 POWER SUPPLY

2.0 SPECIFICATIONS

DIMENSIONS: 2.8-in. H x 4.5-in. D x 12-in. W (7.11 cm x 11.43 cm x 30.48 cm).

INPUT: 103 to 130V ac, 50 to 60 Hz; 206 to 260V ac, 50 to 60 Hz.

OUTPUT: +6V or -6V at 5A. 30 VA maximum.

RANGE OF ADJUSTMENT: $\pm 0.5\%$.

REGULATION: Less than 1.0% for line voltage variation of $\pm 10\%$ as the output current varies from no load to full load.

RIPPLE AND NOISE: 5mV peak-to-peak.

THERMAL COEFFICIENT OF OUTPUT VOLTAGE: Less than $0.01\%/^{\circ}\text{C}$.

STABILITY: Less than 0.3%/six months with constant ambient temperature after warm-up and with constant line voltage and load.

RECOVERY TIME: Less than 200 μsec to return to regulation limits for a 100% step-change in rated load.

CIRCUIT PROTECTION: Fully protected against overload via the internal protection circuitry. When any output current drain exceeds the rated output by 10%, the foldback circuitry is activated and the supply is disabled. The supply returns to normal operating conditions when overload or short no longer exists. Overvoltage protection is provided by the internal "crowbar" circuitry. This circuit is activated when the output voltage is exceeded by .4V dc.

ORDERING INFORMATION: Specify 117V ac or 234V ac.

WARRANTY: One year.

3.0 CONTROLS AND CONNECTORS

The TC 966 supplies power to the bin through the PG-16 connector of the TC 911 NIM Power Supply. The ON/OFF switch on the bin controls both the TC 911 and the TC 966.

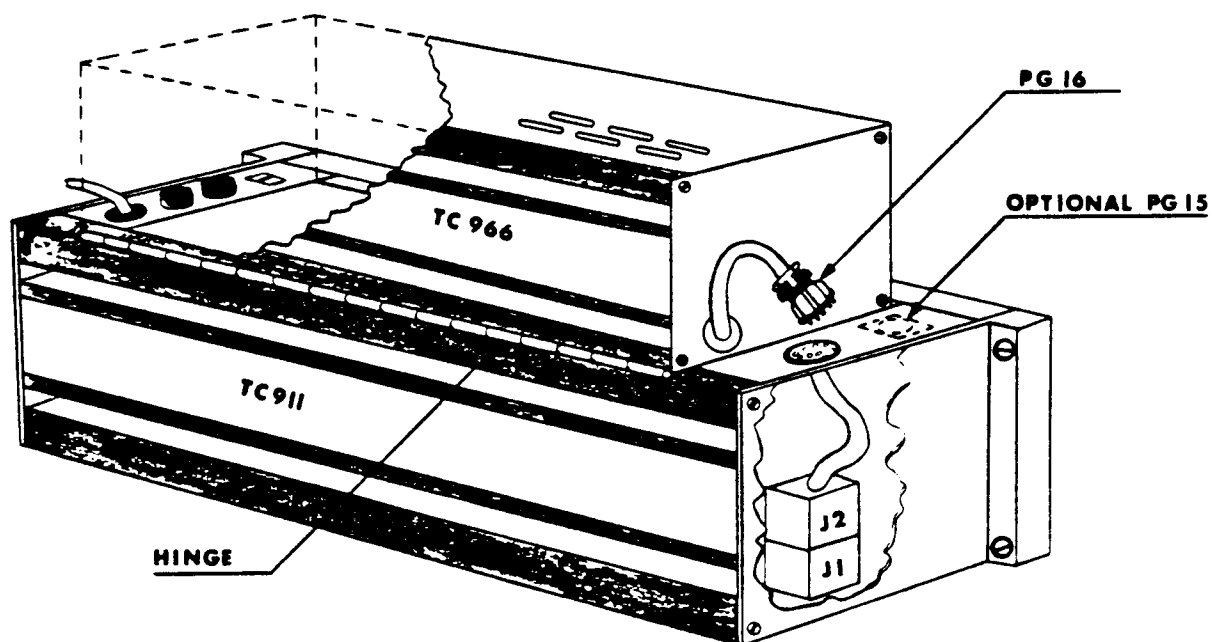


Figure 2 NIM Bin Configuration of the TC 911 and TC 966

4.0 INSTALLATION

The TC 966 Power Supply can be field-installed in fifteen minutes or less using only a screwdriver. It is recommended that the TC 911 be OFF before connecting the TC 966 output to the TC 911 to avoid damage to the units.

To attach the TC 966 to the TC 911, first remove the top cover plate of the TC 911. Plug the connector on the PG-16 cover plate (J2) into the matching connector on the TC 911 Power Supply (J1) as shown in Fig. 2 in the TC 911 section of this manual and attach this cover plate to the TC 911. Use the washers supplied as spacers between the hinge on the TC 966 and the back frame of the TC 911 and screw on the TC 966. The front of the TC 966 is then screwed onto the TC 911. Connecting PG-16 to its mating connector on the TC 911 completes the installation. If access to the TC 911 is necessary, removing the front screws from the TC 966 allows it to swing back on its hinge.

4.1 OPERATION

The power control on the bin controls both the TC 911 and the TC 966. After installation, the unit should be allowed to warm up for about 30 minutes and the voltage checked. A potentiometer located on the right side of the unit (and accessible through the top cover) allows for adjustments to the output voltage if necessary. An insulated screwdriver should be used to prevent accidental grounding of the circuit.

4.2 CAPTIVE LINE CORD

The line cord of the TC 966 should be plugged into the same ac lines as the TC 911 to prevent ground loop problems. A good ground should be provided for both power supplies.

5.0 FIRST-TIME OPERATION

Every instrument from TENNELEC, Inc. is thoroughly checked before it leaves the plant. However, it is possible for damage to occur during shipping; it is therefore advisable to conduct appropriate tests (see Section 4.3) before the instrument is put into actual operation.

Visually check the instrument upon receipt for possible external damage. If the unit is damaged, proceed according to instructions given in the SHIPPING DAMAGE section of this manual.

6.0 SERVICING

In the event of a component failure, replacement may be done in the field or the instrument may be returned to our plant for repair. There will be no charge for repairs that fall within the warranty.

7.0 SHIPPING DAMAGE

Upon receipt of the instrument, examine it for shipping damage. Damage claims should be filed with the carrier. The claims agent should receive a full report; a copy of that report should be sent to TENNELEC, Inc., P.O. Box D,

Oak Ridge, Tennessee 37830. The model and serial numbers of the instrument must be included in the report. Any remedial action taken by TENNELEC, Inc., will be based on the information contained in this report.

8.0 WARRANTY

In connection with TENNELEC's warranty (inside front cover) TENNELEC suggests that if a fault develops, the customer should immediately notify the TENNELEC Customer Service Manager. He may be able to prescribe repairs and to send replacement parts which will enable the user to get the instrument operating sooner and at less expense than if it were returned.

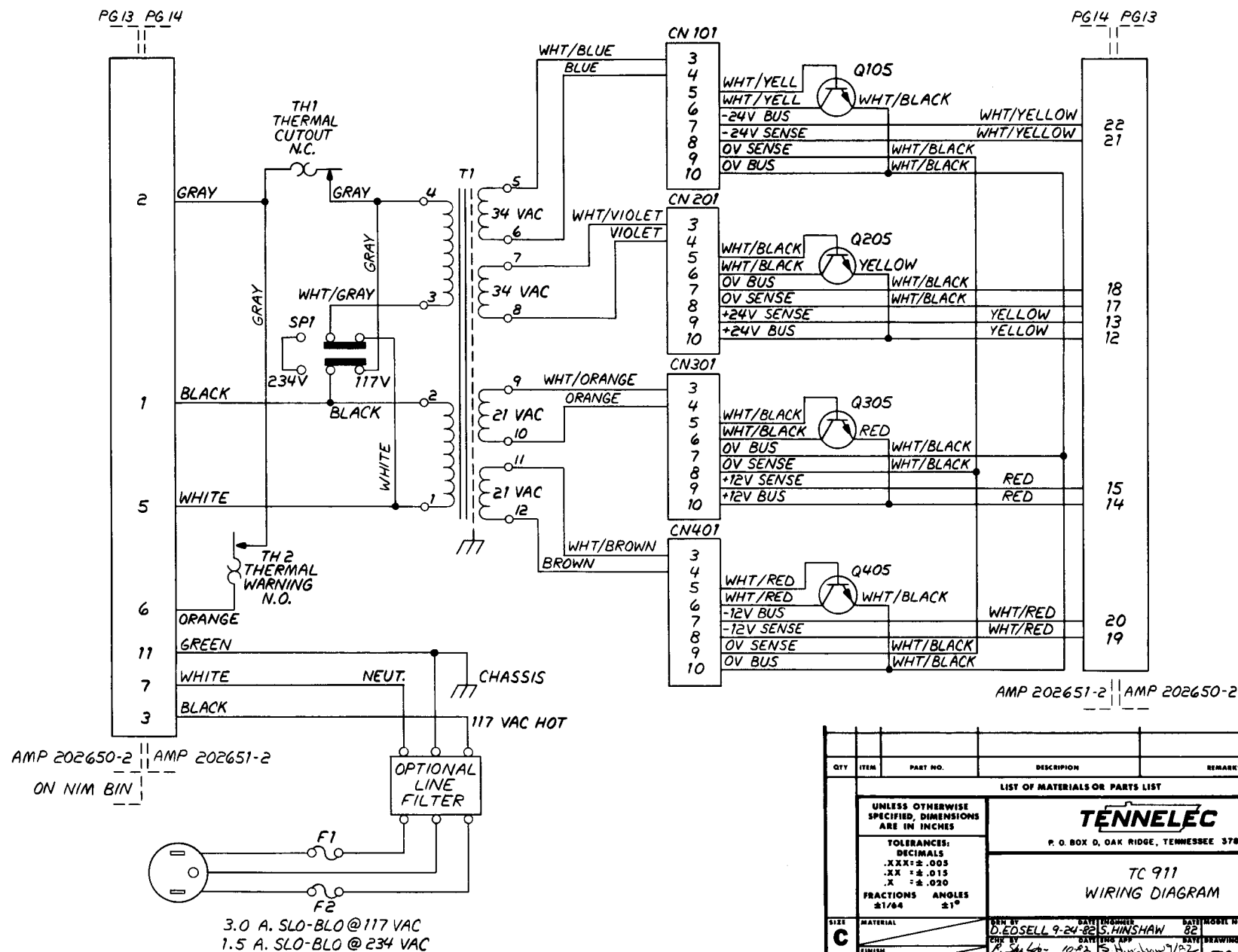
Should return prove necessary, the TENNELEC Customer Service Manager must be informed either in WRITING or BY CABLE of the nature of the fault and the model and serial numbers of the instrument. Pack the instrument well and ship PREPAID and INSURED to TENNELEC, Inc., 601 Oak Ridge Turnpike, Oak Ridge, Tennessee 37830. As stated in the warranty, DAMAGE IN TRANSIT WILL BE REPAIRED AT THE SENDER'S EXPENSE as will damage that obviously resulted from abuse or misuse of the instrument.

Quotations for the repair of such damage will be sent for your approval before repair is undertaken.

1/75 - Engineering and component improvements may be made after date of printing.

NOTES

REV.	ECN NO.	REVISIONS	DATE	BY
1	82-160		9-82	D.E./SMH



AMP 202651-2 AMP 202650-2

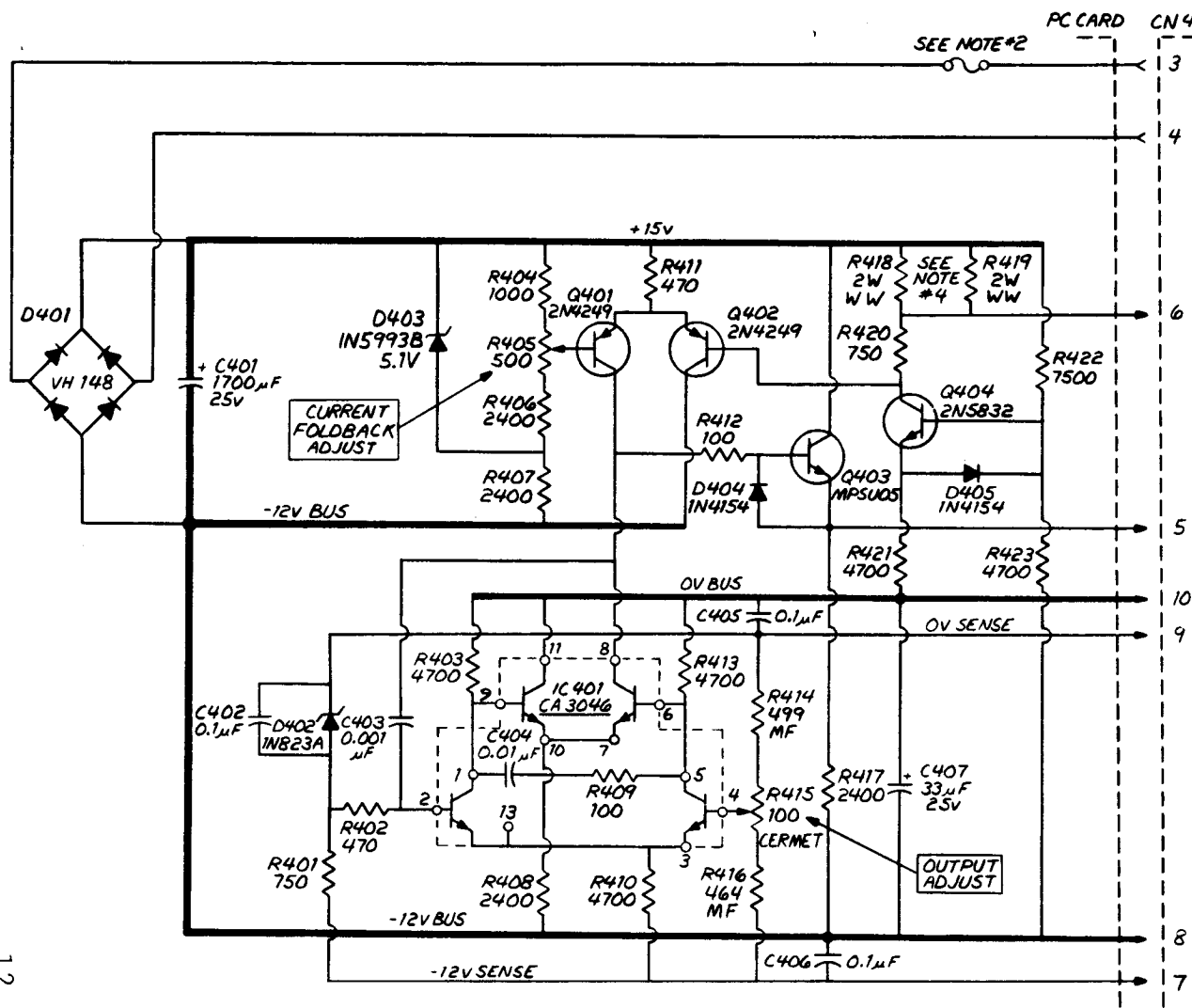
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UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES				
TOLERANCES:				
DECIMALS				
.XXX ± .005				
.XX ± .015				
.X ± .020				
FRACTIONS				
± 1/64				
ANGLES				
± 1°				
MATERIAL				
FINISH				
SCALE				
NONE				
DRAWN BY				
D. E. OSSELL 9-24-82 S. HINSHAW 82				
CHECKED BY				
A. S. G. 10-22 S. H. 9/82				
DATE				
9/82				
DRAWING NO.				
TC 911				

TENNELEC

P. O. BOX D, OAK RIDGE, TENNESSEE 37830

TC 911
WIRING DIAGRAM

12



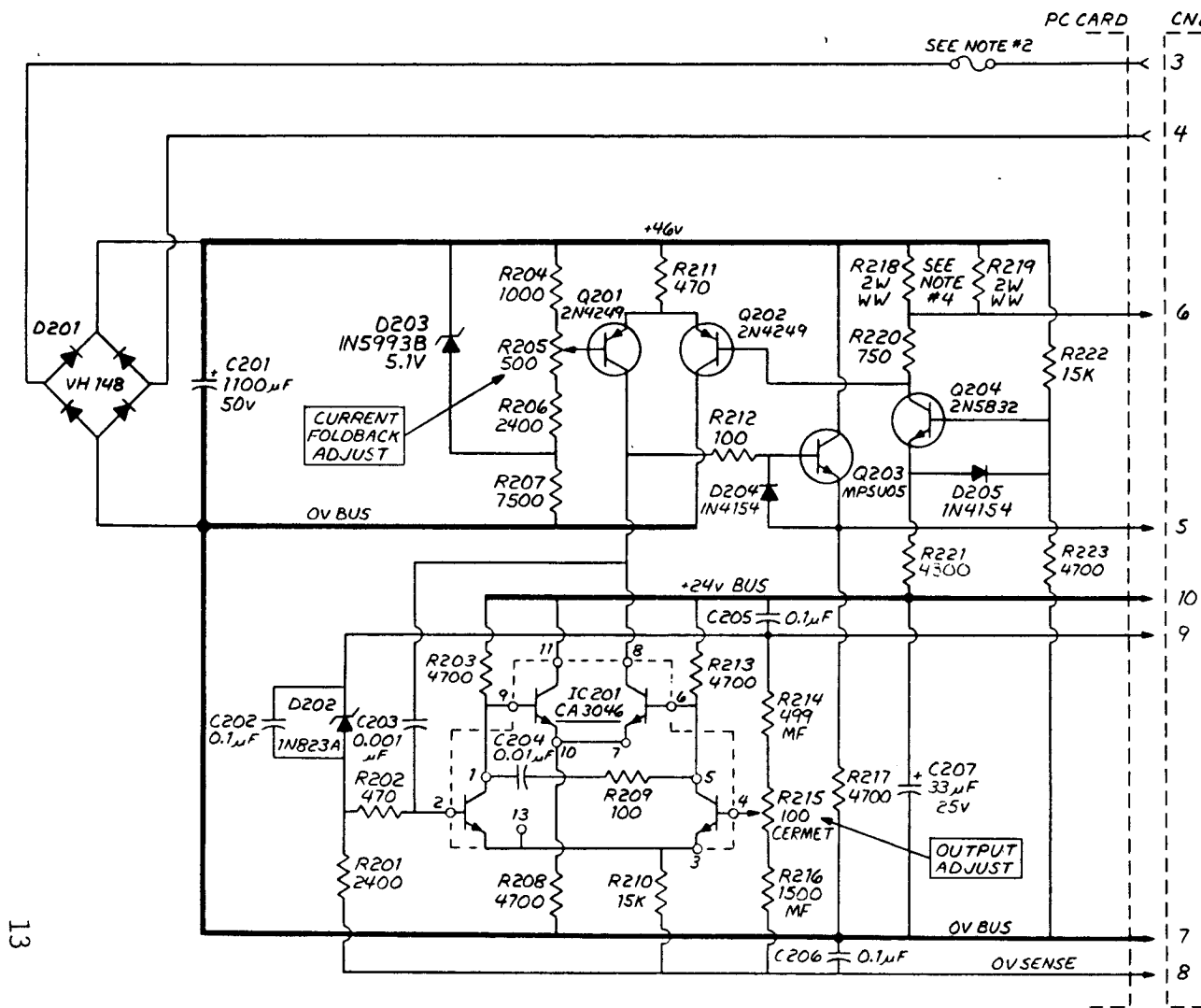
NOTES:

- (1) ALL RESISTORS $\frac{1}{4}$ W 5% DEPOSITED CARBON, EXCEPT AS NOTED.
- (2) 346A. COPPER WIRE, PC CARD PROTECTION.
- (3) ALL VOLTAGE MEASUREMENTS IN RESPECT TO GROUND (NO LOAD) 117VAC LINE INPUT.
- (4) RESISTOR VALUES ARE AS FOLLOWS FOR R418 AND R419:
 TC 909 - 2.7 Ω
 TC 910 - 1.6 Ω
 TC 911 - 1.3 Ω
 TC 930A - 1.6 Ω

8	84-196 THRU 84-200	11-5-84	D.E./SMH
7	84-138 THRU 84-142	6-13-84	D.E./SMH
6	83-93, 94, 95 & 96	7-14-83	D.E./SMH
5	81-280, 281, 282, 283, 284	12-09-81	D.E./SMH
4	81-17	1-26-81	D.E./SMH
3	75-124	9-10-75	R.C.S.
2	73-54	7-12-73	J.W.
1	73-34	4-16-73	R.C.S.
REV.	ECN NO.	DATE	BY

REVISIONS

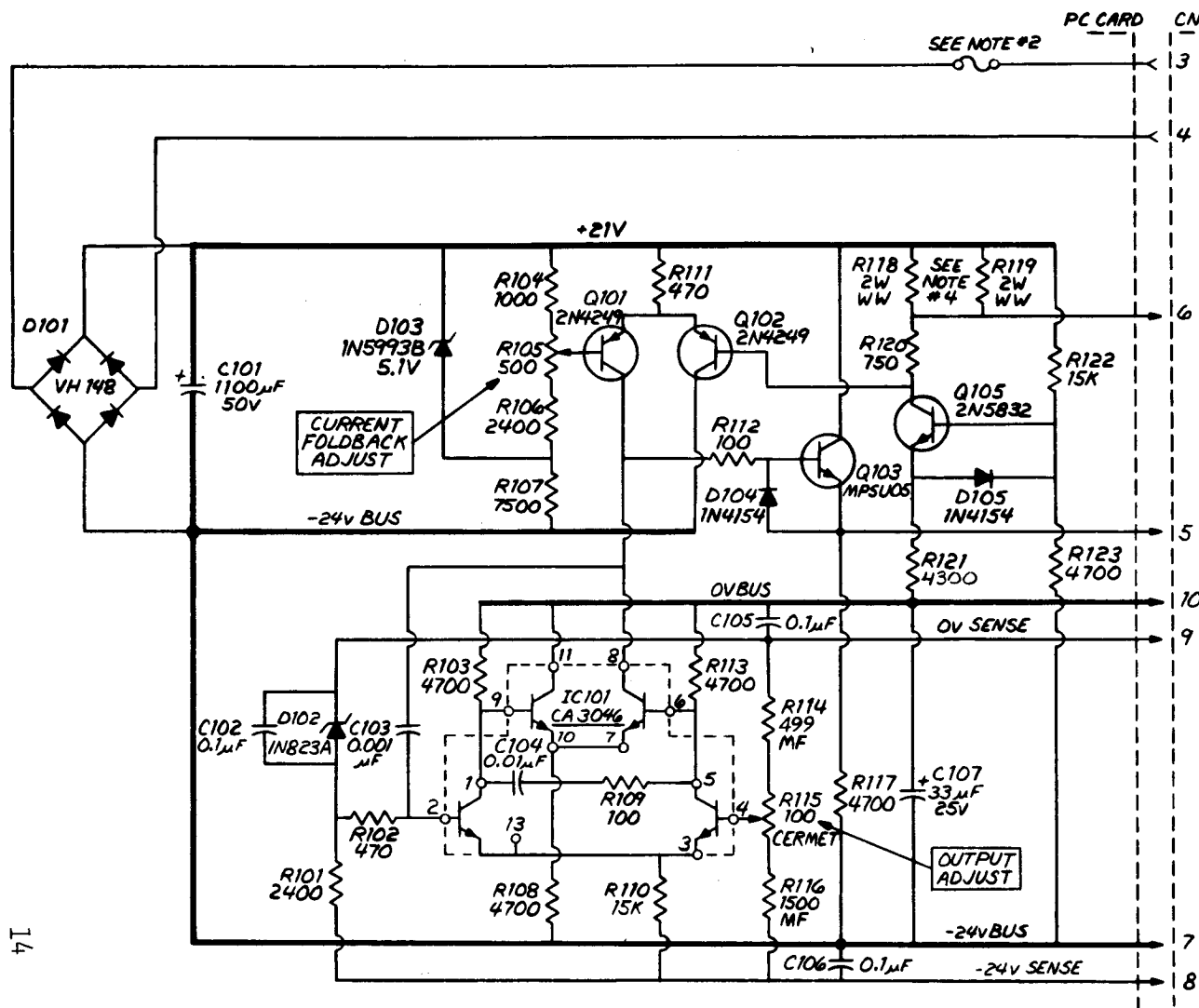
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P O BOX D, OAK RIDGE, TENNESSEE 37830			
TITLE TC 909-TC 910-TC 911-TC 930A -12V CIRCUIT DIAGRAM			
DESIGNED BY ART SMITH	DATE 1-16-73	FILED APPROVAL 1-16-73	PART NO.
CHECKED BY C. COFFEY	DATE 1-11-73	RELEASED BY W. B. BARNES	DATE
SCALE NONE			



- (1) ALL RESISTORS 1/4W 5% DEPOSITED CARBON, EXCEPT AS NOTED.
 (2) 34GA. COPPER WIRE, PC CARD PROTECTION.
 (3) ALL VOLTAGE MEASUREMENTS IN RESPECT TO GROUND (NO LOAD) 117 VAC LINE INPUT.
 (4) RESISTOR VALUES ARE AS FOLLOWS FOR R218 AND R219:
 TC 909-5.6Ω
 TC 910-3.6Ω
 TC 911-2.7Ω
 TC 930A-3.6Ω

8	84-196 THRU 84-200	11-5-84	D.E./SMH
7	84-138 THRU 84-142	6-13-84	D.E./SMH
6	83-93, 94, 95 & 96	7-14-83	D.E./SMH
5	82-85, 86, 87, 88, 89	5-11-82	D.G./SMH
4	81-280, 281, 282, 283, 284	12-09-81	D.E./SMH
3	81-17	1-26-81	D.E./SMH
2	75-123	9-10-75	R.C.S.
1	73-34	4-16-73	R.C.S.
REV.	ECN NO	DATE	BY

TENNELEC			
P O BOX D, OAK RIDGE, TENNESSEE 37830			
TC 909-TC 910-TC 911-TC 930A +24V CIRCUIT DIAGRAM			
DESIGNED BY ART SMITH	DATE 4-16-73	INSTR. APPROVAL R.S.	PART NO.
CHECKED BY C. COFFEY	DATE 1-10-73	DATE 4-16-73	DATE



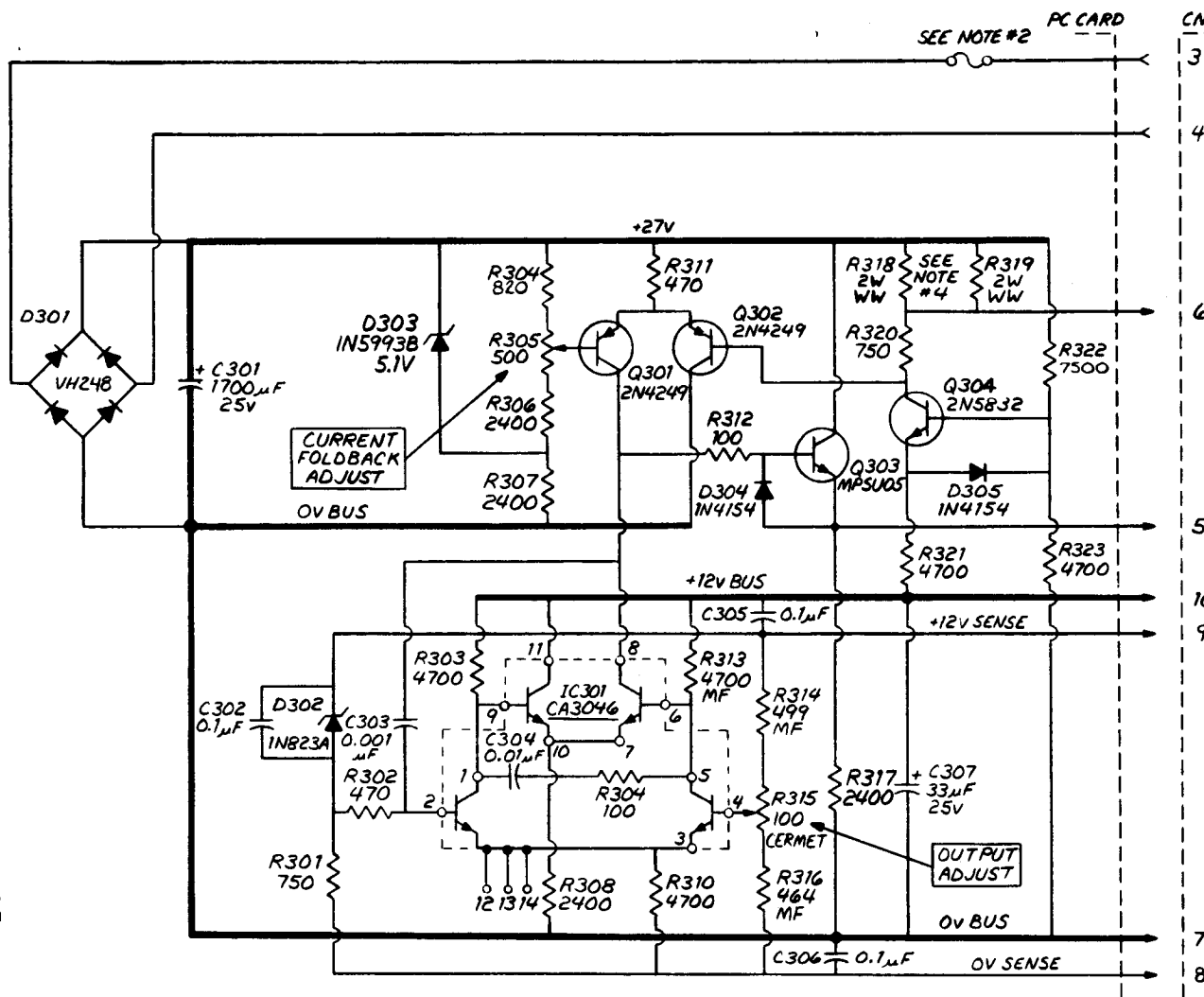
NOTES:

- (1) ALL RESISTORS 1/4 W 5% DEPOSITED CARBON, EXCEPT AS NOTED.
- (2) 34 GA. COPPER WIRE, PC CARD PROTECTION.
- (3) ALL VOLTAGE MEASUREMENTS IN RESPECT TO GROUND (NO LOAD) 117 VAC NO LOAD.
- (4) RESISTOR VALUES ARE AS FOLLOWS FOR R118 AND R119:
 TC 909-5.6 Ω
 TC 910-3.6 Ω
 TC 911-2.7 Ω
 TC 930A-3.6 Ω

8	84-196 THRU 84-200	11-5-84	D.E./SMH
7	84-138 THRU 84-142	6-13-84	D.E./SMH
6	83-93, 94, 95 & 96	7-15-83	D.E./SMH
5	82-85, 86, 87, 88, 89	5-11-82	DG/SMH
4	81-880, 281, 282, 283, 284	12-09-81	D.E./SMH
3	81-17	1-26-81	D.E./SMH
2	75-121	9-10-75	R.C.S.
1	73-34	4-16-73	R.C.S.
REV.	ECN NO.	DATE	BY

REVISIONS

TENNELEC			
P. O. BOX D, OAK RIDGE, TENNESSEE 37830			
TITLE TC 909-TC 910-TC 911-TC 930A -24V CIRCUIT DIAGRAM			
DESIGNED ART SMITH	DATE 8-16-78	ENG. APPROVAL C. COFFEY 1-10-78	PART NO.
SCALE NONE	RELEASED BY	DATE	DRAWING NO.



9	84-196 THRU 84-200	11-5-84	D.E./SMH
8	84-138 THRU 84-142	6-13-84	D.E./SMH
7	83-93, 94, 95 & 96	7-14-83	D.E./SMH
6	83-60	5-2-83	DG/SMH
5	81-280, 281, 282, 284	12-09-81	D.E./SMH
4	81-17	1-26-81	D.E./SMH
3	75-122	9-10-75	R.C.S.
2	73-54	7-12-73	J.W.
1	73-34	4-16-73	R.C.S.
REV.	ECN NO.	DATE	BY

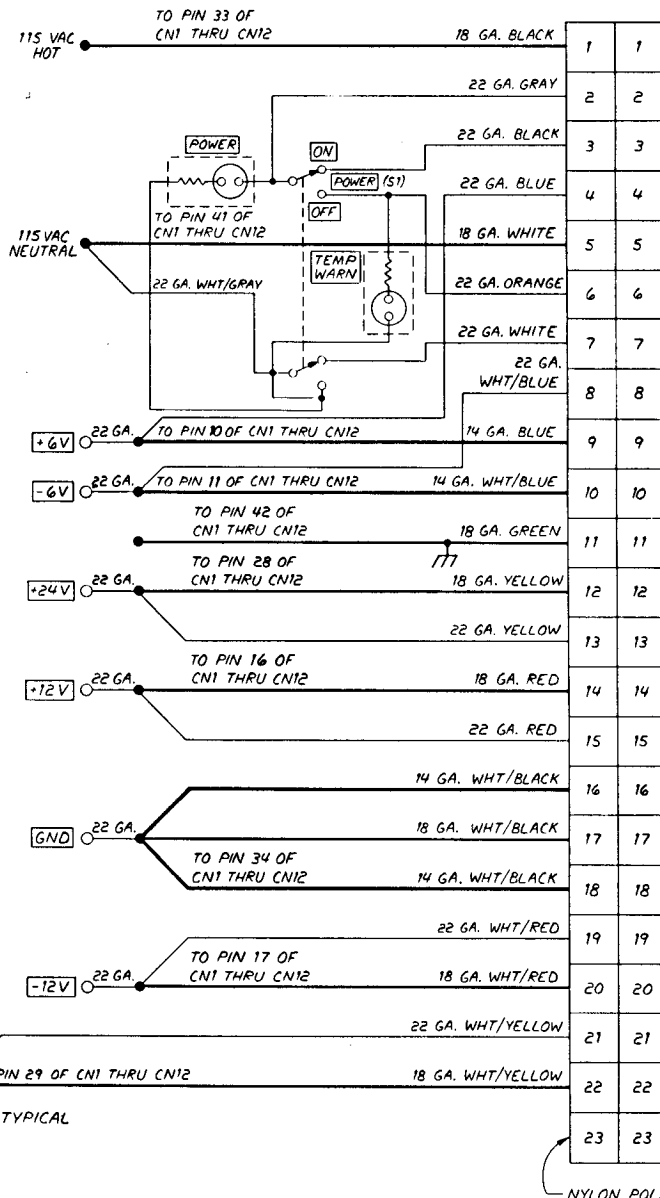
REVISIONS

- (1) ALL RESISTORS $\frac{1}{4}$ W 5% DEPOSITED CARBON, EXCEPT AS NOTED.
- (2) 34GA. COPPERWIRE, PC CARD PROTECTION.
- (3) ALL VOLTAGE MEASUREMENTS IN RESPECT TO GROUND (NO LOAD) 117 VAC LINE INPUT.
- (4) RESISTOR VALUES ARE AS FOLLOWS FOR R318 AND R319:
TC 909-2.7 Ω
TC 910-1.6 Ω
TC 911-1.3 Ω
TC 930A-1.6 Ω

<h1 style="text-align: center;">TENNELEC</h1> <p style="text-align: center;">P. O. BOX D, OAK RIDGE, TENNESSEE 37830</p>			
<p>TITLE</p> <p style="text-align: center;">TC 909-TC 910-TC 911-TC 930A +12V CIRCUIT DIAGRAM</p>			
ENGINEER	DATE	ENG APPROVAL	PART NO
ART SMITH		A.S. 4-16-73	
DRAWN BY	DATE	CHECK APPROVAL	OR-DRWG NO
C. COFFEY	1-12-73	G.W. BISHOP	
SCALE	RELEASED BY		DATE
NONE			

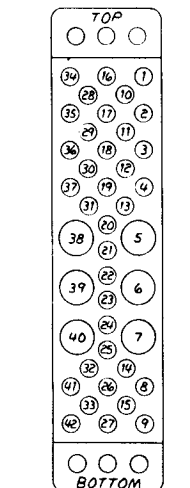
NOTES:

- (1) THE HIGH QUALITY GROUND BUS FEED WIRE AND THE POWER RETURN BUS FEED WIRE ARE CONNECTED TO GROUND GUIDE PIN. THESE MAY BE DISCONNECTED IF DESIRED.
- (2) REFER TO STANDARD NIM CATALOG #TID20893.

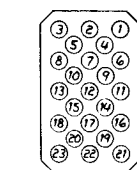


REV	ECN	DESCRIPTION	BY	APP	DATE
1	82-52	REDRAWN	D.E.	S.H.P.	9-22-82
2	82-21	WIRE COLOR / SIZE CHANGE	D.E.	S.H.P.	9-29-82
3	83-33	CORRECT PIN NUMBERING	D.E.	S.H.P.	3-16-82

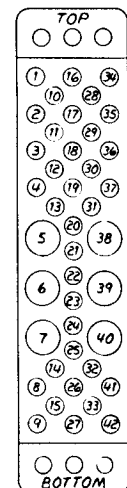
CN1 THRU CN12	
PIN	FUNCTION
1	+3 VOLTS
2	-3 VOLTS
3	SPARE
4	RESERVED
5	COAXIAL
6	COAXIAL
7	COAXIAL
8	+200 VOLTS D.C.
9	SPARE
10	+6 VOLTS
11	-6 VOLTS
12	RESERVED
13	CARRY NO. 1
14	SPARE
15	RESERVED
16	+12 VOLTS
17	-12 VOLTS
18	SPARE
19	RESERVED
20	SPARE
21	SPARE
22	RESERVED
23	RESERVED
24	RESERVED
25	RESERVED
26	SPARE
27	SPARE
28	+24 VOLTS
29	-24 VOLTS
30	SPARE
31	CARRY NO. 2
32	SPARE
33	117 VOLTS A.C. (H)
34	POWER RETURN GND.
35	RESET
36	GATE
37	SPARE
38	COAXIAL
39	COAXIAL
40	COAXIAL
41	117 VOLTS A.C. (N)
42	HIGH QUALITY GND.



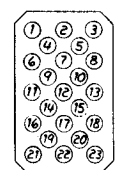
REAR VIEW
BIN CONNECTOR
AMP NO. 202516-3
(TYP. OF CN1 THRU CN12)
(ALL PINS FEMALE)



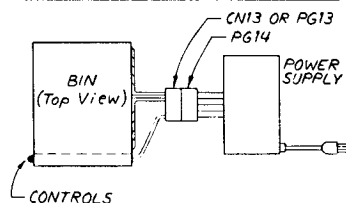
REAR VIEW
CN13 OR PG13 ON BIN
AMP NO. 202650-2
(ALL PINS MALE)



REAR VIEW
MODULE CONNECTOR
AMP NO. 202515-5
(ALL PINS MALE)



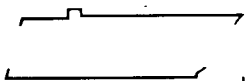
REAR VIEW
PG14 ON POWER SUPPLY
AMP NO. 202651-2
(ALL PINS FEMALE)



TENNELEC
P.O. BOX D, OAK RIDGE, TENNESSEE 37830

TENNEBIN 3
CIRCUIT DIAGRAM

BY: D. EDSELL 9-22-82
CHECKED: S. HANSHAW 82
DATE: 9-22-82
BY: S. HANSHAW 9-22-82
DATE: 9-22-82



INC.

601 OAK RIDGE TURNPIKE, P.O. BOX 2560, OAK RIDGE, TN 37831-2560, USA
PHONE 615-483-8405 TWX 810/572-1018